Polytec

VibroFlex

Non-contact vibration measurement from nano to macro

Product brochure

Precision is a choice

Laser Doppler vibrometers from Polytec combine precise optical vibration measurement with easy and rapid operation. Measuring without contact, they sense the true vibrations of microscopic to macro-sized structures and lightweight components with the highest accuracy.

The modular concept of VibroFlex combines the versatility of a universal front-end with a selection of special sensor heads, tailored to the needs of your measuring task.

The new flexibility in optical vibration measurement

With VibroFlex, Polytec introduces the new flexibility in optical vibration measurement with a modular sensor solution that adapts to your needs: Add microscope optics for tiny structures or measure large, complex samples like machinery, motors etc. Discover acoustics and vibration phenomena in research and product development for a faster time-to-market or use it for reliable in-line inspections of your production parts with the focus on cost-efficiency.

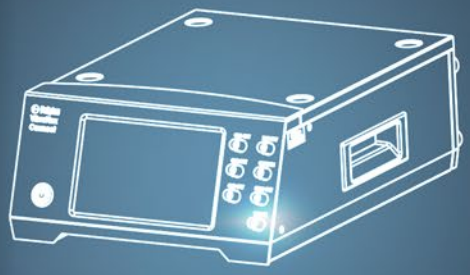
Resolve from DC to 24 MHz bandwidth, sub-picometer displacements and up to 30 m/s fast movements. Easily access confined spaces using fiber-optics and analyze relative motions with differential optics. Use an optional integrated video camera for precise laser positioning. Measure vibrations reliably and with laser precision on all surfaces – no matter if dark, oily, shiny or (red) hot. Benefit from the new flexibility in optical vibration measurement – VibroFlex.

- High-performance non-contact vibration measurement solution
- Flexible, modular sensor solution that adapts to your needs
- Sub-pm displacement resolution and vibration velocities up to 30 m/s
- Configurable bandwidth from DC to 24 MHz with highest time resolution
- Sensor heads with auto- and remote focus for excellent signal quality
- Compact sensor head with integrated camera for precise laser positioning and sample monitoring
- Differential fiber optic sensor head for separating relative motions
- Reliable measurement even on challenging surfaces (dark, oily, shiny, hot)
- Digital data interface for convenient setup and best SNR

Modular sensor solution that adapts to your needs

Configurable front-end

VibroFlex Connect



- Synchronous output of displacement, velocity and acceleration
- VibroLink digital interface for comfortable measurement data transfer (Ethernet TCP/IP)
- Measurement bandwidth up to 24 MHz

The modular VibroFlex laser vibrometer system can be configured using two different laser technologies, providing you the best choice for your application. The Helium-Neon laser configuration used in the sensor heads Neo, Compact and Fiber allow measurements on super-fine structures with its small laser spot. This laser technology even allows measurements into and through water.

When measuring at high velocities up to 30 m/s or needing large stand-off distances, we recommend the Xtra laser technology for the best optical sensitivity. VibroFlex Xtra enables high-fidelity measurements even on dark, moving or rotating surfaces and on biological samples.

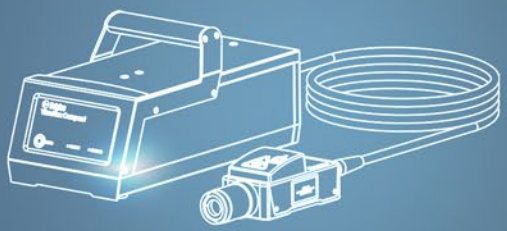
VibroFlex Neo

- Outstanding signal-to-noise ratio
- Quick setup by auto focus
- Measurements through glass or water

VibroFlex Xtra

- Vibrations velocities up to 30m/s
- Measurement on all surfaces (oily, shiny, dark)
- Large stand-off distances
- Auto and remote focus for best signal quality

VibroFlex Compact



- Compact design for narrow setups
- Analyze microstructures with microscope objectives
- Simplified targeting with optional HD camera module
- Easy integration into test stands

VibroFlex Fiber

- For short distances and hard-to-reach locations
- Micron sized spot size for tiny structures
- Measures relative motion of two points on the sample

+ choose your sensor head

The VibroFlex modular vibrometer comprises the front-end Connect with a multi touch display and a selection of laser sensor heads. Connect is the hub for decoding raw measurement data signal conditioning and data interfacing. The modular concept simplifies handling and parametrization without touching the sensors and hence influencing the measurement procedure.

With the optional VibroLink digital interface to the VibSoft data acquisition and analysis software, the system is ready to go. View measurement data, video data and control all functions remotely.

Non-contact vibration analysis in research, product development and production testing

Benefit from the modular laser Doppler vibrometer

- Selection of handy, lightweight sensor heads covers all application needs
- Multi-wavelength system for all surfaces, media and working distances
- Variable working distances
- Laser spot in the µm range for resolving tiny details
- Simple alignment using a visible measurement point, optional auto-focus or integrated camera
- Wide range of application-specific accessories
- Eye-safe laser protection class 2

VibroFlex Connect
Configurable core of the modular vibration sensing system

Core of VibroFlex as flexible laser vibrometer solution is the front-end Connect. Its latest generation FPGA-based signal processing takes care of decoding raw measurement data in displacement, velocity and acceleration, signal conditioning and data interfacing (analog and digital). The front-end Connect enables custom setups and makes sure to have the application-specific settings with upgrade options at any time. The high-performance signal processing of the Connect assures reliable measurement data even under challenging conditions. Keep track of all relevant parameters and control via PC or the 7" large touch screen, avoiding any influences on the measurement by this no-touch concept.

Best signal quality

- Robust and fast FPGA decoding assures phase synchronized signals and best SNR
- Adaptive Signal Enhancement and tracking filter for reliable measurement results even under difficult conditions
- Dynamics Enhancement Filter: Suppression of DC contribution emphasizes small dynamic signals

Flexibility

- Configure your options freely, upgrade later and stay future-proof
- Large bandwidth from DC to 24 MHz, also upgradeable
- High velocity measuring range up to 30 m/s

Smart data interfaces

- VibroLink digital interface for comfortable measurement data transfer (Ethernet TCP/IP)
- Standardized BNC outputs compatible with your DAQ
- Synchronous output of velocity, displacement and acceleration signals

Remote control

- Remote control via VibSoft software or web interface
- Measure from a safe distance (e.g. in danger zones)
- HD camera simplifies laser spot positioning on samples

VibSoft data acquisition and analysis

digital

VibSoft data acquisition with the VibroLink Ethernet interface or using the analog junction box with additional signal inputs

analog

VibSoft closes the gap between raw signal acquisition and profound analysis of vibration measurement data. Choose the VibroLink interface for direct and fully digital data acquisition via Ethernet. Alternatively choose the multi-channel DAQ unit and connect additional analog inputs like other sensors, processing data up to 40 MHz. Further options like the powerful SignalProcessor (a Polytec math library for post-processing) or a scripting engine take the flexibility for individual post-processing and control to the next level.

!

Benefit from advanced options

- Fully digital data acquisition with VibroLink
- Multi-channel data acquisition up to 40 MHz
- Portable notebook-based solution
- Signal Enhancement for optimal signal-to-noise ratio (SNR)
- Comprehensive toolbox for analysis in the time and frequency domain
- Sample excitation via internal signal generator (optional)
- Individual post-processing with the optional Polytec SignalProcessor
- Integrated scripting and interfaces for Matlab®, LabView®, Microsoft Excel®

VibroFlex Neo
For demanding vibration measuring tasks

VibroFlex Neo is the robust and reliable laser Doppler vibrometer sensor head for demanding measurement tasks. Gather high-resolution vibration data anytime, and even measure through transparent media like glass for climate chamber tests or water like fluid-coupled ultrasonic analysis.

Highlights

- Outstanding nominal signal-to-noise ratio (SNR)
- Integrated signal level indicator for optimizing data quality
- Fast remote and auto focus for best signal quality
- Measures through transparent media like glass or water
- Full remote control for zero impact on the measurement setup

VibroFlex Xtra
Xtra sensitivity and versatility

Measuring vibrations with the VibroFlex Xtra assures high-fidelity data from all surfaces – even on dark, biological, rotating or moving objects. This eye-safe laser technology is perfect for challenging applications such as NDT, biomedical, long distance displacement measurements, quasi-static displacement measurement and shaker feedback control.

Use the optional VFX-O-FMI Fiber optics for reaching hard-to-access measuring areas

Highlights

- High-fidelity data from all surfaces – even dark, biological or moving objects
- From µm-sized to large, distant objects
- High dynamic range up to 30 m/s
- Fast remote and auto focus for best signal quality
- Optional fiber lens for hard to access areas
- Best optical sensitivity and depth of field with a selection of interchangeable lenses
- Remote operation keeps laser precisely focused

VibroFlex Compact
Compactness meets versatility

The VibroFlex Compact is a very compact and versatile vibrometer sensor head and is designed for tightly packed setups, challenging production environments and tiny details in technology or bio-med applications. The optional inline HD camera helps positioning the laser precisely and provides proper test documentation. An optical filter adjusts for a perfect contrast. Optional microscope objectives focus the laser spot down to 1.5 µm, allowing the characterization of microsystems and complex structures with fine details.

Optional microscope objectives available

Highlights

- Very compact design for easy setup in limited workspaces and integration into test stands
- Easy laser positioning and test documentation with integrated HD camera (optional)
- Excellent optical sensitivity
- Completly integrated miniaturized interferometer for robust measurements under noisy conditions
- Microscope objectives and coaxial illumination unit available
- Protective accessories and beam defelction for robust test stand integrationfor analyzing microstructures

VibroFlex Fiber
Big insights from small spaces

The VibroFlex Fiber is a fiber-optic vibrometer sensor head and particularly suitable for short measurement distances and sample points difficult to access by using the flexible and slim optical fiber cables. In addition the VibroFlex Fiber sensor head is capable of measuring differentially, i.e. it can acquire relative movements between two sample points. The differential interferometer separates the different motion vectors already in the optical signal path and allows high-resolution measurement with inherent absolute phase stability. Thus VibroFlex Fiber extracts minute vibrations of components on heavily vibrating structures.

Highlights

- 10 mm diameter fiber-optic head reaches hard-to-access areas
- Inherent absolute phase stability between two measurement points
- Differential optics measures relative motions between two locations
- Micron-sized measurement spot for tiny structures
- Also configurable for single-point vibration measurement
- Wide range of optical accessories available

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.

A wide range of application-specific accessories

We constantly learn from our customers and every project. Benefit now from the wide range of smart and well-thought accessories to comfortably solve your specific measurement task.

Optical accessories

Multiple microscopic objectives for observing fine details, mirror sets, laser beam deflection units and fiber lenses for accessing hard-to-reach locations

Positioning accessories

Stands, tip-tilt and xy-positioning stages and more

Miscellaneous

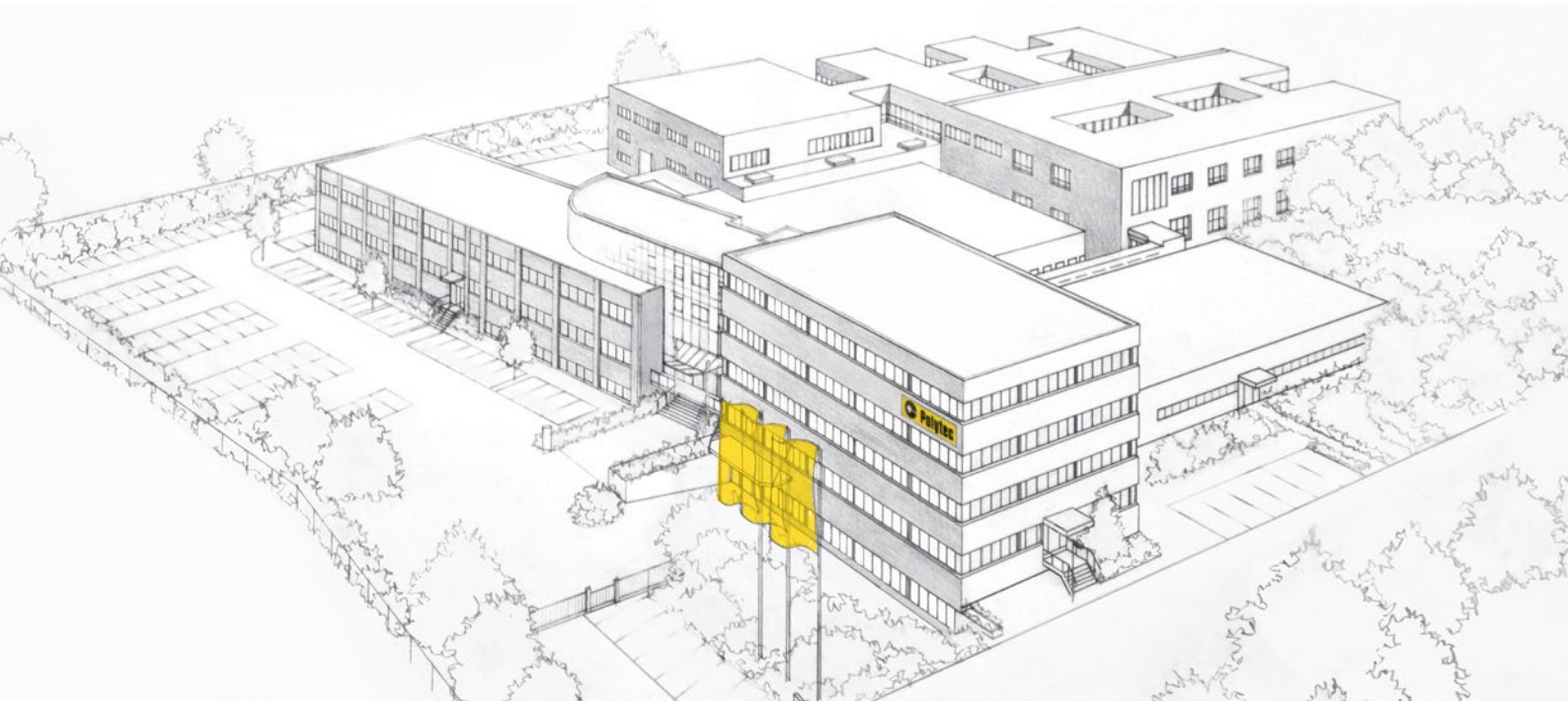
Transportation cases, laser adjustment goggles and more

!

For detailed technical specifications of the new VibroFlex laser vibrometer system refer to the corresponding datasheets.

www.polytec.com/vibroflex

Polytec



Shaping the future since 1967

High tech for research and industry.
Pioneers. Innovators. Perfectionists.

Find your Polytec representative:
www.polytec.com/contact

Polytec GmbH · Germany
Polytec-Platz 1-7 · 76337 Waldbronn

www.polytec.com

OM_PR_VibroFlex_E_52025
2019/04 · Technical specifications are subject to change without notice.