Mezzo Software Suite

Waveform Recorder Module

User Guide – v1.1

2015-02-27
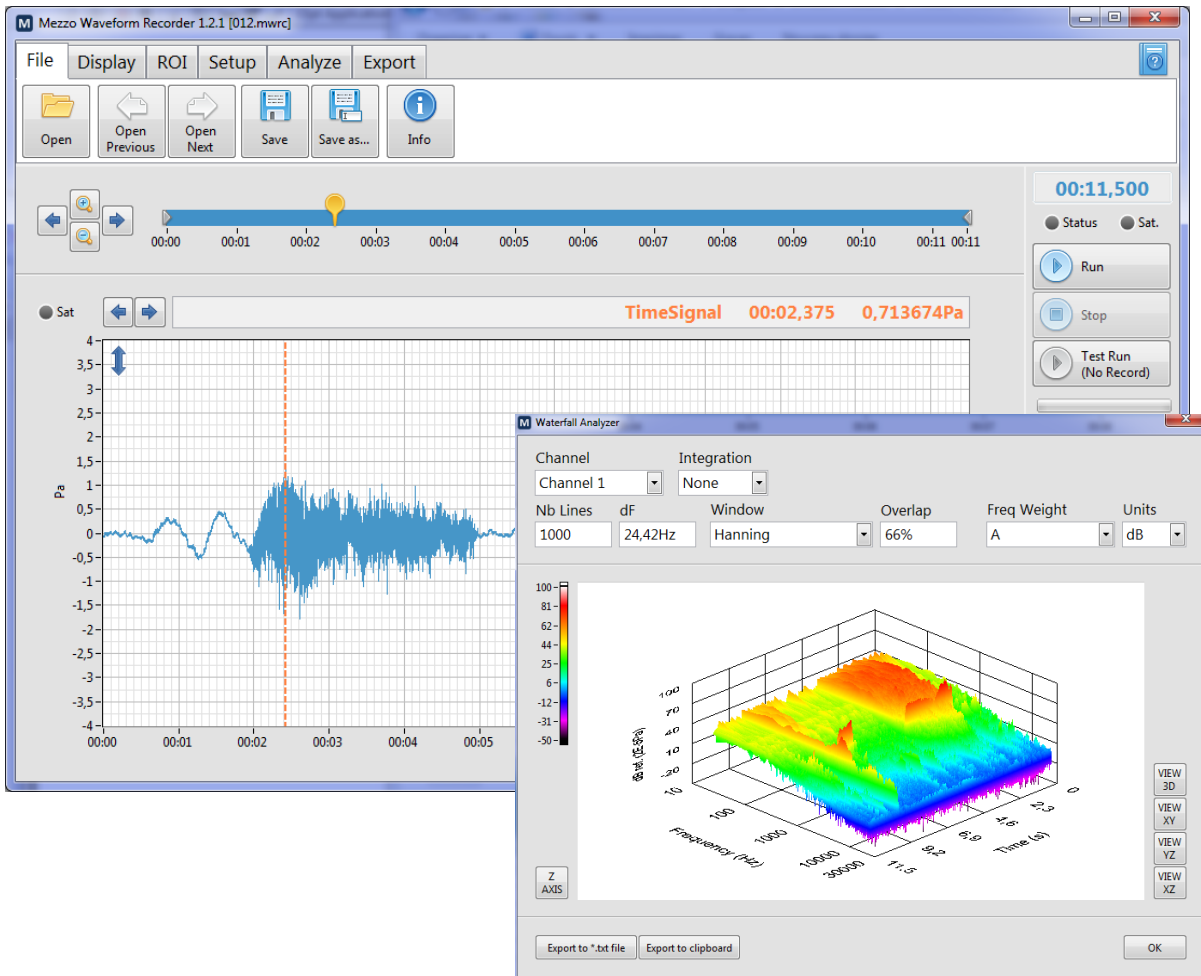
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Contents

1 Introduction

Congratulations on your purchase of the Mezzo Waveform Recorder Module.

Intended to be used with the Mezzo Precision Microphone, the Mezzo Waveform Recorder is the perfect tool for advanced sound and vibration signal processing. More than just a recorder, it also provides several post-processing tools:

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

The current user guide describes the functionalities of the Waveform Recorder Module. For more information on the Mezzo Precision Microphone hardware, please refer to the Mezzo Precision Microphone user guide.

2 Waveform Recorder System Description

The following sub-sections describe the three main components of the Waveform Recorder system: the computer, the Mezzo unit and the sensor.

2.1 Computer

The PC is at the heart of the monitoring station. Of course, this PC needs to have the Waveform Recorder Module installed.

Computer Requirements

Item	Minimum Requirements
Operating System	Windows XP SP3, Windows Vista, Windows 7, Windows 8
CPU	Dual-Core at1.2 GHz
Memory	2 GB RAM
Hard drive	300 MB free hard disk space
Port	USB 2.0
Minimal Display resolution	800 x 600

2.1.1 Power consumption

The computer is the most power demanding item from the whole system. Thus, its power requirements will be the most significant in the power estimation of the system.

2.1.2 Sleep and Standby

While an acquisition is in progress, the software normally prevents Windows from going into sleep.

2.2 Mezzo Unit

The Mezzo unit provides the interface for signal measurement. The input of the Mezzo Precision Microphone is a SMB connector. An extension cable (SMB to BNC, optional item) may be use to interface to with BNC sensor.
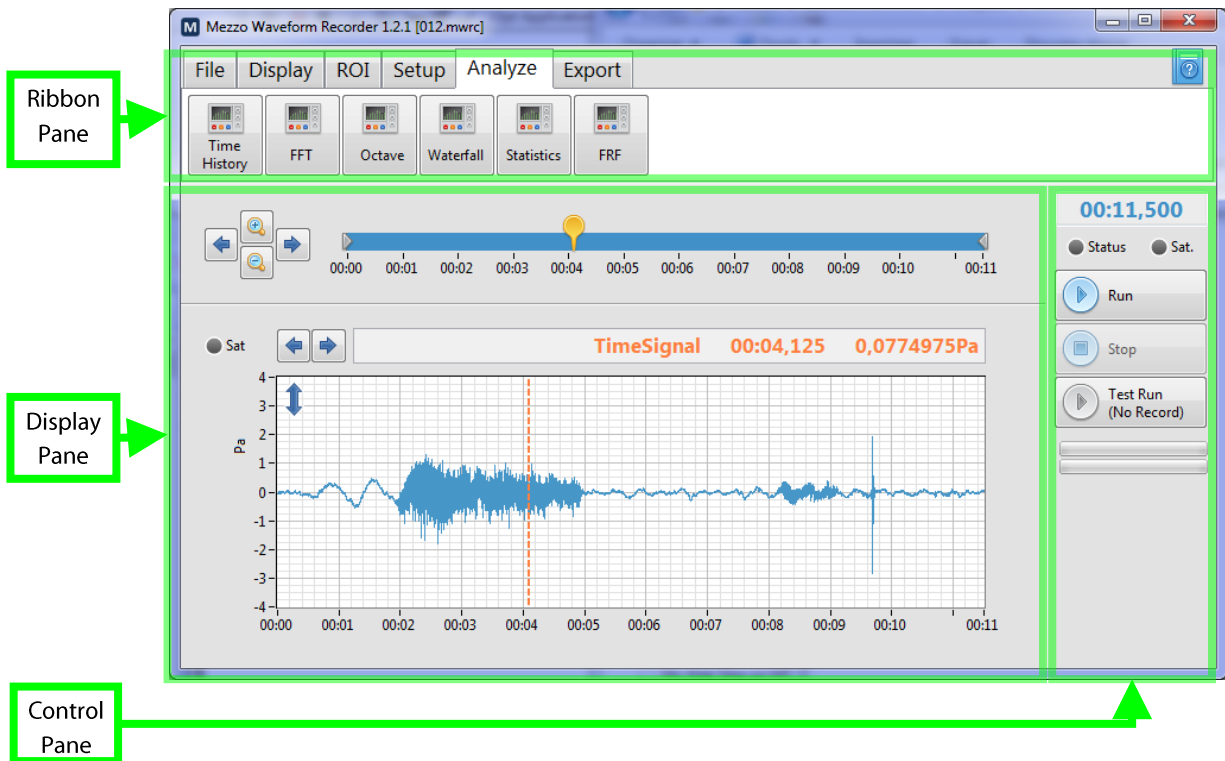
2.3 Sensors

The Mezzo unit supports any IEPE compatible sensor. The following table gives the recommended sensors.

Recommended sensors

Sensor type	Description
Standard microphone	BSWA type MPA221(Class 1) BSWA type MPA225 (Class 2)
Outdoor microphone	GRAS type 41AL-S1 BSWA type OM231

3 Waveform Recorder Module

The Waveform Recorder module is part of the Mezzo Software Suite and is optional with the Mezzo Precision Microphone. It contains several professional tools for acoustic or vibration analysis of recorded signals.

Main interface of the Waveform Recorder Module

General Module Specifications

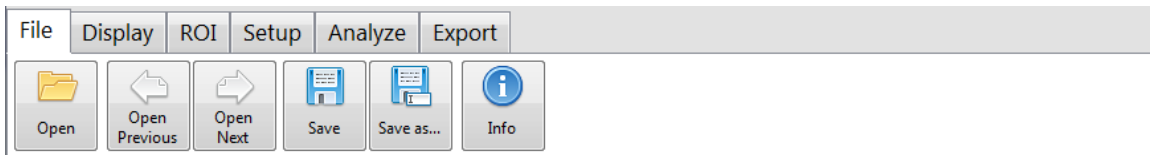| Parameter	Value
Inputs	IEPE compatible sensors. Records 1 or 2 channels (if available). Each input has 2 ranges available: $0.42V_{pk}$ and $2.1V_{pk}$. Sampling rate of 48.8 kHz, 24.4 kHz or 12.2 kHz.
Record	Save the whole time signal for post analysis

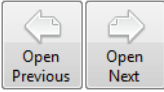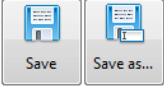| Display	Time signal or instant FFT Spectrum (linear or dB).
	Time bar for easy scrolling and zooming.
Analyze	Time History, FFT, Octave Spectrum (1/1, 1/3, 1/24), Waterfall, Statistics, FRF.
	Analyse the data selected on the Time Bar.
	Use of Regions Of Interest (ROI) to save the time span used for an analysis.
Export	Export of the signal into a wave file (.wav) or into a tab-delimited file (.txt).

3.1   Ribbon Pane

Press from upper right corner of the main panel to open the user guide in the default pdf reader application (if any).
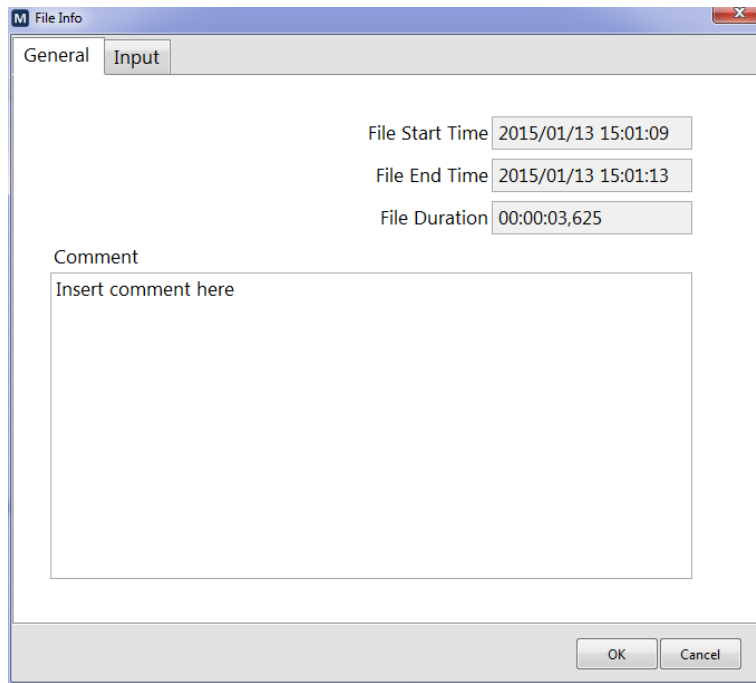
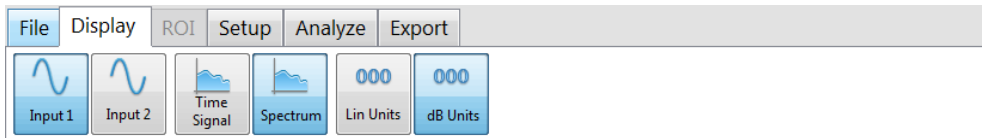### 3.1.1   File Menu

File Menu

File Menu

Icon	Description
	The Open button prompts the user to open a data file (.mspa).
	These two buttons open the previous/next data file in the Record Directory.
	These buttons save the data into the opened file or into a new file. Other than the time signal itself, a data file also includes the comment, the input information (name, sensitivity, units) and the Regions Of Interest (ROI).
	This button pops the File Info interface (figure below).
	It contains the information on the measurement over several tabs:
	• General information (start time, end time, comment)
	• Input setup
	The Comment can be modified either during or after a measurement. Other fields of the input setup can also be edited but only when the measurement is completed (Input name, Units, dB ref, Sensitivity, Manufacturer, Model, Serial Number).
	Notice that changing the sensitivity will affect the amplitude of the signal accordingly.
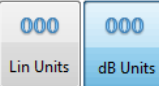
File Info Interface

3.1.2 Display Menu

Display Menu

Display Menu

Icon	Description
	Toggles between Input 1 and 2 (if available).
	Toggles between available graph types: Time Signal and FFT Spectrum. During measurement the Time Signal displays the last 10 seconds and the FFT is evaluated from the last 1/8 second. After the measurement, the Time Signal displays the time span as selected in the Timer Bar and the FFT is the value at the yellow cursor position in the Time Bar.
	When displaying the spectrum graph, toggles between the linear and dB units.

3.1.3 ROI Menu
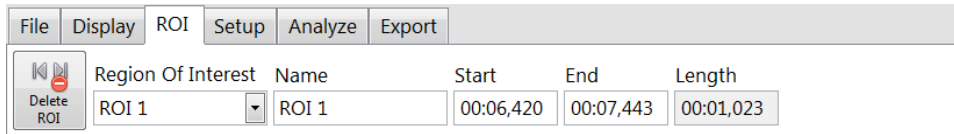
ROI Menu

A Region of Interest (ROI) is a section of the measurement time span. Typically, a user will record during a relatively long period of time, but will be interested in only some sections. The ROI allows the users to keep a record of these sections that were used for the analysis. Therefore, it is easier to reproduce the result of a previous analysis. The ROI tab is only available when the Time Signal graph is selected in the Display tab.

ROI Menu

Icon	Description
	The Add ROI button adds the current time span as a new Region Of Interest of the measurement. The ROI is saved along with the file. To recall the ROI, simply select it from the Region Of Interest drop down menu.
	The Delete ROI button removes the active ROI from the Region Of Interest menu
	The Name control should be used to identify the ROI for further reference.
	The Start and End controls are the ROI boundaries. They can be adjusted directly and the time span of the Time Signal graph will update accordingly.
	The Length indicator is the difference of the ROI start time and end time.

3.1.4 Setup Menu
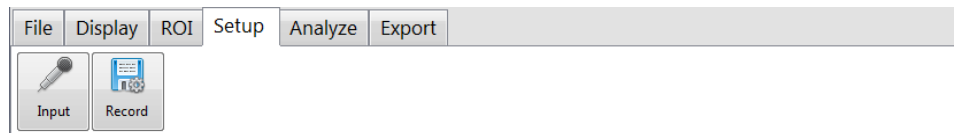
Setup Menu

Setup Menu

Icon	Description
	The Input button calls the Input Setup Interface. It mainly sets the input sensitivity, the input range and sampling frequency.
	The Record button calls the Record Setup interface. It sets the record directory.

Input Setup

Input Setup Interface – Mezzo Analyzer Parameters

| Control / Indicator	Description
Model Intensity Probe	Model of the detected hardware.
Serial Number M14100602-01	Serial Number of the detected hardware.
Conditioning IEPE Supply Direct AC IEPE Supply	Conditioning applied on the input sensor. Most microphones and accelerometer use the IEPE Supply (also called ICP). Using the Direct AC mode disables the IEPE conditioning and still filter the DC amplitude on the input.
Input 1 Input 2 Active Active	Enables the input. The available inputs vary according to the detected hardware.
Range Low Low High	Selects the Low or High input range to be used during the measurement. Low Range: 0.42Vpk High Range: 2.1Vpk
Units Pa	Sets the units that will be used for the input when displaying a linear level. Changing the Units parameter will not affect the numeric of the measurement. The Sensitivity and dBref are also defined with the Units.
dB Ref 2E-5Pa	Sets the linear level of reference for 0 dB. It is only used when displaying data in decibels.
Name	Sets the name of the input. It is intended for documentation purpose only.

Sensitivity 47,88mV/Pa Calib. Date 2014/11/28 17:04 [Calibrate]	Sets the sensitivity of the sensor in millivolts per unit. To set the sensitivity, a level calibration is usually done using the Sensor Calibration interface. Alternatively, it can be set by manually overwriting the Sensitivity field.
Manufacturer BSWA Model MP201-MA221 Serial Number 480265-451706	The Manufacturer, Model and Serial Number of the sensor.
[Load Sensor Info From Mezzo]	Loads the sensors information from the Mezzo unit (factory defined).

Sensor Calibration Interface

The sensor can be calibrated using the Sensor Calibration interface and a calibrator.
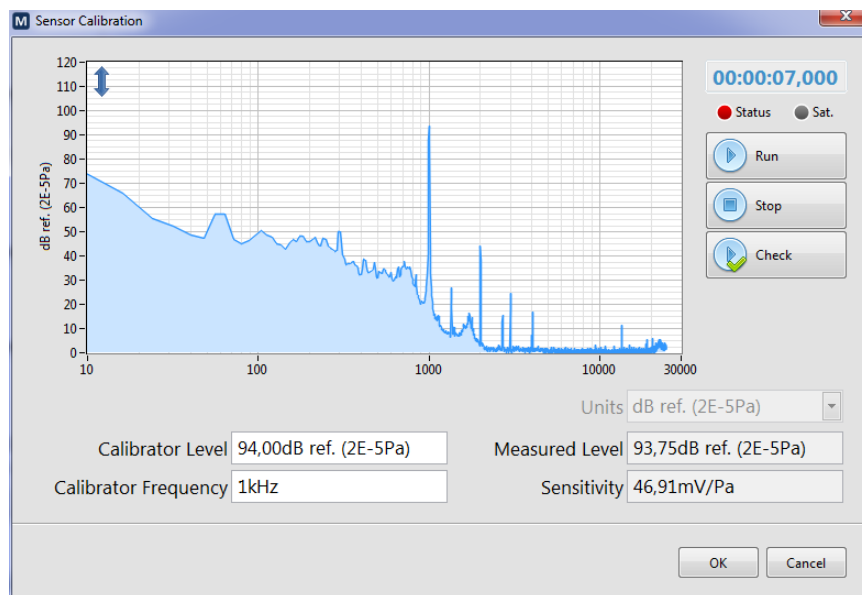
Sensor Calibration interface

1) Adjust the Calibrator Level and Calibrator Frequency according to the Level of the calibrator used. Most sound calibrators generate 94 dB at 1 kHz.
2) Install the calibrator on the sensor and start the calibration signal.
3) Press Run to start the calibration measurement.
4) Wait a few seconds until the measured level stabilizes. 10 seconds should be enough.
5) Press Stop. The sensitivity is updated according to the calibration measurement.
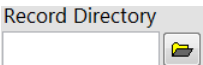6) If the new Sensitivity value is acceptable, press OK

Also, the Check button allows to run a calibration measurement using the current sensitivity but without automatically updating it.
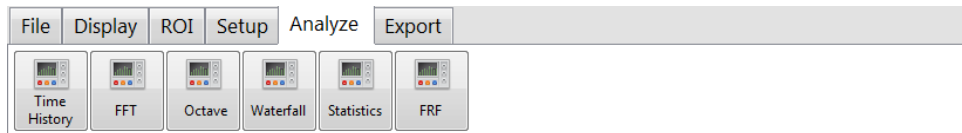
Record Setup
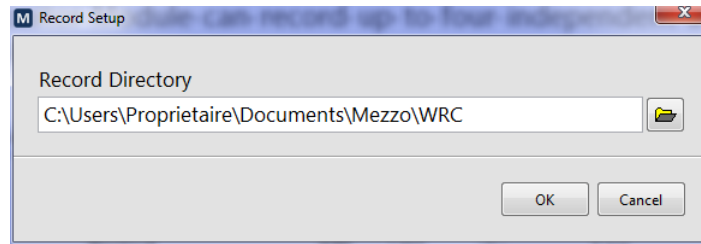
Record Setup interface

Record Setup interface

| Control or Indicator	Description
Record Directory	This field allows selecting the record directory. The default directory is *User Documents*\Mezzo\WRC.

3.1.5 Analyze Menu

Analyze Menu

All the analysis functions use the time span defined on the time bar (i.e. the data currently displayed on the Time Signal graph).

Analyze Menu

Icon	Description
Time History	This button opens the interface of the Time History Analyzer. The analyzer builds a global level historic with an adjustable time resolution.
FFT	This button opens the interface of the FFT Analyzer. The analyzer computes the FFT spectrum.
Octave	This button opens the interface of the Octave Analyzer. The analyzer computes the octave spectrum (1/1 octave, 1/3 octave or 1/24 octave).
Waterfall	This button opens the interface of the Statistics Analyzer. The analyzer presents the evolution of the power spectra in time on a 3-dimension graph (level vs frequency vs time).
Statistics	This buttons opens the interface of the Statistics Analyzer. The analyzer compiles the percentiles levels of the signal.
FRF	This button opens the interface of the FRF Analyzer. The analyzer computes the frequency response function between 2 channels.
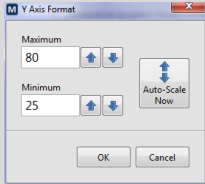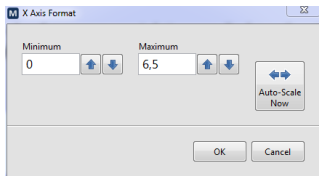
Time History Analyzer
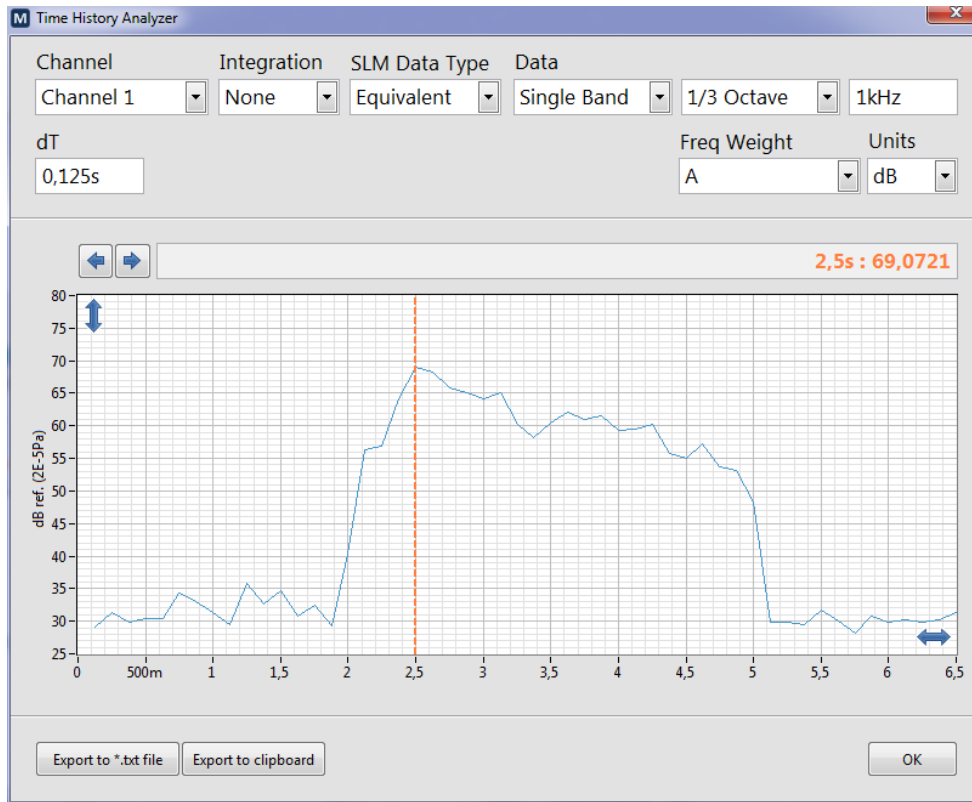
Time History Analyzer interface

Time History Analyzer interface

Icon	Description
Channel Channel 1	Selects the input channel to analyze.
Integration None → None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.
SLM Data Type Equivalent → Equivalent Slow Fast Impulse Peak	Selects the data type: • Equivalent: average level during the sampling period dT. Noted Leq in acoustic. • Slow: exponential filter of time constant of 1 sec applied on time signal. The value is outputted at the sampling rate dT. • Fast: exponential of time constant of 0.125 sec. The value is outputted at the sampling rate dT. • Impulse: exponential of time constant of 0.035 and 1.5 sec for rising and falling signal respectively. The value is outputted at a sampling rate dT. • Peak Max: Maximum value of the time signal during the period.

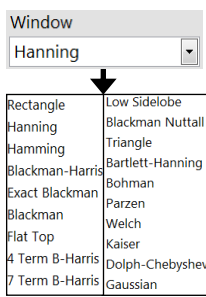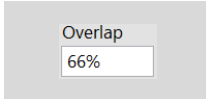|	
Data **Single Band** ▼ Global Single Band **1/3 Octave** ▼ 1/1 Octave 1/3 Octave 1/24 Octave 1kHz	Selects between the global value and a single band of an octave spectrum. When Single Band value is selected, the octave menu and frequency band become available.
dT 0,125s	Sets the data sampling period (interval between the values on the graph)
Freq Weight A ▼ Z (No Weight) A C	Sets the frequency weighting applied to the time signal. The standard weighting are Z (no weighting), A or C.
Units dB ▼ Lin dB	Sets the units as linear (Unit^2) or decibel.
	Sets the vertical scale through the Y Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
	Sets the horizontal scale through the X Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
◄ ► **2,5s : 69,0721**	The value at the cursor position is displayed in the legend above the graph. The cursor can be moved by clicking on the graph or by using the left and right arrows.
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab-delimited text. The data can then be pasted as text into any software that accepts a text entry.

FFT Analyzer
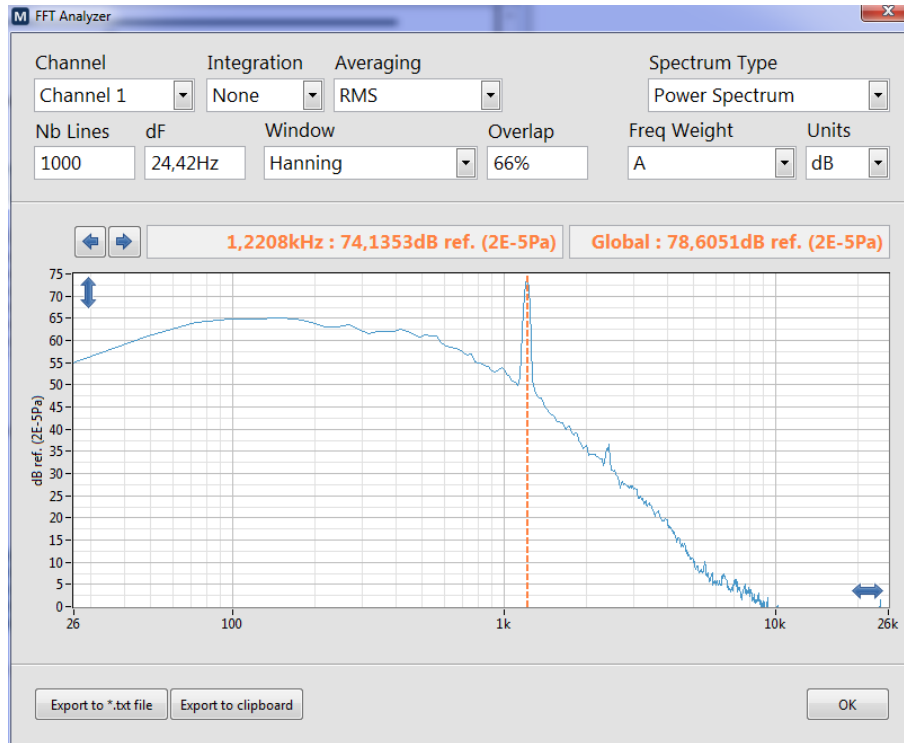
FFT Analyzer interface

FFT Analyzer interface

Icon	Description
Channel Channel 1	Selects the input channel to analyze.
Integration None → None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.
Averaging RMS → RMS Max Hold	Selects the Averaging mode: • RMS: linear average of the FFT blocks • Max Hold: keeps track of the maximum level at each frequency of the FFT
Nb Lines 1000 **dF** 24,42Hz	Set the frequency resolution of the spectrum. Changing one control will change the other right away since both are linked as see in the following formula: dF = Fs / (2*Nb Lines) where Fs is the sampling frequency (see Input Setup p.7). The size of a block of time signal used to compute the FFT is twice the number of lines in the FFT.

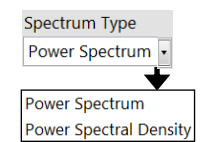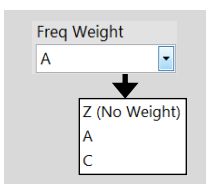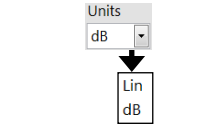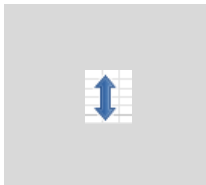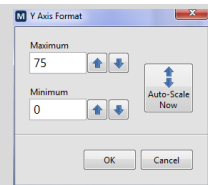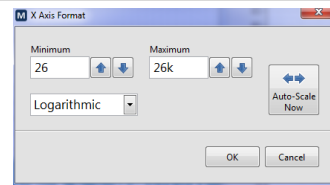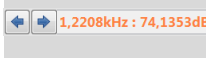|	
Window Hanning	Sets the time window applied on each block of data before evaluating the FFT spectrum of a block. This is commonly used to avoid aliasing due to the discontinuity on both ends of the blocks. Hanning is the most common window used.
Overlap 66%	Sets the overlap applied of the time blocks used to compute the FFT. It is common to use of an overlap of 66% in order to compensate the effect of applying a time window on each block.
Spectrum Type Power Spectrum	Sets the spectrum type. Commonly, the power spectrum will be used. Optionally, the power spectral density spectrum, which is basically the power spectrum divided by the frequency resolution.
Freq Weight A	Sets the frequency weighting applied to the time signal. The standard weighting are Z (no weighting), A or C.
Units dB	Sets the units as linear (Unit^2) or decibel.
	Sets the vertical scale through the Y Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
	Sets the horizontal scale through the X Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges. Also, the frequency axis can be either linear or logarithmic.
1,2208kHz : 74,1353dB	The value at the cursor position is displayed in the legend above the graph. The cursor can be moved by clicking on the graph or by using the left and right arrows.
Global : 78,6051dB ref. (2E-5Pa)	The global value (sommation of the bands) is also displayed in the legend above the graph.
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab-delimited text. The data can then be pasted as text into any software that accepts a text entry.

Octave Analyzer

Octave Analyzer interface

The Octave Analyzer computes each band independently.

Octave Analyzer interface

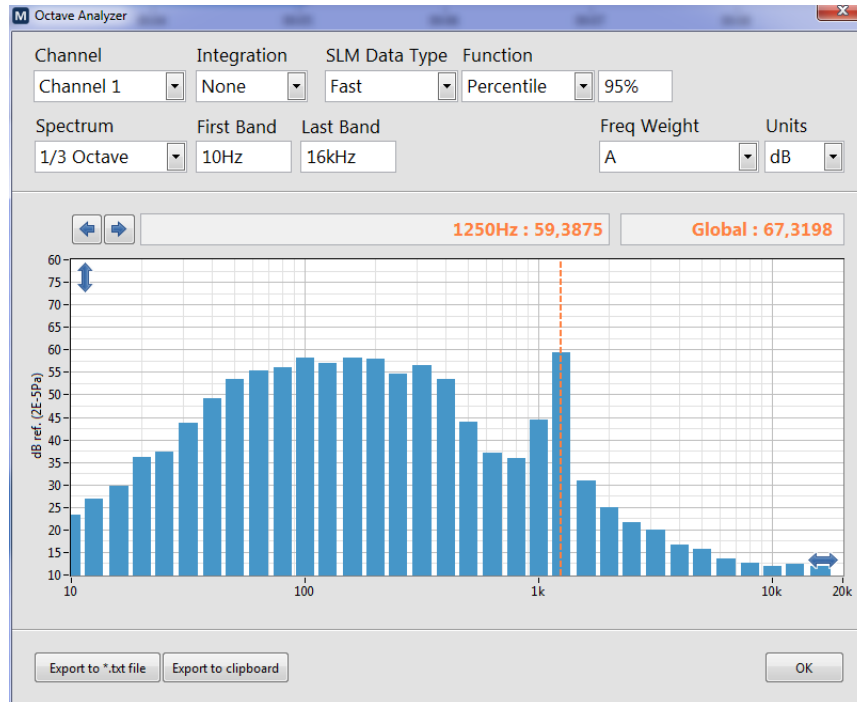| Icon	Description
Channel Channel 1	Selects the input channel to analyze.
Integration None None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.
SLM Data Type Fast Equivalent Slow Fast Impulse Peak	Selects the data type • Equivalent: average level during the sampling period dT. Noted Leq in acoustic. • Slow: exponential filter of time constant of 1 sec applied on time signal. The value is outputted at the sampling rate dT. • Fast: exponential of time constant of 0.125 sec. The value is outputted at the sampling rate dT. • Impulse: exponential of time constant of 0.035 and 1.5 sec for rising and falling signal respectively. The value is outputted at a sampling rate dT. • Peak Max: Maximum value of the time signal during the period.

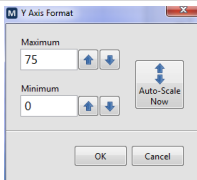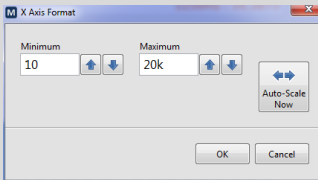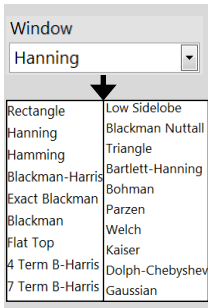|	
Function Percentile / Max / Min / Percentile 95%	When an exponential SLM Data type is selected (Slow, Fast or Impulse), Function specifies what data to display. • Min: the lowest value of the exponential level during the period dT. • Max: the highest value of the exponential level during the period dT. • Percentile: the level that is exceeded by X percent of the time during the period dT.
Spectrum 1/3 Octave / 1/1 Octave / 1/3 Octave / 1/24 Octave	Sets the spectrum type to 1/1 octave, 1/3 octave or 1/24 octave.
First Band 10Hz **Last Band** 16kHz	Sets the first and last bands to be computed.
Freq Weight A / Z (No Weight) / A / C	Sets the frequency weighting applied to the time signal. The standard weighting are Z (no weighting), A or C.
Units dB / Lin / dB	Sets the units as linear (Unit^2) or decibel.
↕	Sets the vertical scale through the Y Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
↔	Sets the horizontal scale through the X Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
1250Hz : 59,3875	The value at the cursor position is displayed in the legend above the graph. The cursor can be moved by clicking on the graph or by using the left and right arrow.
Global : 67,3198	The global value (sommation of the bands) is also displayed in the legend above the graph.
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab-delimited text. The data can then be pasted as text into any software that accepts a text entry.

Waterfall Analyzer
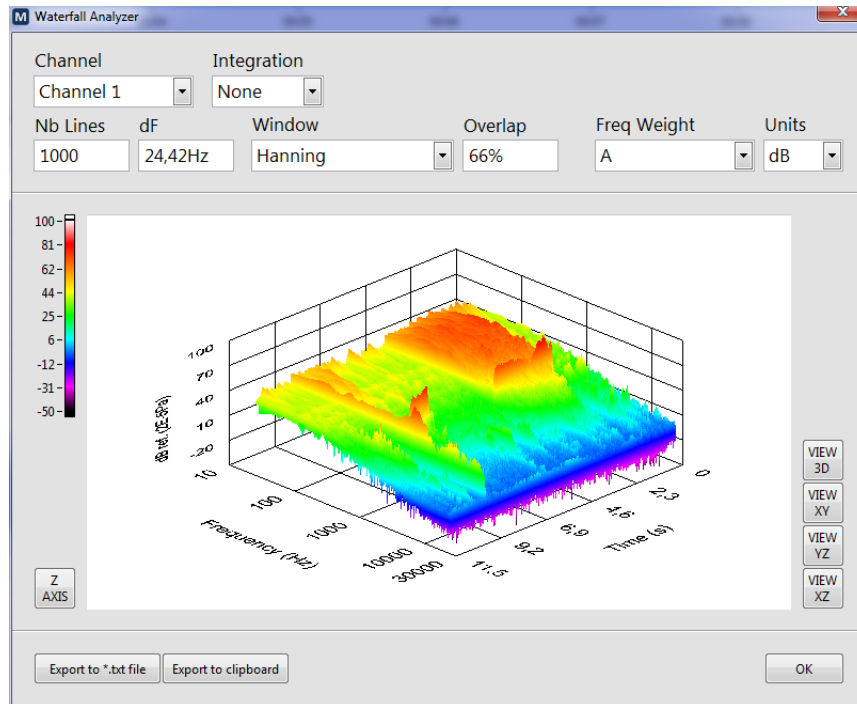
Waterfall Analyzer interface

The Waterfall Analyzer presents the evolution of the power spectra in time. It computes the power spectra using the selected frequency resolution and overlap. Each power spectrum is presented in a 3-dimension graph along a time axis. As well as the numerical amplitude scale, a color scale is employed to help in visualizing the high and low levels of the power spectra. The graph can be rotated, zoomed and moved.

Waterfall Analyzer interface

Icon	Description
Channel Channel 1	Selects the input channel to analyze.
Integration None ↓ None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.
Nb Lines 1000 dF 24,42Hz	Set the frequency resolution of the spectrum. Changing one control will change the other right away since both are linked as see in the following formula: dF = Fs / (2*Nb Lines) where Fs is the sampling frequency (see Input Setup p.7). The size of a block of time signal used to compute the FFT is twice the number of lines in the FFT. The block size along with the overlap directly affect the time interval between the spectra: interval= (1-Overlap) * Nb Lines * 2 / Fs.

Window — Hanning (dropdown) options: Rectangle, Hanning, Hamming, Blackman-Harris, Exact Blackman, Blackman, Flat Top, 4 Term B-Harris, 7 Term B-Harris, Low Sidelobe, Blackman Nuttall, Triangle, Bartlett-Hanning, Bohman, Parzen, Welch, Kaiser, Dolph-Chebyshev, Gaussian	Sets the time window applied on each block of data before evaluating the FFT spectrum of a block. This is commonly used to avoid aliasing due to the discontinuity on both ends of the blocks. Hanning is the most common window used.
Overlap 66%	Sets the overlap applied of the time blocks used to compute the FFT. It is common to use of an overlap of 66% in order to compensate the effect of applying a time window on each block. The block size along with the overlap directly affect the time interval between the spectra: interval= (1-Overlap) * Nb Lines * 2 / Fs.
Spectrum Type Power Spectrum (dropdown): Power Spectrum, Power Spectral Density	Sets the spectrum type. Commonly, the power spectrum will be used. Optionally, the power spectral density spectrum, which is basically the power spectrum divided by the frequency resolution.
Freq Weight A (dropdown): Z (No Weight), A, C	Sets the frequency weighting applied to the time signal. The standard weighting are Z (no weighting), A or C.
Units dB (dropdown): Lin, dB	Sets the units as linear ($Unit^2$) or decibel.
Z AXIS	Sets the vertical scale through the Z Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum range.
(color scale)	The color scale of the level on the graph. The color scale matches the Z axis.
VIEW 3D, VIEW XY, VIEW YZ, VIEW XZ	Switches between the general 3d view and the plan views XY (freq vs time), YZ (level vs freq) and XZ (level vs time).
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab delimited text. The data can then be pasted as text into any software that accepts a text entry.
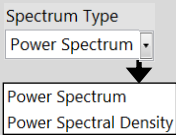
Statistics Analyzer
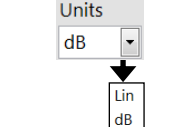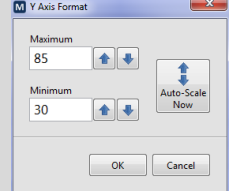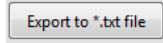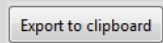
Statistic Analyzer interface

The Statistics Analyzer displays the percentile levels of the selected data during the selected time span. The percentiles (horizontal axis) range from 0 to 100, where 0 and 100 are the maximum and minimum values respectively.
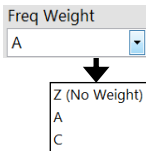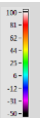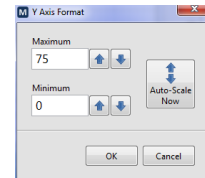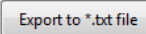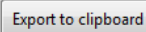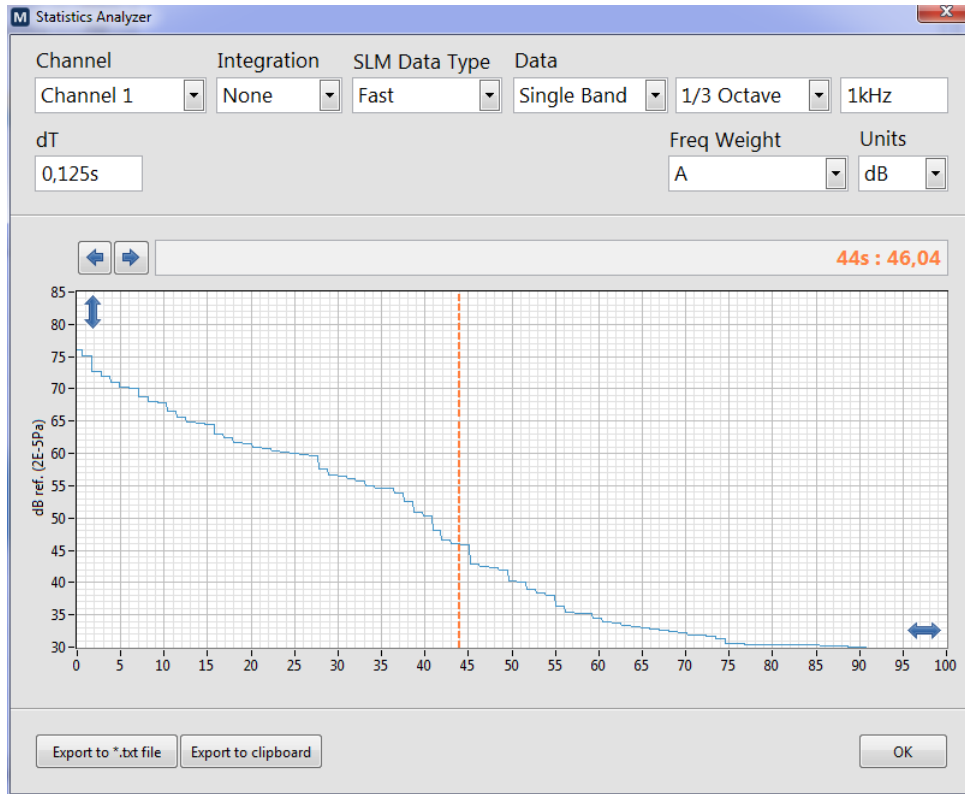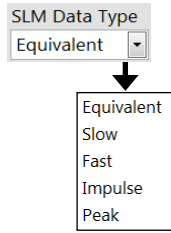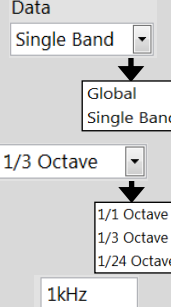
Statistics Analyzer interface

Icon	Description
Channel / Channel 1	Selects the input channel to analyze.
Integration / None → None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.

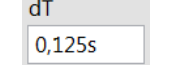|	
SLM Data Type — Equivalent (Equivalent, Slow, Fast, Impulse, Peak)	Selects the data type • Equivalent: average level during the sampling period dT. Noted Leq in acoustic. • Slow: exponential filter of time constant of 1 sec applied on time signal. The value is outputted at the sampling rate dT. • Fast: exponential of time constant of 0.125 sec. The value is outputted at the sampling rate dT. • Impulse: exponential of time constant of 0.035 and 1.5 sec for rising and falling signal respectively. The value is outputted at a sampling rate dT. • Peak Max: Maximum value of the time signal during the period.
Data — Single Band (Global, Single Band); 1/3 Octave (1/1 Octave, 1/3 Octave, 1/24 Octave); 1kHz	Selects between the global value and a single band of an octave spectrum. When Single Band value is selected, the octave menu and frequency band become available.
dT — 0,125s	Sets the data sampling period (interval between the values on the graph)
Freq Weight — A (Z (No Weight), A, C)	Sets the frequency weighting applied to the time signal. The standard weighting are Z (no weighting), A or C.
Units — dB (Lin, dB)	Sets the units as linear (Unit²) or decibel.
↕ icon	Sets the vertical scale through the Y Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
↔ icon	Sets the horizontal scale through the X Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
← → 2,5s : 69,0721	The value at the cursor position is displayed in the legend above the graph. The cursor can be moved by clicking on the graph or by using the left and right arrows.
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab-delimited text. The data can then be pasted as text into any software that accepts a text entry.

FRF Analyzer

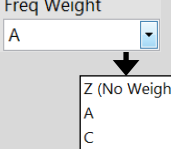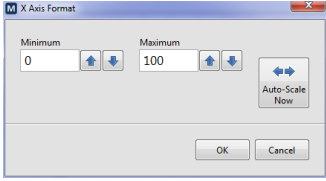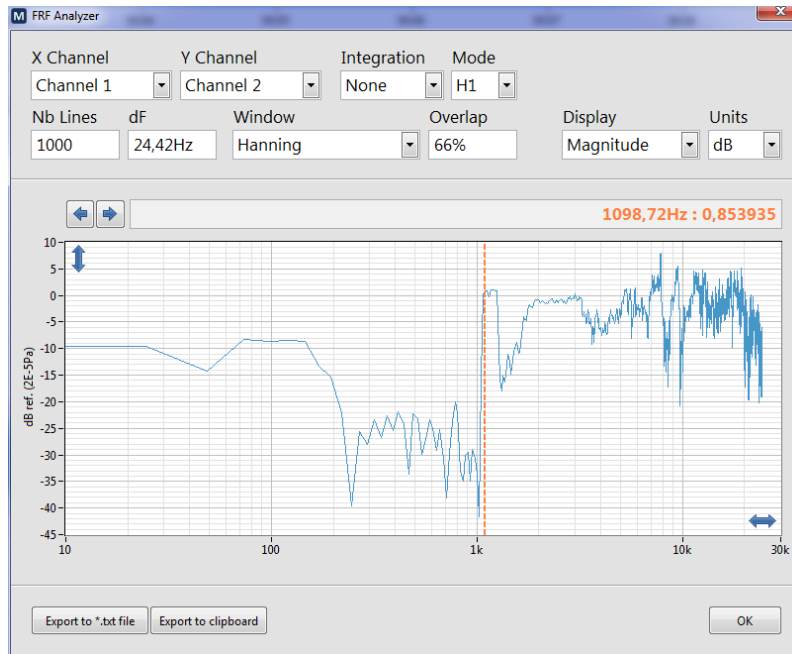

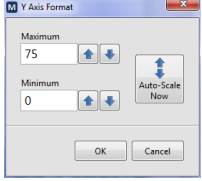FFT Analyzer interface

The FRF Analyzer computes the average frequency response between channels.

FFT Analyzer interface

Icon	Description
X Channel / Channel 1 / Y Channel / Channel 2	Selects the input channels to analyze.
Integration / None → None Single Double	Selects whether integration is applied on the time signal. It is particularly useful to get the velocity or displacement from an acceleration measurement.
Mode / H1 → H1 H2 H3	Selects the mode of FRF: • H1 = y/x = Sxy/Sxx • H2 = y/x = Syy/Sxy • H3 = y/x = (H1+H2)/2 where x is the reference channel and y the second channel. In theory, all Hx must give the same result. However, when the FRF contains resonance and/or anti-resonance, the result can vary from one equation to another. In effect, noise on the X or Y channel on the anti-resonance or resonance can distort the results. The H1 equation is better when the noise is on the Y channel while the H2 equation gives better results when the noise is on the X channel.

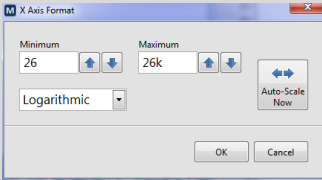|	
Nb Lines 1000 **dF** 24,42Hz	Set the frequency resolution of the spectrum. Changing one control will change the other right away since both are linked as see in the following formula: dF = Fs / (2*Nb Lines) where Fs is the sampling frequency (see Input Setup p.7). The size of a block of time signal used to compute the FFT is twice the number of lines in the FFT.
Window Hanning — Rectangle / Low Sidelobe / Hanning / Blackman Nuttall / Hamming / Triangle / Blackman-Harris / Bartlett-Hanning / Exact Blackman / Bohman / Blackman / Parzen / Flat Top / Welch / 4 Term B-Harris / Kaiser / 7 Term B-Harris / Dolph-Chebyshev / Gaussian	Sets the time window applied on each block of data before evaluating the FFT spectrum of a block. This is commonly used to avoid aliasing due to the discontinuity on both ends of the blocks. Hanning is the most common window used.
Overlap 66%	Sets the overlap applied of the time blocks used to compute the FFT. It is common to use of an overlap of 66% in order to compensate the effect of applying a time window on each block.
Display Magnitude — Magnitude / Phase / Coherence	Selects if the magnitude, phase or coherence is displayed. The magnitude and phase result from selected mode Hx. The equation used for the coherence is: Coherence=H1/H2=Sxy2/(Sxx*Syy). It allows determining if the signal measured on both channels is linked.
Units dB — Lin / dB	Sets the units as linear ($Unit^2$) or decibel (for Magnitude or Coherence display). Sets the units as degree ($Unit^2$) or decibel (for Magnitude or Coherence display).
(vertical scale icon)	Sets the vertical scale through the Y Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges.
(horizontal scale icon)	Sets the horizontal scale through the X Axis Format interface. The Auto-Scale Now button adjusts the scale automatically. It is also possible to manually adjust the minimum and maximum ranges. Also, the frequency axis can be either linear or logarithmic.
1098,72Hz : 0,853935	The value at the cursor position is displayed in the legend above the graph. The cursor can be moved by clicking on the graph or by using the left and right arrow.
Export to *.txt file	Exports the data into a tab-delimited file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.
Export to clipboard	Copies the data to the Windows clipboard as tab-delimited text. The data can then be pasted as text into any software that accepts a text entry.

3.1.6　Export Menu

Export Menu

All the export functions use the time span defined on the time bar (i.e. the data currently displayed on the Time Signal graph).

Export Menu

Icon	Description
	Exports the selected signal into a standard wave file (.wav), which is compatible to most audio player.
	Exports the selected signal into a tab-separated file (.txt). The exported file can be easily opened with any spreadsheet application such as Microsoft Excel.

3.2 Control Pane
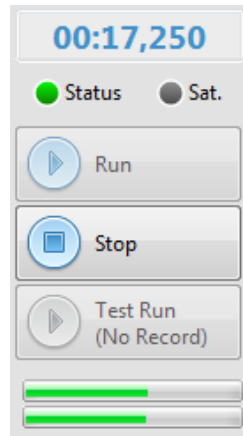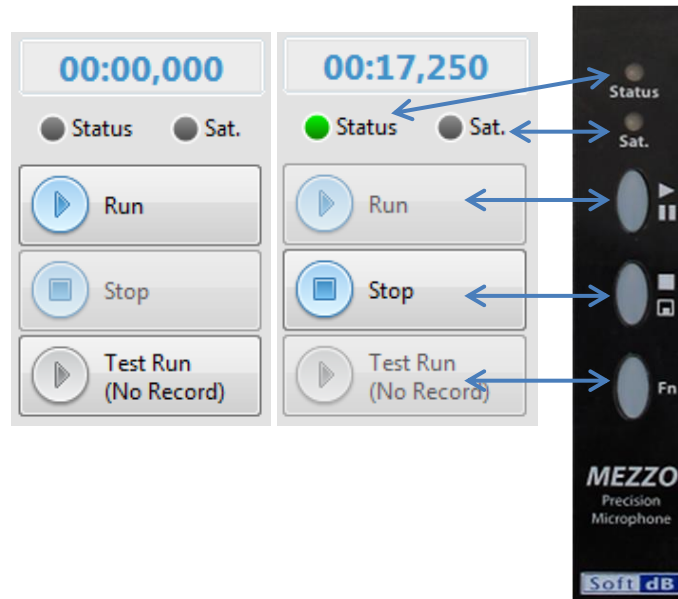
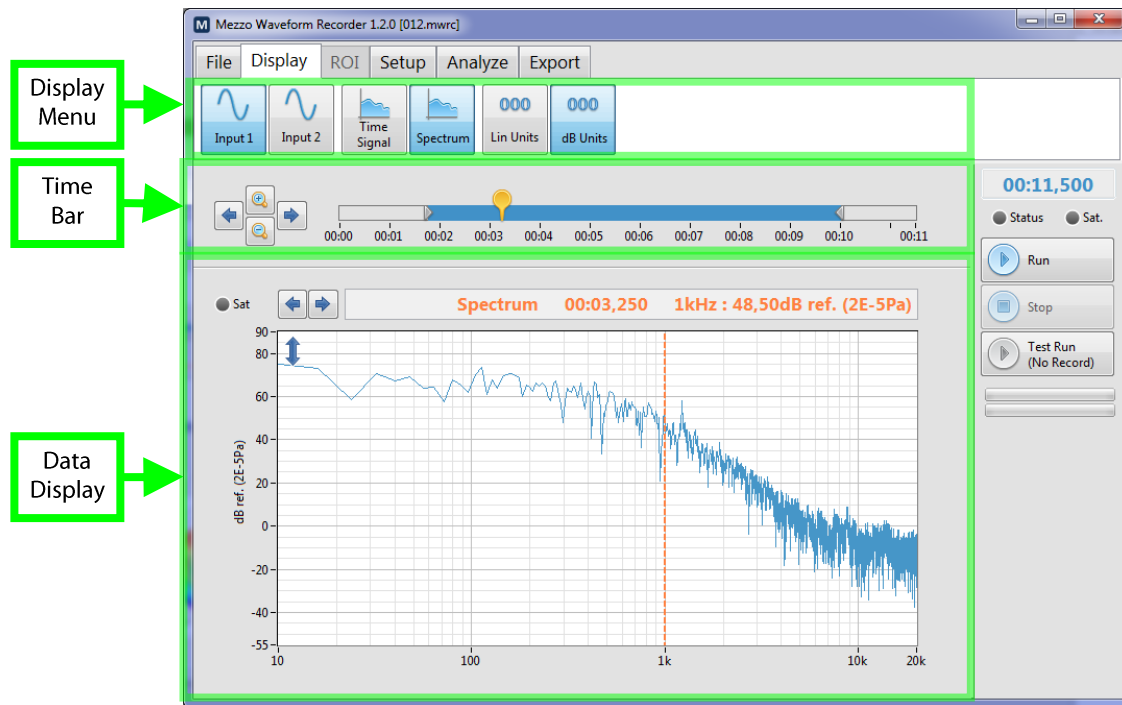

Control Pane

Controls & Indicators

Control / Indicator	Description
	The duration of the measurement in format HH:MM:SS.
	The Run button starts the measurement.
	The Stop button stops the measurement.
	The Test Run (No Record) button starts a measurement without recording the signal.
	The Status color indicates what is the acquisition state: • Grey: acquisition off • Green: acquisition running
	The Sat color indicates if the measured signal is overloading during the acquisition. • Grey: no overload detected • Red: overload detected on at least one channel
	The level vu-meter shows the current level of the active channel. The scale is logarithmic and cover the level operating range of the input from minimum (left) to maximum (right)

Control Pane correspondence on the Mezzo Precision Microphone.

As shown above, several controls and indicators found in the Control Pane are duplicated on the Mezzo Precision Microphone. Therefore, the Status, Sat, Run and Stop have the save functionalities. The function button Fn on the handle is used as a Test Run button.
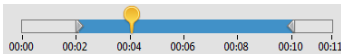
![Soft dB logo]

## 3.3 Display Pane

Display Pane

3.3.1 Time Bar

Time Bar

Control / Indicator	Description
![Time slider]	This time slider gives time information about the measurement and the displayed data. • The leftmost and rightmost values: zero time and total elapsed time respectively. • The grey cursors that enclose the blue span: the time span on the Time Signal graph. • The yellow cursor: the time cursor on the Time Signal graph and the time used to display a value on the Spectrum graph or Stats Table. The cursor can be moved directly from the slider control.
![Magnifier and arrow buttons]	The magnifier buttons zoom in and out the span of the Time History. The arrow buttons shift left or right the span of the Time History.

3.3.2 Data Display

The Data Display area can display either a time signal graph or a FFT spectrum graph.

Time Signal Graph
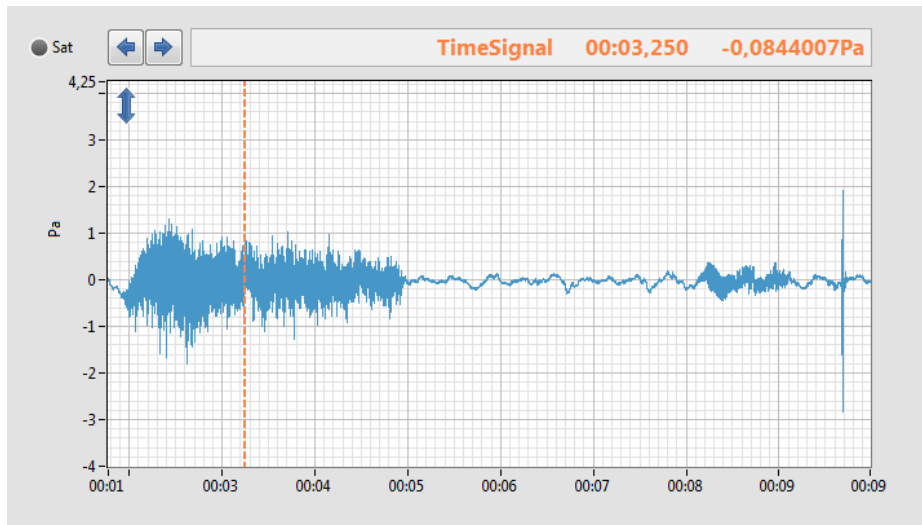
Time History Graph

The Time Signal displays the signal of the input selected in the Display Menu. The time span of the graph is set from the Time Bar.

Time History Graph

Control / Indicator	Description
TimeSignal 00:03,250 -0,0844007Pa	This legend gives the main information on the data being displayed: • The graph type. • The time of the data. • The value of the cursor on the graph.
(arrow buttons)	The arrow buttons shift left or right the cursor on the graph.
Sat	When measuring, the indicator turns red if the input is currently saturated. In post-analysis, the indicator is red if saturation occurred in the displayed time signal.
(vertical arrows)	This button opens the Y Axis Format interface from which the vertical scale of the graph can be modified. The Minimum and Maximum fields can be set manually or automatically using the Auto-Scale Now button.
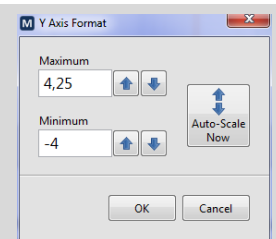
Spectrum Graph
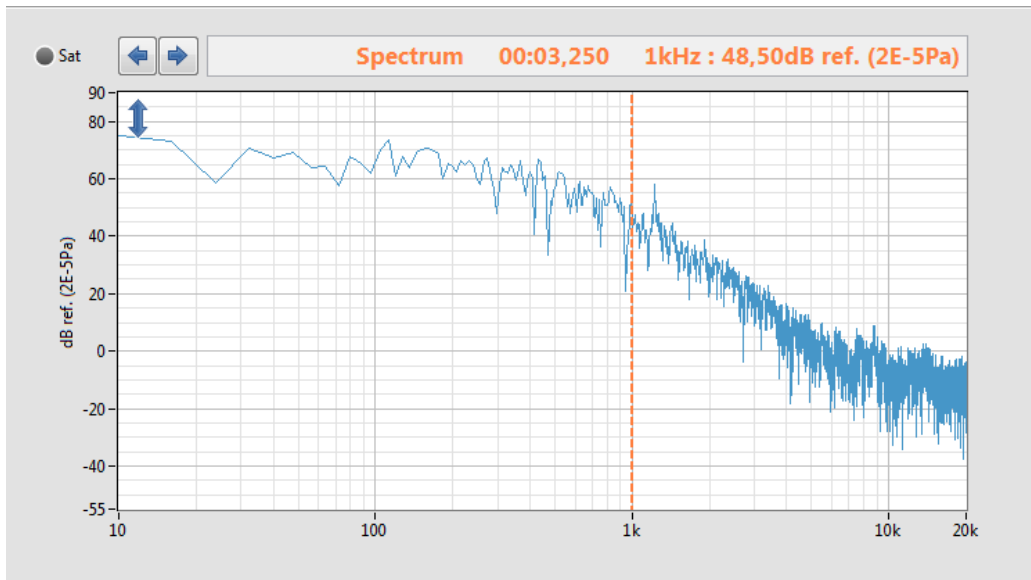
Spectrum Graph display

The Spectrum graph displays the instant FFT spectrum with level scale either in linear or decibels (dB). A FFT spectrum is generated each 0.125 second. During the acquisition, the current spectrum is displayed. Once the measurement is completed, the time of the data can be set by moving the yellow cursor in the Time Bar.

Spectrum Graph

Control / Indicator	Description
Spectrum 00:03,250 1kHz : 48,50dB	This legend gives the main information on the data being displayed: • The graph type. • The time of the data. • The value of the cursor on the graph.
(arrow buttons)	The arrow buttons shift left or right the cursor on the spectrum graph.
Sat	The indicator turn red if saturation occurred on the signal used to compute the displayed FFT spectrum.
(vertical arrow button)	This button opens the Y Axis Format interface from which the vertical scale of the graph can be modified. The Minimum and Maximum fields can be set manually or automatically using the Auto-Scale Now button.