

ETAS VECU-BUILDER V1.8



Release Notes

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Definitions and Abbreviations

API

Application Programming Interface

ASIL

Automotive Safety Integrity Level

CAN

Controller Area Network

CDD

Complex Device Driver

CPU

Central Processing Unit

DLL

Dynamic Link Library

ECU

Electronic Control Unit

EEPROM

Electrically Erasable Programmable Read-Only Memory

ETAS

ETAS Helpdesk International

FMI

Functional Mock-Up Interface

FMU

Functional Mock-Up Unit

KIR

Known Issue Report

MCAL

Microcontroller Abstraction Layer

NVRAM

non-volatile Random-Access Memory

OS

Operating System

OSS

Open Source Software

PR

Problem Report

SiL

Software-in-the-Loop

SuT

System under Test

SW

Software

V&V

Verification and Validation

vCDD

Virtual CDD

vECU

Virtual ECU

vmCAL

Virtual MCAL

WSL

Windows Subsystem for Linux

XCP

Universal Measurement and Calibration Protocol

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1. General Description

VECU-BUILDER is a tool that builds a virtual ECU (vECU) for V&V of automotive ECU software via Software-in-the-Loop (SIL) simulations. The inputs can either be Classic AUTOSAR sources, non-AUTOSAR C/C++ sources, or compiled binaries including symbol information. The tool uses a text file in YAML format for configuring all vECU properties such as inputs, outputs, parameters, tasks, or the XCP slave.

VECU-BUILDER wraps the binaries of the vECU into an FMU. The resulting FMU adheres to the FMI standard for Co-Simulation 2.0 or 3.0. VECU-BUILDER utilizes CMake and the GNU compilers or Microsoft Visual C/C++ compiler for compiling the vECU. It includes its own MinGW installation and supports user provided installations of MingW as well.

The software is delivered with an installer via download as a zip archive. The user documentation in PDF format can be found as part of the archive.

1.1. System and Software Prerequisites

The following minimum system prerequisites must be met:

Hardware	2.0 GHz PC, 8 GiB RAM
Operating System	Windows® 10 (64bit) or Ubuntu Linux 22.04 LTS
Free Disk Space	5 GiB (not including the size for application data)

The following system prerequisites are recommended:

Hardware	3.0 GHz PC, 32 GiB RAM
Operating System	Windows® 11 or Ubuntu Linux 22.04 LTS
Free Disk Space	>100,0 GiB

The following 3rd-party software installations are mandatory:

- CMake 3.15 or higher

The following 3rd-party software installations are recommended:

- Notepad++

The following 3rd-party software installations are optional:

- Microsoft Visual Studio 2015, 2017, 2019, 2022
- Visual Studio Code

1.2. Installation

You can start the installation on Windows by executing `VECU-BUILDER_installer_1.8.0.exe`. On Ubuntu Linux you can use one of the package managers to install the package `VECU-BUILDER_installer_1.8.0.deb`.

An installation of the 3rd-party product CMake is required. The installer gives a hint where to download this tool. However, the installer does not enforce the installation. Please ensure that

CMake has been installed before using ETAS VECU-BUILDER.

We recommend installing the open-source software Notepad++.

1.3. Licensing

The use of ETAS VECU-BUILDER is protected by electronic licensing. Valid licenses are necessary to install ETAS VECU-BUILDER and its add-ons. The use of unlicensed ETAS software is prohibited. The required licenses are not included in this delivery. When you purchase ETAS VECU-BUILDER licenses, you receive a separate entitlement certificate which contains an activation ID needed to acquire the license. It is necessary to distinguish the used technology.

1.3.1. Machine based licenses

Install your ETAS Software and start ETAS License Manager In Windows Start menu go to: ETAS → ETAS License Manager In the ETAS License Manager, you can acquire your license either online or offline.

For further details see the License manager help chapter "Machine-Based License with FlexNet Embedded".

1.3.2. Floating, server-based licenses

You activate the license using the self-service portal on the [ETAS website](#). During the activation process, you create a license file for download that you add to the license server. To generate the license file, you need the server ID. Additional information is available in the license administration guide.

For assistance, please consult the manual available under "help" on the start page of the self-service portal or see [the ETAS licensing FAQ](#).

1.4. Restrictions

Here is a list of known limitations of VECU-BUILDER:

- vECU Calibration:
 - The DCM parser supports VALUEs, CURVEs, and MAPs only.
 - The A2L parser supports COMPU_TAB and COMPU_VTAB only. Conversion table COMPU_VTAB_RANGE is not supported.
- XCP Slave / A2L:
 - The XCP slave and the A2L parser support the measurement and calibration use cases only.
 - XCP support is available on Windows only.
 - Only the characteristics of type VALUE, CURVE, and MAP in the A2L file are patched.
 - The XCP slave and the A2L parser support only STATIC DAQ_CONFIG_TYPE. The support of DYNAMIC DAQ_CONFIG_TYPE is experimental.

- XCPplus support is experimental.
- The support of 3rd-party MCD tools is experimental.
- ETAS license activation on WSL does not work.
- The usage of non-latin characters in path names or file names is unsupported.
- Certain C++ functions may not appear in the symbol details.

1.5. Used 3rd Party Software

VECU-BUILDER uses the following 3rd-party software components internally:

- Visu-IT ASAP2 parser NG
- Open-Source Software. See separate OSS Attribution Document.

1.6. Release Test Configuration

ETAS VECU-BUILDER has been tested with the following software test setup (other versions will work as well):

- Microsoft Windows Server 2019, Microsoft Windows Sever 2022, Windows 10, Windows 11, and Ubuntu Linux 22.04 LTS
- Compilers: MinGW, Microsoft Visual Studio 2019, GCC 11.4.0
- XCP Connection with ETAS INCA V7.3 and V7.4

1.7. Known Issue Reports

If a product issue develops, ETAS will prepare a Known Issue Report (KIR) and post it on [the internet](#). The report includes information regarding the technical impact and status of the solution. Therefore, you must check the KIR applicable to this ETAS product version and follow the relevant instructions prior to operation of the product.

2. Changes

2.1. Changes in VECU-BUILDER V1.8

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.1.1. What's New

The following changes have been applied since the previous version:

- Added support of Ubuntu Linux 22.04 LTS. Removed support for Ubuntu Linux 20.04 LTS.
- Added functionality to retrieve task configuration from AUTOSAR XML files
- Replaced FMPy by fmusim 0.0.36
- Improved ASAP2 A2L parsing on Ubuntu Linux
- Added creation of softlinks to source codes for faster vECU generation

2.1.2. Compatibility to earlier releases

VECU-BUILDER V1.8 is largely compatible with VECU-BUILDER V1.7. For adaptations needed when migrating workspace created with previous versions, please refer to the User Guide.

Please contact ETAS Technical Support if you need any assistance when migrating your workspace to the latest version of VECU-BUILDER.

2.1.3. Fixed Problems

Since the last release of VECU-BUILDER we have fixed the following problems:

Problem Number	Title
760094	XCP Server crashing during fmi2Terminate()
761693	Building FMU archives failed by Error: '<' not supported between instance of 'ModelVariableInfo' and 'ModelVariableInfo'
762966	Checksum issue in INCA
764973	Creation FMU fails with Ubuntu language packs German
767804	Different results in validating FMUs with missing outputs in FMI 2.0 and FMI 3.0
770422	Value specified as "TEXT" in DCM file is not reflected
771945	DDAQ and events broken after A2L patching

2.1.4. Known Issues

The following problems are known issues in this release of VECU-BUILDER.

Problem Number	Title
	Examples "SimpleExample_Plugin_v1_FMI2" and "SimpleExample_Plugin_v2_FMI3" require manual changes.

2.2. Changes in VECU-BUILDER V1.7

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.2.1. What's New

The following changes have been applied since the previous version:

- Portable version of VECU-BUILDER for Windows without installation
- Extended handling of initial data
- FMI 3.0 Support for Plugins

2.2.2. Compatibility to earlier releases

VECU-BUILDER V1.7 is largely compatible with VECU-BUILDER V1.6. For adaptations needed when migrating workspace created with previous versions, please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to the latest version of VECU-BUILDER.

2.2.3. Fixed Problems

Since the last release of VECU-BUILDER we have fixed the following problems:

Problem Number	Title
742275	Issue with SymbolDetails.txt
746135	Unsupported encoding in DCM files
758397	MergedInitialData.VarVal has missing address for multi dimensional array variable
759164	Plugin example: access violation in the call to task of getInternalName()
759761	fmi2DoStep() and Task execution out of phase

2.2.4. Known Issues

The following problems are known issues in this release of VECU-BUILDER.

Problem Number	Title
760094	XCP Server crashing during fmi2Terminate()
761693	Building FMU archives failed by Error: '<' not supported between instance of 'ModelVariableInfo' and 'ModelVariableInfo'
764973	Creation FMU fails with Ubuntu language packs German

2.3. Changes in VECU-BUILDER V1.6

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.3.1. What's New

The following changes have been applied since the previous version:

- Support of FMI 3.0 for Co-Simulation
- Event-triggered Tasks
- Update of DCM Parser and Handling of Initial Data
- Improved Handling of interplay with ETAS INCA on XCP connections

2.3.2. Compatibility to earlier releases

VECU-BUILDER V1.6 is largely compatible with VECU-BUILDER V1.5. For adaptations needed when migrating workspace created with previous versions, please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to the latest version of VECU-BUILDER.

2.3.3. Fixed Problems

Since the last release of VECU-BUILDER we have fixed the following problems:

Problem Number	Title
746774	HEX File not created when DCM file contains 1.7976931348623158e308 as a value
748253	VECU-BUILDER sets Integer variable's variability to "continuous"
747548, 751914, 751326, 743682	The example FMU cannot disconnect or restart
750886	Float32 arrays are not included in MergedInitialData.VarVal

Problem Number	Title
756238	3a_CheckFMU.bat failed to instantiate FMU if build_tool is Microsoft Visual Studio
756261	Changing build_tool in yaml file gives error
748197	Compilation error with unclear error message references:'NoneType' object is not iterable
753446	Error encountered during FMU generation phase

2.3.4. Known Issues

The following problems are known issues in this release of VECU-BUILDER.

Problem Number	Title
742275	Issue with SymbolDetails.txt
746135	Unsupported encoding in DCM files

2.4. Changes in VECU-BUILDER V1.5

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.4.1. What's New

The following changes have been applied since the previous version:

- Support of DCM files and A2L COMPU_METHODs for initial data
- Improved MCD use case through the generation of .hex-file
- Support of Bitfields
- Replacement of fmuChecker by FMPy
- Additional Compile Flags for C and C++

2.4.2. Compatibility to earlier releases

VECU-BUILDER V1.5 is largely compatible with VECU-BUILDER V1.4. For adaptations needed when migrating workspace created with previous versions, please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to the latest version of VECU-BUILDER.

2.4.3. Fixed Problems

Since the last release of VECU-BUILDER we have fixed the following problems:

Problem Number	Title
717061	DCM values differ after 7th decimal digit
719549	DCM data lost after 6 decimal places.
739677	Union Type variables have wrong data and address

2.4.4. Known Issues

The following problems are known issues in this release of VECU-BUILDER.

Problem Number	Title
742275	Issue with SymbolDetails.txt
746135	Unsupported encoding in DCM files
746774	HEX File not created when DCM file contains 1.7976931348623158e308 as a value
748253	VECU-BUILDER sets Integer variable's variability to "continuous"

2.5. Changes in VECU-BUILDER V1.4

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.5.1. What's New

The following changes have been applied since the previous version:

- A plugin mechanism for vECU with a C/C++ API
- Addition of task triggers for early initialization
- Addition of licensing mechanism to Linux vECUs
- Performance improvement of A2L label mappings

2.5.2. Compatibility to earlier releases

ECU-BUILDER V1.4 is largely compatible with the VECU-BUILDER V1.3. For adaptations needed when migrating workspace created with VECU-BUILDER V1.3 please refer to the User Guide.

Please contact ETAS Technical Support if you need any assistance when migrating your workspace to VECU-BUILDER V1.4.

2.5.3. Fixed Problems

This section describes the set of fixed problems of the released version of VECU-BUILDER V1.4.

Problem Number	Title
732528	Return status incorrect when disk is full
731757	Reinstallation issue with different folder name
735644	additional_scripts executing twice
738234	Improved FMI compliance when no signals exist
734018	Symbol name error with MinGW
713944	Can't run additional script with arguments
713295	Problem with selection of DAQ list

2.5.4. Known Issues

This section describes the set of known problems of the released version of VECU-BUILDER V1.4.

Problem Number	Title
719549	DCM data lost after 6 decimal places
742275	Issue with SymbolDetails.txt

2.6. Changes in VECU-BUILDER V1.3

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.6.1. What's New

The following changes have been applied since the previous version:

- Simple File Modifications
- Example on how to add characteristics as parameters to a given YAML file
- Many bugfixes and improvements

2.6.2. Compatibility to earlier releases

VECU-BUILDER V1.3 is largely compatible with the VECU-BUILDER V1.2. For adaptations needed when migrating workspace created with VECU-BUILDER V1.2 please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to VECU-BUILDER V1.3.

2.6.3. Fixed Problems

This section describes the set of fixed problems of the released version of VECU-BUILDER V1.3.

Problem Number	Title
722829	Sporadic Issue with renaming the resources folder
712894	Support all types of characteristics when patching A2L files
720072	Patched A2L had wrong address for array type variables
711731	License Manager popup blocks automated CI environment

2.6.4. Known Issues

This section describes the set of known problems of the released version of VECU-BUILDER V1.3.

Problem Number	Title
713944	Can't run additional script with arguments
719549	DCM data lost after 6 decimal places
713295	Problem with selection of DAQ list

2.7. Changes in VECU-BUILDER V1.2

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.7.1. What's New

The following changes have been applied since the previous version: * Full support for Ubuntu 20.04 LTS Linux * Many bugfixes and improvements

2.7.2. Compatibility to earlier releases

VECU-BUILDER V1.2 is largely compatible with the VECU-BUILDER V1.1. For adaptations needed when migrating workspace created with VECU-BUILDER V1.1 please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to VECU-BUILDER V1.2.

2.7.3. Fixed Problems

This section describes the set of fixed problems of the released version of VECU-BUILDER V1.2.

Problem Number	Title
696454	A2L patch lost variable information
698175	FMU creation fails at step 2/5 without any usable message
702849	2_Build.cmd does not work with the arguments --no-dialogs in CLI
703309	Building FMU archives fails with error “not enough values to unpack”
704091	Fix launch.json
706255	A2L Patch delete 2 type of data object <COMPU_VTAB_RANGE> and <RECORD_LAYOUT>
706565	Notepad++ 32bit registry key not considered
709255	Invalid timestamp for “generationDateAndTime” in modelDescription.xml
709442	DCM parser swaps x and y axis
715279	Missing static variables in symbol details
716524	Array data in FMU by VECU-BUILDER does not correctly show in COSYM

2.7.4. Known Issues

This section describes the set of known problems of the released version of VECU-BUILDER V1.2.

Problem Number	Title
713944	Can't run additional script with arguments
719549	DCM data lost after 6 decimal places

2.8. Changes in VECU-BUILDER V1.1

This chapter describes changes with respect to the previous version of VECU-BUILDER.

2.8.1. What's New

The following changes have been applied since the previous version:

- Advanced Build Flags can be defined in the YAML file
- Aliases for FMI Variables can be defined in the YAML file
- Mapping between symbols and A2L labels can be defined in the YAML file
- vECU can be built directly in Visual Studio or VS Code
- vECU built with MinGW can be debugged using VS Code
- Debug Hook can be configured in the YAML file

2.8.2. Compatibility to earlier releases

VECU-BUILDER V1.1 is largely compatible with the VECU-BUILDER V1.0. For adaptations needed when migrating workspace created with VECU-BUILDER V1.0 please refer to the User Guide. Please contact ETAS Technical Support if you need any assistance when migrating your workspace to VECU-BUILDER V1.1.

2.8.3. Fixed Problems

Since the last release of VECU-BUILDER we have fixed the following problems:

Problem Number	Title
686446	FMU with GO License not executable on PC without LIMA
687970	Crashes when simulation starts with active XCP configuration
688347	Does not patch AXIS_PTS segments of A2L file
688673	EEPROM variable cannot be written if defined as const
688713	COMPU_METHODs removed by the patching process
689088	No .die file created
690021	In A2L comment name contain 0x.....causes address modified error during patch
691013	CLI not working
692104	Cannot debug a vECU built by gcc

2.8.4. Known Issues

Problem Number	Title
691641	INCA crashes when experiment is open with XCP Sim
696454	A2L patch lost variable information
698175	FMU creation fails at step 2/5 without message

2.9. Changes in VECU-BUILDER V1.0

This chapter describes changes with respect to the previous version of VECU-BUILDER V1.0.

2.9.1. What's New

This is the initial release of ETAS VECU-BUILDER as a product. The following changes have been applied since the last pre-release version vEcuBuild 0.7.3:

- A mandatory keyword “version” has been added to the YAML file
- An optional keyword “sync” has been added to the eeprom section of the YAML file
- The keyword “patch_a2l_files” has been renamed to “patch_a2l_file”. Only a single file can be specified.
- Stability of symbol parser has been improved.
- Behavior of task scheduler has been improved.

2.9.2. Compatibility to earlier releases

This is the first release as a product. All older versions of vEcuBuild are deprecated and no longer supported. VECU-BUILDER V1.0 is largely compatible with the pre-released versions of vEcuBuild; manual adaptations when upgrading might be needed, though. Please contact ETAS Technical Support if you need any assistance when upgrading to VECU-BUILDER V1.0.

2.9.3. Fixed Problems

This section describes the set of fixed problems of the released version of VECU-BUILDER V1.0.

Problem Number	Title
676011	Failed to parse the large *.die files
676651	VECU crashes when calling fmi2FreeInstance
676674	Invalid ModelDescription.xml caused by Enumeration
682813	Does not patch AXIS_PTS segments of A2L file
685992	VECU not buildable without useful error message and massive resource usage
684579	Error encrypting message after stop simulation
684845	XCP Transport layer configuration failed in INCA when vECU is created with VECU-BUILDER-XCP license
684582	Created 3d_RemoveGoLicense.bat in workspace fails

2.9.4. Known Issues

Problem Number	Title
687970	Crashes when simulation starts with active XCP configuration
688347	Does not patch AXIS_PTS segments of A2L file
686446	FMU with GO License not executable on PC without LIMA
688673	EEPROM variable cannot be written if defined as const

Problem Number	Title
688713	COMPU_METHODs removed by the patching process
689088	No .die file created
690021	In A2L comment name contain 0x.....causes address modified error during patch

3. Hints

3.1. Windows Defender blocks CMake configuration

The 3rd-party program CMake generates temporary executables during the configuration phase. When using certain versions of CMake, in particular 3.23.1, the Windows Defender warns about the Trojan "Win32/Tiggre!pz" in these executables. This is a false positive and causes no harm. Nevertheless, Windows Defender blocks their execution and the CMake configuration process fails.

If you experience a similar behavior, ETAS recommends you the installation of a recent version of CMake. Please contact ETAS Technical Support if you require further assistance.

4. Hotfix Information

Not applicable.

5. Contact Information

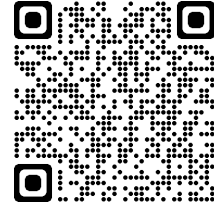
Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the ETAS website:

<https://www.etas.com/hotlines>

ETAS offers trainings for its products:

<https://www.etas.com/academy>



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