

# What's New In MapleSim™ 7

MapleSim™ 7 makes it substantially easier to investigate your models, create and manage libraries of custom components, and use your models with other simulation programs.

## Easy Model Investigation

A new Results Manager gives you greater flexibility when it comes to investigating your simulation results.

- Compare multiple simulation runs at the click of a button, including simulations of a single model and simulations of different models.
- Instantly plot the behavior of any variable in your model, not just the ones you probed.
- Create custom plots simply by placing values of interest onto a common set of axes.
- Zoom in on a region of interest once, and the zoomed view is retained in subsequent simulation runs.
- Visualize the correspondence between the 2-D simulation and the 3-D animation.
- Access simulation results performed in Maple™ as easily as those run in MapleSim.

## Convenient Library Creation

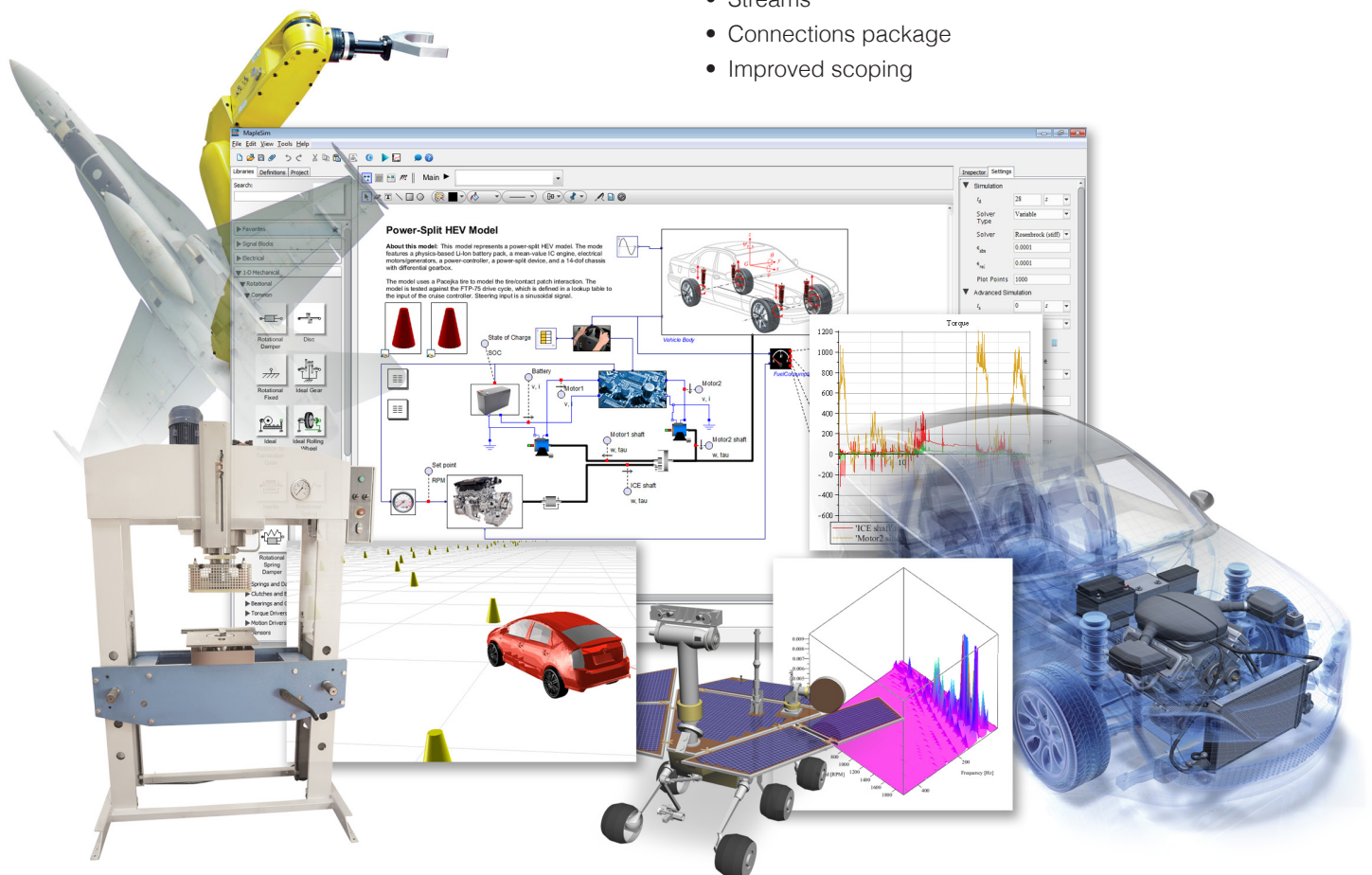
MapleSim 7 makes it easier than ever before to create, manage, and share libraries of custom components.

- Organize your components using a hierarchical structure.
- Update, test, and save individual components locally without having to rebuild the library.
- Easily create custom port definitions with an interactive template.

## Improved Modelica® Support

MapleSim allows you to use components and models written in Modelica in your MapleSim models. MapleSim 7 expands the support of the Modelica language so that more Modelica definitions can be used directly inside MapleSim. Newly supported structures include:

- Streams
- Connections package
- Improved scoping



## New Components

MapleSim 7 includes new and updated components to expand the scope of what MapleSim can model.

- The Signal Blocks Library now provides new blocks for both fixed delay and variable delay.
- Rigid body components in the Multibody Library now act as a variable point mass, so the model can take into account changes in the mass of the object during operation.
- The Translational Spring Damper Actuator in the Multibody Library now accepts connections to 1-D translational ports, simplifying interactions between the two domains.

## Expanded Connectivity through FMI

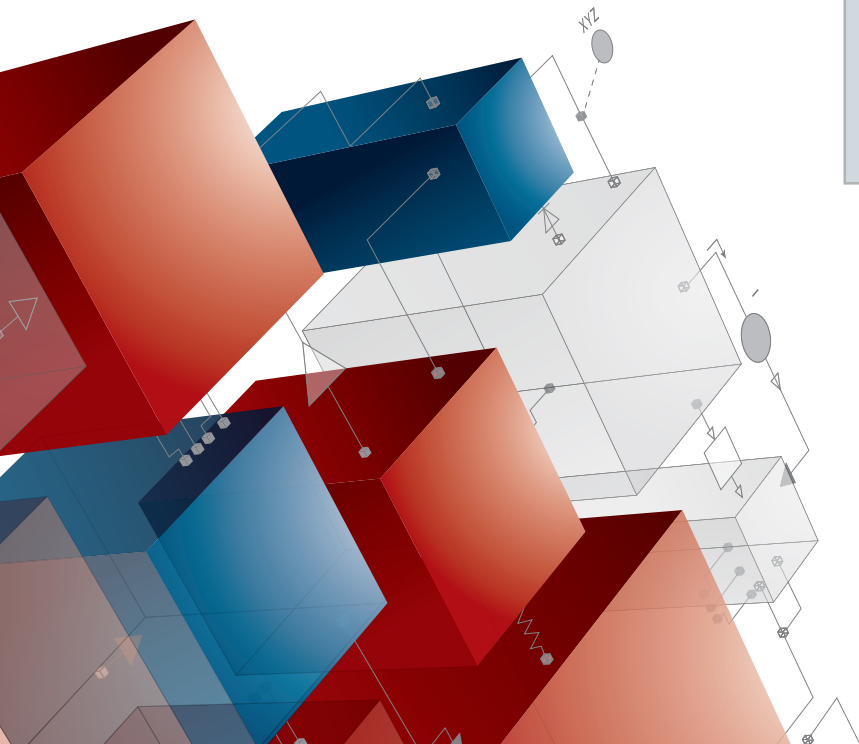
The **MapleSim Connector for FMI** allows you to share very efficient, high-fidelity models created in MapleSim with other modeling tools. FMI (Functional Mockup Interface) is an increasingly popular standard format for defining models to facilitate the sharing of models across different tool sets. For MapleSim 7, the MapleSim Connector for FMI supports more export formats.

- Leverage highly efficient MapleSim models in other simulations tools with export to FMI for Co-Simulation, versions 1.0 and 2.0
- Share MapleSim models with more tools using the expanded export to FMI for Model Exchange, which now also supports version 2.0

## Battery Modeling

The new **MapleSim Battery Library**, which is available as a separate add-on component library, allows you to incorporate physics-based predictive models of battery cells into your multidomain models so you can take battery behavior into account early in your design process. With these models, you can understand the loading effect on the battery as it undergoes many different duty cycles and how the battery will behave as part of the greater system. In addition, you will gain a better understanding of the heat flow in the battery, how rising temperature and age affects efficiency, and what critical factors could cause thermal runaway. Equipped with this knowledge, you can then adjust your designs to optimize performance and reduce the risk of undesirable effects.

- Supports full electrochemical physics and equivalent-circuit models
- Includes chemistries for Li-Ion (14 Anode/Cathode combinations) and NiMH
- Captures thermal effects through an optional heat port
- Supports State of Health (SoH) studies through capacity fading and increased internal resistance
- Provides parameter identification tools for determining model parameters from experimental data



**MapleSim**<sup>™</sup>  
Advanced System-Level Modeling