

What's New In MapleSim 6.1

MapleSim™ 6.1 provides improved performance, more tools for programmatic analysis and custom components, connectivity enhancements, and more.

Faster Simulations

MapleSim 6.1 produces simulations faster than ever before due to a variety of improvements in the simulation engine. In particular:

- For all models, the model pre-processing phase is more efficient, so your simulation results appear sooner.
- Substantial improvements have been made in creating the 3-D visualizations of large models, so simulation animations appear much more quickly than before.

API Enhancements

The MapleSim Application Programming Interface (API) is a collection of procedures for manipulating, simulating, and analyzing a MapleSim model in the Maple™ document environment. In MapleSim 6.1, this API has been extended to provide even more flexibility for model creation and analysis.

Programmatic Analysis Tools

New commands make it easier to analyze the parameters in your model programmatically. These commands can take advantage of the full processing power of your computer, automatically detecting and using all available processor cores to perform your computations in parallel whenever possible. You can even specify how many cores you wish to involve, keeping the remaining cores available for other tasks. As a result, you can perform large numbers of computations rapidly and get your results faster. With these new commands, you can:

- Perform a **Monte Carlo analysis** of your model. With each simulation, the parameters you specify are varied randomly.
- Do a **parameter sweep** of your model. You can provide a range of parameter values to sweep through or give a specific list of values.

Creating Custom Components

With the updated API, you can easily create custom components programmatically instead of using the interactive template in MapleSim. Using new API commands, you can:

- **Extract your defining equations from any Maple document**, not just the Custom Component Template, or define your model from Modelica® source code.
- Take advantage of extra flexibility to **define new port types** for your component.
- **Send the component directly to MapleSim** for inclusion in your next model.

Preferred Variables

MapleSim optimizes the equations of a MapleSim model by removing redundant equations and variables from the system of equations. Running the GetEquations API command returns this system of equations so they can be examined in Maple.

In previous versions of MapleSim, MapleSim decided which variables were eliminated during the optimization process. In MapleSim 6.1, you can give MapleSim a list of preferred variables. The equation simplification process keeps these variables in the final system of equations whenever possible.



Connectivity

New and improved connectivity add-ons to MapleSim 6.1 provide even more ways to integrate MapleSim into your toolchain.

- **New! MapleSim Connector for JMAG®-RT:** This new connector allows you to use motor files exported from JMAG-RT directly in your MapleSim simulations.
- **MapleSim Connector for FMI:** The MapleSim Connector for FMI adds support for v2.0 Beta 4 of the FMI standard, the most current definition available at this time. With this option, you can now choose to export your model for co-simulation using fixed-step solvers as well as model exchange. Maplesoft will extend its support to meet the final version 2.0 standard once that definition is released.
- **Connectivity to Simulink®, NI LabVIEW™, and NI VeriStand™ Software:** New export options allow you to export your MapleSim model as a discrete model (that is, a model without any continuous states), even if the model itself is continuous or includes continuous elements. With this option, the solver is included in the export, so the exported model can be simulated without any calls to external solvers. In some situations, the result is a much faster simulation in the target system, especially in the cases where the original model included both discrete and continuous elements. This approach is also useful for embedded controller code. When this option is selected you can choose from one of five embedded solvers (Euler, RK2, RK3, RK4, and Implicit Euler) and specify the time step for the discretization.
- **All connectivity add-ons**, including those listed above and connectors for dSPACE® systems, B&R Automation Studio, and VI-CarRealTime™, have been updated to work with the latest MapleSim release.

Additional Features and Improvements

- **Enhancements to exported code** include improvements to model initialization. Exported code includes both discrete and continuous variable iteration loops to ensure that the initial conditions adjust for changes in both the specified parameters and initial conditions. Other changes include the ability to specify a boolean or integer parameter in addition to continuous parameters.
- **A new transparency option for multibody geometry components** allows you to make components transparent so you can see the elements underneath. For example, you can add a transparent car body to your engine model to provide additional visual context.
- MapleSim 6.1 further enhances **support for Modelica**. In addition to new API commands that support the creation of custom components using Modelica code, MapleSim 6.1 also offers improved support of Modelica functions and algorithms.
- Compatibility with the latest Maple release lets you **take advantage of all the enhancements of Maple 17**, including a wide variety of improvements in both the computation engine and interface. Additions include a new code editor, new tools for signal processing, improved subscript handling, and much more.

