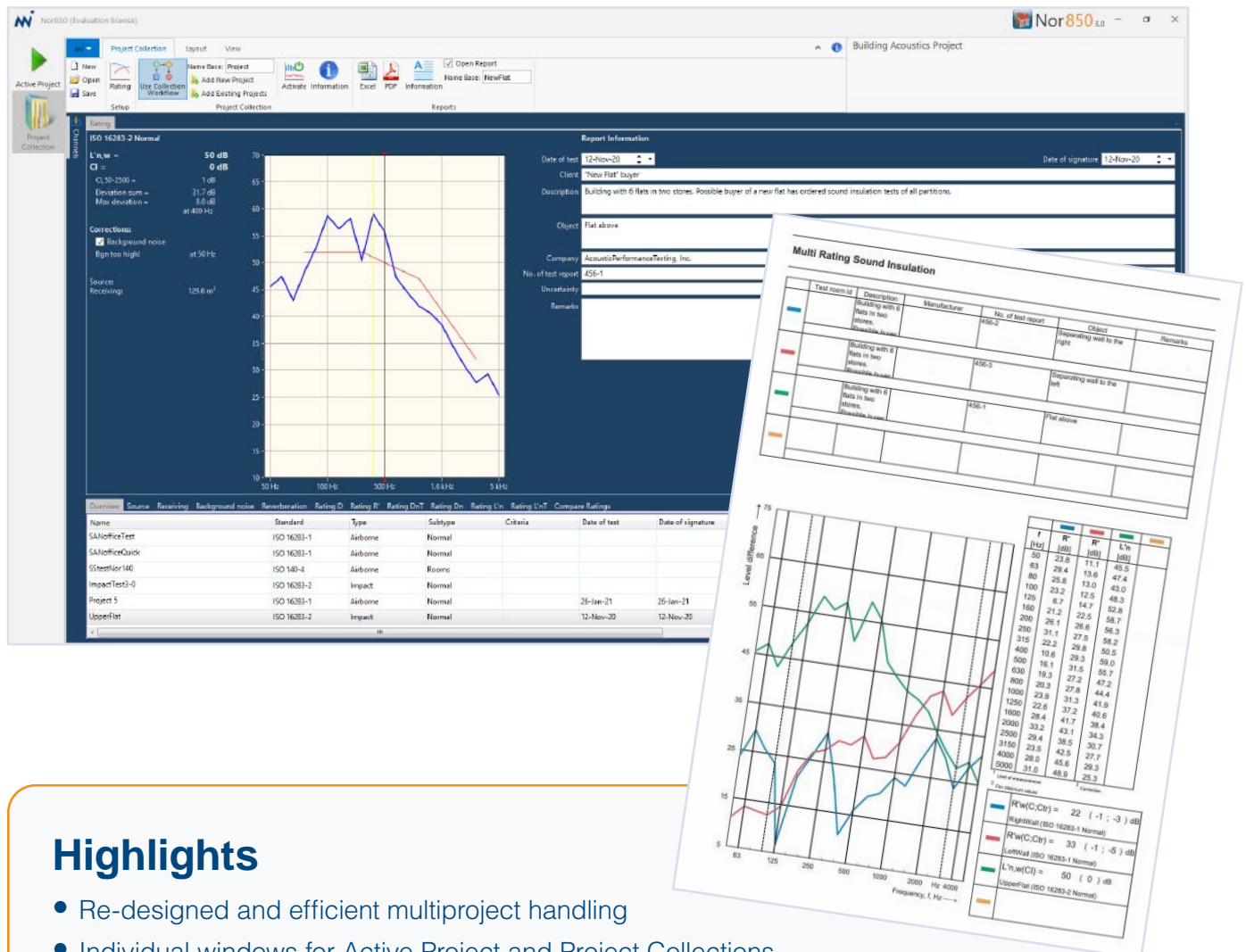# Short form manual Nor850 v3
Introduction and highlights

Highlights

- Re-designed and efficient multiproject handling
- Individual windows for Active Project and Project Collections
- Automated workflow features
- Pre-setting of planned project with setup transfer to individual instruments
- Arithmetic, energetic or inverse energetic averaging of multiple rating indices
- Simultaneous editing of report information in multiple rating reports
- Rating reports in .pdf format
- Multi-project rating reports
- Extended search and filtering features for Rating index higher/lower than xx dB
- Calculation of survey service equipment in accordance with ISO 10052
- Calculations of sound intensity transmission loss in accordance with ISO 15186-2
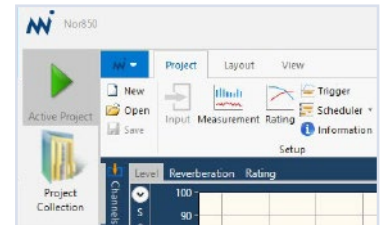
Active Project & Project Collection

In the Nor850 software version 3, Norsonic introduce a new efficient workflow feature for Building Acoustics and Sound Power testing. The new feature offers the users several great improvements such as automatic storage in pre-defined project groups, pre-setting of measurement and report properties for planned projects, easy drag&drop of data from one project to another, easy comparison of project results, multiple project report forms, and more.

Principles

In the former version 2.x, multiple tabs were used for multiple projects where each tab represented one specific project. This functioned well as long as the number of projects (i.e. tabs) was limited to less than 8-10, but for larger laboratories this principle created practical problems and slowed down the system when running 50-100 projects which needed the same number of tabs.

In version 3, Norsonic use the following definitions or phrases:

— *Measurement* is each single level, background or reverberation time measurement taken at one specific microphone position (or microphone boom sweep

— *Project* is a group of various measurements that put together gives the result of the full test (the LwA of a pump, or the sound insulation index R'w of a door, etc.)

— *Project Collection* is the group of projects that the user has decided to evaluate together for comparison or other reasons (all the walls inside a building, or various pumps from the same supplier, etc.)

— *Active Project* is the project in the selected collection which currently is connected to the measurement channels and into which new data are imported for each new measurement

Based on the above definitions, the Nor850 software version 3 has two main windows which are selectable by the buttons in the upper left corner named *Active Project* and *Project Collection*. For users with multiple screens, these windows may be separated for simultaneous view.
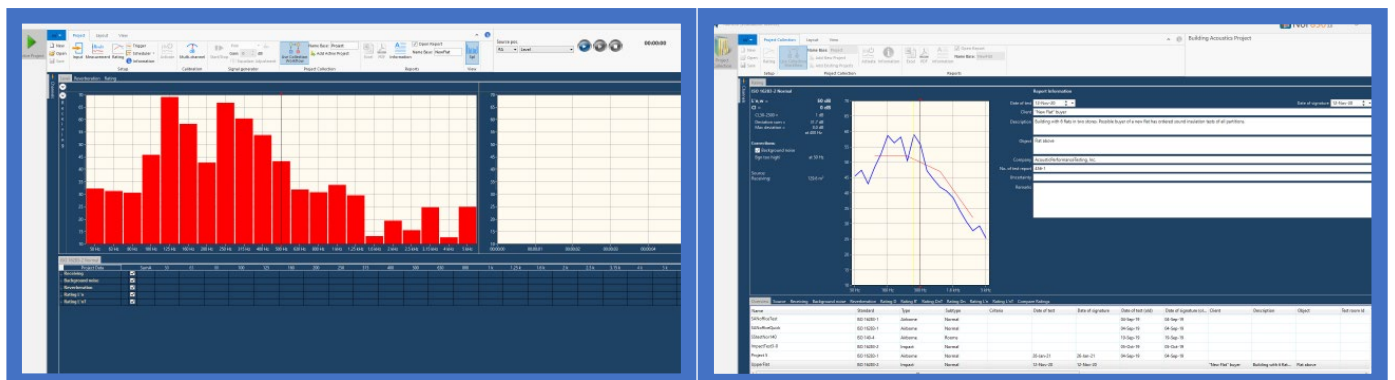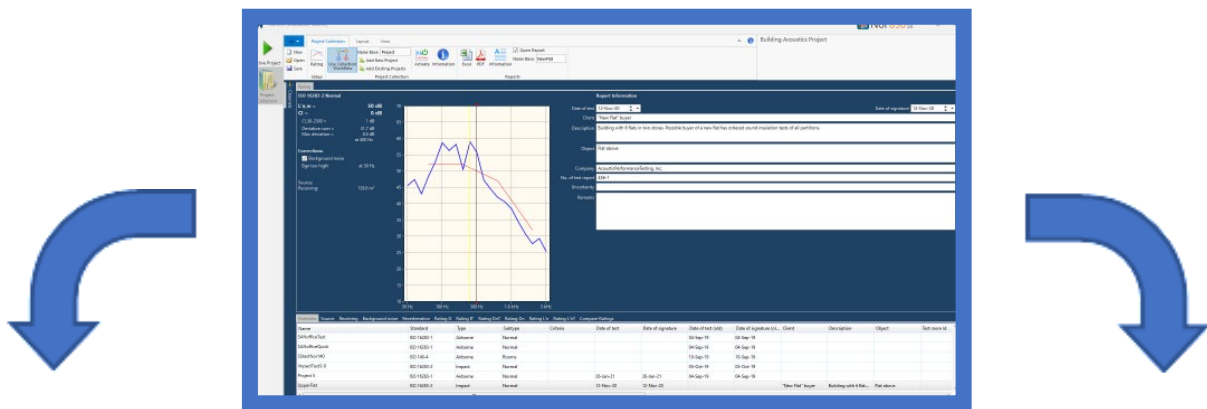
The following example of a group of all sound isolation tests made on all partitions in one specific "New Flat" illustrates these definitions.

The below example is used in the following instructions in order to make the description of these new feature more practical. Note that measurement data for Background Level and Reverberation Time from the first project can be re-used in the next two projects reducing the total measurement time for the entire Collection.
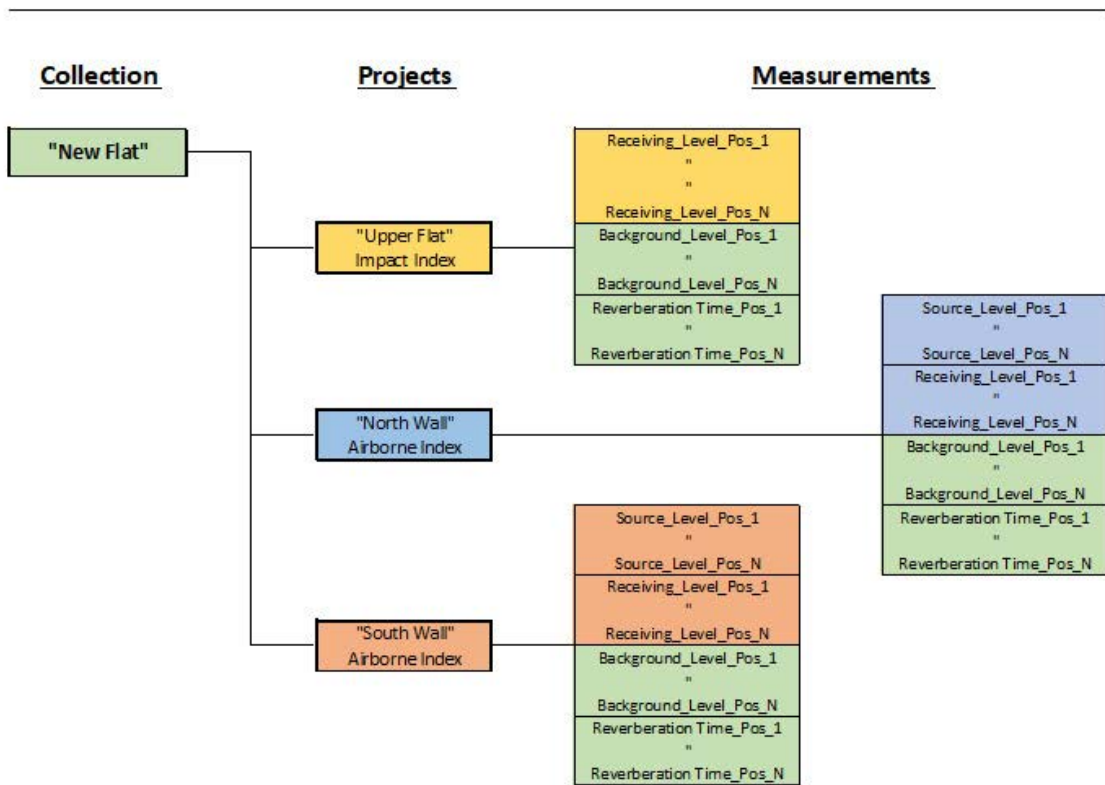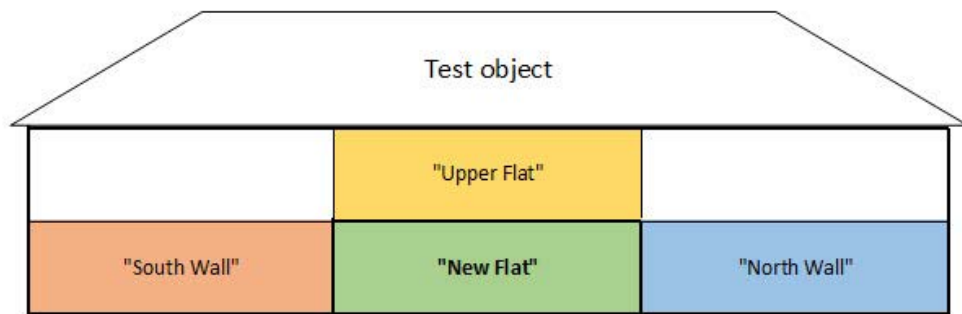
Workflow

The new software allows the user to operate the measurements with various levels of storage automation. These are selectable through the use of the new *Collection Workflow* feature combined with the existing *Auto save on accept* and *Auto accept* features found in the Options menu. The new *Use Collection Workflow* button is placed in the Menu bar.

By combining these settings, the operator may set the Nor850 system to full manually operation in which each single measurement is accepted and the final project is individually stored manually, or to a fully automated system in which each individual measurement is copied into the pre-selected collection upon measurement end.
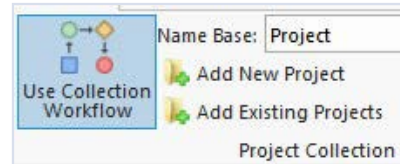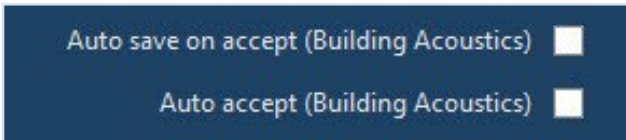
Pre-setting measurement projects

The Project Collection feature enables the operator to pre-set all details for upcoming measurements. This will speed up the measurement tasks and save a lot of time in the final reporting. The process is started by creating a new Collection by use of the New button in the Collection window, and then entering the name of the new upcoming Collection.
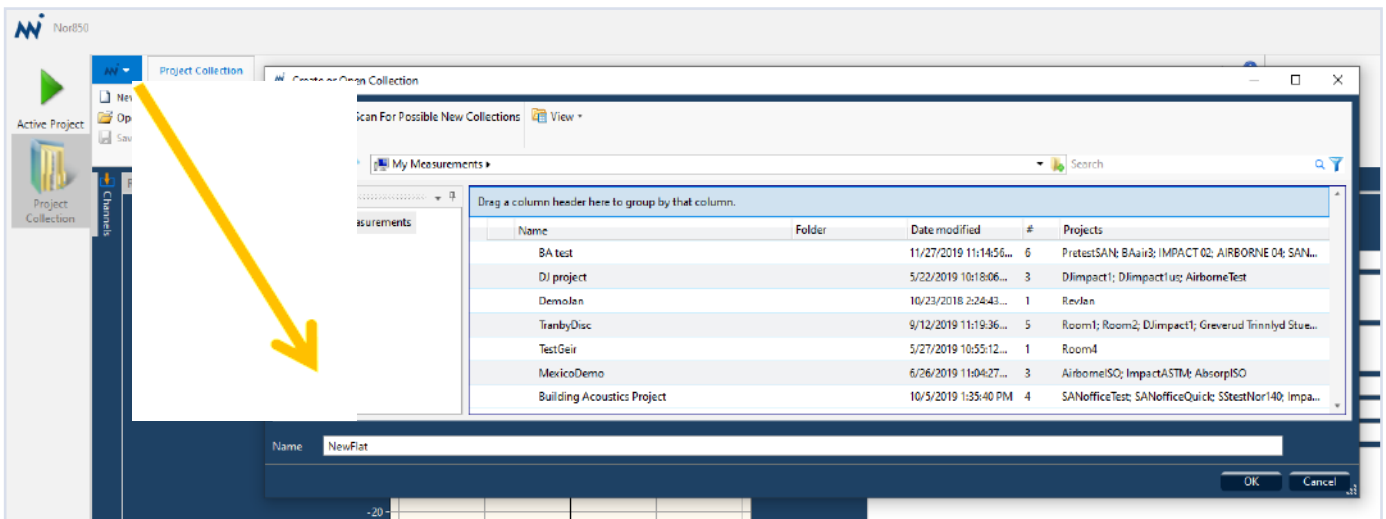
The Nor850 will then create an empty Collection window with the name of the new Collection in the upper right area. In the example below, the name is "NewFlat".
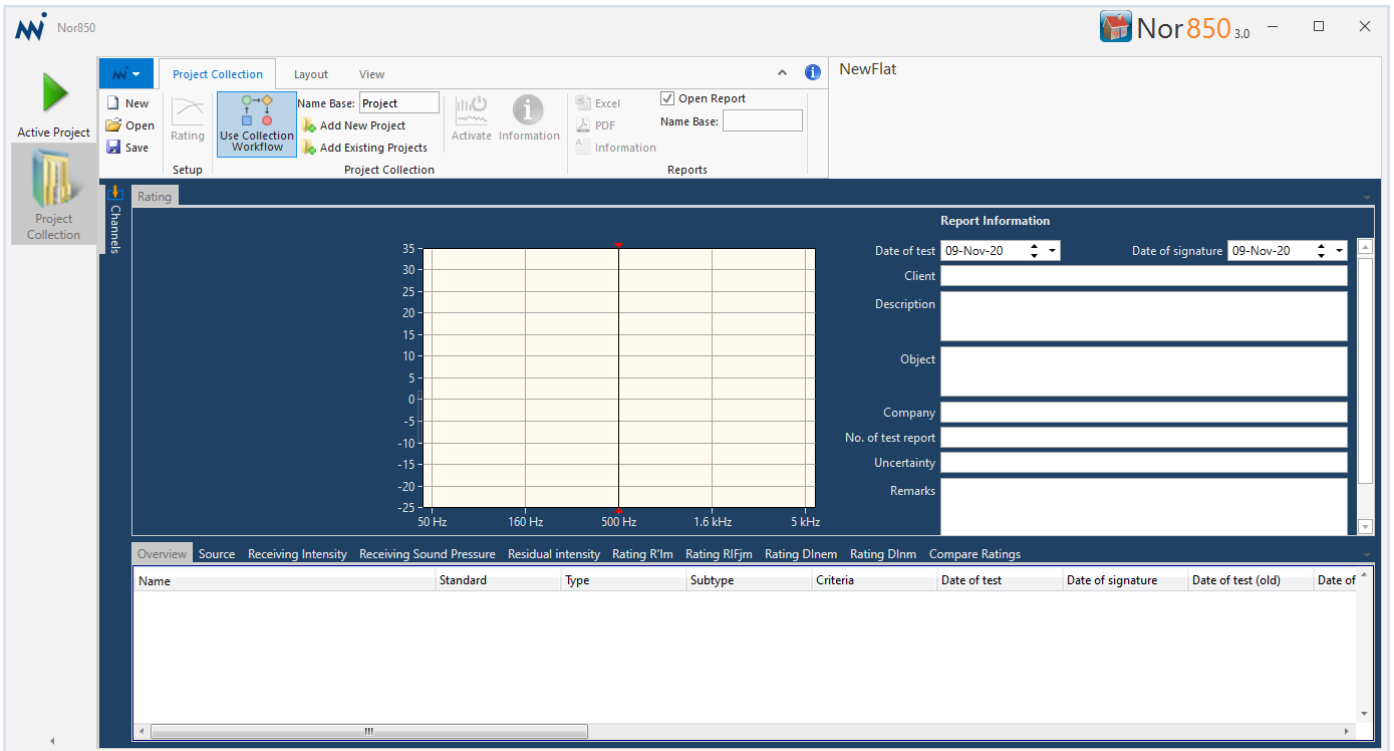
The next step is to set all properties for the first project. Click on the *Active Project*, and set all parameters and properties in the Measurement and Rating menus. Then activate the *Use Collection Workflow* button followed by a click on the *Add Active Project*.
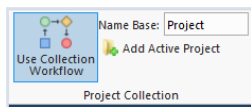

Return to the Project Collection window and check that a new Project is listed under the Overview tab in the lower part of the display. Then, type in all available Report Information for the upcoming Project.

To ease a later search, choose a proper indication name of the pre-set project by use the Rename feature found in the right-click menu. It should be noted that if the final Collection is a combination of both 1/3- and 1/1-octave measurements, the initial project bandwidth will decide which of these project that displays the individual filter values. Therefore, make sure the initial project is based on the filter bandwidth of main interest. The first project should then be ready for measurement data at a later stage.

For setting up the second project, there are two possibilities. Either follow the same procedure from the Active Project window as for the first project, or use the Clone feature. The Clone feature is found in the right-click menu of the existing project in the Collection window. By selecting the Clone, a full copy of the first project is saved in the Collection with the extension "- Copy" on the previous name as shown in the example where the first project was named "Ceiling".
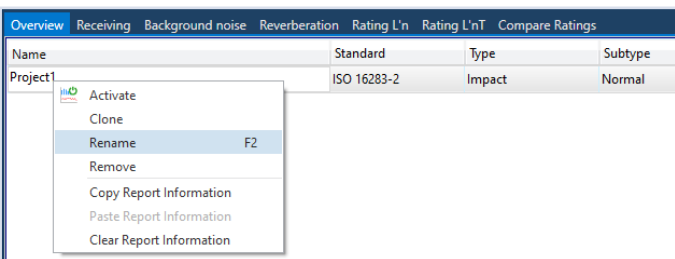
Properties and parameters for the second project may now be edited. Click on the second project and open the Rating menu by the icon found in the upper left part of the Collection window. The operator may now choose another Standard or type of measurement, edit the room sizes etc. It is also possible to edit some of the text in the Report Information fields. Finally, rename the second project, and there are then two projects ready for measurement data in the Collection window.
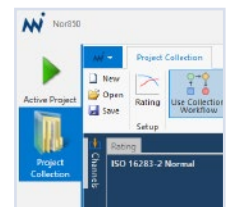
When the Clone feature is used for the additional projects, all measurement parameters will follow the settings from the initial project. In cases where these measurement parameters will vary, it is advisable to make the pre-settings in the Active Project window in which both the Measurement menu and the Rating menu are available, and then save the next project into the existing Collection.

To fulfill all the planned projects in the previous "NewFlat" example, repeat any of the procedures above to generate the third project. By using the names "LeftWall" and "RightWall" on the last projects, the Overview will then look like the below example in the Collection window.
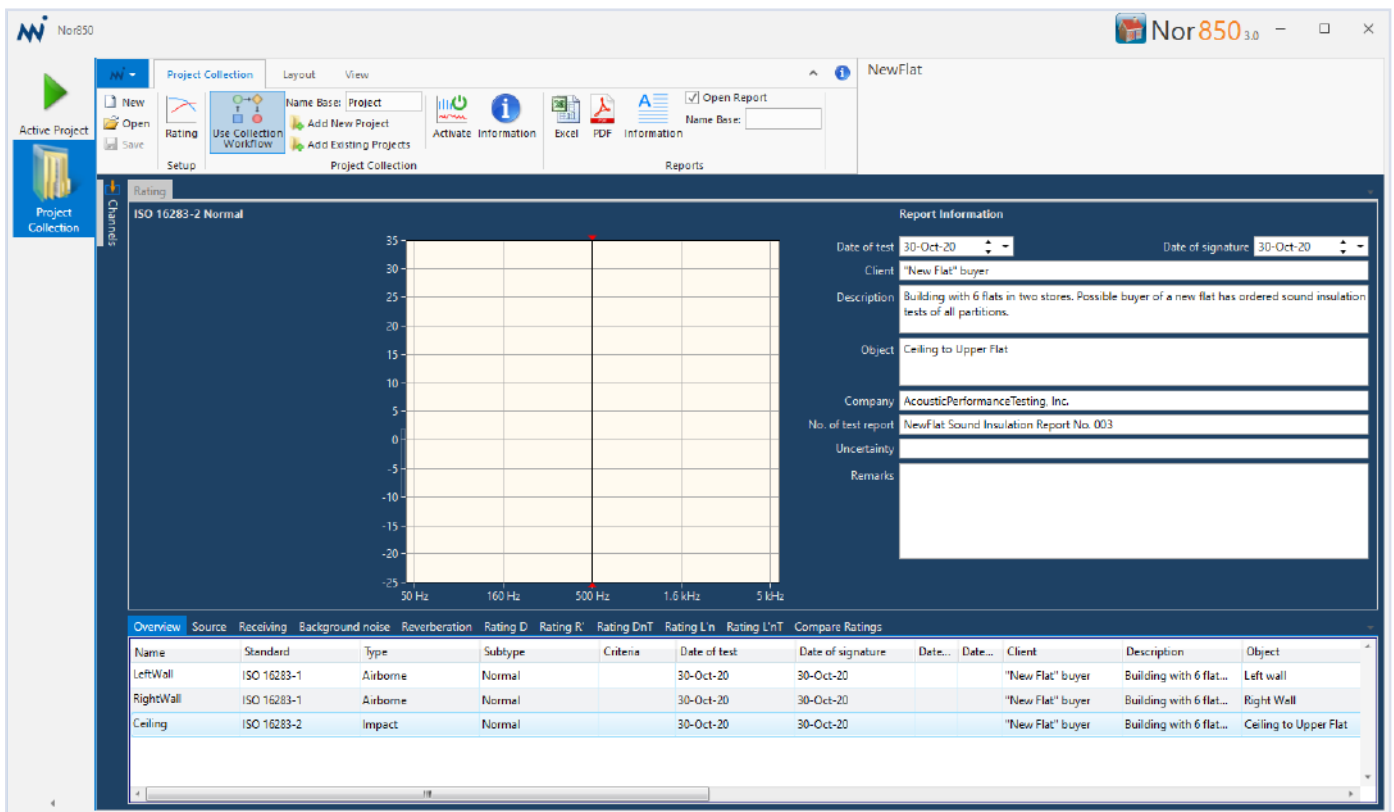
The entire Collection may now be saved, and re-opened when the real measurements are to be started.

Measuring a pre-set Project

When a pre-set project, or a collection of projects, are to be measured, the Nor850 v3.x software offers the users two methods. Either using the Nor850 to control the measurements with the connected instruments, or, transferring the complete setup onto a Nor145/150 instrument which then are used manually in the field without connection to the Nor850 software.

If a PC with the Nor850 is available during the measurements, the pre-set project or collection must be opened in the collection window. Each project must be activated one-by-one using the Active button in the upper part of the Collection window. All parameters and properties are then copied into the Active Project, and the normal measurement is controlled from this window. When all the pre-set projects are measured, the user may save the entire Collection including the measurement data.

Alternatively, the pre-set projects or entire collection may be transferred onto a Nor145/150 instrument. This is done using the NorConnect software, and will make the pre-set projects available inside the instrument in order to avoid keying-in all properties and measurement parameters out in a stressful field situation. Upon return to the office, transfer the projects from the instrument onto the PC again, and overwrite the previous pre-set projects. The Nor850 software may then be used for further editing and report generation. (This feature requires that the instrument run the upcoming firmware v4.x.)

Copying measurement data from one project to another

In many cases some of the measurements within one project may be re-used in another project. This is typically for both reverberation time and background noise measurements in a receiving room. Therefore, when measuring multiple walls and a ceiling in the same room, these measurements can be used for all projects. Hence, the total measurement time for all projects may be greatly reduced.

With reference to the above example, it will only be necessary to make all the measurements for the impact test project named "UpperFlat". Then this project is saved, and the pre-set project for "RightWall" is opened, but only the source and receiving rooms level measurements are performed. Same principle for the "LeftWall" project. The user then has three projects within the collection, but only one of the projects are complete.

Copying measurement data from one project to another is done in the lower collection window. For background noise data, click on the Background tab. The measured background noise levels will then appear in the graph, but only for the UpperFlat project as the other projects do not contain any background noise data yet.

Right-click on the UpperFlat project and select Copy.

Then click on the RightWall project, right-click and select Paste. The Background noise data from the UpperFlat project are then copied into the RightWall project.
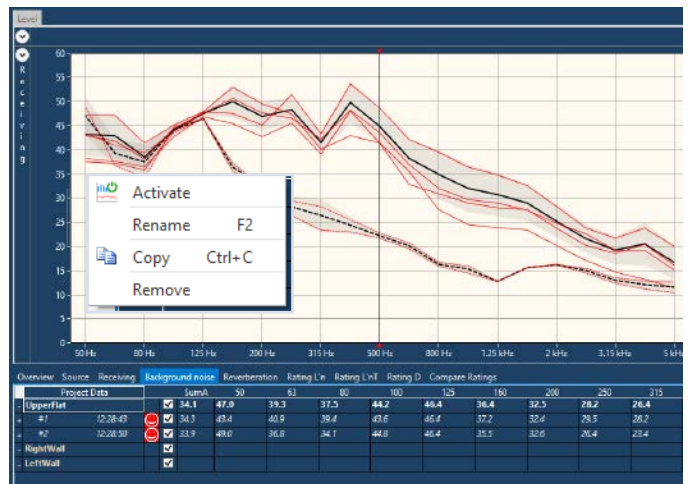
Follow up by copying the Background Noise Data from the UpperFlat project to the LeftWall project in the similar way.
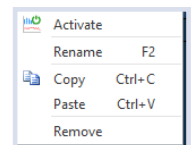
Finally, the Revereberation time data from the UpperFlat project should be copied into both the other projects. First select the Reverberation tab, and then follow the same procedure as for the Background Noise data.

All three projects should then have all required measurement data. Individual Report Information could be entered into the upper right window for each project.

Evaluating the Rating Indices

By selecting any of the tab's indicating transmission loss indices, the normal rating display will appear in the upper window as each project is clicked. For comparison of all calculated indices - independent of project type – click on the Compare Ratings tab.
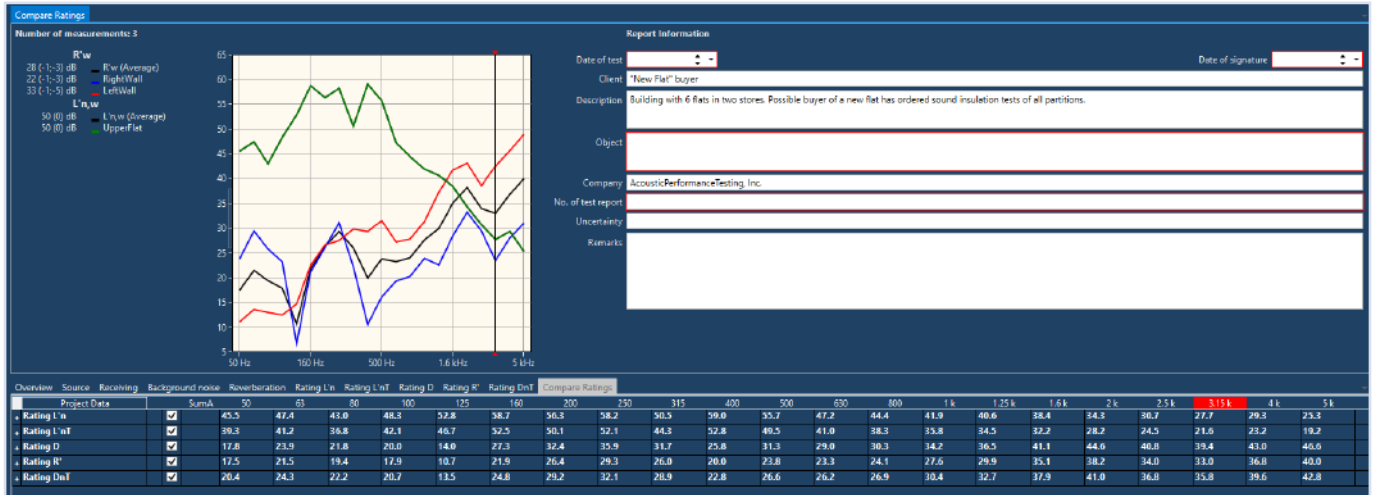
The type of rating index to be presented in this window is selected by clicking on the leftmost column in the lower part of the display. It is even possible to use Ctrl+Click to select multiple indices, or to limit the selection by opening the desired rating in the leftmost column and selecting only those of interest.

In order to facilitate the feature of averaging multiple rating indices, the average rating is calculated. The method of averaging is chosen in the View/CompareRating menubar. The user has the choice of 'Energetic', 'Arithmetic' or 'Energetic Inverse'.
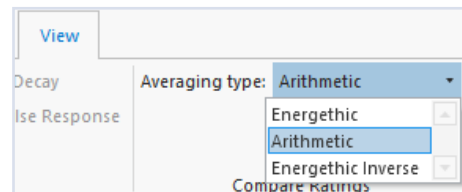
Editing common Report Information for multiple projects

In some cases, are the Report Information partly identical for multiple projects within a collection. As it can be seen from the figure above, some fields in the Report Information window have got a red line around it when more than one project are displayed in the Compare Rating window. The red line indicates that the selected projects have different content inside the given field. If no red line is shown, the Report Information is identical for all selected projects.

Should something be wrong, mis-spelled or for other reasons need to be edited in multiple projects, it is possible to type in the correct text in the desired field. The original text will then be deleted in this field for all selected projects and exchanged with new text. It is also a copy/paste feature available by use of the right-click menu inside each field.
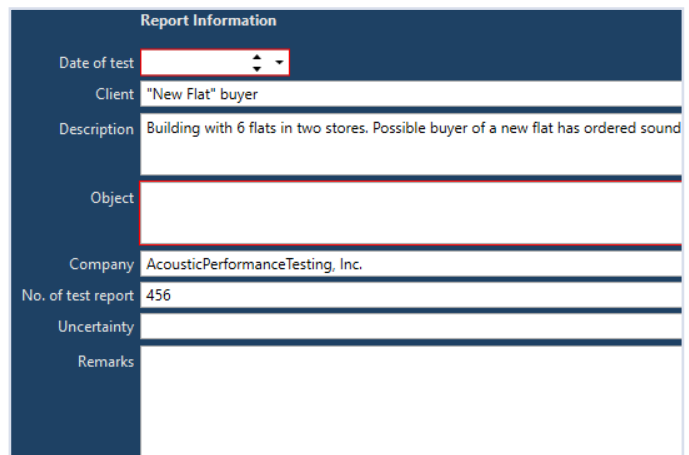
Final reports

The final step of a measurement job is the reports. Nor850 v3 offer a choice between one report for each project, or one single report containing all projects. Both report formats may be exported either in an excel format or in a .pdf format by clicking on the desired button in the menu bar.

The menu additionally offers the user the choice opening the report automatically, or not, after generation, plus the possibility to enter a 'NameBase' text string ahead of a sequence number as the name of each report.
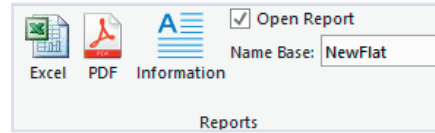
In the Nor850 v3 software, the user may specify a dedicated user-defined folder for saving the reports. The reports may therefore be stored in a different folder than the rest of the project. This setting is available in the Option menu found by clicking the Nor850 button in the upper left corner of the main window.
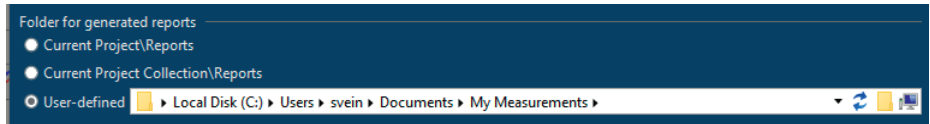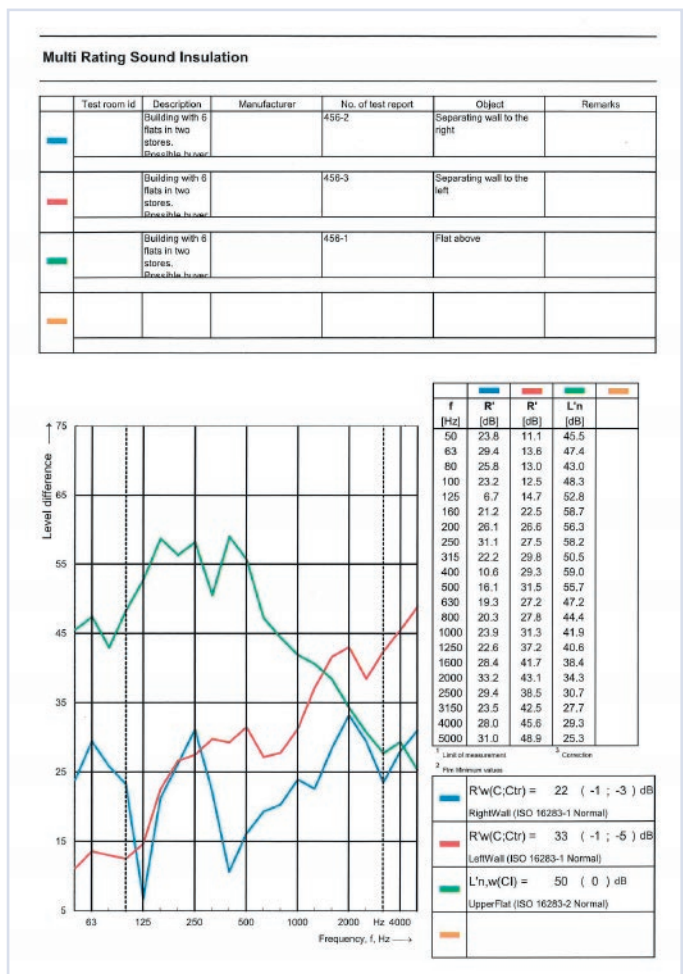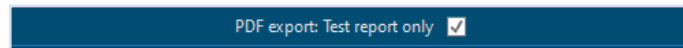
To generate the report for one project in a collection, select the project in the Overview tab and click on either the Excel or PDF button in the menu bar. The software will produce the report and open it if the 'Open Report' tick-box is activated.

The Excel report will contain all available data and results, while the PDF report is either limited to graphical-report only, or to three page report containing graphical-report, table-report and background correction table report. The choice between these two version is done in the Option menu.

When many reports are to be generated from multiple projects, all reports may be produced after each other automatically. Simply select all projects and click the required format button. In this case it is advisable to unclick the 'Open Report' tick-box to avoid the Nor850 system to hold after each report has been generated.

Nor850 v3 additionally offers a multi-project report. From the Compare Rating tab, select the projects that should be reported and click either of the report format buttons. Even projects of varying type may be mixed in the same multi-report.

The multi-report puts four projects on one page, but if required it will produce multiple pages if the number of selected projects are higher than four. In the excel format, separate sheets for all measured data of each selected project are additionally available.


PDF export: Test report only ✓

Multi Rating Sound Insulation

	Test room Id	Description	Manufacturer	No. of test report	Object	Remarks
▬		Building with 6 flats in two stores. Possible buyer		456-2	Separating wall to the right	
▬		Building with 6 flats in two stores. Possible buyer		456-3	Separating wall to the left	
▬		Building with 6 flats in two stores. Possible buyer		456-1	Flat above	
▬						

f [Hz]	R' [dB]	R' [dB]	L'n [dB]
50	23.8	11.1	45.5
63	29.4	13.6	47.4
80	25.8	13.0	43.0
100	23.2	12.5	48.3
125	6.7	14.7	52.8
160	21.2	22.5	58.7
200	26.1	26.6	56.3
250	31.1	27.5	58.2
315	22.2	29.8	50.5
400	10.6	29.3	59.0
500	16.1	31.5	55.7
630	19.3	27.2	47.2
800	20.3	27.8	44.4
1000	23.9	31.3	41.9
1250	22.6	37.2	40.6
1600	28.4	41.7	38.4
2000	33.2	43.1	34.3
2500	29.4	38.5	30.7
3150	23.5	42.5	27.7
4000	28.0	45.6	29.3
5000	31.0	48.9	25.3

R'w(C;Ctr) = 22 (-1 ; -3) dB
RightWall (ISO 16283-1 Normal)

R'w(C;Ctr) = 33 (-1 ; -5) dB
LeftWall (ISO 16283-1 Normal)

L'n,w(CI) = 50 (0) dB
UpperFlat (ISO 16283-2 Normal)

Search for projects with specified rating index

In many cases, a comparison of a newly measured project with similar older projects are of interest. For Nor850 users with many previous projects such as laboratories, software v3 offer a new a search or filter feature for making this search more efficient. This feature is also implemented in the latest upgrade of the NorConnect transfer software.

In the Project Collection window, click on the 'Add Existing Projects' button in the Project Collection menu bar. The 'Add Projects to

Collection' window will appear on the screen.
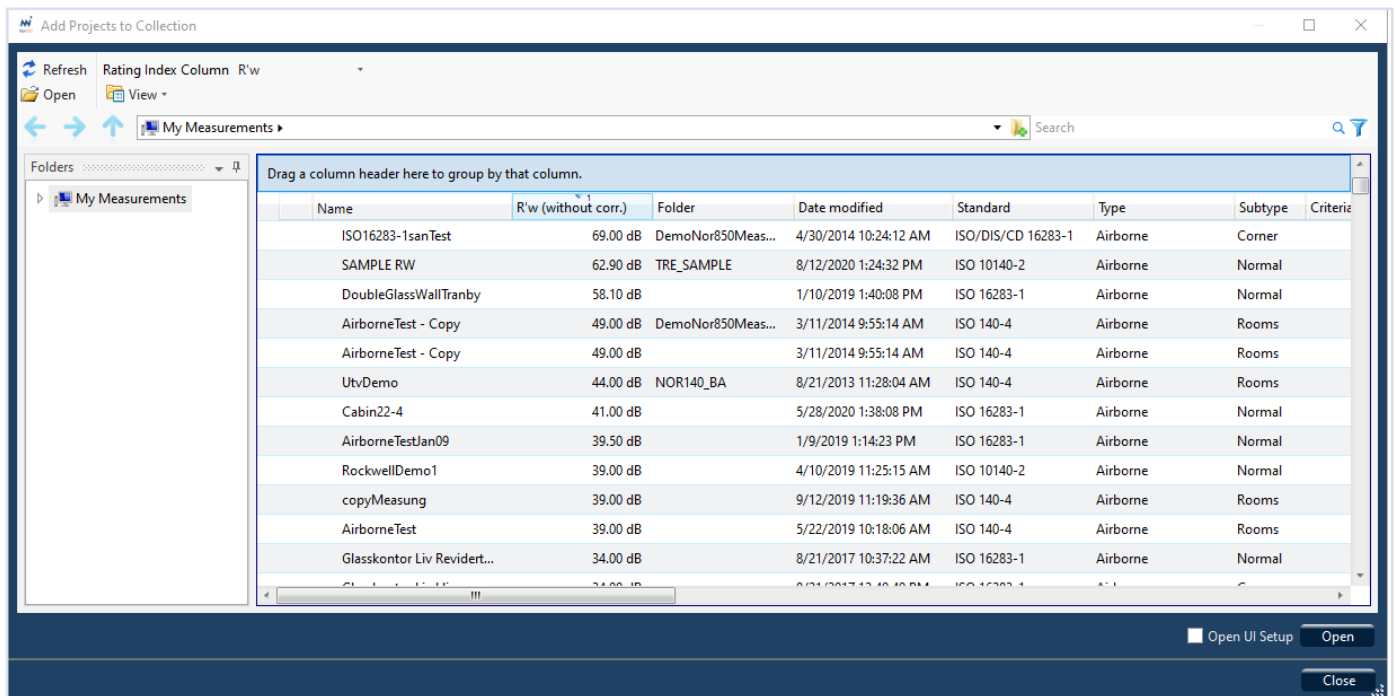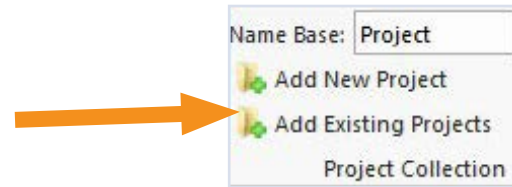
In the list of all available projects, a new column for the Rating Index is shown. Clicking on the column header will generate a filtering of alll projects according to the selected rating index. The user may specify which rating index that are desired by opening the 'Rating Index Column' drop-down menu.

Note that the first time this feature is used on previous projects, the exisiting 'Measurement Cache' must be re-generated in order to make the calculated rating index from these projects visible. This function is started by clicking on the 'Delete Measurement Cache' button found in the Option menu.
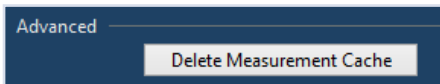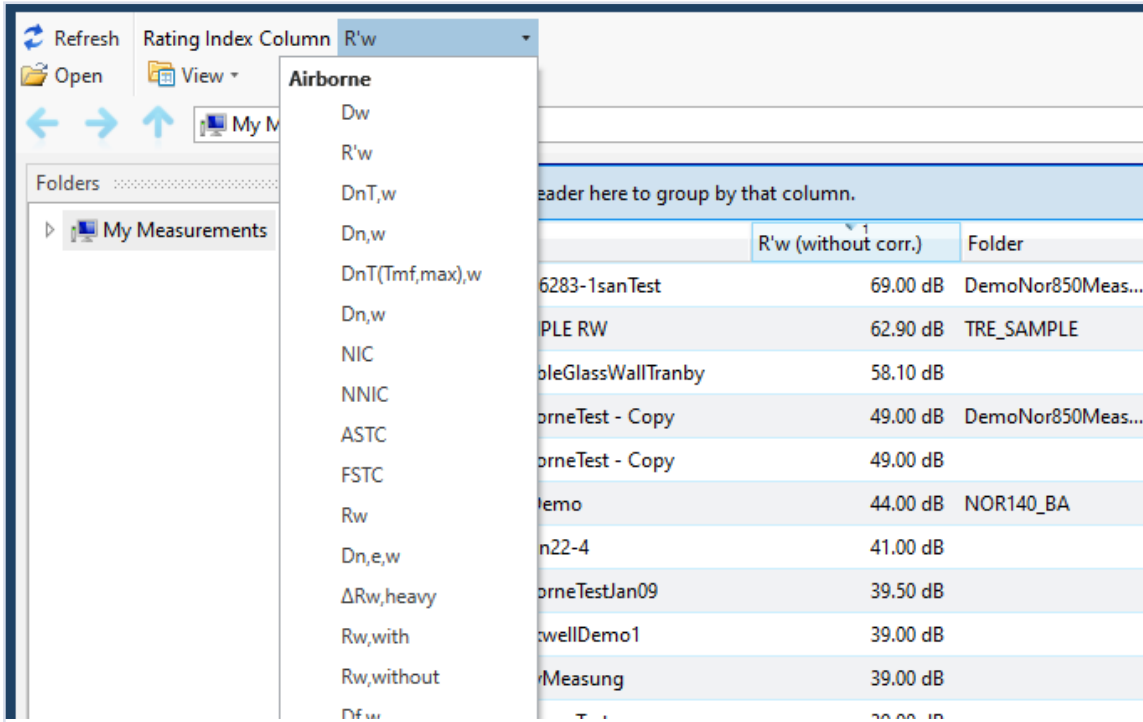
Please observe that initiating this re-generation of exisiting projects may take considerable time (up to one hour) if the number of exisiting projects is large, and that the Nor850 system will not be operative during this time period. Do therefore not initate the process without considering this fact. Smaller amounts of exisiting projects (typically a couple of hundreds) will only take a minute.

The Rating Index Column always shows the index with two decimals. This is unusual for many indices such as Rw, Lnw etc., but is impotant for some special indices. The Nor850 system therefore always use two decimals. Another important fact is that the index value shown is without any correction. Hence, if the official calculated index is based on either a background noise correction and/or a sensor correction, these correction are not considered for the indices listed in the Rating Index Column. That means that if a project shows Rw = 62.90 dB, the correct index when opening this project would be 1-2 dB different. This is not perfect for the user, but it is a far better feature compared to not having any index shown prior to selecting an exisiting project at all.

Service Equipment testing

In the Nor850 software version 3, Norsonic introduce a feature for performing a noise test of Service Equipment in accordance with ISO 10052. The reverberation time measurements and the final calculation are done in the Building Acoustic mode, but requires that the level measurements of the service equipment are performed in the General mode.

Select the required measurement functions (normally LAeq, LAFmax and LASmax), set the profile resolution to a suitable value for the actual noise source, and run the measurement in General mode. Insert markers along the time-axis either during the measurement using the Marker Bar, or afterwards. The final calculation requires that there are markers both for the actual service equipment to be tested as well as for the background noise level. In the example below, there are three markers used for the various service equipment plus a dedicated marker for the background noise level.


The General mode level profile with markers must be saved for later import to the Building Acoustic mode.

Switch the Nor850 software into the Building Acoustic mode, and select the ISO 10052 Standard in the Rating menu.

Then, open the NorConnect software, search for the previously stored General mode profile test, and drag this file onto the project data area of the Nor850 screen. Alternatively, use the Windows Explorer to perform this drag&drop file transfer.
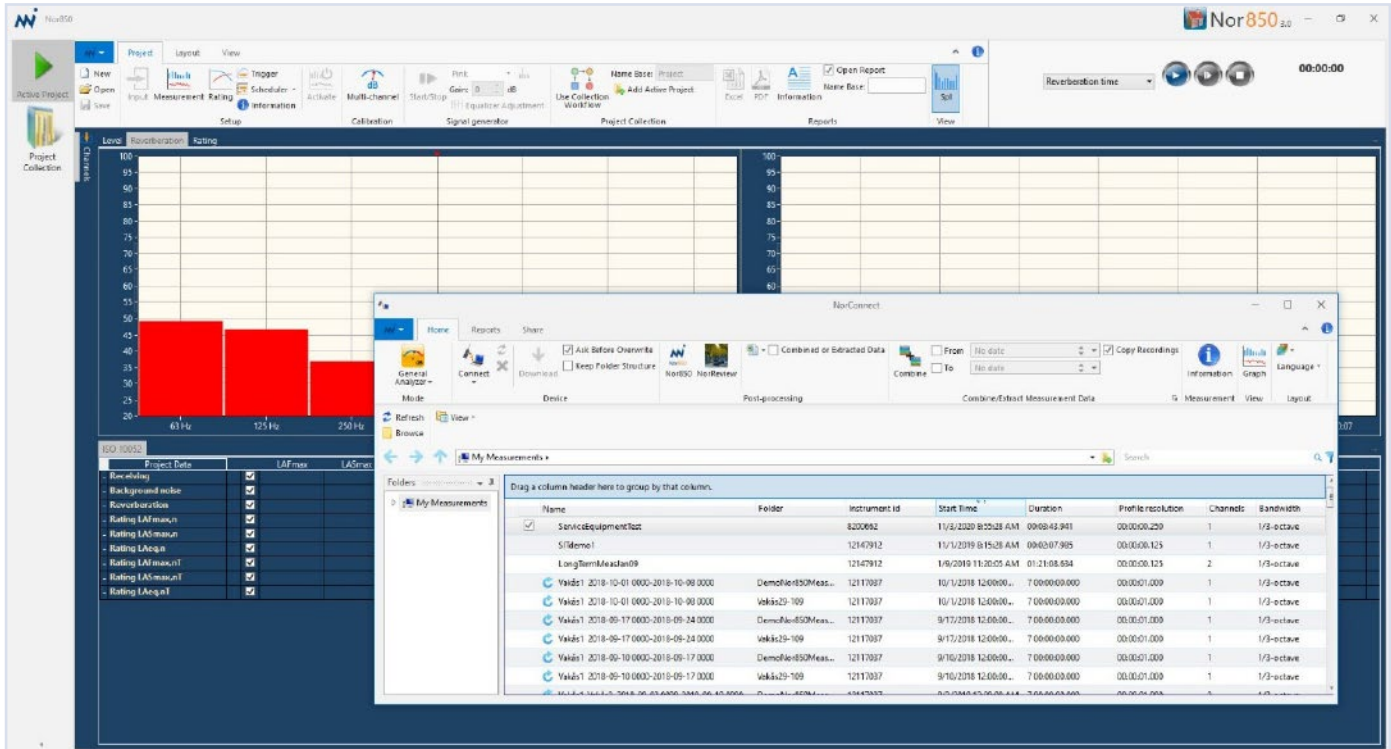
As soon as the drag&drop is finished, a new window will open in which the operator must tick-on the actual markers that are going to be used in the calculations. In the example below, data for the 'Washer' as well as the 'Background' are selected as correct data for the Receiving room as well as for the Background Noise.

Upon confirming the choice by pushing OK, these data will be imported to the Project Data area.
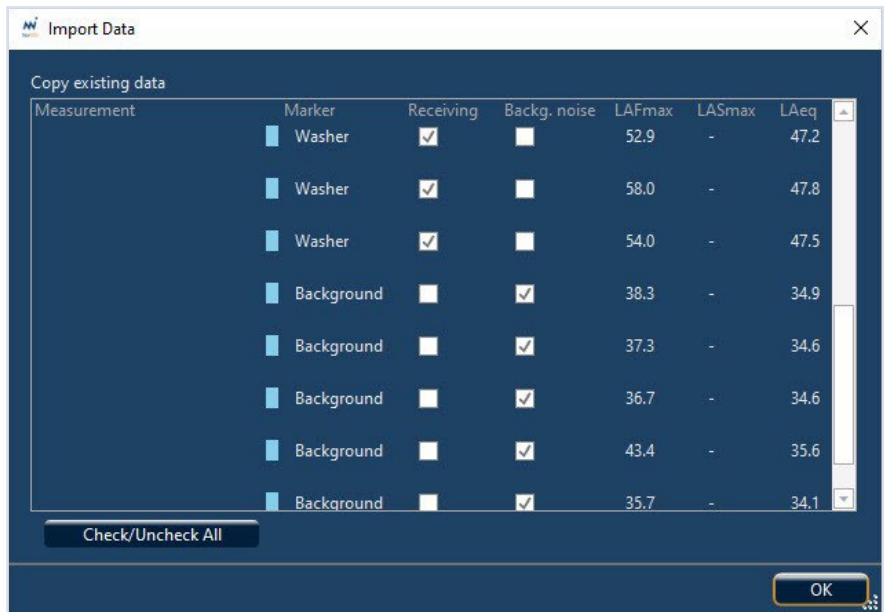
The reverberation time data are also needed for the final calculations, and this may now either be measured using an instrument connected to the Nor850, or by importing a previously measured file.

As soon as the reverberation data are available, the Rating display will show the correct Service Equipment value.
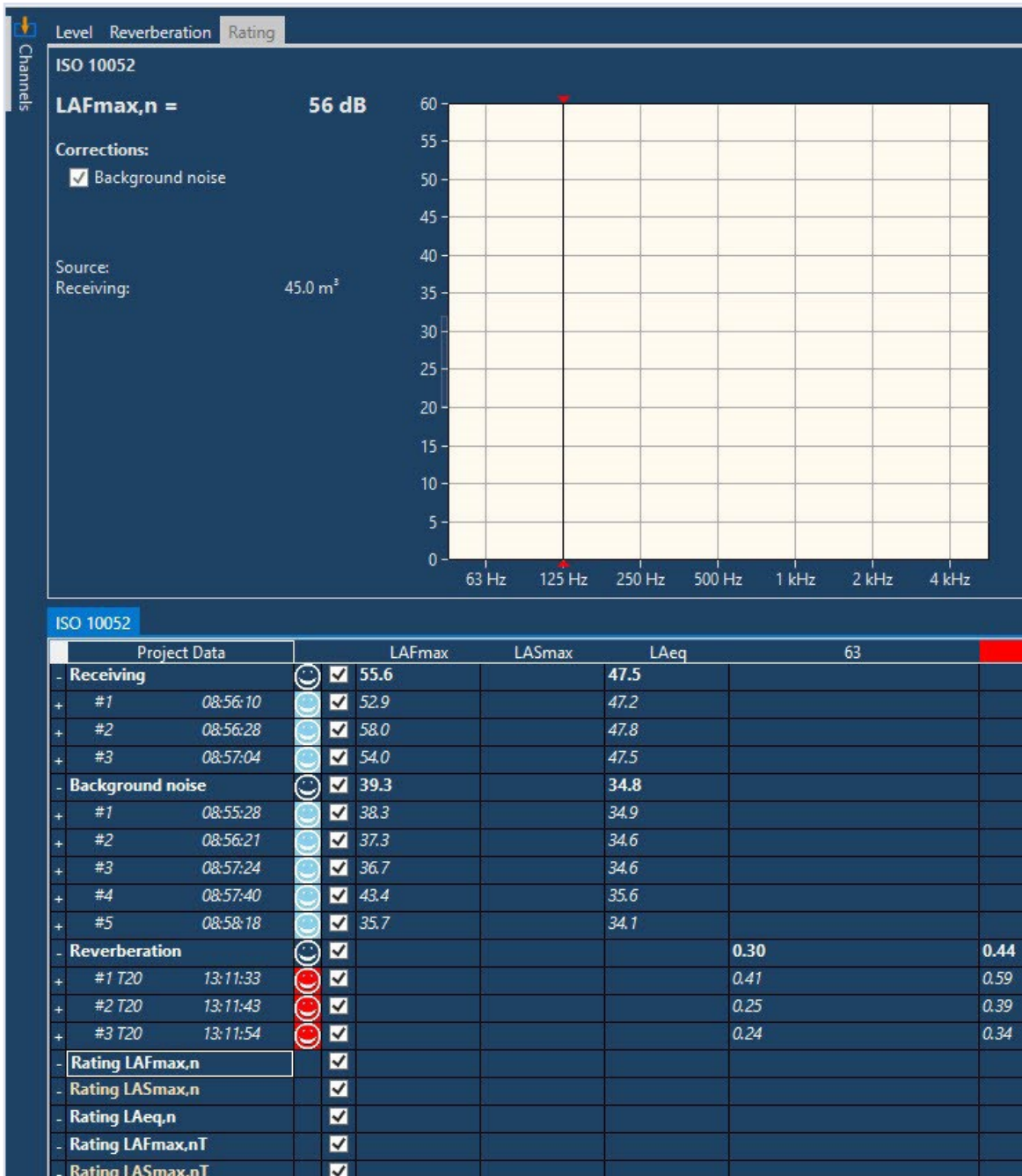
As soon as the complete test is saved, a measurement report is available either as an excel-file or as a .pdf document.
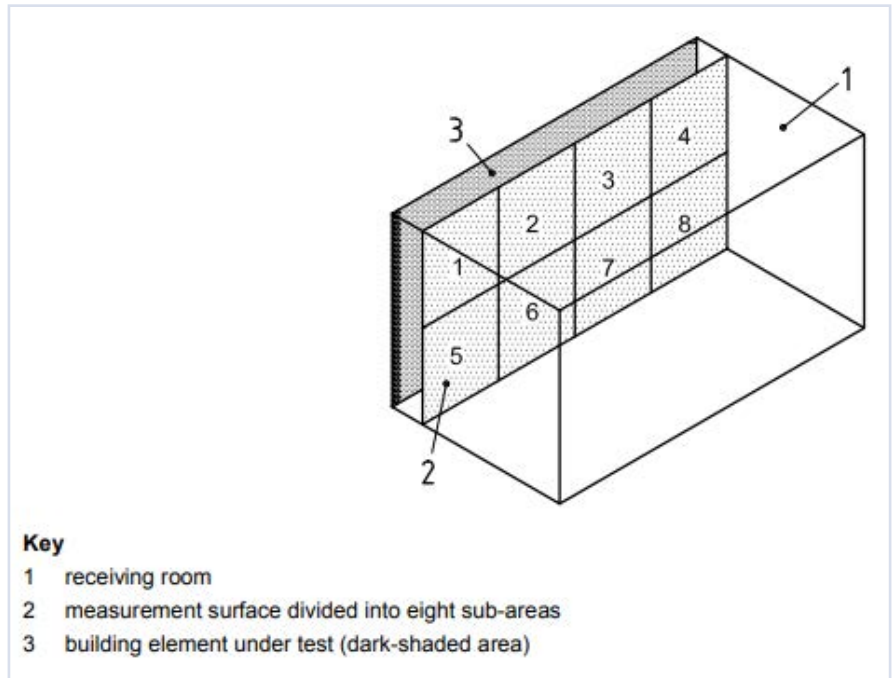
Sound Intensity Transmission Loss testing

In the Nor850 software version 3, Norsonic introduce the possibility to measure the sound transmission loss in accordance with ISO 15168-2. That means using sound intensity technique in the receiving room to determine the sound energy that comes through the partition wall from the source room.

This new feature requires a two-step measuring procedure. Initially, place the sound source in the source room and use the Nor150 with an intensity probe in the receiving room. Divide the transmission wall in a suitable number of sub-sections as described in the Standard, and use the single surface mode in the Nor150 Intensity mode divided into the same x/y sub-areas.

Each sub-area may be measured either as a fix-point or scanned with both x- and y-direction.

When all the measurements are done, save the measurement and transfer it to the PC by use of the NorConnect software to finalize the first step of the measuring procedure.

Key
1   receiving room
2   measurement surface divided into eight sub-areas
3   building element under test (dark-shaded area)

The second step is started by opening the Nor850 software in the Building Acoustic mode. Select the ISO 15186-2 Standard in the Rating menu, and key-in the receiving room volume and transmission wall area.
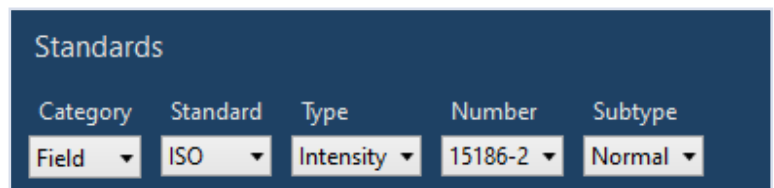

Connect a measurement channel (i.e. Norsonic instrument) to the PC, and make the source room level measurement in a sufficient number of microphone positions in order to measure the average source room level. Alternatively, use a rotating boom. If the source level measurements already are stored on the PC, use the NorConnect software to drag this into the Project Data window of the Nor850.

The previously measured sound intensity file must then be imported to the Project Data window. This is done by opening NorConnect and use the drag&drop feature.
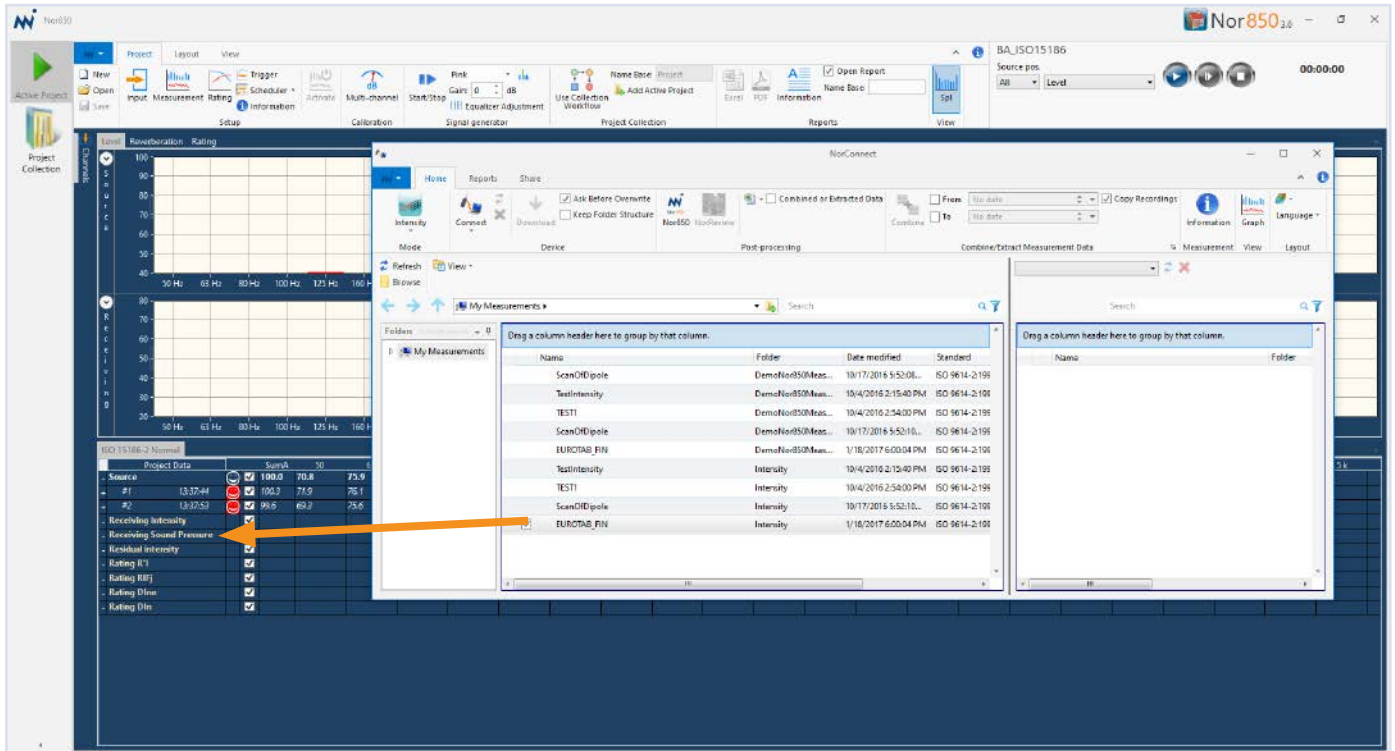
The induvial sub-areas may have varying sizes, and these values can be modified by the operator by opening the right-click menu on the sound intensity measurements displayed in the Project Data window. In this window, all the induvial sub-areas may be edited.
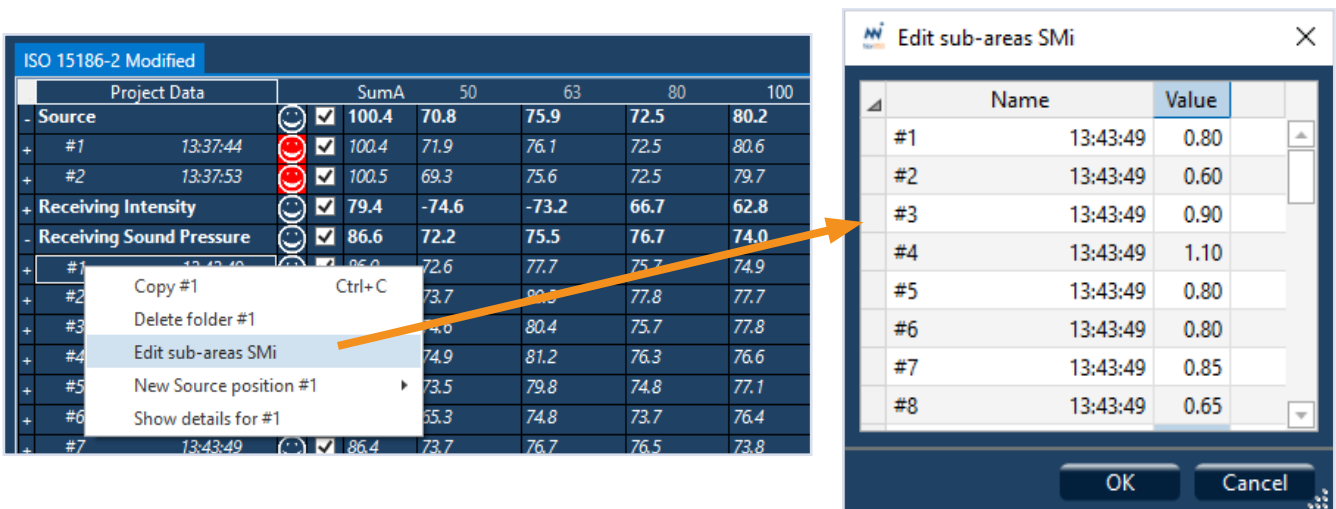
The final transmission loss indices R'I, RIFj, Dine and Din are then calculated, and presented graphically in the upper window.

After saving the total project, standardized reports may be printed out based on an excel- or .pdf report.
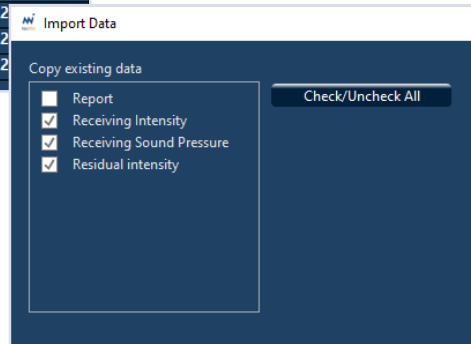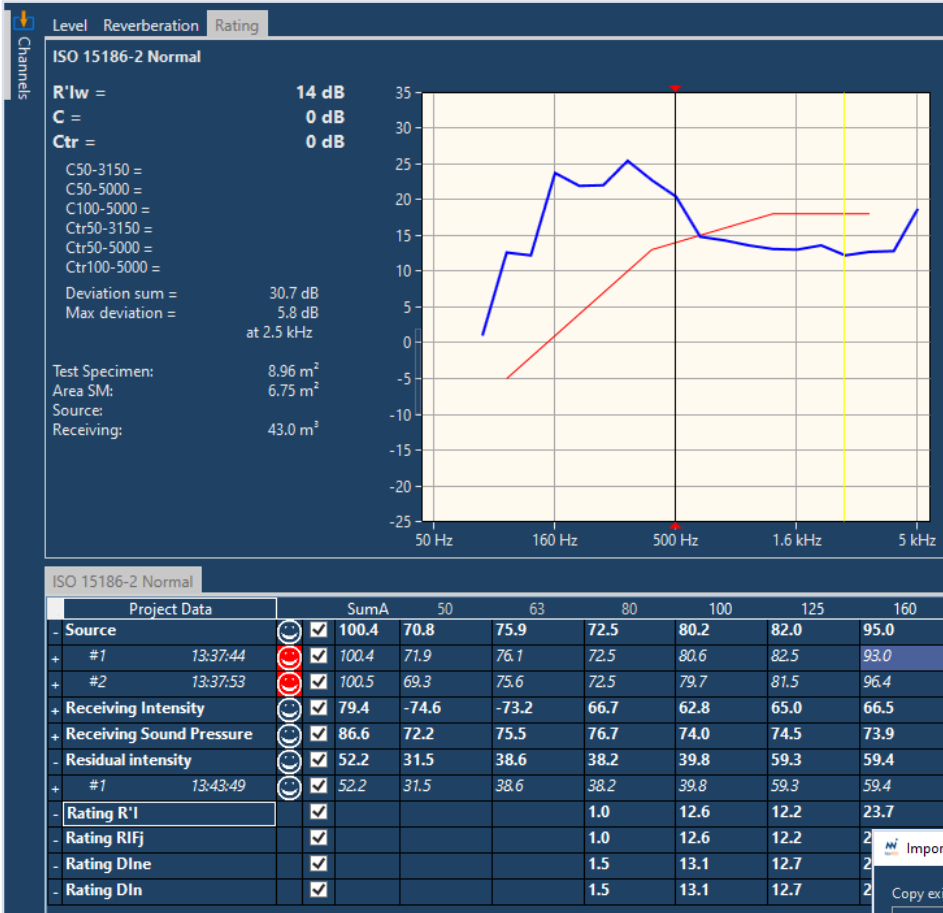
Modified indices

As explained in the ISO 15186 Standard, the final transmission loss index R'I cannot be directly compared with the traditional indices R'w or DnTw. The Annex A in the Standard therefore gives a method for calculating modified indices based on an adaption factor which results in final indices that are closer to the traditional ones. This correction is based on an adaption term for each frequency band, and includes the total area of all boundary surfaces – named "Sb2" - in the receiving room.

The modified calculation is selected prior to the process described above by selecting the subtype "Modified" instead of the "Normal" in the Standard selection of the Rating menu. If the "Normal" calculation is already done, the user may make the "Modified" calculation based on these by simply select the modified Standard and reuse the measurement data.
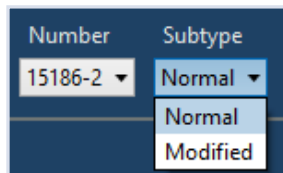
When using the modified calculation, the additional parameter Sb2 is found in the Receiving room section of the Rating menu. The value of the total area of all boundary surfaces should be keyed-in to this field.
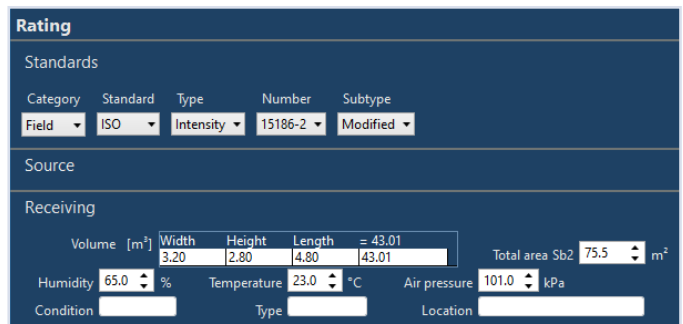
Upon closing the Rating menu, the modified transmission loss indices R'Im, RIFjm, Dinem and Dinm are calculated, and presented graphically in the upper window.
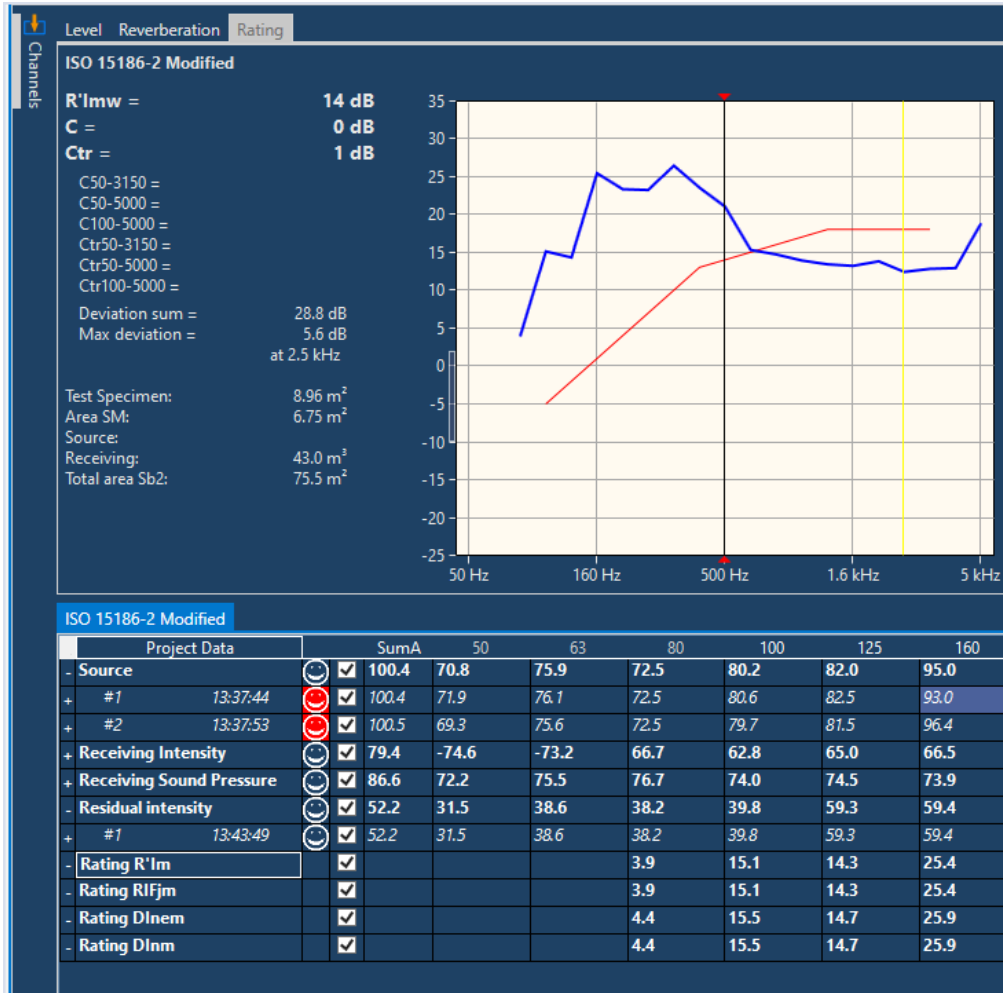
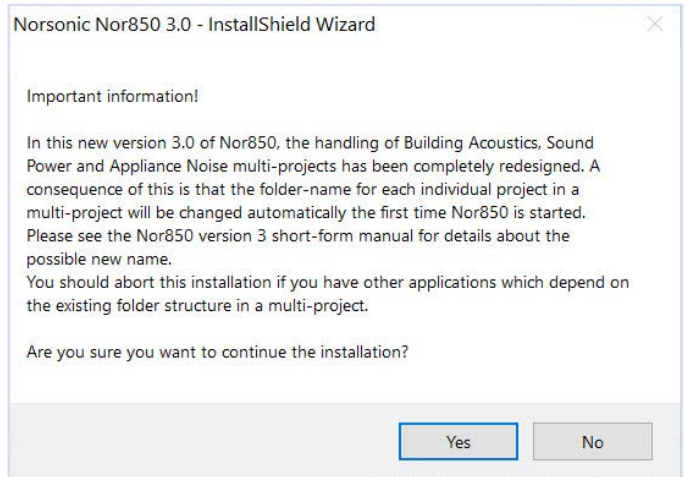# Important information!

Automatic renaming of individual Project-folders in older v2.x MultiProjects

In the Nor850 v2.x, the projects stored under each individual Tab in a MultiProject, are named with a number 1, 2, 3, a.s.o. To enable all the new "Collection" features in v3, these folder-names are changed upon the first start of the newly installed v3 software.

This automated renaming process follows two possible name conventions depending on the user's earlier operations when running tests with the v2.x software:

- If the old MultiProject was saved without renaming the individual Project Tab's, the Nor850 software will automatically rename these individual Projects to the same name as the MultiProject plus the relevant number at the end (see upper half of the figure).

- If the old MultiProject was saved with manually renaming the individual Project Tab's, the Nor850 software will automatically rename these individual Projects to the same name as the earlier manually selected Tab name (see lower half of the figure).

In case the old folders are used by other software or macro's, the operator may need to modify these for the new names.

During installation of the new v3 software, a window will pop-up to warn the user about these automatic renaming of the old MultiProjects. The user may then choose to cancel the upgrade in order to keep the old names on the folders which means the v3 software is not available.

Norsonic Nor850 3.0 - InstallShield Wizard

Important information!

In this new version 3.0 of Nor850, the handling of Building Acoustics, Sound Power and Appliance Noise multi-projects has been completely redesigned. A consequence of this is that the folder-name for each individual project in a multi-project will be changed automatically the first time Nor850 is started. Please see the Nor850 version 3 short-form manual for details about the possible new name.
You should abort this installation if you have other applications which depend on the existing folder structure in a multi-project.

Are you sure you want to continue the installation?

Yes   No

After installing v3 and starting it for the first time, the old MultiProjects from the left side of the figure will be converted to individual Project files according to the right side of the figure.
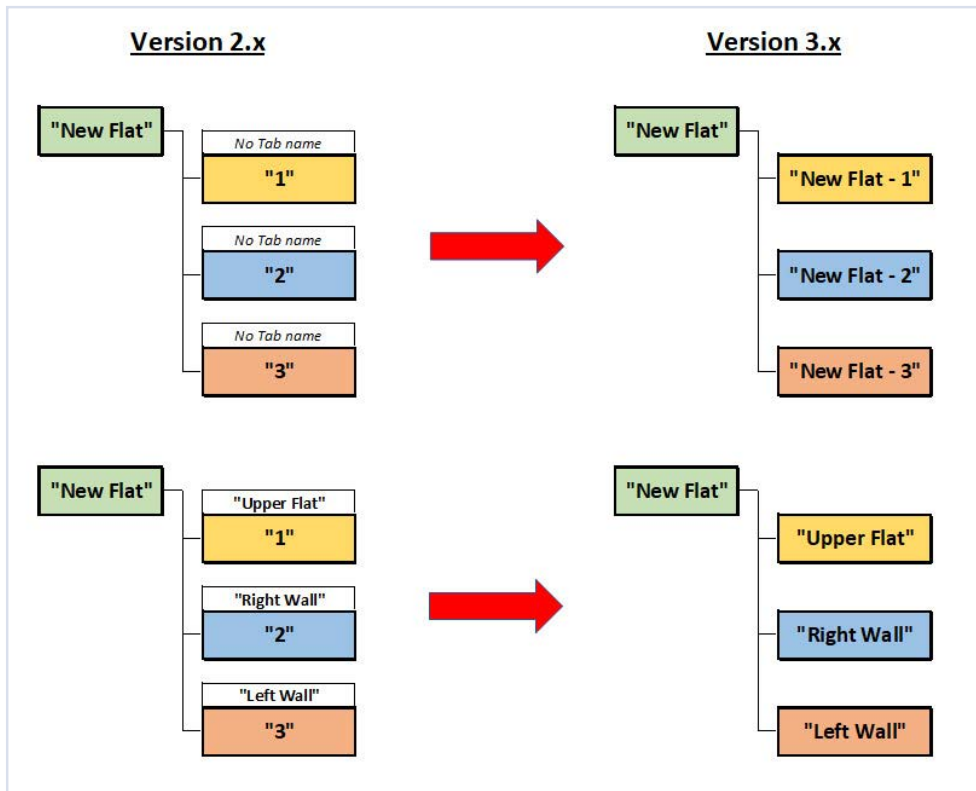
Existing Nor850 v2.x users may order the software upgrade through their local Norsonic distributor.

Ordering information

Nor850/v3-Std: Standard upgrade to Nor850 v3 for limited Nor850 license without any of the options;
                 BA-2, LW-2, APL & Ext3-4.
Nor850/v3-Ext: Extended upgrade to Nor850 v3 for advanced Nor850 license including any of the options;

                 BA-2, LW-2, APL & Ext3-4.

Customers with multiple licenses get 2nd license with 30% discount, and further licenses with 50% discount.