ASAP2 Tool-Set

Product Information

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1 Overview

1.1 Introduction

One prerequisite for using CCP and XCP as measurement and calibration protocol is the existence of an ASAP2 description file. The ASAP2 Tool-Set is used to create and check this file. The six console programs are configured using initialization files and can thus be easily integrated in batch and make processes. The ASAP2 Studio also provides you an additional convenient tool for entering and editing all information via a dialog-based user interface.

> Automatically generate ASAP2 files based on C-Code comments

> Update the address and data type information in an ASAP2 file

> Merge multiple ASAP2 files into one joint file

> Compare two ASAP2 files with results documentation in various formats

> Check ASAP2 files for syntactic and semantic errors

> Search filters enable specific modifications and optimizations of ASAP2 files

> ASAP2 Studio is the right solution for creating and visualizing standardized ECU description files

1.2 Overview of Advantages

> The ASAP2 Tool-Set offers extensive and easy support in editing ECU description files in A2L format.

> Programs can be integrated in a Makefile process.

> Warnings and error messages can be stored in a log file. The result can be determined by the exit code.

> Convenient creation, modification, and updating of ECU description files with a dialog-based user interface in the ASAP2 Studio.

> All versions released by ASAM can be read in, including the latest version 1.7.1. In doing so, both UTF8- and UTF16-coded files are supported. Files in ASAP2 format Version 1.4.0 and higher can be generated.

> Easy adoption of address and data type information from the linker map file or debug file.

> Even A2L files that do not conform to the standard are read in through the adjustable tolerance.

> The interface-specific parts of the ASAP2 file are generically interpreted based on the specified meta language so that no limitations with regard to the supported IF_DATA types exist.
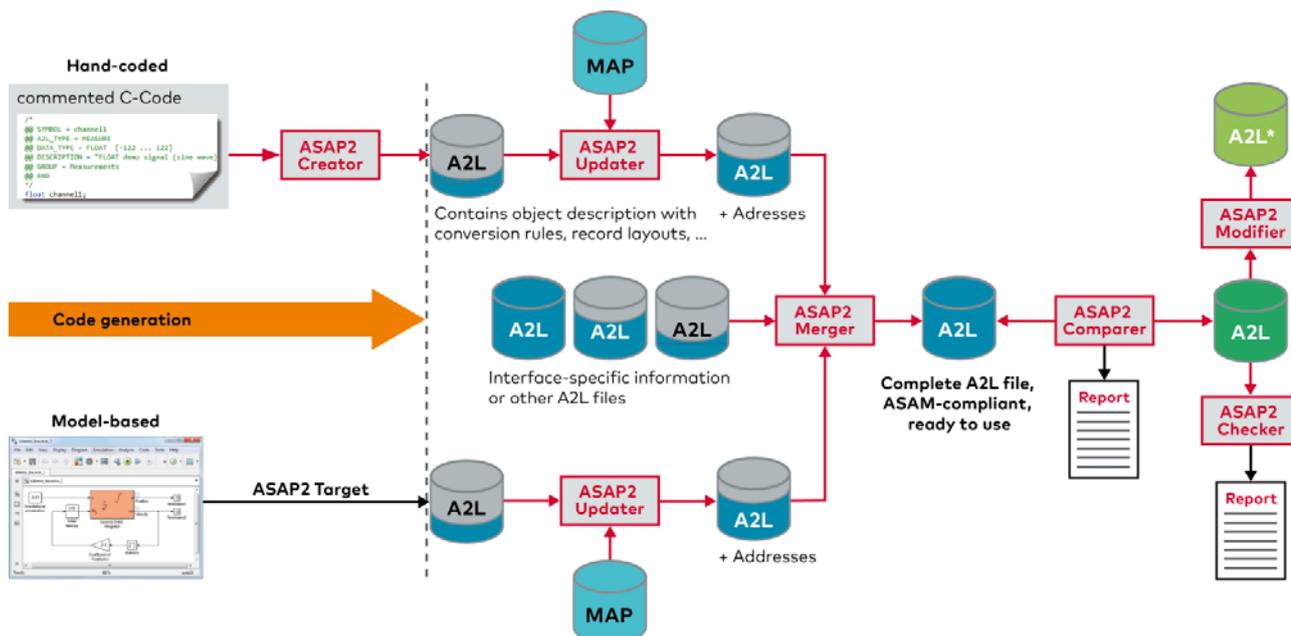

Figure 1: Automatic ASAP2 generation process with ASAP2 Creator, Updater and Merger. Comparison of ASAP2 files and specific modification results using the ASAP2 Comparer and Modifier. The ASAP2 Checker checks ASAP2 files for syntactic and semantic errors.

1.3   System Requirements

> Windows 10/8.1/7 (32-bit and 64-bit, ASAP2 Studio only 64-bit)

2   Functions

2.1   ASAP2 Creator

A prerequisite for use of the ASAP2 Creator is that comments must be inserted in the C-Code. ASAP2-specific information such as data type, conversion rules, min-max conditions, structures, arrays, etc. is defined in these comments.

> Information values can be stored centrally by the use of macros.

> The ASAP2 Creator reads in this supplemental information, and from this information it generates ASAP2 fragments for the objects described by the comments.

> A key advantage of this solution lies in the single source principle, since the supplemental information is stored together in the parameter definition section of the code.

> The integrated merge function ensures that changes which are made to ASAP2 fragments after they have been automatically generated are considered in a later generating process.

> Support of structures and variants greatly reduces description effort in the comments of the code.

2.2   ASAP2 Updater

The ASAP2 Updater reads in an ASAP2 source file, updates all address and data type information based on the entries in a linker map file and generates a new ASAP2 file from this information.

> The most current linker map file and debug file formats are supported, for example IEEE, COFF, ELF/DWARF, EXE/DWARF, and the ASCII Map formats of many compilers.

> The address information is updated for all measurement and calibration parameters, for memory segments and pointer-based calibration methods as well as for variant coding.

> You can use the integrated filter functions to hide certain objects or object groups.

> It is possible to generate additional ASAP2 objects from configurable address ranges of the linker map file.

> For enum variables, it is possible to automatically generate conversion methods from the information of the MAP file.

> The file size of the generated ASAP2 file can be minimized by removing redundant information.

2.3   ASAP2 Merger

The ASAP2 Merger merges several ASAP2 files to a common ASAP2 file. One of the source files must be determined as master, the other source files are slaves. From the master, all information is used for the result ASAP2 file, from the slaves only the measurement and calibration objects, conversion rules, functions, groups, and record layouts are taken into account. For each slave it must be defined which modules have to be attached to which master module. There is an option for the objects in the resulting ASAP2 file to receive a suffix, which indicates from which source file these objects originated. A check for name conflicts is also possible, and new unique names can be generated if necessary. The source file's include structure can be preserved in the generated ASAP2 file.

2.4   ASAP2 Comparer

You perform a quick and easy comparison of two ASAP2 files with the ASAP2 Comparer. Identically named objects, for which a comparison of contents will be made, are specified via an initialization file. With the help of a thesaurus, measurement and parameter objects with different names can also be compared. The comparison result is documented in a file in text, CSV, XML or Excel format. The comparison between two A2L files also includes referenced objects.

2.5   ASAP2 Checker

Not every A2L file conforms to criteria of the standard. To assure high process reliability over the entire toolchain, an A2L file is checked against the standard, and deviations are pointed out. Along with syntax checking, more extensive semantic plausibility checks can also be performed.

The ASAP2 Checker automatically corrects a series of semantic errors and a new, correct ASAP2 file is generated. The result of the syntactic check and the semantic plausibility checks are available to you in a clearly organized report in HTML format.

2.6 ASAP2 Modifier

The ASAP2 Modifier lets users modify ASAP2 files in specific ways. Some of the supported modifications are:

> Complex filtering of ASAP2 files by any desired search criteria (name, comment, address, object attribute, etc.). Search filter results may either be removed from the ASAP2 file or may be extracted to a separate file that is automatically linked to the main file.

> Configurable optimization of the ASAP2 file (reducing file size by removing redundant information)

> Correction functions (removing invalid key words and references from the ASAP2 file, invalid characters in object names can be replaced)

> Removal of information in the ASAP2 file (stepwise: comments, header, AML, IF_DATA, etc.)

> Modification of object attributes (e.g. address offset, write protection, etc.)

> You rename variables with the help of patterns.

> ASAP2 Modifier can read in Excel/CSV files. This enables the properties of the measurement and calibration values from the ASAP2 file to be updated.

> Files in the CANape update format are also imported with the Modifier. The update format can be used to remove or rename variables or to modify their properties.

2.7 ASAP2 Studio

The convenient ASAP2 Studio is used to create, modify and update ECU description files in ASAP2 Version 1.x format. The editor is optimally integrated in the development process. For example, when the ASAP2 Studio is used to create database objects, address and data type information can be taken from the linker map file or debug file. ASAP2 Studio is the "standalone" version of the database editor integrated in CANape. The updated graphical user interface is sorted by areas of application and permits fast, easy use with the intuitive ribbon.

The ASAP2 Studio offers the following functions:

> All information can be entered and changed in windows dialogs. Clear, dialog-based configuration and call of command line tools is also possible.

> ECU descriptions can be read-in in ASAP2 format and can also be saved in these formats.

> Selective export of individual database objects is possible, as is import of individual objects from other ASAP2 files.

> Linker-map or debug files can be used to automatically update address and data type information. All commonly used linker-map and debug formats are supported such as IEEE, ELF/DWARF, COFF and PDB.

> Corrupt (not standard-conformant) A2L files can also be read-in using the configurable tolerance.

> Various plausibility checks can detect such errors as address overlaps, duplicate object names, invalid references and much more.

> Mass operations accelerate the working process letting users select many objects and change their properties together.

> All IF_DATA information for which a suitable AML description exists can be edited in the editor.

> A2L files can be opened from the Windows Explorer by drag & drop operation.

> Zipped ASAP2 files can be read in.

> User-defined filters simplify navigation.

> Undo/redo function is available for all modifications of A2L files.

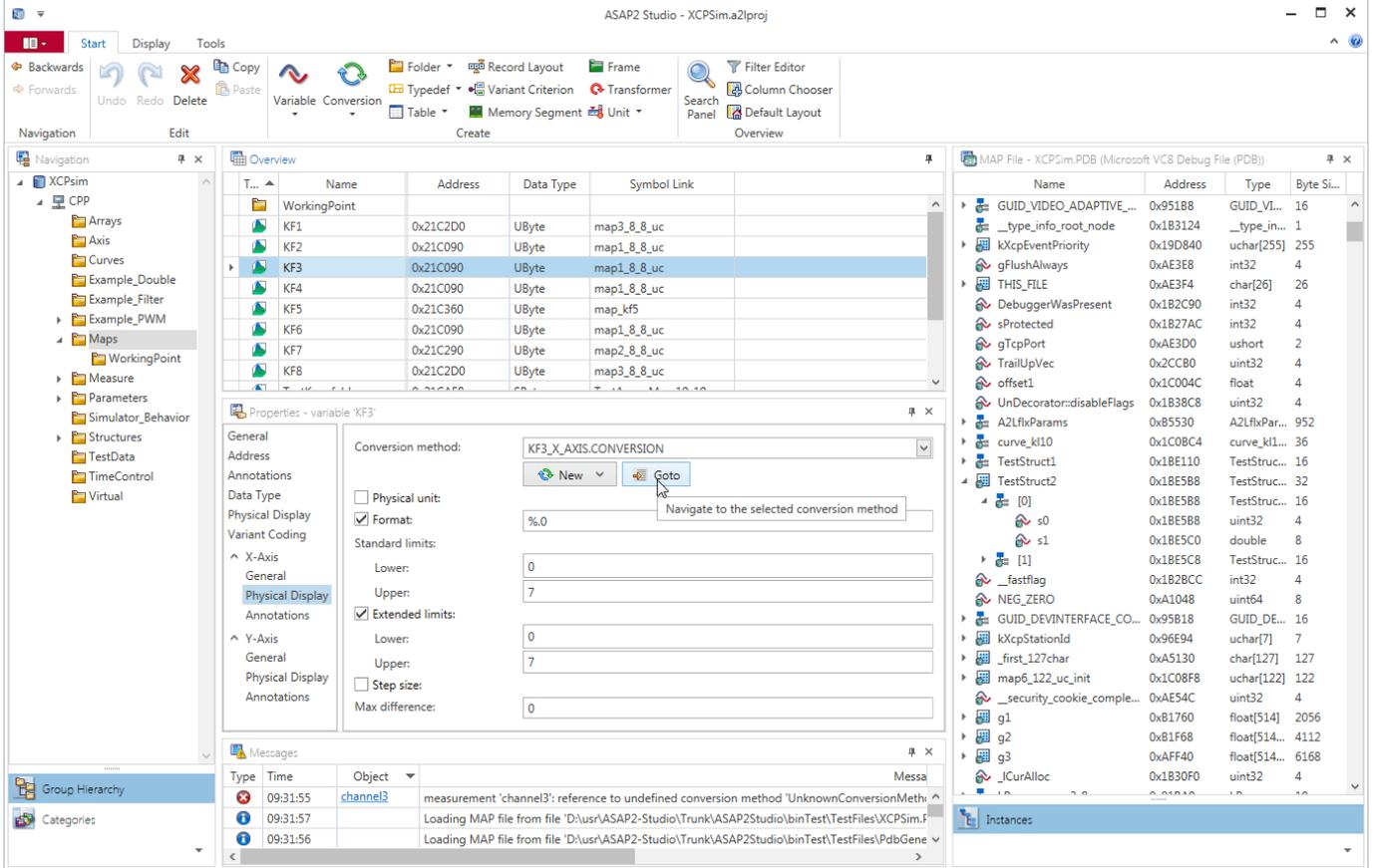> Layout of ASAP2 Studio is customizable with freely dockable windows.

Figure 2: Configuration of a characteristic map in the ASAP2 Studio

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