

Name of the Technology: Free-field Calibration System for Noise Measuring Devices with a Portable Anechoic Chamber

Brief Summary: The present technology is a calibration system developed for free field calibration of sound level meters and analyzers in a portable anechoic chamber developed. The portable chamber developed has been verified for free field characteristics and the sound absorption characteristics of the absorptive materials has been evaluated in reverberation chambers. The technology shall be very helpful for calibration and testing laboratories and industries like toy manufacturing, manufactures of sound level meters, noise monitoring terminals for ascertaining the free-field characteristics of the devices manufactured by them. The traceability of the system is through the National standards of sound pressure level maintained at Acoustics and Vibration Metrology, CSIR-NPL. Figs 1 (a) and (b) show the pictorial view of the developed facility and GUI software window developed for the same.

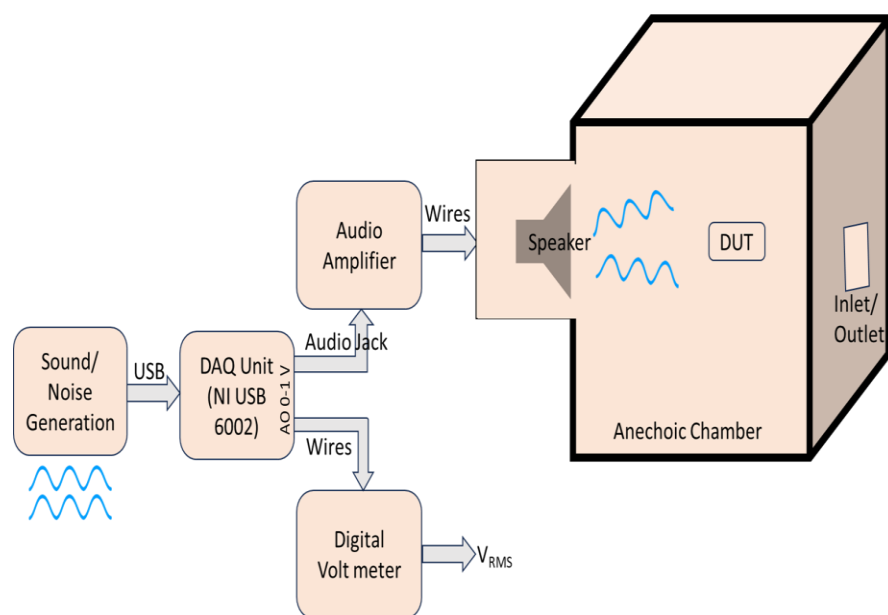


Fig.1: (a) Schematic of Free-field calibration facility (Left); Pictorial view of Developed Free-field calibration facility at CSIR-NPL (Right)

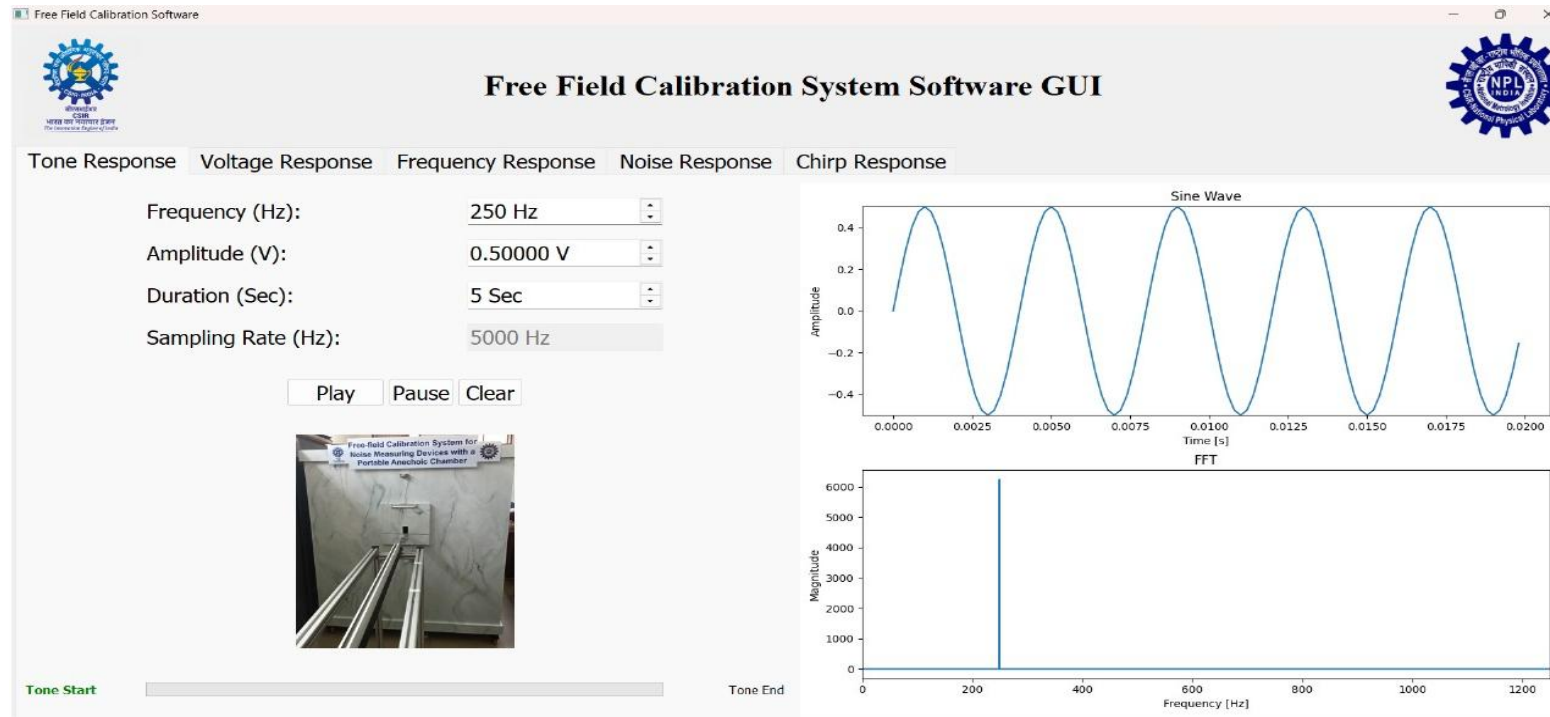


Fig. 1: (b) Software GUI developed for the Free-field calibration facility

Applications: The technology shall be useful for calibration and testing of the noise measuring devices in the free-field conditions. The portable anechoic chamber so developed shall be cost effective solution for the free-field conditions and acquiring the frequency response at varied amplitude levels.

Novelty Features: The calibration system so developed has been verified for free-field characteristics. The major novelty features are as:

- The system can calibrate Noise measuring devices in range of 50 dB to 110 dB at varied amplitude and frequency levels
- The frequency response of the noise measuring device can be ascertained by various signals such as pure tone, random noise and chirp signals
- The user-friendly GUI so developed facilitates the free-field calibration of the device with various amplitudes ranging from **50 dB to 110 dB, frequency ranging from 125 Hz to 10 kHz** and signal such as pure tone, random noise and chirp signals



Advantages: A free-field calibration facility provides highly accurate, traceable calibration under reflection-free conditions, ensuring reliable sound measurements across a wide frequency range. It benefits various industries—including environmental monitoring, manufacturing, construction, automotive, and acoustics—by supporting regulatory compliance, product development, occupational safety, and research. This facility enhances measurement credibility, supports quality assurance, and strengthens metrological infrastructure for noise control and acoustic assessments. Some of the major sectors are listed as

1. Environmental Monitoring Agencies
2. Industrial and Manufacturing Companies
3. Automotive and Aerospace Industries
4. Acoustic Equipment Manufacturers
5. Calibration and Testing Labs

Technology Readiness Level:

Idea	Concept Definition	Proof of Concept	Prototype	Lab Validation	Technology Development	Technology Demonstration	Technology Integrated	Market Launch

Broad Area/Category: Electronics & Instrumentation

User Industries: Calibration and Testing Laboratories