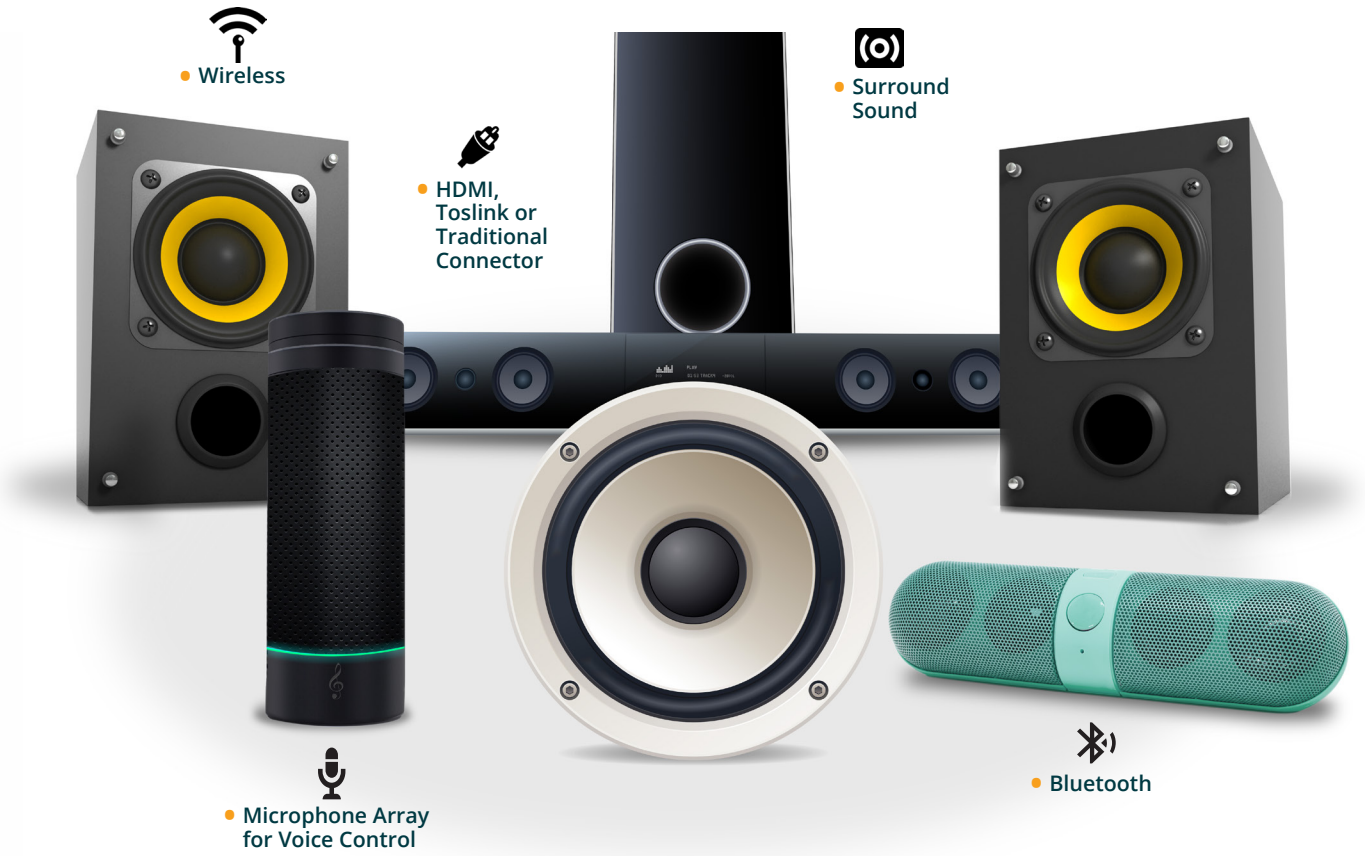
Speaker Testing

Any Loudspeaker, Any Measurement

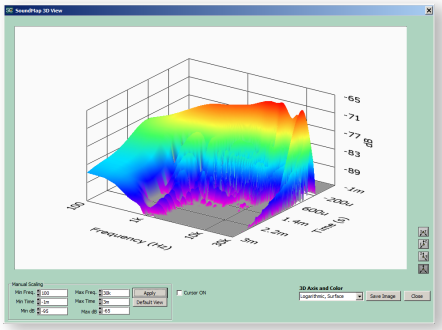


- Drivers
- Microspeakers
- Active Loudspeakers
- Systems

SoundCheck®
Audio Test and Measurement System

Any Loudspeaker, Any Measurement

SoundCheck offers simple, fast and accurate testing of any loudspeaker – no matter what the form factor, functionality, connector or additional features. It measures a full range of driver parameters via traditional analog or digital, wireless/Bluetooth, Toslink, HDMI or USB connections, as well as microphone performance, surround sound and more.



Loudspeaker 3D Waterfall Plot (Wigner-Ville)

Measurements include:

- Frequency response
- Phase & polarity
- Distortion: harmonic, IM, multitone & non-coherent
- Rub & Buzz (inc. Perceptual Rub & Buzz)
- Impedance
- Directivity (including polar plots)
- Max SPL
- Power rating tests
- Simulated free field measurements
- Thiele-Small parameters
- Time-frequency analysis

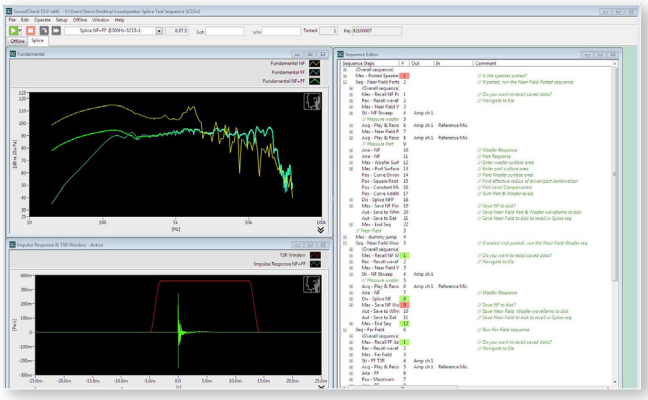
The System

SoundCheck's modular combination of hardware and software is cost-effective, flexible and expandable.

At the heart of the system is the SoundCheck software. Powerful, fast and accurate, it measures every audio parameter from the R&D laboratory to the production line. Complete flexibility in stimulus choice enables the use of a continuous log sweep (Farina sweep) for simulated free field measurements including harmonics, and permits any test signal, even music, to be used. Virtual instruments offer the functionality of stand-alone hardware on your laptop. Advanced analysis and powerful post-processing options allow all types of analysis and mathematical operations - for example, estimated resonance for finding the true resonant frequency (f_0), quality factor (Q) and impedance (Z_{max}) of a loudspeaker. Display options range from comprehensive Microsoft Word or Excel reports to simple pass/fail output or writing to a database.

Repeatable, automated tests are quickly and easily created, modified and saved using the simple point-and-click interface. Several easy to modify sample loudspeaker sequences are provided for measurements such as Thiele-Small parameters, simulated free field measurements, polar plots, etc. and more complex sequences are available for specific test standards such as IEC 60268-5 and ALMA and AES standards.

The software also controls the audio measurement hardware – an audio interface, measurement microphone, power supplies, amplifiers and optional turntable.



Loudspeaker test sequence with nearfield and farfield response.

Listen's loudspeaker test hardware includes:

AmpConnect™

Listen's all-in-one hardware includes an audio interface, amplifier, power and gain for up to 2 SCM or IEPE microphones, digital I/O, and integrated impedance circuit for all loudspeaker tests.

SCM™ Measurement Microphones

SCM measurement microphones are robust, accurate, low noise and stable.

SoundConnect 2™

A 2-channel microphone power supply (SCM, IEPE, 200V polarization) ideal for applications where polarization and high and low pass filtering are required. It also provides autoranging when used with SoundCheck to maximize the dynamic range of a measurement.

AudioConnect™

A compact audio interface with power supply and gain for up to 2 SCM™ microphones. This is a very cost-effective approach for basic loudspeaker testing.

SC Amp™

Listen's audio test amplifier offers a patented integrated impedance circuit, fixed gain to reduce calibration errors and DC voltage offset support, along with low distortion and a low noise floor.

Bluetooth Audio Interfaces

Bluetooth interfaces connect Bluetooth speakers to SoundCheck, offering full control over all Bluetooth protocol settings and explicit control over the CODEC choice and transmitter power.

Also available for more complex test requirements: multichannel audio interfaces, MEMS interfaces, amplifiers, current monitors, and 3rd party hardware.

R&D Loudspeaker Testing

In the R&D lab, SoundCheck measures loudspeaker design characteristics such as Thiele-Small parameters, voicecoil offset, polar response, spliced nearfield-farfield sequences and more. SoundCheck's sequence editor makes it simple to re-run tests and compare results as designs are modified. Powerful test capabilities, with many stimuli, analysis, post-processing and statistics options allow you to make all the measurements you need, plus offer unrivalled flexibility to calculate any parameters arising from these without leaving the system.

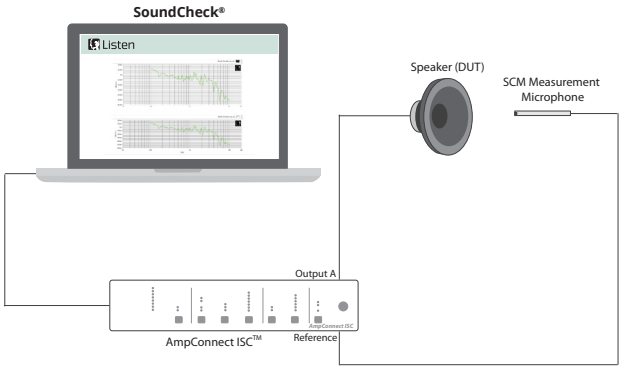
Production Line Loudspeaker Testing

On the production line, SoundCheck offers extremely fast and accurate testing of microspeakers, drivers and speaker systems. It is simple to operate, offers high immunity to background noise, and can carry out a complete production test including frequency response, Rub & Buzz (or perceptual Rub & Buzz), THD, loose particles, polarity and phase in as little as one second. Results can be compared to pre-set limits or a reference standard, and can be presented as a simple audible or visual pass/fail indication, a detailed failure mode analysis, or automatically written to a database. SoundCheck interfaces with barcode systems, footswitches and PLCs, and can be controlled via National Instruments Test Stand or LabVIEW for full integration with automatic production lines and large-scale test systems.

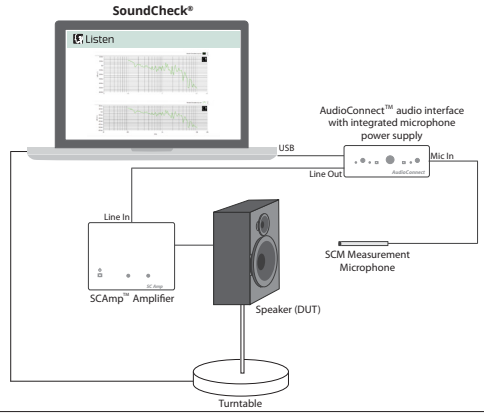
TEST CONFIGURATIONS

There are many possible loudspeaker test configurations; here are just a few options.

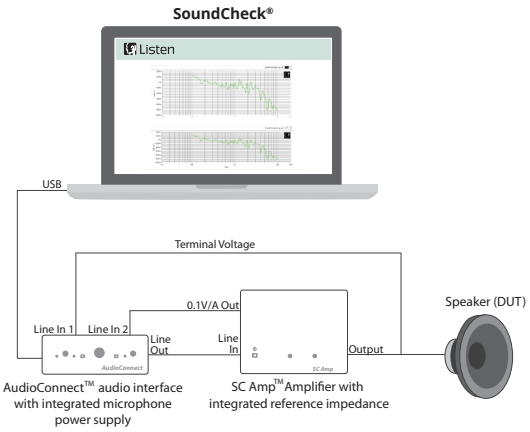
Typical low-cost production-line speaker test configuration



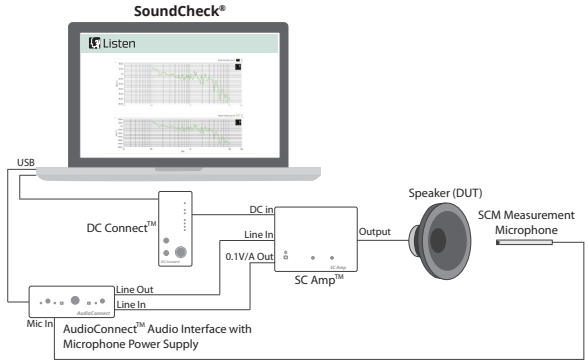
Directional loudspeaker measurements



Thiele-Small parameter measurement



Voicecoil offset measurement



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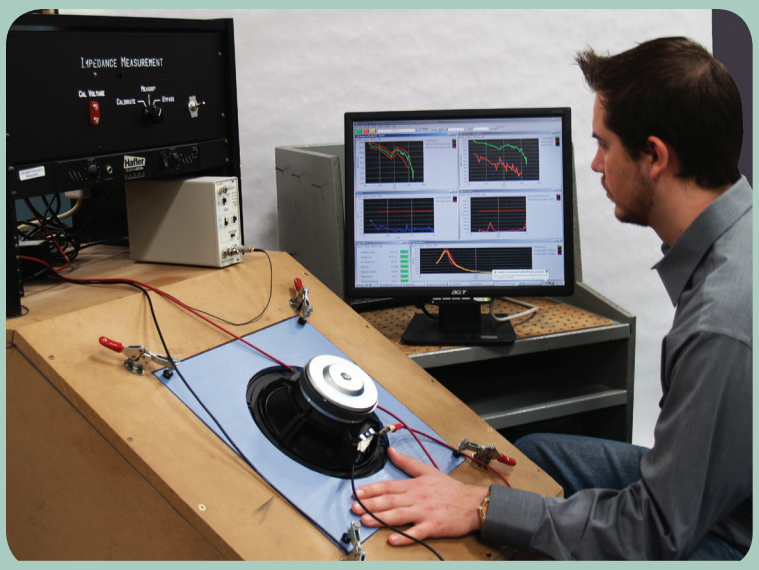

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