

MicW i436 Frequent Asked Questions

➤ Question 1

I am looking into using the i436 product as part of a sound analyser solution as I understand it achieves Class 2 status. If successful, this could result in a large number of your products being purchased.

I understand that there is a 200Hz hi-pass filter at the input stage of the iPhone and iPad devices which would limit the frequency range of such a system. Has this been corrected somehow within the microphone circuitry? Otherwise it would seem that its designation as a Class 2 microphone for such applications is misleading!

➤ Answer 1

The i436 is designed and manufactured according to our measurement technologies. The i436 meets the IEC 61672 Class 2 requirements when it inputs high end sound cards. But if it is connected to iPhone or iPad, the accuracy is depended on the software. The i436 does not have the correction for low frequency. The correction should be done on the software part.

In conclusion, i436 meets the Class 2 standard. But i436 with iPhone sound card and RTA software will need some correction at low frequency to meet the Class 2. The customers need to know the limitations.

➤ **Question2** What is the minimum sound pressure level iPhone or iPad can measure?

➤ **Answer 2** 34 dB (A)

➤ **Question 3** What is the maximum sound pressure level iPhone or iPad can measure?

➤ **Answer 3** 102 dB.

➤ **Question 4** Does it work on Apple Laptops too

➤ **Answer 4** Yes, It works

➤ **Question 5** Where does that little peak in the frequency response (15kHz) come from?

➤ **Answer 5** It related to the diaphragm resonance frequency of the microphone capsule.

➤ **Question 6** Does it work on other phones (Android)

➤ **Answer 6** We did not test i436 with other phones

➤ **Question 7**

Is there a chance to integrate some kind of pad-switch or make some special low sensitive model. the Car-HiFi and Live-Engineer guys are asking for 150dB!!

➤ **Answer 7:**

It is possible to design a special cable with -20dB or -40 dB pad to low the sensitive. However the current design of i436 can only achieve 130 dB even with special pad cable. For 150dB, the engineers may have to use N401 microphone which can handle 160dB.

➤ **Question 8** What is the bit depth and the sampling rate of the iPhone

Answer 8: The iPhone 3 and 4 use 24 bits and 48kHz sampling.

➤ **Question 9:**

Is there a chance to integrate an inverted frequency response to the Iphone Low-Cut in an app?

➤ **Answer 9**

Yes. It can be done in the software. For the recording application, the software allows the users to control the gains at each octave bands. For the measurement application, the users have to look into the software specifications. The i436 only gives the flat frequency response.

➤ **Question 10**

What kind of spilt cable is supplied in the kit of the i436, I hope it is with Cinch/RCA-Connectors for Line Out.

➤ **Answer 10**

The i436 Kit includes i436 microphone; split cable, extension cable (3meters), clip,



windscreen. The split cable has two 3.5 mm jacks, one for microphone and the other for earphone.

➤ **Question 11** Is there a comparison chart between the integrated mic of the iPhone and the i436

➤ **Answer 11** No, but we are planning to do the comparison measurements in our anechoic chamber.

➤ **Question 12** What kind of software could i436 work with? Which is the price range?

➤ **Answer 12**

It can work with most of the **Sound Level Meter**, **Real Time Analyser (RTA)** and **Recording** software. The software is available from App Store. The price ranges from \$1.0 to \$500.

We did not fully test any software against IEC61672 standard. Please note that the different software could give you different results.

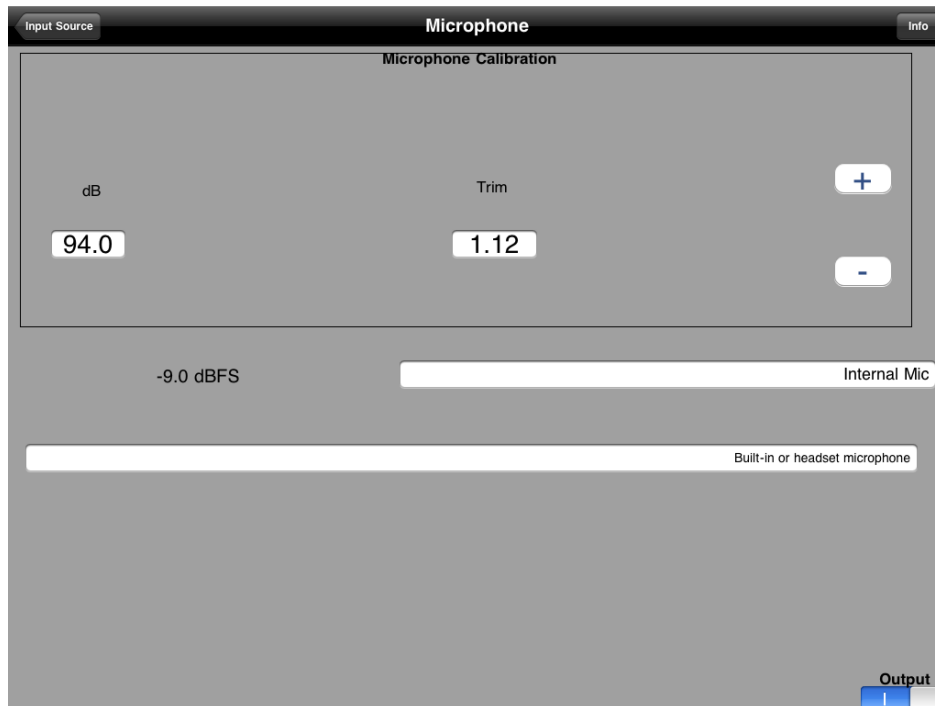
➤ **Question 13** How to Calibrate the system with Sound Level Calibrator

➤ **Answer 13**

If you have a sound level calibrator, such as BSWA CA114 (www.bswa-tech.com), the calibration is simply follow the software instruction.

- 1) Insert i436 into the calibrator, and switch on the calibrator,
- 2) The calibrator will produce 94dB at 1000 Hz (BSWA CA114)
- 3) Go to the calibration screen of the software. Some software needs manual adjustment; The reading should be 94dB as shown in the software.
- 4) An example of the calibration is shown in the following picture.
- 5) After the calibration, go back to the measurement screen, The reading should be 94dB with the calibrator on.





The calibration procedures are very much software dependent, Please read the software manual on Calibration.

➤ **Question 14** How to Calibrate the system **without** Sound Level Calibrator

➤ **Answer 14**

If you do not have a sound level calibrator, you also could calibrate the system with the sensitivity provided with each i436. The sensitivity value is shown in the User's Manual. For example, the sensitivity of 6.6 mV/Pa means the output voltage from i436 is 6.6 mV when it is exposed to 94 dB (or 1.0 Pascal) sound field.

The calibration procedures using the sensitivity value is software dependent. The following two examples are based on our measurement results for two iOS devices and five i436 microphones. The procedures are your information only. You need to contact your software suppliers on how to use our sensitivity value in their software calibration.

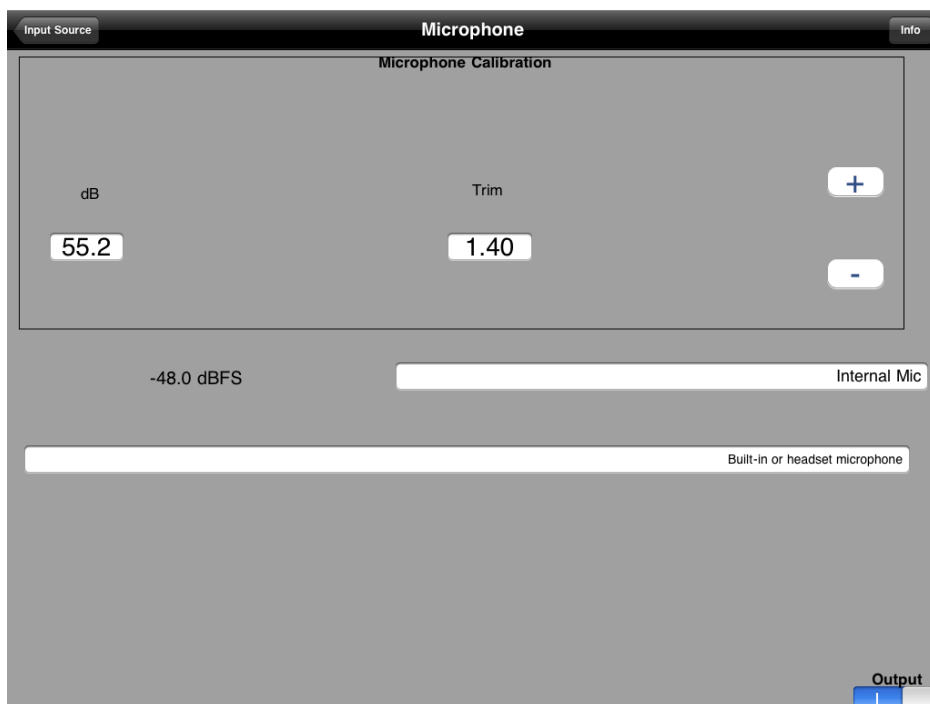
1) AudioTool 3.0 from Studio Six Digital:

Step 1: You will need to have the Trim value for the software. The Trim value can be calculated by

$$\text{Trim} = -42.4 - 20\lg (\text{Sensitivity}/1000)$$

For example: The i436 Sensitivity is 6.6mV/Pa; The Trim = $-42.4 - 20\lg (6.6/1000) = 1.2$

Step 2: Go to the calibration screen of the AudioTool, adjust the Trim value by press “+” or “-” signs, and the Trim should show “1.4”. The calibration is done.



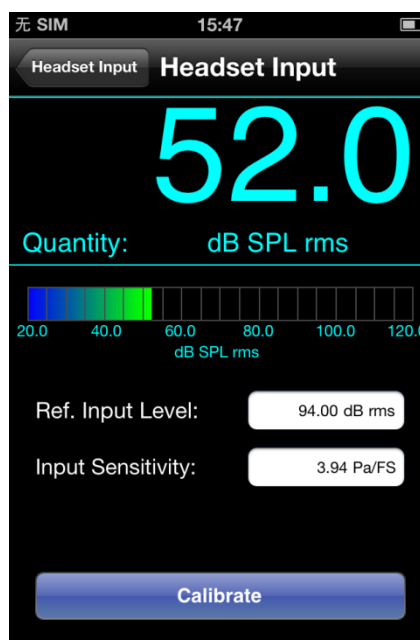
2) SignalScopePro from Faberacoulstical:

Step 1: You will need to have the Calibration value in terms of Pa/FS. The Calibration Pa/FS can be calculated by:

$$\text{The Calibration Value (Pa/FS)} = 26/\text{Sensitivity}$$

For example: The i436 Sensitivity is 6.6 mV/Pa, The Calibration Values = $26/6.6 = 3.94 \text{ Pa/FS}$

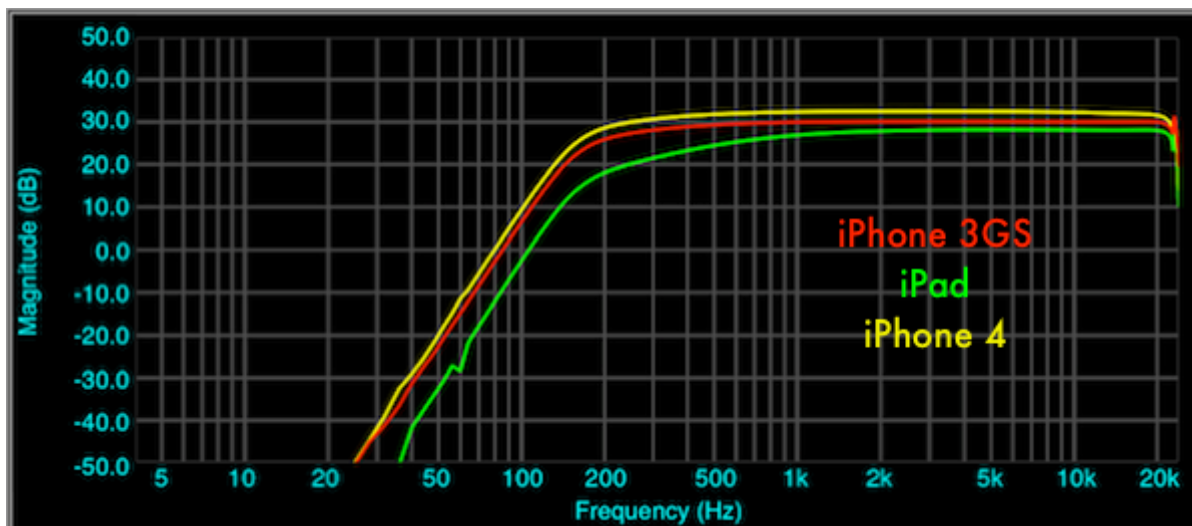
Step 2: Go to the calibration screen and manually input 3.94 Pa/FS in the “input Sensitivity”. The calibration is done



Please note that the calibration without the calibrator is not accuracy. The error should be within +-1.5dB. Please contact your software suppliers for more information regarding the calibration.

Question 15 If I have the iPhone 4 Headset Input Frequency Response data, how can I correct my measurement results?

Answer 15: If you have the iPhone 4 Headset Input Frequency Response data (the data is from Faber Acoustical [blog](#)) as shown in the following graph.



The correction can be done by added the numbers from the following table.

1/3 Octave Frequency (Hz)	20	25	31.5	40	50	63	80	100	125	160	200
Octave Frequency			31.5			63			125		
dB added to the 1/3 Octave measurement results (dB)	83	80	68	60	50	40	30	20	10	8	0

Question 17 Can I do Reverberation Time (RT60) measurement with i436

Answer 17: Theoretically yes, but you need software which supports RT60 measurements. We did not find any software yet which can do RT60 in iOS device.

Question 18 How accuracy does iPhone or iPad with i436 measure overall dBA for Pink noise?

We made comparison measurements in our Anechoic Chamber with BSWA801 Class 1 sound level meter. We used a loudspeaker to generate the Pink noise and used BSWA CA114 to calibrate both iPhone device and BSWA801. The measurements are taking at the same position. The overall dBA readings from two devices are within +/- 1.0 dBA.