



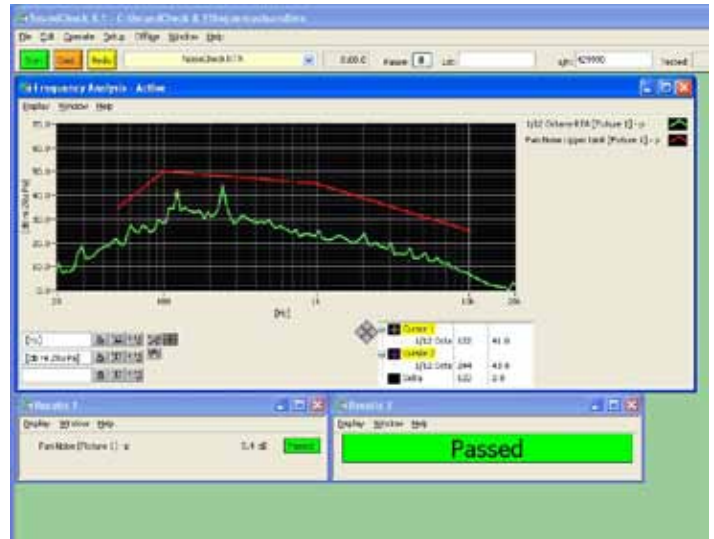
NoiseCheck™ The engineering and production line solution for noise measurements



Introduction

NoiseCheck is a cost-effective software and sound card-based system for measuring noise and vibration of motors, fans, gears, bearings, pumps and other electromechanical products.

NoiseCheck 'listens' to the product and quantifies both the level and frequency of the noise to ensure that they are within pre-set limits. It can simultaneously carry out time domain analysis for transient noise and frequency domain analysis for steady-state noise, replicating the human ear's ability to hear both types of noise at once. It offers many advantages over human listeners, such as detailed fault detection analysis, clearly displaying the type and magnitude of the fault, automatic saving of data for later analysis, automated record keeping / part traceability, and can easily be integrated as part of an automated production line. NoiseCheck can also be used in the R&D lab to aid in the design of quiet products.



Sample final display in NoiseCheck



Applications

- Quality Control on the Production line
- Incoming Inspection
- Quality Assurance
- Pre and post-service evaluation
- Sound Power Labeling
- Component testing
- Endurance test monitoring
- Gage R& R studies
- Product design
- Component and product level testing

How does NoiseCheck work?

The device under test is powered up, either using DC connect, a Listen-manufactured power supply that integrates with SoundCheck for automated testing (for devices requiring a power supply less than 10V DC) or an external source, and Noisecheck records the noise it produces via a microphone. If it is preferable to measure vibration rather than sound, an accelerometer or a laser vibrometer may be used instead of the microphone. For testing run up/down and variable speed products such as some fans, DC Connect can be programmed via NoiseCheck to ramp voltage up/down.

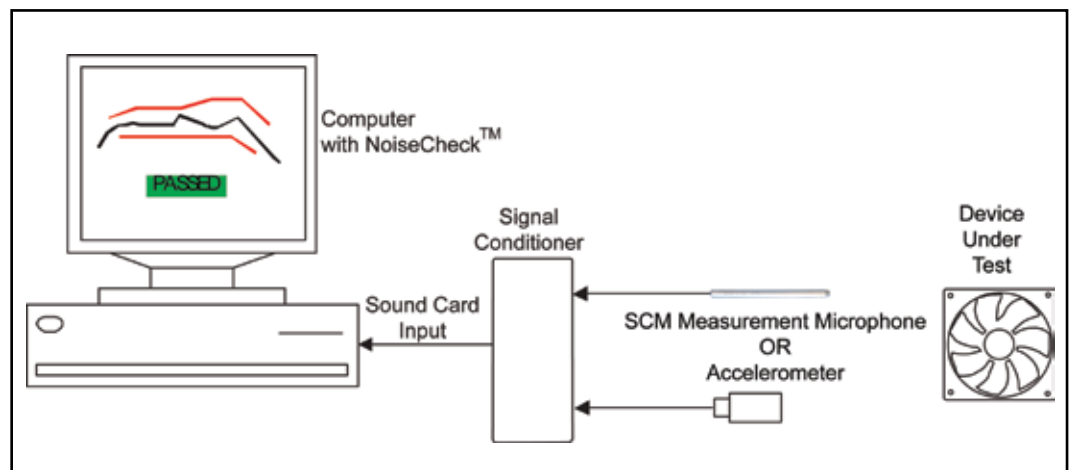
Recording is started either manually (remotely) by an operator, or triggered at a given level. A spectrum analysis is performed on the recorded noise, and it is compared to pre-set limits which may either be based on a reference unit, or entered manually. Noise-Check offers two options for analyzing the signal from the DUT. The Scope-FFT includes a spectrum analyzer for measuring high resolution FFTs in the frequency domain and an Oscilloscope for measuring in the time domain. The Real Time Analyzer measures in the frequency domain by analyzing user-selectable 1/nth octave bins. The Spectrum analyzer offers high frequency resolution, and the real time analyzer offers nth octave resolution (like the human ear) and is less sensitive to fluctuations in rotation speed. Both instruments offer selectable averaging parameters to suit the application. The comparison of actual noise to pre-set limits or a reference unit is used to generate an output, ranging from a simple pass/fail signal, to a full failure mode analysis and report.

Customized Tests

Customized test sequences are easy to develop using a simple point-and-click interface that enables complex tests to be built in a flow chart like format. Pre-programmed or user defined options are simply selected for each step in the test procedure, e.g. input voltage, recording trigger, recording time, type of analysis, output, data recording, etc.

Data is output in a variety of ways, ranging from a simple comparison to a reference unit with a PASS/FAIL indication for the production line operator, to customized reports or writing of complete test results to databases such as Microsoft® Access, SQL or Oracle® for parts traceability archiving, data-mining or report writing. NoiseCheck also features an extensive statistical analysis toolbox which can be used for Gage R&R studies including, max, min, mean, standard deviation, yield, Cpk, and Best Fit to Average.

Test Setup



NoiseCheck on the Production Line

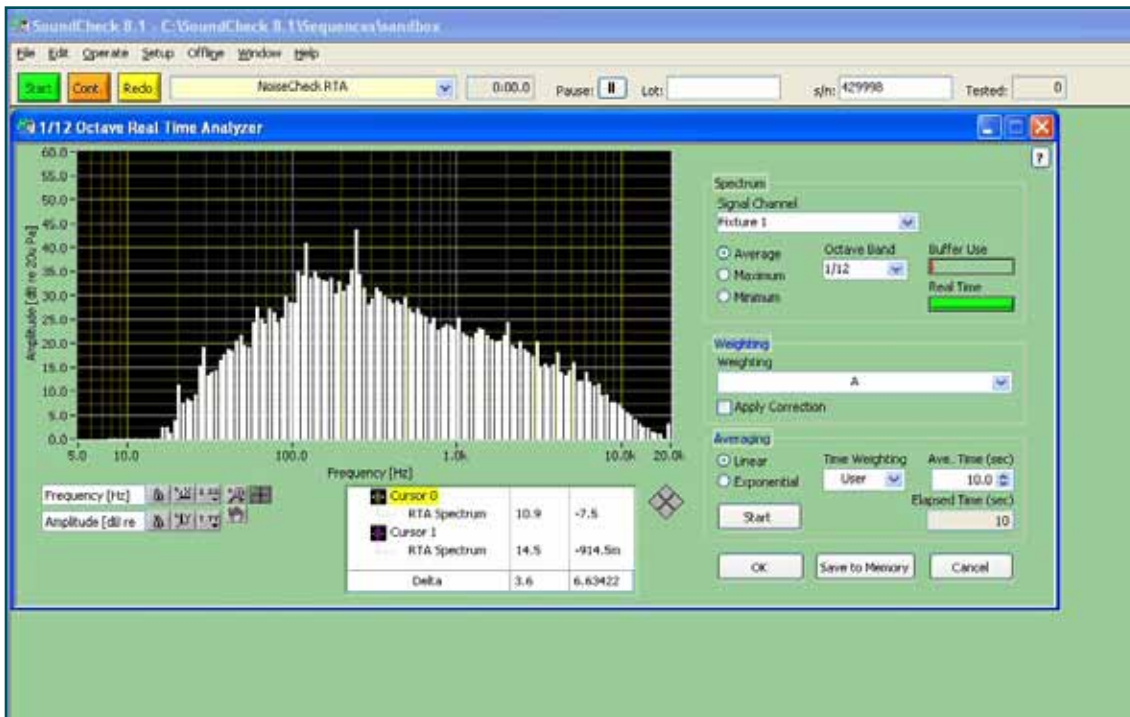
NoiseCheck's advanced algorithms allow fast and accurate testing even in noisy environments, and it is designed with automated production line integration in mind. NoiseCheck is compatible with automation software and communicates with hardware such as barcode systems and PLCs, using RS-232, IEEE-488, Bluetooth, FireWire, USB, and TTL interfaces. It can be integrated into larger test applications using National Instruments' Test Stand™ or Active X® environments, and controlled by other programs through LabVIEW™ or any programming language that supports ActiveX commands (VB.NET, C#, C++, Java etc. Test results can either be recorded in NoiseCheck or output to other software for full statistical process control. Within an automated environment, tests can be configured to start when the device under test is in place, and failed devices automatically removed from the production line.

NoiseCheck offers various levels of operator access to prevent accidental modification to test sequences and tests can be configured for one-click testing. This means that the operator simply chooses the product model and the test from a preprogrammed list and hits "start". NoiseCheck then executes the test, analyzes the data and compares the results to pre-defined pass/fail limits. Clear visual and/or audible pass/fail signals are returned to the operator and data can be automatically exported for archiving. Various levels of operator control can be set to prevent modification to the test sequence.

Test sequences can be shared and emailed, making it easy to recreate the same test throughout production facilities around the world. This saves time and offers increased repeatability of test procedures. With the software's different language options and the use of the Internet to transfer data, the possibilities are endless.

NoiseCheck in the R&D Laboratory

Noise characteristics are an important part of the design of many products. NoiseCheck is an extremely flexible R&D test platform as its detailed results can be analyzed in many different ways and easily stored for further analysis.



The Real Time Analyzer in NoiseCheck

NoiseCheck Product Options

1200 NoiseCheck FFT QC

Acoustic/Vibration Production Test (FFT). Includes: FFT Spectrum Analyzer and Oscilloscope Virtual Instrument, Listen-certified 24bit 96kHz Sound Card (Data Acquisition Board), Multimeter Virtual Instrument for overall acoustic/vibration measurements, Limits Tester Software

1201 NoiseCheck RTA QC

Acoustic/Vibration Production Test (RTA). Includes: Real-time Analyzer (1/1, 1/3, 1/6, 1/12, & 1/24 octave), Listen-certified 24bit 96kHz Sound Card (Data Acquisition Board), Multimeter Virtual Instrument for overall acoustic/vibration measurements, Limits Tester Software

1202 NoiseCheck QC - Acoustic/Vibration Production Test (FFT&RTA)

Includes: Real-time Analyzer (1/1, 1/3, 1/6, 1/12, & 1/24 octave), FFT Spectrum Analyzer and Oscilloscope Virtual Instrument, Listen-certified 24bit 96kHz Sound Card (Data Acquisition Board), Multimeter Virtual Instrument for overall acoustic/vibration measurements, Limits Tester Software

1203 NoiseCheck QC Test Development

Includes: Listen-certified 24bit 96kHz Sound Card (Data Acquisition Board), Multimeter Virtual Instrument for overall acoustic/vibration measurements, Limits Tester Software, Post-Processing Software, Sequence Editor, FFT Spectrum Analyzer and Oscilloscope Virtual Instrument, Real-time Analyzer (1/1, 1/3, 1/6, 1/12, & 1/24 octave)

1204 NoiseCheck Sound Power Test

Includes: Real-time Analyzer (1/1, 1/3, 1/6, 1/12, & 1/24 octave), Listen-certified 24bit 96kHz Sound Card (Data Acquisition Board), Multimeter Virtual Instrument for overall acoustic/vibration measurements, Limits Tester Software, Sound Power Sequence and custom tests including Reports

Associated Hardware

Listen SCM Microphone
Listen SoundConnect™ or AmpConnect™
Listen DC Connect™

