VibSoft *Data Acquisition Software*

SIMPLE, POWERFUL AND COMPLETE SOFTWARE FOR SINGLE-POINT VIBROMETRY

VibSoft is a comprehensive software and hardware package for acquiring and processing data from Polytec's line of single-point laser vibrometers. It manages the data acquisition, signal decoding, function generator, data display and remote control of vibrometer controller settings. Measurements can be presented in both time and frequency domains with applying digital filters, signal averaging as well as real-time integration and differentiation.

Software for Single-Point Vibration Measurement

Polytec's family of single-point laser vibrometers are indespensable tools for engineers looking to optimize product performance and to investigate natural dynamic responses. Based on the Doppler effect, these instruments are precise optical transducers that sense the frequency shift of back scattered laser light from a moving surface to determine the vibration velocity and displacement at a specific point on a test structure.

To properly measure a structure's vibration response, Polytec's VibSoft data acquisition software precisely controls the vibrometer, producing accurate data and meaningful analysis.

It is optimally designed for interfacing with laser vibrometers and for interactive acquisition and analysis of measurements.

Within VibSoft, the user can access a spectrum of high quality measurement features including a wide range of functions that are standard for FFT analyzers. Also, there are special features designed just for Polytec vibrometers such as vibrometer controller operation and function generator control. When an application needs a specialized solution that isn't met by the standard functionality of VibSoft, Polytec can supply software products that allow the user to customize VibSoft to their individual requirements.

VibSoft is available in several versions featuring either two or four channel data acquisition of velocity and displacement. Maximum vibration frequencies can range from 80 kHz to 40 MHz.

To learn more about laser-Doppler vibrometry, please visit **www.polytec.com/usa/vib-university.**
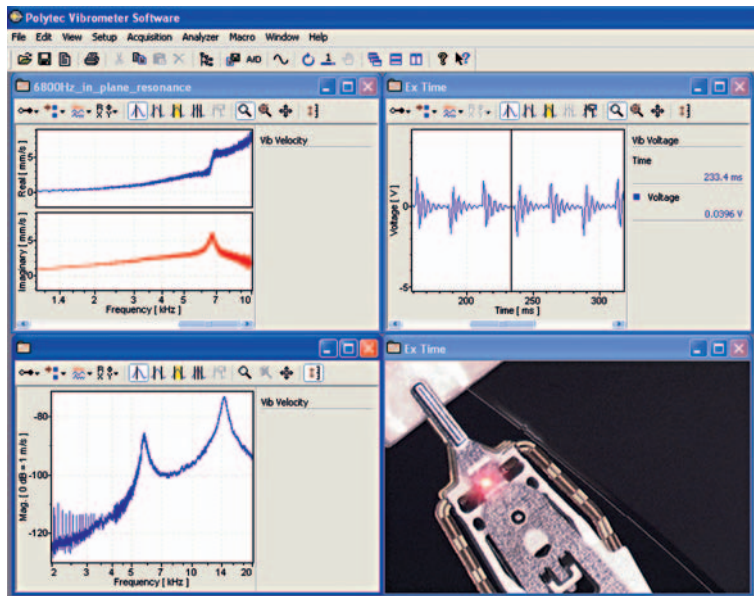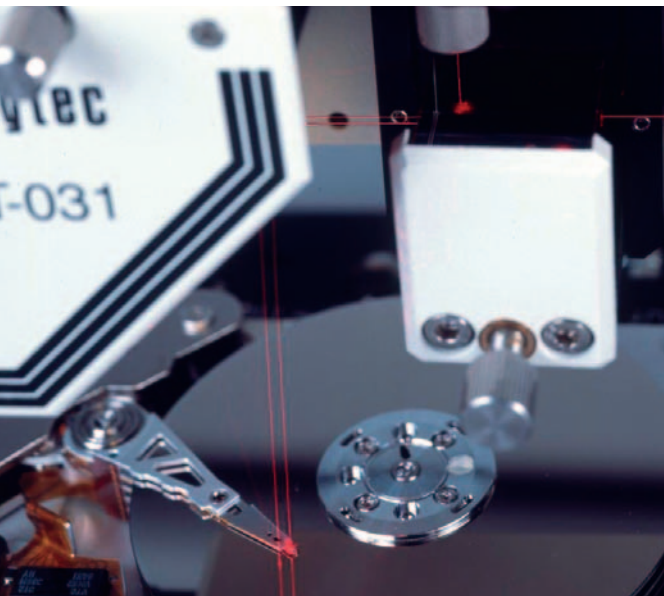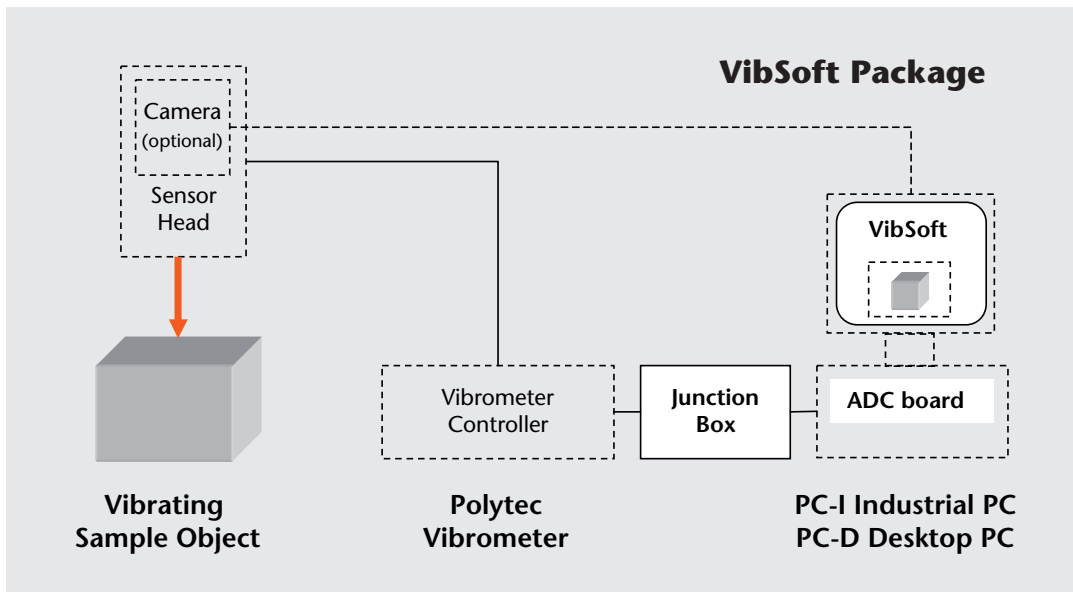
VibSoft Data Acquisition Features

- Provides access to all vibrometer settings via RS-232 interface

- Sets integrated function generator (optional) to standard and user-defined excitation waveforms

- Provides live video images of the test object and laser beam position when using an OFV-534 Sensor Head equipped with an internal video camera, or an MSV-050/100 Microscope Adapter

- Acquires time and FFT response signatures of arbitrary drive voltages

- Averages the input signal in the time domain

- Differentiates and integrates in time and frequency domain

- Calculates FFT with 12,800 lines of resolution; optional Zoom FFT

- Enables sensitivity calibration for 3rd party sensors
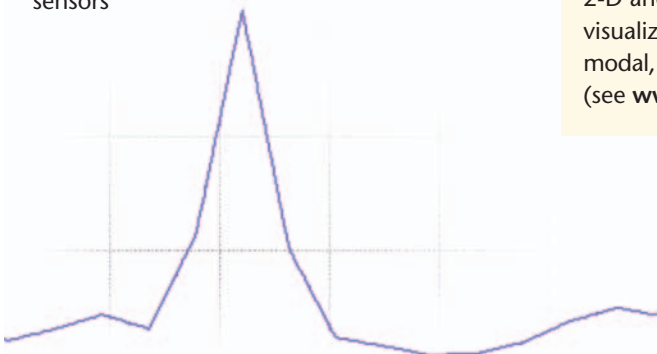
VibSoft Data Processing Features

- Displays 3rd octave, magnitude, real & imaginary, and Nyquist diagrams

- Provides complex spectral analysis with auto power, cross power, H1, H2, FRF, phase and coherence functions, and other signal properties

- Applies digital high, low and band pass filters

- Enables automatic test routines and interface with other software using Visual Basic scripting (VBS)

- Exports data in ASCII format and Universal file UFF, provides direct access to binary data for processing in MATLAB

For full-field Scanning Vibrometer measurements, VibSoft should be replaced by PSV Software to provide 2-D and 3-D data acquisition and visualization as well as interface to modal, FEM and other software (see **www.polytec.com/usa/psv400**).

VibSoft Package

Camera (optional)

Sensor Head

VibSoft

Vibrating Sample Object

Vibrometer Controller

Junction Box

ADC board

Polytec Vibrometer

PC-I Industrial PC
PC-D Desktop PC

How it Works

The VibSoft package manages the data acquisition, signal decoding, function generator and data display. It includes a data acquisition board to be installed in the computer, and a Junction Box to connect the vibrometer to the board. The Junction Box provides inputs and outputs for the vibrometer signal, function generator, reference, trigger and others.

When using vibrometer hardware equipped with a video camera, choose the VIB-S-Video option to display and save the video image along with the measurement data.

Features

All VibSoft packages include a Visual Basic® compatible scripting engine to implement automated process sequences, for example:

- Carrying out a sequence of measurements
- Exporting data in specific target formats
- Customer specific applications, e.g. monitoring external instruments by programming the digital I/O port, creating customer-specific dialog boxes

VibSoft's extensive peak analysis capability is enhanced by a band cursor providing statistical parameters and harmonic oscillator curve fitting as well as a harmonic cursor that plots up to 12 cursor lines at the 2nd, 3rd, … order of the base frequency. VibSoft can export files as a universal file (UFF), ASCII data and as PolyFileAccess,

Turnkey Systems – Leave it to Polytec's Experts!

If VibSoft is ordered together with either PC-D or PC-I computers, Polytec will do all necessary installation, configuration and system testing.

Just unpack and start your measurements!

a software component according to the Microsoft COM standard for 3rd party software data access (e.g. MATLAB). ME'scope binary export is available as an option.

Band cursor featuring statistical parameters in VibSoft analyzer window
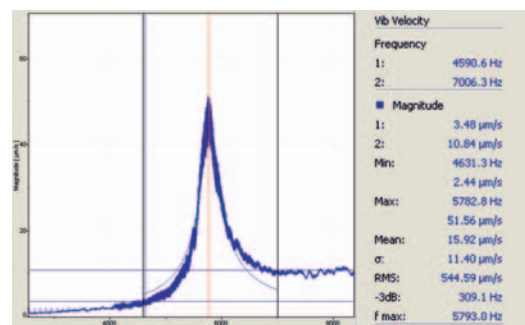
Powerful Options

The performance of VibSoft can be greatly enhanced by adding appropriate hardware and software options. Various external or internal function generators support a wide range of arbitrary waveforms for sample excitation. The Polytec Signal Processor is a powerful user interface to the math library included in VibSoft. Designed as an easy-to-use spreadsheet, measurement data from different sources can be post processed by simple drag and drop operations. Data can easily be shown in one plot, subtracted from a trace in another plot, and integrated in a third plot.
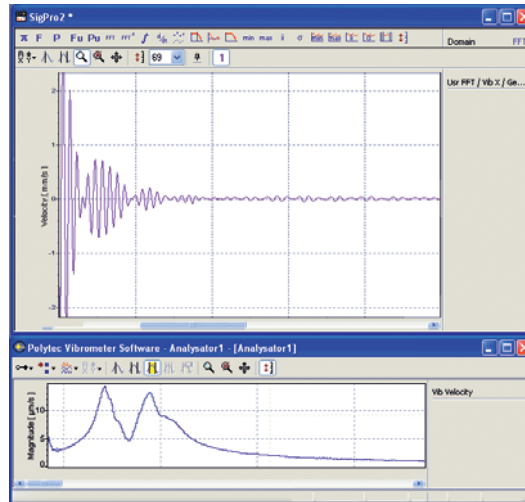
Response of a MEMS pressure sensor to a pulsed input and frequency spectrum calculated by the VibSoft Signal Processor

VibSoft Software Versions

VibSoft Based on Analog-to-Digital Conversion

The analog-to-digital converter (ADC) board included in these packages is intended for digitizing both the analog velocity and displacement signals from the vibrometer controller output, as well as reference signals of various origins. VibSoft can be operated in conjunction with any single-point laser vibrometer ranging from industrial vibration sensors to high-end OFV-5000 based systems.

VibSoft is available as a standard two-channel version with maximum signal bandwidths of either 80 kHz, 1 MHz or 40 MHz. When more inputs are needed for velocity, displacement or frequency response measurements from the high-end OFV-5000 Modular Vibrometer Controller, VibSoft can be ordered in an expanded four-channel version. The same ADC board is incorporated in the PSV-400 Scanning Vibrometers. VibSoft can therefore be the base for a subsequent upgrade to a PSV system.

VibSoft-FC for Digital Fringe Counting

VibSoft-FC is a two-channel FFT analyzer software for measurements using laser vibrometers that are equipped with a displacement decoder based on digital fringe counting. It acquires the counting pulses from the fringe counter output signal of the vibrometer controller. Regarding the OFV-5000 Modular Vibrometers, VibSoft-FC is best suited for the DD-100 and DD-200 Displacement

Decoders. VibSoft-FC is the ideal tool for all applications requiring displacement measurements ranging from high speed valve lift to large amplitude printer head tracking. For displacement measurements, VibSoft-FC is more accurate, has a wider dynamic range and is lower cost than feeding the analog controller output into an FFT analyzer. It features data acquisition in time and frequency domain, digital filters, signal averaging and real-time integration and differentiation.

VibSoft-VDD for PC-Based Digital Vibrometers

VibSoft-VDD is a software package for PC-based vibrometer systems. In the VDD system, a quadrature demodulator generates the sine and cosine components of the sensor head signal. These are digitized by a high sampling rate ADC board inside the data management system to measure the dynamic displacement of the test object. The VDD PC-Based Digital Vibrometer is an excellent tool to characterize very small dynamic displacements with large bandwidth, flat response and fine resolution. For more information please see the VDD PC-Based Vibrometer data sheet or visit **www.polytec.com/ usa/LM-digital**.
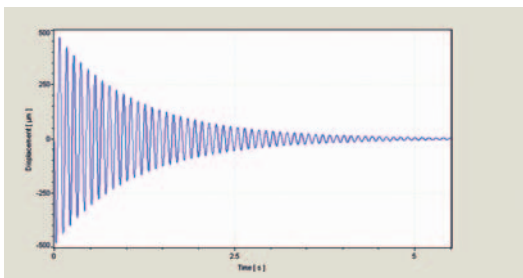
Applications

VibSoft supports and enhances any application of single-point vibrometry including acoustics, medical and biological research, production testing, civil engineering, automotive, aerospace and data storage development.
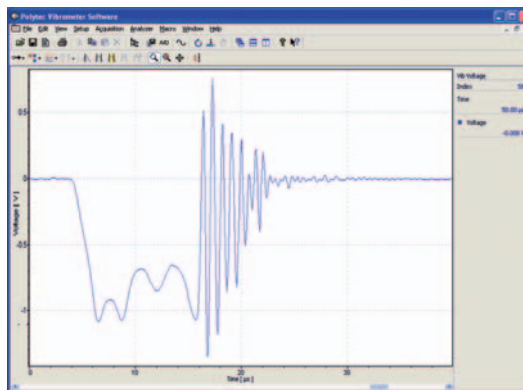
Time response of an optical switch
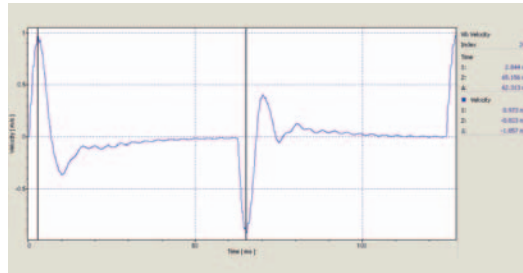
Decaying oscillation from a seismic sensor

Response of a loudspeaker to a short input pulse

Technical Data

VibSoft Specifications

Version	VibSoft-80	VibSoft-84	VibSoft-1000	VibSoft-1004	VibSoft-M2-40	VibSoft-FC	VibSoft-VDD	
Operating principle	ADC	ADC	ADC	ADC	ADC	Fringe counter	I & Q demodulator	
Acquisition bandwidth	80 kHz	80 kHz	1 MHz/ 2 MHz[1]	1MHz/ 2 MHz[1]	40 MHz	100 kHz	2 MHz	
No. of channels	2	4	2	4	2	2	1 Vib. 1 Ref.	1 Vib. 2 Ref.
Recommended Vibrometer Configurations (when covering the whole frequency range):								
Modular (OFV-5000)	VD-01	VD+DD Combi-nation	VD-02, -04,-06 DD-400, DD-500	VD+DD Combi-nation	DD-300, VD-05	DD-100, DD-200	DD-600	
Single-Point	IVS-200 IVS-300 PDV-100		OVF-2500-1 CLV-2534 NLV-2500	OFV-2502	OFV-2570	OFV-2510		VDD-E-600
Special Purpose	OFV-4000 OFV-3310	HSV-2000 CLV-3220	HSV-2000 OFV-3320	CLV-3230				
Included Software Features								
VIB-S-FFT128	Supports 12,800 FFT lines							
VIB-S-VBEng	Creates Visual Basic® Scripts for automation of measurements and data presentation. Supports User Defined Data Sets (UDDS) to apply mathematical operation to internal and external measurement data files. Includes PolyFileAccess which supports Microsoft's standard Component Object Model (COM).							
VIB-S-ExpUFF	Converts data to Universal File Format (UFF)							

[1] With VIB-S-Bw2M 2 MHz Bandwidth option

VibSoft Specifications

Hardware								
Version	**VibSoft-80**	**VibSoft-84**	**VibSoft-1000**	**VibSoft-1004**	**VibSoft-M2-40**	**VibSoft-FC**	**VibSoft-VDD**	
Junction Box	VIB-Z-012	VIB-Z-016	VIB-Z 017	VIB-Z 017	–	VIB-Z 015	VDD-Z-011	–
Trigger In	•	•	•	•	•	•	•	•
Gate In	•	•	•	•	–	–	•	•
Sync Out	•	•	•	•	•	–	•	•
ICP® Support	•	•	–	–	–	–	–	–
Ref.	1	3	1	3	1	–	1	2

VibSoft Options

Version	VibSoft-80	VibSoft-84	VibSoft-1000	VibSoft-1004	VibSoft-M2-40	VibSoft-FC	VibSoft-VDD
Function Generators							
Internal Generator	VIB-S-SIG-B	VIB-S-SIG-H	VIB-S-SIG-M	VIB-S-SIG-M	VIB-S-SIG-M40	–	VIB-S-SIG-M
Bandwidth	20 kHz	80 kHz	500 kHz	500 kHz	40 MHz	–	500 kHz
Output waveforms	Sine, periodic chirp, burst chirp, pseudo random, burst random, true random, rectangle, triangle, ramp, and user defined signals						
External Generator [1]	For model HP 33120A function generator: – GEN-HP-IEEE including IEEE connecting cable – GEN-HP-232 including RS-232 connecting cable						
Software Options							
VIB-S-ExtSig	Controls external function generator via optional adapter						
VIB-S-ZFFT	Zoom FFT, significantly increases frequency resolution for selected frequency bands						
VIB-S-ExpME	Binary data interface for data exchange with ME'scope software						
VIB-S-SigPro	Polytec Signal Processor, the user interface to the math library included in the VibSoft Software. Operations include FFT, inverse FFT, digital filters, windowing functions, basic math functions (+; -; *; /), integration, differentiation, resampling or extracting data						
VIB-S-VIDEO	Video option, in conjunction with the optional video camera. The video image is displayed and saved together with the measurement data						
VIB-S-SM-1	Software Maintenance. New releases of the software are provided free of charge for a period of 24 months from purchase (12 months is standard).						
Data Management System							
Optional	Polytec PC-D Desktop PC or PC-I Industrial PC						
System Requirements	Windows® XP Professional or Windows® 2000 operating system						
VibSoft-VDD	AMD Athlon(64)™ (X2) 3000 XP+ or higher; Intel Pentium 4(D), 3.0 GHz or higher; Intel Core 2 Duo, 2.0 GHz or higher; min. 512 MByte RAM						
All other	Pentium III 800 MHz; min. 128 MB RAM. Recommended: AMD Athlon 1.3 GHz; min. 256 MB RAM						

[1] This option is included in the internal generator adapter to be added

For additional technical information and applications of Polytec VibSoft Software please contact your local Polytec sales engineer or visit our website at **www.polytec.com/usa/vibsoft**.

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