

4X Diagnostics Products and Services



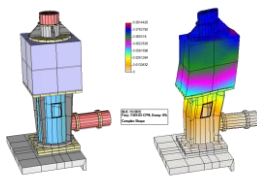
Providing vibration analysis & diagnostic measurement consulting services nationwide.

4X Diagnostics is **ISO Category IV** Certified and provides advanced vibration analysis testing, training, mentoring & certification. We also offer ME'scope software sales & support. Our customers include manufacturing, technology, research and service industries, local municipalities and government agencies.

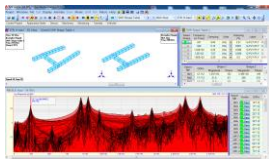
Top Services:



Route based data collection & Vibration Analysis of rotating machines and equipment - Used to determine the mechanical health of machines. Typical measurements include vibration testing to identify mechanical and electrical issues and Stress Wave measurements to identify bearing and gear faults. **Including Route Database Creation & Tune-ups.**



Operational Deflection Shape Analysis - Time or frequency based Operational Deflection Shape (**ODS**) is used to analyze the motion of rotating equipment and structures. An ODS animates a computer generated model of the machine with phase and magnitude data or simultaneously measured time waveform captures. ODS is a non-intrusive testing technique.



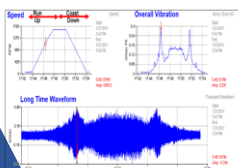
Modal Analysis – An experimental method of determining the natural frequencies, damping values and mode shapes of a structure. Modal analysis is needed when machine vibration is amplified due to resonance.

Motion Amplification

Seeing is Believing



Motion Amplification Video Recording - Motion Amplification is a revolutionary video-processing product and software package that detects subtle motion and amplifies that motion to a level visible with the naked eye. Every pixel becomes a sensor creating millions of data points in an instant. **Spectrum and waveform data can be calculated from the video images.** 4X Diagnostics owns Motion Amplification Equipment and is Trained & Certified to complete testing for you.

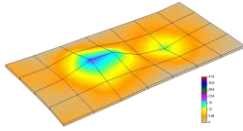


Resonance Testing – Resonant amplification (Resonance) results whenever forced vibration, from mechanical faults, coincides with a natural frequency. A natural frequency is the frequency or frequencies that a machine “likes” to vibrate or “ring”. At resonance, a small change in the exciting force produces a large change in vibration.

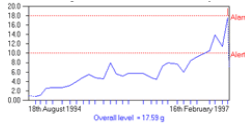


Vibration Consulting, Training & Mentoring

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Seismic Vibration Studies – Floor vibration, structure or ground vibration monitoring and analysis. Used for vibration sensitive equipment and slow speed equipment.



Remote Data Analysis – Remote analysis and reporting of route based data, online data or any diagnostic measurements.



Short or Long Term Monitoring – Short or long-term monitoring of vibration or process signals. Monitoring instrumentation is 24 channels and is capable of measuring and storing long time waveform captures, trends, spectrums, waveforms.



Fan/Rotor Balancing – Dynamic balancing of rotating equipment in-situ or in a balance stand.



Turbine Startups – Multi-channel measurement and data analysis of turbine startups and shutdowns. Including **Speed, Orbits, Shaft Centerline, and Shaft Position** measurements.



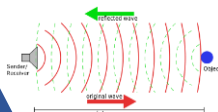
Sound/Noise – Airborne noise measurement used to diagnose vibration on rotating machines or to investigate neighborhood noise complaints, or document fence-line noise and human exposure levels.



Phase Studies – Relative or absolute phase studies to diagnose or confirm the source of vibration issues.



Acceptance Testing – To test and evaluate components for compliance & acceptability related to vibration and/or sound.



Ultrasonic Thickness and inspection – Used to determine the thickness of metal castings, metal components and concrete structures.



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Additional Services:

- ⇒ **Speed Variation or Torsional Analysis** – Used to identify dynamic changes in shaft torsion, rotational or linear speed.
- ⇒ **Laser Shaft Alignment** – Identification and correction of shaft misalignment.
- ⇒ **Transient Capture Analysis** – Long time waveform captures used to study periodic or non-periodic signals. Transient capture analysis is commonly used when impacting or randomly occurring signals are present.
- ⇒ **Displacement Measurements** – Static or dynamic measurement of displacement using eddy current, laser or other contacting or non-contacting displacement measurement systems.
- ⇒ **Product Defect Analysis** – To investigate product quality issues. Signal types include flow, pressure, vacuum, density, speed, displacement, force or any other analog signal.
- ⇒ **Ultrasonic Measurement and Analysis** – Ultrasonic testing is used to identify air or fluid leaks, mechanical or electrical faults or corona in power distribution
- ⇒ **Permanent Vibration Sensor and Tachometer installations** – Typical installations include spot face/surface prep, epoxy/drill and tap, and connector/junction box wiring.
- ⇒ **Phone Support**– For all vibration related services.

Training Services:

Vibration Training, Mentoring and Vibration Certification Training

4X Diagnostics provides public and on-site vibration training, mentoring and vibration certification courses for many subjects including:

Operational Deflection Shape, Modal Analysis & ME'scope training

Time Waveform Analysis

Advanced Vibration Analysis Techniques

Fundamentals of Vibration Analysis

On-site Category I, II and III vibration training and certification classes (4X Diagnostics is a certified North America training instructor for Mobius Institute)

Route Database Training & Tune-up

Rotor Balancing Workshop

*Onsite Mentoring
also available*

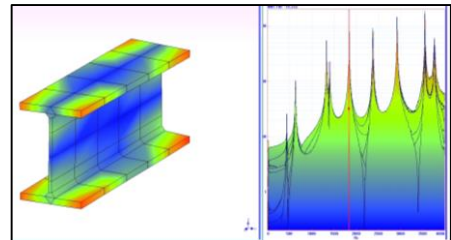
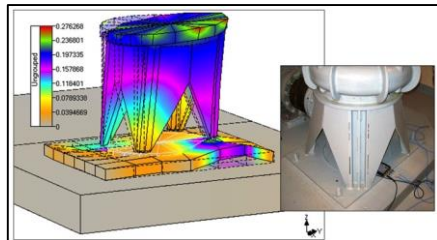


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ODS/Modal Software

4X Diagnostics sells and supports ME'scope VES Operational Deflection Shape and Modal Analysis software, which makes it easier for you to observe and analyze noise & vibration problems in machinery.



**Renew you Software
Maintenance & Support (SMS)**

Updates: Gain full functionality of the latest software improvements & upgrades

Avoid extra fees when renewing

Get phone and e-mail support through Vibrant Technology

**Upgrade and do more with
your ME'scope Software**

Visual Modal – Obtain Modal Parameters

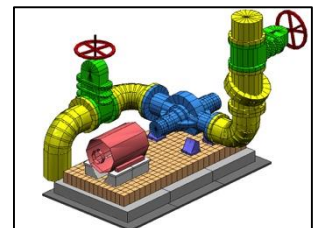
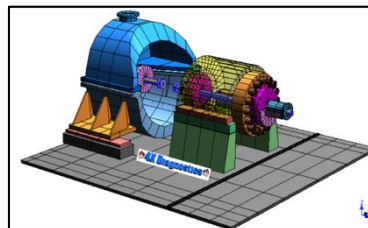
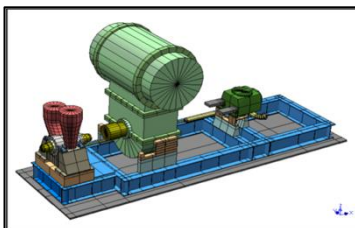
Visual SDM – Experiment with Structural Modifications.

Visual Experimental – (FEA) Finite Element Analysis

****We are your authorized reseller****

Contact us or for more information, pricing, package options or to renew support

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4X DIAGNOSTICS
Vibration Consulting, Training & Mentoring

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