



# MEMS Microphone Interfaces

## The DCC-1448 (for R&D) and PQC-3048 (For QC)

Listen offers 2 MEMS digital microphone measurement interfaces from Portland Tool & Die, the laboratory-grade DCC-1448 and the low cost PQC-3048 for production line use.

### Introduction

The DCC-1448 and PQC-3048 interface your MEMS microphone to the SoundCheck test system, converting the 1-bit PDM output of a Digital MEMS microphone to the 24-bit, 48kHz PCM signal accepted by audio test systems. This enables measurement of typical microphone characteristics such as frequency response, sensitivity and directivity.

### The DCC-1448 for R&D

The DCC-1448 is a research-grade interface for measuring and characterizing MEMS (Micro-Electro-Mechanical-Systems) microphones and other devices with a 1-bit PDM (Pulse Density Modulation) output.

In addition to converting the MEMS microphone's 1-bit PDM output to a 24-bit, 48kHz PCM signal, it also includes features to measure characteristics unique to MEMS microphones. These include a programmable clock for measuring performance relative to sample rate, a programmable power supply for measuring performance relative to supply voltage and a power supply rejection impairment generator for measuring power supply rejection ratio (PSRR). The instrument is acoustically silent and can therefore be used inside an anechoic chamber, a useful feature since MEMS microphones can only drive a short cable.

Features include:

- Control and configuration within SoundCheck, via USB, or using front panel
- Straightforward operation - the data input, clock, Vdd, and ground interface are on the front panel, and the rear panel contains USB and SPDIF interfaces for connection to the computer's audio interface
- simultaneous SPDIF and USB digital audio output are compatible with most test equipment with digital audio inputs and both Mac and Windows computers.
- Programmable clock typically operates as the master, but can also operate in slave mode (e.g. for measuring performance of a PDM signal generator, syncing multiple microphones in an array, or where use of an external clock is preferred)
- Conversion occurs entirely in the digital domain
- Can interface with two microphones simultaneously



DCC-1448 (right) and PQC-3048 (left) Interfaces

### The PQC-3048 for QC

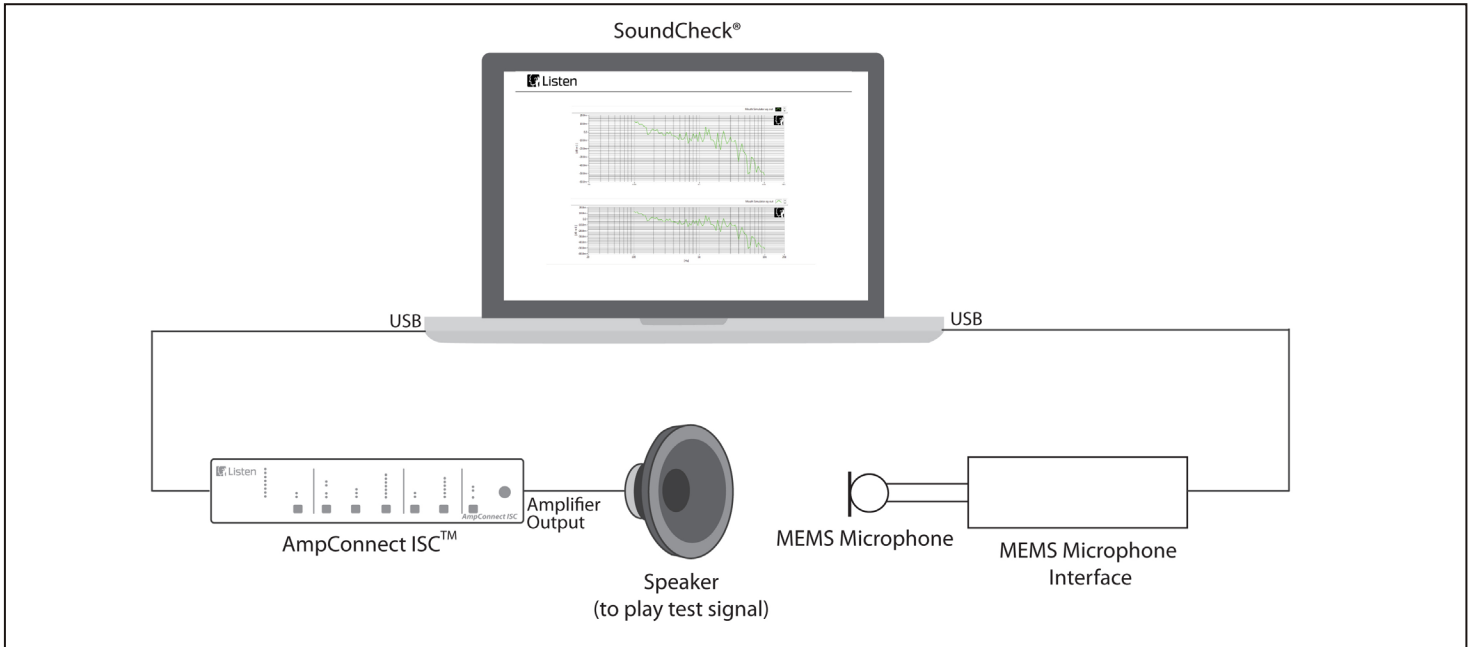
The PQC-3048 MEMS digital microphone interface is designed for high volume production line testing of MEMS microphones. It converts, in the digital domain, the 1-bit audio data returned by the device under test to 24 bit PCM audio at 48kHz sample rate and supplies the required clock signal and DC power for testing.

Features include:

- Control from within SoundCheck or via USB virtual com port using a command line utility
- Just two connectors: USB for power and control, and a pluggable phoenix connector to interface with the device under test
- rugged and compact
- Simple to use with minimal potential for incorrect operation.
- 2 microphones can be connected simultaneously, and multiple units can be connected to the same computer for simultaneous testing of multiple devices.
- Uses the same 1-bit PDM to multi-bit PCM conversion algorithm as the DCC-1448 MEMS interface, ensuring that measurements made with one can be reproduced with the other
- Low cost - less than half the price of the DCC-1448

## MEMS Microphone Interfaces (cont.)

### Setup Diagram



### Specifications & Comparison

	DCC-1448	PQC-3048
<b>PDM Data Input</b>	0.5 to 5.5 MHz	
<b>Clock modes</b>	In, Out, Hold High, Hold Low	Out only
<b>Clock Direction</b>	Selectable clock master or slave	Clock master only
<b>Clock logic</b>	1.4-5.5V, Independent	Locked to Vdd level
<b>Data input</b>	On/Off	Always On
<b>Selectable Capacitance</b>	5, 50, 100, 200 or 400 pF	5 pF Fixed
<b>PCM Data Output</b>	24 bit, 48 kHz sample rate	
<b>Interface</b>	SPDIF, USB	USB Only
<b>Vdd DC Power Supply</b>	0 to 5.5 V DC	0 to 3.3 V DC
<b>PSR Impairment Generator</b>	Sine or Square waveform, 20 Hz - 20 kHz, 0 - 1 Vpp waveform amplitude	No
<b>Control Interface</b>	Touchscreen, USB	USB Only
<b>Dimensions (H x W x D)</b>	86mm x 271mm x 211mm	30mm x 64mm x 135mm
<b>Weight</b>	1.6 kg	0.18kg
<b>Power</b>	12 VDC, 24W power input - supplied with universal 100 to 240 VAC, 50 to 60 Hz power supply	USB Bus powered

NOTE: Specifications are subject to change. Please contact Listen for current information or questions.