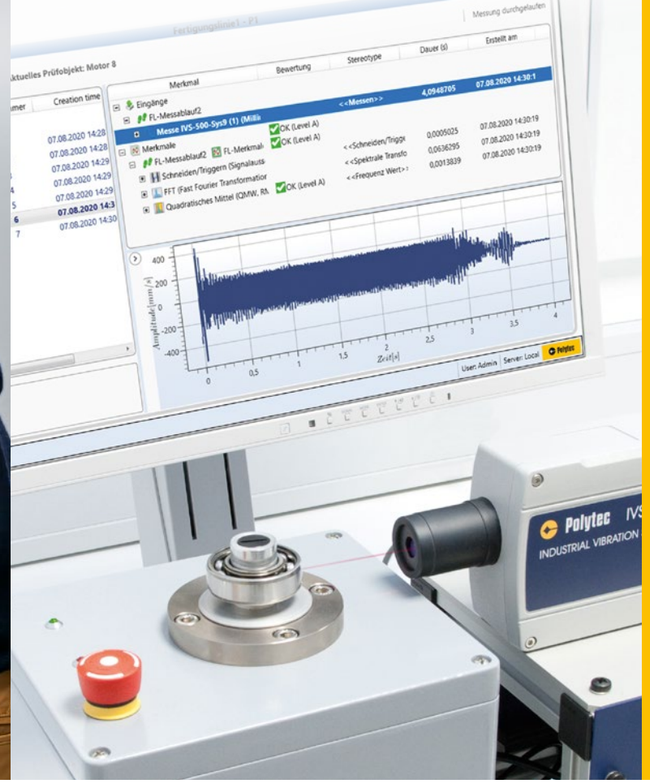
Vibrometry

Laser vibrometers

Optical measurement solutions for vibration

Product brochure

Laser Doppler vibrometry



Polytec has been providing light in the darkness for more than 50 years. With nearly 500 employees worldwide, the company develops, produces, and distributes optical measurement systems for research and industry. The products enjoy an outstanding reputation in the international professional world.

The company manufactures a range of laser vibrometers that have become the accepted gold standard for non-contact vibration measurement.

The laser Doppler vibrometer is a precision optical sensor used for determining vibration velocity and displacement at a fixed point. The technology is based on the Doppler effect, sensing the frequency shift of back scattered light from a moving surface.

Whether the application is for 100 % Q.A. inspection of motors or bearings on a production line, optimizing of ultrasonic tools, confirming the characteristics of MEMS resonators and other microstructures or identifying torsional modes in a vehicle's drive-train and many more, there is a Polytec system that can provide the measurement solution.

Single point vibrometers

VibroFlex

- Modular sensor solution that grows with your needs
- Resolve sub-pm vibration and velocities up to 30 m/s
- Configurable front-end from DC to 24 MHz
- Choose from sensor heads (compact design, fiber-optics, with HD+ camera) and patented multi-path QTec® technology for best SNR on technical surfaces and at large working distances

VibroOne®

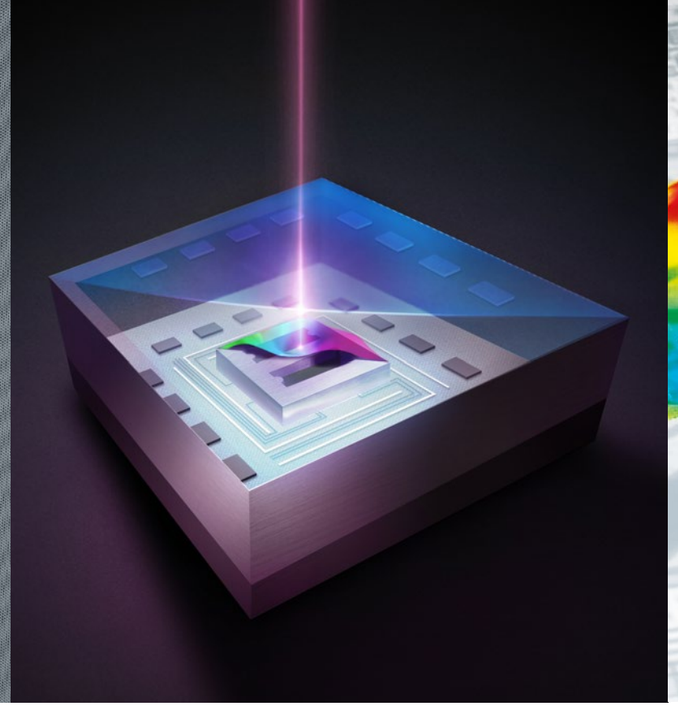
- Compact sensor head with remote controller for frequencies from DC up to 3 MHz
- Integrated camera for visually monitoring the sample (optional)

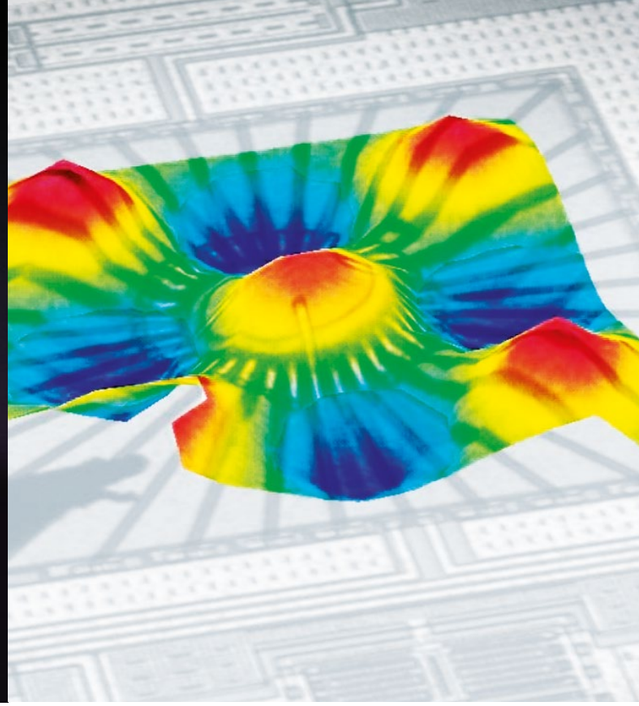
IVS Industrial Vibration Sensor

- Robust and wear-free sensor for vibro-acoustic quality inspection in-line up to 100 kHz
- Clear pass/fail decisions for production testing based on reliable vibration measurement
- Best signal quality and flexible working distances with auto and remote focus
- Economic automation using open source drivers for Windows and Linux

VibroGo®

- Truly portable, compact laser sensor enabling non-contact vibration analysis
- On-board data analysis for condition monitoring, research and vibration measurement in the field
- Extended frequency range up to 320 kHz, 30 m large stand-off distance and up to 6 m/s velocities





QTec full-field vibrometers

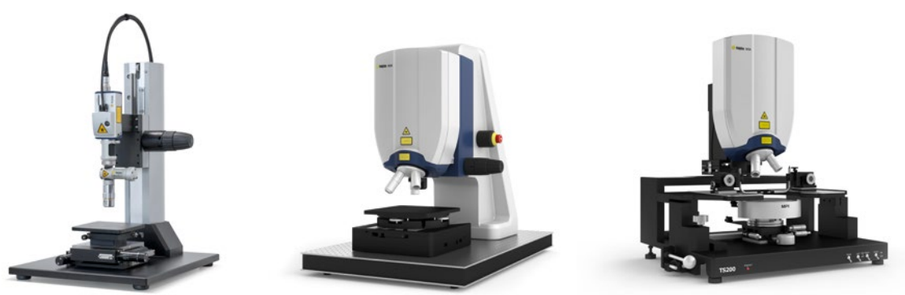
VibroScan QTec Vibrometer 1D & 3D

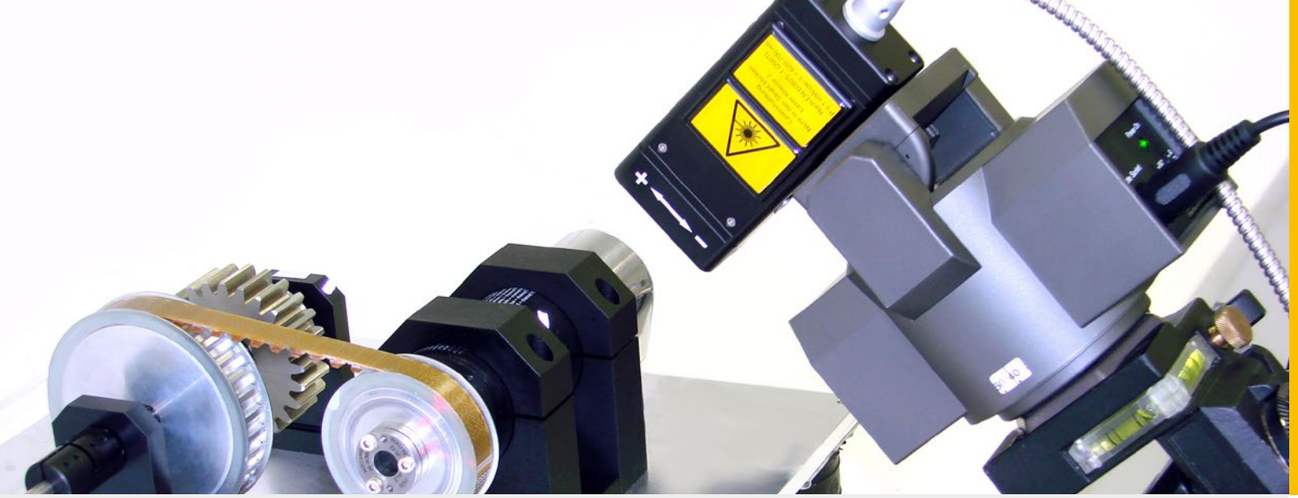
- For comprehensive, full-field analysis for NVH, acoustics, structural dynamics, ultrasonics and FEM validation up to 32 MHz
- PSV Software package provides detailed vibration data analysis and 3D animation of deflection shapes with automation interface and CAE interoperability
- Full-field vibration measurement in 1D and 3D
- Patented QTec® multi-path interferometry for 10x faster measurements and best SNR on technical surfaces
- Powerful accessories like the geometry scan unit for direct detection of geometry data or the optical derotator enabling measurements on rotating parts
- Automated modal analysis for small objects with RotoVib and large structures with the RoboVib Structural Test Station

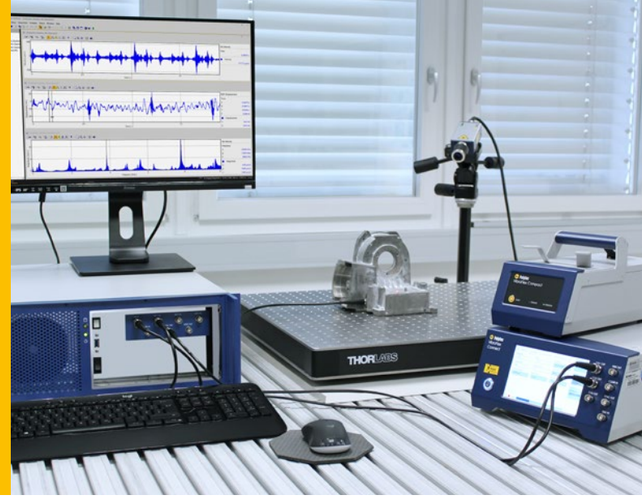
Microscope-based vibrometers

MSA Micro System Analyzer

- Microscope-based vibrometers for a reactionless characterization of microsystems, MEMS, BAW/SAW, biological probes, etc.
- Flexible configurations for single point vibration measurement, deflection shape and topography measurement in frequency ranges from 100 kHz to 8 GHz ultra-high frequency
- For measuring dynamics, securing microsystems functionality, modal analysis or FE model updating
- Integrated microscope optics for highest lateral resolution and image quality
- Patented MSA IRIS technology measuring capped MEMS through Si-encapsulation







Special application vibrometers

VibroFlex Range

- Remote vibration analysis > 500 m with laser precision
- Remote access to distant and hazardous areas
- Patented coaxial HD camera for precise targeting

Differential vibrometers

- Optical subtraction of ambient vibrations
- Specially suited for microsystems and material science (e.g. piezoelectric materials)
- High-speed (up to 40 m/s) and multi-channel measurements of valve train dynamics

3D Vibrometry

- Non-contact measurement of triaxial vibrations
- Modular stand solution VibroFlex TriMount

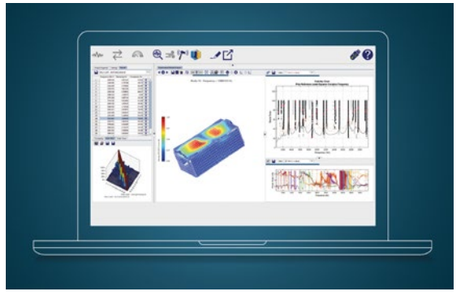
Rotational Laser Vibrometer

- For torsional vibration and rotational speed variation measurement, e.g. automotive engine and drivetrain torque, motors and pumps, etc.
- Provides angular velocity, displacement and rpm outputs

Software, accessories and service

Powerful software

Use meaningful data visualization and animated deflection shapes, build complete measurement solutions featuring post-processing, enabling order analysis, EMA and OMA for FEM validation



Data transparency

Analog & digital interfaces, free tools for easy sharing and visualization, open interfaces enabling automation and scripting for custom applications (Python, MatLab [1], LabView [2], C++, etc.)

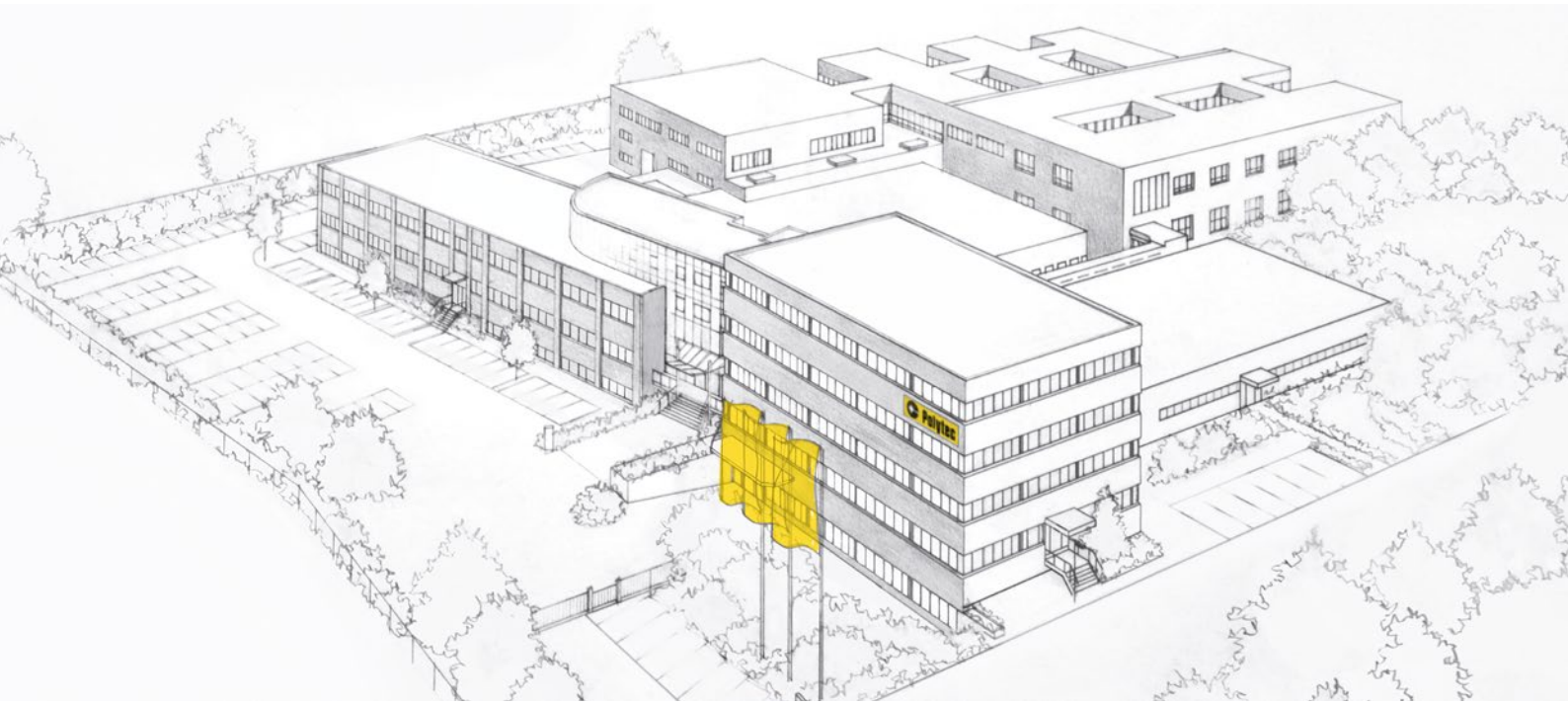
Accessories and options

Customized configurations using special optics, stands, positioning stages, beam deflection and much more

PolyXpert Service

Contact us for contract measurements, rentals, feasibility studies, free demonstrations, on-site support or outsourcing to our fully equipped (automated) laboratories

[1] MATLAB® is a trademark of The MathWorks, Inc.
[2] LabVIEW™ is a trademark of the National Instruments Corporation



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

OM_PB_VIB_E_42337
2025/02 · Technical specifications are subject to change without notice.