NWE-IP User Guide

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Our mission is to:

1. Provide a Superior Customer Experience
   - offer the best product quality and support
2. Make Cool Practical Technology
   - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com*.

David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

NWE-IP · User Guide

- Ross Part Number: **3900DR-204-08**
- Release Date: March 3, 2023.

The information contained in this Guide is subject to change without notice or obligation.

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Safety Notices

Refer to the "**Important Regulatory and Safety Notices**" document that accompanied your product.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

> **Notice** — *Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.*

Canada

This Class "A" digital apparatus complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appareil numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

European Union

This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the "New Legislative Framework".

> ⚠️ **Warning** — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

Australia/New Zealand

This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 and found to comply with the limits for a Class A Digital device.

> **Notice** — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Maintenance/User Serviceable Parts

Routine maintenance to this product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "**Contact Us**" section of this manual. All openGear products are covered by a generous 3-year warranty and will be repaired without charge for materials or labor within this period. See the "**Warranty and Repair Policy**" section in this manual for details.

Environmental Information

The equipment may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

Company Address

Ross Video Limited
8 John Street
Iroquois, Ontario
Canada, K0E 1K0

Ross Video Incorporated
P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office:	(+1) 613 ● 652 ● 4886
Fax:	(+1) 613 ● 652 ● 4425
Technical Support:	(+1) 613 ● 652 ● 4886
After Hours Emergency:	(+1) 613 ● 349 ● 0006
E-mail (Technical Support):	techsupport@rossvideo.com
E-mail (General Information):	solutions@rossvideo.com
Website:	http://www.rossvideo.com

The Nielsen Company

Encoder Support Group

501 Brooker Creek Blvd.

Oldsmar, Florida, USA 34677

Phone:	(+1) 800 • 537 • 4872
E-mail:	encoders@nielsen.com
Website:	http://www.nielsen.com

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Introduction

This guide covers the installation, configuration, and use of the NWE-IP. The following chapters are included:

* "**Introduction**" summarizes the guide and provides important terms, and conventions.
* "**Before You Begin**" summarizes the features of the NWE-IP.
* "**Integration Example**" provides a possible implementation of the NWE-IP in a facility work-flow.
* "**Hardware Overview**" presents information on the NWE-IP hardware.
* "**Physical Installation**" provides additional information for installing the NWE-IP, and DashBoard before you can proceed to cabling and configuring your NWE-IP.
* "**Cabling**" outlines how to connect to your facility network. Information is also given about connecting peripheral devices you will need for initial setup.
* "**Initial Connection**" provides instructions for configuring the initial IP address for the NWE-IP.
* "**Using DashBoard**" provides instructions for launching DashBoard, and accessing the NWE-IP interfaces in DashBoard.
* "**Updating the Network Settings**" provides instructions for configuring the RJ45 ports of the NWE-IP for communication with your facility network and streaming devices.
* "**Configuring the PTP Settings**" provides instructions for configuring the NWE-IP to use Precision Time Protocol, and specifying a system clock reference source.
* "**Configuring the AES67 Receiver**" outlines the steps required to configuring the AES67 receiver streams on the NWE-IP.
* "**Enabling the Watermark Encoders**" outlines the steps required to configuring and enabling up to four watermark encoder channels.
* "**Configuring the AES67 Senders**" outlines the steps required to configuring the AES67 sender streams on the NWE-IP.
* "**Third-Party Protocols**" summarizes how the NWE-IP implements third-party protocols such as Ember+.
* "**Upgrading the Software**" provides instructions on how to upgrade the NWE-IP software via DashBoard.
* "**DashBoard Interface Overview**" summarizes the menus and parameters of the NWE-IP tabs in DashBoard.
* "**Technical Specifications**" provides the specifications for the NWE-IP.
* "**Service Information**" provides information on the warranty and repair policy for your NWE-IP.
* "**Glossary**"provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your NWE-IP:

* *DashBoard User Manual*, Ross Part Number: 8351DR-004
* *NWE-IP Quick Start Guide*, Ross Part Number: NWEIPDR-002

Documentation Conventions

Special text formats are used in this guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and sub-menus that must be followed to reach a particular command.

Interface Elements

Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example:

In the **Network** tab, click **Apply**.

User Entered Text

Courier text is used to identify text that a user must enter. For example:

In the **Language** box, enter `English`.

Referenced Guides

Text set in bold and italic represent the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the ***DashBoard User Manual***.

Menu Sequences

Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example, if a step reads "**File** > **Save As**," you would click the **File** menu and then click **Save As**.

Important Instructions

Star icons are used to identify important instructions or features. For example:

✸ Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your device.

Contacting Ross Video Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern Time), technical support personnel are available by telephone. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

• **Technical Support**: (+1) 613-652-4886
• **After Hours Emergency**: (+1) 613-349-0006
• **E-mail**: techsupport@rossvideo.com
• **Website**: http://www.rossvideo.com

Contacting the Nielsen Encoder Support Group

• **Support**: (+1) 800-537-4872
• **E-mail**: encoders@nielsen.com
• **Website**: http://www.nielsen.com

Before You Begin

If you have questions pertaining to the operation of NWE-IP, contact us at the numbers listed in the section "**Contacting Ross Video Technical Support**". Our technical staff is always available for consultation, training, or service.

Overview

The NWE-IP is a fully compliant SMPTE ST2110-30 Nielsen Watermark encoder that will add watermark information to track a video program through many national distribution systems. The information that is encoded is used to uniquely identify the content of the creative and, if desired, track the transport path of the creative through any other point in the distribution system that does watermarking. This patented ability to add information at various stages is called multi-level encoding.

The encoded information typically consists of:

- **Source Identification Number (SID)** — A unique number is assigned to each source of creative. Post-production facilities that serve more than one Automated Measurement of Lineups (AMOL) client may use a separate SID for each client.

- **Date/Time** — The local time that the creative was encoded. The NWE-IP uses the Nielsen Audio Encoding System (NAES), Nielsen Watermarks (NW) and Critical Band Encoding Technology (CBET) audio encoder.

✦ Audio is encoded on a continuous basis. The data is embedded in an audio signal by performing minor modification of selected spectral frequency components of successive blocks of audio data.

Functional Block Diagram

Figure 2.1 provides a general functional block diagram of the NWE-IP.
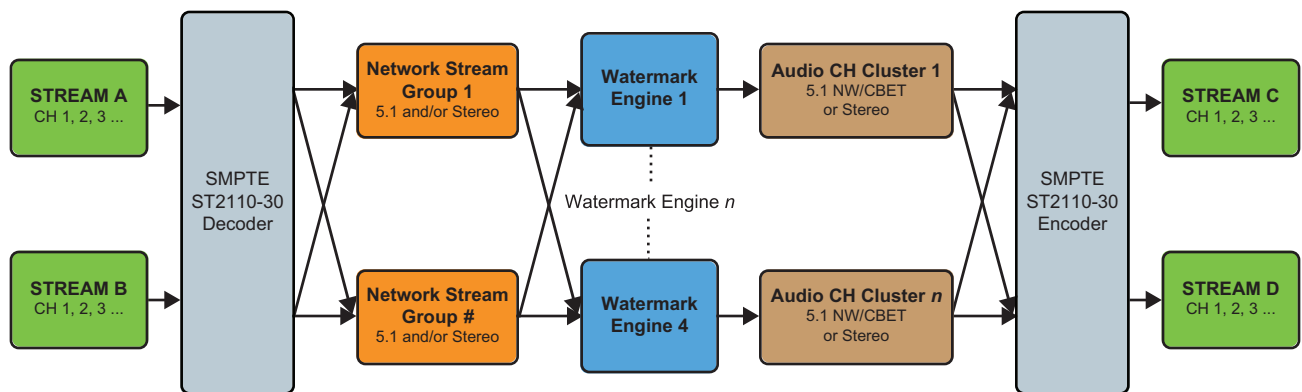
Figure 2.1 Functional Block Diagram

Features

The NWE-IP includes the following features:

- 4 independent Nielsen watermark engine with converged encoding support (NAES only, CBET only, or NAES and CBET)

- Support for up to 32 audio channels
  › 1ms (or 125µs) packet time with flow containing up to 8 channels
  › 48KHz L24 audio

- Provides protection switching using hitless merge of all streams per SMPTE ST 2022-7

- Support for the following PTP profiles:
  › SMPTE ST 2059 profile
  › IEEE 1588 default profile
  › AES67 profile
- Ember+ (BESS 1.2) connection control
- Support for NMOS IS-04 and IS-05
- RTP timestamp preserve or re-stamp
- Latency < 35ms + link offset
- Independent management and media 1000 BaseT Gigabit Ethernet
- Management under DashBoard control

DashBoard Interfaces

The NWE-IP requires an Ethernet network connection between it and a computer that will run the DashBoard client. The DashBoard client software enables you to monitor and control DashBoard Connect compatible devices from a computer.

The NWE-IP includes DashBoard interfaces for configuration and operation. The interfaces are accessed by expanding the NWE-IP node in the DashBoard Tree View and selecting the appropriate sub-node.

For More Information on...
- displaying the DashBoard interfaces, refer to the chapter "**Using DashBoard**" on page 29.

Planning the Installation

Before inserting the NWE-IP into your program path, determine if this replaces a current hardware solution or will be used for a new service. If this will be used for a new service or distribution path, you will need to obtain a Source Identification (SID) code from Nielsen. The SID is a unique identifier assigned to each source of creative.

✱ Contact the Nielsen Encoder Support Group to obtain a SID code by telephone at 1-800-537-4872 or by e-mail at encoders@nielsen.com. Be prepared to give them the serial number of your NWE-IP.

The best insertion point for the NWE-IP is downstream of all switchers, routers, and processing equipment but before any Dolby® E or Dolby® AC-3 encoders. To ensure that the coding remains in the audio signals, the NWE-IP should be downstream of any equipment that may strip or modify audio. Contact Nielsen if you are unsure about the proper system installation.

What are Receivers, Senders, and Streams?

The following terms are used throughout this user guide:

Device

A physical, virtual, or software application that may include multiple sources, destinations, senders, or receivers.

Essence

A single elementary logical media signal. An audio essence is a single audio (mono) channel.

Flow

The continuous raw media content. It can contain more than one essence (e.g. an audio flow can contain multiple channels).

A flow is independent of the transport protocol. For example, 48kHz LPCM audio is a flow; AES67 is one type of stream which can carry the flow.

Flows cannot generally be passed around natively, and need to be encapsulated in a stream. Flows from the same source are considered "editorially equivalent", but may be encoded differently.

Receiver

An element within a device that receives exactly one stream, which contains one flow from a network.

Sender

An element within a device which presents exactly one flow, packaged as a stream onto a network.

Stream

One flow (session) encapsulated within a transport protocol (e.g. SMPTE ST 2110-30 Audio (AES67)).

Network Stream Group

A network stream group allows you to create a grouping of streams on the network into a unit that can be mapped to a Watermark Encoder channel. Network stream groups are required when:

• the output has more channels than a stream on the network and the user wants to drive all channels;
• the user wants to perform complicated audio shuffling.

Configuration Overview

Figure 2.2 provides a generalized work-flow of installing and configuring your NWE-IP.
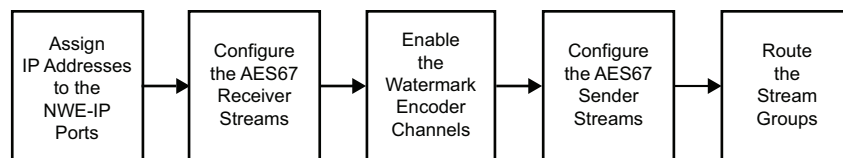
Figure 2.2 Configuration Work-flow

Audio Channel Mapping Example

Figure 2.2 provides a generalized work-flow of mapping eight channels from an AES67 device to different groups.

AES67 Device
IP: 239.1.1.1

Ch8 Ch7 Ch6 Ch5 Ch4 Ch3 Ch2 Ch1

NWE-IP

Group 1 - Stream 1
5.1 Surround

Group 1

NWE-IP

Watermark 1

AES67 Sender Stream 1 - Ch1
AES67 Sender Stream 1 - Ch2
AES67 Sender Stream 1 - Ch3
AES67 Sender Stream 1 - Ch4
AES67 Sender Stream 1 - Ch5
AES67 Sender Stream 1 - Ch6

AES67 Device
IP: 239.4.4.4

NWE-IP

Group 2 - Stream 1
Stereo

Group 2

NWE-IP

Watermark 2*

AES67 Sender Stream 1 - Ch7
AES67 Sender Stream 1 - Ch8

AES67 Device
IP: 239.5.5.5

—— AES67 Input
—— AES67 Output

*The number of Watermark Encoders is dependent on the number of encoders enabled for the NWE-IP.

Figure 2.3 Example of Channel Mapping

Integration Example

A user is a broadcast engineer that wants to watermark the transmission path using either Nielsen converged watermarks (NW/NAES/CBET) or just CBET. Their facility is an IP infrastructure with the following challenges:

- a requirement to synchronize the unit time to the house Grandmaster timing source

- includes SMPTE ST-2110 streams with different channel counts to handle Stereo and 5.1

- the local program is stereo and the network program is 5.1, but there is a requirement to seamlessly switch between the two

- a requirement to re-time the audio and video downstream from the NWE-IP to address possible latency
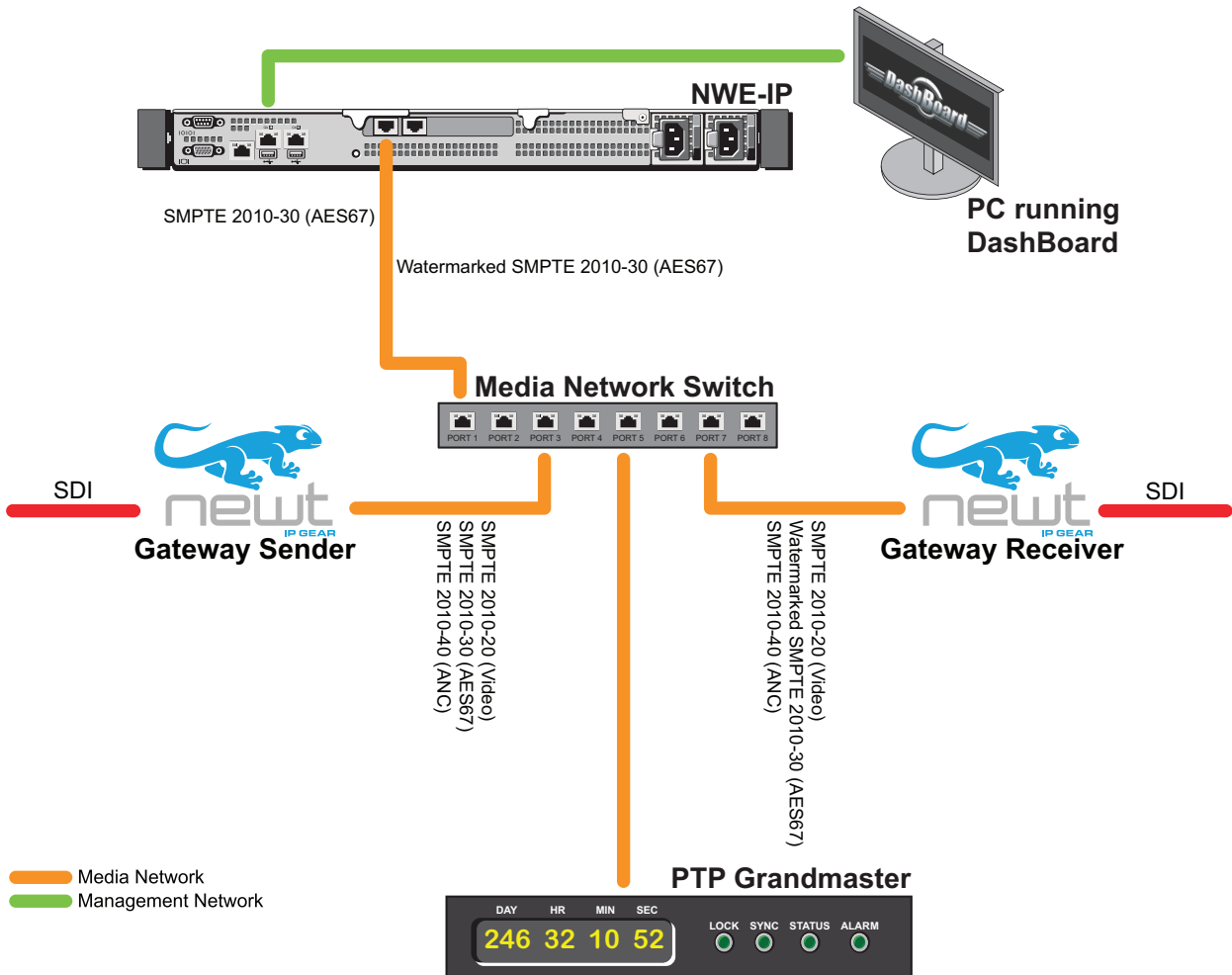
Figure 3.1 Example Work-flow

Basic Physical Setup

The user needs to physically install the NWE-IP and ensure the following tasks are performed:

1. Physically install the NWE-IP in a rack frame. Refer to the ***NWE-IP Quick Start Guide***.

2. Cable the two Ethernet connections. Refer to "**Connecting to a Network**" on page 21.

3. Power the two connections. Refer to "**Connecting the Power Supplies**" on page 22.

4. External equipment (e.g. monitor, keyboard) required to configure the initial network settings of the NWE-IP. Refer to "**Connecting Peripheral Devices**" on page 25.

Configure the Initial Network Settings

Next the user connects the NWE-IP to the network and ensures it can communicate with a computer running the latest DashBoard client software. The DashBoard client software enables you to monitor, configure, and operate your NWE-IP.

This step requires that the user configure the initial network settings for the NWE-IP as outlined in the chapter "**Initial Connection**" on page 27.

Configure the Basic Settings of the NWE-IP

The NWE-IP is now ready for configuration. To complete the setup, the user must:

1. Set up the media network by configuring the **Gb1** and **NET1** ports. Refer to "**Updating the Gb1 Port Settings**" on page 33 and "**Updating the NET1 Port Settings**" on page 34.

2. Configure the PTP settings for the NWE-IP as outlined in "**Configuring the PTP Settings**" on page 39.

Connect to the 5.1 and Stereo Streams with Different Channel Counts

The 5.1 surround essence includes three streams with two channels, where the stereo essence is one stream of two channels. The user needs to create a stream group for every related audio channel (e.g. stereo pair, 5.1 surround channels) using the AES67 Receiver interface.

1. Use the AES Receiver interface to add a new group for each channel group as outlined in "**Creating Network Stream Groups for the AES67 Receiver**" on page 42.

2. Configure the IP address and specify 6-channel for the stream size

✷ If all your streams use the same number of channels, you can change the default number under the Device Setup tab.

3. Ensure that you set the **Target Type** for each group to **5.1**.

4. Map the audio accordingly as outlined in "**Routing a Network Stream Group to a Watermark Encoder Channel**" on page 45.

Map the Sources to a Watermark Engine

Refer to "**Configuring a Watermark Encoder Channel**" on page 48.

Hardware Overview

This chapter presents information on the NWE-IP hardware.

Front Panel Overview

This section provides a general overview of the features of the NWE-IP front panel.
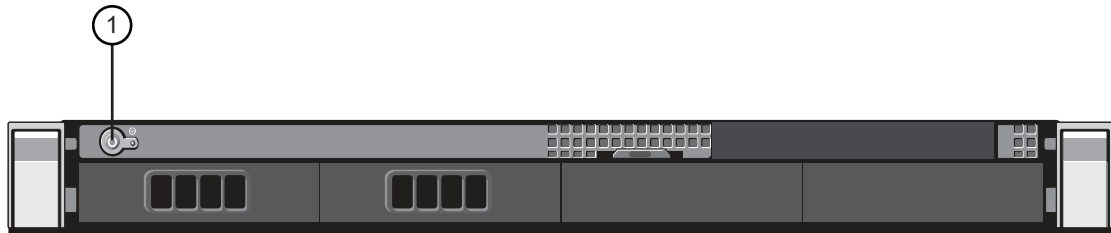
Figure 4.1 NWE-IP — Front Panel (Door Removed)

1. POWER Button

This is the main power button for the NWE-IP.

2. VGA Port

Use this port to connect a monitor if you do not have access to a network with DHCP for the initial Ethernet setup, or if you have a need to reset your NWE-IP static IP address outside of DashBoard.

3. Diagnostic Panel

This panel reports the serial number, network address mode, IP address, and net mask of the NWE-IP. Status information on the Dell® hardware is also displayed. Refer to the Dell documentation that accompanied the NWE-IP for details on the type of messages this panel displays.

4. USB Ports

Use each port to connect a keyboard and mouse if you do not have access to a network with DHCP for the initial Ethernet setup, or if you have a need to reset your NWE-IP static IP address outside of DashBoard.

Rear Panel Overview

This section provides an overview of the connections and cabling designations for the NWE-IP rear panel.
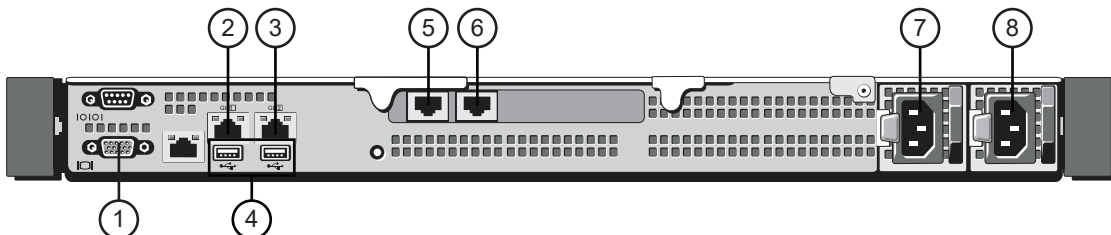
Figure 4.2 NWE-IP — Rear Panel

1. VGA Port

Use this port to connect a monitor if you do not have access to a network with DHCP for the initial Ethernet setup, or if you have a need to reset your NWE-IP static IP address outside of DashBoard. If the VGA Port on the front panel is also connected to a monitor, this connection supersedes it.

2. Gb1 Ethernet Port

This standard 10/100/1000 Base-TXRJ45 connector is used to connect the NWE-IP to your facility network. This connector is required to bridge the external Ethernet network to the local communication bus for monitoring and controlling the NWE-IP using DashBoard. This port is also used for software upgrades.

3. Gb2 Ethernet Port

This port is not implemented.

4. USB Port(s)

Use each port to connect a keyboard and mouse if you do not have access to a network with DHCP for the initial Ethernet setup, or if you have a need to reset your NWE-IP static IP address outside of DashBoard.

5. NET1 Port

The NET1 port is populated with a standard 10/100/1000 Base-TXRJ45 module from the factory. This port enables the NWE-IP to communicate with your PTP Grandmaster and act as a transmitter/receiver for network streams.

6. NET2 Port

The NET2 port is populated with a standard 10/100/1000 Base-TXRJ45 module from the factory. This port enables protection switching as per SMPTE ST 2022-7.

7, 8 Power Supplies

The NWE-IP comes standard with two power supplies.

Physical Installation

This chapter provides additional information for installing the NWE-IP, and DashBoard before you can proceed to cabling and configuring your NWE-IP.

Installing the NWE-IP in a Rack Frame

Refer to the *NWE-IP Quick Start Guide* that accompanied your device and its mounting kit for installation information.

Connecting to a Network

The NWE-IP is connected to your network via the **Gb1**, **NET1**, and **NET2** ports on the rear panel. Each port has a specific purpose:

* **Gb1** port — This port enables the NWE-IP to interface with other devices in your facility, and the computer running the DashBoard client.
* **NET1** port — This port enables the NWE-IP to interface with your facility PTP Grandmaster and enables the ability to receive and transmit network streams.
* **NET2** port — This port enables the NWE-IP to implement protection switching as per SMPTE ST 2022-7.

Before You Begin

Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your NWE-IP.

✦ If difficulties or problems are experienced when connecting the NWE-IP to a network hub, contact your network administrator.

For More Information on...

* downloading and installing DashBoard, refer to the *DashBoard User Manual*.

Connecting to your Facility Network

✦ You will need to ensure that the NWE-IP is on the same network as your DashBoard client computer.

To connect the NWE-IP to your facility network

1. Connect one end of a standard RJ45 cable to the **Gb1** port on the NWE-IP rear panel.
2. Connect the other end of the same RJ45 cable to your Local Area Network (LAN).
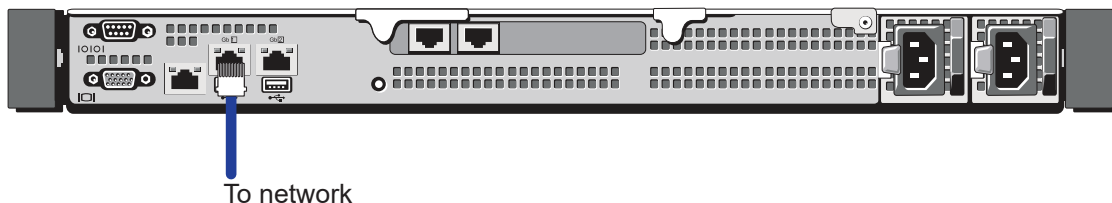
To network

Connecting to the PTP Grandmaster

Connect the **NET1** port on the NWE-IP rear panel to establish communications with the PTP Grandmaster in your facility. This port is also used by the NWE-IP to transmit/receive network streams in your system.

To establish a connection for the PTP Grandmaster

1. Connect one end of a standard RJ45 cable to the **NET1** port on the NWE-IP rear panel.

2. Connect the other end of the same RJ45 cable to your Local Area Network (LAN).

3. Verify that the bottom right LED of the **NET1** port is lit green. This indicates that the connection is 1Gig.

✶ If this LED is not lit green, verify that the settings of your network switch allow 1Gig communication.

To network for PTP Grandmaster
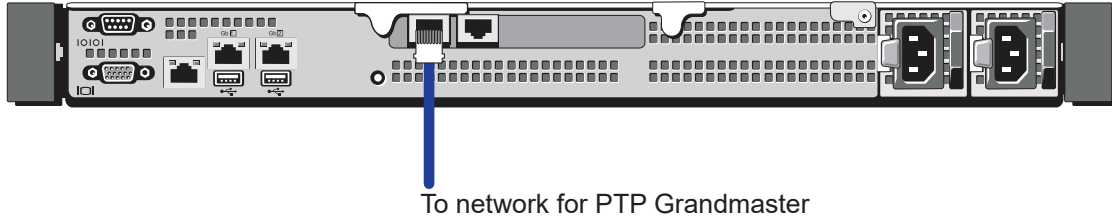
Cabling for Protection Switching

The NWE-IP enables a user to protect their streams to ensure mission critical operation. Using SMPTE ST 2022-7 they can run the same audio over two separate, redundant networks in case an error occurs with any hardware.

✶ This section is only applicable if your system requires protection switching.

To cable the protection switching connection for the NWE-IP

1. Connect one end of a standard RJ45 cable to the **NET2** port on the NWE-IP rear panel.

2. Connect the other end of the same RJ45 cable to your Local Area Network (LAN).

3. Verify that the bottom right LED of the **NET2** port is lit green. This indicates that the connection is 1Gig.

✶ If this LED is not lit green, verify that the settings of your network switch allow 1Gig communication.

To network for Protection Switching (SMPTE ST 2022-7)
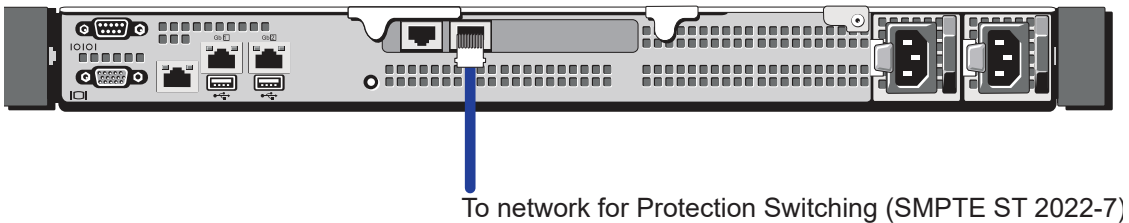
Connecting the Power Supplies

For redundancy, each power cord should be connected to a separate power source for protection against failure of the A/C power circuit. In the event of one power supply failure, the frame load is transferred to the other redundant power supply.

⚠ **Warning** — *In some countries, it may be necessary to supply the correct mains supply cord. Use only an approved IEC 320 C-13 type A/C line cord rated for a minimum 10A at 250V and certified for the country of use.*

The power supply plugs into the right-hand section of the NWE-IP rear panel. The universal power supply supports all worldwide AC power voltages, and no power adjustments are required.

To connect the NWE-IP to the power supplies

⚠ **Warning Hazardous Voltages** — *The safe operation of this product requires that a protective earth connection be provided. This protective earth is provided by the grounding conductor in the equipment's supply cord. To reduce the risk of electrical shock to operator and service personnel, this ground conductor must be connected to an earthed ground.*

1. Connect the cable's female IEC connector to the right power socket.

2. Plug the second IEC connector into left power socket.

To Power Source 2   To Power Source 1
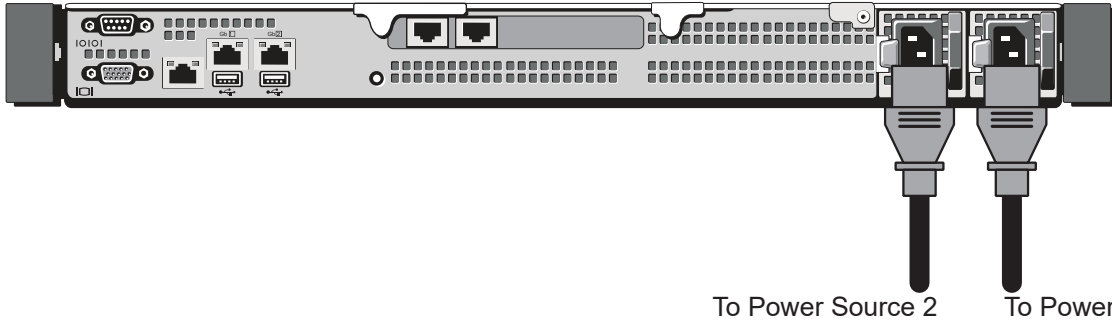
3. Each AC connector includes a Power-Lock, which is designed to retain the power cable connector. Clip the Power-Lock over the shoulder of the inserted AC Cable end.

4. Connect each supplied power cable's three-prong male connector to an AC outlet.

5. Power on the NWE-IP by pressing the **POWER** button on the front panel. Refer to "**Front Panel Overview**" on page 19 for the location of this button.

✱ The fans run at full speed for a short period at the startup.

Cabling

If you have questions pertaining to the installation of NWE-IP, contact us at the numbers listed in the section "**Contacting Ross Video Technical Support**". Our technical staff is always available for consultation, training, or service.

Connecting Peripheral Devices

During initial setup, you can optionally connect peripheral devices (such as a keyboard, mouse, and monitor) to the NWE-IP to use in establishing the initial IP settings for the NWE-IP. This is especially useful if your facility network does not support DHCP.

✶ KVM Extenders (customer supplied) are required when the NWE-IP monitor, keyboard/mouse are located remotely from the rack room. Ensure the cable length does not exceed the recommended standard length for your peripheral device.

To connect peripheral devices to the NWE-IP

1. Plug a keyboard into the top **USB** port on the NWE-IP rear panel.

2. Plug a mouse into the bottom **USB** port on the NWE-IP rear panel.

3. Plug a monitor into the **VGA** port on the NWE-IP rear panel.
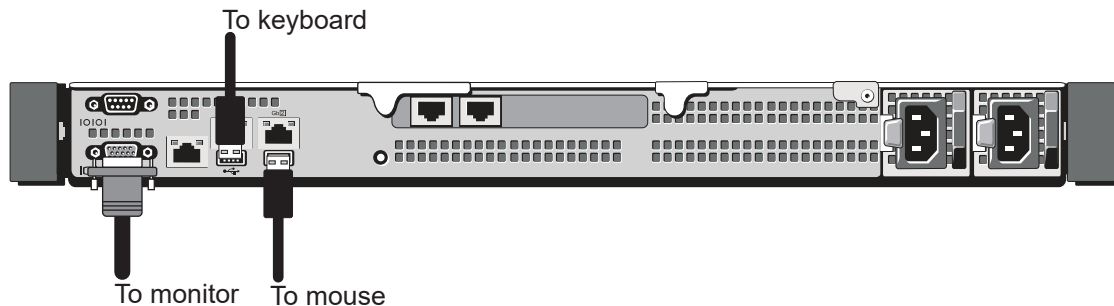
Initial Connection

The NWE-IP is configured and operated via its interfaces in DashBoard. Once the NWE-IP is physically installed and connected to your facility network, you must establish a connection between it and the computer running your DashBoard client software.

✱ If you have questions pertaining to the operation of NWE-IP, contact us at the numbers listed in the section **"Contacting Ross Video Technical Support"** on page 12. Our technical staff is always available for consultation, training, or service.

✱ This chapter applies to the **Gb1** port only.

Physical Connections to the NWE-IP

Before configuring the initial network settings of the NWE-IP, you must:

• physically connect the NWE-IP to your network. Refer to "**Connecting to a Network**" on page 21.

• power on the NWE-IP. Refer to "**Connecting the Power Supplies**" on page 22.

Manually Adding the NWE-IP to the Tree View

The Tree View lists all DashBoard Connect devices that the DashBoard client can communicate with. Once you have added the NWE-IP to the Tree View, you can access its interfaces.

✱ The NWE-IP does not automatically display the DashBoard Tree View. You must manually add it to the Tree View.

To manually add the NWE-IP to the Tree View in DashBoard

1. From the main tool-bar in DashBoard, select **File** > **New** > **TCP/IP DashBoard Connect or openGear Device**.

   The **New TCP openGear Frame Connection** dialog opens.
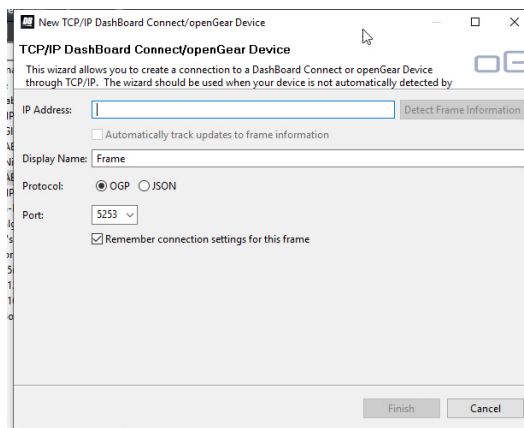
2. In the **IP Address** field, enter the default IP Address of 192.168.0.100.

3. Click **Detect Frame Information**.

✱ If you wish to assign a unique name for the NWE-IP, enter it in the **Display Name** field.

4. Click **Finish** to close the dialog.

   The NWE-IP node displays in the DashBoard Tree View.

5. Proceed to the section "**Accessing the NWE-IP Interfaces in DashBoard**" on page 30.

Using DashBoard

This chapter provides instructions for launching DashBoard, and accessing the NWE-IP interfaces in DashBoard.

Overview

The NWE-IP interfaces are accessed by expanding the main NWE-IP node in the Tree View and selecting from a series of sub-nodes. (**Figure 8.1**)

The NWE-IP nodes are organized in a logical order for ease of configuration:

* The Global node provides global settings for configuring the network settings of the NWE-IP.

* Sub-node labels display with the nomenclature of `NWE # <interface name>` where `#` represents a Nielsen Watermark encoder and `<interface name>` represents a setup step. Double-click these sub-nodes to access the AES67, Nielsen Watermarking, and NMOS configuration options. (**Figure 8.1**)
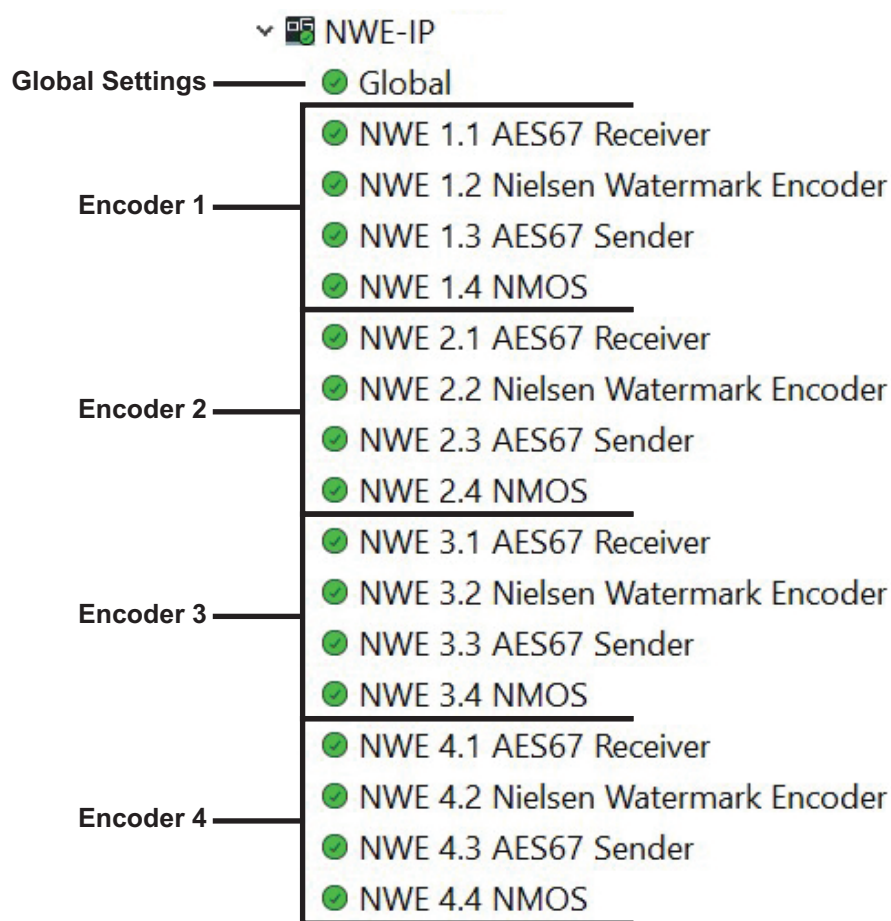
Figure 8.1 Example of the NWE-IP Tree View in DashBoard

Launching DashBoard

DashBoard must run on a computer that has a physical wired Ethernet connection. Wireless connections do not allow device discovery.

For More Information on...

* downloading and installing the DashBoard client software, refer to the ***DashBoard User Manual***.

To launch DashBoard

1. Ensure that you are running DashBoard software version 9.2.0 or higher.

2. Launch DashBoard by double-clicking its icon on your computer desktop.

Accessing the NWE-IP Interfaces in DashBoard

The NWE-IP interfaces are accessed by expanding the NWE-IP node in the Tree View and selecting a sub-node.

To display the NWE-IP interfaces in DashBoard

1. Launch DashBoard.

2. In the Basic Tree View of DashBoard, expand the **NWE-IP** node.

3. Double-click the **Global** sub-node to display its tabs in the right-most pane of the DashBoard window.
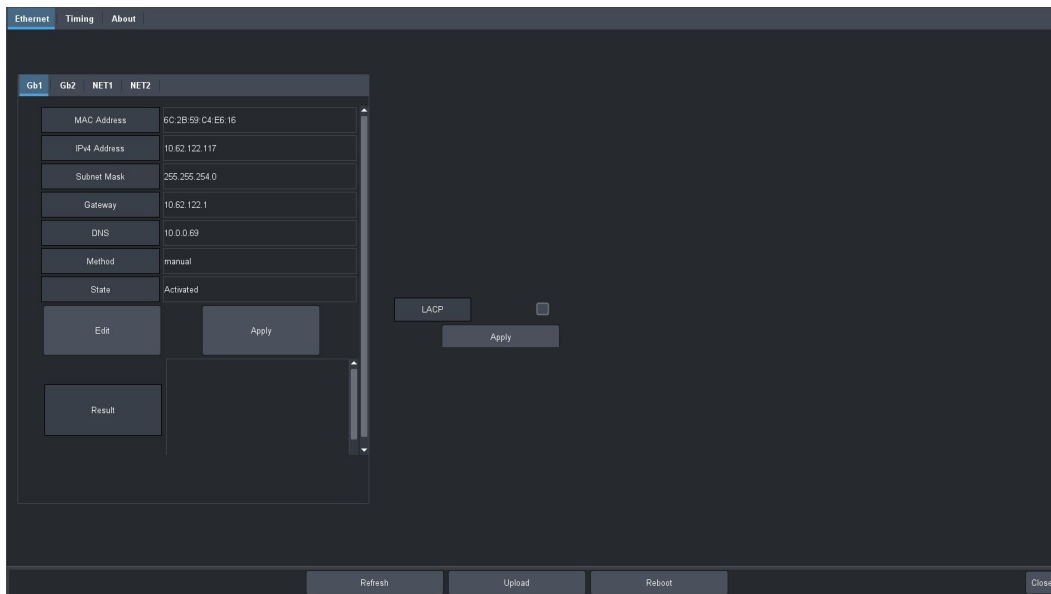
4. Double-click an **AES67 Receiver** sub-node to display its tabs in the DashBoard window.
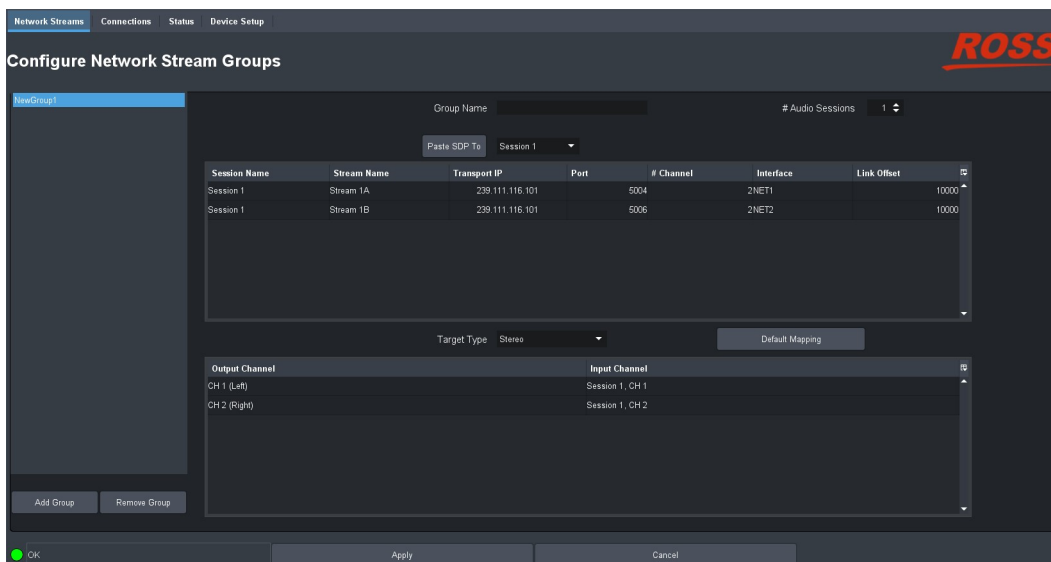
5. Double-click a **Nielsen Watermark Encoder** sub-node to display its tabs in the DashBoard window.
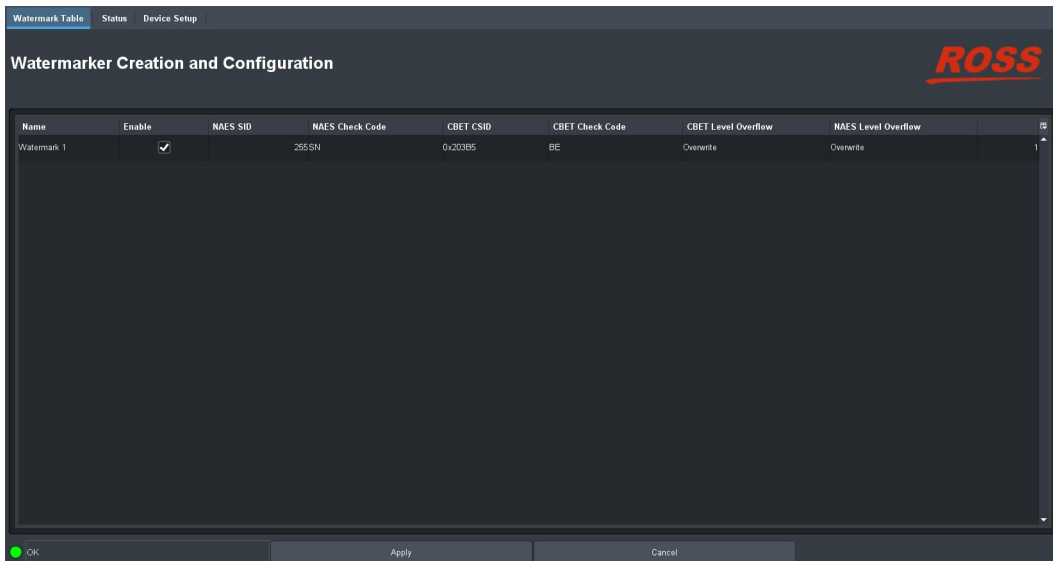
6. Double-click an **AES67 Sender** sub-node to display its tabs in the DashBoard window.
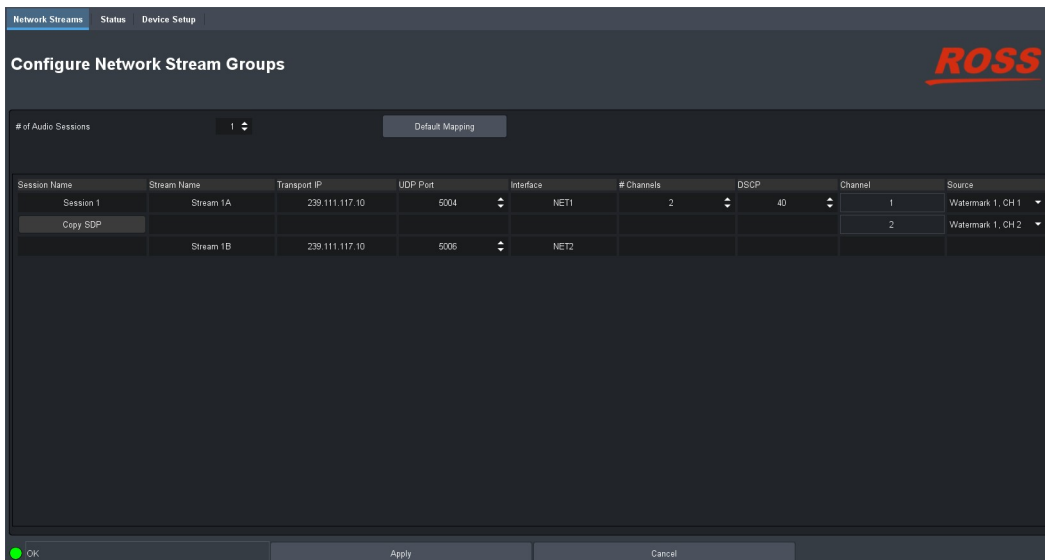
7. Double-click an **NMOS** sub-node to display its tabs in the DashBoard window.

For More Information on...

• the NWE-IP interfaces in DashBoard, refer to the chapter "**DashBoard Interface Overview**" on page 59.

Updating the Network Settings

Once the NWE-IP is communicating via DashBoard, it is recommended to assign a different static IP address from the factory default values. These default values were used to initially establish a connection point to the NWE-IP, as outlined in your *NWE-IP Quick Start Guide*. This chapter provides instructions for configuring the **Gb1**, **NET1,** and **NET2** ports of the NWE-IP for communication with your facility network and streaming devices.

✱ Contact your IT Department for more information on changing these settings.

Network Connections to the NWE-IP

There are two Ethernet ports that must be configured on the NWE-IP: **Gb1** and **NET1**. Each port has a specific purpose:

*   **Gb1** port — This port enables the NWE-IP to interface with other devices in your facility, and the computer running the DashBoard client. After the initial connection is established (as outlined in "**Initial Connection**" on page 27), DashBoard is used to update the network settings for the NWE-IP as determined by your IT Department and network requirements.

*   **NET1** port — This port enables the NWE-IP to interface with your facility PTP Grandmaster and enables the ability to receive and transmit network streams.

*   **NET2** port — This port enables protection switching on the NWE-IP as per SMPTE ST 2022-7

Updating the Gb1 Port Settings

Once the NWE-IP is communicating via DashBoard, you may wish to assign a different static IP Address from the factory default value (which was used to initially establish a connection point to the NWE-IP).

✱ The **Gb2** port is not implemented.

To update the Gb1 port settings for the NWE-IP

1. Display the **Global** interface as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Ethernet** tab.

3. Select the **Gb1** sub-tab.
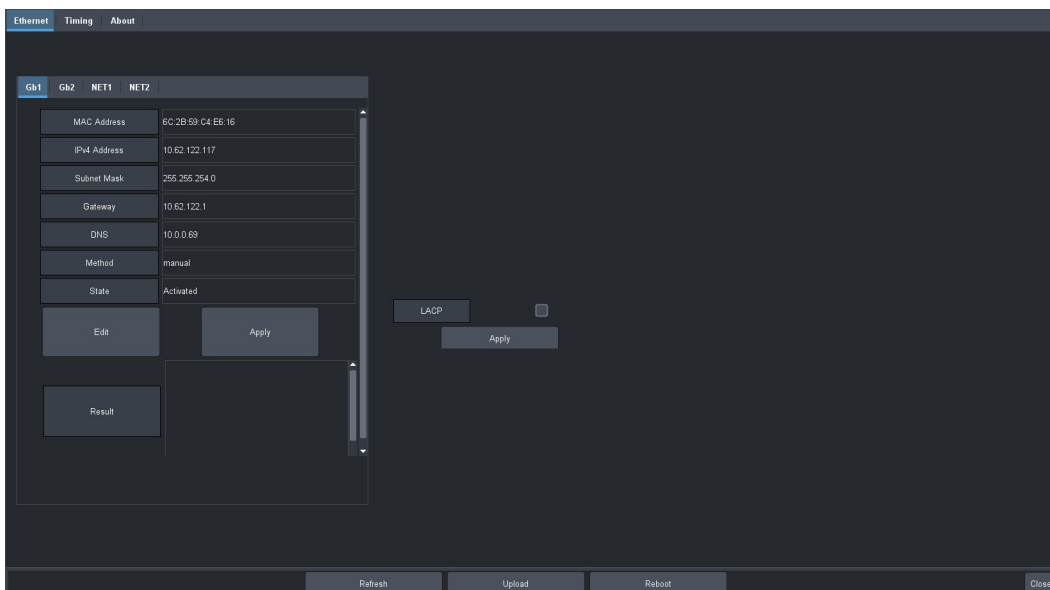
4. Click **Edit**.

   The fields are now editable on the tab.

5. Use the **DNS** field to specify the IP address of the DNS server that the NWE-IP will communicate with.

6. Use the **Method** menu to specify **Manual**.

7. Use the **Address** field to specify the new static IP Address for the **Gb1** port.

8. Use the **Subnet Mask** field to specify the subnet mask for the **Gb1** port.

9. Use the **Gateway** field to specify the gateway for communications outside of the local area network (LAN) the NWE-IP will use.

10. Click **Apply**.

✱ The NWE-IP automatically reboots and applies the changes.

Updating the NET1 Port Settings

By assigning an IP Address to the **NET1** port, you are able to uniquely identify it on the network and control it via the DashBoard interface. Once these network settings are successfully assigned, you can proceed to configure the **NET1** port for media traffic for the NWE-IP.

To update the NET port settings for the NWE-IP

1. Display the **Global** interface as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Ethernet** tab.

3. Select the **NET1** sub-tab.

4. Click **Edit**.

   The fields are now editable on the tab.

5. Use the **Method** menu to specify **Manual**.

6. Use the **Address** field to enter the new IP Address for the **NET1** port as provided by your IT Department. This is the IP Address that is used to control and communicate with the NET1 port.

7. Use the **Subnet Mask** field to specify the subnet mask for the NET1 port.

8. Set the **Gateway** field to `0.0.0.0`.

9. Set the **DNS** field to `0.0.0.0`.

10. Click **Apply**.

Using LACP

You have the option of using Link Aggregation Control Protocol (LACP). This feature provides redundancy. Using LACP combines both Ethernet ports and portrays them as a single port in the DashBoard interface, displaying a sub-tab labelled **Bond**, instead of the two sub-tabs labelled **Gb1** and **Gb2** that are displayed when not using LACP.

Note that while the unit has LACP enabled, the upgrade and downgrade process will be disabled. Please disable LACP before attempting an upgrade or downgrade.

Enabling LACP

When enabling LACP, the IP settings are taken from **Gb1** and applied to **Bond**.

To enable LACP

1. Display the **Global** interface as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Ethernet** tab.

3. Select the **LACP** box.
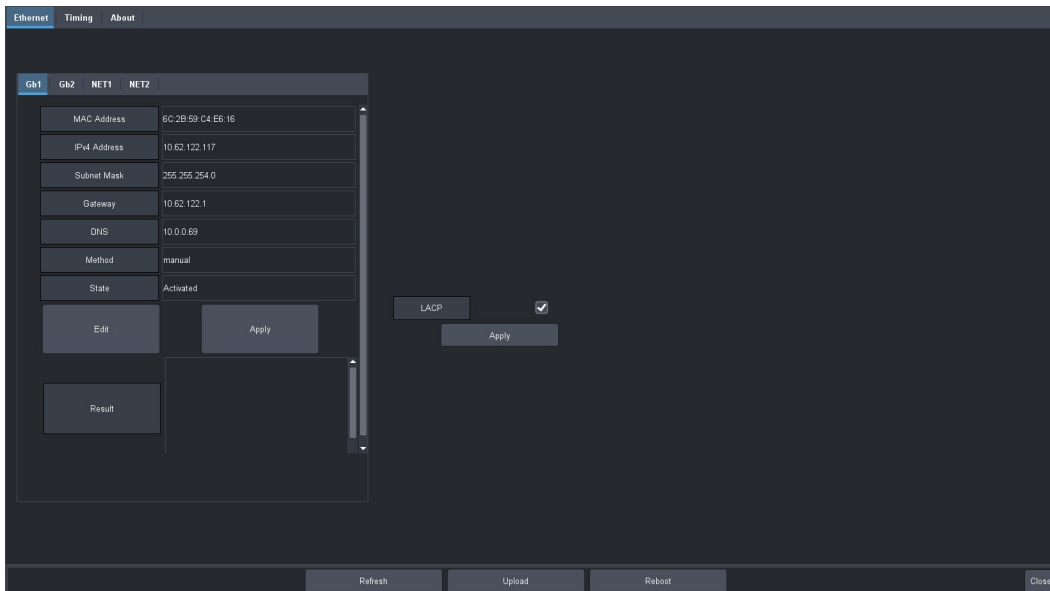
4. Click **Apply**.

✴ The NWE-IP automatically reboots. The **Gb1** and **Gb2** sub-tabs are now gone and the **Bond** sub-tab is displayed.
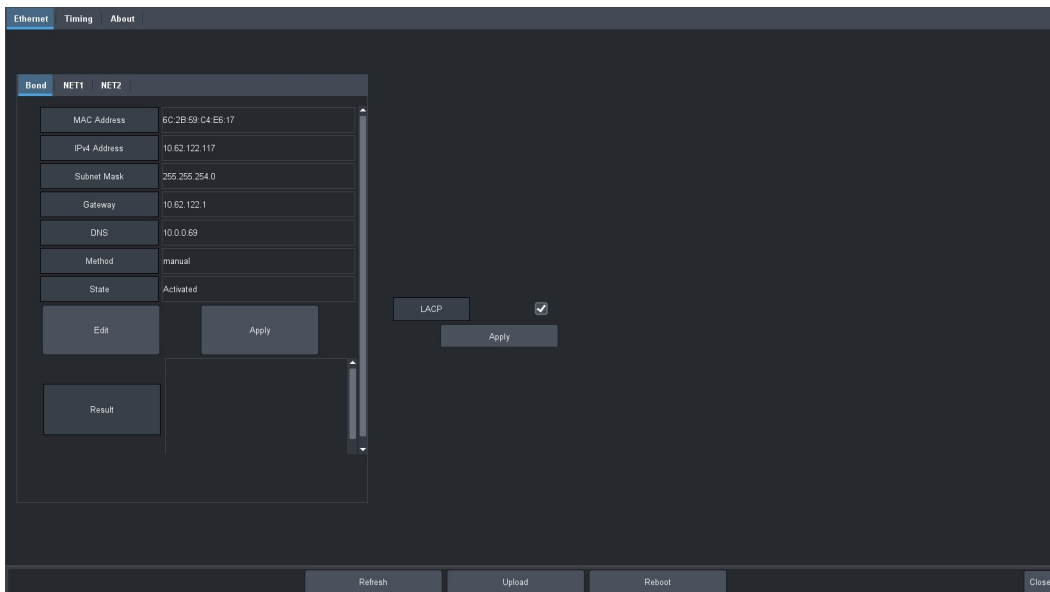
Disabling LACP

When disabling LACP, the IP settings are taken from **Bond** and applied to **Gb1**.

To disable LACP

1. Display the **Global** interface as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Ethernet** tab.

3. Clear the **LACP** box.
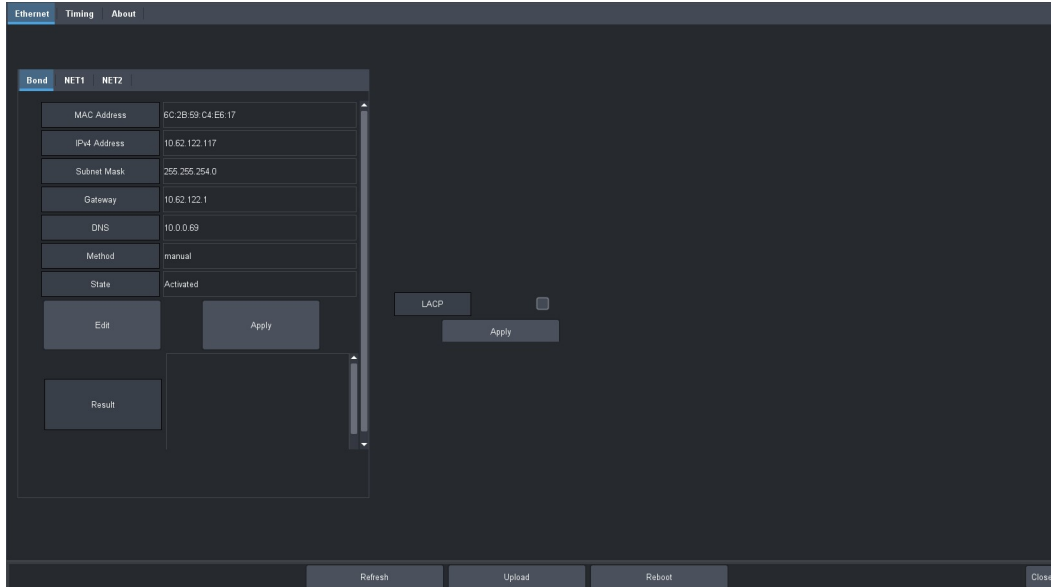
4. Click **Apply**.

✶ The NWE-IP automatically reboots. The **Bond** sub-tab is now gone and the **Gb1** and **Gb2** sub-tabs are displayed.
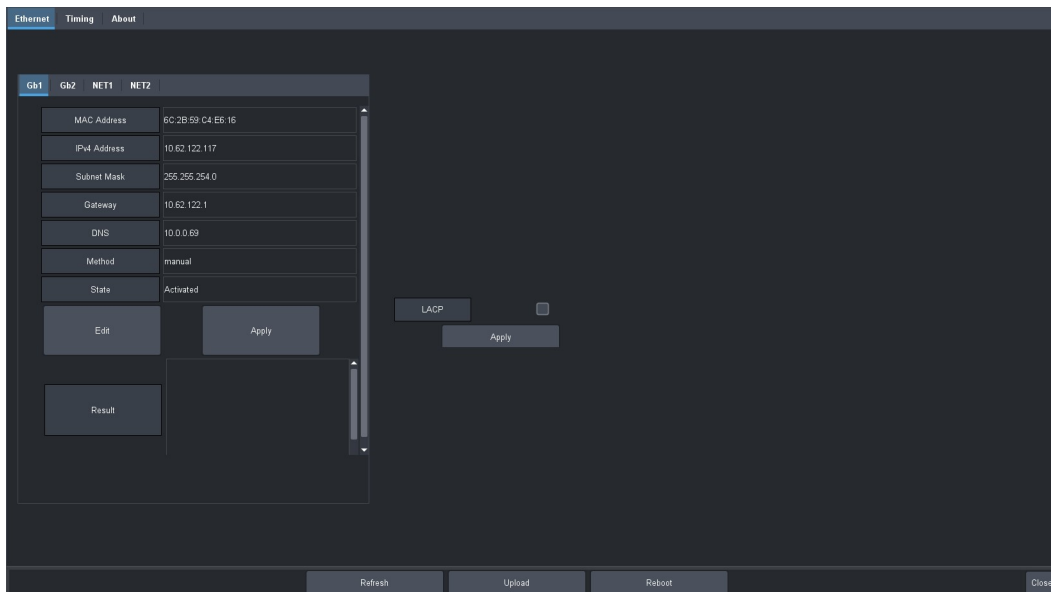
Setting up Protection Switching

This section is only applicable if your system requires protection switching (SMPTE ST 2022-7).

Before You Begin

Ensure that:

*   your source is capable of sending SMPTE ST 2022-7 streams
*   the NWE-IP is set up within a protection switching network
*   the **NET2** port on the NWE-IP is cabled correctly

Configuring the NWE-IP for Protection Switching

You will need to assign a unique IP Address to the **NET2** port.

To configure the NET2 port for protection switching

1. Display the **Global** interface as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Ethernet** tab.

3. Select the **NET2** sub-tab.

4. Click **Edit**.

    The fields are now editable on the tab.

5. Use the **Method** menu to specify **Manual**.

6. Use the **Address** field to enter the new IP Address for the **NET2** port as provided by your IT Department. This is the IP Address that is used to control and communicate with the NET2 port.

7. Use the **Subnet Mask** field to specify the subnet mask for the NET port.

8. Set the **Gateway** field to `0.0.0.0`.

9. Set the **DNS** field to `0.0.0.0`.

10. Click **Apply**.

Troubleshooting

This section outlines how to use the Command Line Interface (CLI) to view the IP address assigned to the NWE-IP, and how to reset the IP settings.

Using the CLI to View the IP Address

With the following credentials, users can view the IP address of the NWE-IP using the CLI. This is helpful should your unit lose connection to DashBoard and you cannot access the NWE-IP interfaces to learn the IP address.

To view the IP address of the NWE-IP outside of DashBoard

1. Use a monitor and keyboard to access the CLI of the NWE-IP. Refer to **Rear Panel Overview** for port locations.

2. At the **login** prompt, type `ipcheck` and press **Enter**.

3. At the **password** prompt, type `check` and press **Enter**.

    The IP address is reported under **Gb1**, or **Bond** if unit is in LACP mode.

4. Press **"Q"** to log out of the CLI.

Using the CLI to Reset the IP Settings

With the following credentials. users can reset the IP settings to disable LACP, and set the Gb1 IP address to the factory default of 192.168.0.100.

To reset the IP address of the NWE-IP outside of DashBoard

1. Use a monitor and keyboard to access the CLI of the NWE-IP. Refer to **Rear Panel Overview** for port locations.

2. At the **login** prompt, type `ipreset` and press **Enter**.

3. At the **password** prompt, type `reset` and press **Enter**.

4. When prompted, type the password `reset` again and press **Enter**

    The unit will revert to factory default IP settings.

Configuring the Timing Settings

The NWE-IP supports the Precision Time Protocol (PTP) as defined in the IEEE 1588-2008 standard and the SMPTE ST 2059 specification.

Configuring the PTP Settings

From the Timing tab in DashBoard, you can synchronize the NWE-IP to real-time clocks of other devices in the same network.

✶ There are several criteria that PTP clocks compare to determine who will be master and who will be slave (called the Best Master Clock Algorithm, or BMCA), and they are evaluated in order: Priority1, clock class, accuracy, scaled log variance, Priority2, clock ID (similar to the MAC address). Practically, Priority1 is the only setting configured on all clocks to control the outcome of the Grandmaster election. If Priority1s are equal, the next criterion is evaluated (clock class) and the criteria are evaluated in succession until a Grandmaster is determined.

To update the PTP settings for the NWE-IP

1. Display the NWE-IP interfaces in DashBoard as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Timing** tab.

✶ The **Slave Only** box is selected and cannot be edited.

3. Use the **Profile** menu to specify the standard/specification used for PTP.

4. Use the **Domain** field to specify the sub-domain the PTP clock is assigned to.

✶ There can be multiple PTP domains operating concurrently within a network. The domain is a field in all PTP message headers. Messaging between entities are segregated by domain (e.g. The NWE-IP is an endpoint configured for domain 128 and ignores messages from a neighboring clock configured for domain 127).

5. Use the **Sync Interval** field to specify the number of seconds at which synchronization messages are sent from the master clock to the specified NET port on the NWE-IP.

6. Use the **Announce Interval** field to specify the rate of announce messages that the specified NET port on the NWE-IP requests from the master clock during a Unicast session.

7. Use the **Announce Receipt Timeout** field to specify the number of seconds the specified NET port on the NWE-IP waits for an announce interval message before timing out.

8. Click **Apply Changes** to save the new settings.

Configuring the AES67 Receiver

This chapter outlines the steps required to configuring and allocate the AES67 receiver streams to Watermark Encoder channels on the NWE-IP.

Overview

From DashBoard you defining audio streams that provide AES67 data (including the IP Address of each stream and the number of audio channels it includes) then map the streams to create Network Stream groups. Each Network Stream group can then be allocated as a source for a Watermark Encoder channel.

The following steps are required:

1. Configure the AES67 Receiver global settings.

2. Define the Network Stream group(s) that will provide the AES67 data to be encoded.

3. Route each Network Stream group to a Watermark Encoder channel.

Configure the Global AES67 Receiver Settings

There are two settings that impact all AES67 Receiver streams on the NWE-IP: the default number of (audio) channels, and specify a Link Offset. These settings are located on the Device Setup tab in the AES67 Receiver interface.

To define the default number of audio channels for the AES67 Receiver

1. Display the **AES67 Receiver** interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Device Setup** tab.
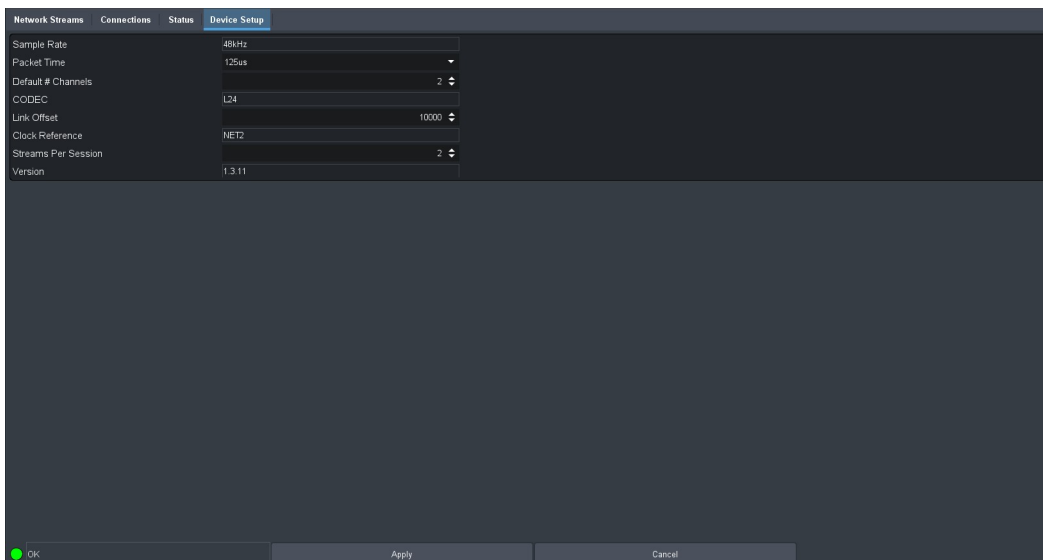
3. Use the **Default # Channels** field to specify the number of audio channels available to map for any network stream group for the AES67 Receiver.

✸ This number can be updated for each group during configuration.

4. Use the **Link Offset** field to specify the number of nanoseconds (offset) the source will be delayed from the sender's RTP timestamps.

✸ This allows for non-PTP aligned source to be passed through with fixed latency.

5. Click **Apply** to save your changes.

6. Repeat for additional Watermark Encoder channels.

Creating Network Stream Groups for the AES67 Receiver

A network stream group includes a specified number of audio streams, with each stream from a defined IP Address. Further define each group by specifying the type of audio (Stereo or 5.1 Surround) and mapping the input channels. You can create as many network stream groups as required.

Once you have created your network stream groups, you then can allocate them to Watermark Encoder channels (as described in "**Routing a Network Stream Group to a Watermark Encoder Channel**" on page 45).

To add a new network stream group

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Network Streams** tab.

3. Click **Add Group**.

    • The fields in the **Network Streams** tab clear.
    • The **Group Name** field displays "`NewGroup#`" where # is an auto-generated character.

4. Use the **Group Name** field to specify a unique identifier for the network stream group.

5. Use the **# Audio Sessions** field to specify the number of audio streams this network stream group will contain.

    The Group list (on the left of the tab) updates to display a row for each defined network stream group. .
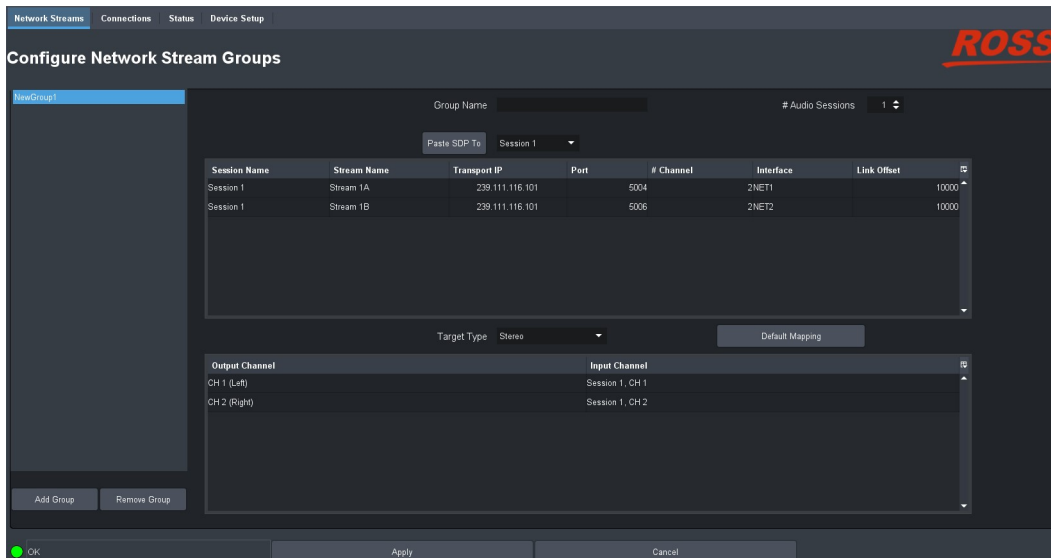
6. Use the **Group Name** field to assign a unique name to the audio stream in the network session.

7. Repeat for additional Watermark Encoder channels

To define the streams within a group

1. Locate the stream group table on the **Network Streams** tab.

    Each row in the table represents an audio stream within that network group.

2. If your upstream network device supports the Session Description Protocol (SDP), create a session for it as follows:

    a. Copy the settings of the upstream device by opening its *.sdp file and copying the settings to the clipboard function of your PC.

    b. Return to the **Network Streams** tab in DashBoard for the NWE-IP.

    c. Click **Paste SDP To**.

    d. From the drop-down menu next to the **Paste SDP To** button, select the specified session to copy the SDP settings to.

    e. Continue to step 10.

3. Locate the row for the stream you wish to configure.

4. Use the **Name** field to assign a unique name to the audio stream.

5. Use the **Transport IP** field to specify the Multicast IP Address for the audio stream.

✸ Only multicast IP Address of 239.x.x.x and 232.x.x.x can be received by the NWE-IP. Contact Ross Technical Support if you need additional IP ranges.

6. Use the **Port** field to specify the RTP port for the audio stream.

7. Use the **# Channel** field to specify the maximum number of audio channels in this stream.

8. Use the **Link Offset** field to adjust the relative position of the audio start position as an offset to the reference.

9. Repeat steps 3 to 8 for each audio stream you wish to define.

10. Click **Save** to update save your changes and update the list in the Network Streams tab.

11. Repeat for additional Watermark Encoder channels.

Mapping the Audio Channels to the AES67 Receiver

When defining a network stream group, you can choose to apply the default audio channel map or assign the channels as required by your system.

To apply the default audio map to the network stream group

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Network Streams** tab.

3. Use the **Target Type** menu to specify the type of audio channels that will be assigned to the network stream group.

4. Click **Default**.

    The Audio Channel Map table updates to display the default settings for the audio type selected.

5. Click **Apply** to save your settings.

To customize the stereo audio channels assigned to a network stream

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Network Streams** tab.

3. Select **Stereo** from the **Target Type** menu.

The Audio Channel Map table updates to display rows for the Left and Right in the Output Channel column.
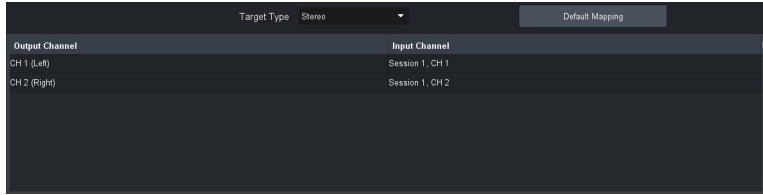
4. Use the **Input Channel** menu to assign a specific stream/channel pair to the output channel of the network stream group.

5. Click **Apply** to save your settings.

To customize the Dolby® Surround audio channels assigned to a network stream

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Network Streams** tab.

3. Select **5.1 Surround** from the **Target Type** menu.

    The Audio Channel Map table updates to displays a row for each channel in the Output Channel column.
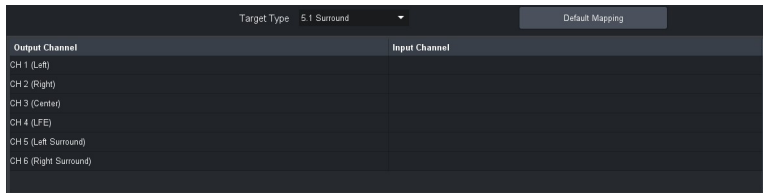
4. Use the **Input Channel** menu to assign a specific stream/channel pair to the output channel of the network stream group.

5. Click **Apply** to save your settings.

To customize the Dolby® Surround and Stereo audio channels assigned to a network stream

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Network Streams** tab.

3. Select **5.1 Surround and Stereo** from the **Target Type** menu.

    The Audio Channel Map table updates to displays a row for each channel in the Output Channel column. There are eight channels available; you may need to scroll to the bottom of the table to access the Stereo channels.
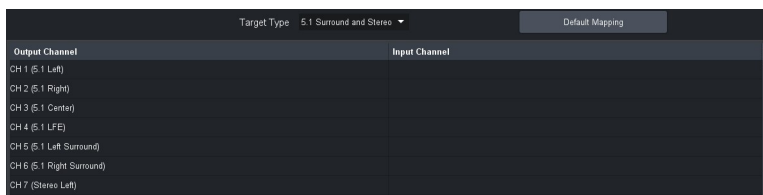
4. Use the **Input Channel** menu to assign a specific stream/channel pair to the output channel of the network stream group.

5. Click **Apply** to save your settings.

Routing a Network Stream Group to a Watermark Encoder Channel

To route the audio streams, you must first select a Watermark Encoder channel then a network stream group. Keep in mind that routing occurs automatically after a Stream Group button is selected.

✱ The number of available Watermark Encoder channels depends on the number of encoder channels configured for your NWE-IP. Refer to the section "**Configuring a Watermark Encoder Channel**" on page 48 for details.

To select a Watermark Encoder channel

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Connections** tab.

3. In the **Output Name** row of the **Outputs** area, locate the button for the Watermark Encoder channel you wish to allocate the Network Stream Group to.
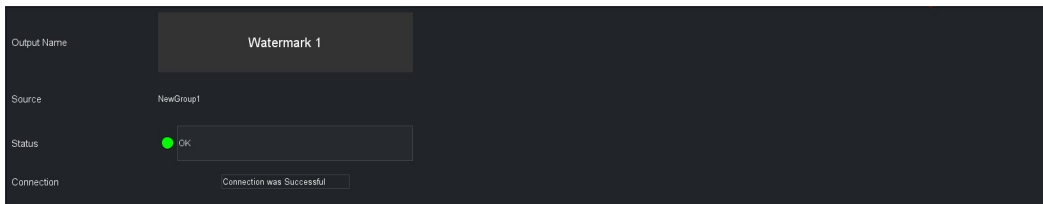
4. Click the required **Watermark** button.

To allocate a Network Stream Group to a Watermark Encoder channel

1. In the **Stream Groups** area, locate the button for the Network Stream group you wish to route to the selected watermark encoder.

✱ Each button represents a Network Stream Group configured in "**Creating Network Stream Groups for the AES67 Receiver**" on page 42.
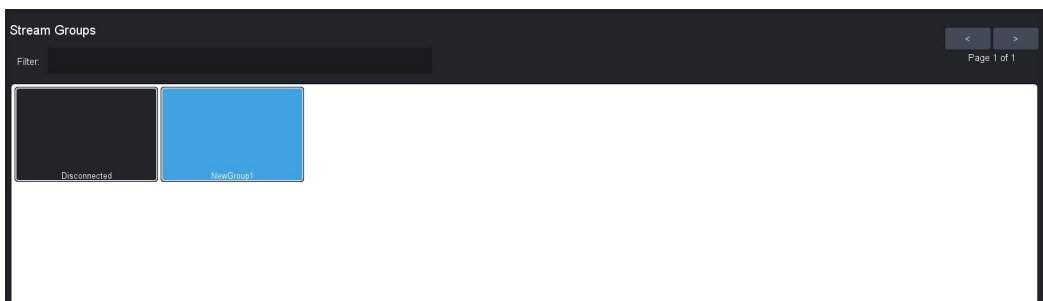
2. Click the required **Stream Group** button to perform the switch.

The selected Network Stream Group is now allocated as the source for the Watermark Encoder channel.

Enabling the Watermark Encoders

This chapter outlines the steps required to configure and enable the Watermark Encoder channels for the NWE-IP.

Overview

A Watermark Encoder provides transport stream processing to add Nielsen Watermarking to AES67 audio streams. DashBoard provides options for specifying the watermarking parameters, including the Source Identification (SID) obtained from Nielsen Encoder Support.

By default, there are up to four Watermark Encoder channels that can be configured. Each channel is configured and enabled independently.

Before proceeding, ensure that you have the following information from Nielsen Encoder Support:

* NAES SID
* NAES Check Code
* CBET CSID
* CBET Check Code

Changing the Watermark Encoder Channel Names

It is highly recommended to re-name each Watermark Encoder channel from the default values. This will help to identify the channels in the other NWE-IP tabs and interfaces.

To change the name for a watermark encoder channel

1. Display the AES67 Receiver interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Connections** tab.

3. Locate the row of buttons in the **Output Name** area of the tab.
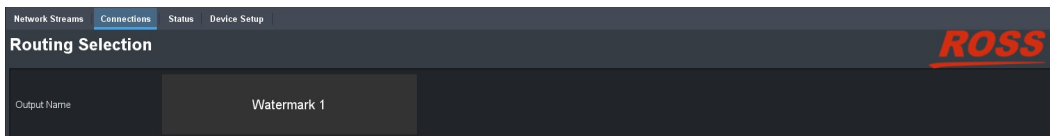
4. Click the **Watermark 1** button.

   The button is highlighted and a cursor displays in the button label.

5. Type a new name for the Watermark Encoder channel.

6. Press **Enter**.

7. Repeat steps 4 to 6 for each button.

Configuring the Global Encoder Settings

There are two settings that impact all Watermark Encoder channels on the NWE-IP: Code Type and Time Zone. These settings are located on the Device Setup tab in the Nielsen Watermark Encoder interface.

To configure the global settings for all watermark encoders

1. Display the **Nielsen Watermark Encoder** interface in DashBoard as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Device Setup** tab.

3. Set the audio code scheme for your NWE-IP by selecting an option in the **Code Type** area. This affects NAES 2 code production only. Choose from the following:

   • **Final Distributor** — Select this option if the NWE-IP is installed in the station or cable network slot of the program-distribution chain.

   • **Program Content** — Select this option if the NWE-IP is installed in the broadcast network or syndicate slot of the program-distribution chain.

4. Use the **Time Zone** menu to specify the time zone that your facility is located in.

Configuring a Watermark Encoder Channel

Each row in the Watermark Table tab represents an encoder channel. You can enable up to four encoder channels.

For More Information on...

• AES67 Receiver streams, refer to the chapter "**Configuring the AES67 Receiver**" on page 41.

• AES67 Sender streams, refer to the chapter "**Configuring the AES67 Senders**" on page 51.

To configure a watermark encoder channel

1. Display the **Nielsen Watermark Encoder** interface in DashBoard as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Watermark Table** tab.
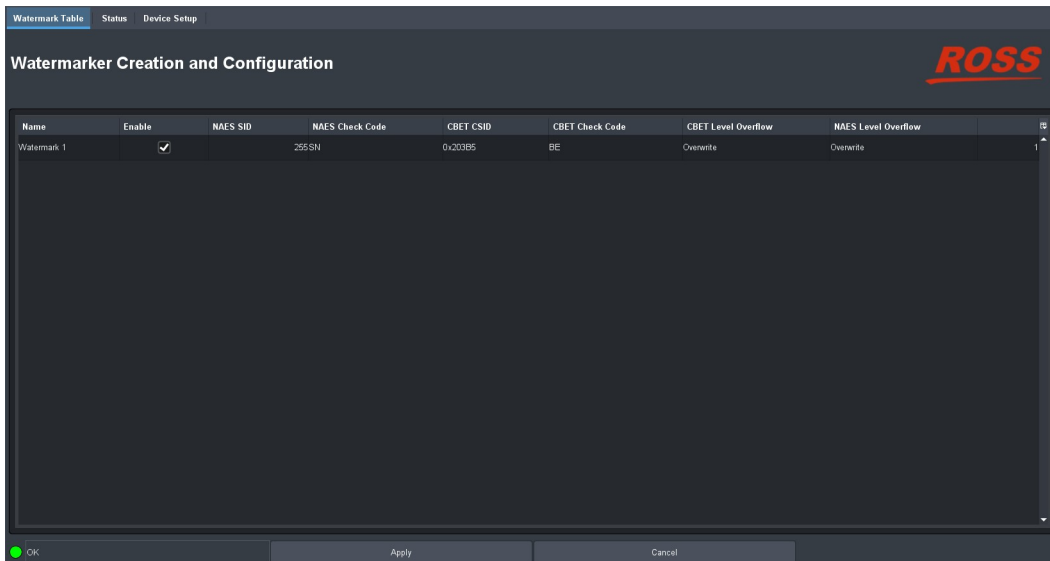
3. Locate the row for the Watermark Encoder channel you wish to configure.

4. Type your NAES SID value into the **NAES SID** cell.

5. In the **NAES Check Code** cell, enter

6. Type your CBET CSID value into the **CBET CSID** cell. Leave this field blank if you have not been assigned a CSID by Nielsen.

7. In the **CBET Check Code** cell, enter the Critical Band Encoding Technology (CBET) Source Identification code you obtained from Nielsen Encoder Support. The CSID is supplied with check characters (different from the SID code) to ensure that it is entered correctly into the NWE-IP. Note that this field:

   • is case sensitive and the check characters must be entered in upper case with no spaces between the CSID and check code.

   • can be left blank if no CBET encoding is performed for the encoder channel.

8. Specify how to resolve conflicts between data already present in the incoming signal, and data to be added by the NWE-IP by selecting an option in the **CBET Level Overflow** and **NAES Level Overflow** areas. This affects NAES 2 code production only. The NAES SID and CBET CSID can be configured independently. For each data type, choose from the following overflow methods:

   • **Refrain** — Select this option to not encode the NWE-IP data and only transmit the incoming data.

   • **Overwrite** — Select this option to encode the NWE-IP data regardless of the presence of incoming data.

9. Select the **Enable** box for the Watermark Output channel.

10. Click **Apply** to save your changes.

Configuring the AES67 Senders

This chapter outlines the steps required for configuring the AES67 sender streams on the NWE-IP. Each sender stream can be configured independently.

Overview

From DashBoard you specify which audio streams will transmit the encoded audio data to specific NWE-IP Watermark Encoder channels. The following steps are required:

1. Configure the AES67 Sender global settings.

2. Configure the Network Stream groups, including the number of channels in each

3. Map the audio channels to specific Watermark Encoder channels.

Configuring the Global AES67 Sender Settings

There are two settings that impact all AES67 sender streams on the NWE-IP: the default number of (audio) channels in each stream, and how to process the AES67 timestamps. These settings are located on the Device Setup tab in the AES67 Sender interface.

To configure the global settings for all AES67 sender streams

1. Display the AES67 Sender interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

2. Select the **Device Setup** tab.

Network Streams	Status	Device Setup	
Packet Time		125us	▾
Default # Channels		2	⇕
TTL(Time To Live)		1	⇕
CODEC		L24	
RTP Payload Type		96	⇕
Latency (microseconds)		44937	
AES67 Timestamp Adjustment		0	⇕
Clock Reference		NET2	
Streams Per Session		2	⇕
Version		1.4.0	

● OK	Apply	Cancel
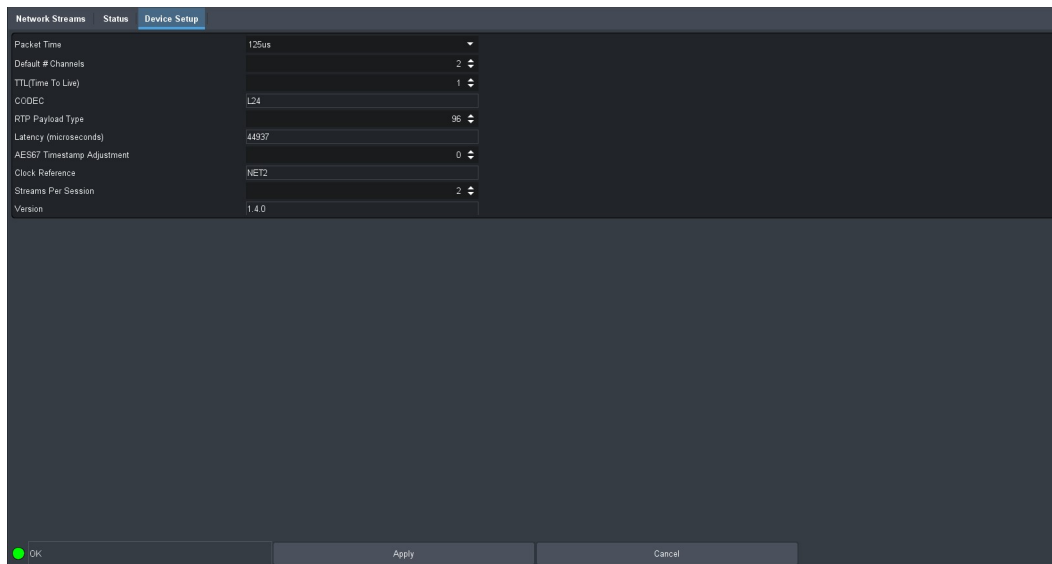
3. Use the **Default # of Channels** field to specify the maximum number of audio channels available to map for any network stream group for the AES67 Sender.

Mapping the Audio Channels for the AES67 Sender

You need to specify the IP encapsulation properties for the active audio for each input signal.

To map the audio channels for the AES67 Sender

1. Display the AES67 Sender interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

   The **Network Streams** tab is automatically selected.

2. Use the **# of Audio Sessions** field to specify the total number of streams available to the **AES67 Sender**.

   In the example below, the user specified 2 audio streams.
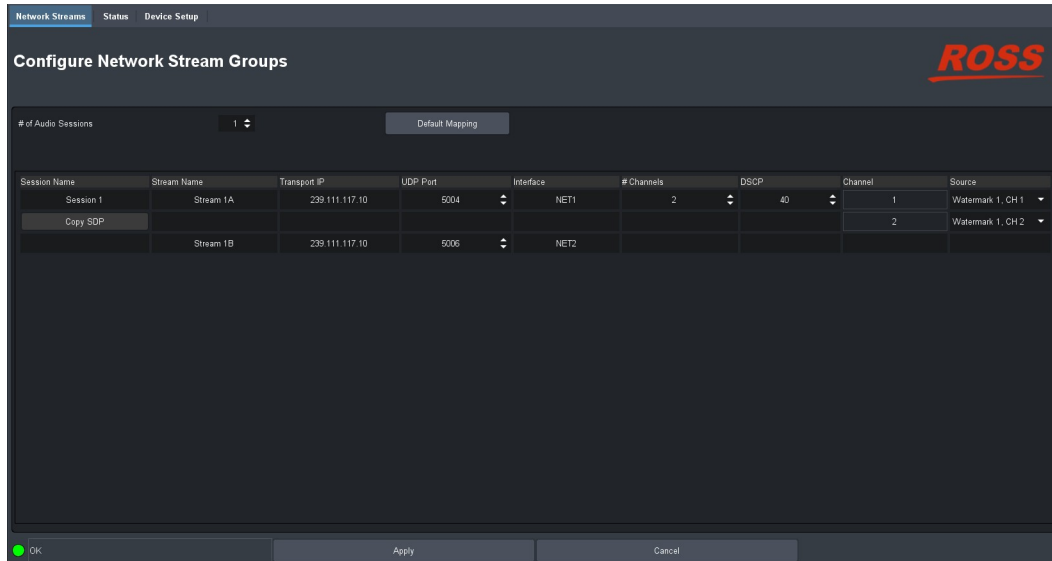
✴ Click **Default Mapping** to use the default values.

3. Use the **Name** field to assign a unique identifier to the stream.

✴ The **Name** is used to help identify the stream within your system and other tabs in the DashBoard window.

4. Use the **Transport IP** field to specify the network socket for the data for the session.

5. Use the **Port** field to specify the source port to connect to the stream. This must match the source you are attempting to connect to.

6. Use the **# Channels** field to specify the number of audio channels in the specified stream.

   The tab updates to display a row for each channel. In the example below, the # Channels field was set to 2.

7. Use the **DSCP** field to specify the Differentiated Service Code Point value for the network layer service for this session.

8. Use the **Channel** field to specify the audio channel within the network stream group you are defining.

9. To allocate an audio stream to a Watermark Encoder channel:

   a. Use the **NWE Channel** field to assign the audio stream to a Watermark Encoder output.

   b. Click **Apply** to save the new settings.

10. If your downstream network device supports the Session Description Protocol (SDP):

    a. In the **Network Streams** tab of the NWE-IP, locate the row for the network session you want to connect to the downstream device.

    b. Click **Copy SDP** to copy the settings of the NWE-IP session.

    c. Apply the copied SDP settings to the downstream device as outlined in its user documentation.

Third-Party Protocols

This chapter summarizes how the NWE-IP implements third-party protocols.

Ember+ Support

✸ NWE-IP implements BESS v1.2 for Ember+ support to communicate with third-party controllers.

Keep the following in mind when setting up an Ember+ connection with NWE-IP:

• Ensure that all network streams have a consistent audio channel count.

• Audio shuffling is not supported in Ember+ setups.

• NWE-IP supports one-to-many connections (where one source can be routed to multiple targets).

• By default, the ports are automatically assigned as 9095, 9096, 9097, and 9098.

Audio Channel Mapping for Ember+

Ember+ controls up to 16 Receiver and Senders Group, each carrying a single independent Audio session. Audio streams can be setup for redundancy using DashBoard. SDP for each Audio channel contains information for all the streams for that Source. In other words, each Group has 1-to-1 mapping with Audio sessions.

AES67 Transmitters

✸ Ember+ transmitters are labeled as Senders in DashBoard.

The Sender configuration must first be created in DashBoard to show up in the Ember+ tree under Transmitters. If a Sender Session is not configured in DashBoard, then these Audio sub-groups will contain empty SDP descriptors and any attempt to make a connection will be ignored. If a Sender is created without following the channel mapping configuration, the Ember+ tree contents will not be correct. In **Figure 14.1**, the Transmitters > Audio 1 > SDP node represents the first session that maps to audio channels 1 to 4 of the configured AES67 Sender on the NWE-IP.

```
● Transmitters
  ● Group 1
    ● Audio 1
      ● SDP
      ● GUID
    ● Audio 2
      ● SDP
      ● GUID
    ● Audio 3
      ● SDP
      ● GUID
    ● Audio 4
      ● SDP
      ● GUID
  ● Group 2
  ● Group 3
  ● Group 4
```

Figure 14.1 Ember+ Tree Example — Transmitters

AES67 Receivers

The NWE-IP supports up to 4 Groups with four Audio sessions (Audio 1-4) per Group. Because DashBoard configuration allows for flexible channel mappings, this should be configured prior to making connections with Ember+. In **Figure 14.2**, the Receivers > Group > Audio 1 > SDP corresponds to the first Group and the first Session.

```
● Receivers
  ● Group 1
    ● Audio 1
      ● SDP
      ● GUID
      ● Stream Present
      ● Stream Impaired
      ● Channels
    ● Audio 2
      ● SDP
      ● GUID
      ● Stream Present
      ● Stream Impaired
      ● Channels
    ● Audio 3
      ● SDP
      ● GUID
      ● Stream Present
      ● Stream Impaired
      ● Channels
    ● Audio 4
      ● SDP
      ● GUID
      ● Stream Present
      ● Stream Impaired
      ● Channels
  ● Group 2
  ● Group 3
  ● Group 4
```
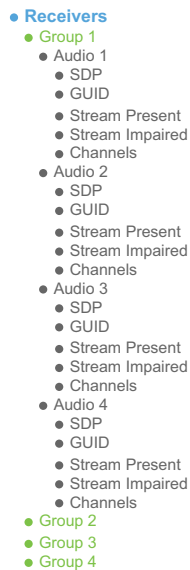
Figure 14.2 Ember+ Tree Example — Receivers

NMOS Support

This section outlines the required settings on the NWE-IP to establish communications via the Networked Media Open Specifications (NMOS).

✱ The NWE-IP supports IS-04 and IS-05.

In order for the NWE-IP to provide Receivers and Senders for NMOS, they must first be created and configured in DashBoard. You can have up to 4 instances running at one time.

Configure the AES67 Receiver on the NWE-IP

First, configure the AES67 Receiver by creating the groups and sessions desired, setting their channel mappings, and then applying. Refer to "**Configuring the AES67 Receiver**" on page 41.

✱ The AES67 Receiver must be configured and receiving data before the AES67 Sender is configured.

Enable NMOS on the NWE-IP

Now, NMOS can be enabled on the NWE-IP.

To configure the NWE-IP as a NMOS device

1. Display the NMOS interface for a Watermark Encoder channel as outlined in "**To display the NWE-IP interfaces in DashBoard**" on page 30.

   The **Node** tab is automatically selected.
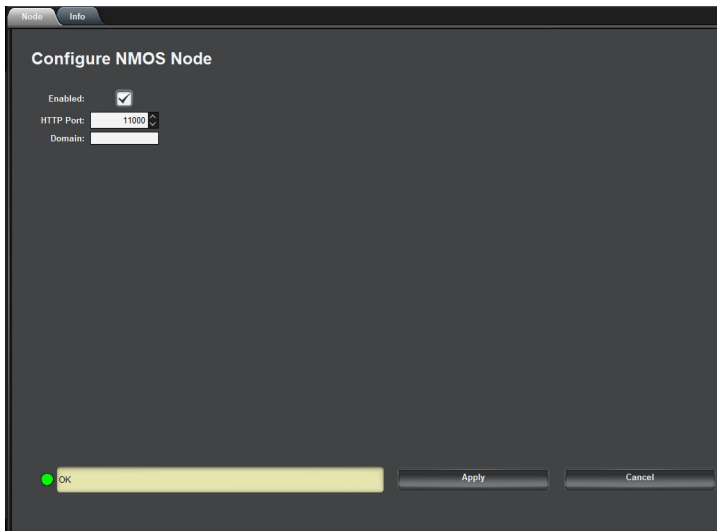
2. Use the **HTTP Port** field to specify the port on which the Node API is running on.

✱ A unique HTTP Port must be assigned to each NMOS node.

3. Use the **Domain** field to specify which domain to browse for services.

4. Select the **Enabled** box.

5. Click **Apply** to save the new settings.

Configure the AES67 Receiver through NMOS

Once the sessions are created in the AES67 Receiver, they must be configured through NMOS.

Configure the AES67 Sender on the NWE-IP

Once the AES67 Receiver is configured and is receiving data, the AES67 Sender must be configured on the NWE-IP. There will be one session automatically defined. You must configure its channel mapping, and then apply it. Refer to "**Configuring the AES67 Senders**" on page 51.

Configure the AES67 Sender through NMOS

Next, configure the AES67 Sender through NMOS.

✱ Disabling an AES67 Receiver or Sender session through NMOS will set its IP and port to 0 in DashBoard. If the NWE-IP is restarted, all sessions that were disabled must be configured for the system to function correctly again.

Upgrading the Software

The NWE-IP can be upgraded in the field via DashBoard.

To upgrade the software on the NWE-IP

1. Contact Ross Technical Support for the latest software version file.

2. Ensure the Ethernet cable is connected to the **Gb1** port on the NWE-IP.

3. From the **Tree View** in DashBoard, expand the node for the NWE-IP you want to access.

4. Double-click the Global sub-node to display the interface in the right-half of DashBoard.

5. Software upgrades and downgrades do not work in LACP mode. Ensure **LACP** is disabled before continuing with the upgrade.

6. Select **Upload**, located near the bottom of the interface, to display the **Select file Upload** dialog.

7. Navigate to the ***.bin** file you want to upload.

8. Click **Open**.

9. Click **Next >** to display the **Select Destination** menu. This menu provides a list of the compatible units.

10. Select the check box for the NWE-IP you want to upload the file to.

11. Verify the NWE-IP you want to upload the file to.

    The **Error/Warning** fields indicate any errors, such as incompatible software or product type mismatch.

12. Click **Finish**.

13. Monitor the upgrade.

    • An **Upload Status** dialog enables you to monitor the upgrade process.

    • Notice that each NWE-IP is listed in the dialog with a 🔳 button. This button is replaced with a **Reboot** button once the software file is loaded to that NWE-IP.

✶ Avoid clicking the individual Reboot buttons until all units have successfully completed the file upload process and the OK button, located in the bottom right corner of the dialog, is enabled.

14. Click **OK** to close the **Upload Status** dialog.

15. Click **Reboot** to continue the upgrade process.

✶ This **Reboot** button is located at the bottom of the DashBoard window.

    • The NWE-IP is temporarily taken off-line during the reboot process.

    • The process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.

DashBoard Interface Overview

This chapter summarizes the interfaces, and tabs available from DashBoard for the NWE-IP.

Global Interface

The Global interface enables you to define the Ethernet settings for each port on the rear panel, and define the timing requirements for your NWE-IP. The options are organized into three tabs: Ethernet, Timing, and About.
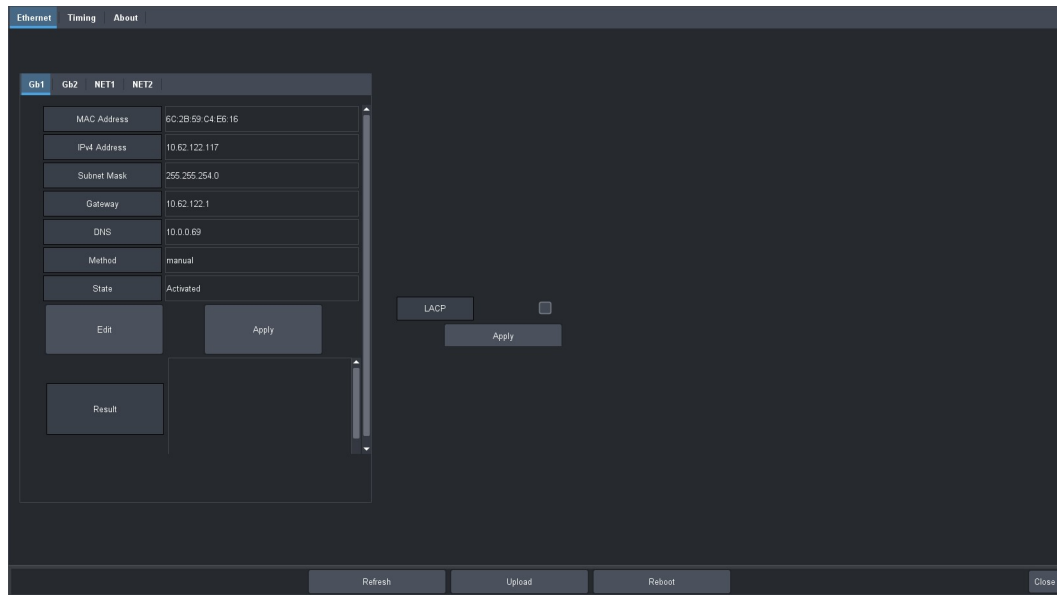
Figure 16.1 Example of the Global Interface in DashBoard

Ethernet Tab

Table 16.1 summarizes the read-only information displayed in the **Ethernet** tab.

Table 16.1 Ethernet Tab

Item	Parameters	Description
Gb#, NET#, Bond		
MAC Address	#	Specifies the unique Media Access Control (MAC) Address assigned to the NWE-IP
IPv4 Address[a]	#	Specifies the static IP Address that the users wants to manually assign to the specified NWE-IP port
	Unknown	The specified port is not configured
Subnet Mask	#	Specifies the subnet mask value for the specified port on the NWE-IP
	Unknown	The specified port is not configured
Gateway	#	Specifies the gateway for communications outside of the local area network (LAN) the specified port on the NWE-IP will use
	Unknown	The specified port is not configured

Table 16.1 Ethernet Tab

Item	Parameters	Description
DNS	#	On the Gb1 tab, this field is used to specify the IP address of the DNS server that the NWE-IP will communicate with. On the NET1 and NET 2 tabs, do not change this field from its default value of 0.0.0.0.
Method	Auto	The settings will be assigned by a DHCP server in your facility
	Manual	The user manually supplies the Ethernet settings
	Link-local	
	Unknown	The specified port is not used
	DHCP[b]	Automates the assignment of the Ethernet settings
State (read-only)	Activated	The specified port is active and is communicating with valid settings
	Disconnected	Communication to the specified port is interrupted. Verify that the settings are correct and the port is physically cabled correctly.
	Unavailable	The specified port is not active and is not configured for use
Edit	Click this button to edit the Address, Subnet Mask, gateway, and Method fields for the specified port	
Apply	Click this button to apply the new settings to the specified port	
Result (read-only)	Success	The settings are valid and applied. The specified port is now active.
	Problem: x, y	Indicates that the specified port is experiencing an error where: • **x** states the type of problem • **y** indicates the possible cause
LACP	Selected	LACP is used and both Ethernet ports are combined and portrayed as a single port in the DashBoard interface
	Cleared	LACP is not used and both Ethernet ports are portrayed individually in the DashBoard interface
Apply	Click this button to enable/disable LACP	

a. By default, the Gb1 port is assigned to port 192.168.0.100.
b. If the NWE-IP loses connection to the DHCP server, the Gb1 port is automatically set to an IP address of 169.254.0.100 (link local).

Timing Tab

Table 16.2 summarizes the fields displayed in the **Timing** tab.

Table 16.2 Timing Tab

Item	Parameters	Description
PTP Status (read-only)	OK (Green)	Communication between the NWE-IP and the Grandmaster or Master device is valid
	GM Not Found (Red)	Connection to the Grandmaster or Master device is invalid. Verify that the Domain field on the Timing tab is set to the correct value.
	Apply Changes	There are unsaved changes made to the Timing tab settings
Current Time (read-only)	#	Reports the current time as reported by your system clock
Profile	AES	Specifies that the NWE-IP timing uses the AES67 Media standard
	SMPTE	Specifies that the NWE-IP timing uses the SMPTE ST 2059-2 standards. This is the recommended setting.
	Default	Specifies that the NWE-IP timing uses the IEEE1588 Default profile standards
	Free-running	The NWE-IP automatically selects the timing profile based on the detected stream
Slave Only (read-only)	Selected	Defines the NWE-IP as a slave only device in the system; the NWE-IP cannot be used as a Grandmaster or Master device
Domain	#	Specifies that the NWE-IP is within the group of clocks in your network
Priority 1	#	Assigns the first priority level to the NWE-IP during a Grandmaster election where a value of: • 1 is the highest priority • 255 is the lowest priority This menu is applicable when the Slave Only box is not selected.
Priority 2	#	Assigns the secondary priority level to the NWE-IP during a Grandmaster election where a value of: • 1 is the highest priority • 255 is the lowest priority This menu is applicable when the Slave Only box is not selected.
Sync Interval	#	Specifies how often the NWE-IP sends Sync messages
Announce Interval	#	Specifies how often the NWE-IP sends Announce messages

Item	Parameters	Description
Announce Receipt Timeout	#	Controls how long the NWE-IP will wait before declaring the Grandmaster absent and initiating a new election
NET#		
Steps Removed (read-only)	#	Specifies the number of communication paths to the Grandmaster clock
Offset from Master (read-only)	#	Specifies the last measured time offset from the master in number of nanoseconds
Mean Path Delay (read-only)	#	Average time in nanoseconds it takes a packet to traverse end to end from the PTP master
Master Offset (read-only)	#	The last measured offset of the clock from the Master in nanoseconds
GM Present (read-only)	True	Indicates a Grandmaster is available
	False	Indicates a Grandmaster is unavailable
GM Identity (read-only)	#	Reports the ID number assigned to the Grandmaster within the system

About Tab

Table 16.3 summarizes the read-only information displayed in the About tab.

Table 16.3 About Tab

Item	Parameters	Description
Serial Number	#	The serial number assigned to this NWE-IP
Assembly Revision	#	The version of the NWE-IP hardware
Software Version	#	The software build the NWE-IP is currently running
Frame Name	<text>	Assigns a unique identifier to the NWE-IP. This name also displays in the node for the NWE-IP in the Tree View of DashBoard.
Factory Default	Click this button to reset all NWE-IP editable fields to the factory default values. This impacts all tabs except the Ethernet, Timing, and About tabs.	

AES67 Receiver Interface

The options for configuring the AES67 Receiver are organized into four tabs: Network Streams, Connections, Status, and Device Setup.

Network Streams Tab

The options in the Network Streams tab enable you to create and manage the IP sessions in your system for the AES67 Receiver. A session is defined using the Transport IP, Port, and Link Offset fields for the audio signals.
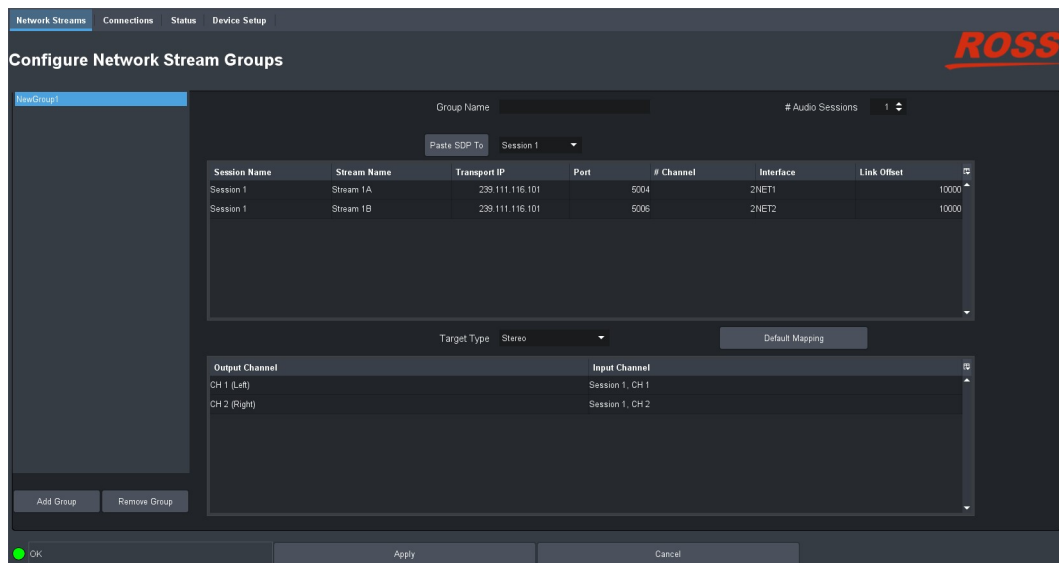
Figure 16.2 Network Streams Tab

Table 16.4 outlines the options displayed in the Network Streams tab starting from the left-most area of the tab.

Table 16.4 Network Streams Tab

Item	Parameters	Description
Configure Network Stream Groups		
List	<name>	Lists the configured groups for the NWE-IP
Add Group		Enables you to configure a new stream group
Remove Group		Deletes the selected group
Group Name	<text>	Specifies a unique identifier for the group
# Audio Sessions	#	Specifies the number of audio streams available in the stream group. The default value is 2.
Paste SDP To	<session name>	Applies the settings, copied from a device that supports the Session Description Protocol (SDP), to the specified session of the selected NWE-IP group
Interface	#	Indicates the specified port the NWE-IP is using for the AES67 Receiver streams
Stream Name	<name>	Assigns a name for the specific audio stream
Session Name	<name>	Assigns a name for the session
Transport IP	#	Specifies the network socket for the audio data for the session
Port	#	Specifies the source port to connect to the stream. This must match the source you are attempting to connect to.
# Channel	#	Specifies the maximum number of audio channels in the specified stream
Link Offset	#	Specifies the offset from the input stream to add to the output

Table 16.4 Network Streams Tab

Item	Parameters	Description
Target Type	Stereo	Specifies that the audio stream transports stereo data
	5.1 Surround	Specifies that the audio stream transports Dolby® 5.1 Surround data
	5.1 Surround and Stereo	Specifies that the audio stream transports the six channels of 5.1 Surround and two channels of stereo
Audio Channel Map		
Default Mapping		Automatically maps all incoming streams to the output streams using a 1:1 map
Output Channel	#	The options depend on the Target Type
Input Channel	#	

Connections Tab

The Connections tab is a patch-panel style interface that enables the NWE-IP to connect to the configured AES67 network stream groups to Watermark Encoder channels.
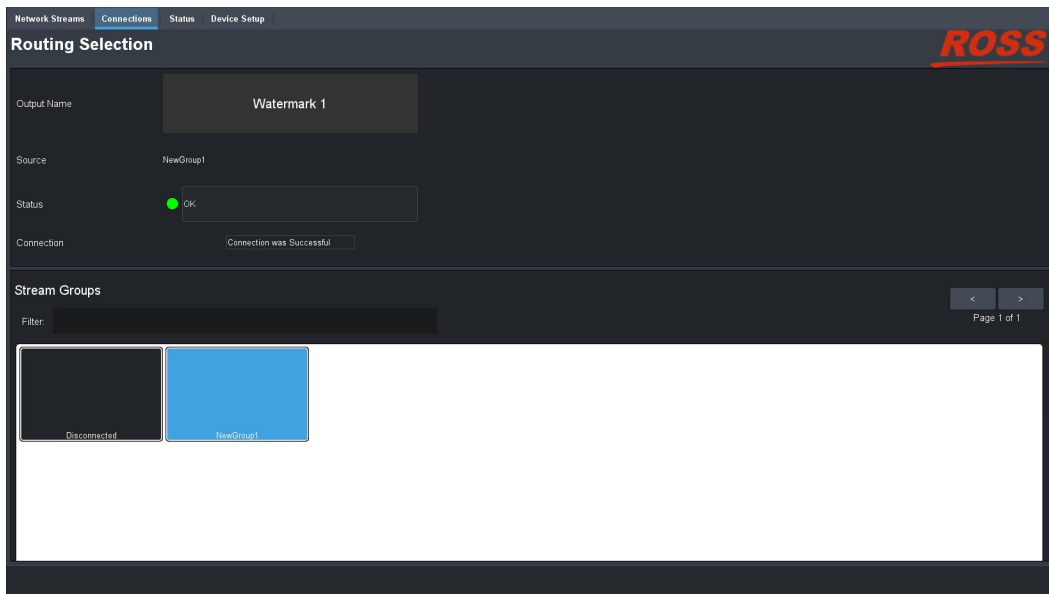
Figure 16.3 Connections Tab

Outputs Area

The Outputs area is located at the top of the Connections tab and provides options for routing signals to the Watermark outputs on the NWE-IP. From this area you can quickly select outputs and monitor the status of the output signals.

Table 16.5 summarizes the buttons, menus, and fields available in the Output area of the Connections tab.

Table 16.5 Connections Tab — Outputs Area

Item	Parameters	Description
Output Name	#	Each button represents an output that is configured and available for switching
Source (read-only)	#	Indicates the network stream currently used by the specified output. Select an Audio button to specify an audio-only receiver for a breakaway.
Status (read-only)	OK (Green)	No errors are detected on this output
	Off (Green)	This SDI output is disabled
	Alarm Suppressed (Green)	An alarm condition is present, but the alarm is disabled on the Alarm Enable tab
	Network Delay Too Big (Yellow)	The link offset selected by the user is smaller than the propagation delay of the network
	No packets received (Yellow)	The configured destination IP stream(s) is not receiving any packets; stream might not be on the network or experiencing other issues
Status (read-only)	System clock is in failure (Red)	The NWE-IP is unable to re-obtain a stable clock source. Sessions cannot be created until this condition is fixed. It is recommended to navigate to the Advanced > Timing > PTP tab to check the status of the PTP and update the Configuration settings. Once PTP is locked again, the Network Groups will need to be disconnected and then re-connected to clear the alarm.
	Param Out of Range (Red)	One of the following is occurring: • A Destination was configured with an invalid setting • Two receivers with the same network stream were created. NWE-IP can only subscribe to a stream once.
Connection (read-only)	Connection was successful	Indicates the connection status between the selected input and output
	Not in Use	
	<blank>	

Stream Groups Area

The Stream Groups area is located on the bottom half of the Connections tab. From this area you can route any source signal to an output. Each button displayed here represents a configured network stream.

✦ Once a Watermark Output is selected, clicking a **Stream Group** button performs an immediate switch (a hot-punch). In the example below, **Server10** was selected.
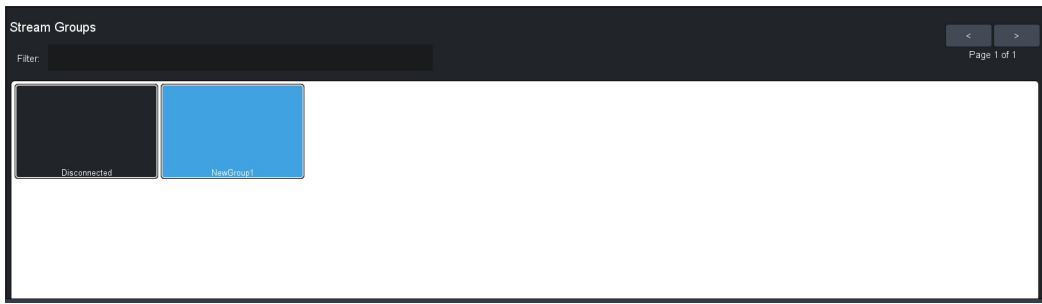
Figure 16.4 Connections — Stream Groups Area

Status Tab

Table 16.6 summarizes the read-only information displayed in the Status tab.

Table 16.6 Status Tab — Device Status

Item	Parameters	Description
Stream Status		
Session Name	<text>	Displays the unique identifier assigned to the current session
Stream Name	<text>	Displays the unique identifier assigned to the stream (as defined on the Network Streams tab)
Status	OK (Green)	The incoming stream is valid and is not experiencing errors
	Exceed Link Offset (Yellow)	The link offset selected by the user is smaller than the propagation delay of the network
	No Packet Received (Yellow)	The configured destination IP stream(s) is not receiving any packets; stream might not be on the network or experiencing other issues
	Packets Missing (Yellow)	The configured receiver IP stream(s) is not receiving any packets; stream might not be on the network or experiencing other issues
Packets Received	#	The number of packets received by the NWE-IP
Buffer Level	#	The number of packets stored in the NWE-IP buffer
Packets Lost	#	The number of packets lost by the receiver
Packets Dropped	#	The number of packets dropped by the receiver
Packets Out of Order	#	The number of packets that were received but were not in the correct order
Timestamp Mismatch	#	The number of packets with a timestamp that does not match the expected one
Net Delay	#	Specifies the detected network delay in microseconds

Device Setup Tab

Table 16.7 summarizes the read-only information displayed in the Device Setup tab.

Table 16.7 Device Setup Tab

Item	Parameters	Description
Sample Rate	#	Indicates the sample rate of the audio signal
Packet Time	#	Indicates the offset to the audio streams
Default # Channels	#	Specifies the default number of audio channel available for configuration
CODEC	#	Indicates the communication protocol used for the AES67 Receiver stream(s)
Link Offset	#	Reports the Audio Offset and/or Audio Delay values set for the output
Clock Reference	NET #	Assigns the specified port on the NWE-IP as the timing source
Streams Per Session	#	Indicates the total number of network streams that are active in the current session. The default is 2.
Version	#	The software build the Receiver component of the NWE-IP is currently running

Nielsen Watermark Encoder Interface

The Nielsen Watermark Encoder interface enables you to configure each available watermark engine.
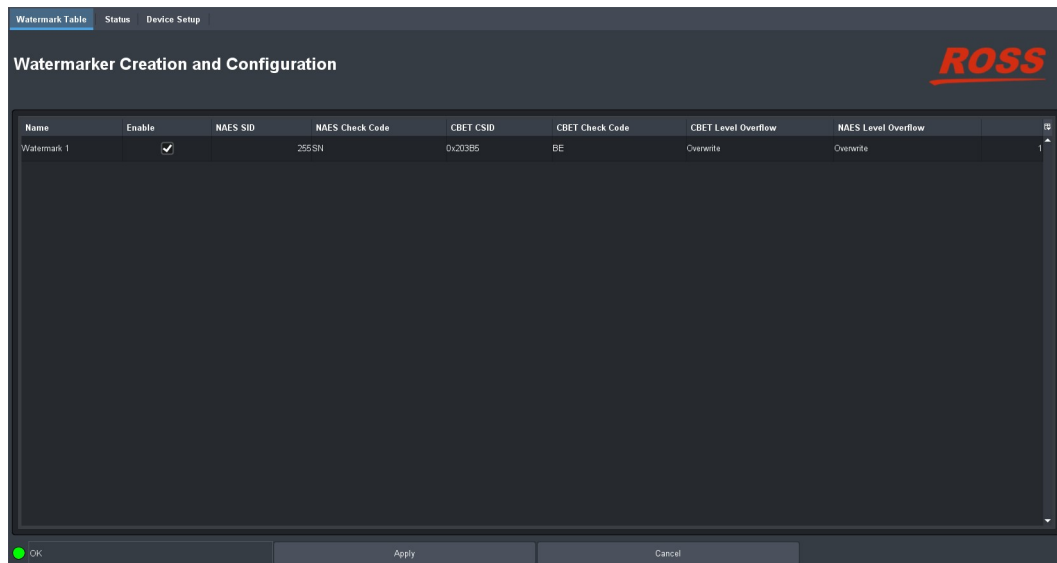

Figure 16.5 Example of the Nielsen Watermark Encoder Interface in DashBoard

Watermark Table Tab

Table 16.8 summarizes the information displayed in the Watermark Table tab.

Table 16.8 Watermark Table Tab

Item	Parameters	Description
Name	<text>	Specifies a unique name for the watermark output stream
Enable	Selected	Enables the specified watermark encoder output and makes it available on the AES67 Receiver > Connections tab
	Cleared	Disables this output
NAES SID	#	Specifies the Source Identification Number (SID) that is assigned by Nielsen. This field is case sensitive and your must enter the characters in upper case.
NAES Check Code		Specifies the Check Code for the specific Source Identification Number (SID) that was entered. This field is case sensitive and your must enter the characters in upper case.
CBET CSID		Specifies the Critical Band Encoding Technology (CBET) Source Identification Number (SID) that is assigned by Nielsen to this NWE-IP. This field is case sensitive and your must enter the characters in upper case.
CBET Check Code		Specifies the Check Code for the specific CBET value assigned by Nielsen to this NWE-IP. This field is case sensitive and your must enter the characters in upper case.
CBET Level Overflow	Refrain	Select this option to not encode the NWE-IP CBET CSID data when incoming data is present, and only transmit the incoming data. This should only be selected under the guidance of Nielsen.
	Overwrite	Select this option to encode the NWE-IP CBET CSID data regardless of the presence of incoming data
NAES Level Overflow	Refrain	Select this option to not encode the NWE-IP NAES SID data when incoming data is present, and only transmit the incoming data. This should only be selected under the guidance of Nielsen.
	Overwrite	Select this option to encode the NWE-IP NAES SID data regardless of the presence of incoming data

Status Tab

Table 16.9 summarizes the information displayed in the Status tab.

Table 16.9 Status Tab

Item	Parameters	Description
Status (read-only)	OK (Green)	The Check Code is validated for the SID and watermarking is operating correctly
	Off (Yellow)	One of the following has occurred: • The Watermark output is not enabled • No audio streams are assigned
	Orchestrating (Yellow)	The NWE-IP is attempting to watermark the output
	Invalid SDI and/or CSID Check Code (Red)	An incorrect Check Code was entered for the specified SID or CSID
Watermarker Name	\<text\>	Indicates the unique identifier for the specific watermark output stream

Device Setup Tab

Table 16.10 summarizes the options displayed in the Device Setup tab.

Table 16.10 Device Setup Tab

Item	Parameters	Description
Watermark Type	NAES/CBET	The NWE-IP uses both NAES and CBET for watermark encoding. This is the default.
	NAES	The NWE-IP applies the NAES values for watermark encoding. Entries made to the CBET fields on the Watermark Table tab will be ignored.
	CBET	The NWE-IP applies the CBET values for watermark encoding. Entries made to the NAES fields on the Watermark Table tab will be ignored.
Code Type	Final Distributer	Specifies that your facility is the final station or network in the program distribution chain
	Program Content	Specifies that your facility is the broadcast network or syndicate in the program distribution chain
Time Zone	#	Specifies the time zone your facility is located in
Version	#	The software build the watermark encoder of the NWE-IP is currently running

AES67 Sender Interface

The AES67 Sender interface provides options for configuring the network streams for the AES67 senders.
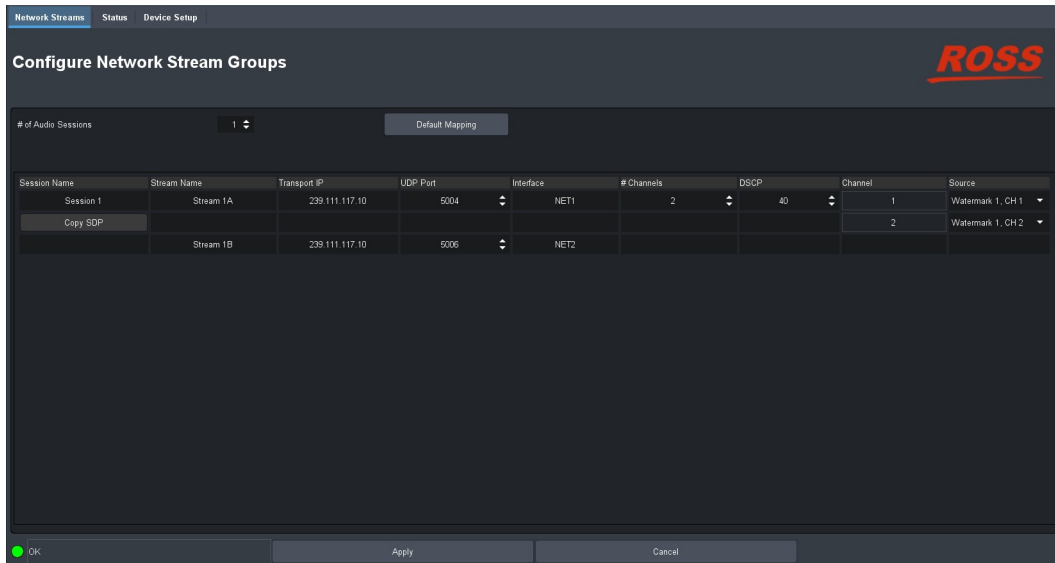
Figure 16.6 Example of the AES67 Sender Interface

Network Streams Tab

Table 16.11 summarizes the options displayed in the Network Streams tab.

Table 16.11 Network Streams Tab

Item	Parameters	Description
# of Audio Sessions	#	Specifies the number of audio sessions for the AES67 Sender. The Network Streams tab updates automatically to provide options for configuring each stream independently.
Default Mapping		Applies a default audio mapping of 1:1 where: • Target 1-8 is mapped to A1-A8 • Target 9-16 is mapped to B1-B8 etc.
Session Name	<text>	Specifies a unique name for the Sender session
Copy SDP	<session name>	Copies the Session Description Protocol (SDP) settings of the specified NWE-IP session. These settings can then be applied to a downstream device to establish communications via SDP.
Stream Name	<text>	Specifies a unique name for the AES67 stream
Transport IP	#.#.#.#	Specifies the network socket for the audio data for the session
UDP Port	#	Specifies the source port to connect to the advertised stream. This must match the source you are attempting to connect to.
Interface	NET#	Specifies the physical port on the NWE-IP that is used for the stream

Item	Parameters	Description
# Channels	#	Specifies the maximum number of audio channels in the specified stream
DSCP	#	Specifies the Differential Service Code Point value for the network layer service for this stream
Channel (read-only)	#	Assigns a channel ID to the stream
NWE Channel	<blank>	The specified stream is not assigned to an output of the NWE-IP
	Output #, CH #	Assigns the audio stream to a watermark engine of the NWE-IP

Status Tab

Table 16.12 summarizes the read-only information displayed in the Status tab.

Table 16.12 Status Tab

Item	Parameters	Description
Stream Name	<text>	Displays the unique identifier assigned to the specified AES67 stream
Packets Sent	#	Specifies the number of packets sent on the output for the specified stream
Buffer Level	#	The number of packets stored in the NWE-IP buffer for the specified stream
Buffer Underrun	#	Specifies the number of under runs of the sender buffer
Packets Lost	#	The number of packets lost by the specified stream
Session Name	<text>	Reports the unique name for the Sender session
Timestamp Mismatch	#	The number of packets the AES67 Sender receives with an unexpected timestamp

Device Setup Tab

Table 16.13 summarizes the read-only information displayed in the Device Setup tab.

Table 16.13 Device Setup Tab

Item	Parameters	Description
Packet Time	#	Adds an offset to the audio streams if you suspect the audio packets may be received out of order or delayed.

This impacts all connected audio stream. It is recommended to set the Packet Time before configuring your network streams. |
| Default # Channels | # | Defines the default number of audio channels available for configuration. You can still specify a value other than the default for each individual stream. |

Table 16.13 Device Setup Tab

Item	Parameters	Description
TTL (Time to Live)	#	The number of frames the data packets are kept before included in the sender session. The default is 1.
CODEC (read-only)	L24	Specifies the Real-time Transport Protocol (RTP) the NWE-IP uses for delivering audio over the network
	L16	
RTP Payload Type	#	Indicates the Payload Type in the RTP header
Latency (microseconds)	#	The number of microseconds between when the packet was received on the AES67 Receiver stream and when it was sent out on the AES67 Sender stream
AES67 Timestamp Adjustment	#	The number of microseconds to adjust the timestamp of the output packets. It is recommended to set this value to one that is at least 2000ms less than the value reported in the **Latency** field.
Clock Reference	NET#	Indicates the physical port on the NWE-IP that is used as the timing source
Streams Per Session	#	Indicates the total number of network streams that are active in the current session. The default is 2.
Version (read-only)	#	The software build the Sender component of the NWE-IP is currently running

NMOS Interface

The NMOS interface provides options for configuring communications via the Networked Media Open Specifications (NMOS).

Figure 16.7 Example of the NMOS Interface

Node Tab

Table 16.14 summarizes the options displayed in the Node tab.

Table 16.14 Node Tab

Item	Parameters	Description
Configure NMOS Node		
Enabled	Selected	NMOS is enabled
	Cleared	Disables this feature
HTTP Port	0 to 65535	Specifies the port on which the Node API is running on
Domain	<text>	Specifies which domain to browse for services. When this field is blank, the NWE-IP uses the default domain. Specify local to explicitly select mDNS.

Technical Specifications

This chapter provides technical information for the NWE-IP.

✱ Specifications are subject to change without notice.

Gb1 Specifications

✱ The Gb2 port is not implemented.

Table 17.1 Technical Specifications — Gb1

Item	Specifications
Standards Accommodated	1000 BASE T
Connector Type	RJ45

NET1, NET2 Specifications

Table 17.2 Technical Specifications — NET1

Item	Specifications
Standards Accommodated	1000 BASE T
Connector Type	RJ45

USB Port Specifications

Table 17.3 Technical Specifications — USB Port

Item	Specifications
Connector Type	USB3.0

Environment

Table 17.4 Technical Specifications — Environment

Item	Specifications
Maximum ambient temperature	40°C (104°F)

Power

Table 17.5 Technical Specifications — Power

Item	Specifications
Power supply	350W per power supply
Maximum Power Consumption	700W

Service Information

Routine maintenance to this Ross product is not required. In the event of problems with your product, the following basic troubleshooting checklist may help identify the source of the problem. If the NWE-IP still does not appear to be working properly after checking all possible causes, please contact the Technical Support department at the numbers listed under the **"Contacting Ross Video Technical Support"** on page 12.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the NWE-IP, and any associated peripheral equipment for signs of trouble.

2. **Power Check —** Inspect the power indicator LED on the chassis for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. If the power LED is still not illuminated, replace the power supply with one that is verified to work.

3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.

4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.

5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

Warranty and Repair Policy

The NWE-IP is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of THREE (3) years from the date of shipment from our factory. In the event that your NWE-IP proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this NWE-IP has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the THREE (3) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This User Manual provides all pertinent information for the safe installation and operation of your NWE-IP. Ross Video policy dictates that all repairs to the NWE-IP are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your NWE-IP, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your NWE-IP. If required, a temporary replacement NWE-IP will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Glossary

The following terms are used throughout this guide:

5.1 — refers to 5.1 surround sound.

Basic Tree View — refers to the area located to the far left of the DashBoard window. This area displays devices in a tree structure. When you launch DashBoard, all DashBoard Connect compatible devices on the same network are auto-detected by default.

CBET — Critical Band Encoding Technology

Check Code — The check digit is a 2-byte string of upper-case alphabetic characters assigned to a specific Source ID. The application must present the correct check-digit string to the watermark encoder in order to use the SID / CSID as a watermark component.

CSID — CBET Source Identification (CBET Media Code). Nielsen assigns one or more CSIDs (CBET Source Identification) to each content provider or distribution source. Included as a component of each watermark, the CSID uniquely identifies the distribution source.

DashBoard — refers to the DashBoard Control System.

Decoder — An application that decodes an audio stream and reports on Nielsen codes that it finds in the audio stream such as a SID

Device View — refers to the area located to the far right of the DashBoard window. This area typically displays tabs that include menus and options for control and monitoring an openGear Connect compatible devices.

DHCP — refers to Dynamic Host Configuration Protocol.

DST — refers to Daylight Saving Time.

Final Distributor (FD) Code — FD watermarks are assigned to local broadcast affiliates or to cable network content. Typically, it specifies that your facility is the final station or network in the program distribution chain.

LACP — refers to Link Aggregation Control Protocol.

LTC and **Timecode** — refer to Linear Timecode unless otherwise noted.

NAES — refers to Nielsen Audio Encoding System.

NTP — refers to Network Time Protocol.

Operator and **User** — refer to the person who uses the NWE-IP.

Overwrite Mode — This mode specifies whether the watermarker overwrites existing audio codes of the same type as the watermark that is currently proposed for insertion.

Program Content (PC) Code — Typically, PC watermarks are assigned to syndication content or to content providers (i.e. broadcast networks, etc.). It specifies that your facility is the broadcast network or syndicate in the program distribution chain.

Refrain Mode — Pre-existing watermarks are left intact; new watermarks are inserted only in portions of the audio stream where there are no pre-existing watermarks.

SID — Source Identification. Nielsen assigns one or more SIDs (Source Identification) to each content provider or distribution source. Included as a component of each watermark, the SID uniquely identifies the distribution source.

Watermark — Also referred to as an audio code, a watermark is a sequence of bits that the Nielsen Watermark software inserts periodically in an audio stream. The components of the watermark (SID, timestamp, and distribution type) uniquely identify the portion of audio from which the watermark is extracted and the distribution source to which the audio content can be credited.

Watermarking Level — Identifies the type of watermark. See Program Content (PC) or Final Distributor (FD).