



## SoundCheck® Package & Module Guide

### SoundCheck Packages

SoundCheck is a modular system which can be built entirely from scratch based on your test needs and budget. However, it is usually most cost-effective to start with one of our packages and add on additional modules if necessary. The best way to specify a system is to discuss your needs with one of our sales engineers, who will learn about your current and future needs, and help you select the best software and hardware to configure the system in the most cost-effective way. Here is an outline of our standard packages, along with a table indicating which modules are contained within each package, and a description of what they do.

#### Soundcheck Basic

Created with cost-sensitive production customers in mind, SoundCheck Basic performs simple sine-based measurements such as frequency response, sensitivity, and harmonic distortion. It does not include the sequence editor, so an additional system with a higher package is required to generate test sequences, or the sequence editor module should be added.

#### SoundCheck Plus

SoundCheck Plus is the most common starting point for customers measuring simple transducers. In addition to the SoundCheck Basic modules the Plus package includes the Sequence Editor and the Signal Generator, Multimeter, and Scope-FFT virtual instrument modules.

#### SoundCheck Advanced

SoundCheck Advanced is a powerful tool for R&D testing with additional modules including the Real Time Analyzer virtual instrument, Time Selective Response (for performing simulated free field measurements), Polar Plot, and the Equation Editor, as well as everything in the Plus package. Customers wanting to measure Thiele-Small parameters should select this package.

#### SoundCheck Complete

SoundCheck Complete offers the most comprehensive set of audio testing tools available. It includes nearly all the available modules for SoundCheck incorporating everything from the Advanced package plus additional analyses such as IM Distortion, Multi-tone, Transfer Functions, and Perceptual Rub & Buzz. It also includes the powerful post processing options Zwicker Loudness and the Waveform Filter.

#### SoundCheck ONE

SoundCheck ONE is a simple, low-cost version of the SoundCheck software, designed for production testing of loudspeakers, microphones, and headphones. Designed to work seamlessly with the AmpConnect hardware, SoundCheck ONE is quick to setup and easy to use. Tests are created from a series of basic templates, within which settings such as stimulus range and level, limits, and display preferences are customized. These custom sequences can then be saved for each product tested.





# Module Details & System Comparison

Part #	Part Name	Module Description	Basic 1000	Plus 1102	Advanced 1103	Complete 1111
<b>Channel Configurations</b>						
2022	2 Channel Acquisition (Included with Sound-Check)	Enables 2 channels of simultaneous acquisition	✓	✓	✓	✓
2023	4 Channel Acquisition	Enables 4 channels of simultaneous acquisition				
2024	8 Channel Acquisition	Enables 8 channels of simultaneous acquisition				
2025	16 Channel Acquisition	Enables 16 channels of simultaneous acquisition				
2026	32 Channel Acquisition	Enables 32 channels of simultaneous acquisition				
2027	64 Channel Acquisition	Enables 64 channels of simultaneous acquisition				
<b>SoundCheck Software Modules</b>						
2099	SoundCheck runtime engine for Windows	This module is the foundation of the SoundCheck software and is required for building all windows-based systems. It is included in all standard Windows SoundCheck packages.	✓	✓	✓	✓
2100	SoundCheck runtime engine for Mac OS	This module is the foundation of the Mac-based SoundCheck software and is required for building all Mac SoundCheck systems. It is included in all standard macOS SoundCheck packages. A system that will run on both Windows and Mac can be purchased by specifying the Windows version and requesting part #2100 as an additional module (charge applies)				
2000	Limits Editor	The Limits Editor enables the user to define tolerances for data measured within a sequence. Data is automatically compared to the tolerances set in the limit steps, and a pass/fail result returned. This result can be displayed, saved, and used for logic in the sequence.	✓	✓	✓	✓
2002	Sequence Editor	The sequence editor is the simple point and click interface used to create and edit automated test scripts. Steps are added in a flow chart-like format to create a customized test sequence.		✓	✓	✓
2009	Statistics Module	Enables calculation of statistics in a sequence or offline. Options include maximum, minimum, mean, standard deviation, yields for individual results and overall. 'Best' and 'worst fit to average' enable reference standards and outlying units to be identified from a group of curves.	✓	✓	✓	✓
2010	Database Module	A fast and space-efficient data management tool for storing large volumes of data in external Access or SQL databases. SQL and Python tools are provided to facilitate data extraction to your Business Intelligence system of choice, and a converter imports data to WATS. Note that Listen does not offer a database; data is directed to the customer's appropriately configured database through the autosave editor.				



## Module Details & System Comparison (cont.)

Part #	Part Name	Module Description	Basic	Plus	Advanced	Complete
			1000	1102	1103	1111
2011	Polar Plotting	The polar plotting module is designed for making directional measurements. It includes turntable control, and enables a series of angular measurements to be displayed as a polar plot. Used in conjunction with a turntable, a loudspeaker or microphone's directional response can be plotted with a single test sequence.			✓	✓
2013	WAV file Equalization	Enables any WAV file to be used as a calibrated test signal, including various types of noise, speech, and even music. It allows equalization of a WAV file in both the signal generator (p/n 2014) and the stimulus editor (p/n 2017). It is often used to apply a calibration curve to a WAV file to account for the frequency response of the speaker.				✓
<b>Virtual Instrument Modules (VI's)</b>						
2003	FFT Spectrum Analyzer and Oscilloscope	The FFT Spectrum Analyzer and Oscilloscope is a spectrum analyzer when viewed in the frequency domain, and an oscilloscope when used in the time domain. The user can specify the averaging time, window type, and apply custom weightings.		✓	✓	✓
2005	Multichannel Real-time Analyzer (1/1, 1/3, 1/6, 1/12, & 1/24 octave)	The Multichannel Real-Time Analyzer measures frequency response using constant percentage bandwidth (CPB) filters. Multiple channels can be viewed simultaneously, and spectrum settings are set individually for each channel. Frequency resolution, averaging time, and standard and custom weighting curves are all user-defined.			✓	✓
2014	Signal Generator	Generates sine waves, pink noise, white noise, and WAV file signals. With the addition of p/n 2013 (wave file equalization), any signal can be equalized simply by checking a box to ensure that test signals are fully calibrated.		✓	✓	✓
2015	Multimeter	The multimeter module offers all the functionality of an analog multimeter, measuring a non-bandlimited RMS level. Standard weightings such as A, B, and C can be applied along with custom weighting curves. Average, maximum, and minimum values over a user defined time can be recorded. The optional strip chart recorder (p/n 2040) also enables the multimeter output to be viewed over time.		✓	✓	✓
2036	Distortion Analyzer	The Distortion Analyzer enables distortion to be quickly viewed without having to set up a sequence. It provides continuous real time measurement of output distortion including THD and THD+N, THD and THD+N residual level and SINAD. A, B, and C weighting filters along with user-defined arbitrary weighting functions can be used. Data from the distortion analyzer can be saved to the memory list.				



## Module Details & System Comparison (cont.)

Part #	Part Name	Module Description	Basic 1000	Plus 1102	Advanced 1103	Complete 1111
2037	Frequency Counter	The Frequency Counter determines the dominant signal in a selected signal path and returns a precise frequency measurement. This measurement can be saved to the memory list and used in a sequence.				
2040	Strip Chart Recorder	The Strip Chart Recorder is the electronic equivalent of connecting a paper chart recorder to a hardware instrument. It enables the multimeter, distortion analyzer and frequency counter to plot measurements over time.				
<b>Stimulus Modules</b>						
2017	Stimulus Editor basic, includes Pink and White noise, WAV files	The stimulus editor includes pink noise, white noise, and WAV file stimuli. It allows the user to customize the frequency range and level of the stimulus, as well as combine multiple stimuli types into a more complex compound stimulus. This module is required to use other stimulus types such as Stepped Sine (p/n 2018) and Log Sweep with TSR (p/n 2006).	✓	✓	✓	✓
2018	Stepped Sine and Amplitude Sweep Stimulus, (requires p/n 2017)	This module adds the Stweep™ (stepped sine) option to the stimulus editor. The user selects the frequency range, resolution, level, and the minimum cycles or time per step. This stimulus type is most often used with the Heterodyne analysis algorithm for frequency response only or HarmonicTrak (p/n 2001) for measurement of frequency response and harmonic distortion.	✓	✓	✓	✓
2020	Multi-Tone Excitation (requires p/n 2017)	This module enables Multitone stimulus (a group of sine tones with user-defined spacing played simultaneously) and analysis types. Multitone analysis is a form of transfer function that measures the specific tones of the stimulus. This method measures frequency response very quickly with a short stimulus. The analysis step also yields non-coherent distortion information.				✓
<b>Analysis Modules</b>						
2001	HarmonicTrak™ (THD, THD+N, Rub & Buzz, Total Distortion, Normalized THD & R&B)	The HarmonicTrak™ analysis module provides the capability to measure user-defined harmonics and to use these harmonics to calculate distortion data such as THD, THD+N, and Rub & Buzz. This module is also required to analyze harmonic distortion when using the Time Selective Response (p/n 2006) module.	✓	✓	✓	✓
2006	Time Selective Response For Simulated Free-field Measurement and Analysis	Time selective responses analysis is used with a frequency log sweep stimulus to perform a time windowed measurement. Time windowing eliminates the influence of acoustic reflections in the data, allowing the user to make simulated free field frequency response measurements in a non-anechoic environment. This is useful for measuring loudspeakers and microphones when an anechoic chamber is not available. Harmonic distortion can also be measured with this method (p/n 2001 required).			✓	✓



## Module Details & System Comparison (cont.)

Part #	Part Name	Module Description	Basic 1000	Plus 1102	Advanced 1103	Complete 1111
2016	Loose Particle detection	This module enables the detection of loose particle defects in loudspeakers (which present as randomly spaced transients) by analyzing a time envelope and counting the number of transients that peak above a user-defined threshold.	✓	✓	✓	✓
2019	Intermodulation (IM) & Difference Frequency (DF) distortion (requires 2001, 2017 & 2018)	This module enables the Two Tone stimulus type, Intermodulation (IM) and difference frequency distortion options in the analysis editor under the HarmonicTrak algorithm. These are commonly used to characterize loudspeaker performance and microphone distortion.				✓
2021	Transfer Functions for dual channel spectrum analysis	This module provides transfer function analysis, a true 2 channel measurement directly comparing two waveforms. This function analyzes the spectral content of both waveforms and the cross spectrum. The resulting data includes frequency response, coherence, and non-coherent distortion information.				✓
2030	Perceptual Rub & Buzz (requires 2001)	The Perceptual Rub & Buzz option uses Listen's CLEAR algorithm, a simplified auditory perceptual model, to measure the loudness of Rub & Buzz distortion in phons rather than the more traditional dB SPL and % distortion units. This measurement better identifies whether distortion due to manufacturing defects can be heard by the listener than conventional Rub & Buzz measurements.	✓	✓	✓	✓
2050	RT60 Room Acoustics	The RT60 Room Acoustics module enables measurement of the reverberation time and clarity of any room or space with fully calibrated signal paths. The tet method uses a continuous sine sweep with the Log TSR algorithm to obtain the impulse response, and the reverberation decay curve is calculated from the backwards integrated impulse response. This ISO 3382-1:2009-conforming method is fast, requires just one measurement at each location, and minimizes the effect of noise and distortion on the measurement. (requires p/n 2006)				
1300	SoundMap Full Version (Time Frequency Analysis, CSD, Short Time Fourier, Wigner-Ville, Wavelet)	The full SoundMap option enables detailed analysis of signals simultaneously in both the time and frequency domain. It is ideal for impulse response analysis and detection of loose particles and Rub & Buzz in loudspeakers and for identification of transient effects such as drop out in digital devices including VoIP and Bluetooth headsets. Four different analysis options are offered: Cumulative Spectral Decay (CSD) – also known as waterfall plots, Short Time Fourier Transform (STFT), Wavelet and Wigner-Ville.				



## Module Details & System Comparison (cont.)

Part #	Part Name	Module Description	Basic 1000	Plus 1102	Advanced 1103	Complete 1111
1301	SoundMap CSD (Cumulative Spectral Decay)	The CSD Soundmap option enables detailed analysis of signals simultaneously in both the time and frequency domain using Cumulative Spectral Decay (CSD) – also known as waterfall plots.				
<b>Post-Processing Modules</b>						
2004	Post-Processing basic	This module enables a variety of post processing functions that can be used within a sequence or offline on saved data. These functions include everything from basic arithmetic, curve smoothing and power averaging, to more advanced functions like 1/nth octave synthesis and directivity index calculations.	✓	✓	✓	✓
2007	Telephone Loudness Ratings	This module calculates IEEE and ITU loudness ratings in telecom applications. It enables the TOLR, ROLR, SOLR, SLR, RLR, and STMR functions in the post processing editor.				
2008	Attack & Release	This module is used for calculating Attack and Release times (calculating rise or delay time of response signal) for hearing aids with AGC (automatic gain control). These functions are required for many hearing aid test standards.				
2012	Equation Editor, Includes T-S Parameters using added-mass and known volume (requires 2004)	The equation editor allows the use of custom variables and equations via a simple text editor. A single step can run a number of different equations at once, eliminating the need for lengthy sequences and multiple post processing steps. Matlab users will find the equation editor especially useful, as will loudspeaker customers who want to measure Thiele-Small Parameters.			✓	✓
2031	Zwicker Loudness Rating (requires 2004)	This module calculates the overall perceived loudness of a sound using a psycho-acoustic model which takes into account the nonlinearity of the human ear to sound at different frequencies and levels. It is often used to measure the perceived loudness of complex sounds, e.g. telephone ringtones.				✓
2032	Waveform Filter (requires 2004)	The waveform filter allows the user to choose a curve from the memory list, use it as the filter response and apply it to a waveform in the memory list. The result is a new waveform that has its spectral content shaped by the selected curve. There is also an option for minimum phase and inverting the curve. This may be used, for example, for measuring the A-weighted peak acoustic pressure of a waveform.				✓
2033	Active Speech Level (requires 2004)	This module enables the stimulus level to be set using the active speech level of the .wav file rather than the average level of the .wav file. This is useful for telephony applications.				





# SoundCheck Test Sequences

The test sequences available for purchase and listed below measure to specific standards. Listen, Inc. also offers many additional test sequences for a wide range of products at no charge, which can be customized for your precise needs. See the Sequences section of our website for a full listing.

Part #	Description	Required Software / Hardware
<b>Telecommunications</b>		
3111	TIA-920-B is a dual-bandwidth standard that applies to both narrowband (NB) and wideband (WB) devices. It also allows a choice between Free Field (FF) and Dif-fuse Field (DF) as the Listener Reference Point (LRP). Both FF and DF are allowed in TIA-920.110-B	Software: package 1102, plus modules 2005, 2007, 2013
3103	IEEE 1329-1999 Voice switching measurements Clause 10 of Std Method for Measuring Transmission.	Software: package 1102, plus modules 2005, 2007, 2013
3112	TIA-5050 measures the volume control requirements for wireless (mobile) devices according to TIA-5050	Software: package 1102 plus modules 2005 and 2007
<b>Hearing Aids</b>		
3000	Hearing Aid Application for ANSI S3.22 and IEC 60318-7, and some 'Annex C' items from 2003 ANSI std	Software: package 1102 plus module 2008 Hardware: DC Connect
3106	Hearing Aid Compatibility (HAC) Sequence. FCC Part 68.316 and TIA-1083.	Software: package 1102
<b>Headphones</b>		
3102	Max SPL for headphones standard EN50332-1 and EN50332-2	Software: package 1102 plus modules 2005 and 2023
<b>Loudspeakers</b>		
3113	Stereo Soundfield Parameters - measures stereo soundfield parameters such as interaural level differ-ence (ILD) and interaural cross-correlation (IACC) using a Head and Torso Simulator (HATS)	Software: package 1102 plus modules 2032 and 2006 Hardware: Head and Torso Simulator
<b>Background Noise</b>		
3121	Background Noise. Calibrates a 4.1 speaker array to conform with the ETSI ES 202 396-1 Standard	Software: package 1102, plus modules 2005, 2013, 2023.

**Need Help?** Contact our Sales/application engineers at 617-556-4104 or sales@listeninc.com.

