VECTOR

ASAP2 Tool-Set

Product Information

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Valid for ASAP2 Tool-Set as of version 18

1 Overview

1.1 Introduction

An ASAP2 description file (A2L) is a prerequisite for using XCP and CCP as a measurement and calibration protocol. The ASAP2 Tool-Set is used to create, modify and verify the A2L files. It includes 7 console programs, which can be configured via initialization files and easily integrated into automated processes, and the ASAP2 Studio. With the ASAP2 Studio a comfortable tool with user interface is available to see and modify all contents of the finished description file.

- Automatic generation of A2L files based on special comments in the ECU code
- Update the address and structure information in an A2L file based on the contents of linker MAP and debug files.
- Merge multiple A2L fragments into a single A2L file
- Comparison of A2L files and export of the comparison result to various report formats
- Checking A2L files for syntactic and semantic errors
- Targeted filtering, modification, addition and optimization of A2L files
- Visualize and manually edit A2L files using dialogs

1.2 The Advantages at a Glance

- The ASAP2 Tool-Set offers comprehensive and convenient creation and editing of ECU description files in A2L format.
- The console programs can be easily integrated into automated processes. Warnings and error messages are stored in a log file and the result is determined via the exit code.
- With the ASAP2 Studio, ECU description files are conveniently created, modified and updated through the dialog-guided user interface.
- All versions released by ASAM, including the current version 1.7.1 can be edited. Both UTF8 and UTF16 encoded files are supported. Files in A2L format from version 1.4.0 can be generated.
- Address and structure information can be easily transferred from linker MAP or debug files by means of a large number of integrated MAP readers.
- Even non-standard A2L files can be read in by adjusting the tolerances.
- All IF_DATA types are supported. The interface-specific parts of an A2L file are interpreted and processed generically based on the included meta language definition AML.

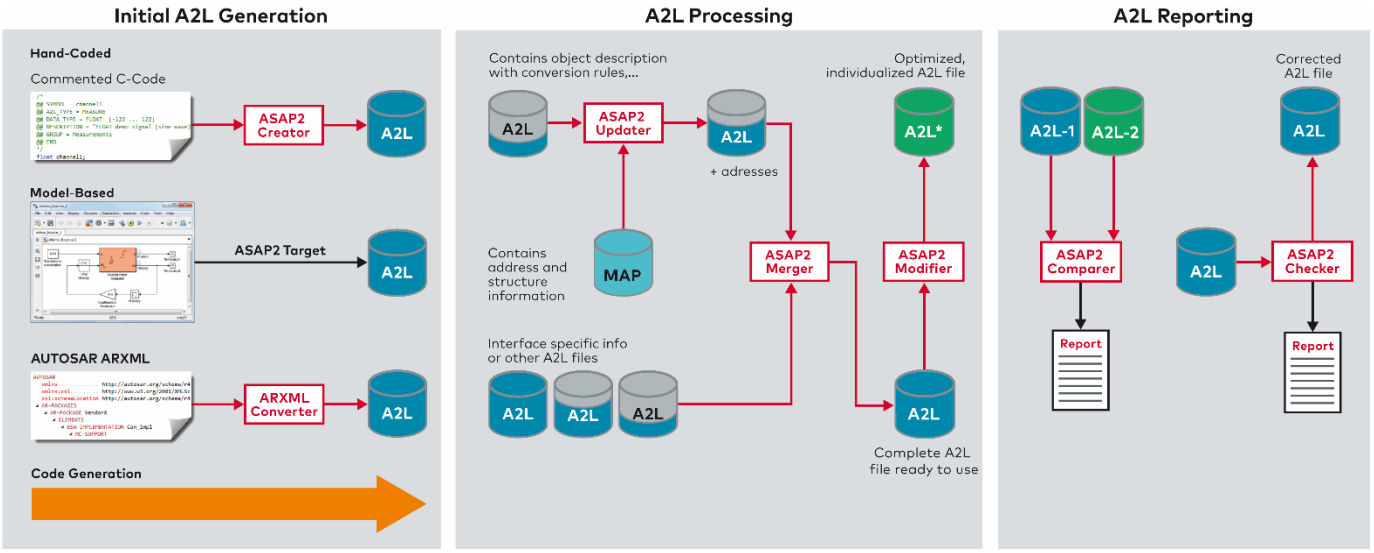

Figure 1: Automatic ASAP2 generation process with the ASAP2 Creator, Updater and Merger and the ARXML Converter. The comparison of ASAP2 files as well as the targeted modification is done with the ASAP2 Comparer and Modifier. The ASAP2 Checker checks ASAP2 files for syntactic and semantic errors.

1.3 System requirements

> Windows 10/11 or Linux with .Net 6

2 Functions

2.1 ASAP2 Creator

Prerequisite for the use of the ASAP2 Creator is the insertion of special comments into the ECU code. ASAP2 information such as data type, conversion rules, min-max conditions, structures, arrays, etc. are defined via these comments.

> The particular advantage of this solution is the single-source principle, since the additional information is also stored at the parameter definition point in the code.

> The ASAP2 Creator reads this additional information and uses it to create A2L fragments for the objects described by the comments.

> An integrated merge function ensures that changes made subsequently to the automatically generated A2L fragments are taken into account when they are regenerated.

> The support of structures and variants massively reduces the description effort in the comments of the code.

> The use of macros enables the central storage of these information values.

2.2 ASAP2 Updater

The ASAP2 Updater reads an A2L source file, matches the information with entries from a linker MAP file, generates missing objects if needed, and creates a new A2L file.

> The most common linker MAP and debug formats are supported, e.g. ELF/DWARF, PDB, IEEE, COFF and the ASCII MAP formats of many compilers.

> Address updating is possible for measurement and adjustment sizes, for memory segments and pointer-based calibration methods, as well as for variant coding.

> Data type and dimension information can be updated for measurement and adjustment sizes.

> For variables with enumeration types, conversion methods can be generated automatically from the information in the MAP file.

> For structures, missing structure components can be added automatically.

- Additional ASAP2 objects can be generated from configurable address ranges of the linker MAP file.
- Objects or groups of objects can be hidden using the integrated filter functions.

2.3 ASAP2 Merger

The ASAP2 Merger merges multiple A2L fragments into a common A2L file. One of the source files must be set as master, the other source files are slaves. From the master file all information is taken over into the result file, from the slave files only the measurement and adjustment quantities, conversion rules, functions, groups and record layouts.

- Naming conflicts are automatically detected and can be resolved using various configurable resolution strategies.
- The objects in the result file can optionally be provided with prefixes and/or suffixes indicating from which source file these objects originate.
- The included structure of the source file can be preserved in the generated ASAP2 file.

2.4 ASAP2 Comparer

With ASAP2 Comparer you can quickly and easily compare two A2L files and generate documentation of the comparison result.

- The objects to be compared can be restricted via freely definable filters
- With the help of a thesaurus, measurement and parameter objects with different names can also be compared.
- Recursively referenced objects are included in the comparison.
- The comparison result can be exported as text, CSV, XML or Excel format.

2.5 ASAP2 Checker

Not every A2L file meets the criteria of the standard. To ensure a high level of process reliability throughout the entire tool chain, an A2L file is checked for compliance with the standard and deviations are highlighted.

- In addition to the syntactic check, further semantic plausibility checks can also be performed
- The error tolerance of the check is configurable.
- A number of semantic errors can be corrected automatically, generating a new, correct A2L file.
- The result of the syntactic and semantic check is available as a clear report.

2.6 ASAP2 Modifier

The ASAP2 Modifier allows targeted, user-defined modification of A2L files. Among others, the following modifications are supported:

- Complex filtering of A2L files according to freely configurable search criteria.
- Precise selection of elements to be changed or removed.
- Redundant information can be removed to minimize the size of the A2L file.
- Anonymize A2L files by hiding information.
- Modify object attributes
- Global Renaming variables with the help of patterns.
- Updating A2L objects by importing foreign formats, such as DBU, Excel and JSON.

2.7 ARXML Converter

With the ARXML Converter you can easily convert AUTOSAR ARXML files containing MC support data into the ASAP2 format:

- AML and interface specific data such as XCP communication parameters can be used from an A2L master file.
- Any number of ARXML files can be imported into the master file in one program run.
- Name conflicts are automatically resolved by suffix generation.
- The generated group structure in the A2L file can be user-defined optimized.

2.8 ASAP2 Studio

With the ASAP2 Studio, A2L files can be visualized, created, modified and updated. By visualizing the contents of MAP and debug files, specific objects can be selected from them and integrated into the A2L file. The command line tools of the Tool-Set are integrated and can be configured and controlled via dialogs. The graphical user interface is sorted according to application areas and enables fast, convenient operation.

The ASAP2 Studio is available for Windows only.

The ASAP2 Studio offers the following functions:

- All information can be entered and changed via dialog.
- Changes can be undone and restored step by step.
- The integrated navigation function allows you to jump back and forth between objects.
- The configuration of A2L and related MAP files can be managed in A2L project files.
- Flexibly dockable partial windows allow an individual layout adapted to the respective requirements.
- A2L files can be opened from Windows Explorer using drag-and-drop.
- MAP and debug files can be visualized and used to quickly generate new objects.
- An update of address and structure information is done via the integrated ASAP2 Updater.
- Database objects can be imported from other A2L files or from foreign formats such as Excel or DBU.
- Export of subsets of the database is done as A2L file or in a foreign format such as Excel.
- The integrated ASAP2 Comparer is available for the comparison of A2L files. The comparison result can be visualized and exported to various formats for documentation purposes.
- User-defined complex filters enable fast searching - both within the database and within the MAP file.
- Plausibility checks are performed via the integrated ASAP2 Checker.
- Mass operations allow the simultaneous modification of multiple objects.
- All IF_DATA information for which a suitable AML description exists can be processed generically.

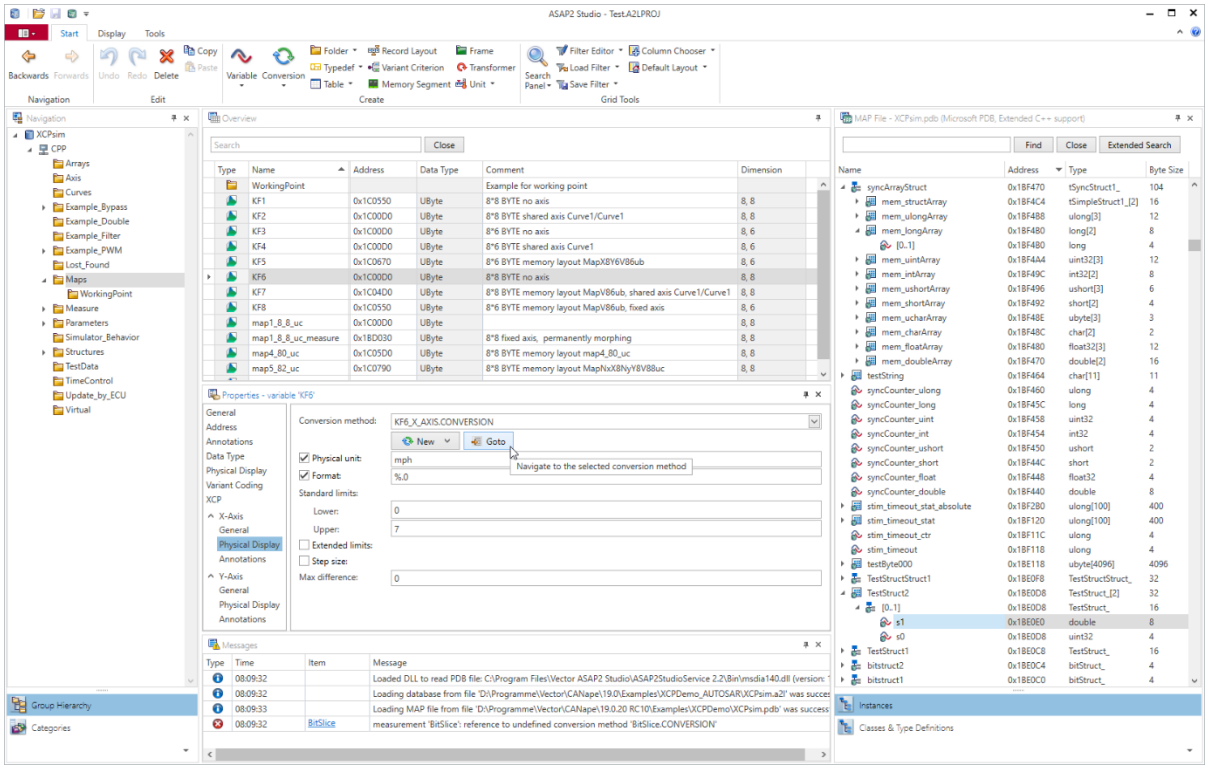

Figure 2: Editing a map object with the ASAP2 Studio

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