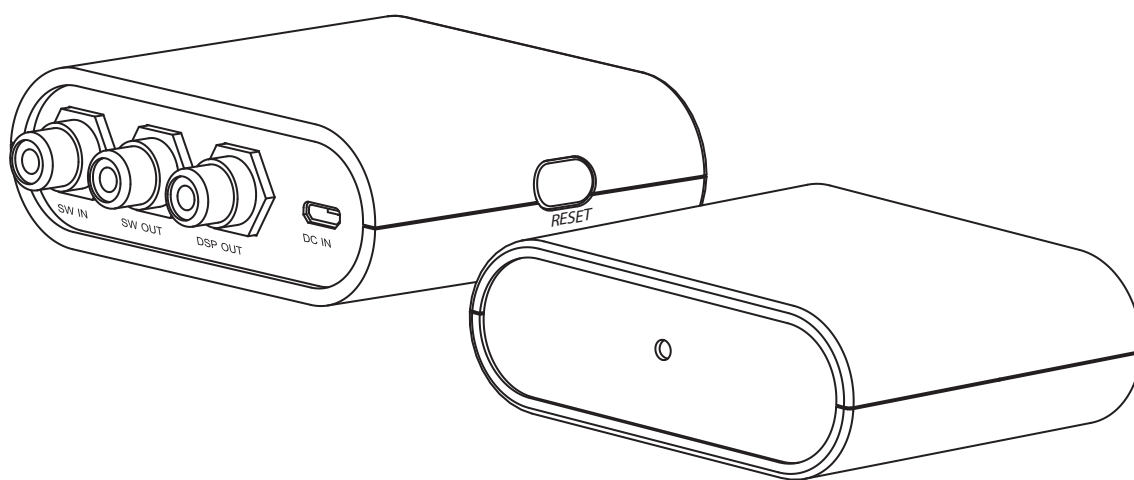
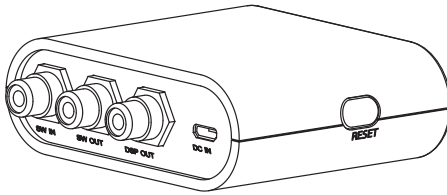




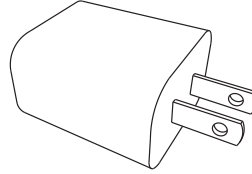
iDSP INSTALL GUIDE



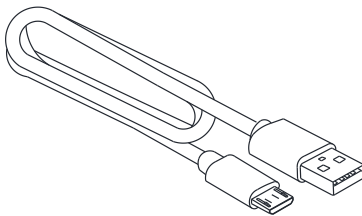
Contents:



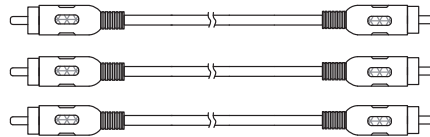
Unit x 1 pcs



Power Adaptor x 1 pcs



Power Cable x 1 pcs



RCA Signal Cable x 3 pcs



User Manual x 1 pcs

Installation Precautions:

Before installing

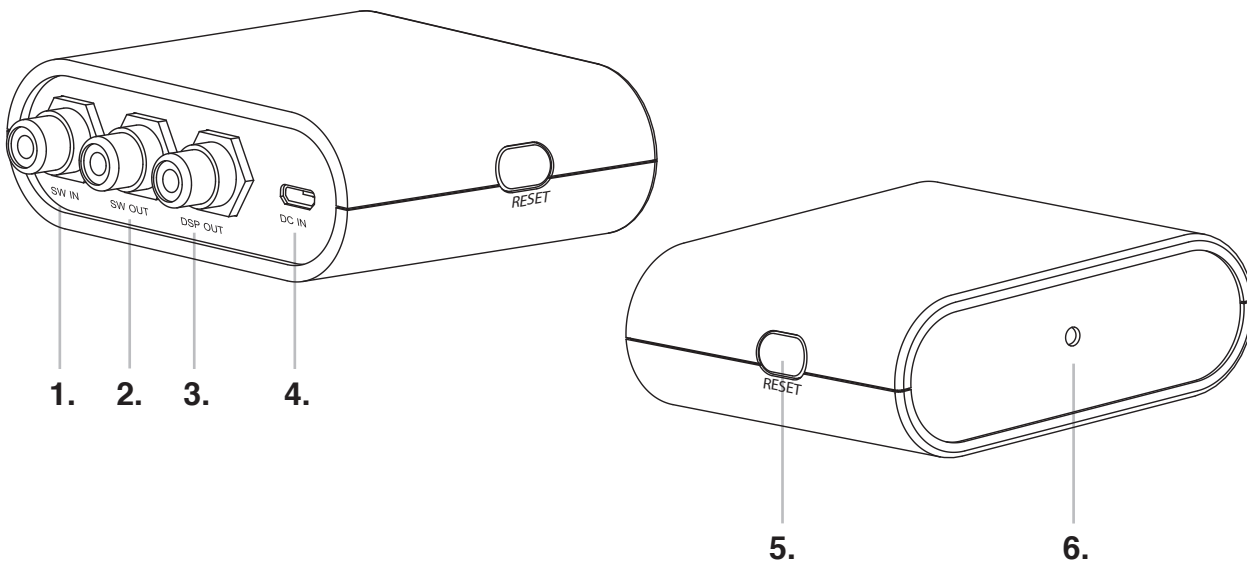
Before connecting, make sure all equipment is switched off. Do not connect the subwoofer power supply cable before completing all connections.

Moving the unit

Always disconnect the power supply cable and any audio cables connected to the subwoofer before moving it. This will prevent a short circuit or damage to any plugs or connecting cables.

Before switching the unit on

Double check that all connections are correct and that the volume is turned all the way down.



Connection & Controls

1. SW IN

Input sub signal from audio source.

2. SW OUT

Output sub signal (by pass).

3. DSP OUT

The output signal with iWoofer DSP function.

4. DC IN

DC5V/1A power input via power adaptor.

5. RESET

Press the reset key and hold about 4 seconds (led blinks one time), the pairing code of bluetooth would be changed to digital "0".

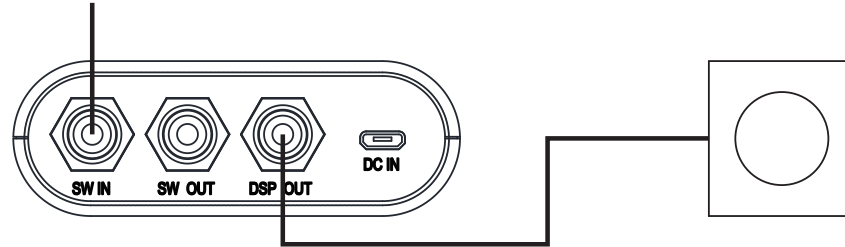
6. LED

Power and control led: it's blue color, when input DC power, the led turn on and flash one time.

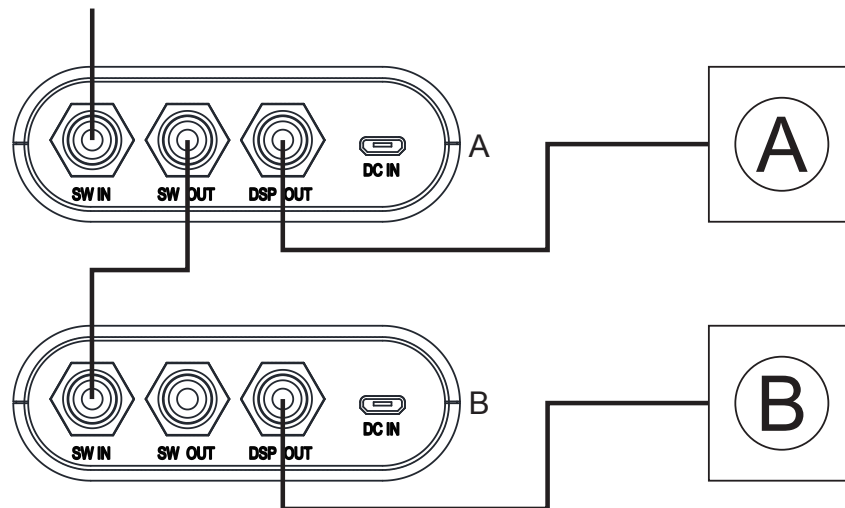
- a. if no signal input the led will lighting about 3 seconds and turn off automatically.
- b. if with signal input, the led will turn on and keep lighting status.
- c. when adjust specification (Gain, delay, phase ect) via App of mobile phone, the led with blinking lighting status.
- d. no signal input last about 2 minutes, the led will turn off automatically.

Connection:

1. Setup for one Subwoofer



2. Setup for multiple Subwoofers



3. Download the iWoofers App and continue reading to setup the iWoofers app and iDSP features.



iWoofers App



iWoofers App Features Set

Features / Version	Standard	Pro
X-Over Control	✓	✓
Gain Control	✓	✓
SHS Control	✓	✓
Delay Control	✓	✓
Phase Control	✓	✓
Limiter-Compressor Base Control	✓	✓
Limiter-Compressor Detailed Control	x	✓
Dynamic Bass Base Control	✓	✓
Dynamic Bass Detailed Control	x	✓
Remote Hardware Control (Hardware Vr Detailed Settings, Auto On Threshold Features)	✓	✓
Preset Manager	✓	✓
Preset Import/Export Features	✓	✓
Room Correction (Group Of Functions For A Minimum Phase For Frequency/Impulse Response Correction)	x	✓
SPL Meter	x	✓

The premium version of the app (iWoofers Pro, \$5) is only available on iOS. The main difference between these apps is the addition of a room correction feature that utilizes the microphone of your iPhone or iPad and corrects the room response of your subwoofer with advanced algorithms that automatically create FIR filters tailored to your specific room and subwoofer. The premium version of the app is only available on iOS because all iOS devices use consistent microphones with a smooth, predictable frequency response that can be compensated for in software. Android microphones are not as predictable as an iOS microphone, due to the number of manufacturers and different implementations. The premium version of iWoofers also adds extra settings for the limiter/compressor and dynamic bass control.

Device Connection and Setup

Power

Because of its minimal current draw and convenient 5V micro USB power connection, the iDSP can be powered by nearly any USB Type-A port with a standard micro USB cable. It is recommended to use the supplied USB power brick.

Input Audio Signal

Connecting the iDSP to a typical AV receiver is easy. Simply use the provided RCA cable by plugging the RCA end into the 'sub out' port on your AV Receiver (AVR) and the other end into the input side of your iDSP. It is okay only to use either the red or white RCA plug, and leave the other one unused, but you can also use an RCA Y Adapter that is 2 Female to 1 Male to eliminate this. If you are currently using the high-level inputs on your subwoofer amp to add a subwoofer to your system, adding a iDSP might not be possible without modifying what equipment you are using. It is possible to use a RCA male to dual RCA female cable (also known as an 'aux splitter') with the iDSP, which might allow you to use the iDSP if you are currently using high-level inputs on a subwoofer amplifier.

Output Audio Signal

The RCA output jack on your iDSP should be hooked up to the line-level input to your subwoofer amplifier using the provided RCA cable. If your subwoofer amplifier only has one RCA jack instead of two (often labeled LFE), it is okay only to attach only one of the RCA plugs into your subwoofer.

If you have two subwoofers in your system, you can use an RCA male to dual RCA female cable (also known as an ‘aux splitter’) or other types of “Y” cables on the output of the iDSP to hook up both of your subwoofers. You could even use a typical RCA male to stereo RCA cable, and use the white RCA plug for one subwoofer, and the red RCA plug for the other subwoofer.

AV Receiver and Subwoofer Amplifier Settings

To avoid conflicts between the iDSP’s settings and your AVR / subwoofer amplifier settings, make sure to make the following adjustments on both before using your iDSP. If your AVR or sub amp supports these settings, you will be able to find how to adjust them in that product’s user manual/guide.

1) Adjust the low pass dial to the highest frequency available on your AV receiver and subwoofer amp to prevent interference between your amp crossover and the iWoofers crossover. It is recommended to use the iWoofers software crossover as opposed to the crossover in your subwoofer amp.

a. Note: A low pass filter means that all of the frequencies below this value will pass through, and frequencies above this value will be attenuated and then altogether eliminated. This filter is essential for subwoofers and is one of the main things that separates a subwoofer amplifier from a normal amplifier.

2) Turn off any EQ settings your amplifier, or AVR, might have for bass, to prevent interference between these settings and the iWoofers software. EQ settings on an amp or AVR will prevent you from getting optimal results from the iWoofers Pro’s room correction algorithm.

3) Turn off any additional processing you can find within your subwoofer amplifier or AVR unless you are confident it will not conflict with any DSP settings in iWoofers.

4) Note about AVR Crossovers: For many AV receivers, there will be a single ‘crossover’ frequency setting that will high pass your main speakers at this frequency, and low pass the signal going to the ‘sub out’ on your AVR. If this is the case for your system, you will want to utilize this crossover, and set the low-pass frequency within the iWoofers app to 500 Hz (all the way up). It is important to high pass your main speakers with this crossover whenever possible to prevent interference in the bass range between your main speakers and your subwoofer. Although it’s possible to get a good response without high passing your mains, the iWoofers room correction algorithm cannot account for the bass response of your main speakers, which is why we recommend high passing them.

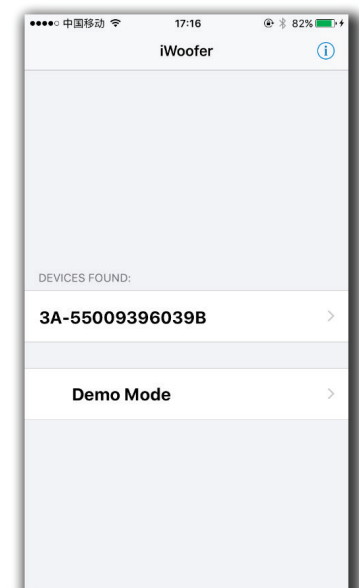
iWoofers App Quick Start

Note: All screenshots shown are from the iOS version of the app. These instructions will work for the Android app as well, but the look of the app is different.

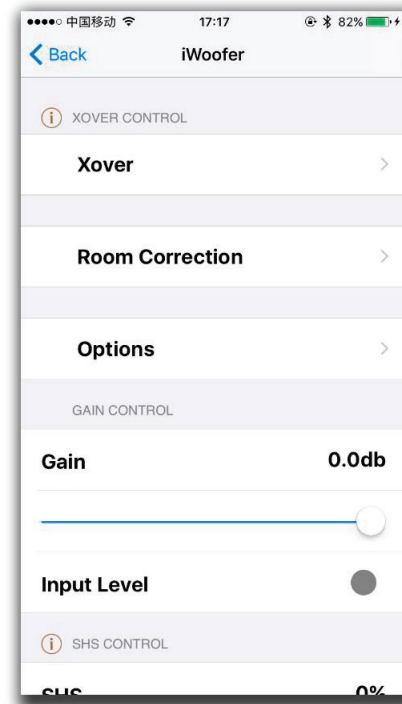
1. Navigate to the app store of your smart device and search for the “iWoofers” or “iWoofers Pro” app by Artem Khlyupin and install it.

2. As long as your iDSP has power and the Bluetooth of your smart device is turned on, you will see a seemingly random string of letters and numbers when opening the app (this can be renamed in the options menu of the app). Select this device, or if you don’t yet have a iDSP, press demo mode to view the app. If you have multiple iDSP devices, they will all show up here.

Troubleshooting: The device will enter standby after a while if it does not sense any input signal and will not show up on this screen. If this happens to you, either unplug your device and plug it back in, or provide an input signal to kick it out of standby. If this does not work, make sure no other smart device is connected to the iDSP with the iWoofers app. Otherwise, try a different smartphone or tablet.



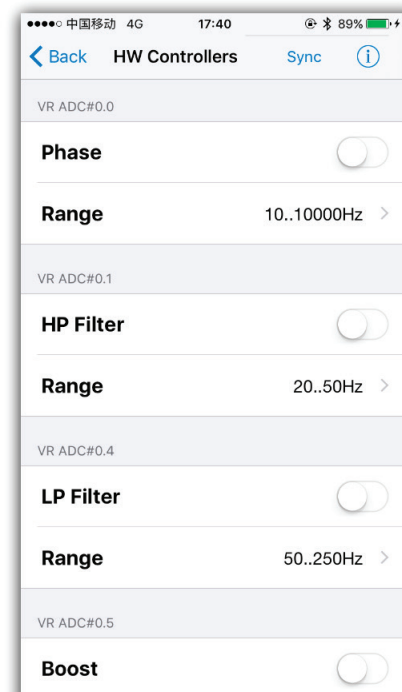
3. After connecting to the iDSP hardware, you should see the home screen of the app like below (room correction will not be available if you do not use the pro app).



4. Before you start exploring the app, navigate to the “HW Controllers” screen found by pressing Options -> HW Controllers. The screen should look like the screenshot (right). Everything on this menu should be turned OFF, as the iDSP does not have any hardware controllers and leaving these on can result in a distortion of frequency response (because nothing is connected to these pins in the iDSP. Note: If you restore the iDSP to factory defaults, you MUST turn these settings off again as they might be activated by the factory reset.

Notes about the iWoofer App

- When it asks to import presets from DSP, if you press yes, that means it will import the settings currently set on device to your app. If you say no, it will use the default (or locally stored) settings stored in the app. You will get this message if you make initial adjustments with one smart device and then connect to the same DSP-LF with a different smart device.
- When the app says, “import preset is not success,” that is a typo. It is actually successful.
- There are many features and settings to explore in the app, make sure to try them all.



Auto Room Correction With iWoofers Pro (Paid App)

The premium version of the app (iWoofers Pro, \$5) is only available on iOS.

NOTE: If using the free app skip the Auto Room Correction section.

Even with high-class speakers and subwoofers, the complexity of room acoustics can cause nonlinearities in audio signals once the sound bounces around your room and eventually reaches your listening position. Room reflections combined with the direct sound from a speaker will usually create a misrepresentation of your audio signal, meaning what you hear is not the same as what the recording /mastering engineer heard in their studio. Phasing issues are especially true with the very long wavelengths of bass frequencies, as they wrap around the whole room and then eventually find their way to your listening position. Room reflections are the main reason that recording engineers go through the extraordinary effort with room treatment, speaker placement, and sometimes precise EQ to make their studios and speakers have a flat response as possible. Flat response means the audio signal is represented accurately (it will look like a straight, horizontal line when taking frequency response measurements).

Room correction is powerful because it can take a measurement of your listening position, and apply precise FIR filters to automatically ‘flatten’ the response and minimize any adverse effects of room acoustics. The Automatic Room Correction algorithm works by taking a measurement right next to your subwoofer (a near field measurement) and then takes more measurements in your listening position to determine what DSP parameters need adjusting for optimum room correction. If you look closely, you will see that your near field response will look more like a flat line while your listening position measurement will likely look more ragged as represented by dips and peaks throughout. Depending on which type of correction you choose, the app will apply equalization to make your listening position more faithfully represent the original audio signal.

Before You Begin

- For optimal results, take off any case you might have on your iOS device. Because the microphone on your iOS device was calibrated for the iWoofers app without a case on, your case can cause inaccuracies in measurements due to diffraction.
- Make sure to follow the “AVR and Subwoofer Amplifier Settings” section earlier in the manual before proceeding with room correction.
- In the X-Over menu of the iWoofers app, set your desired high pass (subsonic filter) and low pass filters for your subwoofer. These settings are used by the room correction function to determine how high and low to correct the frequency response. If you decide to change these crossover points after doing room correction, you will need to rerun the room correction function for optimal results.
- Remove all EQ settings you might have made in the X-Over menu.
- If a sweep is not audible while running the AutoEQ, make sure your sub is powered on, and the audio connections are correct. If the sweep is not audible once confirming the subwoofer is connected correctly, try restarting the app and or removing and then reconnecting power to the iDSP hardware unit. The iDSP unit has a standby function and will temporarily shut off if it does not receive input for a period of time, but you can quickly kick it out of standby with a power cycle.
- Turn off any input signal going into your iDSP, so it does not interfere with your measurements.

Auto Room Correction Settings

Auto Level – When this is on, the DSP will automatically change the sweep volume to a specific level, as interpreted by your iOS device's microphone. During room correction measuring, you will hear a series of very short sweeps of varying volume levels before each measurement. The DSP is trying to find out how loud the subwoofer should be to achieve the target volume. It is recommended to keep this feature on for optimum results.

Auto Range Recognition – This setting affects how 'optimistic' the iWoofers are about the limits of your subwoofer, as in how low it is capable of playing. If you're confident your subwoofer can handle extremely low notes, you can increase the optimism. If you're unsure, leave the setting at the default or off.

Frequency Step Delay – The frequency step delay setting will affect how long the sweeps are. The lower the delay number, the shorter the sweep will be. The larger the number, the longer the sweep, but the more accurate, the sweep will be.

Max Boost of Compensation – This is the maximum limit that the DSP will boost a frequency band. It's recommended to leave this at its default value of 9 or reduce it for a gentler correction.

Xover Menu

Xover - control of Low Pass and High Pass Filters (LPF/HPF), double tap (or tap&hold on > 1S) on the slope to select one, slide left/right to control a frequency (20:500Hz), and up/down to control an order (2:4:8 or 12/24/48 db/oct Butterworth).

Also, LPF/HPF frequencies limits the frequency range for Room Correction. Xover controls up to 25 bands fully Parametric Equalizer (PEQ), to add a new PEQ tap to "+" icon, to delete "Trash" icon. Slide right/left to set a frequency, up/down to set a gain (db), zoom-in/zoom-out to control a Q factor (PEQ bandwidth), double tap (or tap&hold on > 1S) on PEQ to select it.

AUTO LEVEL

Enabled



Target

-17db



AUTO RANGE RECOGNITION

AUTO RANGE RECOGNITION

Enabled



Optimism

14



FREQUENCY STEP DELAY

Delay

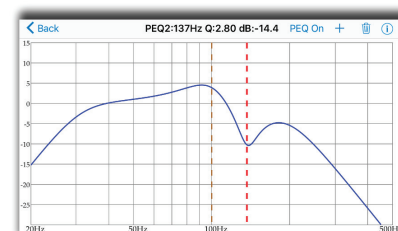
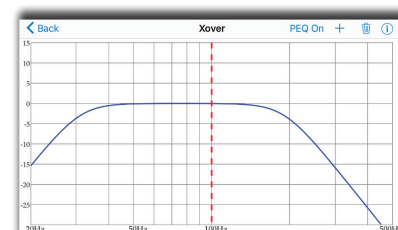
256ms



MAX BOOST OF COMPENSATION

No more than

9.00

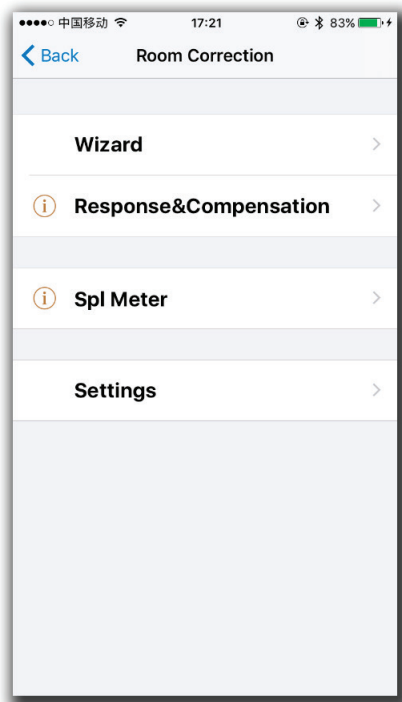


Room Correction Menu

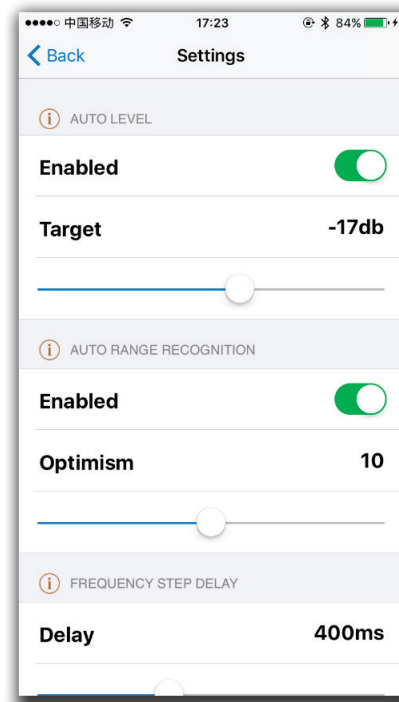
Room Correction - minimum phase FIR based compensation algorithm with 5mS of total latency. iWoofers uses precise frequency sweep with adjustable time setting (Room Correction/ Settings/ Frequency step delay), to compensate echo's delay time.

Auto range recognition function for a reasonable frequency response definition. iWoofers uses the phone mic with model related LUT correction, Fast 20:500Hz sweep + FFT analysis. Controls: On/Off (with self-reset to Off position), Optimism 5:15 (more means wider). The function sets HPF and LPF frequencies, and builds preliminary response, as dashed blue.

Auto level function obtains optimal volume level for an accurate frequency response measurement. Controls: On/Off, Target -30:-8db (-8db means louder).



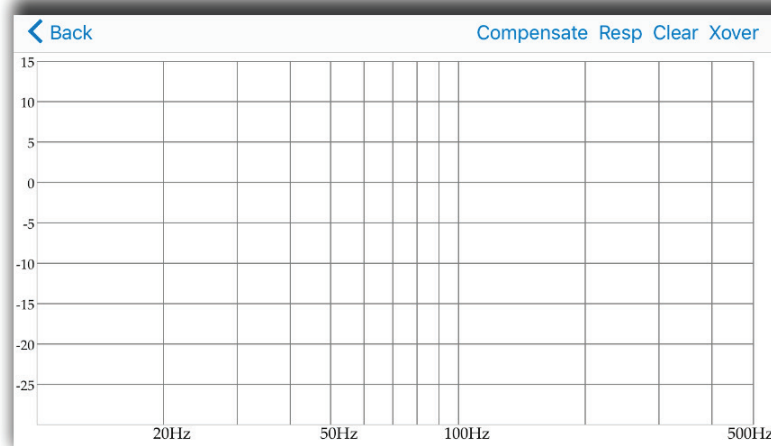
Room correction menu.



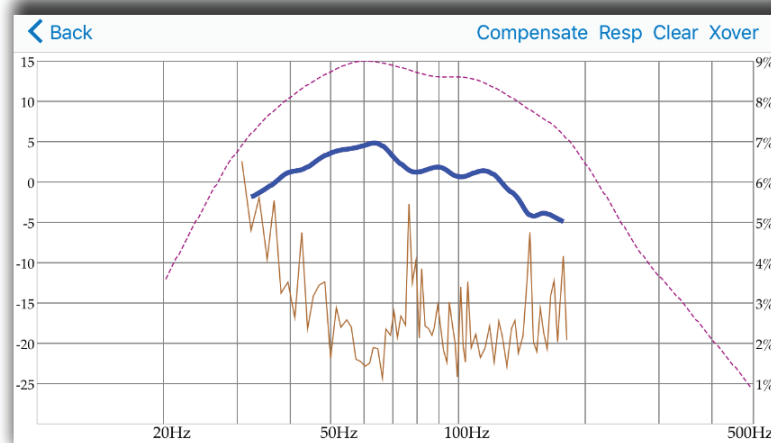
Room correction settings menu.

Get Response

Get Response function using a combination of the phone's mic signal (corrected by model related LUT) to build frequency response plot across the slow and accurate sweep within HPF to LPF range. The function builds a THD plot as well, as an easy way to see if high distortion levels affect an accuracy. The last one is a frequency response plot that could be set as Reference by double tap on that plot or tap & hold > 1S, slide up/down on the Compensate/Resp window to adjust a smoothness.



Response & Compensation window.

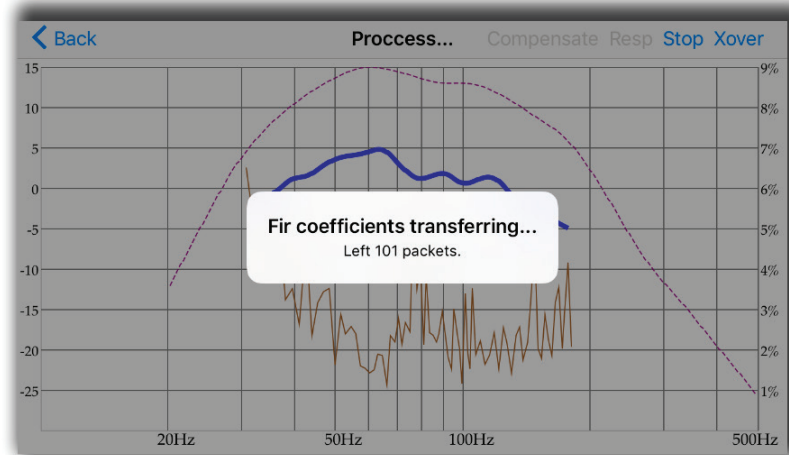


Response & Compensation window after response.

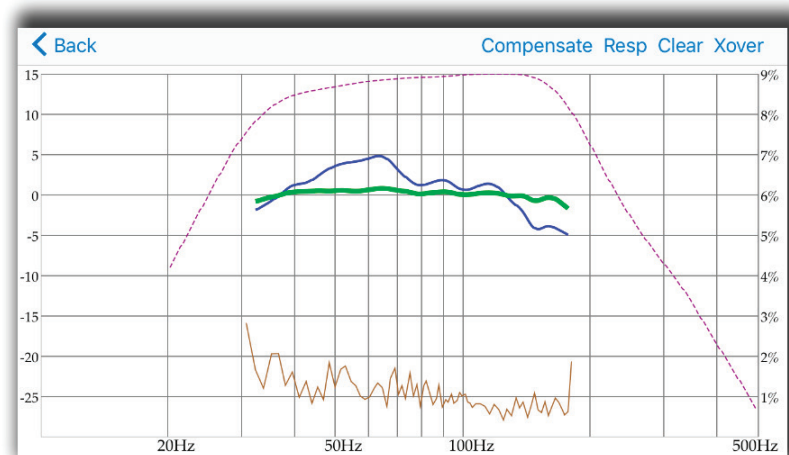
Compensate

Compensate is the function using a minimum phase FIR filter (resolution 2.9Hz, range 20:500Hz, 5mS total latency) to fitting final response to the Reference Shape within the range defined by HPF and LPF frequencies. The Reference Shape could be an exact copy of Near Field response (even copy of another subwoofer's response if a user wishes, furthermore – the preset saves all parameters data + ref. shape, so one user can export it with preset by email, another user may receive the preset and build a copy of this response on his own subwoofer) or simply horizontal line 0db, depends on smoothness.

Controls: Frequency step delay 50:1000mS (a large hall may need a longer delay to compensate echo's decay time), Reference Shape Smoothness 0:100% (the target curve becomes 0db line if Smoothness = 100%), Max Boost 0:10db.



Fir coefficients transferring to hardware.



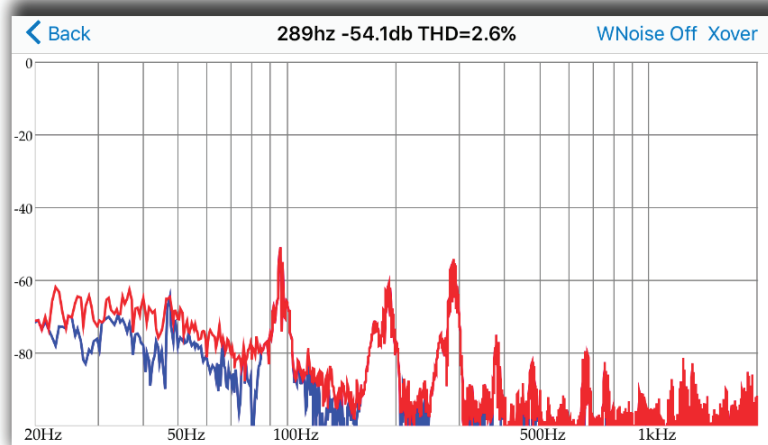
Result response after compensation



SPL Meter

SPL Meter is a simple FFT visualization instrument for checking and manual tweaking of frequency response.

Controls: White Noise generation On/Off. Peak hold reset by windows change. For instance, go to X-Over window and back again to the SPL Meter to reset Peak Hold data.



SPL meter window.



Room Correction Process

Once you have done everything in the “before you start” section and adjust the “room correction settings” menu, click the “wizard” section in the room correction menu, which will bring you to the screen below.

Note: Remain quiet and block out outside noises as much as possible during this whole process for optimal response. A loud noise during your measurements will not ruin the measurements. However, it’s recommended to restart if noise interference occurs while measuring.

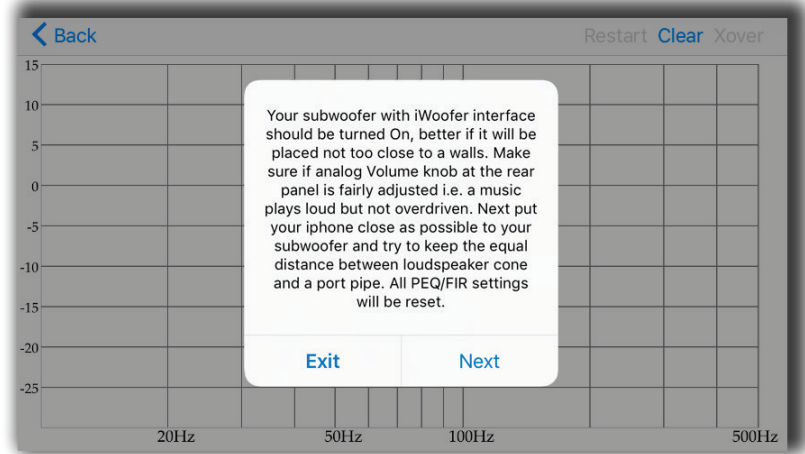
Note: The intention of this algorithm is not to correct the response of an entire room, but rather a single listening position (for example, an area of a few square feet, like an armchair or at most an entire couch). Although the algorithm isn’t optimized for it, and OSD Audio does not recommend it, you can try to use it to correct the sound across the entire room by averaging responses across the room in the 2nd step. Ultimately, if you like the way it corrects your room, you can call it successful!

There are three main steps that the wizard will take in order to do room correction.

1) The first step is a near field measurement of your subwoofer that will occur right when you press next on the screen above. This measurement gives the app knowledge about the initial response of your subwoofer, without any of the effects of room acoustics. You will hear it first make a few rapid sweep sounds at varying volumes while it figures out how loudly it should perform the real sweep. You will then hear it play a longer sweep, the length of which depends on the “frequency step delay setting.”

a. You will have the option to average as many responses together as you want. We recommend averaging at least three measurements for optimal response. Keep the iOS device close to the subwoofer, but move it around for each measurement, especially if your subwoofer has a port.

2) The second step is to choose the correction type and to take measurements in your listening position. A description of each correction type is below. Because the correction process is quick and easy, it’s recommended to try each of the three types to see what kind of sound you like best. While conducting measurements in your listening position, take an average of at least three measurements while slightly moving your phone around your listening position. You will want to place the phone near where your ears are while you’re sitting in the listening position.

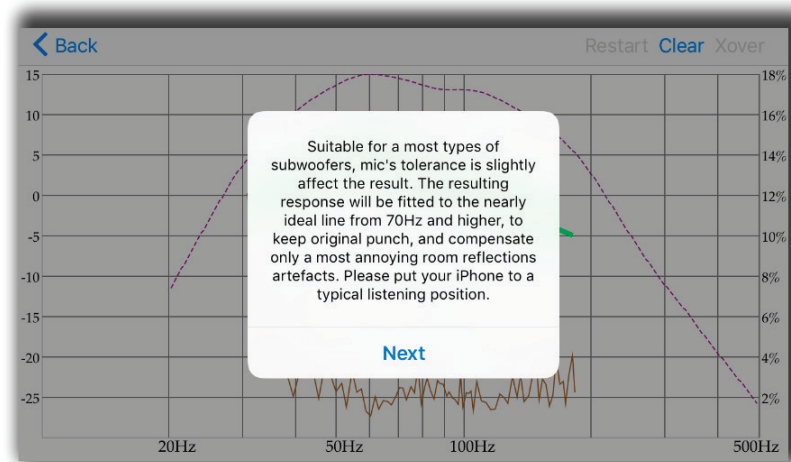


Start wizard window.

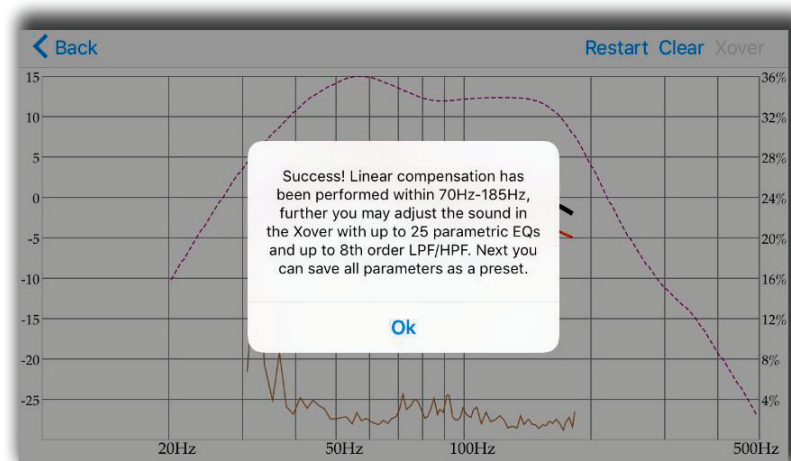


Boomy Region Compensation

The first recommended type is a Boomy region compensation i.e. FIR affecting a most annoying room reflections artifacts from 70Hz and higher, and keep original subwoofer punch energy. A typical subwoofer always designed as a compromise between box+speaker size and lowest audible frequency SPL (Sound Pressure Level) performance in a typical room. The same room, which may produce ugly boomy coloration in the midbass, for sure doing serious SPL “amplification” +5:15db within 20-40Hz. In terms of power, it’s a huge advantage, +10db equals to x10 watts - 500W vs 5000W! So we believe it’s better to keep lowest frequencies as they are and linearize only midbass, boomy region to make the bass more transparent, fast and well controlled. One more reason to put this type of correction to the first position is microphone tolerance. IOS devices use a modern MEMS mics with very good consistency of frequency response, especially higher 50-70Hz. So this is a practical approach, but for enthusiasts, we offer 3rd correction type i.e. entire range correction or even go to “low level” Response/Compensation menu to get the control on a lot of parameters. Please keep reading the app’s hints (!), which contains info about many, if not for all, functions.



Start Boomy region correction.



Boomy region correction is complete.



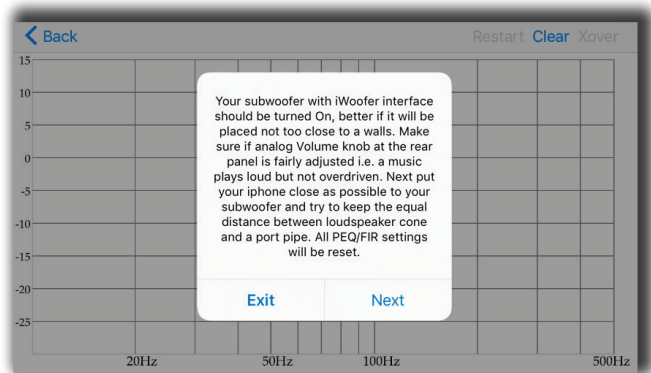
Boomy Region – Suitable most types of subwoofers, this mode will retain the original ‘punch’ of your subwoofer, but removes the most obvious and undesirable response issues from room reflections. The Boomy Region mode will correct the frequency response to fit the ideal flat line from 70 Hz and up, which is where the most annoying room reflections are likely to occur.

Choose this mode if unsure of which mode to use.

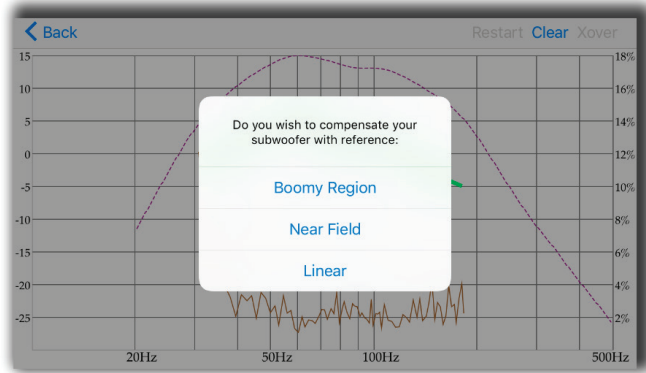
Near Field – Suitable for any subwoofer, this mode will fit the response of your listening position to match the near field response of your subwoofer. Near Field mode only eliminates room reflections and does not alter the initial response of your subwoofer. This mode simulates what it would be like if you moved your subwoofer into your listening position.

Linear - Suitable for high class and high-performance subwoofers, this mode will equalize the entire frequency spectrum of your subwoofer’s response to create an ideal, flat response, much like what is found in mastering studios. This mode will significantly reduce the effects of room reflections and also will equalize the initial response of your subwoofer to an ideal flat line. This mode might result in less “punch,” but it is a more accurate sound suitable for audiophiles or audio professionals. Using the Linear mode is a good starting point for further EQ customization.

3) Once you have finished taking your averages and press “no, next” you will see the following screen. The DSP calculates what filters are necessary to correct your response and then applies them. While this is taking place, keep your phone in your listening position. The app will immediately take another measurement once it’s finished calculating to show you the final results of your room correction. If you took measurements from a wide range of positions in your room for the 2nd step, this measurement might not be totally reflective of how successful the correction was, as this final measurement is only taken in one spot.



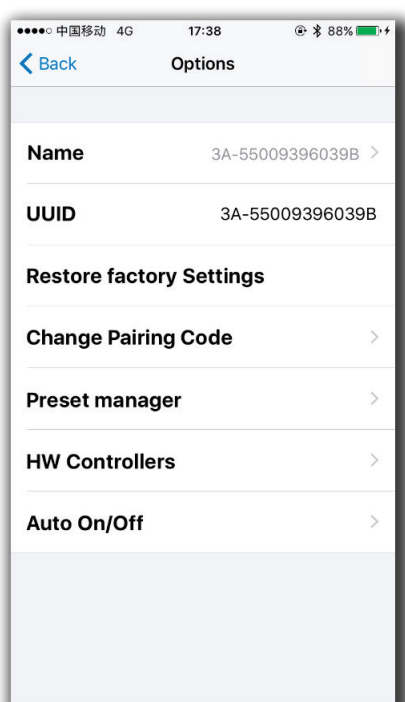
Start Near Field correction.



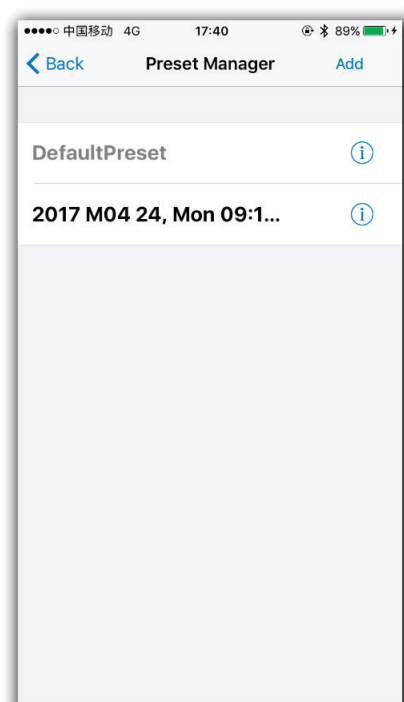
Near Field correction is complete.



iDSP INSTALL GUIDE



Options window.



Preset manager window.

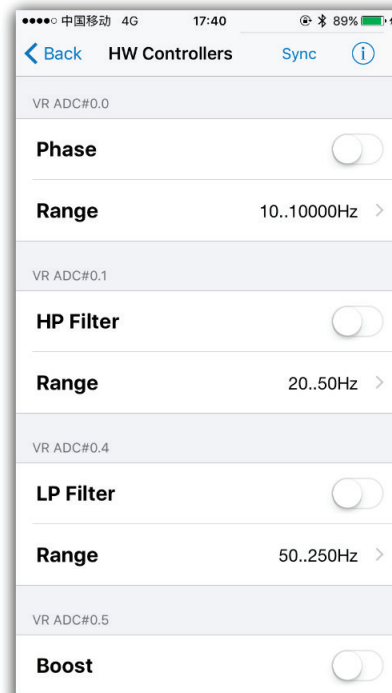


Options Menu Cont.

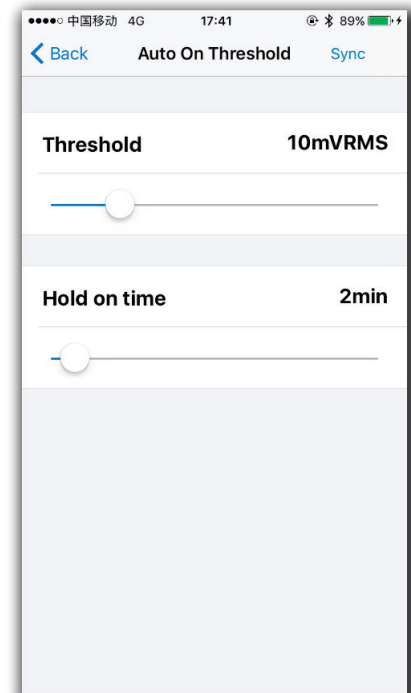
HW Controllers

Hardware controllers options lets you to adjust or deactivate up to four knobs or switches on the rear panel of your subwoofer. For a full control by app, please switch Off all controllers, otherwise turning Off/On of the subwoofer will return the control to the rear panel knobs.

Auto On/Off allows you to adjust auto On threshold in mVRMS units, and hold On time in minutes. 10mVRMS and 2 minutes are default values.



HW controllers window.



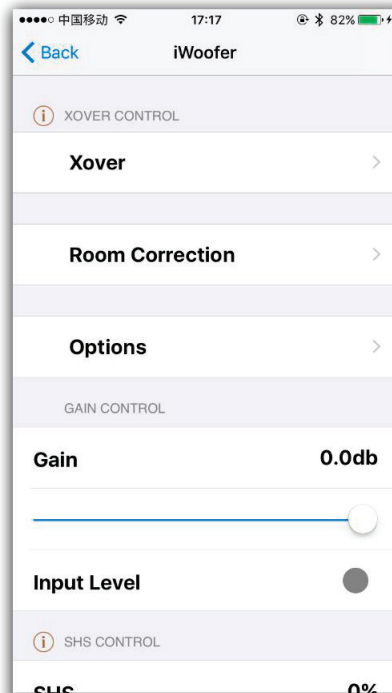
Auto on/off window.

Gain Slider: The volume slider with Input Level indication (gray/green/red means, signal is less/more than Auto On Threshold, or input clipped).

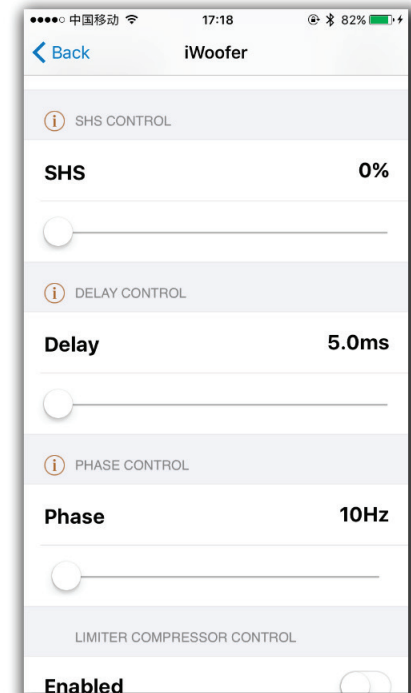
SHS: Sub Harmonic Synthesizer (old tracks bass restoration, good example is Jackson Sisters - I Believe In Miracles or Diana Krall - Temptation). Controls: dry/wet 0:100%. Brings a lot of tectonic punch, better if the limiter is On, ideal for closed box subwoofers.

Delay Controls: 2.5:65mS or 5:67.5mS for the FIR room correction mode (latency 2.5/5mS). Sometimes needed to match delay with full range speakers if delayed.

Phase: the 1st order all pass filter F 10:10000Hz. Sometimes needed to match a phase with full range in the crossover point.



Main window.

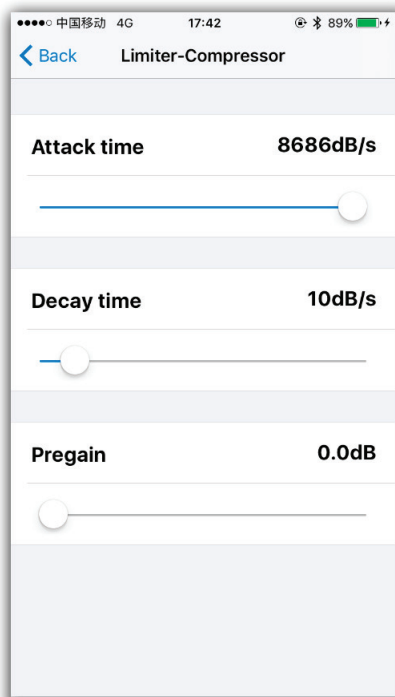


Main window (continuation).

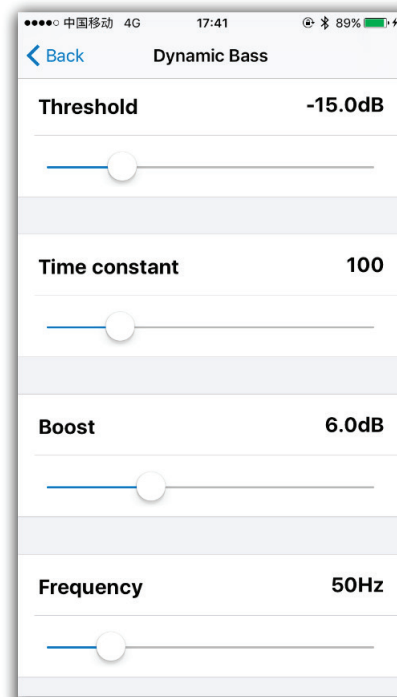
Options Menu Cont.

Limiter Compressor (RMS detector type), better to turn up the sound during adjustment, but if you need kind of “classical limiter”, try to set Pre-gain to 0db and Decay for 10-20db/S. In case of “auto-level”, set Pre-gain to +12db and slowdown Decay to 2-5db/S. Faster Decay could be suitable rather for a club’s subwoofers. The Attack time at max db/S in most cases.

Dynamic Bass is one more dynamic processing algorithm aka band compressor, you can adjust the frequency range, bass boost and threshold for the effect.



Limiter-Compressor window.



Dynamic Bass window.

Warranty Information

All OSD Audio electronics products have a 2 Year Limited Warranty against defects in materials and workmanship. Proof of purchase must accompany all claims. During the warranty period OSD Audio will replace any defective part and correct any defect in workmanship without charge for either parts or labor. OSD Audio may replace returned speakers with a product of equal value and performance. In such cases, some modification to the mounting may be necessary and are not OSD Audios responsibility.

For this warranty to apply, the unit must be installed and used according to its written instructions. If necessary, repairs must be performed by OSD Audio. The unit must be returned to OSD Audio at the owner's expense and with prior written permission. Accidental damage and shipping damage are not considered defects, nor is damaged resulting from abuse or from servicing performed by an agency or person not specifically authorized in writing by OSD Audio.

OSD Audio sells products only through authorized dealers and distributors to ensure that customers obtain proper support and service. Any OSD Audio product purchased from an unauthorized dealer or other source, including retailers, mail over dealers and on-line sellers will not be honored or serviced under existing OSD Audio warranty policy. Any sale of product by an unauthorized source or other manner not authorized by OSD Audio shall void the warranty on the applicable product.

Damage to or destruction of components due to application of excessive power voids the warranty on those parts. In these cases, repairs will be made on the basis of the retail value of the parts and labor. To return for repairs, you must email customer service at RMA@audiogeargroup.com for a Returned Merchandise Authorization (RMA) number# then the unit must be shipped to OSD Audio at the owner's expense, along with a note explaining the nature of service required. Be sure to pack the speaker(s) in a corrugated container with at least 3 inches of resilient material to protect the unit from damage in transit.

This Warranty Does Not Cover: Damage caused by abuse, accident, misuse, negligence, or improper operation (installation) • Any products that have been altered or modified • Any product whose identifying number of decal, serial #, etc. has been altered, defaced or removed • Normal wear and maintenance.



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