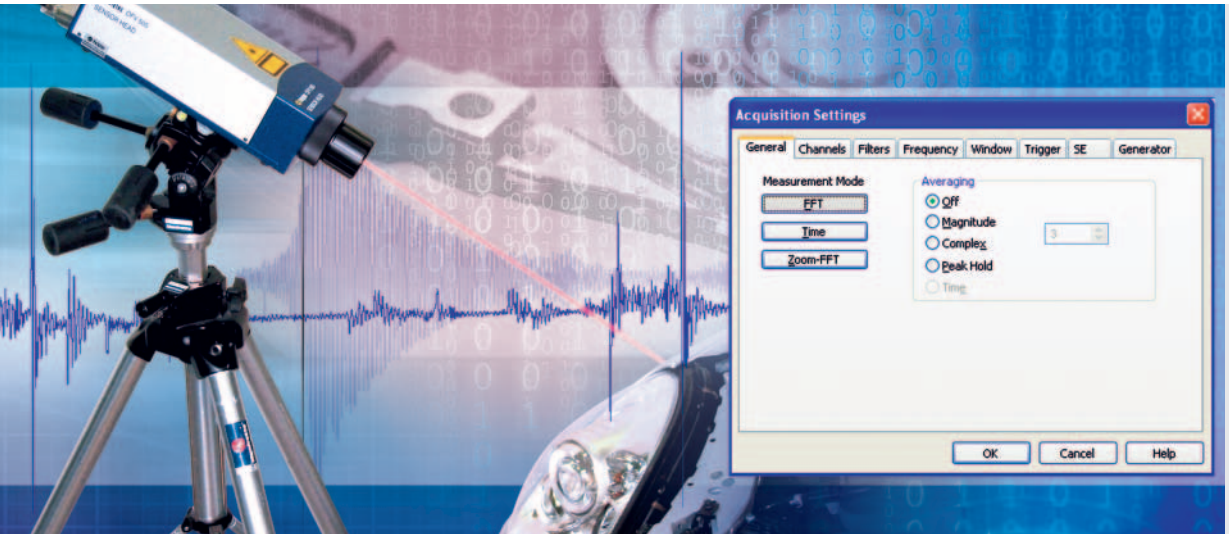
VibSoft Data Acquisition Software



Modular Vibrometer System

- OFV-5000 Vibrometer Controller
- OFV-505/503 Standard Sensor Heads
- OFV-534 Compact Sensor Head
- OVF-551/552 Fiber Interferometers
- VDD PC-Based Digital Vibrometer
- **VibSoft Software**

Single-Point Vibrometry Software – Simple, Powerful and Complete

Innovative sensor technologies require powerful software. VibSoft data acquisition packages are the perfect match for Polytec laser-based vibration sensors. Covering the many applications of laser vibrometry, VibSoft is a fully featured scientific and industrial package with a simple and intuitive look and feel that lets the user get familiar with the workflow in minutes.

Software for Single-Point Vibration Measurement

Polytec's family of single-point laser vibrometers are indispensable 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.

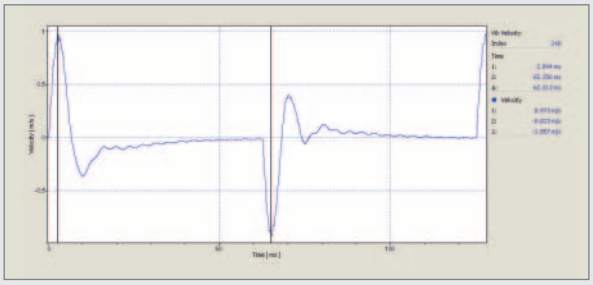
To properly measure a structure's vibration response, the VibSoft data acquisition software precisely controls the vibrometer and the data acquisition, producing accurate data and meaningful analysis. It is optimally designed for interfacing with laser vibrometers and for interactive acquisition and analysis of measurements. VibSoft allows the user to access a wide range of functions that are standard for FFT analyzers. In addition, the software incorporates special features designed just for Polytec vibrometers taking advantage of the unique properties of the laser vibrometer sensor and controller. Further expanding the capabilities, a wide range of options are available for post processing and export filtering data and for driving function generators.

VibSoft is available in several versions featuring either two or four channel data acquisition of velocity and displacement. Maximum vibration frequencies cover a wide dynamic range from 20 kHz to 40 MHz.

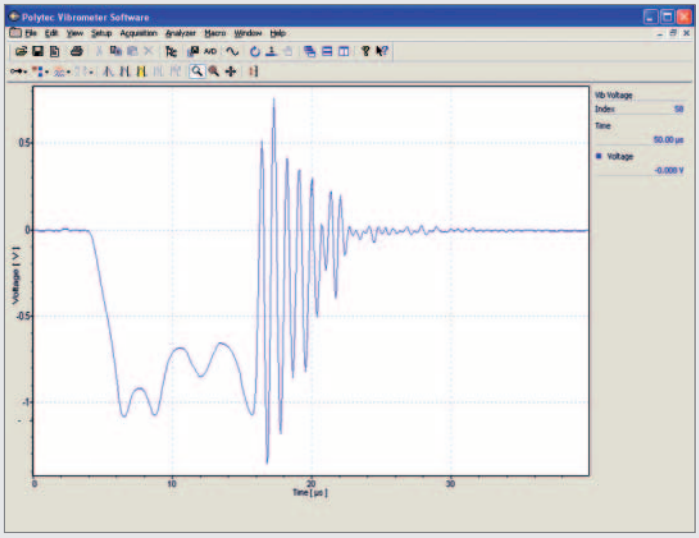
To learn more about laser-Doppler vibrometry, please visit **www.polytec.com/usa/vib-university**.

Applications

VibSoft supports and enhances any single-point vibrometry application including research, development and testing in acoustics, medicine, biology, manufacturing and production, civil engineering, automotive, aerospace and data storage.



Time response of an optical switch



Response of a loudspeaker to a short input pulse

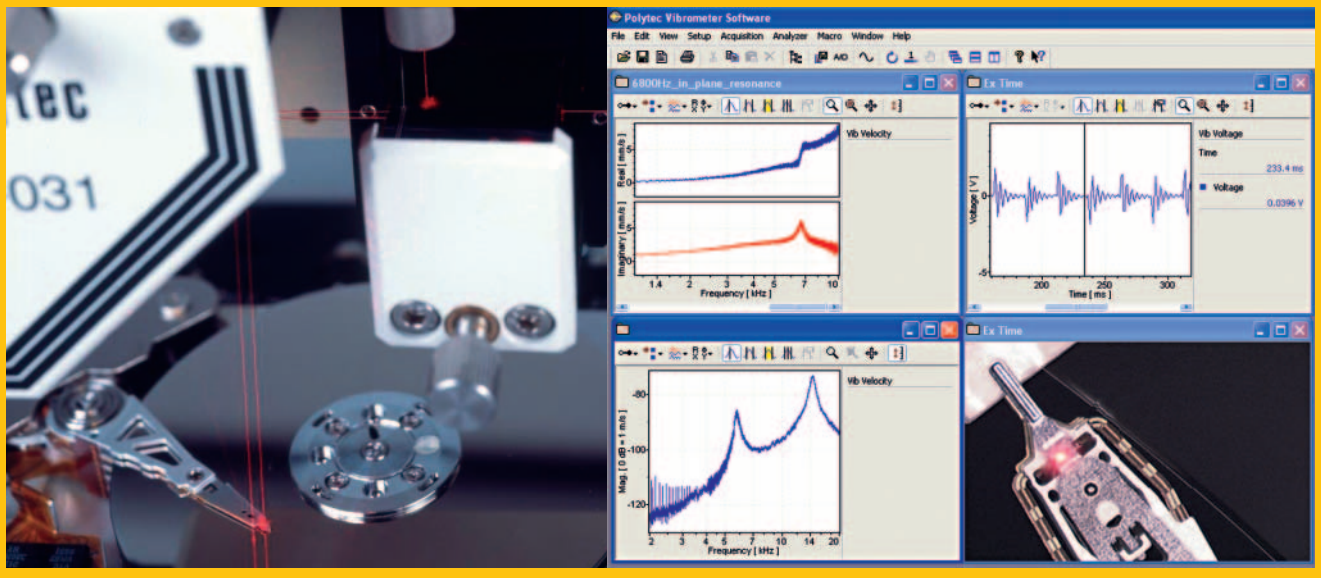
Technical Data

VibSoft Specifications

Version	VibSoft-20	VibSoft-80	VibSoft-84	VibSoft-1000	VibSoft-1004	VibSoft-M2-40	VibSoft-VDD
Operating principle	ADC (USB)	ADC	ADC	ADC	ADC	ADC	I & Q demodulator
Acquisition bandwidth	20 kHz	80 kHz	80 kHz	1 MHz/ 2 MHz[1)]	1 MHz/ 2 MHz[1)]	40 MHz	2 MHz
No. of channels	2	2	4	2	4	2	1 Vib. / 2 Ref.
Recommended Vibrometer Configurations							
Decoder for OFV-5000 Controller	VD-06	VD-02, VD-06	VD+DD Combination	VD-02, -06, -09 DD-500, DD-900	VD+DD Combination	DD-300, VD-05	DD-600
Single-point Vibrometer	IVS-400 PDV-100	IVS-400 PDV-100	–	OVF-2500 CLV-2534 NLV-2500	–	OFV-2570	VDD-E-600
Special Purpose	–	RLV-5500	CLV-3220	–	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 operations to internal and external measurement data files. Includes PolyFileAccess complying with Microsoft's Component Object Model (COM).						
VIB-S-ExpUFF	Converts data to Universal File Format (UFF)						

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

VibSoft Features



VibSoft Data Acquisition Features

- Control of all vibrometer settings via RS-232 interface; all settings stored with the data files – ideal for test stand installations and extensive test series (with most models)
- Integrated signal enhancement provides best laser vibrometer performance
- Integrated function generator (option) including user-defined excitation waveforms – tight control and synchronization
- Provides live video images of the test object and laser beam position (option)* – for easy measurement point definition and documentation
- Acquires time and FFT response signatures for arbitrary drive voltages
- Averages the input signal in the time domain

* requires VIB-S-Video option, sensor head equipped with internal video camera and video-in capability of the PC

- Differentiates and integrates in time and frequency domain
- Calculates FFT with 12,800 lines of resolution; optional Zoom FFT and extended FFT resolution up to 819,200 lines available
- IEPE (ICP) support for 3rd party sensors (with most models)

VibSoft Data Processing Features

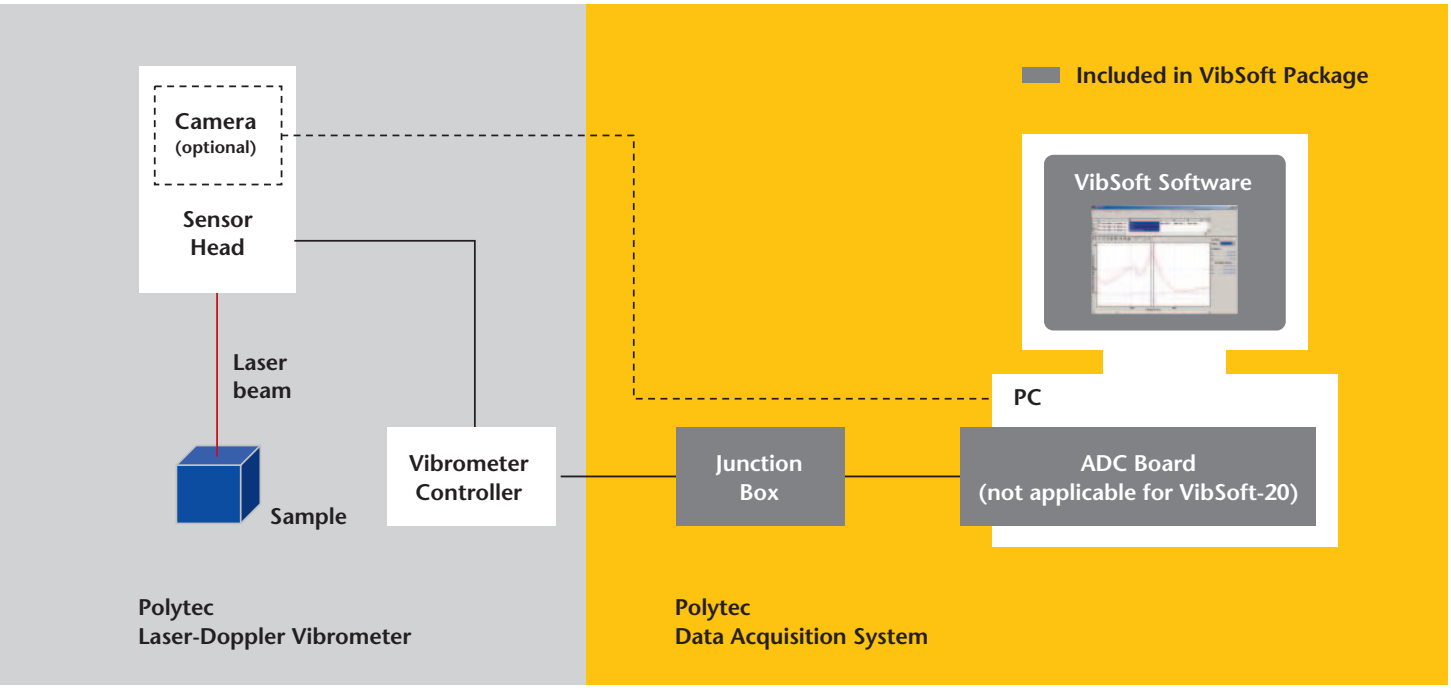
- Displays 3rd octave, magnitude, real & imaginary, and Nyquist diagrams
- Provides complex spectral analysis with auto power, cross power, H1, H2, FRF, PSD, phase and coherence functions
- Applies digital high, low and band pass filters
- Extensive peak analysis capability is enhanced by a band cursor providing statistical parameters and harmonic oscillator curve fitting. A harmonic cursor plots up to 12 cursor lines at the 2nd, 3rd, … order of the base frequency
- Visual Basic Scripting (VBS) simplifies automatic test routines and enables interfaces with other software
- Exports data in ASCII format and Universal file UFF; provides direct access to binary data for processing in MATLAB and LabView using the PolyFileAccess open data interface (Microsoft COM standard)

Full-field Data Acquisition

For scanning small parts, VibSoft teams up with the VIB-A-600 Polytec ODS Extension and StageControl Software.

For larger parts, a range of Scanning Vibrometers is available, providing 2-D and 3-D data acquisition and visualization as well as interfaces to modal, FEM and other software (**see www.polytec.com/psv400**).

VibSoft Package



How it Works

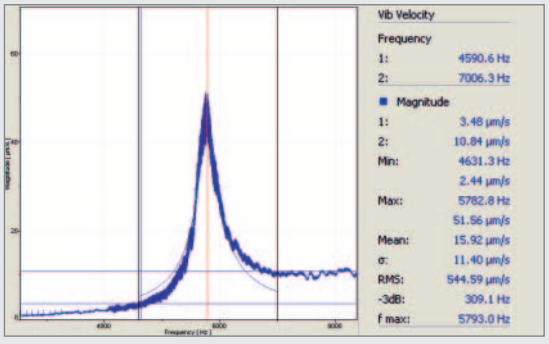
The VibSoft package manages the data acquisition, signal decoding, function generator and data display. It includes a data acquisition board that is installed in the computer, and a Junction Box or cable to connect the vibrometer to the board. The Junction Box provides inputs and outputs for the vibrometer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

When using vibrometer hardware equipped with a video camera, the VIB-S-Video option is used 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 such as:

- Making a sequence of measurements
- Exporting data in specific target formats
- Customer specific applications such as monitoring external instruments by programming the digital I/O port, creating customer-specific dialog boxes
- ME'scope binary export is available as an option



Band cursor featuring statistical parameters in VibSoft analyzer window

Turnkey Systems – Leave it to Polytec!

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!

VibSoft Software Versions

Freedom to Move: VibSoft-20

VibSoft-20 is a full featured USB-based dual channel FFT analyzer and time trace data recorder for up to 64 MSamples and 204,800 FFT lines (option). Standard features include 20 kHz signal and reference channels, IEPE power supply for third party sensors (e.g. force transducers) on reference channel, anti-aliasing filters, DC and AC coupling. VibSoft-20 requires no external power source. Thus, powerful data analysis is at your fingertips anywhere a notebook computer provides power.

A Matching Pair: PDV-100 and VibSoft-20

The PDV-100 Portable Digital Vibrometer is designed for field use. With the battery pack option, it works perfectly with VibSoft-20 on a notebook computer. The PDV-100 can be used for distances up to 30 m and is suitable for measurements on structures difficult to measure or access – indoors or outdoors, high or low to the ground. Set up with a tripod is fast and easy, yielding precise measurement results.

The Workhorse: 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 vibrometer systems.

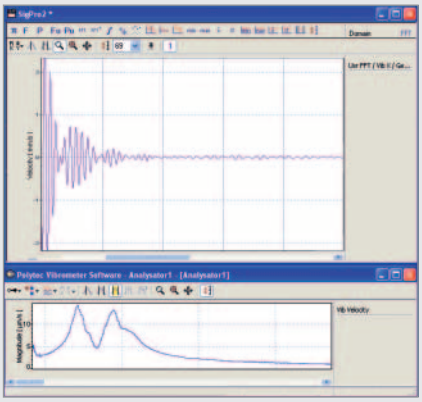
VibSoft is available as a standard two-channel version with maximum signal bandwidths of either 80 kHz, 1 MHz or 40 MHz. When more inputs are needed for velocity, displacement or frequency response measurements, VibSoft can be ordered in an expanded four-channel version that works well with the OFV-5000 Modular Vibrometer Controller.

The Highest Resolution: 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 refer to the VDD PC-based Vibrometer data sheet or visit **www.polytec.com/LM-digital**

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. For example, data can easily be shown in one plot, subtracted from a trace in another plot, and integrated in a third plot.



Top: Response of a MEMS pressure sensor to a pulsed input. Bottom: The calculated frequency response spectrum displayed by the VibSoft Signal Processor

Technical Data

VibSoft Specifications

Hardware							
Version	**VibSoft-20**	**VibSoft-80**	**VibSoft-84**	**VibSoft-1000**	**VibSoft-1004**	**VibSoft-M2-40**	**VibSoft-VDD**
Junction Box	VIB-E-220 (USB)	VIB-E-400	VIB-E-400	VIB-E-400	VIB-E-400	–	VIB-E-400-VDD
Trigger In	–	•	•	•	•	•	•
Gate In	–	•	•	•	•	–	•
Sync Out [1]	–	•	•	•	•	•	•
ICP® Support	•	•	•	–	–	–	–
Ref.	1	1	3	1	3	1	2

VibSoft Options

Version	**VibSoft-20**	**VibSoft-80**	**VibSoft-84**	**VibSoft-1000**	**VibSoft-1004**	**VibSoft-M2-40**	**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						
Software Options							
VIB-S-FFTEXT	Extended Number of FFT lines. Up to 819,200 (depending on version)						
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. Displays and stores images of the sample. Works with camera equipped sensor heads. Requires PC-I, PC-D or the Polytec UBS Video-in adaptor A-CON-VIDEO for notebooks.						
VIBSOFT-DESK	Analysis version of the VibSoft software. For display, post-processing and hardcopy of measurement files.						
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, recommended for Video Option VIB-S-Video						
System Requirements	Windows® XP 32 (SP3) Professional or Vista 64 (SP2) operating system. VibSoft-20 and Desktop version are also compatible to Vista 32.						
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	Recommended: 1.3 GHz CPU; min. 256 MB RAM						

[1] This feature is included in the internal function generator option

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/software**

Polytec GmbH (Germany)
Polytec-Platz 1-7
76337 Waldbronn
Tel. +49 (0) 7243 604-0
Fax +49 (0) 7243 69944
info@polytec.de

Polytec France S.A.S.
32 rue Delizy
93694 Pantin Cedex
Tel. +33 (0) 1 48 10 39 30
Fax +33 (0) 1 48 10 09 66
info@polytec.fr

Polytec Ltd. (Great Britain)
Lambda House, Batford Mill
Harpenden, Herts AL5 5BZ
Tel. +44 (0) 1582 711670
Fax +44 (0) 1582 712084
info@polytec-ltd.co.uk

Polytec Japan
354 German Centre
1-18-2 Hakusan, Midori-ku
Yokohama-shi, Kanagawa
226-0006
Tel. +81 (0) 45 938-4960
Fax +81 (0) 45 938-4961
info@polytec.co.jp

Polytec, Inc. (USA)
North American Headquarters
16400 Bake Parkway
Suites 150 & 200
Irvine, CA 92618
Tel. +1 949 769 2626
Fax +1 949 769 2622
info@polytec.com

Midwest Office
3915 Research Park Dr.
Suite A-12
Ann Arbor, MI 48108
Tel. +1 734 662 4900
Fax +1 734 662 4451

East Coast Office
25 South Street, Suite A
Hopkinton, MA 01748
Tel. +1 508 544 1224
Fax +1 508 544 1225