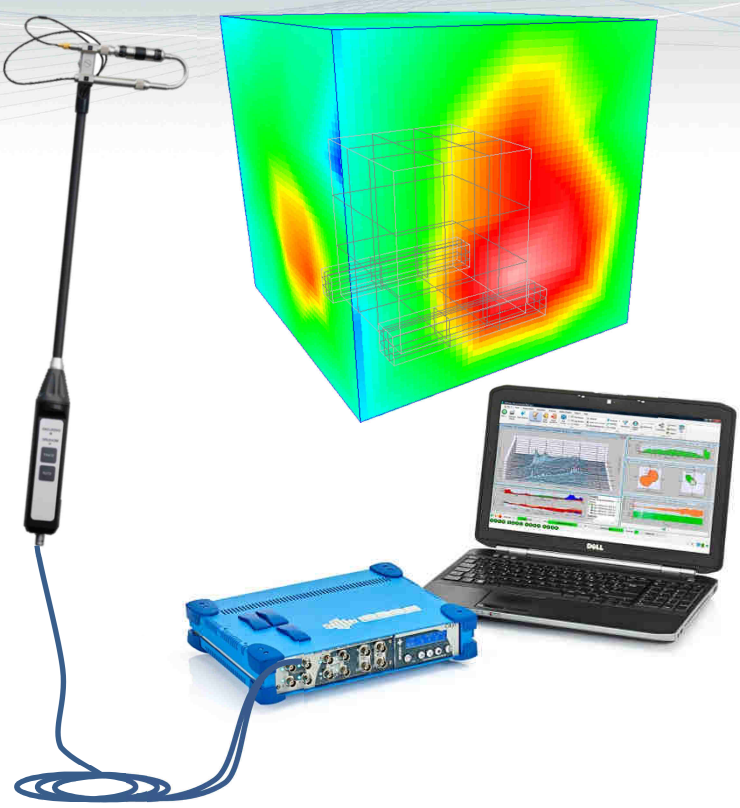
OROS
DATASHEET

Sound Intensity

Sound Power and Localization Software Module



Introduction

The OROS Sound Intensity software module is a tool for noise localization and sound power determination. Measurements can be made in laboratory or in noisy environments. With the OROS Sound Intensity software module, the sound intensity measurement and distribution visualization are realized over one or several measurement surfaces surrounding the noise sources under test. The obtained results can be used for sound source localization and sound power calculation according to ISO 9614: either using a measurement at discrete points (part 1) or a scanning measurement (part 2).

Industries

- **Energy and Process**
- **Electronic Appliances**
- **Automotive**
- **Aerospace**

Machines

- **Fans & HVAC**
- **Motors and Generators**
- **White Goods**
- **Materials Testing**
- **Aircrafts**

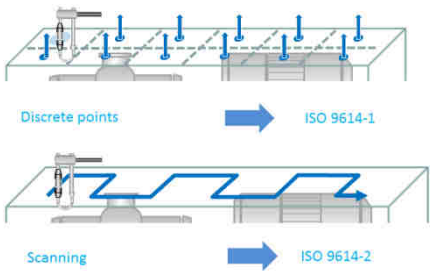
Applications

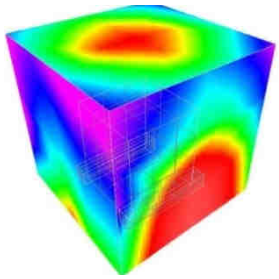
- Sound power measurements
- Field criteria check
- ISO 9614-1: discrete points measurement
- ISO 9614-2: scanning measurement
- Acceptance tests (FAT)
- Noise source localization
- Field measurements
- Noisy environments
- Sound pressure 3D map
- Sound intensity 3D map
- Multiple sources

Table of Content

Main Features

- Real time sound intensity spectrum
- Narrow band, octave, and 1/3 octave representation
- Sound power measurement: guided procedure following ISO9614 Part 1 and Part 2
- Field criteria and indicators calculation
- Easy and flexible generation of multiple surfaces
- Classical exploded 2D view & advanced 3D graphics sound mapping
- Intensity, pressure selectable by segments
- Multi-frequency views
- Isolevel contours and picture overlay
- Automatic sound power report
- Calibration module for level, phase correction and pressure-residual intensity index
- Transducer database
- Probe remote control management

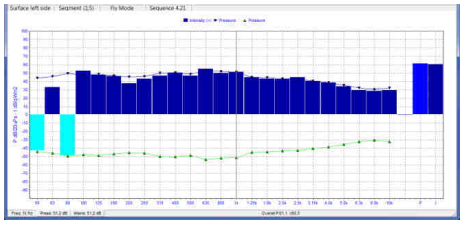




Description

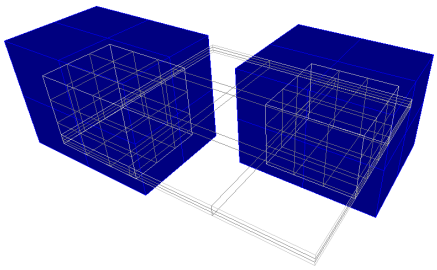
Real-Time Sound Intensity Acquisition

The software is based on the OROS Teamwork instruments range making it a full packaged sound intensity system. When used in combination with a standard sound intensity probe, the system displays in real-time the sound pressure spectrum, and the sound intensity spectrum.

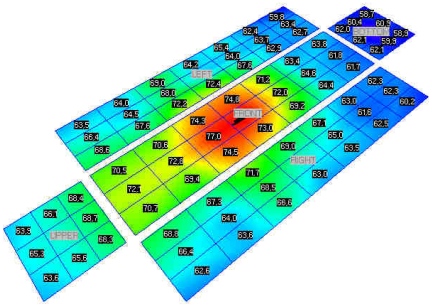


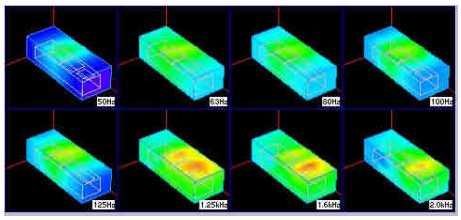
Sound Mapping & Source Localization

As standard, it is always possible to visualize results in a 2D graph. In the industry, many sources require more flexibility than a simple parallepipedic surface. For this reason the OROS Sound Intensity software module features an extended 3D representation of the map of interpolated results on the measurement grid.



These geometric surfaces can be entirely designed within the software in a user-friendly way. Several 3D shapes can be visualized in one shot as well as their environment. In addition the 3D representation allows the spectrum representation (intensity, pressure, and reactivity) by selecting the measurement point with the mouse. A 3D map is displayed for a chosen frequency. In order to complete these facilities, the multi-frequency view tool can show the maps of the selected frequencies in one shot: the user can check the source behavior at several frequencies simultaneously. Among other

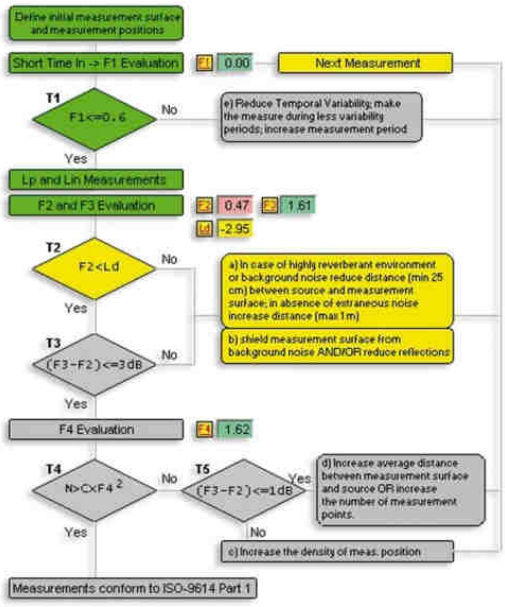




representations available, it is possible to display the repartition of the isolevel contours and overlay them with a picture of the measured object.

Sound Power Measurement according to ISO9614

Besides the sound intensity determination, the second major use of the OROS Sound Intensity software module is the sound power determination. **Both ISO9614 part I and part II are covered**. The user is guided through the standard procedure with the use of a comprehensive flowchart.

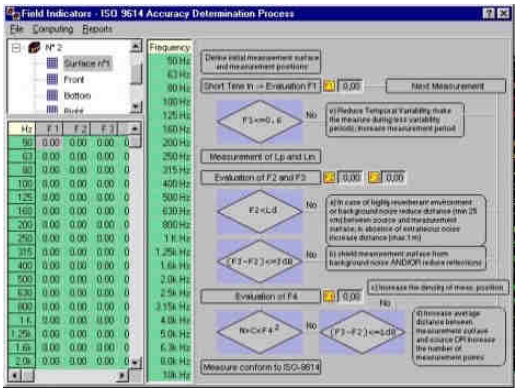


During this procedure, the field indicators and criteria are checked by the software. Whenever one of them does not satisfy the standard, the software assists the user through the successive measurements and improvements needed to meet the standards requirements. Then, a table gives a comprehensive insight of the field indicators computed for each of the surfaces included in the computations.

The procedure is guided, but a more flexible approach is also possible: it is always possible to set up the acquisition procedure as a sequence of actions or as a selectable access to the different measurement points.

Final Results & Reporting

The software assists the user until the final stage issuing the sound power result. Finally, a report can be automatically generated and printed. The sound power levels are calculated for each surface and can be displayed also for the overall measurement surface with or without A-weighting. In addition, it is also possible to exclude some frequencies from the calculation procedure selecting them from a list.



A Powerful and Flexible Range for Your Needs

OROS Sound Intensity software module can run on or analyze results from all Teamwork instruments providing flexible choices of the hardware platform size. The OROS Teamwork instruments offer flexible connection and configuration: mobile analyzer, distributed configuration, remote access or large channel count systems. Based on the same platform, same technology and same software, the OROS instruments are portable, rugged and real-time.

- OR38: 8, 16, 24, 32 channels
- OR36: 4, 8, 12, 16 channels
- Mobi-Pack: 4, 8, 12, 16 channels
- OR35 : 6, 10 channels
- OR34 : 2, 4 channels

OROS Sound Intensity software module belongs to the comprehensive OROS product line. Other software modules such as FFTDiag, Turbomachinery vibration (ORBIGate), Balancing, Modal and Acoustics (multi-channel Sound Level Meter, 1/n Octave, Sound Power) are provided on the same hardware platform.

Accessories

Sound Intensity Probe Kit

Thanks to its two-channel technology the Sound Intensity Probe makes it possible not only to measure sound pressure levels but also to record the sound pressure gradient which is needed to calculate the sound intensity. The probe consists of two measuring microphones with matched phase response and frequency response. Due to the use of two constant current powered 1/4” measuring microphone preamplifiers, sound field distortions (shadowing and diffractions) are minimal. In addition, the probe can be connected directly to the analyzer. No extra conditioning unit is required. The distance between both microphones is defined by spacers (6 mm, 12 mm, 50 mm). These enable measurements in a frequency range between 35 Hz and 12 kHz. The quality of conformance between both measuring microphone capsules with regard to their transforming functions is measured in compliance with DIN EN 61043, respectively IEC 1043 and documented as minimum pressure-residual intensity index for probes. Each microphone capsules pair comes with a measuring protocol. It shows the tolerance limits for class 1 probes.

On-Site Measurements & Applied Trainings

Experts from OROS may come on-site for applied trainings. They will help you using your OROS system. They can provide assistance in your measurement. They are also able to recommend optimization in your measurement process depending on your application and field constraints.

Applied trainings

Sound Intensity

> **Objective**

Understand and be able to perform a sound intensity measurement with the OROS system.

> **Public**

Technician or engineer with basic knowledge in measurement and acoustics

> **Program**

Theoretical

- What is sound power - sound pressure - sound intensity?
- Theoretical in computation of sound intensity spectrum
- Material: intensity probe, spacer, pressure calibrator, phase calibrator, analyzer
- Active/reactive field, PRI, calibration
- Standard ISO 9614 part 1 and part 2
- Acceptance criteria

Practical

- Use the material and the OROS Sound Intensity software on the customer industrial machine: install, geometry building, software setup, measurement, results analysis
- Customer practical

> **Duration** 1 day

On-site measurements

> Assistance in your measurement, sound power measurement based on the sound intensity technique
> Expertise in diagnostics



Specifications

ORNVS-SI Software module

Feature	Description
Frequency Range	up to 10 kHz / 1/3 Octave, Octave and Narrowband spectrum
Sound Power	ISO 9614-I discrete points method, ISO 9614-II 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

Sound Intensity Probe Kit

Capsule pairs can be chosen to be ¼" or ½". The kit includes the remote control, a windshield, a carrying case, and the required cabling.

Capsule Pair	Spacer	Frequency range
½"	50 mm / 12 mm	35 Hz -1.5 kHz / 70 Hz – 5 kHz
¼"	12 mm / 6 mm	1 kHz – 6 kHz / 1 KHz – 12 kHz

ICP® ¼" preamplifier

Feature	Description
Current consumption	2…10 mA
Transducer Excitation	24…30V DC
Frequency Range	20 Hz…100 kHz

1/2" microphone capsule pair

Feature	Description
Polarization voltage	0 V
Frequency Range	35 Hz…5kHz
Sensitivity	50 mv/Pa

1/4" microphone capsule pair

Feature	Description
Polarization voltage	0 V
Frequency Range	1 kHz…12 kHz
Sensitivity	4 mv/Pa

Ordering Information

Reference	Description
ORNVS-SI-LOC	3D noise localization software based on sound intensity
ORNVS-SI-POW	Sound Power determination software based on sound intensity
ORNVS-SI-PLOC	Sound power determination and 3D noise localization software based on sound intensity
ORNVS-SI-uL	Upgrade from ORNVS-SI-LOC to ORNVS-SI-PLOC
ORNVS-SI-uP	Upgrade from ORNVS-SI-POW to ORNVS-SI-PLOC
ORAC-PROB-M01	Microtech / Sound Intensity Probe Kit, SIS 190 - ½"
OR34-SI-2	OR34-2 channels Sound Intensity pack

OROS, Leadership through Innovation

About Us
30-years in business, OROS' designs and manufacturing have been renowned for providing the best in noise and vibration analyzers as well as in specific application solutions.

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

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

Worldwide Presence
OROS solutions are marketed in more than 35 countries, through our authorized network of representatives, offices and accredited maintenance centers.

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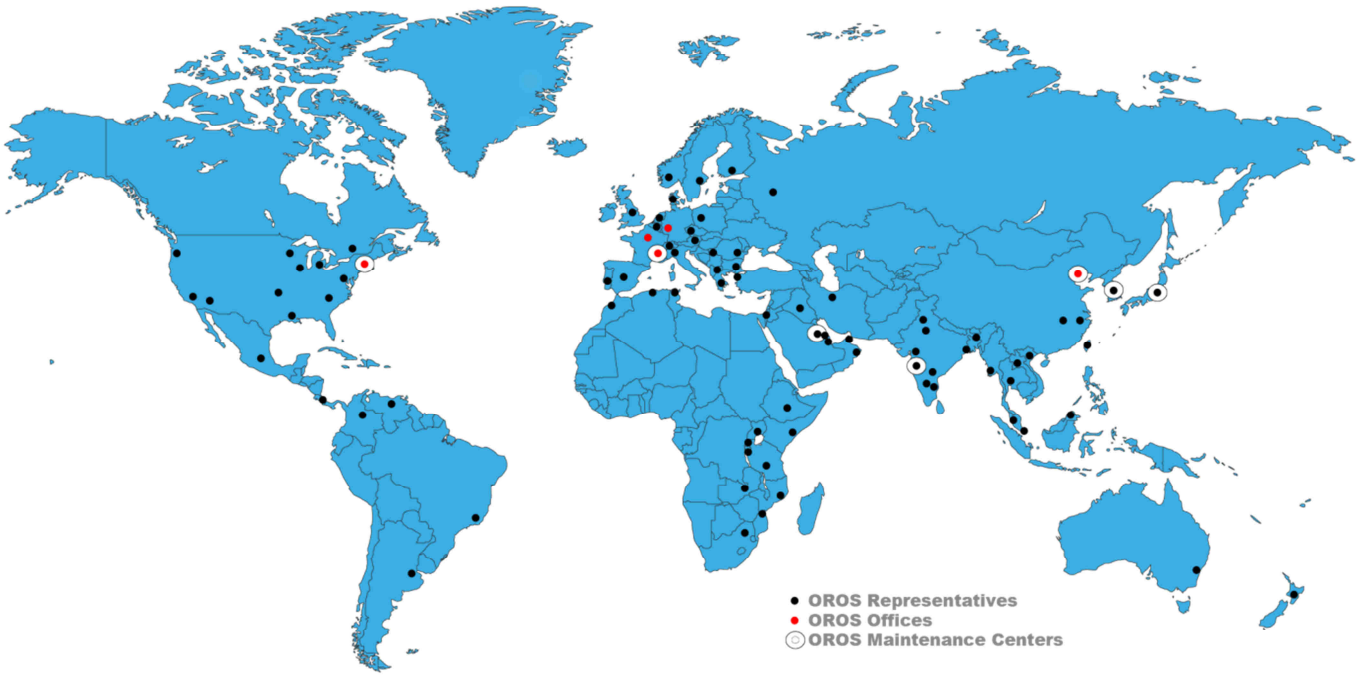

ISO 9001 BUREAU VERITAS Certification