

BikeSim Model and License Options

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

BikeSim for Windows

The basic BikeSim 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 BikeSim math model supports 2- and 3-wheeled motorcycles, using any combination of rigid or flexible options for the fixed-caster and variable-caster front suspensions, and swing-arm rear suspensions. 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 BikeSim 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 BikeSim main GUI; when used with third-party 64-bit software (e.g., 64-bit Simulink), the 64-bit BikeSim solvers must be used.

The basic BikeSim for Windows package includes two licenses:

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

The BikeSim Solver for Windows License supports all BikeSim vehicle configurations based on a single unit with a sprung mass.

ADAS Sensors

The optional BikeSim 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.

3rd Party Tire Models (TNO, Siemens, and COSIN)

The BikeSim Windows installation includes DLLs for tire models from TNO (MF-Tyre/MF-Swift v6.2), Siemens (MF-Tyre/MF-Swift v2020.1), and COSIN (FTire), with example datasets. There are five license options below:

1. TNO Delft-Tyre v6.2 (MF-Tyre only) runs under any BikeSim 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 BikeSim license. With this license the MF-Swift model will work together with all options that run under Windows OS.
3. Siemens MF-Tyre v2020.1 runs under any BikeSim license together with all options except the **Enveloping contact**, **Rigid-ring** and **Turnslip** options that run only under Windows OS.
4. Siemens MF-Swift v2020.1 (including **Enveloping contact**, **Rigid-ring** and **Turnslip** option) requires an optional paid license from Siemens in addition to a basic BikeSim license. With this license the MF-Tyre/MF-Swift model will work together with all options that run under Windows OS.
5. COSIN FTire requires an optional paid license from COSIN in addition to a basic BikeSim 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.

Siemens MF-Tyre/MF-Swift v2020.1 is also available for RT use on dSPACE DS1006. The RT version requires a paid license from Siemens.

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

Parallel Solver

This optional counted license allows additional process instances to simultaneously run BikeSim 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 BikeSim expected to be running many BikeSim simulations.

BikeSim Real Time

RT Platforms

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

1. dSPACE DS1006/DS1005/DS1103/DS1401 and SCALEXIO
2. National Instruments LabVIEW RT/VeriStand (ETS OS and Linux RT OS)
3. ETAS LabCar RTPC

4. Opal RT-LAB (QNX RT OS and Linux RT OS)
5. Concurrent Real Time System
6. 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 BikeSim Windows installation are also available for BikeSim RT: ADAS Sensors.

The BikeSim RT solvers do not work with the external tire models from Siemens and COSIN, with the exception that Siemens MF-Tyre/MF-Swift v2020.1 is available only for dSPACE DS1006.

Extra Live Animations

BikeSim 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.