

SimMechanics Release Notes

The “SimMechanics 2.1.1 Release Notes” on page 1-1 describe the changes in this product since Version 2.1.

Note Version 2.1.1 is available as part of the R13 SP1 release.

If you are upgrading from a version earlier than Version 2.1.1, you should also see:

- “SimMechanics 2.1 Release Notes” on page 2-1
- “SimMechanics 2.0.1 Release Notes” on page 3-1
- “SimMechanics 2.0 Release Notes” on page 4-1

Printing the Release Notes

If you would like to print the Release Notes, you can link to a PDF version.



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SimMechanics 2.1.1

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Major Bug Fixes

SimMechanics 2.1.1 includes these important bug fixes made since Version 2.1.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site, and use the link provided.

Upgrading from an Earlier Release

SimMechanics 2.1.1 includes the following changes since Version 2.1.

SimMechanics Demos

The some of the demo models of SimMechanics, located in `toolbox/physmod/mech/mechdemos`, have been updated.

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New Features

Two important features have been introduced in SimMechanics 2.1 since Version 2.0.1.

Computer-Aided Design Translator for SolidWorks

SimMechanics 2.1 contains a standalone computer-aided design (CAD) translator for the SolidWorks® CAD platform. You install and use the CAD translator with SolidWorks but independently of MATLAB.

The translator converts a SolidWorks CAD machine assembly into an XML file in a special Physical Modeling format. The XML file represents the assembly in a form that you can use with SimMechanics to generate a block diagram model dynamically equivalent to the original CAD assembly. To generate models, use the new `import_physmod` command. See “`import_physmod` Command for Generating Models” below.

Relative to the main directory of your SolidWorks installation, the CAD translator installs to `Applications/TheMathWorks/SimMechanics/`.

import_physmod Command for Generating Models

Using the CAD translator (see above), you export a CAD assembly into an XML file in the Physical Modeling format.

This XML file represents the assembly in a form that you can use to generate a SimMechanics block diagram model dynamically equivalent to the original CAD assembly. You generate the model from the XML file with the `import_physmod` command.

The generated model contains Bodies and Joints that represent the original parts and degrees of freedom of the assembly. You can edit the generated model to add additional SimMechanics and Simulink blocks.

Special Documentation and Examples for CAD Translator

Special help files accompany the CAD translator. They include two HTML pages and a special PDF book.

These files are independent of the MATLAB help system. Relative to the main directory of your SolidWorks installation, the special CAD translator documentation installs to Applications/TheMathWorks/SimMechanics/help/.

The SimMechanics User's Guide has not been updated for this release.

Some examples of SolidWorks CAD assemblies are installed to Applications/TheMathWorks/SimMechanics/examples/. One of the examples is a robot arm assembly. The corresponding XML file in Physical Modeling format, robot.xml, is located in the toolbox/physmod/mech/mechdemos directory, relative to your MATLAB root.

Major Bug Fixes

SimMechanics 2.1 includes these important bug fixes made since Version 2.0.1.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site, and use the link provided.

Upgrading from an Earlier Release

This section presents issues involved in upgrading from SimMechanics 2.0 to SimMechanics 2.1.

Installing the CAD Translator for SolidWorks

The computer-aided design (CAD) translator for SolidWorks is independent of MATLAB. You must install it separately, then interface it with SolidWorks.

Installing

You can obtain the self-extracting executable archive `SimMechanics_Translator_for_SolidWorks.exe` in two ways.

- When you install SimMechanics 2.1, the archive is installed to `toolbox/physmod/import/standalone/solidworks/win32/`, relative to your MATLAB root.
- Alternatively, you can download the archive independently of MATLAB at www.mathworks.com/products/simmechanics/.

Once you have the archive, run it. Click **Setup**.

The setup utility searches your hard drive for the SolidWorks installation location. If you wish to specify the location yourself, you can interrupt the search at any time by pressing the spacebar and then entering a full or partial path to your SolidWorks directory. Once the installer finds SolidWorks, it prompts you to confirm. After you confirm, the installation runs to completion.

A README file, with additional instructions, appears after installation.

Linking to SolidWorks

After you have completed the preceding steps to install the translator, start SolidWorks.

Choose **Add-Ins** from the **Tools** menu. Then select **SimMechanics**.

Known Software and Documentation Limitations

This section describes known software and documentation problems in Version 2.1.

SolidWorks Versions Compatibility for CAD Translator

The SimMechanics computer-aided design (CAD) translator for Solid Works is designed to work with SolidWorks 2001Plus SP2.0 or later versions.

Uninstalling and Reinstalling the CAD Translator

If you remove the CAD translator for SolidWorks and want to reinstall it, you must reboot your system first after uninstalling. Then you can reinstall the translator.

Platform Limitations

The SolidWorks CAD platform and the SimMechanics CAD translator for SolidWorks are available only for the Microsoft Windows operating system.

SimMechanics User's Guide Not Updated

The SimMechanics User's Guide has not been updated for this release. It is identical to the Version 2.0 User's Guide.

The computer-aided design (CAD) translator, installed separately from MATLAB, contains its own special, standalone documentation. This documentation is independent of the MATLAB help system. See "Special Documentation and Examples for CAD Translator" on page 2-2.

SimMechanics 2.0.1

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Major Bug Fixes

SimMechanics 2.0.1 includes the following bug fix.

Code Compilation with lcc Compiler

Attempting to compile code generated from SimMechanics models using lcc led to errors in Version 2.0. This bug is now fixed.

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New Features

A number of important features have been introduced in SimMechanics 2.0 since Version 1.1 (Release 13). This section summarizes them.

Code Generation with Real-Time Workshop

You can now generate stand-alone C code from SimMechanics models using Real-Time Workshop[®]. You can also export it to a PC kernel using xPC Target.

SimMechanics 2.0 requires Real-Time Workshop 5.0.1 or later to generate code for the Rapid Simulation (RSIM) target.

Accelerator Mode and Discrete Events

Accelerator mode now supports discrete events associated with the Joint Stiction Actuator and the Point-Curve Constraint.

Expanded Handle Graphics Visualization Features

The Handle Graphics visualization tool of SimMechanics has a large number of new features, including recording and playback of simulation animations.

Variable Body Mass and Inertia Tensor

The Sensors & Actuators library features a new Variable Mass & Inertia Actuator block. This block accepts Simulink signals that vary the mass and/or inertia tensor of the Body block to which it is connected. The block only simulates the changes in the body's mass properties and does not simulate the effect of the thrust forces or torques resulting from the accretion or ejection of mass.

Vectorized Joint Initial Condition Actuation

The Joint Initial Condition Actuator block now lists all the primitives in the Joint block to which it is connected. You can set initial positions/angles and initial velocities separately for each prismatic and revolute primitive.

Damped Linear Force Element Blocks

This release introduces a new block library, Force Elements, with two blocks representing damped linear harmonic oscillator forces. The Body

Spring-Damper block simulates a damped spring-like force between two bodies. The Joint Spring-Damper block actuates a joint primitive with a damped spring-like force or torque.

New Mechanical Branching Bar Block

The Utilities library features the new Mechanical Branching Bar block. You can use this block to map multiple sensor and actuator lines to one sensor/actuator port on a Joint, Constraint, or Driver or to one Body coordinate system on a Body.

Major Bug Fixes

SimMechanics 2.0 includes these important bug fixes made since Version 1.1 (Release 13).

Upgrading from an Earlier Release

This section presents issues involved in upgrading from SimMechanics 1.1 to SimMechanics 2.0.

Reconfiguring Virtual Reality Visualization

The SimMechanics documentation assumes that you are using the default Virtual Reality Toolbox viewer. You are free to install and use the blaxxun Contact 4.4 plug-in viewer with a Web browser. The plug-in is supported only on Microsoft Windows platforms.

Installing the Browser Plug-in Viewer

Important tips for installing the blaxxun Contact browser plug-in viewer:

- Use Version 4.4 of the Contact viewer that ships with the Virtual Reality Toolbox and which is available for Web download from the MathWorks. Do not upgrade to a later version of the blaxxun Contact plug-in.
- Before installing the blaxxun Contact plug-in, turn off the MATLAB Web server. This allows the blaxxun viewer to register itself over the Web and complete its installation. You can turn the MATLAB Web server back on after installing. You can also avoid installing the Web server altogether.
- The Microsoft Internet Explorer browser, Version 5.5 or higher, requires manual reconfiguration for use with the blaxxun viewer. You must reset the Java-related network security settings, as explained in the Virtual Reality Toolbox User's Guide.

Known Software and Documentation Limitations

This section describes known software and documentation problems in Version 2.0.

Virtual Reality Toolbox Viewers

The default viewer functions on UNIX/Linux platforms, including the Mac OS X, but only with virtual reality code written in the VRML 2 standard.

The blaxxun Contact plug-in viewer works only on Windows platforms. It can read virtual reality code in both VRML 1 and VRML 2 formats.

Configurable Subsystems Limitation

Simulink configurable subsystems work with SimMechanics blocks only if all of the block choices have consistent port signatures.

Unsupported Nonvirtual Subsystems

For Iterator, Function-Call, Triggered, and While Iterator subsystems cannot contain SimMechanics blocks.

Currently Unsupported Simulink Features and Tools

Certain Simulink features and tools are currently not functioning with SimMechanics blocks or SimMechanics models. Consult the section on SimMechanics limitations.

Avoiding Singular Initial Configurations

Avoid starting a machine in a singular configuration. Its subsequent motion violates assembly tolerances, as the simulation incorrectly removes one or more necessary constraints. A common singular configuration is one where the machine could move in two or three dimensions, but starts in exactly one or two dimensions.

Work around an initial singularity by slightly misaligning the joint axes, within assembly tolerances, before starting the simulation. You can tame singularities encountered later in a simulation by selecting the **Use robust singularity handling** check box on the **Constraints** pane of the **Mechanical Environment Settings** dialog.

Virtual Reality Visualization

Consult the Virtual Reality Toolbox Version documentation for product limitations.

The presentations of virtual reality visualization in the SimMechanics User's Guide assume that you are using the default viewer.

Rendering and Animation Bugs with the blaxxun Plug-in Viewer

The Virtual Reality Toolbox documentation contains instructions for using the optional blaxxun Contact 4.4 plug-in viewer for Web browsers. You must use the plug-in viewer if you want to view virtual reality scenes written in the VRML 1 format.

These are sporadic minor problems with the blaxxun plug-in viewer:

- If the machine is not initially visible in the browser, try closing the browser and restarting, or try the browser's **Refresh** or **Reload** buttons.
- When you update a diagram, the virtual reality scene might not update as it should. Click the browser's **Refresh** or **Reload** buttons to update the scene manually.
- Microsoft Internet Explorer 6 sometimes fails if you use it as the default browser for virtual reality the blaxxun plug-in viewer. Restart the visualization from the **Mechanical Environment Settings** dialog if this happens.

