

iTestMic2 User Guide



STUDIO SIX DIGITAL LLC

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Quick Start

iTestMic2 is a professional-grade test & measurement microphone for iPhone® 5, 6 and 6S, 7 Plus, iPod touch® 5 and 6, and iPad® and iPad Mini®. It connects to the attached iOS device using a digital audio link for the lowest noise and highest quality audio. iTestMic2 also has an 1/8" stereo line output and it includes a power supply so that you can provide power to the attached iOS device for extended run time.

Hardware Requirements

iPhone® 5, 6, 6S, and 7, iPod touch® 5 and 6, and iPad® and iPad Mini® running OS 6.1 or later.

App Compatibility

iTestMic2 is compatible with AudioTools (which requires iOS 6.1 or later), and many other iOS Apps which record or process audio. While we have tested iTestMic2 with many Apps and found that it works with many (including Apple's GarageBand), we can not guarantee compatibility with all Apple or 3rd party Apps. In particular, the phone App on iPhone does not use dock connector audio, and will not work with iTestMic2.

Once iTestMic2 is plugged in, it will be active and immediately available to iOS as an audio source. There are no controls or setup required to make it function.

Installation

To install iTestMic2, plug it into the dock connector of any compatible iOS device. Some third-party plastic outer cases have smaller openings for dock connector cables, so make sure that the case does not interfere with the iTestMic2 connector, and that the connector is fully seated in the Lightning socket.

Note that it takes approximately 3 seconds for iTestMic2 to be recognized by your iOS device. So, if you plug iTestMic2 in while AudioTools is running, wait for the confirmation box to appear before trying to use it.

App Installation

If you do not have the AudioTools App installed, when you connect iTestMic2 to your device a prompt may appear, and you may be asked if you want to install AudioTools. This behavior is normal and is a feature of iOS.

Calibration

You can use iTestMic2 right out of the box, since it automatically transmits its calibration values to the AudioTools app. This gives you an instantly usable acoustic analysis tool. To recalibrate it, or to check its calibration, see the section on Calibration, below.

Lightning Connector Cable

The Lightning connector cable is used to attach iTestMic2 to your device. Connect it only to an iPhone 5, 6, or 7, iPod touch 5 or , or any iPad or iPad Mini. The cable should be connected to the device before starting AudioTools. Never use any extender cable, as these are not approved for usage.

Line Output Connector

iTestMic2 features an 1/8" (3.5mm) stereo line output connector. **Note that this output is always at full volume, and does not respond to level changes from the iOS device.** In the AudioTools app, there are some modules which can alter the output level of the signal going to iTestMic2.

NOTE: This output is not designed for headphones and may produce excessive volume levels to some headset or headphones.

Power Connector

iTestMic2 includes a power adapter. Use only this adapter when you need to charge or supply power to the attached iOS device.

iTestMic2 can supply up to 2.1A of 5V power to your iOS device. Note that it will not provide enough current to power an iPad Pro.

AudioTools App

iTestMic2 is designed to work with the Studio Six Digital App “AudioTools”, which is available for download on the App Store. When used with AudioTools, all of the features of iTestMic2, such as multiple gain ranges and output configuration, are available. When used with any other App, iTestMic2 operates in the configuration specified on the Settings->Configuration Settings screen of AudioTools.

This manual will not cover the AudioTools App in detail, but it will discuss some of the ways in which AudioTools interacts with iTestMic2.

Acoustic Analysis and SPL Functions

These functions use the input source selected and gain range settings on the Settings menu, Microphone Setup module. The currently active input source is always shown on the screen. You may see labels like “iTestMic2 Mic Low Range” or “iTestMic2 Line High Range”.

SPL Meter

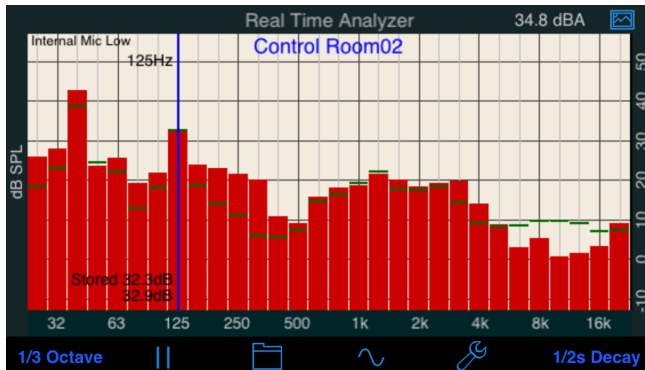


SPL Meter gives you a way to accurately measure Sound Pressure Levels with iTestMic2.

SPL Meter uses ANSI / ISO Type 1 filters for A and C weighting, as well Type exponential decay characteristics. Needle dynamics are carefully matched to real analog meter ballistics.

Range may be set from 40 dB to 140 dB to measure sound levels over a wide range.

RTA



Use the Real Time Analyzer to display levels for each frequency band.

You can view the display in octave or 1/3 octave mode, display a cursor to readout actual levels, and see max and min values.

Graphs may be saved and recalled, or exported for reports or further analysis.

Calibration

iTestMic2 is factory-calibrated a 94.0 dB at 1kHz, +/- 0.1 dB. The high and low range trim values are stored in the mic in non-volatile memory, so that when iTestMic2 is plugged into AudioTools, the calibration factors are read by the app, giving you a ready-to-use calibrated system. You don't have to do anything to store these values, they are read every time that AudioTools detects iTestMic2.

iTestMic2 will typically hold its calibration within a fraction of a dB, but if exposed to extremes of heat, cold, or humidity, the microphone calibration may change. At any time, you can check the calibration using an SPL calibrator, and if necessary adjust the trim values and store them back into iTestMic2. These instructions are below.

Microphone Calibration with a Calibrator

Before beginning calibration, connect iTestMic2 to your iOS device.

Now start the AudioTools App and go to the Settings menu, Microphone Setup function. The Input Sources screen appears.

Select the first calibration option, by tapping the blue disclosure triangle for the first entry on the top of the screen.

Note: AudioTools uses the AES standard for dBFS, which is that for a sine wave just reaching clipping, the reading will be 0.00. A square would by this formula show +3.00 dBFS.

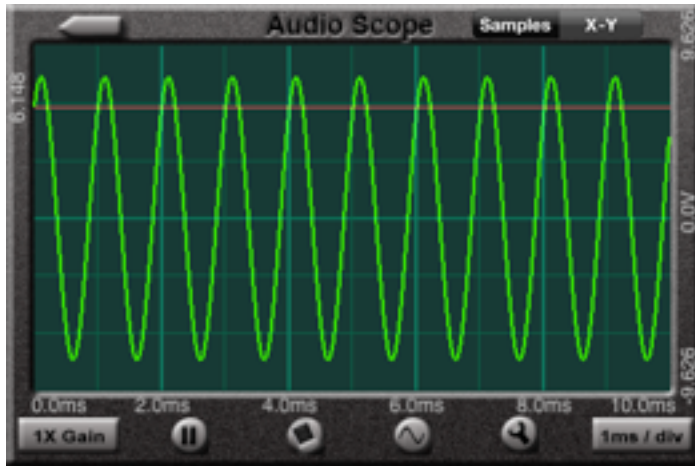
Select Low Range.

Now enter the calibrator output setting (typically 94) in the dB field by tapping on the field, clearing the value in the field, and entering your calibrator's fixed value. Tap Done. The trim value will be set automatically by this process, so do not alter it.

Select High Range, and repeat the calibration process. Now, you should be able to switch back and forth between Low and High range, and the dB value should stay the same.

When you have completed setting the calibration Trim values, tap the button "Store Calibration in iTestMic2". Accept the confirmation screen. Now the new calibration is stored in the microphone, and will be available to any iOS device that is running AudioTools.

After setting the ranges, it's a good idea to double check your headroom using Audio Scope. To do this, exit this screen, and go to the Line Input menu, Audio Scope screen. Go to settings (tap the wrench icon), and select Line Input Mode Mono, Input Source Mic. Now go back to the scope screen and check that the sine wave is not clipped. It should look something like this picture:



Microphone Calibration by Matching

If you do not have access to a microphone calibrator, but you do have access to a calibrated SPL meter, you can do basic calibration by matching iTestMic2 to the SPL meter. Since iTestMic2 comes calibrated from the factory, we do not normally recommend doing this procedure.

To do this, follow the instructions above, with these changes:

- * Use an acoustic noise source such as pink noise, or white noise. White noise will have less low frequency, and may be a better choice, since it is best to calibrate with mid-band energy. Do not use a sine wave signal, because you may get cancellation or reinforcement effects that can throw off the readings.
- * Use A Weighting, if possible, with the calibrated meter.
- * Enter the value read from the calibrated SPL meter into the dB field in AudioTools.

Specifications

All specifications are subject to change.

Microphone

28 dBA - 120 dBA

Frequency Response 20Hz - 20kHz, +/- 3.0 dB

1/2" Nominal diameter, fits standard calibrators

Consumes less than 90ma in use

Omnidirectional

Line Output

Stereo output

Output level @ 10k Ohm load +9.0 dBu or 2.1Vrms

Distortion at 1kHz less than 0.010%

Charging

Up to 2.1A of 5V power is available for your iOS device.

iTestMic will shutdown the output power if it detects an over-current situation.

Support

See our website for the most up-to-date information about our products.

www.studiosixdigital.com

support@studiosixdigital.com

Warranty

Studio Six Digital LLC (Manufacturer) warrants the Products, so far as the same are of its own manufacture, against defects in material and workmanship under the normal use and service for which they were designed, for a period of one (1) year after date of shipment. Manufacturer's obligation under this warranty being limited, at its option, however, to the replacement or repair of a part or parts determined by it to be defective. All necessary packing and transportation costs for return of the goods to be paid by sender. The Products must be returned in appropriate packaging, comparable to that used in the original package by Manufacturer. All replacement or required goods will be returned to sender by like means at Manufacturer's expense. Manufacturer shall under no circumstances be liable for any special, indirect or consequential damages owing to failure of the Products. MANUFACTURER MAKES NO WARRANTY OF FITNESS OR MERCHANTABILITY AND NO OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, EXCEPT AS SPECIFICALLY SET FORTH HEREIN.

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