Noise & Vibration
Test and Measurement Solutions
for Energy & Process Industries
Power Generation | Oil & Gas | Chemical | Petrochemical

www.oros.com
They trust Oros

“From rotating analysis to structural dynamic analysis: with my OROS system, I am ready for everything when I go out in the field.”

Greg PARKER, 39
Noise and Vibration technician, Installation & Maintenance division.

Made for Your Demanding World

1- Improve Efficiency
2- Maximize Uptime
3- Minimize Costs

Test Cells
- Prototype validation
- Overhaul and acceptance at OEM

Improve acceptance testing efficiency
- Integrated & automated test process and report generation
- User friendly operation
- Multi-channel real-time processing and monitoring
- Universal and multiple sensors’ types: proximity, velocity, acceleration, temperature, strain, pressure, etc

Field Testing
- On-site commissioning
- Machinery startup
- Predictive maintenance
- Installation vibration signatures
- Diagnostics and troubleshooting

Travel light for reliable tests
- Versatile toolbox for all noise and vibration diagnostic applications
- Portable and rugged analyzers for the field measurements
- Multi-channel simultaneous acquisition for run-up and coast downs
- Real-time analysis for field efficiency
- Full signal recording for office processing and archiving

Remote Monitoring
- After installation follow-up
- Random & unrepeateable phenomena

Optimize costs and predict failure
- Data and signals recording based on alarm level trigerring
- Collect raw signal information for thorough office processing

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OROS Solutions
Boost your Efficiency

INSTRUMENTS from 2 to 32 channels, distributed up to 1000+

Flexible Connection
- Mobile Analyzer
- Distributed Configuration
- Remote Access
- Large Channel Count Systems

Multioperations
- ORBIGate Turbomachinery Vibration
- Reciprocating Machines Diagnostics: EngineDiag
- FFT, Spectral Based Diagnostics
- Balancing
- Synchronous Order Analysis
- Torsion & Twist

Made For the Field
- Portable
- Rugged
- Real-Time
- Multi-Channel

Accurate
- DSP-based
- 24 Bit – 40 kHz – 140 dB
- ± 40 V input range
- ±0.02 dB / ±0.02°

SOFTWARE R&D, Acceptance, Diagnostics

Data Acquisition
- Recorder
- Time Domain Analysis
- Spectral monitoring

Rotating Analysis
- ORBIGate Turbomachinery Vibration
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Structural Dynamics
- FRF's, Resonances
- ODS (Operating Deflection Shape)
- Modal analysis

Noise Analysis
- 1/3rd octave
- Sound Intensity
- Sound Power

SERVICES Anywhere Close to You

Training
- Initial
- Advanced
- Webinar

Coaching
- Software customization
- Assistance in your measurement

Testing
- Expertise in diagnostics
- Troubleshooting
- Tools for automation

A Dedicated Team
- Dynamic and responsive Services department
- Worldwide hotline
- Global Accredited Maintenance Centers (worldwide coverage)
- Renting
- Ready-to-go systems at any time

Maintenance and Contracts
- Premium contracts
- Software updates
- Hardware upgrades
- Calibration

INSTRUMENTS from 2 to 32 channels, distributed up to 1000+
Measuring your Rotating Machinery

Rotating Analysis

Fluid Film Bearings
Relative shaft vibration is captured with proximity probes. Analyzing this data requires a number of software tools such as orbit and shaft centerline as well as order analysis (nX, Bode, Polar, etc.). ORBIGate, the OROS turbomachinery vibration solution, features these analysis and many more analysis tools. These tools display the physical motion of the shaft and let you detect faults such as oil whirl & whip, preload, misalignment, rub and others.

Roller Bearings
Damaged roller bearings are common. Their vibration signatures are usually measured with an accelerometer mounted on the bearing housing. In particular, the FFT-Diagnostics module uses envelope demodulation to analyze these vibration sources to determine if the source is from the roller elements or the races.

Gear Analysis
Gear boxes have a complex vibration signature, usually occurring at high frequencies. The FFT-Diagnostics tool, such as cepstrum, kurtosis and harmonic markers are necessary to describe and understand the generated vibrations. The virtual tachometers management feature allows the analyst to determine the speed and phase information based on the gear ratio.

Reciprocating Machines Analysis
Reciprocating machines are complex installations. They generate specific vibration signatures. The objective is their performance optimization and faults detections. For example, injection delay, valves faults, segmentation wear can be identified with EngineDiag. This software module integrates the machine mechanical properties: number of cylinders, firing order and timing diagram, allowing to provide pertinent decision criteria on the field. Time signal, overall levels as well as angle-frequency representation on the machine cycle are efficient results for diagnostics.

Torsional Analysis
Torsional vibration and torque fluctuation are usual phenomena especially on large internal combustion engines. The OROS torsional software module utilizes a frequency to voltage converter for speed input providing the following information: the angular velocity profile displays RPM variations. 2 pulse train combination detects torsional resonances.

Balancing
Imbalance is probably the most common source of vibration on rotating machinery. Depending on the machine and the rotating speed range the rotor can be considered to be rigid or flexible. In the first case, the Single Dual plane balancing module will be used. In the second case a multiplane approach should be preferred and the associated Multiplane module should be used.

On-Site Measurements & Applied Trainings
Experts from OROS come on-site for applied trainings. They will help you using your OROS system. They can provide assistance in your measurement. They are also able to recommend optimization in your measurement process depending on your application and field requirements.
Turbines and Compressors
- Gas and Steam Turbines
- Compressors
- Pumps
- Hydro Turbines
- Wind Mills
- Fans and Blowers

Reciprocating Machinery
- Internal Combustion Engines: Diesel and Gas
- Reciprocating Compressors

Electric Machines
- Electric Motors
- Power Generators

Structural Dynamics

ODS (Operating Deflection Shape)
Operating deflection shape is an important analysis procedure used to locate machinery and piping system deflection during operation. It is based upon simplified geometry description of the machine train. After measuring the vibration response at multiple locations, the mechanical source can be identified. The ODS software module helps to determine vibration sources, a transmission point and eventually a mechanical modification to be implemented.

End Winding Bump Testing
Generators and motors end windings are strongly excited by frequencies at twice the network frequency: any mode nearby that frequency will create high vibration response. FFT analyzers and Modal, the OROS Structural Dynamics module, are well adapted for bump tests acquisition, resonance frequency determination and deflection shapes.

Blade Modal Testing
When blade dynamic structural characteristics should be determined, they are submitted to modal testing: based on impact hammer testing or shaker excitation. Based on multichannel analyzers, vibration response can be captured by accelerometers or strain gauges. Modal, the OROS Structural Dynamics module, can process the FRFs to give the modal characteristics.

Damping & Isolation
Dynamic coupling between machine trains and their skids or foundations can be a problem during the machine installation and the field acceptance test. Excitation frequencies should not match the response frequencies of the hosting structure: the mounting choice is key. To tackle this issue, OROS products such as transfer functions, ODS, and damping calculations assist the user in the procedures.

Noise Analysis

Octave & Sound Intensity Safety
The ambient noise generated from rotating machinery can be evaluated using general tools such as the 1/3 octave analysis. But more thorough measurements can be achieved using the sound power value. The sound intensity technique is often completed in the field thanks to its portability and adaptability.
OROS is a global manufacturer and solution provider of noise and vibration measurement systems.

OROS masters the latest technology of data acquisition, digital signal processing as well as user interface software.

OROS instruments are used in the major sectors of industry and research, for industrial acoustics, structural dynamics and rotating machinery applications. Hardware and software are totally designed in-house.

OROS instruments are renowned as being designed for the field but powerful enough for any lab.