ALTAIR
ONLY FORWARD

RELEASE NOTES

Altair Twin Activate® 2023.1

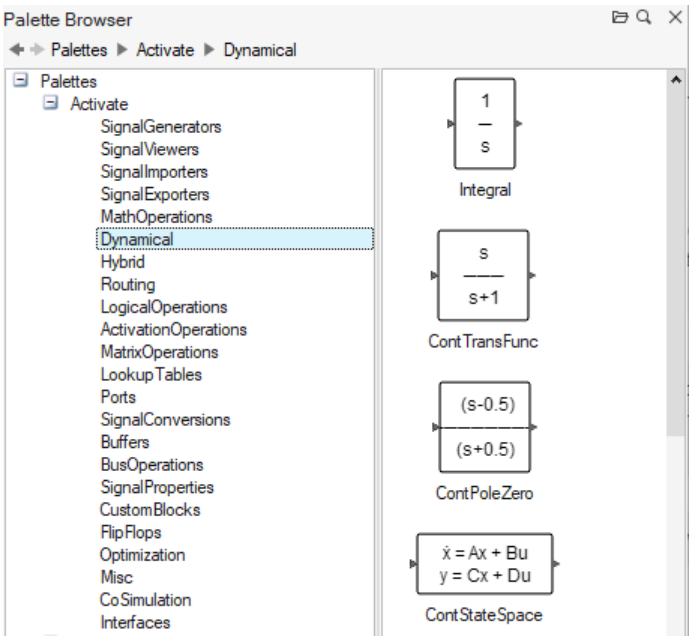
New Features and Enhancements 2023.1

Release Highlights

User Interface

Palette Browser

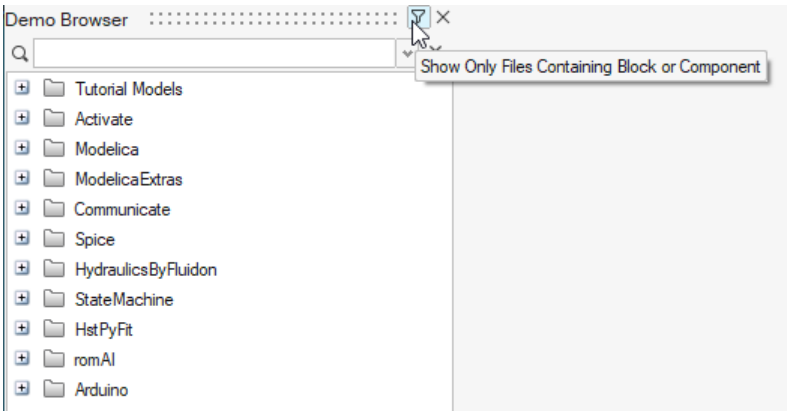
The tree view has been added to the left side of the window. This lets you switch directly between different subfolders without many double-clicks.



Demo Browser

Additional search functionality has been added. The new search feature lets you search for blocks and components in demo models. This is helpful if you want to know more about the usage of a specific block or component.

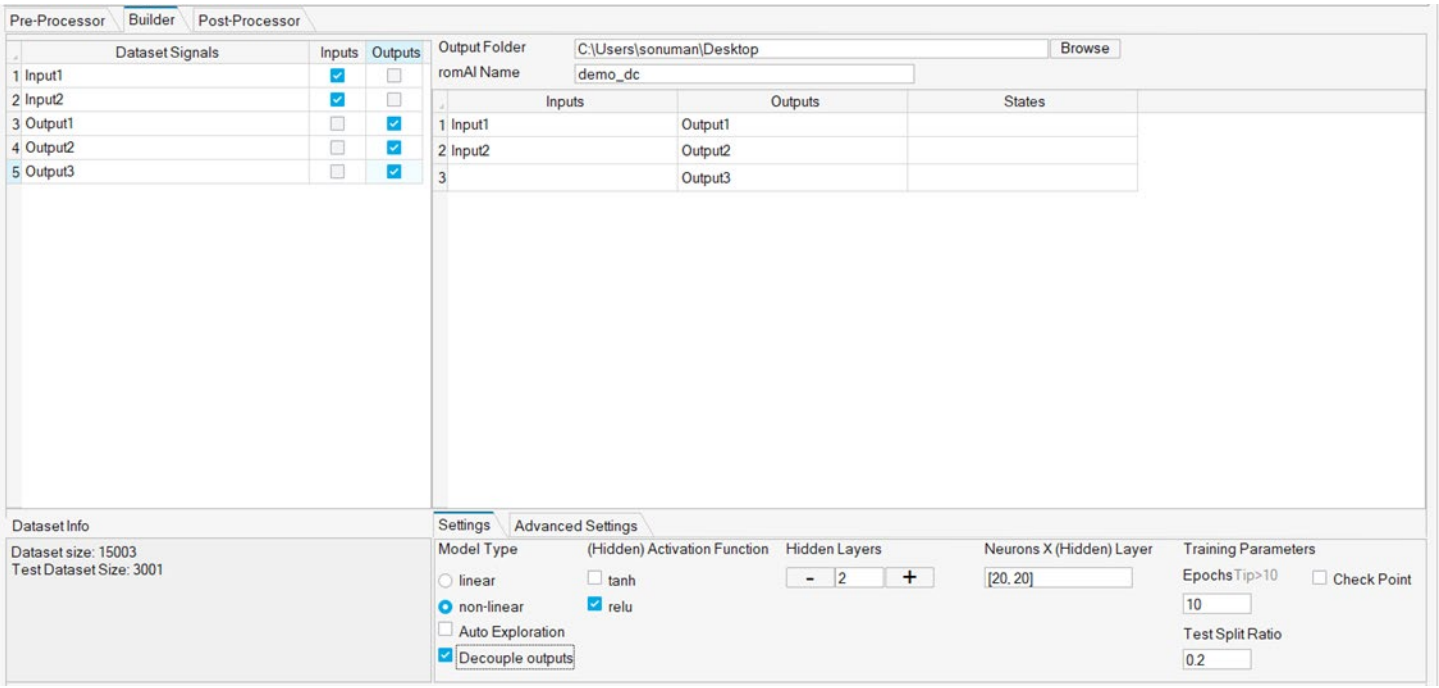
The basic file search is visible by default. To switch to block search, click on . Search options like **Whole Names Only** or **Use Wildcards** are used for both.



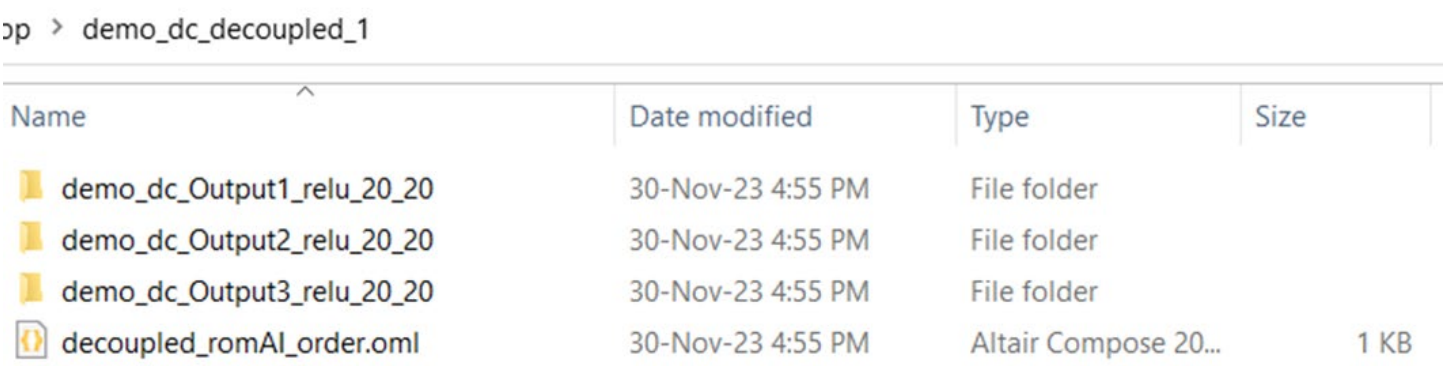
romAI Director*

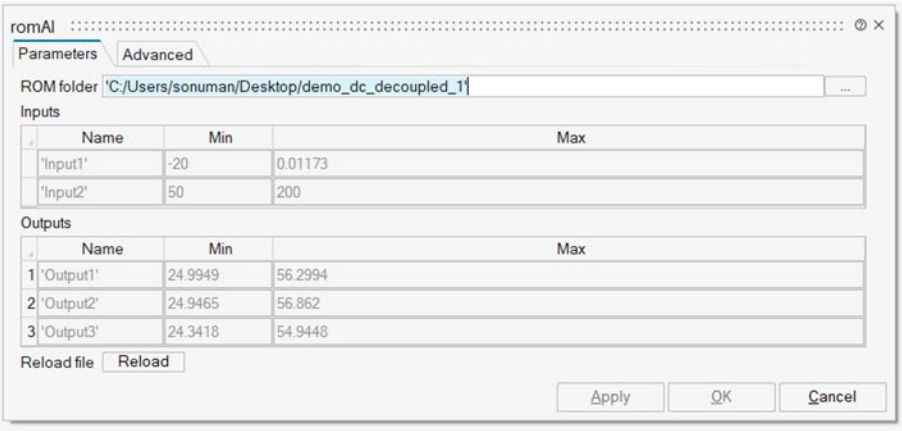
Decoupled Outputs

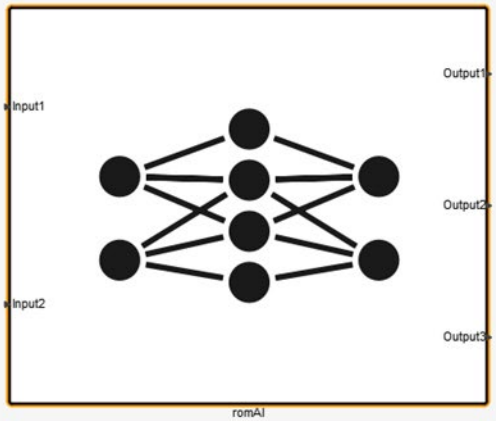
If a static model has multiple outputs, you can select the **Decouple Outputs** option to split a single romAI model into multiple romAIs.



In Twin Activate block of romAI, multiple romAIs are read automatically into one block.

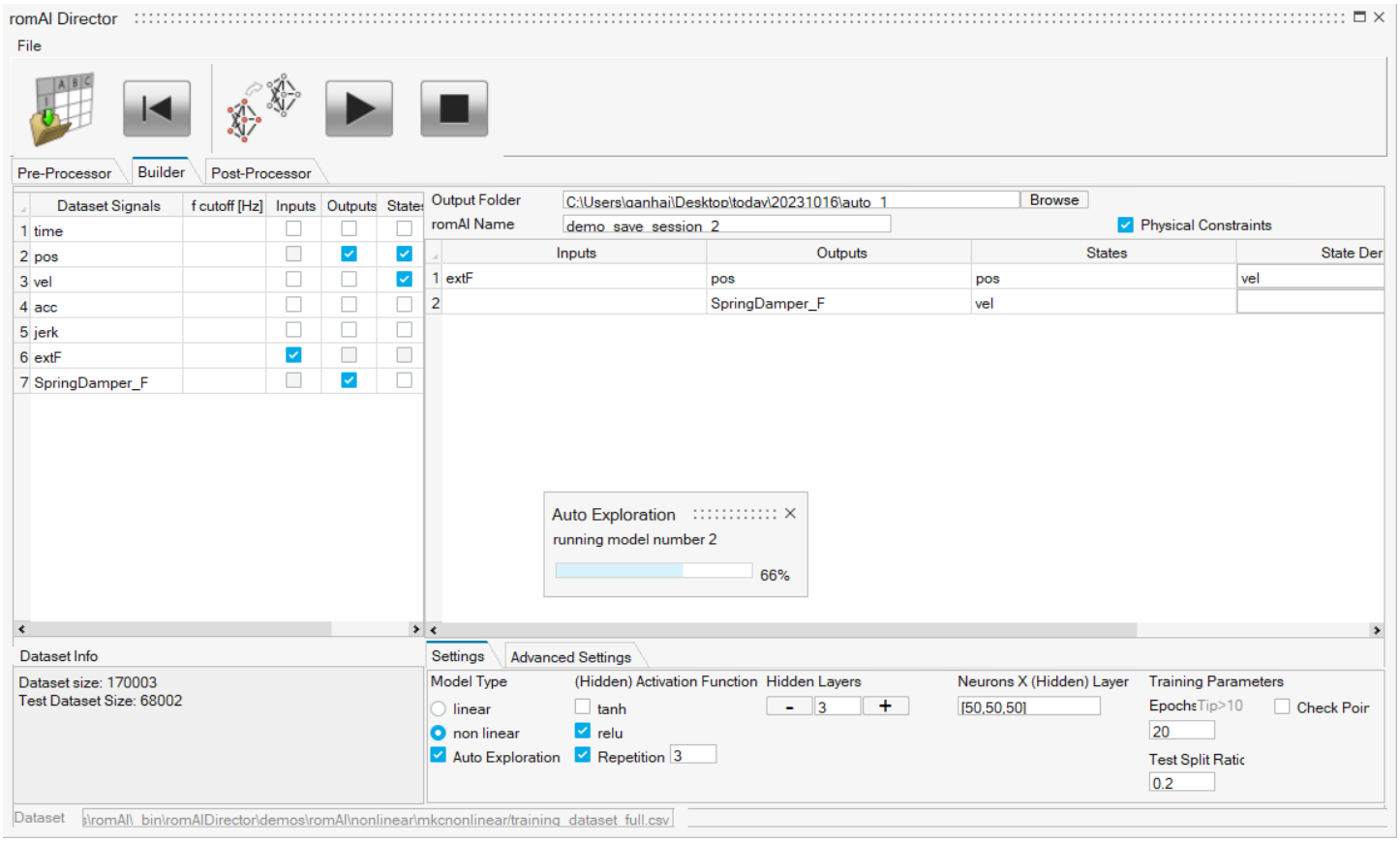






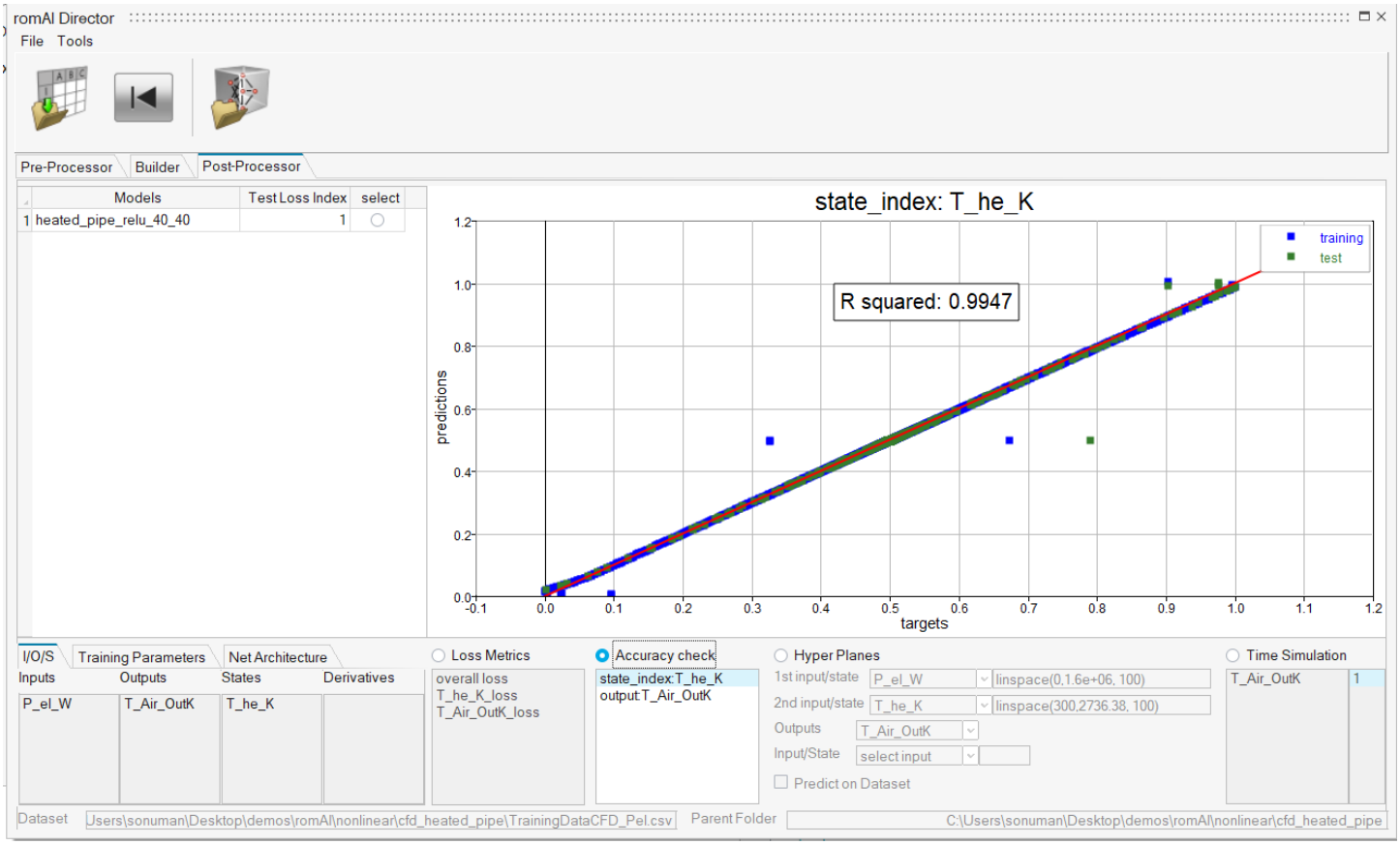
Training Repetition

As mentioned in Tips on ROM Generation in the romAI documentation, weights and biases are randomly initialized, and multiple retraining is recommended. The **Repetition** option automatically runs the training the specified number of times.



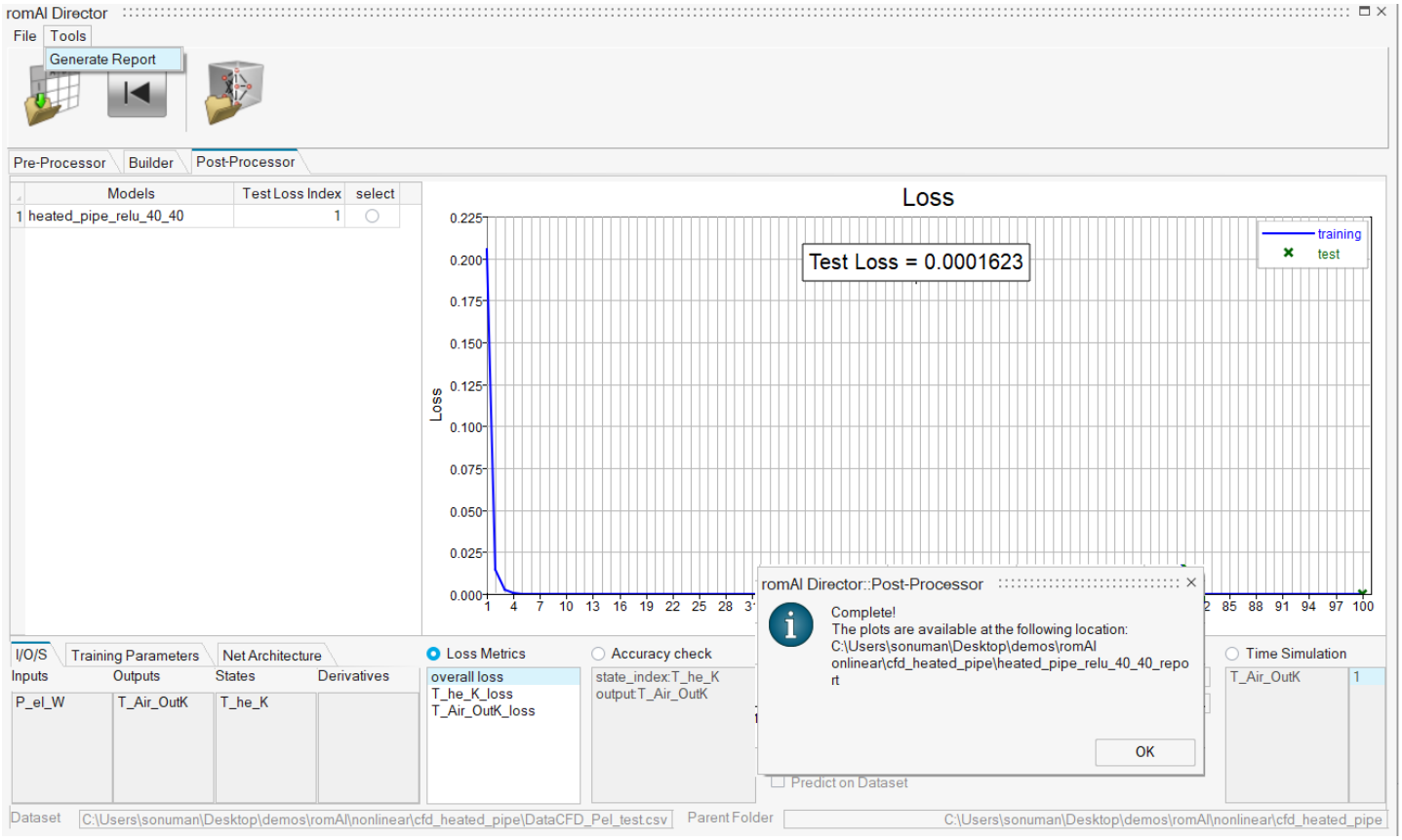
Accuracy Check

Training and testing data are shown with different colors for Accuracy check after model training.



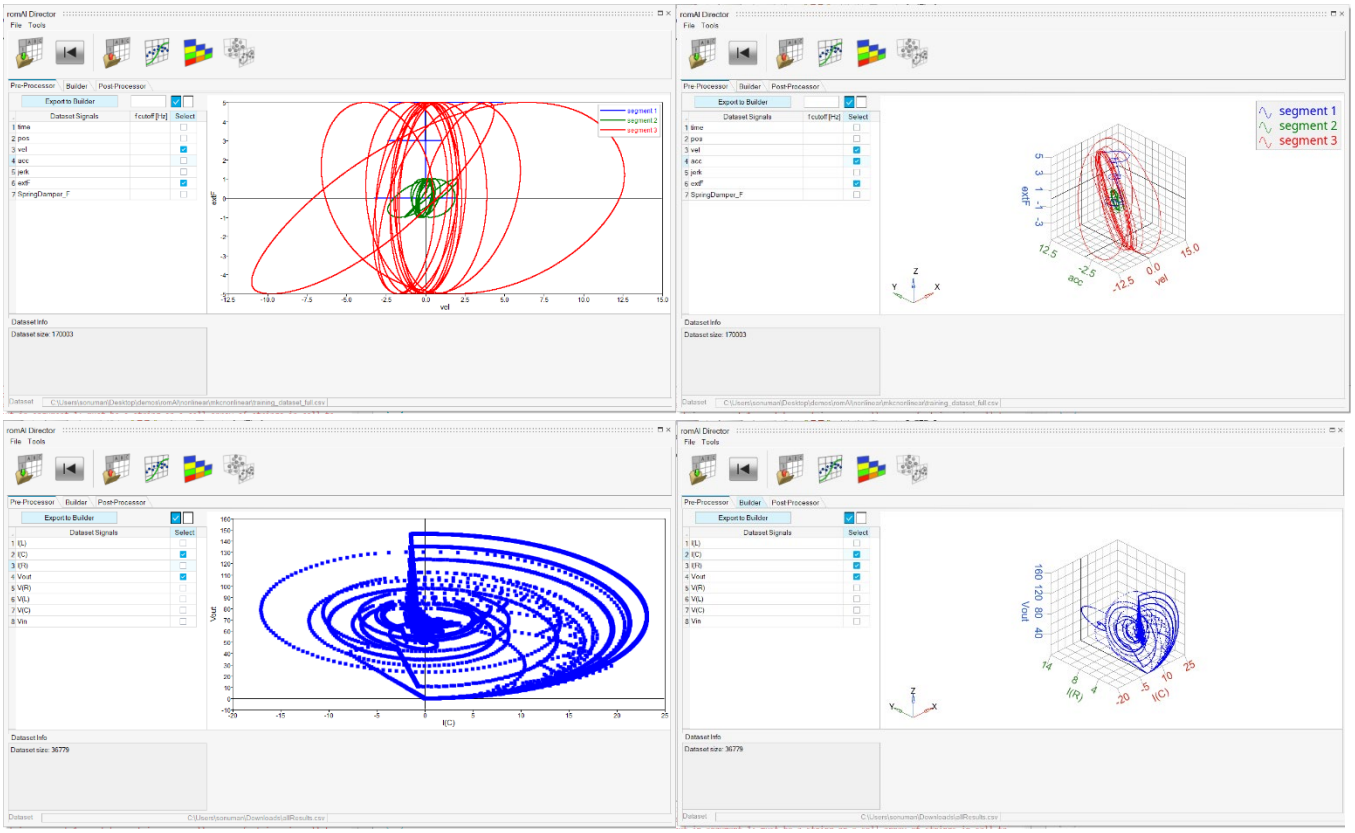
Report Generation

The Generate Report option lets you automatically test and save snapshots of loss metrics, accuracy check, and time simulation or instance evaluation.



Domain View Plotting

The Domain view in pre-processor can be used to visualize the data variation. It plots 2D/3D scatter plots and 2D/3D line plots based on the number of selected signals and model type.



Tutorials

Connect to an MQTT Broker using Twin Activate

A new “Connect to an MQTT Broker using Twin Activate” tutorial has been added.

One of Twin Activate's communication protocol options is MQTT, a well-known communication protocol used in IoT (Internet of Things). It is possible to both publish and subscribe to any MQTT broker, local or external, very quickly and lightly.

When publishing messages to a topic, Twin Activate will send data from the software to the broker, on the other hand, when subscribing to a topic, Twin Activate will receive data from the broker to the software.

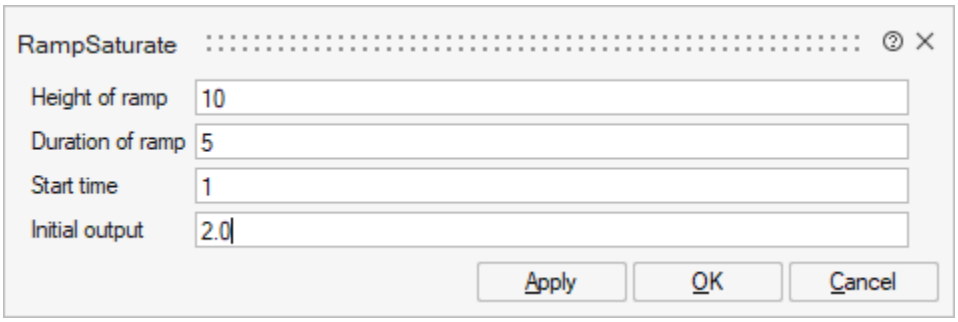
In this tutorial, the external MQTT broker is on Altair SmartWorks, the end-to-end Altair IoT platform that covers all necessary technology for Smart and connected products development.

In SmartWorks you can create Things that represent entities in your world. They store information about real-world objects like assets, rooms, or buildings, as well as information about concepts like Tasks or processes. These Things receive data if Twin Activate is publishing, and send data if Twin Activate is subscribing to the MQTT topic.

Libraries

Additional Changes and Enhancements for Libraries

- RampSaturate now exposes the Initial output parameter.



- Display block is implemented in a more efficient way. It's running now with improved performance.

Enhancements

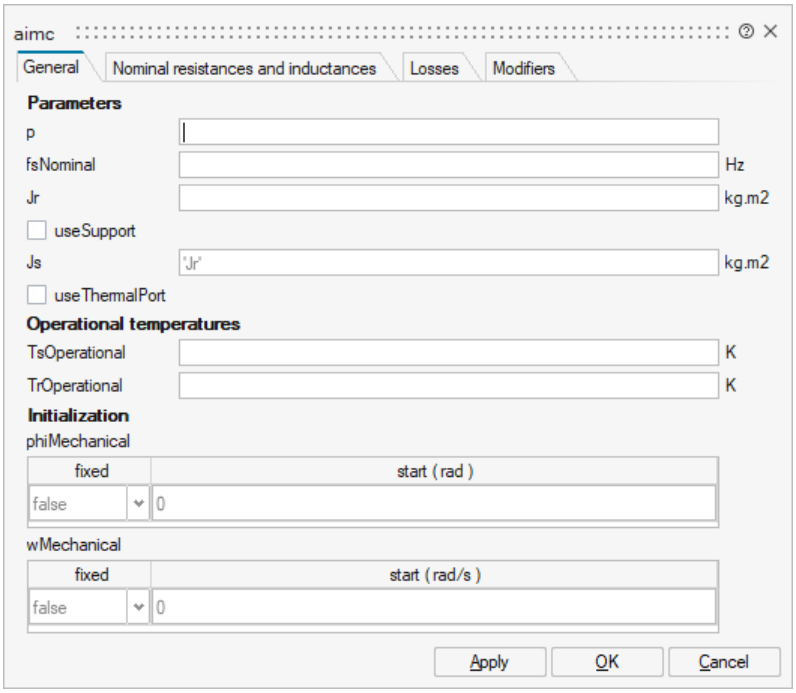
Enhancements for Code Generation and Export*

For a Host Standalone target, the executable is now compiled, in addition to the source code files and makefile.

Enhancements for Modelica

Variable Organization

Modelica components expose many internal variables that should not be exposed. The parameters dialog box now shows only relevant variables in the General tab under Initialization. All others can be set by modifiers.

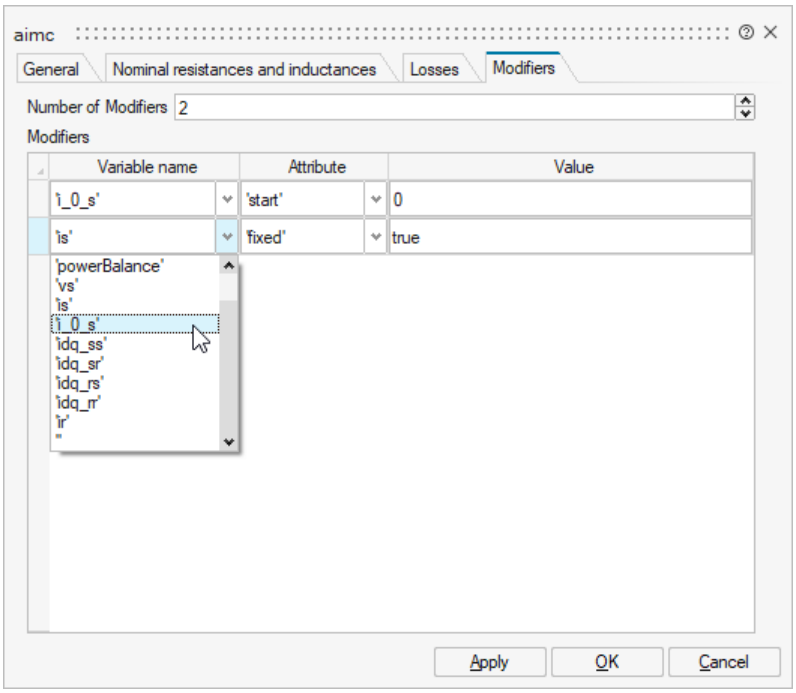


In order to make use of the new variables display for self-imported Modelica libraries, the library must be updated and imported again.

Note: The re-import of a library is optional. The library still works as in Twin Activate 2023.

Modifiers

Internal variables can be set in the Modifiers tab, if necessary. All accessible variables are listed in the Variable name drop-down list. Start value and fixed are the attributes of each variable.

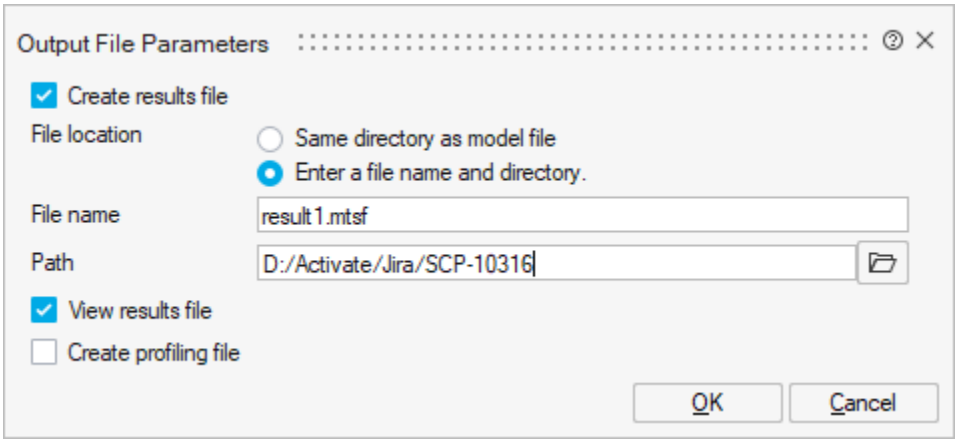


Connectors are removed from the variables and modifiers list.

Enhancements for Simulation

Results file of Modelica model

The result filename of the Modelica part of a model is no longer independent of the result filename. It uses the filename given in Output File Parameters and combines it with the model name. This means that both result files can be clearly assigned.



Enhancements for OML Functions

New Functions

MQTT *

Communication protocol used to communicate using MQTT

- **mqttclient**: Connect to MQTT broker.
- **mqttpublish**: Publish a topic message to the MQTT broker.
- **mqttsubscribe**: Subscribe to a topic and receive message from MQTT broker.
- **mqttunsubscribe**: Unsubscribe a topic that is already subscribed from MQTT broker.
- utility functions: **mqttclientinfo**, **mqttdestroy**, **mqttreconnect**, and **mqttdisconnect**.

RestAPI *

This library communicates with web services using the REST protocol.

- **webread**: Read content from Restful web service specified by URL.
- **webwrite**: Write content to Restful web service specified by URL.
- **weboptions**: Specify parameters for Restful web services.

TCP/IP *

Communication protocol used to interconnect network devices on the internet.

- **tcpclient**: Create a TCP client, for connecting, sending, and receiving a stream of data over a network.
- **tcpserver**: Create a TCP server, to listen to TCP client to send and receive data.

UDP *

Communication protocol used to communicate using UDP port on local host.

- **udpport**: Create and open UDP port for communication.

JSON *

Encoding and decoding of JSON format to OML datatypes.

- **jsonencode**: Encodes data into a JavaScript Object Notation (JSON) format string.
- **jsondecode**: Decodes a JavaScript Object Notation (JSON) string to an OML object.

Resolved Issues

UI

- Python home path is not set automatically.

Code Generation

- Code Generation of Activate block fails with tcc.
- FMU export with inlined code generation and solver embedding doesn't support exposable parameters.
- Code generation does not work for targets Embed Block, Python, and Host Standalone if blas/lapack is required.

Library

- Python demos updated due to changed Python library (Tutorial models/Extended Book Models/Chapter_21_ExecScripts and Chapter_22_Code_Generation).

Linux

- Activate crashes when drag and drop to open an opened model.

* ***Applies to Commercial Edition only***

