

# OFV-5000 Modular Vibrometer



## OFV-5000 Modular Vibrometer

### Non-Contact Vibration Measurement

### Product Brochure



Laser Vibrometers from Polytec Combine Precise Optical Vibration Measurements with Easy and Rapid Operation. They Work Completely without Contact and Therefore Measure Vibrations of Even Small and Lightweight Components with the Highest Accuracy.



# Measuring Vibrations: Without Contact and with High Precision

The OFV-5000 Controller is at the heart of the modular vibrometer. The controller decodes signals coming from the optical sensor head in real time. Latest decoding technology ensures precise measurement results – with resolutions in the picometer range.

## Rapid and Simple

The vibrometer system is ready for operation within a few minutes. After connecting the sensor head, set the measurement range and filters using the touch screen of the OFV-5000. Then, simply point and focus the laser onto the object, and the vibration data are immediately available at the signal output.



## Highlights

- Resolve vibration down to 0.1 pm
- Frequency range from DC to 24 MHz
- High velocities  $\pm 25$  m/s
- Reliable measurement even on difficult surfaces
- Remotely-controllable from a PC

## Optimize the Solution for Your Application



The Laser Vibrometer System can be configured using two different laser technologies, providing you the best choice for your application. The OFV-5000 Modular Vibrometer in the standard laser configuration allows you to measure super-fine structures like electronics or hard disk drives with its small laser spot. This laser technology even allows measurements into and through water.

When measuring at high velocities up to 25 m/s or needing large stand-off distances, we recommend the Xtra laser technology for the best sensitivity. The Xtra system enables high-fidelity measurements even on dark, moving or rotating surfaces and on biological samples.

# Complete Solutions for Demanding Vibration Measurements

## OFV-5000 Modular Vibrometer

A modular vibrometer comprises the OFV-5000 Vibrometer Controller and an optical sensor head. The VibSoft data acquisition and analysis software completes the measurement system for comprehensive and convenient data analysis.

### Flexibility by Way of Exchangeable Sensor Heads

- Five small, lightweight sensor heads are available
- Rapid changeover by the operator
- All sensor heads have variable working distance
- Laser spot in the  $\mu\text{m}$  range
- Simple alignment using a visible measurement point
- Eye-safe laser protection class 2

2 Sensor Head

1 Controller

3 VibSoft DAQ



1

## OFV-5000 Vibrometer Controller

### Best Signal Quality

- Tracking filter for reliable measurement results even under difficult conditions

### Simple and Comfortable Operation

- Large 7" color touch screen
- All relevant parameters at a glance
- Intuitive operation
- Complete focus on the measurement task

### Remote Control

- RS-232 interface for remote control of the VibSoft software or included Vibrometer panel software for operation from a safe distance in dangerous areas

### Universal Data Interface

- Synchronous output of velocity and displacement signals
- Standardized BNC outputs for data capture compatibility
- Wide voltage swing of the output signals (+/- 10 V) for low-noise, high-resolution data

## Signal Decoder for Displacement and Velocity

### Flexible Signal Processing in Real Time

- Broad range of applications for the OFV-5000 controller realized by having up to four decoders installed
- Digital decoder technologies for optimal signal-to-noise ratio

### Future-proof

- Decoders can be upgraded or exchanged at any time
- Easy decoder re-configuration for new measurement tasks

2

## OFV-505 Sensor Head

### Ultimate Performance Vibrometer

- Low-noise optical design for best signal quality
- Integrated signal level meter for optimizing data quality

### Fault-free Measurement

- Remote focus control via Controller (with Autofocus)
- Measurements are undisturbed from vibrations when operating the measurement system

3

## VibSoft Data Acquisition and Analysis

### Compact Data Acquisition

- Multi-channel data acquisition system with integrated Controller interface
- Mobile, notebook-based or industrial PC solution

### Intelligent Measurement Data Analysis

- Signal Enhancement improves the signal-to-noise ratio of vibrometer measurements
- Simple operation
- Comprehensive range of analysis tools for time and frequency domain
- Sample excitation via internal signal generator (optional)

# Other Sensor Heads for Restricted Space and Special Applications

All sensor heads are equipped with manual focus and integrated optical signal level indicator for optimizing signal output quality. Comprehensive range of accessories – such as tripods, stages and optical beam deflectors – ensures simple integration even in special measurement applications. For more details see:  
[www.polytec.com/int/vibrometry](http://www.polytec.com/int/vibrometry)

## Compactness Meets Versatility

### OFV-534 Compact Sensor Head

- Extremely compact sensor head with separate laser unit
- Excellent optical sensitivity
- Microscope objectives (optional) for measurements on even the smallest devices
- Easy set-up and documentation with integrated CCD video camera (optional)
- Suitable for industrial applications - IP64 protection



# Big Insights from Small Spaces

## OFV-551/552 Fiber-Optic Sensor Head

- 10 mm diameter fiber-optic head for very-hard-to-access measurement points
- Good optical sensitivity
- Integrated laser dimmer for controlling the light output level (optional)

### OFV-551 Fiber-Optic Sensor Head

- Fiber head with 1.4 mm diameter and fixed working distance is available



### OFV-552 Fiber-Optic Sensor Head

- Measurement of the relative motion between two locations



## OFV-503 Single Point Sensor Head

- Basic sensor head similar in design to OFV-505 with manual focus only

# Xtra Sensitivity and Versatility

## OFV-5000 **Xtra** Laser Vibrometer

Polytec now introduces Xtra technology for its OFV-5000 Modular Vibrometer series, featuring Xtra optical sensitivity.

The OFV-5000 Xtra Vibrometer Controller with the new MLV-I-120 Sensor Head Xtra gathers high-fidelity data from all surfaces – even on dark, biological, rotating or moving objects. This eye-safe laser technology is perfect for challenging applications like NDT, biomedical, longer distance displacement measurements, quasi-static displacement measurement and shaker control.

- Non-contact vibration sensor with Xtra sensitivity
- High-fidelity data from all surfaces – even dark, biological or moving objects
- From  $\mu\text{m}$ -sized to large, distant objects
- High dynamic range with wide bandwidth up to 24 MHz
- Remote operation keeps laser precisely focused



**Xtra sensitivity allows better measurements without contact in hard-to-reach areas, on hot surfaces or while monitoring operating equipment such as an engine**



By using the analog output voltages, the OFV-5000 Xtra can easily be connected to any FFT analyzer or oscilloscope. For the best performance, the controller can be matched to the measurement requirements by choosing from five different low noise decoders for velocity, displacement and acceleration. To match the optics to the specific measurement task, there are two easily exchangeable lenses available. For confined spaces where line-of-sight might be difficult, Polytec provides a fiber optic alternative with its own specialized lenses.

The expertly engineered sensor system is designed to be highly sensitive, compact and robust, doing remote condition monitoring, monitoring environmental testing, or making measurements in a development lab.



**MLV-O-FMI Fiber lens for confined spaces**

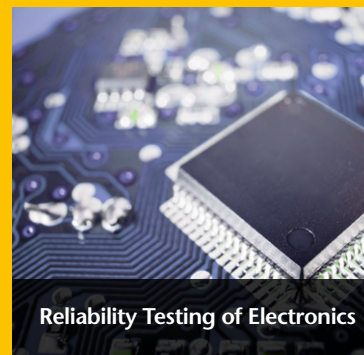
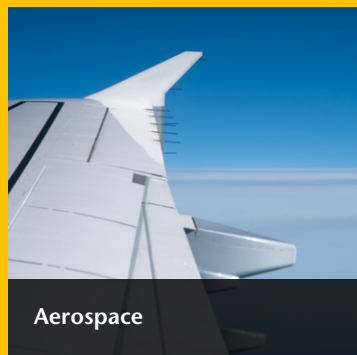
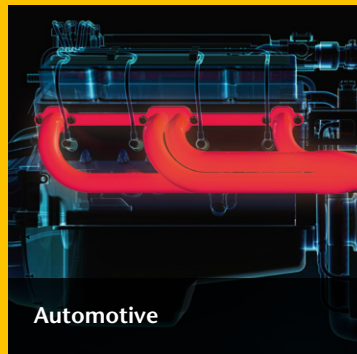
# Vibrations Everywhere

The heart beats, wings flap, sounds are sent out and received – life would be much too quiet without vibrations.

In the field of industrial research and development, Polytec's laser Doppler vibrometers are used to study objects of very different sizes including large automobile bodies, airplane fuselages, ship engines and buildings as well as tiny silicon micromachines, hard disk drive components and wirebonders. There are numerous other research applications in mechanical and civil engineering.

Demanding applications such as measurements on hot running exhausts, rotating surfaces, under water objects, delicate structures or ultrasonic devices are all made possible by non-contact laser vibrometry.

To investigate vibrating systems in nature requires sensitive and flexible measurements that don't disturb the specimen. Challenging tasks in medicine, biology and many other sciences take advantage of Polytec's universal laser Doppler vibrometers.



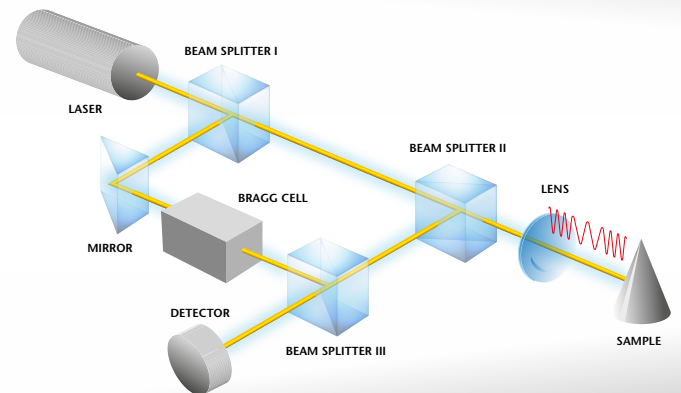
## The Polytec Company

50 years of innovation, performance and quality ensures Polytec's continued role as the leading supplier of optical, non-contact vibration measurement solutions. As technology leader for about 30 years Polytec has set the standards worldwide for the very best products in laser Doppler vibrometry. For decades, Polytec systems are established tools in the research and development of cutting edge technologies.

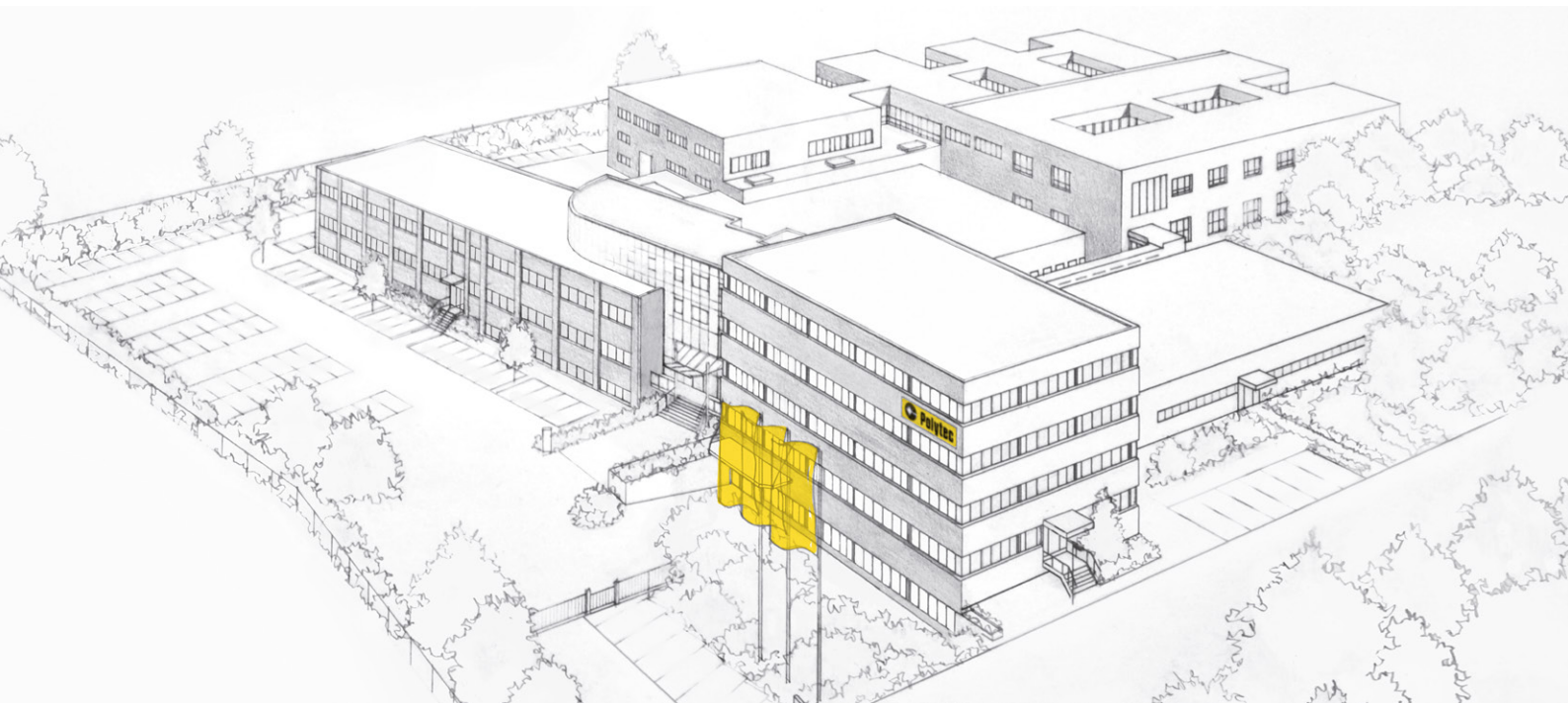
### How it works: Laser Doppler Vibrometry

If a light beam is reflected by a moving object, the frequency of the light is shifted proportional to its velocity, a phenomenon referred to as the Doppler shift.

Through this process, the velocity information becomes coded in the frequency of the light and is subsequently used by the laser Doppler vibrometry to measure the vibration. A precision interferometer and digital decoding electronics transform the frequency shift into a voltage signal that can be processed by standard data acquisition systems.



**A significant property of the technology, the velocity information is independent of the intensity of the reflected light; hence, the robust measuring principle works well even for objects with low reflectivity surfaces.**



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

**Polytec GmbH  
(Germany)**  
**Vertriebs- und  
Beratungsbüro**  
Schwarzschildstraße 1  
12489 Berlin  
Tel. +49 30 6392-5140

 **Polytec, Inc.  
(USA)**  
North American  
Headquarters  
16400 Bake Parkway  
Suites 150 & 200  
Irvine, CA 92618  
Tel. +1 949 943-3033  
info@polytec.com

**Central Office**  
1046 Baker Road  
Dexter, MI 48130  
Tel. +1 734 253-9428

**East Coast Office**  
1 Cabot Road  
Suites 101 & 102  
Hudson, MA 01749  
Tel. +1 508 417-1040

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

 **Polytec France S.A.S.**  
Technosud II  
Bâtiment A  
99, Rue Pierre Semard  
92320 Châtillon  
Tel. +33 1 496569-00  
info@polytec.fr

 **Polytec Japan**  
Arena Tower, 13th floor  
3-1-9, Shinyokohama  
Kohoku-ku, Yokohama-shi  
Kanagawa 222-0033  
Tel. +81 45 478-6980  
info@polytec.co.jp

 **Polytec South-East Asia  
Pte Ltd**  
Blk 4010 Ang Mo Kio Ave 10  
#06-06 TechPlace 1  
Singapore 569626  
Tel. +65 64510886  
info@polytec-sea.com

 **Polytec China Ltd.**  
Room 402, Tower B  
Minmetals Plaza  
No. 5 Chaoyang North Ave  
Dongcheng District  
100010 Beijing  
Tel. +86 10 65682591  
info-cn@polytec.com