DDR-16/32 AES67 Receiver/DAC

Installation and Operating Guide

Version 0.91

Effective Date: January 2020
Document # 9301H85300

Amplifier Technologies Inc.
1749 Chapin Road, Montebello, CA 90640
USA

GENERAL SAFETY WARNINGS AND GUIDELINES

AVERTISSEMENTS ET DIRECTIVES GÉNÉRALES DE SÉCURITÉ

Please Read First

CAUTION: To reduce the risk of electrical shock, do not remove the cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.

ATTENTION: Pour réduire le risque de choc électrique, ne retirez le couvercle (ou l'arrière). Aucune pièce réparable par l'utilisateur à l'intérieur.
Confiez l'entretien à un technicien qualifié.

WARNING: To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

VERTISSEMENT: Pour réduire le risque d'incendie ou de choc électrique,
n'exposez pas cet appareil à la pluie ou à l'humidité.

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation maintenance (servicing) instructions in the literature accompanying the appliance.

Le flash avec pointe de flèche, dans un triangle équilatéral, est destiné à alerter l'utilisateur de la présence d'une "tension dangereuse" non isolée dans l'enceinte du produit qui peut être d'une amplitude suffisante pour constituer un risque de choc électrique pour les personnes.

Le point d'exclamation dans un équilatéral triangle est destiné à alerter l'utilisateur de la présence d'une opération importante instructions de maintenance (entretien) la documentation accompagnant l'appareil.

- This device is intended for indoor use only.
- Cet appareil est destiné à une utilisation en intérieur uniquement.
- Do not expose this device to water or moisture of any kind. Do not place drinks or other containers with moisture on or near the device. If moisture does get in or on the device, immediately unplug it from the power outlet and allow it to fully dry before reapplying power.
- N'exposez pas cet appareil à l'eau ou à l'humidité d'aucune sorte. Ne placez pas de boissons ou autres récipients humides sur ou à proximité de l'appareil. Si de l'humidité pénètre dans ou sur l'appareil, débranchez-le immédiatement de la prise de courant et laissez-le sécher complètement avant de remettre l'appareil sous tension.
- Do not touch the device, the power cord, or any other connected cables with wet hands.
- Ne touchez pas l'appareil, le cordon d'alimentation ou tout autre câble connecté avec les mains mouillées.
- Do not expose this device to excessively high temperatures. Do not place it in, on, or near heat sources, such as a fireplace, stove, radiator, etc. Do not leave it in direct sunlight.
- N'exposez pas cet appareil à des températures excessivement élevées. Ne le placez pas dans, sur ou près de sources de chaleur, comme un foyer, une cuisinière, un radiateur, etc. Ne le laissez pas en plein soleil.
- This device ventilates excessive heat through the slots and openings in the case. Do not block or cover these openings. Ensure that the device is in an open area where it can get sufficient airflow to keep from overheating.

- Cet appareil évacue une chaleur excessive à travers les fentes et les ouvertures du boîtier. Ne bloquez pas et ne couvrez pas ces ouvertures. Assurez-vous que l'appareil est dans une zone ouverte où il peut obtenir un flux d'air suffisant pour éviter la surchauffe.
- Do not place or install this device in an area where it can be exposed to excessive amounts of dust, humidity, oil, smoke, or combustible vapors.
- Ne placez pas ou n'installez pas cet appareil dans une zone où il peut être exposé à des quantités excessives de poussière, d'humidité, d'huile, de fumée ou de vapeurs combustibles.
- Prior to operation, check the unit and power cord for physical damage. Do not use if physical damage has occurred.
- Avant utilisation, vérifiez que l'unité et le cordon d'alimentation ne sont pas endommagés physiquement. Ne pas utiliser en cas de dommages physiques.
- CAUTION: FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE AND RATING OF FUSE.
- ATTENTION: POUR UNE PROTECTION CONTINUE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR LE MÊME TYPE ET LA QUALITÉ DES FUSIBLES.
- This equipment is not suitable for use in locations where children are likely to be present.
- Cet équipement n'est pas adapté à une utilisation dans des endroits où des enfants sont susceptibles d'être présents.
- Take care to prevent damage to the power cord. Do not allow it to become crimped, pinched, walked on, or become tangled with other cords. Ensure that the power cord does not present a tripping hazard.
- Prenez soin de ne pas endommager le cordon d'alimentation. Ne le laissez pas se froncer, pincer, marcher ou s'emmêler avec d'autres cordons. Assurez-vous que le cordon d'alimentation ne présente pas de risque de trébuchement.
- Before plugging the unit into a power outlet, ensure that the outlet provides the same type and level of power required by the device.
- Avant de brancher l'appareil dans une prise de courant, assurez-vous que la prise fournit le même type et niveau d'alimentation requis par l'appareil.
- This device uses a grounded power cord and requires a ground connection for safe operation. Ensure that the power source has a proper ground connection. Do not modify the plug or use a "cheater" plug to bypass the ground connection.
- Cet appareil utilise un cordon d'alimentation mis à la terre et nécessite une connexion à la terre pour un fonctionnement sûr. Assurez-vous que la source d'alimentation est correctement raccordée à la terre. Ne modifiez pas la fiche et n'utilisez pas de fiche "tricheur" pour contourner la connexion à la terre.
- Ensure that power is turned off and disconnected before making any electrical connections.
- Assurez-vous que l'alimentation est coupée et déconnectée avant de faire des connexions électriques.
- Do not plug this device into the switched output of a preamplifier or other audio component. *Power Amplifiers only:* This amplifier requires higher current levels than these devices are designed to handle.
- Ne branchez pas cet appareil sur la sortie commutée d'un préamplificateur ou autre composant audio. *Amplificateurs de puissance uniquement:* cet amplificateur nécessite des niveaux de courant plus élevés que ceux que ces appareils sont conçus pour gérer.
- Unplug this device from the power source when not in use.
- Débranchez cet appareil de la source d'alimentation lorsqu'il n'est pas utilisé.
- Never unplug the unit by pulling on the power cord. Always grasp the connector head or adapter body.
- Ne débranchez jamais l'appareil en tirant sur le cordon d'alimentation. Saisissez toujours la tête du connecteur ou le corps de l'adaptateur.
- Clean using a soft, dry cloth only. Do not use chemical cleaners, solvents, or detergents.
- Nettoyez uniquement avec un chiffon doux et sec. N'utilisez pas de nettoyants chimiques, de solvants ou de détergents.
- This device has no user serviceable parts. Do not attempt to open, service, or modify this device.

- Cet appareil ne contient aucune pièce réparable par l'utilisateur. N'essayez pas d'ouvrir, de réparer ou de modifier cet appareil.

Notices

This product contains software proprietary to Amplifier Technologies Inc. and protected by US and International copyright law. Unauthorized reproduction or disclosure, in whole or in part, is strictly prohibited.

WARRANTY/LIMITATION OF LIABILITY

EXCEPT FOR THE LIMITED WARRANTY PROVIDED HEREIN, THIS PRODUCT IS PROVIDED "AS IS" AND WITHOUT WARRANTY OF ANY KIND. AMPLIFIER TECHNOLOGIES INC. EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AMPLIFIER TECHNOLOGIES INC. DOES NOT WARRANT THAT THIS PRODUCT WILL MEET USER'S REQUIREMENTS, OR THAT THE OPERATION OF THIS PRODUCT WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT DEFECTS IN THIS PRODUCT WILL BE CORRECTED. UNDER NO CIRCUMSTANCES, INCLUDING NEGLIGENCE, SHALL AMPLIFIER TECHNOLOGIES INC, OR ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS, BE LIABLE TO USER FOR ANY INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, AND THE LIKE) ARISING OUT OF THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT OR RELATED DOCUMENTATION.

Copyright

Document No. 9301H85300

December 2020

Record of Changes

Manual Version / Date	Description
0.91 / January 2020	Preliminary version

Regulatory Notices

EMI NOTICE

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications compliance statement:

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de conformité aux normes du ministère des Communications du Canada:

Cet Equipment ne dépasse pas les limites de Classe A D'émission de bruits radioélectriques pour les appareils numériques telles que perscrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entrainer le brouillage des réceptions radio et télévision, ce qui obligerait le propriétaire ou l'operateur a prendre les dispositions nécessaires pour en éliminer les causes.

Limited Warranty

Datasat Digital Entertainment software is warranted against defects for a period of 90 days from the date of the original purchase. DDR-16/32 hardware is warranted against defects in material and workmanship for a period of one year from the date of the original purchase. This warranty includes parts and labor.

THIS WARRANTY EXCLUDES UNITS THAT HAVE BEEN MODIFIED, REPAIRED BY UNAUTHORIZED PERSONNEL, OR DAMAGED BY ABUSE, IMPROPER OPERATION, DIRT, MOISTURE OR STATIC ELECTRICITY. PROPER OPERATION OF THIS EQUIPMENT REQUIRES THE USE OF A SURGE PROTECTOR. SUPPLYING POWER TO THE DDR-16/32 UNIT WITHOUT THE USE OF A PROPERLY FUNCTIONING SURGE PROTECTOR WILL VOID THIS WARRANTY.

Using an uninterruptible power supply (UPS) is highly recommended.

Products being returned under warranty should be sent to Datasat Digital Entertainment freight prepaid in the original or equivalent packaging. Please contact Datasat Digital Entertainment prior to shipping any parts or merchandise to receive a Return Merchandise Authorization number. Datasat Digital Entertainment's shipping address is:

Datasat Digital Entertainment
Attn: RMA #
4596 Ish Drive #210
Simi Valley, CA 93063
U.S.A.

Product Improvements and Upgrades

Datasat Digital Entertainment reserves the right to make changes and/or improvements to its products, without notification and without incurring any obligation to incorporate such changes or improvements in products previously sold or shipped.

To receive notification about upgrades or bulletins that may become available from time to time, please complete the enclosed Warranty Card and mail or fax it to Datasat Digital Entertainment.

Contact Information

To contact Datasat Digital Entertainment's Technical Support staff:

Telephone: +1.818.401.4253 or toll free in USA and Canada: 1(888) 428-2268

Customer Service: customerservice@ati-amp.com
Technical Support: techsupport@ati-amp.com

Thank you for choosing Datasat Digital Entertainment!

Software License Agreement

IMPORTANT: READ THIS SOFTWARE LICENSE ("LICENSE") CAREFULLY BEFORE USING THE DATASAT DIGITAL ENTERTAINMENT SOFTWARE. THE SOFTWARE RESIDING ON THE DDR-16/32 AES67 RECEIVER/DAC AND ANY ACCOMPANYING MATERIALS (COLLECTIVELY, THE "SOFTWARE") ARE LICENSED, NOT SOLD. BY USING THE DDR-16/32 AES67 RECEIVER/DAC, YOU ARE ACCEPTING AND AGREEING TO THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, DO NOT USE THE DDR-16/32 AES67 RECEIVER/DAC.

1. Grant. Subject to your compliance with the terms of this License, Datasat Digital Entertainment hereby grants you a non-exclusive, non-transferable, revocable, limited license to use the Software solely for your internal business purposes and solely in connection with the DDR-16/32 AES67 receiver/DAC. All rights not expressly granted to you are reserved by Datasat Digital Entertainment.
2. Ownership. All right, title and interest in and to the Software, all physical copies thereof and all intellectual property embodied therein are and shall remain vested in Datasat Digital Entertainment. You do not own the Software, physical copies thereof or any intellectual property embodied therein.
3. Restrictions. You may not (i) copy, distribute, sublicense, lease, transfer or use for external purposes the Software; (ii) reverse engineer, decompile, disassemble, translate, modify, attempt to reveal the source code of the Software, or (iii) create derivative works from the Software.
4. Termination. Datasat Digital Entertainment may terminate this license at any time if you violate the terms of this license. Upon termination, you must destroy the Software and related documentation.
5. **LIMITATION ON WARRANTY.** YOU EXPRESSLY ACKNOWLEDGE AND AGREE THAT USE OF DATASAT DIGITAL ENTERTAINMENT SOFTWARE AND HARDWARE IS AT YOUR SOLE RISK. DATASAT DIGITAL ENTERTAINMENT DOES NOT WARRANT THAT THE OPERATION

OF THE SOFTWARE OR THE HARDWARE WILL BE UNINTERRUPTED OR ERROR FREE. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE DATASAT DIGITAL ENTERTAINMENT SOFTWARE AND HARDWARE PROVIDED "AS IS," WITH ALL FAULTS AND WITHOUT WARRANTY OF ANY KIND, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSES, AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

6. **LIMITATION OF LIABILITY.** UNDER NO CIRCUMSTANCES, INCLUDING, WITHOUT LIMITATION, NEGLIGENCE, SHALL DATASAT DIGITAL ENTERTAINMENT OR ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR PERSONAL INJURY, OR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, LOSS OF DATA, BUSINESS INTERRUPTION OR ANY OTHER COMMERCIAL DAMAGES OR LOSSES, ARISING OUT OF OR RELATED TO YOUR USE OF THE DATASAT DIGITAL ENTERTAINMENT SOFTWARE OR HARDWARE, HOWEVER CAUSED, REGARDLESS OF THE THEORY OF LIABILITY AND EVEN IF DATASAT DIGITAL ENTERTAINMENT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL DATASAT DIGITAL ENTERTAINMENT'S LIABILITY EXCEED THE AMOUNT PAID TO DATASAT DIGITAL ENTERTAINMENT. SOME STATES DO NOT ALLOW THE LIMITATION AND/OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

7. General. This License shall be governed by the laws of the State of California as applied to contracts performed wholly therein. In any action brought by either party arising out of this License, the prevailing party shall be entitled to recover its reasonable attorney's fees and costs. If any provision of this License is held by a court of competent jurisdiction to be unenforceable or if a provision of this License is waived by either party, the remainder of this License shall remain in full force and effect. You may not assign this License without the prior, express written consent of Datasat Digital Entertainment.

TABLE OF CONTENTS

Introduction

This manual explains the DDR-16/32 AES67 Receiver/DAC setup and operation. It contains full instructions for installing hardware and software, setting up audio playback and configuring the system.

The DDR-16/32 AES67 Receiver/DAC converts up to 24 channels of AES67 audio formatted signal to up to 32 channels of balanced analog audio output. Output connector wiring is in Tascam format. It can accept input streaming at 48kHz for 24 channels.

The DDR-16/32 is available in two configurations:

- 16 Channel output DAC (DDR-16)
- 32 Channel output DAC (DDR-32).

For output, any combination of DDR-16/32 output channels may be selected, and can have crossovers set.

The rear panel Ethernet: Status/Control connector provides access to status, control and setup functions thru a computer, using an internet browser.

The DDR-16/32 is designed to work seamlessly with the Datasat AP25 Audio Processor when the optional H790 AES67 output card is installed. The H790 card supports streaming of up to 16 channels at 96kHz, and 24 channels at 48kHz. The H790 card also provides additional output channel mapping over the Ethernet connection (24 channels total) for use in Bi-amping / Tri-amping, or to add additional speakers to existing input channels. Please see appendix C for more information on the H790 card.

To get the most out of your DDR-16/32, we suggest that you review this manual and keep it available during system installation and initial operation.

The DDR-16/32 utilizes Momentum Data Systems (MDS) EQ3-AoIP (Audio over IP) technology.

NOTE: Technical adjustments should only be performed by a qualified theater technician. The appendices provide detailed information for the theater technician.

1.0 Installation

1.1 Unpacking System Components

The packaging is designed to handle normal shipping and handling. Upon receipt of shipment, check for signs of damage before opening and report all damage to the carrier. All shipments made from Datasat Digital Entertainment are customer responsibility once they leave our premises.

Before installation begins, we suggest that a complete inventory be taken to minimize problems or questions during installation. Additionally, save all packing material until installation is complete in the unlikely event that a component(s) requires return to the factory. Use the packing slip that came with your unit to verify received inventory.

1.2 Chassis Rack Mounting and Connection

The DDR-16/32 chassis requires 2U of standard rack space for proper mounting.

⚠ **Caution:** Because power line surges can damage the DDR-16/32, we require the use of a properly functioning computer-grade surge /spike suppressor. We also recommend using an uninterruptible power supply (UPS).

⚠ **Device Disconnect:** The power outlet shall be installed near the equipment and shall be easily accessible, in order to quickly disconnect power.

1. Install the DDR-16/32 into the audio rack, securing it properly with rack screws.
2. Connect the DDR-16/32 to other equipment (see appendix: A Connector Pinouts).
3. Connect the supplied power cable between the DDR-16/32 unit and the AC mains source.

1.2.1 Rack Mount Recommendations

Follow these recommendations if the DDR-16/32 unit will be installed in a closed or multi-unit rack assembly.

- Determine the maximum and ambient temperatures within the rack, since they may be greater than the maximum and ambient temperatures in the room. The maximum temperature for the equipment in a closed or multi-rack assembly is 40°C (104F°)
- Ensure adequate airflow for cooling purposes on all sides of rack-mounted equipment.
- Check nameplate ratings to ensure there is no overloading of supply circuits that could have an effect on over-current protection and supply wiring.
- Maintain reliable grounding of the equipment. Give particular attention to supply connections when connecting to power strips, rather than direct connections to the branch circuit.
- Using a properly functioning quality surge protector is required to protect the unit. Using an uninterruptible power supply (UPS) is also recommended.

1.2.2 Power Supply

The DDR-16/32 power supply automatically switches itself to accommodate AC input between 110 VAC and 220 VAC.

1.3 Powering ON the DDR-16/32

The main power switch for the DDR-16/32 is located on the rear panel. A “hard boot” (cycling the power at the power entry module on the rear panel). When the main power switch is on, the DDR-16/32 can be switched in and out of standby power mode using the pushbutton power switch on the front panel.

1.4 Front Panel Controls

Figure 1: Front Panel Controls

The front panel contains the following controls:

1. **Power button/indicator**: Push button switch puts the DDR-16/32 in and out of standby power mode.
2. **ON and STANDBY LEDs**: Upon switching the rear panel main power switch to On, the orange Standby LED begins to blink, indicating system is booting. When booting has successfully completed, orange LED goes solid. Pressing the front panel (Standby) Power Button extinguishes the standby LED and the blue On LED will light. Pressing Power Button once again returns the unit to the Standby state with orange LED on.

1.5 Rear Panel Controls / Connections

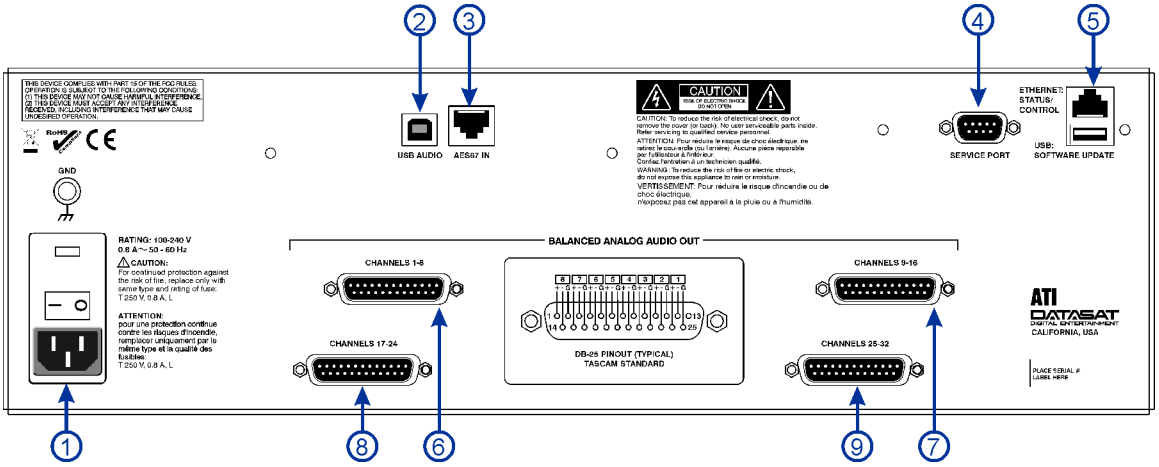


Figure 2. DDR-16/32 Rear Panel

Table 1 gives a description of each connector shown in the figure. For specific information on the pin-outs of each connector, please see Appendix A of this manual.

Table 1. DDR-16/32 Rear Panel Connections/Controls

ITEM	DESCRIPTION
1	Power Entry Module/Power Switch
2	USB Audio – Not functional
3	AES67 In – RJ45F (connect to AES67 audio source). Cat-5e or better (Cat-6 preferred).
4	Service Port – DB9 RS232 (used for setup)
5a	Ethernet: Status/Control – RJ45F (used for setup and control. Connect to computer)
5b	USB: Software update – USB-A
6	Analog Audio Out (CH 1 – 8) – DB25F (connect to amplifiers)
7	Analog Audio Out (CH 9 – 16) – DB25F (connect to amplifiers)
8	Analog Audio Out (CH 17 – 24) – DB25F (connect to amplifiers). DDR-32 only.
9	Analog Audio Out (CH 25 – 32) – DB25F (connect to amplifiers). DDR-32 only.

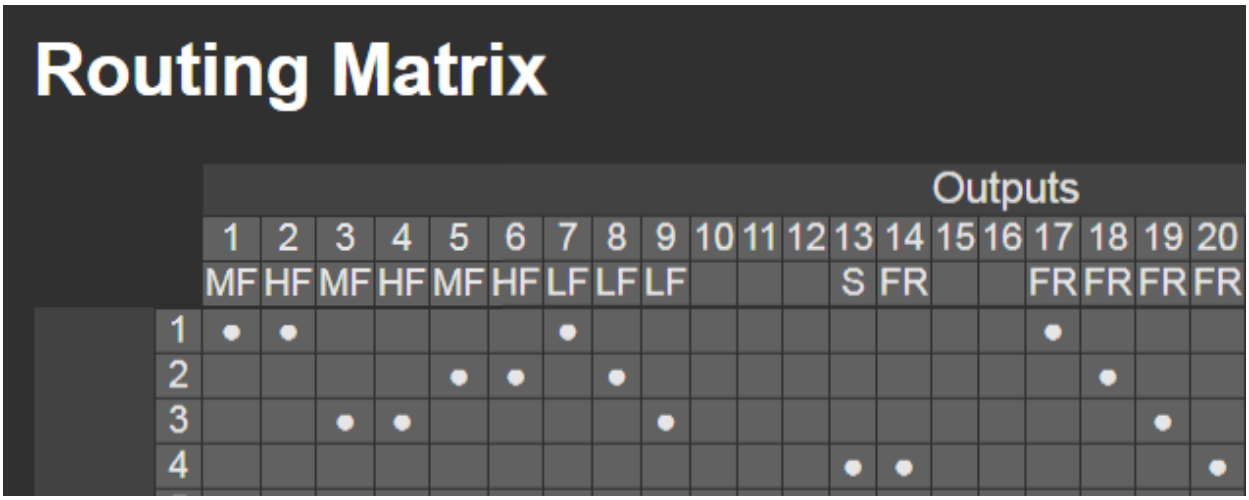
2.0 Pre-configured Systems

Units in the initial engineering deliveries have been pre-tested and already setup to stream using AES67. Please follow these steps to setup the system:

1. Connect the EQ3-AoIP analog outputs to the power amplifiers.
2. Connect a source to the AP25. Currently HDMI IN 1 is setup as the source.
3. Optionally connect a DTV to the AP25 HDMI OUT for video monitoring.
4. Connect the AES67 Ethernet port on the AP25 (the one on the option card backplate; not the one labeled Ethernet next to the SERVICE PORT) to the AES Ethernet port on the EQ3 (the one next to IN3/IN4 cut out; not the one labeled Ethernet.) The connection may be made through a Gigibit Ethernet switch, or with a direct Ethernet cable.
5. Power up EQ3-AoIP and AP25. They can be powered up in any sequence.
6. Power up the audio amplifiers.
7. Once EQ3-AoIP and AP25 completed their startup initializations, audio should be passing through. On some occasions audio streaming does not start up immediately due to some AES67 network negotiation issues, but they will resolve themselves in a few minutes.

2.1 EQ3-AoIP Analog Output Configuration

The EQ3-AoIP routing configuration is shown in the following screen capture of the EQ3-AoIP configuration screen. The numbers on the left are the AES67 channel numbers for the AES67 stream. The numbers on the top are the EQ3-AoIP output channel numbers. However, the pre-production EQ3-AoIP does not have the correct silkscreen marking on the back panel. Output 1 is simply marked as 17, output 2 as 18, etc. LF is low frequency crossover filtered output, MH is mid frequency, HF is high frequency, and FR is full range monitor outputs.



3.0 Systems Not Pre-Configured

All MDS EQ3-AoIP units are fully tested before shipping, and therefore in the event that audio streaming is not working out of the box, it is likely that the AES67 routing settings have been changed or are incompatible with the current environment, for example the sourcing device name has changed. The following details simple configuration verification and modification that can easily performed in the field.

1. Start the Chrome MDNS Browser (see troubleshooting) to discover the IP addresses of these destinations: EQ3 Configuration page and two ArchWave pages (one from inside the EQ3, and the other from inside the AP25.) See Appendix for sample screen captures.
2. Connection to the EQ3 Configuration page indicates that EQ3 is up and running.
3. Connect to the AP25 AUDIOLAN page which is indicated by the Device name of ‘uNet2500-42-04-DA’. Under the ‘Stream provider’ tab the status for each of the streams should be ‘Transmitting’. See Appendix for a sample screen capture.
4. Connect to the EQ3 AUDIOLAN page which is indicated by the Device name of ‘EQ3-AES67-sink’. Under the ‘Stream consumer’ tab there should be a square block for each channel. At the top right corner of each block there should be a blue ‘Receiving’ indication. If it is red Receiving text with error, there may be a AES67 negotiation problem which will resolve itself in a few minutes. See Appendix for a sample screen capture.
5. Connect to the EQ3 RS-232 serial port (8 bit, 115200 bps.) In response to ‘/’ (the slash key) and <Enter> some status information is printed. Specifically the ‘Consecutive frames’ counter should be incremented between each ‘/’ command, indicating that the DSP is receiving I2S clocks. See the Appendix for a sample screen capture.

In case the above steps did not resolve the problem, it is possible that for unknown reason the system configuration has been lost. To fully configure the system from factory reset, please refer to the EQ3 document ‘Getting Started with EQ3.pdf’ and the AP25 document ‘AP25 AES67 Out Card (H790) Installation and Setup’ (included with the AP25 shipping box.)

3.1 Troubleshooting Tips

In the event the system configuration has been lost or does not match the operating environment, some simple troubleshooting steps could be taken in the field to identify and correct configuration problems. In order to carry out these troubleshooting steps, some supporting equipment and software are needed:

1. A computer with Ethernet connection to run web browsers.
2. A computer with RS-232 connection to connect to the EQ3 console. RS-232 to USB adapter and a null modem cable will be necessary in most cases.
3. A Gigabit Ethernet switch so multiple devices and the troubleshooting computer can be connected to the same network. A DHCP server is not necessary.
4. MDNS Browser, a Google Chrome extension to browse the network: https://chrome.google.com/webstore/detail/mdns-browser/kipighjpklofchgbdgclfaoccdlghidp. See the Appendix for a sample screen capture.
5. AES67 network audio sometimes will start up instantly as soon as the sourcing and sinking devices are up and ready, but sometimes may take up to several minutes to correctly sync and pass audio. Wait a few minutes to see if audio streaming starts on its own.

Appendix A. Connector Pin-outs

This appendix lists the pin-out of all of the connectors on the back panel of the DDR-16/32.

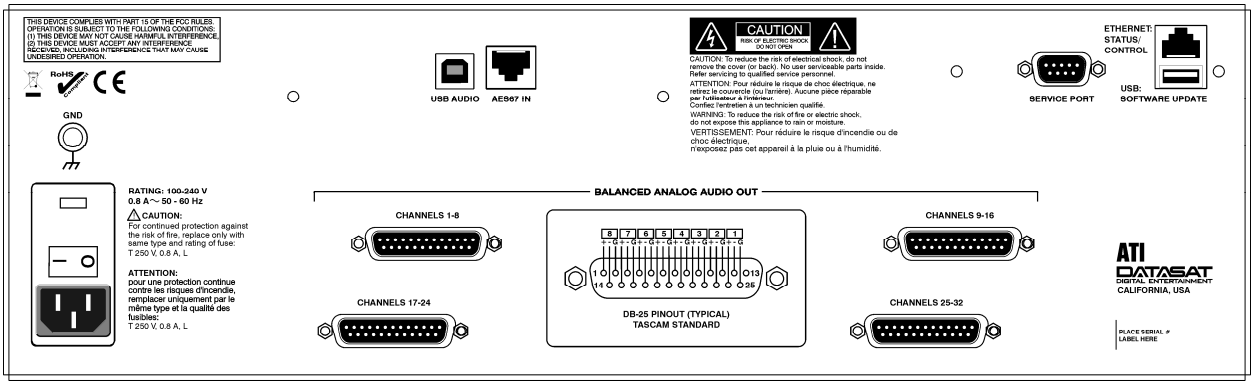
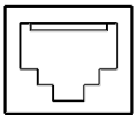


Figure 1. DDR-16/32 Rear Panel

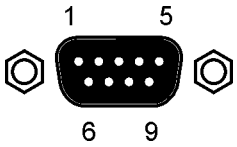
AES67 IN – RJ45F	
Pin	**Description**
1	TX_D1 (+)
2	TX_D1 (-)
3	RX_D2 (+)
4	Not used
5	Not used
6	RX_ D2 (-)
7	Not used
8	Not used

8-PIN FEMALE RJ45



SERVICE PORT (RS232)– DB9M	
Pin	**Description**
1	
2	Data in - RXD
3	Data out - TXD
4	
5	Chassis GND
6	
7	
8	
9	

9-PIN MALE “D”

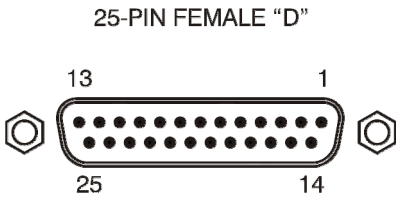


USB: SOFTWARE UPDATE – USB-A TYPE

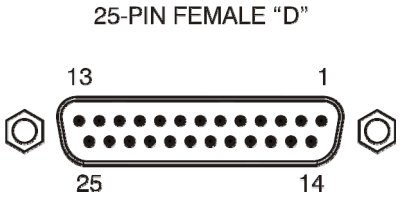
USB AUDIO – USB-B TYPE

Note: Not functional for this application

ANALOG AUDIO OUT (CH 1 – 8) DB25F – TASCAM pinout	
Pin	**Description**
1	CHANNEL 8 (+)
2	ANALOG GND
3	CHANNEL 7 (-)
4	CHANNEL 6 (+)
5	ANALOG GND
6	CHANNEL 5 (-)
7	CHANNEL 4 (+)
8	ANALOG GND
9	CHANNEL 3 (-)
10	CHANNEL 2 (+)
11	ANALOG GND
12	CHANNEL 1 (-)
13	Not used
14	CHANNEL 8 (-)
15	CHANNEL 7 (+)
16	ANALOG GND
17	CHANNEL 6 (-)
18	CHANNEL 5 (+)
19	ANALOG GND
20	CHANNEL 4 (-)
21	CHANNEL 3 (+)
22	ANALOG GND
23	CHANNEL 2 (-)
24	CHANNEL 1 (+)
25	ANALOG GND



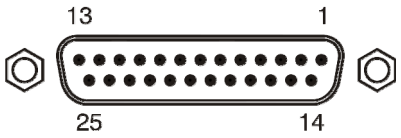
ANALOG AUDIO OUT (CH 9 – 16) DB25F – TASCAM pinout	
Pin	**Description**
1	CHANNEL 16 (+)
2	ANALOG GND
3	CHANNEL 15 (-)
4	CHANNEL 14 (+)
5	ANALOG GND
6	CHANNEL 13 (-)
7	CHANNEL 12 (+)
8	ANALOG GND
9	CHANNEL 11 (-)
10	CHANNEL 10 (+)
11	ANALOG GND
12	CHANNEL 9 (-)
13	Not used
14	CHANNEL 16 (-)
15	CHANNEL 15 (+)
16	ANALOG GND
17	CHANNEL 14 (-)
18	CHANNEL 13 (+)
19	ANALOG GND
20	CHANNEL 12 (-)
21	CHANNEL 11 (+)
22	ANALOG GND
23	CHANNEL 10 (-)
24	CHANNEL 9 (+)
25	ANALOG GND



ANALOG AUDIO OUT (CH 17 – 24) DB25F – TASCAM pinout	
Pin	**Description**
1	CHANNEL 24 (+)
2	ANALOG GND
3	CHANNEL 23 (-)
4	CHANNEL 22 (+)
5	ANALOG GND
6	CHANNEL 21 (-)
7	CHANNEL 20 (+)
8	ANALOG GND
9	CHANNEL 19 (-)
10	CHANNEL 18 (+)
11	ANALOG GND
12	CHANNEL 17 (-)
13	Not used
14	CHANNEL 24 (-)
15	CHANNEL 23 (+)
16	ANALOG GND
17	CHANNEL 22 (-)
18	CHANNEL 21 (+)
19	ANALOG GND
20	CHANNEL 20 (-)
21	CHANNEL 19 (+)
22	ANALOG GND
23	CHANNEL 18 (-)
24	CHANNEL 17 (+)
25	ANALOG GND

(DDR-32 only)

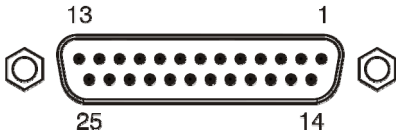
25-PIN FEMALE “D”



ANALOG AUDIO OUT (CH 25 – 32) DB25F – TASCAM pinout	
Pin	**Description**
1	CHANNEL 32 (+)
2	ANALOG GND
3	CHANNEL 31 (-)
4	CHANNEL 30 (+)
5	ANALOG GND
6	CHANNEL 29 (-)
7	CHANNEL 28 (+)
8	ANALOG GND
9	CHANNEL 27 (-)
10	CHANNEL 26 (+)
11	ANALOG GND
12	CHANNEL 25 (-)
13	Not used
14	CHANNEL 32 (-)
15	CHANNEL 31 (+)
16	ANALOG GND
17	CHANNEL 30 (-)
18	CHANNEL 29 (+)
19	ANALOG GND
20	CHANNEL 28 (-)
21	CHANNEL 27 (+)
22	ANALOG GND
23	CHANNEL 26 (-)
24	CHANNEL 25 (+)
25	ANALOG GND

(DDR-32 only)

25-PIN FEMALE “D”



Appendix B: DDR-16/32 Product Specifications

System Features

- Modular design
- AES67 input- up to 24 channels at 48kHz
- DDR-16 supports 16 channel analog output
- DDR-32 supports 32 channel analog output
- Supports bass management
- Two and three way crossover
- Linkwitz-Riley or Butterworth filters
- Filter types:
  - Low Pass
  - High Pass
  - Band Pass
  - Low and High Shelving
  - Parametric EQ
- Optional Phase inversion of signals
- Initialization and control uses web interface
- Optional support for Dirac
- Test Signal generator
- Routing matrix display – also shows any summation of channels
- Web-based firmware update

Signal Input

Digital Audio Input (AES67)

- Channels: Up to 24 at sample rate of 48kHz
- Connector: One RJ45 Ethernet

Signal Outputs

Analog Audio Outputs

- Channels: 16 (DDR-16)
  - 32 (DDR-32)
- Connectors: Two DB25 Female (Ch 1-8 and Ch 9-16)
  - Two DB25 Female (Ch 17-24 and Ch 25-32 (DDR-32 only))
- TASCAM pinout
- Output impedance: 182 Ohm
- Recommended minimum load impedance: 5k Ohm to ground on either side, or 10k Ohm Differential
- Output Signal amplitude
- Operating point: 4dBu
- Maximum unclipped output: +24 dBu

- Output levels adjusted using volume control chips

AC Power Supply Electrical Specification

- 90-264 VAC, 47-63Hz, auto-switching
- 60w power consumption
- Power supply standby power output: 40W
- Efficiency: greater than 85%
- Switching frequency: 67kHz typical
- Conducted EMI EN 55022-B, FCC Part 15 Level B
- Complies with EN61000-3-2, Class A standard
- ITE Safety Agency Approvals
- RoHS Compliant

Thermal Specification

- Operating temperature range: 10 to 45 degrees Celsius
- Convection passive cooling.

Management

Ethernet: Status/Control

- Status information and setup via external device using internet web browser
- Connector: One RJ45 Ethernet

Software update

- Connector: One USB A-type

Service Port

- RS-232
- Connector: One DB9 male

Hardware Dimensions

DDR-16/32 unit

- 3U 19” rackmount standard
- Imperial – 5.22 in (H) x 19.0 in (W) x 10.5 in (D). Unit weight: 12.7 lb
- Metric – 13.26 cm (H) x 48.25 cm (W) x 26.67 cm (D) Unit weight: 5.76 kg

Shipping

- Imperial – 10.0 in (H) x 22.0 in (W) x 21.0 in (D). Shipping Weight: 18.0 lb
- Metric – 25.4 cm (H) x 55.88 cm (W) x 53.34 cm (D). Shipping Weight: 8.16 kg

Regulatory Compliance

TUV

FCC Part 15, subpart B Class A

CE

RoHS compliant

E&OE - All product specifications subject to change without notice. All trademarks are properties of their respective owners.

Appendix C. AP25 AES67 Out Card (H790) Setup

The AP25 AES67 Out card (H790) is a plug in option for the Datasat AP25 audio processor, allowing it to work seamlessly with the DDR-16/32. This appendix describes setup of the H790. The H790 card converts audio channels from the AP25 to AES67 format, allowing streaming over an Ethernet cable. The AES67 signal is then sent to the Datasat DDR-16/32 receiver/DAC unit. The H790 supports streaming of up to 16 channels at 96kHz, and 24 channels at 48kHz.

The H790 card also provides additional output channel mapping over the Ethernet connection (24 channels total) for use in Bi-amping / Tri-amping, or adding additional speakers to existing input channels. It does not provide additional input or processing channels.

Setup

Access the AES67 setup screen by selecting the AES67 button from the System Setup (2) screen.

Menu → System → More → AES67

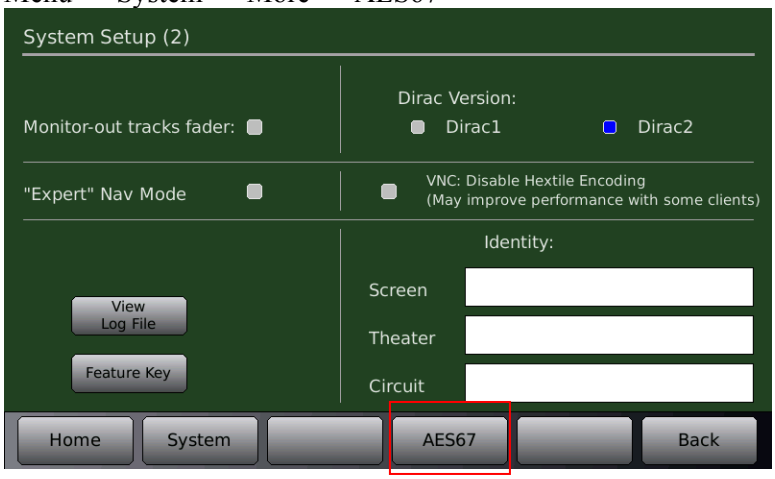


Figure 1 – AP25 Setup (2) Screen

☑ Note: If the AP25 has been set to "Expert Nav Mode" the AES67 button will appear on the main setup screen.

Figure 2 below shows the main AES67 setup and information screen.

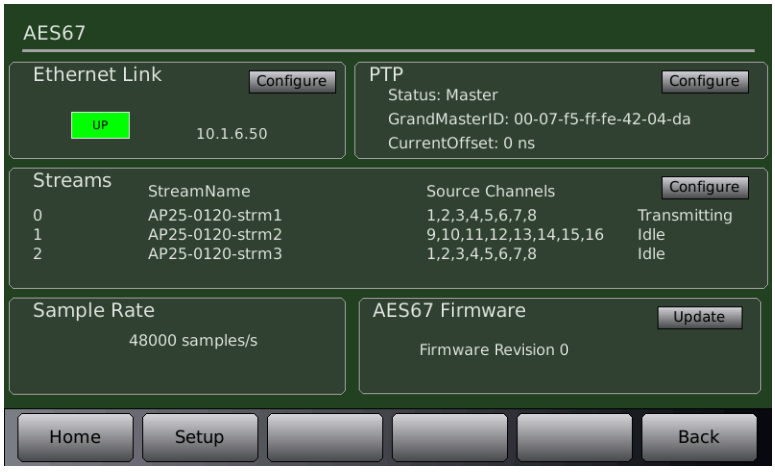


Figure 2 – AES67 Setup Screen

This screen is divided into several sections:

Ethernet Link

This section displays:

Ethernet link status (up, down)
Current IP address of the AP25

Select the Configure button to bring up the AES67 Network configuration screen.

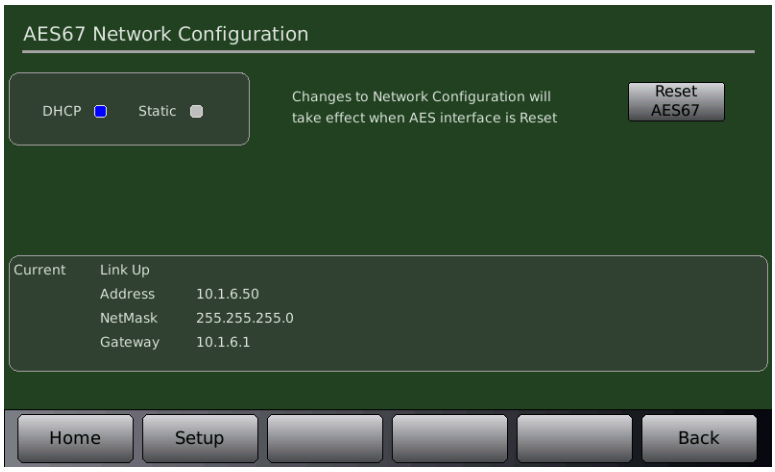


Figure 3 – Network Configuration Screen

DHCP is the default selection. To enter a Static IP address, select the Static checkbox. This will bring up the screen shown in **Figure 4** . Tapping in the gray boxes will bring up a virtual keyboard allowing the address, mask and gateway to be entered. To activate changes, the Reset AES67 button must be selected.

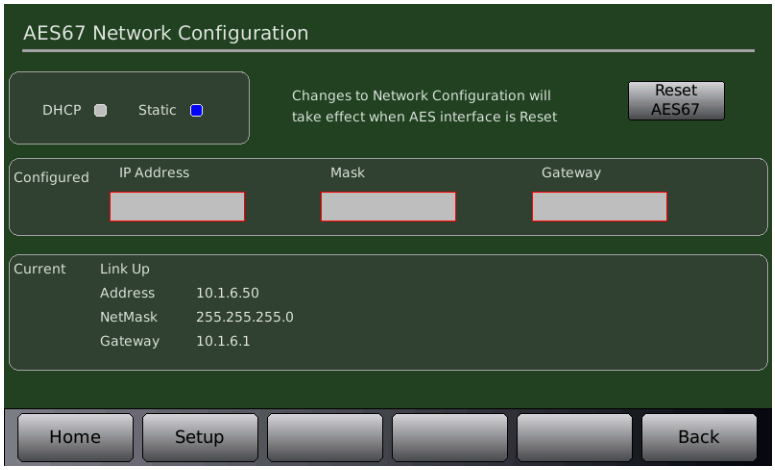


Figure 4 – Static IP Configuration Screen

PTP (Precision Time Protocol)

This section displays:

PTP status. The example screen in **Figure 2** shows that this device is currently the Master.
PTP Grand Master ID
PTP Current offset

Select the Configure button to bring up the AES67 PTP configuration screen.

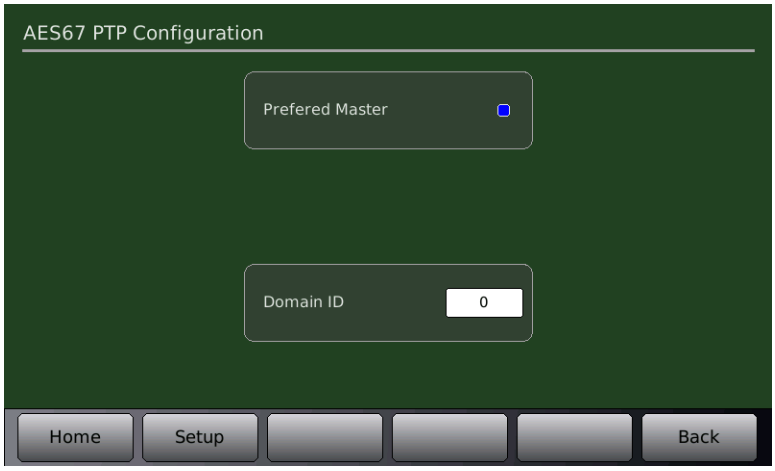


Figure 5 – PTP Configuration Screen

The default is to have the AP25 set as the Preferred Master, but alternatively another device may be chosen. The Domain ID may be configured to any number between 0 and 127. Sending and receiving AES67 devices should be configured with the same PTP Domain ID.

☑ Note: Selecting a device as the preferred master does not guarantee that if will be the master device on the PTP network, but increases its chances.

Streams

This section displays:

Available stream ID numbers, names and the AP25 source channels assigned to them.
Whether the stream is transmitting or idle.

The H790 supports up to 24 channels at 48k (three streams of 8 channels) or 16 channels at 96k (four streams of 4 channels).

Select the Configure button to bring up the AES67 Streams configuration screen.

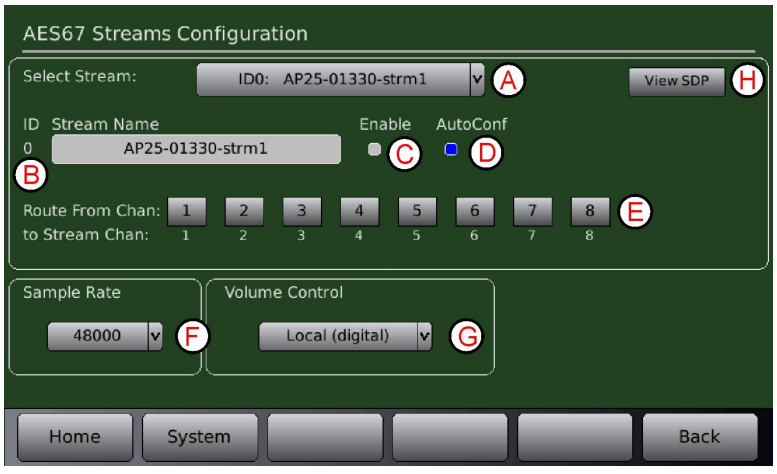


Figure 6 – Streams Configuration Screen

(A) Select the stream that you wish to configure from the dropdown menu.
(B) The **Stream Name** can be changed, if desired, by tapping in the gray box. This will bring up a virtual keyboard.
(C) Select the **Enable** checkbox to enable transmitting of the stream

(D) If **AutoConf** is selected, the stream will be automatically configured. To manually configure the stream, deselect the **AutoConf** button. Tap in the gray boxes that appear to bring up a virtual keyboard to enter the multicast address and port. The multicast address is computed from the current IP address of the device as follows: 239.N.AAA.AAA, where N is the stream number and AAA.AAA are the last two bytes of the device's IP address. The port is typically fixed to the default: 5004.

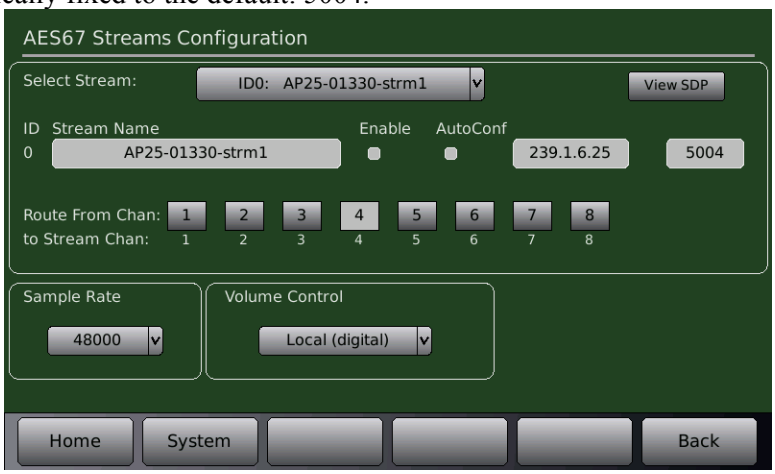


Figure 7 – Streams Configuration Screen

(E) Channel routing. Available AP25 channels may be routed to any of the stream channels. Select a gray **Route From Chan** box above the stream channel you wish to route to, and scroll to the AP25 channel desired.

(F) Select the **Sample Rate** from the dropdown menu. Choices are 48000 and 96000. Select 48000 when using the DDR-16/32.

(G) **Volume Control.** When **Local (Digital)** is selected from the dropdown menu, the Master Fader will control the volume on the receiver DAC using digital processing on the H790 card. The AES67 signal is attenuated before it is sent to the DAC. This selection will work with any AES67 DAC.

(H) View SDP. Most receive devices will be able to detect the stream information being transmitted. Selecting the View SDP button brings up info on the current stream that can be pasted into a receive device that can't auto detect the information.

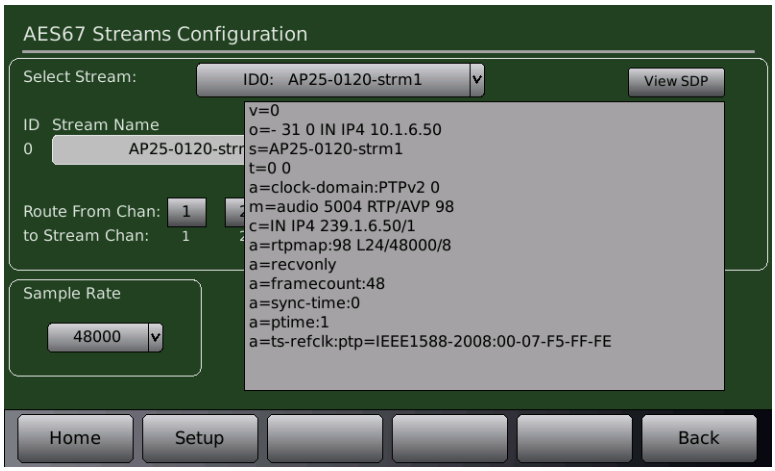


Figure 8 – View SDP

Sample Rate

Displays the currently selected sample rate

AES67 Firmware

Allows update of the AES67 firmware on the card. Selecting the **Update** button will bring up the screen shown in **Figure 9**. The top information box shows the current firmware version, and if another version is available. Select **Continue** to proceed with the update.

☑ **Note:** The firmware update may take up to 30 minutes to install, and can't be interrupted once started.

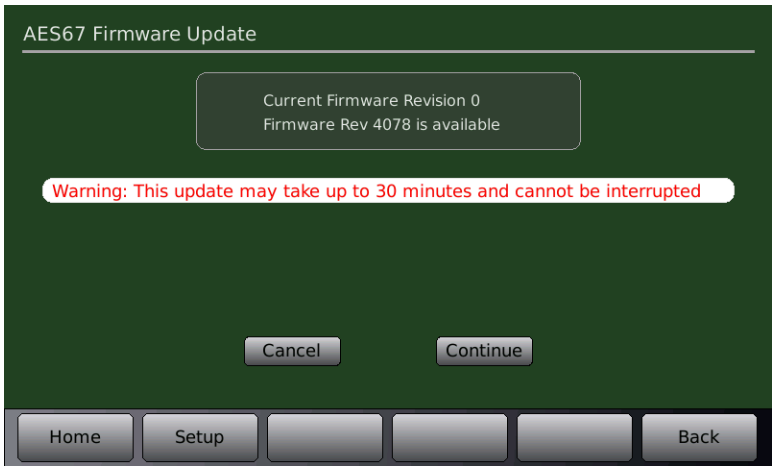


Figure 9 – AES67 Firmware Update