DRIVING **EMBEDDED EXCELLENCE**

LABCAR-MODEL-FC V4.3.0

Release Notes

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Contents

1   Introduction...4
   1.1   Definitions and Abbreviations...4
   1.2   Conventions..4
   1.3   User Documentation...4

2   Product Definition...5
   2.1   Functions at a glance 5
   2.2   General Description..5
      2.2.1 System Prerequisites..5
      2.2.2 Software Prerequisites 5
      2.2.3 Release Test Configuration 6
      2.2.4 Restrictions 6
      2.2.5 Miscellaneous 6
   2.3   Delivery..6
      2.3.1 Used 3rd Party Software 6
   2.4   Installation 7
      2.4.1 Installation Hints 7
   2.5   Licensing 7

3   Changes 7
   3.1   What's New 7
   3.2   Compatibility to Earlier Releases...7
   3.3   Fixed Problems 7
   3.4   Known Issue Reports..8
   3.5   Known Issues 8
      3.5.1 Software related Items..8
      3.5.2 Hardware related Items 8

4   Hints 9

5   Hotfix Information...10

6   Contact, Support and Problem Reporting 11

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1 Introduction

1.1 Definitions and Abbreviations

Term/Abbreviation	Definition
EHI	**E**TAS **H**elp Desk **I**nternational
HW	Hardware
FC	Fuel-Cell
KIR	**K**nown **I**ssue **R**eport – 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: http://www.etas.com/kir
PR	Problem Report
SW	Software
LVM	ETAS LABCAR VARIANT MANAGEMENT
PDF	Portable Document Format
PR	Problem Report
RT	Real-time
SW	Software
LCO	ETAS LABCAR-OPERATOR

1.2 Conventions

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

The LABCAR-MODEL-FC user's documentation in PDF format is available on the DVD and in the installation location of the product.

2 Product Definition

2.1 Functions at a glance

ETAS LABCAR-MODEL-FC is a realtime-capable simulation model of a fuel cell system including a PEM fuel cell stack, a hydrogen supply, an oxygen supply, and a coolant supply. The stack model includes a 1-D membrane model for a detailed description of the membrane resistance, water content, and the resulting water exchange between the electrodes. ETAS LABCAR-MODEL-FC allows you to perform test and validation of

an automotive fuel cell control unit (FCCU) in closed-loop.

2.2 General Description

2.2.1 System Prerequisites

The following minimum system prerequisites have to be met:

Required Hardware	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
Required Free Disk Space	500 MB (not including the size for application data)

The following system prerequisites are recommended:

Recommended Hardware	2,0 GHz Dual-Core PC or equivalent (x86_64)
	2 GB RAM
	DVD-ROM drive
	Network adapter
	Graphics with a resolution of 1280 x 1024, 1 GB RAM
Recommended Free Disk Space	>2,0 GB

2.2.2 Software Prerequisites

The following minimum software prerequisites have to be met:

Operating System	Microsoft Windows 10 Version 1703 or higher
MATLAB/Simulink	R2016b 64bit or higher
Microsoft Visual C++ Redistributables	Microsoft Visual C++ 2015 Redistributables (x64)
ETAS LABCAR-OPERATOR	V5.4.11
ETAS COSYM	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 V5.4.11 and ETAS COSYM V2.3 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-FC requires a 64-bit (x86_64 architecture) simulation environment. All 32-bit versions of MATLAB, Windows, or RTPC are unsupported.

2.2.5 Miscellaneous

Not applicable

2.3 Delivery

The software is delivered on a DVD including LABCAR-MODEL-FC 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:

Directory	Meaning / Explanation
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 3rd 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.

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2.4 Installation

2.4.1 Installation Hints

Installation is required to use ETAS LABCAR-MODEL products. Please execute the file `setup.exe` in the `Installation` folder of this DVD. Please 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

Two different licenses are available for LABCAR-MODEL-FC: 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-FC. 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

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

3.1 What's New

V4.3.0:

- FMU generation support for Co-simulation on Windows 64 Bit platforms.

V4.2.0:

- First version of LABCAR-MODEL-FC

3.2 Compatibility to Earlier Releases

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

3.3 Fixed Problems

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

Version	JIRA\TFS No.	Title
4.3.0	EHI 641840	Incompatible connection files delivered as part of COSYM Project Items

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3.4 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.

The Known Issue Report (KIR) can be found here:

http://www.etas.com/kir

3.5 Known Issues

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

3.5.1 Software related Items

Problem Number	Title
LM-3202	FMU Exporter produces ambiguous interface names:
	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

Problem Number	Title

4 Hints

Not applicable

5 Hotfix Information

Not applicable

6   Contact, Support and Problem Reporting

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:	www.etas.com/en/contact.php
ETAS technical support	WWW:	www.etas.com/en/hotlines.php