OROS

Noise & Vibration

Test and Measurement Solutions

for Automotive Industries

Made for Your Demanding World

1- Improve Efficiency   2- Minimize Testing Costs   3- Improve Quality

Laboratory
> Component specification
> Engine and motor R&D
> Subsystems NVH
> Sound power
> Continuously Variable Transmission (CVT)
> Vehicles structure

Improve testing efficiency
> Integrated & automated test process and report generation
> Project management and data sharing: ASAM ODS compliant
> Universal and multiple sensor's types: microphones, acceleration, temperature, strain, pressure…

In-Vehicle Test
> Prototype
> Component in-vehicle integration
> Cabin noise
> Interior NVH

Be fast and flexible
> Portable and rugged systems for in-vehicle tests
> PC free operation: full signal recording for office processing and archiving
> Real-time results for direct live monitoring
> Get all data through conditioners and CAN Bus

Production Test
> Test bench maintenance
> Components end of line
> Quality check
> Test bench integration with NVDrive
> Balancing

Optimize costs and quality
> Automate production test process
> Versatile tool box for all noise and vibration troubleshooting and diagnostics applications

They trust OROS

> "For in-vehicle tests, I really appreciate flexibility and portability of the OROS analyzers."

John ARISTON, 32
Noise and Vibration technician,
Road test validation division.

OROS Solutions
Boost your Efficiency

Based on a range of modular instruments, from 2 to 32 channels, the Teamwork technology enables to cascade or distribute the analyzers to measure up to 1000 channels. Instruments, conditioners and software licenses are exchangeable and flexible. Data are also easy to share thanks to the native technology.
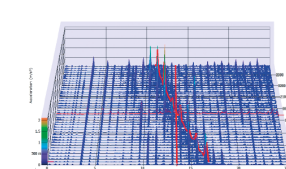
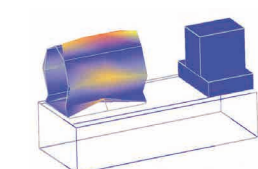## SOFTWARE R&D, Acceptance, Diagnostics
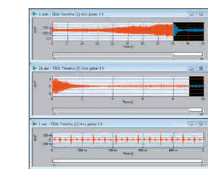
Data Acquisition
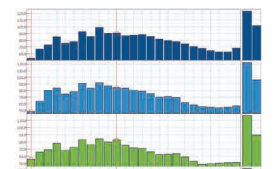> Recorder
> Time Domain Analysis

Rotating Analysis
> Synchronous Order Analysis
> Constant Band Tracking
> Reciprocating Machines Diagnostics: EngineDiag
> Torsion & Twist
> Balancing

Structural Dynamics
> FRF
> ODS (Operating Deflection Shape)
> Modal analysis

Noise Analysis
> Octave Analysis
> Sound Intensity
> Sound Power
> Sound Quality
> Air Holography
> Transfer Path Analysis
> EV-HEV

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

Flexible Connection
> Mobile Analyzer, Wi-Fi
> Distributed Configuration
> Remote Access
> Large Channel Count Systems

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

Multioperations
> PC Free Recorder
> Online & Post Analysis
> Multianalysis
> Handling Any Transducers

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

SERVICES Anywhere Close to You

Training
> Initial
> Advanced
> Webinar

Coaching
> Sofware customization
> Assistance in your measurement

Testing
> Expertise in diagnostics
> Troubleshooting
> Tools for automation
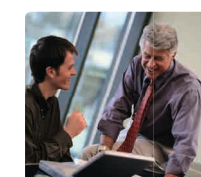
A Dedicated Team
> Dynamic and responsive Services department
> Worldwide hotline
> Global Accredited Maintenance Centers (worldwide coverage)
> Renting
> Ready-to-go systems at any time

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

www.oros.com

OROS
MEASURING NOISE & VIBRATION

Vehicles, Engines and Components NVH

⟳ Rotating Analysis

Gear Analysis
> Frequency analysis (FFT) for high frequency vibrations
> Cepstrum, kurtosis and harmonic markers
> Constant Band Tracking tracks order energy by bands in run-up/down
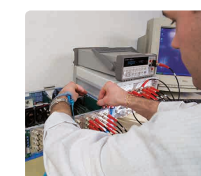
Hybrid Transmission / CVT
> Synchronous order tracking, phase reference and cross-phase tracking
> Virtual tachometers calculation for belt speed determination

Engines Analysis
> Identification of injection delay or valves faults
> Time signal, overall levels, cylinders phase alignment as well as angle-frequency representation
> Timing analysis with angular sampling

Torsional Analysis
> Frequency to voltage converter transforming a pulse train signal into a varying rotating speed value
> Instantaneous angular velocity profile versus time
> Synchronous Order Analysis (SOA) module to get order tracking profiles

Balancing
> Balance crankshafts quickly and accurately
> High speed balancing for turbochargers

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.
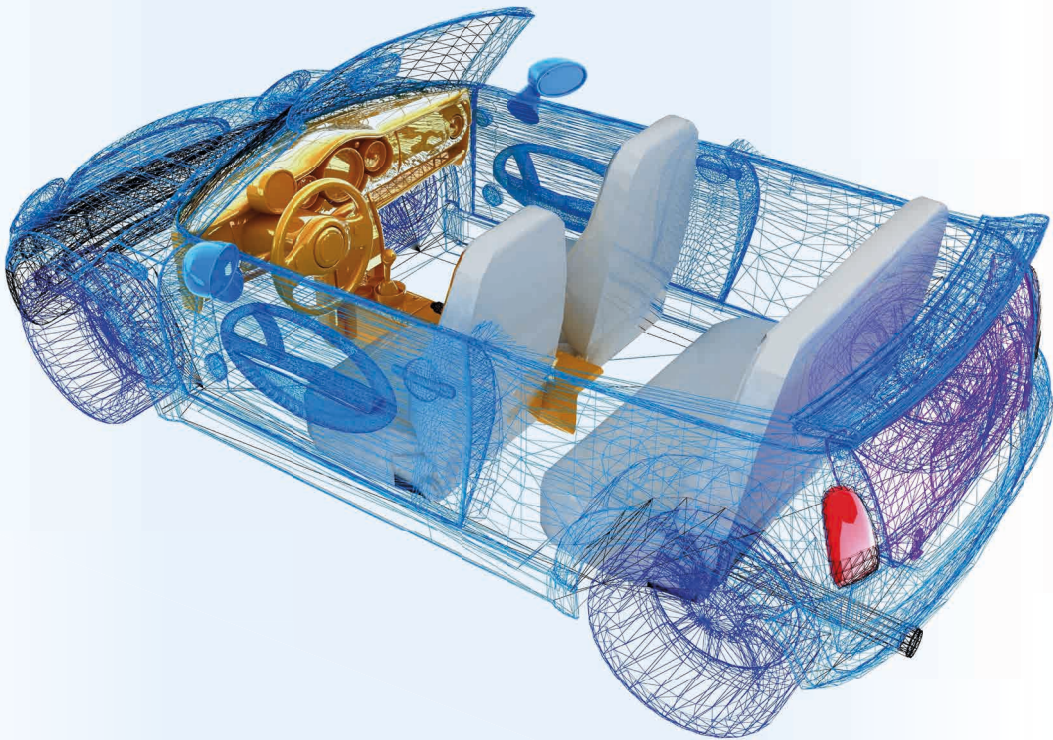
▦ Structural Dynamics

Damping & Isolation
> Cross spectrum, transfer functions, damping
> Bump tests
> Swept sine

Modal & Experimental Analysis
> Structural characteristics determination
> Shaker or impact hammer excitations
> ODS (Operating Deflection Shape), OMA (Operational Modal Analysis), EMA (Experimental Modal Analysis)

Source	Transfer		Response

Vehicles	Engines	Components	
> Automotive	> Downsizing	> Hybrid Drivetrains	> Electric Motors
> Motorcycles	> Hybrid	> Turbochargers	> Exhausts
> Trucks & Buses	> Timing	> Transmissions	> Tires
> Earth Moving Vehicles	> Crankshaft	> Steerings	> Rubber Components
> Industrial Vehicles	> Diesel	> Brakes	> Gear boxes
> Leisure Vehicles		> Alternators	> Continuous Variable Transmissions (CVT)
> Trains		> Compressors	

›)) Noise Analysis

Sound Power
> Sound pressure level acquisition (ISO 374x)
> Sound intensity: discrete points (ISO 9614-1) or through surface scanning (ISO 9614-2)

Source Localization & Sound Mapping
> Standard 1/3 octave analysis
> Sound intensity acquisition at discrete points with colored noise map and acoustic isolines
> Nearfield Acoustic Holography (NAH)

Sound Quality
> Pyschoacoustic parameters evaluation
> Sound design with filtered playback of signals
> Jury testing

Transfer Path Analysis
> Experimental approach to determine the frequency transfer relationship between sources, attached structures and the passenger.
> Sources and panels contributions evaluation and ranking
> Airborne and structure-borne separation

EV/HEV
> Electric markers e-NVH excitations are spot right away (PWM, slotting...)
> Spatiogram a unique tool to quickly quantify the contribution of different e-NVH excitation wavenumbers to vibrations
> Sound design listen and playback the motor noise separating and designing the various sources
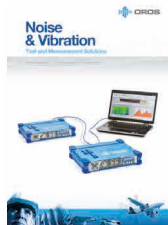
∿ Data Acquisition

In-Vehicle Recording
> Portable, rugged and easy recording system with a CAN Bus interface
> PC free recording

Fatigue Test
> Static, dynamic stress, fatigue
> Strain gauges, plug and play signal conditioning

OROS

Ordering Information

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.

Find out more on the OROS offer in the range brochure.

Downloadable on www.oros.com

Rotating Analysis

ORNV-SOA	Synchronous Order Analysis plug-in
ORNV-CBT	Real -time constant band tracking add-on
ORNV-FFTDiag	Real-time diagnostic tool set (Envelope, Cepstrum, Pk; Pk-Pk, Crest factor, shaft view) add-on
ORNV-IVC	Integrated Instantaneous angular Velocity Converter plug-in, allows on-line and offline torsional analysis
ORNVS-ENGD	EngineDiag, Reciprocating Machines Diagnostics Software Module
ORNVS-BAL	Balancing Solution

Structural Dynamics

ORNV-FFT	Real-time FFT plug-in
ORNVS-MOD-ODS	Operating Deflection Shape
ORNVS-MOD-MIMO	MIMO Modal Analysis

Data Acquisition

ORNV-REC	Recorder
ORNV-TDA	Real-time time domain analysis plug-in
OR36/8-CAN	CAN Bus hardware interface and software components for OR36/OR38
OR36/8-PXD-B	8 Strain gauges bridge conditioner Xpod
OR36/8-XPOD-T	8 ch. PT100 and thermocouple conditioner for OR36 & OR38
OR36/8-XPOD-V	3 Display analog and digital vumeter monitoring XPod

Noise Analysis

ORNV-OCT	Real-time filter based 1/n octave plug-in
ORNVS-SI	Sound Intensity
ORNVS-SP	Sound Power
ORNVS-SQ	Sound Quality Lite: psycho-acoustics and filtered playback
ORNVS-SQP	Sound Quality Plus
ORNVS-AH-PCK-D	Air Holography
ORNVS-TPA	Transfer Path Analysis

Analyzers: examples of configurations

Above software options may be added to these configurations

OR10-DAQ-8	Mobile DAQ 8 ch.
OR34-FREQ-4	OR34-4 ch. FFT analyzer
OR35-FREQ-10	OR35-10 ch. FFT analyzer
OR36-FREQ-16	OR36-16 ch. FFT analyzer
ORMP-FREQ-16	Mobi-Pack 16 ch. FFT analyzer
OR38-FREQ-32	OR38-32 ch. FFT analyzer

Specifications

Channels count	2 to 1000+ channels
Inputs	
Sampling	2 kS/s to 102.4 kS/s - 24 bits delta sigma ADC
Accuracy	Phase ±0.02° - amplitude ±0.02 dB - Dynamic > 160 dB
Conditioning	AC/DC/ICP/TEDS up to ±40 V
Auxiliaries	
Outputs	DC to 40 kHz - ±10 V range - 24 bits DACs -THD < 0.002%
Ext. synch (Trigger / Tach)	64 x over sampled - Resolution < 160 ns (0.06° @ 1 kHz) - up to 40 V
DC channels*	Sampling 10 Hz - 50 Hz/60 Hz rejection - reproducibility <1 mV
CAN Bus	CAN 2.0A & 2.0B – 125 kb/s to 500 Mb/s
System	
Hard disk	64 to 512 GB SSD
Internal battery	up to 3h
Link to PC	1 Gb/s Ethernet
Weight	from 1.4 kg/3 lb to 10 kg/22 lb

M002-112-5

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