VehicleSim System Requirements & Software Compatibility

VehicleSim Products
- CarSim, TruckSim, BikeSim, and SuspensionSim
- Version 2020.1

Windows Operating Systems
- Windows 8 (32-bit and 64-bit)
- Windows 10 (32-bit and 64-bit)

Linux Operating Systems (CarSim and TruckSim only)
- Red Hat Enterprise Linux 7.2 (64-bit)
- CentOS 7 (64-bit)
- SUSE Linux Enterprise Server 12 (64-bit)
- openSUSE 42.3 Leap (64-bit)
- Ubuntu 14.04.3 LTS, 16.04.1, and 18.04.0 LTS (64-bit)

Minimum Hardware Specifications
- Hard Drive: 8 GB free disk space
- Memory: 4 GB RAM
- CPU: 2 GHz Intel® Core or equivalent
- Graphic processing unit (GPU): OpenGL 2.1 hardware support with 512 MB video memory (NVIDIA, AMD, or similar)

The software may run on a lower specification, but these numbers represent what we consider to be the lower bound of acceptable user experience.

Recommended Hardware Specifications (Required for DS)
- Hard Drive: 10 GB free disk space
- Memory: 4 GB RAM
- CPU: 2.2 GHz Intel® i5 or equivalent for laptop; 3.0 GHz for desktop
- GPU: OpenGL 3.0 hardware support, 1 GB video memory (NVIDIA, AMD, or similar)
- For a driving simulator, consider a high-end gaming computer
External Software Compatibility

**Notes** Both 32-bit and 64-bit versions are supported unless indicated otherwise.

For products and versions not listed, please contact Mechanical Simulation for more information. See also the summery for external tire and powertrain programs in Table 1.

- LabVIEW: tested with versions 2011 and 2012. No known issues for LabVIEW versions back to 8.5 (32-bit only)
- ASCET 5.2 (32-bit only)
- TNO MF-Tyre 6.1 (32-bit only), 6.1.2 and 6.2.0.2
- TNO MF-Swift 6.1 (32-bit only), 6.1.2 and 6.2.0.2 (optional license required from TNO/TASS)
- Siemens MF-Tyre/MF-Swift 2020.1 for CarSim (optional license required from Siemens)
- Siemens MF-Tyre/MF-Swift 2020.1 (dSPACE DS1006; dSPACE SCALEXIO release 2017A and up; and Concurrent Real-Time) for CarSim RT (optional license required from Siemens)
- Siemens MF-Tyre/MF-Swift 2020.1 for BikeSim (optional license required from Siemens)
- Siemens MF-Tyre/MF-Swift 2020.1 (dSPACE DS1006 release 2017A and up) for BikeSim RT (optional license required from Siemens)
- COSIN FTire 2019-4 (optional license required from COSIN)
- Michelin TameTire 5.1 (5.1.5545) and 6.1.2 for CarSim (optional license required from Michelin)
- AVL Cruise for CarSim starting with Version 2010.1 (optional licenses required from AVL and Mechanical Simulation). Tested versions 2010.1 through 2017.
- ADAS Research Platform Version 5.1.2015.1 for MSVC 18.00.
Table 1. Summary of system compatibility with external tire and powertrain programs

<table>
<thead>
<tr>
<th>External Software</th>
<th>Platform</th>
<th>C</th>
<th>T</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO MF-Tyre/MF-Swift 6.2</td>
<td>Windows 32/64-bit</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Siemens MF-Tyre/MF-Swift 2020.1</td>
<td>Windows 32/64</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td></td>
<td>dSPACE DS1006</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>Concurrent RT 64-bit</td>
<td>○</td>
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<tr>
<td></td>
<td>dSPACE SCALEXIO</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COSIN FTire</td>
<td>Windows 32/64</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Michelin TameTire</td>
<td>Windows 32/64</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVL CRUISE</td>
<td>Windows 32/64</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>General 3rd-party tire model interface*** (VS/STI)</td>
<td>Windows 32/64</td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td></td>
<td>dSPACE DS1006</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td></td>
<td>Concurrent RT 32/64</td>
<td>○</td>
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<td></td>
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<tr>
<td></td>
<td>dSPACE SCALEXIO</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C: CarSim; T: TruckSim; B: BikeSim</td>
<td></td>
<td>○: tested and supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MF-Swift 6.2/2020.1, MF-Tyre/Swift on RTs, FTire and CRUISE require separate licenses.</td>
<td></td>
<td>Blank: not supported</td>
<td></td>
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</tbody>
</table>

Real-Time System Compatibility (Optional Licenses Required)

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Simulation has tested CarSim, TruckSim, and BikeSim on some versions of each supported RT system, but not all combinations. For more details about specific combinations, please contact us at <a href="mailto:tech@carsim.com">tech@carsim.com</a> or 734-668-2930.</td>
</tr>
</tbody>
</table>

Following are the minimum hardware requirements for each supported RT system.

**dSPACE**

We support dSPACE DS Board 6.6 and newer; we have tested releases 6.6, 7.4, 2016B, 2017A, 2017B, 2018A and 2019A.

<table>
<thead>
<tr>
<th></th>
<th>CarSim</th>
<th>TruckSim</th>
<th>BikeSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1006</td>
<td>2.0 GHz</td>
<td>2.0 GHz</td>
<td>2.0 GHz</td>
</tr>
<tr>
<td>SCALEXIO (7.4 – 2019A)</td>
<td>2.2 GHz</td>
<td>2.2 GHz</td>
<td>2.2 GHz</td>
</tr>
<tr>
<td>include DS6001</td>
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</tr>
</tbody>
</table>

*DS1401 (MicroAutobox II) is supported for BikeSim only.

*For SCALEXIO, we currently support PC-based only.

*DS1005 and DS1103 builds are available in this release. However, Mechanical Simulation will not support installations using these hardware platforms. These platforms cannot maintain real-time and support all solver features.

*DS6001 requires dSPACE Release 2018B and above. There is an additional setting of the network. Please contact our support to get help.
**RT-Lab**

We support RT-Lab 10.4.x and newer based on documented support from Opal-RT; we have tested releases 10.4.x, 11.0.8 and 11.3 on QNX 6.3.2 and Linux. Support for RT-Lab 7.x – 8.x was discontinued from 2018 release. However, we cannot support breaking changes between versions which are produced by Opal-RT.

<table>
<thead>
<tr>
<th>CarSim</th>
<th>TruckSim</th>
<th>BikeSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 GHz Dual Core</td>
<td>2.4 GHz Dual Core</td>
<td>2.0 GHz Dual Core</td>
</tr>
</tbody>
</table>

**ETAS LabCar**

We support LabCar 5 and newer; we have tested release 5.31, 5.40, 5.4.2, 5.4.4, and 5.4.8.

<table>
<thead>
<tr>
<th>CarSim</th>
<th>TruckSim</th>
<th>BikeSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 GHz Dual Core</td>
<td>2.4 GHz Dual Core</td>
<td>2.0 GHz Dual Core</td>
</tr>
</tbody>
</table>

**National Instruments**

For NI ETS Real-Time system, we support and have tested LabVIEW 2015/2016/2017/2018 & VeriStand 2015/2016/2017/2018.

<table>
<thead>
<tr>
<th>CarSim</th>
<th>TruckSim</th>
<th>BikeSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabVIEW-RT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0 GHz Dual Core</td>
<td>2.4 GHz Dual Core</td>
<td>2.0 GHz Dual Core</td>
</tr>
<tr>
<td>VeriStand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0 GHz Dual Core</td>
<td>2.4 GHz Dual Core</td>
<td>2.0 GHz Dual Core</td>
</tr>
</tbody>
</table>

For NI Linux Real-Time system, we support LabVIEW 2015 and newer; we have tested LabVIEW 2015/2016/2017/2018 & VeriStand 2015/2016/2017/2018. On cRIO/cDAQ Real-Time Linux target, “Write all outputs” should not be checked. We have tested the NI Industrial Controller (IC-3173) with Linux RT system and LabVIEW 2016. We support LabVIEW 2019 with NI Linux Real-Time on PXIe controllers.

<table>
<thead>
<tr>
<th>BikeSim, CarSim and TruckSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabVIEW-RT</td>
</tr>
<tr>
<td>cRIO/cDAQ 1.9 GHz CPU and IC-3173 i7 CPU</td>
</tr>
<tr>
<td>PXIe-8840 Quad-Core, PXIe-8861 and PXIe-8880</td>
</tr>
<tr>
<td>VeriStand</td>
</tr>
<tr>
<td>cRIO 1.9 GHz CPU</td>
</tr>
</tbody>
</table>

NI cRIO with 1.9 GHz CPU is either cRIO-9034 (4 slots) or cRIO-9039 (8 slots). NI cDAQ with 1.9 GHz CPU is either cDAQ-9136 (4 slots) or cDAQ-9137 (8 slots).

NI Industrial Controller, for example IC-3173 with i7 2.2 GHz CPU, runs Linux Real-Time system with NI-9144/9145 expand chassis, for IO, and EtherCAT Real-Time data synchronization.

**Concurrent Redhawk with SIMulation Workbench (SimWB)**

We support Concurrent Redhawk 32bit/64bit Real-Time system, Linux Real-Time system, with SIMulation Workbench (SimWB). For 32bit Linux from Redhawk 5.4 with SimWB 6.0 or newer. For 64bit Linux from Redhawk 6.3 with SimWB 7.2 or newer.

<table>
<thead>
<tr>
<th>CarSim</th>
<th>TruckSim</th>
<th>BikeSim</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 GHz Dual Core</td>
<td>2.4 GHz Dual Core</td>
<td>2.0 GHz Dual Core</td>
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</tbody>
</table>
**A&D**
We support A&D hardware 5436, 5445/5446/5447, and the following software.

- AD5436 01.04.00 and up
- AD5445 02.07.00 and up
- VirtualDSPConsole 03.03 and up

**AVL ARTE.Lab**
CarSim is supported and was tested on ARTE.Lab 3.1.