Automatic Report Generation in ArtemiS

The report generation function of ArtemiS allows users to have measurement reports created automatically, which can then be saved or printed. A basic form of the automatic report generation is available with the base version of ArtemiS. It is described in the first part of this Application Note. The second part covers the advanced version, which allows, for example, custom templates to be created.

Report Generation with the ArtemiS Base Version

Template Configuration

Before reports can be generated automatically in ArtemiS, the layout of the analysis results must be specified in a template[1]. To do so, use the configuration mode of the Report Generator element placed into the Destination Pool. Figure 1 shows an example project. Five sound files have been placed into the Source Pool, of which only one is activated for the configuration mode for now. Furthermore, two analysis functions have been included and activated in the project.

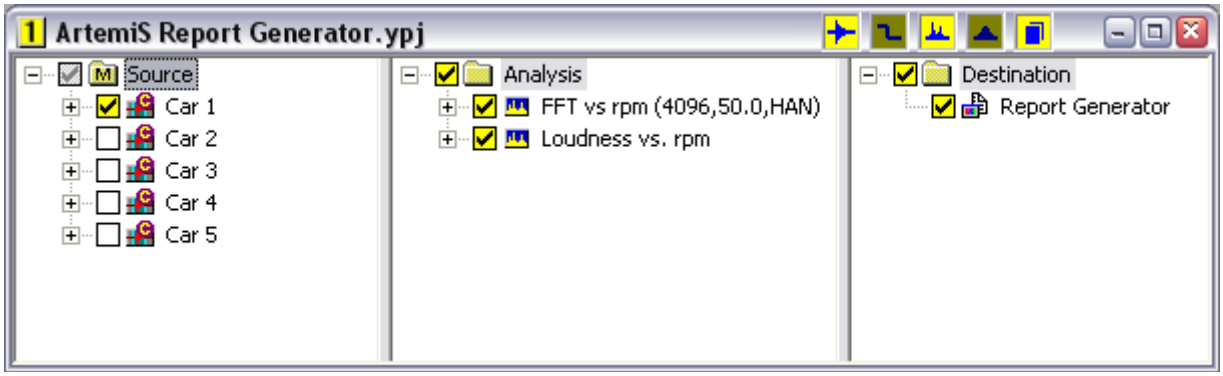

Figure 1: Example project

Figure 2 shows the Properties dialog of the Report Generator element with the configuration mode activated. The Properties dialog also allows you to specify the number of ArtemiS diagrams included in the report to be generated. This is done in the form of a matrix, for which you can specify the number of columns and rows. In our example with a two-channel sound file and two active analysis functions, a 2 x 2 matrix is a natural choice.

[1] In the following, the term "template" refers to a Microsoft Word® document with the file name extension ".doc", which contains placeholders for ArtemiS diagrams.

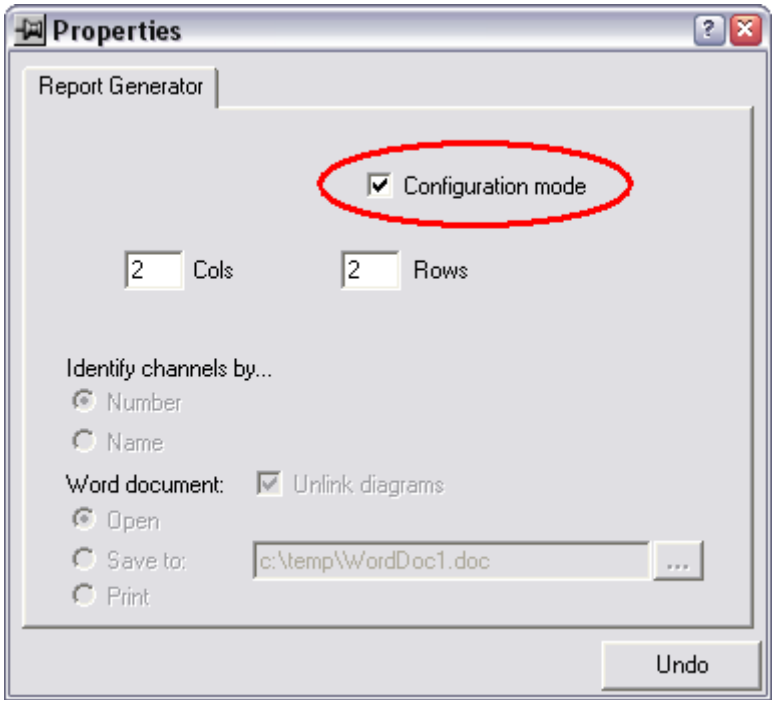

Figure 2: Properties dialog of the Report Generator element with activated configuration mode

Clicking on the Calculate button starts the configuration mode. In this mode, the left side of the screen shows a directory structure listing the audio signal and below it the results of the analysis, and the right side shows a Word template, into which the analysis results can be inserted (see figure 3).

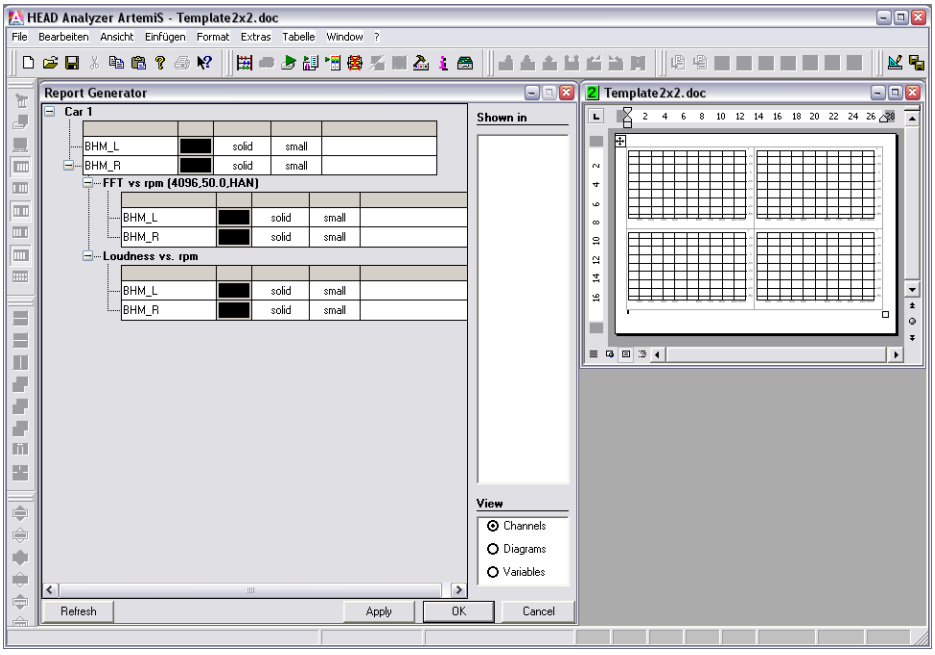

Figure 3: Configuration mode of the Report Generator

Once an entry has been selected in the results list, the column labeled "Shown in" shows all the possible diagram positions. The selected diagram position is shown next to the respective analysis result. Figure 4 shows an example for such a layout specification.

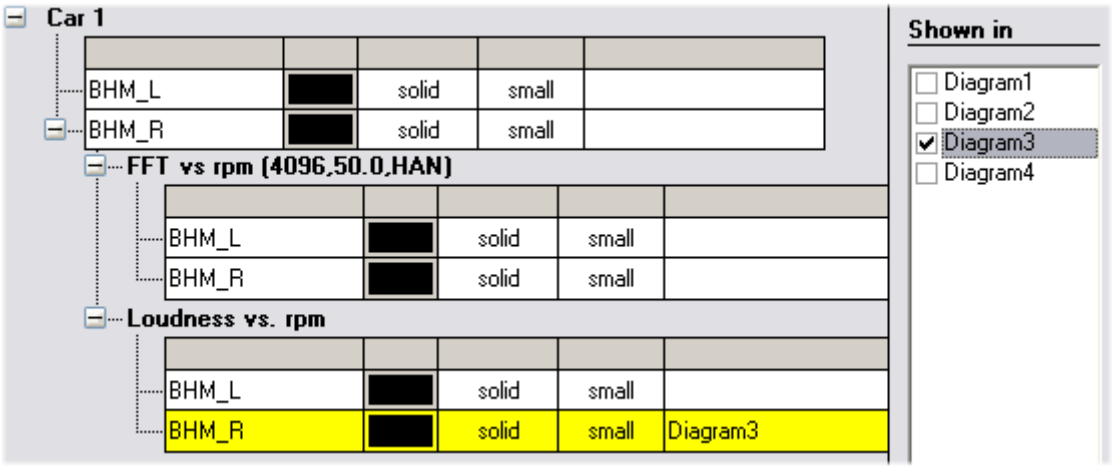

Figure 4: Layout specification for the analysis results

In the layout specification for the analysis results, it is possible to combine the data of several two-dimensional analyses into one diagram, as long as they all have the same unit of measurement. The results of three-dimensional analyses should always be shown in separate diagrams. In the first position of the results list, you will always find the original audio signal. It can be shown in a diagram as well.
The list also shows the display options for the curves, such as the color, the line thickness and line type. These parameters refer to the display of two-dimensional results. For example, it is advisable to use different colors if several two-dimensional curves are to be displayed in the same diagram. To change a color, click on the black color box with the left mouse button (see figure 5).

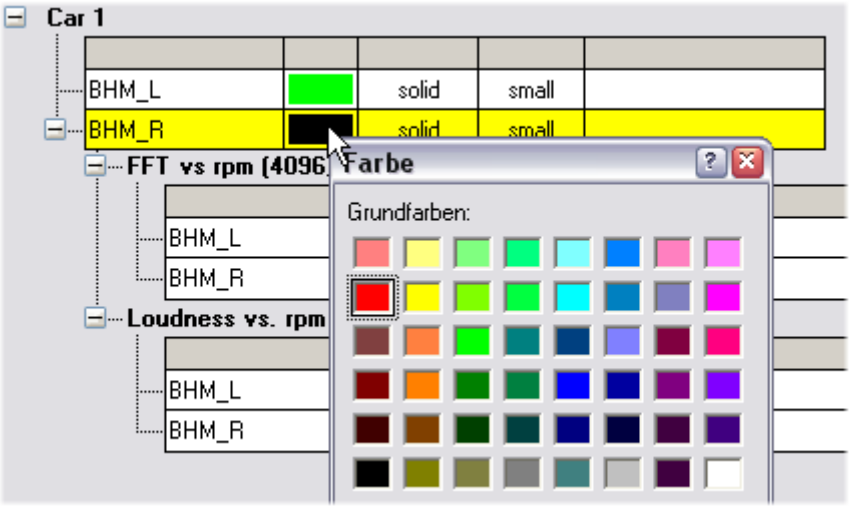

Figure 5: Dialog for changing the curve color

Once the curve properties and the diagram positions are specified, you can preview the layout in the template by clicking on the "Apply" button. This is only for checking the selected settings. When all settings are done according to the requirements, exit the configuration mode by clicking on the "OK" button. The created template can be saved as a Word document with the "Save as" command. That way, the first report is already completed.

Report Generation Using the Preconfigured Template

All other reports can now be generated in a batch process based on the template created before. To do so, disable the configuration mode in the Properties dialog of the Report Generator element. In addition, you can specify a number of options for the batch process. Figure 6 shows the Properties dialog with the configuration mode disabled.

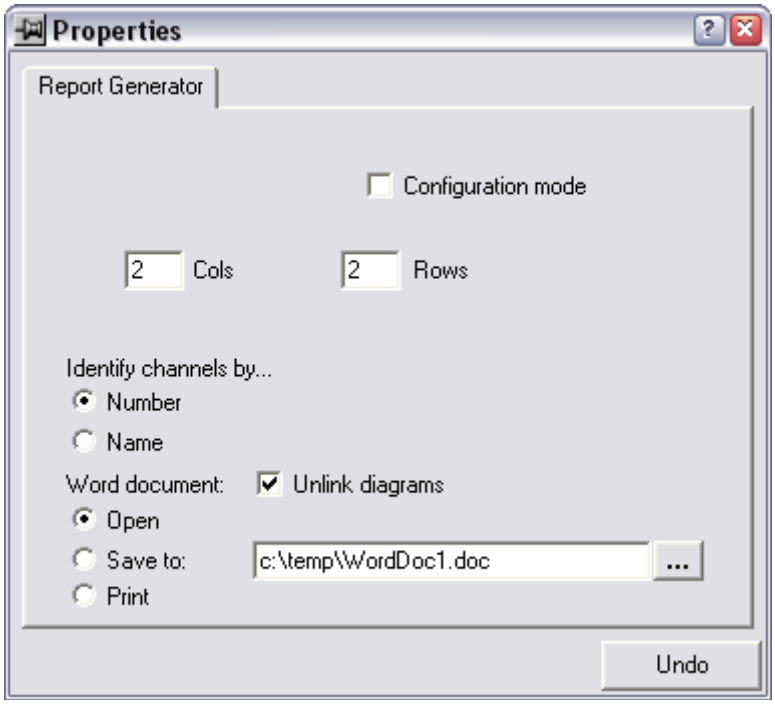

Figure 6: Properties dialog of the Report Generator

In the lower part of the Properties dialog, you can specify how the channels are identified. Select "Numbers" for a layout that is based on the channel number, or select "Name" for a layout based on the names of the channels. The following example illustrates the difference: In configuration mode, the first channel of a file is shown in the first diagram and the second channel in the second diagram. Let's assume that the name of the first channel of the file used in configuration mode is "mic_lower", and the name of the second channel is "mic_upper". With the setting "Identify channels by number", the subsequent batch process will always display the first channel in the first diagram and the second channel in the second diagram. With the setting "Identify channels by name", the channel named "mic_lower" will always be displayed in the first diagram and the channel named "mic_upper" in the second diagram. If the report generation process encounters a file that does not contain a channel named "mic_lower", the first diagram in that report will remain empty.
Below the channel identification option, you can choose into which form the diagrams are to be inserted in the report. If the option "Unlink diagrams" is enabled, the diagrams will be inserted

into the report as graphics objects. Otherwise, the analysis results will be inserted as active diagrams, which can be configured just like in ArtemiS, for example to change the scaling of the axes. To ensure this functionality, the original file must be available under the specified channel name and file path when the report is opened. This means that the report cannot be displayed easily on another computer. If the "Unlink diagrams" function diagrams is enabled, it is no longer possible to make major edits to the diagrams, but it allows the reports to be displayed on other computers. Furthermore, in that case the reports are displayed correctly even if the file structure on the computer has been modified.
In the last section of the Properties dialog, you can specify what should be done with the finished reports. You can choose to open the reports, to save them or to print them. If the "Open" option is selected, the reports are only shown on the screen. You can then save selected reports using the "Save as" command in the "File" menu. The "Save to" option causes all generated reports to be saved automatically under the specified file name. The "Print" option prints all reports on the printer connected to the computer.
When the settings described above have been made in the Properties dialog, the report generation can be started. To do so, place all the files you want to generate a report for, into the Source Pool, activate them and start the calculation.

The following should be considered when generating reports:

- The layout specification for the analysis results in the template diagrams is saved within the Report Generator element of the project. If you want to reuse the diagram layout for other sound files in the future, the project with the Report Generator element must be saved.
- The number and layout of analyses in the project should be saved as well. The information contained in the Report Generator element only specifies that, for example, the results of the first analysis should be displayed in the first diagram etc. If the type of analysis is changed in the Analysis Pool, this automatically affects the display in future reports as well. That way, the reports can easily be adapted to meet new requirements. To make sure that the reports are always generated in the same way, the items in the Analysis Pool and the Destination Pool can be protected. To do so, use the "Lock" command in the context menu of the respective item and specify a password for making modifications to the item (see figure 7, next page). After this the ArtemiS project has to be saved.
- The axis range shown in the report can be configured on the Property Page ("representation" tab) of the respective analysis. By using "Fix range" the axis range is fixed and used for every following report. Thus the results can be easily compared to each other. The "Fix range" setting is retained by saving the ArtemiS projects and can be protected with the "Lock" command.
- A report can also be used to compile the results for several sound files. To do so, activate several files in the Source Pool for the template configuration. The results list in configuration mode then contains the audio signals and the analysis results of all activated files. For the subsequent calculation, the sound files are combined in the report according to the number specified in configuration mode.

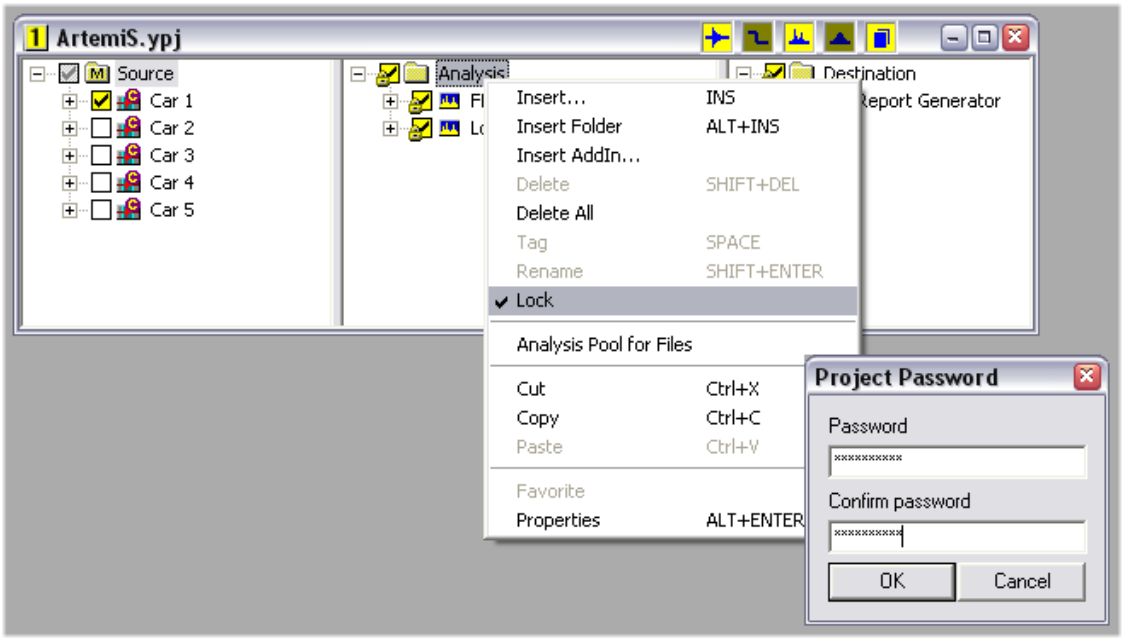

Figure 7: Password protection of elements used in the project pools

Advanced Report Generation with the ArtemiS Tool Pack ATP 11

Template Configuration

With ATP 11, in addition to the template creation method described above, it is also possible to create and use your own custom templates. These templates can include, for example, your company logo and custom text modules, such as the current date. The ArtemiS installation folder contains some example templates. These can be used as a basis for creating your own templates. The names of the included example templates differ in their first letter: "L" or "P". The letter "L" stands for landscape format and "P" for portrait format. The numbers in the template names refer to the layout of the diagrams. This means that, for example, the template "L2x3.doc" contains a matrix of 2 x 3 diagrams in landscape format.

To customize your templates, first open them in Microsoft Word®. Using the normal editing functions offered by Word, you can adapt the design according to your needs. For example, you can extend the table containing the diagrams, so that it can also accommodate your company logo and name. Figure 8 shows such an edited template. In addition to the diagram objects, the table now also contains a line with company logos and a field into which Word automatically inserts the current date. Such a field can be included into the table using the "Field" command in the "Insert" menu. In addition, the word "File name" has been entered. After this word, ArtemiS will insert the name of the respective sound file when generating the report.

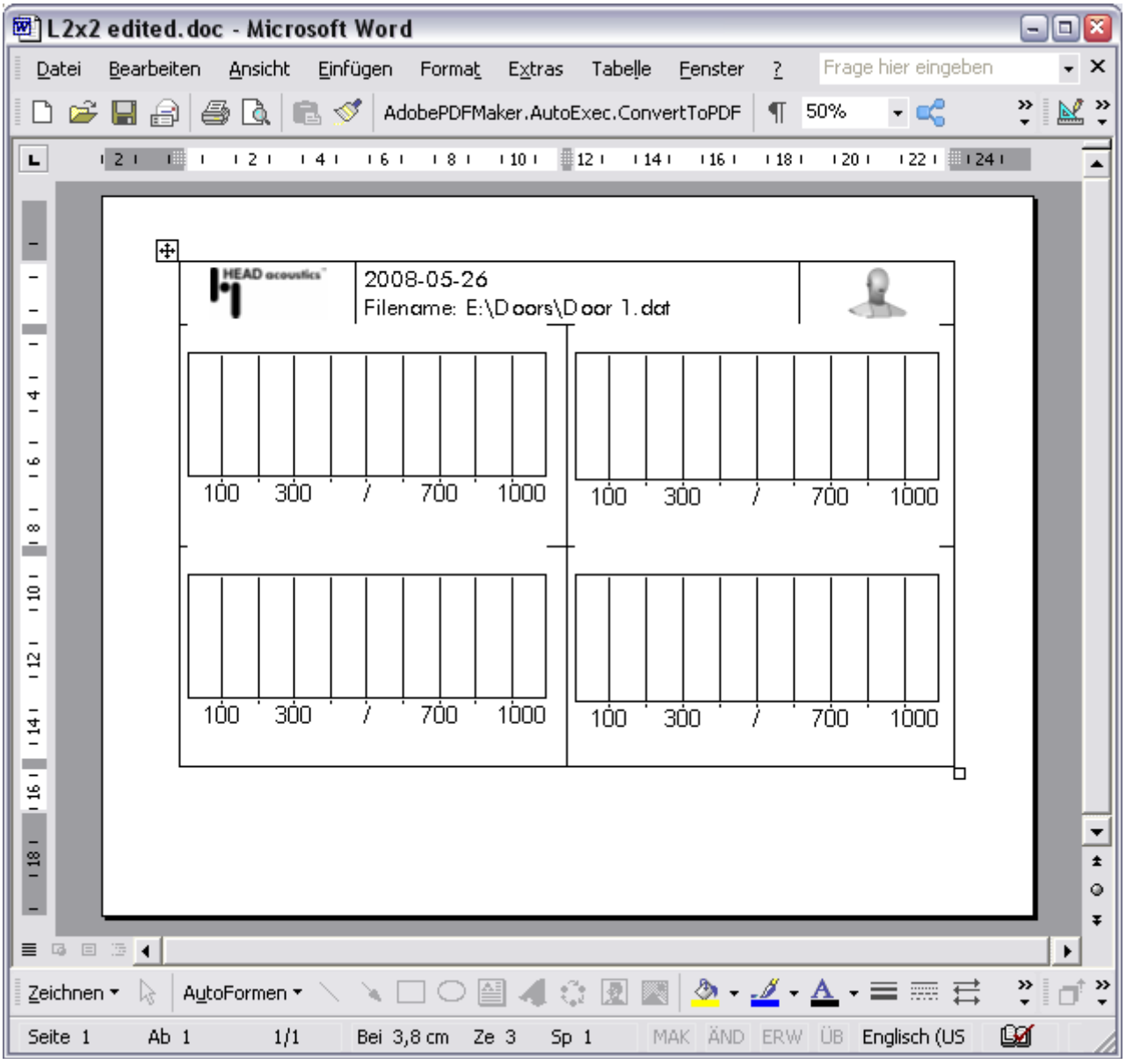

Figure 8: Editing a template with Microsoft Word®

Using the command "Insert" -> "Object" -> "HEAD Diagram Control" you can also insert additional diagrams in order to display additional analysis results. With this command, you can also create new templates from scratch, which need not be based on the included example templates and can contain several pages.
Once a template has been created according to your individual needs, you can save it with the "Save as" command and use it in ArtemiS.

Report Generation Using the Saved Template

In ArtemiS, open the Properties dialog of the Report Generator element and enter the path and file name of your saved template in the corresponding field. Clicking on the button with the three dots opens a file selector dialog, where you can browse for your Word file. In order for the template to be used, the radio button next to the file name field must be active.

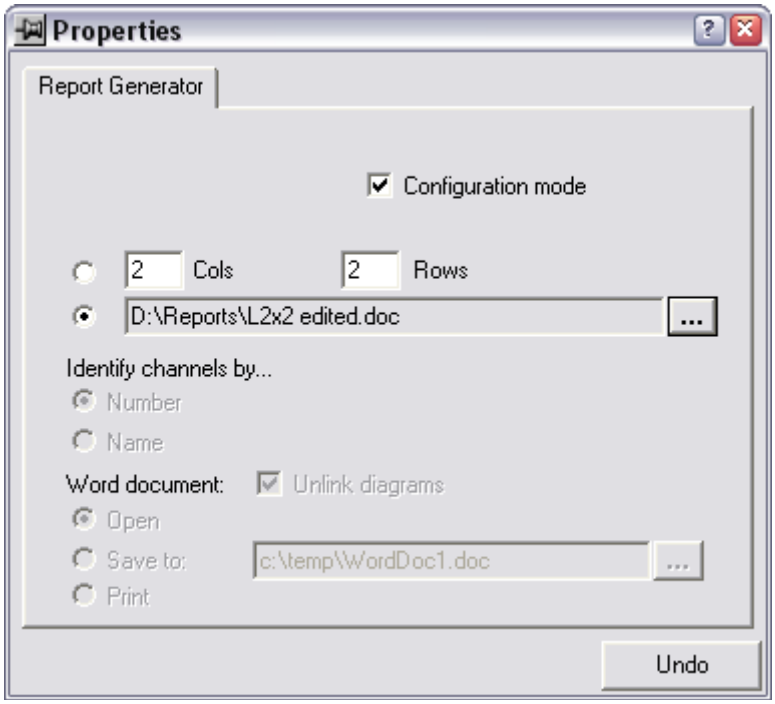

Figure 9: Selecting a saved template for the report generation

For the advanced report generation it is again necessary to start with the configuration mode to specify the diagram layout. This is done as described before. Just like in the base version, this layout specification is then saved in the Report Generator element of the ArtemiS project.
In addition to the layout of the analysis results, you can also specify additional written information about the data files. This includes, for example, the name of the data file, the single-number value of the analysis, or information saved with the file as comments.
To insert this information, the view in configuration mode must be switched from “Channels” to “Variables”. In this view, the list of analysis results is replaced by a list of available variables. To insert one of these variables into the template, the cursor in the Word document must be placed in the desired position. Then click on the desired variable in the list with the left mouse button. The variable immediately appears in the chosen position in the Word document. Figure 10 shows an example.

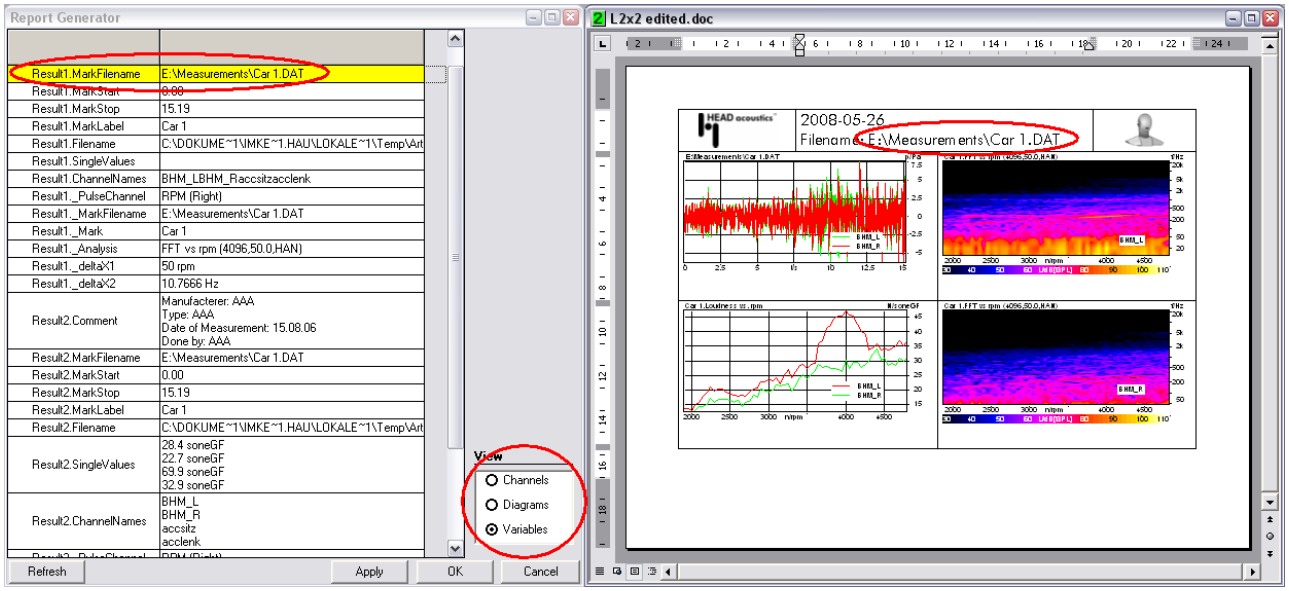

Figure 10: Inserting text variables

As soon as all desired variables have been inserted, the changes can be saved as a new template with the command “Save Template as” in the “File” menu. Unlike the diagram layout, which is saved with the Report Generator element in the ArtemiS project, the inserted variables must be saved in the actual Word template.
When the configuration of the template is complete, it can be used just like the standard templates for the automatic report generation.
In order to use a report template repeatedly in the same way, the ArtemiS project with the configured Report Generator element and the properly defined analyses must be kept available (preferably in locked mode). In addition, in order for the advanced report generation functions to be used, the Word template to be used must be available on the computer under the file path specified in the Report Generator element. That way, standardized reports that are directly comparable to each other can be created quickly and easily.

Notes

For the applications described in this Application Note, you need the ArtemiS base version (code 4600); the advanced report generation requires the ArtemiS Tool Pack 11 (code 4611).

Do you have questions for the author? Contact us at imke.hauswirth@head-acoustics.de.
We look forward to your feedback!