# Basics of working with user documentation in software applications from HEAD acoustics

Does the following situation sound familiar? When measuring some noise signals, you have given your recordings names as intuitive as *Engine_2245_mod1_v3.hdf* or *Car_465_testmed_A1_wcov.hdf*. When you made the recordings, it was absolutely clear that mod1 was the modification with the cover in place, whereas wcov stands for the recording without the cover. Or was it the other way around?

It costs time and money to make recordings. But if just a few months later nobody can figure out any more what the files actually contain, the recordings quickly become worthless. Good, consistent documentation is therefore a measure of value conservation.

The possibility to enter and save user documentation in HEAD Recorder and in ArtemiS SUITE helps you to tidy up your data, ensuring quick and easy access to your recordings at any time.

After a brief introduction, this Application Note[1] will inform you how to create and use documentation templates, how to document your files and how to use pick lists for your documentation:

## What is user documentation?

The documentation functionality offered by ArtemiS SUITE allows you to store useful information along with your measurement data. The documentation is subdivided into system documentation , i.e., information that is always saved automatically, and user documentation  maintained by the user (see figure 1).

The system documentation of time-domain signals contains information written to the files automatically during the recording, e.g., the number of channels, measurement units, recording date and information about the frontend used. In case of analysis results, the system documentation contains information on analysis settings, e.g., window function and window length.

User documentation can be created during the recording with HEAD Recorder, but can also be added later. The scope of the user documentation is defined by the user. For example, it is possible to document only the operating state, or document the complete measurement setup.

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[1] The descriptions in this Application Note refer to version 9.2 of ArtemiS SUITE and HEAD Recorder 9.1. The general procedures also apply to other versions. However, the scope of functionality and the user interface may differ.

| Car | |
|---|---|
| Manufacturer: | Manufacturer 1 |
| Model: | Model A |
| Segment: | Upper Class |
| VIN (Vehicle ID): | JERGDN67H57915469 |
| Date of Production: | 19.02.2009 00:00 |
| Role: | Good Vehicle |
| **Engine** | |
| Displacement: | 3,6 L |
| Fuel type: | Petrol |
| Cylinder layout: | VR |
| Power: | 195 kW |
| Turbo: | False |
| **Test** | |
| Status: | Improved Exhaust |
| Drive State: | Run Up WOT |
| Gear: | M3 |
| **@Datafile** | **WOT.hdf** |
| Classification: | Timedata |
| Date of Recording (UTC): | 2012-10-29 08:47 |
| Date of Recording (local): | 2012-10-29 09:47 |
| Local UTC Offset: | +01:00 |
| Title: | |
| Moniker: | Recording |
| Comment: | |
| Complex Data: | False |
| 3d Data: | False |
| Time Data: | True |
| Total Bytes: | 36535808 |
| Audio Channels: | 13 |
| Pulse Channels: | 0 |
| Coded Channels: | 0 |

**Figure 1:**   User documentation and system documentation of an HDF file in the ***Documentation Viewer***

In ArtemiS SUITE, you can display the documentation of the active file in the ***Documentation Viewer***. Moreover, the user documentation can be used, for example, for searching the database, for labeling diagrams, or for reporting. Ideally, when you replace an HDF file in a preconfigured report, the corresponding information from the documentation will be updated automatically in the report. This saves time and avoids additional typing and research work.

The user documentation has been designed with a transparent and straightforward structure: you create a documentation template, i.e., a preconfigured form, in ArtemiS SUITE, fill it in and assign it to a file. This is all you need to do to document your measurement. The template you created can then be used for future measurements, as well. The main advantage of using templates is that it ensures standardized documentation, which allows for extensive application possibilities in the areas of reporting and documentation search. By specifying mandatory fields, you can make sure that important parameters are always entered. On the other hand, freely editable text fields provide room for users to note down individual comments about a measurement.

## Creating documentation templates

To create a documentation template in ArtemiS SUITE, open a new template (**START** -> **New** -> **Documentation template**). Of course, you can create various templates customized for different types of measurements, e.g., one template for measurements of engine noise for documenting the engine parameters and another template for measurements of tire noise, with information on the tire.

In order to ensure that the template can be filled in quickly and easily during the measurement, some consideration should be given when creating it, because the better the documentation template, the quicker it can be filled in later. And only if the structure of the documentation template fits the measurement process and can be filled in quickly, will it be filled in reliably.

A documentation template is basically a form with several fields. If needed, the form can be subdivided into several subforms. Such a subdivision provides a better overview when working with the documentation in ArtemiS SUITE. Figure 2 shows an example of a subdivided template.



**Figure 2:**     Documentation template subdivided into subforms

After opening a new documentation template you will see a default template with three text fields (see figure 3).
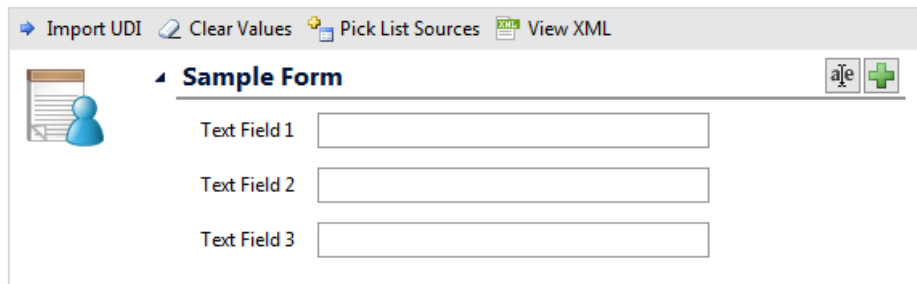
**Figure 3:** Default template with three text fields

Now you modify this standard template according to the requirements of your applications. Click on the ⊞ button to add more fields to your template. Besides text fields, other field types are available:

- **Subform**: with subforms you can structure your template for a better overview.
- **Number Field (Integer)**: use this field type for entering integer values (whole numbers), which are particularly suitable for documentation searches with relational operators (e.g., ≤, ≥).
- **Number Field (Real)**: this numeric field allows real numbers (with decimal places) to be entered.
- **Date Field**: this field type prompts for a date including the time. A date field can be filled in either directly using the keyboard or by selecting the date from an on-screen calendar. Even when entered with the keyboard, the date will be converted to a standardized format, thus ensuring consistent date and time information across all files for reliable search.
- **Boolean Field**: this field type only allows a selection between two options (true or false) by clicking on a checkbox.

Note that once a field has been added, its field type cannot afterwards be changed.

Clicking on the aᵉ button allows you to change the name of your form or a subform.
Additional customization is possible in the respective Properties window of the individual field. As an example, figure 4 shows the Properties window of a text field.
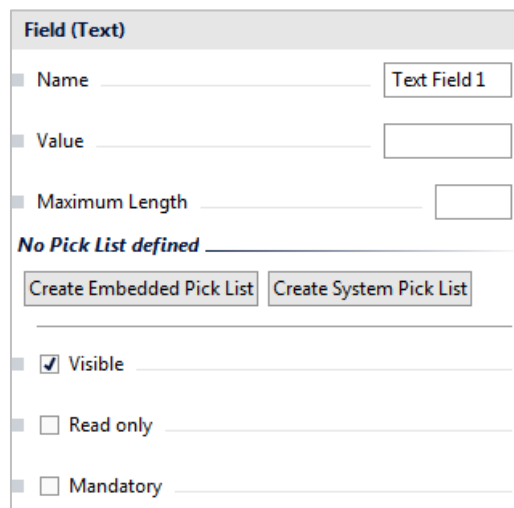


**Figure 4:** Properties window of a text field

For this type of field, you can change the following settings, for example:

- In the **Name** area, you can change the caption of the field, e.g., from *Text Field 1* to *Model*.
- In the **Value** area, you can enter a default text. When the documentation template is invoked later, the field is already filled with the default text. This is useful if a parameter stays the same for most measurements and must be modified only in special cases.

- The checkboxes *Visible*, *Read only*, and *Mandatory* specify whether the field is visible when the template is invoked, whether its content is write-protected, and whether it is mandatory to fill in the field.

Moreover, a *Pick List* can be created in the Properties window. The use of pick lists is explained in detail later in this document.

The Properties windows of the other available field types are different from the one shown above. They are explained in detail in the Help System of ArtemiS SUITE.

When you have finished configuring your documentation template, save it with the menu command *Save as*.

You can save several instances of the same template, each with its own default value(s) entered in the *Value* field(s). When creating the documentation, you can then select the template that is pre-filled for the respective application case.

# Documenting files

To document a file, highlight it in the HEAD Navigator in ArtemiS SUITE and open its user documentation with the keyboard shortcut *Ctrl + D*. With the command *Assign template* in the toolbar, open the appropriate template and fill it in for the file you highlighted.

This way of documenting existing files is available at any time in ArtemiS SUITE. However, it is recommended to enter the documentation immediately when recording the file with HEAD Recorder. This allows the relevant information related to the measurement to be secured directly where it is available, i.e., during the measurement at the test facility, on the test track, etc.

## Documentation in HEAD Recorder

To do so, use the *Flow Control* functionality of HEAD Recorder[2]. Open the Flow Control editor with the keyboard shortcut *Alt + F11* and stop the running program by clicking on the 🔲 button. Before modifying the existing Flow Control program, you should save it by clicking on the 💾 button so you can restore it later if needed.

Now you can add a *User Documentation* block to the Flow Control program. This block opens a documentation template created with ArtemiS SUITE and is usually placed after the recording block (see figure 5).

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[2] For detailed information on using the Flow Control functionality, see the Application Note "Using Flow Control with HEAD Recorder" and the online help of HEAD Recorder.
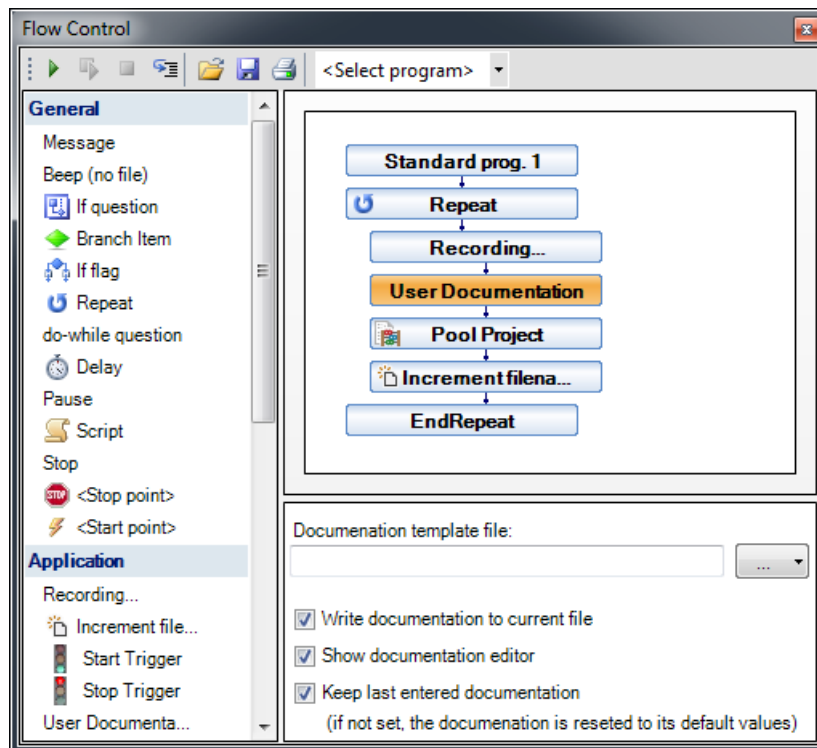
**Figure 5:** Flow Control editor

The desired template is specified in the Properties window in the field ***Documentation template file*** (see figure 5). Various other functions that can be enabled in the Properties window of the user documentation block facilitate the user's work when entering the documentation:

- ***Write documentation to current file***: If this option is enabled, user documentation entered after the measurement is immediately saved to the current recording file.
  However, if you want to use parameters from the user documentation for the file or path name, for example, you need two user documentation blocks:
  - one where this option is disabled and which is placed before the measurement in the Flow Control program,
  - and one where the function is enabled and which is placed after the measurement.
  In this case, the user enters the documentation before the measurement, and it can then be used, for example, for generating the file name (using an ***Increment filename*** block), and is also written to the file after the measurement.
- ***Show documentation editor***: If this option is enabled, the documentation editor for filling in or modifying the specified documentation template is displayed. If the function is disabled, the editor is no longer displayed, and the current user documentation (either the last entered version or the one saved with the specified documentation template) is used. That way, the same user documentation is saved for all measurements without user intervention. This is useful to reduce work if the user documentation entered is valid for all subsequent measurements.
- ***Keep last entered documentation***: Enabling this checkbox causes HEAD Recorder to preconfigure the fields of the user documentation with the last entered values, thus avoiding the need to enter the same information over and over. But unlike the function described above, the editor is still displayed, so the user can modify the information if needed.

## Saving user documentation

Basically, user documentation can be saved in two different ways: it can either be embedded in the HDF file, or it can be saved as a separate file in the same folder as the measurement data. The separate file has the same name as the measurement file, but the extension *.hadx* is appended after the extension *.hdf*. The content as well as the usage of the user documentation, e.g., in ArtemiS SUITE, is independent of the storage method chosen.

The advantage of embedded user documentation is that the information cannot be forgotten when the measurement files are archived or copied to another computer, since the documentation is included in the HDF file. However, user documentation embedded in an HDF file can only be read and edited with software applications from HEAD acoustics.

The method of creating a separate HADX file allows you to access the documentation with third-party software. In companies where recordings are stored in company-wide databases, this method also allows access with third-party database applications.

We recommend that you choose the storage method according to your company's specific needs. You can configure the storage method in HEAD Recorder options (*Tools* -> *Options* -> *User Documentation* -> *Embed file documentation in HDF file*, see figure 6).
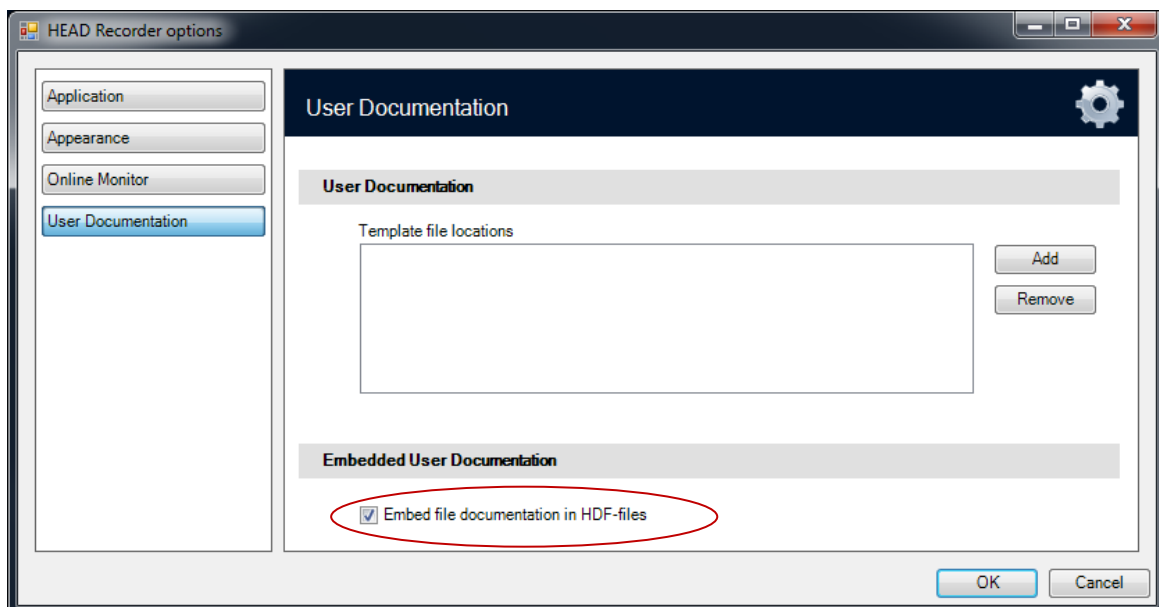


**Figure 6:**   Properties window of the user documentation in HEAD Recorder

In addition, ArtemiS SUITE always allows you to extract embedded data to a separate file, or to embed documentation from a separate file in the HDF file (e.g., in case of a reorganization of data storage within the company or for archiving purposes).

HEAD acoustics will gladly assist you with choosing the appropriate storage method and with the creation of suitable templates and Flow Control programs. Please contact your HEAD acoustics representative.

# Using pick list

An important aspect of the usability of user documentation is the use of an embedded or a system pick list. Integrating such lists not only facilitates work when creating the documentation, since content need no longer be typed in manually, but is conveniently picked from the list. Pick lists also ensure that the information is saved in a standardized way. And only if the same kind of information is always saved with the same structure, can the user benefit from the advantages of user documentation, e.g., in a documentation search or when creating reports.

At the beginning when creating the template, an embedded pick list can be created in the Properties window of a text field. To do so, click on the button **Create Embedded Pick List** in the Properties window. This opens a table (see figure 7), where you can enter the desired items for the pick list in the first column (**Value**).



**Figure 7:** Properties window of a text field displaying an embedded pick list

In the second column, you can enter detailed explanations that will be displayed to the user when filling in the template. The checkbox **Allow pick list values only** specifies whether the user can only select from the predefined values, or also type in other values.
If you save the documentation template now, the created pick list is embedded in the template and will be displayed when the template is filled in.

The difference between an embedded pick list and a system pick List is that the embedded pick list can only be used for the current template, whereas the system pick list is available for all templates, i.e., it needs only be created once, even if it is to be used in several documentation templates.
The method of embedded pick lists is quick and effective and allows the documentation templates to be moved to a different computer without problems, because the pick list is built into the template. This is very useful: for example, if you create your documentation templates on an office PC but record your measurements with a laptop. When you copy your documentation templates to the laptop after creating them, you need not worry about the embedded pick lists. The lists are available immediately when the template is invoked on the laptop.

The advantage of system pick lists is that they are stored in a separate pick list source and therefore can be used for multiple documentation templates. System pick lists can be saved and maintained by

an administrator in a central location (e.g., a network drive). Additions must be entered only once and are then available to all users who have access to this pick list source. Furthermore, system pick lists allow dependencies between pick lists to be defined. For example, if a certain car manufacturer is selected from a pick list, another pick list with car models – if configured accordingly – will only show the models from this manufacturer.

So system pick lists are much more flexible, but their creation and maintenance is somewhat more complex. If you move a documentation template containing a link to a system pick list to a different computer, you must also move the separate pick list source and link it again before using the template.

The application possibilities and advantages of system pick lists are manifold and exceed the scope that can be covered in this Application Note. Please contact your HEAD acoustics representative to learn more about the creation of suitable pick lists and how to benefit from the advantages of the storage method chosen.