



Broadcast Audio Processor User Guide

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2. Make Cool Practical Technology
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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.)*

BAP • User Guide

- Ross Part Number: **3900DR-404-04**
- Release Date: November 16, 2023.
- Software Version: 1.1.4

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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 numérique de la classe "A" est conforme à 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.

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Introduction

This guide covers the installation, configuration, and use of the Broadcast Audio Processor (BAP). The following chapters are included:

- **“Introduction”** summarizes the guide and provides important terms, and conventions.
- **“Before You Begin”** summarizes the features of the BAP.
- **“Integration Example”** provides an example of how to configure the BAP.
- **“Hardware Overview”** presents information on the BAP hardware.
- **“Physical Installation”** provides additional information for installing the BAP, and DashBoard before you can proceed to cabling and configuring your BAP.
- **“Cabling”** outlines how to connect to your facility network, and peripheral devices.
- **“Initial Connection”** provides instructions for configuring the initial IP address for the BAP.
- **“Using DashBoard”** provides instructions for launching DashBoard, and accessing the BAP interfaces in DashBoard.
- **“Updating the Network Settings”** provides instructions for configuring the Gb1 port of the BAP for communication with your facility network.
- **“Configuring the Timing Settings”** outlines how to set up communications to an NTP Server and specify the local timezone for the BAP.
- **“Specifying the Video Format”** outlines how to configure the input and output video formats for the BAP.
- **“Channel Mapping”** to apply the default audio channel map or assign the channels as required by your system.
- **“Real-Time Loudness Leveling”** summarizes the steps to configure the Dolby® Real-Time Loudness Leveling (RTLL) feature.
- **“Verance Watermarker Setup”** outlines the steps required to configure and enable the Verance Watermarker (VP1) for the BAP.
- **“Nielsen Watermarker Setup”** outlines the steps required to configure and enable the Nielsen watermark encoder channels.
- **“Configuring the Dolby® Encoders”** outlines the steps required to configure a Dolby® encoder channel for an SDI output.
- **“Outputting PCM Data”** summarizes how to configure the BAP to embed PCM data for a path.
- **“Third-Party Protocols”** summarizes how the BAP implements third-party protocols such as the REST API.
- **“Upgrading the Software”** provides instructions on how to upgrade the BAP software via DashBoard.
- **“DashBoard Interface Overview”** summarizes the menus and parameters of the BAP tabs in DashBoard.
- **“Technical Specifications”** provides the specifications for the BAP.
- **“Service Information”** provides information on the warranty and repair policy for your BAP.
- **“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 BAP:

- ***DashBoard User Manual***, Ross Part Number: 8351DR-004

- **BAP 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>

Contacting Verance Technical Support

- **Support:** (+1) 866-VERANCE
- **E-mail:** support@verance.com
- **Website:** <http://www.verance.com>

Before You Begin

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

Overview

The BAP combines Nielsen® Watermarking, Verance Watermarking (VP1), Dolby® Loudness Leveling and Dolby Digital®/Dolby Digital Plus® Encoding on COTS hardware. The Broadcast Audio Processor is your versatile play-out application based on softGear™ micro-service architecture running on commercial-off-the-shelf hardware.

Figure 1 provides a general functional block diagram of the BAP.

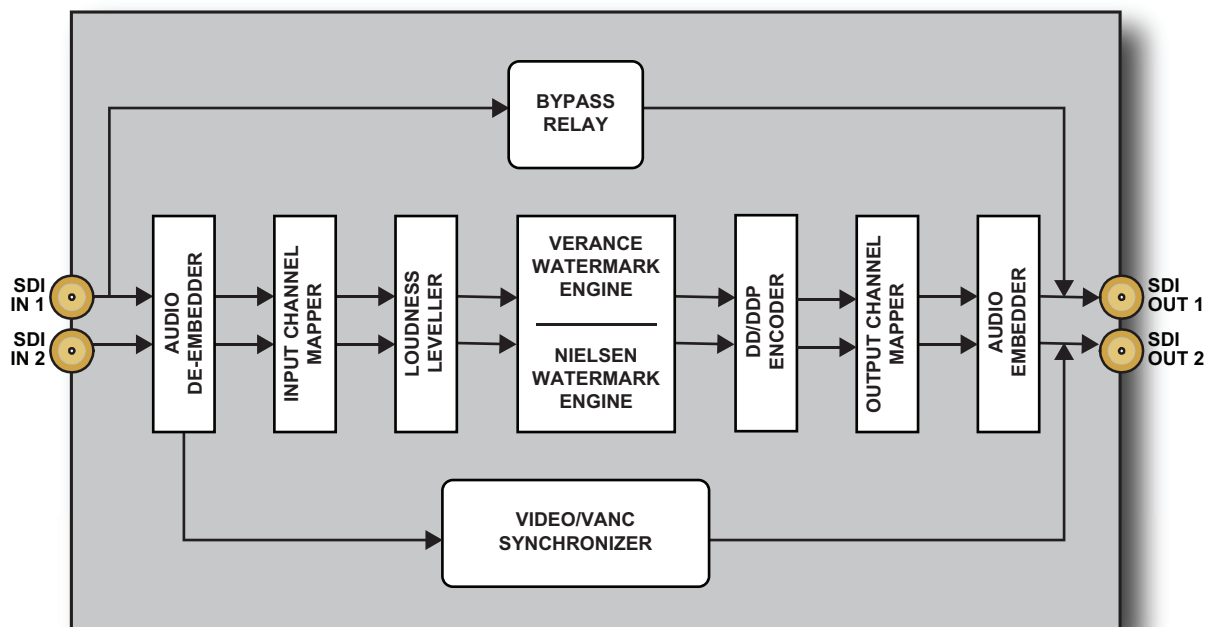


Figure 1 Functional Block Diagram

Features

The BAP includes the following features:

- Based on softGear™ OS-level virtualization technology
- Provides 8 independent Nielsen® watermark engines for reliable audience measurements
- Provides 8 independent Verance VP1 watermark encoders
- Ability to provide multiple independent Dolby Digital® or Dolby Digital Plus® 5.1 and 2.0 work-flows
- Dolby Digital or Dolby Digital Plus encoding configurable to 2.0 and/or 5.1 processing modes
- Independent software bypass, with fixed delay, for Dolby RTLL®, Nielsen® Watermarking, Verance Watermarking, and Dolby encoding
- Support for multiple concurrent audio processing paths with up to 32 channels

- On-demand audio shuffling for channel mixing on input and output
- BS-1770 real time loudness leveler for automatic and intelligent loudness processing, and true peak limiting
- Intuitive control and monitoring via DashBoard
- Hardware relay bypass (automatic on loss of power) for all processing

Channel Mapping Overview

The BAP organizes the audio channels into paths. (**Figure 2**) Each SDI has four paths with the following default channel mapping:

- Path 1 includes channels 1-6
- Path 2 includes channels 7-8
- Path 3 includes channels 9-14
- Path 4 includes channels 15-16

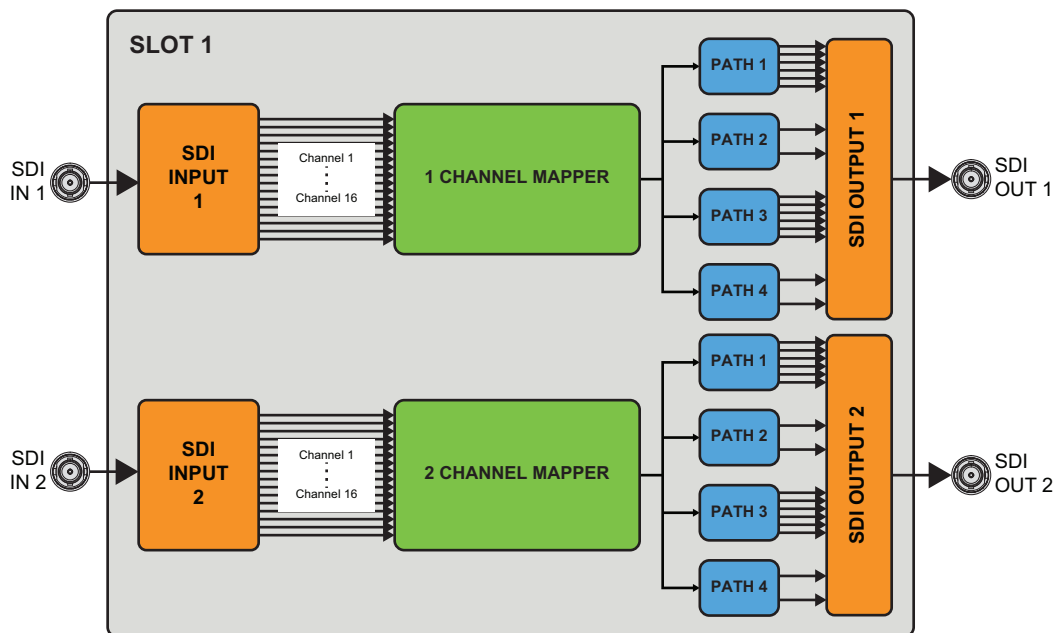


Figure 2 Channel Mapping Flow Diagram

For More Information on...

- the DashBoard interfaces, refer to **"Using DashBoard"** and **"DashBoard Interface Overview"**.
- how to map the audio channels, refer to **"Channel Mapping"**.

Dolby Encoder Work-flow Overview

The Dolby Encoder feature enables you to specify if a path is encoded using Dolby Digital or Dolby Digital Plus. You also have the option to bypass the encoder and configure the paths to output PCM data instead.

Embedding Dolby Digital or Dolby Digital Plus Data

You can configure the BAP to embed Dolby Digital or Dolby Digital Plus, using the options available in DashBoard.

The encoded audio and metadata are carried together as a data stream on two regular digital AES3 audio channels. When the Dolby encoder is enabled for an SDI path, the encoded audio always occupies a two channel-pair even if the encoded audio is more than two channels. (**Figure 3**)

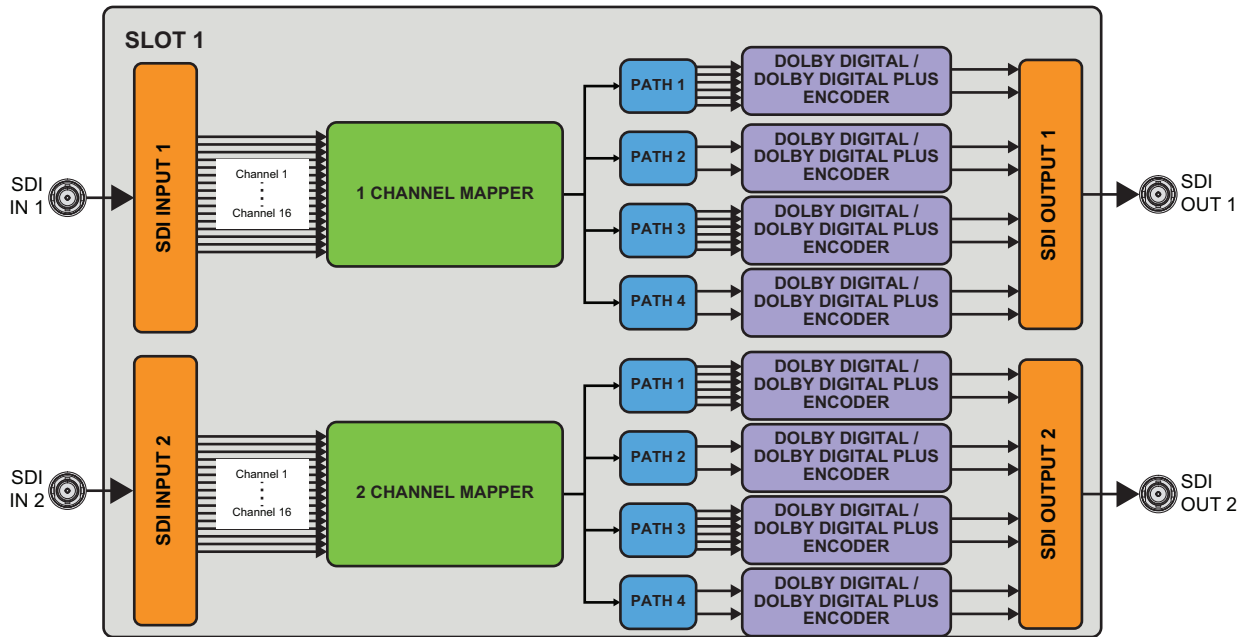


Figure 3 Example of Work Flow with Dolby Encoding Enabled

Embedding PCM Data

To output PCM data on a path, set the Dolby encoder for that path to bypass. When the Dolby encoder is bypassed, the number of channels in the path is not altered. **Figure 4** shows SDI IN 1 > PATH 1 and SDI IN 2 > PATH 3 with bypass enabled.

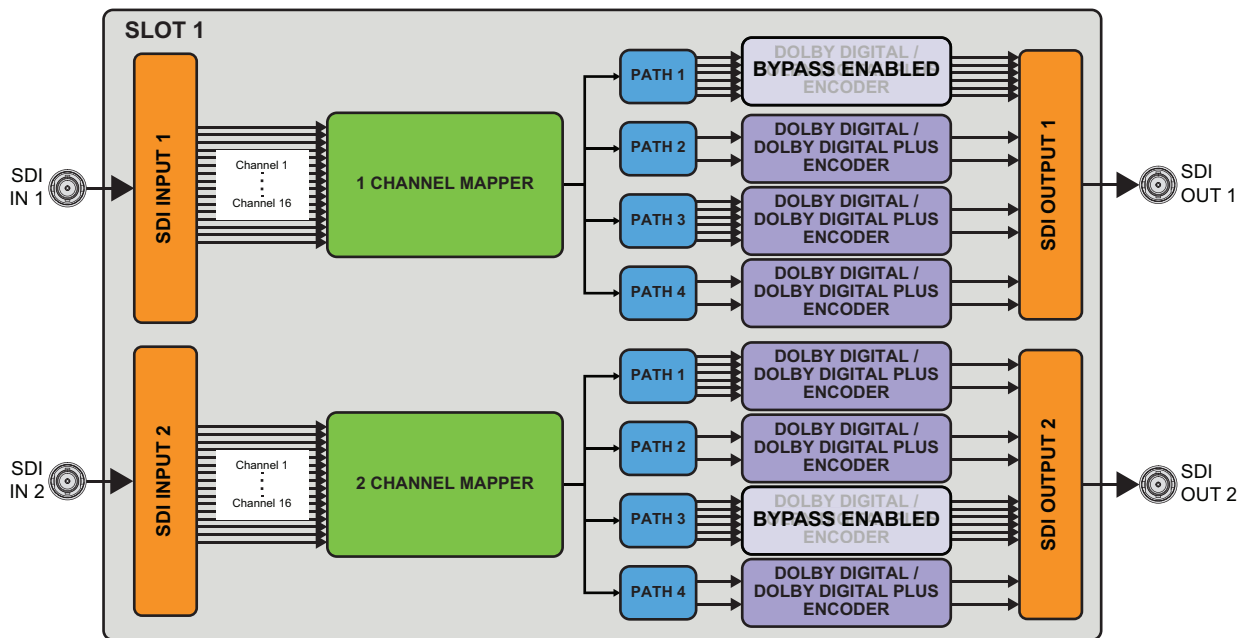


Figure 4 Example of a Work Flow with PCM Data on Two Paths

DashBoard Interfaces

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

For More Information on...

- displaying the DashBoard interfaces, refer to **"Using DashBoard"**.

Planning the Installation

Before inserting the BAP into your program path, determine if this replaces a current hardware solution or will be used for a new service.

Verance Watermarking

If this will be used for a new service or distribution path, you will need to obtain a Verance activation code from Verance. To ensure that the coding remains in the audio signals, the BAP should be downstream of any equipment that may strip or modify audio.

- ★ Contact Verance to obtain an activation code for your BAP unit and provide them with the MAC address. The MAC address is displayed in the Verance Watermarker > MAC Address field in DashBoard.

Nielsen Watermarking

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 BAP.

To ensure that the coding remains in the audio signals, the BAP should be downstream of any equipment that may strip or modify audio. Contact Nielsen if you are unsure about the proper system installation.

Configuration Overview

Figure 5 provides a generalized work-flow of configuring your BAP.

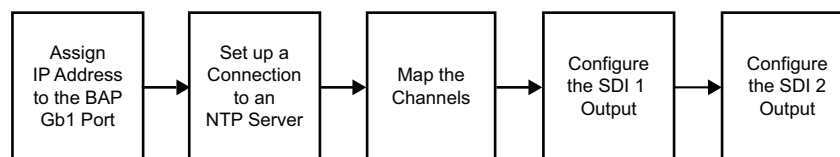


Figure 5 Configuration Work-flow

Integration Example

The Broadcast Audio Processor (BAP) is your versatile play-out application based on softGear™ micro-service architecture running on commercial-off-the-shelf hardware. softGear's flexible architecture is designed to accommodate your current and future audio needs by allowing additional processing blocks as required. The BAP offers a robust, standalone solution with transmission path protection that allows you to integrate with any playout system. As a result, you can customize your automation, master control, and graphics engine.

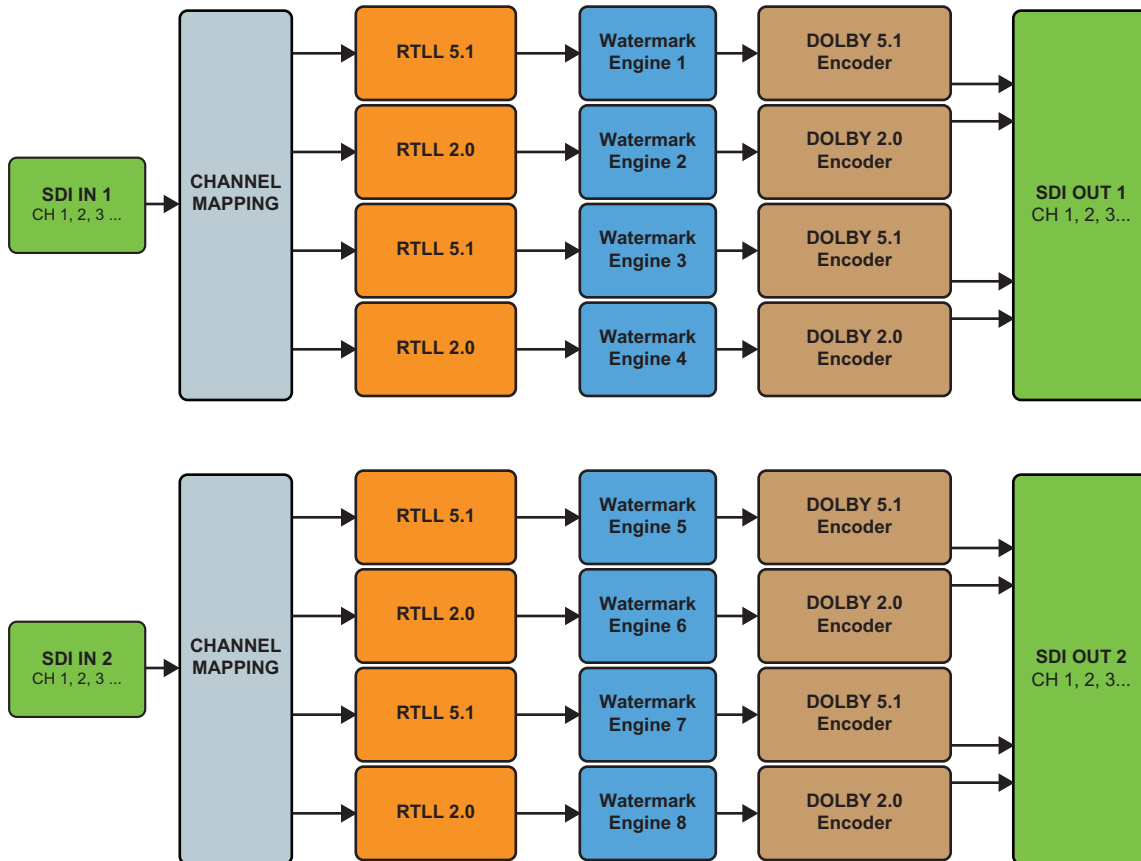


Figure 6 BAP System Work-flow

Basic Physical Setup

The user needs to physically install the BAP and ensure the following tasks are performed:

1. Physically install the BAP in a rack frame. Refer to the **BAP Quick Start Guide**.
2. Cable the Ethernet connection. Refer to “**Connecting to your Facility Network**”.
3. Connect the two power ports. Refer to “**Connecting the Power Supplies**”.

Configure the Initial Network Settings

Next the user connects the BAP 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 BAP.

This step requires that the user configure the initial network settings for the BAP as outlined in the chapter “**Initial Connection**”.

An overview of accessing the BAP in DashBoard is provided in the chapter **“Using DashBoard”**. For information on the tabs, menus, and parameters available in Dashboard, refer to **“Dashboard Interface Overview”**.

Connect to an NTP Server

Once the user can successfully access the BAP in DashBoard, the next step is to establish a connection to an NTP Server. The BAP requires an accurate time reference, in order to ensure correct watermarking and crediting.

Specify the Local Time Zone

It is recommended to specify the time zone that the BAP unit is physically located in. This also helps ensure an accurate time reference.

Configure the SDI Outputs

The next step is to configure each SDI output independently. The following steps are required for each SDI output:

1. Map the audio channels from SDI Inputs to each path. Refer to **“Channel Mapping”**.
2. Map the SDI output paths. Refer to **“Mapping the Paths to an SDI Output”**.
3. Configure the Real-Time Loudness Leveling settings. Refer to **“Real-Time Loudness Leveling”**.
4. Configure the Watermark Channels.
 - Refer to **“Verance Watermarker Setup”**.
 - Refer to **“Nielsen Watermarker Setup”**.
5. Configure the Dolby® Encoder Channels. Refer to **“Configuring the Dolby® Encoders”**.

Hardware Overview

This chapter presents information on the BAP hardware.

Front Panel Overview

This section provides a general overview of the features of the BAP front panel.

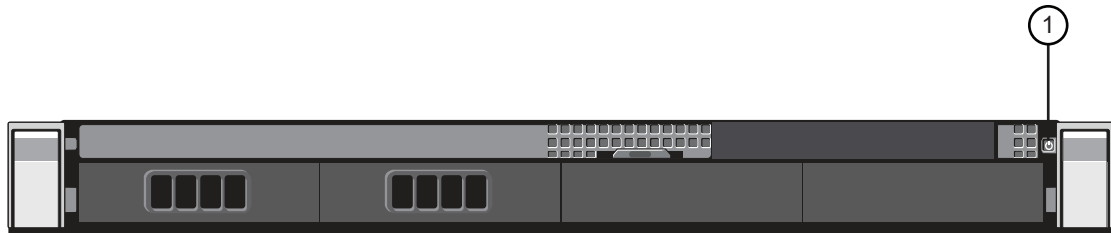


Figure 7 BAP — Front Panel (Door Removed)

1. POWER Button

This is the main power button for the BAP.

Rear Panel Overview

This section provides an overview of the connections and cabling designations for the BAP rear panel.

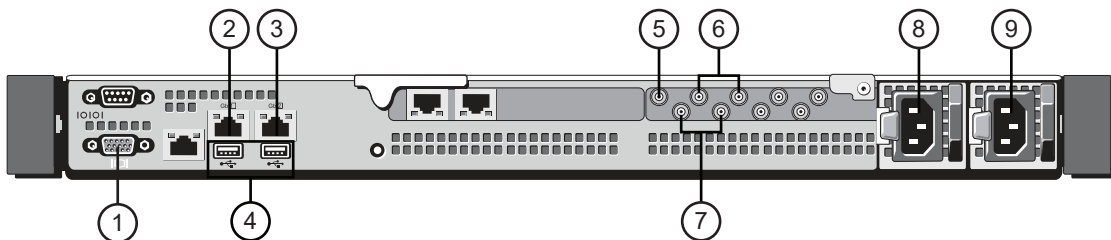


Figure 8 BAP — Rear Panel

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 BAP 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-TX RJ45 connector is used to connect the BAP to your facility network. This connector is required to bridge the external Ethernet network to the local communication bus for monitoring and controlling the BAP 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 have a need to verify the BAP static IP address outside of DashBoard.

5. REF IN BNC

This BNC provides an analog reference input connection.

6. SDI OUT BNCs

There are two SDI OUT BNCs (OUT 1, OUT 2).

7. SDI IN BNCs

There are two SDI IN BNCs (IN 1, IN 2).

8,9 Power Supplies

The BAP comes standard with two power supplies.

Physical Installation

This chapter provides additional information for installing the BAP.

Installing the BAP in a Rack Frame

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

Connecting to a Network

The BAP is connected to your network via the **Gb1** port on the rear panel. The **Gb1** port enables the BAP to interface with other devices in your facility (such as an NTP server), and the computer running the DashBoard client.

★ The **Gb2**, **NET1**, and **NET2** ports are not implemented at this time.

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 BAP.

★ If difficulties or problems are experienced when connecting the BAP 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

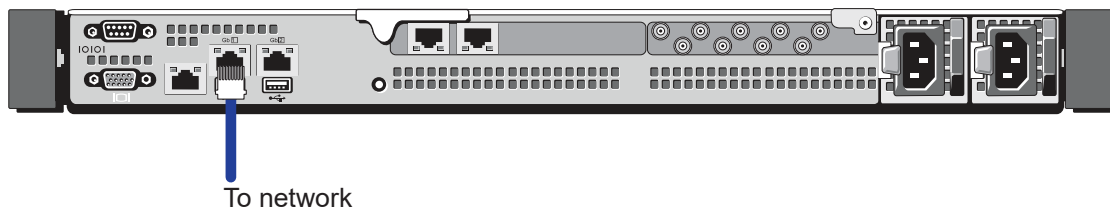
★ You will need to ensure that the BAP is on the same network as your DashBoard client computer.



Notice — The BAP requires a valid network connection before powering on. Failure to do so may cause communication errors.

To connect the BAP to your facility network

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



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.*

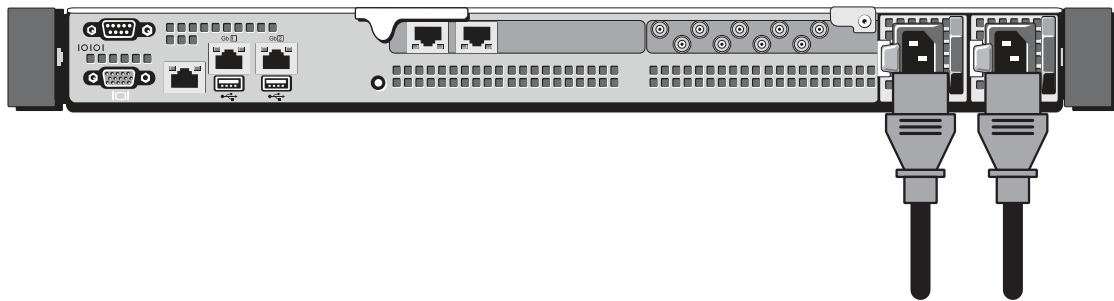
The power supply plugs into the right-hand section of the BAP rear panel. The universal power supply supports all worldwide AC power voltages, and no power adjustments are required.

To connect the BAP 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.



3. Connect each supplied power cable's three-prong male connector to an AC outlet.
4. Power on the BAP by pressing the **POWER** button on the front panel. Refer to "**Front Panel Overview**" for the location of this button.

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

Cabling

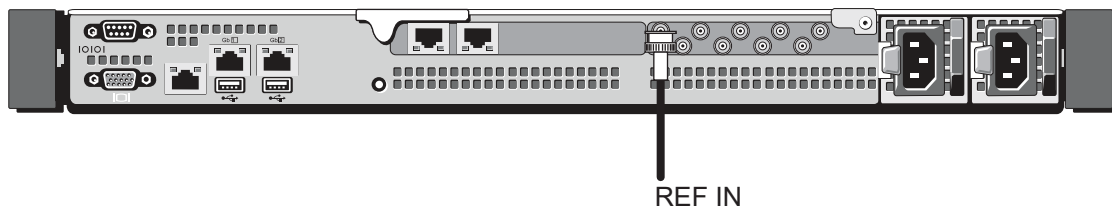
If you have questions pertaining to the installation of BAP, contact us at the numbers listed in **“Contacting Ross Video Technical Support”**. Our technical staff is always available for consultation, training, or service.

Connecting a Reference Source to the BAP

The BAP rear panel also includes a **REF IN** HD-BNC that can connect to a blackburst reference source.

To connect a reference source to the BAP

1. Connect one end of a cable to the **REF IN** HD-BNC on the BAP rear panel.
2. Connect the other end of the same cable to the applicable output port on the external reference source device.



Video Signal Cabling

The BAP provides connections for two SDI inputs and two SDI outputs.

SDI Inputs

Connect your input video signals to the SDI IN HD-BNCs on the rear panel as required. **(Figure 9)**

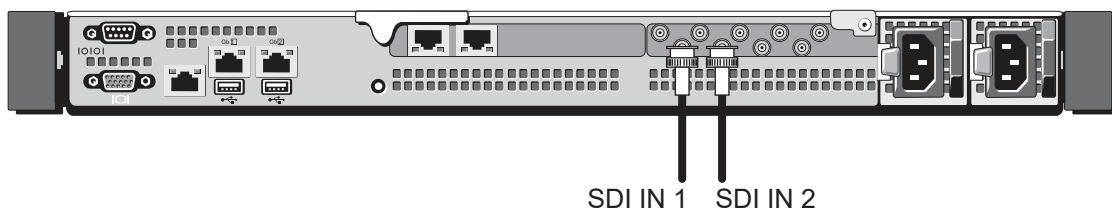


Figure 9 BAP Cabling — SDI Inputs

SDI Outputs

Connect your destination devices to the SDI OUT HD-BNCs on the rear panel as required. **(Figure 10)**

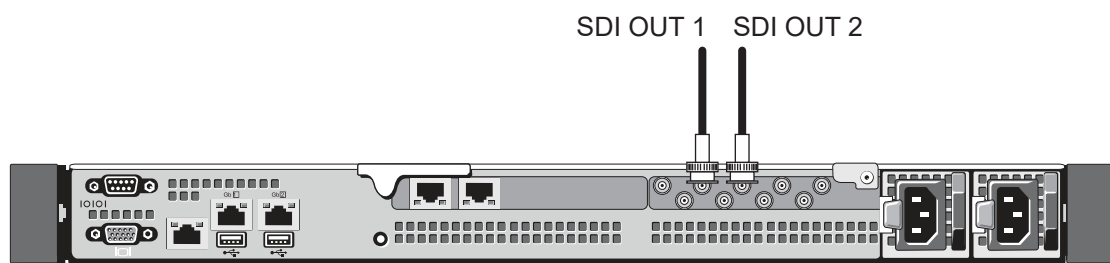


Figure 10 BAP Cabling — SDI Outputs

Initial Connection

The BAP is configured and operated via its interfaces in DashBoard. Once the BAP is physically installed and connected to your facility network, you must manually add the BAP to the Tree View in DashBoard.

- ★ If you have questions pertaining to the operation of BAP, 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.

Physical Connections to the BAP

Before configuring the initial network settings of the BAP, you must:

- physically connect the BAP to your network. Refer to “**Connecting to a Network**”.
- power on the BAP. Refer to “**Connecting the Power Supplies**”.

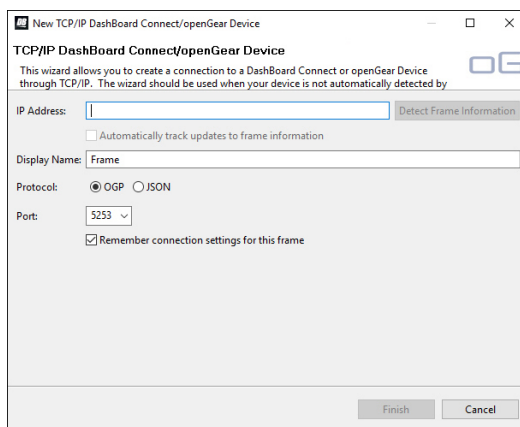
Manually Adding the BAP to the DashBoard Tree View

The Tree View lists all DashBoard Connect devices that the DashBoard client can communicate with. The BAP does not automatically display the DashBoard Tree View. You must manually add it to the Tree View.

To manually add the BAP to the Tree View in DashBoard

1. Ensure that you are running DashBoard software version 9.2 or higher.
2. Launch DashBoard by double-clicking its icon on your computer desktop.
3. From the main toolbar in DashBoard, select **File > New > TCP/IP DashBoard Connect or openGear Device**.

The **New TCP openGear Frame Connection** dialog opens.



4. In the **IP Address** field, enter the default IP Address of 192.168.0.100.
5. Click **Detect Frame Information**.
- ★ If you wish to assign a unique name for the BAP, enter it in the **Display Name** field.
6. Click **Finish** to close the dialog.

The BAP node displays in the DashBoard Tree View.

7. Proceed to the section “**Accessing the BAP Interfaces in DashBoard**”.

Using DashBoard

This chapter provides instructions for launching DashBoard, and accessing the BAP interfaces in DashBoard.

Overview

The BAP interfaces are accessed by expanding the main BAP node in the Tree View and selecting a series of sub-nodes. (**Figure 11**)

The BAP nodes are organized in a logical order for ease of configuration:

- The SDI IO node provides global settings for configuring the SDI input and outputs on the BAP.
- Sub-node labels display with the nomenclature of **SDI #** where # represents the SDI signal.
- The SDI-specific Channel Mapper node enables you to map each input audio channel to an audio channel in one of the four paths.
- Subsequent sub-nodes display with the nomenclature of **Path x** where **x** represents the output path for that SDI signal (there are four per SDI) and **y <interface name>** represents a setup step. Expand these sub-nodes to access the encoding and watermarking configuration options. In **Figure 11**, the user expanded the SDI 1 Path 1 node to access the Dolby RTLL, Nielsen Watermarker, and Dolby Digital (DD) DDP Encoder sub-nodes.

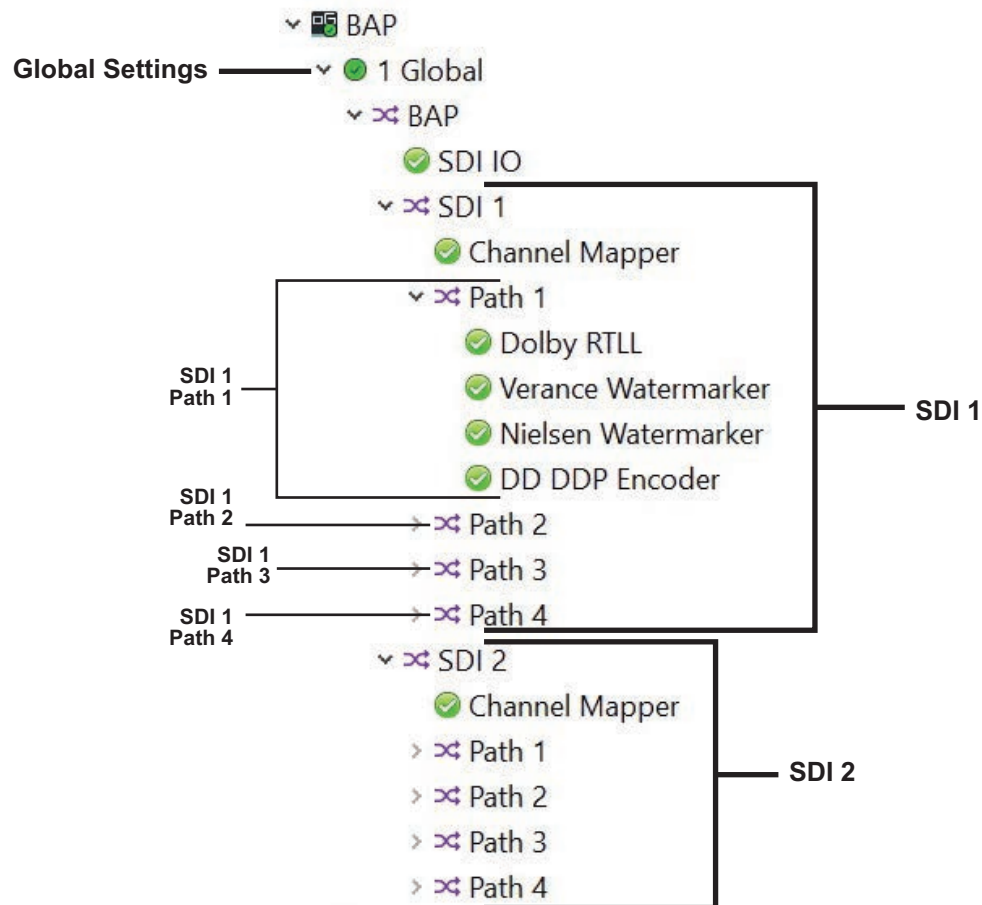


Figure 11 Example of the BAP Tree View in DashBoard

Launching DashBoard

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

To launch DashBoard

1. Ensure that you are running DashBoard software version 9.0 or higher.
2. Launch DashBoard by double-clicking its icon on your computer desktop.

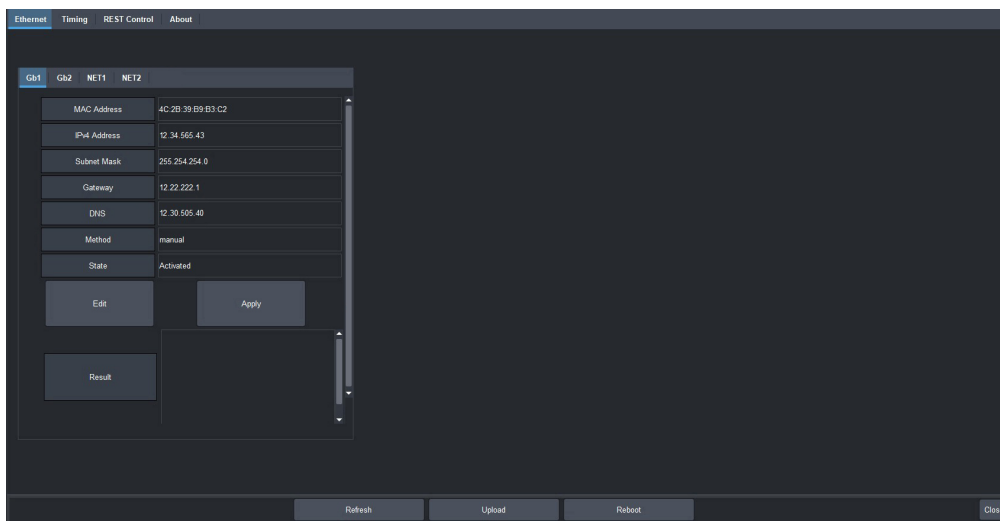
Accessing the BAP Interfaces in DashBoard

Each node represents an interface, or configuration step, for a specified SDI path. Selecting a node displays its tabs in the right-most pane of the DashBoard window.

To display the BAP interfaces in DashBoard

1. In the Basic Tree View of DashBoard, locate the **BAP** node.
2. Expand the **BAP** node.
3. Right-click the **1 Global** node and select **Open**.

The Global interface enables you to define the Ethernet settings and timing requirements.



4. Expand the **1 Global** node.
5. Expand the **BAP** sub-node.

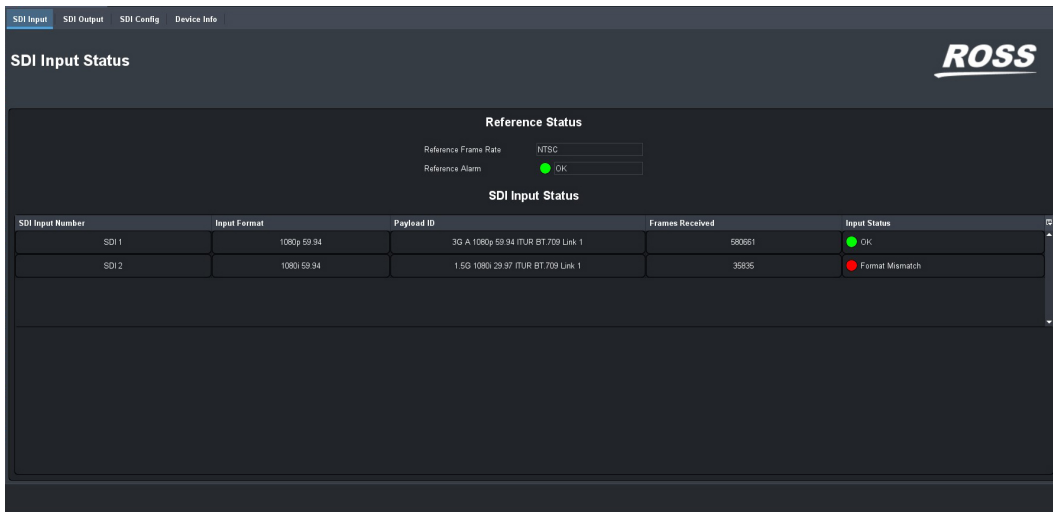
The **BAP** sub-node displays.

The BAP tree view displays with the **SDI IO** node at the top, and a sub-node for each SDI connection on the BAP.

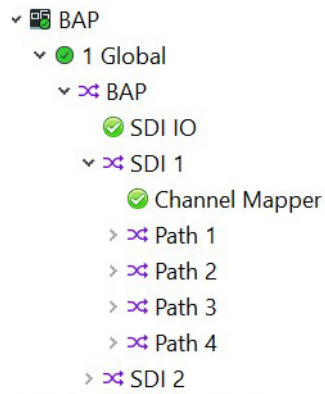


6. Double-click the **SDI IO** node.

The SDI IO interface enables you to configure and/or monitor the global settings for each SDI.

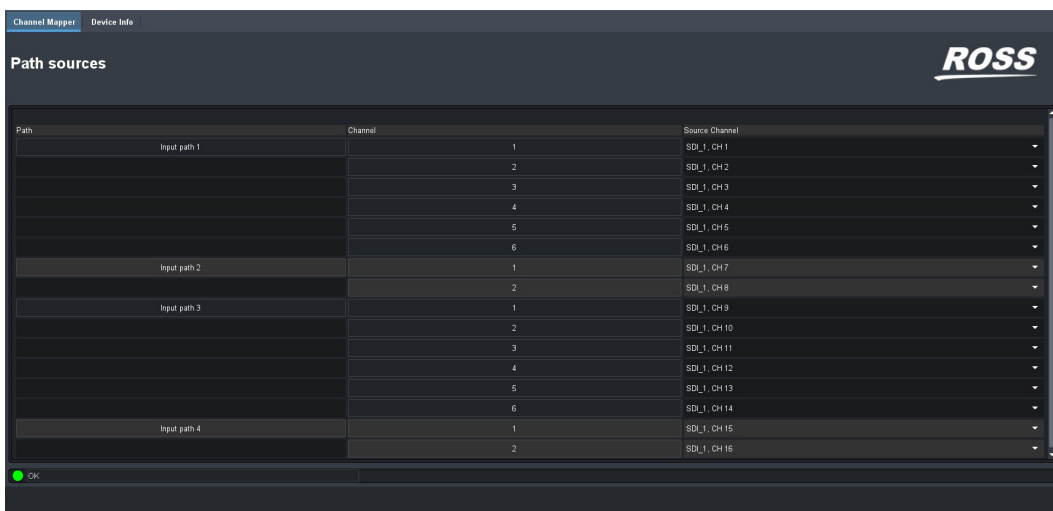


- Expand an **SDI** node to display the sub-nodes for configuring the specified SDI.



- Double-click the **Channel Mapper** sub-node.

The Channel Mapper interface enables you to assign input audio channels to a specific path to be processed.

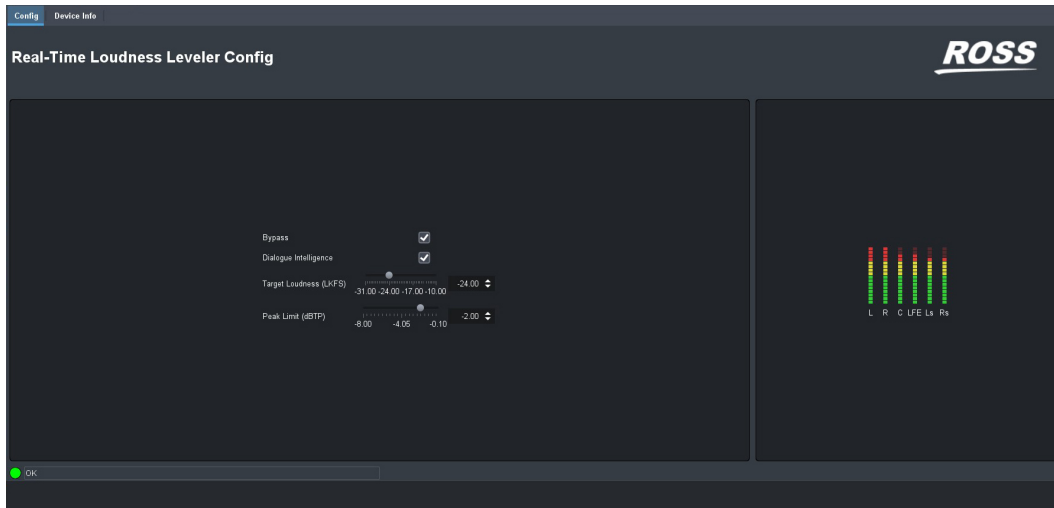


9. Expand a **Path** sub-node to display the sub-nodes for configuring the specified path.



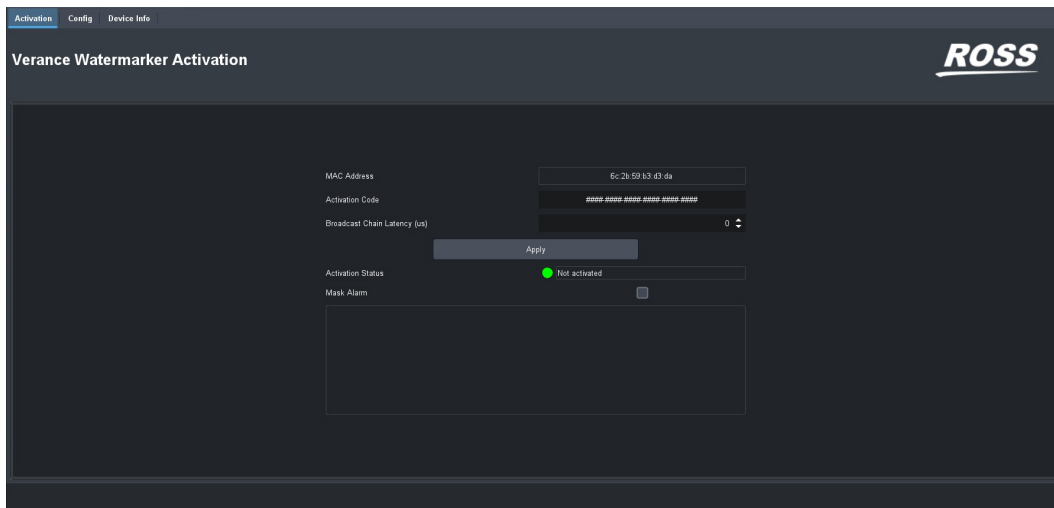
10. Double-click the **Dolby RTLL** sub-node.

The Dolby RTLL interface enables you to adjust the target loudness settings for the BAP output.



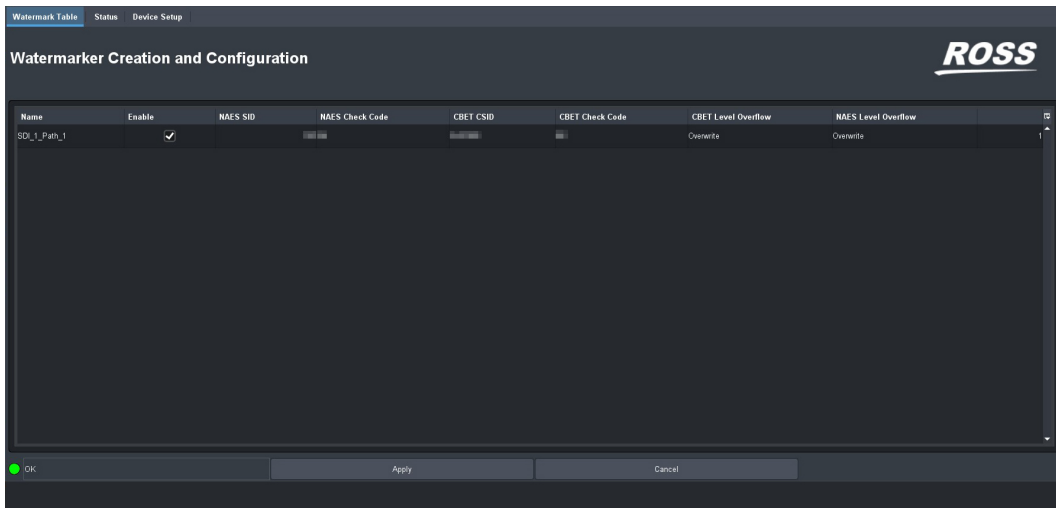
11. Double-click the **Verance Watermarker** sub-node.

The Verance Watermarker interface enables you to configure the VP1 watermarker channels.



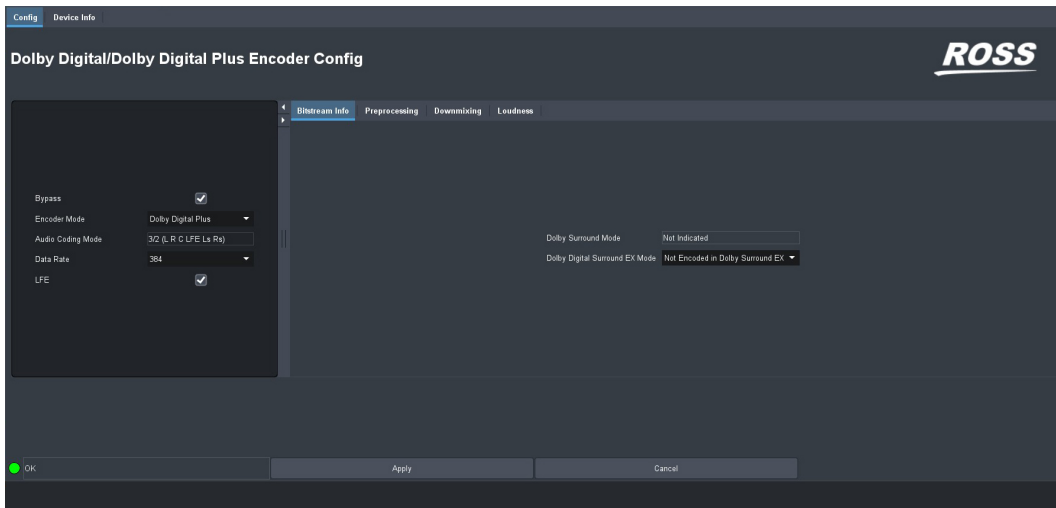
12. Double-click the **Nielsen Watermarker** sub-node.

The Nielsen Watermark interface enables you to configure the Nielsen Watermark Encoder channels.



13. Double-click the **DD DDP Encoder** sub-node.

The DD DDP (Dolby Digital/Dolby Digital Plus) provides options for configuring the Dolby encoder settings for a path.



Updating the Network Settings

Once the BAP 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 BAP, as outlined in your **BAP Quick Start Guide**. This chapter provides instructions for configuring the RJ45 ports of the BAP for communication with your facility network and streaming devices.

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

Network Connections to the BAP

There is one Ethernet port that must be configured on the BAP: **Gb1**. This port enables the BAP to interface with other devices in your facility, and the computer running the DashBoard client. After the initial connection is established, DashBoard is used to update the network settings for the BAP as determined by your IT Department and network requirements.

★ The **Gb2**, **NET1**, and **NET2** ports are not implemented.

Updating the Gb1 Port Settings

Once the BAP 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 BAP).

To update the Gb1 port settings for the BAP

1. Display the **Global** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Ethernet** tab.
3. Select the **Gb1** 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 BAP will communicate with.
6. Use the **Method** menu to specify **Manual**.
- ★ Do not set **Method** to **Unknown**. This option is not implemented for the Gb1 port.
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 BAP will use.
10. Click **Apply**.

★ The BAP automatically reboots and applies the changes.

Troubleshooting

This section outlines how to use the Command Line Interface (CLI) to view the IP address assigned to the BAP. This is helpful should your unit lose connection to DashBoard and you cannot access the BAP interfaces to learn the IP address.

To view the IP address of the BAP outside of DashBoard

1. Use a monitor and keyboard to access the CLI of the BAP. 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 on the interface for a short period of time.

You are then automatically logged out of the CLI.

Configuring the Timing Settings

Once the user can successfully access the BAP in DashBoard, the next step is to establish a connection to an NTP Server and specify the local timezone for the BAP. The BAP requires an accurate time reference, in order to ensure correct watermarking and crediting.

For More Information on...

- on monitoring the NTP communication with the BAP, refer to **Table 7**.

Connecting to an NTP Server

The BAP supports connection to an Network Time (NTP) Server for timecode information. From the Timing tab in DashBoard, you can specify an NTP Server on the same network. An additional NTP Server can be specified in cases where connection to the first server is lost.

To connect the BAP to an NTP Server

1. Display the **Global** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Timing** tab.
3. Use the **NTP Server 1** field to specify the first Network Time Server (NTP) address that the BAP can use for timecode information.
4. Use the **NTP Server 2** field to specify an additional Network Time Server (NTP) address the BAP can use for timecode information.
5. Click **Apply Changes** to save the new settings.

Specifying the Local Timezone

It is recommended to specify the timezone that the BAP unit is physically located in. This also helps ensure an accurate time reference and is a requirement for Verance watermarking.

To specify a local timezone for the BAP

1. Display the **Global** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Timing** tab.
3. Use the **Local Timezone** field to specify the timezone that the BAP unit is located in.
4. Click **Apply Changes** to save the new setting.

Specifying the Video Format

This chapter provides information on the reference formats, and how to specify the video format for your inputs and outputs.

Frame Rate Compatibility

It is important to remember that when using the reference source connected to the rear panel, the BAP input video frame rate must match the reference frame rate. Reference compatibility is shown in **Table 1**.

Table 1 Output/Reference Compatibility

Reference Input Format	Video (SDI) Input Formats					
	1080i 59.94Hz	720p 59.94Hz	1080p 59.94Hz	1080i 50Hz	720p 50Hz	1080p 50Hz
NTSC 59.94Hz (Black Burst)	GL	GL	GL			
1080i 59.94Hz (Tri-level Sync)	GL	GL	GL			
720p 59.94Hz (Tri-level Sync)	GL ^a	GL	GL			
PAL 50Hz (Black Burst)				GL	GL	GL
1080i 50Hz (Tri-level Sync)				GL	GL	GL
720p 50Hz (Tri-level Sync)				GL ^a	GL	GL

a. Genlocked but without Field Lock.

Specifying a Video Format

The BAP has built-in hysteresis to avoid visible artifacts if the input and output timing alignment oscillates around the drop/repeat cross-over point.

To specify a video format for the BAP

1. Display the **SDI IO** interface as outlined in “**To display the BAP interfaces in Dashboard**”.
2. Select the **SDI Config** tab.
3. Use the **Video Format** options to specify the video format for the input and output signals.
4. Click **Apply** to save the new setting.
5. To apply the new setting:
 - a. Display the **Global** interface as outlined in “**To display the BAP interfaces in Dashboard**”.
 - b. Click **Reboot**, located at the bottom of the **Global** interface to apply the new setting.

Specifying the Payload ID Colorimetry

The Payload ID Colorimetry options in Dashboard are used to specify the Colorimetry and Transfer Characteristics of the signal in the egress Payload ID (ST 352). Ensure to set this value to match the ingress value.

To specify the payload ID colorimetry for the SDI signals

1. Display the **SDI IO** interface as outlined in “**To display the BAP interfaces in Dashboard**”.
2. Select the **SDI Config** tab.

3. Use the **Payload ID Colorimetry** options to specify the color gamut for the input and output signals. Choose from the following:
 - ITUR BT.709 — for HD video signals within the Standard Dynamic Range (SDR) color gamut.
 - ITUR BT.2020 — for video signals within the BT.2020 color gamut.
 - ITUR BT.2100 PQ — for video signals within the BT.2100 Color Gamut using the Perceptual Quantizer transfer characteristic.
 - ITUR BT.2100 HLG — for video signals within the BT.2100 Color Gamut using the Hybrid Log Gamma transfer characteristic.
 - ITUR BT.2100 SLOG3 — for video signals within the BT.2100 Color Gamut using the Sony® S-Log3 transfer characteristic.
4. Click **Apply** to save the new setting.
5. To apply the new setting:
 - a. Display the **Global** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
 - b. Click **Reboot**, located at the bottom of the **Global** interface, to apply the new setting.

Channel Mapping

The BAP provides a single interface that enables you to map each input audio channel to an audio channel in one of the four output paths. You can choose to apply the default audio channel map or assign the channels as required by your system. Both methods are described in this chapter.

Before You Begin

In DashBoard, the Tree View displays the configuration options as sub-nodes organized under numbered slot nodes (SDI 1, SDI 2). Each SDI includes a Channel Mapper interface that organizes the SDI audio channels into 4 paths. The input channels to each path are selected here. **Figure 12** shows the default channel mapping.

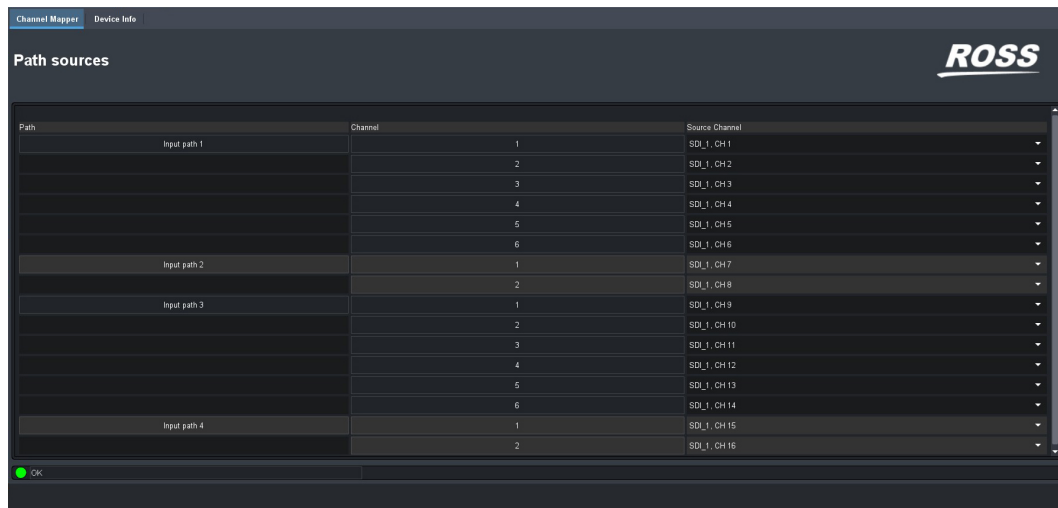


Figure 12 Example of Channel Mapper Default Settings — SDI 1

Figure 13 shows the SDI 2 Channel Mapper that configures the 16 channels for SDI 2.

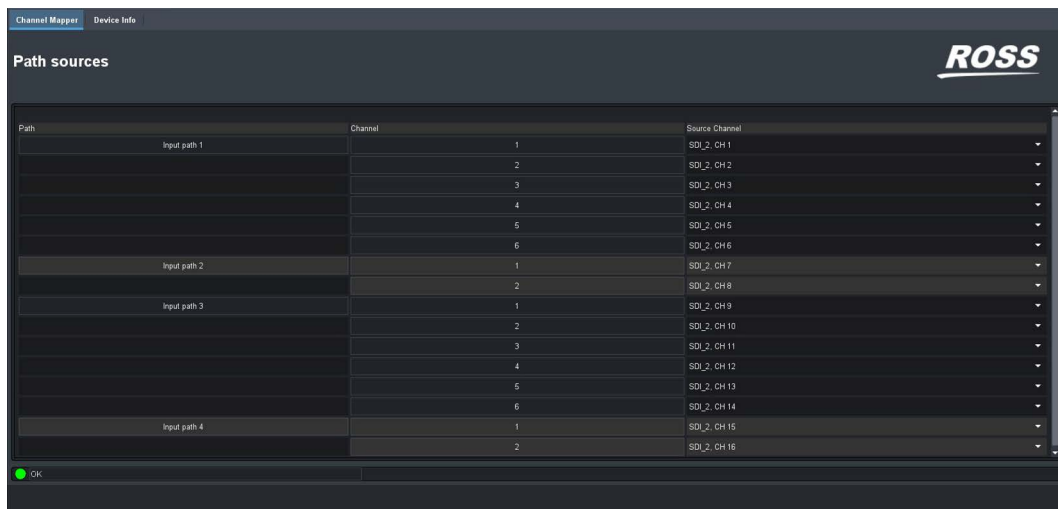


Figure 13 Example of Channel Mapper Default Settings — SDI 2

Using the Default Channel Mapping

Each SDI has four paths with the following default channel mapping:

- Path 1 includes channels 1-6
- Path 2 includes channels 7-8
- Path 3 includes channels 9-14
- Path 4 includes channels 15-16

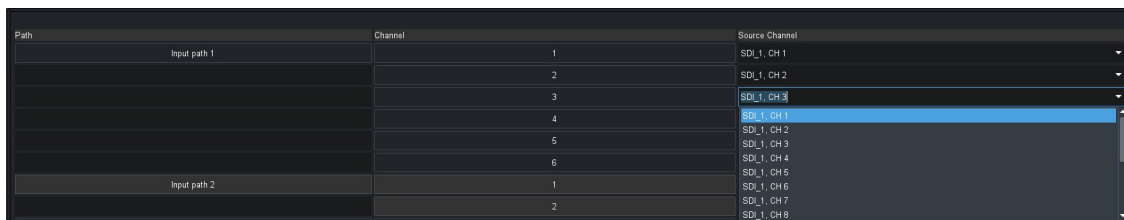
You can choose to use the default channel mapping, or customize the map based on your facility requirements. No further steps are required to use the default channel mapping as described above. You can proceed to **“Real-Time Loudness Leveling”**.

Customizing the Audio Channel Mapping

This section outlines how to customize the channel mapping for an SDI path.

To customize the input channel mapping for a path

1. Display the **Channel Mapping** interface for an SDI as outlined in **“To display the BAP interfaces in DashBoard”**.
2. Locate the row for the Path you want to customize the input for.
3. Use the **Source Channel** menu to assign an audio channel to a specified channel in a Path.
In the example below, the user assigns SDI IN 1 > Ch 3 to Input Path 1 > Channel 3.



Path	Channel	Source Channel
Input path 1	1	SDI_1_CH 1
	2	SDI_1_CH 2
	3	SDI_1_CH 3
	4	SDI_1_CH 1
	5	SDI_1_CH 2
	6	SDI_1_CH 3
Input path 2	1	SDI_1_CH 4
	2	SDI_1_CH 5

4. Repeat step 2 and 3 for each path you wish to customize.
- ★ The new settings are applied automatically.
5. Repeat the procedure for the other SDI if required.

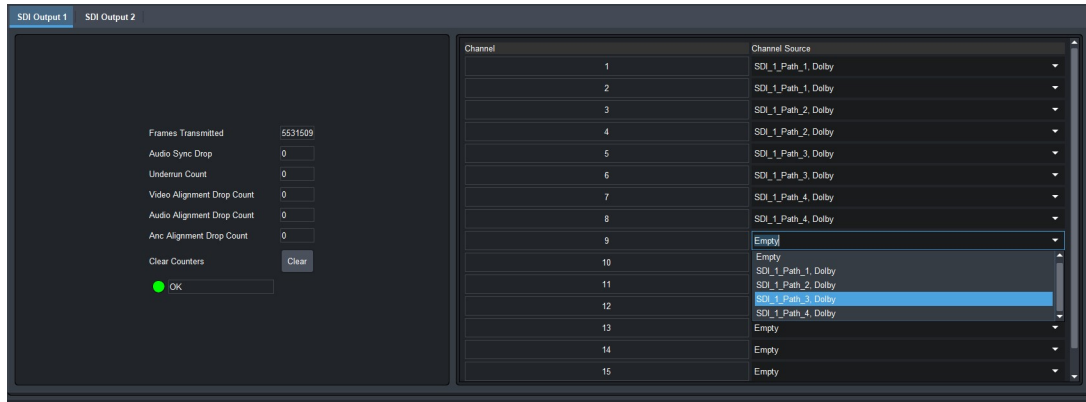
Mapping the Paths to an SDI Output

- ★ If you have bypassed the encoder channel for a path, the default channel mapping for that path is automatically reset to the default values.

To map a path to an SDI Output

1. Display the **SDI IO** interface as outlined in **“To display the BAP interfaces in DashBoard”**.
2. Select the **SDI Output** tab.
3. Select the sub-tab for the physical SDI output you want to map.
4. Locate the row for the Output Channel you want to customize.
- ★ Mapping PCM channels will map 1 to 1, but the Dolby output will always be matched to an audio pair (2 channels).
5. Use the **Channel Source** menu to assign a channel from a path to the specified channel of the selected SDI output. If a path is Dolby encoded, the Channel Source menu will only display one option for that path.

In the example below, the user assigns Path 4 of SDI IN 1 to Channel 9 of SDI Output 1.



- Repeat step 3 to 5 for each path and channel you wish to customize.

Real-Time Loudness Leveling

This chapter summarizes the steps to configure the Dolby® Real-Time Loudness Leveling (RTLL) feature.

Configuring the RTLL Settings for an SDI Output

The RTLL interface offers parametric controls for loudness leveling. Basic setup is setting RTLL to Enabled, and choosing a Manual IRL level (typically same as the desired loudness level). Other settings can typically be left at the default settings provided. Default settings are recommended and conform to **ATSC A/85**.

To enable the RTLL for a path on an SDI output

1. Display the **Dolby RTLL** interface for an SDI Path as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Config** tab.
3. Verify that the **Bypass** box is not selected.
4. Repeat steps 1 to 3 for the remaining paths.

To configure the RTLL settings for a path on an SDI output

1. Select the **Dialog Intelligence** box to allow loudness processing speech-gating that measures and adjusts loudness only during segments that contain dialog.
2. Use the **Target Loudness** slider to specify the Loudness K-weighted relative to Full-Scale (LKFS) value for the audio output.
3. Use the **Peak Limit** slider to apply a peak compressor/ limiter if the selected target loudness is exceeded.
4. Repeat steps 1 to 3 for the other paths in the first SDI output, and for all paths in the second SDI output.

Bypassing the RTLL

It is recommended to configure the BAP to bypass the RTLL when the incoming audio loudness level is already set and should not be further adjusted.

If the RTLL is bypassed on the BAP, the user must select the correct **Fallback dialnorm** value in the DD DDP Encoder. This value should match the level of the incoming audio loudness (eg. if the audio was leveled to -20dB, the user should bypass RTLL, and set the Fallback dialnorm value to -20dB on the BAP).

You can still adjust the loudness level of the signal using the options in the Dolby Encoder > Loudness tab.

To bypass the RTLL for an SDI output

1. Display the **Dolby RTLL** interface for an SDI Path as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Config** tab.
3. Select the **Bypass** box.

The loudness settings from the source are ignored.

To set the Fallback dialnorm value on the BAP

1. Display the **DD DDP Encoder** interface as outlined in “To display the BAP interfaces in DashBoard”.
2. Select the **Loudness** sub-tab located in the far-right pane of the DashBoard window.
3. Use the **Fallback Dialnorm** slider to specify the dialog level of the bitstream program at the decoder output

Monitoring the Audio Levels

The right-side pane of the **Dolby RTLL > Config** tab displays a set of audio meters. Measurement units are in dBFS (decibel full scale) where 0dBFS is the maximum digital value. Each audio meter displays audio level information for a channel as illustrated in **Figure 14**.

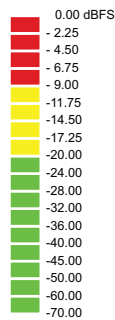


Figure 14 Illustrative Example of Audio Level Information

Verance Watermarker Setup

This chapter outlines the steps required to configure and enable the Verance Aspect Watermark embedder for the BAP.

- ★ If you do not require Verance Aspect watermarking, it is recommended to mask the alarms by selecting the Mask Alarms box on the Verance > Activation tab.

Overview

The Aspect Watermark fully supports the ATSC 3.0 A/334 specification and enables deployment of key ATSC 3.0 and HbbTV features across all broadcast distribution environments: over-the-air (OTA), over-the-top (OTT), and Multichannel Video Programming Distributor (MVPD). The Aspect Watermark embedder inserts the Aspect Watermark into the LPCM audio of the linear broadcast and survives processing and transcoding into the broadcast signal. When the watermark is received by the consumer television and decoded, it enables features such as interactivity and targeted advertising.

- ★ Before proceeding, ensure that the BAP is running the latest software. Refer to “**Upgrading the Software**”.

Enabling the Aspect Watermark

Each Aspect Watermark embedder has a Server Code that has been specifically assigned to the BAP device. Enabling the Aspect Watermark is achieved by entering the activation code, then enabling the Aspect Watermark for each set of channels output by the device.

Activation codes are specific to the MAC Address of the BAP device. The activation code must be entered exactly as provided by Verance. If a single device has more than one embedder instance (or channel grouping), the same activation code may be entered for each instance as long as they will use the same Server Code; if a different Server Code is needed for each instance, additional Activation Codes must be requested from Verance.

Enabling the Aspect Watermark requires you to:

- learn the MAC address assigned to your BAP
- contact Verance for an activation code
- apply the activation code to the BAP

To enable the Aspect Watermark

1. Display the **Verance** interface as outlined in “**To display the BAP interfaces in DashBoard**”. The **Activation** tab is automatically selected.
2. To learn the MAC address assigned to your BAP:
 - a. Locate the **MAC Address** field in the **Activation** tab.
 - b. Make a note of the character string in the field. This must be kept in lower case when providing it to Verance.
3. Contact Verance for an activation code. Refer to “**Contacting Verance Technical Support**”.
4. To apply the activation code:
 - a. Locate the **Activation Code** field in the **Activation** tab.
 - b. Enter the code provided by Verance.

5. Use the **Broadcast Chain Latency** field to specify the number of microseconds between the audio exiting the playout system and entering the BAP.
6. Click **Apply**.
7. Verify that the **Activation Status** field on the **Activation** tab reports "OK".

Configuring the Verance Watermarker

You have the option to add an offset.

To configure the Verance Watermark

1. Display the **Verance** interface as outlined in "**To display the BAP interfaces in DashBoard**".
2. Select the **Config** tab.
3. Select the **Enable Embedding** box.
4. Verify the Local Timezone is set correctly for this BAP unit:
 - a. Navigate to the **Global** interface as outlined in "**To display the BAP interfaces in DashBoard**".
 - b. Ensure the **Local Timezone** menu is set to the time zone that the BAP is located within.

Time Zone Database Updates

The implementation of the Aspect Watermark in the BAP is dependent upon TAI (temps atomique internationale) for correct operation of its algorithm. This requires a time zone database (tzdata) on the BAP.

The IANA (Internet Assigned Numbers Authority) manages the maintenance of the tzdata database. A periodic update of this database is used to manage changes to time zone boundaries, UTC offsets, and daylight-saving rules. The management procedure is documented in **BCP 175: Procedures for Maintaining the Time Zone Database**.

Ross Video packages the debian version of the tzdata in an upload file specifically for the BAP. The file is of the format: tzdata-update_<yrrel>.bin where <yrrel> represents the year and the build version. You will receive a notification from Ross Video when a new tzdata file is available. Once you obtain the new file, you will need to upload it to the BAP using DashBoard.

To upload a new tzdata file to the BAP

1. Obtain the latest tzdata file from Ross Video.
2. Display the **Global** interface as outlined in "**To display the BAP interfaces in DashBoard**".
3. Click **Upload**. This button is located at the bottom of the DashBoard window.
4. Follow the on-screen instructions to update the tzdata file on your BAP.
5. To apply the new file:
 - a. Display the **Global** interface as outlined in "**To display the BAP interfaces in DashBoard**".
 - b. Click **Reboot**, located at the bottom of the **Global** interface, to apply the new file.

Nielsen Watermarker Setup

This chapter outlines the steps required to configure and enable the Nielsen Watermark Encoder channels for the BAP.

Overview

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

There is one Watermark Encoder channel per path. Each channel is configured and enabled independently.

Before proceeding, ensure that you have the following information from the 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 BAP tabs and interfaces.

To change the name for a watermark encoder channel

1. Display the **Nielson Watermarker** interface as outlined in “**To display the BAP interfaces in DashBoard**”.

The **Watermark Table** tab is automatically selected.

2. Locate the **Name** column of the tab.
3. Type a new name for the Watermark Encoder channel.
4. Press **Enter**.
5. Click **Apply** to save your changes.

★ Changing the Watermark Encoder Channel name will create a video and audio glitch.

Configuring the Global Encoder Settings

There are two settings that impact all Watermark Encoder channels on the BAP: 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 **Nielson Watermarker** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **Device Setup** tab.

★ It is recommended to leave the **Watermark Type** set to the default value.

3. Set the audio code scheme for your BAP 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 BAP is installed in the station or cable network slot of the program-distribution chain.
 - **Program Content** — Select this option if the BAP 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.

To configure a watermark encoder channel

1. Display the **Nielsen Watermarker** interface as outlined in “**To display the BAP interfaces in DashBoard**”.

The **Watermark Table** tab is automatically selected.

2. Locate the row for the Watermark Encoder channel you wish to configure.
3. Type your NAES SID value into the **NAES SID** cell.
4. In the **NAES Check Code** cell, enter the Check Code for the specific NAES Source Identification Number (SID) that was entered in step 3.

★ The **NAES Check Code** cell is case sensitive and you must enter the characters in upper case.

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

6. 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 BAP.

★ This cell is case sensitive and the check characters must be entered in upper case with no spaces between the CSID and check code. Leave the field blank if no CBET encoding is performed for the encoder channel.

7. Specify how to resolve conflicts between data already present in the incoming signal, and data to be added by the BAP 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 BAP data and only transmit the incoming data.
- **Overwrite** — Select this option to encode the BAP data regardless of the presence of incoming data.

8. Select the **Enable** box.

The **Apply** button is now selectable.

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

★ Applying changes will create a video and audio glitch.

Configuring the Dolby® Encoders

This chapter outlines the steps required to configure a Dolby® encoder channel for an SDI path.

Enabling a Dolby Encoder Channel for an SDI Path

The first step in setting up an encoder is selecting the Encoder Format.

To enable an encoder channel for an SDI path

1. Display the **DD DDP Encoder** interface as outlined in “To display the BAP interfaces in DashBoard”.

The **Config** tab is automatically selected.

2. Verify that the **Bypass** box is cleared (unselected).

★ If the **Bypass** box is selected, the Dolby encoder is bypassed and the output is PCM data.

★ Changing the **Bypass** box state will create a video and audio glitch.

3. Use the **Encoder Mode** menu to specify the type of Dolby encoding for the output audio channel.

★ Changing the Encoder Mode will create a video and audio glitch.

★ The **Audio Coding Mode** read-only field reports the active channels within the encoded bitstream. Paths 1 and 3 are fixed to 3/2 (L R C LFE Ls Rs). Paths 2 and 4 are fixed to 2/0 (L R).

4. Use the **Data Rate** menu to specify the maximum data rate allowed for the output audio channel.

★ A minimum Data Rate of 192kbps is recommended for 2/0 Audio Coding Mode, and 384kbps for 3/2 Audio Coding Mode if using Nielsen Watermark Encoders.

5. Select the **LFE** box if a Low-Frequency Effects (LFE) channel is present in the encoder data or if the **Audio Coding Mode** is set to 3/2.

★ Clear the **LFE** box if an LFE channel is not present in the encoder data or if the Audio Coding Mode is set to 2/0.

Specifying the Bitstream

The section outlines how to enable the BAP to indicate the bitstream properties of the audio. This information is used by downstream Dolby® devices to decode the data.

To configure the bitstream properties of the encoder channel

1. Ensure the **DD DDP Encoder > Config** tab is selected.
2. Select the **Bitstream Info** sub-tab.
3. Use the **Dolby Surround Mode** menu to indicate whether the 2-channel bitstream includes Dolby Surround (Lt/Rt) data.
4. Use the **Dolby Digital Surround EX Mode** menu to specify whether the audio data is encoded using Dolby Digital Surround EX.

Preprocessing

This section outlines how to select a standard operational mode for the encoder channel. The operational mode automatically configures the decoder to implement the dialogue normalization, DRC, and downmixing settings.

To configure the preprocessing engine for the Dolby encoder channel

1. Ensure the **DD DDP Encoder > Config** tab is selected.
2. Select the **Preprocessing** sub-tab.
3. Use the **Line Mode Profile** menu if your downstream equipment requires a specific type of speaker-level output. This is set to Film Standard by default.
4. Use the **RF Mode Profile** menu if you require a downmixed signal for subsequent channel 3 RF modulation and transmission. This is set to Film Standard by default.
5. Select the **90 degree Phase Shift** box to apply a 90° phase shift to the surround channels.
- ★ Select this box if a surround-compatible downmix is later applied to the decoded audio and you want to avoid the possibility of the input signals in the L and Ls channels canceling each other out.
6. Select the **3dB Sound Attenuation** box to apply a 3dB attenuation to the surround channels.

Specifying the Preferred Stereo Downmix Mode

The BAP enables you to specify the preferred stereo downmix mode when a stereo-compatible Dolby Surround downmix of a multichannel source program for decoding. This feature allows the user to specify how the program should be downmixed by the downstream decoder device. The device then downmixes the tracks to a stereo track as specified by the preferred mode.

To specify the preferred stereo downmix mode

1. Ensure the **DD DDP Encoder > Config** tab is selected.
2. Select the **Downmixing** sub-tab.
3. Use the **Preferred Stereo Downmix Mode** menu to choose one of the following:
 - **Lt/Rt** — sums the Surround channels and adds them, in-phase to the Left channel and out-of-phase to the Right channel. This allows a Dolby Surround Pro Logic decoder to reconstruct the Lt/Rt (Left total/Right total) channels for a Pro Logic setup.
 - **Lo/Ro** — adds the Left and Right Surround channels discretely to the Left and Right speaker channels, respectively. This preserves the stereo separation for stereo-only monitoring and produces a mono-compatible signal (Left only/Right only).
 - **Pro Logic II Downmix** — processes the stereo source into 5 channels (Right Front, Center, Left Front, Right Back, and Left Back). Also enables the processing of 5-channels from a 4-channel Dolby Stereo source.
4. Use the provided **Mix Level** fields to apply a level shift value to the specified channel when downmixing.

Loudness

If you choose to disable the Dolby RTLL for an output path, you have the option in the encoder interface to adjust the loudness level as required.

To configure the loudness level

1. Ensure the **DD DDP Encoder > Config** tab is selected.
2. Select the **Loudness** sub-tab.
3. Use the **Fallback Dialnorm** slider to report the output loudness level to the downstream decoder.

Outputting PCM Data

This chapter outlines the steps to configure the BAP to embed PCM data for a path. When outputting PCM data for an audio channel, you will need to:

1. Bypass the Dolby encoder for the required path.
2. Re-map the channels for the path as outlined in “**Mapping the Paths to an SDI Output**”.

Bypassing a Dolby Encoder Channel for a Path

By default, the encoder is disabled for each SDI. To embed PCM data, you must first bypass the encoder for the path.

★ Changing the Bypass state will create a video and audio glitch.

To bypass an encoder channel for a path

1. Display the **DD DDP Encoder** interface as outlined in “**To display the BAP interfaces in DashBoard**”.

The **Config** tab is automatically selected.

2. Select the **Bypass** box.
3. Click **Apply**.

Re-map the Path Channels

When the Bypass box is selected in the **DD DDP Encoder** > **Config** tab, the path channels are automatically reset to the default mapping values. If your requirements differ from the default mapping, you must re-map the channels. Refer to “**Mapping the Paths to an SDI Output**”.

Third-Party Protocols

This chapter summarizes how the BAP implements third-party protocols.

REST API

The Verance watermarking (VP1) on the BAP can also be controlled by the Representational State Transfer (REST) API. Using the REST API, an automation system can send and receive a set of commands from a Verance watermarker on the BAP.

This section briefly outlines how to enable the REST API on the BAP, how the API is implemented on the BAP, and provides a list of the supported commands (OIDs).

For More Information on...

- VP1 watermarking, refer to “**Verance Watermarker Setup**”.

Enabling the REST API on the BAP

You must enable the REST server on the BAP before sending/receiving REST API commands. This feature is disabled by default.

To enable REST API control for VPI watermarking on the BAP

1. Display the **Global** interface as outlined in “**To display the BAP interfaces in DashBoard**”.
2. Select the **REST Control** tab.
3. Use the **REST Port** field to specify the port number the REST API is available on.
4. Select the **REST Enable** box.

Overview

The BAP includes a REST server that communicates over TCP/IP using a set of REST API commands. The nomenclature for commands is: Base URL: /api/v1/. **Table 2** outlines the endpoint parameters for the Verance watermarker to REST API.

Table 2 Slot Numbers Assigned to Verance Watermarker

Endpoint	Parameter	Description
GET		
/help	None	List the available commands
/params/slot/{slot}/oid/{oid}	slot [path parameter] <ul style="list-style-type: none">• Which slot the BAP parameter is in oid [path parameter] <ul style="list-style-type: none">• the OID of the BAP parameter	Get the value of the BAP parameter with the given slot and OID

Table 2 Slot Numbers Assigned to Verance Watermarker

Endpoint	Parameter	Description
PUT		
/params/slot/{slot}/oid/{oid}	slot [path parameter] <ul style="list-style-type: none">Which slot the BAP parameter is in oid [path parameter] <ul style="list-style-type: none">the OID of the BAP parameter value [formData parameter] <ul style="list-style-type: none">Value to be set	Set the value of the BAP parameter with the given slot and OID

The BAP hosts the Swagger™ documentation which defines the available resources and requests the REST API supports. The Swagger interface gives examples of how to execute the requests and the possible return codes.

To access the Swagger documentation for the BAP

1. Launch a web browser on your PC.
2. Enter the following URL: `https://<bap-ip-address>:<rest-port>/docs/`
 - **bap-ip-address** is the IP address of your BAP unit.
 - **rest-port** is the port listed in the BAP > Global > REST Control tab in DashBoard. The default is 8000.

★ The REST API uses a self-signed certificate, so your browser will generate a warning message.

Slot Numbering

Each Verance watermarker is assigned a specific slot number which identifies it in the REST API. To send and receive commands from the BAP, you will need to know the slot number assigned to the Verance watermarker on the BAP, and the list of supported commands (OIDs).

Table 3 outlines the mapping for the Verance watermarker to slot numbers for the BAP.

Table 3 Slot Numbers Assigned to Verance Watermarker

Verance Watermarker on the BAP	Assigned Slot Number
SDI 1	
PATH 1	5
PATH 2	9
PATH 3	13
PATH 4	17
SDI 2	
PATH 1	21
PATH 2	25
PATH 3	29
PATH 4	33

GET OIDs

Table 4 summarizes the GET Object Identifiers (OIDs) that the BAP supports via the REST API.

Table 4 Supported OIDs in REST — GET

OID	Description
activeAlarm	Alarm for the activation key and server code
errorMessage	Reports the message when there is an activation or server code error
broadcastChainLatency	Amount of time (us) from leaving playout system to entering the BAP
enableEmbedding	Reports if the Verance watermarking enabled or disabled
serverCode	Server Code from Verance
baseYear	Specifies the year that the server code starts
expirationYear	Specifies the year that the server code ends
queryFlagStatus	State of the Query Flag
displayOverride	State of the Display Override condition

SET OIDs

Table 5 summarizes the SET Object Identifiers (OIDs) that the BAP supports via the REST API.

Table 5 Supported OIDs in REST — SET

OID	Value	Description
broadcastChainLatency	Integer	Amount of time (us) from leaving playout system to entering the BAP
queryFlagToggle	Any value will toggle the query flag	Toggle the Query Flag
displayOverride	1 = display override 0 = no display override	Display the Override condition

Upgrading the Software

The BAP can be upgraded in the field via DashBoard.

To upgrade the software on the BAP

1. Contact Ross Technical Support for the latest software version file.
2. Ensure the Ethernet cable is connected to the **Gb1** port on the BAP.
3. From the **Tree View** in DashBoard, expand the node for the BAP you want to access.
4. Right-click the **Global** sub-node.
5. Click **Open**.
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 BAP you want to upload the file to.
11. Verify the BAP 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.
 - The BAP is temporarily taken off-line during the upgrade process.
 - The process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.
14. Once upgrade is complete and the **Upload Status** dialog closes, you must manually reboot the BAP.
 - a. From the **Tree View** in DashBoard, expand the node for the BAP you upgraded.
 - b. Right-click the **Global** sub-node.
 - c. Click **Open**.
 - d. Click **Reboot**. This button is located at the bottom of the Global tab.

DashBoard Interface Overview

This chapter summarizes the interfaces, tabs, and menus available from DashBoard for the BAP.

Global Interface

The Global interface displays four tabs: Ethernet, Timing, REST Control, and About.

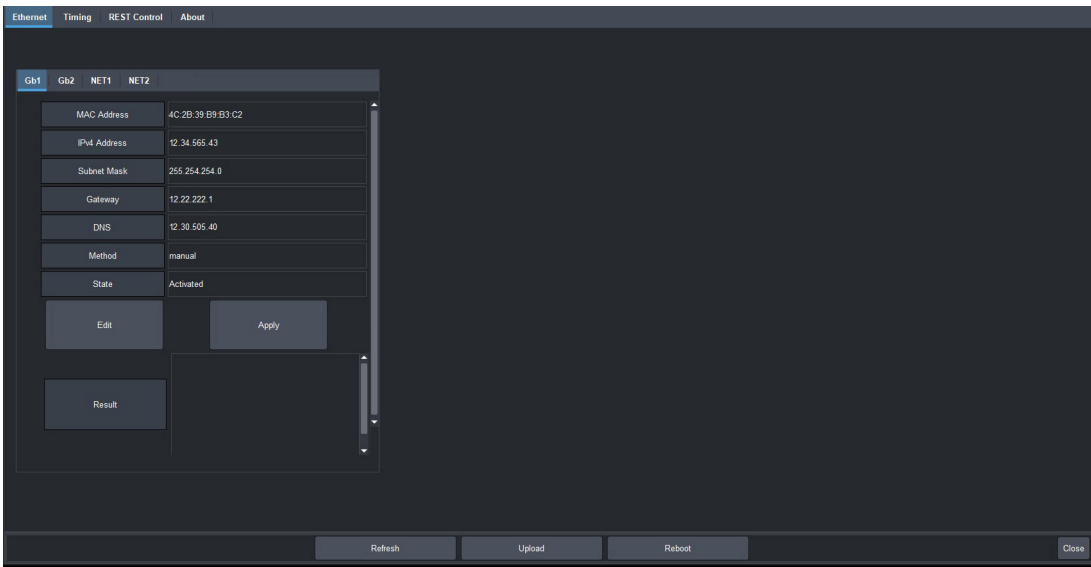


Figure 15 Example of the Global Interface

Ethernet Tab

Table 6 summarizes the read-only information displayed in the **Ethernet > Gb1** tab.

Table 6 Ethernet — Gb1 Tab

Item	Parameters	Description
Gb1		
MAC Address	#	Specifies the unique Media Access Control (MAC) Address assigned to the BAP
	Unknown	The specified port is not configured
IPv4 Address	#	Specifies the static IP Address that is currently assigned to the Gb1 port. The default is 192.168.0.100.
	Unknown	The specified port is not configured
Subnet Mask	#	Specifies the subnet mask value for the specified port on the BAP. The default is 255.255.255.0.
	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 BAP will use. The default is 192.168.0.1.
	Unknown	The specified port is not configured

Table 6 Ethernet — Gb1 Tab

Item	Parameters	Description
DNS	#	Specifies the IP address of the DNS server that the BAP will communicate with. The default is 192.168.0.1.
Method	Auto	The settings will be assigned by a DHCP server in your facility
	Manual	The user manually supplies the Ethernet settings
	Unknown	The specified port is not used. This option is not implemented for the Gb1 port.
	DHCP	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 Gb1 port	
Apply	Click this button to apply the new settings to the Gb1 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: <ul style="list-style-type: none"> • x states the type of problem • y indicates the possible cause

Timing Tab

Table 7 summarizes the read-only information displayed in the **Timing** tab.

Table 7 Timing Tab Items

Item	Parameters	Description
NTP Status	OK (Green)	Indicates a valid time source is reporting to the BAP
	Apply Changes (Yellow)	At least one NTP Server address has changed. Click Apply to save the new setting(s).
	Not Running (Red)	Software was not able to start NTP client
	No Servers Configured (Red)	The NTP Server fields are blank

Table 7 Timing Tab Items

Item	Parameters	Description
NTP Status	Cannot Resolve Server Name (Red)	At least one of the NTP Server host-names could not be resolved. It is recommended to specify the IP address instead of a host-name for the server.
	No Time Server Available At Address (Red)	At least one NTP Server IP Address does not have a valid time server running.
Local Timezone	#	Specifies the time zone the BAP is located in
Current Time	Ddd Mmm ## hh : mm : ss yyyy GMT	Indicates the encoded date where: <ul style="list-style-type: none"> • Ddd represents the day of the week • Mmm represents the month • ## represents the day of the month • hh : mm : ss reports the current encoding time as reported by the NTP Server(s) • yyyy represents the year
NTP Server 1	#	Specifies the first Network Time Server (NTP) address the BAP can use for timecode information
NTP Server 2	#	Specifies an additional Network Time Server (NTP) address the BAP can use for timecode information

REST Control Tab

Table 8 summarizes the fields displayed in the REST Control tab.

Table 8 REST Control Tab

Item	Parameters	Description
REST Enabled	Selected	Enables the REST API
	Cleared	Disables this feature
REST Port	#	Specifies the port the BAP will use to communicate via the REST API

About Tab

Table 9 summarizes the read-only information displayed in the About tab.

Table 9 About Tab

Item	Parameters	Description
Serial Number	#	The serial number assigned to this BAP
Assembly Revision	#	The version of the BAP hardware
Software Version	#	The software build the BAP is currently running

Table 9 About Tab

Item	Parameters	Description
Frame Name	<text>	Assigns a unique identifier to the BAP. This name also displays in the node for the BAP in the Tree View of DashBoard.
Factory Default	Resets all BAP editable fields to the factory default values. This does not impact the Ethernet, Timing, and About tabs.	

SDI IO Interface

The SDI IO interface displays four tabs: SDI Input, SDI Output, SDI Config, and Device Info.

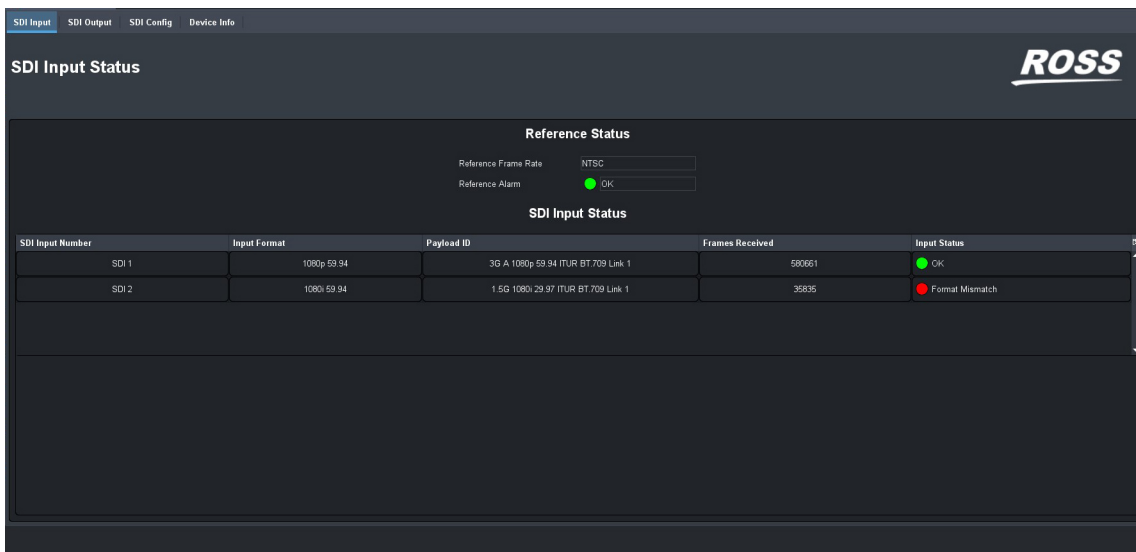


Figure 16 Example of the SDI IO Interface in DashBoard

SDI Input Tab

Table 10 outlines the options and read-only fields displayed in the SDI Input tab.

Table 10 SDI IO — SDI Input

Item	Parameters	Description
Reference Status		
Reference Frame Rate (read-only)	#	Reports the video frame rate detected on the SDI Input signal
Reference Alarm (read-only)	OK (Green)	A valid reference source is detected in a video format that is supported
	Reference Mismatch (Red)	The frame rate from the Reference does not match the frame rate for the SDI input
SDI Input Status (Read-only)		
SDI Input Number	SDI #	Indicates the specific SDI input signal
Input Format	#	Indicates the detected input format
Payload ID	#	Reports a summary of the Payload ID (ST 352) on the SDI input signal

Table 10 SDI IO — SDI Input

Item	Parameters	Description
Frames Received	#	Reports the number of frames received since startup
Input Status	OK (Green)	Indicates a valid SDI input signal is detected and no errors are currently detected
	No Input (Green)	Indicates that the specified SDI input is not in use
	Reference Mismatch (Red)	The frame rate from the Reference does not match the frame rate for the SDI input
	Format Mismatch (Red)	The format of the specified SDI input does not match the Video Format menu setting

SDI Output Tab

The SDI Output Config tab provides options for configuring each SDI output. A sub-tab for each output provides the options for configuring that output.

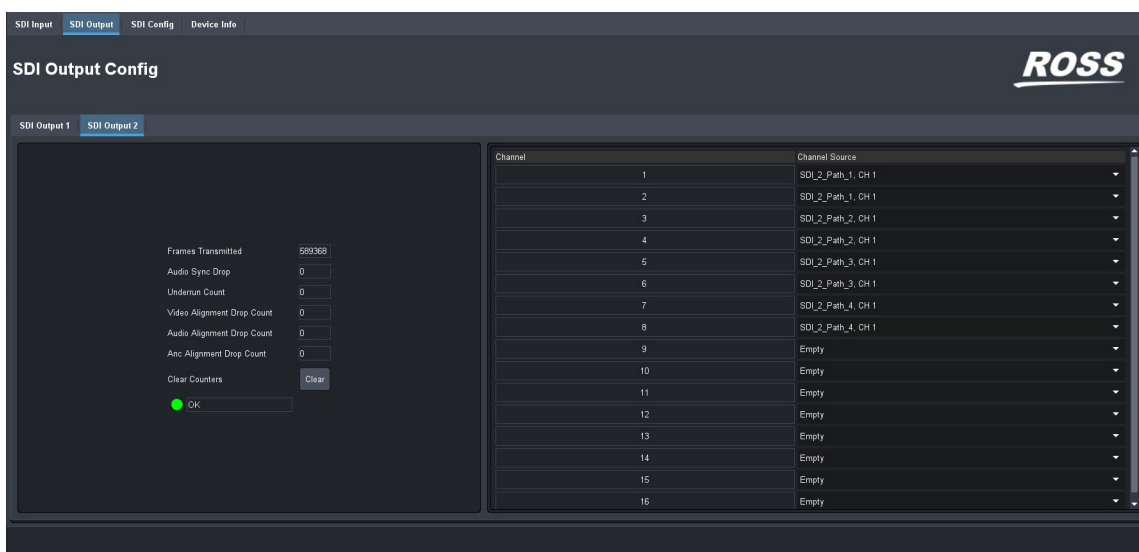


Figure 17 Example of the SDI Output Tab

Table 11 outlines the fields displayed in the SDI Output tab starting from the left-most area of the tab.

Table 11 SDI IO — SDI Output

Item	Parameters	Description
SDI Output # (Read-only)		
Frames Transmitted ^a	#	Reports the number of valid SDI frames transmitted when the audio, video, and ANC data are in sync on the specified SDI output
Audio Sync Drop	#	Reports the number of instances that audio data was dropped to align all of the audio from all of the paths (on the specified SDI output)

Table 11 SDI IO — SDI Output

Item	Parameters	Description
Underrun Count	#	Indicates the number of frames that were not included on the specified SDI output
Video Alignment Drop Count	#	
Audio Alignment Drop Count	#	
ANC Alignment Drop Count	#	
Clear Counters	Resets the values to zero (0) of the Count read-only fields	
Channel	#	Specifies the output channel that the Channel Source value will be assigned to
Channel Source	Empty	No input channel signal is assigned
	SDI_#_Path_#	Assigns the specific SDI input and channel to the output channel

- a. Reports the number of fields transmitted when using interlaced SDI formats.

SDI Config Tab

The SDI Config tab provides options for configuring settings that are applied to the SDI inputs and outputs.

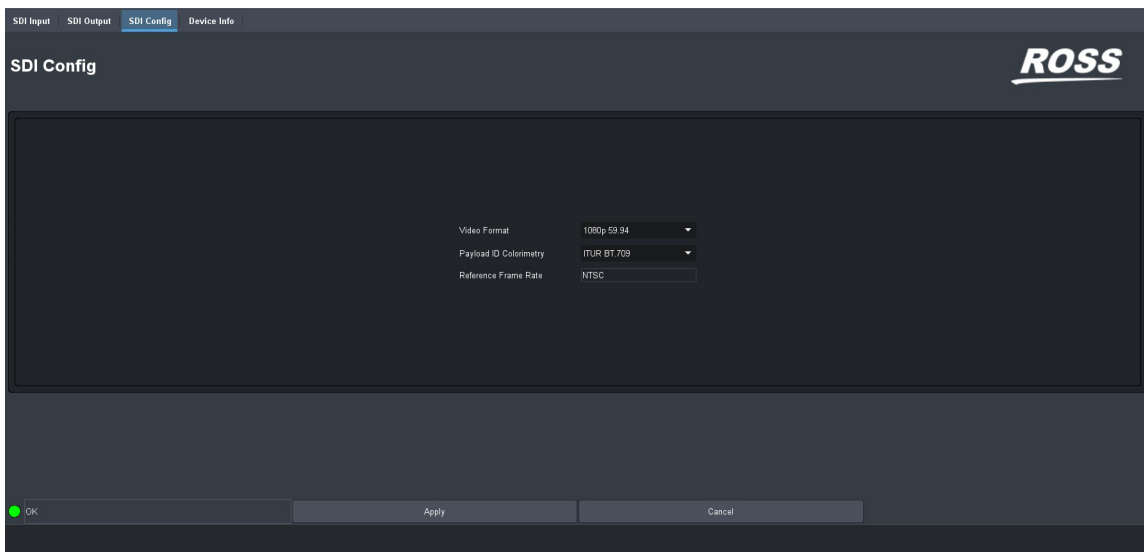


Figure 18 Example of the SDI Config Tab

Table 11 outlines the fields displayed in the SDI Config tab.

Table 12 SDI IO — SDI Config

Item	Parameters	Description
Video Format	#	Specifies the input and output video format

Table 12 SDI IO — SDI Config

Item	Parameters	Description
Payload ID Colorimetry	ITUR BT.709	For HD video signals within the Standard Dynamic Range (SDR) color gamut
	ITUR BT.2020	For video signals within the BT.2020 color gamut
	ITUR BT.2100 PQ	For video signals within the BT.2100 Color Gamut using the Perceptual Quantizer transfer characteristic
	ITUR BT.2100 HLG	For video signals within the BT.2100 Color Gamut using the Hybrid Log Gamma transfer characteristic
	ITUR BT.2100 SLOG3	For video signals within the BT.2100 Color Gamut using the Sony® S-Log3 transfer characteristic
Reference Frame Rate (read-only)	#	Reports the video frame rate detected on the Reference input signal

Device Info Tab

Table 13 outlines the read-only fields displayed in the Device Info tab.

Table 13 SDI IO — Device Info

Item	Parameters	Description
Version	#	Reports information on the SDI IO service running on the BAP
Hardware Model	#	
Matrox SDK Version	#	

Channel Mapper Interface

The Channel Mapper interface displays two tabs: Channel Mapper and Device Info.

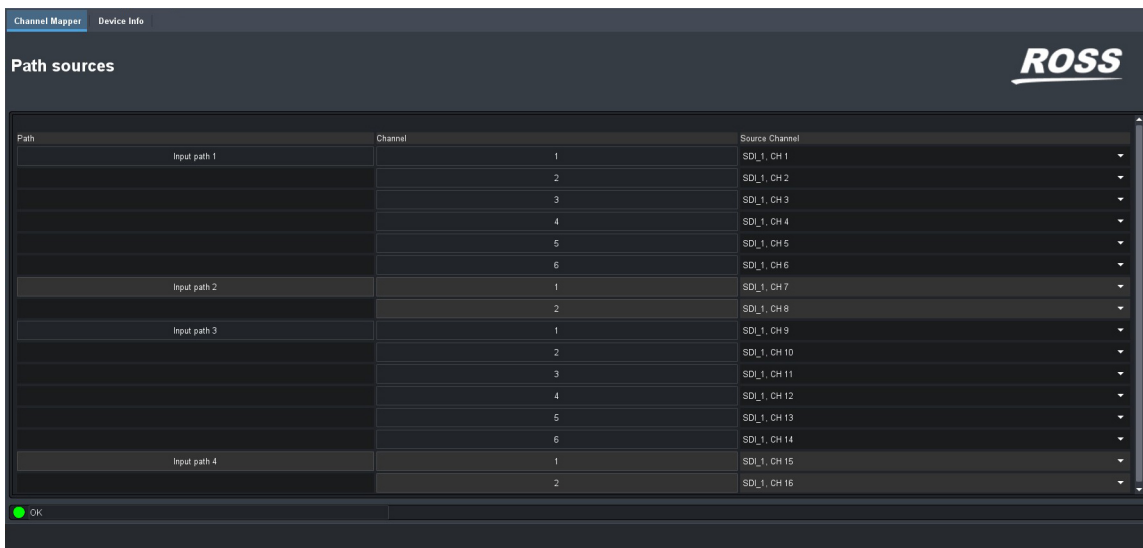


Figure 19 Example of the Channel Mapper Interface in DashBoard

Channel Mapper Tab

Table 14 summarizes the options displayed in the **Channel Mapper > Path sources** tab.

Table 14 Channel Mapper > Path sources Tab

Item	Parameters	Description
Path		
Input Path #	<text>	Specifies which Path to configure the input
Channel	#	Specifies the input channel to the path you are configuring
Source Channel	SDI_ x , CH y	Assigns an SDI channel to be input to the specified path where: <ul style="list-style-type: none">• x represents the input (source)• y represents the audio channel from that source

Device Info Tab

Table 15 summarizes the read-only information displayed in the **Device Info** tab.

Table 15 Device Info Tab

Item	Parameters	Description
Version	#	Indicates the current version of the Channel Mapper settings
Path #		
Packets Processed	#	Indicates the total number of data packets the SDI path has processed since the last reboot of the unit

Dolby RTLL Interface

The Dolby RTLL interface displays two tabs: Config, and Device Info.

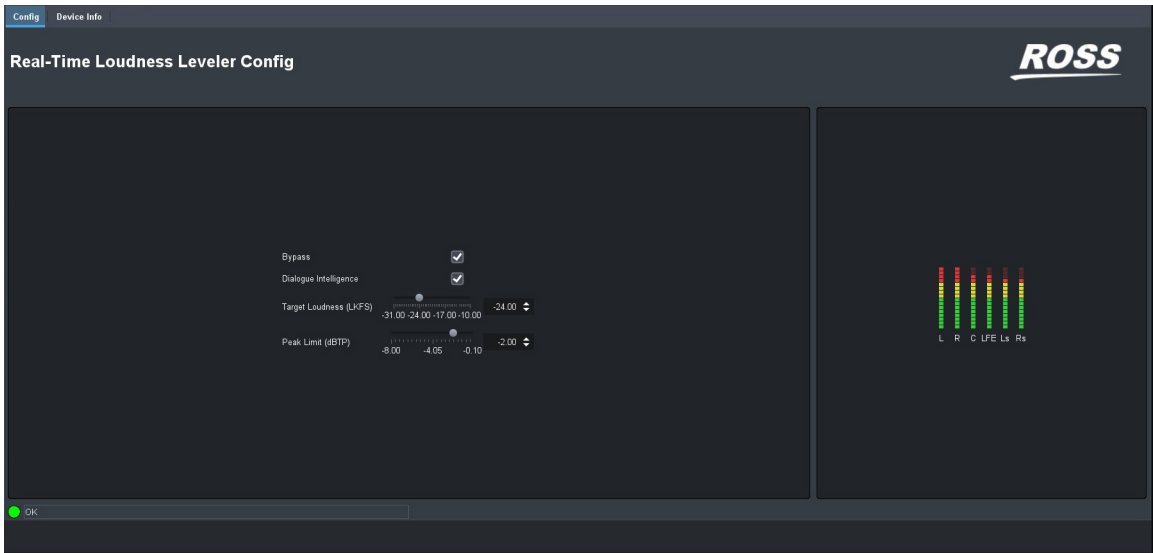


Figure 20 Example of the Dolby RTLL Interface in DashBoard

Config Tab

Table 16 summarizes the options available in the Config tab.

Table 16 Dolby RTLL — Config

Item	Parameters	Description
Bypass	Selected	Ignores the Real-Time Loudness Leveling settings
	Cleared	Applies the Real-Time Loudness Leveling settings
Dialog Intelligence	Selected	Select this box when using ATSC A/85
	Cleared	Clear this box when using EBU R128
Target Loudness (LKFS)	#	Adjusts the Loudness K-weighted Relative to Full Scale (LKFS) value for the output signals
Peak Limit (dBTP)	#	Adjusts the audio loudness level based on the highest signal level present in the audio signal
Audio Meters		
L	An audio meter reports a measured unit in dBFS (decibel full scale) where 0dBFS is the maximum digital value. <ul style="list-style-type: none">• L represents the left channel• R represents the right channel• C represents the center channel• LFE represents the low frequency effects channel• Ls represents the left surround channel• Rs represents the right surround channel	
R		
C		
LFE		
Ls		
Rs		

Device Info Tab

Table 17 summarizes the read-only information displayed in the Device Info tab.

Table 17 Dolby RTLL — Device Info

Item	Parameters	Description
Version	#	Reports the software version of the RTLL processor service
Dolby Library Version	#	
# Input Buffer Channels	#	Specifies the number of input channels available to the RTLL processor
Packets Processed	#	Displays a running count of how many audio frames have been processed by the RTLL processor

Verance Watermarker Interface

The Verance Watermarker interface enables you to configure each available Aspect watermark engine for each SDI output path.

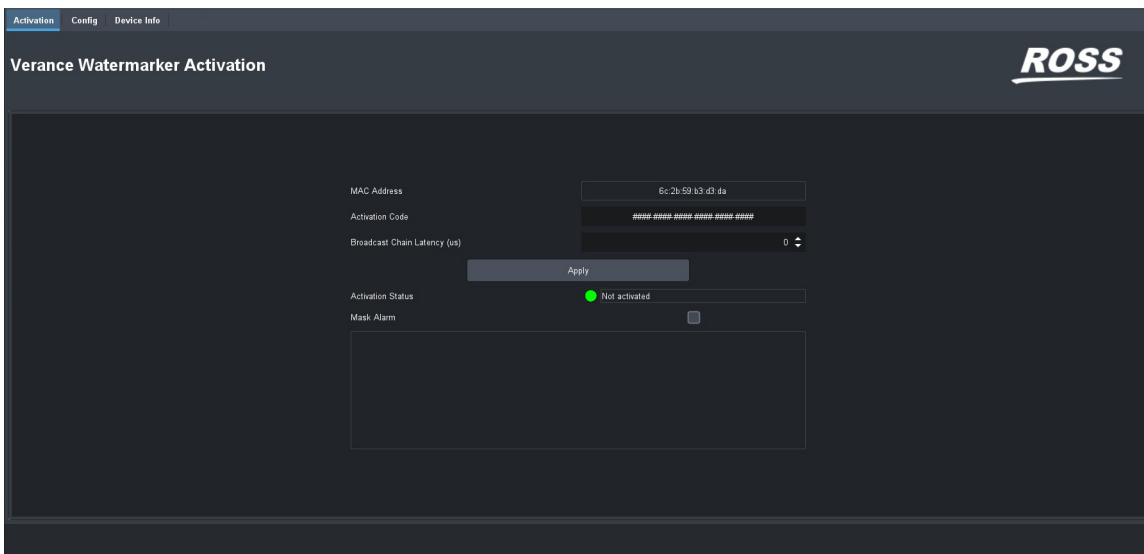


Figure 21 Example of the Verance Watermarker Interface in DashBoard

Activation Tab

Table 18 summarizes the information displayed in the Activation tab.

Table 18 Verance Watermarker — Activation Tab

Item	Parameters	Description
MAC Address (read-only)	#	Reports the MAC Address of your BAP. This information is needed when contacting Verance for your Activation Code.
Activation Code	#	The code provided by Verance that is assigned to your BAP. This code is required to enable Verance Aspect watermarking on the selected path.

Table 18 Verance Watermarker — Activation Tab

Item	Parameters	Description
Broadcast Chain Latency (us)	#	Specifies the offset, in number of microseconds, between the playout system and entering the BAP
Apply	Click this button to activate the Verance Watermarker for this path	
Status (read-only)	OK (Green)	The Activation Code is valid and no error conditions are detected.
	Not activated (Green)	An Activation Code is not yet entered.
	Alarm Masked (Green)	There may be an error condition but the Mask Alarm box is selected
	Not Validated (Yellow)	An Activation Code was entered but the Validate Code button was not selected
	Last Server Code (Yellow)	The server code is close to expiration. Contact Verance for assistance.
	Invalid Code (Red)	The Activation Code entered is not valid. Check that the character string entered into the field does not include any errors. Contact Verance to validate your code.
Mask Alarm	Selected	The BAP will not report any errors with the Verance Watermarker.
	Cleared	Errors are reported in the Status field

Config Tab

Table 19 summarizes the options available in the Config tab.

Table 19 Verance Watermarker — Config Tab

Item	Parameters	Description
Enable Embedding	Selected	Aspect watermarks are embedded in this audio channel
	Cleared	Disables the Aspect watermarking feature. This is the default.
Server Code	#	Indicates the server code included in the Activation Code for this BAP
Server Code Base Year	YYYY	Indicates the first year that is used to set the Activation Code validation period
Server Code Expiration Year	YYYY	Indicates the last year that the Activation Code will be valid in
Query Flag Status (read-only)	OFF	Reports when ATSC 3.0 metadata has changed in the broadcast channel
	ON	
Query Flag Toggle	Click this button to indicate to downstream devices that the ATSC 3.0 metadata content was updated and a re-sync is required	

Table 19 Verance Watermarker — Config Tab

Item	Parameters	Description
Display Override Condition Toggle	Selected	The viewer's ATSC 3.0 overlays will be removed and the original broadcast will pass through
	Cleared	Viewer overlays are allowed

Device Info Tab

Table 20 summarizes the read-only information displayed in the Device Info tab.

Table 20 Verance Watermarker — Device Info Tab

Item	Parameters	Description
Version	#	Reports the Aspect Watermark embedder software version
Verance Library Version	#	
# Input Buffer Channels	#	Indicates the number of channels this Verance Watermarker is processing
tzdata Version		Indicates the current version of tzdata on the system
Packets Processed	#	Indicates the number of packets that this Aspect watermarked channel has processed

Nielsen Watermarker Encoder Interface

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

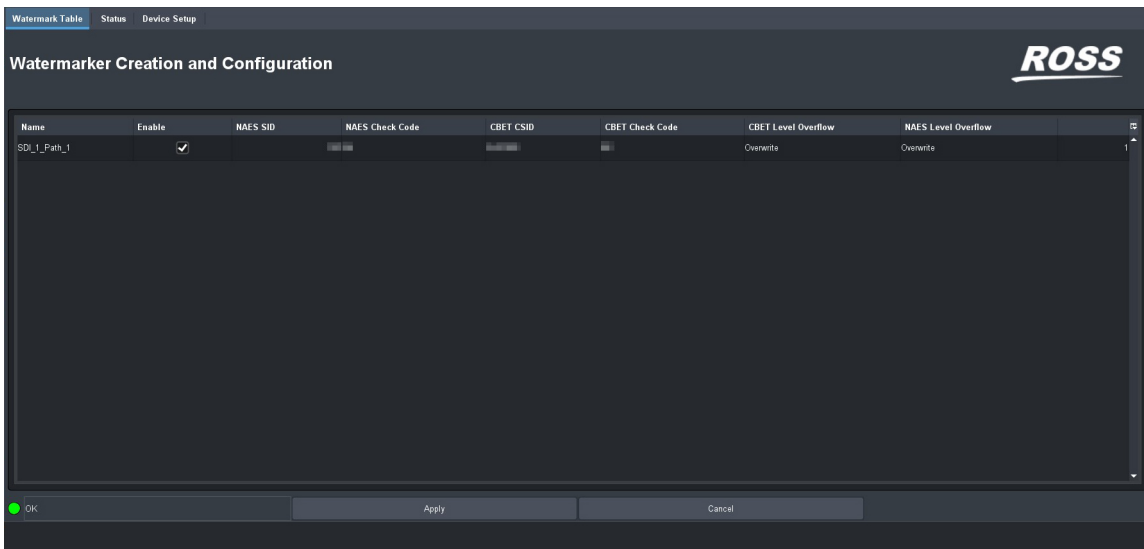


Figure 22 Example of the Nielsen Watermarker Encoder Interface in Dashboard

Watermarker Table Tab

Table 21 summarizes the information displayed in the Watermarker Table tab.

Table 21 Watermarker 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 BAP. 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 BAP. 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 BAP 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 BAP CBET CSID data regardless of the presence of incoming data
NAES Level Overflow	Refrain	Select this option to not encode the BAP 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 BAP NAES SID data regardless of the presence of incoming data

Status Tab

Table 22 summarizes the information displayed in the Status tab.

Table 22 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: <ul style="list-style-type: none">• The Watermark output is not enabled• No audio streams are assigned
	Orchestrating (Yellow)	The BAP 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 23 summarizes the options displayed in the Device Setup tab.

Table 23 Device Setup Tab

Item	Parameters	Description
Watermark Type	NAES/CBET	The BAP uses both NAES and CBET for watermark encoding. This is the default.
	NAES	The BAP applies the NAES values for watermark encoding. Entries made to the CBET fields on the Watermark Table tab will be ignored.
	CBET	The BAP 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 BAP is currently running

DD DDP Encoder interface

The DD DDP Encoder interface displays two main tabs: Config and Device Info.

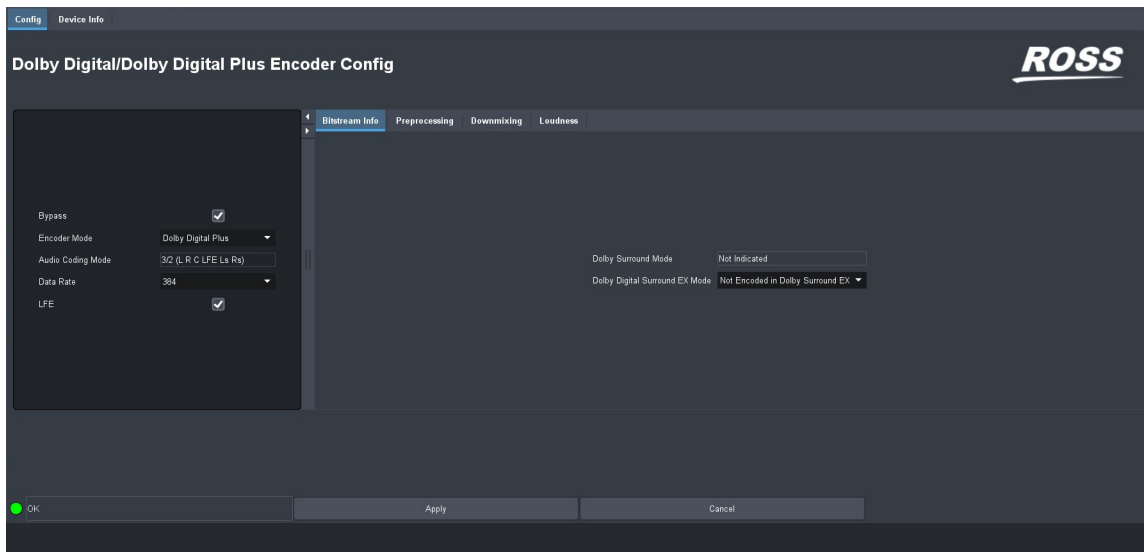


Figure 23 Example of the DD DDP Encoder Interface in Dashboard

Config Tab

Table 24 summarizes the options displayed in the Config tab.

Table 24 DD DDP Encoder — Config

Item	Parameters	Description
Bypass ^a	Selected	Does not apply the Dolby® encoding and instead outputs the PCM data
	Cleared	Applies the Dolby Encoder > Config settings
Encoder Mode ^b	Dolby Digital	The audio data is encoded using the Dolby® Digital® protocol
	Dolby Digital Plus	The audio data is encoded using the Dolby® Digital® Plus protocol
Audio Coding Mode (read-only)	2/0 (L R)	Sets the audio output channel configuration to two channels (Left and Right). Path 2 and 4 are fixed to this mode.
	3/2 (L R C LFE Ls Rs)	Sets the audio output channel configuration to multichannel (Left, Right, Center, Low-Frequency Effects, Left Surround, and Right Surround). Path 1 and 3 are fixed to this mode.

Table 24 DD DDP Encoder — Config

Item	Parameters	Description
Data Rate	#	Specifies the encoder data rate in kilobits per second (kbps). The default data rate changes based on the number of channels: <ul style="list-style-type: none"> • For 2/0 mode, the data rate should be 192kbps or higher. • For 3/2 mode, the data rate should be 384kbps or higher. It is recommended to set the data rate to 192kbps for watermark encoding.
LFE	Selected	A Low-Frequency Effects (LFE) channel is present in the encoder data. Select this box if the Audio Coding Mode is set to 3/2.
	Cleared	A Low-Frequency Effects (LFE) channel is not present in the encoder data. Select this box if the Audio Coding Mode is set to 2/0.
Bitstream Info		
Surround Mode ^c	#	Specifies the bitstream that includes the Dolby® Surround data (Lt/Rt)
Surround EX Mode ^d	Enabled	The audio data will be encoded using Dolby Digital Sound EX™
	Disabled	Disables this feature
Preprocessing		
Line Mode Profile	None	The audio data will not be encoded for use by line mode downstream equipment
	Film Standard	This is the default.
	Film Light	
	Music Standard	
	Music Light	
	Speech	
RF Mode Profile	None	
	Film Standard	This is the default
	Film Light	
	Music Standard	
	Music Light	
	Speech	
Phase Shift 90 ^e	Selected	De-correlates the front and back channels when a surround-compatible downmix is later applied to the decoded data
	Cleared	Disables this feature

Table 24 DD DDP Encoder — Config

Item	Parameters	Description
Surround Attenuation ^f	Selected	Applies a 3dB attenuation to the surround channels
	Cleared	Disables this feature
Downmixing^g		
Lt/Rt Center Mix Level	#dB	Applies the specified level shift value to the Center channel when downmixing to an Lt/Rt output
Lt/Rt Surround Mix Level	#dB	Applies the specified level shift value to the surround channels when downmixing to an Lt/Rt output
Lo/Ro Center Mix Level	#dB	Applies the specified level shift value to the Center channel when downmixing to an Lo/Ro output
Lo/Ro Surround Mix Level	#dB	Applies the specified level shift value to the surround channels when downmixing to an Lo/Ro output
Preferred Stereo Downmix Mode ^h	Not Indicated	The BAP does not specify a downmix mode to downstream devices
	Lt/Rt	Sums the Surround channels and adds them, in-phase to the Left channel and out-of-phase to the Right channel. This allows a Dolby Surround Pro Logic decoder to reconstruct the Lt/Rt channels.
Preferred Stereo Downmix Mode ^h	Lo/Ro	Adds the Left and Right Surround channels discretely to the Left and Right speaker channels, respectively. This preserves the stereo separation for stereo-only monitoring and produces a mono-compatible signal.
	Dolby Pro Logic II	Processes the stereo source into 5 channels (Right Front, Center, Left Front, Right Back, and Left Back). Also enables the processing of 5-channels from a 4-channel Dolby Stereo source.
Loudness		
Fallback Dialnorm	#	<p>This field updates automatically to the target loudness value of the RTTL if it is enabled.</p> <p>If the RTLL is disabled, then the user should set this field value to the loudness of the program.</p>

- a. Changing this setting can cause audio glitches.
- b. Changing this setting can cause audio glitches.
- c. This field is read-only when the Audio Coding Mode is set to 3/2.
- d. This menu is read-only when the Audio Coding Mode is set to 2/0.
- e. This menu is read-only when the Audio Coding Mode is set to 2/0.

- f. This menu is read-only when the Audio Coding Mode is set to 2/0.
- g. These menus are read-only when the Audio Coding Mode is set to 2/0.
- h. The LFE channel is not included in all downmix modes.

Device Info Tab

Table 25 summarizes the read-only information displayed in the Device Info tab.

Table 25 DD DDP Encoder — Device Info

Item	Parameters	Description
Version	#	Reports the software version of the Dolby Digital DDP Encoder service
Dolby Library Version	#	Reports the version of the Dolby encoder library
# Input Buffer Channels	#	Specifies the number of detected input channels available to the Dolby Encoder
Packets Processed	#	Displays a running count of how many audio frames have been processed by the Dolby Encoder

Technical Specifications

This chapter provides technical information for the BAP.

★ Specifications are subject to change without notice.

Reference Input Specifications

Table 26 Technical Specifications — Reference Input

Item	Specifications
Connector Type	HD-BNC

SDI Specifications

Table 27 Technical Specifications — SDI

Item	Specifications
Number of Inputs	2
Number of Outputs	2
Connector Type	HD-BNC

Gb1 Specifications

★ The Gb2, NET1, and NET2 tabs are not implemented.

Table 28 Technical Specifications — Gb1

Item	Specifications
Standards Accommodated	1000 BASE T
Connector Type	RJ45

USB Port Specifications

Table 29 Technical Specifications — USB Port

Item	Specifications
Connector Type	USB3.0

Environment

Table 30 Technical Specifications — Environment

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

Power

Table 31 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 BAP 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**”.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the BAP, 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 BAP 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 BAP 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 BAP 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 BAP. Ross Video policy dictates that all repairs to the BAP 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 BAP, 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 BAP. If required, a temporary replacement BAP 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.

CBET — refers to 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 your 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.

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 BAP.

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).

