

OR36-OR38

MEASUREMENT MACHINES

OR36 & OR38 latest generation of dynamic signal analyzers go one step further in terms of measurement process speed, data reduction and security.

- **Faster:** OR36 & OR38 dramatically increase measurement efficiency from the preparation to the report, taking advantage of their multi-analysis power.
- **Secure:** Embedded recorder increases your data traceability by simultaneous recording of raw data.
- **Consistent:** Parallel analysis allows up stream data reduction by recording only effective time data.

OR36 & OR38 are designed for high channel count measurement without compromising the analyzer features. All the channels are processed in real-time whatever the analysis mode: FFT, 1/3rd Octave, CPB or Synchronous order analysis. OR36 & OR38 maintain these real-time capabilities up to 20 kHz.

MULTI-ANALYSIS WITHOUT COMPROMISE

OR36 & OR38 provide real multi-analysis capabilities using powerful internal DSPs for maximum computation power. Keep your complete measurement request within a multi-analysis such as high bandwidth, up to 32 channels in real-time data acquisition and processing. In one shot, get a complete view of your measurements ensuring your test validity.

PARALLEL RECORDING

OR36 & OR38 provide high throughput recording capabilities using an internal 20 Gbyte hard disk. Save the signal from each input directly to your analyzer during the measurement. The real-time analysis results ensure the signal validity using spectral and overall analysis. After measurement, the recorded signal can be post-processed at the office.

POWERFUL ANALYZERS



OROS OR36 & OR38 analyzers operate throughout the entire measurement process providing 3 different operating modes.



REAL-TIME ACQUISITION AND ANALYSIS

For real-time measurements, you control directly the OR36 & OR38 hardware through an Ethernet link. OR36 & OR38 feature fluid dynamic displays and immediate settings capabilities, allowing complete control of your measurement.



POST-PROCESSING ON YOUR PC

After in-the-field data acquisition, you can post-process the results on your office PC without any hardware, leaving the OR36 & OR38 units to be used again for other measurements. Generate reports, backup signals, analyse in different modes and bandwidth, etc. The software does not change and the settings used in the field can be reloaded.



LONG-TERM MONITORING

OR36 & OR38 can operate for a long-term survey, where you cannot leave a PC connected to the OROS unit due to environmental, security or power supply problems. Once the system has been set up, the PC can be disconnected and the analyzer runs on its own. The measured data (analysis results and time records) are available when you reconnect your PC to the stand-alone unit.

Like all OROS products, OR36 & OR38 are designed for field operation, and therefore include the essential features for a confident measurement tool.



ACCURATE INSTRUMENT

OR36 & OR38 analyzers are equipped with the latest measurement capabilities, providing large bandwidth (40 kHz) and high dynamics (24 bits/ 120 dB) associated with state-of-the-art input stages and ADC which provide extremely high amplitude and phase resolution.



PORTABLE

These units are battery sustained and can be AC or DC powered in a rugged enclosure. In addition, they provide ICP coupling on all their inputs, as well as high precision generators and trigger inputs.



OPEN

The entire system is contained in a portable unit connected to your PC through a flexible Ethernet link, giving the user the benefit of a LAN connection or wireless capabilities. You are not hooked onto your analyzer but linked to it.

HIGH-END INSTRUMENTS

ALL AT ONCE

ALL IN ONE INSTRUMENT

NVGate®

THE ANALYZER DASHBOARD

NVGate®, the OROS noise and vibration software platform, lets you control the analyses and measurements through OR36 & OR38. Whatever the operating mode, on-line measurement or post-analysis without hardware, you run the same software application.

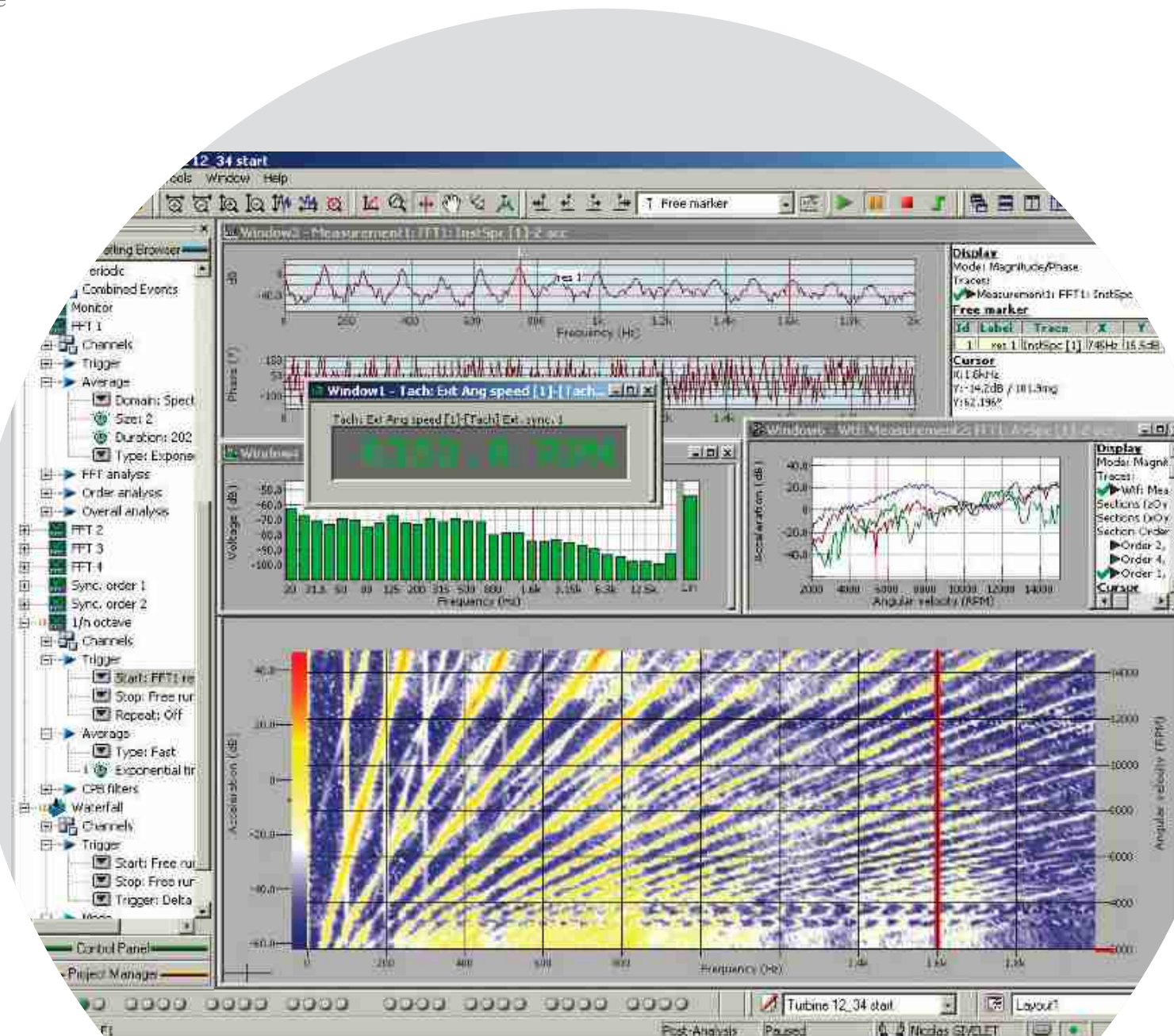
NVGate® can run with or without OR3x devices. It is the right tool for visualizing your data in different domains as it manages multiple analysis modes, such as narrow band, constant percentage band octave, overall and order tracking.

Speed up and guarantee your measurements with multi-analysis

The main improvement of NVGate® associated with OR36 & OR38 unit is the capability of processing parallel analyses of the measured channels. This means that several measurement passes can be achieved at the same time. Simultaneous analysis and recording let you control the consistency of your data, and different analysis bandwidths allow wide band monitoring during selective frequency span measurement.

GENERAL SOUND & VIBRATION

Common requirements in NVH or noise characterization is the comparison of the vibration source with the noise results. NVGate® can achieve this on-line as it can process narrow band (frequency or order) spectra simultaneously with octave spectra and overall level. For example, you can investigate the relative contribution of gearbox orders and structural resonance to cabin noise during road tests of a vehicle. Overall levels are also an important part of the measurement; waterfall acquisition lets you monitor the influence of these levels (RPM speed, pressure, temperature) relative to spectra (vibrations, orders) as well as 1/3rd octave spectra (noises).



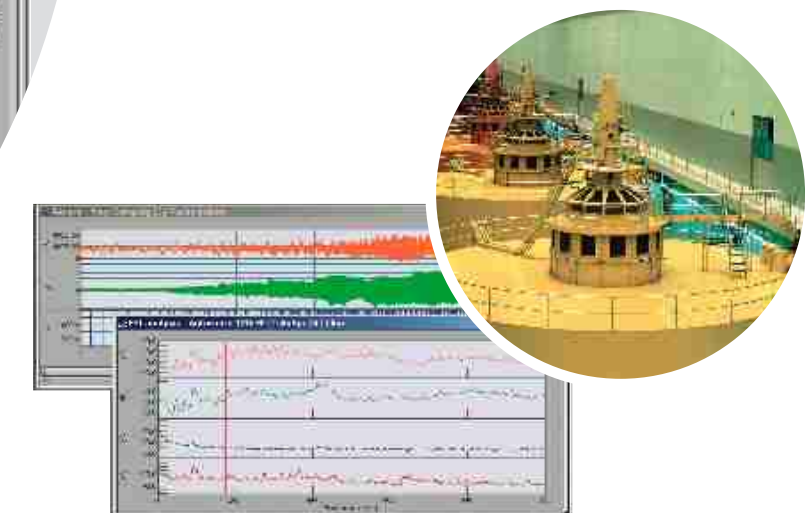
SMART RECORDER

Recording raw data is a security requirement, but it can lead to tedious post-analysis when you are looking for a small part of a huge amount of data. It is also cumbersome to manipulate, backup, and retrieve large records representing Mbytes or Gbytes of samples. NVGate® features a solution for data reduction: just record the interesting part of the raw signal and reject upstream data you should ignore during post-analysis. Multi-analysis allows extraction of representative values from the input signal such as RMS in a specific bandwidth, kurtosis and overall level. OR36 & OR38 use these values to start and stop the recorder around the studied part of the signal. For non-predictive events where you want to study the previous data, the OR36 & OR38 recorder can operate in time-to-stop mode recording only the latest specified amount of time on the disk.

CRITICAL AND NON-REPEATABLE TESTS

With critical tests such as satellite certification, building shaking or gas turbine start-up, you cannot repeat the vibration acquisition several times. OR36 & OR38 let you monitor the test and record the raw data simultaneously. This unique feature guarantees:

- The validity of the passed test with the real-time analysis using the complete analysis features of all the plug-in analyzers
- The validity of the measured data by recording the raw data that you can post-analyze any time you want.



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OR36-OR38

15 YEARS OF NOISE AND VIBRATION ANALYZER DESIGN

OR36 & OR38 coupled with NVGate® bring you measurement tools based on OROS experience in designing and building noise and vibration analyzers. This new class of analyzers includes functions and modular features to help you throughout the measurement process, from the initial field trip to the report.

INTEGRATED AND MODULAR

OR36 & OR38 reduce the amount of hardware required to take field measurements. These self-contained units integrate the components previously found in separate units. OR36 & OR38 can also be used with external devices and needs such as external amplifiers, speakers, and support for multiple channels.

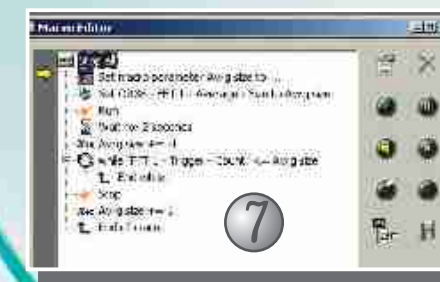
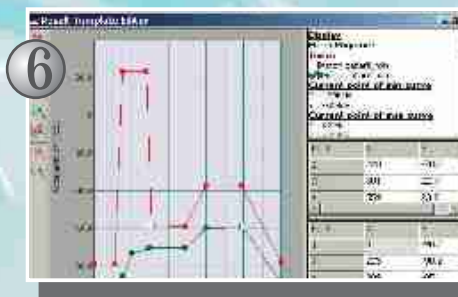
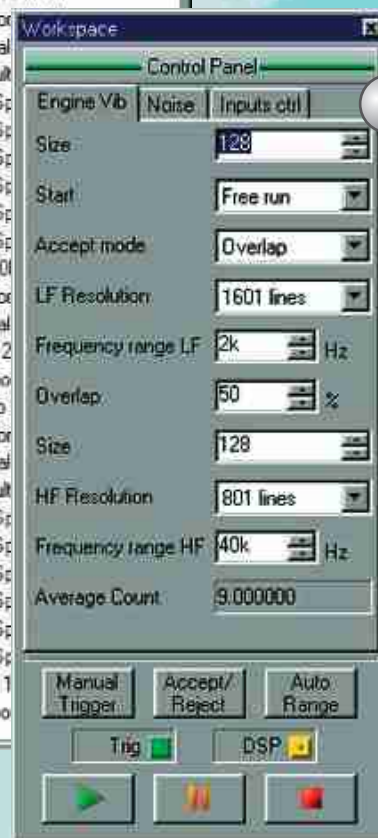
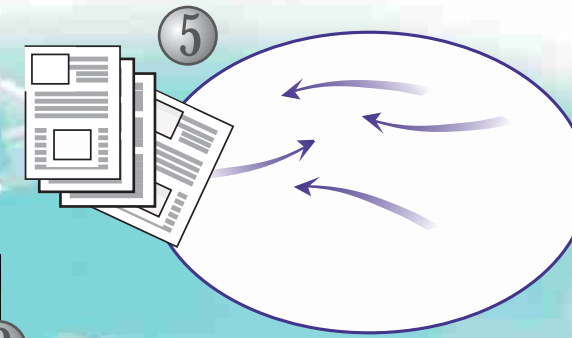
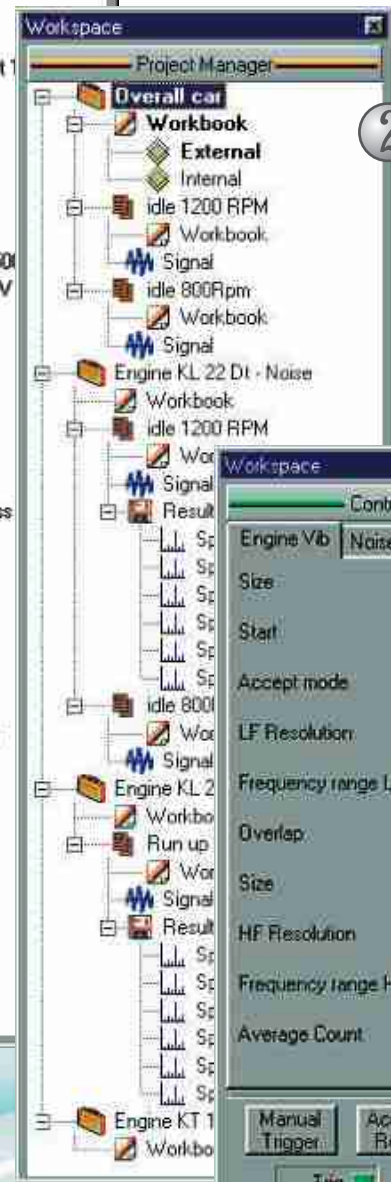
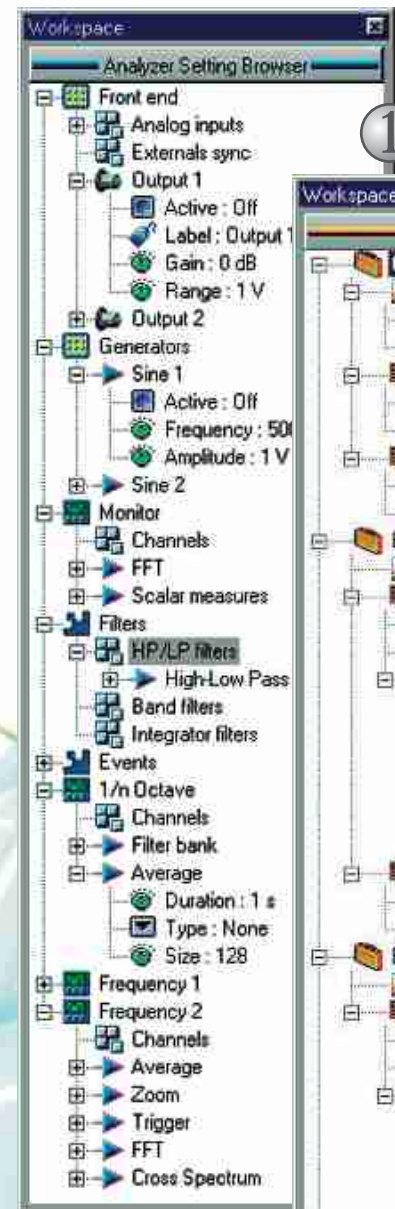
LEAD 2 provides additional I/O inputs to replace the standard BNC inputs with 7 pin connectors that provide 28 V power supply and a sensitive 200 V peak-to-peak input for polarized noise measurements. In addition, it is suitable for use with a wide range of transducers.

OR38 unit comes with a built-in LCD with control buttons that let you control the analyzer directly without using the PC. Functions such as audible fan ramp, pause, accept/reject are available through the control panel for stand-alone and local control of your analyzer.

Integrated disk for recording purposes. OR36 & OR38 have an integrated hard disk which provides gap-free recording regardless of the measurement conditions in cases where the PC or the link is not capable of processing the amount of incoming data. The 200 MB integrated disk is the safety buffer for raw data recording.

Auxiliary channels. OR36 & OR38 include as standard 2 generator outputs and 2 trigger inputs plus 4 auxiliary BNCs configurable with different options. You can add DC inputs or additional generators as well as supplementary trigger inputs on these 4 channels. This option can be increased to 6 generator or 6 trigger inputs or 4 DC inputs in addition to the 32 (or 16) channels.

Ethernet connection. OR36 & OR38 are connected to the PC through 100 Mb/s Ethernet link. As this connection is a standard for PC and industrial devices, OR36 & OR38 are easily connectable in a LAN architecture or even with wireless tools.



NVGATE® TOOLBOX

NVGate® adds major improvements to its applied features that let you optimize and personalize your instrument such as:

1. Analyzer setting browser: reach any analyzer setting in a maximum of 3 steps with its intuitive tree architecture.
2. Project manager lets you manage settings and measurements with exchange capabilities for data or setting transfers.
3. Control panel editor lets you define the settings you want to access directly and reduce the time needed to set up your analyzer with dedicated instrument panels.
4. Grids give you fast and immediate access to large channel count settings. With the copy/paste feature set up all your channels through a single dialog box.
5. Dispatch multiple displays (especially in a large channel count multi-analysis operation) in different layouts and swap them easily, a way to enlarge your screen capacities.
6. Advanced and real-time display: All NVGate® displays allow instantaneous changes such as zoom, scale unit modification, integration/differentiation.
7. Real-time marker gives you the extracted information (peak, harmonic, band power etc) during acquisition. This lets you track specific phenomena without waiting for measurement completion.
5. Report template editor: makes it easy to set up and modify the format of your reports. NVGate® reports are Word® documents for full compatibility with your customers or colleagues.
6. Spectral template editor: define the shape of the requested results and check it in real-time available for 1/n octave, narrow band FFT and order results.
7. User profiles let you automatically retrieve your display and set-up preferences in a multi-user environment. Special profiles can restrict the rights of a specific user for systematic and modification-free acquisition procedures.
7. Macro recorder and editor includes algorithmic and user query capabilities. Automate setting modifications, measurement sequences as well as operator interactions.
- NVDrive is an external TCP/IP control language that lets you set up, control and collect data from your analyzer from any system (also via internet).
- Measurement chain calibration tool and transducer database management allow fast and accurate measurements avoiding calibration errors.

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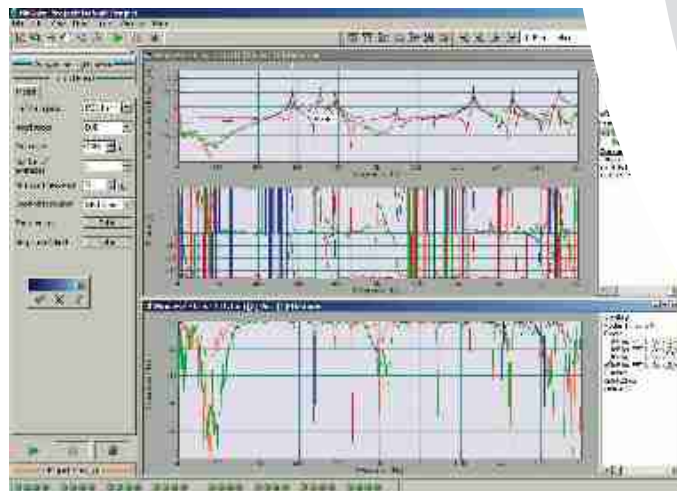
APPLIED INSTRUMENTS

In addition to their general purpose analysis modes OR36 & OR38 can be configured as dedicated instruments for your applications. OROS proposes a set of optional solutions that make your analyzer a fully applied instrument.

STRUCTURAL ANALYSIS

Structural analyses such as modal analysis and vibration tests are commonly addressed in NVH studies. OR36 & OR38 provide acquisition and analysis tools for this purpose.

- As the first step, roving impact hammer techniques or shaker excitation (SIMO, MIMO) acquisition require specific displays, functions and monitoring. OR36 & OR38 FFT Plug-in analyzer lets you acquire structural properties featuring high dynamics range, automatic node incrementation, direct control of weighted force and response signals, with impact rejection capabilities after averaged FRF and coherence preview. For shaker excitation and high channel count on large structures, OR36 & OR38 include advanced sweep/step sine, noise generation, associated with the FFT plug-in cross-spectra matrix. Measurement efficiency is greatly improved as all channel results are calculated and displayed in real-time.
- OROS Structural Solutions help you through the result exploitation stage. OROS ODS and OROS Modal are software modules dedicated to users ranging from beginners to modal experts. The task-oriented wizards provide adapted guidance from structure node and DOFS modeling to modal parameter extraction and animated deflection shapes.



INDUSTRIAL ACOUSTICS

Industrial acoustics represents a wide range of applications covering R&D design, compliance with standards, and noise diagnostics. In product design, common objectives are noise source characterization and noise reduction. OR36 & OR38 1/nth Octave plug-in analyzer brings the useful tools for large microphone array real-time CPB processing, live spectra and overall profile displays, result comparison and reporting. OR36 & OR38 feature integrated functions such as automatic microphone calibration, LEMO and polarized inputs reducing set-up and measurement time.

Real-time sound power, noise mapping and sound intensity solutions bring you advanced comparison and investigation tools for your products sound optimization. Used simultaneously with narrow-band (FFT plug-in) and order analysis, OROS Acoustics Solutions speed up and simplify your acoustics R&D.

- International standards require both accuracy and automated procedure for fast and reliable quality control. OROS Sound power solution features a task-oriented user interface guiding set-up and measurement through the recommendations of the international standards. Type 1 precision results of overall and CPB octave analysis with standard averaging modes (Leq, Fast, Slow, Impulse, Constant BT) ensure measurement validity. Directive noise-emitting products must be measured with numerous microphones requiring large processing capabilities for a one shot measurement. OR36 & OR38 Sound Power Solution is designed for this purpose.

ROTATING MACHINES

From engine gearboxes to steam turbines, sound and vibration phenomena are related to their rotating speed. In order to handle these dynamic phenomena, OROS proposes a set of tools such as constant band tracking, synchronous order tracking, waterfall order extraction or simply parameter profiles as a function of RPM.

- For run-up, torque application, or even stabilized speed trials, the FFT plug-in analyzer provides a complete Constant Band Tracking function able to track up to 8 orders per channel. Measurements can be optimized using the accurate triggering tool related to RPM or any other parameter evolution.
- The Synchronous order plug-in analyzer gives accurate results on applications involving fast run-up/down, coast down, or rotor balancing. This analysis is based on signal re-sampling synchronized with the tachometer, resulting in a steady exploitable display: the order spectra. This is the most efficient solution for order tracking of high rotation speed acceleration machines.
- Based on buffered acquisition of spectra and tachometers OR36 & OR38 Waterfall lets you extract any order, choosing the order bandwidth, the associated tacho, as well as the peak search in the neighborhood of the chosen order.
- For all these analysis techniques several tachometers can be processed simultaneously to track multiple shafts or gearwheel influence.

REPORTING

OR36 & OR38 generate multiple data that you must interpret and present. For this purpose, OROS provides reporting tools for field and office use.

- During the acquisition runs, you can generate a report for each measurement directly from your analyzer software. No need to wait until you get back to the office. These reports are generated as Microsoft Word® documents.
- OROS-Reporter lets you organize and present efficiently your result in common applications such as Microsoft Word® or Powerpoint®. The exported displays are active documents so you can work with them (marker, animation, etc). When you need to compare data from other acquisition systems OROS-Reporter is able to handle data from OR36 & OR38 as well as many other formats, and it merges all these sources in a coherent database for batch printing, for example.

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OR36-OR38

SPECIFICATION SUMMARY

System features	OR38	OR36
Channel count (standard)	8, 16, 24 or 32 input• 2 generator outputs • 2 ext. sync• 4 auxiliary BNC	4, 8, 12 or 16 input• 2 generator outputs • 2 ext. sync• 4 auxiliary BNC
Inputs channels	2 k to 102.4 kSample/s 24 bits ADCs• ±17 mV to ±40V range• AC/DC/ICP [®] coupling	
Input accuracy	Phase± 0.02°• Amplitude± 0.02 dB• Frequency± 0.005 %• 120dB dynamic	
Output channels	2 to 6 generator outputs• ± 10V range• 24 bits DACs• F < 40 kHz• THD < 0.002%	
Ext. sync channels	2 to 6 ext. sync trigger• ± 40V range• Time resolution > 80 ns (0.03° at 1 kHz)	
Miscellaneous I/O	4 auxiliary BNC sockets for additional: Output• Ext. sync• DC inputs Note : each input block can be replaced by a DC input block	
AC Power supply	Integrated 100 to 240 V	External AC 100 to 240 V
DC Power supply	10 to 28 V• 100 W	10 to 28 V• 60 W
Battery	Integrated• Autonomy >30min for power outage protection	
Link to PC	Ethernet 100 base T • Connector RJ45• 100 Mb/s• Up to 100m• Wireless capable	
Hard Disk	Integrated• 20 GBytes• Continuous rate 32 x 51.2kS/s mounted on shock absorber	
DSPs	1 to 8 computation DSP• Up to 96 SPU	1 to 4 computation DSP• Up to 48 SPU
Dimensions	w: 102 mm• h: 364 mm• d: 311 mm• 8.2 kgs	w: 102 mm• h: 260 mm• d: 311 mm• 5.2 kgs

Operating modes	OR38	OR36
Windows	Compatible with : 98SE• 2000• XP pro• MS Excel [®] • MS Word [®]	
Connected	Direct analysis and recording control (includes all analyzers features)	
Office	Post-analysis• Measurement set-up• Data and result consulting Report generation	
Stand-alone	Autonomous record and analysis without PC• PC required for set-up and result retrieval	
Real-time Narrow band FFT	96 ¹ channels• 20 kHz• 401 lines 48 ¹ channels• 40 kHz• 401 lines	48 ¹ channels• 20 kHz• 401 lines 24 ¹ channels• 40 kHz• 401 lines
Real-time 1/n Oct	32 ¹ channels• 20 kHz• 1/3 rd octave	16 ¹ channels• 20 kHz• 1/3 rd octave
Real-time synchronous order	32 ¹ channels• order max 400 at 20 kHz Resolution 1 order	16 ¹ channels• order max 400 at 20 kHz Resolution 1 order
Recording	32 channels• 20 kHz• 32 bit/sample 16 channels• 40 kHz• 32 bit/sample	16 channels• 20 kHz• 32 bit/sample 8 channels • 40 kHz• 32 bit/sample

¹Depends on number of computation DSPs

NOTE: THE MEANING OF REAL-TIME

The Fast Fourier Transform gives a direct representation of the signal in the frequency or order domain. This technique computes frequency spectrum and derived results like FRF from time domain data acquired by blocks. Real-time can have two meanings: one, quite obvious, is that you can see the frequency spectrum in live mode, continuously. This is equivalent to an oscilloscope in the frequency domain. The second meaning, which is the real meaning, is that the computation takes into account all the time domain data to compute the frequency spectrum. A consequence is that the computation rate has to be faster than the acquisition rate. This is a challenge for analyzers, but a necessary condition to have an exact representation of the signal spectrum. Any loss of time domain data results in an error in the frequency or order spectrum. The real-time band is then a critical parameter if you want precise measurements.

Analysis modes	OR3x unit with NVGate [®]
Overall	DC• Max• Min• RMS• Skew• Kurtosis• User selectable band pass filter• User selectable average time
Monitoring	4 channel FFT analyzer• Hot connections of any input (do not stop running analysis or recording)• 401 lines• Hanning • Always running• Non triggerable
Waterfall acquisition	Collect and synchronize any result from Overall, FFT, Octave, Synchronous order • 2 to 10 000 slices• Profiles and 3D real-time display• One shot or continuous scrolling acquisition• Synchronized cursors between multiple display
Narrow band FFT ²	Frequency Range from 0.8 Hz to 40 kHz• 101 to 6401 lines• Time or spectral averaging• Linear, exponential, peak, hold & ref peak hold averaging• Integrated Constant Band Order Tracking • Instant and averaged spectrum• Cross spectrum• FRF H1 & H2• Coherence • Preview before accept/reject• Overall levels
1/n CPB Octave ²	1/1, 1/3 rd , 1/12 th , 1/24 th octave resolution based on filter bank• User selectable frequency span• Complies with IEC1260 A, B, C weighting• Short Leq, Fast, Slow, Impulse, Constant BT, linear & exponential averaging• Instantaneous and averaged spectrum • Global averaged and weighted levels
Synchronous order ²	Time domain Digital re-sampling 1 to 1/32 nd order resolution• Max order 6.25 to 400 • Time or spectral averaging• Linear, exponential, peak hold & ref peak hold averaging • Integrated order tracking• Overall analysis on order band
Recorder	32 track recorder/player• DC + 2 user selectable frequencies on the same record• Record from start to stop, start to time and time to stop• Multi-record file• File split: tracks and time
Multi-analysis	Up to 4 FFT analyzer, 1 1/n octave, 2 synchronous order, 1 recorder (plus monitoring) with different frequency ranges and set-ups.

Miscellaneous	OR3x unit with NVGate [®]
Generators	2 Pure tones• up to 6 swept sines with phase offset and frequency tracking• Multi-sine • 2 Uncorrelated random noises• File playback• Input playback
Triggering	All the following events can start and stop averaging, start a new record, trigger analysis, acquire a slice• Edge from ext. sync or any input• RPM & Delta RPM• Level & delta level from DC, max, min, RMS or kurtosis• Manual• Time interval• Event combination (and /or / precedence)
Display	Time: triggered blocks, weighted blocks, compressed view of file Narrow band: magnitude, phase, Bode, imaginary & real part, polar, log X scale 1/n Octave: 1, 1/3 rd 1/12 th , 1/24 th • Profiles: RPM, DC, RMS, kurtosis• Waterfall: 3D Narrow band, 3D Octave, colour-spectrogram, X/Y, Y/ref, order and frequency extraction view (function of tachometer) meter, digital display of RPM, DC, MAX, MIN. On all displays: Trace overlay with file template or real-time measurement. Y scale Lin, Log or dB. Zoom & translation on X, Y, Z, dual cursor with delta, multi-graph
Export	Spectra (frequency, octave, order) UFF, TXT, Matlab [®] • Profiles: UFF, TXT, Matlab [®] • Recorded time data: WAV (with frequency choice), SDF, Matlab [®] • Report: MS Word [®] Marker values: MS Word [®] , Excel [®]

² Optional plug-in analyzer

OR36 & OR38 units and their options can be ordered from your local representative using the following codes.
Note that this list does not show all the configurations and options related to OR36 & OR38.

4 channel units		24 channel units	
OR36-FREQ-4	FFT analyzer for vibrations, Impact, CBT	OR38-FREQ-24	FFT analyzer for vibrations, Impact, CBT
OR36-OCT-4	1/n Octave analyzer (complies with IEC1260)	OR38-OCT-24	1/n Octave analyzer (complies with IEC1260)
OR36-ORD-4	Synchronous order tracking analyzer	OR38-ORD-24	Synchronous order tracking analyzer
8 channel units		32 channel units	
Can be ordered in OR36 or OR38 case		OR38-FREQ-32	
OR36-FREQ-8	FFT analyzer for vibrations, Impact, CBT	OR38-OCT-32	1/n Octave analyzer (complies with IEC1260)
OR36-OCT-8	1/n Octave analyzer (complies with IEC1260)	OR38-ORD-32	Synchronous order tracking analyzer
OR36-ORD-8	Synchronous order tracking analyzer		
12 channel units		Additional analysis modes	
OR36-FREQ-12	FFT analyzer for vibrations, Impact, CBT	The following modes can be added to the previous units	
OR36-OCT-12	1/n Octave analyzer (complies with IEC1260)	ORNV-FREQ	FFT analyzer for vibrations, Impact, CBT
OR36-ORD-12	Synchronous order tracking analyzer	ORNV-OCT	1/n Octave analyzer (complies with IEC1260)
		ORNV-ORD	Synchronous order tracking analyzer
16 channel units		Applied Solutions	
Can be ordered in OR36 or OR38 case		ORNVS-REP	General reporting tool
OR36-FREQ-16	FFT analyzer for vibrations, Impact, CBT	ORNVS-SP	Sound power module
OR36-OCT-16	1/n Octave analyzer (complies with IEC1260)	ORNVS-ODS	Operating deflection shape animator
OR36-ORD-16	Synchronous order tracking analyzer	ORNVS-MOD	Modal analysis software suite
		ORNVS-SI	Sound intensity module

specifications not binding • design: Genco Oil - F38000 / photos: Nocomment - Genco Oil

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OR36

4 TO 16 CHANNELS

PORTABLE REAL-TIME
MULTI-ANALYZER/RECORDER

OR38

8 TO 32 CHANNELS

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