Axon D2FLEXio

Dante™/AES67 Networked Audio Interface

User Manual

Date 2/21/2020

614-0004747

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. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
17. 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.
18. 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.

WARRANTY INFORMATION

For a copy of the QSC Limited Warranty, visit the QSC website at www.qsc.com

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.

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1 – Overview

Figure 1 - D2FLEXio Front Panel

The D2FLEXio provides cost effective analog audio connectivity for installed AV systems.

Each analog audio I/O features an installer selectable switch to assign input or output audio connectivity. The D2FLEXio is 802.3af PoE powered with the option of a local DC supply in cases where PoE power is not available. Simple analog gain trim pots are provided for proper gain staging with pro or consumer line level audio equipment.

This flexibility provides a single product solution for cost effective analog audio conversion to and from any Dante™ or AES67 system.
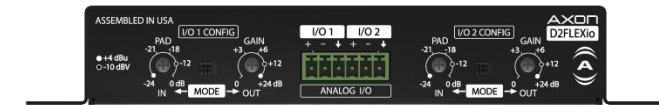

Figure 2 - D2FLEXio Rear Panel

1.1 – What's in the Box

The D2FELXio comes supplied with the following:

- o   D2FLEXio device (P/N: 900-00225-01)

1.2 – Optional Extras

The following are available as options for the D2FLEXio and that may be ordered separately:

- o   A 24 V DC power supply is available if PoE power is not desired or available – P/N: 900-00175-01
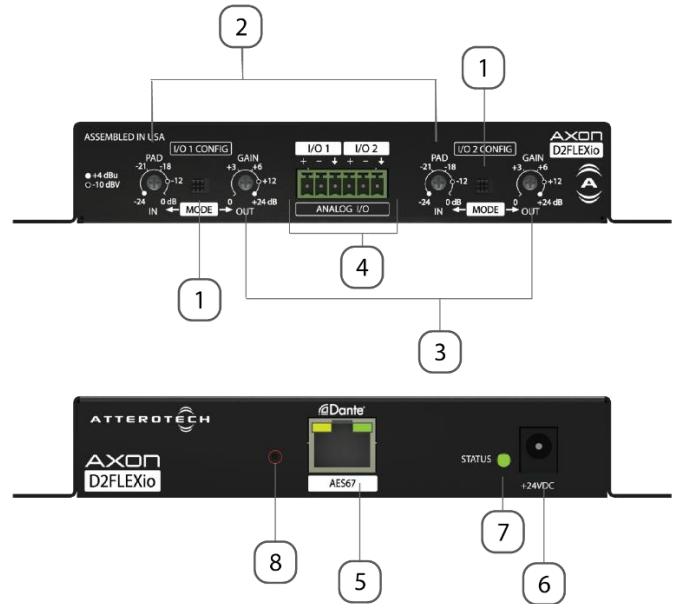
2 – Device Installation

Figure 3 - Product Overview

ID	Description
1	I/O Mode selection switch
2	Input Pad Control
3	Output Gain Control
4	Balanced Audio I/O (based on Mode selection)
5	Dante™/AES67 Ethernet interface connector and indicators
6	DC Input – Use with optional 24 V DC wall wart only
7	Status LED

__Note:__ The D2FLEXio has a label on one of the mounting flanges that shows the MAC address. This is important for initial device identification as the last 6 digits make up part of the devices default network name that is shown when the device is detected by Dante™ Controller. The full MAC address is also given on the bottom of the unit

2.1– Mounting

It is recommended that the unit be secured to a flat surface with a screw through each mounting flange. Dimensions for mounting are show in the Figure 3 below. Use a No. 6 screw of a type and size that is applicable to the surface to which the D2FLEXio will be attached.

Notes for mounting: All connections to the D2FLEXio should be made before the power is applied.

- o Attach any audio sources that will be used. The I/O terminals are balanced so be sure to check what I/O type the source or destination to be connected uses. In order to find how to connect it correctly (see Hardware Connections section).

When powering using PoE:
- o Attach the Dante™/AES67 port to a spare PoE-enabled port on a PoE switch using a CAT-5e cable. If a mid-span injector is being used, connect a spare input port to the network switch using a CAT-5e cable, and then connect the corresponding output port to the Dante™/AES67 port of the D2FLEXio.

When powering using an optional external supply:
- o Attach the Dante™/AES67 port to a spare port on the network switch using a CAT-5e cable.
- o Attach the power supply to the power input jack and then power up the external supply.

If all steps are performed correctly, the Status LED should be lit.

There may also be some activity on the D2FLEXio Dante™/AES667 Ethernet connector LED indicators. With no Dante™/AES67 network, both LEDs will remain off. If an active connection is made both LEDs will come on and if there is network activity, the yellow LED will then flash.

Note: CAD drawings can be downloaded from the D2FLEXio product page on the QSC website. Please contact QSC tech support for any further product related information that is not accessible on the website.
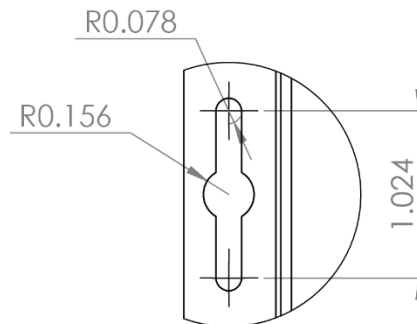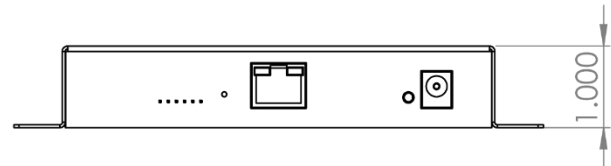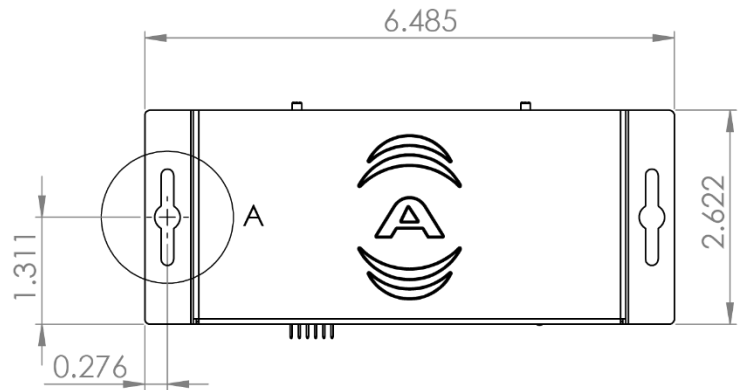
Figure 4- Dimensional Drawing

2.2– Error Reporting

The D2FLEXio 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. The following chart indicates other error states:

LED State	Status
Red	No Sync present or Error
Flashing Red	Corrupt Image (Contact Tech Support)
Green	Slave Synchronized
Flashing Green	Clock Master
Flashing Blue	Identify
White	Factory Mode

2.3 – Hardware Connections

The D2FLEXio provides balanced line-level 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/or outputs of the D2FLEXio. Professional grade audio cabling is recommended to achieve the best audio performance throughout the system.
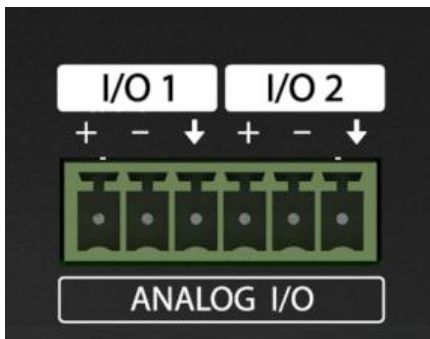

Figure 5 - I/O ports/wiring
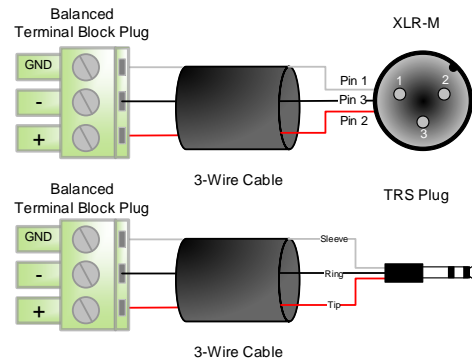
2.3.1 – Balanced to Balanced Wiring

Figure 6 - Balanced Wiring Guide

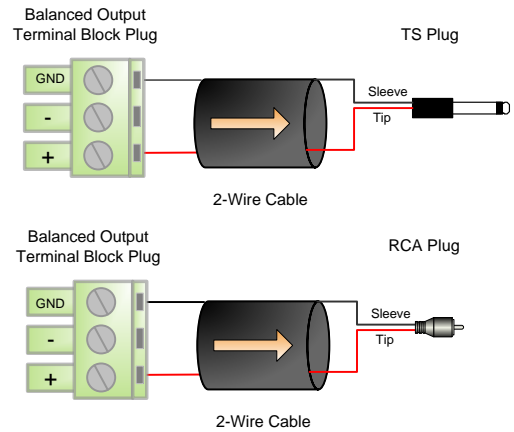### 2.3.2 Balanced to Unbalanced Wiring

Figure 7 – Unbalanced Wiring Guide

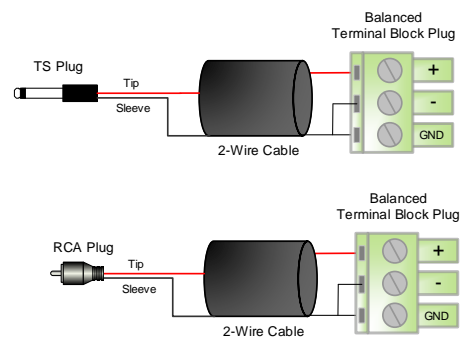### 2.3.3– Unbalanced to Balanced Wiring

Figure 8 – Unbalanced Wiring Guide

3 – Device Configuration

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

The audio routing should be carried out using any application that supports Dante™ audio routing. This could be from a 3rd party manufacturer or be Audinate's Dante Controller software. Dante™ Controller can be obtained from the Audinate website. Instructions on how to use this software and about setting up routes on a Dante™ network can also be found on Audinate's website.

Note: When using Dante™ Controller, the D2FLEXio will be shown using a default device name of D2FLEXio-###### where '######' is the last six characters of the devices MAC address.

3.1 – Audio Configuration

Based on the I/O mode selected the device can be configured with two options.
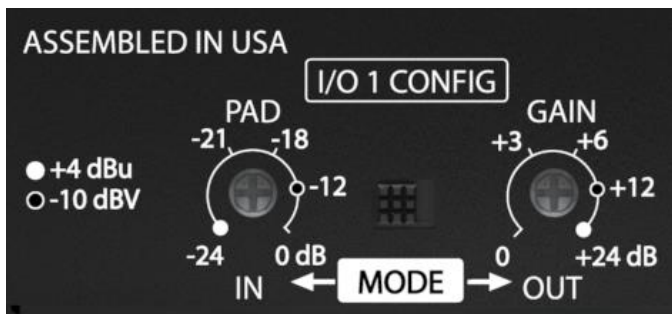

Figure 9 - I/O configuration pots

3.1.1 – Input Settings

The line-level input pads are adjusted using 2 rotary pots. A small screwdriver is needed to adjust the input pad levels. The inputs have an adjustable attenuation range of 0 to -24dB, allowing an input full scale input signal range of 0 dBu to +24 dBu.

3.1.2 – Output Settings

The output gains are adjusted using 2 rotary pots. A small screwdriver is needed to adjust the gain levels. The outputs have an adjustable gain range of 0 to +24dB, allowing for full scale output levels of 0 dBu to +24 dBu.

3.2– IP Address Setup

************************* **IMPORTANT** *************************
Failure to correctly configure IP addresses will not allow an D2FLEXio device to correctly authenticate in the unIFY Control Panel software and while it will show up in Dante Controller, the input and output channels won't be visible and routing of audio to and from the D2FLEXio will not be possible.
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In order to configure a D2FLEXio both set up audio routing and to update firmware, the PC will need to be able to communicate with it over the network. While all Dante™/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, D2FLEXio is set to get a dynamic IP address. As with all Dante™/AES67 devices, if the D2FLEXio device does not find a DHCP server to retrieve an IP address from, it will give itself an automatic private IP address (APIPA) instead. An APIPA 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 for the changes to take effect.

Further information on IP setup for an audio system using Dante can be found on Audnate's FAQ page.

3.3– Factory Reset

**************************** **IMPORTANT** *************************
The factory reset returns the entire device to its factory defaults. Using this feature will mean all custom Dante™ 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.

Figure 10 - Reset button access

The factory reset button is accessed through a small hole on the back 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 powered on. If done correctly, the status LED will change to white. This indicates the D2FLEXio has entered factory mode.

If Dante Controller or other Dante device discovery software is in use, the device may show up as "Ultimo-xxxxxx". This simply indicated the device is in factory mode.

To complete the factory reset and revert back to normal operation. Simple toggle the factory reset button again with a short press and release or power cycle the device.

Having applied a successful factory reset, on the Dante™/AES67 side, customized device name and channel names will be cleared and any receive flow subscriptions will be removed. The network settings will also be reset so the device will return to retrieving an IP address dynamically.

3.4 – Firmware Updates

The D2FLEXio 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 D2FLEXio SFU file is available from the Attero Tech firmware page on the QSC website.

ARCHITECTS & ENGINEERS SPECIFICATION

The Dante™/AES67 flange mount interface unit shall two installer selectable analog inputs or outputs. The line-level analog inputs shall have an attenuation range of 0 to -24dB, allowing an input full scale input signal range of 0 dBu to +24 dBu. The line-level analog outputs shall have a gain range of 0 to +24dB, allowing for full scale output levels of 0 dBu to +24 dBu.

The unit shall provide a terminal block connection for analog conversion of up to 2 Dante™/AES67 digital audio network channels. The internal digital to analog signal conversion shall support 16 and 24-bit resolution with sampling frequencies of 44.1, 48, 88.2, and 96 kHz. The default sample rate shall be 48 kHz.

The unit shall accept either +24VDC or IEEE 802.3af standard PoE from an IEEE 802.3af PoE compliant network switch or mid-span injector.

The Dante™/AES67 interface shall be compliant with the RoHS, WEEE and REACH directives.

The Dante™/AES67 interface unit shall be Compliant with the EMC/ESD requirements for FCC and CE.

The unit shall be the Attero Tech AXON D2FLEXio interface.

Device Specifications

Analog Audio Inputs (when selected)	
I/O Type	Two switchable Balanced and RF filtered 3-pin de-pluggable terminal blocks
Maximum Input Levels	0 dBu to +24dBu line-level (Pad attenuation 0 to -24dB)
THD+N	<= 0.05% at 3dB for all attenuation levels
Dynamic Range	>= 100 dB (20 -22 kHz)
Frequency Response	20 to 20 kHz, +/- 1 dB at all attenuation settings

Analog Audio Outputs (when selected)	
I/O Type	Two switchable Balanced and RF filtered 3-pin de-pluggable
Maximum output level	0 dBu to +24 dBu (0 to +24 dB gain range)
THD+N	<= 0.05% at 3dB for all gain levels
Dynamic Range	>= 95 dB (20 -22 kHz) @ any output gain

Dante™/AES67 Network	
Physical Layer	Ethernet
Connector (s)	RJ-45
Cable Quality	CAT-5e or better, UTP
Transmission Speed	100 Mbps
Supported Bit Rates	16, 24
Supported Sample Rates	44.1kHz, 48kHz (default), 88.2kHz, 96kHz
Minimum Audio Latency	1ms
AES67 Support	AES67, SAP based stream discovery

Power Specifications	
PoE Power	802.3af Class 0
Power Consumption	< 3W Max
Local Power	+24V DC

Physical Dimensions	
Width	6.485"
Height	1"
Depth	2.622"
Weight	0.65 lbs.

Regulatory Compliance	
Certifications	FCC Part 15, Subpart B, Class A EMC CE (EN55032 EMC / EN55024 ESD) WEEE RoHS REACH

Environmental Operating Specifications	
Operating Temperature	0 to 40° C