

# Simcenter Amesim ROM Builder

## Leveraging the comprehensive digital twin across the product lifecycle

### Benefits

- Expand the value of the digital twin from design to operations
- Create a tool-agnostic digital twin from various design, testing and operational data
- Improve product or process design with a comprehensive digital twin
- Explore more design and usage options thanks to fast computing models
- Maximize product operation efficiency with an embedded digital twin
- Create smart and predictive applications from real-time ROM

### Features

- Import heterogenous sources of data for fitting models and blending simulation and experimental data
- Use all types of Simcenter Amesim results: simulation, design exploration, optimization, linearization
- Create static and dynamic reduced order model generated with leading data-driven methods

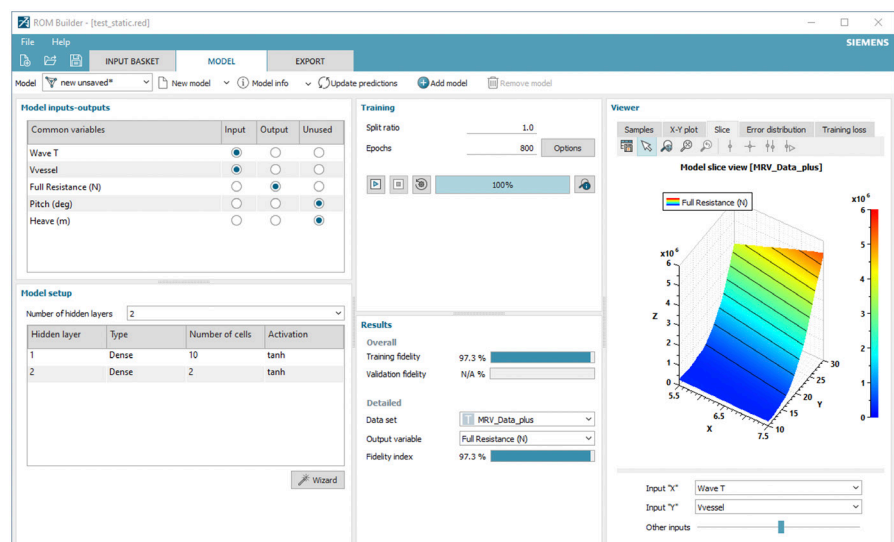
### Summary

The digital twin is a virtual representation of a product or process. Whether it is based on physics or is data-driven, the comprehensive digital twin enables design optimization and provides various types of services when the asset is being operated.

From a design perspective, the digital twin created in 1D, 3D or computational fluid dynamics (CFD) simulation tools is

primarily used for design analysis and optimization. The digital twin is usually specialized to predict a set of attributes. Hence, getting a fair representation of all key indicators becomes a challenge. Although co-simulation can provide a solution, it is complex and might come with prohibitive computational costs.

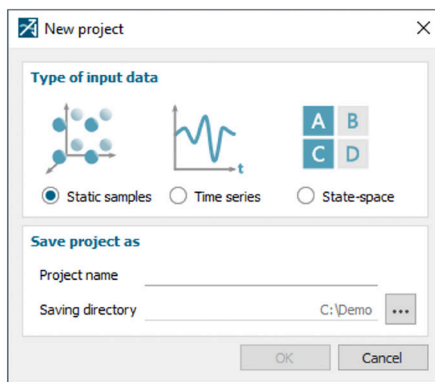
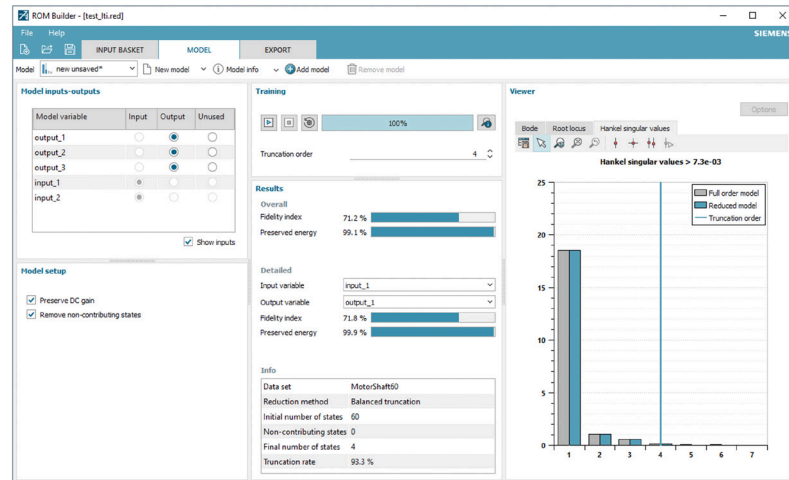
Reducing complexity to relevant system-level expectations promises more affordable runtime. However, simplifying the model often requires expertise outside of the application domain: applied mathematics, statistics, machine learning, etc. By removing this technical barrier, Simcenter™ Amesim™ ROM Builder software, which is part of the Xcelerator™ portfolio, the comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software, unlocks the scope of the specialized digital twin and makes it available for more applications.



# Simcenter Amesim ROM Builder

## Features *continued*

- Easily set up and evaluate ROM with templates and automation
- Export ROM to various targets for different types of usage



The digital twin applies to operations as well as design. Maximizing throughput and performance of mechatronics systems can be achieved by leveraging the system's knowledge with smart controllers. Such controllers, empowered by real-time models for predicting behavior, can define setpoints that balance the system, environment and economic constraints. The Simcenter Amesim ROM Builder exports real-time models with small memory size that are tailored for this purpose.

Finally, the comprehensive digital twin opens new opportunities. For instance, smart virtual sensors rely on internal models to predict quantities that can't be directly measured. Powered by a real-time reduced order model (ROM), they can save the cost of a sensor or provide a competitive advantage whenever quantity can't be directly sensed.

### Leverage models and data

The Simcenter Amesim ROM Builder grabs data that represents a model or a process and in a few clicks provides reduced versions of it. Those reduced models come with unique features: they have a small memory footprint, are tool-agnostic (a fixed step Euler solver is enough) and can be operated in real

time. With such properties, a ROM overcomes all roadblocks listed above. For instance, complex 3D models can be simplified into a ROM that can be used in a system simulation model or on an edge device.

Further, the Simcenter Amesim ROM Builder provides to any simulation, testing, production or service professional a fast and easy way to create, evaluate and export ROM. Thanks to advanced automation, no expertise is needed to convert data into ROM.

As such, the Simcenter Amesim ROM Builder unleashes the power of existing models and data to provide extra value for design and for operations.

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