



# OR35

4 TO 8 CHANNEL  
INTEGRATED MULTI-ANALYZER

*OROS* **OROS**

NOISE AND VIBRATION ANALYZERS

[www.oros.com](http://www.oros.com)

# OR35

## INTEGRATED MULTI-ANALYZER

**OR35 is the portable real-time multi-analyzer that integrates the best of sound & vibration analysis technology in a truly mobile instrument. OR35 is the synthesis of the ultimate OR3X technology and OROS' wealth of experience in measurement. Designed to be the best for field operation, OR35 takes any measurement situation in its stride. Choose OR35 and go confidently.**

*OR35 has been designed to handle numerous acquisition and analysis situations. OR35 integrates the best of OROS' 15 years of experience in designing and building noise and vibrations analyzers. This class of instrument contains everything you need to cover the complete measurement process, from trip to report.*

### MOBILE

OR35 is the lightest 8 channel multi-analyzer available. Discover the OR35 real mobility and be comfortable for carrying it along with your laptop, for intensive use, with all you need close at hand. Its exceptional robustness ensures to succeed in any environment.

### COMPREHENSIVE

Beyond the 8 channels, OR35 integrates as standard 2 tach inputs, 2 generators, a battery and dedicated DSPs. This set of functions makes OR35 the most all-round solution for mobile dynamic signal measurement and analysis.

### CONSISTENT

Designed for measurement, OR35 strikes the perfect balance of features selected for optimum acquisitions efficiency. Whatever the measurement situation, OR35 addresses it. You will not miss a thing!



**OROS is the manufacturer of noise and vibration analyzers who entirely designs and manufactures its products. We master software and hardware empowering the contribution of each part offering the best efficiency to your instrument. This makes OROS analyzers the most accurate and reliable instruments for noise and vibration.**





**GO ON CONFIDENTLY**



**OR35 is part of the OR3x analyzer range that offers the largest analyzer set from 2 to 64 channels in highly portable instruments. They are all based on OR3x technology and NVGate® offering full multi-analysis and real-time performances.**

**NVGate®, the OROS noise and vibration software platform, controls all the analyses and measurements carried out by OR35. Full multi-analysis performance opens a new dimension in the analysis span. Parallel and related analyses focus immediately on any part of the measurement. Whatever the situation, on-line measurement or office post-analysis, you run the same software application, with or without OR35 connected.**

## **E F F I C I E N T**

NVGate® anticipates your needs from measurement preparation to reporting tasks. Hundreds of experienced functions help you reduce test set up and configuration time. NVGate® integrates all the functions you need to complete entire measurement campaigns as well as simple spectrum check out.

## **E A S Y**

The ergonomic, intuitive and modern interface places the analysis functions at your fingertips. All set-ups are based on graphics tools, making advanced set-up easy to handle. NVGate® uses the Windows standards strictly (graphics, selection tools, *What you see is what you set rules*) focusing on the measurement application rather than understanding the software.

## **O P E N**

Tried and tested tools enhance set-up, analysis, storage and report capacities, while keeping them simple. High-level automation tools such as macros, a sequencer and TCP/IP control enable you to create dedicated applications based on this analyzer.

**ALL AT ONCE**

**ALL IN ONE INSTRUMENT**

# OR35

## TECHNOLOGY FOR MEASUREMENTS

**The OR35 integrated multi-analyzer is based on OR3x, the technology breakthrough in dynamic measurement systems. Created by OROS for measurement efficiency, OR3x innovates in terms of both hardware and software architectures. The extraordinary capabilities of this unique concept have been brought to the OR35 analyzer.**

### 24 BITS / 40 KHZ

All inputs are based on the latest analog and digital technologies making OR35 the accurate instrument that enhances the meaning of measurements.

- State-of-the-art-analog conditioning stages use 24 bits ADC to the full. Up to 40 kHz bandwidth inputs ensure extremely high amplitude ( $\pm 0.05$  dB) and phase ( $0.05^\circ$ ) precision.
- OR3x inputs integrate ICP, AC/DC and floating coupling. Front-end LEDs indicate activity and overloading for each channel.
- Optional LEMO inputs can be added to the standard BNC inputs. They provide a 28V power supply and a selectable 200V polarization.

### INTEGRATED AND DEDICATED DSPs

OR3x analyzers include multiple DSPs that ensure analysis integrity. All channels are then processed in real-time whatever the analysis modes, regardless of the PC.

4 dedicated DSPs (digital signal processors):

- 1 Master DSP for monitoring, triggering, and signal generation.
- 1 Ethernet/Recorder DSP to ensure continuous communication between analyzer and PC for gap-free recording
- 1 or 2 computation DSPs that provide independent power to achieve real-time analysis whatever the mode (FFT, 1/n Octave, Order) and the bandwidth.

### TRIGGERS AND GENERATORS AS STANDARD

Enhance your measurement capacity with additional dedicated channels. They come as standard and can be used simultaneously with the dynamic inputs, thanks to the dedicated master DSP and connectors.

- OR35 integrates 2 high quality 40 kHz generators ( $\pm 10V$  / 24 bits / THD < 0.002%) for any type of excitation (playback, noises, and sweep) available during analysis.
- OR35 integrates 2 high-speed external syncs for high-speed tachometer (up to 100 000 RPM with 64 pulses/rev) and sharp triggering (resolution < 160 ns).

### RUGGED INSTRUMENT

You work in the field, OR35 does it too:

- These instruments are built in a strong aluminium body reinforced by an external 2 mm thick shell, providing high protection against shocks.
- OR35 includes a controlled fan, which regulates internal temperature avoiding precision errors in warm conditions. For quiet acoustic acquisition, the fan can be disabled.
- OR35 complies with the most demanding EMC standard (IEC61326:2002-A) for measurement in industrial environments thanks to its fully decoupled Ethernet PC connection.
- All inputs are protected against over-voltage up to  $\pm 60$  V without damage.

### VERSATILE POWER SUPPLY

OR35 accepts many types of power supply for easy field operation:

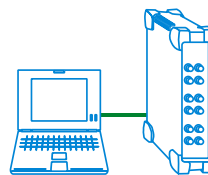
- DC in a wide range of voltages (10 to 28 V)
- AC (100 V to 240 V) compatible with all international standards.
- Integrated NiMh battery and charger.

### ETHERNET 100 MB/S LINK

OR35 is linked to the PC via a fast and reliable 100Mbit/s Ethernet connection. As this connection is a standard for PC and industrial devices, OR35 units can be easily connected to a LAN architecture or via wireless tools.

### A WAY - A MODE

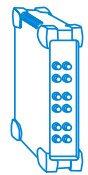
OR35 operates throughout the entire measurement process providing operating modes suited to each step of your measurement process.



**REAL-TIME  
ANALYSIS**



**OFFICE  
POST-PROCESSING**



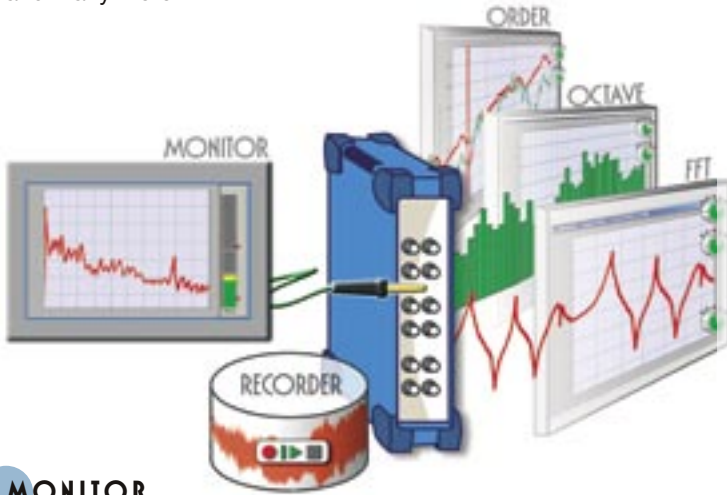
**STAND  
ALONE**



**Created by OROS for measurement efficiency, NVGate® innovates in terms of both functions and interface. NVGate® brings its extraordinary flexibility to the OR35 analyzer.**

## **MULTI-ANALYSIS AS STANDARD**

OR3x technology provides a unique feature in real-time parallel analysis capability. The analyzer operates with one independent plug-in for each analysis mode. To achieve this, OR3x technology takes advantage of its dedicated DSP architecture, a real-time, multi-processor and multi-task operating system. This enables OR3x multi-analyzers to record and analyse simultaneously, compute FFT and track synchronous order during one run-up and many more.

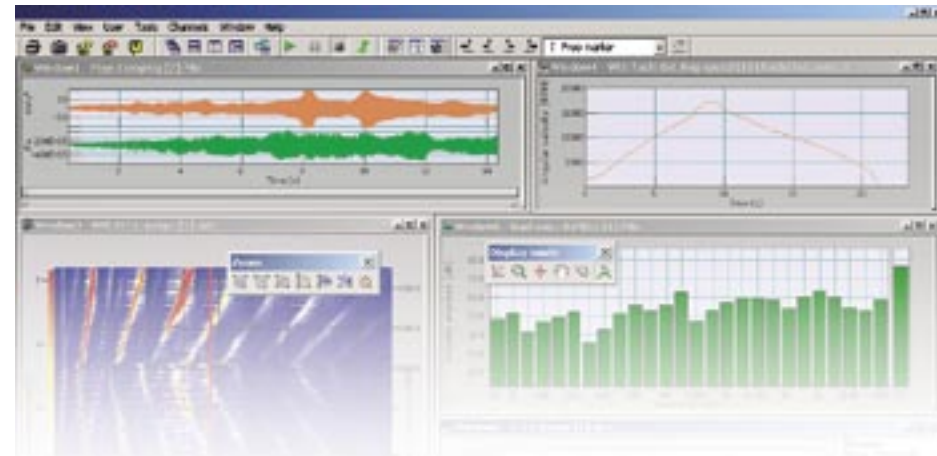


## **MONITOR**

OR3x analyzers include a 4-channel monitor, which continuously runs FFT and time domain detectors. The FFT keeps a large band signal overview during dedicated analysis. Time domain detectors - DC, filtered RMS, Max, Min, and kurtosis - are available for profiles and advanced triggering. The monitor inputs can be hot-swapped during acquisition and analysis.

## **WATERFALL**

NVGate® Waterfall collects and synchronizes any kind of data, and offers the best of 3D and referenced profile displays. You can correlate measurements from different analysis modes (FFT, 1/n Octave, Order, overall) with specific references (RPM, DC, RMS) adding a new dimension to basic analysis. With the OR3x waterfall, make the most of multi-analysis!



## **NVGate® WORKSPACE**

Whether you are an expert or a beginner, you will appreciate the specific functions that make measurement faster, easier and more efficient.

- **ANALYZER SETTING BROWSER:** Reach any analyzer setting in a maximum of 3 steps with its intuitive tree architecture.
- **PROJECT MANAGER** lets you manage settings and measurement with exchange capabilities for data or setting transfers. Reproduce measurement set-up, filters your measurements database, exchange data, and comment on results!
- The **CONTROL PANEL** editor enables you to define the setting you want to access directly, creating a dedicated instrument panel.
- **REPORT GENERATION:** set up the format of your reports, and manage it easily. NVGate® reports are Word® documents.
- **DEDICATED MODES** fit the type of settings, graphics and available results for acoustics, rotating, and structural fields of interest.
- **MACROS** recorder and editor include algorithmic functions and is able to generate dialog boxes for user interaction.
- **MASKS:** Define the permissible boundaries for your results, check them in real-time and generate alarms.
- **SEQUENCES** let you automate measurements set from a simple Excel® sheet.
- **NVDRIVE®** and **LINK TO MATLAB®** are external TCP/IP control languages that provide automation and results input from your own application.
- **CALIBRATION** tool and **TRANSDUCER DATABASE MANAGEMENT** simplify transducers settings management.
- **SET-UP WIZARDS:** downloadable applicative set-up guides make OR35 a dedicated tool for your application, regardless your background.

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# OR35 SOLUTIONS

A P P L I E D I N S T R U M E N T

***OROS proposes a set of solutions, the NVSolutions®, that make your analyzer a fully applied instrument.***

## STRUCTURAL ANALYSIS

Modal data acquisition, using roving impact hammer or shaker excitation, requires specific displays and functions. The OR35 FFT plug-in analyzer features a high dynamic range, automatic node increment, easy control of force and response weightings, averaged FRF and coherence preview. For shaker excitation, it includes advanced sweep/step sinus and noise generation.

OROS Structural Solutions, OROS ODS and OROS Modal, based on task-oriented wizards, guides the user from geometry definition to modal parameters extraction and animated deflection shapes.

## INDUSTRIAL ACOUSTICS

In R&D product design and troubleshooting, the instrument is sufficiently flexible to take general-purpose acoustic studies in its stride. OR35 features conditioning for all types of microphone. The 1/nth Octave plug-in analyzer features automated microphone calibration, real-time CPB processing, overall time history profiles and reporting with a flexibility and power matching the widest range of applications.

OROS Sound Power, Sound Intensity and Sound Quality Meter Solutions are specially dedicated to their corresponding applications. These solutions feature task-oriented interfaces that guide the user easily along the application. Type 1 accuracy and automated procedures are required for fast and reliable tests. The answer lies in OROS Sound Power and Sound Intensity Solutions, where the acquisition is guided in accordance with recommendations given in International Standards.

The OROS Sound Quality Meter Solution enables the user to estimate sound quality by calculating the psychoacoustic metrics.

## ROTATING

From engine gearboxes to steam turbines, sound and vibrations are related to rotating speed. In order to measure these phenomena, OROS proposes a set of tools based on one or several tachometers.

The Waterfall is a powerful analysis tool enabling the user to study variations in spectra and overall levels over time.

For run-up, torque application or stable speed trials, the FFT plug-in analyzer features Constant Band Tracking with up to 8 tracked orders per channel.

The Synchronous Order plug-in analyzer, based on signal re-sampling, gives accurate results on applications involving fast run-up, coast-down, or rotor balancing.

## REPORTING

During field tests, reports can be generated easily on the spot for each measurement as standard Microsoft Word® documents.

For presentations of your test campaign, OROS Reporter Solution enables you to organize and present your results efficiently in common Microsoft Office applications such as PowerPoint®. The exported displays are active documents so they can still be handled in the report itself, making it easy for working groups, to share information.

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## FRONT-END

CHANNEL COUNT	4, 6 or 8 inputs ♦ BNC or BNC+LEMO ♦ one led per input
INPUTS CHANNELS	Sampling: 2 k to 102.4 kHz 24 bits ADCs ♦ ± 17 mV to ± 10 V ♦ AC/DC/ICP®
INPUT ACCURACY	Phase ± 0.02° ♦ Amplitude ± 0.02 dB ♦ Frequency ± 0.005 % ♦ 120 dB dynamic ♦ up to 20 kHz
OUTPUT CHANNELS	2 output generators ♦ ±10 V range ♦ 24 bits DACs ♦ 0 to 40 kHz ♦ THD < 0.002%
EXT. SYNC CHANNELS	2 ext. sync triggers/tachs. ♦ ± 10 V range ♦ Time resolution < 160 ns (0.06° at 1 kHz)
POWER SUPPLY	External AC 100 to 240 V ♦ DC 10 V to 28 V ♦ 20 W
BATTERY	Integrated ♦ Autonomy > 2 hours ♦ NiMh (no memory effect)
LINK TO PC	Ethernet 100 base T ♦ 100 Mb/s ♦ Up to 100m ♦ Wireless capable
DSPS	1 to 2 computation DSP (24 SPU) ♦ 1 master DSP ♦ 1 recorder DSP
DIMENSIONS	w: 67 mm, h: 254 mm, d: 232 mm ♦ (2.6" x 10" x 9.15") ♦ 2.8 kgs (6.2 lbs)

## ANALYSIS MODES

NARROW BAND FFT <sup>1</sup>	0.8 Hz to 40 kHz ♦ 101 to 6401 lines ♦ Time or spectral domain averaging ♦ Linear, exponential, peak hold & ref peak hold averaging ♦ A, C weighting ♦ Constant band order tracking ♦ Full matrix cross spectrum ♦ FRFs H1 & H2 ♦ Coherence ♦ 2 to 128 time FFT zoom simultaneous with wide band FFT ♦ FDSA
1/N CPB OCTAVE <sup>1</sup>	1/1, 1/3 <sup>rd</sup> , 1/12 <sup>th</sup> , 1/24 <sup>th</sup> octave ♦ User selectable frequency span ♦ Complies with IEC1260 A,B, C weighting ♦ Short Leq, Fast, Slow, Impulse, linear & exponential averaging ♦ Instantaneous and averaged Spectrum ♦ Global averaged and weighted levels ♦ Max and min spectrum
SYNCHRONOUS ORDER <sup>1</sup>	Time domain re-sampling and interpolation ♦ 1 to 1/32 <sup>nd</sup> order resolution ♦ Max order 6.25 to 400 ♦ Time or spectral averaging ♦ Linear, exponential, peak hold & ref peak hold averaging A, C weighting ♦ Integrated order tracking ♦ Overall analysis on order band
RECORDER	8 tracks + ext. sync recorder/player ♦ 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
OVERALL	4 channel time domain analyzer ♦ DC, Max, Min, RMS, Skew, Kurtosis User selectable frequency band ♦ User selectable average time
MONITORING	4 channel FFT (401 lines, Hanning) analyzer ♦ Hot plug of any input (do not stop running analysis or recording)
WATERFALL ACQUISITION	Collects and synchronizes any results from Overall, FFT, Octave, Synchronous order 1 to 10.000 slices ♦ Profiles and 3D real-time displays ♦ One shot or continuous scrolling acquisition Synchronized cursors between displays
MULTI-ANALYSIS	All analysis modes can run simultaneously on any channels with separated bandwidth, averaging, triggering, and filtering.

## I/O FUNCTIONS

GENERATORS	2 Pure tones ♦ 2 swept sine with phase offset and frequency tracking ♦ 1 Multi-sine 2 uncorrelated random noises ♦ File playback ♦ Input playback ♦ Burst ♦ 2 Chirps
TACHOMETER	2 ext tach ♦ tach from any dynamic input ♦ pre-divider 2 to 1024 Virtual tach (compute gear ratio) up to 1 200 000 RPM
TRIGGERING	All the following events can start and stop averaging, start a new record, trigger analysis and acquire a slice: Edge from ext. sync or any input ♦ RPM & Delta RPM ♦ Level & delta level from DC, max, min, RMS or kurtosis value ♦ Manual ♦ Time interval ♦ Event combination (and, or, precedence) ♦ Generators steps stabilization and burst ♦ Available results from any analysis mode.

## REAL-TIME PERFORMANCES

REAL TIME FFT <sup>2</sup>	8 channels ♦ 40 kHz ♦ 401 lines
1/N OCTAVE <sup>2</sup>	8 channels ♦ 25.6 kHz ♦ 1/3 <sup>rd</sup> octave
SYNCHRONOUS ORDER <sup>2</sup>	8 channels ♦ order max 100 ♦ Resolution 1/8 <sup>th</sup> of order ♦ 12 000 RPM
RECORDING	8 channels 20 kHz + 2 ext sync (6.4 MHz) ♦ Records on PC hard disk ♦ 32 bit/sample
MULTI-JOB <sup>1</sup>	Up to 4 parallel FFTs (8 ch. each), 2 parallel synchronous order analyzers (8 ch. each)

## DISPLAYS

TIME	Triggered blocs ♦ Weighted blocs ♦ Filtered blocs ♦ Compressed view of large file X/Y view of triggered blocks
NARROW BAND	Magnitude ♦ Phase ♦ Bode ♦ Imaginary & real part ♦ Polar
1/N OCTAVE	1, 1/3 <sup>rd</sup> 1/12 <sup>th</sup> , 1/24 <sup>th</sup> linear and weighted overalls
PROFILES	RPM, DC, Max, Min, RMS, kurtosis, order and overall Vs time or RPM.
WATERFALL	3D Narrow band ♦ 3D Octave ♦ Colour-spectrogram ♦ X/Y, Y/ref, order and frequency extraction views
VIEW METER	Digital display of RPM, DC, MAX, MIN, Order (magnitude and phase) ♦ Alarms levels
ON ALL DISPLAYS	Trace overlay with saved result or real-time measurement ♦ Y scale Lin, Log or dB ♦ EU, EU <sup>2</sup> , EU <sup>2</sup> / <sub>Hz</sub> , EU/ <sub>Hz</sub> Zooms & translations on X, Y, Z axis ♦ Dual cursor ♦ Multi-graph, multi-trace Markers (peak, max, sideband, power band, harmonics, free) ♦ Operators, compare, average

## IMPORT/EXPORT

EXPORT	UFF ♦ TXT ♦ SDF ♦ Matlab® ♦ Wav audio (with frequency selection) ♦ Wav OROS.
IMPORT	TXT ♦ AE2 ♦ Wav ♦ Excel®
COMPATIBILITY	Windows 98SE ♦ 2000 (SP3 or higher) ♦ XP pro ♦ MSWord® ♦ MSEXcel®

## SPECIALS

MASKS	Mask editor for freq. Spectrum, order spectrum, profiles (magnitude/phase), 1/n Octave spectrum Real-time alarms ♦ Link to macro.
MACROS	Excel® like macros ♦ Graphic based recorder/editor ♦ Algorithmic instructions Interactive query management
NVDRIVE	External TCP/IP control of NVGate® ♦ Access setup, data take-in, data injection Operates in the same computer or through LAN and Internet.
SEQUENCER	Imports acquisition setup sequences from Excel® ♦ Sequence navigator lets you select the current step

<sup>1</sup>: Optional plug-in analyzer

<sup>2</sup>: For 2 DSPs configurations

# ORDERING INFORMATION

## 4 CHANNEL UNITS

Include 1 DSP, 2 ext. sync and 2 generators.

OR35-FREQ-4 FFT analyzer for vibrations, Impact, CBT  
OR35-OCT-4 1/n Octave analyzer (complies IEC1260)  
OR35-ORD-4 Synchronous order tracking analyzer

## 6 CHANNEL UNITS

Include 1 or 2 DSP, 2 ext. sync and, 2 generators.

OR35-FREQ-6 FFT analyzer for vibrations, Impact, CBT  
OR35-OCT-6 1/n Octave analyzer (complies IEC1260)  
OR35-ORD-6 Synchronous order tracking analyzer

## 8 CHANNEL UNITS

Include 2 DSP, 2 ext. sync and, 2 generators.

OR35-FREQ-8 FFT analyzer for vibrations, Impact, CBT  
OR35-OCT-8 1/n Octave analyzer (complies IEC1260)  
OR35-ORD-8 Synchronous order tracking analyzer

All presented configurations are guaranteed for 20 kHz real-time acquisition, record and analyses.

## ADDITIONAL ANALYSIS MODES

The following analysis modules can be added to the previous units:

ORNV-FREQ FFT plug-in analysis mode for vibrations, Impact, CBT  
ORNV-OCT 1/n Octave plug-in analysis mode (complies IEC1260)  
ORNV-ORD Synchronous order tracking plug-in analysis mode  
ORNV-OVA Overall acoustics detector set (complies IEC 61-672)

## NVSOLUTIONS® MODULES

The following additional software modules are available for real-time and post-analysis:

ORNVS-REP General reporting tool  
ORNVS-ODS Operating Deflection Shape animator  
ORNVS-MOD Modal analysis software suite  
ORNVS-SQM Sound quality meter  
ORNVS-SP Real-time Sound Power module  
ORNVS-SI Real-time Sound Intensity module

**OR35 unit and its options can be ordered from your local representative, using the above mentioned codes.**  
Note that this list does not show the entire configuration and options related to the OR35 analyzers.



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