

CarSim Model and License Options

This memo summarizes model and license options for CarSim 2018.0. Unless noted otherwise, all optional features are supported on all operating systems and in combination with all other features.

CarSim for Windows

The basic CarSim installer provides a database and browser with user interface, plotter, animator, both 32-bit and 64-bit math model solver programs, extensive documentation, and many example vehicles, procedures, and simulations.

The CarSim math model supports four-wheeled motor vehicles with or without a trailer (with one or two axles), using any combination of independent and solid-axle suspensions, and possibly a twist-beam rear suspension. The model works as-is, and can optionally be extended with the built-in scripting language (VS commands), Simulink, LabVIEW, and ETAS ASCET. They can also be extended using external programs written in MATLAB, Visual Basic, C/C++, Python, and other languages that can interact with Windows DLLs. Up to 200 built-in moving objects can be controlled to simulate traffic and safety-related scenarios.

The 32-bit and 64-bit versions of the CarSim math models run at the same speed. The two versions are provided solely to provide compatibility with third-party software. When used alone, all calculations are done with the 32-bit versions for compatibility with the CarSim main GUI; when used with third-party 64-bit software (e.g., 64-bit Simulink), then the 64-bit CarSim solvers must be used.

The basic CarSim for Windows package includes two licenses:

1. The CarSim Solver for Windows License is needed to make a new simulation run with a math model.
2. The CarSim Browser and Graphical User Interface License is needed to run the main GUI, manage the database, control runs, view animations, etc.

It is rare to provide one of the basic licenses alone; both are needed for normal operation and both are provided in the basic package. (The option for obtaining just one license is to support custom automation capabilities for sites with many CarSim installations.)

The CarSim Solver for Windows License supports all CarSim vehicle configurations based on a single unit (no trailer) with a rigid sprung mass.

ADAS Sensors

The optional CarSim Sensor License allows activation of up to 99 built-in range and tracking sensors to sense the moving objects (up to 200), sending variables to external controller models in Simulink, LabVIEW, or other environments.

Trailer

The optional CarSim Trailer License allows use of a trailer with one or two axles.

Engine Mount

The optional CarSim Engine Mount License allows the use of vehicle models an engine and torque rod with additional degrees of freedom (DOF) and six mounts (four for the engine, two for the torque rod).

The engine mount feature cannot be used at the same time as the frame twist model feature.

Frame Twist

The optional CarSim Frame Twist License allows use of models with frame twist DOFs that affect the load transfer of the tires.

The frame twist feature cannot be used at the same time as the model engine mount feature.

TASS and COSIN Tires

The CarSim Windows installation includes DLLs for tire models from TASS (MF-Tyre and MF-Swift) and COSIN (FTire), with example datasets. There are three license options:

1. TASS Delft Tyre (MF-Tyre Only) runs under any CarSim license together with all options that run under Windows OS.
2. TASS Delft Tyre (Including MF-Swift) requires an optional paid license from TASS in addition to a Basic CarSim license. With this license the MF Swift model will work together with all options that run under Windows OS.
3. COSIN FTire requires an optional paid license from COSIN in addition to a Basic CarSim license. With this license the FTire model will work together with all options that run under Windows OS.

The above external tire models work in both 32-bit and 64-bit versions.

TASS Delft Tyre is also available for RT use on dSPACE DS1006. The RT versions requires a paid license from TASS.

COSIN FTire models run much slower than real time and should not be considered for use in a CarSim Windows Driving Simulator.

AVL Cruise Powertrain

The optional CarSim AVL Cruise License allows the CarSim vehicle model to link to a powertrain model defined in the AVL Cruise software. The DLL for AVL Cruise must be obtained from AVL, along with the license for Cruise and the Cruise interface to CarSim.

Integration with AVL Cruise is supported for both 32-bit and 64-bit solvers on Windows. It is not supported for real-time systems.

CarSim Real Time

RT Platforms

The CarSim installer for Windows includes support for five RT platforms:

1. dSPACE and SCALEXIO
2. National Instrument LabVIEW RT and VeriStand
3. ETAS LabCar RTPC
4. Opal RT-LAB (QNX RT OS and Linux RT OS)
5. Concurrent Real Time System

Two additional platforms are supported in the Japanese market. These are provided with separate installers that add the RT-specific files to an existing CarSim Windows installation.

6. Fujitsu-Ten CRAMUS (Japan only)
7. AND Technology (Japan Only)

An optional RT license is needed to run on any of the above systems. All of the optional licenses for Windows CarSim that do not involve external components are also available for CarSim RT. That is, CarSim RT can optionally support ADAS Sensors, Trailers, Engine Mounts, and Frame Twist.

The CarSim RT solvers do not work with the external component models from TASS, COSIN, or AVL, with the exception that TASS Tyre models are available for dSPACE DS1006.

Extra Live Animations

CarSim RT supports a live animation license that supports a single connection between the math model and VS Visualizer, which in turn supports up to three monitors. If more connected computers running VS Visualizer are needed, additional live animation licenses can be purchased for all systems except dSPACE.

Windows DS for CarSim

The optional CarSim DS License allows a Windows-based desktop driving simulator.

A separate package adds files to an existing CarSim Windows installation to provide a virtual proving ground and a vehicle dataset that has been well tested in the DS environment. The DS database includes software to support a single live connection between a vehicle math model and the animator.

CarSim DS normally includes a Logitech G29 or G920 steering wheel with pedals and shifter hardware.

CarSim DS supports a live animation license that supports a single connection between the math model and VS Visualizer, which in turn supports up to three monitors. Additional live animation licenses can be purchased if more connected computers are needed to run more VS Visualizer instances.