



RELEASE NOTES

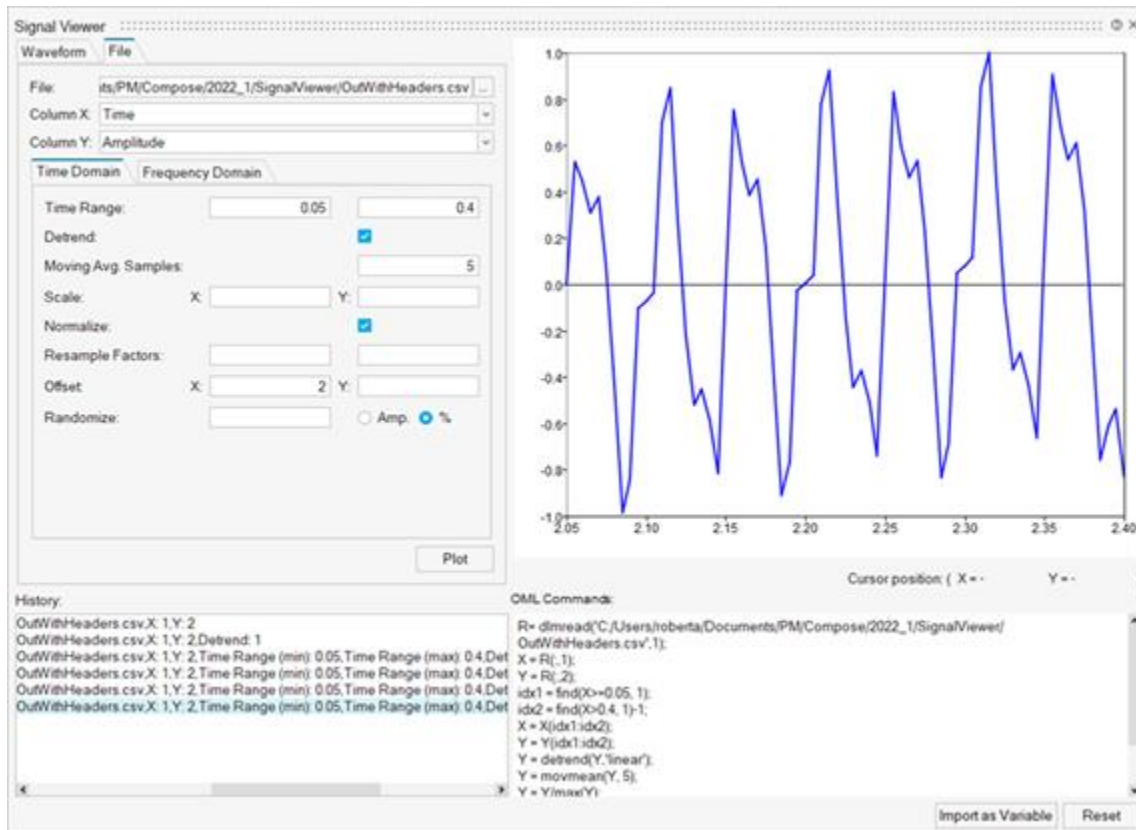
Altair Compose[®] 2022.1

New Features and Enhancements 2022.1

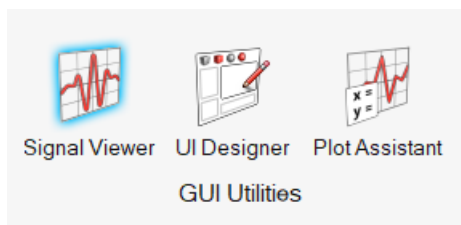
Release Highlights

Signal Viewer Utility*

The Signal Viewer lets you import and treat signals (basic) in both time and frequency domains, as well as generate signals based on the most common waveforms such as step, chirp and sawtooth.



Access the Signal Viewer from the GUI Utilities ribbon.



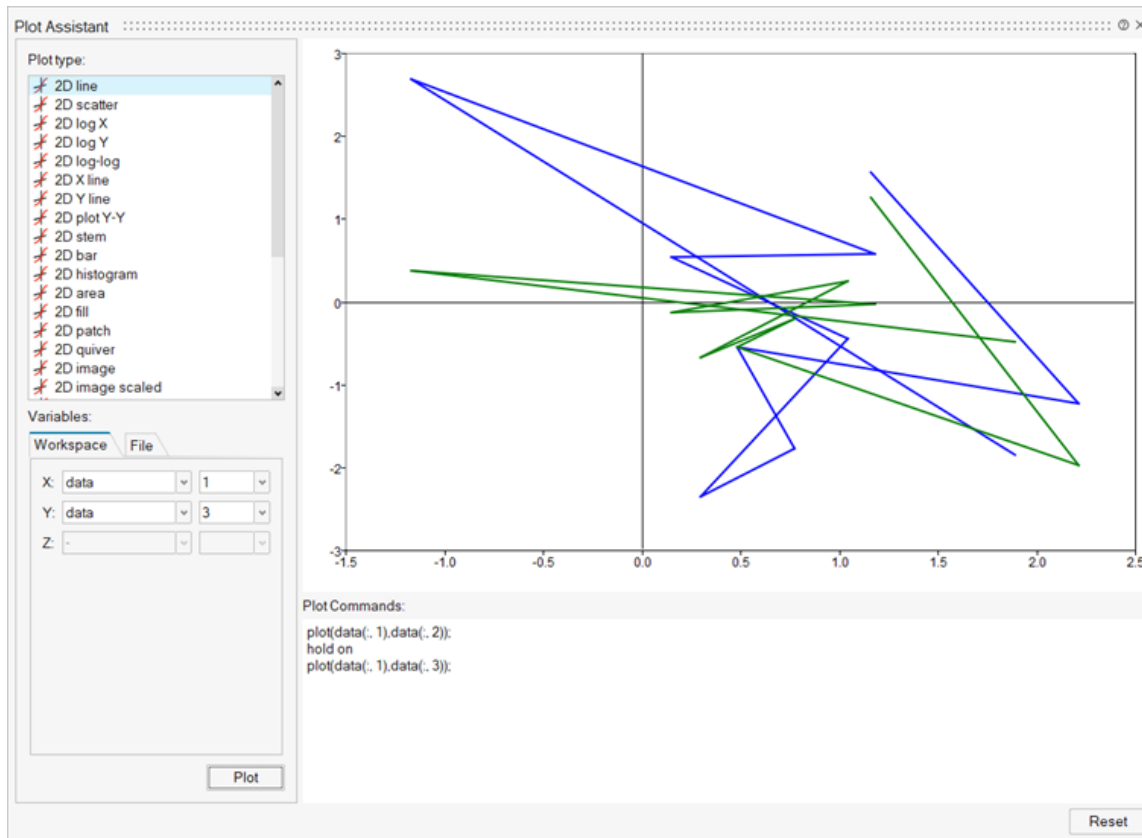
Features include:

- **Plotting:** Utility plots information as defined through the waveform or file and signal processing options.
- **History:** Dialog displays commands generated in the session. You can view or re-apply the selected command by double clicking.

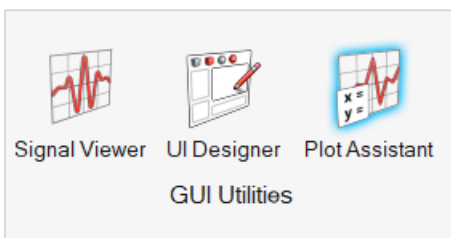
- **OML Command Generation:** The OML Commands window autogenerates the OML syntax for producing the same output that is displayed in the plot window.
- **Import Data as Variable:** This button imports the visualized data as a variable. The default variable name is data.
- **Reset:** Clears the Signal Viewer interface and resets it to its initial state.

Plot Assistant Utility*

The Plot Assistant lets you create plots from the various 2D and 3D OML plot types. You can also plot data from your OML workspace or delimited file, such as a .csv file.



Access the Plot Assistant from the GUI Utilities ribbon:



Multibody Processing Library*

The Multibody Processing library supports multibody-related, multi-disciplinary workflows and system-level vibration analysis in time and frequency domains.

The library is based on linear steady-state analysis (modes) or nonlinear transient analysis (signals) and includes the following command modules:

HyperStudy Utilities

Features **mbrcrossvalue**, **mbindexatvalue**, and **mbipsd** commands to detect the time of events, and related index, to compute a response over a reduced time domain by leveraging the corresponding index range.

MotionSolve Post-Processing

Features **cpsdplot** and **dsacpsdplot** commands to Estimate Frequency Response Functions between multiple output signals and one input signal by leveraging Cross Power Spectral Density.

Features **dsafftplot** and **fftplot** commands to compare plots of results in time and frequency domains by leveraging Fast Fourier Transform of multiple output signals.

Features **dsafrrplot** and **frfplot** commands to compare plots of results in a frequency domain with computed FRF between multiple plant outputs and inputs by leveraging the output of A, B, C, D state matrices.


MotionView Utilities

Features **pully**, **tangent**, and **winch** to parametrize the definition of a cable system.

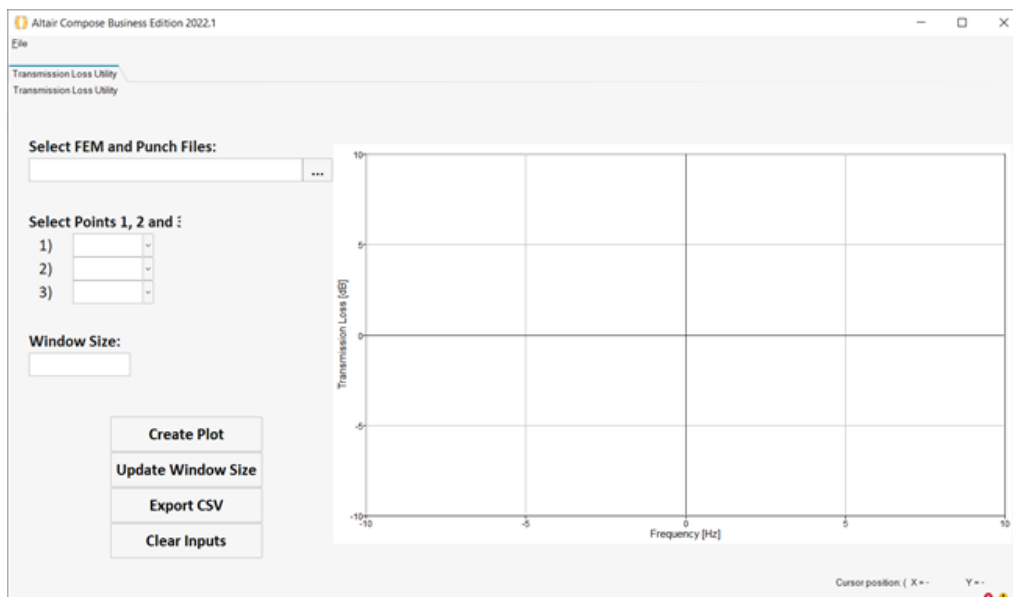
Compose Light*

Compose Light is a mode that runs the Compose software through a customized GUI that cleanly displays the features you specify without the visual distraction of features that are not pertinent to your session.

This mode leverages an OML distributable file (.omd) that is generated with the **createdistributable** function and is automatically recognized by the operating system as a Compose Light file, for example:

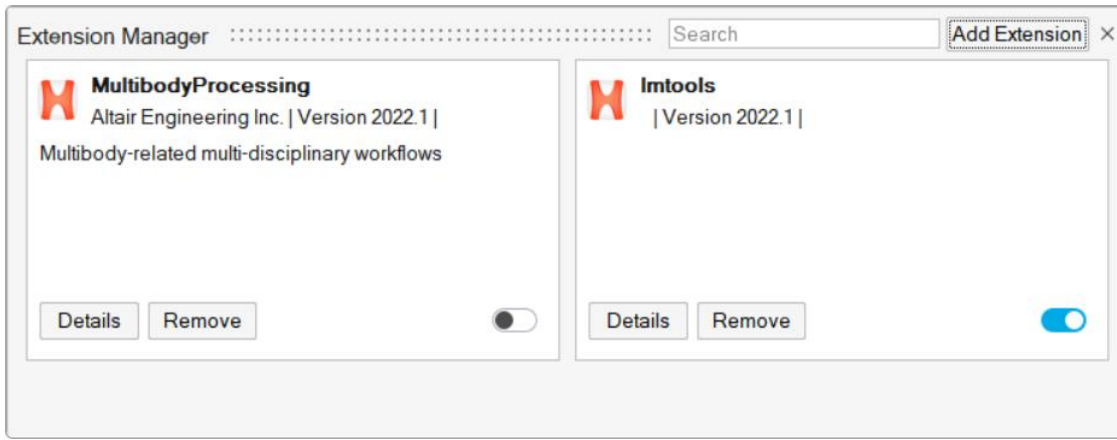
 ComposeDemo_TransmissionLoss.omd

Compose Light displays only the end application that is generated by the .omd script:



Extension Manager as a Library Loader*

When installing or uninstalling a library through the **Tools > OML Library Manager**, the status of the library is now automatically reflected in the Extension Manager along with the options to install, uninstall and remove the library.



New OML Commands

Altair Integration Command

- **setmsolveapi**: Sets the MotionSolve API, which is a Python-based package part of the installation.

Computer Vision

- **magnitudecv**: Computes the magnitude of 2D matrices.
- **goodfeaturestotrackcv**: Finds prominent corners in an image.

Coreminimalinterpreter

- **isbatch**: Returns true if the Compose session is in batch; false otherwise.
- **clearvars**: Deletes all or specified variable(s) from memory in the current session of the application. When no variable names are specified, the command deletes all variables. When **-except** is specified, the command excludes the specified variable names from deletion.

Data Structures

- **arrayfun**: Evaluates the function **func** on each element of the array **m**. Each element is passed into the function individually.
- **structfun**: Evaluates the function **func** on the fields of the structure **s**. Each field is passed into the function individually.

Linear Algebra

- **bicgstab**: Solves a linear system of equations with the biconjugate gradient stabilized method.
- **gmres**: Solves a system of linear equations with the generalized minimum residual method.
- **pcg**: Solves a linear system of equations with the preconditioned conjugate gradient method.

Plotting

- **uitree**: Creates a hierarchy in the graphical user interface.
- **uitreenode**: Creates a node in a uitree hierarchy.

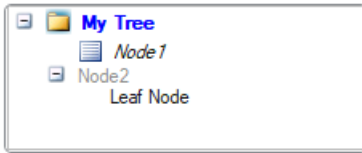


Figure 1. uitree command

- **savefig**: Saves a figure to a .fig file.
- **openfig**: Restores a figure from a .fig file.

Signal Processing

- **diric**: Generates the Dirichlet function.
- **sawtooth**: Generates a sawtooth wave with range [-1,1] and period 2π .
- **stairs**: Generates a stair step plot.
- **rectpuls**: Generates a sampled rectangular pulse centered at zero, with a specified width.
- **pulstran**: Generates a pulse train, with the pulse defined either by a function or a sampled pulse.
- **gauspuls**: Generates a sampled Gaussian modulated sinusoidal pulse centered at zero, with a specified center frequency and fractional bandwidth.
- **chirp**: Generates a chirp signal.
- **tripuls**: Generates a sampled triangular pulse centered at zero, with a specified width and skew.

Statistical Analysis

- **movmean**: Computes moving average values.

Additional Changes and Enhancements for OML Commands

CAE Readers

You can now interrupt a Compose execution with a *stop* button when running the **readcae** command.

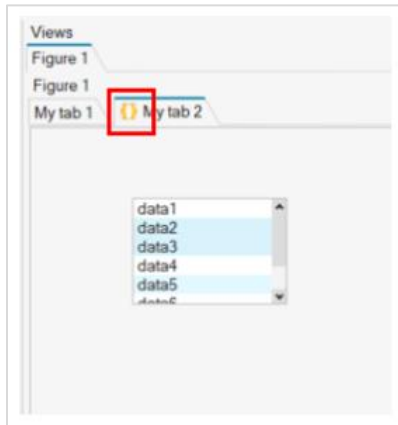
File I/O

Saving data as .gif is now supported in the **imwrite** command.

GUI Creation

- Retrieving multiple properties from a single handle of **uicontrol** and plot objects is supported.
- **foregroundcolor** and **backgroundcolor** properties are added for **uicontrol**.
- **cellselectioncallback** property is added to **uitable**.
- **backgroundimage**, **enable**, **style**, **userdata** properties are added to **uicontextmenuItem**.
- **bordertype**, **borderwidth** properties are added to **uipanel**, **uimenuitem**.

- A user-designed icon can be now displayed next to a tab name:



- You can now set the data of **uitables** with **uicontrols**.

Linear Algebra

Kron, **issymmetric**, and **ishermitian** now support sparse matrix.

Plotting: findobj Command

- `findobj('-property', propName);` % finds objects that have the given property.
- `findobj(handlesList, '-depth', d, propName, propValue, ...)` % Searches objects in depth from given object handles.
- `findobj(handlesList, 'flat', propName, propValue, ...)` % Searches only in the objects that are given in the handlesList.
- `findobj(propName, propValue, <operator>, propName, propValue)` % Uses a logical operator on a pair of properties/values; Available operators are '-and', '-or', '-xor' and '-not'.

Plotting: Graphical Object Properties

- Figure: **filename** property is added to figure property.
- Axes: **fontangle**, **fontname**, **fontsize**, **fontweight** properties are added for axis tick labels.
- **displayname** property is added for the line, surface and group object.
- **linewidth** property is added for waterfall plot.

User Interface

- *Search Paths* option added to Preferences.
- *Copy* is now supported in the Project Browser to copy an image to the clipboard.

Miscellaneous

- Normalization of paths is now supported for file i/o utilities: **load**, **save**, **dload**, **dloadwrite**, **textscan**, **textread**, **xlsread**, **xlsreadwrite**, **audioread**, **audiowrite**, **imwrite**, **imread**, **xlsread**, **readcae**, **readcae3d**, **readvector**, **readmultivectors**, and **readhdf5**.
- Improve the way errors are displayed in OML built-in libraries.
- **strcmp** & **strcmpi** error messages have been improved and a potential memory growth issue has been fixed. Improvements in the **rainflow** command.

Enhancements for Compose Python

Python Version

Supported Python version is upgraded from 3.5.4 to 3.8.

Python Libraries: Windows

These libraries have been removed for the current release:

- backports-abc
- chardet
- client
- jupyter-sphinx
- Keras (Note: This library module is natively supported in the Tensorflow library.)
- Nose
- Ptvsd
- Pyreadline
- sphinxcontrib-github-alt
- symengine
- tensorflow-tensorboard (Note: This library module is natively supported in the Tensorflow library.)
- typing
- wincertstore

Python Libraries: Linux

These libraries have been removed for the current release:

- backports-abc
- chardet
- client
- jupyter-sphinx
- Keras (Note: This library module is natively supported in the Tensorflow library.)
- nose
- sphinxcontrib-github-alt
- symengine
- tensorflow-tensorboard (Note: This library module is natively supported in the Tensorflow library.)
- typing

Enhancements for File Utilities

CAE Reader Utility*

- *Import as Variable* option is supported.

HDF5 Viewer Utility*

- *Import as Variable* option is supported.
- The option to resize the window is supported.

Interrupt readcae command

- Interrupt **readcae** command execution with "stop" button.

Enhancements for UI Designer*

- New widgets are available for UITable, UIPanel, UITabGroup, and waitbar.
- Axes can now be added to the UIPanel.
- The combobox widget is renamed Popupmenu.
- The Listwidget widget is renamed Listbox.
- Additional graphic object properties are supported for each of the widgets.

Known Issues

Licensing

When exiting Compose 2022.1 Jupyter Notebook using either **Control+C** in the command window or **File > Exit**, your AltairOne license check-in will not occur immediately, and you may need to wait 30 minutes before attempting to check out the license again.

Resolved Issues

User Interface

- TCL statements in dark theme with white background.
- Cae Reader Commands function metadata nargin, nargsout are not consistent.
- Ribbon function issue.
- Print preview does not display correctly in dark mode.
- Opening a containing folder doesn't work if the file has special characters.

OML

- Application crashes when running OML commands of struct insert on Linux.
- Try catch does not work properly on OML example.
- Table function crashes with Linux.
- Issue with relative path in addpath.
- ismember doesn't handle NaN correctly.
- Issue with esort for negative real component.
- Error message from bi2de is not proper.
- parfor crash when the iterator is passed through the variable.
- The ZIP command stores file hierarchy using backslash(\) instead of slash(/).
- Incorrect extraction in case of 1x1 sized variable.

Python Support

- Crash with a certain Python scriptError message from bi2de is not proper.
- Lost interactive behavior when *Debug* is turned on and preference *Compose>Python>Interactive Execution* is turned off

Plotting

- Figure titles are not centered if a size is given.
- The `cla()` function is not clearing the secondary axis.

Math Libraries

- Rainflow command generates incorrect error message when 3rd argument is not valid.
- Crash has been resolved when using `convhull` command.
- Proper error message to be supported for `bi2de` command.
- `ismember,issorted` doesn't handle NaN correctly.
- concatenation functions need to return logical outputs when all inputs are logical.

Control System

- Issue with `esort` for negative real component is resolved.

CAE Readers

- Crash on reading data using `readcae` when there are no requests.
- Reading `control_arm_sol111.pch` in batch mode results in an error in Windows error report and caused test failure.
- Performance issues when reading a large CAE result file.
- Crash on reading data using `readcae` when there are no requests.
- Widgets in `readcae` builder are disabled.
- CAE Reader commands function metadata `nargin`, `nargout` are not consistent.

HWX Bridges

- Memory leak in `dresp3.Optistruct` on Linux.

Table Command

- `table` function crashes on Linux.

GUI

- Boolean cell in `uitable`.
- Cannot change background color in `uicontrol` style textbox.
- When in keyboard mode, the prompt should be displayed after the up arrow is pressed.
- Default vertical position of the text in the `uicontrol` style text is *center*, while it should be *top*.
- Selection of a `uitab` does not update the property `selectedtab` on `uitabgroup`.
- Cannot assign value to `uicontrol()` function.

String Operation

- Memory leak has been resolved when using `strcmp` & `strcmpi`.

Miscellaneous

- Mask password for user login in Compose console.
- Input/keyboard prompts should be displayed on up arrow.
- Input/keyboard prompts should not be editable.
- Response for input function with even number of quotes, half of the quotes are lost.
- Open containing folder doesn't work when folder has special characters.
- Crash on Debug_demo.py demo script.
- Class defined object issue in the C++ interface.
- parcluster does not seem to have an error check on the limit it can take.
- Update platform support for Linux.

*** Applies to Business Edition only**