Simscape Release Notes

Contents

Summary by Version

This table provides quick access to what's new in each version. For clarification, see "About Release Notes" on page 1.

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Latest Version V2.0 (R2007b)	Yes Details	No	Bug Reports	Printable Release Notes: PDF Current product documentation
V1.0 (R2007a)	Yes Details	Yes Summary	Bug Reports	No

About Release Notes

Use release notes when upgrading to a newer version to learn about new features and changes, and the potential impact on your existing files and practices. Release notes are also beneficial if you use or support multiple versions.

If you are not upgrading from the most recent previous version, review release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the New Features and Changes, Version Compatibility Considerations, and Bug Reports for V1.1 and V1.2.

New Features and Changes

These include

- New functionality
- Changes to existing functionality
- Changes to system requirements (complete system requirements for the current version are at the MathWorks Web site)

- Any version compatibility considerations associated with each new feature or change

Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, its description includes a **Compatibility Considerations** subsection that details the impact. For a list of all new features and changes that have reported compatibility impact, see the "Compatibility Summary for Simscape" on page 8.

Compatibility issues that are reported after the product has been released are added to Bug Reports at the MathWorks Web site. Because bug fixes can sometimes result in incompatibilities, also review fixed bugs in Bug Reports for any compatibility impact.

Fixed Bugs and Known Problems

MathWorks Bug Reports is a user-searchable database of known problems, workarounds, and fixes. The MathWorks updates the Bug Reports database as new problems and resolutions become known, so check it as needed for the latest information.

Access Bug Reports at the MathWorks Web site using your MathWorks Account. If you are not logged in to your MathWorks Account when you link to Bug Reports, you are prompted to log in or create an account. You then can view bug fixes and known problems for R14SP2 and more recent releases.

Related Documentation at Web Site

Printable Release Notes (PDF). You can print release notes from the PDF version, located at the MathWorks Web site. The PDF version does not support links to other documents or to the Web site, such as to Bug Reports. Use the browser-based version of release notes for access to all information.

Product Documentation. At the MathWorks Web site, you can access complete product documentation for the current version and some previous versions, as noted in the summary table.

Version 2.0 (R2007b) Simscape

This table summarizes what's new in Version 2.0 (R2007b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this version are

Code Generation Now Available for Simscape Models

Code generation has been implemented for models that include Simscape and SimHydraulics® blocks. For more information, see "Generating Code" in the Simscape documentation.

New Thermal Block Libraries

Simscape 2.0 contains new block libraries of fundamental thermal elements, sensors, and sources:

- Conductive Heat Transfer
- Convective Heat Transfer
- Radiative Heat Transfer
- Thermal Mass

- Thermal Reference
- Ideal Heat Flow Source
- Ideal Heat Flow Sensor
- Ideal Temperature Source
- Ideal Temperature Sensor

Additional Physical Signal Blocks

The new Physical Signal blocks introduced in Simscape 2.0 are listed below:

- PS Constant
- PS Math Function
- PS Max
- PS Min
- PS Sign

Improved Simulation Performance

In Simscape 2.0, various solver improvements have led to improved simulation performance:

- Enhanced handling of dependent dynamic states (higher-index DAEs)

  Simscape can now handle dependencies among the dynamic states as long as they are linear in the states and independent of time and inputs. This allows you, for example, to connect capacitors in parallel (even with their parasitic series resistances set to 0), inductors in series, and so on.

- Significant reduction of the number of equations, which substantially increased simulation speed

  The typical speedup of your models is between 5 and 10 times. There are some models that are below and above this range. Also, the number of states and equations changed between releases. This means that you will have to reset any calculations that relied on the states (such as initial state setting).

The changes to the simulation technology are significant. You may find that some of your models may require different or tighter tolerances to converge, while others will require no change. Refer to the troubleshooting section in the User's Guide for help in finding the cause of a problem if simulation failed.

New Simscape Demos

The following demos have been added in Simscape 2.0:

Demo Name	Description
DC Motor Thermal Circuit (`ssc_dc_motor_thermal_circuit`)	The demo illustrates how the thermal behavior of a motor can be simulated in lumped parameters.
Round Rod Heat Conduction (`ssc_round_rod_heat_conduction`)	The demo illustrates the usage of thermal blocks for developing a model of a long iron rod that is heated with a heat source through its left face. The right face and the outer cylindrical surface are open to atmosphere, with a force heat convection.

Version 1.0 (R2007a) Simscape

This table summarizes what's new in V1.0 (R2007a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes—Details labeled as **Compatibility Considerations**, below. See also Summary.	Bug Reports	No

New features introduced in this version are described here.

Introduction of Simscape

Simscape extends Simulink® with tools for modeling and simulating multidomain physical systems. It enables you to describe multidomain physical systems containing mechanical, hydraulic, and electrical components as physical networks.

Simscape has the following key features:

- Single modeling environment for modeling and simulating physical systems, such as mechanical, electrical, and hydraulic systems
- Foundation library of physical modeling building blocks and fundamental mathematical elements
- Connection blocks to bridge modeling domains
- Full simulation and limited editing capabilities for models built with SimMechanics, SimDriveline, or SimHydraulics® (no license for these products required as long as the products are installed)
- Ability to specify units of parameters and variables, with all unit conversion handled automatically

Simscape can be used for a variety of automotive, aerospace, defense, and industrial equipment applications. Together with SimMechanics,

SimDriveline, SimHydraulics, and SimPowerSystems (all available separately), Simscape lets you model complex interactions in electromechanical and hydromechanical systems.

Block Libraries Moved from SimHydraulics to Simscape

The Foundation and Utilities block libraries that used to be included in SimHydraulics (V1.0 and V1.1) are now part of Simscape.

Compatibility Considerations

Several blocks that used to be in SimHydraulics V1.1 and are now part of Simscape have undergone changes that have compatibility impact. These blocks are:

- Fluid Inertia
- Inertia
- Mass
- PS Integrator
- Rotational Spring
- Translational Spring

Each of these blocks has a parameter that specifies the initial condition for use in computing the block's initial state at the beginning of a simulation run. In this version, there is a difference in the way these initial conditions are computed, and as a result, the blocks work differently than they used to in the previous version. For details, see the block reference pages.

Compatibility Summary for Simscape

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

Version (Release)	New Features and Changes with Version Compatibility Impact
Latest Version V2.0 (R2007b)	None
V1.0 (R2007a)	See the **Compatibility Considerations** subheading for this new feature or change: • "Block Libraries Moved from SimHydraulics to Simscape" on page 7