



# Modal Analysis

Documentation

NVH CONSULTING AND ENGINEERING

# **End-User License Agreement (EULA) of Modal Analysis**

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This EULA agreement, and any dispute arising out of or in connection with this EULA agreement, shall be governed by and construed in accordance with the laws of Germany, Bavaria.

## A word from the engineers

Thank you for purchasing our software. This software was designed by engineers for engineers and portability and simplicity were the key features in our development strategy, so it can run on any type of hardware (low- or high-end machines).

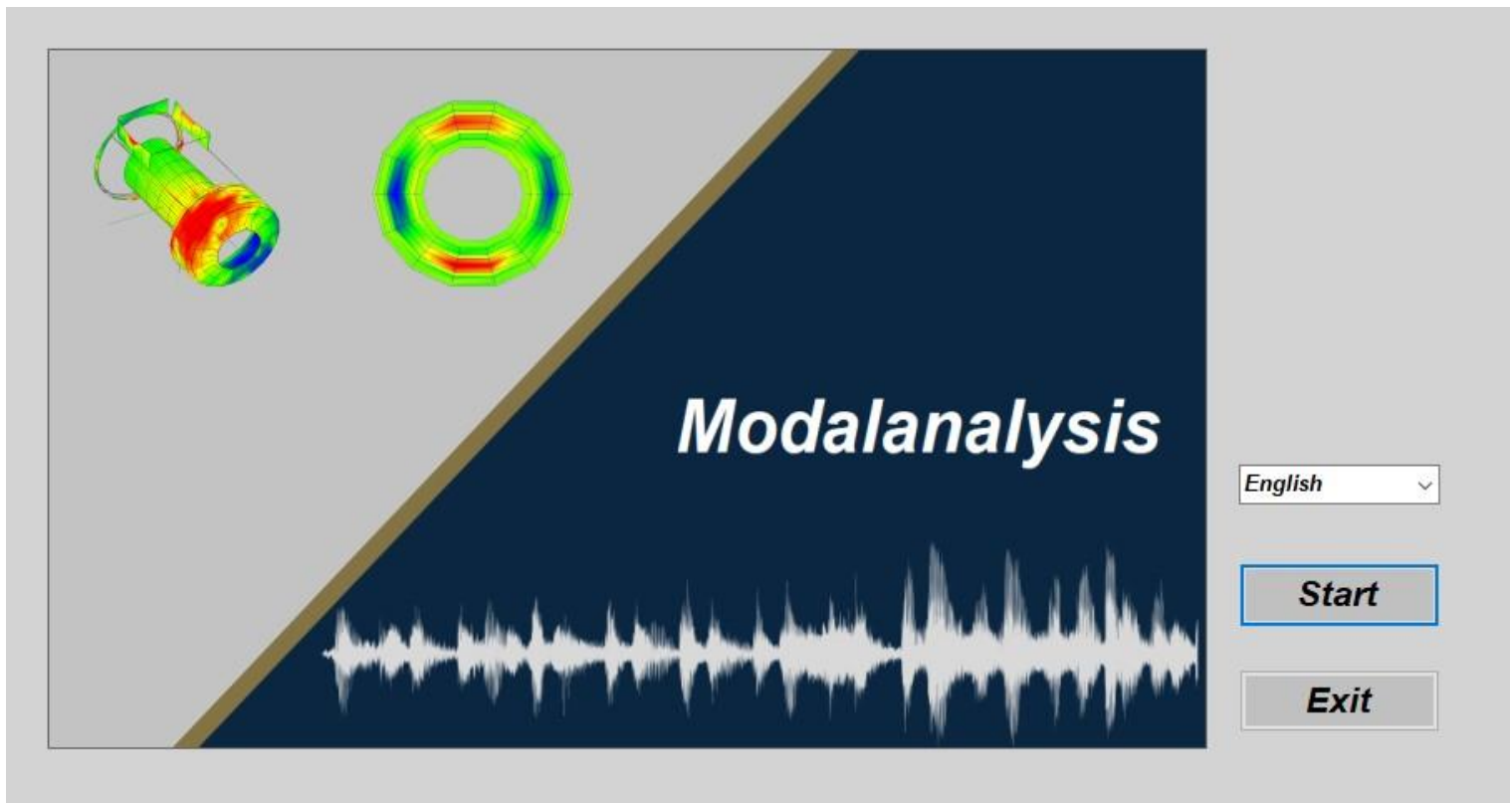
This software will help you with all your modal analysis needs whether the data is captured live using one of our partners tools or prerecorded data.

For any information do not hesitate to contact us we will be glad to help you.

E-mail: [info@sibaei-engineering.de](mailto:info@sibaei-engineering.de)

Website: [www.sibaei-engineering.de](http://www.sibaei-engineering.de)

## Welcome Screen



This is the first screen you see when the software is launched.

Here can be chosen:

- The language for the software
- **START:** Start the software
- **EXIT:** Quit the software

## Project creation

Combine Geometry Data with FRF Data to a Project

Geometry Data	FRF Data	Project
MOTOR	MOTOR	ENGINE

>>

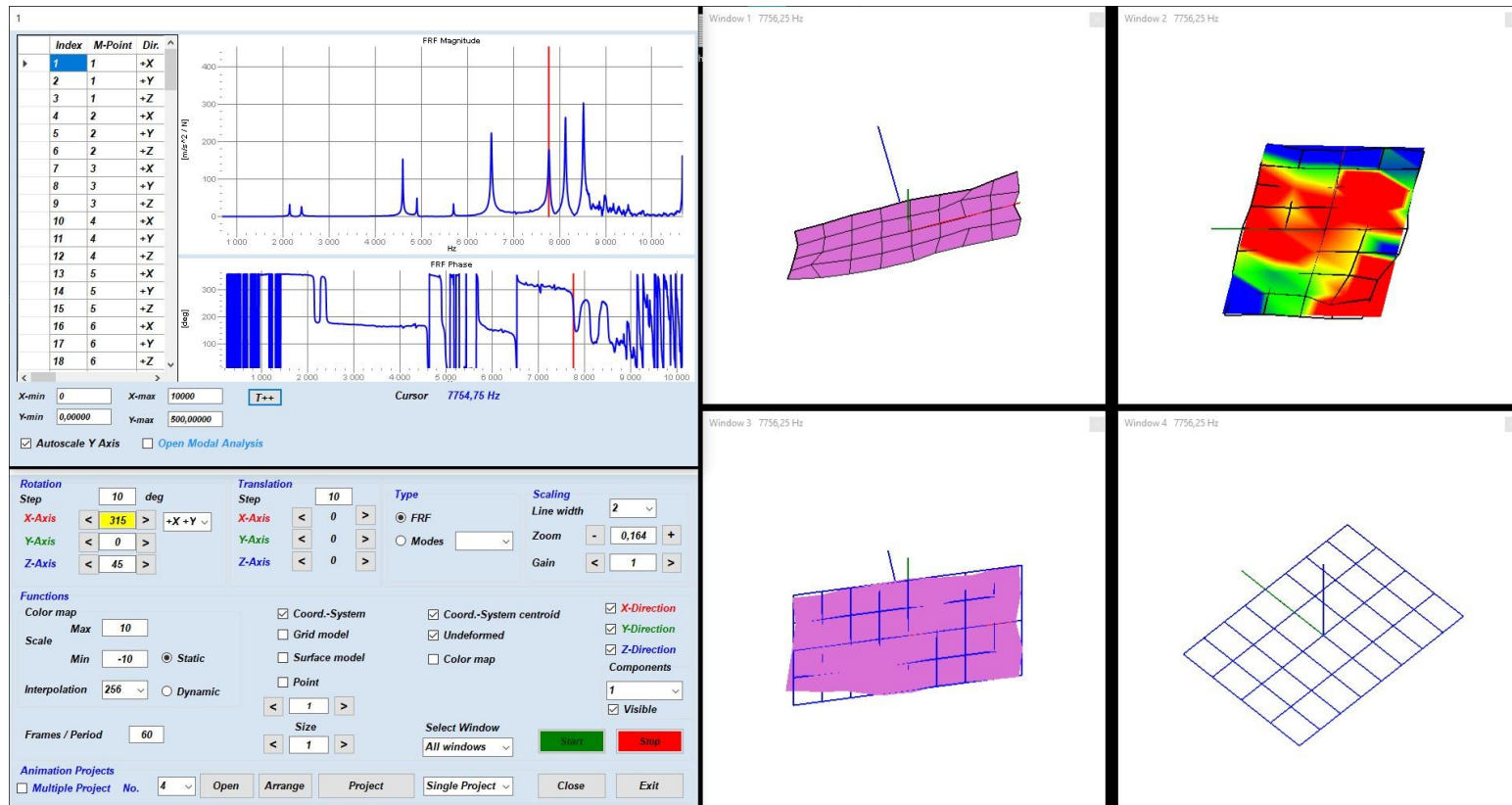
Geometry  
FRF

FRF-Meas.   Geometry   Apply to window   Import UFF   Save as Project   Load Project   Return

After launching the software, you will be presented with this screen to create your own project here you need to choose the geometry data and the FRF data to be combined into to one project.

- **GEOMETRY DATA:** Select the geometry file data to be combined with the FRF-Data into a project file
- **FRF-DATA:** Select the FRF-Data file to be combined with the geometry file into a project file
- **FRF-MEAS.:** Load the FRF Measurement file
- **GEOMETRY:** Create the geometry data points (grid and surface model)
- **APPLY TO WINDOW:** Apply current settings to window
- **IMPORT UFF:** Import Universal File Format project
- **SAVE AS PROJECT:** Combines the selected geometry and FRF data files into a project and saves them
- **LOAD PROJECT:** Load a previously saved project
- **RETURN:** Go back to previous screen

# Main window



This is the main window of the software, using this view you can analyze and visualize the data acquired. The data is displayed in a 3-axis environment (X, Y, Z).

The user can rotate the animation using his mouse (left click) and using the right click will change the axis of rotation (X, Y, Z).



## Main panel

The Main panel is divided into several sections for configuring the animation and visualization:

- Rotation:** Step (1 deg), X-Axis (315), Y-Axis (0), Z-Axis (45). Includes a +X +Y button.
- Translation:** Step (10), X-Axis (0), Y-Axis (0), Z-Axis (0).
- Type:** FRF (selected) or Modes.
- Scaling:** Line width (2), Zoom (0,135), Gain (1).
- Functions:**
  - Color map:** Max (10), Min (-10), Interpolation (16). Options: Static (selected) or Dynamic.
  - Frames / Period:** 30.
  - Size:** 1.
  - Select Window:** All windows.
  - Start/Stop buttons:** Green Start button, Red Stop button.
- Animation Projects:**
  - ☐ Multiple Project
  - No. 4
  - Open
  - Arrange (highlighted)
  - Project
  - Single Project
  - Close
  - Exit

Additional checkboxes in the middle section include: Coord.-System, Grid model, Surface model, Point, Coord.-System centroid, Undeformed, Color map, X-Direction, Y-Direction, Z-Direction, Components (1), and Visible.

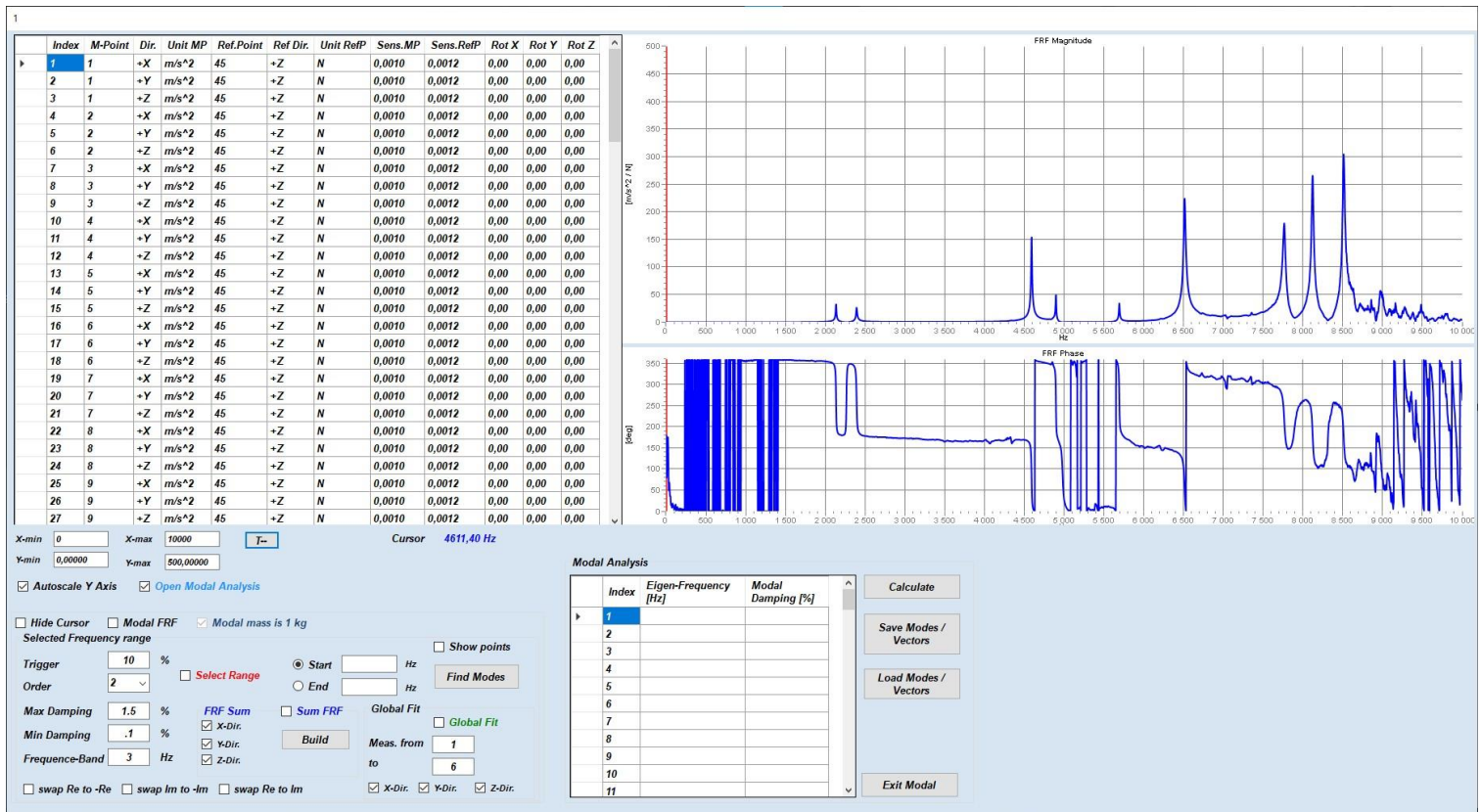
The main panel is used to configure how the data is shown. The user can rotate on all three axes the animation, choose parts of the animated object, customize the scale for the color map and zoom in and out. All the above-mentioned options can be applied to all the window animations or individually by using the select window **drop down menu**.

You can customize the animation in several ways using the check boxes provided in the middle of the panel:

- **GRID MODEL:** Show / hide grid model
- **SURFACE MODEL:** Show / hide surface model (you can choose the color that suites your project)
- **UNDEFORMED:** Show / hide an undeformed model
- **COLOR MAP:** Show / hide color map for the model

- **START:** Start the animation
- **STOP:** Stop the animation
- **OPEN:** Choose how many animation windows to open (default is 4)
- **ARRANGE:** Arrange all windows to the default locations
- **PROJECT:** Load previously saved project
- **CLOSE:** Close all animation windows
- **EXIT:** Quit the software

# Modal Window



Modal calculation system used to calculate Eigen-Freq & modal damping & the modal vectors

To find the modes you have to:

1. Select the frequency range to calculate the modes by using the cursor to choose the start and end point (**Select Range** check box)
2. Click on start radio button and with the mouse choose the starting point on the displayed graph (left click with the mouse)
3. Click on end radio button and with the mouse choose the end point on the displayed graph (left click with the mouse)
4. Click the Find Modes button
5. The results will appear in the table
6. To display the mathematical model (Synthetical FRF) select the **Modal FRF** check box

To fine tune the results the user can choose the Maximum and Minimum Damping range in order to filter unwanted mathematical Modes.

In order to calculate Global Modes, the user must check the **Global Fit** check box and define the measurement range (start and finish points), the user can also define the axis (X, Y, Z).