Sonarworks Reference 4

User Manual

Version 3 (May 2018)

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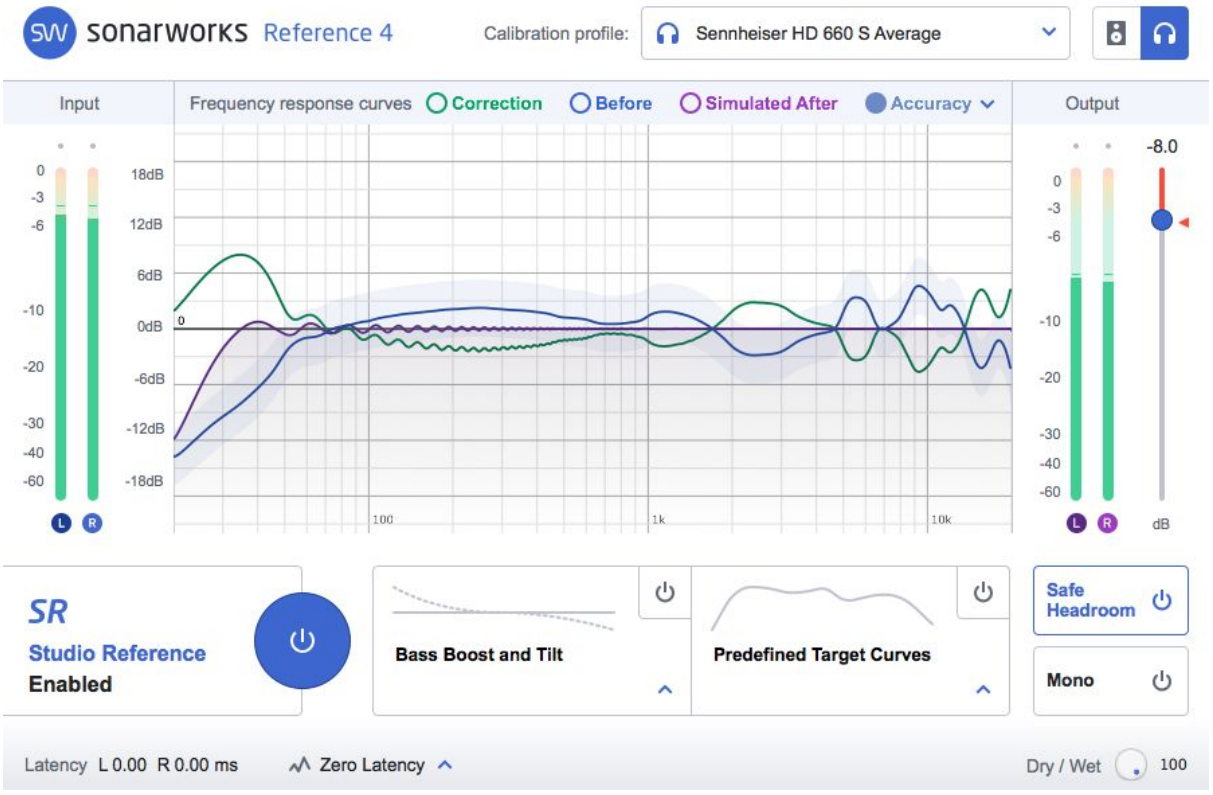
1. Product Overview

What is Reference 4 ?

Sonarworks Reference 4 is a high-precision convolution-based equalizer system formed of 2 (Headphone Edition) and 4 (Studio Edition) modules - Reference 4 Plugin, Reference 4 Systemwide, Reference 4 Measure (Studio Edition) and XREF20 calibration microphone (if you've purchased Studio edition bundled with the microphone).

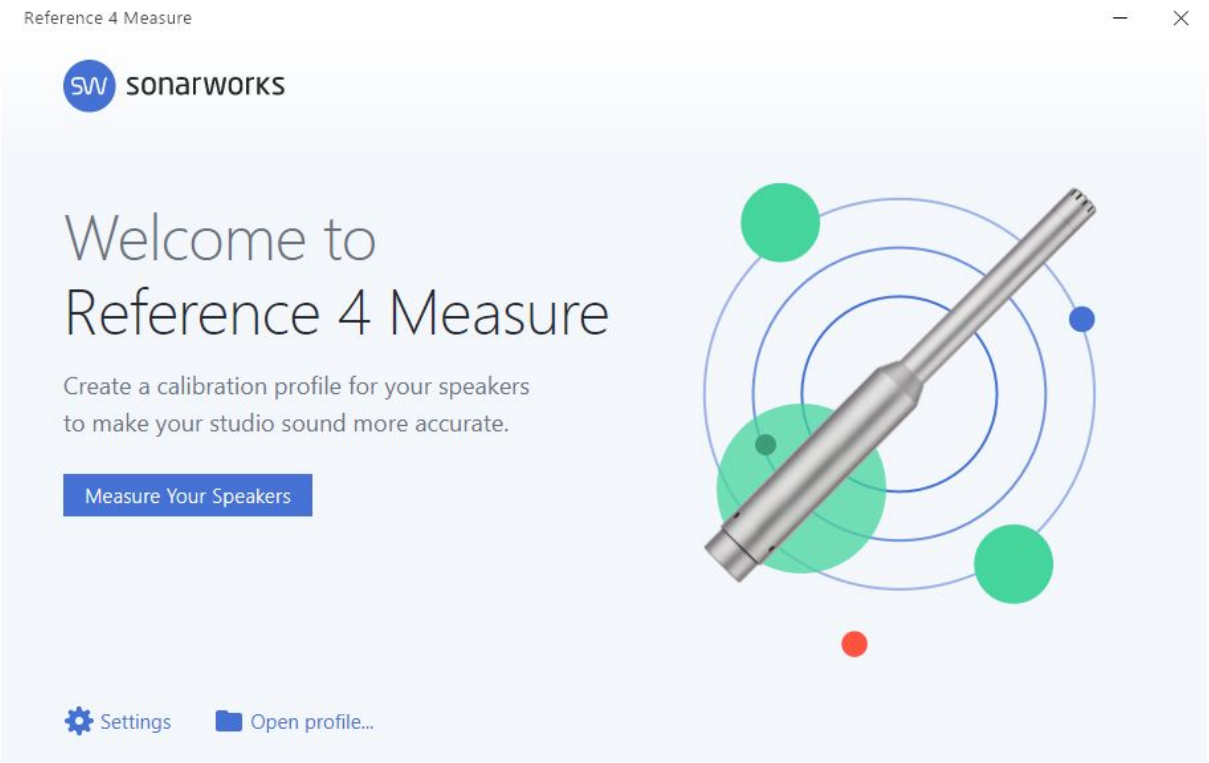
1. Reference 4 plugin



Compatible with any host application supporting VST, AU, AAX or RTAS plugins, Sonarworks Reference 4 plugin uses headphone correction profile created by either averaging multiple measurements of the same headphone model or Individual Calibration Service, done by our specialists in Sonarworks HQ in Latvia and speaker calibration profiles, created by user. Besides achieving neutral (i.e. flat) sound, the plugin allows for the system's calibration towards custom non-flat target frequency response The choice between linear

and zero latency filter calibration is available, creating an effective balance in CPU efficiency and filtering latency for the chosen use case.

2. Reference 4 Measure (only in Studio Edition)



The Reference 4 measurement application is used to measure the frequency response of your room and speakers, capturing the particular acoustical characteristics your listening environment exhibits. A calibration profile is generated, based on the captured data, to digitally represent the acoustics of the audio playback system and the surrounding physical environment and remove the unwanted artifacts from the sound arriving to the users' ears.

3. XREF 20 measurement microphone (if purchased either separately or together with Studio Edition as a bundle)

Each Sonarworks XREF 20 microphone is an individually calibrated professional measurement tool that ensures a flat frequency response and maximum precision. The microphone comes with an individual 30° off-axis calibration profile for best accuracy with Sonarworks measurement software, as well as a standard 0° calibration file for use with

other calibration systems.

Technical specifications:

Pre-polarized electret-condenser capsule
Flat frequency response from 20 Hz to 20 kHz with individual calibration curve (supplied with mic)
Omnidirectional polar pattern
Sensitivity is rated at -37 dB/Pa (14mV)
Self noise: 24 dB
Signal to noise ratio: 70 dB
Dynamic range: 106 dB
Maximum SPL: 132 dB

4. Reference 4 Systemwide

Compatible with the latest versions of Windows and Mac OS systems, Sonarworks Systemwide is a standalone application implemented as a virtual audio driver - all system's audio sources are calibrated based on the loaded headphone or speaker profile. Additional

target curves can also be chosen, and set on top of the Studio Reference flat target, to achieve different tonal balance.

How does the Reference speaker calibration system work?

Sonarworks Reference system uses advanced patent-pending technologies to measure and calibrate your speakers.

Automatic Microphone Positioning System (AMPS) and Perceived Acoustic Power Frequency Response (PAPFR) measurement technology create an array of data tied specifically to the chosen audio playback region relative to the physical surroundings, highlighting any deviations in the audio spectra due to any dampening or sound augmenting elements arriving to the human ear.

The calibration is carried out by Sonarworks Audio Calibration Filter Engine (ACFE) that also includes Speaker Range Extension (SRE) technology to extend or limit the high and low end response of the target speaker system. The calibration engine also supports realistic simulations of other speakers for quick and easy referencing via the Acoustic Power Simulation (APS) technology that simulates the speakers based on their respective acoustic power generated in the correction field.

2. Using Reference 4 Measure

Speaker measurement overview

The full calibration of your speaker system is carried out in 3 general steps:

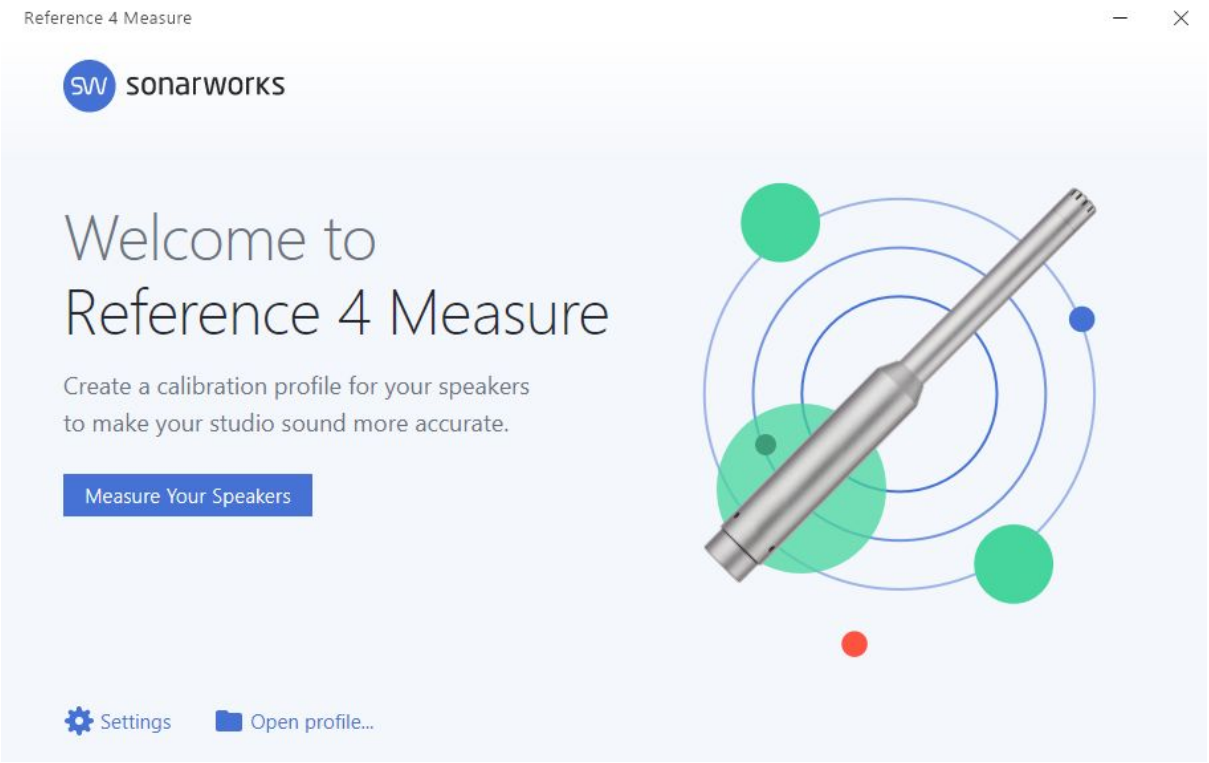
1) **Measuring your audio system's physical dimensions, placement and noise floor.**
   All of the aforementioned parameters have an effect on the final waveform that propagates through your working acoustic environment. During this step, 3 specific types of data sets are captured:
   a) distance between speakers, accounting for inter-speaker interactions in the free-field
   b) distance from the midpoint between the speakers to the sweet spot, establishing the position of the sweet spot in the room
   c) room and microphone noise floor, potentially corrupting the data captured by the measurement microphone
2) **Measuring the frequency response of your room and speakers.**
   The measurement is a weighted average of **37** measurement points taken around the sweet spot area. The resultant smoothing takes into account random peaks or notches in the frequency spectra caused by the playback environment's acoustic properties. As a result, the speaker frequency response correction profile tends towards optimum precision in the area to be calibrated.
3) **Reviewing the final result and saving the project.**
   If the software indicates a successful measurement process completion, save the session in the 'Sonarworks Projects' folder.

Measurement process walkthrough

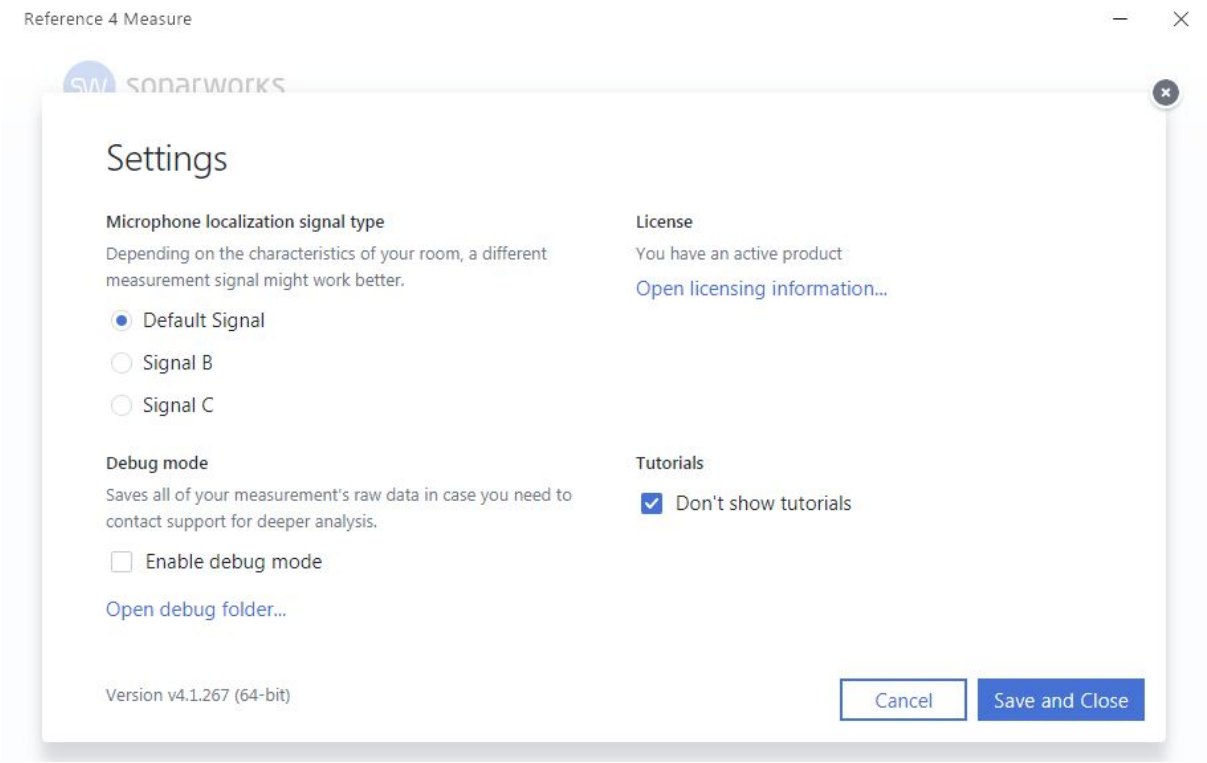
Start by opening Sonarworks Reference 4 Measure speaker calibration software.

!NB - If you are using an audio interface that does not support ASIO, search your installed applications and launch **Sonarworks Reference 4 (WASAPI Mode)** version of the software!

If this is your first time installing Sonarworks Reference 4, then you will be greeted with the activation window and are required to enter your email and activation code first. For more information about activation, please refer to Chapter 5.



MEASURE YOUR SPEAKERS - begin the measurement process
OPEN PROFILE… - open and review a previously carried out measurement session
SETTINGS - change the measurement signal type, if there are issues with the default signal, see your licensing information and activate debug mode

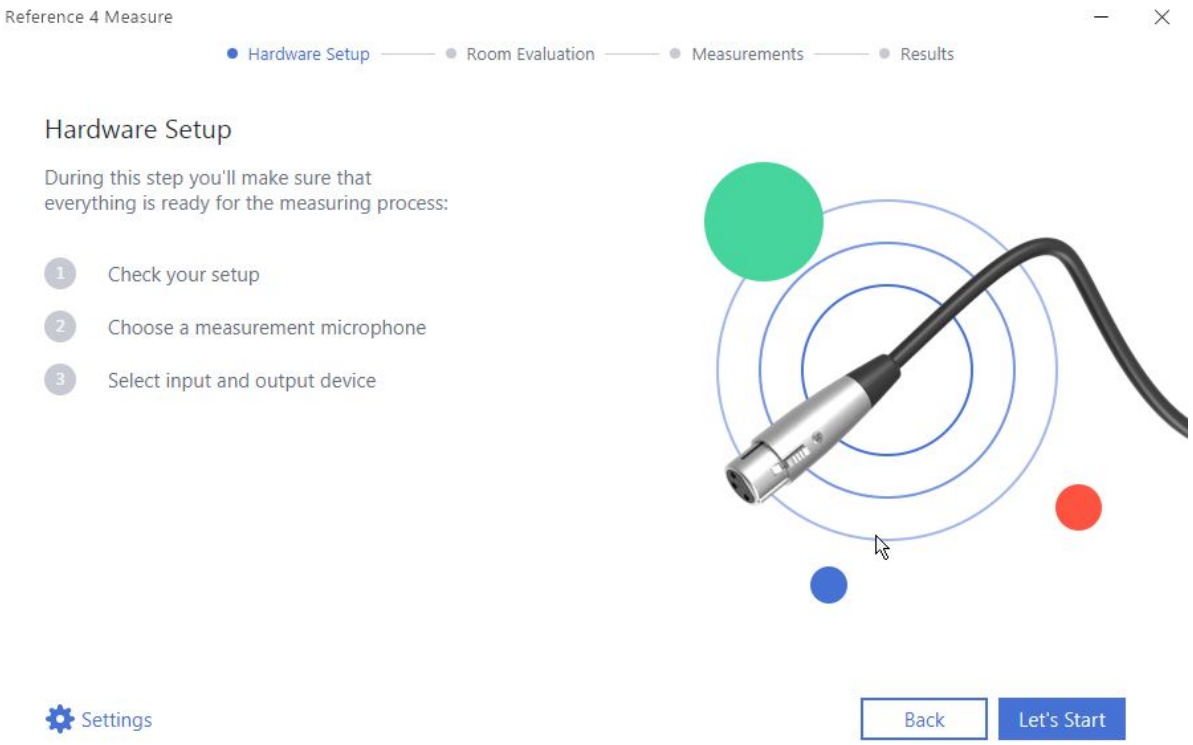


MICROPHONE LOCALIZATION SIGNAL TYPE - offers different localization signal types that might work better in certain rooms.

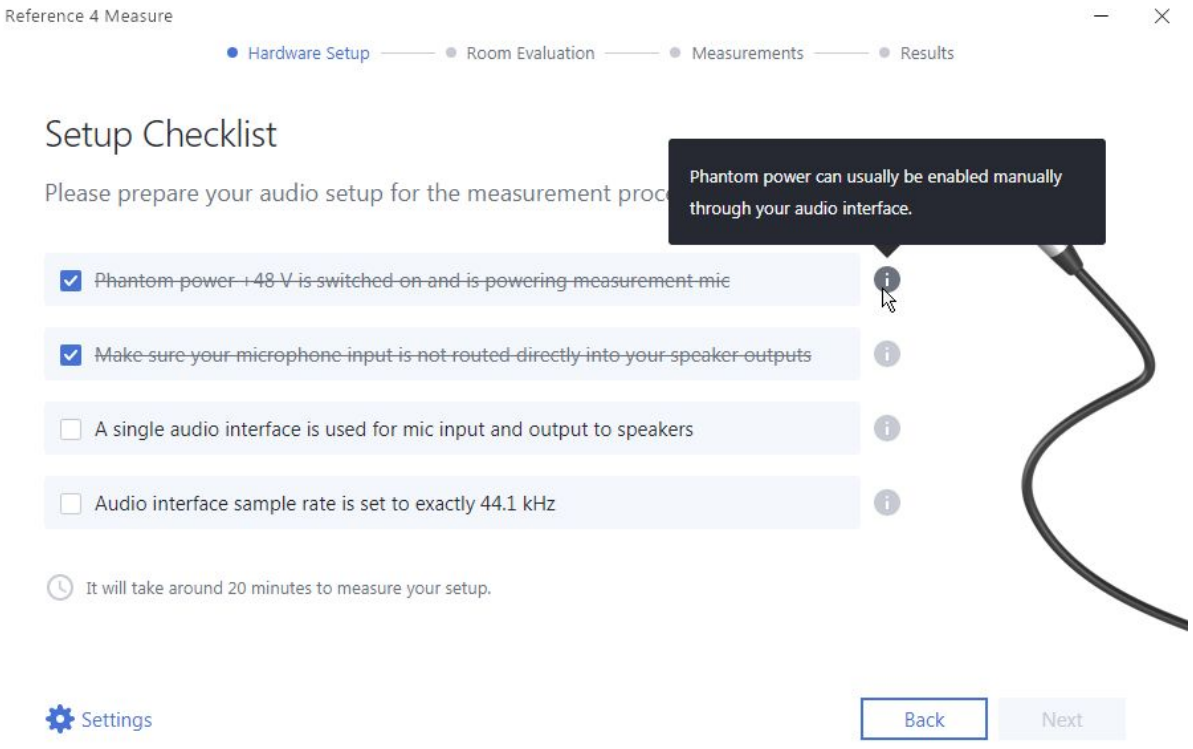
DEBUG MODE - useful option when the measuring process is failing at some steps. This gathers information about what is happening within software so that our support staff can help you getting Measure software to run properly.

LICENSE - information about your license status and gives you the option to activate additional Sonarworks Reference product. If you're on a trial, you can also access our store directly from this page.

TUTORIALS - option to turn off built-in tutorials for a quicker measuring process.

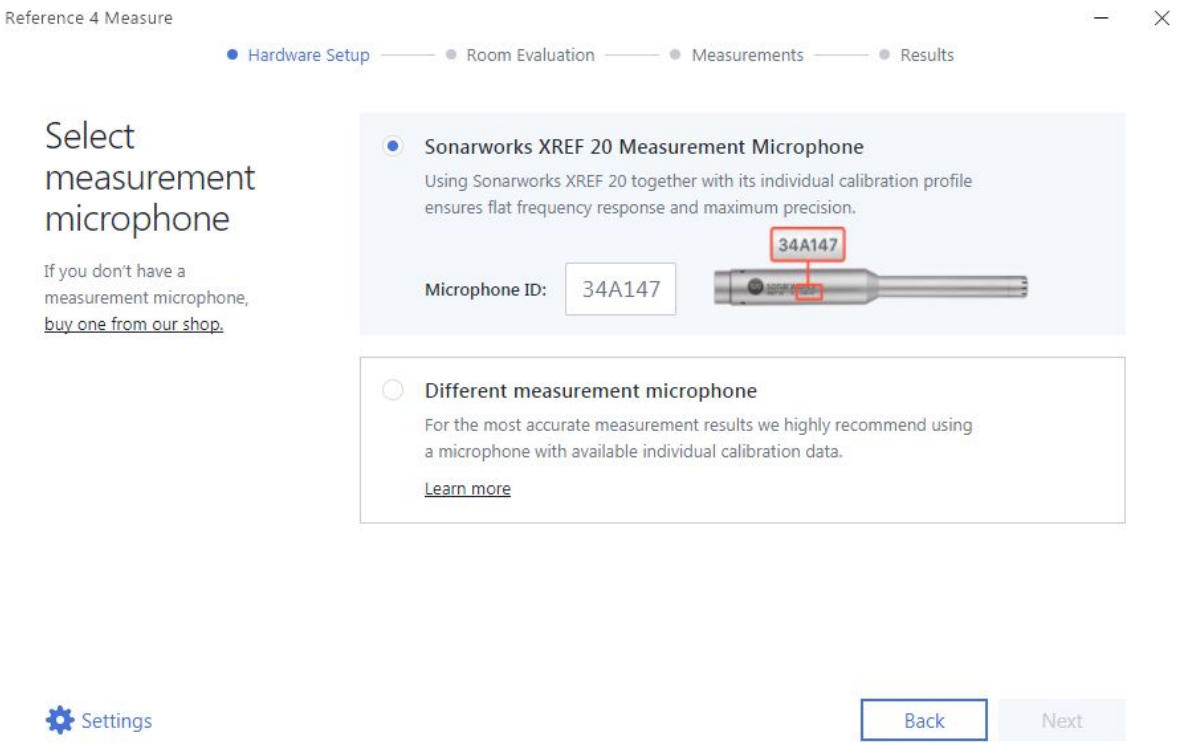


This is a preview of what tasks will be carried out by the user in the next group of steps.

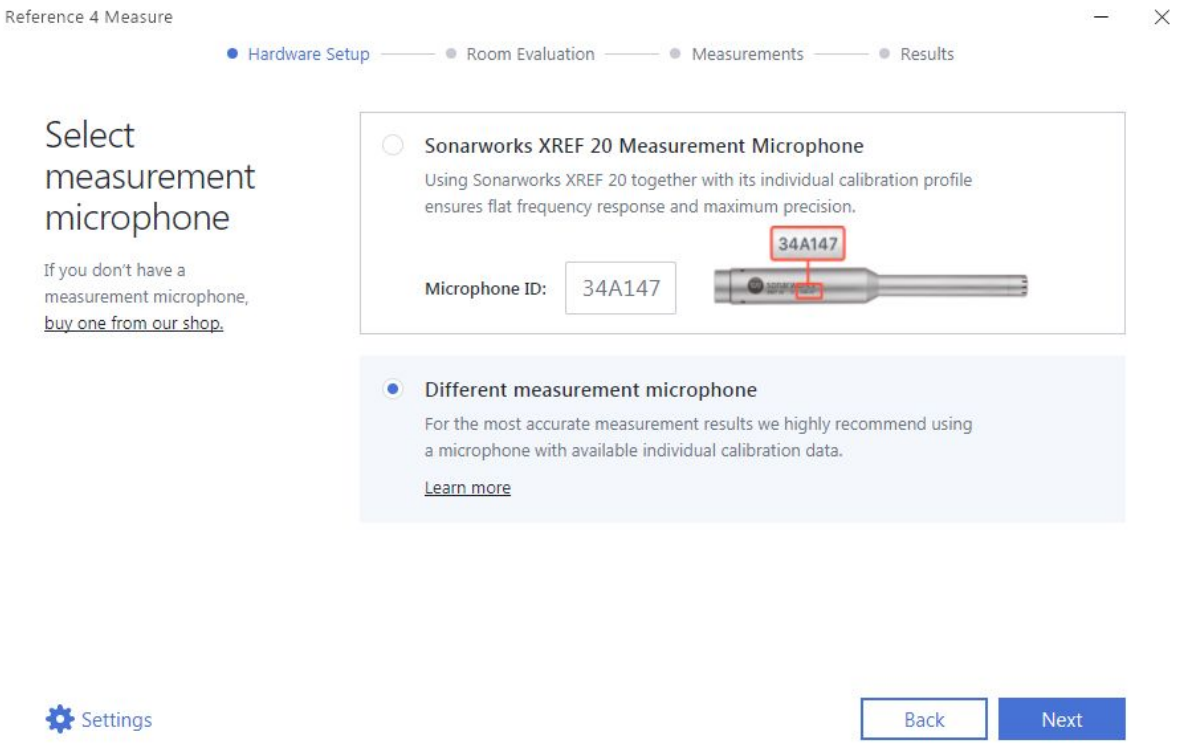


The checklist is here to make sure you have everything set up for a successful speaker measurement run. These are the most common things that, when overseen, can compromise the measurement process. On the right from every item on the list there is an

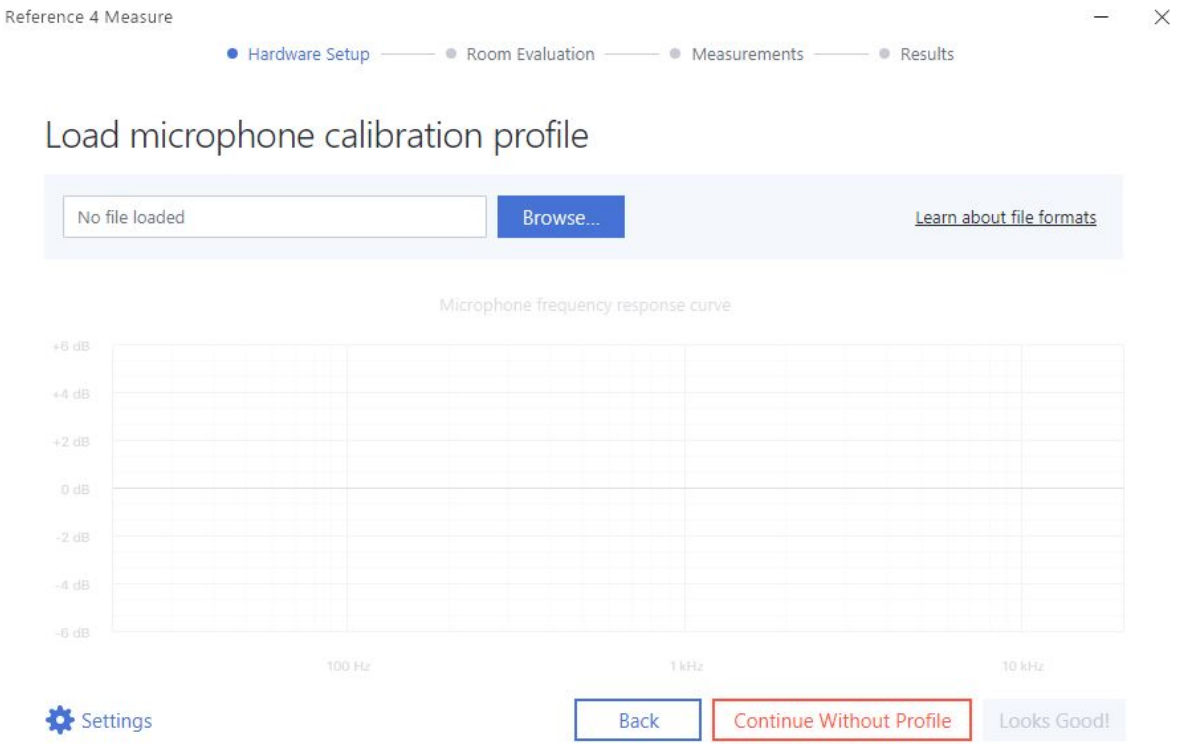
info bubble giving you more information about the specific item in question. Every item on the list has to be checked out by the user manually.



SONARWORKS MEASUREMENT MICROPHONE (XREF 20) - if you have one of our XREF 20 measurement microphones for recording studios, enter its' Microphone ID in the indicated field and click Next. This will automatically fetch the corresponding microphone calibration profile from our servers. All Sonarworks XREF 20 microphone calibration files are also available on our downloads page. We provide calibration data for 0° on axis and 30° off-axis. Use the 30° calibration file with Reference 4. In the next window you'll be able to see the unique frequency response of your microphone

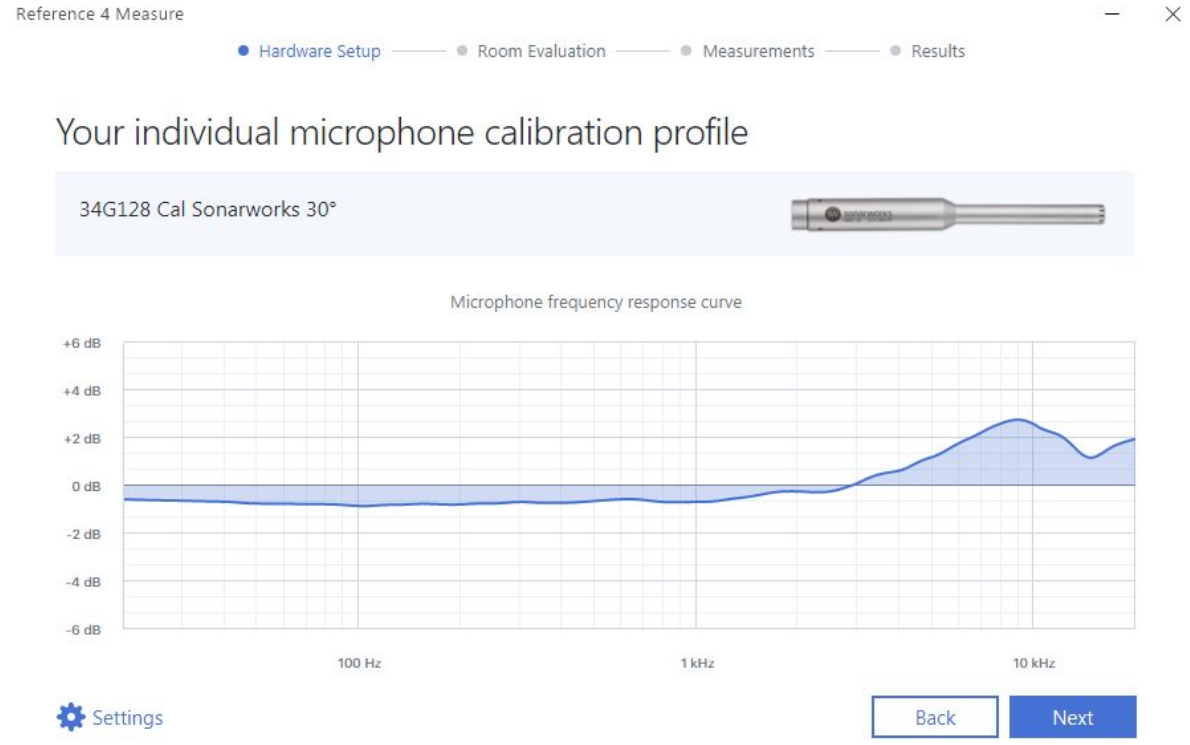


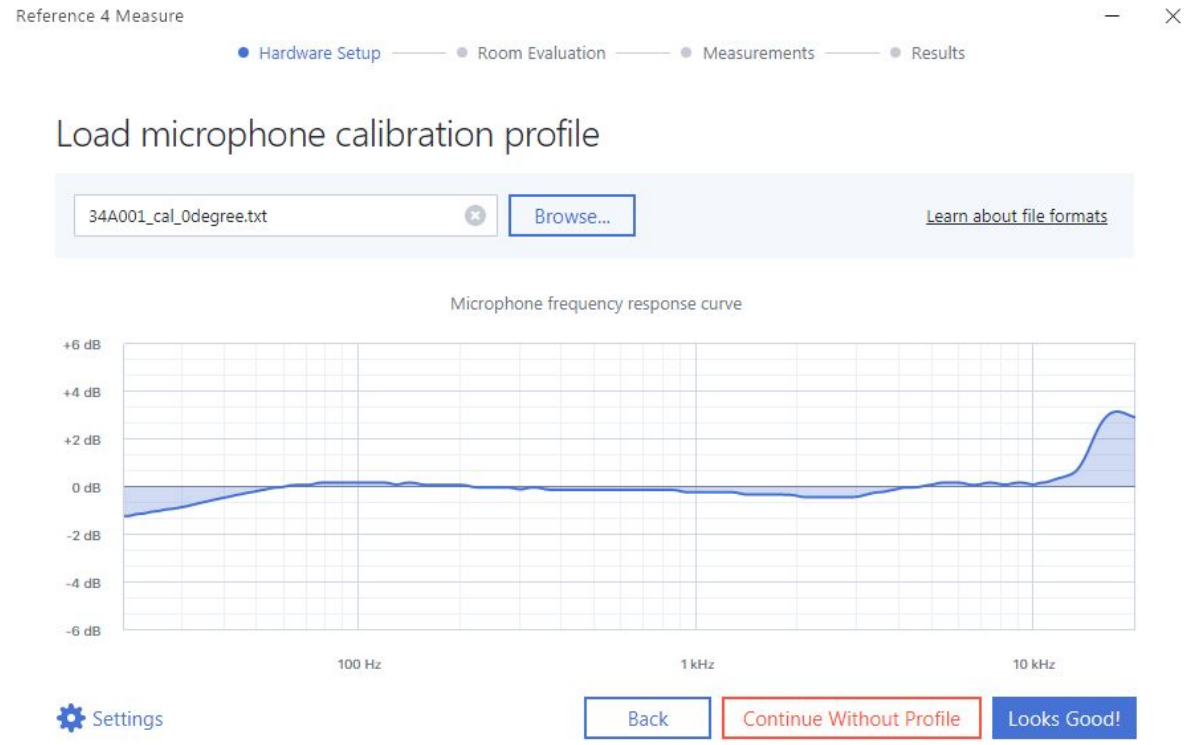
DIFFERENT MEASUREMENT MICROPHONE - choose this option if you have a measurement microphone of your own. We highly recommend to use a calibration file for it, if provided. You'll be able to load it up in the next window.



BROWSE… - if you have a calibration file available for the microphone you will use, select it here. It has to be in a supported .txt format. Click “Learn about microphone profile files…” to see specific information about the formatting of such calibration files.

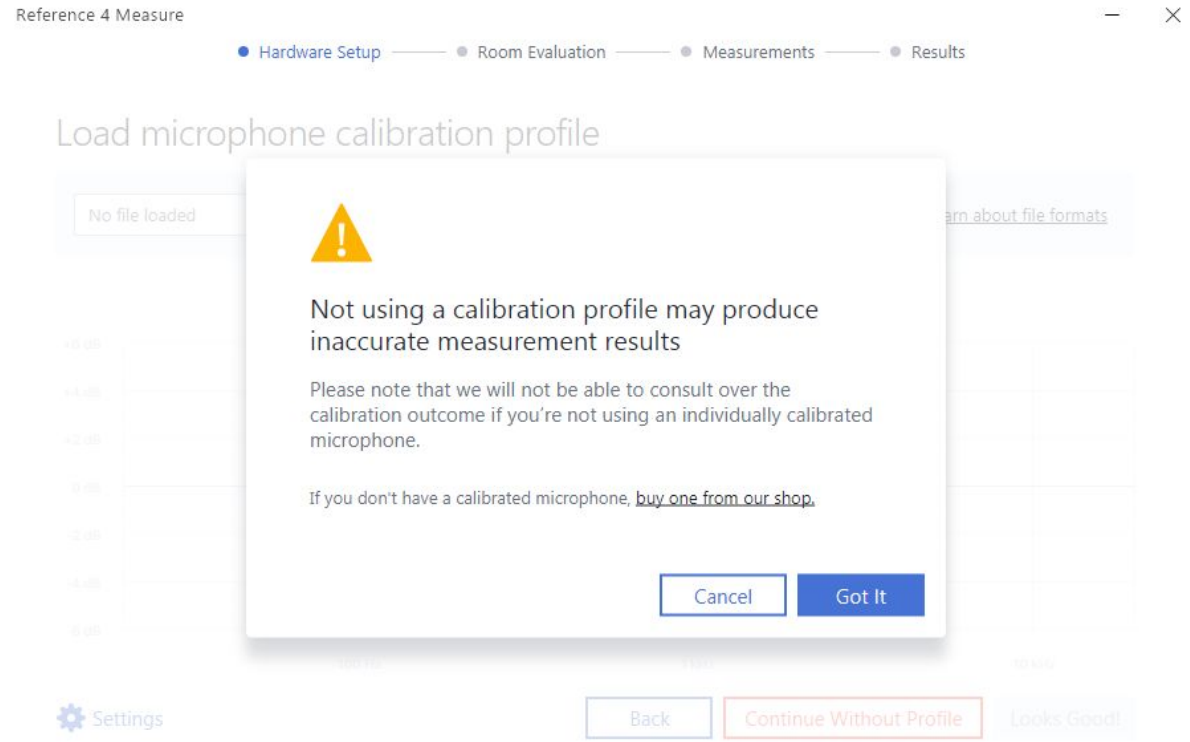
MICROPHONE FREQUENCY RESPONSE CURVE - this will show you the frequency response of the calibration file that you’ve selected.

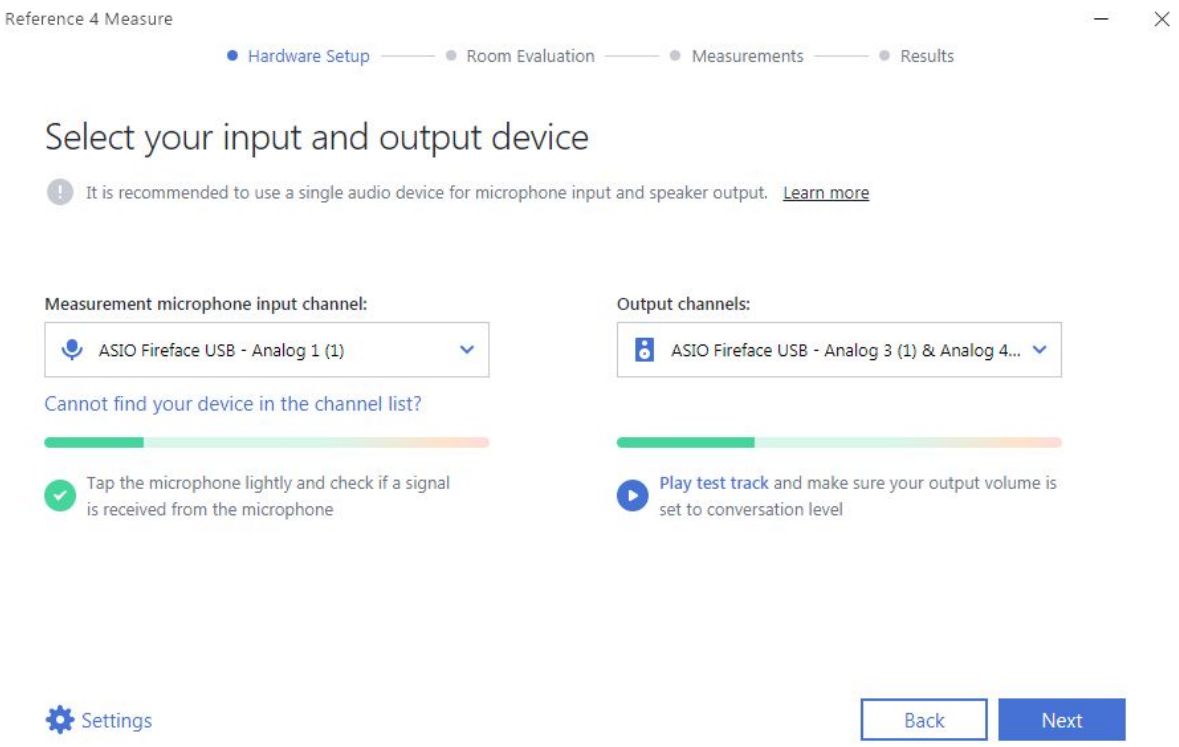




You can consult our FAQ on how to properly format the .txt file, or, you can always reach out to our support.

CONTINUE WITHOUT PROFILE - select this if the microphone you are going to use does not come with a calibration profile. This option will assume that the microphone you will be using does not have any dips and peaks in its' frequency response, so your speaker calibration results might vary from the actual situation and our support staff won't be able to consult you on the results.

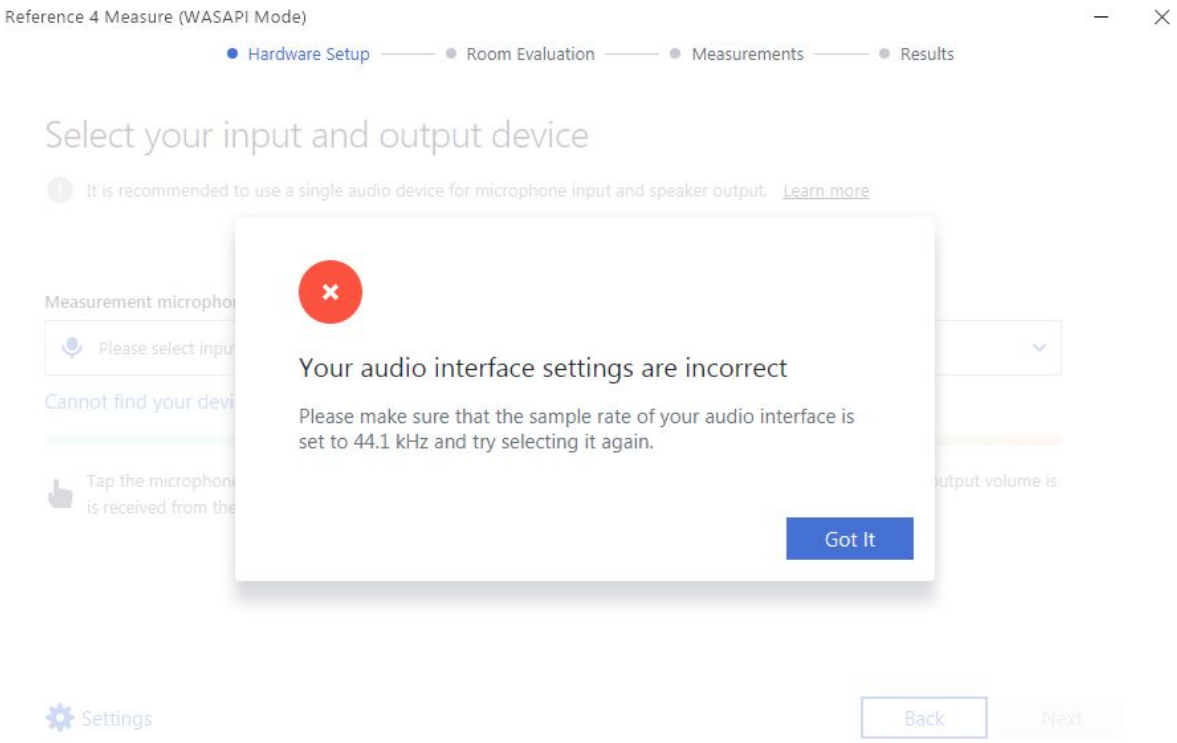




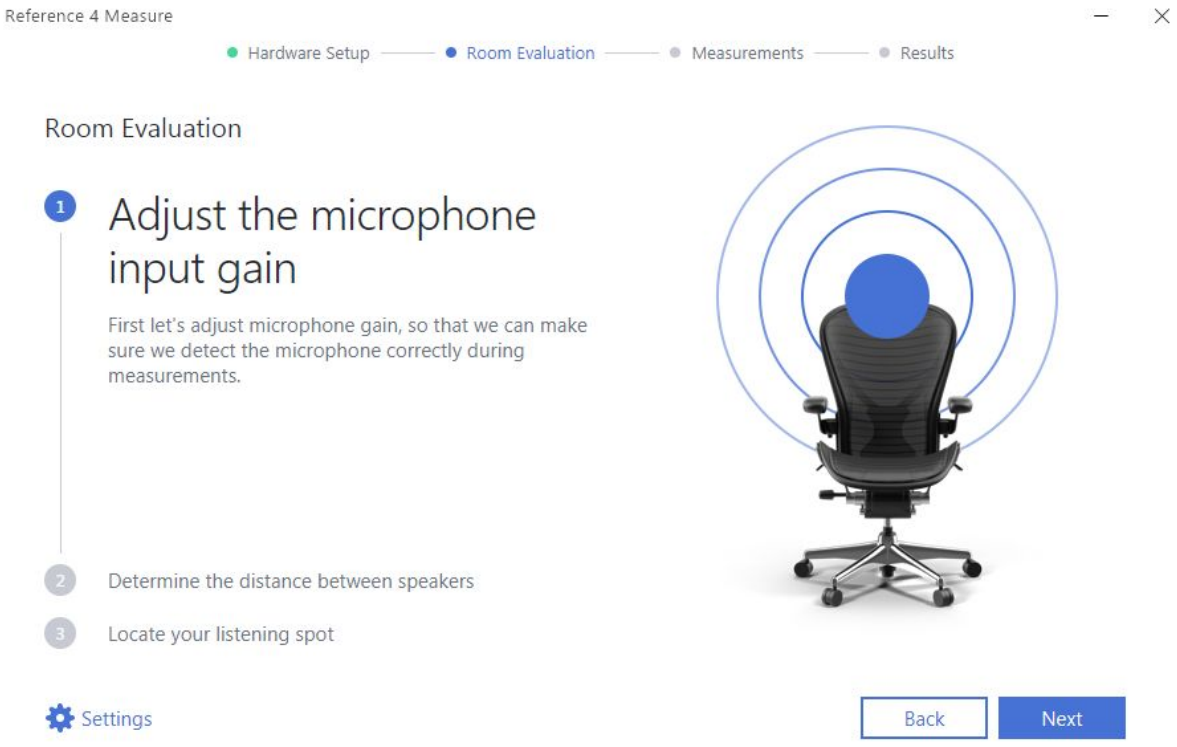
In this step, you'll be required to select your input and output channels of your audio interface. Note, that it's highly recommended to use a single device for both input and output to minimize the risk of incomplete measuring process. When devices are selected, tap lightly on the microphone to let software know that a signal is flowing through the selected input channel. Click "Play test track" to make sure that the correct output device is selected. Pay close attention to the test signal and ensure that Left and Right speaker audio indicators are coming through the correct speaker.

Remember, if you're using Sonarworks XREF 20 measurement microphone (or any condenser microphone), it requires a +48V phantom power to work.

To ensure that our software can do all of the calculations correctly, it is important to set and lock your audio interface to 44.1kHz sample rate. In Reference 4.1 Measure software, ASIO mode (default application settings) will do this for you. After the measuring process is done, you can then switch back to any sample rate that you prefer.

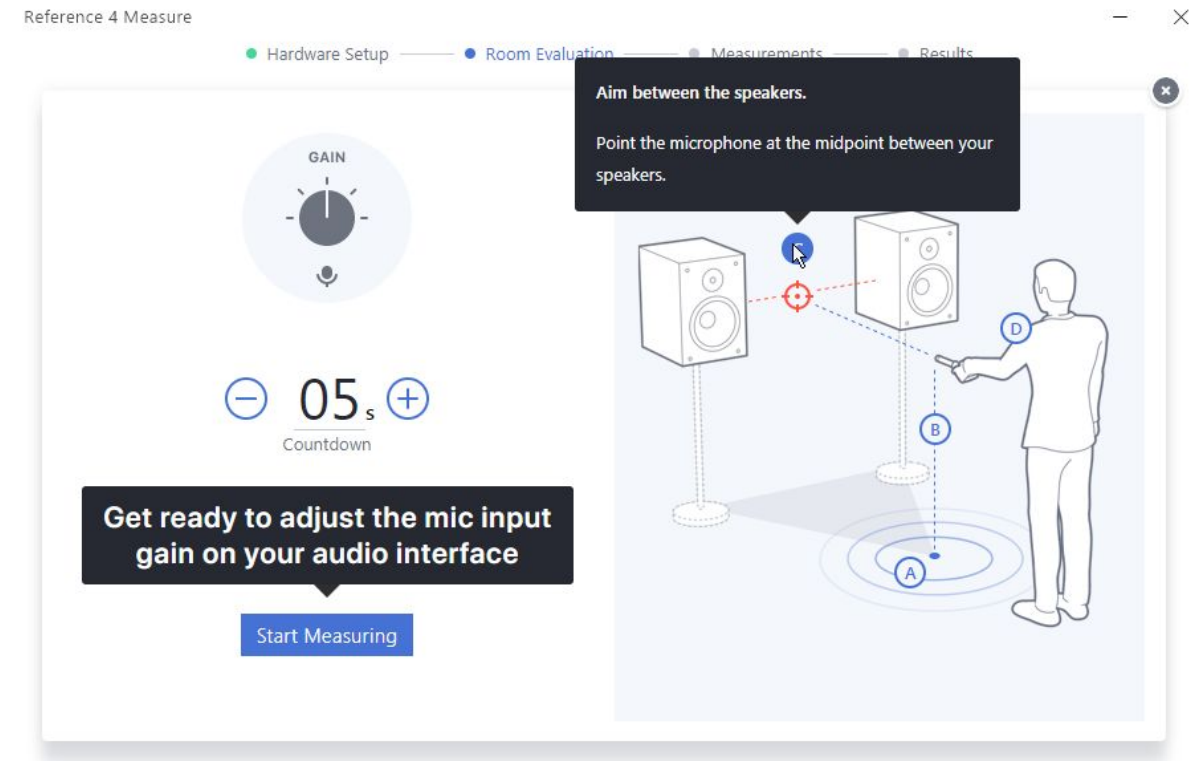


If you are running the software in WASAPI Mode and your audio device is not set to the 44.1kHz an error message will pop up. Please locate your audio device settings and change the sample rate in order to continue.



In this step you'll need to adjust the gain knob on your audio device. If you find yourself maxing out the gain and not getting sufficient results, please go back to the previous step and increase the volume of your device. Please make sure your set-up does not produce any feedback by the microphone input being routed directly to your speaker outputs on your audio device.

If you've kept tutorials enabled, after clicking "Next" an onboarding will be shown, explaining how to hold the measurement microphone correctly and you'll also be able to hear the signals used in this step.

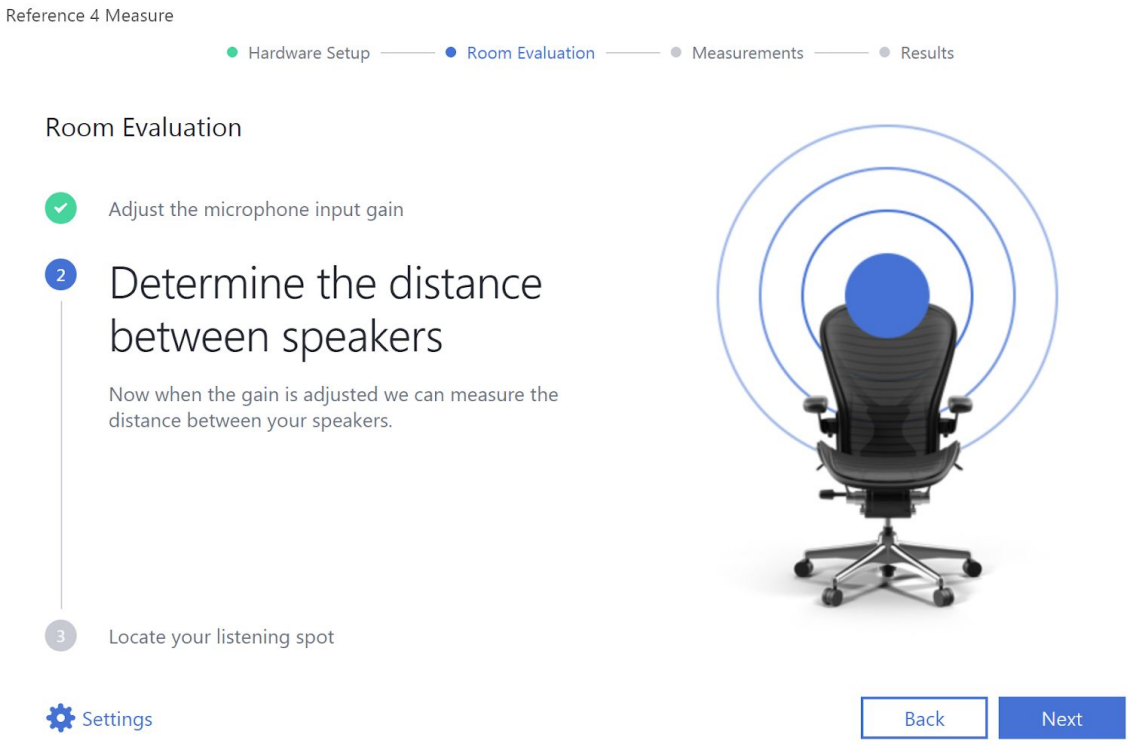


The number of seconds displayed next to the blue button fine-tunes the time frame before the software starts capturing the incoming data - adjust this accordingly to allow yourself the time to place the microphone at the starting location. This feature will also be available for the next steps throughout the measurement process.

After you've clicked "Start Measuring", you'll be asked to adjust microphone gain until the software confirms the optimal level.

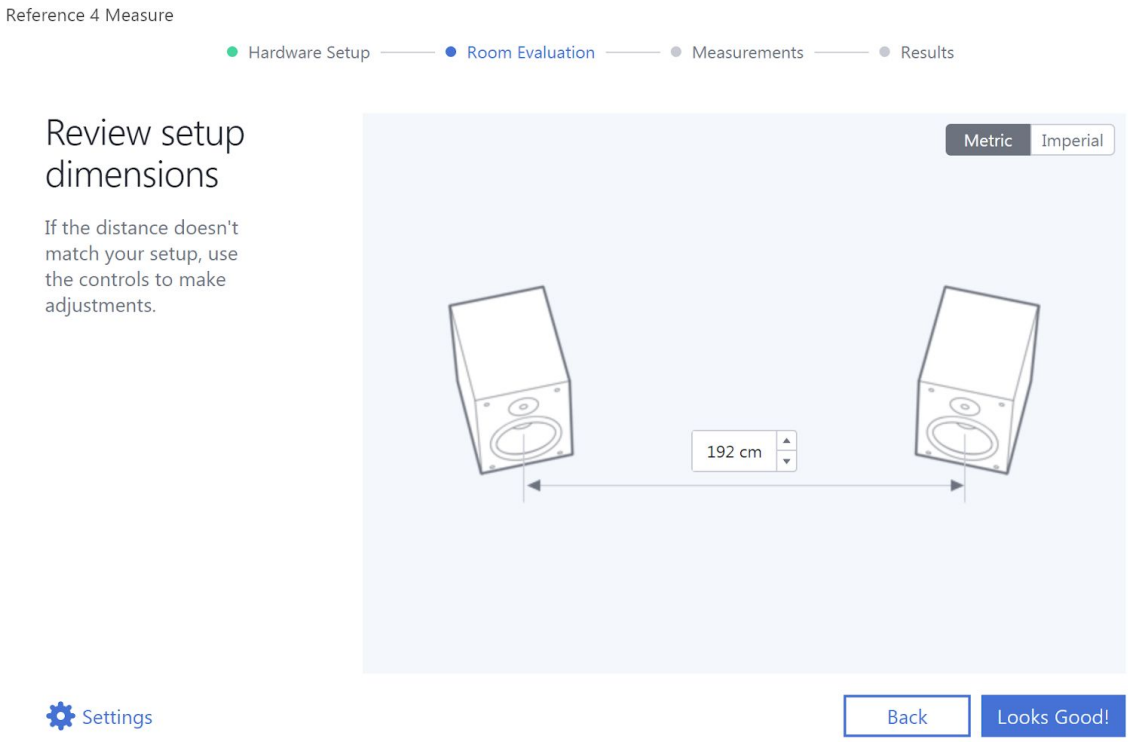
Check if you can minimize any noise in the room by switching off any adjacent trivial electronics, standalone non-relevant sound sources or removing physical objects placed temporarily into the acoustic space that might resonate or cause additional reverberation.

If a “**High noise levels detected**” error message is displayed after lowering external noises, increase the speaker playback volume and decrease the microphone sensitivity level. Be careful when you do this, since it is possible to damage your speakers if you turn up the volume too much. Look for balance between microphone gain and speaker volume. The measurements are not SPL-dependent.
Once the optimal balance between microphone gain and speaker volume is found, a verification process will start. Hold still while it finishes.



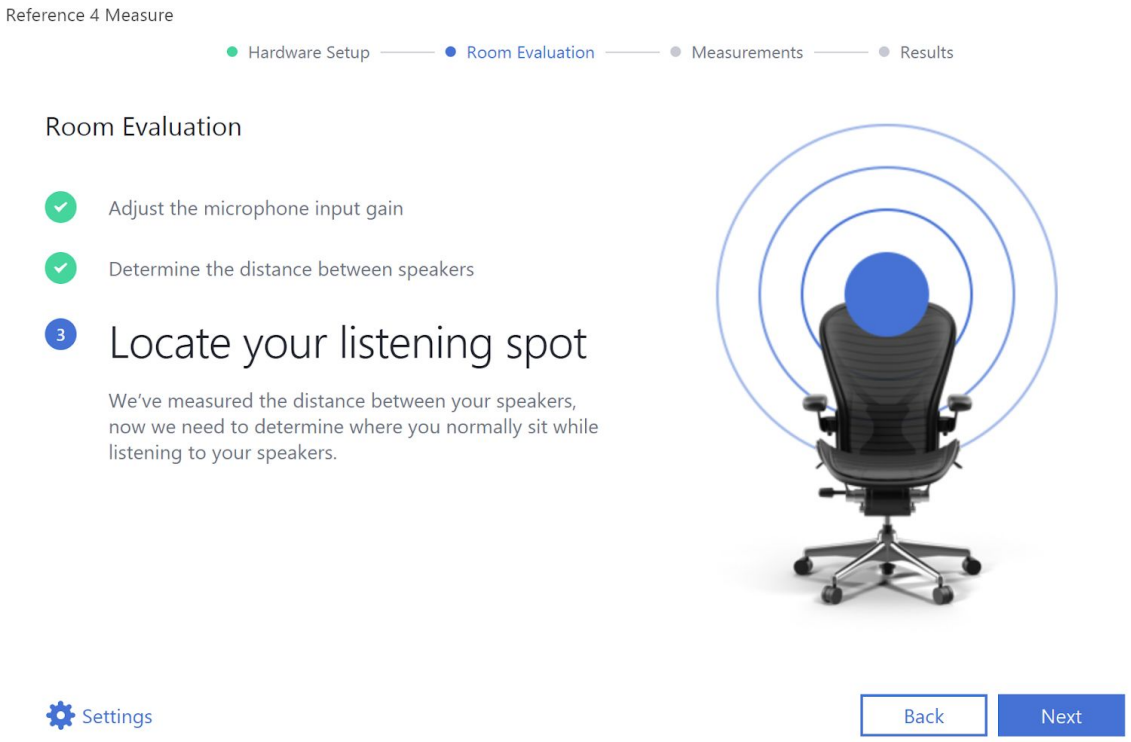
Follow the instructions on screen.
In the following two steps the software will measure the distance between your speakers.

Note: Place the microphone at a distance of no more than 5 cm (2 inches) from the main speaker driver. If 3-way or 4-way monitors are measured, hold the microphone close to the midrange driver which is “inside” on the horizontal plane. It is not necessary to use a microphone stand.
Avoid standing between speakers as this might compromise the results.

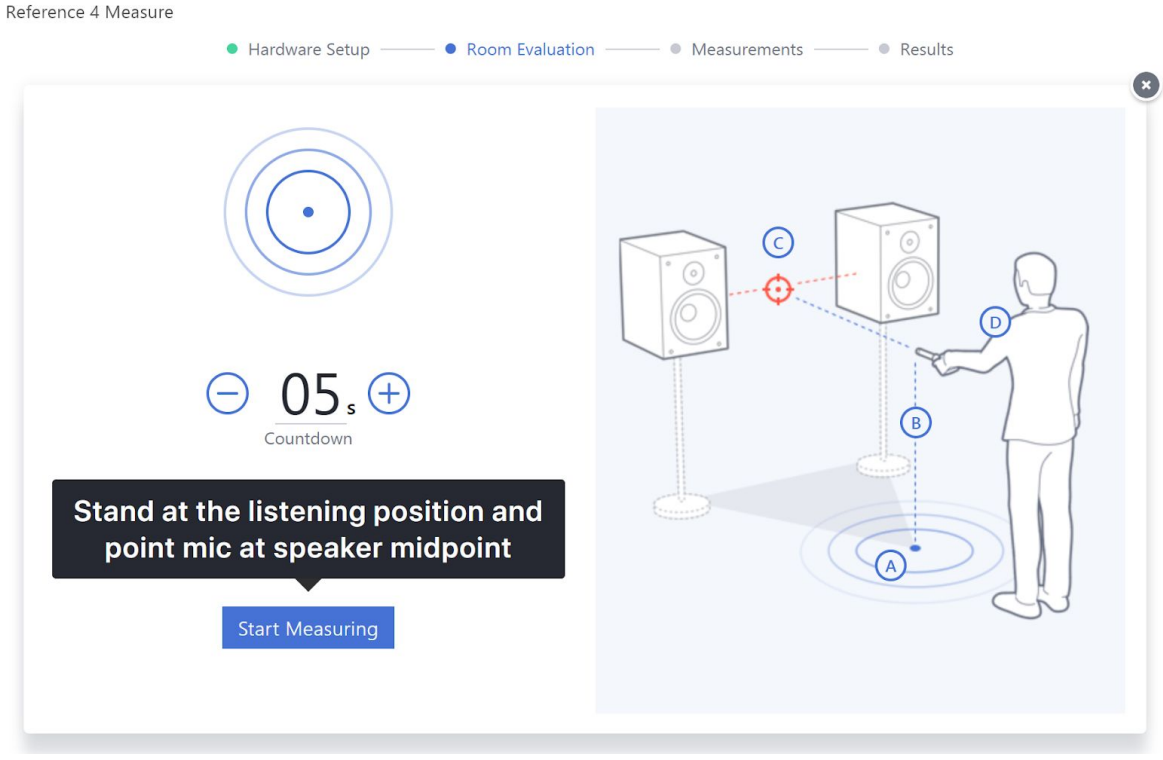


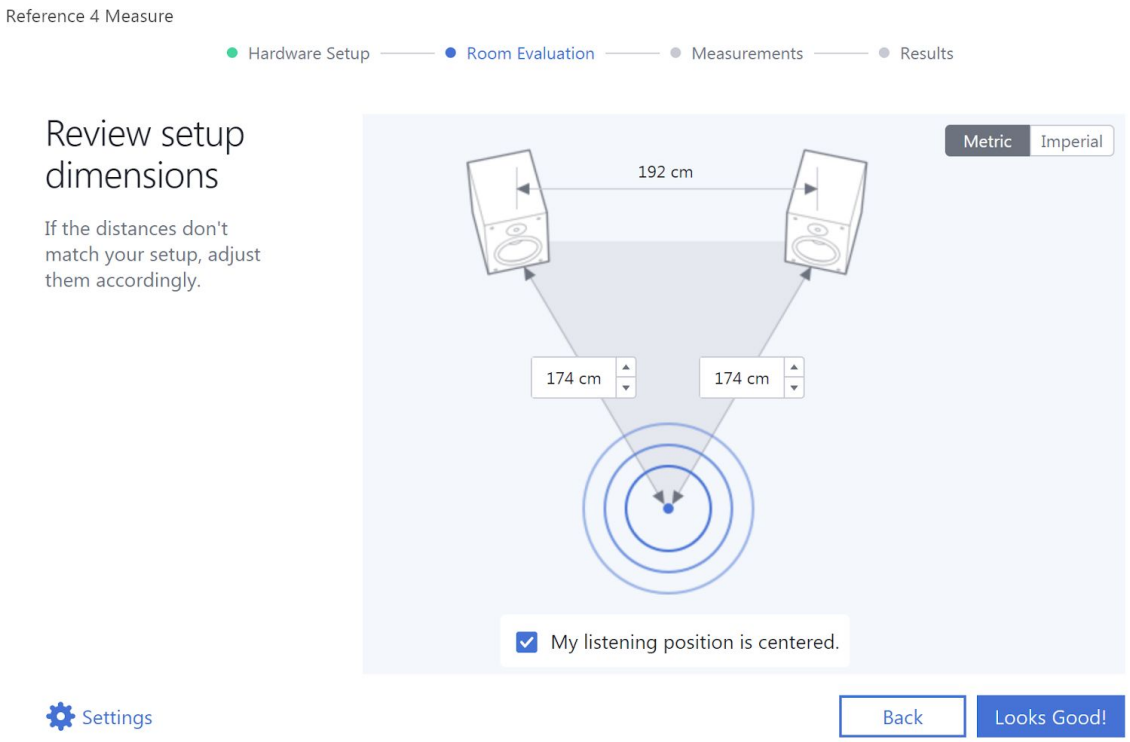
After completing the measurements for each speaker, the calculated distance between the speakers is shown. Here you can easily switch between metric and imperial system.

In some rooms due to unordinary reflections the distance is not measured with sufficient precision. You can adjust the distance in the software to match the actual distance between your speakers. If the deviation from actuality differs by more than 15 cm / 6 inches, it is recommended to repeat the previous step. Make sure any direct monitoring is turned off (your microphone input isn't routed directly to your audio interfaces' outputs), and your audio interface sample rate is set to 44.1 kHz. You can also switch between Imperial and Metric systems, to suit your preference.



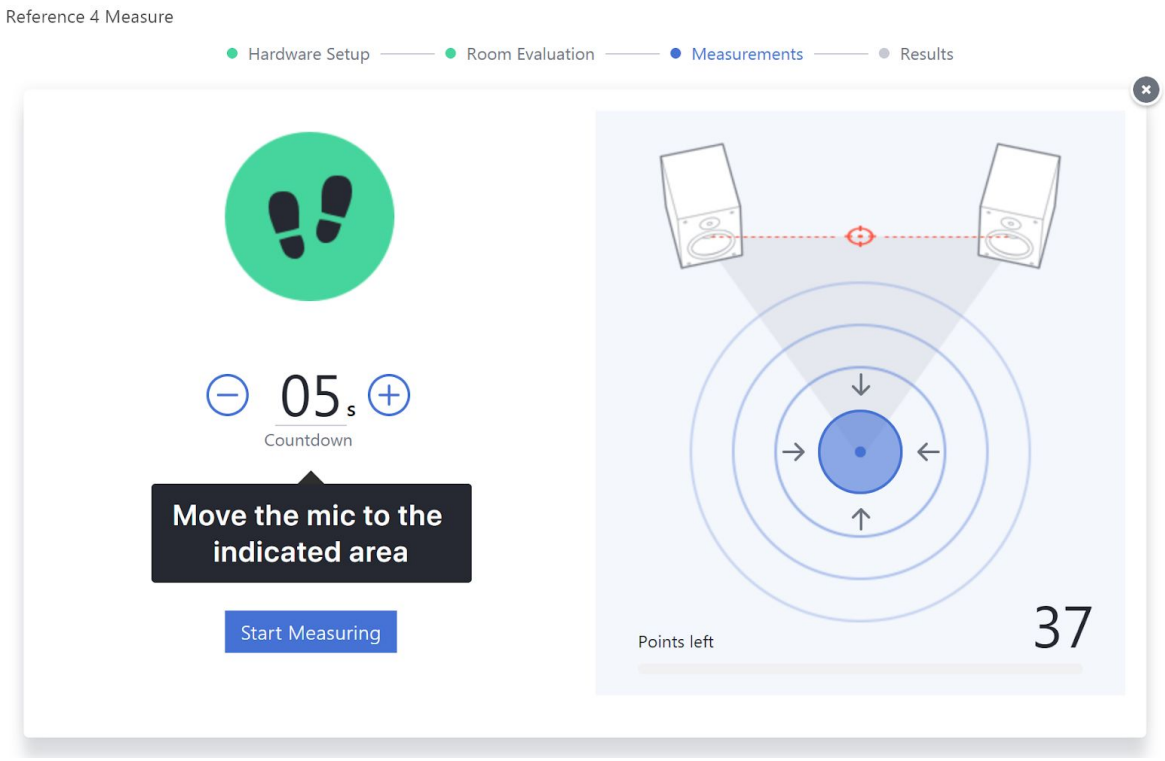
Listening Spot - In this step the software digitally positions the sweet spot in your room relative to the speaker placement. This is the desired region in your room where the sound requires calibration. This means you will need to hold the microphone at ear height (assuming seated position) around your listening position.





You can consider fine-tuning of the measured positions of the speakers under test and the user's listening position. If the imprecision is more than 15 cm / 6 inches, then it is recommended to either repeat this step or manually match the distances to the actuality.

MY LISTENING SPOT IS CENTERED - by default the software assumes your listening spot is centered between your speakers. If this is not the case and your listening spot is not centered, uncheck this box and adjust the position manually.

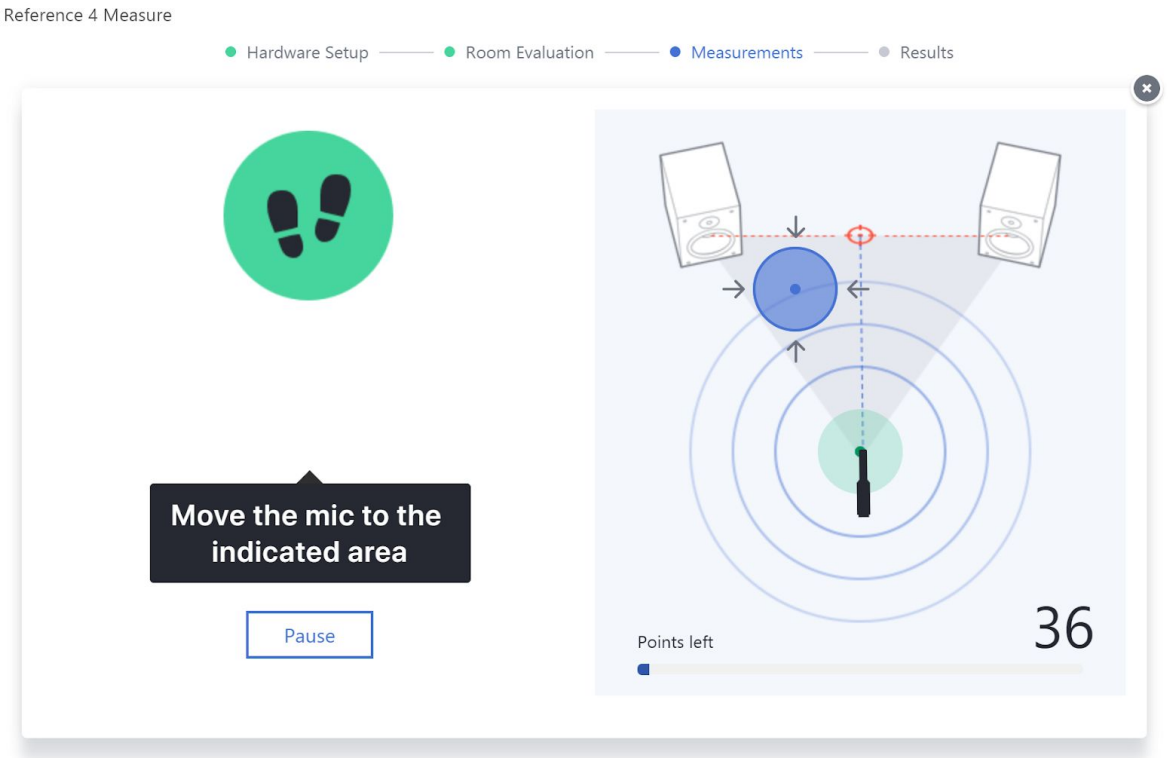


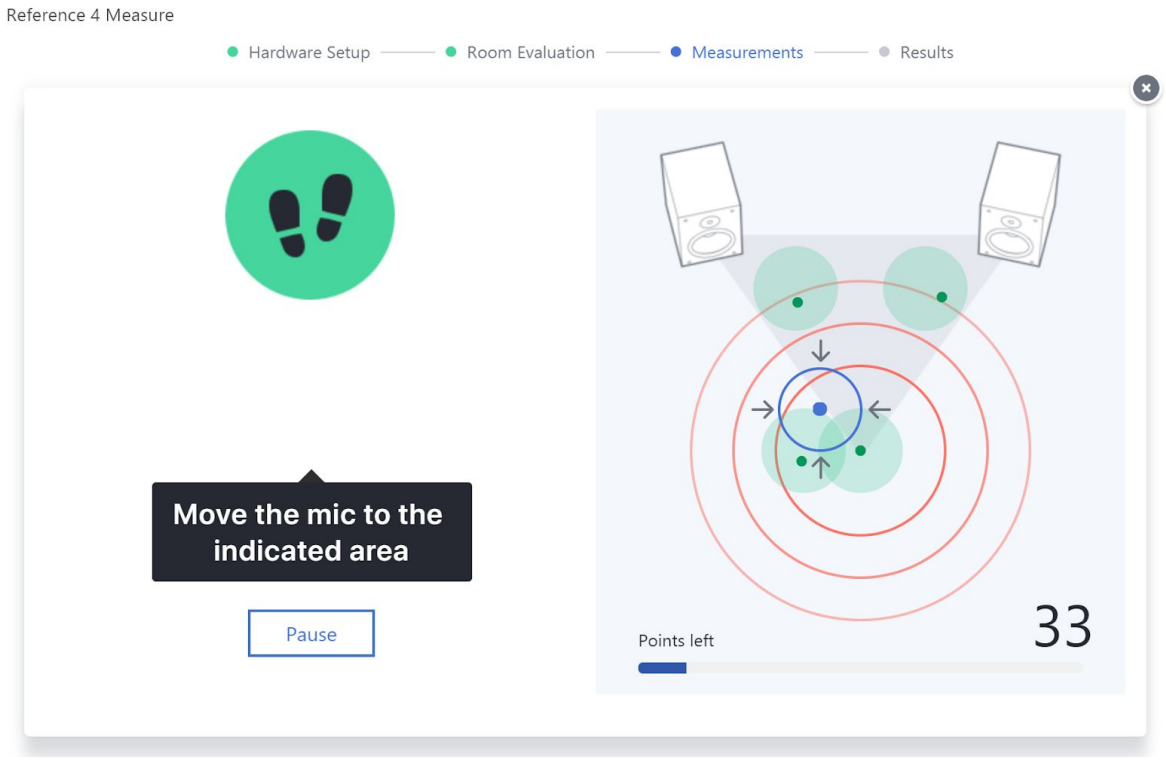
Points left - This counter shows how many more measurements you need to make to complete the calibration process. A total of 37 measurements are required for the generation of a calibration profile.

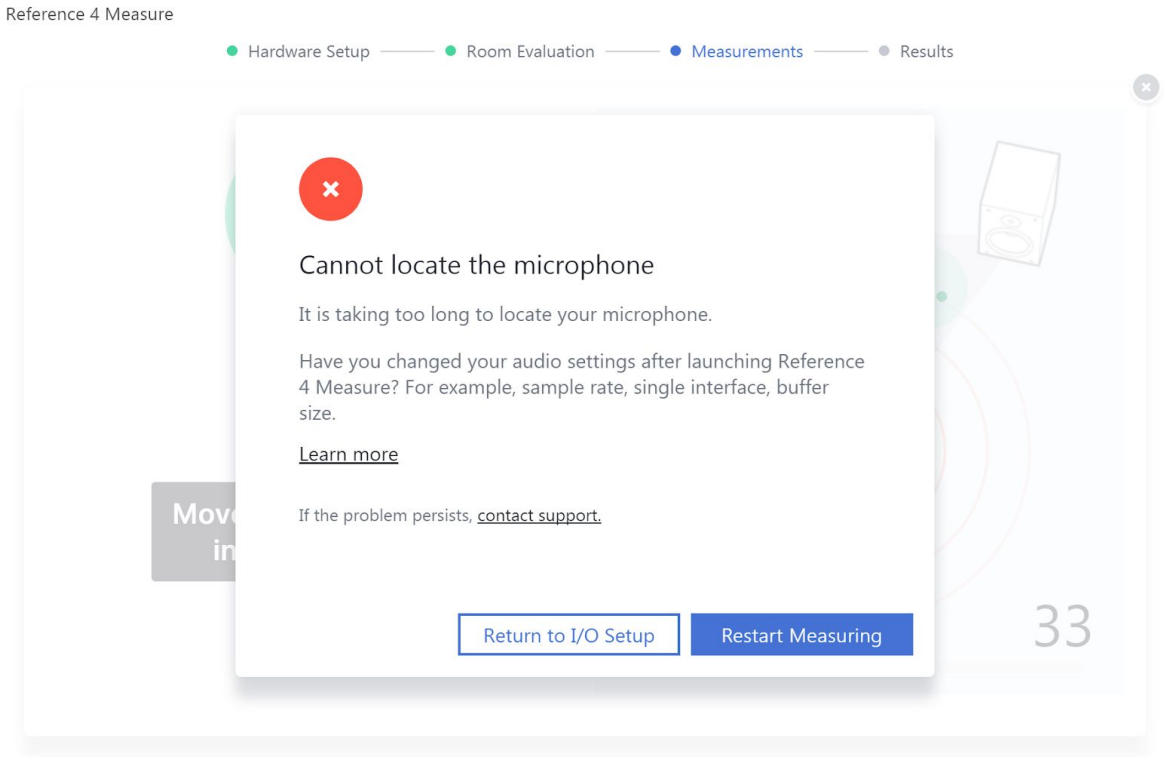
It is not necessary to use a microphone stand to make measurements but holding the microphone very close to your body can affect the result in the mid-range around 300 Hz. Make sure your arm is at least semi-extended.

The blue circle around the area represents the spot where measurements will be made. A microphone icon will appear within the area which will guide you on the microphone placement during a particular measurement. A successful measurement will be marked with a green circle

.





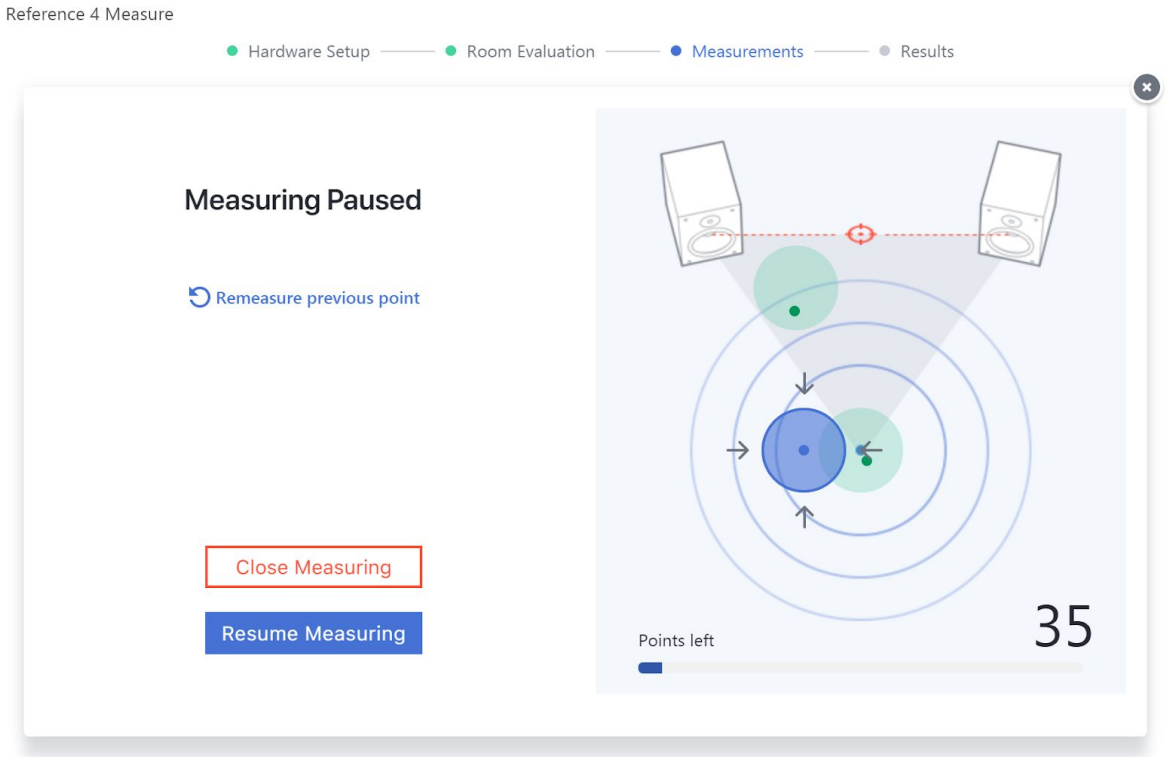


Should the software fail to locate the microphone within the measurement area (indicated by grid circles turning red), a “Cannot locate the microphone” error will pop up. If this occurs, gently shift the position of the mic around the room, and restart measuring process so that

the software can detect it and re-calibrate itself relative to the microphones' new position. This will also offer some suggestions and a quick way to get back to the Input/Output section.

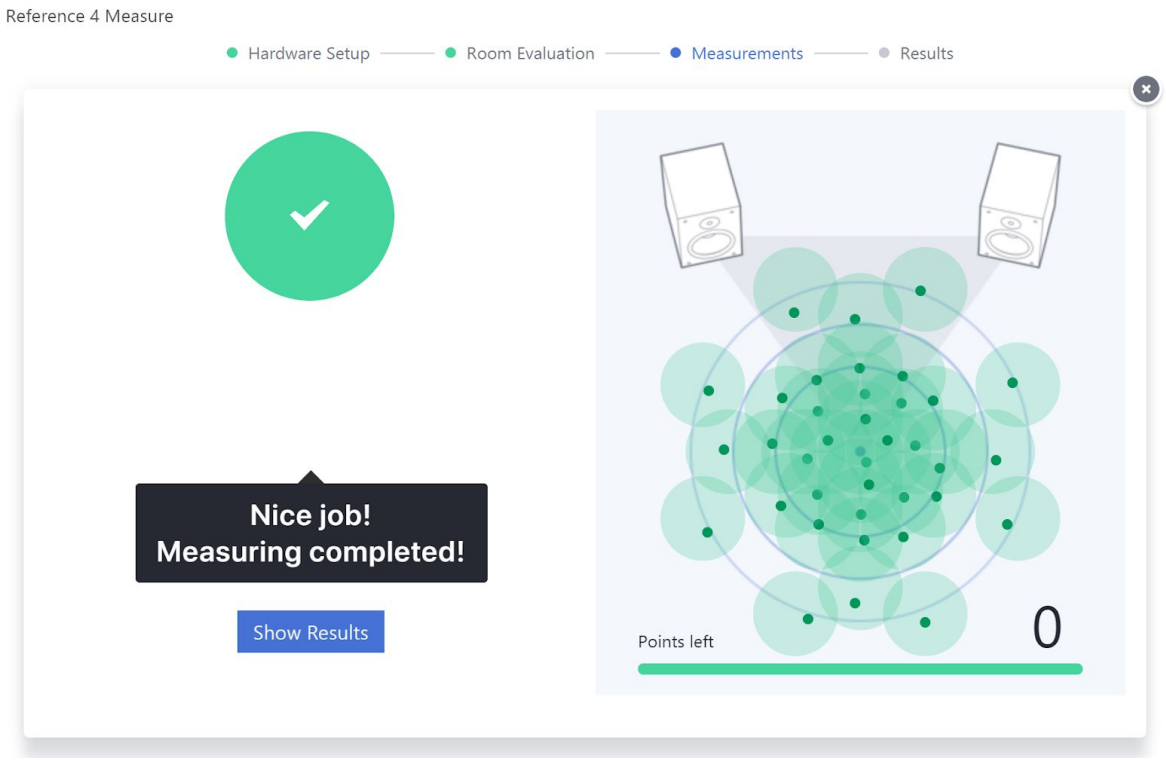
High noise measurements will be automatically detected and removed, indicating the measurement point in red. Do not worry, since the software will ask you to repeat the measurement in the failed point.

The Pause button pauses the measurement process.

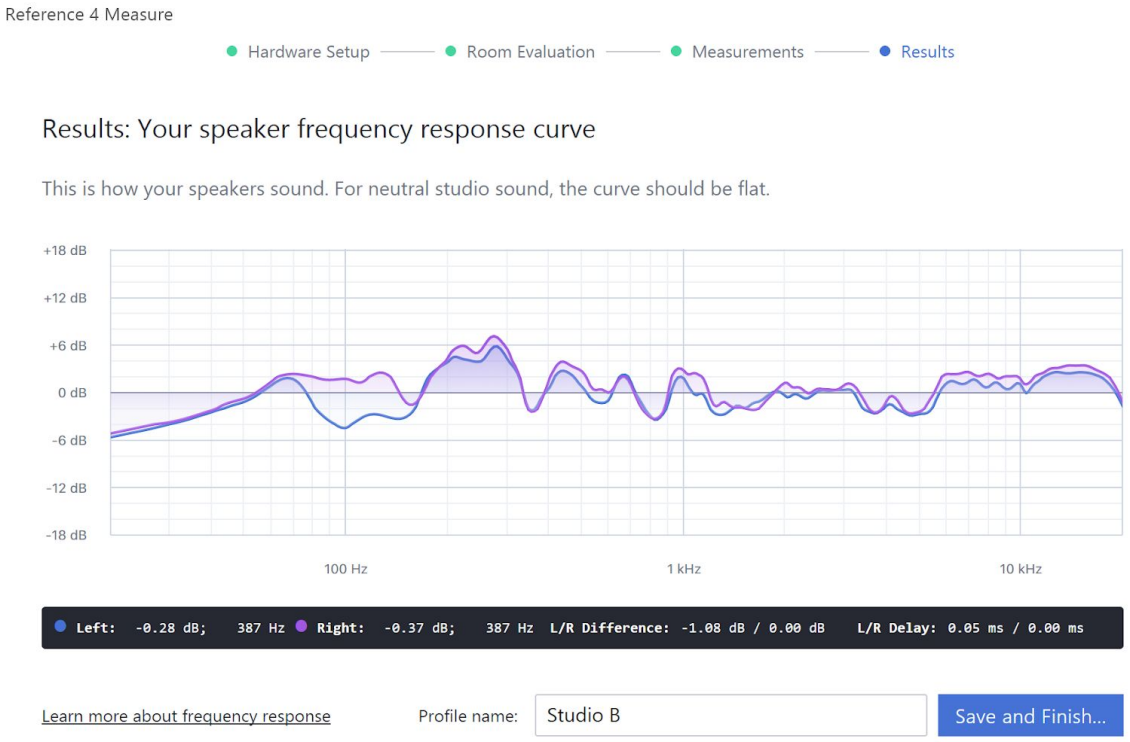


REMEASURE PREVIOUS POINT - if you believe that the software captured previous point too early, you can remeasure it again.
CLOSE MEASURING - if you wish to cancel measuring process, click this button.

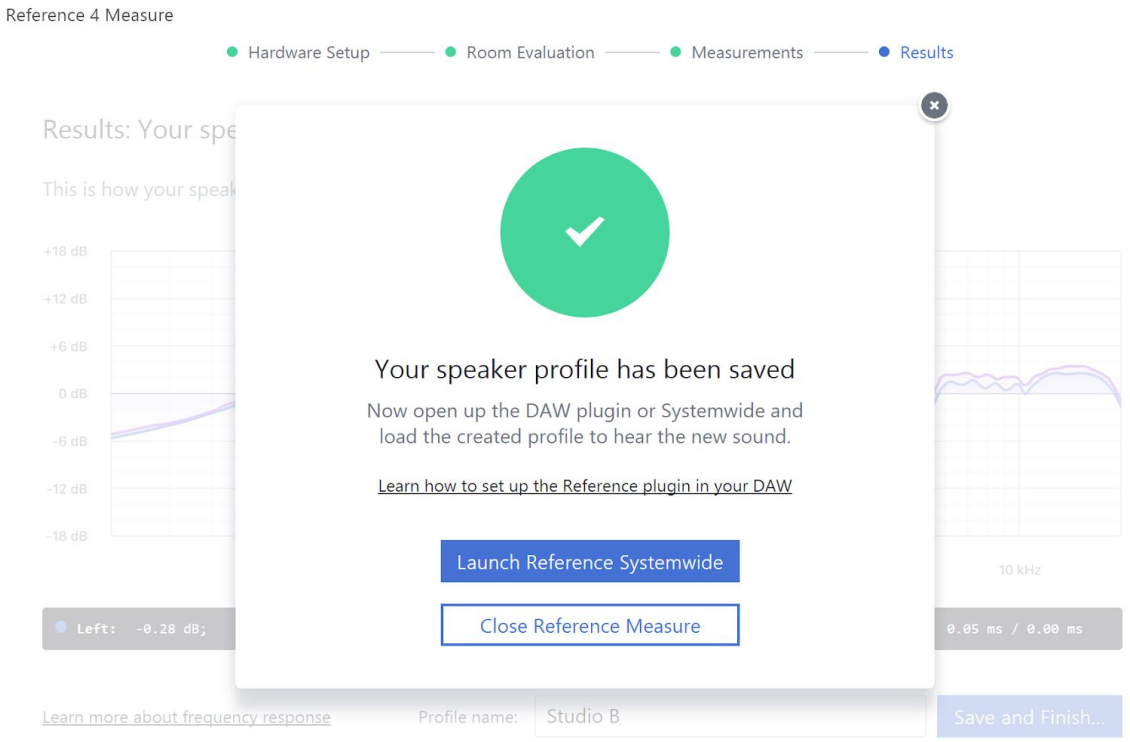
RESUME MEASURING - lets you return to the measuring process at any time.



Once the measurement process is done, you'll be able to review the results. With the new update to Reference 4.1, you'll be able to interact with the frequency graph and it now enables you to inspect closely specific frequencies and their level for both left and right channels. This will allow you to make informative decisions, should you want to adjust your acoustic treatment or speaker position.



SAVE AND FINISH... - Store your calibration project to use it within the plugin. It is recommended to use the default ‘Sonarworks Projects’ folder suggested by the software.



LAUNCH REFERENCE SYSTEMWIDE - you can start using your created profile right away by launching Systemwide.

3. Using Reference DAW Plugin

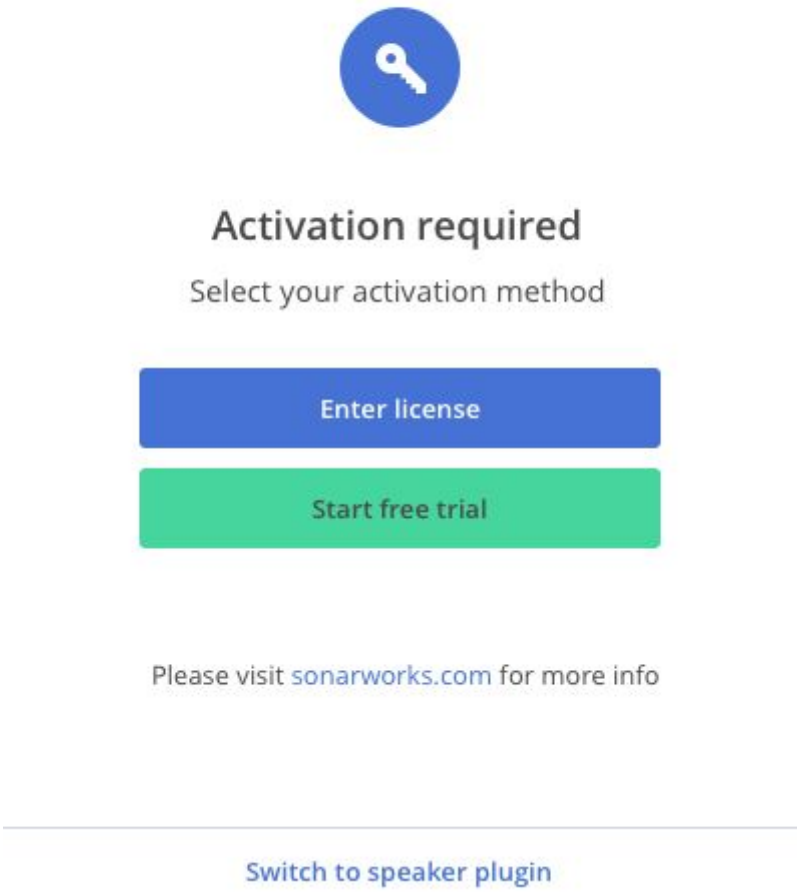
Installation overview

Upon successful installation of the Sonarworks plugin (available at sonarworks.com/downloads), it should be accessible through your DAW. If not, please make sure that your DAW is scanning for plugins where Reference 4 is installed.

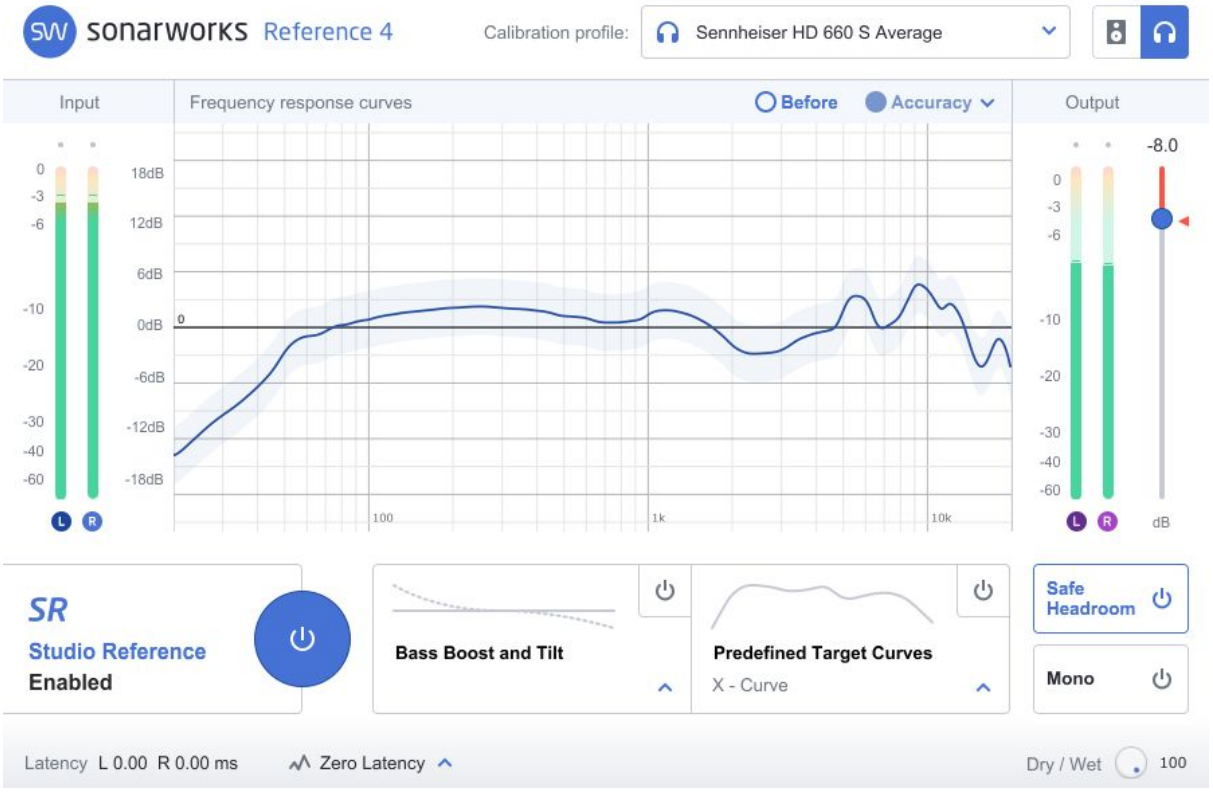
Windows:
C:/Program files/VSTPlugins/Sonarworks_Reference4_x64.dll
C:/Program files(x86)/VSTPlugins/Sonarworks_Reference4_x86.dll
C:/Users/user/AppData/Local/Sonarworks/Reference 4
C:/Program files(x86)/Common Files/Digidesign/DAE/Plug-Ins/Reference4.dmp
C:/Program files(x86)/Common Files/Digidesign/DAE/Plug-Ins/Reference4.dmp.rsr
C:/Program files(x86)/Common Files/Avid/Audio/Plug-Ins/Reference4.aaxplugin
C:/Program files/Common Files/Avid/Audio/Plug-Ins/Reference4.aaxplugin

Mac OS:
/Macintosh HD/Library/Audio/Plug-Ins/Components -> Sonarworks Reference 4 plugin.component
/Macintosh HD/Library/Application Support/Avid/Audio/Plug-Ins/Sonarworks Reference 4 plugin.aaxplugin
/Users/Username*/Sonarworks Projects/

Usage guidelines



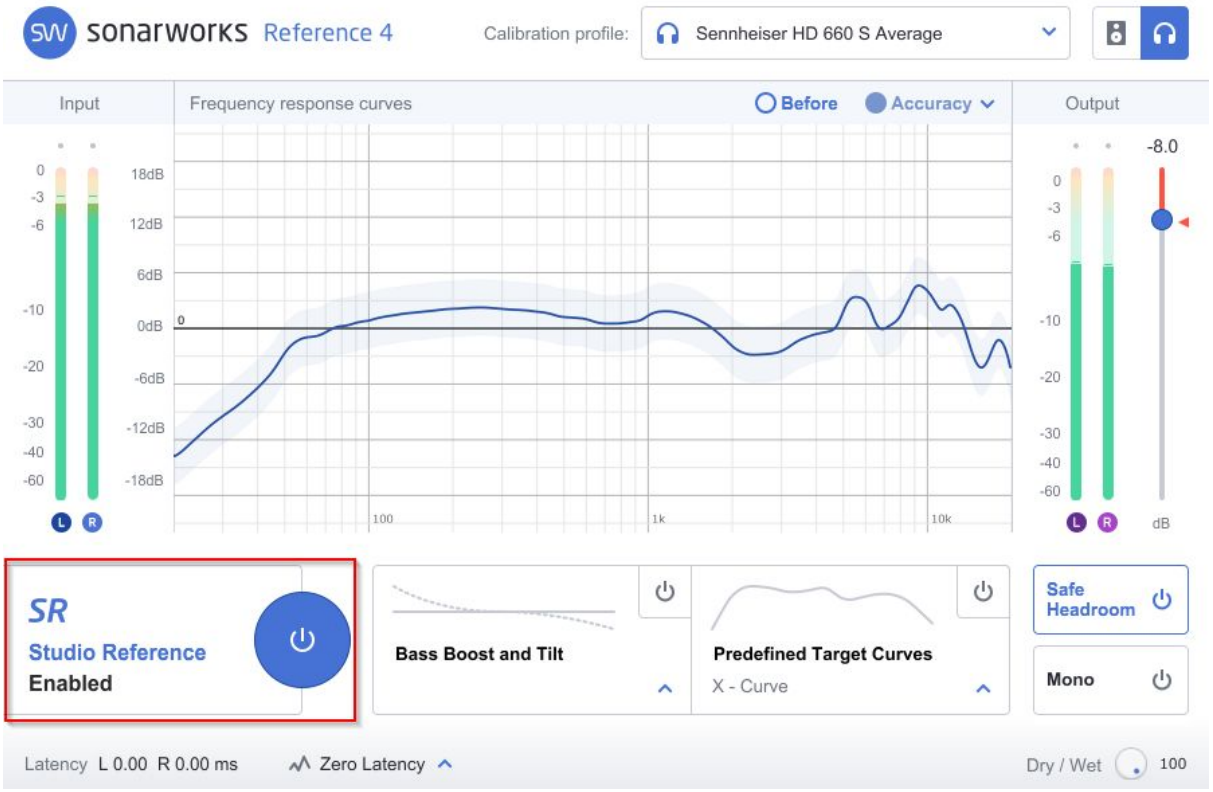
Before the plugin can be used, the user will be prompted for an activation key. Any purchased Sonarworks license should be available in the email sent upon the purchase. Use it to activate a trial license or full license.



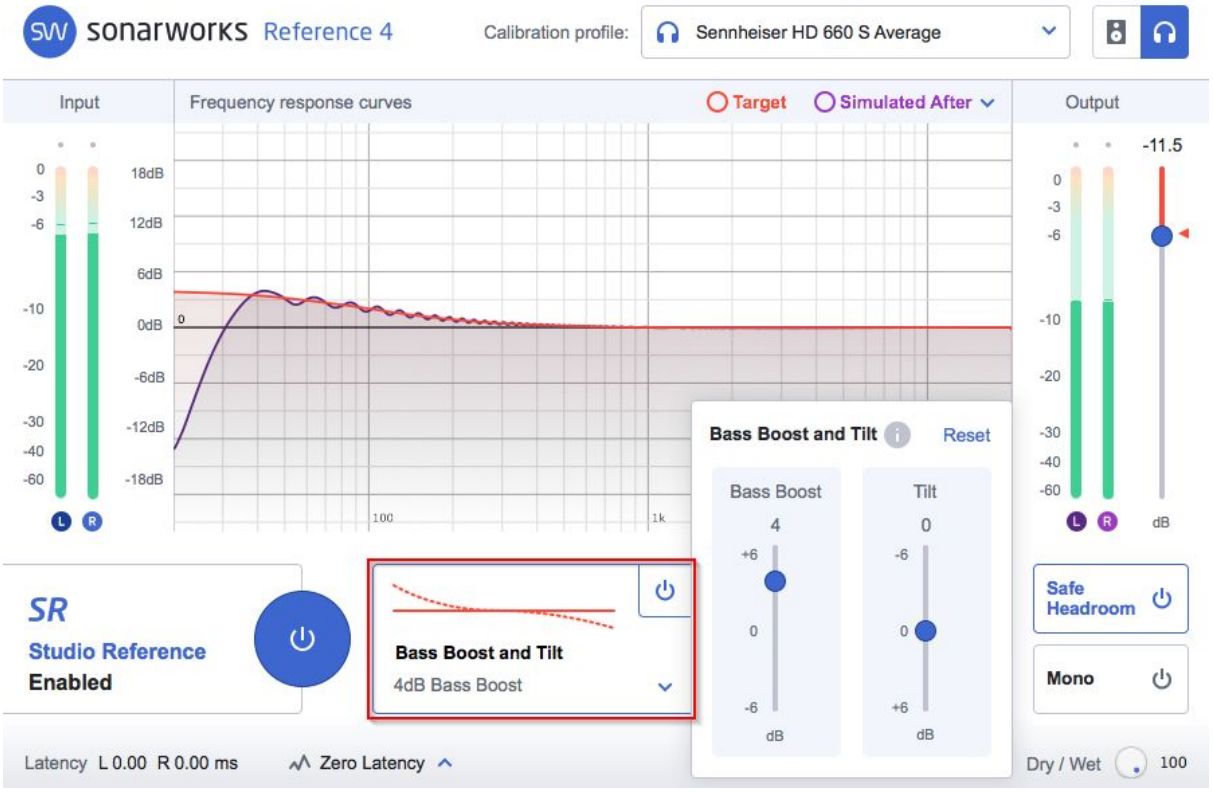
The Reference 4 plugin behaves as any other in a DAW environment. Be sure to put the plugin last in the master bus chain, so that no other audio production effects can interfere with the calibration curve. In order to load your desired profile, click on the “Calibration profile” field.

Important: Bypass plugin when rendering audio.
The plugin must be bypassed when exporting audio to be played back to any other device than your headphones or speakers. Otherwise the correction will be applied to the master mixdown which is undesirable and not what the software was designed to do. Correction is a part of YOUR speakers in YOUR room, not anyone else’s.
If you resample/render inside your DAW, pay attention whether the audio you're resampling is going through master bus, and if it is, remember to bypass the plugin.

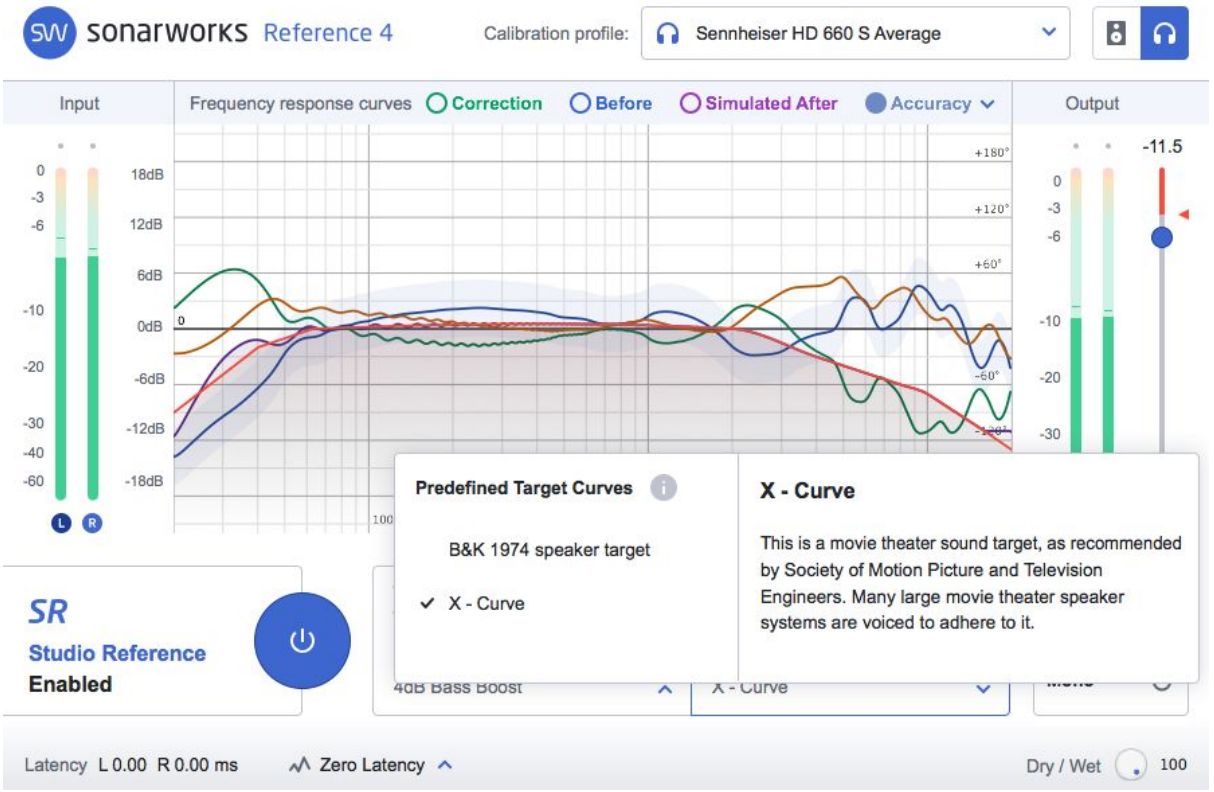
Plugin features



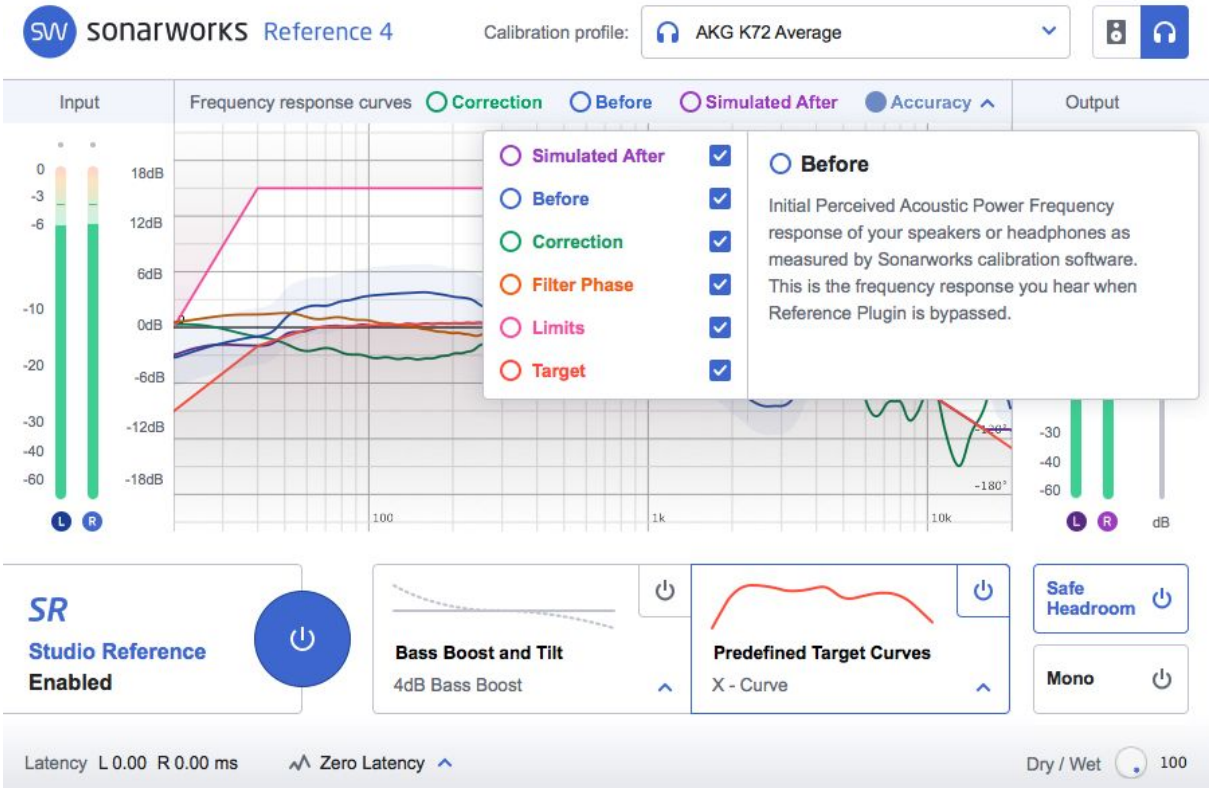
STUDIO REFERENCE - Enable or disable Studio Reference sound by clicking the blue button. This will either enable or disable calibration with any applied changes to the Studio Reference. Studio Reference (SR) is our flat sound target which ensures the most neutral listening experience. Bypassing SR will also bypass “Bass Boost and Tilt” and “Custom Targed Curves”.

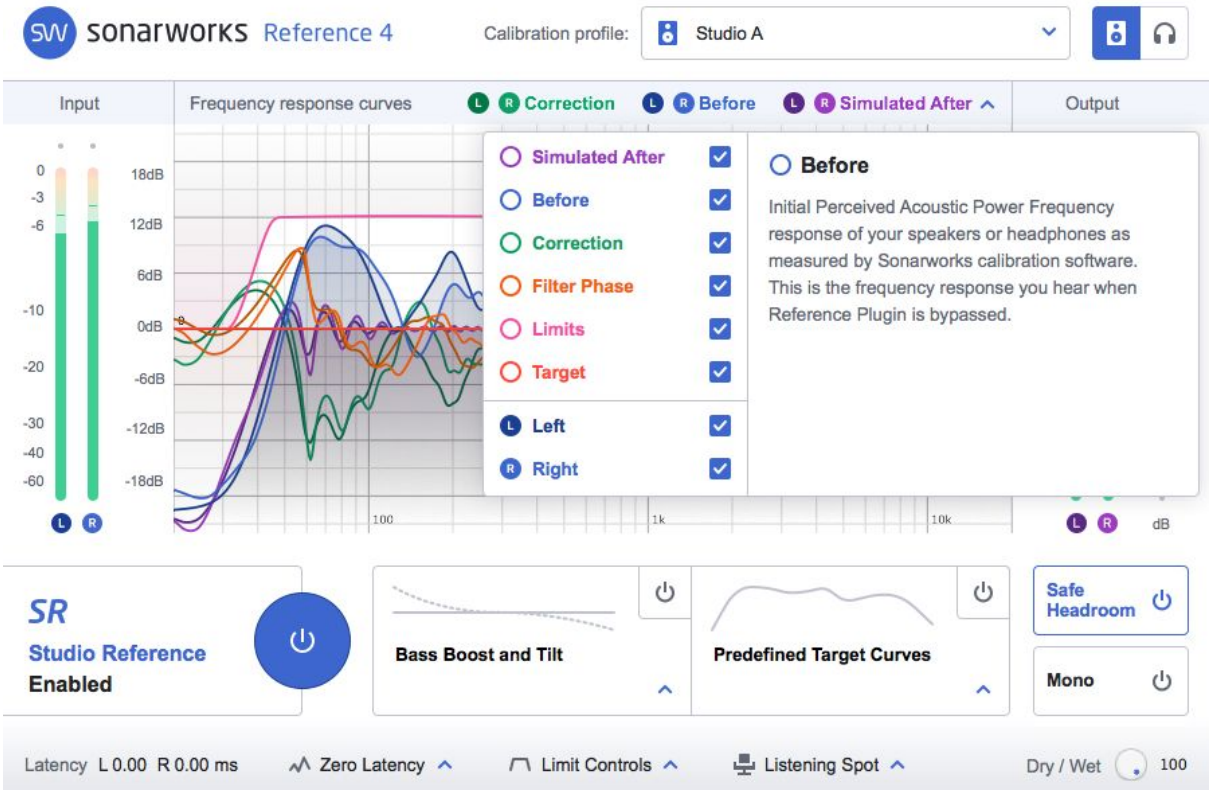


Enable Bass Boost and Tilt by clicking on the top right button and adjust the parameters to taste. This will apply very musical adjustments on top of the SR standard in order to tailor the sound to your preference.



Predefined Target Curves allows you to apply specifically designed, predefined target curves. This re-creates some of the more known suggested and optimal listening curves while being applied on top of a perfectly neutral initial sound signature.


sonarworks Reference 4
Calibration profile:
AKG K72 Average
Input
Frequency response curves
Correction
Before
Simulated After
Accuracy
Output
Simulated After
Before
Correction
Filter Phase
Limits
Target
Before
Initial Perceived Acoustic Power Frequency response of your speakers or headphones as measured by Sonarworks calibration software. This is the frequency response you hear when Reference Plugin is bypassed.
18dB
12dB
6dB
0dB
-6dB
-12dB
-18dB
100
1k
10k
dB
SR
Studio Reference
Enabled
Bass Boost and Tilt
4dB Bass Boost
Predefined Target Curves
X - Curve
Safe Headroom
Mono
Latency L 0.00 R 0.00 ms
Zero Latency
Dry / Wet
100


sonarworks Reference 4
Calibration profile:
Studio A
Input
Frequency response curves
Correction
Before
Simulated After
Output
Simulated After
Before
Correction
Filter Phase
Limits
Target
Left
Right
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-6dB
-12dB
-18dB
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1k
10k
dB
SR
Studio Reference
Enabled
Bass Boost and Tilt
Predefined Target Curves
Safe Headroom
Mono
Latency L 0.00 R 0.00 ms
Zero Latency
Limit Controls
Listening Spot
Dry / Wet
100

Frequency response curve graph

This graph shows useful information regarding the calibration. The state of the frequency response curve can be shown for both channels, both before and after correction, including representative graph of phase relationships and relevant differences between left and right drivers/speakers. For average profiles, these curves are shown in mono. Also, you can hover over the curve type to show a description of what it represents.

Dry / wet control

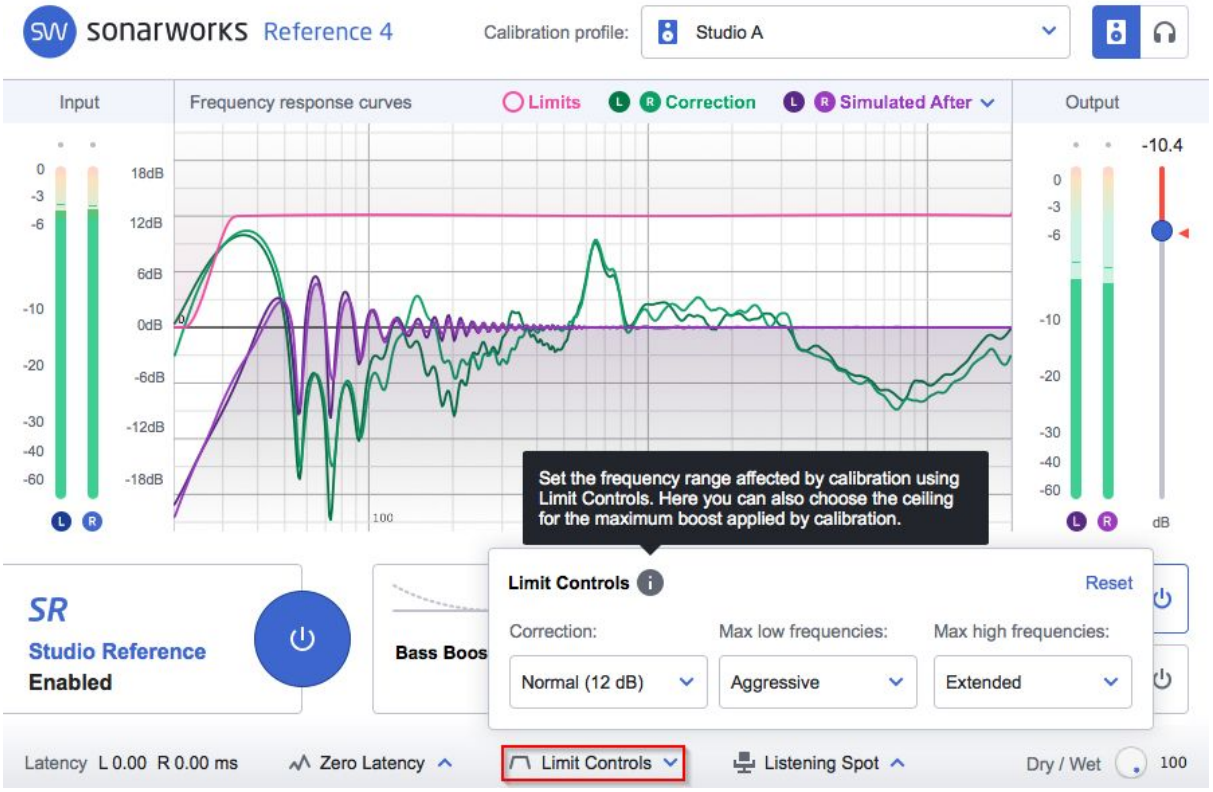
The Dry / Wet control lets you adjust the level of correction applied to the audio signal. Normally this should be set to 100% wet to ensure that the calibration is accurate. If you feel that the correction is too drastic for your needs, tweak this to your liking, but keep in mind that the calibration will get increasingly less accurate. Note that this is not a typical Dry / Wet mixer - the knob controls the “depth” of the correction. The core signal is always Wet, but the correction amount can be dynamically adjusted.

Advanced features

The **Zero Latency** mode ensures zero latency of the plugin, making it accessible for live tracking applications. As a trade-off, this setting increases CPU load and slightly changes the phase response of the signal, which is a natural property of minimum phase filters. (View the effect on phase response by enabling the "Filter phase" curve under the "Add" curves selector.) In most cases the phase shift is inaudible - the human brain simply tends to ignore the phase alterations in the signal. However, we recommend the user to decide for themselves the audibility of minimum phase filter artefacts by performing listening tests.

The **Linear Phase** setting guarantees linearity in phase response producing ~50 ms latency at 44.1 kHz sample rate. Most of the time this is the best setting to use when adjusting the overall spectral balance of your music.

Be aware that Linear mode can introduce pre-ringing artifacts in bass frequencies. This is hardly audible when listening to the overall spectral balance of a song, but when working on solo drum tracks, it is best to use the Zero Latency mode.



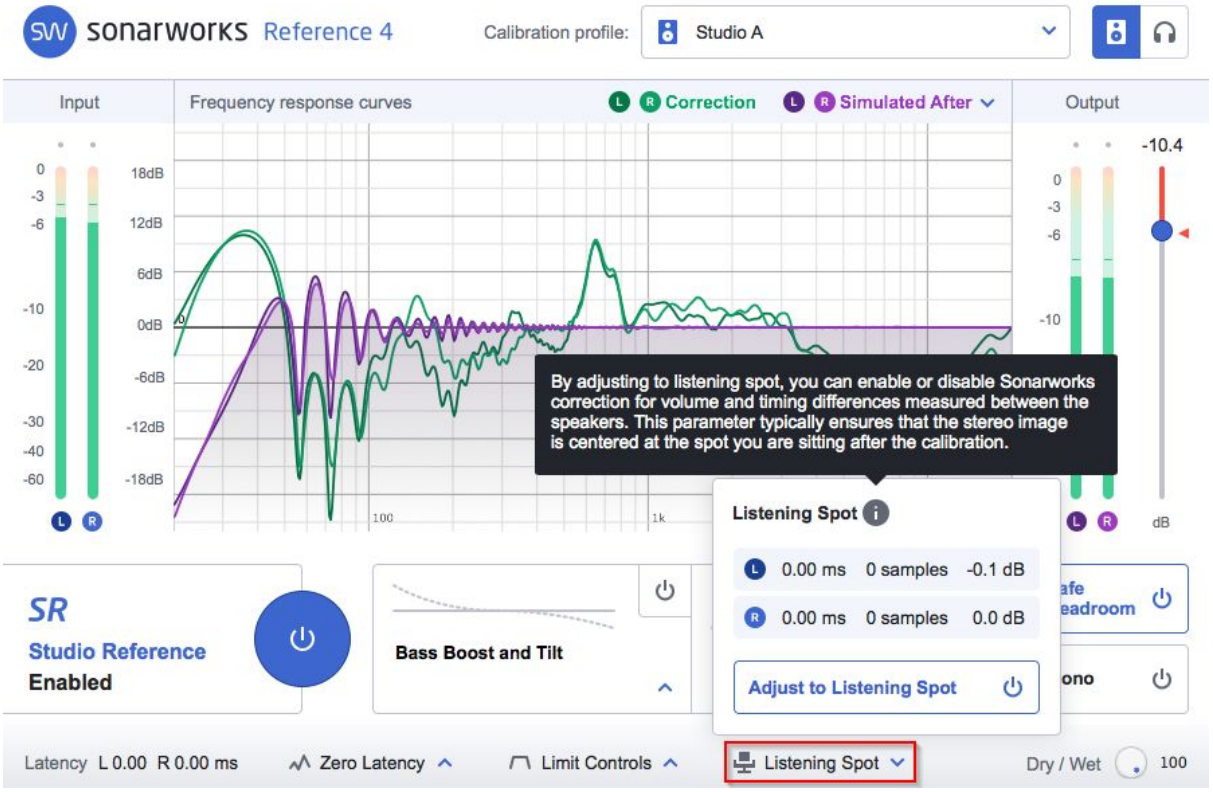
LIMIT CONTROLS (available with Speaker Calibration profiles) - Limit Controls allows you to control the amount by which Reference software is allowed to boost when correcting your speakers.

This can be controlled in three steps:

Correction - let's you decide the maximum boost value in dB

Max low frequencies - controls the low-cut point of the correction in order to avoid overloading drivers with excessive low-end boost. This control ranges from 27Hz up to 80Hz.

Max high frequencies - this will let you decide where the top end cut-off point will be located. Ranges from 16kHz all the way to flat.



LISTENING SPOT (available with Speaker Calibration profiles) - enables or disables Sonarworks detected differences in volume and timing between speakers. This ensures that the stereo image after the calibration is centered at the position you are sitting at.

SAFE HEADROOM - Marks and limits the output level at the highest peak in correction. E.g. if the software is required to boost something by 8.9dB, this means that the output will be brought down by the same amount in order to avoid potential clipping.

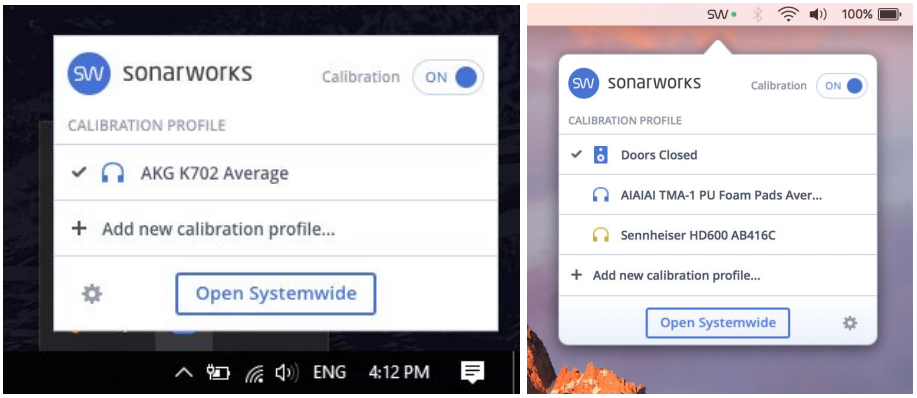
MONO - Allows you to quickly check your mix in mono for any phase cancelling or overall balance.

4. Using Reference Systemwide

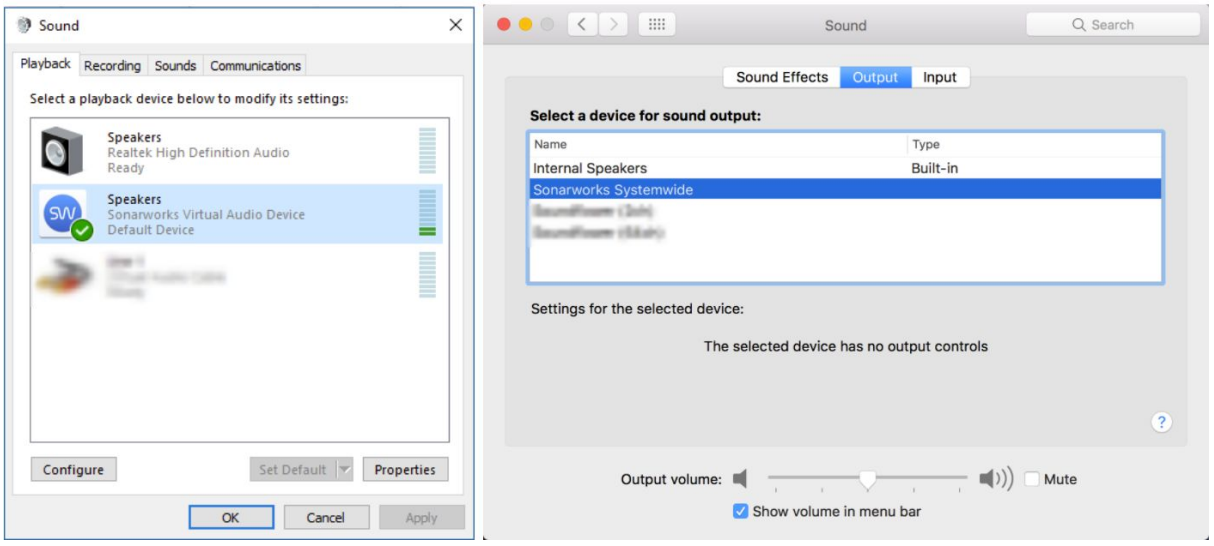
Enabling Reference Systemwide software installs a virtual audio driver on your device capable of calibrating all outgoing audio from your system. Achieving access to full power of Systemwide's functionality is carried out in 2 steps:

1. Installing the relevant software edition based on your license (available at http://www.sonarworks.com/reference/downloads)
2. Loading a calibration profile into the software either from the built-in profile library or adding an individual headphone or your room's calibration profile, if either are available to you.

Upon successful installation, Systemwide will be accessible from the taskbar on Windows and the menubar on Mac OS.

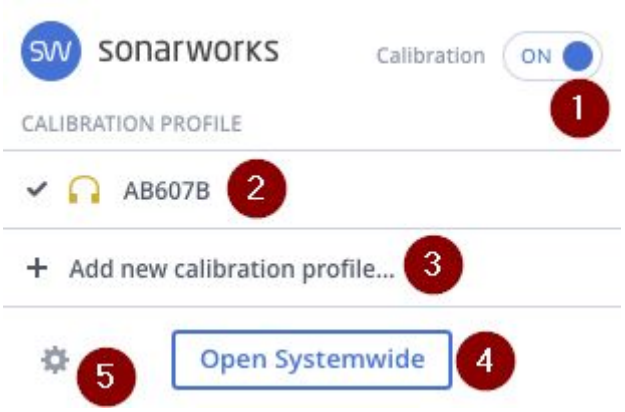


Also, the Sonarworks virtual sound driver will be available in your system sound preferences as an output device.



Systemwide quick-control menu

Left-clicking on the icon in the taskbar (Windows) or menubar (Mac OS) will open general controls to the Systemwide application. This view has 4 main functionalities:

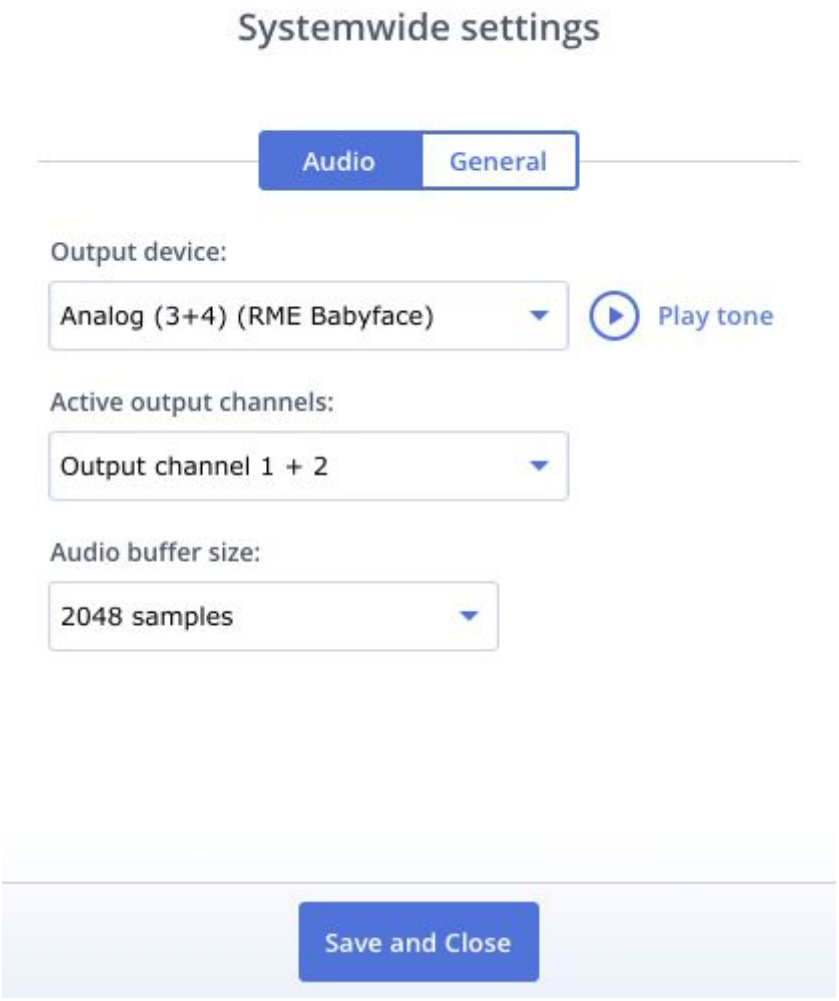


1. Turn **Calibration** on and off via toggle button on the top right-hand side.
2. Select or remove the desired **Calibration Profile** from a list of previously loaded profiles.
3. Add a new **Calibration Profile**.
4. Open the full Systemwide GUI by pressing the **Open Systemwide** button.
5. Access Systemwide **Settings** or **Quit** Systemwide by clicking the gear icon.

Systemwide settings

Split into two sections, ‘Audio’ and ‘General’, the settings menu provides access to the output device settings as well as controls for various Systemwide features.

Audio settings

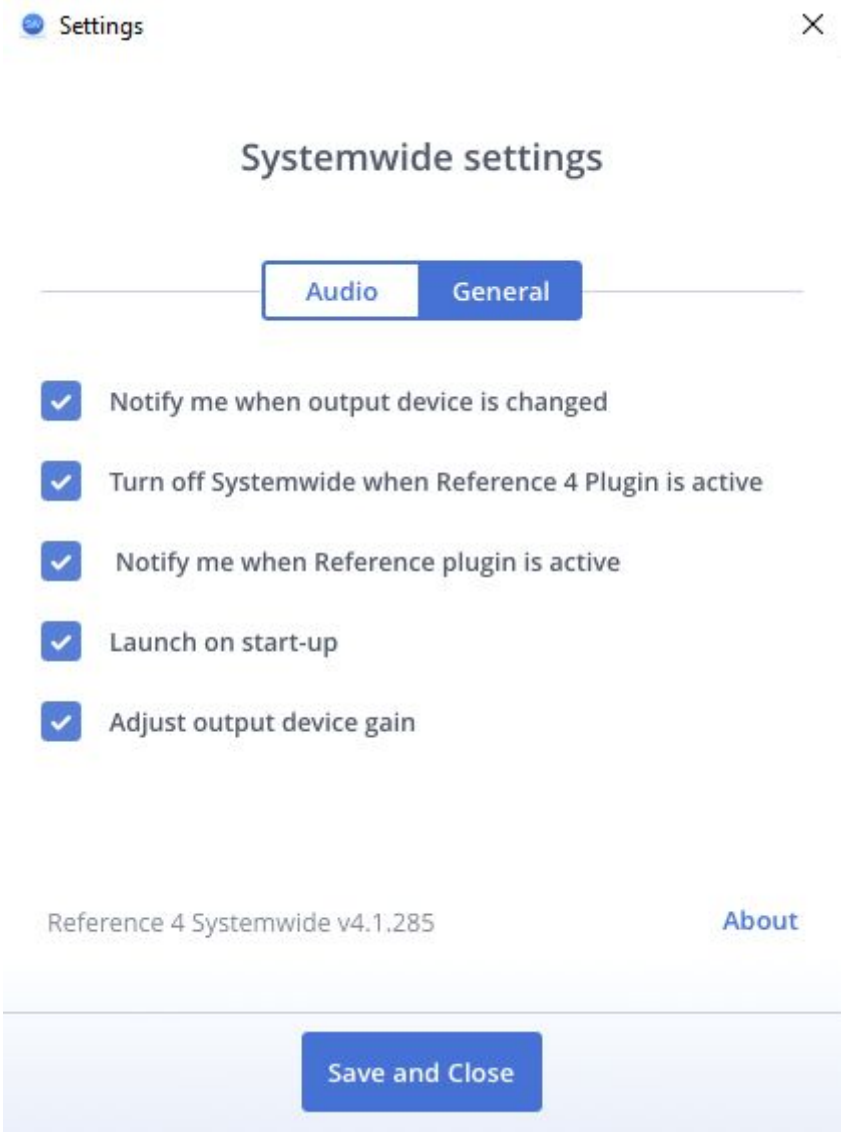


The **Output device** section allows for the selection of your system's audio output device. The drop-down menu will hold the list of output devices connected to and recognized by your system. The **Play tone** button triggers a test signal in each audio playback channel for you to ensure that the audio is routed properly through the Systemwide software and your sound will be calibrated. Make sure to set Systemwide as your default audio device in the OS sound settings.

If your system setup employs multiple audio channel outputs, use **Active output channels** dropdown menu to select the audio path you want to feed the calibrated signal through.

Audio buffer size menu allows adjusting the input buffer size to the software in the range of 32 samples to 2048 samples.

General settings



Notify me when output device is changed

A pop-up will appear when a new audio device is plugged into your system or an existing device is removed.

Turn off Systemwide when Reference 4 Plugin is active

Automatically bypass Systemwide when working in your DAW with the plugin enabled.

Notify me when Reference Plugin is active

Enables desktop notifications when Reference plugin is active while using Systemwide.

Launch on start-up

Automatically enable Systemwide calibration upon System start-up.

Adjust output device gain

This feature adjusts the output level of the Systemwide virtual output device to the current output level of the selected output device and sets the output device's output level to 100% (if possible). This removes the need to adjust two separate volume controls (i.e. that of the Systemwide virtual device and the physical output device) to get more volume out of your system.

Main Systemwide view

The functionality of Systemwide main GUI greatly resembles the Reference Plugin used in DAW. This view is the main environment where the level, type and parameters of processing applied to the audio signal is set.

Use the drop-down box on the top-right of the view to select the **Calibration profile** to be applied to the signal.

Click on the **SW Icon** on the top left to see the currently active Sonarworks licenses on the system, add a new license or add an individual calibration profile.

Turn **Calibration** on/off via button on the bottom-right side of the view.

For information regarding the **Dry / Wet knob**, the **Calibrate** and **Simulate** features, or to understand the preferences available under the **Advanced** tab, please refer to Chapter 3 - Plugin Features.

5. Activation

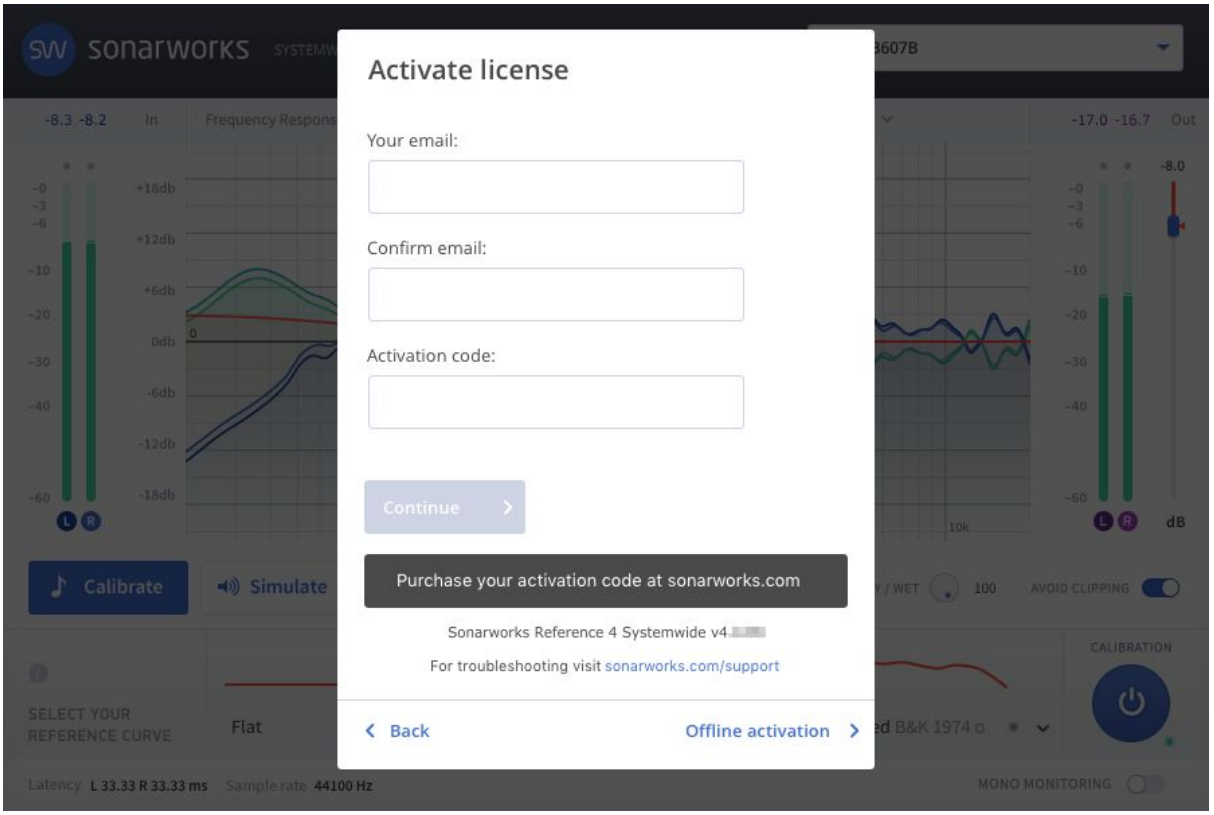
For Sonarworks Reference products, activation can be split into 3 parts - trial activation, online activation and offline activation. Trial has its own activation specification, but can also be executed via online and offline methods.

1. Trial

A typical way to start trial is to do so after the initial installation from our new installer is successfully finished. After it’s done, there will be a button that will ask you to start a trial. This should be enough for most situations. In case it isn’t and you’re experiencing some issues with the trial activation process, reach out to support for a new trial key and follow next two methods.

2. Online method

This is the standard activation method that should work in most of the situations if the computer has a stable internet connection. To activate with this method, open any of the Reference line products for the first time and the Activate License window will be presented to you with fields that are required to be filled out. Besides that, you can locate the blue SW button on the top left corner (in Measure software, licensing information can be found under Settings) and bring up the same window from there.



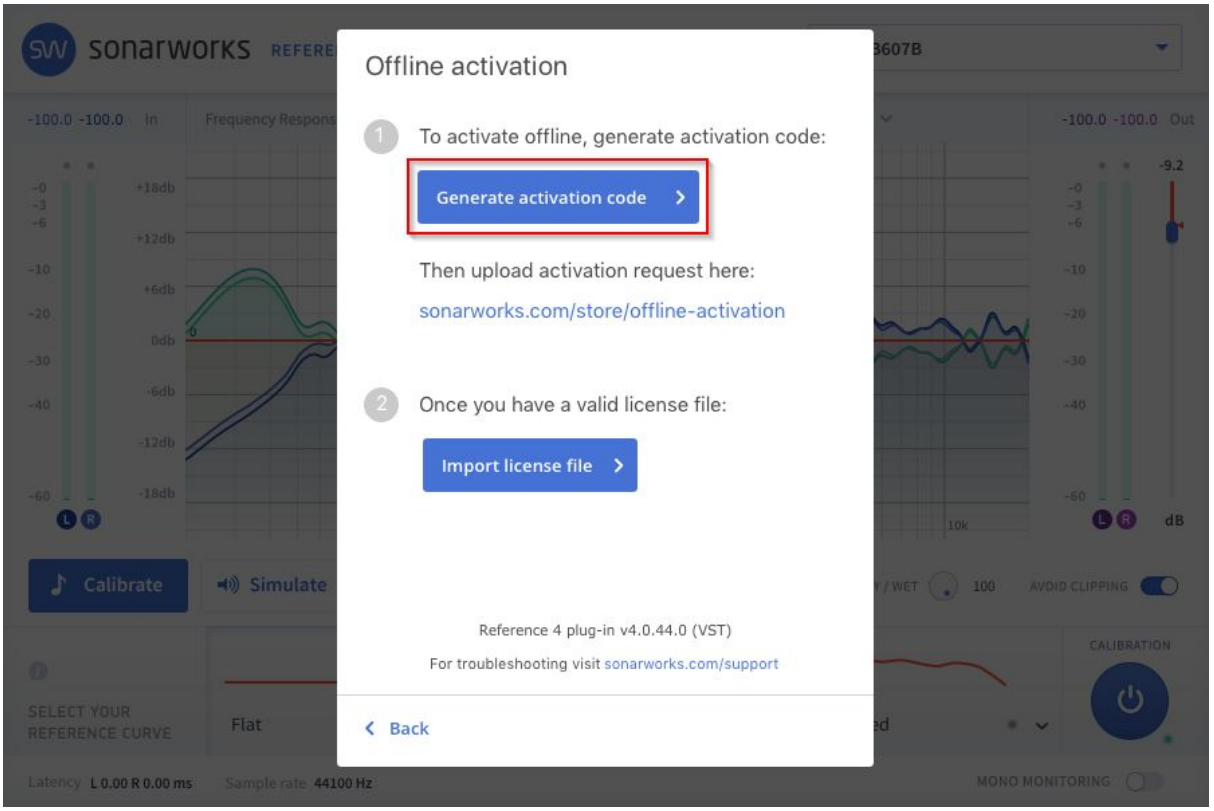
After filling out the information, click “Continue”. This will bring you to a window where you’ll need to select which products at this time you wish to activate. Clicking Next will initiate syncing and activation process. Outcome of this process will be marked with a corresponding message.

3. Offline method

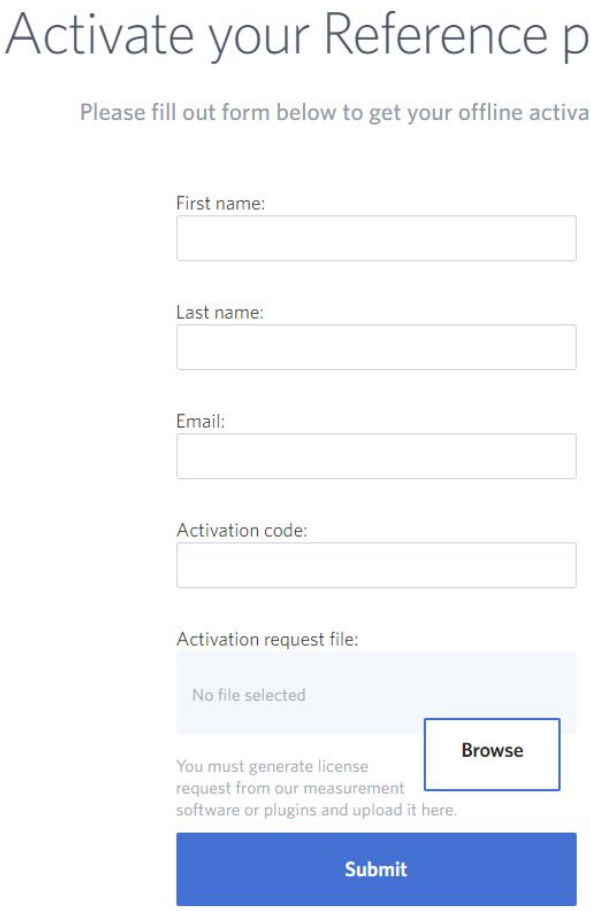
To activate Sonarworks Reference products with offline activation method, start by either opening one of the products for the first time, or locating the licensing information, described in article about Online Activation. In the Activate License window, on the bottom right a button called “Offline activation” will be present. Click on it and you’ll be taken to a different window

NB! This is also very useful method if you need to re-authorize your products in order to get new headphone profiles synced.

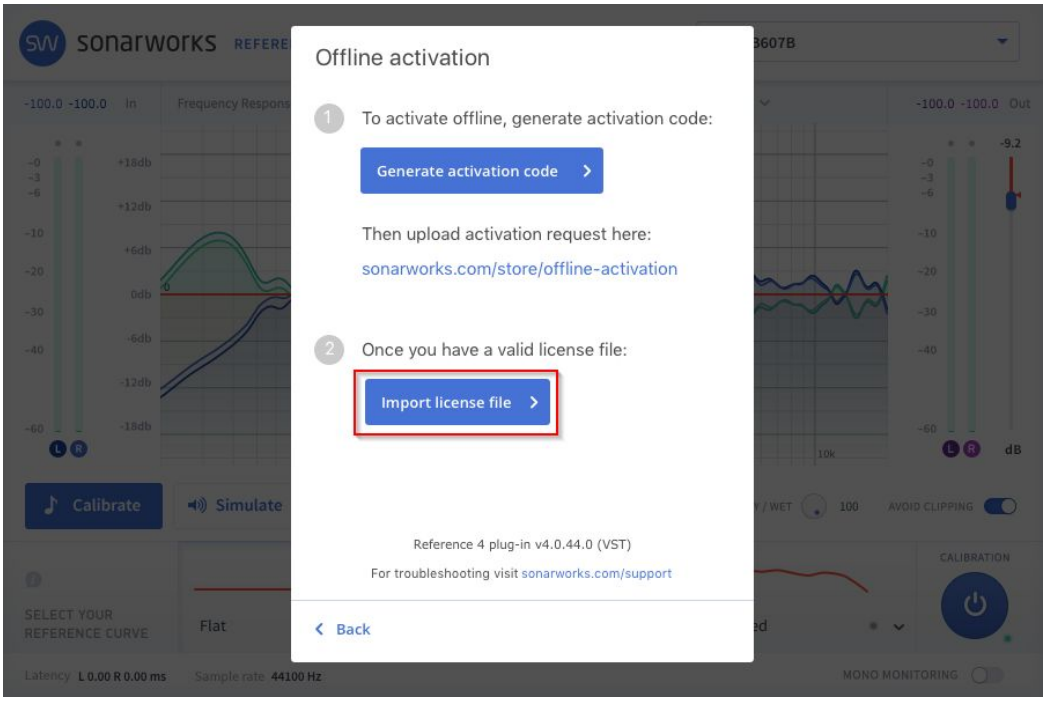
1. Generate activation request file with the plugin / Measure / Systemwide



2. Go to sonarworks.com/offline-activation.
3. Enter all your details, license key (activation code in this page), and import the activation request file you just generated.

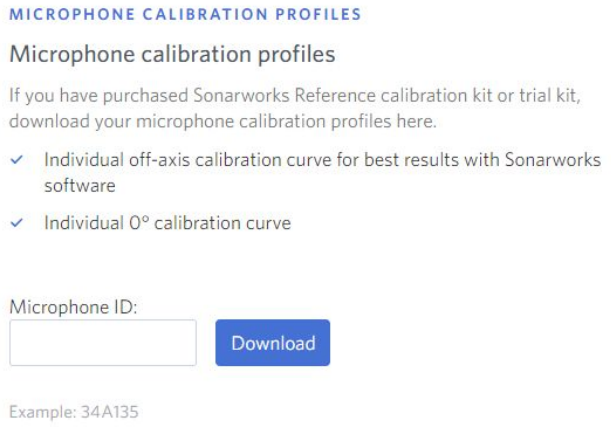


4. Click Submit and in the next page, choose products you want to activate
5. Download the offline-activated license file.
6. Import the license file in the plugin / Measure / Systemwide



6. Troubleshooting

Where can I find the calibration file for my XREF microphone?



Go to http://sonarworks.com/reference/downloads/ , select your OS and go to the bottom of the page. Enter the microphone's serial number into the microphone ID field and click "Download". Once downloaded, unzip the files and choose the 30 degree calibration file when prompted by the measurement app. The microphone profile can also be downloaded directly from new Measure software available with Reference 4.1 when prompted to enter Microphone ID.

The system measures incorrect distance between my speakers, what should I do?

Sometimes due to reflections in your room, or if your display is in front of your speakers, the software becomes quite picky about how you place the microphone. Feel free to move the microphone around the midrange driver a bit until it measures correctly. If the measured distance has an error more than a 15 cm / 6 inch from your actual distance, then you should repeat this step.

Where should I hold the microphone if I have 3-way speakers?

To measure horizontal 3-way speakers (such as Focal Twins or ADAM A77X, etc), hold the microphone next to the mid-range drivers that are on the inner side of each of the speakers.

There is feedback from the mic when I hold it close to the speaker!

Before connecting the measurement microphone to your sound card, ensure that your audio interface does not have direct monitoring turned on, that is, the microphone input is not routed directly to your speaker outputs. This is also crucial for the other steps of the measurement process.

I cannot select my audio interface for input and/or output!

Make sure that your sample rate is set to 44.1 kHz, as other sample rates are not supported. Your sound card has to support DirectSound drivers, if you are using Windows.

Can I use other microphones for the measurements?

You need to use an omni-directional condenser microphone. A regular SM58 or U87 will not be sufficient.
You can also use other measurement microphones, just keep in mind that to get the best precision we highly recommend using an individually calibrated microphone. Usually low grade calibration microphones do not have individual calibration, so they are not best for precise measurements (usually problems with frequencies above 8 kHz), but will get the job done to some extent. We will not be able to consult the calibration outcome if you are not using an individually calibrated microphone.

IMPORTANT: USB measurement microphones are not supported and will not work correctly with the measurement software due to digital clock issues.

Why am I constantly getting the “Microphone is out of measurement area” error?

If you microphone keeps "sliding" or simply can not be placed in the measurement area, then there is a problem with sample rate drift. Sample drift occurs when you have different input and output hardware and they are not synchronized to a single word clock. You can solve this problem by synchronizing your input and output hardware word clock or using the same hardware for input and output (recommended).

Using the plugin for multiple sets of speakers

If you have a setup with multiple sets of speakers, you will need to measure each audio playback system separately and load the respective profile in the plugin for the set you are going to use.

Transferring your product license to a different computer

All of Sonarworks Reference products can be activated on 3 computers simultaneously. If you have used up all of your activations, it is possible to transfer licenses between your computers. To transfer your license please submit a request at our customer support page. The transfer does not cost any service fee, but the process might take up to 2 working days.

I can’t find the Sonarworks Reference calibration plugin

In order to access the plugin in your DAW, make sure to search for ‘Reference4’ instead of ‘Sonarworks’. Also, it is always worth confirming that the plugin is located in any of the folders your DAW is scanning for plugins. Re-scan the plugin directory in your DAW just in case the DAW doesn’t automatically add the plugin to the plugin library.

I have no sound coming out of Systemwide

If you are not getting any output to your speakers / headphone after Systemwide is activated, please make sure that your Systemwide Audio settings has the correct audio device selected. Also, confirm that, in your computer’s system sound settings, the volume of either the Sonarworks virtual sound device or the output hardware device is not turned down.