

**KEF**



**LS50W**

Frequently Asked Questions



The LS50W is an amazing engineering feat. Our engineers have taken the unrivaled-in-its-class performance of the LS50 passive speaker and turned it in to a completely self-contained (and mighty powerful) music system. The technologies used in the LS50W are all state-of-the-art and perfectly matched to high-fidelity systems costing hundreds, if not thousands of dollars more.



# AUDIO

## Does the LS50W use the same driver as the LS50?

Yes. From a sonic standpoint, the LS50W is identical to the LS50 passive. Great care and effort was put in to ensuring the LS50W had the same sonic signature as the LS50 passive. LS50W uses the same 5.25" Uni-Q driver array inside a symmetrical cabinet design with constrained layer damping.

## What is the upper frequency output range of the LS50W?

As is typical with our Uni-Q drivers, the upper frequency range is near flat, up until well over 40kHz – twice the frequency of even the best human hearing. This is an important accomplishment as it means the Uni-Q performs solidly all the way up to the upper limit of the human ear – ensuring absolutely stunning highs and natural harmonics.

## What is the lower frequency output range of the LS50W?

In standard operation, the LS50W will produce a flat response to 43Hz. With our powerful on-board Digital Signal Processor (DSP) the LS50W is capable of producing a flat frequency response down to 40Hz. That means in Bass Extension mode, you will get all but the very lowest natural musical notes without a subwoofer.

## What is a “bi-amp dual-mono” amplifier?

The LS50W is powered by an onboard bi-amp dual-mono amplifier configuration that was designed to get the absolute peak performance out of the 5.25" Uni-Q driver. Basically, “bi-amp” means that the high-frequencies are amplified separately from the low-frequencies. “Dual-mono” means that each channel (left and right) have their own bi-amp configuration. Thusly, the LS50W uses four separate amps: Two in each channel powering the high frequencies and two in each channel powering the low frequencies.

## How powerful are the amps in the LS50W?

There is one 200W Class D amplifier in each channel for the low frequencies and one 30W Class AB amplifier in each channel for the high-frequencies, combined for an amazing 230 WPC. The LS50W is capable of producing 106dB of sound.

## What is a Class D amp and why does the LS50W use it?

Class D amplifiers are extremely efficient amps capable of producing a lot of current (i.e. power) without producing the same heat as a Class AB amp. By using the Class D amp we were able to design an active LS50 without the need for massive heat sinks.

## Is it true that Class D amps produce a lot of distortion and noise?

The transistors in Class D amplifiers switch on and off twice per musical cycle (think of one cycle as a single note) which is why they are so efficient. The downside is that when a transistor switches off, it produces noise. Think of it as a “bounce” as the transistor shuts down – a small amount of switching noise is introduced. However, with a properly designed Class D amp, these unwanted signals are far above the audible range of human hearing, and with the proper use of lo-pass filters, all of that switching noise is eradicated. That means by using a 200W Class D amp for each channel's low frequency, the LS50W produces a massive amount of low frequency energy without noise and without the need for giant heat sinks.

## Why not use a Class D amp for all frequencies then?

Class D amps are great, especially for low frequency output, but a Class AB amp is even better for higher frequency output. While Class AB amps are generally less efficient than Class D amps because high frequencies by their very nature do not require a lot of energy to produce high volumes, a Class AB amp is ideal.

The LS50W's amp configuration is the ultimate configuration - an extremely efficient amp dedicated to low frequencies and a cleaner amp dedicated to the high frequencies. A 30 watt Class AB amp that is only producing output to the tweeter will produce a tremendous amount of volume, and that output is exceptionally clean well beyond the upper limit of human hearing.

## Is there a subwoofer output?

Yes, there is a dedicated subwoofer output via a single RCA-type analogue connector.

## Is the crossover of the subwoofer output controllable?

The default crossover setting of the subwoofer output is 80Hz, but with the LS50W app, that crossover point is customizable. This is achieved through use of an adjustable lo-pass filter controlled by the DSP. In conjunction with the lo-pass sub out, there is also a hi-pass output to the Uni-Q drivers which allows the user to precisely set the relationship between the subwoofer and the LS50W to suit their taste.

# ANALOGUE / DIGITAL CONVERSION & STREAMING

## What is the output resolution of the LS50W?

There are four Digital-to-Analog Converters (DAC) in the LS50W system: One for the low frequencies and one for the high frequencies in each channel. This configuration allows the LS50W to produce extremely high resolution output without any compromise in either frequency range. By using dedicated DACs for each range, we are able to achieve extremely clean and granular analogue output. Because the DACs all operate under the same system clock, jitter and drop outs are eliminated.

The LS50W decodes at 192kHz/24-bit resolution, but of course that is also dependent upon the source resolution. The source resolution will not (cannot) change, so mp3 files will still be mp3 files, but the LS50W allows you to play mp3 files and high-resolution lossless files (such as AIFF and FLAC) as well.

## What is the sampling rate of the LS50W?

Depending on the source, the LS50W uses a sample rate of 192kHz (for USB Type-B audio) or 96kHz for the optical TOSLINK input.

## What is the resolution?

Depending on the source resolution, it is up to 24-bit. CD quality audio is 16-bit.



## CONNECTIVITY

### If it's a wireless music system, why are the left and right speakers connected with a wire?

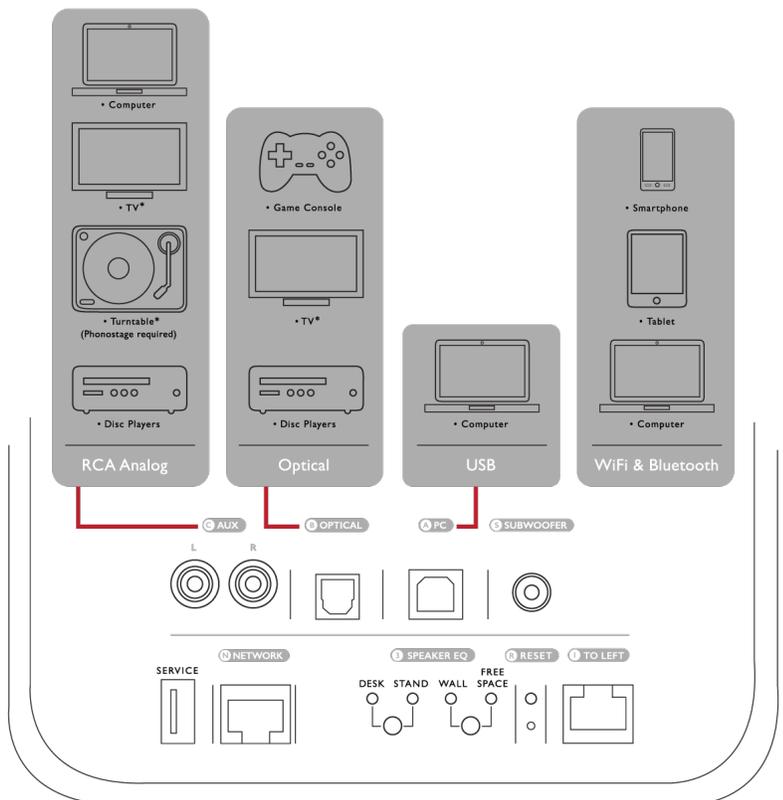
The LS50W uses extremely accurate high-quality DACs and a streaming pre-amp. In order to provide 192k/24-bit resolution, a wired digital connection (USB) is necessary between the streaming pre-amp in the master unit (right channel) and the DACs onboard the slave unit (left channel). "Wireless" is a conventional term relating to the connection from your streaming device (phone, computer, etc.) and the LS50W System.

### What type of inputs does the LS50W have?

There are five ways to connect to the LS50W: 2.4GHz/5GHz Dual-Band Wi-Fi network, Bluetooth 4.0 with aptX, USB Type-B, TOSLINK digital optical, and RCA-type analogue line-level. There is also a dedicated RJ45 Ethernet connector for network and service purposes.

### High resolution audio takes up a lot of bandwidth. Is this a concern?

The LS50W operates via the IEEE 802.11 a/b/g/n standard at a dual-band frequency of 2.4GHz/5GHz, so a standard wireless router will work. It is important to keep in mind that high-resolution audio does require a lot of bandwidth to operate properly. We recommended that the user purchase as high quality of a router as is possible to ensure full enjoyment of the wireless network features of the LS50W.



## THE APP

### What can I do with the app?

The app is the control center for the LS50W. The app sets up the network connection, allows you to adjust the DSP and functions as a music player for the music files that reside on your phone.



### Can I skip connecting my LS50W to my network?

The LS50W will work without being connected to your local network. To take full advantage of the features the app provides, like adjusting DSP, you will need to be connected to your local network.

### When I go to Speaker Settings on the app (My Speakers -> KEF LS50W (default speaker name) -> Speaker Sound Settings) there are three settings – Default, Basic and Expert. What are the differences between the three?

The “Default” setting is the factory setting. You can always reset your LS50W system to the factory default by choosing this setting (you will get a message indicating a conflict between default and actual speaker settings; by clicking “OK” you are resetting the LS50W DSP to its factory settings).

In “Basic” mode you can set your speakers for enhanced performance depending on your specific setup. These settings are duplicated as manual switch settings on the rear control panel of the Master (right channel) unit.

“Expert” mode gives you greater control of the sound profile of the LS50W.

## “Basic” Mode DSP Settings Guide

Stand vs Desk	Surfaces in front of a driver change the driver’s response. This setting allows the powerful onboard DSP in the LS50W to make adjustments.
Distance to Wall	Speakers may develop a “boomy” or muddy sound when placed close to a rear wall. This setting allows you to control the DSP to compensate for any unwanted coloration that may occur from a wall surface adjacent to the LS50W. The closer your speakers are to a wall the more pronounced this effect will be. The app allows you to compensate for distances from <10 cm (3.93”) to >50 cm (19.69”)
“How is your room?”	This setting allows you to compensate for rooms that are sonically dampened (lots of furniture, carpets, pillows drapes, etc.) to rooms that are sonically lively and filled with reverb (tile or hardwood floors, high-ceilings, large windows, etc.) Using the psycho-acoustic properties of the DSP, you can tailor your sound to your taste depending on how your room responds to sound energy.
How much bass do you want?	In the “Standard” setting the bass will approximate that of the LS50 passive. The “Standard” setting has been designed to get the most out of the onboard DSP of the LS50W. The “More” setting is useful for larger rooms that may require more bass energy. Please note that in the “More” setting speaker protection happens earlier than in the other two settings. You may experience a situation where your speakers shut down after lengthy periods of with extreme volumes while in the “More” setting. This is normal and has been designed to protect your speaker system.
Subwoofer Plugged In	Turning this setting on lets the DSP know you are using an auxiliary subwoofer (via the provided RCA-type subwoofer connection). The default subwoofer lo-pass out is 80 Hz, and in conjunction, the default hi-pass out to the LS50W Uni-Q will also be set to 80 Hz.
Subwoofer Volume	This setting allows you to independently control the lo-pass output to the auxiliary subwoofer.
Subwoofer/Speaker Balance	This slider controls the lo-pass-hi-pass frequency point of the DSP. Slide toward SUBWOOFER to raise the lo-pass frequency (allowing more bass to be handled by the subwoofer). Slide toward SPEAKER to lower the lo-pass frequency (sending less bass to the subwoofer).



## “Expert” Mode DSP Settings Guide

Desk Mode	Are your speakers closer to the back of the desk/table/shelf or the front? If there is no horizontal surface in front of your speakers, then the DESK MODE switch should be off. If your speakers are close to the front of the horizontal surface, but there is some horizontal surface between open space and the speakers, DESK MODE is on and the slider should be set to approximately -2 to -3 dB. If your speakers are set at the rear of your table or desk top, DESK MODE should be on and the slider should be set to approximately -4 to -6 dB. The slider control allows you to fine tune this adjustment to your taste.
Wall Mode	If your speakers are greater than 19” from a wall or vertical surface behind the speakers, then the WALL MODE switch is off. If the rear of your speakers are approximately 9” to 18” from a wall, then the WALL MODE switch is on and the slider should be set to -3 dB. If the rear of your speakers are very close to the wall, WALL MODE is on and the slider should be set to -6 dB. The slider control allows you to fine tune this adjustment to your taste. You can use DESK MODE and WALL MODE together to further fine tune your LS50W system’s response.
Treble Trim	Some rooms don’t respond well to high levels of mid-range energy, causing your speakers to sound harsh or strident. The TREBLE TRIM adjustment allows you to compensate for room interaction with your speakers at these mid-range frequencies. Experiment with this setting to find a position for your taste and environment.
Phase Correction	The PHASE CORRECTION control allows the DSP to correct for inherent phase misalignment due to the crossover. You may or may not hear a difference, so experiment with this setting to find a DSP setting that fits your taste.
Hi-pass Mode	Allows you to finely tune the output from the crossover to the LS50W Uni-Qs when using a subwoofer.
Sub-out Lo-pass Frequency	Allows you to finely tune the upper limit of the low frequencies that are sent to the connected subwoofer.
Hi-pass/Lo-pass Note	It is possible to set the lo-pass (output to the subwoofer) at a very low frequency (e.g. 60Hz) and the hi-pass output to the Uni-Q drivers at a very high-frequency (120 Hz). Doing this will cause a diminishment of output at the frequencies between the lo-pass setting and the hi-pass setting, which would basically result in a loss of musical output in the band inbetween the two settings. Great care should be taken when setting your speakers up in EXPERT MODE. You can always reset to the factory settings if you think you may have caused your speakers to perform poorly.
Sub Gain	This allows independent control of the subwoofer audio output which is helpful in balancing the output of the LS50W with the output of an auxiliary subwoofer.
Sub Polarity	Generally this setting would be at (+), but for situations where the subwoofer is in a different phase than the LS50 drivers, you can change the polarity of the subwoofer to (-). Incorrect subwoofer polarity will result in a loss of bass response at the subwoofer.

## POWER AND OPERATION

### I bought my LS50W in the United States but I want to take it to another country with a different voltage standard. Can I do that?

The LS50W uses a power supply that automatically senses the input voltage from your power outlet and adjusts accordingly. The LS50W will operate at 110VAC/60Hz or 220VAC/50Hz without any switching required by the user. Of course, you will need to have the appropriate socket adapter for your power outlet.

### Why do I have to download the audio driver to my Windows machine, but Mac users don’t?

Because this is how Windows is set up to operate. The audio driver download is a one-time download operation that adds the necessary driver for playing and streaming high resolution audio in your Windows computer. The Mac driver is resident in the Apple operating system. In some cases you may not need to download the audio driver if it is already resident on your Windows machine.