Listen AudioConnect 2 Analyzer Audio Interfaces User Manual

Listen

Audio Connect 2 ™
User Manual

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AUDIOCONNECT 2 USER MANUAL

Contents

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   This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

Introduction

Audio Connect 2TM is a fully-featured yet portable dual-channel audio test interface with high resolution measurement, microphone power and more in a cost-effective and compact package. It is ideal for headphone and automotive measurements from the production line to out in the field.

Features

- Sample rates up to 192kHz
- 2 input channels that can be independently configured as TEDS-compatible microphone inputs with constant current bias, microphone inputs with constant voltage bias, or regular line-in. Inputs feature selectable 0/20dB input gain with level and overload indicators.
- Listen's SCM mics are supported using a BNC to microdot adapter (not included).
- 2 line output channels for driving powered speakers, amplifiers etc.
- A low noise, low distortion, headphone amplifier to power headphones or monitor the audio signal.
- A Single USB-C connection to interface with the computer AND provide power.
- Some laptops with USB-A offer insufficient output to power Audio Connect 2. An AC adapter is also included.
- Error-proof operation with exclusive software control (no front panel knobs), input protection, and BNC connectors.
- Automatic configuration with Sound Check.

High resolution measurements
With sampling rates up to 192kHz and 24 Bits, Audio Connect 2 is ideal for high resolution audio measurements on headphones, automotive systems and more.

Powers most microphones, couplers and head and torso simulators
The two inputs can be independently configured as line inputs or TEDS-compatible microphone input channels, offering both constant voltage (SCM) and constant current (IEPE) power. This makes it ideal for headphone measurements as it can power ear couplers, and most modern head and torso simulators in addition to a wide range of microphones.

Complete test control
Two line outputs drive micro speakers and powered loudspeakers or mouth simulators, or control SC Amp or other amplifiers. The separate low noise, low distortion headphone amplifier powers headphones or permits monitoring of the audio signal via wired headphones.

Seamless integration
Integration with Sound Check® (version 21 and higher) is seamless, and setup is fast. The device is fully calibrated before it leaves the factory. Calibration values are stored on the device firmware. When the Audio Connect 2 is connected to Sound Check, the system reads the calibration values, avoiding the need for manual calibration. The input channels are automatically populated with sampling rate and device self test requires no additional cabling as all switching is internal. Setup is further streamlined with TEDS support to automatically identify and read data from TEDS microphones and accelerometers.

Simple Configuration and Error-free Operation
The interface is completely knob-free, with control only via the software – either through a sequence or a dedicated control panel. This eliminates any possibility of accidental change to the settings. Level and overload indicators ensure the integrity of your results with a clear warning if the signal is near or actually clipping, and BNC connectors minimize the possibility of poor cable connection.

Portable and rugged
Audio Connect 2 is designed for portability. It is powered from a laptop via USB-C, eliminating the need for a dedicated power supply. This makes it ideal for measurements outside the lab such as testing headphones and hearing aids in real-world environments and making in-car audio measurements. Used with the line powered BQC-4149 interface you have a fully portable Bluetooth headphone test system with both hardware devices running from your laptop’s USB power! Its ruggedness and competitive price point also ensure that it offers excellent value for production line applications. It can be rack mounted, and the fingerprint-resistant matte finish ensures that it always looks great!

Hardware Setup

- 2 Input channels – Mic or Line
- 2 Line Output channels
- 2 Headphone channels
- Separate D/A converter channels are used so different signals can be routed to the line and headphone outputs.
- Sample Rate selections are: 44100, 48000, 88200, 96000, 176400, 192000.

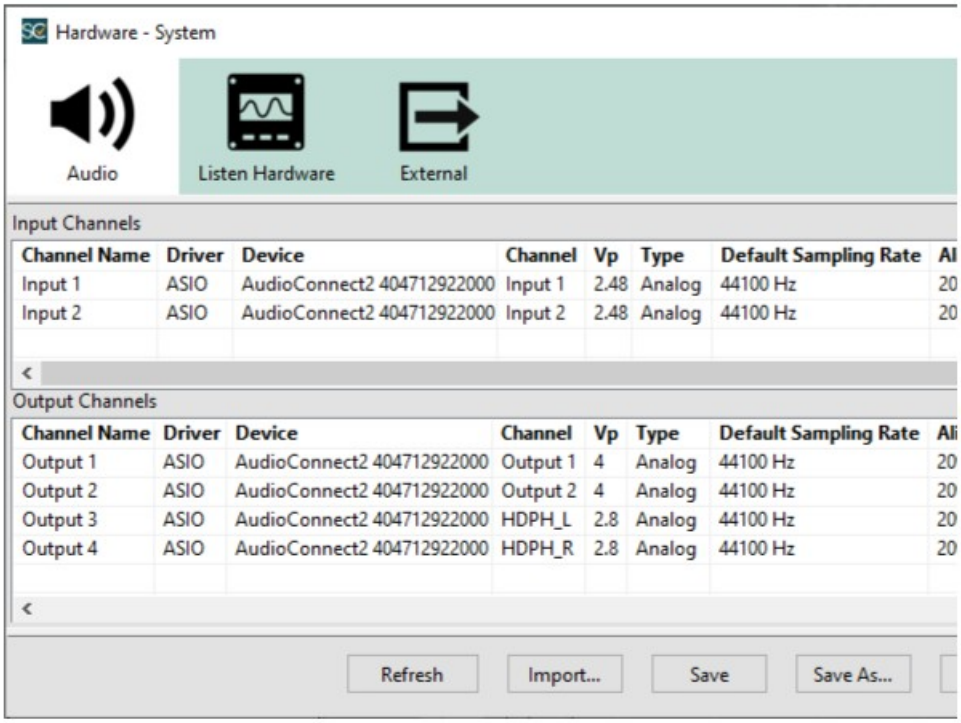

Figure 1-1: Hardware Editor

Sound Check Message Step

Audio Connect 2 is controlled by a Sound Check Message Step and through the Hardware Editor Startup Default. This enables all Audio Connect 2 settings and parameters such as gain and signal routing to be controlled within a test sequence.

Input Monitoring via Headphones

When the Headphone Source is set to Monitor in the Message Step, the input signal is also sent to the headphone output and the output Attenuation can be adjusted in real time.

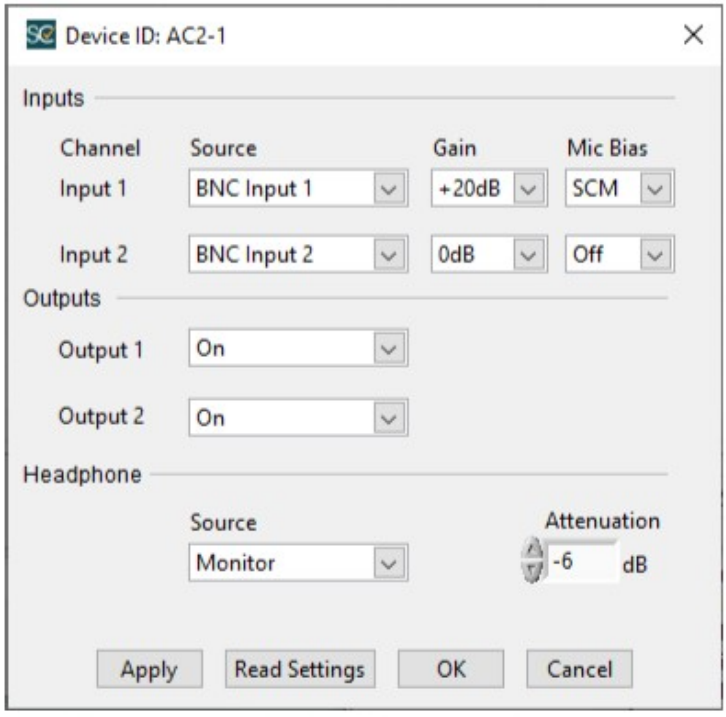

Figure 1-2: Headphone Attenuation

Operation

Installation

Windows – Audio Connect 2 uses an ASIO driver that is installed with Sound Check 21 and later versions. Once Audio Connect 2 is attached to the computer with the included USB-C cable, start Sound Check and the device will automatically be recognized in the Sound Check Hardware Editor.
Mac – Audio Connect 2 uses a native Core Audio driver. The device is recognized after connecting with the USB-C cable provided.

Firmware Update (DFU)

A Windows DFU application is available to update the Audio Connect 2 firmware. A macOS application is not available.

Sound Check Hardware Configuration

The Hardware Configuration in Sound Check must be setup for use with Audio Connect 2 before attempting a measurement. The Plug and Play feature in Sound Check ensures that all the required Hardware Editor channels and Calibration Editor signal paths are established when Audio Connect 2 is connected to the computer.

Plug and Play

"Automatically create Signal Paths for Listen Devices" runs at startup to create signal paths in the Calibration Editor for any connected Listen Hardware. It can be disabled to prevent changes if necessary.
Settings are found in Sound Check Preferences > Launch. This is enabled by default.
See the main Sound Check manual > Sound Check Main Screen > Preferences for more information on "Automatically create signal paths for Listen devices".

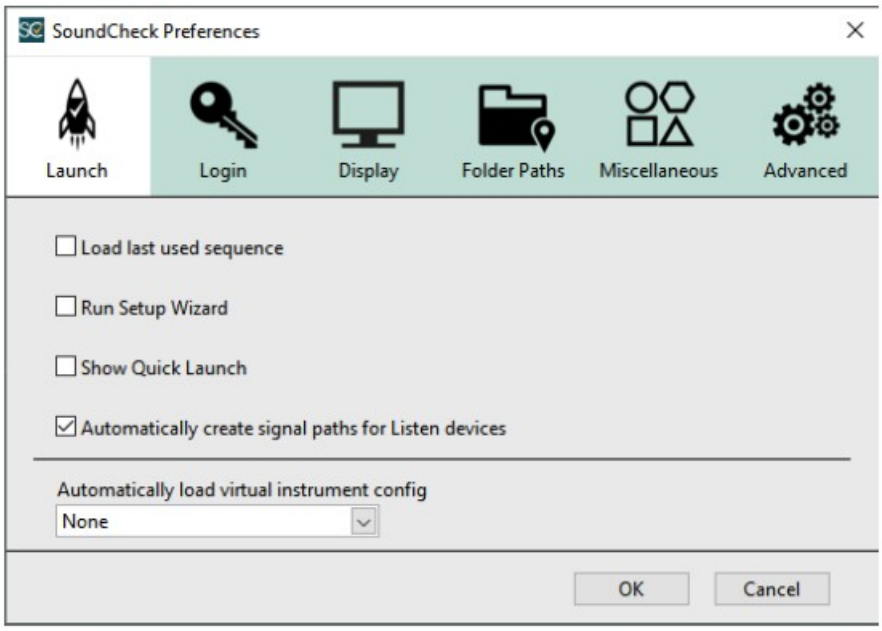

Figure 2-1: Hardware Editor

Note: The input and output Vp values are determined at Listen and are stored in Audio Connect 2. These values are automatically loaded into the Hardware Editor even if "Plug and Play" is not selected. The Vp value defines the maximum peak voltage that corresponds to 0 dBFs (Full Scale Deflection).

Driver Selection

Audio Connect 2 should be set to use the preferred ASIO driver as shown in Figure 2-2. Audio Connect 2 can also be used with WASAPI drivers. Core Audio drivers are used for macOS.

Swapping Devices
If Audio Connect 2 is exchanged for a different Audio Connect 2 while Sound Check is open:

- Open the Sound Check Hardware Editor
- Click Refresh. The editor will update to show the serial number of the new unit in the Device field as well as the new Vp values. The Listen Hardware Tab will also update and show that the new interface has replaced the old one.

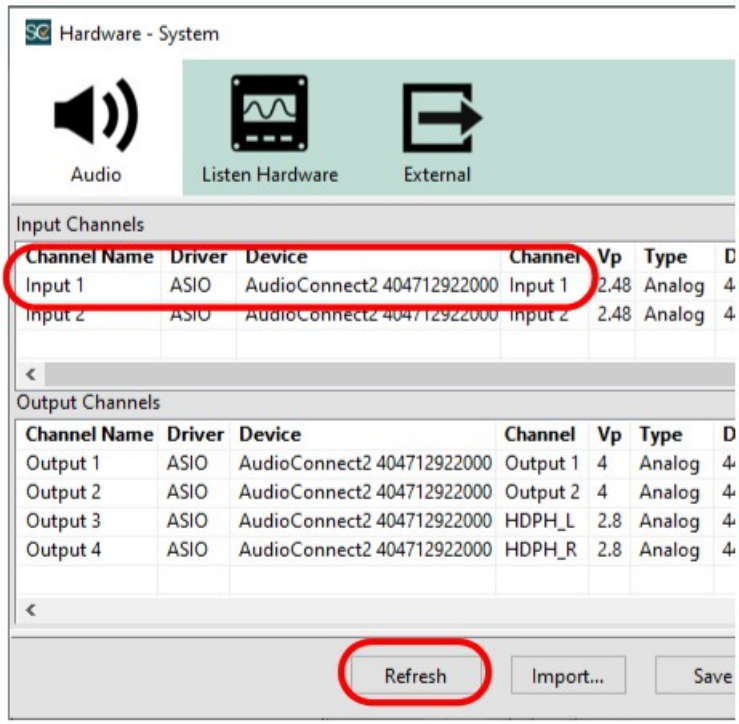

Figure 2-2: Refresh Hardware Editor

Operating Modes

Normal
Under normal operation, the Audio Connect 2 is connected to a Windows or Mac computer via USB-C. Sound Check is used to control the Audio Connect 2 settings. Sound Check allows audio data to be transferred using ASIO or WASAPI protocols. When Audio Connect 2 is powered up, it recalls its last settings used during normal operation.

Standalone
Audio Connect 2 will identify itself as a USB Audio device to a software host allowing it to be used in other applications. The WASAPI driver selection will allow all channels to be accessed in other applications. It will retain its last known state and cannot be reconfigured without being connected to the Sound Check system.

Front Panel

Audio Connect 2 front panel has no physical controls. All functions are controlled through Message Steps in Sound Check.

Connectors

- 2 – BNC connectors for Mic/Line inputs

- 1 – ¼” TRS Stereo Headphone output jack

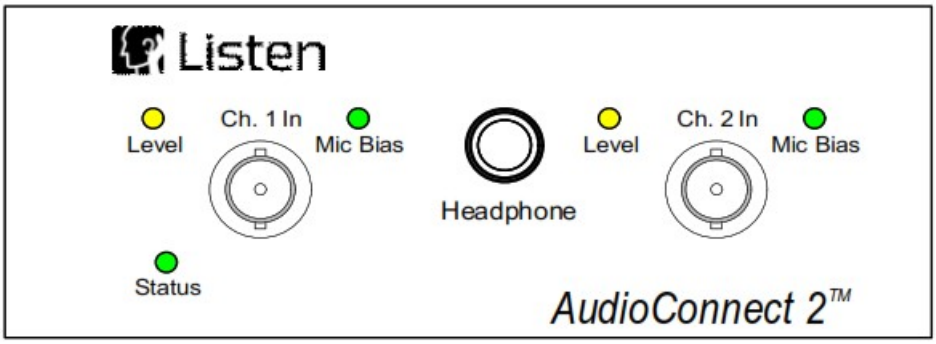

Figure 2-3: Front Panel

Indicators

Status LED

- Off: no power has been applied to the unit
- Blue: power applied to the unit, but there is no USB communication with the host
- Green: power applied to the unit, active USB communication with the host

Input Level LEDs

- Off: no signal
- Green: signal present
- Yellow: signal level > -6 dBs
- Red: signal level > -1 dBFs

Microphone Bias LEDs

- Off: no bias
- Green: SCM voltage bias
- Blue: IEPE constant current bias

Rear Panel

Connectors

- 2 – BNC connectors for Line outputs
- 1 – USB-C connector
- 1 – Power Input connector for a +5 VDC power adapter (barrel-style, mates to 2.5 mm (ID) x 5.5 mm (OD) plug)
  - +5 VDC power supply (included)
  - Audio Connect 2 automatically switches power source from USB-C to the power input connector when the external AC adapter is used.

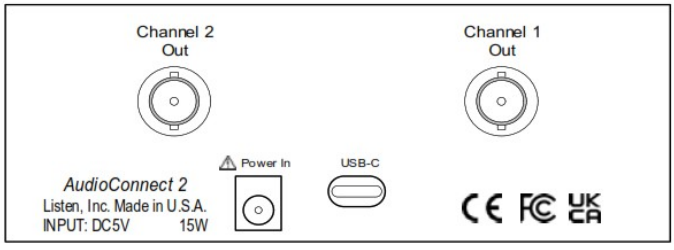

Figure 2-4: Back Panel

Hardware Editor

The default hardware channels for Audio Connect 2 are shown in Figure 2-5.
The sample rate for Audio Connect 2 is set to 44.1kHz by default. Click on the drop-down arrow in the Default Sample Rate column and select from the available rates. This will update all input and output sample rate fields for the device.

- When using the ASIO or WASAPI drivers Vp values are automatically loaded from Audio Connect 2.
- Outputs 3 and 4 are for the discrete Headphone Output.

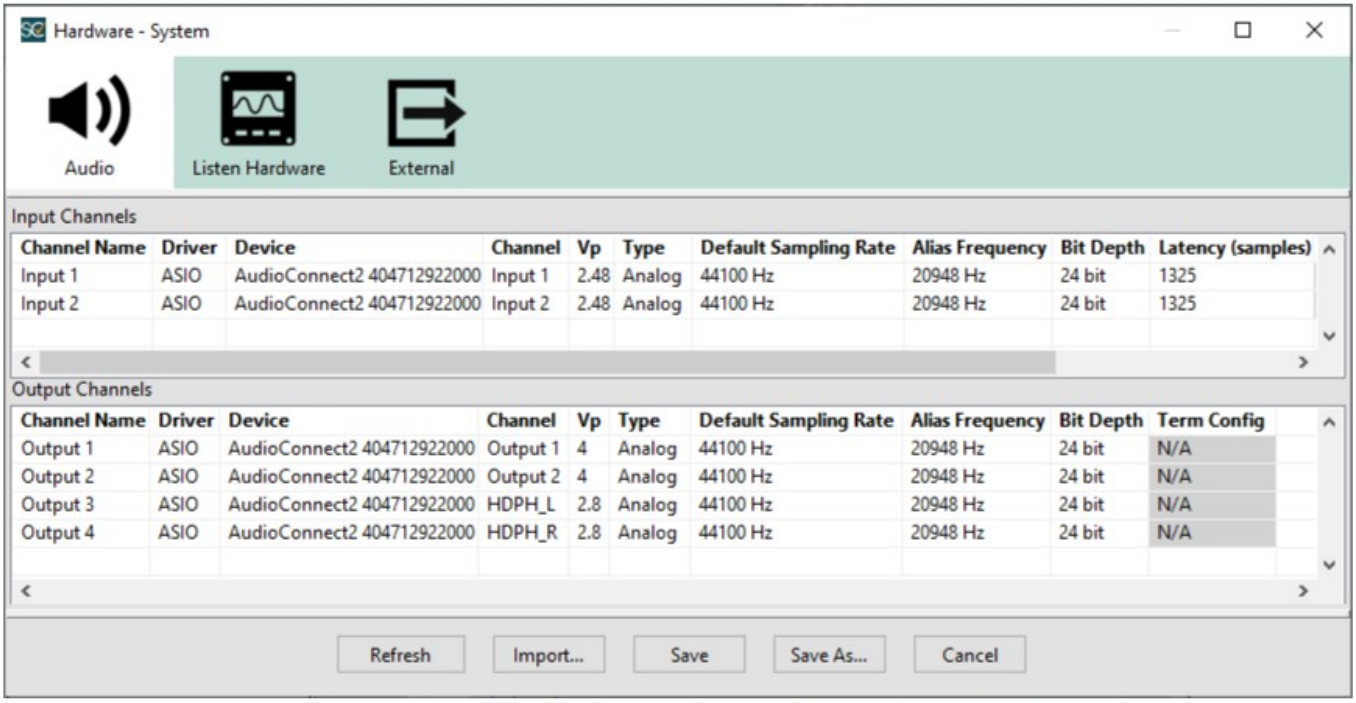

Figure 2-5: Hardware Editor - Audio Tab

The default driver selection is ASIO.

- Using the ASIO driver will provide repeatable latency
- WASAPI does not allow for repeatable latency so all Analysis Steps in Sound Check sequences should use Auto Delay on the Delay Tab

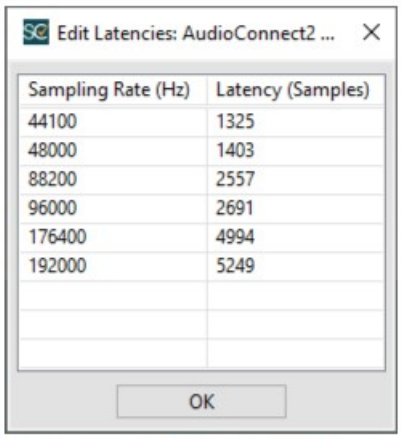

Figure 2-6: ASIO Latency Table

Note: Connecting two Audio Connect 2 interfaces or an Audio Connect 2 with an Amp Connect 621 will set the Hardware Editor Driver selection for both devices to WASAPI. This is typically used on a fresh installation where the Hardware Editor has not been populated.

Latency – The ASIO Latency value for each sample rate is preset for Audio Connect 2. Generally these values should not need to be adjusted. For default Latency values see the tables on page 8.
If using the WASAPI driver, see Default Latency on page 8.
Latency is the round trip time delay between input and output channels on a single audio interface when operating in full-duplex mode (record and play simultaneously). Consistent latency is essential for sample accurate measurements such as Absolute Phase. Refer to the Sound Check Manual > Hardware Configuration > Latency Adjustment.
The following process should be followed if you find that latency is slightly different than the default hardware step included with Sound Check. This could be due to differences in motherboard or driver version.

1. Open the Hardware Editor. Since Latency is Sample Rate dependent, click on the Default Sample Rate drop down to select the desired rate.
2. Click on the drop down arrow next to the value in the Latency field of the Hardware Editor. Select Edit and the Latency Table will open.
3. Set the Latency for the desired sample rate to 0 (zero) and click OK.
4. Make sure the sample rate of the audio interface has updated.
5. Run the Audio Connect 2 Self Test sequence from the Calibration folder in Sound Check. This determines the Latency for the selected Sample Rate. (“Fine Tuning” of the Latency value may be required by repeating Step 5.)
6. Enter this value in the Latency field of the Hardware Editor Sample Rate/ Latency Table. Repeat this process for other required Sample Rates.
7. All channels, analog or digital, must have the same latency value per sample rate for that audio interface. This ensures the system will work correctly if they are used simultaneously in a sequence.

Default Latency

Windows Default Latency in Samples for Typical Sample Rate and Buffer Values						
USB Connection	**44.1 kHz**	**48 kHz**	**88.2k**	**96 kHz**	**176.4 kHz**	**192 kHz**
ASIO/USB Buffer	512 / Safe	512 / Safe	1024 / Safe	1024 / Safe	2048 / Safe	2048 / Safe
Samples / ASIO	1325	1403	2557	2691	4994	5249
Samples / WASAPI	1343	1468	2593	2819	5064	5506
Enter the Samples value in the Hardware Editor Latency field for the selected Sample Rate.						
Figure 2-9: Windows Latency in Samples						

Important! WASAPI – If the user switches to the WASAPI driver for Audio Connect 2 and then selects Refresh in the Hardware Editor, both the latency and Vp values will be populated.

macOS Default Latency in Samples for Typical Sample Rate Values						
USB Connection Samples	**44.1 kHz** 1163	**48 kHz** 1277	**88.2k** 1451	**96 kHz** 2437	**176.4 kHz** 4357	**192 kHz** 4739
Enter the Samples value in the Hardware Editor Latency field for the selected Sample Rate.						
Figure 2-10: macOS Latency in Samples						

Calibration Editor

When Audio Connect 2 is recognized during Sound Check startup, the Calibration Editor Table is populated with new channels specifically for Audio Connect 2. These channels are setup with Auto Dev and Auto Ch which is required to use the Auto Gain function in SoundCheck.

- Mic 1 – Routed to Input 1
- Mic 2 – Routed to Input 2
- Headphone Amp 1 – Routed to Output 3
- Headphone Amp 2 – Routed to Output 4
- Direct In 1 & 2 and Direct Out 1 & 2 channels are routed to Hardware Channels 1 and 2 respectively.

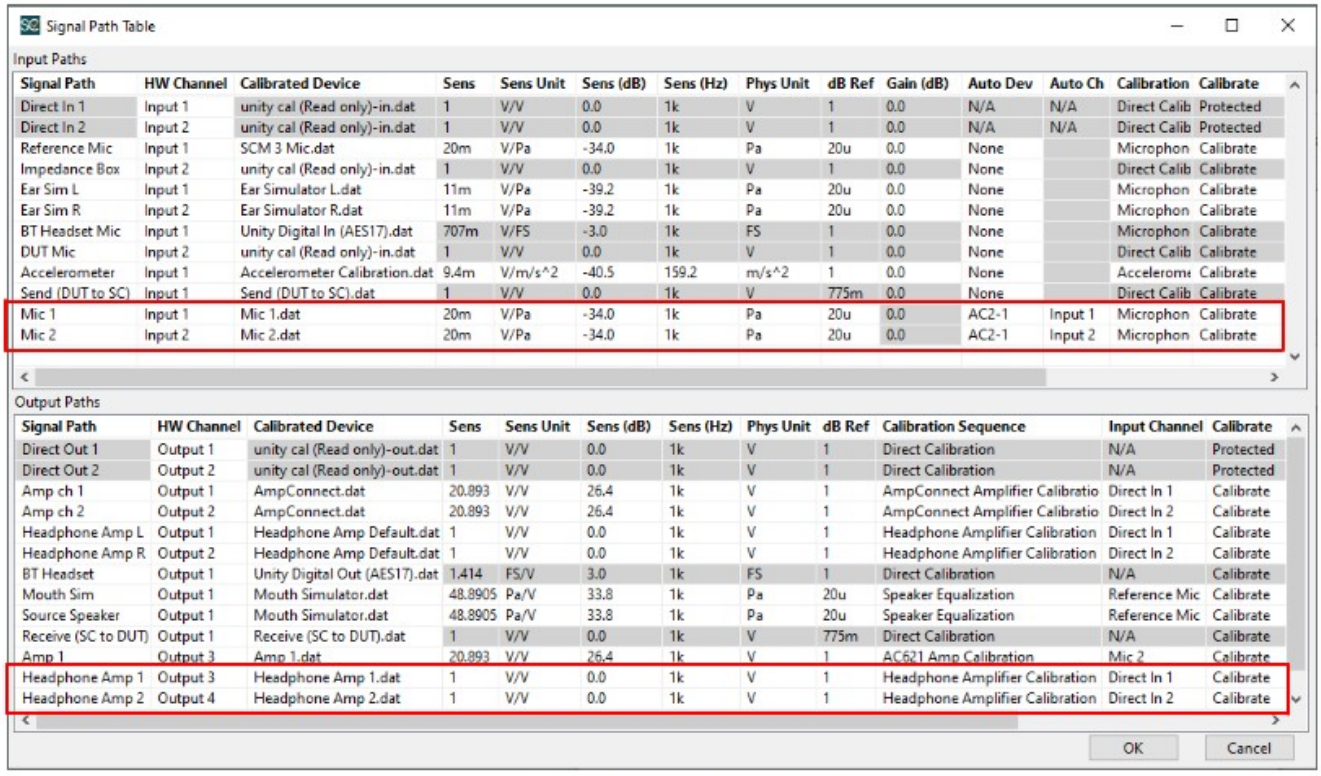

Figure 2-11: Calibration Editor Table

SoundCheck Control

All functions are controlled through a Message Step in a sequence or through the Hardware Editor Listen Hardware configuration. The same controls are used by both.

Message Step

All functions of Audio Connect 2 are controlled through a SoundCheck Message Step allowing for setting changes during the run of a test sequence. The Message Step is also available in the Hardware Editor Listen Hardware Tab to set the hardware defaults for Audio Connect 2. The factory default settings are shown in Figure 2-12.

- Source: BNC Input 1 and 2
- Input 1: Gain 0dB, Mic Bias – SCM
- Input 2: Gain 0dB, Mic Bias – Off
- Output 1 and 2: On
- Headphone – Source: On

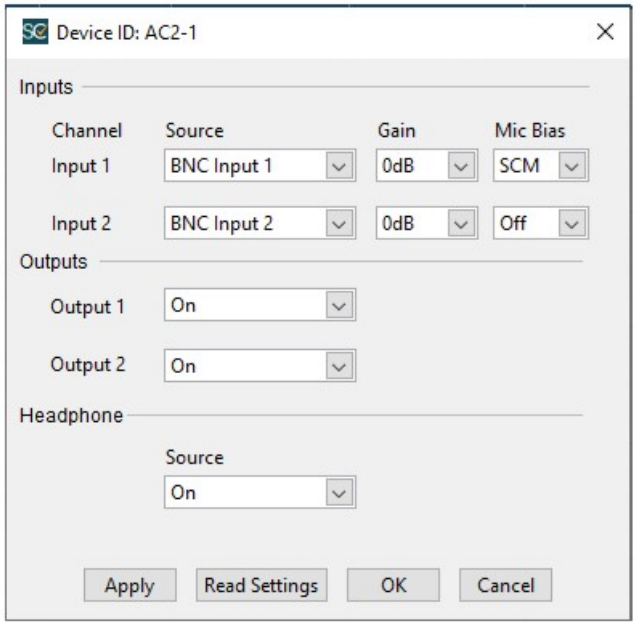

Figure 2-12: Factory Defaults

Input Monitoring via Headphones

When Monitor is selected in the Message Step, Audio Connect 2 will pass the input signal directly to the headphone output. The allows the user to hear the signal applied to the inputs.

See Headphone on page 11.

The following controls are available in an Audio Connect 2 Message Step.

Inputs

Mic Bias – Independently selectable for each input

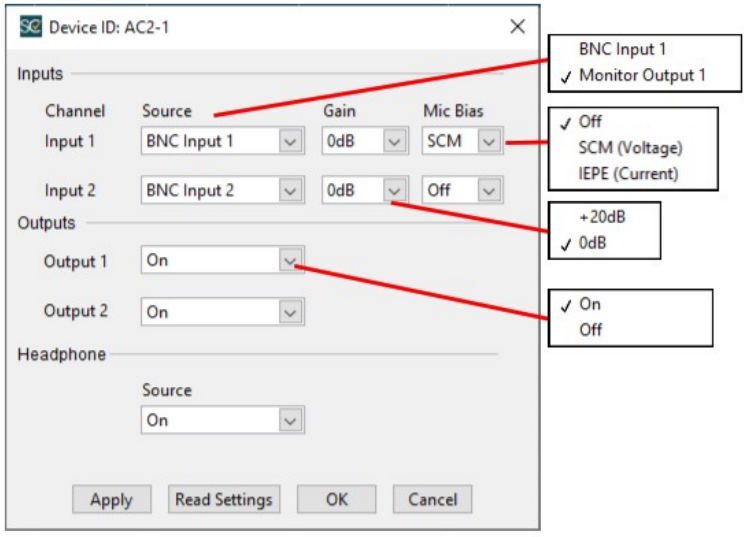

Figure 2-13: Settings

- Off
- SCM (Voltage)
- IEPE (Current)

Source

- **BNC Input** – Routes signal from the BNC input to the digital audio buss of the SoundCheck computer.
- **Monitor Output** – Routes the signal from the audio interface output to the audio interface input (Loop Back). This is used for the device self test sequence. The BNC input is internally terminated.

Gain – Set independently for each channel

- 0 dB or +20 dB
- This gain value is used in Calibration Configuration > Auto Dev/Auto Ch. See Listen Hardware – Auto Device / Auto Channel in the SoundCheck manual.

Outputs

- On or Off

Headphone

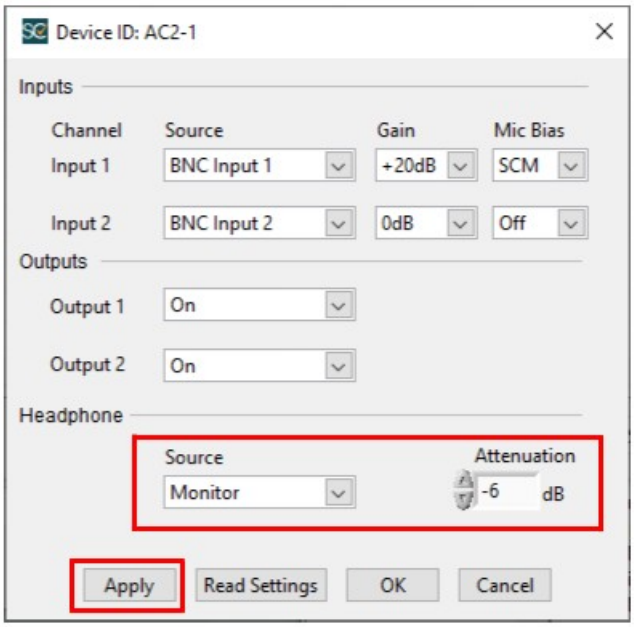

Figure 2-14: Headphone Attenuation

- **On** – Sends the SoundCheck Stimulus to the headphone output for headphone measurement
- **Off** – No signal is sent to the headphone output
- **Monitor** – This allows the user to directly monitor the input signals through the headphone out and hear the signal being applied to SoundCheck for measurement
  When Monitor is selected an additional control for output attenuation is available. This allows the user to set the desired output level in real time without having to select the Apply button in the Message Step.
- The attenuation range is 0 to -60 dB in 1 dB steps
- Changing the Source or the Attenuation value is a real time control. All changes in the Headphone section occur instantly.
- Input 1 monitors on headphone left and input 2 monitors on headphone right

Headphone Amp Calibration

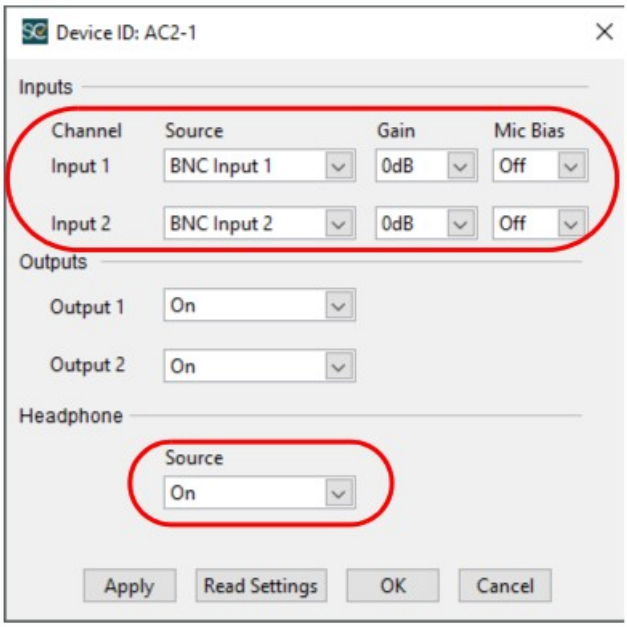

Figure 2-15: AudioConnect 2 Setup

When using the Headphone Out of Audio Connect 2 for headphone testing, the Headphone Amp should be calibrated in the SoundCheck Calibration editor. The following procedure fine tunes the amp sensitivity and creates independent correction curves to the Headphone Amp output channels.
Audio Connect 2 must be set to BNC Input 1 & 2 before running the calibration procedure. This can be performed in the Hardware Editor – Listen Hardware – Startup Defaults or from an Offline Message Step (select AudioConnect2.MES template). See Figure 2-15.

- Set Channel 1 and 2 Source to BNC Input 1 & 2
- Set the Headphone Source to On
- Select Apply to send the settings to Audio Connect 2 and OK to exit the editor

This procedure requires the use of a Stereo 1/4” TRS to RCA Male Left/Right cable (typically called an Insert Cable) with two RCA to BNC adapters. The wiring is shown in Figure 2-16.

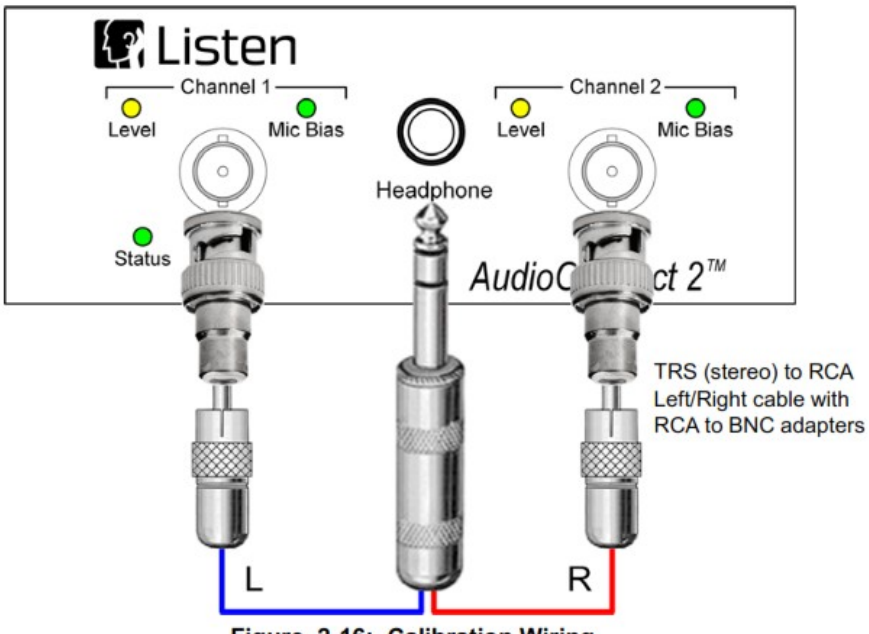

Figure 2-16: Calibration Wiring

Calibration Procedure

The Audio Connect 2 Headphone Amp uses Signal Paths Headphone Amp 1 and 2 which are assigned to Output 3 and 4 hardware channels. The two Calibrated Devices files allow for independent Sensitivity values and correction curves for the headphone amp.

1. Open the Calibration Editor and then select Open Table. The table is shown in Figure 2-17.

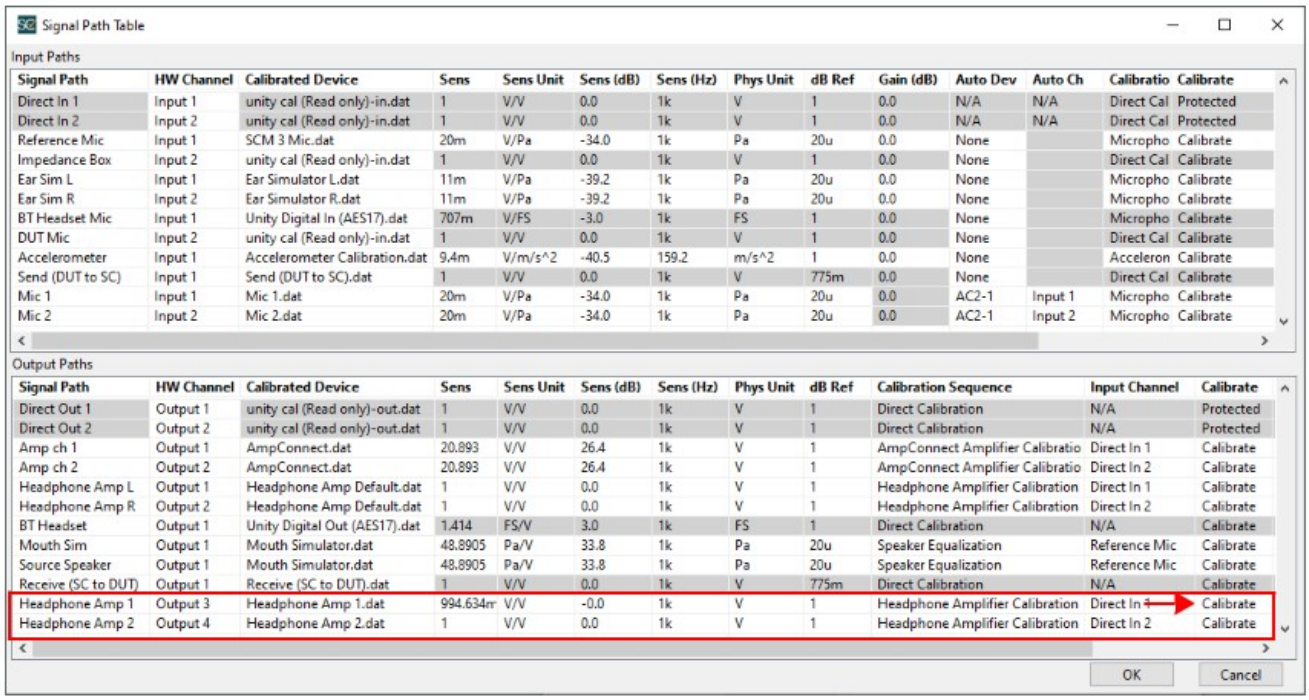

Figure 2-17: Calibration Table

2. Start with Headphone Amp 1 and select Calibrate.
3. When prompted with the wiring instructions shown Figure 218, use the example from Figure 2-16. Select Enter to continue.
4. Follow the sequence prompts, selecting Enter to continue.
5. When the Amplifier Calibration process is complete the display shows the response curve of the headphone amp and the measured gain. Select Enter to finish the sequence. The gain value is automatically entered in the Sensitivity field as shown in Figure 2-17. Select dBV to see the gain in dB.
6. Repeat the above procedure for the Headphone Amp 2.
7. Select OK to close the Calibration Table and select Save to close the Calibration Editor.

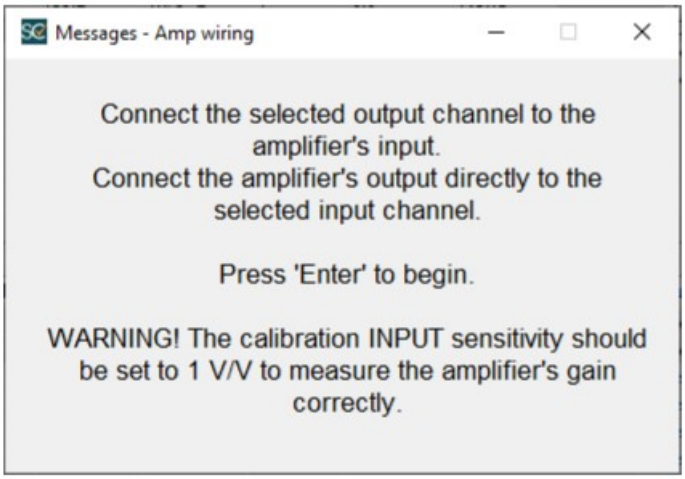

Figure 2-18: Wiring Instructions

Connection Diagrams

Loudspeaker Test using Audio Connect 2™ and SC Amp™

- Audio Connect 2 connected to the SoundCheck computer via USB
- SCM Microphone connected to Channel 1 Input of Audio Connect 2
- SoundCheck Message Step used to assign Audio Connect 2 channel settings. See Hardware Editor on page 7.
- Audio Connect 2 Output 1 to SC Amp Line Input: BNC Out to 1/4″ TS phone plug
- SC Amp 0.1 V/A – Impedance Interface Output to Audio Connect 2 Input 2: Typically uses a 1/4″ phone plug to BNC adapter and a BNC to BNC Cable. (See Figure 2-19)

  Note: The SC Amp manual indicates that a 1/4″ Tip Ring connection is required. This is not the case when connecting to Audio Connect 2 BNC inputs.

  Audio Connect 2 inputs are not referenced to earth ground. This prevents ground loops between SC Amp, Audio Connect 2 and the SoundCheck computer.
- Loudspeaker connected to SC Amp Output

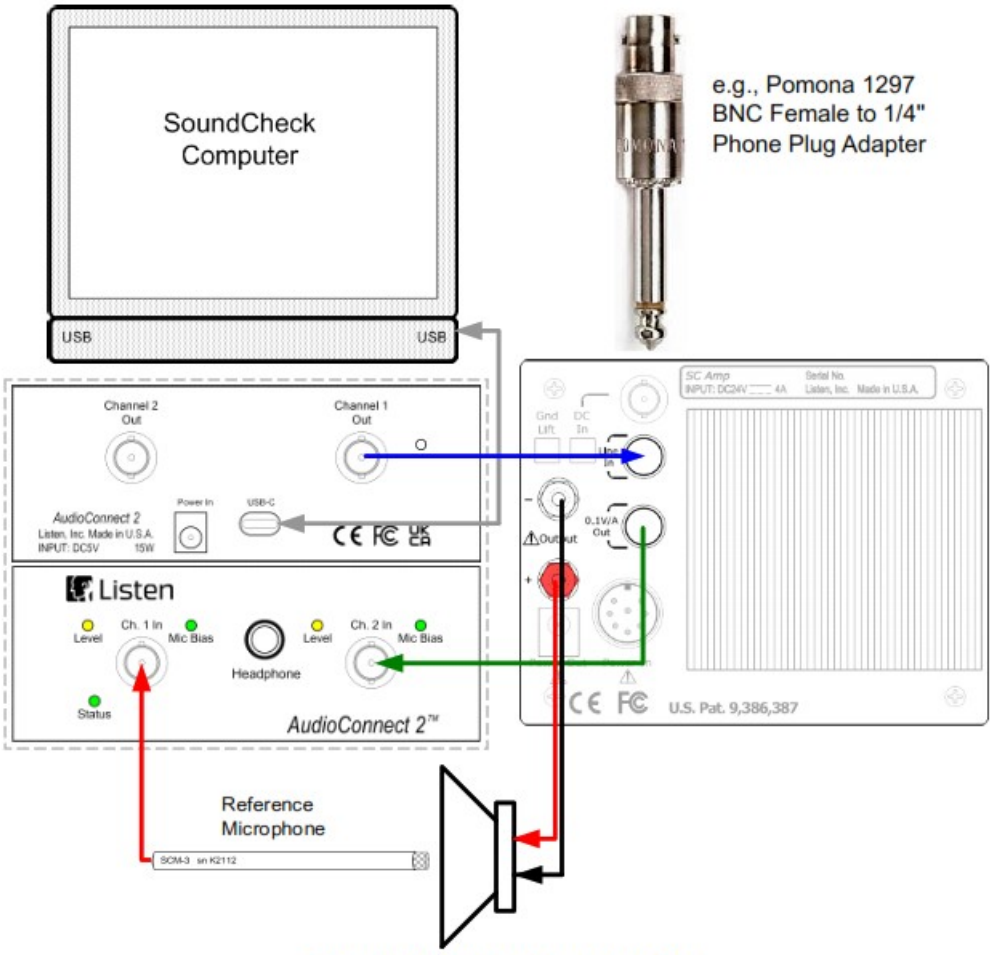

Figure 2-19: Loudspeaker Test

Specifications

Line/Mic In	
Frequency Response	20 Hz to 20 kHz +0.1. -0.4 dB (all) at 0 dB gain 10 Hz to 90 kHz +0.1. -2.0 dB (1 92k) at 0 dB gain
Gain	0. +20 db. + 0.3 dB (at 1 kHz. 25°C)
Maximum Input Voltage	2.5 V (1.77 Vims) at 0 dB gain

Mic Bias Settings	Off / SCM / IEPE
IEPE Bias	IEPE BIAS: 28 VDC @ 4 mA constant current
SCM (Electret) Bias	SCM VOLTAGE BIAS: 10 VDC. 7.5 kgs
Input Impedance	100 kelp @ 1 kHz
Equivalent Input Noise	<15 ova at 0 dB gain: 20 Hz to 20 kHz bandwidth
THD+N	-94 dB (0.002%) typical, 44.1 kHz sample rate, 0 dB gain, 20-20kHz BW -88 dB (0.004%) typical. 192 kHz sample rate, 0 dB gain, 20-40kHz BW
Crosstalk	<-100 dB at 10 kHz
Inter-channel Phase	± 0.25 degrees. 20 Hz to 20 kHz
TEDS (all Mic inputs)	IEEE Standard 1451.4
Connector	(2) BNC connectors, unbalanced
Line Out	
Frequency Response	20 Hz to 20 kHz ± 0.1 dB (all) 10 Hz to 90 kHz +0.1. -2.0 dB (192k)
Maximum Output Voltage	4 VIP (2.82 Verm's)
Output Impedance	<1 0 @ 20 Hz to 20 kHz
THD+N	-100 dB (0.001%) typical, 44.1 kHz sample rate, 20-20kHz BW -98 dB (0.00125 %) typical, 192 kHz sample rate, 20-40kHz BW
Crosstalk	<-110 dB at 10 kHz
Connectors	(2) BNC connectors, unbalanced
Headphone Output	
Frequency Response	20 Hz to 20 kHz + 0.1 dB (all) 10 Hz to 90 kHz +0.1. -2.0 dB (192k)
Output Power	150 mW @ 32 ohms 90 mW @ 16 ohms
THD+N @ 1 kHz, 10 mW int o 20f0	_100 dB (0.001%) typical, 100mW, 320, 44.1 kHz, 20-20k bandwidth
Connector	'A' TRS Phone jack unbalanced stereo
USB-C Interface	
Sample Rate	44.1 kHz (default), 48, 88.2, 96, 176.4. 192 kHz (selectable)
Bit Depth	24 bits
USB 2.0, Windows and macOS HID compliant USB Audio Class 2 (macOS – Core Audio, Windows 10 – WASAPI) ASIO audio driver (Windows only)	
Physical	
Dimensions	4.375'W x 1.8″H x 8.625-D (111 x 46 x 219 mm)

Weight	1.25 lbs (0.57 kg)
Power	May be powered from either USB-C or an AC adapter. Universal AC Adapter: 5 VDC. 1.2-3.0 A output. 100-240 VAC, 50-60 Hz input (in cluded)
Operating Temperature	0 to 40 C ambient; 10 to 80% relative humidity. non-condensing
Optional Accessories	
BNC to Microdot Adapter	Required for SCM microphones as well as other microphones, couplers and hea d and torso simulators. Part number: 4014
BNC Female to 1/4″ Phone Plug Adapter	For connection to power amplifier input. Pomona Pan number: 1297
BNC to RCA Female Adapte r	For connection to extremal devices. e.g.; Headphone Amp Calibration on page 1 2. Part number: Cinch CP-AD-515

Equipment Ratings

Normal Environmental Conditions
Audio Connect 2 may be used under the following environmental conditions:

- Indoor use only, Pollution Degree 2
- Altitudes up to 2,000 m
- Temperatures between 0 °C to 40 °C
- Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C

Power Requirements:

- 5 VDC, 1.2 A

USB Connection
Audio Connect 2 must be connected to the SoundCheck computer via the included USB-C cable in order to meet FCC and CE requirements.
Power is supplied via USB-C or by an external DC power supply rated at 5 VDC, 2 A (included).

Cleaning
Clean the outside of the instrument with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.

Regulatory Requirements

EMI
EN 55011:2016+A1:2017+A11:2020 – Class AEN 61000-3-2:2014 – Class A
EN 61000-3-3:2013
EN 61326-1:2013, EN 61326-1:2021

Other conducted and radiated emissions:
USA: FCC Part 15, Class A

Canada: ICES-003:2020
Australia: AS CISPR11:2017

Safety
EN 62638-1:2020+A11:2020
USA/Canada: CSA/UL 62368-1:2019
Australia/NZ: AS/NZS 62638.1:2022
Conducted & Radiated emissions and Harmonics
Voltage fluctuations and flicker immunity

DECLARATION OF CONFORMITY

According to EN ISO/IEC 17050-1:2004

Manufacturer's Name: Listen, Inc.
Manufacturer's Address:
580 Harrison Avenue
Suite 3W
Boston, MA, 02118
U.S.A.

Declares under sole responsibility that the product as originally delivered
Product Description: Audio Connect 2 Audio Measurement Interface
Model Number: 4047
complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:
Low Voltage Directive (2014/35/EU)
EMC Directive (2014/30/EU)
and conforms with the following product standards:
Safety:
IEC 62368-1:2018 + EN 62368-1:2020+A11:2020
USA/Canada: CSA/UL 62368-1:2019
Australia/New Zealand: AS/NZS 62368.1:2022

EMC:
EN55011:2016+A1:2017+A11:2020 – Class A
EN61000-3-2:2014 – Class A
EN61000-3-3:2013
EN61326-1:2013, EN61326-1:2021
USA: FCC Part 15, Class A Canada: ICES-003:2020 Australia: AS CISPR11:2017
This Declaration of Conformity applies to the products listed herein and placed on the EU market after:
Date: 1* day of December, 2022
Manufacturer:

Signature
Name: Steve Temme
Position: President
Date: December 1, 2022

Manufacturer's Name: Listen, Inc.
Manufacturer's Address:
580 Harrison Avenue
Suite 3W
Boston, MA, 02118
U.S.A.

Declares under sole responsibility that the product as originally delivered
Product Description: Audio Connect 2 Audio Measurement Interface
Model Number: 4047

complies with the essential requirements of the following applicable United Kingdom Regulations, and carries the UKCA marking accordingly:
Electrical Equipment (Safety) Regulations 2016
Electromagnetic Compatibility Regulations 2016
and conforms with the following product standards:
Safety:
BS EN 62368-1:2020+A11:2020

EMC:
BS EN 55011:2016+A11:2020 – Class A
BS EN 61000-3-2:2014 – Class A
BS EN 61000-3-3:2013
BS EN 61326-1:2021
This Declaration of Conformity applies to the products listed herein and placed on the UK market after:
Date: 1% day of December, 2022
Manufacturer:

Signature
Name: Steve Temme
Position: President
Date: December 1, 2022

IMPORTANT SAFETY PRECAUTIONS AND SYMBOL EXPLANATIONS

Audio Connect 2 has been supplied in safe operating condition.
This User's Manual contains information and warnings that should be followed by the user to ensure safe and service free operation. Special note should be made of the following:

1. Read these instructions
2. Keep these instructions
3. Heed all warnings
4. Follow all instructions
5. **WARNING:** To prevent fire or electric shock, do not expose this equipment to rain or moisture. Do not use this apparatus near water.
6. Clean only with a dry cloth. Do not use spray or liquid cleaning solutions.
7. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
8. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
9. Use only attachments/accessories specified by Listen, Inc.
10. Use only with hardware, brackets, stands, and components sold with the apparatus or by Listen, Inc.
11. Unplug the apparatus during lightning storms or when unused for long periods of time.
12. Whenever it is likely that the correct functioning or operating safety of the apparatus has been impaired, the apparatus must be made inoperative and be secured against unintended operation. Any adjustment, maintenance and repair of the open apparatus, under power, must be avoided as far as possible and, if unavoidable, must be carried out only by trained 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.

Safety Symbols

The exclamation point triangle is used to indicate that caution is necessary when operating the device or control close to where the symbol is placed, or to indicate that the current situation needs operator awareness or operator action in order to avoid undesirable consequences. This alerts the user to the presence of important operating and maintenance (servicing) instructions in the this manual.

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   LISTEN, Inc.

   580 Harrison Ave.,

Suite 3W,

Boston, MA 02118

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Documents / Resources

	**Listen AudioConnect 2 Analyzer Audio Interfaces** [pdf] User Manual AudioConnect 2 Analyzer Audio Interfaces, AudioConnect 2, Analyzer Audio Interfaces, Audio I nterfaces, Interfaces

References

- **Listen, Inc. - Electroacoustic Test and Audio Test & Measurement Systems**