

TruckSim Model and License Options

This memo summarizes model and license options for TruckSim 2020.1. Unless noted otherwise, all optional features are supported on all operating systems and in combination with all other features.

TruckSim for Windows

The basic TruckSim 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 TruckSim math model supports single-unit and combination vehicles. The TruckSim GUI supports a lead motor vehicle unit with up to five axles, semitrailers with up to four axles, and dollies with up to three axles. Suspensions can be generic/independent or solid-axle. Advanced users can simulate more complex vehicles by using generic GUI screens: TruckSim supports up to 64 units, each with any number of axles in groups of 1, 2 (tandems), or 3 (tridems). The maximum number of axles allowed in a vehicle is 128.

The model works as-is, and can optionally be extended with the built-in scripting language (VS Commands), Simulink, LabVIEW, and ETAS ASCET. The math model 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 TruckSim 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 TruckSim main GUI; when used with third-party 64-bit software (e.g., 64-bit Simulink), then the 64-bit TruckSim solvers must be used.

The basic TruckSim for Windows package includes two licenses:

1. The TruckSim Solver for Windows License is needed to make a new simulation run with a math model.
2. The TruckSim 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 TruckSim installations.)

The TruckSim Solver for Windows License supports all TruckSim vehicle configurations that use rigid sprung masses.

ADAS Sensors

The optional TruckSim 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.

Multiple Vehicles

The optional TruckSim Multiple Vehicle License allows use of up to 3 additional lead vehicles in a single solver instance. Multiple vehicles may be configured in the TruckSim Browser.

Frame Twist and Suspended Cab

The optional TruckSim Frame Twist License allows use of models with frame twist DOFs that represent the distribution of torsional compliance along the length of the Sprung Mass body and therefore affect the load transfer to the tires. When enabled, the Frame Twist option affects the lead unit and a trailer(s), if linked.

The lead unit with frame twist also has a suspended cab with three additional DOFs.

MF-Tyre/MF-Swift 6.2 and COSIN Tires

The TruckSim Windows installation includes DLLs for tire models from TNO (MF-Tyre/MF-Swift v6.2) and COSIN (FTire), with example datasets. There are three license options:

1. TNO Delft-Tyre v6.2 (MF-Tyre only) runs under any TruckSim license together with all options that run under Windows OS.
2. TNO Delft-Tyre v6.2 (including MF-Swift) requires an optional paid license from Siemens in addition to a basic TruckSim 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 TruckSim license. With this license the FTire model will work together with all options that run under Windows OS.

These external tire models support 32-bit and 64-bit versions.

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

AVL Cruise Powertrain

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

Integration with AVL Cruise is supported for both 32-bit and 64-bit solvers on Windows only; support does not exist for running this combination on real-time systems. The connection is native, which means a 3rd party software like Simulink or LabVIEW is not used as the interface.

Parallel Solver

This optional counted license allows additional process instances to simultaneously run TruckSim simulations on the targeted machine (process-level parallelism). This is useful for simulations involving multiple vehicle interactions orchestrated by external software such as MATLAB Simulink, or for custom server deployments of TruckSim expected to be running many TruckSim simulations.

TruckSim Real Time

RT Platforms

The TruckSim installer for Windows includes support for six RT platforms:

1. dSPACE DS1006/DS1005/DS1103 and SCALEXIO
1. National Instruments LabVIEW RT/VeriStand (ETS OS and Linux RT OS)
2. ETAS LabCar RTPC
3. Opal RT-LAB (QNX RT OS and Linux RT OS)
4. Concurrent Real Time System
5. A&D Technology

An optional RT license is needed to run on any of the above systems. The same set of optional licensed features that are available for the TruckSim Windows installation are also available for CarSim RT: ADAS Sensors and Frame Twist with Suspended Cab.

The TruckSim RT solvers do not work with the external component models from TASS, COSIN, or AVL.

Extra Live Animations

TruckSim 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 TruckSim

The optional TruckSim DS License is available to support a Windows-based desktop driving simulator.

A separate package adds files to an existing TruckSim Windows installation to provide a virtual proving ground and a vehicle dataset that has been well tested in the DS environment. Driving hardware is either a Logitech G29 or G920 steering wheel and pedal set.

The DS database includes software to support a single live connection between a vehicle math model and the 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.

