Technical Note 1402

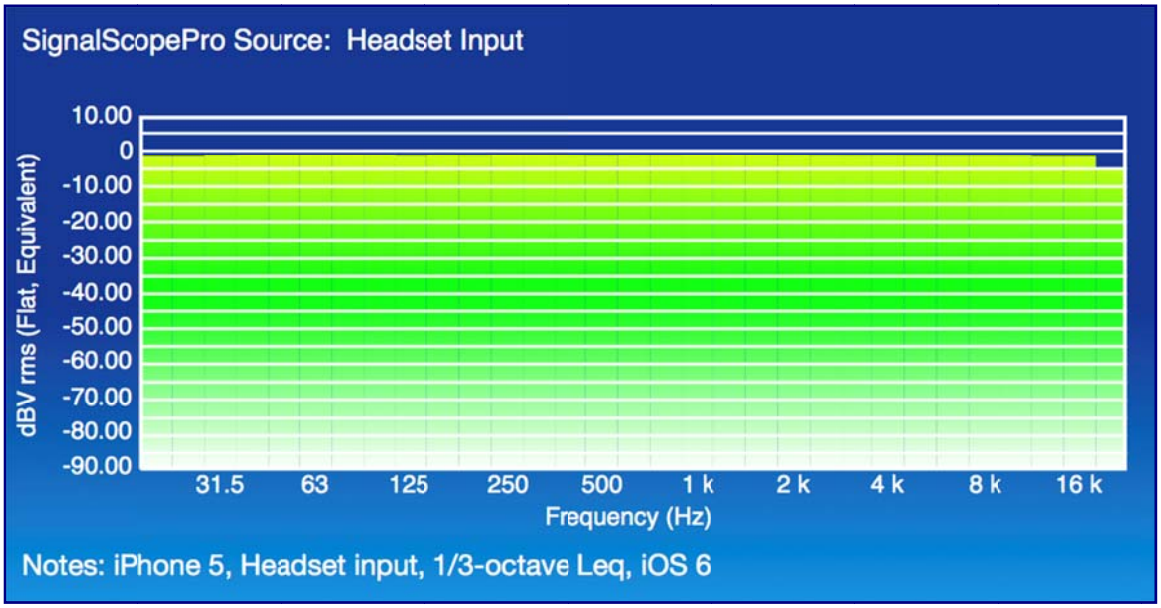
i436 - Frequent Asked Questions

- **Question 1 :**

  Studio Six Digital acclaimed that "We have thoroughly tested MicW, and our conclusion is that it does not improve on the performance of the built-in Apple device microphones, whether the iPhone mic or the supplied headset mic, other than in appearance, and in the fact that it is a couple of inches away from the iPhone. This is because any mic that plugs into the headset connector is subject to the same filters as the Apple mics. There is no way to avoid the effects of the severe Apple low-frequency roll-off filters, so any mic plugged into the headset connector suffers from the same problems." Is this true or false?

- **Answer 1 :**

- This is the false statement. We have tested the headset input of iPhone 5, 5S and 5C. The results show that the frequency responses of the iPhones are flat. There are no roll-off filters in the headset inputs. The third part test results published in www.faberacoustical.com confirmed our conclusions. Here is the result in the web.



- **Question2** What is the minimum sound pressure level iPhone or iPad can measure?
- **Answer 2** 35 dB (A) (iPhone 5 and above)
- **Question 3** What is the maximum sound pressure level iPhone or iPad can measure?
- **Answer 3** 120 dB. (iPhone 5 and above)
- **Question 4** Does it work on Apple Notebooks too?
- **Answer 4** Yes, It works with Apple Notebooks
- **Question 5** Does it work on Window PC?
- **Answer 5** Yes, it works, but it requires CB013 cable. You need to plug the i-Series mic into CB013 first and then plug into the microphone port in the PC.
- **Question 6** Does it work on other phones (Android)
- **Answer 6** Yes, It works with Samsung Galaxy, Moto X and most of Android phones.
- **Question 7** Is there a chance to integrate some kind of pad-switch or make some special low sensitive model? The Car-Hi Fi and Live-Engineer guys are asking for 150dB!!
- **Answer 7** We have AT020 attenuator for -20dB pad. However the current design of i436 can only achieve 130 dB even with AT020 attenuator. For 150dB, the engineers may have to use our Professional M series microphones, such as MicW M215.

- **Question 8** What is the bit depth and the sampling rate of the iPhone?
- **Answer 8:** The iPhones use 24 bits and 48kHz sampling. This specification may change with new iPhone.

- **Question 9**

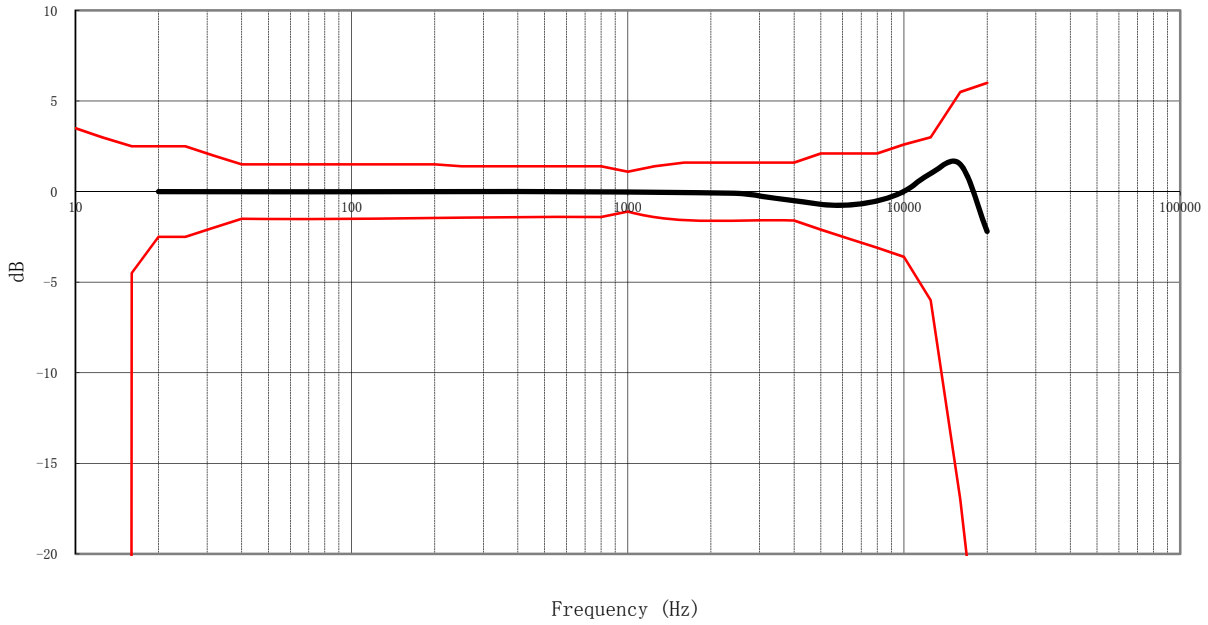
  What kind of spilt cable is supplied in the i436 Kit, I hope it is with Cinch/RCA-Connectors for Line Out.

- **Answer 9**

  The i436 Kit includes i436 microphone; split cable, extension cable (2meters), clip and windscreen. The split cable has two 3.5 mm jacks, one for microphone and the other for earphone. i456 and i266 kits have the same accessories.

- **Question 10** What are the typical frequency responses of i436 and how the results related to IEC61672 standard?
- **Answer 10**

  The typical frequency response of i436 is shown in black line of the following chart. The red lines are the limits specified in IEC 61672 standards for Class 1 Sound Level Meter. Our production are followed those limits as quality control.



- **Question 11** What responses correction data can I use to generate the microphone calibration files?
- **Answer 11**

  The typical calibration data for i436 is as follows. The data should be added to the measurement results to obtain the frequency corrected results. This is common way in audio measurements.

The Typical Frequency Response of i436:

Frequency (Hz)	Corrections (dB)
20	0.0
31.5	0.0
40	0.0
50	0.0
63	0.0
80	0.0
100	0.0
125	0.0
160	0.0
200	0.0
250	0.0
315	0.0
400	0.0
500	0.0
630	0.0
800	0.0
1000	0.0
1250	0.0
1600	0.0
2000	0.0
2500	0.1
3150	0.3
4000	0.5
5000	0.7
6300	0.6
8000	0.5
10000	0.0
12500	-0.8
16000	-1.2
20000	2.2

- **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 in App Store and Google Play. 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.

We tested SignalScopePro and DSP mobile which have professional calibration functions.

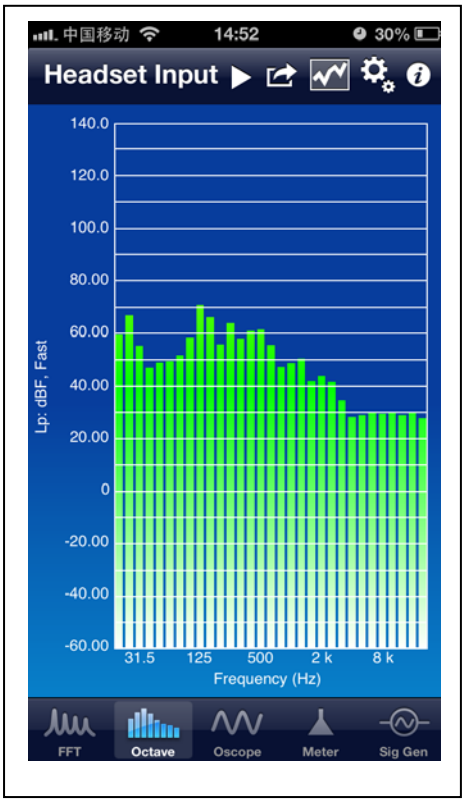
- **Question 13** How to calibrate the system with Sound Level Calibrator?
- **Answer 13**

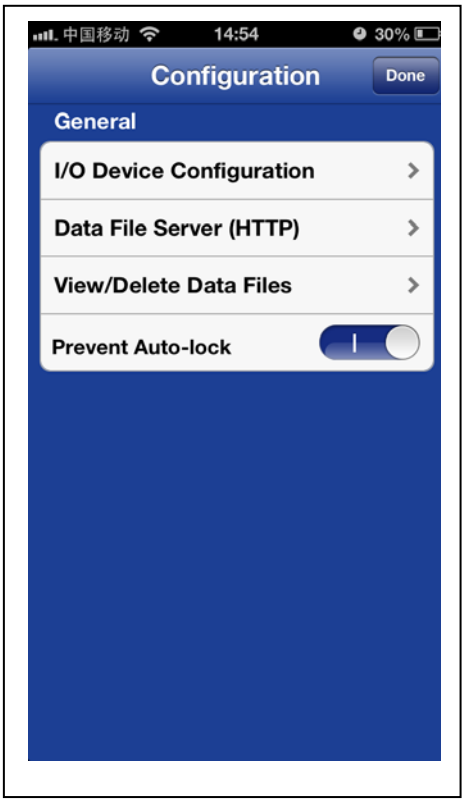
If you have a sound level calibrator, such as BSWA CA114 (www.bswa-tech.com), the calibration is simply to follow the software instruction.

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.

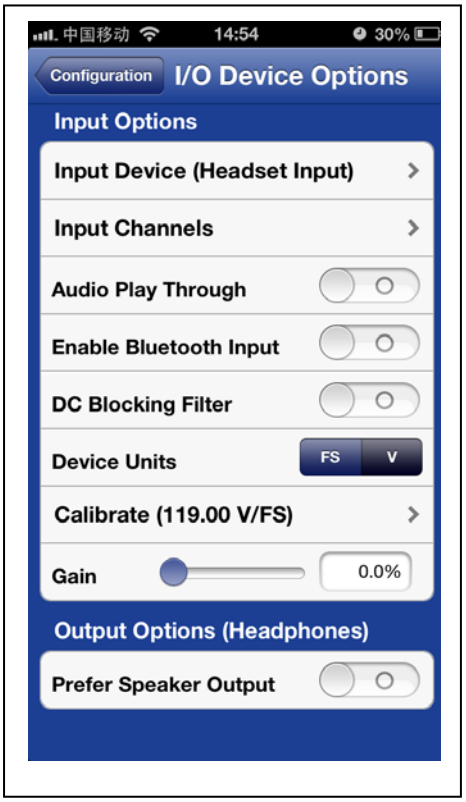
The followings are example of using SigScopePro from Faber Acoustics.

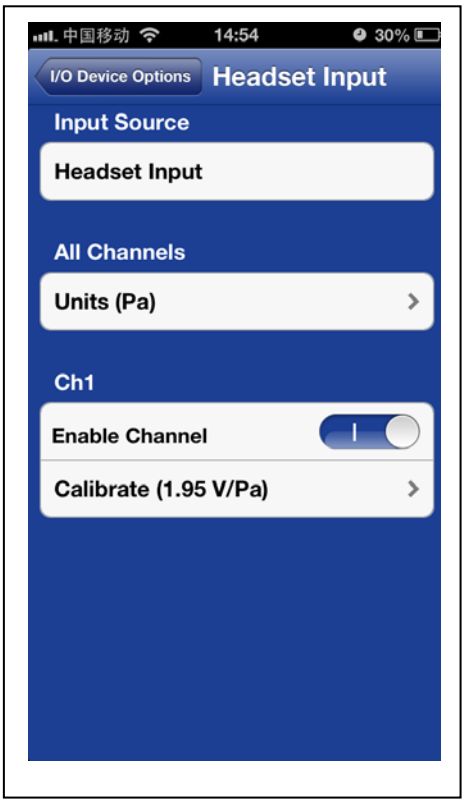




➢ **Press “Set up” in upper right corner.**

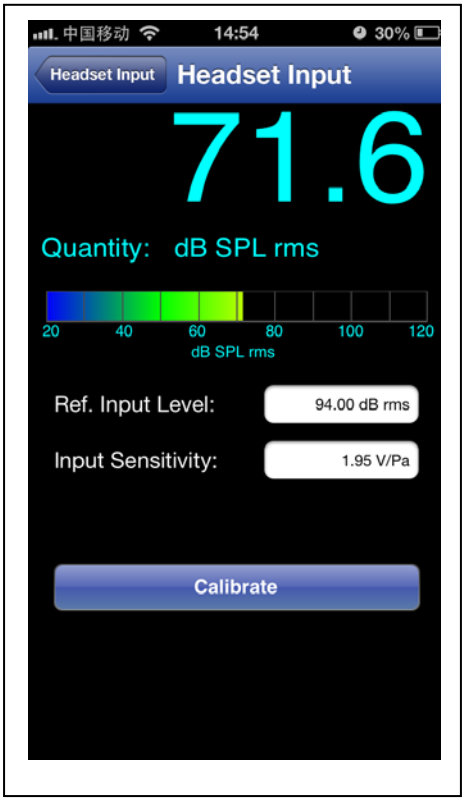
Press “I/O Device Configuration”





➢ **Press “Input Channels”**

Press “Calibrate “



➢ When the calibrator is on, Press “Calibrate”

The reading should be 94.0. Done!

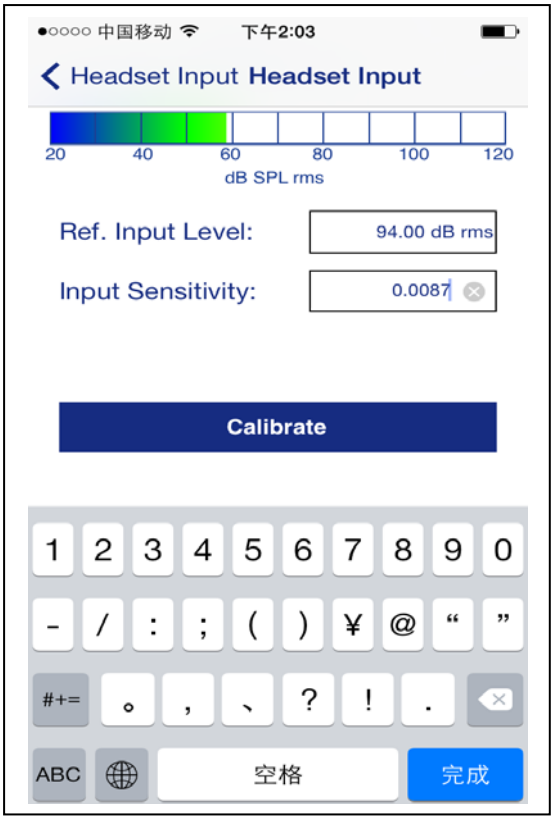
➢ **Question 14** How to Calibrate the system **without** Sound Level Calibrator

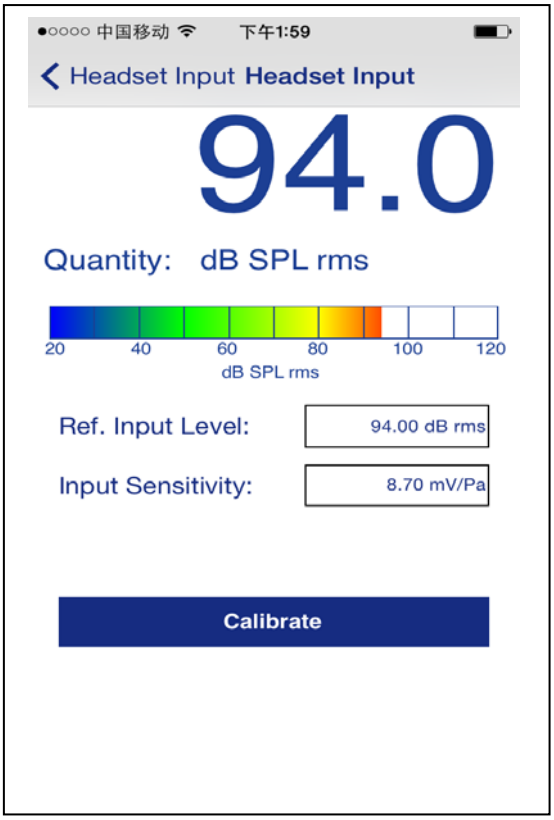
➢ **Answer 14**

If you do not have a sound level calibrator, you also can 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 6.9 mV/Pa means the output voltage from i436 is 6.9 mV when it is exposed to 94 dB (or 1.0 Pascal) sound field.

The calibration procedures using the sensitivity value is software and hardware dependent. The hardware may have amplification factor in the headset input. We tested iPhone 5S. The input amplification factor is 1.26.





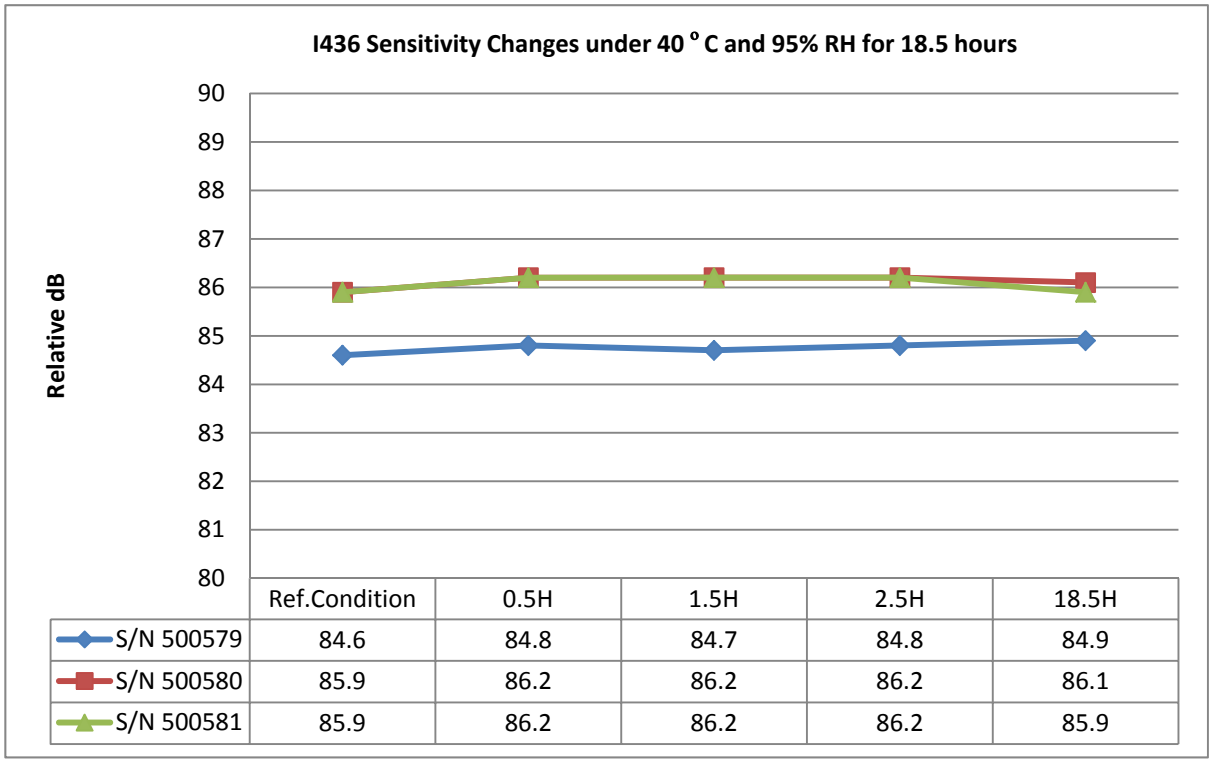
Example: SignalScopePro with iPhone 5S:

Step 1: Calculation Input Sensitivity:
Input Sensitivity = Sensitivity from the Chart x Amplification Factor = 6.9x1.26= 8.7
For iPhone 5S: Amplification Factor =1.26

Step 2: Go to the calibration screen and manually input 0.0087V/Pa (8.7 mV/Pa) in the “Input Sensitivity”. The calibration is done
The Amplification Factor is the most important factor to do the manual calibration without the calibrator.

- **Question 15** How accuracy does iPhone or iPad with i436 measure overall dBA for Pink noise?
- **Answer 15**

  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.
- **Question 16** How does the i436 perform under high temperature and humidity environments?
- **Answer 16** Three i436 microphones were tested in the environmental chamber for 18,5 hours under 40 C and 95% RH humidity. The related sensitivity changes are within 0.5 dB.



	Ref.Condition	0.5H	1.5H	2.5H	18.5H
S/N 500579	84.6	84.8	84.7	84.8	84.9
S/N 500580	85.9	86.2	86.2	86.2	86.1
S/N 500581	85.9	86.2	86.2	86.2	85.9

- **Question 17** How to measure Reverberation Time and other room properties using i436?

- **Answer 17** There is an excellent document on how to measure reverberation time and room parameters by Odeon. The application notes can be downloaded from: http://www.odeon.dk/pdf/Application_Note_Smart_Phone_Measurements.pdf

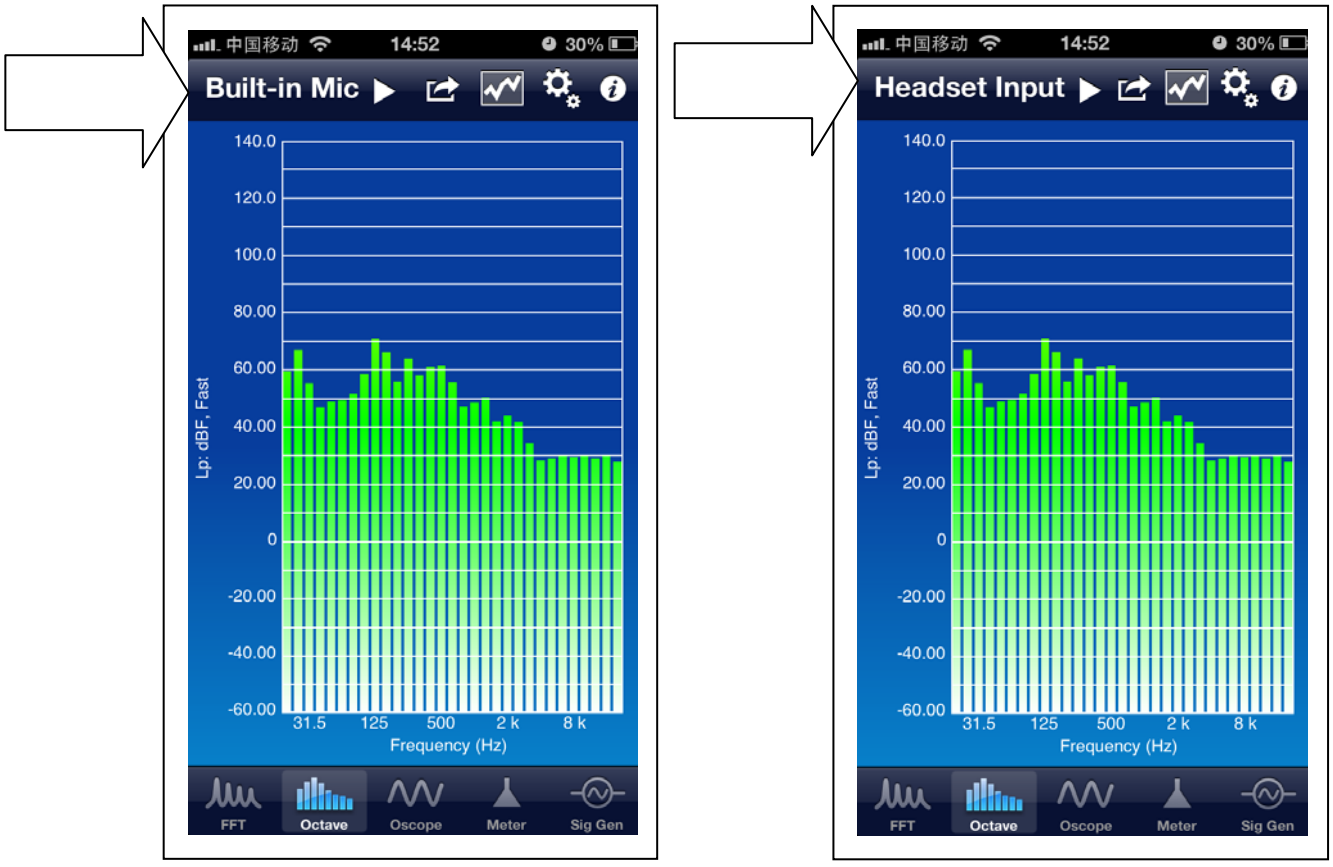
  You can measure RT30, RT20, ETD, C80 using i436 and Odeon software.

- **Question 18** What APP do you recommend for STIPA (Speech Transmission Index) measurements?

- **Answer 18** We recommend iSTI Professional from Embedded Acoustics.

- **Question 19** How do I know the i436 is connected to the iPhone?

- **Answer 19** The APP software such as SigScopePro has indication when external microphone is inserted into the headset connector.



Built-in Mic

i436 is inserted

- **Question20** What is the pin definition of headset input of Smartphones?
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- **Answer 20** The most of Smartphone's, including iPhone, Galaxy and MotoX on the market have the following pin definitions: