DM-NVX-SW-C310

DM NVX® 4K60 Network AV Software

Product Manual

Crestron Electronics, Inc.

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Overview

DM NVX® software is a flexible, IT-friendly companion to the DM NVX AV-over-IP hardware portfolio. The DM-NVX-SW-C310 encoder/decoder offers a software solution that is interoperable with DM NVX encoder/decoder hardware devices, providing the flexibility to mix DM NVX software and hardware endpoints in a DM NVX system. The platform enables visually lossless compression for crystal-clear video. Installation of DM-NVX-SW-C310 software on a computer enables DM NVX 4K60 encoding or decoding of a single AV stream over a Gigabit Ethernet network.

NOTES:

- DM-NVX-SW-C310 software is not interoperable with the DM-NVX-E10/D10 and DM-NVX-E20/D20/D200 Series encoders and decoders.
- The minimum cable required for DM NVX transport over 1000BASE-T Ethernet (copper) is unshielded CAT5e. A nonblocking network is required.

Features of DM-NVX-SW-C310 software include the following:

- DM NVX® encoder/decoder software
- Interoperability with DM NVX encoder/decoder hardware devices[1]
- Easy installation onto a computer running the Microsoft® Windows 10 or Windows 11 operating system (64 bit)
- Single-stream 4K60 video over standard Gigabit Ethernet
- Real-time video performance over the network
- Pixel Perfect Processing technology
- Enterprise-grade security including TLS and AES-128 (802.1X and Active Directory® credential management dependent on Windows® operating system settings)
- 4K60 video scaling capability integrated with Windows operating system setting
- Test pattern generator
- Fixed bit rate
- 2-channel PCM audio
- Interoperability with a Crestron 3-Series® or later control system
- XiO Cloud® service support
- API for full control of DM NVX encoder/decoder software
- License required per computer for one DM NVX stream

Windows® Application

DM-NVX-SW-C310 software runs on the 64-bit version of the Microsoft® Windows 10 or Windows 11 operating system. The DM NVX software package has modest system requirements and runs on most modern Windows computers.

Real Time 4K60 Video Performance

Engineered for demanding conference room and classroom applications, DM NVX technology ensures real-time, full-motion 4K60 video performance for the presentation of multimedia, videoconferencing, and live camera images. Interactive inputs from a gamepad or a mouse function seamlessly over DM NVX.

A DM NVX system also provides stability and 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.

Pixel Perfect Processing Technology

Pixel Perfect Processing technology provides flawless video transport in all applications. Depending on the operating mode, DM-NVX-SW-C310 software can encode or decode a video signal to achieve imperceptible end-to-end latency. The source image quality is maintained across a 1-Gigabit network at any resolution up to 4K60.

Enterprise-Grade Security

A DM NVX system delivers a true enterprise-grade network AV solution. DM-NVX-SW-C310 software uses advanced security features and protocols such as AES-128 content encryption, PKI authentication, TLS, and HTTPS. Support for 802.1X authentication and Active Directory® credential management is dependent on the Windows operating system settings.

Encoder or Decoder Functionality

DM-NVX-SW-C310 software is configurable to operate as either a network AV encoder or decoder. As an encoder, DM-NVX-SW-C310 software enables the user to select the screen to be transmitted over the network to one or more decoders. As a decoder, DM-NVX-SW-C310 software receives the signal from a DM NVX encoder and feeds it to the viewer window. The decoder can quickly and easily switch between multiple encoders on the network. Encoder and decoder operating modes can be changed dynamically in less than 1 minute by using a web browser or a control system.

Test Pattern Generator

When DM-NVX-SW-C310 software is configured as an encoder, the built-in test pattern generator can be used during setup to ensure that video streaming is functional and can also be used as a tool for the adjustment, calibration, and alignment of displays and projectors. The DM NVX encoder can send the test pattern to any routed DM NVX decoder.

Fixed Bit Rate

In DM NVX encoder mode, a web interface or control system can be used to set a fixed bit rate ranging from 150Mbps to 500 Mbps.

Network Adapter Selection

Network adapter selection enables network traffic to be segregated based on traffic type. For an encoder and decoder, the desired management network adapter can be selected for management traffic on the network. For an encoder only, the desired stream network adapter can be selected for the transmitted AV stream.

Web Interface for Software Configuration

DM-NVX-SW-C310 software configuration is accomplished by using a web browser. Full control and monitoring of the software is enabled through control system integration.

Licensing

A license is required for DM-NVX-SW-C310 software on a per-computer basis for a single stream. DM-NVX-SW-C310 provides two licensing options: online licensing via the XiO Cloud® service or offline licensing via the USB-OFFLINE dongle.

For online licensing via the XiO Cloud service, the DM-NVX-SW-C310 requires access to XiO Cloud to validate its licenses. An active XiO Cloud account is required, subject to the terms of the Crestron Cloudware License. However, a paid XiO Cloud subscription is not required to manage licenses for the DM-NVX-SW-C310.

For offline licensing via the USB-OFFLINE dongle, the dongle must be connected to the computer to validate the license. The license must be ordered and the Offline License form must be completed prior to validating the license.

Any existing DM-NVX-SW-C310 licenses within the XiO Cloud service cannot be converted to offline licenses. If switching your DM-NVX-SW-C310 installation from online to offline licensing mode, a new license must be purchased.

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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.

Specifications

System Requirements - Minimum

Hardware	Processor: Intel® Core™ i7, 12th generation with 12 cores; RAM: Dual-channel memory, 2 x 8 GB; Wired Ethernet Network Interface: 1 Gb
Operating System	Windows 10 or Windows 11, 64 bit

Encoding/Decoding

Stream Type	Pixel Perfect Processing
Video Resolutions	Up to 4096x2160@60Hz (DCI 4K60)
Audio Format	2-channel PCM
Bit Rates	150 to 500 Mbps
Streaming Protocols	RTP, SDP
Container	MPEG-2 transport stream (.ts)
Session Initiation	Multicast via secure RTSP
Copy Protection	AES-128, PKI

Video

Scaler	Scaling capability integrated with Windows operating system setting

Communications

Ethernet	Auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, SSL, TLS, variable Multicast TTL, HTTPS web browser setup and control, Crestron 3-Series® or later control system integration; IEEE 802.1X, Active Directory® credential management, and IPv4 dependent on Windows operating system settings
DM NVX via Ethernet	AES-128 AV content encryption with PKI authentication, RTP, secure RTSP, SDP, ONVIF, IGMPv2, SMPTE 2022

Application Drawings

This section contains examples of projects utilizing the DM NVX software.

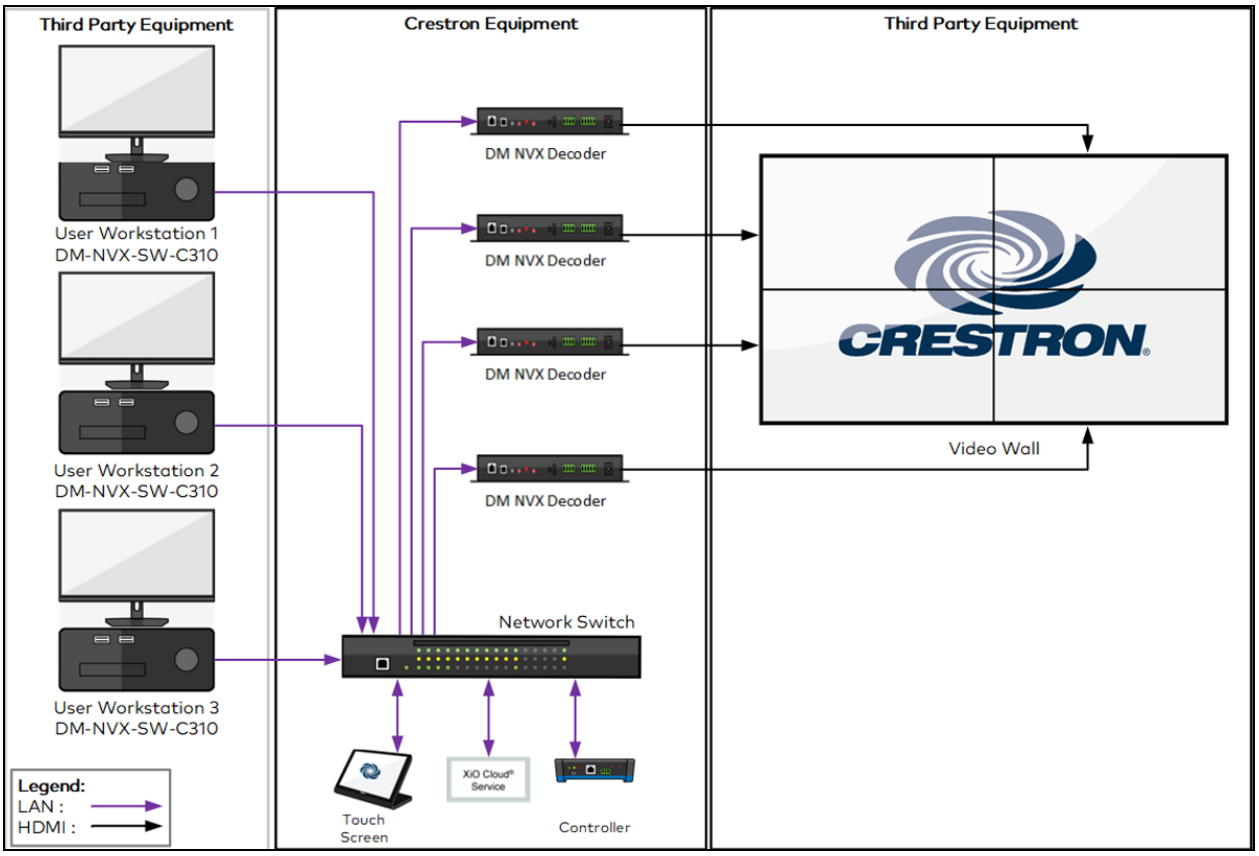
- Routing Multiple Workstations to One Video Wall
- Routing a Lectern to Multiple Projectors

Routing Multiple Workstations to One Video Wall

In this scenario, multiple workstations running DM NVX software are being routed to a video wall.

- A touch panel offers users an additional interface to control video switching.
- A control processor has been added to control video switching and the touch panel.
- With the XiO Cloud service, supported devices are managed remotely.

This setup is ideal for a Command and Control or Emergency Operations Center.

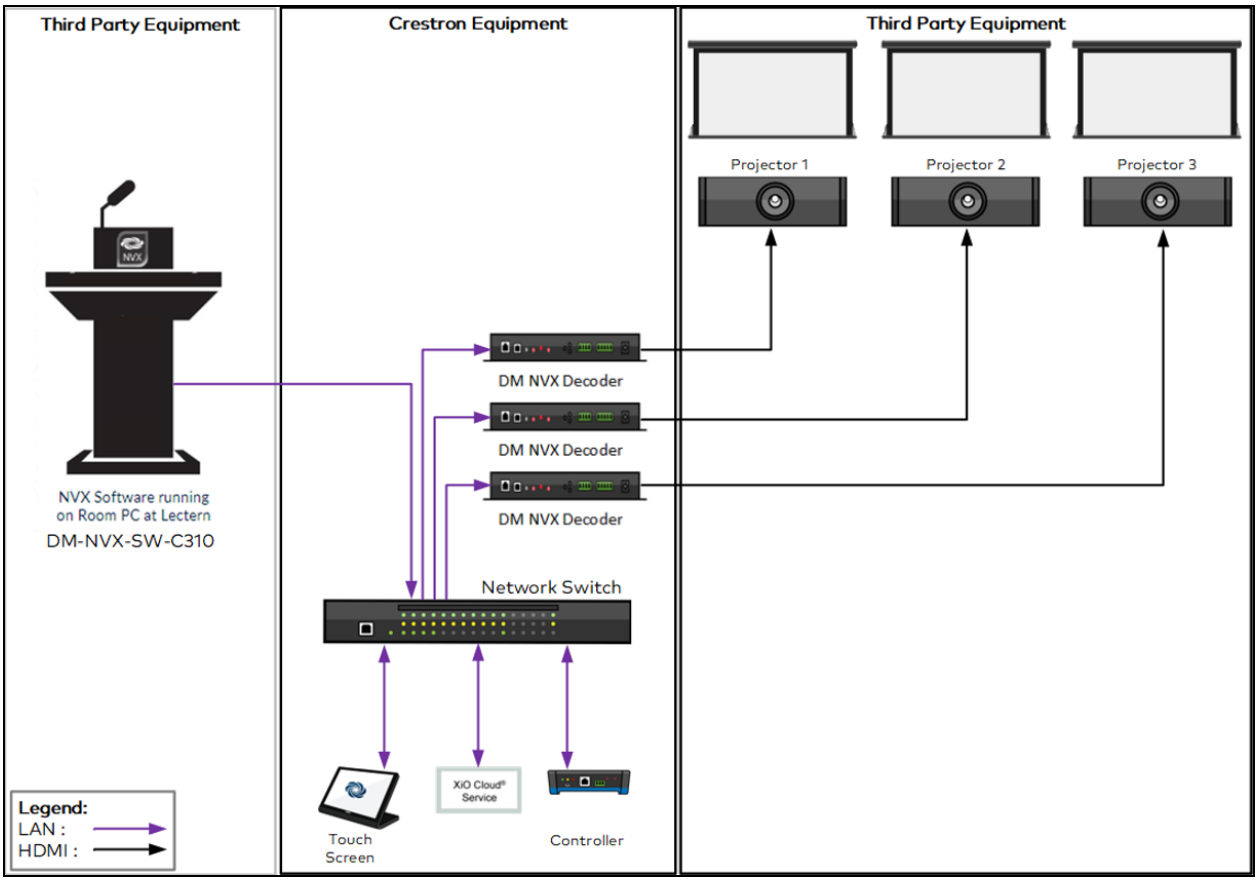


Routing a Lectern to Multiple Projectors

In this scenario, a presentation from a lectern running DM NVX software is being routed to multiple projectors.

- A touch panel offers users an additional interface to control video switching.
- A control processor has been added to control video switching and the touch panel.
- With the XiO Cloud service, supported devices are managed remotely.

This setup is ideal for a classroom, lecture hall, or auditorium.



Installation

This section provides information about the following:

- Licensing
- System requirements
- Installing the DM NVX software
- Using the DM NVX main page
- Closing the DM NVX main page
- Opening the DM NVX background application
- Exiting the DM NVX application

Licensing

For information on licensing, refer to Activating Licenses on page 67.

System Requirements

DM NVX software must be installed on a computer that meets the minimum system requirements listed in the following table.

System Requirements - Minimum

Hardware	Processor: Intel® Core™ i7, 12th generation with 12 cores; RAM: Dual-channel memory, 2 x 8 GB; Wired Ethernet Network Interface: 1 Gb
Operating System	Windows 10 or Windows 11, 64 bit

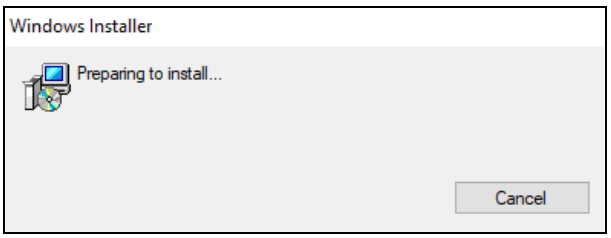
Installing the DM NVX Software

To install the DM NVX software on a computer:

1. Download the latest DM NVX software (*.msi).
2. Copy the *.msi file to the desired location on the computer.
3. Double-click the *.msi file.

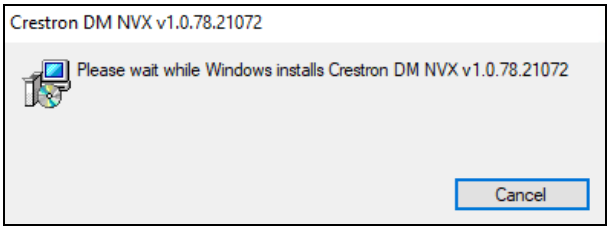
   The Windows Installer dialog box opens, indicating that the Windows operating system is preparing to install the DM NVX software.

   Windows Installer Dialog Box



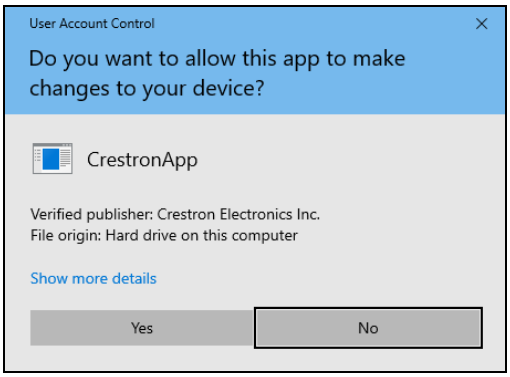
   A Windows dialog box opens, prompting that you wait while the Windows operating system installs the DM NVX software.

   Windows Dialog Box for DM NVX Software Installation



   The User Account Control dialog box opens, prompting whether the DM NVX application can make changes to your device.

   User Account Control Dialog Box

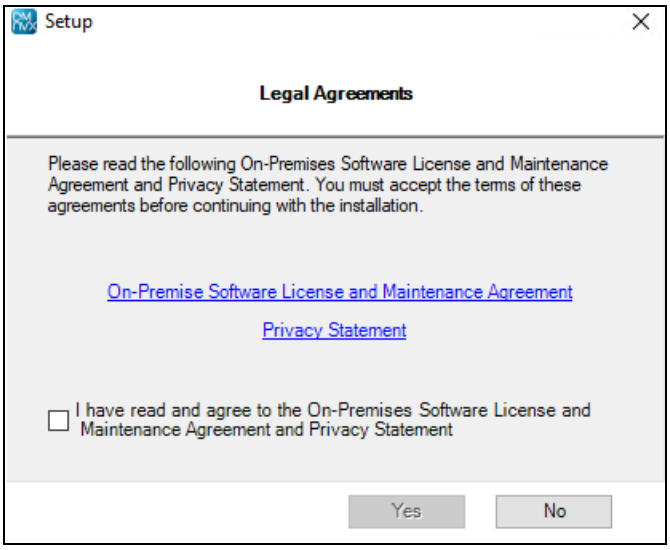


4. Proceed as follows:
    a. If desired, click **Show more details** to view additional information about the DM NVX application.
    b. Click **Yes** to enable the DM NVX application to be installed and changes to be made to your device.

       A Windows dialog box opens, indicating that the required information is being gathered. The dialog box then displays the time remaining for completion of the DM NVX software installation.

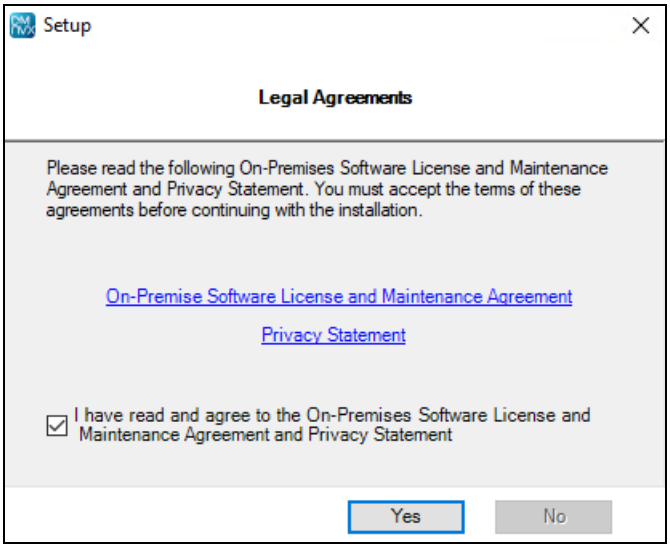
       The Legal Agreements dialog box opens, indicating that the On-Premise Software License and Maintenance Agreement and the Privacy Statement must be read and accepted before the installation process can be continued.

       Legal Agreements Dialog Box



5. Read the legal agreements, and then do the following:
   a. Select the checkbox to specify that you have read and agree to the legal agreements.

      Legal Agreements Dialog Box with Checkbox Selected

   b. Click **Yes**.

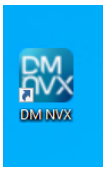
      Either of the following occurs depending on whether the minimum system requirements are met:

- If the minimum system requirements are met, a series of DM NVX splash screens appears on the desktop while the Windows operating system installs the DM NVX software.

DM NVX Splash Screen (Initial Screen Shown)

When display of the splash screens completes, the DM NVX icon appears on the desktop of the computer.

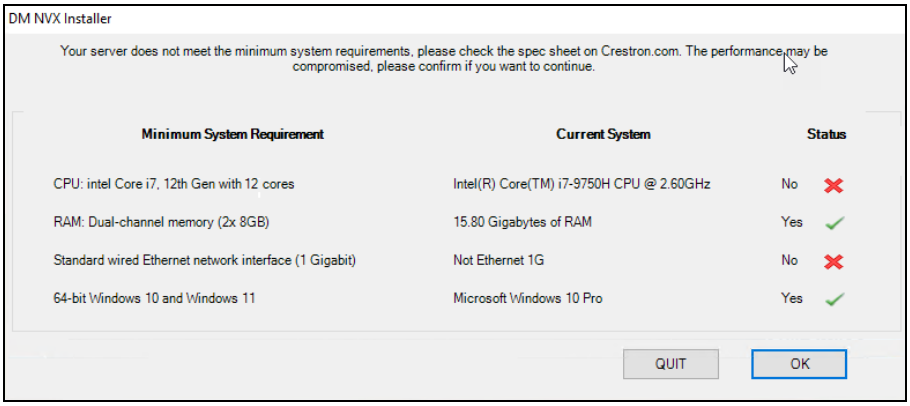
DM NVX Desktop Icon



In addition, the DM NVX main page opens. Refer to Using the DM NVX Main Page for information.

- If the minimum system requirements are not met, the DM NVX Installer dialog box opens.

  Sample DM NVX Installer Dialog Box Indicating Minimum Requirements Not Met



  When a system requirement is met, the **Status** column indicates **Yes** followed by a green check mark (✓). When a system requirement is not met, the **Status** column indicates **No** followed by the letter **x** in red (✗).

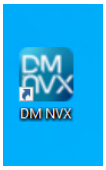
  Do either of the following:

  - Click **QUIT** to cancel the installation process. Ensure that the computer meets the minimum system requirements before attempting to install the DM NVX software a second time.
  - Click **OK** to continue with the installation and be aware that performance may be compromised. A series of DM NVX splash screens then appear on the desktop while the Windows operating system installs the DM NVX software.

    DM NVX Splash Screen (Initial Screen Shown)

    When display of the splash screens completes, the DM NVX icon appears on the desktop of the computer.

DM NVX Desktop Icon



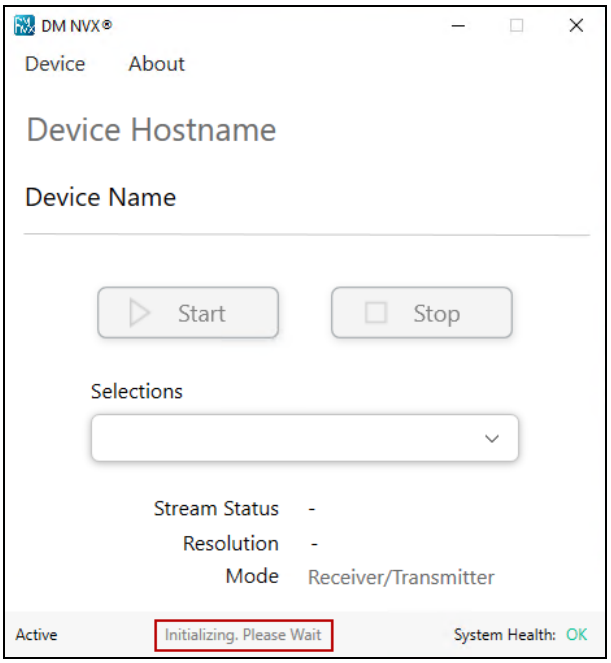
In addition, the DM NVX main page opens. Refer to Using the DM NVX Main Page for information.

Using the DM NVX Main Page

> **NOTE:** After installation of the DM NVX software, restart the computer before using the DM NVX main page.

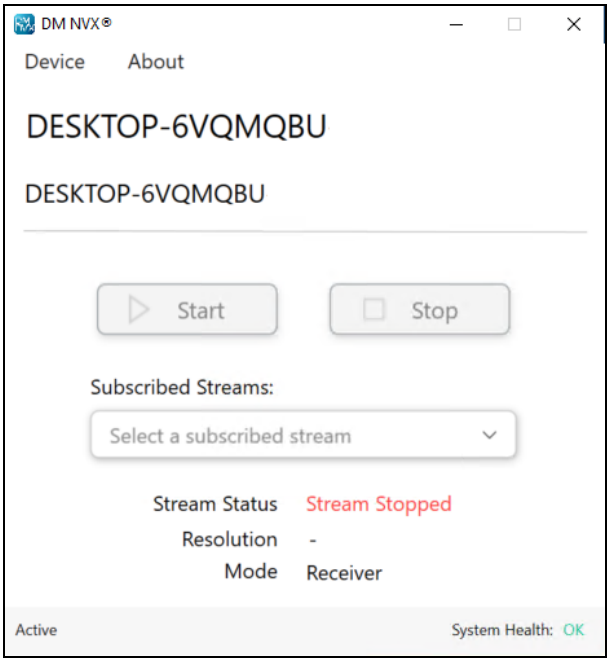
When the DM NVX main page opens for the first time, the page indicates the initialization process, which takes about 20 seconds to complete.

DM NVX Main Page - Initialization



The DM NVX main page then appears as shown in the following example.

DM NVX Main Page Example



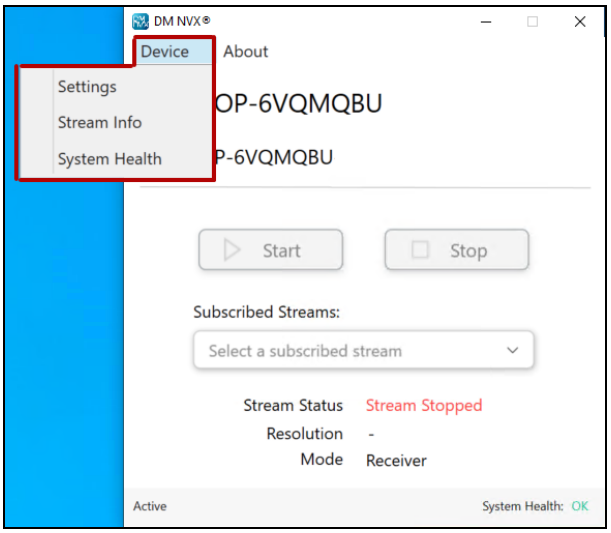
The main page provides the following items:

- Device Menu
- About Menu
- Device Hostname
- Device Name
- Start and Stop Buttons
- Subscribed Streams (DM NVX receiver mode only)
- Screen Selection (DM NVX transmitter mode only, not shown in the DM NVX main page above)
- Stream Status
- Resolution
- Mode
- Active or Demo
- System Health

Device Menu

Clicking **Device** on the DM NVX main page opens the Device menu.

DM NVX Main Page - Device Menu



The Device menu consists of the following options:

- Settings
- Stream Info
- System Health

Settings

Clicking **Settings** in the Device menu accesses the web interface of the DM NVX software. The web interface provides status information and enables configuration of the software. For information about using the web interface, refer to Configuration.

Stream Info

Clicking **Stream Info** in the Device menu displays the hostname of the DM NVX software endpoint and information related to the AV stream.

Stream Info (Default Screen Example Shown)

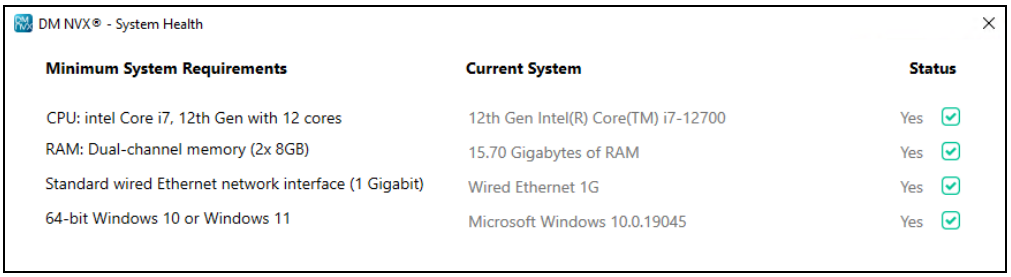
The following information is displayed:

- **Mode:** Indicates the operating mode of the DM NVX software endpoint: **Transmitter** or **Receiver**. The default operating mode is **Receiver**.
- **Multicast Address:** Indicates the multicast address assigned to the transmitter
- **Stream Location:** Displays the RTSP (Real Time Streaming Protocol) URL of the transmitter
- **Resolution:** Indicates the video resolution of the stream

System Health

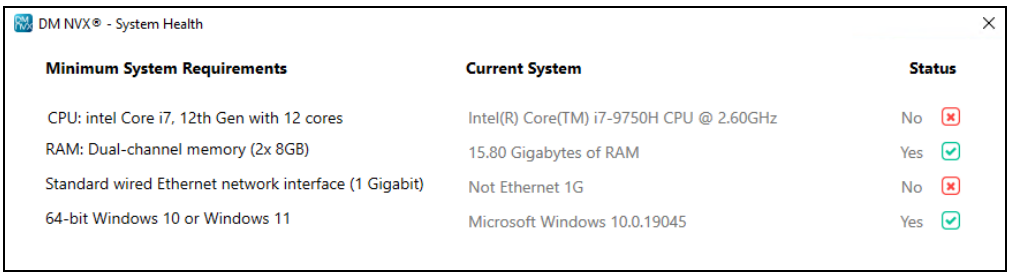
Clicking **System Health** in the Device menu displays the minimum system requirements, the current system, and the system requirements status. The following screen indicates that all system requirements are met.

System Health - All System Requirements Met



When a system requirement is met, the **Status** column indicates **Yes** followed by a green check mark in a green checkbox (). When a system requirement is not met, the **Status** column indicates **No** followed by a red letter **x** in a red checkbox (). The following screen indicates that some system requirements are not met.

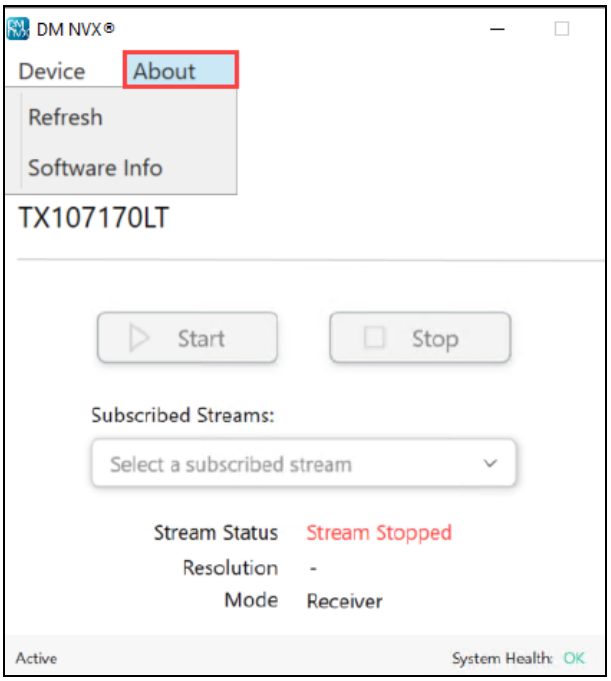
Sample System Health - System Requirements Not Met



About Menu

Clicking **About** on the DM NVX main page opens the About menu.

DM NVX Main Page - About Menu



The **About** menu consists of the following options:

- Refresh
- Software Info

Refresh

Clicking **Refresh** in the About menu refreshes the DM NVX main page.

Software Info

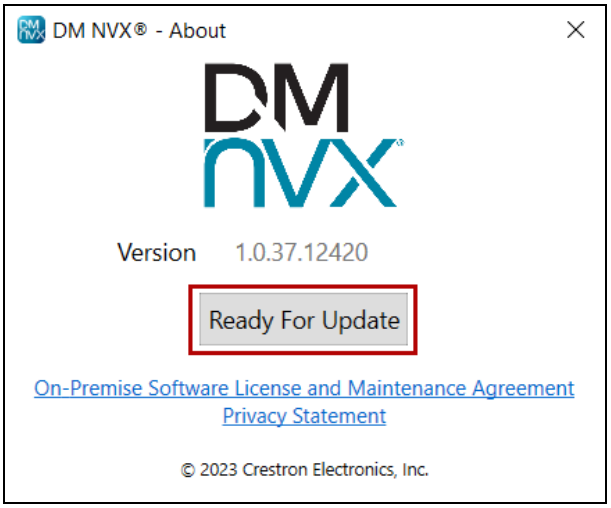
Clicking **Software Info** in the About menu provides a dialog box that displays the version of the DM NVX software and also enables update of the software.

If the software is the latest version, the **Software Info** dialog box indicates **All Up To Date**.

About Menu - Software Info, All Up To Date

If the software is not the latest version, update the software by clicking the **Ready for Update** button.

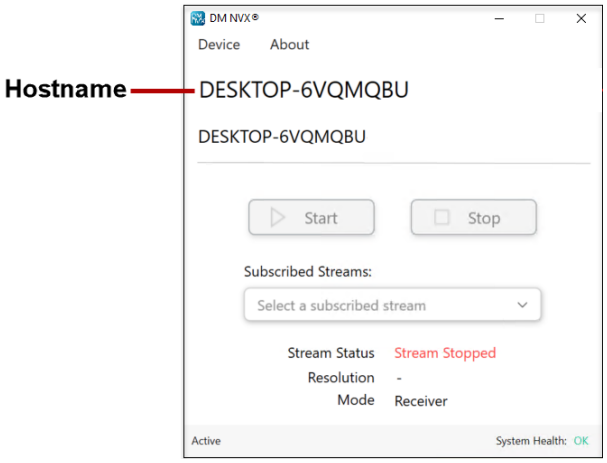
About Menu - Software Info, Ready for Update



Device Hostname

The DM NVX main page displays the hostname of the computer running the DM NVX software.

DM NVX Main Page - Hostname Example

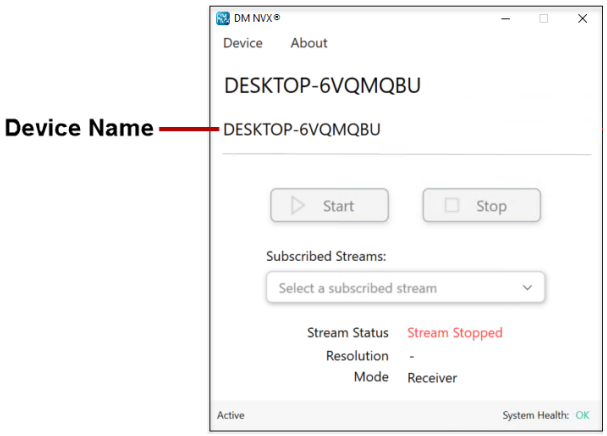


The default hostname is the computer name of the DM NVX software endpoint. In the hostname example above, the computer name is DESKTOP-6VQMQBU.

Device Name

The DM NVX main page displays the device name assigned to the computer running the DM NVX software.

DM NVX Main Page - Device Name Example

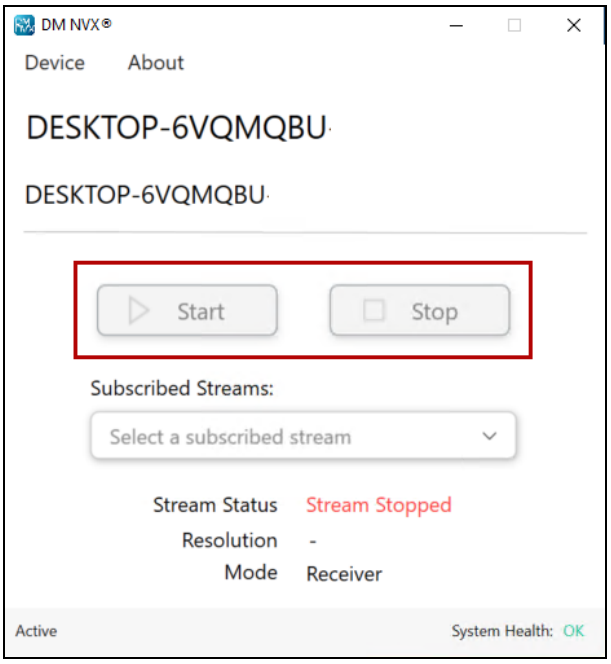


The default device name is the same as the default hostname. For information about assigning a new device name using the web interface, refer to Stream in the Configuration section of this documentation.

Start and Stop Buttons

Clicking the **Start** and **Stop** buttons enables AV streaming to be started or stopped, respectively.

DM NVX Main Page - Start and Stop Buttons

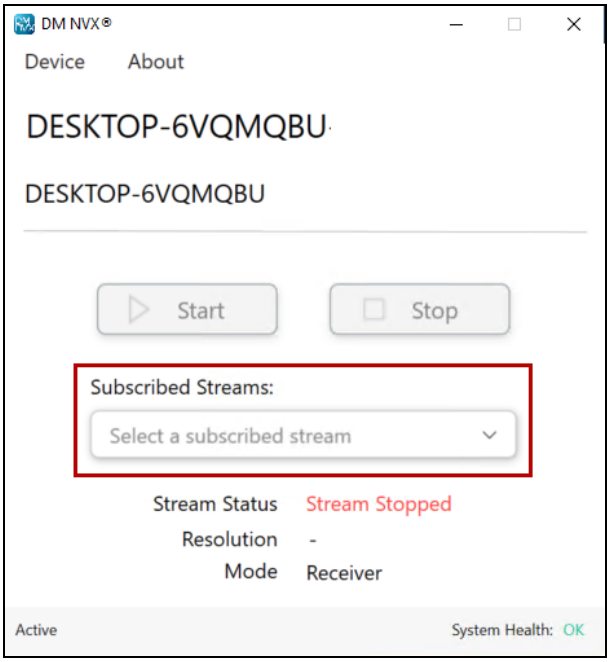


Subscribed Streams (Receiver Mode Only)

When the DM NVX software is operating in Receiver mode (default setting), **Subscribed Streams** enables the desired stream to be selected. For information about stream subscriptions, refer to Subscriptions in the Configuration section of this documentation.

> **NOTE:** The **Subscribed Streams** drop-down list may not reflect the complete list of streams added in the web interface of the DM NVX software.

DM NVX Main Page - Subscribed Streams (Receiver Mode Only)

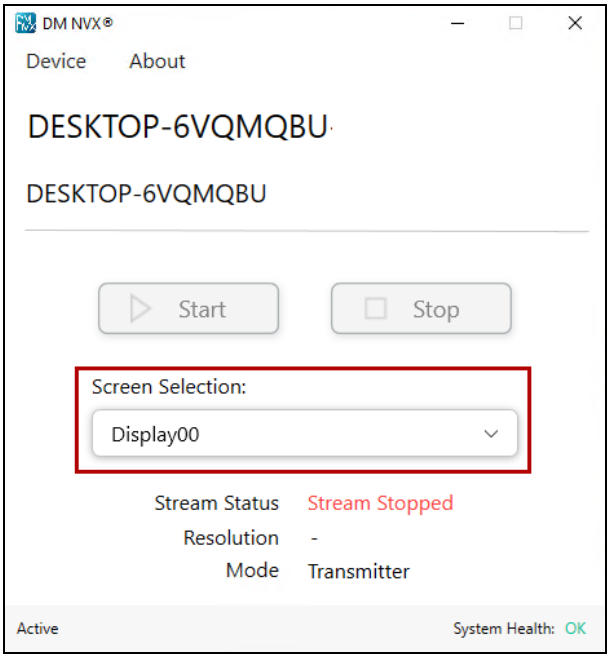


Screen Selection (Transmitter Mode Only)

When the DM NVX software is operating in Transmitter mode, **Screen Selection** enables selection of the desired screen whose desktop content is to be transmitted over the network. The available options are inherited from the host computer's Windows Display Settings.

> **NOTE:** Dynamic display changes are not supported.

DM NVX Main Page - Screen Selection (Transmitter Mode Only)

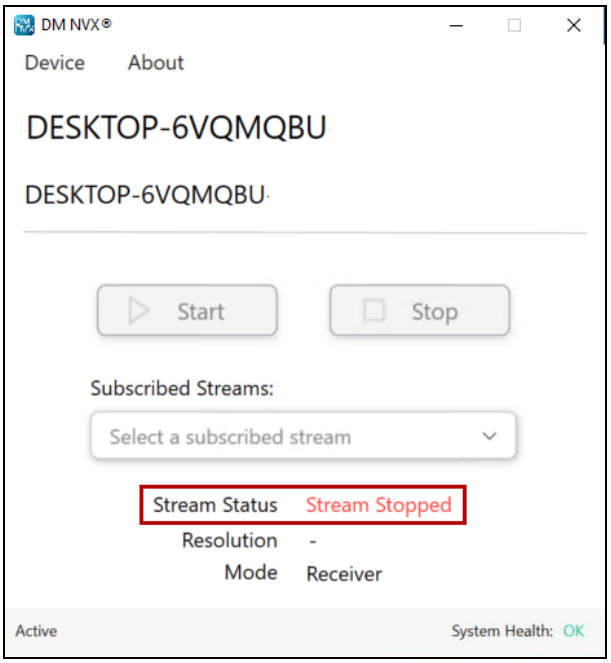


> **NOTE:** If a stream has been started for the selected screen, the stream will stop when a different screen is selected and the stream of the newly selected screen will automatically start.
>
> If a stream has not been started for the selected screen and a different screen is selected, the stream of the newly selected screen must be started manually.

Stream Status

Stream Status displays the status of a stream: **Stream Stopped** (default setting), **Stream Started**, or **Connecting**.

DM NVX Main Page - Stream Status

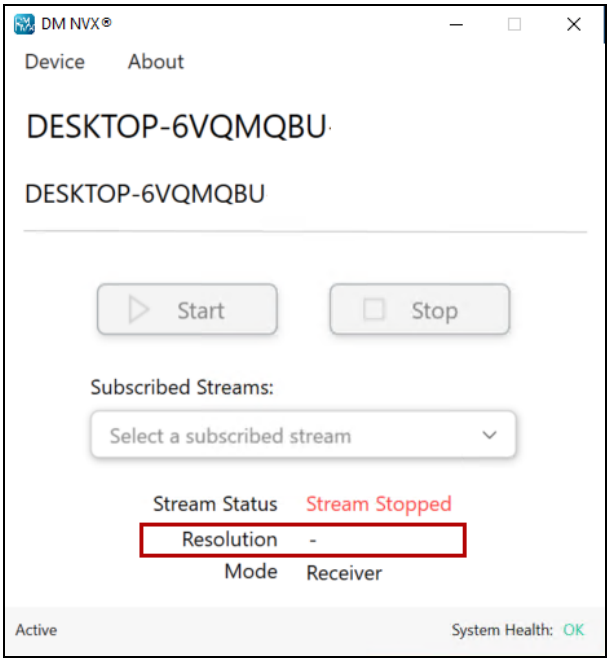


Resolution

Resolution displays the resolution of the stream. If no video is streaming, a hyphen (-) is displayed.

> **NOTE**: Until a complete chain of encoder and decoder is established, **Resolution** will remain empty.

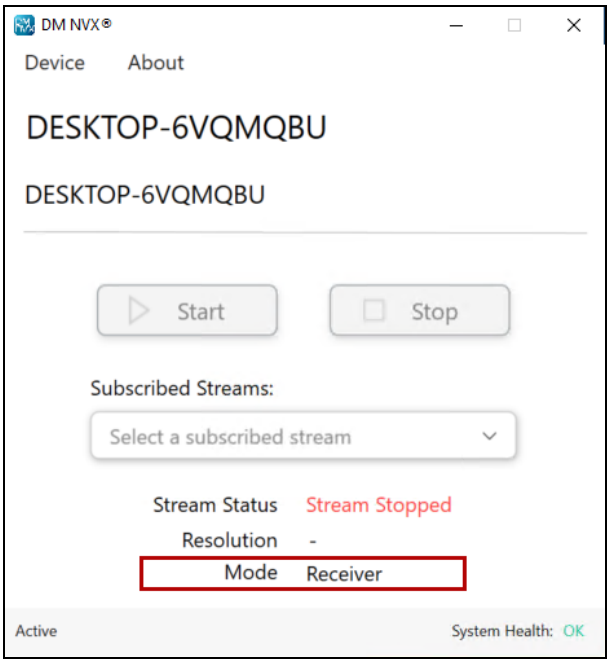
DM NVX Main Page - Resolution



Mode

Mode displays the operating mode of the DM NVX software endpoint as either a transmitter or a receiver. The default mode is **Receiver**.

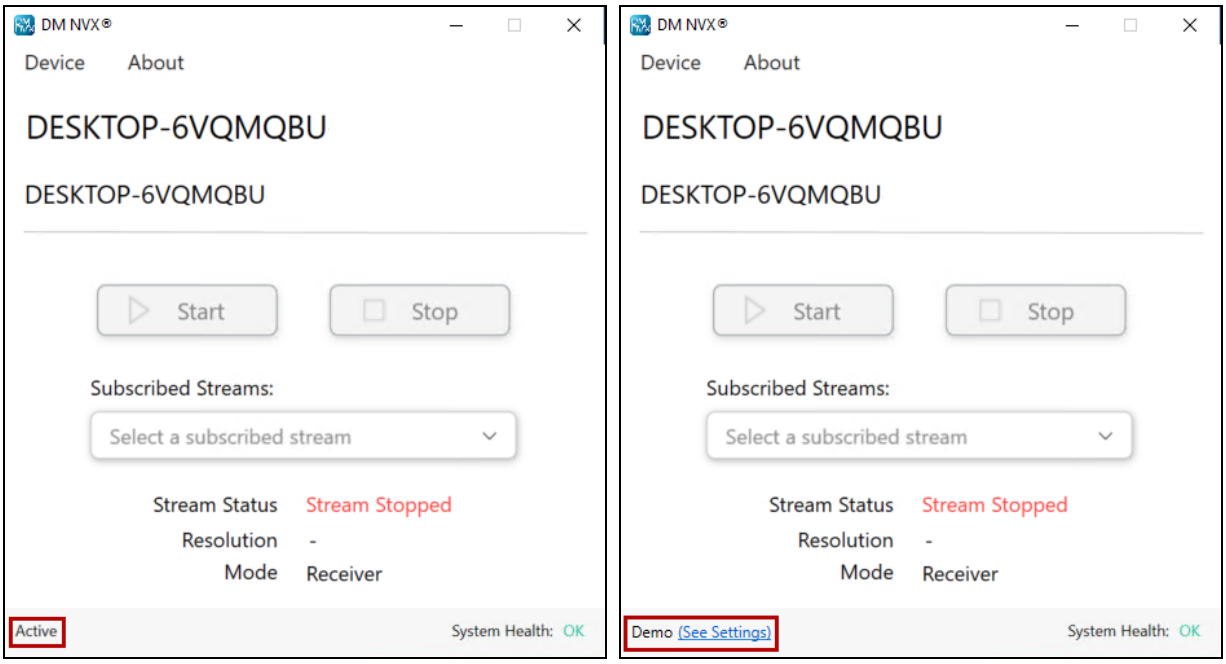
DM NVX Main Page - Mode



Active or Demo

Licensing status is indicated in the lower-left corner of the DM NVX main page.

DM NVX Main Page - Licensing Status, Active or Demo



As shown in the main pages above, licensing status is displayed as either of the following:

- **Active:** Indicates that the DM NVX software is licensed.

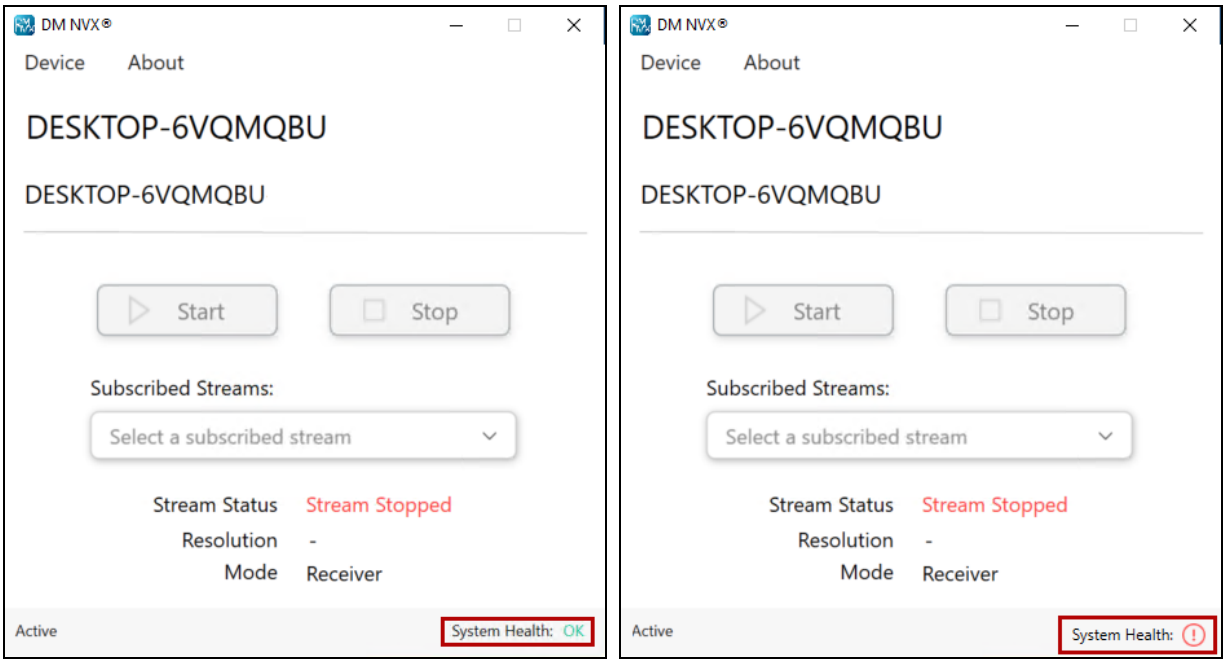
  For information about activating the license, refer to Activating Licensing in the Configuration section of this documentation.
- **Demo:** Indicates that the DM NVX software is not licensed. Clicking **See Settings** accesses the web interface of the DM NVX software.

  For information about obtaining a license, refer to Licensing.

System Health

System health is indicated in the lower-right corner of the DM NVX main page.

DM NVX Main Page - System Health, OK or !



As shown in the main pages above, system health is indicated as either of the following:

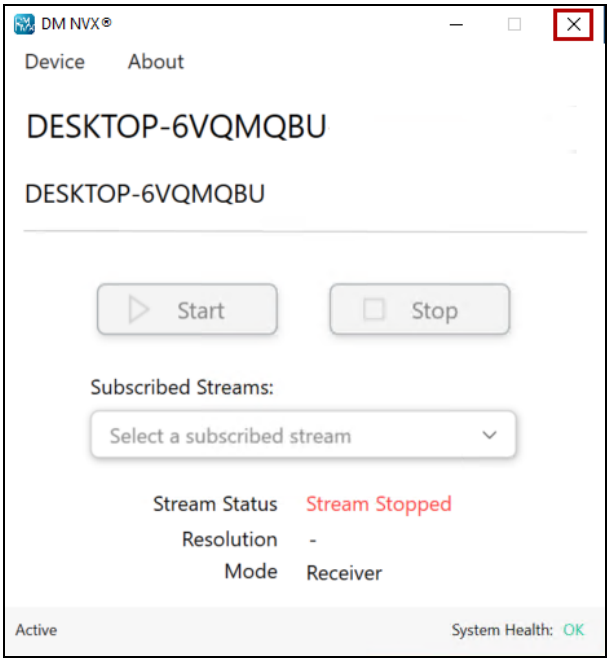
- **OK** in green (OK): Indicates that the system health of the computer meets the system requirements.
- Red exclamation point in a red circle (!): Indicates that the system health of the computer does not meet the system requirements. Clicking the red circle and exclamation point displays the status of the various system requirements of the computer.

Closing the DM NVX Main Page

> **NOTE:** When the DM NVX main page is closed, the DM NVX application continues to run in the background.

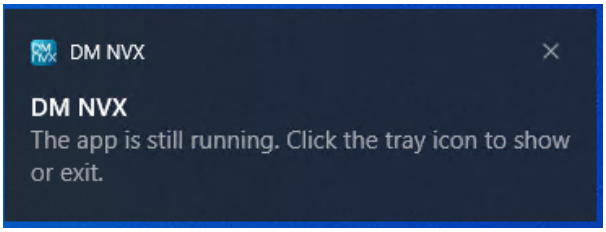
To close the DM NVX main page, click the **x** in the upper-right corner.

DM NVX Main Page



A message box opens in the lower-right corner of the desktop, stating that the DM NVX application is still running.

DM NVX Message Box



As indicated in the message box, click the DM NVX system tray icon to do either of the following:

- Show the DM NVX main page again. Refer to Opening the DM NVX Background Application for information.
- Exit the DM NVX application and prevent it from running. Refer to Exiting the DM NVX Application for information.

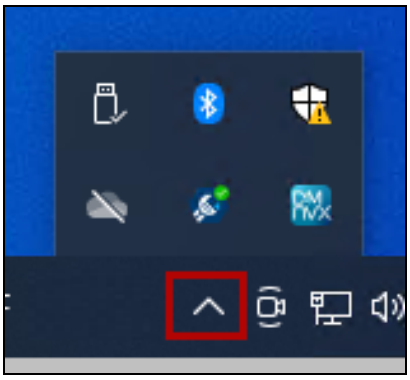
To close the DM NVX message box, click the **x** in the upper-right corner.

Opening the DM NVX Background Application

To open the DM NVX application when it is running in the background and enable display of the DM NVX main page, do the following:

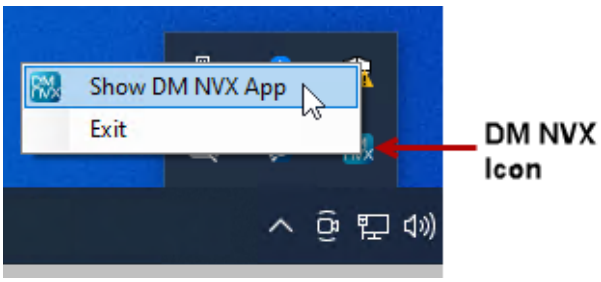
1. Open the Windows system tray by clicking the caret (^) located in the lower-right corner of the Windows taskbar.

   System Tray Example

2. Right-click the DM NVX icon and select **Show DM NVX App**.

   DM NVX System Tray Icon - Show DM NVX App

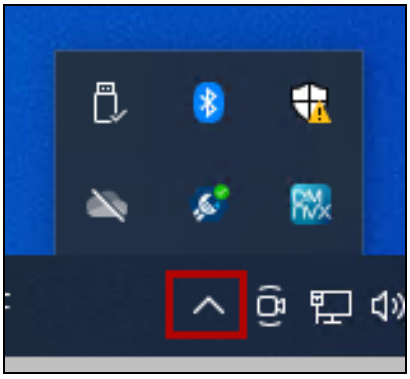
   The DM NVX main page opens, displaying the last main page that was closed.

Exiting the DM NVX Application

To exit the DM NVX application and prevent it from running in the background:

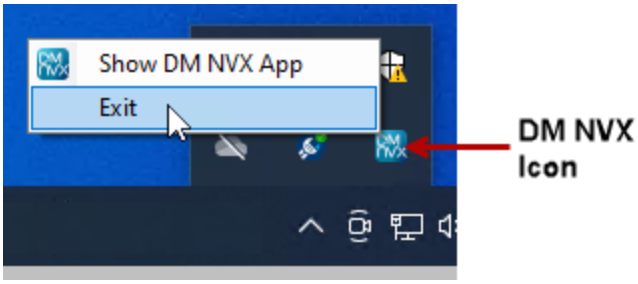
1. Open the Windows system tray by clicking the caret (^) located in the lower-right corner of the Windows taskbar.

   System Tray Example

2. Right-click the DM NVX icon and select **Exit**.

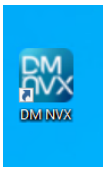
   DM NVX System Tray Icon - Exit

   The DM NVX main page closes and the DM NVX icon is removed from the system tray.

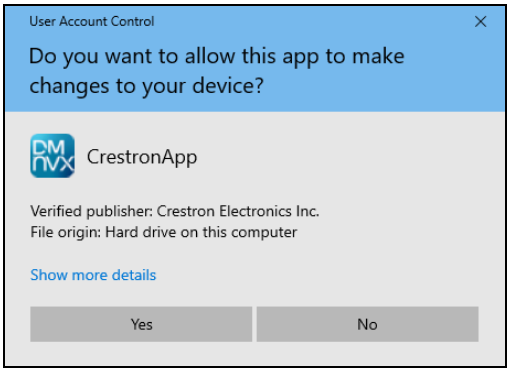
To reopen the DM NVX application, double-click the DM NVX desktop icon.

DM NVX Desktop Icon



The User Account Control dialog box opens, prompting whether the DM NVX application can make changes to your device.

User Account Control Dialog Box



Clicking **Yes** enables the DM NVX main page to open, displaying the initialization page followed by the last main page that was exited.

Configuration

NOTE: Prior to configuration, ensure that the latest DM NVX software version is running on the computer. Refer to Software Info for information.

DM NVX software provides a web interface that enables viewing of status information and configuration of the DM NVX software encoder or decoder.

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
- Activating licensing

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.

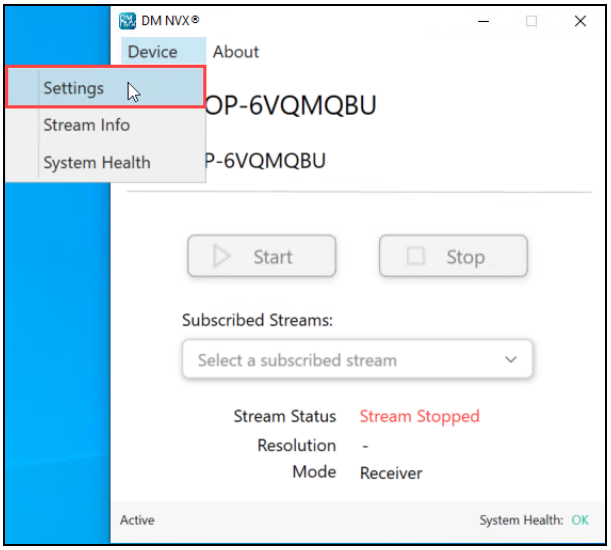
Supported Operating Systems and Corresponding Web Browsers

Operating System	Supported Web Browser
Windows® operating system	Chrome™ web browser, version 110.0.5481.104 or later
	Firefox® web browser, version 110.0 or later
	Microsoft Edge® web browser, version 110.0.1587.50 or later
	Opera™ web browser, version : 96.0.4693.20 or later

To access the web interface:

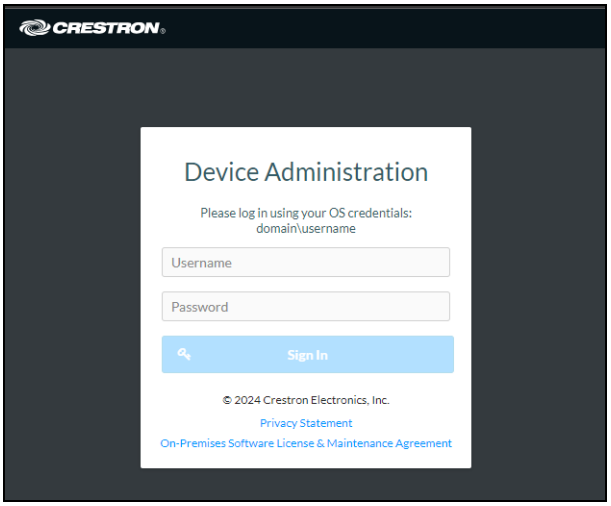
1. On the DM NVX main page, open the Device menu and click **Settings**.

   DM NVX Main Page - Device Menu, Settings



   The Device Administration page opens.

   Device Administration Page



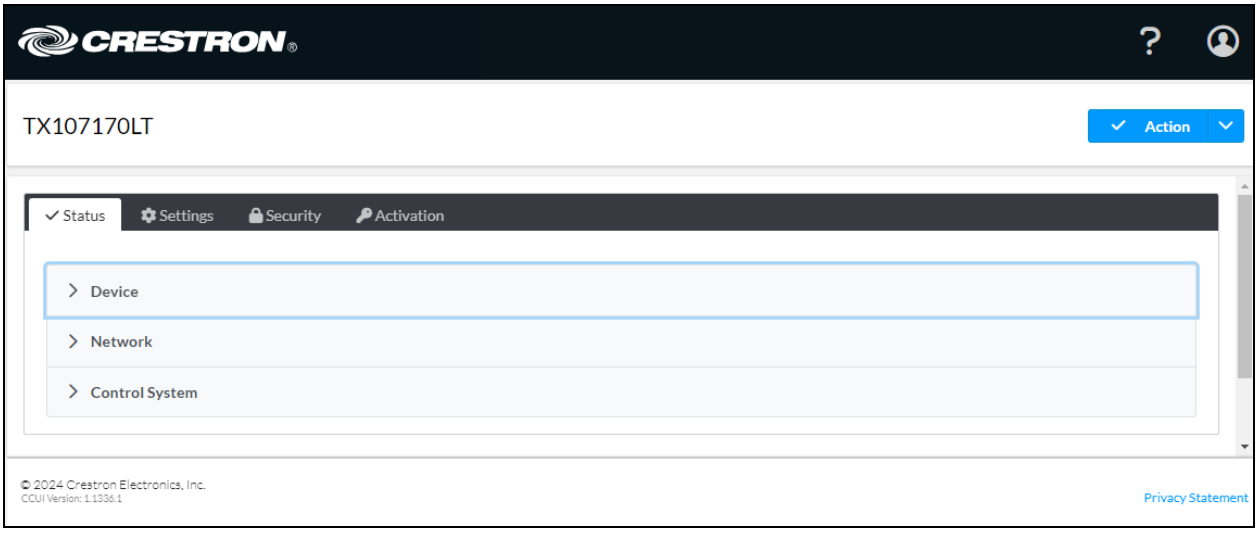
2. Use your Windows OS credentials to login:
    a. In the **Username** text box, enter a valid Windows OS username for the host computer.
        i. In a domain managed network, include **domain** before the username. For example, if the domain is Crestron and the username is Smith, enter the following: **crestron\smith**
        ii. In a non-domain managed network, only enter the username.
    b. In the **Password** text box, enter the password for the Windows OS username.
    c. Click **Sign In**.

    The web interface opens. Refer to Navigating the Web Interface for additional information.

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 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 on page 66 for information)
- Activation (refer to Activating Licensing 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 also enables the following device management functions to be performed:

- Saving Configuration Changes
- Restoring Factory Default Settings on page 41
- Downloading Message Logs on page 41
- Managing Certificates on page 41

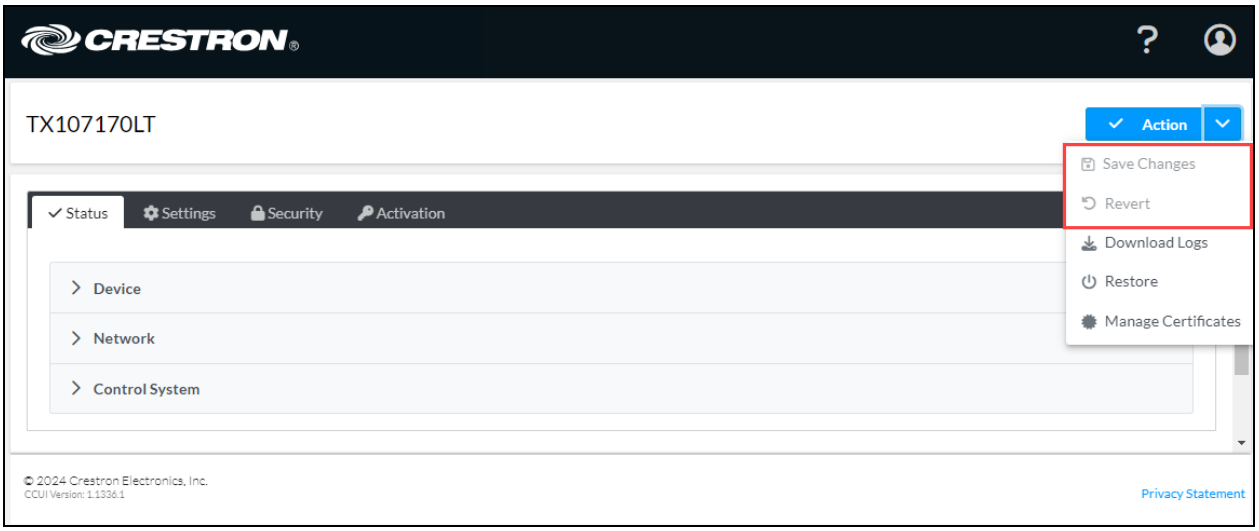
Saving Configuration Changes

Some configuration settings are saved automatically and others 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.

Do either of the following:

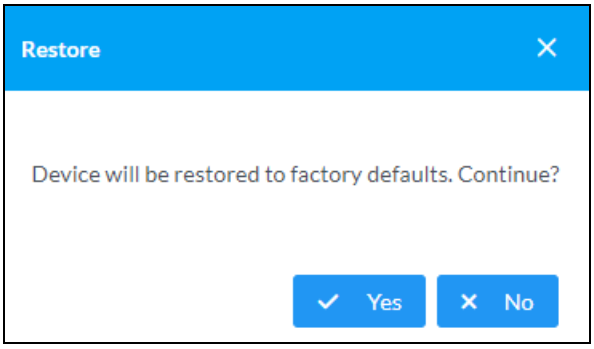
- To save one or more configuration changes, click **Save Changes**.
- To undo the newly entered configuration changes and revert to the previously saved settings, click the drop-down arrow to the right of the **Save Changes** menu item and click **Revert**.

Restoring Factory Default Settings

To restore all settings to the factory defaults, follow the instructions below.

1. Use the **Action** drop-down list and select **Restore**. The **Restore** dialogue box appears.
2. Select **Yes** to restore the settings or **No** to cancel.

Restore Dialogue Box



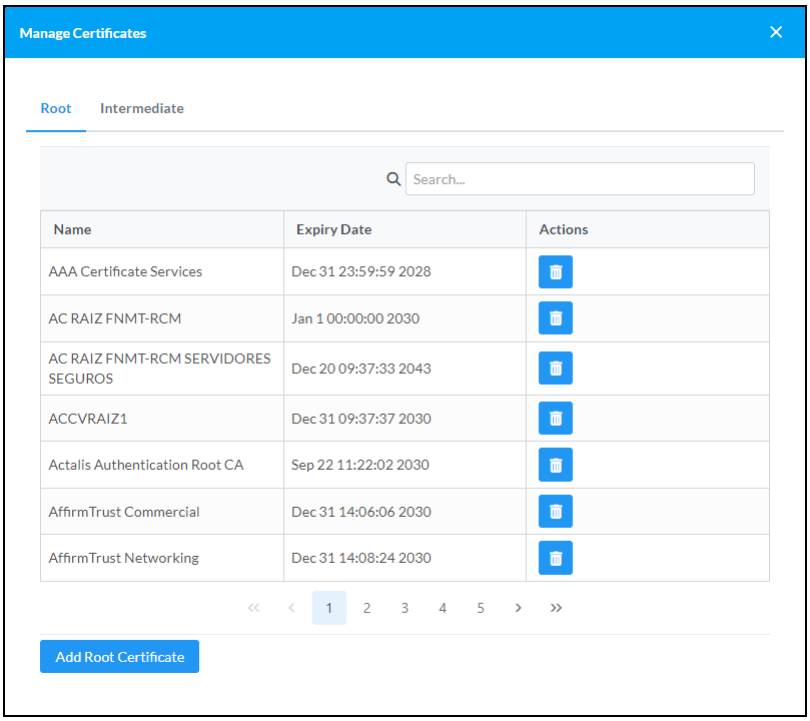
After the restore process is complete, all settings will be restored to the factory defaults.

Downloading Message Logs

To download message logs, use the **Action** drop-down list and select **Download Logs**. The web browser will immediately download the message logs in a .tgz file.

Managing Certificates

Use the Manage Certificates dialog to add, remove and manage certificates used in 802.1x and other protected networks. Click **Manage Certificates** in the **Action** drop-down menu.



The following certificate tabs are displayed:

- **Root:** The Root certificate is used to validate the network's authentication server. There are a variety of Root certificates, self-signed by trusted CAs (Certificate Authorities), preloaded into the software. Root certificates must be self-signed.
- **Intermediate:** The Intermediate store holds non self-signed certificates that are used to validate the authentication server. These certificates will be provided by the network administrator if the network does not use self-signed Root certificates.

Adding Certificates

To add certificates, follow the instructions below.

1. Click the corresponding certificate tab.
2. Click the **Add Certificate** button.
3. Click the **+ Browse** button.
4. Locate and select the file, and then click the **Open** button.
5. Click **OK**. This will add the certificate to the list box, displaying the file name and expiration date.

The certificate is now available for selection and can be loaded to the device.

Deleting Certificates

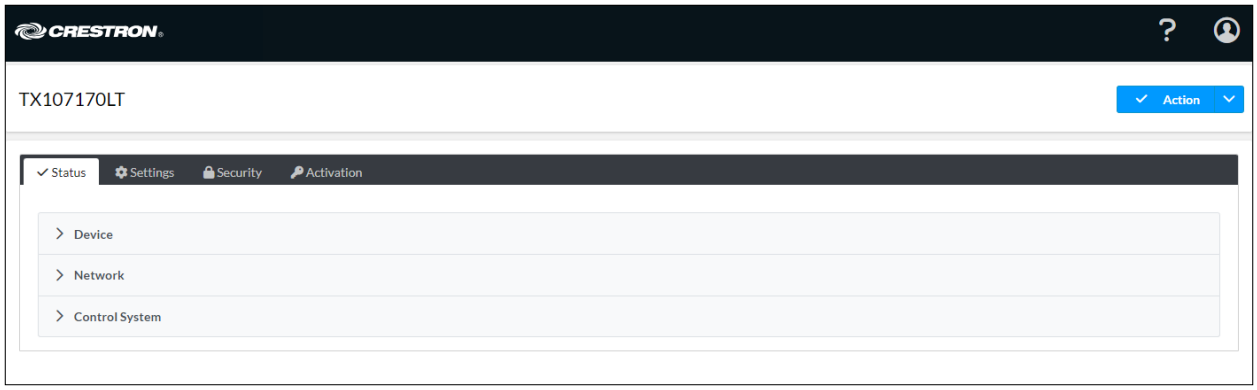
To delete certificates, follow the instructions below.

1. Click the corresponding certificate tab.
2. Click the trashcan button in the **Actions** column.
3. Click **Yes** when prompted to delete the certificate or **No** to cancel the deletion.

Viewing Status Information

Click the **Status** tab to view information about the DM NVX software endpoint. By default, the **Status** tab is displayed after the web interface is accessed by clicking **Device > Settings** on the DM NVX main page.

Status Tab



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

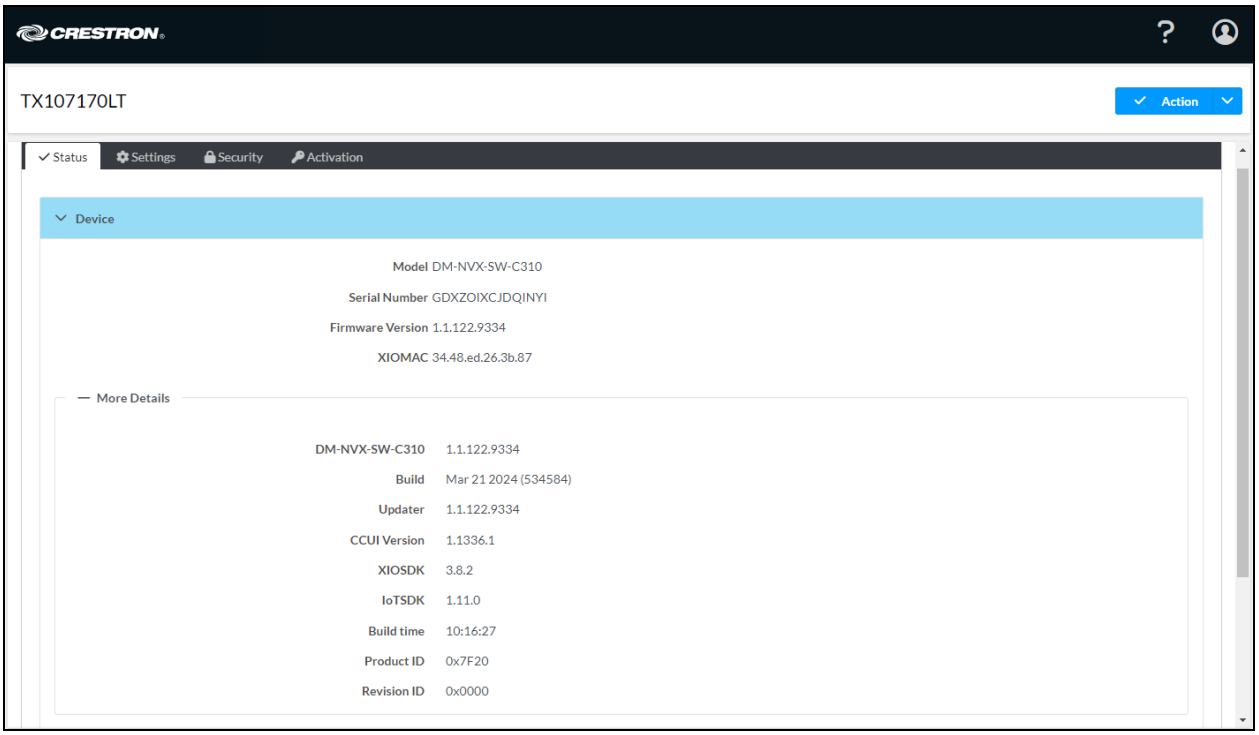
- Device
- Network
- Control system

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



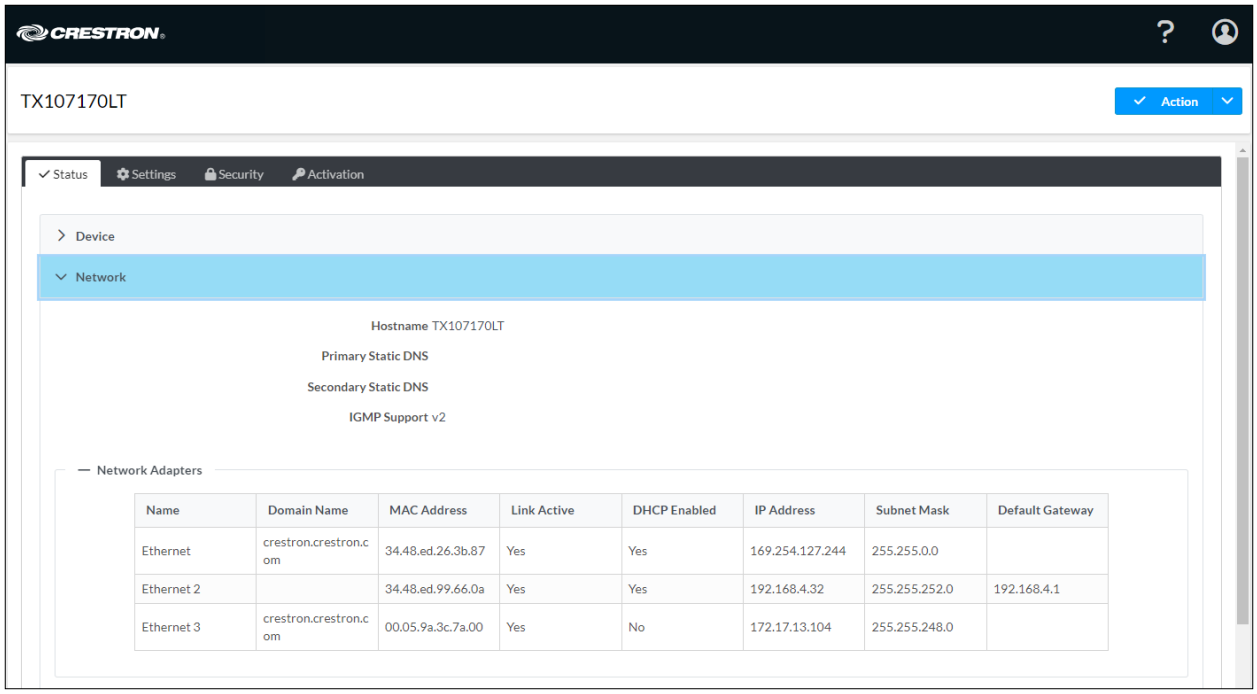
The **Device** section displays general information such as the model name, serial number, and firmware version of the DM NVX software. The XIOMAC address, which is used for registering the device with the XiO Cloud® service, is also displayed.

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

Network

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

Status Tab - Network



The **Network** section displays the hostname of the device, the primary and secondary static DNS IP addresses, and the supported IGMP version **(v2)**.

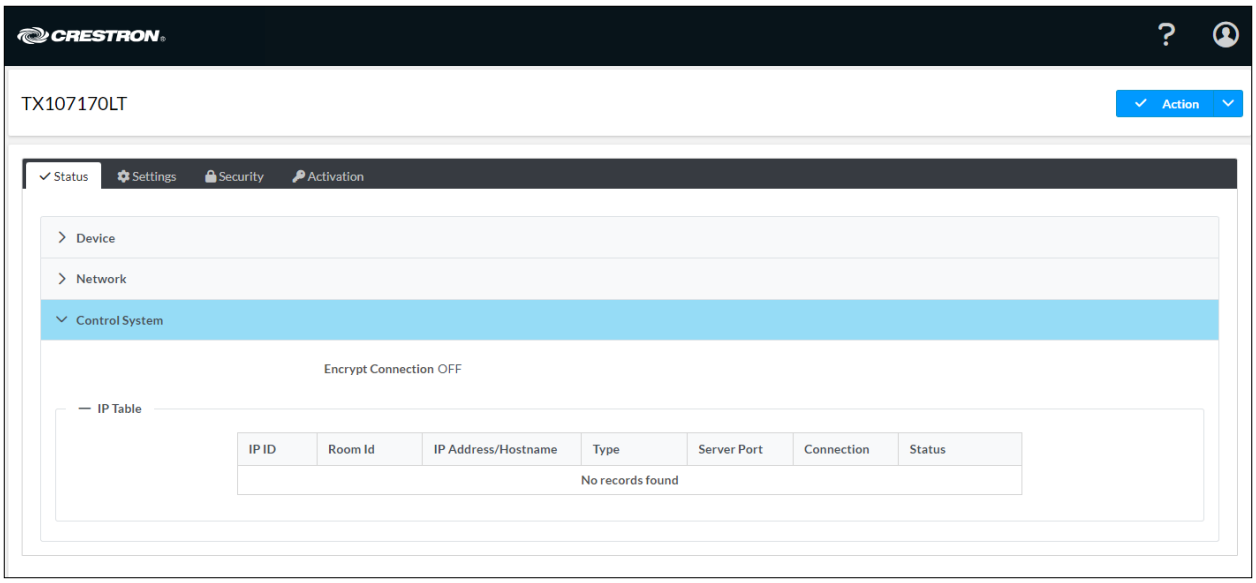
By default, the **Primary LAN** section is open, displaying additional details about the network. Details include the domain name, whether DHCP is enabled or disabled, the IP address of the DM NVX software endpoint, and other network-related information.

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

Control System

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

Status Tab - Control System

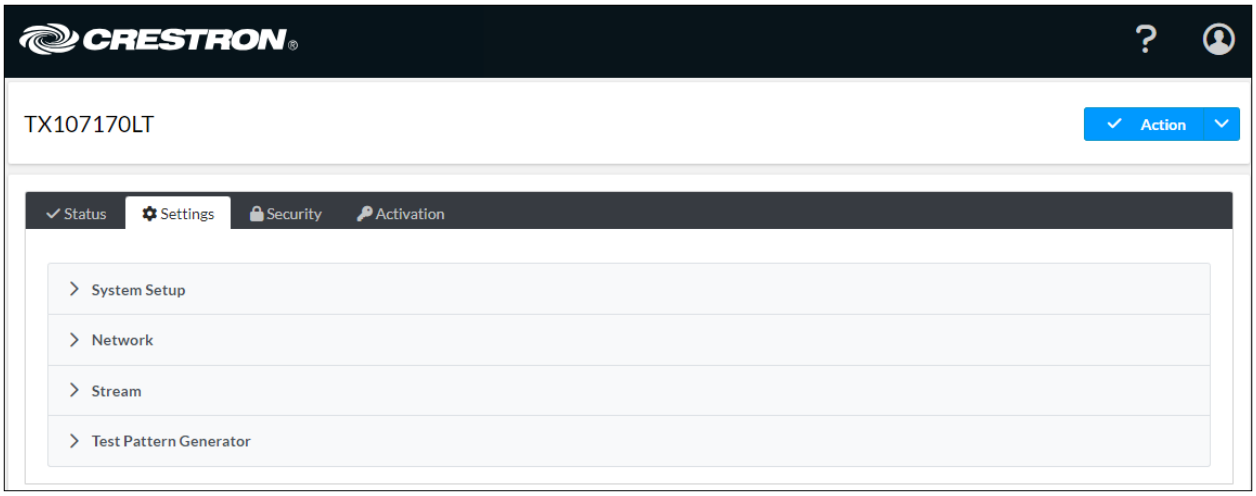


The **Control System** section displays information about whether the connection to the control system is encrypted. Information about the IP table is also displayed.

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 functioning as a transmitter or a receiver.

Settings Tab



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

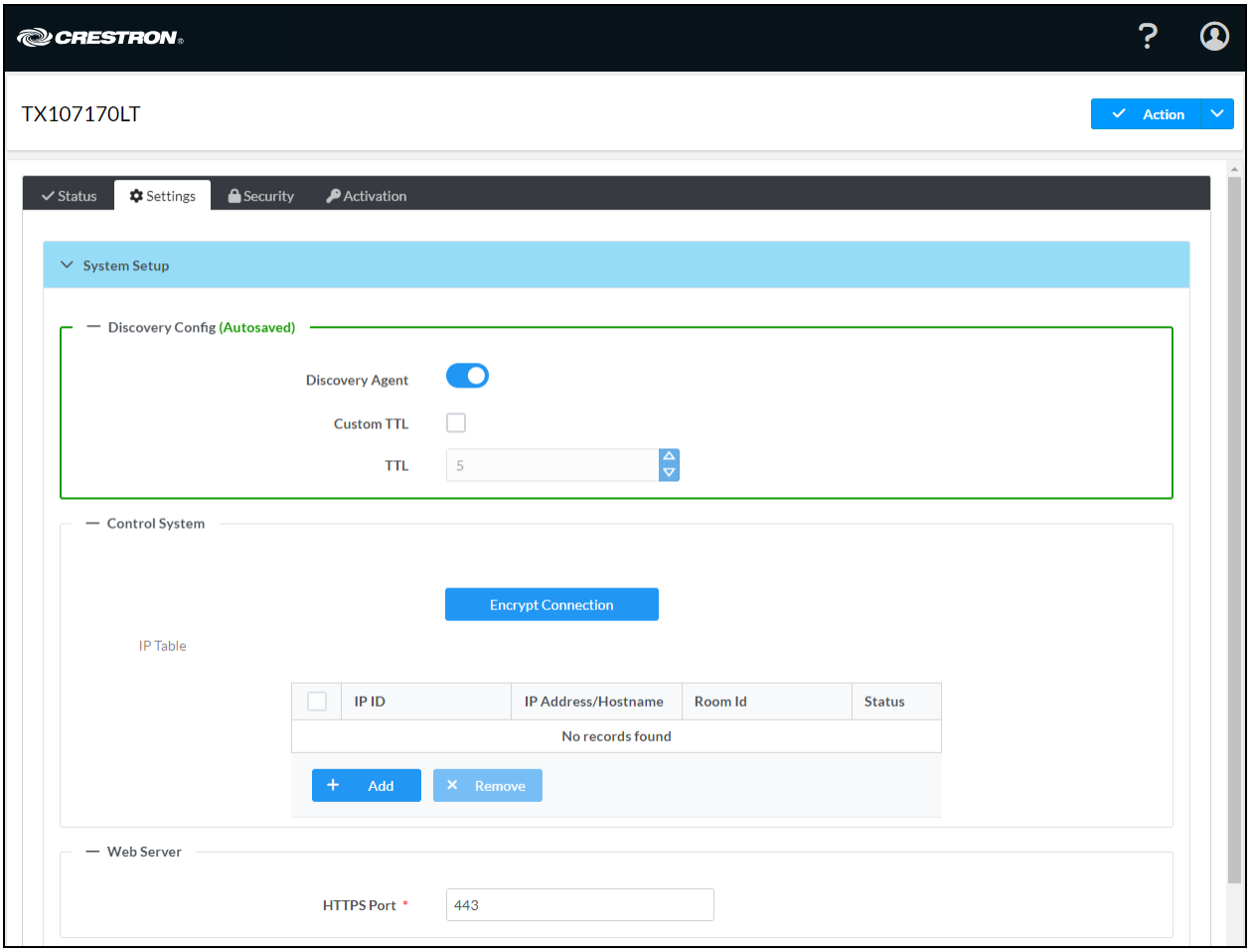
- System setup
- Network
- Stream
- Test Pattern Generator (transmitter only)
- Routing (receiver only)
- Subscriptions (receiver only)

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:

- Discovery Config
- Control System
- Web Server

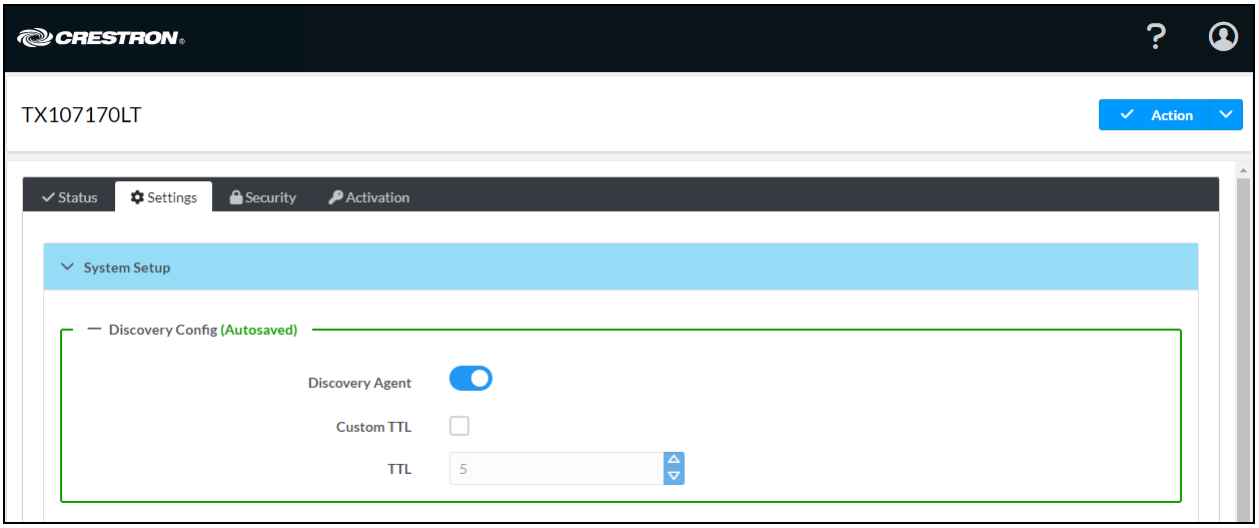
By default, the configuration items within each section are displayed. To close or reopen a section, click the section name.

Discovery Config

To configure device discovery settings:

In the **Settings** tab, go to the **System Setup > Discovery Config** section.

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 transmitters can be discovered for subscription to a receiver in order to stream video and audio. The transmitters are listed in the **Available Streams** list in the Subscriptions section of the **Settings** tab for a receiver.

  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** checkbox.
  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** checkbox returns the TTL value to **5**, which is the default setting.

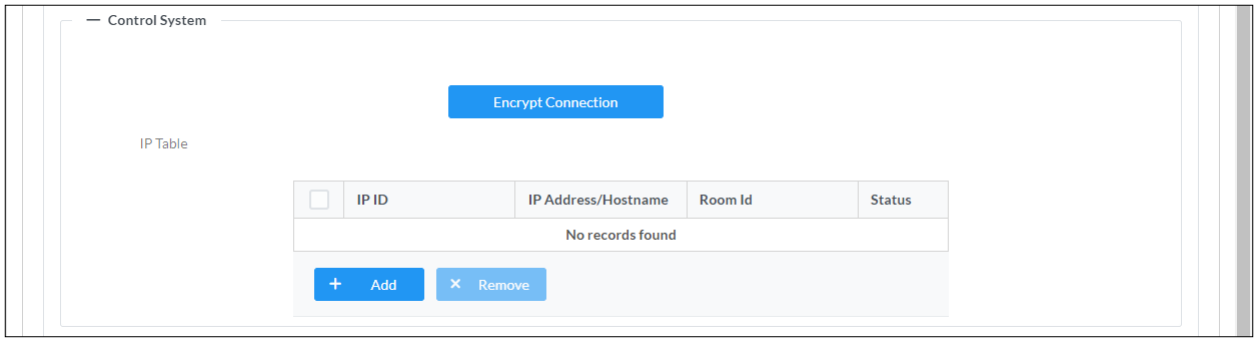
Control System

Connection to up to 16 control systems is supported.

To configure control system connections:

In the **Settings** tab, go to the **System Setup > Control System** section.

Settings Tab - Control System



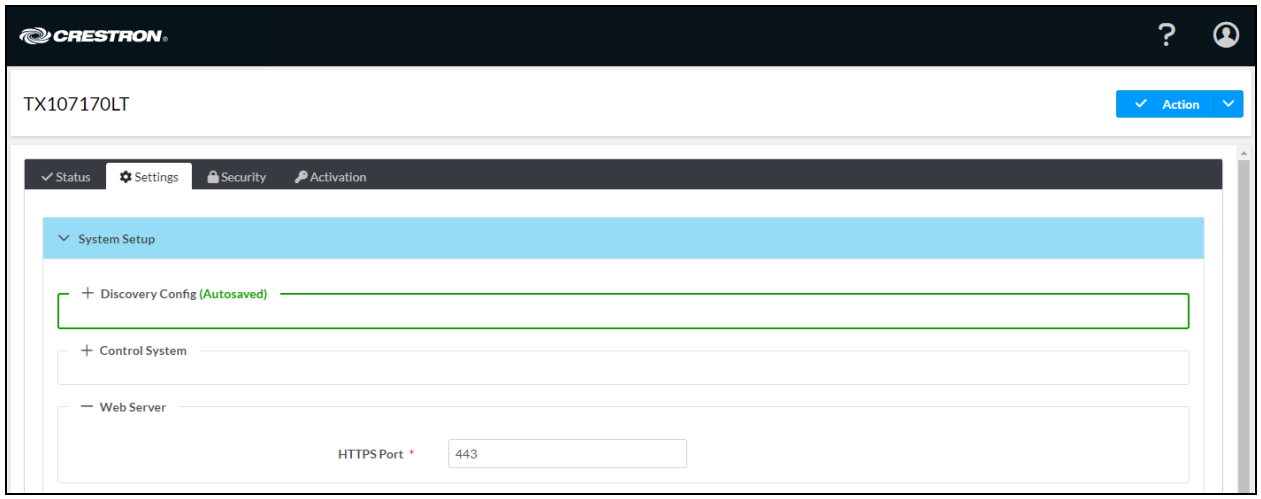
Refer to the configuration guidelines that follow.

Encrypt Connection: To enable an encrypted connection between the control system and the DM NVX software endpoint, select Encrypt Connection. For more information, refer to Configuring Security Settings on page 66.

Web Server

Use the **Web Server** section to set the **HTTPS Port** for all web server functions. The default value is **443**.

Settings Tab - Web Server

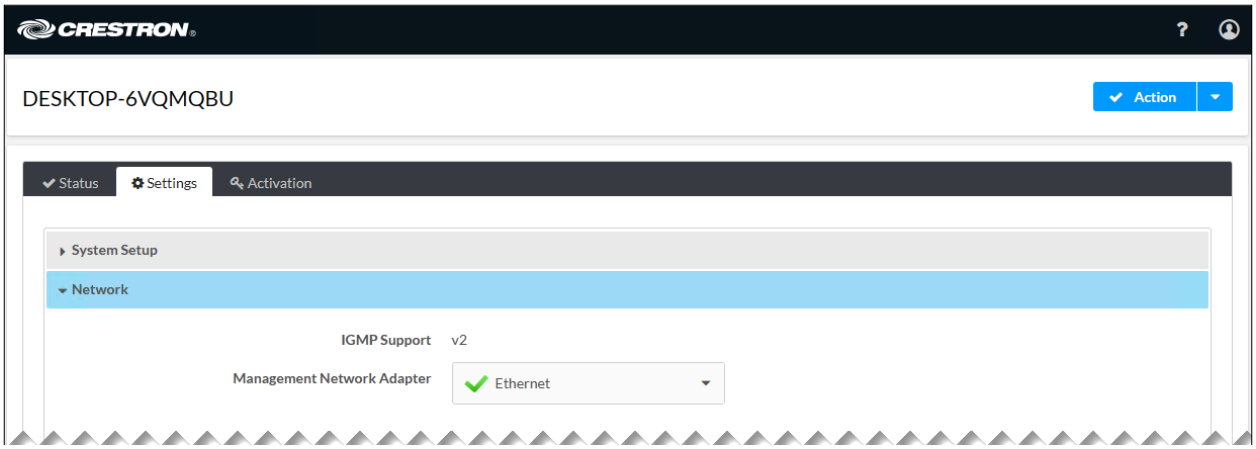


Network

To configure network settings:

In the **Settings** tab, go to the **Network** section.

Settings Tab - Network



The **Network** section displays the supported IGMP version and enables selection of the desired network connection:

- **IGMP Support:** Displays **v2** as the IGMP version

  > **NOTE:** IGMP v3 is not supported.

- **Management Network Adapter:** From your computer's list of network adapters, select one with a √ to be used for management traffic.

  > **NOTE:** The management network adapter controls the connection to the web interface of the DM-NVX-SW-C310.

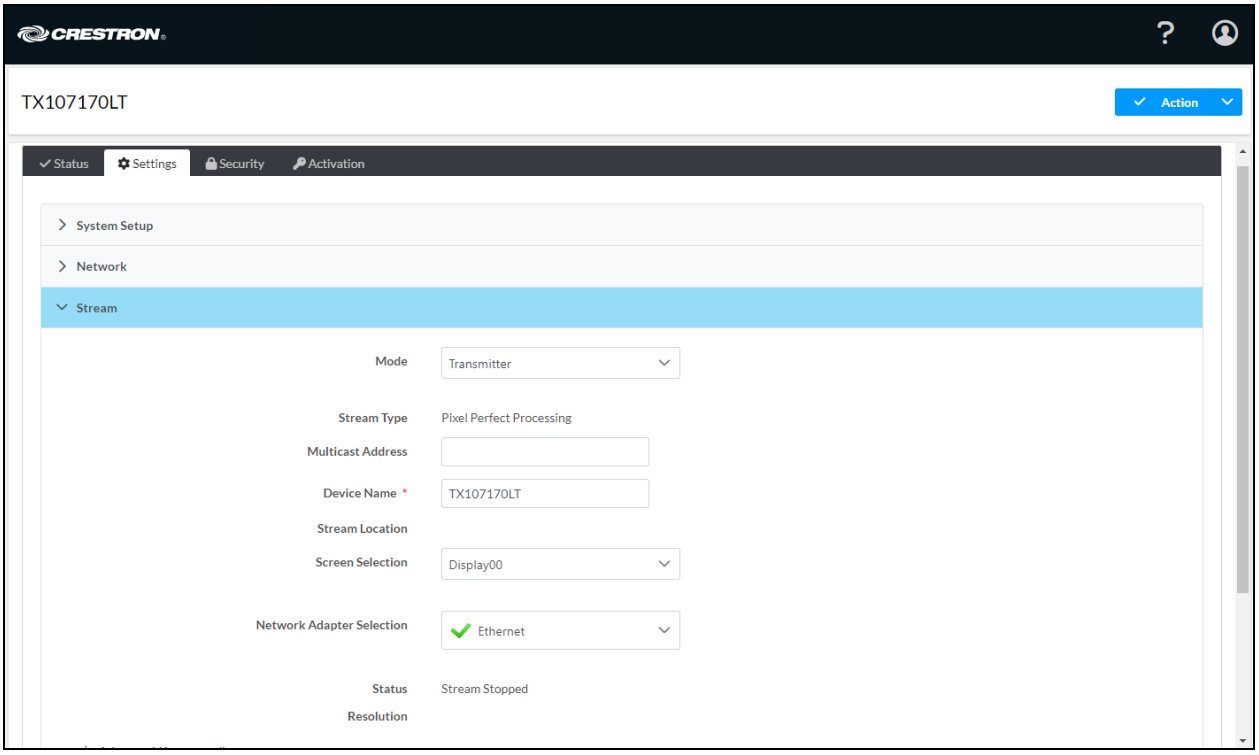
Stream

To configure stream settings:

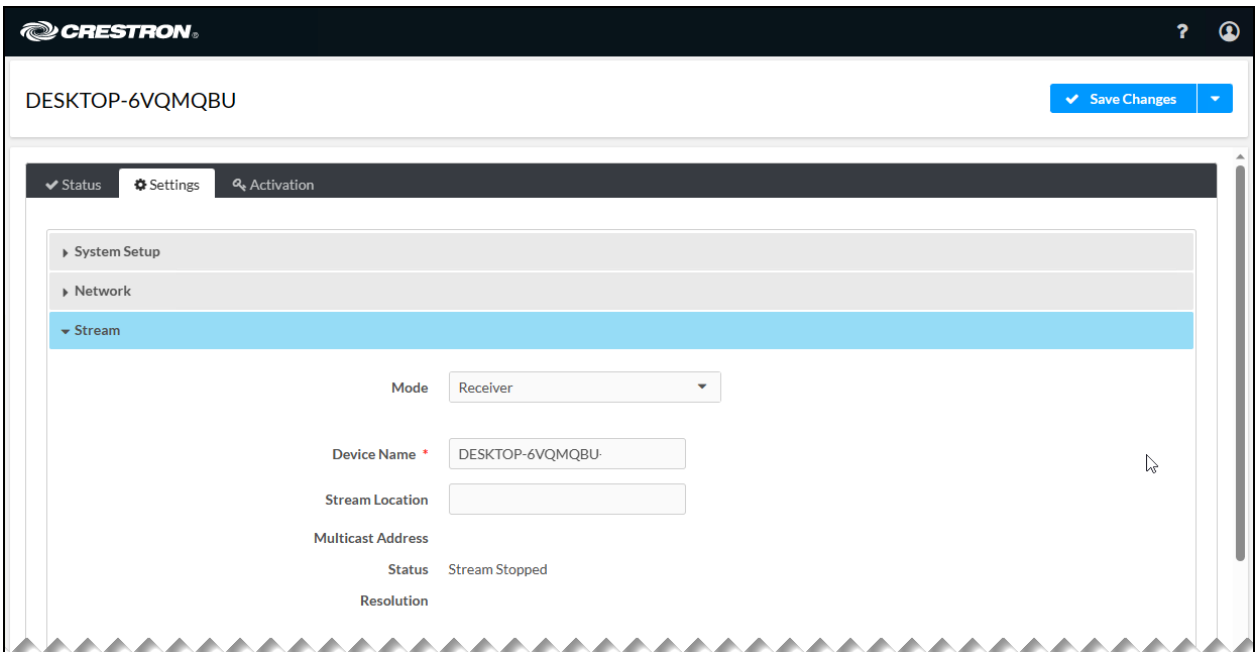
In the **Settings** tab, go to the **Stream** section.

The **Stream** section varies depending on whether the DM NVX device is functioning as a transmitter or a receiver.

Settings Tab - Stream (Transmitter Shown)



Settings Tab - Stream (Receiver Shown)



Refer to the configuration guidelines that follow.

- **Mode:** Select the desired operating mode of the DM NVX software endpoint: **Receiver** (default setting) or **Transmitter**.

  > **NOTE:** Changing the operating mode requires a reboot of the computer.

- **Multicast Address:** (Transmitter only) Enter the primary multicast IP address using 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.
- **Device Name:** Enter a meaningful name to identify the DM NVX software endpoint on the network.
- **Stream Location:** For a DM NVX transmitter, **Stream Location** is read only and displays the RTSP (Real Time Streaming Protocol) URL of the transmitter.

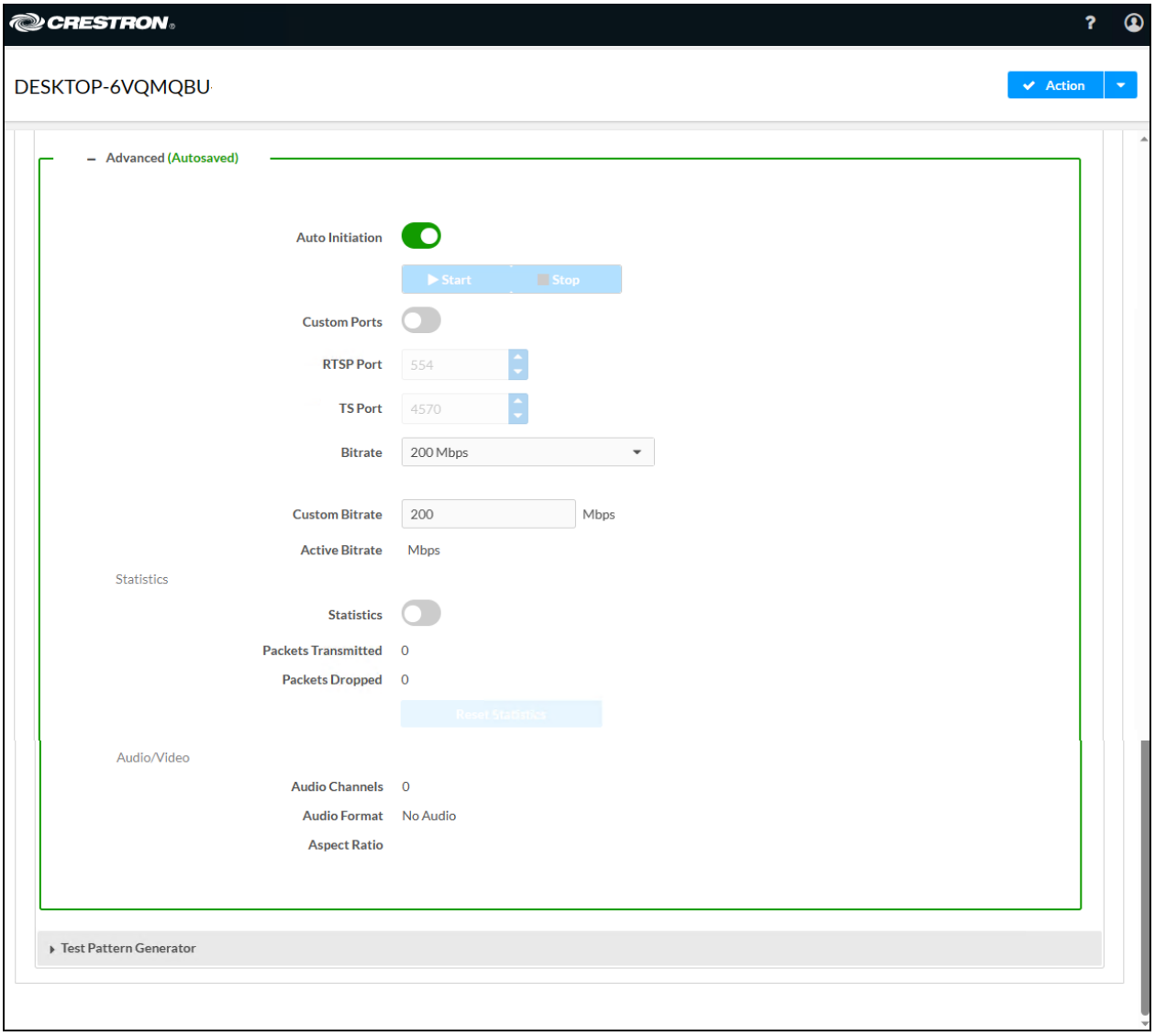
  For a DM NVX receiver, enter the RTSP URL to which the receiver can connect. The RTSP URL must not exceed 255 characters.
- **Multicast Address:** (Receiver only) Displays the primary multicast address set for the transmitter.
- **Screen Selection:** (Transmitter only) Select the desired available display whose desktop content is to be transmitted over the network. By default, **Display00** is selected, representing the default display of the computer. If additional displays are available, **Screen Selection** enables selection of **Display01**, **Display02**, and so on.

  > **NOTE:** If a stream has been started for the selected display, the stream will stop when a different display is selected and the stream of the newly selected display will automatically start.
  >
  > If a stream has not been started for the selected display and a different display is selected, the stream of the newly selected display must be started manually.

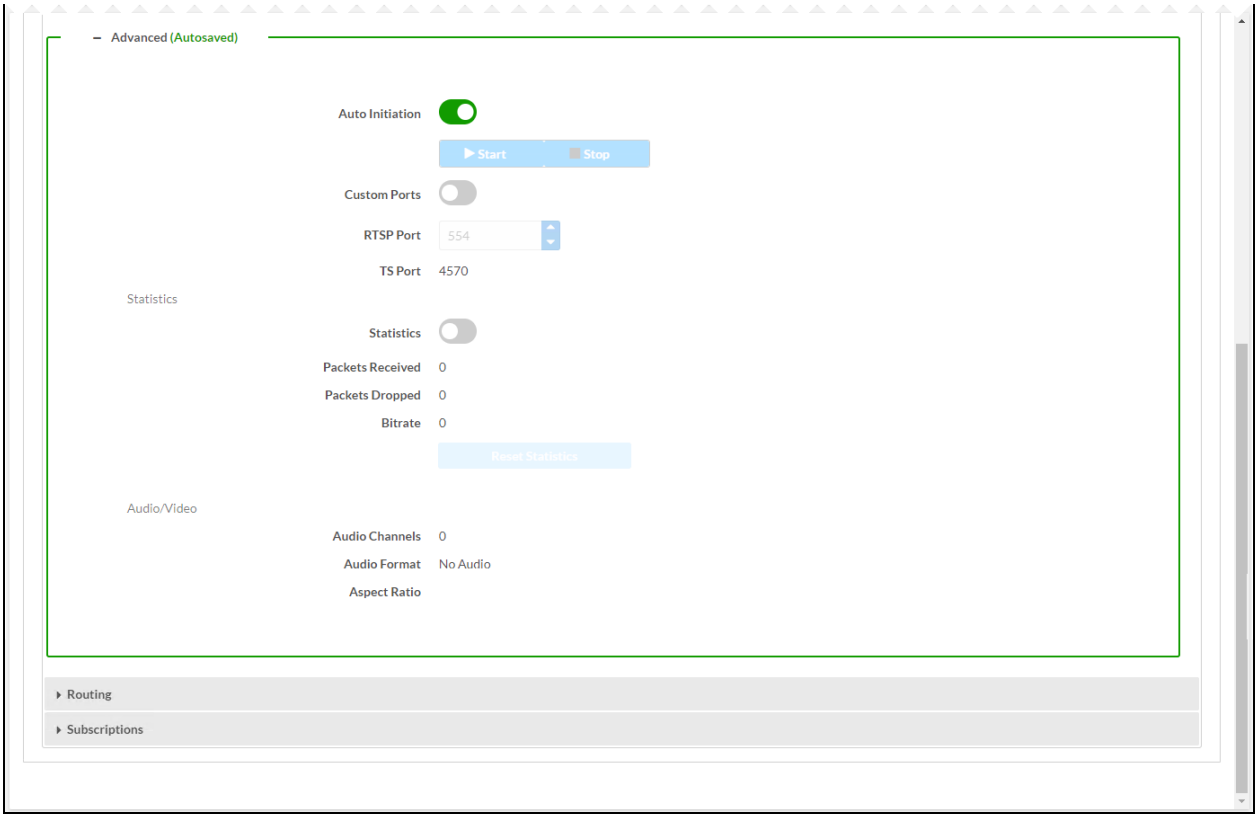
- **Network Adapter Selection:** (Transmitter only) Select the stream network adapter to be used for the transmitted stream.
- **Status:** Displays the status of the stream: **Stream Stopped**, **Stream Started**, or **Connecting**.
- **Resolution:** Displays the video resolution being used for the stream.

The **Advanced** section for stream configuration varies depending on whether the DM NVX software endpoint is functioning as a transmitter or a receiver.

Settings Tab - Stream, Advanced (Transmitter Shown)



Settings Tab - Stream, Advanced (Receiver Shown)



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:

  - **RTSP Port:** Enter or select an RTSP port number. Valid values range from **1** to **65535**. The default RTSP port number is **554**.

- **TS Port:** For a DM NVX transmitter, 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 receiver, the TS port number is read only and is always set to the TS port number of the encoded stream.

- (Transmitter only) Configure the following:
  - **Bitrate:** Set the Constant Bit Rate (CBR) of the stream. The default value is **300 Mbps**.

    If **Custom** is selected, enter the desired bit rate in the **Custom Bitrate** text box. Valid values range from **150** to **500** Mbps.
  - **Active Bitrate:** Indicates the active bit rate of the stream

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

To reset stream statistics, select 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 a transmitter or received by a receiver.
- **Audio Format:** Displays the audio format. 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.

Test Pattern Generator (Transmitter Only)

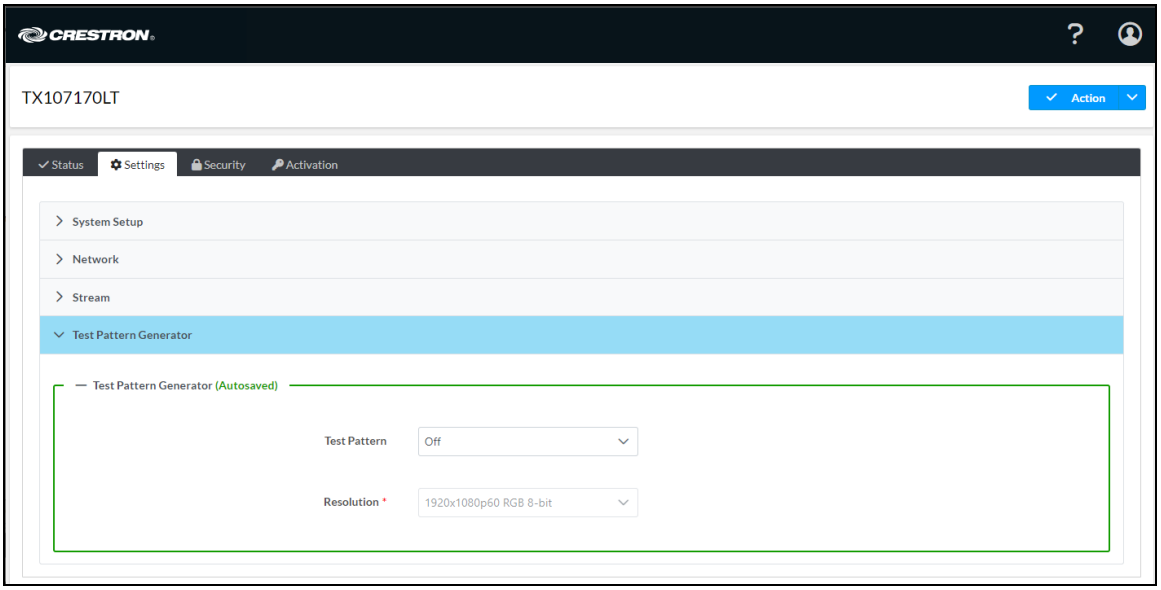
The built-in test pattern generator can be used to ensure that video streaming is functioning and can also be used as a tool for the adjustment, calibration, and alignment of displays, video walls, and projectors.

A DM NVX transmitter can send the test pattern to any routed DM NVX receiver.

To select the desired test pattern:

In the **Settings** tab, go to the **Test Pattern Generator** section.

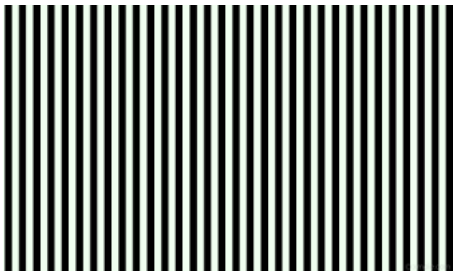
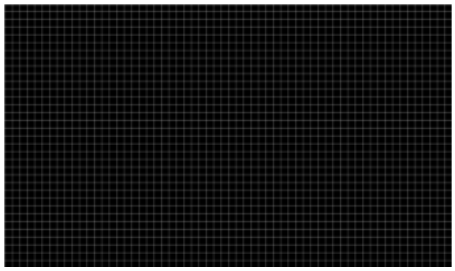
Settings Tab - Test Pattern Generator (Transmitter Mode Only)

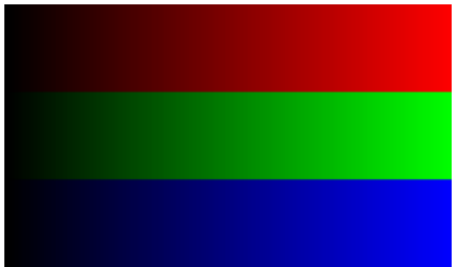


Do the following:

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	
Black	

Test Pattern Option	Test Pattern
White	
Vertical Lines	
Grid	
Color Bars	
Gray Gradient	

Test Pattern Option	Test Pattern
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

   3840x2160p30 RGB 8-bit

   1920x1080p60 RGB 8-bit

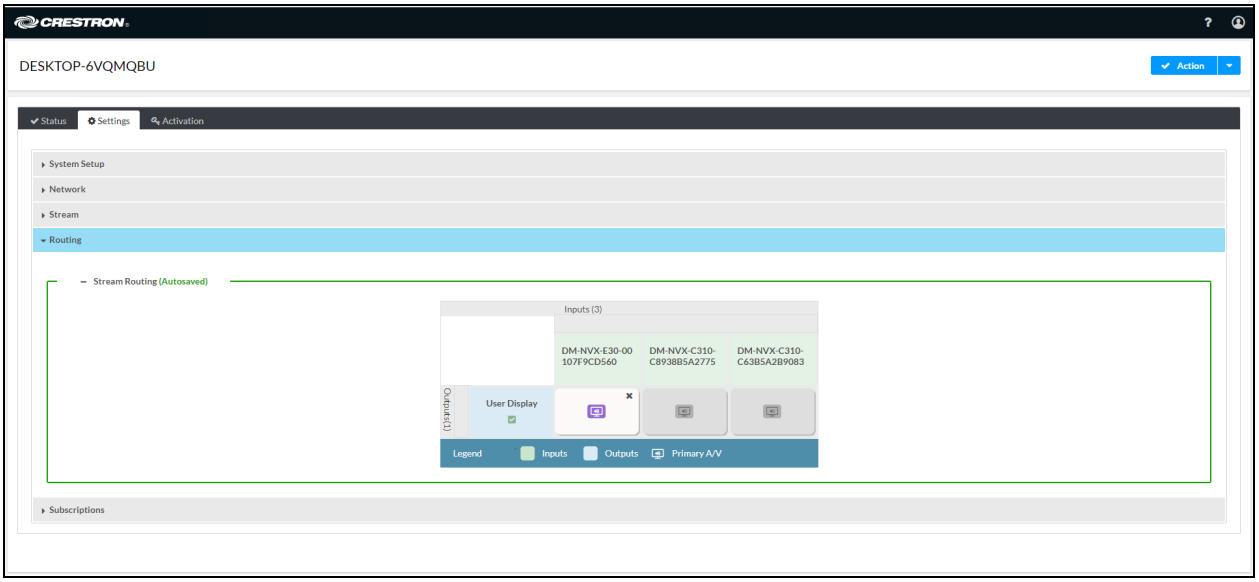
   720p60 RGB 8-bit

Routing (Receiver Only)

To configure routing settings:

In the **Settings** tab, go to the **Routing** section.

Settings Tab - Routing (Receiver Only)



Refer to the configuration guidelines that follow.

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

In the **Stream Routing** section, the Inputs/Outputs table provides cells identifying the receiver and the subscribed transmitters.

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

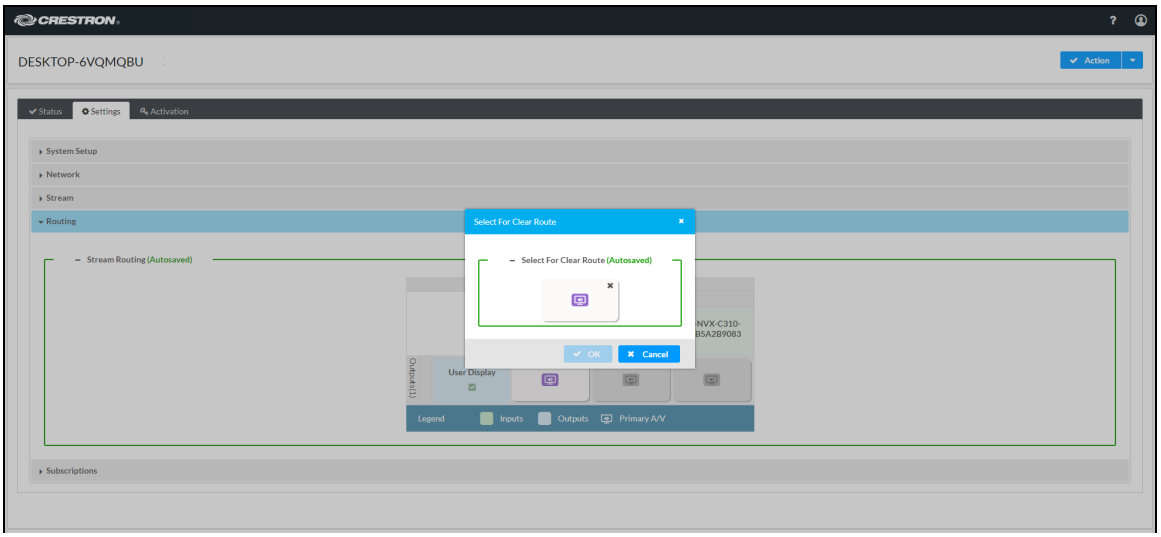
In the Inputs/Outputs table, the cell for the receiver is shaded blue and is named **User Display** by default. Cells for transmitters are shaded green and are named using the transmitter host name. An icon for each transmitter represents the primary A/V stream. When the **Primary A/V** icon is not selected for routing, the icon is shaded gray ( ). When the icon is selected for routing, the icon turns purple ( ).

Select the **Primary A/V** icon of the desired transmitter (Input) to route the corresponding A/V stream to the receiver (Output).

The A/V stream can be cleared for a transmitter in any of the following ways:

- In the cell containing the purple **Primary A/V** icon, select the icon. The primary A/V stream is cleared. Alternatively, select the **x** in the upper-right corner of the cell. When the stream is cleared, the icon turns gray.
- Select the checkbox under the output name (the default output name is **User Display**). The **Select For Clear Route** pop-up dialog box opens.

  Select for Clear Route Pop-Up Dialog Box



  Select the **Primary A/V** icon or the **x** in the upper-right corner of the cell, and then select **OK** to clear the stream. When the stream is cleared, the icon turns gray in the cell for the corresponding transmitter.

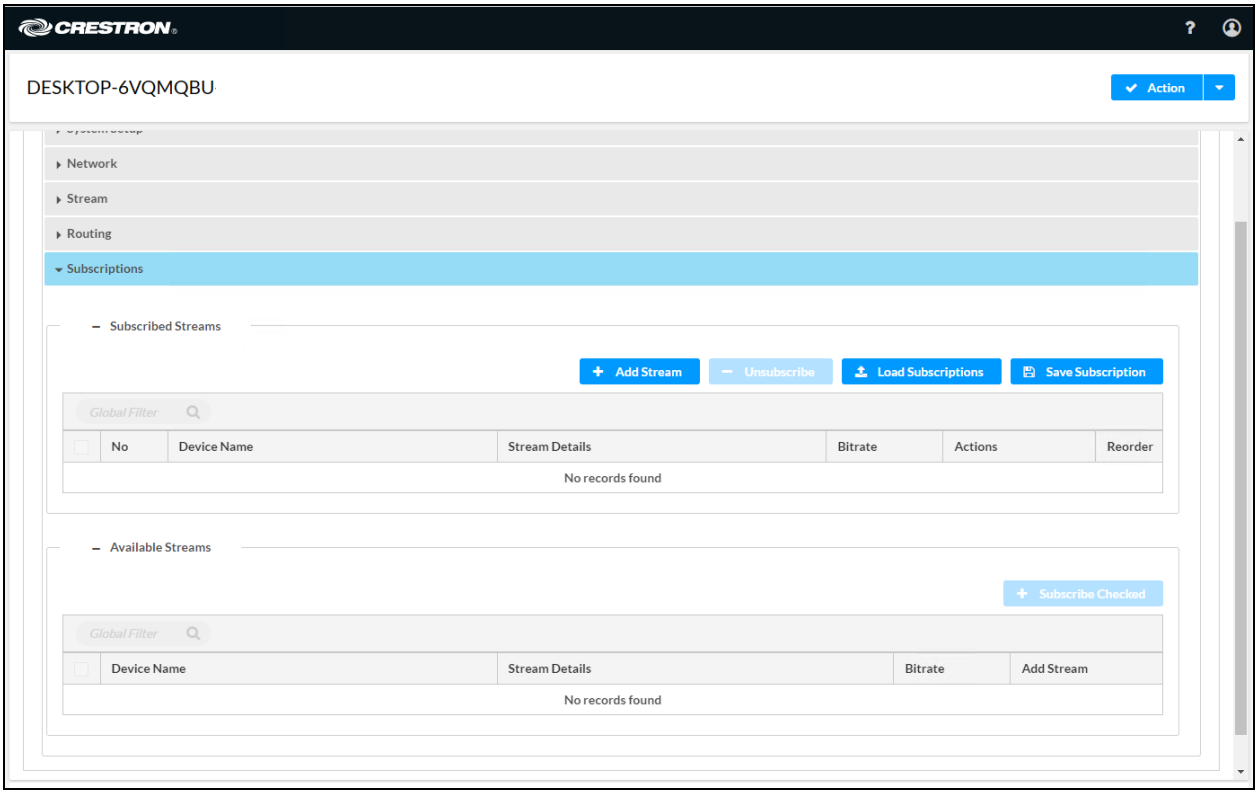
Subscriptions (Receiver Only)

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

To configure subscriptions:

In the **Settings** tab, go to the **Subscriptions** section.

Settings Tab - Subscriptions (Receiver Only)



The **Subscriptions** section enables transmitters to be subscribed to the receiver in the **Subscribed Streams** and **Available Streams** sections.

Subscribed Streams

The **Subscribed Streams** section enables the following tasks to be performed:

- Subscribing transmitters to the receiver
- Saving subscriptions
- Unsubscribing transmitters

Subscribing Transmitters to the Receiver

To subscribe transmitters to the receiver, do either of the following:

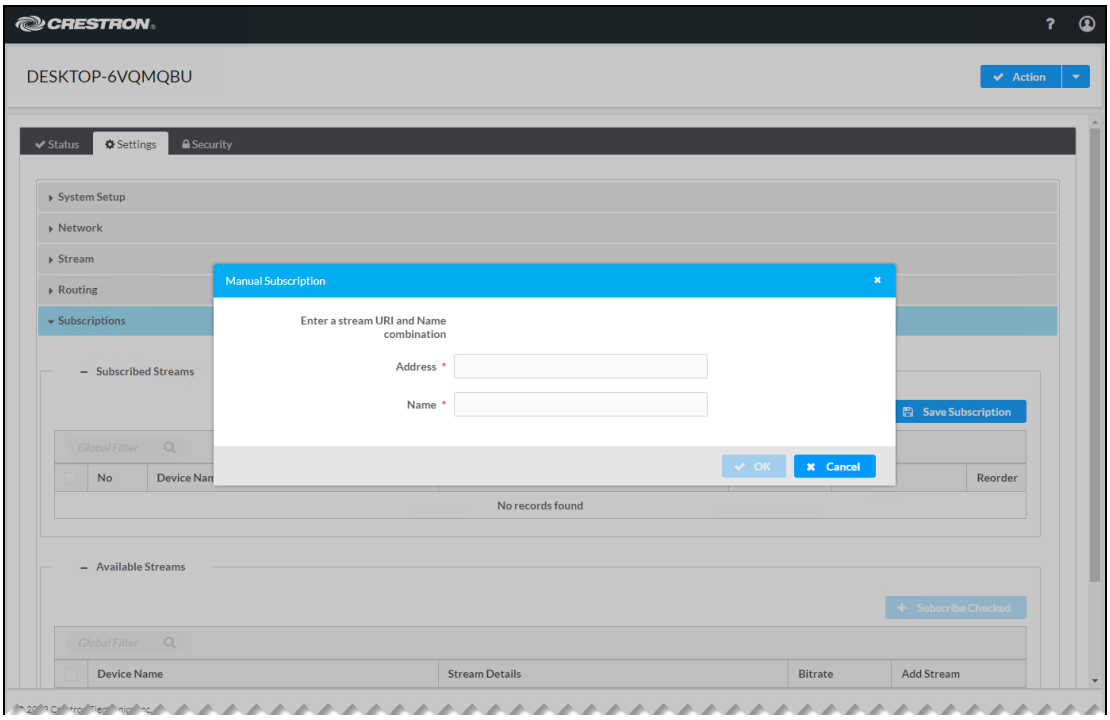
- Manually add each transmitter for subscription to the receiver
- Load subscription lists

Manually Add Each Transmitter

In the **Subscribed Streams** section, manually add each transmitter for subscription to the receiver as follows:

1. Select the **Add Stream** button. The Manual Subscription pop-up dialog box opens.

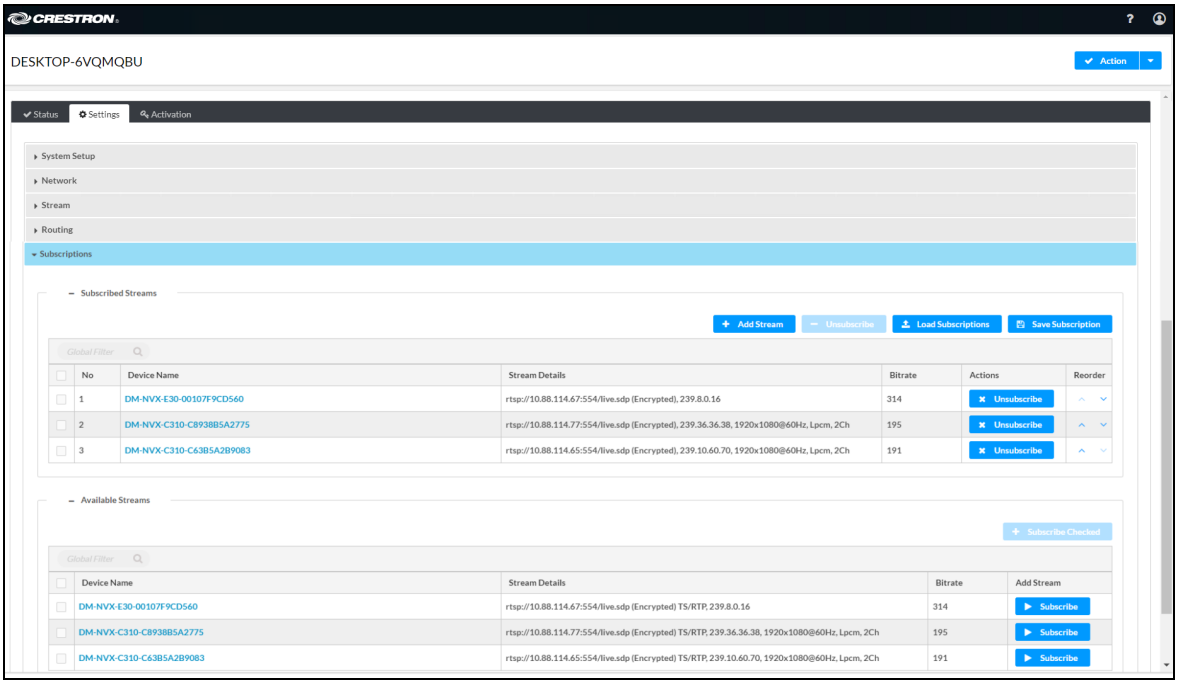
Manual Subscription Pop-Up Dialog Box



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

   The transmitter 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 transmitter. If the stream has not been started, the **Stream Details** column indicates **Stream not started**.

Stream Subscription Example (Three Transmitters Shown)



> **NOTE:** Subscribed transmitters can be reordered in the **Subscribed Streams** table. 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.

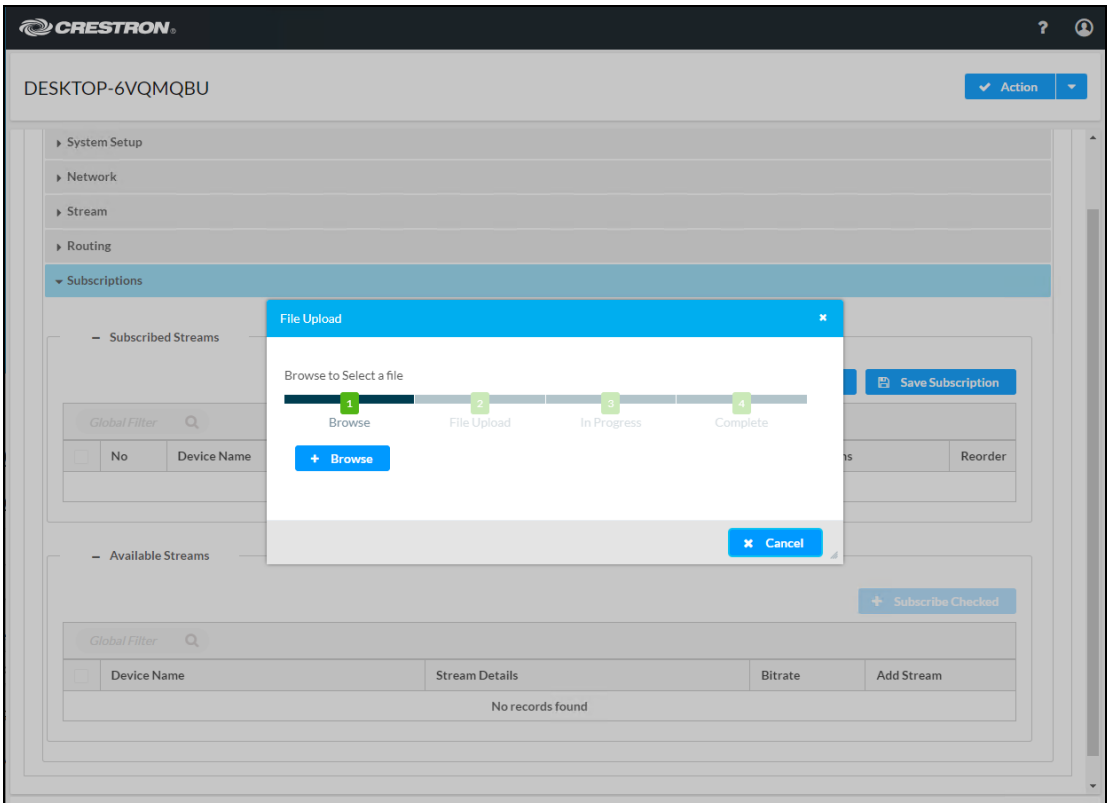
Load Subscription Lists

In the **Subscribed Streams** section, 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.

   File Upload Dialog Box - Browse



2. Click **Browse**. File Explorer opens.
3. Navigate to the desired file, select the file, and then click **Open**. The File Upload pop-up dialog box opens.
4. Click the **Upload** button. When the file upload process is complete, the **File upload is complete** message appears.
5. Click **OK** to close the dialog box.

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

> **NOTE:** Subscribed transmitters can be reordered in the **Subscribed Streams** table. 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.

Saving Subscriptions

If desired, save the subscribed transmitters to a file by clicking the **Save Subscriptions** button in the **Subscribed Streams** section. The subscribed transmitters are downloaded to a file named **subscription.xml** by default.

Unsubscribing Transmitters

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

- To unsubscribe a transmitter on an individual basis, click the corresponding **Unsubscribe** button in the **Actions** column. The transmitter is removed from the list.
- To unsubscribe all transmitters simultaneously, select the topmost checkbox in the first column. The checkboxes for all transmitters in the list are automatically selected. Click the **Unsubscribe** button above the **Subscribed Streams** table.
- To unsubscribe some transmitters simultaneously, select the corresponding checkboxes 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 transmitters that can be subscribed to the receiver:

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

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

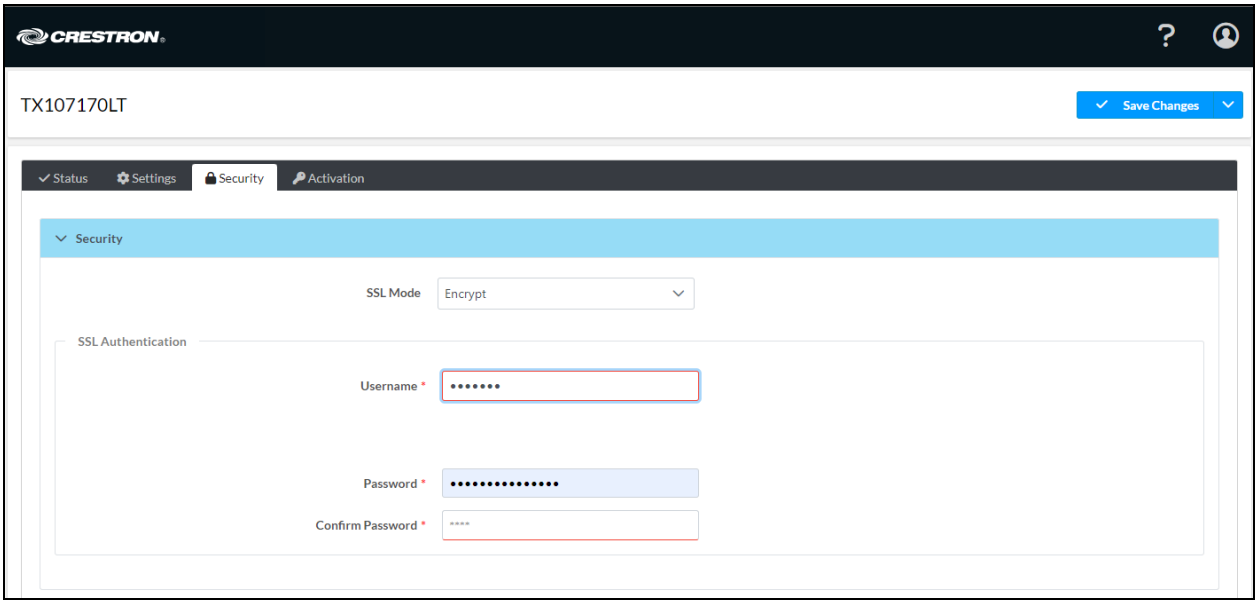
Configuring Security Settings

Select the **Security** tab to configure SSL (Secure Sockets Layer) mode.

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

Activating Licenses

A license is required for DM-NVX-SW-C310 software on a per-computer basis for a single stream.

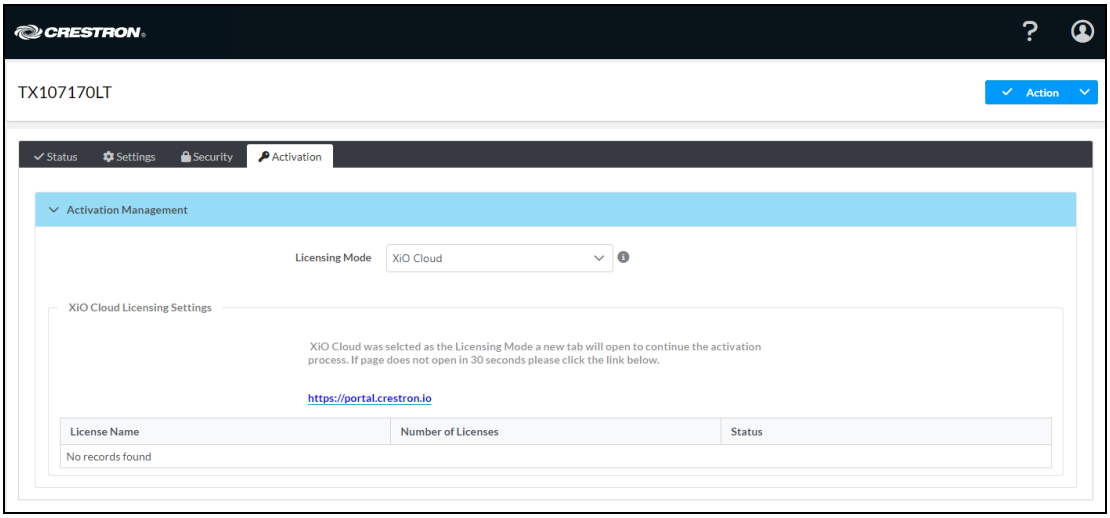
DM-NVX-SW-C310 provides two licensing options: online licensing via the XiO Cloud® service, or offline licensing via the USB-OFFLINE dongle. Each licensing mode is covered in the following sections.

- Manage Licensing with XiO Cloud on page 68
- Manage Licenses Offline on page 70

> **NOTE:** For information about obtaining a license for the DM NVX software, refer to Licensing in the Installation section of this documentation.

To activate or view current licensing information, select the **Activation** tab.

Activation Tab



The **License Management** table indicates the following:

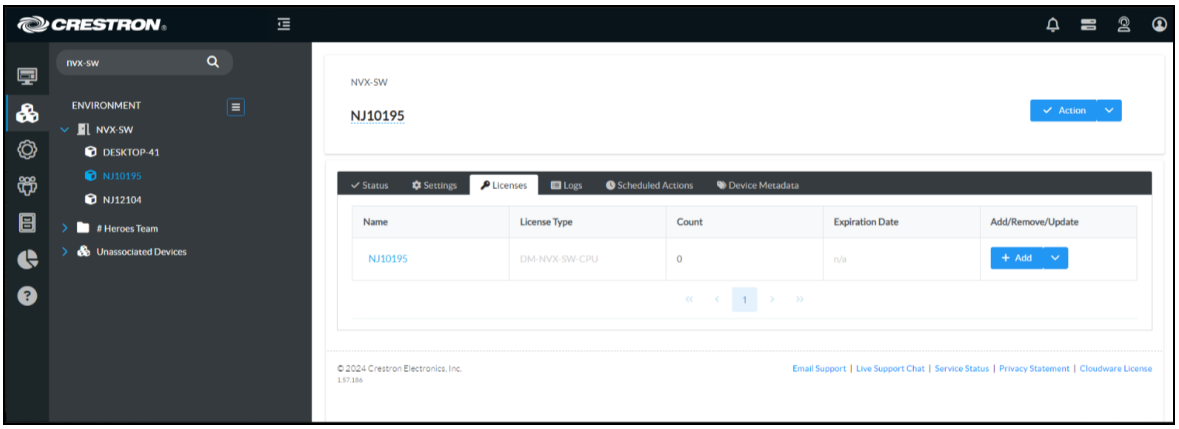
- **Licensing Mode:** To manage licenses, select a license type from the drop-down list.
- **License type:** For the DM-NVX-SW-C310, the license type is **DM-NVX-SW-CPU**.
- **Status:** Indicates **Active** or **No records found**.

Manage Licensing with XiO Cloud

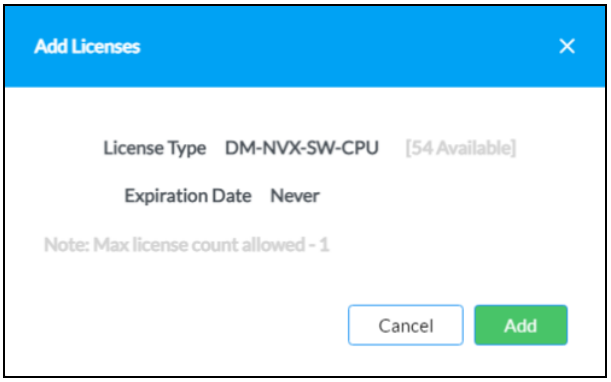
Purchased DM NVX software licenses can be managed through the XiO Cloud service portal. For more information on using XiO Cloud, refer to the XiO Cloud Service User Guide.

To activate licensing through XiO Cloud, follow the instructions below.

1. Place your DM NVX software order with Crestron using the provided form.
2. In the **Licensing Mode** drop-down list, select **XiO Cloud**.
3. Select **Activate**. The XiO Cloud service portal opens.
4. Claim the DM NVX software to your XiO Cloud account as described in the XiO Cloud Service User Guide.
5. Navigate to the DM NVX software in the **ENVIRONMENT** menu tree in XiO Cloud.
6. Select the **Licenses** tab in the device settings.
   Licenses Tab



7. Select **+ Add** next to the license. The **Add Licenses** dialog box is displayed.
   Add Licenses Dialog Box



8. Select **Add**.

The **Licenses** tab updates to show that the selected license has been added.

Licenses Tab

Select **- Remove** to remove the license. The license is added back to your license pool.

Manage Licenses Offline

Purchased DM-NVX-SW-C310 licenses can be managed offline via the USB-OFFLINE dongle as described in the following procedures.

IMPORTANT! Any existing DM-NVX-SW-C310 licenses within the XiO Cloud service cannot be converted to offline licenses. If switching your DM-NVX-SW-C310 installation from online to offline licensing mode, a new license must be purchased.

Note: The USB-OFFLINE dongle must be connected to the computer running DM-NVX-SW-C310 at all times. If the USB-OFFLINE dongle is removed, the program will stop functioning and an error message will be displayed within the web configuration interface indicating that there is no dongle detected.

Each computer that will run a DM-NVX-SW-C310 installation using offline licensing requires the purchase of one USB-OFFLINE dongle. Once all DM-NVX-SW-C310 licenses and the USB-OFFLINE have been purchased, the offline license mode must be configured using the provided license utility or through the web configuration interface.

To configure your DM-NVX-SW-C310 for offline licensing:

1. Order your DM-NVX-SW-C310 license(s) and one USB-OFFLINE dongle per computer.
2. For DM-NVX-SW-C310 installations licensed through the XiO Cloud service, remove all existing licenses as described in the XiO Cloud Service User Guide.

   NOTE: Ensure the computer is online within XiO Cloud prior to removing your existing licenses.
3. Connect the USB-OFFLINE dongle into an available USB port on the computer.
4. Switch the license mode by performing the following steps:
   a. Select the **Activation** tab of the web interface.
   b. In the **Licensing Mode** drop-down list, select **Offline**.

The Licensing table indicates the following:

- **License type:** For the DM-NVX-SW-C310, the license type is **DM-NVX-SW-CPU**.
- **Status:** Indicates **Active** or **No records found**.

To activate the license, click the **Activate** button.

Resources

The following resources are provided for the DM-NVX-SW-C310.

> **NOTE:** You may need to provide your Crestron.com web account credentials when prompted to access some of the following resources.

Crestron Support and Training

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

Programmer and Developer Resources

- help.crestron.com: Provides help files for Crestron programming tools such as SIMPL, SIMPL#, and Crestron Toolbox™ software
- developer.crestron.com: Provides developer documentation for Crestron APIs, SDKs, and other development tools

Product Certificates

To search for product certificates, refer to the Product Certificates section of the Crestron Resource Library.

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

Product Manual — Doc. 9394A
05/14/24
Specifications subject to
change without notice.