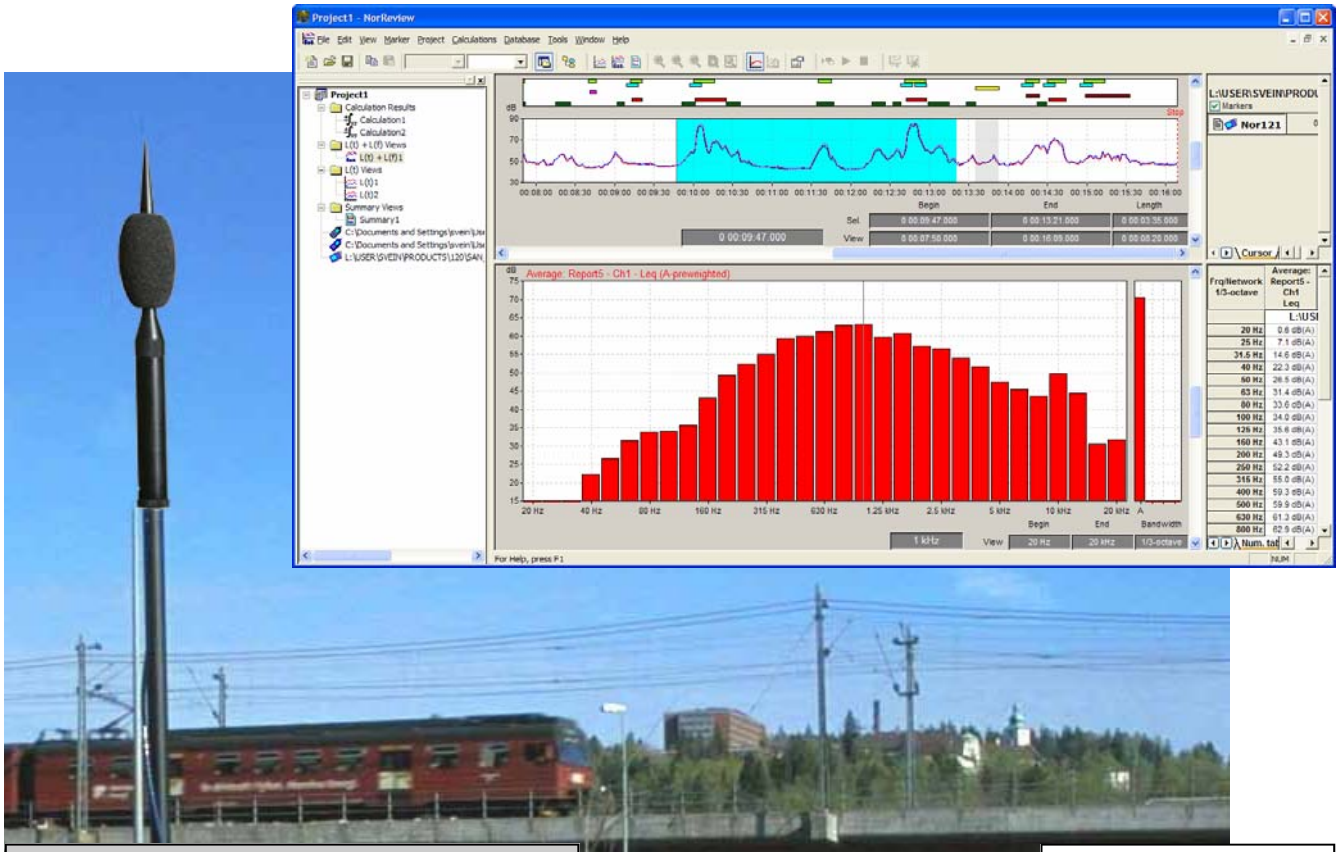
NorReview Reporting Software

Type Nor1026
Version 1.4



Features:

- Flexible and versatile user-interface
- Evaluation of industrial noise
- Evaluation of rail and road traffic noise
- Evaluation of residential noise
- Direct import or file read-in from Norsonic instruments (Nor110, Nor116, Nor118 and Nor121)
- Accept measurement files from Nor840
- Marker view, edit and insert functions
- Replay of noise recordings with dynamic cursor and marker insert features
- Post processed event analysis with marker insert feature
- Post processed calculations on pre-marked sections
- Rating calculations according to National Standards
- Pre-defined project reports
- User-defined project reports

The NorReview is a flexible PC software package for presenting and post processing data from any noise or vibration data from a Norsonic instrument. It can be used to quickly generate a single report, to make advanced evaluations and complex project reports.

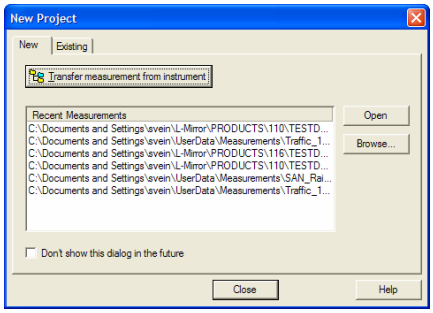
All users may start up with the basic package, and then add the optional features as new requirements arise.

The NorReview software package is compatible with the WindowsXP platform.

Norsonic

Starting a new project

The NorReview initially presents a special start-up menu containing all possible choices the operator may have when a project is commenced.



Program start-up selection menu

This includes all recent measurements, all existing projects, a browser for the computers memory, and a link to the NorXfer transfer software to enable direct transfer from the internal memory of a Norsonic instrument.

Level vs. time views

Upon selecting the desired measurement file, it may be dragged and dropped, as the first measurement file, into the workspace section of NorReview and a level versus time graphical view (i.e. L(t) View) is displayed automatically.

The name of each new L(t) View is generated automatically using L(t)1, L(t)2, L(t)3, …. By using the context menu, displayed by a right mouse-click on the desired L(t) View in the Workspace area, a rename function is available in order to give each L(t) View a name that better describes its individual content. Similarly, the automatically generated project name (i.e. Project1) may be renamed to be more relevant to the project.

Each L(t) View contains information about markers used, either as single markers or as on/off markers along the upper x-axis.

The display of the Workspace area annotations may be turned on or off as required in order to make maximum space available for the graphical measurement views.

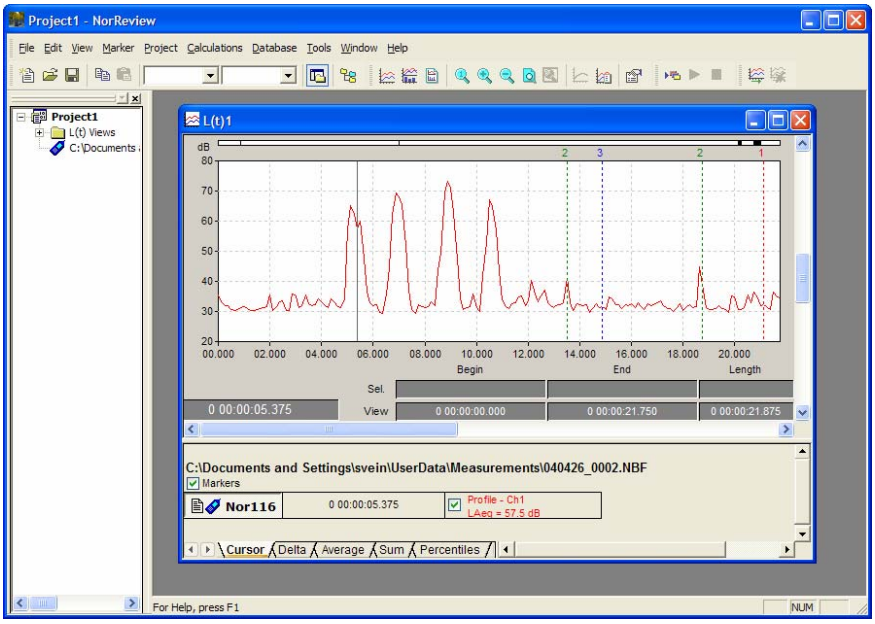
X- and Y-axis selections

The L(t) View may be adjusted using scroll-bars along the X- and Y-axis in order to present the measured data in the most convenient way.

For the annotation of the X-axis the user has a selection from *Absolute time* including the correct date, *Relative time* with the starting point from the measurement origin or the number of the preset measurement *Periods*. The label resolution along the x-axis may be set to either a preset time range or to Auto adjustment.

On demand, the user may also exclude the x- and y-grid completely by a use of a tick-box.

The Y-axis range is adjustable to a preset dB-span selectable from 20 – 120 dB in 20 dB steps.



Automatically generated L(t) View of the initial measurement file dropped into the workspace section on the left-hand side

Zoom features

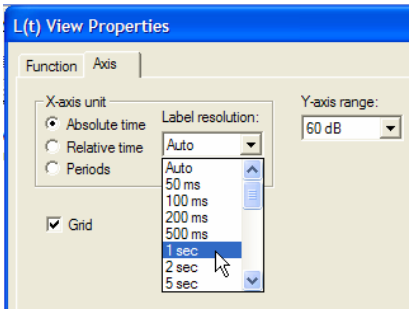
Long measurement durations and short sampling intervals for the "Profile" measurements makes it necessary to zoom-in to particularly interesting parts of the L(t) View. This is easily done using the mouse to select the desired area and clicking the "Zoom-to-selection" choice on the context menu that pops up automatically. Alternatively, the desired zoom function may be selected in the View menu.

Extensive zoom features are available for detailed views along the x-axis

Along the lower graph, a scroll bar is available for a quick step-by-step tour through the entire measurement.

Direct connection with Norsonic instruments

Measurement files from Norsonic instrument stored in the PC memory can be handled by the NorReview software package. Alternatively, NorReview uses the Data Transfer Software NorXfer (Nor1020 version 4) to establish a connection directly with the memory in the Norsonic instruments Nor110, Nor116, Nor118 or Nor121. The NorXfer software runs within the frame of the NorReview package and is easily accessed by a push on the NorXfer icon on the toolbar. Simply drag the measurement file from the instrument memory directly into the NorReview workspace. (See separate NorXfer datasheet for further details.)

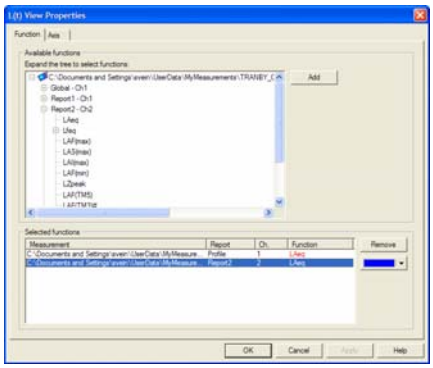


Axis selection menu

The “Zoom-out full” feature is handy when the complete measurement has to be displayed. Predefinition of the overall time-span of the displayed L(t) View is available.

Multiple measurement functions

The L(t) View is based on any measurement function stored with an interval in hours, minutes, seconds or milliseconds. The user may choose up to



four different functions to be displayed in the same window.

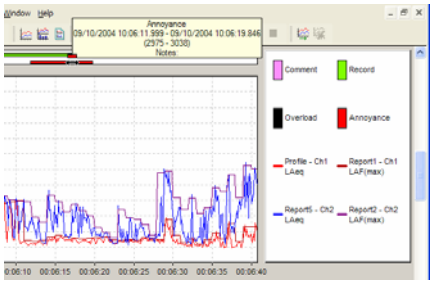
Measurement function selection menu

The measured values at the cursor position are displayed in the screen area below the L(t) graph. The cursor is easily moved to another position by use of the mouse or the arrow-keys on the PC keyboard.

On demand, the view of the individual functions may be turned on and off by clicking on a desired function tick-box situated to the left of the cursor position value.

Marker view

Markers set by the instrument during the measurements, are displayed along the upper part of the L(t) View. For the Nor121, even the selected marker names defined prior to the measurement are displayed.



Detailed information about each marker is available by pointing the mouse onto the marker. A legend may also be displayed to the right.

A click on any of the displayed markers will automatically change the background colour on the corresponding L(t) View into light blue. Hence, the borders of the actual markers are very easy to evaluate in detail.

By only pointing the mouse onto any marker, an information display for this particular marker pops up on the screen.

Legend

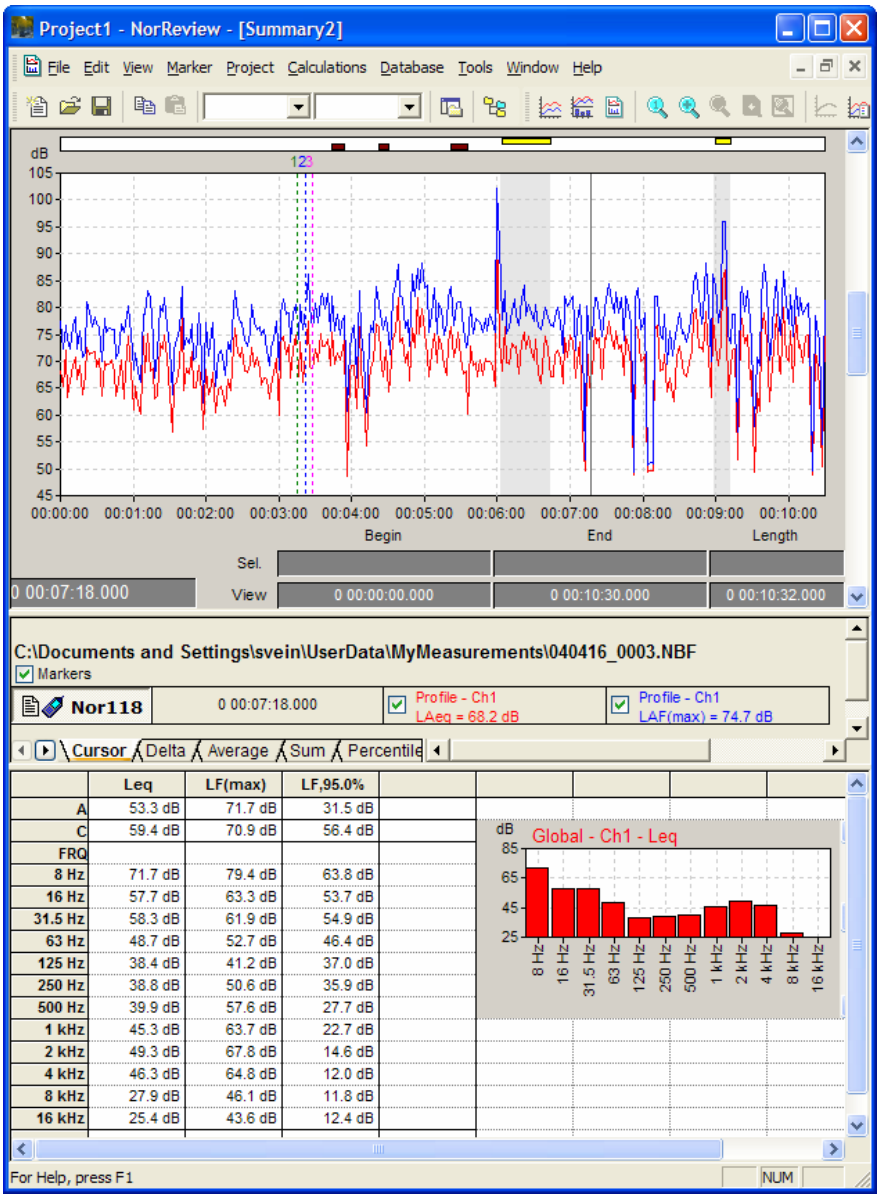
On demand, a marker legend is available to the right displaying the actual marker numbers or texts used in the measuring instrument

Summary” report

The NorReview package may produce a quick general report of the selected measurement data. This report is displayed as a “Summary” containing the “Profile” data in a graphical L(t) View, plus the “Global” data both in a tabular display and in a Level versus Frequency graph.

The user may exchange or add measurement functions in the “Summary” report as required.

Each “Summary” report is automatically stored within the project tree, and the automatically assigned name may be changed by a rename function.



Pre-defined “Summary” reports. Note the grey background colour for the paused parts of the measurement.

Printed “Summary” report

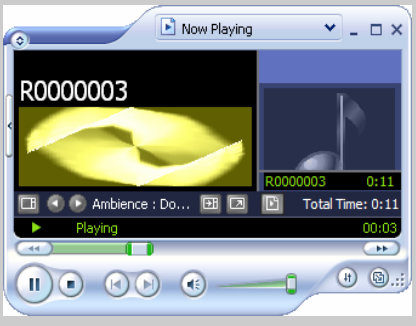
When the “Summary” report is displayed on the screen, the user may use the “Generate Report” feature in the File menu to make a Word document that includes all of the graphs from the “Summary” Report. Additional text may then easily be added to the Word document as desired.

Audio recording replay

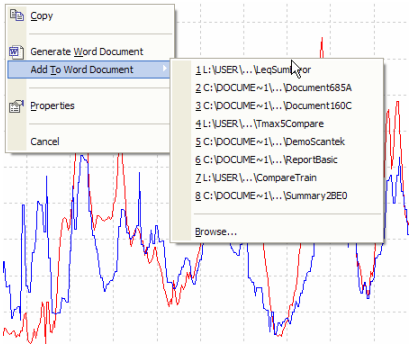
The Nor121 Environmental Noise Analyser is capable of storing audio recordings of the actual noise during the measurement. It may also store voice comments made by the operator. These two functions are shown as markers along the upper part of the graph using the names “Record” and “Comment”.

In the NorReview software, a double mouse-click on any of these markers will initiate the installed multi-media driver of the PC to replay of the sound file. Hence, the user may listen to the actual noise recordings or operator voice comments even days or weeks after the measurement took place. In this way, small notes on paper that disappear prior to the final reporting are no longer a problem.

By adding the optional internal NorReview multimedia driver (option 4), the user may even watch the cursor moving along the L(t) View as the recorded file is replayed. Combined with the optional edit marker feature (option 1), simultaneously insertion of new markers is possible with the audio review function.



Noise recordings and operator voice comments are replayed on the installed multi-media driver



Add-to-Word object transfer

Add-to-Word feature

Any graph or table that appears in any of the NorReview displays or Reports, may be used in other Windows documents by use of the Copy & Paste feature. Alternatively, make a right-click within the desired graph or table, and select which Word-file the actual object should be added to. This way views other than the standard graphs of the Summary report may easily be added to any new or existing Word document.

Pause/Continue handling

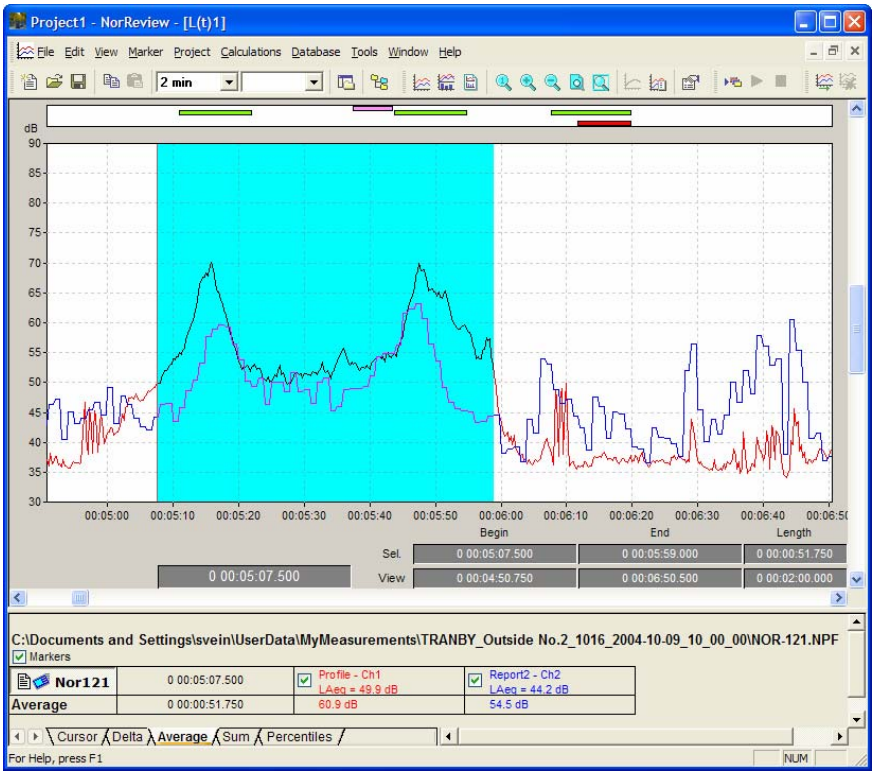
In some cases, measurements include the use of a stop/continue function. Seen on the time-axis, this means that for an interval of time, there is no measurement data available. The NorReview handles this by putting a stop-marker as a vertical line across the graph plus an automatically step adjustment on the displayed numerical value along the time-line.

The possible use of the Pause/Continue function in the Norsonic Nor116, Nor118 or Nor121 instruments will not result in any adjustment to the Global value as these will already have had the data excluded; but the Profile measurement will have continued with the data appropriately tagged. In the L(t) Views the pauses are marked with a grey background.

Quick-Calc feature

Below the L(t) Views, there is a tabular area which normally displays the data connected to the actual measurement. This includes the name of the measurement file, the type of instrument and small boxes that include the descriptors and origins of the displayed data along with the actual levels at the cursor position.

The individual L(t) curves may quickly be turned on/off by a tick-



The Quick-Calc feature rapidly calculates levels from cursor-selected areas of the Level vs. Time measurement

boxes for each function. Similarly, all markers associated with this measurement file may be turned on/off with a tick in the box named *Markers*.

As an alternative to the measurement values at the *Cursor* position, other Tabs may be selected for displaying the *Delta*, *Average*, *Sum* or *Percentiles* calculated from a selected area of the L(t) View. This *Quick-Calc* feature is an extremely user-friendly method for making quick calculations on any required part of the entire measurement.

Preferences

The desired settings of the Y-axis range, the Y-axis top scale, the x-axis label, the grid on/off, the displayed measurement functions and the marker legend on/off may be stored for later use by using the View/ Default-Properties/Set feature.

Add-to-Project

The *Project tree* found in the Workspace area contains all measurements, all L(t) Views, all optional Views, all Summary reports and all other Word or Excel reports that the operator has generated as part of the actual project. In addition, any optional calculation or rating sheets are available here as well.

However, within the project, the operator may additionally insert other files such as digital photos, pdf-copies of client's requirements, etc. Thereby, anything related to the actual project is found within the project tree.

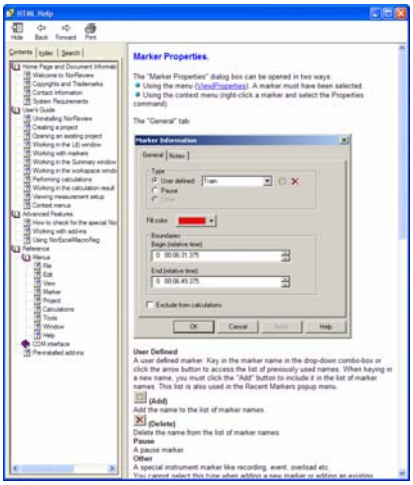
Project save

When work on a project is finished, either completely, or temporarily, the user may save all sub-files and views that are currently located in the *project tree* within one NorReview *project file*. Hence, the project can easily be re-opened simply by selecting the appropriate project file within the existing project menu.

It is possible to automatically include all sub-files such as unused parts of the measurement file, audio recording files, etc. by ticking the *subfolder* feature in the Save Project Menu. That may make the Project file larger, but it means that everything can be stored on a single CD for re-evaluation years later without risk that parts of the supporting material has disappeared.

Help functions

The NorReview package comes with an on-board help facility. The user will get on-line help during the operation of the software package.



A Help feature is available for more detailed explanations of the individual functions

Internal Excel macros

The NorReview package includes a feature for running Excel macro within the frame of the software. This means that data transfer, Excel conversion of data, graphical presentations etc. are made with the standard features of NorReview. The special calculations and presentations written as an Excel macro can be initiated directly within the NorReview, and the final report from the Excel macro is automatically stored within the project tree.

This feature makes the NorReview reporting software extremely flexible as it combines the user friendliness of a high-level package with the individual needs for special calculations and presentations, possibly in your own language.

Optional Add-in Tools

The possibility to use Excel macros can be quite useful, but there are quite strict limitations in their use, as any minor change of or missing data in one particular measurement file will force the macro to crash. It cannot, therefore, be guaranteed that later versions of NorReview will run existing macros without the need for modifications. To overcome these limitations NorReview offers an alternative solution for users who have no personal experience with macros.

The add-in tools facility includes pre-designed routines for presentation and calculations to your NorReview package. These tools are made in professional software languages and offer much better operational security than macros. These optional add-in tools are designed for more advanced use of the NorReview package and to perform predefined functions in line with different international or national requirements. Extensive marker editing, event analysis, in-depth calculations on sub-sections, frequency analysis and simultaneously evaluation of multiple measurement files are possible using these add-in features. Rating calculations such as the L_{den}-calculation, the German TA-Lärm 1998, and the Italian DM 16/3/98, may also be added.

The previously mentioned Summary Reports is a quick and simple way of making pre-defined reports. However, many professional users have a need for detailed reports according to their user-defined templates. This is possible using the NorReport ad-in tool.

This means that each individual customer can tailor the NorReview package to perform in accordance with the local needs. The different add-in features are described in the next sections.

Add-in OPTION 1:

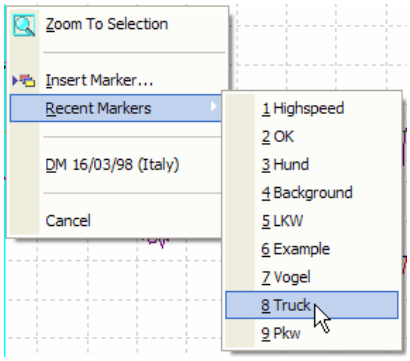
Edit markers

Most Norsonic instruments offer the possibility to enter markers along the level versus time profile reports. These markers are automatically displayed in the L(t) Views in the NorReview software package.

In many cases, it is desirable to edit these markers. Perhaps the markers are slightly wrong in their position along the time-axis when compared to the actual time axis, or additional markers are required. Maybe, some of the original markers should be deleted, the length adjusted, or the names of the marker need to be enhanced. Even a dedicated text-note may be inserted. All these adjustments are available when the option 1 of NorReview is installed.

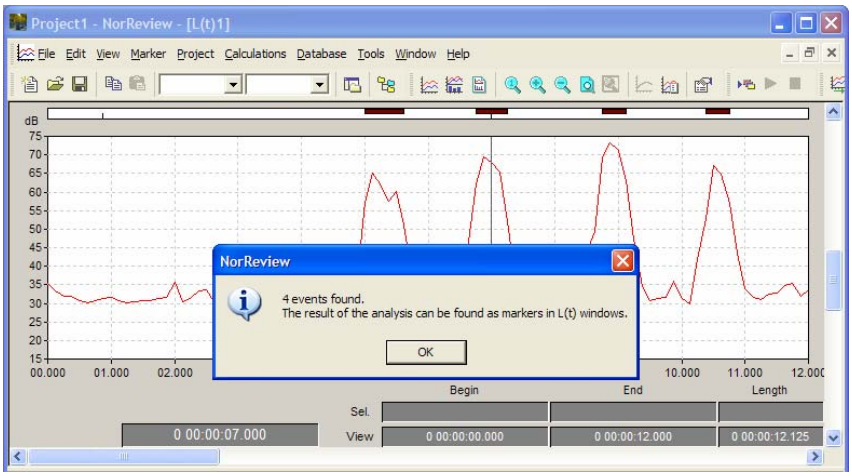
Clicking the mouse on the displayed marker enables the editing function. A light-blue area will then be displayed behind the L(t) curves. The user may now easily move the entire marker along the time-axis, or adjust the start or stop position.

For repeated insertion of the most commonly used markers, NorReview offers a list of previously used markers directly after selecting a new area with the cursor. The user may edit this list according to individual needs.



Repeated insertion of new markers directly from the Recent Markers list.

On demand, each marker may be treated as a *Pause*-marker. This means that the area covered by such a marker is not included in any further calculations. This *Exclude from calculations* feature may be turned on/off, even for pauses inserted during the actual measurement made in the instrument itself.



The Event Analysis inserts new markers along the x-axis where the pre-defined thresholds are met.

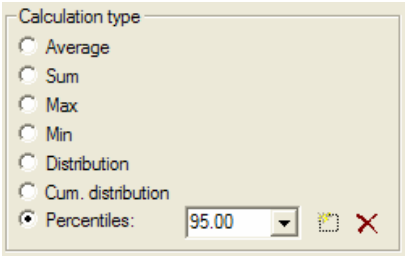
Event analysis

Option 1 also includes a post-processing feature to automatically search for events in a level vs. time measurement file. At each event, a new marker will automatically be inserted using a user-defined name. The user may specify the start and stop trigger conditions for the events defined by a level threshold, as an existing single marker, or as a combination.

Calculations

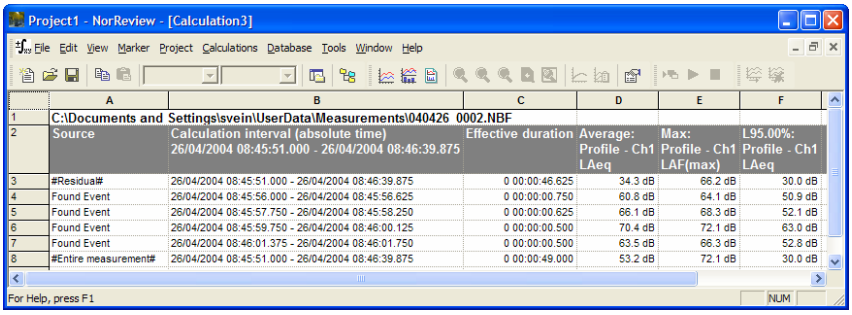
Post-processed calculations based on the concatenation of the original measurement are easily performed with option 1 installed.

This feature includes the possibility to perform overall calculations based on pre-selected measurement functions where selected markers are included and other markers excluded.



Post-processed calculations may be performed on a range of measurements, functions, and marker combinations

The calculations may additionally divide the overall measurement and calculation into pre-defined time periods such as every 15 minutes or every hour.



The Calculations feature extracts the details of the marked areas out of the entire measurement.

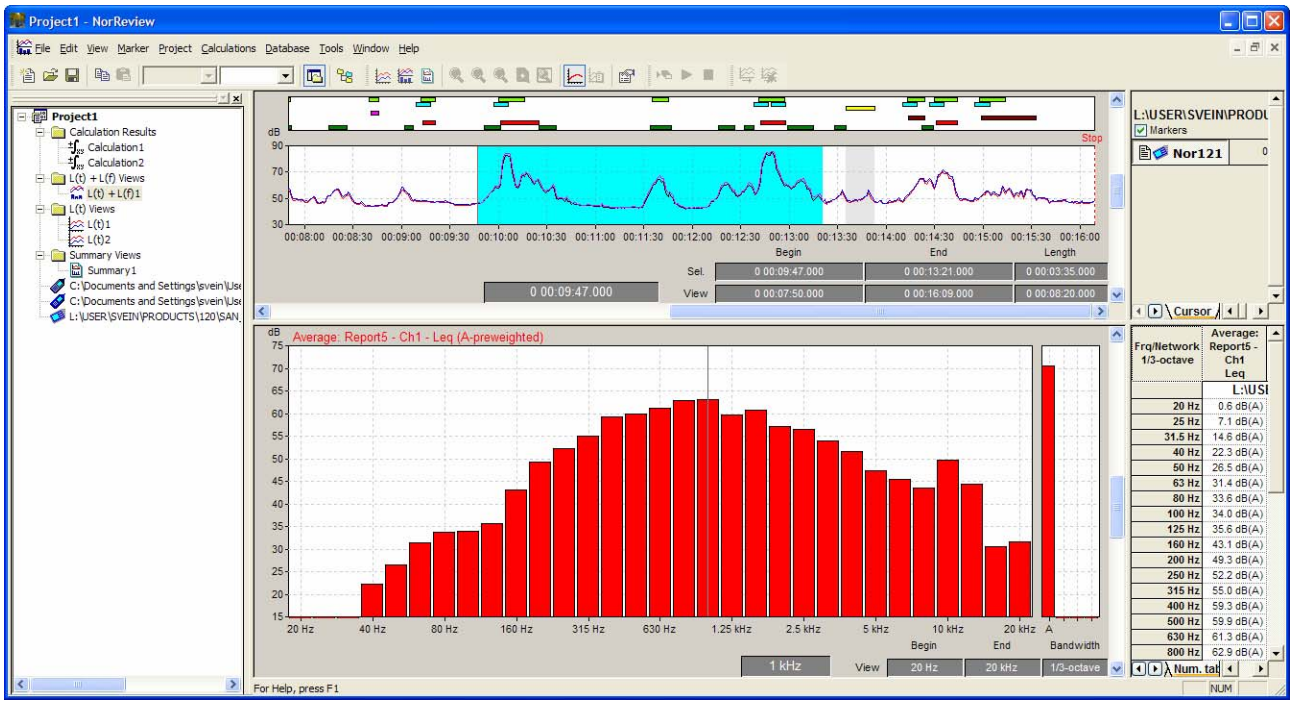
Add-in OPTION 2:

Level vs. Frequency view
This add-in feature (option 2) enables the user to view both the measured level along the time-axis as well as the frequency spectrum of any position along the x-axis in the same split display. The requirement is, of course, that the frequency bands have been measured for the desired measurement function.

The displayed frequency spectrum (i.e. L(f) View) may be pre-weighted with any of the normal weighting networks (A-, B-, C– etc.), and to the right of the graph the user will find a tabular including the value at each frequency band.

By selecting a part of the upper L(t) View with the cursor, the corresponding average spectrum is calculated using the Quick-Calc feature.

All these additional features are available with the NorReview package when the Level vs. Frequency option 2 is installed.



The split display showing a L(t) View (above) and a L(f) View (below) for evaluation of the frequency content at specific points or time-areas are of interest.

Add-in OPTION 3:

Multiple measurement files
It is often desirable to compare data from one instrument with that taken with another, or alternatively with that taken on another day.

This is possible with the NorReview software when the add-in "Multi file/project" (option 3) is installed. The user may then include level versus time measurement data from different measurements, or even from different instrument types, into the project tree as well as into the same L(t) View. Up to four different functions may be displayed simultaneously, and there is no limitation to the number of measurement files connected to the same project in the project tree.

All markers connected to any of the selected measurements are displayed along the upper x-axis. However, the markers for each measurement can be turned on/off on demand. New markers may be inserted, when this feature is combined with the edit marker feature in option 1.

Multiple projects
When a noise measurement project has been evaluated and saved, it may sometimes be of interest to compare this project with a similar one evaluated months or years ago.

The NorReview option 3 "Multi file/project" enables multiple projects into the same project tree. This feature then allows the user to select views from old measurements within the new project.

It is also possible to combine measurement data files from an old project with data from a new project. Hence, direct comparisons of measurements taken on the same sources are easily available.

All these features are available when the "Multi file/project" option 3 is installed.

Add-in OPTION 4:

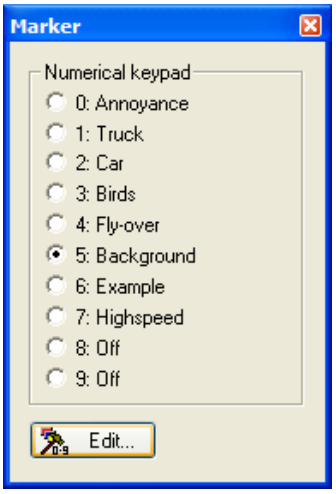
Audio replay with moving cursor

The Nor121 instrument is capable of storing audio recordings of the subject noise and it also stores voice comments made by the operator. These audio recordings are shown as markers along the upper part of the graph using the names "Record" and "Comment".

In the basic version of the NorReview software, a double mouse-click on any of these markers will initiate a replay of these audio files with the installed multi-media driver on the PC.

By adding this optional internal NorReview multimedia driver, the user may even watch the cursor moving along the L(t) View as the recorded file is replayed. A push on the *Space* key will pause and continue the player. Combined with the optional edit marker feature (option 1), simultaneously insertion of new markers is possible within the replayed section.

The inserted markers are available from a pre-defined list. A single push on any of the numerical keys inserts the marker. Each marker may be inserted as a spot marker (at one point only) or as a toggle marker (from/to). A delay may be specified for each marker in both directions.



Insertion of new markers directly from the user-defined list is possible using the numerical keypad.

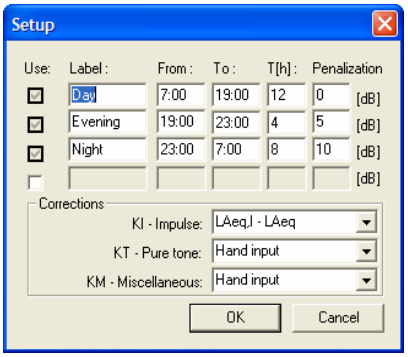
Add-in OPTION L_{den}:

Calculation of the L_{den} value

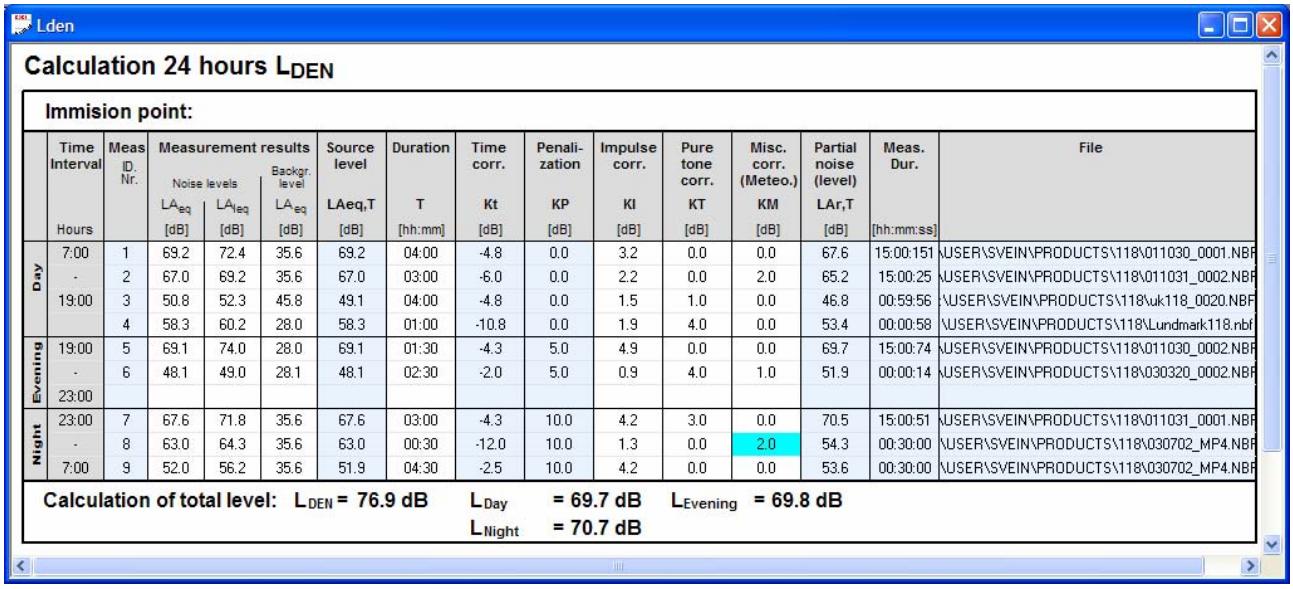
This add-in tool opens a predefined calculation sheet where the actual day-periods are specified according to the L_{den} protocol. There are individual rows for day, evening and night, and several measurements may be included in each period.

The actual measurements are dragged from the project tree and into the desired rows of the calculation sheet. The operator may adjust the length of the measurement as well as the measured values before the final L_{den} value is calculated.

This option may also be used for the calculation of the L_{dn} value.



The EU directive allows member states to vary the time periods used in the calculation and hence the operator may specify local parameters such as time, duration and penality of the different periods in the L_{den} setup menu.


Lden

Calculation 24 hours L_{DEN}

Immision point:

	Time Interval	Meas ID. Nr.	Measurement results: Noise levels LA_{eq} [dB]	Noise levels LA_{leq} [dB]	Backgr. level LA_{eq} [dB]	Source level LAeq,T [dB]	Duration T [hh:mm]	Time corr. Kt [dB]	Penalization KP [dB]	Impulse corr. KI [dB]	Pure tone corr. KT [dB]	Misc. corr. (Meteo.) KM [dB]	Partial noise (level) LAr,T [dB]	Meas. Dur. [hh:mm:ss]	File
	Hours														
Day	7:00	1	69.2	72.4	35.6	69.2	04:00	-4.8	0.0	3.2	0.0	0.0	67.6	15:00:151	\USER\SVEIN\PRODUCTS\118\011030_0001.NBF
	-	2	67.0	69.2	35.6	67.0	03:00	-6.0	0.0	2.2	0.0	2.0	65.2	15:00:25	\USER\SVEIN\PRODUCTS\118\011031_0002.NBF
	19:00	3	50.8	52.3	45.8	49.1	04:00	-4.8	0.0	1.5	1.0	0.0	46.8	00:59:56	\USER\SVEIN\PRODUCTS\118\uk118_0020.NBF
		4	58.3	60.2	28.0	58.3	01:00	-10.8	0.0	1.9	4.0	0.0	53.4	00:00:58	\USER\SVEIN\PRODUCTS\118\Lundmark118.nbf
Evening	19:00	5	69.1	74.0	28.0	69.1	01:30	-4.3	5.0	4.9	0.0	0.0	69.7	15:00:74	\USER\SVEIN\PRODUCTS\118\011030_0002.NBF
	-	6	48.1	49.0	28.1	48.1	02:30	-2.0	5.0	0.9	4.0	1.0	51.9	00:00:14	\USER\SVEIN\PRODUCTS\118\030320_0002.NBF
	23:00														
Night	23:00	7	67.6	71.8	35.6	67.6	03:00	-4.3	10.0	4.2	3.0	0.0	70.5	15:00:51	\USER\SVEIN\PRODUCTS\118\011031_0001.NBF
	-	8	63.0	64.3	35.6	63.0	00:30	-12.0	10.0	1.3	0.0	2.0	54.3	00:30:00	\USER\SVEIN\PRODUCTS\118\030702_MP4.NBF
	7:00	9	52.0	56.2	35.6	51.9	04:30	-2.5	10.0	4.2	0.0	0.0	53.6	00:30:00	\USER\SVEIN\PRODUCTS\118\030702_MP4.NBF

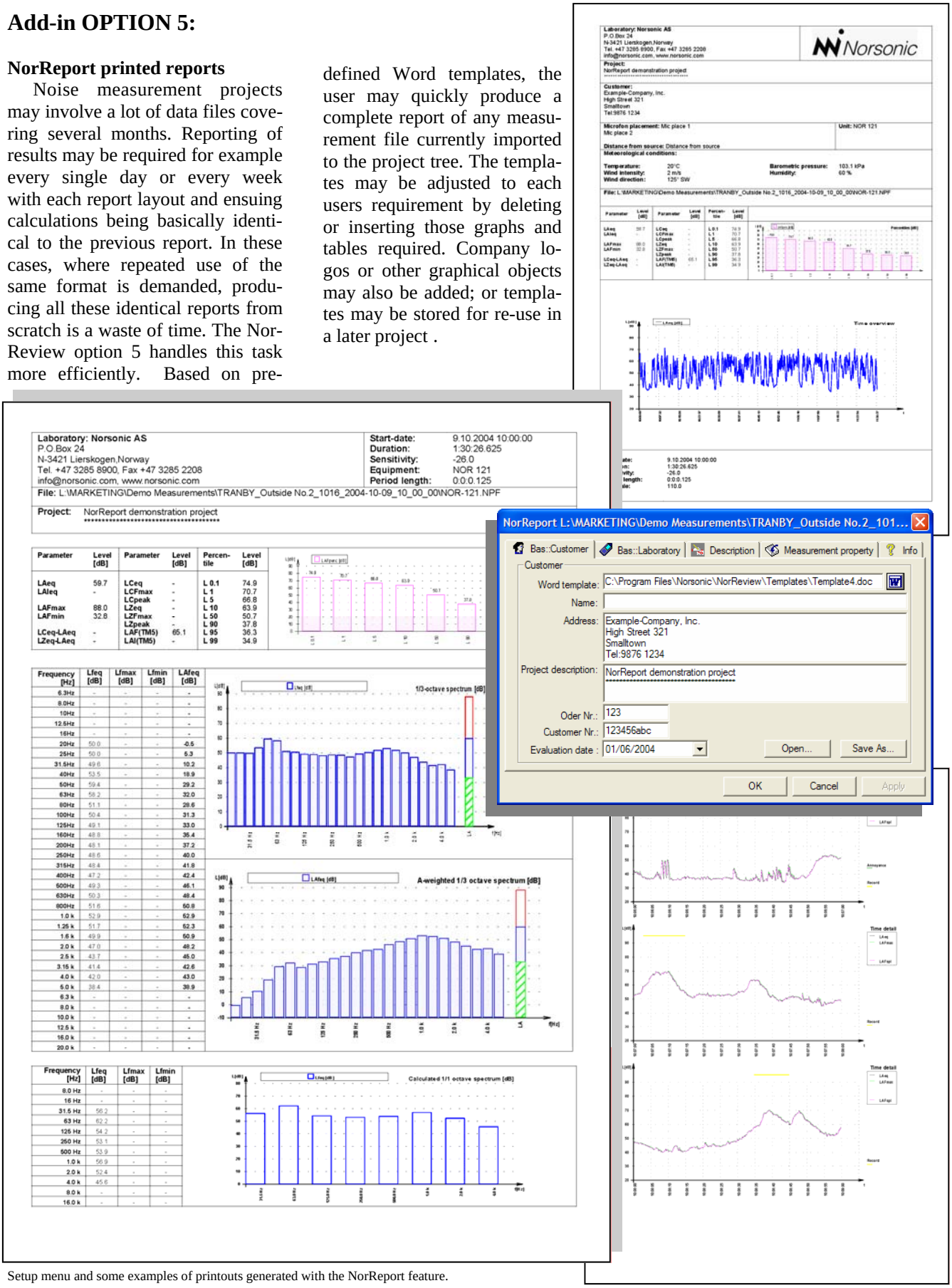
Calculation of total level: L_{DEN} = 76.9 dB L_{Day} = 69.7 dB $L_{Evening}$ = 69.8 dB L_{Night} = 70.7 dB

The L_{den} calculation sheet accepts measurement file entries from various parts of the 24 hour Lden-periods.

Add-in OPTION 5:

NorReport printed reports

Noise measurement projects may involve a lot of data files covering several months. Reporting of results may be required for example every single day or every week with each report layout and ensuing calculations being basically identical to the previous report. In these cases, where repeated use of the same format is demanded, producing all these identical reports from scratch is a waste of time. The NorReview option 5 handles this task more efficiently. Based on predefined Word templates, the user may quickly produce a complete report of any measurement file currently imported to the project tree. The templates may be adjusted to each users requirement by deleting or inserting those graphs and tables required. Company logos or other graphical objects may also be added; or templates may be stored for re-use in a later project .



Setup menu and some examples of printouts generated with the NorReport feature.

Add-in OPTION TA-Lärm:

German TA-Lärm Standard
This add-in tool opens a pre-defined calculation sheet, similar to the L_{den} calculation sheet, where the actual 24 hours periods are defined according to the TA-Lärm Standard. There are individual sheets for workdays, -nights and weekend calculations.

The actual measurements are dragged from the project tree and into the desired field of the calculation sheet. All required data are then automatically placed in their individual columns. The operator may adjust the length of each measurement as well as the measured values before the rating value ("Beurteilungspegel") is calculated. The entire sheet can be saved in the project tree for later evaluation, or printed out on a printer.

Add-in OPTION DM 16/03/98:

Italian DM 16/03/98 Standard
The Italian Standard DM 16/03/98 has its own requirements. Hence, the NorReview package offers a special add-in calculation tool for this Standard as well. After choosing the desired measurement file in the project tree and clicking on the DM 16/03/98 (Italy) choice in the Calculation menu, a predefined report is generated on screen. This report may be printed out as a Word file, or saved in the project tree for later evaluation.

Ordering information:

N-1026	NorReview 1.4 : Post-processing software for graphically and numerically review of Level vs. time profiles and Global frequency spectrum on screen and hardcopy (Windows XP compatible). Generates Summary Word-reports of basic measurement functions/graphs for further editing by operator. Works with measurement files from Norsonic instrument Nor110, Nor116, Nor118, Nor121, or Nor840. Nor121 recordings may be replayed on PC installed media-player. NorXfer software version 4.x required for data transfer from instrument memory. (NB: Single user licence with USB-Dongle!)
N-1026/01	Opt. 1 : Marker editing, Event and Calculation module for editing the L/t-graphs with markers, noise sources and descriptors, performing averaging on selected time intervals, and post-process statistics and event-detections.
N-1026/02	Opt. 2 : Frequency module with level vs. frequency presentation of multi-spectrum measurements from Nor118, Nor121 or Nor840.
N-1026/03	Opt. 3 : Multi-file read-in module for displaying and calculating of multiple measurements files in parallel (even from different instruments), as well as combining multiple project files.
N-1026/04	Opt. 4 : Special NorReview sound player with moving cursor along the Level versus Time graphical views for Nor121 measurement recordings. Combined with opt.1, new markers may be inserted simultaneously with the moving cursor.
N-1026/05	Opt. 5 : General report module ("NorReport") using editable Word-templates to user-define printed report of measurement result. Requires Microsoft Word2000 SP3, or newer, installed on the PC.
N-1026/L_{den}	Opt. L_{den} : Rating module enabling calculations according to L_{den} (Day-Evening-Night) and L_{dn} (Day-Night) functions.
N-1026/TA-Lärm	Opt. TALärm : Rating module enabling calculations according to German Standard TALärm (1998).
N-1026/DM160398	Opt. DM160398 : Rating module enabling calculations according to Italian Standard DM 16.03.98 based on the level vs. time profile.
N-1026/Maintenance	Opt. Maintenance: Annual maintenance fee to ensure free upgrade to the next released versions.
N-1026/LIC	Licence: Additional user license for each configured NorReview software package. Add per extra USB-Dongle.

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