

# Data Declaration System



The Visu-IT! Data Declaration System represents a central repository for all ECU variable declarations and thereby ensures consistency between your ECU source code and the description files generated for ASAP2 reading calibration and measurement systems.

## General Information

The Visu-IT! **Data Declaration System (DDS)** is an intuitive database application for defining and managing calibration and measurement items to be used in embedded controllers.

DDS manages the calibration and measurement object attributes required for configuring calibration systems, as well as code representation information. To ensure consistency of the DDS data pool and the actual ECU software, ANSI-C code is generated out of the DDS data definitions.

This ANSI-C code is compiled and linked with the ECU software.

The generated locator file is used by DDS to:

- Perform validity checks.
- Capture the address information required for creating an ASAP2 description file.

## Basic Functions

DDS serves for three major tasks in the ECU code development process:

- ANSI-C source code export of the data definitions in the database.
- Locator address import (IEEE-695 file or ELF/DWARF file).
- Creation of description files for calibration tools reading ASAP2 files

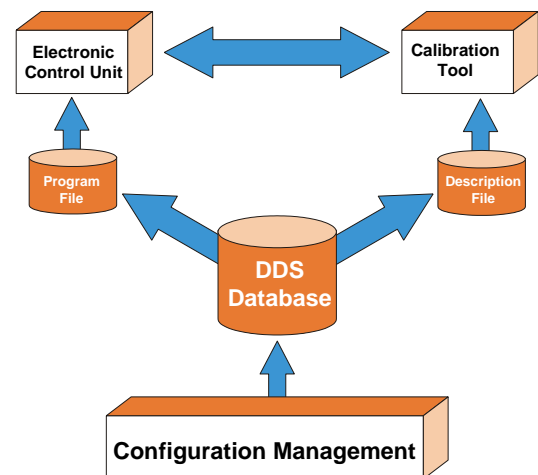
Providing a versatile link between software development and calibration activities, DDS adds physical interpretation, including: conversions, physical units, formatting information.

Arrays and structured data are mapped to the calibration data object model (curve/map, axis, parameter, online data).

The modular DDS database itself consists of so-called configuration units in the form of (ASCII format) GRL files, which can be managed, together with the ECU source code, by the use of a configuration management system.

The DDS Scripting Host provides basic search and modification operations on the command-line.

The DDS COM-API provides access to the internal data structures of the DDS database.



## DDS ASAP2 Editor

The graphical user interface of the DDS Editor provides:

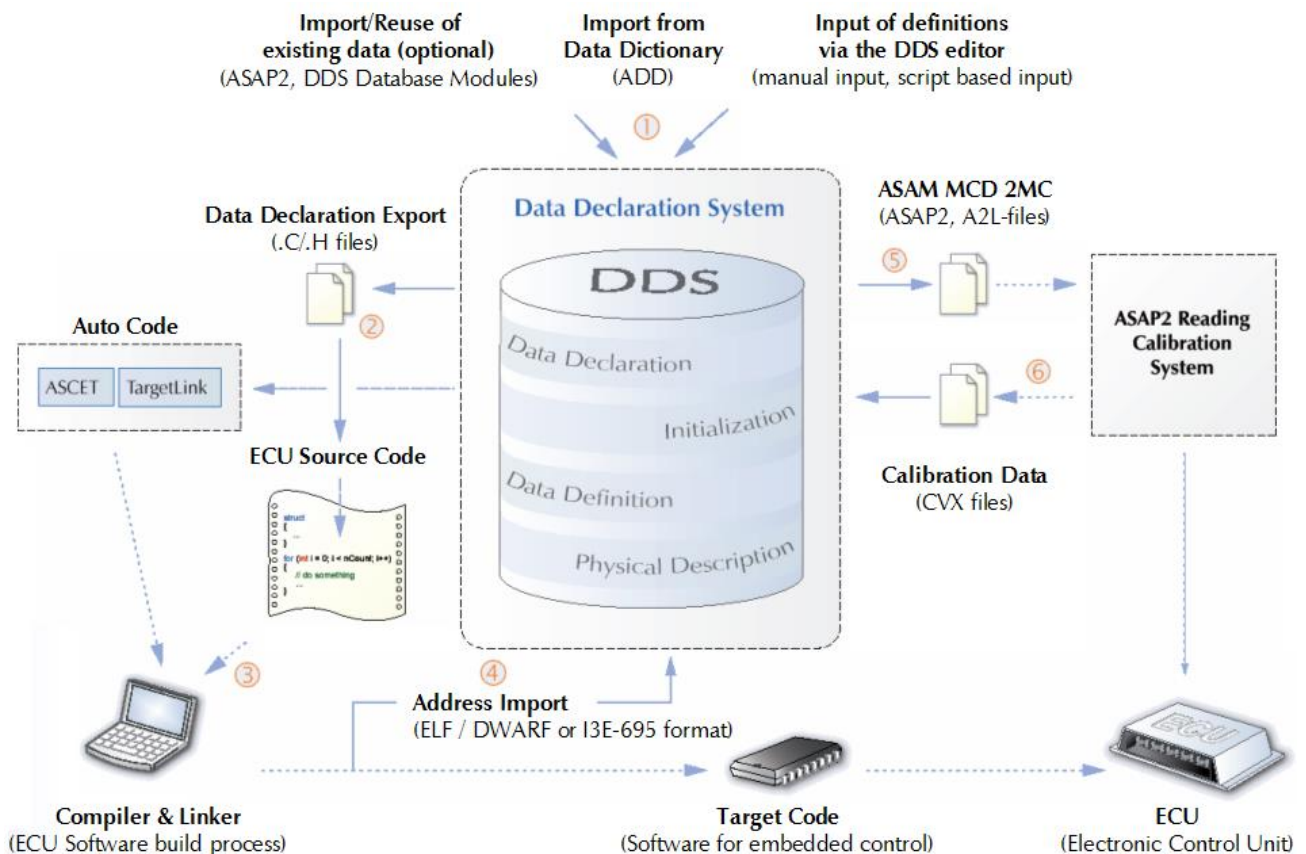
- |                                                       |                                              |
|-------------------------------------------------------|----------------------------------------------|
| • Context-sensitive online help                       | • Data pool navigation features              |
| • An intuitive tree browser for all data pool entries | • Simultaneous handling of multiple projects |
| • Entity sorting and filtering capabilities           | • Multi-level online check features          |

The DDS Editor enables the user to enter all data required for Source Code Export and for the calibration tools:

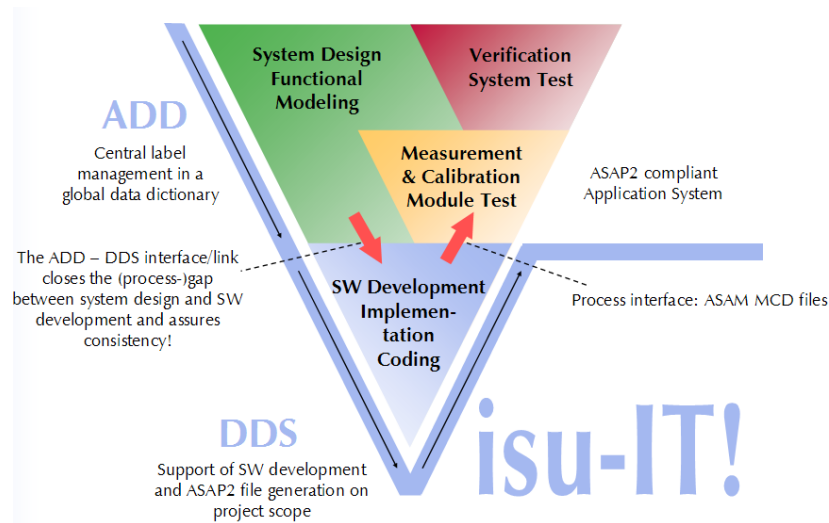
- |                                        |                                            |                                                  |
|----------------------------------------|--------------------------------------------|--------------------------------------------------|
| • Identifier name                      | • Physical units                           | • Relations between maps, axes and online values |
| • Alternative (display) name           | • Display format                           | • Arrays and structures                          |
| • Description text                     | • Conversion rules, e.g. resolution/offset | • Subsystems and C/H files                       |
| • Memory type (RAM, ROM, internal RAM) | • Initialization values                    | • Calibration Functions or Components            |
| • Data types                           |                                            |                                                  |

**Workflow**

1. The user enters calibration data by defining those manually via the DDS Editor, by importing ASAP2 files, by running customer specific import scripts using the DDS COM API or by re-using existing data pool files. Additionally, since DDS V5.x it is possible to import data definitions from a global (company-wide) Data Dictionary - > Visu-IT! **Automotive Data Dictionary (ADD)**. You can find detailed information about ADD at our website <http://www.visu-it.de/ADD>.
2. The Source Export filter is used to generate ANSI C declaration and definition files. Together with the ECU algorithms, these \*.c and \*.h files will be used for ECU software development. Optionally, the DDS data definitions can be exported to model driven and auto-coding development tools like Ascet-SD and TargetLink.
3. The DDS generated C source files as well as the ECU algorithm software are compiled by one of the supported compilers (see list below). The locator file generated by this step provides the address information for the calibration data definitions.
4. DDS provides a filter for importing the locator file into the database. The address information will be merged with the existing description data.
5. An ASAP2 (ASAM MCD 2 MC) description file (\*.a2l) is generated.
6. Calibration data provided as CVX files can be imported to define initialization values.



## Role of DDS in ECU Development Process



### Documentation

A comprehensive online help system provides context-sensitive user information and step-by-step guidance for all input fields, system messages and command line tool options.

### Application

DDS supports command line controlled filters. File imports or exports can be invoked either from the DDS Editor graphical user interface or via a command line, allowing the DDS functionality to be integrated with script, batch and make processes. Severity level control mechanisms support the fine-tuning of error management policies to specific customer requirements.

### Interfaces

- ASAM-MCD-2MC export: versions 1.7, 1.6, 1.5.1, 1.4.1, 1.3.1, 1.2.1 (or 1.2.0 for Softing EDICmobil)
- ASAM-MCD-2MC import: versions 1.7, 1.6, 1.5.1, 1.4.1, 1.3.1 and 1.2.1
- ASAM-MCD-2D export: version 2.0 (ODX) -> ODX-FLASH export (prototype)
- Calibration Value import: CVX versions v1.0, v2.1
- ELF/DWARF import: DIAB DATA (Motorola MPC555 series), Hitachi (SH7055), Tasking TriCoreVX, etc.
- IEEE-695 import: Tasking C166, Tasking TriCore, etc.
- MSRSW export: version 2.2.2 (prototype)
- ASAM MDX V1.1, 1.2 (Meta Data Exchange Format for Software Module Sharing) export (optional AddOn)
- Intel Hex and ELF DataRecord export/update
- XML Export and Import (DDX)
- Export to ETAS Ascet: versions 5.2, 6.1, 6.2
- Export to dSpace TargetLink: versions 3.0, 3.1, 3.2, 3.3, 3.4, 3.5
- Visu-IT! Automotive Data Dictionary (ADD) -> Import of (calibration) data from a global data dictionary

### System Requirements

Operating System	Windows 7/10, Microsoft Visual C++ Redistributable 2017, .NET Framework V4.7.2
Hard disk	100 MB (minimum) of free hard disk space, depending on database size
Display resolution	1024x768, 256 colors, 17 inch

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