



Loudspeaker Testing

System Overview

SoundCheck™ is an easily configurable, Windows-based system for efficient and comprehensive testing of loudspeakers.

Applications include:

- High-speed production testing
- Research and development
- Incoming inspection
- Vendor auditing

Production Testing

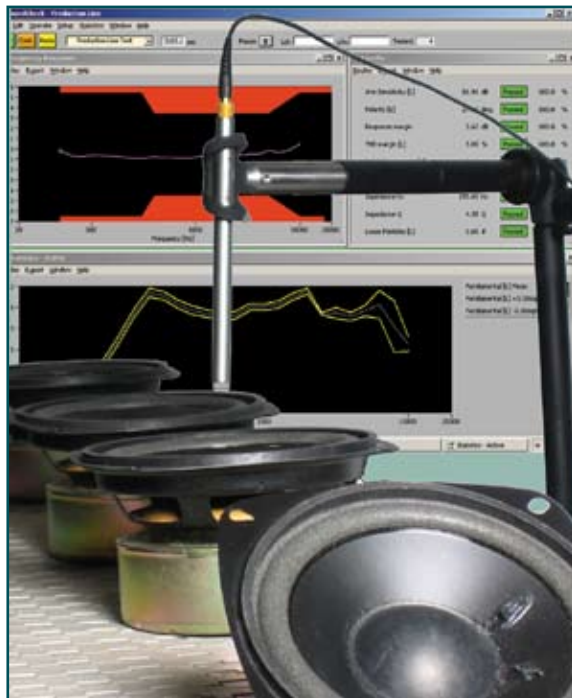
SoundCheck is a fast and accurate system for production line testing. All quality-related parameters – both acoustical and electrical – are measured simultaneously, resulting in fast and thorough loudspeaker evaluation. SoundCheck's unique stepped sine excitation signal (Stweep™) permits such detailed tests to be performed in as little as 3 seconds without sacrificing test accuracy, and its proprietary HarmonicTrak™ algorithm maintains measurement accuracy even in noisy environments.

The software can be configured for one-click access to commonly used tests, and various levels of operator control can be assigned to prevent modification of the test sequence. Results can be presented as a simple pass/fail indication, or a detailed failure mode analysis. Pass/Fail limits can be user-defined, determined by offsetting data from a measurement (e.g. ±3dB from the response curve of a reference loudspeaker), or determined statistically using SoundCheck's statistical analysis module. Detailed results can be exported to other programs for additional processing, statistical control, and generating documents in standardized formats.

SoundCheck interfaces with barcode readers, footswitches, and other digital I/O devices such as TTL controlled relays, RS-232, and IEEE-488 to integrate fully with automatic production lines.

R&D Applications

SoundCheck is a powerful and flexible tool for the R&D laboratory. Its advanced measurement algorithms enable rapid characterization of prototypes, performing comprehensive tests such as frequency response, phase, sensitivity, distortion, directivity, impedance, and Thiele-Small parameters in a matter of seconds. SoundCheck is



available with either a sound card or with National Instrument's data acquisition cards for high precision measurements.

SoundCheck offers unrivalled flexibility at every stage in the test process. Input test signals include sine, noise, and any signal stored as a WAV file (e.g. multi-tone, impulse, tone burst, etc.). Customized test sequences are easily developed using SoundCheck's unique point and click interface. SoundCheck can be easily incorporated into existing test programs that utilize ActiveX controls or National Instruments LabVIEW®.

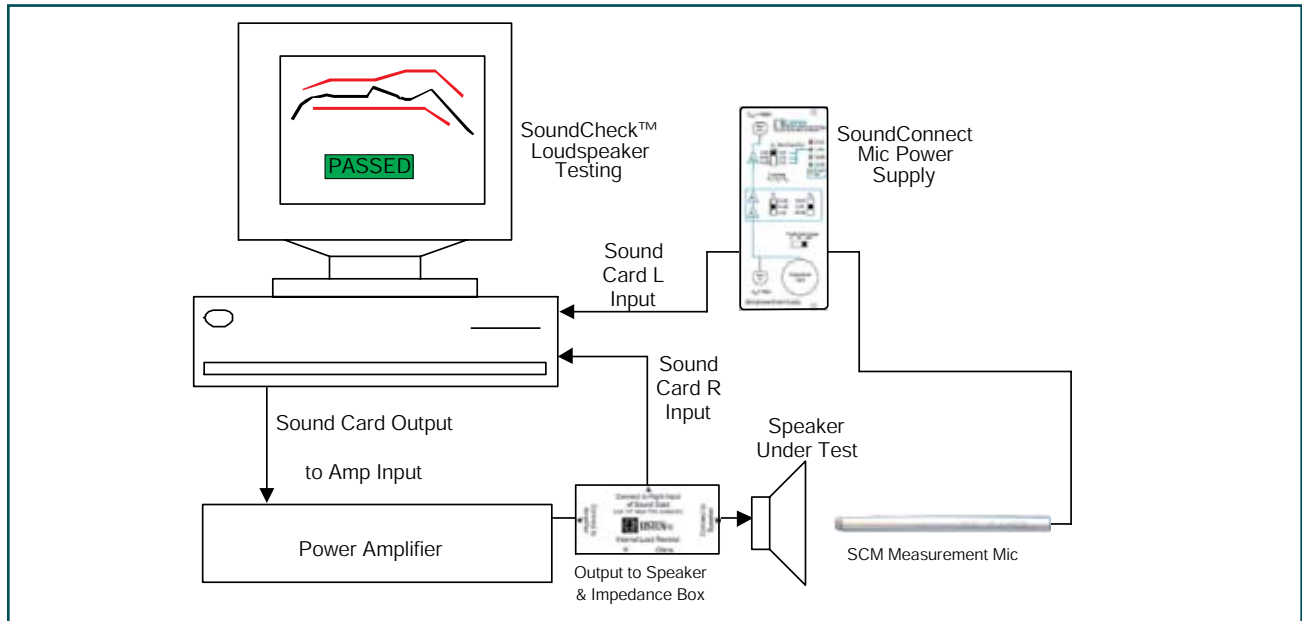
Typical Tests

- Frequency response
- Phase
- Distortion
- Rub & Buzz
- Polarity
- Impedance
- Sensitivity
- Polar plots
- THD
- Sound pressure level
- Power rating tests
- FFT and Real Time analyses



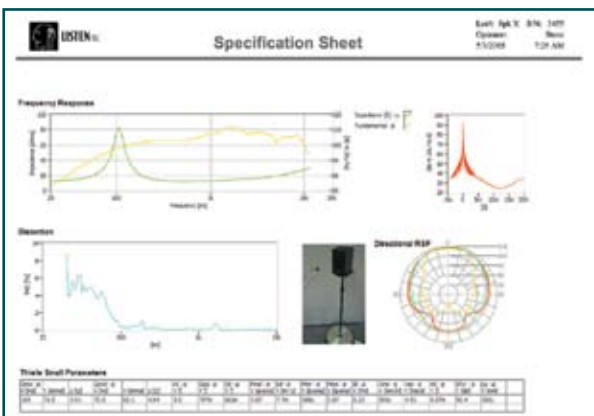
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Typical System Configuration



A typical loudspeaker test system consists of the SoundCheck Basic Software with optional Distortion, Post-Processing, Simulated Free-Field and Equation Editor modules, computer, sound card, audio amplifier, impedance box, microphone, and microphone power supply (options may vary depending upon application).

Analysis tools include a FFT analyzer and an optional real time analyzer (RTA), which provides the R&D engineer with 1/1, 1/3, 1/6, 1/12, and 1/24 octave analysis. An optional analysis module enables the measurement of a loudspeaker's free-field response and free-field harmonic distortion in a non-anechoic environment using a continuous logarithmic sine sweep. Soundcheck's post-processing editor has many pre-programmed routines including Thiele-Small parameters, curve fitting to determine resonances, arithmetic operations, curve smoothing, and statistical functions. SoundCheck can also record the loudspeaker's response as a WAV file for additional analysis.



Loudspeaker Specification Sheet

Features and Benefits

Same System for R&D and Production

With a common system for R&D and for the production line, it is easy for the tests developed by engineering to be performed on the production line. Identical virtual laboratories can be recreated around the world, making it easy for manufacturing to carry out the same tests as engineering, even if they are thousands of miles away.

Virtual Audio Test Bench

The SoundCheck software includes a virtual audio test bench. This includes a Signal Generator, Multimeter, Real Time Analyzer, Oscilloscope and Spectrum Analyzer. These virtual instruments provide exactly the same functionality as their expensive hardware equivalents, avoiding the need to purchase any additional stand-alone instrumentation.

One System, Many Options

SoundCheck is a modular system. Whether you want a basic sound card based system for production line testing of loudspeakers, or a sophisticated R&D system with National Instrument's PXI-4461 dynamic signal acquisition module, for high accuracy laboratory measurements, we have a system to match your requirements and your budget.

