Opus Suite

SLM Data Analyzer

Post-Processing Software for the SLM 4-Ch Module

User Guide – v1.2b
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1 Introduction

Congratulations on your purchase of the ***Opus Suite SLM Data Analyzer***.

The ***SLM Data Analyzer*** is a powerful tool for post-processing of measurements made with the ***Opus Suite SLM 4-Ch Module***. The ***SLM Data Analyzer*** software is usually installed on a desktop computer to analyse the measurements made with a Concerto or an Alto unit.

Software Features

Historic Graph	An main graph for historic levels: up to 4 selectable plots Possibility to add period markers for average evaluation Possibility to add masks on data to be removed from the average level Exportation into data or as an image
Secondary graphs	Two secondary graphs: up to 4 selectable plots of 1/3 octave spectrum, fine bands spectrum or statistics. Exportation into data or as an image
Event Graph	An event graph of the audio records, user tag and pictures Audio playback Photo viewer
Measure Information	Measure information: measure setup, GPS info and user comment. Period Graph exportation as data or as an image

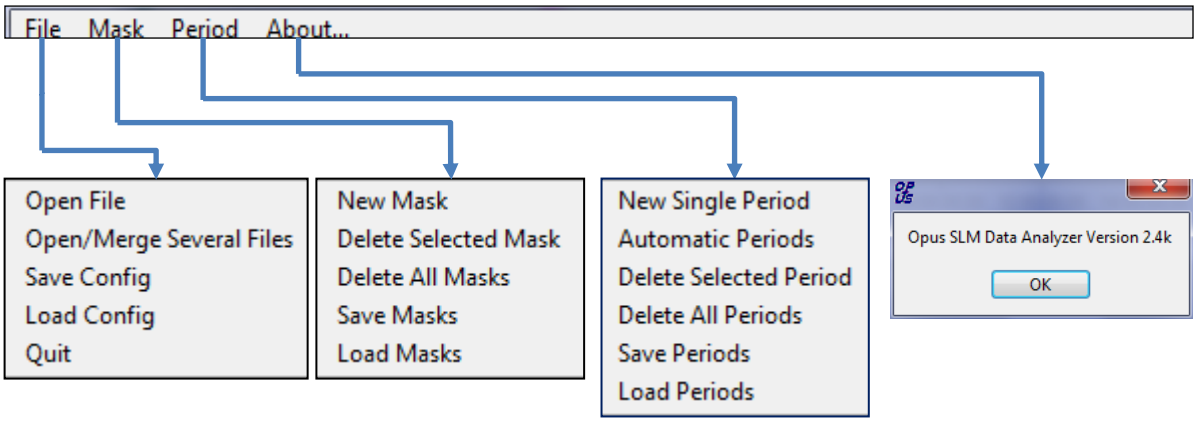
The current documentation use a specific measurement that is provided with the software installer. Once the software is installed on a PC, the data of the example can be found in *\MyDocuments\Opus \SLM_Measure_Example.*

2 Main Interface

The main interface contains a menu bar and four graph areas. They are described in following sections:

- Menu Bar (section 3, p.3)
- Event Graph (section 4, p.7)
- Historic Graph (section 5, p.8)
- Secondary Graphs (section 6, p.10)
- Data Selection (section 7, p.12)

3 Menu Bar



File Menu

File →	Open File	Opens a measurement file. The name of the opened file is displayed in the title barre. The supported file extensions are: - ".slm4": from the SLM 4-Ch module - ".slmv": from the SLM & 3-Vib (only the SLM part is managed) - ".dat": format used by the SLM 4-Ch module for WebStation
	Open/Merge Several Files	Opens as "Open File" but it is possible to concatenate several measurement files (DataSets) that results from the same acquisition.
	Save Config	Saves the configuration to a file (.cfg) The parameters saved are: - Data selection of the historic graph - Data selection and graph type of the secondary graphs - Automatic Periods setup.
	Load Config	Loads a configuration from a file (.cfg)
	Quit	Quits the application

Mask Menu

Mask →	New Mask	Creates a mask on the historic graph (same as New Mask button) To create the mask, the user have to: 1- Press the left button of the mouse at the starting point of the mask 2- Slide the cursor to the ending point of the mask 3- Release the mouse button The newly created mask zone appears in light grey.
	Delete Selected Mask	Deletes a selected mask on the historic graph. To select a mask double-click on it. The selected mask will appear in light blue. Only then the mask can be deleted trough the menu or simply by pressing the delete key.

	Delete All Mask	Deletes all the existing masks from the historic graph.
	Save Masks	Saves the masks into a file(.msk)
	Load Mask	Loads masks from a file (.msk)

Period Menu

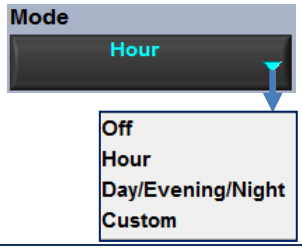
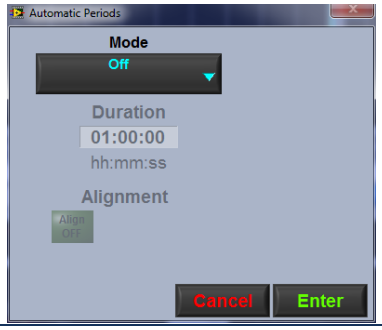
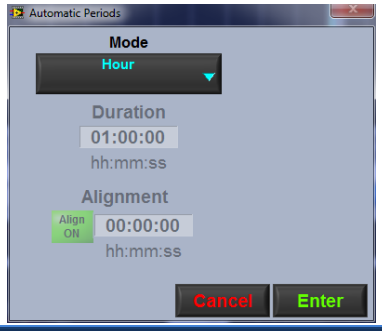
Period →	New Single Period	Creates a period on the historic graph (same as New Period button) After requesting a new period, click on the historic graph to place the new period. The newly created period marker appears as a dark grey vertical line.
	Automatic Periods	Opens an interface to help the user creating a pattern of periods. Refer to section 3.1 for details.
	Delete Selected Period	Deletes a selected period on the historic graph. To select a period marker double-click on it. The selected marker will appear in light blue. Only then the period can be deleted trough the menu or simply by pressing the delete key.
	Delete All Periods	Deletes all the existing periods from the historic graph.
	Save Periods	Saves the period to a file (.prd). This function is useful to later use of the periods that were set manually (Automatic Periods = Off).
	Load Periods	Loads periods from a file (.prd). This function forces the automatic periods off

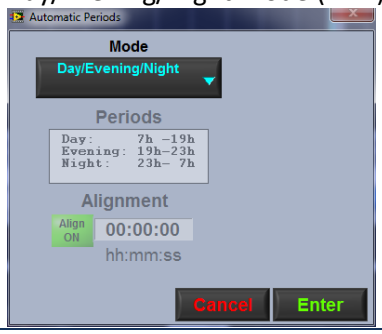
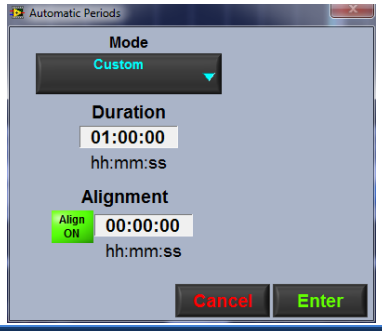
3.1 Automatic Periods Interface

It is common to reprocess raw data with small sampling time into longer periods. For example, one could acquire one-minute averages or even 50 ms instant data and be interested in one-hour averages. Having a good time resolution is essential to a proper analysis of events. Meanwhile, the user is usually interested in the average level of the measurement. Single periods can be added manually or the automatic periods feature can be used.

The Automatic Periods interface can be access from the menu **Period→Automatic Periods**.

Automatic Periods Interface

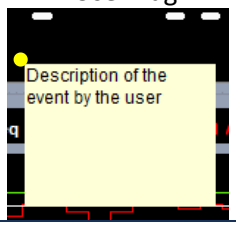
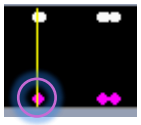
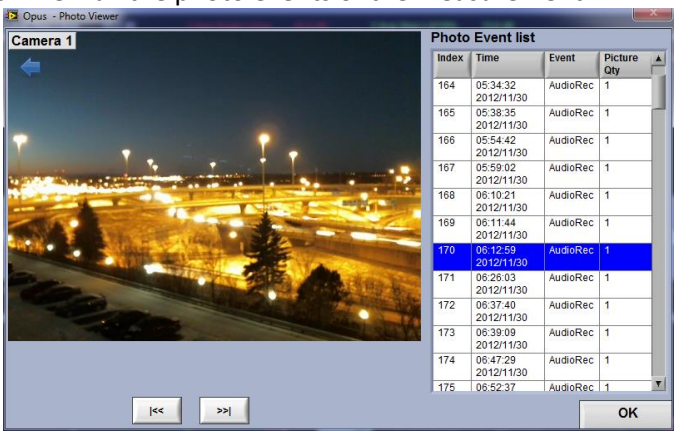
	Selects one of the period generation modes.
Off Mode 	This mode disables the automatic periods feature. The automatic period is set to off as soon as a period marker is placed manually on the graphic.
Hour Mode 	This mode automatically creates a new period marker at every new hour on the clock. This mode will clear all the previously existing periods.

Day/Evening/Night Mode (DEN) 	This mode automatically creates period markers at fixed time during the day: - Day: 07h00 to 19h00 - Evening: 19h00 to 23h00 - Night: 23h00 to 07h00 This mode will clear all the previously existing periods.
Custom Mode 	This mode allows to create a custom pattern of periods by selecting the period duration and (if necessary) the clock alignment. This mode will clear all the previously existing periods.

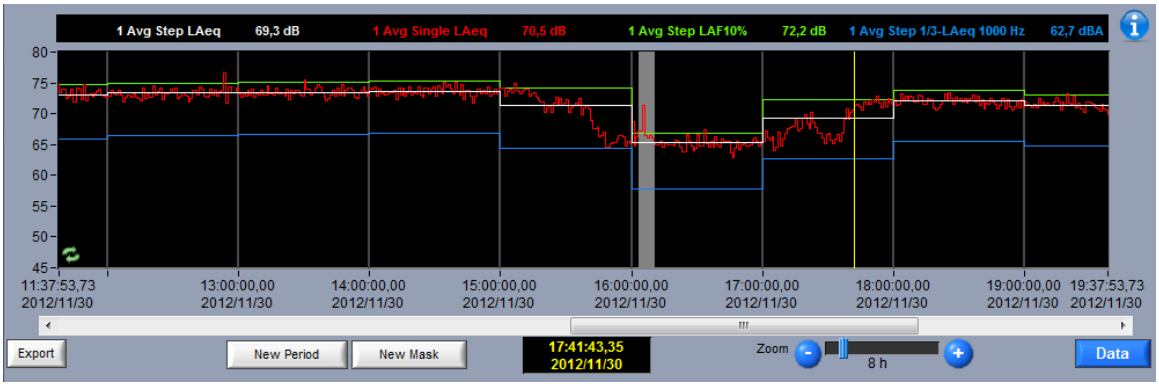
4 Event Graph

The event graph displays all the events that occurred. The horizontal axis matches with the time axis of the historic graph underneath. The cursor also matches the cursor on the historic graph.

Event Graph

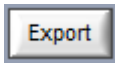
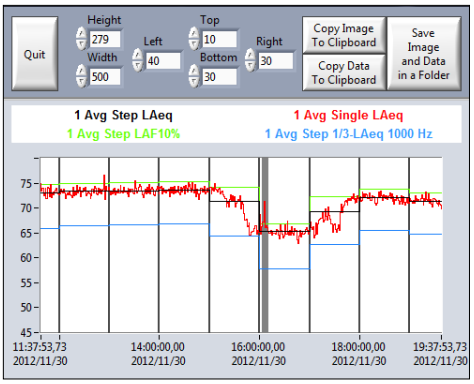
Legend 	The legend of the event can be found on the left side of the graph. - "1" (white): audio record on channel 1 - "2" (red): audio record on channel 2 - "3" (green): audio record on channel 3 - "4" (blue): audio record on channel 4 - "T" (yellow): user tag - "P" (purple): photo
Audio Record 	Select an audio record from the event graph (1, 2, 3 or 4) and press the play button. Alternatively, the user can double-click on the audio record to start playing. The play button is greyed when there is no audio file selected.
User Tag 	A user tag is displayed in a text box as the mouse points to the corresponding yellow marker. A tag is a text description of an event that the user entered during the measurement.
Photo 	Double-click a photo marker (purple) to display the Photo Viewer interface. The interface will open with the selected photo event. Once in the interface, the user can view all the photo events of the measurement. 

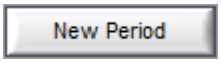
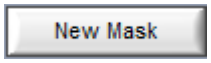
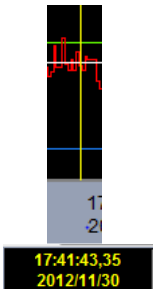
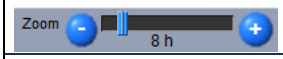
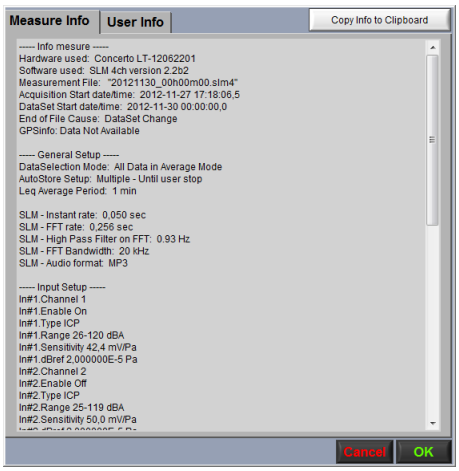
5 Historic Graph



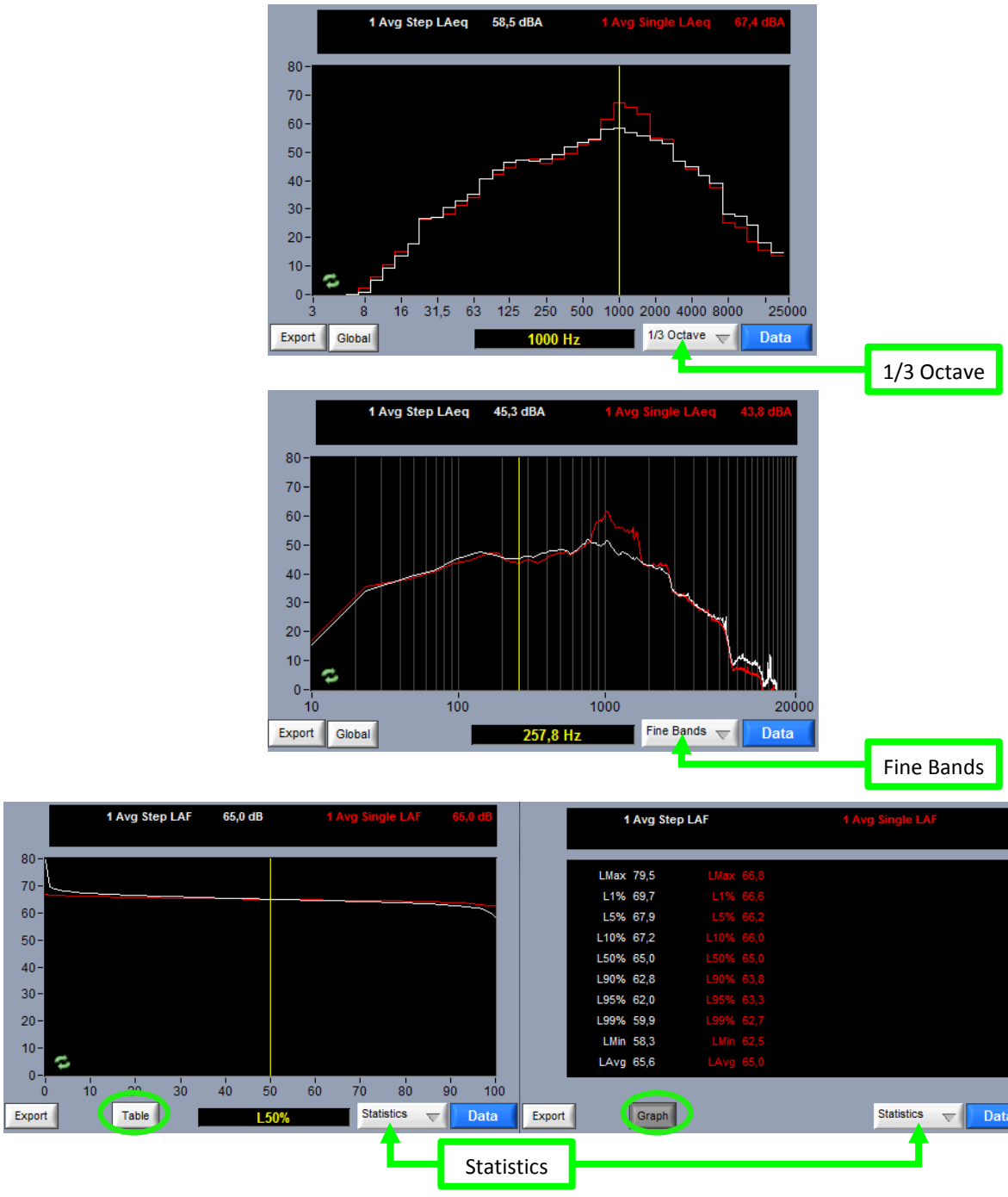
The historic graph displays up to four selectable plots of data (levels vs time).

Historic Graph

Legend / Levels 	The legend of the plots is displayed at the top of the graph. The levels at the position of the time cursor are also displayed.
Level Rescale 	Automatically rescales the vertical axis according to the data that are displayed. The scale can be manually adjusted by clicking on the upper or bottom value on the vertical axis and entering the desired value.
Time scroll bar 	Scrolls the time axis left or right.
	Opens the exportation interface that allows the user to export the graph in three different ways: - Copy image to clipboard - Copy data to clipboard - Save image and data in a folder 

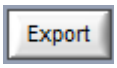
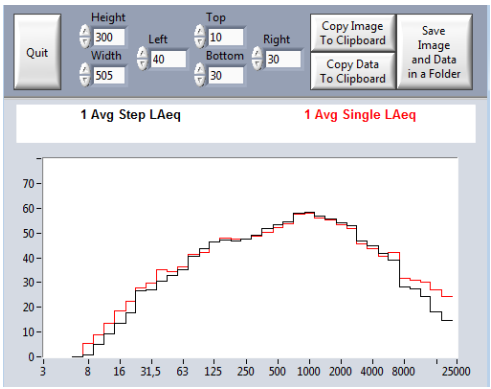
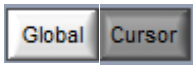
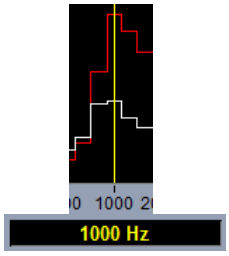
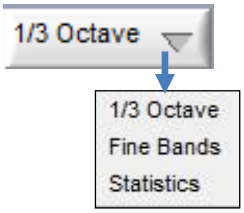
	Creates a period on the historic graph (same as Period→New Single Period) After requesting a new period, click on the historic graph to place the new period. The newly created period marker appears as a dark grey vertical line.
	Creates a mask on the historic graph (same as Mask→New Mask) To create the mask, the user have to: 1- Press the left button of the mouse at the starting point of the mask 2- Slide the cursor to the ending point of the mask 3- Release the mouse button The newly created mask zone will appear in light grey.
Time Cursor 	The yellow cursor on the historic graph is the time probe. Its exact value is displayed in the time indicator below the graph. This time is used for the levels displayed over the graph and both secondary graphs are related to this time cursor. To move the cursor, simply click and release at the desired position on the graph. Then, the position can be fine-tuned using the left and right key.
	Controls the time scale by zooming in and out the historic graph.
	Opens the interface of data selection. Up to four plots can be selected from the available data. Refer to the section 7 for more details.
Measure Info 	Opens the information interface that includes the measurement setup and the user comment. The user comment can be modified. 

6 Secondary Graphs

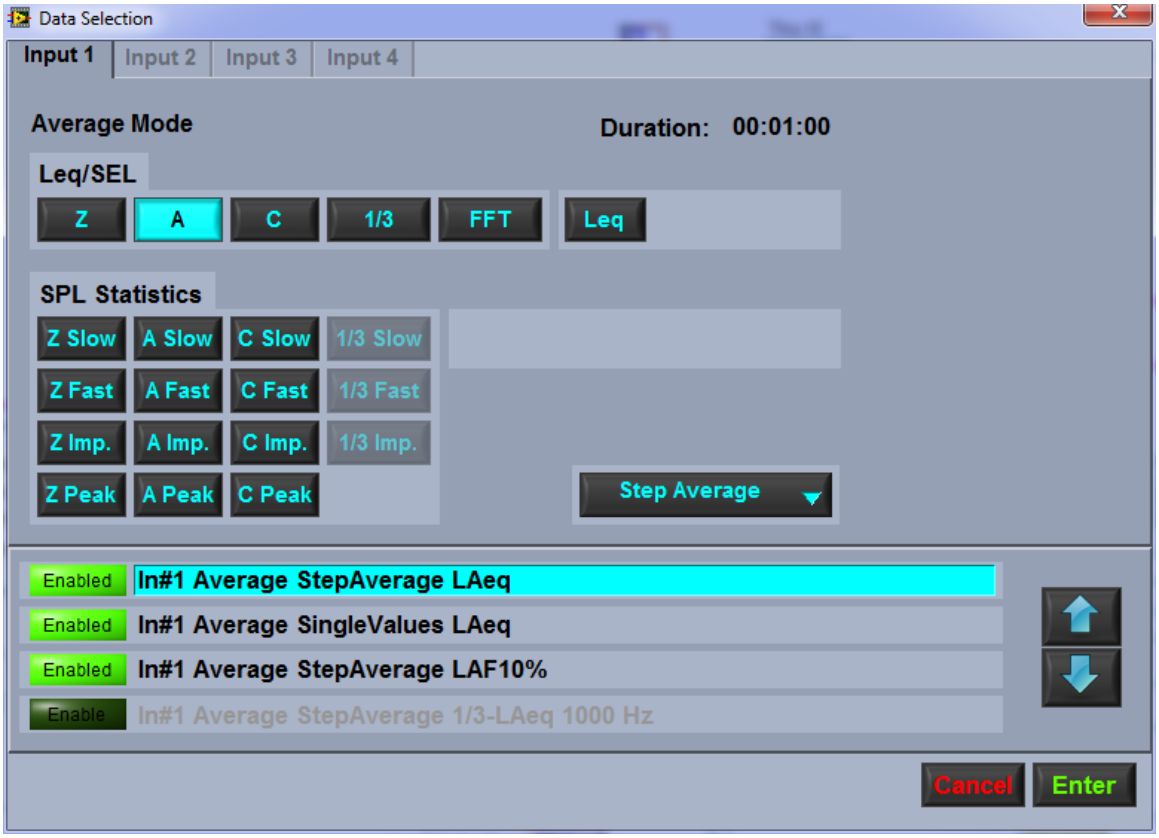


There are two secondary graphs at the bottom of the main interface. Each graph can be set to either 1/3 octave spectrum, fine bands spectrum or statistics (as showed above). The statistics can be displayed either as a graph or as a table with numeric values.

Secondary Graph

Legend / Levels 	The legend of the plots is displayed at the top of the graph. The levels at the position of the time cursor are also displayed.
Level Rescale 	Automatically rescales the vertical axis according to the data that are displayed. The scale can be manually adjusted by clicking on the upper or bottom value on the vertical axis and entering the desired value.
	Opens the exportation interface that allows the user to export the graph in three different ways: - Copy image to clipboard - Copy data to clipboard - Save image and data in a folder 
	Switch between the global and cursor values. The value displayed over the graph is affected accordingly.
Cursor 	The yellow cursor on the graph probes the levels of the plot at the selected value on the horizontal axis. Its exact value is displayed in the indicator below the graph. To move the cursor, simply click and release at the desired position on the graph. Then, the position can be fine-tuned using the left and right key.
	Selects the graph type. As the graph type is changed, the data selection is resetted. Therefore, the user would have to select the data again.
	Opens the interface of data selection. Up to four plots can be selected from the available data. Refer to the section 7 for more details.

7 Data Selection



The historic graph and the two secondary graphs have their own data selection button. This button opens the Data Selection interface. From this interface, the user can select up to four plots to display from the available data.

There are three display modes:

- Single Values: the raw data samples
- Step Average: the average level for a defined period.
- Running Average: the intermediary levels of the Step Average that is building up from the Single Values.

The four plots are indicated at the bottom. The up and down arrows allow to change the order of appearance of the plots on the graph. On the graph, the plot 1 is at the front and the plot 4 is at the back.

The data selection takes place in the upper part. Some buttons may be greyed if the corresponding data were not recorded. The following tables describes the data that can be displayed according to the graph type (historic, 1/3 octave spectrum, fine bands spectrum and statistics).

Historic Graph Data

Leq/SEL	Global Level				Z/A/ C Frequency weighting
	Band of 1/3 octave spectrum		One band of the range 3.1 to 20 kHz or 6.3 to 20 kHz[1]		
	Band of FFT spectrum		One of the 854 lines of the spectrum[2]		
SPL Statistics	Global Level	Slow/Fast/ Impulse/Peak		L1% to L99% /Lmax/Lmin/SPLeq	
	Band of 1/3 octave spectrum	Slow/Fast/ Impulse	One band of the range 3.1 to 20 kHz or 6.3 to 20 kHz[1]		

1/3 Octave Graph Data

Leq/SEL	1/3 octave spectrum		3.1 to 20 kHz or 6.3 to 20 kHz		Z/A/ C Frequency weighting
SPL Statistics	1/3 octave spectrum	Slow/Fast/ Impulse	3.1 to 20 kHz or 6.3 to 20 kHz[1]	L1% to L99% /Lmax/Lmin/SPLeq	

Fine Bands Graph Data

Leq/SEL	Band of FFT spectrum		Spectrum of 854 lines[2]		Z/A/ C Frequency weighting

Statistics Graph Data

SPL Statistics	Global Level	Slow/Fast/ Impulse/Peak		L1% to L99% /Lmax/Lmin/SPLeq	Z/A/ C Frequency weighting
	Band of 1/3 octave spectrum	Slow/Fast/ Impulse	One band of the range 3.1 to 20 kHz or 6.3 to 20 kHz[1]		

[1] The 1/3 octave spectrum ranges from 3.1 Hz to 20 kHz if only 1 or 2 channels were enabled during the acquisition. The range is rather 6.3 Hz to 20 kHz if 3 or 4 channels were enabled.

[2] The FFT spectrum contains 854 lines of a bandwidth that can be adjusted from 1 kHz to 20 kHz.