DEWESoft®

DEWESoft ARTeMIS OMA

Software user manual, version V23-2

1. Table of contents

2. Introduction

DEWESoft ARTeMIS OMA offers a solution to measure and analyze structural dynamics of constructions, machines, vehicles, and other devices as they behave while in operation.

With OMA you can estimate the same modal parameters as with the traditional experimental modal techniques (EMA), but without requiring information and control of external input excitations like shakers and impact hammers.

The modal parameters are the mode shape, the natural frequency, and the damping ratio.

OMA is also referred to as output-only modal analysis, ambient response analysis, ambient modal analysis, in-operation modal analysis, and natural input modal analysis.

DEWESoft ARTeMIS OMA is only working with UNV geometry files and the .dxd format for time-domain data. It does not include any EMA or ODS functionality.

3. Features

DEWESoft ARTeMIS OMA includes the following features:

3.1 Setup task

Prepare Geometry
- Create test geometry from scratch
- Import/modify existing geometry from UNV file

Manage Measurements
- Import measurement files
- Integrate/differentiate measurements
- View raw time series
- Connect/disconnect channels

Assign DOF Information
- Link channels with geometry nodes and directions
- Link using Drag & Drop or by direct editing
- Automatic identification of reference channels
- Easy replication of a Test Setup and its reference channels

3.2 Analysis task

Prepare Data
- Configure all preprocessing of measurements
- View processed data of channels and Test Setups
- Option for automatic selection of projection channels
- Compare processed data of reference channels

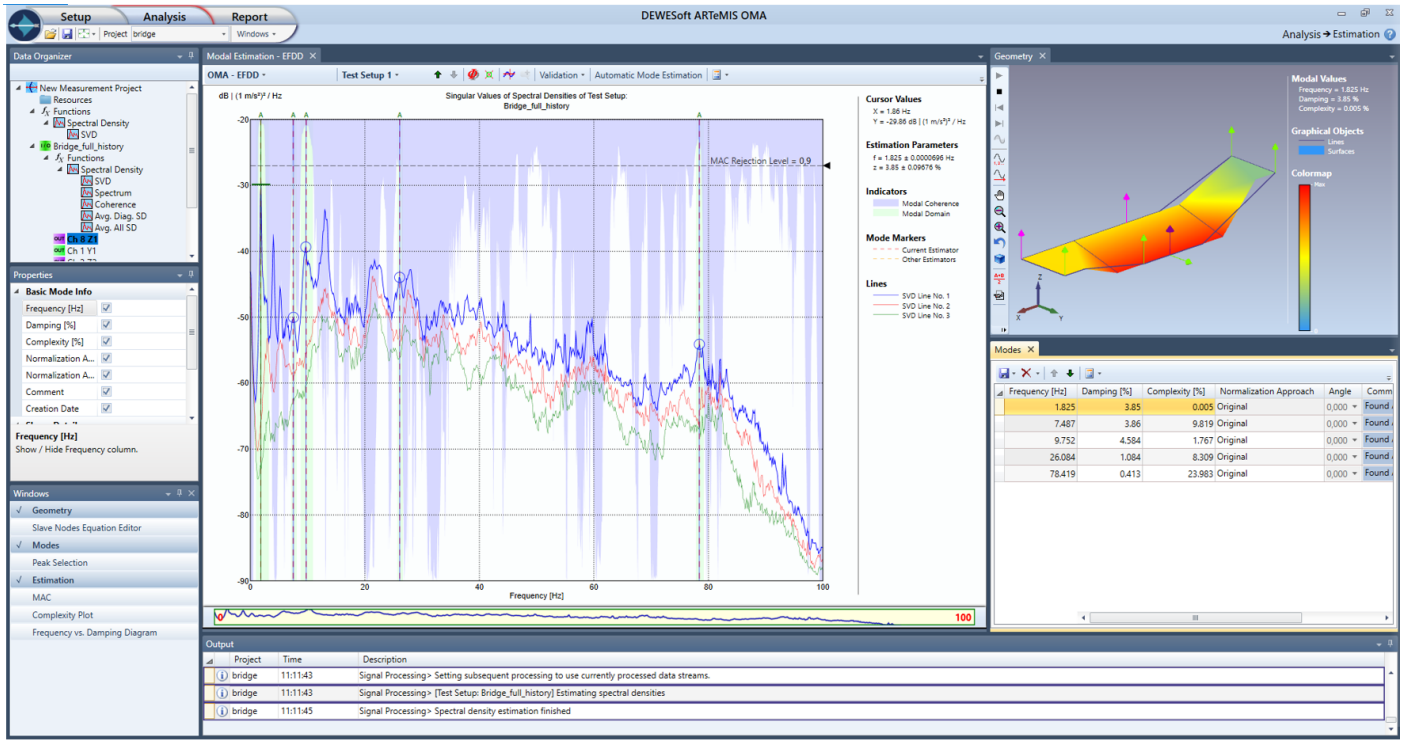
- Outlier detection and signal repair

Modal Estimation (OMA)
- Estimation of natural frequencies
- Estimation of damping ratios
- Estimation and animation of mode shapes
- Estimation of normal mode shapes
- Frequency Domain Decomposition (FDD)
- Enhanced Frequency Domain Decomposition (EFDD)

Validation
- Mode shapes animation, overlaid, side-by-side or top-bottom
- Mode shapes difference animation
- Modal Assurance Criterion
- Comparison of Mode Complexity
- Comparison between estimated and imported modes
- Frequency versus Damping diagrams

3.3 Report Task

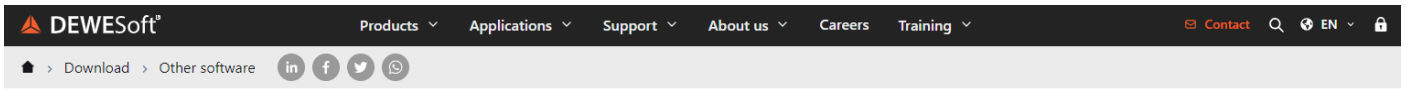
- Easy selection of graphics and tables
- Seamless integration with Microsoft® Office 32bit/64bit
- Generate Word documents and Power Point presentations
- Predefined standard templates
- Exporting mode shapes animations in AVI or GIF formats



4. Installer and license

Download the installer from our webpage https://dewesoft.com/download/other-software and follow the installation process.

If you have a license on a USB dongle, download installer for a dongle version. The Dongle installer is a bit larger in size as it contains the merge module for the HASP driver as well.

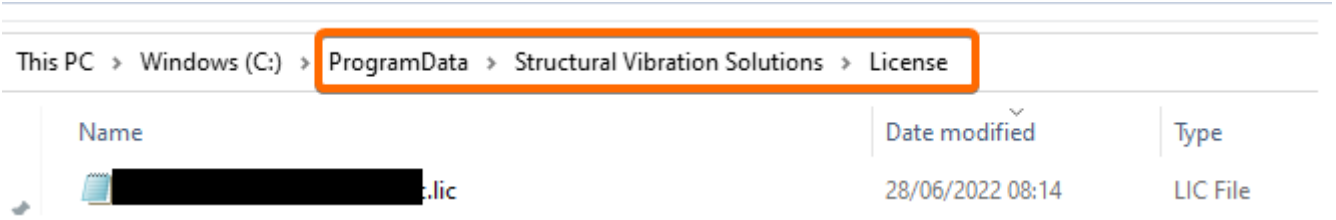


Other software

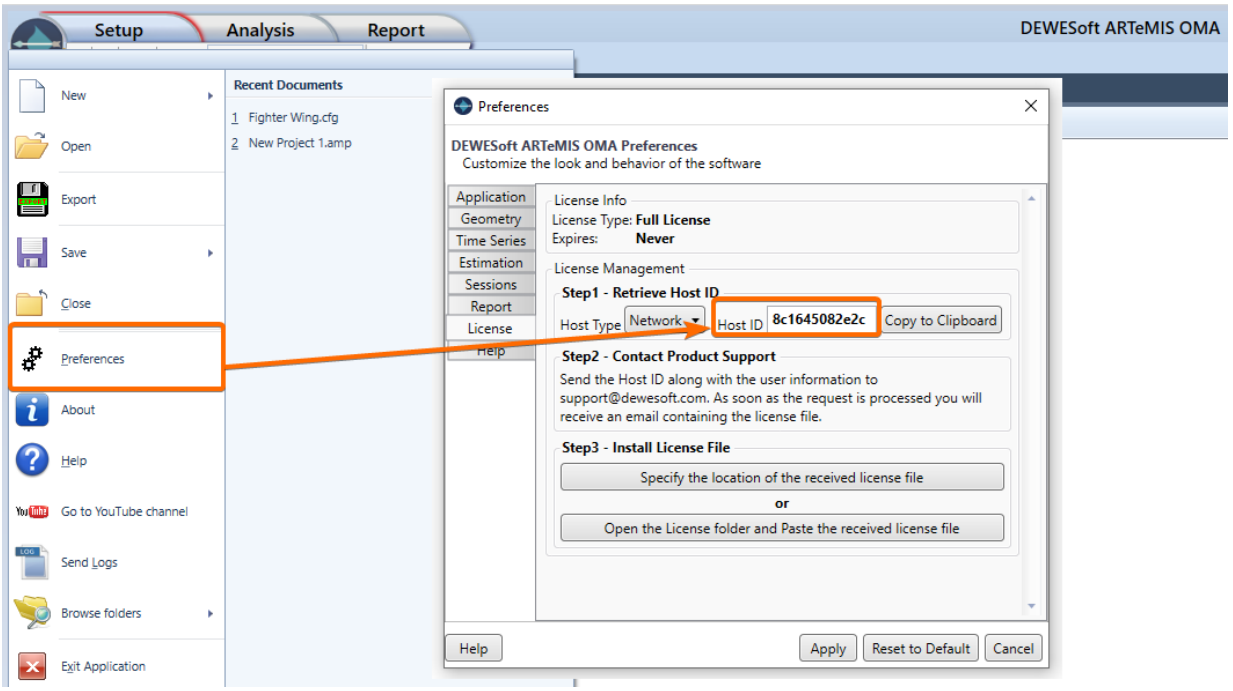
Search downloads: press [Ctrl+K] on Windows or [⌘K] on Mac.

NAME	DESCRIPTION	VERSION	FILE TYPE	PUBLISHED AT	DOWNLOAD
Dewesoft ARTeMIS OMA Installer (64-bit, dongle)	Installer for Dewesoft ARTeMIS OMA software package (64-bit). This installer requires a dongle with a license file installed.	/	exe	5/16/2023	Download 64-bit
Dewesoft ARTeMIS OMA installer (64-bit, no dongle)	Installer for Dewesoft ARTeMIS OMA software package (64-bit). This installer can be used without a license dongle.	/	exe	5/16/2023	Download 64-bit

When using a USB dongle, the license file has to be present in the license folder of all computers where the software should run.



Once you have installed Dewesoft ARTeMIS OMA, open it and go to the Preferences to obtain your computer's host ID. Please send this ID to support@dewesoft.com and we will create a license for you.



NOTE: The 30 days demo license is valid from the date is was issued. Please note that the days are continuous.

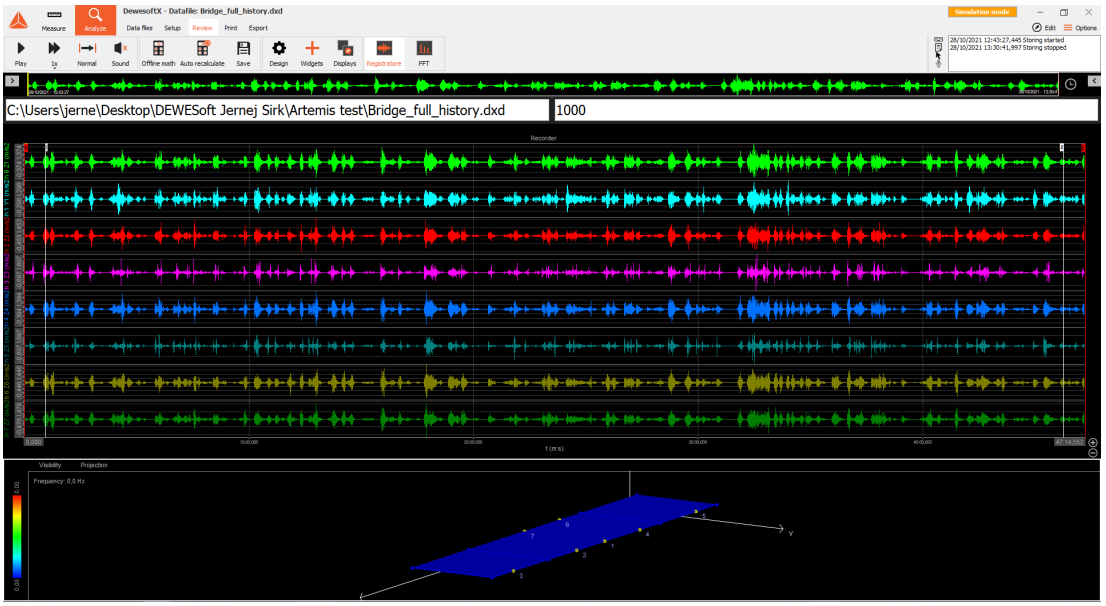
NOTE: Internet connection is necesary to check the license file. If there is no internet connection, we can supply an offline license.

NOTE: Before updating the version, please completely remove the previous version.

NOTE: In case you are using a USB resource (Dongle), make sure that the Dongle is inserted and that the red light is ON, before you start the ARTeMIS Modal application. Once the red light is ON, the user can start the application and extract the Host ID corresponding to the Dongle.

5. Instructions to use

The idea is to collect time-domain data and define the geometry with Dewesoft and then use the data in DEWESoft ARTeMIS OMA for further processing.



Please make sure that the **response direction** and **response node** for time-domain channels are set correctly in the Channels tab in Dewesoft. The node ID and direction will be automatically recognized by DEWESoft ARTeMIS OMA.

Channel type needs to be set to **Time response** (in the setup or in analysis). Only this channels will be imported into Dewesoft ARTeMIS OMA software (units for the time domain channels needs to be defined in the datafile).

If the response nodes and directions are not defined in Dewesoft, they can be defined later in DEWESoft ARTeMIS OMA.

General file information

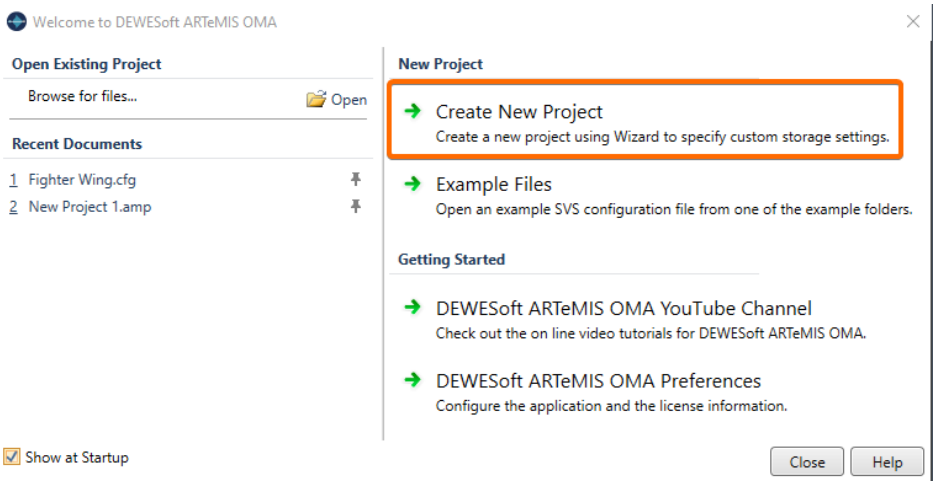
Sample rate **1000 s/sec**	Store date and time **28/10/2021 12:43:27**	Number of channels **18**
Reduced rate	Duration **00:47:15**	Trigger conditions **always fast**

Global channel view

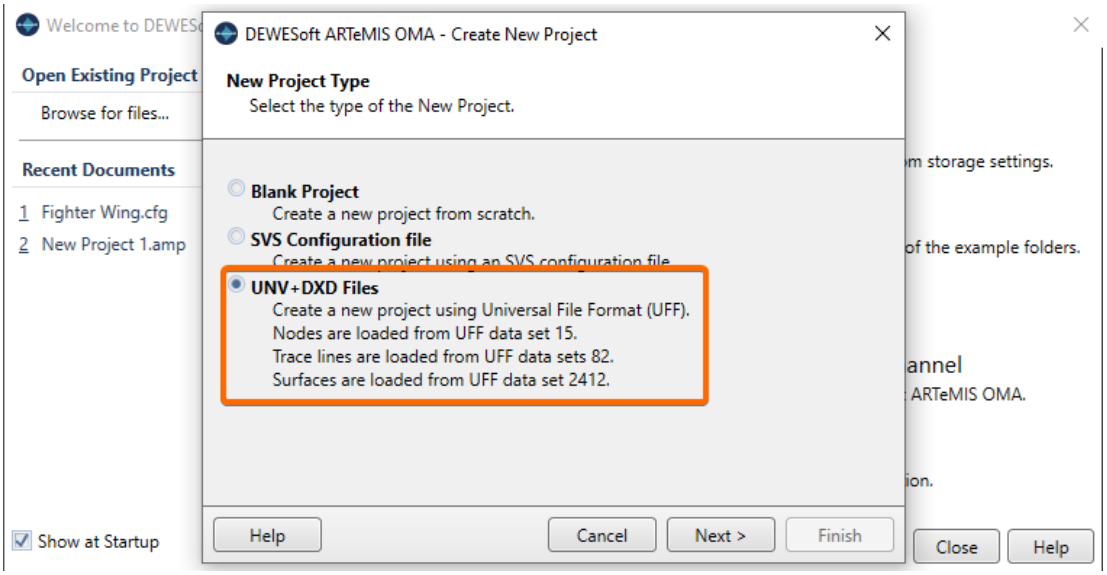
Number of channels: 18 ☐ Show channel setup
Search ☑ Group channels

+	ID	C	Name	Channel info	Unit	Response Direction	Response Node	Reference Direction	Reference Node	Function Type
			--- Analog ---							
	1		Ch 8 Z1	21139; DSI-ACC-0.16...	m/s2	+Z Trans.	1			Time Response
	2		Ch 1 Y1	21140; DSI-ACC-0.16...	m/s2	+Y Trans.	1			Time Response
	3		Ch 2 Z2	21141; DSI-ACC-0.16...	m/s2	+Z Trans.	7			Time Response
	4		Ch 3 Z3	21142; DSI-ACC-0.16...	m/s2	+Z Trans.	10			Time Response
	5		Ch 4 Z4	21143; DSI-ACC-0.16...	m/s2	+Z Trans.	8			Time Response
	6		Ch 5 Z5	21144; DSI-ACC-0.16...	m/s2	+Z Trans.	11			Time Response
	7		Ch 6 Z6	21160; DSI-ACC-0.16...	m/s2	+Z Trans.	9			Time Response
	8		Ch 7 Z7	21161; DSI-ACC-0.16...	m/s2	+Z Trans.	2			Time Response

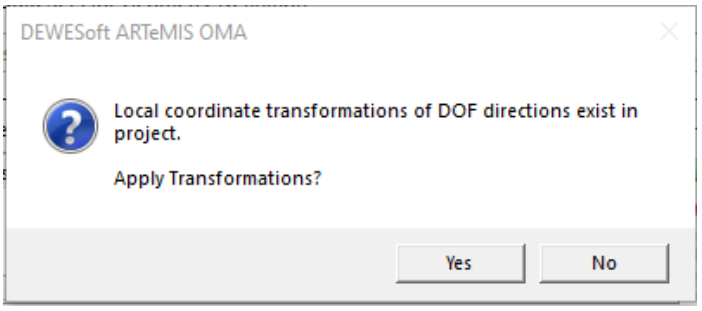
To conduct an analysis of your measurement open DEWESoft ARTeMIS OMA and select the option Create a new project.



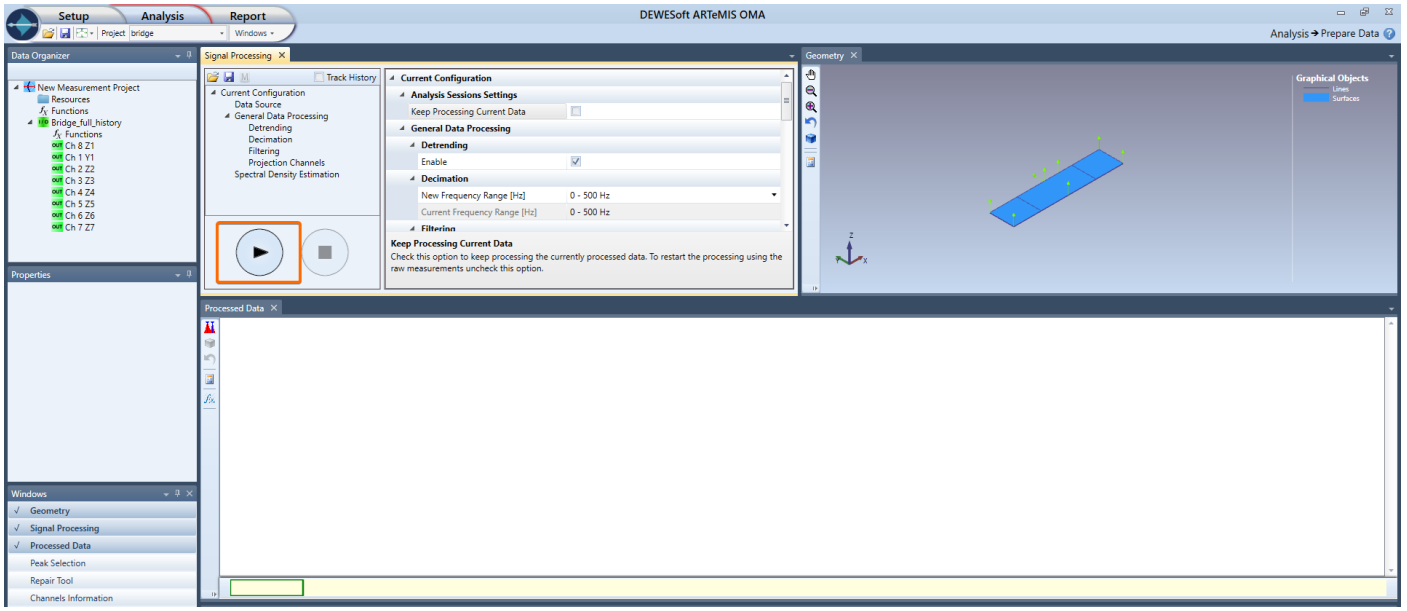
You can directly load the UNV file format for geometry and the Dewesoft DXD file for time-domain data.



If we defined response nodes and direction in Dewesoft, they are automatically recognized and we can apply the transformations.

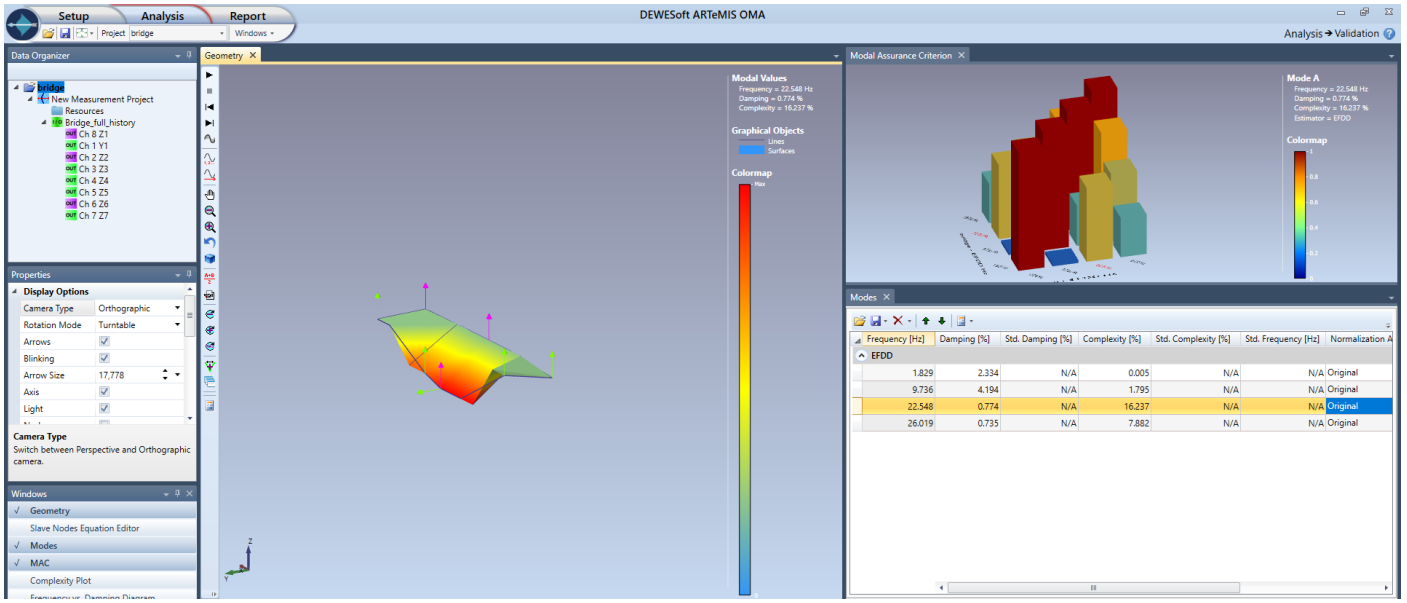


After the geometry and data are imported, we must go to Analyze mode and define the parameters for data processing (frequency range, ...). After that, we press the button to start processing the data.



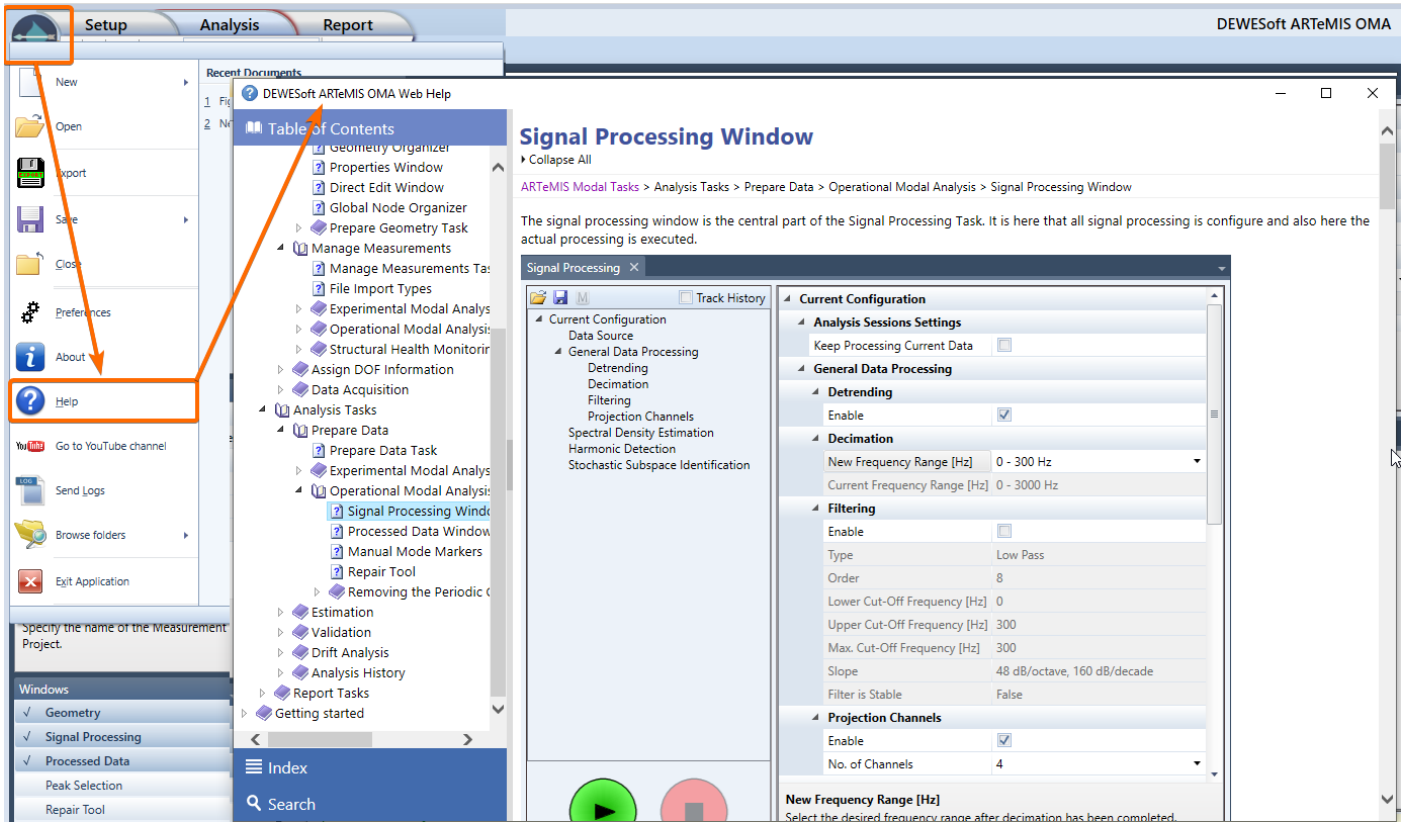
After the data processing, we go to the Estimation tab, where we select the method (FDD or EFDD) and we can run the Automatic mode estimation (modes can also be selected manually).

In the validation tab, we can animate the estimated mode shapes, display the MAC matrix, and display results in a table (frequency, damping ratio, complexity, ...).



For more information please take a look at the Artemis youtube channel:
https://www.youtube.com/channel/UCsyWdETgSNukVi0YxUiKPNA

To get more information about the functions inside the software, click the Help button.



6. Documentation version history

Version	Date	Notes
V22-1	18.5.2022	Initial version
V22-2	13.06.2022	Added notes about licences and updating the installer
V22-3	06.07.2022	Added note about time response properties and units
V22-4	26.07.2022	Added note about the license expiration
V23-1	14.06.2023	Added description for dongle installer
V23-2	06.10.2023	Added description for dongle license