

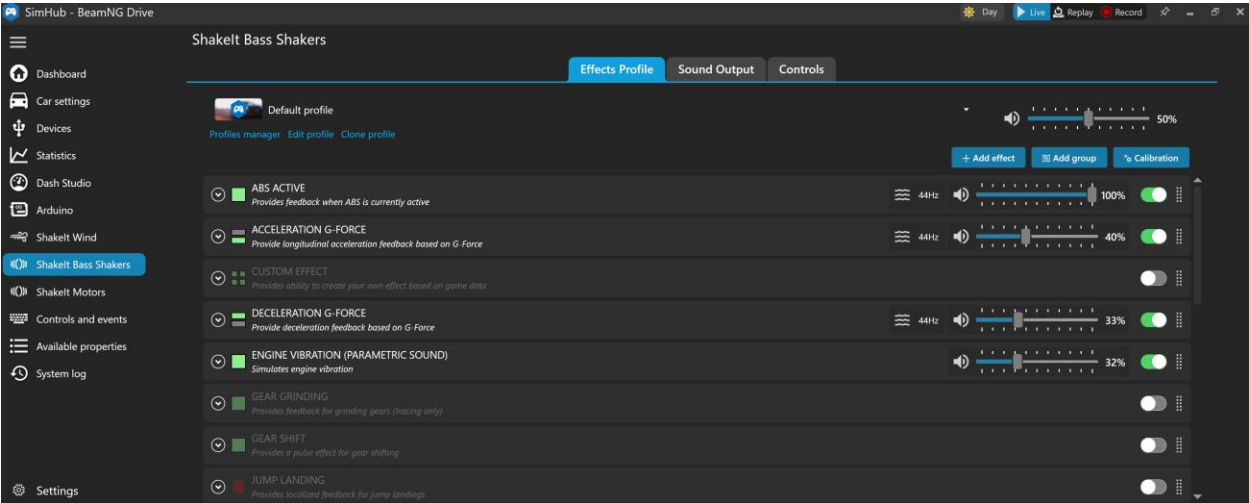
Using the Dayton Audio SAB-1060 with SimHub

Overview

The SAB-1060 is a highly flexible 10 channel amplifier with a built in 7.1 USB DAC as an input. Designed with gaming and simulation in mind, this compact amplifier allows you to create either a custom surround sound audio system for full immersion in games or movies, or a haptic feedback system with multiple zones of customized feedback.

This guide will focus on getting you up and running with the popular SimHub software, which allows you to use telemetry game data from a growing list of video games / simulation software to create customized haptic feedback using attached Bass Shakers. SimHub's Shaker Bass Shaker software will generate bass effects such as G-Forces, Road Rumble, Gear Shifting, and so much more to enhance your gaming experience.

Note: This guide is NOT for surround sound. It is for creating a haptic feedback system.



Equipment Required

- **Dayton Audio SAB-1060 Kit**
 - o Amplifier Board (Included)
 - o 2 x 14 Pin Wiring Harnesses (Included)
 - o 1 x 4 Pin Molex Power Supply Connector (Included)
- **A 15V-30V Power Supply** (see power supply section below)
- **A Windows PC** or laptop capable of running your favorite games, and permissions to install the SimHub software. Must have at least 1 available USB 2.0 port.
- **Bass Shakers:** Visit parts-express.com for more information on bass shakers. This guide will refer to 'bass shaker' generally, but it could also be a high power exciter used for haptics.
- **Installation Tools:** Screwdriver, drill and other installation tools needed for your bass shakers.
- **A USB Type C to USB Type A Cable**, or a USB Type C to USB Type C cable. This will depend on the USB ports available on your PC. Some USB cables can provide power only, such as one included with a device for charging only, so ensure your cable is capable of sending data.
- **(Optional)** A separate audio system such as speakers connected to your TV, headphones, PC speakers, etc. The haptics generated with SimHub can be great, but having good quality game audio is important for immersion as well!
 - o **Note:** The SAB-1060 can be used to power your game audio sound as well as bass shakers

Step 1: Attaching Bass Shakers to your Chair / Simulation Setup

This step will vary depending on your specific setup. We recommend to look at examples online of how other people use Dayton Audio products to create a racing simulator setup, such as on YouTube or the Simracing subreddit. Simhub allows an incredible amount of flexibility in how haptic feedback can be controlled, as we will see later in this guide.

The writer of this guide plays racing games with a controller, and uses an arm chair with a Dayton Audio BST-300 Bass Shaker on the back of the chair, and 4 Dayton Audio Dayton Audio BST-2 bass shakers on the bottom, with one on each corner of the bottom of the chair. Although your setup might be more complicated than this, the general guidance given here will still apply to you.

Tips

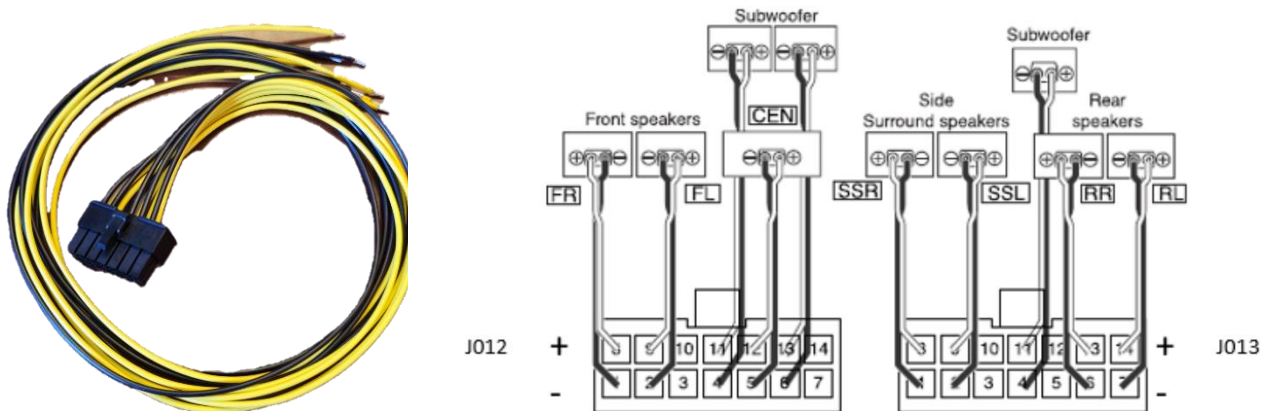
- Make sure that your bass shakers are attached securely and as tightly as possible against the surface of your chair. If it is uneven or otherwise loose, the haptic effect will not feel as accurate as it should.
- Multiple bass shakers could be attached in the same spot of the chair for an extra haptic effect. Multiple outputs of the amplifier can be assigned to the same function in SimHub, giving extra power to your setup where it is needed.
- Not all surfaces of your chair will require as much power as others. For example, if you want haptic feedback in the arms of your chair, and the padding is thin, rather than a bass shaker, you could use a high powered exciter such as the DAEX30HESF-4 for a great effect with a smaller footprint. Additionally, some effects that can be created with Simhub are better when they are more subtle, and might not require a high powered bass shaker.

Step 2: Wiring your Bass Shakers or Speakers to the SAB-1060 Amplifier

If you are using your SAB-1060 as a dedicated sound card strictly for haptics/bass shakers, you can wire your bass shakers to any of the SAB-1060 outputs. If you would like to use the SAB-1060 to power your left and right main speakers and use the remaining outputs of the SAB-1060 for bass shakers, make sure your main speakers are wired to Front Left and Front Right. The remaining outputs can be attached to bass shakers and assigned to bass affects in SimHub later.

The SAB-1060 includes two wiring harnesses that make it easy to connect your bass shakers to the amplifier via 14 pin ports J012 and J013.

Safety Note: You might not use all of your SAB-1060's outputs, especially while prototyping your system. If there are any wires of your wiring harness unused, you **MUST** cover them with electrical tape or remove them from the wiring harness altogether. **Do not let unused wires short** with anything else that is metal, including other wires.



Note: Any of the outputs on the SAB-1060 can power a bass shaker. It does not need to be a SUB output.

Follow the connection guide on the bottom of the amplifier, which shows labels such as OUT1+ and OUT1- which indicates the + and - connection for one of your bass shakers. The wiring harness has yellow wires for + connections, and black wires for - connections. The surround sound labels such as FR- and FR+ are not relevant here besides indicating polarity (+ -), because we are not using the SAB-1060 for surround sound in this case. Each of these outputs can be treated individually within SimHub, and the power output for each output is the same, so it is not important which output you use for which bass shaker or exciter.



Connecting the wires to your bass shakers will vary depending on the bass shaker. On the BST-1 or BST-300 from Dayton Audio, there are convenient spring terminals which make connection very easy, but your bass shaker might require soldering wires together, or soldering the wiring harness directly to the bass shaker /exciter.



Tips

- All of the “SUB” outputs on the SAB-1060 are treated as 1 output on your PC, meaning they are individually amplified, but will always have the same input signal. Later you will see that channel 4 in the ShakeIt menu will affect outputs SUB1, SUB2, and SUB3 all the same.
- In most cases, connect your bass shakers ‘in phase’ with each other, meaning the + and – connections are consistent between bass shakers.
 - o If you have bass shakers oriented on opposite ‘walls’ of the chair (like the image) with the tops or bottoms of the bass shakers facing each other, consider wiring them out of phase, with one of them having the + and – wires flipped. This will cause the bass shakers to move in unison with each other, rather than working against each other. This will vary depending on your setup, but the effect can be easily tested by swapping the wires of one of the bass shakers (power off the amplifier first)
- You might need to extend or replace the wires in the included wiring harness depending on the mounting location of the amp or locations of bass shakers. Do not use very thin, high gauge wire. The wire should be capable of transmitting at least 75 Watts RMS. If the wire you are trying to use is thinner than the wire provided with the wiring harness, do not use it.
- The SAB-1060 has many outputs, so consider placing multiple bass shakers in a single location if more haptic feedback is needed. These can be configured to be the same output or slightly different later on in the guide.



Step 3: Powering the SAB-1060 Amplifier



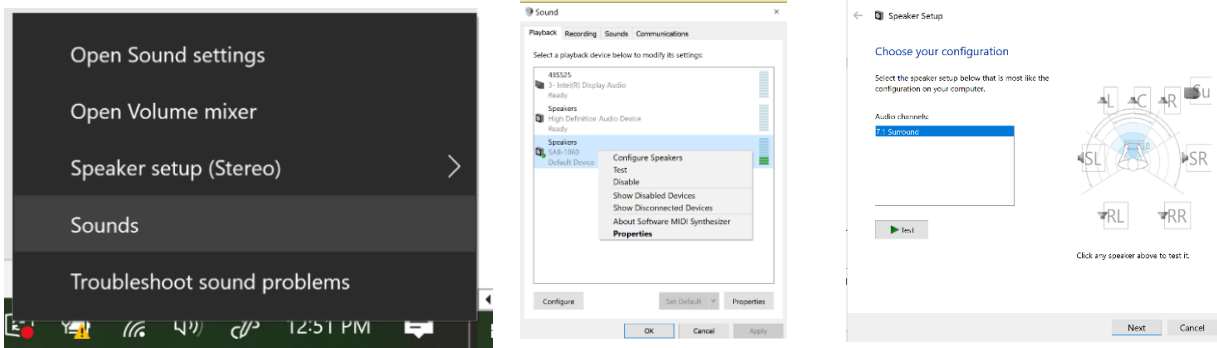
The SAB-1060 comes with a 4 pin molex mini-fit cable with a preinstalled female DC jack for easy connection to a power supply. If it is not needed, it can be cut off. This amplifier can be powered with a wide range of power supplies from 15V-30V, but for maximum stability, the 24V, 350 Watt MEANWELL LRS-350N2 or similar power supply is recommended. If less power is needed, a lower output power supply can be used as long as it is within 15-30V.

See your power supply’s specific use manual for safety and additional and connection information Take special care with the wiring for your power supply, especially if it is high power. Make sure that any wires will not short. Follow all standard electrical safety precautions.

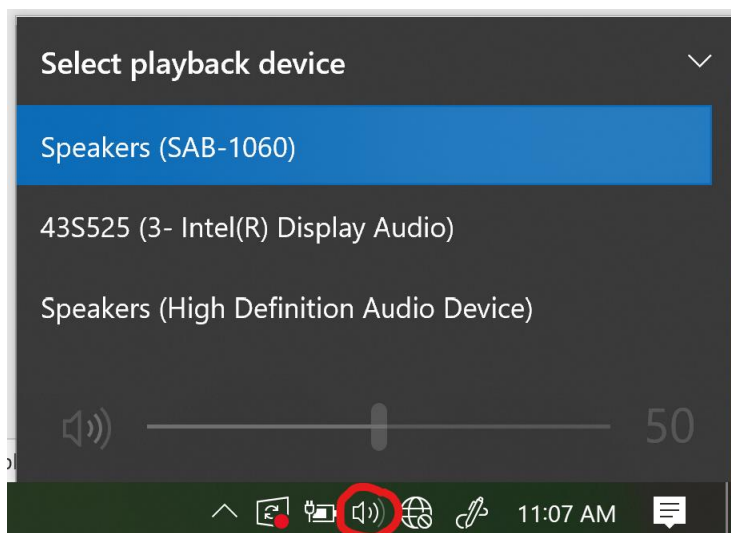
Step 4: Powering on your SAB-1060 for the first time - Configuring Windows Audio Output

Before moving further, make sure your SAB-1060 is connected to power, and connect an appropriate USB type C cable from your SAB-1060 to your PC. This step will make sure your SAB-1060 is setup for 7.1 surround mode. (This should happen automatically, but this step is also helpful for testing connections).

1. **Access Sound Settings:** Right-click on the sound icon in the Windows taskbar. Select "Sounds", then go to the "Playback" tab. Right click on the SAB-1060 and press "configure".
2. This menu will provide an easy test for verifying your speaker connections. Press the speaker icons next to each output to send a test tone to that speaker.

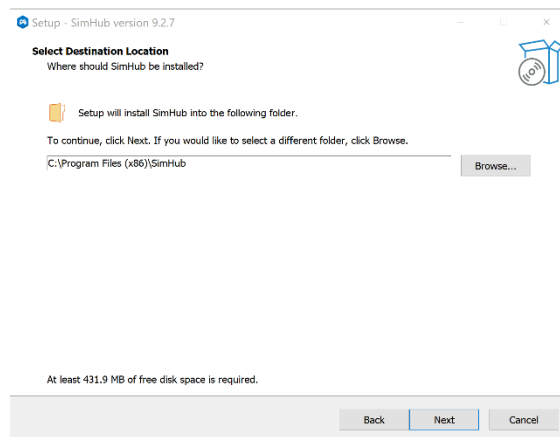


3. If using the SAB-1060 to power your main PC speakers as well as bass shakers, press 'set default' in the menu above. This will send the game audio to your SAB-1060, but does not affect SimHub output. This also can be controlled using the menu below. If you are using the SAB-1060 as a dedicated soundcard only for bass shaker effects in SimHub, select your main PC audio output here. In this case, I would select 43S525 (3- Intel® Display Audio), because my main audio system is attached to my TV. Whatever is selected here is where your game audio will be sent. Later, we will select an audio output for use in SimHub.

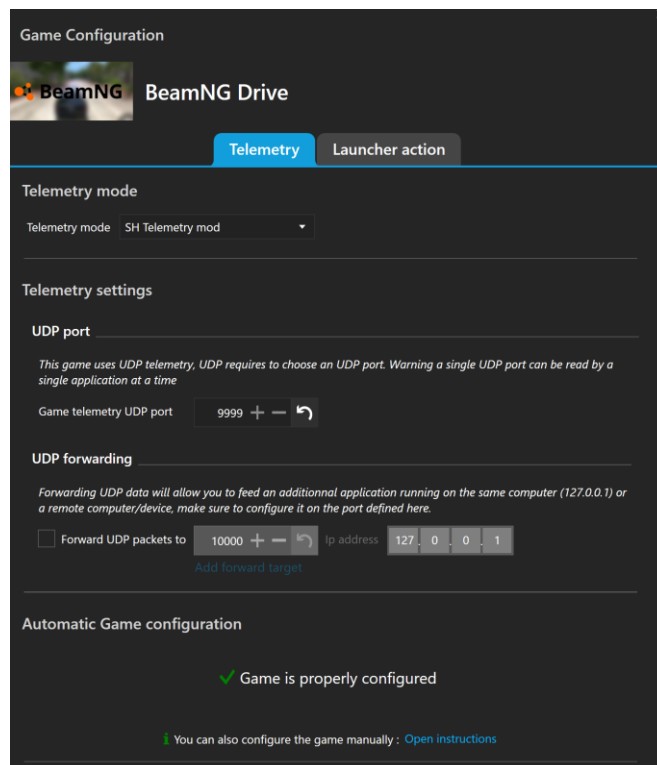
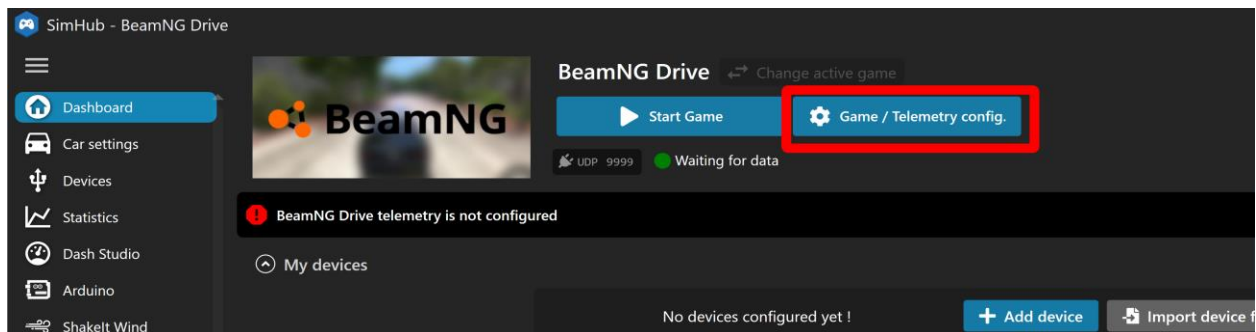


Step 5: Installing and Setting Up Sim Hub

1. **Install Sim Hub:** Download and install Sim Hub [from its official website](#) using standard installation procedures. **Note:** If not using the default options in the installer, make sure the required dependencies are installed that it requests. Without these, the software will not work.
2. **Launch SimHub** by using a desktop shortcut or searching for it by pressing the windows key and then typing “SimHub”.

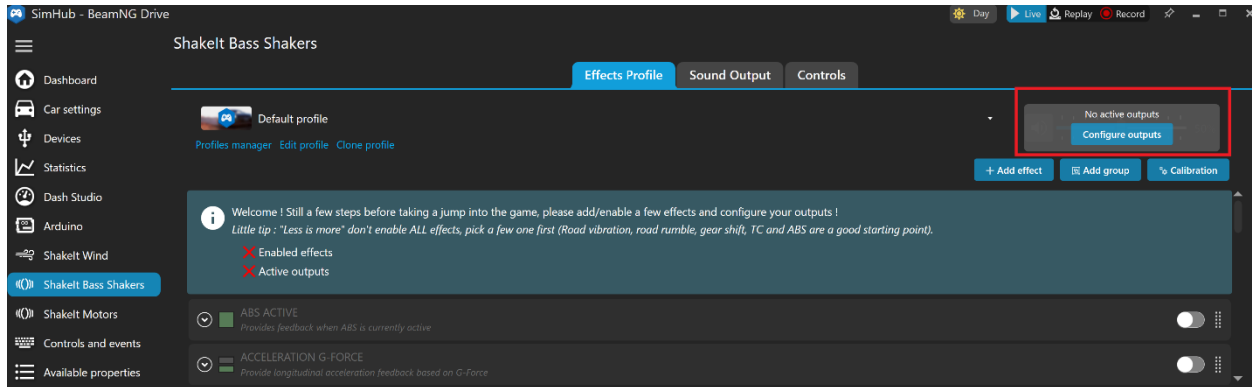


3. **Basic Config and Game Detection:** Start Sim Hub and go through the introductory setup steps, ensuring detects your preferred racing or flight simulation game. You may need to add the game manually if it's not automatically detected.
 - a. Change the 'active game' to your desired game.
 - b. Open the "Game and Telemetry Config" menu as shown below. Follow the instructions in this menu to setup your specific game. This will allow the game and SimHub to talk to each other. Without this step for telemetry data from the game, we would not have the data needed to create bass effects and SimHub could not communicate with the game. Luckily, for many games, there is an option to automatically configure the game within this menu. **Note:** This menu can get cut off if your display scale in windows is set >100%. If you cannot scroll to the bottom of the menu, where the automatic configuration button is, you will need to temporarily change your display scale settings.



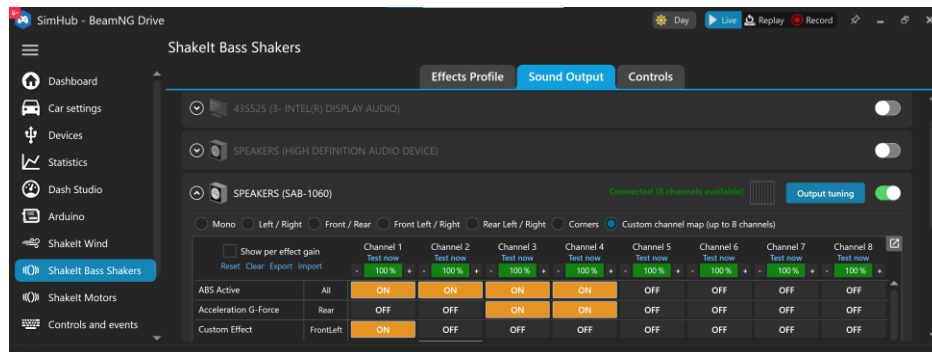
3. Configure Audio Output for Haptic Feedback:

- Navigate to the "Shakelt Bass Shakers" settings menu within Sim Hub using the left side bar, and select "configure outputs"



- Assign the SAB-1060 as the output device for haptic feedback as shown below. Select the output type below that best fits your setup, or create a custom channel map as shown below for full customization. You can use the "test now" buttons below each channel label to test each of your bass shakers.

IMPORTANT: In the next step, we will move to the 'effects profile' tab. If you do not map each effect, such as acceleration G-Force to your desired output in the sound output tab, you will NOT get the effects to work no matter what you do in the effects profile tab. **You must assign each effect first in the sound output tab.**



Note: If you are using front L and front R to power your game audio, do not assign any effects to channel 1 (front L) and channel 2 (front R). CH 3 – 8 are surround sound / sub outputs and should be used for bass shakers. If you are using the SAB-1060 as a dedicated sound card and have an external audio system, it does not matter which outputs you use for bass shakers.

Important: Be careful with the output levels of your bass shakers, especially if they are lower power handling bass shakers or exciters. In the sound output menu, you can change the gain limit of each output. This can be useful in protecting your bass shaker from being overpowered.

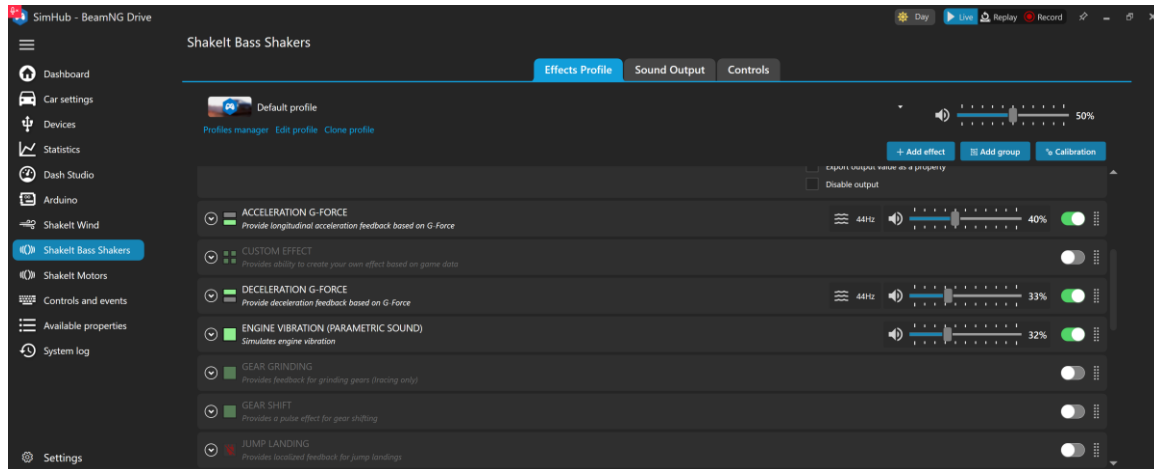
Effects Profile Sound Output Controls

Mono Left / Right Front / Rear Front Left / Right Rear Left / Right Corners Custom channel map (up to 8 channels)

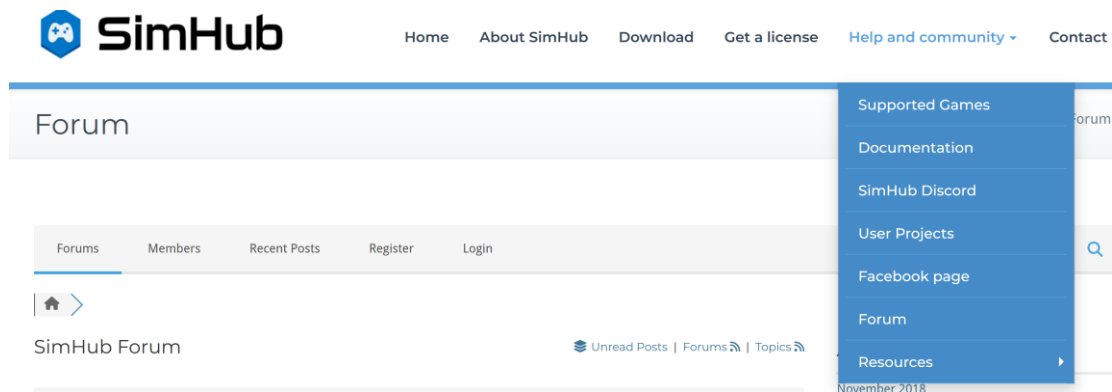
Show per effect gain
Reset Clear Export Import

		Channel 1 Test now - 57% +	Channel 2 Test now - 100% +	Channel 3 Test now - 100% +	Channel 4 Test now - 100% +	Channel 5 Test now - 100% +	Channel 6 Test now - 100% +	Channel 7 Test now - 100% +
ABS Active	All	ON	ON	ON	ON	OFF	OFF	
Acceleration G-Force	Rear	OFF	OFF	ON	ON	OFF	OFF	
Custom Effect	FrontLeft	ON	OFF	OFF	OFF	OFF	OFF	
	FrontRight	OFF	ON	OFF	OFF	OFF	OFF	
	RearLeft	OFF	OFF	ON	OFF	OFF	OFF	
	RearRight	OFF	OFF	OFF	ON	OFF	OFF	
Deceleration G-Force	Front	ON	ON	OFF	OFF	OFF	OFF	
Engine vibration (Parametr	All	ON	ON	ON	ON	OFF	OFF	
Gear grinding	All	ON	ON	ON	ON	OFF	OFF	

4. Customize Feedback: Navigate to the effects profile tab and start configuring your desired effects. What is available will depend on the game you are playing. This can include engine vibration, road texture, or aircraft turbulence, and more depending on the game. Each type of feedback can be assigned to different channels of the amplifier in the output tab, allowing for detailed customization.



For more information about effects types and detailed configuration, search for SimHub on the internet and look for resources that help explain the effects on websites like YouTube, Reddit or SimHub's community pages.



Step 6: Testing and Adjustments

1. Initial Test: With the hardware setup complete and Sim Hub configured, run your simulation game and engage in gameplay to test the haptic feedback system. We recommend to try one effect at a time, to get a feel for how each works and affects your experience. If you turn all of them on all at once, the nuance will be lost.

2. Sim Hub Adjustments: Based on your initial experience, you may wish to adjust the intensity, threshold, and type of haptic feedback within Sim Hub. This includes tweaking settings for different aspects of the game's telemetry data to achieve the desired effect. Depending on your chair, you might want to change the frequency of the generated effects as well.

3. Adding Bass Shakers: Once you get started with haptics for your sim setup, you might want to add new bass shakers. Along with adding new bass shakers for use in SimHub, also consider a bass shaker

using your main audio system with a 2.1 or other subwoofer amplifier that is attached to your sim racing rig. The game audio can often provide bass effects specific to the game that SimHub does not have access to.

Troubleshooting

- **My SAB-1060 is not detected on my computer**
 - Check your USB cable, and try another one. Some USB C cables, especially USB C to A cables are for power only, meaning they do not have the data lines necessary to transmit anything other than power. These cables come with some devices that only use USB for charging.
 - Make sure your SAB-1060 is connected to power, along with being connected to your PC
 - Try a different USB port on your computer
 - If you have a desktop PC, try a port on the back of your computer.
 - Ensure that the daughter board of the SAB-1060 with the USB-C port is securely connected in its port to the main board
 - Restart your PC
- **No Haptic Feedback:**
 - Check the bass shakers' connections to the SAB-1060. Make sure there are no shorted wires. Check that you have connected a bass shaker to only a single outputs + and – wires.
 - Ensure that your power supply is connected and within the 15V-30V specification of the amplifier.
 - Check your configuration of the 'sound output' panel within SimHub. You must have each effect you are using routed to an output. This menu provides a convenient test function.
 - Check that your game is configured correctly to send telemetry data to SimHub, and that SimHub is detecting your game while it is running.
- **Inaccurate or otherwise undesirable haptic feedback**
 - Adjust the feedback settings in Sim Hub's Effects Profile menu. If you have too many settings enabled at once, or assign too many effects to a single bass shaker, the result can be unpleasant. You also might have the intensity too high on specific effects. Start with more subtle settings, and adjust as you go. It is also possible that an effect you chose is not desirable for your needs.
 - Check that you have not overpowered your bass shaker or especially an exciter. If the bass shaker has been overpowered, the bass effect can feel 'sloppy' and inaccurate.
 - It could be that what you desire is more of the game audio for haptic feedback, rather than the generated effects from SimHub. Consider adding a bass shaker to your 'normal' audio output that will handle your game sound in conjunction with the SAB-1060 configured with SimHub's shakeit function.
- **Weak output from bass shakers**
 - Make sure you are using a high quality power supply that is at least 24V and capable of 5A. If this is not enough, consider a more powerful supply. It is especially important if you are using all of the outputs of the SAB-1060.

- Check that you did not wire any bass shakers in series with each other. This will add the impedances of the two bass shakers together, making it harder for the amp to drive them.
 - Check that the volume settings within the SimHub ShakeIt menu are turned to an appropriate volume, and that you have affects applied to the bass shaker.
 - Your chair might have a lot of padding, and you need more bass shakers on a single surface than you expect.
- **No Game Sound**
- Sim Hub's ShakeIt Bass shaker effects are best used when you use the SAB-1060 as a dedicated sound output card. Your default audio output on Windows should be your headphones, PC speakers, or any other normal sound output. Set this by pressing the sound icon on the bottom right panel of your task bar and clicking the arrow. In the case below, the main output for the audio system is connected to the HDMI ARC port of the connected TV. If you are using the SAB-1060 for game audio by attaching speakers to FRONT R and FRONT L, the SAB-1060 needs to be selected here.

