Duplicating report templates for creating extended reports

ArtemiS SUITE provides a very versatile reporting functionality, which facilitates the creation of clearly arranged reports for presenting your analysis results. This Application Note explains a function[1], which allows you to reuse the same report template, e.g., for additional marks and to write the resulting pages successively into a single report. The report can be extended both by selecting additional marks and by applying additional filters or analyses.
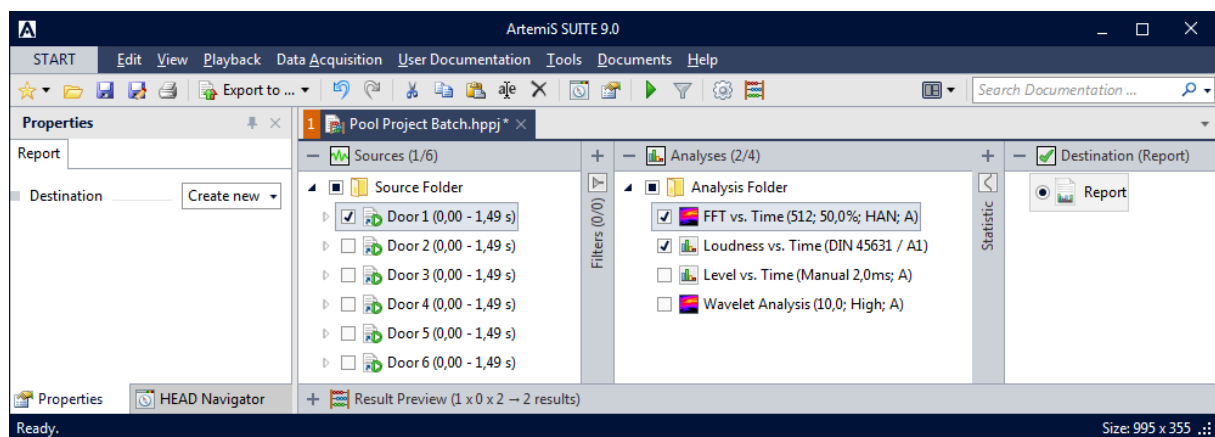
Additional Application Notes are available which describe, for example, the creation of an initial report and the embedding of user documentation in a report. You can download them in the Download Center on the website of HEAD acoustics:

https://www.head-acoustics.de/eng/nvh_application_notes_reporting.htm

The reporting function is described below using a Pool Project as an example. Basically, the descriptions also apply to other projects of ArtemiS SUITE, e.g., the Automation Project.
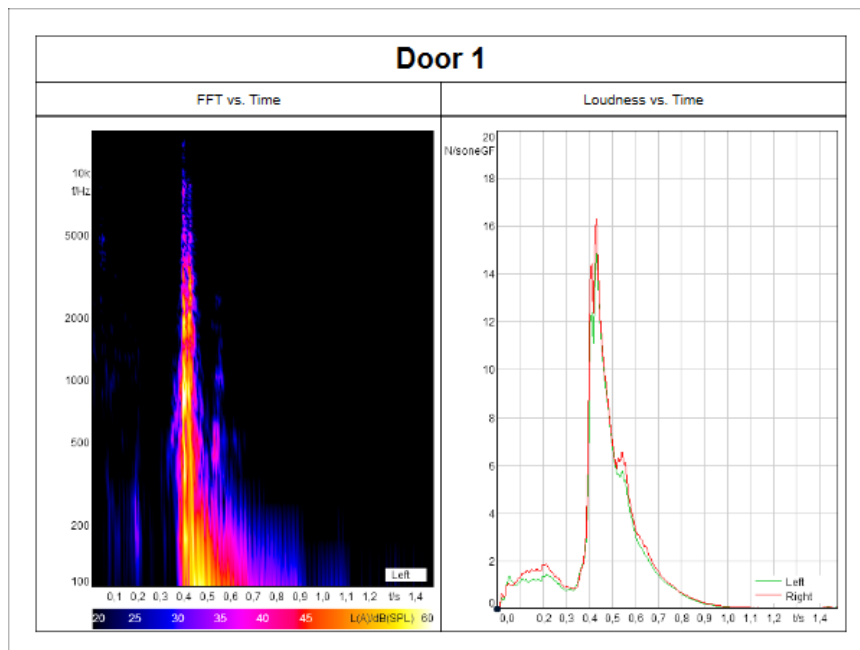
Creating the report template

First, a suitable report template must be created. The report template must be designed so that the requirements of the reports to be created later are fulfilled, too. In the following, the process is illustrated by means of an example: A number of comparable marks exists in the Source Pool. The calculation results of these files are later to be successively inserted into a report. The report template is created with the calculation results of one mark (**Door1**) and two analyses (**FFT vs. Time** and **Loudness vs. Time**). Figure 1 shows the Pool Project used. A new report template is created by selecting the function **Create new** in the Properties window of the report element.

Figure 1: Example Pool Project for creating a report template

After the calculation, the newly created report can be customized, e.g., by adding text fields with the names of the mark and the analyses (see figure 2, next page).

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[1] This function is available in ArtemiS SUITE in version 7.2 or later. The descriptions in this Application Note refer to version 9.0. The general procedures also apply to other versions. However, the scope of functionality and the user interface may differ.

Figure 2:   Example report

This particular report is designed so that it shows one page with two diagrams displayed next to each other. The data link is configured so that the result of the first analysis appears in the left diagram (***FFT vs. Time***, left channel only) and the result of the second one in the right diagram (***Loudness vs. Time***, both channels in one diagram). Furthermore, text fields with the names of the mark and the analyses have been added.[2]
When the report is completed, it must be saved for future use.

Repeated use of a report template within a report

For a repeated use of the report template within a single report, we will now activate four marks.
Also, in the Properties window of the report element, we will change the setting from ***Create new report*** to ***From existing report***. Once this option is active, an additional ***Select Report*** field appears, where you can select the previously created report as your template.
Below the selection field, additional options for duplicating a template are available: ***Repeat template per… Source Group***, ***Filter Group***, ***Analysis Group***.
With these options you can specify how the report template is to be duplicated for the representation of additional calculation results. In our example, we created a report template based on one mark and two analyses. Now if we activate four marks (***Door1***, ***Door2***, ***Door3***, and ***Door4***) for the calculation and use the ***Source group*** function, the result is a report with four pages. The first page shows the analysis results of the first mark, the second page shows those of the second mark, etc. (see figure 3).

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[2]   The creation of a data link and the configuration of text fields are described in detail in the Application Notes "Using the reporting function" and "Creating reports with user documentation and other text modules".
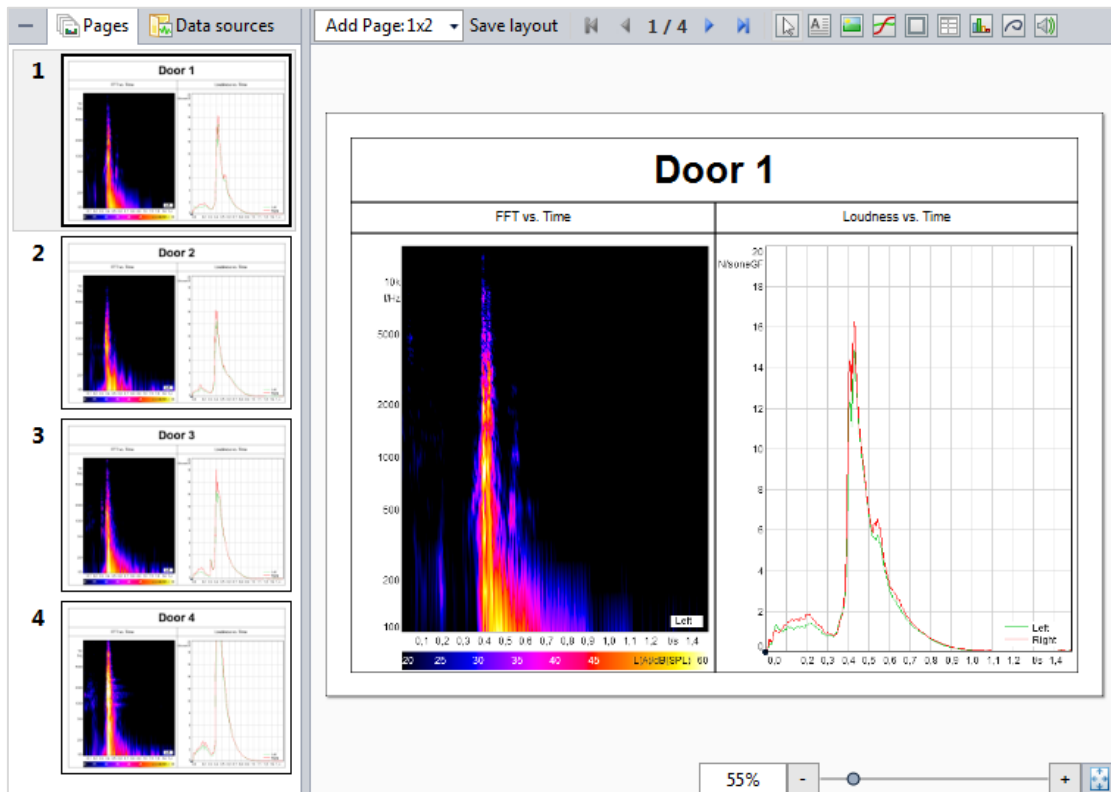
Figure 3: Example of an extended report

The headlines for the individual pages of the report were not entered as a fixed text in the template, but generated via a data link. This ensures that the mark name is automatically adapted for each mark, so the respective correct name will appear on each page.

In the next example, we will increase not only the number of marks, but also the number of analyses. For this purpose, we activate four marks (**Door1**, **Door2**, **Door3**, and **Door4**) and four analyses (**FFT vs. Time**, **Loudness vs. Time**, **Wavelet vs. Time**, and **Level vs. Time**) for the calculation. In the Properties window of the report element in the Destination Pool, we enable the **Analysis Group** option in addition now (see figure 4).
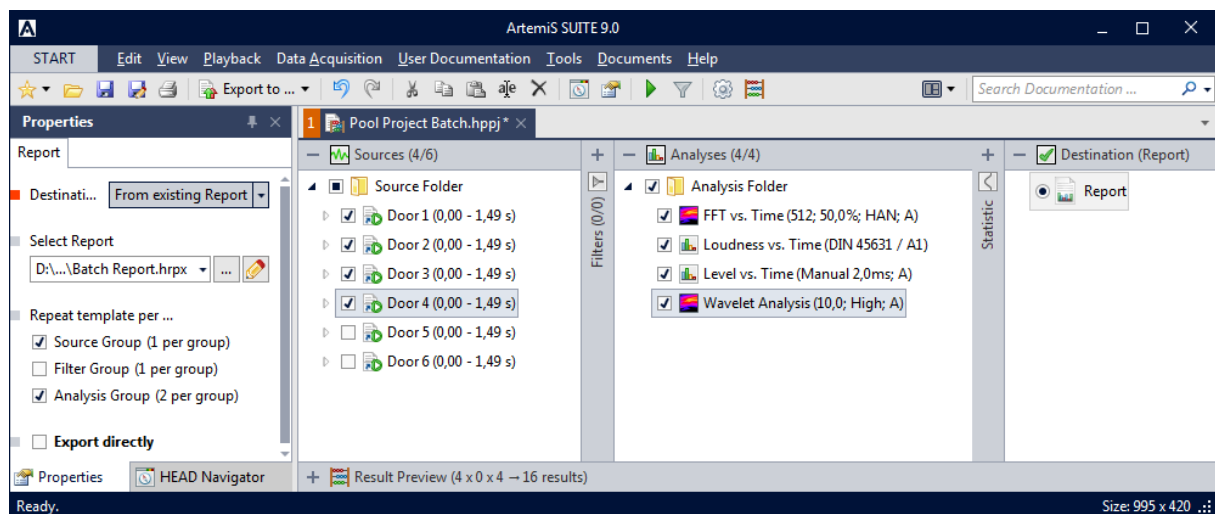

Figure 4: Pool Project with multiple activated marks and analyses and a report element configured for repeated use of a template

Using this setting, the resulting report has a total of eight pages: the first two analysis results of the first mark on the first page, then the results of the third and the fourth analysis of this mark on the second page; on the third page the first two analysis results of the second mark, then the third and the fourth analysis result of the second mark, etc. – up to the last page showing the third and the fourth analysis result of the fourth mark (see figure 5).
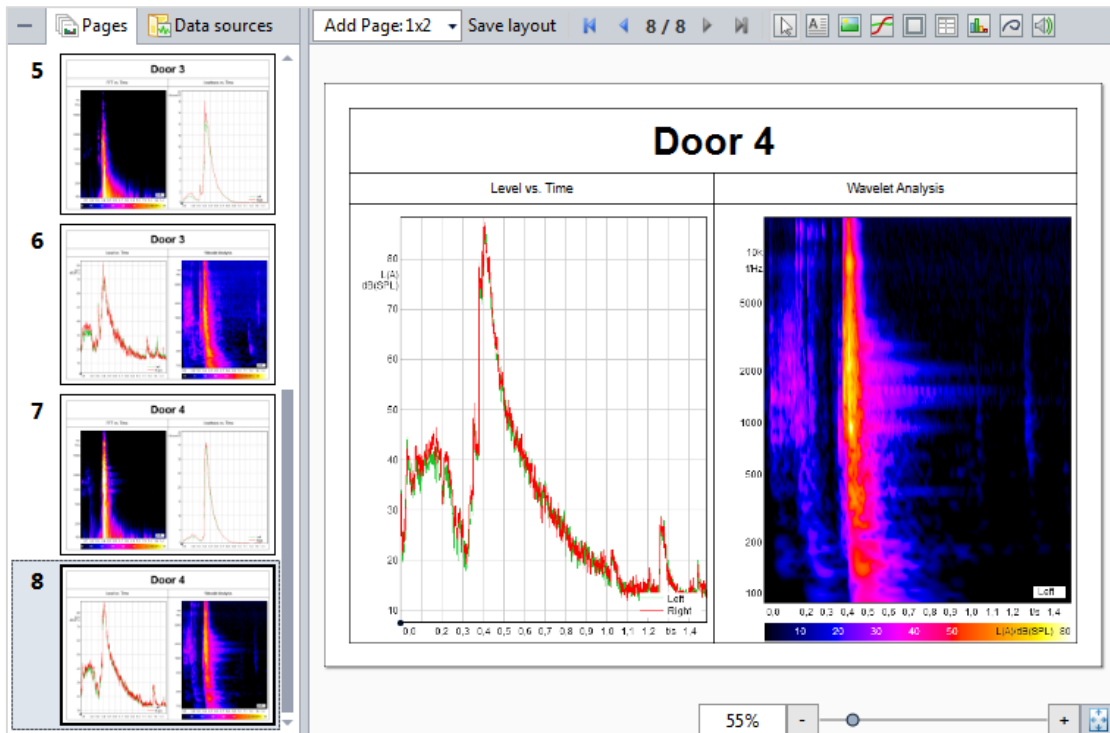

Figure 5:   Example of an extended report

Like the mark name in the main headline, the analysis names in the report template are not entered as fixed text, but inserted via a data link. This ensures that the resulting report automatically shows the correct analysis name above each respective diagram. In spite of being extended, the new report does not require any manual post-processing and can be exported immediately to the desired format using the **Export to** button.

If your report template is optimally configured and you no longer need to review the individual reports in ArtemiS SUITE, you can configure the report generation so that the report is no longer displayed in ArtemiS SUITE, but saved directly. To do so, enable the **Export directly** option in the Properties window of the report element.

Important notes

In order to efficiently use the functionality described above, it is important to pay attention to the following aspects:

The report template should be designed in a way that allows you to add future extensions easily and without post-processing. For example, as mentioned above, headlines and captions should be taken from the user documentation or system documentation of your measurement files via a data link. This is important, and makes sure that the content of the text fields in the report is automatically adapted to new data added to the report. If you enter a fixed text in a text field of your template (such as **Pavement: asphalt**), that text will appear on all pages of the resulting report. This can be useful in some cases, e.g., if you are using one specific report template for evaluating measurements made on asphalt roads, and a different template for measurements made on other pavements. However, as soon as a parameter changes from mark to mark, you should instead use information from the user documentation or system documentation. This allows your reports to be created efficiently without requiring you to correct the text fields manually.

For correct duplication of a report template for creating extended reports, it is important to assure a consistent correlation between the number of diagrams, data links, and other parameters and the data you plan to include later. Example: As a template, you created a report based on two marks and two analyses. The first page shows the results of the first analysis for both marks; the second page shows the results of the second analysis for both marks. If you want to create an extended report based on this template using the **Source Group** function, you must always select an even number of marks for the calculation, because two marks are required for the correct display of each page. If an odd number of marks are activated, the last page of the report will only display the analysis result of one mark and an error message. A different case would be the addition of another analysis for extending the report, without changing the number of marks: i.e., the results of two marks and three analyses would be calculated using the **Analysis Group** function. In this case, the resulting report would have three pages: the first page will show the results of the first analysis for both marks, the second page will show the results of the second analysis for both marks, and the third page will show the results of the third analysis for both marks.

It is also possible to add additional marks and additional analyses for an extended report. In this case, both the **Source Group** function and the **Analysis Group** function must be enabled. In the case of the above example, a report with four marks and three analyses would have six pages. The first three pages present the results of the three analyses for the first two marks, and the other three pages present the results for the marks 3 and 4.

Another possibility for creating a useful extended report is the **Filter Group** function, which successively presents in a single report the results of a mark filtered with different filters.

To help you select and use the correct number of elements, ArtemiS SUITE examines the report selected as template in the Properties window and displays the number of marks, analyses, and filters required for a correct representation. For example, if your template was created based on the results of two marks, the **Source Group** option will show the information **2 per group** in brackets. This means that for a correct extension, the number of activated marks must be a multiple of 2.

Additional Application Notes covering the reporting functionality of ArtemiS SUITE can be found in the Download Center on the website of HEAD acoustics:
https://www.head-acoustics.de/eng/nvh_application_notes_reporting.htm

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