



## Axon A4Mio | A8Mio

AES67 Network Audio Connectivity Interface



### User Manual

900-00233-01 / 900-00232-01

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## 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. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. 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.
15. When permanently connected, on all-pole mains switch with a contact separation of at least 3mm in each pole shall be incorporated in the electrical installation of the building.
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.

For a copy of the QSC Limited Warranty, visit the QSC website at [www.qsc.com](http://www.qsc.com)



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## 1 – Overview



1 – A8Mio Front and Rear

Attero Tech by QSC’s AXON A4Mio and A8Mio are compact and scalable mic/line connectivity solutions for AES67 networked AVC systems. The A4Mio features four high-quality mic/line inputs and four balanced line-level outputs in a compact 1/3 RU size. Similarly, the A8Mio has eight mic/line inputs and eight outputs in only 1/2 RU. Both devices are well suited for I/O extension for Q-SYS Core processors, as well as a wide variety of other DSP platforms. The A4Mio and A8Mio can be a key part of conferencing and presentation systems in corporate, higher education, hospitality and courtroom venues.

### 1.1 – What’s in the Box

The A4Mio/A8Mio comes supplied with the following:

- Axon A4Mio or A8Mio device
- Euro-block mating plugs
- Two removable mounting flanges

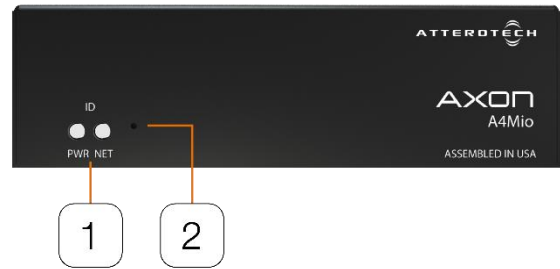
### 1.2– Optional Accessories

- 1 RU Rack/Surface Mount Tray Kit
- 24 V AC/DC Power Supply

## 1.3 - Device Features - Front Panel



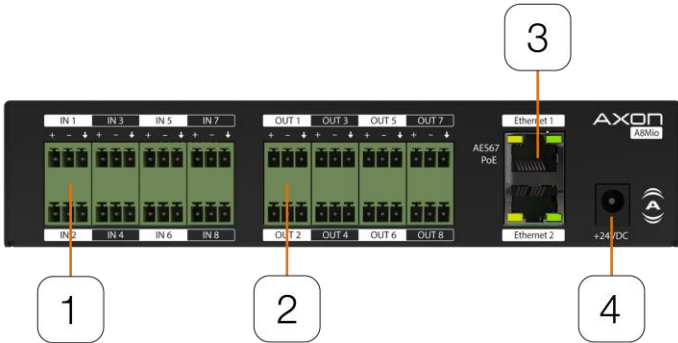
2 – A8Mio Front Panel



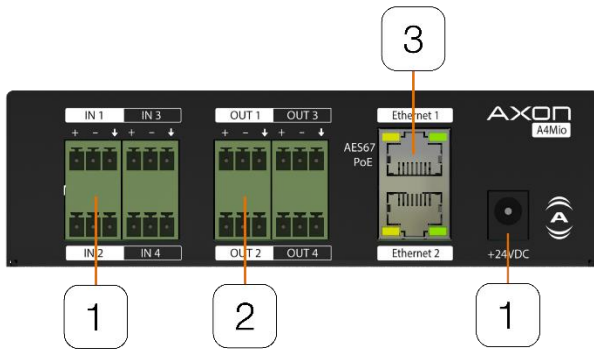
2 – A4Mio Front Panel

	Description
1	LED status indicators
2	Factory reset access

### 1.4 - Device Features - Rear Panel



3 – A8Mio Rear Panel



3 – A4Mio Rear Panel

	Description
1	Balanced mic/line inputs
2	Balanced line outputs
3	Ethernet interface connectors and indicators
4	DC input jack (center positive)

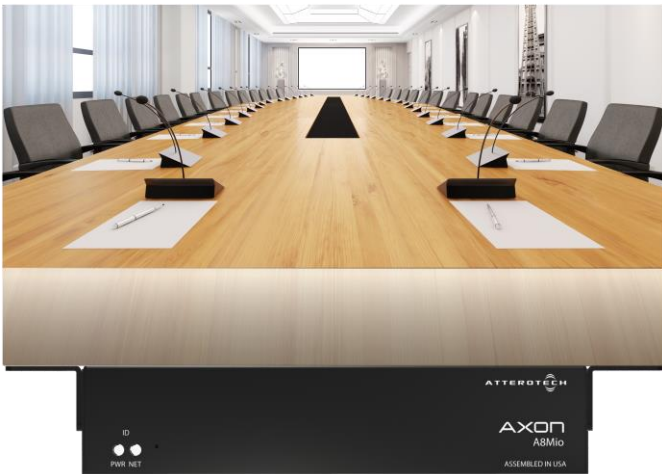
## 2 Product Installation

### 2.1 - Mounting

The A4Mio/A8Mio provides flexible mounting options:

#### Unit Surface Mounting

The A4Mio/A8Mio is supplied with two “L”-shaped mounting brackets that can be attached to either side of the unit. Once fitted, these brackets can be used to secure the A4Mio/A8Mio to any a flat surface. The brackets can be fitted with the flange facing up or down which allows the unit to be fitted under a desk for example.



2 - Under Table Surface Mounting

#### Installation Mounting Template

An installation mounting template is provided to simplify the process of installing the A4Mio/A8Mio in surface mount configuration.

These templates can be downloaded here:

- [Axon A4Mio installation template](#)
- [Axon A8Mio installation template](#)

#### Rack Mounting

The A4Mio is a 1/3 rack width device and is 1RU high. The A8Mio is 1/2 rack width device and is also 1RU high. Both can be mounted into a rack using the rack tray accessory (*sold separately*). The accessory tray can hold up to three 1/3<sup>rd</sup> rack width (or two 1/2 rack width) AXON units.

When used with the rack shelf, the A4Mio/A8Mio is attached to the tray with mounting screws installed through its base. The “L” brackets are then used as the rack ears by installing them to the side flanges of the tray.



3 - Rack Mount Tray

#### Tray Surface Mounting

The tray accessory may also be installed in a surface mount orientation. In this configuration, brackets are installed along the upper lip of on the sides of tray, allowing it to be mounted on any flat surface thus allowing multiple units to be installed easily on a wall or under a table too.



4 - Tray Surface Mounting Configuration

**\*Note:** Complete CAD drawings can be downloaded from the Attero Tech website. Please contact Attero Tech for any further product related information that is not accessible on the website.

## 2.2 – Power & Network Connectivity

The A4Mio/A8Mio can be powered using either PoE or a 24V power supply attached to the power jack input.

When powering using PoE:

- Attach the Ethernet 1 port to a PoE-enabled port on a PoE switch or midspan injector using a CAT-5e or better cabling.

When powering using an optional external supply:

- Attach either Ethernet port to a port on the audio network switch using a CAT-5e or better cable.
- Attach the power supply to the power input jack and then power up the external supply.

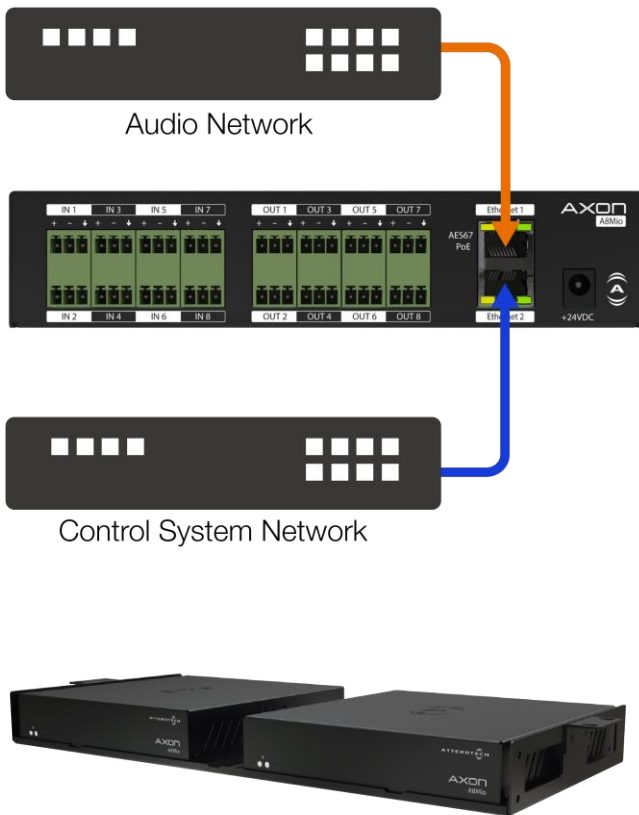
### 2.2.1 - Daisy Chain Switched Configuration

By default, the Ethernet ports on an A4Mio/A8Mio act as a two-port switch. This is useful if, for example, there is a second unit in the same physical location as the A4Mio/A8Mio. Its network can be connected to the A4Mio/A8Mio instead of having to have a separate home run back to the switch, thus creating a daisy chain - saving time, cabling and network infrastructure costs.

Note\* - An external DC power supply is necessary when daisy-chaining two Axon devices via Ethernet.

### 2.2.2 - Independent VLAN Configuration

The Ethernet network ports can also be configured as independent VLANs. This allows the A4Mio/A8Mio to support applications where the audio network and control network are run in their own individual VLANs. "Ethernet 1" would always be the audio connection while "Ethernet 2" would be the control network connection.

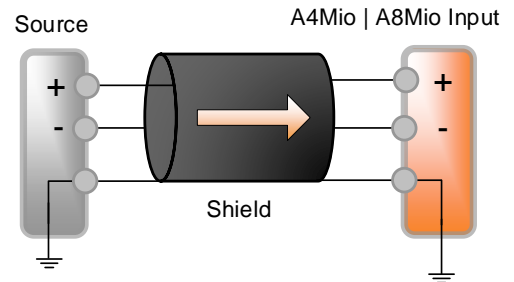


5 - Independent VLAN Configuration

**\*Note:** All Attero Tech products are tested using UTP network cabling and it is recommended that UTP cabling be used when installing them. STP cabling can be used for installation though care must be taken not introduce grounding issues into the system by doing so.

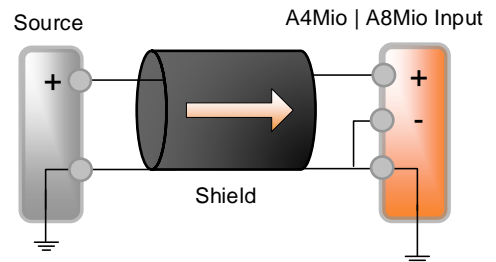
### 2.3 – Audio I/O Connections

The A4Mio/A8Mio features four/eight dedicated audio inputs, and four/eight audio outputs.



6 - Balanced Wiring Example

The audio inputs and outputs use a balanced connection. If connecting to devices that have unbalanced connections, the wiring should be done as follows:



7 - Unbalanced to Balanced Wiring Example



## 2.4 – LED Status Indications

The A4Mio/A8Mio is equipped with two LED indicators, PWR and NET. The following chart indicates the available LED status information:

LED	Device Status	Status Indication (LED)
PWR/NET	Booting	Solid Yellow
	Critical Error	Slow Blink Red
	“Identify” Mode	Slow Blink White
	Firmware Update	Fast Blink Blue
	Factory Reset	Fast Blink Green
PWR	Power on (OK)	White
NET	No PTP sync	Solid Red
	PTP sync – Slave	Solid Green
	PTP sync - Master	Solid White

5 - Status Indicators

## 3 – Device Configuration

The A4MIO/A8MIO product is supported for setup and monitoring within Attero Tech’s unIFY Control Panel software. Additionally, QSYS Designer plugins are available to provide seamless integration with the QSYS DSP platform.

For a complete description of the A4FLEX software controlled features found in unIFY Control Panel and API documentation, please refer to the Documents section of the [A4Mio](#) and [A8Mio](#) product pages on the QSC website.

### 3.1 – IP Address Setup

\*\*\*\*\* IMPORTANT \*\*\*\*\*

Failure to correctly configure IP addresses will not allow an A4Mio/A8Mio device to correctly authenticate in the unIFY Control Panel software, and configuration and control to and from the A4Mio/A8Mio will not be possible.

\*\*\*\*\*

In order to configure an A4Mio/A8Mio or to update A4Mio/A8Mio firmware, a PC will need to be able to communicate with it over the network. While all A4Mio/A8Mio devices will be discovered regardless of the IP address setup on the PC (the A4Mio/A8Mio utilizes mDNS for device discovery), full communication can only occur if the PC and the device have compatible IP addresses.

By default, A4Mio/A8Mio is set to get a dynamic IP address. If the A4Mio/A8Mio device 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 or APIPA) instead. A local link address is always in the range 169.254.x.y.

To ensure communication, the PC can either be also set to get a dynamic IP address, or be given a static IP address in the range 169.254.x.y.

### 3.2– Networking Information

The A4Mio/A8Mio use the following IP addresses, services and ports for communications on the network:

Port	TCP / UDP	Multicast IP	Description
68	UDP	N/A	DHCP
5353	UDP	224.0.0.251	mDNS – Device Discovery
319-320	UDP	224.0.1.129	PTP – Clocking (Domain 0)
49494	UDP	N/A	A4Mio/A8Mio control
49495	UDP	239.255.255.255	A4Mio/A8Mio status and metering

6 - Ports and Protocols



### 3.3 – Audio I/O and DSP Setup

All audio input and output settings may be configured through unIFY Control Panel.

Each analog audio input features switchable +48V phantom power, mic/line pad and supports up to 42 dB of adjustable preamp gain in 1 dB steps.

Each analog line output has a switchable pad allowing the output to be either at either mic or line level.



### 3.4 – Factory Reset

\*\*\*\*\* IMPORTANT \*\*\*\*\*

The factory reset returns the entire device to its factory defaults. Using this feature will mean all custom settings will be cleared.

\*\*\*\*\*

*\*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.*

The factory reset button is accessed through a small hole on the front of the unit using a small screwdriver or a paperclip. A factory reset is initiated by pressing and holding this button for 5 seconds or more while the device

is running and then releasing it. If done correctly, a second or two after the button is released, all the PWR and NET indicators will all turn yellow as the device reboots and it will then go through a normal start-up procedure. If the indicators do not change a couple of seconds after releasing the button, that is an indication the reset button not being held long enough and the factory reset was not applied.

Having applied a successful factory reset, on the network side, any customized settings such as device name, stream names and stream IP addresses, as well as receive stream assignment will all be set back to their defaults. The device will also revert to retrieving an IP address dynamically. The power-up defaults for the audio settings are also cleared.

### 3.5 – Firmware Updates

The A4Mio and A8Mio support field firmware updates. The updates are applied via the network using the smart firmware update tool within the Attero Tech by QSC unIFY Control Panel. This software is available on the [QSC website](#). The latest firmware files are available from the [Attero Tech firmware page](#) on the QSC website.

## 4- ARCHITECTS & ENGINEERS SPECIFICATION

The networked audio interface shall provide the ability to interface four or eight microphone or line-level inputs to an AES67 audio network and remote AES67 enabled audio devices. The networked audio interface shall also provide four or eight line-level outputs from an AES67 audio network.

The device shall support an integrated Ethernet switch for daisy chain connectivity to additional units via the network.

The AES67 networked audio interface shall support transmission and reception of 8 independent channels in both directions at 48 kHz, 24-bits with 1 ms packet times.

The device shall support surface mounting and rack mounting with optional accessories.

The unit shall accept IEEE 802.3af standard PoE from an IEEE 802.3af PoE compliant network switch or mid-span injector.

The unit shall include a software plugin for simple interfacing with QSC Q-SYS Core processor-based systems.

The device shall be compliant with the RoHS, WEEE and REACH directives.

The device unit shall be Compliant with the EMC/ESD requirements of FCC 47 CFR Part 15 - Subpart B, EN55032 and EN55024.

The unit shall be the Attero Tech Axon A4Mio (4in/4out) or A8Mio (8in/8out).

## Device Specifications

Audio Inputs (Mic/Line)	
Connector type	3.81 mm Euro-block, 3 position (16-28 AWG)
Gain	-8 dB to +34 dB gain, 1 dB increments
Input impedance	>2K ohms at any gain
Maximum input levels	-8 dB Gain, max input = +16.5 dBu (+24 dBu w/pad),
Phantom power:	+48 V, software selectable per channel
THD+N	<0.05% @ 1 kHz, -3 dBFS input. 20-20 kHz
Frequency response	20-20 kHz, +/- 1 dB (line), 50-20 kHz +/- 1 dB (mic)
EIN	-125 dBu
Audio Line Outputs	
Connector type	3.81mm Euro-block, 3 position (16-28 AWG)
Maximum output levels	+24 dBu
THD+N	20 Hz-20 kHz, +/-1 dB
Frequency response	20-20 kHz, +/- 1 dB (line), 50-20 kHz +/- 1 dB (mic)
Dynamic range	100 dB
Network	
Physical layer	Ethernet
Connector (s)	Dual RJ-45
Cable quality	CAT-5e or better UTP
Transmission speed	1 Gbps
AES67 Audio Network	
Stream announcement	SAP
Sample rate	48 kHz, 24 bit
Packet times / latency	1 ms / < 2 ms receive latency

Power Specifications	
PoE power	802.3af/at Class 0
A4Mio power consumption	<7 W (with phantom power enabled and powered by 24VDC in) <8 W on PoE
A8Mio power consumption	<10 W (with phantom power enabled and powered by 24VDC in) <12 W on PoE
Power options	PoE, +24 VDC or +24 VDC on 2.1mm jack (PoE and external DC can be used for redundancy)
A4Mio Dimensions	
Height	1.6 in (40.6 mm)
Width	5.4 in (137.2 mm)
Depth	7.9 in (200.7 mm)
Weight	1.8 lbs (0.83 kg)
A8Mio Dimensions	
Height	1.6 in (40.6 mm)
Width	7.4 in (188 mm)
Depth	8 in (203 mm)
Weight	2.1 lbs (0.95 kg)
Regulatory Compliance	
Certifications	FCC Part 15, Subpart B, Class A EMC CE (EN55032 EMC / EN55035 ESD) WEEE RoHS REACH
Environmental Operating Specifications	
Operating temperature	0 to 40° C