1   Introduction

AudioScience's Iyo Dante line of Mic+Line audio interfaces are now compatible with the Telos Alliance Livewire devices. Any Livewire device that supports the AES67 stereo (1ms) format (e.g. Axia Consoles/Engines, Axia xNodes, etc) and the IEEE1588 PTPv2 clock can interoperate seamlessly with an Iyo Dante interface.

The Iyo Dante supports **up to 16 stereo (1ms) Sources and Destinations** in a 1-RU form factor, with terminal block, DB-25 or RJ45/StudioHub audio connections.

When using the Iyo Dante MR (RJ45/StudioHub) models, two DB-15 connectors provide **10 inputs and 10 outputs** of Livewire compatible GPIO.

The Iyo Dante features native Livewire advertisement and routing allowing for full control from the Telos Pathfinder Core Pro VM/appliance, the legacy Pathfinder PC/Pro software, or an equivalent Livewire client application. **See section 9 for special instructions pertaining to the legacy Pathfinder PC/Pro software.**

This document provides an overview of how to integrate the Iyo Dante with Livewire devices. The following steps illustrate how to:

- Configure and connect an Iyo Source to an AES67 stereo (1ms)Destination

- Connect an AES67 stereo (1ms) source to an Iyo Destination

A complete example is illustrated using an **Iyo Dante 32.32MR** and an **Axia IQx AoIP Console.**

2   Important Notes

- Streaming from the Axia IP Audio Driver to the Iyo Dante is not supported due to inherent PC platform software latency issues. Using the Axia IP Audio Driver as a Recorder (i.e. streaming from the Iyo Dante to the Driver) **is** supported.

- All Livewire devices that you wish to connect to/from the Iyo must be configured to use IEEE1588 PTPv2. Note that some Axia devices have the option to function as both a PTPv2 clock slave and a fallback Livewire clock master.

- While Livewire *Advertisement* is supported on the Iyo, *Discovery* is not. If you do not have Pathfinder, you will have to manually enter Livewire channel numbers to connect Network Sources to Iyo Destinations in the Iyo's web interface (see section 5 of this document for details).

- Multicast Low Latency Stereo / Stereo 1ms (Livewire compatible) is the only available stream format. The Iyo Dante will not work with legacy Livewire formats and does not support Unicast.

- AES67 mode must remain enabled on the Iyo Dante (see Dante Controller documentation for details).

- The Iyo Dante RTP multicast prefix must remain **192** (see Dante Controller documentation for details).

- Advanced PTPv2 settings are not available. The Iyo will operate by default with a PTPv2 Priority 1 value of **247** with an option to elevate the priority to **119** (see Dante Controller documentation for details).

- The Iyo does not support Livewire GPIO custom messages, statistics, or pulses.

- Pathfinder Pro (**version 1.5.16.18 or newer**) is required to interoperate with Livewire devices that lack Livewire Routing Protocol (LWRP) GPIO support, i.e. devices that solely rely on Multicast GPIO (e.g. Axia iQx AoIP Console). Pathfinder can be used to bridge the multicast GPIO messages to LWRP. For a complete example, see section 8.

- Self subscription in AES67 is not allowed (i.e. looping back an Iyo Source to an Iyo Destination)

3   Update Iyo Firmware

Use Dante Firmware Update Manager to update the Iyo to the latest firmware (**3.2.0 or later**), downloaded from the AudioScience Iyo web page. If the Iyo does not appear in Firmware Update Manager, ensure the selected network interface in Update Manager and the Iyo are on the same subnet (see section 3 below for help).

4   Configure Iyo Static IP Address from Dante Controller

Use Dante Controller to discover and configure the network interface of the Iyo to match your AES67 subnet. Iyos are in DHCP mode by default. If a static IP is required, navigate to the Network Config tab and click 'Manually configure an IP Address'.
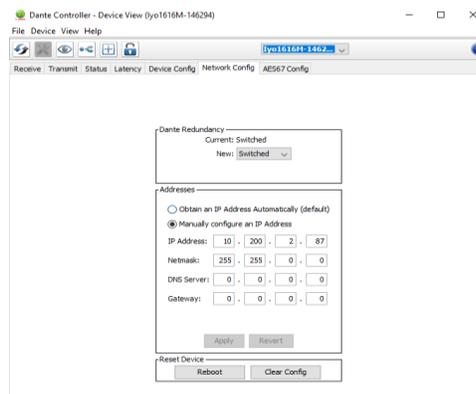

Figure 1 Assign static IP to Iyo

Dante Controller will display an error (see below) if the subnet of the Iyo and the selected Dante Controller network interface do not match. The example below is an interface with a static IP address trying to communicate with a default Iyo connected to a network without a DHCP server. Match the selected Dante Controller network interface subnet to the Iyo's network interface subnet in order to configure the device.
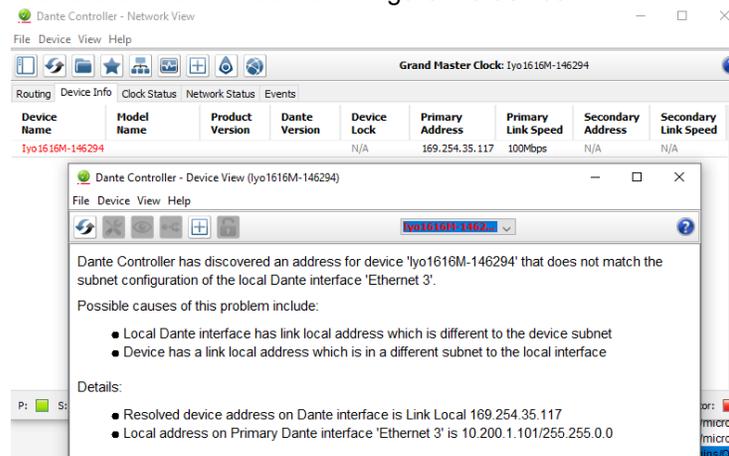

Figure 2 Dante Controller Iyo subnet mismatch

5 Configure AES67 parameters in Dante Controller

In Dante Controller, if AES67 Mode is not already "Enabled" (see the Device View > AES67 Config tab), select "Enabled". Dante Controller will prompt you to reboot the Iyo. Click "Reboot" and wait for the Iyo to boot (up to 1 minute).
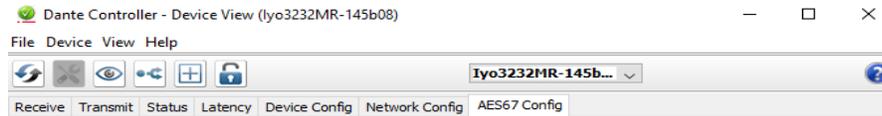
Figure 3 Dante Controller AES67 Mode

In the Dante Controller AES67 Config > RTP/AES67 Multicast Address Prefix grouping, change the Prefix to **192** if not already set.
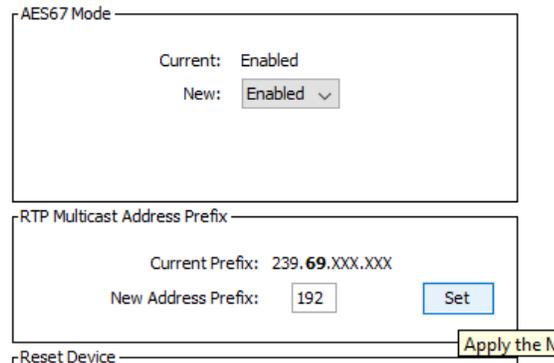
Figure 4 Dante Controller RTP/AES67 Multicast Prefix

6 Connect an Iyo Source to an iQx AoIP Console Destination

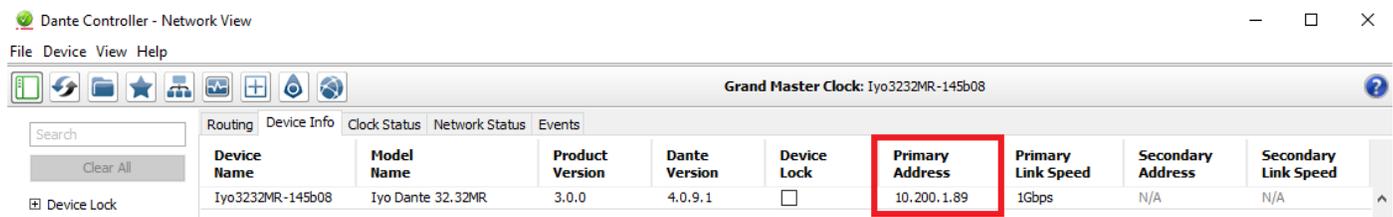Open Dante Controller and navigate to the Device Info tab to find the IP address of the Iyo:

Device Name	Model Name	Product Version	Dante Version	Device Lock	Primary Address	Primary Link Speed	Secondary Address	Secondary Link Speed
Iyo3232MR-145b08	Iyo Dante 32.32MR	3.0.0	4.0.9.1	☐	10.200.1.89	1Gbps	N/A	N/A

Figure 5 Dante Controller Iyo Device IP Address

Type the IP address of the Iyo into the address bar of a web browser to access the device's web application. Navigate to the "AES67" page:
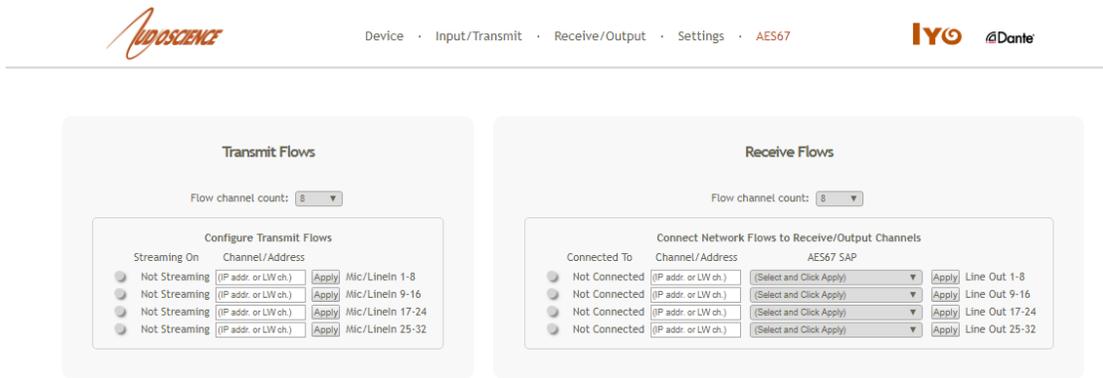

Figure 6 Iyo web UI AES67 page

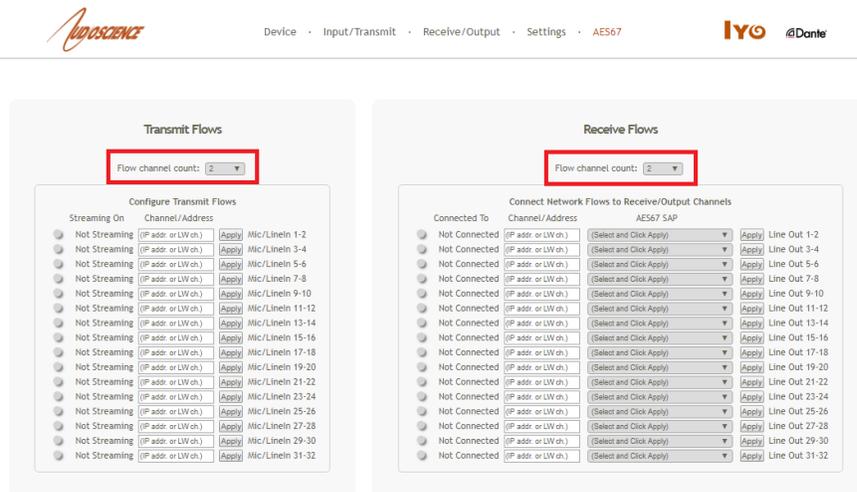Change **Flow channel count** from "8" to "2" in both the Transmit Flows and Receive Flows dropdowns:

Figure 7 Stereo flows

In the "Transmit Flows" section, enter a Livewire channel in the text box adjacent to the desired physical input channel pair and click "Apply". The example below shows a Stereo flow mapped to the physical mono input channels (Mic/Line In 1 and 2) assigned Livewire channel "1".

Figure 8 Example Iyo Source setup

The newly created Source will now be discoverable on a Livewire network.

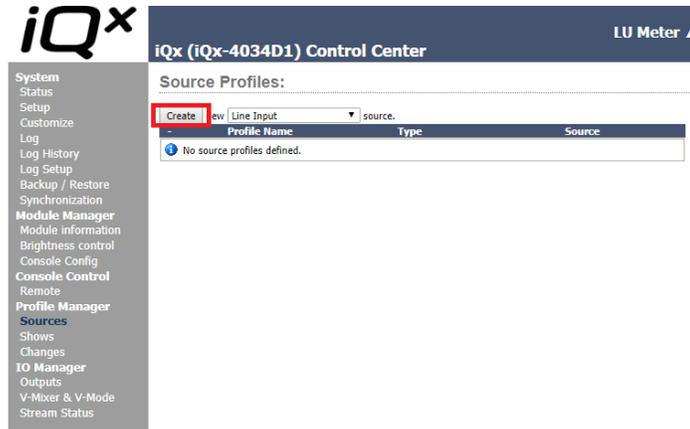From the iQx web interface, create a new "Source Profile".

Figure 9 Create iQx Source Profile

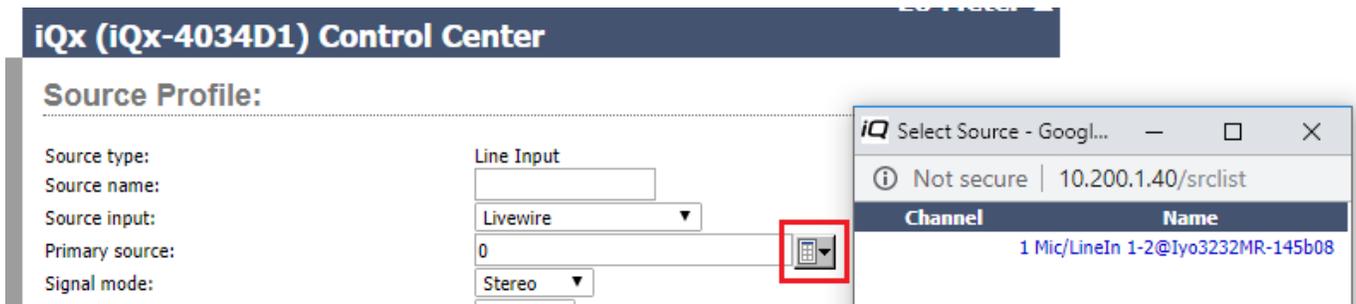Select the Iyo source from the iQx's Livewire source browser.

Figure 10 Select Iyo Source

Follow the iQx Console instruction manual to utilize the Iyo Source in the desired manner.

7   Connect a Axia iQx AoIP Source to an Iyo Destination

From the iQx web interface, configure a Source with a Payload type of "AES67 Stereo (1ms)" and a Livewire channel (e.g. 2)

Figure 11 Example iQx Source setup

From the Iyo web interface, type the Livewire channel of the created Source (2) in the text box adjacent to the desired physical output channel pair and click "Apply". The LED to the left of the Destination row will turn green if the connection is successful.
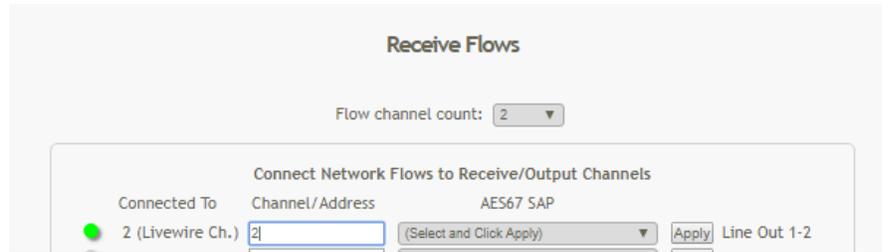
Figure 12 Connect iQx Source to Iyo Destination: Success

If the connection is not successful, the LED will be red, as shown below. Double check that the Source identified by the Livewire Channel is active and providing audio.
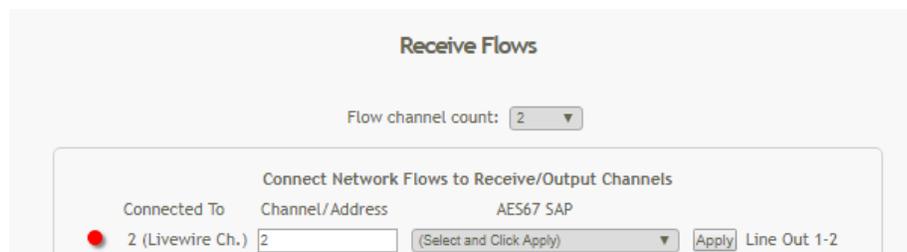

Figure 13 Connect iQx Source to Iyo Destination: Failure

8   Bridging Multicast GPIO to LWRP GPIO, via Pathfinder Core PRO

The following example configures GPO 1 on the Iyo to follow CR Monitor of the iQx Console.

From the iQx web application, define a multicast GPIO logic port for CR Monitor:

Figure 14 Define iQx CR Monitor GPIO Logic port

In Pathfinder, enable two virtual GPIO ports. Configure GPIO_2 to follow the defined multicast iQx CR Monitor logic port. Now, changes on CR Monitor (iQx GPI 1) will be reflected on Pathfinder GPO 2.

Pathfinder Core PRO Gpio

Port Count: [2]   [Update]

Show [10 ▼] entries   Search: [   ]

id ▲	Name	MulticastMode	IRoutedTo	ORoutedTo	SourceAddress	Edit
1	GPIO_1	NODE	O	NONE		edit
2	GPIO_2	NODE	O	NONE	199	edit

Figure 15 Configure Pathfinder virtual GPIO

Use Pathfinder to create a logic flow, tying the desired port bits from Pathfinder GPO 2 to GPI 1:
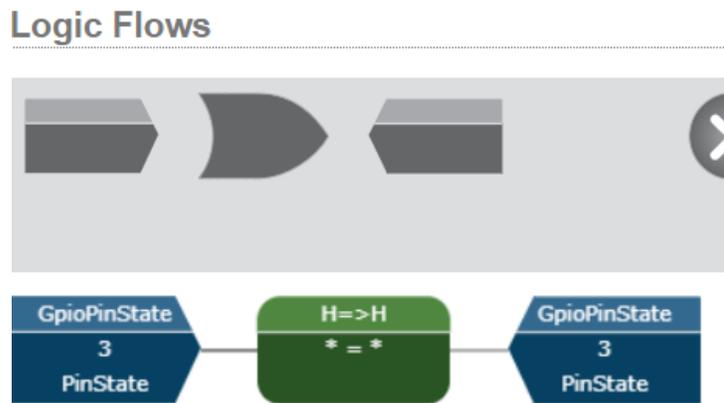

Figure 16 Pathfinder Logic Flow to tie together GPO 2, bit 3 to GPI 1, bit 3

In the Pathfinder GPIO "Routers" page, route Pathfinder GPI 1 to Iyo GPO 1. Now, Iyo GPO 1 will follow state changes on the iQx CR Monitor (GPI 1).

	Source				Destination		
▲	Name	Description	Host Name		Name	Description	Host Name
				➡	GPO_1	GPO_1 ON GenericLivewireLwrpDevice	GenericLivewireLwrpDevice
				➡	GPO_2	GPO_2 ON GenericLivewireLwrpDevice	GenericLivewireLwrpDevice
	GPIO_1	GPIO_1 ON pcp_gpio	pcp_gpio	➡	GPO_1	GPO_1 ON Iyo3232MR-145b08	Iyo3232MR-145b08

Figure 17 Route Pathfinder GPI 1 to Iyo GPO 1

9   Iyo in Pathfinder PC/Pro (legacy Pathfinder software)

As of version 5.79 of PathfinderPC Server, manual discovery is recommended rather than scanning. In addition, the "Timeout" selection must be increased from the default (½ second) to 1 second.
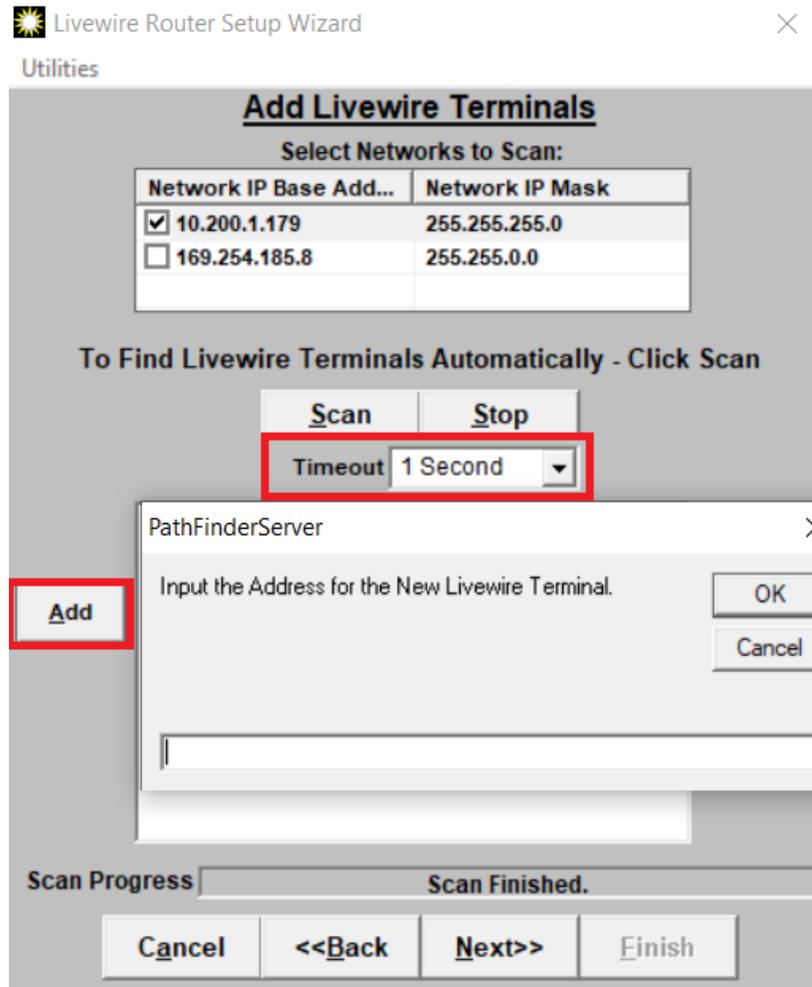
Figure 18 Adding Iyo in PathfinderPC Server