

MEZZO

Precision Microphone

The *MEZZO* Precision Microphone provides an innovative and cost-effective solution for professional grade acoustical measurements.

More than just a DAQ system, the DSP embedded in each *MEZZO* Precision Microphone ensures real-time signal processing.

Designed to be used with a tablet PC or any other Windows-based PC, the *MEZZO* Precision Microphone benefits from the versatility and flexibility provided by computers. This approach also allows the *MEZZO* Precision Microphone along with the *MEZZO* Noise Analyzer Module to be offered at a very competitive price.

- Noise Analyzer Module (SLM, RTA & FFT) (included)
- Noise Monitor Module (Long Term Monitoring) (optional)
- Building Acoustics Module (optional)
- Waveform Recorder and Post-Processing Module (optional)

Used along with the *MEZZO* software, the *MEZZO* Precision Microphone complies with IEC 61672 (2013).



Specifications

Microphone	BSWA MPA221 (Class 1) ¹ or BSWA MPA225 (Class 2) ²
Connector	SMB
Peak Maximum Level ³	Low Range: 112 dB _{pk} High Range: 126 dB _{pk}
Noise Level ⁴	Low Range: 22 dBA, 20 dBC, 25 dBZ High Range: 32 dBA, 30 dBC, 35 dBZ
Under-Range Limit Level ⁵	Low Range: 32 dBA, 30 dBC, 35 dBZ High Range: 39 dBA, 37 dBC, 42 dBZ
Input Range	Low Range: 0.42 V _{pk} High Range: 2.1 V _{pk}
Maximum Sampling Rate	48 kHz
Signal Conditioning	IEPE
Communication	USB 2.0 (Mini B connector)
Dimensions	230 x 32 x 23 mm
Power Supply	USB Powered (Max 0.35W)

1: ½" MP201 Mic with MA221 Preamp – 50 mV/Pa, IEC 61672 (2013) Class 1, SMB Connector

2: ½" MP215 Mic with MA221 Preamp – 40 mV/Pa, IEC 61672 (2013) Class 2, SMB Connector

3, 4, 5: Evaluated according to IEC 61672 (2013) Class 1, using 50 mV/Pa sensitivity

Mezzo Noise Analyzer Module (included)

The *MEZZO* Noise Analyzer Module is the perfect tool for everyday sound level measurements and spectral analysis. With standard 1/1, 1/3, 1/24 octave real-time digital filters and FFT analysis, the Mezzo Noise Analyzer Module provides professional results with ease.

The *MEZZO* Noise Analyzer Module is included as the standard measurement module with the *MEZZO* Precision microphone.

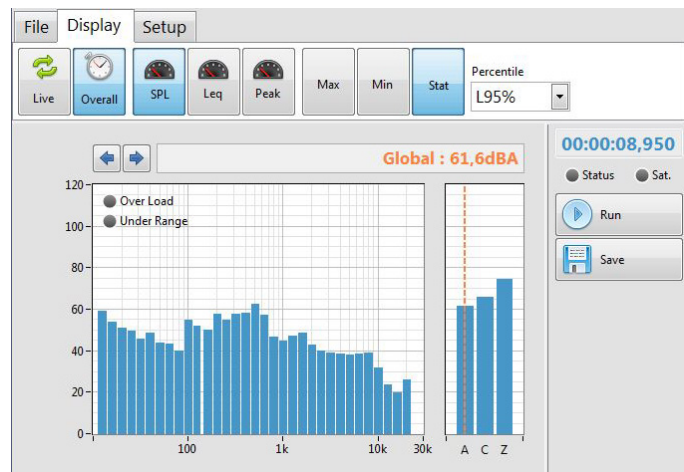
With its intuitive interface the *MEZZO* Noise Analyzer Module eliminates the need to read instruction manuals. Just connect a *MEZZO* Precision Microphone and you are ready to go!

The large and clear interface is easy to read and work with; you will never want to use a small SLM display again.

Designed with touchscreens in mind, the *MEZZO* Noise Analyzer Module includes automatic keyboards and keypads to enhance your mobile experience.

The *MEZZO* Noise Analyzer software provides class 0 digital filters and 64-bit computing offering the highest level of precision.

The *MEZZO* Noise Analyzer Module along with the *MEZZO* Precision Microphone offers a high-quality real-time analyzer with FFT capability at an unbeatable price.



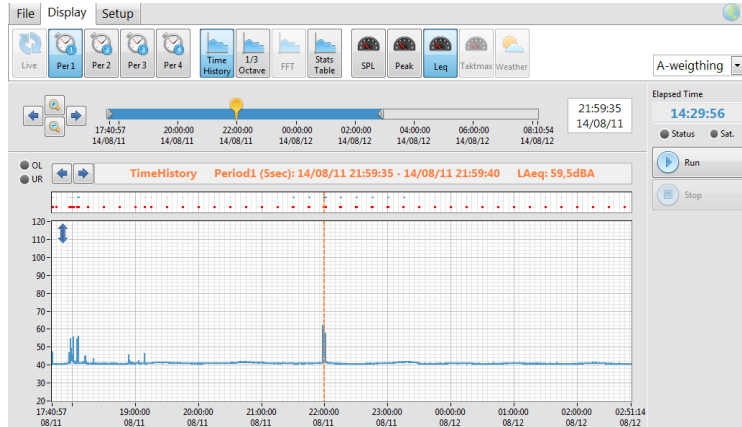
Specifications

Displays	Live and Overall
Spectrums	1/1 Octave (16Hz to 16kHz), 1/3 Octave (12.5Hz to 20kHz), 1/24 Octave (11.4Hz to 22.1kHz), or FFT (DC to 24kHz, Leq only)
Time Weightings (SPL)	Slow, Fast or Impulse
Frequency Weightings	A, C and Z
Metrics (Spectrum and Global levels)	Lmin, Lmax, LN%, Leq, and Lpeak
Instant Rate	50 ms
Standard Compliance	IEC 61672-1 (2013), IEC 61260 (2014), ANSI S1.4 (2014), ANSI S1.11 (2014)
Minimum Requirement	Windows XP SP3 and later, 1.2 GHz CPU, 2 GB RAM

Mezzo Noise Monitor Module (optional)

The *MEZZO* Noise Monitor Module is the perfect tool for remote noise monitoring stations:

- 4 distinct interval periods (1s to 24h);
- Audio records (mp3 and wave) on trigger and/or periodic;
- Continuous camera snapshots on trigger and/or periodic;
- Weather station support;
- Solar panel and power monitoring;
- FTP data transfer;
- And More!



Specifications	
Interval Periods	4 distinct (1s to 24h)
SPL LMax, LMin and LN%	Global and 1/3 Octave
SPL Time Weigth	Slow, Fast or Impulse
Leq	Global, 1/3 octave and FFT
LPeak	Global and 1/3 octave
LTm5 (Taktmax)	Global
Global Levels	A, C and Z
1/3 Octave Band Spectrum	12.5Hz to 20kHz
FFT Spectrum	1000 lines over 20kHz, 10kHz, 5kHz, 3.33kHz, 2kHz or 1kHz
Instant Rate	50 ms
Audio	Mp3 or Wav (periodic or triggered – 5s records to always on)
Camera ¹	Frame rate down to 0.5s (periodic or triggered – 5s sequences to always)
Weather ²	Temperature, Humidity, Wind Speed and Direction, Rain, and Barometer Averaged on each interval period
Power Monitoring ³	Battery state of charge, load power consumption, and solar charging power
Notifications	Noise exceedance and/or power-loss, email and/or SMS
FTP Data Transfer	Text or Binary ⁴ format
Standard Compliance	IEC 61672-1 (2013), IEC 61260 (2014), ANSI S1.4 (2014), ANSI S1.11 (2014)
Minimum Requirement	Windows XP SP3 and later, 1.2 GHz CPU, 2 GB RAM

1: Compatible with IDS XS camera, available with a weatherproof casing; contact us for more info.

2: Compatible with Davis Instruments Vantage stations with Weatherlink USB logger.

3: Compatible with EpSolar Tracer Serie MPPT solar charge controller, proprietary cable required; contact us for more info.

4: The binary format is compatible with Soft dB web interface, contact us for more information

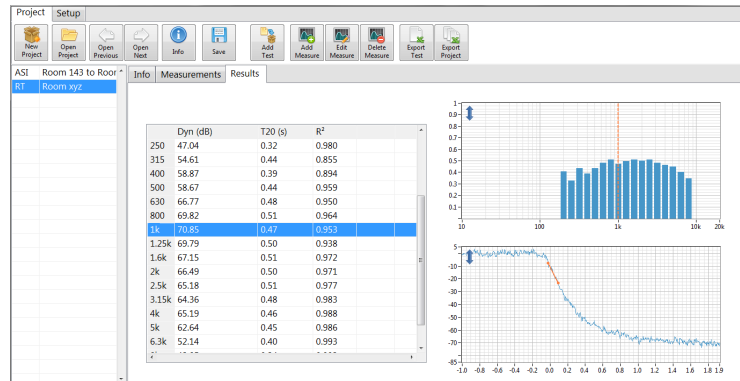
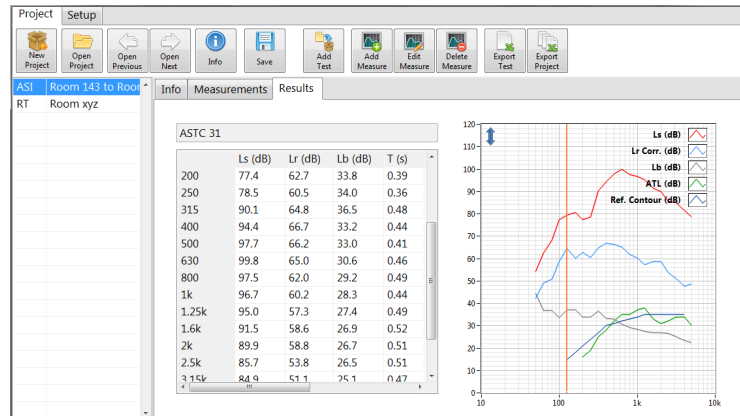
Mezzo Building Acoustics Module (optional)

The *MEZZO* Building Acoustics Module is the ideal software module for the acoustical specialist, providing an integrated project file with on-site reports:

- Room Noise;
- Reverberation Time;
- Airborne Sound Insulation;
- Impact Sound Level;
- And More!

The *MEZZO* Building Acoustics Module uses a project file approach, combining all measurements and test reports in a single file.

This approach makes it easy to manage a large quantity of measurements and provide on-site reports. The on-site reporting allows the user not only to view the test result instantly, but also to make sure that no measurement has been forgotten.



Specifications	
Room Noise	NC, RNC, RC MKII (ANSI S12.2:2008), RC, NCB (ANSI S12.2:1995) NR (ISO 1996:1971)
Reverberation Time	T10, T15 T20, T30 (ISO 3382-2:2008) T25 (ASTM E 2235:2004) Interrupted noise method 1/1 Octave and 1/3 Octave
Airborne Sound Insulation	D _w , D _{n,w} , D _{nT,w} , R' _w (ISO 140-4:1998, ISO 717-1:2013) NIC, NNIC, ASTC (ASTM E 0336:2005, ASTM E 0413:2004)
Impact Sound Level	L' _{n,w} , L' _{nT,w} (ISO 140-7:1998 - ISO 717-2:2013) FIIC (ASTM E 0989:2006, ASTM E 1007:2004)
Spectrums	1/1 Octave (16Hz to 16kHz), 1/3 Octave (12.5Hz to 20kHz),
Minimum Requirement	Windows XP SP3 and later, 1.2 GHz CPU, 2 GB RAM

MEZZO Intensity Probe

The *MEZZO* Intensity Probe provides an innovative and cost-effective solution for sound intensity measurements.

More than just a DAQ system, the DSP embedded in each *MEZZO* Intensity Probe ensures real-time signal processing.

Designed to be used with a tablet PC or any other Windows-based PC, the *MEZZO* Intensity Probe benefits from the versatility and flexibility provided by computers. This approach allows the *MEZZO* Intensity Probe along with the *MEZZO* Intensity Analyzer Module to be offered at a very competitive price.

- Intensity Analyzer (included)
- I-Track for Mezzo (optional)

Used along with the *MEZZO* Intensity Analyzer Module, the *MEZZO* Intensity Probe complies with IEC 61043 (1993) standard.



Specifications

Intensity Microphone Set	GRAS 40GK (IEC 61043 Class 1) ¹ BSWA MPA221 (IEC 61043 Class 2) ^{2,3}
Intensity Processor	IEC 61043 Class 1
Peak Maximum Level ⁴	Low Range: 112 dB _{pk} High Range: 126 dB _{pk}
Noise Level ⁵	Low Range: 22 dBA, 20 dBC, 25 dBZ High Range: 32 dBA, 30 dBC, 35 dBZ
Under-Range Limit Level ⁶	Low Range: 32 dBA, 30 dBC, 35 dBZ High Range: 39 dBA, 37 dBC, 42 dBZ
Input Range	Low Range: 0.42 V _{pk} High Range: 2.1 V _{pk}
Maximum Sampling Rate	48 kHz
Signal Conditioning	IEPE
Communication	USB 2.0 (Mini B connector)
Dimensions	370 x 32 x 23 mm
Power Supply	USB Powered (Max 0.35W)

1: ½" 40GK Mic with 26CB Preamp – 12.5 mV/Pa, IEC 61043 (1993) Class 1, Microdot Connector

2: ½" MP201 Mic with MA221 Preamp – 50 mV/Pa, IEC 61043 (1993) Class 2, SMB Connector

3: IEC 61043 Class 2 mic sets can be enhanced to Class 1 using phase mismatch compensation

4, 5, 6: Evaluated according to IEC 61672 (2013) Class 1, using 50 mV/Pa sensitivity

Mezzo Intensity Analyzer Module (included)

The *MEZZO* Intensity Analyzer Module is the perfect tool for everyday sound intensity measurements. With standard 1/1, 1/3, 1/24 octave real-time digital filters and FFT analysis, the Mezzo Intensity Analyzer Module provides professional results with ease.

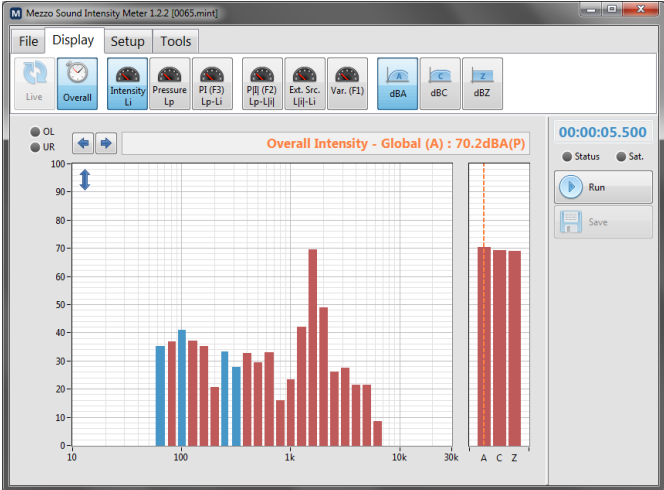
The *MEZZO* Intensity Analyzer Module is included as the standard measurement module with the *MEZZO* Intensity Probe.

With its intuitive interface the *MEZZO* Intensity Analyzer Module eliminates the need to read instruction manuals. Just connect a *MEZZO* Intensity Probe and you are ready to go!

The *MEZZO* Intensity Analyzer Module offers phase mismatch compensation filters, class 0 digital filters and 64-bit computing offering the highest level of precision.

Designed with touchscreens in mind, the *MEZZO* Intensity Analyzer Module includes automatic keyboards and keypads to enhance your mobile experience.

The *MEZZO* Intensity Analyzer Module along with the *MEZZO* Sound Intensity Probe offers a high-quality real-time sound intensity analyzer at an unbeatable price.



Specifications	
Displays	Live and Overall
Spectrums	1/1 Octave , 1/3 Octave, 1/24 Octave, or FFT (user defined bandwidth to fit microphone spacer, from 10Hz to 20kHz)
Frequency Weightings	A, C and Z
Metrics (Spectrum and Global levels)	Pressure, Intensity, PI index (F3), P index (F2), Extraneous Sources index (F3-F2), Time Variability (F1)
Instant Rate	Variable from 50ms to 1s
Phase Mismatch Compensation	FIR-IIR phase correction filters
Environmental Compensation	Compensation for Atmospheric Pressure, Temperature and Humidity
Standard Compliance	IEC 61043 (1993), ISO 9614-1 (1995), ISO 9614-2 (1996), ISO 9614-3 (2002)
Minimum Requirement	Windows XP SP3 and later, 1.2 GHz CPU, 2 GB RAM

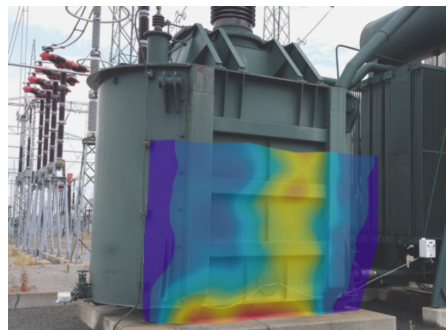
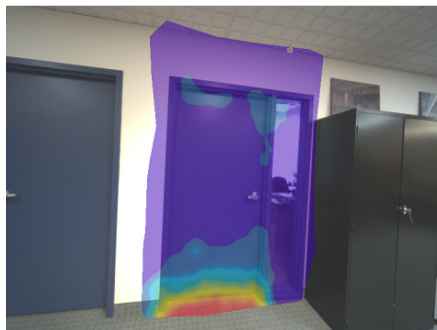
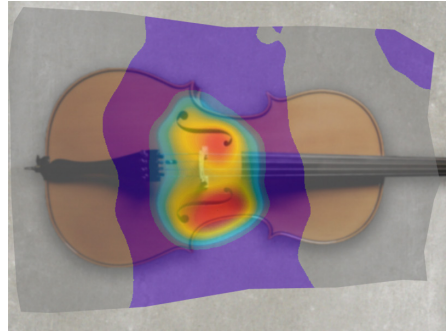
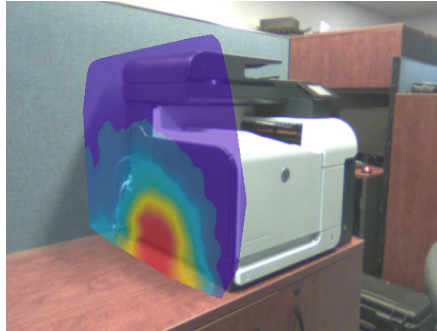
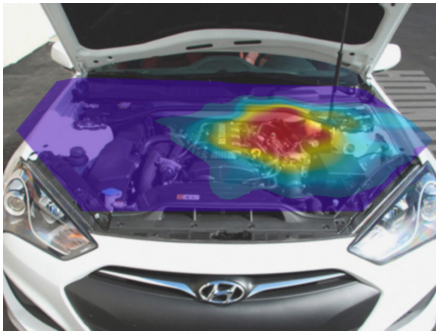
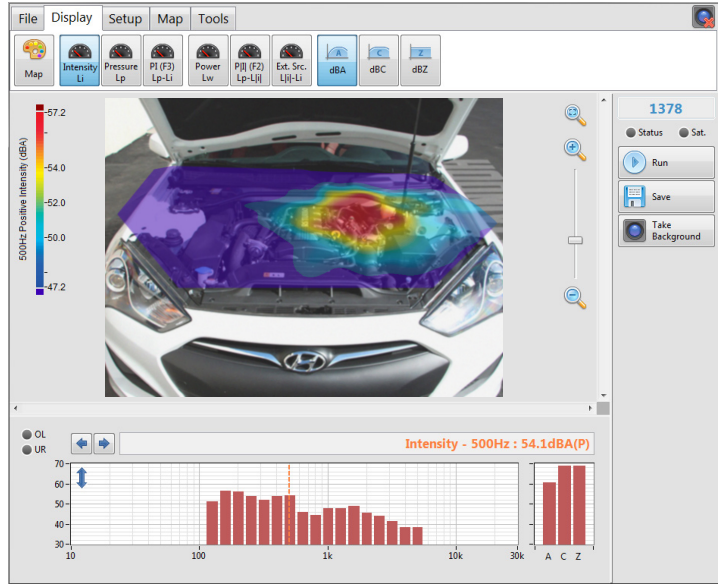
Mezzo I-Track System (Optional)

The adage “A picture is worth a thousand words” has never been truer in the field of acoustics. The translation of complex acoustical phenomena can be a hard task especially when it comes to informing non-technical clients. Wouldn't it be easier just to take a picture? The answer is YES!

The *MEZZO* I-Track System is a powerful tool for easy, fast and accurate sound imagery. The images are created by combining the acoustic data provided by the *MEZZO* Sound Intensity Probe with its position provided by a camera-based tracking device in real-time. The result is a high-definition sound image performed in a few minutes.

The *MEZZO* I-Track System offers a complete solution to create sound imagery both in the field and in laboratory. Its compact system makes it easy to carry and fast to setup a measurement.

The *MEZZO* I-Track System provides invaluable information in many fields of acoustics such as product manufacturing, consulting, and laboratory experiments.



Mezzo I-Track System (Optional)

The *MEZZO* I-Track System uses a digital camera and a tracking device to precisely locate the sound intensity probe in space.

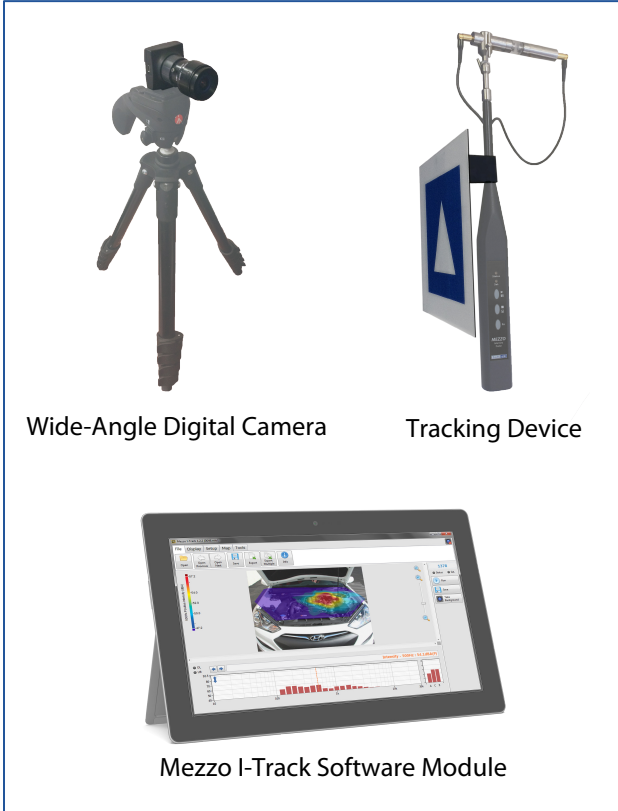
While you scan the measurement surface, the probe position is tracked for each acoustic measurement interval (typically 10 times a second).

Every measurement point is drawn on the picture in real-time creating the sound map on the screen as you scan the measurement surface.

The resulting pictures are not only great looking, but are also highly precise. Sound intensity, pressure and PI index levels can be plotted for every frequency band as well as the global level. Correspondingly, the associated spectrum shows the spatial average of pressure, intensity, PI index (F3), P|| index (F2), Extraneous sources index (F3-F2) and sound power.

The *MEZZO* I-Track Software Module offers the same sound intensity processing features as the *MEZZO* Intensity Analyzer Module such as the phase mismatch compensation filters, class 0 digital filters and 64-bit computing offering the highest level of precision.

The *MEZZO* I-Track system along with the *MEZZO* Sound Intensity Probe offers a high-quality, unrivaled, real-time sound imagery system at an unbeatable price.



Wide-Angle Digital Camera

Tracking Device

Mezzo I-Track Software Module

Specifications

Spectrums	1/1 Octave , 1/3 Octave, 1/24 Octave, or FFT (user defined bandwidth to fit microphone spacer, from 10Hz to 20kHz)
Frequency Weightings	A, C and Z
Metrics (Spectrum and Global levels)	Pressure, Intensity, PI index (F3), P index (F2), Extraneous Sources index (F3-F2), Sound Power
Instant Rate	Variable from 50ms to 1s
Phase Mismatch Compensation	FIR-IIR phase correction filters
Environmental Compensation	Compensation for Atmospheric Pressure, Temperature and Humidity
Tracking	Optical Tracking using digital camera, 6 Degrees of freedom (DOF), Real-World units
Camera Resolution	800 x 600
Camera Field of View	120° (Wide mode), 82° (Zoom mode) [optically corrected to <1% distortion]
Measurement Plane	6 DOF Position and Area automatically computed using 3D data points
Interpolation	Constrained Delaunay Triangulation
Averaging	2D Gaussian averaging (user defined size from 0 to 1m radius)
Standard Compliance	IEC 61043 (1993)
Minimum Requirement	Windows XP SP3 and later, 2.4 GHz CPU, 4 GB RAM

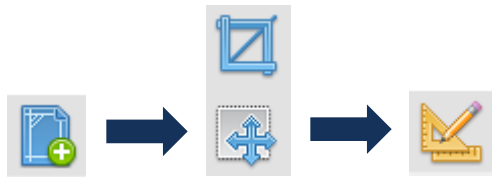
NOISE MAP CALCULATION IN 3 STEPS

A room's noise map is a particularly useful graphic element for analysis and decision making concerning acoustic treatments to be implemented, but also for presentations and project follow-ups. With *RAP-ONE II*, a noise map is rapidly obtained in only 3 steps:

- Definition of the room's configuration
- Positioning of the noise sources
- Determination of the noise map

1) Definition of the room's configuration

The first step consists in importing a file (JPG, PNG, BMP or PDF) that will be used as the background image, making the room's modeling easier. If you want to change the image's position or scale, it can be done during the file importation. A tool is also available to adjust the scale of the model.



RAP-ONE II allows to quickly define the configuration of your room using the features available. With a simple click, it is possible to add walls, screens, absorbent panels and fitting areas.



Other functions are available to determine the acoustic properties of the room's surfaces. Note that the program can be used for any room shape, the only requirement being that the ceiling and floor are flat and parallel.

The room plan is traced with straight lines by clicking with the mouse.

To define the acoustic properties of the room's surfaces, a list of predetermined values is integrated into the software. You only have to choose the values corresponding to the type of material you are interested in (concrete, aluminum, brick, wood, etc.)



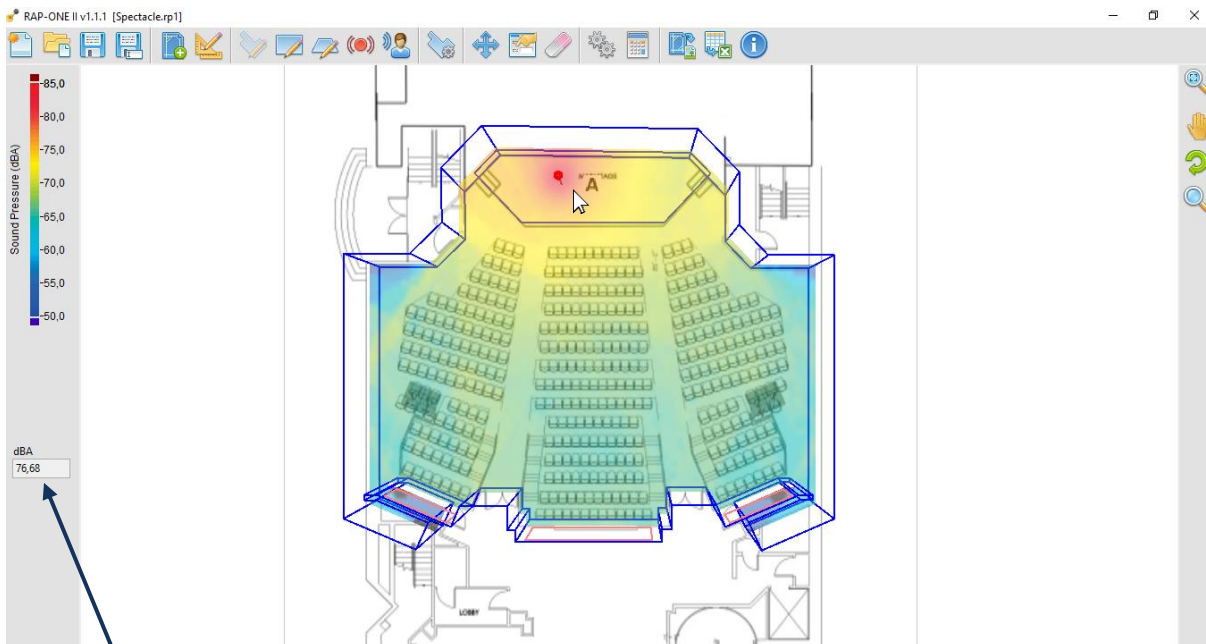
2) Positioning of the noise sources

With the source tool, it is easy to add and position noise sources in the room plan. Once this step is done, all that remains is to define their acoustic power. A source's power may be provided by the manufacturer. Otherwise, the software will assist you in evaluating the power using specially designed dialog boxes.



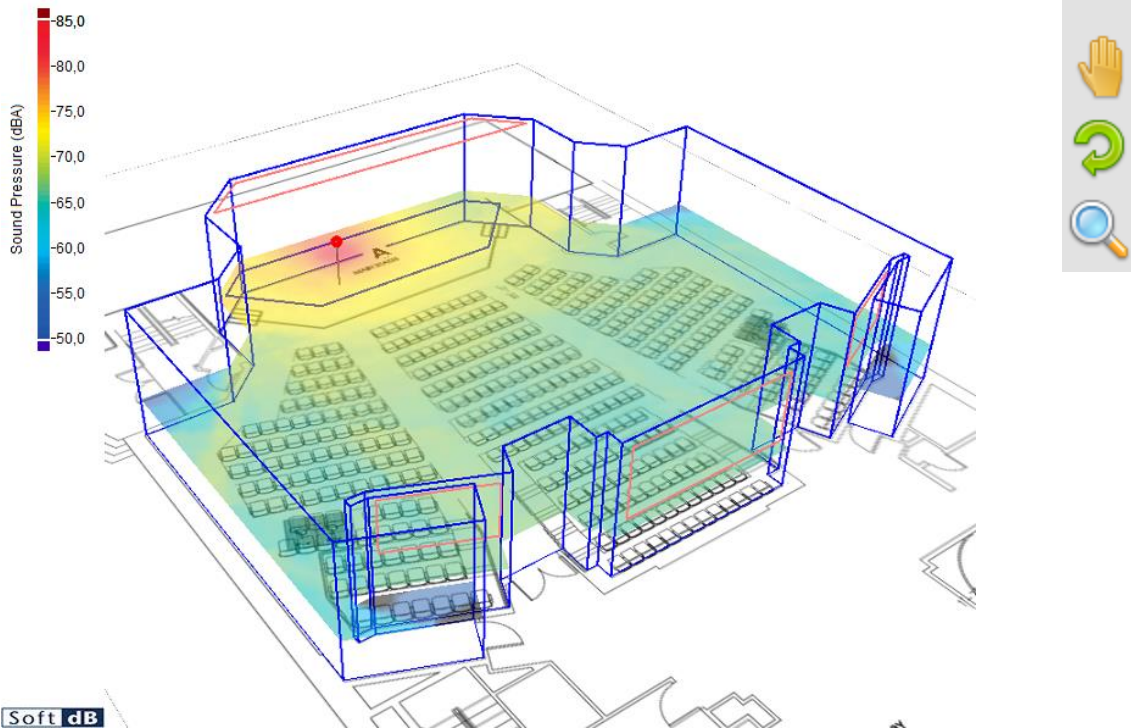
3) Determination of the noise map

To obtain the room's noise map: Click on the calculator button. In less than a few minutes, the noise map will appear on screen.



Move your mouse over the noise map to get the exact noise level at where you position the cursor.

You can also view the room in 3D using View tools :



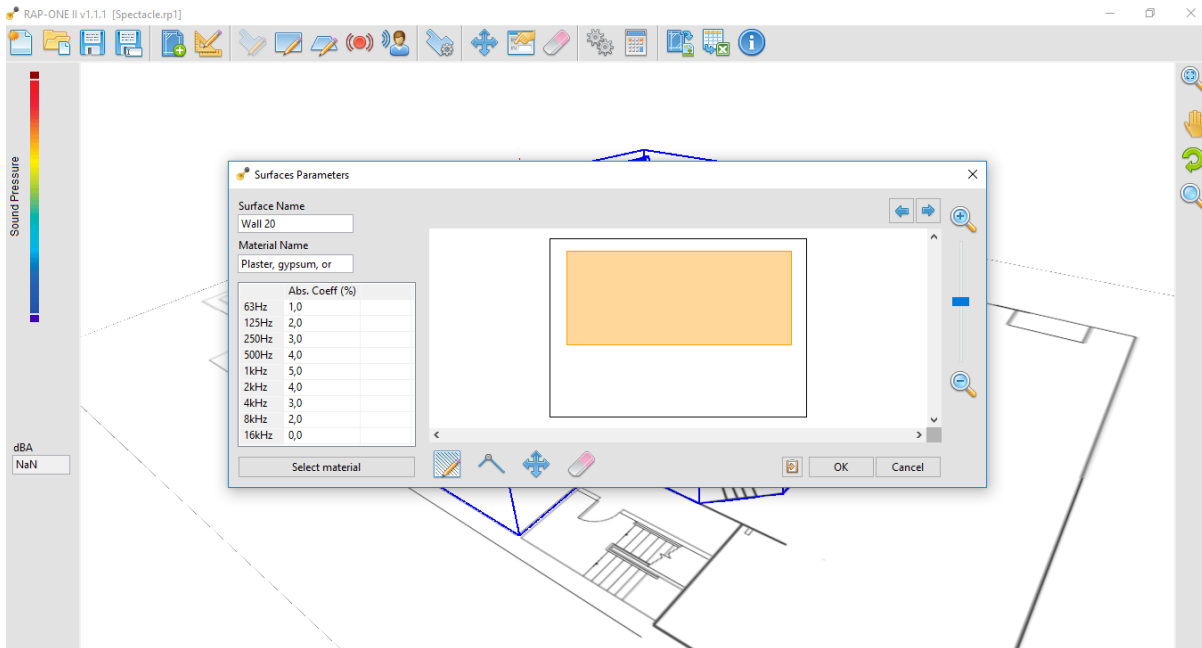
NOISE CONTROL AND MANAGEMENT TOOL

Too often, noise reduction treatments are applied and do not produce the expected results. With *RAP-ONE II*, these problems are avoided because it allows to know in real time the effectiveness of treatment or a combination of treatments, and this, before their implementation.

These are some of the questions you probably already asked yourself and to which the software can answer:

- What will be the increase in noise levels if I add another machine?
- What impact will this new machine have on noise levels perceived by workers?
- What will be the noise reduction if a silencer is installed on a vacuum cleaner or if an acoustic treatment is done on the ceiling?
- How can I be sure that my sound reduction approach is structured?

The evaluation of the performance of potential treatments is simple: introduce the acoustic treatments envisaged in the room by adding screens using the "barrier" tool or by double clicking on any surface to open a window that allows you to draw a panel and apply absorbent properties.



The new noise map of this room will present the noise levels obtained with the addition of treatments. The same treatment approach can be applied to the noise sources of the room (eg adding a silencer).

MEZZO

4-Channel Analyzer

The *MEZZO* 4-Channel Analyzer provides an innovative and cost-effective solution for noise and vibration analysis. More than just a DAQ system, the DSP embedded in each *MEZZO* 4-Channel Analyzer ensures real-time signal processing.

Designed to be used with a tablet PC or any other Windows-based PC, the *MEZZO* 4-Channel Analyzer benefits from the versatility and flexibility provided by computers. This approach allows the *MEZZO* 4-Channel Analyzer along with the *MEZZO* Waveform Recorder and Post-Processing Module to be offered at a very competitive price.

- Waveform Recorder Module (included)
- Noise Analyzer Module (optional)
- Noise Monitor Module (optional)
- Building Acoustics Module (optional)
- Intensity Analyzer Module (optional)



Specifications	
Peak Maximum Level ¹	Low Range: 112 dB _{pk} High Range: 126 dB _{pk}
Noise Level ²	Low Range: 22 dBA, 20 dBC, 25 dBZ High Range: 32 dBA, 30 dBC, 35 dBZ
Under-Range Limit Level ³	Low Range: 32 dBA, 30 dBC, 35 dBZ High Range: 39 dBA, 37 dBC, 42 dBZ
Input Range	Low Range: 0.42 V _{pk} High Range: 2.1 V _{pk}
Maximum Sampling Rate	48 kHz
Signal Conditioning	AC or IEPE
Input/output connectors	LEMO coaxial (Serie 0S, insert config. 116)
Communication	USB 2.0 (Mini B connector)
Dimensions	145 x 60 x 35 mm
Power Supply	USB Powered (Max 0.35W)

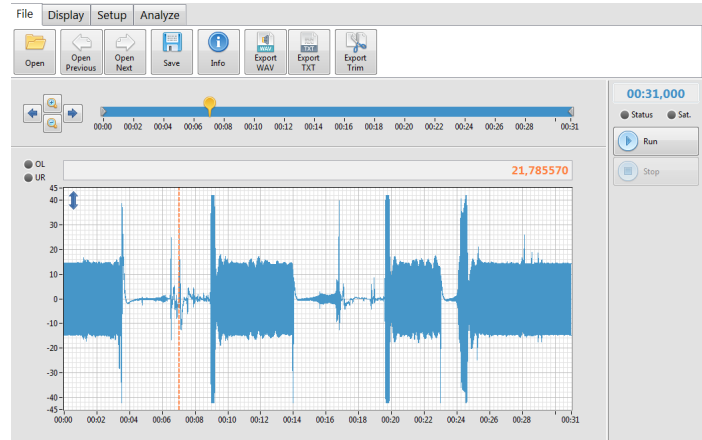
1, 2, 3: Evaluated according to IEC 61672 (2013) Class 1, using 50 mV/Pa sensitivity

Mezzo Waveform Recorder Module (included)

The *MEZZO* Waveform Recorder Module is the perfect tool for advanced noise and vibration waveform processing:

- Time History;
- FFT Spectrum;
- Fractional Octave Spectrum;
- Statistics;
- FRF;
- Waterfall;
- And More.

The intuitive and versatile interface is used for measurement acquisition as well as for the post-processing of measurement files. Its unique file structure allows for fast loading even with very large files.



Specifications

Time History	Global or single band (1/1, 1/3 or 1/24 octave band) RMS (Leq), Slow, Fast, Impulse or Peak A, C or Z frequency weighting
FFT Spectrum	Selectable frequency interval, window and overlap RMS averaging or Max Hold Power spectrum or Power spectral density A, C or Z frequency weighting
Fractional Octave Spectrum	1/1, 1/3 or 1/24 octave band RMS (Leq), Peak Max, or SPL Percentile (Slow, Fast or Impulse) A, C or Z frequency weighting
Statistics	Global or single band (1/1, 1/3 or 1/24 octave band) RMS (Leq), Slow, Fast, Impulse or Peak A, C or Z frequency weighting
FRF	Selectable frequency interval, window and overlap RMS averaging or Max Hold Magnitude, Phase and Coherence
Waterfall	Selectable frequency interval, window and overlap RMS averaging or Max hold Power spectrum or Power spectral density A, C or Z frequency weighting
Signal Integration	Single, double or none
Standard Compliance	IEC 61672-1 (2013), IEC 61260 (2014), ANSI S1.4 (2014), ANSI S1.11 (2014)
Minimum Requirement	Windows XP SP3 and later, 1.2 GHz CPU, 2 GB RAM