

SPECIFICATIONS

	OR24	OR25 - Model 100	OR25 - Model 300
Number of input channels	2 or 4	2 or 4	2, 4, 8 or 16 all upgradable
Frequency band	20 kHz	20 kHz	20 kHz
Dynamic	90 dB	90 dB	90 dB
Throughput rate	4 x 20 kHz	4 x 20 kHz	8 x 20 kHz
Digital trigger/tach	Up to 20 V, up to 300 kHz	Up to 20 V, up to 300 kHz	Up to 20 V, up to 300 kHz
Generators	2 outputs, 3 Vrms - 600 Ω	2 outputs, 3 Vrms - 600 Ω	2 outputs, 3 Vrms - 600 Ω
Connectors	BNC	BNC	BNC pad + cable
Dimensions	250 x 170 x 45 mm	415 x 270 x 55 mm	415 x 270 x 90 mm
	9,8 x 6,7 x 1,8 in	16,3 x 10,6 x 2,2 in	16,3 x 10,6 x 3,5 in
Weight	2 kg - 4.4 lbs	3.5 kg - 8 lbs	5 kg - 11 lbs
Power	100-240 VAC	100-240 VAC, 10-30 VDC	100-240 VAC, 10-30 VDC
Battery	External, 90 min (option)	Internal, 90 min	Internal, 60 min

OR24 and OR25 PC-Pack II are delivered with traceable calibration report, software on CD, key disk for software options, installation and user manual, carrying case and 12 months warranty.
In addition, OR25 PC-Pack is delivered with cigarette lighter adapter.

COMMON SPECIFICATIONS FOR ALL MODELS:

Input voltage range	1 mV to 31,6 Vrms, autorange, accelerometer and microphone constant current supply (ICP™), AC/DC/Float
Overload Protection	100 V
Dynamic range	90 dB
Antialiasing filters	200 dB/octave
Input conditioning	single-double integration / differentiation, time or frequency domain
Input filters	A, B, C, programmable low-pass, high-pass, band-pass, stop-band
External trigger-RPM	0 to 20 V, 300 kHz (over sampling)
Generator	2 outputs, 3 Vrms, 600 Ω
Frequency band	DC to 20 kHz
Power supply	autosensing 100-240 VAC, OR25 only: 10-28 VDC, built-in battery charger
OR24 battery option	100-240 VAC and 10-30 VDC inputs, cigarette lighter cable, same dimensions as OR24
Vibrations	IEC 68-2-6 operating: 5-100 Hz, 5 mm, 2 g (5-500 Hz, 5 mm, 1 g)
Shocks operating	IEC 68-2-7 10 g (11 ms, 1/2 sine), 70 g (3 ms, 1/2 sine)
Shocks storage	IEC 68-2-7 20 g (11 ms, 1/2 sine), 100 g (3 ms, 1/2 sine)
Temperature	operating 0°C [32°F] to 45°C [113°F], storage -25°C [-13°F] to 70°C [158°F]
CE marked	complies with EMC Directive and Low Voltage Directive

FFT	
Real-time band	4 ch. x 20 kHz, 8 ch. x 10 kHz, 16 ch. x 5 kHz continuous, 20 kHz in multiblocks mode
Frequency range	0.5 Hz to 20 kHz, 1, 2, 4, 5, 8, 10, 20, 25 progression
Frequency resolution	100 to 3200 lines
Zoom	1 to 128
Trigger	free run, level, external, manual RPM, delta RPM, delta time, delta level
Valid-reject	normal, manual, automatic on overload
Display trace	input signal, trigger, spectrum, cross spectrum, FRF H1 & H2 (magnitude-phase-real-imaginary), coherence, envelop, spectrum of envelop, orbit, auto & cross correlation, DC level
Display type	2D, single or multitrace, overlay of live and saved traces, waterfall with section in time, frequency or order, XY
Average	linear, expo, peak hold, ref. peak hold, in time or frequency domain
Overlap	0%, 25%, 50%, 75%, 90%, max, retrigger
Weighting	Hanning, Hamming, Flat-top, Uniform, Kaiser-Bessel, Exponential, (adjustable force and response), User defined
Generator 1	Sine, Multisine, Swept Sine, Random, Chirp, Burst, User (*.bin or *.txt file)
Generator 2	Sine with same Gen1-frequency and programmable phase and amplitude, non correlated Random Noise
Export	Bin, Text, UFF (58), Matlab™

RECORDER	
Continuous rate	8 ch. x 20 kHz, 16 ch. x 10 kHz on the disk of the PC
Transient rate	16 ch. x 20 kHz during 5 seconds
Trigger	trigger signal, timer, manual
Length	limited by the size of the disk, 2 bytes/ sample, 100 kb per channel per second (0 - 20 kHz band)
Export	WAV, multichannel, 51.2 kHz sampling frequency, SDF
Display	input signal, frequency spectrum, signal file

OFF-LINE FFT	
Play back	1 or 2 channels of the signal file to generator outputs, complete file, section, single or repeat
Output filters	A, B, C weighting, programmable low-pass, high-pass, band-pass, band-reject
FFT analysis	on complete file or section between 2 cursors, same parameters and display as real-time FFT. continuous or block-by-block analysis on 1 or several channels

For options and NVSolutions®, please ask for the relative data sheets or visit our web site.

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OROS
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C002-092-1

OR24 OR25 PC-PACK ANALYZERS



Specifications not binding - design: Geneco-Oil - F36800 / photos: Noccomment - Geneco Oil

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NOISE AND VIBRATION ANALYZERS
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OR24 & OR25 PC-PACK II

The compact multichannel analyzers for sound & vibration measurements

Big on performance, small in size

The OR24 and OR25 PC-Pack II combine the power and flexibility of a laptop PC with the precision of a dedicated instrument. They feature all functions of a sophisticated dynamic signal analyzer in a rugged package to be connected to a laptop PC for true, go-anywhere portability.

The PC-Pack II is available in 3 models:

- OR24: 2 or 4 channels - 2 kg (4.4 lbs)
- OR25 PCP102 and PCP104: 2 and 4 channels - 3.5 kg (8 lbs)
- OR25 PCP 302, PCP304, PCP308 and PCP316: 2, 4, 8 and 16 channels - 5 kg (11 lbs)

These models use the same software range and the same technology: up to 16 channels of real-time FFT, Octave and Order analysis, a multichannel signal recorder, and all the software facilities for post-analysis and report editing. Communication between the PC and the analyzer is made via an interface designed for industrial environments.

Speed and precision

The OR24 and OR25 PC-Pack II offer high measurement quality: 0.05 dB gain matching, 0.1° phase matching, guaranteed by self-calibration circuitry. The high 90 dB dynamic range and extremely low noise level comply with the most demanding measurements.

All calculations are performed in real-time in the analyzer, ensuring real-time rates as high as 20 kHz for both FFT, Octave or Order analysis. Measurements are thus independent of the performance of the PC. The PC-Pack II can be installed on any PC.

The signal recorder mode can continuously record the time domain signals from 8 channels or more (depending on the PC) up to 51.2 kHz (gap-free) sampling rate.

Light and robust

OR24 and OR25 PC-Pack II are designed for mobile applications and on-the-move engineers. The aluminum housing and corner rubber pads protect it from shocks.

They comply with standard shock and vibration tests for industrial use.

The internal temperature is controlled by a quiet fan, which can even be switched off during sensitive acoustic measurements.

High technology and ease of use

The purpose of PC-Pack II is to make your measurements easier.

Integrated power supply, integrated as well as external battery, cigarette lighter adapters, BNC connectors, convenient carrying case, all these features make it easy to carry and operate anywhere.

The software runs under any version of Windows™: W98, W2000, WNT4, WME or WXP. As standard, analyzers are delivered with a PC Card for notebooks. For use with a desktop PC, a PCI interface is available in option.

The analyzers support the most common data formats for easy communication with other systems.

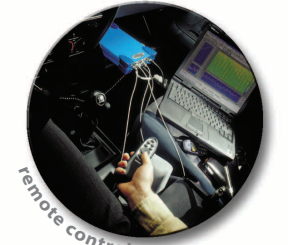
The OROS NVSolutions® range offers complementary packages for specific analyses.



direct input for accelerometers, impact hammer ...



... microphones



remote control



strapped with the laptop



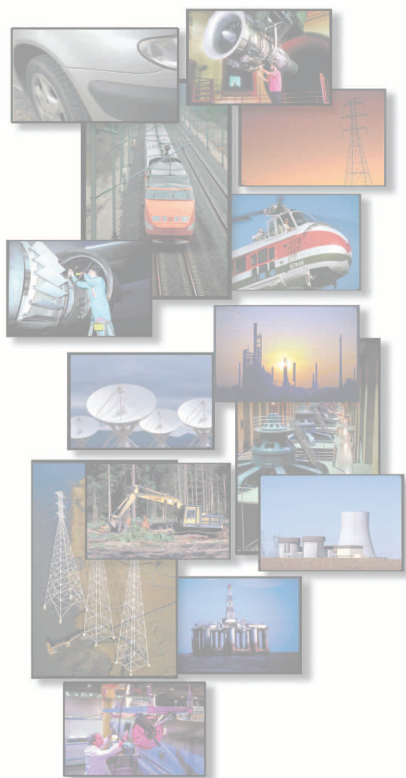
PC card interface

Standard software package

FFT ANALYSIS FEATURES

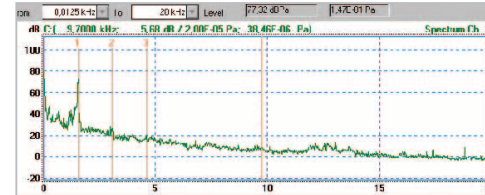
OR24 and OR25 PC-Pack II come with a complete set of software modules for FFT analysis, compiled in 2 main programs:
 - OR763: Real-time FFT and order analysis
 - OR773: Recorder and off-line FFT and order analysis

These two programs run in the same environment, totally integrating all the peripheral features: project and configuration management, transducer management, measurement saving, importing and exporting, report editing.



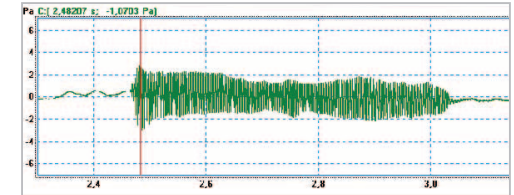
- **Project management:**
it organizes data into a project-subproject-measurement structure: configuration, settings, calibration data, transducer database, time domain data, frequency domain data, ...
- **Guided menus:**
the Next/Previous key is an easy way to explore all the set-up menus in a recommended order.
With some practice, you will invoke directly any menu.
- **Display capabilities:**
up to 32 trace windows, for time domain signal, spectrum, cross spectrum, FRF, envelope, zoom spectrum, coherence or auto and cross correlation...
The overlay capability lets display several traces in the same window: then you can compare signals from different transducers or different saved files.
- **Display tools:**
2D, 3D-waterfall, 3D-color spectrogram, orbit, labelling, lin. and log. scale in both axes, dB, ESD, PSD, simple/double integration/differentiation, graphic zoom, autoscale, cursor, full or selected frequency band RMS indicator, units, 20 kHz band overload indicators...
- **Cursors and markers:**
manual, harmonic, peak, side band, band power, octave bands.
- **Input front-end:**
settings of the hardware analog channels (input voltage range, AC/DC/FLOAT coupling, ICP™ source).
- **Input pre-process:**
some signal processing can be applied on the signal in the time or frequency domain, like digital filters (low pass, high pass, band pass, band reject), A, B, C or custom weighting, time or frequency domain integration, RMS or peak detectors.
- **Transducer management:**
transducer database, units database, transducer calibration (with calibrator or comparison).
- **Triggers:**
selected from any of the analog inputs or on the external trigger/RPM input. In addition to this, delta RPM, delta Time, delta Level, or Manual triggering are provided.
- **Level monitoring:**
this capability computes in real-time the RMS, Min, Max, filtered DC and traces them against RPM or Time.
- **Generators:**
2 generators are available to generate various waveforms: sine, swept sine, random noise, burst chirp, multisine, and also any user defined waveform (with phase control and non correlated signals).
- **RPM:**
1 or 2 tach. signals can be connected to any of the analog inputs or to the external trigger/RPM input. Some pre-processing features are provided for cleaning the tach signal if necessary.
- **Export:**
AE2 (OROS binary), TXT, bitmap and metafile to Word™, UFF to any analysis software package, MAT to Matlab™, SDF.
- **Report:**
several modes of print out are offered. You can choose to print directly what you have on your display, define a template and print your data in this template.

Real-time FFT - OR763



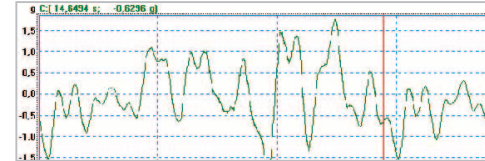
OR763 performs the FFT in real-time on the data from the analog input channels. OR24 and OR25 offer a computation power capable of processing the flow of data continuously. It supports real-time FFT on 4 channels at 320 kHz, with overlap, averaging, frequency resolution up to 3200 lines and various pre-processing functions like filtering or A-weighting.
 The continuous FFT rate is 10 kHz on 8 channels and 5 kHz on 16 channels. This rate can be extended to 20 kHz on 16 channels using multi-block analysis, and the internal memory.
 The real-time FFT mode displays the selected traces live: time domain like an oscilloscope, and frequency domain functions, in 2D or 3D plots. Some additional information is displayed: RMS value and overload indicators.

Off-Line FFT - OR773



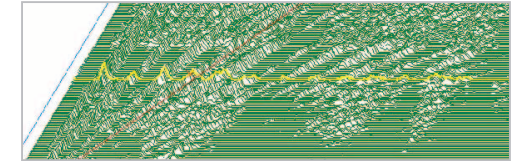
The WAV signal file stored with the recorder is loaded in the off-line mode for processing and analysis. You can then analyze the file or a section of it with the same capabilities as in the real-time mode. It is possible to zoom the signal file, and to move block by block in the file or continuously.
 In addition, the off-line mode offers a playback function: 1 or 2 channels of the recorded signal can be selected and played on the generator outputs, directly or filtered: low pass, high pass, band pass and band reject with programmable cut-off frequency.

Recorder - OR773



This mode makes your PC a multichannel signal recorder, like a DAT. You can acquire and continuously store 1 to 8 channels within 20 kHz bandwidth (51.2 kHz sampling), and 16 channels within 10 kHz without any gap in the signal. The only limit in size is the capacity of your disk. For instance, a capacity of 1 GB can store 8 channels within 20 kHz band during more than 20 minutes continuously.
 During recording, time domain as well as frequency domain signals can be displayed for monitoring.
 You can do several records individually triggered by a time period or a trigger signal.
 The generators can be active during the recording if you want to excite a structure and record the responses.
 The data is recorded in a WAV format which support more than 2 channels, and the sampling frequency of 51.2 kHz. This WAV file can be processed in most multimedia packages or playback with a multimedia board supporting this sampling frequency.
 A WAV signal file can be post analyzed in FFT mode as well as in 1/n octave mode or order tracking mode (as long as a tach signal has been recorded).

Advanced Order Analysis - OR763, OR773



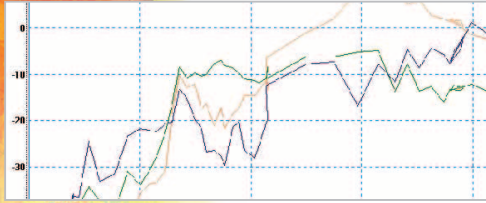
For vibration analysis on rotating machinery during a run-up or coast-down, it is interesting to display the vibration related to the RPM speed, the order plot. The order n is the vibration related to the nth harmonic of the rotating speed, and gives a representation of vibration coming from phenomena occurring n times in a rev of the machine.
 The Real-time FFT software and the Off-line FFT offer this feature: the signal is acquired according to the measured RPM speed and the delta RPM selected for the triggering. A waterfall plot is then displayed, and the order trace can be extracted from this waterfall.

Note: the meaning of Real-time FFT

The Fast Fourier Transform gives a direct representation of the signal in the frequency 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 FFT 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 spectrum. The real-time band is then a critical parameter if you want precise measurements.

OPTIONS

Advanced Diagnostics Order Analysis - OR7936



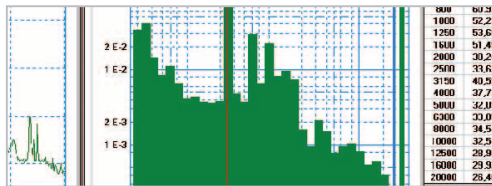
This option gathers some tools dedicated to rotating machinery: Cepstrum, Kurtosis, envelope listening, Bode plot and the Constant Band Tracking (CBT).

CBT is a technique used to track orders. It is an option of the FFT mode, and displays the energy in a selected frequency band around one selected order, against RPM or Time. CBT operates like a bank of tracking filters. It is possible to display up to 8 orders per channel, with an individually selected frequency band.

Cepstrum and the other tools mentioned above are precious for vibration diagnostics, to isolate phenomena in a rich signal, in order to identify the source of the vibration (bearings, gears, misalignment, ...)

This mode runs in real-time and in off-line modes.

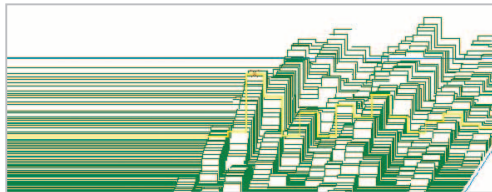
FFT based 1/3 Octave - OR7932



This module computes and displays spectra of a signal in 1/1 octave or 1/3 octave. It is based on a technique using the FFT simultaneously in 3 frequency bands in real-time, and synthesizing the 1/3 octave spectrum conforming to the IEC225 standard. The OR7932 is a complementary tool to the FFT analyzer. It can simultaneously display narrow band FFT and 1/1 or 1/3 octave spectra including phase.

This option runs in real-time and in off-line modes.

Filters based 1/n Octave OR7933



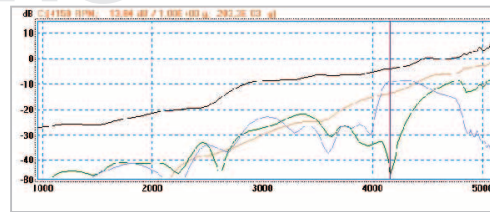
For many acoustics measurements, an analysis of the signal based on filter bank technique is required. The OR7933 performs this using digital filters conforming IEC1260 and IEC 225.

This module constitutes a complete 1/n octave analyzer: 1/1, 1/3, 1/12 and 1/24 octave.

- A, B, C, weighting
- LIN, EXP, LEQ, Fast, Slow, Impulse
- Signal generator
- Waterfall display
- RPM triggering
- Octave tracking

This option runs in real-time and in off-line modes.

Advanced Order Analysis - OR7931



Time resampled order analysis is a key feature for in-depth investigation of engines, transmissions, turbines or any rotating machine. This technique directly computes and displays the vibration spectra in harmonics of the shaft speed, called orders. The result is much easier to analyze than a spectrum in frequency, since most of the vibration sources are related to the rotation of the machine.

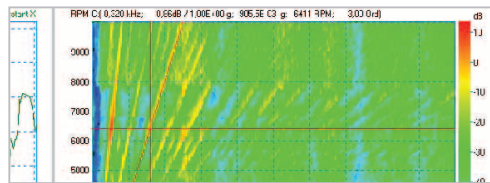
The OR7931 is based on a digital resampling technique, eliminating the various problems associated to analog techniques and offers precision, stability, and tracking capability for very rapid accelerating shafts. A run-up from 1000 to 6000 RPM in a few seconds can be perfectly analyzed with high precision. For slower run-ups, the analyzer can average the data during the run-up to offer a higher precision.

The display capabilities are: spectra in order, traces of selected orders against RPM or Time, waterfall display against RPM or Time, RPM profile. It is possible to track up to 8 orders per channel + overall, and to display them in one or several windows. A window edit function allows to overlay order traces from various sources: orders, channels directly or superimposed with saved data.

For transmission analysis, 2 tach. channels are typically supported.

This option can be used in real-time mode and in off-line mode.

Color spectrogram - OR7934



This option supports the FFT mode and the Advanced Order Analysis mode, and adds a time frequency color display capability.

This display is very efficient for following up the results at a glance. The user can quickly locate the most critical points in the map, and then zoom and edit. Functions are offered to get more details at these points. The color spectrogram displays the main color map and 3 traces which are 3 sections of the color map.

The real-time color map traces the history of the spectrum in frequency or order domain, against the RPM or the time. The sections are related to a selected RPM, a selected frequency, and a selected order. Moving the cursor on the color map continuously updates traces, and enables you to quickly find part of the map. An edit function allows you to set markers on the display.

This mode runs in real-time and in off-line modes.

Spectral weight filters - OR7937

This option enables the selection of specific filters on any input signal, in real-time or off-line mode.

These filters are often required for evaluation of comfort in vehicles. The available set is : A, D, 1/A, A*D, 1/A*D, A*D[200-5000Hz], ISO2631 (Wc, Wd and Wk), BS16841 (Wb, Wc, Wd, We, Wf), BS16842 (Wh).

The spectral weight filters can be used in the FFT and 1/n Octave modes.

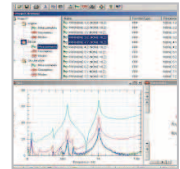
OROS NVSolutions®

OR24 and OR25 PC-Pack II offer very flexible and advanced analysis tools for various purposes. In addition to these analyzers, OROS proposes a range of complementary solutions, developed by OROS or in cooperation with OROS. A total compatibility and suitability is then guaranteed.



OROS - Reporter

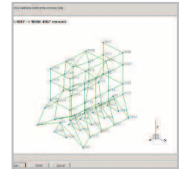
This module is exceptionally easy and efficient for data browsing, calculation, and report edition. Active documents make reports easier and much more attractive.



Reporter

OROS - ODS

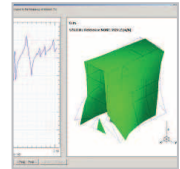
Complementary package to OROS-Reporter, it displays the deflection shapes of a structure in operation. This is a precious tool for development or troubleshooting. OROS-ODS includes a geometry editor, and wizards for easy operation. Some additional translators are included for data exchange with other analyzers as well as software packages.



ODS

OROS - Modal

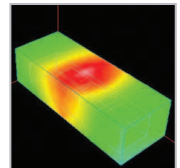
OROS - Modal is a complete package for modal analysis and modal parameter determination. It supports SDOF as well as MDOF. It includes OROS- ODS, a modal shape organizer and efficient wizards.



Modal

OROS - Sound Intensity

This package conforms with ISO9614, parts I and II. It performs noise emission distribution analysis as well as sound power determination. It controls directly the analyzer for easy acquisition, and supports several types of probes with remote control. The 3D color mapping is particularly efficient and readable.



Sound intensity

OROS - Balancing

Supporting 1 or 2 planes, OROS- Balancing uses a special technique usable even without stable speed. The graphic interface guides the user for placing the trial and the correction masses. Placing mass as well as removing material is possible. A mass can be split when some position cannot support the correction mass (blades).



Balancing