



LISTEN INC



AmpConnect™

USB Controlled Microphone & Loudspeaker Test Interface

Introduction

AmpConnect makes loudspeaker and microphone testing simpler AND more cost-effective. It replaces an impedance box, amplifier, microphone power supply and digital I/O card with one simple USB controlled piece of hardware. AmpConnect provides all the necessary calibration, voltage, & current signals to perform acoustic and electronic tests such as frequency response, sensitivity, distortion, and impedance. It can also drive sound sources (e.g. mouth simulators) for testing microphones.

This reduces operator error as multiple hardware items are replaced by a single rugged, rack mountable unit with fully labeled connections. AmpConnect is fully controllable via SoundCheck which means that adjustments of parameters such as gain can be included in test sequences. AmpConnect will self-calibrate with SoundCheck and is more immune to ground loops than off-the-shelf components.

AmpConnect can route/select all test signals, and contains an integral power amplifier to drive the device under test (or mouth simulator). Two selectable internal reference resistances to measure device impedance offer much simpler impedance measurements than conventional methods.

No additional external equipment is required to realize a complete acoustic test platform for a wide range of devices – simply connect your device to AmpConnect and SoundCheck, and start testing.

Control

AmpConnect can be controlled either using the switches on the front-panel, or remotely via a USB-connected PC. This makes it equally suitable for use as a standalone device (e.g., in a lab or during production line setup), or with a PC on a production line. An eight-bit digital I/O port provides digital control and/or status monitoring of external devices for operator feedback, test fixture control, etc.

Connections

Connection to SoundCheck (or any other test system) is simple via balanced (XLR) or single-ended (BNC) connections. Two simultaneous user-selectable inputs enable 2 measurements to be made



AmpConnect™ is the only piece of hardware you need with SoundCheck for testing loudspeakers and microphones

simultaneously. In the case of a loudspeaker test, this may be an acoustic signal and an electrical signal such as impedance, and in the case of a microphone test a reference microphone may be measured at the same time as the microphone under test for comparison purposes.

Two sets of output connections for the devices under test, either of which can be selected as the active output, permit one test to be performed while simultaneously setting up a test on the other output, thereby increasing production line testing throughput.

A reference input connection allows the output from an external electrical test signal (typically the output of a measurement microphone) to be routed through and selected by AmpConnect and communicated to SoundCheck, freeing the operator from having to handle any external signal switching during testing. This reference input also provides voltage and IEPE bias, supporting transducers requiring either type of powering. The bias can be removed to allow direct connection to a microphone power supply or preamplifier.

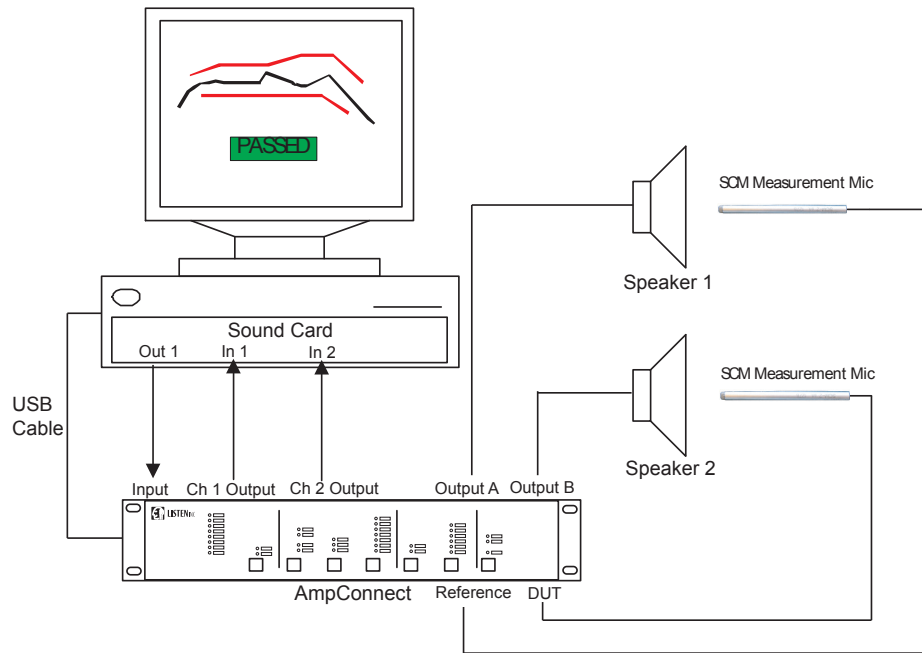
The amplitude of signals can be adjusted for optimal levels without the need for external amplifiers or attenuators. Both the reference input signal and the signal from the device under test, can be attenuated by 10 or 20 dB, or amplified by 0, 10, 20, 30, or 40 dB before being output to SoundCheck.

Simplicity and ease of use has been carried through to the user display, with three-color indicators on the front panel (as well as a signal to the computer via the USB) to provide a clear visual signal to the user that the reference, device-under-test, and power amplifier levels are operating within range.



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AmpConnect™ (cont.)



Loudspeaker Test Schematic using AmpConnect™

Preliminary Specifications

Power Amplifier:

Continuous Output Power: 60W RMS into 4 Ohms, 47W RMS into 8 Ohms

Frequency Response: -3dB at 4Hz & 90KHz

THD at 60W, 4 Ohms: 0.019%

Voltage Gain: +26.4dB, +/-0.1dB

Loudspeaker Current Measurement:

Z-High = 1V/A +/-1%

Z-Low = 100mV/A +/-1%

Output Impedance = 0 Ohms

Reference & DUT Inputs:

Gain: -20dB to +40dB in 10dB steps

Maximum input at -20dB: 100V RMS

Maximum input at +40dB: 100mV RMS

Frequency Response: -3dB at 20Hz & 150KHz;

IEPE Bias: 10mA, 20VDC (max)

ECM / Electret Bias: 10 VDC through 2.2K Ohms

Channel 1 and 2 Outputs (To Soundcard Inputs):

Maximum Output: 10V RMS into 600 Ohms (Balanced and Unbalanced)

Unbalanced Output Impedance: Less than 5 Ohms

Unbalanced Output Tolerances: +/- 0.1dB for gains

-20dB, 0dB, +20dB, +/-0.2dB for gains -10dB, +10dB, +30dB, +40dB
Balanced Output Impedance: 100 Ohms

Digital I/O: 8 Bit; any bit may be configured for input or output

Outputs: +5V/GND 10mA (max) each

Note: USB required for Digital I/O operation

Internal Sine Generator:

Output Level: 1V RMS +/-TBD dB

Output Frequency: 1KHz +/- TBD Hz

USB 2.0 Interface:

All front panel functions USB controllable

Front panel can be locked out via USB

Outputs automatically disabled upon USB disconnect or PC shutdown

Physical:

Without rack mounting flanges: 17 in. wide, 2-Unit (3-1/2 in.) high, 11 in. deep

Weight: 7 lbs (3.2kgm) approx.

Power: 85 - 264VAC 50/60 Hz, 150 Watts (max)