

# Speaker Test Module

option for  
**AIO Test System**



The Speaker Test Module (AIO-S) is designed for making advanced acoustic and impedance measurements of a device under test (DUT)—typically a speaker or driver. Ideal for use with measurement microphones, ear simulators, artificial heads, speakers, actuators, and mouth simulators. AIO-S is a configuration option for the AIO Test System and requires the AIO chassis to operate.



**HARDWARE FEATURES:**

- Two mic/line inputs
- CCP/IEPE/ICP microphone power
- TEDS reader for microphone data
- Two 10 W class-D amplifier outputs
- Internal 0.1  $\Omega$  impedance sense resistor
- Additional inputs for voltage and current monitoring

**KEY APPLICATIONS:**

- Speaker measurements with impedance
- Drivers

**MIC/LINE INPUTS:**

Two low-noise inputs accommodate a very wide range of input voltages, from dynamic microphones to line-level inputs. Features include adjustable gain, constant current power, and TEDS readers.

**AMPLIFIER/SPEAKER OUTPUTS:**

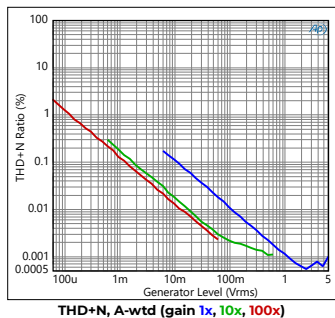
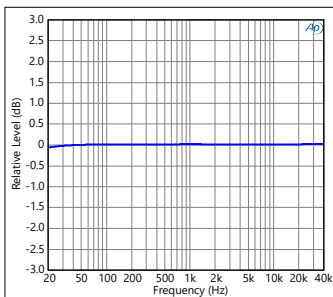
Two high-quality 10 Watt class-D floating amplifier outputs, one with impedance measurement.

**IMPEDANCE MEASUREMENT:**

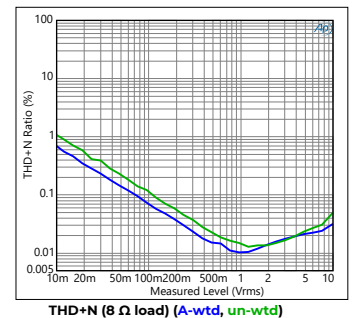
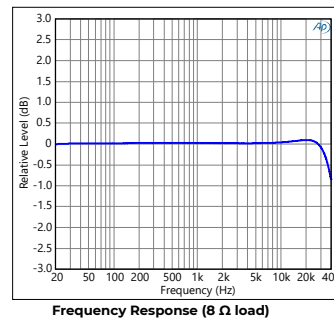
Two additional inputs are used to measure load impedance via the remote voltage sense terminals and an internal 0.1  $\Omega$  sense resistor. These inputs appear as additional audio input channels.

**PERFORMANCE GRAPHS:**

**Mic/Line Inputs**



**Amplifier/Speaker Outputs**



The Echo AIO™ 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.

**SPEAKER MODULE 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-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-SC	AIO-S	AIO-C	2			2	1		Yes	8/8	Yes
AIO-SL	AIO-S	AIO-L	6	2		2	1				
AIO-ST	AIO-S	AIO-T	2			2	1	TDM 10/10			

**SPECIFICATIONS:**

Microphone / Line Inputs	
Input bandwidth	72 kHz
Input impedance	1 MΩ
Input gain	1x, 10x, and 100x
Full-scale input voltage (1x gain)	8.75 Vpk
Maximum input voltage	15 Vpk (do not exceed)
Dynamic range (1x gain, A-wtd)	> 110 dB
THD+N (1x gain, A-weighted)	< -95 dB (20 Hz – 20 kHz)
Frequency response	±0.5 dB (20 Hz – 20 kHz)
Constant current supply	CCP/IEPE/ICP, 4 mA
TEDS	IEEE 1451.4 Class 1

Amplifier / Speaker Outputs	
Output power (THD+N < .1%)	10 W continuous at 1 kHz
Maximum output voltage	13.5 Vpk
Frequency response	±0.5 dB (20 Hz – 20 kHz)

Impedance Measurement:	
Full-scale input voltage	17.5 Vpk
Full-scale input current	8.75 Apk
THD+N (A-weighted)	< -95 dB (20 Hz – 20 kHz)
Frequency response	±0.5 dB (20 Hz – 20 kHz)

Interface	
Sample rates	44.1 kHz – 192 kHz
USB	USB 2.0 audio class compliant
Supported operating systems	Windows 10 or later, macOS
Audio APIs	ASIO, WASAPI, Core Audio
AC power	90 – 264 VAC, 50/60 Hz, 60 W

Dimensions and Weight	
Single unit	17.5" (44.4 cm) x 8.75" (22.2 cm) x 1.75" (4.4 cm), 7.2 lbs (3.3 kg)
Single unit boxed with cables	21" (53 cm) x 10" (25.4 cm) x 5" (12.7 cm), 8.75 lbs (4 kg)
Carton (4 units)	22" (55.8 cm) x 22" (55.8 cm) x 12.6" (32 cm), 42.5 lbs (19.3 kg)

**AIO Test System**

(see system datasheet for more details)



Shown: AIO-SA rear view with one **S** speaker and one **A** acoustic test module.

**FEATURES:**

- High accuracy
- Cost effective
- Silent—no fan!
- Standard USB audio interface
- Wide test & measurement software compatibility
- ASIO, WASAPI, & Core Audio protocols



**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.

**Echo Test + Measurement**

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**MODULE OPTIONS:**

(see individual datasheets for details and 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:** Four 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, 192 kHz.



Specifications are subject to change without notice. All trademarks or registered trademarks are the property of their respective owners. The AIO Test System is CE compliant.