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## LABCAR-MODEL-VVTB V4.3.0

Release Notes

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## 1 Introduction

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### 1.1 Definitions and Abbreviations

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Term/Abbreviation	Definition
ECU	Electronic Control Unit
EHI	ETAS Help Desk International
HW	Hardware
KIR	Known Issue Report – For severe Problem Reports which occur after a release, ETAS has introduced the Known Issue Report to inform affected customer immediately. The current Known Issues of former versions can be found on the ETAS website: <a href="http://www.etas.com/kir">http://www.etas.com/kir</a>
LVM	ETAS LABCAR VARIANT MANAGEMENT
PDF	Portable Document Format
PR	Problem Report
RT	Realtime
SW	Software
LCO	ETAS LABCAR-OPERATOR

### 1.2 Conventions

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The following typographical conventions are used in this document:

Choose **File** → **Open**.

Menu commands are shown in boldface.

Click **OK**.

Buttons are shown in boldface.

Press <ENTER>.

Keyboard commands are shown in angled brackets.

The "Open File" dialog box is displayed.

Names of program windows, dialog boxes, fields, etc. are shown in quotation marks.

Select the file `setup.exe`

Text in drop-down lists on the screen, program code, as well as path- and file names are shown in the Courier font.

A *distribution* is always a one-dimensional table of sample points.

General emphasis and new terms are set in italics.

### 1.3 User Documentation

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The LABCAR-MODEL-VVTB user's documentation in PDF format is available on the DVD.

## 2 Product Definition

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### 2.1 Functions at a glance

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LABCAR-MODEL-VVTB – Virtual Vehicle Test Bench – is a numerical computer simulation model of a complete vehicle with driver and environment. It contains models to reconstruct the most important physics of a vehicle and features both manual transmission and

automatic transmission variants as well as several SoftECUs for an intelligent restbus simulation.

For sophisticated closed-loop operation with an ECU, it needs to be extended by detailed, domain-specific subsystem models; for instance, an engine, a chassis, or a fuel cell system. These domain-specific subsystem models form the LABCAR-MODEL product family and are available separately.

An integration of user-specific subsystem models is possible as well.

## 2.2 General Description

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### 2.2.1 System Prerequisites

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The following minimum system prerequisites have to be met:

<b>Required Hardware</b>	1,0 GHz PC (x86_64) 1 GB RAM DVD-ROM drive Network adapter Graphics with a resolution of at least 1024 x 768, 32 MB RAM  ETAS RTPC (needed for realtime execution)
<b>Required Free Disk Space</b>	1 GB (not including the size for application data)

The following system prerequisites are recommended:

<b>Recommended Hardware</b>	2,0 GHz Dual-Core PC or equivalent (x86_64) 2 GB RAM DVD-ROM drive Network adapter Graphics with a resolution of 1920 x 1280, 1 GB RAM  ETAS RTPC (needed for realtime execution)
<b>Recommended Free Disk Space</b>	>2,0 GB

### 2.2.2 Software Prerequisites

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The following minimum software prerequisites have to be met:

<b>Operating System</b>	Microsoft Windows 10 Version 1703 or higher
<b>MATLAB/Simulink</b>	R2016b 64bit or higher
<b>Microsoft Visual C++ Redistributables</b>	Microsoft Visual C++ 2015 Redistributables (x64)
<b>ETAS LABCAR-OPERATOR</b>	V5.4.11
<b>ETAS COSYM</b>	V2.3

**ETAS RTPC** V6.4.1

2.2.3 Release Test Configuration

The simulation model has been developed and tested using ETAS LABCAR-OPERATOR V5.4.10 and following MATLAB 64bit versions:

- R2016b
- R2017a and R2017b
- R2018a and R2018b
- R2019a and R2019b
- R2020a

The model may also work with other versions of this software.

2.2.4 Restrictions

LABCAR-MODEL-VVTB requires a 64bit (x86\_64 architecture) simulation environment. All 32bit versions of MATLAB, Window or RTPC are unsupported.

2.2.5 Miscellaneous

Not applicable

2.3 Delivery

The software is delivered on a DVD including LABCAR-MODEL-VVTB software, documentation, tools, utilities, and further information. All software documentation is available in the Portable Document Format (PDF), which requires Adobe Reader.

The DVD contains the following items:

<b>Directory</b>	<b>Meaning / Explanation</b>
Documentation	General and model-specific user documentation
Documentation \ OSS	Source codes of used open source components
Installation	Installation files for this product

2.3.1 Used 3rd Party Software

Starting with LABCAR-MODEL V4.3, FMU Export Tooling is introduced to generate FMUs out of LABCAR-MODEL products. The FMU Export Tooling relies internally on below 3<sup>rd</sup> party products which help in compilation and generation of FMUs.

- [FMI-Kit for Simulink V2.9](#)
- [Microsoft Visual Studio 2015 Build Tools](#)

The above tools are not part of LABCAR-MODEL product installers and needs to be installed separately. Please follow the links above to download and install them.

## 2.4 Installation

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### 2.4.1 Installation Hints

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Installation is required to use ETAS LABCAR-MODEL products. Please execute the file `setup.exe` in the `Installation` folder of this DVD. Please take a look at the Chapter "Installation" in the User's Guide to learn about the files and folders that will be installed by this procedure.

## 2.5 Licensing

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Two different licenses are available for LABCAR-MODEL-VVTB: an operator license and a runtime license. The operator license is required for generating C-code from MATLAB/Simulink including one or more of the S-Functions from LABCAR-MODEL-VVTB. The runtime license is required for executing the model either in MATLAB/Simulink directly or on the ETAS RTPC.

The ETAS License Manager is used for licensing. Please refer to the corresponding documentation.

### **3 Changes**

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This chapter describes changes with respect to the previous version of LABCAR-MODEL-VVTB.

#### **3.1 What's New**

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Changes from V4.2.0 to V4.3.0:

- FMU generation support for Co-simulation on Windows 64 Bit platforms.
- Support for COSYM HiL.
- Replaced wiring at Vehicle Subsystem level by buses to make it more flexible.

Changes from V4.1.0 to V4.2.0:

- Extended compatibility towards more versions of MATLAB/Simulink
- Major improvements in driver model

Changes from V4.0.1 to V4.1.0:

- Enhancement of documentation
- Updated licensing mechanism
- Standard installation of the product

Changes from V4.0.0 to V4.0.1:

- Improved Driver Documentation
- Extended SoftTCU gear shift logic for automatic transmissions
- Modified licensing mechanism
- Switched to Microsoft Visual C++ 2015 runtime

Changes from V1.1 to V4.0.0:

- Automatic transmission variant including a SoftTCU added (VVTB\_AT)
- Native support of the product LABCAR-MODEL-ICE using LABCAR VARIANT MANAGEMENT

Changes from V1.0 to V1.1:

- Native support of the LABCAR-MODEL-VDYN product using the LABCAR VARIANT MANAGEMENT
- Enhanced SoftECU with a more detailed ASR, MSR logic for a simplified integration of Chassis Control Units.
- MT Powertrain with a more clear structure for improved handling

#### **3.2 Compatibility to Earlier Releases**

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This release of LABCAR-MODEL-VVTB is fully compatible with all older releases.



### 3.3 Fixed Problems

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This section describes the set of fixed problems of the released version of LABCAR-MODEL-VVTB.

Version	Problem Number	Title
4.2.0	EHI 631150	AMT TCU Connection mistake

### 3.4 Known Issue Reports

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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.

The Known Issue Report (KIR) is available online: <http://www.etas.com/kir>

### 3.5 Known Issues

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This section describes the set of known problems of the released version of LABCAR-MODEL-VVTB.

#### 3.5.1 Software related Items

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Problem Number	Title
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LM-3202	FMU Exporter produces ambiguous interface names:
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The interfaces (Inports and Outports) of generated FMUs are appended with suffixes (Ex: Label\_d1, Label\_d2) when the port names are not unique in the Simulink model.

This results in ambiguity of Inport and Outport names when the User is accessing the interfaces of the generated FMUs in co-simulation platforms.

The warnings printed by FMU Exporter tooling during the FMU generation help in differentiating these interfaces. They can be used as reference when creating connections to the FMU in a co-simulation environment. The User can make use of FMU Exporter tooling function 'ExportAsFmuWithConfig' to save the console messages including warnings to a log file.

Please refer to LABCAR-MODEL Users Guide Section 2.4.1 for additional details on the function usage.

#### 3.5.2 Hardware related Items

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Problem Number	Title
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## **4 Hints**

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Not applicable.

## **5** **Hotfix Information**

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Not applicable.

## **6** **Contact, Support and Problem Reporting**

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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:

ETAS subsidiaries	WWW:	<a href="http://www.etas.com/en/contact.php">www.etas.com/en/contact.php</a>
ETAS technical support	WWW:	<a href="http://www.etas.com/en/hotlines.php">www.etas.com/en/hotlines.php</a>