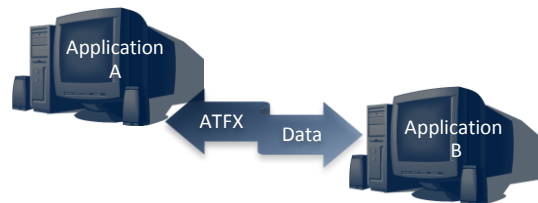


Data exchange via the XML-based ASAM Transfer Format (ATF/XML or ATFX)

Introduction

The Association for Standardization of Automation and Measuring Systems (ASAM e. V.) is an association that coordinates the development of technological standards. The standards are developed in project groups by experts from the member companies. The standards are supposed to allow consistent data exchange between the tools of different manufacturers that are used within a product development process. For this purpose, the standards define, for example, protocols and file formats for software development and testing of vehicle control devices. ASAM standards are based on other public standards and are independent of specific IT technologies and platforms.



The standard *ASAM ODS (Open Data Services)* defines the permanent storage and retrieval of data independent of an IT infrastructure and specifies two file formats for file-based data exchange. One of them is the XML-based ASAM Transfer Format (ATFX or ATF/XML). This is the exchange format recommended for new tools, which will be further developed in the future along with revisions of the ODS standard. Since the information is mostly stored in XML format, an ATFX file can be accessed by a wide variety of tools.

ArtemiS SUITE¹ provides ATFX import and export functions allowing you to read and store files in ATFX format in order to exchange data with software applications from other manufacturers. The ATFX import and export functions are already included in the base version of ArtemiS SUITE (code 5000). Exported ATFX files comply with the ASAM ODS standard version 5.3.0 and support the bus data models CAN and FlexRay. A file with the extension *.atfx* is created, which is structurally based on the ODS database specification. Regarding its content, it is compatible with the NVH database model based on this specification. In addition to the ATFX file, another file with the extension *.atfbn* containing binary data is created where necessary.

ArtemiS SUITE allows you to export or import 1D, 2D, and 3D datasets², i.e., you can save or import both time-domain signals and analysis results to or from an ATFX file.

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¹ The descriptions in this Application Note refer to version 8.0. The general procedures also apply to other versions. However, the scope of functionality and the user interface may differ.

² For example, a pulse signal is a 1D dataset; the file only contains the time values of the pulses as a one-dimensional quantity. A 2D dataset contains information based on an abscissa and an ordinate (x and y axes), e.g., sound pressure (ordinate) vs. time (abscissa). A 3D dataset contains an array of curves of multiple 2D datasets, which are connected in the third dimension via an additional parameter, e.g., analysis results of FFT vs. time: multiple FFT spectra (2D datasets with sound pressure level vs. frequency) for different time values (3rd dimension).

ATFX export in ArtemiS SUITE

ArtemiS SUITE offers several possibilities to export an HDF file to the ATFX format: In the HEAD Navigator, you can open the context menu of an HDF file and select the command **Export -> Export to ATFX**. Alternatively, you can perform an ATFX export in the Destination Pool of a Pool Project using the corresponding element. The export is started when you click the Calculate button. With an export process in the processing chain of an automation project, you can also have the ATFX export performed automatically.

Export settings

The parameters for exports performed via the HEAD Navigator can be configured via **Tools -> Options -> HDF Export**.

In the **Common** section, you can configure general settings applying to all export formats. Figure 1 shows the user interface.

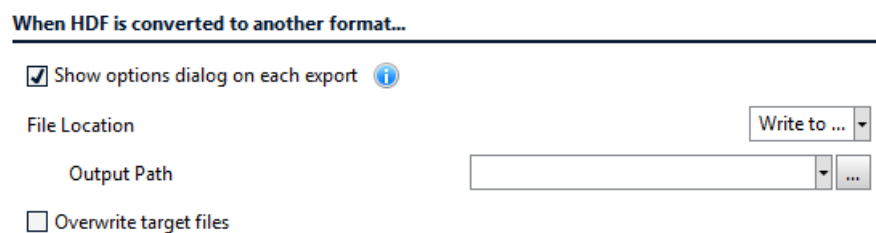


Figure 1: General export settings

The option **Show options dialog on each export** causes this dialog to appear in each export process, so you can adapt the setting each time.

In the **File Location** section you specify where the converted file is to be written to. You can define a target folder (**Write to...**) or you can select the original folder (**Use source directory**). If you select the option **Write to**, the field **Output Path** appears allowing you to define the desired file location.

The option **Overwrite Target Files** allows existing files created before to be overwritten.

In the **ATFX Format** section, you can configure settings applying specifically to the ATFX export (see figure 2).

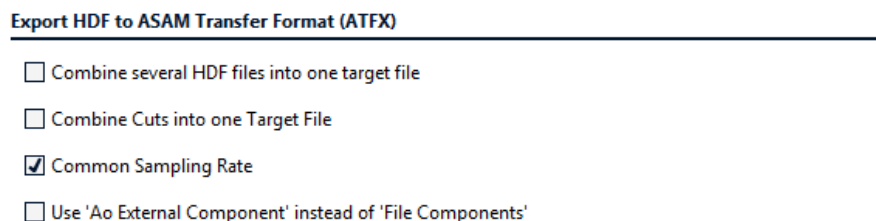


Figure 2: Settings for ATFX export

The option **Combine several HDF files into one target file** allows you to combine all input signals selected in the HEAD Navigator for export and to save them to a single ATFX file. This setting can be useful, for example, if you have performed several analyses on a mark, which are saved as individual HDF files, and you want to join them into a single export file. It is also possible to combine data from different marks into a single ATFX file. If you disable this option, each result will be written to its own ATFX file.

By means of the function **Combine Cuts into one Target File** all activated cuts³ of an input signal will be merged and written to one single ATFX file during the export. If you deactivate this function, a separate ATFX file for every cut is created.

The option **Common Sampling Rate** is activated by default, thus all channels of the resulting ATFX file are stored with the same sampling rate. This resulting sampling rate is the highest occurring in the involved input data. In order to keep the original sampling rates, you can deactivate this function. An

³ You can activate the cut function in the Properties window of certain analyses, e.g., **Order Spectrum vs. Time / RPM**.

export with different sampling rates is only possible for time signals⁴. For calculating analysis results as well as for integrations and other preprocessing operations, the data sets are put to a common sampling rate first, so that the original sampling rates are no longer available for the export.

The option **Use 'Ao External Component' instead of 'File Components'** instructs the ODS server to leave the corresponding data from the ATFBIN file as an external data file instead of storing it in its SQL database.

The settings for ATFX export via an export element in the Destination Pool or in an automation project are the same as described above.

ATFX import in ArtemiS SUITE

For ATFX import, ArtemiS SUITE offers various possibilities as well: For an import in the HEAD Navigator, right-click on the ATFX file to open its context menu. Then select **Import -> Import to HDF...** to convert the file into an HDF file according to the configured import settings. Alternatively, you can use an import process in the processing chain of an automation project to import ATFX files automatically.

Import settings

The import settings dialog can be opened via **Tools -> Options -> Import -> Common** (see figure 3). Similar to the ATFX export settings, the import settings dialog offers the option **Show options dialog on each import**, which causes this dialog to be opened each time you import a file, allowing you to adapt the settings each time.

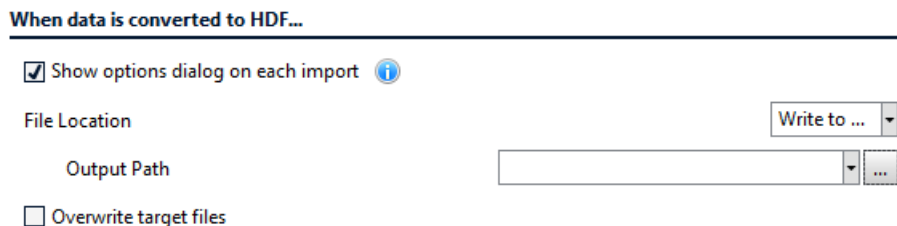


Figure 3: General import settings

In the **File Location** section you specify where the newly created HDF file is to be written to. You can define a target folder (**Write to...**) or select the original folder (**Use source directory**). If you select the option **Write to**, the field **Output Path** appears allowing you to define the desired file location. The option **Overwrite Target Files** allows existing files created before to be overwritten.

Additional notes

- After importing an ATFX file via the HEAD Navigator, you can easily find the newly created HDF file via the HEAD Navigator's **Recent Results** list, from where you can drag it, for example, into the Source Pool of your Pool Project. The most recently created file is always located at the beginning of this list.
- When importing an ATFX file containing channels with very different sampling rates, a sampling rate conversion is applied during the import. All channels with a sampling rate lower than 1/32 of the highest occurring sampling rate are upsampled to 1/32 of that maximum rate. The newly created HDF file thus no longer contains the original sampling rates.
- ATFX files containing 2D datasets (e.g., time-domain signals) with more than one abscissa cannot be imported by ArtemiS SUITE.
- Importing an ATFX file with a large number of channels, resulting in an HDF file larger than approx. 750 MB, can take very long. This can happen in case of very long time-domain signals with many channels.

⁴ These could be filtered time signals as well.