



Welcome to Wwise Car Sim

The Car Sim is a sample application that uses SoundFrame to simulate car engine physics. It is an example of the kind of application that can be connected to Wwise using the SoundFrame. You can use the Car Sim to simulate the various car engine sounds before the game engine is complete. It allows you to make multiple changes to RTPC values simultaneously. This means that you can try out different engine physics and algorithms for your game long before you actually integrate these into the game and then audition them in Wwise. This extra lead time for development and testing can save you valuable time at the end of the cycle as well as enhance the quality of your game.

This small application allows you to add environmental effects and change the dry and wet volume as well as save the simulations and car settings data for further use.

How to Use the Car Sim Help

Wwise Car Sim Help contains both reference topics describing each view, field, and option, and task-based information. This compiled Microsoft HTML Help is grouped into two separate sections to provide you with comprehensive information about the Wwise Car Sim.

- **Using the Car Sim**—shows you how to get started with the Car Sim.

Car Sim Reference—provides complete information about all the options and views in the Car Sim.

Using Other Wwise Documents and Support

The Car Sim Help is only one component in our comprehensive set of materials and resources that are available for you. Consult the other Wwise documents as needed. For additional help you can also visit our [online support center](#).


Using the Car Sim

This section includes the following topics:

- [About the Wwise Car Sim](#)
- [Running the Car Sim](#)

About the Wwise Car Sim

The Car Sim is a sample application that demonstrates the flexibility and power of SoundFrame. Using SoundFrame, you can integrate an external application like the Car Sim into Wwise. Since it is meant to work with Wwise, it comes with a sample Wwise project that contains the car engine sounds as well as the settings to run a simulation. The simulation consists of Porsche® engine sounds and is stored in the WwiseProject folder.

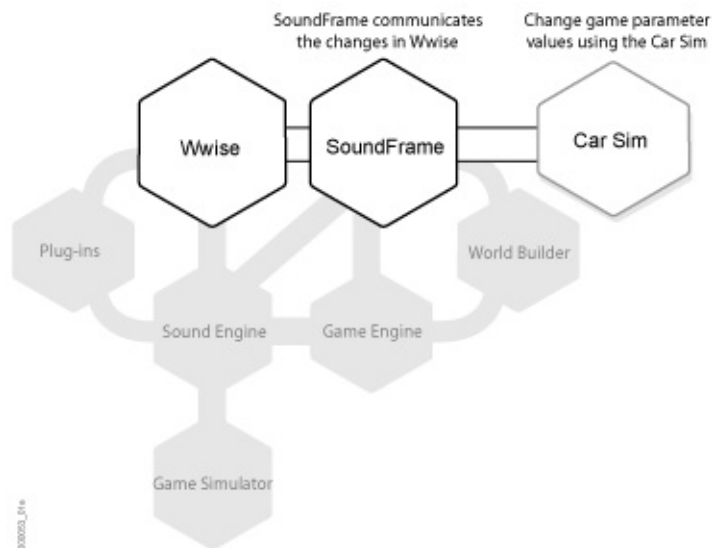
 **Note:** This is a sample application to give you an idea of what you can do with SoundFrame. You can access the complete source code for the Car Sim application in the Wwise SDK, and create your own applications and then easily integrate them into Wwise with SoundFrame.



SoundFrame and the Car Sim

The SoundFrame technology provides a unique medium to access an external application such as the Car Sim in Wwise and use Wwise as the sound engine. In this way you do not need to generate SoundBanks to play events. You can also carry out complex tasks using the external application that would not otherwise be possible in Wwise, such as modifying many game parameter values at the same time, as you would in the sound engine. From SoundFrame, you can modify everything that can normally be modified using the Sound Engine API, such as Game Syncs. In addition it can be used to integrate the Wwise sound engine into an external editor such as 3ds Max®.

The Car Sim uses the SoundFrame API to send commands to Wwise. Playback occurs in Wwise in the same way it would in the Transport Control or the Soundcaster. Using SoundFrame, it is possible to modify game parameters for RPM and Load, and to add environmental effects to simulate, for example, driving in a tunnel.



Running the Car Sim

The Car Sim is installed as part of the Wwise SDK and the following components are found in the SDK folder:

- **WwiseProject folder**—samples\SoundFrame\CarSim\WwiseProject
- **CarSim.exe**— Win32\Release\bin\CarSim.exe
- **CarSim source code**— samples\SoundFrame\CarSim\Win32

The WwiseProject folder includes all the components of a Wwise project and the following which are specific to the Car Sim:

- **PorscheSim.carsim**—the simulation settings for the Porsche car simulation.

Readme.txt—additional information and legal notices for the Car Sim application.


To run the Car Sim involves the following tasks:

- [Opening the Wwise Car Sim project](#)
- [Opening the Car Sim application](#)
- [Loading the Porsche settings](#)

To open the Wwise project:


1. From Start menu, click **All Programs > Audiokinetic > Wwise xxxx build xxxx > Samples > SoundFrame > CarSim > Open the CarSim Wwise Project**.

A message appears prompting you to update your audio cache for the project.

 **Note:** The actual version and build number will correspond with the version and build installed.

2. Click **Yes**.


Your project cache file will be updated with all the latest versions of the project audio files and the Wwise Car Sim sample project is loaded. Now you are ready to open the Car Sim.

 **Note:** When you first open a project, the audio cache is empty and there will be no sounds in the project. If you did not update your audio cache when you opened the project, you can update

your audio cache from the Wwise Project menu by selecting **Update Audio Files**.

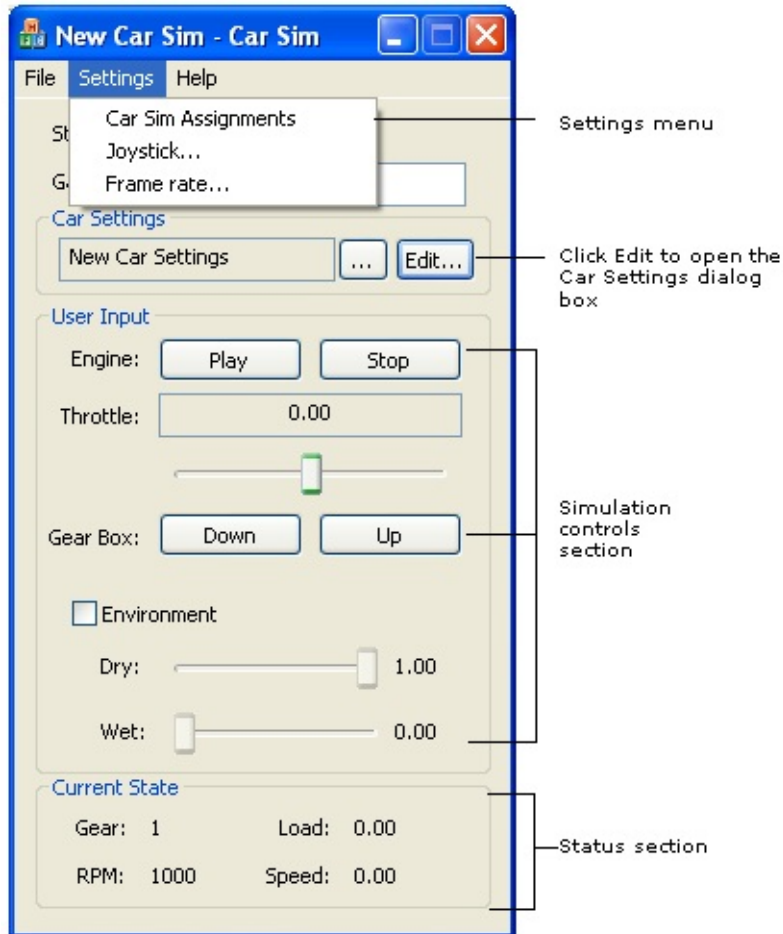
To open the Car Sim:

From Start menu, click **All Programs > Audiokinetic > Wwise xxxx build xxxx > Samples > SoundFrame > CarSim > Run CarSim Release**.

 **Note:** The actual version and build number will correspond with the version and build installed.

The Car Sim opens.

In this window you can carry out your simulation and access the dialog boxes where you can configure the joystick, assign Wwise elements for the simulation, and specify the frame rate for updating RTPCs. You can also define the settings for the cars being simulated. For information about all the views and dialog boxes in the Car Sim refer to the [Car Sim Reference](#).



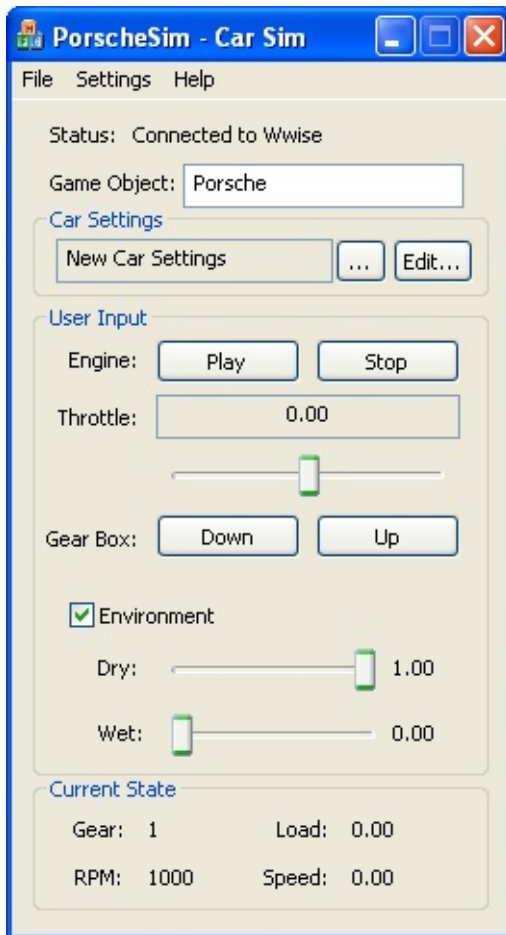
At this point, the default settings are displayed. The next step is to load the the PorscheSim simulation settings for this project.

To load the Porsche settings:

From the menu bar in the Car Sim main window, click **File > Open** and navigate to the PorscheSim.carsim file in the WwiseProject folder.

Click **Open**.

The settings for the selected file are loaded into the Car Sim.



With the settings loaded, you are now ready to begin your simulation in the Wwise Car Sim project, using the Engine and Gear Box buttons.

Note: You can also use the Car Sim to create your own simulations and add settings for different car models. Remember that this is just a sample. Full source code is available in the SDK so you can adapt this application to your own needs, for example to integrate a more complex engine simulation, to simulate jet engines, or anything else that might require the use of states, switches, RTPCs, etc. and that you might want to simulate within Wwise.



Car Sim Reference

This section includes the following topics:

- [Car Sim Window](#)
- [Car Settings Dialog Box](#)
- [Car Sim Assignments Dialog Box](#)
- [Joystick Settings Dialog Box](#)
- [Framerate Dialog Box](#)

Car Sim Window

In the Car Sim you can carry out your simulation as well as access the dialog boxes where you can configure the settings for the joystick, assign Wwise elements for the simulation and define the frame rate for updating RTPCs. You can also define the settings for different car models that you plan to simulate.

Interface Element	Description
(Title Bar)	The name of the currently selected car simulation. To create a new simulation, click File > New and type the name of the new simulation in this text box.
Status	The connection status with Wwise. When Wwise is open, the connection is automatic when using SoundFrame.
Game Object	The name of the game object used by the Car Sim. This name is editable but if you change the name during playback, playback will cease.
Car Settings	
(Name)	The name of the currently selected car model in the simulation.
	Opens the Open dialog box where you can select the settings for another car.
	Opens the Car Settings dialog box where you can customize your simulation settings for different types of cars.
User Input	
Engine	The controls to run the simulation. Select one of the following options to play back engine sounds: <ul style="list-style-type: none">• Play to post an event in Wwise to start playback.• Stop to post an event in Wwise to stop playback.

Throttle

Simulates using the gas pedal and the brake pedal. Positive units simulate pressing the gas pedal and negative simulate using the brake.

Range: -1 to +1

Gear Box

Simulates shifting gears. Select one of the following to change gears:

- **Up** to shift gears up, or to post an assigned event to simulate up shifting.

Down to downshift, or to post an assigned event to simulate downshifting.

Note: Events are assigned in the Car Sim Assignment dialog box.

Environment

Determines whether you will be using an environmental effect that you have assigned.

Dry

The unprocessed portion of an object's volume at the point at which the environmental effect is applied.

Range: 0 to 1—where 1 means that none of the volume is affected by the environmental effect, and 0 means that the volume is entirely processed with the environmental effect. The values in between represent how much unprocessed volume you want.

Wet

The processed portion of an object's volume at the point at which the environmental effect is applied.

Range: 0 to 1—where 1 means that all of the object's volume is processed with the environmental effect, and 0 means that none of the volume has been processed with the environmental effect. The values in between represent how much processed volume you want.

Current State

Gear

The current gear position in the simulation.

RPM

The current RPM value in the simulation. This represents the current game parameter value for this RTPC.

Load

The current value for the on and off load. This represents the current game parameter value of this RTPC.

Range: -1 to 1 where a positive value indicates that the car is accelerating, and a negative value indicates that the car is slowing down.

Speed

The current speed measured in Km/h. This represents the current game

parameter value for this RTPC.


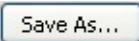
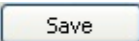
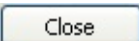
Note: In the Car Sim, the speed is displayed in Km/h but the Game Parameter value in Wwise is displayed in meters per second. $1 \text{ m/s} = 3.6 \text{ Km/h}$.

Car Settings Dialog Box

In the Car Settings dialog box, you can define the properties for the cars that you are simulating. These settings are saved in a .carset file in the Car Sim project. In the Wwise Car Sim project, the .carset file with the default settings is automatically loaded with the project .carsim file. Any changes you make in this dialog box are reflected immediately in the simulation and you can save the changes in a separate .carset file.

To access the Car Settings dialog box click **Edit** in the Car Sim window.

Interface Element	Description
No. of Gears	The number of gears that you plan to use in this car simulation. You can use up to seven gears.
(Gear)	The gear ratio that is being used in the simulation for each of the defined number of gears. This ratio does not affect any property values in Wwise. Range: 5.00 to 0.01 Default: Each gear has its own default value.
Weight (Kg)	The weight of the car that you are simulating. Range: 100000 to 1 Default: 1470 Units: Kg
Torque (N-M)	The torque of the car that you are simulating. Range: 10000 to 1 Default: 370 Units: N-M (Newton-meters)
Drag Coefficient (Cd)	The value of the aerodynamic drag on the car that you are simulating. Range: 1000 to 0 Default: .29 Units: Cd
Front Surface	The value for the area of the front surface of the car you are simulating. This value is directly related to the drag. Range: 1000 to 0 Default: 1.5

	Units: m ²
Rolling resistance	The value for the resistance encountered by the wheel or tire of the car you are simulating. Range: 100 to 0 Default: 0.050 Units: crr
Differential ratio (x:1)	The ratio between the number of times the drive shaft of the engine rotates to the number of times the driven wheel rotates. Range: 100 to 0 Default: 3.44
Wheel radius (m)	The value of the wheel radius for the car that you are simulating. Range: 100 to 0.01 Default: 0.23 Units: m
Minimum RPM	The minimum game parameter value mapped to an RTPC property. Range: 100,000 to 0 Default: 1000
RPM Cut Off	The maximum game parameter value mapped to an RTPC property. Range: 100,000 to 0 Default: 7500
	Returns all settings to their default values.
	Saves the .carset file using a name and location that you specify.
	Saves the .carset file in a previously defined location. If this is the first time you are saving this file, the Save as dialog box opens.
	Closes the Car Settings dialog box. If you have made unsaved changes to the settings, you will be prompted to save your settings.

Car Sim Assignments Dialog Box

In the Car Sim Assignments dialog box, you can specify which of the following elements, previously defined in the Wwise authoring application for the current project, can be used in the simulation.

- Game parameters

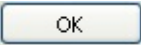
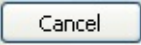
Events

Environmental effects

If you will not be using one of these, you can select None from the list. If the Car Sim is not connected to Wwise the settings in this dialog box will not be available.

To access the CarSim Assignments dialog box, click **Settings > Car Sim Assignments** from the menu bar.

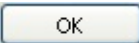
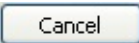
Interface Element	Description
Game Parameters	
RPM	The list of available game parameters that can be assigned to RPM for the simulation.
Load	The list of available game parameters that can be assigned to Load for the simulation.
Speed	The list of available game parameters that can be assigned to Speed for the simulation.
Events	
Engine Play	The list of available events that can be called for the Engine Play action in the simulation.
Engine Stop	The list of available events that can be called for the Engine Stop action in the simulation.
Up Shift	The list of available events that can be called for the Up Shift action in the simulation.
Down Shift	The list of available events that can be called for the Down Shift action in the simulation.
Environment	
Env. 1	The list of available environmental effects that can be

	assigned for the simulation.
	Closes the Car Sim Assignments dialog box and saves your settings.
	Closes the Car Sim Assignments dialog box without saving your settings.

Joystick Settings Dialog Box

The Car Sim allows you to use joysticks for the simulation. In the Joystick dialog box, you can configure the settings for the joystick.

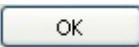
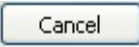
To access the Joystick dialog box, click **Settings > Joystick** from the menu bar.

Interface Element	Description
Use Joystick	Enables the joystick configuration settings.
Joystick	The list of available joysticks for the simulation.
Gearbox Up	Defines a button for the joystick's Gearbox Up command.
Gearbox Down	Defines a button for the joystick's Gearbox Down command.
Throttle	Defines the axis for adjusting the throttle using the joystick.
Environment (wet)	Defines the axis for applying the environmental effect using the joystick.
	Closes the Joystick dialog box and saves your settings.
	Closes the Joystick dialog box without saving your settings.

Framerate Dialog Box

In this dialog box, you can customize the rate at which the RTPC's are updated for the simulation.

To access the Framerate dialog box, click **Settings > Framerate** from the menu bar.

Interface Element	Description
FPS	The number of frames per second for the simulation.
	Closes the Framerate dialog box and saves your settings.
	Closes the Framerate dialog box without saving your settings.



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Patents pending

Wwise - Car Sim Help (Build 625)

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