AIO Test System

The Echo AIO™ test system is a modular audio test platform ideally suited for high-volume production-line testing and QA/QC verification. The AIO combines the functionality of multiple standalone devices into a single, integrated unit, making test stations both more reliable and less expensive.

Shown: AIO-AC rear view with **A** acoustic and **C** combo test modules. Other configuration combinations available—see chart on back.

APPLICATIONS:

- **Speakers & headphones**
- **Mobile devices**
- **Car audio**
- **Microphones**
- **Analog and digital audio**
- **And more...**

FEATURES:

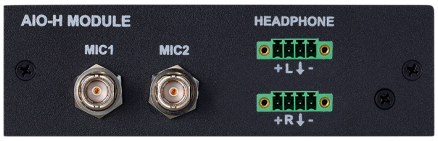
- **High accuracy**
- **Cost effective**
- **Silent—no fan!**
- **Standard USB 2.0 audio class interface**
- **Wide test & measurement software compatibility**
- **Runs on Windows (10 or later) or macOS**
- **ASIO, WASAPI, & Core Audio protocols**

MODULES:

The AIO Test System is a modular design consisting of an AIO Chassis, an AIO Interface Module, and one or two test modules. Individual modules not sold separately. (See chart on back for available configurations.)

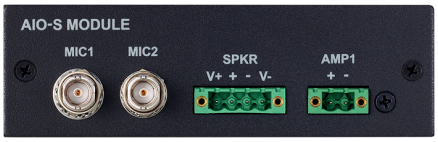
A **Acoustic:** Four mic/line inputs with CCP, TEDS; two 10 W class-D amplifier outputs.

C **Combo:** GPIO; 5 VDC fixed supply; 5 VDC battery simulator; Pressure, temperature, and humidity sensor.



H **Headphone:** Two mic/line inputs with CCP, TEDS; two headphone/earbud outputs with impedance measurement.

L **Line-level:** Four mic/line inputs with CCP, TEDS; two balanced line-level outputs.

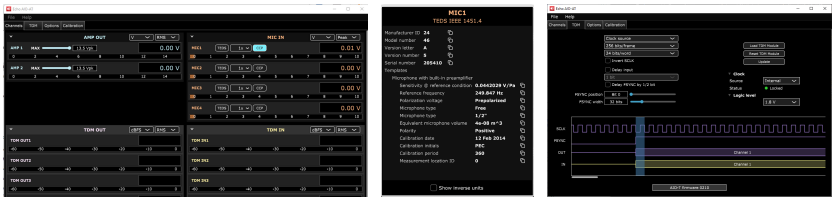


S **Speaker:** Two mic/line inputs with CCP, TEDS; two 10 W class-D amplifier outputs; built-in speaker impedance measurement.

T **TDM:** Digital TDM, up to 10 channels, 24 or 32 bit samples.

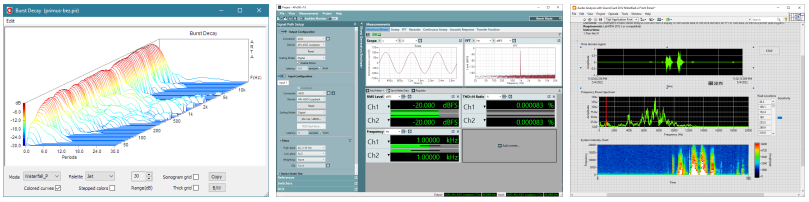
CONTROL PANEL SOFTWARE:

Provides comprehensive level monitoring and control over hardware settings, including transducer power, TEDS data, gain, TDM format, and calibration. Command-line and API access to settings is also available.



TEST & MEASUREMENT SOFTWARE:

Choose from a wide variety of third-party test and measurement software, including APx500 Flex, ARTA, LabVIEW, and MATLAB. The AIO system works just like a standard sound card for Windows, Mac, or Linux.



COMMON CONFIGURATIONS: (Other configurations may be available—check with your dealer.)

Model	Inner Module	Outer Module	Mic/Line Inputs	Line Outputs	Headphone Outputs	Amp Outputs	Impedance	Digital	5VDC & Battery Simulator	GPIO	PTH
AIO-A1	AIO-A		4			2					
AIO-A2	AIO-A	AIO-A	8			4					
AIO-AC	AIO-A	AIO-C	4			2			Yes	8/8	Yes
AIO-AH	AIO-A	AIO-H	6		2		1				
AIO-AT	AIO-A	AIO-T	4			2		TDM 10/10			
AIO-C1		AIO-C							Yes	8/8	Yes
AIO-H1	AIO-H		2		2		1				
AIO-H2	AIO-H	AIO-H	4		4		2				
AIO-L1	AIO-L		4	2							
AIO-L2	AIO-L	AIO-L	8	4							
AIO-LT	AIO-L	AIO-T	4	2				TDM 10/10			
AIO-S1	AIO-S		2			2	1				
AIO-S2	AIO-S	AIO-S	4			4	2				
AIO-SA	AIO-S	AIO-A	6			3	1				
AIO-SL	AIO-S	AIO-L	6	2		2	1				
AIO-T1		AIO-T						TDM 10/10			

SPECIFICATIONS: (See individual datasheets for complete specifications.)

Microphone / Line Inputs **A H L S**	
Input impedance:	1 MΩ
Input coupling:	AC
Input gain:	1x, 10x, and 100x
Voltage, full scale (1x gain):	8.75 Vpk (+15.8 dBV)
Frequency response:	±0.01 dB (10 Hz – 22 kHz) (48k SR) ±0.01 dB (10 Hz – 44 kHz) (96k SR) ±1 dB (10 Hz – 86 kHz) (192k SR)
Input bandwidth (-3 dB @ 192k SR):	94 kHz
Dynamic range (20 kHz BW):	112 dB
THD+N (1x gain, 20 kHz BW):	< -105 dB (20 Hz – 20 kHz)
Constant current supply:	CCP/IEPE/ICP, 4 mA
TEDS reader:	IEEE 1451.4 Class 1

Line Outputs **L**	
Output coupling:	DC
Voltage, maximum:	16 Vrms (+24 dBV) (bal) 8 Vrms (+18 dBV) (unbal)
Frequency response:	±0.01 dB (10 Hz – 21 kHz) (48k SR) ±0.01 dB (10 Hz – 43 kHz) (96k SR) ±1 dB (10 Hz – 75 kHz) (192k SR)
Output bandwidth (-3 dB @ 192k SR):	90 kHz
Dynamic range (20 kHz BW):	120 dB
THD+N (20 kHz BW):	< -102 dB (20 Hz – 20 kHz)

Amplifier / Speaker Outputs **A S**	
Output coupling:	AC
Load, minimum:	4 Ω
Voltage, full scale:	9.475 Vrms (8 Ω load)
Power output (20 Hz – 20 kHz, all channels driven):	10 W @ <0.2% THD+N (8 Ω load) 6 W @ <0.3% THD+N (4 Ω load)
Frequency response:	±0.2 dB (10 Hz – 20 kHz) (8 Ω load)
Output bandwidth (-3 dB @ 192k SR):	44 kHz
Dynamic range (20 kHz BW):	100 dB
Impedance measurement accuracy:	≤ 0.5% (20 Hz – 20 kHz)

Headphone Outputs **H**	
Output coupling:	DC
Load, minimum:	16 Ω
Voltage, maximum:	3 Vrms (+9.5 dBV) (≥ 32 Ω load)
Current, maximum:	125 mA
Power output (20 Hz – 20 kHz, all channels driven):	281 mW @ < 0.0016% THD+N (32 Ω) 250 mW @ < 0.0019% THD+N (16 Ω)
Frequency response:	±0.01 dB (10 Hz – 21 kHz) (48k SR) ±0.01 dB (10 Hz – 43 kHz) (96k SR) ±1 dB (10 Hz – 75 kHz) (192k SR)
Output bandwidth (-3 dB @ 192k SR):	89 kHz
Dynamic range (20 kHz BW):	120 dB
Impedance measurement accuracy:	≤ 1% (20 Hz – 20 kHz)

TDM **T**	
Channels	2, 4, 8, or 10
Clock source	Internal or external
Bits per frame	64, 128, or 256
Bits per sample	24 or 32
Frame sync width	1 – 128 bits
Frame sync position	Bit 0 – 255
Sample rate	44.1k, 48k

Combo **C**	
GPIO inputs and outputs	8/8
Atmospheric pressure measurement	260 to 1260 hPa absolute
Ambient temperature measurement	-40 °C – 90 °C ±0.2°
Humidity measurement	±1.5 % relative humidity
Fixed DC power supply	5 VDC, 1 A max
Battery simulator, output	600m VDC – 5 VDC, 1 A max, with current measurement

General (all)	
Power:	90 – 264 VAC, 50/60 Hz, 60 W
Dimensions:	17.5" (44.4 cm) x 8.75" (22.2 cm) x 1.75" (4.4 cm)
Weight:	42.5 lbs (19.3 kg)

Echo Test + Measurement
402 E Carrillo St Ste A, Santa Barbara CA 93101 USA
echotm.com sales@echotm.com +1 805-880-5590

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