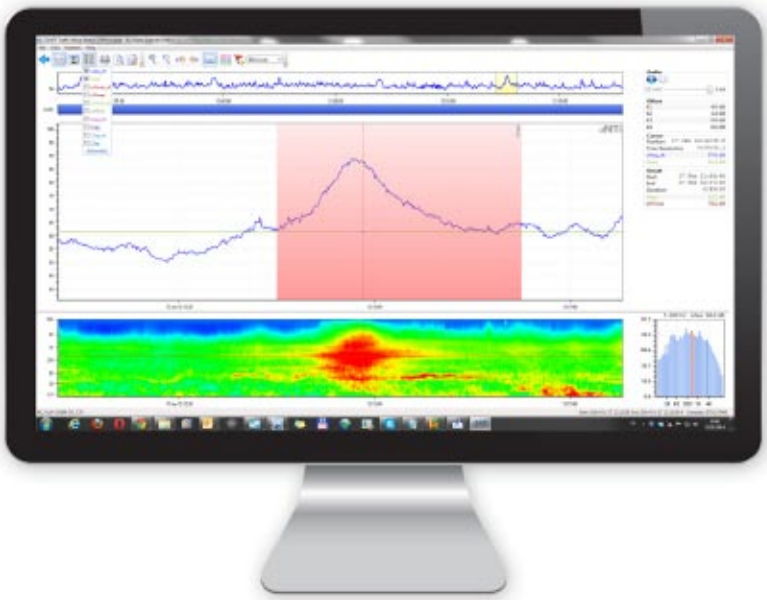
User Manual

XL2 Data Explorer

PC-Software for the Analysis of XL2 Sound Level Data



Doc version *1.5.0/0e*
Refers to SW *v1.5.0 or higher*

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Part

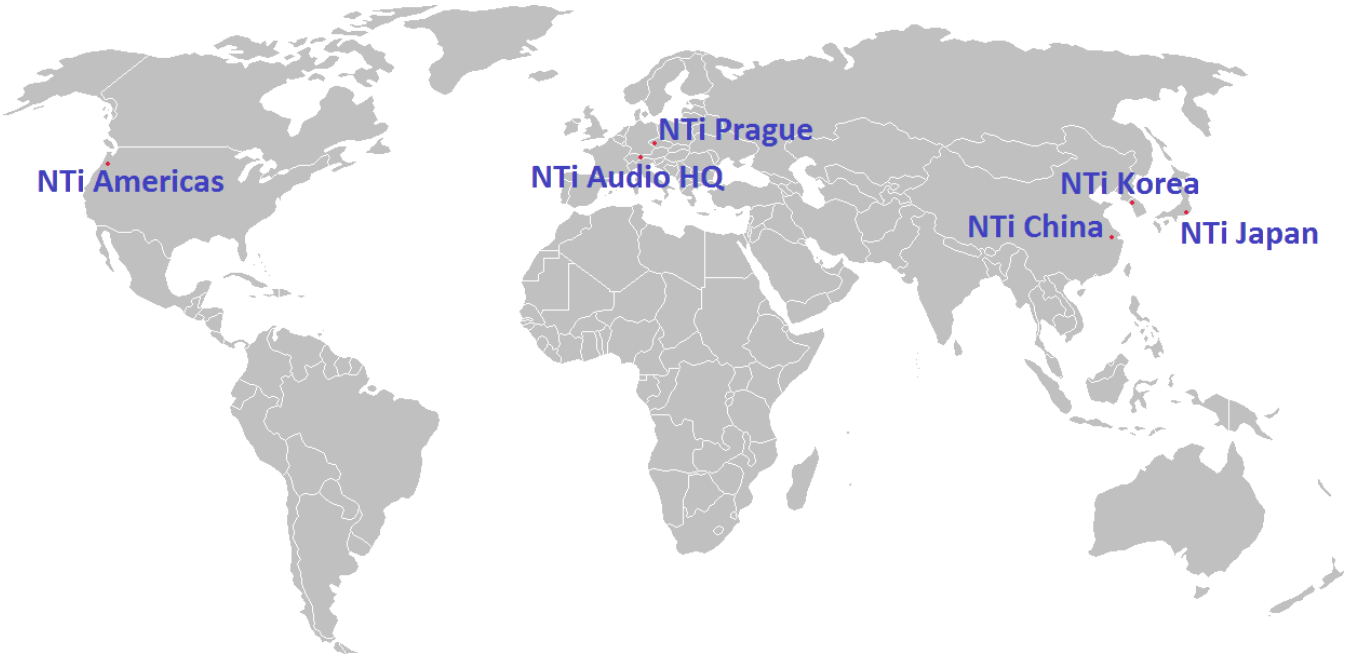
1 Introduction

The XL2 Data Explorer is a PC-based software application with a powerful data processor for easy and fast analysis of sound level measurement data. Visualize, analyze and control millions of data points with this tool that is dedicated to acoustic consultants and noise measurement professionals. It provides a convenient way to view and manage your data and quickly create professional customized reports.

Features

- Data visualization
- Fast zoom and pan
- Audio playback synchronized to graph
- Markers with on-the-fly calculation
- Automated tonal and impulsive marker generation
- Percentile levels Ln calculation
- Rating level Lr calculation
- Customized reporting

For dedicated support, please contact your nearest NTi Audio partner.



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v1.50/0e, Feb.2016

1.1 Installation

System requirements

- Supported operating systems:
  - Windows XP SP3
  - Windows Vista SP1 or later
  - Windows 7
  - Windows 8 Pro or 8.1 Pro
  - Windows 10
- Hardware requirements:
  - Recommended Minimum: Pentium 1 GHz or higher with 512 MB RAM or more
  - Video board with shader model 3.0 or higher (DirectX 9.0c)
- Minimum disk space: 2 GB

Hint ***Result data that is exported from the XL2 Data Explorer to MS Excel is saved in "*.xlsx" format. Please check the compatibility of your MS Office installation with this file format, and install the Microsoft Compatibility Pack if necessary.***

Software installation procedure

1. Access your personal account in My NTi Audio
2. Download the XL2 Data Explorer installation package
3. Double left-click on the installation file

XL2 Acoustic and Audio Analyzer

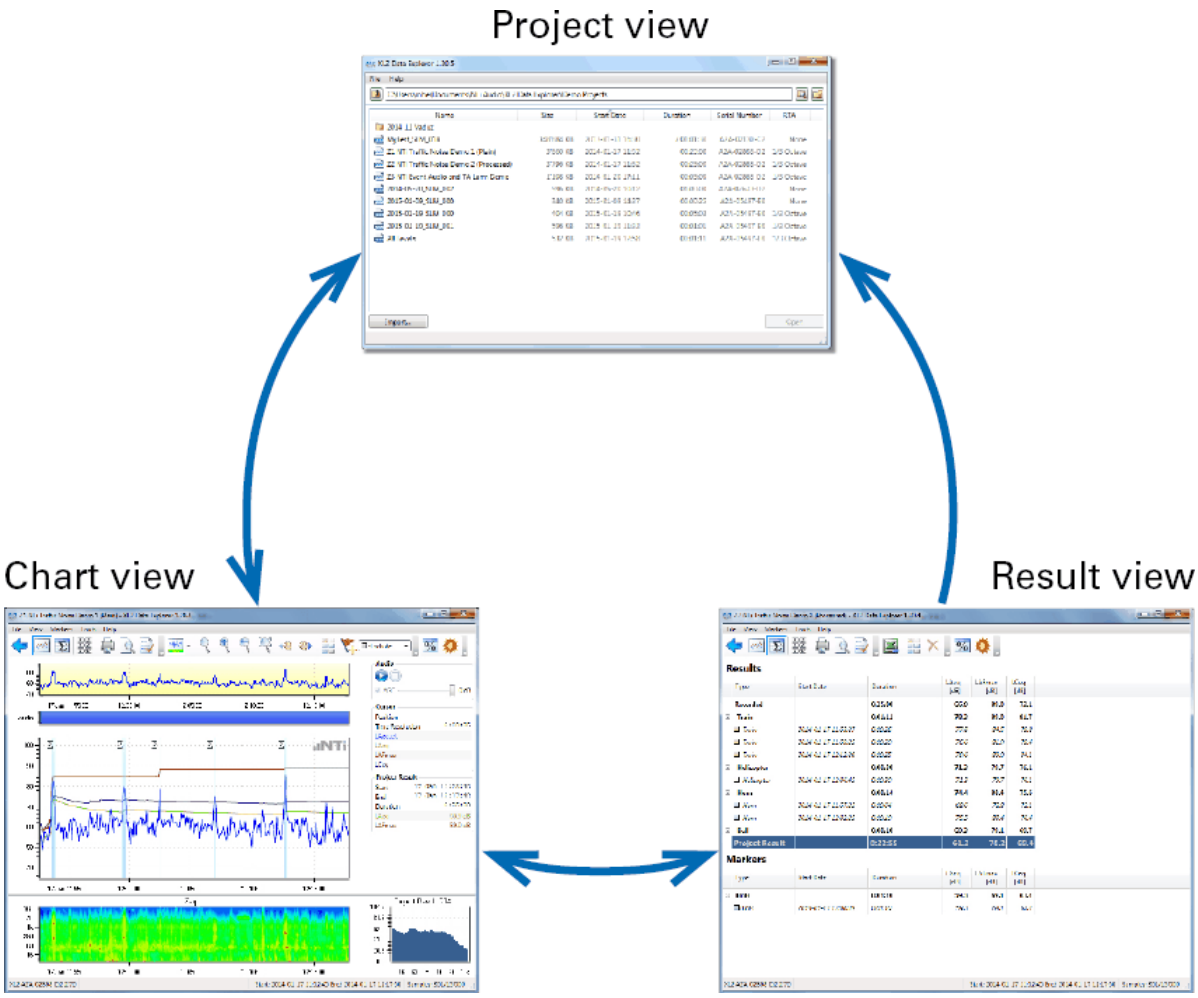
- Firmware V2.70 or higher (legacy data require minimum firmware V2.32 or higher)
- XL2 Data Explorer Option installed on the XL2 device (if you don't have the Option yet, contact your nearest NTi Audio partner).

1.2 Software structure

Views

The XL2 Data Explorer offers three different views,

- Project: list of the imported projects
- Chart: detailed project data in graphical form + numerical readouts
- Result: numerical readout of the measurement results, and of marked sections



XL2 Data Explorer views

Hint ***By switching from the Chart view or Result view to the Project view, all project data (i.e. including your amendments) will be automatically saved.***

Multiple instances

It is possible to run two or more instances of the XL2 Data Explorer on one PC.

Multiple instances

This feature may be used, for example, for comparing

a) XL2 Test files that were recorded in the same location, but at different dates,

b) XL2 Test files that were record during the same event, but at different positions,

c) different sections of the same XL2 Test file.

Hint ***A project file that is simultaneously open in two instances, can be <u>edited</u> only in the first instance.***

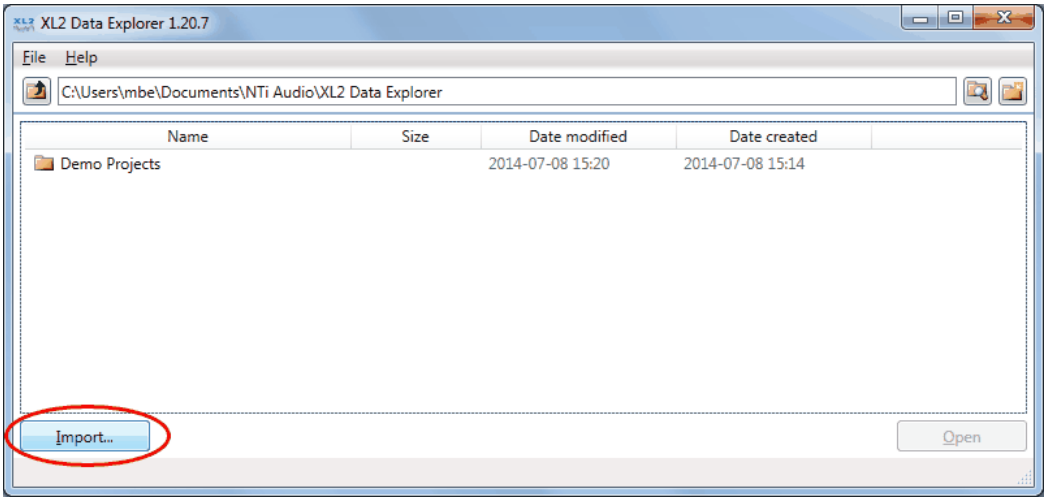
1.3 Tutorial

The following step-by-step guideline demonstrates a typical use of the XL2 Data Explorer.

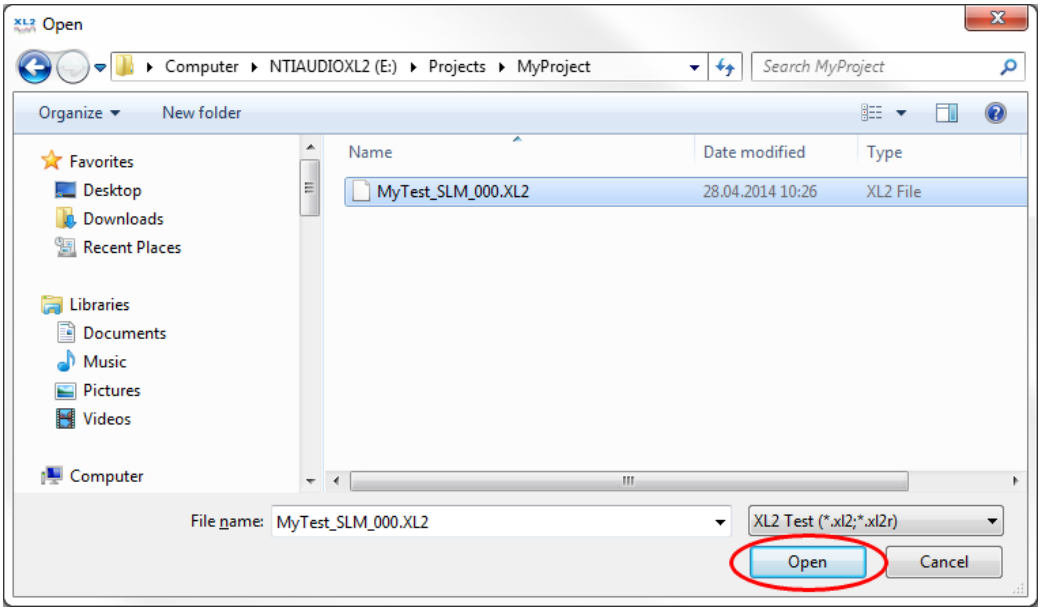
1. Activate the logging as well as the spectra and the audio file recording on the XL2 Audio and Acoustic Analyzer, then execute a sound level measurement and save the test.

2. Connect the XL2 directly to your PC via USB, or insert the SD-card into a card reader for faster data transfer.

3. Run the XL2 Data Explorer and click on the 'Import' button in the Projects view.

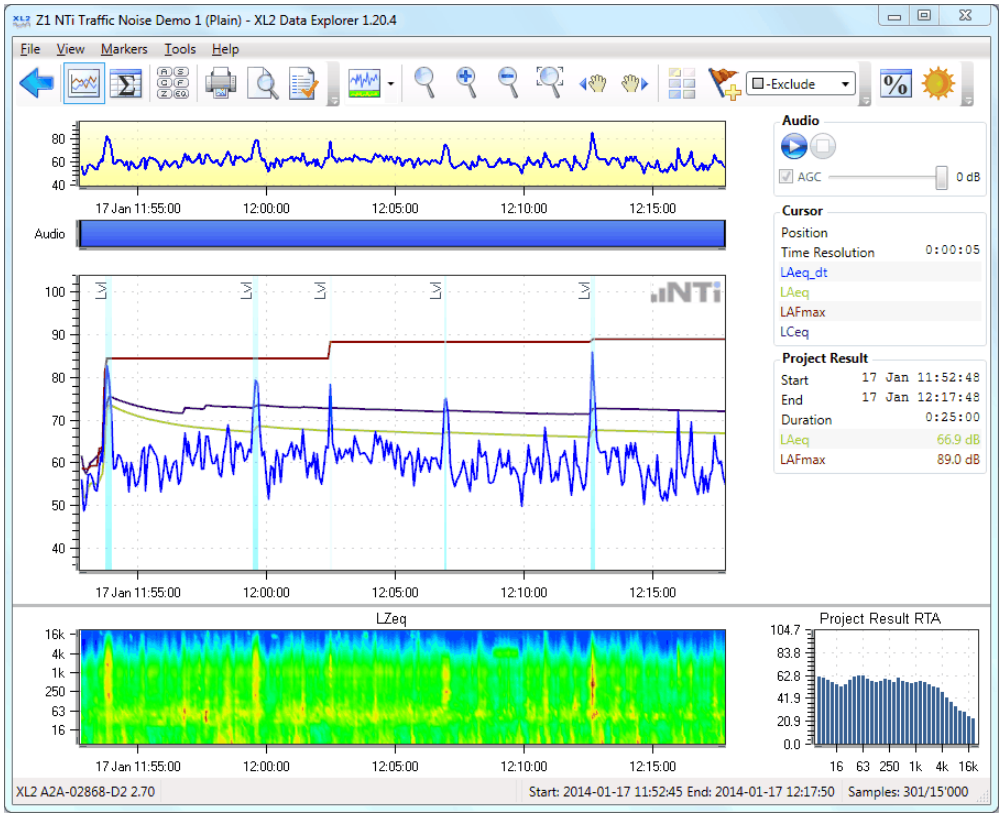


4. Select the XL2 Test file just recorded and click 'Open'. The XL2 Data Explorer imports the logged data and audio file; this procedure can take a few seconds to some minutes, depending on the file sizes. During this process, all relevant files (including the WAV file associated with the selected project) are copied into the Data Explorer project folder.

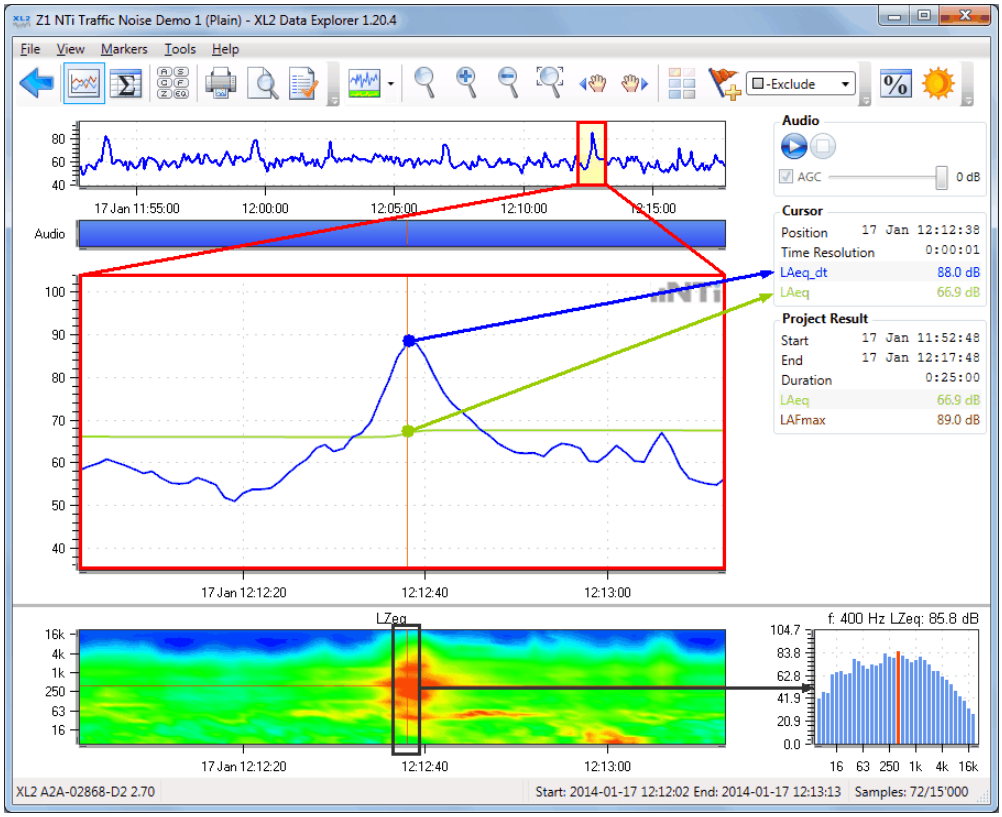


5. As soon as the import process is completed, select the imported project and click on the 'Open' button to open it in the Chart view.

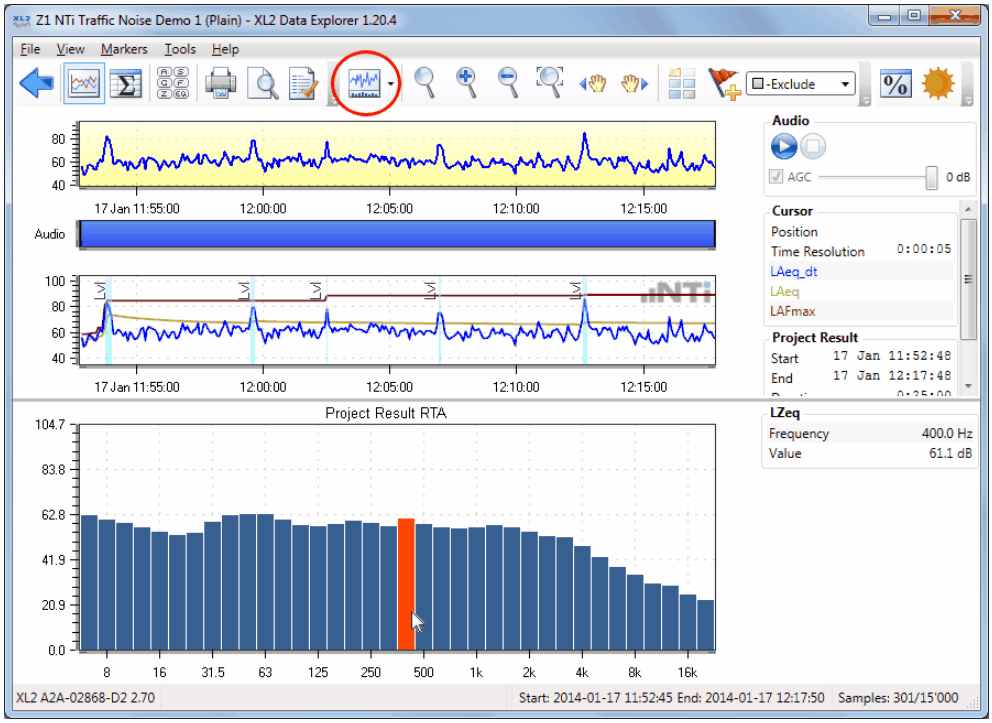
6. You can now view the level curves and results.



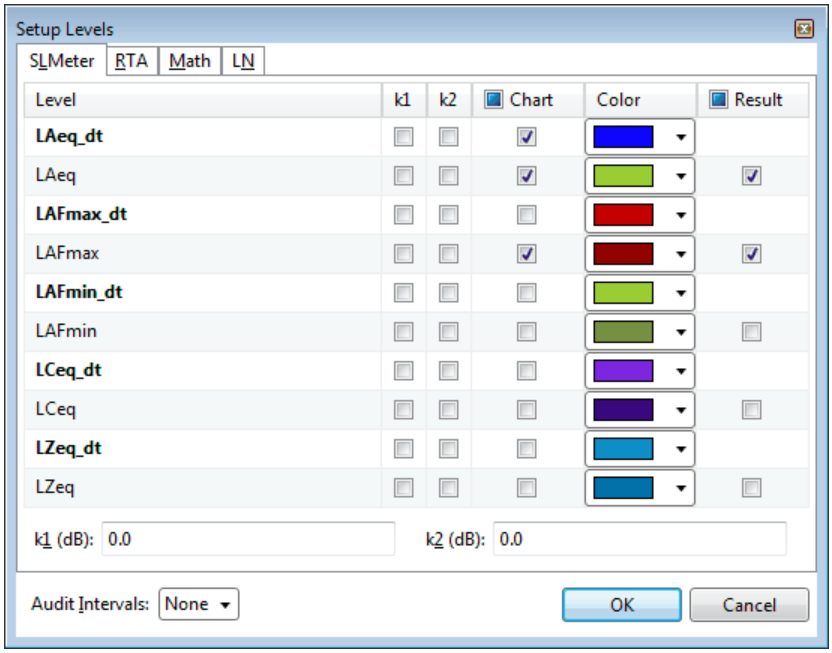
7. You may zoom into any area of the Main chart or Spectrogram: left-click+drag with the mouse over the area of interest. The zoom response is instantaneous. In addition, the Info section on the right-hand side of the Main chart shows the instantaneous levels at the current Cursor position, as well as the result of the whole project.



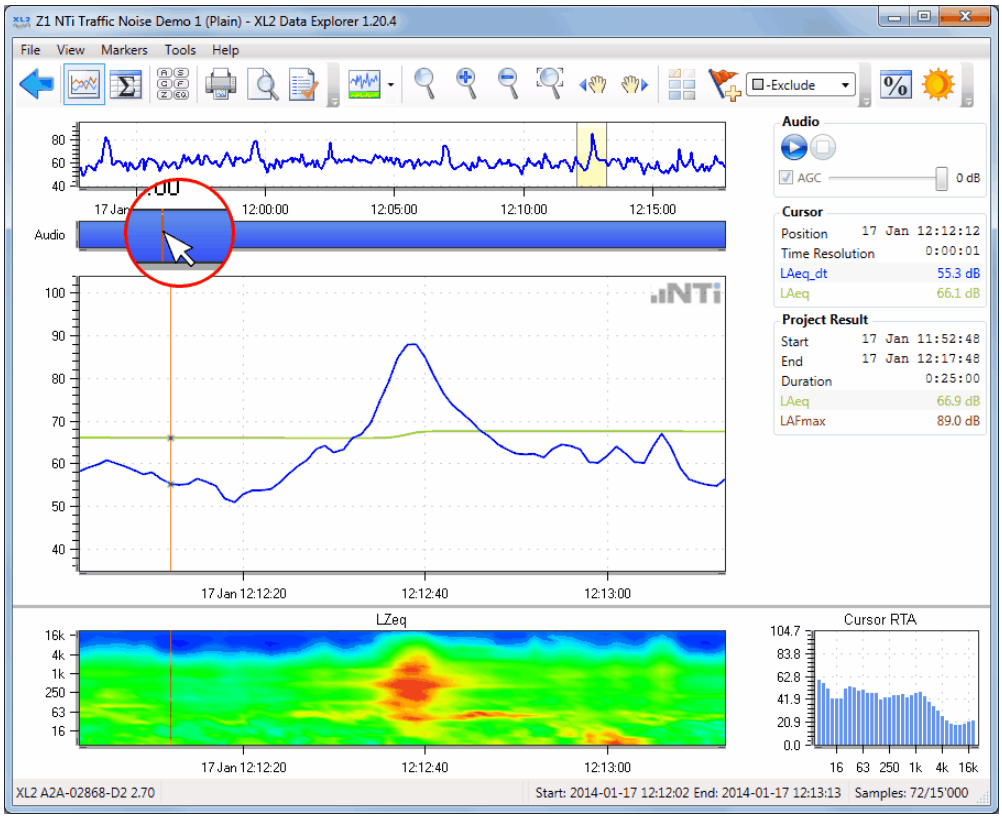
8. Click on the button  , and then on  to display the large RTA spectrum.



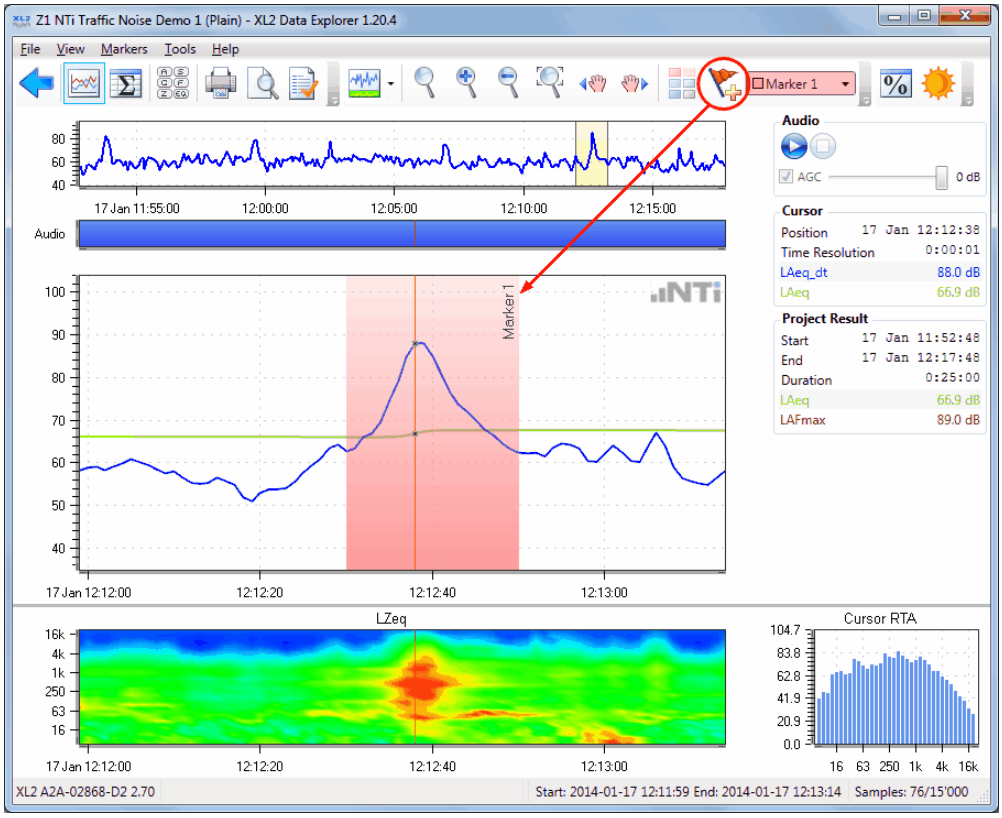
9. Select the menu 'View -> Setup Levels…' to choose which levels are displayed in the Main chart, and select the appropriate colors. Here you may also enable or edit the values of the correction factors (k1, k2).



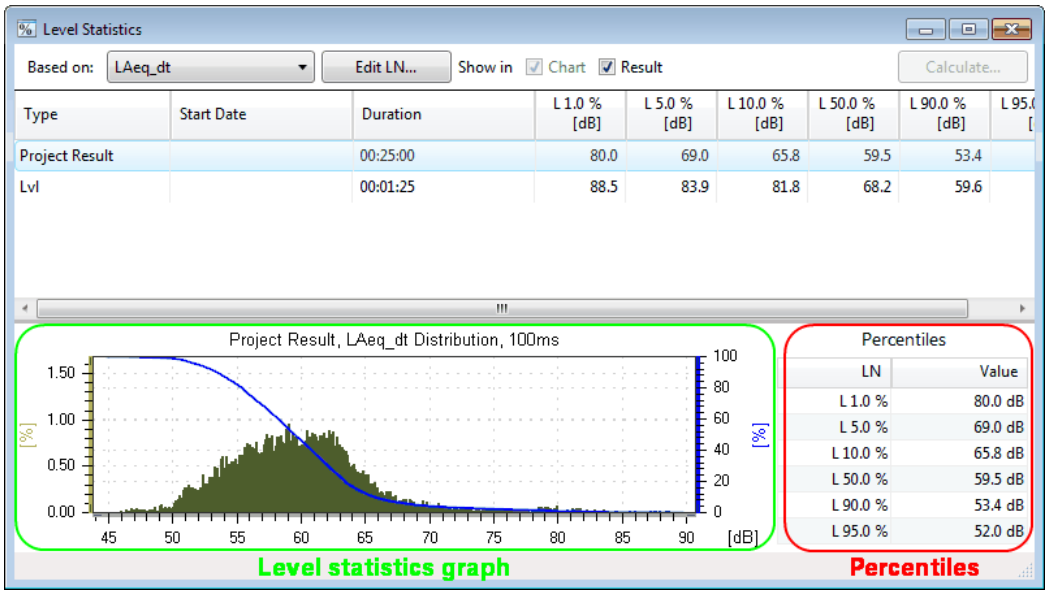
10. Listen to the sound recording to identify or further analyze an event; click on the corresponding point in the Audio bar to replay the sound.



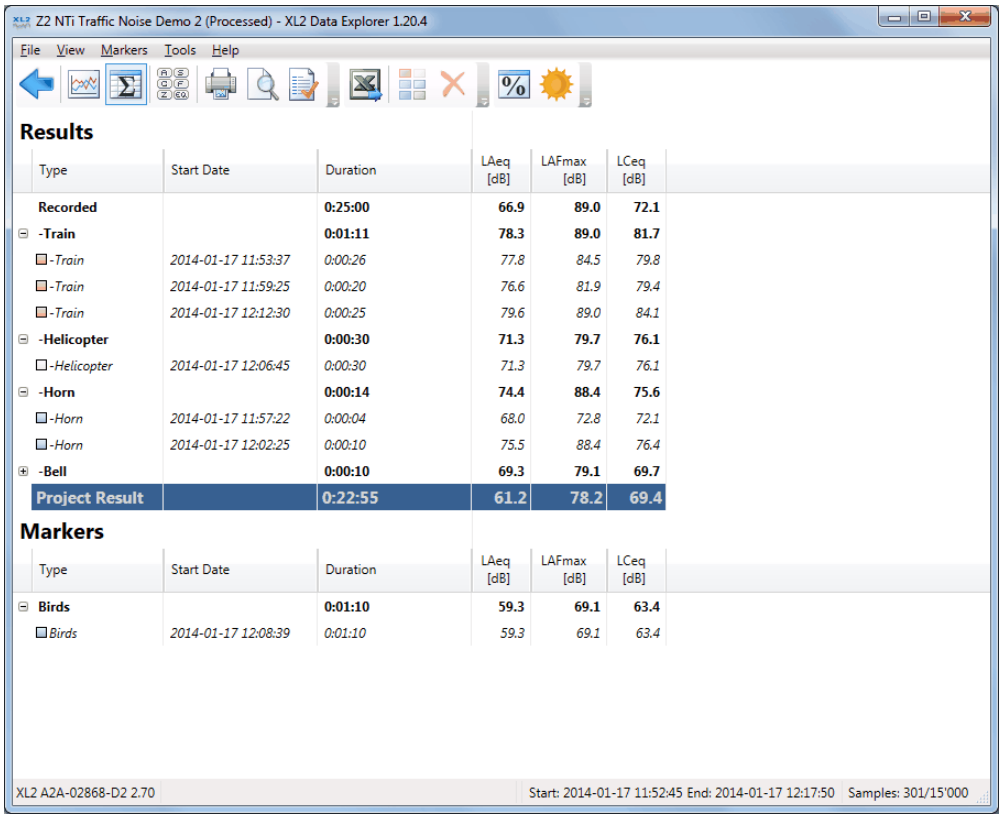
11. To highlight an area, or exclude it from the overall result calculation, add a Marker: first select the Marker type using the -Exclude button, click on the button, and then left-click+drag with the mouse over the Main chart to add the Marker.



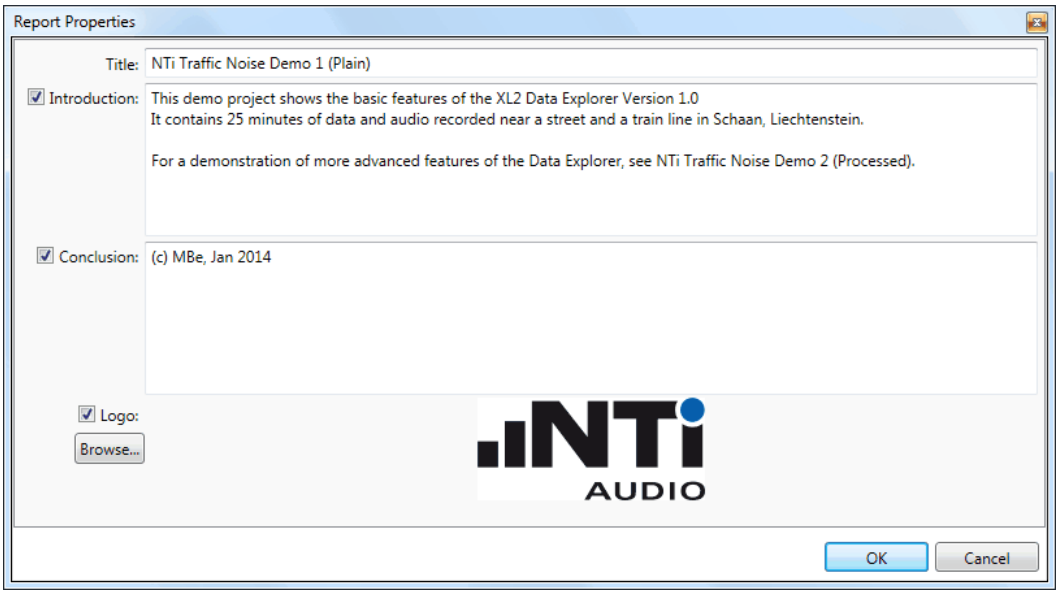
12. Click on to open the Level statistics window, and then on Calculate... to show the statistical distribution of dt values in a graph, as well as the Percentile results in a table.



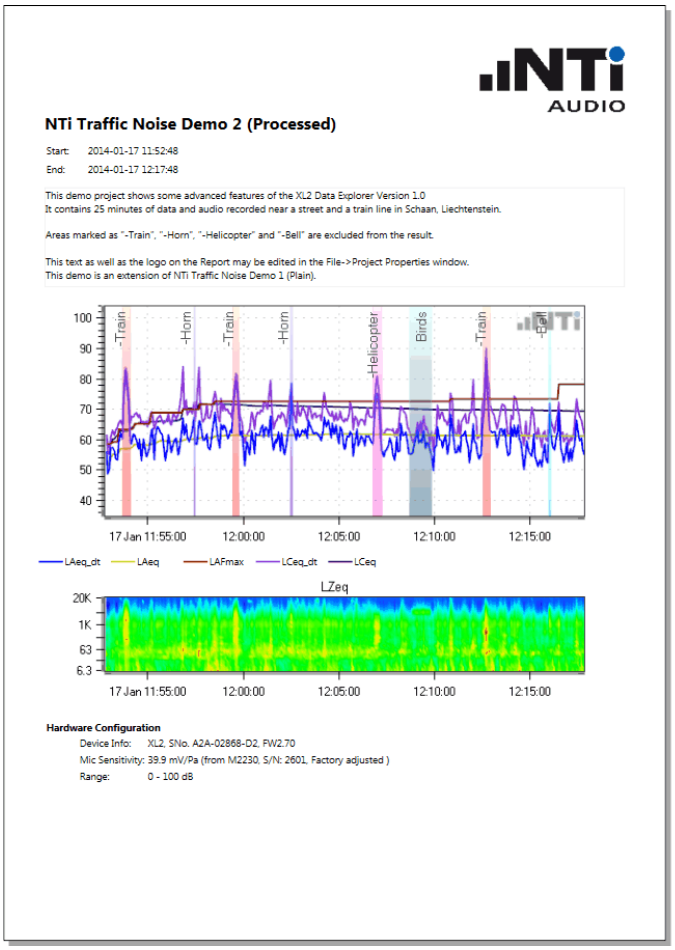
13. Click on  to switch to the Result view, which provides an overview on the individual Marker data and the Project result (highlighted row). You may expand or collapse any of the Marker categories.



14. Click on  to edit the Report properties: tick the checkboxes for the parts to be printed, edit the corresponding text and optionally Browse to add your own logo.



15. Click on  to verify the Print preview.



NTi Traffic Noise Demo 2 (Processed)

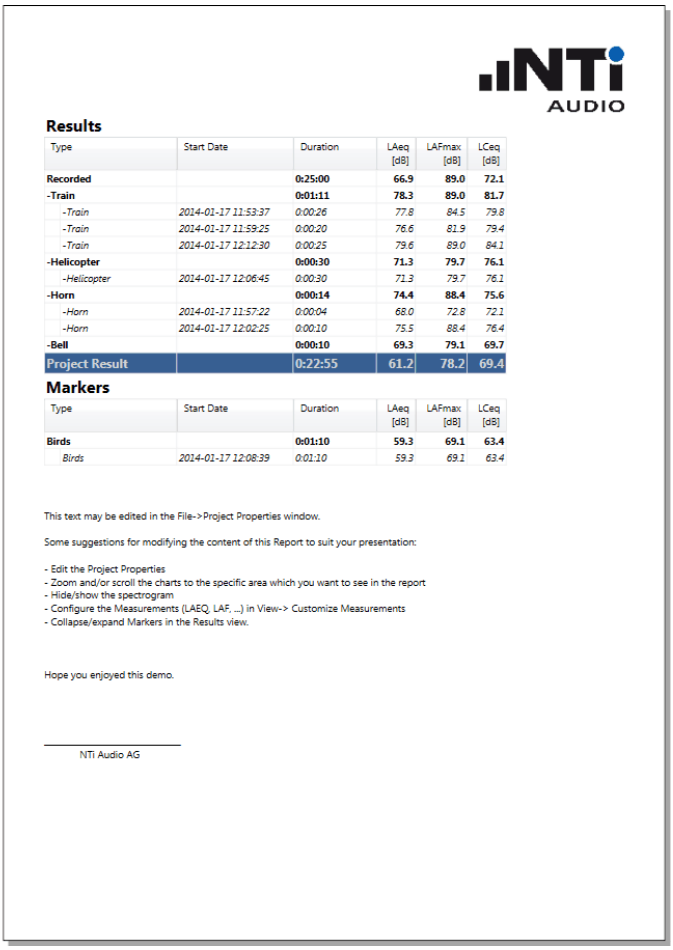
Start: 2014-01-17 11:52:48
End: 2014-01-17 12:17:48

This demo project shows some advanced features of the XL2 Data Explorer Version 1.0
It contains 25 minutes of data and audio recorded near a street and a train line in Schaan, Liechtenstein.

Areas marked as "-Train", "-Horn", "-Helicopter" and "-Bell" are excluded from the result.

This text as well as the logo on the Report may be edited in the File->Project Properties window.
This demo is an extension of NTi Traffic Noise Demo 1 (Plain).

Hardware Configuration
Device Info: XL2, SNo. A2A-02868-D2, FW2.70
Mic Sensitivity: 39.9 mV/Pa (from M2230, S/N: 2601, Factory adjusted)
Range: 0 - 100 dB



Results

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]	LCeq [dB]
Recorded		**0:25:00**	**66.9**	**89.0**	**72.1**
-Train		**0:01:11**	**78.3**	**89.0**	**81.7**
-Train	*2014-01-17 11:53:37*	*0:00:26*	*77.8*	*84.5*	*79.8*
-Train	*2014-01-17 11:59:25*	*0:00:20*	*76.6*	*81.9*	*79.4*
-Train	*2014-01-17 12:12:30*	*0:00:25*	*79.6*	*89.0*	*84.1*
-Helicopter		**0:00:30**	**71.3**	**79.7**	**76.1**
-Helicopter	*2014-01-17 12:06:45*	*0:00:30*	*71.3*	*79.7*	*76.1*
-Horn		**0:00:14**	**74.4**	**88.4**	**75.6**
-Horn	*2014-01-17 11:57:22*	*0:00:04*	*68.0*	*72.8*	*72.1*
-Horn	*2014-01-17 12:02:25*	*0:00:10*	*75.5*	*88.4*	*76.4*
-Bell		**0:00:10**	**69.3**	**79.1**	**69.7**
Project Result		**0:22:55**	**61.2**	**78.2**	**69.4**

Markers

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]	LCeq [dB]
Birds		**0:01:10**	**59.3**	**69.1**	**63.4**
Birds	*2014-01-17 12:08:39*	*0:01:10*	*59.3*	*69.1*	*63.4*

This text may be edited in the File->Project Properties window.

Some suggestions for modifying the content of this Report to suit your presentation:

- Edit the Project Properties
- Zoom and/or scroll the charts to the specific area which you want to see in the report
- Hide/show the spectrogram
- Configure the Measurements (LAEQ, LAF, ...) in View-> Customize Measurements
- Collapse/expand Markers in the Results view.

Hope you enjoyed this demo.

NTi Audio AG

16. Click on  to print the report.

17. Click on  to return to the Project view; this step automatically saves all project data, including your amendments.

1.4 License agreement

Scope

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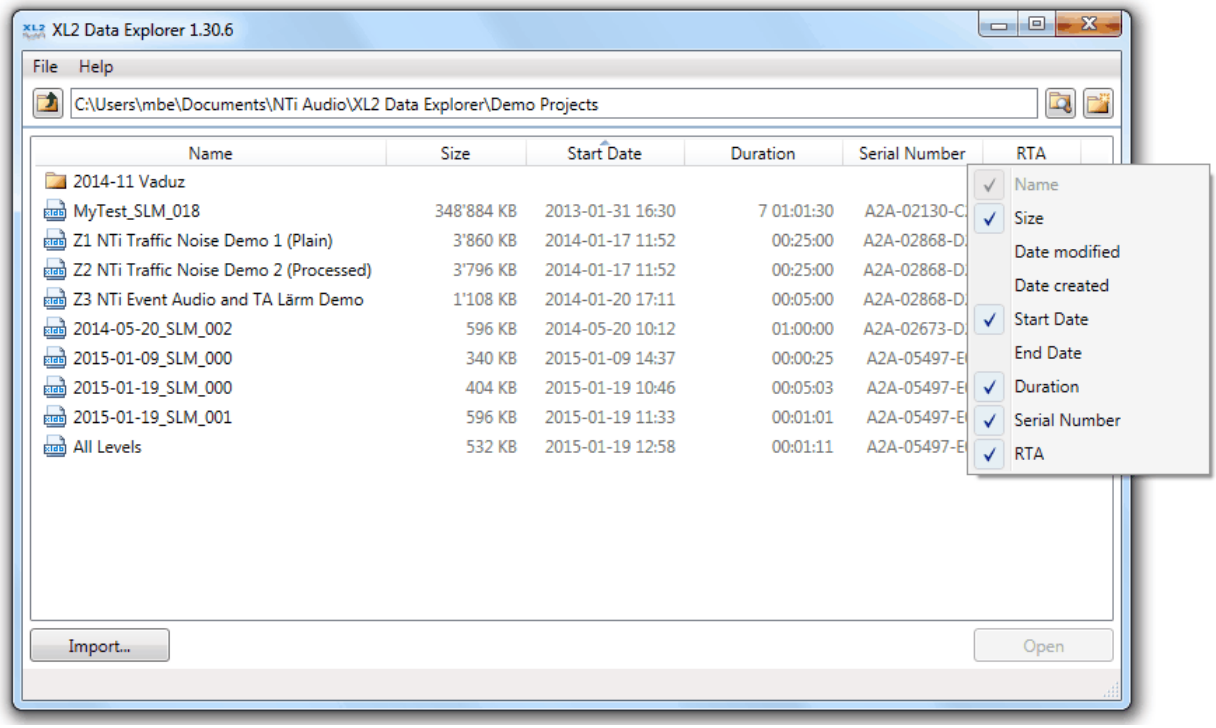
Part

2 Project view

The Data Explorer always starts up in the Project view. The Project view is also accessible from the Chart or Result views by clicking the button.

- After the initial installation, the Project view shows the 'Demo Projects' folder.
- From then on, it always opens the same folder that had been selected the last time.

NOTE The XL2 unit must have a Data Explorer Option installed to allow the direct import of XL2 Test files to the Data Explorer software.



Projects view with imported projects sorted by recording date, and right-click context menu

Hint ***Click on any column title to sort the projects in ascending or descending order. Right-click on any column title to amend the selection of displayed columns.***

Direct actions

- Import project: click on Import... and select an XL2 file (*.XL2)
- Open project:
  - double-click on project name
  - select a project and press Ctrl+O
  - select a project and click on Open
- Delete: select a project or folder and press Del (NOTE - All contents of the folder will be deleted!)
- Rename: select a project or folder and press F2
- Refresh the list of projects: press F5
- Organize the projects in ascending or descending order: click on the preferred column title
- Arrange the columns by moving them with the mouse to the preferred position

- Copy to: right-click on a project and select 'Copy To...'
- New folder: right-click in the Project view and select 'New Folder...'
- Up one folder level: click on 
- Change working folder: click on 
- Create new folder: click on 

Save project

All amendments to an open project (e.g. Markers, layout of the Chart view or Result view) are automatically saved. Furthermore, upon returning to the Project view, the project file (*.xldb) is closed. Consequently, if you want to restore a previous project status, you may either

- manually undo every amendment,
- or restore an older version of the project file on your PC.

Copy project

You can copy & paste a Data Explorer project e.g. to another location, and open the copy if the PC has the XL2 Data Explorer software installed.

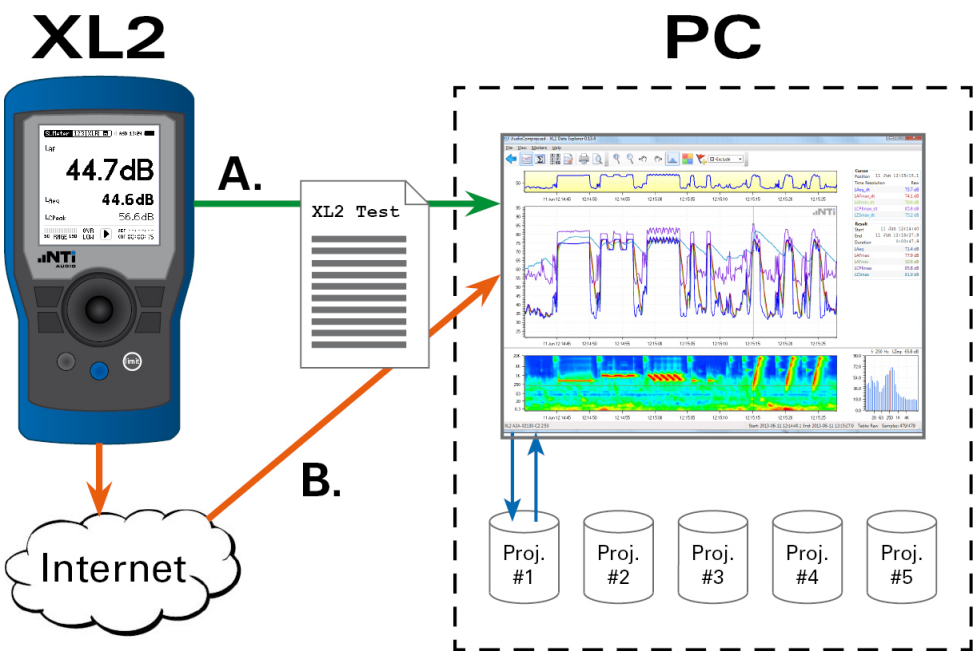
2.1 Data import

Data flow

There are two different ways to import logged data from a XL2 to the Data Explorer software.

A. Test files that were recorded on an XL2 with the Data Explorer Option installed on the XL2 device at the time of recording the data, can be imported directly to the Data Explorer software.

B. Test files that were recorded on an XL2 without the Data Explorer Option installed on the XL2 device at the time of recording the data ("Legacy data"), require an internet connection in order to be imported to the Data Explorer software.



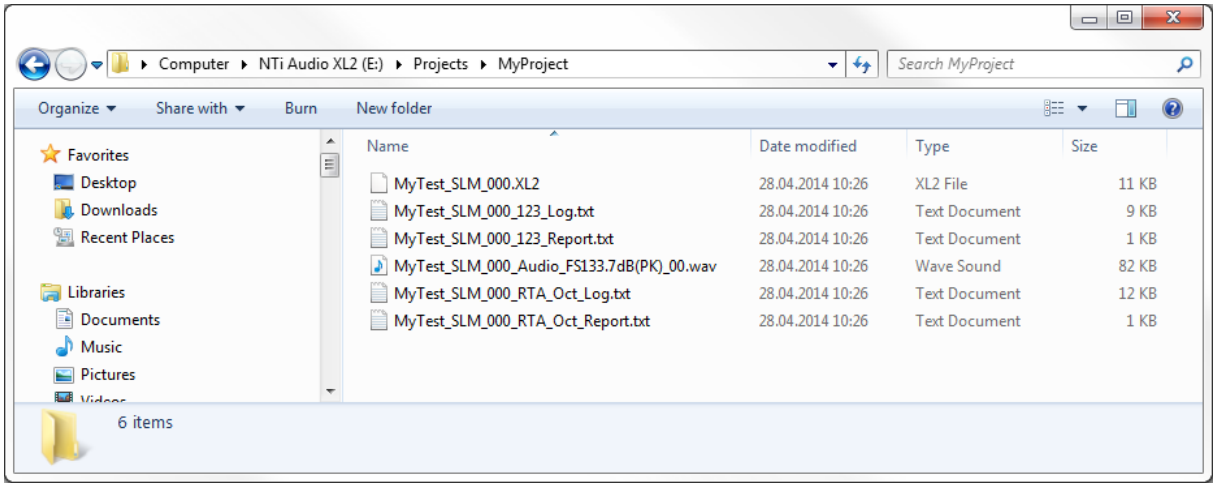
Data import procedures

NOTE The XL2 Data Explorer allows the import of XL2 log files, regardless in which mode they have been recorded; however, this does not include the "cycle results" that were acquired in the 'Repeated Timer' mode.

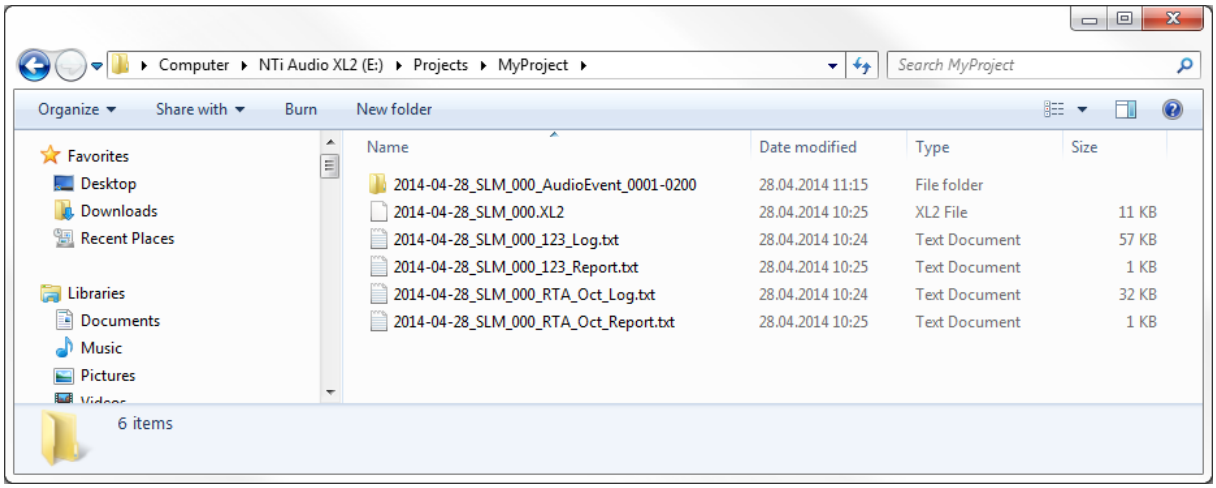
Import procedure

1. Define the Y-axis and percentile preferences for imported files (optional).

2. Connect the XL2 to your PC with the Data Explorer software via the USB interface, or insert the SD-card into a card reader, and copy the required XL2 test files to the hard disk.



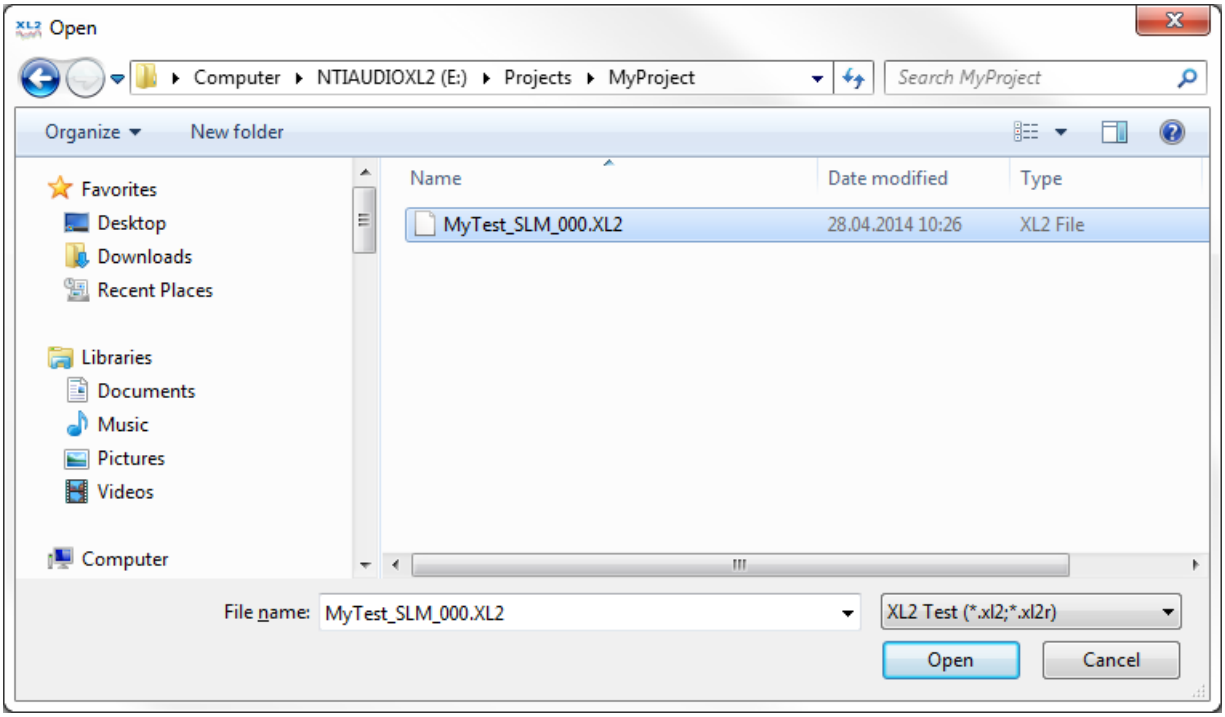
Example of XL2 Test files with continuous audio file



Example of XL2 Test files with segmented audio files

3. Click on the 'Import' button in the Project view and select the *.xl2 test file to be imported.

Hint ***It is strongly recommended that you copy the XL2 test files to the PC hard disk first, and then import them into the Data Explorer.***



Select XL2 Test file

Hint ***It is recommended to keep a backup of the imported XL2 Test files or the converted XL2 Data Explorer files in case of loss of data.***

2.2 Preferences

The 'Preferences' feature allows you to customize some default settings according to your demands, e.g. the displayed level or RTA curves, the Main chart Y-axis scale, the default percentiles or the Day Night Level periods.

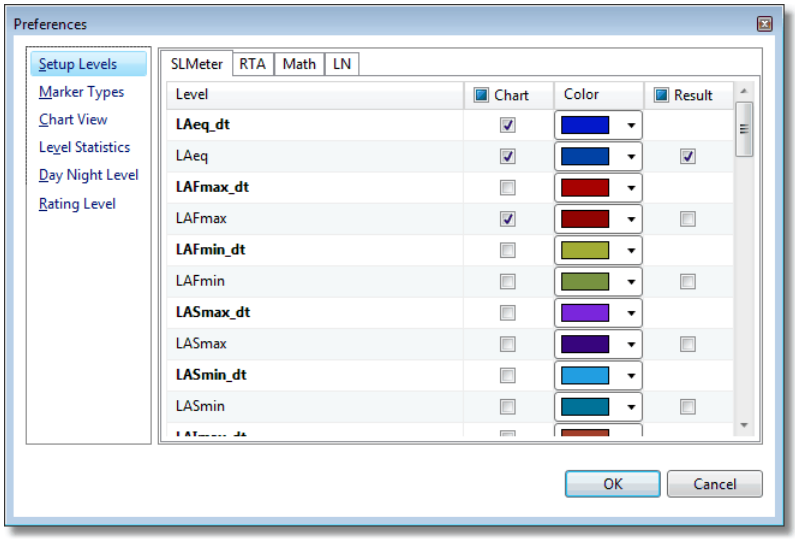
The customized default settings

a) are automatically applied on all XL2 projects that are subsequently imported,

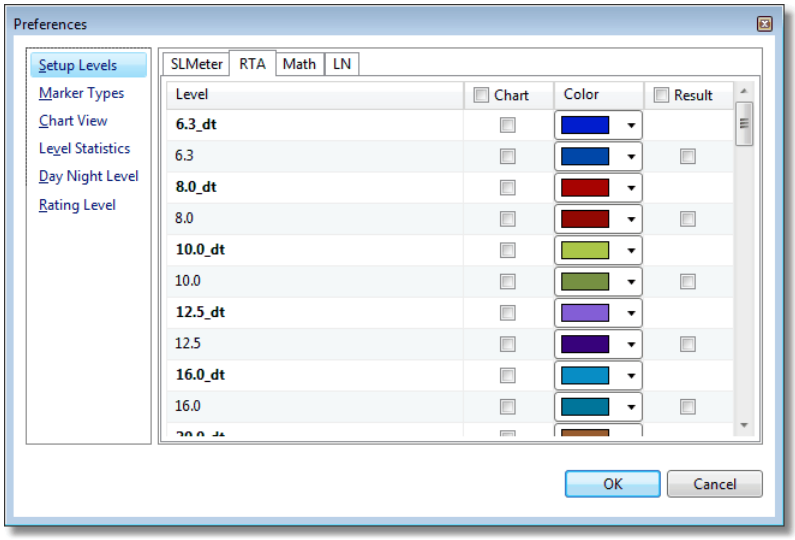
b) may be applied individually by manual interaction on selected older XL2 projects.

To define the default settings, select the menu 'File → Preferences...' in the Project view.

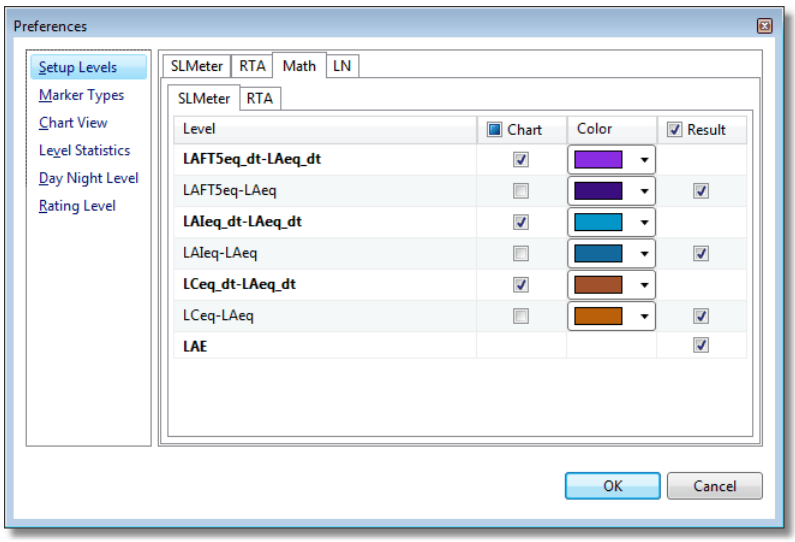
a) Select 'Setup Levels' and 'SLMeter', clear the 'Chart' checkbox and tick the level measurements or results that shall be displayed by default.

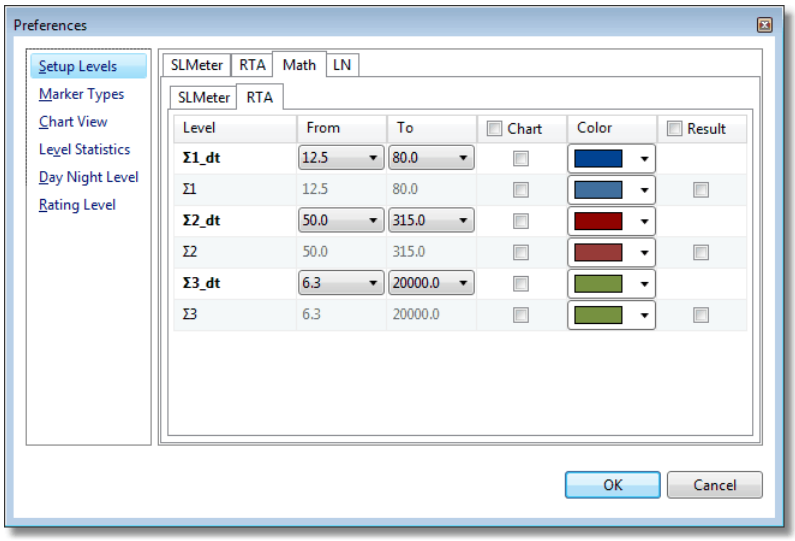


b) Select 'Setup Levels' and 'RTA', clear the 'Chart' checkbox and tick the 1/3rd octave measurements or results that shall be displayed by default.



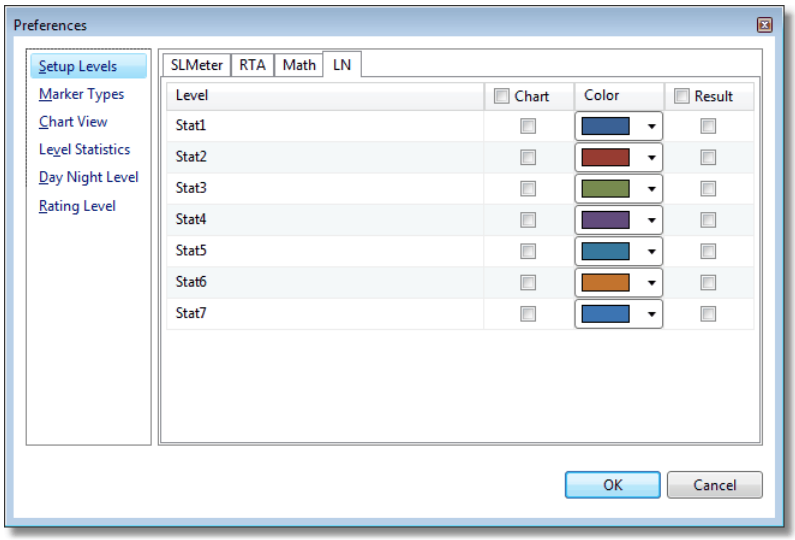
c) Select 'Setup Levels' and 'Math', clear the 'Chart' checkbox and select the SLMeter or RTA calculation results that shall be displayed by default.



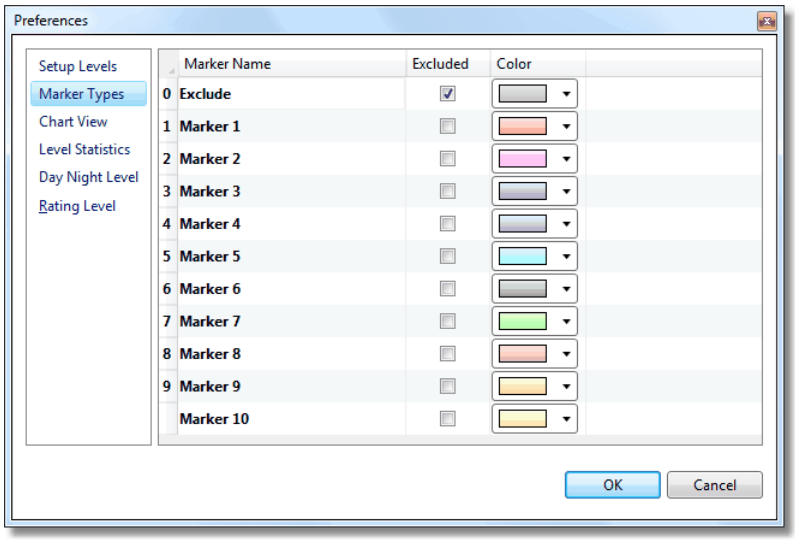


d) Select 'Setup Levels' and 'LN', clear the 'Chart' checkbox and select the Level Statistics that shall be displayed by default.

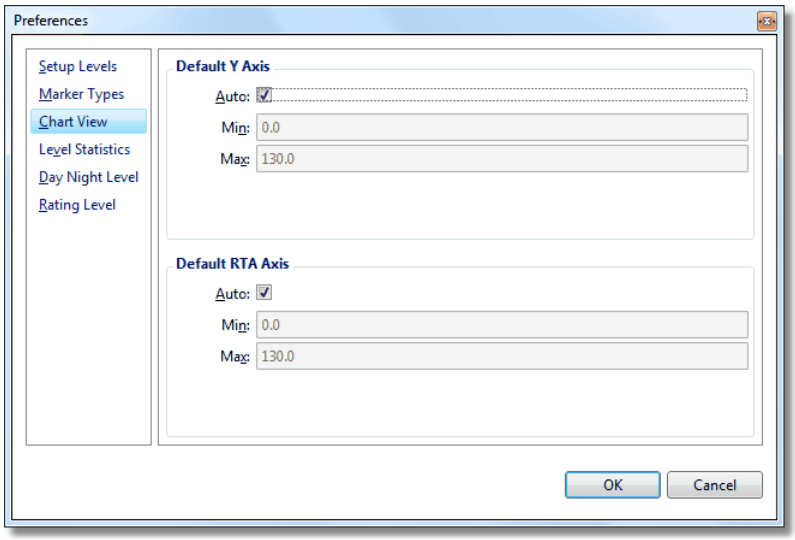
Hint ***The 'Preferences' settings are limited to seven percentiles.***

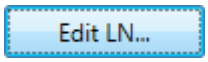


e) Select 'Markers' to edit the default names, Exclude functionality or default colors

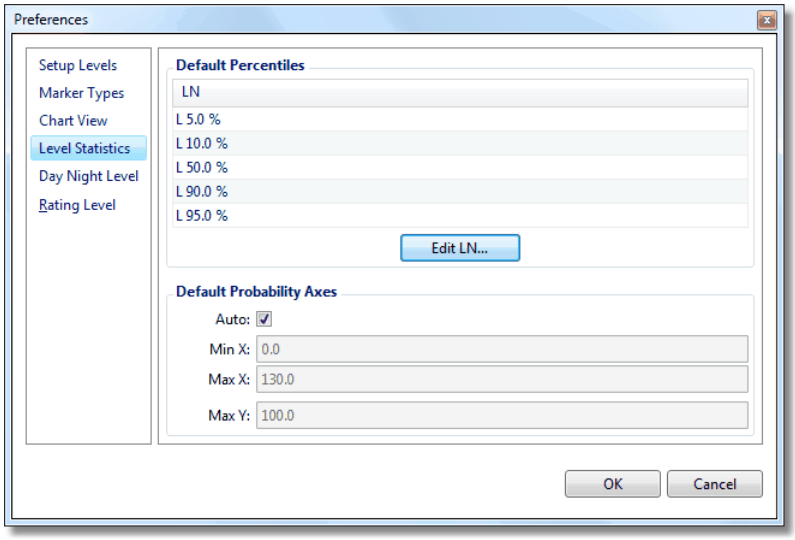


f) Select 'Chart View', clear the 'Auto' checkbox and enter the Minimum and Maximum dB values for the lower and upper ends of the Y-axis.

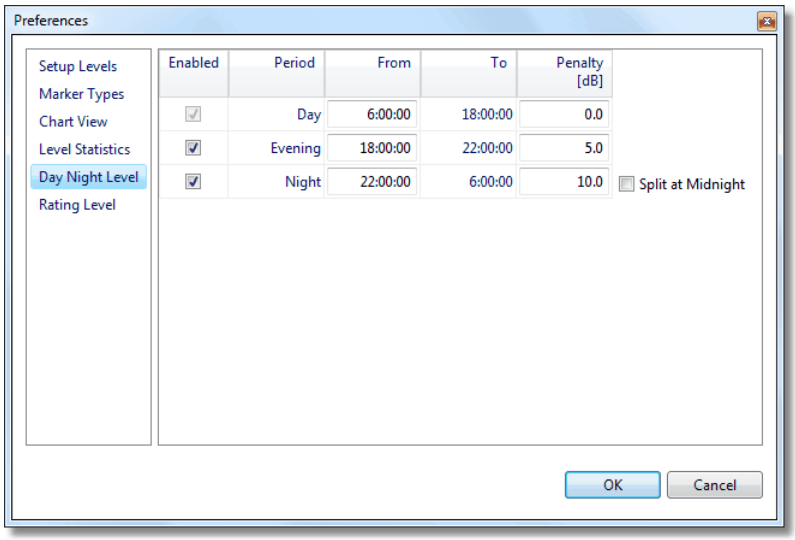


g) Select 'Level Statistics' and press 

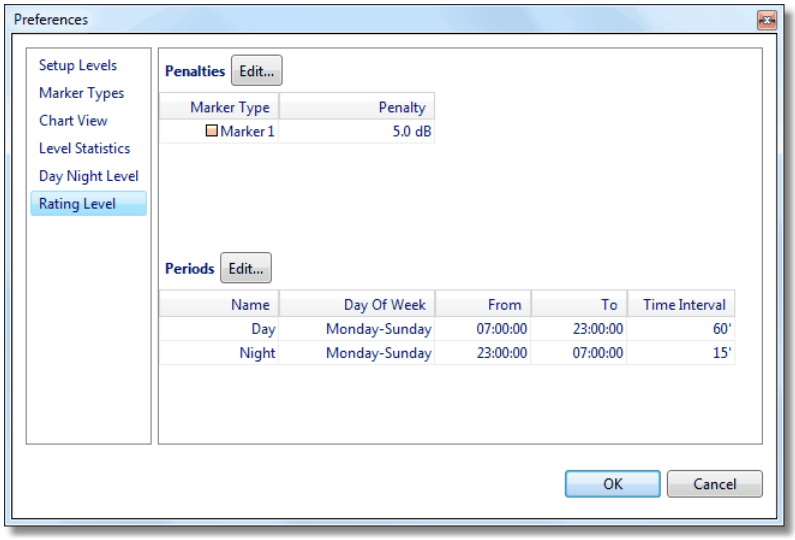
to edit the percentiles that shall be calculated and displayed by default, and/or edit the scaling of the graph axes.



h) Select 'Day Night Level' and the edit the time scheme or penalties according to your demands.



i) Select 'Rating Level' to edit the default penalties or time periods.



Hint ***Changes of the preference settings are applied on all XL2 log files that are subsequently imported. The preferences of older projects may be updated individually via the Setup Levels panel, the Zoom panel, the Edit percentiles panel or the Day Night Level panel.***

2.3 Project info

As soon as an XL2 test file has been imported to the Data Explorer, it becomes a Data Explorer Project with the following content:

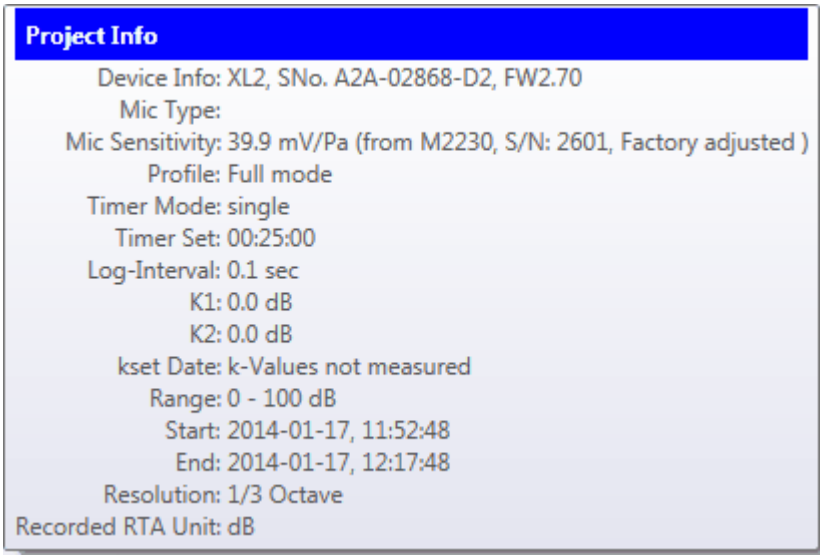
- Logged level data
- Recorded audio file (if applicable)
- Project info (see below)
- Events (Markers) created by the XL2 or by the user from within the Data Explorer
- Report properties
- List of level measurements
- Expansion level / layout of Result view (also after exit & re-enter)

Hint ***To re-establish the original status of a Data Explorer Project after you have amended the data, simply re-import the *.XL2 Test file***

Project Info pop-up

In the Chart or Result view, you may move the cursor to the left bottom corner of the XL2 Data Explorer window to open the Project Info pop-up.

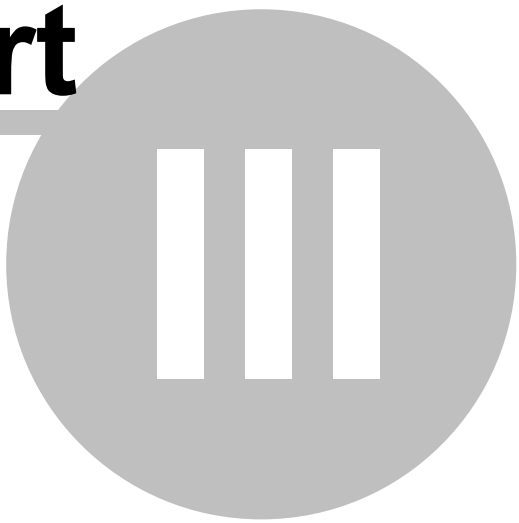
The Project Info pop-up contains the following list of **non-editable** information.



Project info pop-up (example)

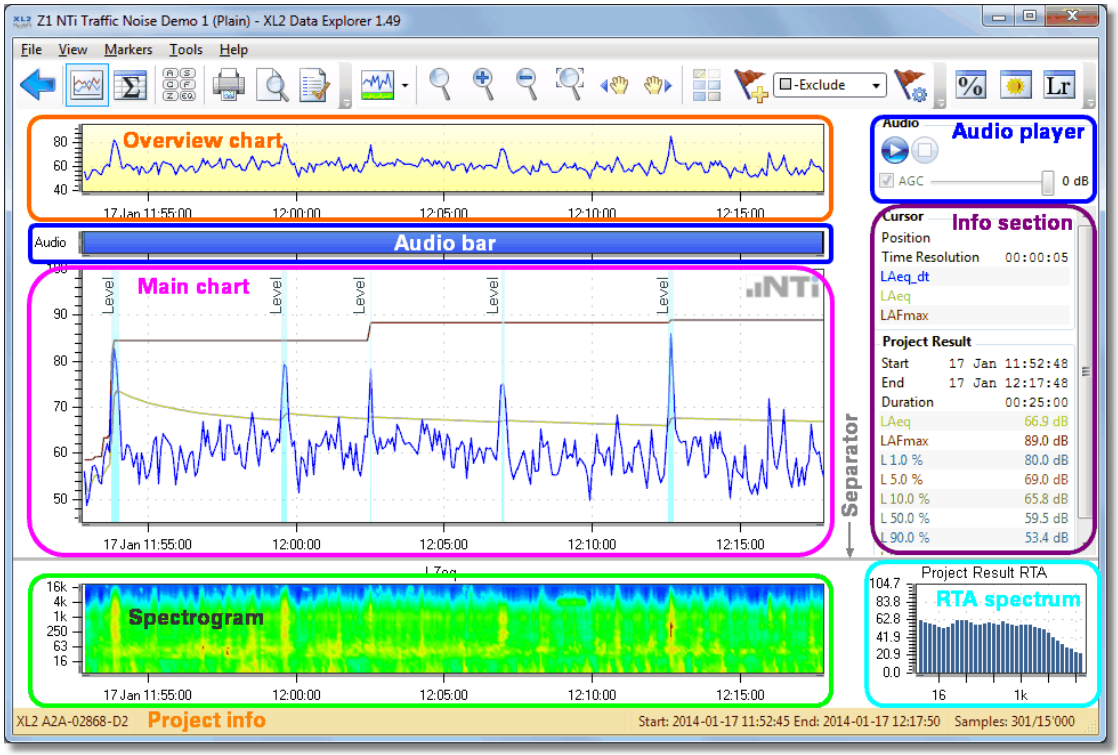
Hint ***Please refer also to chapter Report properties***

Part



3 Chart view

The chart view contains the Overview chart, Audio bar & player, Main chart & info section, Spectrogram with RTA spectrum and the Project info.



Default chart view

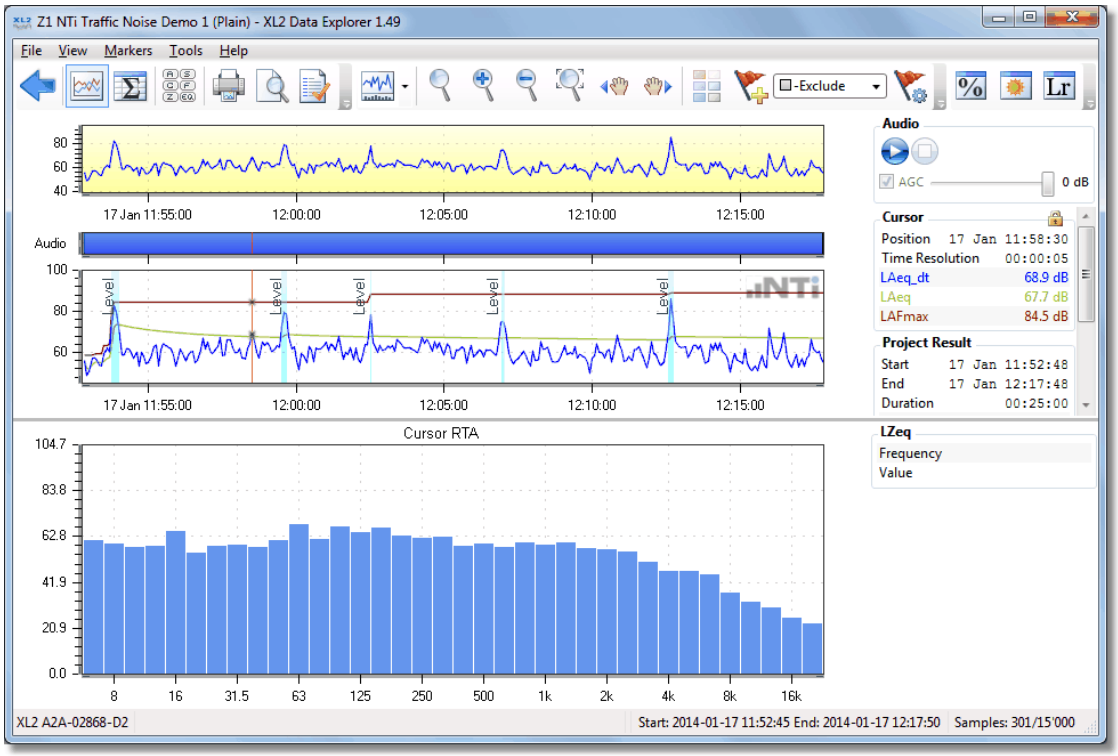


Chart view with large RTA spectrum

Buttons

Icon	Description
	Return to Project view
	Switch to Chart view
	Switch to Result view
	Select the levels to be displayed
	Print the project report
	Preview the project report
	Open the Report properties
	Change the layout of the chart view: Main chart only / with Spectrogram / with large RTA spectrum
	Zoom by Date Time
	Zoom In / Out
	Zoom All out
	Pan left / right
	Edit the name, function or color of the Markers
	Add a Marker
-Exclude	Select the type of a new Marker
	Open the Automatic Marker Generation window
	Open the Level statistics window
	Open the Day Night Level window
	Open the Rating Level window

Time axes

The time axes always show the absolute date & time as recorded by the XL2 at the time when the level data was acquired.

- The time axis of the Overview chart always shows the full recorded period.
- The time axis of the Audio bar, Main chart and Spectrogram automatically adapts to the current zoom range.

Separator

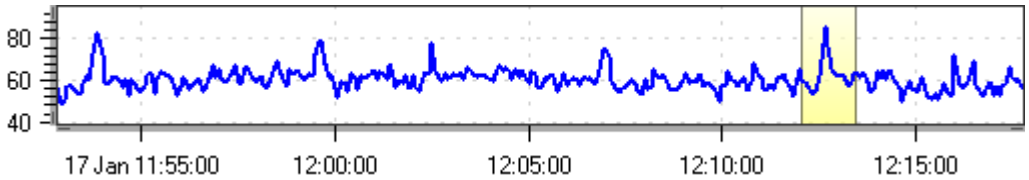
The separator line between the Main chart and the Spectrogram can be shifted vertically, adjusting the height of the graphs.

Project info

A pop-up with the Project info opens as soon as the cursor is moved over the XL2 serial number / firmware version in the left bottom corner of the Chart view.

3.1 Overview chart

The Overview chart provides a permanent view of the full recorded period.

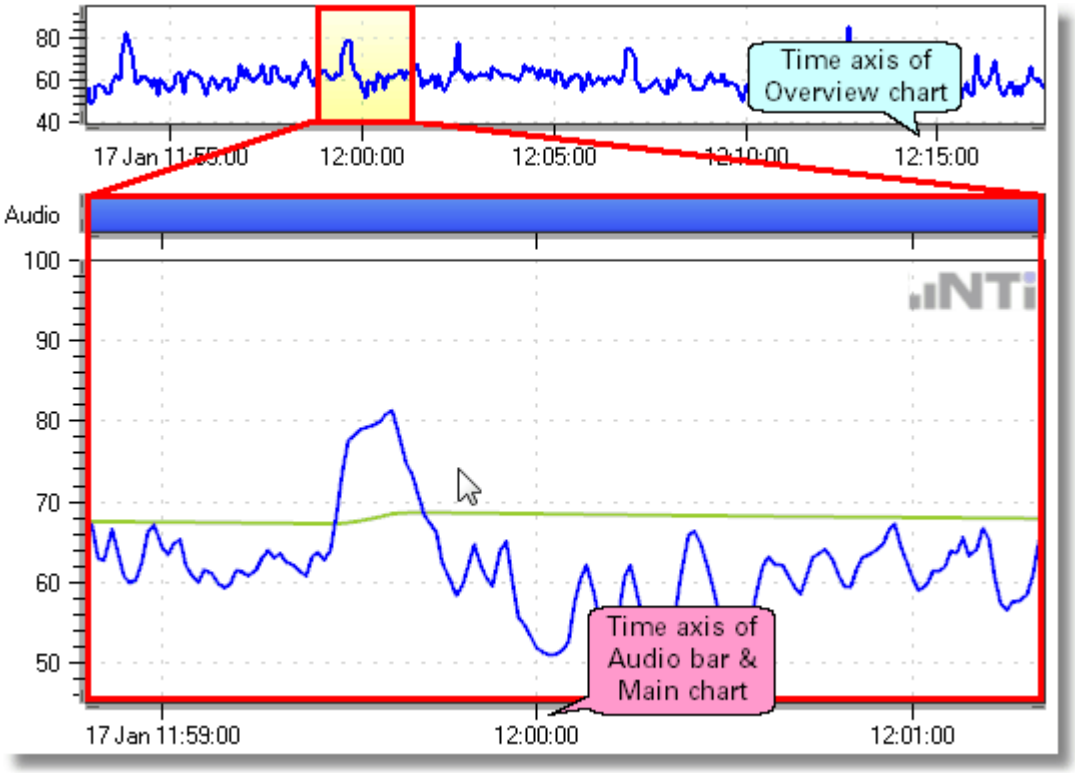


Overview chart with highlighted zoom range

The level curve that is displayed by default is, if available, the LAeq. Otherwise, it's the first level measurement data recorded in the log of the XL2 Test file.

The yellow background of the Overview chart indicates the area that is currently displayed in the Audio bar, Main chart and Spectrogram. If you zoom in to an area in the Main chart, the area will be highlighted in yellow in the Overview chart.

- The time axis of the Overview chart always shows the full recording period.
- The time axis of the Audio bar, Main chart and Spectrogram cover the currently displayed (i.e. zoomed) recording period only.



Example of Overview chart, Audio bar and Main chart

3.2 Audio bar & player

NOTE The Audio bar is only shown if the audio log was switched on in the XL2 at the time of data acquisition.

Example of a continuous Audio bar

Example of a segmented Audio bar

The Audio bar is normally continuous, but can also be segmented. For example, if the XL2 'Log Audio' mode was switched to 'Events Only'. Furthermore, longer audio recordings will be concatenated, as the maximum file size for an audio log is restricted to approx. 500 MB (= 1 hour full audio, or 12 hours compressed audio).

The area displayed in the Audio bar always corresponds to the content of the Main chart (i.e. the zoomed area). The vertical lines below the Audio bar consequently refer to the time scale of the Main chart, too.

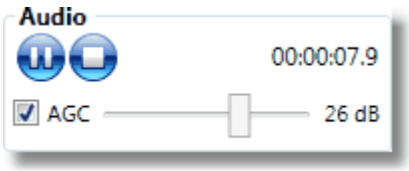
There are three ways to listen to the recorded audio file.

a. To replay the audio file, you may
   - click on the desired position in the audio bar, or
   - right-click on the Audio bar, the Main chart or the Spectrogram and select 'Play from here', or
   - click on the button of the Audio player.

b. To pause the audio file replay,
   - press the 'Space' bar, or
   - right-click on the Audio bar, the Main chart or the Spectrogram and select 'Pause', or
   - click on the button of the Audio player.

c. Stop the audio file replay by
   - pressing the 'Esc' button, or
   - right-clicking on the Audio bar, the Main chart or the Spectrogram and select 'Stop', or
   - clicking on the button of the Audio player.

Right-click context menu



Audio player

You may switch off the AGC (Automated Gain Control), and manually adjust the gain. However, please note that in this mode the Audio player may still reduce the gain to avoid clipping.

Hint ***The AGC cannot be switched off if the XL2 audio file was recorded in the mode 'Compressed+AGC'.***

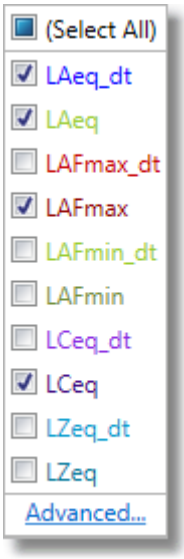
You may access the WAV file(s) behind the Audio bar (segments). To do so, right-click on the requested segment and select 'Browse to ...'.

Alternatively, you may also hover over the time indicator in the Audio player to read the file path of the related WAV file.

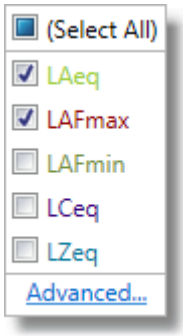
3.3 Setup Levels

Click on the button or press Ctrl + L to select the sound levels, math results and level statistics to be displayed in the Chart view and Result view respectively.

Hint ***The displayed levels are selected independently for the Chart and the Result view.***



Example of available levels in Chart view

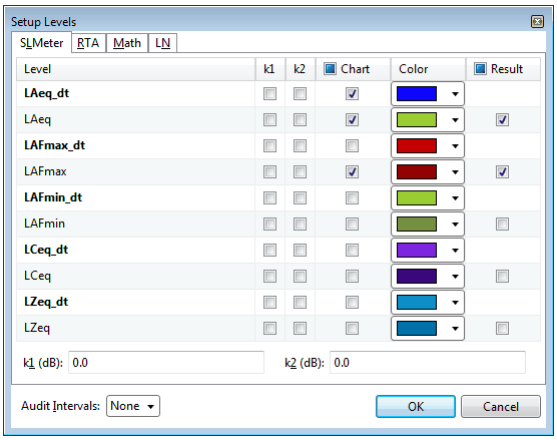


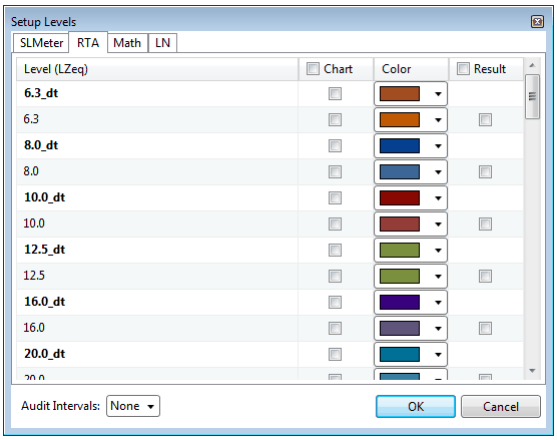
Example of available levels in Result view

Click on 'Advanced...', to open the 'Setup Levels' panel, which provides access to more settings.

a) Sound levels

- Tick the checkbox to select (i.e. display) or deselect all level or RTA curves and results in the corresponding view.
- Tick the particular checkboxes of the levels, RTA spectra or correction factors k1, k2 that shall be displayed.
- Edit the values of the correction factors k1, k2.

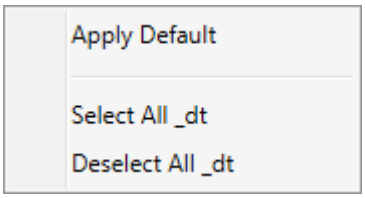




Setup Levels panel, tabs 'SLMeter' and 'RTA'

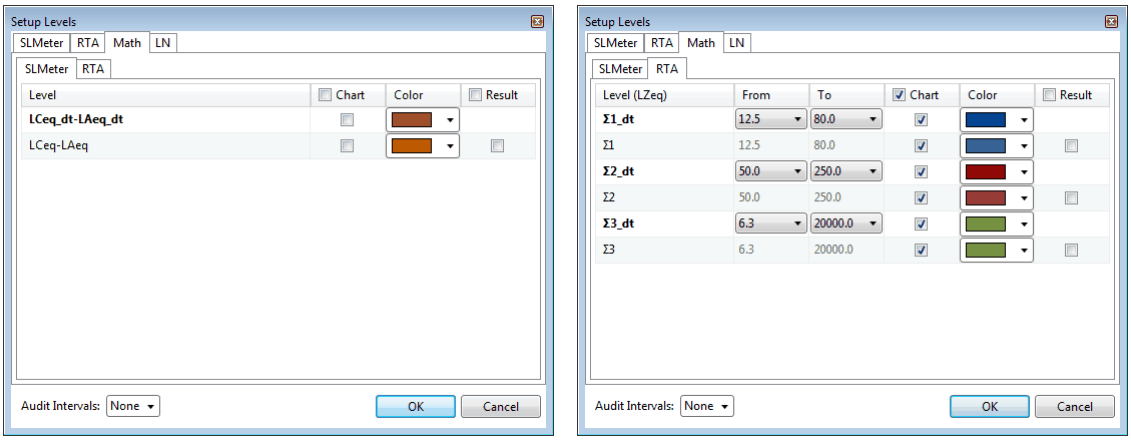
Hint ***Activate an Audit Interval if required (optional)***

Hint ***By right-clicking on the 'SLMeter' or 'RTA' Setup Levels panel you may***
a) apply the current default settings (→ preferences),
b) select all _dt values in the list,
c) deselect all _dt values in the list.



b) Math results

- Tick the checkbox to select (i.e. display) or deselect all math results in the corresponding view.
- Tick the particular checkboxes of the math results that shall be displayed.

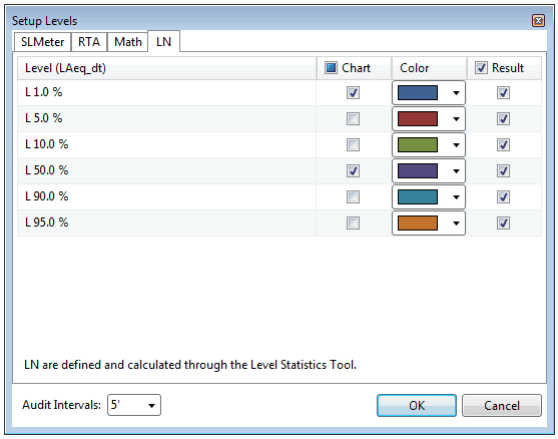


Setup Levels panel, tabs 'Math / SLMeter' and 'Math / RTA'

NOTE **'Math' values are only available if the corresponding raw data have been logged in the XL2 project.**

c) Level statistics

- Tick the checkbox to select (i.e. display) or deselect all level statistics in the corresponding view.
- Tick the particular checkboxes of the level statistics that shall be displayed.



Setup Levels panel, 'LN' (level statistics)

3.4 Audit Intervals

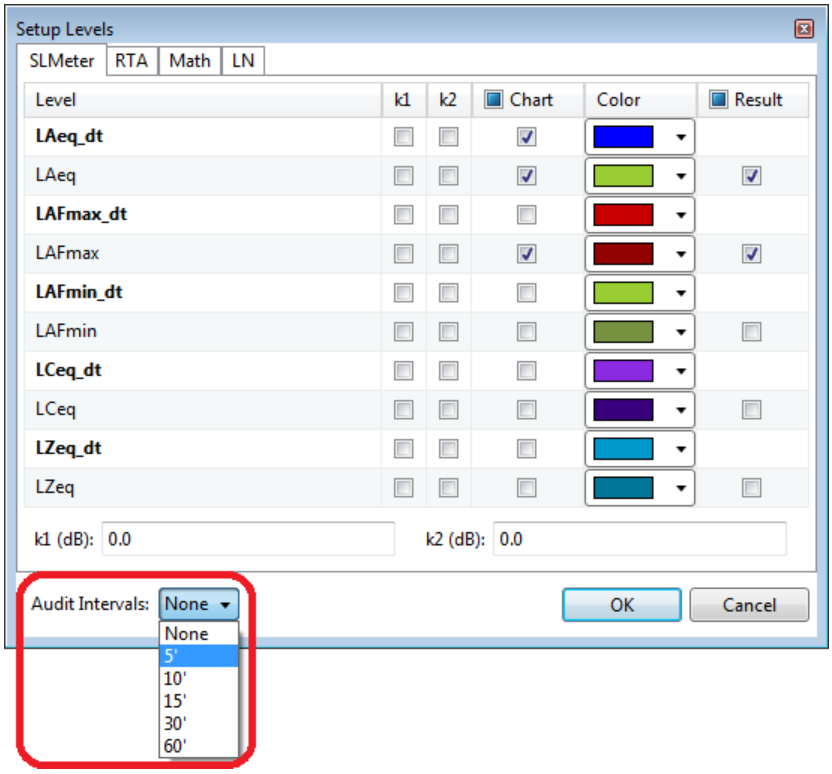
The 'Audit Intervals' feature allows to divide the log data in measurement intervals (segments) of selectable length. These intervals are always synchronized with the time of the day.

For instance, the 15' audit interval would divide a recording from 08:12 to 09:05 into following intervals: 08:12 → 08:15 → 08:30 → 08:45 → 09:00 → 09:05.

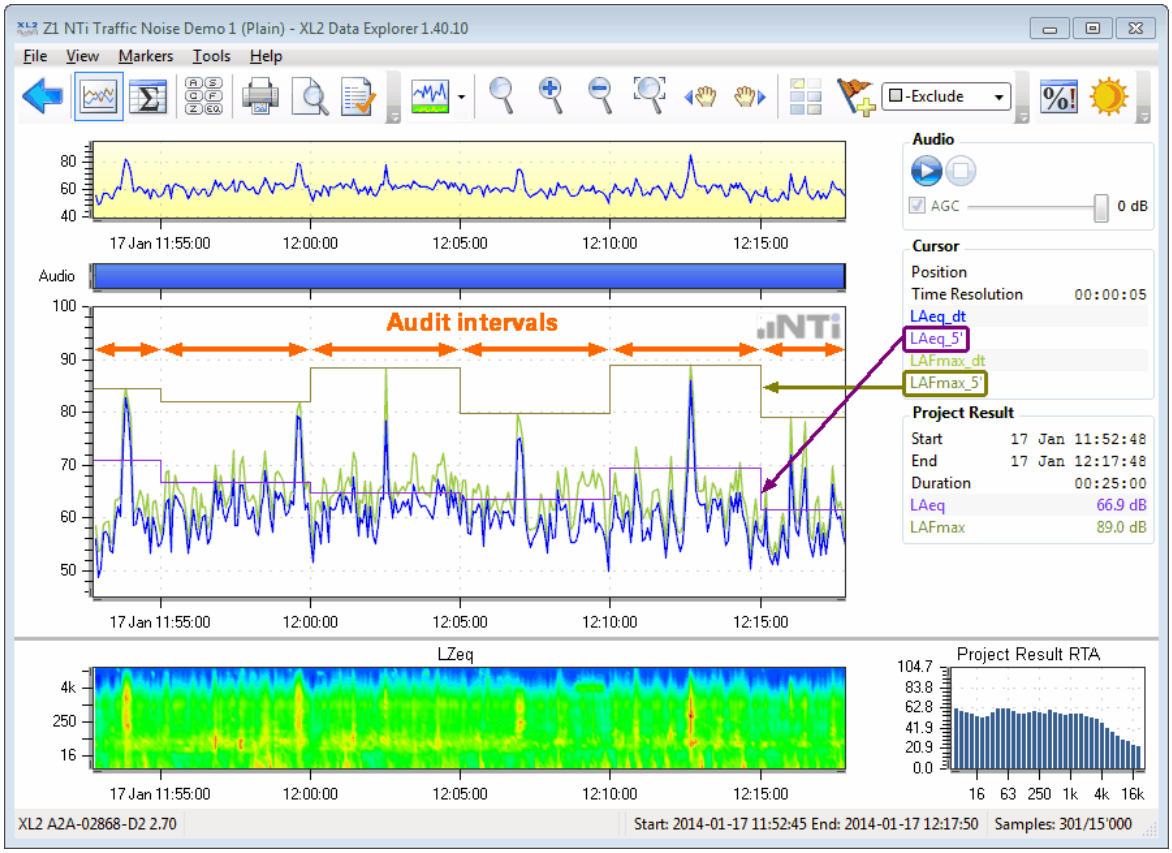
The selected measurement results are then displayed for every interval in the Main chart and in the Result view.

Hint ***The 'Audit Intervals' feature is available regardless in which mode the data had been logged on the XL2.***

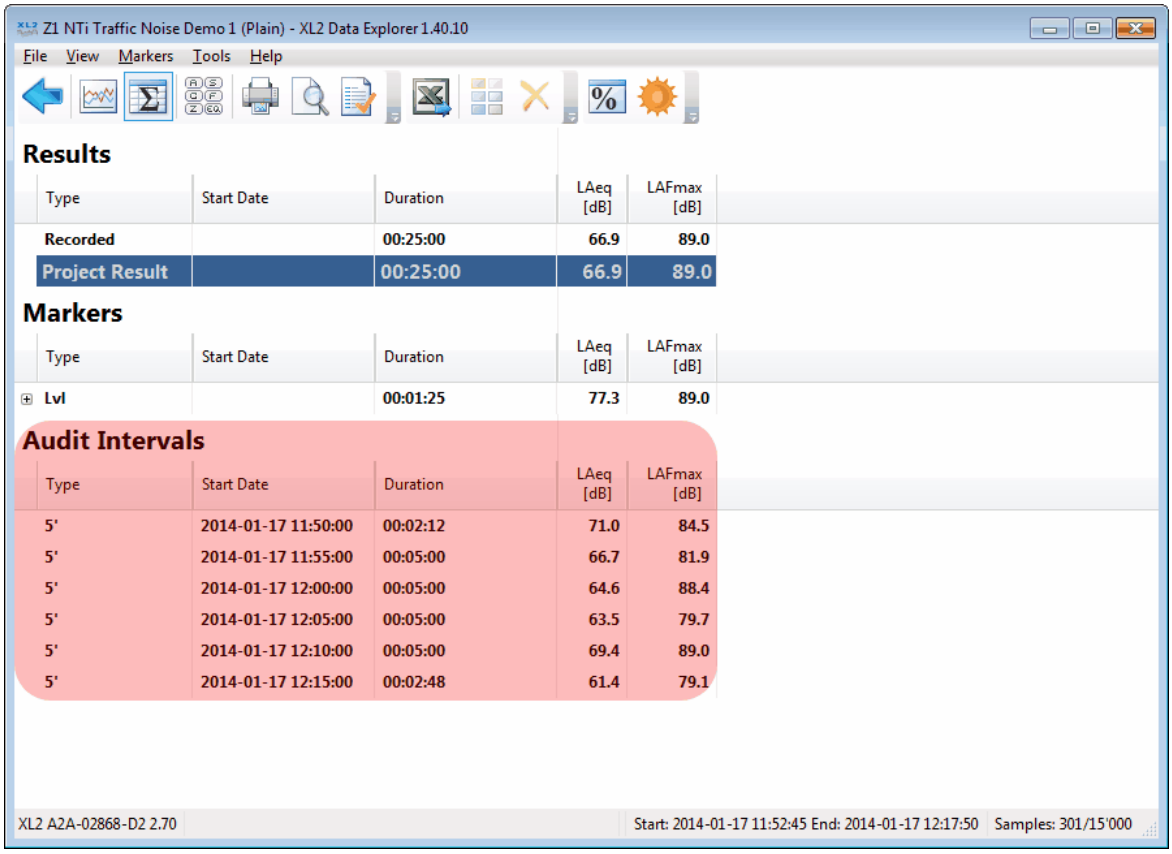
To activate the 'Audit Intervals' feature, open the 'Setup Levels' panel, select the required interval duration and press 'OK'.



Selection of audit interval



Example of Chart view with audit interval = 5'



Results

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]
Recorded		00:25:00	66.9	89.0
Project Result		00:25:00	66.9	89.0

Markers

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]
Lvl		00:01:25	77.3	89.0

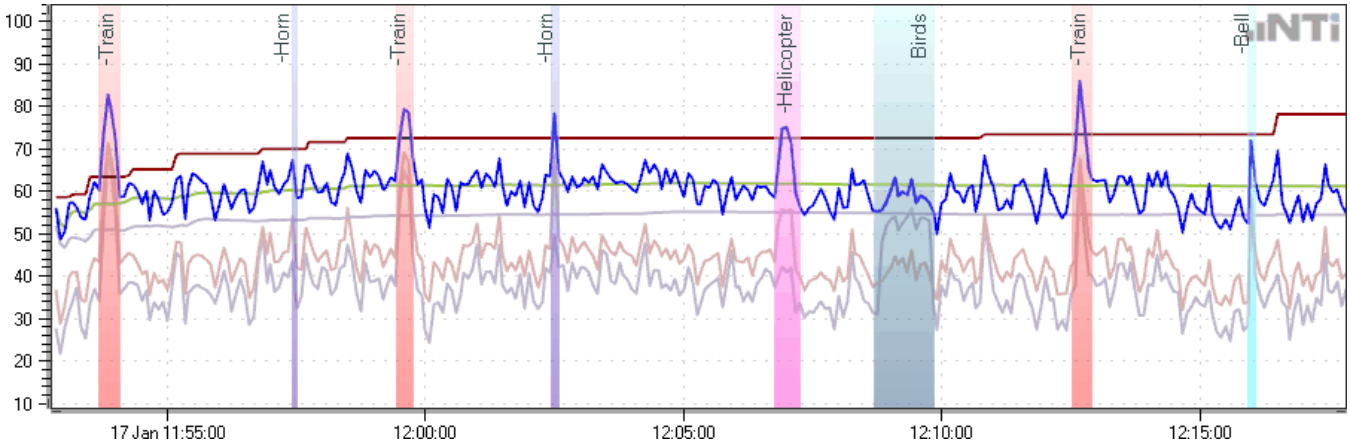
Audit Intervals

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]
5'	2014-01-17 11:50:00	00:02:12	71.0	84.5
5'	2014-01-17 11:55:00	00:05:00	66.7	81.9
5'	2014-01-17 12:00:00	00:05:00	64.6	88.4
5'	2014-01-17 12:05:00	00:05:00	63.5	79.7
5'	2014-01-17 12:10:00	00:05:00	69.4	89.0
5'	2014-01-17 12:15:00	00:02:48	61.4	79.1

Example of Result view with audit interval = 5'

3.5 Main chart, Info section

Main chart

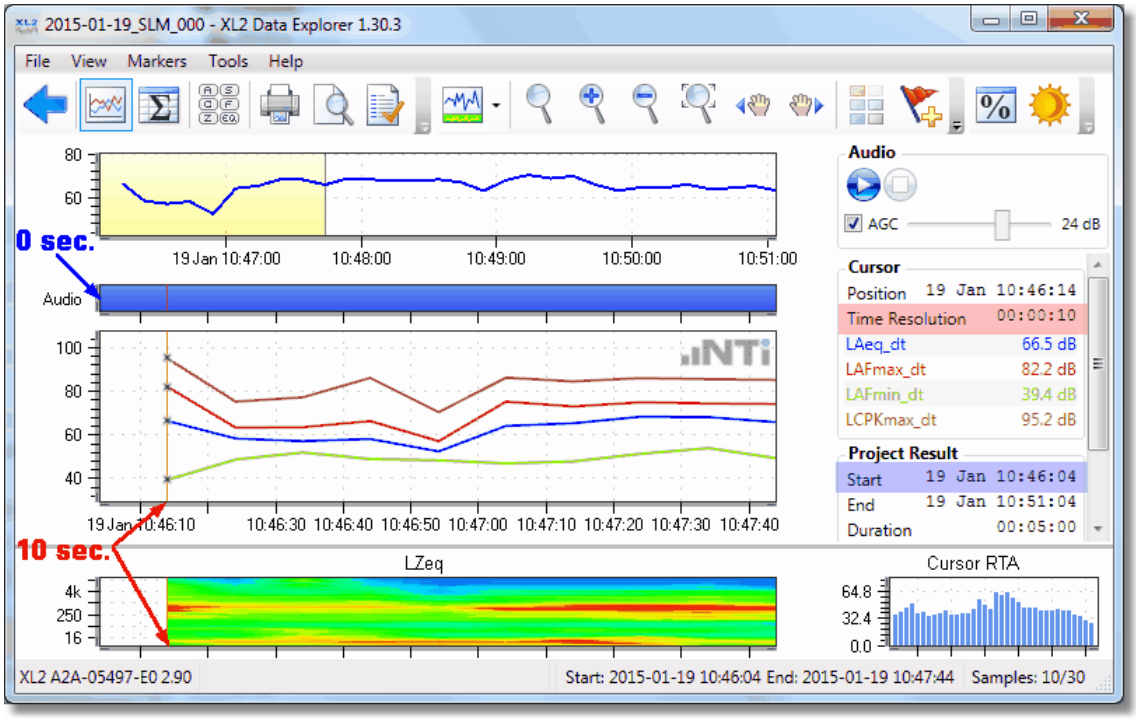


Example of Main chart with Level, RTA curves

The Main chart shows the curves of the selected levels and RTA data over time.

- Zoom in to or out of a specific area.
- Move the cursor to a specific position in the Main chart to read the instantaneous value(s) of the displayed level(s) in the Info section.

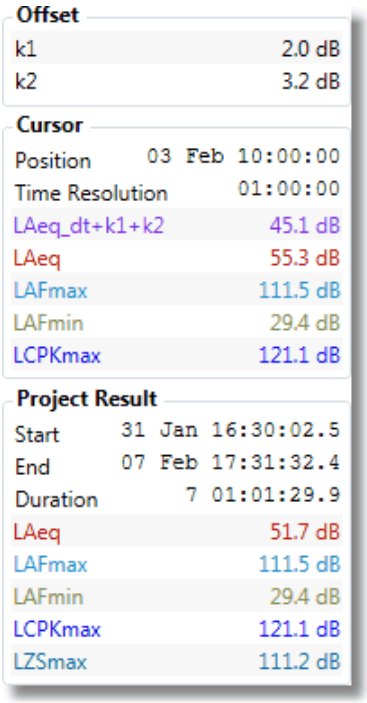
Hint ***There is a gap between the start point of the recording, and the first sample(s) of the result curve(s). This gap corresponds to the XL2 log "Interval dt". The first results are only available at the end of the first log interval, whereas the audio file recording starts at the very beginning.***



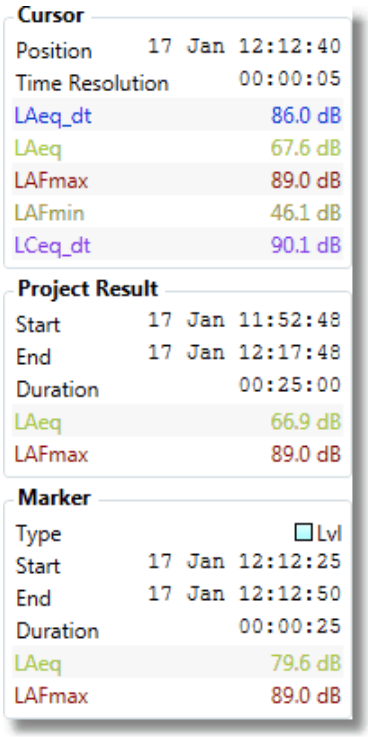
The audio file recording starts at the very beginning (0 s), while the first samples are only available after the first logging interval dt has elapsed (10 s)

Info section

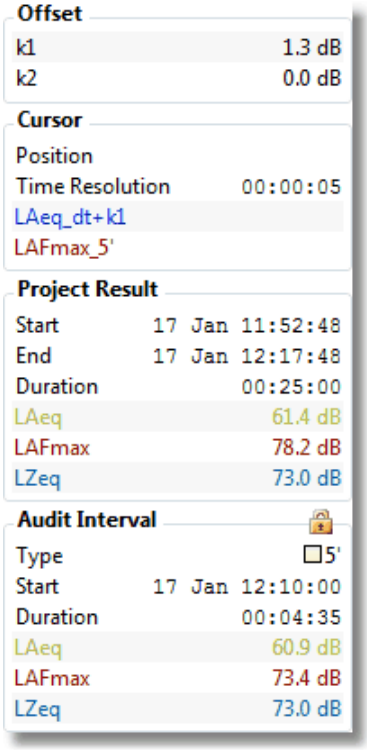
The Info section provides contextual information related to the displayed levels and the current cursor position.



Example #1 of Info section



Example #2 of Info section



Example #3 of Info section

Hint ***The "Marker" extension appears as soon as the mouse is placed on a Marker band.***

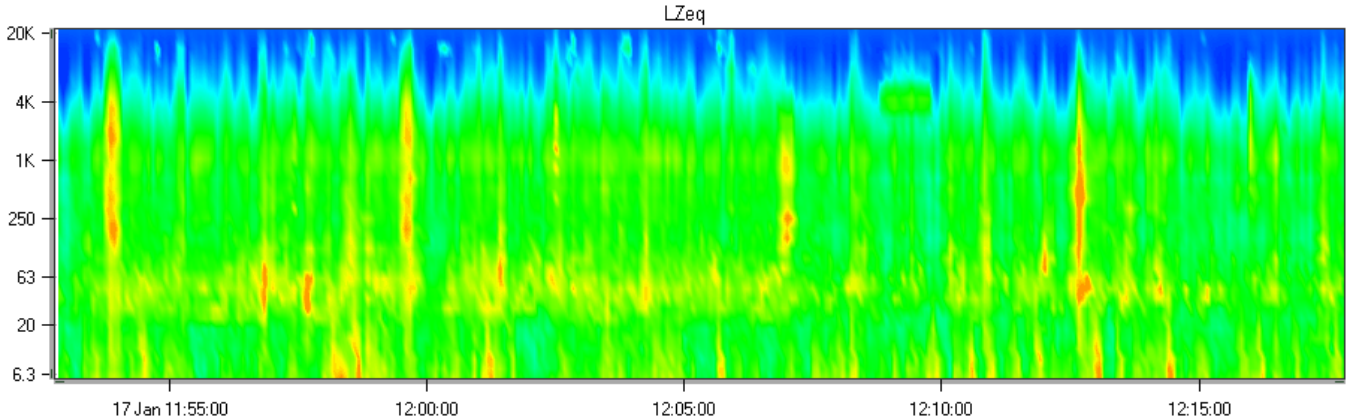
- **Offset**: values of the correction-factors k1, k2 (only visible if at least one correction-factor ≠ 0)
- **Cursor**: instantaneous values of the cursor
  - Position: date & time of the current cursor position
  - Time resolution of the currently-displayed Main chart (depends on the actual zoom range)
  - The instantaneous value(s) and color of the displayed level(s) at the current cursor position
- **Result**: absolute result data
  - Start, End and duration of the whole recording
  - The Results (i.e. all recorded values minus the excluded Markers)
- **Marker**: properties of the selected Marker
  - Type of the Marker
  - Start, End and duration of the Marker
  - Level data values of the Marker
- **Audit Interval**: properties of the selected Audit Interval
  - Type of the Audit Interval
  - Start, End and duration of the Audit Interval
  - Level data values of the Audit Interval

3.6 Spectrogram, RTA spectrum

Spectrogram

The Spectrogram displays the logged spectra of the XL2 test (i.e. sound level at each frequency over time).

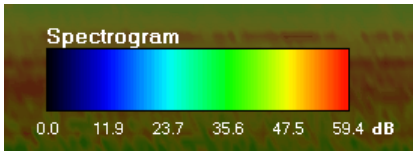
- X-axis: time
- Y-axis: frequency
- Color: sound level
    - red = highest level value
    - green = medium
    - turquoise = 50% of maximum level
    - dark blue = low
    - black = lowest level value



Example of Spectrogram

NOTE The Spectrogram and the RTA spectrum are only available if "Add Spectra" was set to "Yes" in the XL2 during the data logging.

Hint ***Right-click in the Spectrogram and select 'Show Legend' to show the color assignments.***



Legend

Hint ***You may edit the RTA-axis via the Zoom panel and thus define an absolute level ↔ color scheme. This may improve e.g. the comparison of the spectra of different projects.***

RTA spectrum

The RTA spectrum displays the LZeq level vs. frequency of the cursor position; it may be enlarged via the 'Change Layout' button.

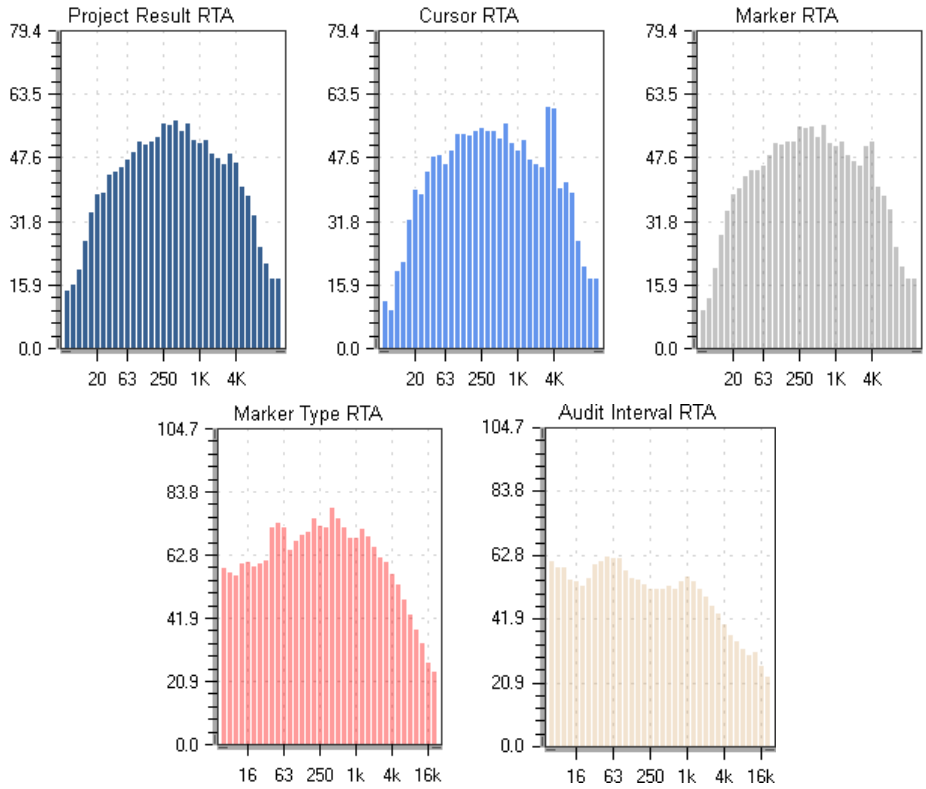
i. Cursor outside Main chart / Spectrogram → overall project spectrum is displayed

ii. Cursor over Main chart or Spectrogram → spectrum at the current cursor position is displayed

iii. Cursor over a Marker label → spectrum of the marked area is displayed (*Hint: Marker color applies also to the RTA spectrum*)

iv. Cursor locked to all markers of the same type → spectrum of all markers of the same type is displayed

v. Cursor locked to Audit Interval → spectrum of the selected area

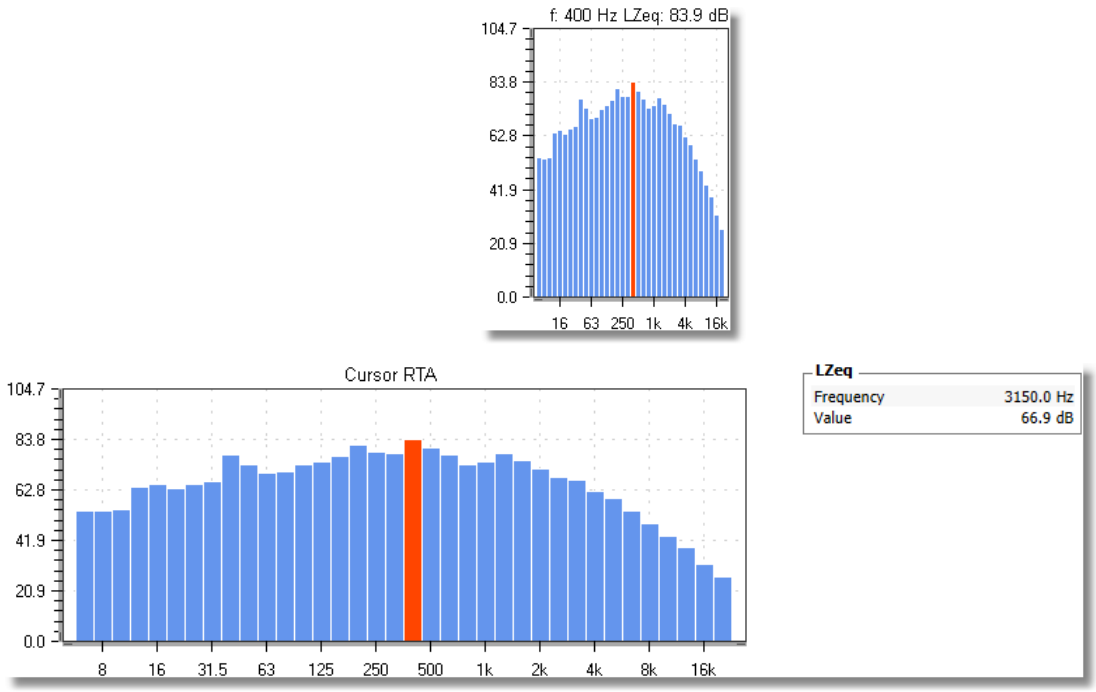


Different RTA spectrums displayed (default size) with different cursor positions (i, ii, iii, iv, v)

In addition, the RTA spectrum provides individual level/frequency information both numerically (on top of the graph), and graphically with a red bar.

a) Move the cursor over the RTA spectrum or Spectrogram

b) Lock the cursor in the Main chart or on a Marker label, then move it over the RTA spectrum.



RTA spectrum with readout: default size (above) / large size (below)

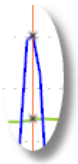
3.7 Cursor

The cursor (mouse pointer) can be used to perform several actions:

- Readout the instantaneous level results (-> info section) or level & frequency (-> RTA spectrum)
- Zoom & pan
- Start audio file replay: right-click on the required start point in the Main chart or Spectrogram, then select 'Play from here'

Readout

The info section shows the instantaneous level or spectrum of the cursor position in the Main chart or Spectrogram.



- If the cursor is located in the Main chart, the info section shows the corresponding level values. In addition, the intersection(s) of the cursor and the displayed curve(s) are highlighted by a small "x".
- If the cursor is located in the Spectrogram, the frequency and the level value that corresponds to the actual cursor position is also shown in the Info section.

Cursor color

The default cursor color is **red**. While the audio file is playing, the cursor is **blue**.

Zoom-in/-out, pan

- Zoom-in:
  - select the zoom area with left-click+drag over the target area of the Main chart or Spectrogram, or
  - use the scroll wheel of your mouse.
- Zoom-out:
  - double left-click on the Main chart or Spectrogram, or
  - use the scroll wheel of your mouse.
- Pan:
  - Overview chart, place the cursor on the zoom range (yellow area) then left-click+drag
  - Main chart or Spectrogram, press Ctrl+left-click+drag

Lock cursor

The cursor position can be locked by right-clicking in the Main chart or Spectrogram, or over a Marker label, or in an Audit Interval. The RTA spectrum consequently shows the spectrum at the corresponding cursor position, or of the marked area.

Lock cursor ... → RTA spectrum

a) ... in the Main chart → of the specific cursor position

b) ... to a single Marker → of the marked area

c) ... to all Markers of a specific type → of the combined Marker areas

d) ... in the Spectrogram → of the specific cursor position

e) ... to an Audit Interval → of the marked area

Hint ***A locked cursor is indicated by a in the Info section.***
When printing a report, the values of the locked cursor appear in the printout below the charts.

To unlock the cursor,

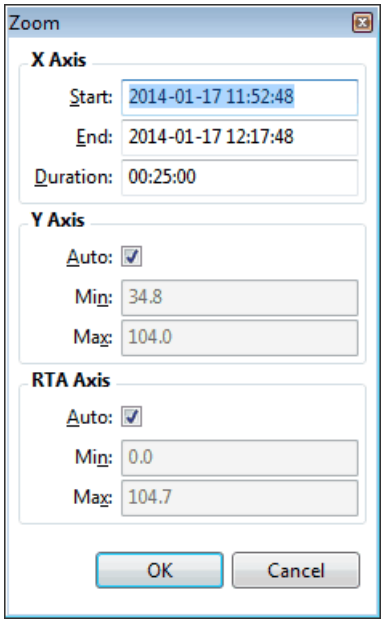
- press Esc
- click on in the Info section
- right-click and select "Lock cursor" again
- lock the cursor at a new position

3.8 Zoom & pan

Zoom

There are several ways to zoom:

- Click on the , buttons to zoom in/out,
- Place the cursor in the Main chart or Spectrogram, then
  - left-click+drag to the end position of the required zoom range,
  - use the scroll wheel of your mouse to zoom in/out.
- Click on the button to open the Zoom panel, and manually edit the X-axis zoom range, Y-axis scale and the RTA-axis color scheme:



Zoom panel

Hint ***The Y-axis scaling may be adjusted to a predefined default via the preferences. To adjust the Y-axis of an XL2 Test file that has been previously imported, right-click on the Y-axis section of the Zoom panel and select 'Default'.***

- Return to the overall view:
  - click on ,
  - double click on the Main chart,
  - right-click on the Main chart or Spectrogram and select 'Zoom All Out'.

Pan

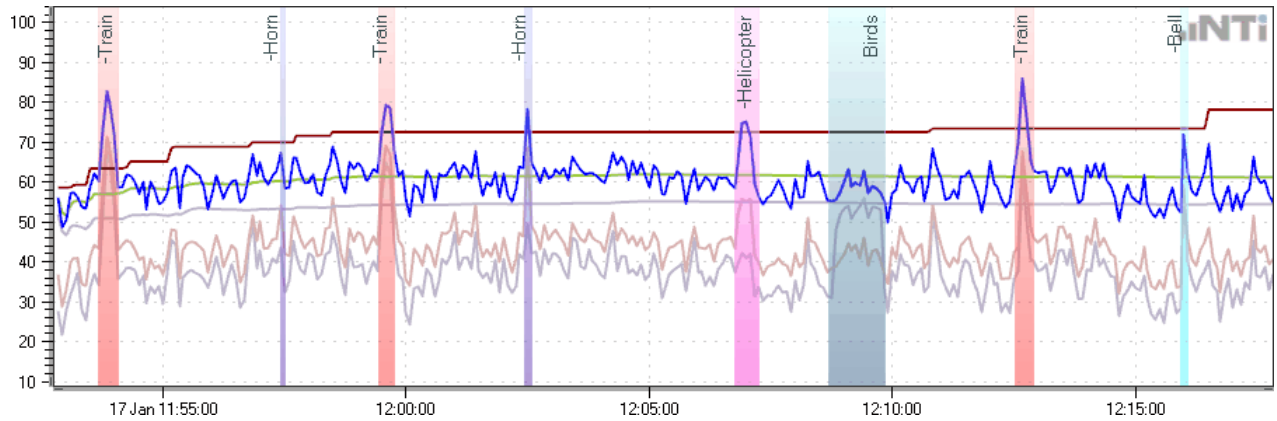
When you are zoomed in, there are several ways to pan:

- Click on the or button.
- Press the left / right arrow on the PC keyboard.
- Click on the zoom range in the Overview chart and move it with the mouse.
- Press Ctrl+left-click in the Main chart or Spectrogram and move the zoom range with the mouse

3.9 Markers

Markers are a very helpful way to

- exclude user-defined areas of the recording from the overall result calculation,
- and highlight specific events that occurred during the recording.



Example of main chart with five different marker types

Markers are either logged by the XL2 during the recording, or manually added by the user within the Data Explorer. Every Marker is displayed as a colored band in the Main chart.

Irrespective of how it was created, any Marker may be edited or deleted by the user.

Hint ***From Data Explorer v1.50 onwards, the Simplified Marker Calculations apply.***

A) Marker types

The XL2 Data Explorer supports eleven different Marker types, which are by default labeled "Exclude" and "Marker 1…10". The name & color of each Marker type may be edited. Also, you can choose which Marker type(s) should be excluded from the result calculation. These settings may be edited in two different ways,

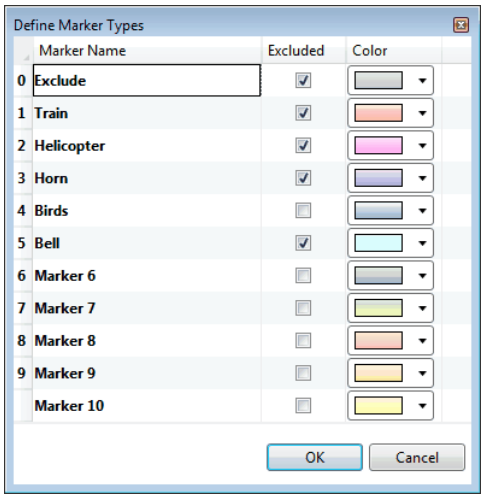
i. globally via the Preferences → amends the default settings,

ii. individually for each project → amendments apply only for the selected project.

Click on  to open the 'Define Marker Types' panel. The panel shows the 11 Marker types.

- Double left-click on any entry in the first column to edit the corresponding Marker Name (consequently the name of all Markers of this type in the Main chart or Result view will be amended).
- Tick the checkbox in the second column to exclude all Markers of this type from the level result calculation.
- Amend the color of any Marker type via the corresponding dropdown menu.

Hints ***The level data of an excluded Marker is <u>not</u> considered for the overall level result calculation. In the Main chart, every excluded Marker is identified by a "–" (minus) sign in front of its name. If an excluded Marker overlaps with a standard (included) Marker, the overlapping part will be ignored (i.e. excluded).***



Example of edited Marker types

B) Create a Marker

Markers can be created in three different ways,

i. Automatically by the XL2

ii. Manually via the Data Explorer

iii. Automatically via the Data Explorer

NOTE Proper creation of Markers is an essential prerequisite for the Rating Level calculations

i. XL2 Markers

If Markers were set by the XL2 unit during the recording, they are assigned and labeled as follows:

- Marker 4 → Pause: the XL2 recording had paused for a while
- Marker 5 → Lvl: the XL2 input level exceeded the user-defined threshold
- Marker 6..9 → Key 1...4: the operator pressed the XL2 Input Keypad during the recording
- Marker 10 → Error: a technical problem (e.g. SD-card overflow) occurred during the recording

ii. Manually created Markers

1. Select the Marker type using the -Exclude combo box, then click on the button
   - or -
   press the corresponding number key 0...9 on the PC keyboard.

2. Create the Marker by selecting an area in the Main chart with left-click+drag.

Hints ***Overlapping Markers of different types are supported.***
Overlapping Markers of the same types are merged.

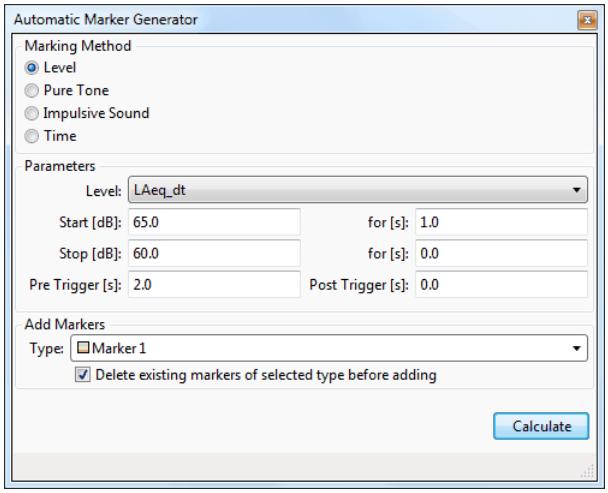
iii Automatic Marker generation

1. Click on the button, or select the menu 'Markers → Automatic Marker Generator ...' to open the Automatic Marker Generator panel

2. Select the method, how the Marker(s) shall be generated,
   a) Level → if the sound level exceeds a user-defined threshold
   b) Pure Tone → identification of tones (a frequency band sticks out of the spectrum)
   c) Impulsive Sound → detection of short impulses
   d) Time → user-defined time periods

a) Level

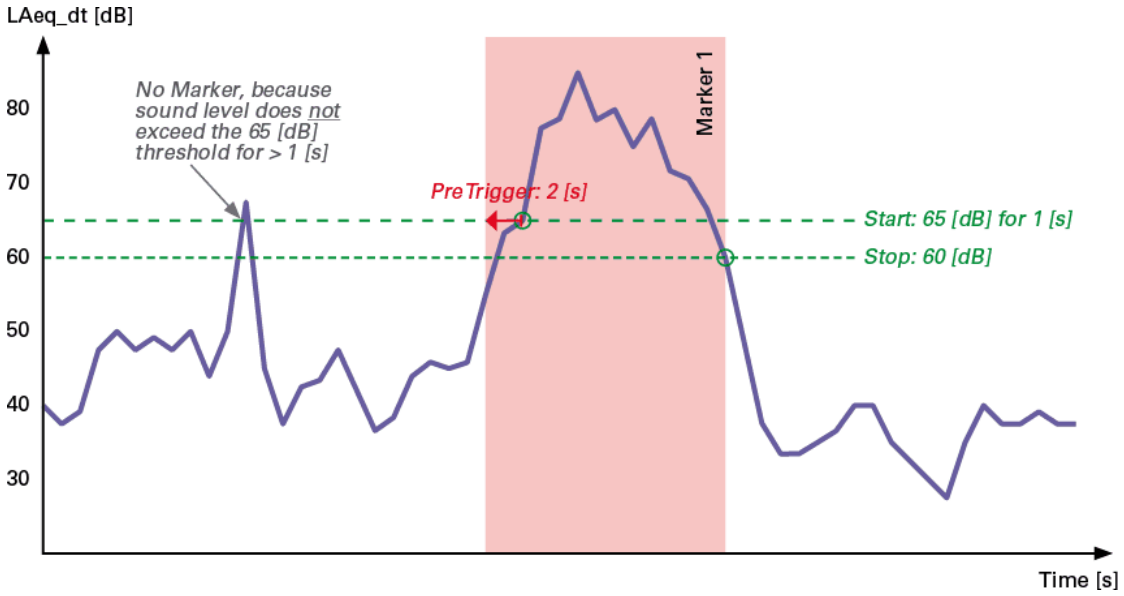
The Data Explorer automatically marks every section of the recorded sound level that exceeds the user-defined threshold.



Parameters

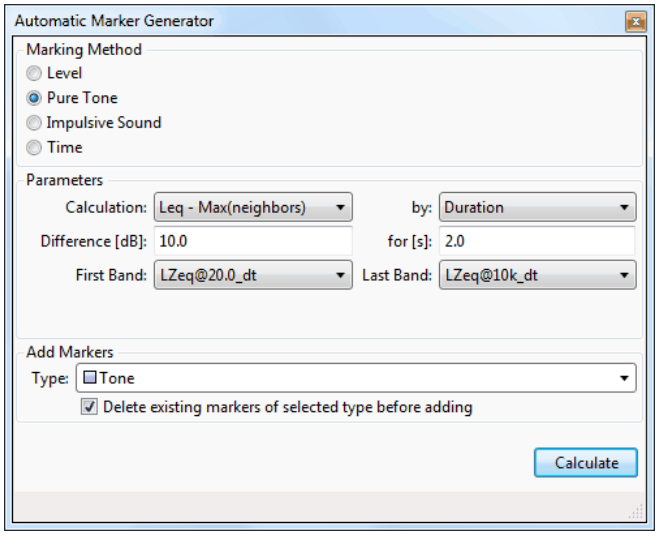
- Level → select the sound level, for which the automatic Level Markers shall be generated.
- Start [dB] / for [s] → threshold level that must be exceeded for the selected duration (or longer) to generate a Marker at this point
- Stop [dB] / for [s] → the generated Marker ends as soon as the sound level falls below this threshold for the selected duration (or longer)
- Pre Trigger [s] → the generated Marker starts earlier than the point, where the aforementioned 'Start' threshold is exceeded
- Post Trigger [s] → the generated Marker ends later than the point, where the sound level falls below the aforementioned 'Stop' threshold
- Add Markers Type → select the Marker type that shall be generated
- ☑ → tick this checkbox if you want that all previously created Markers of the selected type shall be automatically deleted

Example



b) Pure Tone

The Data Explorer automatically marks every section of the recorded sound level, where the level in a band of the 1/1 or 1/3rd Octave spectrum (i.e. a tone) exceeds the level of the two neighboring bands by a user-defined minimum difference (⇒ identification of discrete-frequency spectral components).



Parameters

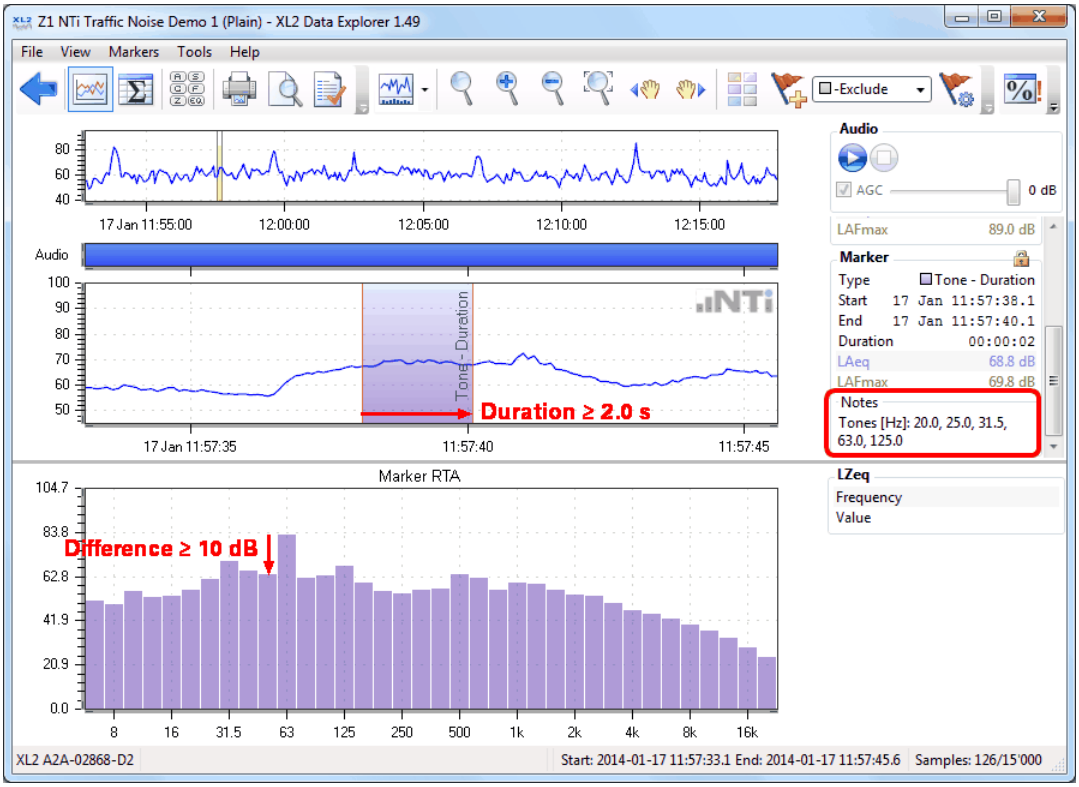
- Calculation → select the condition for the tone detection
  - Leq – Max (neighbors) → a tone is marked, if its Leq exceeds the maximum levels of the two neighbor bands
  - Leq – Mean (neighbors) → a tone is marked, if its Leq exceeds the mean levels of the two neighbor bands
  - ISO 1996:2-2007 → a tone is marked, if it meets the conditions proposed by the standard

  a) Duration → a tone is marked, if it exceeds the minimum difference and lasts at least for the user-defined time period
  - Difference [dB] → minimum level difference between the tone level and the levels of the two neighbor bands
  - for [s] → minimum time period, for which the 'Difference' condition must be met

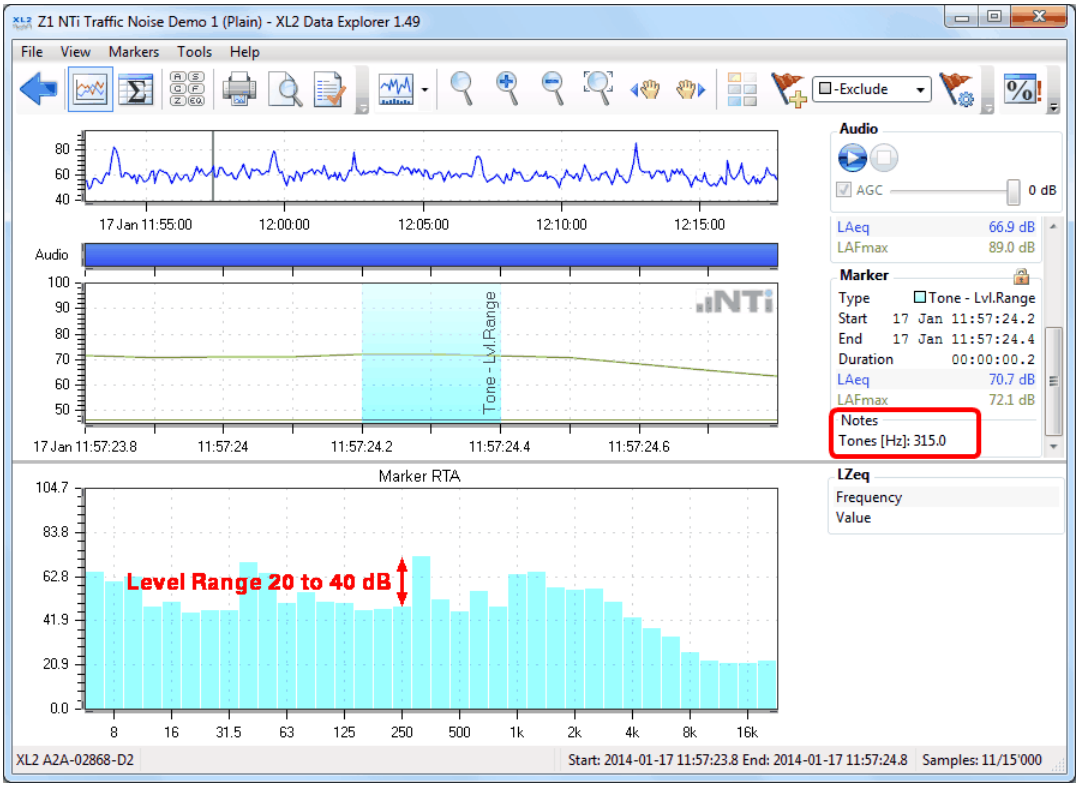
  b) Level Range ® a tone is marked, if its level difference to the neighbor bands is within the user-defined range
  - Difference [dB] → minimum level difference between the tone level and the levels of the two neighbor bands
  - to [dB] → maximum level difference between the tone level and the levels of the two neighbor bands
- First / Last Band → optional user-defined limitation of the frequency band, in which tones shall be marked
- Add Markers Type → select the Marker type that shall be generated
- ☑ → tick this checkbox if you want that all previously created Markers of the selected type shall be automatically deleted

Hint ***The detected tones are listed in the Info section under 'Marker → Notes'***

Examples



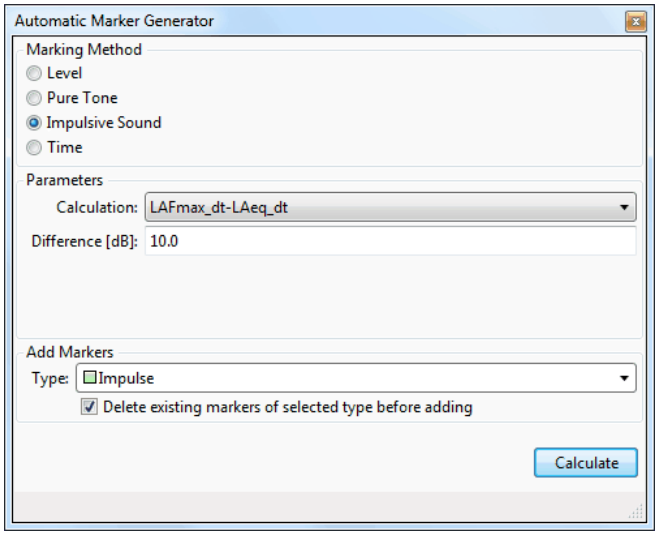
a) Level difference ≥ 10 dB, Duration ≥ 2 s



b) Level difference 20 … 40 dB

c) Impulsive Sound

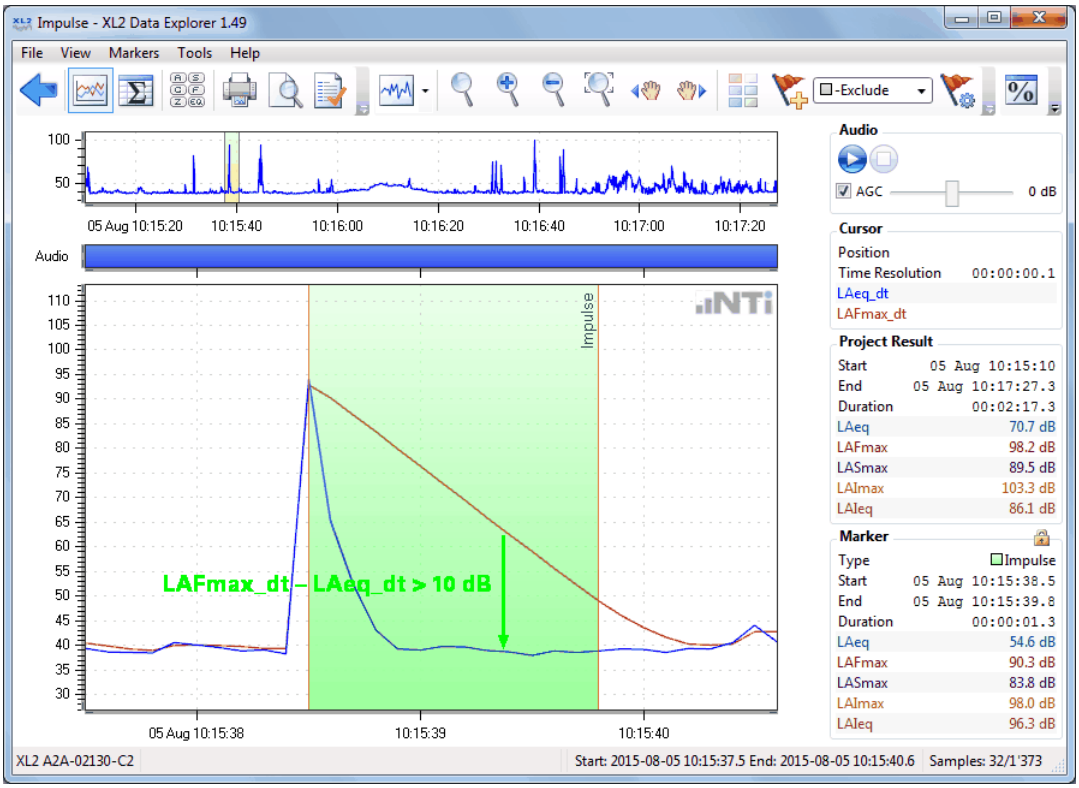
The Data Explorer automatically identifies & marks short impulsive sounds (⇒ identification of brief bursts of sound pressure, usually < 1 s).



Parameters

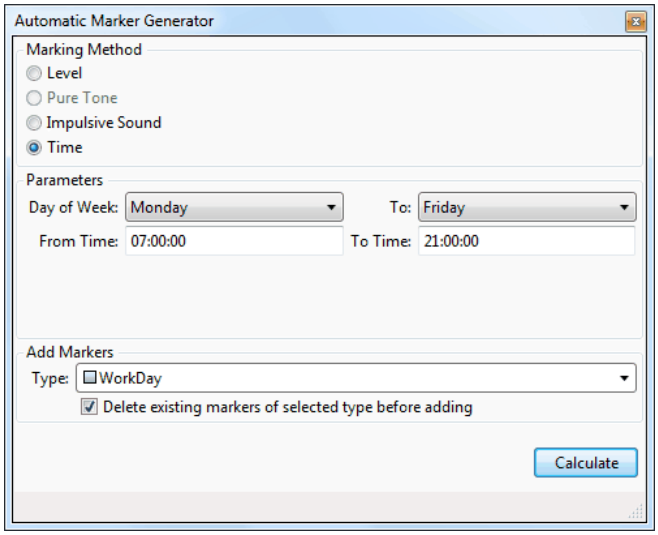
- Calculation → select the sound level, for which the automatic Impulsive Sound Markers shall be generated
- Difference [dB] → threshold level that must be exceeded to generate a Marker at this point
- Add Markers Type → select the Marker type that shall be generated
- ☑ → tick this checkbox if you want that all previously created Markers of the selected type shall be automatically deleted

Example



d) Time

The Data Explorer marks user-defined time intervals (⇒ identification of user-defined rest time slots).

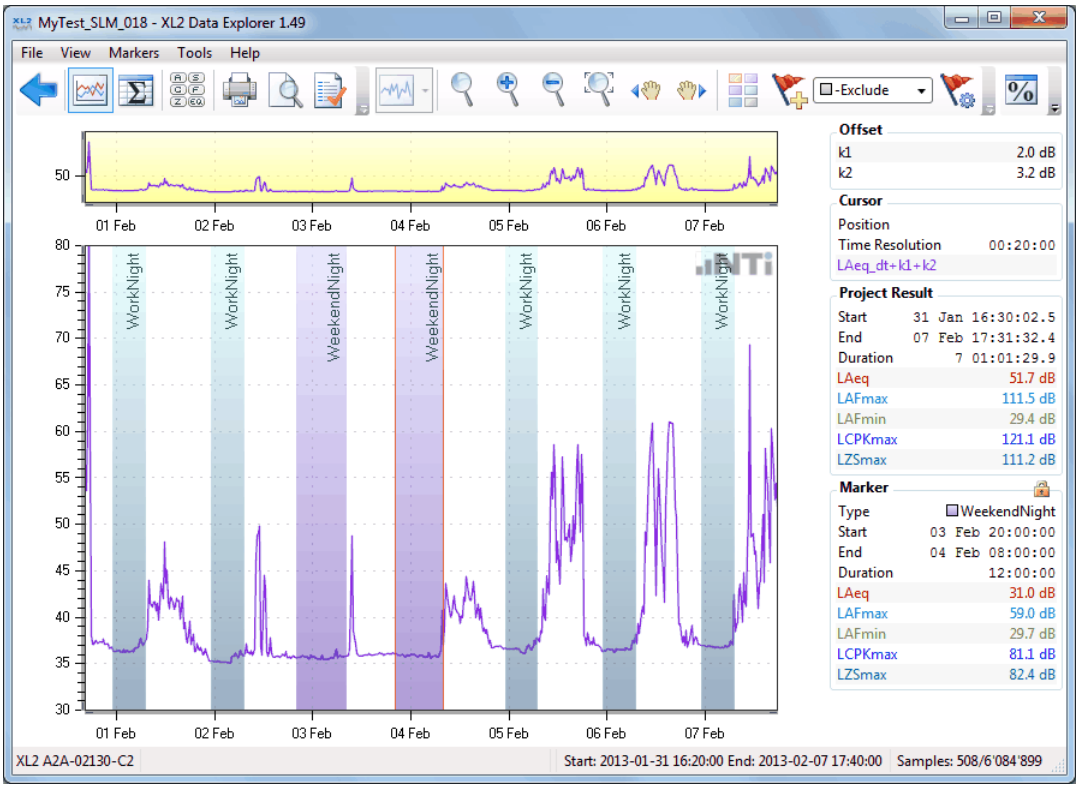


Parameters

- Day of Week / To → select the day(s), when the Marker(s) shall be generated
- From Time / To Time → the start & stop times of the Marker per day (*e.g. Monday 07:00 to 21:00, Tuesday 07:00 to 21:00, …*)
- Add Markers Type → select the Marker type that shall be generated
- ☑ → tick this checkbox if you want that all previously created Markers of the selected type shall be automatically deleted

Hint ***If you want to mark separate time slots per day, you have to generate these Markers one by one.***

Example



C) Edit a Marker

The type, the start/end points or the duration of any Marker can be edited, regardless whether it has been imported from an XL2 test, or created in the Data Explorer software.

Right-click on the Marker (or Marker name) in the Main chart and select 'Edit', then

- amend the Marker Type, Start, End or Duration in the Info section, or
- click on the left or right edge of the Marker band and manually adjust it with the ↔ cursor, or
- click on the Marker band and pan it with the ⇔ cursor, or
- edit a note (e.g. comment) to the Marker via the Info section

Click on 'OK' in the Info section to confirm or on 'Cancel' to abandon your changes.

Hint ***If two or more Markers of the same type are overlapping, they will be merged***

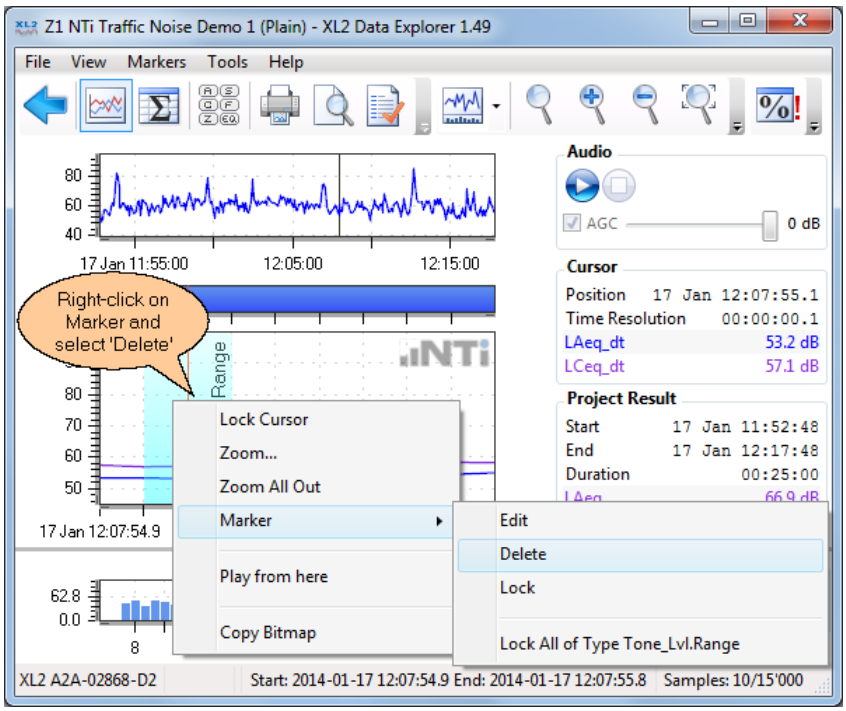
D) Delete a Marker

There are two ways to remove Marker(s).

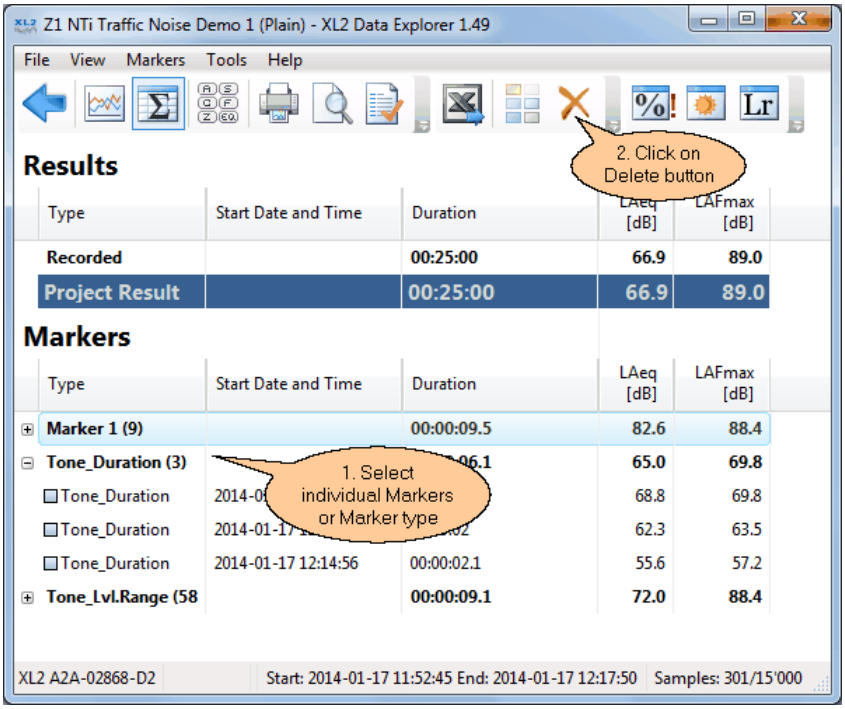
i. In the Main chart
   - Right-click on a Marker and select 'Marker → Delete', or
   - Right-click on the Marker name and select 'Delete', or

ii. In the Result view
   - Left-click on a single or several Markers and click on ✕
   - Select several Markers via shift + left-click or Ctrl + left-click and click on ✕
   - Select a Marker type (⇒ all Markers of that type) and click on ✕

Examples



Delete Marker in Main chart



Delete Marker in Result view

E) Marker Spectrum

You may either display the RTA spectrum of a specific Marker, or of all Markers of the same type.

a) RTA spectrum of a specific Marker

i. Right-click on the Marker name and select 'Lock'

ii. Right-click on the Marker area and select 'Marker → Lock'

b) RTA spectrum of all Markers of the same type

i. Right-click on the Marker name and select 'Lock All of Type [*MarkerName*]'

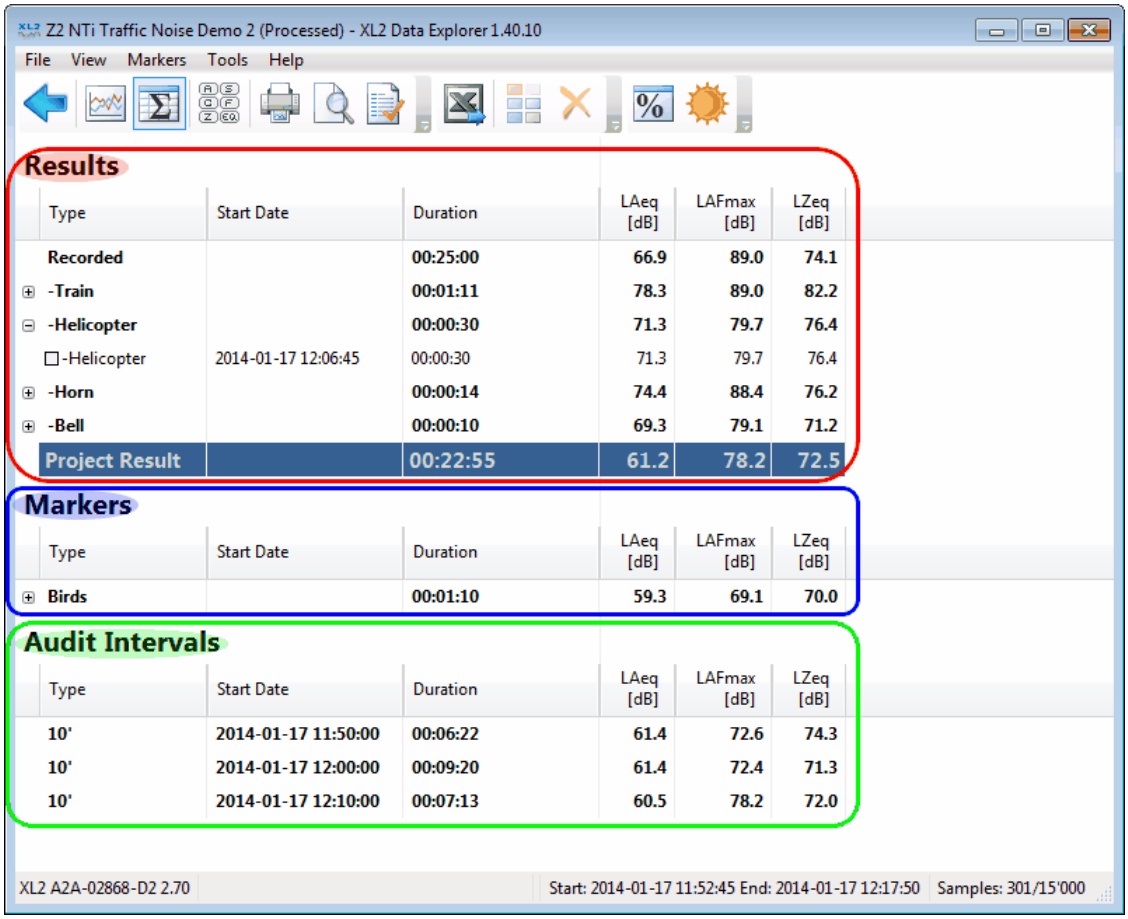
ii. Right-click on the Marker area and select 'Marker → Lock All of Type [*MarkerName*]'

Part IV

4 Result view

The Result view summarizes the numerical results of the selected levels in a table.

Hint ***Click on to select the level results that are displayed in the columns. Notice that the Result view does not display dt values.***



Example of Result view

Structure

The Result view is vertically divided in two sections, Project Results and Markers.

a) Project Results

1. **Recorded**: the overall level results including the data of all Markers.
2. Every Marker with a "–" sign in front of its name is excluded from the Result and shown separately
3. **Result** (highlighted row): the overall level results without considering the data of the excluded Markers.

b) Markers

The individual results of all remaining Markers (i.e. no excluded Markers)

c) Audit Intervals

The individual results of all Audit Intervals

Features

The following operations are supported in the Result view.

- Select the levels that are displayed.
- Click on ⊞ or ⊟ to expand or collapse Markers.
- Right-click to the Result view and select 'Expand All' or 'Collapse All' (applies to all Marker categories).
- Double click on a Marker or an Audit Interval to open the Chart view, with the zoom range at the selected Marker position / Audit Interval, respectively.
- Delete a selected Marker if necessary.
- Click on  to export the formatted table to an MS Excel file.
- Open the Level statistics calculation
- Open the Day Night Level calculation.

Hint ***All settings are saved in the Project, i.e. the Result view layout will re-open in its last state when the project is opened again.***

4.1 Markers (in Result view)

The Result view shows the Marker Types, number of Markers per type, Start Date & Time, Duration, the measured level(s) within the corresponding Marker and Notes (optional).

Markers

Type	Start Date and Time	Duration	LAeq [dB]	LAFmax [dB]	Notes
Tone_Duration (3)		**00:00:06.1**	**65.0**	**69.8**	
Tone_Duration	2014-01-17 11:57:38.1	00:00:02	68.8	69.8	Tones [Hz]: 20.0, 25.0, 31.5, 63.0, 125.0
Tone_Duration	2014-01-17 12:12:49.7	00:00:02	62.3	63.5	Tones [Hz]: 50.0, 80.0
Tone_Duration	2014-01-17 12:14:56	00:00:02.1	55.6	57.2	Tones [Hz]: 20.0, 31.5, 63.0
Tone_Lvl.Range (5)		**00:00:00.5**	**60.8**	**65.0**	
Impulse (7)		**00:00:01.1**	**61.7**	**83.6**	
Impulse	2014-01-17 12:02:29.4	00:00:00.1	70.1	83.6	
Impulse	2014-01-17 12:02:29.6	00:00:00.1	67.2	77.4	Construction
Impulse	2014-01-17 12:09:30.9	00:00:00.1	53.7	63.9	
Impulse	2014-01-17 12:09:39.4	00:00:00.2	48.1	59.8	Traffic
Impulse	2014-01-17 12:09:40.6	00:00:00.3	49.5	63.3	
Impulse	2014-01-17 12:09:41.6	00:00:00.2	48.4	60.5	
Impulse	2014-01-17 12:09:42.6	00:00:00.1	49.3	59.6	Clapping

Example of Markers in the Result view

Hint ***The impact of including/excluding a Marker in/from the result calculation can be directly visualized via the 'Define Marker Types' panel.***

Please notice that

- Markers can only be edited in the Main chart
- you may nevertheless delete the Marker(s) in the Result view by using the button
- if you double-click on a Marker line, the software automatically toggles to the Chart view and displays the corresponding section

Hints ***Right-clicking in the Result view opens a context menu to***
• expand or collapse all Markers,
• show or hide the notes
• copy the selected row to the clipboard.

4.2 Audit Intervals (in Result view)

The Result view shows the Type, Start Date, Duration and the measured level(s) within the corresponding Audit Interval.

Audit Intervals

Type	Start Date	Duration	LAeq [dB]	LAFmax [dB]	LZeq [dB]
5'	2014-01-17 11:50:00	00:01:46	58.2	65.2	69.6
5'	2014-01-17 11:55:00	00:04:36	62.2	72.6	75.3
5'	2014-01-17 12:00:00	00:04:50	62.5	72.4	72.2
5'	2014-01-17 12:05:00	00:00:00	---	---	---
5'	2014-01-17 12:10:00	00:04:35	60.9	73.4	73.0
5'	2014-01-17 12:15:00	00:02:38	59.7	78.2	69.4

Example of Audit Intervals in the Result view

Hint ***If an Audit Interval is completely covered by an 'Exclude' Marker, it has no results.***

Please notice that

- the duration of the Audit Intervals must be selected via the Setup Levels
- if you double-click on an Audit Interval line, the software automatically toggles to the Chart view, displays the corresponding section and locks the cursor to it.

Part V

5 Level Calculations

The XL2 Data Explorer offers three tools for customized level calculations,

i. the Level statistics, or percentiles are accessible via the button,

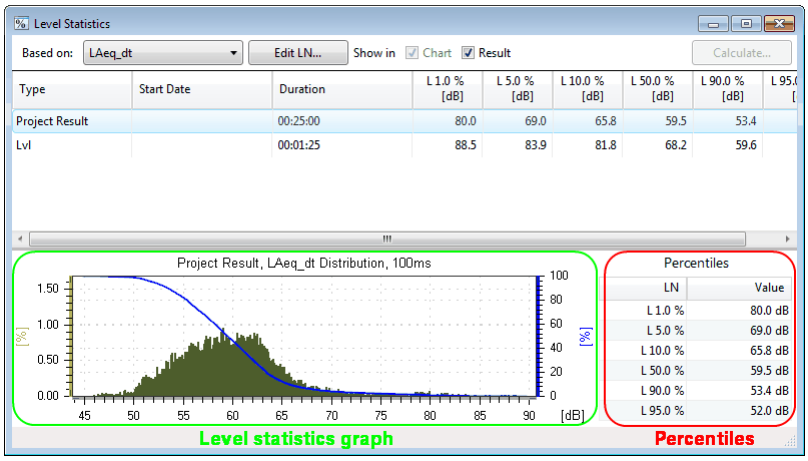
ii. the Day Night level window is opened by clicking on the button.

iii. click on the button to definite the Penalties or calculate the Rating Levels.

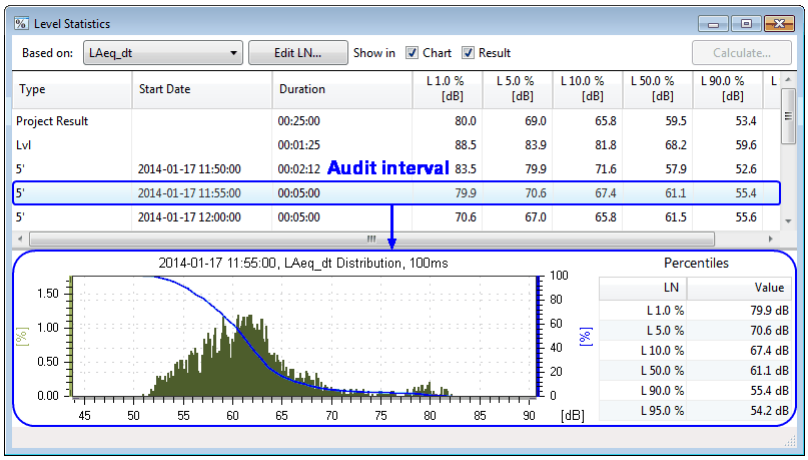
5.1 Level statistics

Click on to open the 'Level Statistics' window, select the Level and click on Calculate... to calculate & display the statistical distribution of recorded dt values.

- Level: select any dt value that has been recorded by the XL2
- Percentiles:
  - click on Edit LN... to open the 'Edit percentiles' panel.
  - tick the 'Chart' or 'Result' checkbox to select (i.e. display) or deselect all percentile results in the corresponding view.
- Audit intervals (if active): click on an Audit Interval to see the corresponding level statistics and percentile results.



Level statistics window



Level statistics of selected audit interval

Hint ***A red exclamation mark next to the button shows that the level statistics have to be re-calculated. This has to be done every time when you activate, amend or deactivate the Audit Intervals, or one or several Markers.***

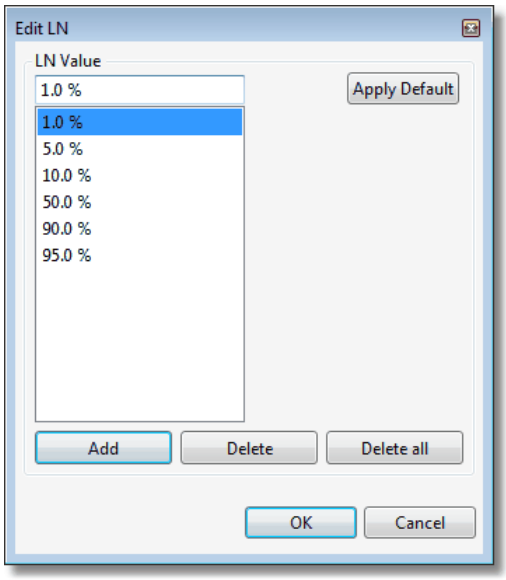
Level statistics graph

- Axes:
  - the left axis [%] refers to the dt levels (green bars)
  - the right axis [%] refers to the percentiles (blue line).
- Cursor: hover over the graph to read out the dB value, probability and cumulative probability at the corresponding x-axis position.
- Zoom:
  - click & drag to select an area of the graph that shall be enlarged
  - right click on the graph, select 'Zoom...' and manually enter the preferred Min.X, Max.X, Max.Y values
  - right click on the graph and select 'Zoom All Out' to return to the full view

5.1.1 Percentiles

The list of LN values for the percentiles calculation can be edited as follows.

- Enter a numerical LN value in the top input box and click on 'Add'.
- Select an LN value from the list and click on 'Delete', or 'Delete All'.
- Click on 'Apply Default' to apply the default values (→ preferences).

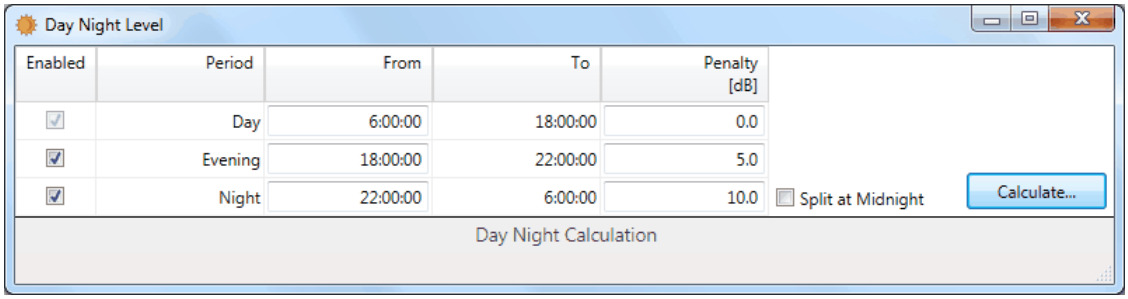


Edit percentiles panel

Hint ***The default list of LN values may be defined via the preferences. XL2 Test files that have been previously imported, may be adjusted by clicking on the 'Default' button.***

5.2 Day Night Level

The 'Day Night Level' window calculates the L_{Day}, $L_{Evening}$, L_{Night}, L_{DN}, L_{DEN} levels with individual weightings (penalties).



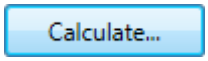
Example of Day-Evening-Night time scheme with penalties

Time scheme and penalties

The top section of the window comprises of the parameter settings for the time scheme and penalties.

- Enabled, Period: each 24 hour period can be divided into between 1 and 3 periods,
  1) Day → always enabled
  2) Night → tick checkbox to enable a separate result calculation or penalty for the night period
  3) Evening → tick checkbox to enable a separate result calculation or penalty for the evening period (only accessible if 'Night' is enabled)
- From, To: assign individual start times to the enabled periods
  - Adjust the times for when the individual enabled periods begin.
  - The end time of a period is automatically the start time of the next period.
  - Enter the times in the format **hh:mm:ss**
- Penalty: positive offset that should be added to the measurement results to reflect the annoyance level during that period.
  - Enter the penalties, expressed in dB, for the Day, Evening and Night periods separately.
- Split at Midnight: the Night level is calculated separately for each calendar day (*see example*), i.e. split by
  1) 00:00:00 hrs to start of Day +
  2) end of Day/Evening to 24:00:00 hrs

Hint ***The default list of Day Night Levels may be defined via the preferences. XL2 Test files that have been previously imported, may be adjusted by right-clicking on the top section of the window and selecting 'Default'.***

Click on 

to let the system evaluate & display the level results that correspond to the current settings.

NOTE **If no valid measurement could be executed, the message "n. def." (not defined) is shown as result.**

5.2.1 LDEN examples

Example #1

Day Night Level

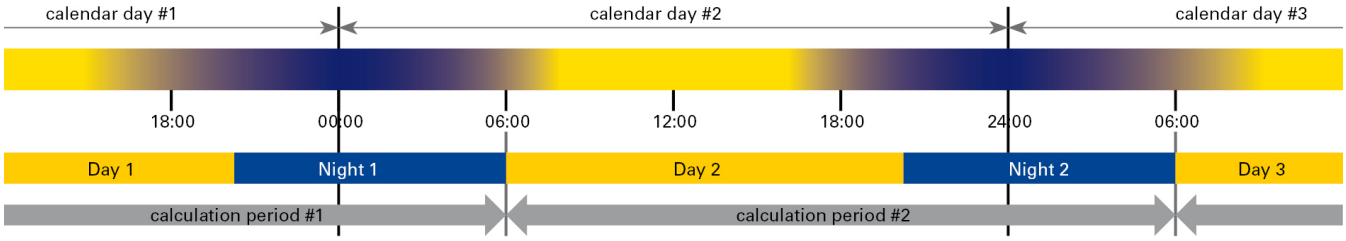
Enabled	Period	From	To	Penalty [dB]
☑	Day	6:00:00	20:00:00	0.0
☐	Evening	18:00:00	22:00:00	5.0
☑	Night	20:00:00	6:00:00	10.0

☐ Split at Midnight Calculate...

Day Night Calculation

Period	Start Date	Measurement Duration	Weighting Duration	LAeq [dB]	Penalty [dB]	Result [dB]
Day	31 Jan	3:29:57.5	14:00:00	68.0	0.0	68.0
Night	31 Jan	10:00:00	10:00:00	31.5	10.0	41.5
Ldn	**31 Jan**					**65.7**
Day	01 Feb	14:00:00	14:00:00	36.0	0.0	36.0
Night	01 Feb	10:00:00	10:00:00	30.4	10.0	40.4
Ldn	**01 Feb**					**38.4**
Day	02 Feb	14:00:00	14:00:00	35.4	0.0	35.4
Night	02 Feb	10:00:00	10:00:00	30.5	10.0	40.5
Ldn	**02 Feb**					**38.2**

Example #1: Day-Night time settings, penalties and calculated results



Example #1: Day-Night time scheme

Example #2

Day Night Level

Enabled	Period	From	To	Penalty [dB]
☑	Day	6:00:00	18:00:00	0.0
☑	Evening	18:00:00	20:00:00	5.0
☑	Night	20:00:00	6:00:00	10.0

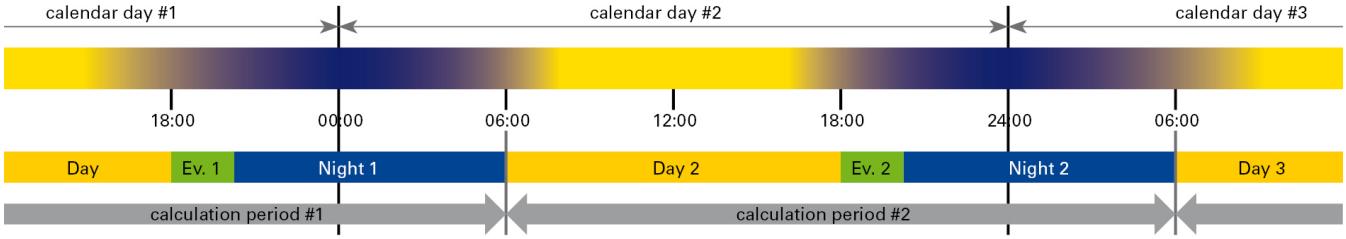
☐ Split at Midnight

Calculate...

Day Night Calculation

Period	Start Date	Measurement Duration	Weighting Duration	LAeq [dB]	Penalty [dB]	Result [dB]
Day	31 Jan	1:29:57.5	12:00:00	71.7	0.0	71.7
Evening	31 Jan	2:00:00	2:00:00	32.1	5.0	37.1
Night	31 Jan	10:00:00	10:00:00	31.5	10.0	41.5
Lden	**31 Jan**					**68.7**
Day	01 Feb	12:00:00	12:00:00	36.4	0.0	36.4
Evening	01 Feb	2:00:00	2:00:00	31.8	5.0	36.8
Night	01 Feb	10:00:00	10:00:00	30.4	10.0	40.4
Lden	**01 Feb**					**38.5**
Day	02 Feb	12:00:00	12:00:00	35.9	0.0	35.9

Example #2: Day-Evening-Night time settings, penalties and calculated results



Example #2: Day-Evening-Night time scheme

Example #3

Day Night Level

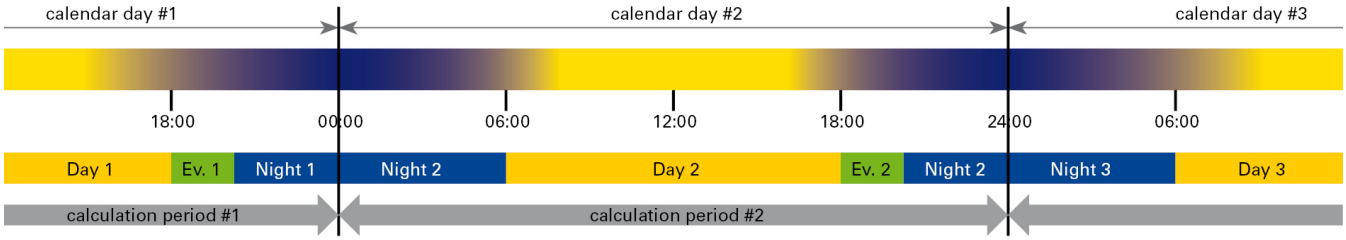
Enabled	Period	From	To	Penalty [dB]
☑	Night	0:00:00	6:00:00	10.0
☑	Day	6:00:00	18:00:00	0.0
☑	Evening	18:00:00	20:00:00	5.0
☑	Night	20:00:00	0:00:00	10.0

☑ Split at Midnight Calculate...

Day Night Calculation

Period	Start Date	Measurement Duration	Weighting Duration	LAeq [dB]	Penalty [dB]	Result [dB]
Day	31 Jan	1:29:57.5	12:00:00	71.7	0.0	71.7
Evening	31 Jan	2:00:00	2:00:00	32.1	5.0	37.1
Night	31 Jan	4:00:00	10:00:00	31.7	10.0	41.7
Lden	**31 Jan**					**68.7**
Day	01 Feb	12:00:00	12:00:00	36.4	0.0	36.4
Evening	01 Feb	2:00:00	2:00:00	31.8	5.0	36.8
Night	01 Feb	10:00:00	10:00:00	31.1	10.0	41.1
Lden	**01 Feb**					**39.0**
Day	02 Feb	12:00:00	12:00:00	35.9	0.0	35.9
Evening	02 Feb	2:00:00	2:00:00	30.5	5.0	35.5
Night	02 Feb	10:00:00	10:00:00	30.3	10.0	40.3
Lden	**02 Feb**					**38.3**

Example #3: Day-Evening-Night time settings, split at midnight, penalties and calculated results



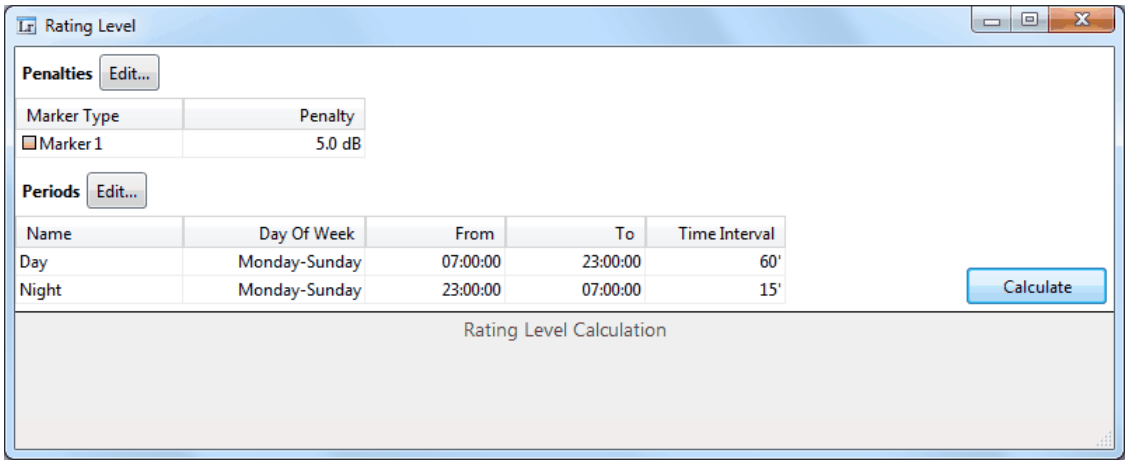
Example #3: Day-Evening-Night time scheme, split at midnight

5.3 Rating Level

The term 'rating level' describes a procedure that adds 'penalties' (i.e. user-defined offsets) to selected sections of the recorded sound level. These penalties are e.g. applied on impulsive noise or annoying sound incidents during a rest time. By using these rating levels, a long-term community noise assessment can be executed with higher relevance.

Click on Lr to open the 'Rating Level' panel. Therein you may define the penalties, daytime periods and time intervals, before you click on Calculate to let the software calculate the rating levels.

- A penalty is an offset that is added to the sound level measurement data of marked sections (e.g. impulsive sounds or tones).
- The sound level recording can be split into time periods (specified by national standards) in order to calculate the rating levels.

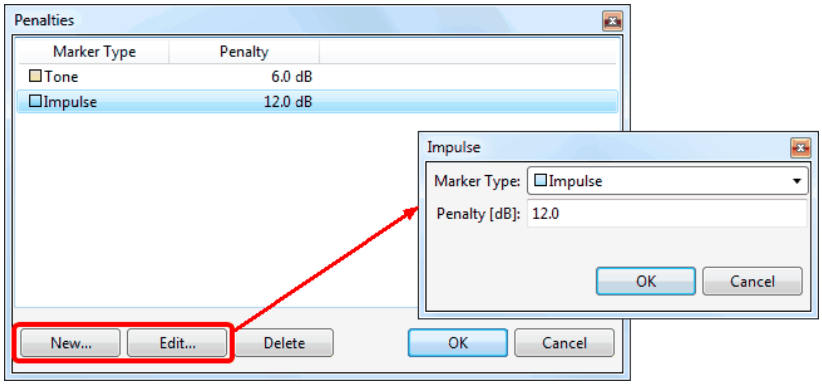


Hint ***Chapter "Lr tutorial" describes step-by-step the typical procedure to establish a rating level calculation.***

Penalties

Penalties are applied on selected Markers that identify the tonal, impulsive, rest time or other periods; different marker types may have have individual penalties.

Click on Penalties Edit... to open the 'Penalties' panel.



i. Create a new penalty:
   - click on 'New',
   - select the Marker type,
   - enter the required penalty,
   - click on 'OK' to confirm.

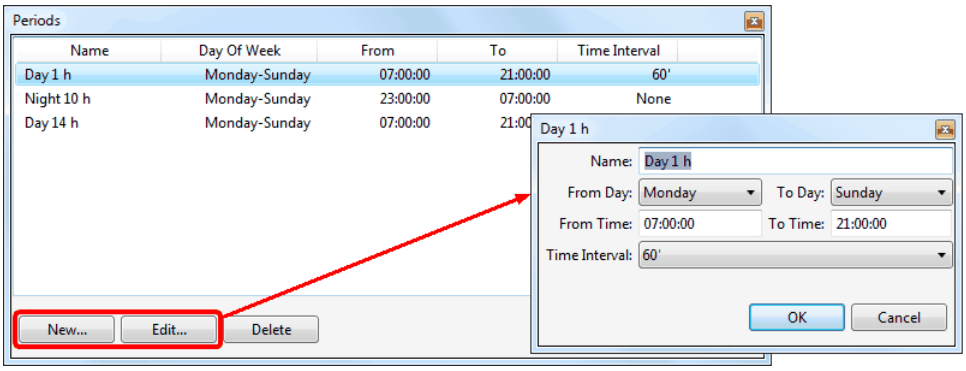
ii. Amend an existing penalty:
   - select the Marker type and click on 'Edit',
   - amend the Marker type or the penalty,
   - click on 'OK' to confirm.

i. Delete an penalty:
   - select the Marker type and click on 'Delete',
   - click on 'OK' to confirm.

Periods

The periods define the (reference) time intervals, in which the rating levels are calculated.

Click on **Periods** Edit... to open the 'Periods' panel.



i. Create a new period:
   - click on 'New',
   - enter the name of the new period,
   - select the day(s), for which the new period shall apply,
   - enter the 'From Time / To Time', i.e. the duration of the new period per day,

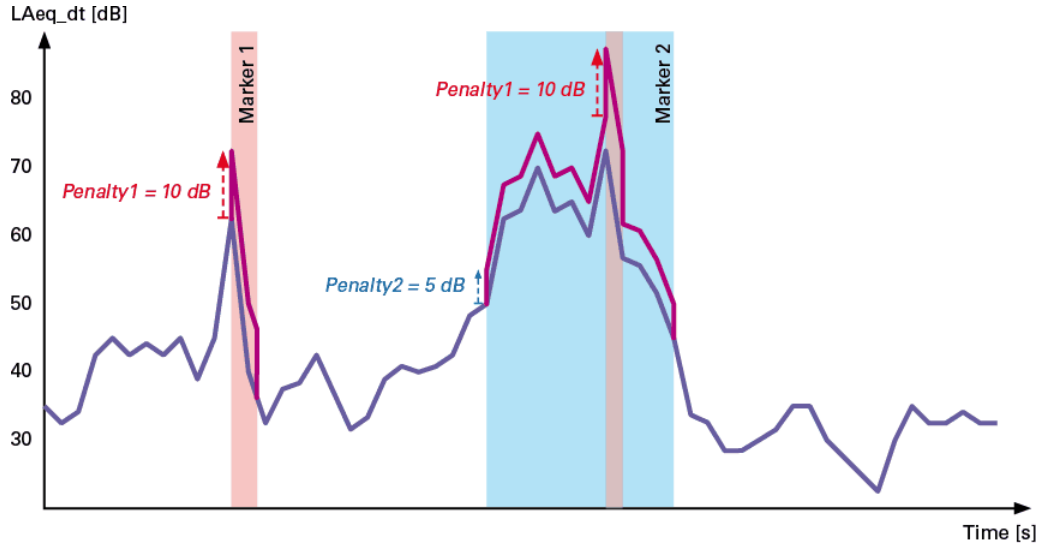
Hint ***The duration applies individually on each of the selected days, e.g. Monday 07:00 to 21:00, Tuesday 07:00 to 21:00, … Sunday 07:00 to 21:00 (i.e. not Monday 07:00 to Sunday 21:00)***

   - select the 'Time Interval' that shall be applied (*Example: Time Period = 60' ⇒ the 'From Time / To Time' is sliced into sub-periods of 1 hour duration*)
   - click on 'OK' to confirm

ii. Amend an existing period
   - select the period and click on 'Edit',
   - amend the settings as requested,
   - click on 'OK' to confirm

iii. Delete a period: select the period and click on 'Delete'.

Hint ***If two or more Markers are overlapping within a time period, their penalties are added together.***



Example of time period with overlapping penalties

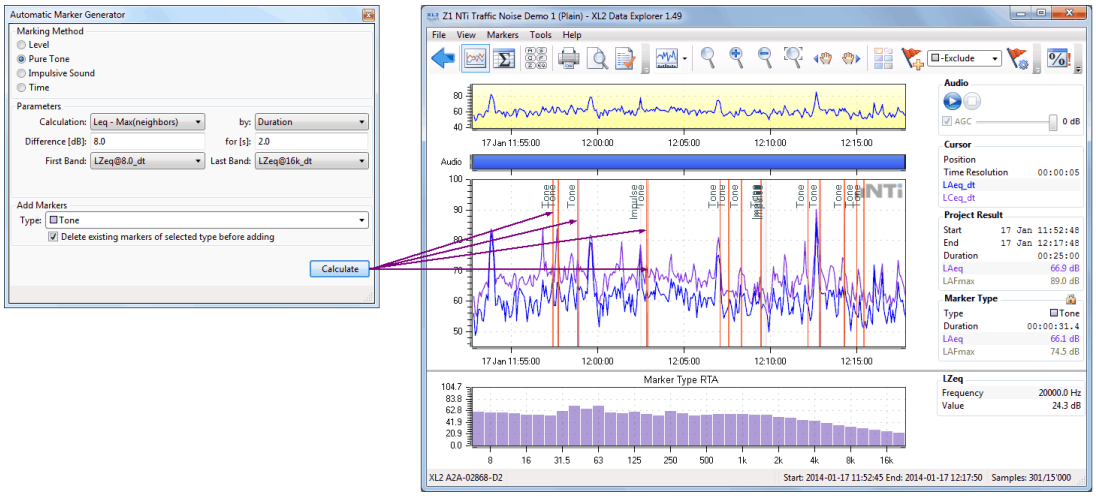
5.3.1 Lr tutorial

The example described hereunder provides a step-by-step description of how to establish a rating level calculation from scratch.

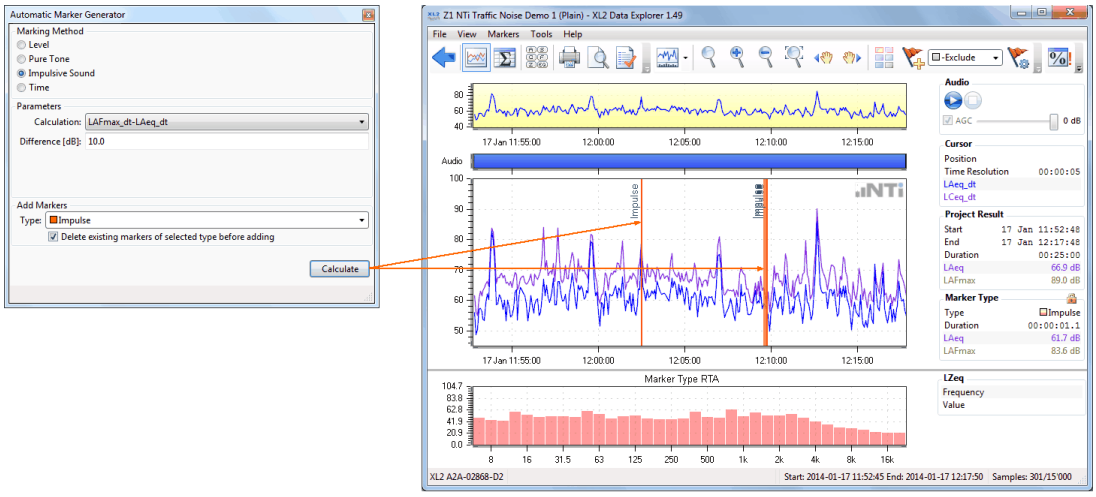
- Data base long-term sound level recording
- Penalties 6 dB penalty @ tone with > 8 dB difference and > 2 s duration
  12 dB penalty @ impulsive sound with > 10 dB difference
- Periods reference interval #1 = day 60 minutes
  reference interval #2 = full day

Step 1 - create Markers automatically

a. Open the Automatic Marker Generation panel
b. Adjust the applicable parameters
c. Select the Marker type
d. Tick or clear the checkbox "Delete existing markers of selected type before adding"
e. Click on "Calculate" to start the automatic Marker generation (*you may optionally abandon this process by pressing the Esc key*)



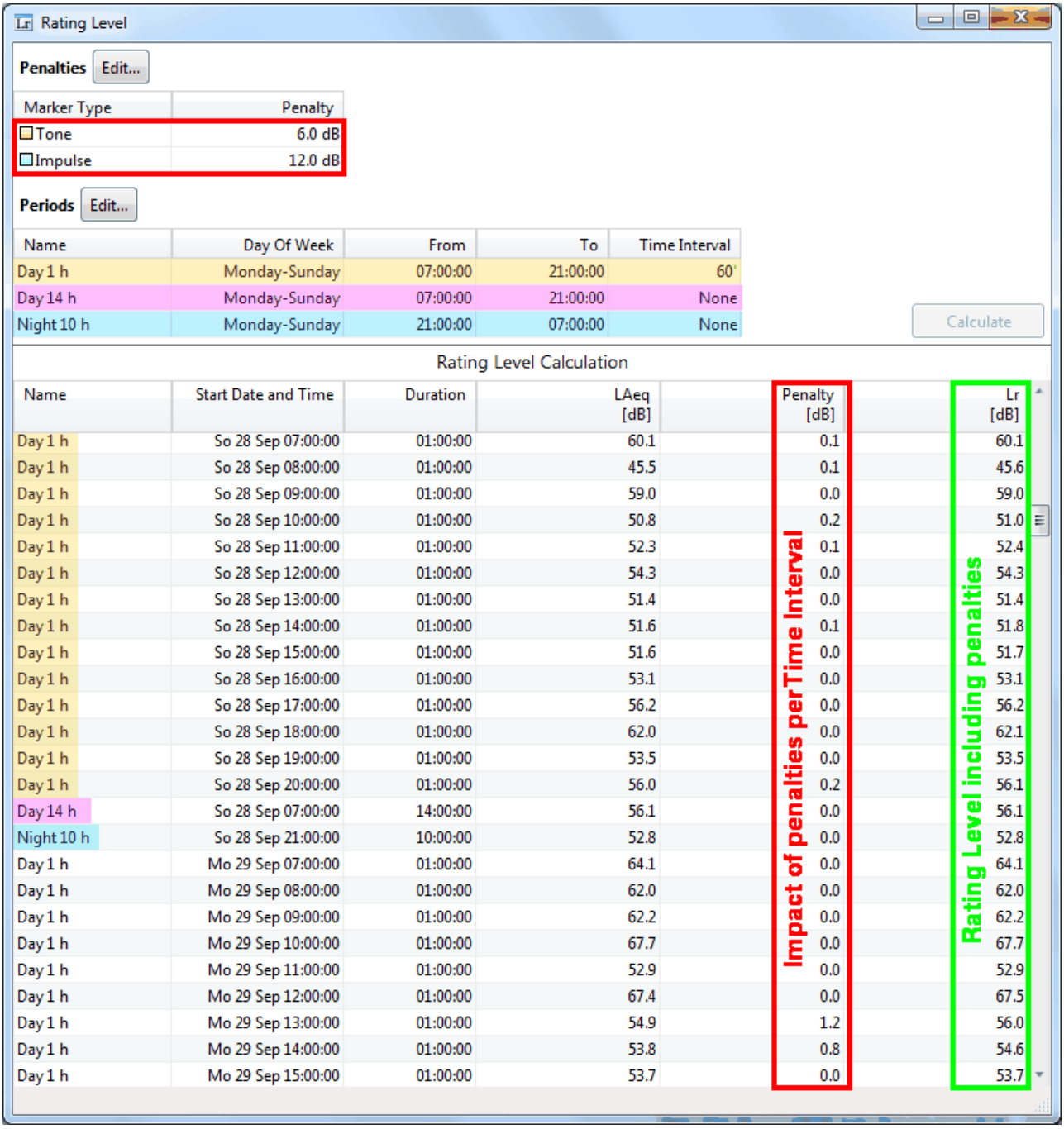
Automatic Tone Marker generation



Automatic Impulsive Sound Marker generation

Step 2 - edit Penalties and Time Periods Lr

a. Open the Rating Level panel
b. Edit the individual Penalties for the generated Markers
c. Define and adjust the Periods (e.g. a day/night scheme)
d. Assign an appropriate (reference) Time Interval to every period
e. Click on 'Calculate' to get the results



Part VI

6 Reporting

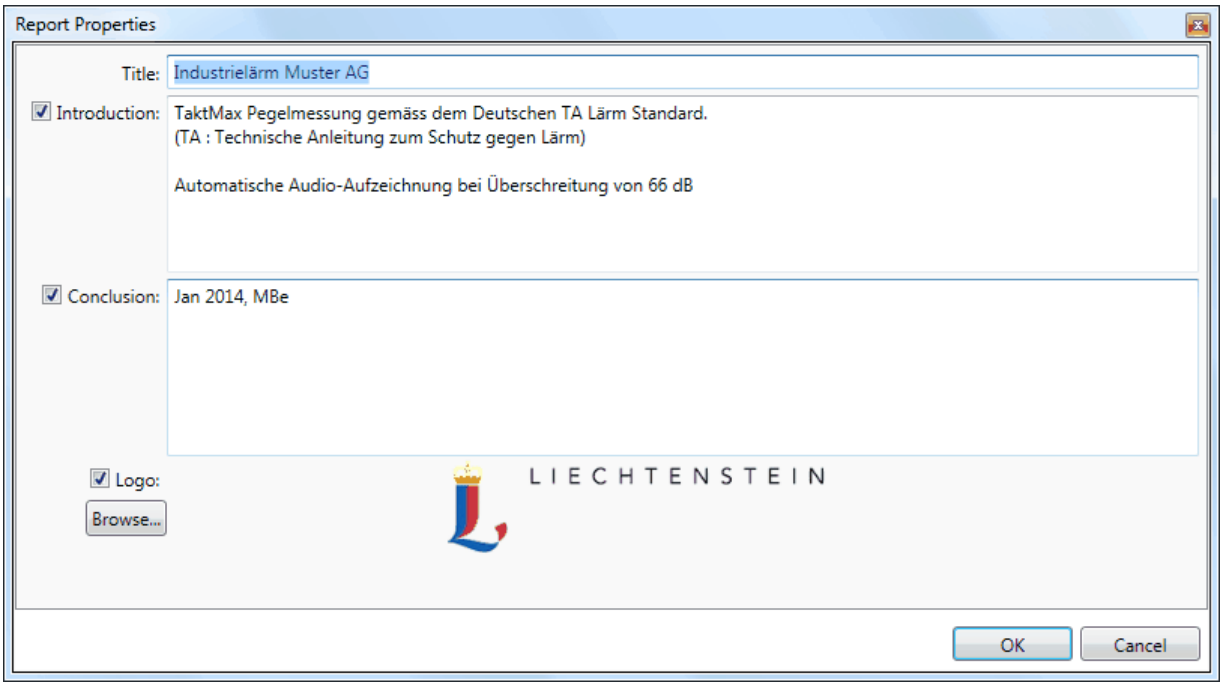
The XL2 Data Explorer provides several features for creating a report from the project data.

- Editable Report properties
- Print preview, printout
- Data export to MS Excel
- Copy graph to clipboard (bitmap format)
- Copy numerical data to clipboard

6.1 Report properties

The Report properties…

- are accessible from the Chart or Result view, via the 'Report Properties' button or the menu 'File → Report Properties..',
- contain the following **editable** information:
  - Title: headline of the project report
  - Introduction: user comment that precedes the charts in the project report
  - Conclusion: user comment that is inserted at the end of the project report
  - Logo: user logo placed in the top right corner of the project report (click on 'Browse...' to select your logo)
- Tick the checkboxes of the sections that shall be included in the report.



Example of Report properties

6.2 Report printout

Printouts

You can create and customize printable reports of the selected project data with the XL2 Data Explorer software.

1. Edit the Report properties (optional)
2. To preview the print, click on the 'Print Preview' button or select the menu 'File → Print Preview'
3. To print, click on the 'Print...' button or select the menu 'File → Print...'

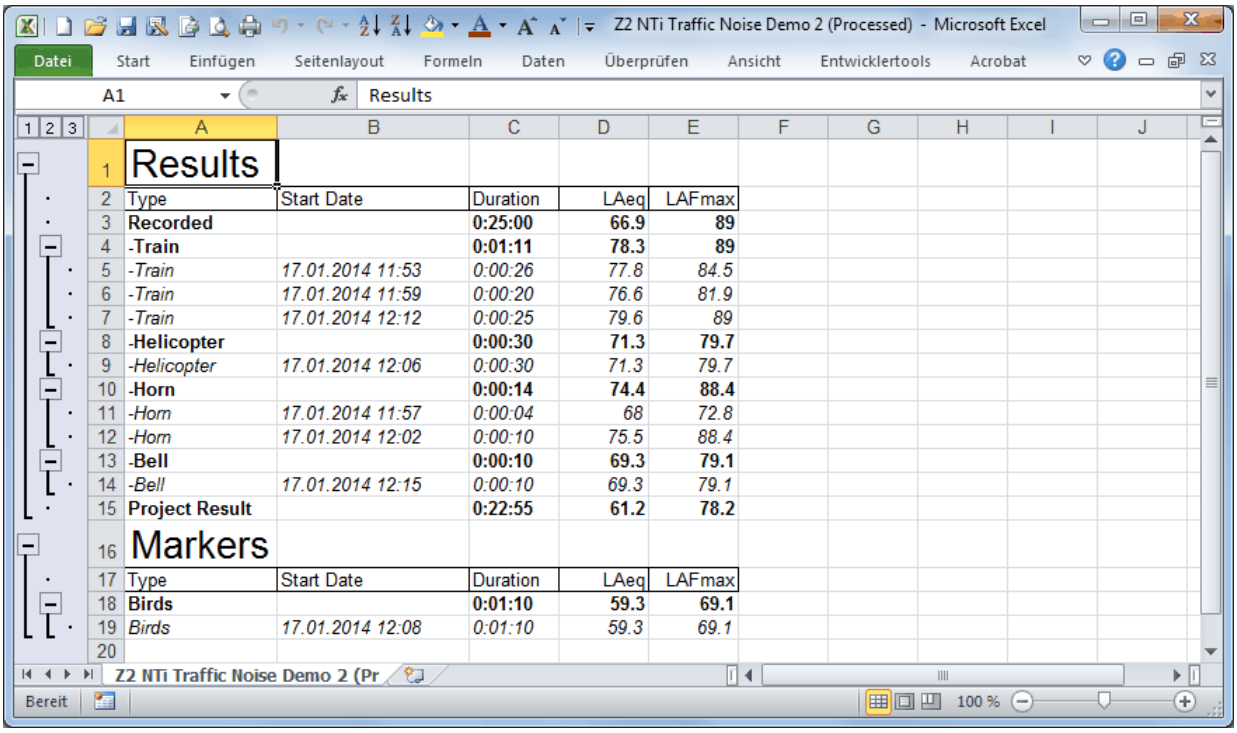
Example of print preview

Hints ***If you lock the cursor within the Main chart or Spectrogram, the corresponding data are added to the printout.***
The report printout includes neither the default size RTA spectrum, nor the Level statistics.

6.3 Data Export

Export to MS Excel

Click on the button to export the numerical data of the Result view to an MS Excel spreadsheet.



	A	B	C	D	E
1	Results				
2	Type	Start Date	Duration	LAeq	LAFmax
3	Recorded		0:25:00	66.9	89
4	-Train		0:01:11	78.3	89
5	-Train	17.01.2014 11:53	0:00:26	77.8	84.5
6	-Train	17.01.2014 11:59	0:00:20	76.6	81.9
7	-Train	17.01.2014 12:12	0:00:25	79.6	89
8	-Helicopter		0:00:30	71.3	79.7
9	-Helicopter	17.01.2014 12:06	0:00:30	71.3	79.7
10	-Horn		0:00:14	74.4	88.4
11	-Horn	17.01.2014 11:57	0:00:04	68	72.8
12	-Horn	17.01.2014 12:02	0:00:10	75.5	88.4
13	-Bell		0:00:10	69.3	79.1
14	-Bell	17.01.2014 12:15	0:00:10	69.3	79.1
15	Project Result		0:22:55	61.2	78.2
16	Markers				
17	Type	Start Date	Duration	LAeq	LAFmax
18	Birds		0:01:10	59.3	69.1
19	Birds	17.01.2014 12:08	0:01:10	59.3	69.1
20					

Example of a Data Explorer result table after export to MS Excel

Copy bitmap to clipboard

Right-click on a graph and select 'Copy Bitmap'; the graph is now in your clipboard and may be pasted to a document, etc.

Copy data to clipboard

Right-click on a graph and select 'Copy Data' or 'Copy Selected Rows'; the relevant data is now in your clipboard and may be pasted to a table, document, etc.

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