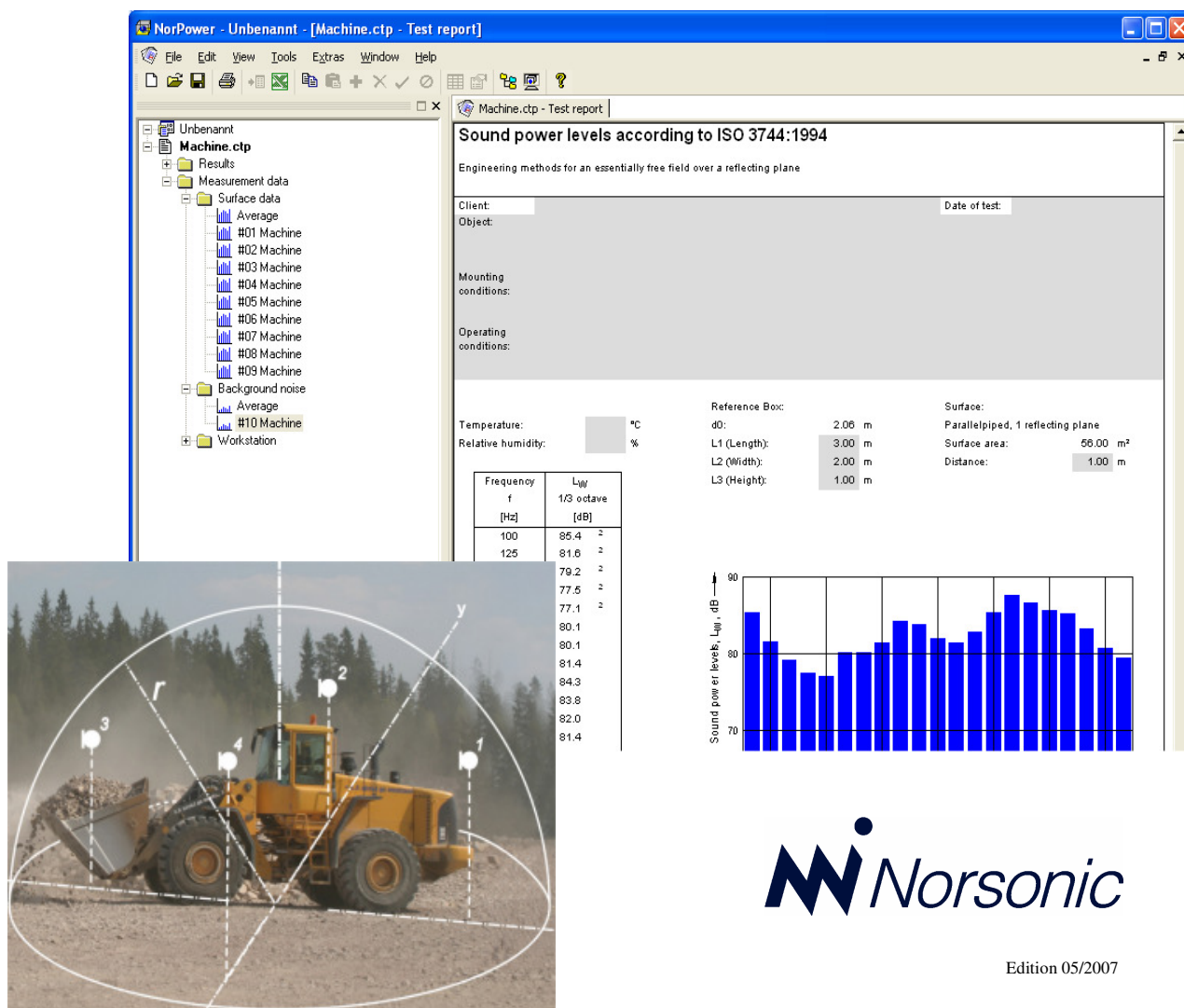


NorPower Sound power software

Type Nor-1035



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Introduction

Support

Support for International Users:

Please contact either the Agent from whom you purchased NorPower, or Norsonic AS, Norway:

Tel.: +47 32858900

Fax.: +47 32852208

E-Mail: support@norsonic.com

Web site:
www.norsonic.com

Norsonic AS, P.O. Box 24, N-342 Lierskogen, Norway

Installation & registration

The NorPower program is delivered on a CD and may be installed directly onto your computer following the instructions below. For the installation of the software you need administrator rights for your computer.

1. Insert the CD-ROM into the drive. If the CD-ROM does not start automatically use Windows Explorer to locate the file *Install.exe* in the root directory of the CD, double-click it and follow the instructions to complete the auto-install of NorPower.
2. Start the NorPower program. The dialog box "Product Registration" will open. Key in the Company, User name and the 32 character Registration code exactly as written in your license information. You may enter DEMO to enable all available options for a 60 day trial period.

For information about additional options and how to install / register them, see chapter *Install options*.

Uninstalling NorPower

Norsonic recommends that you uninstall any older versions of NorPower prior to installing new versions. Running multiple versions of NorPower applications on the same computer is not recommended or supported by Norsonic.

To uninstall NorPower:

1. From the **Start** menu, select **Settings > Control Panel > Software**
2. Click on **Add/Remove Programs**.
3. Click the **Install/Uninstall** tab, if your version of Windows has it.
4. From the list of programs that you can remove, select **NorPower**.
5. Click **Add/Remove**.
6. At the prompt, click **Yes** to confirm that you want to remove the NorPower program. The uninstall program removes program files, folders, and registry entries.
7. When the files are removed, the uninstall program indicates that the process is complete. Click **Finish**.

System requirements

Processor/memory

233 MHz Pentium-class processor with 128Mb RAM (minimum).

600 MHz Pentium III-class processor with 256Mb RAM (recommended).

Display

800x600 or higher resolution display with 16-bit colours (minimum).

USB Port

One USB port has to be available for the software protection module.

Operating system

Windows XP.

Windows 2000.

Windows Vista.

Windows 7.

It is possible that NorPower also runs on older operating systems, however, Norsonic recommends using WinXP.

In order to be able to open and edit Excel files, MS-Excel 2000 or XP needs to be installed. However, the NorPower Export function (sole export without opening the Excel file) does not require MS-Excel to be installed.

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Getting started

Overview

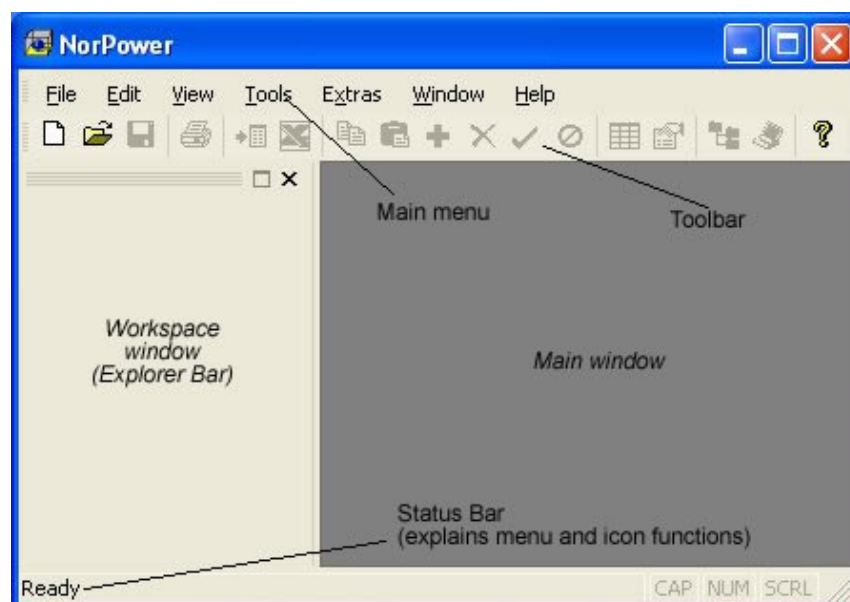
NorPower is a program for the calculation of sound power as set out in various Standards.

The optional software module CtrlPower will guide the operator through the various measurement functions for the data acquisition. Once the measurement data has been acquired NorPower is used to perform the complex calculations needed following the exact requirements of the selected standards.

Hard copy reports are provided in the format specified by the selected standard. The 'report' option allows exporting projects to MS-Excel for user-specific formatting.

Starting NorPower

Launch NorPower like any other MS-Windows program: *Start > Programs > Norsonic > NorPower*. The program window of NorPower appears:



In the *View* menu you can define whether the Toolbar, Explorer Bar and /or the Status Bar should be visible or hidden. In order to view or hide the Toolbar, click *View > Toolbar*.

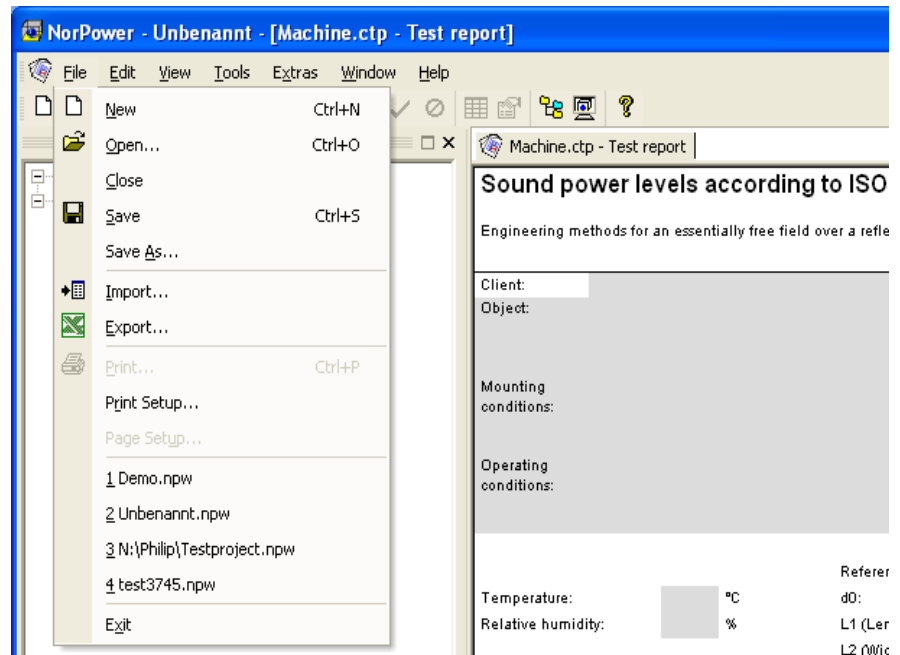
Using NorPower

The operation of NorPower is either by keyboard or mouse. These may be used to access the main menu, dialog boxes and control buttons.

When the mouse pointer is located over a button, a description of its function will appear in the status bar at the bottom of the program window.

The operational procedures of NorPower follow the general principles of MS-Windows programs.

By means of hot keys (underlined letters) the menu functions may be accessed via the keyboard; hold the Alt-button, and type the underlined letter of the menu (e.g. Alt+'F' to open the File menu). Within the menu the hot key letter gives direct access to the functions without the need to use the Alt-button (e.g. 'A' for Save As...).



When working with NorPower some menu items result in a function, others open a dialog box, those followed by '...' open a dialog box.

Clicking the mouse means pushing and releasing the mouse button in a single move. A double click means two successive clicks on the same screen item. Unless stated to the contrary all mouse clicks are made with the left key.

Words that are written *italic* in the handbook (like *save*) are describing menu points, and you can activate them either by mouse or keyboard. Folders in the project tree and titles of opened windows are referred to using "quotation marks". Individual items within a project folder (measurement or protocol) are referred to using 'single quotation marks'.

Summary

The evaluation of a sound power measurement with NorPower includes a few simple steps. These steps are described in more detail in the appropriate section of this manual.

The calculations in NorPower are done automatically, the entire project is updated as soon as you change any input value.

1. Create a new project

(see chapter *Administrating Projects*)

2. Choose the correction table

(see chapter *Correcting measurement data*)

3. Import the measurement data

(see chapter *Importing measurement data*)

4. Enter data

(see chapter *Protocols*)

5. Perform the background noise level correction

(see chapter *Background noise correction*)

6. Print the protocol and report

(see chapter *Printing*)

7. Save the project

Administrating projects

General

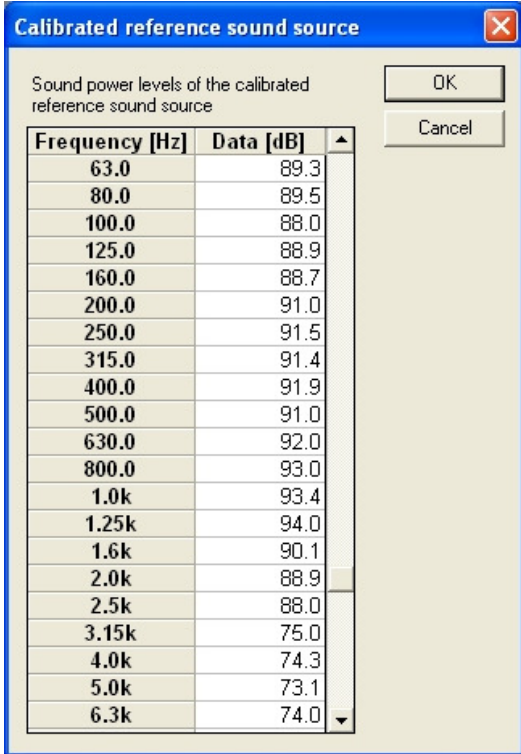
A NorPower project includes all measured values, calculation parameters and protocol statements.

A project is organised in a tree structure, it will be updated as you work with NorPower.

Calibrated reference sound source

Important: Do the following steps before, you create a new project. After creating a new project, the commands will be hidden.

Use the command *Extras > Sound Power Level Ref. Source 1/3oct...* and *Sound Power Level Ref. Source 1/1oct*, to enter the values of your calibrated reference sound source.



Calibrated reference sound source

Sound power levels of the calibrated reference sound source

Frequency [Hz]	Data [dB]
63.0	89.3
80.0	89.5
100.0	88.0
125.0	88.9
160.0	88.7
200.0	91.0
250.0	91.5
315.0	91.4
400.0	91.9
500.0	91.0
630.0	92.0
800.0	93.0
1.0k	93.4
1.25k	94.0
1.6k	90.1
2.0k	88.9
2.5k	88.0
3.15k	75.0
4.0k	74.3
5.0k	73.1
6.3k	74.0

OK

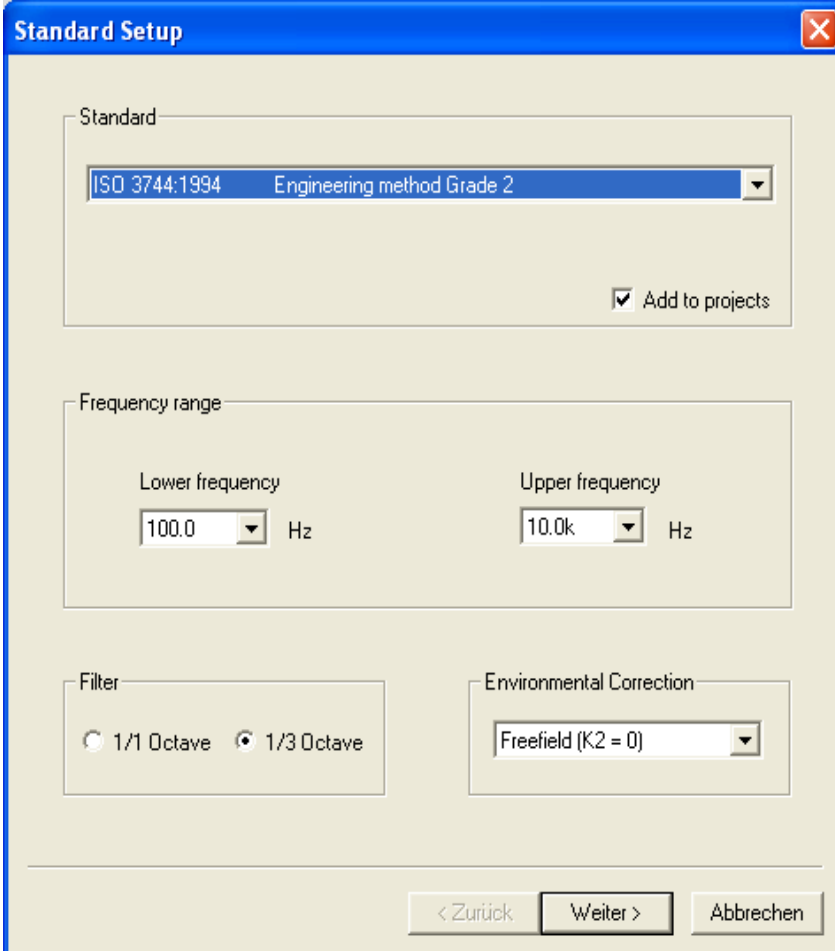
Cancel

Creating a project

When creating a new project, an Assistant (wizard) will start guiding you through the parameters of the sound power measurement.

A new project is created by using the *New* command (*File > New*).

The "Standard Setup" page in the Assistant:



Standard

Choose the standard according to which the evaluation shall be conducted.

Add to projects

If the box "Add to project" is checked the project will appear together with other already opened projects in the workspace window. If it is not checked the workspace window will be cleared so that only the new project will appear in the workspace window. All previously opened projects are closed automatically. NorPower prompts you to save projects with unsaved changes.

Frequency range

The upper and lower frequency limits can be selected within the range of 20 Hz ... 20 kHz in 1/3 octave and 31.5 Hz ... 16 kHz in 1/1 octave projects.

Note: The lower freq. cannot exceed the upper and vice versa.

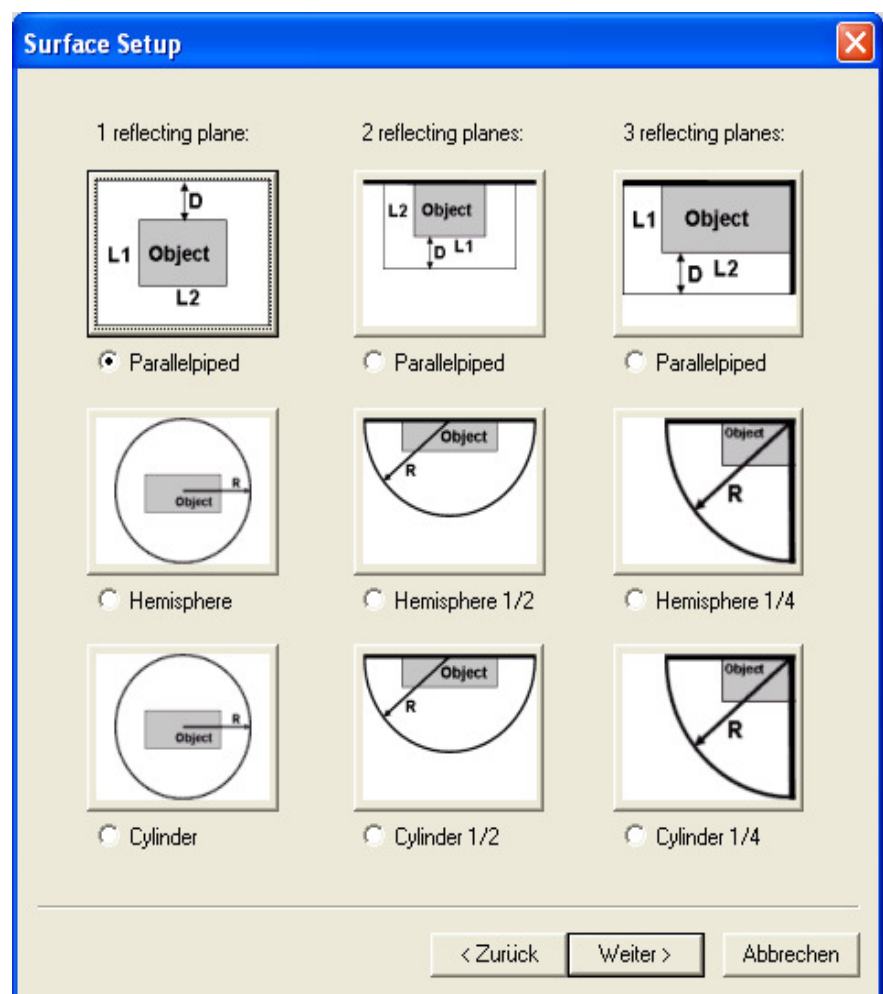
Filter

Selection of the filter, 1/1 octave or 1/3 octave for the entire project.

Environmental
Correction

Selection of the Environmental Correction type. Reference source, Room absorption or Freefield ($K_2=0$)

The "Surface Setup" page in the Assistant:



Depending of the selected standard, the surfaces and the number of reflecting planes can be selected.

The "Geometry Setup" page in the Assistant:

Surface

The surface and the number of reflecting planes, selected in the "Surface Setup" page are shown again on the left top side.

Reference box

The L1 (Length), L2 (Width) and the L3 (Height) of the reference box can be entered in the edit fields. After each changing in the L1, L2, L3 edit fields, NorPower is recalculating the d0.

Dimension

Depending of the surface, the radius/length and the height to calculate the Surface area can be entered.

Direct input

If "Direct input" is checked, the d0 and the Surface area can be entered directly. The L1, L2, L3, radius/length and the height are ignored.

Shortcuts:

Toolbar: 

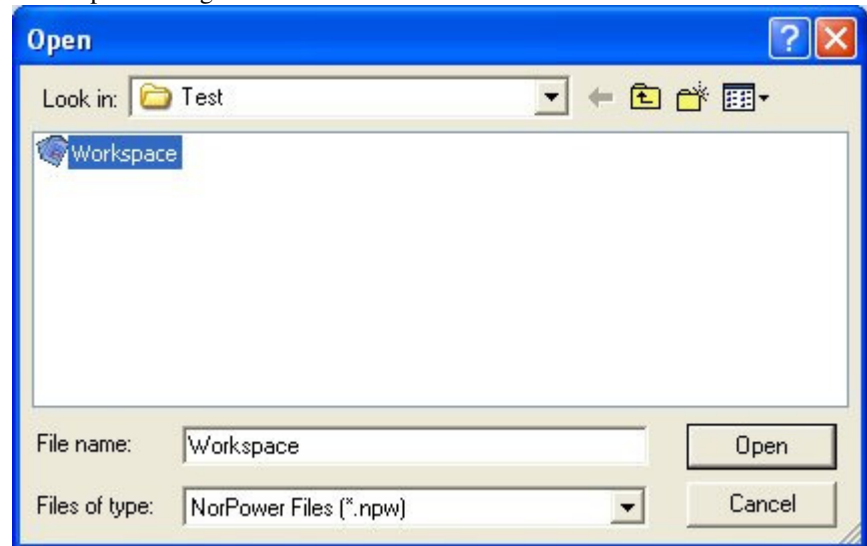
Keys: **Ctrl + N**

Opening existing projects

An existing NorPower file can be opened in two ways:

- Double-click the project file in the Windows Explorer.
- Use the *Open* command (*File > Open*):

The "Open" dialog box:



Choose the directory and select the NorPower file to be opened. Then click *Open*.

A NorPower file has the extension *.npw.

Opening a NorPower file means to open a previously stored workspace which can either hold one or several individual projects.

Shortcuts:

Toolbar: 

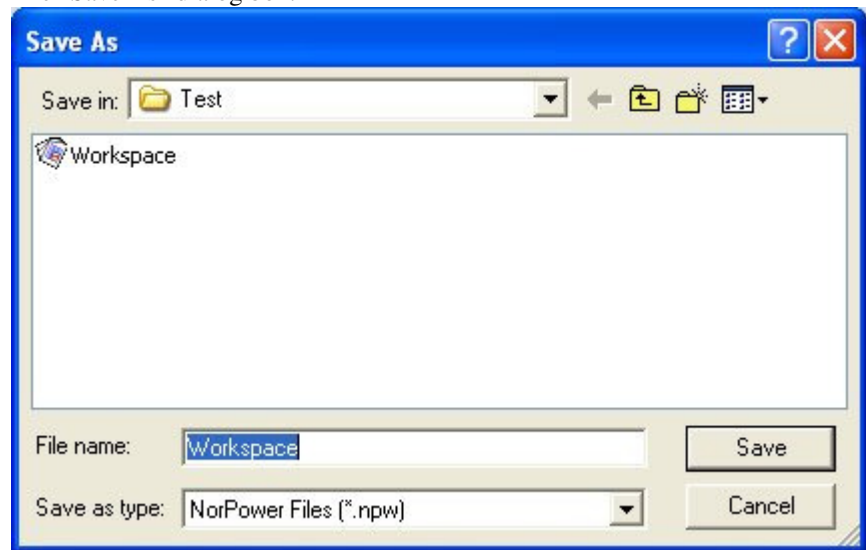
Keys: **Ctrl+O**

Saving project data

Use the command *File > Save* to save the project / workspace to its current name and directory. The workspace can hold one or several individual projects.


When you save a project / workspace for the first time, NorPower displays the "Save As" dialog box so that you can name it. If you want to change the name and directory of an existing file before you save it, choose the *Save As* command.

The "Save As" dialog box:



A NorPower file has the extension *.npw.

Shortcuts:

Toolbar: 

Keys: **Ctrl+S**

Closing the workspace

Use the command *File > Close* to close an open workspace / project. NorPower prompts you to save projects with unsaved changes.

Working in the workspace window

The workspace window is the place to do project administration. You can create several projects in one workspace and save it as one NorPower file.

A project tree will be updated as you work with NorPower. A project includes all measured values, calculation parameters and protocol statements. A NorPower project holds the two folders "Results" and "Measurement data".

The exact layout of the project tree depends on the selected standard.

"Results":

This folder contains the results of the analysis summarized in protocol statements (see chapter *Protocols*):

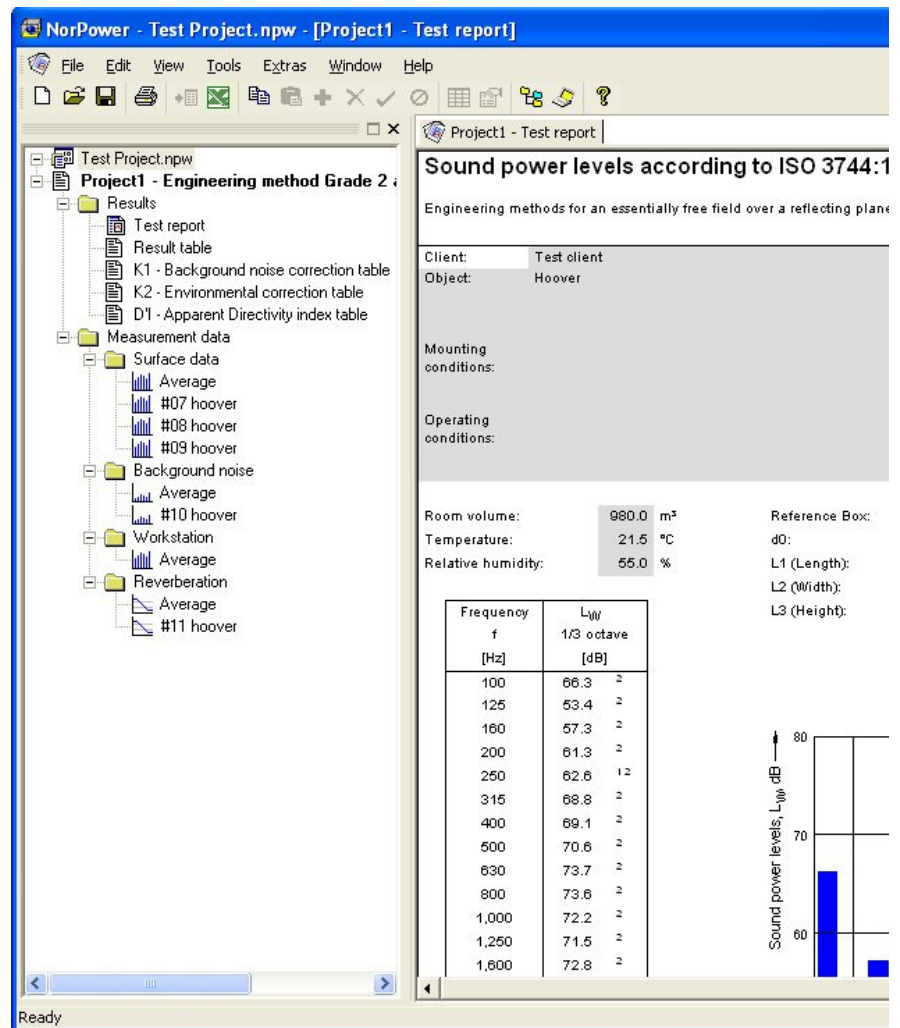
- *'Test report'*: the formal report sheet as specified in the selected standard.
- *'Result table'*: a summary of all numerical results of the analysis.
- *'K1Background noise correction table'*: a summary of the background noise correction data.
- *'D'I Apparent Directivity index table'*:
- *If K2 is not null: 'K2 Environmental correction table'*:

"Measurement data":

Depending of the Standard and the selected environmental correction, the folder contains the following sub-folders:

- "Surface data": contains the surface measurements
- "Reference source": contains the measurements of the reference source
- "Background noise": contains the background noise measurements
- "Reverberation": contains the reverberation time measurements
- "Workstation": contains the measurements of the workstation

Any item within these folders can be opened by double-clicking it or by using *View > Open*. There is also a context menu (right mouse click) holding the menu commands that are available for the currently selected item. It is then opened in the *Main window*, as the 'Test report' below.



In the workspace window you can:

- Open measurement tables and/or protocol statements
- Import new measurements
(see chapter *Importing measurement data*)
- Delete measurements
- Rename a project or measurement
- Copy and Paste measurements or use drag & drop
- View properties of a measurement
- Define the Page and Print Setup
(see chapter *Printing*)

The topics *Importing measurement data* and *Printing* are dealt with in extra chapters; the other functions are explained in more detail in the following sections of this chapter.

Opening tables or protocols

Use the command *View > Open* to open measurement tables or protocol statements.

Select the desired measurement or protocol statement by clicking on its title in the project tree. Then choose the *Open* command either from the *View* menu or from the *Context* menu (right mouse click). Alternatively you can double-click on the desired item in the project tree.


The table will be opened as a new window within the main window.

Deleting a measurement

Use the command *Edit > Delete* to delete the selected measurement. To select a measurement to delete, click on it to activate it and then use this command.

Select the desired measurement by clicking on the measurement title in the project tree. Then choose the *Delete* command either from the *Edit* menu or from the *Context* menu (right mouse click).

Shortcuts:

Toolbar: 

Keys: **DEL**

Renaming a project or measurement

Use the command *Edit > Rename* to rename a selected item in the project tree.

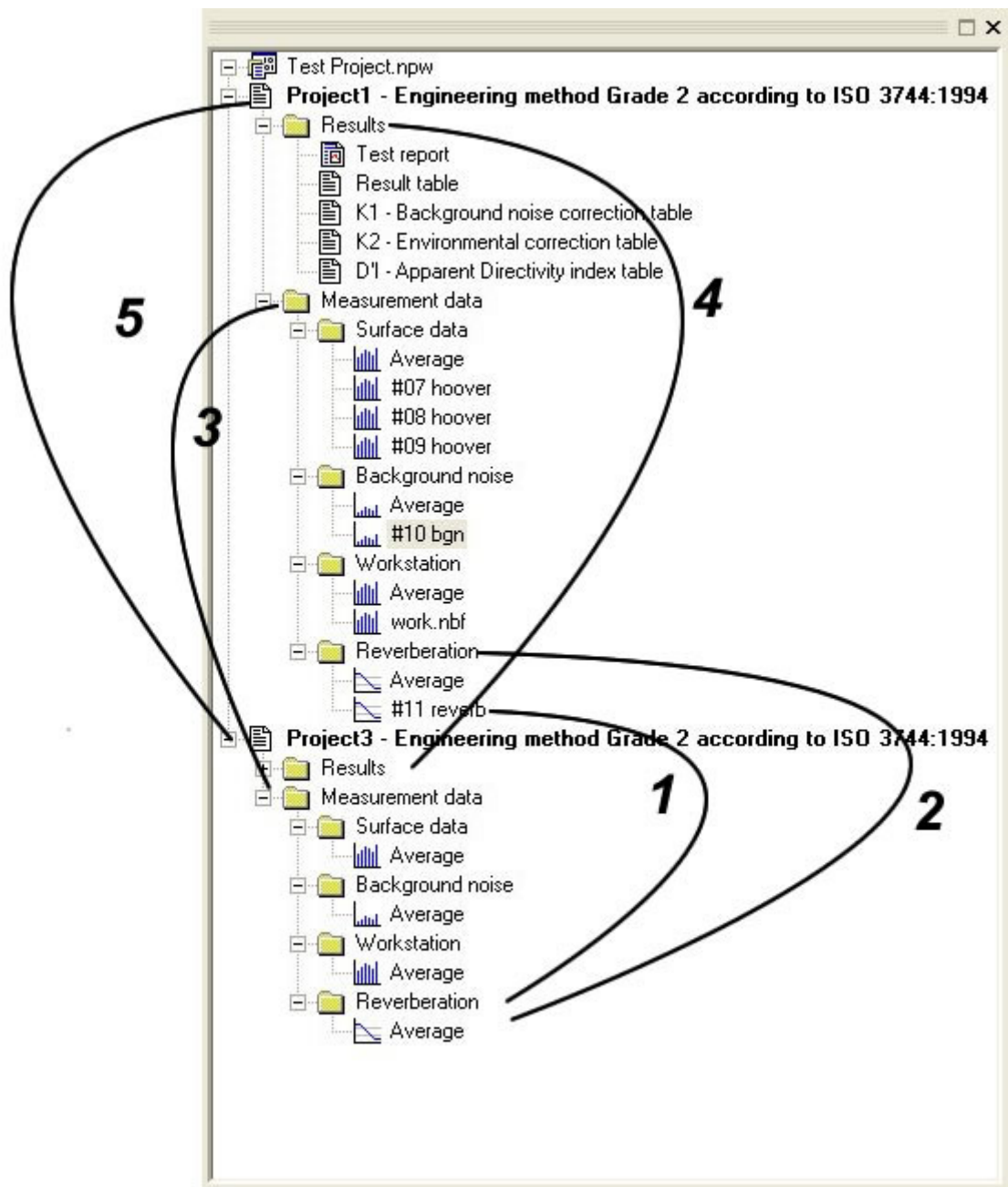
Click on the desired item in the project tree to activate it for the *Rename* function. Then you can use the command *Rename* from the *Edit* menu or from the *context* menu (right mouse click). Alternatively you can just click on the item twice to make it editable (like in Windows Explorer).

The availability of this command depends on the actual item selected. Only the project and individual measurements can be renamed. The title of protocol statements (in the "Results" folder) or the folder names cannot be renamed.

A measurement name can also be changed within the measurement table (see chapter *Tables of measurement series*). Just click on the title cell of the measurement and enter the new name (as in Excel).

Re-use of Project data

In order to copy individual measurements, entire tables, all tables, all user input or the entire project data from one folder to another, use either *Copy & Paste* or drag and drop the object within the project tree using the mouse.



1. individual measurement
2. Entire table (for example the reverberation folder)
3. All tables (Measurement data folder)
4. All user inputs (Results folder)
5. Entire project data (All user inputs and all tables)

Copy & paste of measurements

In the project tree measurements can be copied from one measurement folder to another.

Use the command *Edit > Copy* to copy the selected measurement into the clipboard. To select a measurement to copy, click on it to activate it and then use this command.

Copying data to the clipboard replaces the contents previously stored there.

Shortcuts:

Toolbar: 

Keys: **Ctrl+C**

Use the command *Edit > Paste* to paste the measurement you have cut or copied. Place the cursor where you want to paste the data, and then on the *Edit* menu click *Paste*.

Shortcuts:

Toolbar: 

Keys: **Ctrl+V**

Viewing properties of a measurement

Use the command *View > Properties* to view the properties of a measurement.

Select the desired measurement by clicking on the measurement title in the project tree. Then choose the *Properties* command either from the *View* menu or from the *Context* menu (right mouse click).

The graphical display and the setup details of the particular measurement will be shown. This command is also available within the measurement table, therefore it is explained in more detail in chapter *Tables of measurement series*.

Rounding Rules

The rounding of partial results in NorPower calculations is magisterial.

General rule:

- Positive values: $+xy.5$ is rounded to $xy + 1$
- Negative values: $-xy.5$ is rounded to $-xy - 1$

Level measurements:

- The results of the partial measurements are rounded to 0.1 dB.
- Afterwards, the average of the partial measurement is calculated.
- This average is rounded again, to 0.1 dB.

Reverberation time measurements

- The results of the partial measurements are rounded to 0.01 seconds.
- Afterwards, the average of the partial measurement is calculated.
- This average is rounded again, to 0.01 seconds.

Correcting measurement values

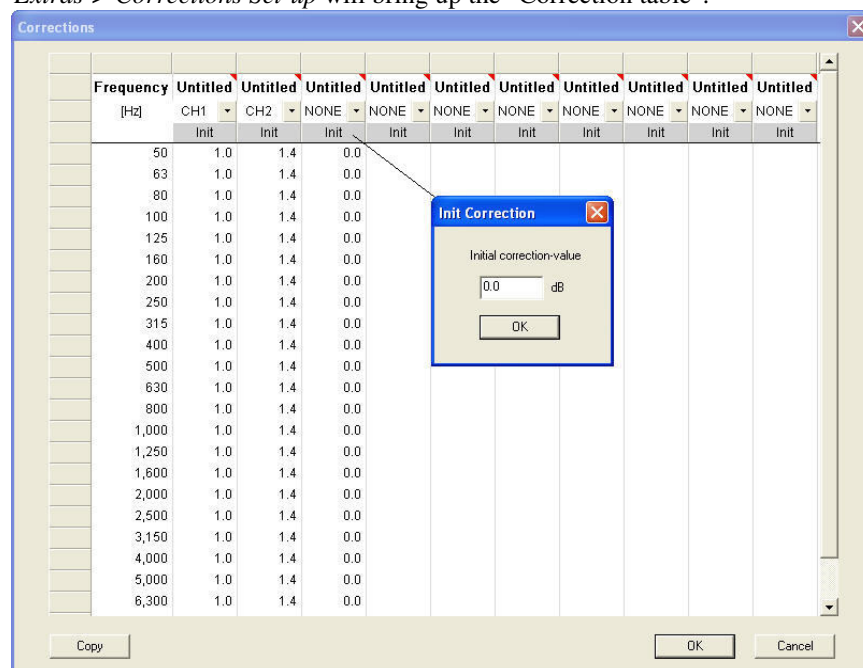
Overview

With NorPower it is possible to automatically correct measured levels with pre-defined k factors. The values used for these are usually filter or microphone correction factors for each individual 1/3 or 1/1 octave band. The necessary data may be determined from the corresponding calibration certificates and can be as small as one tenth dB. The correction values can be applied to both channel 1 and channel 2. They are added to the corresponding measurement values during the data import.

Using the corrections

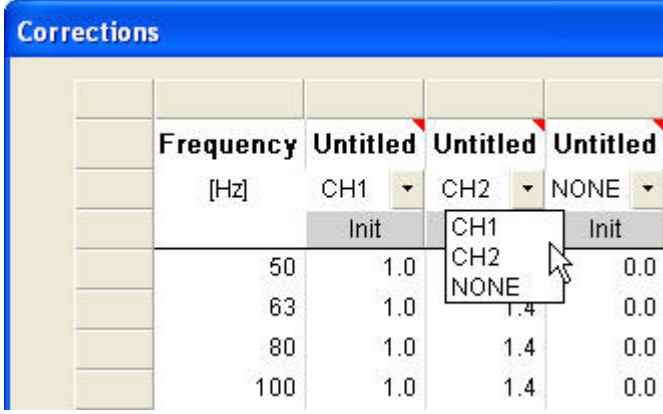
Use *Extras > Corrections Set-up* in order to pre-define level corrections for the data import. The corrections activated here will be applied to each measurement that is imported. The pre-defined corrections are only applied during the import of a measurement but not when opening an existing project.

Extras > Corrections Set-up will bring up the "Correction table":



Click on "Init" to initialise an entire spectrum with a preset value.

In the "Correction table" you can pre-define up to ten spectrum correction tables. You can deactivate a correction table by choosing NONE or activate it by assigning it either to CH1 or CH2:



Frequency [Hz]	CH1	CH2	NONE
50	1.0	0.0	0.0
63	1.0	1.4	0.0
80	1.0	1.4	0.0
100	1.0	1.4	0.0

The activated corrections are applied when a measurement is read in. You can always change the level corrections of an already imported measurement:

1. Open the measurement table by double-clicking on the measurement title in the project tree.
2. Enter the new correction values manually into the "Corr." column (see chapter *Tables of measurement series*).

Note: the presentation of numerical values in any NorPower table (i.e. '.' or ',' as decimal delimiter) depends on the language settings of your computer. These can be changed under *Start > Control Panel > Regional and Language Options*.

Importing measurement data

Overview

Data to be used in the project can either be read from files stored on the hard disk or directly from measurement instruments.

Note: Before importing a reverberation time measurement, the reverberation time import settings (T15/T20, T30 or Auto) need to be made under *Extras > Options*, see section *Importing reverberation time* data later in this chapter. If you want to apply initial corrections to a level measurement, these settings need to be made under *Extras > Corrections-Setup* before the actual import, see the previous chapter *Correcting measurement values*.

Import from the hard disk:

Use the *Import* command to:

- import Norsonic measurement files (*.nbf, *.npf, *.sdf) into an open project, or
- import measurement data from an existing CtrlPower project (*.ctp) into an open NorPower project, or
- import an existing NorPower project (*.nbp) into the workspace.

Alternatively you can drag and drop the desired file from the Windows Explorer (or use *NorXfer* as file Explorer) into the NorPower project tree.

Import from the analyser:

- In order to import a measurement file directly from the analyser you can launch *NorXfer* from the *Tools* menu to start the data transfer from the instrument (see *Import via NorXfer* later in this chapter).
- If the measurement was controlled by the software module CtrlPower you can directly drag and drop the measurement to the NorPower project tree (see *Import from CtrlPower* later in this chapter).

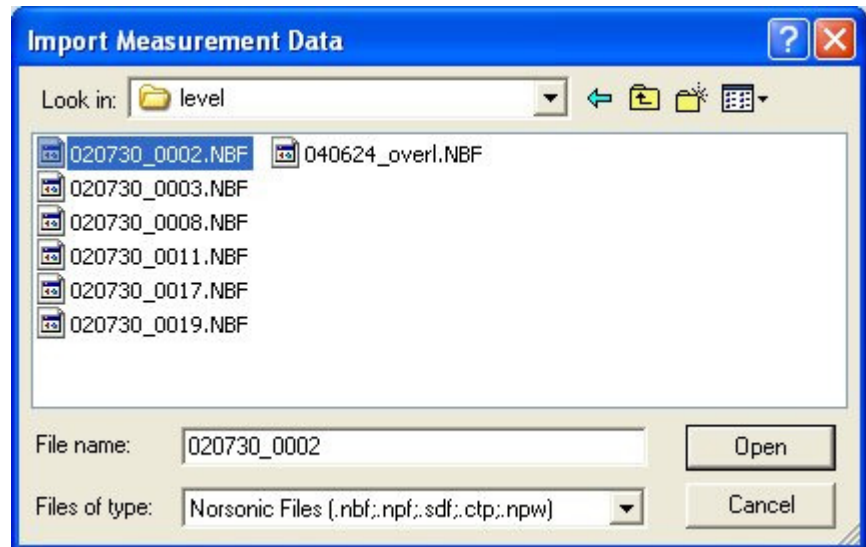
Import from the clipboard:

Measurement data can also be imported from the clipboard, see the according section *Import from the clipboard* in this chapter.


Import command

Use the command *File > Import* to import files that are stored on the hard disk. These can be either Norsonic measurement files (*.nbf, *.npf, *.sdf) or existing projects of NorPower (*.nbp) or CtrlPower (*.ctp).

The "Import" dialog box:



Shortcuts:

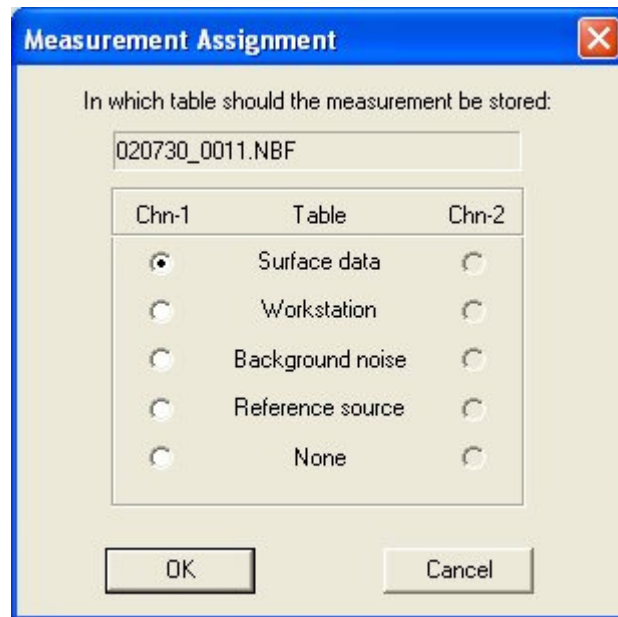
Toolbar: 

Importing Norsonic measurement files:

Note: In general, the import of measurement files into NorPower as described above is supported for the Norsonic analysers Nor840, Nor118/843, Nor110, Nor121 and Nor131/132. The procedure is the same for all instruments.

Measurement files can be imported into an open project in NorPower. The *File > Import* command is available in the workspace window. Click into the workspace window or on a specific measurement folder to make it active for the *Import* function. You can use this command when a specific measurement data folder of a project (e.g. "Surface data") is selected in order to import the data directly into that specified folder.

When using the import command on the project title or the general folder "Measurement data", the "Measurement Assignment" dialog box appears:



Depending on whether the measurement file contains a one- or two- channel measurement, one or two columns will be available in this dialog box. The fields for the unavailable choices are greyed out.

Level measurements can then be assigned to the folder "*Surface data*", "*Workstation*", "*Reference source*" or "*Background noise*". Reverberation time measurements can be assigned to the folder "*Reverberation*".

Importing CtrlPower projects:

Measurement data from CtrlPower project (*.ctp) can be imported into an open NorPower project. When importing an CtrlPower project the measurement files of the entire project will automatically be assigned to the correct measurement folders in NorPower.


Importing NorPower projects:

When importing an existing NorPower project, it will be opened as a separate project in the NorPower workspace. The workspace in NorPower can hold several individual projects (see chapter *Working in the workspace window*). In order to copy individual measurements from one folder to another, use either *Copy & Paste* or drag and drop the measurement within the project tree using the mouse.

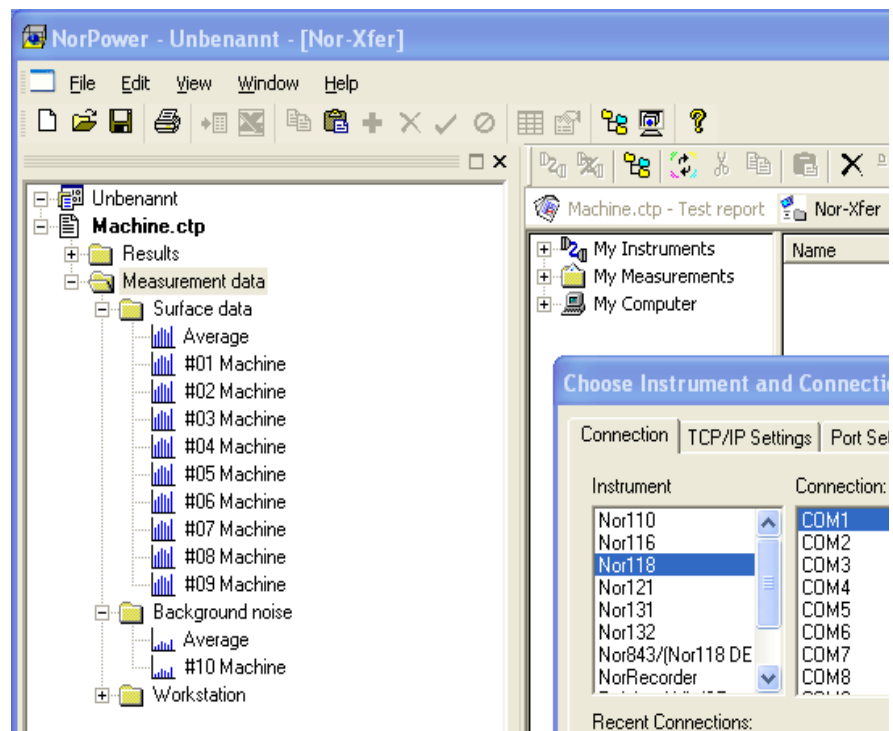
Import via NorXfer

In order to import a measurement file directly from the analyser you can launch *NorXfer* from the *Tools* menu to start the data transfer from the instrument.

NorXfer starts as an integrated software module and appears in the main window of NorPower. It can either be used as a file Explorer to import files from the hard disk or to connect directly to a Norsonic instrument.

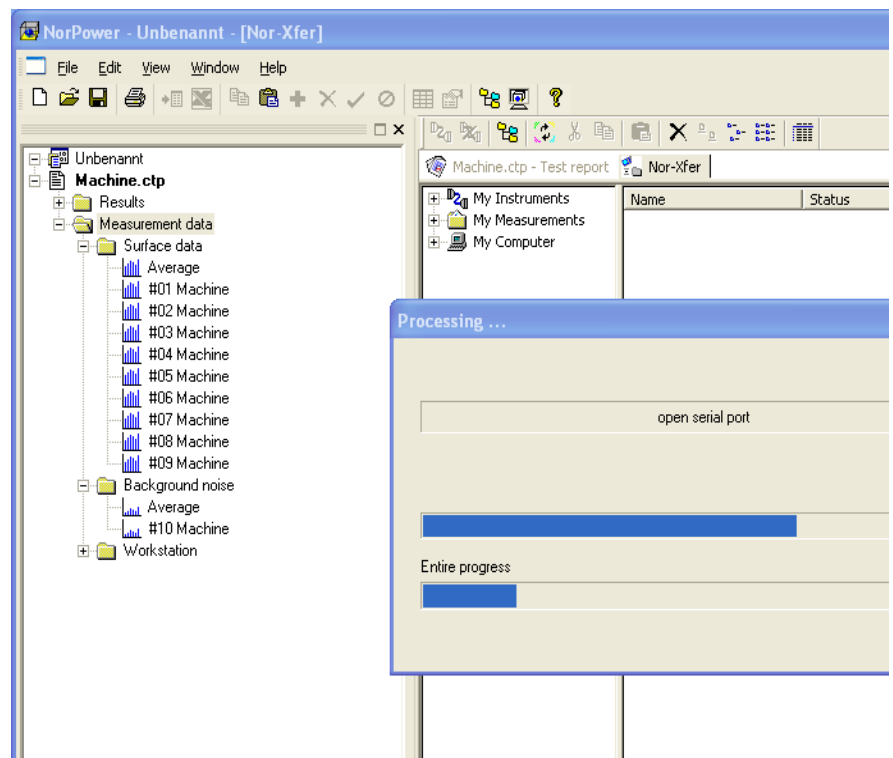
1. Start *NorXfer* from the *Tools* menu or use .
2. NorXfer starts as an integrated software module and appears in the main window of NorPower. As long as NorXfer is running, the main menu of

NorPower is replaced by the main menu of NorXfer:

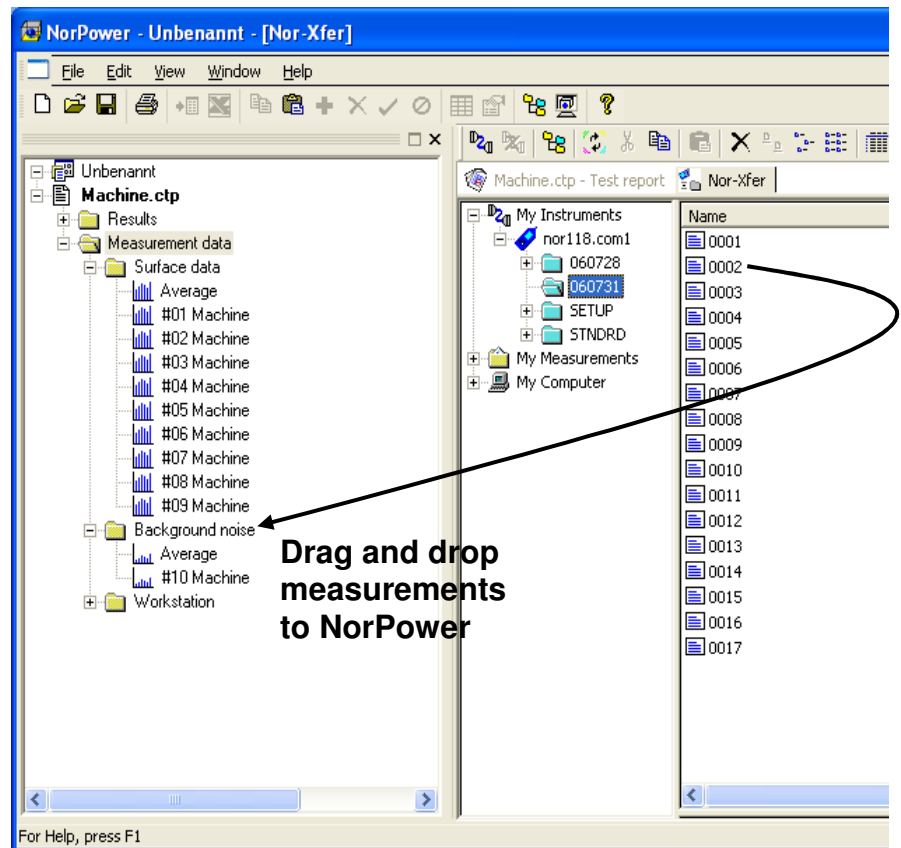


Press the NorXfer button *Connect*. A dialog box will then pop-up asking you to choose the instrument and the COM port it is connected to.

3. NorXfer connects to the measurement instrument:



4. You can see the measurement folders and files on the internal hard disk of the analyser. Drag and drop the desired measurement file(s) from the analyser into the NorPower project tree:




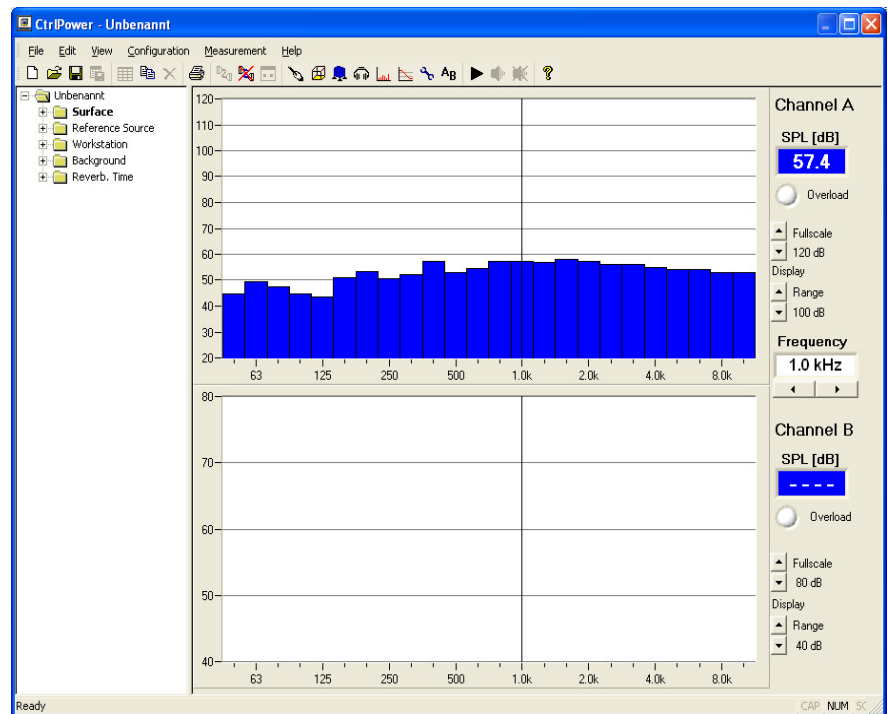
When the data import is completed you can close NorXfer by simply closing its window (click on the cross).

Import from CtrlPower

If a sound power measurement was controlled by the software module CtrlPower you can directly drag and drop the measurement to the NorPower project tree.

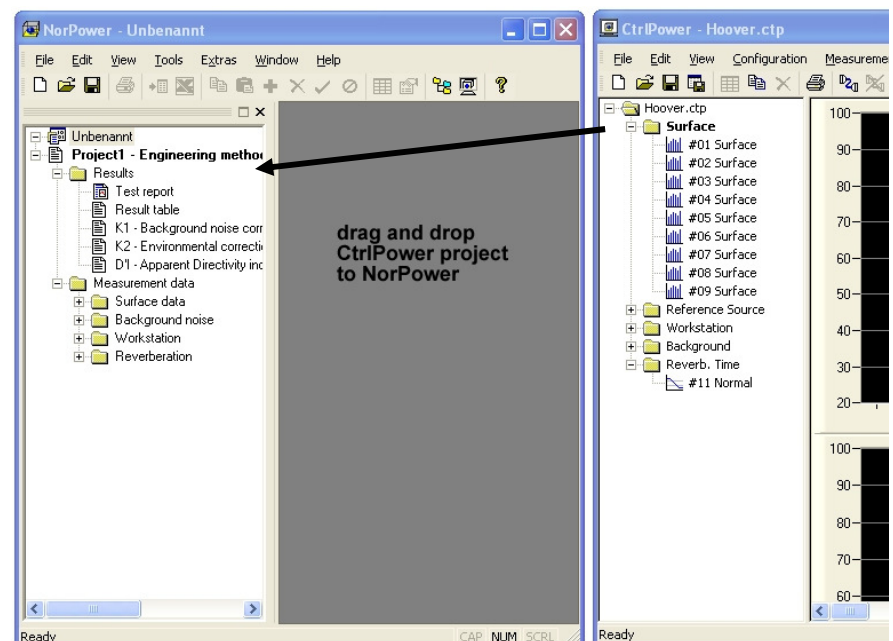
CtrlPower is a module of the NorPower series. Sound power measurements can be made with CtrlPower and the Norsonic real-time analyser types Nor843 or Nor118. CtrlPower enables the user to control the measurement in an interactive way and to get the results per drag and drop into the evaluation program NorPower.

1. Start *CtrlPower* from the *Tools* menu or use .
2. CtrlPower starts as an independent program:



3. Use CtrlPower to control your sound power measurements.

4. Drag and drop the desired measurement from the CtrlPower project tree into the NorPower project tree. You can also drag and drop the entire CtrlPower project to the evaluation program NorPower:



The individual measurements of the CtrlPower project will then automatically be allocated to the correct folders of the NorPower project.

Import from the clipboard

Numerical values can be imported from the clipboard into a measurement series. The data on the clipboard have to contain text (no graphics), and just one column is possible (no Tab delimited text).

To copy the measurement values from the clipboard into a NorPower measurement table:

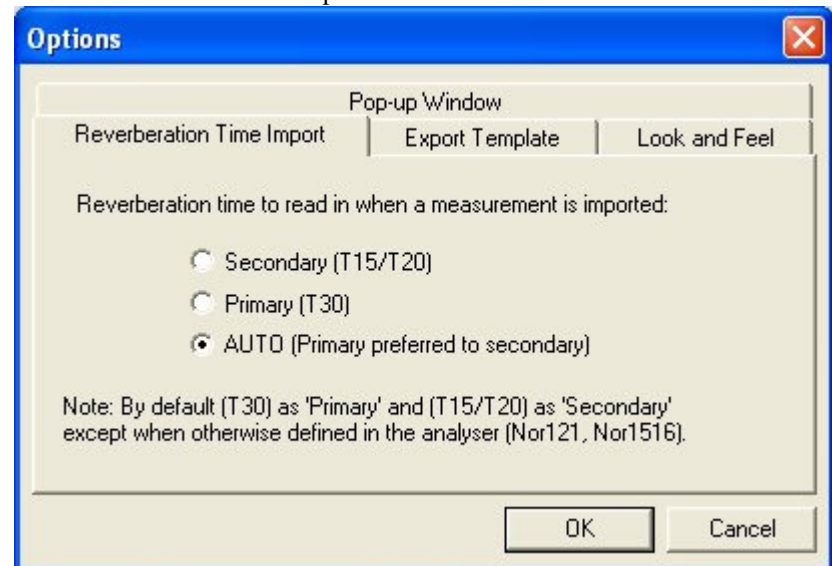
1. Copy the measurement data from your source (e.g. Excel) into the clipboard.
2. Open the desired measurement table in NorPower (e.g. the 'Average' table in the "Surface room") by double-clicking it in the project tree (see chapter *Tables of measurement series*).
3. Use *Edit > Add measurement* to add a new measurement into the desired average table in NorPower.
4. In the column into which the data shall be pasted, click in the field matching the desired frequency.
5. Choose *Edit > Paste* (Ctrl + V).

The average table is refreshed automatically.

Importing reverberation time data

The reverberation setting affects the import of reverberation time measurements. It defines which of the RT values in a file are read into the project. The setting selected applies to both direct reading from an instrument and reading from files.

The "Reverberation Time Import" tab:



By selecting "Secondary (T15/T20)" or "Primary (T30)" just these values are read, even if some values are marked as incorrect or missing for certain frequency bands. "Auto" uses Primary in the first place and replaces only invalid values with Secondary values.

Note: in some instruments (Nor121, Nor1516) the "Primary" and "Secondary" reverberation time can be defined by the user. For all other cases NorPower uses by default T30 as primary and T15/T20 as secondary reverberation time.

Importing 1/3 octave measurements in 1/1 octave projects

If you import 1/3 octave measurements in 1/1 octave projects, NorPower is asking you to convert the 1/3 octave measurement to 1/1 octave.

NorPower is converting according the following rules:

Level: NorPower is calculating the energetic sum.
Reverberation: NorPower is using the highest value.

Note: The import of 1/1 octave measurements in 1/3 octave projects is not possible.

Tables of measurement series

Structure

NorPower displays the measurements in tables. You can open a measurement table by double-clicking on the respective measurement file in the project tree ("Measurement data" folder). Alternatively you can use the *Open* command from the *View* menu or from the *Context* menu (right mouse click).

Measurement table for the surface data:

Frequency [Hz]	Average			#01 Machine			#02 Machine			#03 Machine			#04 Machine			#05 Machine
	L avg	SD	N	L	S	N	L	S	N	L	S	N	L	S	N	L
100	67.9	6.22	9	60.8		1	66.7		1	59.9		1	76.4		1	56.5
125	64.1	9.17	9	46.2		1	49.4		1	45.9		1	73.6		1	45.8
160	61.7	7.81	9	43.9		1	51.1		1	47.5		1	71.0		1	47.5
200	60.0	5.61	9	50.8		1	52.7		1	51.7		1	68.8		1	51.4
250	59.6	3.73	9	57.8		1	57.3		1	55.3		1	66.8		1	55.5
315	62.6	2.38	9	59.8		1	63.5		1	60.6		1	67.4		1	60.7
400	62.6	1.70	9	60.8		1	62.6		1	62.5		1	65.3		1	61.8
500	63.9	1.31	9	62.8		1	63.4		1	63.7		1	66.9		1	63.5
630	66.8	1.27	9	66.4		1	67.2		1	66.5		1	67.1		1	67.3
800	66.3	1.22	9	65.8		1	66.6		1	64.9		1	68.0		1	65.2
1'000	64.5	1.32	9	64.2		1	65.6		1	64.0		1	66.1		1	62.6
1'250	63.9	0.94	9	64.2		1	64.2		1	64.0		1	65.3		1	63.6
1'600	65.4	0.84	9	64.4		1	64.9		1	66.4		1	66.5		1	65.6
2'000	67.9	1.83	9	65.2		1	66.8		1	67.8		1	71.3		1	69.3
2'500	70.1	2.53	9	66.4		1	67.8		1	70.2		1	74.5		1	72.0
3'150	69.1	1.68	9	67.4		1	69.0		1	70.1		1	72.3		1	68.6
4'000	68.2	2.23	9	65.4		1	66.6		1	67.8		1	72.6		1	68.8
5'000	67.8	2.79	9	64.2		1	64.7		1	68.6		1	70.1		1	71.3
6'300	65.8	3.84	9	61.0		1	61.9		1	68.2		1	70.2		1	69.2
8'000	63.3	3.10	9	59.7		1	61.0		1	65.0		1	67.4		1	66.2
10'000	62.0	2.19	9	59.3		1	60.1		1	63.3		1	66.0		1	62.3
Sum A	78.6			76.4			77.6			79.0			82.0			79.8

Frequency column:

The first column contains the centre frequencies of the individual 1/3 octave or 1/1 octave bands. The frequency range to be displayed can be changed under *Extras > Options*, see section *Frequency range display* in this chapter.

Average column:

The column titled "Average" contains three sub-columns of which the first "Lavg" contains the average of all measurements at that frequency with any specified corrections already added (see chapter *Correcting measurement values*). The standard deviation is stated in column "SD". Column "N" holds the number of averages.

Measurement data column:

The next major column represents the first measurement series with the column header showing the file name of the original data. Each measurement is represented by four sub-columns. Column "L" shows the level values, column "S" shows the status ('*' for overload, 'H' for manual input, '?' for suspicious value), column "N" the number of averages for that particular measurement (see section *Number of Averages column* in this chapter) and column "Corr." shows the applied correction values. Use the *View* menu to show or hide the columns "S", "N" or "Corr.".

Note: Following to the upper frequency limit, the A-weighted sum level "Sum A" is shown in the table. The sum level is calculated according to the 1/3 octave band spectrum and the frequency limitations. It is a post-processed value and not a measured value.

Within a measurement table you can:

- **Change values in measurement table**
- **Add a measurement**
- **Import data from the clipboard**
- **Delete a measurement**
- **Exclude (and Include) a measurement**
- **View properties of a measurement**

These functions are explained in the following sections of this chapter.

Note: the presentation of numerical values in any NorPower table (i.e. '.' or ',' as decimal delimiter) depends on the language settings of your computer. These can be changed under *Start > Control Panel > Regional and Language Options*.

Opening a table or protocol

Use the command *View > Open* to open a measurement table or protocol statement.

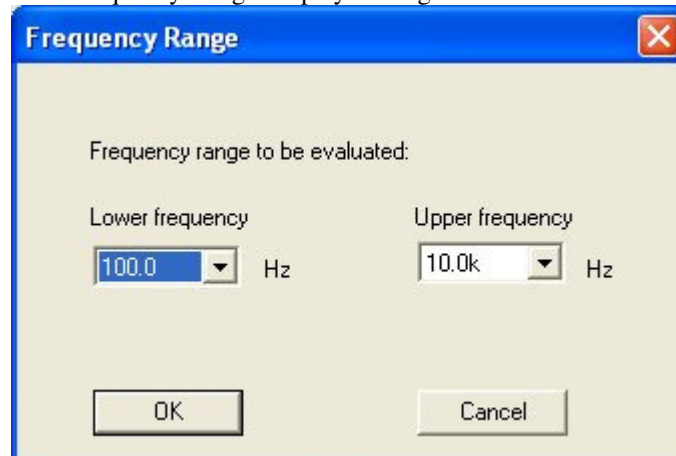
Select the desired item in the project tree. Measurements are stored in the folder "Measurement data" and protocol statements are stored in the folder "Results" in the project tree. Click on the item to make it active for the *Open* command. Then choose *Open* from the *View* menu or from the *Context* menu (right mouse-click).

Alternatively you can just double-click on the desired item in the project tree. It will be opened in the main window.

Frequency range display

Use the command *Extras > Frequency Range Set-up* to define the settings for the frequency range to be displayed in the measurement table.

The "Frequency Range Display" dialog box:



The "Frequency Range Display" dialog box is for display settings of the measurement table only. Lower and upper frequency can be set within the maximum range of 20 Hz ... 20 kHz in 1/3 octave and 31.5 Hz ... 16 kHz in 1/1 octave projects.

Note: Already opened measurement table windows must be closed and re-opened to make the change effective.

Changing values in measurement table

To change specific measurement or correction values just click on the cell containing the value you want to change and then enter the new value using the keyboard.

The status (column "S" in the measurement table) for that particular value will then change to 'H' indicating the manual input.

Data import from the clipboard

Numerical values can be imported from the clipboard into a measurement series. The data on the clipboard have to contain text (no graphics), and just one column is possible (no Tab delimited text).

To copy the measurement values from the clipboard into a NorPower measurement table:

1. Copy the measurement data from your source (e.g. Excel) to the clipboard.
2. Open the desired measurement table in NorPower (e.g. the 'Average' table in the "Surface data") by double-clicking it in the project tree.
3. Use *Edit > Add measurement* to add a new measurement into the desired average table in NorPower.
4. Click in the first field of the column into which the data shall be pasted.
5. Choose *Edit > Paste* (Ctrl + V).

The average table is refreshed automatically.


Adding a measurement

Use the command *Edit > Add Measurement* to add a new measurement to the averaging table. This command is available within the averaging table only. It will add a blank column into which the spectrum data for an additional measurement can be either pasted from the clipboard (e.g. copied from Excel) or keyed in manually.

To add a new measurement to a measurement table, do as follows:

1. Select the desired average table within the project tree.
2. Open the table by double-clicking on it.
3. Click into the table to activate it and then use the command *Add measurement* either from the *Edit* menu or from the *Context* menu (right mouse click).
4. A blank column for an additional measurement appears in the table.
5. The data for the new measurement can then be entered manually or be imported from the clipboard.

Shortcuts:


Toolbar: 

Deleting a measurement

Use the command *Edit > Delete* to delete the selected measurement. This command is unavailable if the currently selected item cannot be deleted.

Select the desired measurement by clicking on the corresponding column header in the measurement table with the mouse. Then choose the *Delete* command either from the *Edit* menu or from the *Context* menu (right mouse click).

Shortcuts:

Toolbar: 


Keys: **DEL**

Including a measurement in average

Use the command *Edit > Include* to include a previously excluded measurement into the average calculation. An excluded measurement is greyed out and not included into the average (see *Excluding a measurement*).

1. To select a measurement to include, mark the measurement within the averaging table by clicking on the corresponding column header.
2. Then choose the *Include* command either from the *Edit* menu or from the *Context* menu (right mouse click).
3. The measurement will then be displayed regularly and is used in the averaging.

Shortcuts:

Toolbar: 

Excluding a measurement


Use the command *Edit > Exclude* to exclude the selected measurement from the average calculation.

1. To select a measurement to exclude, mark the measurement within the averaging table by clicking on the corresponding column header.
2. Then choose the *Exclude* command either from the *Edit* menu or from the *Context* menu (right mouse click).
3. The measurement will then be greyed out and not be included into the average:

Project1 - Surface data																
Frequency	Average			#01 hoover				#02 hoover				#03 hoover				
	[Hz]	L avg	SD	N	L	S	N	Corr.	L	S	N	Corr.	L	S	N	
100	68.1	6.41	8	60.8			1	0.0	66.7		1	0.0	59.9			1
125	64.6	9.80	8	46.2			1	0.0	49.4		1	0.0	45.9			1
160	62.2	8.35	8	43.9			1	0.0	51.1		1	0.0	47.5			1
200	60.5	5.96	8	50.8			1	0.0	52.7		1	0.0	51.7			1
250	59.8	3.98	8	57.8			1	0.0	57.3		1	0.0	55.3			1
315	62.5	2.46	8	59.8			1	0.0	63.5		1	0.0	60.6			1
400	62.5	1.92	8	60.0	H		1	0.0	62.6		1	0.0	62.5			1
500	63.9	1.40	8	62.8			1	0.0	63.4		1	0.0	63.7			1
630	66.8	1.34	8	66.4			1	0.0	67.2		1	0.0	66.5			1
800	66.3	1.29	8	65.8			1	0.0	66.6		1	0.0	64.9			1
1,000	64.3	1.31	8	64.2			1	0.0	65.6		1	0.0	64.0			1
1,250	63.9	1.00	8	64.2			1	0.0	64.2		1	0.0	64.0			1
1,600	65.5	0.88	8	64.4			1	0.0	64.9		1	0.0	66.4			1
2,000	68.0	1.93	8	65.2			1	0.0	66.8		1	0.0	67.8			1
2,500	70.4	2.63	8	66.4			1	0.0	67.8		1	0.0	70.2			1
3,150	69.1	1.80	8	67.4			1	0.0	69.0		1	0.0	70.1			1
4,000	68.4	2.35	8	65.4			1	0.0	66.6		1	0.0	67.8			1
5,000	68.0	2.84	8	64.2			1	0.0	64.7		1	0.0	68.6			1
6,300	66.1	4.00	8	61.0			1	0.0	61.9		1	0.0	68.2			1
8,000	63.5	3.27	8	59.7			1	0.0	61.0		1	0.0	65.0			1
10,000	62.2	2.28	8	59.3			1	0.0	60.1		1	0.0	63.3			1
Sum A	78.8			76.4					77.6				79.0			

To undo this process: see *Include measurement*.

Shortcuts:

Toolbar: 

Correction column "Corr."

Use the command *View > Correction Column* to show or hide the correction column in a measurement table.

Column "Corr." contains the correction values that are applied to the measurement (see chapter *Correcting measurement values*).

Number of averages column "N"

Use the command *View > Number of Averages Column* to show or hide the number of averages column in a measurement table.

Column "N" contains the number of performed averages for a particular measurement file. This column is of interest only for measurements that have been averaged within the analyser already. When importing a measurement file which is a result of three averaging processes done in the analyser itself, column "N" will contain the number 3. If the table contains such a measurement, the total number of averages shown in the average column will be higher than the number of measurement files shown in the table.

Status column "S"

Use the command *View > Status Column* to show or hide the status column in a measurement table.


Column "S" shows the status of a measurement value. There are three possible status characters:

- '*' indicates an overload.
- 'H' indicates that the value was keyed in manually.
- '?' indicates doubts about the validity of that value.

Properties

Use the command *View > Properties* to view the properties of a selected measurement. This command is only available when a measurement is selected. A measurement can be selected by clicking on it in the project tree or by clicking on the according column header within a measurement table.

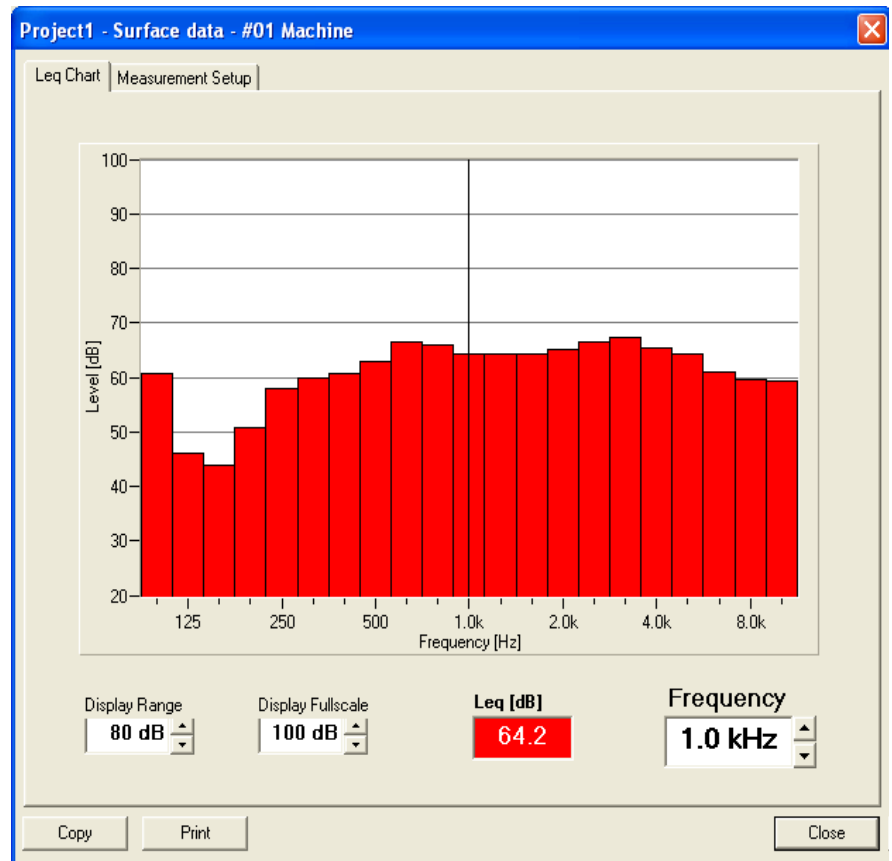
Shortcuts:

Toolbar: 

Keys: **Alt+Enter**

A window appears showing the graphical display of the measurement series (*Leq Chart* or *Reverberation Chart* depending on the type of measurement).

Leq Chart page



The sound pressure level is shown in form of a bar graph within the selected frequency range (select frequency range under *Extras > Options*). The average Leq in every 1/3 octave or 1/1 octave band is shown as a red bar. The numeric Leq value at the cursor frequency is shown in the Leq field below the chart.

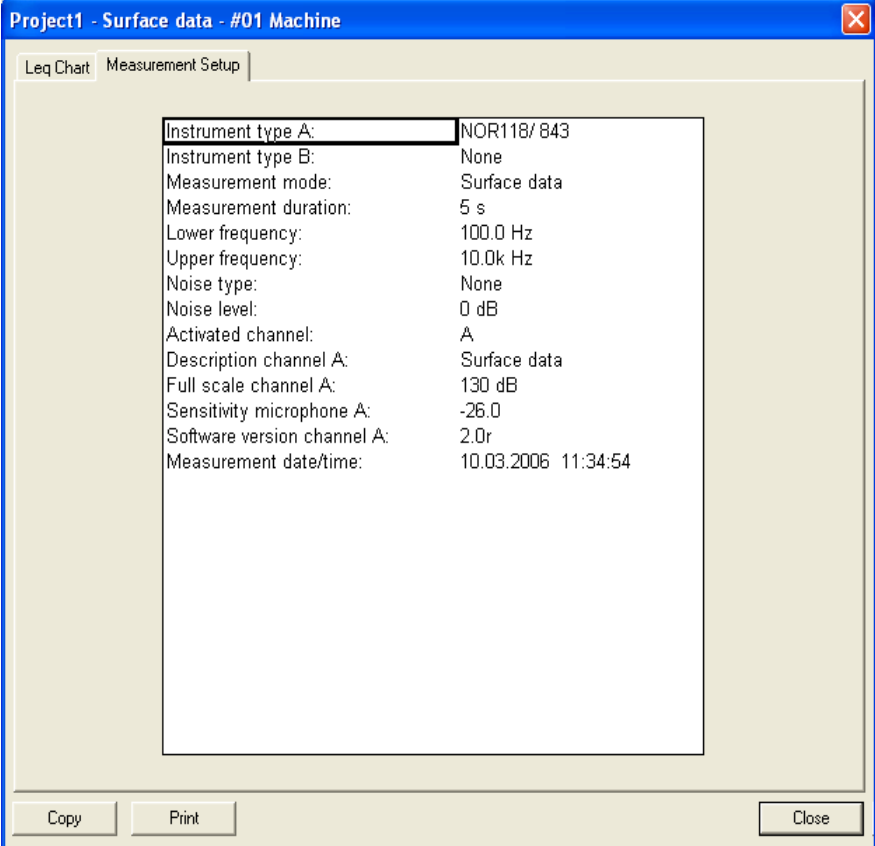
Any 1/3 octave or 1/1 octave bar can be selected by using the frequency up/down buttons or by dragging and dropping the cursor. Display Fullscale and Range can be modified by help of the corresponding control items.

Copy: Copies active chart to the Clipboard. Click into the chart to make it active for the copy function.

Print: Prints out the chart.

In case of a reverberation time measurement the command *View > Properties* will bring up a window showing the graphical display of the reverberation time spectrum.

Measurement Setup page



Project1 - Surface data - #01 Machine

Leq Chart Measurement Setup

Instrument type A:	NOR118/ 843
Instrument type B:	None
Measurement mode:	Surface data
Measurement duration:	5 s
Lower frequency:	100.0 Hz
Upper frequency:	10.0k Hz
Noise type:	None
Noise level:	0 dB
Activated channel:	A
Description channel A:	Surface data
Full scale channel A:	130 dB
Sensitivity microphone A:	-26.0
Software version channel A:	2.0r
Measurement date/time:	10.03.2006 11:34:54

Copy Print Close

This page displays relevant information about the measurement. The amount of information available depends on the type of data acquisition. If a measurement was acquired using the software module *CtrlPower*, there will be more detailed information available (e.g. noise type).

Copy: Copies the selection to the Clipboard.

Print: Prints out the table.

Background noise correction

Overview

The '*Background noise correction table*' is stored in the "Results" folder in the project tree. You can open the table by double-clicking on its title in the project tree. Alternatively you can use the *Open* command from the *View* menu or from the *Context* menu (right mouse click).

The entire table can be printed and exported, as described in the chapters *Printing* and *Export*. The '*Background noise correction table*' is a read only table.

'Background noise correction table':

Background noise correction table:

Machine.ctp - K1 - Background noise correction table					
Frequency [Hz]	L' _p [dB]	L'' _p [dB]	ΔL [dB]	K ₁ [dB]	Remarks:
100	67.9	35.1	32.8	0.0	
125	64.1	26.8	37.3	0.0	
160	61.7	34.2	27.5	0.0	
200	60.0	38.6	21.4	0.0	
250	59.6	32.4	27.2	0.0	
315	62.6	29.9	32.7	0.0	
400	62.6	27.6	35.0	0.0	
500	63.9	28.1	35.8	0.0	
630	66.8	22.9	43.9	0.0	
800	66.3	23.2	43.1	0.0	
1'000	64.5	21.6	42.9	0.0	
1'250	63.9	22.1	41.8	0.0	
1'600	65.4	21.1	44.3	0.0	
2'000	67.9	18.2	49.7	0.0	
2'500	70.1	17.6	52.5	0.0	
3'150	69.1	16.1	53.0	0.0	
4'000	68.2	15.5	52.7	0.0	
5'000	67.8	12.5	55.3	0.0	
6'300	65.8	11.5	54.3	0.0	
8'000	63.3	10.7	52.6	0.0	
10'000	62.0	8.3	53.7	0.0	
Sum A	78.6	34.5	44.1		
Legend:					
L' _p : Noise source under test level					
L'' _p : Background noise level					
ΔL: L' _p - L'' _p					
K ₁ : Corrections for background noise					
Sum A: The sum level is calculated according to the 1/3 octave band spectrum and the frequency limitations. It is a post-processed value and not a measured value.					

Background noise corrections according to ISO 3745:

The calculations according to ISO 3745 are using one background noise measurement on each surface measurement. NorPower calculates K1 only, when there are the same numbers of measurements in background noise and in surface data folder. NorPower keeps strictly the order of measurements.

The first surface measurement is using the first background noise measurement, and so on

In case of ISO 3745, the '*Background noise correction table*', can't be exported to MS Excel.

Procedure

To perform the background noise level correction do as follows:

1. Read the results of the background noise measurement from the analyser or from the measurement file (see chapter *Importing measurement data*).
2. Activate the correction by choosing *Extras > Background noise correction*.
3. The results can be seen in the '*Background noise correction table*'. The corrected values are used for further calculations.

Protocols

Overview

NorPower eases your work. That is why measurement protocols are created automatically according to the standard.

Parameters which are required for the analysis are simply typed into the grey input fields on the test report. The calculations in NorPower are done automatically, the entire project is updated as soon as all required input values have been entered or when individual values are changed.

Protocols are stored in the "Results" folder in the project tree. Depending of the Standard and the selected environmental correction, the folder contains the following sub-folders

- *Test report*
- *Result table*
- *K1Background noise correction table*
- *D'I Apparent Directivity index table*
- *If K2 is not null: K2 Environmental correction table'*

You can open a protocol by double-clicking on the desired item in the project tree. Alternatively you can use the *Open* command from the *View* menu or from the *Context* menu (right mouse click).

Test report

The '*Test report*' is the formal report sheet as specified in the selected standard. It presents project descriptions, the input parameters and both the numerical and graphical representation of the spectrum of the calculated quantity.

All grey fields on the 'Test report' can be edited. All fields are text fields. The plausibility of the fields including numeric values is checked automatically. In order to insert a line break within an input cell, use *Ctrl+Enter*.

'Test report':

Sound power levels according to ISO 3744:1994																																													
Engineering methods for an essentially free field over a reflecting plane																																													
Client:	Date of test:																																												
Object:																																													
Mounting conditions:																																													
Operating conditions:																																													
Temperature: °C	Reference Box:																																												
Relative humidity: %	d0: 2.06 m																																												
	L1 (Length): 3.00 m																																												
	L2 (Width): 2.00 m																																												
	L3 (Height): 1.00 m																																												
	Surface: Parallelepiped, 1 reflecting plane																																												
	Surface area: 56.00 m²																																												
	Distance: 1.00 m																																												
<table><thead><tr><th>Frequency f [Hz]</th><th>L_W 1/3 octave [dB]</th></tr></thead><tbody><tr><td>100</td><td>85.4 ²</td></tr><tr><td>125</td><td>81.6 ²</td></tr><tr><td>160</td><td>79.2 ²</td></tr><tr><td>200</td><td>77.5 ²</td></tr><tr><td>250</td><td>77.1 ²</td></tr><tr><td>315</td><td>80.1</td></tr><tr><td>400</td><td>80.1</td></tr><tr><td>500</td><td>81.4</td></tr><tr><td>630</td><td>84.3</td></tr><tr><td>800</td><td>83.8</td></tr><tr><td>1'000</td><td>82.0</td></tr><tr><td>1'250</td><td>81.4</td></tr><tr><td>1'600</td><td>82.9</td></tr><tr><td>2'000</td><td>85.4</td></tr><tr><td>2'500</td><td>87.6</td></tr><tr><td>3'150</td><td>86.6</td></tr><tr><td>4'000</td><td>85.7</td></tr><tr><td>5'000</td><td>85.3</td></tr><tr><td>6'300</td><td>83.3 ²</td></tr><tr><td>8'000</td><td>80.8</td></tr><tr><td>10'000</td><td>79.5</td></tr></tbody></table>	Frequency f [Hz]	L _W 1/3 octave [dB]	100	85.4 ²	125	81.6 ²	160	79.2 ²	200	77.5 ²	250	77.1 ²	315	80.1	400	80.1	500	81.4	630	84.3	800	83.8	1'000	82.0	1'250	81.4	1'600	82.9	2'000	85.4	2'500	87.6	3'150	86.6	4'000	85.7	5'000	85.3	6'300	83.3 ²	8'000	80.8	10'000	79.5	<table><caption>Sound power level L_W(A): 96.1 dB</caption></table>
Frequency f [Hz]	L _W 1/3 octave [dB]																																												
100	85.4 ²																																												
125	81.6 ²																																												
160	79.2 ²																																												
200	77.5 ²																																												
250	77.1 ²																																												
315	80.1																																												
400	80.1																																												
500	81.4																																												
630	84.3																																												
800	83.8																																												
1'000	82.0																																												
1'250	81.4																																												
1'600	82.9																																												
2'000	85.4																																												
2'500	87.6																																												
3'150	86.6																																												
4'000	85.7																																												
5'000	85.3																																												
6'300	83.3 ²																																												
8'000	80.8																																												
10'000	79.5																																												

Descriptive Inputs:

For identification purpose the input for 'No. of test report' (which can also be edited as you wish) is automatically copied into the last line of the 'Result table'. The entry for the field 'Company' will be stored so that it will remain unchanged even when starting a new project.

Numerical Inputs:

The required numerical input parameters depend on the analysis. Use the keyboard to enter the values into the grey input fields.

If the function *Extras > Background noise correction* is activated, invalid results in the table will be marked with a reference to a footnote. The footnote 'Background noise too high' indicates that the calculated value is invalid due to an insufficient signal-to-noise ratio.

Result table

The '*Result table*' contains all numerical results of the analysis.

If the function *Extras > Background noise correction* is activated, the last column of the result table will contain descriptive information about the background noise.

For identification purpose the input for 'No. of test report' on the 'Test report' (which can also be edited as you wish) is automatically copied into the last line of the 'Result table'. It can only be changed on the 'Test report'.

'Result Table':

Sound power levels according to ISO 3744:1994

Engineering methods for an essentially free field over a reflecting plane

Sound power level L_{WA} : 96.1 dB

Frequency [Hz]	L_{WA} [dB]	L_{pf} [dB]	K_1 [dB]	K_2 [dB]	
100	85.4	67.9	0.0	0.0	Failed: Points
125	81.6	64.1	0.0	0.0	Failed: Points
160	79.2	61.7	0.0	0.0	Failed: Points
200	77.5	60.0	0.0	0.0	Failed: Points
250	77.1	59.6	0.0	0.0	Failed: Points
315	80.1	62.6	0.0	0.0	
400	80.1	62.6	0.0	0.0	
500	81.4	63.9	0.0	0.0	
630	84.3	66.8	0.0	0.0	
800	83.8	66.3	0.0	0.0	
1'000	82.0	64.5	0.0	0.0	
1'250	81.4	63.9	0.0	0.0	
1'600	82.9	65.4	0.0	0.0	
2'000	85.4	67.9	0.0	0.0	
2'500	87.6	70.1	0.0	0.0	
3'150	86.6	69.1	0.0	0.0	
4'000	85.7	68.2	0.0	0.0	
5'000	85.3	67.8	0.0	0.0	
6'300	83.3	65.8	0.0	0.0	Failed: Points
8'000	80.8	63.3	0.0	0.0	
10'000	79.5	62.0	0.0	0.0	
Sum A	96.1			0.0	

Temperature:

Relative humidity:

°C

%

d0:

L1 (Length):

L2 (Width):

L3 (Height):

2.06 m

3.00 m

2.00 m

1.00 m

Reference Box:

Surface:

Parallelepiped, 1 reflecting plane

Surface area: 56.00 m²

Distance: 1.00 m

Remarks:

Background noise correction table

The background noise correction table is explained in chapter *Background noise correction*.

Directivity index table

The '*Directivity index table*' is stored in the "Results" folder in the project tree. You can open the table by double-clicking on its title in the project tree. Alternatively you can use the *Open* command from the *View* menu or from the *Context* menu (right mouse click).

The entire table can be printed, as described in the chapters *Printing*. The '*Directivity index table*' is a read only table.

The '*Directivity index table*', can't be export to MS Excel.

'*Directivity index table*':

Machine.ctp - D'I - Apparent Directivity index table										
Frequency	D'lmax	V'l	N	#01 Machin	#02 Machin	#03 Machin	#04 Machin	#05 Machin	#06 Machin	#
[Hz]	[dB]	[dB]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
100	8.5	6.2	9	-7.1	-1.2	-8.0	8.5	-11.4	-4.2	
125	9.5	9.2	9	-17.9	-14.7	-18.2	9.5	-18.3	-16.6	
160	9.3	7.8	9	-17.8	-10.6	-14.2	9.3	-14.2	-10.5	
200	8.8	5.6	9	-9.2	-7.3	-8.3	8.8	-8.6	-6.6	
250	7.2	3.7	9	-1.8	-2.3	-4.3	7.2	-4.1	-4.3	
315	4.8	2.4	9	-2.8	0.9	-2.0	4.8	-1.9	-0.5	
400	2.7	1.7	9	-1.8	0.0	-0.1	2.7	-0.8	1.1	
500	3.0	1.3	9	-1.1	-0.5	-0.2	3.0	-0.4	0.0	
630	1.5	1.3	9	-0.4	0.4	-0.3	0.3	0.5	1.5	
800	1.7	1.2	9	-0.5	0.3	-1.4	1.7	-1.1	1.3	
1'000	1.6	1.3	9	-0.3	1.1	-0.5	1.6	-1.9	-0.8	
1'250	1.4	0.9	9	0.3	0.3	0.1	1.4	-0.3	-1.7	
1'600	1.1	0.8	9	-1.0	-0.5	1.0	1.1	0.2	-0.5	
2'000	3.4	1.8	9	-2.7	-1.1	-0.1	3.4	1.4	-0.7	
2'500	4.4	2.5	9	-3.7	-2.3	0.1	4.4	1.9	-2.0	
3'150	3.2	1.7	9	-1.7	-0.1	1.0	3.2	-0.5	-0.3	
4'000	4.4	2.2	9	-2.8	-1.6	-0.4	4.4	0.6	-1.7	
5'000	3.5	2.8	9	-3.6	-3.1	0.8	2.3	3.5	-2.3	
6'300	4.4	3.8	9	-4.8	-3.9	2.4	4.4	3.4	-3.6	
8'000	4.1	3.1	9	-3.6	-2.3	1.7	4.1	2.9	-2.6	
10'000	4.0	2.2	9	-2.7	-1.9	1.3	4.0	0.3	-2.7	
Sum A	3.4	27.8		-2.2	-1.1	0.4	3.4	1.2	-1.0	
Legend:										
D'lmax: Maximum directivity index										
V'l: Apparent surface sound pressure level non-uniformity index										
N: Number of microphone positions										
SumA: The sum level is calculated according to the 1/3 octave band spectrum and the frequency limitations. It is a post-processed value and not a measured value.										

Environmental correction table

The 'Environmental correction table' is stored in the "Results" folder in the project tree. You can open the table by double-clicking on its title in the project tree. Alternatively you can use the *Open* command from the *View* menu or from the *Context* menu (right mouse click).

The entire table can be printed and exported, as described in the chapters *Printing* and *Export*.

'Environmental correction table' in a reference sound source project:

Environmental correction table in a reference sound source project.

Machine - K2 - Environmental correction table				
Frequency [Hz]	L' _{p(RSS)} [dB]	L _{wR} [dB]	K ₂ [dB]	Remarks:
100	66.7	65.0	19.2	
125	49.4	65.0	1.9	
160	51.1	65.0	3.6	
200	52.7	65.0	5.2	
250	57.3	65.0	9.8	
315	63.5	65.0	16.0	
400	62.6	65.0	15.1	
500	63.4	65.0	15.9	
630	67.2	65.0	19.7	
800	66.6	65.0	19.1	
1'000	65.6	65.0	18.1	
1'250	64.2	65.0	16.7	
1'600	64.9	65.0	17.4	
2'000	66.8	65.0	19.3	
2'500	67.8	65.0	20.3	
3'150	69.0	65.0	21.5	
4'000	66.6	65.0	19.1	
5'000	64.7	65.0	17.2	
6'300	61.9	65.0	14.4	
8'000	61.0	65.0	13.5	
10'000	60.1	65.0	12.6	
Sum A	77.6	76.7	18.3	K ₂ too high. Standard is not applicable
Legend:				
L' _{p(RSS)} :	Reference sound source level			
L _{wR} :	Sound power level of the calibrated reference sound source			
K ₂ :	Environmental correction			
Sum A:	The sum level is calculated according to the 1/3 octave band spectrum and the frequency limitations. It is a post-processed value and not a measured value.			

'Environmental correction table' in a room absorption project:

Machine.ctp - K2 - Environmental correction table			
Frequency [Hz]	T [s]	K ₂ [dB]	Remarks:
100	2.10	14.0	
125	0.65	9.2	
160	0.32	6.7	
200	0.58	8.8	
250	0.50	8.3	
315	0.51	8.3	
400	0.57	8.7	
500	0.57	8.7	
630	0.61	9.0	
800	0.52	8.4	
1'000	0.52	8.4	
1'250	0.52	8.4	
1'600	0.58	8.8	
2'000	0.53	8.5	
2'500	0.53	8.5	
3'150	0.55	8.6	
4'000	0.51	8.3	
5'000	0.46	7.9	
6'300	0.40	7.4	
8'000	0.35	7.0	
10'000	0.32	6.7	
A-Net	0.52	8.4	K ₂ too high. Standard is not applicable
Legend: T: Reverberation time K ₂ : Environmental correction A-Net: The reverberation time measured in the frequency band with a midband frequency of 1 kHz is used			

Export

Overview

An entire NorPower project, including the averaged measurement data and all result sheets, can be saved as an Excel file. This eases your work when further user-specific editing and formatting in MS-Excel or Word is desired.

NorPower uses Excel templates which are pre-formatted according to the selected standard of the project which is exported. The entire NorPower project, including the measurement data and all result sheets, are written into the Excel template.

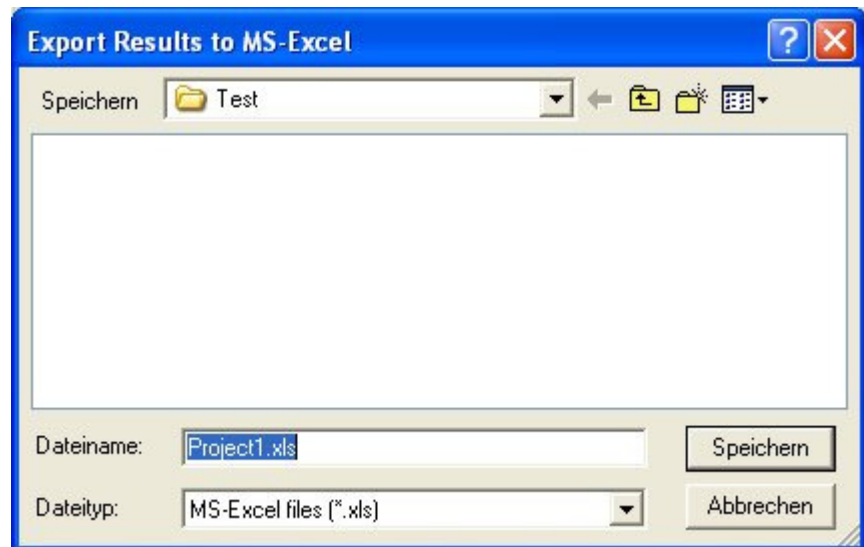
You do not need to select the template file during export, the correct file is found automatically based on the standard according to which the analysis was conducted.

Export command


Use the command *File > Export* to export the entire project to Excel.

Use the command *File > Export All* to export all projects to Excel.

1. Select the desired project in the workspace by clicking on it.
2. Choose *Export* either from the *File* menu or from the *Context* menu (right mouse click).
3. A dialog box appears to save the Excel file. Define directory and file name.
4. Press *Save*.



Shortcuts:

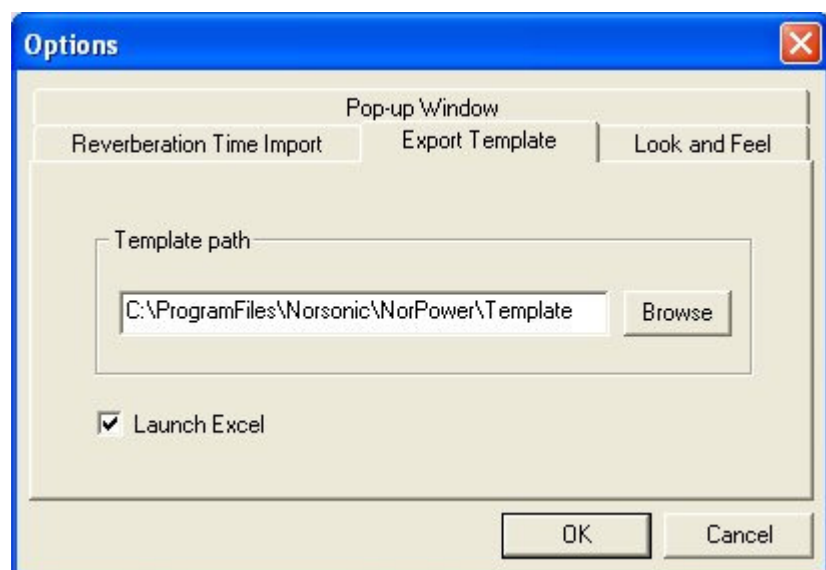
Toolbar: 

Location and name of Excel templates

By default the Excel templates are stored in the NorPower program folder. In the 'Template' folder there is one template for each type of analysis available in NorPower.

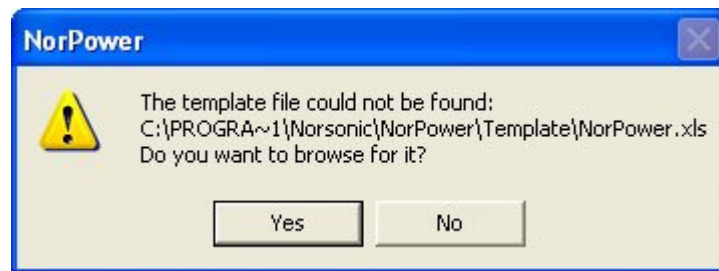
It is only necessary to change the template path if you want the templates to be stored in a directory other than the default directory (e.g. on the network if several people require access to the templates).

Use the 'Export Template' tab under *Extras > Options* in order to change the path of the Excel templates:



Activate the check box 'Launch Excel' if Excel shall be started after export.

If the template path set here is not correct NorPower will not find the required template during export. In that case it will bring up the error message:



You can then decide to abort the export or to browse for the templates yourself.

Name of templates:

During export the templates can only be found by NorPower if the original template name remains unchanged. The templates are named after the standard according to which the analysis is made. The name of the templates shall not be changed. If the name of a template has been changed by mistake NorPower will not find the template during the export and brings up the error message as above.

After having modified the Excel sheets in the 'Template' folder, you can still find the original template files in the corresponding folder on the installation CD.

Working with Excel templates

NorPower uses Excel templates which are pre-formatted according to the selected standard of the project which is exported.

The entire NorPower project, including the measurement data and all result sheets, are written into the Excel template. The templates can be edited and formatted according to your specific needs.

An Excel template contains protocol sheets and one data sheet:

- *Test report*
- *Result table*
- *K1 Background noise correction table*
- *If K2 is not null: K2 Environmental correction table'*
- *Data*

The protocols represent the forms that are stored in the "Results" folder in the NorPower project tree. For more detailed information about the protocols in NorPower, see chapter *Protocols*.

The layout of the protocol spreadsheets can be defined according to the specific needs of the user. For example, you can change the content of any cell, add descriptions, enlarge cells to fit more text, add a company logo, change the graph properties etc.

Working in Excel:

- In order to display the grid and the row and column titles in Excel, use the corresponding checkboxes under *Extras > Options > View*.
- In order to insert a line break within an Excel cell, for example for the description, use *Alt+Enter*.
- In order to change the settings of the graph (e.g. axis scaling or line colour) double-click on the desired item of the diagram (e.g. x-axis, y-axis or curve) to bring up the according Excel dialog box.

After having modified the Excel sheets in the 'Template' folder, you can still find the original template files in the sub-folder 'Backup' (see *Location and name of Excel files*).

Tip: It is strongly recommended to copy all your modified Excel templates (in the folder 'Template') and store them at a different location as a backup. These templates could be overwritten during a new installation of NorPower at a later point in time, so that all your templates would be lost.

From Excel to Word

As described above NorPower projects are exported directly to Excel in order to make use of the extensive functionality that Excel offers for user-specific formatting (e.g. of the diagram).

If you want to paste your individual Excel sheet into a Word document in order to use it as one page of your complete measurement report, do as follows:

1. Mark the desired area of the Excel worksheet.
2. Use the command *Edit > Copy* or *Ctrl+C* to copy the selection into the clipboard.
3. In the Word document, click on the position where the Excel sheet shall be inserted.
4. In Word, use the command *Edit > Paste special* and the option '*as Microsoft Excel-worksheet-object*'.
5. Click *OK*. The Excel sheet will then be pasted into Word retaining its original formatting and scaling.

Tip:

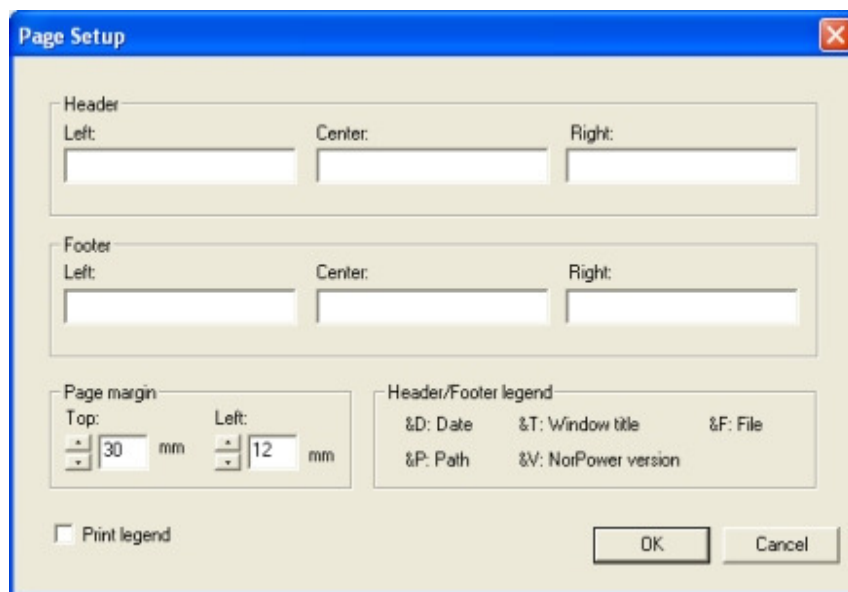
If you paste the Excel sheet into Word using the command *Edit > Paste* or *Ctrl+V*, the original formatting will be lost. If you paste the Excel sheet into Word using the command *Edit > Paste special* as '*Graphic*', the original scaling will be lost.

Printing

Page setup


Use the command *File > Page Setup* to define your page setup. This command is only available when the desired window to be printed is active. Click into the window to make it active for the Page Setup function.

The "Page Setup" dialog box:



In the dialog box you can define the page margins (Top and Left) and the header and footer. In the header and footer fields you can enter text via the keyboard and include the current date, the window title, the file name, the file path and the software version of NorPower, using the short commands "&D", "&T", "&F", "&P" or "&V" respectively.

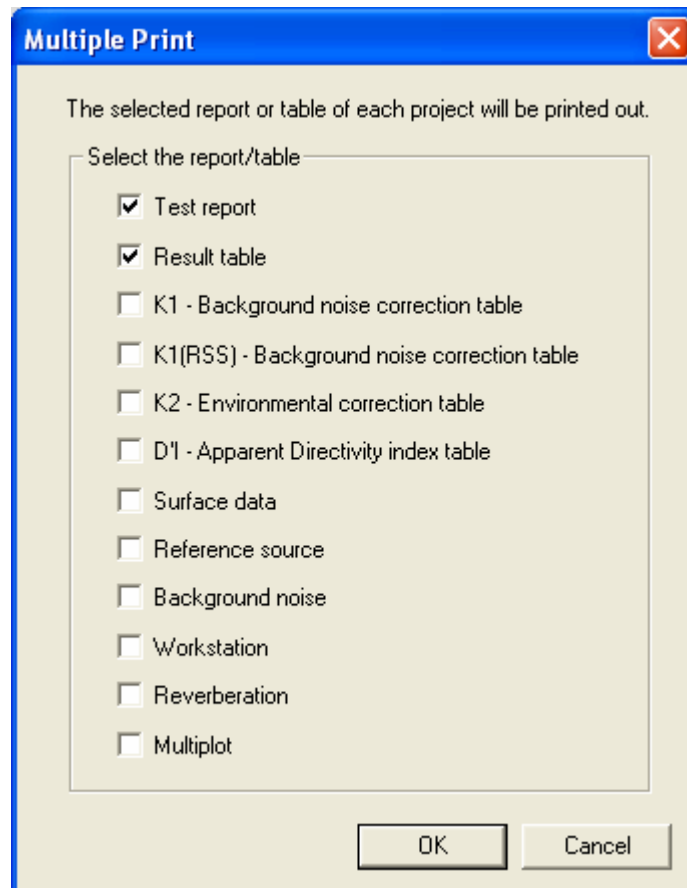
Print

After having defined the Page setup as described above, you can print the active window using the command *File > Print* or the symbol  on the toolbar.

Multiple Print

Use the command *File > Multiple Print...* to print out reports and tables of each project.

The "Multiple Print" dialog box:



In the dialog box you selected the reports and tables to be printed out.

Multiplots

Option Multiplot

NorPower offers the option to plot multiple result curves or measurements within the same diagram. It is possible to display up to 10 calculated result curves or measurements within one diagram.

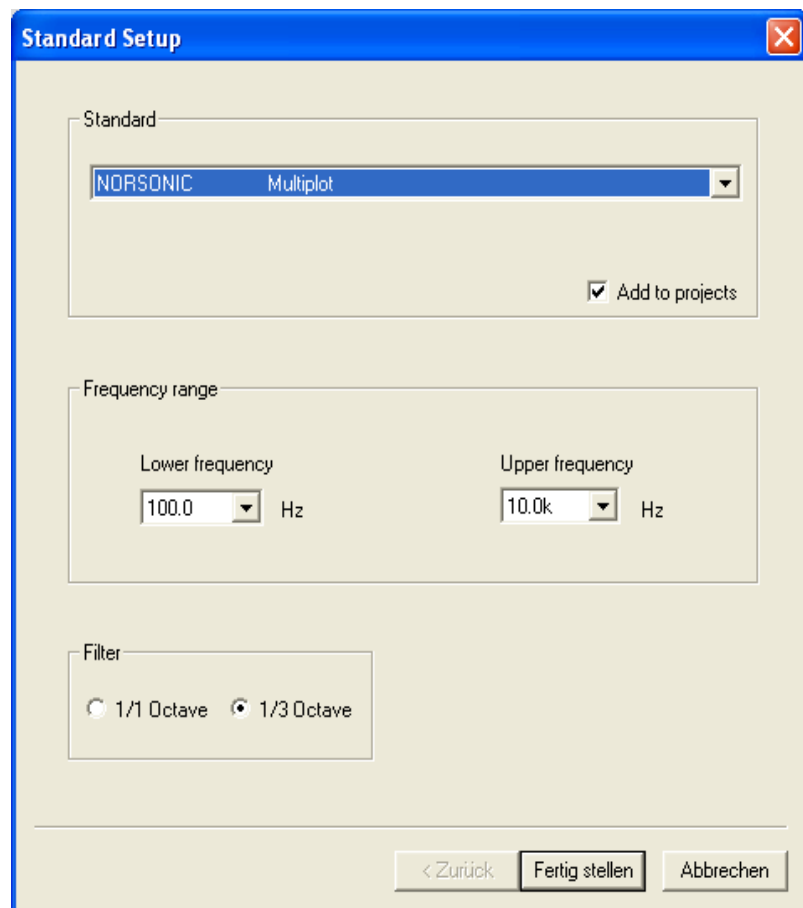
Please proceed as follows:

Creating a Multiplot project

A new project is created as explained in the chapter *Creating a project*. Please select “NORSONIC *Multiplot*” on the Standard Setup dialog box.

A Multiplot project is then created. Within the project, functions like *Save*, *Open* etc. can be applied as in all other NorPower projects.

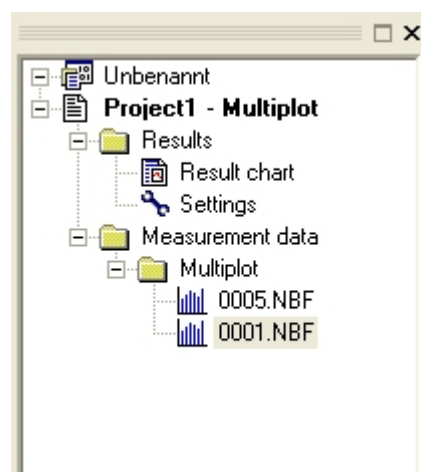
The "Standard Setup" dialog box with the option 'Multiplot':



Working in the workspace with Multiplot

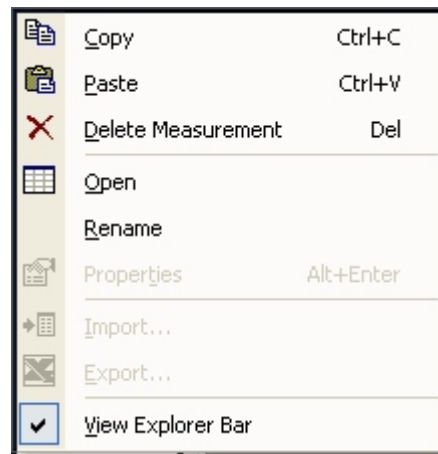
The workspace of a Multiplot project contains the main folders "Results" and "Measurement data". The folder "Results" contains the 'Result chart' and the according 'Settings'. The imported measurements can be found in the folder "Multiplot".

Workspace window of a Multiplot project:



Within the project tree it is possible to open, copy, paste, delete or rename the different items.

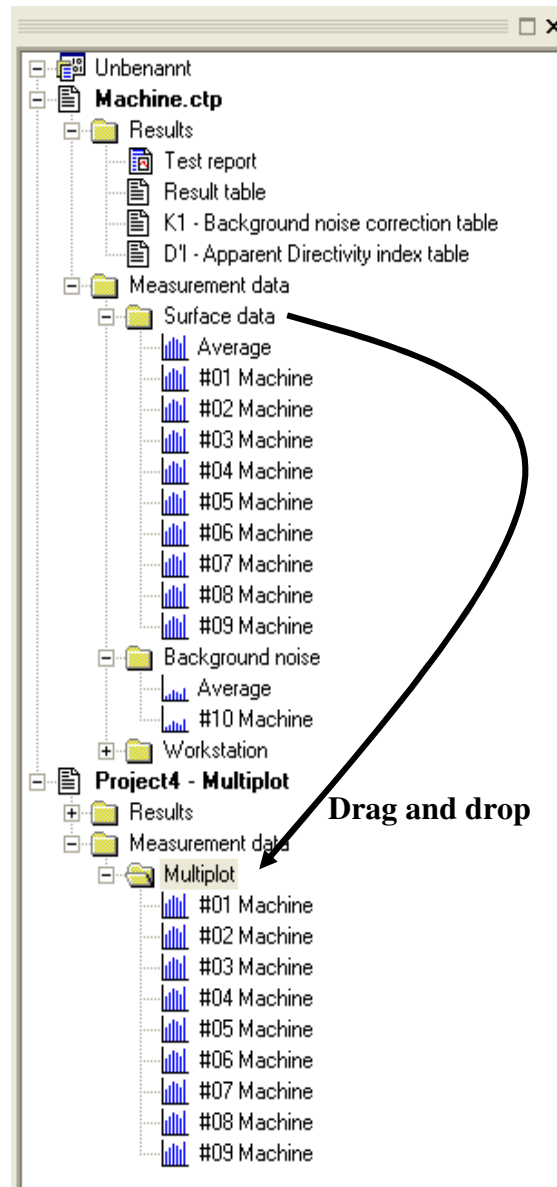
Context menu of the workspace:



Multiplot projects cannot be exported. The following chapter explains how data can be imported into a Multiplot project.

Data import in Multiplot project

Within Multiplot projects the menu item *Import* is inactive. Data can be imported from other NorPower projects (which are opened in the same workspace) using the functions *Copy / Paste* or *drag & drop*.

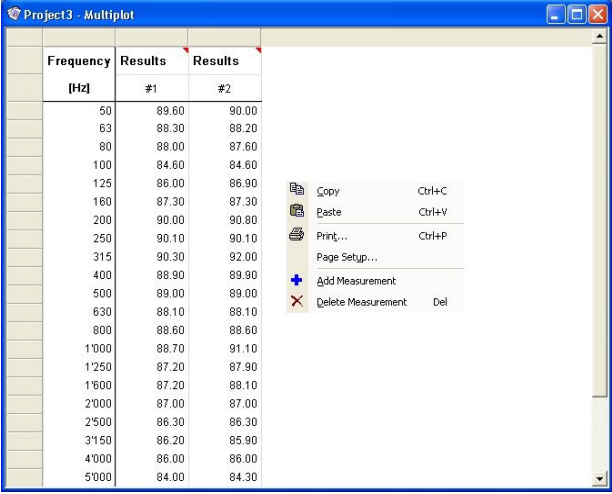


A maximum of 10 measurements can be inserted into the Multiplot project.

Table of measurement series for Multiplots

The measurement tables are stored in the folder "Measurement data". Within the table the data can be altered as usual. Single numerical values and the measurement title can be deleted, copied, pasted or altered. It is also possible to add, delete, copy or paste entire measurements. The entire table can be printed, as described in the chapter *Printing*.

Multiplot measurement table:



The screenshot shows a software window titled "Project3 - Multiplot". It contains a table with the following data:

Frequency	Results	Results
[Hz]	#1	#2
50	89.60	90.00
63	88.30	88.20
80	88.00	87.60
100	84.60	84.60
125	86.00	86.90
160	87.30	87.30
200	90.00	90.80
250	90.10	90.10
315	90.30	92.00
400	88.90	89.90
500	89.00	89.00
630	88.10	88.10
800	88.60	88.60
1'000	88.70	91.10
1'250	87.20	87.90
1'600	87.20	88.10
2'000	87.00	87.00
2'500	86.30	86.30
3'150	86.20	85.90
4'000	86.00	86.00
5'000	84.00	84.30

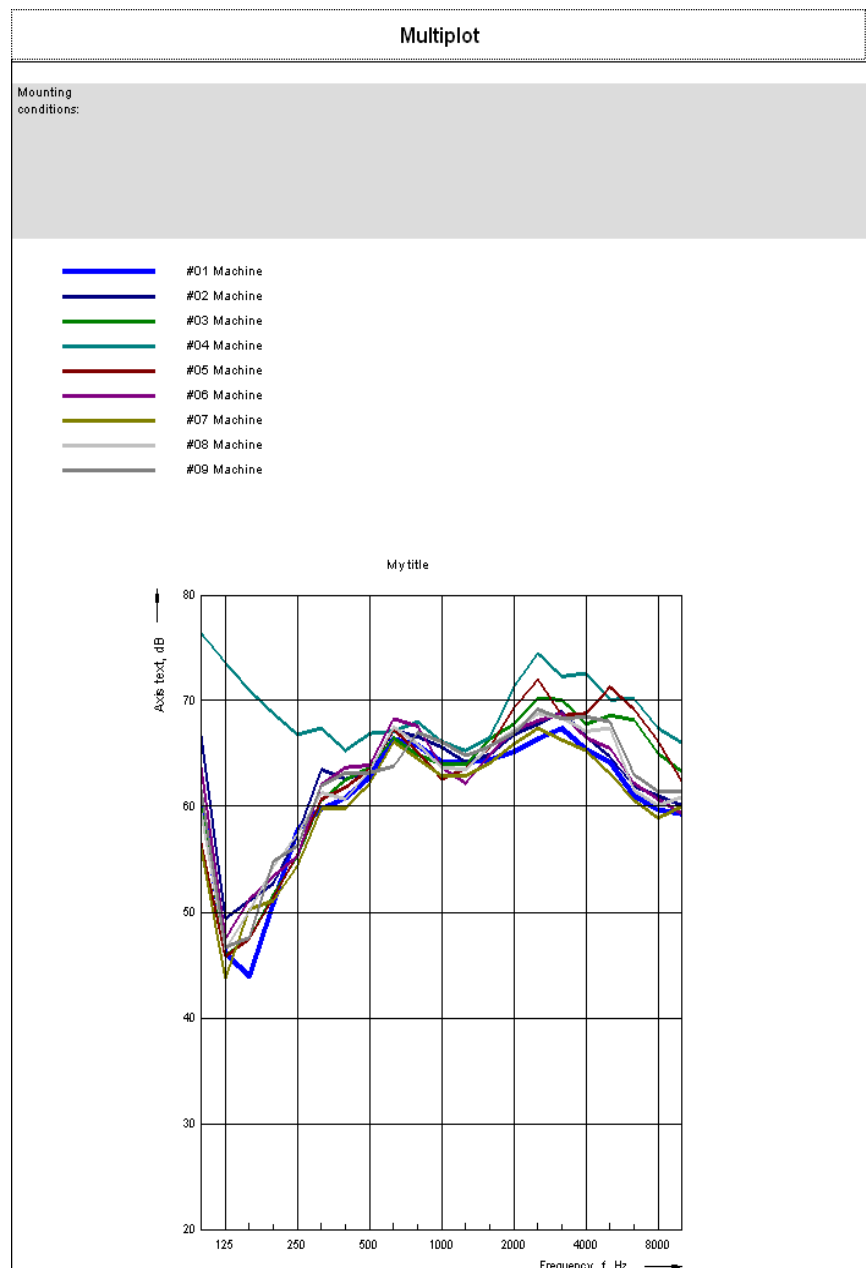
A context menu is open over the table, showing the following options:

- Copy (Ctrl+C)
- Paste (Ctrl+V)
- Print...
- Page Setup...
- Add Measurement
- Delete Measurement (Del)

Result graph

All Multiplot spectra which are stored in the folder "Measurement data" are displayed in the Multiplot Result chart. A legend above the diagram shows the name, line type and line colour of the respective Multiplot spectrum.

The grey field "Mounting conditions" can hold any input from the keypad. It is also possible to apply the functions *Copy* / *Paste* on this text field. The result graph can be printed, as described in the chapter *Printing*.



Graph modifications and settings can be made as described in the following section.

Multiplot set-up

The settings of the Multiplot graph can be opened from within the folder "Results". In the dialog box "Multiplot settings" the following graph settings can be made:

- The graph type can be chosen between Level and Reverberation. This setting affects the size, scaling and labeling of the graph.
- When setting the line style you can select between 'Thickness' and 'Pattern'. When selecting 'Thickness' there will be five lines of different thickness available. When selecting 'Pattern' there will be five lines of different type available (e.g. dashed line, dotted line etc.)
- A line colour can be chosen for each spectrum.
- The title of a line cannot be altered, it is only used for assigning the spectra. A title can only be changed within a measurement table.
- The graph scaling can be chosen by help of the settings 'max. value' and 'Range', unless 'Autoscale' is activated.
- The field 'Graph text' is an input field. Any graph titles and Y-axis labelings can be entered.

Multiplot settings of the chart:

Multiplot Setup

Graph Type
☒ Level ☐ Reverberation

Graph Line
☒ Thickness ☐ Pattern

Line style	Line color	Line title
[Line style 1]	[Blue]	#01 Machine
[Line style 2]	[Dark Blue]	#02 Machine
[Line style 3]	[Green]	#03 Machine
[Line style 4]	[Teal]	#04 Machine
[Line style 5]	[Red]	#05 Machine
[Line style 6]	[Purple]	#06 Machine
[Line style 7]	[Olive]	#07 Machine
[Line style 8]	[Grey]	#08 Machine
[Line style 9]	[Dark Grey]	#09 Machine
[Line style 10]	[Red]	#10

Graph Scale
☒ Autoscale
Max. Value []
Range []

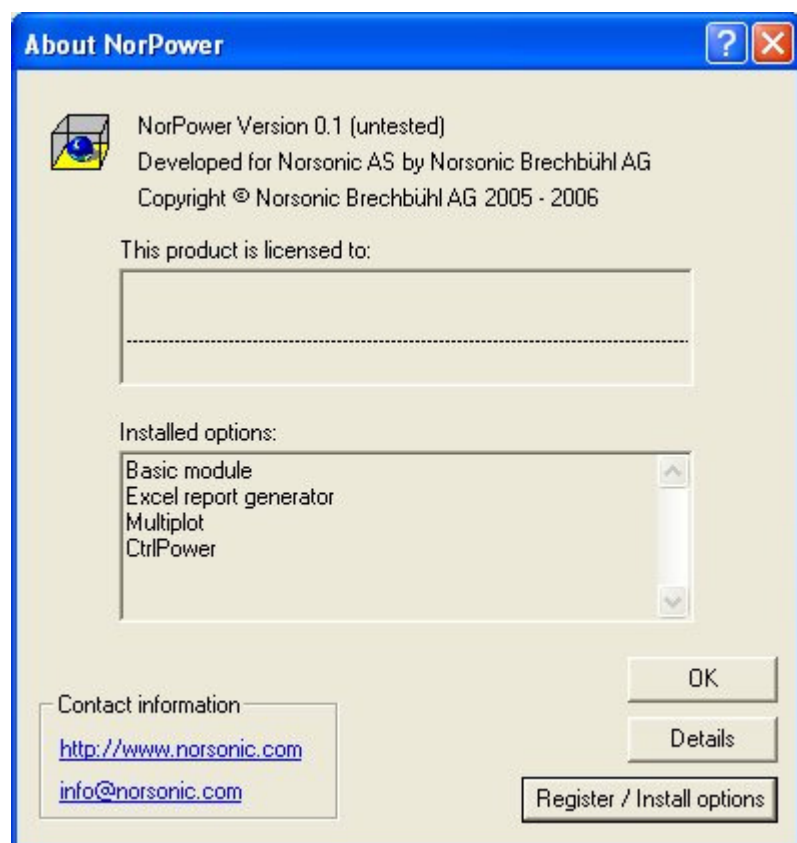
Graph Text
Title [My title]
Y-Axis [Axis text]

OK Cancel Apply

Installing options

About command

Use the *About* command (*Help* menu) to display the dialog box:



The dialog box displays the program information, version number and copyright. License information and installed options are also displayed. This dialog box will open automatically when you run a copy of NorPower that has not been registered.

Possible error messages

- If you try to start a program option that has not been installed (e.g. CtrlPower) the following error message will appear: "Option 'CtrlPower' is not present".
- If your license for NorPower has expired the following error message will appear: "This license has expired x days ago".

In these cases please contact your local Norsonic representative to obtain a valid license key.

Details

Click this button to get detailed version information.

Register / Install options

Click this button to register your copy of NorPower or to install new options. The "Product Registration" dialog box will open. Key in the Company, User name and the 32 character Registration code exactly as written in your license information. You may enter DEMO to enable all available options for a 60 day trial period.



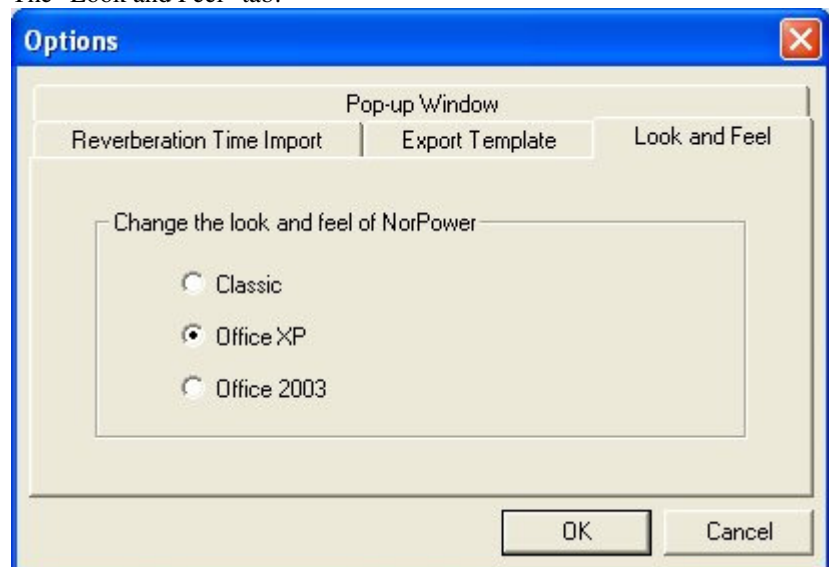
The image shows a Windows-style dialog box titled "Product Registration". It has a blue title bar with a close button (X) in the top right corner. The main area is light beige and contains the following text: "Please enter the 32 character registration code supplied by your vendor or enter 'DEMO' to enable all available options for a 60 day trial period." Below this text are three input fields, each with a label to its left: "Company:", "User name:", and "Registration code:". At the bottom right of the dialog are two buttons: "Register" and "Cancel".

Additional features

Look and feel

The option 'Look and Feel' allows choosing the style in which NorPower should appear. It can be set under *Extras > Options*.

The "Look and Feel" tab:



Choose either the 'Classic', 'Office XP' or 'Office 2003' style.

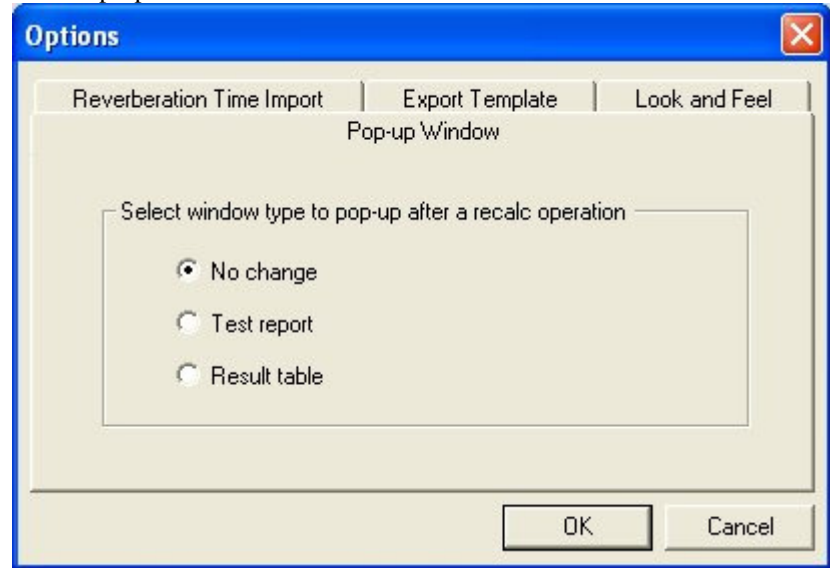
Pop-up window

This option allows defining which window should pop up after a recalculation operation.

The calculations in NorPower are done automatically, a recalculation is done as soon as any input parameter is changed or when calculation options are enabled/disabled (e.g. *Extras > Background noise correction*).

By default the 'Test report' is selected to pop up immediately after a recalculation operation.

The "Pop-up Window" tab:



Choose either the 'Test report' or 'Result table' to pop up after a recalculation operation or choose 'No Change'.

Arrange windows

The menu *Window* contains commands to arrange multiple opened windows in certain ways:

- *Cascade*: arranges all opened windows as overlapping tiles.
- *Tile*: arranges all opened windows as horizontal non-overlapping tiles.
- *Arrange Icons*: arranges the icons for minimized windows at the bottom of the main window. If there is an open window at the bottom of the main window, then some or all of the icons may not be visible because they will be underneath this open window.

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