



Ethernet AVB Network Audio

E64i/o-MADI Quick-Start Guide

© Pivitec, LLC
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READ THIS FIRST

Important Safety Instructions

Read these instructions.

Keep these instructions

Heed all warnings.

Follow all instructions.

Do not use this apparatus near water.

Clean only with a dry cloth.

Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit the apparatus.

Only use attachments/accessories specified by the manufacturer.

Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

No on/off power switches are included in the system. The external power supply should be used to control power to a Pivitec, LLC device. This power supply should remain readily operable.



TO REDUCE THE DANGER OF ELECTRICAL SHOCK DO NOT REMOVE COVERS. NO USER SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY

To reduce the risk of fire or electrical shock, do not expose this product to rain or other types of moisture.
To avoid the hazard of electrical shock, do not handle the power cord with wet hands.

CAUTION:

Using any audio system at high volume levels can cause permanent damage to your hearing.

Set your system volume as low as possible.

Avoid prolonged exposure to excessive sound pressure levels.

IMPORTANT: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to the product not expressly approved by Pivitec, LLC could void the user's FCC authority to operate the equipment.

Warranty

Pivitec, LLC warrants this product against defects in materials and workmanship for a period of **one year** from the date of the original retail purchase.

This warranty does not apply if the equipment has been damaged due to misuse, abuse, accident, or problems with electrical power. The warranty also does not apply if the product has been modified in any way, or if the product serial number has been damaged, modified, or removed.

If a defect is discovered, first write or call Pivitec, LLC to obtain a Return Authorization number. No service will be performed on any product returned without prior authorization. Pivitec, LLC will, at its option, repair or replace the product at no charge to you. The product must be returned during the warranty period, with transportation charges prepaid to Pivitec, LLC, 116 Research Drive, Bethlehem, PA 18015, USA. You must use the product's original packing materials for shipment. Shipments should be insured for the value of the product. Include your name, address, phone number, description of the problem, and copy of the original bill of sale with the shipment. The Return Authorization number should be written on the outside of the box.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION). PIVITEC'S RESPONSIBILITY FOR MALFUNCTIONS AND DEFECTS IN HARDWARE IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS LIMITED WARRANTY STATEMENT. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE. NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER SUCH PERIOD. PIVITEC, LLC DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES SET FORTH IN THIS LIMITED WARRANTY DOCUMENT. PIVITEC, LLC'S LIABILITY IS LIMITED TO THE REPAIR OR REPLACEMENT, AT OUR OPTION, OF ANY DEFECTIVE PRODUCT, AND SHALL IN NO EVENT INCLUDE INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

SOME STATES DO NOT ALLOW EXCLUSIONS OR LIMITATION OF IMPLIED WARRANTIES OR LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Quick Start guide for the e64i/o-MADI for PMM systems

The Pivitec e64i/o-MADI is a bi-directional 64-channel MADI to Ethernet AVB Bridge. The e64i/o-MADI will bi-directionally bridge signals from MADI sources such as mixing consoles, microphone preamps, Analog to Digital converters, AVB Capable computers, and DAW interfaces. Ideal for use in applications such as broadcast, live performance and recording, multiple e64i/o-MADI Bridges can be combined together or used with other Pivitec Network Audio Interface Modules to build larger audio networks.

The e64i/o MADI can connect a MADI enabled Mixer directly into an AVB capable Apple MAC computer, with up to 64 tracks recorded and played back. Minimum requirements are:

Apple Computer with:

- 1). Thunderbolt port.
- 2). OS X 10.10 Yosemite or higher.

Front



The front panel of the e64i/o MADI has indicators for system status:

- 1). When on, unit is powered.
- 2). When on, indicates a MADI signal is present at the Coaxial input.
- 3). When on, indicates a MADI signal is present at the Optical input.

Rear



The Rear panel for the e64i/o MADI has all connections:

- 4).** MADI Optical In and out on a SC Multi-Mode Fiber Connector.
- 5).** MADI Coaxial In an Out on 2 BNC connectors.
- 6).** RJ-45 Network connection.
- 7).** Jack for an external 48VDC Power supply, used only if the e64i/o MADI is not powered by a suitable POE switch.

Use only the 48VDC Power Supply provided by Pivitec!

Setup

The Pivitec 64i/o-MADI will support full 64 channel in and out simultaneously. Also what appears in the currently used input connection appears on both MADI Coaxial and Optical outputs.

Using the e64i/o-MADI as a recording bridge.

The e64i/o-MADI will connect a MADI audio source, such as an audio console, to an AVB Recording device, such as an Apple Mac Computer. Properly set up the MADI stream Sample Rate to 48k or 96k, and make those setting changes in the e64i/o-MADI as described below with the AVDECC controller.

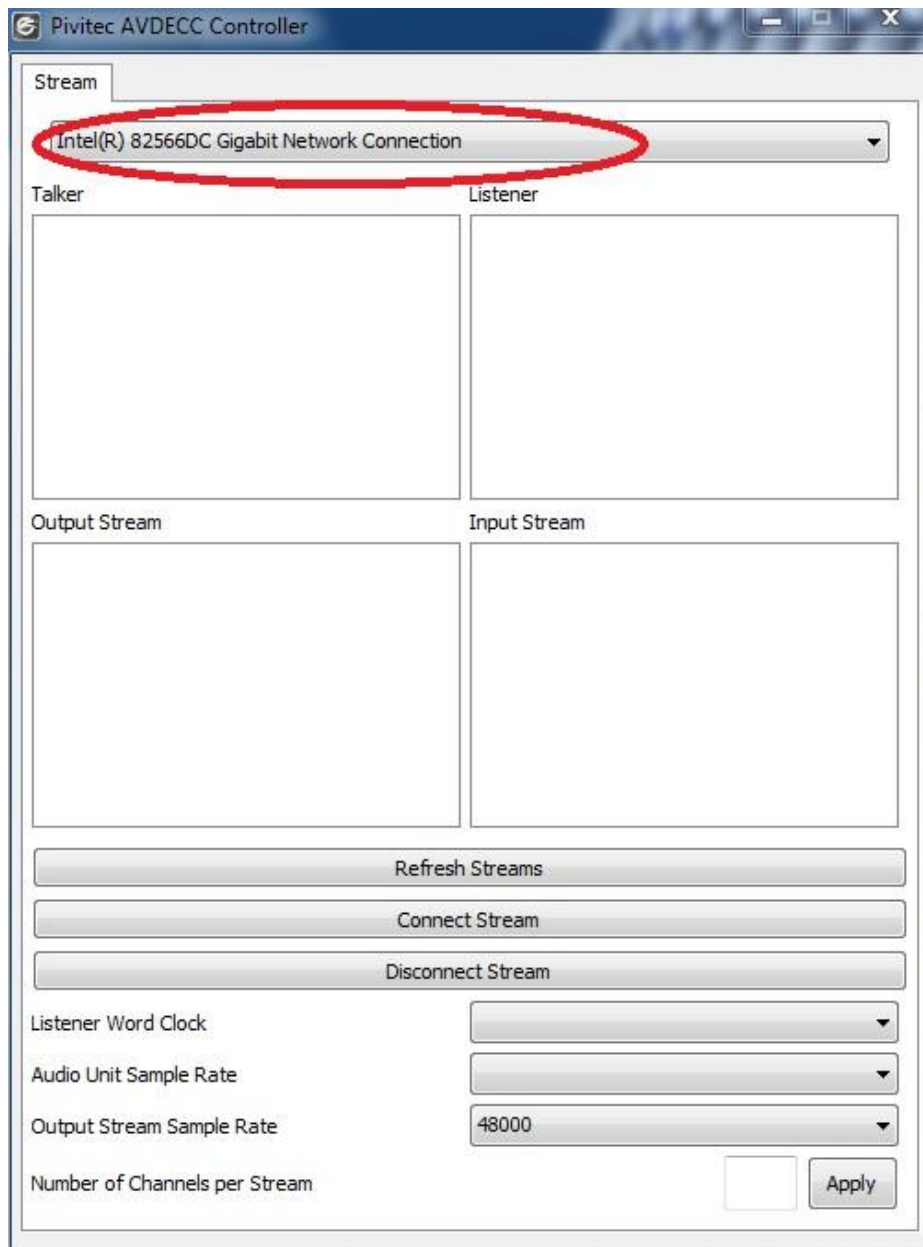
Using the e64i/o-MADI with a Pivitec Personal Monitor Mixing system

The e64i/o-MADI can be used with a managed Non-AVB switch for Personal Monitor Mixing as long as the switch has an available Gigabit Port. The ability to record directly off of the system is not available with this option. Set up your Pivitec system as shown in the [Pivitec Quick Start Guide](#) .

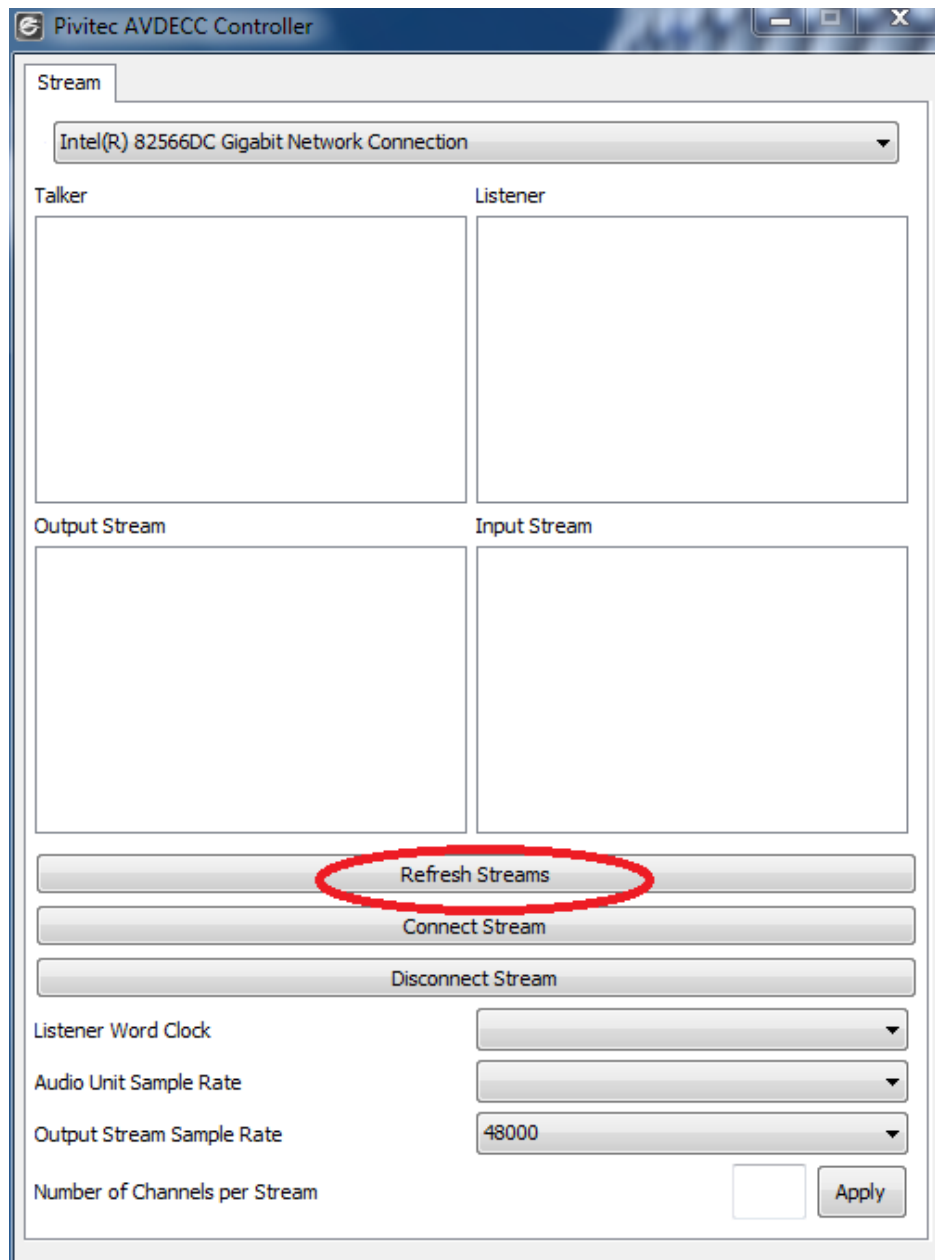
Although the e64i/o MADI is capable of transmitting four 16 channel audio streams, the e32 Mixer with the V2MIX-Pro app can accept only 2 of these streams. Default selection would be 1-16 and 17-32. To select the higher streams, use the Pivitec **AVDECC controller**. The controller may be downloaded here. [AVDECC Controller](#).

Run the AVDECC Controller application. The application works over Wi-Fi and Wired Ethernet.

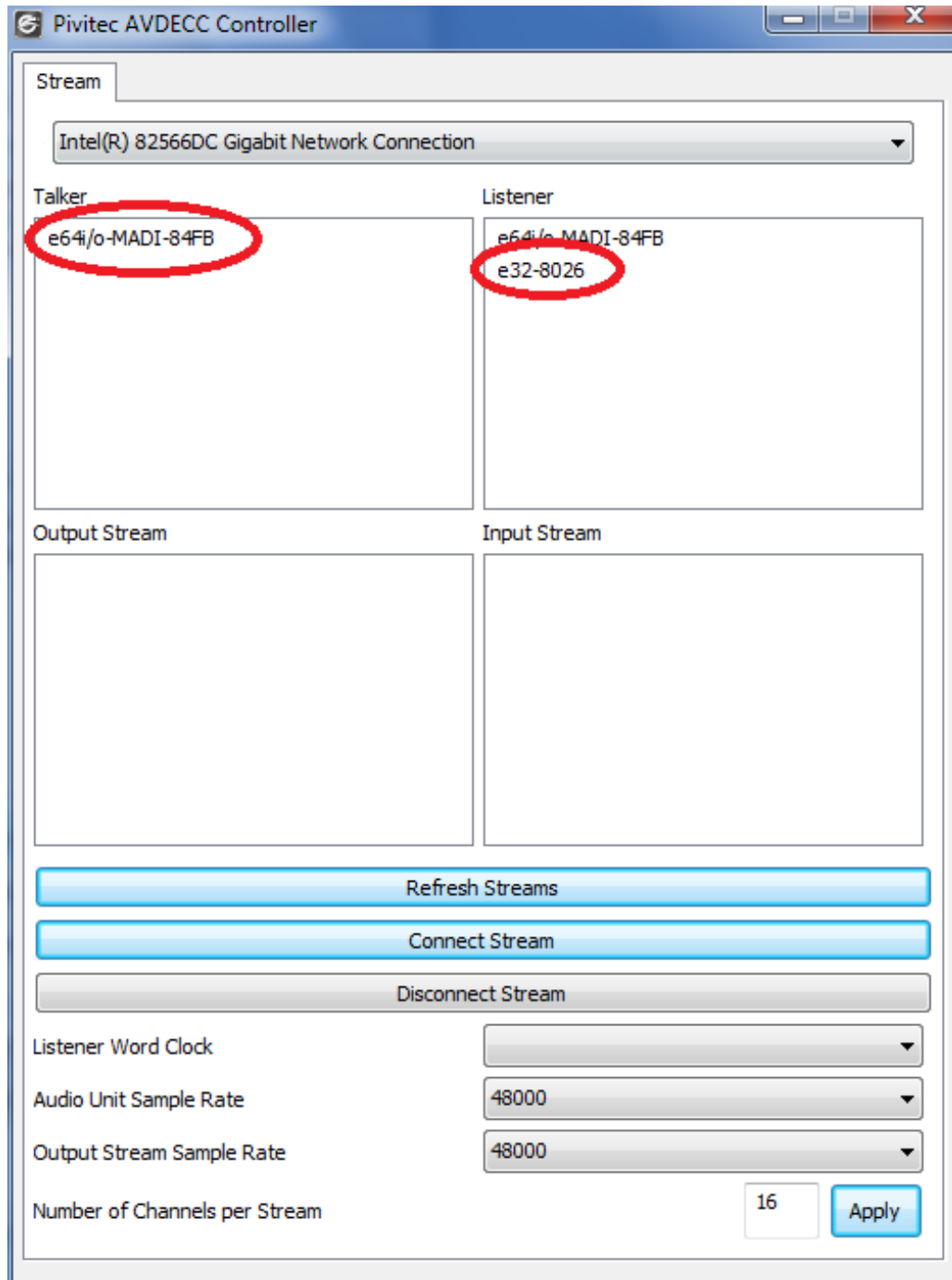
Choose the network interface that is connected to the network:



Next, Press **Refresh Streams**.



The devices in the network will appear as **Talkers** and **Listeners**, with Talkers being a source, and Listeners being a destination. You will notice that the e64i/o MADI is bidirectional, so it appears as both a Talker and a Listener. Select the **e64i/o MADI** talker, and the **e32 Mixer** listener.



The **Output Stream** and **Input Stream** will populate:

The screenshot shows the 'Pivitec AVDECC Controller' window. At the top, a 'Stream' dropdown menu is set to 'Intel(R) 82566DC Gigabit Network Connection'. Below this, there are two columns: 'Talker' and 'Listener'. The 'Talker' column contains 'e64i/o-MADI-84FB'. The 'Listener' column contains 'e64i/o-MADI-84FB' and 'e32-8026'. Below these columns are two larger sections: 'Output Stream' and 'Input Stream'. The 'Output Stream' section lists 'Out Stream 1 - 16', 'Out Stream 17 - 32', 'Out Stream 33 - 48', and 'Out Stream 49 - 64'. The 'Input Stream' section lists 'In Stream 1 - 16' and 'In Stream 17 - 32'. Both of these sections are highlighted with red rectangles. Below the stream lists are three buttons: 'Refresh Streams', 'Connect Stream', and 'Disconnect Stream'. At the bottom, there are four settings: 'Listener Word Clock' (a dropdown menu), 'Audio Unit Sample Rate' (a dropdown menu set to '48000'), 'Output Stream Sample Rate' (a dropdown menu set to '48000'), and 'Number of Channels per Stream' (a text input field). An 'Apply' button is located to the right of the 'Number of Channels per Stream' field.

Stream
Intel(R) 82566DC Gigabit Network Connection

Talker	Listener
e64i/o-MADI-84FB	e64i/o-MADI-84FB
	e32-8026

Output Stream	Input Stream
Out Stream 1 - 16	In Stream 1 - 16
Out Stream 17 - 32	In Stream 17 - 32
Out Stream 33 - 48	
Out Stream 49 - 64	

Refresh Streams

Connect Stream

Disconnect Stream

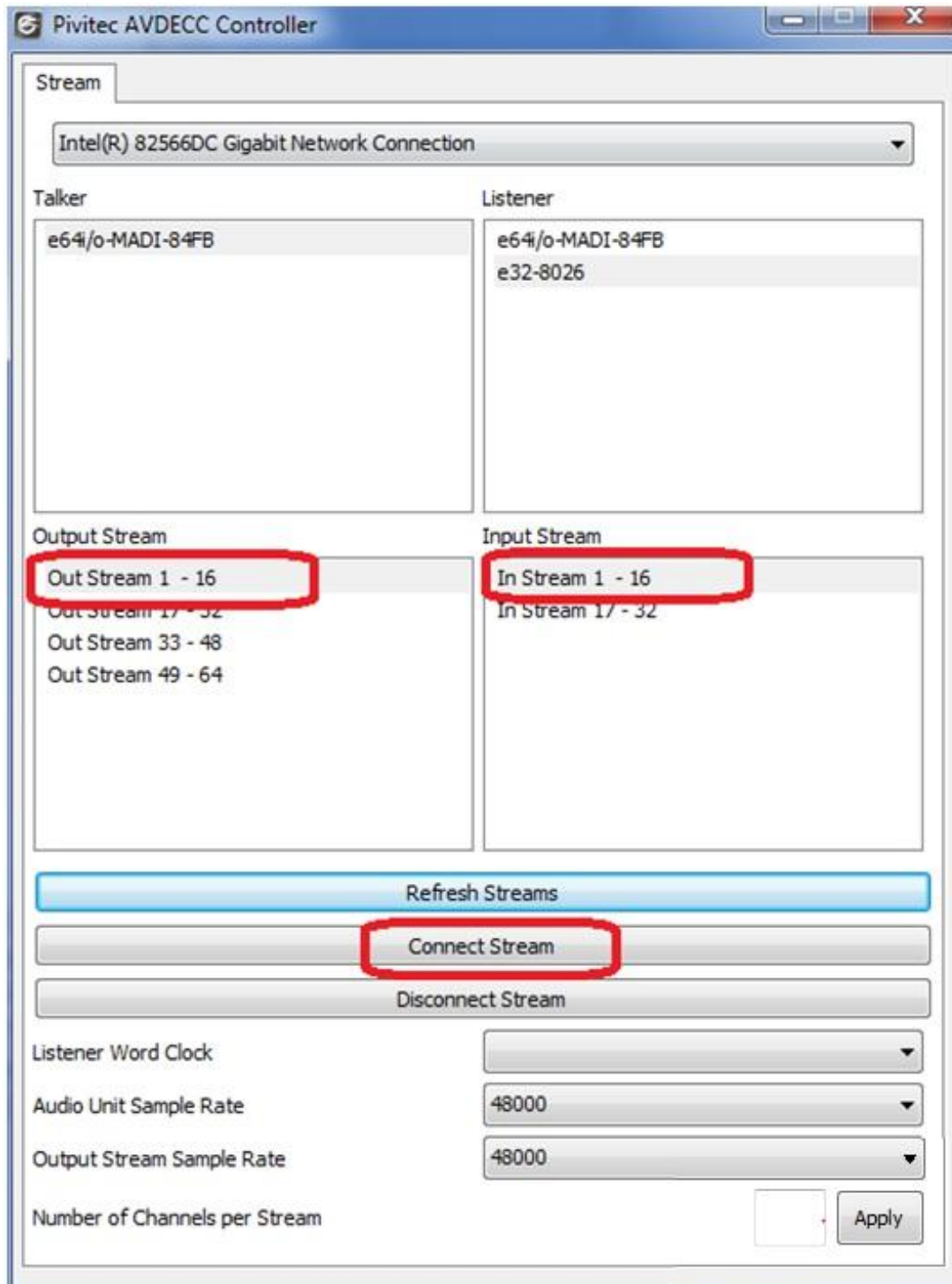
Listener Word Clock: [Dropdown]

Audio Unit Sample Rate: 48000 [Dropdown]

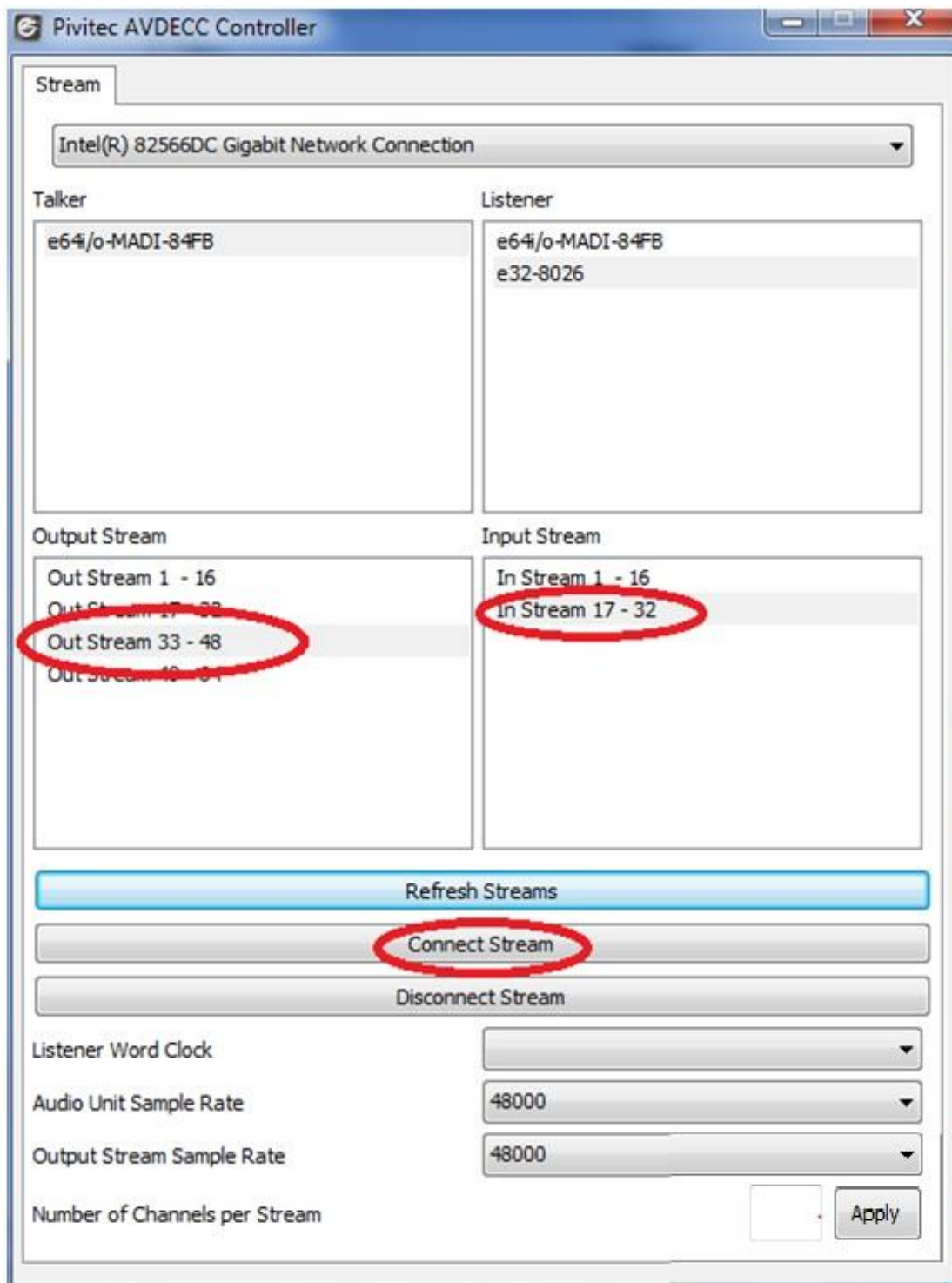
Output Stream Sample Rate: 48000 [Dropdown]

Number of Channels per Stream: [Input] [Apply]

Connect AVB listener streams to AVB talker streams as needed. Select the output stream and the input stream that you would like to link. Here, we are starting with the **e32 Mixer In Stream 1-16**, and connecting with the **e64i/o MADI Out Stream 1-16**. Press **Connect Stream** for each connection.

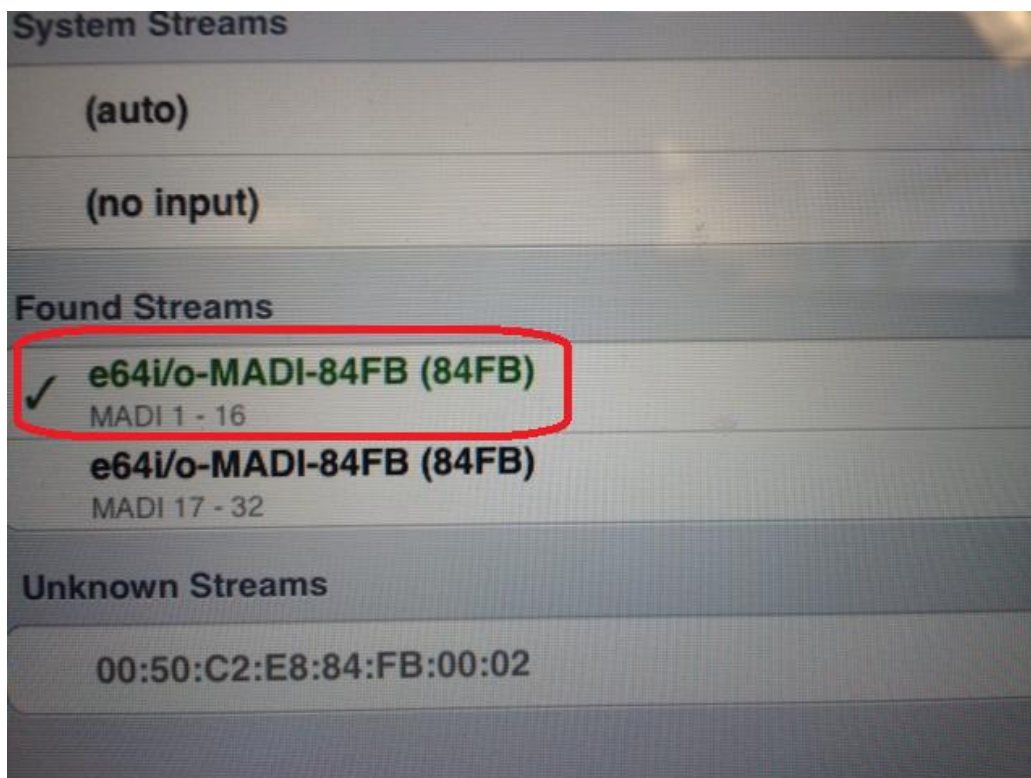
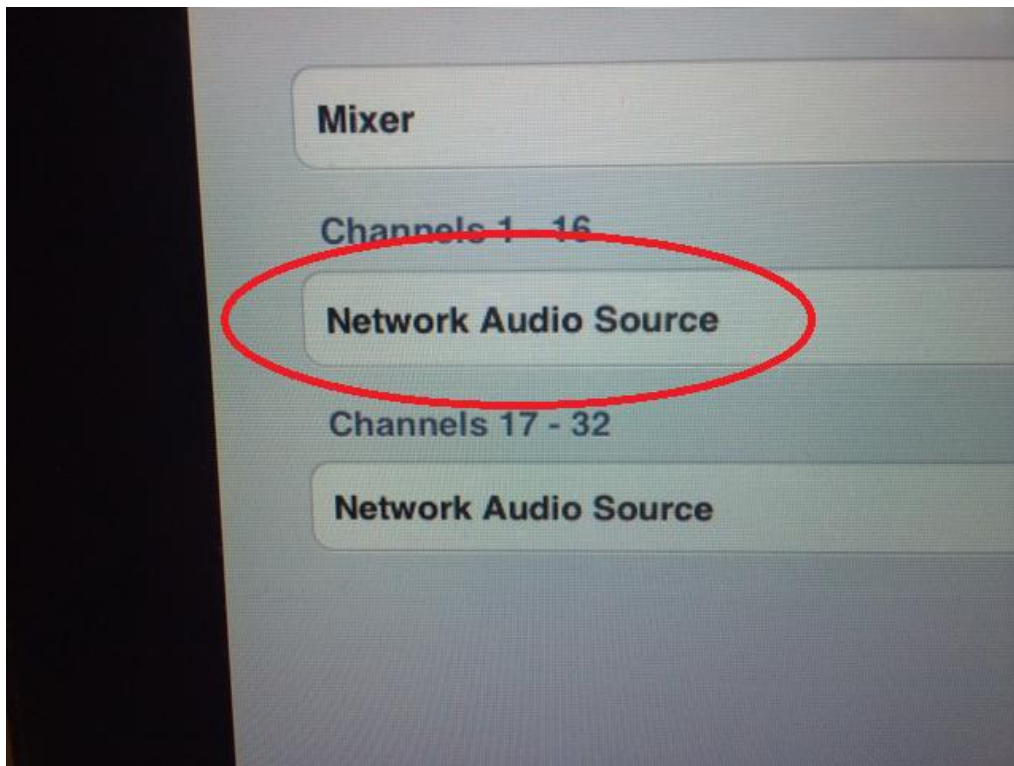


Next, select the second Input Stream for the e32 Mixer. Here, we have selected **Out Stream 33-48** to connect to **In Stream 17-32**. Press **Connect Stream**.



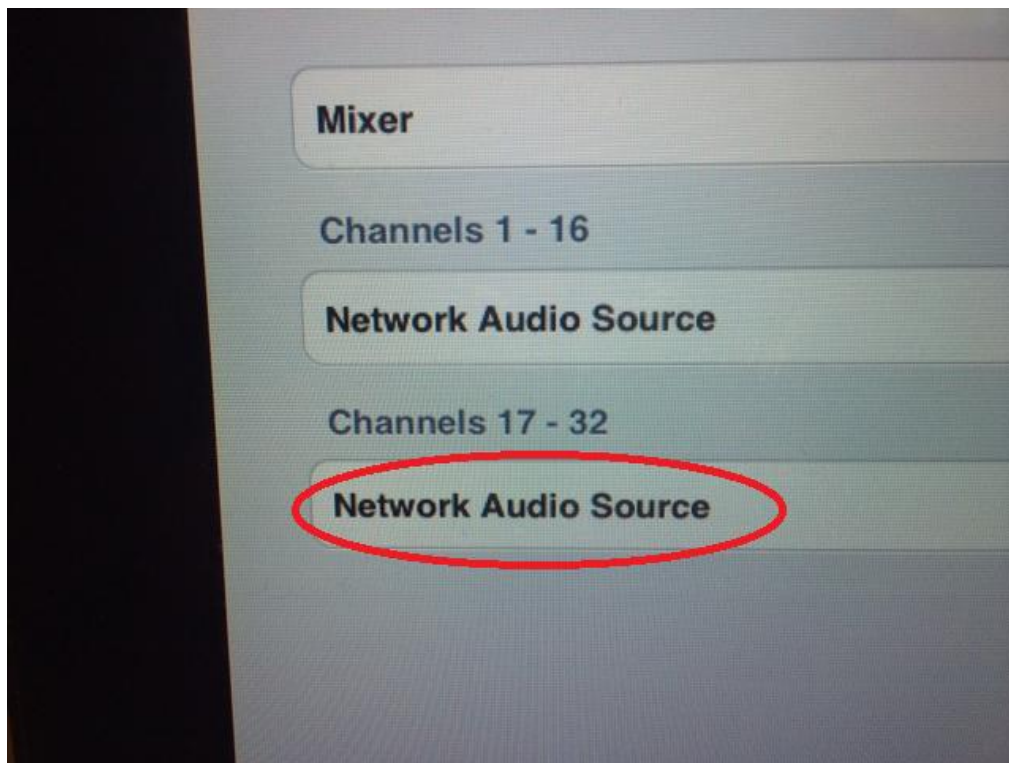
The Pivitec device remembers the connections have you set, so you only have to set them once.

So, now if we look at the network streams for the e32 mixer on the I-Pad, you will see that they have been assigned. Open the settings on the e32 mixer you have set up in the system. Select **Channels 1-16, Network Audio Source**:

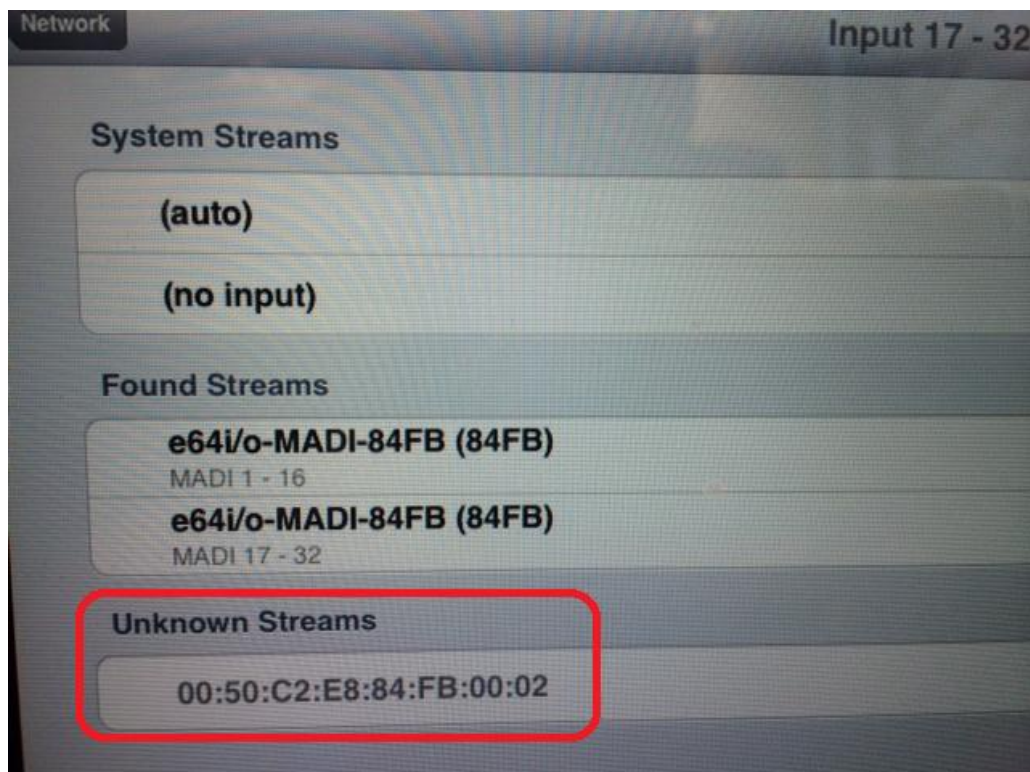


You will see that the **MADI 1-16** Stream has been assigned:

Next, select **Channels 17-32 , Network Audio Source**:



You will notice a listing for **Unknown Streams** with a MAC address. This is the MADI Stream 33-48.



V2Mix software doesn't currently notate any streams higher than the first 32 in Found Streams, but be assured that you are receiving the correct audio streams as dictated by the AVDECC controller.

More notes on operating the e64i/o MADI.

Modes of Operation

MADI optical IN takes precedence over coax IN when both optical and coax are connected. MADI optical OUT and coax OUT can be used at the same time. Conversion of MADI to AVB and AVB to MADI can be done simultaneously.

MADI to AVB

64 channels from MADI IN are sent as AVB talker streams. By default, 64 channels are split into 4 16 channel streams. The number of channels per stream is configurable. This mode is enabled when a signal is detected on MADI IN.

AVB to MADI

Up to 64 channels from AVB are sent to MADI OUT. This mode is enabled when an AVB stream is being received.

MADI Loopback

An exact copy of MADI IN is sent to MADI OUT. MADI IN is available on the AVB network. This mode is enabled when no AVB stream is being received.

48k/96k Operation

On the AVDECC Controller there are dropdowns for Audio Unit Sample Rate, and an Output Stream Sample Rate. The dropdowns will automatically populate with available options. Make the appropriate selections for your situation. Select Apply.

Word Clock

The word clock can be received from one of two sources: MADI IN and AVB Listener. The word clock is set using the Pivitec AVDECC controller.

MADI IN (default)

The clock from MADI IN is used for MADI OUT and AVB talker streams. A MADI device connected to MADI OUT must be configured to get its clock from MADI. An AVB device connected to an AVB talker stream must be configured to get its clock from AVB.

AVB Listener

The clock from the first AVB listener stream is used for MADI OUT and AVB talker streams. For an e64i/o-MADI, choose the e64i/o-MADI in the Listener column and choose whether to clock MADI output off of an incoming AVB stream or incoming MADI coax/optical connection.

Below is an example of an **AVID E-3** mixing engine connected with an **e64i/o MADI** card. Select the appropriate **Listener Word Clock** for your system. Press **Apply**.

The screenshot shows the Pivitec AVDECC Controller window. The 'Stream' tab is active. The Pivitec logo is at the top left, and a dropdown menu shows 'wlan0, address: <192.168.157.2 >'. Below this are four lists:

- Talker:** e64i/o-MADI-8457, Avid E3 AVB 4x16
- Listener:** e64i/o-MADI-8457, Avid E3 AVB 4x16
- Output Stream:** AVB Out 1-16, AVB Out 17-32, AVB Out 33-48, AVB Out 49-64
- Input Stream:** In Stream 1 - 16, In Stream 17 - 32, In Stream 33 - 48, In Stream 49 - 64

Below these lists are three buttons: 'Refresh Streams', 'Connect Stream', and 'Disconnect Stream'. At the bottom, there are several controls:

- Listener Word Clock:** A dropdown menu with 'MADI In' and 'AVB Listener' options. 'MADI In' is selected.
- Audio Unit Sample Rate:** A dropdown menu with '48000' selected.
- Output Stream Sample Rate:** A dropdown menu with '48000' selected.
- Number of Channels per Stream:** A text box with '16' entered.
- Apply:** A button to apply the settings.

Red boxes highlight the 'Listener Word Clock' dropdown, the 'MADI In' and 'AVB Listener' options, the 'Apply' button, and the '16' value in the 'Number of Channels per Stream' field.