Dolby CP750 7.1 audio for the Dolby Multichannel Amplifier

Installation Manual

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Issue 1

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Contents

1 Introduction to Dolby CP750 7.1 audio for the Dolby Multichannel Amplifier

This documentation shows you how to configure a Dolby Digital Cinema Processor CP750 (or other cinema processor) for 7.1 (or 5.1) audio to work with a Dolby Multichannel Amplifier using a Yamaha Tio1608-D analog-to-digital converter.

1.1 About the CP750 (or other cinema processor) configuration for the Dolby Multichannel Amplifier

You need to set up the CP750 (or other cinema processor) to transmit audio to a Dolby Multichannel Amplifier.

The output of the Dolby Cinema Processor CP750 (and some other cinema processors) is analog audio, and the input of the Dolby Multichannel Amplifier is AES67 digital audio. To connect these devices, a converter is required. We have tested a Yamaha Tio1608-D, and it meets Dolby standards.

1.2 Contacting Dolby

You can contact Dolby Cinema Solutions and Support using email or regional telephone numbers.

Contact Dolby Cinema Solutions and Support

- Send an email to cinemasupport@dolby.com.
- Call:

  Americas: +1-415-645-4900
  Europe/Middle East/Africa (EMEA): +44-33-0808-7700
  Asia-Pacific (APAC): +86-400-692-6780
  Japan: +81-3-4540-6782

Access Dolby documentation

Visit www.dolbycustomer.com.

Access Yamaha documentation

Visit http://www.yamahaproaudio.com/europe/en_gb/downloads/manuals.

Submit feedback about Dolby documentation

Send an email to documentation@dolby.com.

1.3 Related documentation

In addition to this manual, Dolby, Yamaha, and Audinate provide a full set of documentation to support the conversion of analog audio from a Dolby Cinema Processor CP750 (or other cinema processor) to AES67 digital audio.

- The *Dolby CP750 Digital Cinema Processor Manual* provides instructions for installing and operating the CP750.
- The *Dolby Multichannel Amplifier Manual* provides instructions for installing and operating the Dolby Multichannel Amplifier.
- The *Yamaha Tio1608-D Owner's Manual, Audinate Dante Controller User Guide,* and *Yamaha R Series R Remote V4.5 User's Guide* provide related documentation. This documentation is shipped with the Yamaha Tio1608-D. You can also obtain this documentation at http://www.yamahaproaudio.com/europe/en_gb/downloads/manuals.
- You can also reference the Dante Controller software training at https://www.audinate.com/resources/training-and-tutorials/dante-certification-training.
- Dolby and other digital cinema playback manufacturers provide documentation for the other products referenced in this manual.

Regulatory and safety information

Caution: Be sure to check the regulatory and safety information in the documentation that is included with all of the applicable hardware referenced in this manual.

2 Requirements

These are the requirements for setting up 7.1 audio to work with a Dolby Audio Processor CP750 (or other sound processor) and the Dolby Multichannel Amplifier.

- Transmitting audio from a media block
- Connecting a CP750 (or other sound processor) to a media block
- Converting audio with the Yamaha Tio1608-D

2.1 Transmitting audio from a media block

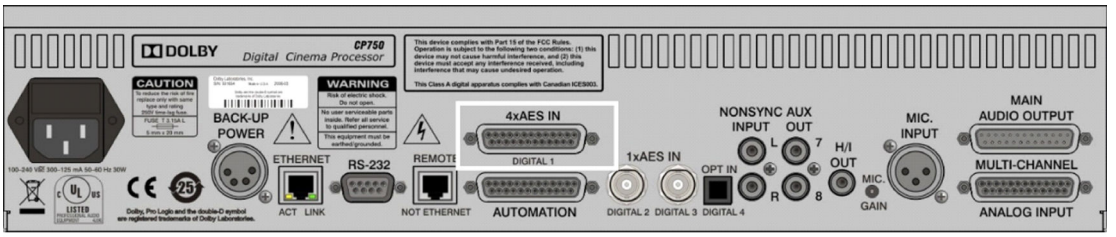
You need to transmit 7.1 audio from a digital cinema playback system media block to a CP750 (or other cinema processor).

You can use any DCI-compliant media block to transmit 7.1 audio to the CP750 (or other audio processor) AES3 digital audio input port. A Dolby IMS2000 media block is shown in the following figure as an example. On the right side of the Dolby IMS2000 front panel, there are two RJ-45 output ports labeled **1–8** and **9–16**.

2.2 Connecting a CP750 (or other sound processor) to a media block

You can connect a CP750 or other cinema processor to a digital cinema playback system media block.

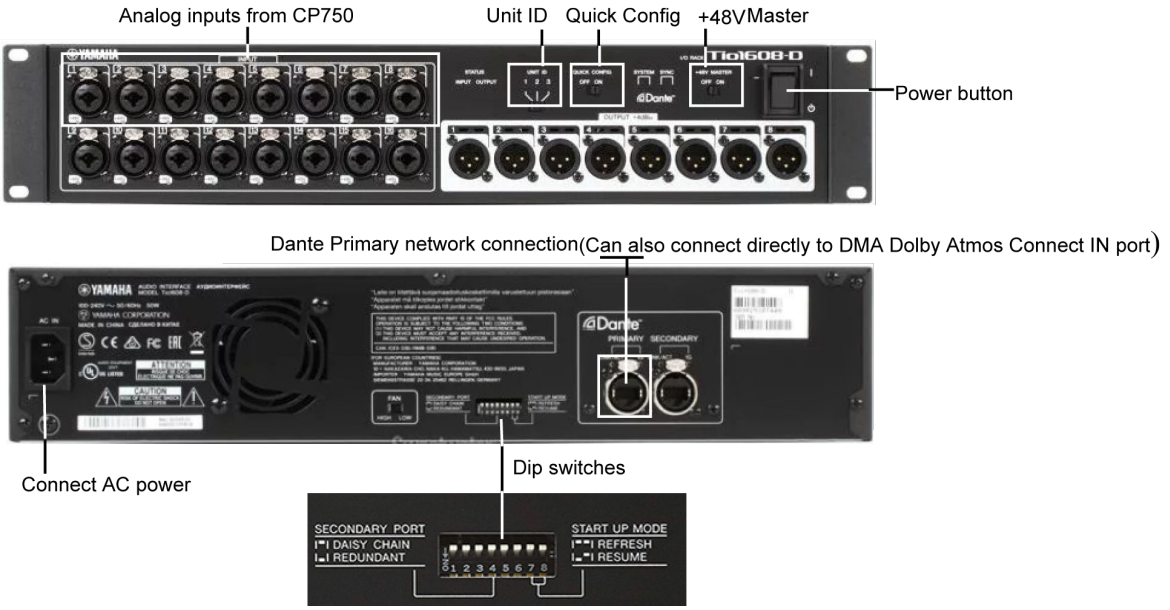
The CP750 receives digital audio from a media block through its 25-pin D-connector (labeled **4×AES IN**). You make this connection using an RJ-45 to 25-pin D-connector adapter, as shown in the following figures.



2.3 Converting audio with the Yamaha Tio1608-D

To convert the eight-channel analog audio from the CP750 (or other cinema processor) to digital AES67/Dante for the Multichannel Amplifier, you must use the Yamaha Tio1608-D analog-to-digital converter.

This figure shows the Yamaha Tio1608-D front and rear views.



3 Setting up the system

To use the CP750 (or other cinema processor) with a Dolby Multichannel Amplifier, you need to set up and connect all of the required hardware and configure the system.

3.1 Setting up the Yamaha Tio1608-D

You need to perform an initial setup of the Yamaha Tio1608-D.

Prerequisites

Download and install the latest Dante Controller software for your computer. This application enables you to configure the inputs and outputs for use with a Dolby Multichannel Amplifier. For additional details, see the *Yamaha Tio1608-D Owner's Manual* and the *Audinate Dante Controller User Guide*, which are shipped with the Yamaha Tio1608-D.

To download the Dante Controller software, you must first open an account with Audinate (free) and then download the software at https://www.audinate.com/products/software/dante-controller.

In some rare situations, you may need to set a static IP address on the Yamaha device. To do this, you can use the Yamaha R-Remote software, which you can download at http://www.yamahaproaudio.com/europe/en_gb/downloads/firmware_software/tio1608d/.

About this task

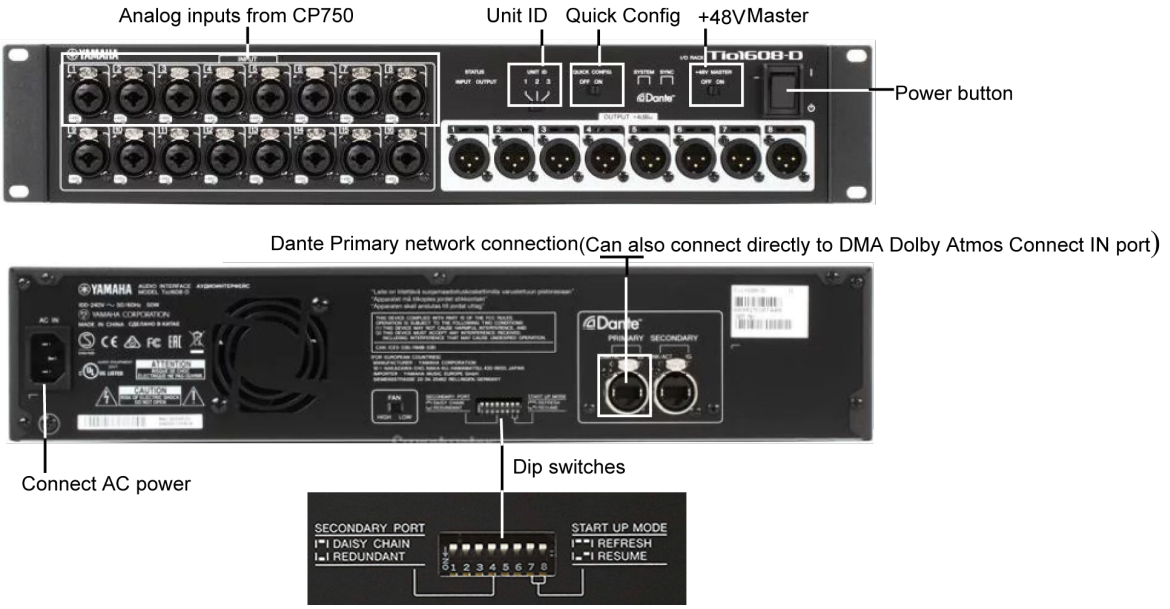
You use the YamahaTio1608-D rear panel to:

- Connect the unit to the network using the **Primary** R-J45 port
- Configure the dip switches
- Connect power

You use the YamahaTio1608-D front panel to:

- Make additional settings
- Connect audio from the CP750
- Turn the unit on

The following figures show the Yamaha Tio1608-D front and rear panels.



Procedure

1. Connect the rear-panel **Dante Primary** port to the network switch.
2. Set the rear-panel DIP switches.

DIP switch setting	Function
1 up (off)	Sets the device ID range to 1, 2, or 3.
2 up (off)	Sets the device ID range to 1, 2, or 3.
3 up (off)	Unit will retain its settings after a reboot.
4 up (off)	Unit will use the primary Ethernet port.
5 up (off)	Unit will start in DHCP mode (also supports local IP addressing).
6 down (on)	Unit will start in DHCP mode (also supports local IP addressing).
7 up (off)	Unit boots up in normal mode.
8 up (off)	Unit boots up in normal mode.

3. Slide the front-panel **UNIT ID** switch to 1.
4. Slide the front-panel **QUICK CONFIG** switch to **OFF**.
5. Slide the front-panel **+48V MASTER** switch to **OFF**.
6. Connect the power cord to the rear-panel AC input port, then press the front-panel power button to turn the unit on.

   You will connect the analog inputs and digital outputs later when you interconnect all of the hardware components.

3.2 Interconnecting the hardware

To use the CP750 (or other cinema processor) with a Dolby Multichannel Amplifier, you need to interconnect the required hardware.

About this task

You need to interconnect a CP750 (or other cinema processor), Dolby Multichannel Amplifier (with version 2.0.x.x software), Yamaha Tio1608-D, media block, your computer, and a network switch.

Procedure

1. Connect the AES3 output from a Dolby IMS2000 (or other cinema media block) channels **1–8** RJ-45 port to the CP750 (or other cinema processor) **4×AES IN** port using an RJ-45 to male 25-pin D-connector audio adapter.
2. Connect the analog output from the CP750 (or other cinema processor) to the Yamaha 8 × analog inputs through a 25-pin D-connector to 8 × XLR audio cable. The optional Dolby accessory kit, DMA-ACC-YAM-ADC, provides this cable.

   The XLR ends of the cable are marked with the channel information. Here is a typical routing configuration:

   1 = Left

   2 = Right

   3= Center

   4 = Low-Frequency Effects/subwoofer

   5 = Left Side Surround

   6 = Right Side Surround

   7 = Left Rear Surround

   8= Right Rear Surround

   If you want purchase a cable from another source, or build your own cable, refer to the pinouts and cable specifications.
3. Set your computer to DHCP or to link local IP.
4. Connect your computer to the network switch.

   When connected directly without a DHCP server, your computer and the Yamaha device select link local IP addresses (169.x.x.x), and can communicate with each other using the Dante Controller autodiscover capabilities.

Related information

Pinouts on page 18

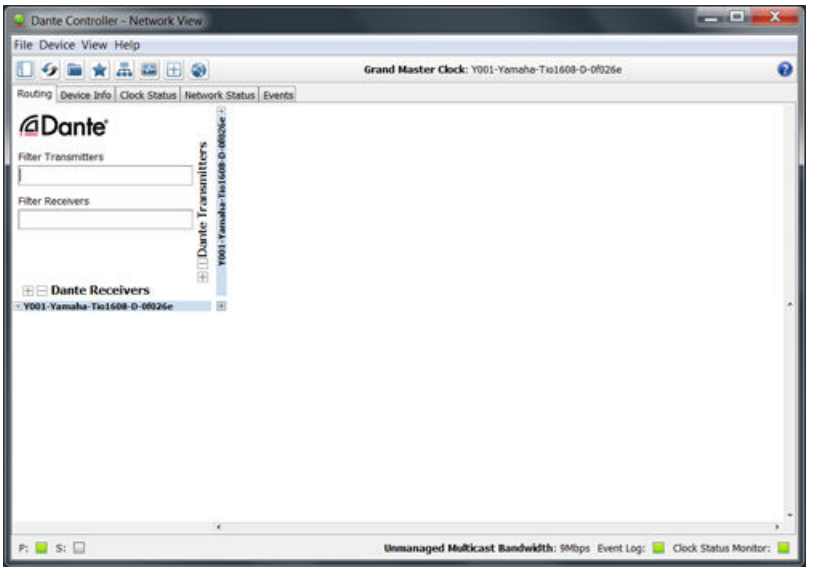
3.3 Using the Dante controller for the AES67 setup

To transmit AES67 output from a CP750 (or other cinema processor) via the Yamaha Tio1608-D to the Dolby Multichannel Amplifier, you need to use the Dante Controller software to set up routing for the Yamaha Tio1608-D.

Procedure

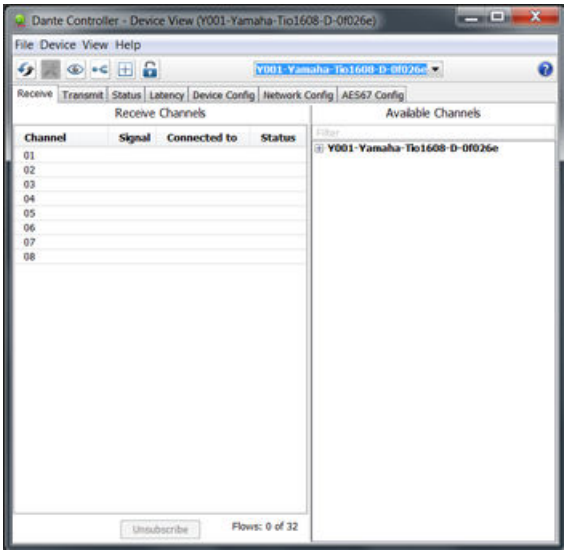
1. Launch the Dante Controller software application on a computer that is attached to the same network as the Yamaha Tio1608-D (A Microsoft Windows system is used in these examples.)

   The **Network View** window appears.

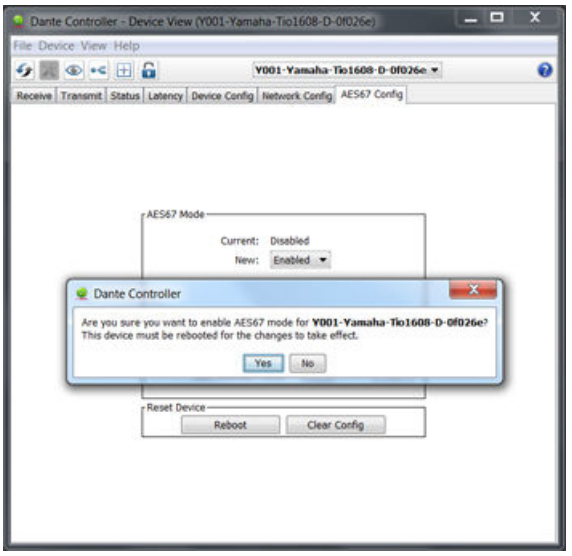


2. Ensure that the Yamaha Tio1608-D is powered up, wait for Dante Controller to detect it, then click the **Device Info** tab.

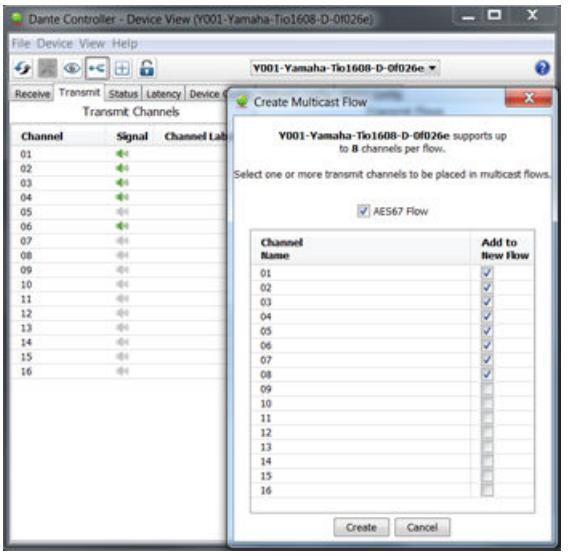
   The **Device View** window appears. The **Receive** tab is selected at the left side of the window, which displays channels 1 through 8.



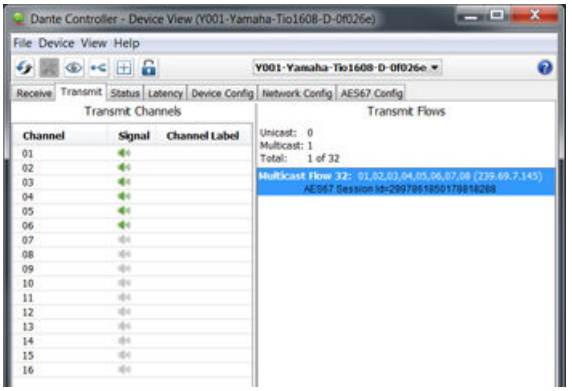
3. Double-click the Yamaha Tio1608-D in the **Available Channels** pane on the right side of the **Device View** window.
4. Click the **AES67 Config** tab, then click **Enabled** in the drop-down menu.
5. Click the **Reboot** button to enable AES67, as indicated by the dialog message.



6. After rebooting, reconnect with the Yamaha device, then click the **Transmit** tab in the **Device View** window, and click the **Create a New Multicast Flow** button.
7. In the **Create Multicast Flow** pop-up screen, click (to check) in the **AES67 Flow** box, then select the first eight channels, and click the **Create** button.

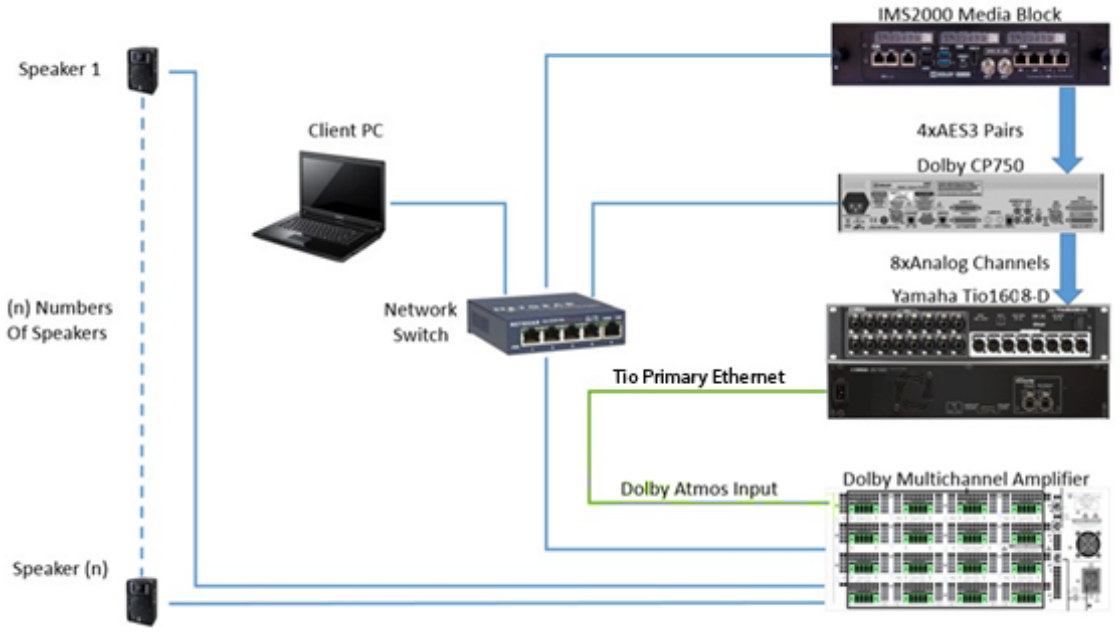


A multicast flow is now listed in the **Transmit Flows** pane of the **Transmit window**. This specifies that audio received on analog channel 1 from the cinema sound processor is routed out of digital channel 1 of the Yamaha device, channel 2 is routed out of digital channel 2, and so on. You have now completed the AES67 setup in the Dante Controller software.



8. Connect the Yamaha Tio1608-D **Primary** Ethernet port directly to the amplifier **DOLBY ATMOS CONNECT IN** port.

The following figure shows the final connections.

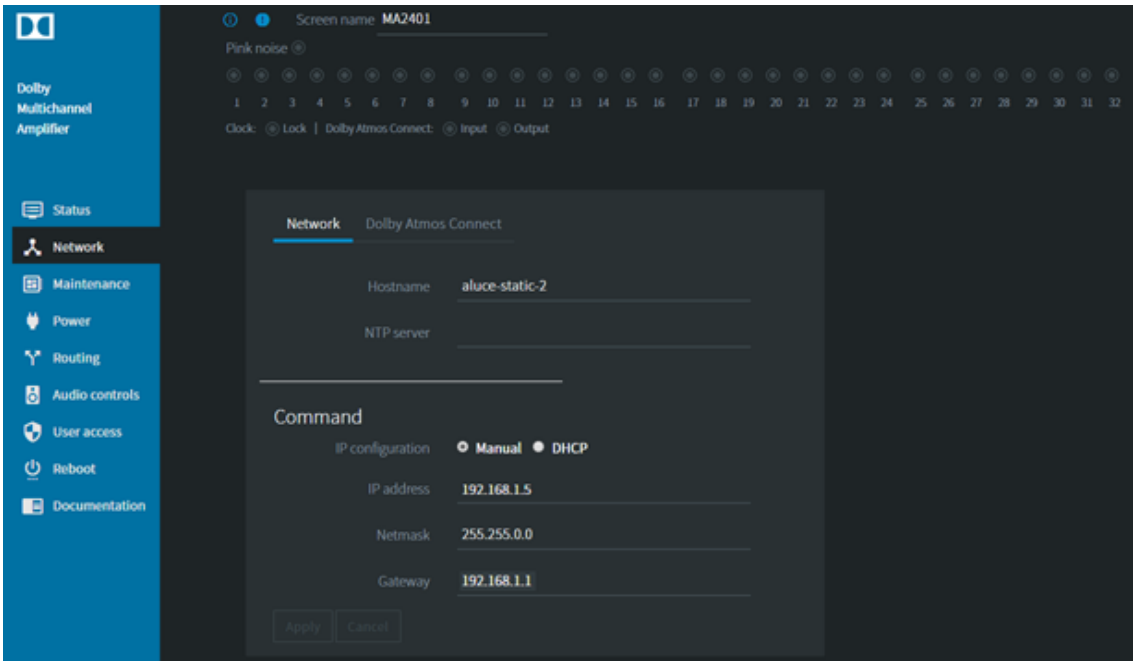


3.4 Setting up the Dolby Multichannel Amplifier

You need to set up the Dolby Multichannel Amplifier and configure it to receive a Yamaha Tio1608-D AES67 input stream.

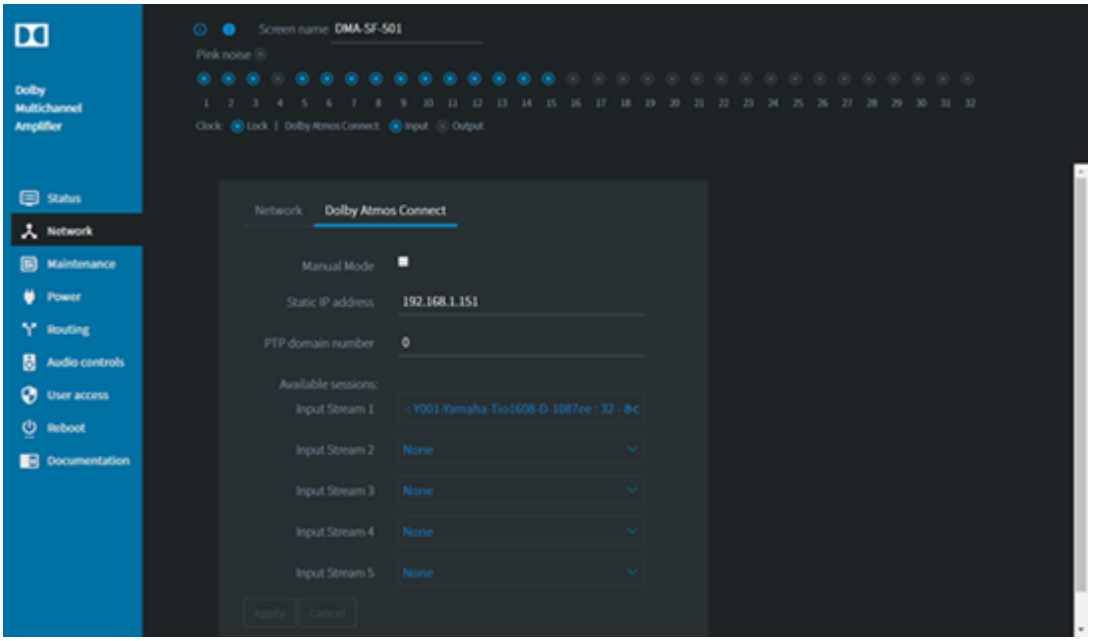
Procedure

1. Connect the amplifier power cord, and press the power button to turn the device on.
2. Connect a CAT5e or greater cable from the **COMMAND** port to the network.
3. Configure your computer IP address to communicate with the Dolby Multichannel Amplifier default IP address (192.168.1.143 [or the address you previously configured]) on the **COMMAND** port. If using the default IP address, we recommend that you enter an IP address above 192.168.1.150 and below 192.168.1.254, with a subnet of 255.255.255.0.
4. Open your web browser, and enter the Dolby Multichannel Amplifier **COMMAND** port default IP address 192.168.1.143 to display the web client user control screen. (Currently, we recommend the Google Chrome browser.)
5. Click **Network** in the navigation bar to display the network parameters (shown in the following figure), and under the **Command** section, click **Manual** for **IP configuration**. When prompted for credentials, the default password is *password*.



If not already done, we recommend that you change the **IP address**, **Netmask**, and **Gateway** settings to work with your IP schema by clicking in the respective fields, making the required entries, and clicking **Apply**. If you are using the Dolby default IP scheme, we recommend that you change the third octet of the default IP address to match your auditorium number and the fourth octet to 143. This will be 192.168. x.143, where x = auditorium number.

6. Under the **Network** tab, click **Dolby Atmos Connect** and uncheck the **Manual Mode** box, enter any static IP address (this value is not used in the configuration), and enter **0** for the PTP domain number. This PTP setting allows the amplifier to search for a Yamaha device (autodetect).



7. In the **Input Stream 1** drop-down menu, select the Yamaha Tio1608-D, then click **Apply**.

Note: To display the Yamaha device as input stream 1, the device must be connected to the amplifier.

8. Select **Routing** in the navigation bar to display the **Output routing** screen, and enter the routing input for the assigned speakers.

   In this **Output Routing** screen, you can route channels from any of the five input streams to one or more speaker outputs. Input streams and the respective UDP ports appear on the left side of the screen, while outputs are listed on top. The UDP ports correspond to the UDP settings in the **Network>Dolby Atmos Connect** screen. The amplifier is shipped with no routing assignments, and there is no audio transmitted until you configure routing.

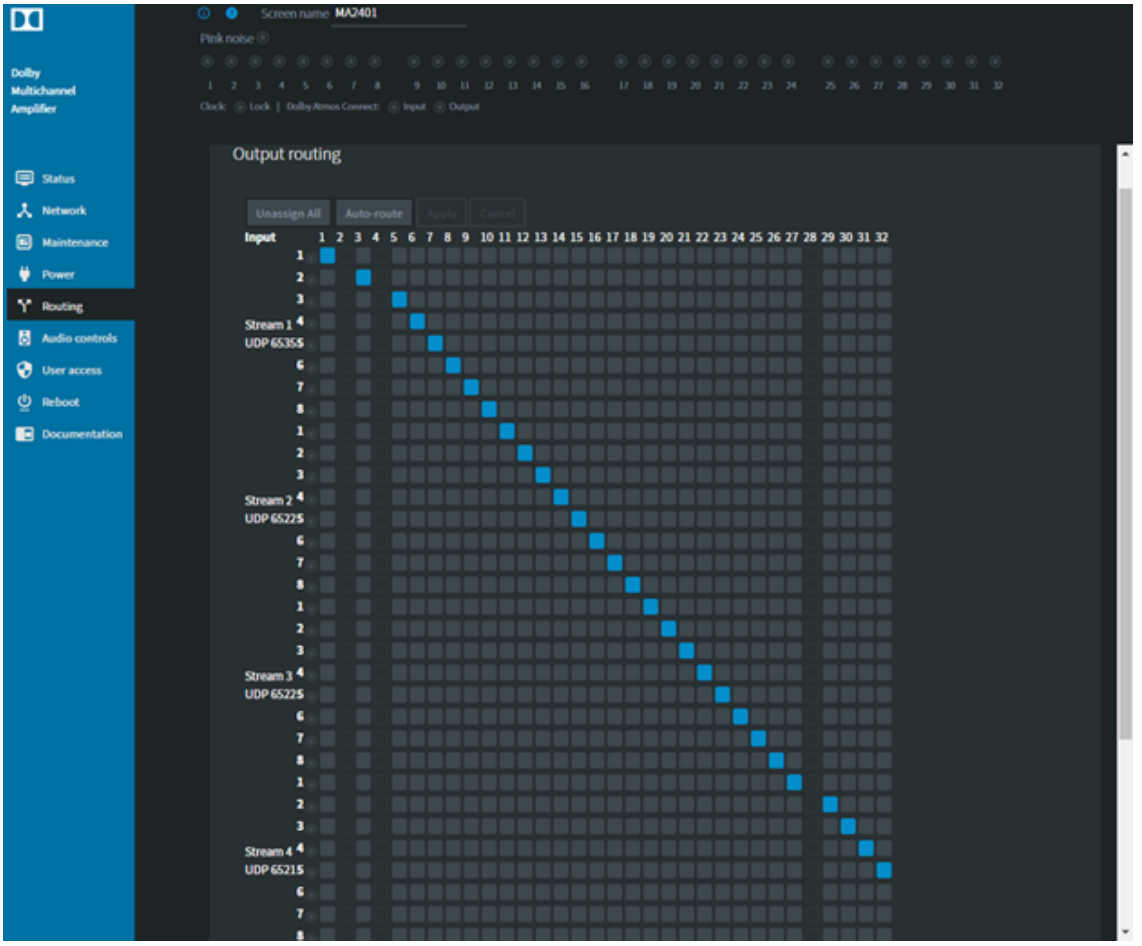
   To configure bridged channels, you must select **Power** in the navigation bar before setting up your routing assignments.

   To configure routing, click in an output box in the row next to the desired input stream and the box is highlighted in blue to show the corresponding routing output. If you click again in a highlighted box, that assignment is removed.

   If you click the **Auto-route** button, the system looks for every available input channel, and assigns consecutive outputs to consecutive inputs.

   Clicking **Unassign all** removes the routing assignments.

   In the following figure, channels 1 and 2 and channels 3 and 4 are bridged. However, you can assign individual inputs to one or more outputs, but cannot assign multiple inputs to an output.



   Here is a typical routing configuration:

   1 = Left

   2 = Right

3 = Center

4 = Low-Frequency Effects/subwoofer

5 = Left Surround

6 = Right Surround

7 = Left Rear Surround

8 = Right Rear Surround

Note: Depending on the number of speakers and power requirements, you may need to configure additional channels. For example, if the stage channels are biamped, you can assign input 1 to two outputs. If there is more than one Low-Frequency Effects unit, you can assign input 4 to two or more outputs to drive all of the speakers.

9. Click **Apply** to save your routing assignments or **Cancel** to discard your changes.
10. Click **Status** in the navigation bar.

    The **Clock Lock** indicator on the **Status** screen should now illuminate in blue, indicating that it is on. The audio stream will now pass through to the speakers.

3.5 Configuring advanced connections

We recommend that you connect the Yamaha Tio1608-D to the Dolby Multichannel Amplifier using only a direct connection between these devices on a **Dolby Atmos Connect** network. In such a configuration, this prevents audio transmission problems between the two devices, as bandwidth on a network switch is not used. Typically, there is no need to access the Yamaha controls using Dante Controller or R-Remote software after the setup is complete. However, if more than one Yamaha device is installed on the network, you need to follow specific instructions to ensure that you transmit the desired audio.

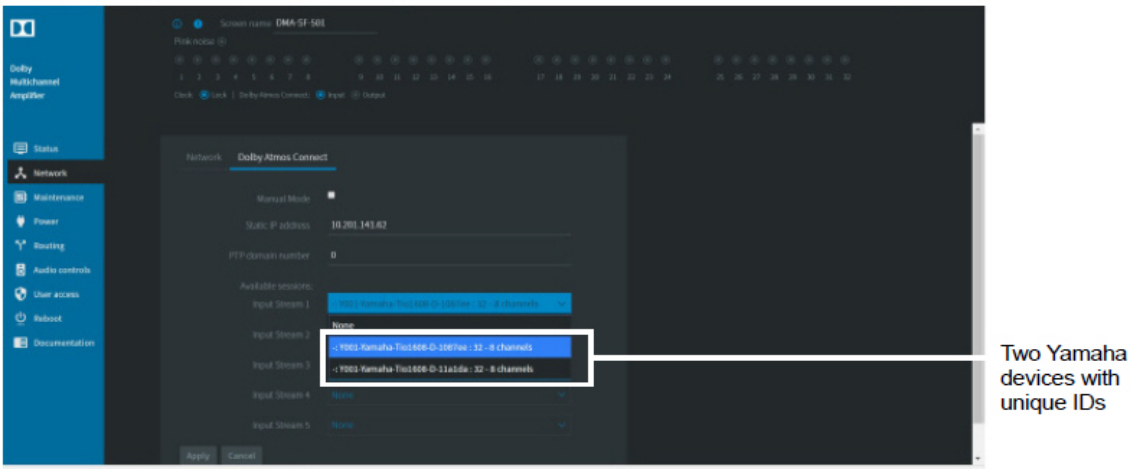
About this task

If more than one Yamaha device is installed on the network, it may be best to attach the **Dolby Atmos Connect** cable from the amplifier to a **Command** network switch. In this type of configuration, more than one Yamaha unit appears in the Dolby Multichannel Amplifier **Network > Dolby Atmos Connect > Available Sessions** screen. In such a case, you need to use the Dante Controller or R-Remote software to ensure you transmit the desired audio from the correct device.

Procedure

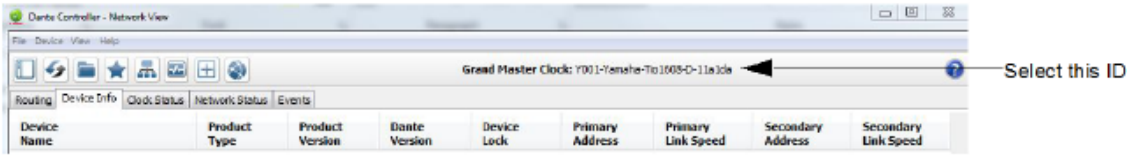
1. Select **Network > Dolby Atmos Connect**, and uncheck **Manual mode** to display the Dolby Multichannel Amplifier **Available Sessions** screen.

   The **Input Stream 1** field displays one Yamaha Tio1608-D and the **Input Stream3** field displays another Yamaha Tio1608-D. Each device has a unique ID.



2. Note the IDs of the Yamaha devices.
3. Launch the Dante Controller or R-Remote software on your computer.

   The ID for the correct unit appears at the top right side of the Dante Controller or R-Remote screen, as shown in the following figures. (In these examples, 11a1da is the ID.) This ID identifies the Yamaha device that you need to select in the Dolby Multichannel Amplifier **Network** > **Dolby Atmos Connect** > **Available Sessions** screen.



4 Pinouts

To connect a digital cinema playback system to a CP750, and a CP750 to a Yamaha Tio1608-D, you need to use the correct audio pinouts for your adapter and cable connections.

- RJ-45 to 25-pin D-connector digital audio pinouts
- CP750 audio output cable pinouts

4.1 RJ-45 to 25-pin D-connector digital audio pinouts

To connect the output of a digital cinema playback system to a CP750, you need to use the correct RJ-45 to 25-pin D-connector adapter pinouts.

Digital cinema playback system AES output channels	CP750 25-pin D-connector side M-adapter pin	CP750 RJ-45 side A-adapter pin
Channels 1 and 2	2	2: Orange
Channels 1 and 2	14	1: Blue
Channels 3 and 4	16	6: Yellow
Channels 3 and 4	3	3: Black
Channels 5 and 6	6	5: Green
Channels 5 and 6	17	4: Red
Channels 7 and 8	19	8: White
Channels 7 and 8	6	7: Brown

4.2 CP750 audio output cable pinouts

To connect a CP750 to a Yamaha Tio1608-D, you need to use a custom cable with the correct audio pinouts. You connect this custom cable to convert eight analog channels from the CP750 **MAIN AUDIO OUTPUT** (25-pin D-connector) to eight digital channels, which are transmitted to the Yamaha Tio1608-D **INPUT** (XLR connector). The optional Dolby accessory kit, DMA-ACC-YAM-ADC, provides this cable, or you can build your own cable.

Channel	CP750 25-pin D-connector pin	Yamaha XLR pin
Left	1	Shield
	2	Positive (+)
	14	Negative (-)
Center	4	Shield
	5	Positive (+)
	17	Negative (-)
Right	7	Shield
	8	Positive (+)
	20	Negative (-)
Left Surround (Ls)	22	Shield
	23	Positive (+)
	10	Negative (-)
Right Surround (Rs)	9	Shield
	24	Positive (+)
	11	Negative (-)
Low-Frequency Effects (LFE)	13	Shield
	25	Positive (+)
	12	Negative (-)
Back Surround Left (Bsl)	15	Shield
	16	Positive (+)
	3	Negative (-)
Back Surround Right (Bsr)	18	Shield
	19	Positive (+)
	6	Negative (-)