



Enhanced Mathematical Tools for Simulation

Integrations, Solvers and new tools to expand your simulations with **MATLAB®**, **Octave** and **Modelica®**

Enterprise Architect 15.2 is a major upgrade for Systems Engineers, Technical Architects and others wishing to couple their modeling and simulation work in Enterprise Architect with **MATLAB®**, **Octave**, **Modelica®** and more.

Integrate **MATLAB®** in multiple ways

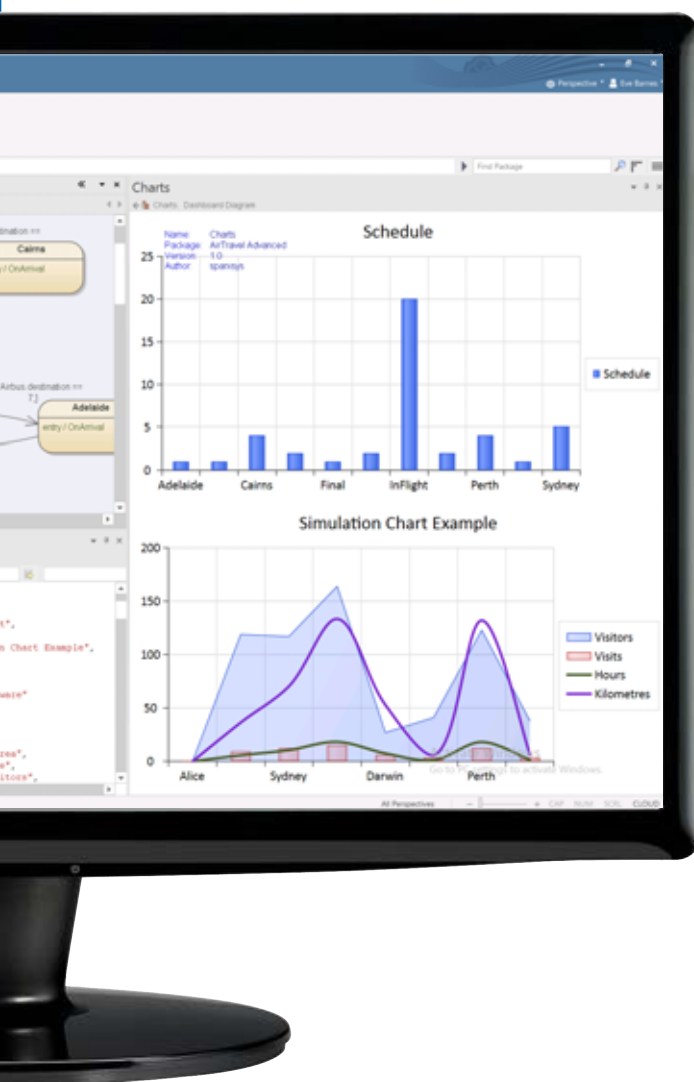
The **MATLAB®** integration connects via the **MATLAB®** API allowing your Enterprise Architect simulations and other scripts to act based on the value of any available **MATLAB®** functions/expressions.

A Rich Library of Mathematical Functions

You can invoke arbitrary mathematical functions from Octave at run time using a simple construct, called a Solver Class, written in JavaScript.

New and Expanded Support for **Modelica®**

Simulation exports now create the complete corresponding **Modelica®** diagram viewable and simulate-able in the OMEDIT.



Model your Enterprise Architect Simulations for



Mathematical Charting



Scientific Applications



Electrical Systems



Physical Systems



State Machines

Its All About the Math

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Invoke Math Functions

Solver classes let you invoke arbitrary mathematical functions from MATLAB® or Octave at run time using a simple structured Solver API. Custom model export to MATLAB® tools such as Simulink and Stateflow provide a platform for modeling and simulating advanced mathematical models and architectures. Improvements to the OpenModelica integration and new ways of interfacing with GNU Octave further expand the options available to the Systems Engineer.

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The Power of JavaScript Engine

Version 15.2 now supports a new JavaScript construct called “Solver”. We have initially provided solvers for integration with MATLAB® and Octave through the built in JavaScript engine. Referencing and invoking functions in these external tools is both simple and intuitive, providing instant access to the rich mathematical libraries and capabilities exposed.

The Solver class allows you to use the functionality of external tools to perform complex tasks within your simulation.



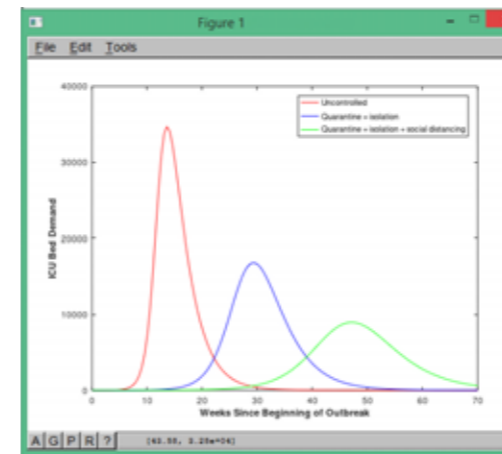
Integrate MATLAB® via API

Millions of engineers and scientists worldwide use MATLAB® to analyze and design the systems and products that are transforming our world. Enterprise Architect’s MATLAB® integration connects via the MATLAB® API allowing your Enterprise Architect simulations and other scripts to act based on the value of any available MATLAB® functions /expressions. Call MATLAB® through the Solver classes, or export your model to Simulink®, Simscape™ and/or Stateflow.



Connect with GNU Octave

The open source Octave project provides a rich library of mathematical functions you can leverage in your models and in your Simulations. You can invoke arbitrary mathematical functions from Octave at run time using a simple construct, called a Solver Class, written in JavaScript; a Solver Class for Octave can call into the external Octave tool and link the powerful mathematical functions directly into your running simulation.



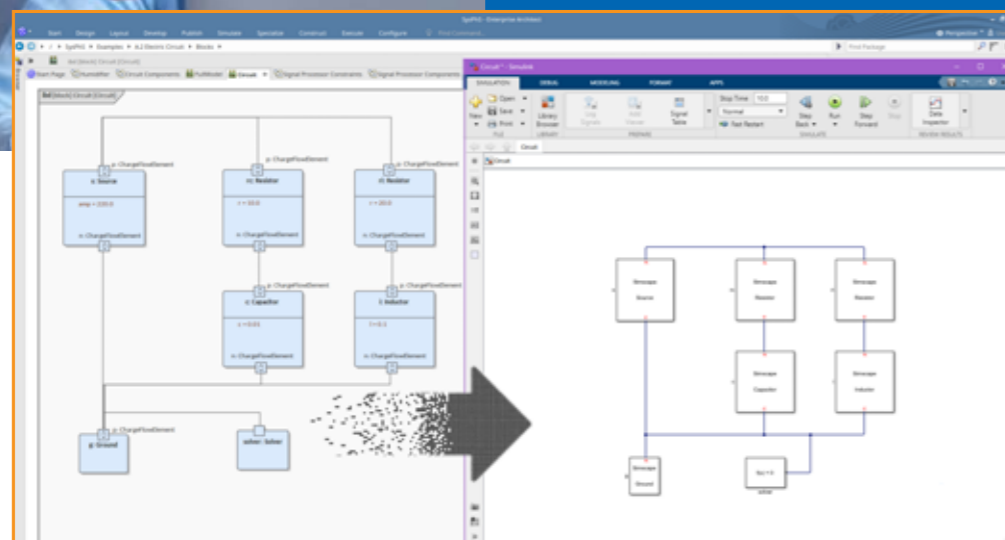
The open source Octave project provides a rich library of mathematical functions

```
function Rand(min, max) {
  1 min = capex.ceil(min);
  2 max = capex.floor(max);
  3 // rand returns 1.0 <= y < 2.0.
  4 return capex.floor((capex.rand()-1) * (max - min+1)) + min; //The
  5 }
  6 var chartData =
  7 {
  8   "Category": "Default",
  9   "Type": "Default",
  10  "Title": "Simulation Chart Example",
  11  "Sparsity": 30,
  12  "Diagram": 1,
  13  "Engine": "Software",
  14  "Series": 1
  15 }
```

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MATLAB Simscape™ for Physical Systems

Enterprise Architect can now translate SysML internal block diagrams into MATLAB's Simscape™, which is an extension to Simulink, and instructs MATLAB® to simulate and plot the requested outputs. This allows simulation of physical systems where components represent physical objects and flows represent physical substances or energy, for example water flowing from one tank to the next, or current flowing through a resistor. Access the vast array of pre-built Simscape™ library blocks, or create references to your own custom library blocks.

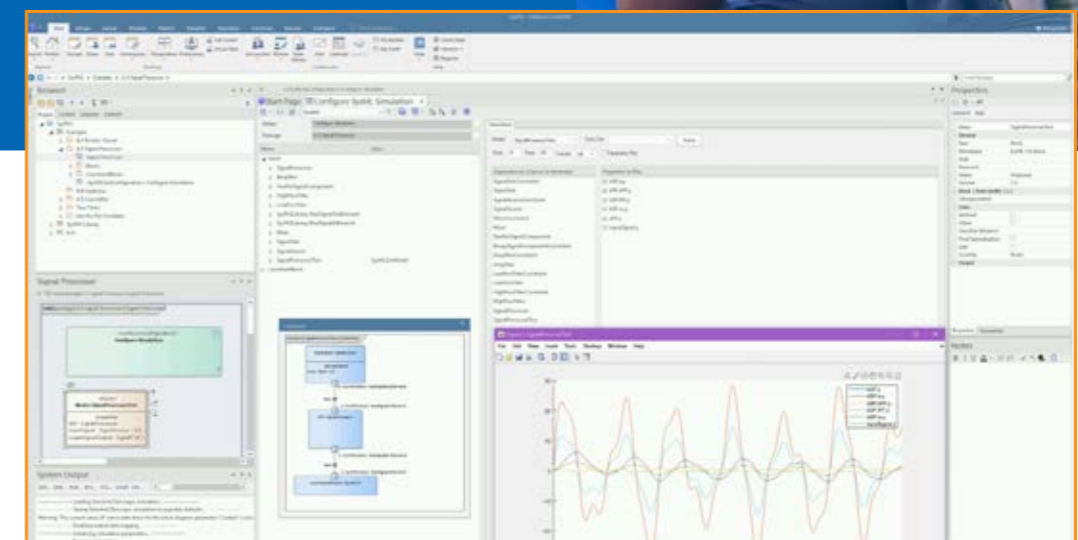


Access the vast array of pre-built Simscape library blocks, or create references to your own custom library blocks.

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MATLAB Simulink®

Using Enterprise Architect 15.2, you can now run SysML simulations in Simulink® as well as Modelica®. Enterprise Architect will translate a SysML model into the Simulink format and automatically run the simulation, plotting the outputs of the selected variables. The generated Simulink® file can also be opened directly in Simulink® allowing modification and fine-tuning of the simulation settings and output functionality.



Drag-and-drop access to common built-in Simulink library blocks directly through new Enterprise Architect patterns

New and Expanded Support for Modelica

Simulation of SysML[®] diagrams using OpenModelica has been expanded with significant enhancements.



Physical Energy



Physical Substances

OMG[®] SysPhS Standard

Enterprise Architect now also supports the OMG[®] SysPhS standards, enabling you to stereotype variables and constants within a simulation and assign various options to those variables. With the introduction of SysPhS, the definition of constants and variables are now in the model rather than in the simulation configuration, providing ease of use and compatibility with MATLAB[®] simulations.

Take Your Model Simulations further



A further compatibility to Matlab is the introduction of StateMachine simulations using OpenModelica. Guide your SysML[®] simulations in Simulink[®] with State Machines. The State Machines are translated into MATLAB[®] Stateflow diagrams.



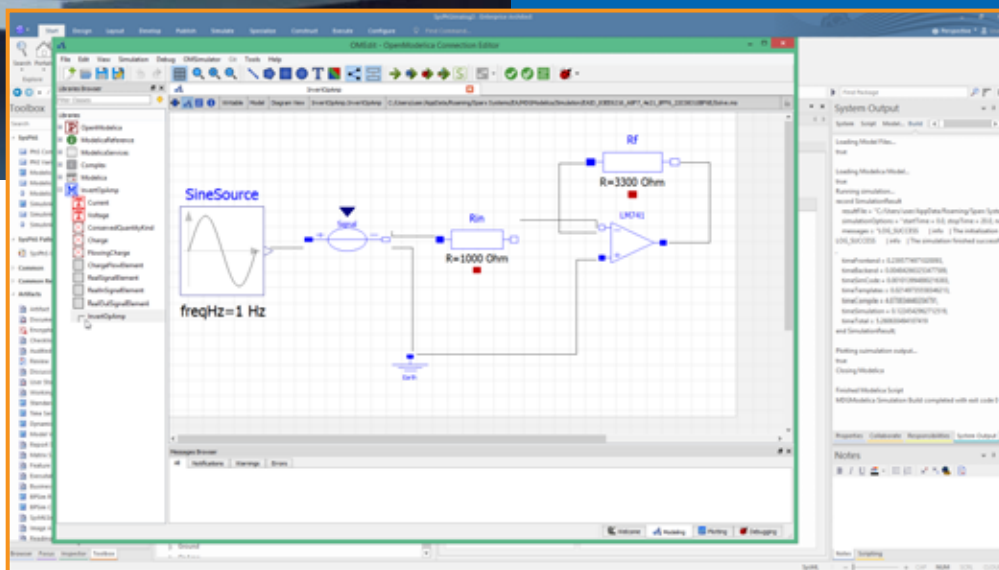
Simulation exports to OMEDIT

Simulation exports now create the complete corresponding Modelica[®] diagram, that can be viewed and simulated via the OMEDIT, meaning that the SysML[®] IBD of a circuit, can now be viewed as circuit diagram with electronic components in OpenModelica.



Infinite SysML[®] Blocks

For a wider usage of Modelica[®] simulation there is now support for referencing existing Modelica[®] library blocks, or custom user defined blocks within the SysML[®] blocks, supporting reference to a wide range of components used in simulations.



Supports the Block diagrams in the OMEdit - OpenModelica Connection Editor

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