unA6IO (discontinued)

4x2 Mic/Line AES67 Networked Audio Wall Plate

User Manual

IMPORTANT SAFETY INSTRUCTIONS

The symbols below are internationally accepted symbols that warn of potential hazards with electrical products.

This symbol, wherever it appears, alerts you to the presence of un-insulated dangerous voltage inside the enclosure -- voltage that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including 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 third grounding prong. The wider blade or the third prong is 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 from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by Attero Tech
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.
13. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
14. Unplug this apparatus during lightning storms or when unused for long periods of time.
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. If rack mounting, provide adequate ventilation. Equipment may be located above or below this apparatus but some equipment (like large power amplifiers) may cause an unacceptable amount of hum, or may generate too much heat and degrade the performance of this apparatus,

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

LIMITED FIVE YEAR WARRANTY

The equipment is warranted for five years from date of purchase from Attero Tech, LLC against defects in materials or workmanship. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment. Should any defect develop, Attero Tech, LLC will, at our option, repair or replace any defective parts without charge for either parts or labor. If Attero Tech, LLC cannot correct the defect in the equipment, it will be replaced at no charge with a similar new item. Attero Tech, LLC will pay for the cost of returning your equipment to you. This warranty applies only to items returned to Attero Tech, LLC, shipping costs prepaid, within five years from the date of purchase. This Limited Warranty is governed by the laws of the State of Indiana. It states the entire liability of Attero Tech, LLC and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER ATTERO TECH, LLC NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF ATTERO TECH, LLC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF ATTERO TECH, LLC EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

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 and EN55022. 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 their own expense.
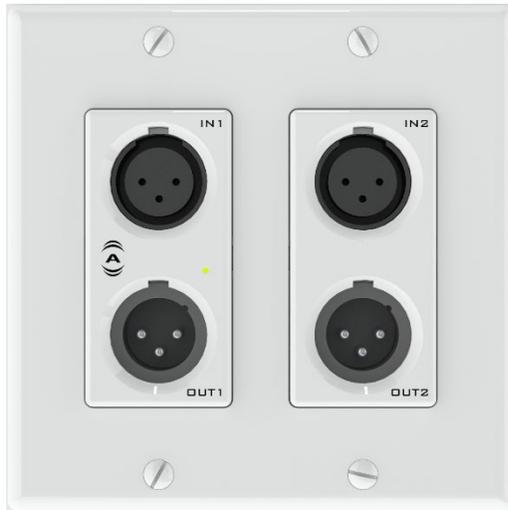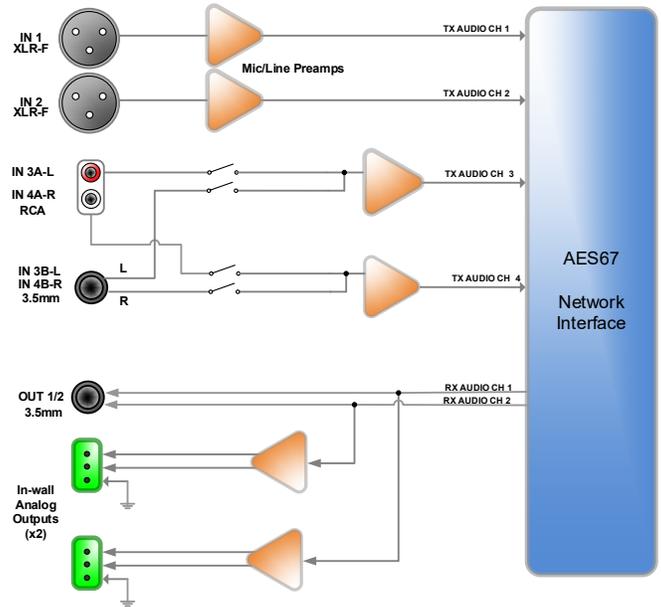
CE

1 – Overview

Figure 1 – unA6IO Front Panel

The unA6IO AES67 Audio interface is a 4x2 AES67 multi-I/O wall plate interfaces designed for in-wall installation into 2-gang US junction boxes. Its form-factor and I/O density make it easy to put AES67 connectivity close to audio sources used in professional AV installations – thereby eliminating costly and interference prone analog wiring, power supplies and giving a clean, finished look to an AV installation all while providing networked audio system flexibility with AES67-compliant audio networking.

The unA6IO features two balanced line-level inputs on XLR connectors. Each input features a software controlled mic preamp with software switchable 48V phantom power.

The unA6IO also features two sets of stereo line-level audio connections for consumer audio device connectivity. The RCA inputs (IN 3/4 A) and 3.5mm stereo input (IN 3/4B) are software selectable to be used as two independent stereo inputs, or summed as shown in the following signal flow diagram.

Attero Tech unIFY Control Panel application can be used to configure the device-specific features. It is also used to configure its AES67 transmit and receive stream configuration.

The unA6IO also supports control by third party systems allowing external configuration of its settings such as phantom power and input gain in real time. Further information on 3rd party control can be found later in this document in section 3.

Figure 2 - unA6IO Signal Flow

1.1 – What's in the Box

The unA6IO comes supplied with the following
- unA6IO device
- Mounting kit
- Decora plate
- 6-position depluggable terminal block

1.2 – Optional Extras

The following are available as options for the unA6IO and that may be ordered separately:

- unXPO - Passive Dual XLR-M single gang Decora wall plate - P/N: 900-00187 -xx
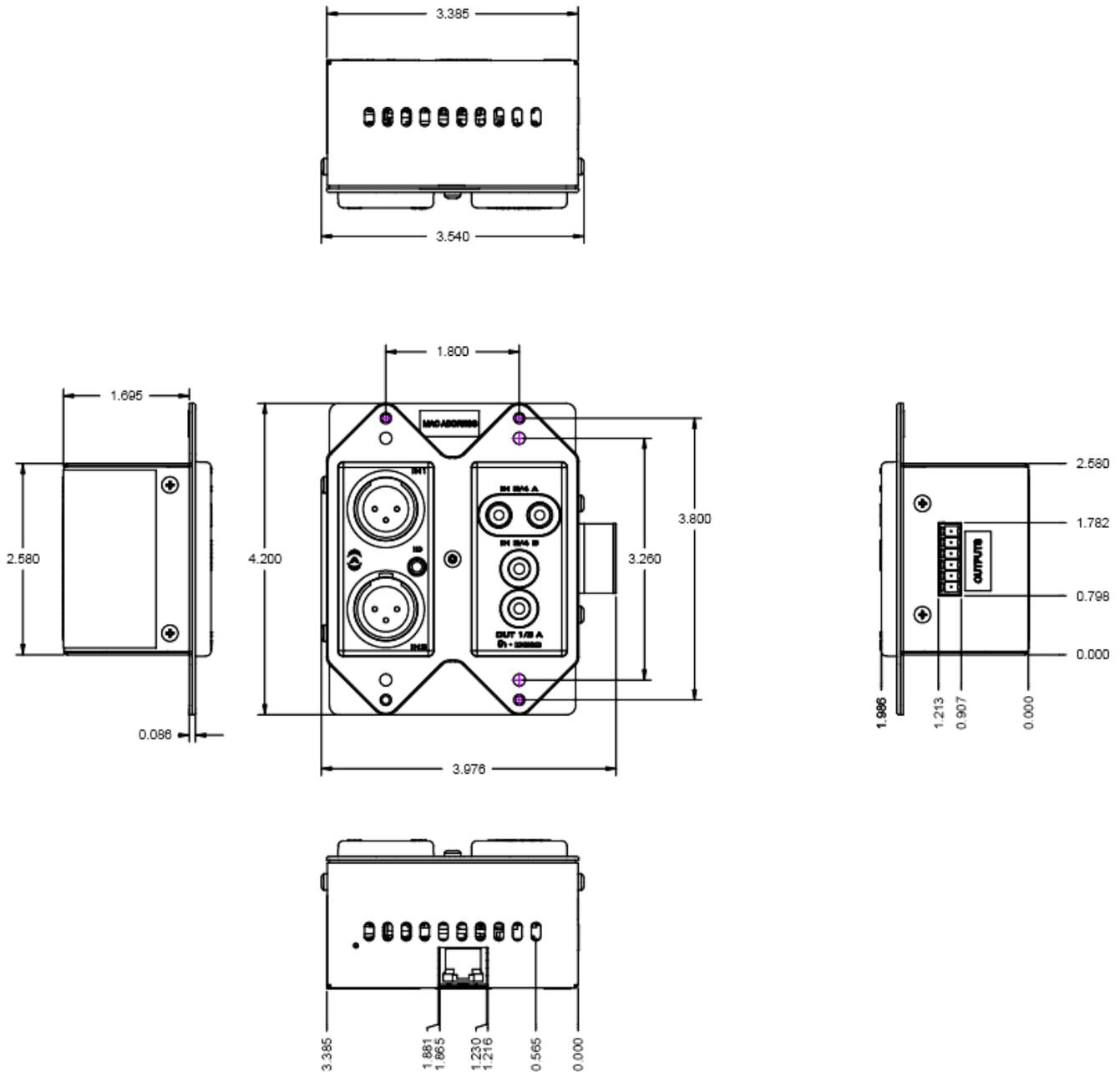 (*Available in white (-01) or black (-02). Supplied with appropriately colored 3-gang Decora cover plate*).

2 – Device Installation

ID	Description
1	2 x Mic/Lin Balanced audio inputs (XLR-F)
2	Power/ ID LED
3	2 x Unbalanced Line Audio inputs (RCA)
4	2 x Unbalanced Line Audio inputs (3.5mm TRS)
5	2 x Unbalanced Line Audio Outputs (3.5mm TRS)
6	2 x Balanced Line Audio Outputs (Terminal Block)
7	AES67 / Control / PoE Port

Note: The unA6IO has a label on the front of the metal housing at the top that shows the devices MAC address. This is important for initial device identification as these digits make up part of the devices default network name. The MAC address is also given on the back of the unit.

2.1 – Mounting

A typical installation will involve mounting the wall plate into a pre mounted wall box or mounting bracket. Before installation, make sure the wall box where the unA6IO is to be installed is pre-wired with a suitable cable back to a PoE-enabled network switch or mid-span injector. If a mid-span injector is being used, the cable should be connected to the port that supplies both Ethernet and power (refer to the devices manual if unsure which port is which).

Attach the network cable from the switch/mid-span injector to the Ethernet port of the unA6IO. If the switch or mid-span injector is already running and PoE is enabled, the unit should power up and the power LED on the front of the device should turn on. First red then green.

With the cable attached, carefully place the unA6IO into the wall box taking care to not trap the cabling. Once fully in place, secure it with the screws provided. Once secured in the wall box, fit the Decora plate and secure it with the screws provided with it.

The figure below shows the installation of the companion passive XLR audio input plate and the unA6IO.

Figure 3 - unA6IO Installed with unXP2O (Rear View)

Figure 4 - Dimensioned Drawing

Note: 2D and 3D CAD models can be downloaded from the Attero Tech customer portal. Please contact Attero Tech for any further product related information that is not accessible on the website.

2.2 – Hardware Connections

The unA6IO provides balanced and unbalanced audio connections to external analog audio equipment. Refer to the following diagrams and instructions for connecting different types of audio devices to the input and outputs of the unA6IO. Professional grade audio cabling is recommended to achieve the best audio performance throughout the system.

2.2.1 – Balanced Output to a Balanced Input
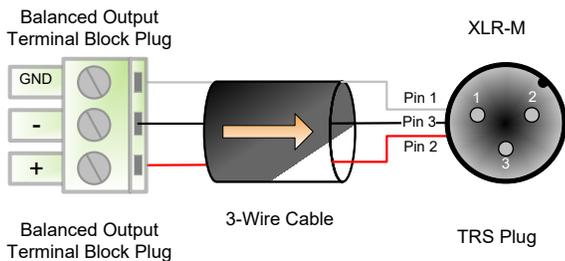
Figure 5 - Balanced Wiring Guide

2.2.2 – Unbalanced Output to an Balanced Input
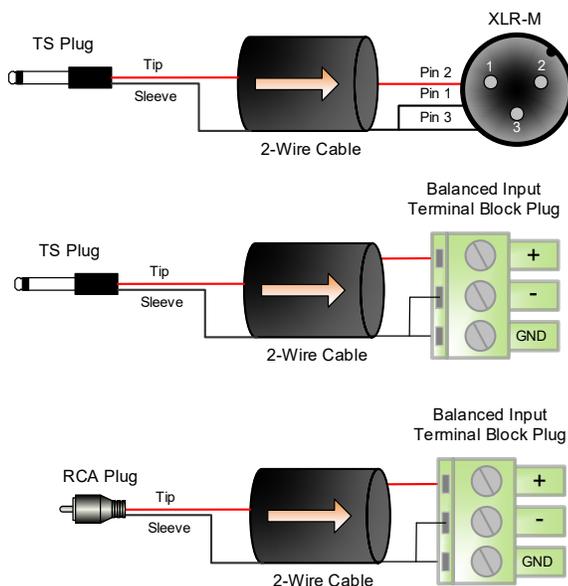
Figure 6 – Unbalanced Wiring Guide
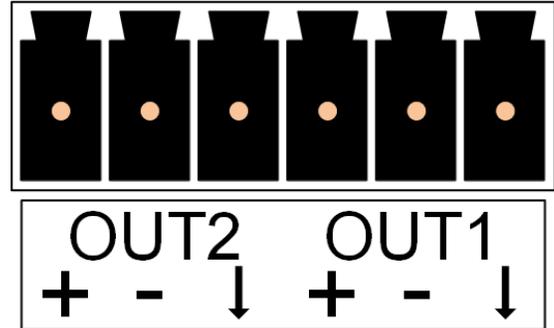
Figure 7 – De-pluggable Terminal Block Wiring

2.3– Error Reporting

The unA6IO is equipped with error reporting features. Upon power up, the front panel power LED will briefly light red and then change to green if the device boots successfully. If the LED remains on solid red, this indicates a device failure. If power cycling the unit does not correct this problem, contact Attero Tech technical support.

3 – Device Configuration

There are two parts of the device that require software to setup. First the audio routing, and second the configurable features of the device itself.

Configuration of the unA6IO specific features is carried out using the Attero Tech unIFY Control Panel application. This application is available from the Attero Tech customer portal at https://portal.atterotech.com/home/. It should be used to examine and modify the device specific features such as mic/line gain settings, and phantom power. See the unIFY Control Panel manual for details on adjusting these settings.

The audio routing is also done using Attero Tech's unIFY Control Panel. There is a tab on the devices configuration for each unit specifically for setting up receive and transmit streams.

Note: When using unIFY Control Panel, the unA6IO will be shown using a default device name of unA6IO -###### where '######' is the last six characters of the devices MAC address.

Note: The unA6IO settings are volatile and parameter changes will be lost if the unit is reset or power cycled. However, unIFY Control Panel can be used to save presets and change the power-on defaults to prevent loss of settings. This is a manual process and is not automatic. See the unIFY Control Panel manual for steps to save.

3.1.1– Preset Configuration

Most devices feature preset capabilities for recalling a previously saved set of settings either from a file on the PC or from non-volatile memory on the target device. When a device is selected for configuration, if the device supports presets, a "Save Presets" button and "Load Presets" button will be added to the toolbar.


3.1.1.1 – Save Presets
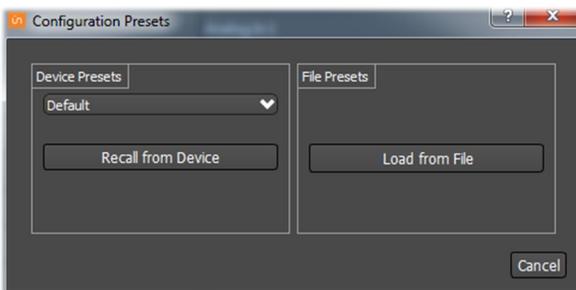
When the "Save Presets" button is pressed, the "Configuration Presets" dialog will open in save mode.

Note: If the parameter lock is active, the device preset side will be greyed out as the parameter lock prevents any change to device settings. This lock must be removed before a preset can be saved to the device. This may require the Dante lock be removed first, if that is also active.
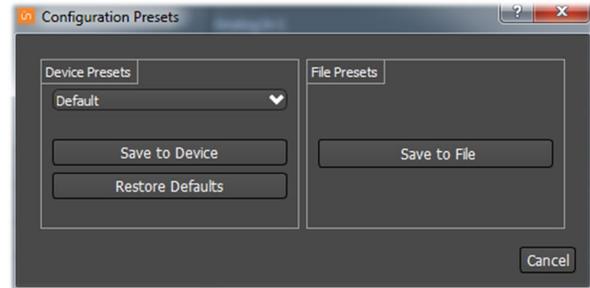
3.1.1.2 – Save: Device Presets

Current settings can be saved to a preset in non-volatile memory on the selected device. Use the dropdown list to select which preset the current settings will be stored to, then click the "Save to Device" button. On all Attero Tech devices, preset 0 is used to store the power-on defaults.

The power-on defaults can be reset back to factory settings with the "Restore Defaults" button.
WARNING: Use this with care!

3.1.1.3 – Save: File Presets

Current settings can also be stored off to a file. The file created can be used to apply the same settings to multiple devices (see Multiple Device Preset Load feature in the unIFY Control Panel manual). It can also be stored off as a back-and recalled later if needed.

3.1.1.4 – Load Presets

When the "Load Presets" button is pressed, the "Configuration Presets" dialog will open in "Load" mode.

Note: If the parameter lock is active, loading a preset will not be possible as configuration changes are blocked. A warning will instead pop up warning the user that the parameter lock is active. This lock must be removed before a preset can be loaded. This may require the Dante lock be removed first, if that is also active.

3.1.1.5 – Recall – Device Presets

Update the current settings from a previously stored preset in non-volatile memory on the device. Use the dropdown list to select the desired preset, then click the "Recall from Device" button.

3.1.1.6 – Recall – File Presets

Use the "Load from File" button to update the current device settings from a file which was previously saved using the "Save Preset to File" feature.

3.2 – AES67 Audio Network Note

For successful deployment of Attero Tech's AES67 enabled products, it is necessary to insure the AES67 audio network is properly configured. A Quick Start Guide for AES67 Audio Networking is available from the Attero Tech Customer Portal at https://portal.atterotech.com/home/?v=files/560321a2b075c.
As setup needs may vary by product, it may also be necessary to check with the AES67-enabled product manufacturer as well.

3.3 – IP Address Setup

*************************IMPORTANT*****************************
Failure to correctly configure IP addresses will not allow an unA6IO device to correctly authenticate in the unIFY Control Panel software, the devices parameters will not be available, the input and output channels also won't be visible and routing of audio to and from the device will not be possible.
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In order to configure a unA6IO both to set up internal parameters and also setup audio routing, the PC will need to be able to communicate with the devices over the network. While all AES67 devices will be discovered regardless of the IP address setup on the PC, communication can only occur if the PC and the device have compatible IP addresses.

By default, the unA6IO is set to get a dynamic IP address. Like almost all network devices, if the unA6IO does not find a DHCP server to retrieve an IP address from, it will give itself a local link address sometimes also known as an automatic private IP address (APIPA) instead. A local link IP address is always in the range 169.254.x.y.

To ensure communication, the PC can either be set to get a dynamic IP address, or be given a static IP address in the range 169.254.x.y. The PC may require a restart if its IP address is changed for the change to take effect.

In some applications, IP addresses of devices may need to be set to something specific and that can be done once initial communication has been established. Bear in mind however that if a static IP address is assigned to a device and that static IP address is in a different range to the IP it was previously using to communicate with the PC, the PC will lose communication with the device until such time as the PC IP address is also changed to an IP in range of the devices new IP address.

3.4 – Factory Reset

*************************IMPORTANT****************************
The factory reset returns the entire device to its factory defaults. Using this feature will mean all custom AES67 settings and all audio power-on default settings will be cleared.
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NOTE: The factory reset is a useful way of quickly restoring communications with a device which has an unknown static IP address as a factory reset returns the device's network settings to getting a dynamic IP. Having successfully completed a factory reset of the device, setting the PC's IP address to also obtain a dynamic IP address should then allow the PC to communicate fully with that device.
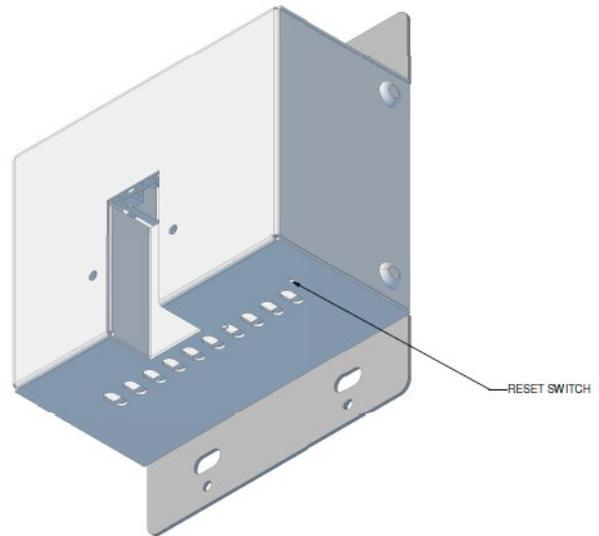
Access to the factory reset button is through a small circular hole on the underside of the unit, next to the ventilation cutouts.

To use the factory reset, insert a small screwdriver or paperclip into the hole to activate the factory reset switch. There should be a noticeable "click" when it's activated. Hold the switch in for 5 to 10 seconds then release. If the factory reset was successful, the unit will reset and is indicated by the power LED will turning red.

3.5 – Firmware Updates

All units should leave the factory with the latest firmware available at the time of shipping. However, the unA6IO has the ability to be updated in the field should it be required. Updates are applied via the network using Attero Tech unIFY Control Panel's smart firmware update facility. The latest unA6IO SFU file is available from the Attero Tech customer portal.

3.6 – 3rd Party Control

The unA6IO supports 3rd party control allowing external system to manage the unA6IO's settings such as phantom power, mic/line gain options and control of presets. The interface which is available to anyone to use with any device capable of sending and receiving UDP messages.

Information on the commands the unA6IO supports as well as details of how to use the 3rd party UDP interface can be found in the unIFY 3rd party Software API document, available from the Attero Tech customer porta.

3.7 – Using the Command interface

In order to make use of the control interface the unA6IO and the controlling device need to be on the same physical subnet and need to have IP addresses in the same range. The control devices should then be able to converse with the unA6IO without any further configuration necessary.

4 – ARCHITECTS & ENGINEERS SPECIFICATION

The AES67 2-gang wall plate interface unit shall provide two front panel mounted mic/line analog inputs on XLR. Selectable gains of -18dB, -3dB, +25dB, and +40dB and a +48V phantom power option shall be provided via software for each balanced mic/line input. These mic/line inputs are digitized and introduced to the audio network as transmit channels 1 and 2.

The device shall also provide two sets of unbalanced line level input connections: one on a set of RCA connectors, the other using a stereo 3.5mm TRS connection. These inputs are selectable for independent or summed operation via software and introduced to the AES67 interface on transmit channels 3 and 4. The internal analog to digital signal conversion shall be performed at 24-bit resolution with a sampling frequency of 48 kHz.

The AES67 interface unit shall provide two balanced analog inputs on the side of the in-wall enclosure via a 6-pin depluggable.

Phoenix-style connector for analog conversion of up to 2 AES67 digital audio network channels. Additionally, the two received AES67 output channels shall also be converted and output on a front panel mounted 3.5mm stereo TRS connector. The internal digital to analog signal conversion shall be performed at 24-bit resolution with a sampling frequency of 48 kHz.

The AES67 interface unit shall receive power over the Ethernet cable from an IEEE 802.3af PoE compliant network switch or midspan injector.

The AES67 interface shall be compliant with the RoHS, WEEE and REACH directives. The AES67 interface unit shall be Compliant with the EMI/EMC requirements for FCC and CE.

The unit shall be the Attero Tech unA6IO I/O Interface.

4.1– Device Specifications

Analog Audio Inputs	
Input Type	Two Balanced and RF filtered inputs on XLR (*Inputs 1/2*) Stereo Unbalanced Inputs on RCA (*Inputs 3/4 A*) Stereo Unbalanced Inputs on 3.5mm TRS (*Inputs 3/4 B*)
Input Impedance	>1.8K Ohms at any gain (*Inputs 1/2*) >10k Ohms (*Inputs 3/4 A & B*)
Maximum Input Levels	+20 dBu, -15 dB Pad Active +5 dBu, 0dB Pad Inactive -22 dBu, +25 dB Gain -38 dBu, +40 dB Gain (*Inputs 1/2*) +12 dBu (*Inputs 3/4 A & B*)
Phantom Power	+48V DC, software selectable (*Inputs 1/2*)
THD+N	< 0.02% @ 1kHz for all gain settings, input signal 3dB below maximum. (*Mic Inputs 1/2*) <0.01% (*Line Inputs 3/4*) (20 -22 kHz Bandwidth)
EIN	-115 dB, 20 -22 kHz Bandwidth (*Inputs 1/2*)
Dynamic Range	> 95 dB (20 -22 kHz)
Frequency Response	20Hz – 20kHz, +/- 1dB (*-18 and – 3 dB gain on Inputs 1/2*) 50Hz – 20kHz +/- 1dB (*+25dB and +40dB gain on Inputs 1/2*) 20Hz – 20kHz, +/- 1dB (*Inputs 3/4 A & B*)

Analog Audio Output	
Output Type	Balanced output on side mounted terminal blocks
Maximum output level	+20 dBu , with SW volume control
THD+N	< 0.05 % (20 -22 kHz)
AES67 Network	
Physical Layer	Ethernet
Connector (s)	RJ-45
Cable Quality	CAT-5e or better, UTP
Transmission Speed	100 Mbps
Supported Sample Rates	48kHz
Minimum Audio Latency	1ms
AES67 Support	AES67, SAP based stream discovery
Power Specifications	
PoE Power	802.3af Class 0
Power Consumption	< 6W Max
Physical Dimensions	
Width	3.54"
Height	4.2"
Depth	2"
Weight	0.6 lbs.
Regulatory Compliance	
Certifications	FCC CFR 47 Parts 15B Class A, EN55011 ICES-003 CE (EN55022 / EN55024) RoHS REACH
Environmental Operating Specifications	
Operating Temperature	0 to 40° C

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Revision History

Revision	Date	Author	Description of change
00_a	08/15/17	JNA	Initial Draft
01	9/1/17	CNL	Initial Release
01	09/14/17	CNL	Review and initial release
01_a	03/15/18	SGG	Warranty Updated
01_b	03/21/18	SGG	Bug #5162 AES67 quick start guide reference in config section
01_c	03/22/18	SGG	Bug #4492 – added graphic w/ side phoenix plug wiring Bug #5127 – Reference volatile memory – save presets/boot config steps.