Made for your Demanding World

R&D | Acceptance | Diagnostics
---|---|---

Distributed Acquisition

Remote Monitoring

Test Bench

Team’s Offices

Instruments store

Office licenses

Data sharing

Reporting

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Large Channel Count Systems

On-Board

On-Site Services

Energy & Process
- Power Generation
- Oil & Gas
- Chemical
- Petrochemical

Marine
- Shipbuilding
- Propulsion

Aerospace
- Aero Engine
- Aircraft, Helicopter
- Components
- Defense Systems, Satellite

Automotive
- Cars
- Heavy Vehicles
- Railways
- Components Suppliers

Manufacturing & Automation
- Machine Tools
- Micro-Electronic Machines
- Components Suppliers
- Robots & Conveyors
OROS Solutions Enhance your Efficiency

OROS designs and manufactures portable, rugged and real-time Noise and Vibration Analyzers with efficient software solutions for all your tests and measurements.

**INSTRUMENTS**

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**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
Efficiency

SOFTWARE
R&D, Acceptance, Diagnostics

Noise & Vibration Software Platform

- Recording
- FFT
- Time Domain Analysis
- Monitoring

Rotating Analysis

- Synchronous Order Tracking
- Turbomachinery Vibration
- Reciprocating Machines Diagnostics
- Torsion & Twist
- Balancing

Structural Dynamics

- Operating Deflection Shape
- Modal Analysis
- FRF & Cross-Spectrum Acquisition
- Advanced Swept Sine

Acoustics Analysis

- 1/n Octave Analysis
- Overall Acoustics: Levels & Profiles
- Sound Power
- Sound Intensity
- Sound Mapping and Source Localization
- Sound Quality
The compact analyzer (2 or 4 inputs)

OR34 is the smallest instrument in this series. Its size sacrifices nothing to efficiency. This 4 channel analyzer brings all the best from the 3-Series technology in a professional, rugged and powerful unit.

- Hand size (A5 foot print)
- Light 1.4 kgs (3 lbs)
- Uninterruptible power supply
- 2 trigger/tachometer inputs
- 1 generator output
- 1 computation DSP

OR35 is the most flexible and modular 10 channels multi-analyzer available. Ideal for mixing laboratory, on-board and field measurement, this analyzer features long autonomy, portability, ruggedness and continuous accuracy. The unique 8+2 channel-count combines high-speed tach and standard inputs offering larger applications coverage than regular 8 channels units.

- Easy to carry 3 kgs (6.6 lbs)
- 6 to 10 universal inputs
- 1 or 2 computation DSPs
- 2 trigger/tachometer inputs
- 2 generator outputs
- 64 GB internal SSD

The modular analyzer (6 to 10 inputs)

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- 2 generator outputs
- 64 GB internal SSD

The recorder/multianalyzer (4 to 16 inputs)

OR36, Mobi-Pack and OR38 open the way for unrivaled measurement possibilities. These 4 to 32 channel instruments are able to acquire and analyze large amount of noise and vibration data without compromise with a comfortable computing power and their built-in Mobi-Disk, OR36, Mobi-P. They offer the capability of an advanced laboratory instrument in a modular, rugged and portable package.

- Portable (5 kgs/11 lbs/ A4+)
- 4 to 16 universal inputs
- 1 to 4 computation DSPs
- 2 to 6 trigger/tachometer inputs
- 2 to 6 generator outputs
- 128 GB Mobi-Disk

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- 128 GB Mobi-Disk

Teamwork Instruments

Same platform, same technology, same software

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. They allow different configurations: mobile analyzer, distributed configuration, remote access and large channel count systems.

2 4 10

OR34

OR35

OR36

MOBI-PACK
The recorder/multianalyzer (4 to 16 inputs)

OR36, Mobi-Pack and OR38 open the way for unrivaled measurement possibilities. These 4 to 32 channel instruments are able to acquire and analyze large amounts of noise and vibration data without compromise with a comfortable computing power and their built-in Mobi-Disk. They face any measurement situation. They offer the capability of an advanced laboratory instrument in a modular, rugged and portable package.
Teamwork Instruments
Same platform, same technology, same software

Cascade

OROS analyzers allow distributed and/or large channel acquisition by using instruments together. Multiple systems are controlled from a single PC running NVGate software which takes advantage of on-board DSP processing and storage ability.

- One software interface for 1 to n hardware together
- Local processing and storage increase with additional units
- Distributed channels along all units (Tachs, Ref. channels, Events)
- Daisy chain up to 100 m between units, 1000+ channels, switchless
- Cross phase between units < +/-0.2° @51.2 kS/s

Remote

With a 1 Gb/s Ethernet connection, OROS analyzers can be controlled through local network or internet. Thanks to the local processing and storage, the data bandwidth remains low, supporting wireless and low speed connection.

- Internet and LAN remote analysis
- Remote post-processing from local storage
- Wi-Fi

PC Free recorder

D-rec, direct recording, offers a unique technology for stand-alone digital data recording measurements. It is the best way to replace old DAT recorders. The unique front-panel with its bright LCD and accessible buttons offers freedom of direct setup, without a PC or a tablet. It is easy to select inputs, modify front-end settings (coupling, range, etc...) or change the bandwidths. Up to 12 user-defined recording configurations can be saved in the instrument. They can be loaded either from the control panel or automatically (routed acquisition).

- 100% PC or tablet free: secured data recording, bright LCD and large buttons, compatible with CAN, Xpod, universal inputs
- Removable storage disks (SSD): more flexible, rugged and much faster!

Mobi-Disk

The Mobi-Disk is the local storage device for OR36, OR38 and Mobi-Pack. This removable device enables each engineer to keep its own raw data.

Connected to the PC through the USB port it allows fast and easy post-processing or back-up.

- 128 to 512 Gb shock proof SSD
- Dual port (USB 3.0 & analyzer slot)
- High throughput (32 ch x 102.4 kS/s)

All-In-One

Auxiliary Channels

In addition to universal inputs, OROS instruments extend input/output capabilities with auxiliary channels. As a standard, teamwork instruments offer 2 high-speed digitizers and 2 multipurpose outputs:

- 2 to 6, 6.4 MHz sampling trigger:
  - Edge detection
  - Tachometer/keyphasor
  - Torsional measurement
  - Angular Sampling
Smart Front-End

OROS 3-Series analyzers are designed to handle numerous transducer types with no hassle. Inputs are compatible with:

- ICP® accelerometer, force sensor & microphone and pressure (2 or 4 mA)
- Proximity probe & keyphasor with ±40 V range
- Temperature, Torque, Power... parameters with universal dynamic + parametric inputs

Plug and Play Signal Conditioning

The Xpod modules add signal conditioning to the OR35, OR36 and OR38 in a smart and field operation driven design. These 8 channels' conditioners can be added, removed and exchanged between the analyzers in a few seconds. Moreover, the lateral side clipping, leaves the BNC input connectors free to be used as classical ICP®/AC/DC/Float inputs

- Exchangeable between any OR35, OR36 and OR38
- 5 sec docking time
- BNC connectors still available

XPods line: bridge & temperature conditioners

Wheatstone bridge conditioner handles any bridge-based transducers (strain, pressure, load, torque, force...).

- Full, ½ and ¼ bridge
- Automatic bridge balance (incl. in D-rec)
- 120 Ω / 350 Ω built-in resistors
- Continuous 0 to 10 V excitation voltage

Temperature conditioner handles thermocouples and RTD transducers.

- PT100, PT1000 and J, K, N, E, T, thermocouples
- Integrated linearization
- Automatic cold junction compensation
- Standard flat pin connectors

CAN Bus

Allows acquiring live parametric data from a car or machine's CAN bus.

- CAN2.0A & CAN2.0B
- 125 kb/s to 1 Mb/s
- Rugged Hi-z probe

> 2 to 6 Synchronized generators
  - High resolution swept sine
  - Multi-sine, White/Pink Noise, Chirp
  - Signal playback
  - All filtered (HP, LP, BP, ∑/dt)
> 2 to 4 parametric DC inputs
  - 10 S/s
  - > 1 mV repeatability
No compromise: Performance & Reliability in the Field

Portable, Rugged...

Designed to be the best for field operations, the OROS 3-Series instruments offer the capabilities of advanced laboratory instruments in a rugged and portable package that takes any measurement situation in its stride.

Specifications for Field Operations

- Being portable is more than just a carrying case!
  - All inputs protected up to ±60 V
  - Internal battery
  - Aircraft cabin compatible carrying case
  - Double shielded chassis
  - Foolproof cooling inlets
  - Secured power supply connector
  - Switchless cascadable units

- Bright LCD panel
- Large and touchable operating buttons
- Environment proof (Vibe, shock and temp)
- BNC connectors
- Ethernet (up to 100 m away)
- Power supply: AC (100 to 240 V) / 50-60 Hz / DC (10 to 28 V)
- Grounded or floating couplings
& Reliability in the Field

and Accurate

Focusing on measurement quality and efficiency, OROS design takes care of every part of the hardware, preventing interferences from internal and external perturbations. It results in an instrument that provides, exact and perfectly reproducible results.

The Need for Real-Time

Every part of the signal may contain important signatures hidden by non real-time analyses. Live synchronous order, 1/n octave and filtering are not possible without gap free analysis capability. Real-time analysis helps getting actual data on-line.

Thanks to this DPS-based architecture, OROS 3-Series analyzers provide the same measurement and analysis performance whatever the number of channels or bandwidths.

The same process applies with distributed units or large channel count. The local processing capability and data storage come natively with the additional inputs. This modular architecture guarantees valuable live results for all your applications, even the most demanding ones.

The Right Result at the Right Time

In regular PC-based test and analysis systems, the un-deterministic behavior of the operating systems may rapidly lead to loss of samples (not real-time) while the acquisition and analyses duty increases. Your test data integrity is not guaranteed.

OROS DSP-based architecture is designed to offer safe and powerful processing capabilities that allow getting the right data with certainty. With DSPs the amount of analyses is known before starting the acquisition.

OROS 3-Series analyzers run the real-time analysis exclusively with their DSP bank:

- Scalable (1 to 8) computation DSPs for analyses (FFT, SOA, 1/n OCT...) on each systems
- Distributed or large channel count with hundreds of processors running your data in parallel
- ForceDSP that offers up to 10 time more horse power for demanding applications
- A dedicated processor handling trigger, monitoring, generators and tachometers
- A disk manager devoted to the true parallel raw data recording

The Best of Electronics for Metrology

The analyzer inputs must accurately read the transducer input signals. They must be properly designed.

- High dynamic range: 24 bits $\Delta / 140$ dB
- Wide voltage range: ±100 mV to ±40 V
- Precise phase matching: < ±0.02° @ 20 kHz
- Multiple frequencies: 2 sampling clocks 102.4 kS/s and 65.536 kS/s with sub-multiples
- Accurate: < ±0.02 dB amplitude match
- Stable: < ±0.1 mV offset drift
NVGate, the software platform is the cornerstone for all measurement tasks. It hosts the suite of OROS software modules. Whatever the application and software module, it allows you working in a coherent and continuous environment.

### Standard Modules

#### Save Your Signal

The **Recorder** captures raw, time-domain data during your acquisition and analysis process. Designed for reliability and fidelity, saved signals may be used for post-processing, export or as an archive.

#### Extract Any Spectral Signature

The **FFT** software module provides all the necessary functions for spectral analyses. From spectra to FRFs with advanced averaging methods and various resolutions and bandwidths, it provides standard and advanced frequency analysis tools.

#### Control Your Acquisitions

The **Monitor** software module brings 4 additional analysis channels (time and spectral domain) free running on a dedicated DSP. Similarly the **TDA** (Time Domain Analysis) software module delivers crystal-clear time views, as well as statistics (RMS, DC, Pk-Pk) of the acquired signal.

#### Track Your Results Along Any Parameter

The **Waterfall** stacks your spectra, levels, orders and trigger blocks providing flexible 3D waterfall and powerful profiles. Color-spectrogram, Bode plots, order tracking trend plots, all that Vs time, RPM, Power or Torque.

### Intuitive Tools

#### Analyze and Compare Your Measurements and Analyses

- Various **markers & cursors** (linked between graphs & windows)
- **Math** between channels on time, angular, spectral and order domain
- **Overlay** reference results with live measurements
- **Mask editor and alarms**

#### Create Your Own Interface

- **Drag, drop and rename any settings in the control panel**
- **Macros** and **Excel based sequences** allows automating recurrent tasks

#### Manage Your Tests: Dataset Management

- **Models’** database provides repeatable predefined setups
- **Projects manager** saves your data, corresponding **setup** and qualified **meta-data**
- **Calibration management**
- Filters, properties, data mining, meta-data and exchange features embedded in the existing project management

#### Broadcast Your Results

- **Instant reports** to Word/Excel
- **Automated company-defined reports** for personalized communication
- **Multiple import/export formats**
Multidomain Analysis

- Multiple bandwidth and sampling
- True multianalysis: time, order, spectra, recording
- Gap free analysis: 100% real-time

Flexible Software Licensing

- Additional post-processing/report license included
- 1 to n Analyzer = distributed software modules
- Company level licensing

Open and Customizable Platform

- Database: results 'access toolkits
- Automation: sequencer, macros, control panel
- 3rd party software: import/export, NVDrive, MATLAB® toolkits
  - Import/Export in .uff, .txt, .mat, .wav, .sdf, .atfx
  - Compatibility: FAMOS, ME'scope, GlyphWorks, DynaWorks®, DynamX®

Software Suite

- Integrated in the same platform with modern ribbons
- Acoustics, Rotating and Structural Dynamics
Rotating Analysis
From Acceptance Tests to Diagnostics

Whatever the machine type: a high speed turbine, a compressor, a transmission or a slow speed engine, OROS analyzers provide all the tools for rotating analysis from R&D, acceptance tests to diagnostics.

Rotating Speed Measurements
OROS 3-Series analyzers feature flexible and accurate shaft speed measurement tools. Tachometer signals are over-sampled to ensure accurate rotating speed and phase. Signals can be adjusted for better pulse detection using filters, holdoff and hysteresis.

External Trigger Channels
- 2 tachometer inputs are standard (6 maximum)
- High sampling rate of 6.4 MHz (<152 ns resolution) to allow an accurate phase measurement

Angular Sampling
For crankshaft, timing and valve analysis on engines.

Order Tracking Analysis
Order Based Diagnostics: ORDdiag
- Rotation synchronous levels (RMS, Min/Max, Pk-Pk, Crest factor)
- Angular correlation

Constant Band Tracking (CBT)
Helps the user acquire gearboxes’ modulated and often buried noise and vibration orders.

Synchronous Order Analysis (SOA)
Provides stable and repeatable measurements for any speed-varying machinery. Using proven real-time angular resampling algorithms, SOA extracts amplitude and phase of orders; even from fast transients.
- Up to 40 kHz real-time analysis
- Order or angular domain averaging
- Max order contribution search
- Simultaneous order analysis on 2 shafts

Waterfall & Profiles
Results are sorted based on a choice of references for the Z Axis (RPM, time and levels) and represented in 3D or profile views (Bode plots, cross-phase tracking, ...)

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Turbomachinery Vibration: ORBGate
ORBGate, the turbomachinery software, gathers all functions required for turbomachinery vibration analysis into one simple to use dedicated user interface.

- **Tabular list:** Gap voltage, Overall, orders amplitude and phase (0.5X, 1X, nX), Sub1X, SMax
- **Orbits** (Overall and nX filtered)
- **Full Shaft Motion:** Shaft centerline + clearance circle + orbits
- **Bode, polar and trend plots**

Reciprocating Machines Diagnostics: EngineDiag
Integrate the machine mechanical properties and kinematics (number of cylinders, machine cycles, timing diagram) into NVGate, the Noise and Vibration software platform. The Advisor offers an easy software configuration and results displays based on the machine characteristics and instrumentation.

- Synchronous time signals with cycles overview
- Overall level on the machine cycles and kinematic phases
- Results comparison and trend
- Angle-Frequency representation based on Wigner-Ville algorithm
- Cylinder phase alignment

**Torsion & Twist**

The Instantaneous angular Velocity Converter (IVC) provides instantaneous angular velocity signal to be analyzed.

- **Integrated Frequency to Voltage converter**
- **Cross Phase Tracking:** the order cross-phase relatively to a reference channel for torsional resonances at specific orders identification.
- **Virtual inputs** compute the static and dynamic twist from 2 tachometers’ signals.

**Single, Dual & Multiplane Balancing**

Assists the user during the test and the correction process:

- Rigid or flexible rotor
- 1 or 2 sensors per plane
- Synchronous Order Analysis based
- Trial mass method
- Balancing prognosis, Trim

**Spectral Based Diagnostics: FFTDiag**
A complete toolset dedicated to machinery diagnostics: rotating machine trains, transmissions, gears and roller bearings.

- ShaftView
- Kinematics’ markers
- Levels & profiles
- Cepstrum
- Envelope demodulation
Structural Dynamics Analysis

From Acquisition to the Result

Structural dynamics is a powerful tool for understanding the behavior of industrial machinery and their supporting structures. It is used in maintenance, prototype validation and mechanical design as well as field applications. Good structural dynamics starts with good data. For that reason, all the tools for efficient and accurate acquisition have been integrated into our structural solutions.

Measurement Acquisition With NVGate

With its dedicated structural mode, the FFT software module offers a comprehensive tool set for FRF acquisition. Whatever the method used, impact hammer or shaker excitation, FRFs are confidently acquired.

- Check the validity of the acquisition thanks to different displays and their preview:
  - Frequency Response Function
  - Coherence
  - Trigger blocks
  - Averaged results
- Adjust the settings using an appropriate weighted window if necessary: uniform, force/response, hanning
- Accept/reject the impact hammer measurement after coherence checking
- Hammer impact auto-range
- Define the measurement sets in Excel and use the node path sequencer to track all measurement points
- Export the FRF in Universal File Format, MATLAB® and ASAM format

Distributed & Large Channel Count Systems

Large structures require a high number of input channels. Multiple OROS analyzers can be cascaded to increase the total channel count. This solution offers the same acquisition, recording and analysis capabilities as 3-Series analyzers on wider scale applications.

Generators

For exciting a large structure, up to 6 shakers can receive signals from the generator outputs of the analyzer. In order to fit the wide range of potential cases, a large series of excitation signals such as swept sine, chirp, random, can be simultaneously generated. Any input can be set as the reference which generates a multiple reference FRF and cross spectrum matrix.
Modal

Now an affordable modal software providing a comprehensive package for modal experts as well as novice engineers.

Modal, the Structural Dynamics Module, is an application-oriented software solution utilizing the most powerful analysis techniques with user friendly and intuitive interfaces and automatic procedures.

Geometry Building

Interactive interface to create, modify and assemble standard elements or complex structures with global and local coordinate systems. Import data from external software in universal file format and .iges

Direct Acquisition & Signal Processing

Dedicated interface for modal acquisition with impact hammer, shakers or under operational conditions to obtain:
- FRF H1, FRF H2 for EMA
- Power Spectral Density, Half Power Spectral Density for OMA

ODS

In time and frequency domain

EMA
SIMO & MIMO
Identification methods

OMA
Narrow Band and Broadband identification for responses only measurement

Focus on Broadband method to identify all the modes in a broad frequency band in one time with a high accuracy

Validation
MAC & COMAC to compare modal parameters from different methods. Compatible with external results from experiment and simulation

Correlation and Model Updating

with FEMtools from DDS
- Structural static and dynamics simulation
- Pre-test and correlation
- Model updating and optimization

Advanced Swept Sine (A2S)

Frequency Response determination is commonly used in various industries for:
- Servo Control: steppers, machine tools, guiding systems
- Structural Dynamics: accurate FRF for modal acquisition with excellent mode separation and non linear structure
- Acoustics: absorption materials, audio systems
- Electronics: filters, amplifiers
- Accelerometers calibration

A2S provides the most adapted answer to these requests. Compared to the standard functions included in a FFT analyzer, A2S dramatically surpasses the capabilities of a random or swept sine excitation coupled with a peak hold FFT, offering:
- Up to 80,000 points
- Fine control of excitation level: control on excitation output or reference or response input with a constant or frequency dependant level
- Boosted mode: dramatically reduces the measurement time with the same accuracy
Acoustics Analysis
From Octave to Sound Power

OROS 3-Series portable analyzers provide accurate and comprehensive results from noise phenomena. Acoustic analysis can be performed simultaneously with other signal processing such as FFT, recorder, or order tracking.

1/n Octave Analysis
Acoustic signature and investigation require the use of appropriate analysis methods. The 1/n Octave plug-in computes levels using constant percentage band filters.

- It complies with the IEC 61260 standard. Noise signals can be analyzed real-time by the system up to 40 kHz, making it a highly flexible acoustic analyzer.
- 1, 1/3rd, 1/12th, 1/24th octave
- Mask, Min/Max live overlay
- Dedicated DSP processing
- Complies with IEC 61260 and IEC 60804
- A,C weighting filters and other common ISO standards
- Fast, slow, impulse time filtering
- Leq, Short Leq, User Leq, Constant BT
- 1/n Octave Waterfall with profile extraction by band

Overall Acoustics: Levels & Profiles
The OVA plug-in, a multichannel sound level meter, extends the analyzers capabilities to a comprehensive acoustic measurement system.

- Complies with the latest standards such as IEC 61672
- Runs 3 RMS and a true peak detector/channel
- Time filtering and weighting
- User selectable 3rd order 10 Hz high pass
- Long duration profile memory (100,000 points/channel)

Sound Quality: Psychoacoustics & Sound Design
The Sound Quality software module is the ideal tool for psychoacoustic metrics determination and filtered playback.

- Accurate and standardized psychoacoustic metrics determination
- Loudness according to Zwicker ISO 532B, sharpness
- Tonality indicators: tone to noise, prominence ratio
- Modulated sound metrics: fluctuation strength, roughness
- Articulation index
- Sound filtering and sound design capabilities
- Interactive filtering: frequency & order based
- Playlist management for fast & easy comparison
- Embedded platform data management: direct compatibility with the OROS range
Sound Power Determination with Sound Pressure Level Measurement

The Sound Power software provides sound power determination in free field environments. It is ideal for test bench: indoor (laboratory anechoic environments) or outdoor.

- Fulfills main international standards for free field environments: ISO 374x
- Dedicated interface for easy and repeatable operation
- All microphone positions measured at once
- Overall and Spectra real-time display
- Type-1 precision results in dBA
- Direct Sound Power determination
- Automatic standard validity check
- Background and environmental corrections
- Repeatability and directivity checks
- Test report with Microsoft Excel

Sound Power Determination with Sound Intensity Measurement

The Sound Intensity software provides Sound Power determination following the point-by-point testing (ISO9614-1) or the scanning procedure (ISO9614-2). It is ideal for tests in the field.

- Real time sound intensity spectrum
- Provide guidance for complying with ISO 9614-1&2
- Field criteria and indicators calculation
- Automatic sound power report
- Calibration module for phase calibration and pressure-residual intensity index.
- Probe remote control management

Sound Mapping and Source Localization

- 2D & 3D sound intensity mapping
- Levels and spectra selectable by segment
- Narrow band, octave, and 1/3 octave
- Guided acquisition procedure
- Multiple measurement surfaces creation
- Multifrequency views
- Probe remote control management
- Picture overlay
Responsiveness is the key to offer the best level of services. OROS relies on a powerful network of subsidiaries, offices, resellers, maintenance centers and qualified partners. They are the first steps of efficiency.  
Our services philosophy: OROS customers should not have to wait for an answer. Our expertise is at their disposal - anywhere, anytime.

**Training**

Experts from OROS offer **theoretical and applied training sessions on noise and vibration.** Our trainings are defined with you according to your needs: content is either initial or advanced depending on your level and skills. Our objective is to be beside you all along the use of your system to **maximize your profitability and efficiency.** We come **on-site for applied trainings.** We will help you using your OROS equipment. We also propose **remote internet training sessions** delivered from OROS offices.

**Customization**

To go beyond the regular uses, we are able to answer **specific requirements and adapt to your specifications.** We customize, either the instrument or the software. We imagine and find the best solution with you.

**Automation Tools**

Large panel of tools for automation that make your test go faster. Macros and sequences are very powerful tools to create automatic procedures.

**Integration**

NVDrive allows you to implement your own solution. From a simple add-on to complete test benches, build your program that drives and gets results from OROS 3-Series analyzers. Whatever your need of customization, OROS experts provide the right solution: simple support to your development team or full project management.

**Renting**

Based on a range of modular instruments, from 6 to 32 channels, the OROS Teamwork technology enables to cascade or distribute the analyzers to measure up to 1000 channels. Instruments, conditioners and software licenses are exchangeable and flexible.

The OROS Customer Care department is at your disposal to propose rentals of instruments and/or software modules to help you in your **fleet management.**

**Hardware:** increase capacity and power of your instruments.

**Software:** try other OROS software modules according to your applications or rent any additional function temporarily.

**They trust Oros**

> “We need to expand our capabilities up to 100 channels about once a year. The analyzer’s rental program is very convenient for us. Moreover with onsite assistance from OROS experts we can quickly setup and secure our measurements.”

Harry DUSSELMAN, 45
NVH Engineer,
Passenger Car Business Unit.
Coaching

Assistance in your measurements
When resources are not available (lack of resources, of skills, of systems), we propose assistance in measurement going on-site. We may manage the entire process of your tests and measurements up to reports. We optimize your measurement process depending on your application and field requirements. We may also integrate your team and deliver knowledge to them.

Expertise in diagnostics
We can even perform the measurement for you: on-site diagnostics or prototype characterization.

Premium Contracts

1, 2 or 4 years renewable contracts (in addition to the 1 year included warranty)
- Satisfied or exchanged*
- Hotline (Help-desk support)
- Full coverage of your analyzer and its options
- Guaranteed turn around time (4 days) for hardware repairs and calibration
- Loan of a replacement instrument (same range or higher) in case of delay overdue
- Access to your personal myOROS section to download software updates
- Calibration reminders
- Priority processing in maintenance center facilities

* during the first 3 months

Additional Services
- Privileged access to extended services at a preferential rate: urgent loan within 1 day,…
- Software Updates: Additional modules, Latest version releases, Additional licenses
- Hardware Upgrades: Channels, DSPs, Accessories
- Calibration: NFX07-011 compliant
- Diagnosis and Repair

The OROS Services Department

Paying the greatest attention to our customers’ satisfaction, OROS devotes a dedicated department, the Services Department, to ensure the best use of our technology. The dynamic and responsive team closely works with all the OROS experts: technical, R&D, manufacturing, marketing and sales.

Global Accredited Maintenance Centers

With a worldwide coverage (China, Europe, India, Japan, Saudi Arabia, South Korea, USA), OROS is in close proximity to its customers, reducing maintenance downtime. Technicians are certified on a regular basis by OROS specialists, enabling them to repair, calibrate and upgrade all OROS systems.

They trust Oros

- “With all new software release available and a reduce turnaround time for hardware maintenance and calibration, the OROS Serenity contract is all what we expect. We optimize the availability and the functions of our system.”

Michio ASANO, 36
Vibration, Environmental & Measurement Manager,
Delivery Division.
## General Specifications

### Instruments

<table>
<thead>
<tr>
<th>Feature</th>
<th>OR34</th>
<th>OR35</th>
<th>OR36</th>
<th>Mobi-Pack™</th>
<th>OR38</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front end</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic inputs</td>
<td>2/4</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Universal inputs (DYN/DC)</td>
<td>-</td>
<td>4/8</td>
<td>4/8/12/16</td>
<td>4/8/12/16</td>
<td>8/16/24/32</td>
</tr>
<tr>
<td>Connections</td>
<td>BNC</td>
<td>BNC</td>
<td>BNC</td>
<td>BNC</td>
<td>BNC</td>
</tr>
<tr>
<td>Type</td>
<td>Dynamic</td>
<td>Dynamic</td>
<td>Universal</td>
<td>Universal</td>
<td>Universal</td>
</tr>
<tr>
<td>Ext. Sync (Triggers/Tach)</td>
<td>2</td>
<td>2</td>
<td>2 (+4*)</td>
<td>2 (+4*)</td>
<td>2 (+4*)</td>
</tr>
<tr>
<td>Outputs</td>
<td>1</td>
<td>2</td>
<td>2 (+4*)</td>
<td>2 (+4*)</td>
<td>2 (+4*)</td>
</tr>
<tr>
<td>Auxiliary DC channels*</td>
<td>-</td>
<td>-</td>
<td>2/4</td>
<td>2/4</td>
<td>2/4</td>
</tr>
</tbody>
</table>

### Inputs

- **Sampling**: 2 kHz to 66.536 kHz/s or 102.4 kHz/s - 24 bits sigma delta ADC.
- **Accuracy**: Phase ±0.02° - amplitude ±0.02 dB - Dynamic > 140 dB.
- **Conditioning**: AC/DC/ICP®/TEDS/Float - ±17 mV to ±10 V.
- **Xpod slots**: 1 or 2*.
- **Filtering**: High/Low Pass - Stop/Pass band - Integrator (simple/double) - Differentiator - A/C/Z.

### Auxiliaries

- **Outputs**: DC to 40 kHz - ±10 V range - 24 bits DACs - THD < 0.002%.
- **Ext. sync (Trigger / Tach)**: 64 x over sampled - Resolution < 160 ns (± 1 kHz) - ±40 V range (±10 V on OR34).
- **DC channels***: Sampling 10 Hz - 50 Hz/60 Hz rejection - reproducibility < 1 mV.

### System

<table>
<thead>
<tr>
<th>Feature</th>
<th>OR34</th>
<th>OR35</th>
<th>OR36</th>
<th>Mobi-Pack™</th>
<th>OR38</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard disk</strong></td>
<td>-</td>
<td>64 GB Internal SSD</td>
<td>128 GB removable SSD - USB 3.0</td>
<td>128 GB removable SSD - USB 3.0</td>
<td>128 GB removable SSD - USB 3.0</td>
</tr>
<tr>
<td><strong>Processors (DSP)</strong></td>
<td>1</td>
<td>1 or 2* - Force</td>
<td>1 to 4* - Force</td>
<td>1 to 4* - Force</td>
<td>1 to 8* - Force</td>
</tr>
<tr>
<td><strong>Autonomy</strong></td>
<td>15 min</td>
<td>3 h</td>
<td>2 h</td>
<td>2 h</td>
<td>2 h</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>AC (100 V to 240 V) / DC (10 V to 28 V), Mobi-Pack is AC only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PC link</strong></td>
<td>100 Mbps Ethernet</td>
<td>1 Gbps Ethernet / LAN / WAN / Wi-Fi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1.4 kg/3 lbs</td>
<td>3 kg/6.6 lbs</td>
<td>5.2 kg/11.5 lbs</td>
<td>10 kg/22 lbs with power supply</td>
<td>8.2 kg / 18 lbs</td>
</tr>
<tr>
<td><strong>Dimensions mm</strong></td>
<td>163 x 54 x 215</td>
<td>310 x 58 x 245</td>
<td>114 x 280 x 325</td>
<td>410 x 180 x 360</td>
<td>114 x 400 x 325</td>
</tr>
<tr>
<td><strong>Dimensions inches</strong></td>
<td>6.4” x 2.1” x 8.4”</td>
<td>12.7/32” in x 2 9/32” in x 9 21/32” in</td>
<td>4 1/2” in x 11 1/32” in</td>
<td>16.15” x 7” x 14”</td>
<td>4 1/2” in x 19 3/4” in x 12 25/32” in</td>
</tr>
</tbody>
</table>

### Large Channel Count Systems

- **Channels**: Max channels: 1000+ - Matching; Phase: 0.2° @ 20 kHz, Amplitude: < ±0.1 dB.
- **Connections**: 1 Gbps Ethernet network (analysis/monitoring).
- **Operations**: Up to 40 kHz analyses and recording - local disk storage.

### Distributed systems

- **Size**: 2 to 16 units.
- **Accuracy**: Between units: ± 0.2° @ 20 kHz - ± 0.02 dB.
- **Network**: Daisy chain - 1 Gbps/3 Ethernet – Switchless – 100 m/branch.

### Accessories

- **CAN bus interface (CAN)**
  - **Type**: CAN Bus Hi-Z, probe and interface.
  - **Standards**: CAN 2.0A & 2.0B - 125 kHz/s to 500 Mb/s - J1939 compliant.
  - **Probe**: Hi-Z Sub D 15 - 1.5 m and 5 m cables - Analyzer or Bus powered.
  - **Capacity**: 24 ch - 10 Hz refresh rate - synchronous with dynamic analyses.

- **Strain gauges (S XPod)**
  - **Type**: Dynamic Wheatstone bridges conditioner extension module for OR36 and OR38.
  - **Bridge type**: Full, Half, Quarter bridge - 120 Ω, 350 Ω built in completion resistors.
  - **Inputs**: 8 dynamics (40 kHz) inputs - ±1 V and ±100 mV range, DC/AC coupling.
  - **Excitation**: continuous 0 to 10 V - 30 mA (0 to 4 V) / 12 mA (4 to 10 V) - Automatic balances.

- **Temperature (T XPod)**
  - **Type**: Parametric thermocouples and RTDs conditioner extension module for OR36 and OR38.
  - **Thermocouple**: J, K, T, N, E; Integrated cold compensation and linearization.
  - **RTDs**: PT100 to ± 40 V range (±10 V on OR34).
  - **Range**: -210°C to +1300°C; accuracy < 0.5% of full range.

Specifications not binding. OROS reserves its right to modify without notifications.
NVGate® (software base)

Graphics

Graphical features
- Windows management: 1 to 16 Layouts - 1 to 32 windows/layout - automatic windows generation on channels activation - linked cursors between windows
- Trace management: Multitrace - Multigraph - Magnitude gathering - Memorization - saved/on-line trace overlay
- Zoom & Translation: Mouse driven X, Y or Z translation - Area/axis zoom - Adjustable X, Y, Z scale
- Scale management: Lin, log or dB Y scale - RMS, Pk, Pk-Pk, EU2, PSD, ESD and PSD unit - Link cursors between windows
- Markers/cursors: Dual cursors with DxDy/Dz - peaks and max automatic detection (interpolated) - adjustable labels, sideband, harmonic, power band, period and kinematics markers

Displays type
- Time series: Triggered, weighted and filtered blocks - File overview / Zoom - XY (Lissajous)
- Narrow band: Magnitude - Phase - Bode - Imaginary & real part - Polar - 3D cascade
- 1/n Octave: 1, 3, 12 and 24 band/octave - linear and weighted overall levels
- Profiles: RPM - DC - Kurtosis - Orders - power band - overall - Time, RPM or DC X axis
- View meter: Digital - Magnitude/phase - Continuous with colored alarms
- 3D: Waterfall (narrow band - 1/n Octave) - color spectrograms - sonogram - orthogonal or isometric views - XY, Yref, order/freq extraction views - sections management

Data management

Project manager
- Setups: Load, save and recall workbook with: instrument setup, analysis setup, layouts, control panel, report setup - Generates models
- Measurements: Save selected results and raw data automatically - Direct recall of measurement setup - Recall, edit and save measurement views
- Projects: Project manager tree - filters (date, keyword, owner) - allows direct access to saved results - manage multiple project databases - import setups and measurement from files

Real-time analysis

<table>
<thead>
<tr>
<th>Performance per DSP</th>
<th>OR34</th>
<th>OR35, MP, OR36 and OR38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap free recording</td>
<td>4 ch 40 kHz</td>
<td>8 channels 40 kHz</td>
</tr>
<tr>
<td>Real-time FFT</td>
<td>4 ch 40 kHz, 401 lines</td>
<td>8 ch 40 kHz, 3201 lines</td>
</tr>
<tr>
<td>Synchronous order</td>
<td>4 ch 12000 RPM, 1/8th order max 100</td>
<td>8 ch 12000 RPM, 1/4th order max 100</td>
</tr>
<tr>
<td>Impedance</td>
<td>4 ch 25.6 kHz, 1/3rd Octave</td>
<td>8 ch 25.6 kHz, 1/3rd Octave</td>
</tr>
<tr>
<td>Time domain analysis</td>
<td>4 ch 20 kHz</td>
<td>8 ch 25.6 kHz, 4 ch 40 kHz</td>
</tr>
<tr>
<td>Sound level meter</td>
<td>4 ch 25.6 kHz - 3 detectors + peak/ch</td>
<td>8 ch 40 kHz - 3 detectors + peak/ch</td>
</tr>
</tbody>
</table>

I/O functions

Tachs / keyphasor
- Sources: Pulses detection from ext, sync or inputs - virtual (compute gear ratio), DC level
- Number: 4 tachs from input - 2 to 6 ext. tach - 4 fractional tach - 4 DC tachometers
- Settings: Adjustable Signal filtering - pre-divider 2 to 1024 - averaging - pulse/rev
- Frequency to voltage converter (option): 152 ns resolution - 1 to 4096 pulse/rev - integrator and differentiator filter - smoother - 12 000 RPM max with 200 pulse/rev - up to 6 inputs fractional Missing teeth management
- Math combined tachometer (option): RPM computation from 2 tachs - Editor with +/-, /, log, exp, power, sqrt and trigonometrical operators - Ideal for Continuously Variable Transmission
- Angular sampling: 2 to 2048 pulse/rev - Decorrelated analysis resolution

Triggers
- Edge: From input or ext, sync - Adjustable threshold, Slope, Hold off, Hysteresis, pre and post-divider
- Level & delta level: From input DC, RMS, Kurtosis pk, crest Factor or DC channel - Adjustable start, stop, delta levels and slope
- RPM & delta RPM: From any tach - adjustable start, stop, delta RPM and slope - Interpolation
- Miscellaneous: Manual - time period (2) - Combination (and, or, before) - generators steps, stabilization and burst - result availability from every plug-in

Generators
- Pure tone: 2 independent fixed sine - 1 to 6 correlated fixed sine with sweep transition - amplitude and phase adjustable
- Noise: 4 uncorrelated random (white/pink) - 4 independent multisine - 2 chirp - Adjustable bandwidth, filtering, amplitude, phase, resolution and burst
- Sweep sine: 1 to 6 simultaneous outputs - phase and amplitude offset - adjustable sweep speed (in log), cycles, steps, frequency span and settling time
- Play-back: File (recorded/imported) - Inputs - Simultaneous with real-time analysis

Compatibility

Automation
- Macros: Automate any NVGate® operation - Graphical editor - Records user operations - Algorithmic instructions - Interactive query management - Sub procedures - Debug/log window
- Mask & Alarms: Mask editor for spectra (freq/order), profiles and 1/nth oct - Dual mask (min/max) - Mask crossing alarms - Link to macro
- Sequencer: imports acquisition setup sequences from Excel® - Sequence navigator (replay, jump to, pause) - Sequence editor (control applied settings)
- NVDrive®: TCP/IP language for control/command of NVGate® - Modifies setup - Collects data - injects result - Operates on-line and office modes - Operates locally or through LAN/WAN

Import / Export
- Signal import (time series): OROS wav - Audio wav (with frequency conversion) - UFF (S8, S16) - Ttxt
- Result import (others): AZ - TXT - Excel® (mask)
- Export: UFF - TXT - TDEF - Matlab® - Audio wav - OROS wav - ATFX (ASAM)
- Report: MS Word® - Excel® - Copy/paste WMF - on-line data refresh
Standard plug-ins

Recorder
- Bandwidths: 4 independent bandwidths/record - 0.8 Hz to 40 kHz - Records DC channels at low rate - Records ext. synch at over sampled resolution - Compressed (16 bits) or native (32 bits) formats - Throughput max: 15 MB/s (38 ch. x 40 kHz)
- Tracks: Up to 128 tracks - Files can be divided by tracks and/or duration
- Modes: Start to time - Start to stop - Time to stop (up to 2 GSamples) - Records on PC or on local disc - Multiple records on one file

Player
- Modes: Playback on outputs - Post-analysis - Repeat mode
- Tracks update: Sensibilities - Units - Labels - Adjustable duration and start offset

Monitor
- Sources: 4 channels - Hot plug of any input (do not stop real-time analysis/recording) - Dedicated DSP
- Fixed setup: 401 lines - Hanning window - Spectral domain exponential averaging
- Detectors: Adjustable band-pass filter with by-pass - Adjustable averaging duration - DC, RMS, Min, Max, Pk, Pk-Pk, Crest factor and Kurtosis detectors

Waterfall
- Stacks results from Monitor (detectors) - FFT (power band, time, spectra, FRFs) - CBT and SOA (Orders, order spectra) - 1/n Oct (instantaneous, max & min hold, averaged CPB spectra) - OVA (Leq, short Leq) - TDA levels (DC, RMS, Min, Max, Pk, Pk-Pk, Crest factor, Kurtosis)
- Acquisition modes: One shot or continuous scrolling - Synchronized on any event or result availability - 1 to 100,000 slices - On-line 3D & color map displays

Optional plug-ins

The following plug-ins are optional. They can be ordered in addition to the chosen analyzer pack.

Narrow band spectra (FFT)
- Bandwidths / Resolution: DC to 40 kHz - 101 to 25601 lines - Simultaneous FFT Zoom (x 128)
- Averaging: Time (STA), Spectral or FDSA domains - Overlap (0 – 99.9%) - Linear, exponential, peak hold and ref peak hold modes
- Weighting window: Hanning - Hamming - Kaiser Bessel - Uniform - User define
- Filters: HP, LP, BP, BS, Integrator (simple and double) - Differentiator A and C laws - Independent on any channels
- Cross functions: Cross spectra - FFT HT H & H2 - Coherence - Zoomed results - Full matrix (32 x 32) of cross functions available simultaneously
- Capacity: 8 or 128 channels plug-ins - Up to 4 FFT plug-ins with independent setups
- Others: Adjustable band power tracking

Constant band order tracking (CBT) FFT Add-on
- Tracked orders: 1 to 6 independent orders tracked per channels - Adjustible frequency span
- Tachometer: Any valid tachometer (ext. sync, inputs, virtual) - adjustable start, stop, delta RPM and slope - Interpolation
- Capacity: Same as FFT
- Others: Order extraction centered on nearest peak - cross phase tracking

FFT-Diag Add-on
- Levels: DC - Min/max - RMS - Peak - Peak to peak - Crest factor - Kurtosis - Time domain extraction
- Correlation: Auto and cross correlation between any channels - instantaneous and averaged results - centered and left zero padding weighting windows
- Demodulation: Envelope demodulation signal - Simultaneously with spectra, zoomed spectra and envelope spectra
- Shaft-view: Unwrapped signal view along shaft profile - polar cursors - direct angle reading
- Cepstrum: Frequency harmonics reducer, quefrencis and time axis
- Kinematic markers: Excel or csv based

Synchronous order analysis (SOA)
- Type: Time domain re-sampling and interpolation function of tachometer
- Span / Resolution: Max order 6.25 to 800 - 1 to 1/32 order resolution
- Tracked orders: 1 to 6 independent orders tracked per channels
- Tachometer: Any valid tachometer (ext. sync, inputs, virtual) - fractional, DC, Maths
- Averaging: Angular or order domain - linear, exponential, peak hold and ref peak hold modes
- Overlap: 1 to 31 rev - % of rev - phase correction to keyphasor reference
- Multiple pulse/rev: 1 to 1024 - spectrum at each new pulse - phase correction to keyphasor reference
- Weighting windows: Hanning - Hamming - Kaiser Bessel - Uniform
- Filters: HP, LP, BP, BS, integrator (simple and double) - Differentiator A and C laws - Independent on any channels
- Capacity: 8 or 128 channels plug-ins - 1 or 2 SOA plug-ins with independent setups and tachometer
- Others: Adjustable band (order) power tracking - cross phase tracking - independent phase shift (e.g. ± 720°) per channel - angular sampling

Time domain analysis (TDA)
- Type: Statistical extraction and view on time series
- Levels: Real-time DC, RMS, min/max, kurtosis, peak, peak-to-peak and crest factor view meters and profiles
- Signal view: Time base and duration independent on each channels - 320 ms to 110 hrs - relative or absolute time
- Bandwidths: Adjustable from DC to 40 kHz
- Filtering: HP, LP, BP, BS, Integrator (simple and double) - Differentiator A and C laws - Independent on any channels
- Averaging: Exponential, linear, repeated linear, repeated on trigger
- Capacity: 8 to 128 channels

Specifications not binding. OROS reserves its right to modify without notifications.
Applications Software Modules

Modal

- Geometry builder - import in UFF and IGES
- Data import/export UFF and Excel compatibility
- Impact hammer acquisition Sequence - FRF, HT/H2, coherence - force/response window - double impact rejection - manual accept/reject
- Shakers acquisition Multielexcitation - sin/random/chirp excitation - hanning window
- Modal indicator Function Based on Singular Value Decomposition - available in ODS, EMA and OMA modules
- Stability diagram Automatic detection of structural modes
- ODS In time and frequency domain
- EMA SIMO method Based on Rational Fraction Polynomial formulation of transfer function
- EMA MIMO 1 method Based on Frequency Domain Poly-Reference algorithm (FDPR)
- EMA/OMA broadband method Based on Polyreference Least Squares Complex Frequency algorithm (p-LSCF)
- Validation Modal Assurance Criterion

Advanced Swept Sine (A2S)

- Frequency range From 0.01 Hz to 40 kHz, in 1 to 8 spans
- Frequency resolution Continuous sweep up to 80 000 points
- Control Automatic control and limiting of generator output level at input or output of the system under test
- Boosted mode To speed up the measurement
- Results Frequency response, coherence, spectrum

EngineDiag

- Marine settings Delivered power, nominal speed, configuration: Inline or Vee, the cycle : 2-stroke or 4 stroke, number of cylinders, firing order
- Timing diagram Kinematic events and phases
- Instrumentation Tables associating input, input label, connected transducer and sensitivity
- Advisor List of rules depending on the Engine Model to set up NVGate automatically or manually
- Synchronous analysis results Triggered block on one machine cycles with cycle overview , triggered block aligned on a same kinematic event, RMS values calculated on the machine cycle and on the different phases of the cycle
- Angle-frequency analysis Wigner-Ville color spectrogram and extracted results : Energy spectrum & Instantaneous power
Applications Software Modules

ORBigate®

Multianalysis Real-time analysis, based on Synchronous Order Analysis (SOA and FFT) + raw signal recording.

Project & data Project, machine train and measurement management interface - Sensors set by angular steps of 1°

Inputs Proximity probes, velocity pick up, accelerometers - Coupling: AC, DC, AC Float, DC Float, ICP®. Up to +/- 40V

Tachs Direct or indirect coupling (1 or 2 shafts per machine trains): simultaneous phase extraction

Overview grid GAP V, GAP Overall, Amplitude & Phase vectors: 1X, 2X, 3X, customizable nk from Subharmonic to 100X Sub1X, Smax

Displays Full Shaft Motion (shaft centerline, clearance and orbit), shaft centerline, overall orbit (up to 512 points), nx filtered orbit, Blode & polar plot, trend (relative or absolute time x-axis), order and frequency spectrum, half and full spectro, waterfall & cascade, time domain signal, shaft view, rotating speed profile

Alarms Trigger action on level above/below scalar values (on any channels), rotating speed, date and time

Sampling type Delta time, Delta RPM, Delta RPM + Delta time, free run

Modes Acquisition, post-analysis & navigation - on-line (connected to analyzer) or office (PC only) operation

GAP reference Reference determination when shaft at bottom or at center

Run-out Vector run-out correction (complex spectrum correction) at slow roll

Reporting Report batch generation and printing with Microsoft Word or Excel: graphics & legends Data export to ASCII and Microsoft Excel.

Single & Dual Balancing

Procedure 1 or 2 plane balancing for rigid rotor, trial weight method at steady state (not necessarily operating speed), trim balance

Analysis 1X amplitude and phase determination: based on Synchronous Order Analysis (SOA) Accuracy ± 0.02dB, ± 0.02°

Inputs 1 or 2 sensors per plane. Proximity probes, velocimeters, accelerometers. Coupling: AC, DC, AC Float, DC Float, ICP®. Up to ± 40V

Correction Adding/retrieving weight, splitted correction weights on defined positions

Residual unbalance ISO 1940-1 admissible residual unbalance determination at operating speed, residual unbalance prognostic

Displays Real-time polar diagram, correction display & correction chart

Report Overview balancing report

Multiplane Balancing

Machines Up to 14 balancing planes

Data Based on 1X data (Amplitude & Phase): Run-up, steady-state or shut-down

Calculations Carried out in office mode with multiple speeds selection

Displays Rotating speed profile (RPM vs time), 1X: Amplitude, Phase, Polar

Correction Adding/retrieving weight, splitted correction weights on defined positions

Features Residual unbalance prognostic as a function of RPM

Report Overview balancing report

Sound Intensity

Sound Power ISO 9614-1 point by point method, ISO 9614-2 scanning method, flowchart for criteria validation

Sequencing Measurement sequence management - Sound intensity probe remote control (start, stop, pause, save) multispace management

Calibration Pressure and phase calibration and correction

Instrument standard PRI (Pressure Residual Intensity) determination according to IEC 1043

Display Real-time octave & 1/3 Octave, FFT narrow-band analysis (sound pressure & intensity)

Sound Mapping Pressure & intensity mapping, 2D or 3D, Isolevel plots & picture overlay in 2D

Reporting Sound power reporting

Sound Power

Method Sound power determination based on sound pressure - Free field conditions

Overall level dB and dBA overall level up to 20 kHz, complies with IEC 60-672 - Delivers class 1 results

Standards ISO 3743, ISO 3744, ISO 3745, ISO 704

Positions Up to 24 simultaneous microphone positions

K1 Background correction Background noise measurement, manual

K2 Reverberation correction Reference source, RT60 based, approached method, manual

Tests Standard conformity, repeatability test

Report Automatic, customizable Excel report template

Sound Quality

Loudness According to ISO 532B, scalar and scalar profiles

Sharpness Scalar Profiles

Modulated sound metrics Fluctuation strength [scalar profiles], Roughness (scalar profiles)

Totality Prominence Ratio (Scalar), Tone to Noise ratio (Scalar)

Articulation index Scalar Profiles

Display 2D filtered color spectrogram versus frequency, time

2D RPM versus time profile

Zoom & scaling (frequency, time, amplitude, color scaling)

Filters Graphical and numerical design of IR filters: combination of up to 20 individual filters

Frequency and order equalization, Low/High/Band pass, Band stop

Display of transfer functions

Magnitude, phase, group delay for individual filters and filters combinations

Specifications not binding. OROS reserves its right to modify without notifications.
Go Ahead…

OROS Representatives
OROS relies on a worldwide network of authorized representatives. OROS products and services are marketed worldwide in more than 35 countries. Our representatives are carefully selected for their knowledge and expertise in noise and vibration analysis. They are regularly trained and updated on OROS products.

> Find your local reseller on www.oros.com

OROS Accredited Maintenance Centers
With worldwide coverage, our Maintenance Centers provide close proximity to our customers. Technicians are certified on a regular basis by the OROS specialists.

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>China, Beijing</td>
<td>TS-Tech</td>
<td>Tel. +86.10.823.66.086 Email: <a href="mailto:oros_support@ts-tech.com.cn">oros_support@ts-tech.com.cn</a></td>
</tr>
<tr>
<td>India, Mumbai</td>
<td>AMIL Limited</td>
<td>Tel. +91.22.391.835.64/65/68 Email: <a href="mailto:orossupport@aimil.com">orossupport@aimil.com</a></td>
</tr>
<tr>
<td>South Korea, Seoul</td>
<td>MIRAE ENSYS</td>
<td>Tel. +82.2.6409.2690 Email: <a href="mailto:support@mirae-ensys.com">support@mirae-ensys.com</a></td>
</tr>
<tr>
<td>Saudi Arabia, Dammam</td>
<td>RIGZONE Engineering</td>
<td>Tel. +966.3.8305.773 Email: <a href="mailto:ceo@rigzonegroup.com">ceo@rigzonegroup.com</a></td>
</tr>
<tr>
<td>Europe</td>
<td>OROS</td>
<td>Tel. +33.4.7690.5240 Email: <a href="mailto:customer.care@oros.com">customer.care@oros.com</a></td>
</tr>
<tr>
<td>Japan, Tokyo</td>
<td>TOYO Corporation</td>
<td>Tel. +81.3.3279.0771 Email: <a href="mailto:nvh@toyo.co.jp">nvh@toyo.co.jp</a></td>
</tr>
<tr>
<td>USA, Washington, DC</td>
<td>OROS Inc</td>
<td>Tel. +1.616.617.2566 Email: <a href="mailto:customer.care@oros.com">customer.care@oros.com</a></td>
</tr>
<tr>
<td>Germany, Koblenz</td>
<td>OROS GmbH</td>
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OROS Literature
Learn more on the OROS offer with our full range of documentation (markets’ brochures, datasheets, application notes, …)
The OROS literature is available on www.myOROS.com, in your personal section.
OROS Global Manufacturer and Solution Provider of Noise and Vibration Measurement Systems

OROS designs and manufactures noise and vibration testing systems (instruments, software and services) for more than 30 years, meeting the requirements and expectations of automotive, aerospace, marine energy & process, manufacturing and automation industries. French company with worldwide scope (80% of turnover with 2 subsidiaries, 6 offices, 8 maintenance centers and representatives in more than 35 countries), OROS is a dynamic company where innovation is at the heart of its strategy to offer a range of high-tech products and solutions.

OROS covers data acquisition, structural dynamics, acoustics and rotating applications as well as a range of related services.

OROS, Leadership through Innovation

About Us
OROS’ designs and manufacturing have been renowned for providing the best in noise and vibration analyzers as well as in specific application solutions.

Our Philosophy
Reliability and efficiency are your ambition everyday. We know you require the same for your measurement instruments: comprehensive solutions providing performance and assurance, designed to fit the challenges of your demanding world.

Our Emphasis
Continuously paying attention to your needs, OROS collaborates with a network of proven scientific affiliates to offer the latest of the technology, always based on innovation.