Noise & Vibration

Measurement and Analysis Solutions

Product Line

- Instruments
- Software
- Services

OROS

Portable Noise & Vibration Analyzers

OROS designs and manufactures Noise and Vibration Analyzers with software solutions for in-the-field usage as well as for measurements in test cells.

Market Oriented

Energy & Process

- Power Generation
- Oil & Gas
- Chemical
- Petrochemical

Marine

- Shipbuilding
- Propulsion

Aerospace

- Aero Engines
- Aircraft, Helicopter
- Components
- Defense Systems, Satellite

Ground Transportation

- Passenger Vehicle
- Heavy Vehicle
- Automotive Suppliers
- Rail

Made for the Field

- 2 to 32 channels
- Portable
- Rugged
- Real-time Analysis

Flexible

- Online & Post Analysis
- Signal Conditioning
- Multi-Analysis
- Remote Access
- PC Free Operation
- Cascadable, up to 300+ channels
- Customization

For Your Noise & Vibration Applications

The OROS software platform (NVGate) features:

- Recorder
- FFT
- Time Domain Analysis
- Monitoring

Rotating Analysis

- Constant Band Tracking
- Synchronous Order Analysis
- Envelope Demodulation
- Turbomachinery Analysis
- Torsion
- Balancing

Structural Analysis

- 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

Accurate

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

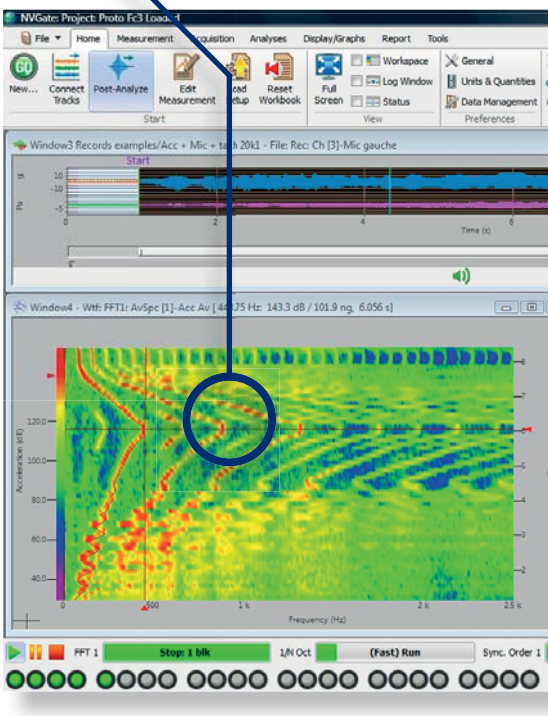
Services

- Dedicated Customer Care Department
- Expertise and Assistance
- Premium Contracts
- Training
- Hotline
- Maintenance, Calibration, Upgrades and Updates
- Customized Applications
- Worldwide Accredited Maintenance Centers

NVGate is the cornerstone for all measurement tasks. From field acquisition to reporting, it gathers the major measurements' steps in a unique interface. **It hosts all OROS software modules driving the 3-Series analyzers.**

Much More Than a Waterfall, a Powerful and Flexible Data Collection

- The Waterfall plug-in **collects and synchronizes** the analyzed data.
- **Performance**: up to **100,000 point profiles** and **fluid 3D displays** at any bandwidth or channel count.
- **Graphics**: data can be sorted according to different parameters (RPM, time, levels, …).
- The **section manager** extracts orders, overall, constant frequencies and spectra, including band power and automatic peak tracking.
- Multiple views (**3D, color map, section, profile**…) provide **parameter-linked cursors**.



Continuous Time Domain and Spectral Monitoring

Secured data acquisition requires careful control of the acquired signal prior to and during measurement.

- **Time Domain Analysis** provides live views of the front-end signals (from milliseconds to hours).
- **The Monitor continuously processes** any input to monitor the incoming signals spectra and statistics.
- **Both operate independently of the measurement status** (acquiring or stopped).

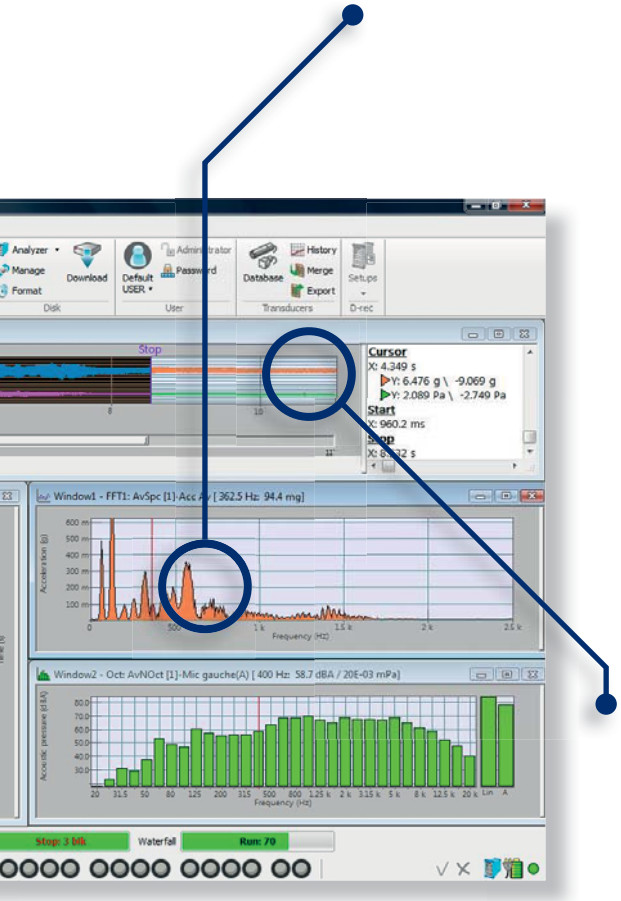
NVGate, a Measurement Dashboard at Your Fingertips

NVGate runs **on-line** or **in the office mode** (hardware connected or PC only), featuring the same interface for **field measurement, post-analysis** and **report generation**. User selected analysis modes (**plug-in analyzers**) operate independently allowing **true multi-analysis** capability: recorder, FFT, order, octave, time domain analyses. **Triggering functions** synchronize the analysis modes together and/or with external events.

Proven tools turn the PC in a powerful analyzer dashboard:

- The **customizable Control Panel** provides the user easy access to his preferred settings.
- Up to **16 layouts** are directly accessible, multiplying the available screen size.
- From **GBytes of raw data** to instantaneous spectrum, each result is efficiently displayed through **dedicated graphs**.

and Vibration Platform



Vision Interface

Narrow Band Spectral Analysis: State-of-the-Art FFT Analyzer!

With its powerful triggering, analysis and averaging modes the FFT plug-in provides a comprehensive set of results adapted for noise and vibration analysis.

Averaging

- Synchronous frequency, time and spectral domain
- Peak-hold, referenced peak-hold

Resolution

- 101 to 6401 lines
- Simultaneous 128 times zoom
- 800 mHz to 40 kHz bandwidths
- Up to 4 FFT per channel

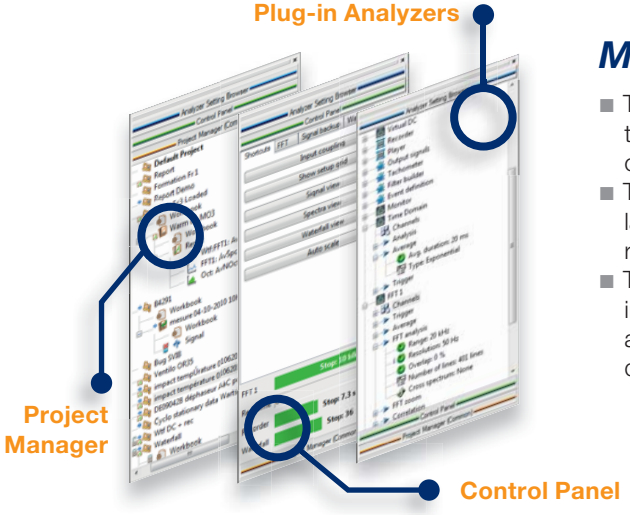
A wide set of results are available all along the signal processing:

- **Time domain** filtered signals, trigger and weighted blocks,
- **Spectra**: Instantaneous averaged and complex (auto-spectra, spectral density, …)
- **Multi reference cross functions**: Xspectra, coherence, FRFs

Recorder

OROS 3-Series systems provide an advanced recorder function. It allows saving and post-processing of raw signals.

- **Performance**: records all channels at highest sampling frequencies (102.4 kHz).
- **Parallel and synchronous recording and analysis**: allows the user to either monitor recordings or to keep a back-up of raw data.
- **Direct recording**: stand-alone, set up and record without a PC.
- **Transient capture**: advanced triggers (pre and post) and on-disk signal buffering (FIFO) reduces the amount of data recorded prior to the transient event.
- **File management**: allows waveform cuts, down sampling, channel selection and export to standard formats.



Measurement Management and Reporting

- The **Project Manager** gathers signals, measurements' results and the analyzer's set up parameters for easy referra on future projects or in the review of recorded data.
- The **Measurement Editor** formats the results into electronic reports labeled by markers and cursors. Measurements are then easy to recall and compare, even with live data.
- The **Reporter** refreshes graphs, data, settings, meta-data and tables into **MS Office documents**. A simple drag & drop makes the document a report template easily updatable with current or saved measurement data.

Rotating Analysis, from Acceptance Tests

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 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 hystersis. When a second gear shaft is not accessible, fractional tachometer computation allows you to calculate its rotating speed and related order analysis.

External Trigger Channels

- 2 tachometer inputs are standard (6 maximum)
- High sampling rate of 6.5 MHz (< 152 ns resolution) to allow a precise measurement of the phase.

Integrated Frequency to Voltage Converter

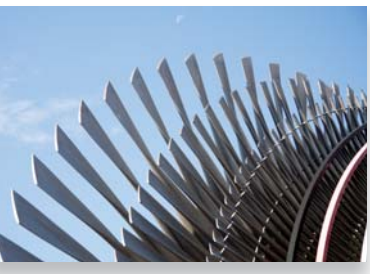
The torsional module utilizes an integrated software frequency to voltage converter based on the signals captured in the external synch inputs.

Tachometer Math Editor for CVT

Real-time calculation of the rotating speed of a Continuously Variable Transmission (CVT) custom formula based on 2 tachometer inputs.

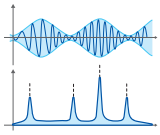
Computation of Gear Elements Rotating Speed

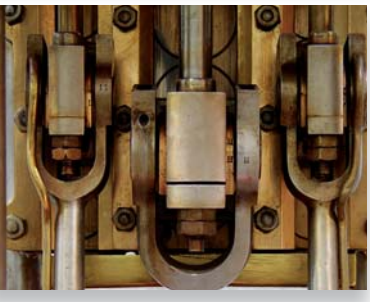
The fractional tachometer computes the speed and phase of the output shaft (based on one tachometer and the gear ratio).



Envelope Demodulation

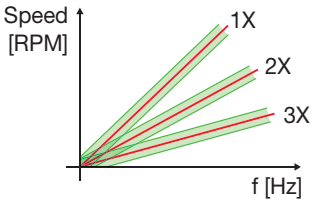
Damaged roller bearings are common sources of vibration. Their **vibration signal**, measured with an accelerometer, allows you to determine the mechanical failures of the bearing. Envelope demodulation, a part of FFT-Diag module, effectively provides this function.





Constant Band Tracking

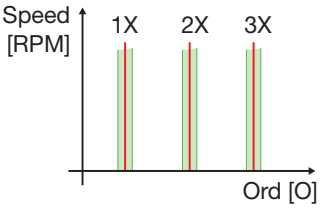
Gearboxes' generate modulated and often buried noise and vibration orders, which are not easy to extract. The CBT helps the user acquire these orders for his analysis.

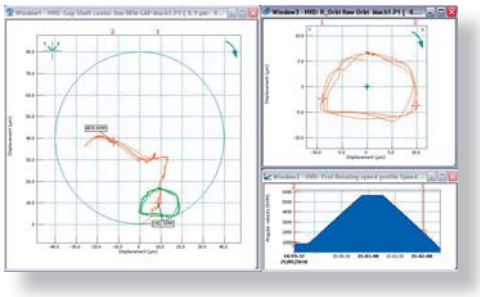


Synchronous Order Analysis

Order tracking is most often used when the rotor speed varies: transient analysis. Obtaining the correct results from run-up/down requires specific signal processing techniques. The software module uses a **resampled angular domain signal** as input data. It extracts complex orders (phase and amplitude) acquired from fast run-up/down.

- Up to 40 kHz real-time analysis, 1/32nd order resolution
- Order or angular domain averaging
- Max order display
- Simultaneous order analysis on 2 shafts
- Simultaneous order analysis on data recording

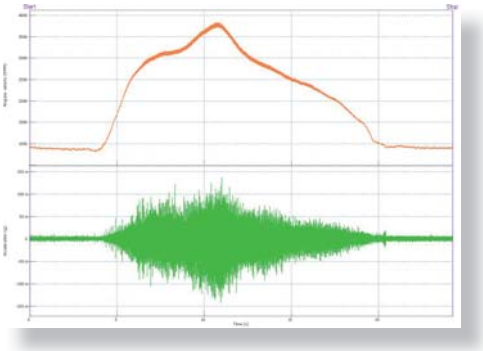




Turbomachinery Vibration: ORBIGate

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

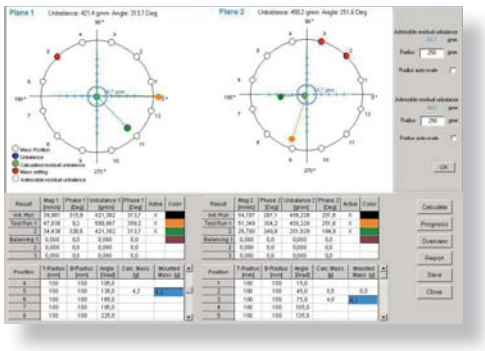
- **Tabular list: Gap voltage, Overall, nX** orders amplitude and phase (0.5X, **1X**, 2X, 3X, user defined), Sub1X, SMax
- **Orbits** (Overall and nX filtered)
- **Full Shaft Motion: Shaft centerline + clearance circle + orbits**
- **Bode, polar and trend** plots
- Spectrum, cascade and waterfall plots for advanced analysis
- Gap voltage reference
- **Slow roll vector** reference for run-out correction
- Raw time signal recording & display
- Real-time acquisition, post analysis (raw time based) and data navigation



Torsion

A Frequency to Voltage converter is integrated into the analyzer's software using the external synch channels as inputs. It is used for the measurement of torsional vibration and twist. The Instantaneous angular Velocity Converter (IVC) software option provides instantaneous angular velocity signal for the analysis plug-ins.

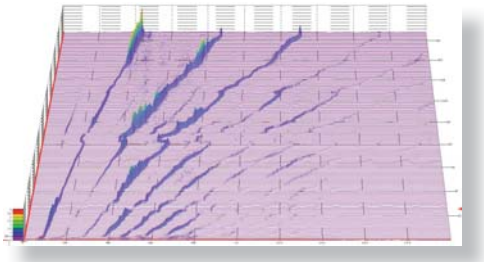
- **Integrated Frequency to Voltage converter**
- **Shaft View**: instantaneous angular signal for single or multiple revolutions
- **Cross Phase Tracking**: the cross-phase order by order between a reference channel and other speed signals. It is useful for the identification of torsional resonances at specific orders and the evaluation of their amplitudes



Balancing

OROS Balancing software is dedicated to rotor & shaft balancing. It assists the user during the test and the correction process:

- Balancing on 1 or 2 planes
- 1 or 2 sensors on each plane
- Synchronous Order Analysis based
- Trial mass method
- Balancing quality selection
- Correction position choice
- Balancing prognosis
- Trim balancing



Waterfall, the Synchronized Data Buffer

This specific plug-in collects and synchronizes all data coming from the analyzers data stack. Results are arranged based on a choice of references for the Z Axis (RPM, Time and levels) and represented in 3D or profile views. Identifying the critical analysis item, such as speed, is then much easier as its effects are seen in different dimensions: order, frequency, octave. The section manager of the waterfall plug-in feature orders, overall, constant frequencies and spectra extraction in one click.

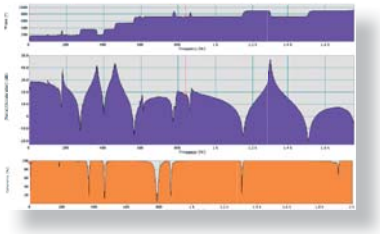
Structural Analysis, from Acquisition…

Structural analysis 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 analysis starts with good data. For that reason, all the tools for efficient and accurate acquisition have been integrated into our structural solutions.

Structural Acquisition With NVGate

With its dedicated structural mode, the **FFT plug-in** offers a comprehensive tool panel 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 validity checking
- Hammer **impact auto-range**
- Define the measurement sets in advance and use the node path **sequencer** to track all measurement points
- Export the FRF in **Universal File Format** and **MATLAB®** format

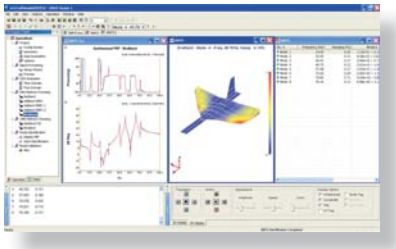


Generators

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 signal such as swept sine, chirp, random, etc. can be simultaneously generated**. Any channel can be set as the reference which generates a multiple reference FRF and cross spectrum matrix.

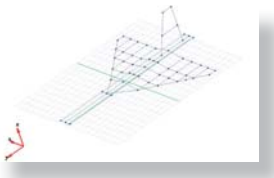
VibeMaster, Large Channel Count System

Large structures require a high number of input channels. With VibeMaster, **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.



OROS Modal 2 (OM2)

Now an affordable modal software providing a comprehensive package for modal experts as well as novice engineers. OROS Modal 2 is an application-oriented software solution utilizing the most powerful analysis techniques with user friendly and intuitive interfaces and automatic procedures.



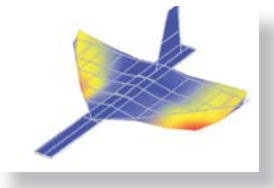
Geometry Building

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

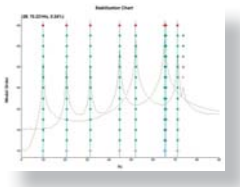
Dedicated interface for modal acquisition **with impact hammer, shakers** or under **operational conditions** to obtain:

- FRF H1, FRF H2 for EMA
- Power Spectral Density, Half Power Spectral Density for OMA



ODS

In **time** and **frequency** domain



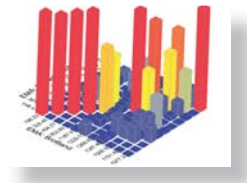
EMA

SIMO & MIMO identification methods

OMA

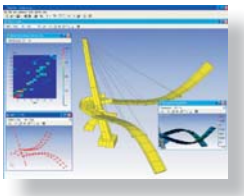
Narrow Band and Broadband identification for responses only measurement

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



Validation

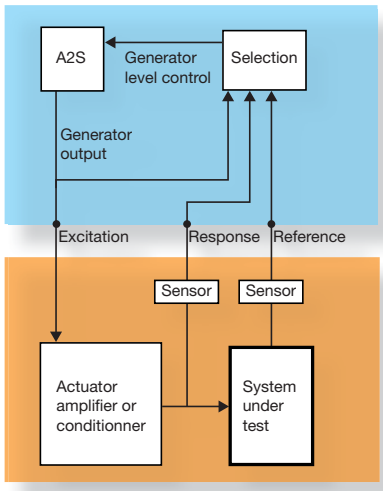
Modal Assurance Criterion to compare modal parameters from different methods. Compatible with external results from experiment and simulation



Compatibility

With FEMtools from Dynamic Design Solution

- Structural static and dynamics simulation
- Validation and updating of **FE models** for structural analysis
- Design optimization



Advanced Swept Sine (A2S)

Frequency Response determination is commonly used in various industries for:

- **Servo Control:** steppers, machine tools, guiding systems
- **Structure:** 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:

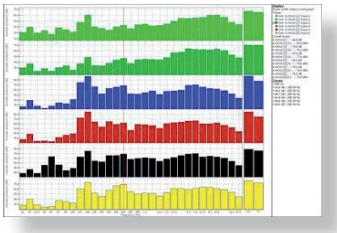
- Up to 80,000 points
- **Fine control of excitation level:** control on excitation output or reference or response input with a constant or frequency dependant level
- Boosted mode: **dramatically reduces the measurement time with the same accuracy**

Acoustics Analysis, from Octave...

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

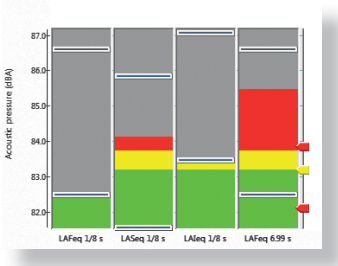
Acoustic signature and investigation require the use of appropriate analysis methods. The 1/n Octave plug-in computes levels using constant percentage band filters. It complies with the **IEC 61260 standard**. Noise signals can be analyzed real-time by the system up to 40 kHz, making it a highly flexible 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

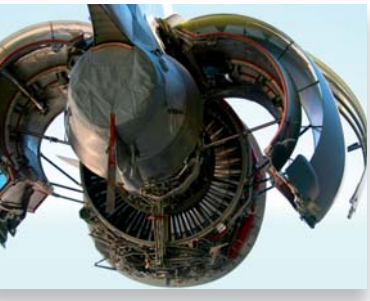
Overall Acoustics: Levels & Profiles

The OVA plug-in, a multi-channel 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)

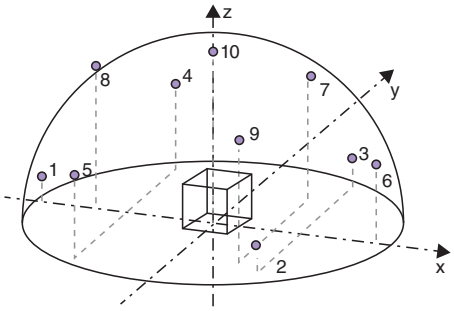
82.5 dBA



- **Classe 1 type instruments with built-in DSP processing**
- **International Standards compliance**
- **ICP® for prepolarized microphone connection**
- **200V polarization for externally polarized microphones**

Sound Pressure Level Measurement for Sound Power Determination

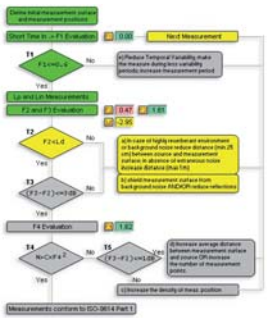
The Sound Power software provides sound power determination in free field environments. It is ideal for test bench: indoor (laboratory anechoic environments) or outdoor.



- 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 Intensity Measurement for Sound Power Determination

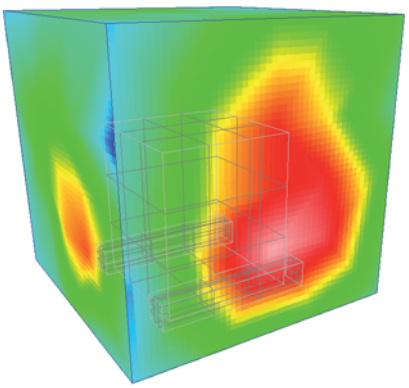
The Sound Intensity software provides Sound Power determination following the point-by-point testing (ISO9614-1) or the scanning procedure (ISO9614-2). It is ideal for tests in the field.

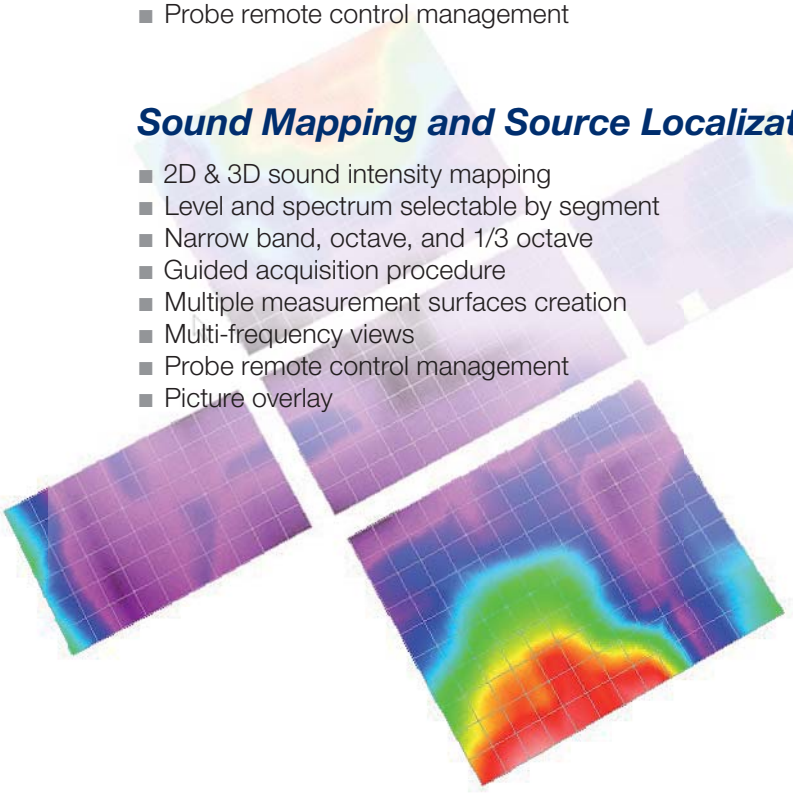


- Real time sound intensity spectrum
- Provide guidance for complying with ISO 9614-1&2
- Field criteria and indicators calculation
- Automatic sound power report
- Calibration module for phase calibration and pressure-residual intensity index.
- Probe remote control management

Sound Mapping and Source Localization

- 2D & 3D sound intensity mapping
- Level and spectrum selectable by segment
- Narrow band, octave, and 1/3 octave
- Guided acquisition procedure
- Multiple measurement surfaces creation
- Multi-frequency views
- Probe remote control management
- Picture overlay





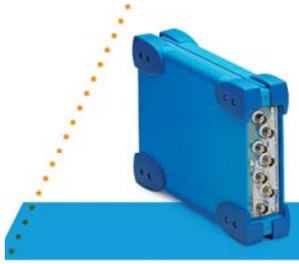
Made for the Field

Same Platform, Same Technology, Same Software

OR34
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 DSPs



OR35
The integrated multi-analyzer
(4, 6 or 8 inputs)

With up to 8 dynamic inputs, by 4 parametric ones, 2 tachometer and 2 generator channels, OR35 makes noise and vibration measurements faster and easier than ever.
OROS puts its wealth of experience designing analyzers for the field into this **mobile, powerful and complete unit.**

- Easy to carry 2.8 kgs (6 lbs)
- Internal battery (1 h 30 min)
- 2 trigger/tachometer inputs
- 2 independent generator outputs
- 4 parametric inputs (10 S/s)
- 1 or 2 computation DSPs

OR36 and OR38
The recorder/multi-analyzers
(4 to 32 inputs)

OR36 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.…

- Portable (5 kgs/11 lbs/ A4+)
- 4 to 16 universal inputs
- 1 to 4 computation DSPs

Additional Features
- 2 to 6 trigger/tachometer inputs
- 2 to 6 independent generator outputs
- +/-40 V on all inputs range
- Removable Mobi-Disk

2 **4** **8**

OR34-VibeShot
The Vibration Catcher

VibeShot is a version of OR34 specifically dedicated to real-time data acquisition and analysis
- Same hardware as OR34
- On-line FFT/recorder
- Upgradeable to regular OR34 software

OR34-VS targets bump test, roving impact hammer, order extraction, vibration monitoring and data collection.

Mobi-Pack
(4 to 16 inputs reinforced)

The Mobi-Pack is a reinforced version of the OR36. Installed in a super-strong carrying case, the Mobi-Pack has essentials of the OR36 plus a PC for running the OROS software modules.
- Same features as OR36
- All-in-one package
- Single cord power supply
- Suitable for touch-screen tablet PC

Mobi-Pack is the right choice for measurement in harsh environments (mud, oil, rain) without impacting the OROS instrument.

… With a comfortable computing power and their built-in Mobi-Disk, OR36 & OR38 faces any measurement situation. They offer the capability of an advanced laboratory instrument in a **modular, rugged and portable package.**

- Portable (8 kgs/18 lbs)
- 8 to 32 universal inputs
- 1 to 8 computation DSPs

- Stand alone recorder (D-rec capable)
- Internal battery
- Signal conditioner expander module (Xpod) compatible
- CAN bus interface

16 **32** **Number of channels**

Cascadable
(2 to 10 systems)

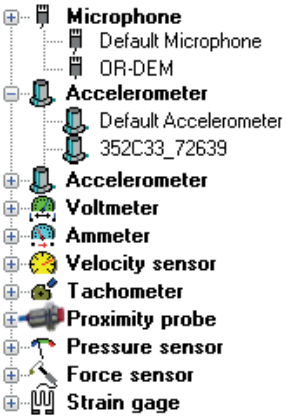
Up to 10 systems may be cascaded to increase the **channel count** required for flexible configurations. **100% plug and play**, the analyzers are simply connected together with a SmartRouter, the controller unit, through a 1 Gb/s Ethernet cable. All the channels remain available for **full performance** analysis and recording, thanks to the local processing and data storage disks.

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
- Bright LCD panel
- Large and touchable operating buttons
- Environment proof (Vibe, shocks 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

Managing Any Transducers



OROS 3-Series analyzers are designed to handle numerous transducer types without additional gears. Inputs are compatible with:

- **ICP® accelerometers, force & microphone** (2 or 4 mA)
- **Proximity probe** & **keyphasor** with ±40 V range
- **Temperature, Torque, Power…** parameter with universal and auxiliary DC inputs
- Workshop/Ship/factory ground loops with Float coupling
- **Strain, Pressure, Thermocouples** with the optional Xpod conditioner
- **High speed Tachometer & Torsional encoder** with the integrated frequency to voltage converter

XPods, Plug and Play Signal Conditioning

The Xpod modules add **signal conditioning** to the OR36 and OR38 in a smart and field operation driven design. These 8 channel 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 OR36 & OR38
- **5 sec** docking time
- BNC connectors still available
- 8 inputs / modules → up to **32 channels**
- Rugged **metal case**
- **Monitoring LED** on each channel

They are specifically adapted to **mobile measurements** with special transducers (temperature, strain, pressure, torque…)

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**
- Integrated **linearization**
- Automatic **cold junction compensation**
- Standard flat pin **connectors**

CAN Bus

A CAN interface may be plugged on the rear panel of the OR36, OR38 and Mobi-Pack. It allows acquiring live parametric data from a car or machine's CAN bus.

- CAN2a & CAN2b
- 125 kb/s to 1 Mb/s
- Rugged Hi-z probe

PC Free Operations

Stand-Alone Recorder (D-rec Recording)

The D-Rec option turns the OR36, OR38 and Mobi-Pack into **a stand-alone digital data recorder**. The unique front-panel with its bright LCD and accessible buttons offers freedom of direct set up, **without a PC or PDA**. 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 PDA free** - Secured data recording - Bright LCD and large buttons - Compatible with CAN, Xpod, Universal inputs

D-rec offers a unique way of using the analyzer for operations usually devoted to **DAT recorders**.

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 of recorded data.

- 60 GB **shock proof** disk
- Dual port (**USB 2.0** & analyzer slot)
- High throughput (32 ch x 51.2 kS/s)

Solid-state version for high vibration levels

Satellite: Remote and Autonomous System for Temporary Monitoring

Fixed on top of the analyzer, the **controller unit** (SmartRouter) makes the analyzer totally independent from the Ethernet connection and operator presence. This set works as a stand alone system.

- Shut-down/restart management - 50 GB local disk - Internal battery (1h30 min) - High readability LCD screen

Telediagnostic: The system can be controlled through an internet connection. All the OROS analysis tools are then available for diagnostics.

Transient event capture: **SysTeo** can take total control of the system even for periods as long as months. Providing the monitoring history and the detection of various events, the software is dedicated to transient event capture.

Dock-Pack, the Field Station

The field offers a tough environment for measurement systems: rain, humidity, oil mist, air leaks, etc… The Dock-Pack is a one-entry power station where **all the measurement system components are packaged and protected** (OROS 3-Series analyzers, SmartRouter, tachometer conditioning, Xpods, PC etc …).

- Integrated PC and tachometer power supply
- Lock pad for preventing breaking into the unit

Autonomy

The OROS 3-Series analyzers are designed to manage multiple power supply issues faced during field operation. In addition to the internal battery and AC/DC power, they feature several external, swappable battery models providing up to 8 hours of operation. For continuous acquisition in benches and remote diagnostics, the analyzer automatically restarts on power recovery or can be remotely powered on or off.

Flexible

Large Channels Count Applications

VibeMaster: the Solution for Acquisition, Recording and Real-Time Analysis, up to 320+ Channels

VibeMaster is a **scalable networking solution for the 3-Series analyzers**. It answers any large channel count application with its **flexible configurations**: from hundreds of channels stacked into racks to any number of channel nodes **distributed along a large structure**. VibeMaster increases the covered area and utilizes the processing capabilities of the networked analyzers.

The whole system is monitored and controlled by **NetGate**, **the supervisor software**, as easy as having a **unique front-end**. NetGate provides clear, fluid and intuitive control/command operations through its **multi-screen interface**. Dedicated to noise and vibration analysis, VibeMaster brings up the renowned OROS analyzers accuracy, real-time capability and analysis modes in **large channel requirements for both mobile or fixed test bench applications**.

- 320+ simultaneously sampled channels per channel
- Records and analyzes up to 40 kHz
- Sampling synchronization (2° @ 20 kHz)
- NetGate supervisor software
- Multi-tasks

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

DSP-Based Architecture

The Need for Real-Time

Every part of the signal contains 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**.

DSP is Your Data Security Passport

Many dynamic signal analyzers get their signal processing power from the PC's processor(s). The **undeterministic behavior of PC operating systems** (not real-time) may rapidly lead to loss of samples while the duty increases. Our DSPs (Digital Signal Processor) are designed to offer 100% controlled computation. They allow to know the amount of analysis capabilities **before starting the acquisition**.

OROS 3-Series analyzers run the real-time analysis exclusively with their 32-bit DSP bank.

- Local and scalable (1 to 8) **computation DSPs** for analysis (FFT, SOA, 1/n OCT...)
- A **Master 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 properly accept the transducer input signals. They must be properly designed.

- **High dynamic range**: 24 bits ΔΣ / 120 dB (130 typ.)
- **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 recording

Open and Customizable Platform

Automation

For several applications, the same measurement procedures have to be repeated to compare each acquisition.
A tool panel, including macro edition and sequencer, is available to create automatic procedures.

Integration

On test benches, the instrument needs to be integrated into existing equipments and database.
The OROS 3-Series analyzers are made for these advanced requirements.

NVDrive, the language to drive NVGate from an external application:

- Allows full remote-control of NVGate using an external software package (configure project, perform and publish results)
- Uses a TCP/IP remote programming interface to control any analyzer feature
- Provides commands listed in the NVDrive library

MatDrive, the language to drive NVGate from MATLAB®:

- Allows the control of OROS 3-Series analyzers by MATLAB®
- Uses a set of MATLAB® functions available as “open source”
- Generates results directly available in MATLAB®
- Uses NVDrive

Sequencer:

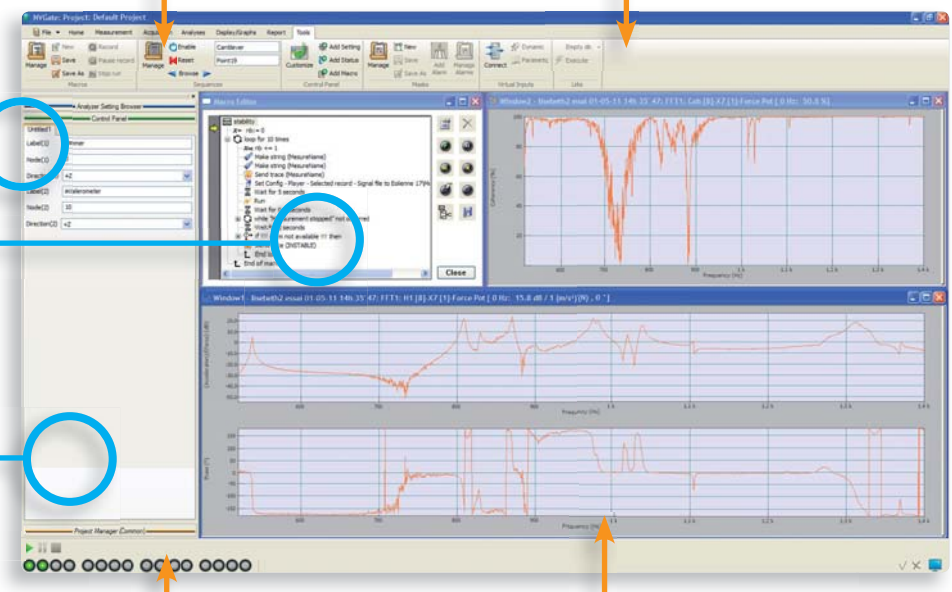
Write the list of settings to be updated at each acquisition into an Excel sheet.
The analyzer follows this road map, faithfully reproducing your sequence.

Macros:

Simply record the actions and then insert algorithmic controls with the graphic editor

Control Panel:

Customize this area with settings, macro access or plug-in status



Import/Export in

- uff
- txt
- mat
- wav
- sdf

Compatibility

The following software is compatible with OROS format,
- FAMOS
- ME’scope
- GlyphWorks
- DynaWorks®
- DynamX®

The **OROS Customer Care** Department is always at your side for your specific application.

Boost Your Measurement Efficiency

As specialist in noise and vibration measurements, OROS relies on a wide network of qualified partners and experts to help you approach and solve your noise and vibration issues.

A Professional Team at your Service

The OROS Customer Care Department

Paying the greatest attention to our customers' satisfaction, OROS devotes a dedicated department, the Customer Care 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, 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.

Managing Your Noise and Vibration Tests and Measurements

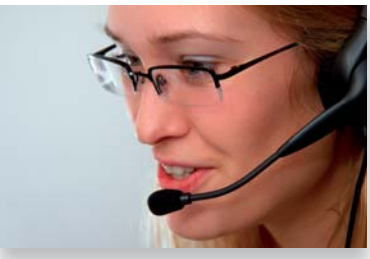
- **Initial Training:** setup, installation and basic knowledge
- **Advanced Training:** learn the full knowledge on specific functions
- **Customized application** with our specialists and network of qualified partners
- **Assistance** in your measurement: Optimize the use of the system for on-site measurement - Audit and recommendation for data analysis and management
- **Expertise in diagnostics**

Ensuring the Best Use of the OROS Technology

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 for hardware repairs and calibration
- Access to your personal myOROS section to download software updates
- Calibration reminders
- Courtesy loan of a replacement instrument (same range or higher) in case of delay overdue
- Priority processing in maintenance center facilities
- Privileged access to extended services at a preferential rate: urgent loan within 1 day, etc.



*During the first 3 months

Additional Services

- Software Updates: Additional modules, Latest version releases, Additional licenses
- Hardware Upgrades: Channels, DSPs, Accessories
- Calibration: NFX07-011 compliant
- Diagnosis and Repair
- Rental: Analyzer, Software modules

General Specifications

Instruments

Front end	OR34	OR35	OR36	Mobi-Pack™	OR38
Inputs	2/4	4/6/8	4/8/12/16	4/8/12/16	8/16/24/32
Connectors	BNC	BNC and Lemo*	BNC	BNC	BNC
Type	Dynamic	Dynamic	Universal	Universal	Universal
Ext. Sync (Triggers/Tach)	2	2	2 (+4*	2 (+4*)	2 (+4*)
Outputs	1	2	2/4	2 (+4*)	2 (+4*)
Auxiliary DC channels*	-	4	2/4	2/4	2/4
DC channels*	-	-	Blocks of 4	Blocks of 4	Blocks of 8

Inputs					
Sampling	2 kS/s to 65.536 kS/s or 102.4 kS/s - 24 bits delta sigma ADC				
Accuracy	Phase ±0.02° - amplitude ±0.02 dB - Dynamic > 120 dB				
Conditioning	AC/DC/ICP®/TEDS/Float - ±17 mV to ±10 V		AC/DC/ICP®/TEDS/Float - ±17 mV to ±40 V		
Xpod	No	No	Supported	No	Supported
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. synch (Trigger / Tach)	64 x over sampled - Resolution < 160 ns (0.06° @ 1 kHz) - ±10 V range (±40 V on OR36, Mobi-Pack™ & OR38)
DC channels*	Sampling 10 Hz - 50 Hz/60 Hz rejection - reproducibility <1 mV

System					
Hard disk	PC	PC	60 GB removable	60 GB removable	60 GB removable
Processors (DSP)	1	1 or 2*	1 or 4*	1 or 4*	1 or 8*
Internal battery	15 min	1h30 min	30 min	30 min	15 min
Power supply	AC (100 V to 240 V) / DC (10 V to 28 V)				
Link to PC	100 Mbit/s Ethernet - 3 m cable		3 & 10 m cable	3 & 10 m cable	3 & 10 m cable
Weight	1.4 kg/3 lbs	2.8 kg/6.2 lbs	5.2 kg/11.5 lbs	12 kg/26.5 lbs with	8.2 kg / 18 lbs
Dimensions (w.h.d) mm	163 x 54 x 215	254 x 67 x 232	114 x 280 x 350	470 x 180 x 360	114 x 410 x 350
Dimensions (w.h.d) inches	6.4" x 2.1" x 8.4"	10" x 2.6" x 9.2"	4.5" x 11" x 13.8"	18.5" x 7" x 14"	4.5" x 16" x 13.8"

Systems cascade	
Channels	Max systems: <32 - Max channels: 320 - Matching; Phase: < ±0.22° @ 1 kHz, Amp: < ±0.1 dB
Connections	1 Gb/s Ethernet network (analysis/monitoring) - BNC cable (Recorder only) - max 100m
Operations	Up to 40 kHz analyses and recording - local disk storage - Parallel USB downloads

*optional features

Accessories

SmartRouter (SAT/NET)	
Type	Autonomous rugged controller unit – Runs OROS analysis software
Memory	50 GB HDD - 1 MB RAM - Store analyzer results and raw data
Power supply	100/240 V AC, 10/28 V DC -1 h 30 battery - auto power-on on mains presence
Interface	2 Ethernet ports: 100 Mb/s & 1 Gb/s - RS232 - 4 USB ports - Wifi capable
NET version	Networker for remote analysis and cascade of analyzers
SAT version	Satellite for tele-diagnostic and stand-alone acquisitions - Adding 8 digital I/O, 8 bright colors LED, 12/24 V power supply
Dimensions	Case: 67 mm (2.6") x 254 mm (10") x 232 mm (9.15") - Weight: 2.7 kg (6 lbs)

Dock-Pack	
Systems	OR35 (+ SmartRouter), OR36(+ SmartRouter or XPods), OR38 (+ SmartRouter or XPods)
Power	One power cable plug: AC (100V to 240V) / DC (10V to 28V) - 3 AC power outlet (for PC and other accessories)
Conditioning	2 tachometer conditioning modules
Accessories	Lockable (TSA lock) PC compartment, in-operation articulated & lockable panels, rolling case, wet environments casing
Dimensions (w x h x d)	625 mm (25.5") x 345 mm (13.6") x 480 mm (18.9")

CAN bus interface (CAN)	
Type	CAN Bus Hi-Z probe and interface
Standards	CAN 2.0A & 2.0B – 125 kb/s to 500 Mb/s
Probe	Hi-Z Sub D 15 - 1.5 m and 5 m cable - Analyzer or Bus powered
Capacity	24 ch - 12.5 to 16 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

NVGate® (software base)

Graphics

Graphical features

Windows management	1 to 16 Layouts - 1 to 32 windows/layout - 1 to 32 traces/window - automatic windows generation on channels activation linked cursors between windows
Trace management	Multi-trace - Multi-graph - 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, EU^2, PSD, ESD and RMS PSD unit - acoustics weightings
Markers/cursors	Dual cursors with Dx/Dy- peaks and max automatic detection (interpolated) - adjustable labels, sideband, harmonic, power band and period markers

Displays type

Time series	Triggered, weighted and filtered blocks - File overview / Zoom - X/Y (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

The following real-time capabilities are guaranteed for one computation DSP. For higher specifications, additional DSP can be added

Performance per computaion DSP

Gap free recording	8 channels - 40 kHz - compressed format
Real-time FFT analysis	8 channels - 20 kHz - 401 lines or 6 channels - 40 kHz - 401 lines
Synchronous order analysis	4 channels - order max 100 - resolution 1/8th of order - 12 000 RPM - 20 kHz
Time domain analysis	8 channels - 40 kHz - no filtering
1/n Octave	4 channels - 25.6 kHz - 1/3rd Octave
Overall acoustics levels	8 channels - 25.6 kHz - All detectors activated

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 fractionnal tach - 4 DC tachometers
Settings	Adjustable Signal filtering - pre-divider 2 to 1024 - averaging - pulse/rev
Frequency to voltage converter (option)	200 ns resolution - 1 to 1024 pulse/rev. - integrator and differentiator filter - smoother - 12 000 RPM max with 200 pulse/rev. - up to 6 inputs 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

Triggers

Edge	From input or ext. synch - Adjustable threshold, Slope, Hold off, Hystersis, 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
Noises	4 uncorrelated random (white/pink) - 4 independent multi-sine - 2 chirp - Adjustable bandwidth, filtering, amplitude, phase, resolution and burst
Swept sine	1 to 6 simultaneous outputs - phase and amplitude offset - adjsutable sweep speed (lin/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/n^{th} 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 (58) - Txt
Result import (others)	AE2 - TXT- Excel® (mask)
Export	UFF - TXT - SDF – Matlab® - Audio wav - OROS wav
Report	MS Word® - Excel® - Copy/paste WMF - on-line data refresh

General Specifications

Modules (software options)

The following modules (plug-ins) run independently. They operate simultaneously on any inputs with separate bandwidths, averaging modes, triggering and filtering. (i.e. an input can be analyzed by the FFT plug-in in the 2 kHz bandwidth while it is integrated and orders are extracted from it by the SOA plug-in)

Standard plug-ins

Recorder	
Bandwidths	4 independents bandwidth/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: 6.4 Mb/s (32 ch. x 40 kHz)
Tracks	Up to 32 tracks + 6 auxiliaries - 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 files

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, blocks, 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 6401 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 - Force & Response
Filters	HP, LP - BP, BS - integrator (simple and double) - Differentiator A and C laws - Independent on any channels
Cross functions	Cross spectra - FRF H1 & H2 - Coherence - Zoomed results - Full matrix (32 x 32) of cross functions available simultaneously
Capacity	8 or 32 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 8 independent orders tracked per channels - Adjustable frequency span
Tachometer	Any valid tachometer (ext. sync, inputs, virtual)
Capacity	Same as FFT
Others	Order extraction centered on nearest peak - cross phase tracking

Diagnostic FFT Add-on	
Levels	DC - Min/max - RMS - Peak - Peak to peak - Crest factor - Kurtosis - On any channels
Correlation	Auto and cross correlation between any channels - instantaneous and averaged results - centered and left zero padding weighting windows
Demodulation	From any tach - adjustable start, stop, delta RPM and slope - Interpolation
Cepstrum	Envelope demodulation signal- Simultaneously with spectra, zoomed spectra and envelope spectra
Shaft-view	Unwrapped signal view along shaft profile - polar cursors - direct angle reading

Synchronous order analysis (SOA)	
Type	Time domain re-sampling and interpolation function of tachometer
Span / Resolution	Max order 6.25 to 400 - 1 to 1/32 order resolution
Tracked orders	1 to 8 independent orders tracked per channels
Tachometer	Any valid tachometer (ext. sync, inputs, fractionnal), DC, Maths
Averaging	Angular or order domain - linear, exponential, peak hold and ref peak hold modes
Overlap	1 to 31 rev - in % 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 32 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 (± 720°) per channel

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 or 32 inputs

1/n Octave constant percentage band (OCT)	
Type	Filter based - complies IEC 1260 & IEC 804
Averaging	Short Leq - Fast - Slow - Impulse - Linear - repeated
Weighting	A - B - C - D - 1/A - 1(A*D) - A*D - Wx(ISO 2631) - Wx (BSI6841)
Capacity	8 or 32 channels plug-ins
Others	Overall levels (linear & time weighted)

Overall acoustics levels (OVA)	
Type	Integrated Sound level meter - complies IEC 60-672 - Delivers class 1 results
Bandwidths	10 Hz (adjustable filter) to 40 kHz
Detectors	1 peak / channel - 3 RMS time weighted detector / channel
Averaging / Weighting	Short Leq 1s and 1/8s - linear / A - C- Z (none) independent on any detector
Time filtering	Fast - Slow - Impulse independent on any detector
Capacity	8 or 32 channels plug-ins

Direct recording (D-rec)	
Type	Stand-alone data recording option for the OR36, OR38 and Moby-Pack analyzers
Capacity	Same as analyzer ones (32 ch @ 40 kHz - multi-records - multi-sampling - all record modes)
Triggers	Periodic, level, edge detection, Ext. sync - pre/post-triggering
Setup	From NVGate or 100% PC free through LCD panel - 12 user define presets
LCD panel settings	Per input: coupling, range, add/remove - Sampling, record mode, bridge autozero
Data security	Power failure, disk extraction and failure proof - Automatic data recovery without PC - Time stamped records - Overload LED

Virtual inputs (VIN, VDC)	
Type	Real-time computation on time series from dynamic (VIN) and parametric (VDC) inputs
Typical operations	Time domain cross function, Vector components contribution, multi-transducers power, torsional twist, trigger on averaged/ratio signal
Dynamic channels	$(A*IN+B)^N$ and filter on each channel – A, B, N positive, negative, decimal ex: $(2 * IN + 0.41)^{-1/2}$
Dynamic operators	Sum, Product, with general coefficient, offset and power - up to 12 ch per operator
Parametric operators	Equation editor: +, -, *, ÷, pwr, sqrt, exp, logs (n, 10,2), trigonometry (arc, hyp), abs

Applications Software Modules

OROS Modal 2 (OM2)

Geometry	Geometry builder - import in UFF and IGES
Data import/export	UFF and Excel compatibility
Impact hammer acquisition	Sequencer - FRF H1/H2, coherence- force/response window - double impact rejection - manual accept/reject
Shakers acquisition	Multi excitation - sine/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 0,01Hz to 40kHz, 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

NETGate

Type	Supervisor software for parallel analyzers operations - Record & real-time analysis
Capacity	10+ systems, 320+ channels - Dynamic inputs, XPod compatible - Plug & play
Operations	All NVGate analysis type - Copy/paste setup - Immediate results - automated time series download
Displays	8 WXGA displays – Unlimited channels grid view with level and status- View channel: one click focus (time + spectrum + level) – Chassis analysis windows

Applications Software Modules

ORBIGate®

Multi Analysis	Real-time analysis, based on Synchronous Order Analysis (SOA) + raw signal recording
Project & data	Project, machine train and measurement management interface - Sensors set by angular steps of 1°
Inputs	Proximity probes, velocimeters, accelerometers - Coupling: AC, DC, AC Float, DC Float, ICP®. Up to +/- 40V
Tachs	Direct or undirect coupling (1 or 2 shafts per machine trains): simultaneous phase extraction Measured, virtual (gear ratio based determination) or simulated tach
Overview grid	GAP V, GAP, Overall, Amplitude & Phase vectors: 1X, 2X, 3X, customizable nX (from Subharmonic to 100) Sub1X, Smax
Displays	Full Shaft Motion (shaft centerline, clearance and orbit), shaft centerline, overall orbit (up to 512 points), nX filtered orbit, Bode & polar plot, trend (relative or absolute time x-axis), order and frequency spectrum, waterfall & cascade, time domain signal, shaft view, rotating speed profile
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)
Reporting	Report batch generation and printing with Microsoft Word (ORBIGate V4) or Excel: graphics & legends Data export to ASCI and Microsoft Excel.

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

Sound Power

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) Multi-spacer management
Calibration	Pressure and phase calibration and correction
Instrument standard	PRI (Pressure Residual Intensity) determination according to IEC 1043
Modes	Acquisition (connected to analyzer), office (PC Only)
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

Systeo

Event detection	Level, threshold, spectral mask
Starting conditions	Rotating speed, DC level, digital input status, date
Results	Historic presentation: envelope, spectra, overall level , DC values, rotating speed
Event notification	SmartRouter's LEDs & LCD screen control, time signal recording, email sending
Power safety	Power cut and restart management
Extraction	Profiles display (overall level, rotating speed,…) on a defined period.

Go Ahead …

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