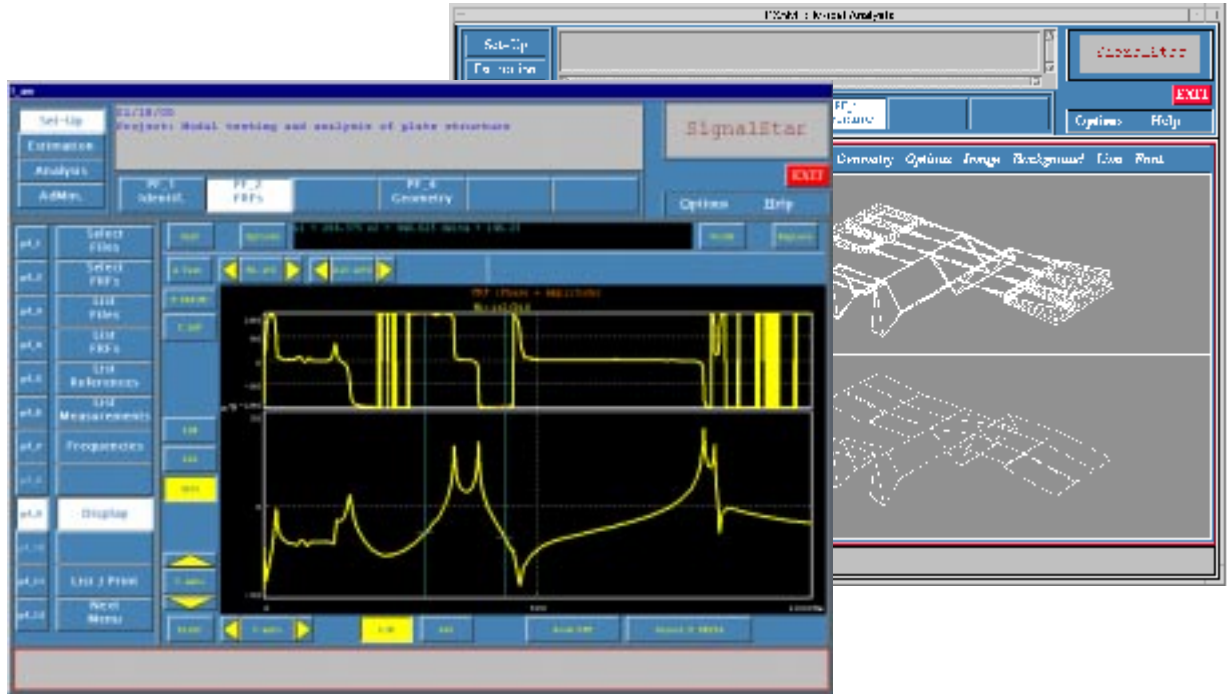


# Modal Analysis Software



Uniting with the SignalCalc® family of Dynamic Signal Analyzers, SignalStar Modal provides a complete measurement and analysis system for structural dynamics applications. The seamless integration of powerful modal analysis software with comprehensive modal measuring instruments in your PC results in a highly productive working environment. You will find the modal system suitable for any size of test, from an experiment in the field on a portable notebook to a full MIMO test of complicated structures involving unlimited channels and measurements.

SignalStar Modal, running in Windows NT, features accurate modal parameter identification, informative mode shape animation, and convenient data management. Intuitive menus, graphical displays, and a well-designed user interface make the system easy to use. At each stage of modal analysis, intermediate results are available for display, print, and export.

## Highly Accurate Modal Parameter Estimation

SignalStar Modal incorporates the most efficient curve fitting technique to extract modal parameters. Two time domain multi-DOF curve fit algorithms are used: LSCE (Least Square Complex Exponential) dedicated to single input excitation, and Polyreference, an extension of LSCE, dedicated to multiple input excitations (MIMO). Up to 10 modes within a given frequency band can be extracted from processing an unlimited number of Frequency Response Functions simultaneously. Highly coupled modes are also handled easily using LSCE.

To accurately separate the physical from the mathematical modes, SignalStar Modal automatically sorts the modes according to a user defined stability criterion called the quality coefficient. Each curve fit result is plotted in the Stability Diagram providing an explicit visual indication of poles. Those poles meeting the stability criterion are selected automatically and the modes are displayed almost instantaneously.

## Geometry

Structural geometry can be created using rectangular, cylindrical, or spherical coordinates, or can be imported from ASCII files in UFF. Geometry of large complicated structures is easily created using any number of components with local coordinate systems. Volume effects may be obtained by rendering or filling a surface.

## Animation

Advanced mode shape animation display functions provide useful insight of the structure under test. Multiple windows display modes in isometric views or three dimensional views with perspective. Deformed mode shapes can be superimposed over the undeformed structure, or multiple deformations can be superimposed for easy comparison of different modes. Multiple formats display real and complex modes. Other convenient display options available are: Rotation & Translation; Perspective Position & Zoom; Wireframe or Vector Deformation; X, Y, Z Deformation Control; and Different Trace Styles.

## Normal Mode Testing

In normal mode operation, each mode of the structure under test is examined separately, physically isolating that mode from other modes of the structure. Normal mode testing is done by first performing swept sine FRF measurements to locate mode frequencies. The shakers are then adjusted for appropriate excitation levels and phase to create the mode shape.

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The software includes the capability to calculate generalized mass, stiffness, and damping parameters using complex power or forces in quadrature. You can also plot impedance curves to show non-linearities of the structure.

## Ordering

Three modal analysis packages are available:

Standard Modal Analysis for use with any SignalCalc Dynamic Signal Analyzer or as a stand alone software package to work with FRFs imported from any FFT analyzer.

Integrated Modal Analysis for use with SignalStar Vibration Control Systems, where transmissibility measurements from a random vibration control test may be used instead of FRFs. Integrated modal analysis can also be used when excitation forces cannot be measured, but acceleration to acceleration transfer functions under working conditions can.

Normal Mode Testing is offered with the Agilent VXI platform with multiple input and output channels. Up to 1024 measurement channels are supported.



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