

ModalVIEW Main Feature List

● Data Acquisition & Management

- NI DSA hardware front end support
- Integrated data management
- Data acquisition and importation
- Multi-channel synchronization
- Selectable IEPE excitation
- Automated measurement set generation
- Sensor arrangement guidance

● 3D Structure Model

- 3D modeling for arbitrary structure
- Basic structure building blocks
- Interactive rotation, zoom and pan of model
- Quad view and 3D view
- Local measurement axial display
- Interactive point numbering
- Motion interpolation for unmeasured points
- 3D model import from ASCII, STL and UFF files

● ODS & Mode Animation

- Time-based ODS, frequency-based ODS and order-based ODS
- Mode shape animation
- Sweep, sine dwell and stationary dwell
- Animation speed & amplitude adjustment
- AVI file generation

● Modal Analysis

- MDOF polynomial curve fitting, global fitting, out of band mode compensation
- Stabilization plot for closed spaced modes identification and automatic mode selection
- Multiple-reference mode estimation
- Order-based operational modal analysis
- FRF synthesis from estimated modal parameters

● Mode Validation and Simulation

- Auto MAC, Cross MAC plot and mode complexity plot
- Mass, stiffness and damping matrix
- Mode normalization and conversion
- Forced response simulation

● Report Generation

- Automatic report generation
- User-defined report content
- Report content of test object, operator, instruments, mode list, model shape diagram

ModalVIEW

A Turnkey Solution for Modal Testing and Analysis

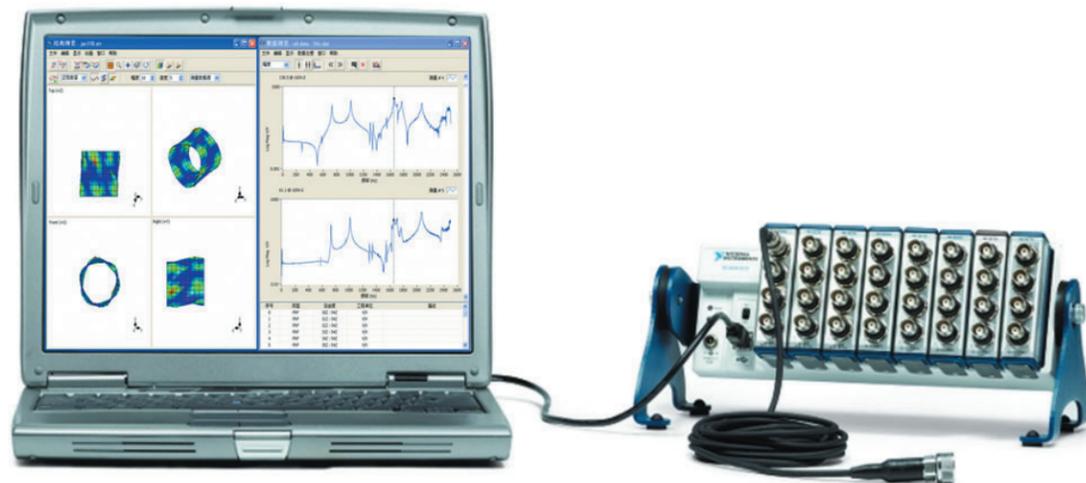


User-Customized Modal Testing Solution

ModalVIEW Supports National Instruments DSA

ModalVIEW is designed to easily acquire multi-channel vibration signals from operating machinery and static or dynamic structures with data acquisition hardware. After obtaining a set of time histories, it can animate the response of a structure and show the structure's vibration behavior. It helps extract and visualize useful modal parameter information from acquired time and frequency domain experimental data.

ModalVIEW software is LabVIEW-based making interfacing with the measurement hardware rapid and simple. ModalVIEW software is compatible with all dynamic signal acquisition (DSA) hardware from National Instruments including PXI, PCI and USB. With the affordable ModalVIEW software, you can leverage your structural testing capabilities by utilizing your existing investment in NI DSA hardware.



The Right Choice to Select ModalVIEW

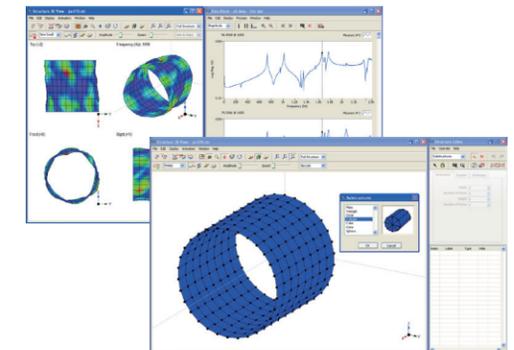
Seamless NI DSA Hardware Connection

ModalVIEW directly supports NI DSA hardware data acquisition front-ends including the PXIe-449X, PXI-449X, PXI-446X, PXI-447X, PCI 4461, PCI 4472, NI 923X and USB-443X through NI-DAQmx. It supports free run and external trigger acquisition modes for hammer or shaker testing. It is designed to reduce the set up time needed for configuring your data acquisition channels.



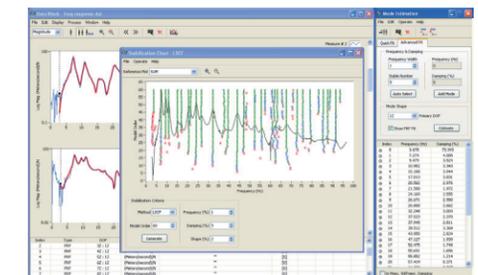
Complete Testing & Analysis Capabilities

ModalVIEW is an easy-to-use modal testing and analysis tool with advanced capabilities. ModalVIEW helps rapidly finish modal testing tasks from simple to large complex structures. Features include structure 3D modeling, data acquisition, operating deflection shapes(ODS), experimental modal analysis (EMA), operational modal analysis (OMA), structure animation and report generation.



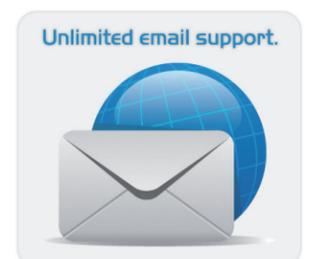
Advanced Modal Estimation Methods

ModalVIEW provides a variety of modal parameter estimation methods from the reliable MDOF polynomial curve fitting method to the advanced LSCF and multi-reference SSI methods. MDOF polynomial curve fitting methods provide a quick insight into the natural frequency, damping ratio and modal shape with minimum interaction. The LSCF method helps to automatically identify modes from a generated stabilization chart. SSI is used for operational modal analysis.



Timely Customer Support and Service

ModalVIEW was developed by signal processing experts in sound & vibration as well as professional software developers. We are dedicated to offer timely technical support to our customers and to constantly improve our software according to customer needs.

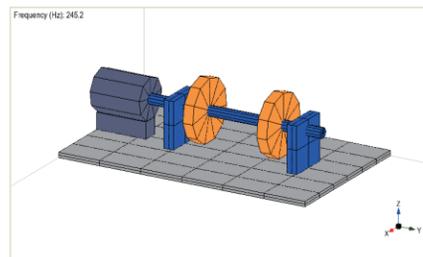


Suitable for Different Types of Testing

ModalVIEW integrates a set of complete modal testing and analysis tools including time-based, frequency-based and order-based ODS, experimental modal analysis (EMA) and operational modal analysis (OMA). It is a suitable tool to solve sound and vibration problems for a variety of mechanical and civil structures.

Operating Deflection Shapes (ODS)

ODS is the visualization of motion status or vibration pattern of a structure according to the time records, frequency response or a specific order component with respect to rotational speed. ModalVIEW supports time-based, frequency-based and order-based ODS. It is useful to investigate if some vibration pattern of a structure is due to an inherent resonance at a specific frequency, or to inspect if some vibration behavior of a structure is due to rotating parts.



Experimental Modal Analysis (EMA)

Experimental modal analysis is used to obtain structure modal parameters by measuring and analyzing the dynamic response of a structure when excited by a stimulus. ModalVIEW supports a variety of MDOF, global fitting analysis methods, and MIMO poly-reference experimental methods using impact hammers or shakers.



Operational Modal Analysis (OMA)

Operational modal analysis performs identification of modal parameters from response measurements of the structures in an operating state where external excitation can't be applied, such as with aircraft, wind generators, drilling platforms, and bridges. Besides traditional OMA methods, ModalVIEW also provides a new order-based operational modal analysis to identify modal parameters from response measurements of rotating machinery in an operating state.



Flexible Data Acquisition Configuration

ModalVIEW supports National Instruments dynamic signal acquisition devices. You can select portable, economical, and professional configurations suitable to your specific requirements. NI dynamic signal acquisition (DSA) devices are designed specifically for applications for noise and vibration measurements, which is ideal platform for modal testing system.

- Up to 204.8 kS/s maximum sampling rate
- 24-bit resolution, up to 118 dB dynamic range
- NIST-traceable calibration
- AC/DC coupling
- IEPE conditioning
- TEDS sensor support

Portable

An ultra portable solution based on the CompactDAQ platform and NI 9234 modules with USB 2.0 hi-speed connectivity to a host PC or a laptop. This is a perfect engineering tool for portable modal testing for small size structures and other noise and vibration applications. The acquisition channels are expandable up to 32 channels.



Economical

A powerful and economical solution based on the NI 4472 DSA board installed into a desktop PC or rugged portable PC. The 102.4k sampling rate, 24-bit resolution ADCs and the 110 dB dynamic range provide the needed accuracy. It covers a full range of modal testing applications in the field and in the laboratory.



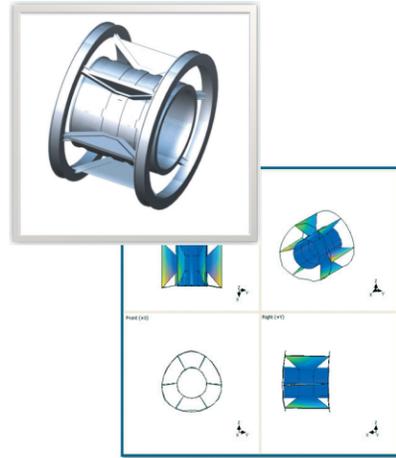
Professional

A professional solution based on the NI PXI platform and PXI DSA boards for advanced needs in large-scale structural modal testing when high-channel counts are required. PXI Express bus technology ensures that massive real-time data can be acquired and transferred simultaneously. The system can be expanded to thousands of channels or more while maintaining tight timing and synchronization between channels.



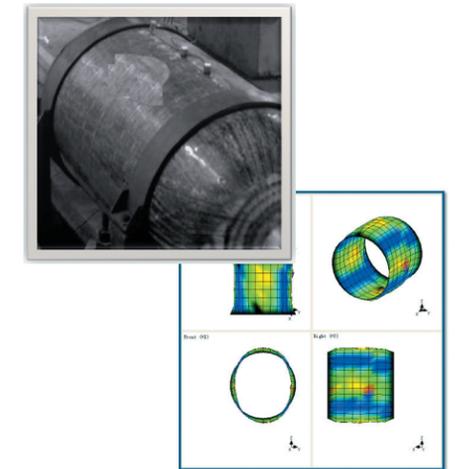
Magnet Coil Structure

The test object is a steel frame for a magnet coil. The structure is symmetrical. There are closely spaced and conjugate modes existing. The structure is large and heavy. The vibration signals of the measured points far away from excitation point are weak. The dynamic range of measured signals is large. A Tri-axial accelerometer is used for each measurement point. There are total 48*3 FRF data to be measured. The NI PXI-449X is used to guarantee accurate measurements. ModalVIEW provides an advanced modal analysis method based on mode stabilization diagram to extract modes from poly-reference FRF measurements.



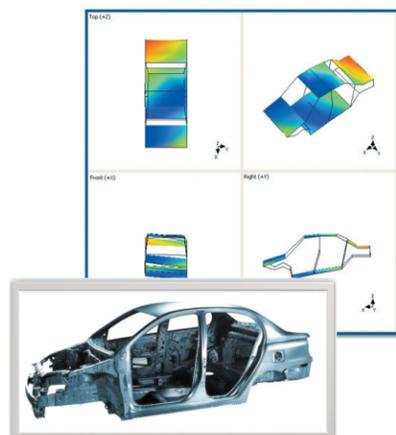
Composite Material Tank Structure

The test object is a hydrogen tank made of composite material with a high resonance frequency. The analysis result provides test-analysis correlation and FEM model updating. The portable NI 9234 is used with USB 2.0 hi-speed connectivity to a laptop. FRF data is measured in batches using ModalVIEW. The whole test system is cost effective and suitable for small structure testing.



Body-in-White (BIW)

The NVH dynamic characteristics of a full vehicle are accessed through experimental modal testing to obtain modal parameters of a BIW structure. In the MIMO modal testing experiment, excitation is applied to the car body structure with two shakers. Operated by ModalVIEW software, vibration responses and excitation forces are measured simultaneously by NI PXI-449X modules in the PXI system. Excitation signals are generated to drive two shakers by the NI PXI-4461. In post-process, MIMO FRF data from measured poly-reference vibration data is computed for further mode estimation.



Sea Crossing Bridge Structure Monitoring

Structure Health Monitoring (SHM) provides quantitative data for assessing the extent of damage and deterioration, evaluating structural performance, responding to unexpected catastrophic events, and researching bridge design and construction technologies. Modal analysis is a standard engineering practice in today's SHM. In this application, an NI PXI-based data acquisition system has been deployed for continuous monitoring. ModalVIEW is used for off-line analysis of data from the bridge. The bridge's modal parameters---resonance frequencies, damping ratios, and mode shapes are calculated using operational modal analysis.

