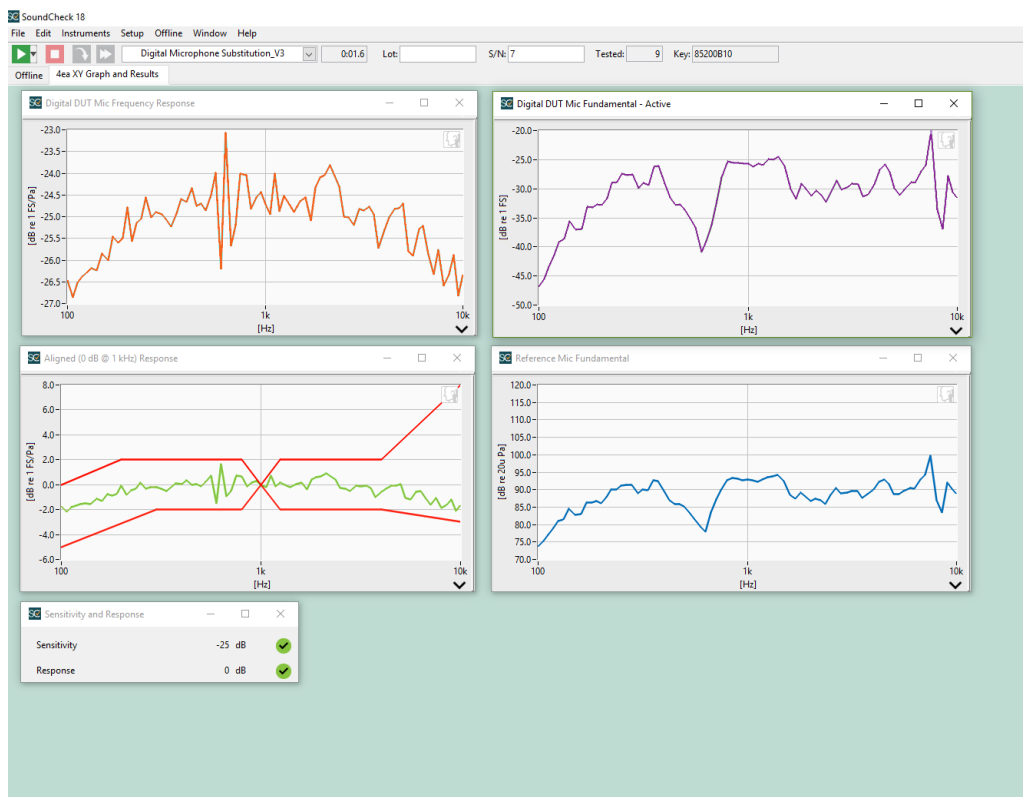


MEMS Microphone Substitution

Introduction

This sequence demonstrates a method for testing a digital MEMS microphone frequency response with a source speaker that is not or cannot be equalized. The method involves playing a sine sweep through the source and simultaneously measuring it with a reference microphone and the microphone under test. Because the measurement microphone is assumed to have a relatively flat response, it is used to acquire the frequency response of the source speaker. By subtracting the response of the reference microphone from the DUT microphone the response and sensitivity of the device under test is found. 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 four graphs. The top left X-Y graph displays the data at its absolute level in dBFS. The lower left graph shows the same response curve but normalized to 0 dB at 1 kHz. This is a common way of displaying microphone frequency response and applying limits. The two graphs on the right display the raw response curves of the reference and the DUT microphones.



Final Display for Digital Microphone Substitution sequence

Requirements:

Software

- SoundCheck 18 Basic or higher

Hardware

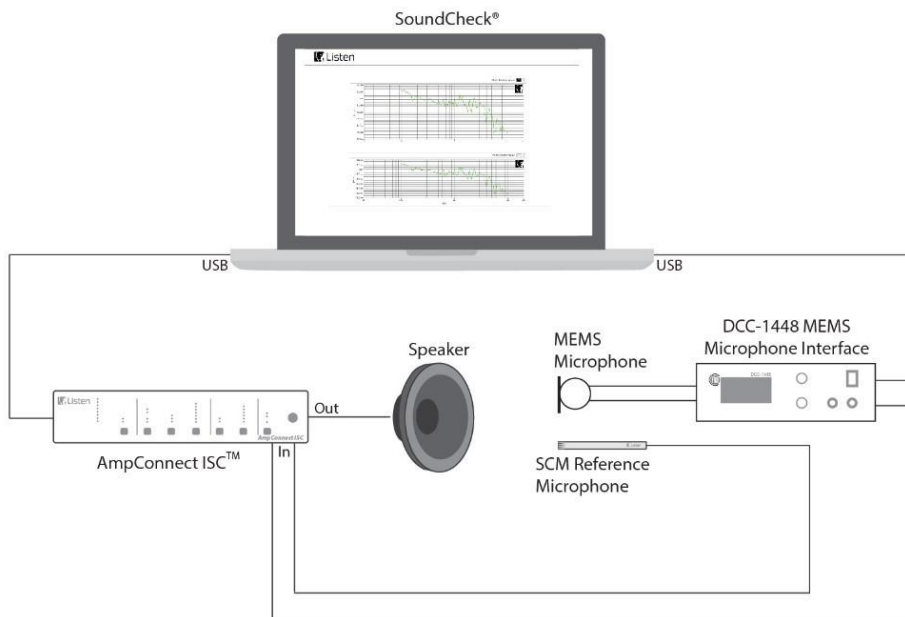
- Portland Tool & Die DCC-1448(Listen p/n 5810) or PQC-3048(p/n 5811)
- Listen AmpConnect(Listen p/n 4042) or another audio interface
- If not using an AmpConnect, then an external power amplifier is needed
- Source Speaker
- Measurement microphone e.g Listen SCM3 (p/n 4002)

Hardware Setup & Calibration

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

You are ready to start the sequence.

System diagram





Sequence Logic

Type	Step Name	#	Out	In
Mes	Recall	1		
Rec	Recall waveforms - automatic	2		
Sti	Stweep - 10k-100Hz (R40)	3	Source Speaker	
Acq	Simultaneous acquisition	4	Source Speaker	Reference Mic Digital In 1
Pos	Frequency Shift	5		
Pos	Resample	6		
Ana	HarmonicTrak	7		
Pos	Curve division	8		
Pos	Sensitivity	9		
Lim	Sensitivity	10		
Lim	Typical MEMS freq response limits	11		
Dis	4ea XY Graph and Results	12		