Extron

NetPA U 2002 SB • Setup Guide

The Extron NetPA U 2002 SB is an ENERGY STAR-qualified, Dante-enabled power amplifier with onboard audio DSP, for use in low-impedance speaker systems or high-impedance line distribution audio systems.

The NetPA U 2002 SB is 1U high, half rack-width, and rack-mountable. The amplifiers have mounting holes for 9" (22.86 cm) and deeper rack shelves and are plenum-rated with an optional flex conduit adapter. The units are convection-cooled.

This guide provides instructions for an experienced installer to set up and operate the NetPA U 2002 SB power amplifier. For full installation, configuration, and operation details, see the *NetPA U 2002 SB User Guide* available at **www.extron.com**.

Installation Steps

Step 1 — Mounting onto a Rack

Turn off all of the equipment and disconnect it from the power source. Mount the amplifier as required. It can be securely mounted in a variety of locations, using optional Extron Mounting Brackets and accessories (see the **Extron website** for compatible optional mounting accessories), or using the included three-piece bracket system. The brackets do not come attached to the amplifier.

The following sections describe two methods of rack-mounting the amplifiers.

Rack Ear Mounting (Single Unit)

The NetPA U 2002 SB amplifier ships with a set of rack ears, so the half-rack width amplifier can be installed in a full-rack width space. Mount the amplifier with rack ears as follows:

1. If the amplifier has its rubber feet installed, remove them.
2. Attach the rack brackets (one long and one short) to the sides with the four provided #6 machine screws (❶).
3. Insert the amplifier into the rack and align the holes in the rack ears with the holes on the rack.
4. Secure the amplifier to the rack using the four provided 10-32 x 3/4" screws (❷).
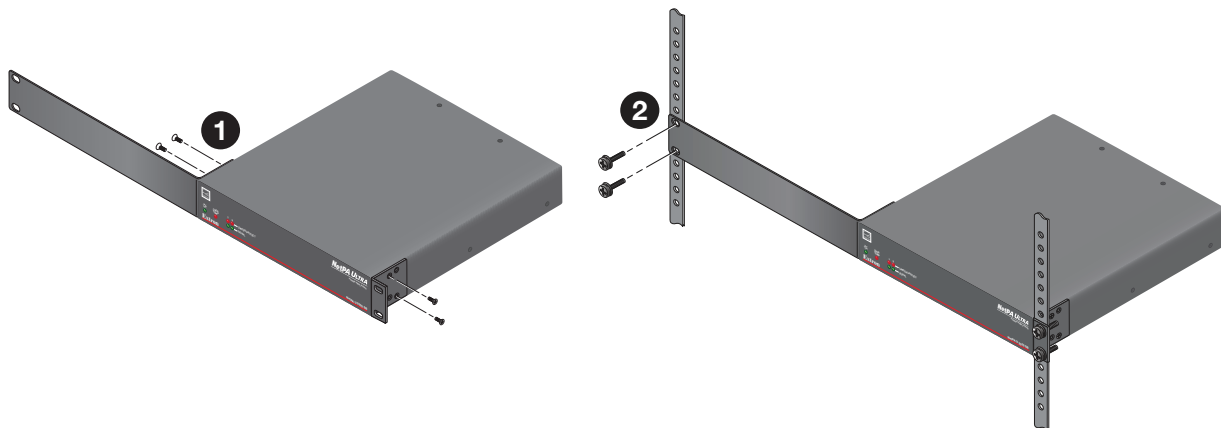
Figure 1. NetPA U 2002 SB Rack Ear Mounting

Bridge Plate Rack Mounting (Side-by-Side)

The NetPA U 2002 SB ships with a bridge plate connector to connect two amplifiers together and form full-rack width unit. Mount and connect two amplifiers as follows:

1. If the amplifier has its rubber feet installed, remove them.

2. Position two amplifiers upside down and side-by-side as shown below.

3. Use the bridge plate connector and the four provided #4 machine screws to connect the two units together (❶).

4. Attach the two short rack ears to the units with the four provided #6 machine screws (❷).

5. Insert the amplifier into the rack and align the holes in the rack ears with the holes on the rack.

6. Secure the amplifier to the rack using the four provided 10-32 x 3/4" screws (❸).
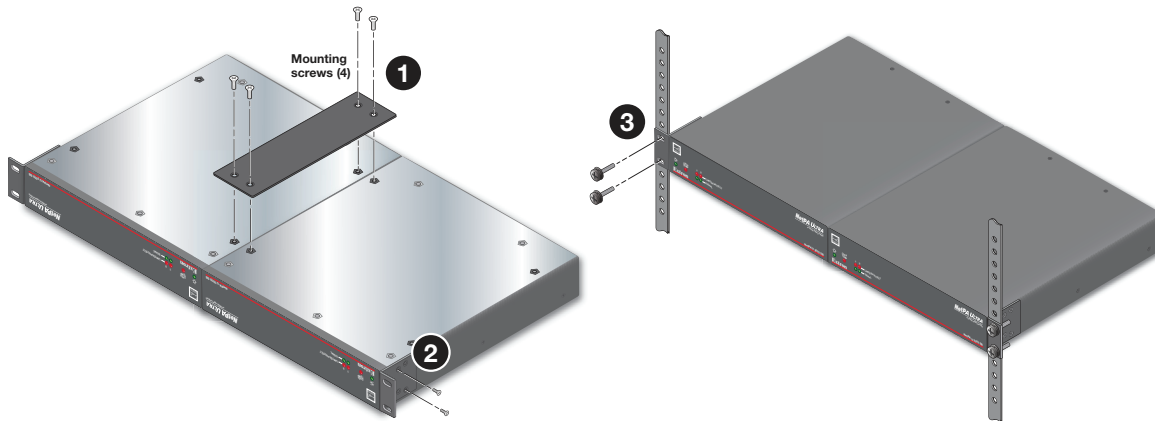

Figure 2. **NetPA U 2002 SB Bridge Plate Rack Mounting**

Ventilation Recommendation

Excessive heat decreases the optimal lifetime of the power amplifier. An Over Temp LED indicator on the front panel of the amplifier lights red when the recommended operating temperature has been exceeded.
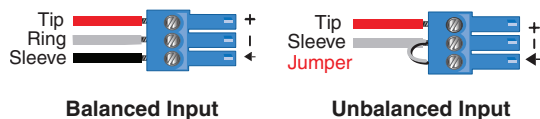
The NetPA Ultra amplifiers need to be arranged in a rack environment, so that the environment around the amplifier does not reach or exceed +122 °F (+50 °C). No more than four amplifiers should be stacked without a ventilation opening between the groups.

The NetPA U 2002 SB can also be arranged above or below a non-NetPA Ultra device, but in any case, the environment should never reach or exceed +122 °F (+50 °C).
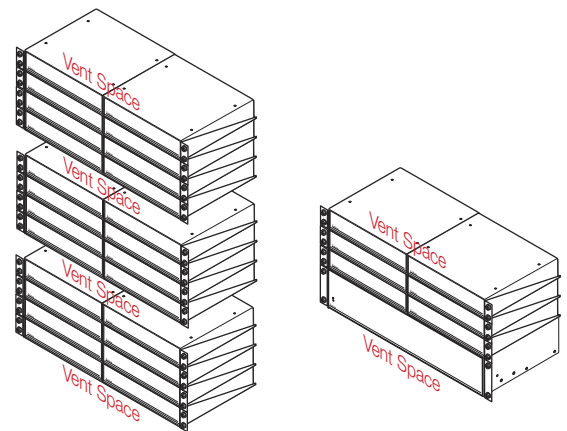
Step 2 — Captive Screw Audio Cable Wiring

Wire the captive-screw connectors to the input or output as shown in the following figures.

Balanced Input   **Unbalanced Input**

Figure 3. **Mic/Line Input Wiring**

Balanced Output   **Unbalanced Output**

Figure 4. **Line Output Wiring**

$\frac{3}{16}$ " (5 mm) MAX.

Do not tin the wires!
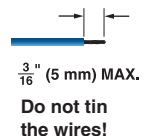
> **NOTE:**
> - Balanced or unbalanced stereo sources can be connected with the 6-pole connectors.
> - When using the 5-pole CSR 6 captive-screw to RCA adapter, connect it so the far left plug is inserted into the far left jack of the 6-pole input.

> **ATTENTION:**
> - For unbalanced audio outputs, connect the sleeves to the ground contact. DO NOT connect the sleeves to the negative (-) contacts.
> - Pour l'audio asymétrique, connectez les manchons au contact au sol. Ne PAS connecter les manchons aux contacts négatifs (–).

Step 3 — Remote Ports
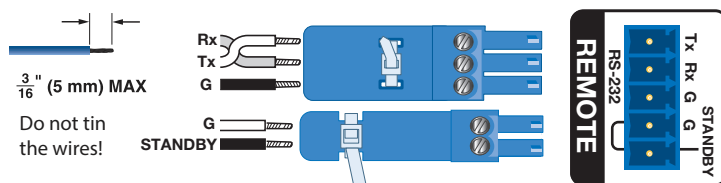
Figure 5. Remote Volume Control and Standby Ports

- Standby mode is forced when the Standby pin is connected to the second G pin. The power LED on the front panel lights amber when the amplifier is in Standby mode, indicating that the amplifier is still receiving power despite the fact that it has turned off all the outputs.

> **NOTE:** The enabling and disabling of the auto-standby timer is handled through SIS or DSP Configurator. For more details, consult the *NetPA U 2002 SB User Guide*.

- Connect a 3.5 mm, 3-pole captive screw connector to remotely control the volume via SIS commands, and connect a 3.5 mm, 2-pole captive screw to place the amplifier into Standby mode.

  Protocol for the RS-232 port:
  - 38,400 baud
  - 1 stop bit
  - 8 data bits
  - no parity

Step 4 — Speaker Wiring

Connect a 4-pin, 5 mm captive-screw connector for two channels of speaker output on the NetPA U 2002 SB amplifier. Each port has a screw flange to secure the plug to the connector (see **figure 6** on the next page to learn how to wire the captive screw connector).
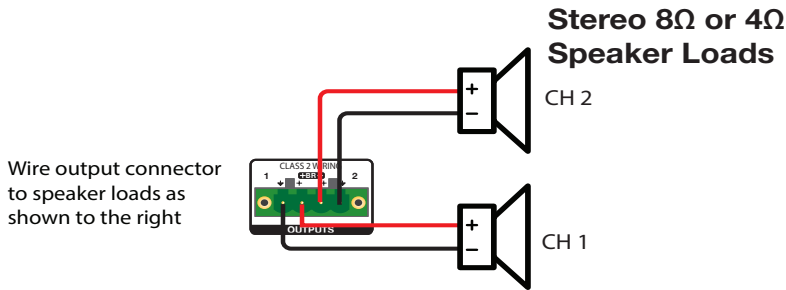
Follow the instructions below to configure the rear panel for the NetPA U 2002 SB:

- For stereo modes, connect a 4-pin, 5 mm captive screw connector for two channels of speaker outputs. The port has a screw flange to secure the plug to the connector.
- For mono modes, connect the same 4-pin, 5 mm captive screw connector but wire only the middle speaker output pins for a single channel of speaker output (see **figure 6** to learn how to wire the speaker output).

> **ATTENTION:**
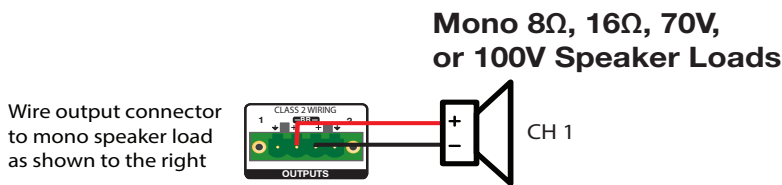> - Do not connect the speaker output connector to the amplifier until the output mode has been set properly (see **"Setting the Output Mode"** on the next page for details).
> - Ne connectez pas le connecteur de sortie du haut-parleur à l'amplificateur tant que le mode de sortie n'a pas êtê rêglê correctment (voir **"Setting the Output Mode"** (Dêfinir le mode sortie) ci-dessous pour plus d'informations).

Stereo 8Ω or 4Ω Output Modes

Stereo 8Ω or 4Ω
Speaker Loads

CH 2

Wire output connector
to speaker loads as
shown to the right

CH 1

Bridged Mono 8Ω/16Ω/70V/100V Modes

Mono 8Ω, 16Ω, 70V,
or 100V Speaker Loads

Wire output connector
to mono speaker load
as shown to the right

CH 1

Figure 6. Speaker Output Port and Wiring Diagram

ATTENTION:

- You must use Class 2 wiring for this output to comply with UL requirements.

- Vous devez utiliser le câblage de classe 2 pour cette sortie afin de vous conformer aux exigences UL.

- Do not tie channel output pins to each other or to ground. Doing so will short out the outputs, damage the amplifier, or both.

- Ne pas lier les sorties 1 et 2 des canaux entre elles ou à la terre. Les sorties pourraient être court-circuitées et/ou l'amplificateur pourrait être endommagé.

- To avoid risk of damage to the amplifier or the speakers, always check that low-impedance speaker loads (4 Ω/8 Ω/16 Ω) and high-impedance speaker loads (70 V/100 V) are appropriately wired to the amplifier for the desired mode.

- Pour éviter les risques de dommages à l'amplificateur ou aux haut-parleurs, vérifiez toujours que les charges de haut-parleur à faible impédance (4 Ω/8 Ω/16 Ω) et les charges de haut-parleurs à haute impédance (70 V/100 V) sont correctement câblées à l'amplificateur pour le mode souhaité..


Step 5 — AT Port

Connect a RJ-45 connector to the AT port to connect and communicate with the Dante network. It is also one of the interfaces DSP Configurator uses to communicate with the amplifier. The Link LED indicates when a connection is made.

Go to **Configure Dante Device Settings** on page 6 for information on Dante settings. See the image to the right for wiring.

Step 6 — Powering on Amplifier and Adjustments

Ensure all sources connected to the amplifier inputs are muted to avoid potential speaker damage during power-up.

Reconnect all the power cables and switch on the rest of the equipment before powering on the power amplifier. The amplifier boots-up for up to 10 seconds as the front panel LED flashes green.

Pins:
12345678

Insert Twisted
Pair Wires

**RJ-45
Connector**
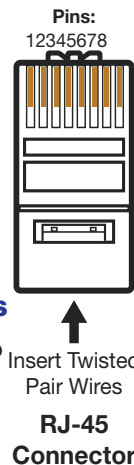
Crossover Cable (for direct connection to a PC)			
End 1		**End 2**	
Pin	Wire Color	Pin	Wire Color
1	white-orange	1	white-green
2	orange	2	green
3	white-green	3	white-orange
4	blue	4	blue
5	white-blue	5	white-blue
6	green	6	orange
7	white-brown	7	white-brown
8	brown	8	brown
T568B		**T568A**	

A cable that is wired as TIA/EIA T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Once the boot-up sequence is complete, the amplifier takes more time to sync with the Dante network and begin the playback of streamed content. The front panel LED lights green after approximately 20 seconds.

> **ATTENTION:**
> - The amplifier must be powered on last.
> - L'amplificateur doit être mis sous tension en dernier.

Step 7 — Checking LEDs

Check the Limiter/Protect and Signal LEDs on the front and rear panels to see if any problems are encountered (see "Front Panel Features and Troubleshooting" in the NetPA U 2002 SB User Guide for more information).

Double-check the correct load is connected and properly wired to the rear panel connections (see **Speaker Wiring** on page 3 for more information).

Step 8 — DSP Configurator Software Installation

There are no hardware controls for the NetPA U 2002 SB. Configuration is done using Extron DSP Configurator software and control is performed using SIS commands. To learn about full computer requirements, see the DSP Configurator product page on **www.extron.com**.

Download DSP Configurator from the Extron Website

1. From the Extron home page (**www.extron.com**), click the `Download` tab to open the `Download` page.

2. Under `Software` (located on the left side of the page), select **DSP Configurator Software**. The `DSP Configurator Software` product page opens.

3. Click the `Download` button and follow the on-screen instructions.

> **NOTE:** An Extron Insider account is required to download DSP Configurator.
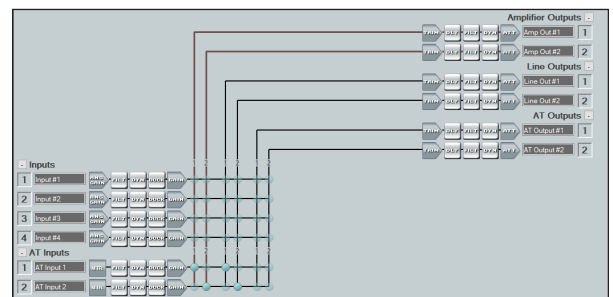
Step 9 — NetPA U 2002 SB Configuration

When power is connected to the unit and the rest of the audio system, audio output can be easily configured for any listening environment via the DSP Configurator. The following steps detail how to configure a NetPA U 2002 SB amplifier.

Configure the NetPA U 2002 SB Amplifier

1. Ensure the control computer is connected to either the AT port, RS-232 port, or the rear panel USB configuration port.

2. Start the DSP Configurator software. From the splash screen drop-down list, select **NetPA U 2002 SB**. Click **OK**. The main workspace opens.

3. The software starts in Emulate mode:

   a. To create a configuration file offline and then upload that configuration to a NetPA U 2002 SB unit at a later time, remain in Emulate mode and save the configuration file.

   b. To upload a configuration to the NetPA U 2002 SB unit or download the current configuration from the unit, enter Live mode. When in Live mode, changes made in DSP Configurator immediately affect the connected NetPA U 2002 SB. To enter Live mode, click **Live** at the top of the DSP Configurator workspace, or select **Tools > Connect to Device**, or press <**F6**> on the keyboard.

> **NOTE:** When Live mode is selected, a connection dialog box appears. Select the desired connection type and follow the on-screen prompts (see the NetPA U 2002 SB User Guide for more information on connecting live to a device).

The main workspace provides access to mix matrices, gain blocks, and DSP processors for configuring a NetPA U 2002 SB. It also provides a menu bar across the top with additional configuration tools. For more information on using the DSP Configurator, see the "DSP Configurator" section of the NetPA U 2002 SB User Guide, or the DSP Configurator Help File that can be accessed by selecting **Help > Contents** or pressing <**F1**>. Most dialog boxes within DSP Configurator contain a **Help** button (?) in the top right corner. Click this button to open the help file topic for that particular dialog box.

Setting the Output Mode

The NetPA U 2002 SB output mode is configured via DSP Configurator and the selection is passed to the amplifier. There are six selectable modes that are divided into two stereo modes and four bridged mono modes.

- **Stereo Modes (8 ohm/4 ohm)** — Each channel of an output pair behaves independently, and each input can be routed to any output.
- **Bridged Mono Modes** — There are four bridged mono modes: two low-impedance (8 ohm and 16 ohm) and two high-impedance (70V and 100V). The second amplifier output is not user-controllable in DSP Configurator.
    - **8 ohm bridged** — This mode bridges the output pair and sets it for an 8 ohm load.
    - **16 ohm bridged** — This mode bridges the output pair and sets it for a 16 ohm load.
    - **70V** — This mode bridges the output pair and sets it for a 70V load.
    - **100V** — This mode bridges the output pair and sets it for a 100V load.

Bridging occurs in the amplifier. The positive pin on Channel 1 becomes the positive pin of the bridged output, and the positive pin on Channel 2 becomes the negative pin of the bridged output.

When the amplifier is set to bridged mono mode, DSP Configurator deletes the Channel 2 amplifier output signal chain, including mix points and output processors.

In the 70V and 100V modes, an 80 Hz, 12 dB/octave high-pass filter is applied to the output filter block by default. The user can change the frequency and slope of this filter. In all other modes, the high-pass filter is not applied by default.
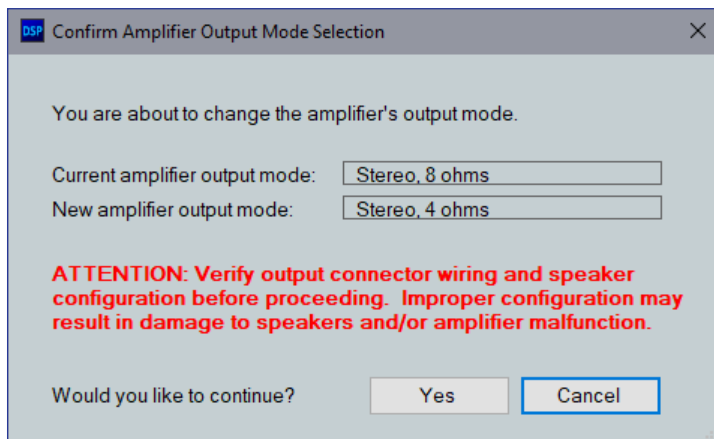
Configuring the Output Mode

1. Select **Tools> Configure Amplifier Output Mode** to open the Configure Amplifier Output Mode dialog box.
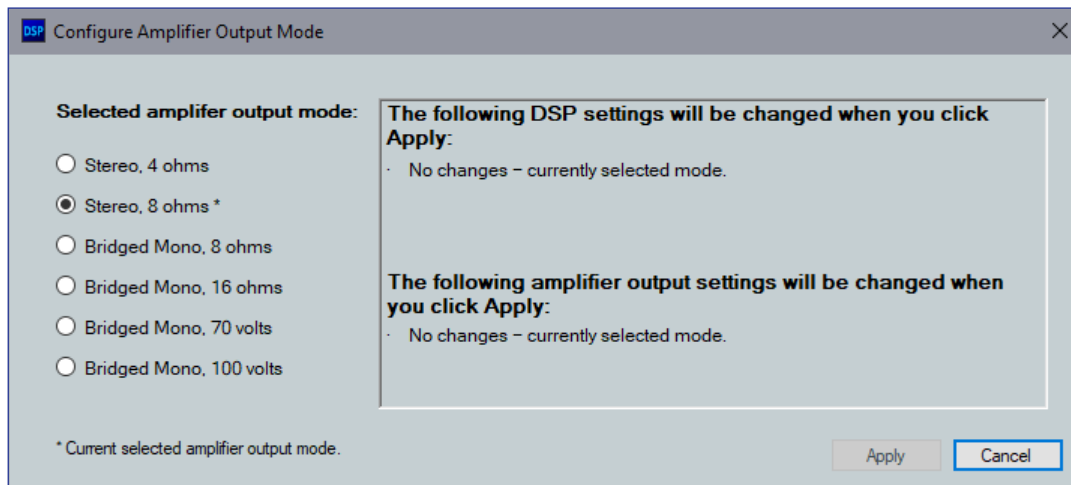
Figure 7. Configure Amplifier Output Mode Dialog Box

2. Select the radio button next to the desired output mode. The currently selected mode is indicated with an asterisk (*) to the right. The information window to the right of the output mode list displays the DSP and amplifier output settings that changes when the mode setting is applied.

3. Click **Apply** to apply the amplifier output mode settings to the device. The Confirm Amplifier Output Mode Selection dialog box opens (see **figure 8** on the next page).

Figure 8. **Confirm Amplifier Output Mode Selection Dialog Box**

4. Click **Yes** to confirm the amplifier output mode selection and apply it to the amplifier.

> **ATTENTION:**
> - Verify output connector wiring and speaker configuration to avoid damage to the speakers and/or amplifier malfunction prior to clicking **Yes**.
> - Vérifiez le câblage du connecteur de sortie et la configuration du haut-parleur pour éviter les dommages aux haut-parleurs et/ou au dysfonctionnement de l'amplificateur avant de cliquer sur **Oui**.

Downloading and Installing Dante Controller

1. From **www.extron.com**, hover over the **Download** tab at the top of the page.

2. From the `Featured Software` list, select **Dante Controller**. The `Dante Controller` product page opens.

3. Click the blue **Download** button.

4. Select **Run** to run the Dante Controller installer or select **Save** to save the install file to run at a later time.

If you choose to run the file, follow all prompts. If you saved the file, click the saved file to begin installation when ready.

> **NOTE:** The installed Dante Controller program files are saved in:
> `C:\Program Files (x86)\Audinate\Dante Controller\DanteController.exe`.

Configure Dante Device Settings

Dante settings in the NetPA U 2002 SB can be configured from DSP Configurator. The device can be named in the `Dante Device Settings`, which assists with identifying a specific device in the Dante Controller software when there are multiple devices on the Dante network.

> **ATTENTION:**
> - It is crucial that a Dante device be named before audio subscriptions with other devices are established. Existing subscriptions are removed when a unit is renamed.
> - Il est crucial qu'un appareil Dante soit nommé avant la création d'abonnements audio avec d'autres appareils. Les abonnements existants sont supprimés lorsqu'une unité est renommée.

To configure Dante device settings:

1. Open DSP Configurator and connect live to the NetPA U 2002 SB.

2. Select **Tools > Device Settings**. The `Device Settings` dialog box opens.

3. From the tabs at the top of the `Device Settings` dialog box, select **Dante Device.**

4. In the **Device Name** field, give the NetPA U 2002 SB a name (recommended to be device model and location) so that it can be easily identified in Dante Controller. No spaces are allowed in the name.

5. Dante device network settings can also be configured in this dialog box. Use the radio buttons and text fields to choose **DHCP** (recommended) or **Static IP** and enter a static IP address configuration.

6. Click **Apply**.

7. Click **OK** to confirm changes and close the `Device Settings` dialog box.

Renaming the NetPA U 2002 SB Amplifier in Dante Controller

1. From the control computer **Start** menu select: `All Programs > Audinate > Dante Controller > Dante Controller`

2. The `Dante Controller - Network View` screen opens. All Dante devices on the network are discovered and listed.

3. From the Device menu, select **Device View** or press <**Ctrl+D**> on the keyboard.

4. The `Dante Controller - Device View` dialog opens. Select the device being configured from the `(Select a Dante Device...)` drop-down list. The `Device View` dialog populates with the selected NetPA U 2002 SB information (see figure 9 below).
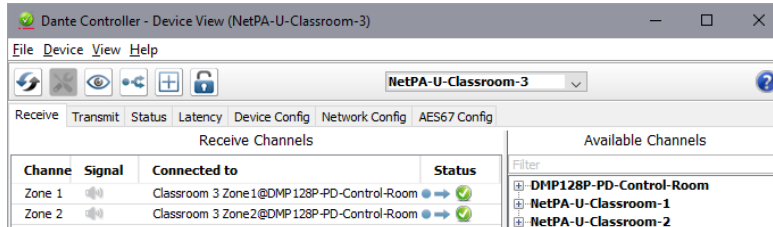

Figure 9. Populated Device View Dialog Box

5. Click the **Device Config** tab to open the `Device Config` page.

6. In the `Rename Device` panel, enter the new name of the device in the text field.

> **NOTE:** No spaces are allowed in the name and names should be significant identifiers. For example,
> `NetPAUAmplifier-MainRack`

7. Click **Apply**. A confirmation prompt opens. Click **Yes** to confirm the new name.

8. Repeat as necessary for all devices.

Creating a Physical Dante Network

A physical network is required to share Dante audio channels among Dante-enabled devices like those found in the NetPA U 2002 SB. Other devices capable of sending and receiving audio over a Dante network must be on the same physical network in order to communicate with Dante (see figure 10 below for an example of a Dante network).
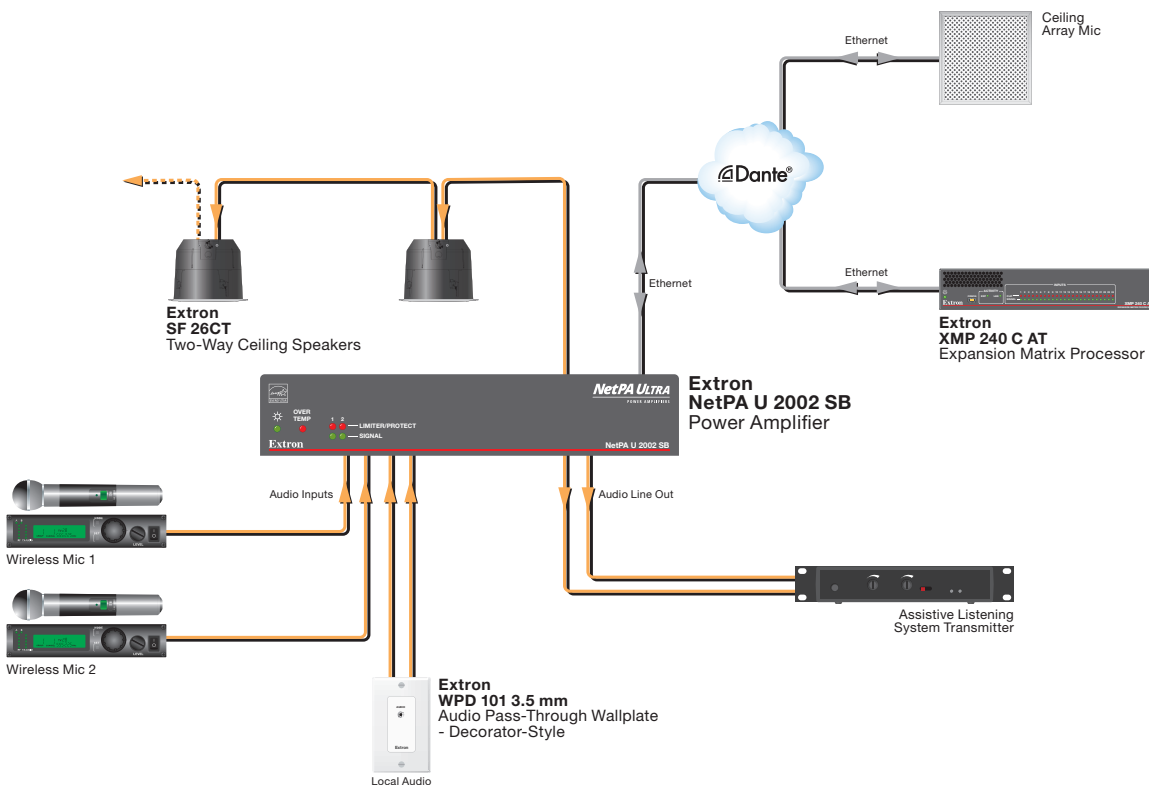
Figure 10. Physical Dante Network Diagram

Dante Network Setup

Use a standard Ethernet cable to connect a NetPA U 2002 SB amplifier to a Dante network via the AT port. Launch the Dante Controller program.

Dante Controller automatically discovers all Dante devices on the network and allows other Dante-enabled devices to communicate with it. The default device name is the model name followed by the last six characters of the device MAC address (for example, `NetPA-U-xxxxxx`). Multiple devices on the same network can present difficulty in identifying inputs and outputs. To avoid confusion, rename each device to a unique identifier.

> **NOTE:** To simplify setup, connect only one Dante device to the network at a time.

Dante Controller Operation

Dante Transmitters and Receivers

A Dante network is comprised of transmitters that output digital audio onto the Dante network and receivers that receive digital audio input from the Dante network.

- Transmitters output digital audio from the device onto the audio network.

- Receivers take in digital audio from the audio network into the device.

Network View Layout

In the Dante Controller software, Dante transmitters are listed horizontally across the top of the `Network View` (❶), while Dante receivers are listed vertically on the left side of the window (❷). Creating a link in the connection matrix routes audio from a transmitter to a receiver (❸).
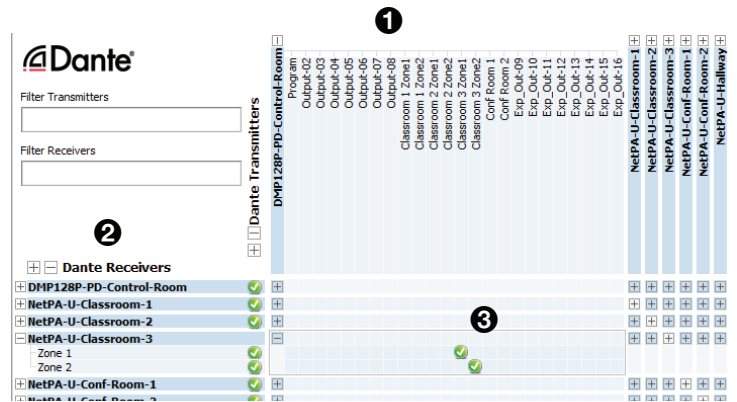
Routing Devices

1. To show the transmitters of a Dante device, click the **+** box next to the desired device in the `Dante Transmitters` panel, such as `NetPA-U-9175f2` (❶). The **+** changes to a **−** sign when the details for the device expand.

2. To show the receivers of a Dante device, click the **+** box next to the desired device in the `Dante Receivers` panel, such as a `NetPA-U-MainRack` (❷).

3. Click the intersection of the desired subscription (discrete connection) between a transmitter and a receiver (❸). A check mark at the intersection indicates the subscription is made. A check mark also appears next to the receiver channel.

> **NOTE:** A receiver can subscribe to only one transmitter. A transmitter can connect to multiple receivers.

4. To undo routing, click the junction again to disconnect the receiver from the transmitter.

> **NOTE:** After making changes to Dante network routing such as subscriptions, device names, or channel labels, wait at least 5 seconds before disconnecting or powering down the devices. This ensures that the new information is properly saved to those devices. Device-level configurations, such as sample rates, latency, and clock settings are saved instantly.

Gain Structure

The input sensitivity of the NetPA U 2002 SB amplifier is 0 dBFS. To achieve maximum output power without degrading audio clarity, the peak signal level on the meter at the amplifier channels output attenuators should be set at—or as close as possible—to 0 dBFS.

The default configuration of the DSP blocks are as follows:

- Input Signal Chain

    - All analog input gains (`ANG GAIN`) are set to 0 dB.

    - All Dante inputs do not have a separate input gain placed before the processors.

    - All processors are disabled.

    - All input pre-mix gains are set to 0 dB.

- Mix Points

    - AT inputs 1 and 2 are mixed at 0 dB to their respective Amplifier and Line outputs .

- Output Signal Chain

    - Amplifier output mode is set to stereo, 8 ohms.

    - All output trims are set to 0 dB.

    - All processors are disabled, except in 70V and 100V output modes. In these modes, a user-modifiable, 80 Hz high-pass filter is applied to the output filter block by default.

    - Amplifier channel output attenuators are set to -24 dB.

    - Amplifier Line and AT outputs are set to 0 dB.

Setting-Up Gain Structure

Setting proper gain structure is necessary to ensure maximum audio clarity and amplifier output performance. To set-up gain structure, follow the steps outlined below, using a calibrated pink noise source.

1. Ensure all pre-mix gain, cross-points, and output trim blocks are set to 0 dB

2. Adjust the Mic/Line Input ANG GAIN blocks so the output meter reads -17dBFS

3. Adjust the output attenuators, so the output meter reads -17 dBFS

Refer to the *NetPA U 2002 SB User Guide* found on **www.extron.com** for more details on setting-up gain structure.

| **NOTE:** | When setting levels, pay attention to avoid digital clipping. |

For more information on configuring a NetPA U 2002 SB unit in Dante Controller, see the "Dante Controller" section of the *NetPA U 2002 SB User Guide* found on **www.extron.com**.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.