ALTAIR
ONLY FORWARD

RELEASE NOTES

Altair® Twin Activate® 2025

New Features and Enhancements 2025

Release Highlights

Code Generation *

Structured Text

Structured Text (ST or STX) is a language that is used in programmable logic controllers (PLCs). It is supported by the IEC 61131-3 standard. The code generation lets you easily create an ST code of a block diagram in Twin Activate.

Two specific targets (OpenPLC, TwinCAT3) are supported by additional XML files to easily load the ST code into the programming environment. For other targets, the generated ST code can be directly used.

Wrapper Library

The Wrapper library is a library that contains generic blocks that make it possible to create new libraries for specific hardware. The blocks are wrappers for hardware-specific code that is used during code generation and added by using OML.

The example targets available for download on Altair One based on wrapper serve as a template to expand the list of blocks in the libraries via the APIs. They support the following:

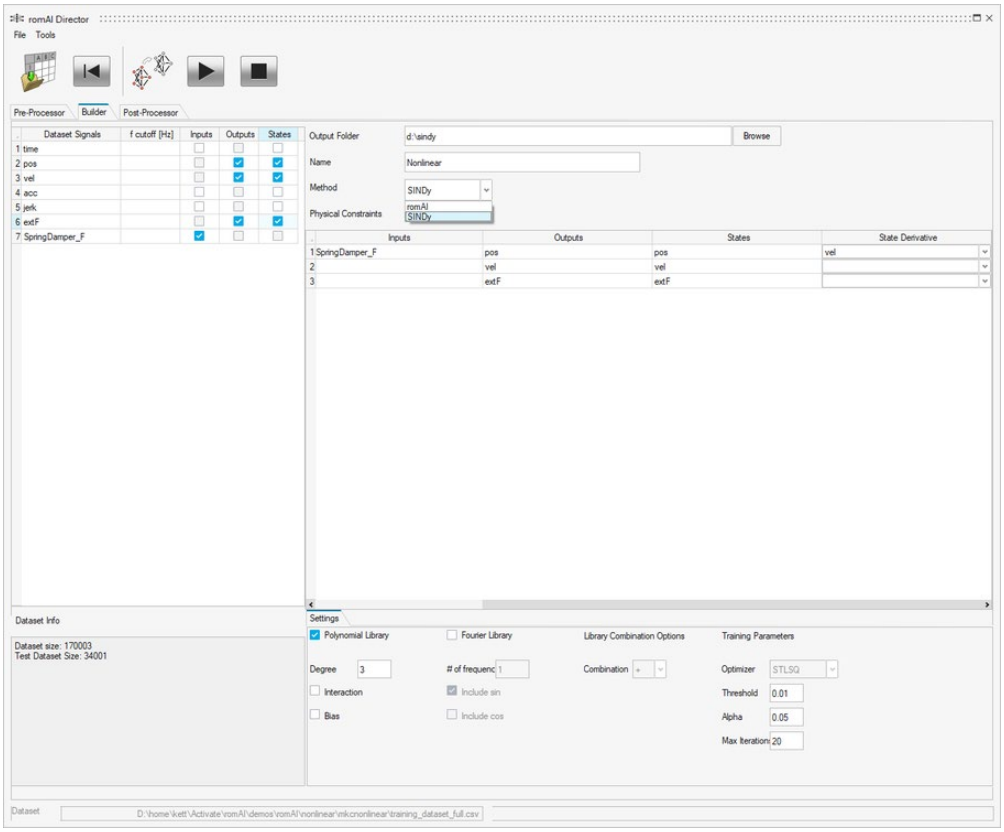
- Espressif ESP32
- Raspberry PI

The libraries are available on Altair One in Twin Activate/Downloads.

romAI *

romAI as a generic tool for the generation of reduced order models supports SINDy (Sparse Identification of Nonlinear Dynamics) as a further method.

SINDy is a data-driven algorithm for obtaining dynamical systems from data. Given a series of snapshots of a dynamical system and its corresponding time derivatives, SINDy performs a sparsity-promoting regression on a library of nonlinear candidate functions of the snapshots against the derivatives to find the governing equations. This procedure relies on the assumption that most physical systems only have a few dominant terms which dictate the dynamics (Wikipedia).



In contrast to the romAI model, SINDy supports only states as outputs, while romAI supports all types of signals.

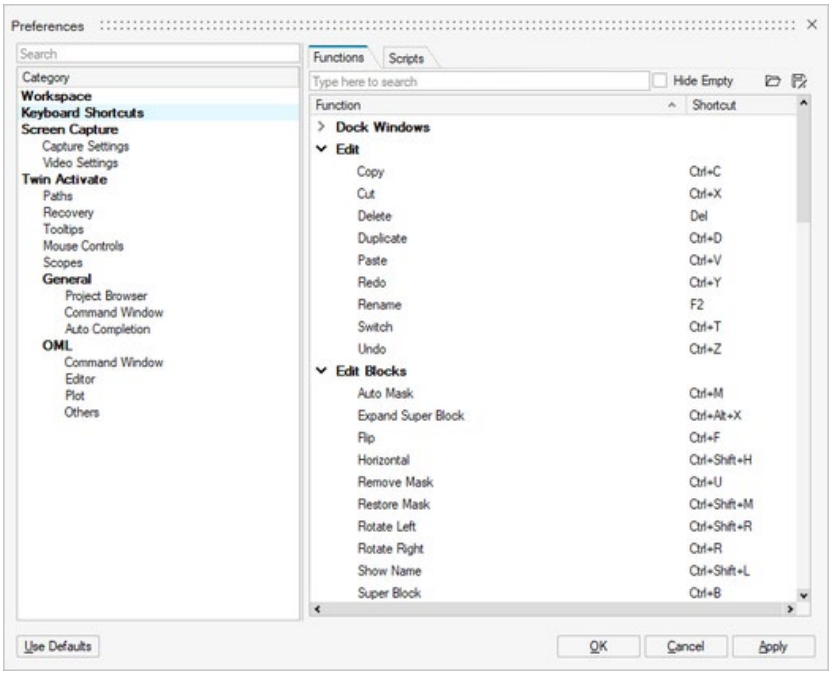
When using the romAI block, nothing changes. You still select only the romAI folder, and the block recognizes the used model.

User Interface

Keyboard Shortcut Editor

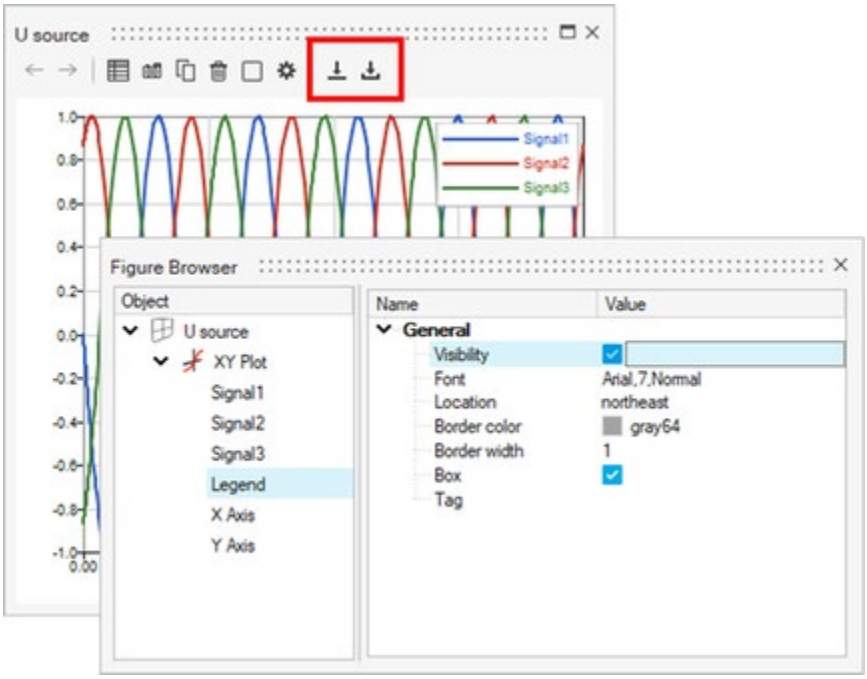
Keyboard Shortcuts Editor lets you introduce new shortcuts or overwrite existing ones to run functions from ribbons and toolbars. It is also possible to run OML or Python scripts with a shortcut.

You can access the Shortcuts Editor from File > **Preferences**.



Scopes

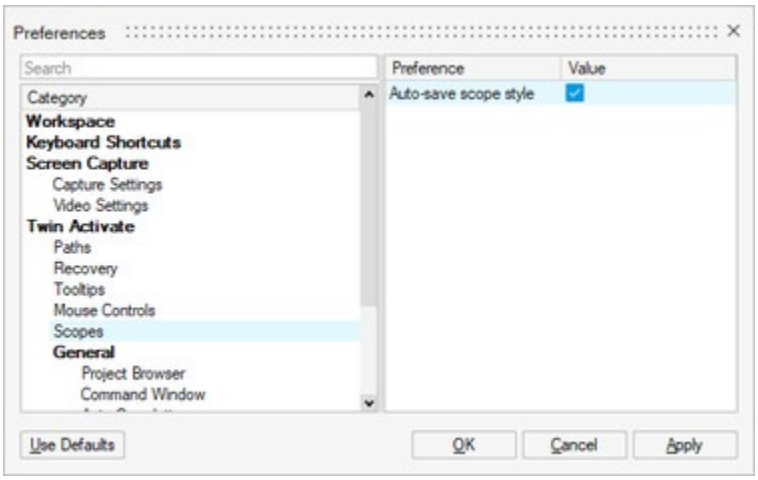
The setting of scope properties has been extended by a function to save them permanently in the model. When saved, they are applied automatically when the model is re-opened.



saves all settings except the position of the scope window.

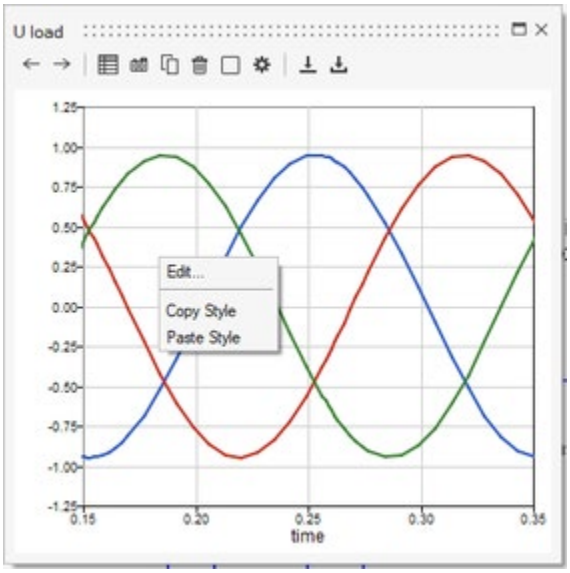
saves the position of the scope window.

The scope settings can be automatically saved as an option in Preferences.



in the scope window lets you go back or forward to the previous and next views. This is helpful to switch between several zoom views.

Copy and Paste Style in the context menu of a scope lets you copy the settings from one scope to another.

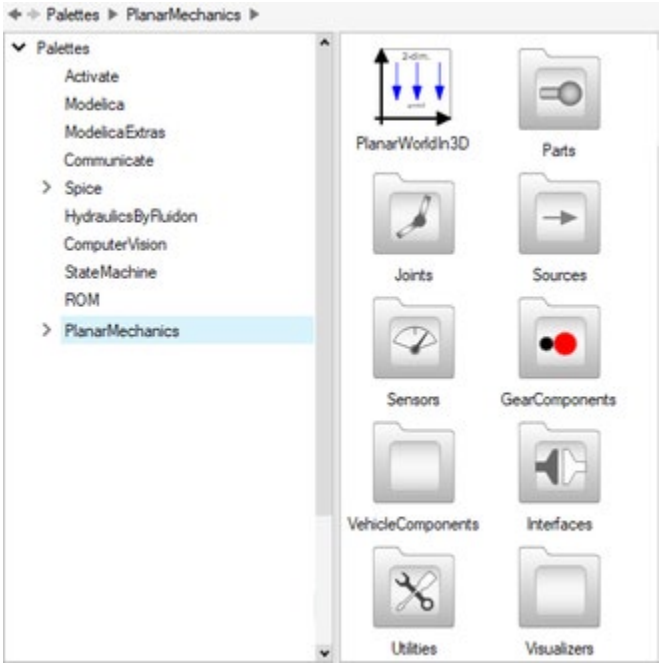


Libraries

Modelica

The PlanarMechanics library is a free Modelica package providing two-dimensional mechanical components to model mechanical systems, such as robots, mechanisms, and vehicles, where the MultiBody library is too complex to use. The main features of the library are:

- Much more compact than MultiBody library, which means fewer parameters to be set, and a shorter time to build up a model-based system, containing as much important information as possible.
- A PlanarWorld model could be used to set up almost all global parameters, such as visualization of global coordinate system, animation parameters of joints, parts, sources, etc., and gravity definition as well as its animation. Note that, in most cases the animation parameters set in PlanarWorld model can also be overwritten in an individual model.
- Built-in animation properties of all components, such as joints, forces, bodies, and sensors. It enables an easy visual check of the constructed model. In all models, animation can be disabled, while in the PlanarWorld model, animations of all models can be switched off.



Enhancements

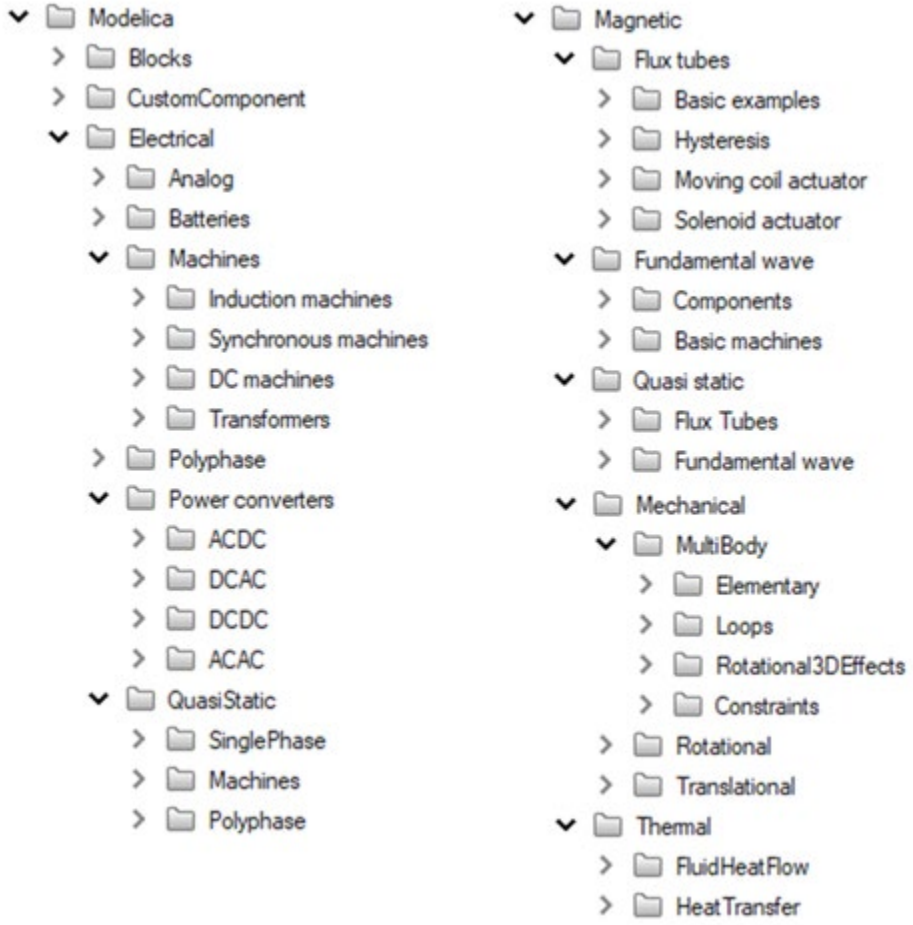
Enhancements for Code Generation *

The ComputerVision library was limited to standard code generation only. Now it supports also the inlined code generation.

Enhancements for Modelica

Demos

The number of demo models of the Modelica library has been increased from ~150 to ~350 models.



MSL 4.0.0

The Modelica Standard Library (MSL) is updated from version 3.2.3 to 4.0.0. (Release notes). Besides the bug fixes and enhancements of the MSL library, this version offers support for more Modelica libraries.

Models that contain Modelica components are updated automatically when they are loaded.

Note: Converted models are not backward compatible.

Demo model import

The import of a Modelica library is extended by the import of the contained demo models (in most cases in the Examples folder) as Twin Activate models. Demo models are recognized by the annotation *experiment*.

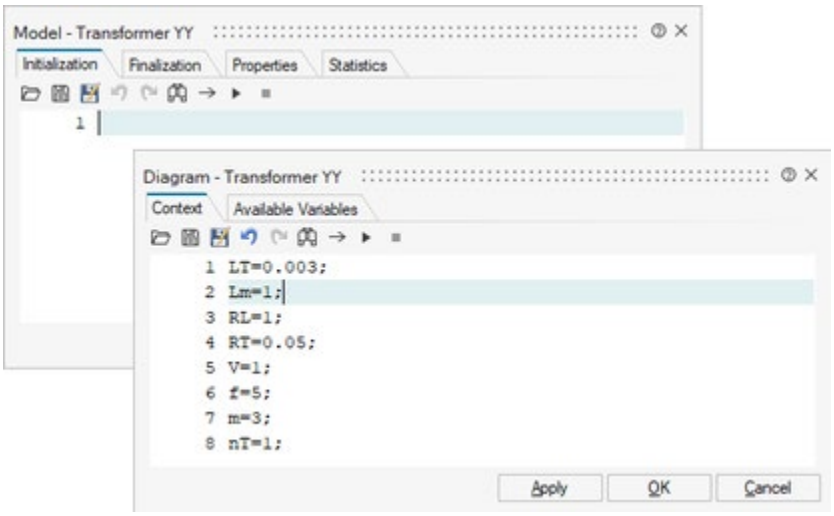
```
annotation (
  experiment(StopTime=3),
```

After the library import, the demo models are listed in the Demo Browser.

Enhancements for UI

Model and Diagram Context

The editors of model and diagram contexts are now non-modal. They no longer block other actions. If you click **Apply**, the changes are saved, but the editors remain open. This makes it easier to copy content between two diagram levels.



Block Diagram Editor

The arrow keys can now be used to move a selection (block, blocks, blocks + connections). Previously, only the mouse could be used.

Resolved Issues

Code Generation *

- Unpacking of fmu fails if the path is a network location
- Inlined code generation doesn’t ignore scope blocks

Library

- The matrix gain block accepts matrices with dimension 0. The block works properly in Activate. But an error message is generated in shell.
- [HydraulicsByFluidon] CustomLiquid causes error with some components

Modelica

- Animation of multibody: widthDirection in BodyBox not taken into account
- Cannot retrieve scalar value from a StructureField
- Inlined code generation for Modelica doesn't work in Linux when it’s done for more than one superblock

romAI *

romAI director failing if Twin Activate is in a dark mode theme

UI

- Genetic Algorithm error in Optimization GUI utility
- Model report OK button is not enabled unless some parameters are changed
- Single-Sided normalized FFT (scope) uses different colors

Known Issues

- Code generation of Computer Vision blocks is not supported under Linux (especially for ShowImage block).

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

