NERO DUAL X8 DSP SUBWOOFER INSTALL GUIDE

Unpacking:

Open the box and carefully remove all staples, then remove subwoofer.

If you notice any defects on any elements during the unpacking process, contact your dealer.

Before disposing the packaging, check that nothing is left inside.

Installation Precautions:

Before installing
Before connecting your subwoofer, 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.

Placement
Place the subwoofer in a cool area with sufficient ventilation. Avoid placing in damp area or areas exposed to excessive sunlight or heat.

Recycling
Your product contains valuable materials that can be recovered and recycled.

Features:

World Class Digital Amplifier Technology
The NERO DUAL X8 DSP powered subwoofer incorporates the latest digital amplifier technology to maximize performance while generating very little heat.

Tuned System Performance
Rear mounted volume control, low pass crossover, phase control and App controlled DSP ensure optimal system integration.

Signal Sensing
When Auto Signal Sense is selected the subwoofer will automatically switch to a power saving stand-by mode if no input signal is detected for approximately 15 minutes. Power will turn on once again when signal is detected through the input jacks.

Cabinet
An attractive furniture quality solid cabinet provides the foundation for high sound quality and clarity.
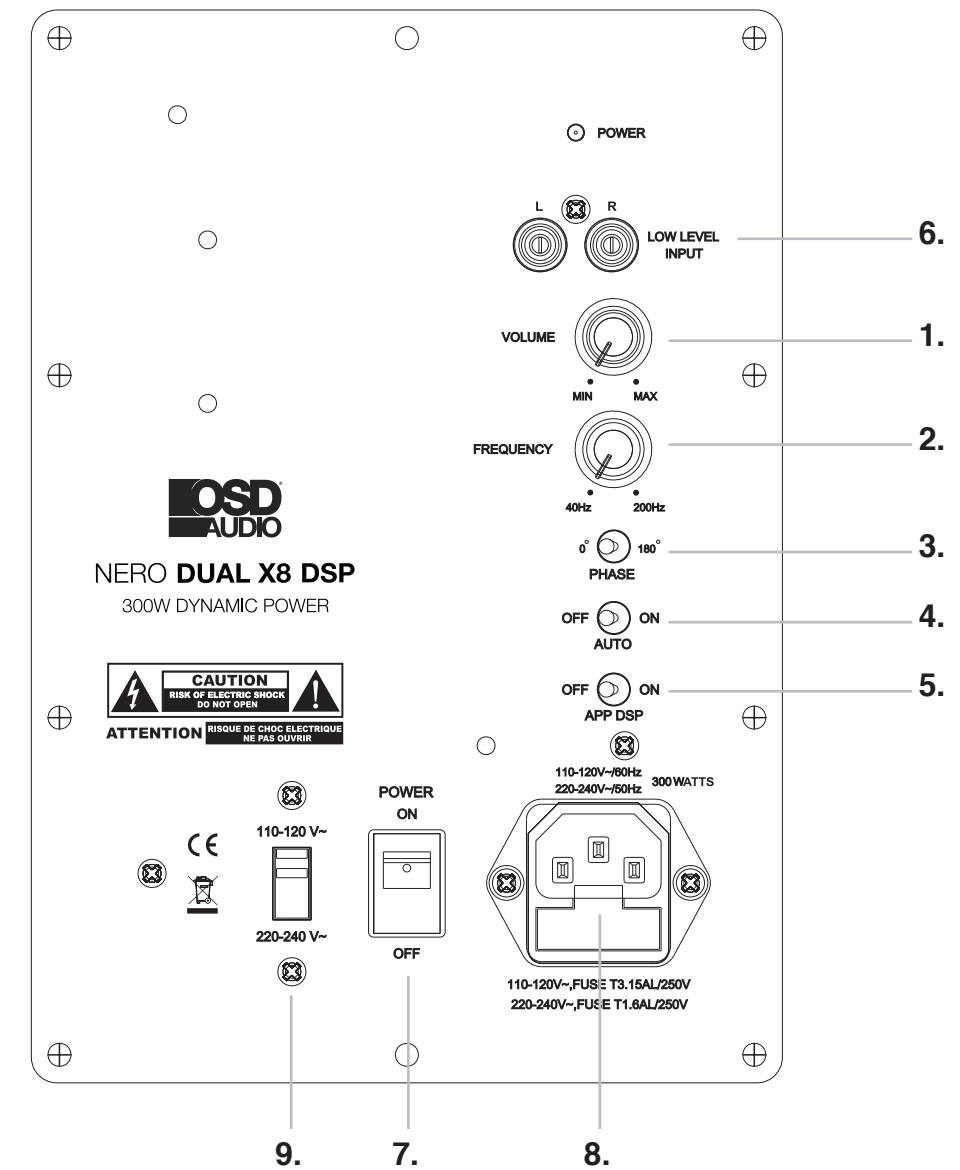
Connection & Controls

1. Volume Control
Adjusts subwoofer volume level.

2. Crossover Control
Adjusts the subwoofers frequency output

3. Phase Switch
Allows you to set the phase of the woofer 0-180°

4. Power Mode Switch
Set the power mode (OFF, AUTO, or ON)

5. DSP Mode Switch
Set the DSP (OFF or ON)

6. Low Level Inputs
Use for Left/Right connection from audio source.

7. Master Power Switch
Controls the main power to the subwoofer

8. AC Power Cord
Connect to an AC outlet.

9. Voltage Switch
Select input voltage. Default: 110-120V or 220-240V

Setting & Controls

Setting the Power Mode

ON Mode:
If the subwoofer is set to ON mode, it will always be ready to play. However, undesired noise from interference or connections changing may be heard. Use the standard ON mode only if needed, set the power switch to OFF when not in use.

AUTO Mode:
Setting the switch to AUTO enables AUTO Sense. The subwoofer turns ON and OFF automatically in response to signal input. The subwoofer will enter standby mode if no signal is sensed for longer than 15 minutes.

Set the MODE switch to the ON position for setup.

After making all the connections, setup your subwoofer using the following steps:

1. Plug the subwoofer into an electrical outlet using the included power cord. The status LED will illuminate solid blue when power is present and the subwoofer is ON.

2. Set the controls and switches to their initial setup positions:

   VOLUME set the dial to 50% or 12 o'clock

   CROSSOVER adjust the upper frequency limit. The purpose is to control the overlap the upper frequencies of the subwoofer and the main speakers lower frequencies. Check your main speakers specs to determine their low-end limit.

   PHASE set to 0°

3. Play a movie scene or soundtrack and set the system volume to an average level. Listen to the bass level from your favorite listening position and adjust the volume accordingly.

4. Continue listening to your favorite source track and experiment with the phase control until you find the best setting for you. Depending on the location of the subwoofer the bass may sound louder and deeper when the phase has been optimized. In some cases adjusting the phase will have no audible difference.

5. Initial setup is now complete.

6. If you intend to use the DSP functions you must first download the iWoofer app from the App Store or Google Play.

7. Continue reading to setup iWoofer app to access and setup the DSP features of the NERO DUAL X8 DSP.

iWoofer App

GET IT ON Google Play

Available on the App Store

DSP Features Set

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

iWoofer App: DSP Discovery & Connect

Open the iWoofer App: Turn On Bluetooth to allow iWoofer to connect to accessories. You may tap Ok, and the app will go into Demo Mode. Otherwise tap Settings, and turn ON Bluetooth, next tap to Home button, and open iWoofer again. Bluetooth range is (30-65ft) the app will find any number of subwoofers equipped iWoofer Hardware, all of them will appear under "Devices Found:" Choose the UDID or MAC address that show up for your iWoofer equipped sub.
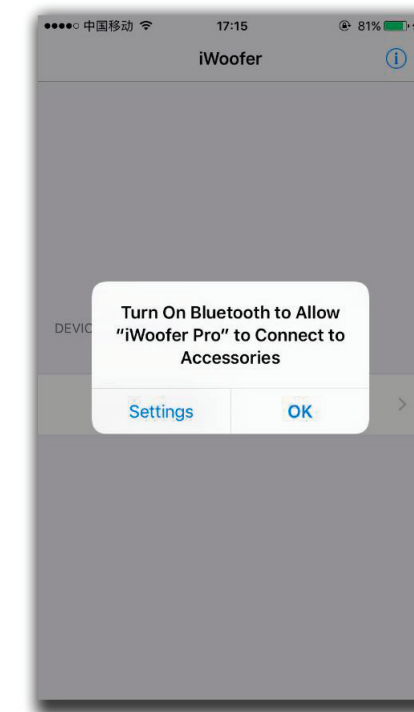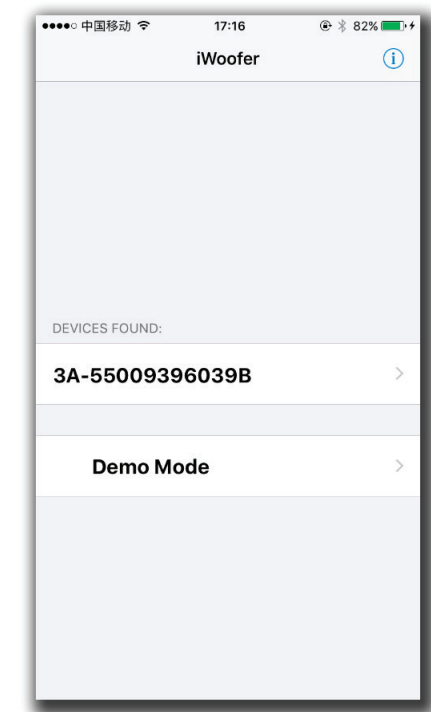
Fig 1. BLE off/on dialog.

Fig 2. Discovery window.

Main Menu / Name Change

Ok, we have seen the UDID and tapping it we get the main control menu (in case this is the hardwares first time connecting to the phone or tablet, the app will offer to import preset from hardware. It is a good idea to do so, and just in case save the preset with an authentic name).

The app has a renaming function in Options/Name menu, and UDID number could be replaced for any name whatever you like.
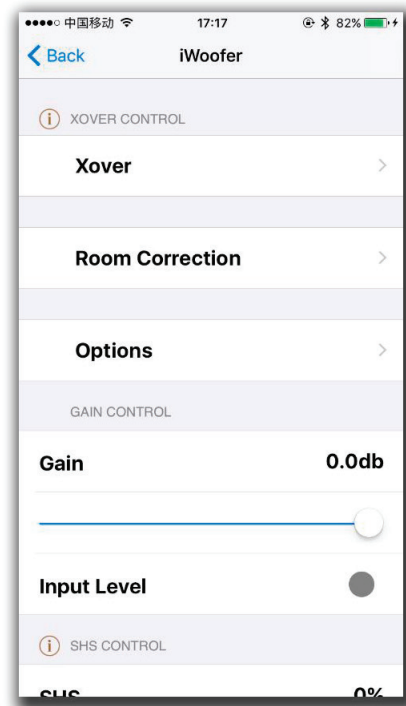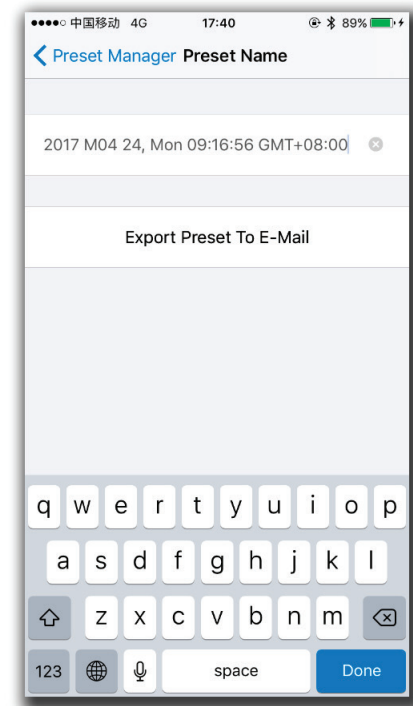
Fig 3. Main control menu.

Fig 4. Preset name menu.

X-Over Menu

X-Over - 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.
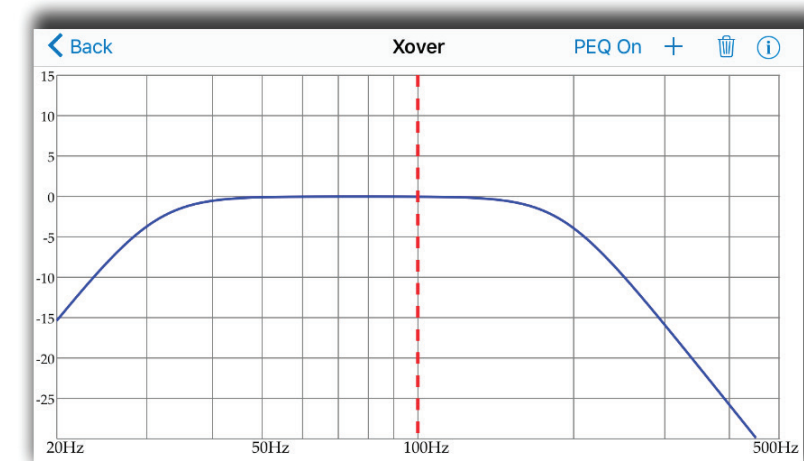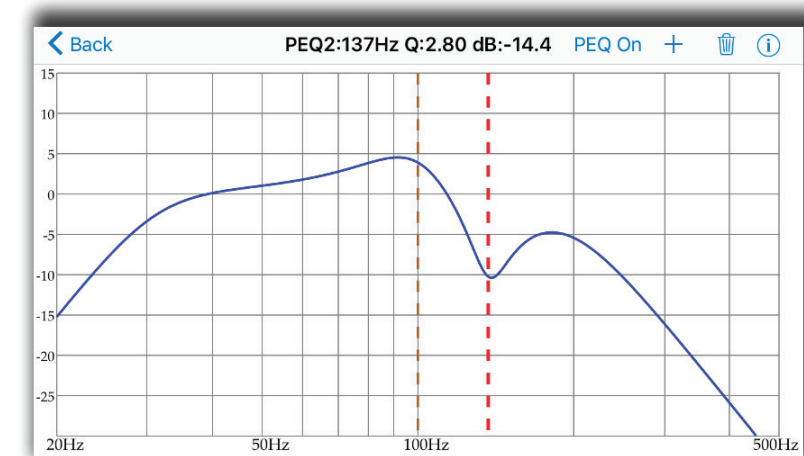
Fig 5. X-Over menu.

Fig 6. Xover menu. Add new PEQ..

Auto Room Correction With iWoofer Pro (Paid App)

The premium version of the app (iWoofer 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 iWoofer 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 iWoofer 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 DSP-LF hardware unit. The DSP-LF 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 DSP-LF, 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 LEVEL	
Enabled	🟢
Target	**-17db**

Auto Range Recognition – This setting affects how 'optimistic' the iWoofer is 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.

ⓘ AUTO RANGE RECOGNITION	
Enabled	⚪
Optimism	**14**

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.

ⓘ FREQUENCY STEP DELAY	
Delay	**256ms**

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.

ⓘ 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. iWoofer 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. iWoofer 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).
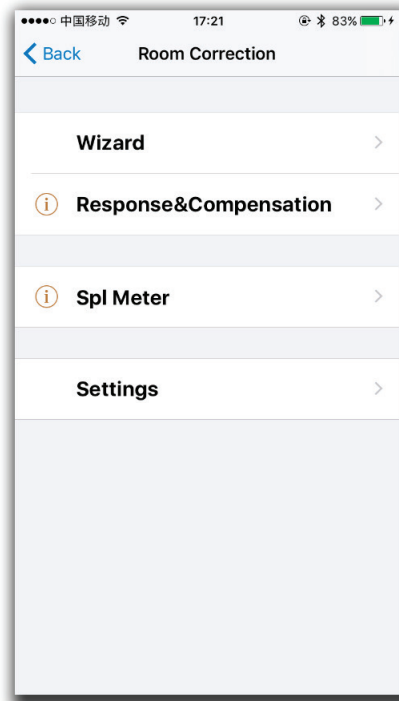
Fig 7. Room correction menu.
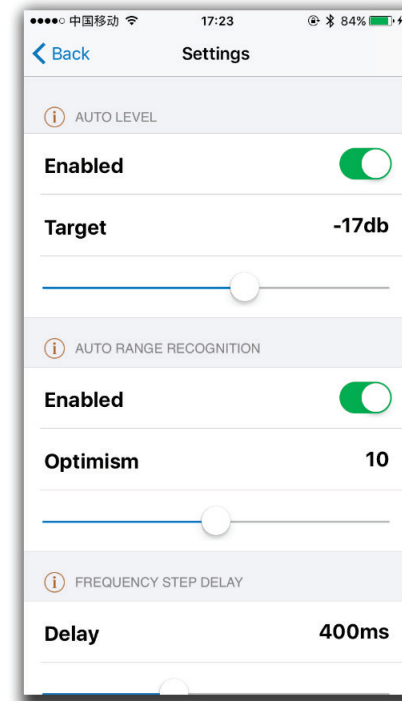
Fig 8. Room correction settings menu.

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.
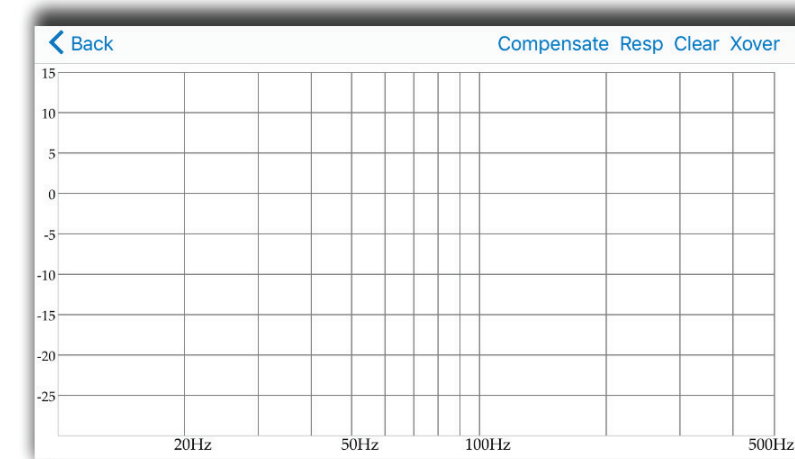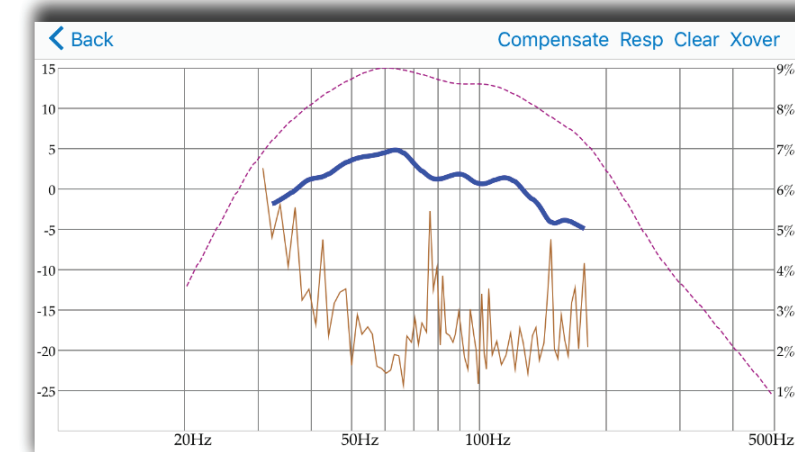

Fig 9. Response&Compensation window.

Fig 10. 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.
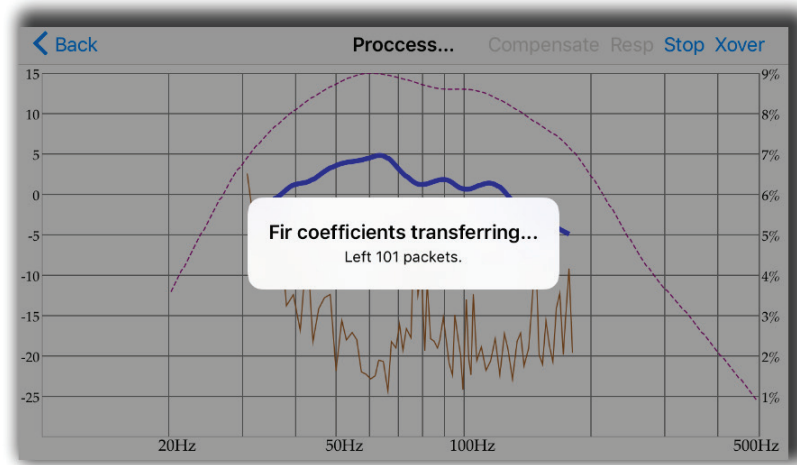
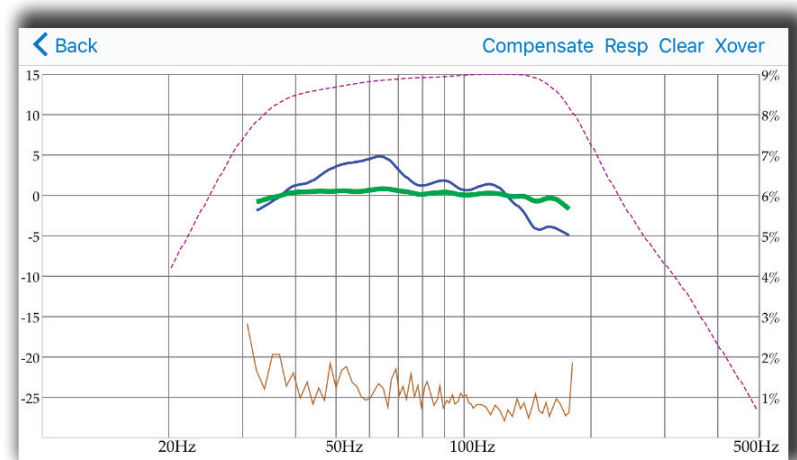Fig 11. Fir coefficients transferring to hardware.

Fig 12. 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.
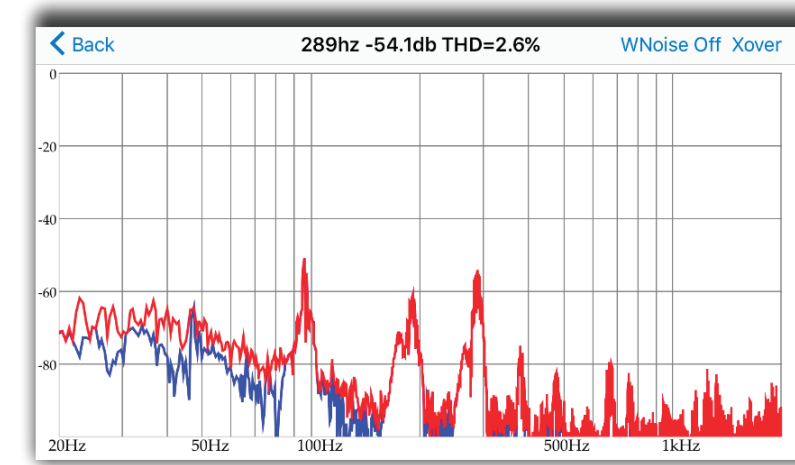

Fig 13. SPL meter window.

Wizard Overview

Wizard is the automation script leading through the Room Correction process step by step. First, the Wizard offers to turn On a sub, and adjust volume knob, on the rear panel. Next move the sub away from walls, ideally in the center of a large room, and place the App equally close to woofer cone and to the bass reflex port. This is an attempt to get more accurate near-field (NF) frequency response of your subwoofer.
Why NF? Because it is the way to get a reasonable and safe frequency range of the particular subwoofer. During 1-2 seconds you'll hear a few fast sweeps (Auto-level and Auto-range recognition), and you'll see a message with the choice of correction types.
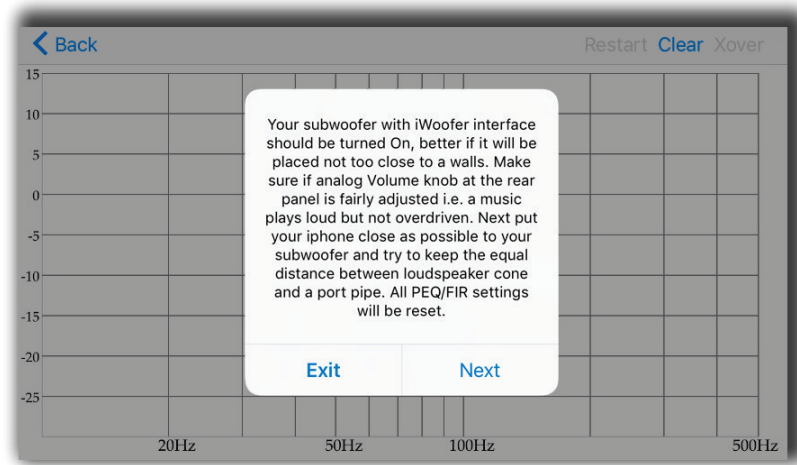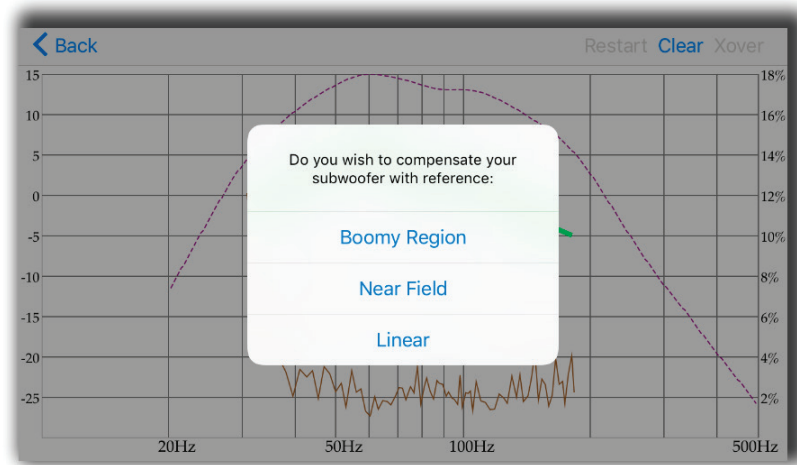

Fig 14. Start wizard window.

Fig 15. Choice of correction type 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.
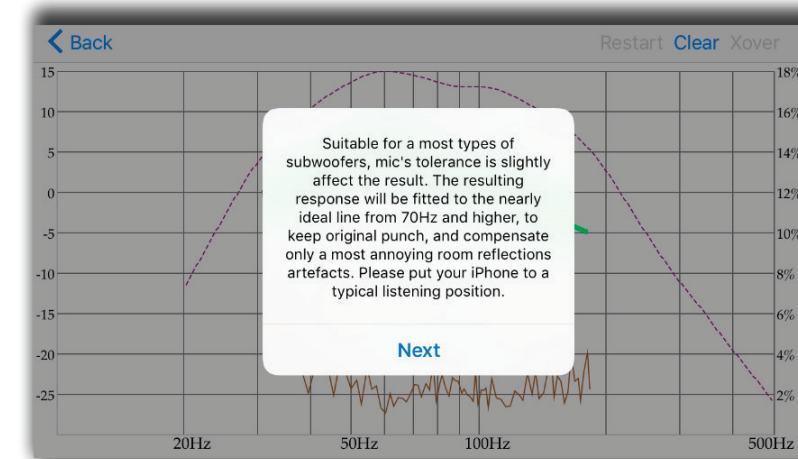Please keep reading the app's hints (!), which contains info about many, if not for all, functions.

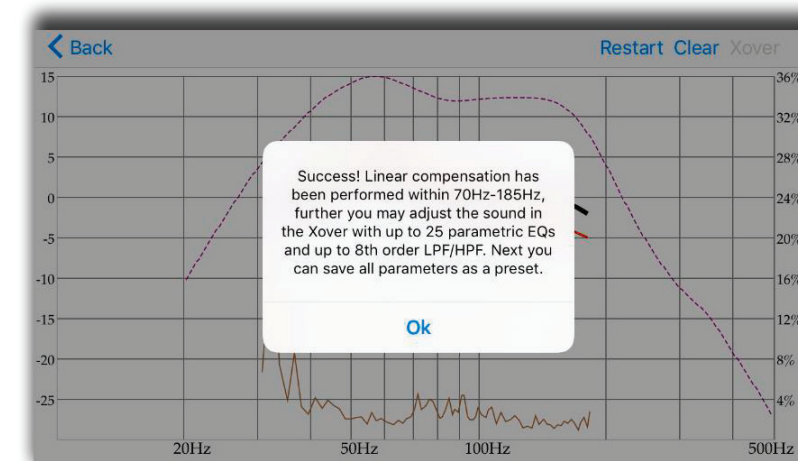Fig 16. Start Boomy region correction.

Fig 17. Boomy region correction is complete.

Near Field Compensation

The second type of correction is the Near-field compensation, that's true room compensation, the final result will be close to how your subwoofer sounds in the ideal room aka no echo chamber.
Don't be surprised if it sounds too dry, ideal world is supposed to be boring, and above we've explained why ;)
A good news - the mic's tolerance now is completely out of brackets, and has zero effect on the final result (relative SPL value is measured).
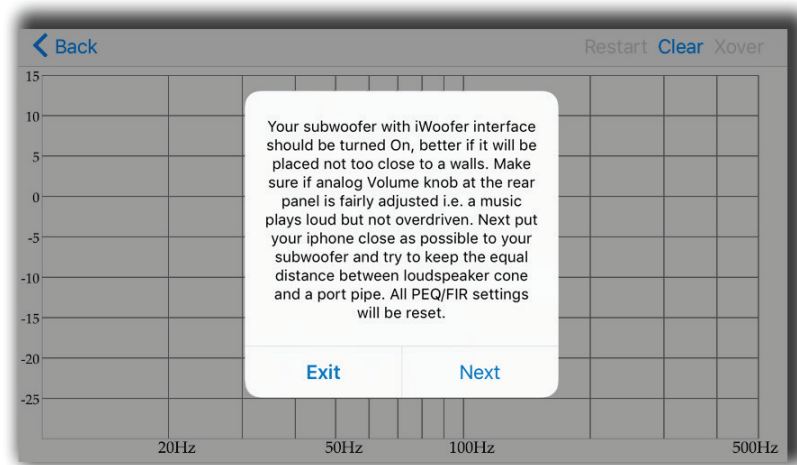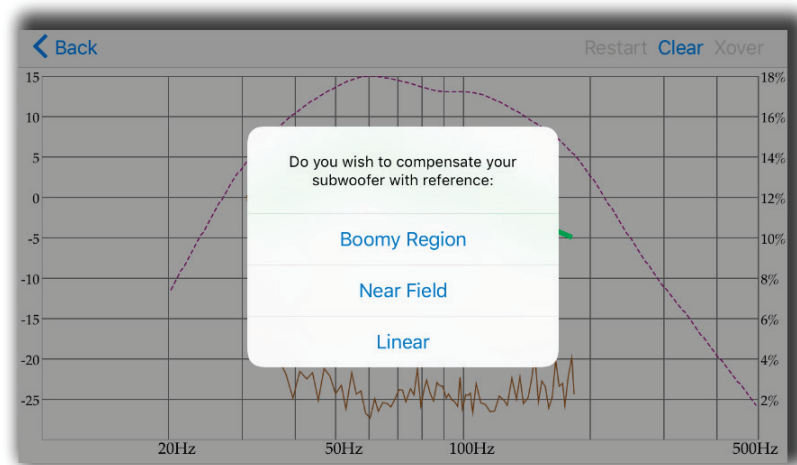

Fig 18. Start near field correction.

Fig 19. Near field correction is complete.

Options Menu

Name: By default the Name field filled with UDID, you may rename it there. UDID shows the MAC address of the connected iWoofer Hardware.

Restore Factory Setting: In case you want to reset all parameters to defaults. Be aware that this defaults is not exactly the same as was preset by the manufacturer of your subwoofer. As mentioned before, the very first connected iWoofer hardware will offer app to import preset from DSP, this one is the manufacturer's default preset.

Change Pairing Code: let you to set a password to you subwoofer/app. In case if the password is forgotten, please press and hold the Pair button on the rear panel of your subwoofer during 3Sec. The subwoofer password will be reset to zero. Preset Manager allow you to save/load and export presets. Please note that only after saving a preset the subwoofer will memorize a new parameters. Without saving a preset, subwoofer loses a new parameters after turn Off. Export presets carried out thru the IOS email account, but the import could work by hyperlink on website.
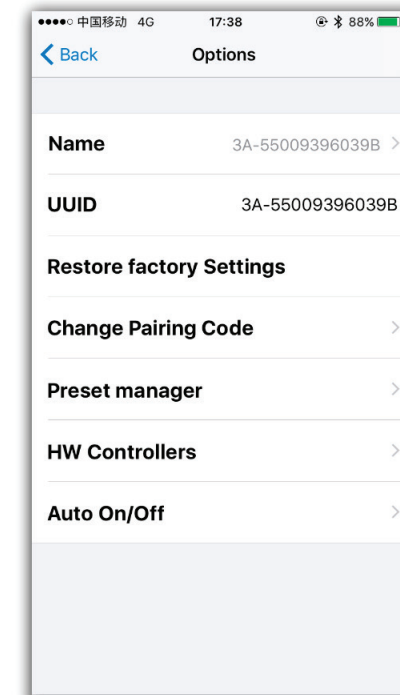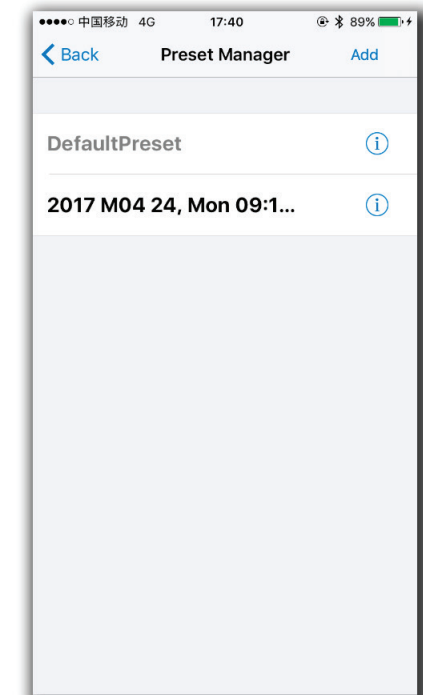

Fig 20. Options window.

Fig 21. 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.
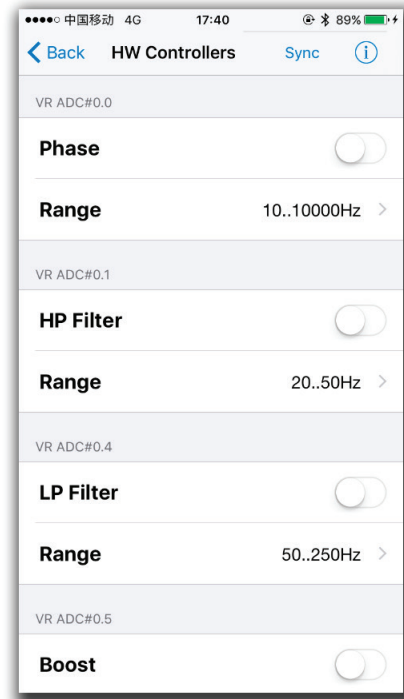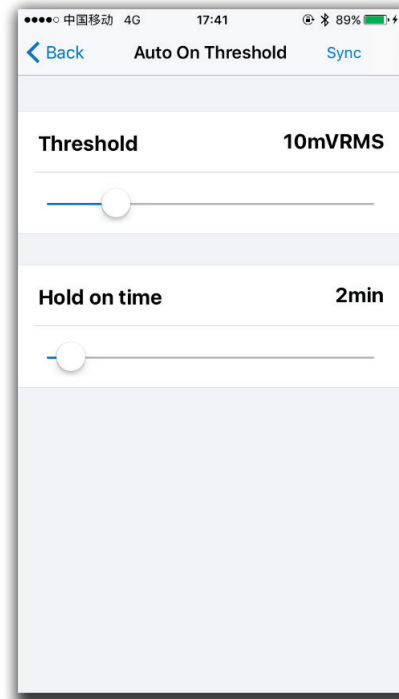
Fig 22. HW controllers window.

Fig 23. 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.
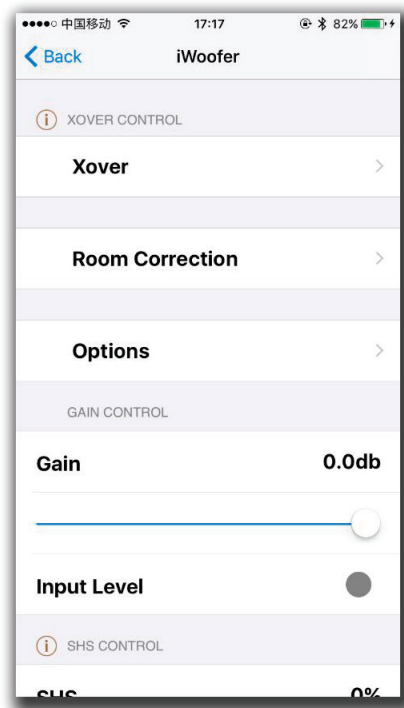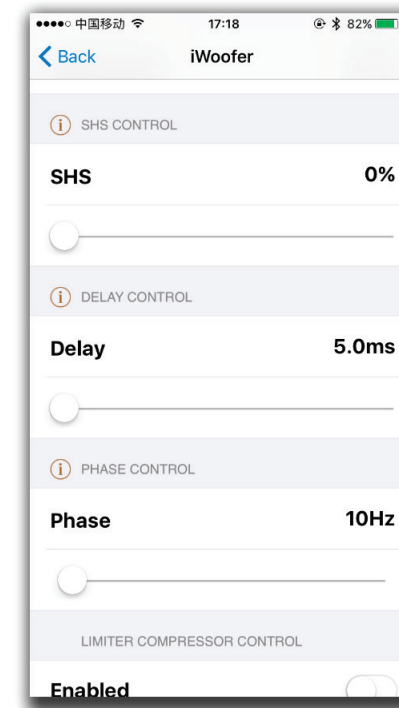
Fig 24. Main window.

Fig 25. 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.
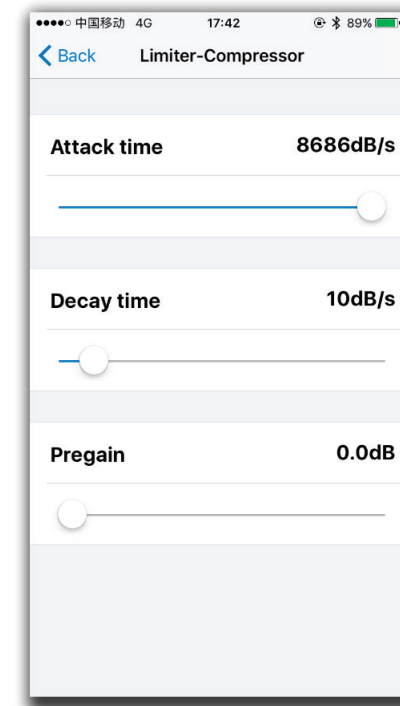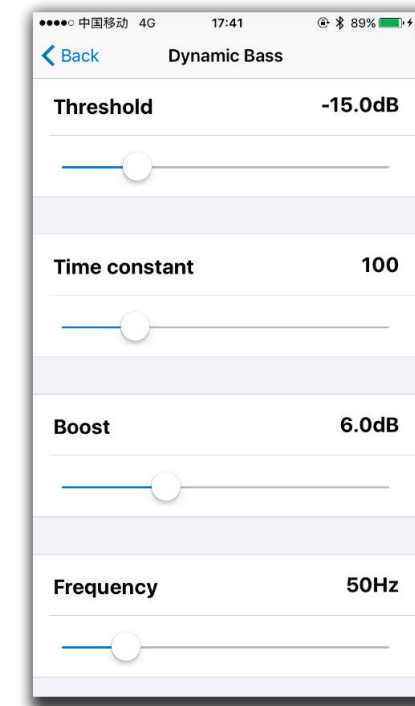
Fig 26. Limiter-Compressor window.

Fig 27. Dynamic Bass window.

Specifications

Spec	NERO DUAL X8 DSP
Power	300W Dynamic
Active Woofer	8"
Passive Woofer	8"
DSP	Built-In DSP W/ App Control
Frequency	20-160 Hz
Phase	0-180°
Voltage	100-120V AC / 220-240V AC
Inputs	L&R / Low Level
Dimensions	(WxHxD) 10.5 x 10.5 x 11in

Warranty Information

All OSD Audio powered subwoofer 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.

OSD AUDIO

OSD Audio | Brea, CA | osdaudio.com