

VNM Enterprise Controller

VN-Matrix® Enterprise Controller 200





Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-2660-01 Rev. C
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Safety Instructions


Safety Instructions • English


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
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ATTENTION : Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

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Istruzioni di sicurezza • Italiano


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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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NOTE: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the “[Extron Safety and Regulatory Compliance Guide](#)” on the Extron website.

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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 ] R0004 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 “0” 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 EC 200 and its features. Topics that are covered include:

- [About this Guide](#)
- [About the VNM EC 200](#)
- [About the Web-based User Interface](#)
- [About Dual \(Redundant\) VNM EC 200s](#)
- [Transport Protocols Used for Streaming](#)
- [Definitions](#)
- [Features](#)

About this Guide

This guide contains installation, configuration, and operating information for the VNM EC 200.

In this guide:

- The terms "controller", "Enterprise Controller", "VNM EC 200", and "EC 200" refer specifically to the VNM Enterprise Controller 200.
- 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 are referenced, the exact model name is used.

NOTE: This user guide details menus used to configure and control VN-Matrix encoder, decoder, and codec devices, VNM recorders, and VNS software decoders. The menus on the VNM EC 200 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 EC 200

The VNM EC 200 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 shows a simple application.

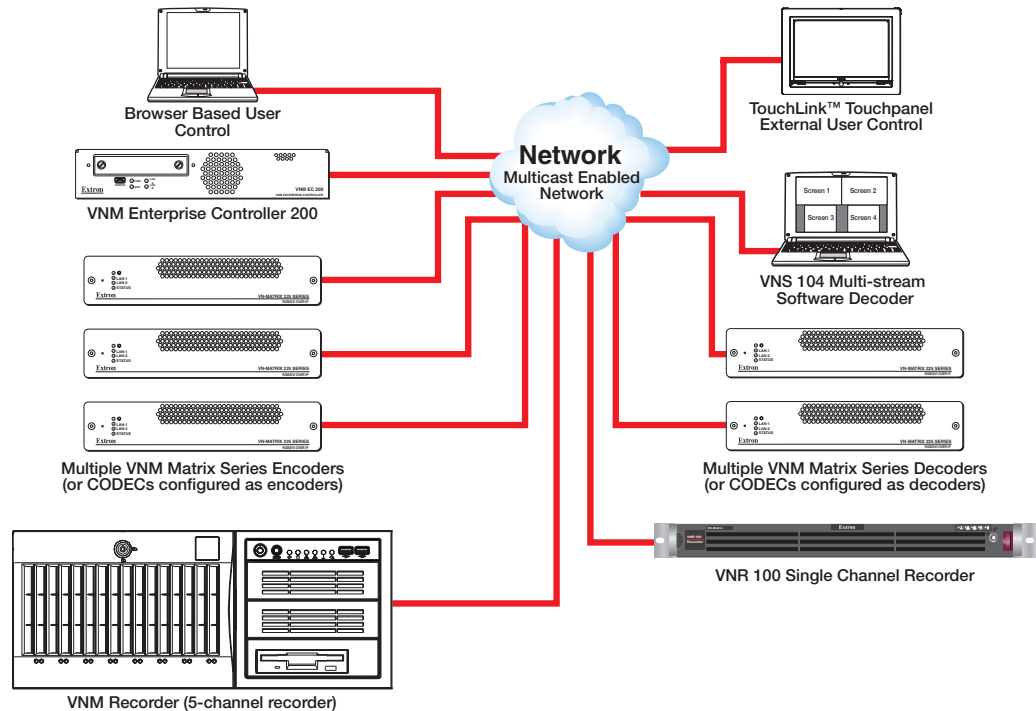


Figure 1. Single VNM EC 200 System with No Redundancy

The VNM EC 200 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 EC 200 system, see the [Single EC 200 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 several units that generally remain in a fixed operational state.

However, for large systems (more than ten devices) the VNM EC 200 provides a more sophisticated user interface that simplifies the configuration and usability of a VN-Matrix system.

The EC 200 includes a removeable SSD that, by purchasing a spare drive, allows users to easily and quickly switch system classifications in secure and unsecure environments.

About Dual (Redundant) VNM EC 200s

For applications where it is essential to maintain system control, a second VNM EC 200 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 LAN B (eth1) port of each VNM EC 200. 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 (LAN A [eth0]).
- The crossover cable must be directly connected between the two VNM EC 200 devices without using extra network equipment (such as a switch or router).

When the VN-Matrix system is started, the VNM EC 200s communicate with each other and one is chosen as the controller for the system. While the VN-Matrix system runs, each VNM EC 200 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 (LAN A [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 EC 200 system, see the [Dual \(Redundant\) Controller Configuration](#) section on page 161.

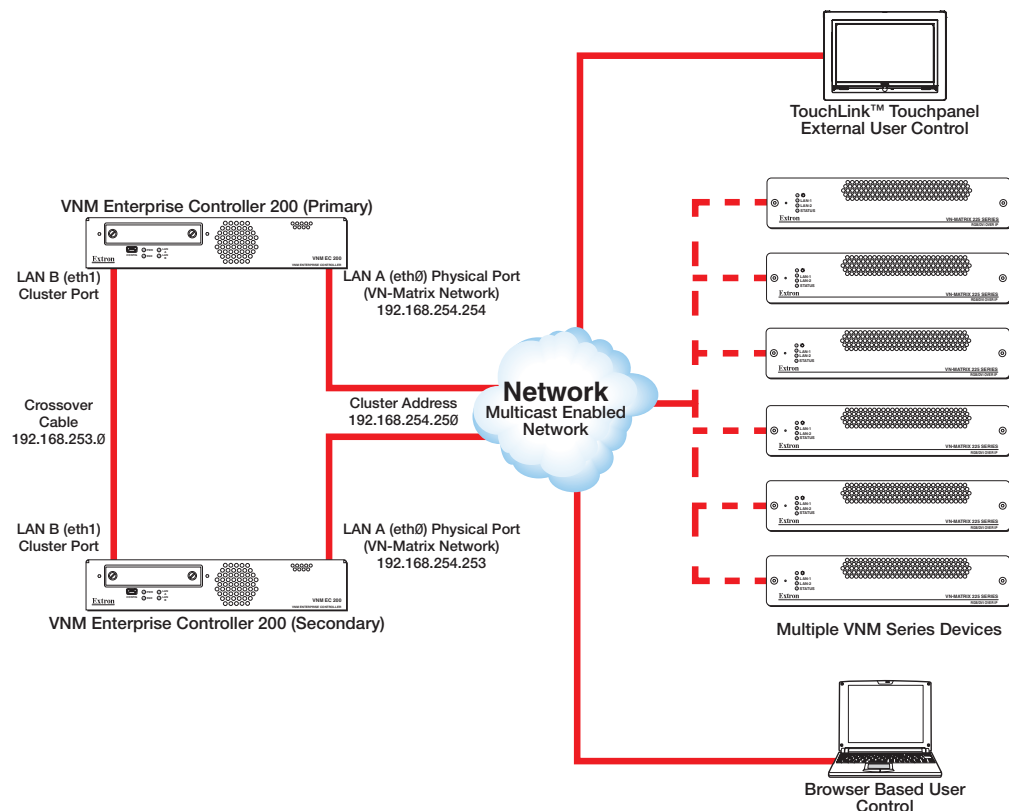


Figure 2. Dual (Redundant) VNM EC 200 System

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 can 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 EC 200 (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).

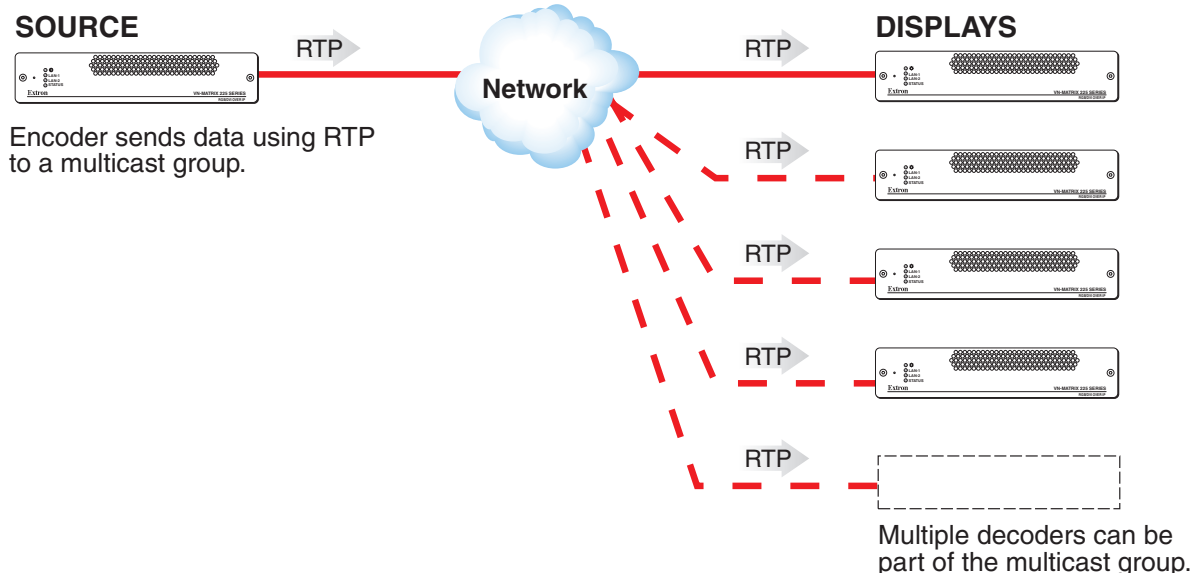


Figure 3. Multicast RTP Streaming

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.

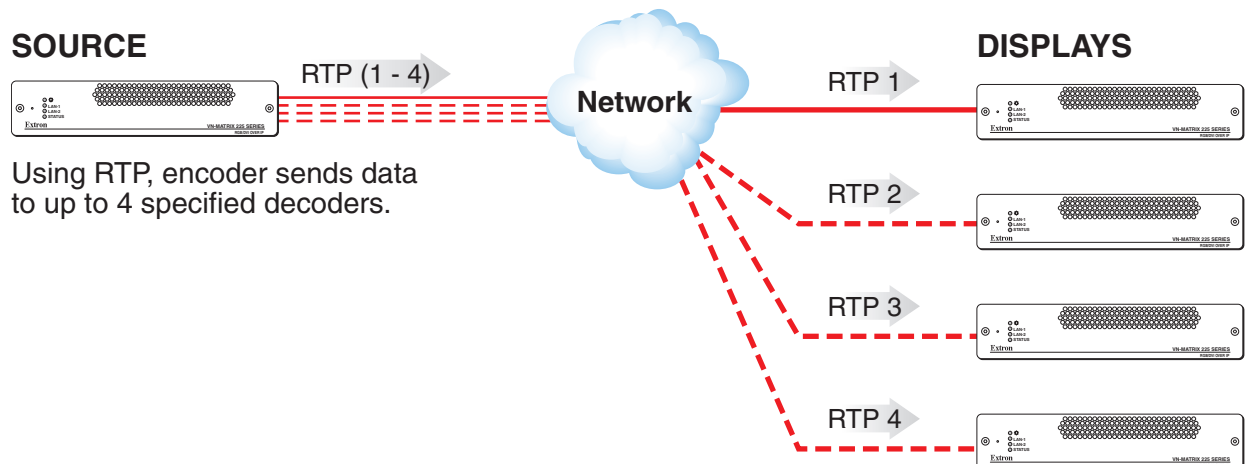


Figure 4. Unicast RTP Streaming

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.

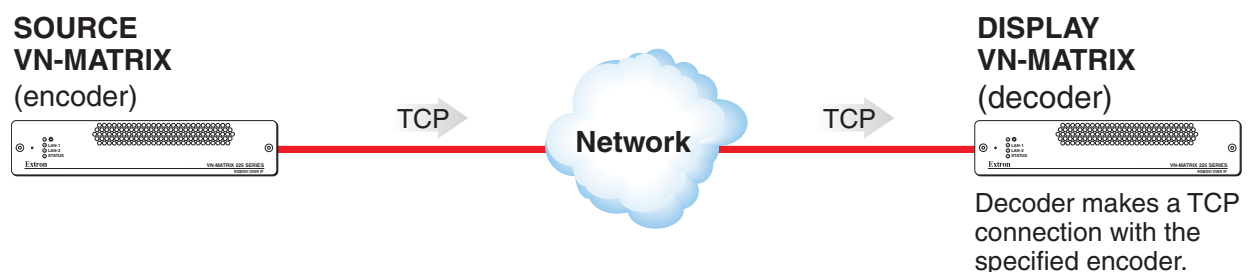


Figure 5. Unicast TCP Streaming

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. See [License Menu](#) on page 60 for information about device licenses.

Controller license — This term refers to the license that is applied to the VNM EC 200. See [Controller Firmware and License Updates](#) on page 182 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 EC 200s that are paired in a redundant configuration. A cluster IP address is used to access both VNM EC 200s at the same time.

Cluster IP address — This refers to a single IP address that is used to access paired VNM EC 200s. A unique IP address on the same subnet as assigned to the eth0 port of the primary and secondary VNM EC 200s is used as the cluster IP address.

NOTE: When configuring the controller IP address of VN-Matrix devices, use the VNM EC 200 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:

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

Front Panel Features

The front panel of the VNM EC 200 is shown in figure 6 below.

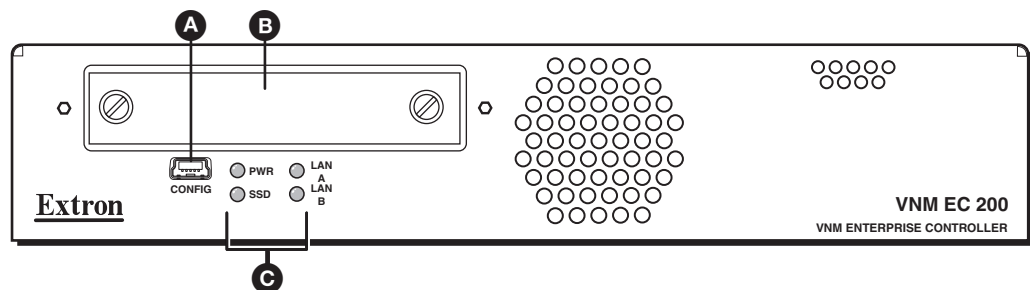


Figure 6. VNM EC 200 Front Panel

- A Config port** — Mini-USB config port for basic network configurations and system resets using Simple Instruction Set (SIS™) commands.
- B SSD Drive** — This (removable) drive holds the operating system (OS) and software required for operation.
- C Status LEDs** — Four LEDs provide the status of the VNM EC 200 (see figure 6).
 - Network Activity LED (A)** — This LED lights solid when a network link is established and flashes to indicate activity on the first network.
 - Network Activity LED (B)** — This LED lights solid when a network link is established and flashes to indicate activity on the second network.
 - Drive Activity LED** — This LED flashes to indicate drive activity.
 - Power LED** — This LED lights when the controller is powered.

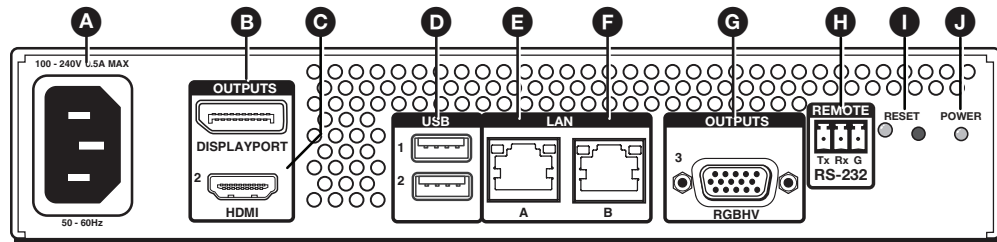
ATTENTION:

- **Do not** remove the SSD drive when the VNM EC 200 is powered on. Power down the controller (see [Power Down Procedure](#) on page 12) before removing the drive.
- Veuillez ne pas retirer le lecteur SSD lorsque le VNM EC 200 est en marche. Le contrôleur doit être éteint (voir la procédure de mise hors tension page 12) avant de pouvoir retirer le lecteur.

Rear Panel Features

NOTES: Items **A** and **E** are required for normal operation. The other items are used during shutdown, configuration and when upgrading the VNM EC 200.

The rear panel of the VNM EC 200 is shown in figure 7 below.



- 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. The EC 200 automatically starts.
- B DisplayPort connector** — for connection of a compatible display.
- C HDMI connector** — for connection of a compatible display.
- D USB (Universal Serial Bus) connectors** — Two USB port connections for mouse and keyboard control during configuration.
- E Lan A 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.
- F Lan B connector (eth1)** — Connect an RJ-45 cable to this port. This port connects to a second VNM EC 200 and is used to monitor the status of the primary VNM EC 200 in a redundant configuration. This port is also referred to as the "cluster" or "service" port.
- G VGA connector** — Connect a compatible VGA monitor to this port.
- H RS-232 connector** — Connect a host computer or control system to this connector. This port can control the VNM EC 200 using HLI commands (see [System Control](#) on page 178).
- I Reset button and indicator LED** — The VNM Enterprise Controller 200 has two reset modes to restore default configuration settings or all settings back to factory defaults. The LED indicates the desired reset mode, and provides the reset status during the reset operation (see [EC 200 Rear Panel Reset](#) on page 9).
- J Recessed power button** — Press to initiate a safe shut down of the system.

NOTE: When the EC 200 has been shut down using the power button, there are two ways to start it again:

- Remove the power input (see figure 7, **A**) and plug it back in.
- Press the recessed power button momentarily (**J**).

Figure 7. VNM EC 200 Rear Panel

EC 200 Rear Panel Reset

The **Reset** button on the rear panel (see [figure 7](#) **J**, on page 8) returns the EC 200 to default states depending on the reset mode. As shown in the reset mode summary below, each reset affects different configurations and local files, resetting some to factory condition and retaining others. The reset modes are used when the device IP address has been forgotten, when improper operation is detected, and when it is desired to start a new configuration.

To enter each reset mode, see the reset mode chart in figure 8.

NOTES:

- Each reset mode is a separate reset (not a continuation from mode 4 to mode 5).
- For information on resetting the EC 200 using SIS commands, see [Resets](#) on page 229 of the Command and Response Tables.

EC 200 Reset Mode Summary				
	Mode	Activation	Result	Purpose and Notes
Reset All IP Settings	4	Hold in the Reset button for about 12 seconds until the Reset LED blinks four times (once at 3 seconds, twice at 6 seconds, three times at 9 seconds, and four times at 12 seconds). Then, release and press Reset again within 1 second*.	Mode 4: Sets the following back to default: <ul style="list-style-type: none"> • IP address (192.168.254.254). • Subnet mask (255.255.255.0). • Gateway IP address (192.168.254.1). • MTU (1500). • The Reset LED on the rear panel of the unit flashes four times in succession. 	Mode 4 is used to reset IP address information. Equivalent to [Esc] 1ZQQQ← SIS command.
	5	Hold in the Reset button for about 15 seconds until the Reset LED blinks five times (once at 3 seconds, twice at 6 seconds, three times at 9 seconds, four times at 12 seconds, and five times at 15 seconds). Then, release and press Reset again within 1 second*.	Mode 5: Performs a complete reset to factory defaults (except the firmware). <ul style="list-style-type: none"> • Resets all mode 4 items. • Resets all IP options. • Clears all user configuration settings. • The Reset LED on the rear panel of the unit flashes four times in succession. 	Mode 5 is useful when it is desired to start over with a new configuration. Equivalent to [Esc] ZQQQ← SIS command.
NOTE: * Nothing happens if the momentary press does not occur within 1 second.				

Figure 8. EC 200 Reset Modes

Installation Overview

1. Power down and disconnect the VNM EC 200 and all devices.
2. Mount the controller (see [Mounting](#) on page 192).
3. Connect all devices to the controller (see [Front Panel Features](#) on page 7 and [Rear Panel Features](#) on page 8).
4. Power on all devices.
5. Connect a control PC to the VNM EC 200 and configure the controller (see [Accessing the Web-based User Interface](#) on page 11).
6. Use the VNM EC 200 and the Web-based User Interface to configure all connected devices.

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 applying power to the VNM EC 200, ensure that all necessary devices are powered on and connected properly.

Plug the IEC power cord into the VNM EC 200 (see [Rear Panel Features](#) on page 8). The VNM EC 200 is configured to start automatically. The power LED lights indicating the unit is powered. It 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 EC 200 into a compatible Web browser. The user interface provides system-level configuration, monitoring, and operation of VN-Matrix devices connected to the VNM EC 200. 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.

Web Browser Requirements

In order to access and view the EC 200 Web-based user interface, use one of the supported Web browsers (and versions) listed below.

- Google® Chrome™ version 46 or higher
- Mozilla® Firefox® version 41 or higher
- Microsoft® Internet Explorer® version 9 (for Windows® operating systems)

NOTE: Some of the embedded configuration and operation pages displayed via a Web browser require the Adobe® Flash® Player plugin for proper viewing.

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 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 EC 200.

3. In the address bar, enter the IP address of the EC 200 (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 browser could require configuration.

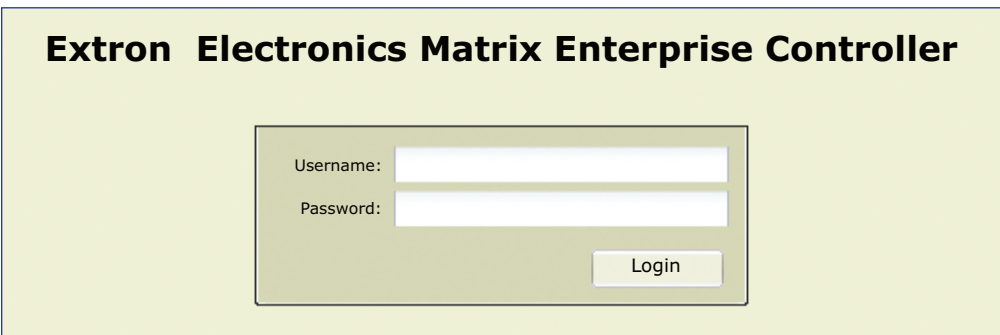


Figure 9. VNM EC 200 Login Page

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 EC 200. Extron recommends that the administrator username and password be given only to those who require it. Other users 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 VNM EC 200.

- **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** — Default: admin

- Click **Login** or press <Enter>. The **Devices** page opens (see figure 10). The VNM EC 200 is now ready for configuration and operation.

NOTE: The **Devices** page displays only devices properly configured to operate with the VNM EC 200 (see the user guides for individual devices for more information). The VNM EC 200 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 EC 200. The remaining tabs for the **Devices**, **Preset Manager**, and **Format Editor** pages can configure and operate connected devices.

Power Down Procedure

To safely power down the VNM EC 200, press the recessed power button on the rear of the controller (see **Rear Panel Features** on page 8). 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 EC 200 Configuration

This section details basic information needed to configure the settings of a single VNM EC 200. For information on how to set up redundant VNM EC 200s, see [Dual \(Redundant\) Controller Configuration](#) on page 161.

This section provides information on:

- [Setup Overview](#)
- [Single VNM EC 200 Configuration](#)
- [Configuring a Single EC 200 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 (LAN A) of the VNM EC 200 (see [Rear Panel Features](#) on page 8).
2. Power on the VNM EC 200, 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 EC 200 (see [Accessing the Web-based User Interface](#) on page 11).
4. Configure the settings of the VNM EC 200 (see [Single VNM EC 200 Configuration](#) on page 13).
5. Configure the VNM EC 200 as the VN-Matrix system controller (see [Configuring a Single EC 200 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 EC 200 (see [Controller Firmware and License Updates](#) on page 182).
8. Power down the VNM EC 200 (see [Power Down Procedure](#) on page 12) and all configured devices. After a few seconds, power on the VNM EC 200 and all necessary devices.

Single VNM EC 200 Configuration

This section details procedures on how to set up and configure a single VNM EC 200 (see [Advanced Controller Configuration](#) on page 19 for additional configuration information).

Configuring the Network Settings

The VNM EC 200 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 EC 200.

1. Log on the VNM EC 200 (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 shows the Extrem Electronics web interface. At the top, there's a navigation bar with tabs: Alarms, Configuration (marked with ①), Devices, Preset Manager, Format Editor, and System Info. Below the tabs, a status bar indicates 'Logged on: admin switcher logout'. On the left, a sidebar lists 'Device Properties' (Network marked with ②, Password, Role, Time, Upgrade, Version) and 'System Properties' (System config, Certificates). The main content area is titled 'Network' (marked with ③) and contains the 'Internet Protocol' configuration section. This section has input fields for IP Address (192.168.254.254), Netmask (255.255.255.0), Gateway (192.168.254.1), MTU (1500), HTTPS/SSL (443), and HLI(SSH) (22). Below this is the 'Ethernet' section with fields for eth0 MAC address (C:C4:7A:53:D1:42) and eth1 MAC address. At the bottom right, there are 'Apply Changes' (marked with ④) and 'Cancel Changes' buttons.

Figure 11. Configuration Page — Configuring the Network Settings

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

NOTE: Make sure the VNM EC 200 is not "paired". If it is paired, the unit must first be unpaired (see [Unpairing controllers](#) on page 177). Be aware that unpairing and then pairing a VNM EC 200 deletes device files and custom input and output modes.

4. Change the **IP Address**, **Netmask**, **Gateway**, and **MTU** fields as necessary (③).

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

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 EC 200.

NOTE: Complete this step only if the IP address of the VNM EC 200 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 EC 200. 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).

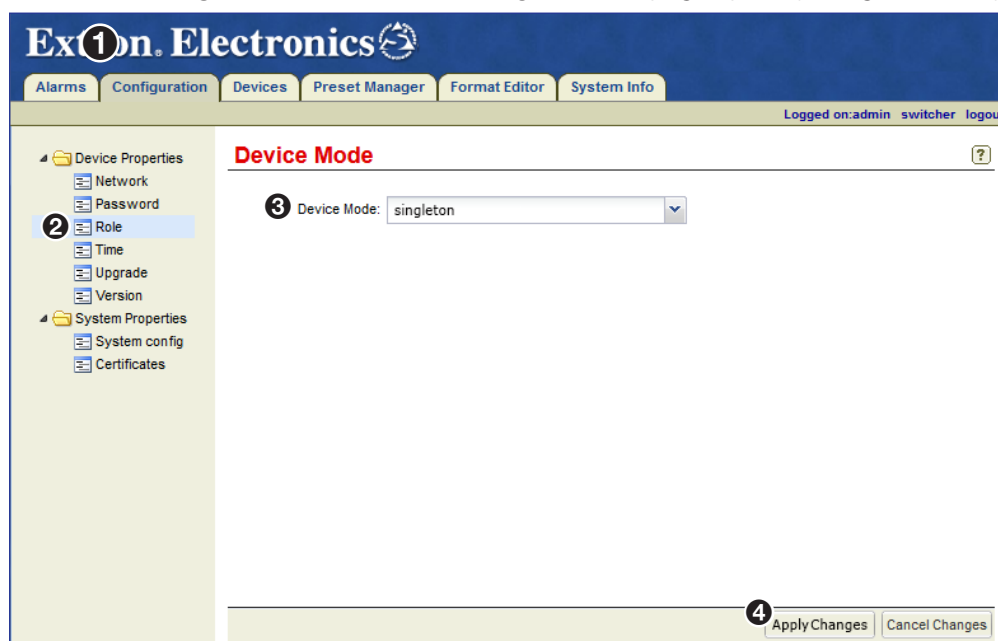


Figure 12. Configuration Page — Single VNM EC 200 Role Setting

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 log in).

1. Click the **Configuration** tab.
The Configuration page opens (see figure 13, ①).

The screenshot shows the Extron Electronics web interface. The 'Configuration' tab is selected. In the left sidebar, 'System config' is selected under 'System Properties'. The main configuration area shows the 'Protocol' set to 'unicast'. The 'Multicast Address' is 'default'. The 'Clean Switch' checkbox is checked. The 'Secure Mode' checkbox is unchecked. The 'Controllers' list contains the IP address '192.168.254.254'. At the bottom right, the 'Apply Changes' button is highlighted with a circled 4.

Figure 13. Configuration Page — Configuring the Transport Protocol

2. Click the **System config** link (see figure 13, ②).
3. From the **Protocol** drop-down list, select the preferred transport protocol that will be used throughout the VN-Matrix system (③).

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** (④), to save the configuration.

Configuring a Single EC 200 as the System Controller

This section details how to assign a single VNM EC 200 as the system controller. Before proceeding, make sure the procedures detailed in [Single VNM EC 200 Configuration](#) on page 13 are completed first.

NOTE: For information on how to configure dual VNM EC 200s as system controllers, see [Configuring Dual EC 200s as the System Controller](#) on page 168.

Adding the VNM EC 200 to the Controller List

Use the following procedure to add the VNM EC 200 to the controller list. See [Accessing the Web-based User Interface](#) on page 11 for information on how to log in.

1. Click the **Configuration** tab.
The Configuration page opens (see figure 14, ①).

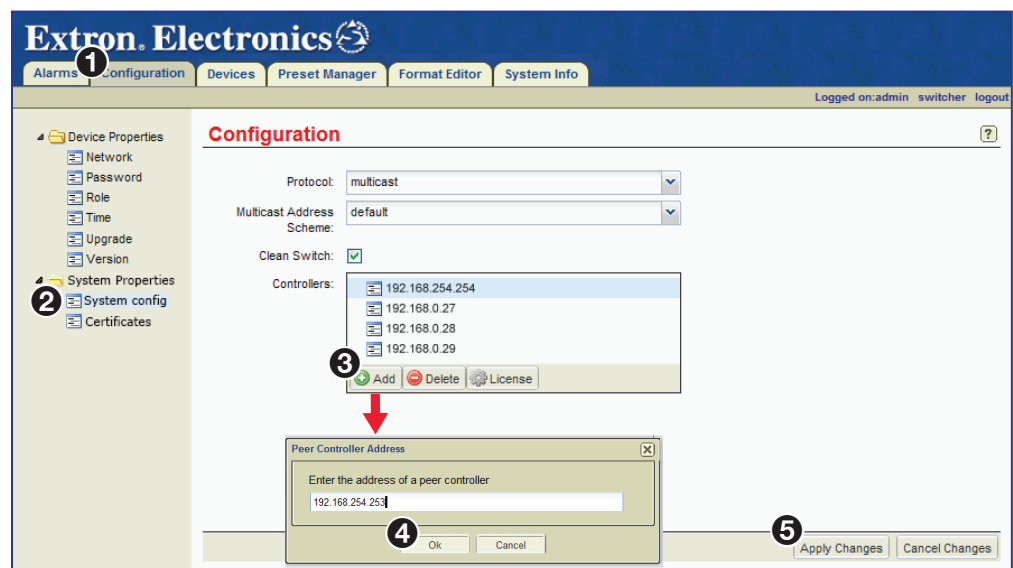


Figure 14. Configuration Page — Adding Controllers to the Controller List

2. Click the **System config** link (see figure 14, ②).
3. Click **Add** (③). The **Peer Controller Address (Add IP)** dialog box opens.
4. Enter the IP address of this VNM EC 200 and click **OK** (④).

NOTE: If necessary, clear the **Controllers** field. Highlight the displayed IP addresses and click **Delete**.

5. Click **Apply Changes** (⑤) to save the configuration.
The VNM EC 200 restarts the user interface, and is assigned as the system controller.

Configuring the VN-Matrix Devices

For the VNM EC 200 to function properly with connected devices:

1. Update each VN-Matrix device with the IP address of the VNM EC 200 and configure each device to operate on the same network as the VNM EC 200.
2. Access the VNM EC 200 Web-based user interface by entering the IP address of the VNM EC 200 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 [Actions Menu Bar Features](#) on page 44, and [Mode Menu \(VNC Devices Only\)](#) on page 63).

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

Advanced Controller Configuration

The Configuration page contains eight additional pages to configure the general settings of the VNM EC 200. 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](#)
- [Certificates Page](#)
- [System Info Page](#)
- [About the Default Multicast Address](#)

NOTE: The [Cluster Page](#) on page 175 and [Node Test Page](#) on page 172 appear only when paired VNM EC 200s are available.

Network Page

The **Network** page (see figure 15) configures the primary physical (LAN A [eth0]) IP address of the VNM EC 200.

The screenshot shows the Extron Electronics web interface for the Network configuration page. The left sidebar contains a tree view with 'Device Properties' expanded, showing 'Network' as the selected option. The main content area is titled 'Network' and contains two sections: 'Internet Protocol' and 'Ethernet'. The 'Internet Protocol' section has six numbered fields: 1. IP Address (192.168.254.254), 2. Netmask (255.255.255.0), 3. Gateway (192.168.254.1), 4. MTU (1500), 5. HTTPS/SSL (443), and 6. HLI(SSH) (9996). The 'Ethernet' section has two numbered fields: 7. eth0 MAC address (C:C4:7A:53:D1:42) and 8. eth1 MAC address (empty). The top navigation bar includes links for Alarms, Configuration, Devices, Preset Manager, Format Editor, and System Info. The user is logged in as 'admin'.

Figure 15. Network Page

The following fields are available for configuration.

- 1 IP Address** — Enter a valid IP address into this field.
- 2 Netmask** — Enter a valid subnet mask into this field.
- 3 Gateway** — Enter a valid gateway address into this field.

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

- 4 MTU** — Enter a valid MTU into this field.

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

- 5 HTTPS/SSL** — The HTTPS/SSL and HLI (SSL) section displays ports that are active when the EC 200 is running. These settings are read only and cannot be changed. Port values are shown whether the EC 200 is running in secure or unsecure mode.
- 6 HLI (SSH)** — SSH port when the EC 200 is running in secure mode. The port displays one of two values:
 - 9996 when not in secure mode.
 - 22 when in secure mode.
- 7 eth0 MAC address (LAN A)** — This field details the Media Access Control (MAC) address assigned to the primary LAN A (eth0) IP address. This field cannot be modified.
- 8 eth1 MAC address (LAN B)** — This field details the MAC address assigned to the secondary LAN B (eth1) IP address. This field cannot be modified.

For information on how to change the network settings of the VNM EC 200, see [Configuring the Network Settings](#) on page 14.

Password Page

The Password page 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, select one of the following account names.

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

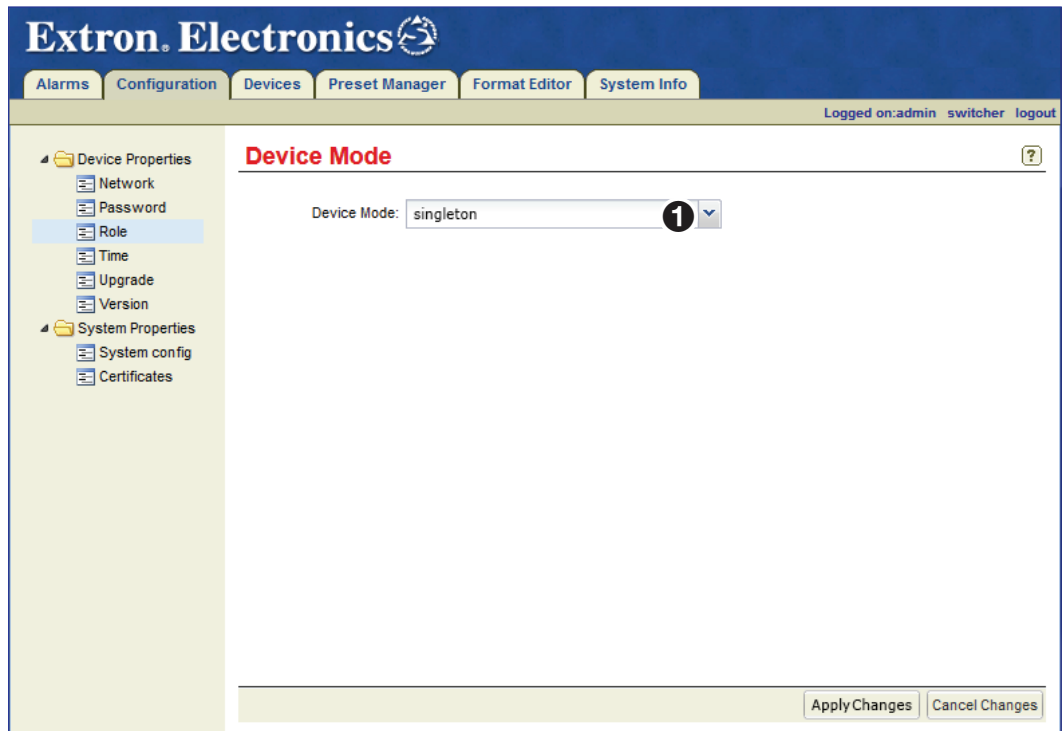
NOTE: The user name entries (**user** and **admin**) cannot be changed.

2. Enter the desired password in the top **Password** field. 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.
4. Click **Apply Changes**, to save the password.

Role Page

The **Role** page is used to set the mode of the VNM EC 200.



The screenshot shows the Extron Electronics web interface. The top navigation bar includes tabs for Alarms, Configuration, Devices, Preset Manager, Format Editor, and System Info. The user is logged in as 'admin' with a 'switcher' and 'logout' link. The left sidebar shows a tree view with 'Device Properties' expanded, containing 'Network', 'Password', 'Role', 'Time', 'Upgrade', and 'Version'. The 'Role' option is selected. The main content area is titled 'Device Mode' and contains a 'Device Mode:' label followed by a drop-down menu currently set to 'singleton'. A circled '1' is placed over the drop-down arrow. At the bottom right of the main area are 'Apply Changes' and 'Cancel Changes' buttons.

Figure 17. Role Page

To set the role, from the **Device Mode** drop-down list (see figure 17, **1**) select:

- **singleton** — Select this option when a single VNM EC 200 is the system controller.
- **redundant_primary** — Select this option when a VNM EC 200 is running as the first (primary) unit of a redundant pair.
- **redundant_secondary** — Select this option when a VNM EC 200 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 [Cluster Properties Pages](#) on page 175).

For information on setting the different device modes, see [Setting the Role](#) on page 15, [Setting the Role of the Primary EC 200](#) on page 164, and [Setting the Role of the Secondary EC 200](#) on page 165.

Time Page

The **Time** page on the **Configuration** tab is used to manage the clock-related functions available on the VNM EC 200.

Extron Electronics

Alarms Configuration Devices Preset Manager Format Editor System Info

Logged on: admin switcher logout

Time

1 Reported Time

Thu Sep 3 14:42:18 UTC 2015

2 Clock Synchronization

Enable Clock ☒

Synchronization:

Sources:

- 192.168.254.254
- 192.168.0.27
- 192.168.0.28
- 192.168.0.29

Add Delete

3 Clock Settings

Set time: 14:37:54

Set date: 09/03/2015

4 Time Zone

Set timezone: UTC

5 Apply Changes Cancel Changes

Figure 18. Time Page

Reported Time Panel

This panel (see figure 18, ①) 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](#), [2](#) on the previous page) is used to determine the primary clock source for the controller.

NOTE: If there is only one VNM EC 200 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** (checked), the controller that is logged in offsets its own time to match the system time of the first VNM EC 200 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** (unchecked), the controller that is logged in references its own clock for the system time (in the case of a singleton system with one VNM EC 200) or the time of the controller acting as the primary (in the case of a paired VNM EC 200 cluster).

NOTES:

- Only physical IP addresses of VNM EC 200s 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 EC 200.

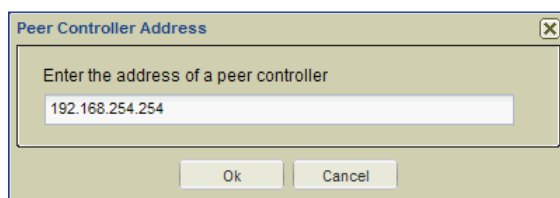
Adding controllers to the Sources list

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 ([1](#)) located below the **Sources** list (see [figure 18](#), [2](#)).




2. The Peer Controller Address dialog box opens.



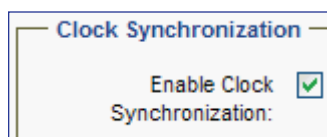
3. Enter the desired IP address and click **OK**.
4. Repeat steps [1](#) through [3](#) for each controller in the VN-Matrix system.
5. When finished adding controllers, click **Apply Changes** located at the lower right corner of the Web page (see [figure 18](#), [5](#)).

Removing controllers from the Sources list

1. To remove a controller from the list, select a controller from the **Sources** list (see [figure 18](#), ② on page 23).
2. Click the  button (② in step 1 on the previous page) 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 (see [figure 18](#), ⑤).

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 (checked) the **Enable Clock Synchronization** check box (see [figure 18](#), ② on page 23 and below).



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 (unchecked).
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](#), ③) is used to set the local time and date on the controller that is logged into.

NOTES:

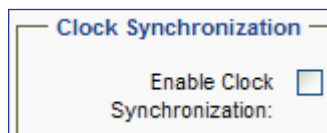
- Do not alter these fields if logged into the cluster IP address.
 - If **Enable Clock Synchronization** is selected in the **Clock Synchronization** panel, the values in this panel are dimmed.
-
- **Set time** — Enter the local time into this field or use the drop-down list button located at the right 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 or 20:35:10.
 - **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:

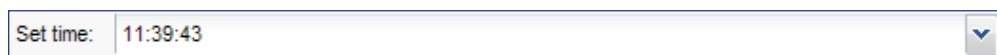
- Set the time zone **before** manually setting the time and date (see [Setting the time zone](#), below).
- Do not alter these fields if logged into the cluster IP address.

1. Make sure **Enable Clock Synchronization** is **not selected** (unchecked).



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, 05/14/2012.

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

Time Zone Panel

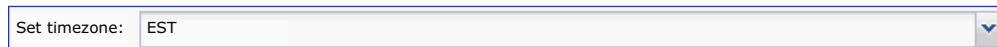
This panel (see [figure 18](#), 4 on page 23) is used to set the time zone.

- **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.

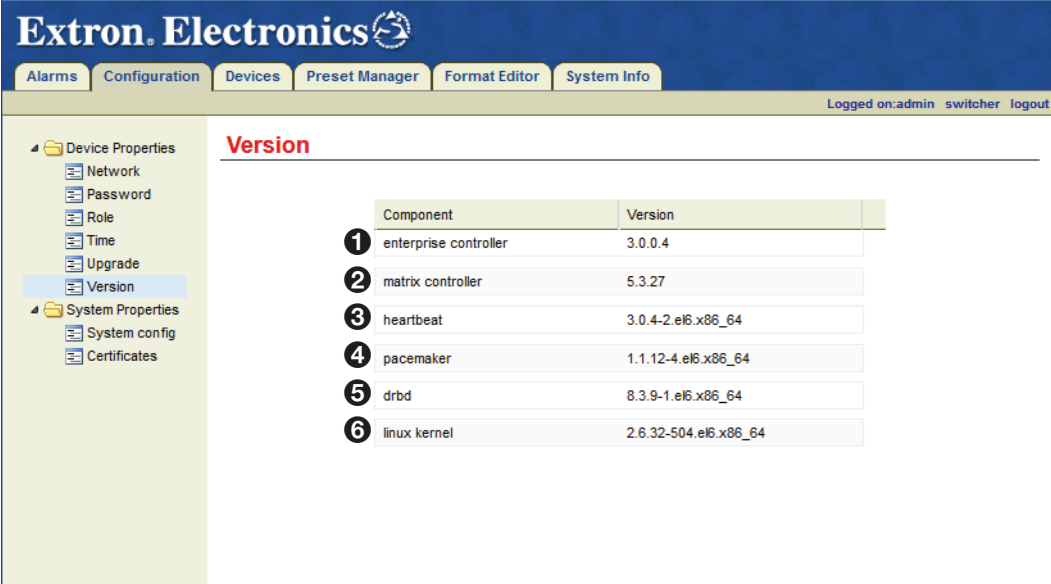
Upgrade Page

The **Upgrade** page is used to update the firmware of the VNM EC 200.

- For information on updating the firmware of a single VNM EC 200, see [Updating the Firmware of a Single EC 200](#) on page 184.
- For information on updating the firmware of dual (redundant) VNM EC 200s, see [Updating the Firmware of Dual \(Redundant\) EC 200s](#) on page 184.

Version Page

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



The screenshot shows the Extron Electronics web interface. The top navigation bar includes links for Alarms, Configuration, Devices, Preset Manager, Format Editor, and System Info. The user is logged in as 'admin' with a 'switcher' role. The left sidebar shows a tree view of system properties, with 'Version' selected under 'Device Properties'. The main content area is titled 'Version' and displays a table of component versions.

	Component	Version
1	enterprise controller	3.0.0.4
2	matrix controller	5.3.27
3	heartbeat	3.0.4-2.el6.x86_64
4	pacemaker	1.1.12-4.el6.x86_64
5	drbd	8.3.9-1.el6.x86_64
6	linux kernel	2.6.32-504.el6.x86_64

Figure 19. Version Page

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

- 1 **enterprise controller** — This field displays the version of software that is running on the VNM EC 200.
- 2 **matrix controller** — This field displays the version of firmware that is running on the VNM EC 200.
- 3 **heartbeat** — This field displays the Heartbeat clustering software version that is running on the VNM EC 200. The Heartbeat and Pacemaker software work together to create a cluster.
- 4 **pacemaker** — This field displays the Pacemaker clustering software version that is running on the VNM EC 200. The Heartbeat and Pacemaker software work together to create a cluster.
- 5 **drbd** — This field displays the Distributed Redundant Block Device (DRBD®) version that is running on the VNM EC 200. DRBD is used to manage and sync a cluster of VNM EC 200s.
- 6 **linux kernel** — This field displays the version of Linux that is running on the VNM EC 200.

System Config Page

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

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

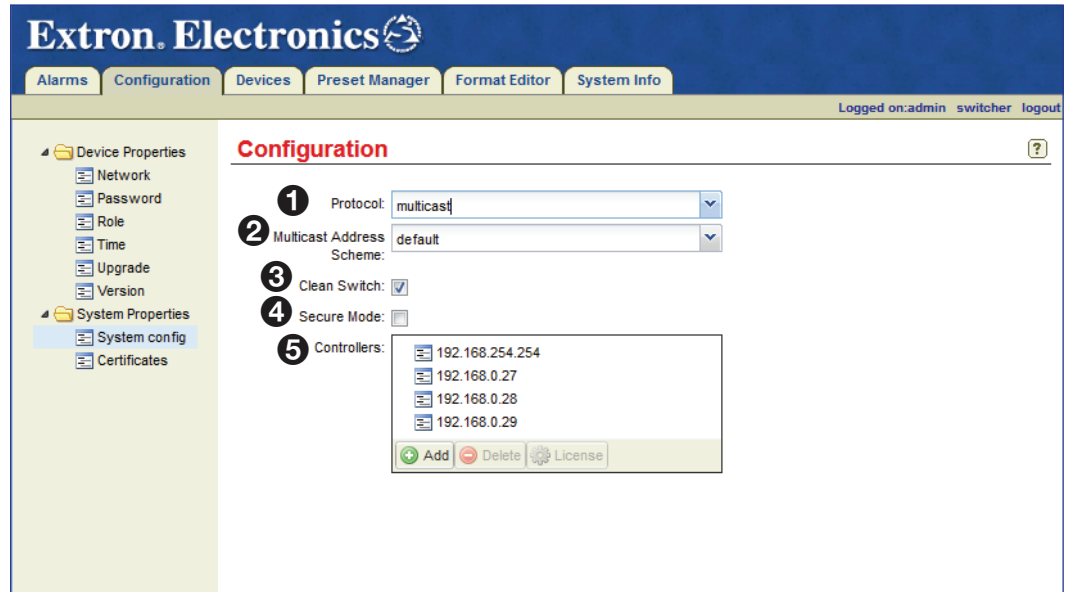


Figure 20. System Config Page

The following options are available for **Configuration**.

- 1 Protocol** — This drop-down list 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).
- 2 Multicast Address Scheme** — This drop-down list 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 34).
- **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.
- **octet-6-3** — 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**, located at the lower right corner of the Web page, to save the setting.

- ③ **Clean Switch (VN-Matrix 2xx only)** — The clean switch feature (see [figure 20](#) on page 28) 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**, 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.

- ④ **Secure Mode** — This feature (see [figure 20](#)) allows the EC 200 to run in a secure mode. When selected, the Web UI can only be contacted using HTTPS. The HLI server can only be contacted using SSH.
- Click the checkbox to activate the secure switch option. If it is checked, click it to uncheck (deactivate).
 - Click **Apply Changes** in the lower right corner of the window.
- ⑤ **Controllers** — This field (see [figure 20](#)) adds the IP addresses of all singleton and service (cluster) controllers. This field is used to keep the VNM EC 200 that is logged into aware of the devices it is controlling and the devices that are managed by the other controllers in the system. The field also 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 [Actions Menu Bar Overview](#) on page 43).

Adding and removing controllers from this field is similar to adding and removing controllers on the **Time** page (see [Time Page](#) on page 23). See [Adding controllers to the Sources list](#) on page 24 and [Removing controllers from the Sources list](#) on page 25 for information on how to add and remove controllers.

Certificates Page

The SSL Certificate is used to validate a secure connection between the Web Server of the VNM EC 200 and the Web browser. When the VNM EC 200 is configured in secure mode the Web browser must connect using Secure Socket Layer (SSL) which is denoted by the browser showing the "https://" moniker in the address bar.

The **Certificates** page allows the user to generate, download, and upload new security certificates when running the system in secure mode. The EC 200 includes a self-signed certificate which can be modified by the user. When modified, the EC 200 then generates a new self-signed certificate. If the company has its own signed certificate, it can be uploaded to the EC 200 from this page.

NOTE: The ability to download or upload a certificate can only be done when the system is running in secure mode. This is to ensure that security keys cannot be intercepted by outside parties.

The **Certificate Details** panel displays the information for the currently loaded certificate (see figure 21).

The screenshot shows the 'HTTPS/SSL Certificates' page in the Extron Electronics web interface. The left sidebar contains a tree view with 'Certificates' selected under 'System Properties'. The main content area displays the 'Certificate Details' form with the following values:

- Country Name: US
- State or Province Name: California
- Locality: Anaheim
- Organization Name: Extron Electronics
- Organization Unit Name: VN Matrix
- Common Name: Extron VNM Enterprise Controller
- Email Address: sales-usa@extron.com

At the bottom of the form, there are five buttons: 'Generate' (labeled 1), 'Download' (labeled 2), 'Upload' (labeled 3), 'Apply Changes' (labeled 4), and 'Cancel Changes'.

Figure 21. Certificates Page

The default self-signed certificate causes the browser to display a warning to the user that the site is not secure. The user must manually accept the connection. Once accepted, the browser and server communicate over a secure link.

Self-signed Certificate Generation

Users can generate a self signed certificate using the **Generate** button. When **Generate** is selected, the **Certificate Details** fields are editable and can be modified with the user information. When the changes are complete, select **Apply Changes** to save the current certificate data. The new data then validates the SSL connection when the system is in secure mode.

If the system is in secure mode and a new certificate is generated and saved, the Web browser returns the user to the login screen. The user must login and manually accept the security warning.

When the system is running in secure mode it is possible to save the current certificate details. It is also possible to upload a previously saved self-signed certificate or a Certified Certificate.

NOTE: A Certified Certificate allows the client to connect without manually accepting the connection. The browser validates the certificate against the CA trusted list.

Generate a new certificate:

1. Click **Generate** (see [figure 21](#), ① on the previous page).

Generate

The **Certificate Details** panel (see [figure 21](#)) unlocks for editing.

2. Click on the desired fields.
3. Enter the required text.
4. When editing is complete, select **Apply Changes** (④).

Apply Changes

Download the current certificate:

1. Select **Download** (②).

Download

2. A dialog opens. Ensure that the **Save File** option is selected.
3. Click **OK**.
4. When the **Enter name of file to save to...** dialog opens, browse to the desired save location for the certificate.
5. Click **Save**.
6. The certificate is saved and the dialog closes.

Upload a new Certificate:

1. Click the **Upload** button (see [figure 21](#), ③).

Upload

2. The **Upload Certificate** dialog opens (see [figure 22](#)). Select **Browse**.

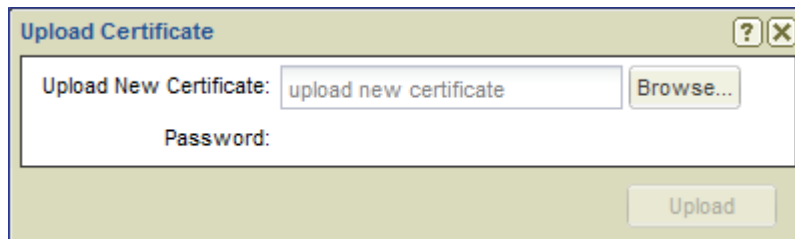


Figure 22. Upload Certificate Dialog

The **File Upload** dialog opens (see [figure 23](#)).

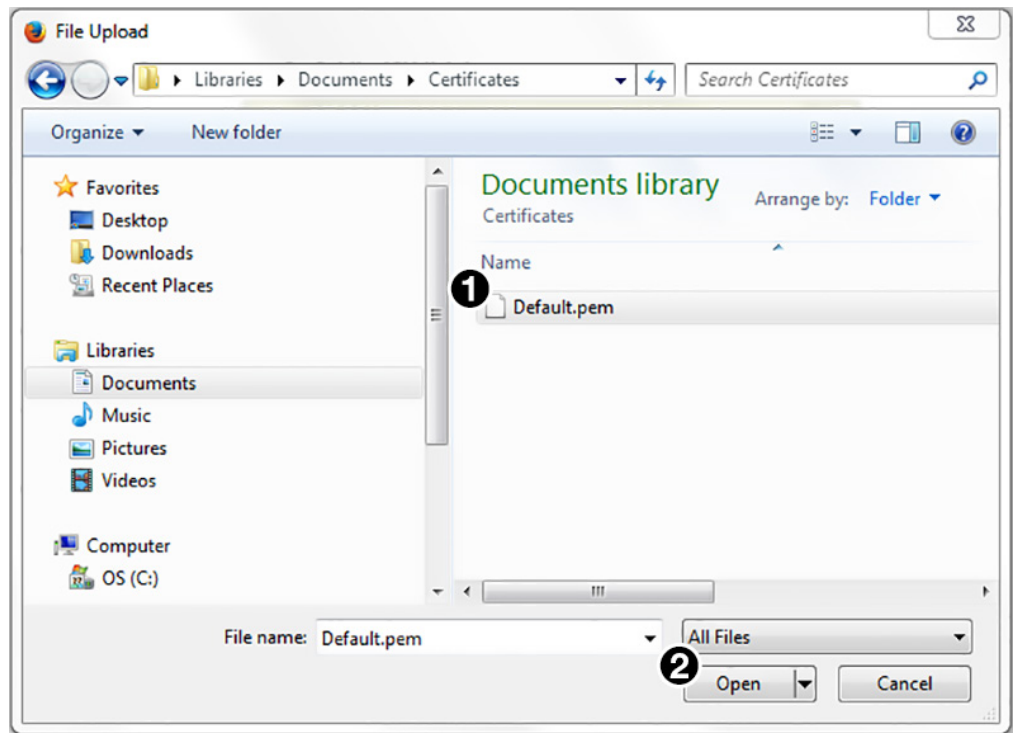


Figure 23. File Upload Dialog

3. Navigate to the folder where the new certificate resides and select the desired file (1).
4. Click **Open** (2). The certificate is prepared for upload to the EC 200.

When the upload is complete, the **Upload Certificate** dialog opens with the new certificate file (see figure 24).

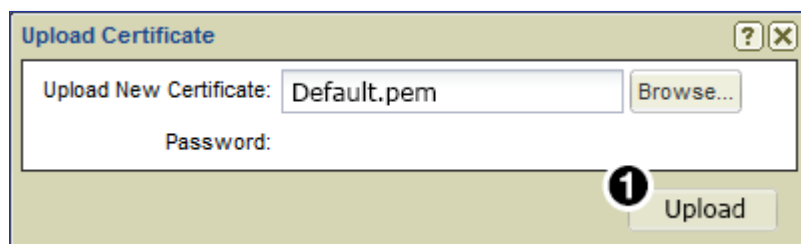


Figure 24. Upload Certificate Dialog

5. Click **Upload** (see figure 24, 1).

The **Confirm Certificate Change** dialog opens (see figure 25).

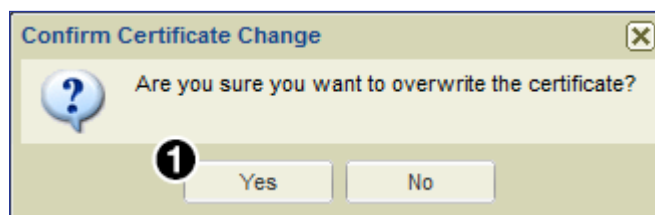


Figure 25. Confirm Certificate Change

NOTE: If the certificate is password protected, the user is prompted to enter the password.

7. Click **Yes** to complete loading the new certificate (see figure 25, 1).

System Info Page

This page is accessed by selecting the **System Info** tab (see figure 26).

Extron® Electronics 			
Alarms Configuration Devices Preset Manager Format Editor System Info			
Logged on: admin switcher logout			
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 26. System Info Page

The **System Info** page displays general information about the VNM EC 200. 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 EC 200 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 EC 200 cluster is currently using for the Web-based user interface.
- ❸ **hli.uptime** — This field displays the number of days the VNM EC 200 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 EC 200 cluster to keep the VN-Matrix system operational.
- ❺ **server.memory_usage** — This field displays the amount of memory being used by the VNM EC 200 cluster to keep the VN-Matrix system operational.
- ❻ **server.uptime** — This field displays the number of days the VNM EC 200 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 EC 200 assigns multicast IP addresses automatically. Four schemes are available. Each scheme 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 last two octets in the derived multicast address are derived from a standard 8-bit binary format. 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 EC 200 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			
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.			
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 EC 200 is the center of an audio and video streaming network that connects and controls VN-Matrix hardware encoders, decoders, recorders, and software decoders.

The EC 200 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 EC 200.

The VN-Matrix devices are monitored and configured from the **Device List** page. Connections between the devices are made on the **Preset Manager** page and can also be made on the **Switcher** page. To enable rapid system configuration, the presets are saved for later use.

This section provides instructions on how to view VN-Matrix codecs, recorders, and software decoders on a VNM EC 200, configure the devices for proper operation, and to operate those devices in a VN-Matrix network.

Sections include:

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

For the VNM EC 200 to operate and control devices on the network:

- Update each VN-Matrix device with the IP address of the VNM EC 200 and configure them to operate on the same network as the VNM EC 200.
- Access the VNM EC 200 Web-based user interface from a control computer on the same network by entering the IP address of the VNM EC 200 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 [Devices Page Features](#) on page 39).

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

Devices Page Overview

The VN-Matrix EC 200 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 EC 200 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 95).

Devices Page Features

The **Devices** page lists all VN-Matrix devices detected on the network and is the main page for configuring and managing devices. It is also the default page upon logging in (see figure 27).

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Alarms Configuration **Devices** Preset Manager Format Editor System Info

1 2 3 4 5 6 7 on:admin 8 er logout

Status	Mode	Device ID	Device Name	IP Address	Controller	Device Type	Version
Controller: 192.168.254.254 (11 Items)							
<input type="checkbox"/>		10101010	VNS104	192.168.245.102	192.168.254.254	VNS 104	ver1.1.0
<input type="checkbox"/>		10101010:1	VNS104:1	192.168.245.102	192.168.254.254	VNS 104	ver1.1.0
<input type="checkbox"/>		10101010:2	VNS104:2	192.168.245.102	192.168.254.254	VNS 104	ver1.1.0
<input type="checkbox"/>		10101010:3	VNS104:3	192.168.245.102	192.168.254.254	VNS 104	ver1.1.0
<input type="checkbox"/>		10101010:4	VNS104:4	192.168.245.102	192.168.254.254	VNS 104	ver1.1.0
<input type="checkbox"/>		2000710	Blu_Ray_2	192.168.245.112	192.168.254.254	VNE 250	ver5.3.27
<input type="checkbox"/>		2000713	Blu_Ray_1	192.168.245.114	192.168.254.254	VNE 250	ver5.3.27
<input type="checkbox"/>		2000714	Blu_Ray_3	192.168.245.108	192.168.254.254	VNE 250	ver5.3.27
<input checked="" type="checkbox"/>		2000715	Blu_Ray_4	192.168.245.103	192.168.254.254	VNE 250	ver5.3.27
<input type="checkbox"/>		2001395	device2001395	192.168.245.110	192.168.254.254	VND 250	ver5.3.27
<input type="checkbox"/>		2001397	device2001397	192.168.245.107	192.168.254.254	VND 250	ver5.3.27
Controller: 192.168.254.250 (8 Items)							
<input type="checkbox"/>		1111888	VNR100_1	192.168.245.85	192.168.254.250	VNR 100	ver9.2.3
<input type="checkbox"/>		1111888:1	VNR100_1:1	192.168.245.85	192.168.254.250	VNR 100	ver9.2.3
<input type="checkbox"/>		2000699	Samsung	192.168.245.111	192.168.254.250	VND 250	ver5.3.27
<input type="checkbox"/>		2001337	Pi	192.168.245.105	192.168.254.250	VNE 250	ver5.3.27
<input type="checkbox"/>		2001346	device2001346	192.168.245.113	192.168.254.250	VNE 250	ver5.3.27
<input type="checkbox"/>		2001392	Dell_24	192.168.245.104	192.168.254.250	VND 250	ver5.3.27
<input type="checkbox"/>		2003	Atom_1	192.168.245.109	192.168.254.250	VNE 250	ver5.3.27
<input type="checkbox"/>		2005000	Set_Top_Box	192.168.245.106	192.168.254.250	VNE 250	ver5.3.27

Actions: Info Connections Configure Format Compression Peripherals License Upgrade Misc Group By

Figure 27. Devices Page

NOTE: If devices are added when the page is open, 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, 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 (see [figure 27](#) on page 39).

1 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).

2 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 156) to see if the device contains an active alarm.

3 Device ID — A unique identifier for each device is shown in this column.

4 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 47.

- ⑤ **IP Address** — The IP address of the device is shown in this column.

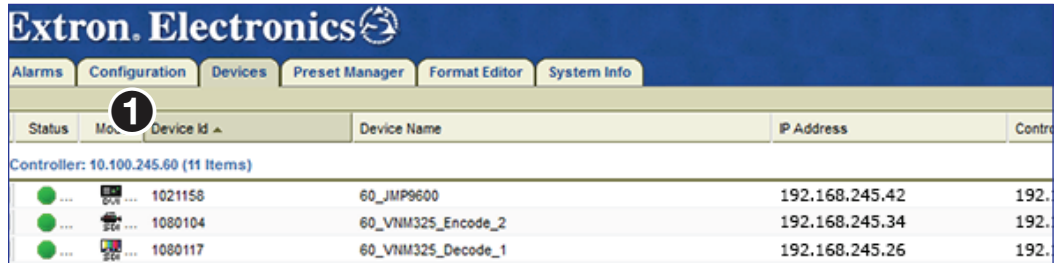
NOTE: The IP address of a device is shown only if the device is currently present on the network and configured to use the VNM EC 200.

- ⑥ **Controller** — This column shows the IP address of the device acting as the system controller.
- ⑦ **Device Type** — This column shows the type of device connected to the VN-Matrix system.
- ⑧ **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

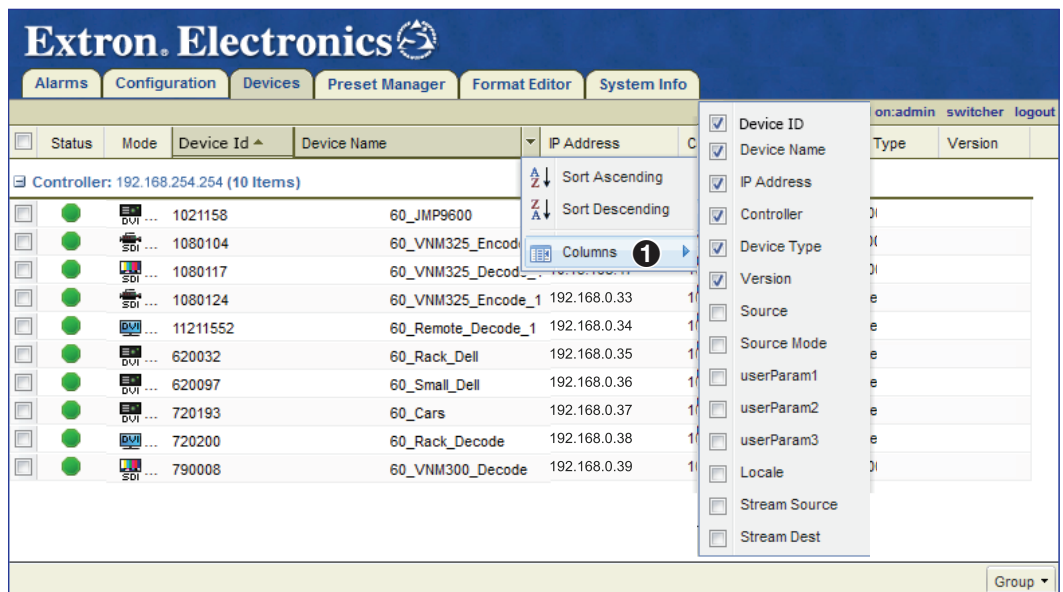
Columns can be sorted by clicking directly on any of the column names. Click a column name to sort the list in ascending or descending order. Figure 28 shows the devices sorted by device ID number. The **Device Id** column is darkened and contains a ▲ icon to indicate the devices are sorted by the device ID number in ascending order.



Status	Mode	Device Id ▲	Device Name	IP Address	Controller
Controller: 10.100.245.60 (11 Items)					
●	...	1021158	60_JMP9600	192.168.245.42	192.168.245.42
●	...	1080104	60_VNM325_Encode_2	192.168.245.34	192.168.245.34
●	...	1080117	60_VNM325_Decode_1	192.168.245.26	192.168.245.26

Figure 28. 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 29, ①). 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	Controller
Controller: 192.168.254.254 (10 Items)					
●	...	1021158	60_JMP9600	192.168.0.33	192.168.0.33
●	...	1080104	60_VNM325_Encode_1	192.168.0.34	192.168.0.34
●	...	1080117	60_VNM325_Decode_1	192.168.0.35	192.168.0.35
●	...	1080124	60_VNM325_Encode_1	192.168.0.36	192.168.0.36
●	...	11211552	60_Remote_Decode_1	192.168.0.37	192.168.0.37
●	...	620032	60_Rack_Dell	192.168.0.38	192.168.0.38
●	...	620097	60_Small_Dell	192.168.0.39	192.168.0.39
●	...	720193	60_Cars		
●	...	720200	60_Rack_Decode		
●	...	790008	60_VNM300_Decode		

Figure 29. Advanced Column Sorting

Sorting Devices by Group

Devices can be sorted in groups using the **Group By** menu (see figure 30, ①).

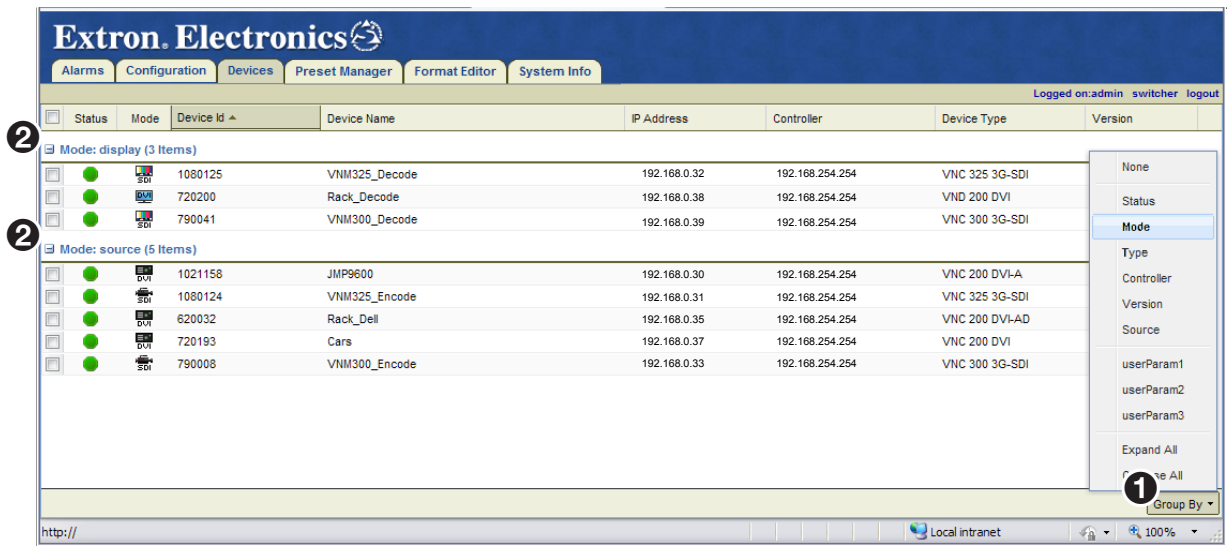



Figure 30. Grouping Devices

The following group options are available:

NOTES:

- After selecting a grouping option, groups can be further sorted using column sorting. Figure 31 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 30, ②).

- **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.

Actions Menu Bar Overview

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 31).

Encoder
Actions: Info Connections Configure Format Compression Peripherals License Upgrade Mode ▾ Misc ▾ Group ▾

Decoder
Actions: Info Connections Configure Format Peripherals License Upgrade Mode ▾ Misc ▾ Group ▾

VN-Matrix Recorder
Actions: Info Recorder Configure License Upgrade Misc ▾ Group ▾

VN-Matrix Recorder Sub-channel
Actions: Info Recorder License Misc ▾ Group ▾

VNS 104
Actions: Info Connections Configure Audio Misc ▾ Group ▾

VNS 104 Decode Windows
Actions: Info Format Misc ▾ Group ▾

Figure 31. 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 32) to open its action bar. Click an action bar menu item to open a dialog box with configuration options for its intended operation.

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Alarms Configuration Devices Preset Manager Format Editor System Info

Logged on: admin switcher logout

Status	Mode	Device Id	Device Name	IP Address	Controller	Device Type	Version
Controller: 10.100.245.60 (11 Items)							
<input checked="" type="checkbox"/>	...	1021158	60_JMP9600	192.168.245.42	192.168.245.60	VNE 200 DVI	ver3.10.8
<input type="checkbox"/>	...	1080104	60_VNM325_Encode_2	192.168.245.34	192.168.245.60	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	1080117	60_VNM325_Decode_1	192.168.245.26	192.168.245.60	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	1080124	60_VNM325_Encode_1	192.168.245.71	192.168.245.60	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	11211552	60_Remote_Decode_1	192.168.245.56	192.168.245.60	VNC 200 DVI-A	ver3.10.8
<input type="checkbox"/>	...	620032	60_Rack_De1	192.168.245.43	192.168.245.60	VNC 200 DVI-A	ver3.10.8
<input type="checkbox"/>	...	620097	60_Small_De1	192.168.245.31	192.168.245.60	VNC 200 DVI-A	ver3.10.8
<input type="checkbox"/>	...	720193	60_Cars	192.168.245.44	192.168.245.60	VNC 200 DVI-A	ver3.10.8
<input type="checkbox"/>	...	720200	60_Rack_Decode	192.168.245.45	192.168.245.60	VND 200 DVI	ver3.10.8
<input type="checkbox"/>	...	790008	60_VNM300_Decode	192.168.245.39	192.168.245.60	VND 300 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	790041	60_VNM300_Encode	192.168.245.52	192.168.245.60	VNC 300 3G-SDI	ver4.6.8
Controller: 10.100.245.61 (7 Items)							
<input type="checkbox"/>	...	1080101	61_VNM325_Decode_2	192.168.245.25	192.168.245.61	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	1080120	61_VNM325_Decode_1	192.168.245.37	192.168.245.61	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	1080121	61_VNM325_Encode_2	192.168.245.24	192.168.245.61	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	1080125	61_VNM325_Encode_1	192.168.245.22	192.168.245.61	VNC 325 3G-SDI	ver4.6.8
<input type="checkbox"/>	...	620023	61_MS9500	192.168.245.48	192.168.245.61	VNC 200 DVI	ver3.10.8
<input type="checkbox"/>	...	620091	61_Remote_Decode_2	192.168.245.30	192.168.245.61	VNC 200 DVI-A	ver3.10.8
<input type="checkbox"/>	...	720202	61_Remote_Decode_1	192.168.245.46	192.168.245.61	VNC 200 DVI	ver3.10.8

Actions: Info Connections Configure Format Compression Peripherals License Upgrade Mode ▾ Misc ▾ Group By ▾

Figure 32. Encoder Actions Bar

The VNM 325 is selected in the example in figure 32 (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 Features

The **Actions** menu bar buttons perform similar functions regardless of the device selected (see **figure 31** on the previous page). 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 67; for VN-Matrix recorders see [Recorder Configuration](#) on page 82; and for software decoders see [VNS 104 Software Decoder Configuration](#) on page 86. 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 31](#) on page 43) to open the **Device Information** dialog box to display basic information for the selected VN-Matrix device (see [figure 33](#)).

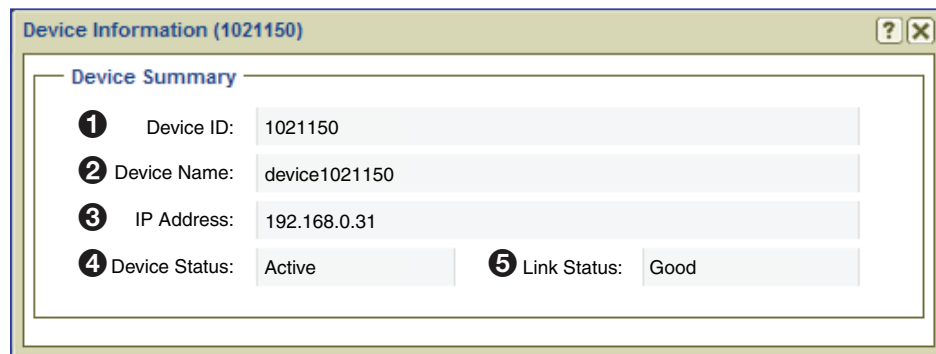


Figure 33. Device Information (Encoder or Decoder Shown)

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

- ❶ **Device ID** — Displays the device ID number of the selected device.
- ❷ **Device Name** — Displays the name of the selected device.
- ❸ **IP Address** — Displays the IP address of the selected device.
- ❹ **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**.
- ❺ **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 34). Click **Connections** (see [figure 31](#) on page 43) to open the **Connections** dialog box.

VNM 200/225

	Video	Audio	Whiteboard	Data
1 Description	61_Decode2.videowindow	61_Decode2.audiowindow	61_Decode2.wbWindow	61_Decode2.dataWindow
2 id	620023.1.0	620023.0.0	620023.2.0	620023.3.0
3 Source	:0	:0	:0	:0
4 Destination	239.192.1.42:9600	239.192.0.42:9088	239.192.2.42:10112	239.192.3.42:10624
5 Locale	ext	ext	ext	ext
6 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

	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 34. 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).

- 1 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.
- 2 id** — Displays the device ID of the connected device.
- 3 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.
- 4 Destination** — Displays the IP address and port number of the stream receiver device.
- 5 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.
- 6 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

To set global parameters specific to the VN-Matrix 200/225 and 3xx devices (see figure 35), click **Configure** (see figure 31 on page 43).

Figure 35. Configure Device Settings

Device Setup panel

- ❶ **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.
- ❷ **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.
- ❸ **Enable Splash Screen (Decoder Only)** — Check this box to display a splash screen on the video output when no video stream is available.
- ❹ **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 65).
- ❺ **Identify Source (Encoder)** — Check this box to display the name of the device on the image 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 65).
- ❻ **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 65).
- ❼ **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 can be used to identify devices. The names can be comprised of letters, numbers, and the underscore character. Spaces are not allowed.

Networking panel

- ❼ **Multicast TTL** — 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** (see [figure 31](#) on page 43) to open the **Source Format** dialog box (see [figure 36](#)) used to view information about the incoming source. It is also used to make adjustments to the signal and to set the EDID options). The menu differs between the VN-Matrix 200/225 and VN-Matrix 3xx series.

VN-Matrix 200/225 Series

VN-Matrix 3xx Series

Figure 36. 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 53.

Status panel

- 1 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.
- 2 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.
- 3 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 (see [figure 36](#) on page 48). The following fields are read-only (cannot be edited).

- ④ **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*.
- ⑤ **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.

- ⑥ **Line Count** — This field details the total number of lines used in the connected source.
- ⑦ **Line Period (ms)** — This field details how often the lines of information are updated in milliseconds (ms).
- ⑧ **Active Pixels** — This field details the number of active pixels used in the connected source.
- ⑨ **Active Lines** — This field details the number of active lines used in the connected source.
- ⑩ **First Pixel** — This field details the position of the first active pixel in a line.
- ⑪ **First Line** — This field details the position of the first active line in a frame.
- ⑫ **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 (see [figure 36](#), ⑬) 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 51 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 (see [figure 36](#)).

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

- ⑭ **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.
- ⑮ **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.

- 16 **Color Space** — This drop-down list selects between RGB and YPbPr video source types (see [figure 36](#) on page 48)

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.

- 17 **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)

- 18 **Blanking** — This drop-down list adjusts the blanking setting (see [figure 36](#)). 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 48).

NOTE: Blanking adjustment is only required on analog sources.

- 19 **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.
- 20 **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)

- 21 **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).
- 22 **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 37). Configuration options change depending upon the model and the transport mode selection. The differences are noted in the following descriptions.

Ancillary Audio

① Audio Channels: 16	③ Audio Type: none
② Transport Mode: transparent	④ Compression: none
⑤ Groups: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	
⑥ FEC Mode: none	⑧ FEC Overhead: 0% (0 Mbps)
⑦ FEC Rows: 0	⑨ FEC Columns: 0

Transparent Mode

Ancillary Audio

① Audio Channels: 2	③ Audio Type: no data
② Transport Mode: stereo	④ Compression: pack20
⑤ Stereo Pairs: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8	
⑥ FEC Mode: none	⑧ FEC Overhead:
⑦ FEC Rows: 0	⑨ FEC Columns: 0

Stereo Mode (VNM 325 Only)

Figure 37. Ancillary Audio Menus

- ① **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**.
- ② **Transport Mode** — A drop-down list with two selections:
 - **Transparent:** Audio is transported in groups of 4 channels. Multiple groups (see **Selection Boxes** on the next page) 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 for the 325 only.
- ③ **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)
- ④ **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.
- ⑤ **Selection Boxes** — When checked, these boxes (**Groups** or **Stereo Pairs**) indicate different items depending on the selected transport mode (see [figure 37](#) on page 51).
- **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.
- ⑥ **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.
- ⑦ **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.
- ⑧ **FEC Overhead (Transparent mode only)** — This field reports the calculated overhead as a percentage of the signal bitrate.
- ⑨ **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** (see [figure 31](#) on page 43) to open the **Display Format** dialog box used to configure the output format of a decoder (see [figure 38](#)). 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 48.

VN-Matrix 200/225 Display Format

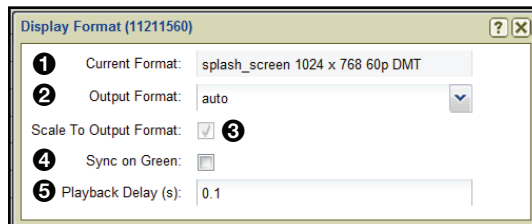


Figure 38. VN-Matrix 200/225 Display Format Dialog Box

- 1 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**.
- 2 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**.

- 3 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.

- ④ **Sync on Green (SoG) (VN-Matrix 200/225 only)** — When selected, this check box (see [figure 38](#) on page 53) 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.

- ⑤ **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

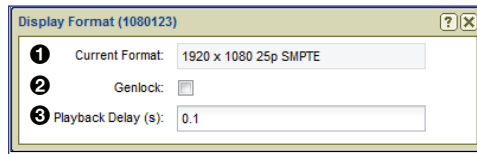


Figure 39. VN-Matrix 3xx Series Display Format Dialog Box

The VN-Matrix 3xx series display format dialog box (see [figure 39](#)) shares two configuration options with the VN-Matrix 200/225 (see [figure 38](#)).

- ① **Current Format**
③ **Playback Delay (s)**

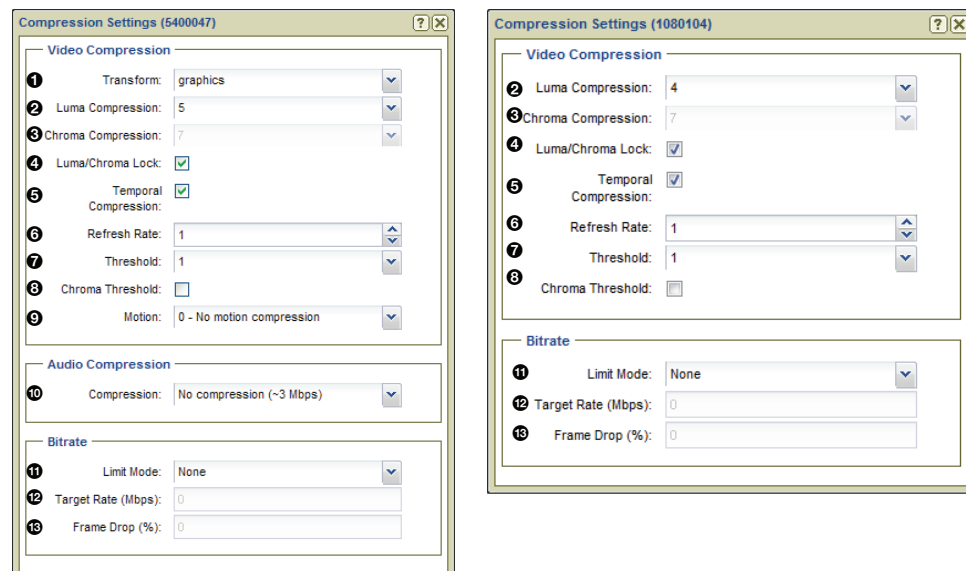
These configuration options function identically to those on the VN-Matrix 2xx series Display Format menu.

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

- ② **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** (see [figure 31](#) on page 43) to open the **Compression Settings** dialog box used to set the amount of compression on the encoded source (see [figure 40](#)).



VNx 200/225 Series

VNx 3xx Series

Figure 40. 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 57) 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 (see **figure 40** on page 54)

- 1 **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.
- 2 **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.
- 3 **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.

- 4 **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).

- 5 **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.

- 6 **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**.
- 7 **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**.

- ⑧ **Chroma Threshold** — This check box (see [figure 40](#) on page 54) 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: The option is normally not required for video or camera type sources.

- ⑨ **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 continues 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 51).

- ⑩ **Compression** — VN-Matrix supports limited compression of S/PDIF audio sources. This is controlled by the **Compression** setting (see [figure 40](#)). 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 (see [figure 40](#) on page 54) sets a specific bandwidth limit for the encoded stream.

- 11 **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.
- 12 **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).
 - 13 **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** (see [figure 31](#) on page 43) to open the **Peripherals Settings** dialog box to manage remote keyboard and mouse communications on a VN-Matrix 200/225 (see [figure 41](#)).

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 dialog is titled 'Peripheral Settings (11211568)' and is for an Encoder. The right dialog is titled 'Peripheral Settings (11211560)' and is for a Decoder. Both dialogs have the same layout with four main sections: Serial Port, Data Channel, Pointer Overlay, and Mouse and Keyboard. The settings are numbered 1 through 15.

Setting Number	Encoder (Left)	Decoder (Right)
1	Mode: None	Mode: None
2	Baud Rate: 115200	Baud Rate: 115200
3	Data Bits: 8	Data Bits: 8
4	Stop Bits: 1	Stop Bits: 1
5	Parity: none	Parity: none
6	Handshake: none	Handshake: none
7	Destination: (empty)	Destination: (empty)
8	UDP Data TX: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	UDP Data: <input type="radio"/> Enable <input checked="" type="radio"/> Disable
9	UDP Data Port: (empty)	UDP Dest IP: (empty)
10		UDP Dest Port: 9002
11	Overlay: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Annotation Port: 9997
12	Mode: enable	Mode: Keyboard
13	IP address: (empty)	IP address: (empty)
14	Status: Local	Status: Local
15		Inactivity: 3811326

Encoder

Decoder

Figure 41. Peripherals Dialog

Serial Port

This panel (see [figure 41](#)) 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 41](#).

- 1 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:** (see [figure 41](#), items **2** through **6** on page 58) Basic configuration of the serial port includes baud rate, data bits, stop bits, parity, and handshake.
- **Destination:** — This option (**7**) can only be modified when the serial port is in client mode. The dropdown 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 (see [figure 41](#)) configures the UDP data stream.

- 8 UDP Data TX (encoder)** — Enables or disables UDP data transport through the dataport.
- 8 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.
- 9 UDP Data RX (decoder)** — Enables or disables the UDP data.
- 9 UDP Dest IP (decoder)** — The IP address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
- 10 UDP Dest Port (decoder)** — This is the port number used by the (external) device or system to receive the UDP data.

Pointer Overlay

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

Mouse and Keyboard

- 12 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 + keeplive:** The link is automatically established if broken.
 - **Force:** Mouse and keyboard forwarding + keeplive is permanently enabled.
- 13 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.
- 14 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.
- 15 Inactivity:** — Read-only, (decoder only). Displays the number of seconds since the mouse or keyboard reported a change.

License Menu

Click **License** (see [figure 31](#) on page 43) 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 42](#)).

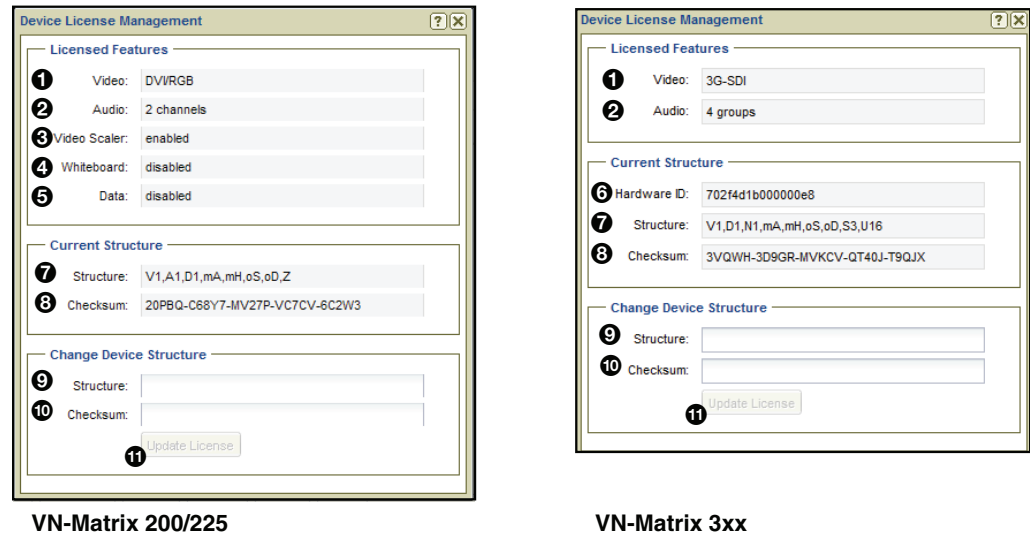


Figure 42. License Menu

NOTE: The Licensed Features panel and Current Structure panel fields are read-only.

Licensed Features panel

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

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

Current Structure panel

- 6 **Hardware ID (VNM 3xx only)** — Displays the hardware ID of the device.
- 7 **Structure (all)** — Details the current structure key used by the selected device.
- 8 **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 EC 200 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 182 for information about VNM EC 200 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 182 pour obtenir des informations sur les licences du contrôleur VNM EC 200.

⑨ **Structure** — This field is used to update the structure key used by the device.

⑩ **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 (see [figure 42](#) ⑨, on the previous).
 - Enter the **checksum** into the **Checksum** field (⑩).
3. Click **Update License** (⑪) to save the new license.

Upgrade Menu (2xx and 3xx Devices)

Click **Upgrade** (see [figure 31](#) on page 43) to open the **Upgrade Device Firmware** dialog box used to upgrade the firmware of one or more VN-Matrix devices (see figure 43).

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.

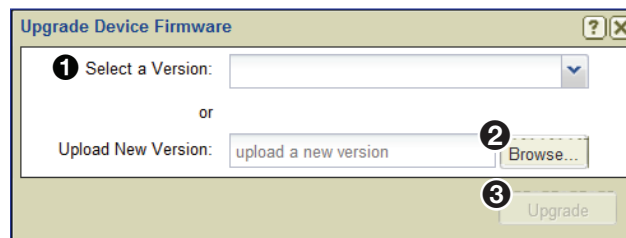


Figure 43. Upgrade FW Dialog

NOTE: When the VNM EC 200 is running in secure mode (see [System Config Page](#) on page 28), devices cannot be upgraded. Take the controller out of secure mode for the upgrades, then place it back in secure mode after completing the upgrades.

- 1 Select a Version** — This drop-down list contains previously uploaded firmware versions that are available.
- 2 Upload New Version** — Click **Browse** to upload new firmware versions. New firmware versions uploaded to the VNM EC 200 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 [Devices Page Features](#) on page 39).
2. Click **Upgrade** on the **Actions** toolbar (see [figure 31](#) on page 43).
3. Select the desired version from the **Select a Version** drop-down list (see figure 43, **1**) and click **Upgrade** (**3**).

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 [Devices Page Features](#) on page 39).
2. Click **Upgrade** on the **Actions** toolbar.
3. Click **Browse** (see figure 43, **2**) and navigate to the appropriate location of the firmware. When the firmware is selected, it is uploaded to the VNM EC 200.

- After the proper firmware is uploaded, select the version from the **Select a Version** drop-down list (see [figure 43](#) on page 62, ❶) and click **Upgrade** (❸).

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 44).
- See [Update a device license](#) on page 61 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 cannot 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 44. Device Firmware Upgrade Status

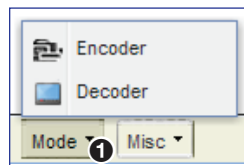
Mode Menu (VNC Devices Only)

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:

- Select a codec device or multiple codec devices from the **Devices** page (see [Devices Page Features](#) on page 39).
- On the action toolbar, click **Mode** (❶).
The **Mode** menu opens.



- 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 45).

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

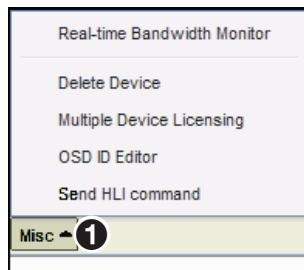


Figure 45. Misc Menu

Click **Misc** (see figure 45, ❶) to open the list.

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 46).

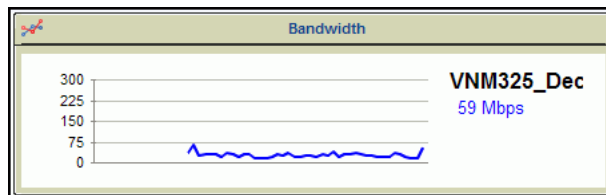


Figure 46. Bandwidth Monitor

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 cannot be removed from the device list.

Multiple Device Licensing

This option is not available on the VNM 250, the VNM 200/225 and VNM 300/325 series.

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 47).

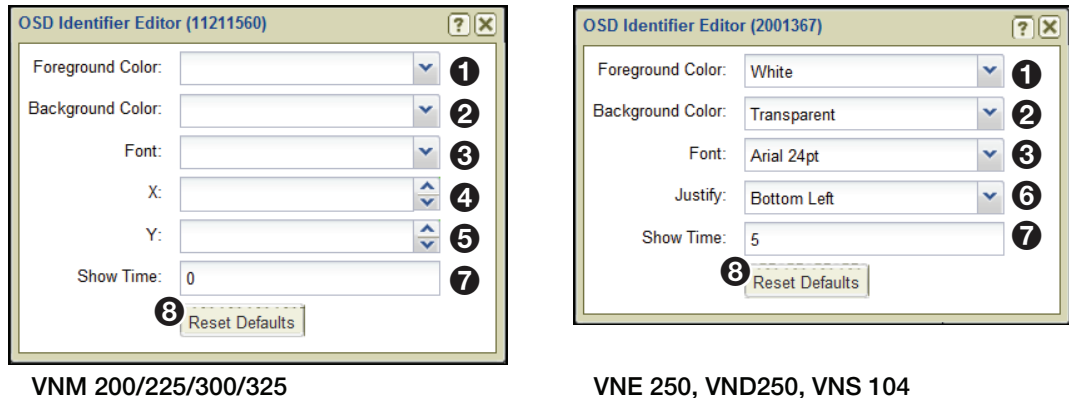


Figure 47. OSD Identifier Editor

- 1 Foreground Color** — This drop-down list selects the color of the text box font.
- 2 Background Color** — This drop-down list selects the text box background color.
- 3 Font** — This drop-down list selects the type of font used in the text block.
- 4 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.
- 5 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.
- 6 Justify** — This drop-down list places the text block in one of nine fixed positions.
- 7 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.
- 8 Reset Defaults** — Returns all OSD Identifier configuration to their defaults.

NOTES:

- This control option only functions when the **Identify Source** check box is selected on the **Configure menu** (see [Configure Menu](#) on page 47).
- The OSD is not recorded.
- See [VNS 104 Software Decoder Configuration](#) on page 86 for VNS 104 OSD options.

Send HLI Command

Selecting this option opens a dialog box for sending High Level Interface (HLI) command strings to VN-Matrix devices (see figure 48).

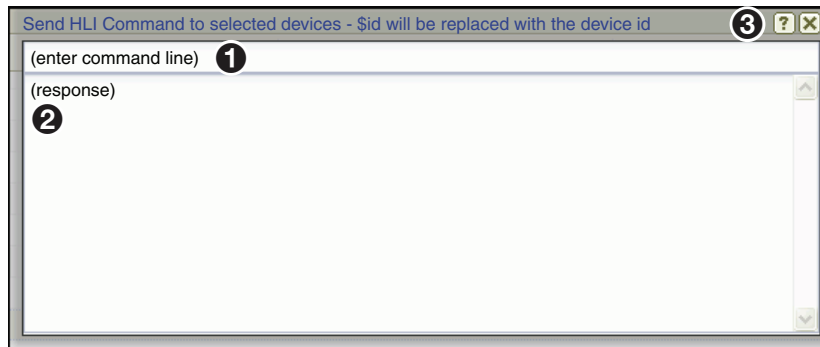


Figure 48. HLI Command Window

To send a command, click in the **(enter command line)** text field (1), type the command, and press <Enter>.

NOTE: The response is returned in the response area of the dialog box (2).

Click the X box (3) to close the dialog

Example HLI commands and information on how to use them are available in **System Control** on page 178.

Group Menu

See **Sorting Devices by Group** on page 42 for information on using this menu.

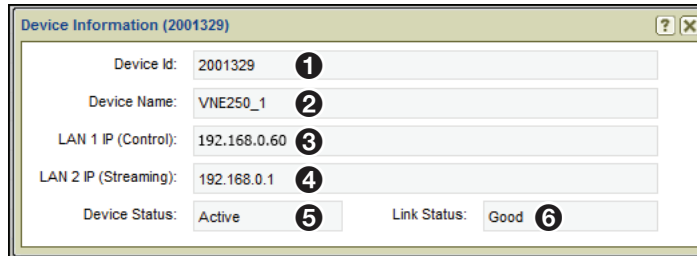
VNM 250 Configuration

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

Info Menu (VNM 250)

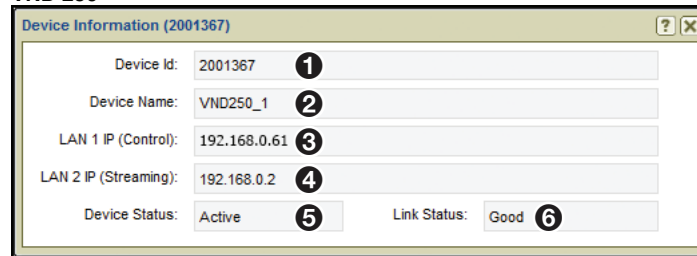
The **Info** action bar dialog adds two LAN port connection entries for separate control and streaming connections. Click **Info** to open the **Device Information** dialog box that displays basic information for the selected VNM 250 (see figure 49).

VNE 250



Device Id:	2001329	1
Device Name:	VNE250_1	2
LAN 1 IP (Control):	192.168.0.60	3
LAN 2 IP (Streaming):	192.168.0.1	4
Device Status:	Active	5
Link Status:	Good	6

VND 250



Device Id:	2001367	1
Device Name:	VND250_1	2
LAN 1 IP (Control):	192.168.0.61	3
LAN 2 IP (Streaming):	192.168.0.2	4
Device Status:	Active	5
Link Status:	Good	6

Figure 49. Device Information - VNM 250

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

- 1 **Device Id** — Displays the ID number of the selected device.
- 2 **Device Name** — Displays the name of the selected device.
- 3 **LAN 1 IP (Control)** — Displays the IP address of the control port.
- 4 **LAN 2 IP (Streaming)** — Displays the IP address of the streaming port.
- 5 **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**.
- 6 **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 50).

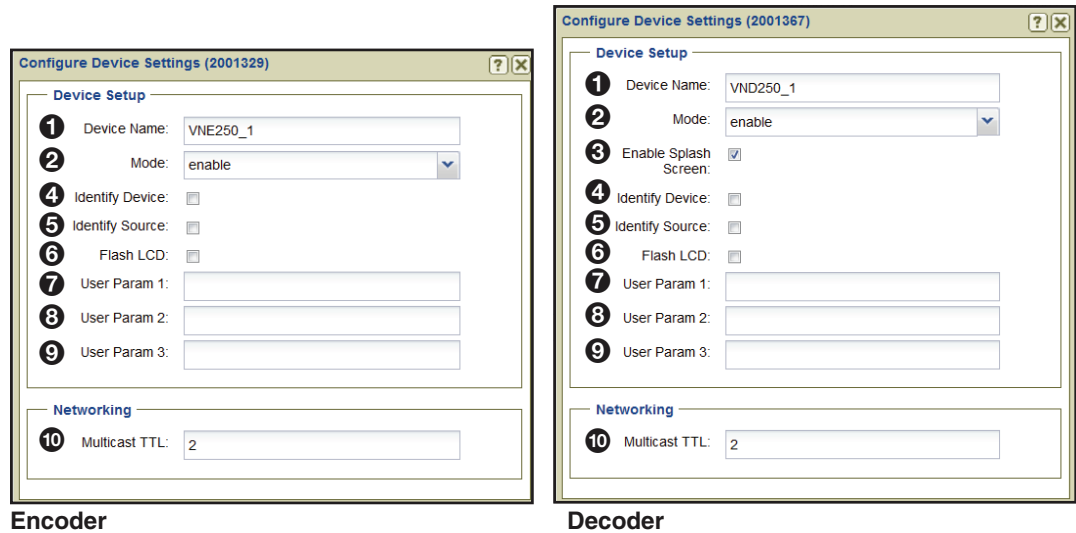


Figure 50. VNM 250 Configure Device Settings

Device Setup panel

- ❶ **Device Name** — Enter a name for the device.
- ❷ **Mode** — A device can be configured in 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.
- ❸ **Enable Splash Screen (decoder only)** — Check this box to display a splash screen on the connected display or device when no video is available.
- ❹ **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 .
- ❺ **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 65).
- ❻ **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 [OSD Identifier Editor \(Encoders and Decoders\)](#).
- ❼ **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.
- ❽, ❾, ❿ **User Param [1, 2, 3]** — These fields are used to enter up to three user defined parameter names (see [Device Setup panel](#) on page 68).

Networking panel

- ❿ **Multicast TTL** — This field specifies the number of hops multicast traffic can make between routed domains as 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 46). 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 48). The VNE 250 adds an input selection, HDCP authorization, EDID selection, program audio selection, analog audio selection and return audio selection.

The screenshot shows the 'Format' menu for the VNE 250 device. It is divided into two main sections: 'Input Configuration' and 'EDID Settings'.
Under 'Input Configuration':
1. 'Input Select' has three radio buttons: 'Auto' (selected), 'HDMI (1)', and 'RGB (2)'.
2. 'HDCP Authorize' has two radio buttons: 'Enable' (selected) and 'Disable'.
Under 'EDID Settings':
3. 'From Monitor' is a read-only text field displaying 'No Device'.
4. 'To Source' is a drop-down menu currently showing 'transparent'.

Figure 51. VNE 250 Source Format

Input Configuration

1 Input Select

- **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.

2 HDCP Authorize: When an HDMI signal is detected, enable or disable HDCP authorization.

EDID Settings

- 3 **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).
- 4 **To Source:** This drop-down lists the EDID device type the VN-Matrix unit identifies itself as when connected to a source. Values are chosen from 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

Program Audio

1 Input Select: ☐ HDMI (1) ☒ Analog (2) ☐ Disable

2 Audio Status: 48kHz

Analog Audio Input

3 Peak Input Level (dBu): 4

4 Measured Input Level (dBu): -72 5 Clip: ☐

Return Audio

6 Mute Audio: ☐

7 Output Level (dBu): 4

Figure 52. Program Audio, Analog Audio Input and Return Audio Panels

- 1 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.
- 2 Audio Status:** Read-only field that displays the sampling rate of the selected audio source.

Analog Audio Input

- 3 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: +4 dBu.
- 4 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.
- 5** When 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

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.

- 6 Mute Audio:** Mutes the return audio.
- 7 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** (see figure 53, ❶)
- **Output Format** (❷)

These two configuration options function identically to those on the VN-Matrix 200/225 (see **Format Menu (Decoders)** on page 53).

Figure 53. VND 250 Display Format Dialog Box (Decoder)

The following configuration options are added:

- ❸ **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**.

- ④ **HDCP Mode** — The HDCP mode control (see [figure 53](#) on the previous page) sets 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.
- ⑤ **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.
- ⑥ **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.
- ⑦ **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.
- ⑧ **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.
- ⑨ **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.

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

The **Video Wall** configuration settings (see [figure 53](#) on page 71) 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.

- 10 **Size (H)** — 1 to 5
- 11 **Size (V)** — 1 to 5
- 12 **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.

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

- 10 **Size (H)** — 2: indicates the videowall is 2 monitors wide.
- 11 **Size (V)** — 2: indicates the videowall is 2 monitors tall.
- 12 **Position** — 3: selects the segment of the full video the decoder outputs, in this example the lower left monitor.

1	2
3	4

Bezel Compensation panel (Mullion Compensation)

In Videowall mode (see [figure 53](#)), 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.

- 13 **Horizontal** — 0 to 100%
- 14 **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 required (see [figure 53](#)):

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

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

- 5 **Genlock and 6 Framelock settings** — All decoders are configured as a genlock group (see [Genlock](#) on page 72).

NOTE: The image quality of a single source that is scaled across multiple displays depends on the compression applied to the source, and on 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 (see [figure 53](#) on page 71)

- 15 **Output Select**— Select HDMI audio, analog audio, both, or none.
- 16 **Analog Audio Output Level (dBu)**— Sets the analog output level from a range of -26 to +12 dBu.
- 17 **Decode Buffer Settings Channel Delay(s)** — Configured the same as the video channel delay (see [Channel Delay\(s\)](#) on page 72).

Return Audio Input panel

- 18 **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.
- 19 **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.
- 20 **Clip Warning Indicator** — 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 54).

Compression Settings (2001329)

Video Compression

- 1 Transform: video
- 2 Luma Compression: 5
- 3 Chroma Compression: 7
- 4 Luma/Chroma Lock: ☒
- 5 Temporal Compression: ☒
- 6 Refresh Rate: 1
- 7 Threshold: 1
- 8 Chroma Threshold: ☐
- 9 Motion: 0 - No motion compression

Audio Compression

- 10 Compression: No compression (~3 Mbps)

Bitrate

- 11 Limit Mode: Peak Flowrate (FD)
- 12 Target Rate (Mbps): 10
- 13 Frame Drop (%): 0

Figure 54. 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 in the **Bitrate** panel to meet the specified bandwidth limit.

Video Compression panel (see [figure 54](#) on the previous page)

- ❶ **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.
- ❷ **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.
- ❸ **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.

- ❹ **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).

- ❺ **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.

- ❻ **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**.
- ❼ **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**.
- ❽ **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.

- ❾ **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 continues at the standard resolution, preserving screen integrity.

Audio Compression panel (see [figure 54](#) on page 74)

- 10 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 (see [figure 54](#))

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

- 11 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.

- 12 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) (see [figure 54](#) on page 74).
- 13 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 55).

VND 250

VNE 250

Figure 55. 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 55.

- 1 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.

- ② through ⑥ **RS-232 Settings:** Basic configuration of the serial port includes baud rate, data bits, stop bits, parity, and handshake.
- ⑦ **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 (see figure 55 on the previous page)

The data channel panel configures the UDP data stream.

- ⑧ **UDP Data TX (encoder)** — Enables or disables UDP data transport through the dataport.
- ⑩ **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.
- ⑧ **UDP Data RX (decoder)** — Enables or disables the UDP data.
- ⑨ **UDP Dest IP (decoder)** — The IP Address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
- ⑩ **UDP Dest Port (decoder)** — This is the port number used by the (external) device or system to receive the UDP data.

Pointer Overlay (see figure 55)

- ⑪ **Overlay (encoder)** — Enable the overlay pointer on the local loop-through display.
- ⑪ **Annotation Port (decoder)** — Read-only value of the annotation port number.

Mouse and Keyboard (see figure 55)

- ⑫ **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.
- ⑬ **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.
- ⑭ **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.
- ⑮ **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 56).

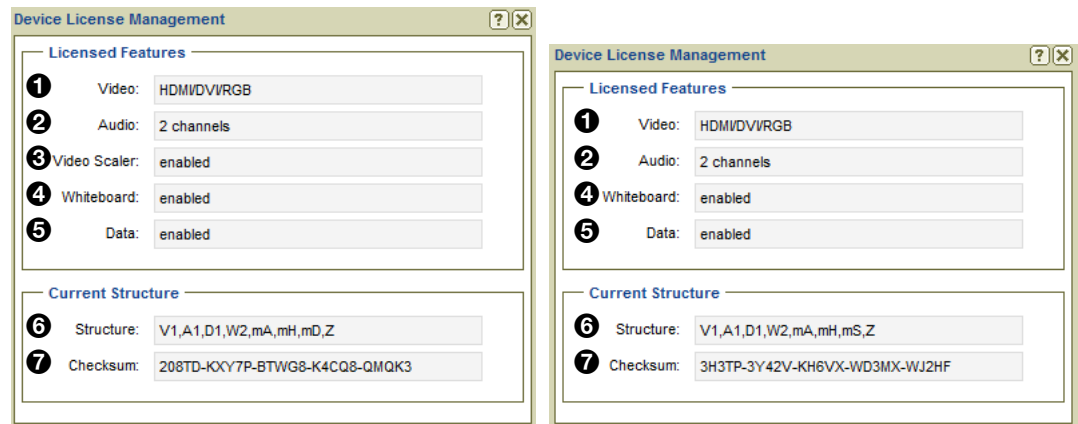


Figure 56. VND 250 (Left) and VNE 250 (Right) License Menu

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.

- ❶ **Video** — Indicates the input signal format type.
- ❷ **Audio** — Indicates the number of supported audio channels.
- ❸ **Video Scaler (VND 250 only)** — Indicates whether video scaling is enabled or disabled.
- ❹ **Whiteboard** — Indicates whether whiteboard data streaming is enabled or disabled.
- ❺ **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 (cannot be edited) fields.

- ❻ **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.
- ❼ **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 62).

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 57).

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



Figure 57. VNM 250 Misc Menu

Real-time Bandwidth Monitor (VND 250)

Select the real-time bandwidth monitor (see figure 57, ①) to open a new dialog box that monitors the bandwidth (measured in Mbps) used by the selected device or devices (see figure 58).

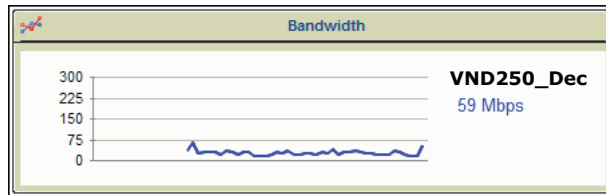


Figure 58. Bandwidth Monitor

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 (②) 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 cannot be removed from the device list.

OSD Identifier Editor

Select this option (see [figure 57](#), ③ on the previous page) to customize the appearance of the **on-screen display** for the selected device or devices (see [figure 59](#)).

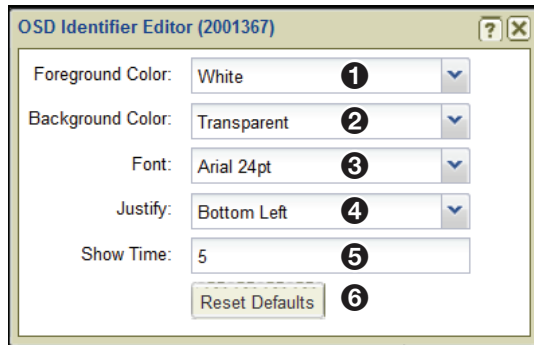


Figure 59. VNM 250 OSD Identifier Editor

- ① **Foreground Color** — This drop-down list selects the color of the text box font.
- ② **Background Color** — This drop-down list selects the text box background color.
- ③ **Font** — This drop-down list selects the type of font used in the text block.
- ④ **Justify** — This drop-down list places the text block in one of nine fixed positions.
- ⑤ **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 67).

- ⑥ **Reset Defaults** — Returns all OSD ID settings to defaults.

Send HLI Command

Select this option (see [figure 57](#), ④) to open a dialog box for sending High Level Interface (HLI) command strings to VN-Matrix devices (see [figure 60](#)).

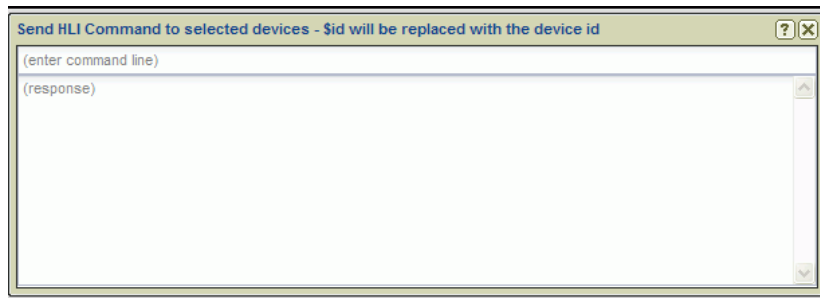


Figure 60. HLI Command Window

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 area of the dialog box **(response)** just below the command.

Example HLI commands and information on how to use them are available in [System Control](#) on page 178.

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 61). 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.

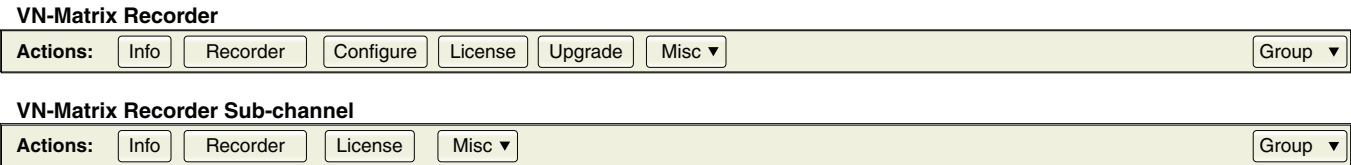


Figure 61. Actions Bar Menu, VN-Matrix Recorders

Info Menu

Click **Info** (see figure 61) 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 62).

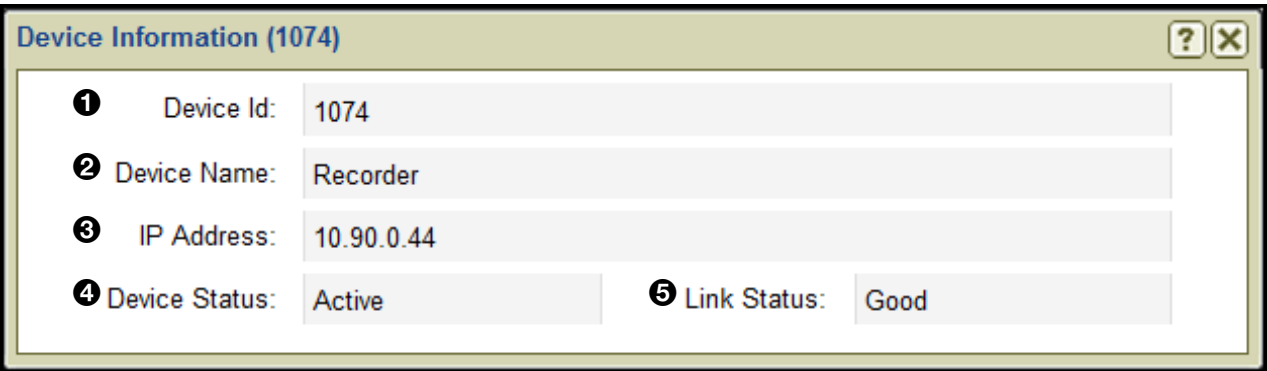


Figure 62. VN-Matrix Recorders, Device Information

- 1 **Device ID** — Displays the device ID number of the selected device.
- 2 **Device Name** — Displays the name of the selected device.
- 3 **IP Address** — Displays the IP address of the selected device.
- 4 **Device Status** — The status of the selected device. Normally it shows **Active** with the quality of the link indicated in the **Link Status** field. If the device is missing or cannot be contacted on the network, it shows **No Device**.
- 5 **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.

Recorder Menu

Click **Recorder** (see [figure 61](#) on the previous page) to open the **Recording Browser** dialog box (see [figure 63](#)). This dialog displays recorded files for the selected recorder and recorder sub-channels.

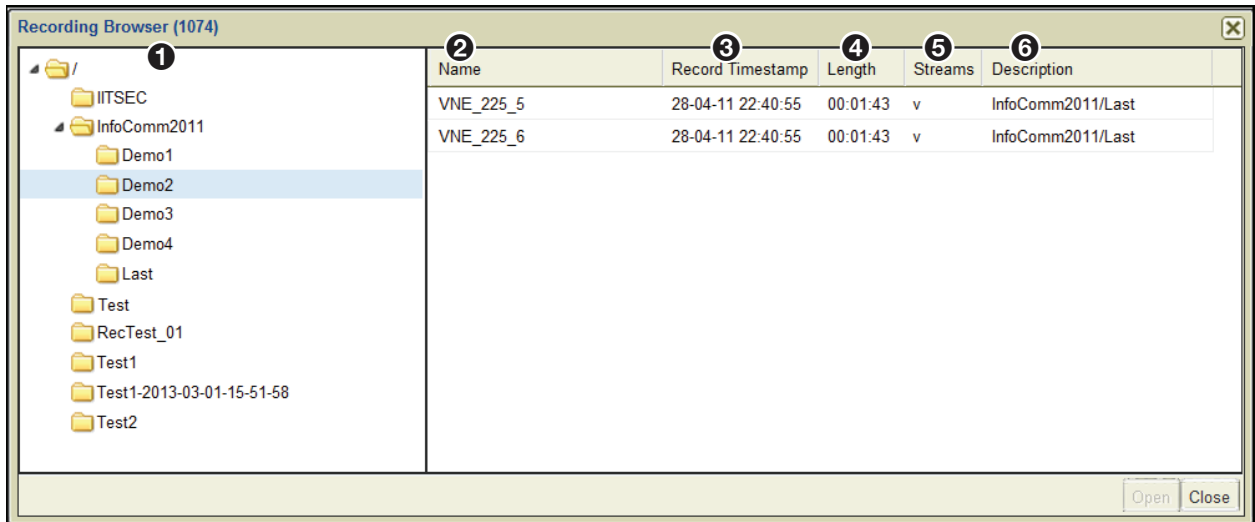


Figure 63. VN-Matrix Recorders, Recording Browser

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 114).

The menu items are:

- 1 Directory Tree** – The directory structure of the recorder. The tree functions like a standard Windows directory structure.
- 2 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.
- 3 Record Timestamp** – The date and time a recording is created.
- 4 Length** – The duration of the recording in hours, minutes, and seconds (HH:MM:SS).
- 5 Streams** – The stream types included in the recording; v=video, a=audio, and d=data.
- 6 Description** – A text string entered by the user when the recording is created.

Configure Menu

Click **Configure** (see [figure 61](#) on page 82) to open the **Configure Device Settings** dialog box (see [figure 64](#)) 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 two tabs: "Device Setup" and "Networking".

Device Setup Panel:

- 1 Device Name: Recorder
- 2 User Param 1: (empty)
- User Param 2: (empty)
- User Param 3: (empty)

Networking Panel:

- 3 Multicast TTL: 2

Figure 64. Recorder Configure Dialog Box

Device Setup Panel

- 1 **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.
- 2 **User Parameters** — Up to three user parameters can be entered in these three fields to customize the operation of the recorder (see [Device Setup panel](#) on page 68).

Networking Panel

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

License Menu

Click **License** (see [figure 61](#) on page 82) to open the **Device License Management** dialog box (see [figure 65](#)). 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 main sections:

- 1 Licensed Features**: This section displays a list of features and their status. The features are Video, Audio, Video Scaler, Whiteboard, and Data. All features are currently disabled.
- Current Structure**: This section displays the current structure key and checksum. The structure key is R5,P5,mR,mP,mV and the checksum is 2WQ8F-BRV7J-7KDTH-Y7D78-FT9W2.
- 4 Change Device Structure**: This section contains input fields for the structure key and checksum, and an **Update License** button.

Feature	Status
Video:	
Audio:	
Video Scaler:	disabled
Whiteboard:	disabled
Data:	disabled

Field	Value
Structure:	R5,P5,mR,mP,mV
Checksum:	2WQ8F-BRV7J-7KDTH-Y7D78-FT9W2

Field	Value
Structure:	
Checksum:	

Update License

Figure 65. Device License Dialog Box, Recorders

Licensed Features

- ❶ The Licensed Features panel is not functional at this time.

Current Structure

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


Change Device Structure

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

VNS 104 Software Decoder Configuration

The VNS 104 Multi-stream Decoding Software decodes up to 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 EC 200. Before you can view content, ensure the VNM EC 200 is properly licensed with the VNS 104 option and checksum (provided by Extron). Once the Controller license is 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 66).

NOTE: The position of the highlighted display in a VNS 104 icon () is the screen position target for the associated video stream (see figure 66). Notice the lit screen in the icon for VNS104:1 is the top left; for VNS104:2, its the top right and so on.











<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 66. Devices Tab, VNS 104

Actions Menu Bar

Action menu bar items change when switching between the main VNS 104 root icon and the individual decode windows. The **Actions** menu bar for the main device (see figure 67, top) contains information and configuration options common to all four decode windows. Selecting an action opens a dialog box to configure the individual device (see figure 67, bottom).

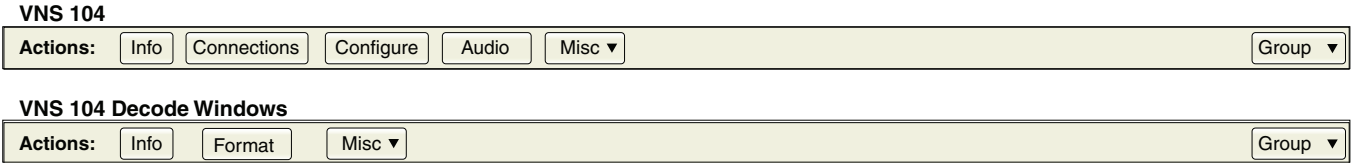


Figure 67. VNS 104 Action Bar, Main Menu

Info Menu

Click **Info** (see [figure 67](#) on the previous page) to open the **Device Information** dialog box (see [figure 68](#)). There are no configuration settings, only information about the connected VNS 104 device.

Device Information (212121)

1	Device Id:	212121			
2	Device Name:	Licensed Desktop			
3	IP Address:	192.168.3.51			
4	Device Status:	Active	5	Link Status:	Good

Figure 68. VNS 104 Root Device - Device Information

The fields are:

- 1 **Device ID** – Displays the device ID of the connected VNS 104.
- 2 **Device Name** – Displays the name of the connected VNS 104.
- 3 **IP Address** – The IP address of the connected VNS 104 device.
- 4 **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.
- 5 **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** (see [figure 67](#)) to open the **Connections** dialog box (see [figure 69](#)). This box contains general information for the connected VNS 104 device and shows the active stream source for each of the four connections.

	Video	Audio
Description	61_D830.videoPort0	
id	720202.0.0	
Source	239.192.1.46:9608	
Destination	239.192.1.46:9608	
Locale	ext	
Slot	-1	
Description	61_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 69. VNS 104 Root Device - Connections

For each connection, the **Connections** dialog box includes:

- ❶ **Description** – Displays the name of the stream source device.
- ❷ **ID** – Displays the device ID of the stream source device.
- ❸ **Source** – For unicast transports, displays the IP address and port number of the stream source device.
- ❹ **Destination** – Displays the IP address and port number of the device receiving the stream.
- ❺ **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.
- ❻ **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.

❶ Description	61_D830.videoPort0
❷ ID	720202.0.0
❸ Source	239.192.1.46:9608
❹ Destination	239.192.1.46:9608
❺ Locale	ext
❻ Slot	-1

Configure Menu

Click **Configure** (see [figure 67](#) on page 86) to open the **Configure Device Settings** dialog box (see [figure 70](#)). This dialog contains general information for the connected VNS 104 device and shows the active stream source for each connection.

Figure 70. VNS 104 Root Device - Actions Bar, Configure Device Settings

This dialog box contains the following settings:

- ❶ **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.
- ❷ **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.
- ③ **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.
 - ④ **Identify Display:** – Overlays the device name on the decode window or windows.
 - ⑤ **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.
 - ⑥ **User Parameters 1-3:** – These fields are used to enter up to three user defined parameter names (see **Device Setup panel** on page 68) to customize the operation of the VNS 104.

Audio Menu

Click **Audio** (see **figure 67** on page 86) to open the **Configure Audio Settings** dialog box (see **figure 71**). 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.

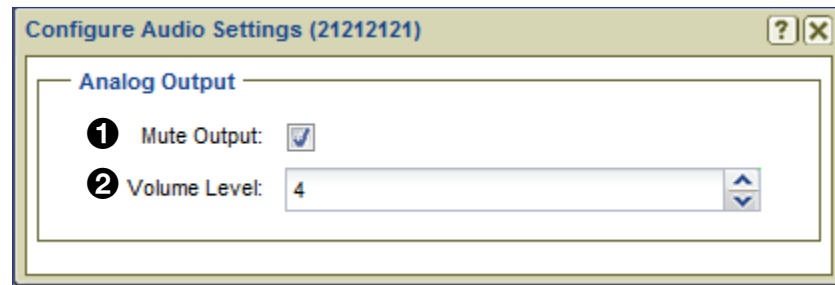


Figure 71. Root Device - Audio Settings Dialog Box

The audio output configuration dialog box provides the following settings:

- ① **Mute Output:** – Place a check mark in the box to mute the audio decode stream.
- ② **Volume Level:** – Adjust the audio level from -70 to +12 dBu. Default is 4.

VNS 104 Misc Menu

The miscellaneous menu (**Misc**) (see [figure 67](#) on page 86) provides the following selections:

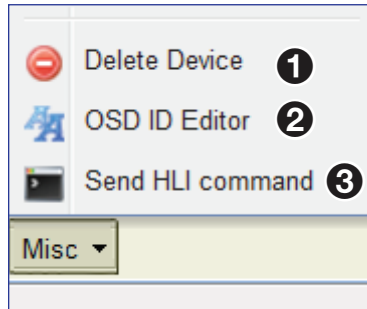


Figure 72. Actions Bar - VNS 104 Root, Misc

1 Delete Device: – Deletes the VNS 104 device from the EC 200 **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 cannot be removed from the device list.

2 Send HLI command: – Sends an HLI command to the selected device.

3 VNS 104 OSD ID Editor – Customize the format and placement of the display text entered in the configuration menu (see [Configure Menu](#) on page 88).

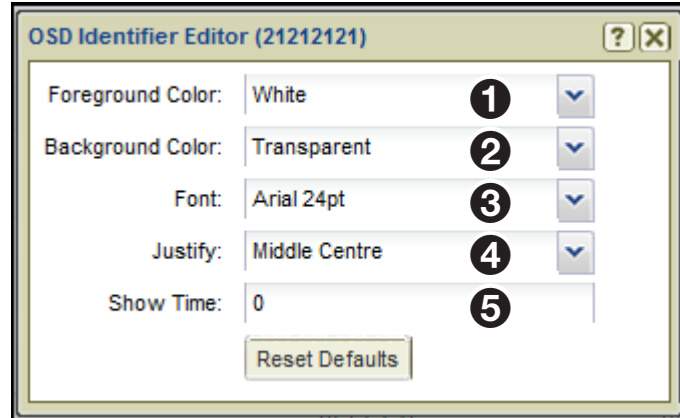


Figure 73. OSD ID Editor, VNS 104 Shown

The OSD ID editor provides the following:

1 Foreground Color: – Sets text color from a list of 11 colors and shades (or transparent).

2 Background Color: – Sets background color from a list of 11 colors and shades (or transparent).

3 Font – Sets the font and font size from a drop-down list.

4 Justify: – Sets the position of the text window from a list of nine locations.

5 Show Time: – Sets the time (in seconds) that 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 96), select an individual stream to view information specific to that stream and also allow the stream to be customized for the preset.



Figure 74. 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 87).

VNS 104 Display Format

Click the **Format** button (see figure 74) to open the **Display Format** dialog box (see figure 75). Each decode window provides a dialog box that allows several ways to customize the display of each stream.

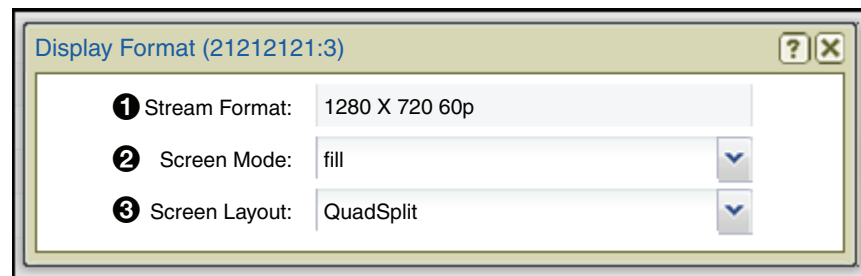


Figure 75. VNS 104 Display Format (One of Four Streams)

In this dialog box the following items are shown:

- ❶ **Stream Format (read-only)** – Displays the format of the assigned stream.
- ❷ **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.
- ❸ **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 109 and [Switcher Page](#) on page 92).

NOTES:

- Settings made here are intended to configure the VNS 104 when the VNM EC 200 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 configuration takes precedence" basis. Modifications to the settings made in either the device list page or preset manager page overwrite previous settings.

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 76, ❶) to open the Switcher page (see [Accessing the Web-based User Interface](#) on page 11 for information on how to log in).



Figure 76. Switcher Access Button

The Switcher page opens in a new window (see figure 77).

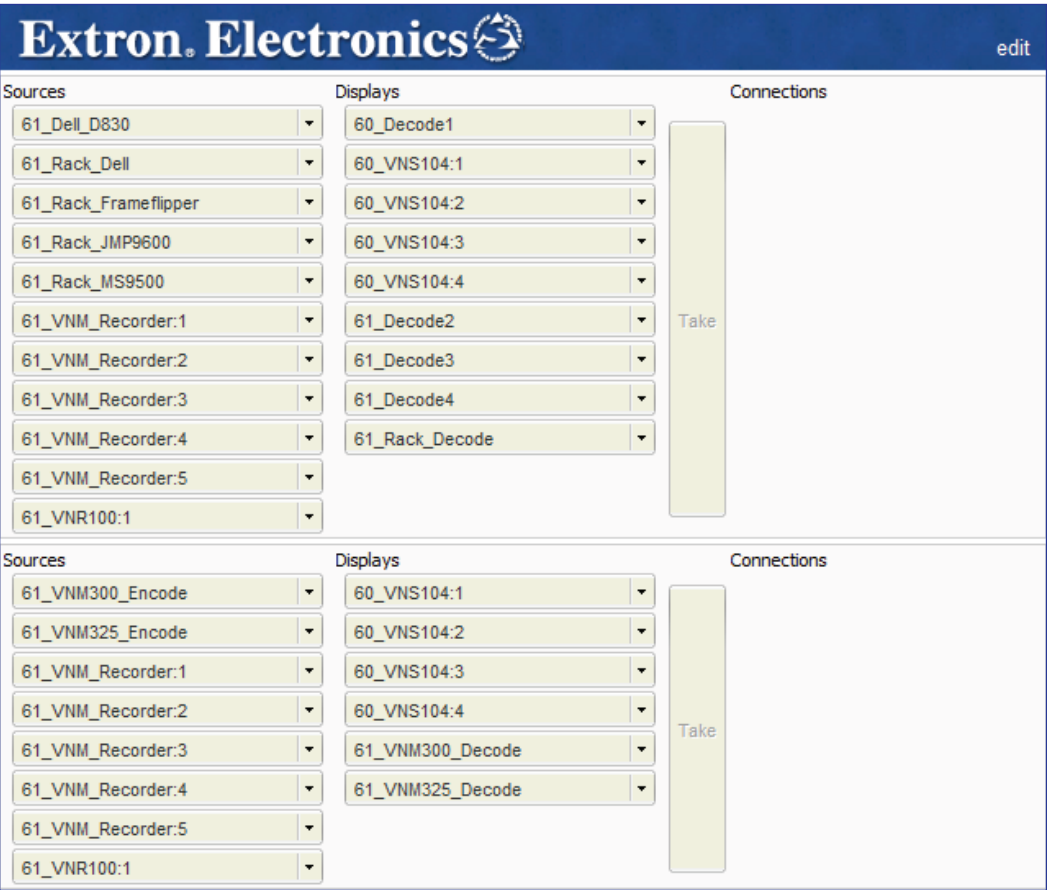


Figure 77. Switcher Window

NOTES:

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

2. In the **Sources** column, click an encoder (sources) (see figure 78, ❶).
The selected box darkens.
3. In the **Displays** column, click a decoder (displays) (❷).
The selected box darkens.
4. Click **Take** (❸).
A connection is created between the selected encoder (source) and decoder (display).
 - Figure 78 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 78) when **Take** is pressed.

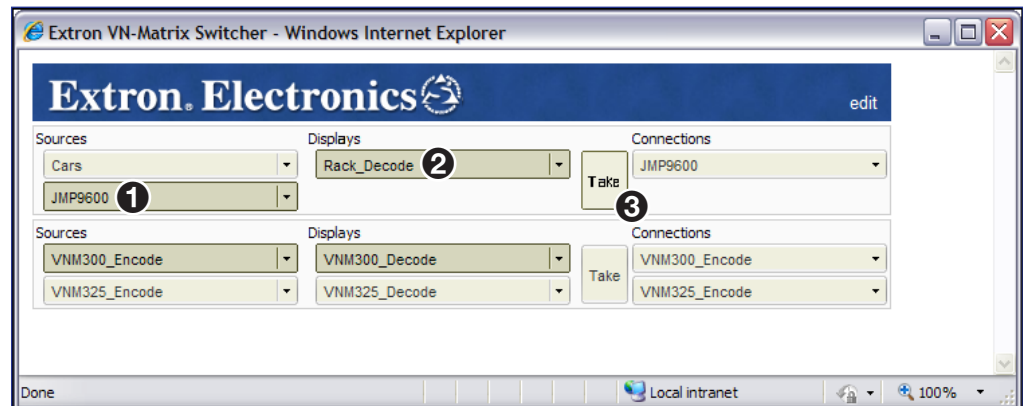
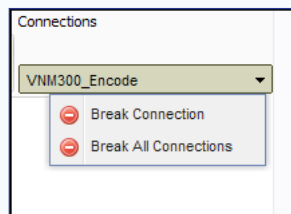


Figure 78. Switcher Window "Take"

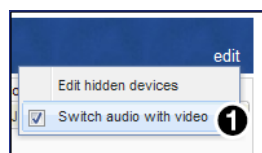
5. Repeat this procedure to create other connections as necessary.

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** option (see ❶, below). This keeps the audio and video together when creating connections.



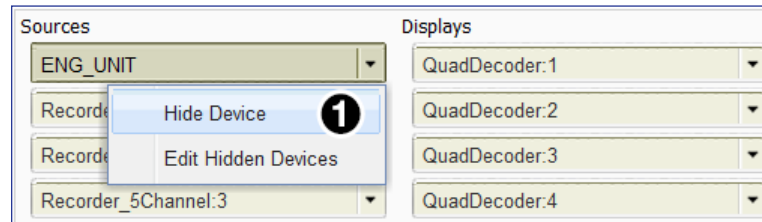
Select **Edit Hidden Devices** (see next page) to display a pop-up that allows the user to hide any devices on the **Switcher** page.

Hidden Devices

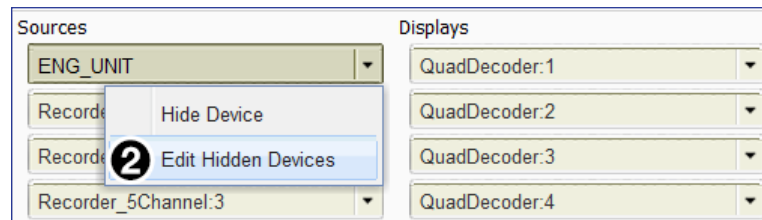
When there are too many devices on the screen, management becomes difficult. The switcher provides a way to hide unused or rarely used devices.

There are two ways to set and recover hidden devices:

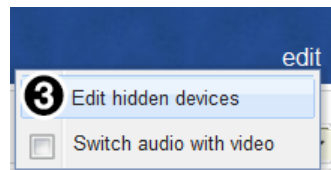
1. Click the drop-down button on any source or display device and select **Hide Device (1)**.



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-

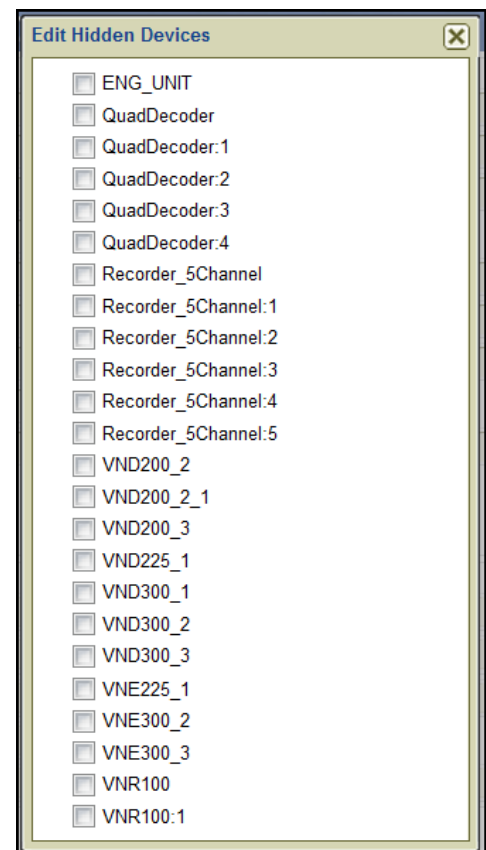


- Click **Edit > Edit hidden devices (3)** on the main switcher menu.



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 and 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 100).

- 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.

Click the **Preset Manager** tab to open the page (see figure 79).

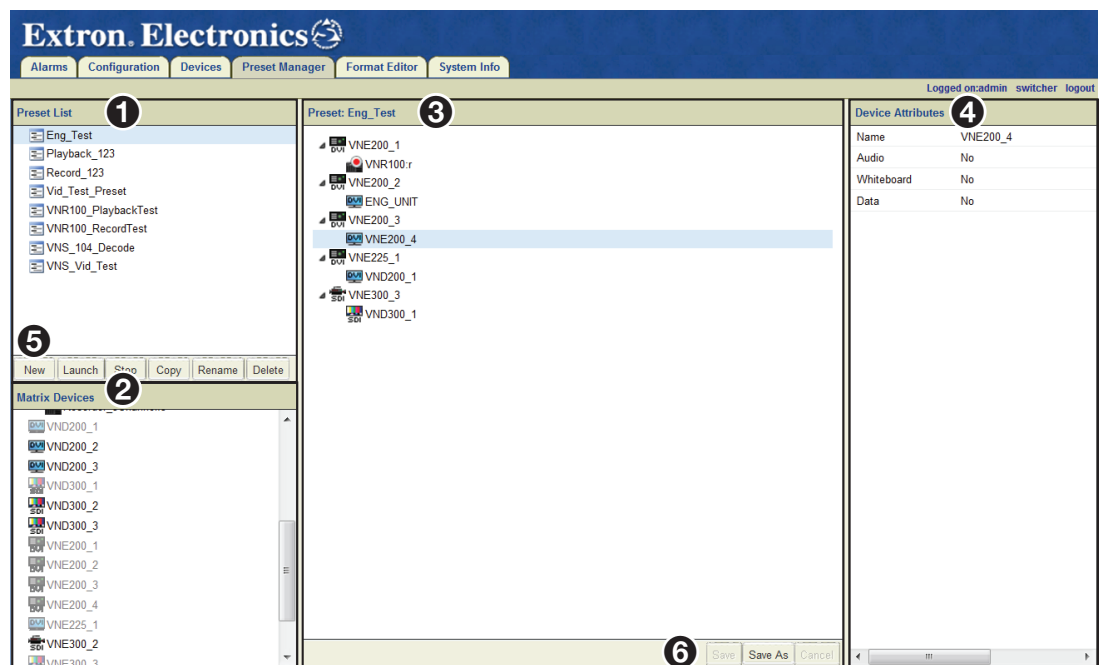


Figure 79. Preset Manager Page

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 79](#), 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 panel (❺).

All saved presets are listed in the **Preset List** workspace in alpha-numeric order. If the list of presets is too long to display within the area, a scroll bar is on the right side of the 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 a previously loaded preset from the preset design area (see [Preset Design Panel](#) on page 100).

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

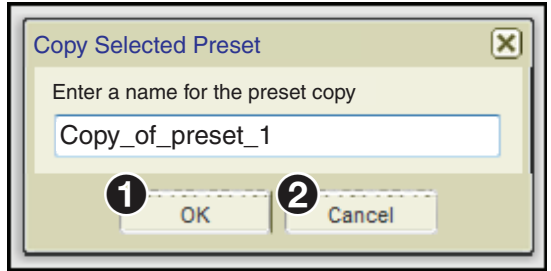
Stop clears all settings made in a preset when launched, including:

- 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** (1) to save the new preset to the **Preset List**, or
Click **Cancel** (2) to abandon the copy process.
5. The new preset appears in the **Preset List**.

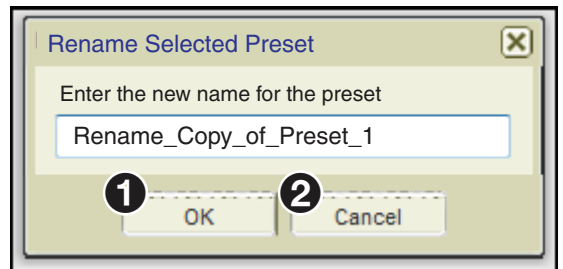


Note: Preset names must not include spaces or non alphanumeric characters such as / \ *, % ! " £ \$ % ^ & * ()@~#?><. These characters are blocked from use. Underscore (_) and hyphen (-) are permitted.

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** (1) to save the new preset to the preset list, or
Click **Cancel** (2) to abandon the rename process.
5. The renamed preset appears in the preset list.



Delete

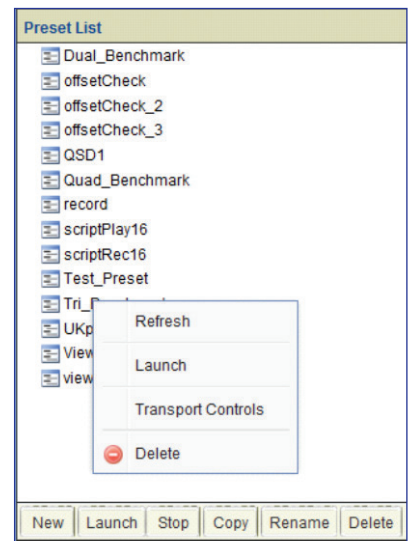
Delete erases a previously defined preset.

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:

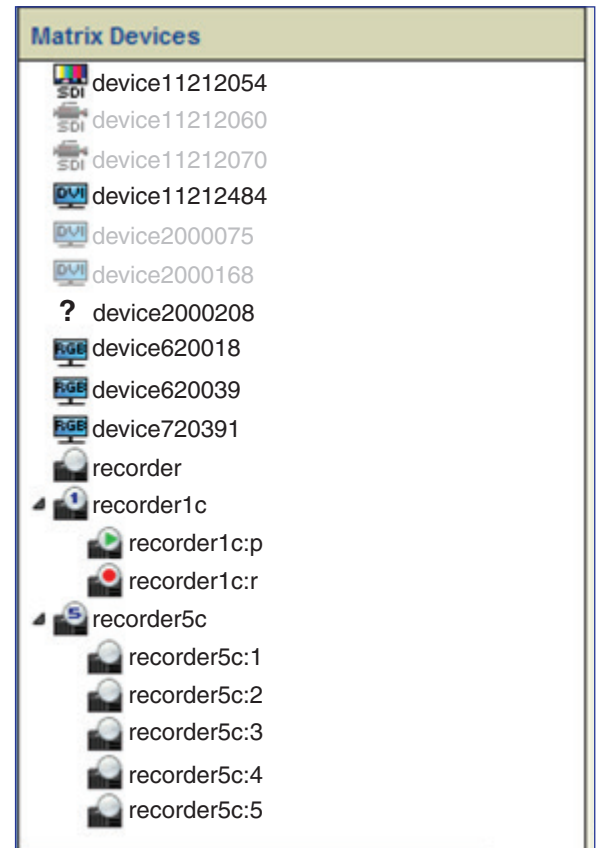
- **Refresh:** Update the list with the latest status.
- **Launch:** Activate the selected preset.
- **Transport Controls:** For a player or recorder preset, displays the **Transport Controls** dialog.
- **Delete:** Deletes the currently selected preset.



Matrix Devices List

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

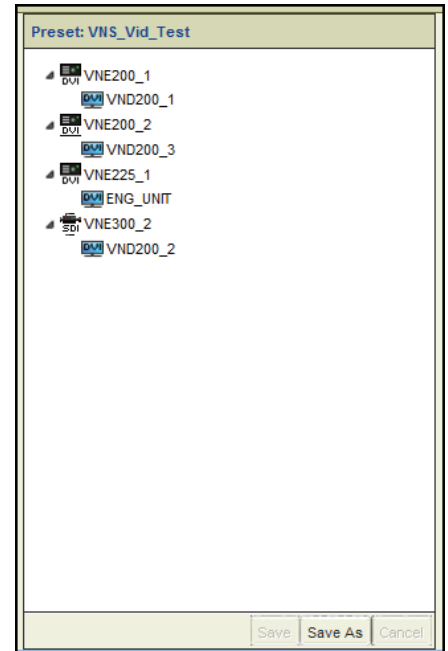
- Matrix devices are listed alphabetically by device name. It is not possible to sort or group them.
- Icons that represent each device are the same as the icons on the devices page (see [Devices Page Features](#) on page 39).
- The icon that represents VN-Matrix codecs depends on the mode of that device 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 either no longer connected to the system or is 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 devices list into the design area to create a preset (see [Creating Presets](#) on page 116).
- A new preset is saved the first time using the **Save As** button. Updates are saved using **Save**.
- Click **Cancel** to discard change made to a preset.
- **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 96), 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 [Devices Page Overview](#) on page 39).

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.
- HDCP protected content cannot be displayed by VNM 200/225 decoders, VNS 104 and VNM Software Decoders.

Device Attributes

When a device is placed in the **Preset Design** workspace, the **Device Attributes** panel (see figure 80) 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 **Devices Page Features** on page 39).

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 80. 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** on 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 contain only a read-only **Name** field.

Device Attributes		
Name	VNE250_1	❶
Video Input	Auto	❷
Program Audio Input	HDMI	❸
Return Audio Source	None	❹
RS232 Mode	Pass through Client	❺
RS232 Server		❻
RS232 Data Tx	Disable	❼
UDP Data Tx	Enable	❽
UDP Data Port	9002	❾

Figure 81. Device Attributes, VNE 250

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

- ② **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.
- ③ **Program Audio Input** — A drop-down list to select the program input source:
- **HDMI** — Selects the digital audio from the HDMI input.
 - **Analog** — Selects the analog audio input.
 - **Disable** — Disables both audio inputs.
- ④ **Return Audio Source (read-only)** — Reports the name of the VND 250 device with return audio enabled in the current preset.
- ⑤ **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 cannot 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.

- ⑥ **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).
- ⑦ **RS-232 Data Tx** — Enable and disable RS-232 data transmission.
- ⑧ **UDP Data Tx** — Enable and disable a UDP data transmission port.
- ⑨ **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 82).

Selected Device		
Device Attributes		
Name	Decoder	❶
Audio	No	❷
Whiteboard	No	❸
Data	No	❹

200/225 Series

Selected Device		
Device Attributes		
Name	325_Device2	❶
Ancillary	No	❺
Column FEC	No	❻
Row FEC	No	❼

3xx Series

Figure 82. Device Attributes Panel, Decoders

❶ **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

❷ **Audio** — Drop-down list enables or disables the audio channels.

❸ **Whiteboard (VND 200/225 only)** — Select **Yes** to decode available whiteboard data from the stream (see [License Menu](#) on page 85).

❹ **Data** — Select Yes to decode data information from the stream.

VND 3xx series only

❺ **Ancillary** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 51.

❻ **Column FEC** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 51.

❼ **Row FEC** — See [Ancillary Audio Panel \(VN-Matrix 3xx Only\)](#) on page 51.

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	
❶ Name	VND250_1
❷ Output Format	1024 x 768 60p GTF
❸ Scale Mode	Fill
❹ Audio Stream	None
❺ Program Audio Source	None
❻ Program Audio Output	HDMI
❼ RS232 Mode	Pass through Client
❽ RS232 Server	VND300_2
❾ Data Stream	Yes
❿ UDP Data Rx	Enable
⓫ UDP Dest IP	
⓬ UDP Dest Port	9002
⓭ Annotation	No

Figure 83. Device Attributes Panel, VND 250

- ❶ **Name** — Read-only field for the device name, taken from the device list.
- ❷ **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.
- ❸ **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.
- ❹ **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.
- ❺ **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.
- ❻ **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.

- 7 **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 cannot 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.

- 8 **RS-232 Server** — When RS-232 mode is set to **Pass through Client** provides a drop-down list of available servers on the system.
- 9 **Data Stream** — Select **Yes** to enable the data stream, **No** to disable.
- 10 **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.
- 11 **UDP Dest IP** — The IP address of the external device or system that receives UDP traffic. UNICAST or MULTICAST addresses are valid.
- 12 **UDP Dest Port** — The port number used by the (external) device or system to receive the UDP data.
- 13 **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 cannot 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 84, left).

Device Attributes		
Name	Recorder_5Channel:1	❶
Directory		❷
File		❸
Launch Status	Play	❹
Repeat	No	❺
Time Sync	Yes	❻
Start Offset	00:00:00	❼
Stop Offset	00:00:00	❽
File Length	00:00:13	❾

Device Attributes		
Name	Recorder_5Channel:2	❶
Directory		❷
File		❸
File Length	00:00:13	❾

Figure 84. 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 84, right) are a reduced set of the attributes for Ch1.

- ❶ **Name** — Read-only field displays the device name and selected sub-channel number.
- ❷ **Directory** — Opens the recorder browser for directory level navigation and selection.
- ❸ **File** — Opens the directory listed in the **Directory** field to enable selection of a single recorded file and displays the filename.
- ❹ **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.
- ❺ **Repeat** — A drop-down control sets a player into loop mode.
- ❻ **Time Sync** — A drop-down control that sets the timing relationship between the channels on multiple devices in a player preset.
- ❼ **Start Offset** — Editable field that sets the start time of a selected file.
- ❽ **Stop Offset** — Editable field that sets the stop time of a selected file.
- ❾ **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		
❶	Name	Recorder_5Channel:1
❷	Directory	/RecTest_01/
❸	File	ChaseTST01
❹	Launch Status	Record
❺	Description	
❻	Audio	No
❼	Whiteboard	No
❽	Data	No

Figure 85. Device Attributes, 5-channel Recorder

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

- ❶ **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.
- ❷ **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 110).
- ❸ **File** — An editable field and navigation tree to create and delete files.
- ❹ **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.
- ❺ **Description** — A user defined text field to describe the recording.
- ❻ **Audio** — Select **Yes** to enable or **No** to disable the audio stream.
- ❼ **Whiteboard** — Enable/disable whiteboard (see [Recorder Configuration](#) on page 82).
- ❽ **Data** — Enable/disable a data stream (see [Recorder Configuration](#) on page 82).

Device Attributes – VNR 100 Player

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

Device Attributes		
❶	Name	VNR100:p
❷	Directory	/GFChaseTest/
❸	File	TEST
❹	Launch Status	Play
❺	Time Sync	Yes
❻	Start Offset	00:00:00
❼	Stop Offset	00:00:00

Figure 86. 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 106).

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 131).

Device Attributes – VNR 100 Recorder

Device Attributes		
❶	Name	VNR100:r
❷	Directory	/New_Directory/
❸	File	GDFTST_002
❹	Launch Status	Record
❺	Description	Test File
❻	Audio	No
❼	Whiteboard	No
❽	Data	No

Figure 87. Device Attributes, Single-Channel Recorder

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

- ❶ **Name** — Read-only field displays the device name.
- ❷ **Directory** — Type a new directory name into this field or use a file browser to create and delete directories.
- ❸ **File** — An editable field and navigation tree to create and delete files.
- ❹ **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.
- ❺ **Description** — A user defined text field to describe the recording.
- ❻ **Audio** — Enables or disables audio recording.
- ❼ **Whiteboard** — Enables or disables whiteboard data recording.
- ❽ **Data** — Enables or disables data stream recording.

Device Attributes – VNS 104 Software Decoder: Decode Window

Device Attributes		
❶	Name	VNS104:1
❷	Audio	No
❸	Mute Audio	No
❹	Audio Volume	4
❺	Screen Mode	Fill
❻	Screen Layout	QuadSplit

Figure 88. Device Attributes, VNS 104

Each VNS 104 decode window has the following attributes (see figure 88):

- ❶ **Name** — Read-only field for the device name.
- ❷ **Audio** — Drop-down list enables (**Yes**) or disables (**No**) connection of specific stream types within a decoder channel.
- ❸ **Mute Audio** — Mutes the audio stream.
- ❹ **Audio Volume** — Sets the volume level of the audio stream.
- ❺ **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.
- ❻ **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 86).

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 122).
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 89, ①).

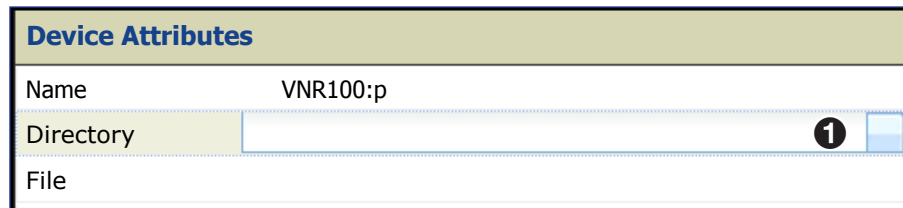


Figure 89. Select Directory Drop-down Box

4. The Recording Browser dialog box opens (see figure 90).

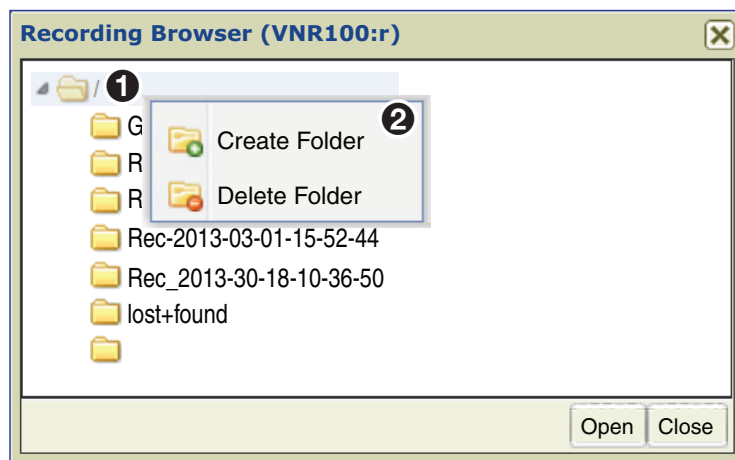


Figure 90. Recording Browser Window, Create Folder

Select the root folder (①), <right-click> on the folder, then click **Create Folder** (②). The **Create Folder** dialog box opens (see figure 91).

5. Enter the directory name (1).

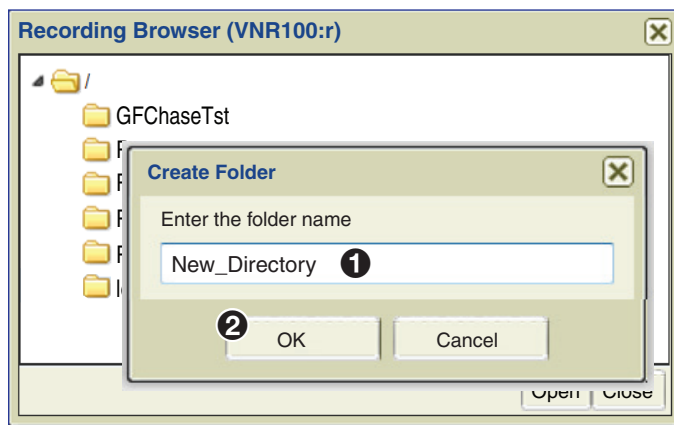


Figure 91. Create Directory, Enter Name

6. Click **OK** (2).

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.

7. Select the new directory, and click **Open** to continue (see figure 92, 1).

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

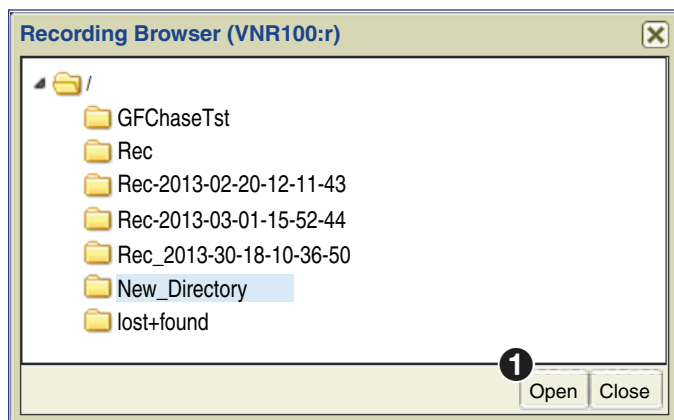


Figure 92. Recording Browser, Select and Open Directory

8. A dialog box opens. Select **Yes** (see figure 93, 1) to automatically create the same directory on other recorder devices in the preset, or **No** to continue.

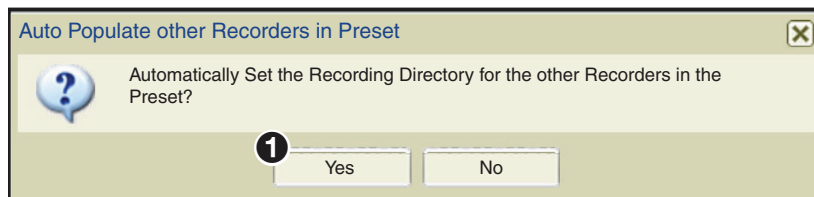


Figure 93. Recording Browser, Auto Populate Other Recorders

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 122).
2. Select a recorder (channel) in the **Preset Design** workspace.
3. In the **Device Attribute** panel, click in the **Directory** row (see figure 94, ❶) and enter the new directory name in the field.
A red marker indicates a change in the device attributes.

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

Figure 94. 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 95).

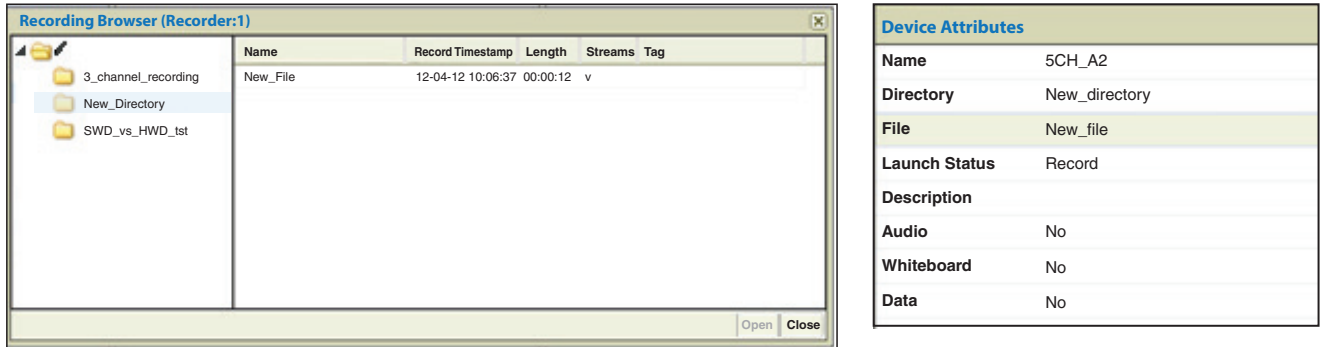


Figure 95. Duplicate Directory Naming

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 96).

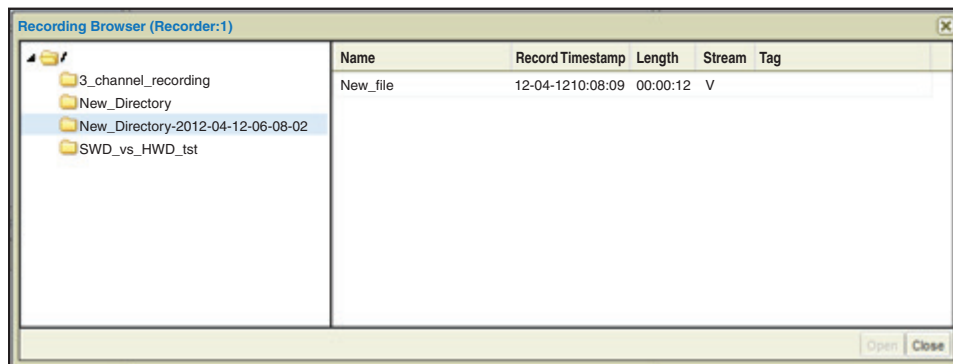


Figure 96. Duplicate Directory Naming, New Recording

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 97).



Figure 97. Delete Directory

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

NOTE: The root directory cannot 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 98, ❶), the device name of the encoder is used as the filename (❷).

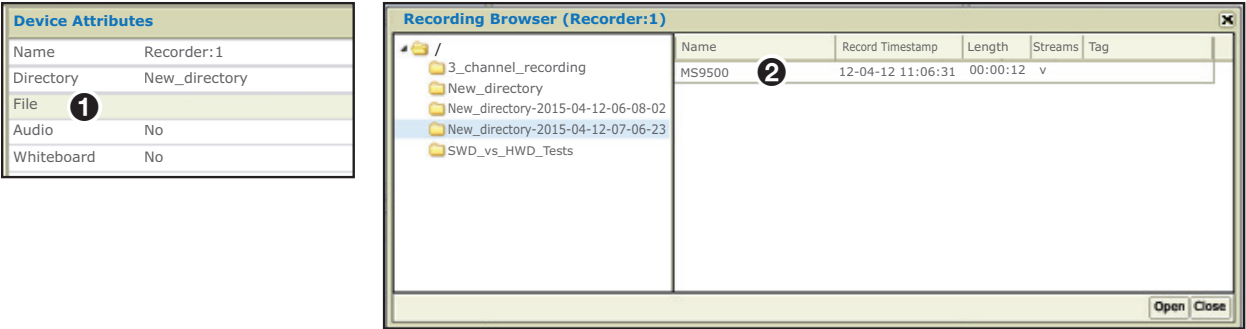


Figure 98. Create a File

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 99, 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.

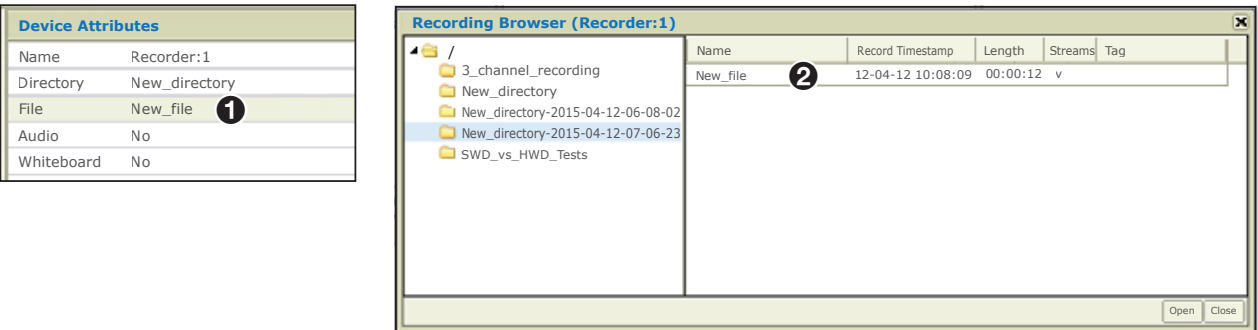


Figure 99. Create a File Using Direct Text Input

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.

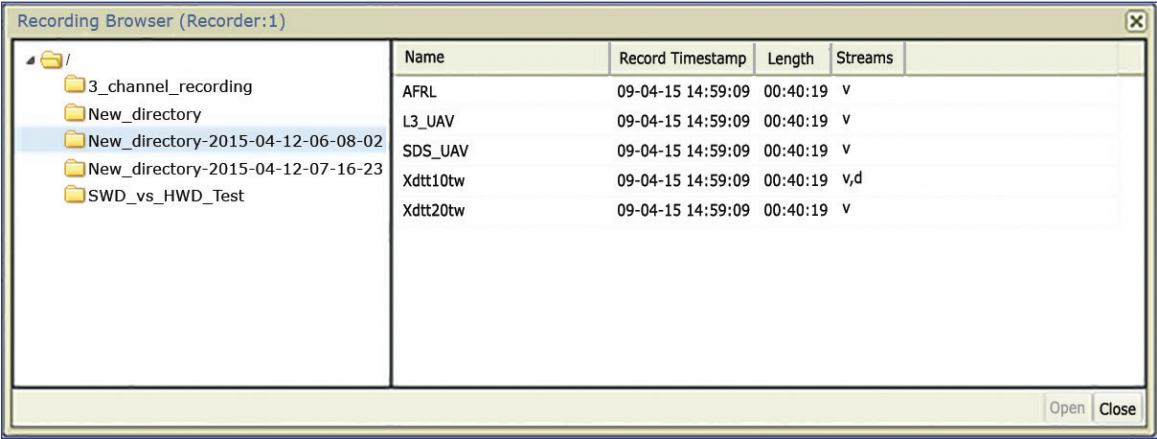


Figure 100. Recording Browser, One File per Channel

Deleting a File

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

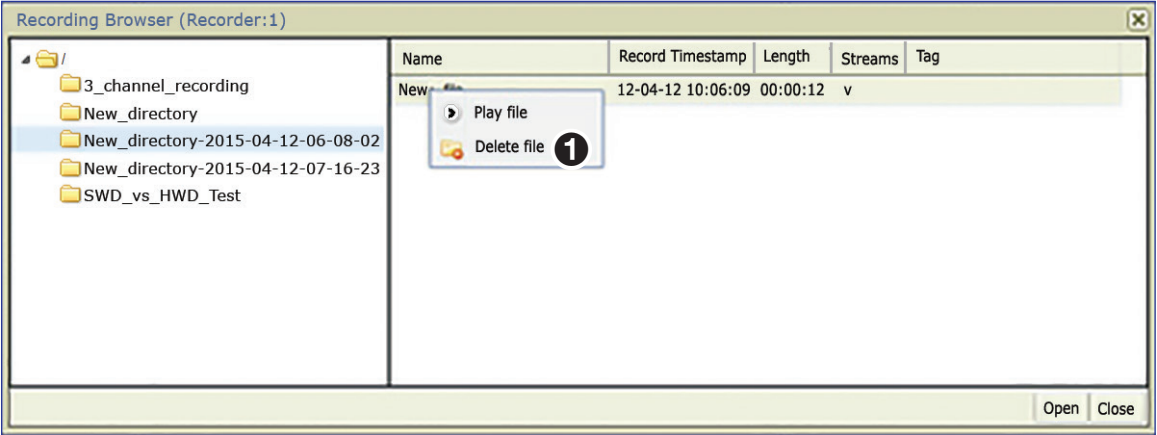


Figure 101. File Browser, Delete a Channel

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 EC 200 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** (see figure 102, ❶) at the base of the **Preset List** panel to create a blank preset (see [Preset Manager Page](#) on page 96).

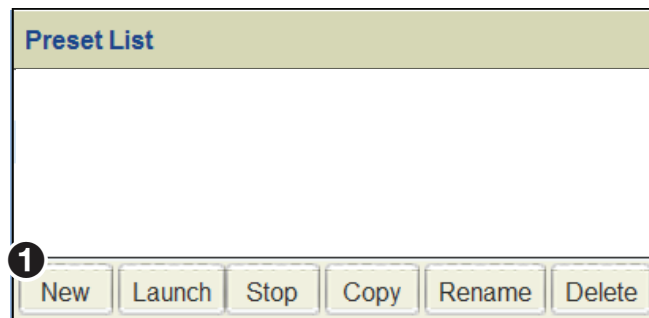


Figure 102. Preset List - New Preset

2. Add an encoder to the **Preset** panel. Click and hold the encoding device (see figure 103, ❶).

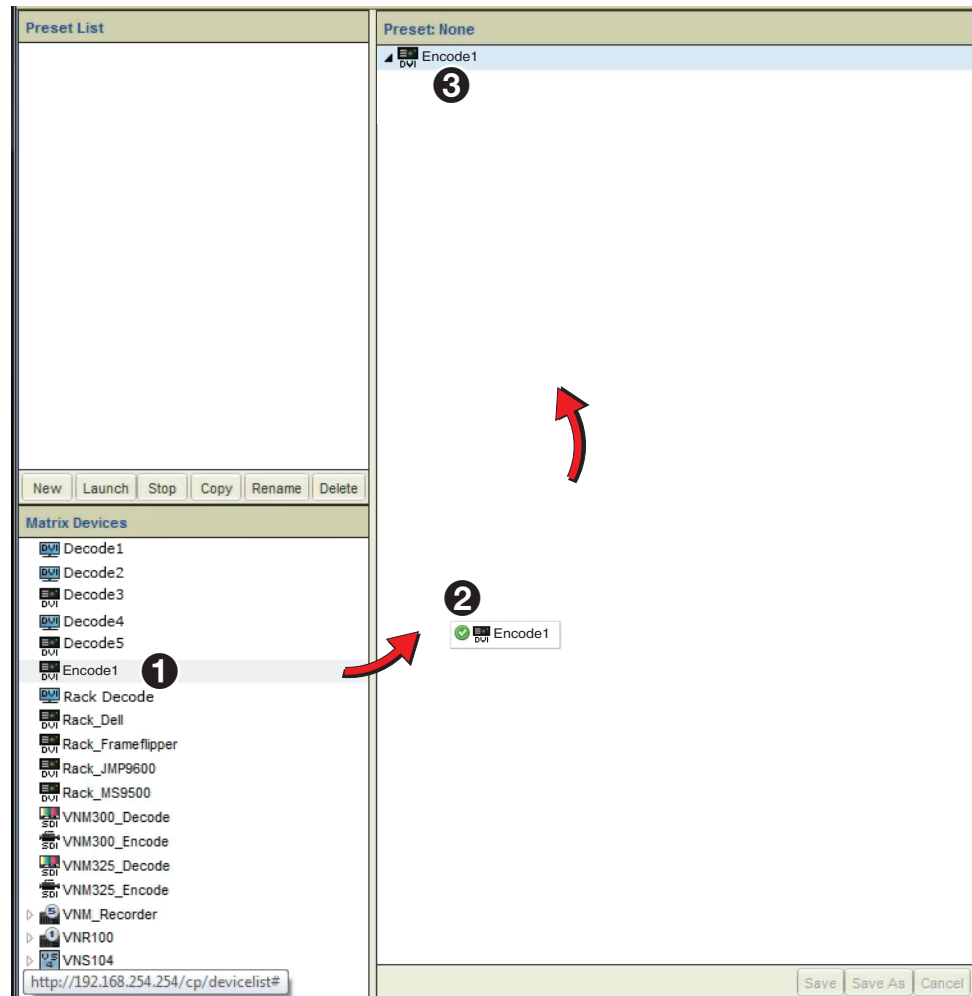


Figure 103. Preset Workspace, Place a Device

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

NOTE: Devices drag and dropped 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 104, ❶).

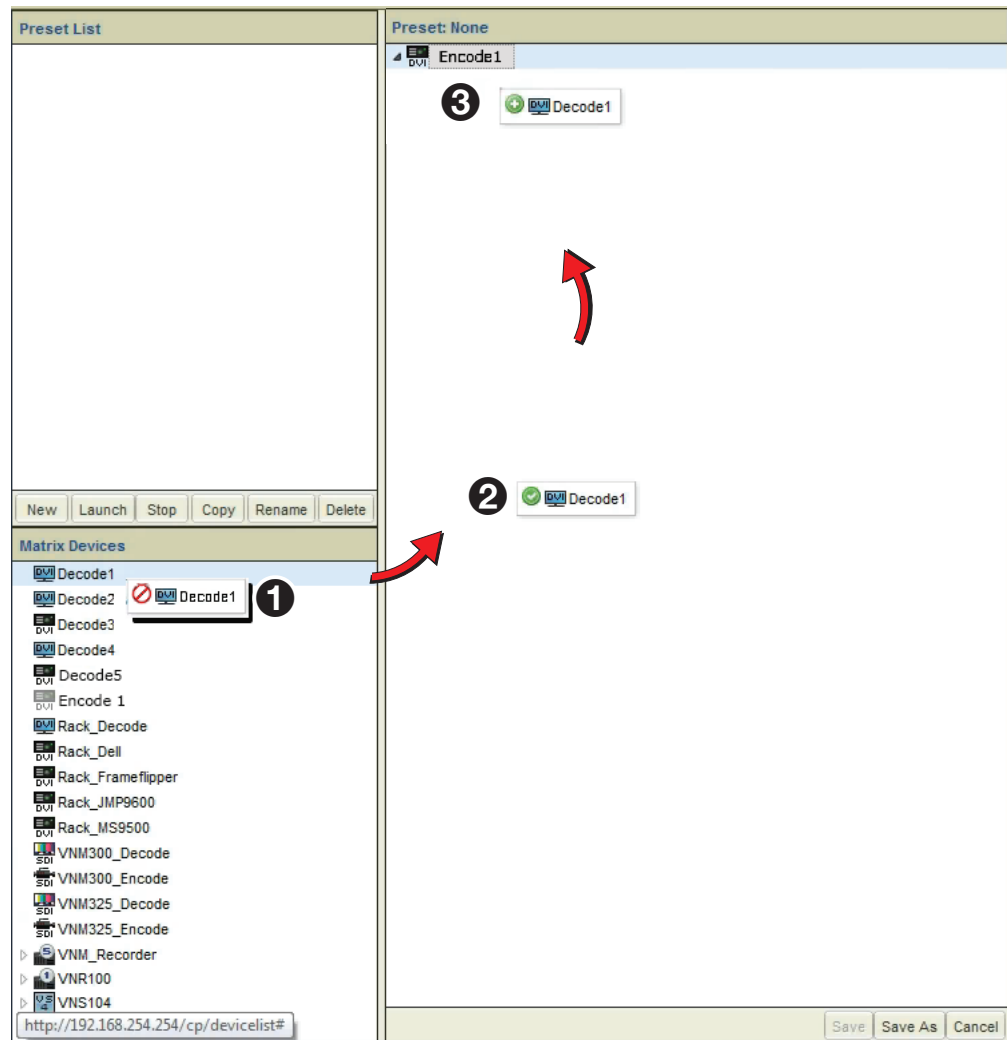


Figure 104. Preset Workspace, Add a Decoder

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 124).

Saving Presets

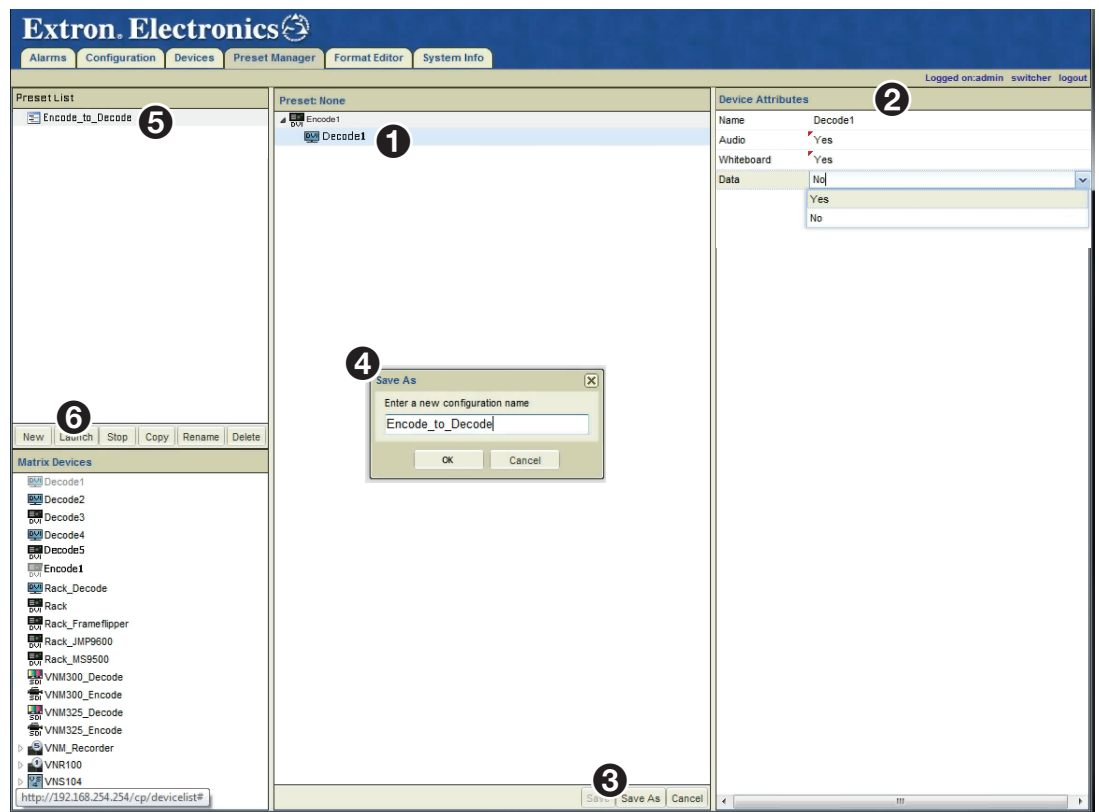


Figure 105. Save a Preset

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 105, **1**) to populate the device attributes (**2**).
2. Configure the attributes of the decoder (**2**) as needed (see [Device Attributes](#) on page 101).

NOTE: A red triangle appears as each attribute is changed to remind you the changes are not 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 is identified 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 106, ❶).

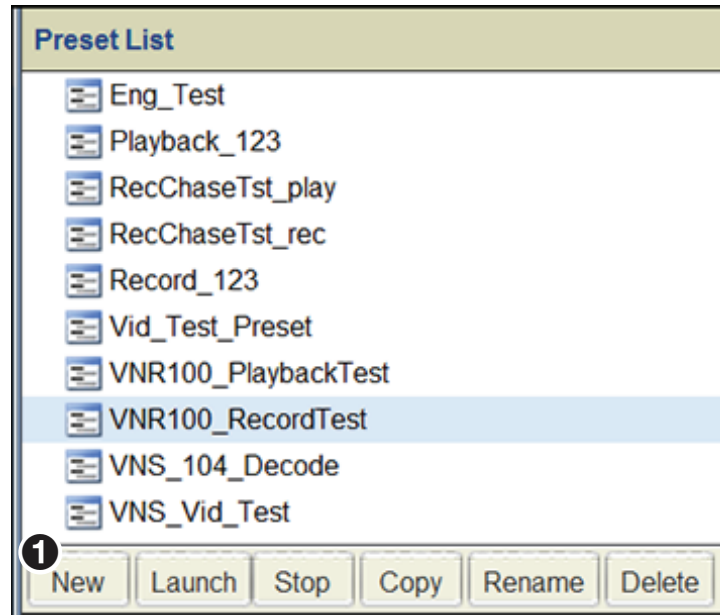


Figure 106. Presets, Using the VNS 104

2. Drag an encoder from the **Device List** and drop it onto the **Preset** design panel (see figure 107, ❶).

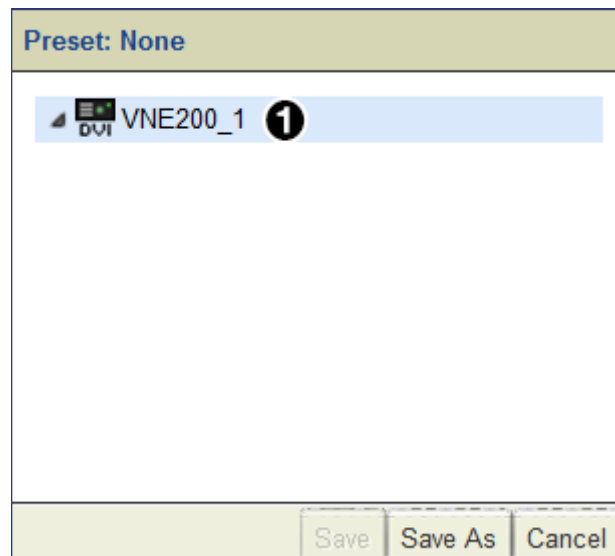


Figure 107. Presets, Drag and Drop an Encoder

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 from the **Device List** (see figure 108, ❶) and drop it onto the source device in the **Preset** panel (❷).

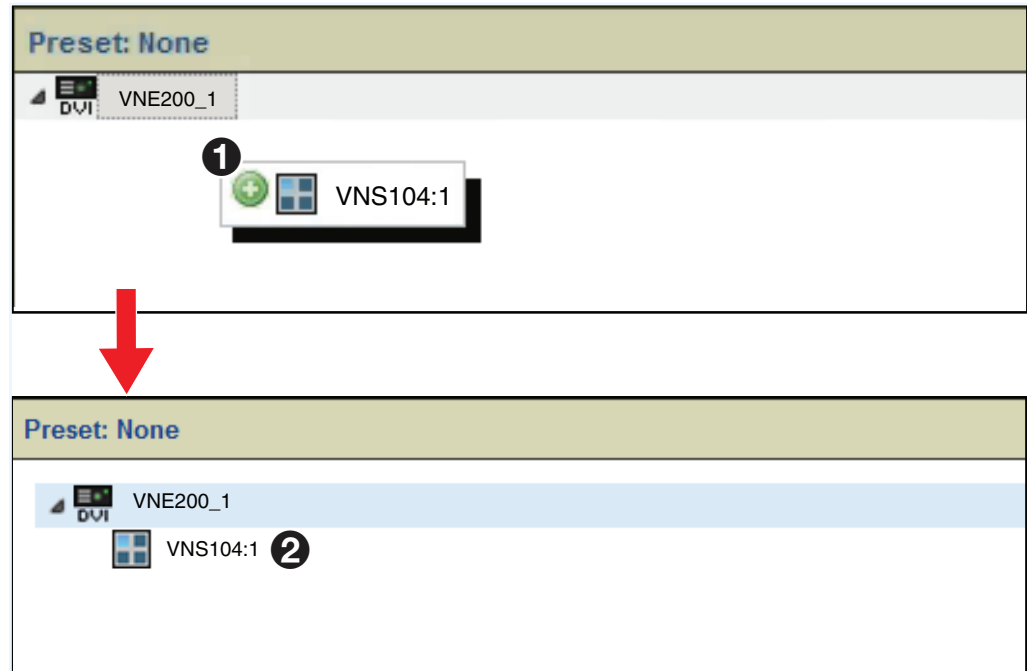


Figure 108. Presets, Drag and Drop the VNS 104

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 101).
 5. Click **Save As** and name the preset (see **Preset List** on page 97).
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 109, ❶).



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

Figure 109. Create a Preset

2. Select the record channel (see figure 110, ❶). The **Device Attributes** panel populates with the configuration options appropriate for the recorder.
3. Create or select a directory (❷) for the recording file (see [Directory Management Overview](#) on page 110).



Preset: New_Recording	Device Attributes
 VNE225_1	Name VNR100.r
 VNR100.r ❶	Directory /New_Recording/ ❷
	File New_File ❸
	Launch Status Record ❹
	Description A new recording in a new directory ❺
	Audio No
	Whiteboard No ❻
	Data No

Figure 110. Select the Record Channel

4. Enter a filename (❸) for the recording (see [Recorder Directory and File Management](#) on page 110).
5. Set the launch status (❹) (see [Launch Behavior](#) on page 124).
6. Enter a description, if desired (❺).
7. Select the remaining recording options (audio, whiteboard, and data) as needed (❻).
8. In the **Preset** panel, click **Save** (see [Saving Presets](#) on page 119).
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 100). 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 116).

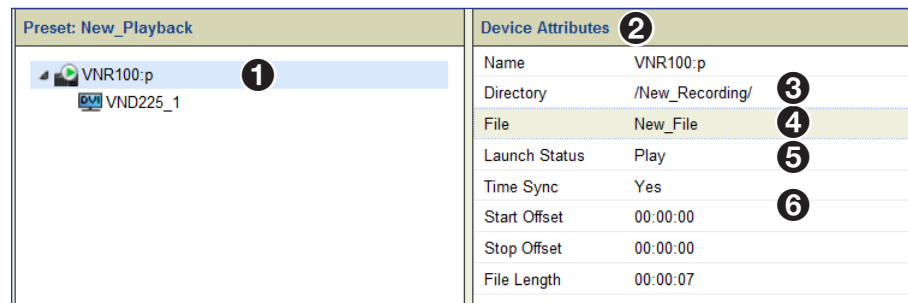


Figure 111. Preset for Playing a Channel

2. In the **Preset** panel, select the player (see figure 111, 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 127).
4. Select a filename (④) for playback (see [Selecting a File for Playback](#) on page 127).
5. Set the launch status (⑤) as desired (see [Launch Behavior](#) on page 124).
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 119).
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 97) 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 101). The connections between the devices are then made according to the diagrams in the **Preset** design workspace (see [Preset Design Panel](#) on page 100).

Recorder Launch Behavior

The **Launch Status** in the **Device Attribute** panel (see [Device Attributes](#) on page 101) 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 130). 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 97), a transport dialog box displays the recording status and provides control of the recording. Only the most recent preset launch is displayed (see figure 112).

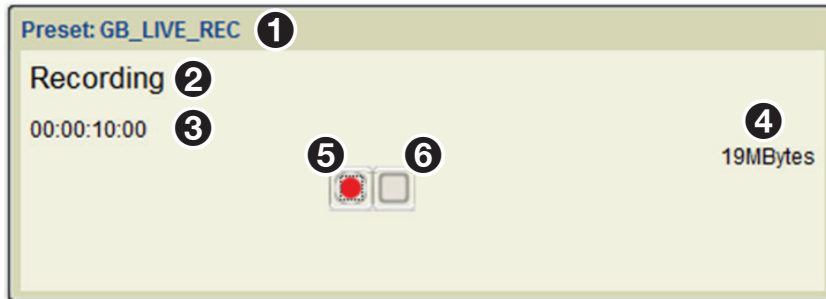


Figure 112. Transport Dialog Box-Recorder

The following information is provided in the recorder **Preset :** dialog box.

1 The name of the preset.	4 The current recording file size.
2 The recorder status (Recording or Stopped).	5 A button to manually start the recording (red during live recording).
3 The current recording duration (elapsed time).	6 A button to stop the current recording.

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 112). 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 (1)	Transport dialog opens.	2 Recording Status = Stopped 3 Recording duration = 00:00:00:00 4 Filesize = 0 MBytes
Record button (Provision) (5)	Begins recording when pressed.	Same as above.
Record button (Record) (5)	Recording starts immediately.	2 Status = Recording 3 Recording duration = Displays the current duration (time) of the recording. 4 Filesize = displays the current storage size (MBytes) of the recording.
Stop (Provision or Record) (6)	Stops recording.	2 Status = Stopped 3 Recording duration = Displays the duration (time) of the entire recording. 4 Filesize = displays the final storage size (MBytes).

NOTE: It is not possible to record an HDCP encrypted source. 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 other 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 (see figure 113) also provides the following functionality:



Figure 113. Transport Dialog Box - Player

Play Transport Control Behavior		
Status / Action	Description	Comment
Preset launched	Transport dialog box launched.	1 Status = Stopped 2 Current file time = 00:00:00:00 3 Progress bar = Slider positioned at left hand side. 4 File duration = File length [time]. 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 Current file time = Shows running file time. 3 Progress bar = Slider moves to the right as the file plays. 4 File duration = File length [time]. 6 Shuttle control = Play x1
Pause button (7)	Pauses the current file (not operable from stop mode).	1 Status = Paused 2 Current file time = Current file time. 3 Progress bar = Slider stationary. 4 File duration = File length [time]. 6 Shuttle control = Pause
Stop (7)	Stops playback.	1 Status = Stopped 2 Current file time = 00:00:00:00 3 Progress bar = Slider positioned at left hand side. 4 File duration = File length [time]. 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 Current file time = Static at last value. 3 Progress bar = Tracks the time and direction. 4 File duration = File length [time]. 6 Shuttle control = Speed and direction are 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 Current file time = Current time, incrementing. 3 Progress bar = File time at the slider position. 4 File duration = File length [time]. 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 Current file time =Not updated. 3 Progress bar = Not updated. 4 File duration = File length [time]. 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 116).
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 114, ❶).

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

Figure 114. 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 115, ❶).

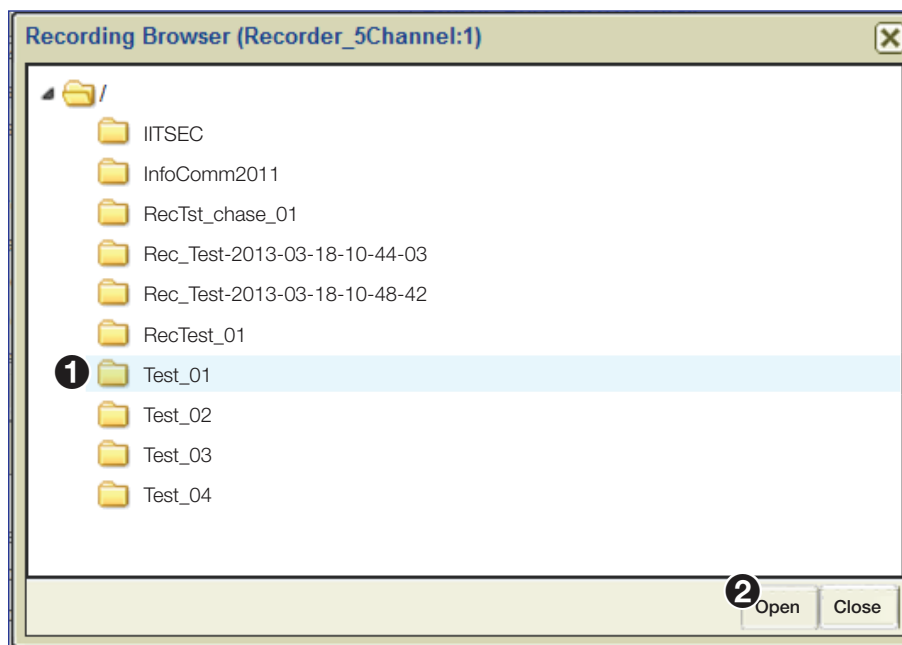


Figure 115. Recorder Browser, Directory Browsing

5. Click **Open** (see figure 115, ❷).

6. A dialog box opens (see figure 116).
 - a. Select **Yes (1)** 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 (2)** loads the file only to the device selected in the **Preset** panel.

Figure 116. Device Attributes, Load Playback File

- Click in the **File** field of the **Device Attribute** panel (see figure 117, ❶), then click on the drop-down button at the right hand side of the **File** field.

Figure 117. Recorder Device Attributes, File Selection

8. Select the desired file (see figure 118, **1**).

Figure 118. File Browser, Select File

The recorder is ready to play the selected file (see figure 119).

Device Attributes		
Name	VNR100:p	
Directory	/GFChaseTst/	
File	GFRecTst_01	
Launch Status	Play	①
Time Sync	Yes	②
Start Offset	00:00:00	③
Stop Offset	00:00:00	④
File Length	00:01:11	⑤

Figure 119. Device Attributes, Playback File Selected

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

Launch Status

The launch status (see figure 119, ①) 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 (②) 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 (③) is changed to set the starting point for replay in hours, minutes, and seconds. The default value is 00:00:00.

The Stop offset (④) 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 (⑤) 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** (see figure 120, ❶).

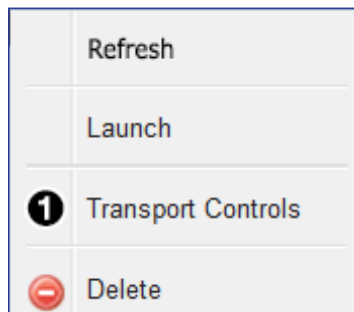


Figure 120. Right-click Access to Transport Controls

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 122). Note the directory and filename given to the recording (see figure 121).



Preset: RecChaseTst_rec	Device Attributes
 VNE300_2	Name VNR100:r
 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

Figure 121. 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 123).



Preset: RecChaseTst_play	Device Attributes
 VNR100:p	Name VNR100:p
 VNS104:1	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 122. 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 123).


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 123. 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 125).
2. Start the recorder from the transport bar.
3. Launch the player preset (see [Transport Dialog Box – Recorder](#) on page 125). 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 124).

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.

Format Editor Page

This section provides information about:

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

This page is accessed by selecting the **Format Editor** tab (see figure 124, ❶).

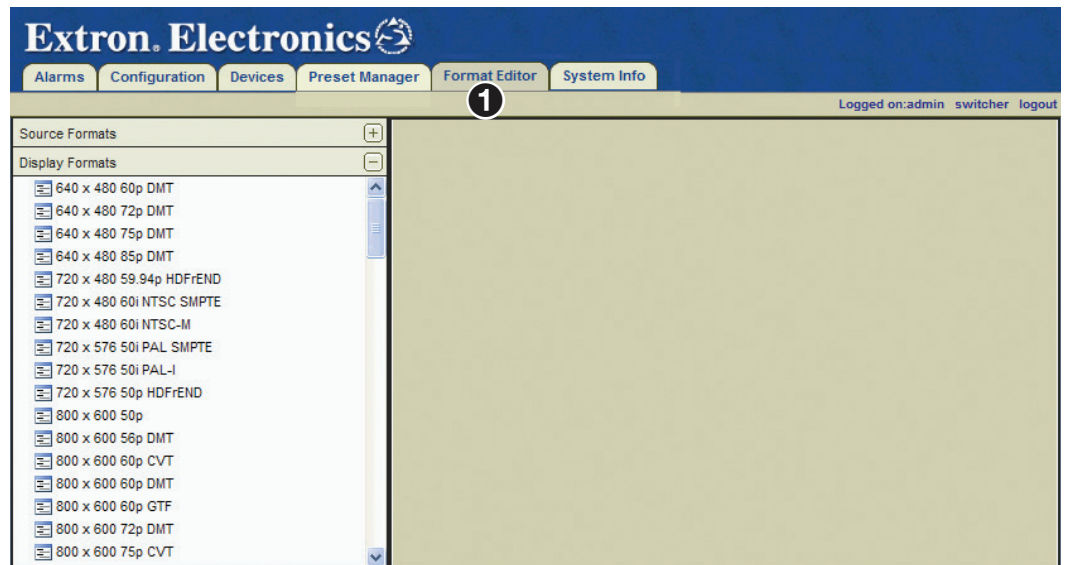


Figure 124. Format Editor Page

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.

Custom Source and Display Formats Overview

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 EC 200. 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 analog input types. It is not possible to create custom input modes for digital inputs.

Figure 125 shows the recommended system configuration used to create a new input or output mode.

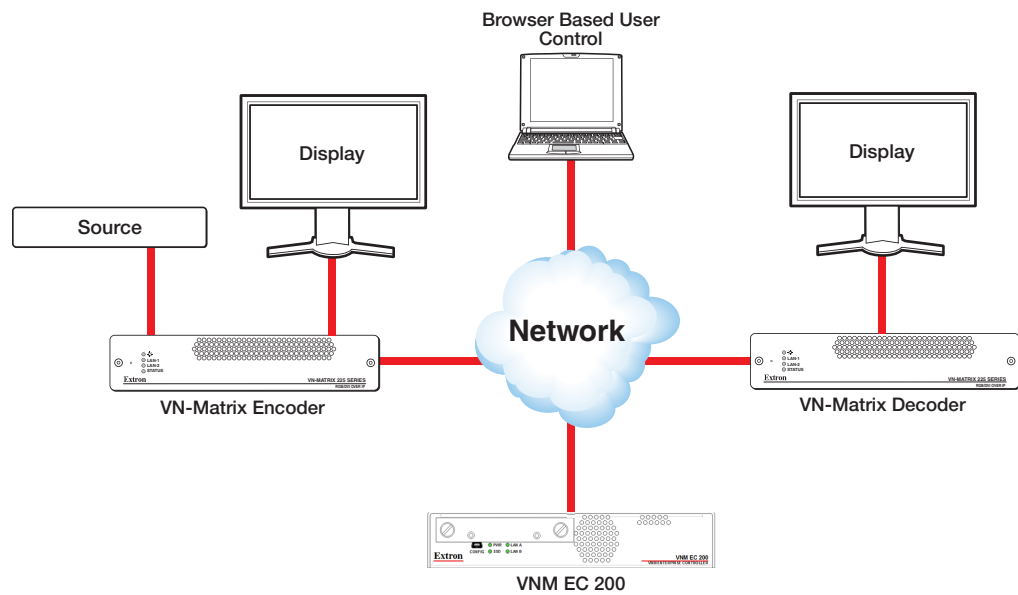


Figure 125. Recommended Setup for Creating Custom Input and Output Modes

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 49).
- The timing of the input source deviates from the standard timings for that signal.

In these situations, a custom input mode can 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).

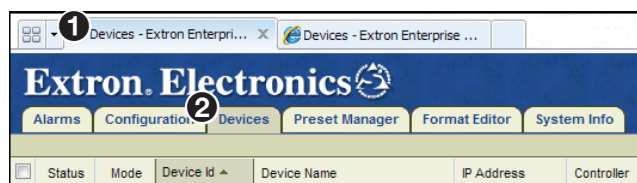
NOTE: This procedure relates to creating a specific new mode (**1280 x 600 60Hz, progressive**). However, it can be used to create any new input mode.

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 EC 200 (see [Accessing the Web-based User Interface](#) on page 11). Keep this tab on the left (see figure 126, ①).
5. **Duplicate** the Web-based user interface of the VNM EC 200 using a second browser tab. Keep this tab on the right (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 126. Devices and Format Editor

On the left tab (see figure 127, ❶) the **Devices** page opens (❷).

7. Choose the encoder connected to the VN-Matrix network in step 3 (❸).

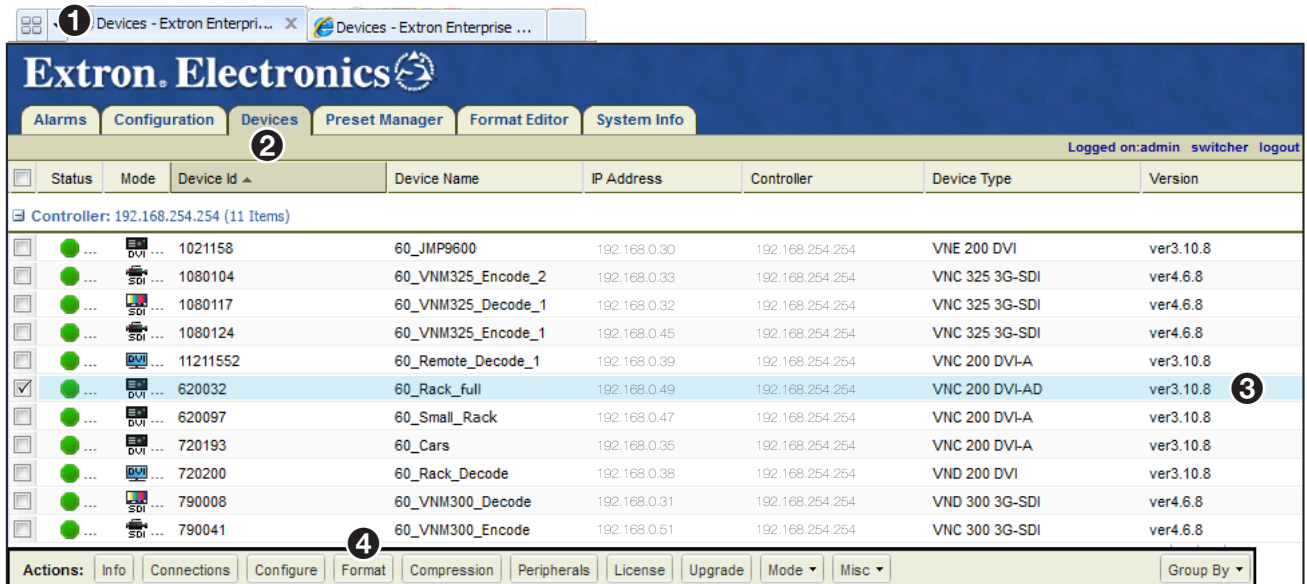


Figure 127. Devices Page

8. From the **Actions** bar located at the bottom of the **Devices** page, click **Format** (❷).

The **Source Format** dialog box opens.

9. Select **auto** from the **Mode** drop-down list (see figure 128, ❶).

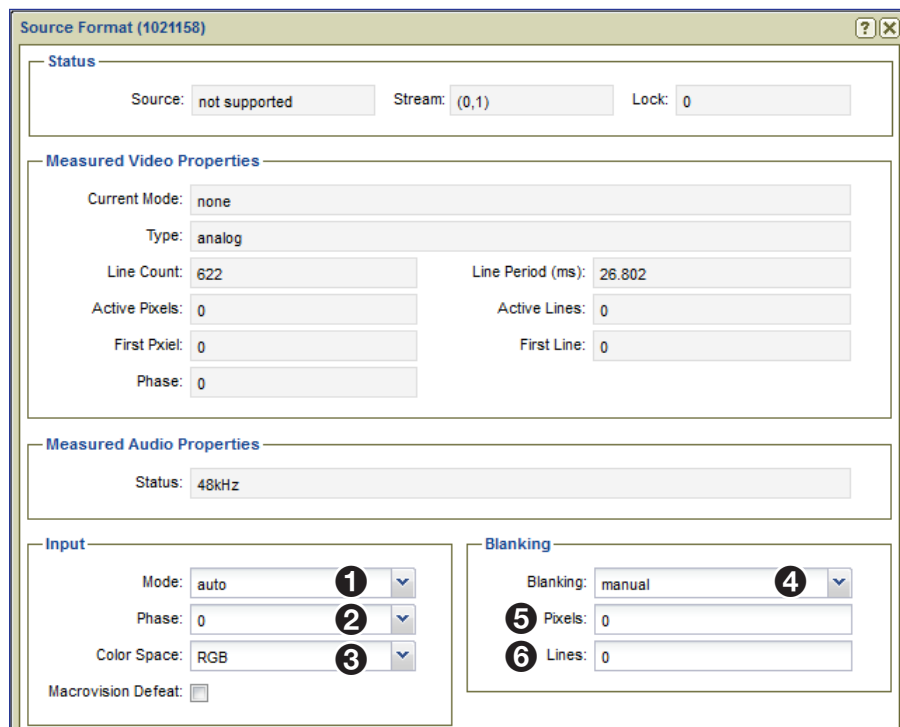


Figure 128. Source Format Menu

10. Select **0** from the **Phase** drop-down list (see figure 128, ❷).

11. Use the **Color Space** drop-down list to select the option that matches the connected source (❸).

12. Select **manual** from the **Blanking** drop-down list (see **Figure 128**, 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 129, 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.

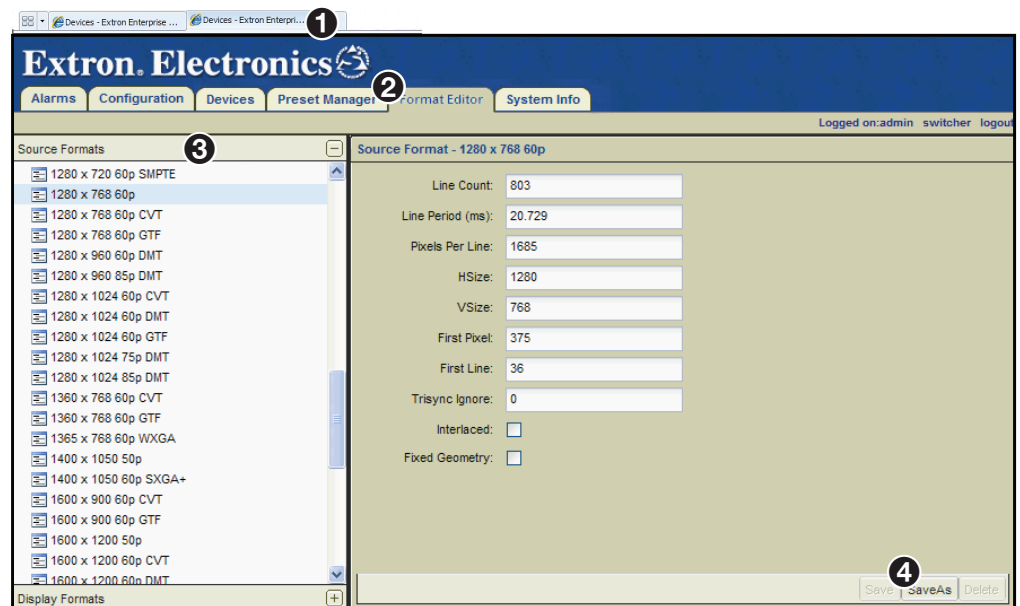


Figure 129. Source Format Editor Page (VN-Matrix 2xx Only)

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 130).

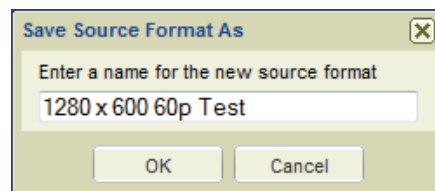


Figure 130. Saving a Source Format

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 can 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 131, ❶).

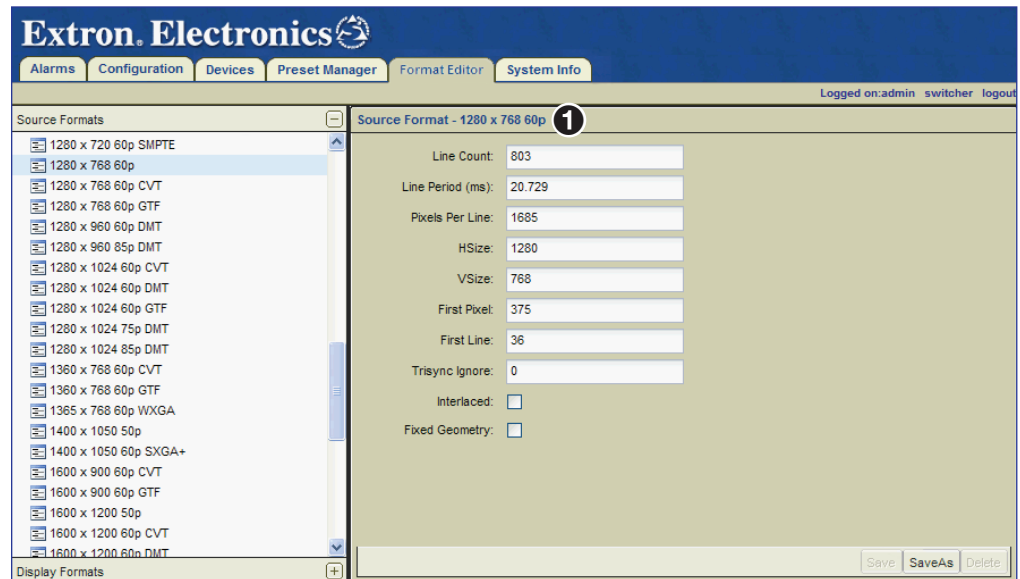


Figure 131. New Source Format Saved

20. Return to the left tab (see figure 132, ❶) where the **Source Format** dialog box is open. Note the values in the **Line Count** (❷) and **Line Period (ms)** (❸) fields.

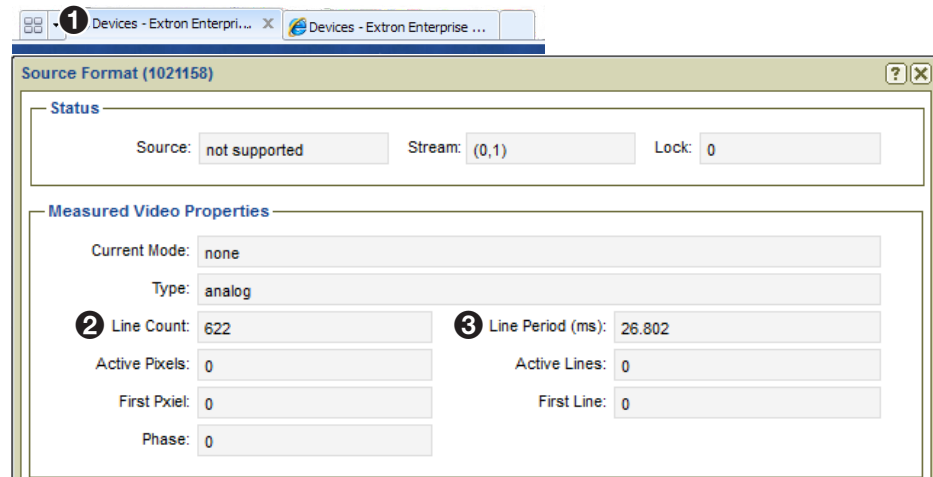


Figure 132. Source Format Line Count and Line Period (ms)

21. On the right tab (see figure 133, ❶) and the format editor (❷), make sure the new source is selected from the **Source Formats** list (❸) panel and enter the values from step 20 into the **Line Count** (❹) and **Line Period (ms)** (❺) fields on the right panel (Source Format - 1280 x 600 60p Test) (❸).

The screenshot shows the Extron Electronics web interface. At the top, there are tabs for Alarms, Configuration, Devices, Preset Manager, Format Editor, and System Info. The 'Format Editor' tab is active. On the left, a list of source formats is displayed, with '1280 x 600 60p Test' selected. On the right, the configuration panel for this format is shown, with fields for Line Count, Line Period (ms), Pixels Per Line, HSize, VSize, First Pixel, First Line, Trisync Ignore, Interlaced, and Fixed Geometry. The 'Save' button is located at the bottom right of the configuration panel.

Figure 133. Enter Values Into the Source Format Editor Page

22. Click **Save** (see figure 133, ❻), to save the resolution.
23. Click the **left tab** (see figure 134, ❶).

The screenshot shows the Extron Electronics web interface with the 'Devices' tab selected. The interface displays a table with columns for Status, Mode, Device Id, Device Name, IP Address, and Controller. The 'Devices' tab is selected, and the table is empty.

Figure 134. First Tab, Devices Selected

24. Click **Devices** (❷).

25. Select **auto** from the **Mode** drop-down list to force a resync of the source. (see figure 135, ①).

Source Format (1021158)

Status

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

Measured Video Properties

Current Mode: 1280 x 600 60p Test ②

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 ①

Phase: 0

Color Space: RGB

Macrovision Defeat: ☐

Blanking

Blanking: manual

Pixels: 0

Lines: 0

EDID

From Monitor: No Device

To Source: transparent

Figure 135. Force a Resync of the Source

26. The name of the new source created in step 18 is now visible in the **Current Mode** field (see figure 135, 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.

The **Measured Video Properties** panel (see figure 136, ❶) now displays information about the new source.

NOTE: The loop-through display now shows an image. The edges of the image can be missing since the image is not properly adjusted at this point.

27. Note the values in the **First Pixel** (❷) and **First Line** fields (❸).

The screenshot shows the 'Source Format (1021158)' dialog box with the following sections and values:

- Status**: Source: not supported, Stream: (0,1), Lock: 0
- Measured Video Properties** (❶):
 - 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** (❷): 322
 - First Line** (❸): 22
 - 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 136. Source Format Menu First Pixel and First Line Values

28. Using the right tab (see figure 137, ❶), on the **Format Editor** page (❷), enter the values noted in step 27 into the **First Pixel** (❸) and **First Line** (❹) fields.

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: 803

Line Period (ms): 26.802

Pixels Per Line: 1685

HSize: 1280

VSize: 768

❸ First Pixel: 322

❹ First Line: 22

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

❺ Save SaveAs Delete

Figure 137. Enter Values Into the Source Format Editor Page

29. Click **Save** (see figure 137, ❺), located at the lower right corner of the page, to save the resolution.

30. Return to the left tab (**Source Format menu**) (see figure 138, 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

❷ 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 138. Force a Resync of the Source

31. Click the **right device tab** (see figure 139, ❶).
32. Select the **Format Editor** (❷).
33. 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).

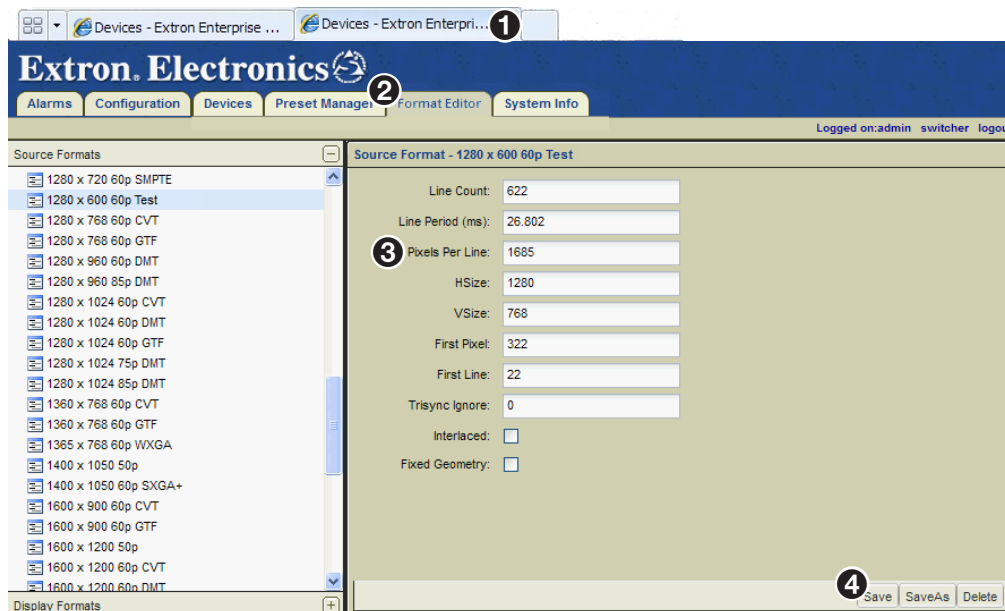


Figure 139. Enter Values Into the Source Format Editor Page

- 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.

- 34. Return to the left tab (Source Format menu)** (see figure 140, **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

② 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 140. Force a Resync of the Source

- 35.** Repeat steps **33** and **34**. Adjust the number of pixels added or subtracted until there is no banding in the image.

36. Using the left tab (Source Format menu), note the value of the **First Pixel** field (see figure 141, ❶).

The screenshot shows a web interface with two main sections. The top section, titled "Status", contains three input fields: "Source:" with the value "not supported", "Stream:" with the value "(1,1)", and "Lock:" with the value "1". The bottom section, titled "Measured Video Properties", contains several input fields: "Current Mode:" with "1280 x 600 60p Test", "Type:" with "analog", "Line Count:" with "622", "Line Period (ms):" with "26.805", "Active Pixels:" with "1308", "Active Lines:" with "600", "❶ First Pixel:" with "308", "First Line:" with "22", and "Phase:" with "4".

Figure 141. Note Source Format Menu Value

37. Click the right tab (Source Format Editor page), (see figure 142, ❶) and enter the value from step 36 into the **First Pixel** field (❷).

The screenshot shows the "Source Format Editor" page in the Extron Electronics web interface. The left sidebar lists various source formats, with "1280 x 600 60p Test" selected. The main area displays the configuration for this format. At the top, there are tabs for "Alarms", "Configuration", "Devices", "Preset Manager", "Format Editor", and "System Info". The "Format Editor" tab is active. The configuration fields include: "Line Count:" (622), "Line Period (ms):" (26.802), "Pixels Per Line:" (1685), "HSize:" (1280), "VSize:" (768), "❷ First Pixel:" (308), "First Line:" (22), "Trisync Ignore:" (0), "Interlaced:" (checkbox), and "Fixed Geometry:" (checkbox). At the bottom right, there are three buttons: "❸ Save", "SaveAs", and "Delete".

Figure 142. Enter Values Into the Source Format Editor Page

38. Click **Save** (❸), located at the lower right corner of the page, to save the resolution.

39. Click the left tab (**Source Format menu**), (see figure 143, 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.

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

❷ Mode: auto

Phase: 0

Color Space: RGB

Macrovision Defeat: ☐

Blanking

Blanking: auto

Pixels: 0

Lines: 0

Figure 143. Force a Resync of the Source

40. Click the right tab (**Source Format Editor**), (see figure 144, 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 41.

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

❷ Pixels Per Line: 1685

HSize: 1280

VSize: 768

First Pixel: 308

First Line: 22

Trisync Ignore: 0

Interlaced: ☐

Fixed Geometry: ☐

❸ Save SaveAs Delete

Figure 144. Enter Values Into the Source Format Editor Page

41. Click the left tab (**Source Format menu**), (see figure 145, ❶) and force a resync of the source by reselecting **auto** from the **Mode** drop-down list (❷).

Source Format (620056)

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

Input

❷ Mode: auto

❸ Phase: auto

Color Space: RGB

Macrovision Defeat: ☐

Blanking

❹ Blanking: auto

Pixels: 0

Lines: 0

Figure 145. 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.

42. Select **auto** from the **Phase** drop-down list (see figure 145, ❸).
43. Select **auto** from the **Blanking** drop-down list (❹).
44. The new source format is now correctly configured. If necessary, see **Creating a New Display Format (Output Mode)** on page 149 for information on how to create a corresponding display format.

Creating a New Display Format (Output Mode)

One issue encountered when using 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 a corresponding input mode.

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 EC 200 (see [Accessing the Web-based User Interface](#) on page 11 for information on how to log in).
2. Duplicate the Web-based user interface of the VNM EC 200 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 146, ①). Select the **Devices** page (②) and choose a VN-Matrix 2xx series decoder from the device list (③). A checkmark appears in the checkbox to the left of the decoder row.

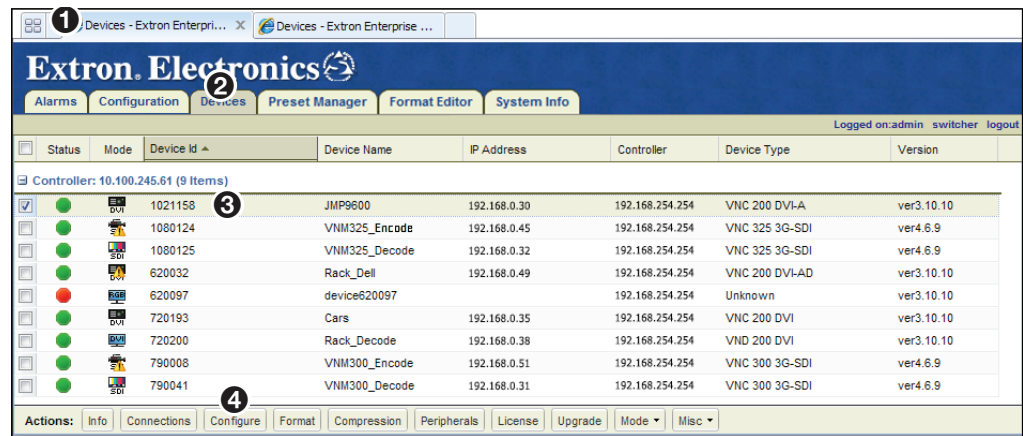


Figure 146. Devices Page

4. From the Actions menu bar located at the bottom of the **Devices** page, click **Configure** (see figure 146, ④). The **Configure Device Settings** dialog box opens (see figure 147).
5. Select **enable** from the **Mode** drop-down list (see figure 147, ①). Click the **X** in the upper right corner of the dialog box (②) to close the dialog box.

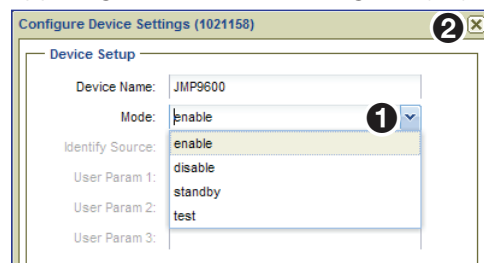


Figure 147. Configure Device Settings Dialog Box

6. Use the **Switcher** page (see [Switcher Page](#) on page 92) 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 148, 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.

Figure 148. Display Format Editor Page

9. Make sure that the **Manual** button (❹), located at the bottom of the page, is selected.
10. Enter the required values into the **Active Pixels** (❺), **Active Lines** (❻), and **Frame Rate** fields (❼).
11. Click **CVT** (see figure 149, ❶) located at the bottom of the page.

Notice that most of the remaining fields are now grayed out.

Figure 149. Display Format Editor Page

12. Click **Save As** (❷) to save the new display format.

13. In the **Save Display Format As** dialog box, enter a name for the new display format and click **OK** (see figure 150).

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

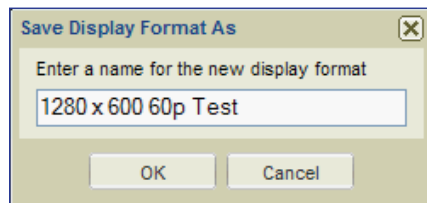


Figure 150. Save a Display Format

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 149) 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 151).

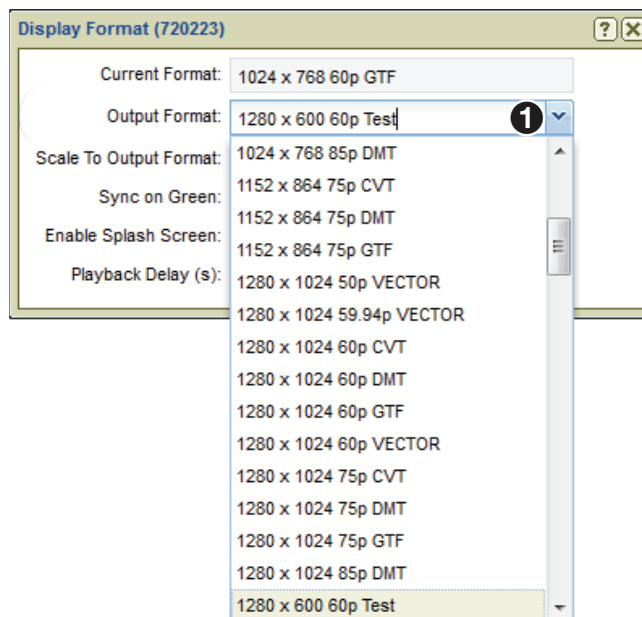


Figure 151. Display Format Menu

17. Select the new display format created in step 13 from the **Output Format** drop-down list (see figure 151, ①). The new display format is applied and the image is displayed.

Deleting Formats

NOTES:

- The default resolutions provided with the VNM EC 200 cannot be deleted.
- Custom resolutions that are in use 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 152, ⑦ below).

Source Format Editor

To view or change the properties of a source format:

1. Click the **right tab**, (see figure 152, 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).

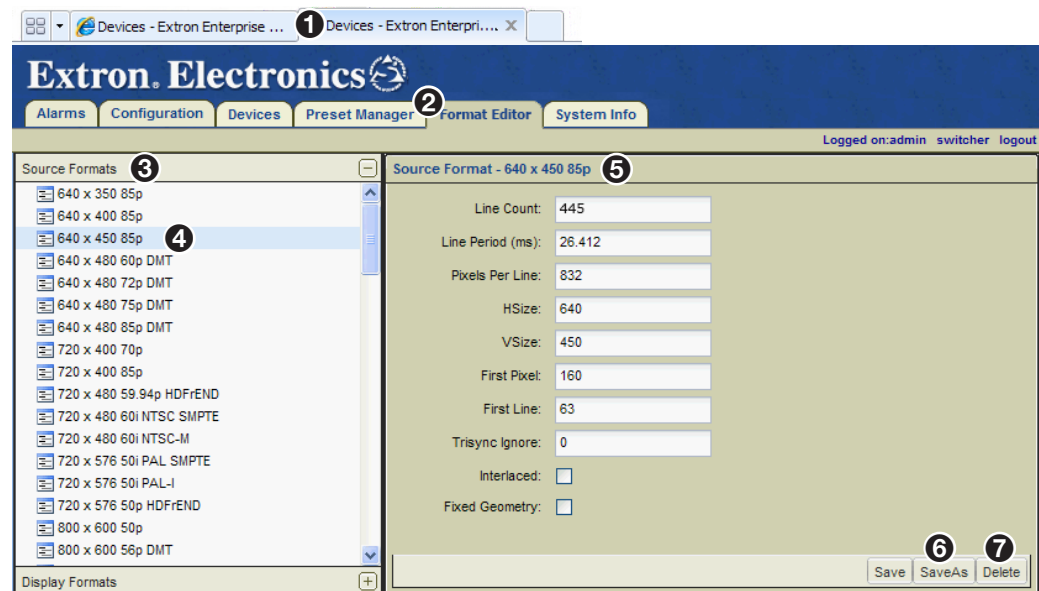


Figure 152. Source Resolution Properties

Source Format panel (⑤)

To create a new source format, modify the desired fields:

- **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.

Click **SaveAs** in the lower right corner (see [figure 152](#), ⑥ on page 152), to save the resolution to the list with a new name. For additional information on creating source formats, see [Creating a New Source Format \(Input Mode\)](#) on page 135.

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

Display Format Editor

1. Select the **Format Editor** tab (see figure 153, ①).
2. Click the **Display Formats** bar (②) to open a list of display resolutions.
3. Select the desired source format resolution (③). The properties populate the **Display Format** panel on the right (④).

The screenshot shows the Extron Electronics Format Editor interface. At the top, there are tabs: Alarms, Configuration, Devices, Preset Manager, Format Editor (selected), and System Info. Below the tabs, there is a 'Source Formats' list on the left and a 'Display Format' panel on the right. The 'Display Format' panel is titled 'Display Format - 600 x 400 60p'. It contains various input fields for resolution properties. The 'Display Formats' bar is highlighted. The 'Display Format' panel is expanded, showing fields for Active Pixels, Active Lines, Total Pixels, Total Lines, Horizontal/Vertical Borders, Horizontal/Vertical Front/Back Porches, Horizontal/Vertical Sync Widths, Horizontal/Vertical Sync Polarities, Frame Rate, Pixel Clock Frequency, Margins, and Reduced Blanking. The 'SaveAs' button is highlighted in the bottom right corner.

Figure 153. Display Resolution Properties

Display Format Editor (④)

To create a new display format, modify the **Display Format** panel fields on the right as needed (see figure 153):

- **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.

Edit and Video Timing (6)

These selections set the video standards for the display timings and allow editing of the display format configuration.

- **Manual** — By default, this button is selected. The 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.

Click **SaveAs** (see [figure 153](#), ⑥ on page 153) 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 149.

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

Alarms

This section provides information on:

- [Alarms Overview](#)
- [Alarms Page](#)
- [Alarm Type Reference Tables](#)

Alarms 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 154. 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	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 rack	VNC 200 DVI-AD	2012/04/02 17:06:01 GMT+0100	192.168.254.254

Figure 154. 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 158.

- ② **ID Number** — The ID number of the alarm.
- ③ **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.

- ④ **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 158.
- ⑤ **Device** — The device ID of the VNM device is shown in this column.
- ⑥ **Name** — The name assigned to the device by the user.
- ⑦ **Device Type** — The type or model number of the connected device.
- ⑧ **Raised Time** — The date and time the alarm first occurred.
- ⑨ **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 155 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 155, 1).

ID	Severity	Alarm Description	Device	Name	Device Type	Raised Time ▼	controller
Severity: critical (11 Items)							1 None
450772	●	Bad Device	620038	device620038	VNC 200 DVI-AD	2012/03/22 17:43:33 GMT+0000	
450112	●	Bad Device	620115	device620115	VNC 200 DVI-AD	2012/03/22 16:27:56 GMT+0000	
322	●	Bad Device	720202	Small rack	VNC 200 DVI-AD	2012/04/02 17:06:01 GMT+0100	
562	●	Bad Device	11211552	D830	VNE 200 DVI	2012/04/02 17:05:08 GMT+0100	
742	●	Bad Device	620091	JMP_Left	VNC 200 DVI-A	2012/04/02 17:04:33 GMT+0100	
382	●	Bad Device	6020056	JMP_Right	VNC 200 DVI-A	2012/04/02 17:04:33 GMT+0100	

Figure 155. Grouping Alarms

The following grouping options (1) are available.

- **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.

NOTES:

- After selecting a grouping option, groups can be further sorted using column sorting (see [Sorting Devices by Column](#) on page 41). Figure 155 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).

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	Invalid reference genlock signal.	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 EC 200s for redundant operation. For information on how to set up a single controller, see [Single VNM EC 200 Configuration](#) on page 13.

This section provides information on:

- [Setup Overview](#)
- [Configuring Dual VNM EC 200s](#)
- [Configuring Dual EC 200s as the System Controller](#)
- [Configuring VN-Matrix Devices for Dual VNM EC 200 Operation](#)
- [Cluster Properties Pages](#)

NOTE: For additional configuration information, see [Advanced Controller Configuration](#) on page 19. Except for the IP Address, configure each VNM EC 200 identically.

Setup Overview

1. Connect one VNM EC 200 to the control PC and change the default IP address (see [Configuring the Network Settings \(Eth0\)](#) on page 162).
2. Use a network switch to connect the primary VN-Matrix network to the rear panel LAN A Ethernet connector (eth0) of each VNM EC 200 (see [Rear Panel Features](#) on page 8).
3. Use an RJ-45 crossover cable to connect the VNM EC 200 LAN B (eth1) Ethernet connectors together (see [figure 2](#) on page 3 and [Rear Panel Features](#) on page 8).
4. Power on each VNM EC 200, all VN-Matrix devices present in the system, and all necessary devices (see [Power Up Procedure](#) on page 10).
5. Connect a control PC to the VN-Matrix network and navigate to the Web-based user interface of each VNM EC 200 (see [Accessing the Web-based User Interface](#) on page 11).
6. Configure the settings of each VNM EC 200 (see [Configuring Dual VNM EC 200s](#) on page 162).
7. Configure the VNM EC 200 pair to act as the controller for the VN-Matrix system (see [Configuring Dual EC 200s as the System Controller](#) on page 168).
8. Configure the devices within the VN-Matrix system (see [Configuring VN-Matrix Devices for Dual VNM EC 200 Operation](#) on page 174).
9. If necessary, update the license of each VNM EC 200 (see [Controller Firmware and License Updates](#) on page 182).
10. Power down each VNM EC 200 and all configured devices (see [Power Down Procedure](#) on page 12). After a few seconds, power on each VNM EC 200 and all necessary devices.

Configuring Dual VNM EC 200s

This section details how to set up and configure dual (redundant) VNM EC 200s.

Configuring the Network Settings (Eth0)

NOTES:

- The VNM EC 200s should not be paired when configuring the network settings. For information on how to unpair previously paired VNM EC 200s, see [Unpairing controllers](#) on page 177.
- Be aware that unpairing and then pairing a VNM EC 200 deletes device configuration files, presets, and custom input or output modes.
- Each VNM EC 200 must use an IP address that contains the same network prefix (for example: **192.168.xxx.xxx**) and subnet.
- Each VNM EC 200 must use the same subnet mask address.

Each VNM EC 200 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

NOTES:

- 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.
- Each VNM EC 200 has a default IP address of 192.168.254.254. This IP must be changed on one of the EC 200s before configuration for dual operation.

In the following examples:

- VNM EC 200 #1 is the redundant primary and has an IP address of **192.168.254.254**.
- VNM EC 200 #2 is the redundant secondary and has an IP address of **192.168.254.253**.
- The cluster IP address is **192.168.254.250**.

Use the following procedure to change the network settings of **each** VNM EC 200.

1. Connect only **ONE** VNM EC 200 to the network the PC controller is connected to.
2. Log into the VNM EC 200 (see [Accessing the Web-based User Interface](#) on page 11) using the default settings.

3. Click the **Configuration** tab (see figure 156, ❶).
The **Configuration** page opens.

Figure 156. Configuration Page — Configuring the Network Setting

4. Click the **Network** link under **Device Properties** (see figure 156, ❷).
5. 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.

6. Click **Apply Changes** (❹) to save the configuration. The controller network settings are now configured. This will become the redundant secondary controller. Note the new IP address.
7. Connect the second VNM EC 200 to the network.

NOTE: If you changed the IP address of the first EC 200 from the default **192.168.254.254**, there is no need to disconnect it from the network.
If you left the IP address at the default (**192.168.254.254**), you must first disconnect it before connecting the second EC 200.

9. Repeat steps 2 through 6 to configure a second VNM EC 200 using a different IP Address. This will become the redundant secondary controller.
10. Configure the IP address of the control PC so that it is within the address range of the VNM EC 200.

NOTE: Complete this step only if the IP address of each VNM EC 200 is using a **network prefix** or **subnet** other than **192.168.254.xxx**.

11. If necessary, restart the control PC to save the new network configuration.

Setting the Role of the Primary EC 200

Use the following procedure to set the role of the redundant primary VNM EC 200 (see [Accessing the Web-based User Interface](#) on page 11).

1. Log into the **redundant primary** VNM EC 200 using the designated IP address and click the **Configuration** tab.
The **Configuration** page opens (see figure 157, ❶).

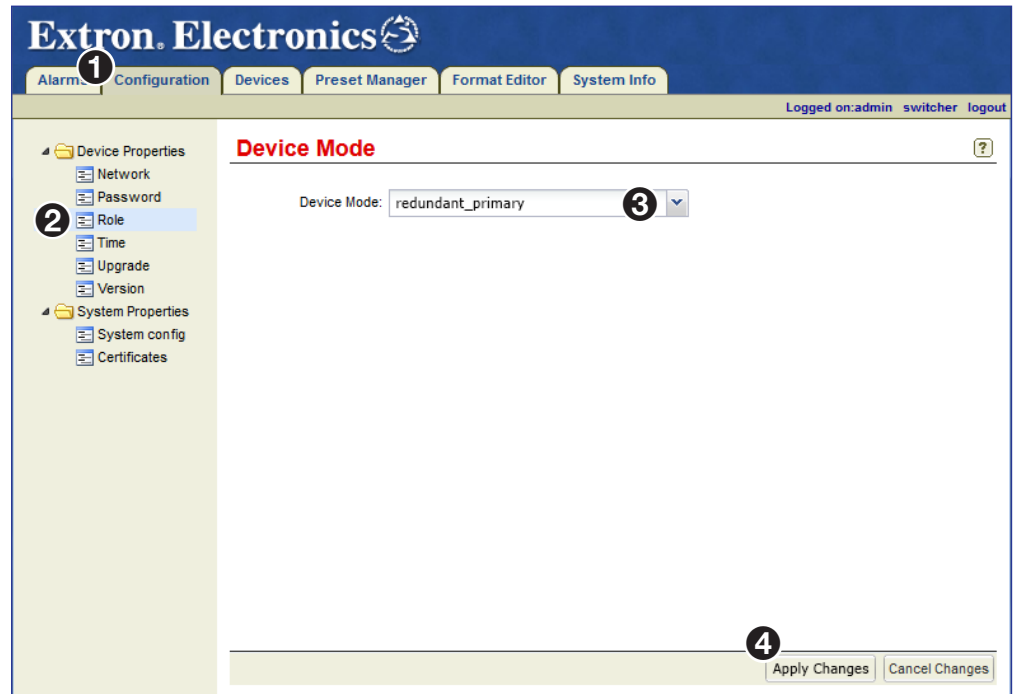


Figure 157. Configuration Page — Redundant Primary Role Setup

2. Under **Device Properties**, click the **Role** link (see ❷).
3. From the **Device Mode** drop-down list, select **redundant_primary** (❸).

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

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

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 175) and [Node Test Page](#) (see page 172) are available under a new **Cluster Properties** folder on the left panel of the **Configuration** page.

Setting the Role of the Secondary EC 200

Use the following procedure to set the role of the redundant secondary VNM EC 200 (see [Accessing the Web-based User Interface](#) on page 11 for information on how to log in).

1. Log into the **redundant secondary** VNM EC 200 using the designated IP address and click the **Configuration** tab.
The **Configuration** page opens (see figure 158, ①).

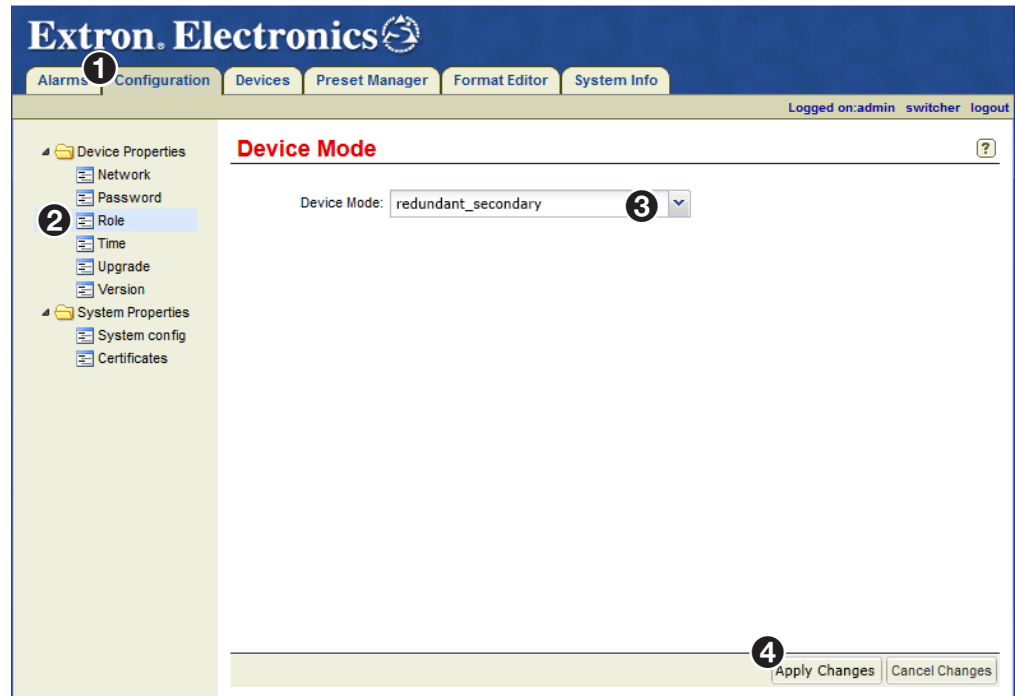


Figure 158. Configuration Page — Redundant Secondary Role Setup

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 EC 200 Time Settings

Use the following procedure to configure the time settings of the redundant primary VNM EC 200. See [Accessing the Web-based User Interface](#) on page 11 for information on how to log in.

1. Log in to the **redundant primary** VNM EC 200 and click the **Configuration** tab. The **Configuration** page opens (see figure 159, ❶).

The screenshot shows the Extron Electronics web interface. The top navigation bar includes 'Alarms', 'Configuration' (selected), 'Devices', 'Preset Manager', 'Format Editor', and 'System Info'. A user is logged in as 'admin' with a 'switcher' role. The left sidebar shows a tree view of configuration options: Device Properties (Network, Password, Role, Time, Upgrade, Version), System Properties (System config, Certificates), and Cluster properties (Cluster, Node test). The 'Time' link is highlighted. The main content area is titled 'Time' and contains several sections: 'Reported Time' showing 'Tue May 10 13:13:43 EDT 2011'; 'Clock Synchronization' with an unchecked 'Enable Clock Synchronization' checkbox and a list of sources (192.168.244.10, 192.168.244.11, 192.168.244.54, 192.168.244.55); 'Clock Settings' with 'Set time' (11:39:43) and 'Set date' (11/05/2010) fields; and 'Time Zone' with a 'Set timezone' dropdown set to 'ESTSEDT'. At the bottom right are 'Apply Changes' and 'Cancel Changes' buttons. Numbered callouts 1 through 7 are placed on the page to indicate the steps in the procedure.

Figure 159. Configuration Page — Primary Controller Time Setup

2. Under Device Properties, click the **Time** link (❷).
3. Make sure **Enable Clock Synchronization** is **not** checked (❸).

NOTE: If **Enable Clock Synchronization** is checked, the **Set time** (❺) and **Set date** (❻) fields are not accessible (dimmed).

4. Select the desired time zone from the **Set timezone** drop-down list (❹) and click **Apply Changes** (❷).
5. Enter the time in the **Set time** field (❺).
 - 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 (❻).
 - Use the MM/DD/YYYY (month/day/year) format. For example, 04/04/2016.
7. Click **Apply Changes** (❷) to save the configuration.

Configuring the Secondary EC 200 Time Settings

Use the following procedure to configure the time settings of the redundant secondary VNM EC 200.

1. Log in to the **redundant secondary** VNM EC 200 (see [Accessing the Web-based User Interface](#) on page 11) and click the **Configuration** tab. The **Configuration** page opens (see figure 160, ①).

The screenshot shows the Extrem Electronics web interface. The top navigation bar includes 'Alarms', 'Configuration' (selected), 'Devices', 'Preset Manager', 'Format Editor', and 'System Info'. The user is logged in as 'admin' with a 'switcher' option and a 'logout' link. The left sidebar menu is expanded, showing 'Device Properties' (Network, Password, Role, Time (selected), Upgrade, Version), 'System Properties' (System config, Certificates), and 'Cluster properties' (Cluster, Node test). The main content area is titled 'Time' and contains several sections: 'Reported Time' showing 'Tue May 10 13:13:43 EDT 2011'; 'Clock Synchronization' with 'Enable Clock Synchronization' checked and a list of sources (192.168.244.10, 192.168.244.11, 192.168.244.54, 192.168.244.55) with an 'Add' button; 'Clock Settings' with 'Set time' at 11:39:43 and 'Set date' at 11/05/2010; and 'Time Zone' with 'Set timezone' set to 'ESTSEDT'. At the bottom right, there are 'Apply Changes' and 'Cancel Changes' buttons.

Figure 160. 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 EC 200.
4. In the **Clock Synchronization** panel, check **Enable Clock Synchronization** (④). This syncs the time settings of this VNM EC 200 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 EC 200 and click **OK** to close the dialog.
6. Click **Apply Changes** to save the configuration (⑥).

Configuring Dual EC 200s as the System Controller

This section details how to assign the dual VNM EC 200s as the system controller. **Before proceeding**, make sure the procedures detailed in [Configuring Dual VNM EC 200s](#) on page 162 are complete.

NOTE: For information on how to configure a single VNM EC 200 as the system controller, see [Single VNM EC 200 Configuration](#) on page 13.

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 log in).

NOTE: When the VN-Matrix system is first set up, this procedure must be performed on both the primary and secondary controllers before pairing.

1. Log into the **redundant primary** VNM EC 200 and click the **Configuration** tab. The **Configuration** page opens (see figure 161, ❶).

The screenshot shows the Extron Electronics web interface. The top navigation bar includes tabs for Alarms, Configuration (marked with ❶), Devices, Preset Manager, Format Editor, and System Info. The left sidebar lists various configuration categories, with 'Cluster' under 'Cluster properties' marked with ❷. 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 has fields for Cluster IP Address (192.168.254.250, marked with ❸), Test Switch on Powerup (unchecked), Switch IP Address (none), and Crossover Subnet (192.168.253.0). At the bottom, there are buttons for Migrate, Unpair, Pair, and Apply Changes (marked with ❹), along with a Cancel Changes button.

Figure 161. Configuration Page — Setting the Cluster IP Address

2. Click the **Cluster** link (❷).
3. Enter the desired IP address into the **Cluster IP Address** field (❸).

NOTE: The cluster IP address must have the same network IP address prefix and the same subnet as the address entered in step 4 of [Configuring the Network Settings \(Eth0\)](#) on page 162. In this example we are using 192.168.254.250.

4. Click **Apply Changes** (❹) to save the setting.
5. Log into the **redundant secondary** VNM EC 200 and repeat this procedure.

Adding the VNM EC 200s to the Controller List

Use the following procedure to add the VNM EC 200s to the controller list (see [Accessing the Web-based User Interface](#) on page 11).

1. Log in to the **redundant primary** VNM EC 200 and click the **Configuration** tab.

The **Configuration** page opens (see figure 162, ①).

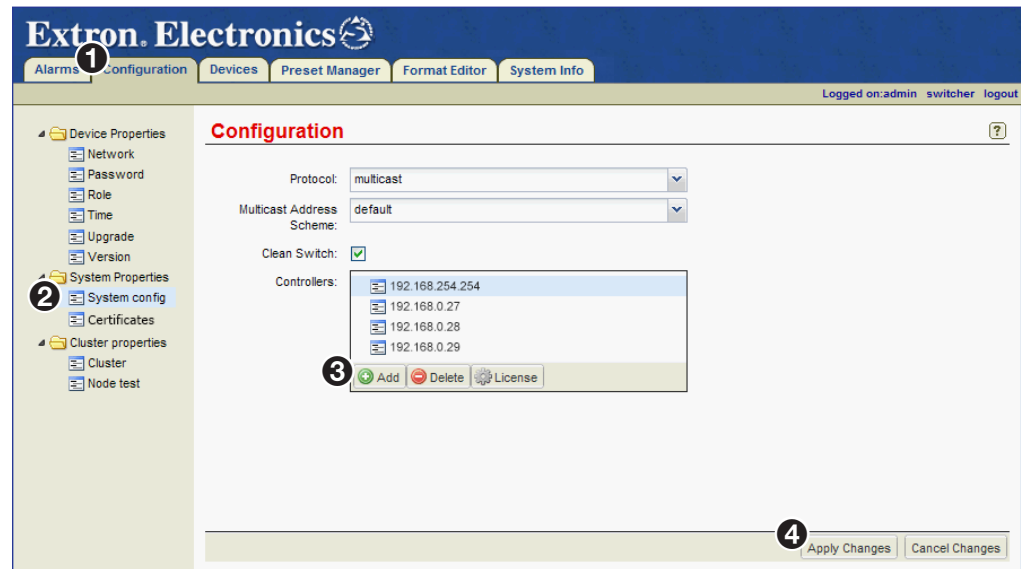


Figure 162. Configuration Page — Adding Controllers to the Controller List

2. Click the **System config** link (②).
3. In the **Controllers** field, click **Add** (③).
4. Enter the cluster IP address of the VNM EC 200 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 EC 200 restarts the user interface and is assigned as the system controller.
6. Log in to the **redundant secondary** VNM EC 200 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 log in).

1. Log into the **redundant primary** VNM EC 200 and click the **Configuration** tab. The Configuration page opens (see figure 163, ①).

The screenshot shows the Extron Electronics web interface. At the top, there's a navigation bar with tabs: Alarms, Configuration (selected), Devices, Preset Manager, Format Editor, and System Info. Below this, a sidebar on the left contains a tree view with categories: Device Properties (Network, Password, Role, Time, Upgrade, Version), System Properties (System config (selected), Certificates), and Cluster properties (Cluster, Node test). The main content area is titled 'Configuration' and contains the following settings:

- Protocol:** A drop-down menu set to 'multicast' (marked with ③).
- Multicast Address Scheme:** A drop-down menu set to 'default'.
- Clean Switch:** A checked checkbox.
- Controllers:** A list box containing four IP addresses: 192.168.254.254, 192.168.0.27, 192.168.0.28, and 192.168.0.29. Below the list are buttons for 'Add', 'Delete', and 'License'.

At the bottom right of the configuration area, there are two buttons: 'Apply Changes' (marked with ④) and 'Cancel Changes'.

Figure 163. 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 EC 200 and repeat this procedure.

Setting the Crossover Subnet IP Address (Eth1)

A crossover cable is connected between the LAN B (eth1) ports of a VNM EC 200 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 LAN A (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 EC 200s are unpaired (see [Unpairing controllers](#) on page 177).
- The **Crossover Subnet** field must be individually set on each VNM EC 200 within the cluster. The entered values must also be identical.
- A crossover cable must be connected between the LAN B (eth1) ports of a VNM EC 200 pair without using 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 log in information).

1. Connect the two Ethernet ports (Eth1) together (see [figure 2](#) on page 3 and [Rear Panel Features](#) on page 8) using a crossover cable.
2. Log into the **redundant primary** VNM EC 200 and click the **Configuration** tab. The **Configuration** page opens (see figure 164, ①).

Figure 164. Configuration Page — Changing the Crossover Subnet

3. Click the **Cluster** link (②).
4. In the **Crossover Subnet** field (③), enter the desired crossover subnet IP address.
5. Click **Apply Changes** to save the configuration (④).
6. Log into the **redundant secondary** VNM EC 200 and repeat this procedure.

NOTE: When a crossover cable connects the primary and secondary VNM EC 200s 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 EC 200 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 165). The VNM EC 200 that communicates best with these devices becomes the Primary and the other unit becomes the Secondary.

The tested devices are called nodes. To create the list, enter the IP address of VN-Matrix devices into the **Sources** list.

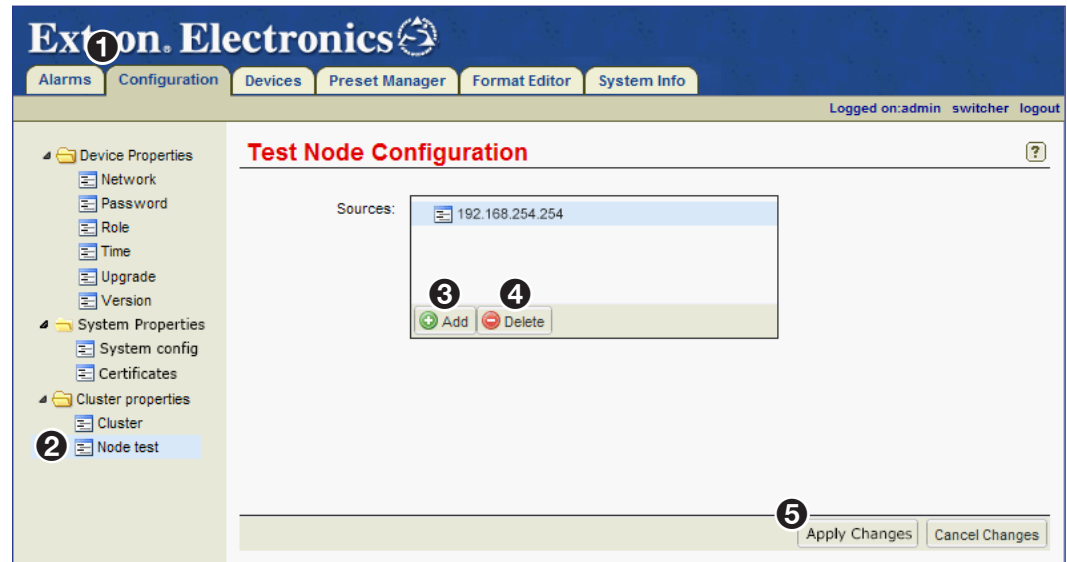


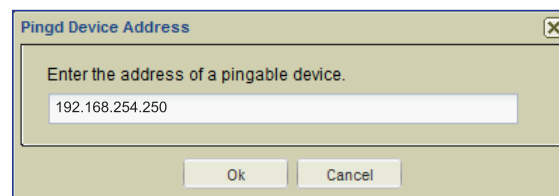
Figure 165. Node Test Page

Adding nodes

NOTE: Nodes can only be added on a VNM EC 200 that is unpaired.

1. Using a Web browser, navigate to the Web-based user interface by entering the physical LAN A (eth0) IP address of the **redundant primary** VNM EC 200.
2. Select the **Configuration** page (see figure 165, ①).
3. Click on the **Node test** link (②).
4. Click **Add** at the bottom of the **Sources** list (③).

The following dialog 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 EC 200 pair.
7. When finished, click **Apply Changes** (⑤).

NOTE: The **redundant secondary** VNM EC 200 automatically matches its **Sources** list to the **redundant primary** VNM EC 200.

Deleting nodes

1. Using a Web browser, navigate to the Web-based user interface by entering the physical LAN A (eth0) IP address of the **redundant primary** VNM EC 200.
2. Select the **Configuration** page (see [figure 165](#), 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 EC 200 automatically matches its **Sources** list to the **redundant primary** VNM EC 200.

Pairing the VNM EC 200s

NOTE: Before pairing the VNM EC 200s, the cluster IP address must be set (see [Setting the Cluster IP Address](#) on page 168).

Use the following procedure to pair the VNM EC 200s (see [Accessing the Web-based User Interface](#) on page 11 for information on how to log in).

1. Using a Web browser, navigate to the Web-based user interface by entering the physical LAN A (eth0) IP address of the **redundant primary** VNM EC 200.
2. Click the **Configuration** tab.
The **Configuration** page opens (see figure 166, ❶).

Figure 166. Configuration Page — Pairing the VNM EC 200s

3. Click the **Cluster** link (❷).
4. Click **Pair** (❸).

NOTES:

- Pairing the VNM EC 200s can take several minutes.
- After the VNM EC 200s are paired, it could be necessary to reconfigure the settings (see [Advanced Controller Configuration](#) on page 19).

Configuring VN-Matrix Devices for Dual VNM EC 200 Operation

For the VNM EC 200 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 EC 200s and configure each device to operate on the same network as the VNM EC 200s.
- Access the VNM EC 200 Web-based user interface by entering the cluster IP address of the VNM EC 200 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 EC 200s, see the user guide for each device.

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 167).

Extron Electronics

Alarms Configuration Devices Preset Manager Format Editor System Info

Logged on: admin switcher logout

Cluster

1 - Status

Active Cluster controller: secondary

Crossover status: connected

Cluster: paired

Device Mode: redundant_secondary

2 - Configuration

Cluster IP Address: 192.168.254.250

Test Switch on Powerup: ☐

Switch IP Address: none

Crossover Subnet: 192.168.253.0

3 Migrate Unpair **4** Apply Changes Cancel Changes

Figure 167. Cluster Page

Status panel (1)

This panel contains four read-only fields that display the following information.

- **Active Cluster controller** — Displays which VNM EC 200 (primary, secondary, or none) is acting as system primary.
- **Crossover status** — Displays the status of the crossover link between the primary and secondary VNM EC 200s.
- **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 (2)

Use this panel (see [figure 167](#), ② on page 175) 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 EC 200 within the cluster.
 - The **Crossover Subnet** field must be individually set on each VNM EC 200 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 EC 200s (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 168.
 - **Test Switch on Powerup** — Selecting this check box causes the primary and secondary VNM EC 200s, 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.

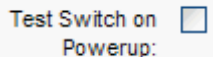
NOTE: This field must contain an IP address for the **Test Switch on Powerup** function to work.

- **Crossover Subnet** — This field displays the IP address of the crossover subnet Ethernet ports (LAN B [eth1]). The crossover subnet monitors the status of the primary and secondary VNM EC 200s 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 171.

NOTE: This field can be edited when the VNM EC 200 cluster is unpaired (see [Unpairing controllers](#) on page 177).

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 167](#), ② on page 175) .



Test Switch on Powerup: ☐

2. Click **Apply Changes** (④), to save the setting.

Setting the Switch IP Address

1. In the **Switch IP Address:** field (②), enter the desired IP address.



Switch IP Address:

2. Click **Apply Changes** (④), to save the setting.

Other cluster control functions

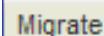
Two buttons at the bottom of the **Cluster** page manage the state of the controller pair (see [figure 167](#), ③ on page 175). The functions that are available are **Migrate**, **Pair**, and **Unpair**. **Pair** and **Unpair** share a single button.

- **Migrate** — When two controllers are paired, click to cause them to switch roles. The service provider (primary VNM EC 200) becomes the backup (secondary VNM EC 200) and the backup becomes the service provider.
- **Pair** — Click to cause a set of controllers to pair together initializing the service (cluster) IP address and setting the units to operate in a shared-role state.
- **Unpair** — Click to cause a controller pair to unpair, stopping the service (cluster) IP address and return the units to independent states.

NOTE: An unpaired controller is not the same thing as a singleton. After unpairing, the primary and secondary VNM EC 200s 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 LAN A (eth0) physical IP address of the primary VNM EC 200, the physical IP address of the secondary VNM EC 200, or enter the service (cluster) IP address for the primary and secondary VNM EC 200s.
2. Navigate to the **Configuration** page.
3. Click on the **Cluster** link (see [Cluster Page](#) on page 175).
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 one of three methods:
 - Enter the LAN A (eth0) IP address of the primary VNM EC 200.
 - Enter the physical IP address of the secondary VNM EC 200.
 - Enter the service (cluster) IP address for the primary and secondary VNM EC 200s.
2. Navigate to the **Configuration** page.
3. Click on the **Cluster** link (see [Cluster Page](#)).
4. Click **Unpair** at the bottom of the screen.



NOTE: Unpairing the VNM EC 200s can take several minutes.

Pairing controllers

See [Pairing the VNM EC 200s](#) on page 174.

System Control

The VNM EC 200 is used to configure and control a VN-Matrix system. When used as part of a larger installation, it is likely that a third party control system integrates all of the system equipment into a single control interface. The VNM EC 200 also uses Extron Simple Instruction Set (SIS) commands from the front panel config connector to perform various reset functions.

It also 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 EC 200.
- **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 Remote RS-232 connector (see [Rear Panel Features](#) on page 8) on the rear panel of the VNM EC 200.

HLI commands are sent to the VN-Matrix system using the following programs:

- Telnet (see [HLI Connection and Control](#) on page 179).
- VNM EC 200 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.
- Operates using TCP on port 9996 (SSH port 22 when running in secure mode).

HLI Connection and Control

HLI commands can be sent from the control computer to the EC 200 using the Remote RS-232 port, the Ethernet port, or using the VNM EC 200 Web-based user interface (see [HLI Command Examples](#) on page 194).

Ethernet Connection

When secure mode is not enabled, the HLI can be accessed using TCP by initiating a Telnet connection to the IP address of the VNM EC 200 on port number 9996.

NOTES:

- If the IP address has not changed, the factory default IP address of a VNM EC 200 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>
```

When secure mode is enabled (see [System Config Page](#) on page 28), HLI can only be accessed using a third party application that supports SSH via a TCP connection to the IP address of the VNM EC 200 on port number 22.

NOTES:

- If the IP address has not changed, the factory default IP address of a VNM EC 200 is 192.168.254.254
- Ensure an application that supports SSH is installed
- If the admin user account of the Web-based user interface has not changed, the login details match the factory default administrator profile:
username - admin
password - admin

Remote RS-232 Port (COM) Connection

The VNM EC 200 receives HLI commands from a control computer directly connected to the RS-232 port (see [Rear Panel Features](#) on page 8).

NOTE: The default configuration settings for the Remote RS-232 serial connector are:

- Baud rate – 115200
- Parity bit – None
- Data bit – 8
- Start bit – None
- Stop bit – 1
- Flow control (handshake) – None

Using the VNM EC 200 User Interface

To enter HLI commands using the VNM EC 200 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 39).
3. At the bottom of the **Devices** page, select the **Misc** menu.

A menu list opens (see figure 168).

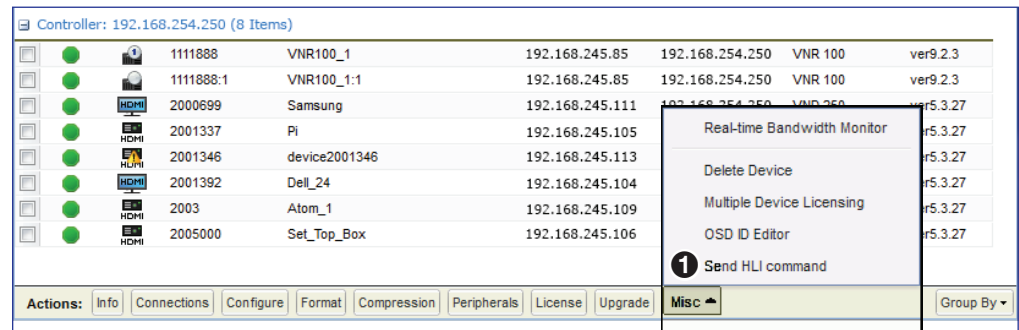


Figure 168. Misc Menu — Select "Send HLI Command"

4. Select **Send HLI command** (see figure 168, ①). A HLI command window opens (see figure 169).

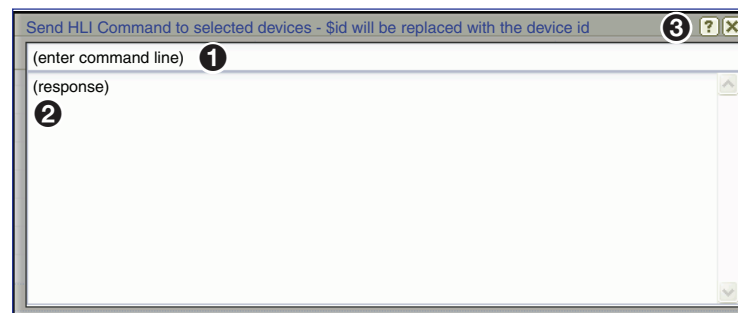


Figure 169. HLI Command Window

5. To send a command, click in the **(enter command line)** text box (see figure 169, ①), and enter the desired HLI command.
6. Press <Enter> on the keyboard.

The response appears in the lower portion of the window (②).

Click the **X** button in the upper right hand corner (③) to close the HLI command window.

HLI Command Tables

HLI commands are listed in the reference section (see [HLI Command Overview](#) on page 193).

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

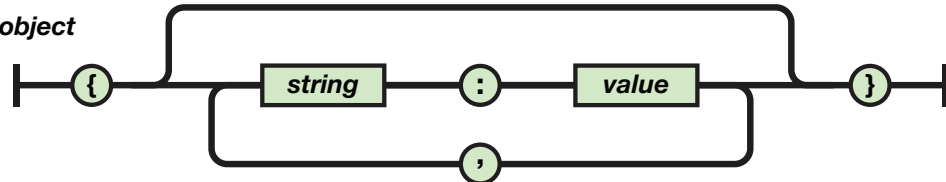
HLI preset commands are used to:

- Launch an action or series of actions
- Control and modify system configurations

HLI Responses

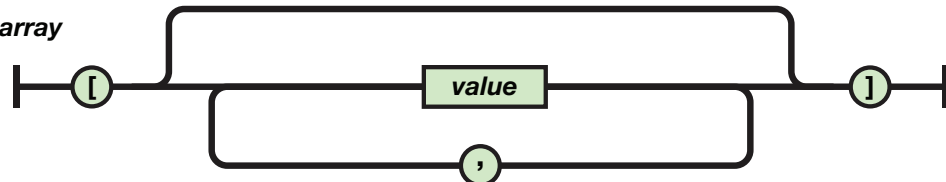
HLI responses are formatted using the Java Script Object Notation (JSON) format. Response strings consist of objects, arrays, and values.

object



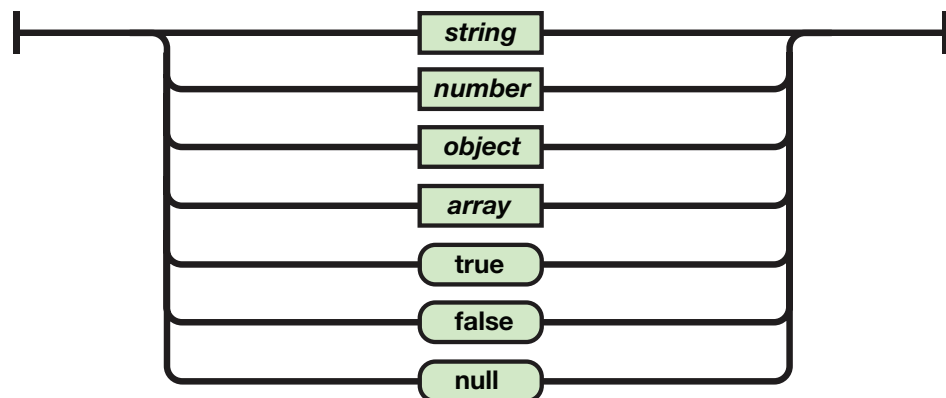
An object is an unordered set of name or value pairs. An object begins with a left brace ({) and ends with a right brace (}). Each name is followed by a colon (:) and the name or value pairs are separated by a comma (,).

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 EC 200 License](#)
- [Updating the Firmware of a Single EC 200](#)
- [Updating the Firmware of Dual \(Redundant\) EC 200s](#)

Updating the VNM EC 200 License

The VNM EC 200 includes a basic license when purchased. Updating the license of the VNM EC 200 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 EC 200 to stop responding. This section provides information for **updating the VNM EC 200 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 EC 200.
- See [License Menu](#) on page 85 for information about device licenses.
- Voir le menu Licence à la page [License Menu](#) on page 85 pour obtenir des informations sur les licences d'appareils.

To update the VNM EC 200 license:

1. Click the **Configuration** tab to open the page (see figure 170, ①).
If login information is required, see [Accessing the Web-based User Interface](#) on page 11.

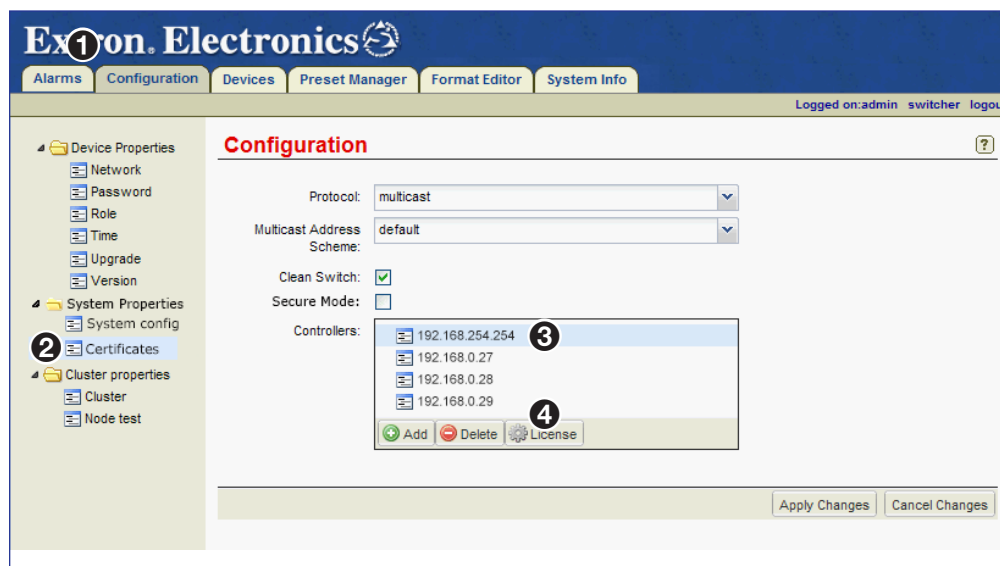


Figure 170. Configuration Page — Updating the Controller License

2. Click the **Certificates** link (②).
3. From the **Controllers** field in the Configuration panel, select the IP address of the controller that requires a new license (③).
4. Click **License** (see figure 170, ④).
The **Controller License Management** dialog box opens (see figure 171). Keep this window open.

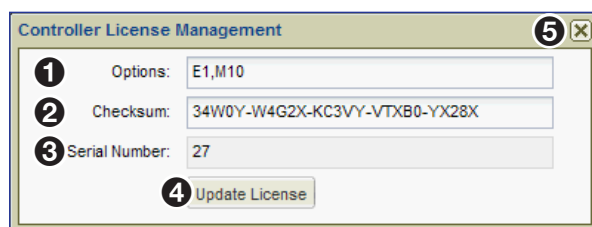


Figure 171. Controller License Management Dialog

5. Contact [Extron Sales Support](#) and provide the following information.
 - The **serial number** of the VNM EC 200 (see figure 171, ③). This can be obtained from the **Controller License Management** dialog, or from the rear panel.
 - The **order number** of the VNM EC 200.

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 (①).
 - Enter the **license key** in the **Checksum** field (②).
7. Click **Update License** (④) to assign the new license settings.
8. Click **X** in the upper right corner of the dialog box (⑤) to close dialog box.

Updating the Firmware of a Single EC 200

Before starting, go to www.extron.com/download and download the latest VNM EC 200 firmware. Then use the following procedure to update the firmware of a single VNM EC 200.

1. Click the **Configuration** tab (see figure 172, ❶).
The Configuration page opens.

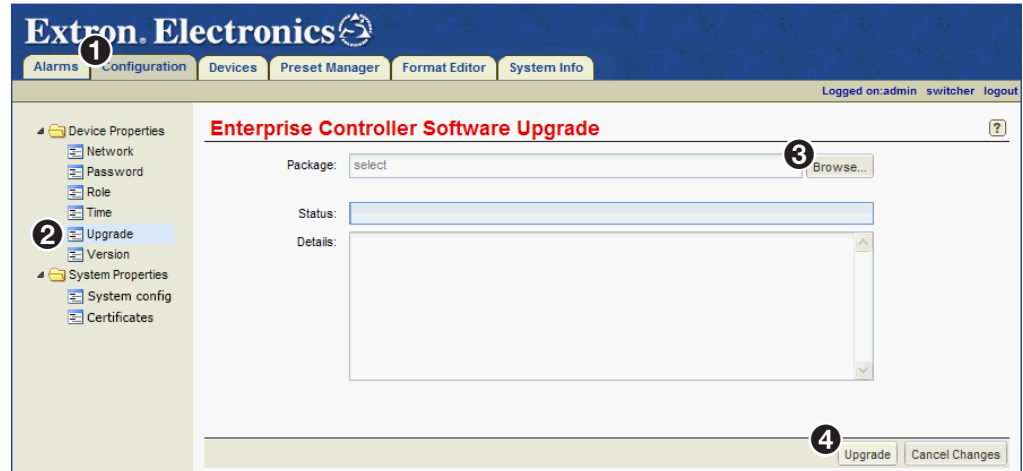


Figure 172. Configuration Page — Single EC 200

2. Click the **Upgrade** link (❷).
3. Click **Browse** (❸) to open a file browser.
4. Navigate to the location of the firmware file, select the file and click **Open**.
5. Click **Upgrade** (❹) to start the firmware update.
6. When the update completes, power down the VNM EC 200 and restart.

Updating the Firmware of Dual (Redundant) EC 200s

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 prérègle 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. Save the device configuration and presets files to a local PC (see [Backup the Device and Preset Configuration](#) on page 185).
2. Unpair the controller cluster (see [Unpair the Controller Cluster](#) on page 186).
3. Update the redundant secondary controller (see [Update the Redundant Secondary Controller](#) on page 187).
4. Update the primary controller (see [Update the Primary Controller](#) on page 187).
5. Pair the two controllers (see [Pair the Controllers](#) on page 188).
6. Restore the device configuration and presets files from the local PC (see [Backup the Device and Preset Configuration](#) on page 185).

Download the Firmware Update File

Before starting this procedure, go to www.extron.com/download and download the latest version of the VNM EC 200 firmware to a folder on the local PC.

Backup the Device and Preset Configuration

Save the current device and configuration files.

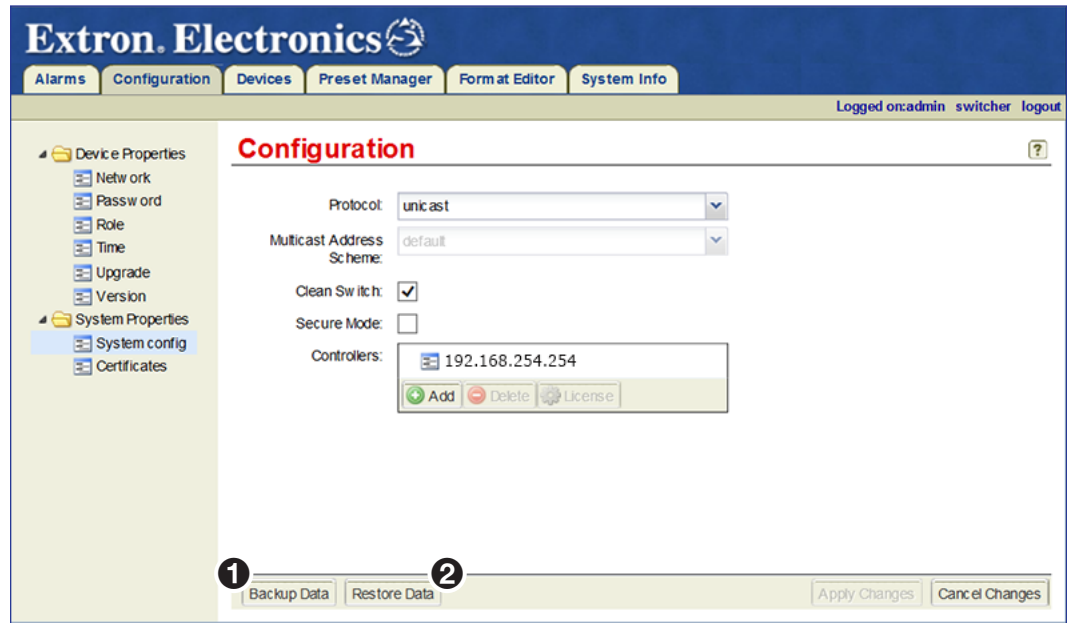


Figure 173. Configuration Tab - Backup and Restore Data

The **Backup** and **Restore** buttons backup and restore configured devices on the **Devices** page and presets on the **Preset Manager** page (see figure 173).

To backup the EC 200:

1. From the **Configuration>System Properties>System Config** page, click **Backup Data** (see figure 173, 1 above).

The following dialog box opens:

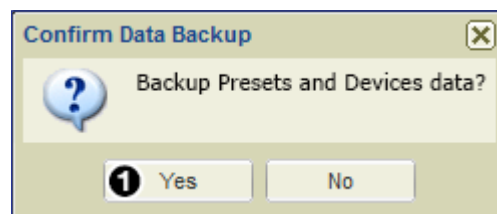


Figure 174. Confirm Data Backup Dialog

2. Click **Yes** (see figure 174, 1).
3. When the **Save File** dialog opens, click **Save As** (1).

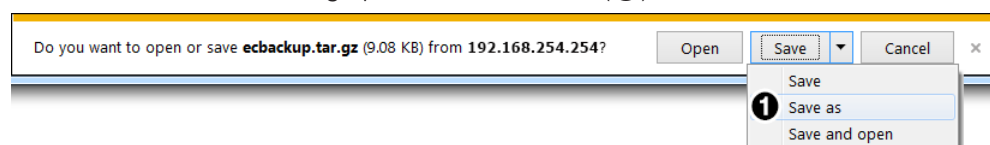


Figure 175. Save File Dialog

4. Browse to the folder where the backup file is to be saved (see figure 176, ❶).

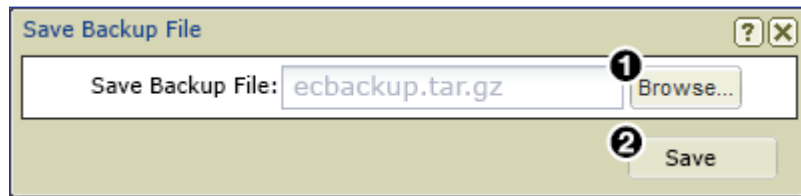


Figure 176. Save Backup File Dialog

5. Click **Save** (❷).

Unpair the Controller Cluster

Before starting this procedure, go to www.extron.com/download and download the latest version of the VNM EC 200 firmware. Note the file location you store it to.

The examples for this update procedure for the dual (redundant) VNM EC 200s 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 EC 200s as the System Controller](#) on page 168 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 log in.

1. Using a Web browser, navigate to the Web-based user interface by entering the **Cluster** IP address of the VNM EC 200 pair.
2. Click the **Configuration** tab (see figure 174, ❶).
The **Configuration** page opens.

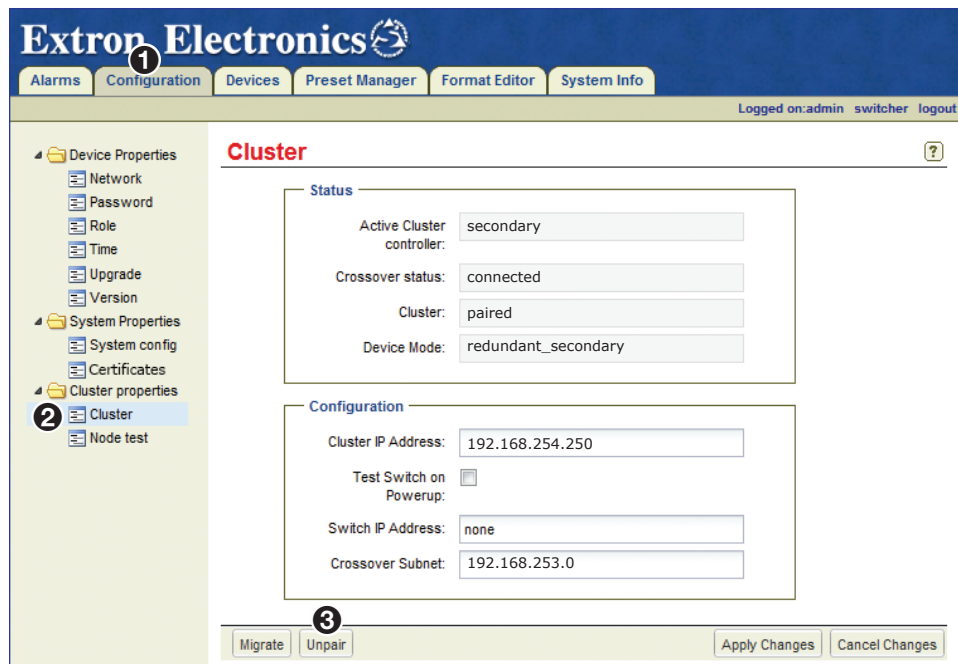


Figure 177. Configuration Page — Cluster Controller

3. Click the **Cluster** link (❷).
4. Click **Unpair** (❸).

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 178, ❶).

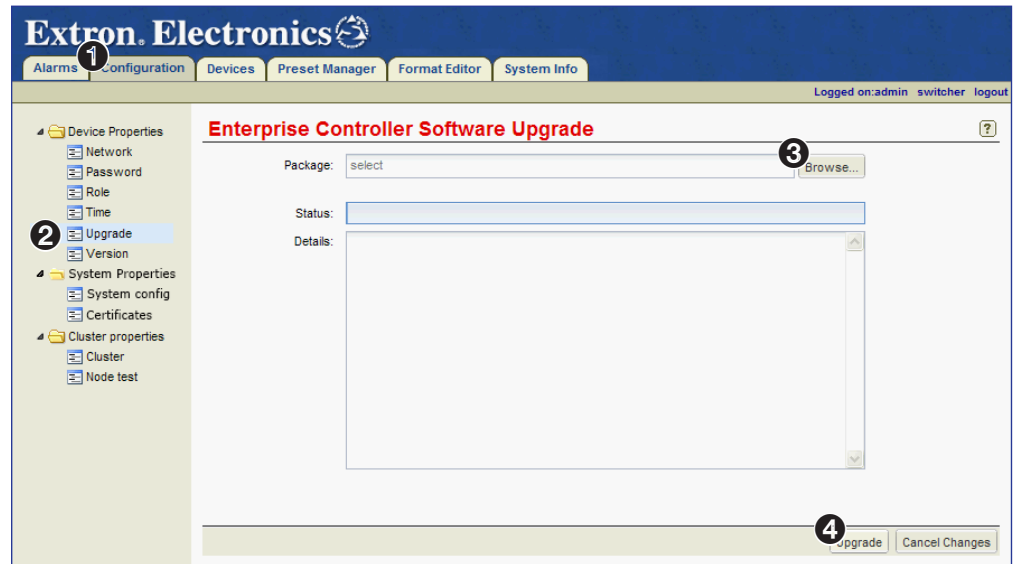


Figure 178. Configuration Page — Redundant Secondary Controller

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 EC 200, in this example 192.168.254.254.
2. Click the **Configuration** tab (see figure 179, ❶).

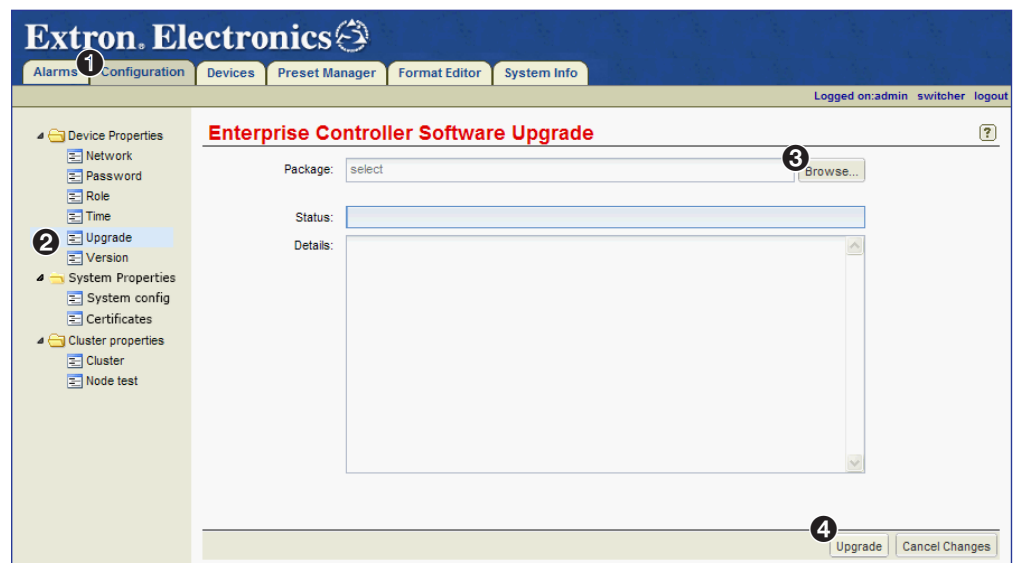


Figure 179. Configuration Page — Primary Controller Configuration Page

3. Click the **Upgrade** link in the left panel (see [figure 179](#), ② on the previous page).
4. Click **Browse** (③), and use the file browser to navigate to the firmware file location.
5. Select the file and click **Open**.
6. Click **Upgrade**, (④).

Pair the Controllers

1. When the primary controller upgrade completes the upgrade, click the **Configuration** tab (if the tab is not open).
The Configuration page opens (see [figure 180](#), ①).

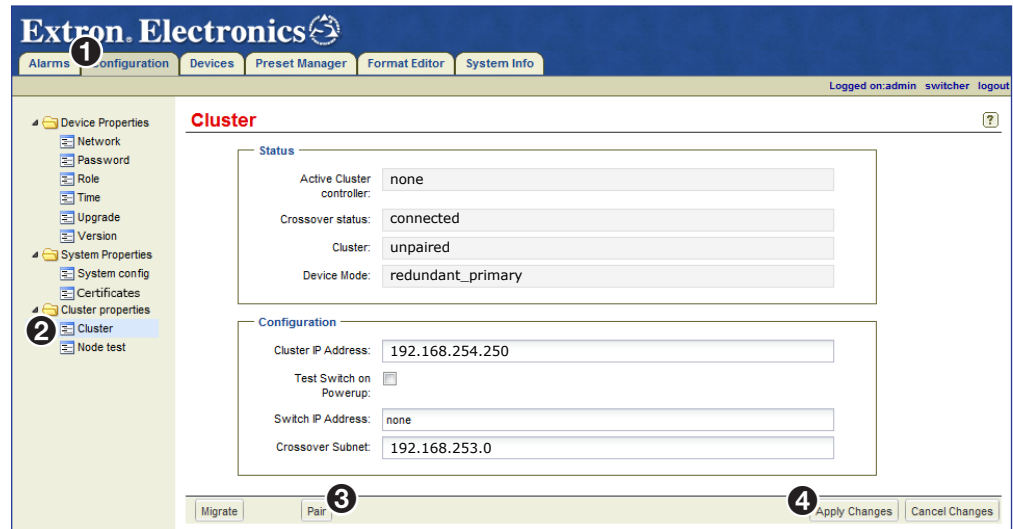


Figure 180. Configuration Page — Primary Controller Pairing

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 Data

The **Restore Data** dialog is used to restore the **Device List** and the **Preset Manager** page from a previously saved file. This operation is not reversible.

1. On the Configuration>System Properties>System config page (see [figure 173](#), ②, on page 185), click **Restore Data**.

The following dialog opens:

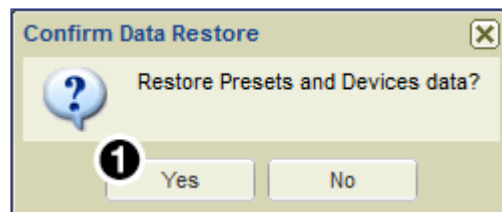


Figure 181. Confirm Data Restore Dialog

2. Click **Yes** (see [figure 181](#), ①).

The following dialog opens:

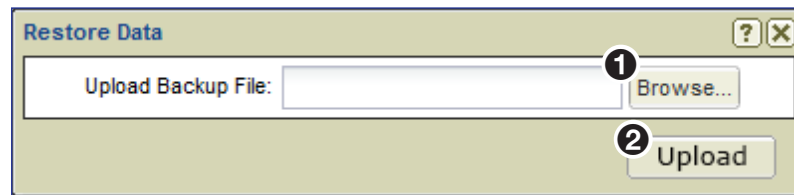


Figure 182. Restore Data Dialog

3. Select **Browse** (see figure 182, ①)

The Choose File to Upload dialog opens.

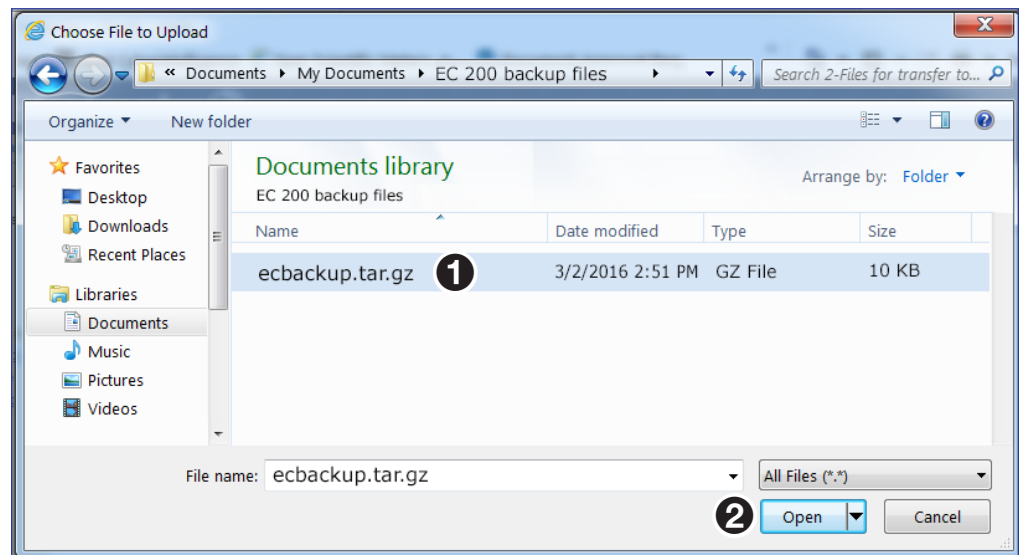


Figure 183. Restore Data Dialog

4. Navigate to, then click to highlight the previously stored backup file (see figure 183, ①), `ecbackup.tar.gz` in the example.
5. Click **Open** (②).

The **Restore Data** dialog reopens (see figure 182)

6. Select **Upload** (see figure 182, ②). The restore begins immediately.

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](#)
- [Remote Communication and Control Using SIS Commands](#)
- [Host-to-device Communications](#)
- [Command and Response Tables](#)
- [DataViewer](#)

Default Factory Settings

LAN A 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 ports required for your given application. The ports highlighted in **yellow** accommodate most simple applications.

Port	Transport	Usage
22	TCP	HLI server port when running in secure mode. To access this port the user needs to enter login credentials.
23	TCP	Telnet (can be disabled).
69	UDP	TFTP Server, for firmware upgrades.
80	TCP	Secure HTTP data communication between the Web browser and the EC 200. Value is not definable; the default is 80.
161	UDP	Simple network management protocol (SNMP) used for alarm access.
199	TCP	Simple network management protocol (SNMP) used for alarm access.
443	TCP	Secure HTTP data communication between the Web-browser and the EC 200. The value is undefinable and enabled only when the user has selected secure mode from the Web-browser..
554	TCP	Real-time streaming protocol (RTSP) server.
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).
5432	UDP	EC 200 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.
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 EC 200.
9002	UDP	Default port for collecting UDP traffic for data transport. Value is user-definable.
9996	TCP	HLI server port when the EC 200 is not running in secure mode.
9997	TCP	Annotation server port.
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).

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. The unit can be rack mounted, using the RSU129 and RSB129 rack mount trays.

- Units can be rack mounted in a single or side by side configuration.
- Rack trays are used to support the unit when rack mounting.

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).

Desk Mounting

The unit can set on a desk using the supplied rubber feet. It can be desk mounted using the MBU125 under-desk and MBD129 through desk mounting. Follow the instructions included with the mounting kits.

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 string 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 EC 200. 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 in figure 184. The devices are connected to the network with corresponding device ID, IP address, and device names.

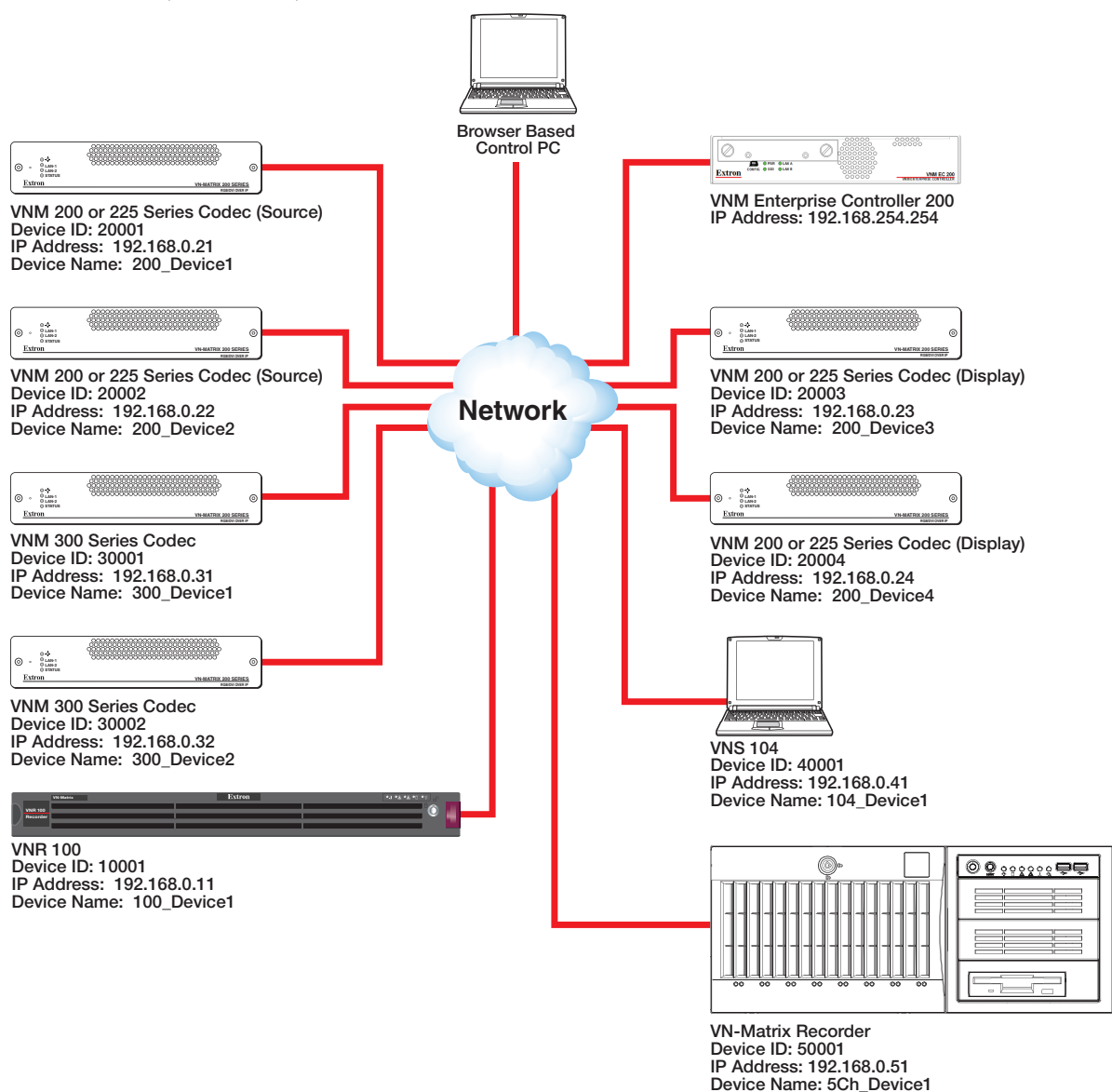


Figure 184. Basic Application Diagram for HLI Command Control

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 HLI 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 **analogueOutputSetLevel** 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 EC 200 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 Matrix1-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 EC 200. 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

getalarmlogs

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>raisetime</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", "raisetime": "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

getcontrollers

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
keys	Attribute or Attribute1, Attribute2 Example: keys="name,localIp0"	Any attribute from the getdevices attribute table. Comma separated list of desired attributes.
where	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' "	
order_by	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
controllerIp	nnn.nnn.nnn.nnn Example: 192.168.0.254	IP address of the controller for this device.
curver	ver(major.minor.build) Example: ver5.2.0	Current firmware version of the device.
device_id	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).
device_type	Text string Example: VNC 200 DVI-AD	Hardware type associated with the device.
dstIp	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.
<i>source_mode</i>	Text string Example: 1280x720 60p	The current video mode of the device.
<i>source_status</i>	active/unplugged/ null Example: active	Indicates status of the video input of a source device. Null in the case of a display device.
<i>srcIp</i>	nnn.nnn.nnn.nnn:nnnn Example: 192.168.0.23:8000	Stream source IP address and port number.
<i>status</i>	active/no device Example: active	Indicates a device is present (active) or unreachable (no device) on the system.
<i>type</i>	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.
<i>userParam1</i>	Text string Example: Group1	User text field.
<i>userParam2</i>	Text string Example: Group2	User text field.
<i>userParam3</i>	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

getDeviceLayout <i>device</i>

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

getFilesInFolder <i>device path type</i>

Available parameters and arguments for this command are:

Parameter	Argument	Description
<i>device</i>	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.
<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
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
device	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.
path	String Example: /folder1	The path from which the walk command is processed.
levels	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
device	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.
recording name	'test_file_1.rec'	The file name of the recording. This can be found using the 'getFilesInFolder' command.
path	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):

<code>mkdir device path</code>

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):

<code>pause source:n</code>

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, 3	
<i>mode</i>	fill, follow, 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 207).

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: 20001	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: /dir1/	The directory used by a device for recording or playback.
<i>filename</i>	Example: file1	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: 01:30:23	The start offset time (playback only).
<i>stop</i>	hh:mm:ss Example: 02:31:25	The stop offset time (playback only, not applicable to VNR 100 chase-play mode).
<i>tag</i>	Example: tag1	The tag name (recording only).
<i>streams</i>	a, v, w, d, r, c Example: a, v, d	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

presetgetlist

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

presetgetplayerstatus <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 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: 01:23:22:00	The current playback position within the recorded file in the format hh:mm:ss:ff. NOTE: Frames are always 00.
<i>filename</i>	String Example: file1_20001.0.0_r0_s0.rec	Name of the recorded file currently loaded for playback.
<i>directory</i>	String Example: /dir1	Name of the directory containing the currently loaded playback file.
<i>duration_timecode</i> <i>ts_duration_timecode</i>	hh:mm:ss:ff Example: 02:23:22:00	The total duration of the recorded file in the format: hh:mm:ss:ff. NOTE: Frames are always 00.
<i>duration</i> <i>ts_duration</i>	nnnn (seconds) Example: 8602	The total duration of the recorded file in seconds.
<i>position</i> <i>ts_position</i>	nnnn (seconds) Example: 5002	The current playback position within the recorded file in seconds.
<i>speed</i> <i>ts_speed</i>	-10.0 to 10.0 Example: 2.3	The current playback speed (a value of 0 indicates the content is paused).
<i>device_id</i>	serial number: channel Example: 50001:2	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 name device
```

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: <i>media</i> =/dir1	The directory for recording or playback.
<i>filename</i>	filename Example: <i>filename</i> =file1	The name of a file present in the specified media folder.
<i>tag</i>	string Example: <i>tag</i> ='session1 '	A description (tag) associated with a recording.
<i>start</i>	hh:mm:ss Example: <i>start</i> =00:01:33	The start offset associated with playback.
<i>stop</i>	hh:mm:ss Example: <i>stop</i> =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: keepoffset=yes	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 181).

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 additional 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 ↵
```

Remote Communication and Control Using SIS Commands

The VNM EC 200 can be remotely connected via a host computer or other device (such as a control system) to the front panel USB Config port. That allows the VNM EC 200 to be reset and provides limited configuration using Simple Instruction Set (SIS) commands. SIS commands are executed using the Extron DataViewer program, found on the Extron Website at www.extron.com.

USB port details:

The Extron USB driver must be installed before use.

Front Panel Configuration Port

The mini type B USB port is located on the front panel (see [Front Panel Features](#) on page 7). It connects to a host computer for configuration using SIS commands with DataViewer, available at www.extron.com.

To connect the EC 200 to a host computer:

NOTE: If an Extron USB device has never been connected to the host computer, prior to connecting the EC 200 config (USB) port for the first time, you must install and activate the USB driver. The simplest way to do this is to install Dataviewer (see [DataViewer](#) on page 230).

1. After the USB driver is loaded, connect a USB A to mini B cable between the Config port on the EC 200 front panel and a USB port of the PC.
2. If this is the first time an Extron product is connected to the PC, the **Found New Hardware Wizard** dialog opens. The first screen offers to connect to Windows Update to search the Web for the appropriate driver. This is not necessary if the USB driver is already on your PC (see the note above).

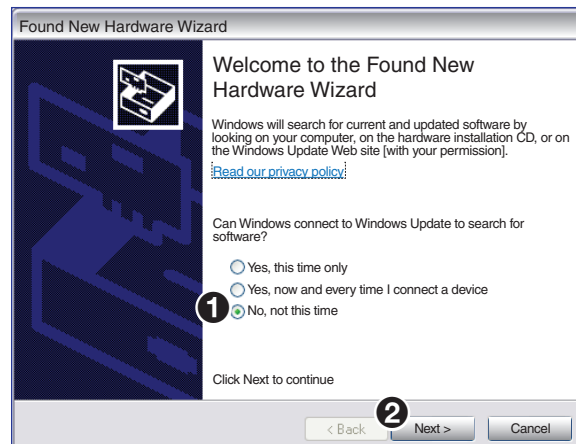


Figure 185. Found New Hardware Wizard

Select **No, not this time** if the driver is already on the PC (see figure 185, **1**).

3. Click **Next** (**2**).

The following dialog opens:

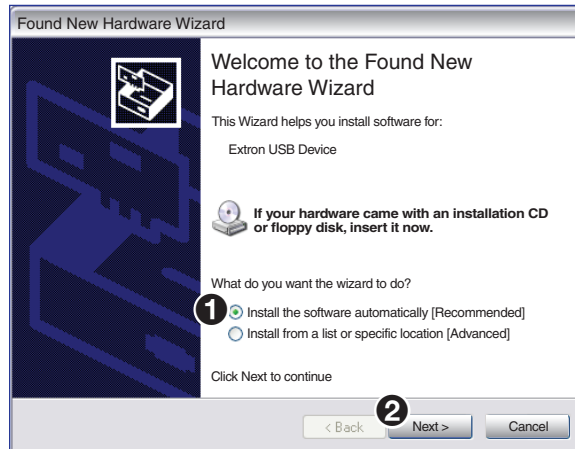


Figure 186. Install the Software Automatically

4. Select **Install the software automatically (Recommended)** (see figure 186, ①).

NOTE: You do not need to insert an installation disc.

5. Click **Next** (②).

The PC locates the driver and installs it.

6. When the **Completed** dialog opens, click **Finish** to close the wizard.

NOTE: The wizard opens only on the first occasion you connect the EC 200 to a USB port. The wizard reopens only if you connect the EC 200 to a different USB port or if you connect a different piece of equipment, requiring a different driver, to the same USB port.

7. Configure the EC 200 as required.

Verbose Mode

Telnet connections can be used to monitor for changes that occur, such as SIS commands from other Telnet sockets or serial port changes. For a Telnet session to receive change notices, the Telnet session must be in verbose mode 1 or 3. In verbose mode 1 or 3, the Telnet socket reports changes in messages that resemble SIS command responses.

Host-to-device Communications

The EC 200 accepts SIS (Simple Instruction Set) commands through the front panel Configuration port (see [Front Panel Features](#) on page 7). SIS commands consist of one or more characters per command field. They do not require special characters to begin or end the command character sequence. Each response to an SIS command ends with a carriage return and a line feed (CR/LF = ␣), which signals the end of the response character string. A string is one or more characters.

EC 200-initiated Messages

The EC 200 initiates messages under specific conditions. No response is required from the host. The EC 200-initiated messages are listed here (underlined).

␣© Copyright 2015, Extron Electronics, Enterprise Controller 200, Vn.nn, 60-xxxx-01␣

Day, DD MMM YYYY HH:MM:SS␣

Vn.nn is the firmware version number.

Error Responses

When the EC 200 is unable to execute the command, it returns an error response to the host. The error response is **E10** to indicate an unrecognized command.

Using the Command and Response Tables

The **Command and Response Tables** begin on page 229. Symbols used in the table represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands are not case sensitive. The ASCII to HEX conversion table below is for use with the command and response table.

ASCII to Hex Conversion Table																Esc	1B	CR	0D	LF	0A
Space →	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27						
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F						
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37						
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F						
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47						
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F						
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57						
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F						
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67						
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F						
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77						
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F						

Figure 187. ASCII to Hex Conversion Table

Symbol definitions

- ↵ = CR/LF (carriage return/line feed)
- ↵ or ; = Carriage return (no line feed, hex 0D)
- = Space
- Esc** = Escape

Command and Response Tables

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Information requests			
Read IP Address	Esc CI ↵	xxx . xxx . xxx . xxx ↵	Dotted decimal notation
Reset Admin password	Esc • CA ↵	Ipa • ↵	Returns admin to: User name: admin Password: admin
Resets			
Reset IP (mode 4 reset)	Esc 1 ZQQQ ↵	Zpq1 ↵	Returns IP Address, Subnet Mask, Gateway, and MTU to default values (see below). User configuration is not changed.
Absolute reset (mode 5 reset)	Esc ZQQQ ↵	Zpq ↵	Returns the unit to default values including the IP address, Subnet Mask, Gateway, and MTU (see below).
Absolute reset and Reset IP default values			
IP Address:	192.268.254.254		
Subnet Mask	255.255.255.0		
Gateway:	192.168.254.1		
MTU:	1500		
Admin Password:	admin		
User Password:	none		
Role:	Singleton		
Time Enable Clock Synchronization:	Unchecked		
Time Sources:	Empty		
Time Zone:	UTC		
Protocol:	Unicast		
Multicast Address Scheme:	default		
Clean Switch:	Checked		
Secure Mode:	Unchecked		
Controller Address:	192.168.254.254		
Certificate:	Default as shown in help file		
All device .xml files:	Removed		
All presets:	Removed		

DataViewer

DataViewer is an enhanced terminal emulation program that facilitates analysis of RS-232, USB, and TCP/IP communication with Extron devices. The software allows users to send commands to a device and view the responses in ASCII or hexadecimal format. Command and response logs can be saved in text or HTML format.

Dataviewer is available at www.extron.com. Download the installation file and load the program on the PC connected to the EC 200.

Start the Dataviewer program

1. Click the desktop icon.
2. The **Communications Setup** dialog box opens. Select the communications tab. Select the **USB** tab (see figure 188, ①) when using the front panel config port.



Figure 188. Communications Dialogs

3. If USB is selected, choose **Extron USB Device** in the drop-down window (see figure 187, ②).

NOTE: To automatically connect to the EC 200, select **Connect on startup** (see figure 187, ③).

4. Click **OK** (④) to connect to the EC 200 and start using the program.

You are now ready to begin entering commands.

Open the DataViewer help file from the toolbar for more information on the program.

Sending commands using DataView

1. Connect the control PC to the EC 200 using the front panel Config Port.
2. Start DataView (see [Start the DataView program](#) on page 230) and follow the steps to connect to the EC 200 via USB.
3. Click **OK**. The **Communication Setup** dialog closes.
4. The main **DataViewer** dialog opens and the EC 200 responds with a copyright statement containing the model number, part number, and current firmware version of the connected EC 200, along with the date (see figure 189, ②).

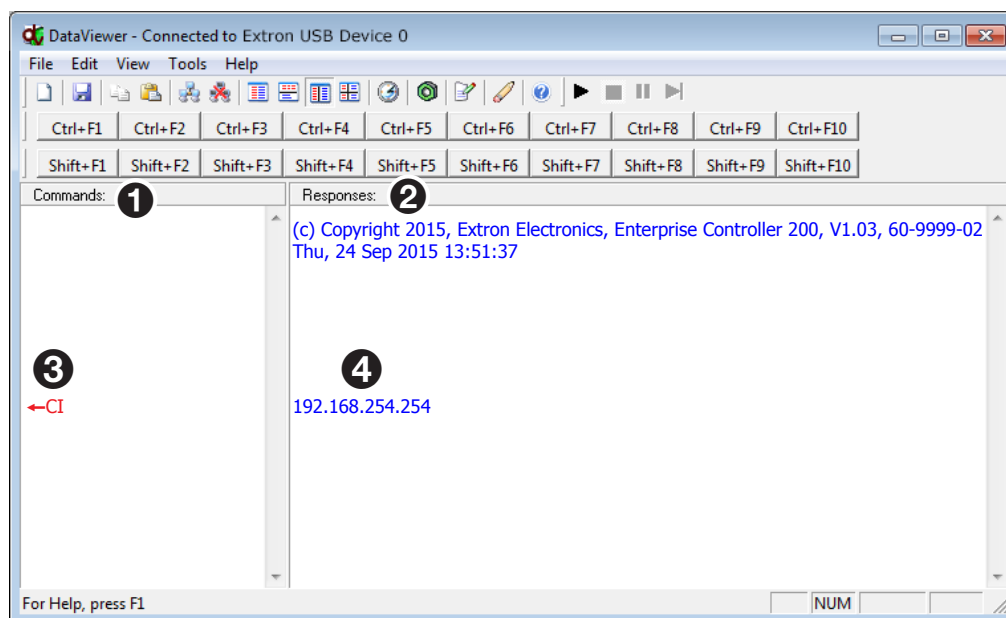


Figure 189. Enter Commands and View Responses

5. Use the **Commands** field to enter SIS commands (①). View the responses in the **Responses** field (②).

For example, in the **Commands:** field (③), enter ←CI, the command to display the IP address. The **Responses:** field (④) returns the IP address of the connection.

Extron Warranty

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:

**USA, Canada, South America,
and Central America:**

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:

Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400

Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East	Extron Australia	Extron India
+1.800.633.9876 (Inside USA/Canada Only) Extron USA - West +1.714.491.1500 +1.714.491.1517 FAX	+800.3987.6673 (Inside Europe Only) +1.919.850.1000 +1.919.850.1001 FAX	+65.6383.4400 +65.6383.4664 FAX	+81.3.3511.7655 +81.3.3511.7656 FAX	+86.21.3760.1568 +86.21.3760.1566 FAX	+971.4.299.1800 +971.4.299.1880 FAX	+61.8.8351.2188 +61.8.8351.2511 FAX	1800.3070.3777 (Inside India Only) +91.80.3055.3777 +91.80.3055.3737 FAX