

ASCET-DEVELOPER 7.3.0
Release Notes



Copyright

The data in this document may not be altered or amended without special notification from ETAS GmbH. ETAS GmbH undertakes no further obligation in relation to this document. The software described in it can only be used if the customer is in possession of a general license agreement or single license. Using and copying is only allowed in concurrence with the specifications stipulated in the contract.

Under no circumstances may any part of this document be copied, reproduced, transmitted, stored in a retrieval system or translated into another language without the express written permission of ETAS GmbH.

© Copyright 2017 ETAS GmbH, Stuttgart

The names and designations used in this document are trademarks or brands belonging to the respective owners.

ASCET-DEVELOPER 7.3.0 Release Notes R01 EN – 12 December 2017

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	Safety Advice.....	5
2.2.2	Your Safety Obligations.....	5
2.2.3	System Prerequisites.....	6
2.2.4	Software Prerequisites.....	6
2.2.5	Access Rights.....	6
2.3	Release Test Configuration.....	7
2.3.1	Host Platform.....	7
2.3.2	Java™ Platform.....	8
2.3.3	Eclipse Target Platform.....	8
2.3.4	Auxiliary ASCET-DEVELOPER Code Generators.....	8
2.3.5	ETAS Companion Products.....	8
2.3.6	3 rd Party Products.....	9
2.4	File Format Compatibility.....	9
2.5	Delivery.....	9
2.5.1	Used 3 rd Party Software.....	11
2.6	Installation.....	11
3	Changes.....	12
3.1	What is new?.....	12
3.2	What has changed?.....	13
3.3	Compatibility to Earlier Releases.....	14
3.4	Unsupported features.....	14
3.5	Known Issues.....	16
3.6	Fixed Problems.....	17
3.7	Known Issue Reports.....	18
4	Contact, Support and Problem Reporting.....	19

1 Introduction

1.1 Definitions and Abbreviations

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: <http://www.etas.com/kir>

PR

Problem Report

SW

Software

1.2 Conventions

The following typographical conventions are used in this document:

OCI_CANTxMessage msg0 =	Code snippets are presented on a gray background and in the Courier font.
	Meaning and usage of each command are explained by means of comments. The comments are enclosed by the usual syntax for comments.
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 fixed width font.
A <i>distribution</i> is always a one-dimensional table of sample points.	General emphasis and new terms are set in italics.

1.3 User Documentation

The ASCET-DEVELOPER 7.3 Getting Started guide in PDF format can be found on the DVD.

All other user documentation is provided as online help. The online help is:

- Linked from the ASCET-DEVELOPER Welcome page that is shown the first time you use the product
- Available at any time from the **Help** → **Help Contents** menu.

2 Product Definition

2.1 Functions at a glance

ASCET-DEVELOPER is an object-oriented model-based software development tool that is designed to help you build real-time, high-performance, low-overhead, ultra-portable, safe and secure software for deeply embedded hardware.

ASCET-DEVELOPER supports multi-paradigm modelling, allowing models in both graphical and textual notation to co-exist.

Graphical notations:

- Block Diagrams (BD)
- State Machines (SM)

Textual notations

- Embedded Software Development Language (ESDL)

All notations allow you to work at the right level of detail for your problem, and make it easy to find classes of error that can be hard to detect by traditional software development approaches.

ASCET-DEVELOPER provides:

- an Eclipse-based rich text editor tooling that makes developing and understanding BDE models and ESDL code quick and easy
- a code generator that translates models into production ready, MISRA-C:2004 compliant code that is free from insecurities, vulnerabilities and portability problems.
- a bridge to the ETAS Experiment Environment that allows you to test the functionality of your models by connecting model inputs to signal generators and observe model outputs.

2.2 General Description

2.2.1 Safety Advice

Safety advice for this ETAS product is available in the following formats:

- A printed document shipped with the DVD media.
- In electronic form on the DVD. See `Documentation\ASCET-DEVELOPER Safety Advice.pdf` for details.
- As a modal dialog displayed by ASCET when you open a new workspace.
- As a dialog accessible from the IDE menu under **Help → Safety Advice**.

2.2.2 Your Safety Obligations

You are a recognized expert in the design and implementation of software-intensive safety-related systems. You have detailed knowledge about the failure modes of the system you are constructing and will have been the author or technical reviewer of the system safety case as it relates to aspects of the systems realized in software.

In particular, you know which safety requirements rely on the correct functioning of code generated by ASCET-DEVELOPER. This establishes the context in which the use of ASCET-DEVELOPER generated code is relevant to overall system safety.

You are familiar with the following:

- embedded programming in the C language;
- tasks in the software engineering process and the use of tools to assist with those tasks;

- ISO26262:2011, IEC61508:2010 or a similar standard (e.g. EN50128) as it applies to your domain.

It is your responsibility to ensure that all code generated by ASCET-DEVELOPER meets the requirements of any regulatory regime and national or international laws with which your development process must comply.

If you require help or further guidance on the use of ASCET-DEVELOPER generated code in safety-related applications please contact ETAS.

2.2.3 System Prerequisites

The following minimum system prerequisites **must** be met:

Required Hardware	2 GHz Dual-Core 64-Bit PC 4 GB RAM DVD-ROM drive Network adapter Graphics with a resolution of at least 1280 x 1024, 32 MB RAM, 32-Bit color and hardware acceleration
Required Operating System	Windows® 7 (x86_64)
Required Free Disk Space	2 GB (not including the size for application data)
Required Software	.NET Framework 3.5 .NET Framework 4.6.2 (or later)

The following system prerequisites are **recommended**:

Recommended Hardware	2 GHz Quad-Core 64-Bit PC 8 GB RAM (16GB RAM if converting from ASCET 6.x) DVD-ROM drive Network adapter Graphics with a resolution of 1650 x 1080, 128 MB RAM 32 Bit color and hardware acceleration
Recommended Operating System	Windows® 7 (x86_64)
Recommended Free Disk Space	2 GB (not including the size for application data)
Required Software	.NET Framework 3.5 .NET Framework 4.6.2 (or later)

2.2.4 Software Prerequisites

None.

2.2.5 Access Rights

Users must have the following access rights to install and use ASCET-DEVELOPER.

Administrator rights

Administrator rights are:

- Mandatory for installation.
- Optional for normal operation.

Registry access

ASCET-DEVELOPER places data in the Windows registry and requires read/write access to the following locations:

- HKEY_LOCAL_MACHINE\Software\ETAS
- HKEY_LOCAL_MACHINE\Software\WOW6432Node\ETAS

File system access

ASCET-DEVELOPER requires access to the following file-system locations:

Folder	Default	Installation	Usage
ASCET-DEVELOPER installation folder	C:\ETAS\ASCET-DEVELOPERx.y C:\ETAS\ASCET-DEVELOPERx.y\configuration	RW RW	R RW
ASCET-DEVELOPER code generation server installation folder	C:\ETAS\ASCET_SERVERx.y.z	RW	RW
Windows Program Data folder	%ProgramData%\ETAS (C:\ProgramData\ETAS)	RW	RW
User's workspace folder	C:\Users\<>username>\ETAS\ASCET-DEVELOPER-x.y.z\workspace	-	RW
User's temporary folder	%TEMP% (C:\Users\<>username>\AppData\Local\Temp)	-	RW
User's roaming folder	C:\Users\<>username>\AppData\Roaming\ETAS	RW	RW

2.3 Release Test Configuration

This section defines the 3rd party products with which ASCET-DEVELOPER has been released tested.

Important: ETAS has tested ASCET-DEVELOPER using the platform and product versions indicated in the following sections. Correct operation of ASCET-DEVELOPER is only covered by the warranty in the terms and conditions of your deployment license agreement when using **identical** versions and options. If you choose to use different versions or feature combinations then it is your responsibility to check that the system works correctly. If you require a statement that ASCET-DEVELOPER works correctly with your chosen tool platform version, Eclipse target platform or other tooling then please contact ETAS to discuss validation possibilities.

2.3.1 Host Platform

ASCET-DEVELOPER has been tested on the following host platforms:

Windows 7 (x86_64 / 64-bit)
 Windows 8.1 (x86_64 / 64-bit)
 Windows 10 (x86_64 / 64-bit)

2.3.2 Java™ Platform

ASCET-DEVELOPER has been tested with the following JRE:

java version "1.8.0_131"
 Java(TM) SE Runtime Environment (build 1.8.0_131-b11)
 Java HotSpot(TM) 64-Bit Server VM (build 25.131-b11, mixed mode)

2.3.3 Eclipse Target Platform

ASCET-DEVELOPER has been tested on the following Eclipse platform releases:

Eclipse Platform Releases	Product Platform	Update Site
Eclipse MARS (4.5.2 / MARS.2)	✓	✓
Eclipse NEON (4.6.3 / NEON.3)		✓
Eclipse OXYGEN (4.7.1 / OXYGEN.1)		✓

Product platform indicates the version of the Eclipse workbench installed when you install ASCET-DEVELOPER from product installer.

Update site indicates the version(s) of Eclipse that are supported when installing ASCET-DEVELOPER from a compatible update site on the product DVD.

The Eclipse target platform configuration for each of these releases is provided on the DVD in the folder EclipseTargetPlatforms.

You can access the Eclipse target platform configuration for your using the following steps:

1. Install the ASCET product
2. Start ASCET
3. Go to **Help** → **About ASCET**
4. Click "Installation Details"
5. Select the "Configuration Tab"

2.3.4 Auxiliary ASCET-DEVELOPER Code Generators

This release of ASCET-DEVELOPER has been tested using the following auxiliary code generators:

Code Generator Version
6.4.3
6.3.1

2.3.5 ETAS Companion Products

This release of ASCET-DEVELOPER has been tested using the following products:

Product	Version
ETAS EXPERIMENT ENVIRONMENT	3.7.3
ETAS INTECRIO	4.6.1
ETAS EHOOKS	4.1.3 4.2.0 4.3.0
ETAS INCA-EIP	7.2 SP2

2.3.6 3rd Party Products

This release of ASCET-DEVELOPER has been tested using the following products:

Product	Version
MinGW GCC (x86/32-bit)	4.8.1
Mathworks MATLAB/Simulink	R2017a
QTronic FMU SDK ¹	2.0.3

2.4 File Format Compatibility

ASCET-DEVELOPER is compatible with the file format versions:

File Format	Compatible Versions
AUTOSAR ARXML (import and export)	4.0.3 4.1.2 4.2.1 4.2.2
ASAM MCD-2 MC / ASAP2 (A2L)	1.4.1
SCOOOP-IX	1.4
FMI	2.0 for co-simulation

2.5 Delivery

The software is delivered with an installation routine on a DVD including ASCET-DEVELOPER 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:

File or Directory	Description
\install	Directory containing the software installation application.
\Documentation	Directory containing copies of the PDF user documentation.
\Documentation\Open Source Software	Directory containing information about 3 rd party open source software used in or provided for use with ASCET-DEVELOPER.

¹ <http://www.qtronic.de/doc/fmusdk.zip>

\HTML	Directory containing text and images for the DVD .
\EclipseTargetPlatforms	Target platform configurations for each of the supported Eclipse platforms.
All root directory files	Windows Autostart support files

2.5.1 Used 3rd Party Software

ASCET-DEVELOPER makes use of third-party software components. Licensing information for these components is described in the ASCET-DEVELOPER 7.3.0 OSS Attributions document. Copies of this document can be found in the following locations:

Location	Path
DVD	Documentation\ASCET-DEVELOPER 7.3.0 OSS Attributions.pdf
Installation	<Installation folder>\Documents\ASCET-DEVELOPER 7.3.0 OSS Attributions.pdf

2.6 Installation

Run `start.exe` from the DVD follow the on-screen instructions to install ASCET-DEVELOPER.

Additional information on how to properly install and configure the product is in the ASCET-DEVELOPER V7.3 Getting Started guide. Copies of this document can be found in the following locations:

Location	Path
DVD	Documentation\ASCET-DEVELOPER 7.3 Getting Started.pdf
Installation	<Installation folder>\Documents\ASCET-DEVELOPER 7.3 Getting Started.pdf

Note that if, during installation, the option to run ASCET-DEVELOPER is selected, then the first workspace will be created in the user account with administrator rights (the default workspace is in User/<Admin>).

When closing/restarting as a normal user, ASCET-DEVELOPER will offer the previously created workspace path as the workspace to open, but there will be no access rights so an error dialog "Workspace Cannot be created" "Could not launch the product..." will be shown. This is correct Windows behavior.

Standard users should create a new workspace.

3 Changes

3.1 What is new?

- Block Diagram Editor
 - Improved hierarchy navigation in the BD including doubling clicking on canvas to return to parent model.
 - Initialization values can be set for out and inout method arguments in the block diagram. For complex arguments like arrays and structs, a tabular data editor is provided.
 - Copy and paste is provided in the outline view.
 - Branch points on lines are now cued using a black dot.
 - Option to hide pin names
 - Option to hide container names
 - New operators to access intrinsic methods for an element (e.g. the number of elements in an array or the validity of a element with a redundant value)
 - Insert an element onto an existing connection line
 - Hovering over a connection line highlights the connection
 - In-place replacement of one block with another using drag'n'drop
- Modelling
 - Method local arrays are permitted
 - Arrays of structs can be created
- "Back animation" into ASCET-DEVELOPER from the ETAS Experiment Environment
 - When an experiment is running, values can be shown live on the block diagram
 - Multiple instances of the same block diagram can be observed simultaneously
- DIFF
 - Ignored differences can be added to the filter.
 - The sequencing view is synchronized to the section in the difference view.
 - Clicking on the canvas allows you to move up a level in the hierarchy
- EHOOKS Integration
 - New tabular editor for configuring EHOOKS bypass applications.
 - Support for EHOOKS 4.2 and 4.3
- AUTOSAR
 - New language for defining basic AUTOSAR SWC properties to enable mapping, C generation and ARXML generation when using a "bottom up" AUTOSAR workflow.
 - New tabular editor for defining the mapping between AUTOSAR interface entities and messages/methods in ASCET-DEVELOPER
- Visualization
 - A graphical visualization of message communication can be generated by right-clicking on an .app file and selecting "Generate UML diagram..."
- Export applications as MATLAB/Simulink S-Functions

- Enables ASCET-DEVELOPER applications to be used open- and closed-loop simulations. Applications are compiled with the MEX compiler in MATLAB/Simulink to ensure cross-platform compatibility.
- Conversion
 - AUTOSAR software components in ASCET 6 are now converted
- Export applications as APP4MC (AMALTHEA) models
 - Information about threads, timing and communication can be exported as an APP4MC model enabling subsequent analysis for multi-/many-core software distribution with the Eclipse APP4MC tools. See <https://www.eclipse.org/app4mc/> for further details.
- Grace mode
 - Allows ASCET-DEVELOPER to be used for a period of up to 2 weeks without a valid license key.

3.2 What has changed?

This release makes the following changes to the previous release:

- Modelling
 - Qualifiers can now be specified for each representation individually in addition to being set on the element itself
 - Where both are defined, the representation overrides the model
 - Range checks can be disabled for each element in a representation
 - Overflow protection handling can be defined for each element in a representation
- AUTOSAR
 - Completely revised AUTOSAR mapping configuration for the following AUTOSAR interface types:
 - Sender-receiver
 - Client-server
 - Mode-switch
 - Parameter
 - NV Data
 - Support for mode-switch events
 - Revised AUTOSAR import wizard.
- The internal code generation shipped with ASCET-DEVELOPER has been updated to V6.4.3.
- "Physical" code generation omits the representation name from all generated C code symbols and source code files
- The automatically created representation is called "Automatic" by default
 - It was previously "Imp1" which clashes with many models that are converted from ASCET 6.4
- Revised C data structures
 - Code generation has been revised to use identical data structure generation to that found in ASCET 6.x. Code generated by ASCET-DEVELOPER is significantly easier to "diff" against code generated by ASCET 6.4
 - <ClassName>_<RepresentationName>_private.h and <StaticClassName>_<RepresentationName>_instance.c files are no longer generated

- Data structures are generated within the `<StaticClassName>_<RepresentationName>.c` as they are in ASCET 6.4.
- Simplified code generation run configuration workflow
 - Input: select the application for code generation
 - Process: choose the code generator to use
 - By default, the internal code generator is selected
 - ASCET-DEVELOPER discovers other ASCET installations on the host PC automatically. Compatible versions can be used instead of the internal code generator.
 - Output: select the destination for the generated code
 - Placed within an existing Eclipse project; or
 - Create a new Eclipse CDT project
- Simplified and extended code generation option control
 - All advanced code generation options are defined in an Eclipse `.properties` file that can be passed to the run configuration. A complete list of the new options is provided in the online help.
- Command line revised to take two arguments only
 - A workspace location (-w)
 - A run configurations (-l) that defines the code generation options (like a command line file for a compiler)
 - Run configurations can be saved by going to the "Common" tab and setting the option to "Save as" a "Shared file"

3.3 Compatibility to Earlier Releases

ASCET-MD V6.4 models must be converted to work with ASCET-DEVELOPER. See the online help for further advice.

Earlier ASCET-DEVELOPER models are compatible with this release.

3.4 Unsupported features

This release of ASCET-DEVELOPER does not support all ASCET 6.x features. This section outlines the features that are not in this release of ASCET and indicates the version of ASCET 6.x when the feature was first provided:

ASCET Version	Feature
6.4	<ul style="list-style-type: none"> ● Declaration of record elements inside a method ● Limited and wrap-around integer types ● Use of externally declared C <code>struct</code> types
6.3	<ul style="list-style-type: none"> ● Adaptive characteristics ● Re-scalable implementations
6.2	--
6.1	<ul style="list-style-type: none"> ● Dependent maps and curves ● Array and struct reference elements
6.0 and earlier	<ul style="list-style-type: none"> ● Code compile, build and link ● CT Blocks

Customized add-ons for earlier versions of ASCET are **not** compatible with this release of ASCET-DEVELOPER.

3.5 Known Issues

This section describes the set of known issues (EC3 bugs) in this release of ASCET-DEVELOPER.

Key	Summary	Workaround
ASCET-31369	ASAP2 file can contain wrong enumeration values for state machine states when on the same hierarchy level upper and lower case state names are used (e.g. "gear" and "Start").	Rename the states and use the same naming convention for ALL state names of the state machine (use either upper case OR lower case).
ASCET-29564	Code generation server fails WHEN model contains names resulting in temporary directory path names that are longer than 260 characters	<ol style="list-style-type: none"> 1. Close ASCET-DEVELOPER. 2. Create a new temporary directory C:\tmp: 3. Open the <install directory>\ASCET.ini file in your installation. 4. Add the following line at the end of the file: -Djava.io.tmpdir=c:\tmp These steps will not completely eradicate the problem, but they will make it less likely to occur.
ASCET-29679	Constant folding at code generation time rounds integer divisions towards zero. ASCET 6.x and earlier used half to infinity rounding for integer divisions.	EITHER re-write the constant expression so that it does not include a division OR replace the constant expression with a literal.
ASCET-30075	Code generation server terminates with UndefinedObject error dialog WHEN using a real type quantized using a Moebius formula AND a literal in the formula has more than 7 decimal digits of precision. (TFS581065)	Use a literal with less than 7 decimal digits of precision.
ASCET-30092	Compile and link error WHEN using the .IsValid() intrinsic method AND advanced option code_optimize_get_set_methods = false (TFS583519)	Set the advanced option code_optimize_get_set_methods = true
ASCET-30863	PC experiment build fails WHEN a class has local elements AND the class declares no methods TFS582036	Add a dummy method to the class.
ASCET-30905	Code generator server terminates with errors (MMdl22, MMdl721) WHEN assigning a value to public element of a class returned by method AND advanced option code_optimize_get_set_methods = false. (TFS583766)	EITHER make the public element private and write your own get and set methods OR set the advanced option code_optimize_get_set_methods = true

ASCET-31212	Code generation error WHEN initializing an out argument indirectly via a method call	Use a temporary variable to collect the result of the method call and then assign the temporary variable to assign to the out argument. For example, re-write this: <pre>public void OutArgument(real out r) { Initialize(r); }</pre> as this: <pre>public void OutArgument(real out r) { real temp = 0.0; Initialize(temp) }</pre>
ASCET-31232	Incorrect validation EAV006 raised WHEN reading a message in the guard of a conditional expression used as a method argument	None
ASCET-31275	Code generation fails WHEN a conditional expression is used to initialize an array element	Write an explicit initialization routine.
ASCET-31277	Code generation fails WHEN assigning a constant struct declared at package scope to a variable struct declared at method scope	Assign the struct field's separately.
ASCET-31288	Code generation error WHEN initializing a class scope element using the .value() intrinsic method invoked on a data interface element of enumeration type AND the enumeration literals have user defined values	Do not assign values to the enumeration literals, for example: For example, re-write this: <pre>typedef TheEnum {A=23, B=45, C=55};</pre> as this: <pre>typedef TheEnum {A,B,C};</pre>
ASCET-31289	Code generation error WHEN a struct at class scope is initialized using an array element of equivalent struct type	Assign the struct fields from the array separately.
ASCET-31290	Code generation error WHEN using a system constant to index into an array element of a data interface	Assign the system constant to a local variable and use the local variable in the array index.
ASCET-31296	Code generation exception WHEN using an imported public static variable without using a fully qualified name	Replace the name of the static variable with the fully qualified name. For example, re-write this: <pre>X = TheName;</pre> with this: <pre>X = TheClass.TheName;</pre>
Generated at Thu Dec 07 10:28:38 CET 2017 by Buttle Darren (ETAS-PGA/PRM-E) using JIRA 7.2.9#72011-sha1:d6cf5f35263cb0451bff611940e6cb537ecc0956.		

3.6 Fixed Problems

The following problems in previous releases of ASCET-DEVELOPER are fixed in this release:

Bug ID	Description
ASCET-24663	C code generation may fail for arrays sized by a wide-range system constant DESCRIPTION: if a system constant has a wide range (e.g. 1 .. 65535) then C code generation may fail.
ASCET-1608 (EHI-484279)	The signal generator in the ETAS Experiment Environment does not support data interface element of enumeration type
ASCET-27319 (PR567204)	Optimized message caching code is not thread safe
PR578821	Wrongly reused subexpression if "Common Subexpression Elimination" is enabled
PR511763	Installation of ASCET causes system crash on systems containing INCA V7.2

3.7 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.

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

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

4 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