

VNM Enterprise Controller


VN-Matrix® Enterprise Controller




Extron Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions


Safety Instructions • English


WARNING: This symbol, , when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, , when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

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
Sicherheitsanweisungen • Deutsch


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Instructions de sécurité • Français


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Istruzioni di sicurezza • Italiano


AVVERTENZA: Il simbolo, , se usato sul prodotto, serve ad avvertire l'utente della presenza di tensione non isolata pericolosa all'interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

ATTENZIONE: Il simbolo, , se usato sul prodotto, serve ad avvertire l'utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l'apparecchio.

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
Instrukcje bezpieczeństwa • Polska


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UWAGI: Ten symbol, , gdy używany na produkt, jest przeznaczony do ostrzegania użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

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Инструкция по технике безопасности • Русский


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안전 지침・한국어

경고: 이 기호 ⚠ 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 △ 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(www.extron.com)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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This product contains a battery. **Do not open the unit to replace the battery.** If the battery needs replacing, return the entire unit to Extron (for the correct address, see the Extron Warranty section on the last page of this guide).

CAUTION: Risk of explosion. Do not replace the battery with an incorrect type. Dispose of used batteries according to the instructions.

ATTENTION : Risque d’explosion. Ne pas remplacer la pile par le mauvais type de pile. Débarrassez-vous des piles usagées selon le mode d’emploi.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

CAUTION: Risk of minor personal injury.

ATTENTION : Risque de blessure mineure.

ATTENTION:

- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene,,Op1 scene 1,1 ^B 51 ^W ^C  
[ 01 ] R 0004 00300 00400 00800 00600 [ 02 ] 35 [ 17 ] [ 03 ]  
Esc [X1] * [X17] * [X20] * [X23] * [X21] CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character “Ø” is used for the number zero and “O” is the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32  
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t  
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.
Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, www.extron.com.

Extron Glossary of Terms

A glossary of terms is available at <http://www.extron.com/technology/glossary.aspx>.

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Introduction

This section gives an overview of the user guide and describes the Extron VNM Enterprise Controller and its features. Topics that are covered include:

- [About this Guide](#)
- [About the VNM Enterprise Controller](#)
- [Accessing the Web-based User Interface](#)
- [About Dual \(Redundant\) VNM Enterprise Controllers](#)
- [Transport Protocols Used for Streaming](#)
- [Definitions](#)
- [Features](#)

About this Guide

This guide contains installation, configuration, and operating information for the VNM Enterprise Controller.

In this guide:

- The terms "controller" and "Enterprise Controller" refer specifically to the VNM Enterprise Controller.
- The term "codec" refers to a VN-Matrix device that can be configured as either an encoder or decoder.
- The term "stream" refers to multimedia that is constantly received by (and normally presented to) an end-user while being delivered by a VN-Matrix encoding device.
- The term "element" refers to the video/graphics, audio, (user) data, and whiteboard (annotation data) content that is contained within a stream.
- The VN-Matrix system model prefix "VNM" is used generically to refer to the VNC (codec), VND (decoder), and VNE (encoder) models, and is used to refer to both the 2xx series and 3xx series devices. If specific models must be referenced, the exact model name is used.

NOTE: This user guide details menus that are used to configure and control VN-Matrix encoder, decoder, and codec devices, VNM recorders, and VNS software decoders. The menus on the VNM Enterprise Controller contain configuration and control menus for these devices. Where necessary, differences in the configuration and operation of controls for a specific VN-Matrix model or series is identified.

About the VNM Enterprise Controller

The VNM Enterprise Controller is a dedicated control device for VN-Matrix systems. The Controller simplifies managing a large VN-Matrix deployment allowing users to view, manage, and dynamically control multiple VN-Matrix systems and networked VN-Matrix domains from a single interface. **Figure 1** on the next page shows a simple application.

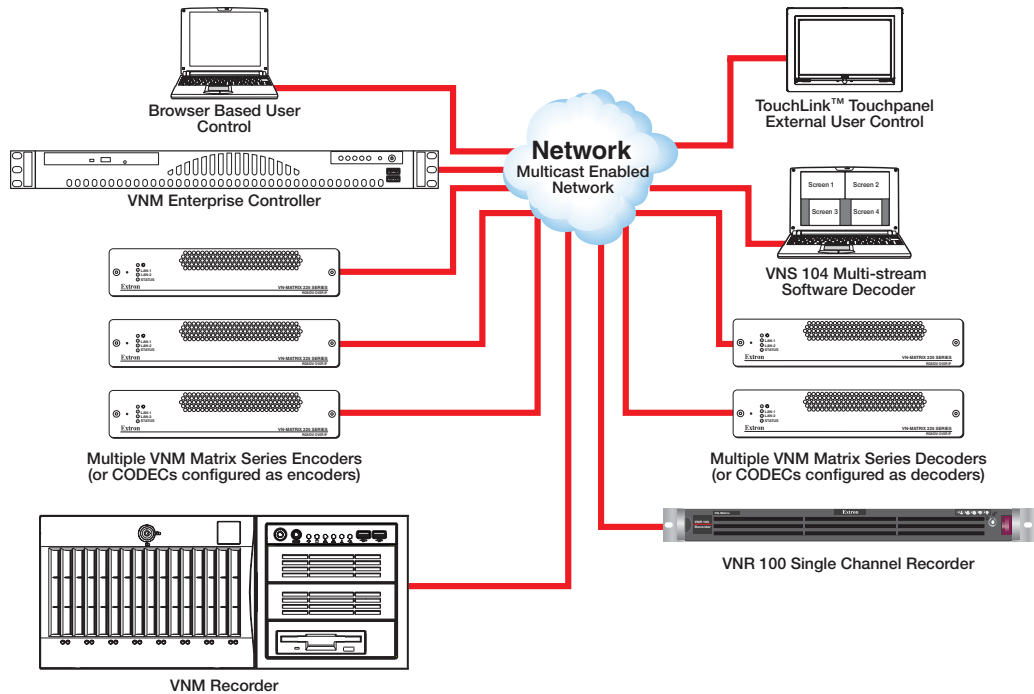


Figure 1. Single VNM Enterprise Controller System with No Redundancy

Two versions of the VNM Enterprise Controller are available:

- VNM Enterprise Controller with fixed hard disk drive
- VNM Enterprise Controller with removable CompactFlash® card

NOTE: Both VNM Enterprise Controllers function the same. The only difference is that one has a removable flash card. For additional information on the VNM Enterprise Controller with removable CompactFlash card, see [VN-Matrix Product Variants](#) on page 194.

The VNM Enterprise Controller is recommended when:

- More than ten VN-Matrix units are configured into a system.
- A system of VN-Matrix units are interfaced to an external control system requiring dynamic control of the units in a switching solution.
- Preset configurations must be prepared and recalled.
- Redundant system control is required.

For information on setting up a single VNM Enterprise Controller system, see the [Single Enterprise Controller Configuration](#) section page 13.

About the Web-based User Interface

Every VN-Matrix system product includes a basic embedded interface for configuration and control of itself and a few additional units. This interface is useful when control is limited to a few units that generally remain in a fixed operational state.

However, for large systems (more than ten devices) the VNM Enterprise Controller provides a more sophisticated user interface that simplifies the configuration and usability of a VN-Matrix system.

About Dual (Redundant) VNM Enterprise Controllers

For applications where it is essential to maintain system control, a second VNM Enterprise Controller can be added with both units configured as part of a redundant pair (see figure 2). In a redundant system, an internal database stores the current system configuration. The internal database is held on both units.

A crossover network cable is fitted to the eth1 port of each VNM Enterprise Controller. This connection is used to monitor the health of the system.

NOTES:

- The crossover connection must use a subnet that is different from the main VN-Matrix network (eth0).
- The crossover cable must be directly connected between the two VNM Enterprise Controller devices without using extra network equipment (such as a switch or router).

When the VN-Matrix system is started, the VNM Enterprise Controllers communicate with each other and one is chosen as the controller for the system. While the VN-Matrix system runs, each VNM Enterprise Controller continually monitors the health of the other. If the primary device (acting as the system controller) fails, the secondary unit takes over control of the VN-Matrix system. Transparent operation and communication within the system is maintained.

The two controllers in a redundant system are known as a "cluster". Each device has its own unique physical IP address (eth0) assigned. A third IP address, known as the cluster address, is also assigned. The cluster IP address is used as the controller IP address for all of the VN-Matrix devices in the system.

For information on setting up a dual (redundant) VNM Enterprise Controller system, see the [Dual \(Redundant\) Controller Configuration](#) section on page 158.

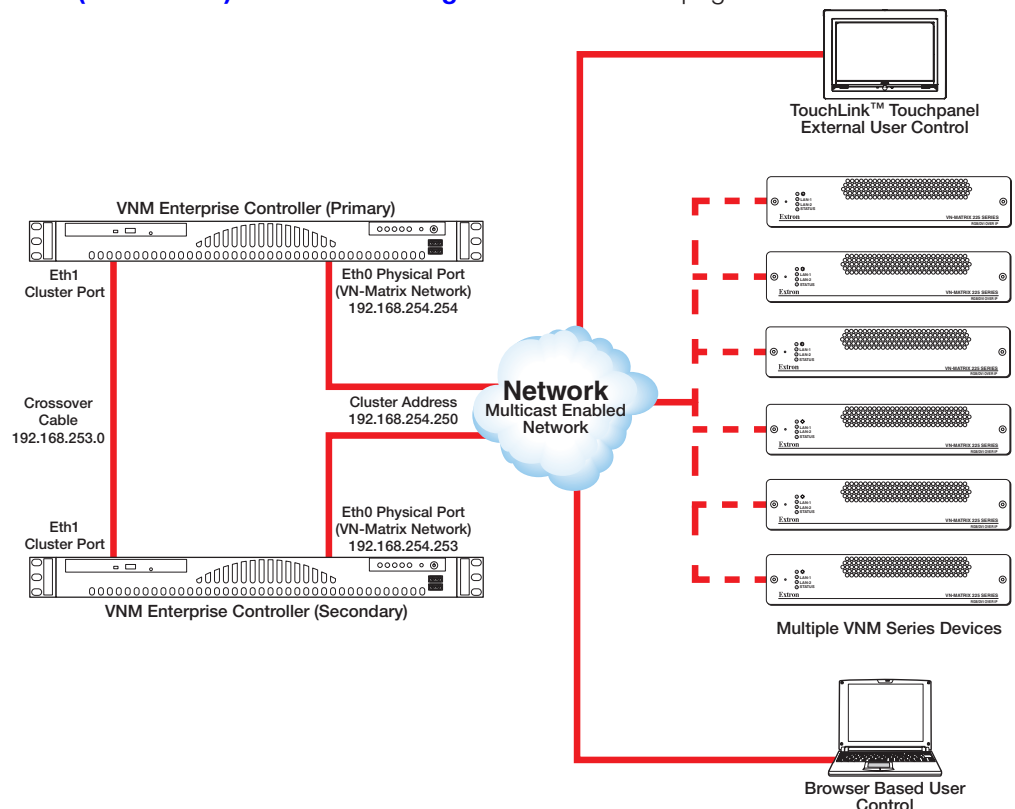


Figure 2. Dual (Redundant) VNM Enterprise Controller System

Transport Protocols Used for Streaming

The source data from a VN-Matrix encoder can be distributed to multiple displays/decoders (one-to-many) or to a single display/decoder (point-to-point). A previously recorded stream can be distributed in the same way and may be thought of as an encoder in this context.

A stream may be transported from the source (encoder, recorded stream) to the display (decoder) using one of three methods:

- Multicast Real-time Transport Protocol (RTP)
- Unicast Real-time Transport Protocol (RTP)
- Unicast Transmission Control Protocol (TCP)

These transport protocols are summarized in this section. For information on how to change the transport protocol used by the VNM Enterprise Controller see [System Config Page](#) on page 28.

Multicast RTP – An Overview

Multicast Real-time Transport Protocol (RTP) allows a source to be viewed on multiple displays. This method uses a real-time variation of UDP (User Datagram Protocol).

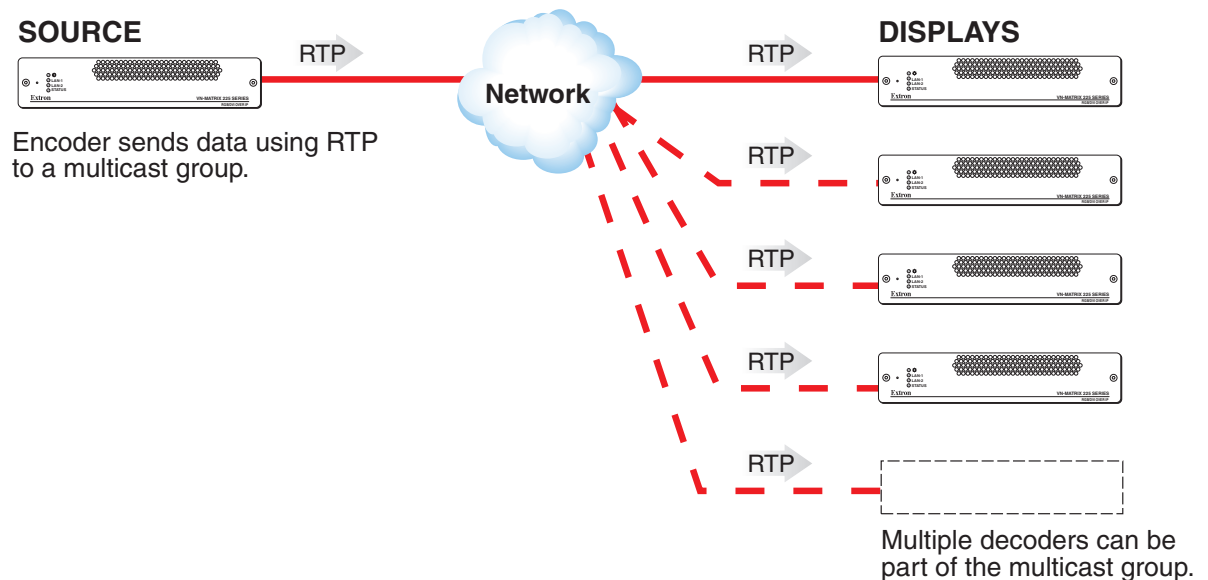


Figure 3. Multicast RTP Streaming

The source encoder uses RTP to send data to a multicast group. The source does not need to know the IP address of the decoders that are using the source.

RTP provides very low latency which is important for video streaming. Unlike other protocols, RTP packets include a time stamp. If packets are received in the wrong order, they are sorted into the correct order for display or discarded if the time stamp is out-of-date.

However, because RTP is a connectionless protocol, data delivery is not guaranteed. When data packets are lost (for example, due to excessive network traffic) the VN-Matrix devices carefully manage the data stream to minimize image disruption.

Unicast RTP — An Overview

Similar to multicast RTP, this method uses a real-time variation of UDP, called unicast RTP. Unicast RTP is used where the network infrastructure does not support multicast traffic. Typically, this protocol is used for point-to-point configuration (single source to single display), but can be configured to stream to a maximum of four displays.

NOTE: The encoder sends an individual stream to each decoder. This means that the total bandwidth of the VN-Matrix system increases as more decoders are added.

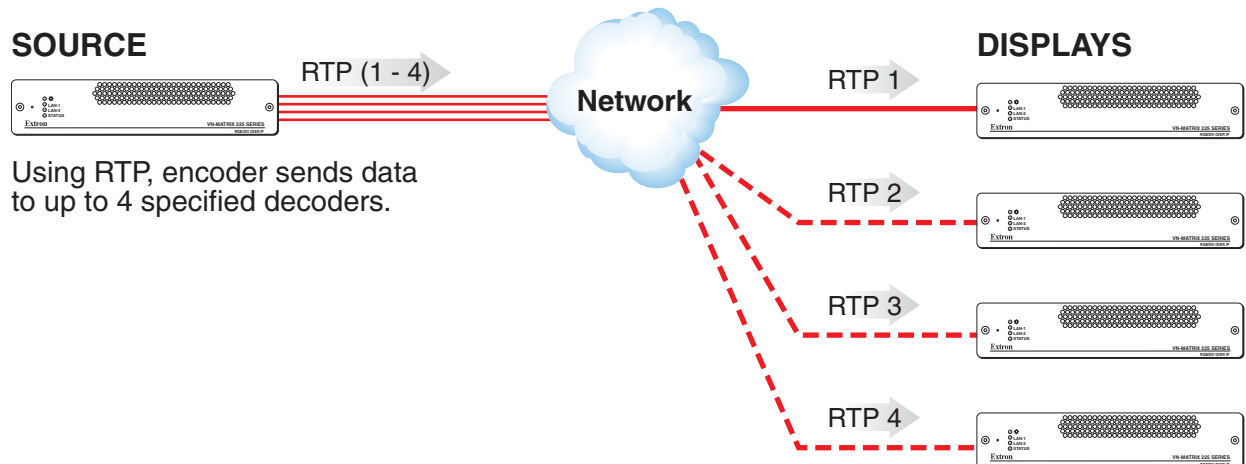


Figure 4. Unicast RTP Streaming

RTP provides very low latency which is important for video streaming. Unlike other protocols, RTP packets include a time stamp. If packets are received in the wrong order, they are sorted into the correct order for display or discarded if the time stamp is out-of-date.

However, because RTP is a connectionless protocol, data delivery is not guaranteed. When data packets are lost (for example, due to excessive network traffic) the VN-Matrix devices carefully manage the data stream to minimize image disruption.

Unicast TCP — An Overview

This method transports data using standard Transport Control Protocol (TCP) and should only be used for single point-to-point transfer of data.

TCP is a connection-based protocol and, therefore, data delivery is guaranteed. However, in the event of excessive network traffic, delivery can be delayed, impacting real-time performance.

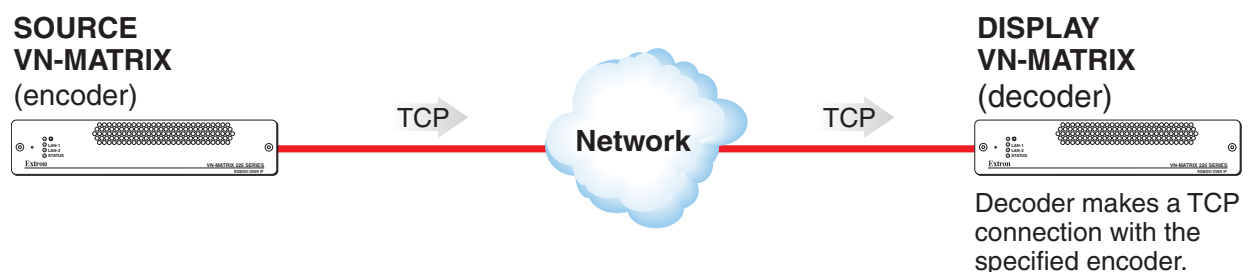


Figure 5. Unicast TCP Streaming

The decoder defines which source it connects to. Other than defining an IP address and source type (if required), no special source encoder setup is required.

Definitions

- **PURE3** — PURE3® is specifically designed for network transmission of real time media (such as video or graphics, audio, data, and whiteboard elements). It features both spatial and temporal image compression, which allows for efficient bandwidth usage and eliminates the need for forward error correction.
 - PURE3 streams always contain video or graphic elements.
 - PURE3 streams may contain audio, data, and whiteboard elements that are associated with the video and graphic elements.
- **Streaming media (stream)** — Multimedia that is constantly received by (and normally presented to) an end-user while being delivered by a streaming provider. Internet television is a commonly streamed medium. Streaming media (stream) in this guide refers to a PURE3 media stream that is produced by a VN-Matrix encoding device.
- **Element** — This term refers to the video/graphics, audio, (user) data, and whiteboard (annotation data) content that is contained within a stream.
- **Device license** — This term refers to the number of licensed features that are available on a device within a VN-Matrix system. All devices contain a default license that offers a default level of functionality. For information about device licenses, see [License Menu](#) on page 57 .
- **Controller license** — This term refers to the license that is applied to the VNM Enterprise Controller (see [Controller Firmware and License Updates](#) on page 179 for information about controller licenses).
- **(User) Data** — This term refers to the transfer of user data between an encoder and a decoder. User data is created at the encoder, placed into the PURE3 stream, and sent to the decoder. The data is received in the same form that it was transmitted. This method of data transfer is unidirectional and can only be sent from an encoder to a decoder.
- **Whiteboard (wb) data** — Also known as annotation data, whiteboard data outputs text and/or simple pointer annotation onto local displays that are connected to VN-Matrix encoders or decoders. This type of data is bidirectional, which allows a decoder to send whiteboard data to an encoder.
- **Cluster** — This refers to VNM Enterprise Controllers that are paired in a redundant configuration. A cluster IP address is used to access both VNM Enterprise Controllers at the same time.
- **Cluster IP address** — This refers to a single IP address that is used to access paired VNM Enterprise Controllers. A unique IP address on the same subnet as assigned to the eth0 port of the primary and secondary VNM Enterprise Controllers is used as the cluster IP address.

NOTE: When configuring the controller IP address of VN-Matrix devices, use the VNM Enterprise Controller cluster IP address.

Features

- Monitor, configure, and manage all VN-Matrix units as a system.
- Supplies the network heartbeat for encoder and decoder synchronization and communication.
- High-level interface provides single point of control for external control systems.
- Manage multiple VN-Matrix systems in combined or independent domains.
- Provides redundant control in mission critical applications.

Panels and Cabling

This section provides information on:

- [Installation Overview](#)
- [Front Panel Features](#)
- [Rear Panel Features](#)

Installation Overview

1. Turn off and disconnect the VNM Enterprise Controller and all existing devices.
2. Mount the controller (see [Mounting](#) on page 206).
3. Connect all devices to the controller (see [Front Panel Features](#) below and [Rear Panel Features](#) on page 9).
4. Reconnect and power on all devices.
5. Configure the controller.
6. Configure all connected devices.

Front Panel Features

NOTE: Some features listed in this user guide may not be available on some units. This will not affect the overall functionality of the VNM Enterprise Controller.

The front panel of the VNM Enterprise Controller is shown in figure 6 below.



Figure 6. VNM Enterprise Controller Front Panel

- A CD/DVD drive** — Insert any compatible CD or DVD into this drive. This drive is used to update the VNM Enterprise Controller software. The drive is not required for normal operation.

A compact flash drive can replace the CD/DVD drive. For more information on the compact flash drive, see [VN-Matrix Product Variants](#) on page 194.

ATTENTION:

- **Do not** remove the compact flash drive when the VNM Enterprise Controller is powered on. Power down the controller before removing the compact flash drive.
- Ne pas retirer la carte de mémoire (CF) lorsque le contrôleur VNM Enterprise Controller est allumé. Éteindre le contrôleur avant de retirer la carte de mémoire (CF).

- B Status LEDs** — Five LEDs provide the status of the VNM Enterprise Controller (see [figure 6](#) on the previous page).



Figure 7. Status LED Icons

- **Overheat LED** — When this LED is lit, the controller has achieved a condition which can cause it to overheat. The LED remains on for as long as the condition exists.

NOTE: If this LED is continuously lit, it can be caused by cables obstructing the airflow of the controller or the ambient room temperature. Check the routing of the cables and make sure all fans are operating normally. If necessary, move the controller to a cooler location or adjust the room temperature.

- **Network Activity LED (2)** — This LED flashes to indicate activity on the second network.
- **Network Activity LED (1)** — This LED flashes to indicate activity on the first network.
- **Drive Activity LED** — This LED flashes to indicate hard drive and CD/DVD drive activity.
- **Power LED** — This LED lights when the controller is receiving power.

- C Reset button** — This button reboots the system.

- D Power button** — This is the main power button, used to apply or turn off the main power. When the main power is turned off, standby power is actively supplied to the controller.

- E USB (Universal Serial Bus) ports** — Insert any compatible USB device into these ports. The ports are not required for normal operation.

Rear Panel Features

NOTES:

- Some features listed in this user guide are not available on each unit. This does not affect the overall functionality of the VNM Enterprise Controller.
- Items **A**, **G**, and **H** are required for normal operation. The other items are used when upgrading the VNM Enterprise Controller.

The rear panel of the VNM Enterprise Controller is shown in figure 8 below.

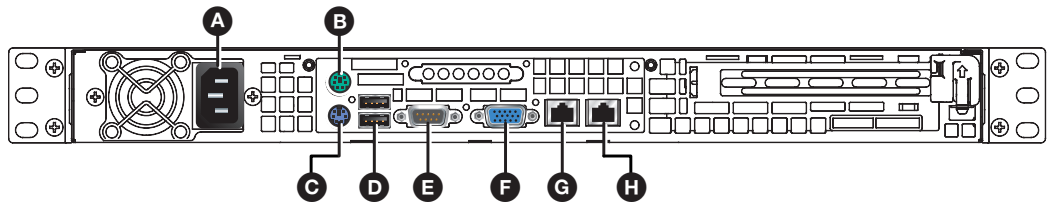


Figure 8. VNM Enterprise Controller Rear Panel

- A Power input (IEC connector)** — Plug a standard IEC power cord into this connector to connect the controller to a 100 to 240 VAC, 50 Hz or 60 Hz power source.
- B PS/2 mouse connector (optional)** — Connect a PS/2 mouse to this port.
- C PS/2 keyboard connector (optional)** — Connect a PS/2 keyboard to this port.
- D USB (Universal Serial Bus) connectors** — Insert any compatible USB device into these ports.
- E COM1 serial connector (optional)** — Connect a compatible device to this 9-pin serial port. This port can control the VNM Enterprise Controller using HLI commands (see [System Control](#) on page 175).
- F VGA connector (optional)** — Connect a compatible VGA monitor to this port.
- G Ethernet connector (eth0)** — Connect an RJ-45 cable to this port. This port connects to a primary network and is the default network port to connect the controller to a VN-Matrix network.
- H Ethernet connector (eth1)** — Connect an RJ-45 cable to this port. This port connects to a second VNM Enterprise Controller and is used to monitor the status of the primary VNM Enterprise Controller in a redundant configuration. This port is also referred to as the "cluster" or "service" port.

Controller Configuration and Operation

This section provides information on:

- [Power Up Procedure](#)
- [Web-based User Interface Overview](#)
- [Accessing the Web-based User Interface](#)
- [Power Down Procedure](#)

Power Up Procedure

NOTE: Before turning on the VNM Enterprise Controller, ensure that all necessary devices are powered on and connected properly.

1. Plug the IEC power cord into the VNM Enterprise Controller (see [Rear Panel Features](#), **A** on page 9).
2. Press the power button on the front of the unit (see [Front Panel Features](#), **D** on page 7). The power LED lights indicating the unit is powered. The VNM Enterprise Controller takes about 60 seconds to boot before it is fully operational.

Web-based User Interface Overview

The web-based user interface is used to configure the controller and operate connected devices in a VN-Matrix network. It is accessed by entering the IP address of the VNM Enterprise Controller into a compatible web browser (see [Browser Configuration](#) on page 200). The user interface provides system level configuration, monitoring, and operation of VN-Matrix devices connected to the VNM Enterprise Controller. The following list outlines the main features of the user interface.

- Codec device configuration includes device name, compression settings, peripheral communications, and device mode.
- Monitor the network bit rate and active connections in a VN-Matrix system.
- Enable and configure the on-screen display (OSD) feature for VN-Matrix devices.
- Update the firmware of connected VN-Matrix devices.
- Record and play back video using a connected VN-Matrix recorder.
- Create and save presets to quickly reconfigure devices.
- Stream to desktops with VN-Matrix software decoders.

Accessing the Web-based User Interface

To access the web-based user interface:

1. Configure the network settings of a control PC so that it is compatible with the VN-Matrix network and connect the control PC to the VN-Matrix network.
2. Open a compatible web browser (Microsoft® Internet Explorer® version 7 or above or Mozilla® Firefox® version 1.3 or above) running on the PC or laptop connected in step 1.

NOTE: See [Configuring the Network Settings](#) on page 14 for information on how to configure the network settings of the VNM Enterprise Controller.

3. In the address bar, enter the IP address of the Enterprise Controller (default IP address is 192.168.254.254).

The login screen opens in the browser (see figure 9). The controller is security protected.

NOTE: If the web browser cannot access the web-based user interface, the security settings of the web browser may need to be configured (see [Browser Configuration](#) on page 200 for more information).

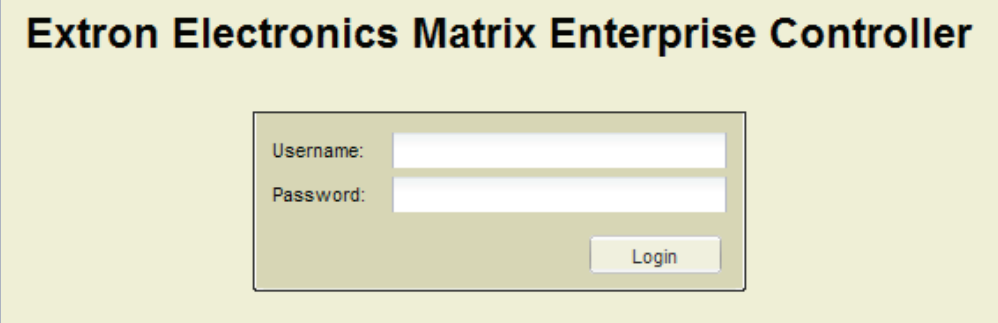


Figure 9. VNM Enterprise Controller Login Page

4. Enter the appropriate username and password. Two profiles are available.

NOTES:

- The procedures detailed use the administrator username and password to configure the VNM Enterprise Controller. Extron recommends that the administrator username and password be given only to those who require it. Others should use the guest login information to access the controller ensuring that important configuration settings are not changed.
 - Username and password entries are case sensitive.
 - For information on how to change the password, see [Changing the login password](#) on page 21.
-
- **Guest** — This profile hides the **Configuration** and **Format Editor** tabs prohibiting system changes to the Enterprise controller.
 - **Guest username** — Default: user
 - **Guest password** — By default, no password is required.
 - **Administrator** — This profile allows full access to all of the web-based user interface configuration settings and is the default configuration profile.
 - **Administrator username** — Default: admin
 - **Administrator password** — By default, no password is required.

- Click **Login** or press <Enter>. The **Devices** page opens (see figure 10) and the VNM Enterprise Controller is now ready for configuration and operation.

NOTE: The **Devices** page only displays devices properly configured to operate with the VNM Enterprise Controller (see the user guides for individual devices for more information). The VNM Enterprise Controller must also be configured properly.

Status	Mode	Device ID	Device Name	IP Address	Controller	Device Type	Version
Controller: 192.168.254.254 (11 Items)							
...	...	1021158	60_JMP9600	192.168.0.30	192.168.254.254	VNE 200 DVI	ver3.10.8
...	...	1080104	60_VNM325_Encode_2	192.168.0.33	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080117	60_VNM325_Decode_1	192.168.0.32	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080124	60_VNM325_Encode_1	192.168.0.45	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	11211552	60_Remote_Decode_1	192.168.0.39	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	620032	60_Rack_Dell	192.168.0.49	192.168.254.254	VNC 200 DVI-AD	ver3.10.8
...	...	620097	60_Small_Dell	192.168.0.47	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720193	60_Cars	192.168.0.35	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720200	60_Rack_Decode	192.168.0.38	192.168.254.254	VND 200 DVI	ver3.10.8
...	...	790008	60_VNM300_Decode	192.168.0.31	192.168.254.254	VND 300 3G-SDI	ver4.6.8
...	...	790041	60_VNM300_Encode	192.168.0.51	192.168.254.254	VNC 300 3G-SDI	ver4.6.8
Controller: 192.168.254.253 (7 Items)							
...	...	1080101	61_VNM325_Decode_2	192.168.0.34	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080120	61_VNM325_Decode_1	192.168.0.42	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080121	61_VNM325_Encode_2	192.168.0.43	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080125	61_VNM325_Encode_1	192.168.0.48	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	620023	61_MS9500	192.168.0.50	192.168.254.253	VNC 200 DVI	ver3.10.8
...	...	620091	61_Remote_Decode_2	192.168.0.54	192.168.254.253	VNC 200 DVI-A	ver3.10.8
...	...	720202	61_Remote_Decode_1	192.168.0.56	192.168.254.253	VNC 200 DVI	ver3.10.8

Figure 10. Devices Page

The **Alarms**, **Configuration**, and **System Info** pages, are used to configure and operate the Enterprise Controller. The remaining tabs for the **Devices**, **Preset Manager**, and **Format Editor** pages can configure and operate connected devices.

Power Down Procedure

To power down the VNM Enterprise Controller, press the power button on the front of the controller (see **Front Panel Features**, **D** on page 7). The power LED turns off.

NOTE: Turning off the controller using the power button removes the main power, but standby power is still supplied to the system.

Single Enterprise Controller Configuration

This section details basic information needed to configure the settings of a single VNM Enterprise Controller. For information on how to set up redundant VNM Enterprise Controllers, see [Dual \(Redundant\) Controller Configuration](#) on page 158.

This section provides information on:

- [Setup Overview](#)
- [Single VNM Enterprise Controller Configuration](#)
- [Configuring a Single Enterprise Controller as the System Controller](#)
- [Configuring the VN-Matrix Devices](#)

NOTE: For additional configuration information, see [Advanced Controller Configuration](#) on page 19.

Setup Overview

1. Use a network switch to connect the primary VN-Matrix network to the rear panel Ethernet connector (eth0) of the VNM Enterprise Controller (see [Rear Panel Features](#) on page 9).
2. Power on the VNM Enterprise Controller, all VN-Matrix devices present in the system, and all necessary devices (see [Power Up Procedure](#) on page 10).
3. Connect a control PC to the VN-Matrix network and navigate to the web-based user interface of the VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11).
4. Configure the settings of the VNM Enterprise Controller (see [Single VNM Enterprise Controller Configuration](#) on page 14).
5. Configure the VNM Enterprise Controller as the VN-Matrix system controller (see [Configuring a Single Enterprise Controller as the System Controller](#) on page 17).
6. Configure the VN-Matrix system devices (see [Configuring the VN-Matrix Devices](#) on page 18).
7. If necessary, update the license of the VNM Enterprise Controller (see [Controller Firmware and License Updates](#) on page 179).
8. Power down the VNM Enterprise Controller (see [Power Down Procedure](#) on page 12) and all configured devices. After a few seconds, power on the VNM Enterprise Controller and all necessary devices.

Single VNM Enterprise Controller Configuration

This section details procedures on how to set up and configure a single VNM Enterprise Controller (see [Advanced Controller Configuration](#) on page 19 for additional configuration information).

Configuring the Network Settings

The VNM Enterprise Controller is pre-configured with the following network settings.

IP address: 192.168.254.254
Subnet mask: 255.255.255.0
Gateway: 192.168.254.1
MTU: 1500

NOTE: With these settings, the units connected to the VN-Matrix network must use IP addresses within the range of 192.168.254.2 through 192.168.254.253 and use the same subnet mask.

Use the following procedure to change the network settings of the VNM Enterprise Controller, if necessary.

1. Log on the VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11).
2. Click the **Configuration** tab (see figure 11, ①).

The **Configuration** page opens.

The screenshot displays the Extron Electronics web interface. At the top, the 'Configuration' tab is selected and marked with a circled 1. The left sidebar shows 'Device Properties' with 'Network' selected, marked with a circled 2. The main content area is titled 'Network' and contains two sections: 'Internet Protocol' and 'Ethernet'. The 'Internet Protocol' section has fields for IP Address (192.168.254.254), Netmask (255.255.255.0), Gateway (192.168.254.253), and MTU (1500), with a circled 3 next to the section header. The 'Ethernet' section has fields for eth0 MAC address (00:25:90:14:b0:60) and eth1 MAC address. At the bottom right, there are 'Apply Changes' and 'Cancel Changes' buttons, with a circled 4 next to the 'Apply Changes' button.

Figure 11. Configuration Page — Configuring the Network Settings

3. Under **Device Properties**, click the **Network** link (②).

NOTE: Make sure the VNM Enterprise Controller is not "paired". If it is paired, the unit must first be unpaired (see [Unpairing controllers](#) on page 174). Be aware that unpairing and then pairing a VNM Enterprise Controller deletes device files and custom input or output modes.

4. Change the **IP Address**, **Netmask**, **Gateway**, and **MTU** fields as necessary (see [figure 11](#), ③ on the previous page).

NOTE: The default value of **1500** in the **MTU** field is the correct setting in most instances.

5. Click **Apply Changes** (④), to save and apply the configuration.
6. Configure the IP address of the control PC so that it is within the address range of the VNM Enterprise Controller.

NOTE: Complete this step only if the IP address of the VNM Enterprise Controller is using a **network prefix** other than **192.168.254.xxx** or **subnet mask** other than **255.255.255.0**.

7. If necessary, restart the control PC to save the configuration.

Setting the Role

Use the following procedure to set the role of the VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11 for login information).

1. Click the **Configuration** tab. The **Configuration** page opens (see figure 12, ①).

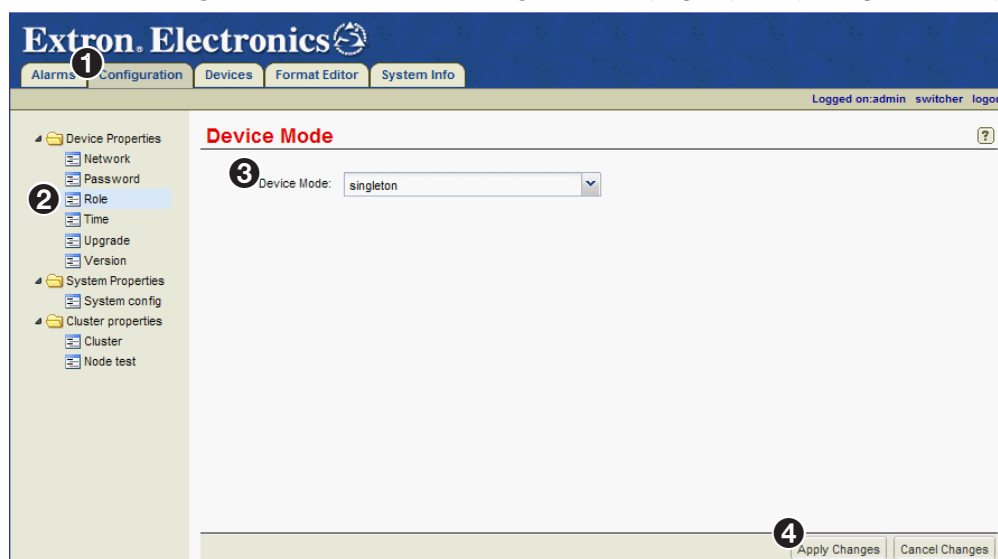


Figure 12. Configuration Page — Single VNM Enterprise Controller Role Setting

2. Click the **Role** link (②).
3. From the **Device Mode** drop-down list, select **singleton** (③).

NOTE: For information on the other device modes, see [Role Page](#) on page 22.

4. Click **Apply Changes** (④).

NOTE: The web-based user interface returns to the login page after saving the configuration.

Configuring the Transport Protocol

Use the following procedure to configure the transport protocol that will be used throughout the VN-Matrix system (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Click the **Configuration** tab.

The **Configuration** page opens (see figure 13, ❶).

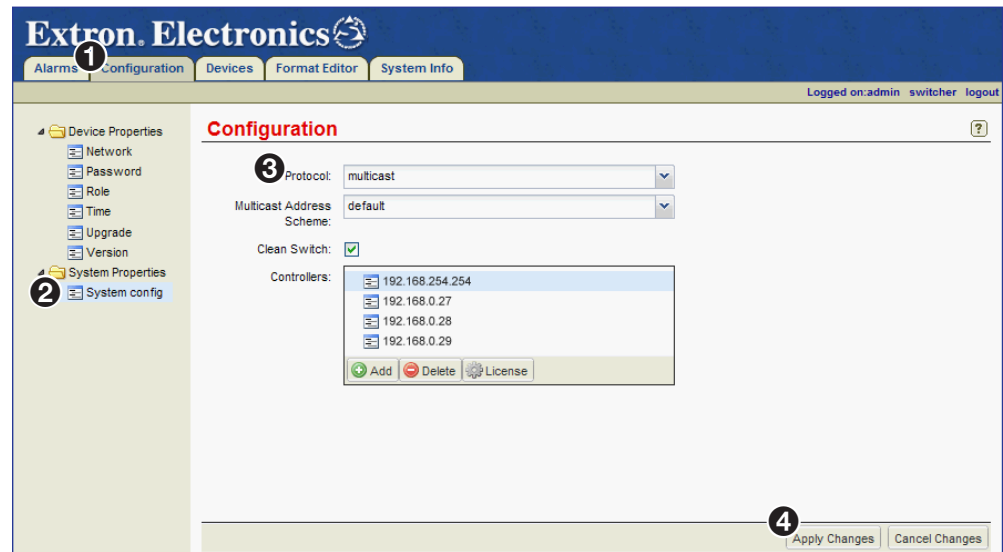


Figure 13. Configuration Page — Configuring the Transport Protocol

2. Click the **System config** link (❷).
3. From the **Protocol** drop-down list, select the preferred transport protocol that will be used throughout the VN-Matrix system (❸).

NOTE: The default transport protocol is **Unicast**. For more information on transport protocols, see [Transport Protocols Used for Streaming](#) on page 4 .

4. Click **Apply Changes** (❹), to save the configuration.

Configuring a Single Enterprise Controller as the System Controller

This section details how to assign a single VNM Enterprise Controller as the system controller. Before proceeding, make sure the procedures detailed in [Single VNM Enterprise Controller Configuration](#) on page 14 are completed first.

NOTE: For information on how to configure dual VNM Enterprise Controllers as system controllers, see [Configuring Dual Enterprise Controllers as the System Controller](#) on page 165.

Adding the VNM Enterprise Controller to the Controller List

Use the following procedure to add the VNM Enterprise Controller to the controller list (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Click the **Configuration** tab.

The Configuration page opens (see figure 14, ①).

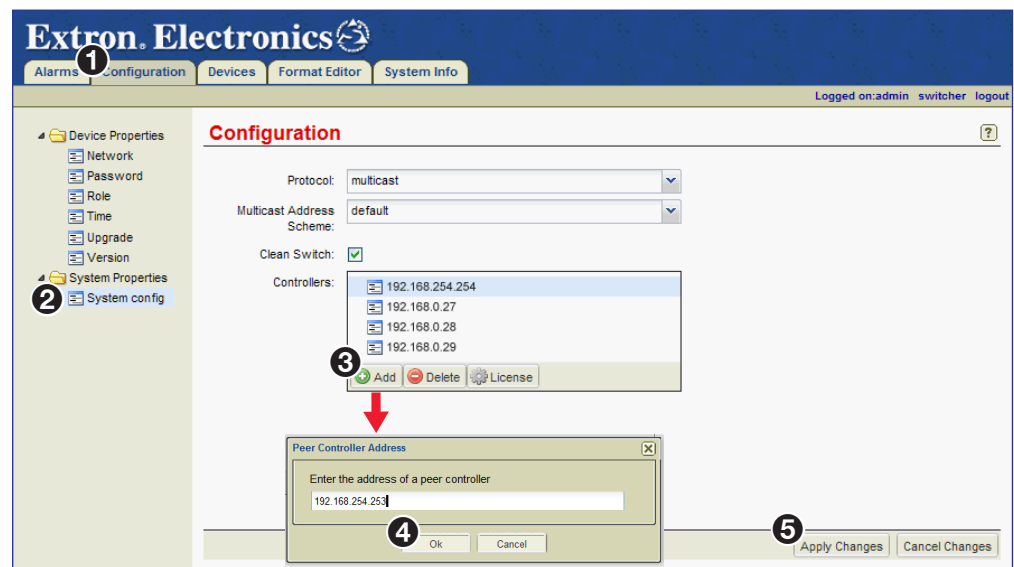


Figure 14. Configuration Page — Adding Controllers to the Controller List

2. Click the **System config** link (②).
3. Click **Add** (③). The Peer Controller Address (Add IP) dialog box opens.
4. Enter the IP address of this VNM Enterprise Controller and click **OK** (④).

NOTE: If necessary, clear the **Controllers** field by highlighting the displayed IP addresses and clicking **Delete**.

5. Click **Apply Changes** (⑤) to save the configuration.

The VNM Enterprise Controller restarts the user interface, and is assigned as the system controller.

Configuring the VN-Matrix Devices

For the VNM Enterprise Controller to function properly with connected devices:

1. Update each VN-Matrix device with the IP address of the VNM Enterprise Controller and configure each device to operate on the same network as the VNM Enterprise Controller.
2. Access the VNM Enterprise Controller web-based user interface by entering the IP address of the VNM Enterprise Controller into the address bar of a web browser.
3. Use the web-based user interface to select one or more devices from the Devices page and use the Actions menu bar at the bottom of the page to configure the selected devices (see [About the Actions Menu Bar](#) on page 40, and [Mode Menu \(VNC Devices Only\)](#) on page 60).

For information on configuring VN-Matrix devices, see the user guide for each device.

Advanced Controller Configuration

The **Configuration** page contains nine additional pages to configure the general settings of the VNM Enterprise Controller. This section presents a detailed overview of each page. The following configuration pages are available.

- [Network Page](#)
- [Password Page](#)
- [Role Page](#)
- [Time Page](#)
- [Upgrade Page](#)
- [Version Page](#)
- [System Config Page](#)
- [About the System Info Page](#)
- [About the Default Multicast Address](#)

NOTE: The [Cluster Page](#) on page 172 and [Node Test Page](#) on page 169 appear only when paired VNM Enterprise Controllers are available.

Network Page

The **Network** page (see figure 15, ❶) configures the primary physical (eth0) IP address of the VNM Enterprise Controller.

Extron Electronics

Alarms Configuration Devices Format Editor System Info

Logged on: admin switcher logout

❶ Device Properties

- ❶ Network
- Password
- Role
- Time
- Upgrade
- Version

System Properties

- System config

Network

Internet Protocol

- ❷ IP Address: 192.168.254.254
- ❸ Netmask: 255.255.255.0
- ❹ Gateway: 192.168.254.253
- ❺ MTU: 1500

Ethernet

- ❻ eth0 MAC address: 0:30:48:FC:E7:CA
- ❼ eth1 MAC address:

Apply Changes Cancel Changes

Figure 15. Network Page

The following fields are available for configuration.

- **IP Address** — Enter a valid IP address into this field (❷).
- **Netmask** — Enter a valid subnet mask into this field (❸).
- **Gateway** — Enter a valid gateway address into this field (❹).

NOTE: The **gateway address** field is only required if devices are on different subnets.

- **MTU** — Enter a valid MTU into this field (❺).

NOTE: The default value of **1500** in the **MTU** field is the correct setting for most systems.

- **eth0 MAC address** — This field details the Media Access Control (MAC) address assigned to the primary physical (eth0) IP address (❻). This field cannot be modified.
- **eth1 MAC address** — This field details the MAC address assigned to the secondary (eth1) IP address (❼). This field cannot be modified.

For information on how to change the network settings of the VNM Enterprise Controller see [Configuring the Network Settings](#) on page 14.

Password Page

The **Password** page (see figure 16, ❶) is used to set the passwords for the administrator and user profiles.

Figure 16. Password Page

Changing the login password

1. From the **User** drop-down list (❷), select one of the following account names.

- Select **user** to change the user password.
- Select **admin** to change the administrator password.

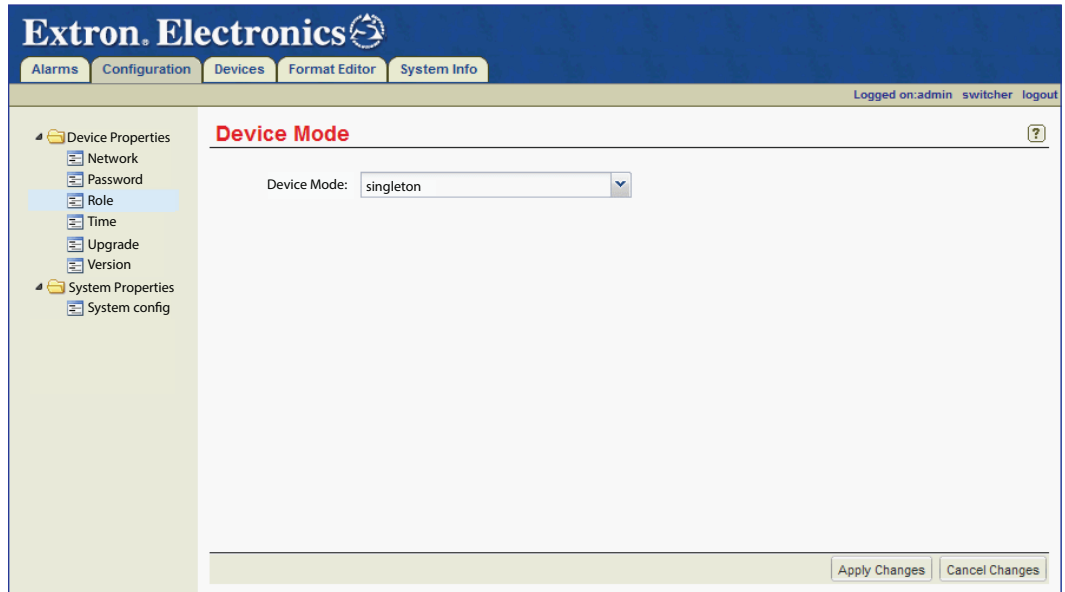
NOTE: The user name entries (**user** and **admin**) cannot be changed.

2. Enter the desired password in the top **Password** field (❸). The password can consist of letters, numbers, and the underscore character. Password entries are case sensitive.

3. Re-enter the password in the bottom **Password** field (❹).
4. Click **Apply Changes** (❺), to save the password.

Role Page

The **Role** page is used to set the mode of the VNM Enterprise Controller.



The screenshot shows the Extron Electronics web interface. At the top is a navigation bar with tabs: Alarms, Configuration, Devices, Format Editor, and System Info. Below this is a status bar indicating 'Logged on: admin switcher logout'. On the left is a sidebar menu with categories: Device Properties (containing Network, Password, Role, Time, Upgrade, Version) and System Properties (containing System config). The 'Role' option is selected. The main content area is titled 'Device Mode' and contains a 'Device Mode:' label followed by a dropdown menu currently set to 'singleton'. At the bottom right of the main area are 'Apply Changes' and 'Cancel Changes' buttons.

Figure 17. Role Page

The following device modes are available.

- **singleton** — Select this option when a single VNM Enterprise Controller is the system controller.
- **redundant_primary** — Select this option when a VNM Enterprise Controller is running as the first (primary) unit of a redundant pair.
- **redundant_secondary** — Select this option when a VNM Enterprise Controller is running as the second (secondary) unit of a redundant pair.

NOTE: If the **Device Mode** field is set to **redundant_primary** or **redundant_secondary**, the cluster properties pages are available for configuration (see [About the Cluster Properties Pages](#) on page 172).

For information on setting the different device modes, see:

- [Setting the Role](#) on page 15
- [Setting the Role of the Primary Enterprise Controller](#) on page 161
- [Setting the Role of the Secondary Enterprise Controller](#) on page 162

Time Page

The **Time** page (see figure 18, ❶) is used to manage the clock-related functions available on the VNM Enterprise Controller.

Extron Electronics

Alarms Configuration Devices Format Editor System Info

Logged on: admin switcher logout

❶ Device Properties

- Network
- Password
- Role
- ❶ Time
- Upgrade
- Version

❷ System Properties

- System Properties
- System config

Time

❷ Reported Time

Tue May 10 13:13:43 EDT 2011

❸ Clock Synchronization

Enable Clock Synchronization: ☒

Sources:

- 192.168.254.254
- 192.168.0.27
- 192.168.0.28
- 192.168.0.29

Add Delete

❹ Clock Settings

Set time: 13:06:07

Set date: 05/10/2011

❺ Time Zone

Set timezone: ESTSEDT

Apply Changes Cancel Changes

Figure 18. Time Page

Reported Time Panel

This panel (❷) contains a read-only field that displays the current system time of the controller that is logged in to.

NOTE: When logged into a cluster, the time of the primary controller is displayed in this field.

Clock Synchronization Panel

This panel (see [figure 18](#), ③ on the previous page) is used to determine the primary clock source for the controller.

NOTE: If there is only one VNM Enterprise Controller in the system, it is not necessary to configure clock synchronization.

All devices in a VN-Matrix system (controllers, encoders, decoders, and recorders) reference a primary system clock, sourced from the controller.

If the **Enable Clock Synchronization** check box is **selected**, the controller that is logged in offsets its own time to match the system time of the first VNM Enterprise Controller in the **Sources** list. If the first controller fails, the system time of the second controller in the list is used as the reference, and so on.


If the **Enable Clock Synchronization** check box is **not selected**, the controller that is logged in references its own clock for the system time (in the case of a singleton system with one VNM Enterprise Controller) or the time of the controller acting as the primary (in the case of a paired VNM Enterprise Controller cluster).

NOTES:

- Only physical IP addresses of VNM Enterprise Controllers should be added to the **Sources** list. **Do not use** service (cluster) IP addresses.
- The order of the controllers in the **Sources** list should be identical for each VNM Enterprise Controller.

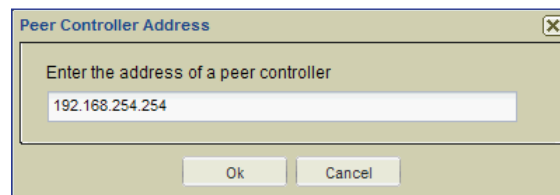
Adding controllers to the Sources list

NOTE: Only IP addresses of valid controller devices can be added to this list.

1. To add a controller to the list, click the  button located below the **Sources** list.




2. The following dialog box appears.



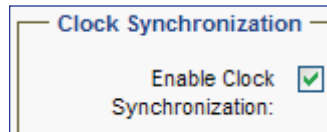
3. Enter the desired IP address and click **OK**.
4. Repeat steps **1** through **3** for each controller in the VN-Matrix system.
5. When finished adding controllers, click **Apply Changes** located at the lower right corner of the web page.

Removing controllers from the Sources list

1. To remove a controller from the list, select a controller from the **Sources** list.
2. Click the  button located below the **Sources** list to remove the selected IP address.
3. When finished, click **Apply Changes** located at the lower right corner of the web page.

Enabling clock synchronization

1. Add all of the controller IP addresses to the **Sources** list (see [Adding controllers to the Sources list](#) on page 24). **Do not add** service (cluster) IP addresses.
2. Select the **Enable Clock Synchronization** check box.



3. Click **Apply Changes**, located at the lower right corner of the web page, to save the setting.
4. Repeat this procedure for each controller device listed in the **Sources** list.

Disabling clock synchronization

1. Deselect the **Enable Clock Synchronization** check box.
2. Click **Apply Changes**, located at the lower right corner of the web page, to save the setting.

Clock Settings Panel

This panel (see [figure 18](#), ④ on page 23) is used to set the local time and date on the controller that is logged into.

NOTES:

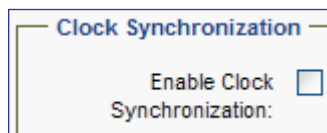
- Do not alter these fields if logged into the cluster IP address.
 - If **Enable Clock Synchronization** is selected in the Clock Synchronization panel (③), the values in this panel are dimmed.
- **Set time** — Enter the local time into this field or use the drop-down list button located at the right side of this field to select the desired time.
The time is entered as follows.
 - Use the HH:MM:SS (hours:minutes:seconds) format based on the 24-hour clock. For example, 08:25:00 for AM or 20:35:10 for PM.
 - **Set date** — Enter the current date into this field or use the calendar button located at the right side of this field to open a calendar and select the desired date.
The date is entered as follows.
 - Use the MM/DD/YYYY (month/day/year) format. For example, 05/14/2012.

Setting the time and date

NOTES:

- Set the time zone **before** manually setting the time and date (see [Setting the time zone](#), below).
- Do not alter these fields if logged into the cluster IP address.

1. Make sure **Enable Clock Synchronization** is **not selected**.



NOTE: If Enable Clock Synchronization is checked, the **Set time** and **Set date** fields are dimmed.

2. Enter the time in the **Set time** field.

- Use the HH:MM:SS (hours:minutes:seconds) format based on the 24-hour clock. For example, 08:25:00 or 20:35:10.

3. Enter or select the date in the **Set date** field.

- Use the MM/DD/YYYY (month/day/year) format. For example, 05/14/2016.

4. Click **Apply Changes**, located at the lower right corner of the web page, to save the configuration.

Time Zone Panel

This panel (see [figure 18](#), ⑤ on page 23) is used to set the time zone.

- **Set timezone** — Use the drop-down list located at the right side of this field to select the desired time zone.

NOTE: Setting the time zone automatically adjusts the field in the Reported Time Panel (see [Reported Time Panel](#) on page 23).

Setting the time zone

1. Select the desired time zone from the **Set timezone** drop-down list.

2. Click **Apply Changes**, located at the lower right corner of the web page, to save the configuration.

Upgrade Page

The **Upgrade** page is used to update the firmware of the VNM Enterprise Controller.

- For information on updating the firmware of a single VNM Enterprise Controller, see [Updating the Firmware of a Single Enterprise Controller](#) on page 181.
- For information on updating the firmware of dual (redundant) VNM Enterprise Controllers, see [Updating the Firmware of Dual \(Redundant\) Enterprise Controllers](#) on page 181.

Version Page

The **Version** page (see figure 19, ❶) details the versions of firmware running on various components of the VN-Matrix system.

Extron Electronics

Alarms Configuration Devices Format Editor System Info

Logged on: admin switcher logout

Version

	Component	Version
❷	enterprise controller	1.03.15
❸	matrix controller	3.8i
❹	heartbeat	3.0.3-2.e15
❺	pacemaker	1.0.8-6.e15
❻	drbd	8.3.7-1
❼	linux kernel	2.6.18-194.3.1.e15

Figure 19. Version Page

The following fields are read-only (cannot be edited).

- **enterprise controller** — This field (❷) displays the version of software that is running on the VNM Enterprise Controller.
- **matrix controller** — This field (❸) displays the version of firmware that is running on the VNM Enterprise Controller.
- **heartbeat** — This field (❹) displays the Heartbeat clustering software version that is running on the VNM Enterprise Controller. The Heartbeat and Pacemaker software work together to create a cluster.
- **pacemaker** — This field (❺) displays the Pacemaker clustering software version that is running on the VNM Enterprise Controller. The Heartbeat and Pacemaker software work together to create a cluster.
- **drbd** — This field (❻) displays the Distributed Redundant Block Device (DRBD®) version that is running on the VNM Enterprise Controller. DRBD is used to manage and sync a cluster of VNM Enterprise Controllers.
- **linux kernel** — This field (❼) displays the version of Linux that is running on the VNM Enterprise Controller.

System Config Page

The **System Config** page (see figure 20, ❶) is used to configure the following sets of control options.

- Transport protocol (multicast RTP, unicast TCP, unicast RTP)
- Multicast addressing schemes
- Clean switch
- Controller listing

Figure 20. System Config Page

The following options are available for configuration.

- **Protocol** — This drop-down list (❷) sets the default transport protocol. Three transport protocol selections are available.
 - **multicast** — This transport protocol supports unlimited endpoints (displays) per single stream (source) (see [Multicast RTP — An Overview](#) on page 4).
 - **unicast** — This transport protocol supports up to four endpoints (displays) per single stream (source) (see [Unicast RTP — An Overview](#) on page 5).
 - **tcp** — This transport protocol supports one endpoint (display) per single stream (source) (see [Unicast TCP — An Overview](#) on page 5).

- **Multicast Address Scheme** — This drop-down list (see [figure 20](#), ③ on the previous page) selects the algorithm that calculates the multicast addresses within the VN-Matrix system.

NOTES:

- This option needs to be set only if **multicast** is selected in the **Protocol** field.
- Class C (255.255.255.0) subnet addresses are supported by default. Contact the Extron S3 Sales and Technical Support Hotline regarding other addressing schemes.

Three multicast address schemes are available.

- **default** — This setting assumes that VN-Matrix devices on the system use Class C (255.255.255.0) subnet addresses. This is the default setting (see [About the Default Multicast Address](#) on page 31).
- **octet-0-1-3** — This is specific to systems that have special addressing schemes. This scheme is not suitable for use on standard system configurations and should not be used.
- **octet-1-3** — This scheme is specific to systems that have special addressing schemes. This scheme is not suitable for use on standard system configurations and should not be used.

Select the **default** multicast address scheme and click **Apply Changes** (⑥), located at the lower right corner of the web page, to save the setting.

- **Clean Switch (VN-Matrix 2xx only)** — The clean switch (④) feature allows glitch free transitions when switching between decoded streams. Select the check box to activate the clean switch option or deselect to deactivate the clean switch option. Click **Apply Changes** (⑥), located at the lower right corner of the web page, to save the setting.

NOTES:

- The **scale output** feature must be **activated on the decoder** when using clean switch.
- VN-Matrix 300 / 325 devices do not support Clean Switch and ignore this setting.

- **Controllers** — This field (⑤) is used to add the IP addresses of all singleton and service (cluster) controllers. This field is used to keep the VNM Enterprise Controller that is logged into aware of the devices it is controlling and the devices that are managed by the other controllers in the system. This field allows streaming between devices managed by other controllers, as well as editing configuration options of devices connected to other controllers.

NOTE: If only one controller is used in the VN-Matrix system, the IP address of the controller still needs to be added to this field. If the IP address is not added, the **Devices** page is empty (see [About the Actions Menu Bar](#) on page 40).

Adding and removing controllers from this field is similar to adding and removing controllers on the [Time](#) page (see page 23).

For information on how to add and remove controllers:

- [Adding controllers to the Sources list](#) on page 24
- [Removing controllers from the Sources list](#) on page 25

About the System Info Page

This page is accessed by selecting the **System Info** tab (see figure 21).

Property	192.168.254.254	192.168.0.27
cluster_server ❶	singleton	singleton
hli.memory_usage ❷	3%	3%
hli.uptime ❸	1 minute	9 seconds
server.disk_usage ❹	13%	13%
server.memory_usage ❺	13%	14%
server.uptime ❻	4 hours	4 hours
time.delta ❼	0.523090362549 ms	-0.151872634888 ms
time.last_mark ❽	2015-09-07 08:08:29	2015-09-08 12:13:45
time.last_rejam ❾	2010-10-18 14:47:47	2015-09-07 09:52:50
time.last_switch ❿	2015-09-07 08:03:32	2015-09-08 07:02:16
time.source ⓫	192.168.254.10	192.168.254.10

Figure 21. System Info Page

The **System Info** page displays general information about the VNM Enterprise Controller. If the VN-Matrix system contains multiple controllers, they are displayed on this page by IP address using individual columns. The following information is displayed.

- ❶ **cluster_server** — This field displays the role of the VNM Enterprise Controller cluster as follows:
 - **singleton** for a single Controller that is **NOT** running as part of a redundant cluster.
 - **primary** for a Controller running as part of a cluster, with the unit configured as the redundant_primary unit in control of the cluster.
 - **secondary** for a Controller running as part of a cluster, with the unit configured as the redundant_secondary unit in control of the cluster.
- ❷ **hli.memory_usage** — This field displays the amount of memory the VNM Enterprise Controller cluster is currently using for the web-based user interface.
- ❸ **hli.uptime** — This field displays the number of days the VNM Enterprise Controller cluster web-based user interface has been operational.
- ❹ **server.disk_usage** — This field displays the amount of disk space being used by the VNM Enterprise Controller cluster to keep the VN-Matrix system operational.
- ❺ **server.memory_usage** — This field displays the amount of memory being used by the VNM Enterprise Controller cluster to keep the VN-Matrix system operational.
- ❻ **server.uptime** — This field displays the number of days the VNM Enterprise Controller cluster server has been operational.
- ❼ **time.delta** — This field displays the time difference between the clock of this Controller and the reference time source. This value is normally less than one video frame.
- ❽ **time.last_mark** — This field displays the date and time that the cluster was last updated.
- ❾ **time.last_rejam** — This field displays the date and time that the cluster was force updated.
- ❿ **time.last_switch** — This field displays the date and time that the cluster last switched roles (primary to secondary or secondary to primary).
- ⓫ **time.source** — This field displays the device being used for clock synchronization within the VN-Matrix system.

About the Default Multicast Address

When multicast is chosen as the transport protocol, the VNM Enterprise Controller assigns multicast IP addresses automatically. Three schemes are available. Each of these schemes is designed to calculate and assign a multicast address based on the IP address of an encoder device. This section details how the default multicast address scheme operates.

The default multicast address scheme is used for all VN-Matrix systems. It creates at least one and a maximum of four multicast addresses for each encoder. This is dependant on how many stream elements are selected for transport. The table below details how the IP address is derived.

Default Multicast Address Scheme		
Address Type	Address Format	Description and Comments
VN-Matrix device IP address	aaa.bbb.ccc.ddd	aaa.bbb.ccc. is the subnet.
		ddd is a host number in the range 1 to 254.
VN-Matrix device subnet mask	255.255.255.0	Subnet mask set on all devices.
Derived multicast address	239.192.bbbxxxyy.zzzzzzzz	b represents bits 8, 7, and 6. – These bits are always 0.
		x represents bits 5, 4, and 3 and is the channel number in the range 0 to 4. – Encoders are always 0. – Recorder channels are 0 to 4 as appropriate.
		y represents bits 2 and 1 and is the stream element number. – 00 = audio – 01 = video – 10 = whiteboard – 11 = data
		z represents the value of the fourth octet in the host IP address.

An example of how video multicast addresses are created is shown in the table below.

Video Multicast Address Example for IP Address 192.168.0.102			
Item	Value	Binary	Comments
Default Value for the First Two Octets			
First octet	239		All multicast addresses in this scheme use these values.
Second octet	192		
Deriving the Third Octet			This is a binary value derived as follows.
Bits 8, 7, 6 (bbb)	0	000 xxx yy	The most significant three bits are always 0.
Channel number (xxx)	0	bbb 000 yy	The channel number for an encoder is 0.
Video stream element (yy)	1	bbb xxx 01	The value for the video stream element is 01.
Resulting third octet	1	000 000 01	
Deriving the Fourth Octet			
Fourth octet (z)	102		Takes the value of the last octet in the device IP address.
Final Multicast Address			
Video stream multicast address	239.192.1.102		

For each of the multicast group addresses, the VNM Enterprise Controller creates two port numbers. The table below details how port numbers are derived.

Default Multicast Address Port Numbers		
Port Type	Port Format	Description and Comments
Base port number	9004	
Derived port number (even)	9004 + xxxyyzzzzzzzzE	x represents the channel number in the range 0 to 4. – Encoders are always 0. – Recorder channels are 0 to 4 as appropriate.
		y represents the stream element number. – 00 = audio – 01 = video – 10 = whiteboard – 11 = data
		z represents the value of the last octet in the host IP address.
		E represents the last bit. – 0 makes the port number an even value. – 0 + 1 makes the port number an odd value.
Derived port number (odd)	9004 + xxxyyzzzzzzzz0 + 1	Derived even port number plus 1.

An example of how port numbers are created is shown in the table below.

Video Port Number Example for IP Address 192.168.0.102			
Item	Value	Binary	Comments
Base port number	9004		All multicast port numbers in this scheme start from this value.
Deriving the Port Number Offset			
Channel number (xxx)	0	000yyzzzzzzzzE	The channel number for an encoder is 0.
Video stream element (yy)	1	xxx01zzzzzzzzE	The value for a video stream element is 01.
Fourth octet (zzzzzzzz)	102	xxxyy01100110E	Takes the value of the last octet in the device IP address.
Last bit (E)	0	xxxyyzzzzzzzz0	Always 0 to make the port number an even value.
Port number offset value	716	00001011001100	716 is the decimal value of the binary number.
Creating the Final Port Number			
<div> NOTE: There are two port numbers associated with each multicast address. The even port number is for RTP stream data. The odd port number is for the associated RTCP data. </div>			
Final port number (RTP, video)	9720		The sum of 9004 and the port offset value, 716.
Second port number (RTCP, video)	9721		Even port number plus 1.

VN-Matrix Device Configuration and Control

The VN-Matrix Enterprise Controller is the center of an audio and video streaming network that connects and controls VN-Matrix hardware encoders, decoders, recorders, and software decoders.

The controller can control all VN-Matrix devices residing on the same network. Each matrix device must have its system controller IP address set to the IP address of the controller.

The matrix devices are monitored and configured from the device list page. The **Preset Manager** page builds connections between VN-Matrix devices. The presets are saved for later use to enable rapid system configuration.

This section provides instructions on how to view VN-Matrix codecs, recorders, and software decoders on a VNM Enterprise Controller, configure the devices for proper operation, and to operate those devices in a VN-Matrix network.

Sections include:

- [Devices Page Overview](#)
- [About the Devices Page](#)
- [About the Actions Menu Bar](#)
- [Actions Menu Bar Overview](#)
- [Device Configuration](#)
- [VNM 200/225/300/325 Configuration](#)
- [VNM 250 Configuration](#)
- [Recorder Configuration](#)
- [VNS 104 Software Decoder Configuration](#)
- [About the Switcher Page](#)

For the VNM Enterprise Controller to operate and control devices on the network:

- Update each VN-Matrix device with the IP address of the VNM Enterprise Controller and configure them to operate on the same network as the VNM Enterprise Controller.
- Access the VNM Enterprise Controller web-based user interface from a control computer on the same network by entering the IP address of the VNM Enterprise Controller into the address bar of a web browser (see [Accessing the Web-based User Interface](#) on page 11).
- Use the web-based user interface to select one or more devices from the **Devices** page and use the **Actions** menu bar at the bottom of the page to configure the selected device (see [About the Devices Page](#) on the next page).

For information on the configuration of VN-Matrix devices, see the user guide for each device.

Devices Page Overview

The VN-Matrix Enterprise Controller is the center of an audio and video streaming network that connects and controls VN-Matrix hardware encoders, decoders, recorders, and software decoders. The controller provides support for third party system control using the HLI protocol.

The following VN-Matrix devices are discussed in this section:

Device	Description
VNM 2xx Series	DVI, HDMI, and RGB encoders, decoders and codecs
VNM 3xx Series	3G-SDI codecs
VNR 100	Single channel recorder/player
VNM Recorder	Five-channel recorder/player
VNS 104	Multi-stream software decoder

To use the devices in a VN-Matrix system, the Enterprise Controller is required. The devices are added to the system, then configured for control from the EC. The controller connects the devices together in smaller systems to support specific operations and tasks using the Preset Manager (see [Preset Manager](#) on page 92).

About the Devices Page

The **Devices** page lists all VN-Matrix devices detected on the network and is the main page for configuring and managing devices. This is also the default page opened after logging in (see figure 22).

Extron Electronics							
Alarms		Configuration		Devices	Preset Manager	Format Editor	System Info
A	B	C	D	E	F	G	H
Status	Mode	Device ID	Device Name	IP Address	Controller	Device Type	Version
Controller: 192.168.254.254 (11 Items)							
...	...	1021158	60_JMP9600	192.168.0.30	192.168.254.254	VNE 200 DVI	ver3.10.8
...	...	1080104	60_VNM325_Encode_2	192.168.0.33	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080117	60_VNM325_Decode_1	192.168.0.32	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080124	60_VNM325_Encode_1	192.168.0.45	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	11211552	60_Remote_Decode_1	192.168.0.39	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	620032	60_Rack_Dell	192.168.0.49	192.168.254.254	VNC 200 DVI-AD	ver3.10.8
...	...	620097	60_Small_Dell	192.168.0.47	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720193	60_Cars	192.168.0.35	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720200	60_Rack_Decode	192.168.0.38	192.168.254.254	VND 200 DVI	ver3.10.8
...	...	790008	60_VNM300_Decode	192.168.0.31	192.168.254.254	VND 300 3G-SDI	ver4.6.8
...	...	790041	60_VNM300_Encode	192.168.0.51	192.168.254.254	VNC 300 3G-SDI	ver4.6.8
Controller: 192.168.254.253 (7 Items)							
...	...	1080101	61_VNM325_Decode_2	192.168.0.34	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080120	61_VNM325_Decode_1	192.168.0.42	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080121	61_VNM325_Encode_2	192.168.0.43	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080125	61_VNM325_Decode_1	192.168.0.48	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	620023	61_MS9500	192.168.0.50	192.168.254.253	VNC 200 DVI	ver3.10.8
...	...	620091	61_Remote_Decode_2	192.168.0.54	192.168.254.253	VNC 200 DVI-A	ver3.10.8
...	...	720202	61_Remote_Decode_1	192.168.0.56	192.168.254.253	VNC 200 DVI	ver3.10.8

Figure 22. Devices Page

NOTE: If devices are added after the page has opened, they might not automatically appear in this list. Refresh the page or click the **Devices** tab to update the list.

When a VN-Matrix device is detected and listed on the **Devices** page, an entry is always displayed even if the device is subsequently disconnected. All valid devices are listed by device name and followed by their current IP address.

NOTE: Some listed devices will not show an IP address. These devices are inactive. A device is considered inactive if it is disconnected from the network or powered down.

The columns on the devices page detail important information about VN-Matrix devices. Each recognized device is listed.

A Status Icons — The status of a device is indicated by a colored icon.



A device under active control and connected to the VN-Matrix network.



A device that is not under active control (not online in the VN-Matrix network).

B Mode Icons — The current configuration status of each device is identified by an icon.



An undefined device. This icon is shown when a codec device is connected to the VN-Matrix system for the first time and before it has been configured as a source or a display.



A VN-Matrix 200 / 225 device configured as an encoder (source).



A VN-Matrix 200 / 225 device configured as a decoder (display).



A VN-Matrix 300 / 325 device configured as an encoder (source).



A VN-Matrix 300 / 325 device configured as a decoder (display).



A VNE 250 encoder.



A VND 250 decoder.



A VNR 100 recorder.



A VN-Matrix 5-channel recorder.



A single sub-channel of a VN-Matrix 5-channel recorder.



A VNS 104 software decoder.



A single VNS 104 window. The lit window indicates the position of the window with active streaming (example icon indicates window 1).



NOTE: A warning triangle over the device icon represents an issue or a problem with the device (such as the device not having an active source or display connection). Search for the device on the [Alarms Page](#) (see page 153) to see if the device contains an active alarm.

C Device ID — The devices unique identifier is shown in this column.

D Device Name — The device name is shown in this field. To change the name of the device, see [Device Name](#) in the [Configure Menu](#) on page 44 .

E IP Address — The IP address of the device is shown in this column.

NOTE: The IP address of a device is shown only if the device is currently present on the network and configured to use the VNM Enterprise Controller.

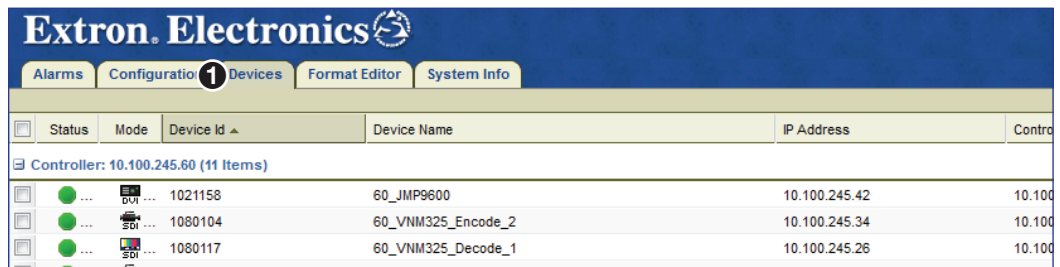
F Controller — This column shows the IP address of the device acting as the system controller.

- G Device Type** — This column shows the type of device connected to the VN-Matrix system.
- H Version** — This column shows the current firmware version installed on each device.

NOTE: To avoid compatibility issues, all devices of the same model must have the same version of firmware installed on each device.

Sorting Devices by Column

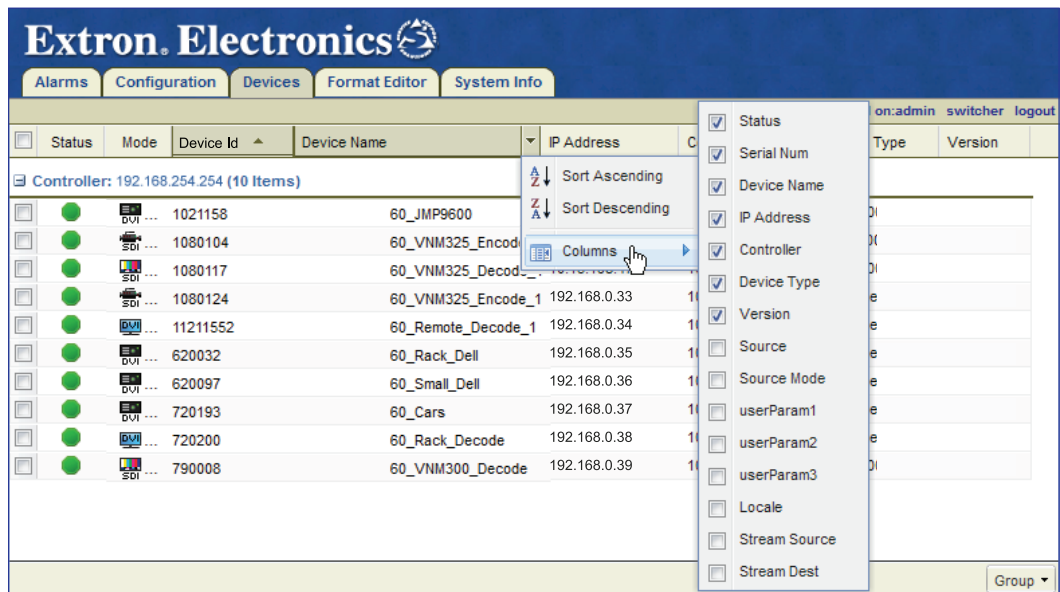
Columns can be sorted by clicking directly on any of the column names. Click a column name to sort the list in ascending or descending order. Figure 23 shows the devices sorted by device ID number. The **Device Id** column (1) is darkened and contains an ▲ icon to indicate the devices are sorted by the **Device ID** number in ascending order.



Status	Mode	Device Id ▲	Device Name	IP Address	Control
Controller: 10.100.245.60 (11 Items)					
●	DVI	1021158	60_JMP9600	10.100.245.42	10.100.245.42
●	SDI	1080104	60_VNM325_Encode_2	10.100.245.34	10.100.245.34
●	SDI	1080117	60_VNM325_Decode_1	10.100.245.26	10.100.245.26

Figure 23. Sort by Device ID

Hovering over the right side of a column name reveals a drop-down arrow that, when clicked, accesses the advanced column sorting menu (see figure 24). Use this menu to sort columns in ascending or descending order and populate the page with necessary information by adding or removing columns. A checkmark indicates the column is visible.



Status	Mode	Device Id ▲	Device Name	IP Address	Control
Controller: 192.168.254.254 (10 Items)					
●	DVI	1021158	60_JMP9600	192.168.0.33	192.168.0.33
●	DVI	1080104	60_VNM325_Encode_1	192.168.0.34	192.168.0.34
●	DVI	1080117	60_VNM325_Decode_1	192.168.0.35	192.168.0.35
●	DVI	1080124	60_VNM325_Encode_1	192.168.0.36	192.168.0.36
●	DVI	11211552	60_Remote_Decode_1	192.168.0.37	192.168.0.37
●	DVI	620032	60_Rack_Dell	192.168.0.38	192.168.0.38
●	DVI	620097	60_Small_Dell	192.168.0.39	192.168.0.39
●	DVI	720193	60_Cars		
●	DVI	720200	60_Rack_Decode		
●	SDI	790008	60_VNM300_Decode		

☒ Status
☒ Serial Num
☒ Device Name
☒ IP Address
☒ Controller
☒ Device Type
☒ Version
☐ Source
☐ Source Mode
☐ userParam1
☐ userParam2
☐ userParam3
☐ Locale
☐ Stream Source
☐ Stream Dest

Figure 24. Advanced Column Sorting

Sorting Devices by Group

Devices can be sorted in groups using the **Group By** menu (see figure 25, **A**).

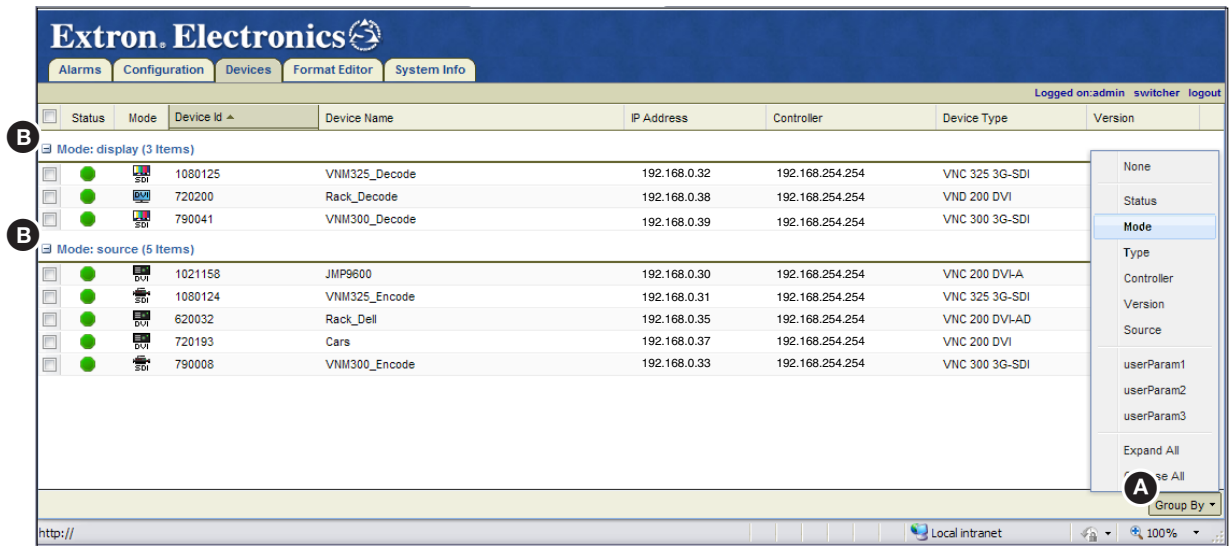


Figure 25. Grouping Devices

The following group options are available.

NOTES:

- After selecting a grouping option, groups can be further sorted using column sorting. Figure 25 shows the devices grouped by mode and sorted by device ID in ascending order.
- Grouped devices can be expanded and collapsed by clicking on the square icon located next to the group name (see figure 25, **B**).

- **None** — Removes group sorting.
- **Status** — Organizes the devices into the following groups.
 - Active
 - No device
- **Mode** — Organizes the devices into the following groups.
 - Display
 - Recorder
 - Source
 - None
- **Type** — Groups the devices by their description (type). For example, all VN-Matrix 200/225/250/300/325 codec devices are grouped together, all VN-Matrix decoder devices are grouped together, all VN-Matrix encoder devices are grouped together, and so on.
- **Controller** — Groups the devices by system controller. When a VN-Matrix system contains more than one system controller, use this option to link the devices to each system controller.
- **Version** — Groups the devices by firmware version.
- **Source** — Groups each source by device ID. Displays or connections associated with each source are also grouped together. Similar devices that are not connected to a source are also grouped together.
- **Expand All** — Reveals all the devices. The devices are displayed under the appropriate group name.
- **Collapse All** — Hides all devices. Only the group names are displayed on the page.

About the Actions Menu Bar

The **Actions** menu bar, located at the bottom of the **Devices** page when a device is selected, is used to check information, configure, license, and upgrade controlled devices. **Actions** menu items change with the selected device (see figure 26).

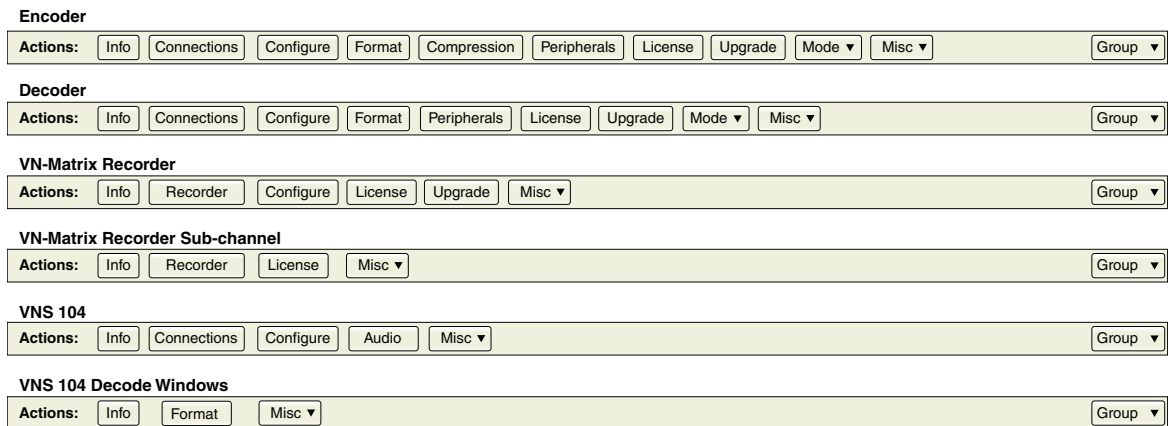


Figure 26. Actions Menu Bar

Using the **Actions** menu bar, the following sections provide individual configuration and connection details for the various VN-Matrix devices.

Click a device on the **Devices** page (see figure 27, ❶) to open its action bar. Click an action bar menu item to open a dialog box with configuration options for its intended operation.

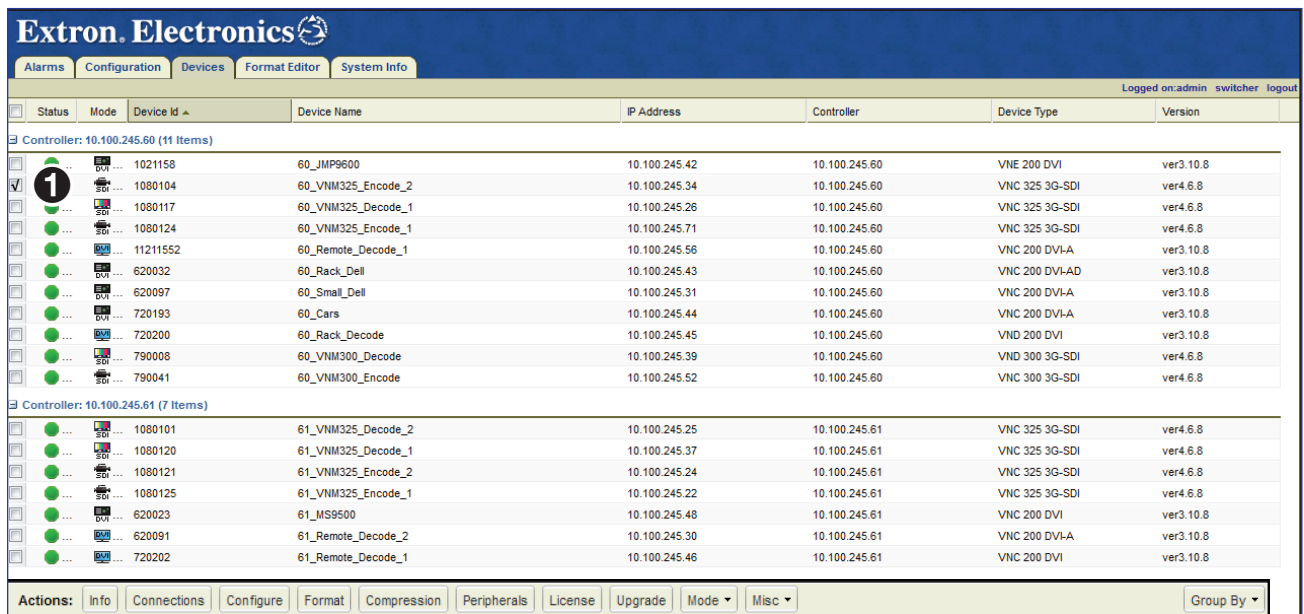


Figure 27. Encoder Actions Bar

The VNM 325 is selected in the example in figure 27 (outlined in red). Notice the check in the device selection box. When a device is selected, the **Actions** bar at the bottom of the page enables all options, connections, and configuration for the device.

Actions Menu Bar Overview

The **Actions** menu bar buttons perform similar functions regardless of the device selected. The following is an overview of each button and the devices they are associated with.

- **Info (all devices)** — The Info button provides information about the device including the Device ID, Device Name, IP address (control and streaming), current status (active, inactive), and the network link status (poor, good). These items change depending on the selected device.
- **Connections (Encoders, Decoders, VNS 104)** — The Connections button provides a real-time display of the device connections.
- **Configure (Encoders, Decoders, VNS 104)** — The Configure button opens a dialog that provides the ability to name the device and enable the text overlay on the local display.
- **Format (Encoders, Decoders, VNS 104)** — The Format button opens a dialog that shows the current status of the device and allows selection and control of the input or output format, video and audio properties, and other configuration options depending on the selected device.
- **Compression (Encoders and Decoders)** — The Compression button opens a dialog used to configure the audio and video compression of the encoder and set the bitrate.
- **Peripherals (Encoders and Decoders)** — The Peripherals button configures the serial control port of the selected device.
- **License (Encoders, Decoders, and Recorders)** — The License button opens a dialog that shows information about the features that are enabled on the device.
- **Upgrade (Encoders, Decoders, and VNR 100)** — The Upgrade button opens a dialog that allows a firmware upgrade file to be downloaded to the selected device.
- **Mode (Encoders, Decoders)** — The Mode button opens a drop-down list used to set a selected codec device to either encoder or decoder operation.
- **Misc (All)** — The Misc button drop-down list has five options that include a real-time bandwidth monitor, a delete device function to remove the selected device from the device list, a multiple device licensing upgrade application, an OSD ID editor, and an application to issue HLI commands to the selected device.
- **Recorder (Recorders only)** — The Recorder button opens the recording browser to allow a user to select previously recorded streams. The browser provides information for each recording and allows users to manage the recordings of a selected device.
- **Audio (VNS 104 only)** — The Audio button opens the **Configure Audio Settings** dialog. This dialog sets the level for the audio stream and also allows it to be muted.

NOTE: Only one of the connected video streams is able to decode audio.

Device Configuration

The next section describes the general configuration of VN-Matrix devices and applies to VN-Matrix hardware encoders, decoders, and codecs.

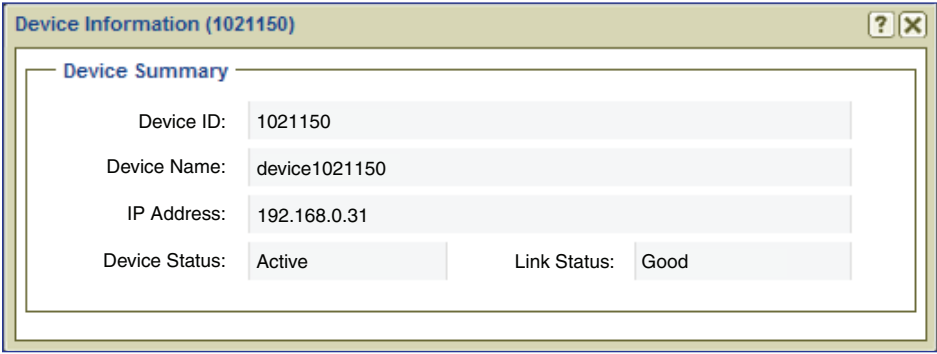
- For details on the configuration of the VNM-250 see [VNM 250 Configuration](#) on page 64.
- For VN-Matrix recorders see [Recorder Configuration](#) on page 79.
- For software decoders see [VNS 104 Software Decoder Configuration](#) on page 83.
- For a full description of a specific function, see the user guide for the device.

The menus change slightly between the encoders, decoders, and codecs. Where differences exist, they are noted.

VNM 200/225/300/325 Configuration

Info Menu

Click **Info** (see [figure 26](#) on page 40) to open the **Device Information** dialog box to display basic information for the selected VN-Matrix device (see [figure 28](#)).



Device Summary	
Device ID:	1021150
Device Name:	device1021150
IP Address:	192.168.0.31
Device Status:	Active
Link Status:	Good

Figure 28. Device Information (Encoder or Decoder Shown)

The following fields are read-only (cannot be edited).

- **Device ID** — Displays the device ID number of the selected device.
- **Device Name** — Displays the name of the selected device.
- **IP Address** — Displays the IP address of the selected device.
- **Device Status** — The status of the selected device. Normally it shows **Active** and the quality of the link is indicated in the **Link Status** field. If the device is missing or cannot be contacted on the network, it shows **No Device**.
- **Link Status** — A link status of **Good** indicates little or no management packet loss. A link status of **Fair** indicates a small amount of packet loss. A link status of **Poor** indicates a bad link; investigate whether the link to the device has sufficient bandwidth to carry the data and management traffic.

Connections Menu

When devices are part of an active (launched) preset, the columns populate with the connection details of the selected VN-Matrix device (see figure 29). Click **Connections** to open the Connections dialog box.

VNM 200/225

Connections				
	Video	Audio	Whiteboard	Data
Description	61_Decode2.videowindow	61_Decode2.audiowindow	61_Decode2.wbWindow	61_Decode2.dataWindow
id	620023.1.0	620023.0.0	620023.2.0	620023.3.0
Source	:0	:0	:0	:0
Destination	239.192.1.42:9600	239.192.0.42:9088	239.192.2.42:10112	239.192.3.42:10624
Locale	ext	ext	ext	ext
Slot	0	0	0	0
Description	61_Decode3.videowindow	61_Decode3.audiowindow		
id	620009.1.0	620009.0.0		
Source	:0	:0		
Destination	239.192.1.42:9600	239.192.0.42:9088		
Locale	ext	ext		
Slot	0	0		

VNM 300/325

Connections				
	Video	Audio	FEC Rows	FEC Cols
Description	61_VNM300_Decode.videowindow	61_VNM300_Decode.audiowindow	61_VNM300_Decode.rowfecWindow	61_VNM300_Decode.colfecWindow
id	790008.1.0	790008.0.0	790008.5.0	790008.4.0
Source	:0	:0	:0	:0
Destination	239.192.1.52:9620	239.192.0.52:9108	239.192.2.52:10132	239.192.3.52:10644
Locale	ext	ext	ext	ext
Slot	0	0	0	0

Figure 29. Connections Dialog Box

NOTE: The VN-Matrix 3xx connections dialog changes the **Whiteboard** column to **FEC Rows** and the **Data** column to **FEC Cols**.

The following fields are read-only (cannot be edited).

- **Description** — For a source, this field is the name of devices receiving a stream from the selected source. For a display, it has the name of the device providing the stream.
- **id** — Displays the device ID of the connected device.
- **Source** — For unicast transports, displays the IP address and port number of the source stream. For multicast transports this value is zero on an encoder.
- **Destination** — Displays the IP address and port number of the stream receiver device.
- **Locale** — This field displays **loc** when the data streaming between source and display are controlled by the same controller (**loc**). It displays **ext** if the data stream is exported across two different controllers or if the transport protocol is multicast RTP.
- **Slot** — This field displays information depending on the type of transport protocol used.
 - For **unicast RTP**, the stream number is displayed. Four streams are available, numbered **0**, **1**, **2**, and **3**.
 - For **multicast RTP**, this field displays **0** for a source and **-1** for a display.

Configure Menu

Click **Configure** to open the **Configure Device Settings** dialog box to set global parameters specific to the VN-Matrix 200/225 and 3xx devices (see figure 30).

The figure displays two side-by-side screenshots of the 'Configure Device Settings' dialog box. The left window is titled 'Encoder' and 'Configure Device Settings (11211570)'. It features a 'Device Setup' section with fields for 'Device Name' (VNE300_3), 'Mode' (enable), 'Identify Source' (checked), and three 'User Param' fields. Below this is a 'Networking' section with a 'Multicast TTL' field set to 2. The right window is titled 'Decoder' and 'Configure Device Settings (11211558)'. It features a 'Device Setup' section with fields for 'Device Name' (VND300_3), 'Mode' (enable), 'Enable Splash Screen' (checked), 'Identify Display' (checked), 'Identify Source' (checked), and three 'User Param' fields. Below this is a 'Networking' section with a 'Multicast TTL' field set to 2.

Figure 30. Configure Device Settings

Device Setup panel

- **Device Name** — Enter a name for the device in this field. This name appears in the device list and can be comprised of letters, numbers, and the underscore character. Spaces are not allowed.
- **Mode** — A device can be configured using one of four modes.
 - **enable** — This is normal operation.
 - **disable** — Use this mode on a source device to stop streaming to the network, but still show pass-through output. A display device outputs a splash screen.
 - **standby** — Use this mode on a source device to stop streaming and also disable pass-through output. On a display device this mode disables all output.
 - **test** — Use this mode on a device (source or display) to show a splash screen with the words "Test Mode". Normal streaming is suspended.
- **Enable Splash Screen (Decoder Only)** — Check this box to display a splash screen on the video output when no video stream is available.
- **Identify Display (Decoder Only)** — Check this box to show the device name on the connected display. The position and appearance of the label can be modified (see [OSD Identifier Editor \(Encoders and Decoders\)](#) on page 62).
- **Identify Source (Encoder)** — Check this box to display the name of the device on the image output to the loop-through connector. The source resolution and frame rate are displayed on the image that is output to the loop-through connector. The position and appearance of the label can be modified (see [OSD Identifier Editor \(Encoders and Decoders\)](#) on page 62).
- **Identify Source (Decoder)** — Check this box to display the name of the currently connected encoder on the connected display. The position and appearance of the label can be modified (see [OSD Identifier Editor \(Encoders and Decoders\)](#) on page 62).
- **User Param [1, 2, 3]** — These fields are used to enter user defined parameter names. When entering HLI or CLI commands into a control program from an external control system, the parameter names identify devices. The names can be comprised of letters, numbers, and the underscore character. Spaces are not allowed.

Networking panel

- **Multicast TTL** — This field specifies the number of hops multicast traffic can make between routed domains when it exits a source. It is not used for TCP or unicast RTP traffic.

Format Menu (Encoders)

Click **Format** to open the **Source Format** dialog box used to view information about the incoming source. It is also used to make adjustments to the signal and set the EDID options (see figure 31). The menu differs between the VN-Matrix 200/225 and VN-Matrix 3xx series.

The figure displays two side-by-side screenshots of the 'Source Format' dialog box. The left dialog is titled 'Source Format (720202)' and is for the 'VN-Matrix 200/225 Series'. It shows a 'Status' panel with 'Source: active', 'Stream: (1,1)', and 'Lock: 1'. The 'Measured Video Properties' panel shows 'Current Mode: 1600 x 1200 60p DMT', 'Type: analog', 'Line Count: 1250', 'Line Period (ms): 13.32', 'Active Pixels: 1600', 'Active Lines: 1200', 'First Pixel: 498', 'First Line: 50', and 'Phase: 18'. The 'Measured Audio Properties' panel shows 'Status: 44kHz'. The 'Input' panel has 'Mode: auto', 'Phase: 18', 'Color Space: RGB', and 'Macrovision Defeat'. The 'Blanking' panel has 'Blanking: auto', 'Pixels: 0', and 'Lines: 0'. The 'EDID' panel has 'From Monitor: NEC-LCD2070NK-DVI' and 'To Source: transparent'. The right dialog is titled 'Source Format (790041)' and is for the 'VN-Matrix 3xx Series'. It shows a 'Status' panel with 'Source: active', 'Stream: (1,1)', and 'Lock: 1'. The 'Measured Video Properties' panel shows 'Current Mode: 1920 x 1080 25p SMPTE', 'Type: sdi', 'Line Count: 1125', 'Line Period (ms): 35.555', 'Active Pixels: 1920', 'Active Lines: 1080', 'First Pixel: 236', 'First Line: 42', and 'Phase: 0'. The 'Measured Audio Properties' panel shows 'Status:'. The 'Ancillary Audio' panel has 'Audio Channels: 8', 'Transport Mode: transparent', 'Audio Type: none', 'Compression: none', 'Groups: 1, 2, 3, 4', 'FEC Mode: row+column', 'FEC Overhead: 50% (16 Mbps)', 'FEC Rows: 4', and 'FEC Columns: 4'.

Figure 31. Source Format Dialog Box

NOTES:

- The **Status** panel and **Measured Video Properties** panel contain fields that are read-only (cannot be edited).
- This menu works differently when a decoder or a display device is selected. For information on how to use the menu for decoders and display devices, see **Format Menu (Decoders)** on page 50.

Status panel

- **Source** — This field details the video input connection. **Active** means a video source is recognized at the input. **Unplugged** means no source is connected or there is no active video.
- **Stream** — When this field displays **(1,1)** the source is recognized and ready to stream. When this field displays **(0,1)** the source is either not connected or not recognized.
- **Lock** — If this field displays a value of **0**, the VN-Matrix device has not locked on to the incoming source. A value of **1** indicates the VN-Matrix device has locked on to the source.

Measured Video Properties panel

This panel provides information about currently connected sources. The following fields are read-only (cannot be edited).

- **Current Mode** — This field details the current video resolution of the connected source. A complete list of supported resolutions is available in the *VN-Matrix 200*, *VN-Matrix 225*, *VN-Matrix 250*, *VN-Matrix 300*, and *VN-Matrix 325 User Guides*.
- **Type** — This field details the type of video format that is connected to the source.

NOTE: The VN-Matrix 200/225 reports DVI or analog. The VN-Matrix 3xx reports SDI.

- **Line Count** — This field details the total number of lines used in the connected source.
- **Line Period (ms)** — This field details how often the lines of information are updated in milliseconds (ms).
- **Active Pixels** — This field details the number of active pixels used in the connected source.
- **Active Lines** — This field details the number of active lines used in the connected source.
- **First Pixel** — This field details the position of the first active pixel in a line.
- **First Line** — This field details the position of the first active line in a frame.
- **Phase** — This field details the current waveform phase setting. The phase setting can be adjusted in the [Input panel](#) (see below).

Measured Audio Properties panel (VN-Matrix 200/225 only)

This panel provides the sampling rate of the incoming audio source for the VN-Matrix 200/225. The line is blank for the VN-Matrix 3xx (see [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 48 for audio details of the VN-Matrix 3xx).

Input panel (VN-Matrix 200/225 only)

This panel is only active for VN-Matrix 200/225 models and provides timing information for the connected analog sources.

NOTE: This panel is only active when configuring analog source types.

- **Mode** — VN-Matrix codecs support automatic video format detection for most standard source types. However, if a non-standard source type is used, the video format can be manually specified using this drop-down list.
- **Phase** — This drop-down list is used to adjust the waveform phase setting. This value should normally be set to **auto**. However, if a waveform suitable for automatic detection is not available, manually select a phase value to provide better image quality. Automatic phase adjustment maximizes the contrast between pixels. A good image for phase adjustment should have adjacent black and white pixels.

NOTE: Phase adjustment is only required on analog sources.

- **Color Space** — This drop-down list selects between RGB and YPbPr video source types.

NOTES:

- When **auto** is selected from the **Mode** drop-down list, the color space cannot be determined.
- Component sources are detected as an RGsB video type.

- **Macrovision Defeat** — Macrovision copy protection is often applied to commercially produced videos and DVDs. This adds additional sync level pulses to the waveform which must be ignored for proper video detection.
 - Select this check box if the source contains content protected with Macrovision copy protection.
 - Deselect this check box for all other sources. Selecting this check box for non-Macrovision sources may result in tearing at the top of the image.

Blanking panel (VN-Matrix 200/225 Only)

- **Blanking** — This drop-down list adjusts the blanking setting. This value is normally set to **auto**. However, if it is important that pixels on the very edge of the display are visible, setting this value to **manual** activates the **Pixels** and **Lines** fields so that offsets can be entered. The offsets are made relative to the **First Pixel** and **First Line** values of the source format selected on the Format Editor page (see [Format Menu \(Encoders\)](#) on page 45).

NOTE: Blanking adjustment is only required on analog sources.

- **Pixels** — This field is used to enter an offset to adjust the horizontal blanking. The value is entered as a positive (for example, 6) or negative (for example, -6) integer.
- **Lines** — This field is used to enter an offset to adjust the vertical blanking. The value is entered as a positive (for example, 6) or negative (for example, -6) integer.

EDID panel (VN-Matrix 200/225 Only)

- **From Monitor** — This field reports the EDID of the locally connected display. If no display is present or the display does not support EDID, **No Device** is reported. This is a read-only field (cannot be edited).
- **To Source** — This drop-down list specifies the EDID device type the VN-Matrix unit identifies itself as when connected to a source. Values are chosen from any of the stored EDID codes used on previously connected devices.

NOTE: If the **transparent** option is selected, the EDID of the last display or the currently connected display is reported.

Ancillary Audio Panel (VN-Matrix 3xx Only)

The VN-Matrix 3xx models replace the Input, Blanking, and EDID panels with an Ancillary Audio panel for audio configuration (see figure 32). Configuration options change depending upon the model and the transport mode selection. The differences are noted in the following descriptions.

Ancillary Audio

Audio Channels: 16

Transport Mode: transparent

Audio Type: none

Compression: none

Groups: ☒ 1 ☐ 2 ☐ 3 ☐ 4

FEC Mode: none

FEC Overhead: 0% (0 Mbps)

FEC Rows: 0

FEC Columns: 0

Transparent Mode

Ancillary Audio

Audio Channels: 2

Transport Mode: stereo

Audio Type: no data

Compression: pack20

Stereo Pairs: ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

FEC Mode: none

FEC Overhead:

FEC Rows: 0

FEC Columns: 0

Stereo Mode (VNM 325 Only)

Figure 32. Ancillary Audio Menus

- **Audio Channels** — This field reports the number of available audio channels.
 - **VN-Matrix 300:** 4, 8, 12, or 16 depending on the number of licensed groups.
 - **VN-Matrix 325:** Reads 16 when the transport mode is set to **Transparent**. Reads 2 when the transport mode is set to **Stereo**.
- **Transport Mode** — A drop-down list with two selections:
 - **Transparent:** Audio is transported in groups of 4 channels. Multiple groups (see **Selection Boxes** below) can be selected for transport with payloads depending on the data: SDI (8 Mbps) or HDSDI/3G-SDI (16 Mbps).
Transparent mode is supported on both the VN-Matrix 300 and 325.
 - **Stereo:** Audio is transported in stereo pairs. Only one pair can be selected at a time. Stereo pairs have a payload of 2.4 Mbps.
Stereo mode is supported on the 325 only.
- **Selection Boxes** — These boxes (**Groups** or **Stereo Pairs**), when checked, indicate different items depending on the selected transport mode.
 - **Transparent:** Each box, when selected, indicates the number of audio groups that are transported with the video stream.
 - **VN-Matrix 300:** The number of groups depends on the license of the connected device. The VN-Matrix 300 series can be licensed for up to four groups (see **Audio Channels** above).
 - **VN-Matrix 325:** Up to four groups can be selected.
 - **Stereo:** The selection boxes indicate the stereo pair selected for transport with the video stream. Only one stereo pair can be selected at a time.

- **Audio Type (Stereo mode only)** — This field reports the format of the audio data stream.
 - PCM 24, 48 KHz: HDSDI and 3GSDI (typical)
 - PCM 20, 48 KHz: SDI (typical)
- **Compression (Stereo mode only)** — This drop-down list selects the compression to apply to the stereo audio signal. The normal bitrate for a stereo pair is 2.4 Mbps.
 - **Pack 24:** Sends all audio (20 or 24 bits) without compression and sends audio control data once per second.
 - **Pack 20:** Same as Pack 24 except the least significant 4 bits of audio data are removed and set to zero. The bit rate is 1.92 Mbps.
 - **Pack 16:** Same as Pack 24 except the least significant 8 bits of audio data are removed and set to zero. The bit rate is 1.54 Mbps.
 - **Decimate 2:** Same as Pack 16 except the sample rate is reduced to half. The bit rate is 768 Kbps.
 - **Decimate 4:** Same as Pack 16 except the sample rate is reduced to one-quarter. The bit rate is 384 Kbps.
- **FEC Mode (Transparent mode only)** — FEC (Forward Error Correction) can be applied to the ancillary audio to protect against errors caused by packet loss when the data is transported over a network. FEC enables the decoder to recreate data that has been lost or corrupted without the need for retransmission. The FEC data is sent separate from the image and ancillary data. The level of FEC can be set to protect against different levels of data loss. This produces a corresponding change in the amount of data that is transported and thus, the bit rate is increased or decreased in proportion to the amount of FEC applied.
- **FEC Overhead (Transparent mode only)** — This field reports the calculated overhead as a percentage of the signal bitrate.
- **FEC Rows (Transparent mode only)** — Row FEC protects against the loss of a single packet. It is the simplest method of protection and results in the lowest overhead in terms of bitrate and latency. However, it is not able to handle consecutive (burst) packet loss. Refer to the *VN-Matrix 3xx Series User Guide* for details on how to configure this setting.
- **FEC Columns (Transparent mode only)** — Column FEC protects against burst packet losses, providing that the burst of packet losses are not in the same row. Column FEC is known as 1D (dimension) FEC, as correction data is only calculated on one dimension. Refer to the *VN-Matrix 3xx Series User Guide* for details on how to configure this setting.

NOTES:

- The values set in the FEC row and column drop-down lists depend on the quality of the network link in use.
- The FEC data can add a large overhead to the overall bit rate. Some settings, while providing a high level of reliability, are inefficient.
- Settings that add little overhead may not provide a sufficient level of protection on networks with a poor Quality of Service (QoS).
- The recommended starting point for the FEC row and column error correction is 5,5.

Format Menu (Decoders)

When a decoder device is selected, click **Format** to open the **Display Format** dialog box used to configure the output format of a decoder (see figure 33 and figure 34). The menu differs slightly depending on the selected VN-Matrix device.

NOTES:

- The **Current Format** field is read-only (cannot be edited).
- This menu works differently when an encoder or a source device is selected. For information on how to use the menu for encoders and source devices, see [Format Menu \(Encoders\)](#) on page 45.

VN-Matrix 200/225 Display Format

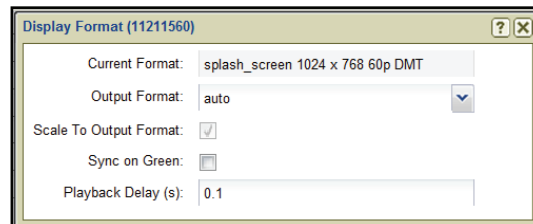


Figure 33. VN-Matrix 200/225 Display Format Dialog Box

- **Current Format** — This read-only field displays the current output video format of the selected VN-Matrix device.
 - When the **Output Format** field is set to **auto**, this field displays the resolution of the decoded stream. If an exact match is not possible, then this field displays **Special** followed by the available resolution closest to the decoded stream.
 - When the **Output Format** field is **not** set to **auto**, this field displays the chosen resolution.
 - If the **Enable Splash Screen** check box is selected and the device is not connected to a stream (or not decoding), this field displays **splash screen 1024x768**.
- **Output Format (VN-Matrix 200/225 only)** — This drop-down lists contain preset output video formats, plus an additional **auto** option. Selecting a preset format forces the output of the VN-Matrix device to the selected format. Selecting **auto** matches the output video format to the native resolution of the decoded stream.

NOTE: When a preset output format is selected, the **Scale to Output Format** check box **must be selected**.

- **Scale to Output Format (VN-Matrix 200/225 only)** — When selected, this check box enables scaling of the decoded stream to the resolution selected in the **Output Format** drop-down list. Upscaling and downscaling are supported.

NOTES:

- For smooth playback, select an output format with approximately the same frame rate as the source.
- Scaling adds two frames of latency to the delay between source capture and display output.
- Scaling is disabled when **auto** is selected in the **Output Format** drop-down list or when the scaling ratio is 1:1

- **Sync on Green (SoG) (VN-Matrix 200/225 only)** — This check box, when selected, enables Sync on Green on the output analog waveform. When SoG is enabled, separate horizontal and vertical syncs are present on the analog output.

NOTE: SoG is currently limited to the output of progressive modes. If an interlace mode is selected, the SoG request is ignored.

- **Playback Delay (s)** — This field is used to enter the amount of time (in seconds) that the display waits before playing back the source stream.

VN-Matrix 3xx Display Format

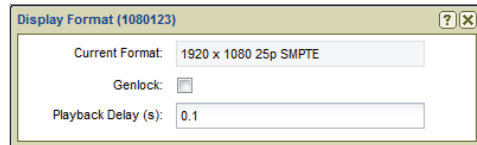


Figure 34. VN-Matrix 3xx Series Display Format Dialog Box

The VN-Matrix 3xx series display format dialog box shares two configuration options with the VN-Matrix 200/225:

- **Current Format**
- **Playback Delay (s)**

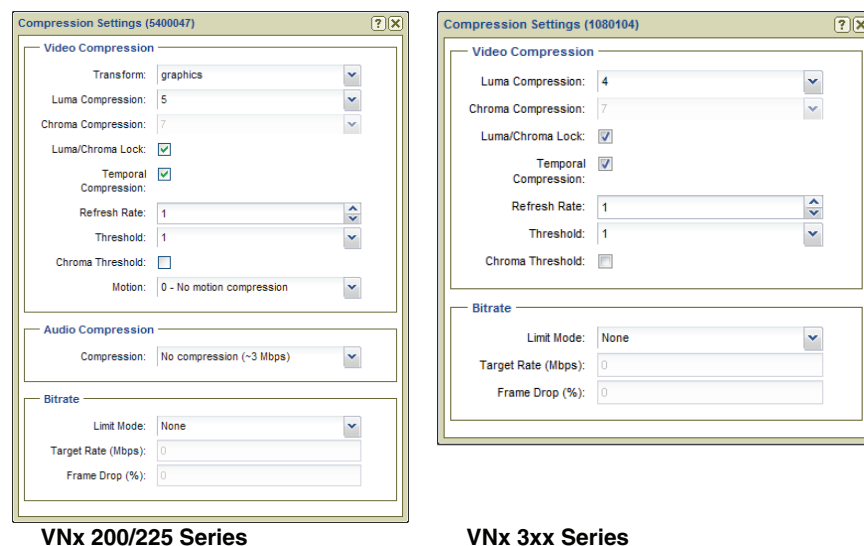
These configuration options function identically to those on the VN-Matrix 2xx series Display Format menu.

Genlock is added to the VN-Matrix 3xx menu, selected with the check box:

- **Genlock** — When selected, enables a local SDI source with the same refresh rate as the streamed video to act as a digital genlock signal to synchronize the decoder.

Compression Menu (Encoders Only)

When an encoder device is selected, click **Compression** to open the **Compression Settings** dialog box used to set the amount of compression on the encoded source (see figure 35).



VNx 200/225 Series

VNx 3xx Series

Figure 35. Compression Dialog Box

The configuration options have a direct effect on the network bandwidth required for the encoded stream.

- Increasing compression decreases the network bandwidth requirements for the stream.
- Decreasing compression increases the network bandwidth requirements for the stream.

Alternatively, the desired bandwidth can be set using the **Bitrate panel** (see page 53) and the VN-Matrix adjusts compression and frame rate to meet the specified bandwidth limit.

NOTE: This menu is only available when an encoder device is selected.

Video Compression panel

- **Transform (VN-Matrix 2xx only)** — Two transform types are supported.
 - **graphics** — Optimizes the video to support text and sharp lines, such as are present on most computer screens.
 - **video** — Optimizes the video to support smooth tone changes such as are present in movies and other video content.
- **Luma Compression** — This drop-down list sets the amount of compression on the luma (black and white) portion of the signal. A value of **1** is the minimum amount of compression available; a value of **10** is maximum compression.
- **Chroma Compression** — This drop-down list sets the amount of compression on the chroma (color) portion of the signal. A value of **1** is the minimum amount of compression available; a value of **10** is maximum compression.

NOTE: This field is available only when the **Luma/Chroma Lock** is not selected.

- **Luma/Chroma Lock** — Selecting this check box automatically sets the chroma compression value higher than the **Luma Compression** setting.

When the check box is selected, the **Chroma Compression** field tracks the **Luma Compression** field by a fixed value of +1 (Luma Compression = 1) or +2 (Luma Compression > 1).

- **Temporal Compression** — Selecting this check box causes areas of the screen to refresh only when a change between frames is detected. Enabling temporal compression can significantly reduce network bandwidth.

NOTE: For all normal operation, **Temporal Compression** should be enabled.

- **Refresh Rate** — This field controls how frequently static parts of the screen are updated when the **Temporal Compression** check box is selected. This is useful when connecting new displays to a temporally encoded source and fills in gaps in the data when using a lossy network transport (such as RTP). A value of **1** refreshes the screen once a second; a value of **10** refreshes the screen once every ten seconds. A value of **0** disables the refresh. Valid settings are **1** through **17**.
- **Threshold** — This drop-down list controls the sensitivity of the temporal change detection algorithm. A value of **0** means any screen changes will be sent. Increasing the value increases the send threshold and reduces the network bandwidth. A setting of **0** is suitable for DVI computer generated sources. Sources with more noise or video-type motion should use a setting between **1** and **4**. Camera sources should always use values greater than **0**.

- **Chroma Threshold** — This check box controls whether the temporal algorithm should consider changes in the color (chrominance) of the image. Selecting this check box provides better results when using digital simulation type sources. However, this can increase the transmit bandwidth by up to 200%, so it should be disabled on bandwidth sensitive systems.

NOTE: This option is normally not required for video or camera type sources.

- **Motion (VN-Matrix 2xx only)** — This drop-down list is used to adjust motion compression. The value can be set from **0** to **15**, where **0** is no additional motion compression and **15** is full motion compression. When enabled, motion detected on the area of the screen is heavily compressed. This reduces bandwidth when the eye cannot perceive significant detail due to the motion. When motion stops, the video is resent at the standard resolution preserving screen integrity.

Audio Compression panel (VN-Matrix 200/225 only)

NOTE: The audio compression settings for the VNM 3xx series are located in the source format menu (see [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 48).

- **Compression** — VN-Matrix supports limited compression of S/PDIF audio sources. This is controlled by the **Compression** setting. The S/PDIF digital data bus can carry two types of data: 2-channel uncompressed audio and encoded digital data, the latter often in AC-3 (Dolby Digital) format. The following compression values are supported.

Available Compression Settings		
Compression	Stereo Audio Tracks	AC-3 Data Track
No compression	24 bit native data (2975 kbps)	24 bit native data (2975 kbps)
24-bit to 16-bit	16 bit data, full sample rate (1517 kbps)	16 bit data, zeros run length encoded (430 kbps)
44 kHz to 22 kHz	16 bit data, 1/2 sample rate (784 kbps)	16 bit data, zeros run length encoded (430 kbps)
44 kHz to 11 kHz	16 bit data, 1/4 sample rate (418 kbps)	16 bit data, zeros run length encoded (430 kbps)

Bitrate panel

The Bitrate panel sets a specific bandwidth limit for the encoded stream.

- **Limit Mode** — This drop-down list contains management modes that limit the instantaneous traffic on the network and drops traffic when the bandwidth rate is exceeded. This is useful when the network connection between the source and display has limited bandwidth.

NOTE: Rapidly changing content may produce instantaneous peaks in bandwidth rate when using PBR-F management mode.

Six bandwidth management modes are supported.

- **None** — This mode does not use bandwidth management. Only the underlying compression settings are managed.
- **Manual Frame Drop** — This mode allows the user to specify the precise fraction of frames to drop. This mode does not manage the bandwidth rate at a fixed level, but does result in a smoother display update when using rapidly changing video content types.

- **Shared Flowrate (FD)** — This mode limits the total video network traffic for the source. Frames are dropped if the **instantaneous** data rate is higher than the flowrate entered in the **Target Rate (Mbps)** field.
- **Peak Flowrate (FD)** — This mode limits the video network traffic for a single source stream. Frames are dropped if the **instantaneous** data rate is higher than the flowrate entered in the **Target Rate (Mbps)** field. Using *N* output streams increases the bandwidth *N* times unless the multicast RTP transport protocol is used.
- **PBR-F** — This mode dynamically modifies the compression settings to limit the transmitted bandwidth depending on the specified value entered in the **Target Rate (Mbps)** field. The specified **Compression** setting is used as the minimum compression value. This control mode averages the bit rate over a period of two frames.
- **PBR-F (FD)** — This mode is the same as **PBR-F** except frames are dropped when a larger bandwidth reduction (such as a reduction that cannot be achieved with compression settings alone) is required.
- **Target Rate (Mbps)** — This field is used in all bandwidth management modes (except **Manual Frame Drop**) to specify the network bandwidth used by the source. This value is specified in Megabits per second (Mbps).
- **Frame Drop (%)** — This field is used in **Manual Frame Drop** mode and specifies the percentage of frames to discard. A value of **95%** discards 19 out of every 20 frames reducing a 60 frames per second (fps) video signal to 3 fps. 1 fps is the minimum frame rate. A value of **99%** results in all frames being dropped due to rounding.

Peripherals Menu

Click **Peripherals** to open the **Peripherals Settings** dialog box to manage remote keyboard and mouse communications on a VN-Matrix 200/225 (see figure 36).

NOTE: Mouse and keyboard functions are supported by VN-Matrix 2xx series devices only. For a complete description, see the device user guide at www.extron.com.

The figure shows two side-by-side screenshots of the "Peripheral Settings" dialog box. The left window is for an "Encoder" (ID: 11211568) and the right window is for a "Decoder" (ID: 11211560). Both windows have a title bar with a question mark and a close button. The "Serial Port" section in both windows has dropdown menus for Mode (None), Baud Rate (115200), Data Bits (8), Stop Bits (1), Parity (none), Handshake (none), and Destination. The "Data Channel" section has radio buttons for UDP Data TX (Enable/Disable) and a text field for UDP Data Port. The "Pointer Overlay" section has radio buttons for Overlay (Enable/Disable). The "Mouse and Keyboard" section has a dropdown menu for Mode (enable/Keyboard), a text field for IP address, and a dropdown menu for Status (Local). The Decoder window has an additional "Annotation Port" text field set to 9997 and an "Inactivity" text field set to 3811326.

Encoder

Decoder

Figure 36. Peripherals Dialog

Serial Port

The serial port panel configures the RS-232 port on VN-Matrix encoder and decoder devices. For a full description of the serial port configuration, including server/client setup, see the User Guide for the device. Default settings are shown in figure 36.

- **Mode:** — The serial port can operate in one of three modes:
 - **None:** The serial port is not used.
 - **Pass-through server:** The serial port acts as a destination for serial port clients.
 - **Pass-through client:** The serial port connects to server serial ports on other devices

A point to point link can be established by setting the serial port of one VN-Matrix device to pass-through server mode and a second device to pass-through client mode. The destination of the second device is set to the pass-through port on the first (server) device.

A server can accept multiple client connections. Under these conditions the data input by the server serial port is duplicated to all connected clients. The data received from the clients is multiplexed (in order of arrival) and output through the server serial port.

- **RS-232 Settings:** Basic configuration of the serial port includes baud rate, data bits, stop bits, parity, and handshake.
- **Destination:** — This option can only be modified when the serial port is in client mode. The dropdown list allows a passthrough connection request from each VN-Matrix device in the network, regardless of whether the device is currently configured as a server.

Data Channel

The data channel panel configures the UDP data stream.

- **UDP Data Tx (encoder)** — Enables or disables UDP data transport through the dataport.
- **UDP Data Port (encoder)** — The port number to receive UDP traffic on. This setting must match the port number defined by the external device or system that generates the UDP data.
- **UDP Data RX (decoder)** — Enables or disables the UDP data.
- **UDP Dest IP (decoder)** — The IP address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
- **UDP Dest Port (decoder)** — This is the port number used by the (external) device or system to receive the UDP data.

Pointer Overlay

- **Overlay (encoder)** — Enable the overlay pointer on the local loop-through display.
- **Annotation Port (decoder)** — Read-only value of the annotation port.

Mouse and Keyboard

- **Mode:** — Device specific.
 - **Encoder:** Enabled, allows mouse and keyboard forwarding.
 - **Decoder:** This control has four options:
 - **Disable:** The decoder does not forward mouse and keyboard information.
 - **Keyboard:** The decoder forwards mouse and keyboard information.
 - **Keyboard + keepalive:** The link is automatically established if broken.
 - **Force:** Mouse and keyboard forwarding + keepalive is permanently enabled.
- **IP Address:** —
 - **Encoder:** Not Required.
 - **Decoder:** Used to specify the IP address of the target encoder when the transport is multicast or when the encoder exists on a different controller domain.

NOTE: Leading zeros are not allowed.

- **Status:** — Read-only, is the current status of the Link.
 - **Encoder:** Disabled, local, or remote keyboard and mouse is displayed.
 - **Decoder:** Disabled, local, or forwarding is displayed. In case of a connection error, a reason is shown in brackets.
 - **Inactivity:** Read-only, (decoder only). Displays the number of seconds since the mouse or keyboard reported a change

License Menu

Click **License** to open the **Device License Management** dialog box. This dialog displays the enabled features on the selected unit and also enables optional features (see figure 37).

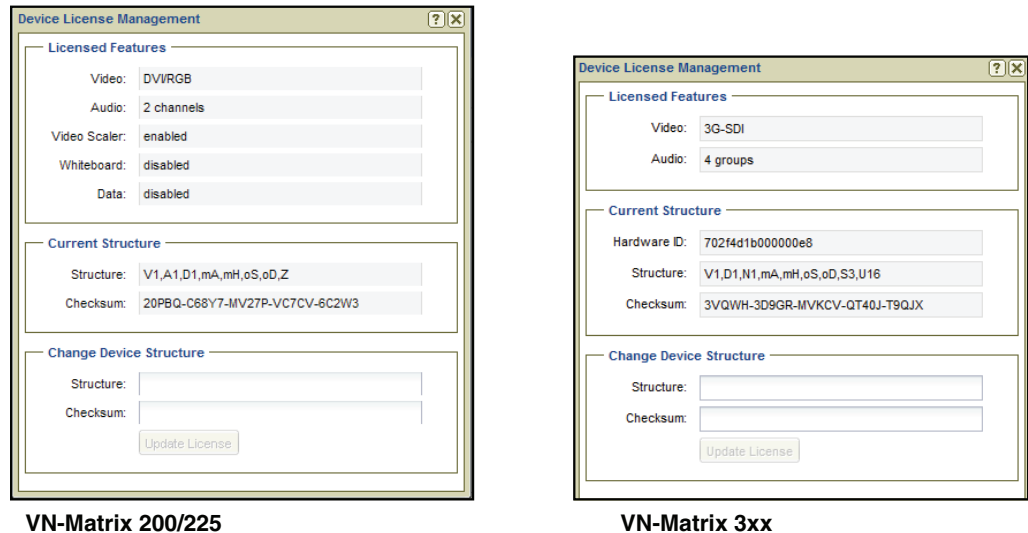


Figure 37. License Menu

NOTE: The Licensed Features panel and Current Structure panel contain fields that are read-only (cannot be edited).

Licensed Features panel

The Licensed Features panel details the features currently enabled on the device.

- **Video (all)** — Details the input signal format type.
- **Audio (all)** — Details the number of supported audio channels.
- **Video Scaler (VNM 200/225)** — Details if video scaling is enabled or disabled.
- **Whiteboard (VNM 200/225)** — Details if whiteboard data streaming is enabled or disabled.
- **Data (VNM 200/225)** — Details if data streaming is enabled or disabled.

Current Structure panel

- **Hardware ID (VNM 3xx only)** — Displays the hardware ID of the device.
- **Structure (all)** — Details the current structure key used by the selected device.
- **Checksum (all)** — Details the current checksum used by the selected device.

Change Device Structure panel

NOTE: See [Update a device license](#) below for information on updating the structure key and checksum.

ATTENTION:

- **DO NOT place information for a VNM Enterprise Controller license** into this menu. Doing so causes the device to stop responding.
- Ne pas mettre d'informations pour une licence VNM contrôleur entreprise dans ce menu. Si c'est le cas l'appareil risque d'arrêter de répondre.
- This menu is used for **updating a device license** only. See [Controller Firmware and License Updates](#) on page 179 for information about VNM Enterprise Controller licenses.
- Ce menu est utilisé seulement pour mettre à jour la licence d'un appareil. Voir [Controller Firmware and License Updates](#) (Firmware de contrôleur et Mises à jour de licence) à la page 179 pour obtenir des informations sur les licences du contrôleur VNM Enterprise Controller.

- **Structure** — This field is used to update the structure key used by the device.
- **Checksum** — This field is used to update the checksum used by the device.

Update a device license

To obtain and install a new device license, follow the procedure below.

1. Contact the Extron S3 Sales and Technical Support Hotline and provide the following information.
 - The **device ID** of the VN-Matrix device. This can be obtained from the back of the device.
 - The **order number** of the VN-Matrix device.
2. The Extron S3 Sales and Technical Support Hotline provides a **structure key** and a **checksum**.
 - Enter the **structure key** into the **Structure** field.
 - Enter the **checksum** into the **Checksum** field.
3. Click **Update License** to save the new license.

Upgrade Menu (2xx and 3xx Devices)

Click **Upgrade** to open the **Upgrade Device Firmware** dialog box used to upgrade the firmware of one or more VN-Matrix devices (see figure 38, on the next page).

ATTENTION:

- Ensure that compatible firmware is used to upgrade the selected VN-Matrix devices.
- Assurez vous qu'un firmware compatible est utilisé pour mettre à jour les appareils VN-Matrix sélectionnés.
- Upgrading with incorrect firmware can cause the VN-Matrix devices to stop responding.
- Mettre à jour avec un firmware incorrect peut faire en sorte que les appareils VN-Matrix arrêtent de répondre.

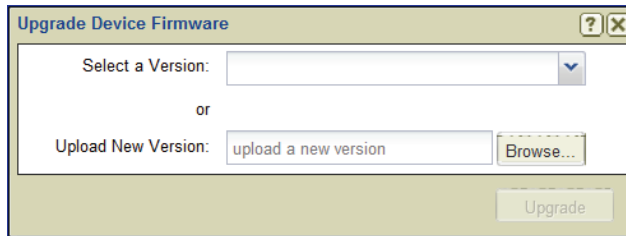


Figure 38. Upgrade FW Dialog

- **Select a Version** — This drop-down list contains previously uploaded firmware versions that are available.
- **Upload New Version** — Click **Browse** to upload new firmware versions. New firmware versions uploaded to the VNM Enterprise Controller are added to the **Select a Version** drop-down list.

To upgrade the firmware:

1. Select a device or multiple devices from the **Devices** page (see [About the Devices Page](#) on page 36).
2. Click **Upgrade** on the Actions toolbar.
3. Select the desired version from the **Select a Version** drop-down list and click **Upgrade**.

If the desired version is not available in the **Select a Version** drop-down list:

1. Select a device or multiple devices from the **Devices** page (see [About the Devices Page](#)).
2. Click **Upgrade** on the Actions toolbar.
3. Click **Browse** and navigate to the appropriate location of the firmware. When the firmware is selected, it is uploaded to the VNM Enterprise Controller.
4. After the proper firmware is uploaded, select the version from the **Select a Version** drop-down list and click **Upgrade**.

NOTES:

- If a VN-Matrix device selected for upgrade already contains the latest version of firmware, the upgrade status displays "Wait". If multiple devices are selected for upgrade, the devices already containing the firmware upgrade display "Wait" while the other devices are upgraded (see figure 39).
- See [Update a device license](#) on page 58 for information on updating the structure key and checksum.
- The firmware for the VN-Matrix 2xx series differs from the firmware for the VN-Matrix 3xx series. Upgrading multiple devices is possible only when selected devices are either all VN-Matrix 2xx series or all VN-Matrix 3xx series.
- The VNM Recorder can not be upgraded from this page (see the *VNM Recorder User Guide* at www.extron.com).

Upgrade Device Firmware			
Device	Vers	Up Vers	Status
11212090	ver4.6.9	ver4.6.9	Done
11212068	ver4.6.9	ver4.6.9	Done
11212094	ver4.6.9	none	WAIT
11212093	ver4.6.9	none	WAIT

Figure 39. Device Firmware Upgrade Status

Mode Menu (VNC Devices Only)

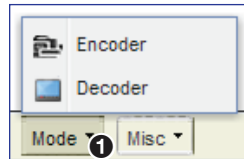
The mode menu assigns VN-Matrix codec devices as decoders or encoders.

NOTE: Choosing a mode or toggling a device between an encoder and a decoder can take a few seconds after the selection is made.

To configure a codec device as a decoder or encoder:

1. Select a codec device or multiple codec devices from the **Devices** page (see [About the Devices Page](#) on page 36).
2. On the action toolbar, click **Mode** (1).

The **Mode** menu opens.



3. Select **Decoder** to set the codec as a display device or select **Encoder** to set the codec as a source device.

Misc Menu

This menu contains five selections (see figure 40).

- **Real-time Bandwidth Monitor**
- **Delete Device**
- **Multiple Device Licensing**
- **OSD Identifier Editor**
- **Send HLI command**

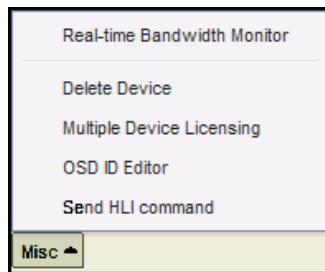


Figure 40. Misc Menu

Real-time Bandwidth Monitor

Select the real-time bandwidth monitor to open a new dialog box that monitors the bandwidth (measured in Mbps) used by the selected device or devices (see figure 41).

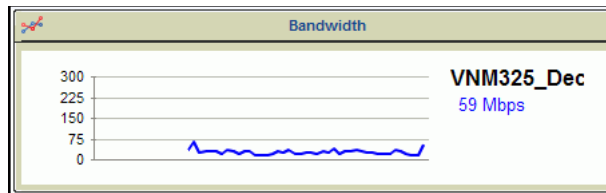


Figure 41. Bandwidth Monitor

NOTE: Bandwidth data is displayed only for decoder devices. A graph is displayed for an encoder, but the data always shows 0 Kbps.

Delete Device

Select this option to delete the selected device or devices.

NOTES:

- Be certain the appropriate devices are selected when using this menu option. The selected devices are deleted right away; no notification or warning is given when the option is selected.
- A device can only be deleted when it is offline. Active devices can not be removed from the device list.

Multiple Device Licensing

Select this option to open a dialog box to upgrade the feature sets of multiple devices simultaneously.

NOTE: This option is not available on the VND 250.

OSD Identifier Editor (Encoders and Decoders)

Select this option to customize the appearance of the **on-screen display** for the selected device or devices (see figure 42).

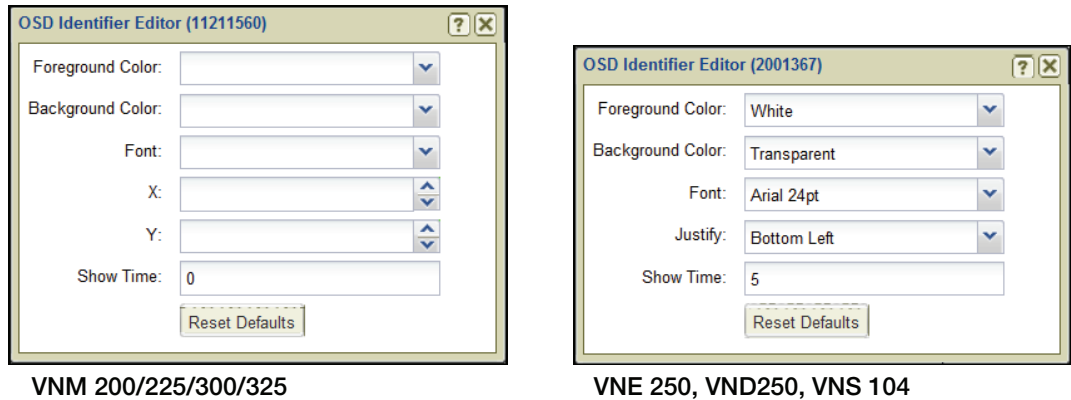


Figure 42. OSD Identifier Editor

- **Foreground Color** — This drop-down list selects the color of the text box font.
- **Background Color** — This drop-down list selects the text box background color.
- **Font** — This drop-down list selects the type of font used in the text block.
- **X** — This field selects the X (horizontal) position for the text block. The value is a percentage of the screen width and references the **center** of the text block.
- **Y** — This field selects the Y (vertical) position for the text block. The value is a percentage of the screen height and references the **center** of the text block.
- **Justify** — This drop-down list places the text block in one of nine fixed positions.
- **Show Time** — Sets the length of time (in seconds) the name of the source device is visible after a connection is made. A value of 0 keeps the name visible indefinitely.

NOTES:

- This control option only functions when the **Identify Source** check box is selected on the **Configure menu** (see [Configure Menu](#) on page 44).
- The OSD is not recorded.
- See [VNS 104 Software Decoder Configuration](#) on page 83 for VNS 104 OSD options.

Send HLI Command

Selecting this option opens a dialog box used to send High Level Interface (HLI) command strings to VN-Matrix devices (see figure 43).

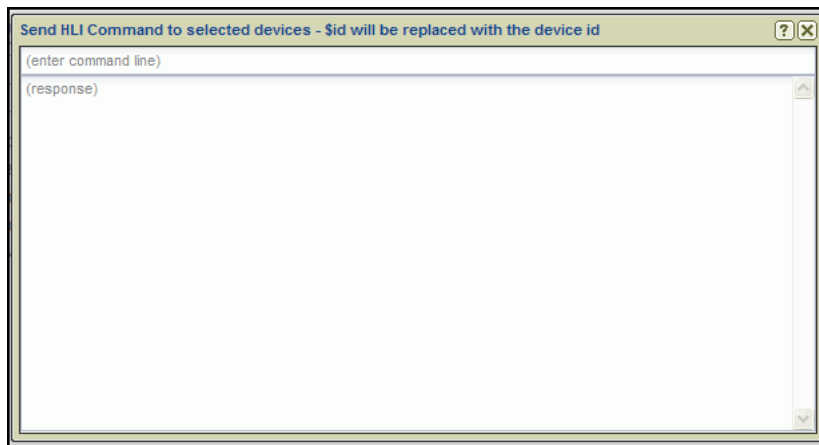


Figure 43. HLI Command Window

To send a command:

1. Click in the **(enter command line)** text field.
2. Type the command.
3. Press <Enter>.

NOTE: The response is returned in the response area of the dialog box.

Example HLI commands and information on how to use them are available in **System Control** on page 175.

Group Menu

See **Sorting Devices by Group** on page 39 for information on using this menu.

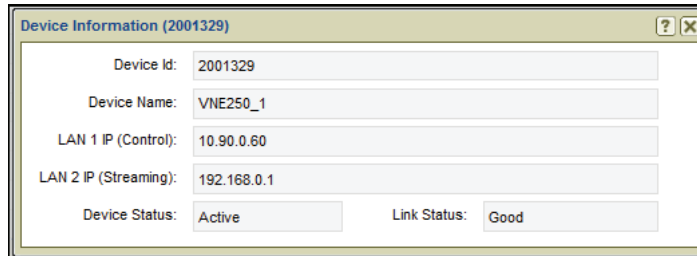
VNM 250 Configuration

The VND 250 and VNE 250 add HDMI input and output capability to the VN-Matrix system. Several configuration items have been added to the normal encoder and decoder configuration pages for HDMI and HDCP compatibility.

Info Menu (VNM 250)

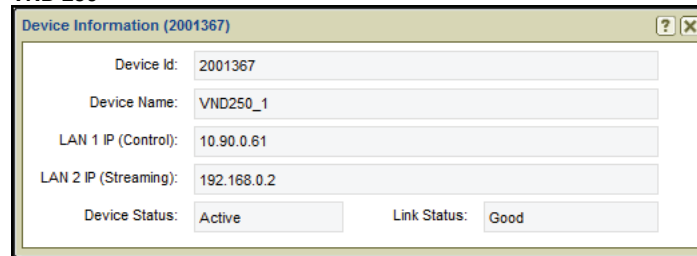
The **Info** action bar dialog adds two LAN port connection entries for separate control and streaming connections. Click **Info** to open the **Device Information** dialog box that displays basic information for the selected VNM 250 (see figure 44).

VNE 250



Device Information (2001329)	
Device Id:	2001329
Device Name:	VNE250_1
LAN 1 IP (Control):	10.90.0.60
LAN 2 IP (Streaming):	192.168.0.1
Device Status:	Active
Link Status:	Good

VND 250



Device Information (2001367)	
Device Id:	2001367
Device Name:	VND250_1
LAN 1 IP (Control):	10.90.0.61
LAN 2 IP (Streaming):	192.168.0.2
Device Status:	Active
Link Status:	Good

Figure 44. Device Information - VNM 250

The following fields are read-only (cannot be edited).

- **Device ID** — Displays the device ID number of the selected device.
- **Device Name** — Displays the name of the selected device.
- **LAN 1 IP (Control)** — Displays the IP address of the control port.
- **LAN 2 IP (Streaming)** — Displays the IP address of the streaming port.
- **Device Status** — The status of the selected device. Normally it shows **Active** and the quality of the link is indicated in the **Link Status** field. If the device is missing or cannot be contacted on the network, it shows **No Device**.
- **Link Status** — A link status of **Good** indicates little or no management packet loss. A link status of **Fair** indicates a small amount of packet loss. A link status of **Poor** indicates a bad link; investigate whether the link to the device has sufficient bandwidth to carry the data and management traffic.

Configure Menu

Click **Configure** to open the **Configure Device Settings** dialog box and set global parameters specific to the VNM 250 devices (see figure 45).

The figure shows two side-by-side dialog boxes titled "Configure Device Settings (2001329)" for the Encoder and "Configure Device Settings (2001367)" for the Decoder. Both dialogs have a "Device Setup" section and a "Networking" section. The Encoder dialog has fields for Device Name (VNE250_1), Mode (enable), Identify Device, Identify Source, Flash LCD, and three User Param fields. The Decoder dialog has fields for Device Name (VND250_1), Mode (enable), a checked "Enable Splash Screen" checkbox, Identify Device, Identify Source, Flash LCD, and three User Param fields. Both have a Multicast TTL field set to 2 in the Networking section.

Figure 45. VNM 250 Configure Device Settings

Device Setup panel

- **Device Name** — Enter a name for the device (see [Device Setup panel](#) on page 44).
- **Mode** — A device can be configured using one of four modes.
 - **enable** — This is normal operation.
 - **disable** — On a source device, stops streaming to the network, but still shows pass-through output. A display device outputs a splash screen.
 - **standby** — Use this mode on a source device to stop streaming and also disable pass-through output. On a display device this mode disables all output.
 - **test** — Use this mode on a device (source or display) to show a splash screen with the words "Test Mode". Normal streaming is suspended.
- **Enable Splash Screen (decoder only)** — Check this box to display a splash screen on the connected display or device when no video is available.
- **Identify Device** — Check this box to show the device name on the pass-through output. The position and appearance of the label can be modified.
- **Identify Source (Encoder)** — Check this box to display the name of the device on the image output to the loop-through connector. The source resolution and frame rate are displayed on the image that is output to the loop-through connector. The position and appearance of the label can be modified (see [OSD Identifier Editor \(Encoders and Decoders\)](#) on page 62).
- **Identify Source (Decoder)** — Check this box to display the name of the currently connected encoder on the connected display. The position and appearance of the label can be modified (see [OSD Identifier Editor \(Encoders and Decoders\)](#) on page 62).
- **Flash LCD** — Check this box to flash the front panel of the selected device. This assists users with identifying an individual device within a large system.
- **User Param [1, 2, 3]** — These fields are used to enter user defined parameter names (see [Device Setup panel](#) on page 44).

Networking panel

- **Multicast TTL** — This field specifies the number of hops multicast traffic can make between routed domains when it exits a source. It is not used for TCP or unicast RTP traffic.

Connections Menu

When devices are part of an active (launched) preset, the columns in the Connections menu populate with the connection details of the selected VN-Matrix device (see [Connections Menu](#) on page 43). The **Connections** dialog adds the location of the return audio path to the columns.

Format Menu (VNE 250)

Select the VNE 250 and click **Format** from the action bar to open the source menu. Status, Measured Video Properties, Measured Audio Properties, and EDID panel configuration is the same as the VNM 200/225/300/325 device (see [Format Menu \(Encoders\)](#) on page 45).

Input Configuration and Audio (VNE 250 Only)

The VNE 250 adds an input selection, HDCP authorization, program audio selection, and return audio selection.

The screenshot shows the 'VNE 250 Source Format' configuration window. It contains the following sections and controls:

- Input Configuration:**
 - Input Select: Radio buttons for **Auto** (selected), **HDMI (1)**, and **RGB (2)**.
 - HDCP Authorize: Radio buttons for **Enable** (selected) and **Disable**.
- EDID Settings:**
 - From Monitor: Dropdown menu showing **No Device**.
 - To Source: Dropdown menu showing **transparent**.
- Program Audio:**
 - Input Select: Radio buttons for **HDMI (1)** (selected), **Analog (2)**, and **Disable**.
 - Audio Status: Text field showing **48kHz**.
 - Analog Audio Input: A collapsed section.
- Return Audio:**
 - Mute Audio: A checkbox that is currently unchecked.
 - Output Level (dBu): A text field showing **4**.

Figure 46. VNE 250 Source Format

- **Input Configuration** — Click the desired input option.
 - **Auto:** When enabled, the HDMI input is automatically selected whenever a digital source is detected. The EDID settings become read only in this mode.
 - **HDMI (1):** Selects the HDMI input. The EDID Settings panel is active.
 - **RGB (2):** Selects the RGB input. The EDID Settings panel is active.
 - **HDCP Authorize:** When an HDMI signal is detected, enable or disable HDCP authorization.

- **EDID Settings** — Select the EDID source from two choices.
 - **From Monitor:** This read-only field reports the EDID of the locally connected display. If no display is present or the display does not support EDID, <No Device> is reported. This is a read-only field (cannot be edited).
 - **To Source:** This drop-down list specifies the EDID device type the VN-Matrix unit identifies itself as when connected to a source. Values are chosen from any of the stored EDID codes used on previously connected devices or from a fixed list of input formats.

NOTE: If the transparent option is selected, the EDID of the last display or the currently connected display is reported.

- **Program Audio** — Click the desired audio input.
 - **Input Select:** Selects the input audio source. HDMI audio is not supported if RGB (2) input video is selected.
 - **HDMI (1):** Selects the embedded HDMI audio.
 - **Analog (2):** Selects the rear panel analog audio input.
 - **Disable:** Mutes all audio inputs.
 - **Audio Status:** Read-only field that displays the sampling rate of the selected audio source.
- **Analog Audio Input** — Available only when the audio source is set to **Analog**.

The screenshot shows a configuration window with two main sections. The top section, titled 'Program Audio', contains 'Input Select' with three radio buttons: 'HDMI (1)', 'Analog (2)' (which is selected), and 'Disable'. Below this is 'Audio Status' showing '48kHz'. The bottom section, titled 'Analog Audio Input', contains 'Peak Input Level (dBu)' with a slider set to '4', 'Measured Input Level (dBu)' showing '-72', and a 'Clip' indicator which is currently a grey circle.

- **Peak Input Level (dBu):** Optimize Signal to Noise Ratio (SNR) prior to the Analog to Digital Conversion (ADC) process. Set the **Peak Input Level** to a value just above the highest level of the source audio material. For example, if the input level from the source material peaks at +3 dBu, the **Peak Input Level** is set to +4 dBu.
The range is -26 to 12 dBu. Default is +4 dBu.
- **Measured Input Level (dBu):** This field shows the current measured input level of the analog input source in dBu. The value is updated every second and can be used as a guide to determine the **Peak Input Level** (see above) of the source material. If the measured input level exceeds the specified peak input level, the **Clip** warning indicator glows red. When the input level falls back within range, the warning indicator remains lit for three seconds and then turns off.
- **Return Audio** — Controls the audio level for audio received from a decoder. Only one decoder receiving an audio stream from an encoder can send return audio to the source or connected audio device. Only analog audio is supported for return audio.
 - **Mute Audio:** Mutes the return audio.
 - **Output Level (dBu):** Only available when a connection is made to a decoder. Adjust the audio level of the rear panel return audio output.
The range is -70 to +12 dBu. Default: +4 dBu.

Format Menu (VND 250)

The VND 250 **Display Format** dialog shares two configuration options with the VN-Matrix 200/225:

- **Current Format**
- **Output Format**

These two configuration options function identically to those on the VN-Matrix 200/225 (see **Format Menu (Decoders)** on page 50).

The screenshot shows the 'Display Format (2001395)' dialog box. It has a title bar with a question mark and close button. The dialog is organized into three expandable sections. The first section, 'Output Configuration', contains: 'Current Format' (text field with 'splash_screen 1920 x 1080 60p HDMI'), 'Output Format' (dropdown menu with 'monitor' selected), 'Scale Mode' (radio buttons for 'Fill' and 'Follow', with 'Fill' selected), 'HDCP Mode' (radio buttons for 'Auto' and 'On', with 'On' selected), 'Genlock' (radio buttons for 'Enable' and 'Disable', with 'Enable' selected), 'Framelock Ref' (dropdown menu with 'none' selected), 'Channel Delay(s)' (spin box with '0'), 'Frame Delay' (spin box with '6'), and 'Total Delay(s)' (spin box with '0.000'). The second section, 'Program Audio Output', contains: 'Output Select' (radio buttons for 'HDMI', 'Analog', 'Both', and 'None', with 'Both' selected), 'Analog Audio Output Level (dBu)' (spin box with '0'), and 'Decode Buffer Settings Channel Delay(s)' (spin box with '0'). The third section, 'Return Audio Input', contains: 'Peak Input Level (dBu)' (spin box with '0'), 'Measured Input Level (dBu)' (spin box with '0'), and a 'Clip' indicator (a small circle).

Figure 47. VND 250 Display Format Dialog Box (Decoder)

The following configuration options are added:

- **Scale Mode** — Select fill or follow.
 - **Fill** scales the output video to fill the entire screen of the connected display. The aspect ratio is not maintained.
 - **Follow** keeps the output format the same as the input, maintaining the aspect ratio and adding black bars as needed.

NOTE: Scale mode options are not available when the output format is set to **Auto**.

- **HDCP Mode** — The HDCP mode control is used to set the encryption negotiation method between the decoder and an HDCP compliant display.
 - **Auto:** HDCP negotiation occurs each time a new stream is decoded. Encryption is set automatically, dependent on the decoded stream.
Encryption is enabled if the decoded stream is protected and disabled if not.
 - **On:** Encryption is forced on (enabled) at all times regardless of the decoded stream type.
Forcing encryption results in a cleaner switching transition between encrypted and non-encrypted content.
- **Genlock** — Enables the synchronization of the output to a reference waveform. The VND 250 uses TTL level signaling which is not compatible with normal genlock sources.
 - **Enable:** Setting this option enables the decoder output to lock to an incoming genlock signal generated by another VND 250 device.
 - **Disable:** The decoder output is locked to its own internal timing reference. Any incoming genlock signal is ignored.
 - **Framelock Ref:** This drop-down control is used with the genlock control described above. It defines which VND 250 device is used as the frame reference in a genlock group. When such a group is formed, a network-based protocol permits the chosen VND 250 to coordinate frame timing so that all decoders are showing frames captured at the same time.
- **Channel Delay(s)** — The channel delay is unique to each channel of video, audio, data or whiteboard data and is set in seconds. In normal operation on a LAN, Channel Delay is set to 0.0.
- **Frame Delay** — The frame delay can only be modified on the video channel and is converted from frames to seconds depending on the video mode the decoder is currently receiving. In normal operation on a LAN, Frame Delay is set to 6 frames.
- **Total Delay(s)** — The delay time between the data being input to the encoder and output on the decoder is controlled by setting the Channel Delay(s) and the Frame Delay. The Total Delay(s) time shown in this read-only field is the sum of the two values.
Where synchronization between channels is required, either between video and audio on one device or between video channels on multiple devices, the default values (Channel Delay: 0.0, Frame Delay: 6) results in an end to end delay of 100ms on a 60 fps signal. On a WAN, the Channel Delay parameter can be used to add an amount corresponding to the one-way network delay (half of the round trip time [RTT]).
The hardware has a minimum delay requirement of 2.5 frames in progressive mode and 3.5 fields in interlace mode. Setting a Total Delay less than these values results in uneven playback and pipeline underflow alarms. There is one exception to this rule. Setting the Total Delay to 0.0 (zero) places the system in a special minimum-latency mode.
Excessively long delays cause data to build up in a software buffer within the decoder. When the build up is more than 10 video frames, frames of data are discarded which can result in on-screen artifacts.

Videowall panel (not available when output format is set to Auto)

The Videowall configuration settings allow a video stream from a single source to split over several decoders, each attached to one monitor of a videowall layout. The number of monitors that make up the full size of the wall and the selected decoders position in the wall must be configured for each decoder.

The videowall can be as large as 5 monitors tall by 5 monitors wide in any variation. The decoder segments its portion of the full video into the proper size based on the two size entries and the position of the connected monitor.

Size tells the decoder how many total monitors (and decoders) make up the videowall. For instance, in the videowall example below, H size is 2 and V size is 2 indicating a 2x2 videowall resulting in four segments of the full video.

Position is the location of the monitor as part of the entire wall and tells the decoder which segment of the full video it displays. Numbering always begins with the upper left monitor.

- **Size (H)**— 1 to 5
- **Size (V)**— 1 to 5
- **Position** — 0 to 25. Position 0 ignores the size entries and displays the full video on the connected display. The top left monitor as the user views the videowall is position 1. Numbering runs left to right and top to bottom from that point as shown.

1	2
3	4

Example: The selected decoder is connected to the video monitor in the lower left of the 2x2 videowall shown at right. The configuration is:

- **Size (H)**— 2: indicates the videowall is 2 monitors wide.
- **Size (V)**— 2: indicates the videowall is 2 monitors tall.
- **Position** — 3: selects the segment of the full video the decoder outputs.

Bezel Compensation panel (Mullion Compensation)

In Videowall mode, the bezel compensation settings correct image geometry when the decoded image is spread across displays that have a mullion. The settings in the horizontal and the vertical adjustments are applied equally to both edges.

- **Horizontal** — 0 to 100%
- **Vertical** — 0 to 100%

Configuring for Videowall

In addition to the size, bezel compensation, and position settings, when configuring a group of decoders for videowall use, the following settings are also required:

- **Output Format** — Select the same output resolution for all decoders in the group.
- **Scale Mode** — Select **Fill** for all decoders in the group.

NOTE: The aspect ratio of the decoded source image is not maintained.

- **Genlock and Framelock settings** — All decoders are configured as a genlock group (see **Genlock** on the previous page).

NOTE: The image quality of a single source that is scaled across multiple displays, depends on the compression applied to the source and the size of the final image. The recommended maximum videowall size is three displays horizontal by three displays vertical. It is further recommended that displays used in a videowall be the same type, resolution, and size.

Program Audio Output panel

- **Output Select**— Select HDMI audio, analog audio, both, or none.
- **Analog Audio Output Level (dBu)**— Sets the analog output level from a range of -26 to +12 dBu.
- **Decode Buffer Settings Channel Delay(s)** — Configured the same as the video channel delay (see Channel Delay(s) on page 69).

Return Audio Input panel

- **Peak Input Level (dBu)**— To optimize signal-to-noise ratio (SNR) prior to the Analog to Digital Conversion (ADC) process, the Peak Input Level is set to a value just above the highest level of the source audio material. For example, if the input level from the source material peaks at +3 dBu, the peak input level is set to +4 dBu. The range is -26 to +12 dBu.
- **Measured Input Level (dBu)** — This read-only field shows the audio level of the analog input source in dBu. The value is updated every second and can be used as a guide to determine the **Peak Input Level** (see above) of the source material. If the measured input level exceeds the specified peak input level, the **Clip** warning indicator glows red. When the input level falls back within range, the warning indicator remains lit for three seconds and then turns off.

Compression Menu (VNE 250 Only)

With an encoder device selected, click **Compression** to open the **Compression Settings** dialog box to set the amount of compression on the encoded source (see figure 48).

Compression Settings (2001329)

Video Compression

Transform: video

Luma Compression: 5

Chroma Compression: 7

Luma/Chroma Lock: ☒

Temporal Compression: ☒

Refresh Rate: 1

Threshold: 1

Chroma Threshold: ☐

Motion: 0 - No motion compression

Audio Compression

Compression: No compression (~3 Mbps)

Bitrate

Limit Mode: Peak Flowrate (FD)

Target Rate (Mbps): 10

Frame Drop (%): 0

Figure 48. Compression Dialog Box (Encoder Only)

These configuration options have a direct effect on the network bandwidth required for the encoded stream.

- Increasing compression decreases the network bandwidth requirements for the stream.
- Decreasing compression increases the network bandwidth requirements for the stream.

Alternatively, the desired bandwidth is set using the Bitrate panel to meet the specified bandwidth limit.

Video Compression panel

- **Transform** — Two transform types are supported.
 - **graphics** — Optimizes the video to support text and sharp lines, such as are present on most computer screens.
 - **video** — Optimizes the video to support smooth tone changes, such as are present in movies and other video content.
- **Luma Compression** — This drop-down list sets the amount of compression on the luma (black and white) portion of the signal. A value of **1** is the minimum amount of compression available; a value of **10** is maximum compression.
- **Chroma Compression** — This drop-down list sets the amount of compression on the chroma (color) portion of the signal. A value of **1** is the minimum amount of compression available; a value of **10** is maximum compression.

NOTE: This field is available only when the **Luma/Chroma Lock** is **not** selected.

- **Luma/Chroma Lock** — Selecting this box disables the **Chroma Compression** field and automatically sets chroma compression two levels higher than **Luma Compression**.

When selected, the **Chroma Compression** field tracks the **Luma Compression** field by a fixed value of +1 (Luma Compression = 1) or +2 (Luma Compression > 1).

- **Temporal Compression** — Selecting this check box causes areas of the screen to refresh only when a change between frames is detected. Enabling temporal compression can significantly reduce network bandwidth.

NOTE: For all normal operation, **Temporal Compression** should be enabled.

- **Refresh Rate** — This field controls how frequently static parts of the screen are updated when the **Temporal Compression** check box is selected. This is useful when connecting new displays to a temporally encoded source and fills in gaps in the data when using a lossy network transport (such as RTP). A value of **1** refreshes the screen once a second; a value of **10** refreshes the screen once every ten seconds. A value of **0** disables the refresh. Valid settings are **1** through **17**.
- **Threshold** — This drop-down list controls the sensitivity of the temporal change detection algorithm. A value of **0** means any screen changes will be sent. Increasing the value increases the send threshold and reduces the network bandwidth. A setting of **0** is suitable for DVI computer generated sources. Sources with more noise or video-type motion should use a setting between **1** and **4**. Camera sources should always use values greater than **0**.
- **Chroma Threshold** — This check box controls whether the temporal algorithm should consider changes in the color (chrominance) of the image. Selecting this check box provides better results when using digital simulation type sources. However, this can increase the transmit bandwidth by up to 200%, so it should be disabled on bandwidth sensitive systems.

NOTE: This option is normally not required for video or camera type sources.

- **Motion** — This drop-down list is used to adjust motion compression. The value can be set from **0** to **15**, where **0** is no additional motion compression and **15** is full motion compression. When enabled, motion detected on the area of the screen is heavily compressed. This reduces bandwidth when the eye cannot perceive significant detail due to the motion. When motion stops, the video is resent at the standard resolution preserving screen integrity.

Audio Compression panel

- **Compression** — VN-Matrix devices support limited compression of audio sources. The S/PDIF digital data bus can carry two types of data: 2-channel uncompressed audio and encoded digital data, the latter often in AC-3 (Dolby Digital) format. If the source is HDMI AC-3, run length encoding (RLE) is applied that results in an output bandwidth of about 430 kbps. If the source is HDMI PCM, the full set of compression values is used.

The following compression values are supported:

Compression	Stereo Audio Tracks	AC-3 Audio Track
No compression (~3 Mbps)	24 bit native data (2975 kbps)	24 bit native data (2975 kbps)
24-bit to 16 bit (~1.5 Mbps)	16 bit data, full sample rate (1517 kbps)	16 bit data, zeros run length encoded (430 kbps)
44 kHz to 22 kHz (~800 kbps)	16 bit data, half sample rate (784 kbps)	16 bit data, zeros run length encoded (430 kbps)
44 kHz to 11 kHz (~400 kbps)	16 bit data, quarter sample rate (418 kbps)	16 bit data, zeros run length encoded (430 kbps)

Bitrate panel

The Bitrate panel sets a specific bandwidth limit for the encoded stream.

- **Limit Mode** — This drop-down list contains management modes that limit the instantaneous traffic on the network and drops traffic when the bandwidth rate is exceeded. This is useful when the network connection between the source and display has limited bandwidth.

NOTE: Rapidly changing content may produce instantaneous peaks in bandwidth rate when using PBR-F management mode.

Six bandwidth management modes are supported.

- **None** — This mode does not use bandwidth management. Only the underlying compression settings are managed.
- **Manual Frame Drop** — This mode allows the user to specify the precise fraction of frames to drop. This mode does not manage the bandwidth rate at a fixed level, but does result in a smoother display update when using rapidly changing video content types.
- **Shared Flowrate (FD)** — This mode limits the total video network traffic for the source. Frames are dropped if the **instantaneous** data rate is higher than the flowrate entered in the **Target Rate (Mbps)** field.
- **Peak Flowrate (FD)** — This mode limits the video network traffic for a single source stream. Frames are dropped if the **instantaneous** data rate is higher than the flowrate entered in the **Target Rate (Mbps)** field. Using *N* output streams increases the bandwidth *N* times unless the multicast RTP transport protocol is used.
- **PBR-F** — This mode dynamically modifies the compression settings to limit the transmitted bandwidth depending on the specified value entered in the **Target Rate (Mbps)** field. The specified **Compression** setting is used as the minimum compression value. This control mode averages the bit rate over a period of two frames.
- **PBR-F (FD)** — This mode is the same as **PBR-F** except frames are dropped when a larger bandwidth reduction (such as a reduction that cannot be achieved with compression settings alone) is required.

- **Target Rate (Mbps)** — This field is used in all bandwidth management modes (except **Manual Frame Drop**) to specify the network bandwidth used by the source. This value is specified in Megabits per second (Mbps).
- **Frame Drop (%)** — This field is used in **Manual Frame Drop** mode and specifies the percentage of frames to discard. A value of **95%** discards 19 out of every 20 frames reducing a 60 frames per second (fps) video signal to 3 fps. 1 fps is the minimum frame rate. A value of **99%** results in all frames being dropped due to rounding.

Peripherals Menu

Click **Peripherals** to open the **Peripherals Settings** dialog box to manage serial port, data channel, pointer overlay, and remote keyboard and mouse communications for the VNM 250 (see figure 49).

Figure 49. Peripherals Dialog Box

Serial Port

The serial port panel configures the RS-232 port. For a full description of the serial port configuration, including server/client setup, see the *VNM 250 User Guide*. Default settings are shown in figure 49.

- **Mode:** — The serial port can operate in one of three modes:
 - **None:** The serial port is not used.
 - **Pass through Server:** The serial port acts as a destination for serial port clients.
 - **Pass through Client:** The serial port can connect to serial ports on other devices

A point to point link can be established by setting the serial port of one VN-Matrix device to **Pass-through Server** mode and a second device to **Pass-through Client** mode. The destination of the second device is set to the pass-through port on the first (server) device.

A server can accept multiple client connections. Under these conditions the data input by the server serial port is duplicated to all connected clients. The data received from the clients is multiplexed (in order of arrival) and output through the server serial port.

- **RS-232 Settings:** Basic configuration of the serial port includes baud rate, data bits, stop bits, parity, and handshake.
- **Destination:** — This option can only be modified with the serial port in client mode. The drop-down list allows a pass-through connection request from each VN-Matrix device in the network, regardless of whether the device is currently configured as a server.

Data Channel

The data channel panel configures the UDP data stream.

- **UDP Data Tx (encoder)** — Enables or disables UDP data transport through the dataport.
- **UDP Data Port (encoder)** — The port number to receive UDP traffic on. This setting must match the port number defined by the external device or system that generates the UDP data.
- **UDP Data RX (decoder)** — Enables or disables the UDP data.
- **UDP Dest IP (decoder)** — The IP Address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
- **UDP Dest Port (decoder)** — This is the port number used by the (external) device or system to receive the UDP data.

Pointer Overlay

- **Overlay (encoder)** — Enable the overlay pointer on the local loop-through display.
- **Annotation Port (decoder)** — Read-only value of the annotation port number.

Mouse and Keyboard

- **Mode:** — Device specific.
 - **Encoder:** Enabled, allows mouse and keyboard forwarding.
 - **Decoder:** The control has four options;
 - Disable: The decoder does not forward mouse and keyboard information.
 - Keyboard: The decoder forwards mouse and keyboard information.
 - Keyboard + keepalive: the link is automatically established if broken.
 - Force: Mouse and keyboard forwarding + keepalive is permanently enabled.
- **IP Address:** —
 - **Encoder:** Not Required.
 - **Decoder:** Used to specify the IP address of the target encoder when the transport is multicast or when the encoder exists on a different controller domain.

NOTE: Leading zeros are not allowed.

- **Status:** — Read-only, is the current status of the link
 - **Encoder:** Disabled, local, or remote keyboard and mouse is displayed.
 - **Decoder:** Disabled, local, or forwarding is displayed. In case of a connection error, a reason is shown in brackets.
- **Inactivity:** — Read-only (decoder only). Displays the number of seconds since the mouse or keyboard reported a change.

License Menu

Click **License** to open the **Device License Management** dialog box. This dialog displays enabled features for the selected unit and enables optional features (see figure 50).

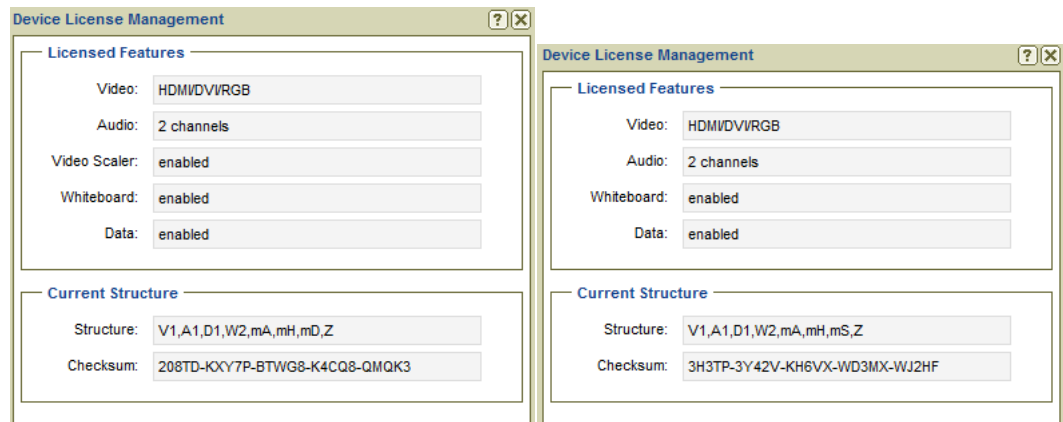


Figure 50. VND 250 (Left) and VNE 250 (Right) License Menu

NOTE: The Licensed Features panel and Current Structure panel fields are read-only (cannot be edited).

Licensed Features panel

The Licensed Features panel details the features currently enabled on the device.

- **Video** — Indicates the input signal format type.
- **Audio** — Indicates the number of supported audio channels.
- **Video Scaler (VND 250 only)** — Indicates whether video scaling is enabled or disabled.
- **Whiteboard** — Indicates whether whiteboard data streaming is enabled or disabled.
- **Data** — Indicates whether data streaming is enabled or disabled.

Current Structure panel

The Current Structure panel details the current structure code and its corresponding checksum. These are read-only (non-changeable) fields.

- **Structure** — Shows the current feature set of the selected device. The values in this code correspond to the active features displayed in the Licensed Features panel, above.
- **Checksum** — Shows the checksum value used to enable the structure code.

Upgrade Menu

Click **Upgrade** to open the Upgrade Device Firmware dialog box used to upgrade the firmware (see [Upgrade Menu \(2xx and 3xx Devices\)](#) on page 58).

ATTENTION:

- Ensure that compatible firmware is used to upgrade the selected VN-Matrix devices.
- Assurez vous qu'un firmware compatible est utilisé pour mettre à jour les appareils VN-Matrix sélectionnés.
- Upgrading with incorrect firmware can cause the VN-Matrix devices to stop responding.
- Mettre à jour avec un firmware incorrect peut faire en sorte que les appareils VN-Matrix arrêtent de répondre.

Misc Menu

This menu contains four selections for the VND 250 and three for the VNE 250 (see figure 51).

- **Real-time Bandwidth Monitor (VND 250)**
- **Delete Device**
- **OSD Identifier Editor**
- **Send HLI Command**

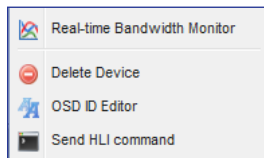


Figure 51. VNM 250 Misc Menu

Real-time Bandwidth Monitor (VND 250)

Select the real-time bandwidth monitor to open a new dialog box that monitors the bandwidth (measured in Mbps) used by the selected device or devices (see figure 52).

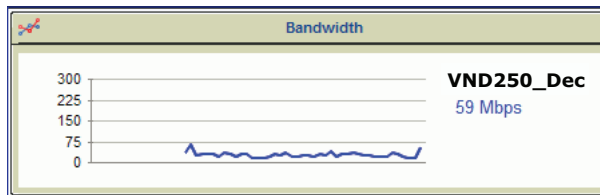


Figure 52. Bandwidth Monitor

NOTE: Bandwidth data is displayed only for decoder devices. A graph is displayed for an encoder, but the data always shows 0 Kbps.

Delete Device

Select this option to delete the selected device or devices.

NOTES:

- Be certain the appropriate devices are selected when using this menu option. The selected devices are deleted right away; no notification or warning is given when the option is selected.
- A device can only be deleted when it is offline. Active devices can not be removed from the device list.

OSD Identifier Editor

Select this option to customize the appearance of the **on-screen display** for the selected device or devices (see figure 53).

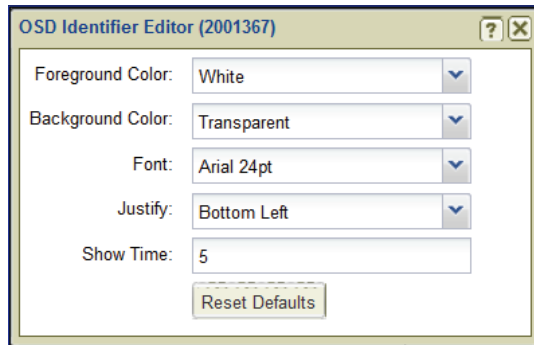


Figure 53. VNM 250 OSD Identifier Editor

- **Foreground Color** — This drop-down list selects the color of the text box font.
- **Background Color** — This drop-down list selects the text box background color.
- **Font** — This drop-down list selects the type of font used in the text block.
- **Justify** — This drop-down list places the text block in one of nine fixed positions.
- **Show Time** — Sets the length of time (in seconds) the name of the source device is visible after a connection is made. A value of 0 keeps the name visible indefinitely.

NOTE: This control option only functions when the **Identify Source** check box is selected in the **Configure** menu (see [VNM 250 Configuration](#) on page 64).

Send HLI Command

Selecting this option opens a dialog box used to send High Level Interface (HLI) command strings to VN-Matrix devices (see figure 54).



Figure 54. HLI Command Window

To send a command, click in the **(enter command line)** text field, type the command, and press <Enter>.

NOTE: The response is returned in the response area of the dialog box.

Example HLI commands and information on how to use them are available in [System Control](#) on page 175.

Recorder Configuration

This section details options available in the Actions menu bar located at the bottom of the devices page. The options associated with recorders are listed below (see figure 55). The first action bar configuration displays when a recorder is selected. The next bar is available only on the sub-channels of a recorder device. Each sub-channel can be used to record video, audio, and data from an associated VN-Matrix encoder. Click an action button to configure the selected recorder.

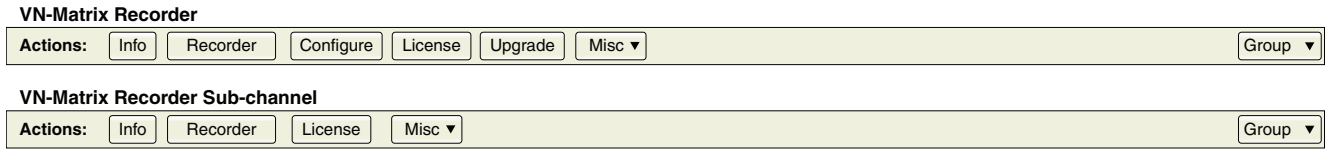


Figure 55. Actions Bar Menu, VN-Matrix Recorders

Info Menu

Click **Info** to open the **Device Information** dialog box. The box displays read-only information for the selected recorder or sub-channel. The display is the same for the VNR 100 and VNM Recorder (see figure 56).

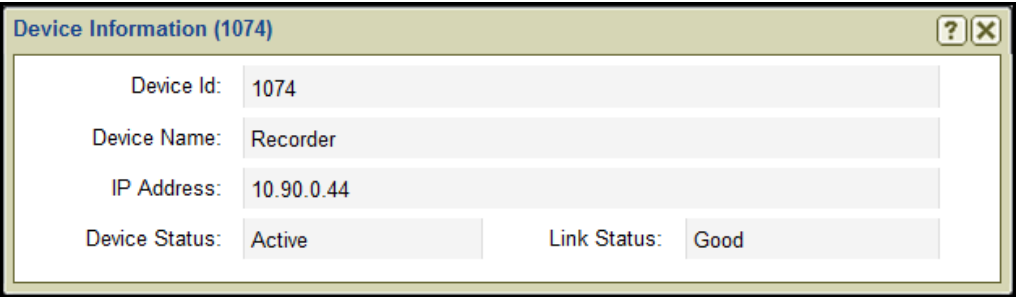


Figure 56. VN-Matrix Recorders, Device Information

Recorder Menu

Click **Recorder** to open the **Recording Browser** dialog box. This box displays recorded files for the selected recorder and recorder sub-channels.

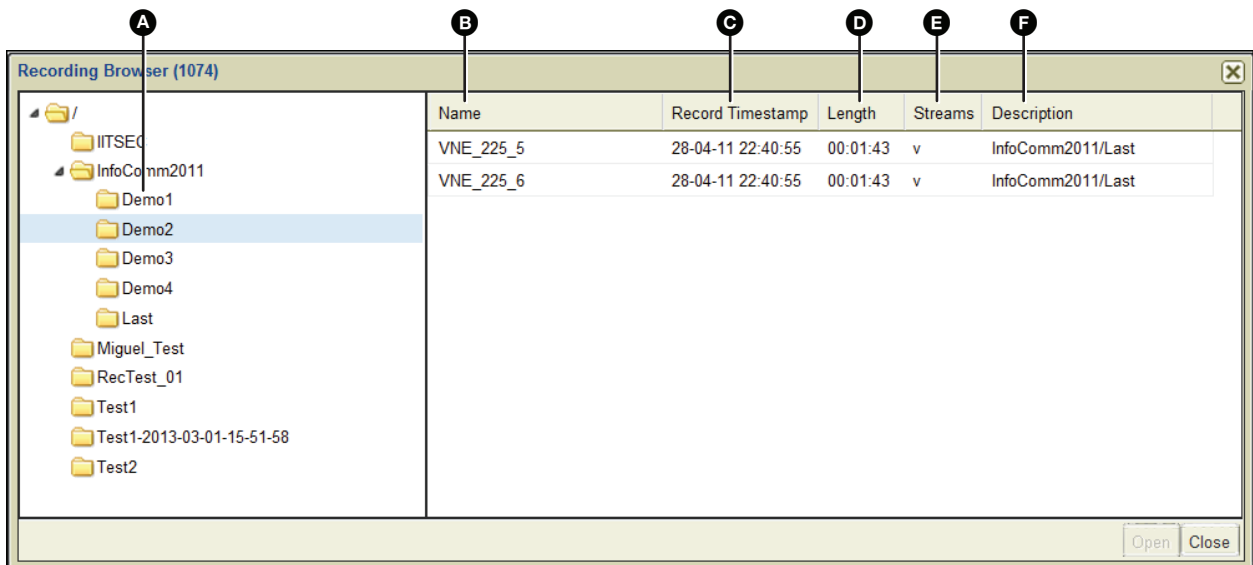


Figure 57. VN-Matrix Recorders, Recording Browser

The user can select a recording from the default location or navigate to another location on the hard drive. The browser provides information on each recording, allowing a user to manage the recordings on the selected device (see [File Management Overview](#) on page 111).

The menu items are:

- A Directory Tree** – The directory structure of the recorder. The tree functions like a standard Windows directory structure.
- B Name** – The name of each channel in the recording. If a name is not set by the user, the default name of the file is the device ID of the connected encoder.
- C Record Timestamp** – The date and time a recording is created.
- D Length** – The duration of the recording in hours, minutes, and seconds (HH:MM:SS).
- E Streams** – The stream types included in the recording; v=video, a=audio, and d=data.
- F Description** – A text string entered by the user when the recording is created.

Configure Menu

Click **Configure** to open the **Configure Device Settings** dialog box used to change the device name or to configure up to three user parameters for the recorder. The dialog box is the same for the VNM Recorder and the VNR 100.

The screenshot shows a dialog box titled "Configure Device Settings (1074)". It has a standard Windows-style title bar with a question mark icon and a close button (X). The dialog is divided into two main sections. The first section, "Device Setup", contains four text input fields: "Device Name" (with the text "Recorder"), "User Param 1", "User Param 2", and "User Param 3". The second section, "Networking", contains one text input field: "Multicast TTL" (with the value "2").

Figure 58. Recorder Configure Dialog Box

Device Setup Panel

- **Device Name:** — Enter a user defined name for the VN-Matrix Recorder. This is the name that appears in the device list. The name can be letters, numbers, and the underscore character. Spaces are not allowed.
- **User Parameters:** — Up to three user parameters can be entered in these three fields to customize the operation of the recorder.

Networking Panel

- **Multicast TTL:** — Specifies the number of router hops multicast traffic can make between routed domains.

License Menu

Click **License** to open the **Device License Management** dialog box. This dialog provides information about the recorder features licensed for use on the VN-Matrix system. The information is read-only, shown for reference.

The **Device License Management** dialog box is divided into three sections:

- Licensed Features:** Contains five read-only fields: Video, Audio, Video Scaler (disabled), Whiteboard (disabled), and Data (disabled).
- Current Structure:** Contains two read-only fields: Structure (R5,P5,mR,mP,mV) and Checksum (2WQ8F-BRV7J-7KDTH-Y7D78-FT9W2).
- Change Device Structure:** Contains two empty text input fields for Structure and Checksum, and an **Update License** button.

Figure 59. Device License Dialog Box, Recorders

Licensed Features

The **Licensed Features** panel is not functional at this time.

Current Structure

- **Structure** — This field details the current structure key for the recorder.
- **Checksum** — This field details the current checksum for the recorder.


Change Device Structure

The **Change Device Structure** panel is not functional at this time.

VNS 104 Software Decoder Configuration

The VNS 104 Multi-stream Decoding Software decodes one or four video streams and one stereo audio stream from VNE 225/250 real-time encoders and VN-Matrix Recorder playback channels. It operates on a Windows PC and is managed from the VN-Matrix Enterprise Controller. Before you can view content, ensure the VNM Enterprise Controller is properly licensed with the VNS 104 option and checksum (provided by Extron). Once the Controller license has been updated, the VNS 104 Multi-stream Software Decoder can be selected and configured.

The VNS 104 appears in the devices list as five separate icons, one for the root and one for the each of the decode windows. Each decode window appends the device ID with a number from 1 to 4 (see figure 60).

NOTE: The position of the highlighted display in the VNS 104 icon () is the screen position target for the associated video stream (see figure 60).











<input checked="" type="checkbox"/>			21212121	VNS104	10.13.3.71	10.90.0.43	VNS 104	ver1.0.0
<input type="checkbox"/>			21212121:1	VNS104:1	10.13.3.71	10.90.0.43	VNS 104	ver1.0.0
<input type="checkbox"/>			21212121:2	VNS104:2	10.13.3.71	10.90.0.43	VNS 104	ver1.0.0
<input type="checkbox"/>			21212121:3	VNS104:3	10.13.3.71	10.90.0.43	VNS 104	ver1.0.0
<input type="checkbox"/>			21212121:4	VNS104:4	10.13.3.71	10.90.0.43	VNS 104	ver1.0.0

Figure 60. Devices Tab, VNS 104

Actions Menu Bar

Action bar menu items change when switching between the main VNS 104 root icon and the individual decode windows. The Actions menu bar for the main device contains information and configuration options common to all four decode windows. Selecting an action opens a dialog box to configure the individual device.

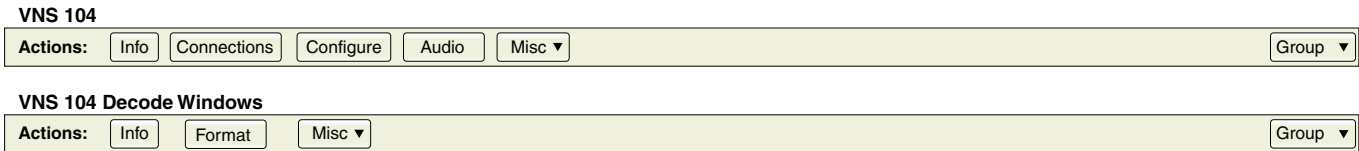


Figure 61. VNS 104 Action Bar, Main Menu

Info Menu

Click **Info** to open the **Device Information** dialog box. There are no configuration settings, only information about the connected VNS 104 device.

Device Information (21212121)	
Device Id:	21212121
Device Name:	Licensed Desktop
IP Address:	10.13.3.51
Device Status:	Active
Link Status:	Good

Figure 62. VNS 104 Root Device - Device Information

The fields are:

- **Device ID** – Displays the device ID of the connected VNS 104.
- **Device Name** – Displays the name of the connected VNS 104.
- **IP Address** – The IP address of the connected VNS 104 device.
- **Device Status** – Displays **Active** when there is a VNS 104 connected, or **No Device** if a VNS 104 is not detected. When the device is active, the **Link Status** indicates the quality of the management link.
- **Link Status** – Displays **Good** when an active VNS 104 device is connected with little or no management packet loss; **Fair** when a small amount of packet loss is detected; and **Poor** for a bad link. When the Link Status is **Poor**, ensure the link has sufficient bandwidth to carry the data.

Connections Menu

Click **Connections** to open the **Connections** dialog box. This box contains general information for the connected VNS 104 device showing the active stream source for each of the four connections.

	Video	Audio
Description	61_Dell_D830.videoPort0	
id	720202.0.0	
Source	239.192.1.46:9608	
Destination	239.192.1.46:9608	
Locale	ext	
Slot	-1	
Description	61_Rack_Dell.videoPort0	
id	620032.0.0	
Source	239.192.1.43:8006	
Destination	239.192.1.43:8006	
Locale	ext	
Slot	-1	
Description	61_Rack_Frameflipper.videoPort0	
id	720197.0.0	
Source	239.192.1.29:9574	
Destination	239.192.1.29:9574	
Locale	ext	
Slot	-1	
Description	61_Rack_JMP9600.videoPort0	
id	1021158.0.0	
Source	239.192.1.42:9600	
Destination	239.192.1.42:9600	
Locale	ext	
Slot	-1	
Description		61_Rack_Dell.audioPort0
id		620032.A0.0
Source		239.192.0.43:8008
Destination		239.192.0.43:8008
Locale		ext
Slot		-1

Figure 63. VNS 104 Root Device - Connections

The **Connections** dialog box includes:

- **Description** – Displays the name of the stream source device.
- **ID** – Displays the device ID of the stream source device.
- **Source** – For unicast transports, displays the IP address and port number of the stream source device.
- **Destination** – Displays the IP address and port number of the device receiving the stream.
- **Locale** – This field displays **loc** when the data streaming between the source and display are controlled by the same controller (**loc**). This field displays **ext** if the data stream has been exported across two different controllers or if the transport protocol is multicast RTP.
- **Slot** – This field displays information depending on the type of transport protocol in use.
 - Using the **unicast RTP** transport protocol, this field displays the stream number. Four streams are available numbered **0**, **1**, **2**, and **3**.
 - Using the **multicast RTP** transport protocol, this field displays **0** for a source and **-1** for a display.

Configure Menu

Click **Configure** to open the **Configure Device Settings** dialog box. This box contains general information for the connected VNS 104 device showing the active stream source for each of the four connections.

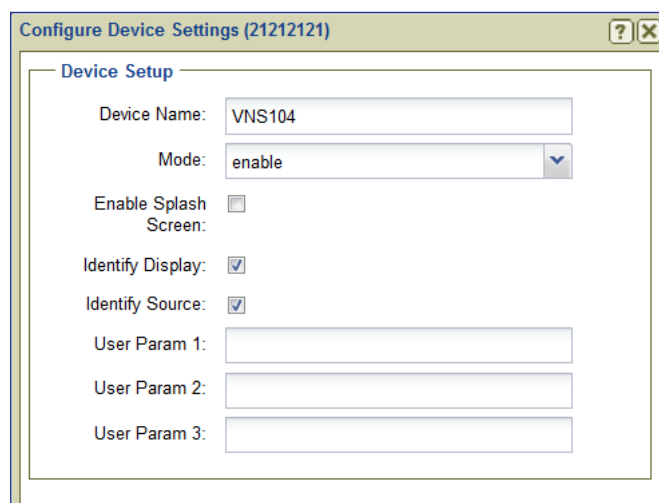


Figure 64. VNS 104 Root Device - Actions Bar, Configure Device Settings

This dialog box contains the following settings:

- **Device Name:** – This field is used to enter a user defined name for the device. The name appears in the device list and can be letters, numbers, and the underscore character. Spaces and other characters are not allowed.
- **Mode:** – Drop-down list selects the operation of the VNS 104. Selections are:
 - **Enable** – Enables normal decoding of assigned streams.
 - **Disable** – Disables decoding. Displays a splash screen (if enabled), or a black screen.
 - **Standby** – Disables decoding and displays a black screen.
 - **Test** – Disables decoding and displays a splash screen (if enabled), or a black screen.

- **Enable Splash Screen:** – Enables the display of a splash screen when the display device detects a break in the input data stream or a source stream is not assigned. When this check box is not selected, a black screen is displayed when a source stream is not present or when the display device detects a break in the input data stream. See the *VNS 104 User Guide* for instructions on how to install and use a custom splash screen.
- **Identify Display:** – Overlays the device name on the decode window or windows.
- **Identify Source:** – Overlays the source name on the decode window or windows. If a source is not selected for the window, "No Stream Selected" is displayed.
- **User Parameters 1-3:** – Up to three user parameters can be entered in these three fields to customize the operation of the VNS 104.

Audio Menu

Click **Audio** to open the **Configure Audio Settings** dialog box. Only one of the connected video streams can have its audio selected for decode. The audio stream is assigned in the preset manager device attributes control. This dialog sets the level for that stream and also allows it to be muted.

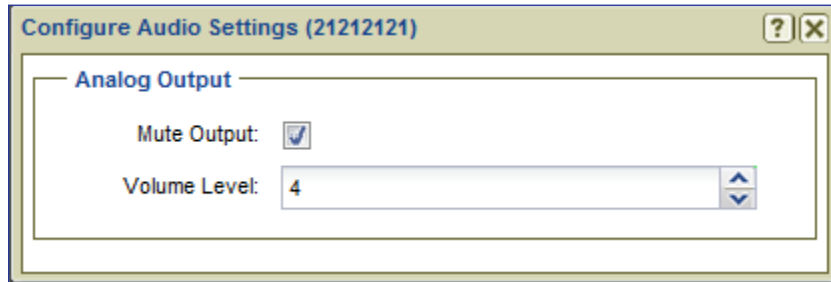


Figure 65. Root Device - Audio Settings Dialog Box

The audio output configuration dialog box provides the following settings:

- **Mute Output:** – Place a check mark in the box to mute the audio decode stream.
- **Volume Level:** – Adjust the audio level from -70 to +12. Default is 4.

VNS 104 Misc Menu

The miscellaneous menu provides the following selections:

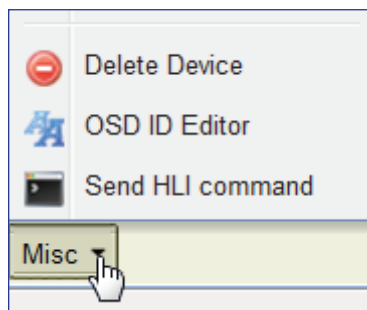


Figure 66. Actions Bar - VNS 104 Root, Misc

- **Delete Device:** – Deletes the VNS 104 device from the Enterprise Controller Devices list.

NOTES:

- Be certain the appropriate devices are selected when using this menu option. The selected devices are deleted right away; no notification or warning dialog box appears when the option is selected.
- A device can only be deleted when it is offline. Active devices can not be removed from the device list.

- **Send HLI command:** – Sends an HLI command to the selected device.
- **VNS 104 OSD ID Editor** – Customize the format and placement of the display text entered in the configuration menu (see [Configure Menu](#) on page 85).

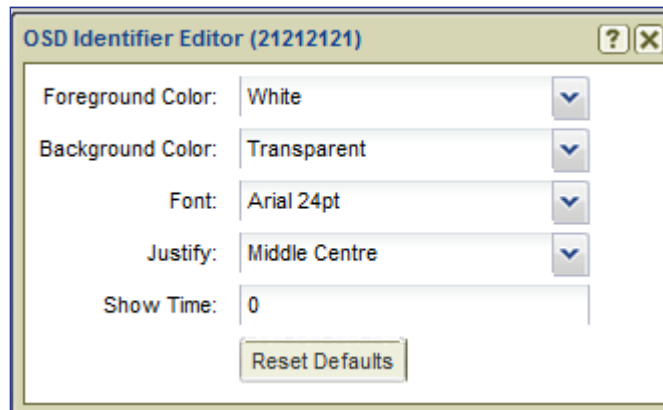


Figure 67. OSD ID Editor, VNS 104 Shown

The OSD ID editor provides the following:

- **Foreground Color:** – Sets text color from a list of 11 colors and shades (or transparent).
- **Background Color:** – Sets background color from a list of 11 colors and shades (or transparent).
- **Font** – Sets the font and font size from a list.
- **Justify:** – Sets the position of the text window from a list of nine locations.
- **Show Time:** – Sets the time (in seconds) the text remains on-screen. 0 leaves the text onscreen permanently.

NOTE: These settings are applied globally to all VNS 104 decode windows.

VNS 104 Decode Windows

When the streams for each of the four displays are assigned using the Preset Manager (see [Preset Manager Page](#) on page 93), select an individual stream to view information specific to that stream and also allow the stream to be customized for the preset.



Figure 68. VNS 104 Action Bar, Single Stream Menu

Info

The **Information** dialog menu is the same as the main VNS 104 root device (see [Info Menu](#) on page 84).

VNS 104 Display Format

Click the **Format** button to open the **Display Format** dialog box. Each decode window provides a dialog box that allows several ways to customize the display of each stream.

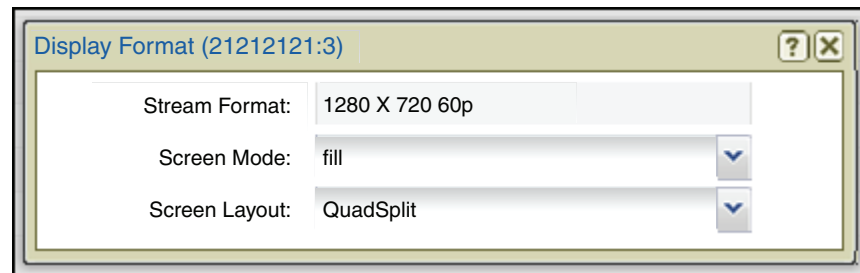


Figure 69. VNS 104 Display Format (One of Four Streams)

In this dialog box the following items are shown:

- **Stream Format (read-only)** – Displays the format of the assigned stream.
- **Screen Mode** – Selects from the three screen modes; **Fill**, **follow**, or **unity** (see the *VNS 104 User Guide* for details on how these screen modes appear on a VNS 104 display).
- **Screen Layout** – Select **Full screen** or **QuadSplit** screen layouts.
 - **Full Screen:** The selected decode window is displayed full screen. Only one decode window can be set to full screen. The other decode windows are no longer visible. The decode window last set becomes the active full screen window.
 - **Quadsplit:** The VNS 104 is configured as four decode windows. Each decode window is positioned as part of a 2x2 array.

Using either layout, streams are assigned to decode windows using the Preset manager control or the Switcher page (see [Device Attributes – VNS 104 Software Decoder: Decode Window](#) on page 106 and [About the Switcher Page](#) on page 89).

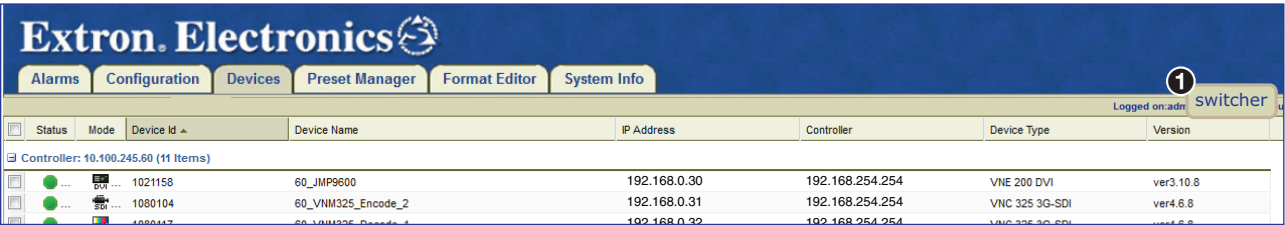
NOTES:

- Settings made here are intended to configure the VNS 104 when the VNM Enterprise Controller Switcher page is used.
- **Screen Mode** and **Screen Layout** configuration settings are also available in the Preset manager device attributes control for the VNS 104.
- The settings operate on a last takes precedence basis. Modifications to the settings made in either the device list page or preset manager page overwrite previous settings.

About the Switcher Page

The Switcher page assigns encoders (sources) to decoders (displays). This allows the user to control streaming throughout the entire system using a single page. Use the following procedure to configure the Switcher page.

- 1. Click **switcher** (see figure 70 , ❶) to open the **Switcher** page (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).



A new window opens.

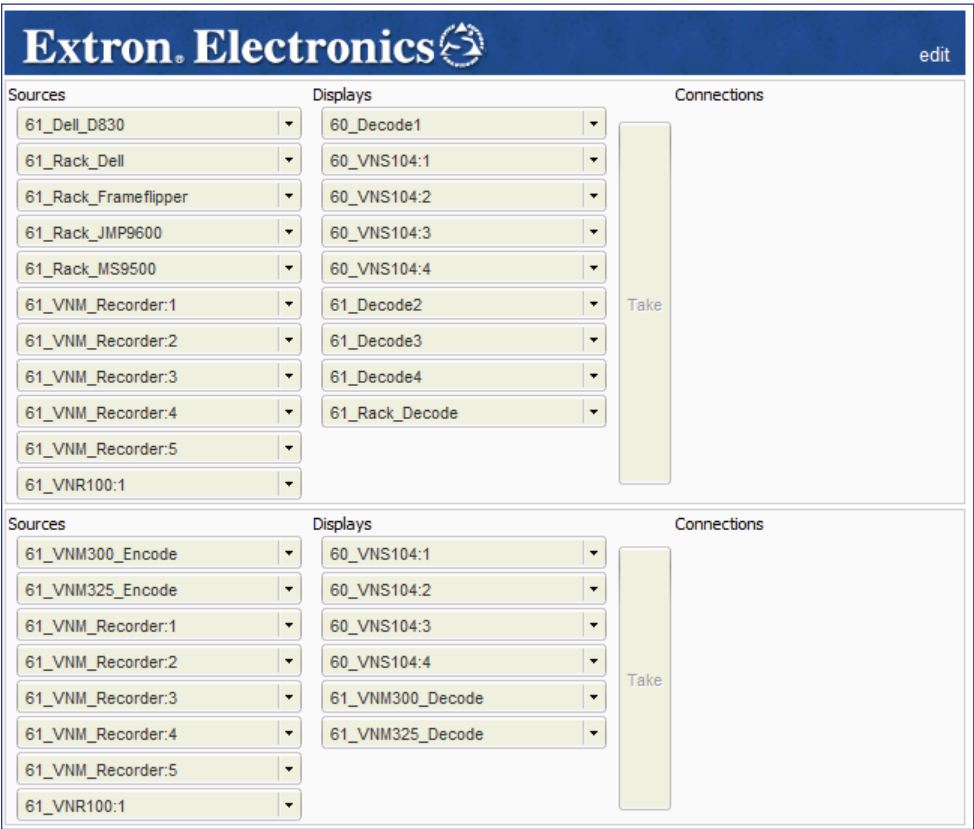


Figure 70. Switcher Window

NOTES:

- In the **Switcher** screen, VN-Matrix 2xx series devices appear in the upper part of the screen and VN-Matrix 3xx devices appear below. VNS 104 devices and recorders can appear in either.
- If a VNS 104 is in full screen mode, only a single channel is available for switching. The other three channels are still listed, but are dimmed.

2. In the **Sources** column, click an encoder (source) (see figure 71, ②).
The selected box darkens.
3. In the **Displays** column, click a decoder (display) (③).
The selected box darkens.
4. Click **Take** (④).
A connection is created between the selected encoder (source) and decoder (display).
 - Figure 71 shows that the JMP9600 **Source** is streaming media to **Rack_Decode**.
 - Also, the VN-Matrix 300 source, **VNM300_Encode**, is streamed to the display, **VNM300_Decode** (both highlighted in figure 71) when **Take** is pressed.

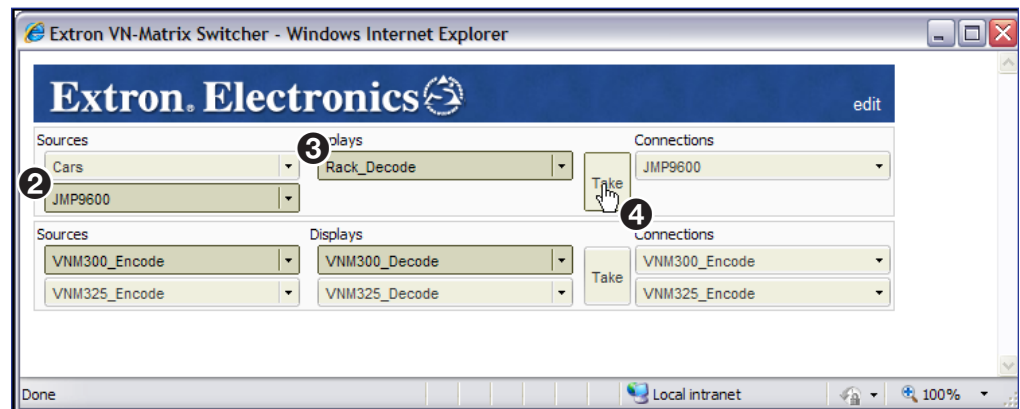
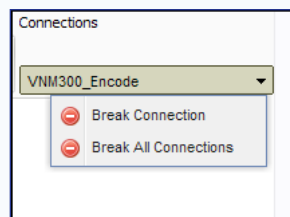


Figure 71. Switcher Window "Take"

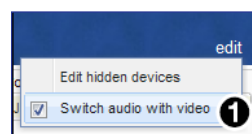
5. Repeat this procedure to create other connections as necessary.

NOTES:

- To remove a connection, select a connection from the **Connections** column and click **Break Connection** from the drop-down list.
- To break all connections, select any connection and click **Break All Connections**.
- Selecting **Break All Connections** immediately disconnects all devices. No other warning is given.



6. If audio data is present within the stream, click on the **edit** link located at the top right of the **Switcher** page and select the **Switch audio with video** (①) option. This keeps the audio and video together when creating connections.



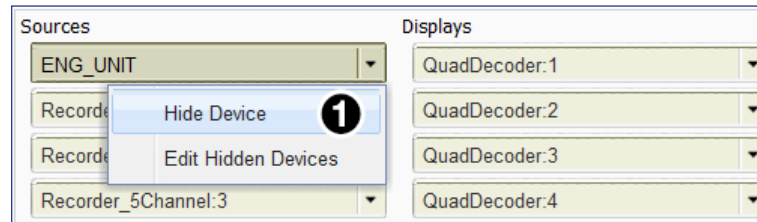
Select **Edit Hidden Devices** (see next page) to display a pop-up that allows the user to hide any devices on the **Switcher** page.

Hidden Devices

When there are too many devices on the screen, management becomes difficult. The switcher provides a way to hide unused or rarely used devices.

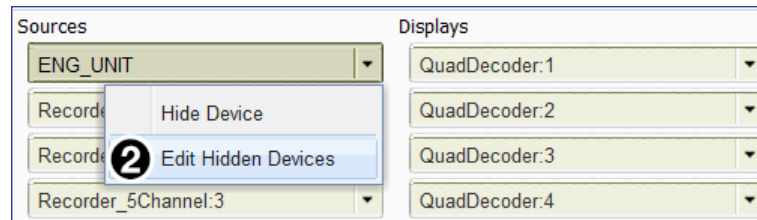
There are two ways to set and recover hidden devices:

1. Click the drop-down button on any source or display device and select **Hide Device (1)**.

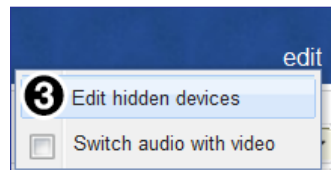


2. To display the **Edit hidden devices** menu:

- Click the drop-down button from a source or display device and choose **Edit hidden devices (2)**. -Or-

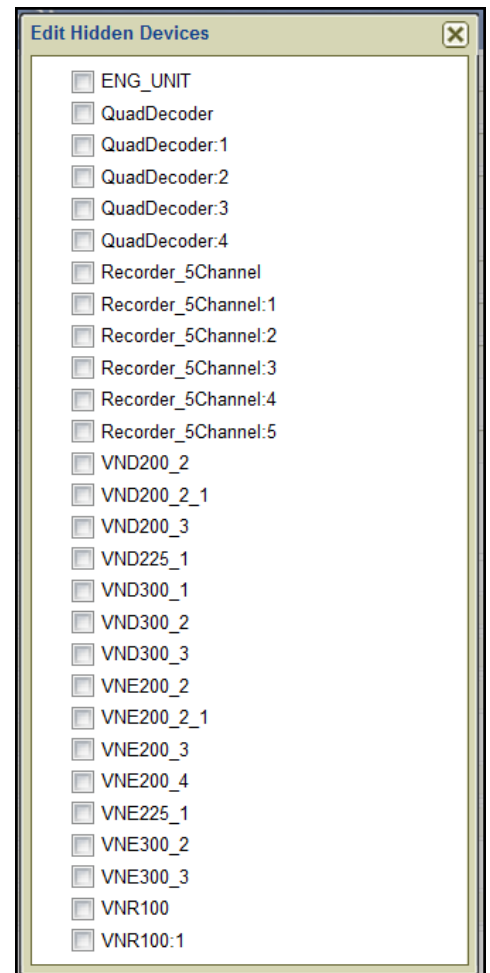


- Click **Edit > Edit hidden devices (3)** on the main switcher menu.



Both step 2 options open the **Edit Hidden Devices** menu (see right). The menu displays a list of all connected devices whether hidden, or not.

A checkmark in the box indicates the device is hidden. To display the device, uncheck the box. If you want to hide a device or series of devices, place a check mark in each device box.



Preset Manager

This section provides instructions to connect, disconnect, and operate VN-Matrix Devices using the Preset Manager.

Sections include:

- [Presets Overview](#)
- [Preset Manager Page](#)
- [Preset List](#)
- [Matrix Devices List](#)
- [Preset Design Panel](#)
- [Device Attributes](#)
- [Recorder Directory and File Management](#)
- [Creating Presets](#)
- [Selecting a File for Playback](#)
- [Chase-Play Feature \(VNR 100 Only\)](#)

Presets Overview

Presets can quickly configure and connect devices to operate as a system and fall into three types:

- **Switching presets** (encoders and decoders only) – Connect an input device (encoder) to an output device (decoder).
- **Recording presets** (encoders and recorders only) – Connect input devices to the inputs (Record) of the recorder in order to record the connected stream.
- **Player presets** (players and decoders only) – Connect recorder outputs (Play) to stream previously recorded programs to an output device.

NOTE: The current settings for a device are reflected in the dialog boxes whenever they are accessed in the **Device List** page, **Actions** bar.

- Configuration changes made on the **Preset Manager** page using **Device Attributes** are applied only when the preset is launched.
- Changes made to a device on the **Device List** page are applied immediately.

Preset Manager Page

The Preset Manager page enables connection of system devices from the device list for use in the VN-Matrix system. It allows users to create, save, and recall simple or complex system configurations using drag and drop rules under the following guidelines:

- A preset can contain a mix of VNM device types.

NOTE: Some device combinations are not allowed (see [Preset Design – Connection Rules](#) on page 97).

- A preset can have a set of attributes that define the mode and configuration parameters of devices in that preset.
- A preset can be named and saved for easy recall.
- A preset can be recalled by name using HLI commands.
- Presets are non-exclusive. The recall of one preset does not affect other devices in the VNM system that are not part of that preset.

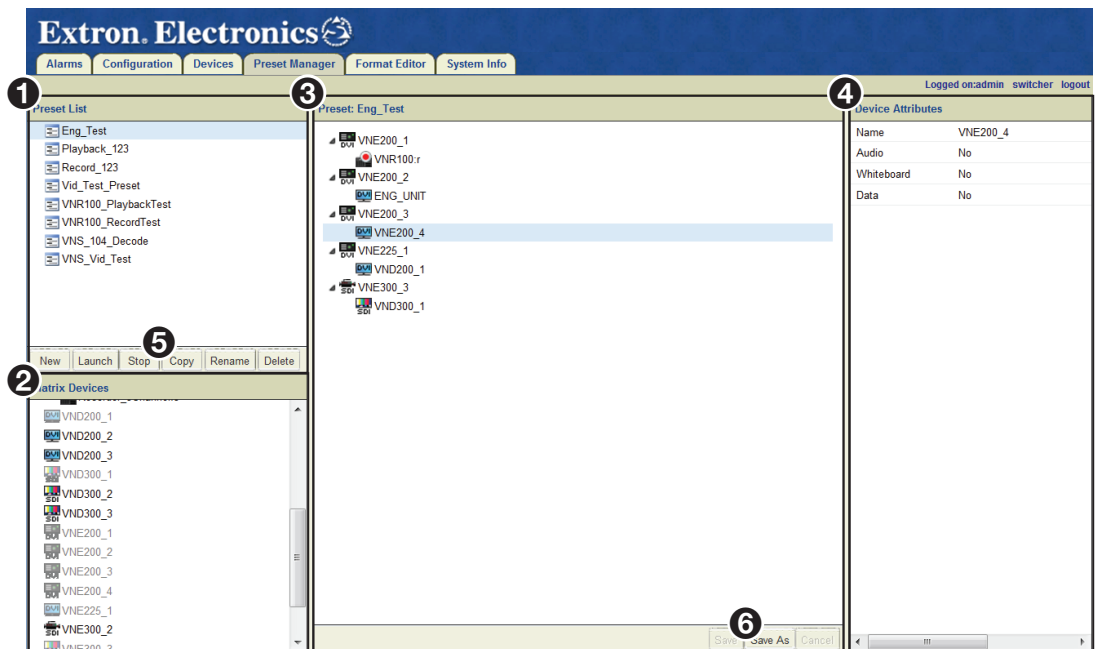


Figure 72. Preset Manager Page

The preset manager page is divided into four panels:

- 1 Preset List
- 2 Matrix Devices list
- 3 The Preset: Design workspace
- 4 Device Attributes

In addition, there are two toolbars:

- 5 To create, launch, stop, copy, rename, or delete a selected preset, a toolbar is located at the bottom of the Preset List panel (1).
- 6 When a new preset is configured or an existing preset modified, it is saved using the toolbar at the bottom of the Preset: Design workspace (3).

Preset List

The **Preset List** panel (see [figure 72](#), ❶ on the previous page) provides management and control of the system presets from the preset list toolbar and provides a way to quickly reconfigure devices.

System presets configure and connect groups of VN-Matrix devices for a specific task. They are built using devices in the **Matrix Devices** list (❷). Once defined in the **Preset Design** workspace (❸), presets are saved (❹) to the **Preset List** for use at a later time.

Each preset can contain a mix of matrix devices that includes encoders, decoders, codecs, and recorders. Controls to manage presets are provided at the bottom of the preset list box (❺).

All saved presets are displayed in the **Preset List** workspace, listed in alpha-numeric order. If the list of presets is too long to display within the area, a scroll bar is displayed on the right side of the window pane.

NOTE: Multiple presets can be active, however, the last preset launched takes precedence when connections conflict with other active presets.

Preset List Controls

A toolbar at the bottom of the **Preset List** workspace provides preset creation and control (❺). It is not possible to select multiple presets.

New

Select **New** to create a preset. When selected, it clears any previously loaded preset from the preset design area (see [Preset Design Panel](#) on page 97).

Note: Preset names must not include spaces or non alphanumeric characters such as / \ * , % ! " £ \$ % ^ & * () @ ~ # ? > < . These characters are blocked from use. Underscore (_) and hyphen (-) are permitted.

Launch

Launch configures and connects devices included in the preset.

Click **Launch** to activate a preset:

1. Select a preset from the list.
2. Click **Launch** to activate the preset.

Launch is also available by right-clicking on a selected preset in the preset list.

Stop

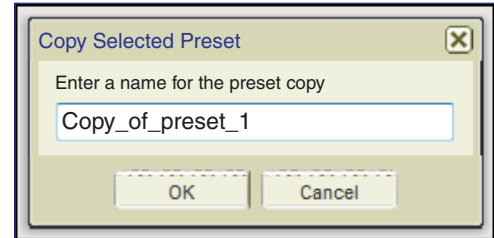
Stop clears all settings made in a preset when launched, including:

- Connections between encoders or players and decoders or recorders are removed.
- An active recording or playback is stopped.

Copy

Click **Copy** to copy a previously defined preset and save it as another name. To copy a preset:

1. In the **Preset List**, select the desired preset.
2. Click **Copy**. The **Copy Selected Preset** dialog box opens.
3. Enter the name for the new preset into the field entry area.
4. Click **OK** to save the new preset to the **Preset List**. -Or-
Click **Cancel** to abandon the copy process.
5. The new preset appears in the **Preset List**.

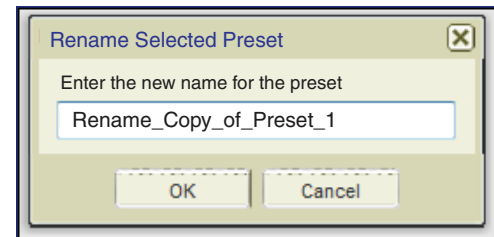


Note: Preset names must not include spaces or non alphanumeric characters such as / \ *, % ! " £ \$ % ^ & * () @ ~ # ? > < . These characters are blocked from use. Underscore (_) and hyphen (-) are permitted.

Rename

Rename changes the name of a previously defined preset.

1. In the **Preset List**, select the required preset.
2. Click **Rename**. The **Rename Selected Preset** dialog box opens.
3. Enter the name for the new preset.
4. Click **OK** to save the new preset to the preset list. -Or-
Click **Cancel** to abandon the rename process.
5. The renamed preset appears in the preset list.



Delete

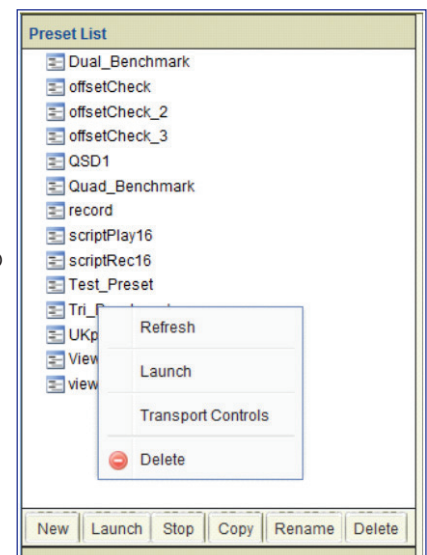
Delete erases a previously defined preset.

NOTE: **Delete** does not clear existing connections made by the preset. To clear those connections, first **Stop** the preset.

Right-click Behavior

Select a preset from the **Preset List** and <right-click> to access the following controls:

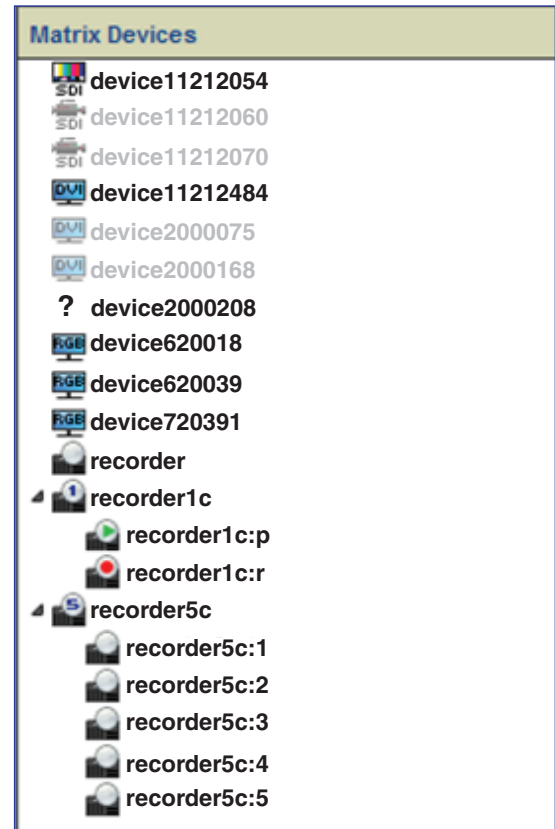
- **Refresh:** Update the list with the latest status.
- **Launch:** Activate the selected preset.
- **Transport Controls:** For a player or recorder preset, displays the **Transport Controls** dialog.
- **Delete:** Deletes the currently selected preset.



Matrix Devices List

The available VN-Matrix devices are displayed on the **Preset Manager** page as a list in the **Matrix Devices** panel.

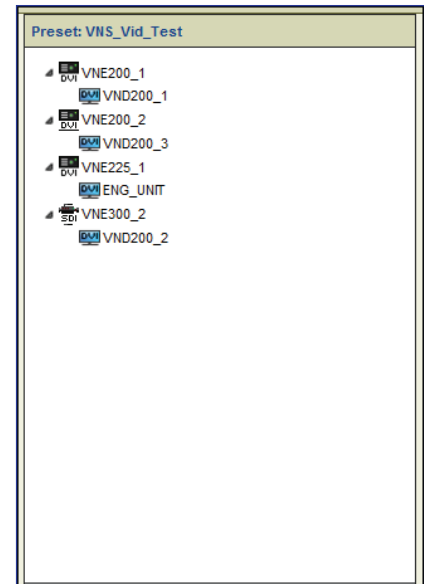
- Matrix devices are listed alphabetically by device name. It is not possible to sort or group them.
- Icons that represent each device are the same as the icons on the devices page (see [About the Devices Page](#) on page 36).
- The icon that represents VN-Matrix codecs depends on the mode of that device as set by the active preset. To determine the current mode, right-click anywhere inside the Matrix device area and select **Refresh**.
- Devices assigned to the currently selected preset appear dim in the list. Note the difference between **device11212054**, not assigned in the selected preset, and **device11212060** and also **device11212070** below it, which are both assigned.
- A question mark in place of the device icon indicates a device that is no longer connected to the system or powered down.
- After the first channel of a 5-channel recorder is added to a preset, all channels default to the same mode; either all recorder channels or all player channels.
- Single channel recorders are listed as one player and one recorder device.
- When the list is too long to display all devices, a scroll bar allows navigation of the list.
- Devices are selected one at a time. It is not possible to select multiple devices from the list.



Preset Design Panel

The workspace in the **Preset: design** panel is where new system presets are created and details of a selected preset are viewed.

- Whether creating a new or modifying a current preset, devices are dragged from the Matrix Devices list into the design area to create a preset (see [Creating Presets](#) on page 113).
- A new preset is saved the first time using the **Save As** button. After that, updates are saved using **Save**.
- Changes made to a preset are discarded by clicking **Cancel**.
- **Save As** copies a selected preset to a new name.
- Devices are removed from a preset by highlighting the device, then right-clicking and selecting **Delete**.
- When a preset is selected from the Preset list (see [Preset Manager Page](#) on page 93), the design workspace displays the configuration of all devices used in that preset.



Preset Design – Device Icons

Device icons used in the preset design area are the same as those used on the **Device** page (see [About the Devices Page](#) on page 36).

The icon used in a preset for certain devices depends on the device function in that preset.

- The function of VNM Recorder devices is set only when the channel is placed in a preset. When the first channel is placed, all channels are set to the same mode (recorder or player).
- A codec device can be used as an encoder or decoder. The appropriate icon is shown when the device is placed in the preset.

Preset Design – Connection Rules

Preset connections are subject to connection rules. In the table below, "**X**" represents connections not allowed or invalid combinations for devices in a preset.

Connection Rules		Source (Input) Device			
		2xx Codec	2xx Encoder	3xx Codec	Player
Output Device	2xx Codec	Yes	Yes	Yes	Yes
	2xx Decoder	Yes	Yes	Yes	Yes
	3xx Codec	X	X	Yes	Yes
	300 Decoder	X	X	Yes	Yes
	Recorder	Yes	Yes	Yes	X
	SW Decoder	Yes	Yes	Yes	Yes

Additionally, it is not possible to place fixed function devices such as encoder-only or decoder-only devices into an illegal position in the preset.

NOTES:

- In unicast transport mode, the maximum number of connections made to an encoder is four.
- It is not possible to record VNE 250 source material that is HDCP encrypted with the VNR 100 or the VNM 5-Channel recorder.

Device Attributes

When a device is placed in the **Preset Design** workspace, the **Device Attributes** panel provides access to preset-specific device settings available to the preset manager.

When the device is selected, an appropriate set of attributes for that device populates the device attributes panel. Attributes customize the device for a specific function within that preset and are a subset of the full configuration control set available in the device list view (see [About the Devices Page](#) on page 36).

Device Attributes	
Name	VN_Recorder_5CH:1
Directory	/Test1/
File	diff1
Launch Status	Play
Repeat	No
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:07:02
File Length	00:07:02

Figure 73. Preset Manager, Device Attributes (Player)

The **Device Attributes** configuration panel populates according to the selected device and its function in the preset. The following information details configuration options available in the attribute panel for each device.

Device Attributes – Codecs

Device attributes change depending on the role of the codec in the preset (see [Device Attributes – Encoders](#), and [Device Attributes – Decoders](#) in the following pages).

Device Attributes – Encoders

Only the VNE 250 has attributes configurable by the preset manager. The attribute panel for the other encoder devices only contain a read-only **Name** field.

Device Attributes	
Name	VNE250_1
Video Input	Auto
Program Audio Input	HDMI
Return Audio Source	None
RS232 Mode	Pass through Client
RS232 Server	
RS232 Data Tx	Disable
UDP Data Tx	Enable
UDP Data Port	9002

Figure 74. Device Attributes, VNE 250

- **Name** — Read-only field for the device name taken from the device list.

- **Video Input** — A drop-down list to select the input video source. Choices are:
 - **Auto** — This option automatically selects the HDMI input when a digital source is detected.
 - **HDMI** — Selects the HDMI input.
 - **RGB** — Selects the RGB input.
- **Program Audio Input** — A drop-down list to select the program input source. Choices are:
 - **HDMI** — Selects the digital audio from the HDMI input.
 - **Analog** — Selects the analog audio input.
 - **Disable** — Disables both audio inputs.
- **Return Audio Source (read-only)** — Reports the name of the VND 250 device with return audio enabled in the current preset.
- **RS-232 Mode** — Drop-down list to select the RS-232 channel mode. Choices are:
 - **None** — the RS232 pass-through port is disabled.
 - **Pass through Server** — Configures the device as a server.
 - **Pass through Client** — Configures the device as a client.
 - **Data channel** — Configures the device to transport RS-232 communications over the data channel.

NOTES:

- In pass-through mode, RS-232 data is bi-directional and can be sent and received between server and client devices. In this mode, RS-232 communications operate independently of device connections. Pass-through communications can not be recorded.
- In data channel mode, RS-232 communications operate over the current connections and are uni-directional, from encoder to decoder. Data channel communications can be recorded.

- **RS-232 Server** — A drop-down list with the servers currently on the same domain. Only available when **Pass through Server** is selected in RS-232 mode (see above).
- **RS-232 Data Tx** — Enable or disable RS-232 data transmission.
- **UDP Data Tx** — Enable or disable a UDP data transmission port.
- **UDP Data Port** — Enter the port number that UDP data is received on. This setting must match the port number that is defined by the external device or system that generates the UDP data.

Device Attributes – Decoders

Decoder device attributes differ depending on the selected device (see figure 75).

Selected Device	
Device Attributes	
Name	Decoder
Audio	No
Whiteboard	No
Data	No

(a) 200/225 Series

Device Attributes	
Name	325_Device2
Ancillary	No
Column FEC	No
Row FEC	No

(b) 3xx Series

Figure 75. Device Attributes Panel, Decoders

- **Name** — Read-only field for the device name taken from the device list.
- **Stream settings** — The following attributes enable or disable the connection of a specific stream. By default, the video stream is always made when a preset is built. A stream type can only be enabled if it is present in the connection from an encoder or player device.
- **VND 200/225 series only**
 - **Audio** — Drop-down list enables or disables the audio channels.
 - **Whiteboard (VND 200/225 only)** — Select **Yes** to decode available whiteboard data from the stream (see [License Menu](#) on page 82).
 - **Data** — Select Yes to decode data information from the stream.
- **VND 3xx series only**
 - **Ancillary** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 48.
 - **Column FEC** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 48.
 - **Row FEC** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 48.

NOTE: The configuration of individual streams is made on the appropriate device in the device list page. For example, the video compression settings or the audio format for an encoder are set on the device list page.

Device Attributes – VND 250 Decoder

The VND 250 decoder has an extended set of device attributes.

Device Attributes	
Name	VND250_1
Output Format	1024 x 768 60p GTF
Scale Mode	Fill
Audio Stream	None
Program Audio Source	None
Program Audio Output	HDMI
RS232 Mode	Pass through Client
RS232 Server	VND300_2
Data Stream	Yes
UDP Data Rx	Enable
UDP Dest IP	
UDP Dest Port	9002
Annotation	No

Figure 76. Device Attributes Panel, VND 250

- **Name** — Read-only field for the device name, taken from the device list.
- **Output Format** — Drop-down list of available output resolutions. Choices are:
 - **Auto** — Output format is the same as the input source (stream) format.
 - **Monitor** — Output format is set to the preferred mode (EDID) of the display. If necessary, scaling is applied.
 - **Fixed** — Output format is selected from a drop-down of available resolutions. If necessary, scaling is applied.
- **Scale Mode** — Drop-down list available when the **Output Format** is **Monitor** or **Fixed**. Choices are:
 - **Fill** — The decoded image is scaled to the selected output format. Aspect ratio is **not** maintained.
 - **Follow** — The decoded image is scaled to the selected output format. Aspect ratio is maintained.
- **Audio Stream** — Drop-down list with the following choices:
 - **None** — Mutes the audio streams.
 - **Program** — Enables the decoding of program audio.
 - **Program plus Return** — Enables the decoding of program audio and return path audio.
- **Program Audio Source** — Drop-down list of the other VNE 250 devices in the preset.
 - **None** — Default. Selects audio from the currently connected stream.
 - **{List}** — Selects an audio source from a list of VNE 250 devices in the preset.
- **Program Audio Output** — Selects the required output for the program audio.
 - **HDMI** — Select to enable the HDMI audio output.
 - **Analog** — Select to enable the analog audio output.
 - **Both** — Selects both the analog and digital audio outputs.
 - **Disable** — Mutes all audio output.

- **RS-232 Mode** — Drop-down list to select the RS-232 channel mode.
 - **None** — the RS-232 pass-through port is disabled.
 - **Pass through Server** — Configures the device as a server.
 - **Pass through Client** — Configures the device as a client.
 - **Data Channel** — Configures the device to transport RS-232 communications over the data channel.

NOTES:

- In pass-through mode, RS-232 data is bi-directional and can be sent and received between server and client devices. In this mode, RS-232 communications operate independently of device connections. Pass-through communications can not be recorded.
- In data channel mode, RS-232 communications operate over the current connections and are uni-directional, from encoder to decoder. Data channel communications can be recorded.

- **RS-232 Server** — When RS-232 mode is set to **Pass through Client** provides a drop-down list of available servers on the system.
 - **Data Stream** — Select **Yes** to enable the data stream, **No** to disable.
 - **UDP Data Rx** — Select **Enable** to receive UDP data from the system. When enabled, the UDP Dest IP and UDP Dest Port selections are listed below.
 - **UDP Dest IP** — The IP address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
 - **UDP Dest Port** — The port number used by the (external) device or system to receive the UDP data.
 - **Annotation** — Select **Yes** to enable annotation pointer overlay functions.

NOTES:

- When creating a videowall using presets, VND 250 devices are configured and connections are built using the **Preset Manager**. Modifying the output format or the scale mode settings of a VND 250 decoder in the Presets **Device Attributes** panel changes the current configuration of the decoder in the Device List to those set in the **Device Attributes** panel **only when the preset is launched**.
- The normal encoder to decoder connection count limit applies.
 - Unicast transport supports a maximum of four connections to a single encoder. Note that each unicast connection increases the bit rate by the same amount for each connection. The aggregate bit rate for four unicast connections can not exceed the maximum supported bit rate of 270 Mbps for an encoder.
 - Multicast transport supports "one to many" connections allowing for wall sizes of more than four displays.

See the [System Config Page](#) on page 28 for additional information on unicast and multicast connections.

Device Attributes – VN-Matrix Recorder: Play Mode

The 5-channel VN-Matrix Recorder in player mode operates with Ch1 set as the primary for all channels (see figure 77, left).

Device Attributes	
Name	Recorder_5Channel:1
Directory	
File	
Launch Status	Play
Repeat	No
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:00:00
File Length	00:00:13

Device Attributes	
Name	Recorder_5Channel:2
Directory	
File	
File Length	00:00:13

Figure 77. Device Attributes, 5-channel Player

The player device attributes for a 5-channel device provide the following functions:

NOTE: The attributes for individual channels 2, 3, 4, and 5 (shown in figure 77, right) are a reduced set of the attributes for Ch1.

- **Name** — Read-only field displays the device name and selected sub-channel number.
- **Directory** — Opens the recorder browser for directory level navigation and selection.
- **File** — Opens the directory listed in the Directory field to enable selection of a single recorded file and displays the filename.
- **Launch Status** — Drop-down control to define the start condition of a Play or Record preset.
 - **Play** (player channel 1 only) — When the preset is launched, playback begins immediately.
 - **Provision** — Delays playback until the appropriate command is sent from the transport bar or from an external control system.
- **Repeat** — A drop-down control sets a player into loop mode.
- **Time Sync** — A drop-down control that sets the timing relationship between the channels on multiple devices in a player preset.
- **Start Offset** — Editable field that sets the start time of a selected file.
- **Stop Offset** — Editable field that sets the stop time of a selected file.
- **File Length** — Displays the length of the recording in hh:mm:ss format.

Device Attributes – VN-Matrix Recorder: Record Mode

The 5-channel VN-Matrix Recorder in recorder mode operates with Ch1 set as the primary for all other channels on that device.

Device Attributes	
Name	Recorder_5Channel:1
Directory	/RecTest_01/
File	ChaseTST01
Launch Status	Record
Description	
Audio	No
Whiteboard	No
Data	No

Figure 78. Device Attributes, 5-channel Recorder

The recorder device attributes for a 5-channel device provide the following functions:

- **Name** — Read-only field displays the device name. For the 5-channel recorder, if a sub-channel is selected, this displays the device name and sub-channel number.
- **Directory** — Type a new directory name directly into an editable field or use a file browser to create and delete directories (see [Recorder Directory and File Management](#) on page 107).
- **File** — An editable field and navigation tree to create and delete files.
- **Launch Status** — Drop-down control to define the start condition of the preset.
 - **Provision** — Places the recorder in pause when the preset is launched. The recording begins only when the record button is clicked on the transport bar.
 - **Record** — When the preset is launched, starts the recording immediately.
- **Description** — A user defined text field used to describe the recording.
- **Audio** — Select **Yes** to enable or **No** to disable the audio stream.
- **Whiteboard** — Enable/disable whiteboard (see [Recorder Configuration](#) on page 79).
- **Data** — Enable/disable a data stream (see [Recorder Configuration](#) on page 79).

Device Attributes – VNR 100 Player

The VNR 100 single-channel player attributes panel provides the following functionality:

Device Attributes	
Name	VNR100:p
Directory	/GFChaseTst/
File	TEST
Launch Status	Play
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:00:00
File Length	00:00:02

Figure 79. Device Attributes, VNR 100 Player

The function of each attribute is the same as the 5-channel player (see [Device Attributes – VN-Matrix Recorder: Play Mode](#) on page 103).

NOTE: You cannot set a stop offset in chase-play (live) mode when using a single channel recorder (see [Chase-Play Feature \(VNR 100 Only\)](#) on page 128).

Device Attributes – VNR 100 Recorder

Device Attributes	
Name	VNR100:r
Directory	/New_Directory/
File	GDFTST_002
Launch Status	Record
Description	Test File
Audio	No
Whiteboard	No
Data	No

Figure 80. Device Attributes, Single-Channel Recorder

The VNR 100 recorder **Device Attributes** panel provides the following functionality:

- **Name** — Read-only field displays the device name.
- **Directory** — Type a new directory name into this field or use a file browser to create and delete directories.
- **File** — An editable field and navigation tree to create and delete files.
- **Launch Status** — Drop-down control to define the start condition of a preset.
 - **Provision** — Places the recorder in pause mode when the preset is launched. The recording begins only when the record button is clicked on the transport bar.
 - **Record** — Starts the recording immediately when the preset is launched.
- **Description** — A user defined text field to describe the recording.
- **Audio** — Enables or disables audio recording.
- **Whiteboard** — Enables or disables whiteboard data recording.
- **Data** — Enables or disables data stream recording.

Device Attributes – VNS 104 Software Decoder: Decode Window

Device Attributes	
Name	VNS104:1
Audio	No
Mute Audio	No
Audio Volume	4
Screen Mode	Fill
Screen Layout	QuadSplit

Figure 81. Device Attributes, VNS 104

Each VNS 104 decode window has the following attributes (see figure 81):

- **Name** — Read-only field for the device name.
- **Audio** — Drop-down list enables (**Yes**) or disables (**No**) connection of specific stream types within a decoder channel.
- **Mute Audio** — Mutes the audio stream.
- **Audio Volume** — Sets the volume level of the audio stream.
- **Screen Mode** — Select from three screen modes; **Fill**, **Follow**, or **Unity** (see the *VNS 104 User Guide* for more details on how these screen modes appear on a connected display).
- **Screen Layout** — Select between **Full** screen or **QuadSplit** screen layouts. In full screen layout, the selected channel is the only one available to the display (see [VNS 104 Software Decoder Configuration](#) on page 83).

Recorder Directory and File Management

VN-Matrix recorders can be used as a source (player) or display (recorder). The following section describes the recorder directory and file structure and rules to assist in their management.

Directory Management Overview

A recording can be made on single or multiple devices (recorders). A recording contains all files required to recreate the original stream from an encoder in a set. The set can consist of audio, video, and data file types. Each recording set is stored in a unique directory.

- Each directory can hold only the files for a single recording.
- Directories must have a unique name, duplicates are not allowed.

A new directory can be created in two ways. The same methods are used on both the single and 5-channel devices.

NOTE: Directory names must not include spaces or non alphanumeric characters such as / \ * , % ! " £ \$ % ^ & * () @ ~ # ? > < . These characters are blocked from use. Underscore (_) and hyphen (-) are permitted.

Create Directory – Directory browser method (preferred)

To create a new directory using the navigation tree:

1. Create a preset with an encoder and recorder (see [Recorder Presets](#) on page 119).
2. Select a recorder (channel) in the **Preset Design** workspace.
3. Click anywhere inside the **Directory** field of the **Device Attributes** panel, then select the drop-down box on the right hand side (see figure 82, ①).



Figure 82. Select Directory Drop-down Box

The Recording Browser dialog box opens.

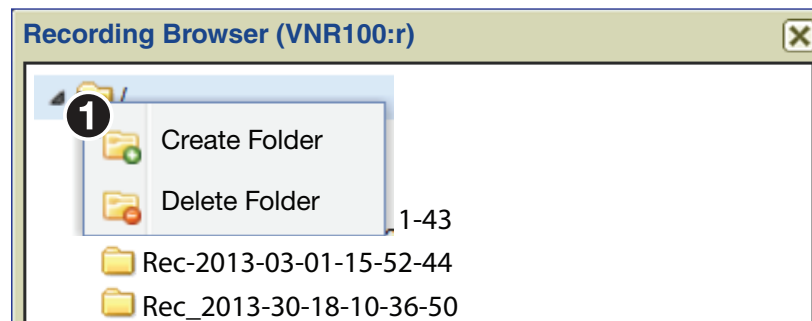


Figure 83. Recording Browser Window, Create Folder

4. Select the root folder, <right-click> on the folder (see figure 83, ①), then click **Create Folder**.

The Create Folder dialog box opens.

5. Enter the directory name and click **OK**.

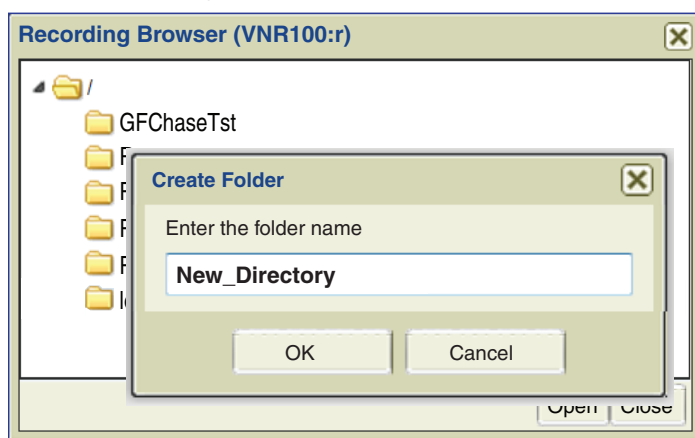


Figure 84. Create Directory, Enter Name

NOTE: Using this method, the directory is created and displayed in the directory list immediately.

The new directory is created and the **Recording Browser** dialog box displays all directories, including the new one. The browser remains open.

6. Select the new directory, and click **Open** to continue (see figure 85, ①).

NOTE: Select **Close** to cancel the process (the new folder remains).

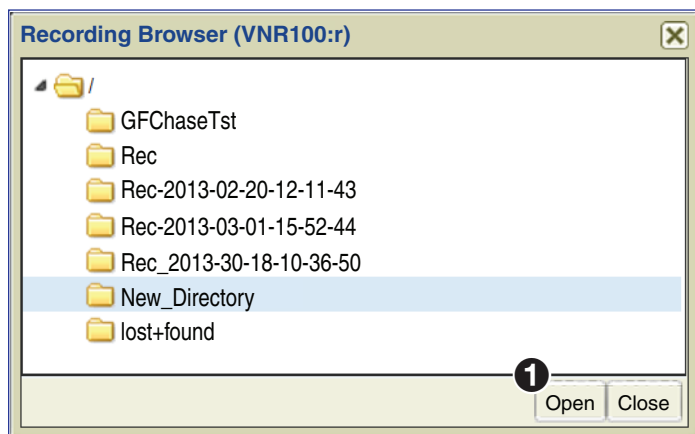


Figure 85. Recording Browser, Select and Open Directory

7. A dialog box opens. Select **Yes** (see figure 86, ①) to automatically create the same directory on other recorder devices in the preset, or **No** to continue.

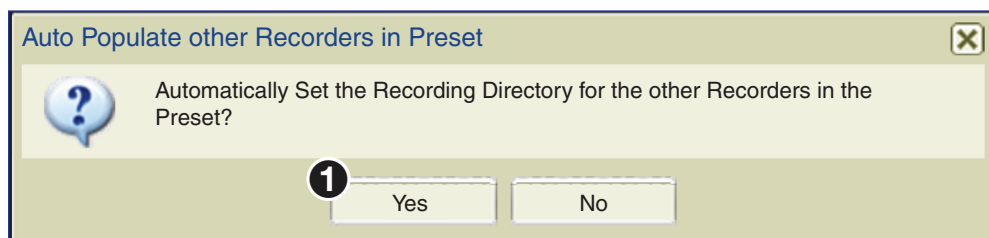


Figure 86. Recording Browser, Auto Populate Other Recorders

NOTE: If multiple recorder devices (single or 5-channel) are in the preset, using the same directory simplifies file selection for replay.

Create Directory – Direct entry method (advanced)

To create a directory using direct entry:

1. Create a preset with an encoder and recorder (see [Recorder Presets](#) on page 119).
2. Select a recorder (channel) in the **Preset Design** workspace.
3. In the **Device Attribute** panel, click in the **Directory** row and enter the new directory name in the field.

A red marker indicates a change in the device attributes (see figure 87).

Device Attributes	
Name	VNR100:r
Directory	New_Directory
File	
Launch Status	Record
Description	
Audio	No
Whiteboard	No
Data	No

Figure 87. Device Attributes - Create Directory (Advanced)

NOTE: Using this method, the new directory appears in the browser directory listing only after the preset is launched.

4. Save the preset. The red marker clears when the preset is saved.

NOTE: It is only necessary to set the directory name on one channel in a 5-channel device. Although it is possible to enter different directory names in the other four channels, the name used for the directory when the preset is launched is the directory name last entered. Therefore, all channels use the directory name entered last and ignore the previous entries.

Duplicate Directory Naming

If a recorder preset is built (or copied) using an existing directory name, or if the same preset is launched more than once without changing the name of the directory, a new directory name is automatically created. The first time a recording is launched, the previously entered directory name is created (see figure 88).

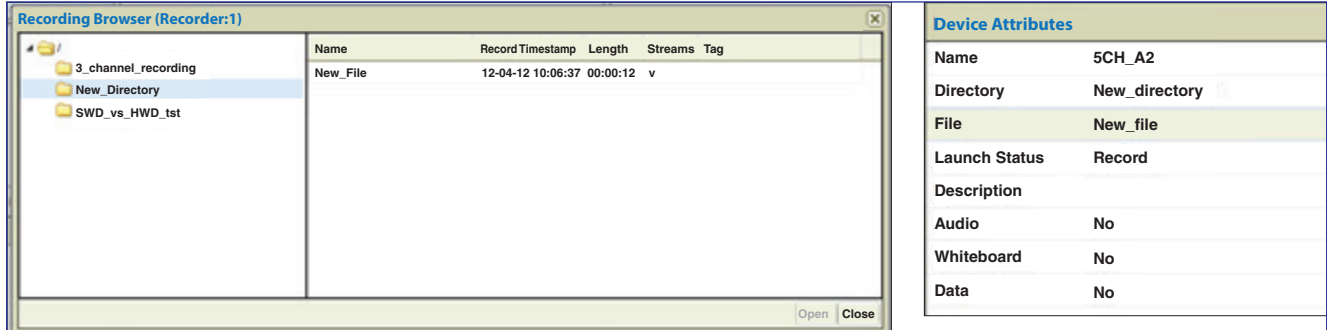


Figure 88. Duplicate Directory Naming

When the same preset is launched a second time, a new directory name is created using the original directory name appended with a time and date stamp (see figure 89).

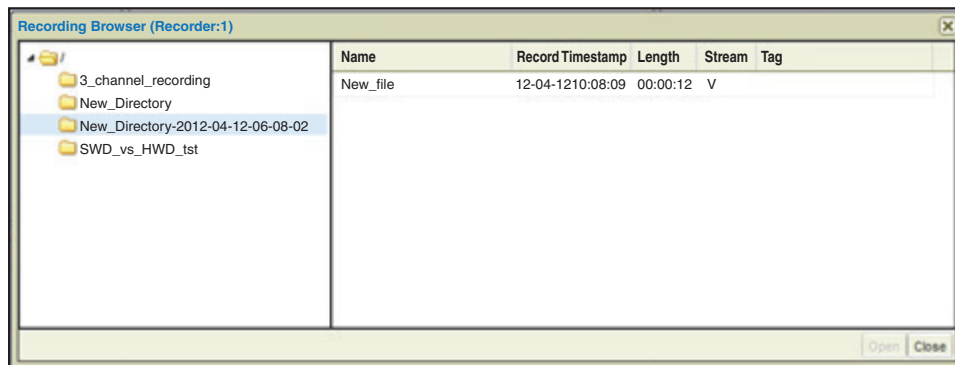


Figure 89. Duplicate Directory Naming, New Recording

Each directory contains only the files from a single recording.

Delete Directory – Recording Browser

Directories are deleted using the Recording Browser. <Right-click> on the folder and select **Delete Folder** (see figure 90).

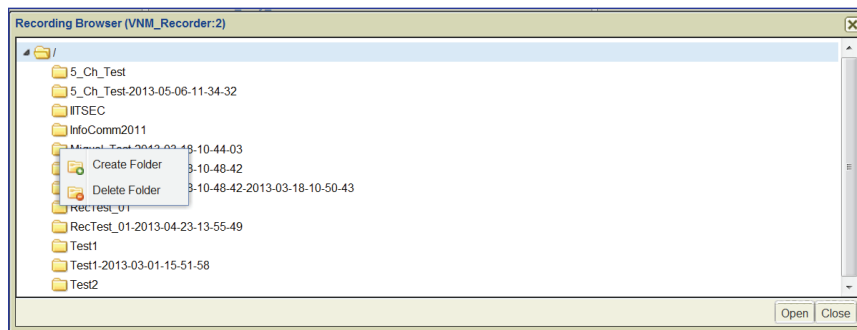


Figure 90. Delete Directory

All files in the directory are deleted. A warning is given to confirm the deletion.

NOTE: The root directory can not be deleted.

File Management Overview

The recorder allows creation of both directories and files while the player can only select directories and files after they are created by the recorder.

Filename

By default, the name of the encoding device is used as the name of the recorder file. The default name is changed by entering a new name in the **Device Attributes File** field.

Creating a File

A file is created when a recording begins. If the file field is blank when the recording starts (see figure 91), the device name of the encoder is used as the filename.

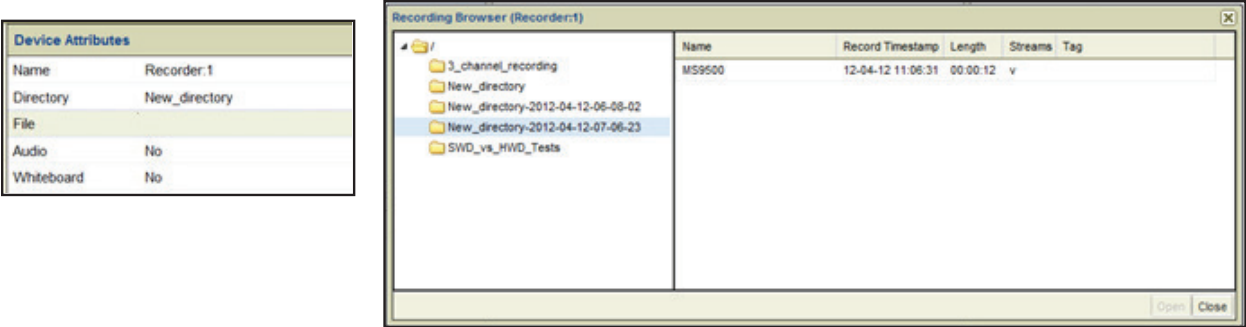


Figure 91. Create a File

NOTE: The filename field in the **Device Attributes** panel remains blank.

If a specific filename is desired, the name is entered in the **File** field (see figure 92, ❶), which then becomes the name of the file in the recording (❷).

NOTE: File names must not include spaces or non alphanumeric characters such as / \ , % ! " £ \$ % ^ & * () @ ~ # ? > < . These characters are blocked from use. Underscore (_) and hyphen (-) are permitted.

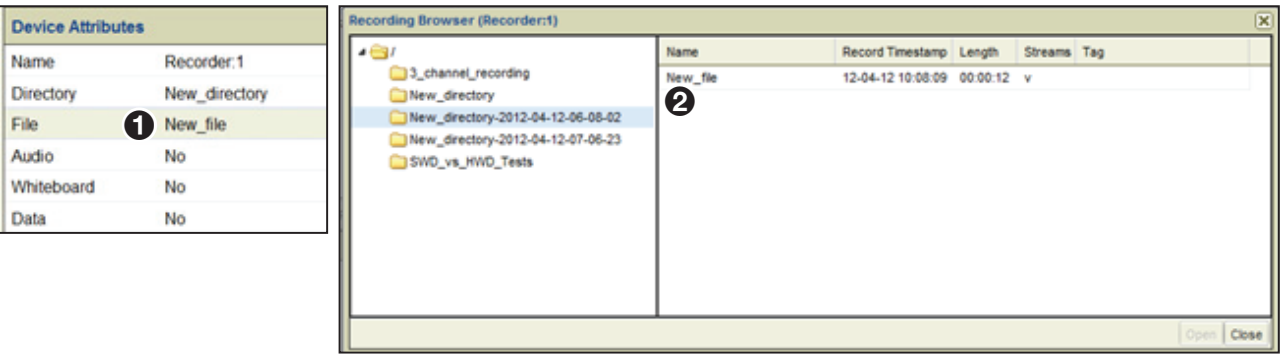


Figure 92. Create a File Using Direct Text Input

Completed Directory Structure

A recording directory contains one set of files for each recorder (channel) in the preset. A file set can contain audio, whiteboard, and other data streams associated with the video file.

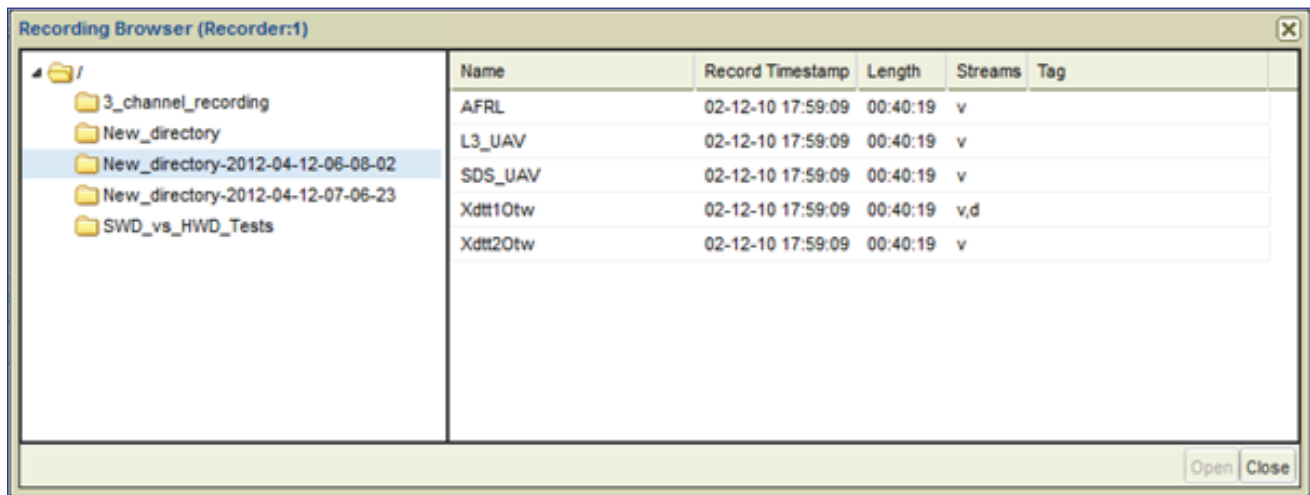


Figure 93. Recording Browser, One File per Channel

Deleting a File

Delete a file by highlighting it in the browser, <right-click>, then select **Delete File**.

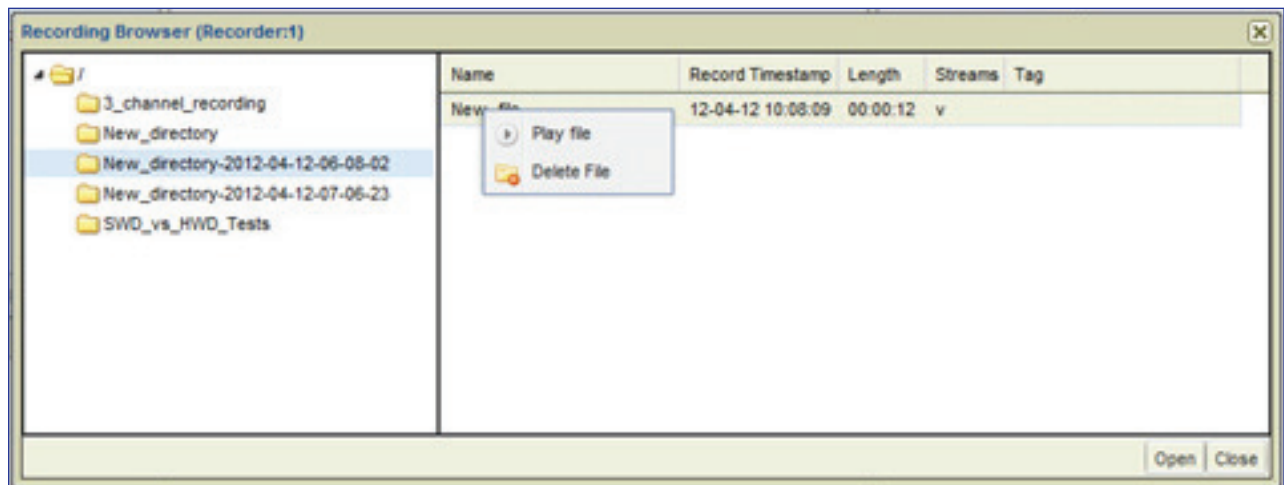


Figure 94. File Browser, Delete a Channel

NOTE: The browser must be refreshed after a delete.

Player File Management

All files for a single recording are in one directory. In a 5-channel device, the directory can contain up to five sets of files, one for each channel.

In a multi-player system, the same directory must be present on all devices, and each directory must contain the files recorded for that channel.

When selecting a previously recorded file for playback, navigate to the directory using the **Recording Browser**. When the directory is selected, files in the directory are loaded into all players automatically. It is not necessary to select individual files for each player device.

Creating Presets

Presets are created that configure devices to operate as a system. Once created, presets can be launched with a single button click. The Enterprise Controller then reconfigures and connects the devices in the preset to create the system.

The three preset types are:

- **Switching** – Connect inputs to outputs. Source devices must always be placed into the design area first. Source devices (codecs, encoders, or players) are dragged from the **Matrix Devices** list into any blank space in the **Preset Design** workspace.
- **Record** – Connect encoders to a record channel, select the stream and stream types to record, and specify the directory and file names. Source devices are always placed first with the desired recording channel dropped on it.
- **Play** – Connect decoders to a player and view previously recorded material. Players are always placed first followed by the decoder.

Several general rules for the **Preset Design** workspace are:

- The first device dragged into the design area is positioned vertically on the left hand side of the workspace. Subsequent devices are positioned under the previous one in the order placed.
- Once placed in this column, the space to the right of a source device becomes a connection point for decoders or recorder channels.
- A Codec can be added to a preset regardless of its current mode. When dropped into the design area first, a codec formatted as a decoder reconfigures to an encoder. Similarly, a codec formatted as an encoder, reconfigures to a decoder when dropped onto an encoder.

Create a New Preset

To create a new preset, drag and drop a device onto the **Preset** panel, then drag an appropriate device onto the first device. In this example, Encode1 is an encoder streaming video to the system. Decode1 is a decoder connected to a display.

To create an encoder to decoder preset:

1. Click **New** (1) at the base of the **Preset List** panel to create a blank preset (see [Preset Manager Page](#) on page 93).

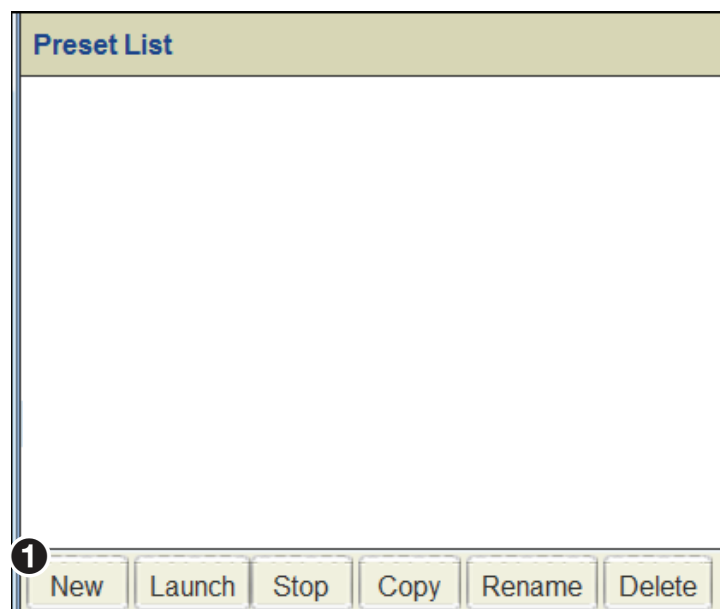


Figure 95. Preset List - New Preset

2. Add an encoder to the **Preset** panel. Click and hold the encoding device (see figure 96, ②).

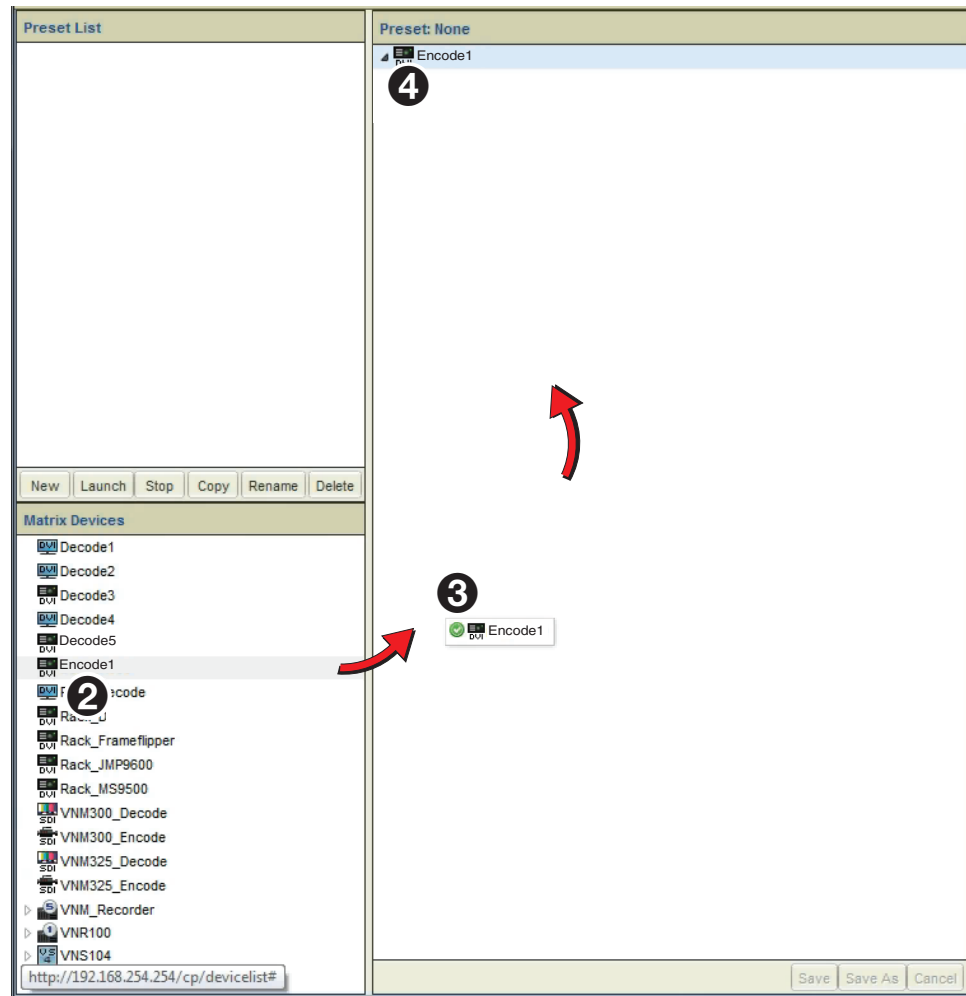


Figure 96. Preset Workspace, Place a Device

3. Drag the device to the upper left corner of the **Preset** panel (③).
4. Drop the device (④).

NOTE: Devices dragged into the **Preset Design** workspace are positioned on the left side in the first open space vertically, and in the order they are placed.

5. Add a decoder to the Preset panel. Click on and hold the desired decoder (see figure 97, ❶).

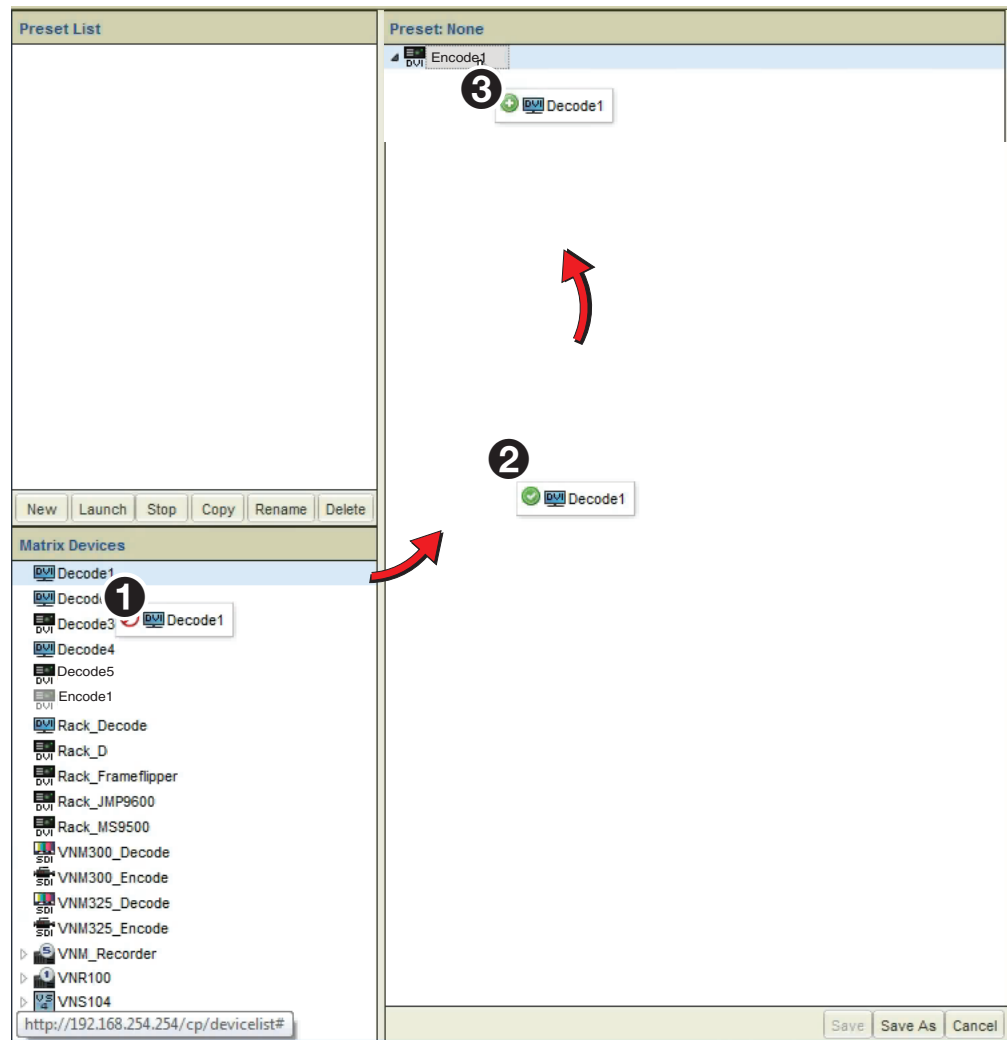


Figure 97. Preset Workspace, Add a Decoder

6. Drag the device to the upper left corner of the preset panel (❷).
7. While holding the decoder, place it on top of the previously placed Encoder1, then release (❸).

The preset completes after a moment.

NOTE: Although the user interface shows a connection between the devices, the connection is made **only when the preset is launched** (see [Launch Behavior](#) on page 121).

Saving Presets

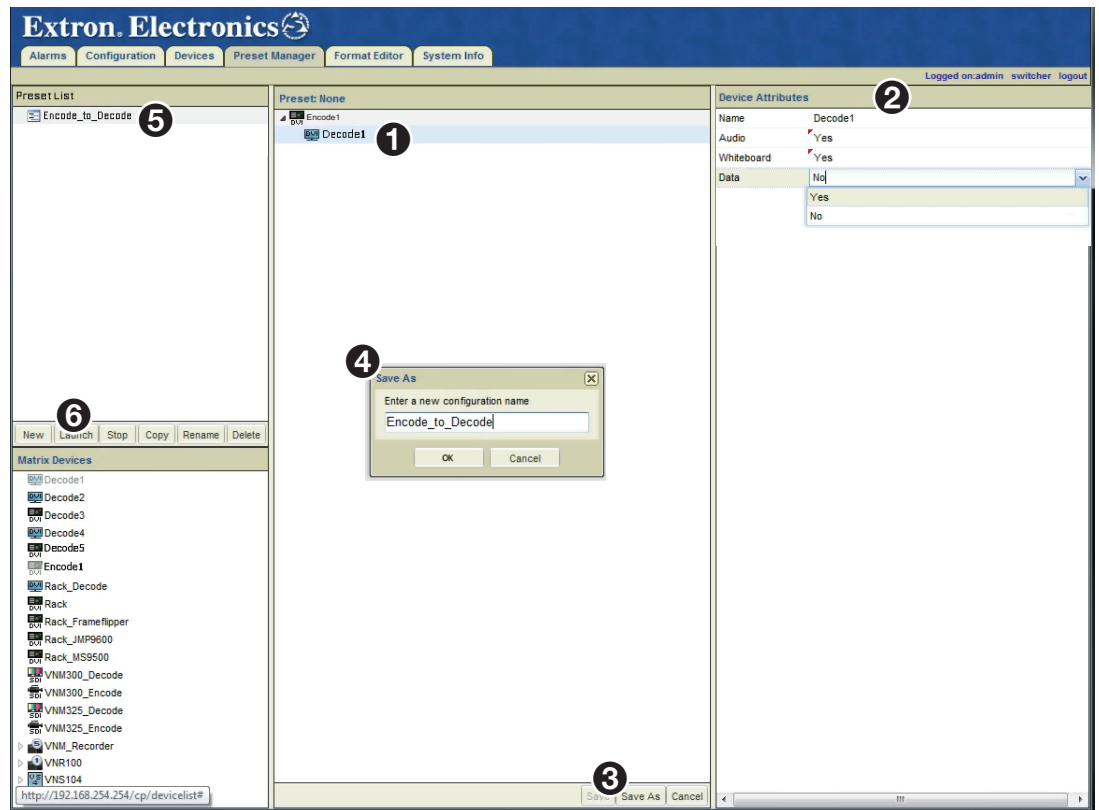


Figure 98. Save a Preset

Before saving the preset, configure the decoder using the **Device Attributes** panel (the encoder has no attributes available).

1. Click on the decoder device in the **Preset** panel (see figure 98, 1) to populate the device attributes (2).
2. Configure the attributes of the decoder (2) as needed (see [Device Attributes](#) on page 98).

NOTE: A red triangle appears as each attribute is changed to remind you the changes have not been saved. The triangle goes away when the preset is saved.

3. When the decoder is configured, click **Save As** on the **Presets** panel toolbar (3). The **Save As** dialog opens.
4. Type a name using the standard naming format, then click **OK** (4).
5. The new name appears in the **Preset List** panel (5).
6. Click on the preset, then click **Launch** on the **Preset List** toolbar to activate the preset (6).

Using the VNS 104 in a Preset

The VNS 104 appears in the **Device List** as a four channel decoder with four possible connections. In the **Preset Design** panel, each channel can be connected to the same or to a different encoder or player channel.

1. Select **New** at the base of the **Preset List** panel to create a blank preset (see figure 99, ❶).

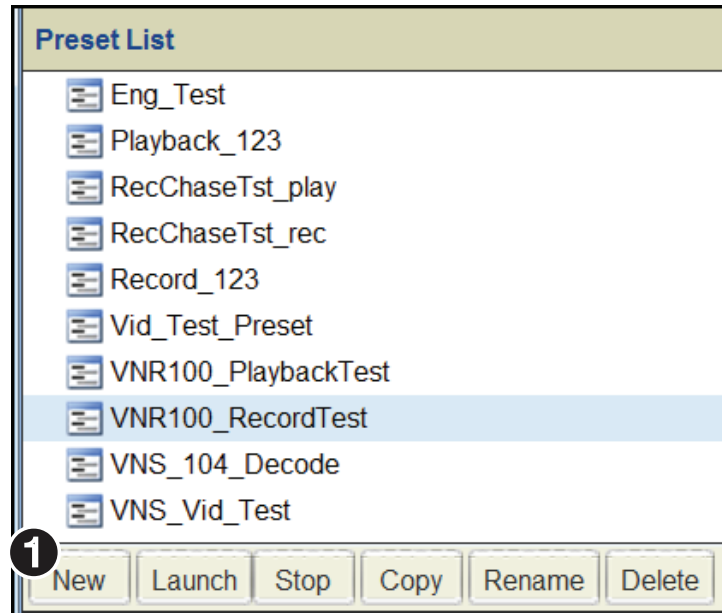


Figure 99. Presets, Using the VNS 104

2. Drag an encoder from the **Device List** and drop it onto the **Preset** design panel.

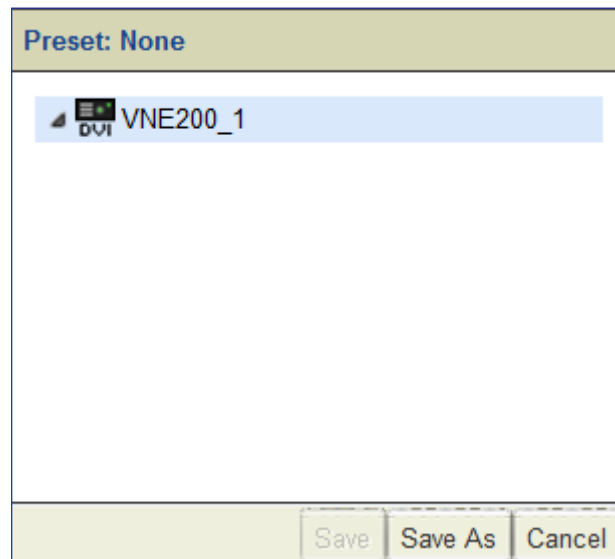


Figure 100. Presets, Drag and Drop an Encoder

NOTE: Devices dragged into the **Preset** panel workspace are positioned in the first open space vertically on the left hand side of the design area in the order they are placed.

3. Drag one of the four software decoder channels (see figure 101, ❶) from the **Device List** and drop it onto the source device in the **Preset** panel.

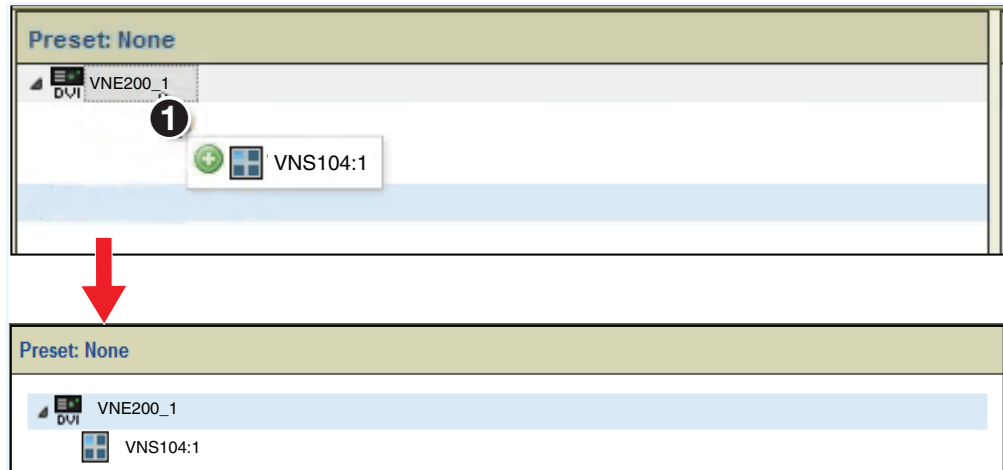


Figure 101. Presets, Drag and Drop the VNS 104

NOTE: Output devices are positioned below and to the right of the source device they are connected to.

4. Set output device attributes as required (see [Device Attributes](#) on page 98).
5. Click **Save As** and name the preset (see [Preset List](#) on page 94).
The connection between the source device and the VNS 104 Software Decoder window is now available.
6. Either drop more software channels onto the encoder, or drag more encoders into the **Preset** panel, then drop additional software decoder channels onto them as required.

In this manner, connections are made between inputs (sources) and any or all channels of the VNS 104 Multi-stream Software Decoder.

Recorder Presets

Recorder presets are created similar to switching presets. Place an encoder device into the **Preset** panel first, followed by a recorder channel or channels. Use the **Device Attributes** panel of a recorder to create or select a file directory, and select the channels to record.

To Record a Channel

1. Create a preset with an encoder source and recorder channel (see figure 102).

Preset: None	Device Attributes
1 VNE225_1	Name VNR100:r
VNR100:r	Directory
	File
	Launch Status Record
	Description
	Audio No
	Whiteboard No
	Data No

Figure 102. Create a Preset

2. Select the record channel (see figure 103, **2**). The **Device Attributes** panel populates with the configuration options appropriate for the recorder.
3. Create or select a directory (**3**) for the recording file (see [Directory Management Overview](#) on page 107).

Preset: New_Recording	Device Attributes
VNE225_1	Name VNR100:r
VNR100:r 2	Directory /New_Recording/ 3
	File New_File 4
	Launch Status Record 5
	Description A new recording in a new directory 6
	Audio No
	Whiteboard No 7
	Data No

Figure 103. Select the Record Channel

4. Enter a filename (**4**) for the recording (see [Recorder Directory and File Management](#) on page 107).
5. Set the launch status (**5**) (see [Launch Behavior](#) on page 121).
6. Enter a description, if desired (**6**).
7. Select the remaining recording options (audio, whiteboard, and data) as needed (**7**).
8. In the **Preset** panel, click **Save** (see [Saving Presets](#) on page 116).
The record preset is now complete.
9. Click **Launch** in the **Preset List** panel to begin the recording.

VNE250, HDCP, and Recording

It is not possible to record an HDCP encrypted source, however, this condition is not rules checked in the preset manager (see [Preset Design – Connection Rules](#) on page 97). The source content is known only when the preset is launched and the recording starts.

If there is an attempt to record HDCP content, the system behaves as described for other content. However, the recorded file is not created if the content is HDCP encrypted. This condition is not flagged in the user interface.

Player Presets

Player presets are created similar to switching presets. A player channel is placed into the **Preset** panel first, followed by a decoder or decoders. The player channel attributes include the playback directory, the playback file, set the start and end offset time and synchronization, and select the playback channels.

To Play a Channel

1. Create a preset with a player channel and a decoder (see [Creating Presets](#) on page 113).

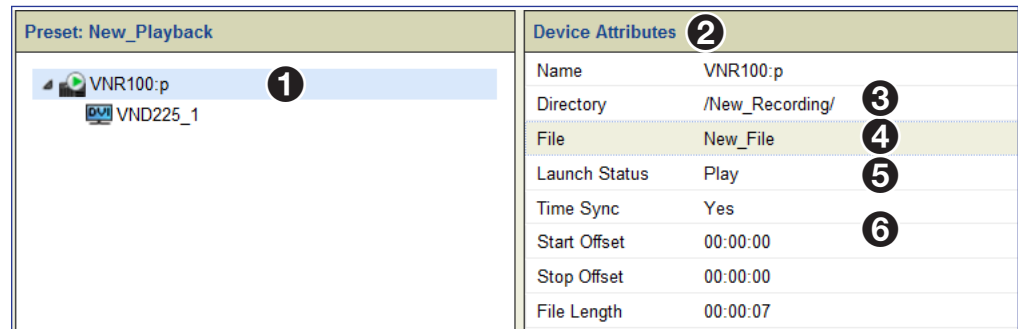


Figure 104. Preset for Playing a Channel

2. In the **Preset** panel, select the player (see figure 104, **1**).
The **Device Attributes** panel populates with the configuration options appropriate for the player (**2**).
3. Select an existing directory (**3**) (see [Selecting a File for Playback](#) on page 124).
4. Select a filename (**4**) for playback (see [Selecting a File for Playback](#) on page 124).
5. Set the launch status (**5**) as desired (see [Launch Behavior](#) on page 121).
6. Select playback options (Time Sync, Start Offset, Stop Offset, and File Length) from the remainder of the list (**6**).
7. In the **Preset** panel, click **Save**, then name the preset (see [Saving Presets](#) on page 116).
The play preset is now ready.
8. Click **Launch** in the **Preset List** panel to start playback of the file.

Launch Behavior

Click **Launch** (see [Preset List Controls](#) on page 94) to activate a previously saved preset. Launching a preset causes the configuration of the devices to change according to the device attributes and connections specified in the preset. Until launched, the **Preset List** defaults each preset to **Stop**.

In general, presets operate independently of each other. When a preset launches, devices in the preset are configured according to the attributes and connections of the preset regardless of their previous mode and operation. No other devices in the system are affected.

When the same devices are used in multiple presets, device operation is defined by the configuration and connections made in the last preset launched.

Switcher Launch Behavior

When a switching preset is launched, attributes for each device in the preset are changed according to the device attributes saved in the preset (see [Device Attributes](#) on page 98). The connections between the devices are then made according to the diagrams in the **Preset** design workspace (see [Preset Design Panel](#) on page 97).

Recorder Launch Behavior

The **Launch Status** in the **Device Attribute** panel (see [Device Attributes](#) on page 98) is available for presets that contain recorder or player devices. A recorder preset follows the same behavior as a switcher, first changing attributes which include creating recording directories and files, then making connections. The recording action provides a transport bar to monitor operation (see [Transport Bar Shortcut](#) on page 127). Playback behavior first selects the location of the playback files, then begins playback according to the launch state selection.

The behavior defines the recorder or player actions when launched, specifically when a new preset uses a device active in another preset. Specific behavior is described in the following tables.

Player		Active Status		
		Playing	Recording (5-Channel Only)	None
Player Preset	Play	Stop playing the existing file, load and play the new file.	Stop recording the existing file, provision and play the new file.	Provision and play the file per the preset.
	Provision	Provision the new file, continue playing the current file according to its preset status and wait.	Stop recording the existing file, provision the new file and wait.	Provision the file and wait.

Recorder		Active Status		
		Playing (5-Channel Only)	Recording	None
Recorder Preset	Record	Stop playing the existing file, provision and record the new file.	Stop recording the existing file. Provision and record the new file.	Provision the new file and start recording.
	Provision	Stop playing the current file, provision the new file for recording and wait.	Stop recording the current file. Provision the new file, and wait.	Provision the recorder per the preset and wait.
NOTE: All channels on a 5-channel recorder are automatically set to the same mode (record or play) whether they are present in the active preset or not.				

Transport Dialog Box – Recorder

When a recorder preset is launched (see [Preset List Controls](#) on page 94), a transport dialog box displays the recording status and provides control of the recording. Only the most recent preset launch is displayed (see figure 105).

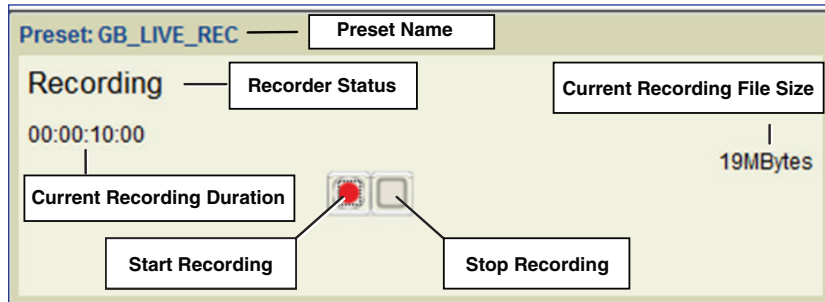


Figure 105. Transport Dialog Box-Recorder

When the launch status in the **Device Attributes** panel is configured to **Record**, recording begins immediately and the transport dialog monitors the recording (see figure 102). If the launch status is set to **Provision**, the panel provides manual control of the recording start and stop.

The recorder transport dialog box has the following functionality:

Status / Action	Description	Comment
Preset launched	Transport dialog opens.	Recording Status = Stopped Recording duration = 00:00:00:00 Filesize = 0 MBytes
Record button (Provision)	Begins recording when pressed.	Same as above.
Record button (Record)	Recording starts immediately.	Status = Recording Recording duration = Displays the current duration (time) of the recording. Filesize = displays the current storage size (MBytes) of the recording.
Stop (Provision or Record)	Stops recording.	Status = Stopped Recording duration = Displays the duration (time) of the entire recording. Filesize = displays the final storage size (MBytes).

NOTE: It is not possible to record an HDCP encrypted source, however, this condition is not rules checked in the preset manager since the source content is known only when the recording is started.

If an attempt to record HDCP content is made, the transport bar behaves as described for all content. However, the recorded file is not created if the content is HDCP encrypted. This condition is not flagged in the user interface.

Transport Dialog Box – Player

When the launch status in **Device Attributes** is configured to **Play**, playback begins immediately and the transport dialog box monitors playback. If the launch status is set to **Provision**, manual control of the playback start and stop is available.

The Player panel also provides the following functionality:



Figure 106. Transport Dialog Box - Player

Play Transport Control Behavior		
Status / Action	Description	Comment
Preset launched	Transport dialog box launched.	1 Status = Stopped 2 File duration = File length [time]. 3 Progress bar = Slider positioned at left hand side. 4 Current file time = 00:00:00:00 6 Shuttle control = Play x1
Play button (7)	From Stop: Start playing the current file. From Pause: Resume play from the current time.	1 Status = Playing 2 File duration = File length [time]. 3 Progress bar = Slider moves to the right as the file plays. 4 Current file time = Shows running file time. 6 Shuttle control = Play x1
Pause button (7)	Pauses the current file (not operative from stop mode).	1 Status = Paused 2 File duration = File length [time]. 3 Progress bar = Slider stationary. 4 Current file time = Current file time. 6 Shuttle control = Pause
Stop (7)	Stops playback.	1 Status = Stopped 2 File duration = File length [time]. 3 Progress bar = Slider positioned at left hand side. 4 Current file time = 00:00:00:00 6 Shuttle control = Play x1
Shuttle control (6)	Provide access to x1, x2, x4 and x8 speed control in forward and reverse.	1 Status = Shows direction and speed. 2 File duration = File length [time]. 3 Progress bar = Tracks the time and direction. 4 Current file time = Static at last value. 6 Shuttle control = Speed and direction appear above the slider control.
Slider control (5)	This slider can be dragged to any point on the progress bar. Forces play x1.	1 Status = Playing 2 File duration = File length [time]. 3 Progress bar = File time at the slider position. 4 Current file time = Current time, incrementing. 6 Shuttle control = Play x1
Jog Control (8)	Provides access to 1, 5, 10 and 20 frame steps in both forward and reverse direction. Only active from Pause mode.	1 Status = Paused 2 File duration = File length [time]. 3 Progress bar = Not updated. 4 Current file time = Not updated. 6 Shuttle control = Pause
NOTE: File time is displayed to the nearest second.		

Selecting a File for Playback

To select a file for playback (single or five channel recorder):

- 1. Create a preset with a player and decoder or display (see [Creating Presets](#) on page 113).
- 2. Select the player channel in the **Preset** workspace. The **Device Attributes** panel populates with the appropriate options.
- 3. Click in the **Directory** field of the **Device Attribute** panel, then click the drop-down button at the right hand side of the **Directory** field (see figure 104, ❶).

Device Attributes	
Name	VNR100:p
Directory	<div><div></div><div>❶</div></div>
File	
Launch Status	Play
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:00:00
File Length	00:00:09

Figure 107. Device Attributes, Directory Selection

The File Recording browser opens.

- 4. In the browser, click the directory containing the desired file (the directory is highlighted, see figure 108, ❶).

Recording Browser (Recorder_5Channel:1)

▲ /

❶

Test_01

Test_02

Test_03

Test_04

❷

Open

Close

Figure 108. Recorder Browser, Directory Browsing

- 5. Click **Open** (see figure 108, ❷).
- 6. A dialog box opens (see [figure 109](#) on the next page).

- a. Select **Yes** to automatically assign the video files to corresponding player channels. If the directory contains five files recorded on a 5-channel recorder, it loads the corresponding files into slots 1 through 5 of the device. It also populates multiple player devices within the preset if they are all part of the same original recording group. The preset is ready to launch.
- b. **No** loads the file only to the device selected in the **Preset** panel. Proceed to step 7.

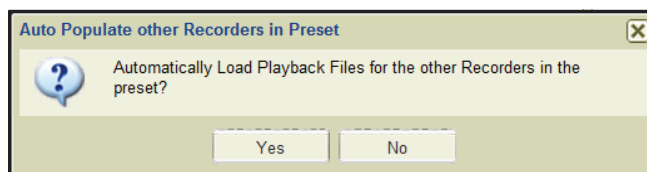


Figure 109. Device Attributes, Load Playback File

NOTE: For multi-channel recordings made on a 5-channel device, it is not possible to select content from different directories (recordings) for replay.

7. Click in the **File** field of the **Device Attribute** panel (see figure 110, ❶), then click on the drop-down button at the right hand side of the **File** field.

Device Attributes	
Name	VNR100:p
Directory	/GFChaseTst/
File	I ❶
Launch Status	Play
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:00:00
File Length	00:00:03

Figure 110. Recorder Device Attributes, File Selection

The browser opens to the directory (see figure 111) with a list of available files.

8. Select the desired file (see figure 111, ❶).

Name	Record Timestamp	Length	Streams	Description
GFRecTst_01 ❶	18-03-13 13:07:02	00:01:11	v	

❷ Open Close

Figure 111. File Browser, Select File

9. Click **Open** (❷).

The recorder is ready to play the selected file (see figure 112).

Device Attributes	
Name	VNR100:p
Directory	/GFChaseTst/
File	GFRecTst_01
Launch Status	Play
Time Sync	Yes
Start Offset	00:00:00
Stop Offset	00:00:00
File Length	00:01:11

Figure 112. Device Attributes, Playback File Selected

The remaining device attributes provide several options for playback of the selected file.

Launch Status

The launch status options are:

- **Play:** When launched, the preset immediately configures the devices in the preset and starts playback of the selected file.
- **Provision:** When launched, the preset configures the devices for playback to begin, then displays the player transport controls with the player in pause. The **Play** button must be pressed to initiate playback.

The playback transport panel opens regardless of which launch status is chosen.

Time Sync

The time sync setting maintains the timing relationship between content loaded across multiple devices.

Select **Yes** (enabled) to play related files made at the same point in time across multiple devices as part of a group.

Select **No** (disabled) to play unrelated files across multiple devices in a preset.

Setting the start and end times for playback

Start offset is changed to set the starting point for replay in hours, minutes, and seconds. The default value is 00:00:00.

The Stop offset setting is changed to set the end point for replay in hours, minutes, and seconds. The default value is the end of the file.

Adjustment of both settings is limited to within the time of the recorded file.

NOTE: An end time cannot be set for live play mode.

File length

The read-only file length field displays the total play time in hh:mm:ss format.

Transport Bar Shortcut

The transport bar can also be launched by <right-clicking> the preset in the **Preset List**, then choosing **Transport Controls**.

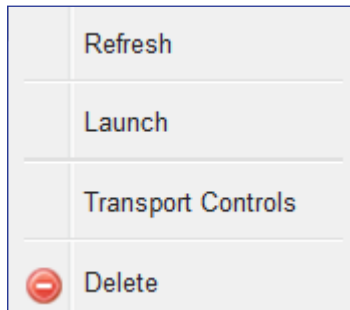




Figure 113. Right-click Access to Transport Controls

Chase-Play Feature (VNR 100 Only)

The chase-play feature allows a user to view a live recording while the recording is in progress. The live file can be played, paused, or searched from any point in the file as the recording progresses.

Configuration

A recording preset is built and configured in the normal way (see [Recorder Presets](#) on page 119). Note the directory and filename given to the recording (see figure 114).

Preset: RecChaseTst_rec	Device Attributes	
 VNE300_2  VNR100:r	Name	VNR100:r
	Directory	/GFChaseTst/
	File	Chase_Play_01
	Launch Status	Provision
	Description	Recording for Chase/Play Test
	Ancillary	No
	Column FEC	No
	Row FEC	No

Directory for the live recording.

File name of the live recording.

Action when file is launched.

Figure 114. Device Attributes, Recording Preset for Live Recording

A corresponding player preset is built and configured in the normal way using the same directory and filename configured in the recorder preset (see [Player Presets](#) on page 120).



Preset: RecChaseTst_play	Device Attributes	
 VNR100:p  VNS104:1	Name	VNR100:p
	Directory	/GFChaseTst/
	File	Chase_Play_01
	Launch Status	Provision
	Time Sync	Yes
	Start Offset	00:00:00
	Stop Offset	00:00:00
	File Length	00:03:41

Figure 115. Device Attributes, Player for Live Recording

NOTE: When selecting the playback filename, a file that is currently recording is flagged with a red record marker in the file browser (see figure 116).


Name	Record Timestamp	Length	Streams	Description
 Chase_Play_01	06-05-13 09:11:12	00:00:16	v	Recording for Chase/Play Test

Figure 116. File Browser, Active Recording

To begin chase-play:

1. Launch the recorder preset. The transport bar opens with the recorder in pause (see [Transport Dialog Box – Recorder](#) on page 122).
2. Start the recorder from the transport bar.
3. Launch the player preset (see [Transport Dialog Box – Recorder](#) on page 122). The transport bar opens with the player in pause.
4. The player file transport bar displays the file information for the live recording. Transport control behavior in live flow is shown in the following table.

Features available for playback of live content (chase-play) are the same as those supported for normal playback (see [Launch Behavior](#) on page 121).

Transport Control Behavior – Live Play		
Player Control	Function	Comments
Play	Starts playing the active recording from any point (time).	The location where replay starts can be set to any time from the file beginning to within one second of the end of the live file.
Pause	Pauses the replay at its current time.	Live recording continues.
Stop	Stops the replay.	Live recording continues.
Fast forward (shuttle)	The content is decoded at the required (faster than real-time) rate in the forward direction.	The speed can be any supported rate.
	NOTE: If the fast forward time is equal to the current time of the file minus 1 second, the transport mode changes to play.	
Fast reverse (shuttle)	The content is decoded at the required (faster than real time) rate in the reverse direction.	The speed can be any supported rate.
	NOTE: If the fast reverse time is equal to the start time of the file, then the transport mode changes to pause.	
Frame advance (jog)	The content is paused and the next new frame is decoded each time the control is operated.	NOTE: If the frame advance time is equal to the current time of the file minus 1 second, then the transport mode remains paused.
Frame reverse (jog)	The content is paused and the previous frame is decoded each time the control is operated.	NOTE: If the fast reverse time is equal to the start time of the file, then the transport mode remains paused.

About the Format Editor Page

This section provides information about:

- [About Custom Source and Display Formats](#)
- [Creating a New Source Format \(Input Mode\)](#)
- [Creating a New Display Format \(Output Mode\)](#)
- [Deleting Formats](#)
- [About the Source Format Editor](#)
- [About the Display Format Editor](#)

This page is accessed by selecting the **Format Editor** tab (see figure 117).

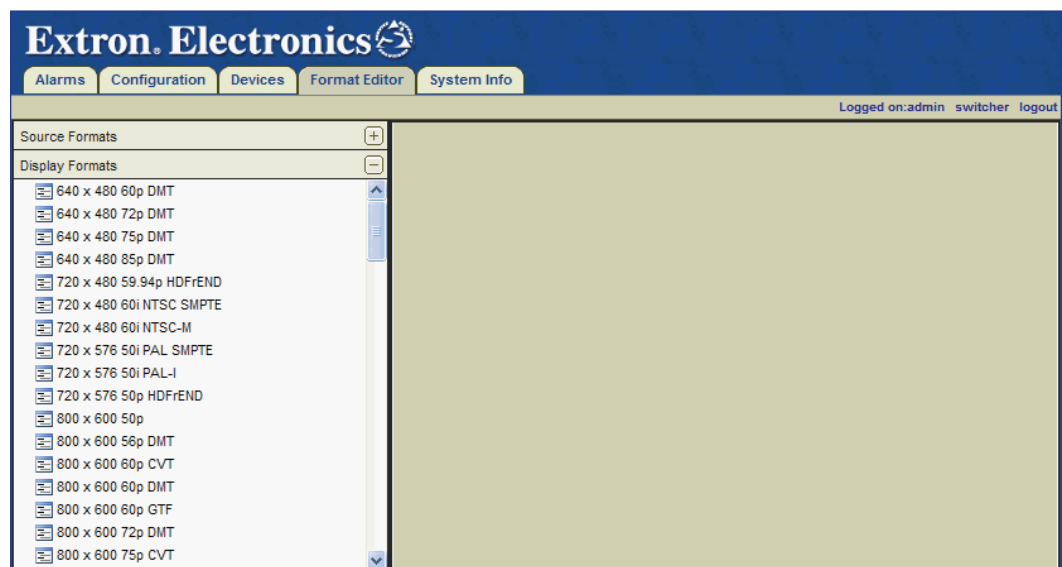


Figure 117. Format Editor Page

The Format Editor page manages and creates resolutions that can be used by sources and displays on the VN-Matrix system.

NOTE: The VN-Matrix 300 and 325 series input and output resolutions are fixed and cannot be modified.

About Custom Source and Display Formats

Custom source and display formats may be created when a specific input or output mode is not supported in the standard list of resolutions supplied with a VN-Matrix device. Once defined, the parameters for custom input and output modes are stored on the VNM Enterprise Controller. This means that they are available for use on any VN-Matrix device that is managed by that controller.

NOTE: Custom input modes can only be created for unsupported analogue input types. It is not possible to create custom input modes for digital inputs.

Figure 118 shows the recommended system configuration used to create a new input or output mode.

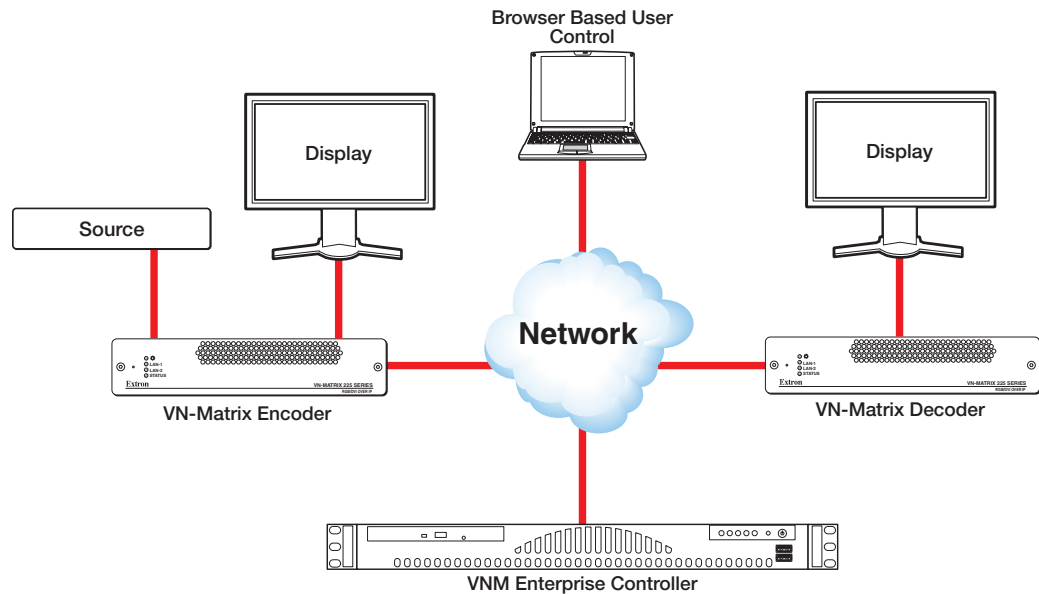


Figure 118. Recommended Setup for Creating Custom Input and Output Modes

Creating a New Source Format (Input Mode)

There can be instances when a VN-Matrix device configured as an encoder cannot detect an input source. This can happen when:

- An unrecognized input source connected to the encoder is not defined in the Format menu (see [Measured Video Properties panel](#) on page 46).
- The timing of the input source may deviate from the standard timings for that signal.

In these situations, a custom input mode needs to be created for the source.

NOTE: Custom input modes are only required for analog sources. A VN-Matrix device automatically creates custom input modes for DVI sources based on their EDID.

Use the following procedure to create a custom source format (input mode).

NOTE: This procedure relates to creating a specific new mode (**1280 x 600 60Hz, progressive**). However, it can be used to create any new input mode.

1. Connect a source that requires a custom input mode to a VN-Matrix encoder.
2. Connect a display monitor to the out/loop connector on the encoder. An analog monitor can also be used, but is not recommended.

NOTES:

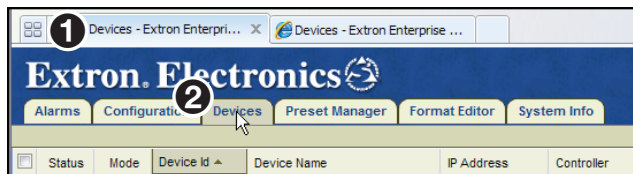
- Using a DVI display eliminates any issues with the monitor not correctly sampling the analog input. If the display device in use does not fully support the source format, then it may not be possible to properly adjust the settings for the encoder itself.
- The VN-Matrix encoder is designed to accept an analog source and output a digital image on the DVI-I out/loop connector if a digital display is connected.
- Initially, there may not be any image output to the display from the DVI-I out/loop connector. If this happens, the default splash screen is displayed.

3. Connect the encoder to the VN-Matrix network (see the VN-Matrix 200/225/300/325 user guides for more information).
4. Open a web browser on the control PC and log into the VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11). Keep this tab on the left (see figure 119, ①).

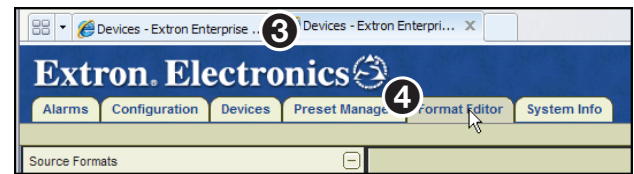
5. **Duplicate** the web-based user interface of the VNM Enterprise Controller using a second browser tab. Keep this tab on the right (see figure 119, ③).

Leave both browser tabs open as they are needed to complete this procedure (see images below).

6. **On the left tab**, select the **Devices** page (②).



First Tab, Devices Selected



Second Tab, Format Editor Selected

Figure 119. Devices and Format Editor

The **Devices** page opens (see figure 120).

7. Choose the encoder connected to the VN-Matrix network in step 3 (see figure 120, ①).

Status	Mode	Device Id	Device Name	IP Address	Controller	Device Type	Version
Controller: 192.168.254.254 (11 Items)							
...	...	1021158	60_JMP9600	192.168.0.30	192.168.254.254	VNE 200 DVI	ver3.10.8
...	...	1080104	60_VNM325_Encode_2	192.168.0.33	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080117	60_VNM325_Decode_1	192.168.0.32	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	1080124	60_VNM325_Encode_1	192.168.0.45	192.168.254.254	VNC 325 3G-SDI	ver4.6.8
...	...	11211552	60_Remote_Decode_1	192.168.0.39	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	620032	60_Rack_Dell	192.168.0.49	192.168.254.254	VNC 200 DVI-AD	ver3.10.8
...	...	620097	60_Small_Dell	192.168.0.47	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720193	60_Cars	192.168.0.35	192.168.254.254	VNC 200 DVI-A	ver3.10.8
...	...	720200	60_Rack_Decode	192.168.0.38	192.168.254.254	VND 200 DVI	ver3.10.8
...	...	790008	60_VNM300_Decode	192.168.0.31	192.168.254.254	VND 300 3G-SDI	ver4.6.8
...	...	790041	60_VNM300_Encode	192.168.0.51	192.168.254.254	VNC 300 3G-SDI	ver4.6.8
Controller: 192.168.254.253 (7 Items)							
...	...	1080101	61_VNM325_Decode_2	192.168.0.33	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080120	61_VNM325_Decode_1	192.168.0.42	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080121	61_VNM325_Encode_2	192.168.0.43	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	1080125	61_VNM325_Encode_1	192.168.0.48	192.168.254.253	VNC 325 3G-SDI	ver4.6.8
...	...	620023	61_MS9500	192.168.0.50	192.168.254.253	VNC 200 DVI	ver3.10.8
...	...	620091	61_Remote_Decode_2	192.168.0.54	192.168.254.253	VNC 200 DVI-A	ver3.10.8
...	...	720202	61_Remote_Decode_1	192.168.0.56	192.168.254.253	VNC 200 DVI	ver3.10.8

Figure 120. Devices Page

8. From the **Actions** bar located at the bottom of the **Devices** page, click **Format** (②).
The **Source Format** dialog box opens.
9. Select **auto** from the **Mode** drop-down list (see figure 121, ①).

Source Format (1021158)

Status

Source: not supported Stream: (0,1) Lock: 0

Measured Video Properties

Current Mode: none
 Type: analog
 Line Count: 622 Line Period (ms): 26.802
 Active Pixels: 0 Active Lines: 0
 First Pixel: 0 First Line: 0
 Phase: 0

Measured Audio Properties

Status: 48kHz

Input

Mode: auto ①
 Phase: 0 ②
 Color Space: RGB ③
 Macrovision Defeat: ☐

Blanking

Blanking: manual ④
 Pixels: 0 ⑤
 Lines: 0 ⑥

Figure 121. Source Format Menu

10. Select **0** from the **Phase** drop-down list (②).
11. Use the **Color Space** drop-down list to select the option that matches the connected source (③).

12. Select **manual** from the **Blanking** drop-down list (see [figure 121](#), ④ on the previous page).
 13. Enter 0 in the **Pixels** field (⑤).
 14. Enter 0 in the **Lines** field (⑥).
- Leave the **Source Format** window open.
15. Using the right tab (see [figure 122](#), ①), select the **Format Editor** page (②).
 16. Select an input mode from the list of source formats (③).

NOTE: If the frame rate or the resolution of the source is already known, select a similar source format. Otherwise, select any source format from the list.

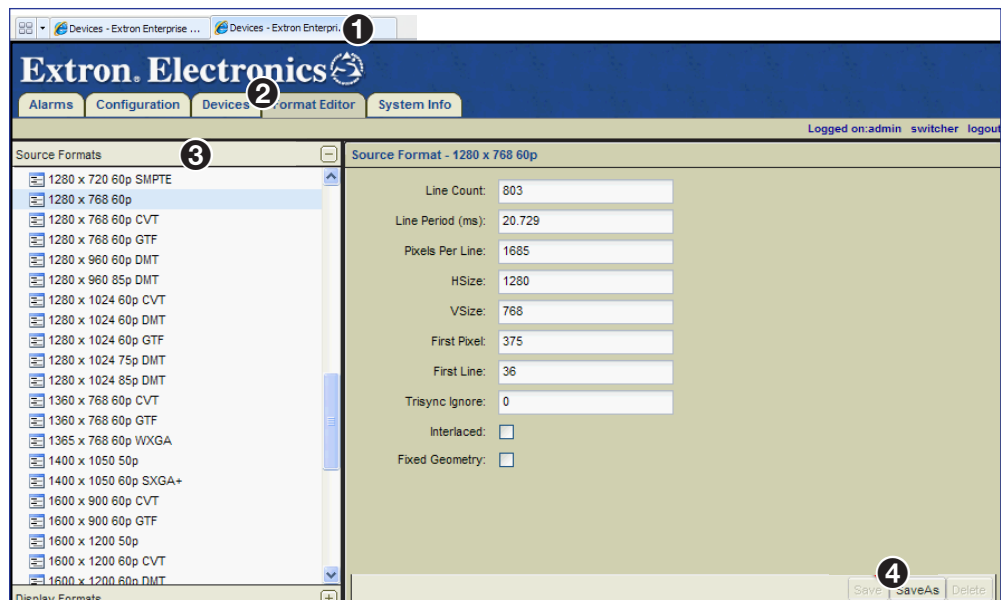


Figure 122. Source Format Editor Page (VN-Matrix 2xx Only)

17. Click **SaveAs** (④), to save the resolution.
18. In the **Save Source Format As** dialog box, enter a name for the new source format and click **OK** (see [figure 123](#)).

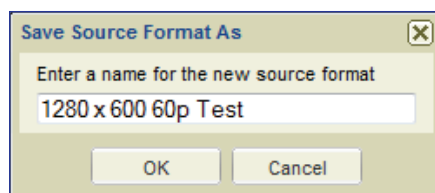


Figure 123. Saving a Source Format

NOTES:

- Resolutions must be saved using the following format at the beginning of the filename: <Hres> x <Vres> <Frame_Rate><Format>
- The end of the filename may contain identifying characters.

Examples:

640 x 400 85p

640 x 400 85p TEST

720 x 480 59.94p HDFrEND

19. The name of the new source is listed above the source format properties (see figure 124, ①).

Extron Electronics

Alarms Configuration Devices **Format Editor** System Info

Logged on: admin switcher logout

Source Formats

Source Format - 1280 x 600 60p Test

Line Count: 803

Line Period (ms): 20.729

Pixels Per Line: 1685

HSize: 1280

VSize: 768

First Pixel: 375

First Line: 36

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

Save SaveAs Delete

Figure 124. New Source Format Saved

20. Return to the left tab (see figure 125, ①) where the **Source Format** dialog box is open. Note the values in the **Line Count** and **Line Period (ms)** fields (②).

① Devices - Extron Enterprise... X Devices - Extron Enterprise...

Source Format (1021158)

Status

Source: not supported Stream: (0,1) Lock: 0

Measured Video Properties

Current Mode: none

Type: analog

② Line Count: 622 Line Period (ms): 26.802

Active Pixels: 0 Active Lines: 0

First Pixel: 0 First Line: 0

Figure 125. Source Format Line Count and Line Period (ms)

21. Using the format editor located on the right tab, make sure the new source is selected from the Source Formats list (see figure 126, ❶) panel and enter the values from step 20 into the **Line Count** and **Line Period (ms)** fields on the right panel (Source Format - 1280 x 600 60p Test) (❷).

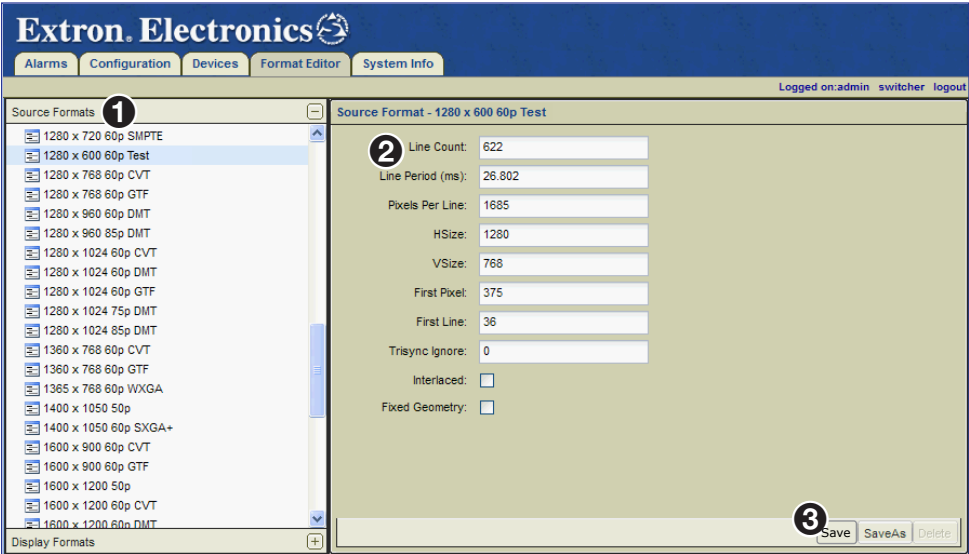


Figure 126. Enter Values Into the Source Format Editor Page

22. Click **Save** (❸), to save the resolution.
23. Click the left tab (see figure 127, ❶).

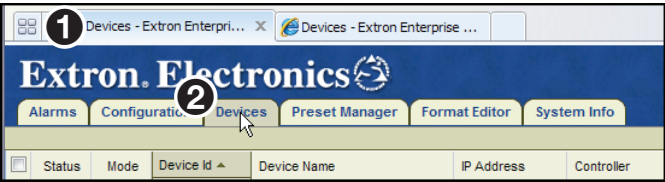


Figure 127. First Tab, Devices Selected

24. Click **Devices** (❷).

25. Force a resync of the source by selecting **auto** from the **Mode** drop-down list (see figure 128, ①).

Figure 128. Force a Resync of the Source

26. The name of the new source created in step 16 is now visible in the **Current Mode** field (②). If the new source name is not visible, check these items.
- Refresh the **Source Format** dialog box. Close, then open the dialog box by clicking **Format** from the Actions menu bar.
 - Is the source still connected or if the source is a PC, is the PC still active or has it entered hibernate mode?
 - Is the new source name in the **Mode** drop-down list? If not, use the **right tab** (**Source Format Editor**) and make sure the new source is saved.
 - Check that values entered into the **Source Format Editor** dialog box (step 21) were input correctly.
27. The **Measured Video Properties** panel now displays information about the new source.

NOTE: The loop-through display can now show an image. The edges of the image can be missing since the image is not properly adjusted yet.

28. Note the values in the **First Pixel** (see figure 129, ❶) and **First Line** fields (❷).

Source Format (1021158) ? X

Status

Source: not supported Stream: (0,1) Lock: 0

Measured Video Properties

Current Mode: 1280 x 600 60p Test
Type: analog

Line Count: 622 Line Period (ms): 26.805
Active Pixels: 1308 Active Lines: 600
First Pixel: 322 ❶ First Line: 22 ❷
Phase: 4

Measured Audio Properties

Status: 48kHz

Input

Mode: auto
Phase: 0
Color Space: RGB
Macrovision Defeat: ☐

Blanking

Blanking: manual
Pixels: 0
Lines: 0

EDID

From Monitor: No Device
To Source: transparent

Figure 129. Source Format Menu First Pixel and First Line Values

29. Using the right tab (see figure 130, ❶), on the **Format Editor** page (❷), enter the values that were noted in step 28 into the **First Pixel** (❸) and **First Line** (❹) fields.

Extron Electronics

Alarms Configuration Devices **Format Editor** System Info

Logged on: admin switcher logout

Source Formats

- 1280 x 720 60p SMPTE
- 1280 x 600 60p Test
- 1280 x 768 60p CVT
- 1280 x 768 60p GTF
- 1280 x 960 60p DMT
- 1280 x 960 85p DMT
- 1280 x 1024 60p CVT
- 1280 x 1024 60p DMT
- 1280 x 1024 60p GTF
- 1280 x 1024 75p DMT
- 1280 x 1024 85p DMT
- 1360 x 768 60p CVT
- 1360 x 768 60p GTF
- 1365 x 768 60p WXGA
- 1400 x 1050 50p
- 1400 x 1050 60p SXGA+
- 1600 x 900 60p CVT
- 1600 x 900 60p GTF
- 1600 x 1200 50p
- 1600 x 1200 60p CVT
- 1600 x 1200 60p DMT

Source Format - 1280 x 600 60p Test

Line Count: 803

Line Period (ms): 26.802

Pixels Per Line: 1685

HSize: 1280

VSize: 768

First Pixel: 322

First Line: 22

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

Save SaveAs Delete

Figure 130. Enter Values Into the Source Format Editor Page

30. Click **Save** (❺), located at the lower right corner of the page, to save the resolution.

31. Return to the left tab (**Source Format menu**) (see figure 131, ❶) and select **auto** from the **Mode** drop-down list (❷) to force a resync of the source.

NOTE: Although the overall image can still look incorrect, the loop-through display now has its top left corner correctly positioned and there should be no cropping on this edge of the image. If the top left corner is still not correctly positioned, fine tune the image position. Alter the value of the **First Pixel** field on the Source Format Editor (right tab) dialog box, force a resync of the source (using the left tab, Source Format menu), and check the image on the loop-through display again.

Source Format (1021158)

Status

Source: not supported Stream: (0,1) Lock: 0

Measured Video Properties

Current Mode: 1280 x 600 60p Test
Type: analog
Line Count: 622 Line Period (ms): 26.805
Active Pixels: 1308 Active Lines: 600
First Pixel: 322 First Line: 22
Phase: 4

Measured Audio Properties

Status: 48kHz

Input

Mode: auto ❷
Phase: 0
Color Space: RGB
Macrovision Defeat: ☐

Blanking

Blanking: manual
Pixels: 0
Lines: 0

EDID

From Monitor: No Device
To Source: transparent

Figure 131. Force a Resync of the Source

32. Click the right device tab (see figure 132, ❶).

33. Select the **Format Editor** (❷).

34. In the **Source Format** panel, adjust the **Pixels Per Line** field (❸) to size the image correctly.

Be sure to click the **Save** button each time the line is adjusted (❹).

NOTE: The pixels per line may or may not be close to the required value depending on the mode chosen as the starting point in step 16. A suitable starting value can be estimated by adding together the values of the **Active Pixels** and **First Pixel** fields shown in the **Source Format** dialog box (left tab in this procedure).

The screenshot shows the Extron Electronics web interface. The top navigation bar includes 'Alarms', 'Configuration', 'Devices', 'Format Editor' (marked with ❷), and 'System Info'. The 'Format Editor' tab is active, showing a list of source formats on the left and a configuration panel on the right. The '1280 x 600 60p Test' format is selected. The configuration panel shows the following fields: Line Count (622), Line Period (ms) (26.802), Pixels Per Line (1685, marked with ❸), HSize (1280), VSize (768), First Pixel (322), First Line (22), Trisync Ignore (0), Interlaced (unchecked), and Fixed Geometry (unchecked). At the bottom right, there are buttons for Save (marked with ❹), SaveAs, and Delete.

Figure 132. Enter Values Into the Source Format Editor Page

- Use the fine line moiré test pattern on the display to adjust this field.

NOTE: If a fine line moiré test pattern is not available, then this field can be adjusted by monitoring the right side of the image and setting the value so that adding or subtracting 1 pixel either shows all of the image or crops the last pixel.

- With the fine line moiré test pattern displayed, there should be no aliasing (banding) visible in the image.
- If banding is visible and the right side of the image is missing, reduce the **Pixels Per Line** value by 20 or 30 pixels.
- If banding is visible and all of the image is shown, increase the **Pixels Per Line** value by 20 or 30 pixels.

- 35. Return to the left tab (Source Format menu)** (see figure 133, **1**) and select **auto** from the **Mode** drop-down list (**2**) to force a resync of the source. Check the display for banding.

Source Format (1021158)

Status

Source: not supported Stream: (0,1) Lock: 0

Measured Video Properties

Current Mode: 1280 x 600 60p Test
Type: analog
Line Count: 622 Line Period (ms): 26.805
Active Pixels: 1308 Active Lines: 600
First Pixel: 322 First Line: 22
Phase: 4

Measured Audio Properties

Status: 48kHz

Input

Mode: auto **2**
Phase: 0
Color Space: RGB
Macrovision Defeat: ☒

Blanking

Blanking: manual
Pixels: 0
Lines: 0

EDID

From Monitor: No Device
To Source: transparent

Figure 133. Force a Resync of the Source

- 36.** Repeat steps **34** and **35**, adjusting the number of pixels added or subtracted until there is no banding in the image.

37. Using the left tab (Source Format menu), note the value of the **First Pixel field** (see figure 134, **1**).

Status

Source: not supported Stream: (1,1) Lock: 1

Measured Video Properties

Current Mode: 1280 x 600 60p Test

Type: analog

Line Count: 622 Line Period (ms): 26.805

Active Pixels: 1308 Active Lines: 600

1 First Pixel: 308 First Line: 22

Phase: 4

Measured Audio Properties

Status: 48kHz

Figure 134. Note Source Format Menu Value

38. Click the right tab (Source Format Editor page), (see figure 135, **1**) and enter the value from step 37 into the **First Pixel** field (**2**).

Extron. Electronics

Alarms Configuration Devices Preset Manager **Format Editor** System Info

Logged on: admin switcher logout

Source Formats

- 1280 x 720 60p SMPTE
- 1280 x 600 60p Test
- 1280 x 768 60p CVT
- 1280 x 768 60p GTF
- 1280 x 960 60p DMT
- 1280 x 960 85p DMT
- 1280 x 1024 60p CVT
- 1280 x 1024 60p DMT
- 1280 x 1024 60p GTF
- 1280 x 1024 75p DMT
- 1280 x 1024 85p DMT
- 1360 x 768 60p CVT
- 1360 x 768 60p GTF
- 1365 x 768 60p WXGA
- 1400 x 1050 50p
- 1400 x 1050 60p SXGA+
- 1600 x 900 60p CVT
- 1600 x 900 60p GTF
- 1600 x 1200 50p
- 1600 x 1200 60p CVT
- 1600 x 1200 60p DMT

Source Format - 1280 x 600 60p Test

Line Count: 622

Line Period (ms): 26.802

Pixels Per Line: 1685

HSize: 1280

VSize: 768

2 First Pixel: 308

First Line: 22

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

3 Save SaveAs Delete

Figure 135. Enter Values Into the Source Format Editor Page

39. Click **Save (**3**),** located at the lower right corner of the page, to save the resolution.

40. Click the left tab (**Source Format menu**), (see figure 136, ❶) and select **auto** from the **Mode** drop-down list to force a resync of the source (❷).

NOTE: The loop-through display now displays the left side of the image correctly.

❶ Source Format (620032)

Status

Source: active Stream: (1,1) Lock: 1

Measured Video Properties

Current Mode: 1280 x 600 60p Test

Type: Analog

Line Count: 622 Line Period (ms): 26.805

Active Pixels: 1308 Active Lines: 600

First Pixel: 322 First Line: 22

Phase: 4

Measured Audio Properties

Status: 48kHz

Input

Mode: auto ❷

Phase: 0

Color Space: RGB

Macrovision Defeat: ☐

Blanking

Blanking: manual

Pixels: 0

Lines: 0

Figure 136. Force a Resync of the Source

41. Click the right tab (**Source Format Editor**), (see figure 137, ❶) and adjust the **Pixels Per Line** value (❷) by plus or minus one pixel to see if this improves image sharpness. Click the **Save** button (❸) each time the source is adjusted.

When you are satisfied with the image, proceed to step 42.

❶

Extron Electronics

Alarms Configuration Devices Format Editor System Info

Logged on: admin switcher logout

Source Formats

- 1280 x 720 60p SMPTE
- 1280 x 600 60p Test
- 1280 x 768 60p CVT
- 1280 x 768 60p GTF
- 1280 x 960 60p DMT
- 1280 x 960 85p DMT
- 1280 x 1024 60p CVT
- 1280 x 1024 60p DMT
- 1280 x 1024 60p GTF
- 1280 x 1024 75p DMT
- 1280 x 1024 85p DMT
- 1360 x 768 60p CVT
- 1360 x 768 60p GTF
- 1365 x 768 60p WXGA
- 1400 x 1050 50p
- 1400 x 1050 60p SXGA+
- 1600 x 900 60p CVT
- 1600 x 900 60p GTF
- 1600 x 1200 50p
- 1600 x 1200 60p CVT
- 1600 x 1200 60p DMT

Source Format - 1280 x 600 60p Test

Line Count: 622

Line Period (ms): 26.802

Pixels Per Line: 1685 ❷

HSize: 1280

VSize: 768

First Pixel: 308

First Line: 22

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

❸ Save SaveAs Delete

Figure 137. Enter Values Into the Source Format Editor Page

42. Click the left tab (**Source Format menu**), (see figure 138, ❶) and force a resync of the source by reselecting **auto** from the **Mode** drop-down list (❷).

Source Format (620032)

Status

Source: active Stream: (1,1) Lock: 1

Measured Video Properties

Current Mode: 1280 x 600 60p Test
Type: Analog
Line Count: 622 Line Period (ms): 26.805
Active Pixels: 1308 Active Lines: 600
First Pixel: 308 First Line: 22
Phase: 4

Measured Audio Properties

Status: 48kHz

Input

❷ Mode: auto
❸ Phase: auto
Color Space: RGB
Macrovision Defeat: ☐

Blanking

❹ Blanking: auto
Pixels: 0
Lines: 0

Figure 138. Force a Resync of the Source

NOTES:

- Check the positioning of the image and adjust if necessary (**First Pixel** and **First Line** fields on the Source Format Editor page).
- Check for aliasing in the moiré pattern and fine tune the **Pixels Per Line** field on the Source Format Editor page if required.
- Check that the right edge of the image is properly displayed.
- Adjustments made to the **Pixels Per Line** field will affect the aliasing in the moiré and the right edge of the image.
- Resync the source each time an adjustment is made.
- Repeat this process to fine tune the displayed image.

43. Select **auto** from the **Phase** drop-down list (see figure 138, ❸).
44. Select **auto** from the **Blanking** drop-down list (❹).
45. The new source format is now correctly configured. If necessary, see **Creating a New Display Format (Output Mode)** on page 146 for information on how to create a corresponding display format.

Creating a New Display Format (Output Mode)

One of the issues encountered using various graphic sources with VN-Matrix encoders and decoders is that the encoder often produces a loop-through image stating it has detected a valid input mode, but the decoder displays a splash screen stating "No Matching Output Mode."

Use the following procedure to create a custom display format (output mode) that is automatically selected by the decoder when it sees the corresponding input mode from the encoder.

NOTE: Before starting this procedure, there must be an active input source connected to a VN-Matrix 2xx encoder (output modes of the VN-Matrix 3xx are fixed) and the source format must be correctly configured (displayed properly).

1. Open a web browser on the control PC and log into the VNM Enterprise Controller. See [Accessing the Web-based User Interface](#) on page 11 for information on how to login.
2. Duplicate the web-based user interface of the VNM Enterprise Controller using a second browser tab. **Leave both browser tabs open** as they are required to complete this procedure.
3. **Click the left tab** (see figure 139, ❶). Select the **Devices** page (❷) and choose a VN-Matrix 2xx series decoder from the device list (❸). A checkmark appears in the checkbox to the left of the decoder row.

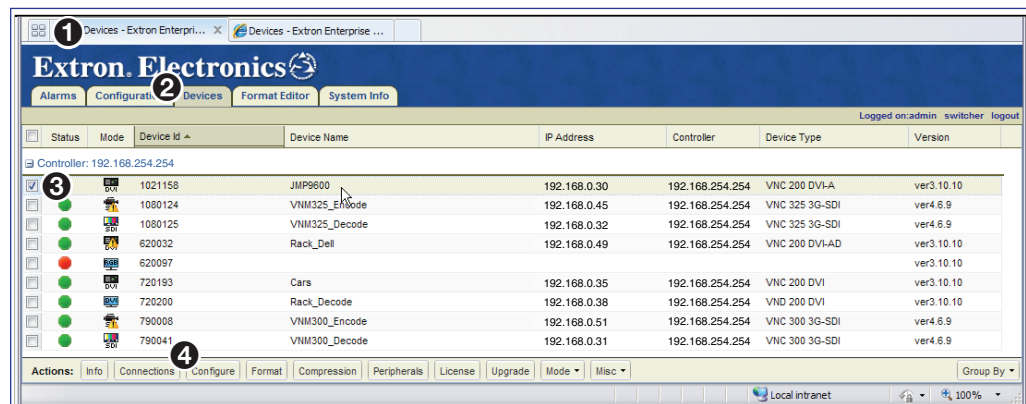


Figure 139. Devices Page

4. From the Actions menu bar located at the bottom of the **Devices** page, click **Configure** (❹).

The **Configure Device Settings** dialog box opens (see figure 140).

5. Select **enable** from the **Mode** drop-down list (see figure 140, ❶). Click the **X** in the upper right corner of the dialog box (❷) to close the **Configure Device Settings** dialog box.

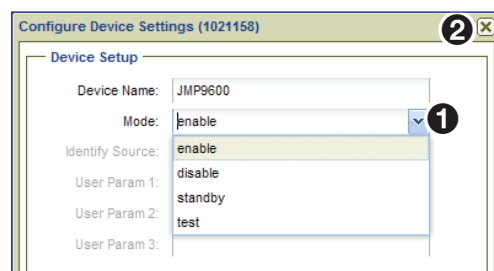


Figure 140. Configure Device Settings Dialog Box

6. Use the **Switcher** page (see [About the Switcher Page](#) on page 89) to create a connection between the required source format and a decoder.

NOTE: The decoder must have a display connected to the DVI-I Out/Loop connector.

7. Click the **right tab**, (see figure 141, ❶) and select the **Format Editor** page (❷).
8. Select an output mode from the display formats panel (❸).

NOTE: Select a display format from the list that closely matches the properties of the new custom display format that is being created.

The screenshot displays the Extron Electronics web interface for the Display Format Editor. The top navigation bar includes 'Alarms', 'Configuration', 'Devices', 'Format Editor' (selected), and 'System Info'. A 'Logged on: admin switcher logout' link is visible on the right. The main content area is divided into two sections. On the left, the 'Display Formats' panel lists various source formats, with '1280 x 768 60p' selected. On the right, the 'Display Format - 1280 x 768 60p' configuration panel contains several input fields and checkboxes. The fields are: 'Active Pixels' (1280), 'Active Lines' (768), 'Total Pixels' (1664), 'Total Lines' (798), 'Horizontal Left Border' (0), 'Horizontal Right Border' (0), 'Horizontal Front Porch' (64), 'Horizontal Sync Width' (128), 'Horizontal Back Porch' (192), 'Horizontal Sync Polarity' (neg), 'Frame Rate' (60), 'Vertical Top Border' (0), 'Vertical Bottom Border' (0), 'Vertical Front Porch' (3), 'Vertical Sync Width' (7), 'Vertical Back Porch' (20), 'Vertical Sync Polarity' (pos), and 'Pixel Clock Frequency' (79500000). Checkboxes for 'Margins' and 'Reduced Blanking' are present. At the bottom, there are buttons for 'Manual', 'CVT', and 'GTF', along with 'Save', 'SaveAs', and 'Delete' buttons.

Figure 141. Display Format Editor Page

9. Make sure that the **Manual** button, located at the bottom of the page, is selected (❹).
10. Enter the required values into the **Active Pixels** (❺), **Active Lines** (❻), and **Frame Rate** fields (❼).
11. Click **CVT** (❽) located at the bottom of the page.

Notice that most of the remaining fields are now grayed out (see figure 142).

Extron Electronics

Alarms Configuration Devices Format Editor System Info

Logged on: admin switcher logout

Source Formats

Display Formats

- 1280 x 720 60p SMPTE
- 1280 x 768 60p
- 1280 x 768 60p GTF
- 1280 x 800 60p
- 1280 x 1024 50p VECTOR
- 1280 x 1024 59.94p VECTOR
- 1280 x 1024 60p CVT
- 1280 x 1024 60p DMT
- 1280 x 1024 60p GTF
- 1280 x 1024 60p VECTOR
- 1280 x 1024 75p CVT
- 1280 x 1024 75p DMT
- 1280 x 1024 75p GTF
- 1280 x 1024 85p DMT
- 1360 x 768 60p CVT
- 1400 x 1050 50p
- 1408 x 1050 50p SXGA+
- 1408 x 1050 60p SXGA+
- 1600 x 900 60p CVT
- 1600 x 900 60p GTF

Display Format - 1280 x 768 60p

Active Pixels: 1280 Active Lines: 600

Total Pixels: 1664 Total Lines: 798

Horizontal Left Border: 0 Vertical Top Border: 0

Horizontal Right Border: 0 Vertical Bottom Border: 0

Horizontal Front Porch: 64 Vertical Front Porch: 3

Horizontal Sync Width: 128 Vertical Sync Width: 7

Horizontal Back Porch: 192 Vertical Back Porch: 20

Horizontal Sync Polarity: neg Vertical Sync Polarity: pos

Frame Rate: 60 Pixel Clock Frequency: 79500000

Margins: ☐ Reduced Blanking: ☐

Manual CVT GTF

Save Save As Delete

Figure 142. Display Format Editor Page

- Click **Save As**, located at the lower right corner of the page, to save the display format (see figure 142, ①).
- In the **Save Display Format As** dialog box, enter a name for the new display format and click **OK** (see figure 143).

NOTES:

- Resolutions must be saved using the following format at the beginning of the filename: <Hres> x <Vres> <Frame_Rate><Format>.
- The end of the filename can contain any identifying characters.

Examples:

640 x 400 85p

640 x 400 85p TEST

720 x 480 59.94p HDFrEND

Save Display Format As

Enter a name for the new display format

1280 x 600 60p Test

OK Cancel

Figure 143. Save a Display Format

14. After saving the new display format, note the grayed out fields are updated revealing the timing details of the required display format.
15. **Using the left browser tab**, select the **Devices** page (see [Creating a New Display Format \(Output Mode\)](#) on page 146) and choose a VN-Matrix decoder from the device list.
16. From the **Actions** menu bar at the bottom of the **Devices** page, click **Format**. The **Display Format** dialog box opens (see figure 144).

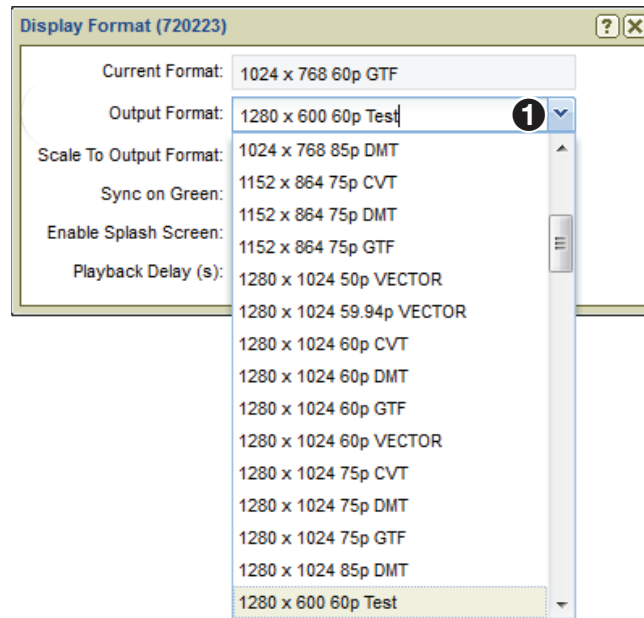


Figure 144. Display Format Menu

17. Select the new display format created in step 13 from the **Output Format** drop-down list (see figure 144, ①). The new display format is applied and the image is displayed.

Deleting Formats

NOTES:

- The default resolutions provided with the VNM Enterprise Controller cannot be deleted.
- Custom resolutions that are being used by any active VN-Matrix device cannot be deleted.

To delete a custom resolution format, select a resolution and click **Delete** located at the lower right corner of the **Format Editor** page (see [figure 145](#) on page 150).

About the Source Format Editor

To view or change the properties of a source format:

1. Click the **right tab**, (see figure 145, **①**).
2. Click the **Format Editor** tab (**②**).
The Format Editor page opens.
3. Click the **Source Formats** bar to open a list of source formats (**③**).
4. Select the desired source format (**④**). The properties of the selected resolution are listed in the **Source Format** panel on the right (**⑤**).

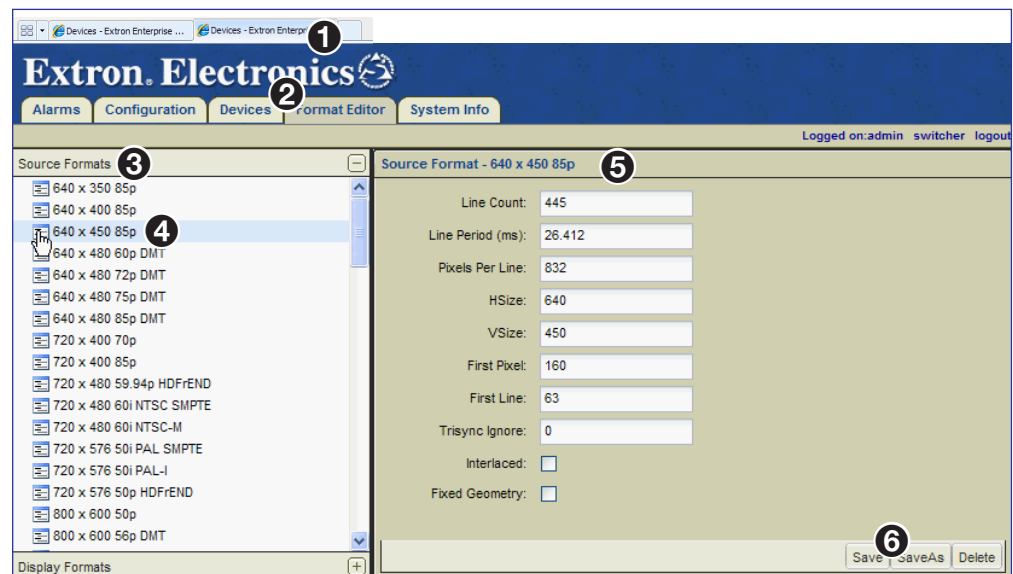


Figure 145. Source Resolution Properties

To create a new source format, modify the desired fields in the **Source Format** panel and click **SaveAs** in the lower right corner (**⑥**), to save the resolution to the **Source Formats** list with a new name. For additional information on creating source formats, see [Creating a New Source Format \(Input Mode\)](#) on page 132.

NOTES:

- Resolutions must be saved using the following format at the beginning of the filename: <Hres> x <Vres> <Frame_Rate><Format>.
- The end of the filename can contain any identifying characters.

Examples:

640 x 400 85p

640 x 400 85p TEST

720 x 480 59.94p HDFrEND

- **Line Count** — Specify the number of horizontal lines of information.
- **Line Period (ms)** — Specify how often the horizontal lines of information are updated.
- **Pixels Per Line** — Specify how many pixels are used to create each line of information.
- **HSize** — Specify the horizontal resolution (number of pixels wide) from the source.
- **VSize** — Specify the vertical resolution (number of pixels high) from the source.
- **First Pixel** — Specify the position of the first active pixel in the line.
- **First Line** — Specify the position of the first active line in the frame.

- **Trisync Ignore** — Zero for all source types. 100 for source types using tri-level sync.
- **Interlaced** — Check this box to use interlaced video.
- **Fixed Geometry** — This function is currently not implemented.

About the Display Format Editor

1. Select the **Format Editor** tab (see figure 146, ❶).
2. Click the **Display Formats** bar (❷) to open a list of display resolutions.
3. Select the desired source format resolution (❸). The properties populate the **Display Format** panel on the right (❹).

Figure 146. Display Resolution Properties

To create a new display format, modify the **Display Format** panel fields on the right as needed, then click **SaveAs** (❺) to save the resolution to the **Display Formats** list. For additional information on creating display formats, see [Creating a New Display Format \(Output Mode\)](#) on page 146.

NOTES:

- Resolutions must be saved using the following format at the beginning of the filename: width x height rate(p).
 - The end of the filename can contain any identifying characters.
- Examples:
- 640 x 400 85p
- 640 x 400 85p TEST
- 720 x 480 59.94p HDFrEND

- **Active Pixels** — Specify the horizontal resolution (number of pixels wide).
- **Active Lines** — Specify the vertical resolution (number of pixels high).
- **Total Pixels** — Specify the total number of pixels (including syncs and blanking).
- **Total Lines** — Specify the total number of lines (including syncs and blanking).
- **Horizontal Left Border** — Specify the horizontal size of the left outer border on the display.

- **Vertical Top Border** — Specify the vertical size of the top outer border on the display.
- **Horizontal Right Border** — Specify the horizontal size of the right outer border on the display.
- **Vertical Bottom Border** — Specify the vertical size of the bottom outer border on the display.
- **Horizontal Front Porch** — Use this field to properly fit the image on the display. This field shifts the image to the left or right and is directly related to the **Horizontal Back Porch** field. If an adjustment is made to this field, it is recommended to adjust the **Horizontal Back Porch** to compensate for the shifted image.
- **Vertical Front Porch** — Use this field to properly fit the image on the display. This field shifts the image up or down and is directly related to the **Vertical Back Porch** field. If an adjustment is made to this field, it is recommended to adjust the **Vertical Back Porch** to compensate for the shifted image.
- **Horizontal Sync Width** — Specify the width (in pixels) of the horizontal sync pulse.
- **Vertical Sync Width** — Specify the width (in lines) of the vertical sync pulse.
- **Horizontal Back Porch** — Use this field to properly fit the image on the display. This field shifts the image left or right and is directly related to the **Horizontal Front Porch** field. If an adjustment is made to this field, it is recommended to adjust the **Horizontal Front Porch** to compensate for the shifted image.
- **Vertical Back Porch** — Use this field to properly fit the image on the display. This field shifts the image to the up or down and is directly related to the **Vertical Front Porch** field. If an adjustment is made to this field, it is recommended to adjust the **Vertical Front Porch** to compensate for the shifted image.
- **Horizontal Sync Polarity** — Select a positive (pos) or negative (neg) horizontal sync.
- **Vertical Sync Polarity** — Select a positive (pos) or negative (neg) vertical sync.
- **Frame Rate** — Specify the refresh rate of the video in Hz (frames per second).
- **Pixel Clock Frequency** — Specify the pixel clock frequency. The higher the frequency of the pixel clock, the more pixels that will appear across the screen.
- **Margins** — This is a legacy control that is used with input sources that contain a colored border used to accommodate displays that have wide bezels.
- **Reduced Blanking** — This is a control that is usually required for wide-screen modes. This control accommodates input sources containing active pixels that extend past the normal (blanking) region.
- **Manual** — By default, this button is selected. This button enables modification of all the display resolution properties.
- **CVT** — Check to select the coordinated video timing (CVT) standard. This is a VESA standard.
- **GTF** — Check to select the generalized timing formula (GTF) standard. This is a VESA standard.

About Alarms

This section provides information on:

- [Overview](#)
- [Alarms Page](#)
- [Alarm Type Reference Tables](#)

Overview

The VN-Matrix system is configured to generate alarms for error conditions. A list of these error conditions and their meanings are presented on the following pages.

Alarms can be monitored using the Alarms page. Alarm conditions, when triggered, remain active for the duration of the error condition and for an additional five seconds after the error is cleared.

Alarms Page

This page is accessed by selecting the **Alarms** tab (see figure 147).

A	B	C	D	E	F	G	H
ID	Severity	Alarm Description	Device	Name	Device Type	Raised Time	controller
Severity: critical (11 items)							
450772		Bad Device	620038	device620038	VNC 200 DVI-AD	2012/03/22 17:43:33 GMT+0000	192.168.254.254
450112		Bad Device	620115	device620115	VNC 200 DVI-AD	2012/03/22 16:27:56 GMT+0000	192.168.254.254
322		Bad Device	720202	Small_Dell	VNC 200 DVI-AD	2012/04/02 17:06:01 GMT+0100	192.168.254.254

Figure 147. Alarms Page

The Alarms page enables a user to sort and monitor system alarms. For information on alarm types, see [Alarm Type Reference Tables](#) on page 155.

- A ID Number** — The ID number of the alarm.
- B Severity Icons** — The alarm severity is indicated by a colored icon.
 - A device under active control showing warning alarms.
 - A device under active control showing critical alarms.
- C Alarm Description** — The type of alarm. The information listed here is directly related to the **Alarm Type** column in the [Alarm Type Reference Tables](#) on page 155.
- D Device** — The device ID of the VNM device is shown in this column.
- E Name** — The name assigned to the device by the user.
- F Device Type** — The type or model number of the connected device.
- G Raised Time** — The date and time the alarm first occurred.
- H Controller** — The IP address of the device acting as the system controller.

Sorting Alarms by Column

Columns can be sorted by clicking directly on any of the column names. Clicking on a column name sorts the list in ascending or descending order. Figure 148 shows the alarms sorted by raised time (2). The **Raised Time** column is darkened and contains a ▼ icon to show that the devices are sorted by the raised alarm time in ascending order.

Hovering over the right side of a column name reveals a pull-down arrow that, when clicked, accesses the advanced column sorting menu. Use this menu to sort columns in ascending or descending order.

Sorting Alarms by Group

Alarms can be sorted in groups using the **Group By** menu (see figure 148, 1).

ID	Severity	Alarm Description	Device	Name	Device Type	Raised Time	controller
Severity: critical (11 items)							
450772	●	Bad Device	620038	device620038	VNC 200 DVI-AD	2012/03/22 17:43:33 GMT+0000	168.192.254.254
450112	●	Bad Device	620115	device620115	VNC 200 DVI-AD	2012/03/22 16:27:56 GMT+0000	168.192.254.254
322	●	Bad Device	720202	Small_Dell	VNC 200 DVI-AD	2012/04/02 17:06:01 GMT+0100	168.192.254.254
562	●	Bad Device	11211552	Dell_D830	VNE 200 DVI	2012/04/02 17:05:08 GMT+0100	168.192.254.254
742	●	Bad Device	620091	JMP_Left	VNC 200 DVI-A	2012/04/02 17:04:33 GMT+0100	168.192.254.254
382	●	Bad Device	6020056	JMP_Right	VNC 200 DVI-A	2012/04/02 17:04:33 GMT+0100	168.192.254.254
202	●	Bad Device	2000199	Proto	VNC 325 3G-SDI	2012/04/02 17:04:28 GMT+0100	168.192.254.254
82	●	Bad Device	1080122	JMP_Rack	VNC 325 3G-SDI	2012/04/02 17:04:28 GMT+0100	168.192.254.254
622	●	Bad Device	1080123	Phabrix	VNC 325 3G-SDI	2012/04/02 17:04:28 GMT+0100	168.192.254.254
262	●	Bad Device	620097	VTG400	VNC 200 DVI-AD	2012/04/02 17:04:20 GMT+0100	168.192.254.254
442	●	Bad Device	620023	Dell_Precision	VNC 200 DVI-AD	2012/04/02 17:04:20 GMT+0100	168.192.254.254

Figure 148. Grouping Alarms

The following grouping options are available.

NOTES:

- After selecting a grouping option, groups can be further sorted using column sorting (see [Sorting Devices by Column](#) on page 38). Figure 148 shows the alarms sorted by raised time in ascending order (2).
- Grouped alarms are expanded and collapsed by clicking on the square icon located next to the group name (3).

- **None** — Removes group sorting.
- **Severity** — Groups the alarms by critical severity and warning severity.
- **Type** — Groups the alarms by their description (type).
- **Device** — Groups the alarms by device ID. In other words, this option links each alarm to the device it originates from.
- **Controller** — Groups the alarms by system controller. When a VN-Matrix system contains more than one system controller, this option links alarms to each system controller.
- **Expand All** — Reveals all alarms. The alarms display under the appropriate group name.
- **Collapse All** — Hides all alarms. Only the group names are displayed on the page.

Alarm Type Reference Tables

Encoders

CLI Alarm	Alarm Description	Fault Description	Alarm Type
NOSRC	No Source	No input source is connected.	Critical, Reporting
BADSRCSYN	Bad Source Syncs	An input source is connected but the sync timing is not recognized. (Unable to input source due to bad sync measurements)	Critical, Reporting
NOSDILOCK	No SDI Source Lock	An SDI source is connected but the signal timing is not recognized. (An SDI source is present but the PLL lock failed).	Critical, Reporting
NOSDIMODE	Unsupported SDI Mode	The connected SDI source mode not supported.	Critical, Reporting
NOMODE	Unsupported Mode	The connected source is not supported; a user-mode must be created.	Critical, Reporting
BADSRC	Bad Source	A source is connected and syncs have been detected, but it is not possible to make active pixel measurements.	Critical, Reporting
PHASING	Analog Phasing Failure	The analog pixel clock auto-phasing process failed.	Warning, Reporting
HWNVIDEO	Hardware Encoding Error	The hardware is unable to encode the input video.	Critical, Reporting
UNSUPAUDIOSRC	Unsupported Audio Source	The digital audio source has a bad or unsupported clock rate.	Critical, Reporting
BADAUDIOSRC	Bad Audio Source	The audio source is not valid for the current video source.	Warning, Reporting
VIDEOOVERLOAD	Data Rate Overload	The system is not able to process the source at the current settings; increase the compression. (The compressed data rate is too high, increase the compression).	Critical, Reporting
NWOVERLOAD	Network Overload	The network is dropping too many packets.	Warning, Reporting
BADREVAUDIO	Bad Reverse Audio	The reverse audio channel contains no data or has a large number of dropouts.	Warning, Reporting

Decoders

CLI Alarm	Alarm Description	Fault description	Alarm type
NOVIDEO	No Decoder Video Data	A stream is assigned but the decoder is not receiving video data.	Warning, Reporting
NOMATCH	No Decoder Mode	A video stream is assigned but the decoder does not recognize the format. (The decoder cannot output the current input stream).	Warning, Reporting
NOSRCREPORT	No Source Report	A video stream is assigned but there is no source present at the encoder. (The encoder is reporting "No Source" to the Decoder).	Warning, Reporting
RECAUDIO	Recovered Audio	The decoder has recovered missing audio packets.	Warning, Reporting
NOAUDIO	No Decoder Audio Data	An audio stream is assigned, but the decoder is not receiving audio data.	Warning, Reporting
BADAUDIO	Bad Audio At Decoder	The decoder is receiving poor quality audio data.	Warning, Reporting
BADAPLL	Bad Audio PLL	The decoder is having problems synchronizing to the audio data.	Warning, Reporting
VIDEODROP	Video Network Packets Dropped	Excess video data has been dropped in the network.	Warning, Reporting
BUFFEROVERFLOW	Decoder Buffer Overflow	Too many data frames at the decoder; reduce the pipeline delay.	Warning, Reporting
BUFFERUNDERFLOW	Decoder Buffer Underflow	Too few data frames at the decoder; increase the pipeline delay.	Warning, Reporting
BADVPLL	Bad Video PLL	The decoder is having problems synchronizing to the video data.	Warning, Reporting
NOANC	No Decoder ANC Data	An ANC stream is assigned, but the decoder is not receiving the ANC data.	Warning, Reporting
BADANC	Missing ANC at Decoder	The decoder is receiving poor quality ANC data.	Warning, Reporting
RECANC	Recovered ANC	The decoder has recovered from missing ANC packets.	Warning, Reporting
GENLOCKNOSOURCE	No Genlock Source Present	There is no reference genlock source present.	Critical, Reporting
GENLOCKNOLOCK	No Genlock Source Lock	The reference genlock signal is invalid.	Critical, Reporting
GENLOCKMISMATCH	Genlock Source Mismatch	The genlock reference signal mismatches the required output mode.	Critical, Reporting
UNSUPAUDIOTYPE	Unsupported Audio Type	Audio data type not supported by current hardware.	Critical, Reporting

Encoder/Decoder

Alarm	Description	Fault Description	Alarm Type
AUDIOOVERRANGE	Audio Input Overrange	The analog input level is too high for the current range setting.	Warning, Reporting
BADAUDIOHW	Bad Audio Hardware Reporting	The audio hardware has failed or is not present.	Critical, reporting

System Controller

Alarm	Description	Fault Description	Alarm Type
OVERTEMP	Over Temperature	The hardware is too hot and operation will likely be erratic.	Warning, Reporting
BADDEVICE	Bad Device	The device is not properly communicating with the controller.	Critical, Reporting
RTPHOLDOFF	RTP Stream Holdoff	The RTP data stream has been temporarily disabled due to excess packet drops.	Critical, Reporting

Dual (Redundant) Controller Configuration

This section details the basic information needed to configure the settings of dual VNM Enterprise Controllers. For information on how to set up a single controller, see [Single VNM Enterprise Controller Configuration](#) on page 14.

This section provides information on:

- [Setup Overview](#)
- [Configuring Dual VNM Enterprise Controllers](#)
- [Configuring Dual Enterprise Controllers as the System Controller](#)
- [Configuring VN-Matrix Devices for Dual VNM Enterprise Controllers](#)
- [About the Cluster Properties Pages](#)

NOTE: For additional configuration information, see [Advanced Controller Configuration](#) on page 19. Configure each VNM Enterprise Controller identically.

Setup Overview

1. Use a network switch to connect the primary VN-Matrix network to the rear panel Ethernet connector (eth0) of each VNM Enterprise Controller (see [Rear Panel Features](#) on page 9).
2. Use an RJ-45 crossover cable to connect the VNM Enterprise Controller Ethernet connectors (eth1) together (see [figure 2](#) on page 3 and [Rear Panel Features](#) on page 9).
3. Power on each VNM Enterprise Controller, all VN-Matrix devices present in the system, and all necessary devices (see [Power Down Procedure](#) on page 12).
4. Connect a control PC to the VN-Matrix network and navigate to the web-based user interface of each VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11).
5. Configure the settings of each VNM Enterprise Controller (see [Configuring Dual VNM Enterprise Controllers](#) on page 159).
6. Configure the VNM Enterprise Controller pair to act as the controller for the VN-Matrix system (see [Configuring Dual Enterprise Controllers as the System Controller](#) on page 165).
7. Configure the devices within the VN-Matrix system (see [Configuring VN-Matrix Devices for Dual VNM Enterprise Controllers](#) on page 171).
8. If necessary, update the license of each VNM Enterprise Controller (see [Controller Firmware and License Updates](#) on page 179).
9. Power down each VNM Enterprise Controller and all configured devices (see [Power Down Procedure](#) on page 12). After a few seconds, power on each VNM Enterprise Controller and all necessary devices.

Configuring Dual VNM Enterprise Controllers

This section details how to set up and configure dual (redundant) VNM Enterprise Controllers.

Configuring the Network Settings (Eth0)

NOTES:

- The VNM Enterprise Controllers should not be paired when configuring the network settings. For information on how to unpair VNM Enterprise Controllers, see [Unpairing controllers](#) on page 174.
- Be aware that unpairing and then pairing a VNM Enterprise Controller deletes device configuration files, presets, and custom input or output modes.
- Each VNM Enterprise Controller must use an IP address that contains the same network prefix and subnet.
- Each VNM Enterprise Controller must use the same subnet mask address.

Each VNM Enterprise Controller is pre-configured with the following network settings.

IP address: 192.168.254.254
Subnet mask: 255.255.255.0
Gateway: 192.168.254.1
MTU: 1500

NOTE: With these default settings, devices connected to the VN-Matrix network must use IP addresses within the range of 192.168.254.2 through 192.168.254.253 and use the same subnet mask.

Use the following procedure to change the network settings of **each** VNM Enterprise Controller.

1. Log into the VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11).
2. Click the **Configuration** tab (see figure 149, ❶).
The Configuration page opens.

The screenshot shows the Extron Electronics web interface. At the top, there's a navigation bar with tabs: Alarms, Configuration (marked with ❶), Devices, Preset Manager, Format Editor, and System Info. Below the navigation bar, there's a sidebar on the left with a tree view under 'Device Properties' (marked with ❷) containing: Network, Password, Role, Time, Upgrade, Version, System Properties, and System config. The main content area is titled 'Network' (marked with ❸) and contains two sections: 'Internet Protocol' and 'Ethernet'. The 'Internet Protocol' section has fields for IP Address (192.168.254.254), Netmask (255.255.255.0), Gateway (192.168.254.253), and MTU (1500). The 'Ethernet' section has fields for eth0 MAC address (00:25:90:14:b0:60) and eth1 MAC address. At the bottom right, there are 'Apply Changes' (marked with ❹) and 'Cancel Changes' buttons. The top right corner shows 'Logged on: admin switcher logout'.

Figure 149. Configuration Page — Configuring the Network Setting

3. Click the **Network** link under Device Properties (❷).
4. In the **Internet Protocol** panel, change the **IP Address**, **Netmask**, **Gateway**, and **MTU** fields as necessary (❸).

NOTE: The default value of **1500** in the **MTU** field is the correct setting in most instances.

5. Click **Apply Changes** to save the configuration (❹). The controller network settings are now applied.
6. Repeat steps 1 through 5 to configure the other VNM Enterprise Controller.
7. Configure the IP address of the control PC so that it is within the address range of the VNM Enterprise Controller.

NOTE: Complete this step only if the IP address of each VNM Enterprise Controller is using a **network prefix** or **subnet** other than **192.168.254.xxx**.

8. If necessary, restart the control PC to save the new network configuration.

Setting the Role of the Primary Enterprise Controller

Use the following procedure to set the role of the redundant primary VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11).

1. Log into the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 150, **1**).

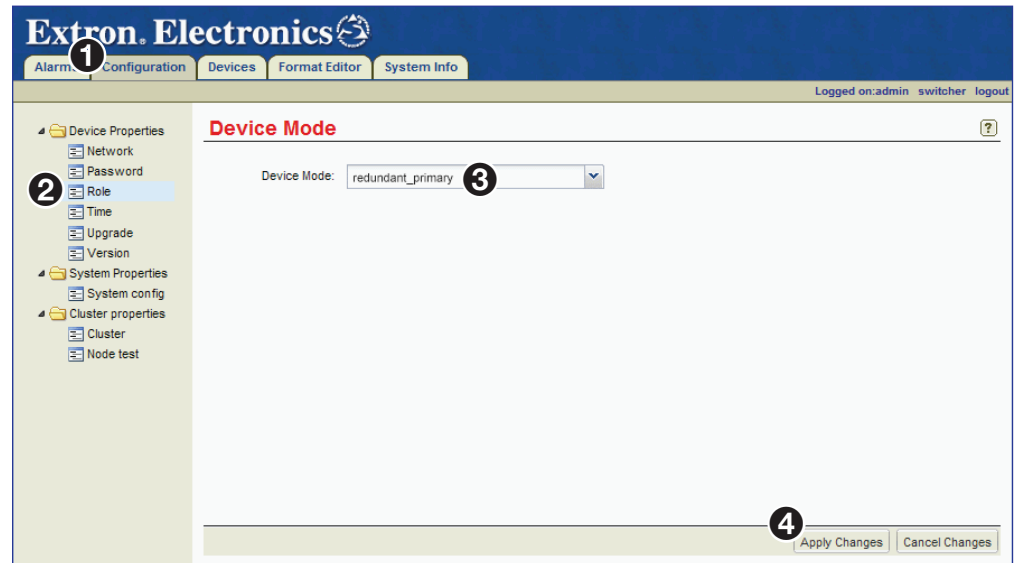


Figure 150. Configuration Page — Redundant Primary Role Setup

2. Under Device Properties, click the **Role** link (**2**).
3. From the **Device Mode** drop-down list, select **redundant_primary** (**3**).

NOTE: For information on the other device modes, see [Role Page](#) on page 22.

4. Click **Apply Changes** to save the configuration (**4**).

NOTES:

- The web-based user interface returns to the **Login** page after saving the configuration. This may take a few seconds.
- After completing this procedure, the [Cluster Page](#) (see page 172) and [Node Test Page](#) (see page 169) are available on the **Configuration** page.

Setting the Role of the Secondary Enterprise Controller

Use the following procedure to set the role of the redundant secondary VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Log into the **redundant secondary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 151, **1**).

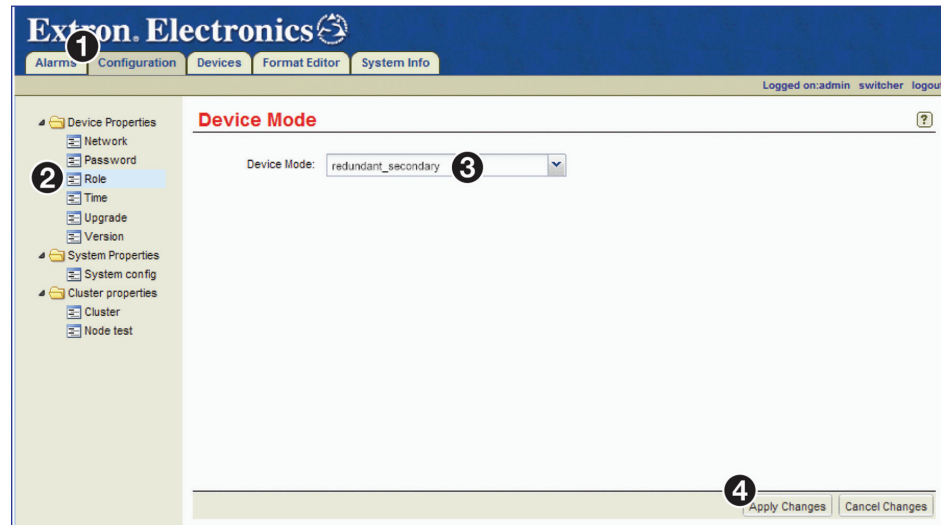


Figure 151. Configuration Page — Redundant Secondary Role Setup

2. Click the **Role** link (**2**).
3. From the **Device Mode** drop-down list in the **Device Mode** panel, select **redundant_secondary** (**3**).

NOTE: For information on the other device modes, see [Role Page](#) on page 22.

4. Click **Apply Changes** (**4**) to save the configuration.

NOTE: The web-based user interface returns to the login page after saving the configuration. This may take a few seconds.

Configuring the Primary Enterprise Controller Time Settings

Use the following procedure to configure the time settings of the redundant primary VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Log in to the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 152, **1**).

Figure 152. Configuration Page — Primary Controller Time Setup

2. Under Device Properties, click the **Time** link (2).
3. Make sure **Enable Clock Synchronization** is **not** checked (3).

NOTE: If **Enable Clock Synchronization** is checked, the **Set time** (5) and **Set date** (6) fields are dimmed.

4. Select the desired time zone from the **Set timezone** drop-down list (4) and click **Apply Changes** (7).
5. Enter the time in the **Set time** field (5).
 - Use the HH:MM:SS (hours:minutes:seconds) format based on the 24-hour clock. For example, 08:25:00 or 20:35:10.
6. Enter or select the date in the **Set date** field (6).
 - Use the MM/DD/YYYY (month/day/year) format. For example, 05/14/2012.
7. Click **Apply Changes** (7) to save the configuration.

Configuring the Secondary Enterprise Controller Time Settings

Use the following procedure to configure the time settings of the redundant secondary VNM Enterprise Controller.

1. Log in to the **redundant secondary** VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11) and click the **Configuration** tab.

The Configuration page opens (see figure 153, **1**).

Figure 153. Configuration Page — Secondary Controller Time Setup

2. Under **Device Properties**, click the **Time** link (**2**).
3. Select the desired time zone from the **Set timezone** drop-down list (**3**). Choose the same time zone selected for the **redundant primary** VNM Enterprise Controller.
4. In the **Clock Synchronization** panel, check **Enable Clock Synchronization** (**4**). This syncs the time settings of this VNM Enterprise Controller to the devices listed in the **Sources** field.
5. Click **Add** (**5**) to open the IP address dialog box. Enter the IP address of the **redundant primary** VNM Enterprise Controller and click **OK** to close the dialog.
6. Click **Apply Changes** to save the configuration (**6**).

Configuring Dual Enterprise Controllers as the System Controller

This section details how to assign the dual VNM Enterprise Controllers as the system controller. **Before proceeding**, make sure the procedures detailed in [Configuring Dual VNM Enterprise Controllers](#) on page 159 are completed.

NOTE: For information on how to configure a single VNM Enterprise Controller as the system controller, see [Single VNM Enterprise Controller Configuration](#) on page 14.

Adding the VNM Enterprise Controllers to the Controller List

Use the following procedure to add the VNM Enterprise Controllers to the controller list (see [Accessing the Web-based User Interface](#) on page 11).

1. Log in to the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 154, ①).

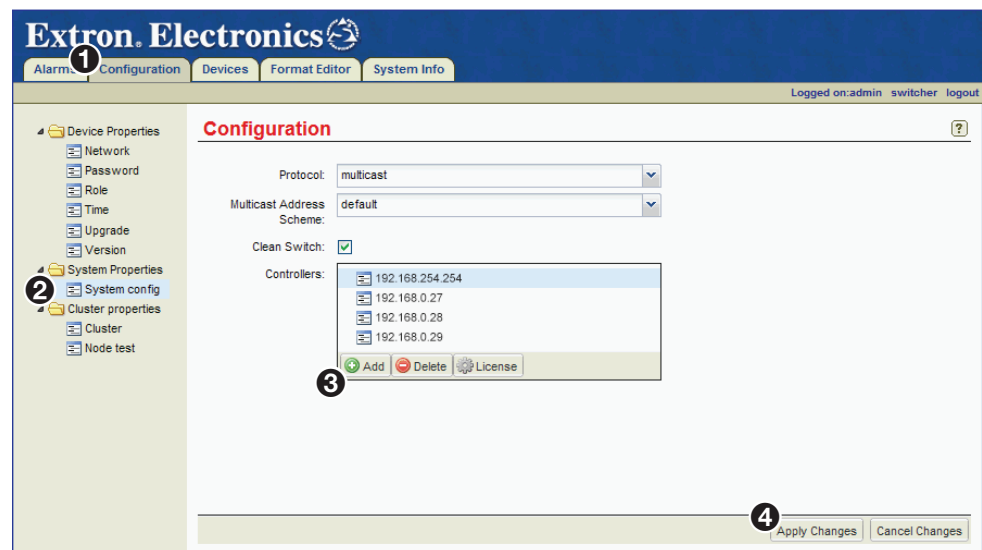


Figure 154. Configuration Page — Adding Controllers to the Controller List

2. Click the **System config** link (②).
3. In the **Controllers** field, click **Add** (③).
4. Enter the cluster IP address of the VNM Enterprise Controller pair into the dialog box (not shown) and click **OK**.

NOTE: If necessary, clear the **Controllers** field. Highlight the IP addresses and click **Delete**.

5. Click **Apply Changes** to save the configuration (④).

The VNM Enterprise Controller restarts the user interface and is assigned as the system controller.

6. Log in to the **redundant secondary** VNM Enterprise Controller and repeat this procedure.

Configuring the Transport Protocol

Use the following procedure to configure the transport protocol that will be used throughout the VN-Matrix system (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Log into the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 155, **1**).

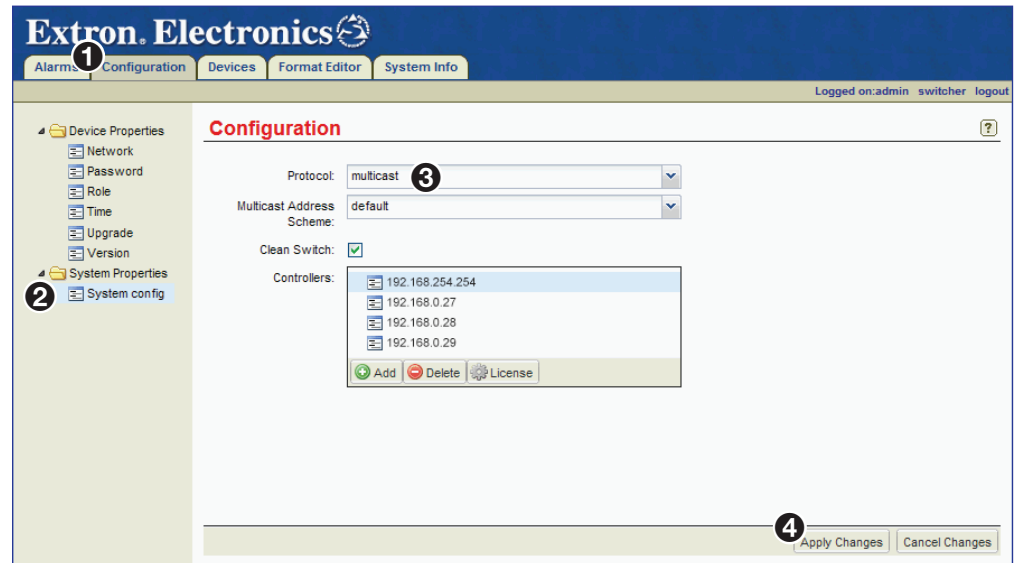


Figure 155. Configuration Page — Configuring the Transport Protocol

2. Click the **System config** link (**2**).
3. From the **Protocol** drop-down list (**3**), select the preferred transport protocol.

NOTE: The default transport protocol is **Unicast**. For more information on transport protocols, see [Transport Protocols Used for Streaming](#) on page 4.

4. Click **Apply Changes** to save the configuration (**4**).
5. Log into the **redundant secondary** VNM Enterprise Controller and repeat this procedure.

Setting the Cluster IP Address

Use the following procedure to set the cluster IP address (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

NOTE: When the VN-Matrix system is first set up, this procedure should be performed on both the primary and secondary controllers before pairing.

1. Log into the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 156, **1**).

The screenshot shows the Extron Electronics web interface. The top navigation bar includes 'Alarms', 'Configuration' (marked with a circled 1), 'Devices', 'Format Editor', and 'System Info'. The user is logged in as 'admin' with a 'switcher' role. The left sidebar lists various configuration categories, with 'Cluster' (marked with a circled 2) selected under 'System Properties'. The main content area is titled 'Cluster' and contains two sections: 'Status' and 'Configuration'. The 'Status' section shows 'Active Cluster controller: none', 'Crossover status: connected', 'Cluster: unpaired', and 'Device Mode: redundant_primary'. The 'Configuration' section has a 'Cluster IP Address' field (marked with a circled 3) containing '192.168.254.250', a 'Test Switch on Powerup' checkbox, a 'Switch IP Address' field set to 'none', and a 'Crossover Subnet' field set to '192.168.253.0'. At the bottom, there are buttons for 'Migrate', 'Unpair', 'Pair', and 'Apply Changes' (marked with a circled 4), along with a 'Cancel Changes' button.

Figure 156. Configuration Page — Setting the Cluster IP Address

2. Click the **Cluster** link (**2**).
3. Enter the desired IP address into the **Cluster IP Address** field (**3**).

NOTE: The cluster IP address must have the same network prefix and subnet as the IP address entered in step 4 of [Configuring the Network Settings \(Eth0\)](#) on page 159.

4. Click **Apply Changes** (**4**) to save the setting.
5. Log into the **redundant secondary** VNM Enterprise Controller and repeat this procedure.

Setting the Crossover Subnet IP Address (Eth1)

A crossover cable is connected between the eth1 ports of a VNM Enterprise Controller pair. By default, the crossover subnet IP address for this port is **192.168.253.0**. In most cases, this is acceptable and does not need altered.

NOTES:

- If a **network prefix** or **subnet** of **192.168.253.xxx** is used for the main eth0 ports, a crossover subnet IP address must be created that uses a different network prefix or subnet.
- The **Crossover Subnet** field can only be changed when the VNM Enterprise Controllers are unpaired (see [Unpairing controllers](#) on page 174).
- The **Crossover Subnet** field must be individually set on each VNM Enterprise Controller within the cluster. The entered values must also be identical.
- A crossover cable must be directly connected between the eth1 ports of a VNM Enterprise Controller pair without using extra network equipment (such as a switch or router).

If necessary, use the following procedure to change the crossover subnet IP address (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Log into the **redundant primary** VNM Enterprise Controller and click the **Configuration** tab.

The Configuration page opens (see figure 157, **1**).

Figure 157. Configuration Page — Changing the Crossover Subnet

2. Click the **Cluster** link (**2**).
3. In the **Crossover Subnet** field (**3**), enter the desired crossover subnet IP address.
4. Click **Apply Changes** to save the configuration (**4**).
5. Log into the **redundant secondary** VNM Enterprise Controller and repeat this procedure.

NOTE: When a crossover cable connects the primary and secondary VNM Enterprise Controllers and the crossover subnet address on both (**3**) are set identically, the **Crossover status** field displays **connected**.

Node Test Page

This page is used to test the VNM Enterprise Controller pair by determining which controller, primary or secondary, has the best communication with the devices in the VN-Matrix system at power up (see figure 158). The VNM Enterprise Controller that communicates best with these devices becomes the Primary and the other unit becomes the Secondary.

The tested devices are called nodes. This list is created by entering IP address values of VN-Matrix devices into the **Sources** list.

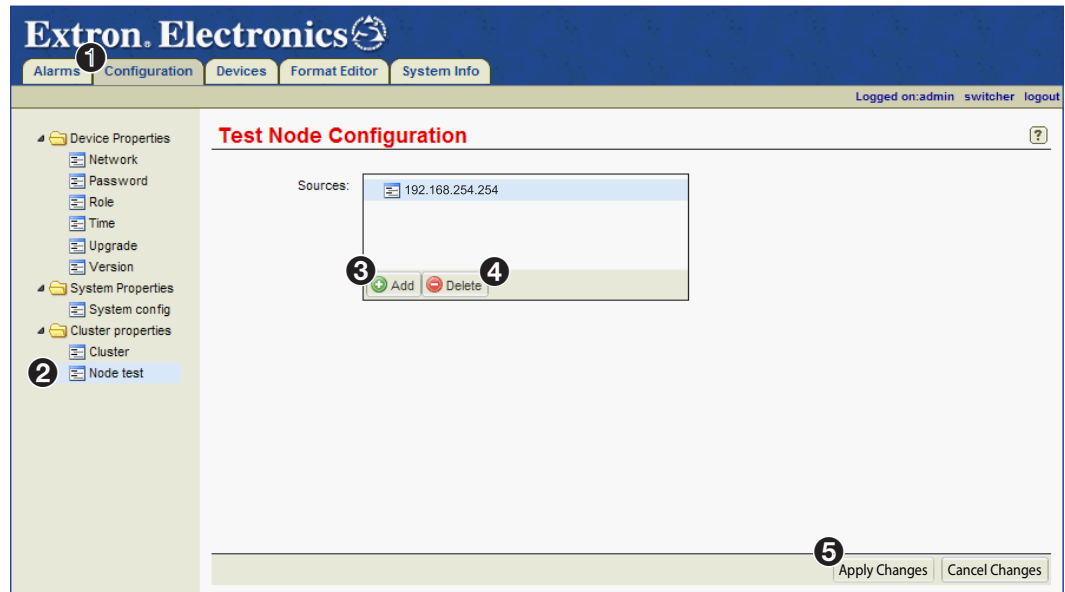


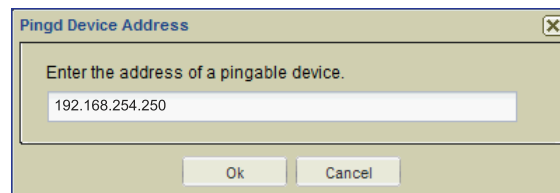
Figure 158. Node Test Page

Adding nodes

NOTE: Nodes can only be added on a VNM Enterprise Controller that is unpaired.

1. Using a web browser, navigate to the web-based user interface by entering the physical IP address (eth0) of the **redundant primary** VNM Enterprise Controller.
2. Select the Configuration page (see figure 158, ①).
3. Click on the **Node test** link (②).
4. Click **Add** at the bottom of the **Sources** list (③).

The following dialog box opens.



5. Enter the desired IP address and click **OK**.
6. Continue to add the IP addresses of from four to six VN-Matrix devices controlled by the VNM Enterprise Controller pair.
7. When finished, click **Apply Changes** (⑤).

NOTE: The **redundant secondary** VNM Enterprise Controller automatically matches its **Sources** list to the **redundant primary** VNM Enterprise Controller.

Deleting nodes

1. Using a web browser, navigate to the web-based user interface by entering the physical IP address (eth0) of the **redundant primary** VNM Enterprise Controller.
2. Select the **Configuration** page (see [figure 158](#), ❶ on the previous page).
3. Click on the **Node test** link (❷).
4. In the **Sources** list, select the node to delete.
5. Click **Delete** (❸) located below the **Sources** list to remove the selected IP address.

NOTE: The **redundant secondary** VNM Enterprise Controller automatically matches its **Sources** list to the **redundant primary** VNM Enterprise Controller.

Pairing the VNM Enterprise Controllers

NOTE: Before pairing the VNM Enterprise Controllers, the cluster IP address must be set (see [Setting the Cluster IP Address](#) on page 167).

Use the following procedure to pair the VNM Enterprise Controllers (see [Accessing the Web-based User Interface](#) on page 11 for information on how to login).

1. Using a web browser, navigate to the web-based user interface by entering the physical IP address (eth0) of the **redundant primary** VNM Enterprise Controller.
2. Click the **Configuration** tab.

The Configuration page opens (see figure 159, ①).

Figure 159. Configuration Page — Pairing the VNM Enterprise Controllers

3. Click the **Cluster** link (②).
4. Click **Pair** (③).

NOTES:

- Pairing the VNM Enterprise Controllers can take several minutes.
- After the VNM Enterprise Controllers are paired, it could be necessary to reconfigure the settings (see [Advanced Controller Configuration](#) on page 19).

Configuring VN-Matrix Devices for Dual VNM Enterprise Controllers

For the VNM Enterprise Controller to function properly:

- Update each VN-Matrix device so that the controller address of each device points to the cluster IP address of the VNM Enterprise Controllers and configure each device to operate on the same network as the VNM Enterprise Controllers.
- Access the VNM Enterprise Controller web-based user interface by entering the cluster IP address of the VNM Enterprise Controller pair into the address bar of the web browser.
- Use the web-based user interface to select a device from the **Devices** page and use the **Actions** menu bar at the bottom of the page to configure the selected device.

For additional information on configuring VN-Matrix devices to operate with the VNM Enterprise Controllers, see the user guide for each device.

About the Cluster Properties Pages

This section details the control options available using the Cluster and Node Test pages. Procedures relevant to these pages are also detailed in this section.

Cluster Page

The **Cluster** page is used to view and manage the pairing status of the controller (see figure 160).

Figure 160. Cluster Page

Status panel (A)

This panel contains four read-only fields that display the following information.

- **Active Cluster controller** — Displays which VNM Enterprise Controller (primary, secondary, or none) is acting as system primary.
- **Crossover status** — Displays the status of the crossover link between the primary and secondary VNM Enterprise Controllers.
- **Cluster** — Displays whether the primary and secondary controllers are paired together or unpaired.
- **Device Mode** — Displays the role of the controller that is logged into (for example, whether it is the primary or secondary controller).

Configuration panel (B)

Use this panel (see [figure 160](#), **B** on the previous page) to configure the following options.

NOTES:

- The **Cluster IP Address**, **Test Switch on Powerup**, and **Switch IP Address** fields can be configured using any VNM Enterprise Controller within the cluster.
 - The **Crossover Subnet** field must be individually set on each VNM Enterprise Controller within the cluster. The entered values must be identical.
- **Cluster IP Address** — This field is used to set the cluster (shared) IP address for the controller pair. This IP address is used as the controller address by the other devices in the VN-Matrix system. Both the primary and secondary VNM Enterprise Controllers (whichever one is active) use the cluster IP address for all system control communications. For information on setting the cluster IP address, see [Setting the Cluster IP Address](#) on page 167.
 - **Test Switch on Powerup** — Selecting this check box causes the primary and secondary VNM Enterprise Controllers, when first powered on, to wait until they are both able to communicate with the network switch before determining which controller (primary or secondary) is the best device to manage the VN-Matrix system.
 - **Switch IP Address** — This field is used to set the IP address of the network switch that is being used in the VN-Matrix system.

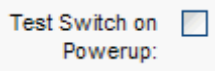
NOTE: This field must contain an IP address for the **Test Switch on Powerup** function to work.

- **Crossover Subnet** — This field displays the IP address of the crossover subnet Ethernet ports (eth1). The crossover subnet monitors the status of the primary and secondary VNM Enterprise Controllers when the system is configured for redundant operation. For information on setting the crossover subnet, see [Setting the Crossover Subnet IP Address \(Eth1\)](#) on page 168.

NOTE: This field can be edited when the VNM Enterprise Controller cluster is unpaired (see [Unpairing controllers](#) on page 174).

Setting the Test Switch on Powerup option

1. Select the **Test Switch on Powerup** check box to activate this option or deselect the check box to deactivate this option (see [figure 160](#), **B** on the previous page).



Test Switch on Powerup: ☐

2. Click **Apply Changes** (**D**), to save the setting.

Setting the switch IP address


1. In the **Switch IP Address** field (**B**), enter the desired IP address.



Switch IP Address:

2. Click **Apply Changes** (**D**), to save the setting.

Other cluster control functions

Two buttons are available at the bottom of the Cluster page used to manage the state of the controller pair (see [figure 160](#),  on page 172). The functions that are available are **Migrate**, **Pair**, and **Unpair**.


Pair and **Unpair** share a single button.

- **Migrate** — Clicking this button causes a controller pair to switch roles. The service provider (primary VNM Enterprise Controller) becomes the backup (secondary VNM Enterprise Controller) and the backup becomes the service provider.
- **Pair** — Clicking this button causes a set of controllers to pair together which initializes the service (cluster) IP address and sets the units to operate in a shared-role state.
- **Unpair** — Clicking this button causes a controller pair to unpair which stops the service (cluster) IP address and returns the units to independent states.

NOTE: An unpaired controller is not the same thing as a singleton. After unpairing, the primary and secondary VNM Enterprise Controllers will not perform their role as controllers until they have been paired back up.

Migrating a controller pair

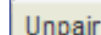
1. Using a web browser, navigate to the web-based user interface by entering the physical IP address (eth0) of the primary VNM Enterprise Controller, the physical IP address of the secondary VNM Enterprise Controller, or enter the service (cluster) IP address for the primary and secondary VNM Enterprise Controllers.
2. Navigate to the Configuration page.
3. Click on the **Cluster** link (see [Cluster Page](#) on page 172).
4. Click **Migrate** at the bottom of the screen.



NOTE: The web browser automatically logs out of the web-based user interface and returns to the login page.

Unpairing controllers

1. Using a web browser, navigate to the web-based user interface by entering the physical IP address (eth0) of the primary VNM Enterprise Controller, the physical IP address of the secondary VNM Enterprise Controller, or enter the service (cluster) IP address for the primary and secondary VNM Enterprise Controllers.
2. Navigate to the Configuration page.
3. Click on the **Cluster** link (see [Cluster Page](#) on page 172).
4. Click **Unpair** at the bottom of the screen.



NOTE: Unpairing the VNM Enterprise Controllers may take several minutes.

Pairing controllers

See [Pairing the VNM Enterprise Controllers](#) on page 171.

System Control

The VNM Enterprise Controller is used to configure and control a VN-Matrix system. When used as part of a larger installation, it is likely that there will be a third party control system that integrates all of the system equipment into a single control interface.

The VMN Enterprise Controller incorporates two methods of control to support this system architecture.

- **High Level Interface (HLI)** — The HLI is a control protocol that allows users to interface their control system with the devices on a VN-Matrix network. This is the main control protocol used with the VNM Enterprise Controller.
- **Command Line Interface (CLI)** — The CLI provides low level control of a VN-Matrix device. This is the control protocol that is used by the system controller to communicate with other VN-Matrix devices on the network. The CLI protocol contains a complex instruction set and requires a thorough understanding of VN-Matrix devices and their operation. This complexity makes the CLI unsuitable for most users with limited knowledge of a VN-Matrix system.

NOTE: The Command Line Interface protocol is not thoroughly documented in this user guide.

This section provides information on:

- [HLI Overview](#)
- [HLI Features](#)
- [HLI Connection and Control](#)
- [HLI Command Tables](#)

HLI Overview

The HLI is positioned **between** the CLI and the user control system. The HLI manages the underlying complexity of the CLI and presents a streamlined control method.

The HLI is accessed from the control computer over the VN-Matrix network or by direct connection using the COM1 serial connector (see [Rear Panel Features](#) on page 9) on the rear panel of the VNM Enterprise Controller.

HLI commands are sent to the VN-Matrix system using the following programs:

- Telnet (see [HLI Connection and Control](#) below).
- VNM Enterprise Controller web-based user interface (see [About the Web-based User Interface](#) on page 2).

NOTE: The commands detailed in the HLI command sections are commonly used to communicate with devices on a VN-Matrix network and represent a subset of the HLI command language.

HLI Features

HLI commands:

- Provide a single point of control for all VN-Matrix domains.
- Operate using TCP on port 9996 of the VNM Enterprise Controller.

HLI Connection and Control

HLI commands can be sent from the control computer to the Enterprise Controller using the serial port, the Ethernet port, or using the VNM Enterprise Controller Web-based user interface (see [HLI Command Examples](#) on page 212).

Ethernet Connection

The HLI can be accessed using TCP by initiating a Telnet connection to the IP address of the VNM Enterprise Controller on port number 9996.

NOTES:

- If the IP address has not changed, the factory default IP address of a VNM Enterprise Controller is 192.168.254.254.
- Ensure the Telnet service is installed.

Example: Connect to the HLI in Microsoft® Windows® operating systems using the command prompt:

```
C:\> telnet 192.168.254.254 9996 <enter>
```

Serial Port (COM) Connection

The VNM Enterprise Controller receives HLI commands from a control computer directly connected to the COM1 serial connector (see [Rear Panel Features](#) on page 9).

NOTE: The default configuration settings for the COM1 serial connector are:

- Com port – COM1
- Baud rate – 115200
- Parity bit – None
- Data bit – 8
- Start bit – None
- Stop bit – 1
- Flow control (handshake) – None

Using the VNM Enterprise Controller User Interface

To enter HLI commands into the VNM Enterprise Controller web-based user interface:

1. Access the web-based user interface (see [Accessing the Web-based User Interface](#) on page 11).
2. From the **Devices** page, select a device. If necessary, multiple devices can be selected by clicking the check boxes located on the left side of the Devices page (see [Devices Page Overview](#) on page 36).
3. At the bottom of the **Devices** page, select the **Misc** menu.

A menu list opens (see figure 161).

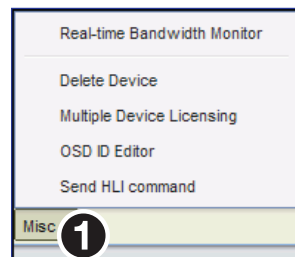


Figure 161. Misc Menu — Select "Send HLI Command"

4. Select **Send HLI command**. A HLI command window opens (see figure 162).

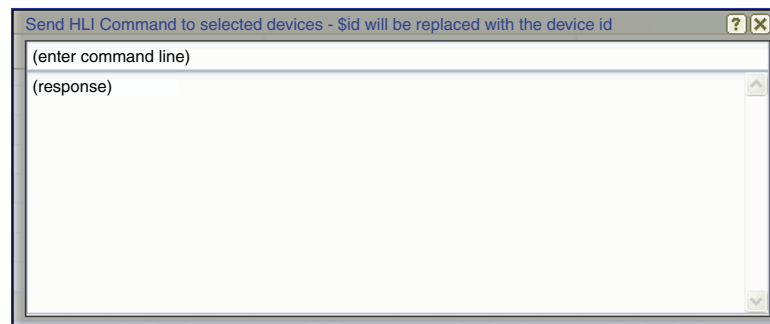


Figure 162. HLI Command Window

5. To send a command, click in the **(enter command line)** text box, and enter the desired HLI command. Press <Enter>.

The response appears in the lower portion of the window.

Click the **X** button in the upper right hand corner to close the HLI command window.

HLI Command Tables

HLI commands are listed in the reference section (see [HLI Command Overview](#) on page 211).

HLI general commands are used to:

- Control a specific function of a single device
- Build a connection between devices
- Modify the mode of a device
- Retrieve system information and monitor system status

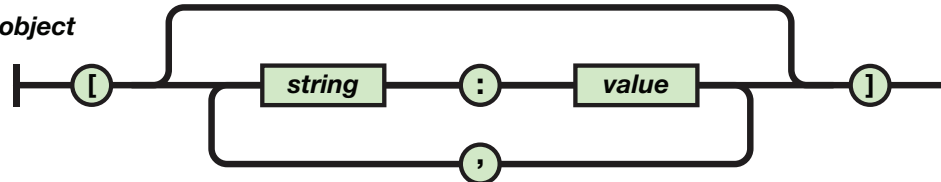
HLI preset commands are used to:

- Launch an action or series of actions
- Control and modify system configurations

HLI Responses

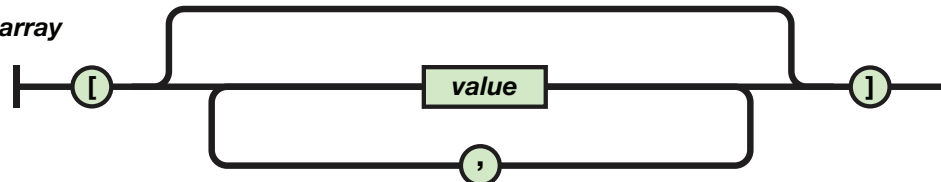
HLI responses are formatted using the Java Script Object Notation (JSON) format. Response strings consist of objects, arrays, and values.

object



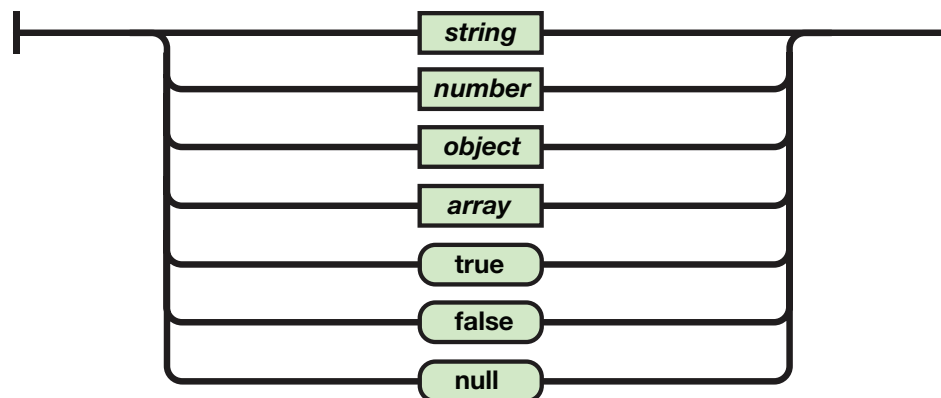
An object is an unordered set of name or value pairs. An object begins with a left brace ([) and ends with a right brace (]). Each name is followed by a colon (:) and the name or value pairs are separated by a comma (,).

array



An array is an ordered collection of values. An array begins with a left bracket([) and ends with a right bracket (]). Values are separated by a comma (,).

value



A value can be a string in double quotes, a number, true or false, null, an object, or an array. These structures can be nested.

Controller Firmware and License Updates

This section provides information about:

- [Updating the VNM Enterprise Controller License](#)
- [Updating the Firmware of a Single Enterprise Controller](#)
- [Updating the Firmware of Dual \(Redundant\) Enterprise Controllers](#)

Updating the VNM Enterprise Controller License

The VNM Enterprise Controller includes a basic license when purchased. Updating the license of the VNM Enterprise Controller enables the VN-Matrix system to operate with the VNM Software Decoder and the VNS 104 Multi-stream Software Decoder.

ATTENTION:

- **DO NOT place information for a device license** into the controller license panel. Doing this may cause the VNM Enterprise Controller to stop responding. This section provides information for **updating the VNM Enterprise Controller license** only.
- Ne pas mettre d'informations pour une licence VNM contrôleur entreprise dans ce menu. Si c'est le cas l'appareil risque d'arrêter de répondre. Cette section contient les informations nécessaires seulement pour mettre à jour la licence du contrôleur VNM Enterprise Controller.
- See [License Menu](#) on page 82 for information about device licenses.
- Voir le menu Licence à la page 82 pour obtenir des informations sur les licences d'appareils.

To update the VNM Enterprise Controller license:

1. Click the **Configuration** tab to open the page (see figure 163, ❶).

If login information is required, see [Accessing the Web-based User Interface](#) on page 11.

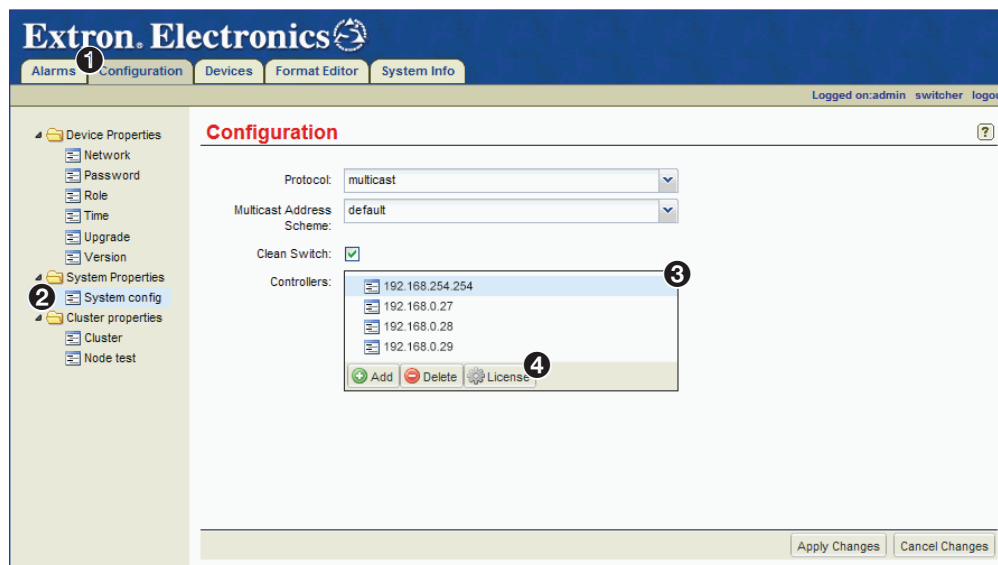


Figure 163. Configuration Page — Updating the Controller License

2. Click the **System config** link (❷).
3. From the **Controllers** field in the Configuration panel, select the IP address of the controller that requires a new license (❸).
4. Click **License** (❹).

The **Controller License Management** dialog box opens (see figure 164). Keep this window open.

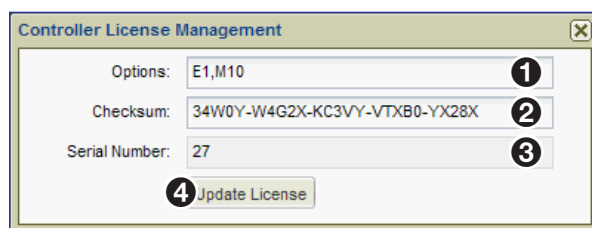


Figure 164. Controller License Management Dialog

5. Contact [Extron Sales Support](#) and provide the following information.
 - The **serial number** of the VNM Enterprise Controller (see figure 164, ❸). This can be obtained from the **Controller License Management** dialog in figure 164, or from the rear panel.
 - The **order number** of the VNM Enterprise Controller.

NOTE: Contact information is available on the last page of this user guide.

6. Extron Sales Support provides a **structure key** and a **license key**.
 - Enter the **structure key** in the **Options** field (❶).
 - Enter the **license key** in the **Checksum** field (❷).
7. Click **Update License** (❹) to assign the new license settings.
8. Click **X** in the upper right corner of the dialog box to close dialog box.

Updating the Firmware of a Single Enterprise Controller

Before starting this procedure, go to www.extron.com/download and download the latest version of the VNM Enterprise Controller firmware.

Use the following procedure to update the firmware of a single VNM Enterprise Controller (see [Accessing the Web-based User Interface](#) on page 11 for login information).

1. Click the **Configuration** tab (see figure 165, ❶).

The **Configuration** page opens.

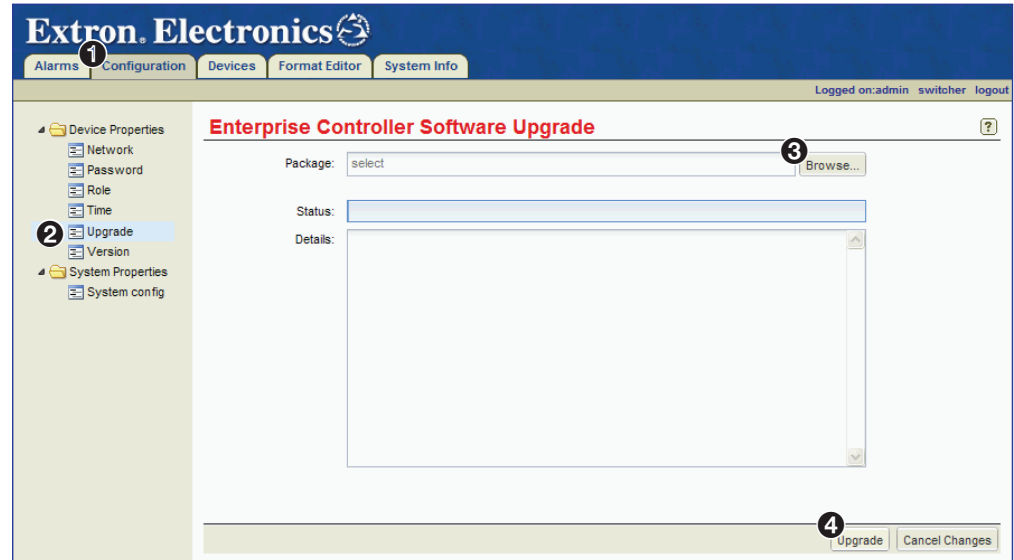


Figure 165. Configuration Page — Single Enterprise Controller

2. Click the **Upgrade** link (❷).
3. Click **Browse** (❸) to open a file browser to navigate to the location of the firmware file. Select the file and click **Open**.
4. Click **Upgrade** (❹) to start the firmware update.
5. When the update completes, power down the VNM Enterprise Controller and restart.

Updating the Firmware of Dual (Redundant) Enterprise Controllers

ATTENTION:

- The firmware update process for dual controllers deletes device configuration and presets files stored in the cluster folders. If you want to return the controllers to their pre-update configuration, those files must be temporarily saved to a secure location on a local PC before updating the firmware. After the update, the files must be restored.
- Le processus de mise à jour firmware pour double contrôleur supprime la configuration d'appareils et préregistre les fichiers enregistrés dans les dossiers partagés. Si vous souhaitez revenir à la configuration des contrôleurs avant leur mise à jour, ces fichiers doivent être temporairement sauvegardés à un endroit sécurisé sur un ordinateur local avant de mettre à jour le firmware. Après la mise à jour les fichiers sont restaurés.

The firmware update for dual controllers requires the following steps:

1. Download the firmware update from www.extron.com/download.
2. Save the device configuration and presets files to a local PC (see [Unpair the Controller Cluster](#) on page 186).
3. Unpair the controller cluster (see [Unpair the Controller Cluster](#) on page 186).

4. Update the redundant secondary controller (see [Update the Redundant Secondary Controller](#) on page 187).
5. Update the primary controller (see [Update the Primary Controller](#) on page 187).
6. Pair the two controllers (see [Pair the Controllers](#) on page 188).
7. Restore the device configuration and presets files from the local PC (see [Restore the Device Configuration and Presets Files](#) on page 189).

Download the Firmware Update File

Before starting this procedure, go to www.extron.com/download and download the latest version of the VNM Enterprise Controller firmware to a folder on the local PC.

Save the Device Configuration and Presets Files

Save the current device and configuration files using WinSCP, a free Windows application that allows the user to connect to the Enterprise Controller pair and copy the configuration data to a local folder on the connected PC.

To copy the device and preset files:

1. Download and install WinSCP on the local PC from www.winscp.net.
2. Open WinSCP and create a connection with the following parameters (see figure 166):

File Protocol	=	SFTP
Host Name	=	The Cluster IP address of your Enterprise Controller system.
Port Number	=	22
User Name	=	root
Password	=	Extron2010

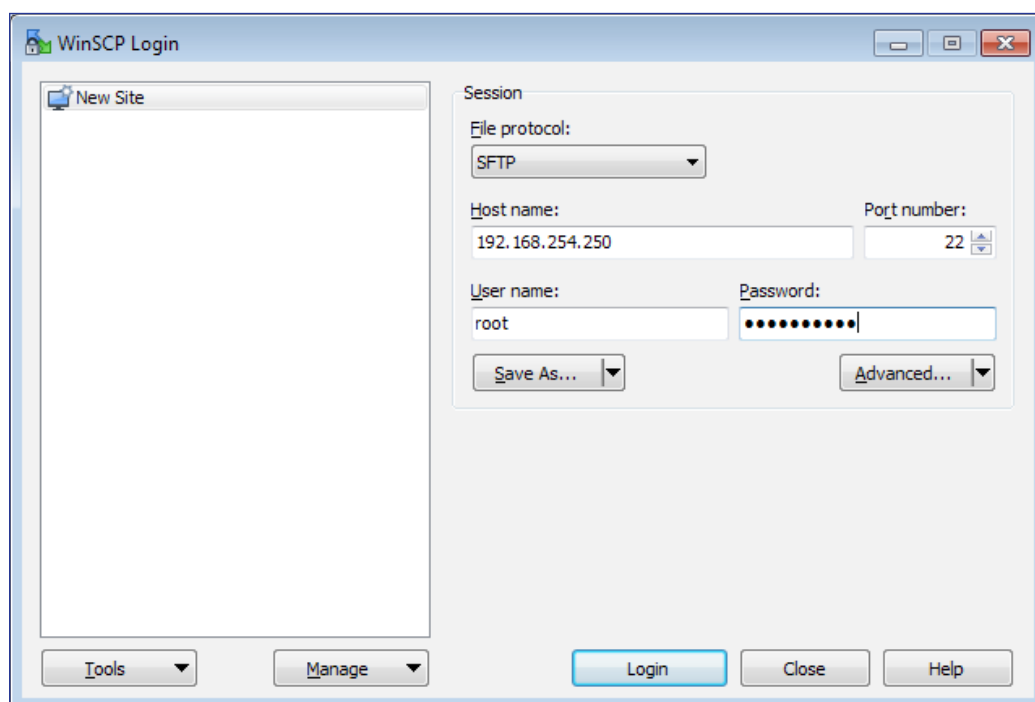


Figure 166. WinSCP Login Screen

3. When configuration is completed, click **Login**.

WinSCP connects to the Enterprise Controller **Cluster** and the following dialog opens:

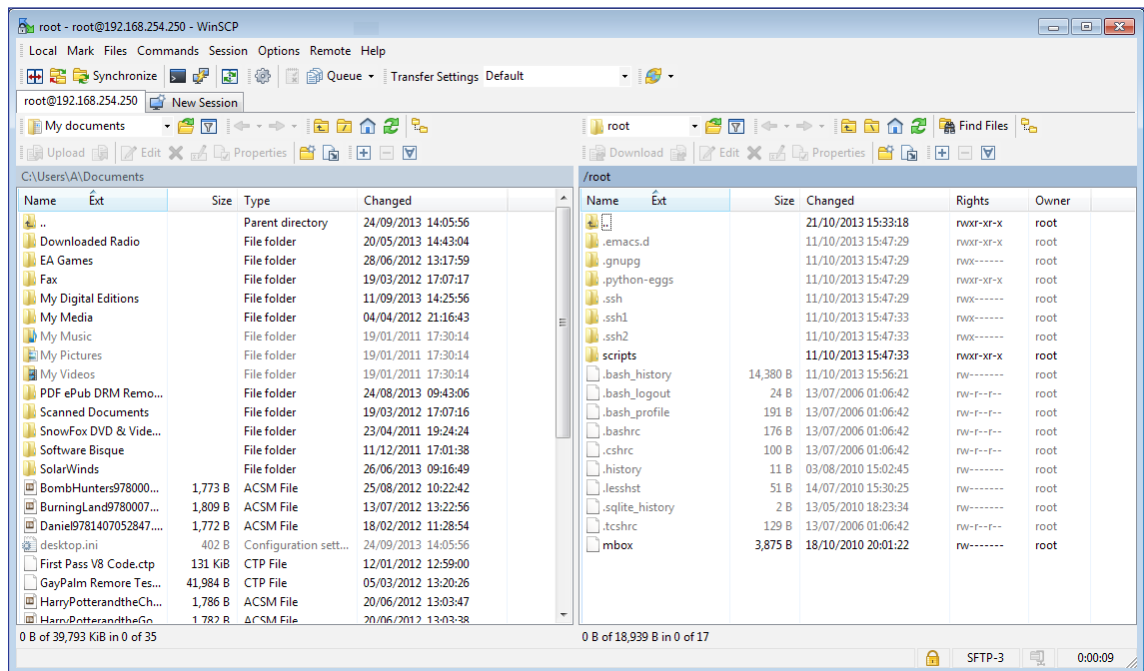


Figure 167. WinSCP Browser, Default View

The left pane defaults to the user documents folder on the local PC. If a different folder is desired, create and select it using the tools provided by WinSCP.

TIP: Create a new folder with an appropriate name that is easily identified as the cluster configuration, device configuration, and presets files.

The right pane defaults to the Enterprise Controller cluster **root** directory.

4. In the right pane, <double-click> the top folder to display the controller drive root.

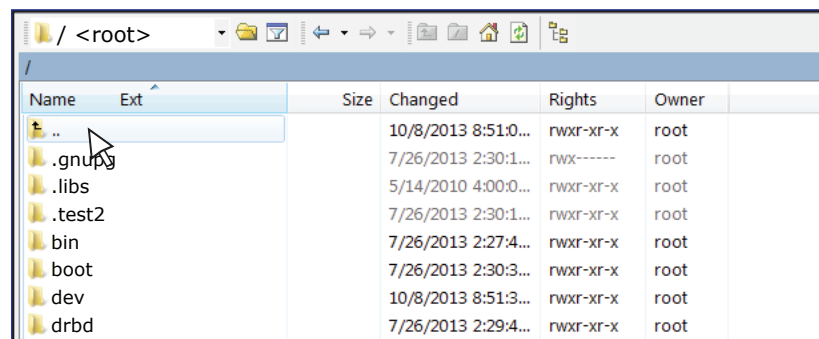


Figure 168. WinSCP Browser – Right Pane, Controller Root Folder

5. In the right pane, select the **/drbd/etc/vncontroller** folder.

6. In the **vncontroller** folder, select the following XML files:

devicexxxxxx.xml (all .xml files that begin with "device"),

User.Edid.Config.xml,

User.Output.Config.xml

User.Source.Config.xml.

Copy (**F5**) the files in the right pane, to the left pane user documents folder (EC Database in the example below) (see figure 169).

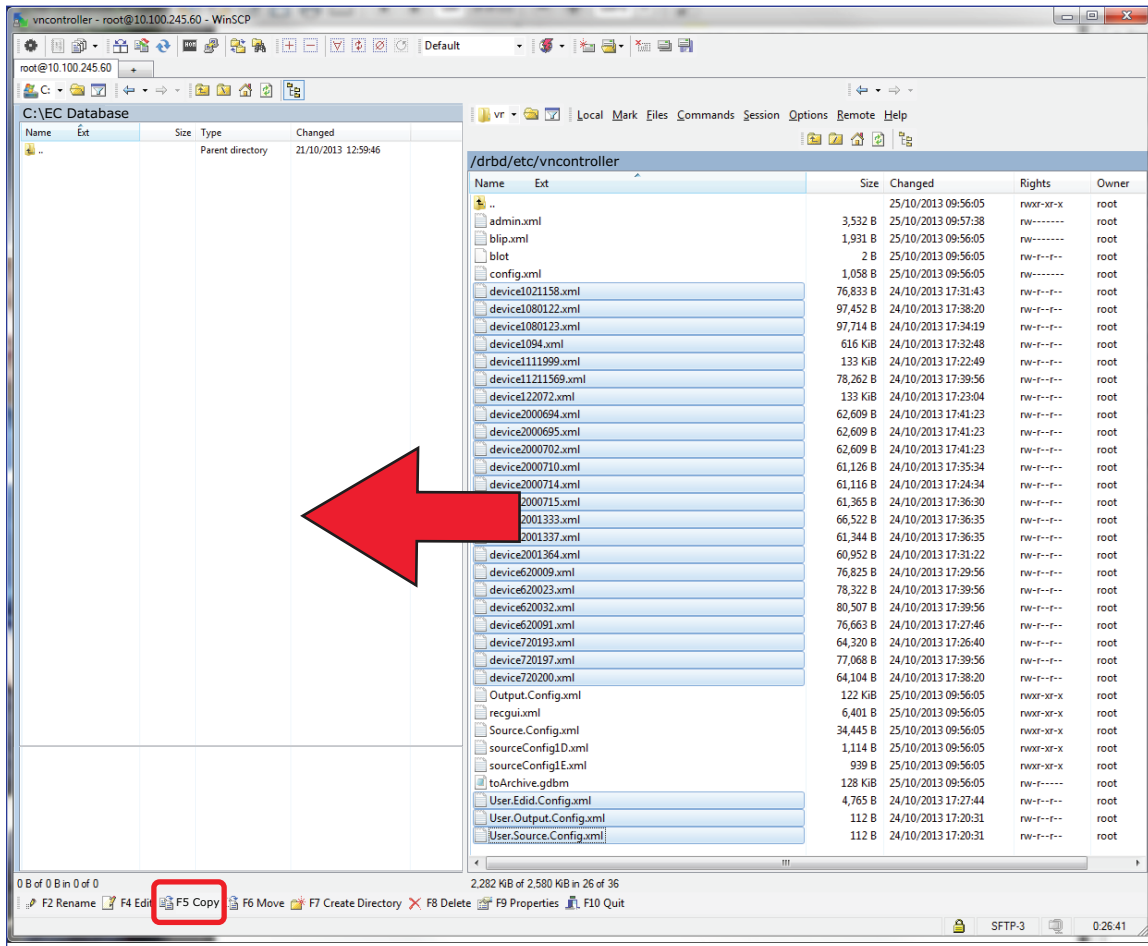


Figure 169. WinSCP Default Folders

7. In the right pane, browse to the `/drdb/var/lib/extron/matrix.hli` folder (see figure 170).
8. Copy the following files to the user documents folder (EC Database in the example below) in the left pane:

`graph.gdbm`

`layout.gdbm`

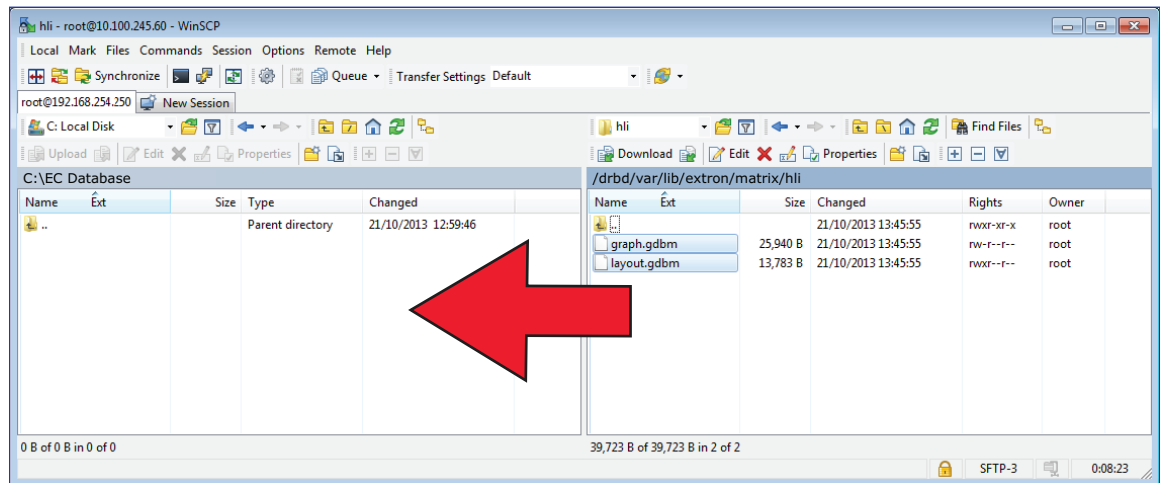


Figure 170. Copy Graph Files to PC User Folder

This completes the EC files backup.

Unpair the Controller Cluster

Before starting this procedure, go to www.extron.com/download and download the latest version of the VNM Enterprise Controller firmware. Note the file location you store it to.

The examples for this update procedure for the dual (redundant) VNM Enterprise Controllers use the following IP addresses:

Primary Redundant: 192.168.254.254

Secondary Redundant: 192.168.254.253

Cluster: 192.168.254.250

Copy your current IP addresses and substitute them in the appropriate update instructions.

See [Configuring Dual Enterprise Controllers as the System Controller](#) on page 165 for information on changing the IP address of the controllers, and [Accessing the Web-based User Interface](#) on page 11 for information on how to login.

1. Using a web browser, navigate to the web-based user interface by entering the **Cluster** IP address of the VNM Enterprise Controller pair.
2. Click the **Configuration** tab (see figure 171, ①).

The **Configuration** page opens.

Figure 171. Configuration Page — Cluster Controller

3. Click the **Cluster** link (②).
4. Click **Unpair** (③).

Update the Redundant Secondary Controller

1. When **Unpair** is complete, use a new browser window or tab to log on to the **redundant secondary** controller, in this example 192.168.254.253.
2. Select the **Configuration** tab (see figure 172, ❶).

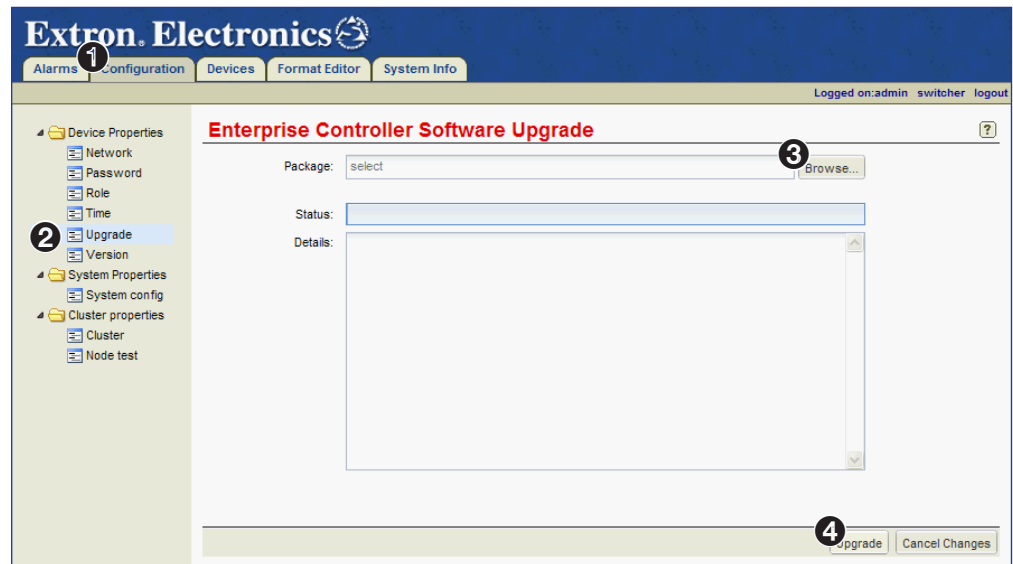


Figure 172. Configuration Page — Redundant Secondary Controller

3. Click the **Upgrade** link (❷).
4. Click **Browse** (❸). Use the file browser to navigate to the firmware file location. Select the file and click **Open**. The selected file location is now in the **Package** field.
5. Click **Upgrade**, (❹).

Update the Primary Controller

1. When the redundant controller upgrade completes, in a new browser window or tab, enter the IP address of the **Primary** VNM Enterprise Controller, in this example 192.168.254.254.
 2. Click the **Configuration** tab (see figure 173, ❶).
- The **Configuration** page opens.

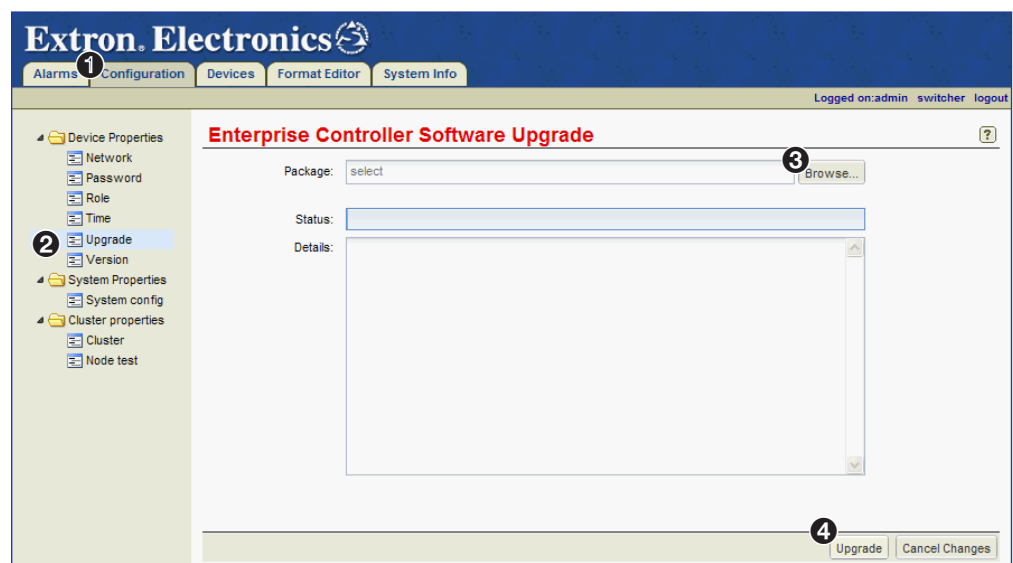


Figure 173. Configuration Page — Primary Controller Configuration Page

3. Click the **Upgrade** link in the left panel (see [figure 173](#), ② on the previous page).
4. Click **Browse** (③), and use the file browser to navigate to the firmware file location. Select the file and click **Open**.
5. Click **Upgrade**, (④).

Pair the Controllers

1. When the primary controller upgrade completes, click the **Configuration** tab (if the tab is not open).

The **Configuration** page opens (see figure 174, ①).

The screenshot displays the Extron Electronics web interface. The top navigation bar includes tabs for Alarms, Configuration (marked with ①), Devices, Preset Manager, Format Editor, and System Info. The left sidebar shows a tree view with categories like Device Properties, System Properties, and Cluster properties (marked with ②), where the 'Cluster' link is selected. The main content area is titled 'Cluster' and contains two sections: 'Status' and 'Configuration'. The 'Status' section shows fields for Active Cluster controller (none), Crossover status (connected), Cluster (unpaired), and Device Mode (redundant_primary). The 'Configuration' section includes fields for Cluster IP Address (192.168.254.250), a checkbox for Test Switch on Powerup, Switch IP Address (none), and Crossover Subnet (192.168.253.0). At the bottom, there are buttons for Migrate, Unpair, Pair (marked with ③), Apply Changes (marked with ④), and Cancel Changes. The top right corner indicates the user is logged on as 'admin' with a 'switcher' and 'logout' link.

Figure 174. Configuration Page — Primary Controller Pairing

2. Click the **Cluster** link (②).
3. Click **Pair** (③).
4. Click **Apply Changes** (④).

Note the Cluster IP Address, in this example: **192.168.254.250**.

Restore the Device Configuration and Presets Files

When the pairing process is complete, the device and presets files can be restored.

1. Reconnect WinSCP to the Enterprise Controller Cluster IP. Open WinSCP and create a connection with the following parameters (see figure 175):

File Protocol	=	SFTP
Host Name	=	The Cluster IP address of the upgraded Enterprise Controller system (192.168.254.250).
Port Number	=	22
User Name	=	root
Password	=	Extron2010

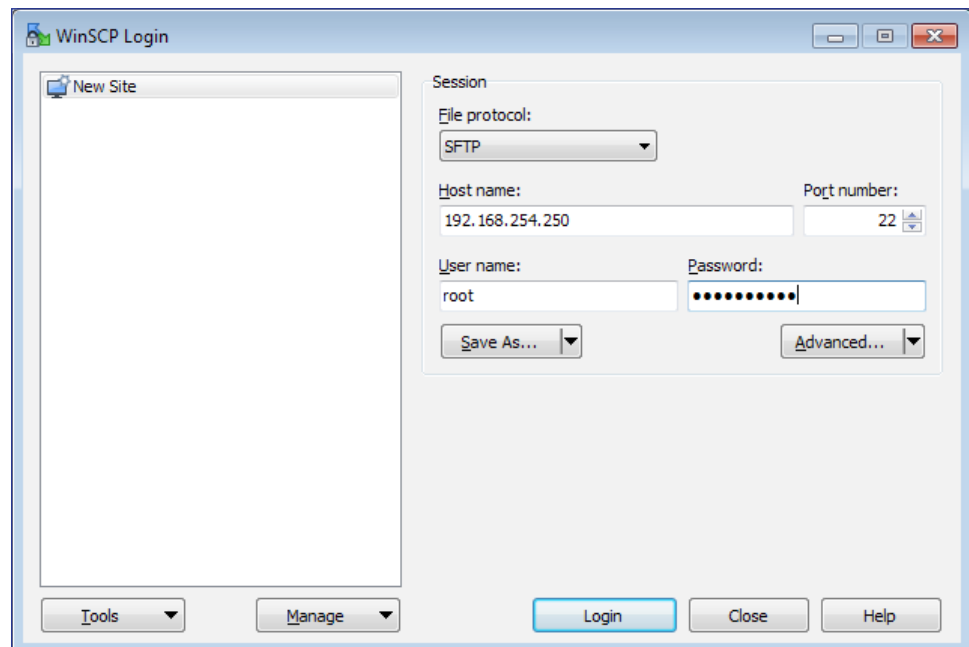


Figure 175. WinSCP Login Screen

2. When configuration is completed, click **Login**.

WinSCP connects to the Enterprise Controller Cluster and opens the following dialog:

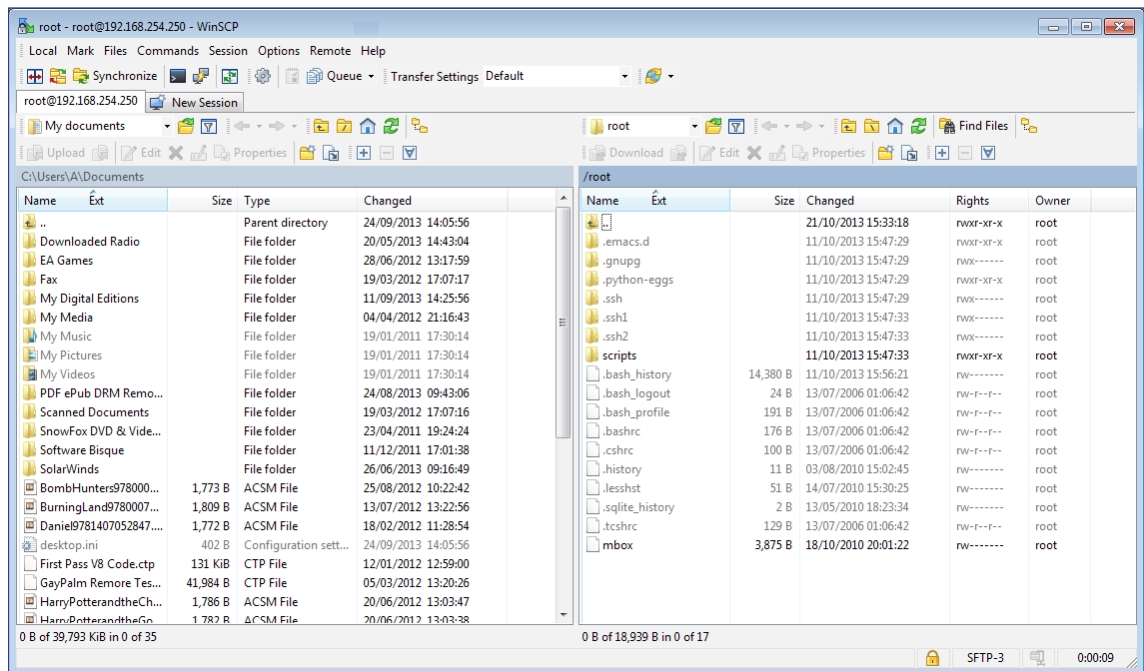


Figure 176. WinSCP Browser

The left pane defaults to the connected PC user documents folder. The right pane defaults to the Enterprise Controller cluster root directory.

3. In the left pane, navigate to the folder containing the previously saved XML files (see figure 177).
4. In the right pane, navigate to the server location:
 - /drdb/etc/vncontroller
5. From the the left pane, copy the following files to the server location (see figure 177).
 - devicexxxxxx.xml (all .xml files that begin with "device")
 - User.Edid.Config.xml
 - User.Output.Config.xml
 - User.Source.Config.xml

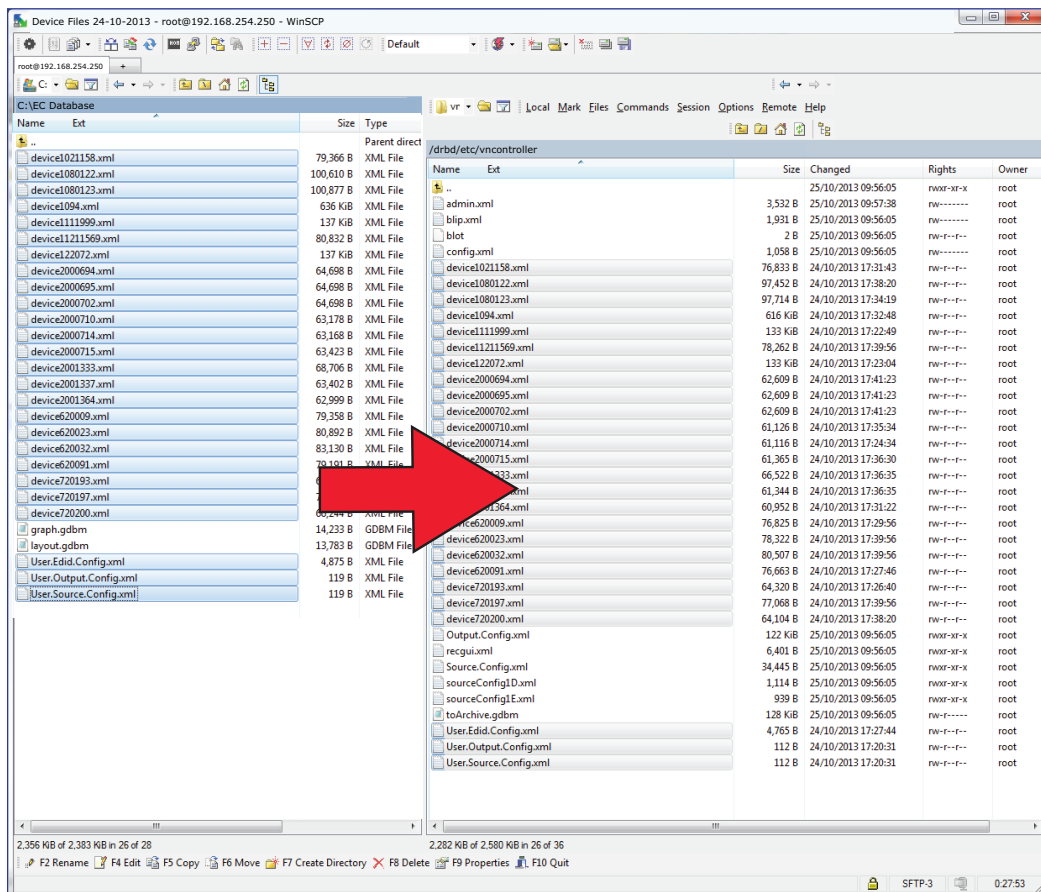


Figure 177. Copy Files to Enterprise Controller

6. After the files are copied, set the file permissions on the copied files to "rw-r--r--".
 - a. In the **right** pane, select (highlight) all of the copied files.
 - b. <Right-click> the selected files and choose **Properties** from the drop-down list. The following dialog opens.

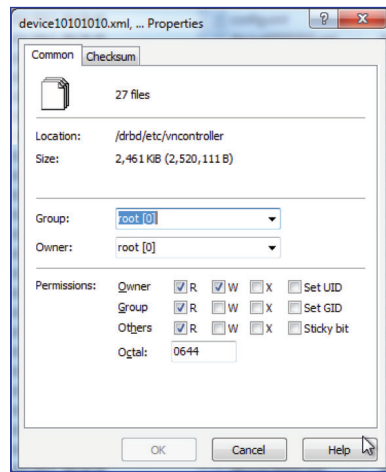


Figure 178. Change File Properties

- c. In the Permissions panel, enter **0644** in the Octal: field.
 - d. Click **OK** to close the dialog.
7. In the **right** pane, browse to the following folder (see figure 179):
/drbd/var.lib/extron/matrix.hli.

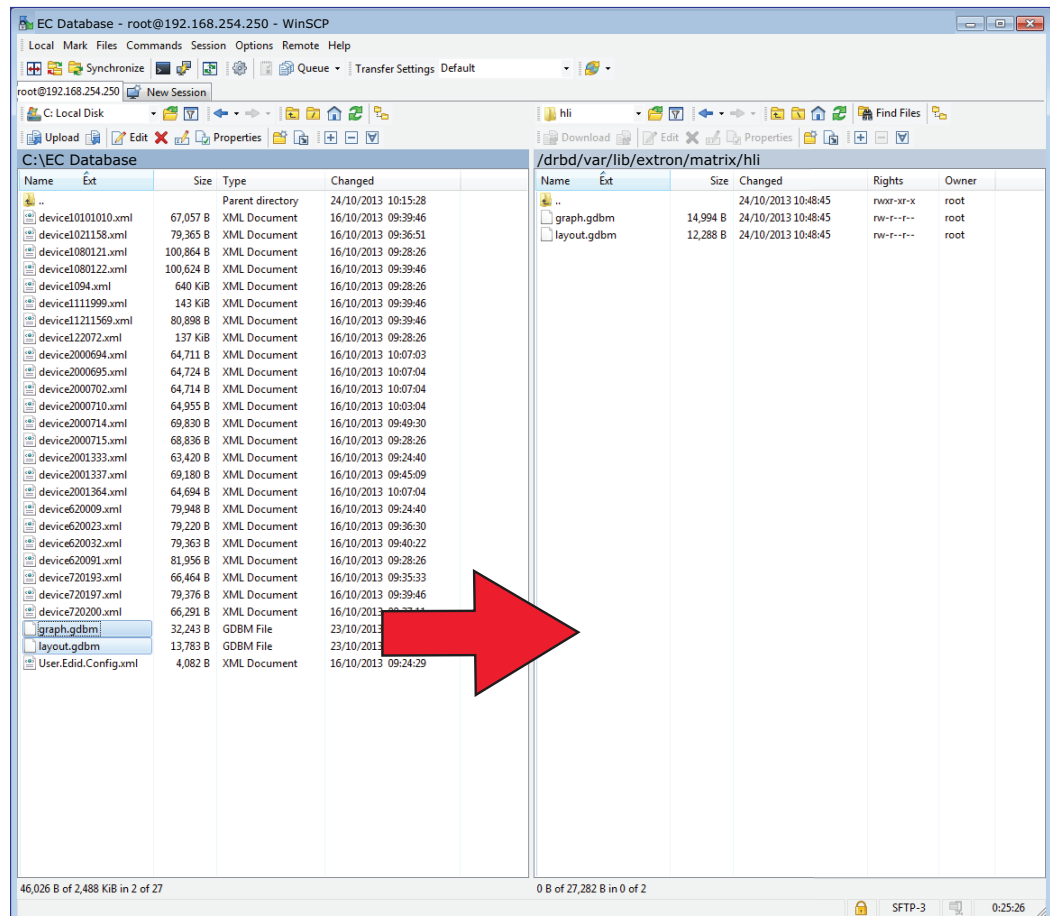


Figure 179. Copy Graph and Layout Files to Enterprise Controller

8. In the left pane, copy the following files to the right pane (see [figure 179](#) on the previous page):
 - `graph.gdbm`
 - `layout.gdbm`
9. After copying the files, in the right pane, select, then <right-click> `graph.gdbm`, and set the file permissions to "rw-rw-rw-" (**0666**), (see [step 6](#) on the previous page).
10. Click **OK** to close the dialog.
11. In the right pane, select, then <right-click> `layout.gdbm` and set the file permissions to "rwxr--r--" (**0744**), (see step 6 on the previous page).
12. Click **OK** to close the dialog.
13. Close or exit the WinSCP application.

This completes the EC files restore and the firmware upgrade.

Remove power from both Enterprise Controllers.

Reapply power. When the system boots, the new firmware is installed and the system returns to its previous operational state.

VN-Matrix Product Variants

The VNM Enterprise Controller is used with other products in the VN-Matrix range. The preceding sections of this user guide deal specifically with the configuration of the VNM Enterprise Controller with examples based on VN-Matrix systems that use VN-Matrix devices.

This section of the user guide provides information on the configuration and control of the other VN-Matrix Enterprise Controller variants and their operation with the VNM Enterprise Controller.

The following topics are covered in this section:

- [VNM Enterprise Controller with CompactFlash Overview](#)
- [Installing and Configuring the CompactFlash Replacement Card](#)

VNM Enterprise Controller with CompactFlash Overview

The VNM Enterprise Controller is available with an installed CompactFlash (CF) card. This card replaces the internal hard drive of the VNM Enterprise Controller. The CompactFlash VNM Enterprise Controller operates in the same way as the hard drive VNM Enterprise Controller and provides a removable operating system drive for secure operation in critical applications. The CompactFlash card is installed on the front panel of the VNM Enterprise Controller where the CD/DVD drive is located.

The CompactFlash card can be replaced, if necessary (see [Installing and Configuring the CompactFlash Replacement Card](#) below for information).

Installing and Configuring the CompactFlash Replacement Card

This section details the basic information needed to replace and configure an existing VNM Enterprise Controller CompactFlash card.

The replacement CF card is pre-configured with the following settings.

IP address: 192.168.254.254
Username: admin
Password: <No password is set>

Obtain the Configuration Settings of the VNM Enterprise Controller

Before replacing the VNM Enterprise Controller CF card, use the following steps to collect information about the current system configuration. The collected information should be copied and pasted into a text program (for example, Notepad).

ATTENTION:

- The licensing information must be written accurately. Copying incorrect data to the replacement CF card results in a non-functional unit.
- L'information concernant l'octroi de licences doit être écrit avec précision. Le fait de copier des données incorrectes sur la carte CF de remplacement donne lieu à une unité non fonctionnelle.

1. Ensure the VNM Enterprise Controller has a CF card installed.
2. Power on the VNM Enterprise Controller.
3. Configure the network settings of a control PC so that it is compatible with the VN-Matrix network. Connect the control PC to the VN-Matrix network.
4. Open a web browser on the control PC and type in the IP address of the VNM Enterprise Controller in the address bar (the default address is `http://192.168.254.254`). The login page opens (see figure 180).

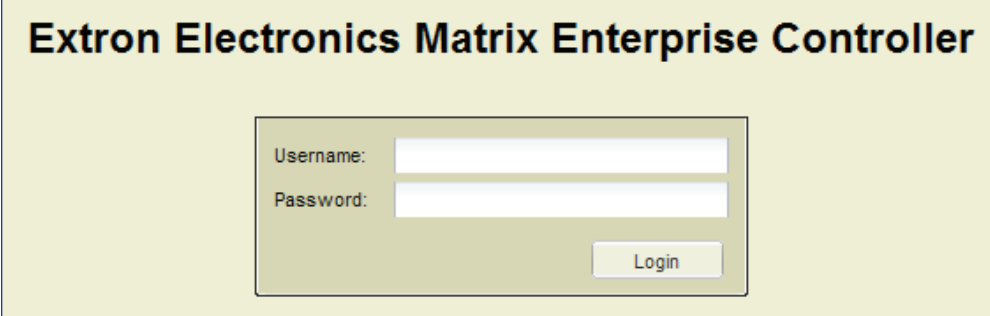


Figure 180. VNM Enterprise Controller Login Page

5. Enter the appropriate username and password.

NOTE: The default username is **admin**. By default, no password is required. These entries are case sensitive.

6. Click **Login** or press <Enter>. The **Devices** page opens (see [About the Devices Page](#) on page 36).

7. From the **Devices** page, click the **Configuration** tab.
The **Configuration** page opens (see figure 181, ①).

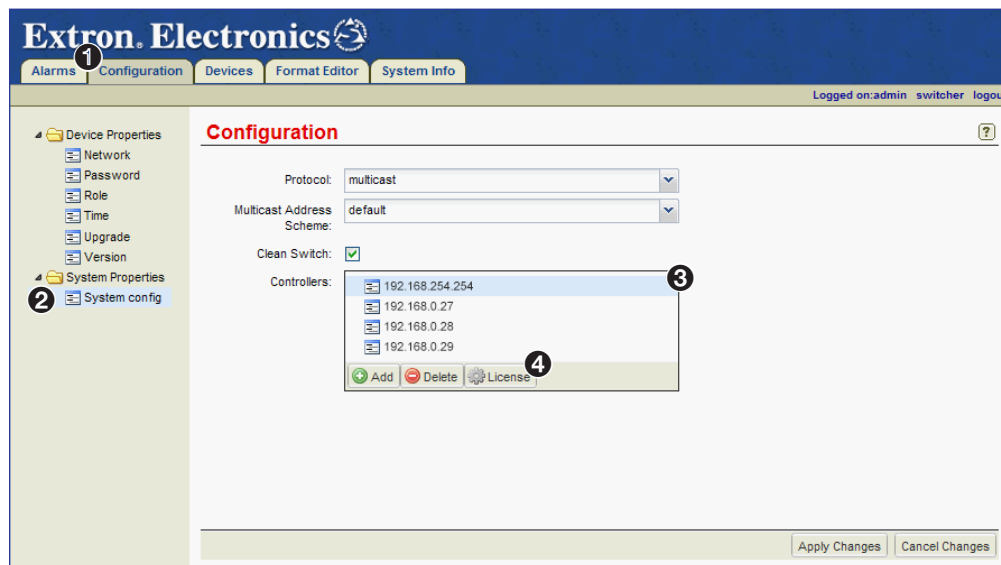
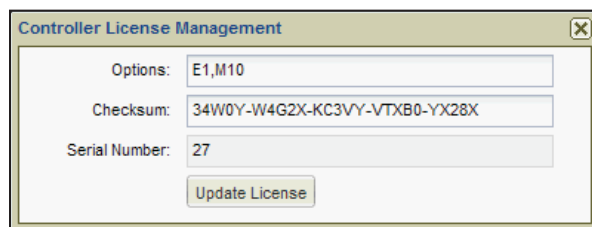


Figure 181. Configuration Page

8. Click the **System Config** link (②).
9. In the **Controllers** field click on the IP address of **this** VNM Enterprise Controller (③).
10. Click **License** (④).

The **Controller License Management** dialog opens.



11. Copy the values from the **Options**, **Checksum**, and **Serial Number** fields.

ATTENTION:

- The licensing information must be written accurately. Copying incorrect data to the replacement CF card results in a non-functional unit.
- L'information concernant l'octroi de licences doit être écrit avec précision. Le fait de copier des données incorrectes sur la carte CF de remplacement donne lieu à une unité non fonctionnelle.

12. Close the web browser on the control PC.

Install the CompactFlash Card

NOTE: The replacement CF card must be programmed with the correct operating system and VNM Enterprise Controller application files. Only use CF cards supplied by Extron.

1. Power down the VNM Enterprise Controller and remove the front cover plate from the CF drive (see [Front Panel Features](#) on page 7).
2. Eject the CF card from the CF drive and insert the replacement CF card.
3. Replace the CF drive front cover plate.

Configure the Settings of the VNM Enterprise Controller

After the CF card is replaced, the VNM Enterprise Controller is returned to its default configuration settings and must be configured using the settings obtained in [Obtain the Configuration Settings of the VNM Enterprise Controller](#) on page 195.

Use the following procedures to configure the new CF card.

Set the serial number

1. Connect a mouse, keyboard, and monitor to the VNM Enterprise Controller (see [Rear Panel Features](#) on page 9).
2. Power on the VNM Enterprise Controller.
3. When fully booted up, log into the VNM Enterprise Controller.

NOTE: The default username is **root**. The default password is **Extron2010**. These entries are case sensitive.

4. At the prompt `[root@singleton ~]#`
 - Type `cd scripts`
 - Press <Enter>
5. At the prompt `[root@singleton scripts]#`
 - Type `./set_serial.sh xxxxxx`
where xxxxxx is the serial number of the VNM Enterprise Controller saved in step **11** of [Obtain the Configuration Settings of the VNM Enterprise Controller](#) on page 195.
 - Press <Enter>
A script runs, entering the serial number into the VNM Enterprise Controller.
6. At the prompt `[root@singleton ~]#`
 - Type `reboot`
 - Press <Enter>
The VNM Enterprise Controller reboots.

License configuration

1. After the VNM Enterprise Controller has rebooted, configure the network settings of a control PC so that it is compatible with the VN-Matrix network. Connect the control PC to the VN-Matrix network.

NOTE: The control PC must use an IP address within 192.168.254.2 to 192.168.254.253 and a subnet mask of 255.255.255.0.

2. Open a web browser on the control PC and type the IP address of the VNM Enterprise Controller in the address bar (the default address is **http://192.168.254.254**). The login page opens in the browser.
3. Enter the default username and password.

NOTE: The default username is **admin**. By default, no password is required. These entries are case sensitive.

4. Click **Login** or press <Enter>.
The **Devices** page opens.
5. Click the **Configuration** tab (see figure 182, ①).
The **Configuration** page opens.

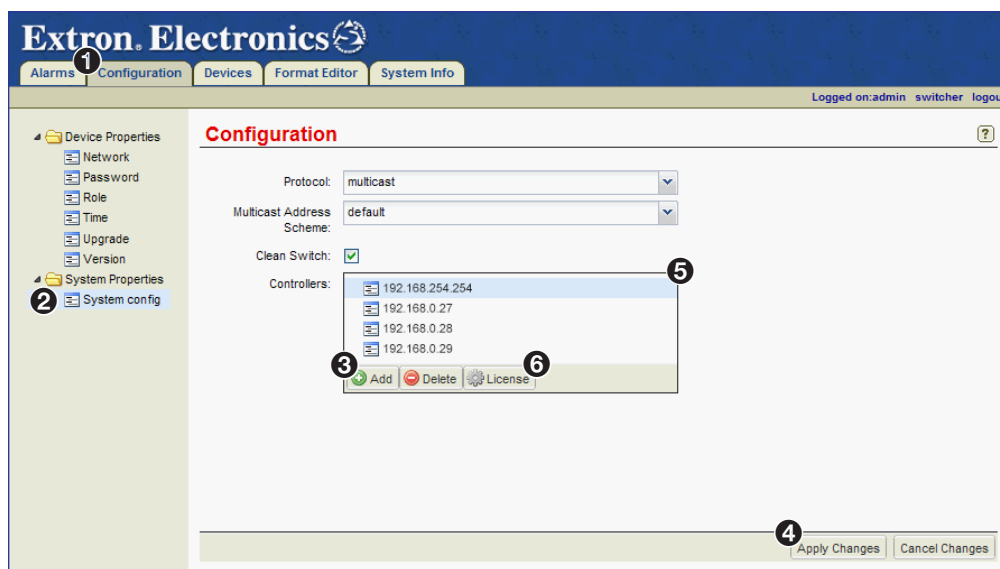
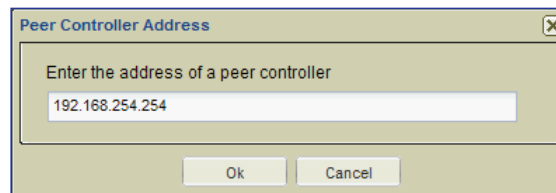


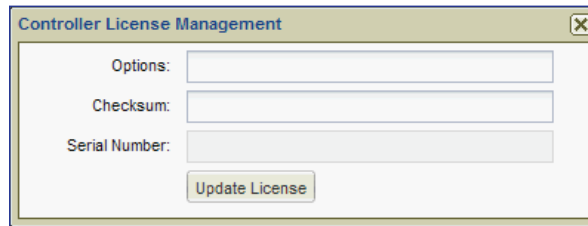
Figure 182. Configuration Page

6. Click the **System Config** link (②).
7. In the **Controllers** field, click the **Add** button (③).
The **Peer Controller Address** dialog box opens.
8. Enter the IP address of **this** VNM Enterprise Controller and click **OK**.
9. Click **Apply Changes** (④) to save the settings.
10. In the **Controllers** field (⑤), select the IP address of **this** VNM Enterprise Controller.
11. Click **License** (⑥).



The **Controller License Management** dialog box opens (see figure 183).

12. Enter the information previously saved (see [Obtain the Configuration Settings of the VNM Enterprise Controller](#) on page 195) into the **Options**, **Checksum**, and **Serial Number** fields and click **Update License**.



The screenshot shows a dialog box titled "Controller License Management". Inside the dialog, there are three text input fields. The first is labeled "Options:", the second is labeled "Checksum:", and the third is labeled "Serial Number:". Below these fields is a button labeled "Update License". The dialog box has a standard Windows-style title bar with a close button (X) in the top right corner.

Figure 183. Controller License Management Dialog

ATTENTION:

- The licensing information must be entered correctly. Entering incorrect information results in a non-functional unit.
- L'information concernant l'octroi de licences doit être écrit avec précision. Le fait de copier des données incorrectes sur la carte CF de remplacement donne lieu à une unité non fonctionnelle.

NOTE: After clicking **Update License**, there is no feedback provided to show that the license information has been accepted.

13. To check the license information, restart the VNM Enterprise Controller. Reconnect to the VNM Enterprise Controller by opening a web browser on the control PC and view the license information in the **Controller License Management** dialog box.

NOTE: The information in the **Controller License Management** dialog box takes several seconds to appear after the VNM Enterprise Controller has rebooted.

- If the information does not appear, close the dialog box, wait for ten seconds and retry.
- If the information is still not present, enter the serial number and license data again.

The VNM Enterprise Controller can now be configured for operation with the VN-Matrix system (see [Advanced Controller Configuration](#) on page 19).

Browser Configuration

This section provides information on configuring the following web browsers:

- **Microsoft® Internet Explorer® (version 7 or above)**
- **Mozilla Firefox (version 1.3 or above)**

Microsoft Internet Explorer (version 7 or above)

1. Open Internet Explorer and select **Tools > Internet Options**. The Internet Options dialog opens (see figure 184).



Figure 184. Internet Options

2. To enable cookies, select the **Privacy** tab (1) and (if required) adjust the slider control (2) to set the required security level. VN-Matrix systems operate correctly using security that **does not** exceed the **Medium High** setting.

NOTE: Setting the security slider to block all cookies prevents the VN-Matrix web interface from operating.

TIP: If a high security level is required, click on the **Edit** button (3) and allow the VN-Matrix web interface to use cookies (see [figure 185](#) on the next page).

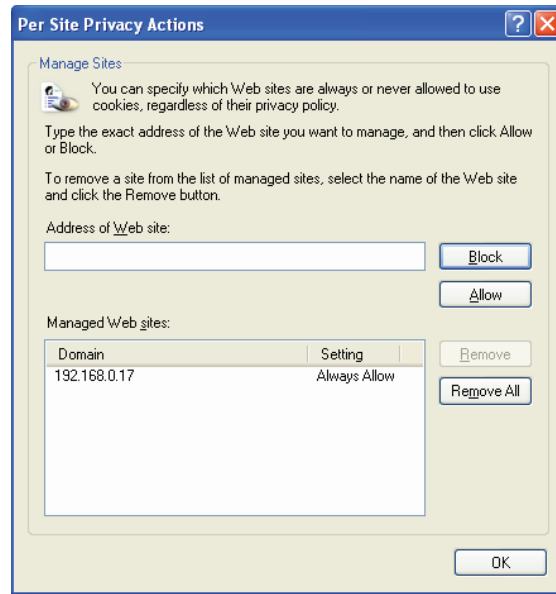


Figure 185. Per Site Internet Options

3. To enable JavaScript, select the **Security** tab (see figure 186, ①).

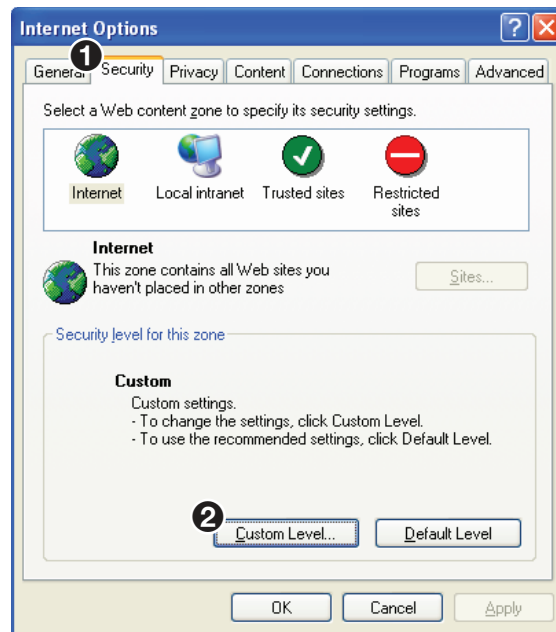


Figure 186. Security Options

4. Click **Custom Level** (②).

The **Security Settings** dialog box opens (see figure 187).

5. Scroll down to the **Scripting** setting and under **Active scripting**, select **Enable** (1).

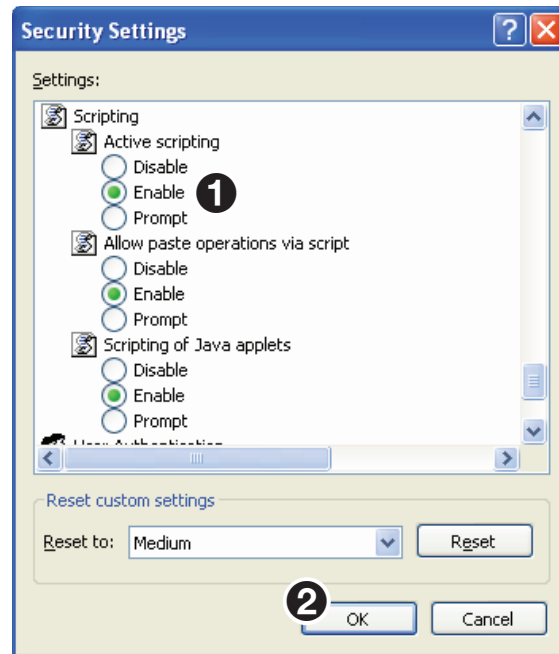


Figure 187. Custom Level Security Options

6. Click **OK** (2) on both dialog boxes to save the new settings and close the dialogs.

Mozilla Firefox (version 1.3 or above)

1. Open Mozilla Firefox and select **Edit > Preferences**.

The **Preferences** dialog box opens (see figure 188).

2. To enable cookies, go to the **Privacy & Security** category and choose **Cookies** (see figure 188, 1).

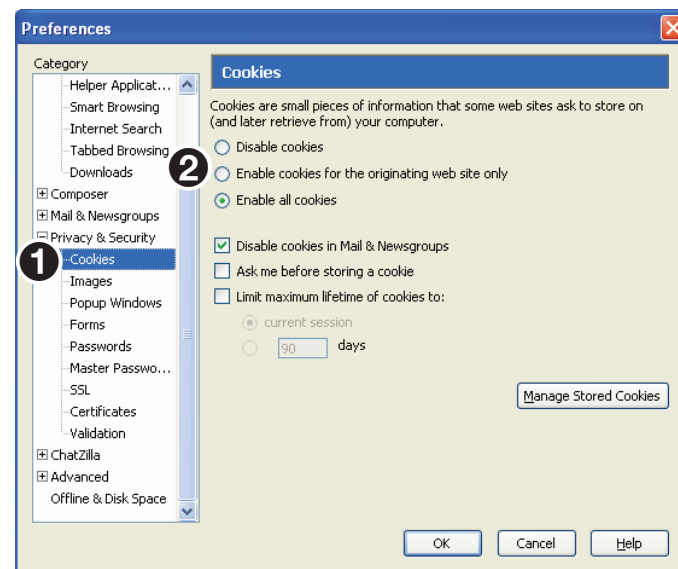


Figure 188. Cookie Preferences

3. Ensure that either the **Enable all cookies** or **Enable cookies for the originating web site only** (2) option is selected.

4. To enable JavaScript, go to the **Advanced** category and choose **Scripts & Plugins** (see figure 189, ❶).

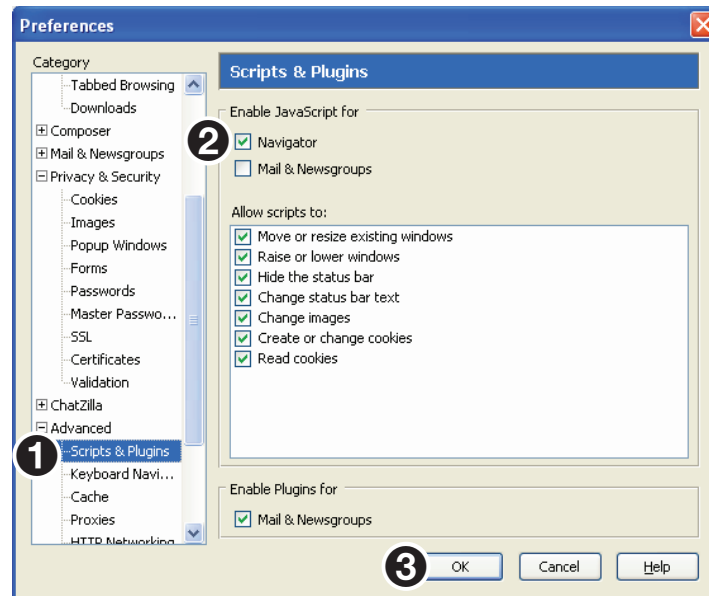


Figure 189. Scripts and Plugins Preferences

5. Ensure that the **Enable JavaScript for Navigator** (❷) option is selected.
6. Click **OK** (❸) to close the dialog box and save the settings.

Reference Information

This section provides information about:

- [Default Factory Settings](#)
- [VN-Matrix System Port Usage](#)
- [Mounting](#)
- [HLI Command Overview](#)
- [HLI Command Examples](#)
- [General Commands](#)
- [Preset Commands](#)

Default Factory Settings

Network settings (ETH0)	IP address	192.168.254.254
	Subnet mask	255.255.255.0
	Gateway address	192.168.254.1

VN-Matrix System Port Usage

The VN-Matrix system uses a variety of network port numbers for streaming and inter-communication functions. Just as the universal "telnet" function typically uses TCP port number 23, VN-Matrix systems use specific port numbers for operation.

The table on the following page lists the port numbers used by the VN-Matrix series products. The port numbers are, in most cases, for the sender. Port numbers used for receiving are less important in regards to security.

When configuring a network, make sure it allows traffic on the ports required for your given application. The ports highlighted in **yellow** accommodate most simple applications.

Port	Transport	Usage
69	UDP	TFTP Server, for firmware upgrades.
80	TCP	HTTP data for communication between the web browser and the Enterprise Controller. Value is user definable; the default is 80.
554	TCP	Real-time streaming protocol (RTSP) server.
5432	UDP	Enterprise Controller outgoing and incoming control messages used on the device acting as controller to communicate with other VN-Matrix devices. Value is user definable; the default is 5432.
5555	TCP	Old XML interface and old VN-Matrix recorder software application. No longer used.
9998	TCP	Telnet Command Line Interface (CLI) messages to the controller used for sending text-based control commands.
9999	TCP	Deprecated: Old remote control server, replaced by CLI (port 9998).
23	TCP	Telnet (can be disabled).
161	UDP	Simple network management protocol (SNMP) used for alarm access.
199	TCP	Simple network management protocol (SNMP) used for alarm access.
4002	TCP	Source stream information, used to telnet to a VN-Matrix decoder to view information about the source it is decoding.
5002	TCP	Serial port bidirectional protocol (not data channel streaming).
6666	TCP	Keyboard and mouse forwarding.
7777	UDP	Upgrade daemon, local access only.
8000-8098 (even)	UDP	RTP unicast or RTP multicast audio, video, whiteboard, and data streams used as the port number of the destination (receiver). The controller selects a port number, starting at 8000.
8001-8099 (odd)	UDP	RTCP channel for audio, video, whiteboard, and data streams used as the port number of the destination (receiver). Grouped with the even-numbered stream (8000 with 8001, 8002 with 8003, and so on).
8000	TCP	Video streams, used as the port number of the source (sender).
8100	TCP	Audio streams, used as the port number of the source (sender).
8200	TCP	Whiteboard streams, used as the port number of the source (sender).
8201	TCP	Data streams, used as the port number of the source (sender).
9000	TCP	HSI interface when using ThorDebug.
9001	UDP	VN-Matrix outgoing and incoming control messages. Communicates with port 5432 (or the user defined port number) on the Enterprise Controller.
9002	UDP	Default port for collecting UDP traffic for data transport. Value is user-definable.
9996	TCP	HLI server port.
9997	TCP	Annotation server port.

Mounting

Rack Installation

This section provides information on installing the controller into a rack cabinet. Rack installation requires the use of the optional rack mount kit.

There are a variety of rack cabinets on the market, which may mean the assembly procedure will differ slightly. If necessary, refer to the instructions that came with the rack cabinet to complete the rack installation.

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

- 1. Elevated operating ambient temperature** — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (TMA: +122 °F, +50 °C) specified by Extron.
- 2. Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
- 3. Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- 4. Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider the equipment nameplate ratings when addressing this concern.
- 5. Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Basic Rack Mounting

The VNM Enterprise Controller comes with two rack mounting brackets, located on each side at the front of the chassis. To mount the controller, screw these brackets directly to the front of the rack using two screws for each bracket (see figure 190).

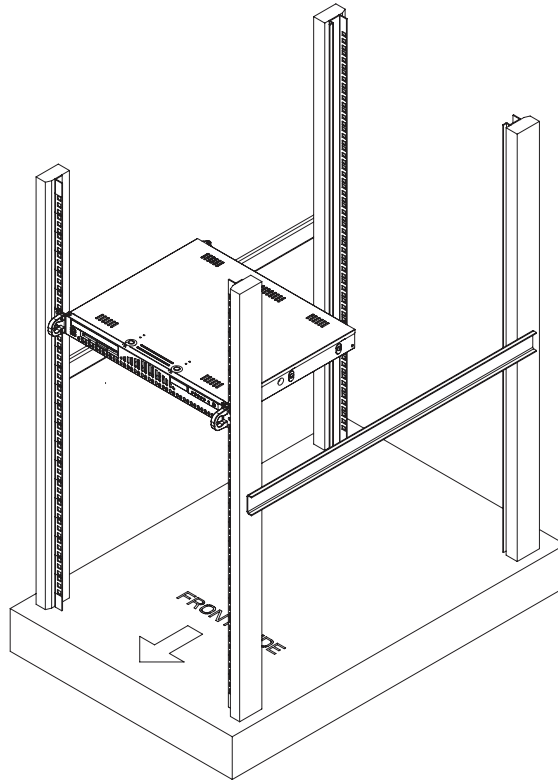


Figure 190. Basic Rack Installation

Rack Mounting Using Rack Rails

The supplied rack mount kit includes two rack rail assemblies. Each of these assemblies consist of three sections: an inner fixed rail that secures to the controller frame (see figure 191, **(A)**) an outer rack rail that secures directly to the rack (**(B)**), and two rail brackets (**(C)**) that also attach to the rack.

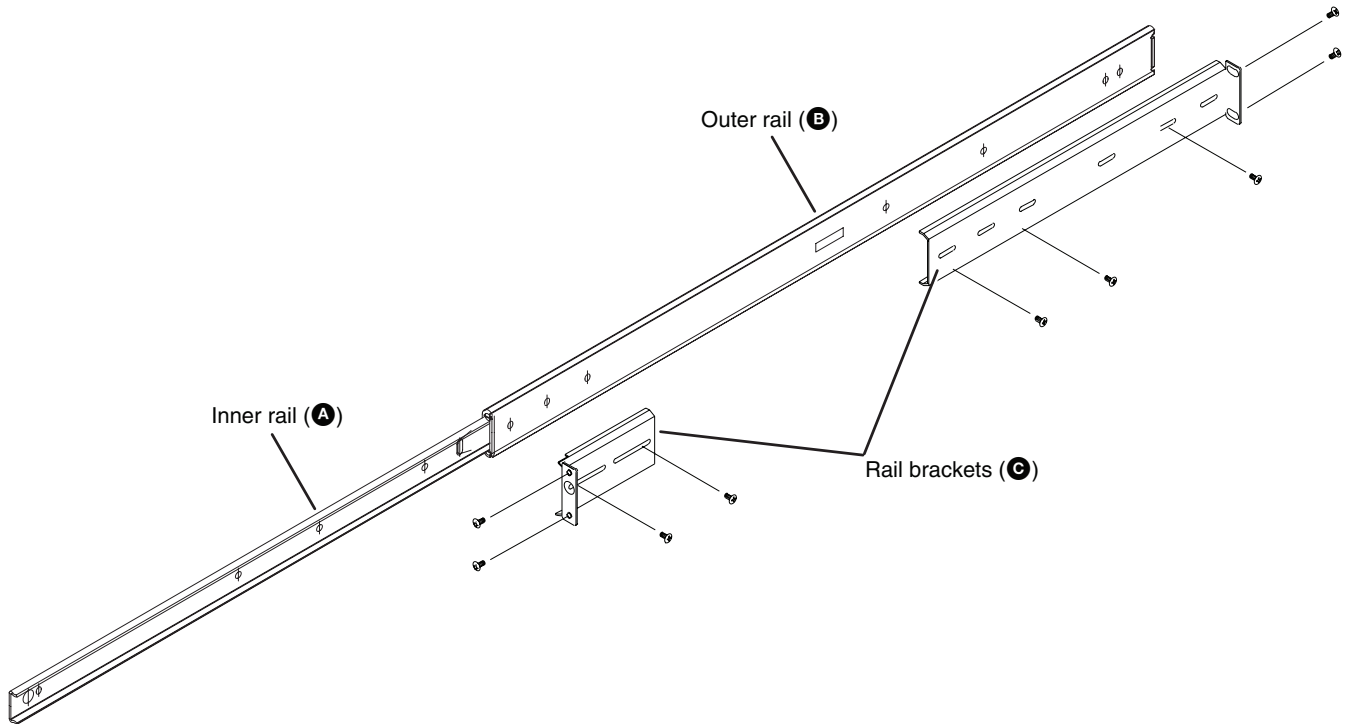


Figure 191. Identifying the Sections of the Rack Rails

To install the controller into a rack, follow the steps below.

1. Remove the inner rail (**(A)**) by pulling it out as far as possible. A locking tab prevents the rail from pulling all the way out, and makes a clicking noise when the rail is fully extended. Depress the locking tab to pull the inner rail completely out. Do this for both assemblies (one for each side).

NOTE: Each rail has a locking tab serving two functions. The first is to lock the controller in place when installed and pushed fully into the rack. Secondly, the tabs lock the controller in place when fully extended from the rack to prevent pulling the controller completely out of the rack.

2. Align each inner rail (A) to the screw holes located on the left and right side of the controller. Secure the rails to the sides of the controller frame (see figure 192).

NOTE: The two inner rail assemblies are left and right specific.

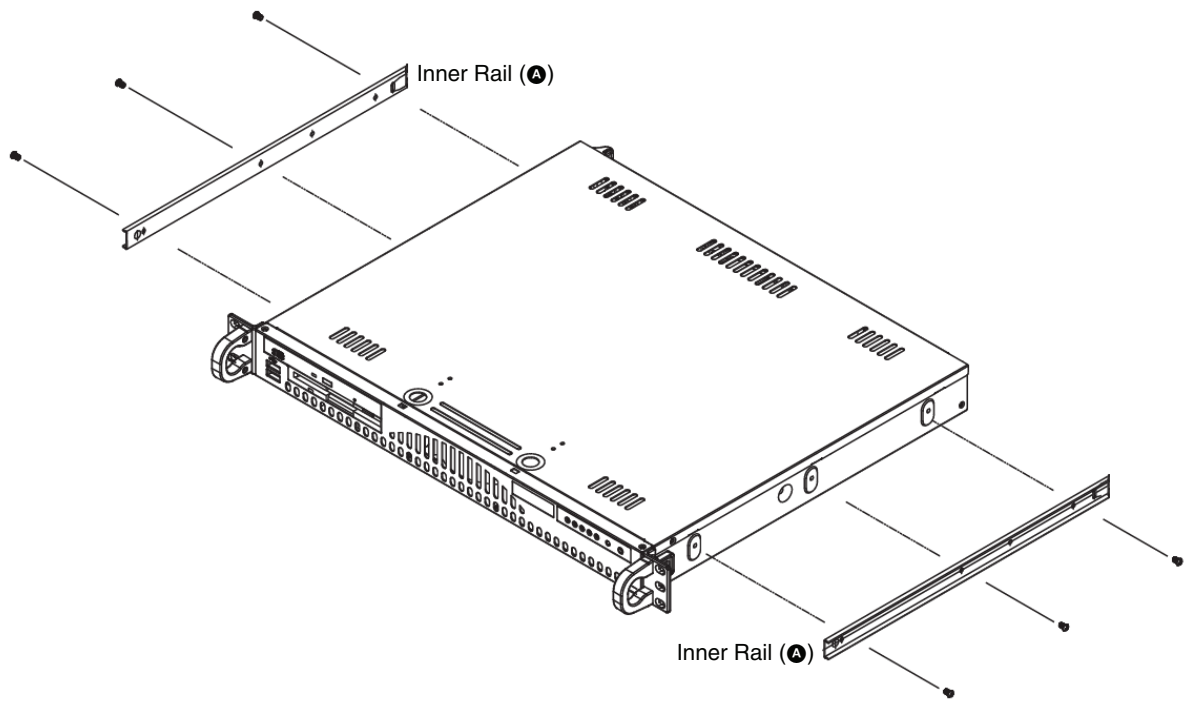


Figure 192. Installing the Rails onto the Controller Frame

3. Determine where the controller is located within the rack (see [Mounting](#) on page 206).
4. Position the front and rear rail brackets at the desired location in the rack (see figure 193). Screw the rail brackets securely to the rack. Attach the remaining rail brackets to the other side of the rack, making sure both sets are at the same height.

NOTE: The smaller rail bracket is positioned at the front of the rack and the larger rail bracket is positioned at the back of the rack.

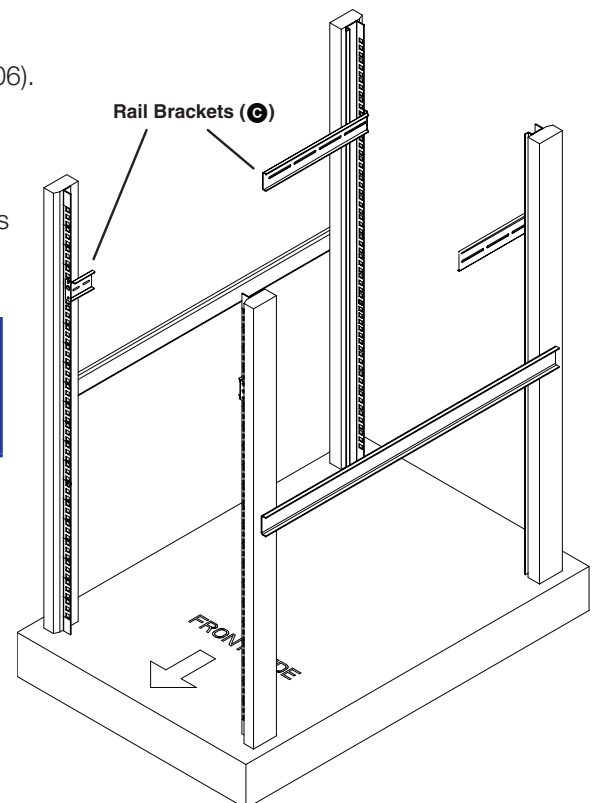


Figure 193. Install Rail Brackets (C)

5. Secure the outer rails to the rail brackets (see figure 194).

NOTE: The two outer rails are left and right specific.

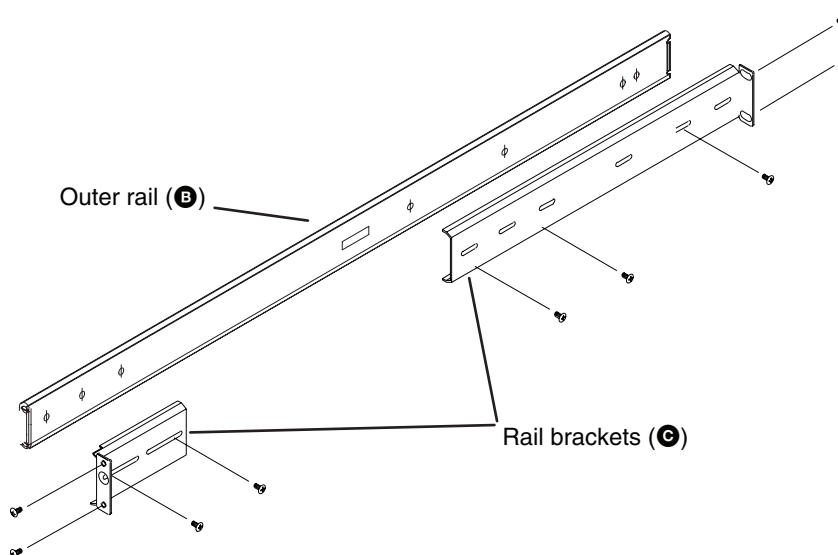


Figure 194. Installing the Outer Rail (B) to the Rail Brackets (C)

6. Line up the inner rails on the controller with the outer rails on the rack. Gently slide the controller into the outer rails of the rack (see figure 195). Depress the locking tabs, if necessary, when sliding the controller into the outer rails.

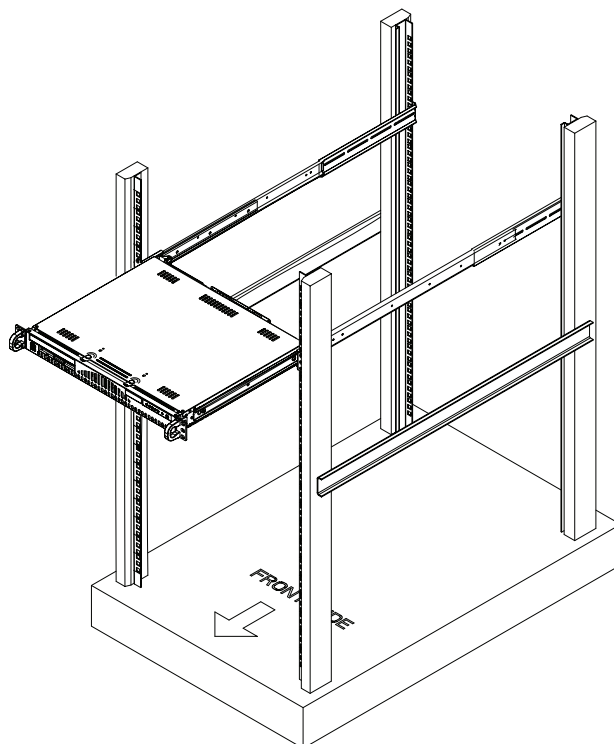


Figure 195. Installing the Controller into a Rack

7. Connect the necessary devices to the controller (see [Front Panel Features](#) on page 7 and [Rear Panel Features](#) on page 9).
8. When the controller is pushed completely into the rack, the locking tabs make a clicking sound. If necessary, secure the front mounting brackets (located on each side at the front of the chassis) to the rack to keep the controller in a fixed position.

HLI Command Overview

The format of an HLI command is shown below.

Command Structure

command *argument1 argument2* [optional argument1] [optional argument2] ... ↵

NOTE: The number of arguments, both required and optional, depends on the command.

Each command has a defined structure. The HLI command must begin the string but additional commands can follow that include arguments, parameters, and other variables. Each command ends with an <enter> (CRLF) command (↵).

In the commands and examples that follow, HLI commands are represented in **fixed fonts**. Identifiers, variables, arguments, and parameters are in *slanted fonts*.

NOTES:

- Text inside brackets [*example text*] represent optional command arguments. Do not include the brackets when entering the command.
- A response is returned each time an HLI command is properly sent. The text depends on the type of command. If the command is formatted correctly and accepted, the reply is "okay" unless otherwise stated.

Devices can be identified in one of three ways:

- **IP Address** – The IP address of the target device.
- **Device Name** – The name of the device as assigned by the user.
- **Device ID** – A unique number identifying the target device.

NOTE: The device ID is found on the product sticker located on the device, or in the Device List of the Enterprise Controller. The ID numbers used in the following examples have been simplified for the HLI command structure examples and do not represent actual device IDs.

HLI Command Examples

The HLI command examples that follow refer to a VN-Matrix system consisting of the devices shown in figure 196. The devices are connected using their Ethernet ports with corresponding device ID, IP address, and device names.

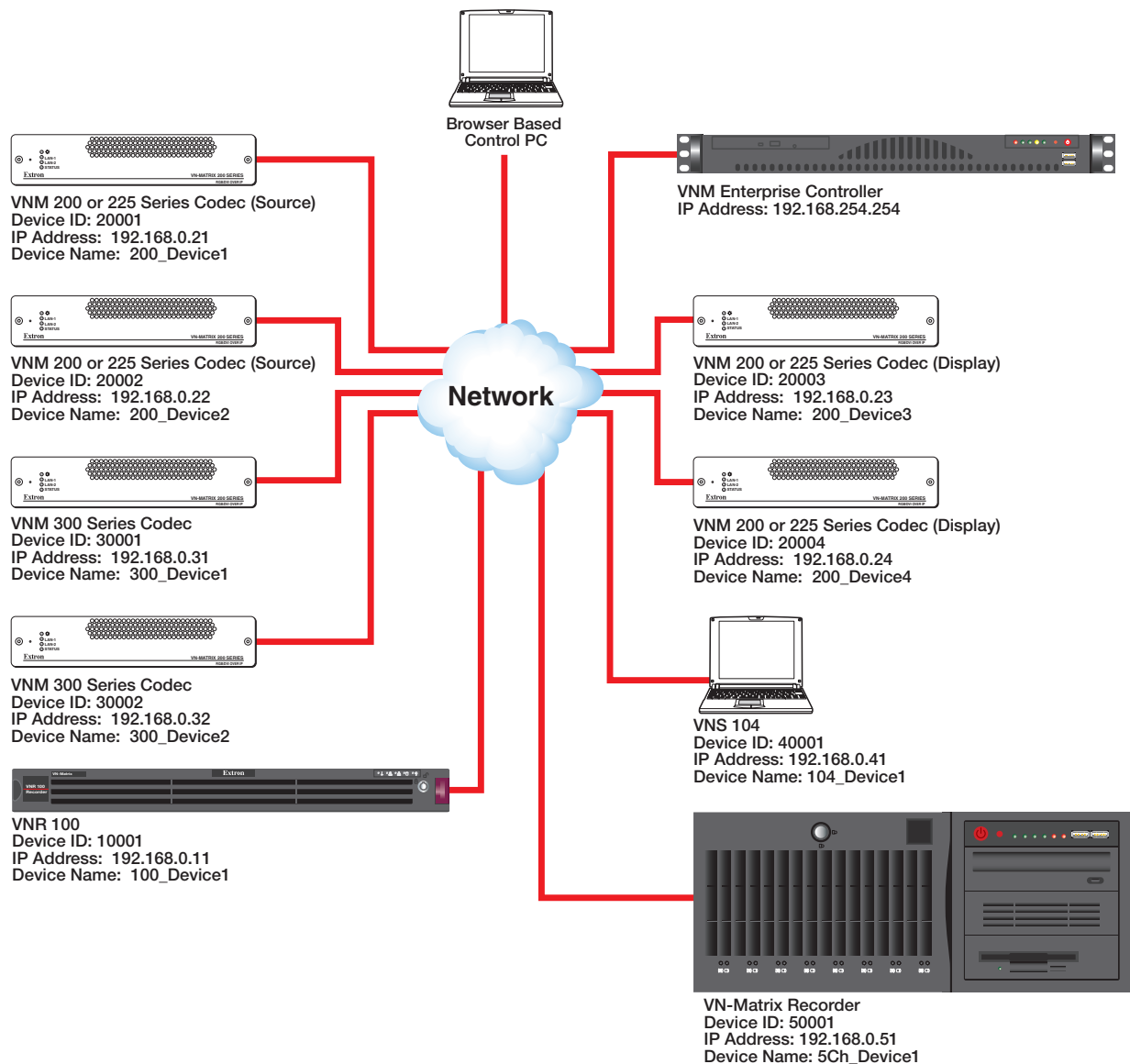


Figure 196. Basic Application Diagram for HLI Command Control

Not shown: VNM 250.

General Commands

General commands are structured using both fixed commands and variables. In the following pages, fixed commands are in **command fonts** that identify the CLI commands. Variables that represent the device identifier, argument, or parameter values are in *italic fonts*.

analogOutputEnable

The **analogOutputEnable** command enables or disables audio for devices running the VNS 104 software decoder. The command is sent to window 4, the VNS 104 audio channel.

NOTE: This command uses zero-based window numbering. Channel numbers 0 to 3 refer to the top-left, top-right, bottom-left and bottom-right positions respectively. Channel number 4 selects the audio channel.

Command line structure — analogOutputEnable

```
set device identifier swdecoder window 4 analogOutputEnable enablemode↵
```

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>identifier</i>	Device ID, IP address or Device name	
<i>enablemode</i>	enable or disable	Mutes or unmutes the audio.

For the following examples:

VNS 104: Device name = **104_Device1**, Device ID = **40001**, IP address = **192.168.0.41**

Example 1 - Enable (unmute) audio on a VNS 104 using device name.

```
set device 104_Device1 swdecoder window 4 analogOutputEnable enable↵
```

Example 2 - Disable (mute) audio on a VNS 104 using device ID

```
set device 40001 swdecoder window 4 analogOutputEnable disable↵
```

analogOutputMute

The **analogOutputMute** command mutes or un-mutes the audio channel for devices running the VNS 104 software decoder. The command is sent to window 4, the VNS 104 audio channel.

NOTE: This command uses zero-based window numbering. Channel numbers 0 to 3 refer to the top-left, top-right, bottom-left and bottom-right positions respectively. Channel number 4 selects the audio channel.

Command line structure

```
set device identifier swdecoder window 4 analogOutputMute mutemode↵
```

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>identifier</i>	Device ID, IP address or Device name	
<i>mutemode</i>	normal or mute	mutes or unmutes the audio.

For the following examples:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - Mute the audio on a VNS 104 using the device name.

```
set device 104_Device1 swdecoder window 4 analogOutputMute mute↵
```

Example 2 - Unmute audio on a VNS 104 using the device ID.

```
set device 40001 swdecoder window 4 analogOutputMute normal↵
```

analogOutputSetLevel

The `analogOutputSetLevel` command sets the level of the audio channel on VNS 104 devices. The command is sent to window 4, the VNS 104 audio channel.

NOTE: This command uses zero-based window numbering. Channel numbers 0 to 3 refer to the top-left, top-right, bottom-left and bottom-right positions respectively. Channel number 4 selects the audio channel.

Command line structure

```
set device identifier swdecoder window 4 analogOutputSetLevel level
```

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>identifier</i>	Device ID, IP address, or device name	
<i>level</i>	integer between -70 and 12	

For the following examples:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - Set the audio level on a VNS 104 to a value of +6 using the device name.

```
set device 104_Device1 swdecoder window 4 analogOutputSetLevel 6 ↵
```

Example 2 - Set the audio level on a VNS 104 to a value of -36 using a device ID:

```
set device 40001 swdecoder window 4 analogOutputSetLevel -36 ↵
```

connect

The `connect` command switches streams from a source device to a destination device. This command manages the individual parameters required to configure a VN-Matrix stream, including the provisioning of the VN-Matrix devices, to their required state.

Command line structure

```
connect source:n destination:n [optional parameters]
```

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>source:n</i>	Device ID, IP address, or Device name followed by an optional channel number <i>:n</i>	
<i>destination</i>	Device ID, IP address, or Device name followed by an optional channel number <i>:n</i>	

Additional stream types (audio, data, whiteboard) can be specified as well as the network transport protocol (TCP, UDP or multicast) using optional parameters. Unless otherwise specified, the current global values as defined in the System Controller are used.

The channel designator *:n* provides support for channel-based devices such as the VN Recorder and VNS 104.

If either the source or destination devices are a VNM Recorder or VNR 100, the `connect` command is also used to select or create a directory for recording or to load an existing directory for playback.

If the command and parameters are correctly entered and accepted by the controller the return is: "okay"

Additional optional parameters and arguments for this command are:

Parameter	Arguments	Description
<i>source</i>	50001:1	The serial number (ID) of the source device followed by the channel number (if applicable)
	192.168.0.51:1	The IP address of the source device followed by the channel number (if applicable)
	VN_Recorder:1	The user-defined name of the source device followed by the channel number (if applicable)
	none	Clears all connections to this source
<i>destination</i>	40001:1	The serial number (ID) of the display device followed by the channel number (if applicable)
	192.168.0.41:1	The IP address of the display device followed by the channel number (if applicable)
	VNS_104:1	The user-defined name of the display device followed by the channel number (if applicable)
	none	Removes the display device connection from the source device
<i>streams</i>	a	Audio (excluding VNM 3xx series devices)
	a2	Program and return audio (VNM 250 only)
	n	ANC (VNM 3xx series audio)
	v	Video
	w	Whiteboard (specially licensed feature)
	d	Data (specially licensed feature)
	r	Row FEC (VNM 3xx only)
	c	Column FEC (VNM 3xx only)
	Example: streams=n,v,d	ANC, video and data
<i>program_audio_source</i>	25002	The serial number (ID) of the device (VNE 250 only)
	192.168.0.252	The IP address of the device (VNE 250 only)
	250_Encoder_2	The user-defined name of the device (VNE 250 only)
<i>transport</i>	unicast	UDP point to point connection
	tcp	TCP connection using IP address of source and destination devices
	multicast	Multicast – addresses managed by Enterprise Controller settings
	Example: transport=unicast	Unicast mode
<i>name</i>	name=dir1 Example: name=dir1:Matrix1	Specifies directory name "dir1" for recording Specifies directory name "dir1" with filename "Matrix1" for recording
<i>directory</i>	directory=dir1	Specifies directory name "dir1" for playback
<i>filename</i>	filename=Matrix1	Specifies filename "Matrix1" for playback
<i>timestamp</i>	timestamp="duplicate1"	Specifies a user-defined text string appended to a new directory if the directory name exists. For example, a duplicate Matrix1 directory becomes Matrix_1-duplicate1. If the timestamp parameter is not included, duplicate directories are automatically appended with the Controller date and time in the form YYYY-MM-DD-hh-mm-ss. Example: Matrix_1-2013-01-19-12-19-24

VNM 200/225 Device Examples

For the VNM 200/225 device examples:

2xx Device1: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

2xx Device2: Name = **200_Device2**, ID = **20002**, IP = **192.168.0.22**

Example 1 - Connect Device1 to Device2 using the device IDs.

```
connect 20001 20002 ↵
```

Example 2 - Connect Device1 to Device2 using the device names.

```
connect 200_Device1 200_Device2 ↵
```

Example 3 - Connect Device1 to Device2 using the IP addresses.

```
connect 192.168.0.21 192.168.0.22 ↵
```

Example 4 - Connect Device1 to Device2 using a combination of device ID and IP address.

```
connect 20001 192.168.0.22 ↵
```

Example 5 - Connect Device1 to Device2 with audio, video, and data streams.

```
connect 20001 20002 streams=a,v,d ↵
```

Example 6 - Connect Device1 to Device2 in multicast mode, with audio, video, and data streams.

```
connect 20001 20002 transport=multicast streams=a,v,d ↵
```

Example 7 - Break connections to Device1 (where Device1 is a source).

```
connect 20001 none ↵
```

Example 8 - Break connections to Device2 (where Device2 is a display).

```
connect none 20002 ↵
```

VNM 250 Device Examples

For the VNM 250 device examples:

VNE 250 Encoder1: Name = **250_Encoder1**, ID = **25001**, IP = **192.168.0.251**

VNE 250 Encoder2: Name = **250_Encoder2**, ID = **25002**, IP = **192.168.0.252**

VND 250 Decoder1: Name = **250_Decoder1**, ID = **25003**, IP = **192.168.0.253**

Example 1 - Connect Encoder1 to Decoder1 using the device IDs.

```
connect 25001 25003 ↵
```

Example 2 - Connect Encoder1 to Decoder1 using the device names.

```
connect 250_Encoder1 250_Decoder1 ↵
```

Example 3 - Connect Encoder1 to Decoder1 using the device IP addresses.

```
connect 192.168.0.251 192.168.0.253 ↵
```

Example 4 - Connect Encoder1 to Decoder1 using a combination of device ID and IP address.

```
connect 25001 192.168.0.253 ↵
```

Example 5 - Connect Encoder1 to Decoder1 with audio, video, and data streams.

```
connect 25001 25003 streams=a,v,d ↵
```

Example 6 - Connect Encoder1 to Decoder1 in multicast mode, with audio, video, and data streams.

```
connect 25001 25003 transport=multicast streams=v,d ↵
```

Example 7 - Connect Encoder1 to Decoder1 with breakaway audio from Encoder2.

```
connect 25001 25003 streams=v,a program_audio_source=25002 ↵
```

Example 8 - Connect Encoder1 to Decoder1 with program and return audio (Decoder1 back to Encoder1).

```
connect 25001 25003 streams=v,a2 ↵
```

Example 9 - Break connections to Encoder1.

```
connect 25001 none ↵
```

Example 10 - Break connections to Decoder1.

```
connect none 25003 ↵
```

VNM 3xx Devices

For the VNM 3xx device examples:

3xx Device1: Name = **300_Device1**, ID = **30001**, IP = **192.168.0.31**

3xx Device2: Name = **300_Device2**, ID = **30002**, IP = **192.168.0.32**

Example 1 - Connect Device1 to Device2 using device ID.

```
connect 30001 30002 ↵
```

Example 2 - Connect Device1 to Device2 using device names.

```
connect 300_Device1 300_Device2 ↵
```

Example 3 - Connecting Device1 to Device2 using IP addresses.

```
connect 192.168.0.31 192.168.0.32 ↵
```

Example 4 - Connecting Device1 to Device2 using a combination of device ID and IP address.

```
connect 30001 192.168.0.32 ↵
```

Example 5 - Connect Device1 to Device2 with audio, video, FEC row, and FEC column streams.

```
connect 30001 30002 streams=n,v,r,c ↵
```

Example 6 - Connect Device1 to Device2 in multicast mode, with video, FEC row, and FEC column streams.

```
connect 30001 30002 transport=multicast streams=v,r,c ↵
```

Example 7 - Break connections to Device1 (where Device1 is a source).

```
connect 30001 none ↵
```

Example 8 - Break connections to Device2 (where Device2 is a display).

```
connect none 30002 ↵
```

VNS 104 Devices

For the VNS 104 device examples:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

VNM 2xx: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

Example 1 - Connect VNM 2xx to VNS 104 top left quadrant using device IDs.

```
connect 20001 40001:0 ↵
```

Example 2 - Connecting VNM 2xx to VNS 104 top left quadrant using device names.

```
connect 200_Device1 104_Device1:0 ↵
```

Example 3 - Connect VNM 2xx to VNS 104 top left quadrant using IP addresses.

```
connect 192.168.0.21 192.168.0.41:0 ◀
```

Example 4 - Connect VNM 2xx to VNS 104 using a combination of device ID and IP address.

```
connect 20001 192.168.0.41:0 ◀
```

Example 5 - Connect VNM 2xx to VNS 104 bottom right quadrant.

```
connect 20001 40001:3 ◀
```

Example 6 - Connect VNM 2xx video and audio only to VNS 104 bottom right quadrant.

```
connect 20001 40001:3 streams=v,a ◀
```

Example 7 - Connect VNM 2xx video and audio to VNS 104 bottom right quadrant in multicast mode.

```
connect 20001 40001:3 streams=v,a transport=multicast ◀
```

Example 8 - Break connection of the VNS 104 bottom left quadrant.

```
connect none 40001:2 ◀
```

VNR 100 Devices

For the VNR 100 device examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM 2xx: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

Example 1 - Connect VNM 2xx (source) to VNR 100 (recorder) specifying a recording directory "dir1".

```
connect 20001 10001 name=dir1 ◀
```

Example 2 - Connect VNM 2xx (source) to VNR 100 (recorder) specifying a recording directory "dir1" with a filename of "matrix".

```
connect 20001 10001 name=dir1:matrix ◀
```

Example 3 - Connect VNM 2xx (source) to VNR 100 (recorder) with video, audio, and data streams and specify a recording directory "dir1" with a filename of "matrix".

```
connect 20001 10001 streams=a,v,d name=dir1:matrix ◀
```

Example 4 - Connect VNM 2xx (source) audio, video, and data streams to VNR 100 (recorder) specifying a recording directory "dir1" with a filename of "matrix" and a custom duplicate directory suffix of "duplicate1".

```
connect 20001 10001 streams=a,v,d name=dir1:matrix  
timestamp="duplicate1" ◀
```

Example 5 - Connect VNM 2xx (source) video, audio, and data streams to VNR 100 (recorder) in multicast mode specifying a recording directory "dir1" with a filename of "matrix".

```
connect 20001 10001 transport=multicast streams=a,v,d  
name=dir1:matrix ◀
```

Example 6 - Connect VNR 100 (player) to VNM 2xx (display) specifying a filename "recording1" located in directory "dir1".

```
connect 10001 20001 directory=dir1 filename=recording1 ◀
```

Example 7 - Connect VNR 100 (player) video and audio streams to VNM 2xx (display) in unicast mode specifying a filename "recording1" located in directory "dir1".

```
connect 10001 20001 transport=unicast streams=v,a directory=dir1  
filename=recording1 ◀
```

Example 8 - Break connections to the VNR 100 (recorder).

```
connect none 10001 ◀
```

VNM Recorder (5 Channel) Devices

For the VNM Recorder device examples:

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

VNM 2xx: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

Example 1 - Connect VNM 2xx (source) to VNM Recorder channel 2 specifying a recording directory "dir1".

```
connect 20001 50001:2 name=dir1 ↵
```

Example 2 - Connect VNM 2xx (source) to VNM Recorder channel 2 specifying a recording directory "dir1" with a filename of "matrix"

```
connect 20001 50001:2 name=dir1:matrix ↵
```

Example 3 - Connect VNM 2xx (source) video, audio, and data streams to VNR 100 (recorder) specifying a recording directory "dir1" with a filename of "matrix".

```
connect 20001 10001 streams=a,v,d name=dir1:matrix ↵
```

Example 4 - Connect VNM 2xx (source) video, audio, and data streams to VNM Recorder channel 2 specifying a recording directory "dir1" with a filename of "matrix" and a custom duplicate directory suffix of "duplicate1".

```
connect 20001 50001:2 streams=a,v,d name=dir1:matrix  
timestamp=duplicate1 ↵
```

Example 5 - Connect VNM 2xx (source) video, audio, and data streams to VNM Recorder channel 2 in multicast mode specifying a recording directory "dir1" with a filename of "matrix".

```
connect 20001 50001:2 transport=multicast streams=a,v,d  
name=dir1:matrix ↵
```

Example 6 - Connect VNM-Recorder (player) channel 3 to VNM 2xx (display) specifying a filename "rec1" located in directory "dir1".

```
connect 50001:3 20001 directory=dir1 filename=rec1 ↵
```

Example 7 - Connect VNM-Recorder (player) channel 3 video and audio streams to VNM 2xx (display) in unicast mode with a filename "rec1" located in directory "dir1".

```
connect 50001:3 20001 transport=unicast streams=v,a  
directory=dir1 filename=rec1 ↵
```

Example 8 - Break connections to VNM-Recorder channel 2.

```
connect none 50001:2 ↵
```

createdisplay

The **createdisplay** command sets a VN-Matrix Codec device to display mode (decoder). It disconnects existing connections before changing the device mode.

Command line structure

createdisplay <i>device</i>

device: Device name, device ID, or IP address.

For the following examples:

VNM 2xx: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

VNM 3xx: Name = **300_Device2**, ID = **30001**, IP = **192.168.0.31**

Example 1 - Set a VNM 2xx device to display mode using the IP address.

```
createdisplay 192.168.0.21 ↵
```

Example 2 - Set a VNM 2xx device to display mode using the device name.

```
createdisplay 200_Device1 ↵
```

Example 3 - Set a VNM 3xx device to display mode using the device ID.

```
createdisplay 30001 ↵
```

createsource

The **createsource** command sets a VN-Matrix Codec device to source mode (encoder). It disconnects existing connections before changing the device mode.

Command line structure

createsource <i>device</i>

device: Device name, device ID, or IP address.

For the following examples:

VNM 2xx: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

VNM 3xx: Name = **300_Device2**, ID = **30001**, IP = **192.168.0.31**

Example 1 - Set a VNM 2xx device to source mode using the IP address.

```
createsource 192.168.0.21 ↵
```

Example 2 - Set a VNM 2xx device to source mode using the device name.

```
createsource 200_Device1 ↵
```

Example 3 - Set a VNM 3xx device to source mode using the device ID.

```
createsource 30001 ↵
```

currentTime

The `currentTime` command returns the current system time of the VN-Matrix controller. It can be obtained from any active VN-Matrix device on the system excluding the VN-Matrix Enterprise Controller. The `currentTime` value is the reference point when setting future event start times (see `play`).

Command line structure

<code>get device <i>identifier</i> currentTime</code>

identifier: Device name, device ID, or IP address of VN-Matrix device (not the EC).

Return attributes:

`currentTime`: hh:mm:ss:uuuuuu

For the following examples:

2xx Device1: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

Example 1 - Getting the VN-Matrix controller system time using the IP address as identifier.

```
get device 192.168.0.21 currentTime ↵
```

```
Returns: "11:53:02.174478"
```

Example 2 - Getting the VN-Matrix controller system time using device name as identifier.

```
get device 200_Device1 currentTime ↵
```

```
Returns: "11:53:02.174478"
```

deletedevice

The `deletedevice` command removes unused devices from the VN-Matrix system. Attempting to remove a device currently in use results in a fail code.

Command line structure

<code>deletedevice <i>device</i></code>

device: Device name, device ID, or IP address.

For the following examples:

2xx Device1: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

2xx Device2: Name = **200_Device2**, ID = **20002**, IP = **192.168.0.22**

Example 1 - Delete an unused 2xx device from the system.

```
deletedevice 20001 ↵
```

Example 2 - Attempting to delete a 2xx device with active connections.

```
deletedevice 20002 ↵
```

```
Returns: "fail: code=13,object in use"
```

disconnectall

The `disconnectall` command breaks all connections to all devices on the VN-Matrix controller.

Command line structure

<code>disconnectall</code>

Example 1 - Break all connections to all devices on a VN-Matrix controller.

```
disconnectall ↵
```

getalarmlogs

The `getalarmlogs` command returns a list and details of alarms present on the VN-Matrix system.

Command line structure

<code>getalarmlogs</code>

Returned attributes for this command are:

Attribute	Value	Description
<i>severity</i>	critical, warning, none	A summary of the severity of the alarm.
<i>alarm_id</i>	nnn Example: 232	The associated ID number of the alarm.
<i>controller</i>	IP address: nnn.nnn.nnn.nnn Example: 192.168.0.254	The IP address of the controller on which the alarm has been flagged.
<i>device_type</i>	Text string Example: VNM Recorder	The type of device the alarm has been raised.
<i>raissetime</i>	Text string, date Example: Wed, 06 Feb 2013 09:56:15 GMT	The time and date when the alarm condition was raised.
<i>type</i>	Text string Example: 22 – Bad Device	The type code and description of the raised alarm.
<i>serial</i>	nnnnn Example: 50001	The serial number (ID) of the device where the alarm has been raised.
<i>name</i>	Text string Example: 5ch_Device1	The name of the device where the alarm has been raised.

Example 1 - Return a list of current alarms on the system.

```
getalarmlogs ↵
```

```
Returns: [{"severity": "Critical", "alarm_id": 232, "controller": "192.168.0.254", "device_type": "VNM Recorder", "raissetime": "Wed, 06 Feb 2013 09:56:15 GMT", "type": "22 – Bad Device", "serial": 50001, "name": "5ch_Device1"}]
```

getcontrollers

The `getcontrollers` command returns a list of controller IP addresses associated with the VN-Matrix system.

Command line structure

<code>getcontrollers</code>

Example 1 - Return a list of controller IP addresses on the VN-Matrix system.

```
getcontrollers ↵
```

```
Returns: [ "192.168.0.254" ]
```

getdevices

The **getdevices** command returns attributes and values for all devices connected to the VN-Matrix System Controller. Optional parameters can limit the attributes that are returned or can filter which devices return attributes.

Command line structure

```
getdevices keys where order_by
```

Available parameters and arguments for this command:

Parameter	Argument	Description
<i>keys</i>	Attribute or Attribute1, Attribute2 Example: keys="name,localIp0"	Any attribute from the getdevices attribute table. Comma separated list of desired attributes.
<i>where</i>	Attribute	Any attribute from the getdevices attribute table.
	=	Equals
	<>	Does not equal
	like 'so%'	Starts with string 'so'
	like '%urce'	Ends with string 'urce'
	like '%our%'	Contains string 'our'
	and	Logical and
	or	Logical or
	Example: where="type='source'"	
	Example: where="type='source' and source_status='Active'"	
<i>order_by</i>	Attribute:	Any attribute from the getdevices attribute table.
	ASC	Sort in ascending order.
	DESC	Sort in descending order.
	Example: order_by="localIp0 ASC"	

Attributes for the command parameter argument (all are returned by default):

Attribute	Value	Description
<i>controllerIp</i>	nnn.nnn.nnn.nnn Example: 192.168.0.254	IP address of the controller for this device.
<i>curver</i>	ver(major.minor.build) Example: ver5.2.0	Current firmware version of the device.
<i>device_id</i>	Serial number: channel Example: 50001:2	The unique serial number of the device, followed by the channel number if applicable (VNM Recorder and VNS 104).
<i>device_type</i>	Text string Example: VNC 200 DVI-AD	Hardware type associated with the device.
<i>dstIp</i>	nnn.nnn.nnn.nnn :nnnn Example: 192.168.0.23:8000	Stream destination IP address and port number.
<i>localIp0</i>	nnn.nnn.nnn.nnn Example: 192.168.0.51	IP address of Ethernet port 0 on the device.
<i>mode</i>	enable/disable/standby Example: enable	The current operating mode of the device.
<i>name</i>	Name: channel Example: 5ch_Device1:2	The user-defined name of the device followed by the channel number if applicable (VNM Recorder and VNS104).
<i>source_device</i>	Serial number: channel or none Example: 50001:2	The device ID of the video source associated with this device, if applicable.

source_mode	Text string Example: 1280 x 720 60p	The current video mode of the device.
source_status	active/unplugged/null Example: active	Indicates status of the video input of a source device. Null in the case of a display device.
srcIp	nnn.nnn.nnn.nnn :nnnn Example: 192.168.0.23:8000	Stream source IP address and port number.
status	active/no device Example: active	Indicates a device is present (active) or unreachable (no device) on the system.
type	source/display/recorder/ swdecoder none Example: swdecoder	Current device type configuration. Where a codec device has yet to be provisioned as a source or display, 'none' is returned.
userParam1	Text string Example: Group1	User text field.
userParam2	Text string Example: Group2	User text field.
userParam3	Text string Example: Group3	User text field.

For the following examples:

VNM 200 (Source): Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

VNM 200 (Source): Name = **200_Device2**, ID = **20002**, IP = **192.168.0.22**

VNM 200 (Display): Name = **200_Device3**, ID = **20003**, IP = **192.168.0.23**

VNM 200 (Display): Name = **200_Device4**, ID = **20004**, IP = **192.168.0.24**

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - List all device names.

```
getdevices keys=name ↵
```

```
Returns: ["200_Device1", "200_Device2", "200_Device3", "200_
Device4", "104_Device1", "104_Device1:1", "104_Device1:2", "104_
Device1:3", "104_Device1:4"]
```

Example 2 - List all device names and firmware versions.

```
getdevices keys=name,curver ↵
```

```
Returns: [{"name": "200_Device1", "curver": "ver3.11.0"}, {"na
me": "200_Device2", "curver": "ver3.11.0"}, {"name": "200_Device3",
"curver": "ver3.11.0"}, {"name": "200_Device4", "curver": "ver3.11.
0"}, {"name": "104_Device1", "curver": "ver1.0.0"}, {"name": "104_De
vice1:1", "curver": "ver1.0.0"}, {"name": "104_Device1:2", "curver"
: "ver1.0.0"}, {"name": "104_Device1:3", "curver": "ver1.0.0"}, {"na
me": "104_Device1:4", "curver": "ver1.0.0"}]
```

Example 3 - List by name all VNM 200 devices that are provisioned as displays.

```
getdevices keys=name where="device_type='VNC 200 DVI-AD' and
type='display'" ↵
```

```
Returns: ["200_Device3", "200_Device4"]
```

getDeviceLayout (VNS 104 Only)

The `getDeviceLayout` command determines whether video streams are currently displayed in quad-split mode or single window full screen mode on a specific device.

Command line structure

<code>getDeviceLayout device</code>

device: Device name, device ID, or IP address

For the following example:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - Determine the current layout of a VNS 104 device using the IP address.

```
getDeviceLayout 192.168.0.41 ↵
```

Returns: QuadSplit

getFilesInFolder

The `getFilesInFolder` command returns a formatted list of files in a specified recorder path.

Command line structure

<code>getFilesInFolder device path type</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
device	50001	The serial number (ID) of the recorder device.
	192.168.0.51	The IP address of the recorder device.
	VN_Recorder	The user-defined name of the recorder device.
path	String Example: /folder1	The path from which the walk command is processed.
type	v	Video
	a	Audio
	w	Whiteboard
	d	Data
NOTE: Specifies the type of files to return if they exist. If no type is specified, all files are returned.		

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Return a list of recorded files in a directory named 'folder3' of a VNR 100.

```
getFilesInFolder 10001 path=/folder3 ↵
```

Returns: `[["File3_20001.0.0_r0_s0.rec"], ["File3_20001.A0.0_r1_s0.rec"]]`

Example 2 - Return a list of audio files in a directory named 'folder3' of a VNM Recorder.

```
getFilesInFolder path=/folder3 type=a ↵
```

Returns: `[["File3_20001.A0.0_r1_s0.rec"]]`

getFolderTree

The `getFolderTree` command returns a formatted list of folders in a specified recorder path.

Command line structure

<code>getFolderTree device path levels</code>

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device</i>	50001	The device ID of the recorder.
	192.168.0.51	The IP address of the recorder.
	VN_Recorder	The user-defined name of the recorder.
<i>path</i>	String Example: /folder1	The path from which the walk command is processed.
<i>levels</i>	1 to 10	Level of folder depth to which the walk function searches. If a level number is not specified, the maximum of 10 is selected.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Return a list of folders from the root recording directory of a VNR 100.

```
getFolderTree 10001 path=/ levels=1 ↵
```

```
Returns: [ ["/", ["folder1", "folder2", "folder3"] ] ]
```

Example 2 - Return a list of the folders in two levels of directories from the root of a VNM Recorder.

```
getFolderTree 50001 path=/ levels=2 ↵
```

```
Returns: [ ["/", ["folderA", "folderB", "folderC"] ], ["/folderA", [ ] ], ["/folderB", [ ] ], ["/folderC", [ ] ] ]
```

Stat

The `Stat` command returns attributes for the selected recording.

Command line structure

<code>stat device 'recording name' path</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device</i>	50001	The device ID of the recorder.
	192.168.0.51	The IP address of the recorder.
	VN_Recorder	The user-defined name of the recorder.
<i>recording name</i>	'test_file_1.rec'	The file name of the recording. This can be found using the 'getFilesInFolder' command.
<i>path</i>	String Example: /folder1	The path from which the stat command is processed.

For the following example:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

Example 1 - Return the attributes of the recording 'Test_file_1.rec' from folder /tstfolder1 on a VNR 100.

```
stat 10001 'Test_file_1.rec' /tstfolder1 ↵
```

```
Returns: {"startTimeUs":626652,"lengthUs":406367,
"isdst":0,"tag":"","length":238,"prefix":
"device2000715.videoPort0.2000715.0.0",
"ftype":"recording","startTime":55040,"date":"06-09-13",
"path":"/Tstfolder1/Test_file_1.rec"}
```

mkdir

The mkdir command creates a new directory on a recorder device.

Command line structure (required parameters in bold):

mkdir <i>device path</i>

device: Device ID, IP address or name.

path: Path and name of new directory.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

Example 1 - Create a new directory named "dir1" in the root folder of a VNR 100 device.

```
mkdir 10001 /dir1 ↵
```

Example 2 - Create a subdirectory named "sub1" within the **existing1** directory of a VNR 100 device.

```
mkdir 192.168.0.11 /existing1/sub1 ↵
```

pause (VNM Recorder and VNR 100 devices only)

The pause command freezes playback of the specified player and channel number. All associated streams (video, audio, data, whiteboard) are paused when the command is issued.

Command line structure (required parameters in bold):

pause <i>source:n</i>

source: Device ID, IP address or name of the VNM Recorder or VNR 100.

:n : Channel number (if not specified, defaults to channel 1).

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Pause playback of a VNR 100 using the IP address.

```
pause 192.168.0.11 ↵
```

Example 2 - Pause playback of a VNR 100 using the device name.

```
pause 100_Device1 ↵
```

Example 3 - Pause playback on channel 2 of a VNM Recorder using the device ID.

```
pause 50001:2 ↵
```

play (VNM Recorder and VNR 100 devices only)

The **play** command starts playback of the specified player and channel number. All associated streams (video, audio, data, whiteboard) start when the command is issued. A **playat** time can be included to start playback at a pre-defined system time in the future, enabling the synchronization of multiple channels. In addition, an offset time can specify a start point other than the beginning of the recording.

Command line structure (required parameters in bold):
--

<code>play source:n playat offset</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>source</i>	Device ID, IP address, or name of the device.	
<i>:n</i>	Channel number	Defaults to channel 1 if not otherwise specified.
<i>playat</i>	hh:mm:ss.uuuuuu Example: 13:23:25.123456	Future time based on the system controller clock. Setting the same playat time across multiple devices and channels allows scalable playback synchronization.
<i>offset</i>	nnn (seconds) Example: 126	Allows playback from a position other than the start of the recording. For example, specifying a value of 126 starts playback 2 minutes and 6 seconds into the recording.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Start playback on a VNR 100 device using the IP address.

```
play 192.168.0.11 ↵
```

Example 2 - Start playback on a VNR 100 device using the device name.

```
play 100_Device1 ↵
```

Example 3 - Start playback on a VNR 100 device 3 minutes into the recorded file.

```
play 100_Device1 offset=180 ↵
```

Example 4 - Start playback at a system time of 15:12:22 on a VNR 100 device 3 minutes into the recorded file.

```
play 100_Device1 playat=15:12:22.123456 offset=180 ↵
```

Example 5 - Start playback on channel 2 of a VNM Recorder using device ID.

```
play 50001:2 ↵
```

Example 6 - Start playback at a system time of 15:12:22 on channel 2 of a VNM Recorder.

```
play 50001:2 playat=15:12:22.123456 ↵
```

record (VNM Recorder and VNR 100 devices only)

The `record` command starts recording on the specified recorder and channel number.

Command line structure

<code>record source:n</code>

source: Device name, device ID, or IP address of the VNM Recorder or VNR 100.

:n Channel number (defaults to channel 1 if not specified).

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Start recording on a VNR 100 device using the IP address.

```
record 192.168.0.11 ↵
```

Example 2 - Start recording on a VNR 100 device using the device name.

```
record 100_Device1 ↵
```

Example 3 - Start recording on channel 2 of a VNM Recorder device using the device ID.

```
record 50001:2 ↵
```

rmdir

The `rmdir` command deletes empty directories on a recorder device.

Command line structure

<code>rmdir device path</code>

device: Device ID, IP address or name.

path: Path and name of the directory to delete.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

Example 1 - Delete directory "dir1" in the root folder using the device ID.

```
rmdir 10001 /dir1 ↵
```

Example 2 - Delete subdirectory "sub1" within the "dir1" directory using the IP address.

```
rmdir 192.168.0.11 /dir1/sub1 ↵
```

setDeviceLayout (VNS 104 only)

The `setDeviceLayout` command determines whether video streams are displayed in quad-split mode or full screen mode. This command uses one-based window numbering. VNS 104 channel numbers 1 to 4 refer to top-left, top-right, bottom-left and bottom-right positions respectively.

NOTE: Connections to all four decode windows are maintained in the background when a specific channel is set to full screen mode, in order to ensure smooth switching between layout modes.
--

Command line structure (required parameters in bold):

<code>setDeviceLayout device:n layout</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device:n</i>	40001:1 or 192.168.0.41:1 or 104_Device1:1	The serial number (ID), IP address, or device name of the VNS 104 device followed by the decode window number, 1-4
<i>layout</i>	QuadSplit or Fullscreen	Quad split layout Full screen layout

For the following examples:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - Set the top-right window of a VNS 104 device to full screen using the IP address.

```
setDeviceLayout 192.168.0.41:2 Fullscreen ↵
```

Example 2 - Set the bottom-left window of a VNS 104 device to full screen using the device name.

```
setDeviceLayout 104_Device1:3 Fullscreen ↵
```

Example 3 - Return the VNS 104 device to quad split mode using the device ID.

```
setDeviceLayout 40001:1 QuadSplit ↵
```

scaleMode

The `scaleMode` command sets the type of scaling applied to VNS 104 decoder windows.

NOTE: This command uses zero-based window numbering. Channel numbers 0, 1, 2, and 3 refer to top-left, top-right, bottom-left, and bottom-right positions respectively. Channel number 4 refers to the audio channel.

Command line structure

```
set device identifier swdecoder window n scaleMode mode
```

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>identifier</i>	Device name, device ID, or IP address	
<i>n:</i>	Window number 0, 1, 2, or 3	
<i>mode</i>	fill, follow, or unity	

For the following examples:

VNS 104: Name = **104_Device1**, ID = **40001**, IP = **192.168.0.41**

Example 1 - Set scaling on a VNS 104 top-left quadrant to fill using the device ID.

```
set device 40001 swdecoder window 0 scaleMode fill ↵
```

Example 2 - Set scaling on a VNS 104 top-right quadrant to follow using the device name.

```
set device 104_Device1 swdecoder window 1 scaleMode follow ↵
```

Example 3 - Set scaling on a VNS 104 bottom-right quadrant to unity using the IP address.

```
set device 192.168.0.41 swdecoder window 3 scaleMode unity ↵
```

stop (VNM Recorder and VNR 100 devices only)

The **stop** command stops playback of a file on the specified player and channel number. All associated streams are also stopped when the command is issued.

Command line structure

<code>stop source:n</code>

source: Device name, device ID, or IP address of the VNM Recorder or VNR 100.

:n Channel number (defaults to channel 1 if not specified).

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Stop playback on a VNR 100 device using the IP address.

```
stop 192.168.0.11 ↵
```

Example 2 - Stop playback on a VNR 100 device using device name.

```
stop 100_Device1 ↵
```

Example 3 - Stop playback on channel 2 of a VNM Recorder device using the device ID.

```
stop 50001:2 ↵
```

userParam [1, 2 or 3]

The **userParam1**, **userParam2** and **userParam3** attributes can be set to hold a user-defined character string. This enables effective filtering and searching when using commands such as **getdevices**.

Command line structure for setting userParam values

<code>set device identifier userParam1 string</code>
--

<code>set device identifier userParam2 string</code>
--

<code>set device identifier userParam3 string</code>
--

Command line structure for getting userParam values

<code>get device identifier userParam1</code>

<code>get device identifier userParam2</code>

<code>get device identifier userParam3</code>

identifier: Device name, device ID, or IP address of VN-Matrix device.

string: Text or character string.

For the following examples:

VNR 100: Name = **200_Device1**, ID = **20001**, IP = **192.168.0.21**

Example 1 - Set **userParam1** to hold the string "group1" using the IP address.

```
set device 192.168.0.21 userParam1 group1 ↵
```

Example 2 - Set **userParam3** to hold the string "group3" using the device name.

```
set device 200_Device1 userParam3 group3 ↵
```

Example 3 - Get **userParam3** (example 2) from device ID **20001**.

```
get device 20001 userParam3 ↵
```

Returns: "group3"

walk

The walk command returns a formatted list of folders and files in a specified recorder path.

Command line structure (required parameters in bold):
--

walk <i>device path type levels</i>

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device</i>	50001	The serial number (ID) of the recorder.
	192.168.0.51	The IP address of the recorder.
	VN_Recorder	The user-defined name of the recorder.
<i>path</i>	String Example: /folder1	The path from which the walk command is processed.
<i>type</i>	v	Video
	a	Audio
	w	Whiteboard
	d	Data
	Specifies the type of files to return if they exist. If not specified, all files are returned.	
<i>levels</i>	1 to 10	Level of folder depth the walk function searches. If a level number is not specified, the maximum of 10 is applied.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Return the contents of only the root recording directory on a VNR 100.

```
walk 10001 path=/ levels=1 ↵
```

```
Returns: [{" /", ["folder1", "folder2", "folder3"], []}]
```

Example 2 - Return the contents of two levels of directories from the root on a VNM Recorder.

```
walk 50001 path=/ levels=2 ↵
```

```
Returns: [{" /", ["folderA", "folderB", "folderC"], []}, [{" /folderA", [], []}, [{" /folderB", [], []}, [{" /folderC", [], ["FileC_20001.0.0_r0_s0.rec", "FileC_20001.A0.0_r1_s0.rec"]}]
```

Example 3 - Return only the audio files from the directory named folder3 on a VNR 100.

```
walk 10001 path=/folder3 type=a levels=1 ↵
```

```
Returns: [{" /folder3", [], ["File3_20001.A0.0_r1_s0.rec"]}]
```

delete (VNM Recorder and VNR 100 devices only)

The `delete` command deletes recordings on a recording device.

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device</i>	50001	The serial number (ID) of the recorder.
	192.168.0.51	The IP address of the recorder.
	VN_Recorder	The user-defined name of the recorder.
<i>path</i>	String	The path of the recording to be deleted.

For the following examples:

VNR 100: Name = **100_Device1**, ID = **10001**, IP = **192.168.0.11**

VNM Recorder: Name = **5ch_Device1**, ID = **50001**, IP = **192.168.0.51**

Example 1 - Delete the root folder and all recorded content from a folder on a VNR 100.

```
delete 10001 /Delete_Test
```

Returns: okay

Example 2 - Delete the recording from a folder on a VNR 100.

```
delete 100_Device1 /Device_Test/  
Delete_Test_Record_2001346.0.0_r0_s0.rec
```

Returns: okay

Example 3 - Delete the root folder and all recorded content from a folder on a VNM Recorder.

```
delete 192.168.0.51 /Delete_Test
```

Returns: okay

Example 4 - Delete the recording made on Channel 2 from a folder on a VNM Recorder.

```
delete 5ch_Device1 /Delete_Test/  
Delete_Test_Record_2001346.0.0_r6_s0.rec
```

Returns: okay

NOTE: When deleting a single file, the full file name must be specified. The full file name can be found by using the [getFilesInFolder](#) command (see page 225).

Preset Commands

Preset commands are structured using both fixed commands and variables. In the following pages, fixed commands are in **command fonts** that identify the HLI commands, and variables that represent the device, argument, or parameter value are in *slanted fonts*.

presetadvance

The **presetadvance** command advances or reverses the player in a preset by a single frame. The command is issued each time a single frame advance or reverse is required. The players in the preset must be in pause (playspeed: 0) before the command is issued. See **presetplay** and **pause**.

NOTE: This command only applies to video channels. To step both video and data synchronously, use the **presetstep** command.

Command line structure (required parameters in bold):

presetadvance *name direction*

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>name</i>	string Example: preset1	The name of the stored preset.
<i>direction</i>	Any positive or negative integer Example: 1 or -1	A positive integer is a single forward frame step. A negative integer is a single reverse frame step.

Example 1 - Stepping the players in the preset named "preset1" by 1 frame in a forward direction.

```
presetadvance preset1 1 ↵
```

Example 2 - Stepping the players in the preset named "preset1" by 1 frame in a reverse direction.

```
presetadvance preset1 -1 ↵
```

Example 3 - Stepping the players in the preset named "preset1" by 2 frames in a reverse direction.

```
presetadvance preset1 -1 ↵
```

```
presetadvance preset1 -1 ↵
```

Example 4 - Stepping the currently running players in "preset1" by 1 frame in a reverse direction.

```
presetplay preset1 0 ↵
```

```
presetadvance preset1 -1 ↵
```

presetcopy

The **presetcopy** command makes a copy of an existing preset and assigns it a new name.

Command line structure (required parameters in bold):

presetcopy *name newname*

name: Name of the stored preset.

newname: New preset name.

Example 1 - Make a copy of "preset1" named "preset2".

```
presetcopy preset1 preset2 ↵
```

presetdelete

The `presetdelete` command deletes the specified preset from memory.

Command line structure

<code>presetdelete name</code>

name: Name of the stored preset.

Example 1 - Delete a preset named `preset1`.

```
presetdelete preset1 ↵
```

presetget

The `presetget` command returns the connection status of all devices within a specified preset. Devices are listed by connection in the returned JSON string, depending on their assigned function.

Command line structure

<code>presetget name</code>

name: Name of the stored preset.

Returned attributes for this command are:

Attribute	Value	Description
<i>device</i>	Device ID Example: <code>20001</code>	The device ID within the preset.
<i>onlaunch</i>	Provision, Play, or Launch	The launch status of the device within the preset.
<i>directory</i>	Example: <code>/dir1/</code>	The directory used by a device for recording or playback.
<i>filename</i>	Example: <code>file1</code>	The filename used by the device for recording or playback.
<i>timesync</i>	Yes or No	Time Sync (playback only).
<i>start</i>	hh:mm:ss Example: <code>01:30:23</code>	The start offset time (playback only).
<i>stop</i>	hh:mm:ss Example: <code>02:31:25</code>	The stop offset time (playback only, not applicable to VNR 100 chase-play mode).
<i>tag</i>	Example: <code>tag1</code>	The tag name (recording only).
<i>streams</i>	a, v, w, d, r, c Example: <code>a,v,d</code>	The streams provisioned for playback or recording.
<i>mode</i>	fill, follow, or unity	The scale mode of a VNS 104 decoder window.
<i>audio_level</i>	-36 to +6	The audio level of a VNS 104 decoder window.
<i>mute_audio</i>	yes or no	The mute status of a VNS 104.

Example 1 - List connection attributes of a preset named `"preset1"`.

```
presetget preset1 ↵
```

```
Returns: {"connections": [{"source": {"device": "20001"},  
"sinks": [{"device": "20001"}]}], "name": "preset1"}
```

presetgetlist

The `presetgetlist` command returns a list of all currently stored presets on a system.

Command line structure

<code>presetgetlist</code>

Example 1 - Return a list of all the presets on a system.

```
presetgetlist ↵
```

Returns: ["Preset1", "Preset2", "Preset3", "Preset4"]

presetgetplayerstatus (VNM Recorder and VNR 100 only)

The `presetgetplayerstatus` command returns a list of playback status properties associated with a specified preset.

Command line structure

<code>presetgetplayerstatus name device</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>name</i>	string Example: <code>preset1</code>	The name of the stored preset.
<i>device</i>	Device serial number Example: <code>50001</code>	The ID of a specific player device within the preset. This optional parameter can be used for filtering or search.

Returned attributes for this command are:

Attribute	Value	Description
<i>playstate</i> <i>ts_playstate</i>	PLAY STOP PAUSE	File is currently playing. Playback is stopped. Playback is paused.
<i>position_timecode</i> <i>ts_position_timecode</i>	hh:mm:ss:ff Example: <code>01:23:22:00</code>	The current playback position within the recorded file in the format hh:mm:ss:ff. <div>NOTE: Frames are always 00.</div>
<i>filename</i>	String Example: <code>file1_20001.0.0_r0_s0.rec</code>	Name of the recorded file currently loaded for playback.
<i>directory</i>	String Example: <code>/dir1</code>	Name of the directory containing the currently loaded playback file.
<i>duration_timecode</i> <i>ts_duration_timecode</i>	hh:mm:ss:ff Example: <code>02:23:22:00</code>	The total duration of the recorded file in the format: hh:mm:ss:ff. <div>NOTE: Frames are always 00.</div>
<i>duration</i> <i>ts_duration</i>	nnnn (seconds) Example: <code>8602</code>	The total duration of the recorded file in seconds.
<i>position</i> <i>ts_position</i>	nnnn (seconds) Example: <code>5002</code>	The current playback position within the recorded file in seconds.
<i>speed</i> <i>ts_speed</i>	-10.0 to 10.0 Example: <code>2.3</code>	The current playback speed (a value of 0 indicates the content is paused).
<i>device_id</i>	serial number: channel Example: <code>50001:2</code>	The device ID and channel number of the player device.

NOTE: Attributes with a `ts_` prefix refer to the synchronized playback status of a preset where Time Sync mode is enabled.

Example 1 - Return the playback properties of all player devices within a preset named "preset1".

```
presetgetplayerstatus preset1 ↵
```

```
Returns: [{"playstate": "PLAY", "position_timecode": "01:23:22:00",
"filename": "File1_20001.0.0_r0_s0.rec", "directory": "/dir1",
"duration_timecode": "02:23:22:00", "duration": 8602,
"position": 5002, "speed": 2.3, "device_id": "100_Device1"},
{"playstate": "PLAY", "position_timecode": "01:23:22:00",
"filename": "File2_20002.0.0_r0_s0.rec", "directory":
"/dir2", "duration_timecode": "02:23:22:00", "duration": 8602,
"position": 5002, "speed": 2.3, "device_id": "100_Device2"},
{"ts_playstate": "PLAY", "ts_duration_timecode": "02:23:22:00",
"ts_speed": 2.3, "ts_position": 5002, "ts_position_
timecode": "01:23:22:00", "device_id": "preset", "ts_
duration": 8602}]
```

Example 2 - Return the playback properties of device ID 10002 within a preset named "preset1".

```
presetgetplayerstatus preset1 device=10002 ↵
```

```
Returns: [{"playstate": "PLAY", "position_timecode": "01:23:22:
00", "filename": "File2_20002.0.0_r0_s0.rec", "directory": "/
dir2", "duration_timecode": "02:23:22:00", "duration": "8602",
"position": "5002", "speed": "2.3", "device_id": "100_Device2"}]
```

presetgetrecorderstatus (VNM Recorder and VNR 100 only)

The presetgetrecorderstatus command returns a list of recording status properties associated with a specified preset.

Command line structure
presetgetrecorderstatus <i>name device</i>

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>name</i>	string Example: preset1	The name of the stored preset.
<i>device</i>	Device serial number Example: 50001	The ID of a specific recorder device within the preset. This optional parameter can be used for filtering or search.

Returned attributes for this command are:

Attribute	Value	Description
<i>recordstate</i>	enable disable	Recording is currently in progress. Recording is stopped.
<i>duration</i>	0-99999 Example: 5002	The current length (or total length if the recording has completed) of the recorded file in seconds.
<i>Mbytes</i>	0-99999 Example: 5002	The current size (or total size if the recording has finished) of the recorded file in megabytes.
<i>filename</i>	String Example: file1_20001.0.0_r0_s0.rec	Name of the recording file.
<i>directory</i>	String Example: /dir1	Name of the recording directory.
<i>device_id</i>	serial number: channel Example: 50001:2	The device ID and channel number of the recorder device.

Example 1 - Return the recording properties of all recorder devices in "preset1".

```
presetgetrecorderstatus preset1 ↵
```

```
Returns: [{"Mbytes": "1564", "filename": "File1_20001.0.0_r0_
s0.rec", "directory": "/dir1", "duration": "8602", "recordstate":
"disable", "device_id": "10001:1"}, {"Mbytes": "1564", "filename":
"File2_20002.0.0_r0_s0.rec", "directory": "/dir2", "duration":
"8602", "recordstate": "disable", "device_id": "10002:1"}]
```

Example 2 - Return the recording properties of device ID 10002 within a preset named "preset1".

```
presetgetplayerstatus preset1 device=10002 ↵
```

```
Returns: [{"Mbytes": "1564", "filename":
"File2_20002.0.0_r0_s0.rec", "directory":
"/dir2", "duration": "8602", "recordstate": "disable",
"device_id": "10002:1"}]
```

presetlaunch

The **presetlaunch** command calls a previously stored preset and creates all associated connections between source and sink devices. If the preset includes recorder devices (VNM Recorder or VNR 100), directories and filenames are created (if they do not exist). If the preset includes player devices (VNM Recorder or VNR 100), associated files and offset times are provisioned ready for playback. In addition, players or recorders start to playback or record if the **onlaunch** status within the preset is set to play or record respectively (see **presetset**).

Command line structure

presetlaunch <i>name</i>

name: Name of the stored preset.

Example 1 - Launch preset1.

```
presetlaunch preset1 ↵
```

presetload

The **presetload** command calls a previously stored preset and creates all of the associated connections between source and sink devices. If the preset includes recorder devices (VNM Recorder or VNR 100), directories and filenames are created (if they do not already exist).

If the preset includes player devices (VNM Recorder or VNR 100), associated folders, files and offset times are provisioned ready for playback. Optional parameters allow certain preset attributes to be changed and loaded on a one-time basis.

NOTE: Optional parameters allow certain preset attributes to be changed and loaded on a one-time basis. The changes do not overwrite the original preset.

When a VNR 100 is present in the preset, both the media and filename parameters **MUST** be set for the command to complete.

Command line structure

presetload *name parameters*

name: Name of the stored preset.

parameters: Optional parameters.

Available parameters and arguments for this command:

Parameter	Argument	Description
<i>media</i>	directory Example: media=/dir1	The directory for recording or playback.
<i>filename</i>	filename Example: filename=file1	The name of a file present in the specified media folder.
<i>tag</i>	string Example: tag='session1'	A description (tag) associated with a recording.
<i>start</i>	hh:mm:ss Example: start=00:01:33	The start offset associated with playback.
<i>stop</i>	hh:mm:ss Example: stop=00:02:50	The stop offset associated with playback.

Example 1 - Load a preset named "preset1".

```
presetload preset1 ↵
```

Example 2 - Load a preset named "preset1", specifying directory 'dir1'.

```
presetload preset1 media=/dir1 ↵
```

Example 3 - Load a preset named "preset1", specifying directory 'dir1' and a filename 'test'.

```
presetload preset1 media=/dir1 filename=test ↵
```

Example 4 - Load a preset named "preset1", specifying directory 'dir1', and start and stop offsets.

```
presetload preset1 media=/dir1 start=00:01:33 stop=00:02:50 ↵
```


presetplay

The **presetplay** command controls the playback speed of all currently playing player devices (VNM Recorder and VNR 100) within a preset. If **presetplay** is called while the players in a preset are paused, playback is resumed at the specified speed.

NOTE: **presetplay** cannot be used to start players currently stopped. The **presetplayerstart** command is used in this instance.

Command line structure

```
presetplay name speed
```

Available parameters and arguments for this command:

Parameter	Argument	Description
<i>name</i>	string Example: preset1	The name of the stored preset.
<i>speed</i>	-10.0 to 10.0	Playback speed where -10.0 to 10.0 is a multiple of 1x play speed (negative values are reverse playback).

Example 1 - Setting the players in **preset1** to play at x1.5 speed forward.

```
presetplay preset1 1.5 ↵
```

Example 2 - Setting the players in **preset1** to play at x2.3 speed in reverse.

```
presetplay preset1 -2.3 ↵
```

Example 3 - Setting the players in **preset1** to play at x0.0 speed (pause).

```
presetplay preset1 0 ↵
```

presetplayerpause

The **presetplayerpause** command pauses playback on all active players in a specified preset.

Command line structure

```
presetplayerpause name
```

name: Name of the stored preset.

Example 1 - Pause all active playback in "preset1".

```
presetplayerpause preset1 ↵
```

presetplayerstart

The **presetplayerstart** command activates playback on all provisioned players in a specified preset. The optional **keepoffset** parameter determines whether a start and stop offset (specified in the preset) is applied.

Command line structure

```
presetplayerstart name keepoffset
```

name: Name of the stored preset.

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>keepoffset</i>	yes or no Example: <code>keepoffset=yes</code>	Applies start, stop, or both offsets specified in a preset.

Example 1 - Start all players in "preset1".

```
presetplayerstart preset1 ↵
```

Example 2 - Start all players in "preset1" while maintaining all offsets.

```
presetplayerstart preset1 keepoffset=yes↵
```

presetplayerstop

The `presetplayerstop` command stops playback on all active players in a specified preset.

Command line structure
<code>presetplayerstop name</code>

name: Name of the stored preset.

Example 1 - Stop all active playback in a preset named "preset1".

```
presetplayerstop preset1 ↵
```

presetrecstart

The `presetrecstart` command activates recording on all provisioned recorders in a specified preset.

Command line structure
<code>presetrecstart name</code>

name: Name of the stored preset.

Example 1 - Start all recorders in the preset named "preset1".

```
presetrecstart preset1 ↵
```

presetrecstop

The `presetrecstop` command stops all active recordings on all recorders in a specified preset.

Command line structure
<code>presetrecstop name</code>

name: Name of the stored preset.

Example 1 - Stop all active recordings in a preset named "preset1".

```
presetrecstop preset1 ↵
```

presetrename

The `presetrename` command renames the specified preset to a new name.

Command line structure

<code>presetrename name newname</code>
--

name: Name of the stored preset.

newname: New preset name.

Example 1 - Rename "preset1" to "preset2".

```
presetrename preset1 preset2 ↵
```

presetset

The `presetset` command creates and stores a new preset with a specified name and attributes using a JSON string (see [HLI Responses](#) on page 178).

Command line structure

<code>presetset name {JSON}</code>

name: The name of the preset (A-Z,a-z,0-9,dash [-], and underscore [_]).

{JSON}: The JSON string containing details of sources, displays, and attributes.

presetstep

The `presetstep` command advances or reverses the players in a preset by approximately 250 milliseconds, referred to as a **step**. The command is issued each time a single step advance or reverse is required. The players in the preset must be paused before this command can be issued. See `presetplay`, `presetplayerpause` and `pause`.

NOTE: This command applies to video, data, and whiteboard channels.
--

Command line structure

<code>presetstep name direction</code>
--

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>name</i>	string Example: <code>preset1</code>	The name of the stored preset.
<i>direction</i>	Any positive or negative integer. Example: <code>-1</code> or <code>1</code>	A positive integer is a single step forward, a negative integer is a single reverse step.

Example 1 - Step the players in the preset named "preset1" by one step in a forward direction.

```
presetstep preset1 1 ↵
```

Example 2 - Step the players in the preset named "preset1" by one step in a reverse direction.

```
presetstep preset1 -1 ↵
```

Example 3 - Step the players in the preset named "preset1" by two steps in a reverse direction.

```
presetstep preset1 -1 ↵  
Returns: "okay"
```

```
presetstep preset1 -1 ↵  
Returns: "okay"
```

Example 4 - Stepping the currently running players in "preset1" by one frame in a reverse direction.

```
presetplay preset1 0 ↵  
Returns: "okay"
```

```
presetstep preset1 -1 ↵  
Returns: "okay"
```

presetseek

The **presetseek** command allows the user to seek a specific point in the files of the currently playing recorders in a preset.

NOTE: Playback automatically continues from the specified time. No extra play commands are required to continue the playback.

Command line structure

```
presetseek name time
```

name: Name of the stored preset.

time: Time value in hh:mm:ss:dd (must be within the maximum time of the file)

Example 1 - Search all channels of all recorders in the preset named "preset1" to 00:03:30:00.

```
presetseek preset1 00:03:30:00 ↵  
Returns: "okay"
```

presetunlaunch

The **presetunlaunch** command breaks all connections to and from devices associated with a specific preset.

NOTE: The command does not stop file playback on associated player devices (VNM Recorder or VNR 100).

Command line structure

```
presetunlaunch name
```

name: Name of the stored preset.

Example 1 - Break all connections specific to "preset1".

```
presetunlaunch preset1 ↵
```

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Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

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Chiyoda-ku, Tokyo 102-0082
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Shanghai 201611
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