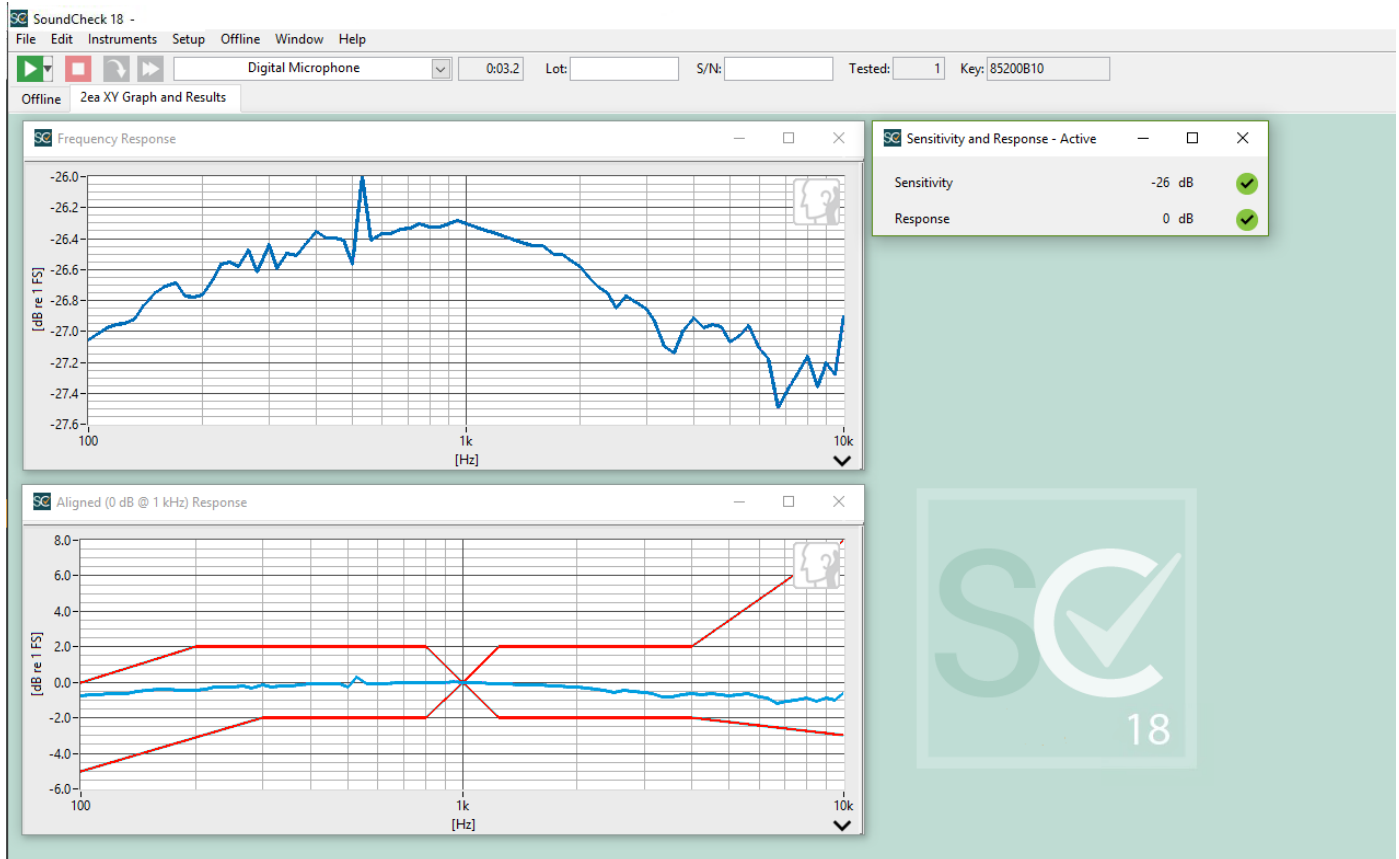


Digital Microphone: Response & Sensitivity

Introduction

This sequence demonstrates the two most common ways digital MEMS microphones are measured: frequency response and sensitivity. A stepped sine sweep is played from 10kHz to 100Hz through a source that has previously been calibrated to produce 1 Pascal across the frequency band. The recorded signal is analyzed with a HarmonicTrak analysis step, which calculates the response curve. A post processing step is then used to extract the sensitivity value at 1kHz. Limits are set around both the frequency response and the sensitivity, the default values are for a typical MEMS microphone and should be adapted to your device.

The final display shows two graphs. The top X-Y graph displays the data at its absolute level in dBFS. The lower graph shows the same frequency response curve but normalized to 0dB at 1kHz. This is a common way of displaying microphone frequency response and applying limits.



FINAL DISPLAY FOR DIGITAL MICROPHONE SEQUENCE

Requirements

Software

- SoundCheck 18.0 Basic or later

Hardware

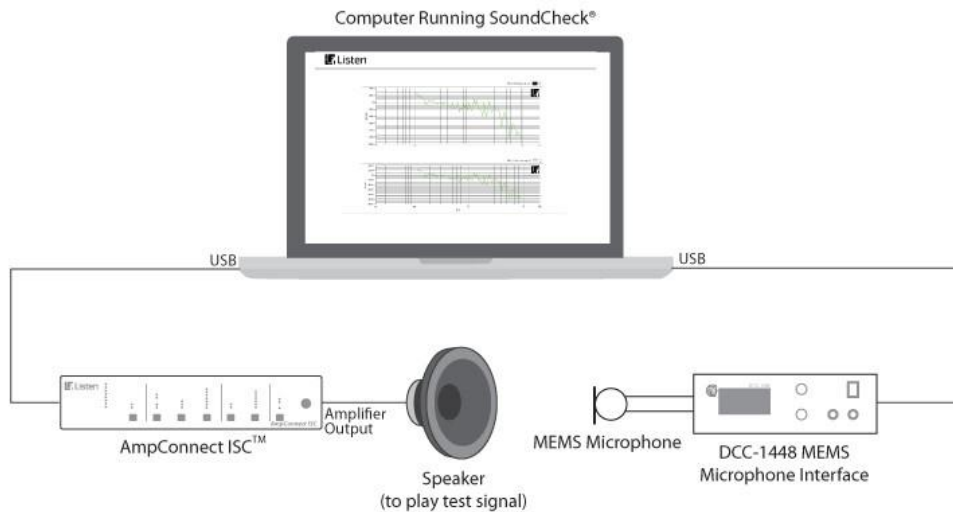
- Portland Tool & Die DCC-1448 (Listen p/n 2018) or PQC-3048 (Listen p/n 2018)
- AmpConnect (Listen p/n 4042), SC Amp (Listen p/n 4060) or other power amplifier
- Source Speaker
- Measurement microphone e.g. Listen SCM3 (p/n 4002) and any required power supply e.g. (Listen SoundConnect 2 p/n 4025 & 4026)

Hardware Setup & Calibration

1. Calibrate your microphone and the source speaker as per the instructions in the SoundCheck manual
2. Connect the MEMS microphone and digital MEMS interface per Digital Microphone Test Configuration Notes.

You are ready to start the sequence.

System diagram





Sequence Logic

Type	Step Name	#	Out	In
	Stweep - 10k-100Hz			
Sti	(R40)	1	Source Speaker	
Acq	Play & Record	2	Source Speaker	Digital In 1
Ana	HarmonicTrak	3		
Pos	Sensitivity	4		// Finds the sensitivity value at 1 kHz
Lim	Sensitivity	5		// Typical sensitivity limits for MEMS microphone
Lim	Response	6		// Typical frequency response limits for MEMS microphone
	2ea XY Graph and			
Dis	Results	7		
Aut	Save to Dat - Append	8		