Smart Audio Soundbar
Calibration Reference Guide

The Savant Smart Audio Soundbar is an elegant and intelligent alternative to the traditional audio/video receiver, with a wide sound stage, and best in class audio quality. WiSA certification enables the addition of subwoofers and surrounds in fully uncompressed 24-bit wireless resolution. The Smart Audio Soundbar has Savant Host capability built right in, offering clients whole-home control and impressive audio in a single easily configurable package.

This guide outlines the recommended best practices for calibrating the Savant Smart Audio WiSA Soundbar with wireless surround speakers and subwoofers - saving precious install time while delivering an uncompromising entertainment experience to clients.

Required Devices:

- Savant Smart Audio WiSA Soundbar [HST-STUDIO55WS-SUR]
- Savant Smart Audio WiSA Surround Speakers [SPK-SUR3WSx]
- Savant Smart Audio WiSA Sub 1 [SPK-S1WSx]
- Sound Pressure Level meter (SPL)
- Savant Development Environment (SDE)
- Access to the network that the Soundbar is connected to
- Access to the Internet
- Login info to preferred music application
- Phone/tablet with Savant Pro App installed or other Savant UI device

1. Set Up Devices

Follow the install and setup instructions found in the guides for the devices being used. Below is a list of recommended documents.

All configuration must be completed, including physical connections and WiSA device setup, before proceeding with the calibration process.

⚠️ IMPORTANT!

- The Smart Audio Soundbar receives its Surround Sound signal from its TOSLink input. If there is more than one video source the TOSLink output of the TV is the recommended way to get the audio signal to the Soundbar. With all HDMI sources routed to the display.
- For best results the Smart Audio Soundbar should be connected to the network using it's RJ45 Ethernet connection.

Recommended Documents

This is a list of documents that may need to be referenced for installation or setup. These documents can be found on the Savant Customer Community.

- Savant IP Audio Products with Integrated Host Deployment Guide [009-1839-xx]
- Savant Smart Audio WiSA Setup Guide [009-1903-xx]
- Savant Smart Audio WiSA Soundbar Quick Reference Guide [009-1878-xx]
- Savant Smart Audio WiSA Surround Speakers Quick Reference Guide [009-1883-xx]
- Savant Smart Audio WiSA Sub 1 Quick Reference Guide [009-1886-xx]

2. Speaker Placement

When considering the placement of speakers within a room, there are a number of relevant factors to take into account; such as the size and shape of the space, and the location of available power outlets. The diagram below shows an example of the ideal placement for a five channel Smart Audio Soundbar system.
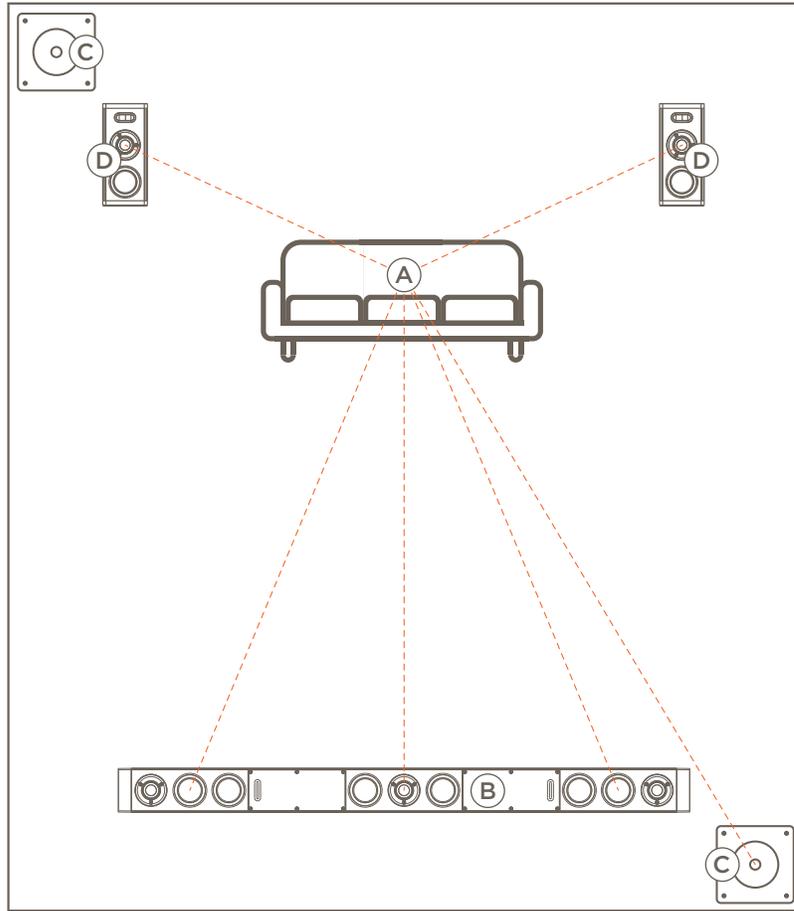
Ⓐ	Ideal Listener Location	This is the location of the prime listening/viewing position.
Ⓑ	Smart Audio WiSA Soundbar	Ideally, the Soundbar should be mounted directly below the TV. With the middle of the center channel directly in front of the listener.
Ⓒ	Smart Audio WiSA Sub	One Sub: Ideal location is in one of the front corners of the room. Two Subs: The subs should be placed in opposing corners of the room as shown.
Ⓓ	Smart Audio WiSA Surrounds	Surround speakers should be placed slightly behind the direct right and left of the listener at approximately head height.

2.1. Subwoofer Placement

Savant recommends using two subwoofers in a system. Using multiple subwoofers placed in diagonally opposed corners yields the most even in-room bass response.

When using a single subwoofer, it should be placed in or near a corner boundary. This type of placement, sometimes referred to as "corner loading", returns the greatest output across the widest possible frequency range.
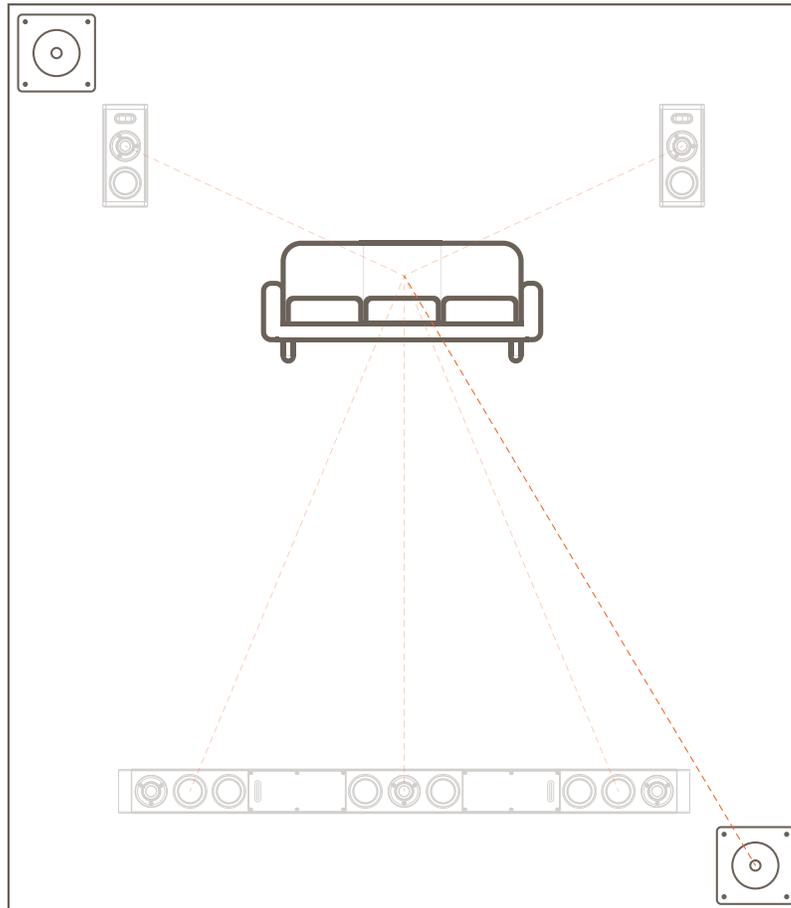
NOTE: Distance should be measured from the sub placed furthest from the ideal listening position when completing the calibration tab of the Web UI described below.

Subwoofer Settings

All bass settings, such as crossover and gain, are managed through the Soundbar. Select the settings below on the bottom panel of the Nano Subwoofer:

- Volume Level = Maximum
- Low-Pass Filter = 160Hz
- Phase = 0
- Crossover Slope = 12db Per Octave
- Power = Always On

2.2. Surround Placement

Savant WiSA Surround Speakers have optional speaker stands that are recommended. Use of the optional speaker stands available from the Savant Store for Savant WiSA Surround Speakers is recommended. Surrounds must be plugged in to a power outlet, and should be placed behind the primary seating for the room as shown in the example below.
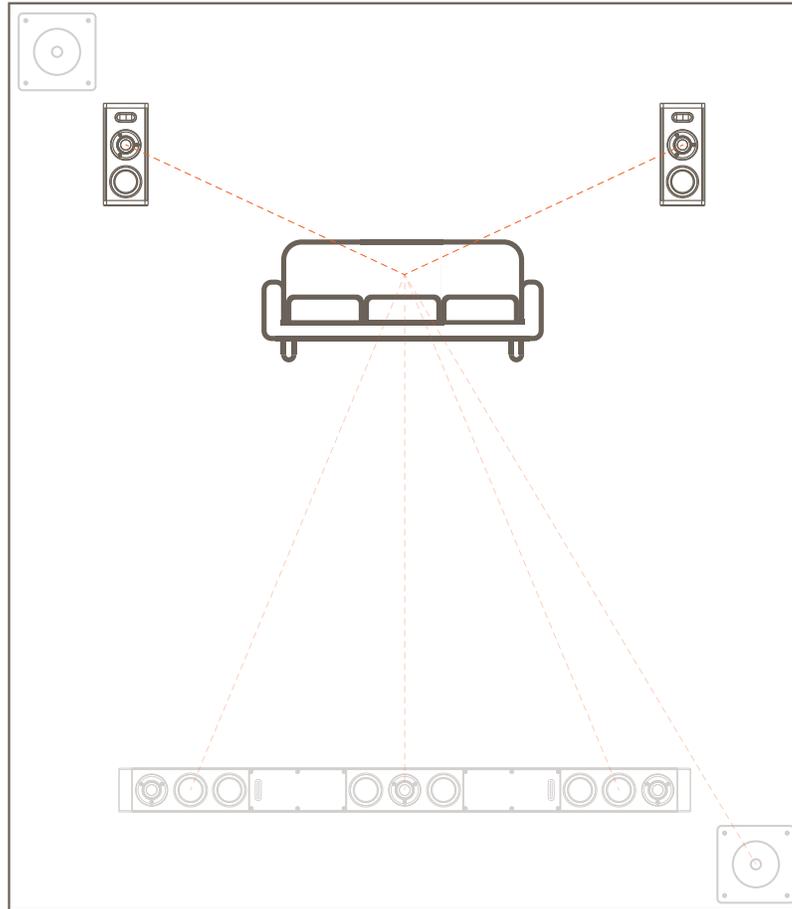
NOTE: Surround speakers should be placed to the left and right rear at approximately 110º to 120º angles relative to the center channel.

110˚ to 120˚
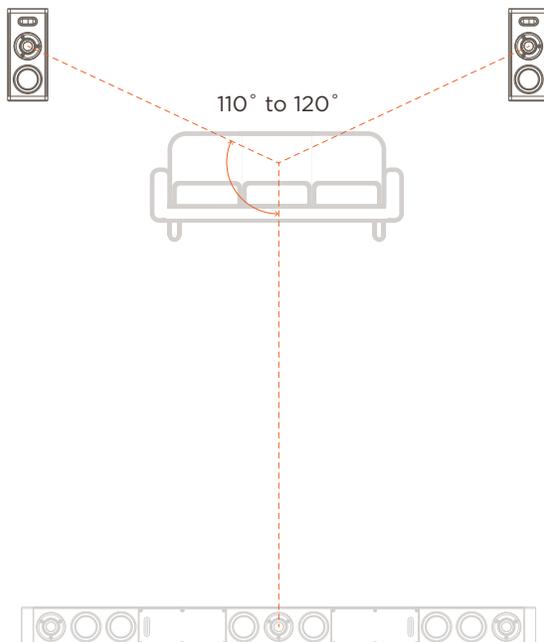
3. Soundbar Web Configuration

The subsections below describe recommended settings for optimal calibration of a Smart Audio Soundbar system, including connected WiSA subwoofer(s) and surround speakers. For more detail on each setting and its function, refer to the IP Audio Products with Host Deployment Guide on the Savant Customer Community.

3.1. Configuration Starting Point

HELPFUL INFO: For Smart Audio Soundbars deployed with da Vinci 9.4 or higher, the settings below are preconfigured by default.

1. Using a web browser, open the Soundbar's Web UI by typing in the Soundbar's IP address in the address bar, and log in.
Default username and password is RPM / RPM.

2. Navigate to the **Inputs and Outputs** tab, and verify that the Digital In 1 and the Media Server have the trim set to zero.

3. Navigate to the **Calibration** tab, and verify that the delay is set to 0 ms on all channels.

4. Physically measure the distance from each channel to the preferred seating position.

5. Enter the distance for each channel.

6. Verify that the Crossover Frequency is set to 100 Hz for all channels.

7. Verify that the Trim is set to 0 dB for all channels.

8. Verify that the Slope is set to +24 dB for all channels.

Below is an image that shows the Calibration tab with these settings completed.

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55-Inch Host Soundbar w/Surround Sound, HST-STUDIO55WS-SUR

Status   Network   Inputs & Outputs   Calibration   Firmware

Calibration

	Delay	Distance	Frequency	Slope	Trim	Mute
Left	0 ms	2.1 m	100 hz	+24 dB	0 dB	Unmute
Right	0 ms	2.1 m	100 hz	+24 dB	0 dB	Unmute
Center	0 ms	2 m	100 hz	+24 dB	0 dB	Unmute
Surround Left	0 ms	1.4 m	100 hz	+24 dB	0 dB	Unmute
Surround right	0 ms	1.6 m	100 hz	+24 dB	0 dB	Unmute
Subwoofer	0 ms	2.3 m	100 hz	+24 dB	0 dB	Unmute

Diagnostics

Start Test Tone

3.2. Subwoofer Phase Alignment

The purpose of phase alignment is to ensure that the Soundbar and the subwoofer are playing the same audio in exact or near perfect time with one another.

The crossover setting made above (100hz) acts as a filter between Soundbar and sub(s). The audio information between 100hz (the crossover point) and 50hz (the first octave below the crossover point) will be shared by both the subwoofer and the Soundbar. This region where the audio energy is 'crossed over' from one device to the other is especially critical to the 'time-sensitivity' of the listener. In order to ensure the most accurate transition in time, phase can be adjusted and measured to ensure proper phase alignment between the Soundbar and subwoofer.

Using 100hz as crossover point, use a 100hz test tone to phase align the subwoofer with the Soundbar. For test tone generation Savant recommends using the album Audio Line-Up Test Tones (Calibration Reference Check) track 7 – 100hz -10db. Below are direct links for Spotify, Deezer, and Tidal.

Tidal: https://tidal.com/browse/album/29581889

Spotify: https://open.spotify.com/album/2biaLMlbvp49RqkEhKNK0w?si=a0CycfQ0TzquPoJrNZFxqQ

Deezer: https://www.deezer.com/en/album/7789589

NOTE: If two subwoofers have been deployed follow the steps outlined in the Two Subwoofers in Use section below before completing these steps.

1. Using a web browser, open the Soundbar's Web UI, and log in.
2. Select the Calibration tab.
3. Use the Savant Pro App to activate a Savant Music stream playing the recommended 100 Hz track listed above on repeat.
4. Using a SPL meter, set to 'C' Weighing and 'Slow' Response.
5. In the Web UI select the Subwoofer distance field. Changing the distance will change the phase alignment. This change should be no more than plus or minus 10 feet.
6. Make distance adjustments until the sound is the loudest within the +/- 10 ft (3 m) range.

Two Subwoofers in Use

These steps should be completed first when two subwoofers are in use. This will likely require a second person to adjust the phase knob on the subwoofer.

1. Use the Savant Pro App to activate a Savant Music stream playing the recommended 100 Hz track listed above on repeat.
2. Set the phase to 0 for both subwoofers.
3. Using a SPL meter, set to 'C' Weighing and 'Slow' Response.
4. Make slow adjustment to the phase knob on the subwoofer that is closest to the listener. To find the point when the volume is the highest.
   As the phase knob is adjusted a peak volume will be found, if passed slowly turn the knob back to the peak volume.

3.3. Calibrate Trim

1. Use the Savant Pro App to activate a Savant Music service without playing any content.
2. Using a web browser, open the Soundbar's Web UI, and log in.
3. Select the Calibration tab.
4. Select Start Test Tone.
5. Unmute center channel.
6. Sit in the preferred seating position.
7. Using a SPL meter set to 'C' Weighing and 'Slow' Response, point the meter at the channel being calibrated.
8. Use the Savant App to adjust the volume of the service until the meters reads 75 dB.
9. Mute the center channel and unmute the left channel, raise or lower the trim until the SPL meter reads 75 dB.
10. Mute the active channel in the Web UI.
11. Repeat steps 10 and 11 for the right channel, both surround channels and Subwoofer. All channels should have th trim setting adjusted to a reference of 75 dB at the same seating position.
12. Once complete select Stop Test Tone.

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Left	0 ms	2.1 m	100 hz	+24 dB	+3 dB	Unmute
Right	0 ms	2.1 m	100 hz	+24 dB	+3 dB	Unmute
Center	0 ms	2 m	100 hz	+24 dB	0 dB	Unmute
Surround Left	0 ms	1.4 m	100 hz	+24 dB	-2 dB	Unmute
Surround right	0 ms	1.6 m	100 hz	+24 dB	-3 dB	Unmute
Subwoofer	0 ms	1.9 m	100 hz	+24 dB	+6 dB	Unmute

Diagnostics

Start Test Tone