



**hear**  
TECHNOLOGIES®

# switch back M8RX™

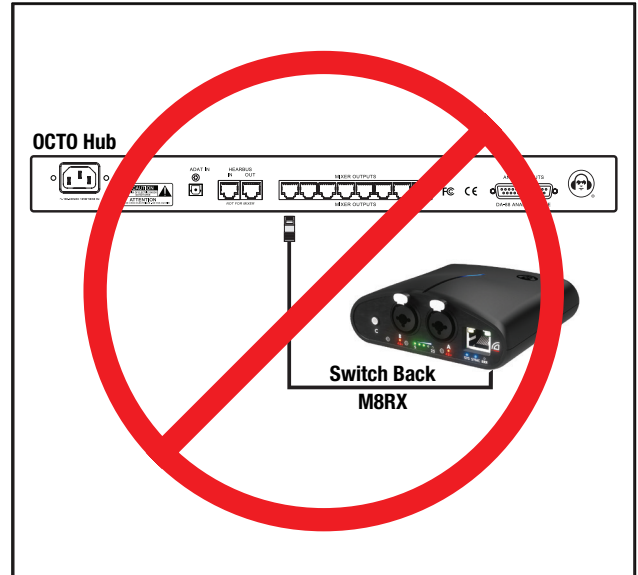
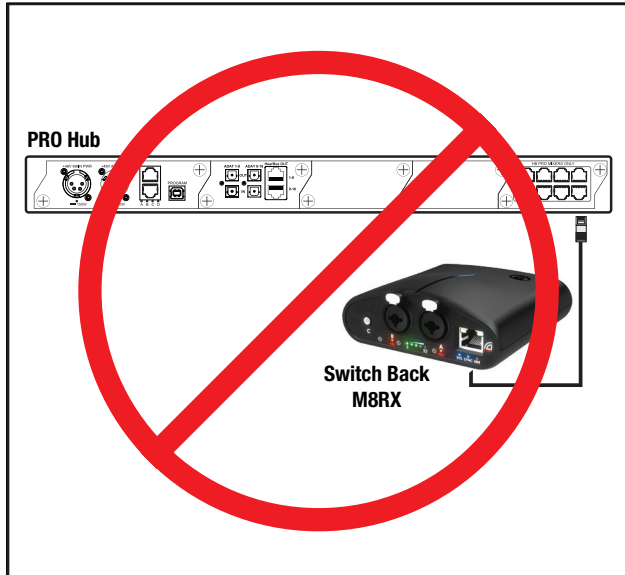
user guide

## NOTES ABOUT THE SYSTEM

- **DO NOT USE SHIELDED CAT6 CABLES.** Rebooting and ground loops will occur. Use only unshielded network cables.
- If the Mixer detects a headphone short, it will automatically mute the output in attempt to keep from damaging the headphones.

## WARNING

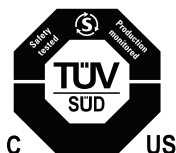
**DO NOT CONNECT M8RX TO A PRO HUB OR OCTO HUB. Damage to either system can occur!**



## 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.



# ENGLISH

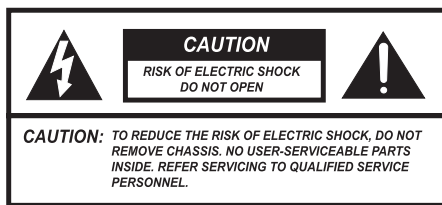
## Danger

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 inducing high sound pressure levels, such as this amplification system, be protected by hearing protectors while this unit is in operation.



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 impede 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.

# FRENCH

Danger

L'exposition a des niveaux eleves de bruit peut provoquer une perte permanente de l'audition. Chaque organisme humain reagit differemment quant a la perte de l'audition, mais quasiment tout le monde subit une diminution de l'acuite auditive lors d'une exposition suffisamment longue au bruit intense. Les autorites competentes en reglementation de bruit ont defini les expositions tolerees aux niveaux de bruits:

DURE EN HEURES PAR JOUR	8	6	4	3	2	1
NIVEAU SONORE CONTINU EN dB	90	93	95	97	100	103

Selon les autorites, toute exposition dans les limites citees ci-dessus, peuvent provoquer certaines pertes d'audition. Des bouchons ou protections dans l'appareil auditif ou sur l'oreille doivent etre portes lors de l'utilisation de ce systeme d'amplification afin de prevenir le risque de perte permanente de l'audition. Dans le cas d'expositions superieures aux limites precitees il est recommande, afin de se premunir contre les expositions aux pressions acoustiques elevees potentiellement dangeereuses, aux personnes exposees aux equipements capables de delivrer de telles puissances, tels ce systeme d'amplification en fonctionnement, de proteger l'appareil auditif.



CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE DE VOLTAGE DANGEREUX NON-ISOLE A L'INTERIEUR DE CE PRODUIT QUI PEUT ETRE DE PUISSANCE SUFFISAMMENT IMPORTANTE POUR PROVOQUER UN CHOC ELECTRIQUE AUX PERSONNES.



CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE D'INSTRUCTIONS D'UTILISATION ET DE MAINTENANCE DANS LES DOCUMENTS FOURNIS AVEC CE PRODUIT.

## IMPORTANTES INSTRUCTIONS DE SECURITE

1. Lire avec attention toutes les recommandations et precautions d'emploi avant d'utiliser ce produit.
2. Toutes les recommandations et precautions d'emploi doivent etre conservees afin de pouvoir s'y reporter si necessaire.
3. Lire et comprendre tous les avertissements enumerés dans les precautions d'emploi.
4. Suivre toutes les precautions d'emploi pour utiliser ce produit.
5. Ce produit ne doit pas etre utilise pres d'eau, comme par exemple baignoires, eviers, piscine, sous-sol humides...etc.
6. Utiliser exclusivement un chiffon sec pour nettoyer ce produit.
7. Ne bloquer aucune ouverture de ventilation. Ne pas placer le produit tout contre un mur ou dans une enceinte fermée, cela generait le flux d'air necessaire au refroidissement.
8. Ne pas placer le produit pres de toute source de chaleur telle que radiateurs, arrivees d'air chaud, fourneaux ou autres appareils generant de la chaleur (incluant les amplificateurs producteurs de chaleur).
9. Ne pas negliger la securite que procure un branchement polarise ou avec raccordement a la terre. Un branchement polarise comprend deux fiches dont l'une est plus large que l'autre. Un branchement a la terre comprend deux fiches plus une troisieme reliee a la terre. Si la fiche secteur fournie ne s'insert pas dans votre prise de courant, consulter un electricien afin de remplacer votre prise obsolete.
10. Protéger le cordon d'alimentation de tout ecrasement ou pincement, particulierement au niveau des fiches, des receptacles utilises et a l'endroit de sortie de l'appareil. Ne pas casser la fiche de terre du cordon d'alimentation.
11. Utiliser uniquement les accessoires specifiés par le constructeur.
12. Utiliser uniquement avec le chariot de transport, le support, le trépied, la console ou la table specifiés par le constructeur ou vendus avec l'appareil. Lors de l'utilisation d'un chariot, bouger avec precaution l'ensemble chariot/appareil afin d'éviter les dommages d'un renversement.
13. Débrancher cet appareil lors d'orages ou s'il n'est pas utilise pendant une longue periode.
14. Des precautions doivent etre prises afin qu'aucun objet ne tombe et qu'aucun liquide ne se repande a l'interieur de l'appareil par les orifices de ventilation ou n'importe quelle autre ouverture.
15. Pour toutes interventions techniques s'adresser a un technicien qualifié. L'intervention technique est necessaire lorsque l'appareil a été endommage de n'importe quelle façon, comme par exemple si le cordon secteur ou sa fiche sont detériorés, si du liquide a coulé ou si des objets sont tombés a l'interieur de l'appareil, si l'appareil a été expose a la pluie ou a l'humidité, s'il ne fonctionne pas normalement ou s'il est tombé.
16. ATTENTION: Pour réduire le risque d'incendie ou de choc électrique ne pas exposer l'appareil a la pluie ou a l'humidité.
17. L'appareil sera relie a un socle principal d'électricité muni d'une mise a terre protectrice.
18. Le cordon d'alimentation est utilisée comme dispositif de débranchement. Il restera aisément fonctionnelle et ne devrait pas être obstrué pendant l'utilisation prévue.
19. AVERTISSEMENT Pour raison de securite, cet appareil doit être solidement fixé a un rack selon les instructions d'installation.
20. Instruction d'installation détaillée a l'interieur du manuel d'utilisateur.

# 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.

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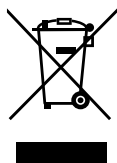
## WARNING

**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.

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## DECLARATION OF CONFORMITY

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

**Declares that the product:**

**Product Name:** Switch Back M8RX  
**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: March 1, 2018

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## 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.

The following are registered trademarks of Hear Technologies:  
Hear Technologies, Hear Back, Control Your Mix, Talk Back, Extreme Extender, Hearbuds, HearBus, and the “Jack” logo.  
All names and marks of other companies belong to those respective companies.



# switch back M8RX™



## OVERVIEW

The **Switch Back M8RX™** is a personal interface to be used for live sound or recording, and also a multi-channel headphone monitoring system. While compact in size, the M8RX gives individuals options to use it in multiple ways, such as a mini recording studio setup or a simple communication system.

The M8RX features a total of eight channels of audio mixing – two channels with studio-quality microphone preamps, two channels of line-level inputs, and four Dante network audio inputs/outputs. The M8RX's two mic preamps have a distortion spec below 0.001% along with zero-latency analog mixing and monitoring of the four analog inputs. With Ethernet capability becoming standard in most pro audio gear today, the M8RX includes a total of four channels of Dante network audio inputs/outputs. The sleek look and feel makes it perfect for clipping to a belt, mounting on a mic stand, or sitting on a table.

Along with the same high quality headphone amplifier as in the Hear Back PRO and OCTO systems, the M8RX has 5 watts of headphone power and can be connected to a computer via the Ethernet port using an external power injector. The M8RX utilizes PoE+ (Power-over-Ethernet+), which allows the unit to be powered over the same unshielded Cat6 cable used to transmit data.

## ADVANTAGES / FEATURES

- 4x4 Dante I/O (4 Dante Inputs and 4 Dante Outputs)
- Easy access to all volume controls on face of unit
- Compact, concentric volume knobs allow volume control of local inputs using the tip, and Dante inputs using the rings
- Master volume control for headphones
- True 48-volt phantom power remotely/locally selectable on each microphone input
- Burr-Brown 24-bit Delta-Sigma ( $\Delta\Sigma$ ) A/D converters
- Burr-Brown 24-bit enhanced multilevel delta-sigma ( $\Delta\Sigma$ ) D/A conversion
- Dual-color signal and peak indicators on each input channel
- Gain, phantom power, and Dante status indicators tucked away on rear of unit
- Streamlined cable connections on rear of unit
- Combo XLR & 1/4" TRS balanced inputs on channels 1 & 2 for connecting microphones or instruments
- Balanced 1/4" inputs automatically have 18dB of padding over XLR inputs
- 1/8" unbalanced stereo input for auxiliary sources such as metronome, iPod, external microphone preamp, etc.
- 100 BaseT Ethernet
- Powered by PoE+
- Locally selectable LED color on top for easy color-coding and identification



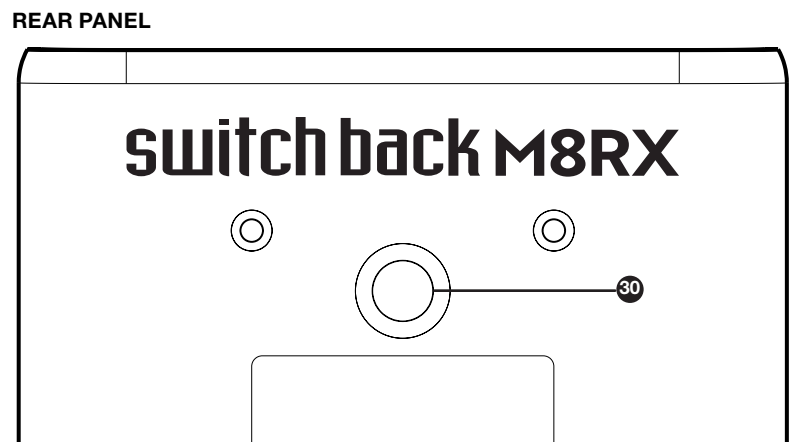
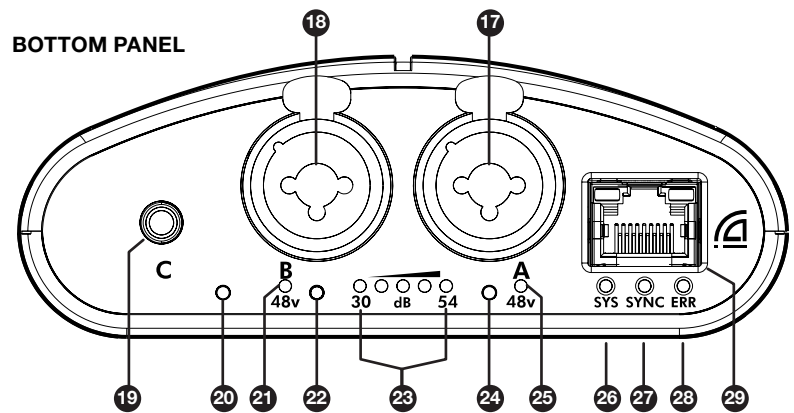
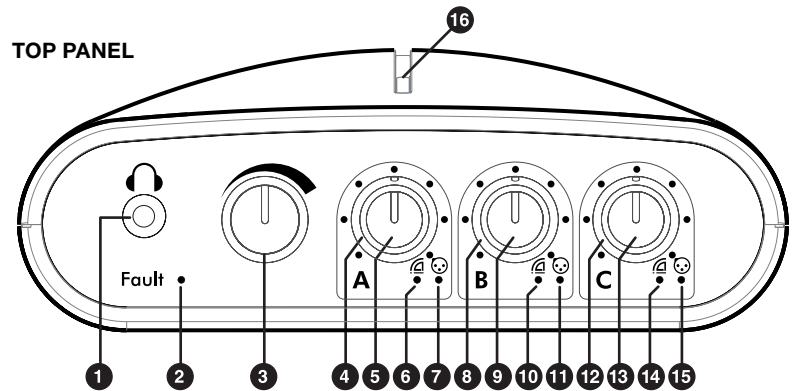
**MADE IN THE U.S.A.**

## SYSTEM STANDOUTS

- Two ultra-low noise studio-quality discrete microphone preamplifiers
- Locally adjustable microphone gain, in selectable increments between 30 and 54 dB
- Local volume control of up to 8 channels of audio (4 local analog inputs and 4 Dante digital inputs)
- 1/8" Stereo Input (input 3/4)
- Ultra-low distortion of 0.001% THD+N (even with 60 dB of gain on the microphone preamp!)
- PoE+ power guarantees ground isolation between M8RX interfaces
- Standard unshielded CAT6 cabling delivers power and Dante digital audio to each M8RX
- Zero latency headphone monitoring of the local analog inputs
- All 4 local analog input channels are made available on the Dante network as sources
- Small enough to be clipped on your belt (with the included belt clip) or mount on a stand using the built-in standard camera-tripod mount (1/4"-20 thread)
- Can use stand-alone (without a Dante network connection) as a small microphone preamp, analog mixer, and headphone amplifier (great as a more-me system)

## DETAIL DIAGRAM

- 1/8" Stereo Headphone Output
- Headphone Fault LED
- Master Volume
- Dante Input "A" Level
- Analog Input "A" Level
- Dante "A" Signal & Clip Status LED
- Analog "A" Signal & Clip Status LED
- Dante Input "B" Level
- Analog Input "B" Level
- Dante "B" Signal & Clip Status LED
- Analog "B" Signal & Clip Status LED
- Dante Input "C" Level (Stereo)
- Analog Input "C" Level
- Dante "C" Signal & Clip Status LED
- Analog Input "C" Signal & Clip Status LED
- User-changeable Multi-color LED (for identifying multiple M8RXs)
- Input "A" Balanced XLR or 1/4" Input
- Input "B" Balanced XLR or 1/4" Input
- Input "C" Unbalanced 1/8" Stereo Line Input
- Reset Switch
- Input "B" Phantom Power Indicator
- Input "B" Gain & Phantom Power Button
- Gain Indicator LEDs for Input "A" or "B"
- Input "A" Gain & Phantom Power Button
- Input "A" Phantom Power Indicator
- "SYS" Dante Status Indicator
- "SYNC" Dante Communication Indicator
- "ERR" Error Indicator
- Dante & PoE+ Power RJ45 for 100 BaseT Ethernet Connector (only use unshielded cables)
- 1/4"-20 Thread Standard Camera-Tripod Mount





## MIXER CONSTRUCTION

The Switch Back M8RX is constructed of UV-stabilized ABS and has a built-in standard camera tripod stand mount (1/4"-20 thread). A belt-clip with tripod threaded screw is included so that the M8RX can be attached and worn on a belt. Additionally, a tripod thread to microphone stand adapter (1/4"-20 to 5/8"-27) is also included to allow mounting on a microphone stand.

## STATUS INDICATORS

The M8RX has seven types of status indicators:

- FRONT COLOR-CHANGING LED 16** – A large color-changing indicator is provided to allow easy identification when multiple Switch Back M8RX interfaces are used in a setup. The color of this indicator is user-selectable by pressing both input buttons simultaneously for several seconds. This indicator will also automatically cycle through the color spectrum when booting and also when the identify function is triggered in the Dante Controller software.
- DANTE** – The Dante bus has three indicators that are bi-color. They are **BLUE** under normal operating conditions and **RED** alerting the user a problem exists. The **SYS 26** indicator is **BLUE** if at least one other Dante device is connected to the same network, otherwise it is **RED**. The **SYNC 27** indicator is **BLUE** if the internal clock circuitry is operating properly, otherwise it is **RED**. The **ERR 28** indicator is normally off. If there is a problem with the firmware or memory then the ERR indicator will turn **RED**.
- GAIN 23** – Five **GREEN** indicator LEDs located below and between the XLR input connectors will illuminate when one of the input buttons is pushed (located below each XLR input). These indicators display the current input sensitivity for each input from -54dBu to -30dBu for XLR microphone inputs (-36dBu to -12dBu for 1/4" inputs). These indicators will automatically turn off after a few seconds of pressing one of the input buttons.
- PHANTOM POWER 21 25** – a single **ORANGE** LED indicator is located below each XLR input with the label "48v" below it. When illuminated, 48 volts DC is present on XLR pins 2 and 3 with respect to pin 1. This provides power to any microphones requiring phantom power. This is toggled on or off by holding one of the input buttons for 2 seconds.
- AUDIO SIGNAL** – six indicator LEDs located below the input volume controls illuminate **BLUE** when signal is present and **RED** when the input is too strong and causing distortion. 3 of these indicators represent the **A 6**, **B 10**, and **C 14** Dante inputs (red Dante logo above each) and 3 of these represent the **A 7**, **B 11**, and **C 15** analog inputs (blue XLR logo above each).
- HEADPHONE AMPLIFIER FAULT 2** – The fault indicator is normally off and only illuminates **RED** if an over-current or short circuit condition occurs for a long enough period to cause overheating of the amplifier (100°C or 212°F). Continued use of the amplifier in a fault condition is not recommended as it can degrade the amplifier's performance and life.
- DANTE FAILSAFE BUTTON 20** – Accessible through a small hole using a paper clip or small screw driver. Only use this button if instructed by our technical support.

## CONTROLS

The M8RX has three different types of controls:

- INPUT VOLUME KNOB 5 9 13** – There are 3 input volume knobs labeled "A", "B", and "C". Each of these knobs has two parts that can be adjusted independently: a tip and a ring. The tip of each volume knob adjusts the level of each analog input located on the bottom of the M8RX. The ring of each volume knob adjusts the level of each Dante input which arrives over the Ethernet network connection. These can be assigned from any other Dante device on the network using the Dante Controller software. These volume knobs only adjust the audio level to the headphones, they do not affect the audio level sent to the Dante network.
- MASTER VOLUME KNOB 3** – The master volume is used to set the overall volume level of the headphone output.
- INPUT GAIN PUSH BUTTON 22 24** – Each button is located below its respectful channel's XLR inputs on the bottom of the M8RX. Pushing one of these buttons will display the current input gain for the chosen input on the 5 **GREEN** LED indicators 23 below and between the two XLR inputs. Every press of this button after the initial press will step the gain up or down one step. The gain first steps up until it gets to the top, and then it steps back down until it gets to the bottom and continues to repeat this pattern. Gain has input sensitivity adjustments from -54dBu to -30dBu for XLR microphone inputs (-36dBu to -12dBu for 1/4" inputs). Holding one of these push buttons for 2 seconds will toggle the phantom power for the input which is indicated by an **ORANGE** LED below the XLR input 21 25. Pushing and holding both of these buttons at the same time will cycle through colors on the front color-changing LED 16. These buttons can also be locked or unlocked (see page 4).

## INPUTS

The M8RX has three different types of inputs:

- BALANCED MONO INPUT** – The M8RX has two balanced mono inputs labeled "A" 17 and "B" 18. These inputs have a special "combo" connector that allows either a XLR microphone connector or a 1/4" TRS connector. The XLR input is designed for microphones and has adjustable input gain with sensitivity adjustments from -54dBu to -30dBu and a 48 volt phantom power supply that is selectable per input. The 1/4" input has an 18 dB pad and is designed for line-level and instrument inputs with input sensitivity adjustments from -36dBu to -12dBu. These two inputs can be monitored locally in the analog domain (zero latency) by turning up the tips of volume knobs "A" 5 and "B" 9 respectively. These inputs are also available on the Dante network as channels 1 and 2.
- UNBALANCED STEREO INPUT** – The M8RX has one unbalanced stereo input on a 1/8" TRS connector labeled "C" 19. This input is designed for line-level sources and has a fixed input gain sensitivity of -10dBu. This input can be monitored locally in the analog domain (zero latency) by turning up the tip of volume knob "C" 13. This input is also available on the Dante network as channels 3 (left) and 4 (right).
- DANTE DIGITAL INPUT** – The M8RX has 3 channels of digital audio inputs from the Dante network. These can be monitored using the rings on volume knobs "A" 4, "B" 8, and "C" 12. The first two inputs are mono and audio can be routed to them using the Dante Controller software on channels 1 and 2 of the M8RX. Dante input "C" is a stereo input and audio can be routed to it using the Dante Controller software on channels 3 (left) and 4 (right). Note: If Dante sampling rates 88.2kHz or 96kHz are used, only 2 channels of audio are supported: "A" and "B".

## CONNECTING THE SYSTEM

1. Connect the appropriate input(s), as shown in the hook-up diagram below.
2. Set all volume controls to “Off” (full counter-clock-wise position), connect the headphones or in-ear monitors.
3. Connect the M8RX to PoE+ power such as an in-line PoE+ power injector or PoE+ network switch using unshielded Cat6 cable (never use shielded Cat6 cables). The M8RX receives its power over the unshielded Cat6 cable. The Hear Technologies PRO Mixer Distro (Firmware Version V1.2) is a good choice for a PoE+ network switch. The M8RX can receive power on any pair of the unshielded Cat6 cable. Since the M8RX uses 100BaseT Ethernet, the pairs on pins 4/5 and 7/8 are unused and lend themselves for an easy way to implement a passive power supply. 48 volts DC can be applied to any pair and ground can be applied to any pair. The M8RX must receive 36 - 52 volts DC with a minimum of 320mA.
4. Adjust the level at the input source (microphone gain, Dante source, etc.) until the **RED** clip LED's on the M8RX just come on and then reduce the input(s) until you have a bright **BLUE** LED. NOTE: Adjust the source for as much signal as possible without clipping. Higher input levels improve signal-to-noise and dynamic range.
5. Mixer Adjustment: Once you have the signals optimized, turn the master volume to about 12 o'clock and then raise the desired input volumes. For best performance, avoid adjusting the master volume too high and running the inputs too low.

## LOCK OUT GAIN/PHANTOM POWER BUTTONS

Procedure to lock out Gain/Phantom Power Buttons:

1. Unplug power.
2. Press and hold BOTH blue push buttons (A and B) while inserting network cable to reapply power.
3. Once power is reapplied, release BOTH push buttons.
4. Press either blue button to lock or unlock the Gain/Phantom Power. The LED on the front of the M8RX will glow **RED** when LOCKED and **GREEN** when UNLOCKED.
5. Once set, it will take approximately 10 seconds for the M8RX to reboot (cycles through the color scheme).
6. To change settings again, repeat the steps above.

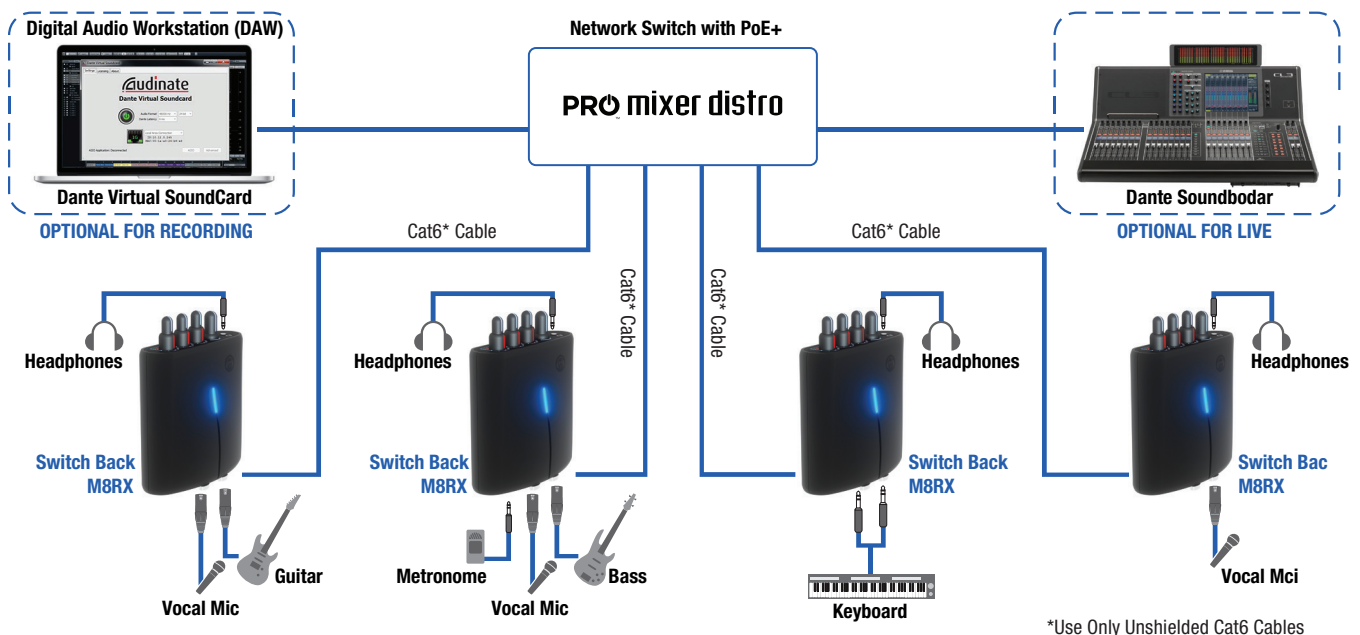
## HEADPHONE AMPLIFIER

When using multiple headsets, the total impedance should not go below 16 ohms. Optimum headphone amplifier performance is achieved with a load of 32 to 50 ohms. At 50 ohms, the amplifier is capable of sustaining 2 watts of power! 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. The amplifiers are short circuit protected and have a fault indicator.

### ⚠ WARNING

- **ALWAYS** turn down the “Master Volume” down before putting on in-ear headsets or headphones because the Switch Back M8RX is capable of driving most headphones to extreme levels that can damage your HEARING!
- It is the user's responsibility to prevent hearing damage by virtue of excessive headphone “Master Volume” settings.

## EXAMPLE HOOK-UP



\*Use Only Unshielded Cat6 Cables

## DANTE NETWORK

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 just barely scratch the surface of Dante's capabilities. The creators of Dante know their protocol better than anyone!*

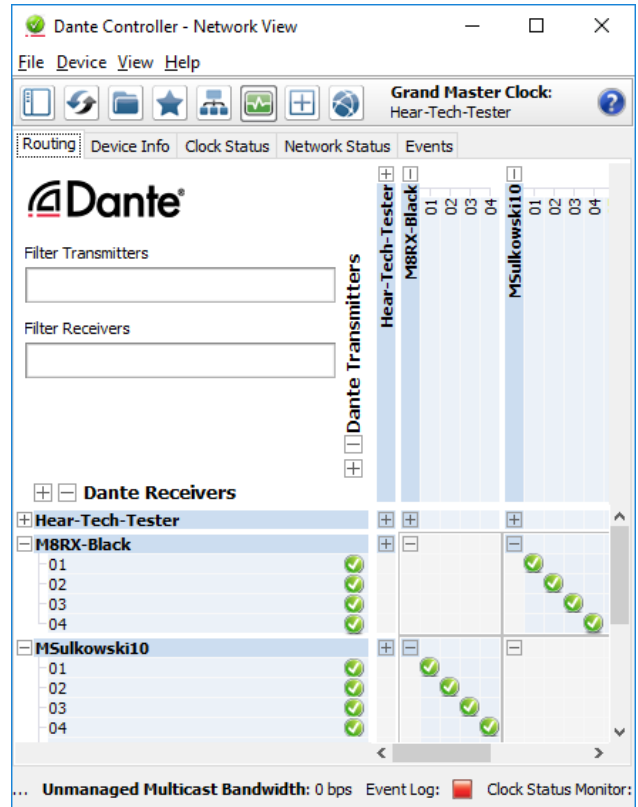
Please visit [www.audinate.com](http://www.audinate.com) for a vast wealth of training videos, example setups, and documentation.

Our Switch Back M8RX connects four channels of simultaneous audio input and output with other Dante enabled equipment using a standard Ethernet network connection and unshielded Cat6 cabling. Dante will work with standard network switches and routers and is safe to combine with your existing computer network, if necessary. 100BaseT network speed is supported. The M8RX supports four channels of inputs and outputs at sampling rates of 44.1kHz or 48kHz and two channels of inputs and outputs at sampling rates of 88.2kHz or 96kHz.

A Dante network requires at least two devices that support the Dante protocol and a single unshielded Cat6 network connection between the two devices. 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](http://www.audinate.com)) in order to configure audio channel routing. You must choose what you want to send to each of the four channels of the M8RX and also if you want to route any of the audio from the 4 inputs of the M8RX to any other Dante device. Whatever is assigned to channels one through four in the Dante Controller software is what will show up on channels A, B, and C on the M8RX. A and B are mono channels and C is a stereo channel.

After configuration, the computer can be disconnected. To connect the PC or Mac, you can connect the computer's Ethernet cable directly into the M8RX (using an in-line PoE+ power injector to power the M8RX) or into a PoE+ network switch to which the other Dante devices are also connected.

## DANTE CONTROLLER SOFTWARE



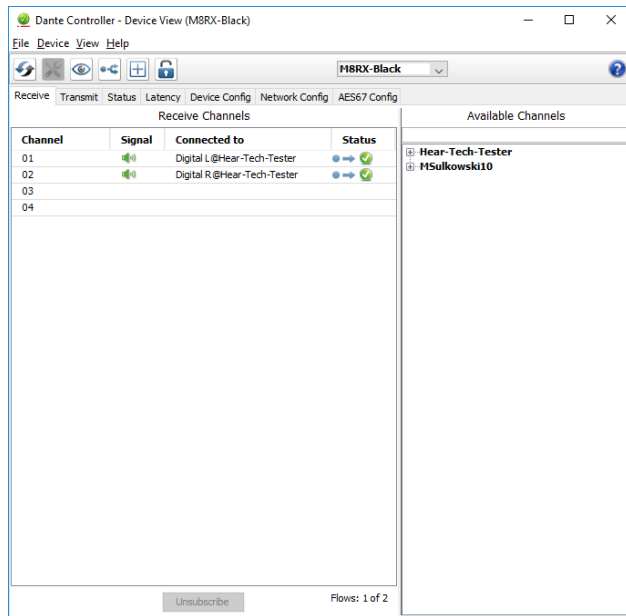
Above is an example of routing audio in the Dante Controller software. Dante devices appear along the top (audio transmitters) and along the left side (receivers). Sampling rates must be set the same on each device before you can route audio from a transmitter to a receiver. Green check marks indicate a route from a transmitter to a receiver. Changes made here are non-volatile and will remain even if the software is closed and power is removed from the Dante devices.

## DEVICE VIEW

If you double click on a device on the routing screen, a **Device View** window will appear. Below is an example of this window.

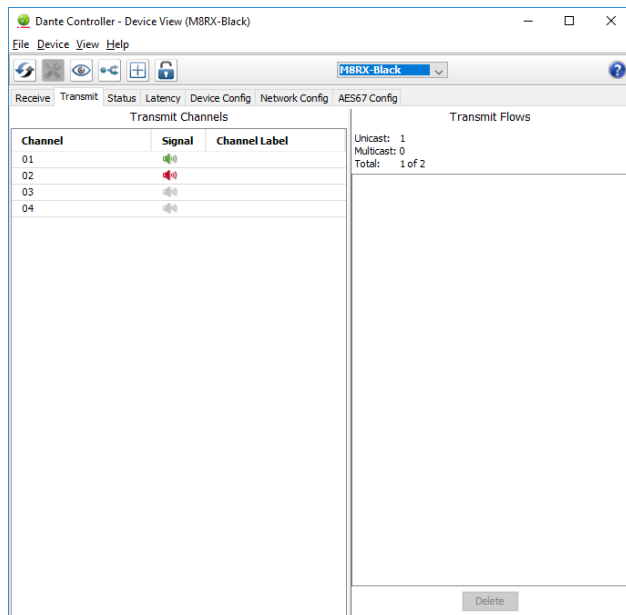
### RECEIVE

The first tab shows the **Receive** sources. This is a good way to see what is currently routed to a M8RX and see the status and audio signal status. This is good for troubleshooting.



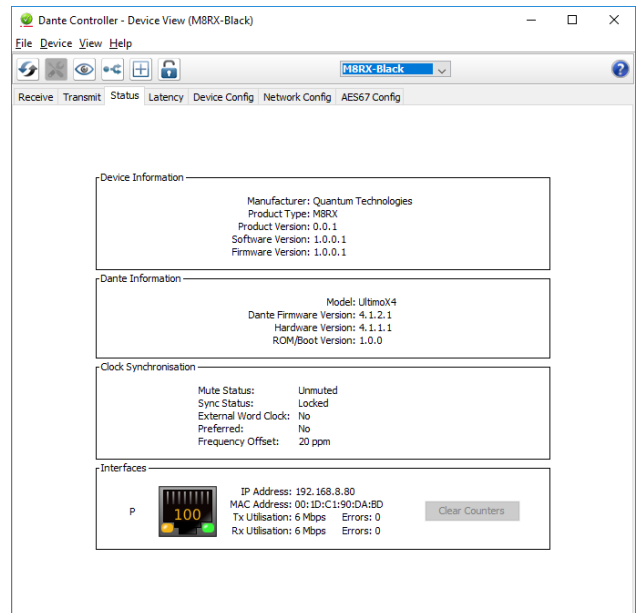
### TRANSMIT

The next tab on the Device View window is the **Transmit** tab. Below is an example of this window. Here you can see the audio signal status. This is also great for troubleshooting.



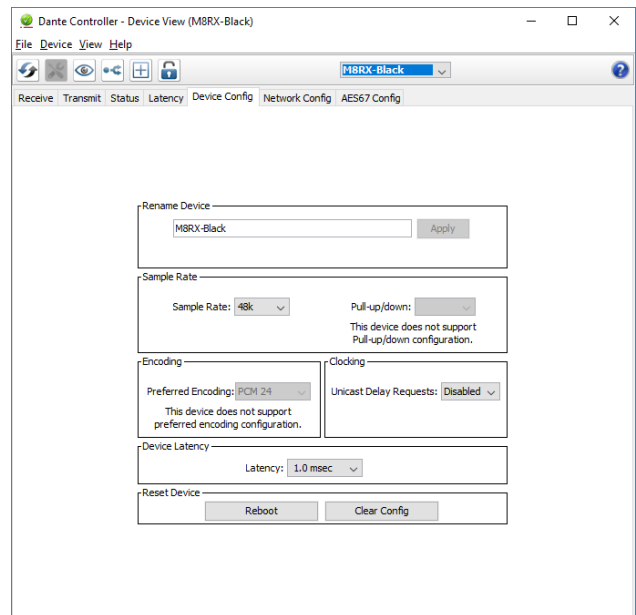
## STATUS

The next tab on the Device View window is the **Status** tab. Below is an example of this window. Here you can see the current version of Dante firmware, clock status and network status.

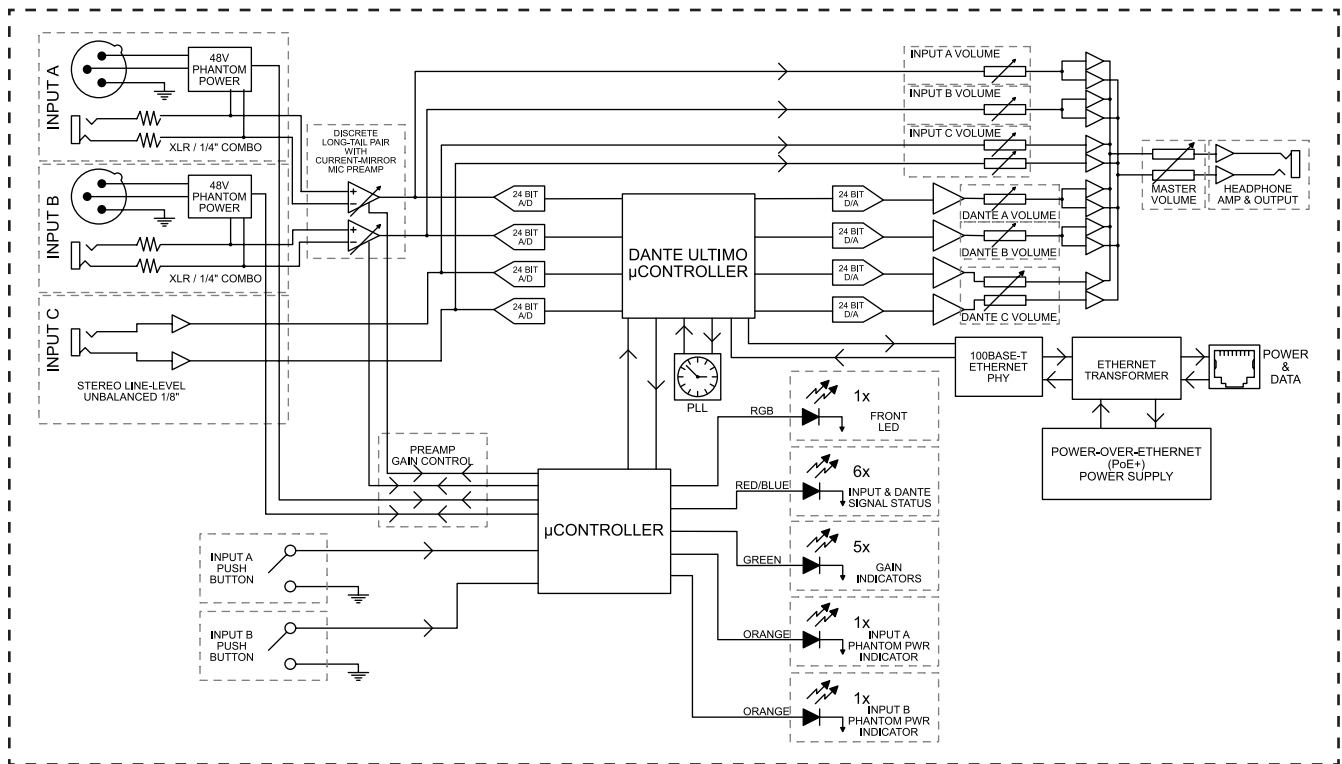


## DEVICE CONFIG

The **Device Config** tab on the Device View window is shown below and this is where you can change the name of the Dante device and also the sampling rate. All devices must be set to the same sampling rate before you can route audio from a transmitter to a receiver. If the sampling rate needs to change, you must change it on all devices individually.



## SYSTEM BLOCK DIAGRAM



## TROUBLESHOOTING AND OPERATING TIPS

No Signal for Analog Input	<ul style="list-style-type: none"> <li>• Verify M8RX has power (front LED illuminated).</li> <li>• Check input connections, input gain (in input is “A” or “B”), input volume controls, and master volume control.</li> <li>• Check output devices, headphones, wireless transmitter/receiver, monitor amplifiers, etc.</li> <li>• Test input source and output device with other known good equipment to rule out the fault through a process of elimination.</li> </ul>
No Signal for Dante Input	<ul style="list-style-type: none"> <li>• Check the Dante audio signal present LED below the volume knob on the M8RX and verify volume knob and master volume knob are turned up enough.</li> <li>• Check routing in the Dante Controller software and make sure there are green check marks on the M8RX receive channels to indicate that a source is routed.</li> <li>• If there are red circle-backslash symbols on the M8RX Dante receive channels in Dante Controller, verify that the M8RX and the source you are trying to send are set to the same sampling rate. (Dante devices do not follow sampling rate changes. You must change the sampling rate on all devices individually in Dante Controller).</li> <li>• If there are yellow exclamation symbols on the M8RX Dante receive channels in Dante Controller, this indicates that the source is missing from the Dante network. Verify source network connectivity and power. Try rebooting the source device.</li> </ul>
Input “C” is only coming out of one ear	<ul style="list-style-type: none"> <li>• Input “C” is a stereo input, you must feed audio into both channels.</li> <li>• If you are using the 1/8” Analog input “C”, you must use a 3 conductor 1/8” connector (TRS) and there must be signal on both the tip and the ring. The tip is the left ear and the ring is right ear.</li> <li>• If you are using the Dante input “C”, you must route audio to both channel 3 and 4. Channel 3 is the left ear and channel 4 is the right ear.</li> </ul>
Power goes out and comes back on when volume is turned up	<ul style="list-style-type: none"> <li>• The M8RX requires 15 watts of power. If you are using a PoE power supply that is not PoE+ it will typically turn off the power to the port that the M8RX is plugged into whenever it exceeds 13 watts. You must make sure to use PoE+ network switches and power injectors to power the M8RX.</li> </ul>
The headphone amplifier fault indicator is on.	<ul style="list-style-type: none"> <li>• The fault indicator indicates either a short circuit or excessive load.</li> </ul>
Unable to route audio in Dante Controller	<ul style="list-style-type: none"> <li>• Verify that the M8RX and the source you are trying to send are set to the same sampling rate. The M8RX can only receive audio from 2 different Dante devices (2 different receive streams).</li> </ul>
Front LED blinks red constantly	<ul style="list-style-type: none"> <li>• This indicates a communication problem between the Audinate Ultimo processor that handles the Dante audio and the microcontroller that processes the gain and handles the push buttons and status LEDs. Try rebooting the M8RX. If the problem persists, please contact technical support.</li> </ul>
Hum or buzz in audio	<ul style="list-style-type: none"> <li>• Ensure you are not using shielded Cat6 cables. Use only unshielded Cat6 for M8RX ethernet connections.</li> </ul>
Mixers reboot when others are plugged in	<ul style="list-style-type: none"> <li>• Use only unshielded Cat6 for connecting M8RX ethernet to the network. Do not use shielded Cat6 cables.</li> </ul>

## TECHNICAL SPECIFICATIONS

### Inputs A & B (available on Dante network as channels 1&2)

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Mic Input Configuration:	Mono, Balanced XLR
Mic Input Frequency Response:	10Hz - 120kHz +/-0.5dB (analog input to headphone output)
Mic Input THD+N:	0.001% @ 150mV input
Mic Input IMD:	0.004% @ 150mV input
Mic Input X-TALK:	-86dBu @ 150mV input
Mic Input Sensitivity:	-64dBu (gain at max), -30dBu (gain at min)
Line Input Frequency Response:	10 Hz - 120kHz +/-0.5dB (analog input to headphone output)
Line Input THD+N:	0.001% @ 1V input
Line Input IMD:	0.004% @ 1V input
Line Input X-TALK:	-91dBu @ 1V input
Line Input Sensitivity:	-13dBu (gain at max), +20dBu (gain at min)

### Input C (available on Dante network as channels 3&4)

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Input Configuration:	Stereo, Unbalanced 1/8" TRS
Input Frequency Response:	10Hz - 120kHz +/-0.5dB (analog input to headphone output)
Input THD+N:	0.005% @ 200mV input
Input IMD:	0.015% @ 200mV input
Input X-TALK:	-70dBu @ 200mV input
Input Sensitivity:	-10dBu (fixed gain)

### Headphone Power (per channel)

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Load Impedance:	THD less than 0.01%*
8 Ohms:	1.2W
16 Ohms:	1.6W
25 Ohms:	2.0W
32 Ohms:	1.8W
50 Ohms:	1.5W
100 Ohms:	1.1W
200 Ohms:	500mW
600 Ohms:	220mW
Inter Modulation Distortion:	Typically less than 0.02%

### System Noise Performance

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Noise, A-Weighted:	-97 dBu
Dynamic Range:	122 dB

### Physical

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Size:	5.5" H x 4.45" W x 1.625" D (13.97 cm H x 11.30 cm W x 4.13 cm D)
Unit Weight:	9.5 oz. (0.27 kg)
Mounting:	Standard camera tripod thread (1/4" 20 threads per inch), belt clip, or desk mounted

### Power

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Power Requirements:	PoE+ 36-52 VDC, 15 Watts max**
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### Cabling

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Use only unshielded Cat6 cables for network connections.

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\*Note: 0 dBu = 0.775 Vrms. Specifications and features subject to change without notice.

\*\*Provided by Hear Technologies PRONET or equivalent network switch with PoE+ capability.

If you need technical assistance, feel free to contact **Hear Technologies** technical support by phone at +1-256-922-1200 or visit our web site at <http://www.HearTechnologies.com>.





## SYSTEM ACCESSORIES

### PRO MIXER DISTRO

- Allows a single CAT6 cable to be run from a Hear Back PRO Hub to the stage/studio where the PRO Mixers are located.
- Provides (8) RJ45 gigabit Ethernet ports with power for connecting Hear Back PRO Mixers, Hubs, or Distros. A ninth input port is included for connecting to the HBUS out of Hubs or other Distros (unlimited daisy-chaining possible).
- Pre-loaded with a network card already (PRONET) so you can use your existing network card from your Hear Back PRO Hub.
- Also functions as a rugged PoE+ gigabit network switch for Dante, Waves SoundGrid, or any other Ethernet application including our Switch Back M8RX (see page 21).
- Durable anodized housing available in black or silver finish.
- Not compatible with original Hear Back or OCTO Mixers.



### POE POWER INJECTOR

- The POE Power Injector provides 18 watts of 48 volt PoE+ power @ 375ma.
- The supply is universal, and can handle voltage inputs anywhere from 90 to 264 VAC, 50 or 60Hz.
- Includes (1) Universal Power Supply, (1) Power Cord, and (1) RJ45 Breakout Cable (standard T-568-B pinout).



### TOTE BACK

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





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