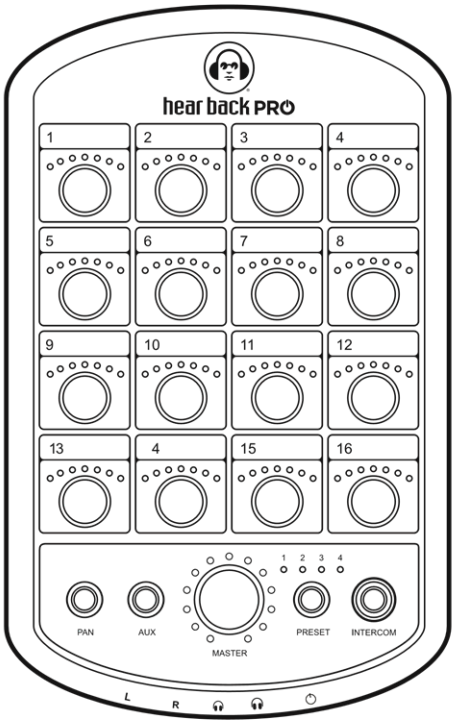

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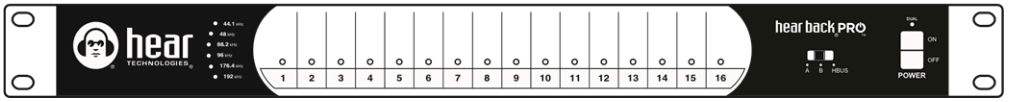

hear back PRO™

PERSONAL MONITOR MIXER SYSTEM

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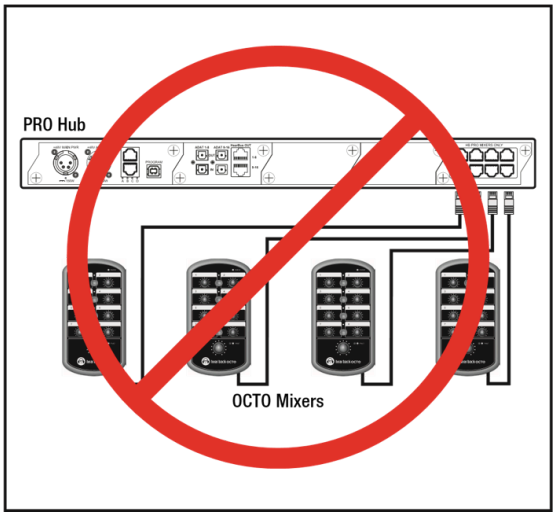
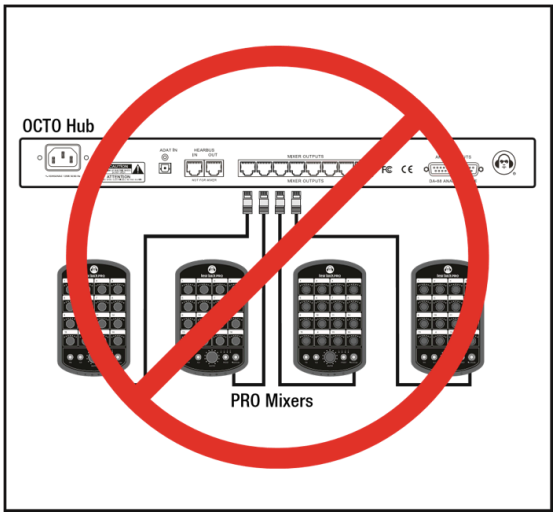
Safety Information

Connection Warning

WARNING

DO NOT CONNECT OCTO MIXERS TO A PRO HUB, OR PRO MIXERS TO AN OCTO HUB. Damage to either system can occur!





English

DANGER

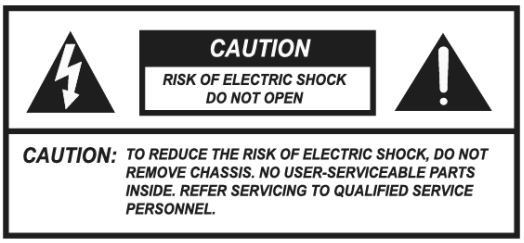
Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably to noise induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time.

The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

DURATION PER DAY (HOURS)	8	6	4	3	2	1
SOUND LEVEL (dB)	90	93	95	97	100	103

According to OSHA, any exposure in the above permissible limits could result in some hearing loss. Ear plugs or protectors in the ear canal or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss. If exposure in excess of the limits as put forth above, to insure against potentially harmful exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels, such as this amplification system, be protected by hearing protectors while this unit is in operation.

Applicable to Power Supply



AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.

THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF NON-INSULATED “DANGEROUS VOLTAGE” WITHIN THE PRODUCT’S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.

THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE UNIT.

Important Safety Instructions

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be kept for future reference.
3. Read and understand all warnings listed on the operating instructions.
4. Follow all operating instructions to operate this product.
5. This product should not be used near water, i.e. bathtub, sink, swimming pool, wet basement, etc.
6. Only use dry cloth to clean this product.
7. Do not block any ventilation openings. It should not be placed flat against a wall or placed in a built-in enclosure that will impeded the flow of cooling air.
8. Do not install this product near any heat sources; such as, radiators, heat registers, stove or other apparatus (including heat producing amplifiers) that produce heat.
9. 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 the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus. Do not break the ground pin of the power supply cord.
11. Only use attachments specified by the manufacturer.
12. 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 cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation ports or any other openings.

15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way; such as, 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.
16.

> **⚠ WARNING**
>
> To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

17. The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
18. Mains plug is used as the disconnect device. It shall remain readily operable and should not be obstructed during intended use.
19.

> **⚠ WARNING**
>
> To prevent injury, this apparatus must be securely attached to a rack in accordance with the installation instructions.

20. Detailed installation instruction in user manual.

Electromagnetic Compatibility

This device complies with part 15 of the FCC Rules and the Product Specifications noted on the Declaration of Conformity. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and

- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting audio cables.
- never use shielded CAT6 network cables as this could cause ground-loops or the Mixers to reboot.

> **WARNING**
>
> The Hub unit produces heat while powered, and therefore requires adequate ventilation to ensure the internal temperature stays within maximum operating temperatures (0° C to 54.5° C, or 32° F to 130° F).

Please ensure that these clearances are met:

- 0.85 inches of clearance on either side of Hub
- 1 inch of clearance in front of Hub
- 11 inches of clearance in back of Hub

Care should be taken so that the Mixer's ventilation holes remain unblocked, allowing adequate airflow through both sides of the unit.

If you want to dispose this product, do not mix it with general household waste. There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling.

Private household in the 25 member states of the EU, in Switzerland and Norway may return their used electronic products free of charge to designated collection facilities or to a retailer (if you purchase a similar new one).

For countries not mentioned above, please contact your local authorities for a correct method of disposal.

By doing so, you will ensure that your disposed product under goes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health.

Declaration of Conformity

Manufacturer's Name:
Hear Technologies
Manufacturer's Address:
991 Discovery Dr.
Huntsville, AL 35806, USA

Declares that the product:
Product Name:
Hear Back PRO
Product Option:
All (requires Class II power adapter that conforms to the requirements of EN60065, EN60742, or equivalent.)

Conforms to the following Product Specifications:
Safety:
IEC 60065 -01+Amd 1
EMC:
EN 55022:2010
55024:2010
FCC Part 15

Supplementary Information:
The product herewith complies with the requirements of the:

> Low Voltage Directive 2006/95/EC
> EMC Directive 2004/108/EC
> RoHS Directive 2002/95/EC
> WEEE Directive 2002/96/EC
> EC Regulation 278/2009

With regard to Directive 2005/32/EC and EC Regulation 1275/2008 of 17 December 2008, this product is designed, produced, and classified as Professional Audio Equipment and thus is exempt from this Directive.

> Nason Tackett
> Senior Design Engineer
> Hear Technologies
> 991 Discovery Drive
> Huntsville, AL 35806, USA
> Date: August 15, 2014

FCC Statement

> **NOTE**
>
> 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 in a commercial 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.

Overview

The Hear Back PRO System

This is it – the most comprehensive digital solution to get everyone the mix they need to perform their best. This new system platform is completely modular and infinitely expandable, which means it is the last personal monitoring system you'll ever need.

Whether or not you've ever used a personal monitor mixer, the simple layout of this powerful system makes getting the right mix a quick and effortless experience. Based in Gigabit Ethernet, this framework paves the way for an impressive range of future possibilities..

Hub & Mixers

The Hear Back PRO system consists of two main components: the Hub and the Mixer. The modular Hub consists of four card slots, which can be populated with any configuration of input and/or output cards to fit your exact needs. Each Hub has the ability to supply signal and power to as many as 32 Mixers (8 per Network Card), each over a single standard CAT6 cable. With the built-in HBUS In/Out ports, multiple Hubs can be daisy-chained together, allowing for truly unlimited system expansion.

The standard Hub (included in the Four Pack) comes pre loaded with one Network Card and your choice of input flavor. For analog, two 8-channel Input Cards are provided which can accept input signals from an audio mixer via auxiliary, matrix, monitor, and/or direct outputs. For digital options, you can chose from our Waves SoundGrid, Dante, ADAT, AES/EBU, or MADI Input/Output cards.

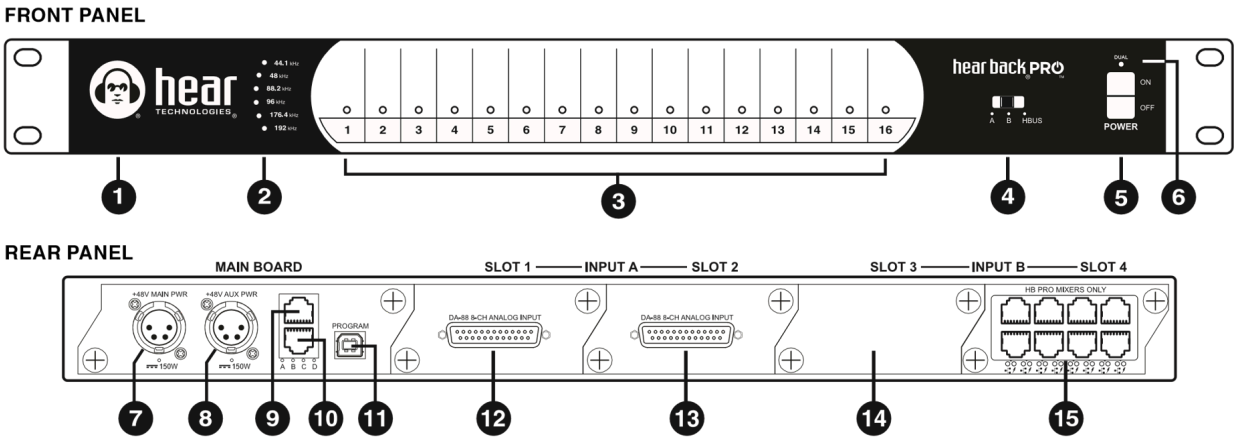
Advantages / Features

- Side-mounted card slot on Mixer for future expansion
- Large master knob controls overall main mix, AUX, and intercom levels independently
- Volume and panning control of all channels
- Direct and immediate visual feedback of all channels
  - Write session info and channel settings on storable Mixer overlays for an unlimited number of presets
  - Optional PRO Digital Overlay (available for FW V6 and later) features OLED graphical displays for electronic channel labeling and Mixer status
  - Instantly store and recall presets from memory with the push of a button
  - Most recent configuration is saved, even after power-down

- Supports sampling rates up to 192 kHz
- Selectable XLR or 1/8" Mixer AUX input on PRO Mixer
- Built-in intercom broadcasts the AUX source (mic, MP3 player, click, etc.)
- Intercom auto adjusts its own level so even the quietest message never goes unheard
- Modular I/O Hub card system lets you customize the system to match your configuration, and can adapt to your needs
    - FW V5 and later allow two independent input sources simultaneously (e.g. Analog, Dante)
- Supports secondary power supply providing redundancy and power for up to 32 Mixers per Hub
- USB port on Hub makes updating firmware for future features and upgrades a simple drag-and-drop operation
- HBUS In/Out connections allow daisy-chaining Hubs
- Status indicating logos on Hub and Mixers make it easy to detect and diagnose problems, should they arise

PRO Hub

Detail Diagram



1	LED Status Indicator	9	HBUS Input
2	Sample Rate LED Indicators	10	HBUS Output
3	Audio Input Channels 1-16 Level LED Metering	11	USB Connection
4	Input Selector Switch	12	Card Slot 1 (8-channel Analog Input shown)
5	Power Switch	13	Card Slot 2 (8-channel Analog Input shown)
6	"Dual" Power LED Indicator	14	Card Slot 3 (shown unpopulated)

7	Main 48V Power Input	15	Card Slot 4 (8-port Network Card shown)
8	Secondary 48V Power Input		

Features

- Three switch selectable 16-channel input sources:
  - Input A (Slots 1 & 2)†
  - Input B (Slots 3 & 4)†
  - HBUS
- 24-bit Delta-Sigma A/D converters (Analog Cards)
- Six user-selectable sample rates, indicated by LEDs: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz
- Less than .25 milliseconds total system delay (latency) at 192 kHz
- 16 RGB LEDs intuitively display signal / peak levels for channel metering†
- Standard CAT6 delivers power and signals to Mixers
- Daisy-chain via HBUS for very large systems
- Quiet, temperature-controlled fan (only runs when internal temperature reaches 43° C or 110° F)
- 1 RU chassis
- Modular I/O card-slot configurable mainframe
- Gigabit Ethernet network fabric, with enough bandwidth to support up to 96 channels of audio at 192/176.4 kHz, 128 channels at 96/88.2 kHz or 48/44.1 kHz
- 48 volt Power Over Ethernet supply
- Port for redundant power supply (or to power more than 16 Mixers)
- USB port only for upgrading from older firmware versions

- Error indicating logo glows "RED" should a fault arise

†Both A and B inputs are used simultaneously. Switching between A and B selects clock source and channel 1. Metering of the 16 channels selected as the clock source will be displayed via the 16 RGB LEDs on the front panel.

Channels

If you are using from 1 to 32 channels you will only need one Hear Back PRO Hub. If you are using 33 channels or greater you will need multiple Hubs.

Channel Names and Links

Channels names can be assigned via the PRO Connect software. Instructions can be found here: Digital Overlay

Channels can also be stereo linked via the PRO Connect software. More information on the benefits of linking can be found in the PRO Mixer section.

Channel names and links are both stored in the Hub's onboard memory.

Channel Locations

> Hub 1: Channels 1-32
> Hub 2: Channels 33-64
> Hub 3: Channels 65-96
> Hub 4: Channels 97-128

Example

An engineer needs to send out up to 64 channels of analog audio to the personal monitoring system. They would need the following hardware:

> 2 x Hear Back PRO Hubs (Additional PRO Hubs or PRO Mixer Distros to connect the PRO Mixers)
> 8 x Hear Back PRO Analog Input Cards (4 in each Hub)

Each Hear Back PRO Analog Input Card supports 8 channels of audio. Each Hub will then support up to 32 channels (4 x 8 = 32) giving the engineer a total of 64 channels.

HBUS

The HBUS permits daisy-chaining of multiple Hubs up to 500 feet apart using the HBUS input and HBUS output. This HBUS is great for inter-studio or stage-to-stage connections, as well as daisy chaining for very large systems.

HBUS RJ45 pin-outs are the same as standard gigabit Ethernet RJ45 pin-outs, only without power. The pin-outs are wired as shown below:

Pin	Pair	Description	Suggested Termination Color Scheme (568B)****
1	A+	Bidirectional Data Pair A	White/Orange
2	A-	Bidirectional Data Pair A	Orange
3	B+	Bidirectional Data Pair B	White/Green
4	C+	Bidirectional Data Pair C	Blue

Pin	Pair	Description	Suggested Termination Color Scheme (568B)****
5	C-	Bidirectional Data Pair C	White/Blue
6	B-	Bidirectional Data Pair B	Green
7	D+	Bidirectional Data Pair D	White/Brown
8	D-	Bidirectional Data Pair D	Brown

****Color Scheme 568A is also acceptable, but do not crossover from 568A to 568B.

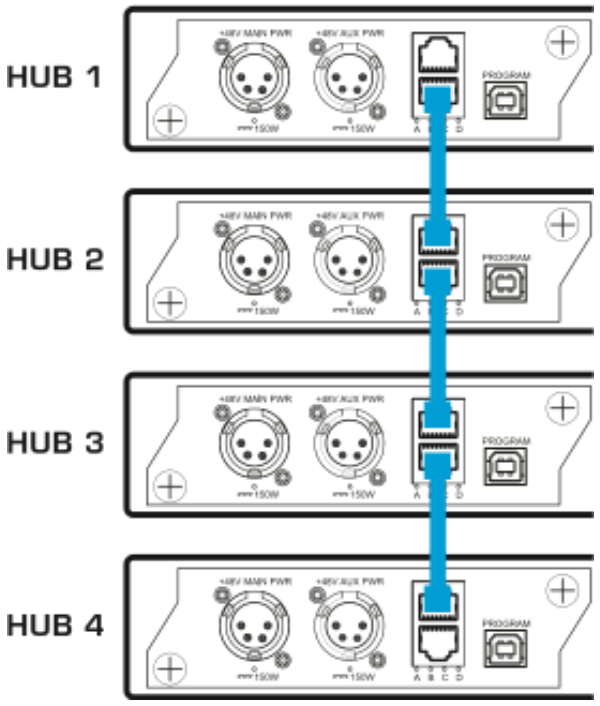
Multiple Hubs

> **NOTE**
>
> All Hubs need to set to the same sampling rate. If there's a mix of input cards (analog and digital), the digital card must be the CLOCK MASTER and then the analog will SLAVE to it. If there are multiple digital cards, the digital audio must all come from the same source and be word-clock synchronized or there will be pops and clicks in the audio. You cannot mix 16-channel and 32-channel cards. In a multi-Hub system with both digital and analog cards, Hub 1 must have a digital card selected as a source to use the digital clock. Otherwise, audio pops and clicks will occur.

Connecting Multiple Hubs

> **NOTE**
>
> Use only unshielded CAT5e or CAT6 Ethernet cables.

1. Connect Hub 1 **HBUS OUT** to Hub 2 **HBUS IN**
2. Connect Hub 2 **HBUS OUT** to Hub 3 **HBUS IN**
3. Connect Hub 3 **HBUS OUT** to Hub 4 **HBUS IN**



Hub Position Indicator

A Hub's position (Hub number) can be seen when powering ON or by switching from A or B to HBUS then back to A or B. The LEDs on the Hub's front panel will light either **WHITE** or **BLUE**.

The **WHITE** LED indicates the Hub's position in the Hub chain (i.e. if LED 2 is **WHITE**, then that Hub is Hub 2 in that Hub chain).

Input Selector Switch

The input selector switch gives the user a simple way to select any one of the three input/clock sources without a patch bay, router, or rewiring.

The Input Selector switch is located on the front panel of the Hear Back PRO Hub. This switch has different functions depending on the FW version installed.

For FW V2, switching between A and B selects 16 channels from either A or B.

For FW V5 and 16-channel card versions of V6 and later, inputs A and B are used simultaneously. Selecting between A and B selects the Clock Source and sets the 16 channel RGB LEDs to display that source. See the following chart.

INPUT SELECTOR SWITCH POSITION	CARD SLOT	RESULTING OUTPUT CARD CHANNELS
A	1	1 THRU 16
	3	17 THRU 32
B	3	1 THRU 16
	1	17 THRU 32

For 32-channel card versions of V6 and later firmwares, all 32 channels are received from the selected card either A or B. The switch also determines the Clock Source.

Input Metering

The Hub features a unique input metering circuit consisting of one RGB LED for each of the first 16 input channels. Each LED provides four visual levels that correspond color to signal strength in dBu:

Analog Input Cards**	
Signal Strength	**Color**
-29 dBu to -18 dBu RMS	Blue
-18 dBu to 0 dBu RMS	Green
0 dBu to +17.5 dBu RMS	Yellow
+17.5 dBu (clip) Peak	Red

**Analog Input Cards with jumpers removed.

Digital Input Cards	
Signal Strength	**Color**
-46 dBFS to -35 dBFS RMS	Blue
-35 dBFS to -17 dBFS RMS	Green
-17 dBFS to -0.5 dBFS RMS	Yellow
-0.5 dBFS Peak	Red

Status Indicating Hub Logo

The illuminated logo serves as an indicator for several purposes. Under normal conditions, the logo will be BLUE, indicating valid clock is present (could be internal or external). A RED logo indicates no valid clock is present. If the logo is blinking RED, this typically indicates a temperature problem, but could indicate something else. Refer to troubleshooting section for detailed information.

Internal Fan

The internal temperature-controlled fan operates whenever the internal temperature reaches 43° C or 110° F. In studio or indoor use, the fan should rarely come on. The Hub should be rack mounted away from high temperature devices such as power amplifiers. Please ensure our recommended clearances listed at the beginning of this manual are met.

> ⚠ **WARNING**
>
> **High temperatures will cause problems!**

Dual Power Ports

The Hub supports two external power supplies. The second power supply serves two purposes: to provide redundancy in case of power failure, and to power more than two network cards (greater than 16 Mixers) in a single Hub. On the front of the Hub, an LED directly above the power switch will be lit if two power supplies are present. This provides an easy way to know if one of the power supplies has failed. On the back of the Hub, an LED is present directly under each power port, and will be lit if power is present at that port.

Firmware Version

It is recommended to check and update the firmware version of all PRO equipment using the PRO Connect Software.

New interface. New level of control.

PRO Connect provides a web-based interface to update, configure, and control your Hear Back PRO and Switch Back PLUS systems.

Download for Windows
[Download for Windows]

Download for Mac OS
[Download for macOS]

To check the version on the Hub directly:

1. Apply Power.
2. Immediately after all the LEDs turn "on", slide the "Input Selector Switch" through all "A,B, HBUS" options, then return to the original selection (**Figure 1**).
3. Channel LEDs will flash **WHITE** to indicate firmware version - once for major number, then once for minor number (e.g. LED #2, then LED #9 = V2.9) (**Figure 2**).

Figure 1

Figure 2

IO Cards

The modular Hub consists of four card slots, which can be populated with any configuration of input and/or output cards to fit your needs.

Installing an IO Card

> **WARNING**
>
> **Make sure you touch a metal object to discharge any static before proceeding with installation.**

1. With power disconnected, orient the Hub with the back towards you.
2. Select the blank slot you wish to utilize and remove the plate and two Phillips screws.
3. Slide the card into the slot, and push gently as the gold fingers mate with the front panel connector. You should feel it "snap" into place.
4. Tighten the set screws on the front of the card.

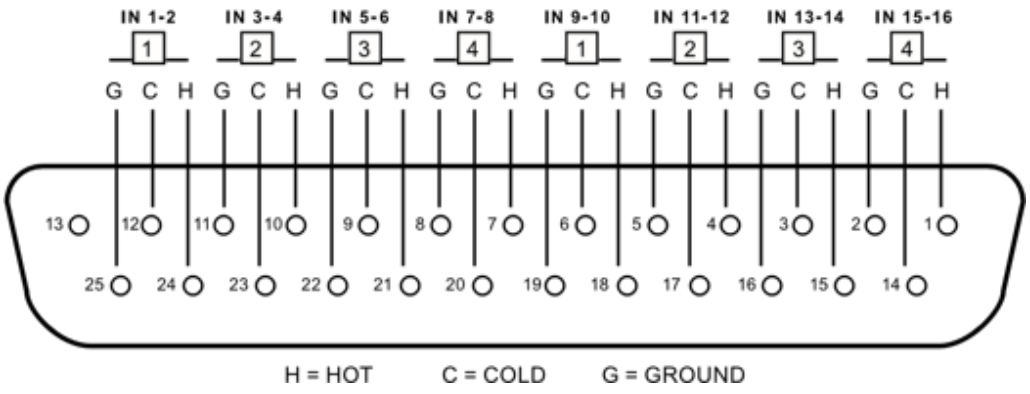
IO Cards / Analog Input Card

Overview

Allows HBPRO Hub to input signal from any professional analog audio equipment. Provides (8) balanced audio inputs using a standard Tascam DA-88-style pin-out on a DB25 connector. A DB25 to 1/4-inch TRS break-out cable is sold separately, unless the Analog input card is purchased as part of the Hear Back PRO Four Pack.

The 8 channels can come from an audio mixer via auxilliary, matrix, monitor, and/or direct outputs.

> ⚠ **CAUTION**
>
> **Use only DA-88 Analog. Do not use TDIF.**

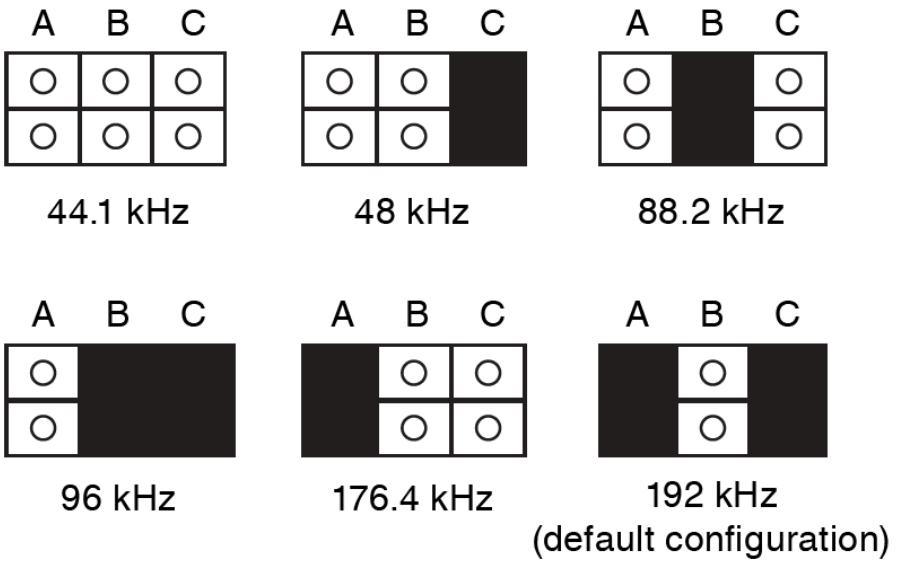


Advantages / Features

- -10dB pad on each channel allows the user to select +8dB or +18dB maximum input sensitivity level
- Custom input sensitivities available up to +34dB upon special request
- User configurable sampling rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz using jumpers
- (2) analog input cards are required to input 16 channels of audio
- Up to (4) cards can be populated per Hub to allow A/B input / clock switching between (2) banks of 16 channels with FW V2 or 32 simultaneous channels with all later versions

Selecting Sampling Rate

The Analog Input Card lets users select the digital sampling rate they wish to convert their analog audio to via three jumpers located directly under the Hear Technologies logo on the Analog Card circuit board. Jumper positions can be configured as shown below, where the blacked-out boxes represent an electrical connection between pins:

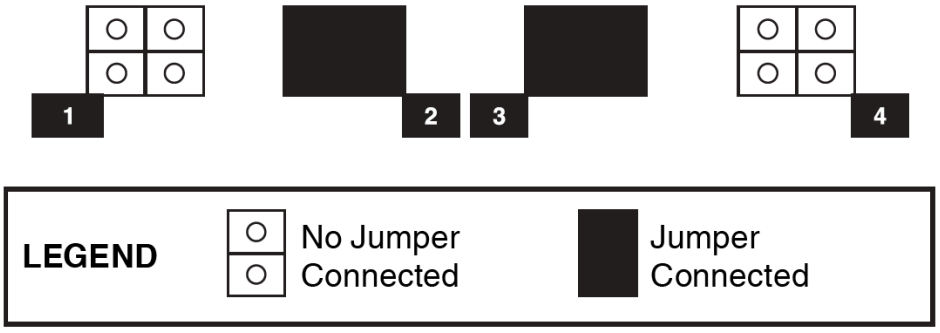


NOTE

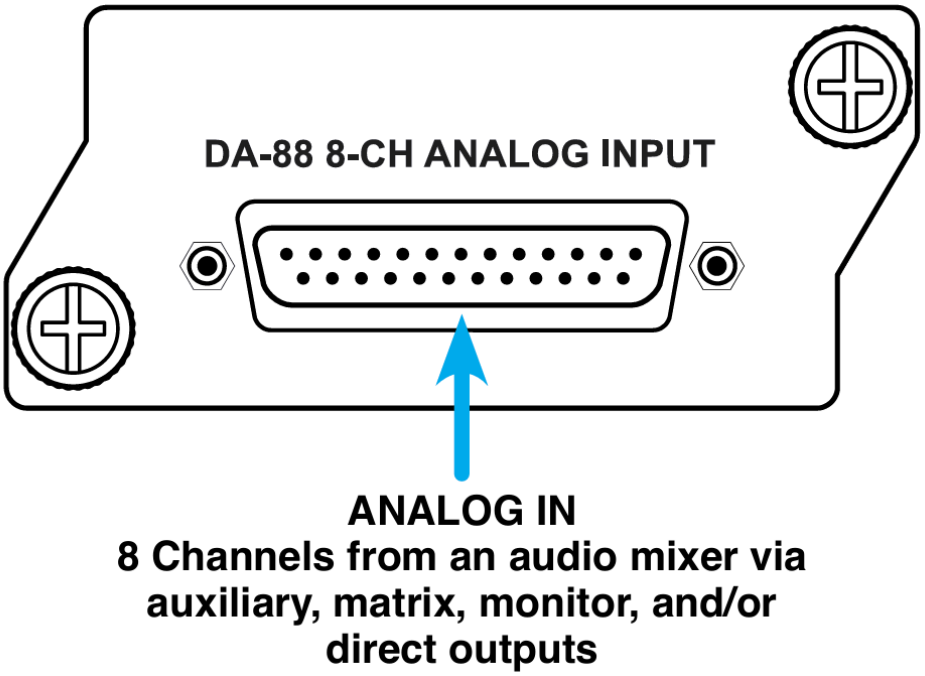
The jumpers affect the sampling rate only when the card is selected as the input. Other Analog Cards will follow that clock. For example, if input A is selected, only the jumpers on the card in slot 1 are used. When using digital input cards simultaneously, select the digital card as the input to keep the clock synchronized and avoid pops and clicks.

-10dB Pad

The Analog Input Card provides 2 jumpers per channel (16 total) that can be removed to achieve a -10dB pad per channel. These jumpers are labeled 1-8 (corresponding to each input channel), and located one inch away from the DB-25 connector. So, in this example, input channels 1 & 4 will be reduced by 10dB, while input channels 2 & 3 are at 0dB:



Installation



The Analog Input Card is designed to use in multiples. The cards must be placed side-by-side, commonly in slots 1 & 2 with select switch at position "A".

For V5 FW and above, additional Analog Input cards may be added to achieve 24 and 32 total channels, depending on how many slots are available in the PRO

Hub. Up to 16 Analog Input Cards can be populated into 4 Hubs totaling 128 channels.

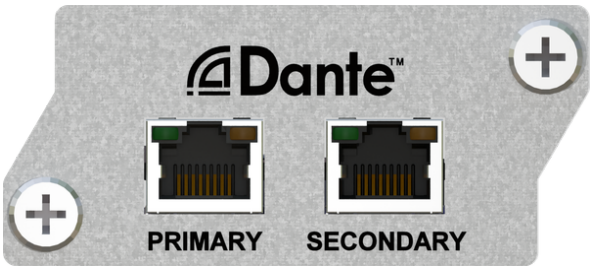
Technical Specifications

System Input

Hub Line In:
  8 Balanced inputs on DB-25 female (DA-88 pinout)
Hub Maximum Input Level:
  +2 dBu with analog card pad jumpers populated, +12dBu with jumpers removed (up to +28dBu upon special request)
Sampling Rates:
  Supports 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
Input Connector:
  DB25 with standard TASCAM DA-88 pin-out

IO Cards / Dante Card

Overview



With hundreds of professional audio manufacturers now supporting Dante, it is an easy way to route multiple channels of high quality audio at a very low latency between two or more pieces of equipment (including directly out of a PC or Mac using only its Ethernet port.) Dante (Digital Audio Network Through Ethernet) is a standard audio-over-Ethernet protocol developed and supported by Audinate Pty Ltd.

Please note that we did not develop the Dante protocol. We are simply an end-point. In this manual, we will just barely scratch the surface of Dante's capabilities. The creators of Dante know their protocol better than anyone! Please visit www.audinate.com for a vast wealth of training videos, example setups, and documentation.

Our **Hear Back PRO Dante card** connects 16 channels of simultaneous audio input and output with other Dante enabled equipment using a standard Ethernet network connection. Dante will work with standard network switches and routers and is safe to combine with your existing computer network, if necessary. Both 100BaseT and 1000BaseT network speeds are supported. However, 1000BaseT (gigabit) Ethernet is highly recommended due to the lower latency that it offers.

Our system supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz.

Advantages / Features

- Connects 16 or 32 channels of simultaneous audio input and output with other Dante-enabled equipment using a standard Ethernet network connection (depending on FW version of Dante Card)
- Supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
- (2) cards can be populated per Hub to allow A/B input switching between (2) banks of 16 channels with FW V2 or 32 simultaneous channels with all later firmware versions.

> **NOTE**
>
> FW V6 and V8 allow the use of a single 32 channel Dante card, allowing the second input to be used as a second switched signal source.

- Up to (2) cards can be populated to allow A/B input/clock switching

Configuration

A Dante network requires at least two devices that support the Dante protocol and a single Cat5e or Cat6 network connection between the two devices. Note that the cable does NOT need to be a cross-over cable. Before you can send audio over the Dante network, you must first connect a Windows PC or Mac running the Dante Controller software (download from www.audinate.com) in order to configure audio channel routing. You must choose what you want to send to each of the sixteen channels of the Hear Back PRO Hub. Whatever is assigned to

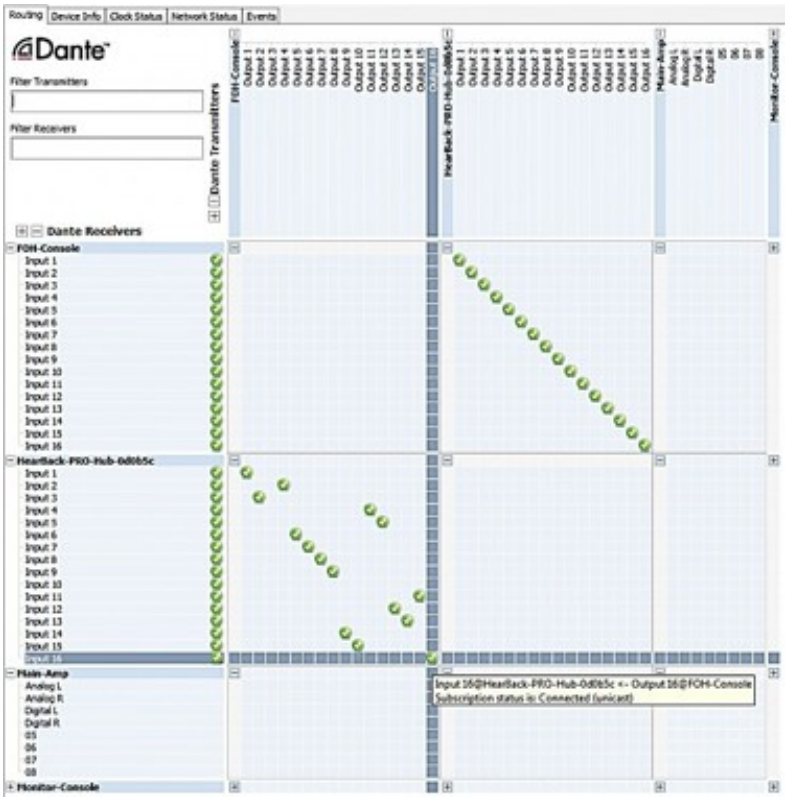
channels one through sixteen in the Dante Controller software is what will show up on channels 1 through 16 on the Hear Back PRO Mixers.

After configuration, the computer can be disconnected. To connect the PC or Mac, you can connect the computer's Ethernet cable directly into the Hear Back PRO Dante card (or into a network switch that the other Dante devices are also connected to.) The card has two Ethernet ports: "PRIMARY" and "SECONDARY". By default, these ports are configured as "switched", meaning that are both interchangeable and Dante equipment can be connected to either port. For example: a sound board with Dante could be plugged into the “PRIMARY” port, and your PC or Mac could be plugged into the "SECONDARY" port.

> **NOTE**
>
> Alternatively, these two ports can be reconfigured (using the Dante Controller software) to function as redundant ports. When the ports are used in redundant mode, two Cat5e or Cat6 cables connect to each Dante device. This provides redundancy and protection from audio interruption in case one network cable gets damaged or a network switch fails. (More on redundant mode later.)

Dante Controller

Once you download and install the Dante Controller software and connect your PC or Mac to the Dante network, the Dante devices will automatically show up in the routing view.

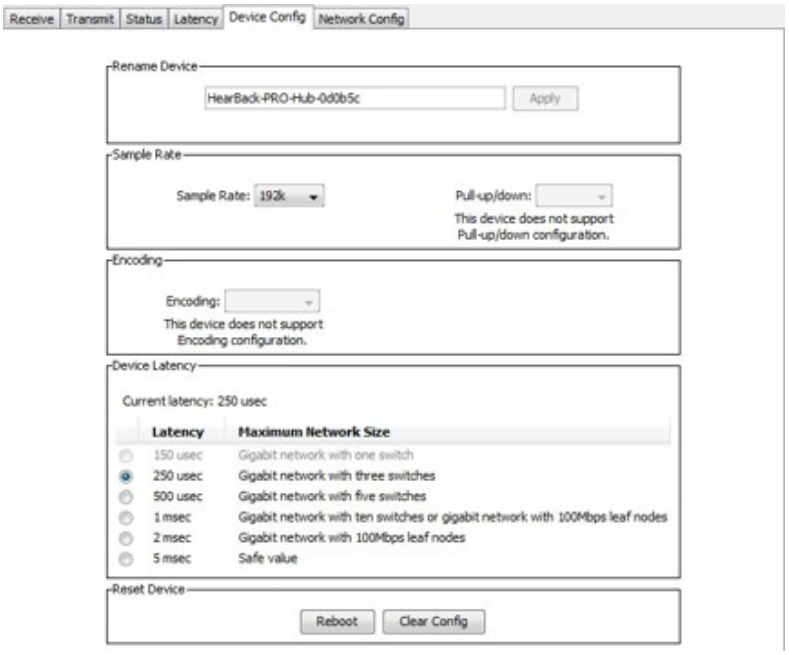


Dante Controller Software – Routing View

> **NOTE**
>
> It is not necessary to assign any special IP address to your computer in order to communicate with the Dante devices. Dante uses broadcast messages to automatically detect and communicate with the devices on the network regardless of your network settings.

In the routing view (shown above), you will see devices that can receive Dante audio along the left (rows) and you will see devices that can transmit Dante audio along the top (columns). Clicking on the "+" next to each device will expand the device to show all of its inputs or outputs. Clicking a cross-point box (as shown in the image above where the two grey lines meet) will route audio from a transmitter to a receiver. If two devices are running at different sampling rates, you will not be able to route audio between them. To view and change the

sampling rate of a device, double click the name of the device in the routing view of the Dante Controller software; a Device View will open up in a new window showing settings and information for that device. Clicking on the Device Config tab will allow you to view and change the current sampling rate.



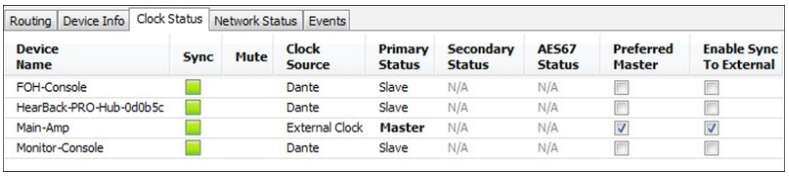
Dante Controller Software – Device Config Tab

> **NOTE**
>
> The Network Config tab (not shown) is another tab on the Device View window which will allow you to change the function of the "SECONDARY" port on the Dante card from switched mode to redundant mode if you are running a second (redundant) Dante network to all your devices.

Master Clock Source

The Dante network must have a master clock source. This is chosen using the Dante Controller Software under the Clock Status view tab (shown below). In most

applications, the Hear Back PRO Dante card is NOT chosen as the master because it is typically the final destination for the audio. Usually, the device that is the source of the audio is chosen as the preferred master clock source.



Dante Controller Software – Clock Status Tab

> **NOTE**
>
> Since the Hear Back PRO Hub can house multiple input and output cards, it is possible to use the Hub as an audio format converter. For example: an AES/EBU, Waves SoundGrid, ADAT, or Analog card could be placed in the first card slot and a Dante card could be placed in the third card slot. If the input select switch on the front of the Hub is selected to input "A", the AES/EBU or whichever card is in the first slot will be chosen as the input. But since the Dante card does both input and output, these 16 channels that are coming in from the first card slot will be sent out over Dante. In this scenario, you would want to choose the Hear Back PRO Dante card as the preferred master clock source in the Dante Control software because the audio is originating from an entirely different clock domain. If you don't do this, you will likely hear digital pops and clicks.

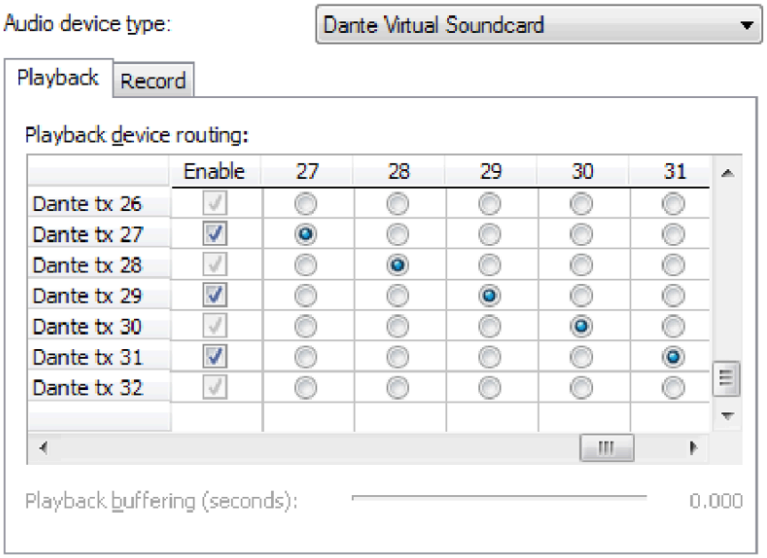
> **NOTE**
>
> Do not populate the Dante card in slots 2 or 4 on the Hear Back PRO Hub. These slots are reserved for Analog input cards, Analog output cards, and Mixer Network cards.

In the rare case that you use the Dante card to send audio out over the Dante network, it is important to understand that the Dante card does NOT automatically set the sampling rate of the Dante network. Due to the Dante architecture, you MUST choose the correct sampling rate (as previously discussed) on the Hear Back PRO Dante card in the Dante Controller software so that it matches the current sampling rate of the Hear Back PRO Hub. Otherwise you will hear some very strange things! Also notice that when the Dante card is not selected as the input on the Hub, the Dante Controller software automatically checks the box "Enable Sync To External" under the Clock Status view. This is because when sending out audio, the clock source must come from the Hear Back PRO Hub in order to keep the clocks synchronized.

If you hear anything unusual, the first place to check is the Clock Status view. Verify that the correct Preferred Master clock source is selected, and "Enable Sync To External" is selected on that device if applicable. Next, make sure that each device (under the Device View) has the correct sampling rate selected. Remember that due to the Dante architecture, changing the sampling rate on one device does NOT change the sampling rates on all the other devices. You must use the software to make the changes on all connected devices!

Virtual Sound Card

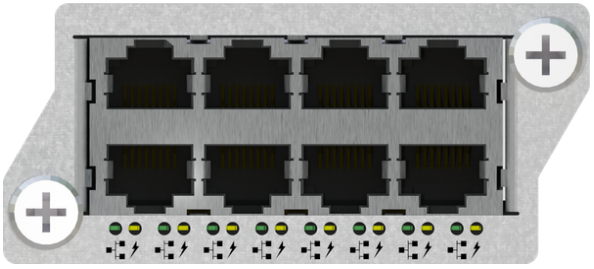
Dante also offers a "Virtual Sound Card" driver for both PC and Mac that can be purchased and downloaded from Dante's site www.audinate.com for a nominal fee. This driver allows you to send and receive Dante audio using nothing but your Ethernet connection on your PC or Mac. The driver shows up as multiple sound devices that you can use in software such as Sound Forge (shown below), Pro Tools, or the like.



Sony Sound Forge Software – Audio Devices

IO Cards / Network Card

Overview



Provides (8) RJ45 Ethernet ports for connecting Hear Back PRO Mixers, PRO Mixer Distros, or other Hear Back PRO Hubs. Each port provides Power over Ethernet Plus (PoE+) power and digital audio over a single CAT6 Ethernet cable that can be run up to 566 feet. Up to (4) Network Cards can be populated per single PRO Hub. Also available as "stand alone" in the PRO Mixer Distro (PRONET).

Advantages / Features

- Each port provides PoE+ power and digital audio over a single CAT6 Ethernet cable that can be run up to 566 feet
- Up to (4) Network Cards can be populated per PRO Hub
- Supports 10Base-T, 100Base-T, 1,000Base-T
- Isolate Mode allows Network Card to function as a stand alone network switch. Not connected to the Mixer network, it can be used for Dante, Waves SoundGrid, or any other Ethernet applications while populated in the Hub.
- Also available as "stand alone" in the PRO Mixer Distro

Pin-outs

The network card's RJ45 pin-outs are the same as standard gigabit Ethernet RJ45 pin-outs, as shown below:

Pin	Pair	Description	Suggested Termination Color Scheme (568B***)
1	A+	Power over Ethernet (PoE) 48V**	White/Orange
2	A-	Power over Ethernet (PoE) 48V**	Orange
3	B+	Power over Ethernet (PoE) GND**	White/Green
4	C+		Blue
5	C-		White/Blue
6	B-	Power over Ethernet (PoE) GND**	Green
7	D+		White/Brown
8	D-		Brown

**Gigabit PoE uses a transformer on the data pairs to allow power and data to share the same pairs similar to how phantom power works on microphones.

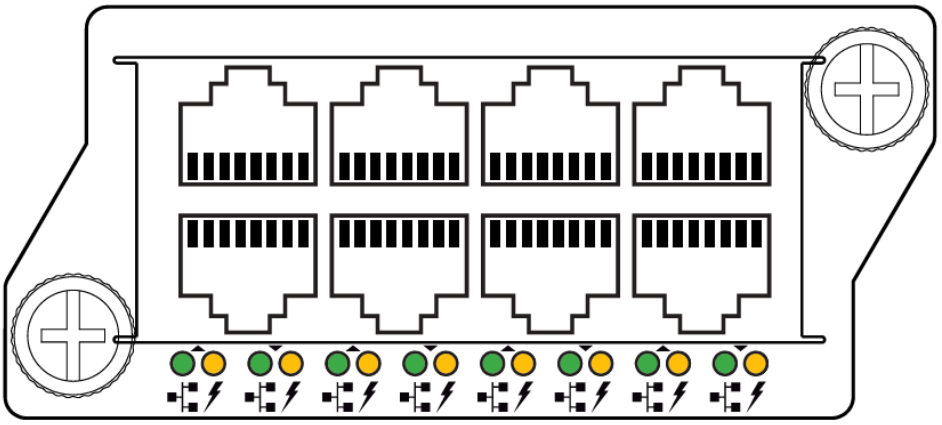
***Color Scheme 568A is also acceptable, but do not crossover from 568A to 568B.

Each Mixer output on the network card has a power supervisor circuit that will only power the port if a valid PoE device is detected. In the event of a shorted cable or broken Mixer, the power supervisor circuit will disconnect the load, permitting other Mixers to function while protecting the power supply from the faulty output.

Although the PRO system is based in Gigabit Ethernet (T1000), the Network card is capable of handling base T10, T100, and T1000. This is especially important for use in a PRONET as a stand-alone network swtich.

> **NOTE**
>
> The Network card requires firmware version 1.4 to be used a network switch in the PRONET.

Installation



PoE+ POWER & DIGITAL AUDIO I/O

8 RJ45 Ethernet ports for connecting Hear Back PRO Mixers, PRO Mixer Distros, or other Hear Back PRO Hubs

STATUS LEDS

Digital Audio status 'Green'

48V PoE+ Power status 'Yellow'

A Network Card must first be inserted into the Hear Back PRO Hub's card slot 3 or 4 to transmit power, ground, and audio to PRO Mixers via standard CAT6 cables. Each network card can support use of up to eight Mixers simultaneously. Additional Mixers can be used by inserting a second, third, or even fourth network card into card slots 3, 2, and 1, respectively. However, to power more than two network cards (or more than 16 Mixers), an additional power supply is required.

The first two network cards in slots 3 and 4 will receive power if a power supply is present in either power port; the second two network cards in slots 1 and 2 will only receive power if a power supply is present in both power ports. Additionally, a second power supply serves as redundant power to slots 3 and 4 in the case

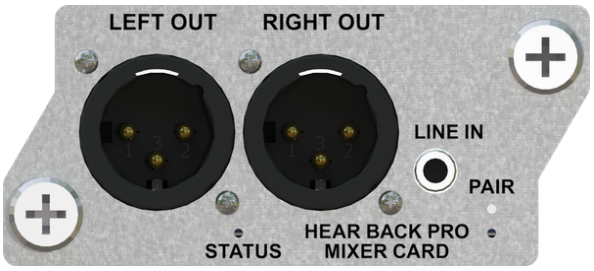
that one power supply were to fail. A yellow LED under each power port indicates the presence of 48 volts, even when the Hub is powered off.

Technical Specifications

Power:
  48 VDC PoE @ 30 watts
Auto-crossover:
  Enabled on every port
Energy Efficient Ethernet (EEE):
  Disabled

IO Cards / Virtual Mixer Card

Overview



Virtual Mixer I/O Card for the HB PRO Hub boasts all the features of the HB PRO Mixer slimmed down into a card format. Control via the PRO Connect interface or from another PRO Mixer. Perfect for wireless in-ear monitor systems, you can mix up to 128 channels of high quality audio with 4 presets and intercom. Features an auxiliary 1/8" Stereo Unbalanced Audio Input and XLR Balanced Left and Right outputs. Also works great for receiving or sending intercom audio in a studio control room.

Advantages / Features

- Control from another PRO Mixer
- Features an auxiliary 1/8" Stereo Unbalanced Audio Input and XLR Balanced Left and Right outputs
- Also works great for receiving or sending intercom audio in a studio control room

Configuration

The following is applicable for V8 FW and later with PRO Connect.

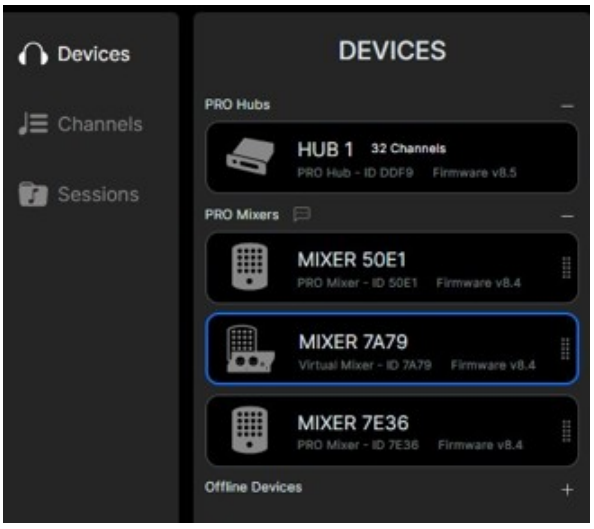
The Virtual Mixer Card may be installed in any open slot on the PRO Hub. With power disconnected, install the Virtual Mixer Card carefully – some of the components on the bottom side of the board barely clear the chassis lip. Push to seat the gold fingers into the front card edge connector, then tighten the thumbscrews. Configure the card in PRO Connect.

Control

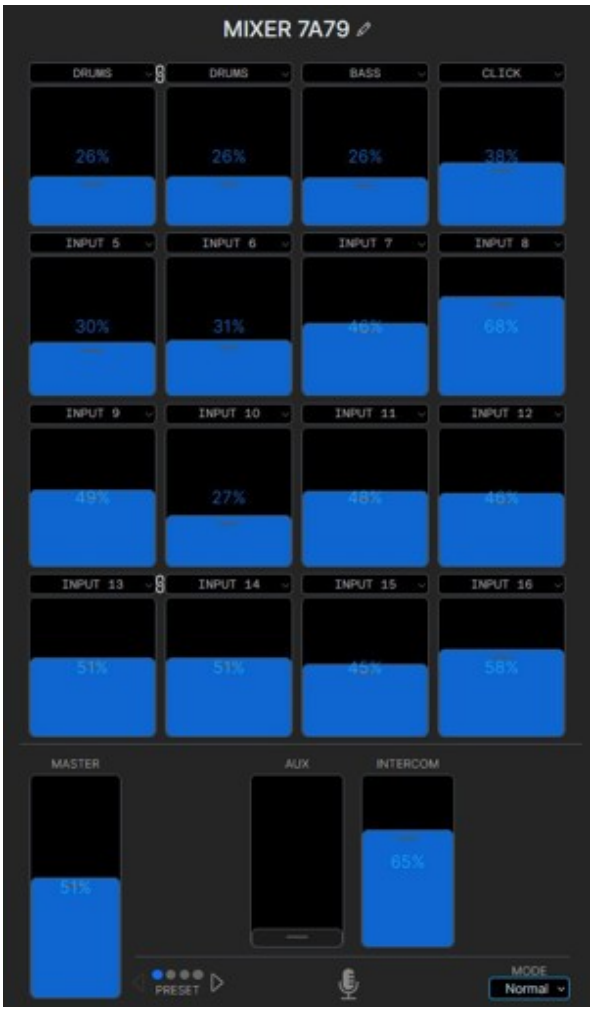
The Virtual Mixer Card can be controlled via PRO Connect or another physical PRO Mixer.

Option 1: Control via PRO Connect

1. Install the Virtual Mixer Card in the desired Hub slot. Open PRO Connect and click the Hub icon, then click the "wrench" icon in the upper right-hand corner. From the drop-down menu of the corresponding Hub slot, select the Virtual Mixer Card.
2. Click the "Devices" icon in PRO Connect. The Virtual Mixer Card will appear in the list of "PRO Mixers" (screen A). Select the Virtual Mixer Card from the list to display the Mixer interface, giving you access to individual channel controls (screen B).



A - Devices Screen



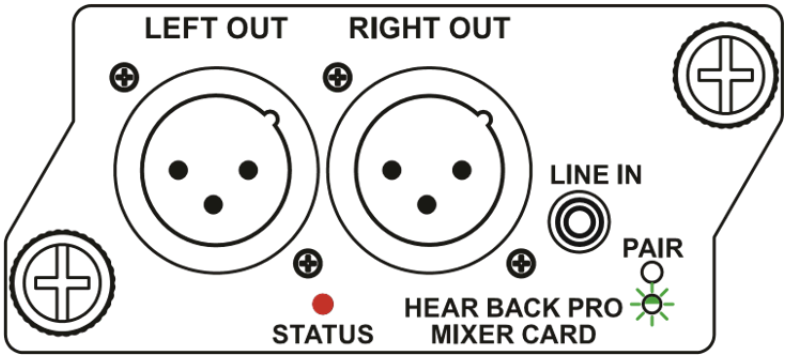
B - Mixer Interface

Option 2: Control via Another PRO Mixer

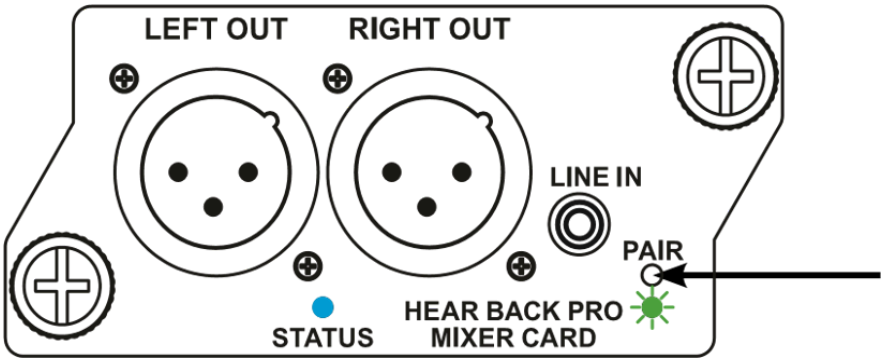
The Virtual Mixer Card can be controlled with another PRO Mixer by A) pairing via the PAIR button or B) pairing via PRO Connect.

A. Pairing via "PAIR" Button

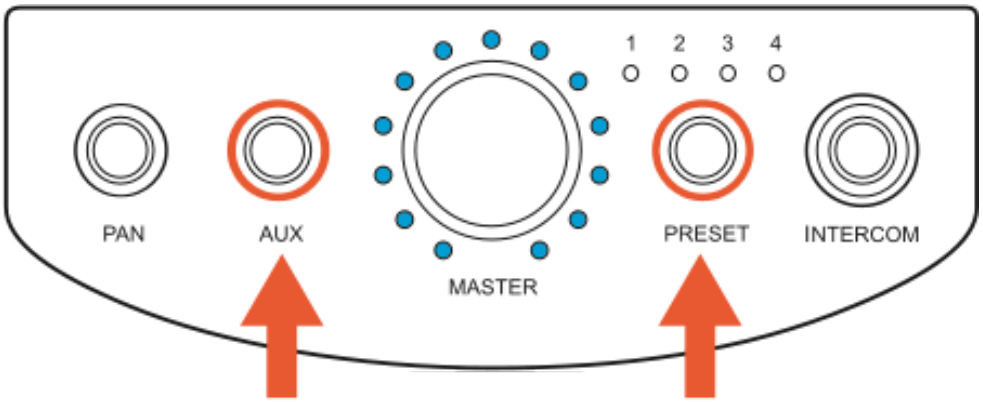
1. Apply power to Hub. The STATUS LED on the Virtual Mixer Card will illuminate **RED**, and then the PAIR LED will flash **GREEN** several times before stopping.



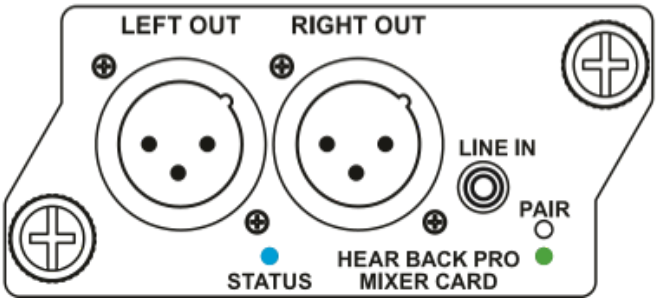
2. Using a micro screwdriver, toothpick, or tweaker, press the recessed PAIR button above the **GREEN** LED. Hold it in until the LED flashes quickly, then release.



3. After a few seconds, the LED will begin to flash slowly. It is now ready to be paired with a PRO mixer.
4. Select the PRO Mixer you wish to pair with the Virtual Mixer Card. On that Mixer, press AUX and PRESET at the same time. You will see all the channels and Master LED rings flash simultaneously, letting you know it has paired with the Virtual Mixer Card. The pairing LED on the card will go solid **GREEN**.



PRO Mixer



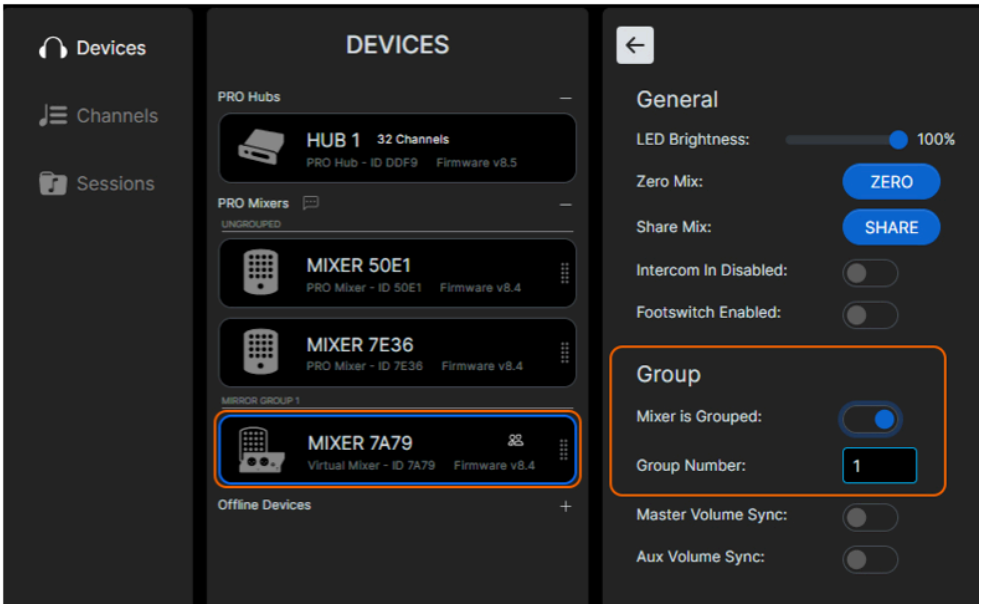
Virtual Mixer Card Status 'Blue' and Pairing LED 'Green'

> **TO UNPAIR THE VIRTUAL MIXER CARD FROM THE PHYSICAL MIXER:**
>
> On the paired Mixer, press AUX and PRESET at the same time while turning the Master Volume knob in any direction. All LEDs around the Master knob will be unlit to indicate that the Mixer is no longer paired.

B. Pairing via PRO Connect

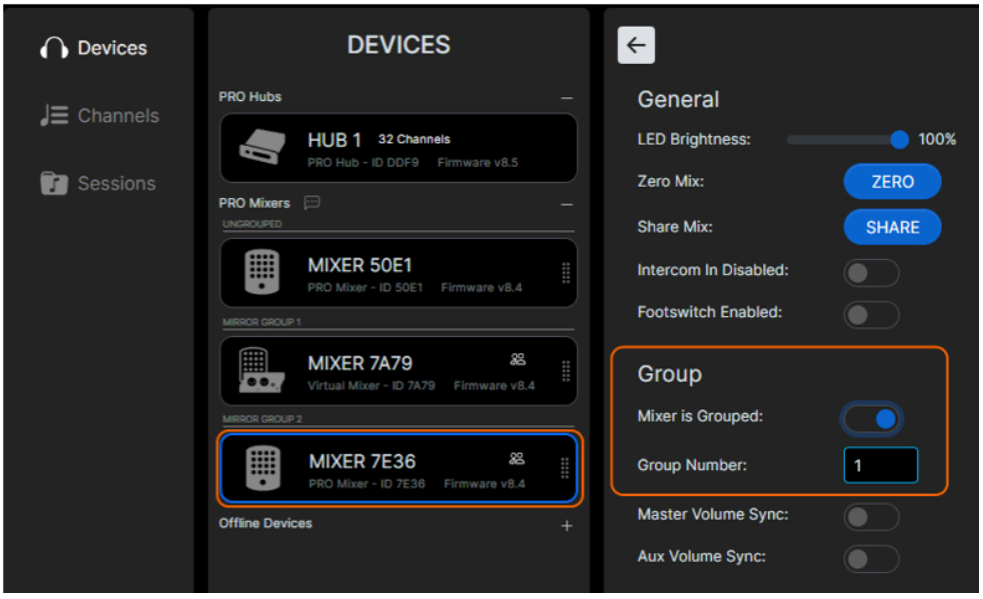
1. To pair a PRO Mixer to your Virtual Mixer Card via PRO Connect, ensure both devices are listed in "Devices". From "DEVICES", select the Virtual Mixer Card then click the "wrench" icon in the top right corner. In "Group" settings, toggle the first setting "Mixer is Grouped" to "On". A "Group Number" box will

appear; enter a specific group number for your Virtual Mixer Card and paired PRO Mixer (screen C).



C - Virtual Mixer Card Grouping

2. Now, from the "DEVICES" list, select the Mixer you wish to pair and click the "wrench" icon in the top right corner. In "Group" settings, toggle the setting "Mixer is Grouped" to "On" and enter the same group number as the Virtual Mixer Card (screen D). Now controlling the PRO Mixer (either physically or via PRO Connect) will also control the mix on the Virtual Mixer Card.



D - Pairing with Mixer

> **TO UNPAIR THE VIRTUAL MIXER CARD FROM THE PHYSICAL MIXER:**
>
> Toggle the "Mixer is grouped" setting to "off" in PRO Connect.

Receiving Intercom Audio in the Control Room

Intercom audio can be received in the control room A) via paired PRO Mixer or B) via PRO Connect.

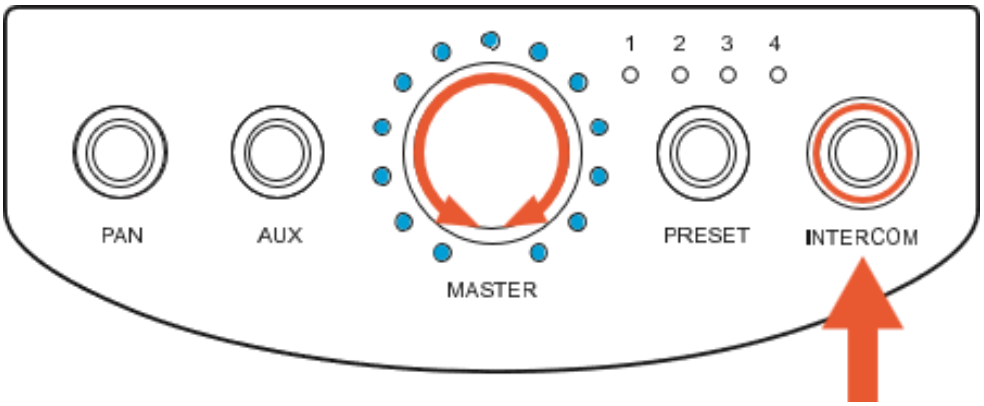
First, connect the LEFT OUT (balanced), located on the Virtual Mixer Card, to an unused input on console.

Option 1: Intercom via PRO Connect

1. From "DEVICES", select the Virtual Mixer Card, then turn all the channels volumes to zero.
2. Trigger "Intercom" on a paired physical Mixer. Listen to the level and adjust the Master Volume to the desired level. The Virtual Mixer Card will retain the settings.

Option 2: Intercom via Paired PRO Mixer

1. Pair the Virtual Mixer Card to a PRO Mixer. Once paired, ensure all channel volume levels are turned down.
2. Press and hold the "INTERCOM" button on the paired Mixer to test and adjust talk back volume with other users. Adjust the INTERCOM Volume (Master knob) to the desired level. The Virtual Mixer Card will retain the volume level of the last Mixer it was paired with or the latest level setting in PRO Connect.

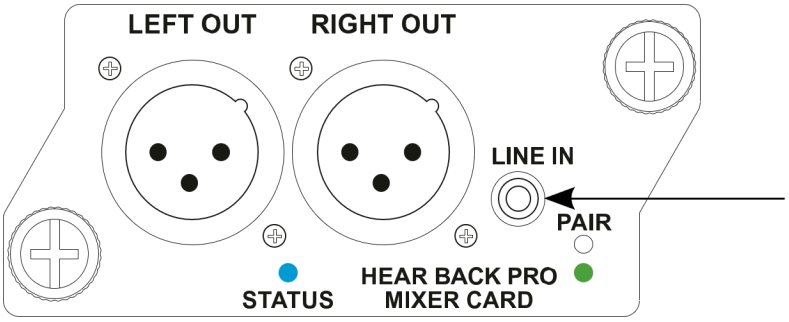


PRO Mixer

Sending Talk Back From the Control Room

1. With a mic connected to the console, connect an output on the console to the 1/8" Stereo LINE IN AUX on the Virtual Mixer Card. This is an unbalanced

input: tip (left), ring (right), sleeve (ground).



2. The intercom and the connected mic will be triggered by clicking "INTERCOM" on the Virtual Mixer Card in PRO Connect. You can now adjust your intercom mic output volume.

Technical Specifications

Aux Input

Line Input Config/Impedance:
1/8" Stereo, unbalanced, 10K ohms typical
Line Input Level:
0 dBu optimal, +18 dBu max

Line Output

Max Output Level:
+24 dBu
Frequency Response:
20 Hz to 20 KHz, +/-0.2 dBu
THD+N:
0.004% typical at 1 KHz, +15 dBu
0.006% typical, 20 Hz – 20 KHz, +4 dBu

Inter Modulation Distortion:

0.004% typical at +4 dBu, 60 Hz/7 KHz

Propagation Delay:

Digital Input to Analog Input:

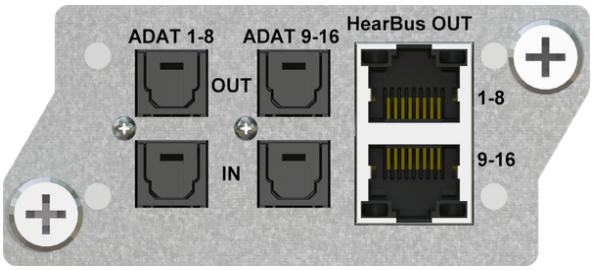
< 0.092 mSec @ 192 kHz sample rate

Analog Input to Analog Input

< 0.248 mSec @ 192 kHz sample rate

IO Cards / ADAT Card

Overview



The Hear Back PRO 16-channel ADAT Input/output Card provides an industry standard method for sending and receiving 16 channels of digital audio. The ADAT card also offers backwards compatibility with the original 8-channel Hear Back system.

The ADAT protocol is a well established standard in the professional audio industry. ADAT uses the same physical TOS-Link optical connection that standard CD, DVD and Blu-ray players use. Although ADAT uses the same fiber optic cables and connectors as these standard consumer electronics devices, the ADAT audio format is different and incompatible. With ADAT, one single optical cable carries 8 channels of digital audio along with the digital synchronizing "clock" in one direction and can support sampling rates up to 48kHz.

The ADAT card can be populated in Hear Back PRO Hub's card slot 1 or card slot 3. If the card is in slot 1, it will input ADAT when the input select switch on the front of the hub is selected to "A." Likewise, if the card is in slot 3, it will input ADAT when the input select switch is selected to "B." Do not populate the ADAT card in slots 2 or 4. These slots are reserved for analog input cards, analog output cards, and mixer network cards.

Advantages / Features

- Simultaneously sends and receives 16 channels of digital audio
- Backwards compatible with the OCTO and original 8-channel Hear Back systems
- (2) optical ADAT TOS-Link inputs, (2) optical ADAT TOS-Link outputs, and (2) RJ45 HearBus outputs (for connecting to the original Hear Back system)
- Supports and automatically locks on to sampling rates of 44.1kHz and 48kHz
- Automatic sampling rate down-conversion is applied on the ADAT and HearBus outputs when the system is running at sampling rates over 48kHz.
- (2) cards can be populated per Hub to allow A/B input switching between (2) banks of 16 channels with FW V2 or 32 simultaneous channels with all later firmware versions
- Up to (4) cards can be populated per Hub to allow A/B input/clock switching as well as a second set of dedicated ADAT outputs

> **NOTE**
>
> SMUX is not supported.

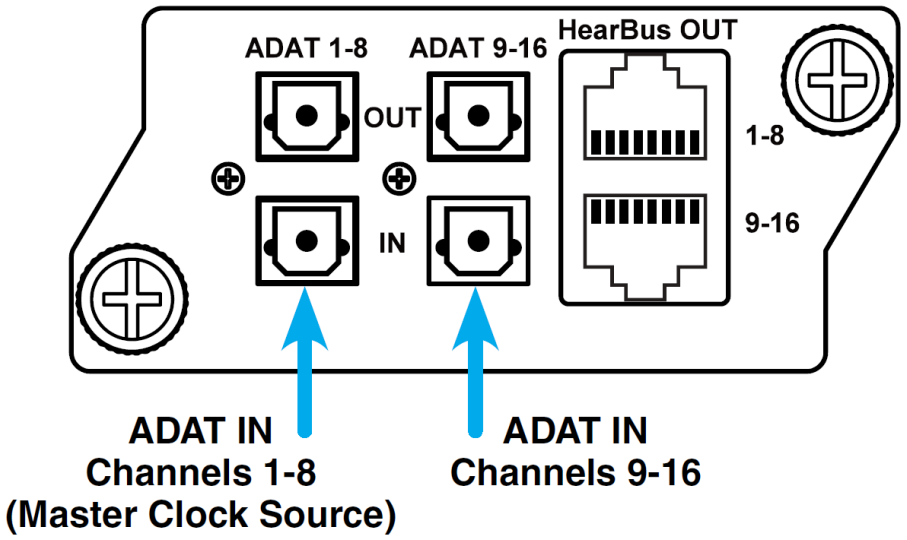
Input and Output Settings

Inputs

16 channels of digital audio input are connected to the card using two ADAT optical cables. On our card, these are the bottom two connectors. The left connector is for Channels 1 – 8 and the right connector is for Channels 9 – 16. Note that the left connector for 1 – 8 must be used because our system uses this connection as the master clock source. Also, to avoid digital pops and clicks, the 9

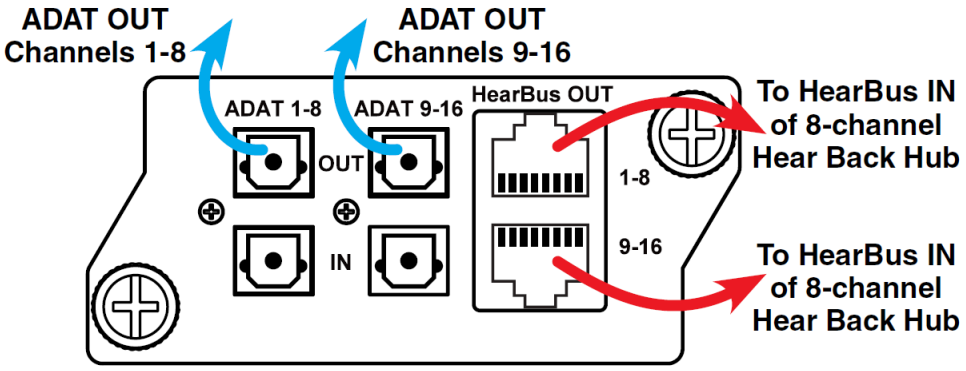
– 16 connection must be clock synchronized with the 1 – 8 connection. This is generally not an issue if both cables are connected to the same source.

The card supports both 44.1kHz and 48kHz sampling rates. Although some manufacturers will support higher sampling rates at the cost of reducing the number of channels (a technique called SMUX), our card does not support SMUX.



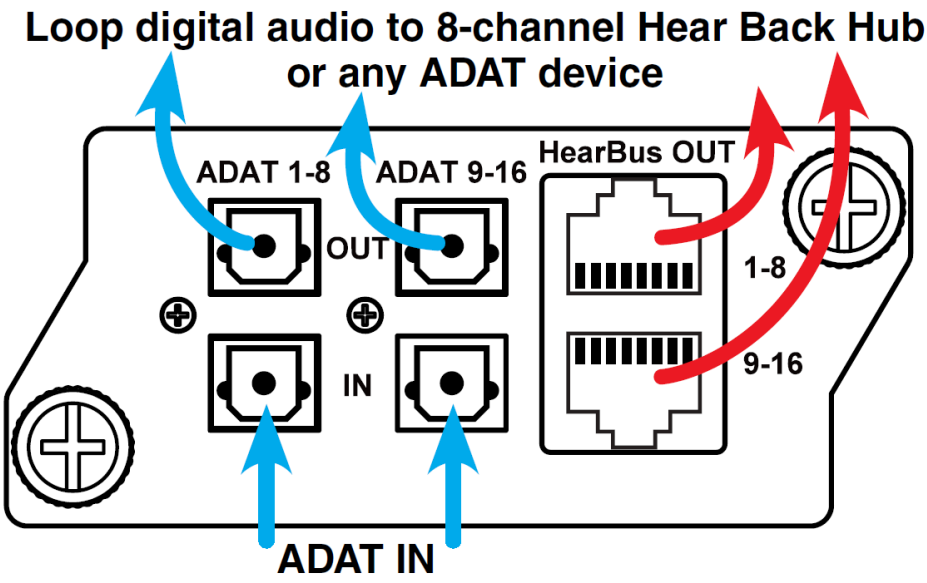
Outputs

In addition to ADAT inputs, the card also has 16 channels of ADAT outputs using two ADAT optical cables. On our card, these are the top two connectors. The left connector is for Channels 1 – 8 and the right connector is for Channels 9 – 16. There are also two RJ45 connectors on the ADAT card labeled HearBus OUT 1 – 8 and 9 – 16. These connections are for sending digital audio to an original 8-channel Hear Back Hub's HearBus IN port. Since there are two HearBus out connections on the ADAT card, two different original Hear Back Hubs can be connected, each with a separate set of 8 channels. This allows both the Hear Back PRO and the original Hear Back systems to be used in conjunction with each other.



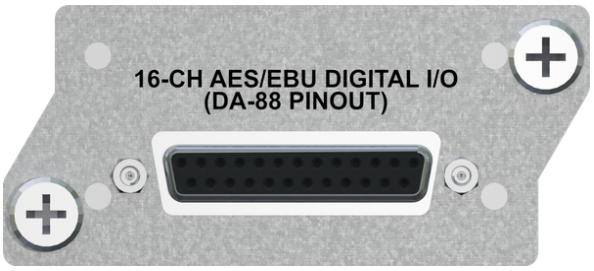
> **NOTE**
>
> The HearBus connections are not Ethernet and are not compatible with the Hear Back PRO HBUS or any Hear Back PRO equipment. HearBus connections are only for connecting to the original Hear Back system. Only the HBUS connections on the Hear Back PRO Hub are used for connecting to other Hear Back PRO Hubs.

When the ADAT card is used as an input to the Hear Back PRO system, the ADAT and HearBus output connectors can be used to loop the digital audio out to an original Hear Back system or another ADAT device. When a different input such as HBUS or another card such as an Analog, AES/EBU, Dante, or Waves SoundGrid card is selected as the input, the ADAT card will continue to output digital audio. It will automatically perform sampling rate conversion if the sampling rate is higher than 48kHz. If the selected input is running at 88.2kHz or 176.4kHz, the ADAT card will down sample it to 44.1kHz. And if the selected input is running at 96kHz or 192kHz, the ADAT card will down sample it to 48kHz.

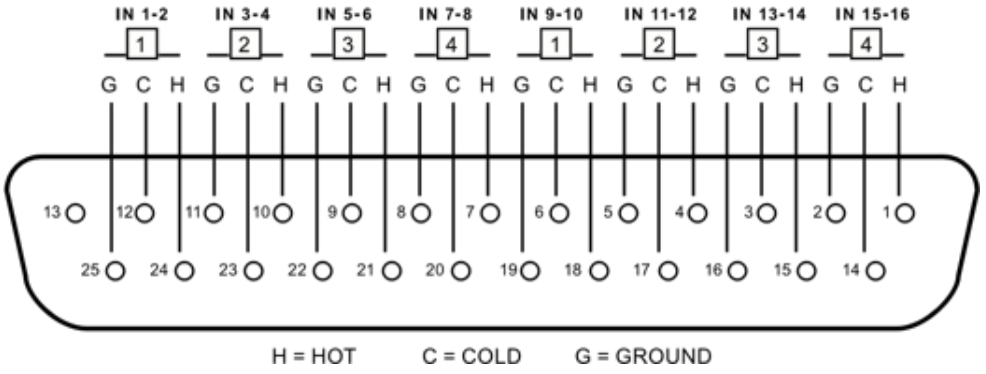

Loop digital audio to 8-channel Hear Back Hub
or any ADAT device
ADAT 1-8
ADAT 9-16
HearBus OUT
OUT
IN
1-8
9-16
ADAT IN

IO Cards / AES/EBU Card

Overview



16 channels of audio are connected to the AES/EBU card using a Tascam DA-88 style pinout on a DB25 connector (see diagram below). This is the same pinout that standard analog DA-88 style connections use (like our Analog input card). There is one difference: Most manufacturers use the first 4 balanced pairs (the first 8 channels) for inputs and the last 4 balanced pairs (the last 8 channels) for outputs. Due to the amount of space available on the back of our card, we use just one DB25 connector to input (or output) all 16 channels. If you are interfacing with AES/EBU on another piece of equipment that uses a DB25 type connector, you will want to use that manufacturer's break-out cable, which splits out to individual XLR connectors first, then patch each of those XLR connectors to our cable. Using a DB25 to DB25 cable will not work (if you try it, you will likely get only 8 channels).



Advantages / Features

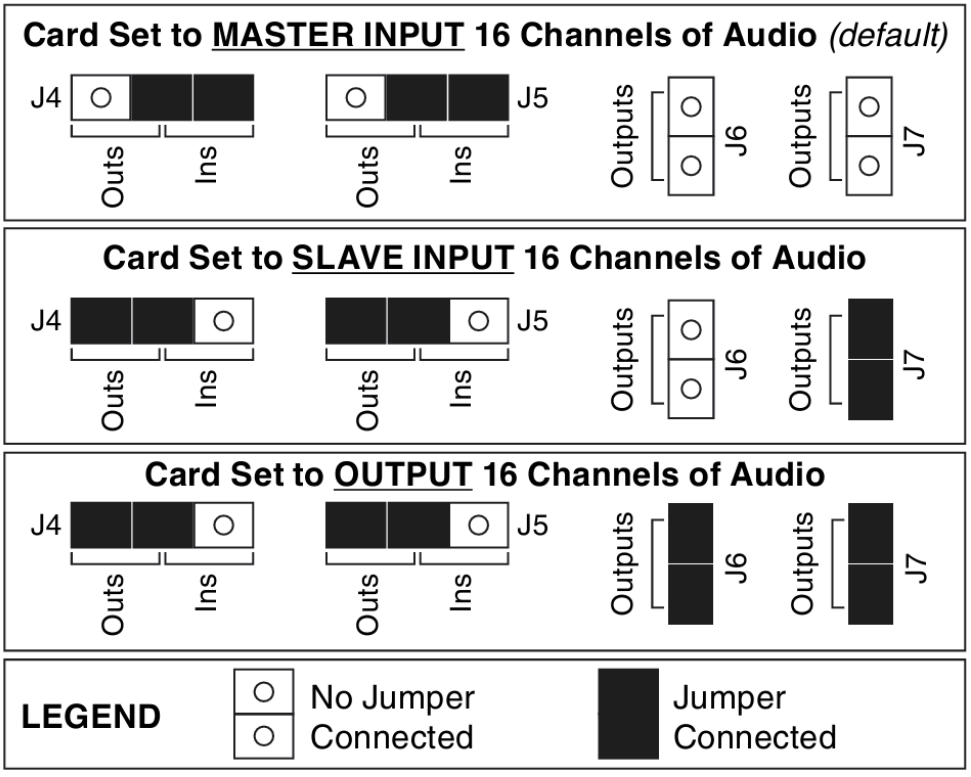
- Tascam DA-88-style pin-out on a DB-25 connector for inputting or outputting 16 channels of digital audio
- Jumper settings allow the user to choose whether the card is 16 inputs or 16 outputs
- Supports and automatically locks onto sampling rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
- DB25 to (8) XLR (each AES/EBU XLR connector supports 2 channels of digital audio) break-out cable is sold separately, unless the AES/EBU card is purchased as part of the Hear Back PRO Four Pack
- (2) cards can be populated per Hub to allow A/B input switching between (2) banks of 16 channels with FW V2 or 32 simultaneous channels with all later firmware versions
- Up to (4) cards can be populated to allow A/B input/clock switching as well as dedicated AES/EBU outputs per Hub

Input and Output Settings

The following is applicable for V8 FW and later with PRO Connect.

The AES/EBU card can either input 16 channels of balanced AES/EBU audio or it can output 16 channels of balanced AES/EBU audio depending on where the four jumpers – J4, J5, J6, and J7 – are set. These jumpers are located on the card, and they are set by default as inputs at the factory. See jumper settings diagram below for both input and output settings.

> **NOTE**
>
> A second AES/EBU card can be added to Slot 3 of the same Hub. That card must be configured as a slave. Other AES/EBU cards in additional hubs will also need to be configured this way.



Master Input

When the card is used as an input, the first pair of channels (1/2) serve as the clock source for the system and must be connected to a valid AES/EBU source in order for the rest of the inputs to work. All inputs MUST run at the same sampling rate and MUST have their word-clocks synchronized to avoid digital pops and clicks. The AES Card will automatically change sampling rate to lock on to the incoming signal.

Slave Input

If multiple AES/EBU or other digital input cards are installed, only the card in the selected input slot can be set as "Master". All other cards must be configured as "Slave" to ensure audio synchronization and prevent pops and clicks.

Output

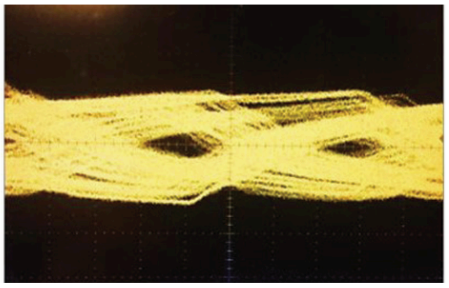
When the card is used as an output, the AES card will automatically change sampling rates to follow the sampling rate of the input source. Supported sampling rates are 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz.

> **NOTE**
>
> If operating at 176.4 or 192kHz sampling rates, a Word Clock Card is recommended to prevent pops and clicks.

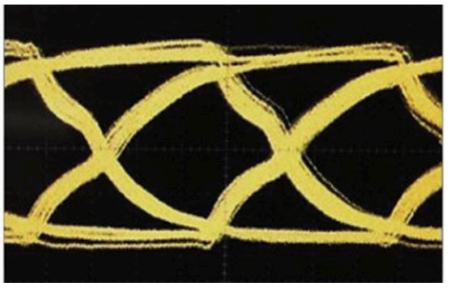
Cabling

Standard microphone cable is not recommended for transmission of the AES/EBU signal. Digital-grade 110Ω AES/EBU cable such as West Penn DA2401 is recommended. Below is a diagram of a good eye pattern of the AES/EBU signal using 100 feet of the correct AES/EBU grade cable and also a bad eye pattern of the AES/EBU signal using 100 feet of standard microphone cable. Not only does

the bad eye pattern look chaotic, it simply does not work. A good eye pattern equals good results!



Good eye-pattern of AES/EBU signal after 100 ft of AES/EBU cable



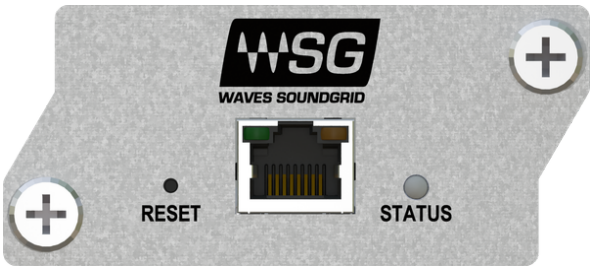
Bad eye-pattern of AES/EBU signal after 100 ft of standard microphone cable

The maximum distance you can run AES/EBU on a good quality digital-grade 110Ω cable is a function of the maximum sampling rate that you wish you support. See the table below.

Sampling Rate	Maximum 110 Ω digital grade AES/EBU cable distance
44.1 kHz	475 feet
48 kHz	475 feet
88.2 kHz	275 feet
96 kHz	275 feet
176.4 kHz	175 feet
192 kHz	175 feet

IO Cards / Waves Soundgrid Card

Overview



The Hear Back PRO SoundGrid Card for Hear Technologies personal monitor Mixers enables integration with Waves SoundGrid systems via a single Ethernet cable. This provides SoundGrid networking technology for low-latency plugin processing, multitrack recording and playback, and audio networking. The Hear Back PRO SoundGrid Card also features Sync-over-Ethernet for clocking multiple Mixers and performing digital splits.

We suggest that you become familiar with the Waves support site www.waves.com/support, where you'll find an extensive answer base, the latest tech specs, detailed installation guides, software updates, and current information about licensing and registration.

Advantages / Features

- Super-low-latency networking platform for processing, playback, and recording

- SoundGrid-compatible devices and SoundGrid systems connect via a single Cat 5e or Cat 6 Ethernet cable. Compatible with standard computers and switches
- (2) cards can be populated per Hub to allow A/B input/clock switching between (2) banks of 16 channels with FW V2 or V5. All later firmware versions enable the use of a single Waves 32 channel card, allowing the second input to be used as a separate switched signal source.
- ASIO/Core Audio drivers for recording and playback
- Supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, and 96kHz
- 1 built-in port for direct connection
- Provides redundancy and recovery options
- Works with MultiRack SoundGrid, SoundGrid Studio, and eMotion LV1 software for setup and control

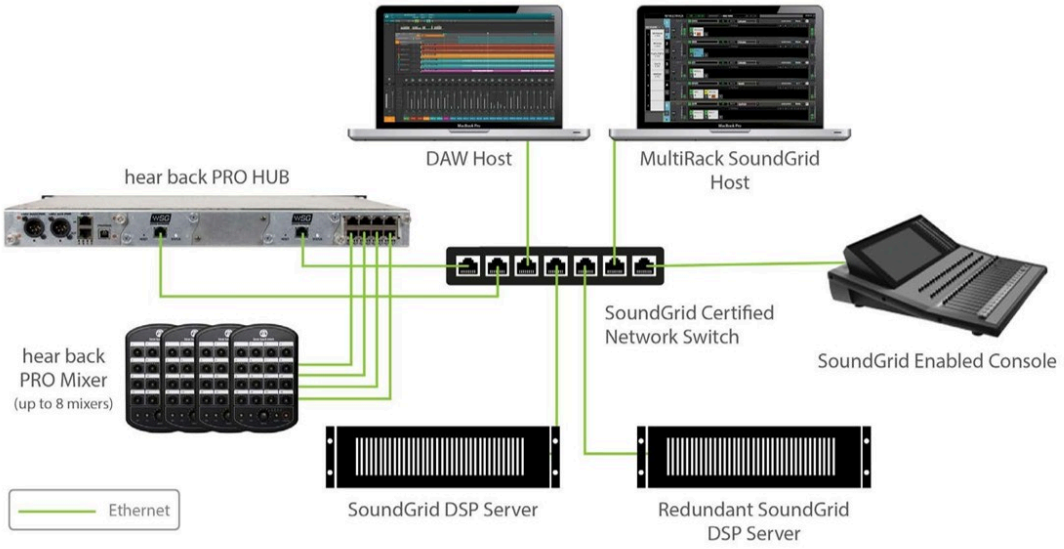
Typical Uses

The Hear Back PRO SoundGrid Card can be used in both SoundGrid and Native configurations.

SoundGrid

In a SoundGrid configuration, the Hear Back PRO SoundGrid Card connects to a SoundGrid network that has a SoundGrid DSP server. This provides a high plugin count with super-low latency processing. It also enables other networking capabilities, including the option of adding an additional DSP server for backup.

> **NOTE**
>
> A SoundGrid DSP server is required for SoundGrid configurations.

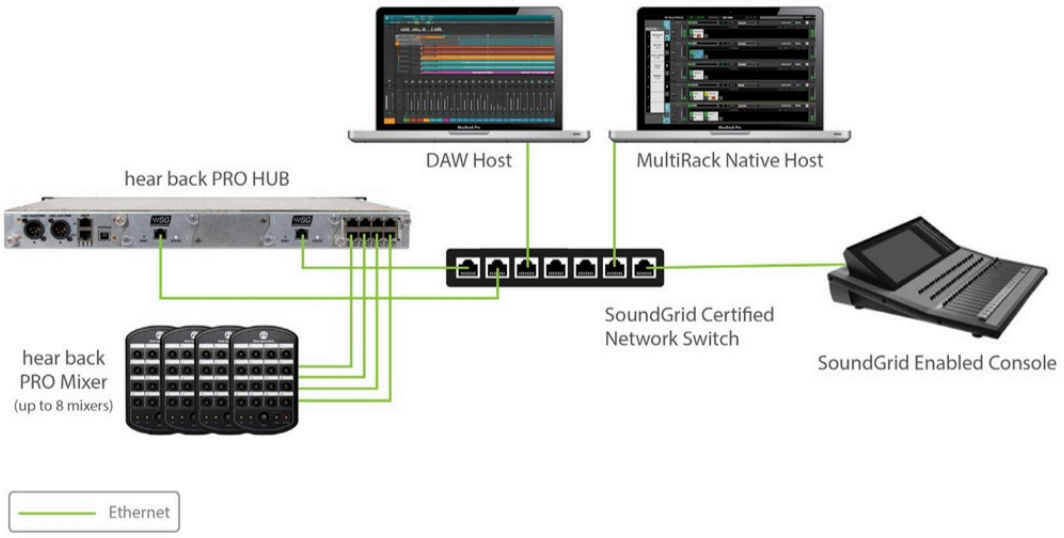


SoundGrid Processing and Recording

Native

In a Native configuration, the Hear Back PRO SoundGrid Card is used to connect a personal monitor mixer to the SoundGrid ASIO/Core Audio driver for plugin processing and/or DAW playback/recording. Since the Native configuration utilizes the computer's CPU to power plugin processing, plugin count and overall system latency depend on the computer's CPU and sound driver capabilities.

> **NOTE**
>
> A SoundGrid DSP server is not required for Native configurations.



Native Processing and Recording

Native/SoundGrid Comparison Table

Features	Native	SoundGrid
Low Latency		✓
Processing	✓	✓
Recording	✓	✓
Simultaneous Recording and Processing		✓
CPU Load	DAW computer's CPU	Dedicated SoundGrid DSP server

Features	Native	SoundGrid
Backup DSP Server		✓
Networking		✓
I/O Interface	Hear Back PRO SoundGrid Card	Hear Back PRO SoundGrid Card
Plugin Host Software	MultiRack Native	MultiRack SoundGrid, SoundGrid Studio, or eMotion LV1 Mixer
Plugin Licenses	Native	SoundGrid

Hardware and Connectors

The card's SoundGrid port (Ethernet) connects to the SoundGrid Network.

LED Indicators

There are two LEDs on the port itself, and a third LED to the right of it.

The two LEDs on the port itself indicate network status:

Link/Activity:
Flashing **GREEN**
GigE Connection
Solid **ORANGE**

The LED to the right of the port ("STATUS") indicates card status:

BLUE:
Card is recognized by the SoundGrid network.
RED:
Card is not recognized by the SoundGrid network.
YELLOW:
During Update - Card is updating properly
Other Conditions - Firmware did not load properly, or the unit did not boot properly.
Cycling Colors:
The LED can be used to identify the card from the control panel. The ID button on the SoundGrid device rack activates the card status LED. When the ID button is pressed, the card status LED changes colors repeatedly to help identify the card.

Reset

If, after an unsuccessful firmware update, the Hear Back PRO SoundGrid Card is not recognized by MultiRack or SoundGrid Studio (that is, the device does not appear in the inventory panel), you can use the Reset button to try to recover the unit. The Reset button is on the front panel of the Hear Back PRO SoundGrid Card. Follow these steps:

1. Turn off the unit.
2. Press and hold the Reset button.

3. Restart the unit while holding the button.
4. Release the Reset button once the device has fully booted.

The unit is now in "force update" mode, and a new firmware update can be performed.

Installation and Configuration

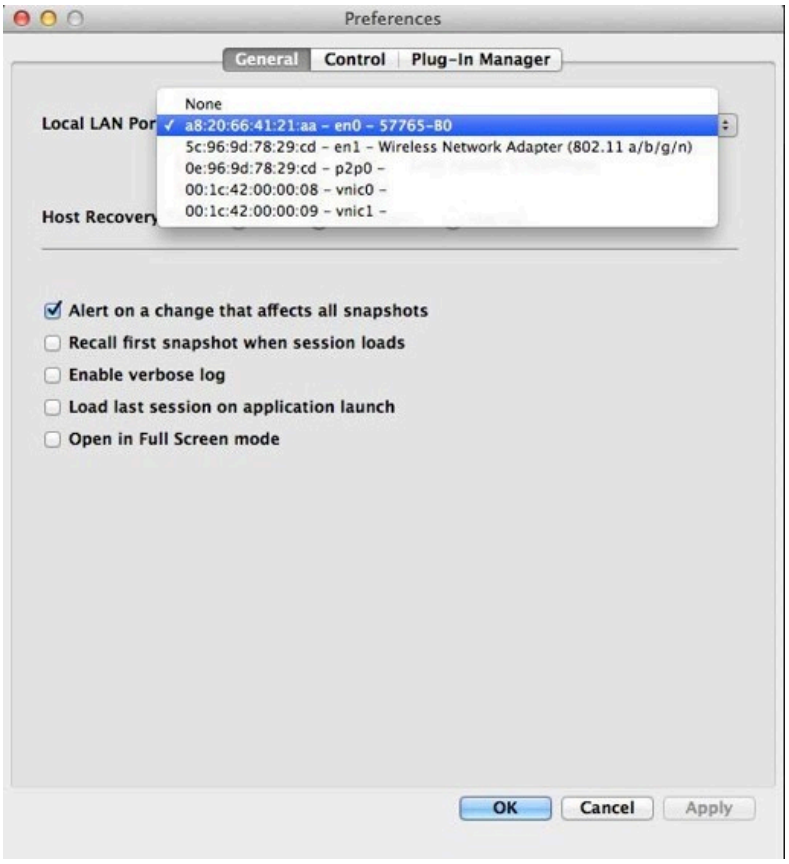
The ASIO/Core Audio drivers and control panel for the Hear Back PRO SoundGrid Card interface—as well as most other Waves products—are installed using the Waves Central application. When you download the drivers and interface, Waves Central also installs the latest version of the SoundGrid driver and the SoundGrid Studio Application, which are required for DAW recording and playback.

Download Waves Central here: www.waves.com/downloads/central

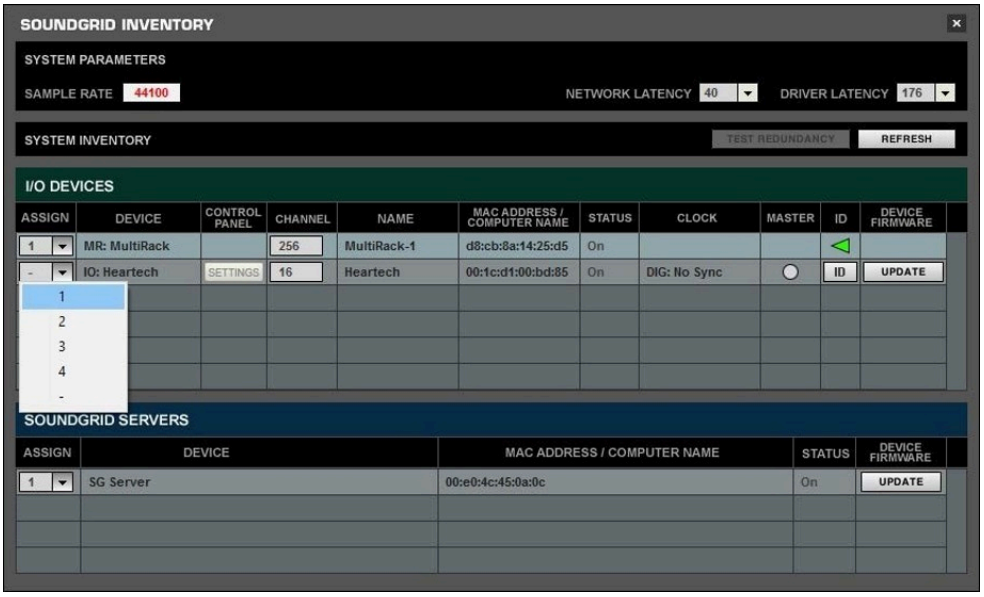
Configuring the SoundGrid Card in MultiRack SoundGrid

Access the Hear Back PRO SoundGrid Card control panel from the **Inventory** window in the MultiRack SoundGrid application.

1. Launch the MultiRack SoundGrid application.
2. Enter the **Preferences** window by typing **Ctrl+P** (Windows) or **Cmd+**, [comma] (Mac), or from the appropriate application menu.
3. Under **Local LAN Port**, choose the adapter connected to the SoundGrid network and the Hear Back PRO SoundGrid Card. Network adapters are displayed as MAC addresses and port names.



4. When you select the correct port, the message "SoundGrid Network Found" will appear on the panel. Close this window.
5. Open the **SoundGrid Inventory** window from the **Audio** Menu (F2). The **SoundGrid Inventory** window displays all SoundGrid I/O devices connected to your network.
6. Assign SoundGrid drivers in the **Assign** column. Use consecutive numbers for multiple devices, with the first unit assigned as number 1.
7. Assign SoundGrid DSP servers in the **Assign** column. The primary SoundGrid DSP server will be assigned as number 1. If you are using a redundant SoundGrid DSP server, assign it as number 2.



8. Assign your Hear Back PRO SoundGrid Card card(s) in the **Assign** column. Use consecutive numbers for multiple devices, with the first unit assigned as number 1.
9. Click **Settings** to open the Hear Back PRO SoundGrid Card Control Panel window.

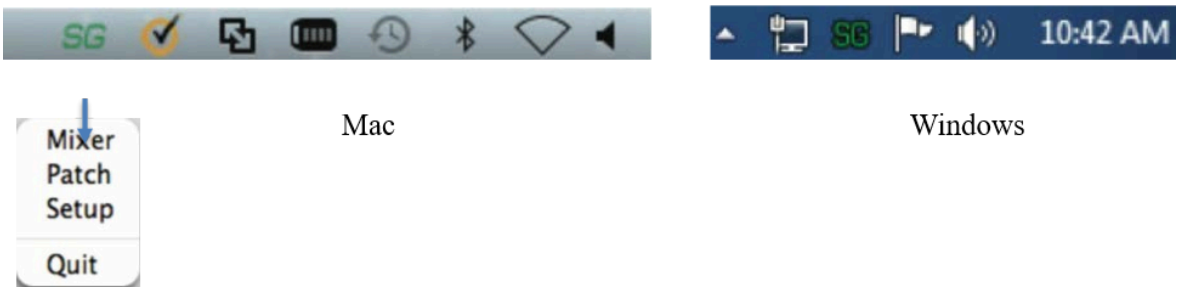
Configuring the SoundGrid Card in SoundGrid Studio

This is a quick overview of what you need to know about SoundGrid Studio software to get your network up to speed. There's enough information here for you to configure a simple network, assess network status, and set up your I/O devices. For more complex configurations, please refer to the MultiRack SoundGrid and SoundGrid Studio user guides.

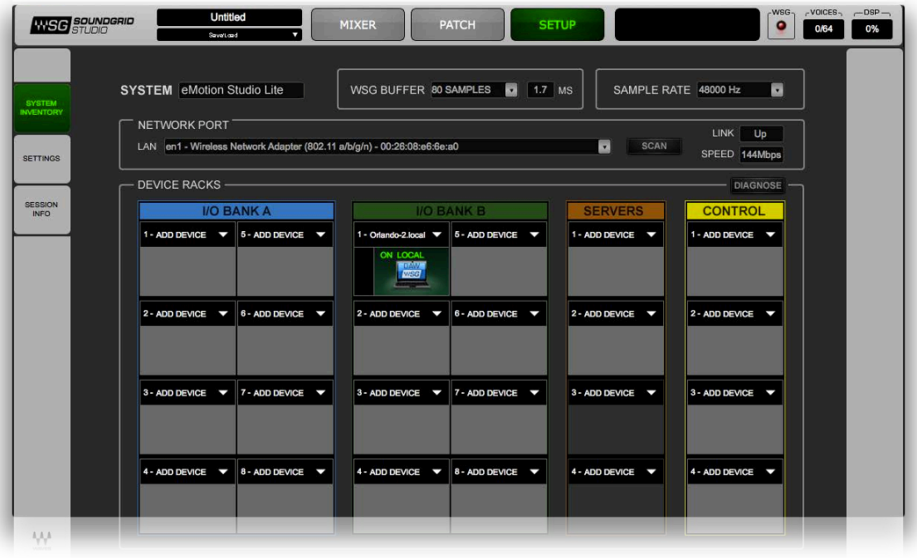
Setting up SoundGrid Studio

The SoundGrid Studio Application oversees the SoundGrid network and manages all network devices. To maintain network effectiveness, the SoundGrid Studio

Application is always running in the background. Bring SoundGrid Studio to the front by clicking on the SoundGrid icon (**SG**) in the Mac Top Bar or the Windows System Tray. Select a SoundGrid window from the drop-down menu.



When SoundGrid Studio opens you will see the System Inventory page, which is part of the Setup window.



The first time you launch SoundGrid Studio, the Wizard will open. It scans the network, inventories its assets, and then configures the devices. If the Wizard does not start automatically, click the "Auto Config Start" button, which is next to the Network Port. Choose "NEXT" to start automatic configuration. This will take a few moments. Choose "CANCEL" to configure manually.

If the Wizard cannot locate the requested SoundGrid network devices, this may mean that the devices might be off or are not connected properly. In such a case the Wizard will allow you to rescan the network or work as a Driver node slaved to another system. For more information please refer the SoundGrid Studio User Guide.

When configuration is complete, close the window. If there's still a problem, you can use the System Inventory page to assign devices, control the network, and manage clock. To learn how to use this page, please refer to the SoundGrid Studio Application user guide.

SoundGrid Studio uses Ethernet to stream audio between devices on a SoundGrid network. Clock synchronization is also carried over Ethernet. This method of

providing clock is called Sync over Ethernet (SoE). SoundGrid I/O devices can clock by other means as well, but SoE is by far the most common (and convenient) way to provide clock information to network devices.

In the SoundGrid Studio Setup page you will see racks containing all of the devices assigned to your system: physical and virtual I/O devices, drivers, and servers. Each I/O rack slot displays the device's mode, clock status, and sample rate.

The first device added to a rack is designated as the Sync-over-Ethernet clock master and is placed in the first rack slot.

A populated device slot displays the mode, clock status, and sample rate of the I/O. The clock master device is indicated by its blue color and the icon text: On, Master Clock, INT (48 kHz).

To add another SoundGrid device, click on the arrow in an empty rack slot. From the list of available devices, choose the one that you want to add—in this example, an M-Waves card. In this image, the first I/O device is grayed out (and therefore unavailable), since it is already claimed.

The new device is visible in the rack slot. Unless changed by the user, it remains the clock slave and is colored green.

Use the same menu to change the assignment of clock master from one device to another, or to remove the device from the rack slot.

Now you know how to assign I/O devices and designate a device as the clock master. Click on the **Gear** symbol in the device slot to open the Hear Back PRO SoundGrid Card control panel in order to set up clock details and configure preamps.

Firmware Status and Updates

On the left of the device icon are two buttons:

FW indicates the status of the device's firmware. The user is given the choice to update it. Status indications are color-coded:

GRAY
: Compatible firmware

BLUE

Compatible firmware, but a newer version exists

RED

Firmware not compatible and must be updated in order to use

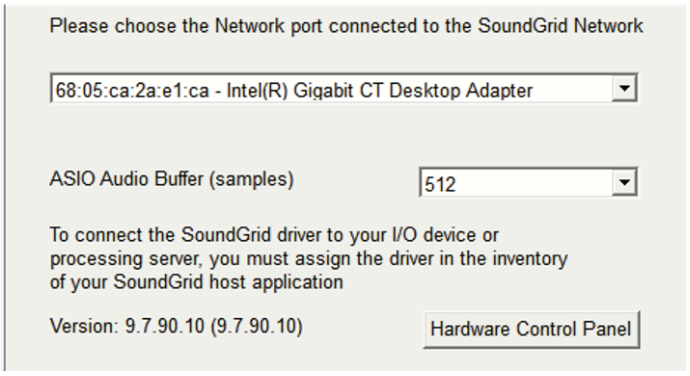
Click on the **FW** button to launch the Reflasher. This will initiate a scan of the hardware and then offer options. Do not disconnect device or turn off your computer until you see "Done".

When the **ID** button on the SoundGrid device rack is pressed, the status LED on the card's front panel change colors repeatedly to help identify the device.

Hear Back PRO SoundGrid Card Control Panel

If you are working with MultiRack SoundGrid, access the Hear Back PRO SoundGrid Card Control Panel via the **Inventory** window.

If you're you are using SoundGrid Studio, click on the **Gear** symbol in the device slot to open the Hear Back PRO SoundGrid Card Control Panel.



Pressing the "Hardware Control Panel" button on the Driver Control Panel app will open the control panels of all I/O devices assigned to your SoundGrid application. If none are assigned, nothing will happen.

The Driver Control Panel app is located here:

PC:
C:\Program Files (x86)\Waves\SoundGrid\Driver Control Panel
Mac:
System HD/Applications/Waves/SoundGrid

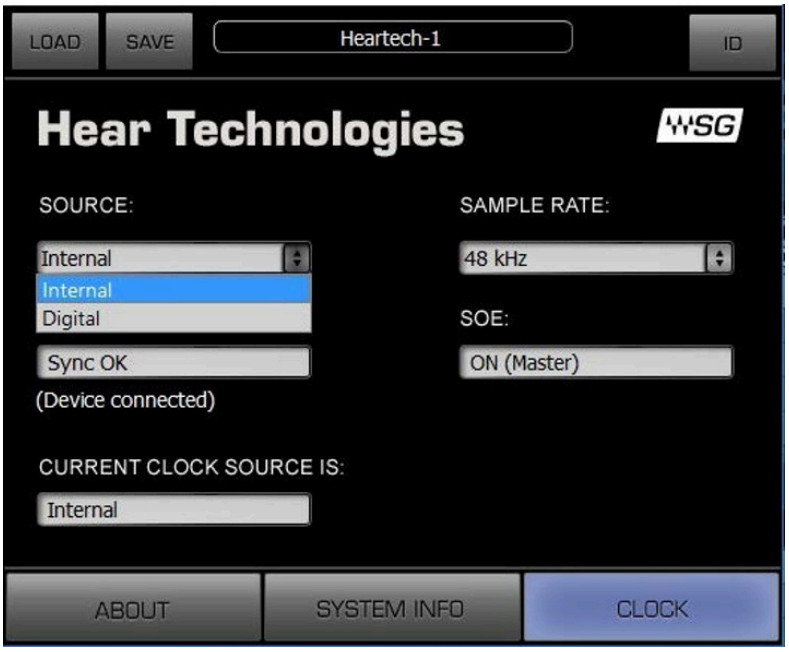
Clock Page

When you launch the Hear Back PRO SoundGrid Card control panel, it loads the Clock Settings tab. The following settings are available here:

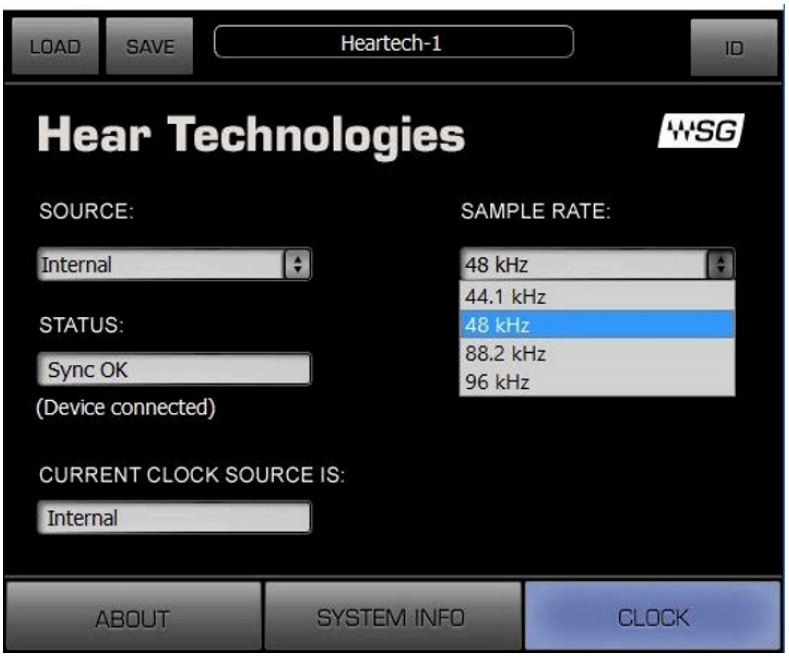
SOURCE sets the clock source.

Internal
The interface itself provides the clock.
Digital
Syncs via the Hear Back PRO SoundGrid Card connection to the personal monitor mixer.
Sync-over-Ethernet

Syncs to the master I/O of the SoundGrid network.



SAMPLE RATE sets the sample rate when Clock Source is set to Internal.



STATUS displays synchronization status (Sync or No Sync).

CURRENT CLOCK SOURCE IS displays the current sync method.

SOE displays Sync-over-Ethernet status (On or Off).

LOAD and **SAVE** (at the top left corner of the control panel window) allow you to save and load your Hear Back PRO SoundGrid Card settings.

About Page

The **About** page displays an overview of the device's specifications.

System Info Page

The **System Info** page displays the device's connection status, manufacturer, model, MAC and SoE Master MAC addresses, and firmware version.

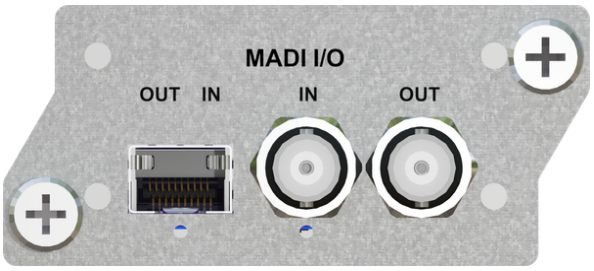
Saving, Loading, and identifying

LOAD and **SAVE** (at the top left corner of the Control Panel window) allow you to save and load your Hear Back PRO SoundGrid Card settings.

IDENTIFY (at the top right corner of the Control Panel window) allows you to identify connected devices. When the ID button on the SoundGrid device rack is pressed, the status LED on the card's front panel change colors repeatedly to help identify the device.

IO Cards / MADI Card

Overview



The MADI Input/Output Card provides an established, professional audio industry-standard method for sending and receiving digital audio. It simultaneously transmits and receives 32 channels with use of the Hear Back PRO system or 64 channels with use of the WSG Bridge.

The MADI Card provides the ability to connect MADI-based audio equipment to a Hear Back PRO Hub for personal monitor mixing or to the WSG Bridge as a conduit for Waves plugins and a bridge between MADI and the Waves SoundGrid or Dante protocols for multi-channel interfacing.

Advantages / Features

- Compatible with Hear Back PRO Hub and WSG Bridge
- Coax connections for Input and Output
- Optional Fiber Optic connections for Input and Output
- Supports 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and192kHz sampling rates:
    - Supports 56-channel and 64-channel framing

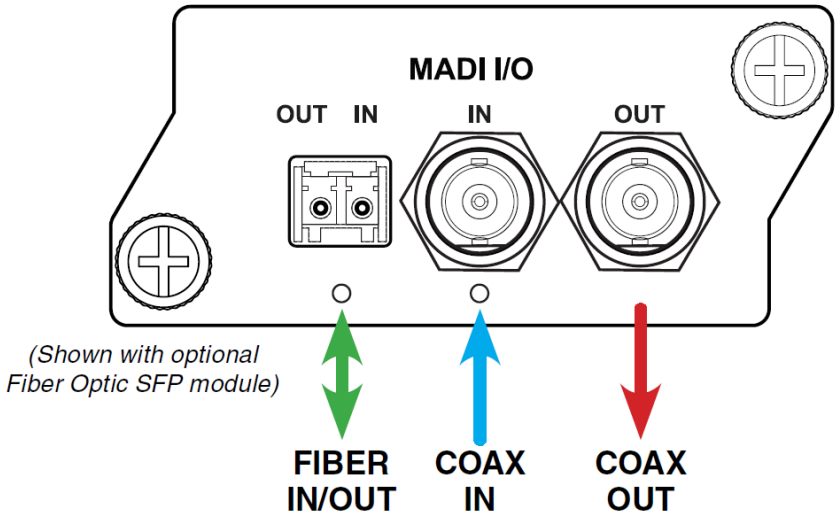
- For sampling rates 88.2kHz and 96kHz: Both 48k (SMUX)and true 96k framing standards supported
- For sampling rates 176.4kHz and 192kHz: Both 48k(SMUX) and true 192k framing standards supported
- All MADI Card transmissions are non-SMUX

An optional Fiber Optic SFP Module (SFPFX) is available as a 100Base-FX Multi-Mode LC Fiber Module, 1300nm. If using the Fiber Optic SFP Module, both the Fiber Optic and the Coax outputs are active at the same time, however the Fiber Optic input takes priority over the Coax input. You can use both inputs as a redundant connection and the MADI card will seamlessly switch over from one to the other in the event of a failure.

> **NOTE**
>
> When purchasing an SFP module, ensure it is 100Base-FX, 1300nm multi-mode. Follow the same instructions for installing the MADI card to install the Fiber Optic SFP module. When not in use, plug the fiber optic module to prevent dust accumulation.

If equipment is sending MADI to the card at 96k or 192k frames (or normal double or quadruple rate), the MADI card will automatically adjust – no action is required from user.

If using a separate word clock to synchronize MADI from another device, we offer a Word Clock card.



Card Slot Compatibility

The MADI Card requires the latest firmware versions installed on the PRO Hub or WSG Bridge prior to installation. FW update is available at: www.HearTechnologies.com > Support

Hear Back PRO

With firmware 6.6 and later, the HB PRO Hub can house two 32-channel cards; however, only one card at a time can be used – selected with the A/B switch. The MADI Card may be installed in Slot 1 or Slot 3 on the PRO Hub.

WSG Bridge

Available slots for installing the MADI Card on the WSG Bridge are Slot 1 or Slot 3.

MADI Input Status Indicator

Located below each input connector is a status LED. Either the SFP or the Coax will be lit depending on which input is currently selected by the automatic switch. The automatic switch selects the SFP module when a fiber optic signal is detected. The color of the LED is "blue" if there is a valid MADI signal detected and "red" when there is not.

SMUX Configuration

If other audio equipment sending MADI uses SMUX – or a 48K frame double or quadruple rate – then the user must select the correct jumper on the MADI Card to determine the rate; otherwise, default is to decode as 48k.

Technical Specifications

Sampling Rates:
  Supports 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
Coax BNC Connector:
  runs up to 100 meters
Fiber LC Connector:
  Operates on 1300nm standard MADI wavelength. Compatible with 62.5/125 micrometer and also 50/125 micrometer multimode fiber.
Cabling:
  Coax cable (75-ohm cable only; RG-6 recommended)
  Optional fiber optic cable (50/125 µm or 62.5/125 µm multimode type fiber with LC connectors at Hub end)

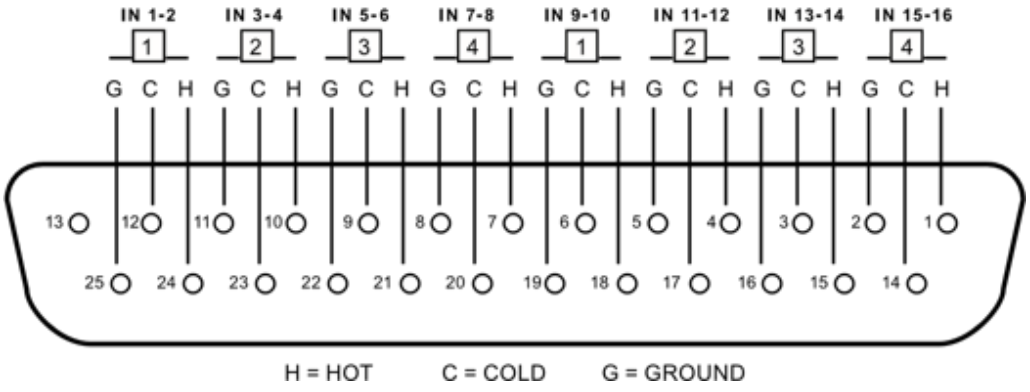
IO Cards / Analog Output Card

Overview

The Analog Output Card provides (8) consecutive balanced channel outputs on a single DB25 connector. Developed for the Hear Back PRO Hub and the WSG Bridge.

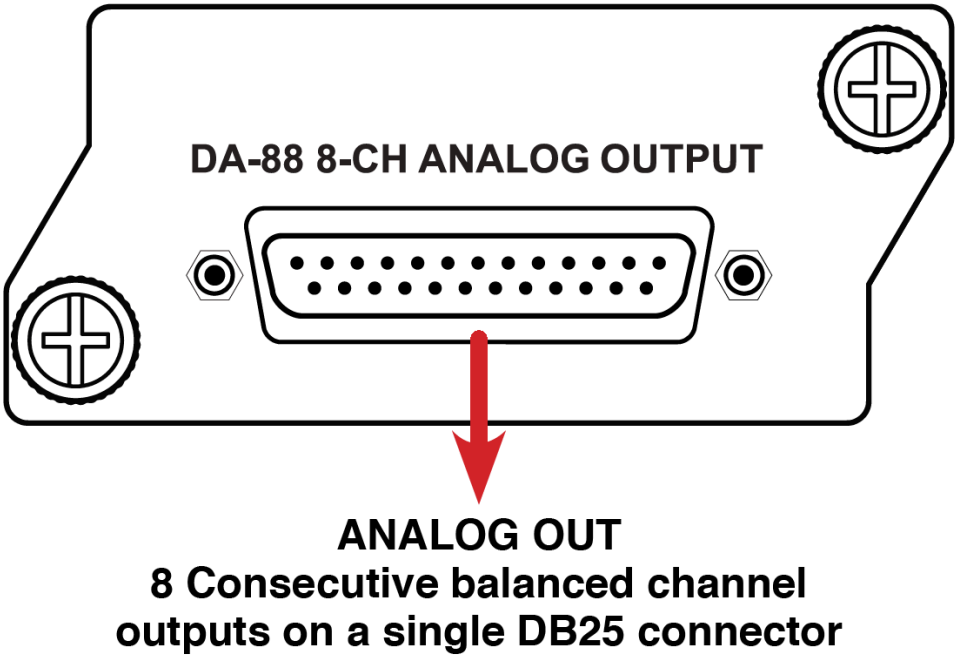
Connect to the Analog Output card using a Tascam DA-88 style pinout on a DB25 connector (see wiring diagram below). This is the same pinout that standard analog DA-88 style connections use.

> ⚠ **CAUTION**
>
> **Use only DA-88 Analog. Do not use TDIF.**



Advantages / Features

- Compatible with any of the PRO input card options
- Supports 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz sampling rates



Card Slot Compatibility

The following is applicable for V8 FW or later with PRO Connect.

Hear Back PRO: The Analog Output card works with ADAT, AES/EBU, and 16-channel Dante and Waves cards only. Depending on your current Hub setup, different vacant slots will provide different outputs (see available combinations below). Use the PRO Connect interface to configure your Hub.

Input Card Position(s)	Analog Output Card Slot	Resulting Output Card Channels
1 (SINGLE DIGITAL)	2	9 THRU 16
	3	1 THRU 8
	4	9 THRU 16
1, 2 (ANALOG)	3	1 THRU 8
	4	9 THRU 16
1, 3 (TWO DIGITAL)	2	
	4	
1, 2, 3 (ANALOG, DIGITAL)	4	

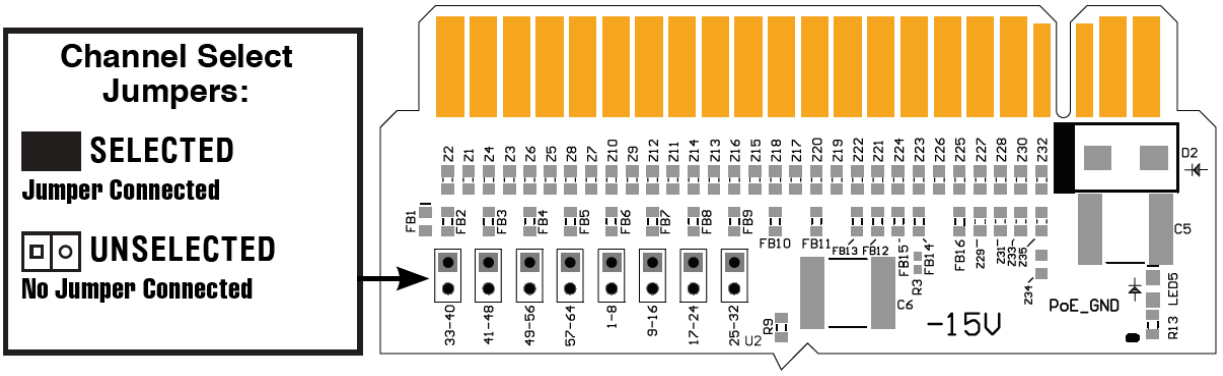
WSG Bridge: The WSG Bridge is preloaded with a Dante or MADI card in slot 1 and the Waves SoundGrid card in slot 3. Available slots for installing the Analog Output Card are slot 2 to monitor from the Waves or MADI inputs or slot 4 to monitor from the Dante inputs (see chart below).

Input Card Position(s)	Analog Output Card Slot	Resulting Output Card Channels
1, 3 (DANTE OR MADI, WAVES SOUNDGRID)	2	Waves Inputs Selectable in Banks of 8
	4	Dante Inputs Selectable in Banks of 8

Channel Select Jumper

Hear Back PRO: The channel select jumper MUST be in the "33-40" position for proper function of the Analog Output card with a Hear Back PRO Hub.

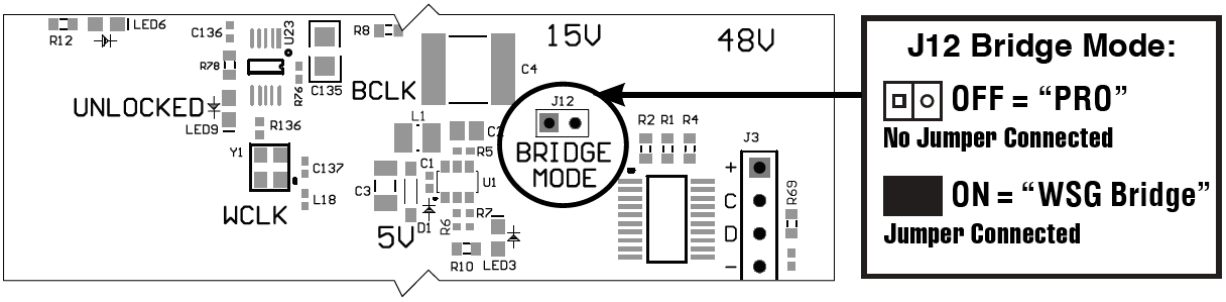
WSG Bridge: The block of eight channels is selected from a row of eight male jumper pin pairs next to the gold fingers. To select your bank of channels, simply short the corresponding pair of pins with the jumper provided.



Bridge Mode Jumper

Before installation, the Bridge Mode jumper J12 must be:

- **"OFF" if using with a PRO Hub**
- **"ON" if using with a WSG Bridge**



Technical Specifications

Analog Distortion:

< 0.003% THD+N

Maximum Output Level:

+23dBU

Sampling Rates:

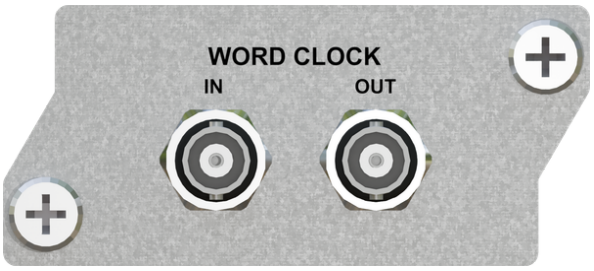
Supports 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz

Output Connector:

DB25 with standard TASCAM DA-88 pin-out

IO Cards / Word Clock Card

Overview



The Word Clock Card was developed for instances where multiple digital audio sources exist in one system and word clock synchronization is necessary to keep all digital audio devices in sync. An example might include a ProTools HD interface feeding our AES/EBU card with channels 1 through 14 but a microphone preamplifier with AES/EBU output is used to feed channels 15/16 as a talkback microphone into the system. In this scenario, ProTools will likely be the master clock and a word clock would connect from the ProTools HD output to the Microphone Preamp and also to the Word Clock Card.

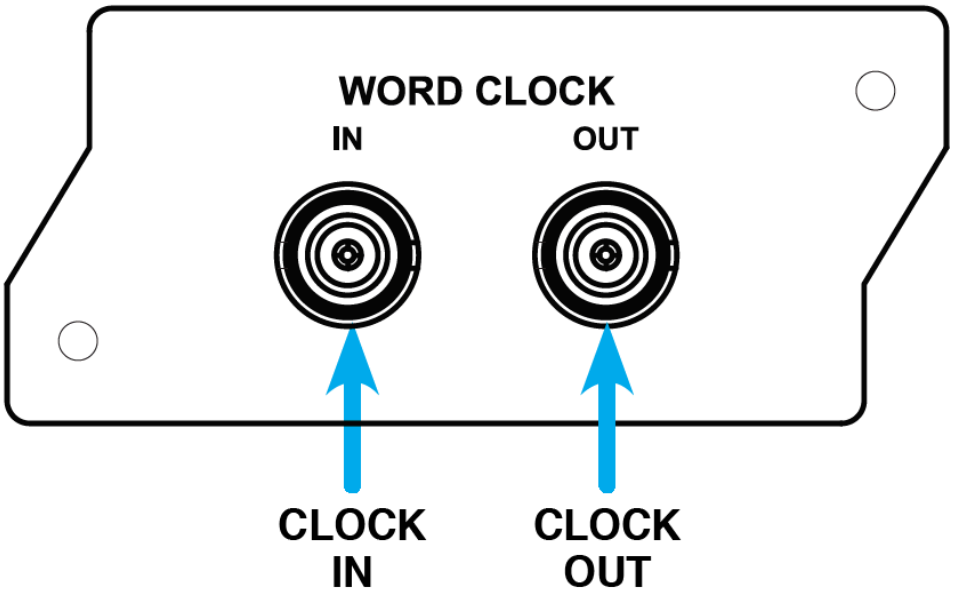
Advantages / Features

- Works with both the Hear Back PRO Hub and the WSG Bridge
- Works in conjunction with any of the Hear Back PRO and WSG Bridge I/O cards
- Has both Word Clock Input and Output BNC connections
- Supports 44.1k, 48k, 88.2k, 96k, 176.4k, and 192k sampling rates

- Automatically detects sampling rate and locks onto incoming word clock with a precision PLL circuit

> **NOTE**
>
> The Word Clock Card will work with PRO Hubs loaded with V6.0 or later. The WSG Bridge must have version 4.5 or later.

Configuration



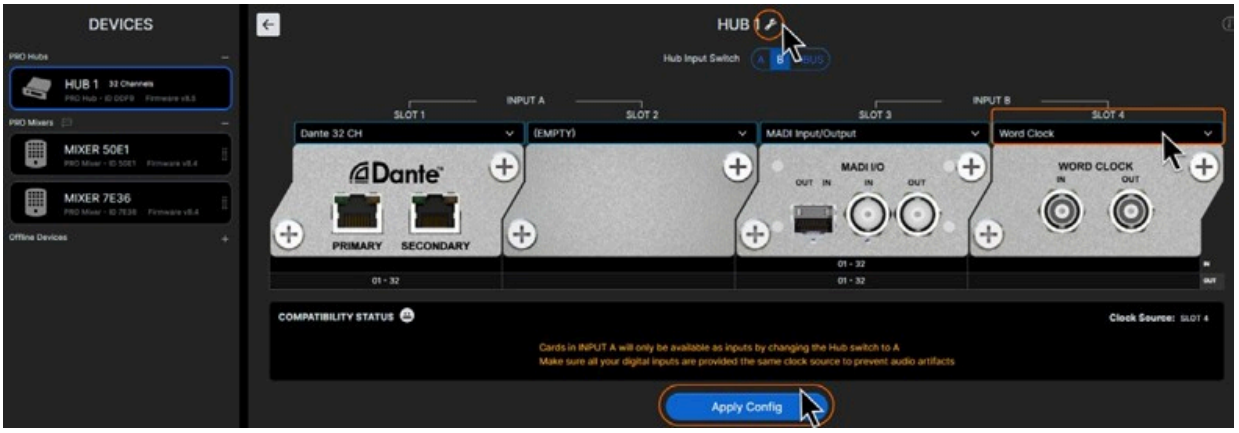
PRO Hub

The following is applicable for V8 FW or later with PRO Connect.

To use the Word Clock card with another I/O card, such as a Dante card in slot 1 (Input A), install the Word Clock Card into slot 2. In PRO Connect, click on the hub,

then click the wrench icon in the top right corner. Use the drop-down box to select the clock card for slot 2. Click "APPLY CONFIG".

The Word Clock Card may also be placed into slot 4 if it is available and an input card is present in slot 3 (such as a Waves SoundGrid Card). Same process as above, however slot 4 would be configured in PRO Connect. Make sure you click "APPLY CONFIG".



To disable the Word Clock Card, simply simply remove it from the Hub configuration in PRO Connect.

> **NOTE**
>
> In a multi-hub system, a Word Clock Card can only be installed in Hub 1. The card in any other Hub will be ignored.

WSG Bridge

To use the Word Clock Card with an I/O card in slot 1 (such as Dante or MADI), place the Clock Card in slot 2. Move the Clock Source Switch on the front panel to "EXT" enabling the Clock Card. To disable the Clock Card, move the Clock Source Switch to "A" or "B". To use the Clock Card with an I/O card in slot 3 (such as Waves), place the Clock Card in slot 4. Moving the Clock Source Switch to "EXT" will enable the Clock Card. Move the Clock Source Switch to "A" or "B" to disable it.

Technical Specifications

Word Clock Input

Impedance:
  75 ohms
Capacitance:
  4.5 pF
Voltage:
  2 to 5.5 volts
Frequency:
  44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz

Word Clock Output

Impedance:

75 ohms

Capacitance:

5.5 pF

Voltage:

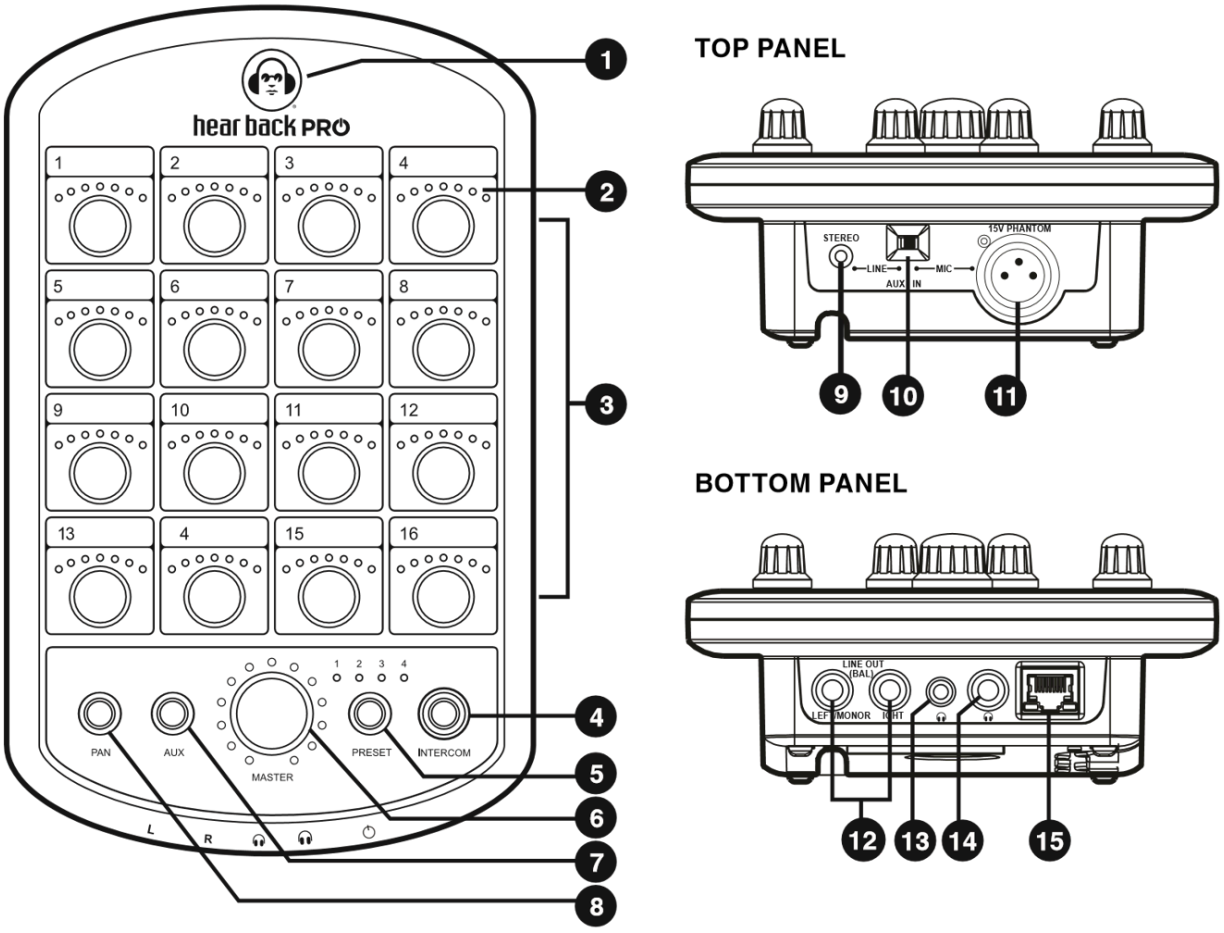
3.3 volts

Frequency:

44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz

PRO Mixer

Mixer Detail Diagram



1	LED Status Indicator	9	Auxiliary 1/8" Stereo Unbalanced Audio Input
2	LED Level Indicators	10	Auxiliary Input Switch

3	Volume/Pan Control Knob for Each Audio Channel	11	Auxiliary Balanced XLR Microphone Input with 15V Phantom Power
4	"Intercom" Button	12	1/4" Left/Mono and Right Outputs (Balanced)
5	"Preset" Button	13	1/8" TRS Headphone Output
6	"Master" Control Knob (Volume / Aux)	14	1/4" TRS Headphone Output
7	"Aux" Input Button	15	Gigabit Ethernet (GbE) Connection with PoE+ (Power over Ethernet)
8	"Pan" Button		

Mixer Features

- Local control of all available audio channels
- Receive power and audio over one Ethernet cable, up to 500' from Hub to each Mixer
- Side-mounted card slot for future expansion
- Large master knob controls overall main mix, AUX, and intercom levels independently
- 24-bit D/A and A/D delta-sigma converters
- Error indicating logo glows "red" to indicate a problem, and flashes "red" when headphone amplifier temperature reaches 100° C (212° F)
- Volume / panning / stereo link control of all channels of audio
- Balanced mono/stereo, line level outputs

- Store up to 4 recallable presets, while most recent configuration is remembered after power-down
- Intercom feature allows communication to anyone with a Hear Back PRO Mixer or Virtual Mixer Card
- Selectable 1/8 inch TRS stereo unbalanced and XLR mono balanced (with 15V phantom power) AUX inputs:
  - Microphone input for crowd/ambiance mic, or for use with intercom
  - Drum module/metronome or local mix input
- One 1/8 inch TRS headphone output
- One 1/4 inch TRS headphone output

Mixer Construction

The Hear Back PRO is constructed of UV-stabilized ABS and has a built-in mic stand mount. The cable strain relief channel (molded into the Mixer) greatly reduces stress on the CAT6 cable connectors and the Mixer RJ45 connector.

Status Indicating Mixer Logo

The illuminated logo serves as an indicator for several purposes. Under normal conditions, the logo will be **BLUE**, indicating digital audio packets are being received. A **PURPLE** logo indicates audio packets are being dropped, and a **RED** logo indicates no valid packets are being received. If the logo is blinking **RED**, this indicates the headphone amplifier has overheated. Check the troubleshooting section if any color other than a **BLUE** logo occurs.

Volume

Each channel knob controls the volume of its respective channel(s) within the mix. The master knob, by default, controls the volume of the overall mix. Volume operation is indicated by **BLUE** LEDs. Volume scales from 0% to 100%, left to right, respectively.

Master Volume

The master volume is used to set the volume of the headphones and the line outputs. When using the line outputs in conjunction with the headphones, optimize the mix for the headphones and then adjust the device connected to the line outputs to balance the gain.

Pan Operation

To control panning of channels, press the **PAN** button. The **PAN** button and channel knob LEDs will turn **GREEN** to indicate that the channel knobs now control panning position of the audio within the stereo field. To return to volume control, press the **PAN** button again, or wait 30 seconds from the last adjustment for the system to automatically return to volume control.

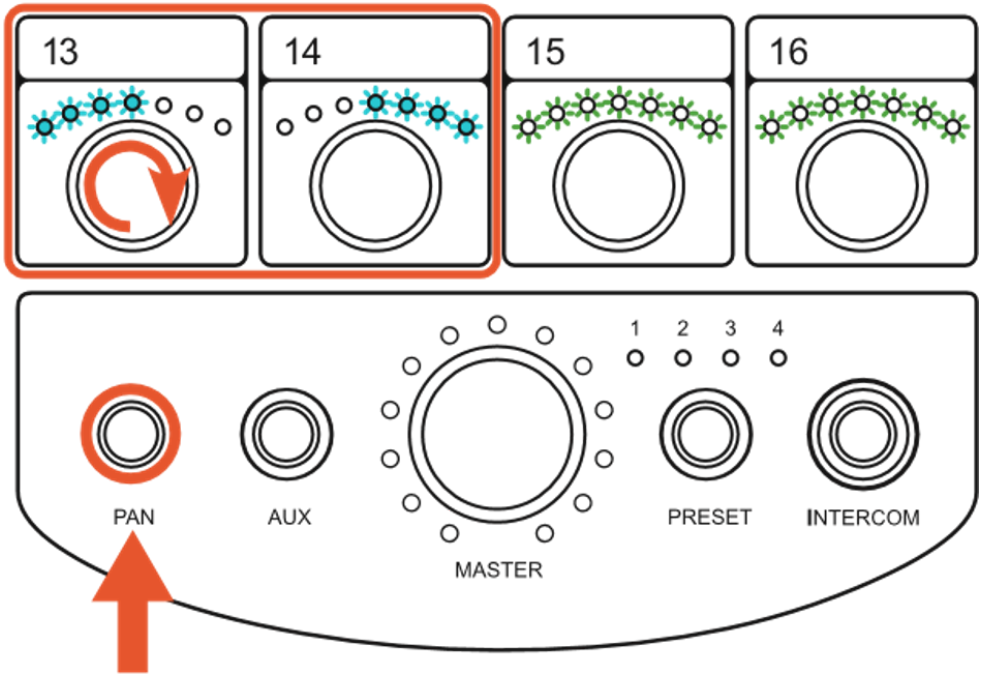
With FW V5 and later, pressing **PAN** while in volume mode will show **PAN** (**GREEN** LEDs) and pressing again will show **AQUA** width controls for channels that are stereo.

Stereo Link Operation

Each audio channel comes from a mono source, and is therefore center-panned by default for any firmware version.

To quickly hard-pan two channels left and right to create a stereo pair via a PRO Mixer:

- Press and hold **PAN** for two seconds to enter linking mode.
- Channel LEDs will flash **GREEN**. Twist one of two adjacent channel knobs (1-2, 3-4, 5-6, etc.) to link them. Channel level indicators will illuminate LEDs #1, #2, #3, #4 above the first knob and LEDs #4, #5, #6, #7 above the second knob.



- To unlink channels, hold the **PAN** button until the LEDs flash **GREEN**, then twist one of the linked knobs until only LED position 4 is lit.
- To EXIT, press **PAN** button or wait 30 seconds to go back to default volume levels.

This operation can only be performed on adjacent pairs of channels. Therefore, channel 1 can only be linked with channel 2, channel 3 with channel 4, and so on. Upon linking channels, the volume of the right channel is set according to the volume of the left channel. Volume adjustments to either stereo-linked channel now effects both channels in unison.

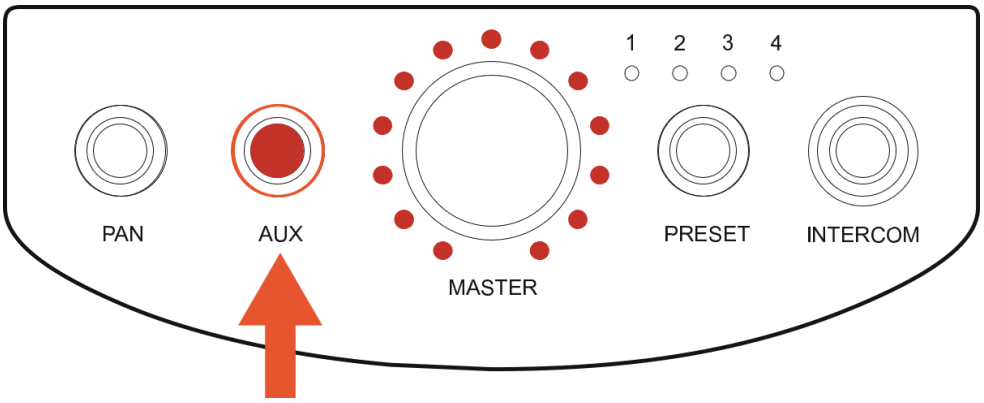
For FW V2, the link settings are stored on each individual Mixer. For example, Mixer #1 may have channels 1 and 2 linked, Mixer #2 may have them set as mono.

For FW V5 and later, link settings are stored in the Hub. For example, if channels 1 and 2 are linked, this is global over all Mixers. Stereo placement and width are added. These links can also be set globally via the PRO Connect software.

Aux Input Operation

The auxiliary input connections provided are one 1/8 inch TRS stereo unbalanced input optimized for 0 dBu input level and one XLR mono balanced input optimized for -42 dBu input level, selectable via the switch located adjacent to the connections. The inputs provide another mono or stereo-mixed channel to be inserted into the Mixer. Examples of use would be a drum machine click track into the drummer's Mixer, or a crowd/ambient mic in everyone's Mixer (which can double as the intercom mic). Another application would be a stereo mix from a guitar, keyboard, or a mix from another Hear Back or Hear Back PRO Mixer, providing additional input sources controlled from your Mixer.

- Press the **AUX** button to change the function of the master knob to control the volume of the auxiliary input in the mix.
- **AUX** button and master knob LEDs will turn **RED** to indicate this function is active.



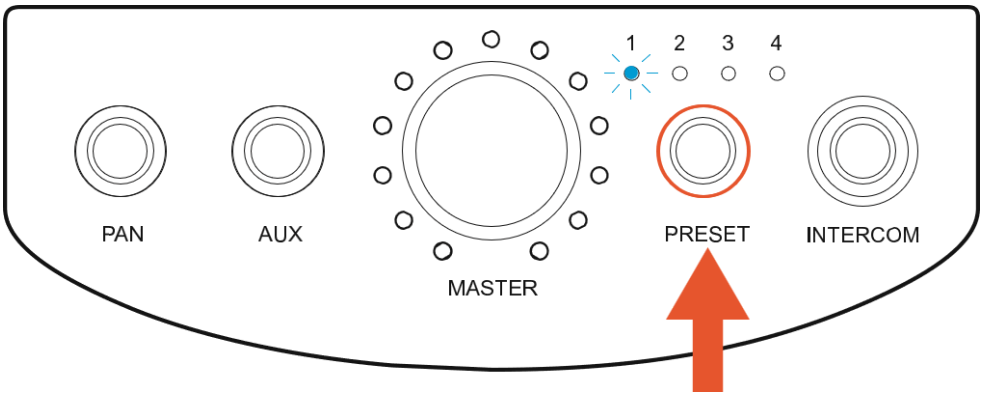
- Press the **AUX** button again to exit auxiliary volume control, or wait 30 seconds from the last adjustment for the system to automatically return the master knob to its default function.

Preset Operation

The Hear Back PRO Mixer has the ability to store up to four system states in internal memory for easy session settings recall. Pressing the **PRESET** button will step through presets 1 – 4, one at a time.

Save a Preset

- Press and hold **PRESET** for two seconds. The current preset LED will begin flashing quickly.
- Keep holding if you wish to save to a different location (unit will scan across the four preset locations). When the desired preset numer is reached, let go of the **PRESET** button.



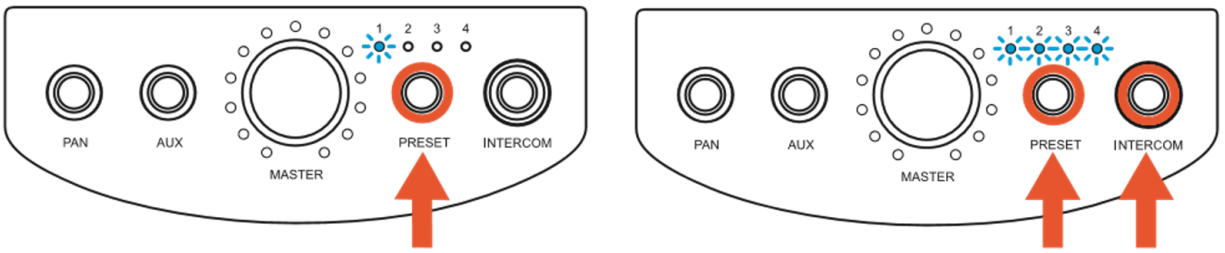
For FW V2, upon making any control change while using a preset, the preset number will slowly blink to let you know your new settings have not been saved. To save the changes to the preset, simply hold the **PRESET** button for 2 seconds until the preset number rapidly blinks, then release.

For V5 and later, presets are saved automatically when powering down or pushing the **PRESET** button to recall another preset.

Preset Copy and Paste

Presets can be sent to another PRO Mixer with the following procedure:

- Press and hold **PRESET** (one of the Preset LEDs will flash), then while holding **PRESET** press the **INTERCOM** button.
- All four of the preset LEDs will flash quickly indicating that the Mixer is in "copy" mode.
- Release buttons.

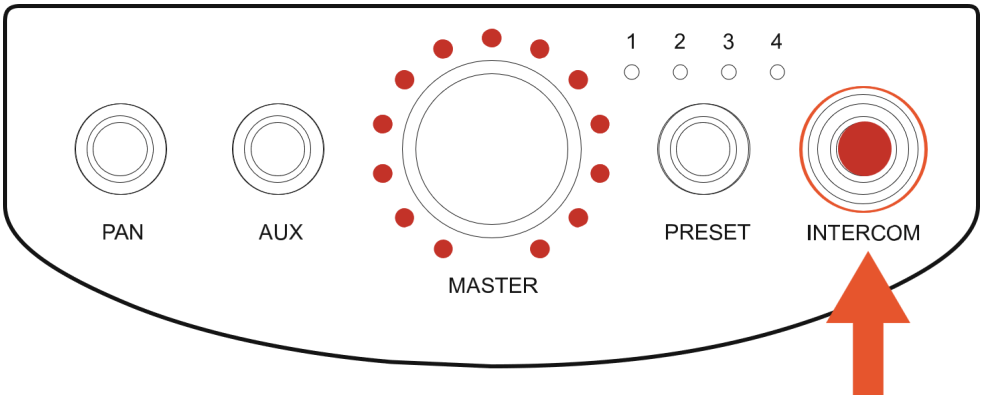


- To "paste" the settings from this Mixer to another Mixer:
  - Go to the Mixer that you wish to paste the settings to and press **PRESET** and **INTERCOM** at the same time.
  - All the LEDs will flash indicating that the settings were copied. You must save these settings to a preset location if you wish to retain the copied settings.
  - > **NOTE**
    >
    > This does not copy all the presets, ONLY the current audio levels and pan settings for FW V2 plus routing and submixing for FW V5 and later.
  - The Mixer you're copying from will continue to stay in "copy" mode for up to 5 minutes, allowing you to "paste" the settings to other Mixers.
  - To EXIT the "copy" mode, press **PRESET** button, or wait for the timeout.

Intercom Operation

The intercom function transmits the AUX IN source to everyone with a Hear Back PRO Mixer on the same network. By default, the input gain for the intercom source is set to 75%. When receiving audio from another Mixer, the intercom has an auto gain feature that automatically adjusts the incoming signal so that you'll always hear it over your mix.

To broadcast your intercom momentarily, simply press and hold the **INTERCOM** button. The button and the master knob LEDs will light up **RED** to indicate that the intercom is broadcasting, and that the master knob now controls the input gain for your intercom source.



The Mixer's intercom can be latched for continuous broadcast. For FW V1 and earlier V2 releases, rapidly push the **INTERCOM** button three times in succession. For V5 and later simply touching the button quickly will latch it. The button and the master knob LEDs will stay **RED** to indicate that the intercom is broadcasting. Press the **INTERCOM** button once more to stop continuous broadcast and return the master knob to its original function.

The **INTERCOM** button will rapidly blink **RED** to indicate that a broadcast from another Hear Back PRO is currently being received.

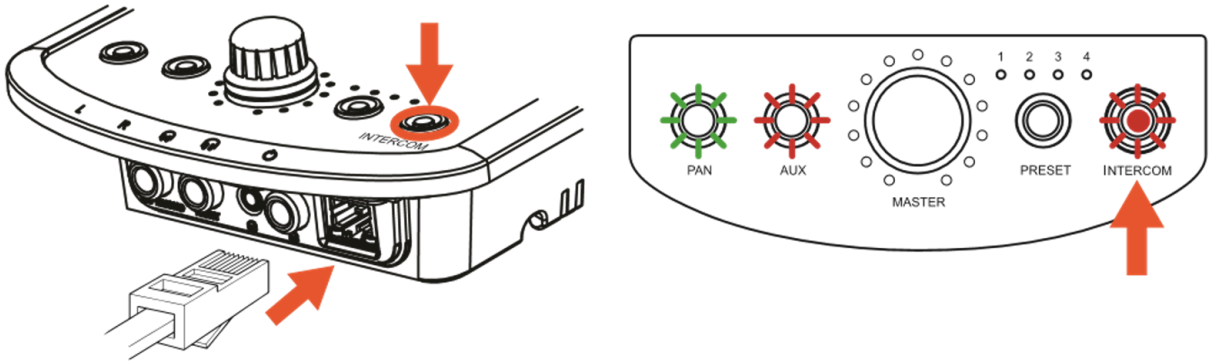
FW V2 allows only one Mixer to broadcast at a time. FW V3.6 and later allow up to (4) people to talk simultaneously and all other Mixers can still listen in. Those other Mixers, on the same network, are "locked out" from broadcasting until a transmitting Mixer's **INTERCOM** button is released or unlatched. With FW V5 and later, four Mixers can be latched at the same time to carry on a conversation.

Enable/Disable Intercom

The easiest way to enable or disable intercom is to use the PRO Connect app.

To enable / disable the **INTERCOM** button FW V6 or earlier or to enable / disable incoming intercom only FW V8 or later on the Mixer:

- Starting with power "off", press and hold the **INTERCOM** button while inserting the network cable to apply power.
- Continue pressing **INTERCOM** until buttons start flashing, then release.
- Toggle the intercom function by pressing **INTERCOM** button. LED "on" is intercom enabled; LED "off" is intercom disabled.
- To SAVE and EXIT, disconnect then reconnect power.



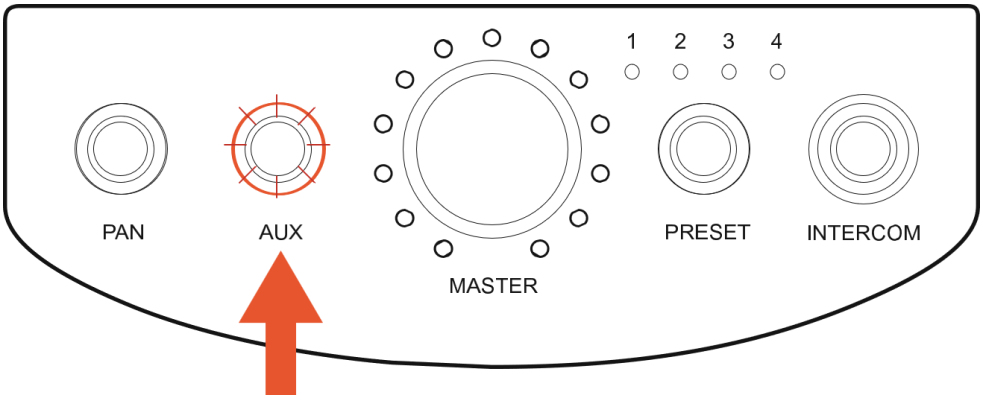
Signal Present Mode

Press and hold the **AUX** button until it starts blinking (but less than 4 seconds) to easily see which channels have signal present without having to turn up each channel individually. If a signal is detected on a channel, the channel's LEDs will light up. Additionally, the **MASTER** knob's LEDs act as an overall RMS meter, showing you how much headroom is available. This makes it easy to see how close the Mixer is to clipping.

> **NOTE**
>
> You are still able to adjust channel and master volume in this mode; however, the channel level indicator will only be shown briefly after making an adjustment, before returning to displaying input signal activity.

> **NOTE**
>
> FW V5 and later enable the signal display function only when a preset has no submixes. It is also enabled in BANK mode.

- Press and hold AUX for 2 seconds until AUX button starts flashing.



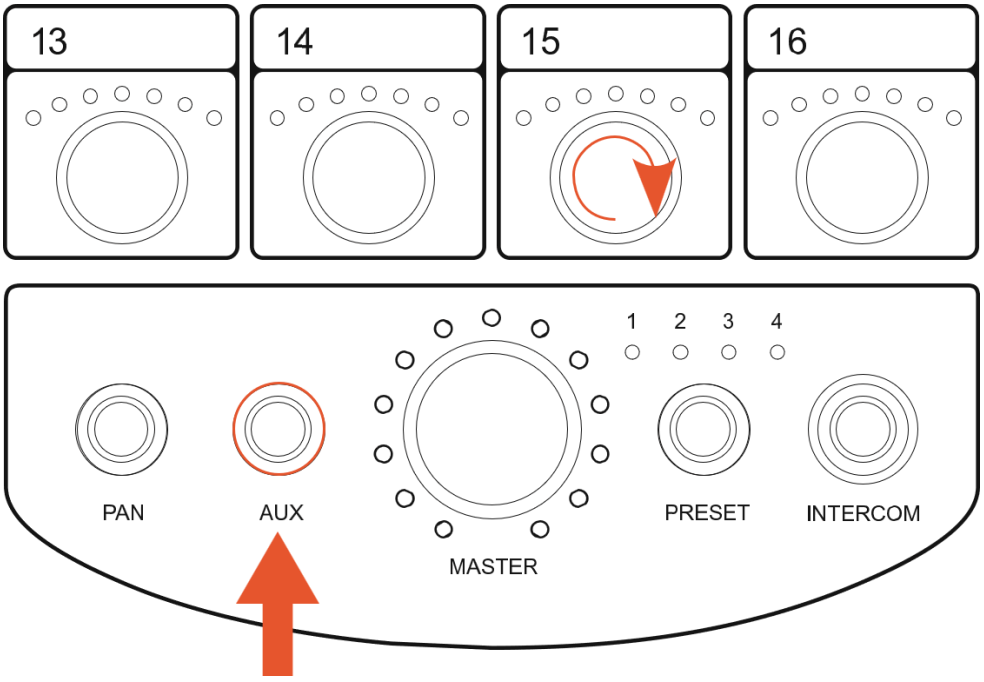
- LEDs above each channel blink to show audio signal is present.
- A level meter is displayed using LEDs around the **MASTER** knob to show the current RMS level of the mix bus.
- To EXIT, press **AUX** button.

Solo in Place

Solo-in-place allows you to listen to just one audio channel (all FW versions) or submix (FW V5 and later) without changing your current mix. Exit solo mode to

return to your original mix.

- To enter press the **AUX** button and twist the desired channel's knob.
- The **PAN** and **AUX** buttons will flash to indicate you are in Solo Mode.
- Once in Solo-in-place mode, Solo other channels by twisting their knob.
- Solo levels are "solo-in-place", which means they are the same level as the mix (unless they are below 25%, then the solo levels are brought up to 25%).
- To adjust the solo level, use the **MASTER** knob.
- To EXIT Solo Mode, press ANY button (**PAN**, **AUX**, **PRESET** or **INTERCOM**).



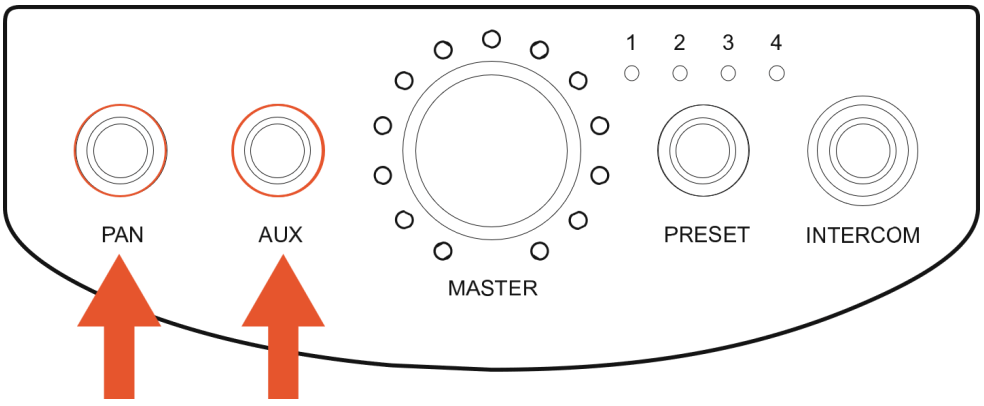
Initialize Mixer (Zero Out)

For FW V2, zeroing out the Mixer will quickly reset all volume to 0%, unlink all stereo-linked channels, and move any panning back to center position.

For FW V5 and later, zeroing out the Mixer will set all volume levels to 0%, panning back to center, and one-to-one routing on all the channels (i.e. input 1 to knob 1, input 2 to knob 2, etc.). However links will remain in place as the linking function is stored in the Hub and is global over all Mixers.

- Press **PAN** and **AUX** at same time for 2 seconds until all LEDs flash to reset all levels to defaults (all volumes to zero and PANs to center).

> **NOTE**
>
> This will not wipe any existing preset settings.



Audio Limiter

FW V6 and later offer the ability to set an audio level limiter. This will prevent audio from growing past a certain threshold given the following constraints. You enter the LIMITER settings page by holding the **AUX** button longer than 4 seconds. You can also set the LIMITER settings in the PRO Connect app.

THRESHOLD:

ADJUSTABLE: The audio threshold at which the limiter can engage to prevent further volume increase.

The **AQUA** LEDs on channel knob 13 (the bottom left channel knob) represent the threshold level.

ATTACK:

ADJUSTABLE: The amount of time it takes to begin limiting volumes once the threshold has been crossed.

The **AQUA** LEDs on channel knob 14 represent the attack time.

RELEASE:

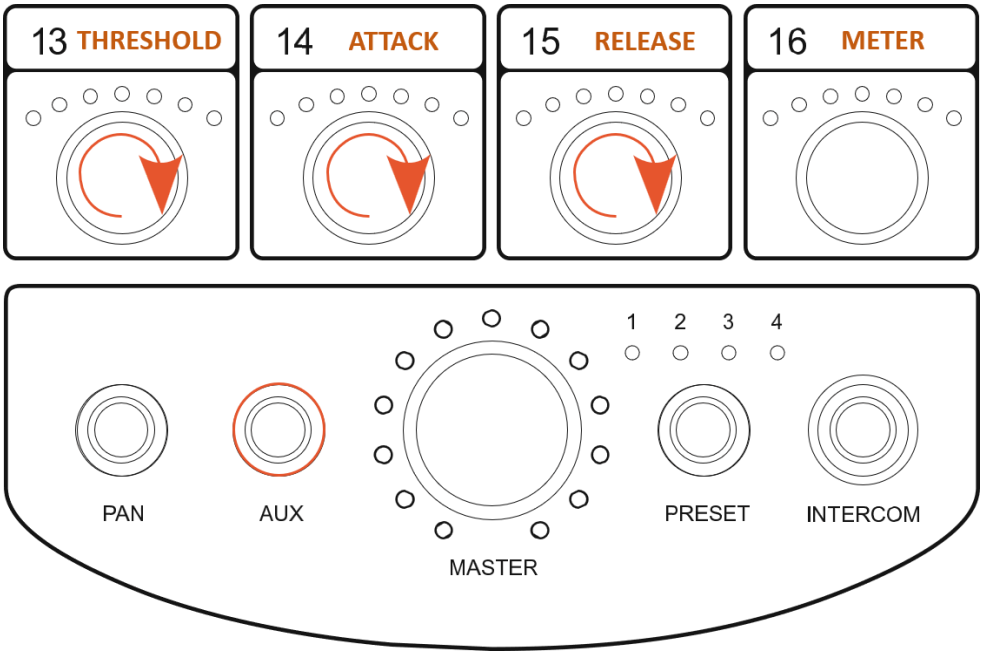
ADJUSTABLE: The amount of time it takes to stop limiting volumes once limiting has engaged and the volume remains below the threshold.

The **AQUA** LEDs on channel knob 15 represent the release time.

METER:

This is a visual representation of the current level of limiting.

The **AQUA** LEDs on channel knob 16 (the bottom right channel knob) display the meter.

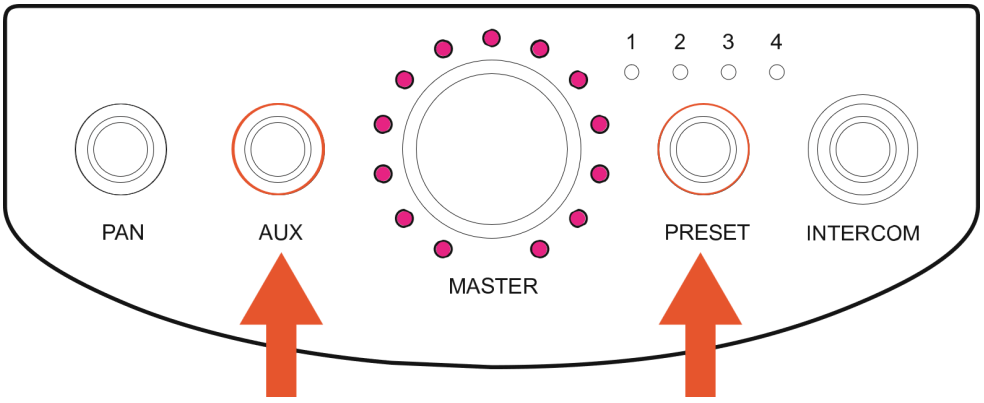


Mirroring

For FW V5 and later, two or more Mixers can be "mirrored" to reflect each other and operate in sync. The mirrored Mixers are "grouped" and you can have up to 16 groups, numbered 1-16. The Virtual Mixer Card when paired with a PRO Mixer uses group numbers higher than 16, thus leaving groups 1-16 available for mirroring.

The Mixers will emulate any changes or edits done to all in the GROUP, including pan and preset functions, with these default exceptions: AUX level, Intercom enable/disable, and Master knob level.

- To mirror a Mixer, press and hold **AUX** and **PRESET**, then twist the channel knob that corresponds to the GROUP you wish to join. (Example: Twisting channel 16 creates GROUP 16.) Repeat this on all Mixers you wish to join this GROUP.



- When in a GROUP, the **MASTER** knob's **BLUE** LED's will dimly light up **MAGENTA** to indicate GROUP status. If using the PRO Digital Overlay, a box will outline the Mixer name in the main screen when mirroring is on and will display the group number.
- To DISPLAY the current group number of a Mixer, press **AUX** and **PRESET** at the same time.
- The LEDs will light up around the knob that corresponds to the group number.

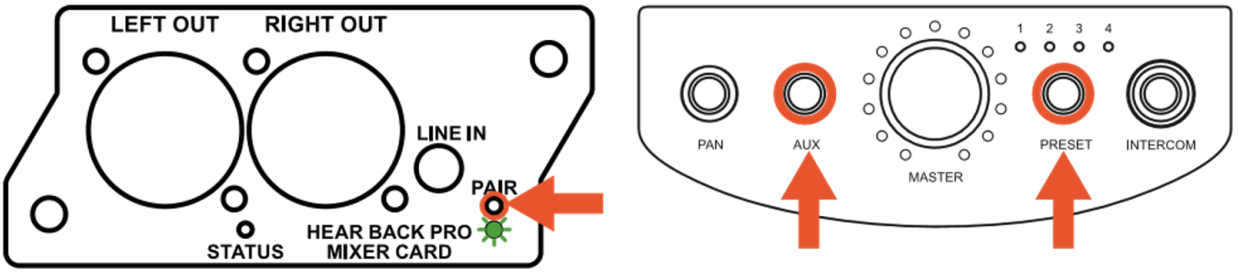
- If the LEDs around the knob for channel #1 are lit, the group is #1. If the LEDs around the MASTER knob are lit, the group is #0, which means mirroring is turned off.
- To CHANGE group numbers, twist a channel knob while pressing **AUX** and **PRESET** buttons.
- To TURN OFF MIRRORING, press and hold **AUX** and **PRESET** and turn the **MASTER** knob.

Pairing with a Virtual Mixer

For FW V2 and later, a Virtual Mixer Card can be paired with a PRO Mixer allowing control of all the audio channels with presets and intercom.

> **NOTE**
>
> The Virtual Mixer Card will not operate with the obsolete FW V1.

- On the Virtual Mixer card, hold the **PAIR** button until the LED begins blinking rapidly.
- After a few seconds, the LED will blink about once a second. Once this happens, press **AUX** and **PRESET** on the Hear Back PRO Mixer you wish to pair with the Virtual Mixer.
- All the LEDs will blink indicating that it is now paired.
- To UNPAIR, hold the **AUX** and **PRESET** buttons on the Mixer that is currently paired with the Virtual Mixer and then turn the **MASTER** knob. All the LEDs around the MASTER knob will light up, indicating the Mixer is NOT paired. After a few seconds, the LED on the Virtual Mixer card will not be lit.



Footswitch Operation

The PRO Intercom Footswitch silently mutes the microphone signal going to front of house, and routes audio only through the PRO Mixer intercom. The switch is momentary, simply let go and signal to FOH is restored. The footswitch utilizes a very low-level 22kHz signal that automatically engages the intercom feature on the Mixer (FW V2 bootloader 1.3 or higher). The footswitch eliminates the need for two microphones and simplifies use of the intercom.

Enable/Disable Footswitch

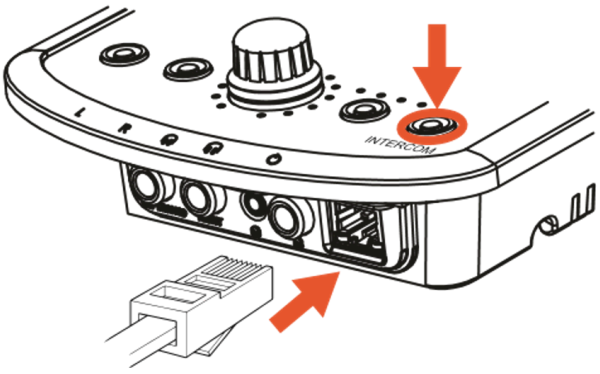
The easiest way to enable or disable the footswitch is to use the PRO Connect app.

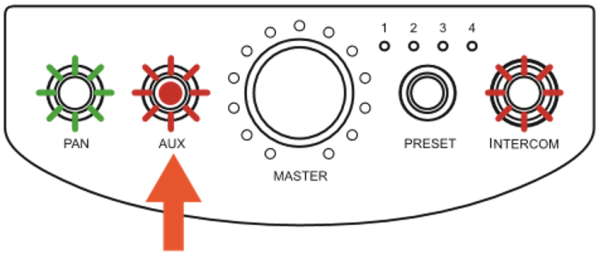
> **NOTE**
>
> The intercom must be enabled before you can enable the footswitch function.

To enable / disable the footswitch on the Mixer:

- Starting with power "off", press and hold **INTERCOM** button while inserting the network cable to apply power.
- Continue pressing **INTERCOM** until buttons start flashing, then release.

- Toggle the footswitch function by pressing the **AUX** button. LED "on" is footswitch enabled; LED "off" is footswitch disabled.
- To SAVE and EXIT, disconnect then reconnect power.



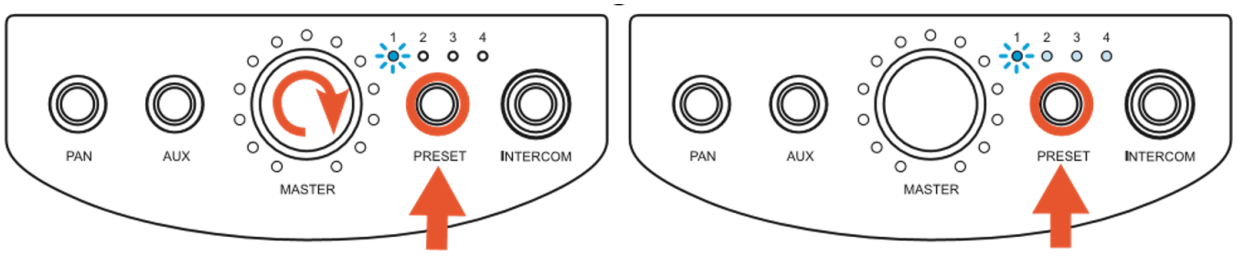


Mixer Bank Mode (128-Channel)

> **NOTE**
>
> BANK Mode is intended for diagnostics and configuration. When you exit BANK Mode, your settings are lost. If you choose to keep your settings, don't exit BANK Mode. Submixing is not possible in BANK mode.

- Press and hold **PRESET** and spin the **MASTER** knob
- Selected preset LED will then flash ONCE per second and the other preset LEDs will light up dimly showing the other Hubs that are connected:
  - 1 Hub connected: Presets 1 and 2 will illuminate (indicates BANK 1 and 2 are available)
  - 2 Hubs connected: Presets 1-4 will illuminate (indicates BANKs 1 through 4 are available)
  - 3 or 4 Hubs connected: Once you press **PRESET** to cycle through the BANKS (Presets 1-4), you will return to Preset 1 but will now be flashing TWICE per second, indicating you are in BANK 5. Continuing to press

PRESET will advance you to BANK 6 (Preset 2), then BANK 7 (Preset 3) and then BANK 8 (Preset 4), with BANKs 5-8 LEDs flashing TWICE a second.



- You have access to all available channels in a one-to-one mapping.
- Step through the BANKs of channels (denoted by the Presets) by selecting a Preset (example: If Preset 1 and 2 are lit, then you have 32 channels to select from).

PRESET LED	LED Flash Pattern	BANK	Channels
1	Single Flash	1	1 - 16
2	Single Flash	2	17 - 32
3	Single Flash	3	32 - 48
4	Single Flash	4	49 - 64
1	Double Flash	5	65 - 80
2	Double Flash	6	81 - 96
3	Double Flash	7	97 - 112

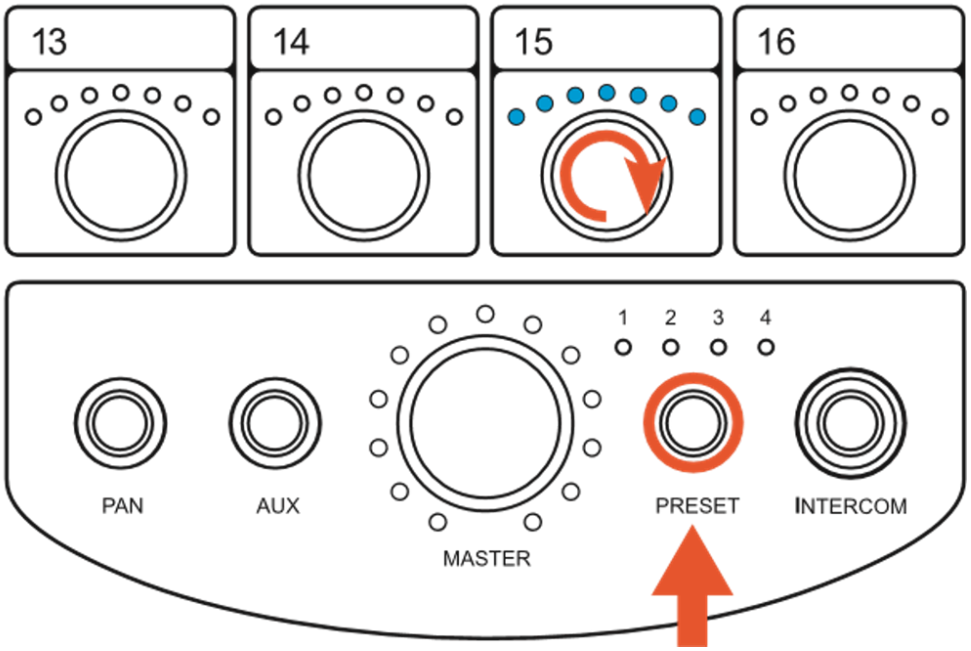
PRESET LED	LED Flash Pattern	BANK	Channels
4	Double Flash	8	113 - 128

Submix Edit Mode

Use this mode to choose what channels are going to a specific knob, such as a single mono channel, stereo pair, or a submix of up to 16 mono or stereo channels. A submix is when 2 or more channels are assigned to a single knob. You can assign up to 16 mono or stereo channels to a single knob. Accidentally going over that number will cause the Mixer LEDs to all flash simultaneously. You can also unroute a channel to turn off its LEDs.

> **NOTE**
>
> You cannot submix an existing submix. It is not recommended to assign a specific input to multiple locations, especially multiple submixes.

- To enter Submix Edit Mode, press and hold **PRESET** then spin the channel knob that you're wanting to edit. LEDs will blink once. Release **PRESET**.



- You can select and edit channels (channels can be turned on or off). A channel with no LEDs ON indicates the channel is OFF or not assigned. A channel with all LEDs ON indicates it is the only channel (or stereo pair) assigned to the submix. If only one channel (or stereo pair) is assigned, then adjusting VOLUME, PAN, and WIDTH is disabled. If you turn up 2 or more knobs while editing, they will each display the respective levels. Adjust each level to balance the mix of channels. You can also adjust PAN and WIDTH (for stereo pairs only) if 2 or more channels are selected. Up to 16 channels can be assigned to a single knob.
- The Preset LEDs indicate the BANK of inputs currently selected (as described previously for BANK mode). *Example:* If Preset 1 LED is flashing (single flash) and Preset 2 LED is on, this would indicate that you are in BANK 1 of 2. If both Preset 3 and 4 were also ON, that would indicate you are in BANK 1 of 4.
- To save, press and hold **PRESET** for 2 seconds. All LEDs will flash, then the preset LEDs will go back to indicating only what preset the Mixer is presently on.

Edit Mode Examples of Use

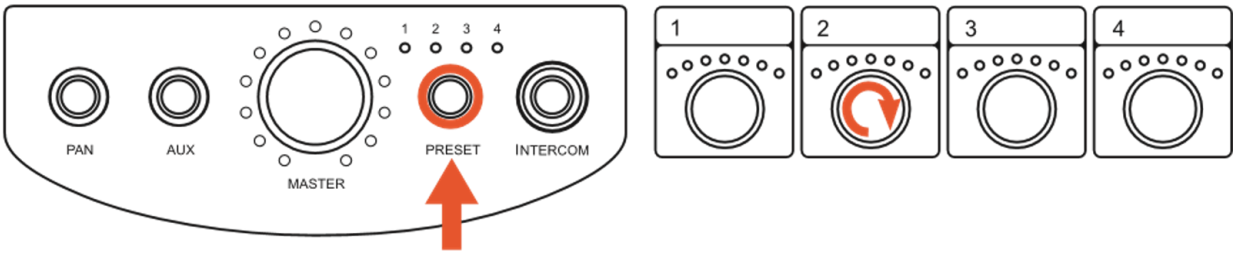
There are countless combinations of routing, submixing and stereo linking. The examples below show simple combinations to gain familiarity with the "hardware" based procedure.

> **NOTE**
>
> This example is based on a single hub system.

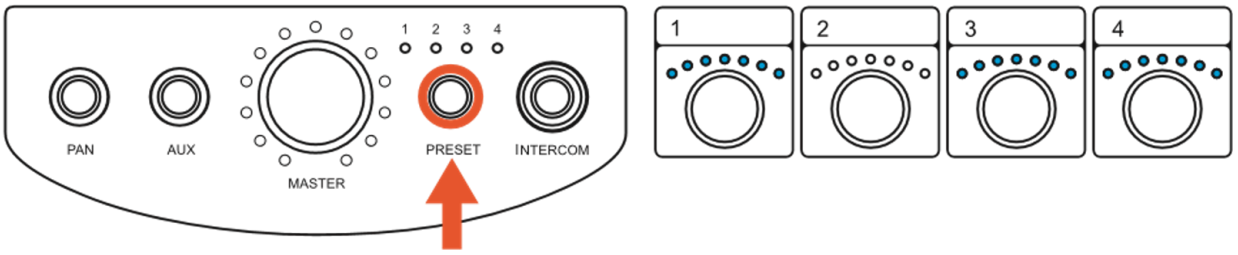
Assign a Stereo Knob

This example will sum channels 1-2 to the channel 1 knob.

1. Ensure your selected channels are stereo linked (see STEREO LINK OPERATION).
2. While HOLDING **PRESET**, twist the channel 2 knob, and release.



3. Channel 1 LEDs will be lit solid and channel 2 LED's are flashing.
4. Twist channel 2 knob. Both channel's LED's will turn off.
5. Press and HOLD **PRESET** until the Mixer's channel LEDs flash quickly to indicate the setting is stored. You will notice that channel 2 LEDs are not lit. At this point, the stereo pair is present on channel 1 and channel 2 is now open for another assignment.



Create a Submix on a Single Knob

This example will create a submix on the now unused channel 2 knob.

1. Hold **PRESET**, twist channel 2 knob, then release. All channel LEDs turn off. The Mixer enters EDIT mode.
2. Twist the channel knobs you wish to be present in this submix. Remember you are setting the submix volume of that channel as you turn the individual knobs.
3. Once you have everything set, press and hold **PRESET** until the LED flashes quickly to save the changes (see SAVE A PRESET).
4. All the channels you selected are now present on the channel 2 knob. If you find one source is too loud or soft, simply repeat the above process, adjust, and exit.

Line Outputs

Two balanced 1/4 inch TRS line outputs are provided. The left operates as a mono output for sub woofers and mono devices if nothing is plugged into the right line output. When a 1/4 inch plug is inserted into the right output, the line outputs operate in a normal stereo mode. The line outputs may be used simultaneously with the headphone outputs, and are both controlled with the master volume knob. In the event of ground loops when connecting the Mixer line outputs to other devices that have an earth ground, it may become necessary to lift the shield at the Mixer outputs.

> **WARNING**
>
> **NEVER lift or disconnect the AC safety ground on the AC power supply cable of any device.**

Headphone Amplifier

The headphone amplifier outputs are paralleled outputs. When using multiple headsets, the total impedance should not go below 16 ohms. The headphone amplifiers are very powerful and can easily damage in-ear transducers, headphones, and your hearing; exercise great care in adjusting the master volume. At 32 ohms, the amplifier is capable of sustaining 2 watts of power per ear! The amplifiers are short circuit protected, and will cause the status indicator logo to blink **RED** if overheated.

Mixer Name

The Mixer name can be updated via the PRO Connect software. More information can be found here: Digital Overlay

Firmware Version

It is recommended to check and update the firmware version of all PRO equipment using the PRO Connect Software.

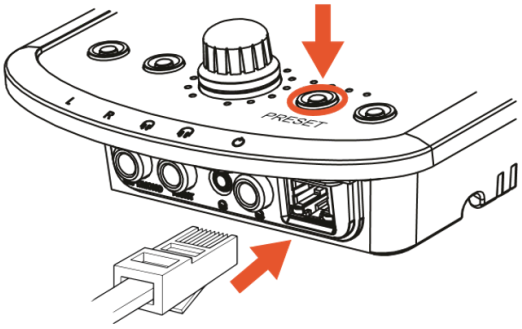
New interface. New level of control.

PRO Connect provides a web-based interface to update, configure, and control your Hear Back PRO and Switch Back PLUS systems.

[Download for Windows] [Download for macOS]

To check the version on the Mixer directly:

1. Starting with power "off", press and hold PRESET button while inserting network cable to apply power (until buttons flash).



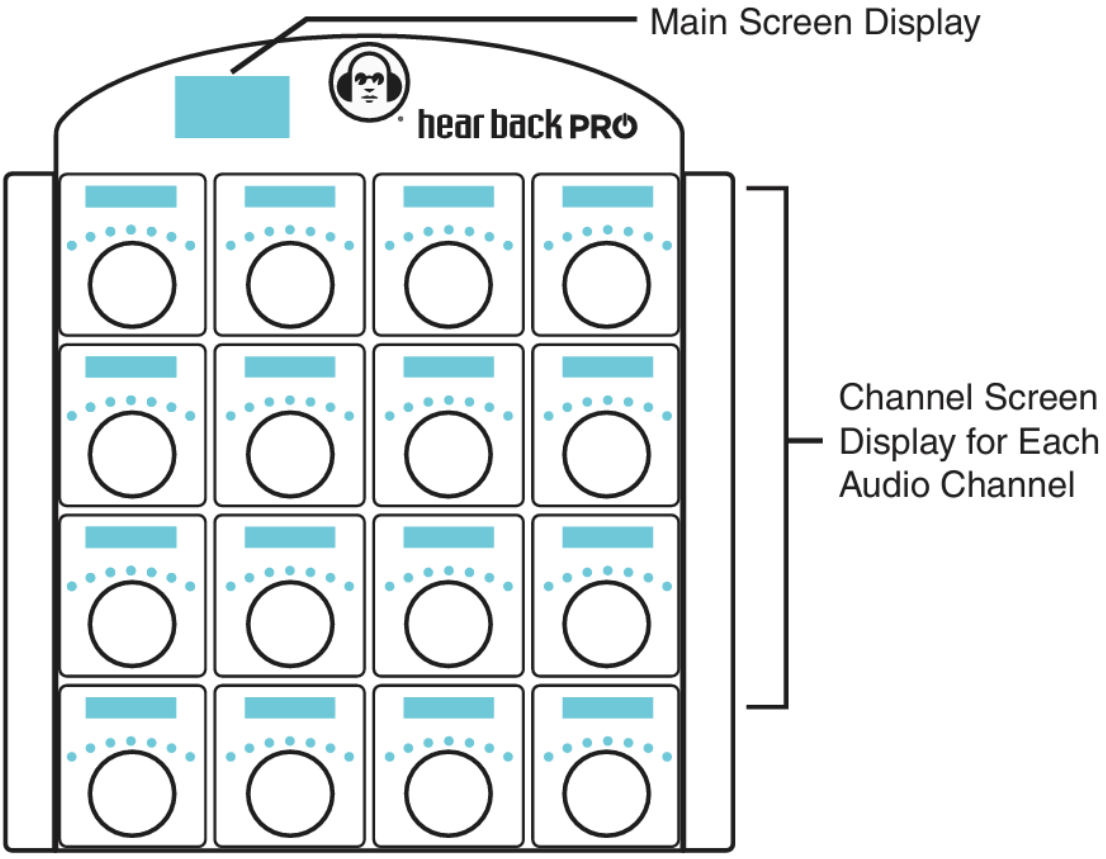
2. The LED that is lit around the MASTER knob shows the major firmware version. The channel knob lit with **BLUE** LEDs indicates the minor firmware version 1-16. With lit **GREEN** LEDs, the minor firmware version is channel number + 16 = 17-32.
    - Example: If the first LED is lit around the MASTER knob and the LEDs above the channel 7 knob are lit **BLUE**, the firmware version is 1.7.
    - To display the bootloader version number, press the **PAN** button. The version number is display in the same way.

3. To EXIT, disconnect then reconnect power.

PRO Digital Overlay

The PRO Digital Overlay is an ultra-thin faceplate for electronic labeling of a Hear Back PRO Mixer. This attachable upgrade modifies and expands the display of channels and mixer functions through high contrast OLED graphical displays. The Digital Overlay permanently mounts directly onto the PRO Mixer's face and connects via a ribbon cable into the Mixer's side expansion slot. The naming functions can be accessed and updated through the PRO Connect software. The PRO Digital Overlay is a time saving and easy to read solution to the standard scribble strip for engineers and end users in studio sessions and live entertainment settings.

Overlay Detail Diagram



Advantages / Features

- Unobtrusive with a thin, ultra-low profile (less than 3mm thickness)
- Rugged design for stage and touring
- Easy and quick installation
- Supports the use of letters, numbers, and symbols when labeling channels and Mixers
- Bright and easily legible OLED screens allow for quick identification and control, even in low or high light environments
- Mixers and channels can be named and updated remotely via the PRO Connect software

NOTE

Miniumum PRO Mixer firware version is V6 for installation. Software Updates are available through PRO Connect.

WARNING

Turning off the PRO system when not in use may prolong OLED screen life!

Burn-in is possible on any display technology.

Installation

WARNING

Though the PRO Digital Overlay is rugged once installed onto the Mixer, **DO NOT BEND OR TWIST THE OVERLAY**, prior to or during the installation process.

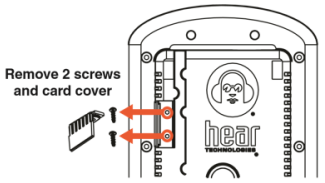
WARNING

Take care when handling the ribbon cable during the installation process. Creasing or twisting the cable can affect performance of the Overlay.

NOTE

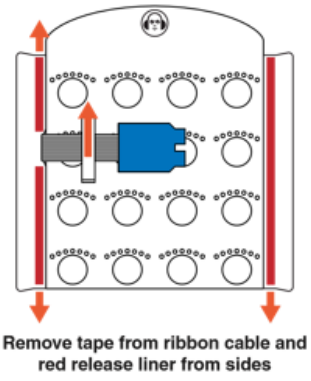
Once mounted, the PRO Digital Overlay cannot be removed. Take adequate care when aligning and applying to the PRO Mixer front.

1. Remove the two screws attaching the expansion card slot cover to the Mixer. Keep screws for reuse.

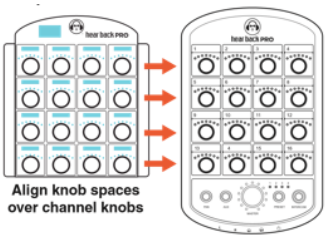


2. Clean Mixer top edges with isopropyl alcohol and a lint-free cloth (do not saturate).

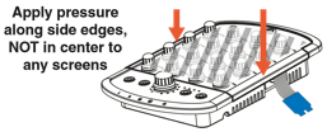
3. With the Overlay face-down, **CAREFULLY** remove the tape securing the flexible ribbon cable to the bottom of the Overlay. Gently pull the tabbed end of the tape while applying pressure to the opposite end.
4. On the left and right sides of the Overlay, peel the red release liner off the double-sided mounting tape.



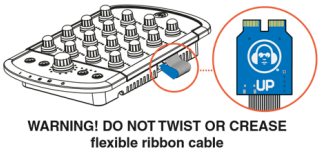
5. Align Digital Overlay above PRO Mixer so the knob spaces are centered over the corresponding knobs.



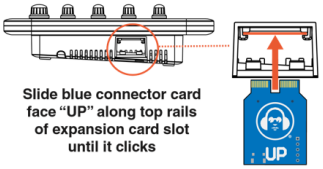
6. Press Digital Overlay firmly onto Mixer faceplate along the side edges. **DO NOT** apply pressure to any screens.



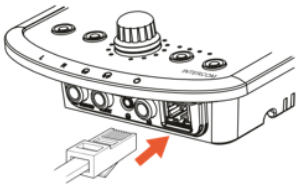
7. Gently curving the flexible ribbon cable, turn the blue connector card towards the expansion slot and align with top rails. (DO NOT TWIST OR CREASE the ribbon cable).



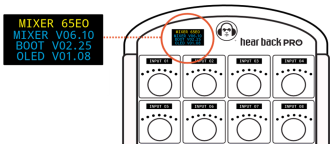
8. Slide connector card face "UP" firmly into the top rails of the expansion slot until it clicks.



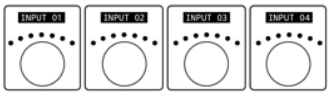
9. Apply power to the Mixer by inserting the network cable into the Ethernet port.



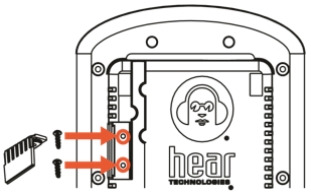
10. Following the bootup sequence, the main screen at the top left of the Digital Overlay will display the Mixer's firmware, bootloader, and overlay version.



11. Each screen above the 16 knobs will illuminate and display either the default channel numbers (INPUT 01, INPUT 02, etc.), or the channel names stored in the V6 Firmware or later PRO Hub.



12. Attach the new expansion card slot cover, supplied with the PRO Digital Overlay, using the original screws that were removed during installation.



Supported Characters

The following characters are supported on all OLED screens:

0-9	#	(	-	<
A-Z	$	)	.	=
space	%	*	/	>
!	&	+	:	?
”	’	,	;	@

Channel Naming

Channel names can be created and updated instantaneously via the PRO Connect software. The names are stored in the Hub's internal memory and shared by all PRO Mixers. Channel names will be displayed on the channel screen displays.

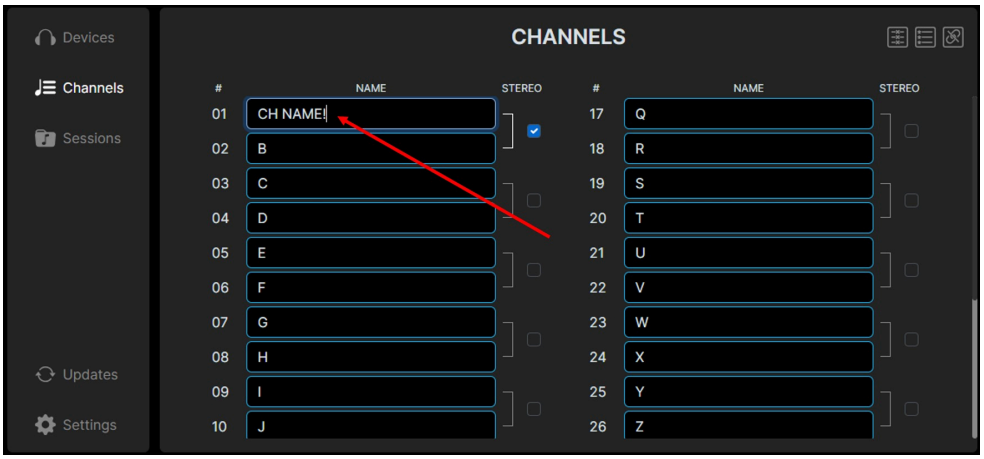
New interface. New level of control.

PRO Connect provides a web-based interface to update, configure, and control your Hear Back PRO and Switch Back PLUS systems.

Download for Windows
[Download for Windows]

Download for Mac OS
[Download for macOS]

1. Select the Channels Tab in PRO Connect.
2. Click inside the channel you intend to edit.

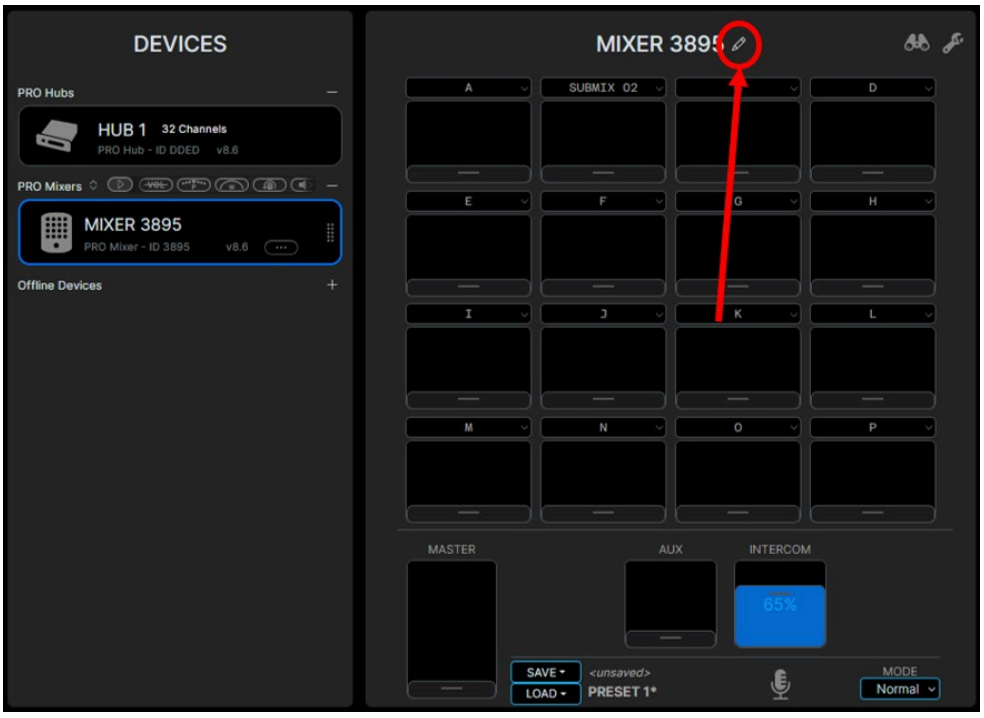


3. Change the channel name and then press ENTER.

Mixer Naming

PRO Mixers can be named for easier identification via the PRO Connect software. Mixer names are saved only on the Mixer, not on the Hub.

1. Select the Devices Tab in PRO Connect.
2. Select your Mixer in the devices list.
3. Click the pencil icon next to the Mixer name.



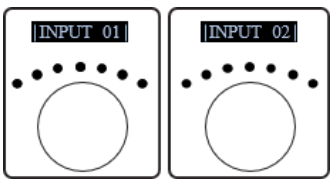
4. Edit the Mixer name and save ✓.

Channel Screen Display

Each screen above the 16 knobs displays either the default channel numbers (INPUT 01, INPUT 02, etc.), or the channel names stored in the V6 or later PRO Hub.

Stereo Links

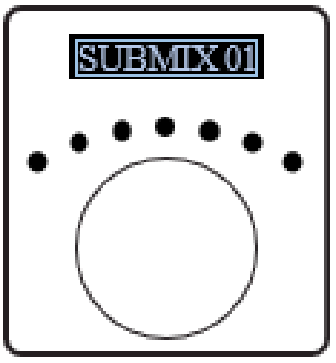
When two adjacent channels are stereo linked, the vertical bar icon "|" will appear on both sides of the channel name (e.g. INPUT 01 and INPUT 02). These



paired channels can be named independently while being controlled simultaneously.

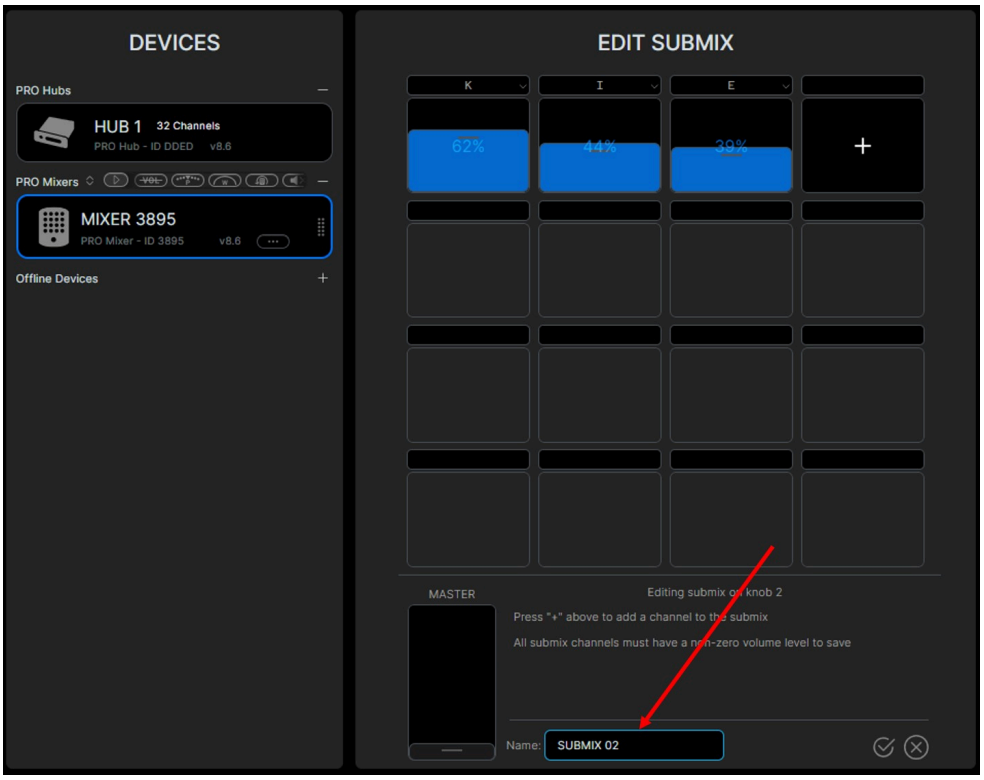
Submixes

Submixes are identified by a rectangular box around the name in the channel screen above any of the Mixer's 16 channel knobs (e.g. SUBMIX 01). Submix names and content can be edited via the PRO Connect software.



Naming a Submix via the PRO Connect Software

1. Select the Devices Tab in PRO Connect.
2. Choose the Mixer you want to edit a submix on.
3. Drop down the channel name display, click the SUBMIX tab, and then click EDIT.
4. Edit the name in the bottom panel and save ✓ the submix.

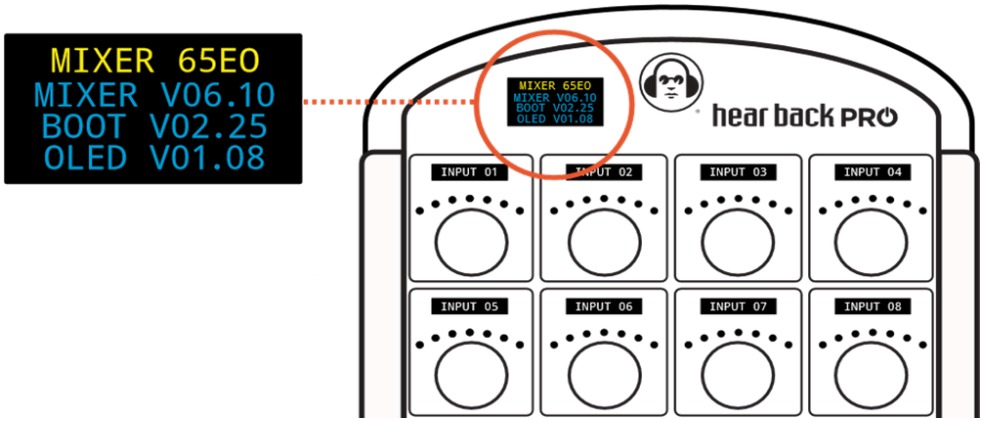


Main Screen Display

The main screen at the top left of the Digital Overlay displays the Mixer's name and status including firmware version, channel levels, mode status, preset function, and text messages.

Firmware Display

Each time a Mixer equipped with the PRO Digital Overlay completes its power up cycle, the main screen will display the current Mixer firmware and boot version, as well as the current Mixer overlay version.

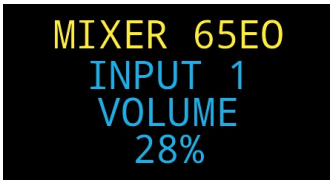


Channel Knob Adjustments

In addition to the seven LED indicators above each channel knob, levels are tracked and the exact value is displayed by the main screen. The main screen will display "Volume Mode", "Pan Mode", and "Stereo Width Mode" statuses. After adjusting, the main screen will continue to display the channel name and current set value for approximately 4 seconds or until another channel is adjusted.

Volume Mode

When making adjustments to one of the 16 channel knobs, the respective channel name will appear in the main screen as well as its current adjusted value as a percentage from 0-100%.



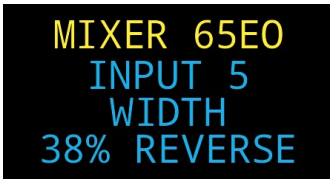
Pan Mode

When making adjustments while in "Pan Mode" mode, the respective channel name will appear in the main

screen, with the pan value in percentage, as well as, the pan direction as "% Left", "Center", or "% Right".

Stereo Width Mode

When stereo-linked channels are present, current stereo width settings are displayed as "% Wide", "Mono", and "% Reverse".



Presets

The following preset functions are displayed in the main screen:

PRESET # LOADED
Displays which preset is selected

PRESET # SAVED
Displays when a current preset is being stored or overwritten

PRESET ERASED
If a preset is zeroed out by holding the PAN and AUX buttons simultaneously

Grouped Mixers

When Mixers are linked together, the first Mixer in the group defaults as the master Mixer, and each concurrent Mixer in the group becomes a slave Mixer. Each slave Mixer in a group will display "REMOTE CONTROL" in the main screen to signify it is functioning in a group.

Text Messages

The PRO Digital Overlay also displays text messages in the main screen. This allows the engineer to communicate with players without using the intercom feature. After a message is sent, it will continue to flash on the main screen until the Mixer is adjusted (e.g. touch a knob, press a button). Text messages can be sent from the PRO Connect app to all the Mixers in a session or to specific individual Mixers equipped with a PRO Digital Overlay.

Send a Text Message to All Mixers

1. Select the Devices tab in PRO Connect.
2. Click the message icon next to the PRO Mixers section label.
3. Enter your message and click SEND.

Send a Text Message to a Specific Mixer

1. Select the Devices tab in PRO Connect.
2. Click the message icon in the individual Mixer in the PRO Connect app.
3. Enter your message and click SEND.

Technical Specifications

Compatibility:

Hear Back PRO Mixer

PRO Mixer Minimum Firmware:

V6.1 with bootloader 2.24 or later

PRO Hub Minimum Firmware:

V6.1 with bootloader 2.25 or later

Screen Dimensions:

Main Screen: 128 x 64 pixels

Channel Screen: 96 x 16 pixels

Screen Character Limit:

Main Screen: 4 lines of 12 characters each

Channel Screen: 1 line of 9 characters

Size:

15.72 cm W x 17.15 cm H x .27 mm D

Unit Weight:

0.14 lbs

Mounting:

3M very high bond (VHB) double-sided tape

Power::

Supplied by PRO Mixer through connected ribbon cable into expansion card slot

Troubleshooting

Mixer power is on, but Overlay's OLED screens don't light up

- Remove the blue connector card at the end of the flexible ribbon cable and reinsert into the Mixer's side expansion slot firmly until it clicks.
- Ensure the connector is aligned straight inside the rails during installation.
  - If the connector has been installed at an angle, the Digital Overlay will not function properly.
- By default if connected properly, the main screen located to the left of the logo should display "PRO Overlay".

Channel screens do not display names

- Overlay should display default channel names above knobs (INPUT 01, INPUT 02, etc.).
  - If this is not the case, it's possible one or more devices do not have the latest firmware updates.
  - Minimum versions required: Hub Firmware 6.1 with Bootloader 2.5; Mixer Firmware 6.1 with Bootloader 2.24.

Cannot name channels with PRO Connect

- Ensure the firmware on the Hub and Mixer have the latest update.
  - Minimum versions required: Hub Firmware 6.1 with Bootloader 2.5; Mixer Firmware 6.1 with Bootloader 2.24.
- Update the PRO Connect software to the latest version.

Firmware Updates

Firmware updates are available through the PRO Connect Software.

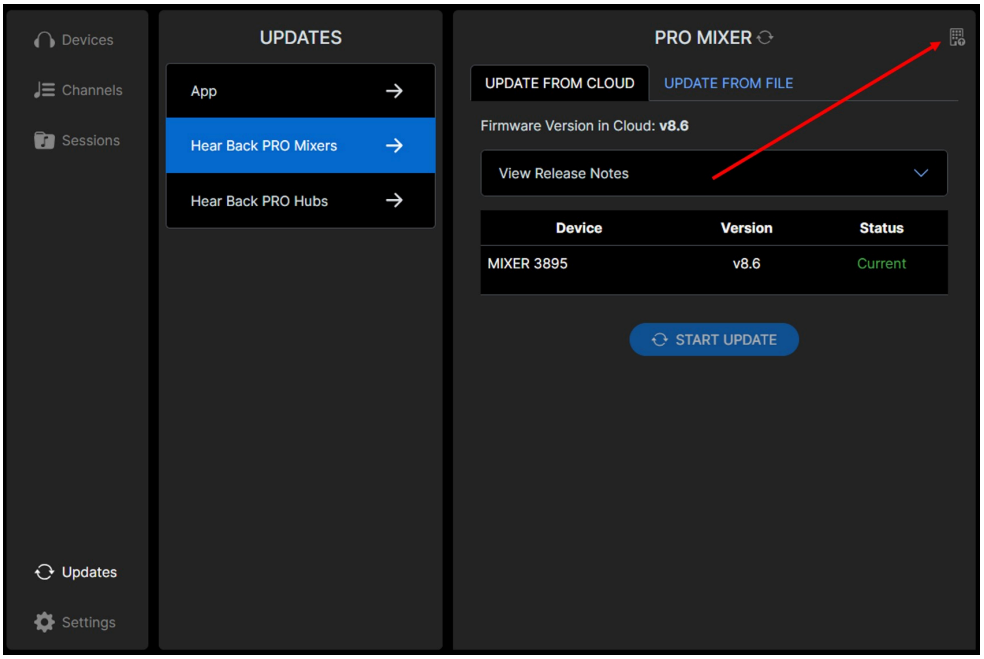
New interface. New level of control.

PRO Connect provides a web-based interface to update, configure, and control your Hear Back PRO and Switch Back PLUS systems.

Download for Windows
[Download for Windows]

Download for Mac OS
[Download for macOS]

1. Select the Updates tab in PRO Connect.
2. Select Hear Back PRO Mixers.
3. Click the Digital Overlay icon in the top right corner of your screen.



4. Follow the on-screen instructions to perform the update.

Firmware Versions

The Hear Back PRO system firmware has evolved through the years. Support is only provided for users of the latest firmware version and this user manual only applies to the latest firmware version.

Firmware upgrades for all PRO hardware are available using the PRO Connect software:

New interface. New level of control.

PRO Connect provides a web-based interface to update, configure, and control your Hear Back PRO and Switch Back PLUS systems.

Download for Windows
[Download for Windows]

Download for Mac OS
[Download for macOS]

Here is a brief overview of the features available with the various firmware versions.

FW Quick Comparison	V2	V5	V6	V8
Channels Per Hub	16	32	32	32
Channels Per Mixer	16 Mono (8 Stereo Pairs)	Up to 128	Up to 128	Up to 128 (64 Stereo Pairs)
Routing Audio	Same to All	Per	Per	Per Mixer

FW Quick Comparison	V2	V5	V6	V8
Channels	Mixers	Mixer	Mixer	
Stereo Link Pairs	Per Mixer	Global Links	Global Links	Global Links Stored in Hub
Submix Function		✓	✓	✓
Channels Per Input Card	16	16	16 or 32	16 or 32
PRO Digital Overlay Available			✓	✓
Map Knobs via PRO Connect				✓
Rename Channels via PRO Connect				✓
Channel Linking via PRO Connect				✓
Save / Recall Sessions via PRO Connect				✓

System Notes

General

- Do not share the HBUS or Mixer connections with any other network devices.
  - High-quality, low-latency audio requires a constant stream of large amounts of data; therefore other devices on the same network could compromise the quality of the audio.
- **The system will not link at 10/100 Mbps, as it is designed to work at gigabit speeds. This includes the HBUS input for connection to a PC, tablet, or smartphone for app functionality.**
- The system is designed to work with suitable unshielded CAT6 cable complying with the National authorities (cable with an outer jacket or sleeving rated VW-1 or better). Note, using low-quality cables may result in the Mixers refusing to link with the Hub.
- Do not use shielded CAT6 cables which can cause ground-loops.
- Unshielded CAT6 cables, used for HBUS or going to PRO Mixers, can be run 100 meters (328 feet) with no problems. Note, due to advanced internal termination techniques, cables used with the PRO series can be run up to 500 feet in ideal conditions (one piece of solid conductor CAT6 with no breaks or couplings). Utilizing proper punch-down and the correct RJ-45 connectors is key. The more breaks/connections/couplings in a cable run, the more limited this distance will be. Poor quality cabling will also limit the maximum distance. Running unshielded CAT6 cables alongside AC cables, fluorescent light fixtures, or computer network wiring will also limit the maximum distance. It is always preferred to run the Hear Back PRO CAT6 cabling by itself, away from other cabling. ALL cabling should be electrically tested before use. Contact an expert network professional for assistance with wiring installation.

- Don't use those old, gray, flat telephone cables (ISDN cables) as those are not gigabit Ethernet cables.
- The ground and power rails of the Mixer are totally isolated from the Hub, meaning no more ground loops to worry about.
- The Mixer faceplate can be labeled by using a dry erase marker (simply wipe off), grease pens (erase with pencil eraser), label maker, by writing on a removable paper overlay, or electronically labeled with the optional PRO Digital Overlay. Please note that using permanent markers results in permanent labels!

CAT6 Cables

Cable complying with the National authorities (cable with an outer jacket or sleeving rated VW-1 or better).

Technical Specifications

Mixer Aux Input

Line Input Config/Impedance:
1/8" Stereo, unbalanced, 10K ohms typical
Line Input Level:
0 dBu optimal, +18 dBu max
Mic Input Config/Impedance:
XLR Mono, balanced, 150 ohms typical, 150 Hz high pass
Mic Input Level:
-42 dBu optimal, -30 dBu max

Mixer Headphone Power

Load Impedance	THD less than 0.01%	THD less than 0.1%
8 Ω	1.2 W*	1.5 W
16 Ω	1.6 W	1.8 W
25 Ω	2.0 W	2.2 W
32 Ω	1.8 W	2.0 W
50 Ω	1.5 W	1.6 W
100 Ω	1.1 W	1.2 W

Load Impedance	THD less than 0.01%	THD less than 0.1%
200 Ω	500 mW	650 mW
600 Ω	220 mW	250 mW

*THD at 8 Ω = 0.015% typical

Inter Modulation Distortion:
Typically less than 0.03%

Mixer Line Output

Frequency Response:
20 Hz to 20 kHz, +/-0.15 dBu
THD+N:
0.004% typical at 1 kHz, +15 dBu
0.008% typical, 20 Hz – 20 kHz, +4 dBu
Inter Modulation Distortion:
0.02% typical at +4 dBu, 60 Hz/7 kHz
Crosstalk:
Less than -93 dBu @ 1 kHz

Propagation Delay:
Analog Input to Analog Output:
0.248 mSec @ 192 kHz sample rate
Digital Input to Analog Output:
0.092 mSec @ 192 kHz sample rate
Digital Input to Digital Output:
0.0452 mSec @ 192 kHz sample rate
HearBus Protocol (HBUS):

0.000592 mSec

System Noise Performance

Noise, A-Weighted:
-93 dBu @ 192 kHz sample rate
Dynamic Range:
117 dB typical

System I/O

Hub Line In, Analog:
8 balanced inputs on a DB-25 female (DA-88 pinout) per Analog Card
Hub Maximum Input Level, Analog:
+8 dBu with analog card pad jumpers populated, +18 dBu with jumpers removed (up to +38dBu upon special request)
Hub HBUS In, Out:
8-pin RJ45 jack (standard Ethernet pinout) (Links at gigabit only, not 10/100 Mbps)
Hub USB Port:
USB 2.0 (for initial firmware upgrade when below FW V8)
Hub Card Slots (4x):
Each slot can accept an analog or digital input card, output card, or 8-port Mixer network card
Mixer to Hub Connection:
8-pin RJ45 jack (8x Mixer connections per network card)
Mixer Headphone Out:
1x TRS 1/4" and 1x TRS 1/8" unbalanced stereo
Mixer Line Out:
2x TRS 1/4" balanced (left/mono and right)
Mixer Max Output Level, Analog:

+24 dBu (mixed output)

Mixer Aux Input:

1x TRS 1/8" unbalanced stereo and 1x XLR balanced mono (with 15 volts phantom power)

Mixer Card Slot:

For future digital or analog input/output expansion capabilities or side-car add-on

Physical, Hub

Size:

1.75" (45 mm) H x 19" (483 mm) W x 8.5" (216 mm) D

Unit Weight:

6.3 lb. (2.8 kg) (nominal depending on card compliment)

Mounting:

Standard rack mount, 1 RU

Physical, Mixer

Size:

9.5" (241 mm) H x 5.95" (151 mm) W x 2.71" (69 mm) D

Unit Weight:

1.6 lb. (0.72 kg)

Mounting:

Standard mic stand (5/8" 27 threads per inch) or desk mounted

Power

Hub Power Requirements:

48VDC, 150 Watts (each external power supply powers up to 16 Mixers). Hub is capable of powering up to 32 Mixers with an additional power supply.

Mixer Power Requirements:

Power over Ethernet (PoE) 36–52 volts DC, 15 Watts max provided by Hub through CAT6 network cabling

Cabling, Mixers and HBUS

Unshielded CAT6 cables used for Mixers or for HBUS can be run up to 500 feet in *ideal conditions* (*one piece of solid conductor CAT6 with no breaks or couplings*). The more breaks/connections/couplings in a cable run, the more limited this distance will be. Poor quality cabling will also limit the maximum distance.

Quick Start

> ⚠ **WARNING**
>
> **The Hear Back PRO is capable of driving most headphones to extreme levels that can damage your HEARING!**
>
> **ALWAYS turn down the Mixer "Master" volume before putting on in-ear headsets or headphones.**

Connecting the System

1. **Connect the appropriate input(s)**, as shown in the example hook-up diagrams.
2. **Select the desired input** using the front panel switch.
3. **Connect Hear Back PRO Mixers to the Network Card** outputs using CAT6 cables.
4. **Turn on Hub Power.**
5. **Set all Mixer channel and master volume levels to 0%.**
6. **Connect the headphones, in-ear monitors, and/or line outputs** for connecting to wireless in-ear systems, powered monitors, or other devices requiring line-level inputs.

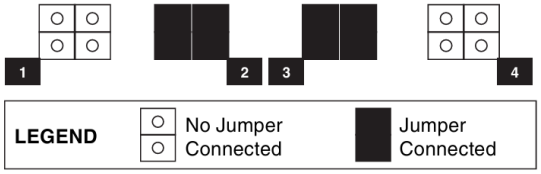
Hub Adjustment

1. **Adjust the level at the input source** (DAW, mixer, etc) until the **RED** clip LED's on the Hub just come on.
2. **Reduce the levels on the input source until you have a GREEN LED.**

3. **Adjust the source for as much signal into the Hub as possible without clipping.** Higher input levels improve signal-to-noise and dynamic range. If using an Analog Input Card and you are unable to adjust your source without overdriving the Hear Back PRO system, follow the "-10dB Pad" instructions below to achieve and extra 10dB of headroom. Remember, higher input levels improve signal-to-noise and dynamic range.

-10DB PAD

The Analog input card provides 2 jumpers per channel (16 total) that can be removed to achieve a -10dB pad per channel. These jumpers are labeled 1-8 (corresponding to each input channel), and located one inch away from the DB25 connector. So, in this example, input channels 1 & 4 will be reduced by 10dB, while input channels 2 & 3 are not reduced:



Mixer Adjustment

1. After you have the signals optimized on the Hub, **turn the "Master" volume up to about 10 o'clock**.
2. **Raise each channel's volume up to a comfortable level.**
3. **Avoid adjusting the master volume too high and running the inputs too low.**
4. **To stereo-link any channels**, enter the stereo-link control interface as described in Stereo Link Control, and toggle them on.
5. **To pan any mono channels** within the stereo field, press the **PAN** button to make adjustments.

> **NOTE**
>
> With FW V2, each Mixer can have stereo links independent of other Mixers.
>
> With V5 and above, stereo links are stored in the Hub – linking is global.

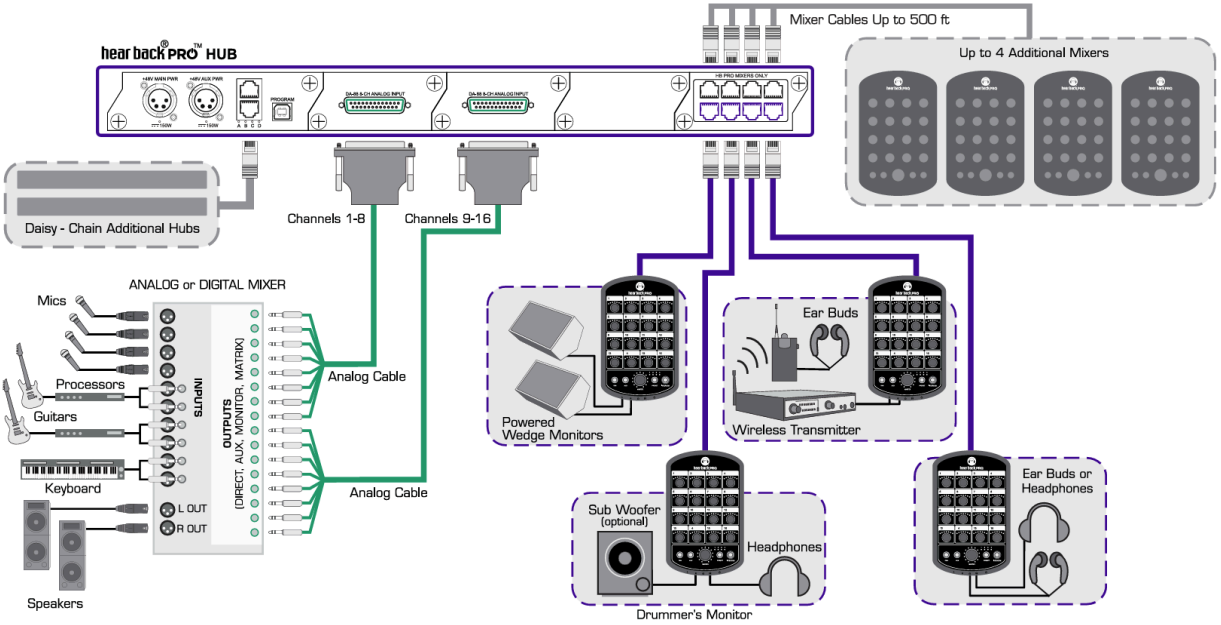
AUX IN Adjustment

1. **If using an auxiliary input, connect it** to the Mixer via the appropriate "LINE" or "MIC" input.
2. **Select the appropriate input** via the "AUX IN" selector switch.
3. **If possible, adjust the input source** for maximum volume without clipping.
4. **Press the "AUX" button** to turn the "Master" knob LEDs "RED" and **slowly turn the "Master" knob** to a comfortable level.
5. **Press the "AUX" button again to exit** auxiliary volume control.

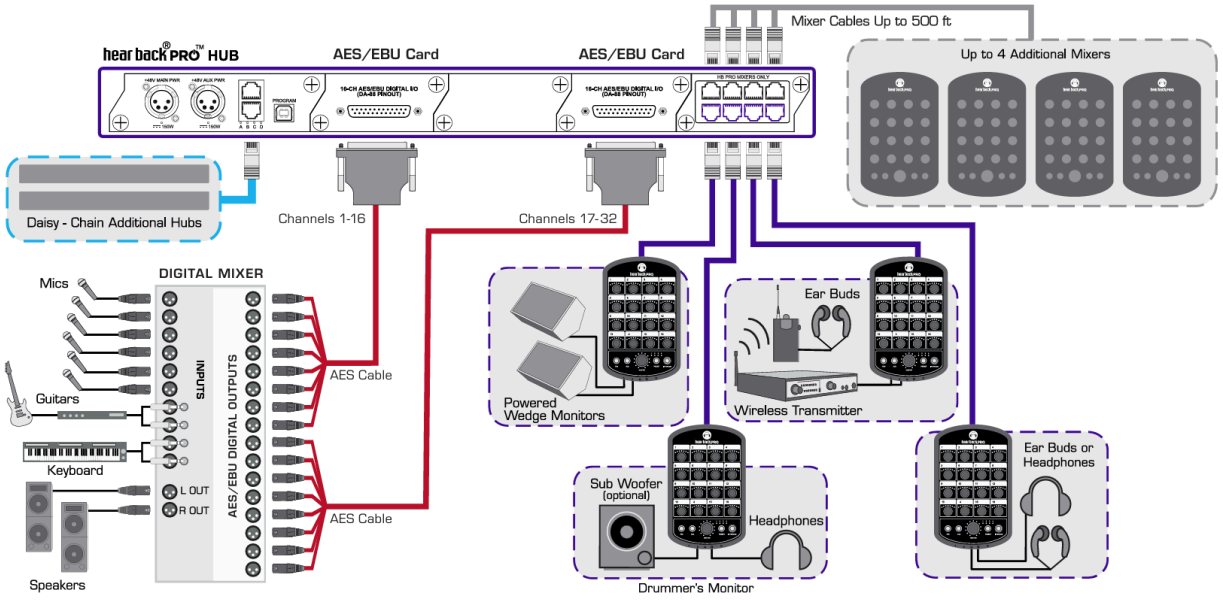
Now enjoy personal monitoring at its best and have fun!

Hook-Up Diagrams

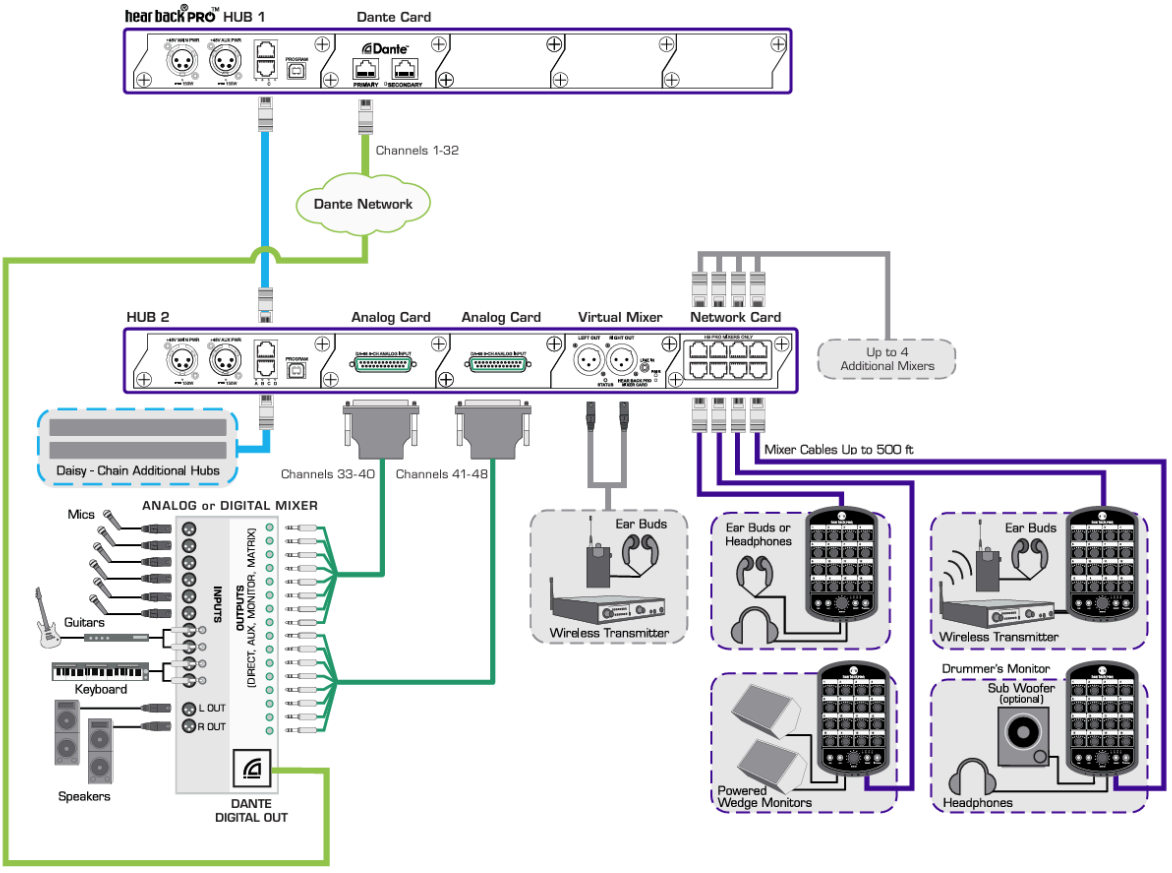
Analog



Digital



Simultaneous Digital and Analog


hear back PRO HUB 1
Dante Card
Channels 1-32
Dante Network
HUB 2
Analog Card
Analog Card
Virtual Mixer
Network Card
Up to 4
Additional Mixers
Daisy - Chain Additional Hubs
Channels 33-40
Channels 41-48
Mixer Cables Up to 500 ft
ANALOG or DIGITAL MIXER
Mics
Guitars
Keyboard
Speakers
INPUTS
OUTPUTS
(DIRECT, AUX, MONITOR, MATRIX)
L OUT
R OUT
DANTE
DIGITAL OUT
Ear Buds
Wireless Transmitter
Ear Buds or
Headphones
Ear Buds
Wireless Transmitter
Drummer's Monitor
Sub Woofer
(optional)
Headphones
Powered
Wedge Monitors

Troubleshooting

> **TIP**
>
> **Upgrading to the latest firmware version is strongly recommended!**

Hear Back PRO Hub

> **NOTE**
>
> Some problems require you to refer to the A-B-C-D error code LEDs below the HBUS ports on back of Hub.

No Audio Output

- Verify the Hub is powered on (Hear logo should be illuminated on front of Hub).
- Check input connections.
- Make sure input selector switch is in the proper position for your audio source – HBUS, input A (slots 1 & 2), or input B (slots 3 & 4).
- Verify the status-indicating logo on both the Hub and Mixer are both BLUE.
- If Mixers have no logo lit:
  - Turn off the Hub power for 5 seconds, then switch on again.
- Check your headphones, wireless transmitters/receivers, monitor amplifiers, etc., to verify they are functioning properly.
- If a digital input card is installed, verify it has a valid clock.

Hub Logo is blinking RED

Refer to the A-B-C-D error code LEDs below the HBUS ports on the back of Hub:

- This is typically an overheating problem – if so, error code LEDs **A**, **B**, & **C** will be lit.
  - Allow adequate ventilation for Hub as specified in owner's manual.
- If any other combination of error code LEDs are lit, please contact customer service.

Hub Logo is solid RED

Refer to the A-B-C-D error code LEDs below the HBUS ports on the back of Hub:

- If no error code LED is lit:
  - No clock is present.
  - If using an Analog Input card:
    - Verify the input selector switch is in the correct position.
    - Verify an Analog Input card is present in either slot 1 (for input A) or slot 3 (for input B).
  - If using Dante or Waves Digital Input cards:
    - The logo should be BLUE even with no input source connected.
    - Verify the input selector switch is in the correct position.
    - Verify the Digital Input card is present in either slot 1 (for input A) or slot 3 (for input B).
  - If using AES or ADAT Digital Input cards:
    - The logo will be RED if no clock source is detected.
    - Verify the digital source is functioning correctly – powered on and sending clock.
    - Verify the input selector switch is in the correct position.

        - Verify the Digital Input card is present in either slot 1 (for input A) or slot 3 (for input B).
    - Check config.txt file to confirm clock source is set "Internal" for inputs A and B, unless you are using a Word Clock Card then clock should be set to "External".
    - If the problem still persists, please call technical support department.
- If error code LED **A**, **B**, or **A** & **B** are lit:
    - An internal problem is present. Please call customer service.
- If error code LED **C** is lit:
    - No firmware file can be found on the internal SD card. Connect the Hub to a computer via USB. The Hub will appear on the computer as a mass storage device named HBPRO. Download the latest firmware file from our website, and simply drag and drop the file onto the HBPRO, then reboot the Hub.
- If error code LED **D** is lit – alone or in combination with any other error LEDs:
    - An internal power problem has occurred. Please call customer service.
- If error codes LED **A**, **B**, **C**, & **D** are constantly flashing every few seconds:
    - Remove the SD memory card from the bottom of the Main Card. Insert the memory card into an SD card reader, format as FAT16, and install the latest Hub firmware version.

Hub Logo is PURPLE

- Verify that there are not two 16 or 2 32 channel (FW V6) input cards on the same input (e.g. slot 1 & slot 2).
    - The Hear Back PRO Hub cannot have more than one 16 or 32-channel (FW V6) input card in adjacent slots.
- If using an off-the-shelf network switch, it might utilize a function known as EEE (Energy Efficient Ethernet).
    - Attempt to bypass the network switch, making a home run from Hub to Mixer, to verify this is the problem – if so, try another network switch.

Hub Logo is OFF

- Verify power switch is on.
- Verify the Hub is receiving power by checking for a yellow LED beneath the power port on the back of the Hub. This LED should be lit when the power supply is connected, even with the Hub powered off.
- If the yellow LED is not lit:
  - Verify the external power supply is the unit provided by Hear Technologies.
  - Replace external supply with known good unit.

Sampling Rate LED is blinking

> **NOTE**
>
> This only applies to FW V5 or later.

- Hub is not set to the same sampling rate as the other Hubs in the system. It can also indicate that there are too many Hubs connected:
  - Maximum of 4 input Hubs for 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz
  - Maximum of 3 input Hubs for 176.4 kHz and 192 kHz
  - All other Hubs must be output only and set to "HBUS" input

Fan does not operate

- The fan only runs when power supply temperature reaches 43° C or 110° F.
- If power supply temperature is over 43° C or 110° F, overheating can cause audio dropout:
  - Please contact technical support department.

Hub is not powering Mixers

- If Mixers connected to Network Cards in Hub slot 1 or 2 are not powering on:
  - Connect 2 power supplies to the Hub and ensure the "DUAL" indicator above the power switch is lit.

Hear Back PRO Mixer

> **TIP**
>
> **Turn system off when not in use**

- This provides optimal care to the OLED screens.
  - The capacitors will thank you!
  - Burn-in is possible on any display technology.

Mixer loses power

- Low-quality or hand-made Ethernet cable is causing problems:
  - Replace the Ethernet cable with a high-quality CAT6 Ethernet cable.
- If Mixers connected to Network Cards in Hub slot 1 or 2 are not powering on:
  - Connect 2 power supplies to the Hub and ensure the "DUAL" indicator above the power switch is lit.
- If all Mixers loose power:
  - Turn off the Hub power for 5 seconds, then switch on again.

Mixer logo is solid RED

- No audio data is being received.
  - If an off-the-shelf gigabit switch is being used, the Mixer may not be seeing the Hub clock.

        - Attempt to bypass the network switch, making a home run from Hub to Mixer, to verify this is the problem – if so, try using a PRO Mixer Distro or PRO Network Card instead.
    - Check the orange and green LEDs on the Ethernet port of the Mixer and ensure that you see a solid lit orange LED and a blinking green LED. The lit orange LED indicates that a gigabit Ethernet link is established and the blinking green LED indicates data is being received.
        - If the orange LED is not lit or it lights intermittently, there is a problem with the cabling between the Mixer and the Hub. To verify this, use a known, high-quality, short Ethernet cable to plug the Mixer directly into the Hub. If the problem still occurs, contact our technical support department.
        - If the Mixer works with the short piece of known good Ethernet cable, investigate the cable between the Hub and the Mixer location.
        - CAT6 cables, used for HBUS or going to PRO Mixers, can be run 100 meters (328 feet) with no problems.

> **NOTE**
>
> Due to advanced internal termination techniques, cables used with the PRO series can be run up to 500 feet in ideal conditions (one piece of solid conductor CAT6 with no breaks or couplings). Utilizing proper punch-down and the correct RJ-45 connectors is key. The more breaks/connections/couplings in a cable run, the more limited this distance will be. Poor quality cabling will also limit the maximum distance.

    - Running CAT6 cables alongside AC cables, florescent light fixtures, or computer network wiring will also limit the maximum distance. It is always preferred to run the Hear Back PRO CAT6 cabling by itself, away from other cabling.
    - ALL cabling should be electrically tested before use. Contact an expert network professional for assistance with wiring installation.

    - Verify the Mixer firmware version is compatible with the Hub.
        - *Example*, the Hub is running V5 firmware, and a newly connected Mixer is running V2. The Mixer logo will be RED; no audio can pass. Either update the Mixer to V5 or swap with another V5 Mixer.

Mixer logo is PURPLE

- If a Mixer cable is connected to two different network ports, a network loop will cause bad audio.
    - Unplug all cables except one Mixer to discover the loop and reconnect correctly.
- Verify Hear Back network is not accidentally connected to a data network. Do not share the Hear Back PRO network with any other devices.
- Verify all off-the-shelf switches used are indeed rated for gigabit speeds.
- If using an off-the-shelf network switch, it might utilize a function known as EEE (Energy Efficient Ethernet).
- Attempt to bypass the network switch, making a home run from Hub to Mixer, to verify this is the problem. If so, try using a PRO Mixer Distro or PRO Network Card instead.

Mixer logo flashes RED

- Internal headphone circuit is overheating.
    - Check to verify headphone load is stereo (not mono).
    - Verify 1/4 inch and/or 1/8 inch plug is tip-ring-sleeve (TRS), not tip-sleeve (TS).
    - Look for shorted cables.
    - Verify total load is not below 8 ohms per channel.
    - Unplug PRO Mixer and allow to cool down for 10 minutes.

When I connect a line level device to the Mixer line outputs, I hear a buzz.

- Wire TRS outputs using only black (ring -) and red (tip +) wires.
- Disconnect shield at the Mixer and terminate at receiving end only.
- For unbalanced outputs, wire the ring (- black) to the receiving end sleeve and tie the shield at the receiving end only. Connect the tip (+ red) to the tip at the receiving end.

When I link two mono channels, the stereo spread is incorrect.

- Verify the source (mixer, DAW, etc.) has these outputs panned hard left and right.
  - The pan control of the source determines the stereo spread.

No intercom audio

- If intercom audio can be heard on the transmitting Mixer, but not other Mixers, either:
  - Mixer Firmware is incompatible. Firmware less than 1.7 is not compatible with firmware equal to or greater than 1.7.
  - Intercom has been disabled (see "INTERCOM OPERATION").

Further Assistance

If you need further assistance, feel free to contact Hear Technologies technical support by phone at +1-256-922-1200 or visit our website at www.HearTechnologies.com.

PRO Connect / Getting Started

Getting Started with PRO Connect

If you are having problems communicating with your PRO Hub from the PRO Connect Application please follow this guide to get started with your system.

> **NOTE**
>
> The PRO Connect application does not currently support the WSG Bridge.

STEP 1: Install PRO Connect

The PRO Connect Application can be obtained here:

- 64 bit Mac Version: https://storage.googleapis.com/ht_firmware/pro_connect_app/pro-connect.dmg
- 64 bit Windows Version: https://storage.googleapis.com/ht_firmware/pro_connect_app/pro-connect-setup.exe

STEP 2: Connect HBUS IN

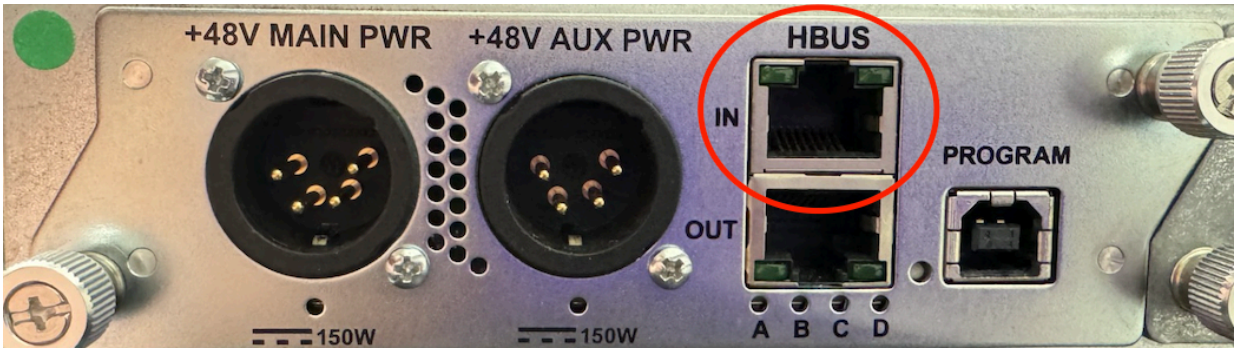
Wire your PRO Hub's HBUS IN port (this is the top ethernet port on your Hub's leftmost main card) directly to your computer's Ethernet port.

NOTE

You can connect your Hub's HBUS IN Port to your computer through a network switch or router, but the Hub must be connected to a Gigabit port. Some managed switches can block the Hub's UDP packets. If you suspect this situation please try connecting the Hub directly to your PC first.

NOTE

Use of Wi-Fi between the PRO Hub and the PRO Connect application is strongly discouraged. Many Wi-Fi networks will drop broadcast UDP packets and will cause unexpected and inconsistent communication with your devices.

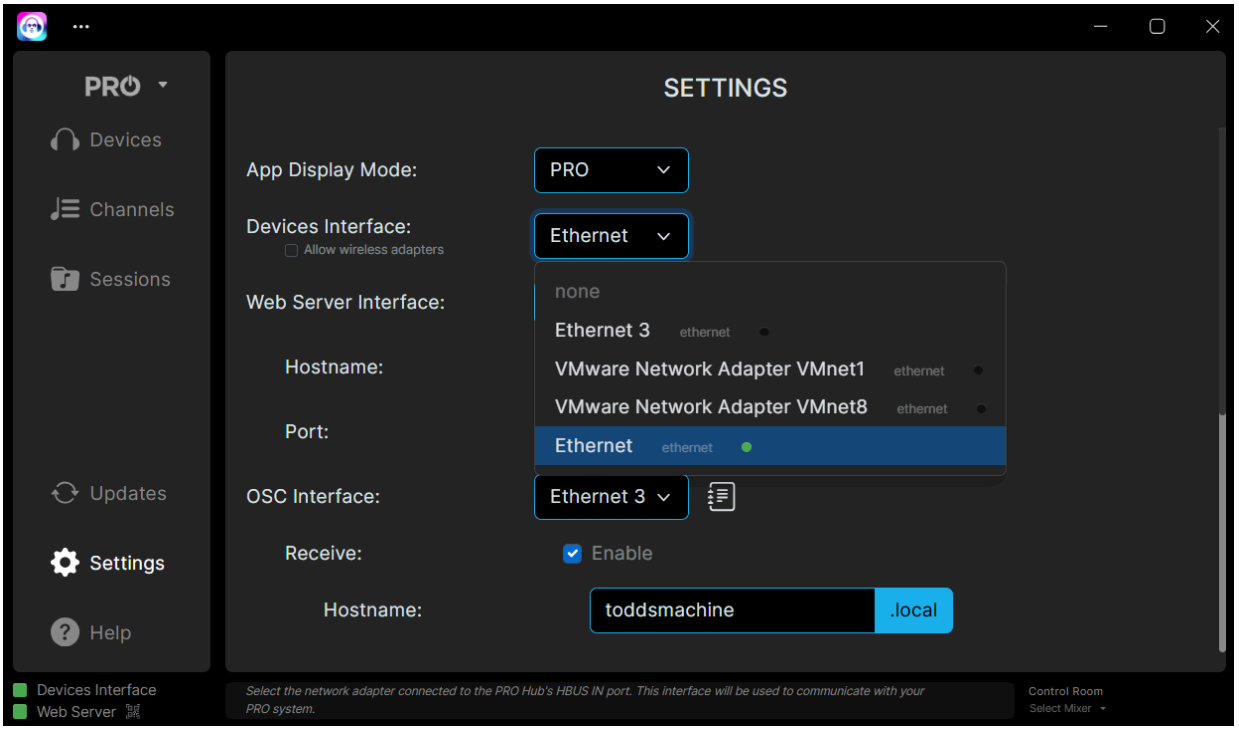


STEP 3: Select the PRO Mode

Ensure you are in PRO Connect's **PRO** mode of operation (not Dante mode). Use the dropdown here:

STEP 4: Select Devices Interface

Select the correct ethernet port in the PRO Connect application for your **Devices Interface** in the app's Settings page. This should be the Ethernet interface that your PRO Hub is connected to.



STEP 5: Cycle Ethernet Cable

Disconnect the Ethernet cable from your computer and then reconnect it. This will allow your computer to properly identify with Hubs on the new Devices Interface.

STEP 6: Wait for Devices

Wait until your Hub is displayed in the PRO Connect device list.

STEP 7: Update PRO Mixers

Update all PRO Mixers as required for compatibility with PRO Connect.

- PRO Mixers with a bootloader **v2.24** and **later** can be updated over the network using the Updates tab in the PRO Connect application.
- Your PRO Mixer firmware will automatically be checked against the latest version in the cloud.
- Plan at least 15 minutes to complete this update.
- **Follow all in-app instructions.**

> **NOTE**
>
> PRO Mixers with a bootloader version < **v2.24** will require an update card. PRO Connect will direct you to the PRO Mixer Bootloader Update guide below.

STEP 8: Update PRO Hub

Update your PRO Hub as required for compatibility with PRO Connect.

- The Hub can be updated using the **Hear Back PRO Hubs** update utility in PRO Connect on the Updates tab.
- Your PRO Hub firmware will automatically be checked against the latest version in the cloud.
- Plan at least 15 minutes to complete this update.
- **Follow all in-app instructions.**

> **NOTE**
>
> If you have a very old PRO Hub system, and this is your first time using PRO Connect, you may need to update the Hub's bootloader. This is a one-time update to make the Hub compatible with the network update feature. **This should only be done if PRO Connect directs you to a bootloader update.**

PRO Hub Bootloader Update

> ⚠ **WARNING**
>
> **ONLY** continue if you have first attempted to use PRO Connect's PRO Hub update utility. PRO Connect will **automatically** walk you through the update process.

PRO Hub bootloader Version

> ⚠ **WARNING**
>
> **DO NOT** attempt to update your Hub's bootloader unless directed to by PRO Connect.

- If your Hub's bootloader is v2.24 you should only be directed here if there is an error during the FPGA update process.

Troubleshooting

- Multiple users have experienced errors during the PRO Hub's FPGA update process.
- The FPGA update process requires treating the Hub's internal memory as USB Mass Storage device. Some computers do not react well to this.

Here are a few useful troubleshooting tips:

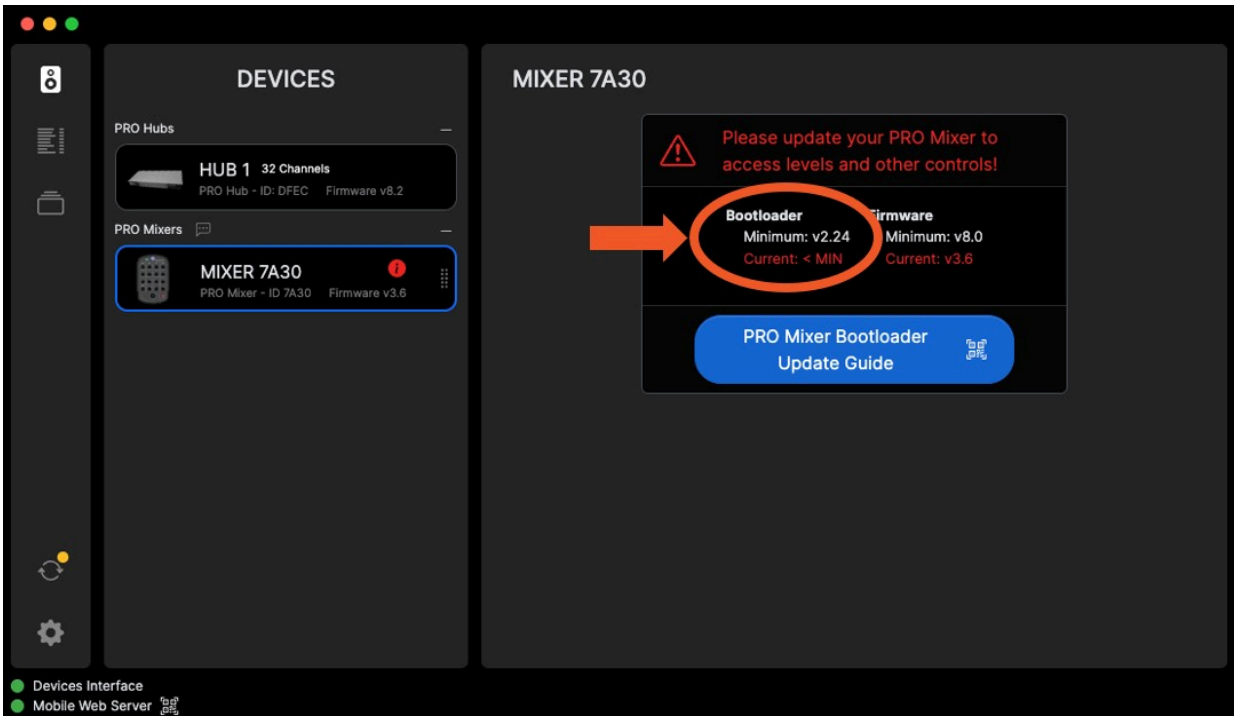
1. Attempt to restart your computer and the PRO Hub before following the guide. Make sure PRO Connect is the only application running.
2. Attempt to use another USB cable for the update.
3. Many users have had trouble performing the USB update from a **Mac Studio**. We recommend trying a Windows computer.
4. Occasionally, Mac computers will write extra cache data to the SD Card inside the PRO Hub. This can cause corrpution. The corruption will generally be

cleared if the update is attempted from a Windows computer.

5. Some IT departments have blocked the full access to USB ports that PRO Connect requires. Attempt to update the Hub from a computer that is not controlled by your IT department prior to installing the Hub in your network.
6. **AS A LAST RESORT** you can attempt to remove your Hub's main card and re-seat the SD Card. Make sure the power is removed from your Hub before attempting this. The main card is always the left-most card if you are looking at the back of your PRO Hub. The SD Card is located on the bottom side of the Hub's main card circuit board. This has helped a few users in the past.

PRO Mixer Bootloader Update

> ⚠ **WARNING**
>
> **ONLY** continue if you see this warning screen in PRO Connect's PRO Mixer update utility and your Mixer's bootloader version is less than the minimum. **DO NOT** proceed if the bootloader version is v2.24 or greater.



- A few early PRO Mixers were shipped with a bootloader that could not be updated over the network. There are very few of these remaining. Updating a Mixer with a bootloader < v2.24 requires using a physical update card that can only be obtained from Hear Technologies support.

STEP 1: Request Update Card

Obtain the mixer firmware update card.

- The initial Mixer bootloader update must be performed using a Firmware Update Card. Firmware Update Cards are available for purchase from Hear Technologies. Please Contact Tech Support to obtain an Update Card.

STEP 2: Follow Guide

Follow this: Firmware Update Guide to make your PRO Mixer's bootloader compatible with network updates.

PRO Distro

Overview

The PRO Mixer Distro can be used to condense stage or studio cabling, serve as a stand-alone Ethernet switch, and power up to eight (8) Hear Back PRO Mixers or Switch Back M8RXs (using standard CAT6 cables). The Distro network card is programmed to handle any 10/100/1000 Base-T Ethernet equipment. Durable anodized aluminum housing protects the network card and allows it to stand up to years of wear and tear in a studio or live environment. The Distro uses the same 4-pin XLR power connector used with the Hear Back PRO Hub. A ninth RJ45 Ethernet connector (unpowered) is provided for connecting to another Distro, a PRO Hub HBUS output, or a Dante enabled device such as the PRO Hub Dante Card.

A yellow LED next to the power port indicates the presence of 48 volts. LEDs under each of the 8 Mixer ports indicate link/activity (green) and PoE power

(yellow). LEDs under the 9th (input) port indicate link (green) and activity (yellow).

Because of the isolated power needed to comply with PoE standards and also to provide electrical isolation, use only the Hear Back PRO power supply provided.

The Distro's RJ45 pin-outs are the same as standard gigabit Ethernet RJ45 pin-outs, as shown below:

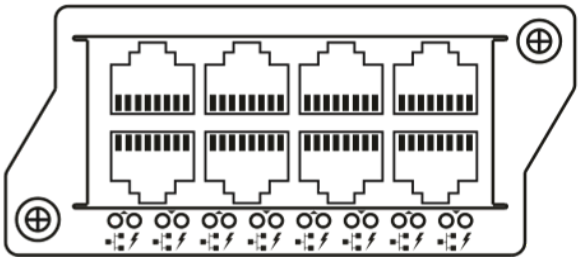
Pin	Pair	Description	Suggested Termination Color Scheme (568B***)
1	A+	Power over Ethernet (PoE) 48V**	White/Orange
2	A-	Power over Ethernet (PoE) 48V**	Orange
3	B+	Power over Ethernet (PoE) GND**	White/Green
4	C+		Blue
5	C-		White/Blue
6	B-	Power over Ethernet (PoE) GND**	Green
7	D+		White/Brown
8	D-		Brown

**Gigabit PoE uses a transformer on the data pairs to allow power and data to share the same pairs similar to how phantom power works on microphones.

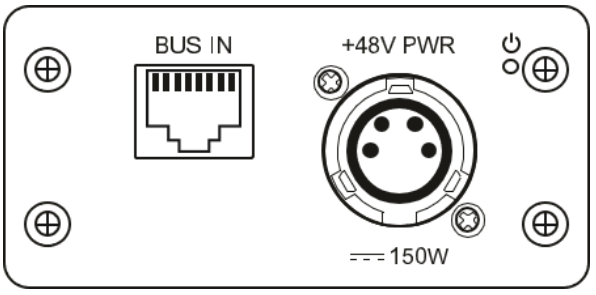
***Color Scheme 568A is also acceptable, but do not crossover from 568A to 568B.

Each output on the network card has a power supervisor circuit that will only power the port if a valid PoE device is detected. In the event of a shorted cable or broken device, the power supervisor circuit will disconnect the load, permitting other connected devices to function while protecting the power supply from the faulty output.

Diagrams



(8) RJ45 Output Connection Ports



Provides Data and Power

Advantages / Features

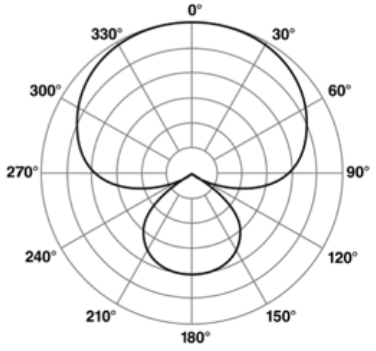
- Small form factor
- Heavy duty stage-worthy design
- Daisy-Chainable for unlimited network sizes
- 1 input, 8 outputs
- Works with any 10/100/1000 Base-T Ethernet equipment
- 30 watt PoE+ power on 8 output ports
- Auto-crossover on every port (no crossover cables needed)
- Energy Efficient Ethernet (EEE) disabled (interferes with network audio)

System Accessories

AM12 Ambient Microphone

12 inch condenser gooseneck mic with super cardioid pattern for use with Hear Back PRO Mixer as an ambient or intercom microphone.

The AM12 features 15 volt phantom power, 30Hz – 16kHz frequency response, and -40dB sensitivity.



Mixer Tilt Adapter

The Mixer Tilt Adapter is for all Hear Back Mixers adding a ball joint with 5/8" 27 male threading to any standard mic stand to get the perfect angle with 360° rotation and 180° tilt.

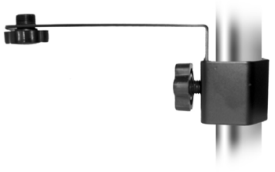
Cables

Hear Technologies offers a variety of quality cables that work with your system including CAT5e, CAT6, Insert, and Analog DA-88 style cables.

Microphone Stand Adapter

Mount the Hear Back Mixer to the side of any mic stand or standard music stand using the MSA Mic Stand Adapter.

This clamp-on adjustable width bracket attaches to the built-in 5/8" threaded socket located on the back of the Mixer.



Tote Back

This soft-side nylon carrying case is perfect for carrying (8) Hear Back Mixers or Switch Back M8RXes. It can also carry (4) Mixers and (1) Hub. Adjustable dividers allow you the freedom to customize the compartments.

Legal

Limited Warranty

Hear Technologies warrants the equipment against defects in materials and labor for a period of one year from the original date of purchase. The duration of this warranty is limited to claims made to Hear Technologies within the periods stated with respect to parts and labor from the date of purchase. During the warranty period, defective equipment will be replaced or repaired to the general condition as received, at the discretion of Hear Technologies.

All transportation is the responsibility of the purchaser or owner. Equipment should be shipped in the original shipping box.

This warranty applies only to defects in materials and workmanship and does not cover failure or damage due to shipping loss or damage, abuse, misuse, misapplication, incorrect or varying power line voltages, lack of proper maintenance, natural disasters, acts of God, or unauthorized modifications, repairs, or any alterations done without the expressed written consent by Hear Technologies. Hear Technologies shall not be liable for any loss of use of the equipment, or consequential damages, including damages to other parts of the installation in which the equipment is a part.

Hear Technologies does not make any warranty, express or implied, other than the warranty contained herein. No agent, representative, or employee has the authority to increase or alter the liability, obligations, and terms of this warranty or sale of the equipment.

> **NOTE**
>
> It is strongly recommended that any equipment returned to Hear Technologies be properly packaged and insured for its full value in case of loss, handling or shipping damage.

Hear Technologies shall not be responsible for damage or loss of equipment during shipment.

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