ETAS

DESK-LABCAR Default Project
DESK-LABCAR Default Project V3.7.1 - Getting Started

Copyright

Contents

1 Introduction

This manual contains information on the configuration and launch of DESK-LABCAR. For an overview of DESK-LABCAR Getting Started please refer to chapter 2 "DESK-LABCAR System Overview".

1.1 About this Manual

This section contains a short overview of the contents and provides information on the user profile and on how to use this manual.

1.1.1 Content

This manual, "ETAS DESK-LABCAR Default Project – Getting started", consists of the following chapters:

- Chapter 1: "Introduction"
  This chapter contains general information, such as user profile, intended use and conventions used in this document. Furthermore, it contains an overview of LABCAR documents.
- Chapter 2: "DESK-LABCAR System Overview"
  This chapter contains an overview of the LABCAR system.
- Chapter 3: "Program Installation"
  This chapter provides installation instructions.
- Chapter 4: "Configuring the User PC "
  This chapter describes how to connect the User PC to the LABCAR.
- Chapter 5: "Licensing for DESK-LABCAR Machine-Named "
  This chapter contains general information about ETAS licensing.
- Chapter 6: "DESK-LABCAR Default Project Content"
  This chapter gives a description of the Default Project Content.
- Chapter 7: "ETAS Contact Addresses"
  In this chapter you can find information how to contact ETAS.
- Chapter 8: "List of abbreviations"
  In this chapter the abbreviations are defined.

1.1.2 User Profile

This manual is intended for specialists who develop or test Electronic Control Units (ECU). Dedicated knowledge of measuring and ECU technology is assumed.

1.1.3 Intended Use

The DESK-LABCAR is designed for the use in industrial laboratories.

It is used for the following tasks:

- For software system tests (manual and automatic)
- For testing the initial control unit setup

If the DESK-LABCAR is used for any other application as mentioned above, ETAS is not responsible for any injury or damage that may occur.

2   DESK-LABCAR System Overview

DESK-LABCAR is designed to simulate interfaces for testing ECUs.

The advantages of FiL systems are:

- Root causes of complex failure types can be found early in development.
- Any test profile can be run repeatedly with the same level of precision and without danger to persons or vehicles.

The system can be used to run tests for the validation of control and diagnostic functions in early phases of ECU development as well as for the release of software variants.
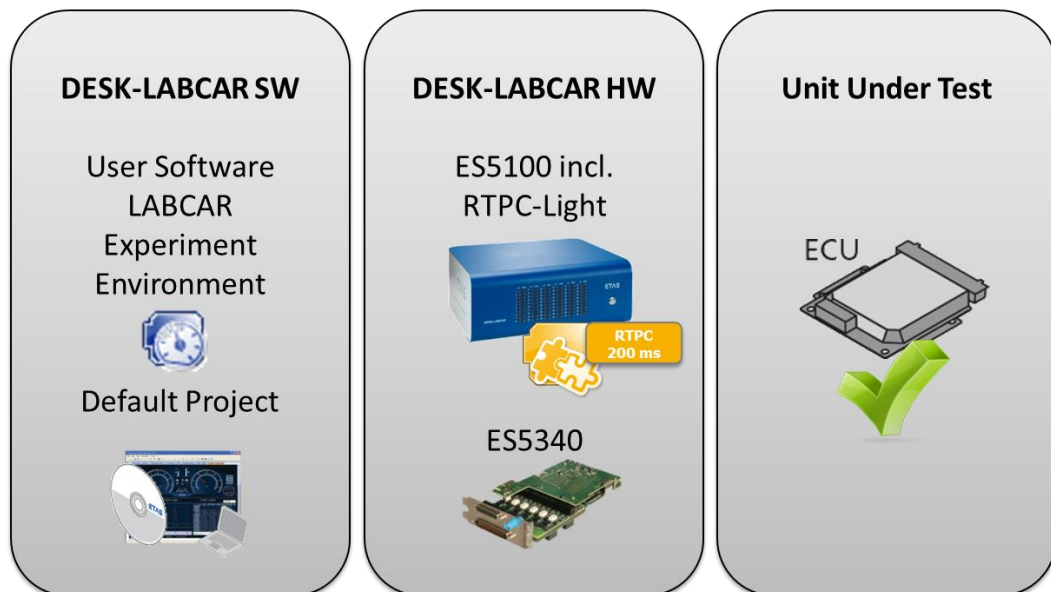
Fig. 2-1   DESK-LABCAR system setup example and its environment.

2.1   DESK-LABCAR Default Project

The DESK-LABCAR Default Project provides a basic Hardware Configuration for the RTPC inside the ES5100.1 and for the ES5340.2 Internal Combustion Engine Board a maximum set of preconfigured HW Channels and IO model signals.

2.2   DESK-LABCAR User Software

The DESK-LABCAR User Software is the environment for configuring (instrumentation, parameterization, etc.) and executing experiments.

The experiment environment offers the following possibilities:

- clear access to all parameters and measure variables due to the combination of the "Element List" and "Signal Center" in the "Workspace Elements" window
- creation of instrumentations for displaying measure variables and for modifying parameters of the running experiment
- signal conversion and sensor/actuator modeling
- tracing signal paths
- data recording with the Datalogger
- stimulating inputs with the Signal Generator.

3 Program Installation

3.1 DESK-LABCAR Default Project Installation

This section describes how to install DESK-LABCAR Default Project.

To install DESK-LABCAR Default Project

Before installing the DESK-LABCAR Default Project, please make sure that the DESK-LABCAR User Software is installed in advance properly (see chapter 3.2 DESK-LABCAR User Software Installation).

- Insert the product DVD in your DVD-ROM drive.
  The DVD-Browser is launched.
- Select
  Tools and Utilities → DESK-LABCAR Default Project.
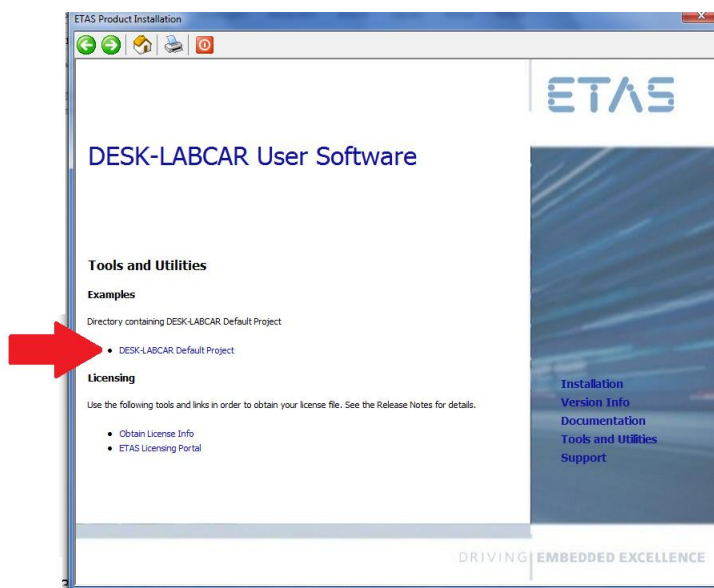
- The following window appears, providing a *.zip file.
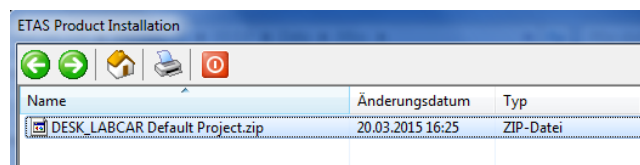
- Extract the DESK-LABCAR_Default_Project.zip file on your PC.
- Afterwards a set of structured files are provided on your PC.
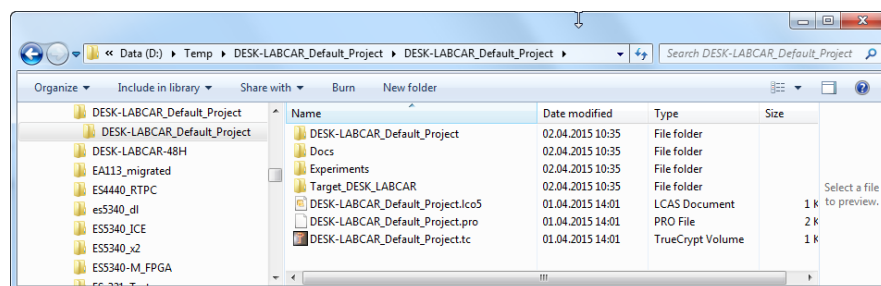
- These structured files contain all necessary target files, as well as a suitable Experiment Environment workspace.

Note for LABCAR-OPERATOR User:
If LABCAR-OPERATOR(-IP) is running on your PC, the DESK-LABCAR_Default_Project.lco5 project in folder (installation_folder)/ DESK-LABCAR_Default_Project can be opened directly. With LABCAR-OPERATOR the project can be edit, modified and stored.

- Open the file "(extraction_folder)\DESK-LABCAR_Default_Project\DESK-LABCAR_Default_Project\DESK-LABCAR_Default_Project\DESK-LABCAR_Default_Project.eew" with the program Experiment Environment of ETAS.
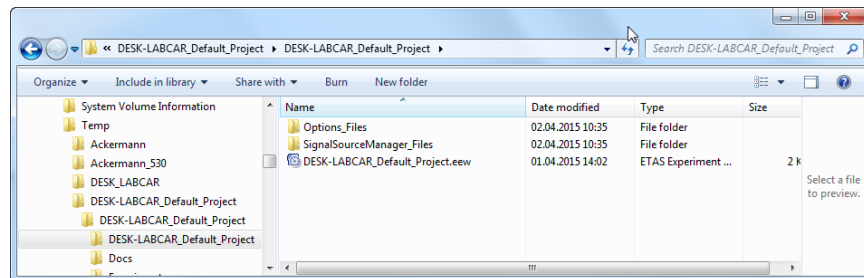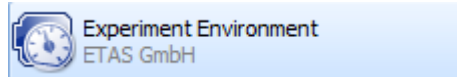
- If the Experiment Environment is opened the first time by a windows user, the ETAS Safety Advice is displayed. Please read it carefully and press → **Acknowledge**.
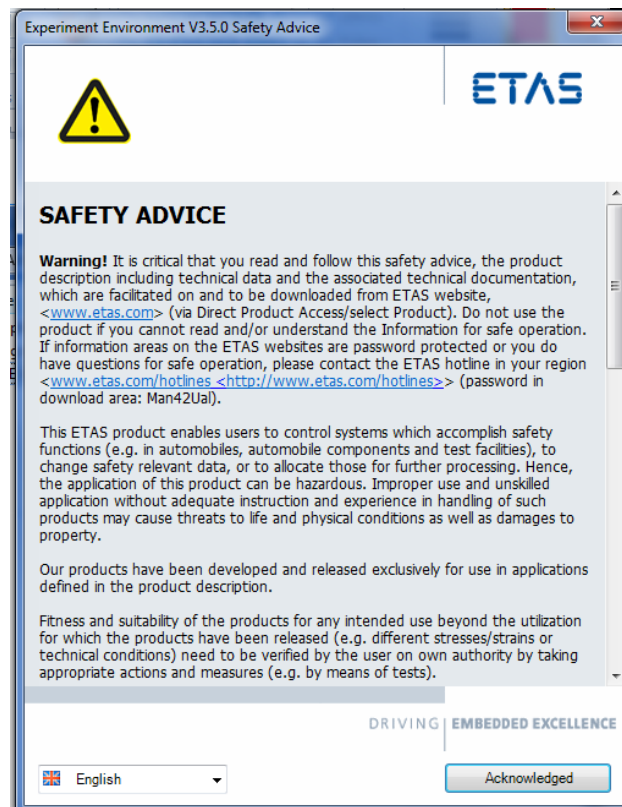
- While opening the file DESK-LABCAR_Default_Project.eew Experiment Environment workspace the first time, a warning might inform that the workspace location has changed.

ETAS

This is an expected behavior in this case.
Please confirm and press → **Yes** to proceed.
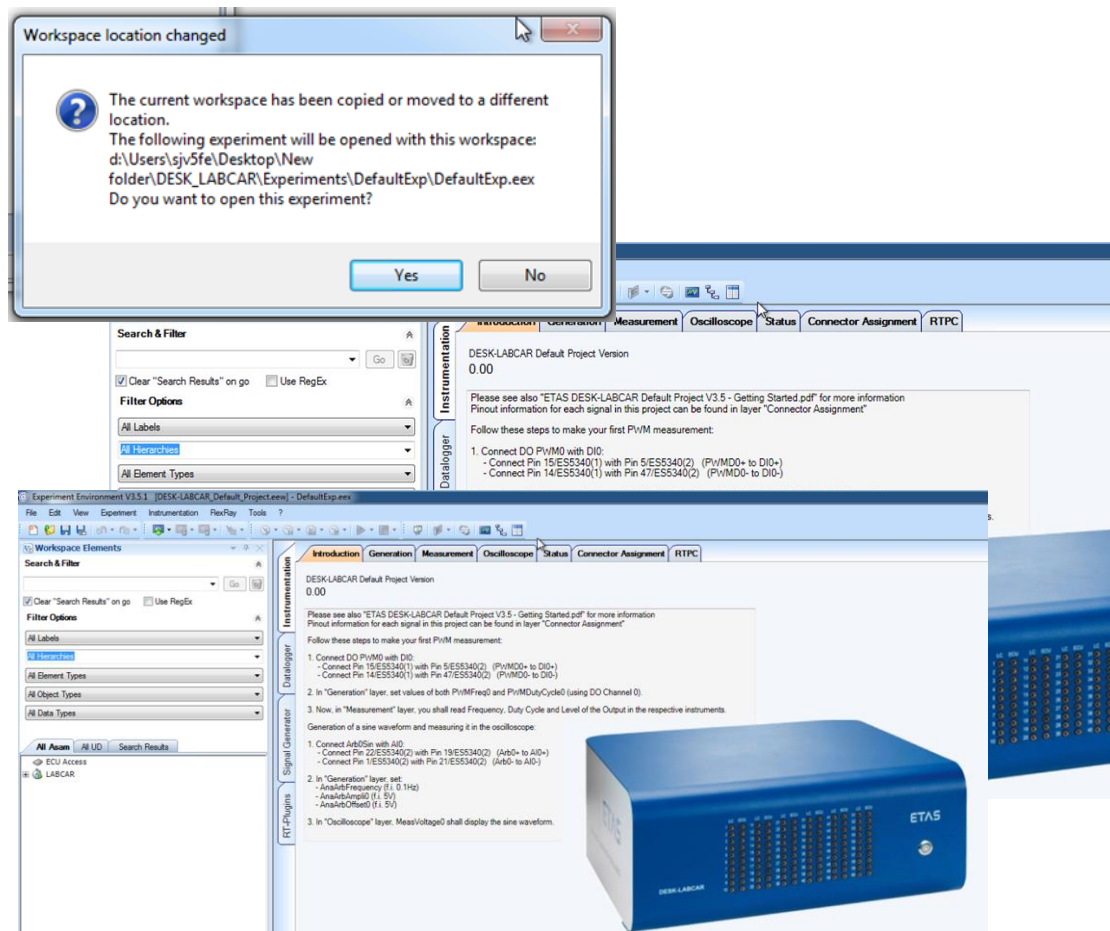
3.2   DESK-LABCAR User Software Installation

This section describes how to install DESK-LABCAR User Software.

To install DESK-LABCAR User Software

- Insert the product DVD in your DVD-ROM drive.
  The DVD-Browser is launched.
- Select
  Installation → Install DESK-LABCAR User Software.
  You can install the HSP (Hardware Service Pack) later.
  The welcome window opens.
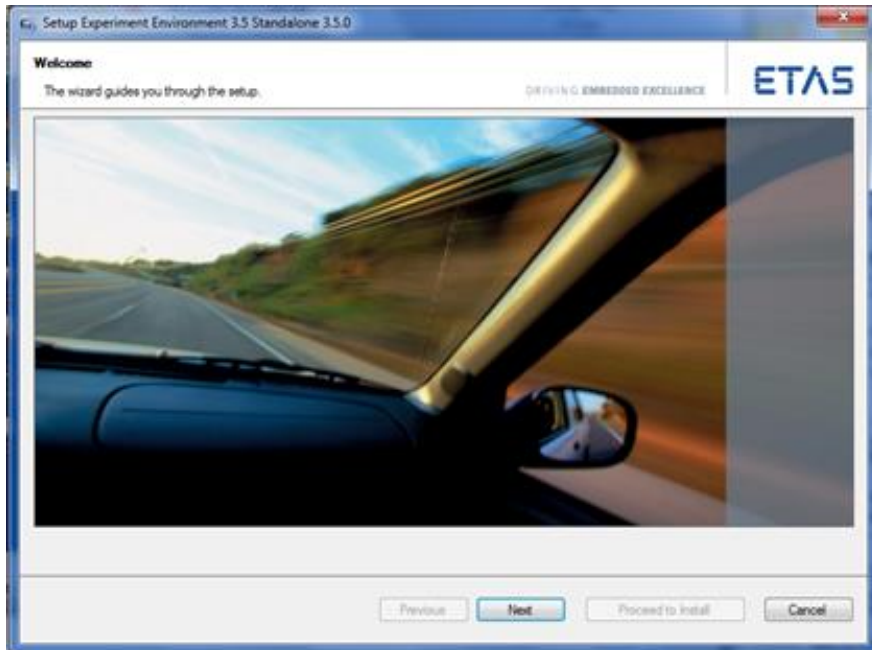
- Click **Next** and follow the instructions of the installation wizard.
- The duration of the installation depends on the components which might be alteady installed on your user PC.
- Make sure, that all available components are selected, which are Ready to install.
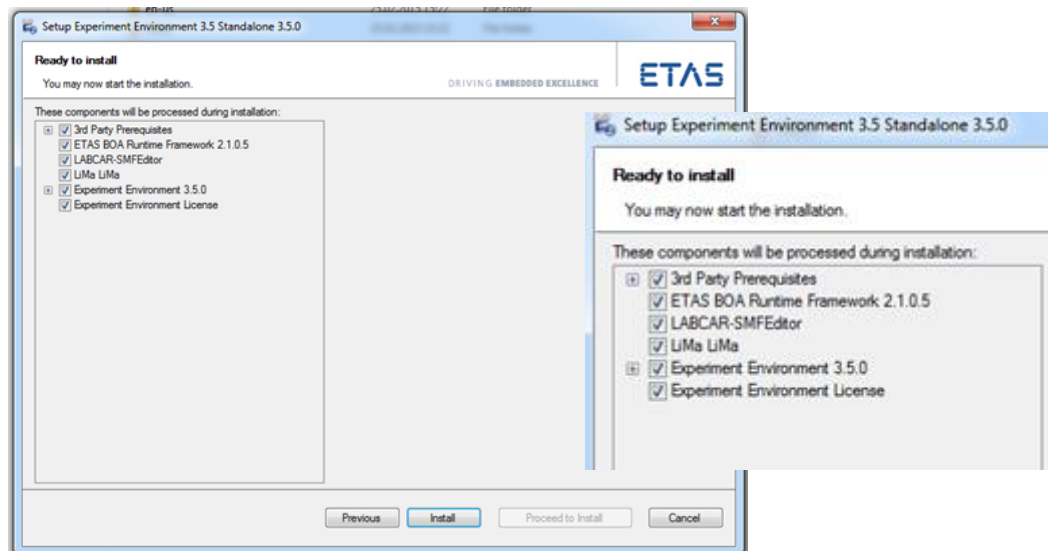
- To complete the installation click **Finish**.
- IMPORTANT: To ensure adequate Licensing see chapter 5.

4 Configuring the User PC

To operate your DESK-LABCAR, you require a user PC with various software and a connection to the ES5100 Real-Time PC simulation target. This section describes how to configure the PC.

This consists of:

- Establishing the Ethernet connection to the simulation target Real-Time PC

4.1 Establishing the Ethernet Connection to ES5100 Simulation Target Real-Time PC

- Make sure that your user PC has an Ethernet interface and a network connection has been configured correctly (default IP address: 192.168.40.240, subnet mask: 255.255.225.0).
- Connect the Ethernet cable (2x RJ45 socket) supplied to your user PC and to the back of the Real-Time PC (Ethernet connector "Eth0 (Host)").

Testing the connection to the Real-Time PC (RTPC)

To test the connection, please proceed as follows:

To switch on and boot the Real-Time PC

- Switch on the power supply (on the back at the bottom right).
- Power on the Real-Time PC using the switch on the front of the housing.

To stop the simulation controller

- Open a web browser on the user PC.
- Invoke the URL http://192.168.40.14.
- To stop the simulation controller (Fig. 4-1/1), refer to the RTPC help file.

ETAS LABCAR-RTPC (V5.1.1+)
Run your models in real time on a PC

Main Page >> Simulation Controller

Running Simulation Controller

The simulation controller is currently running.

Stop Simulation Controller ①

Stops the Simulation Controller and sets the system back to the idle mode.

Restart Simulation Controller

Restarts the Simulation Controller. This may take up to 10 seconds. Basic Interface

System Info
Show system information and log files. View Log File with automatic update.

Runtime Trace
Download the collected trace data files

CAN Trace
Control and handling of runtime trace data files

Model Step
Step by step execution of the real time simulation

Power Control
Reboot or power down LABCAR-RTPC

Fig. 4-1 Stop Simulation Controller (example)

To shut down the Real-Time PC

- Press the on/off switch on the Real-Time PC.

  or

- To shut down the RTPC (Fig. 6-2/1), refer to the RTPC help file.

- If the on/off switch on the Real-Time PC is not accessible or does not exist, the Real-Time PC can be shut down or rebooted using this web interface link.
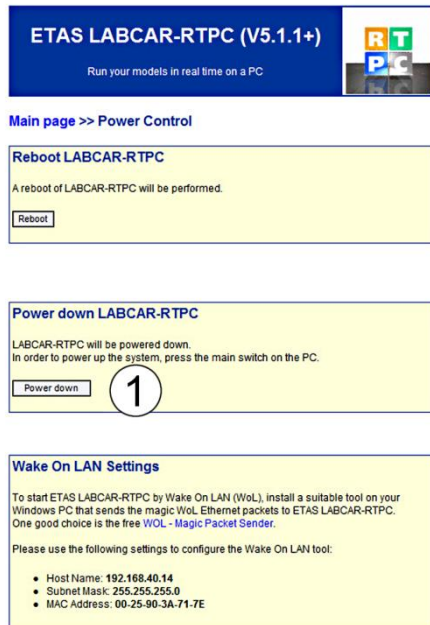
Fig. 4-2   Shutting down RTPC (example)

For more detailed information on LABCAR-RTPC – particularly on the web interface mentioned above – refer to the "LABCAR-RTPC – User's Guide".

5 Licensing for DESK-LABCAR Machine-Named

To be able to work with an ETAS software product, you require a license. This section contains basic details on this subject.
Details concerning the scope of the licenses and other legal aspects can be found in "Terms and Conditions".

5.1 ETAS License Model for DESK-LABCAR User Software

Machine-Named License, Local

- A license of this type is managed by the user him/herself.

- As it is linked to a particular PC (better: to the MAC address of the Ethernet adapter)it is valid wherever the PC is used.

- When you change your PC, you require a new license.

5.2 How to Get a License

For machine-named license you obtain your license from the ETAS license portal (the URL is shown on your Entitlement Certificate).

There are three ways of logging in on the welcome page:

- **Activation ID**

Once you have logged in, a specific activation (1) is visible and can be managed – the activation ID is shown on your Entitlement Certificate.

- **Entitlement ID**

All activations of the entitlement (2) are visible and can be managed (e.g. for a company with just one entitlement).

- **E-mail and password**

All activations of the entitlements assigned to the user account are visible and can be managed (e.g. for a tool coordinator responsible for several entitlements).

If you need help in the portal, click the **Help** link.

(1) The activations refer to a specific product, its license conditions, the available number of licenses and other details required for generating a license. Activations are identified uniquely with activation IDs.

(2) An entitlement shows the authorizations you have as a user; it stands for the right to own one or more licenses for a product. It is a kind of account of rights of use for software from which you can take licenses as you need to.

What Information is Required?

Information on the hosts must be entered to activate licenses:
- Machine-named license

The MAC address of the Ethernet adapter to which the license is to be bound is required.

License File

The result of your activities is the provision of a file <name>.lic with which you can license your software in the ETAS License Manager.

The ETAS License Manager is installed automatically during the previously described installation process.

5.3 The License File

To check license status

- In the Windows Start menu, select **Programs** → ETAS → License Management → ETAS License Manager

  The ETAS License Manager is opened.

  The ETAS License Manager contains one entry for each installed product. The symbol at the beginning of the entry and the "Status" column entry indicate whether a valid license has already been obtained or not.
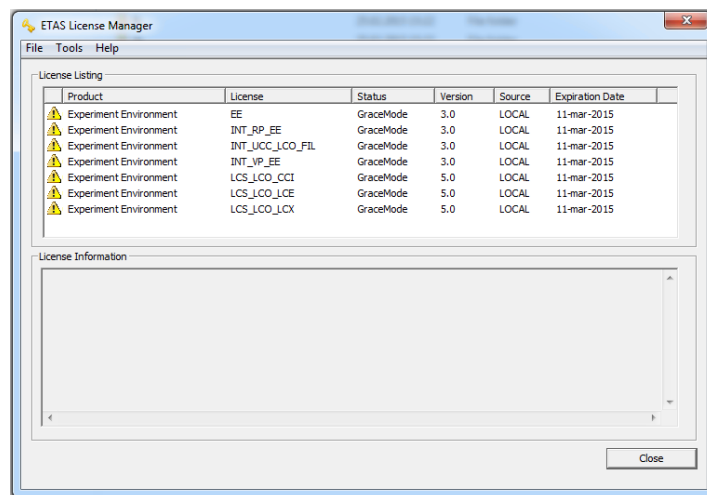
To add a license file

- Open the ETAS License Manager and select **File** → **Add Licensing File.**
- The "Install License" dialog window opens.
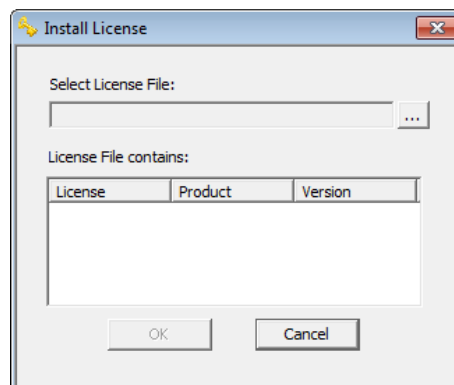
- Click ... next to the "Select License File" field.
- In the file selection window, browse to the folder containing the license file, select the license file and click **Open**.

  The "Install License" dialog window shows information on the selected license. The "Install License" dialog window opens.
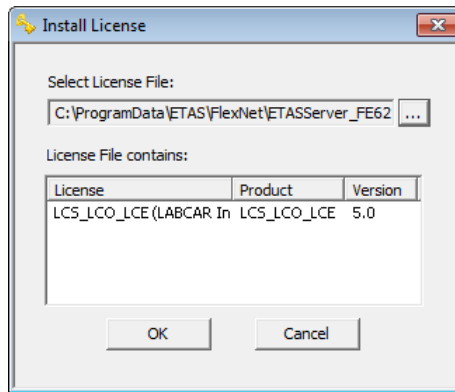
> **Note**
>
> *The "Version" column shows the version number of the license, not the version number of the software.*

- Confirm with **OK**.

  The license just added is now listed in the ETAS License Manager. A green symbol before the entry shows that the license i
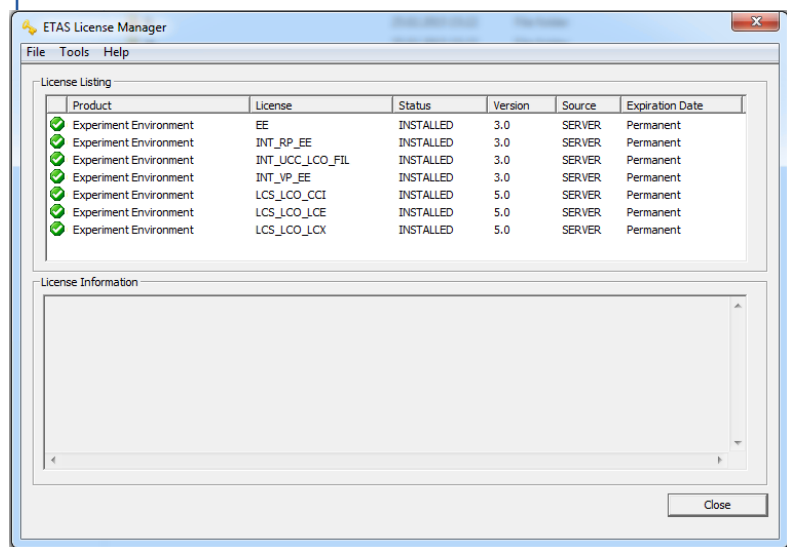
> **Note**
>
> *If the green symbol is not displayed, there might be a problem with the license file or the license relates to another product. Additional information on the ETAS License Manager can be found in the online help of the ETAS License Manager.*

- Close the ETAS License Manager.

6 DESK-LABCAR Default Project Content

The DESK-LABCAR Default Project provides a basic Hardware Configuration for the RTPC inside the ES5100.1 and for the ES5340.2-ICE Board a maximum set of preconfigured Hardware channels and IO model signals in the Experiment Environment.

6.1 DESK-LABCAR System Overview

The figure shows a view of the DESK-LABCAR with its hardware components.
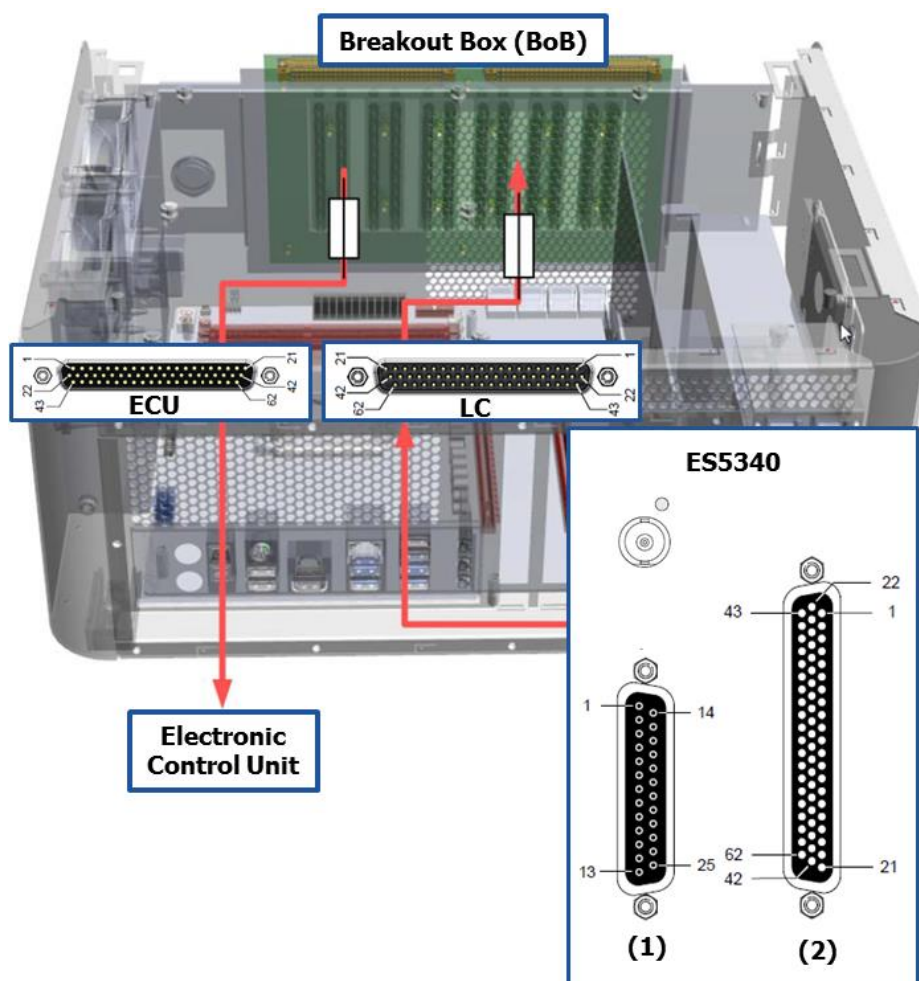
This hardware setup represents the DESK-LABCAR default configuration.
Please refer to user manual for more detailed information.

Fig. 6-1   ES5100 – ES5340.2-ICE System overview

Following table summarizes all pin names of the ES5100 BOB and the ES5340.2-ICE which are relevant for the DESK-LABCAR Default Project Workspace.

The cabling harness can be done individually connecting the Device Under Test, the BOB and ES5340.2-ICE connectors. In the DESK-LABCAR Default Project a maximum of ES5340.2-ICE Hardware channels and the related IO signals are provided and preconfigured in the Experiment Environment. All ES5340.2-ICE IO signals from connector (1) and (2) can be connected on the BOB connector.

ECU	BoB	LC	ES5340 (1)		ES5340 (2)	
1	1	1	1	Analog Output Channel 0	1	Analog Output Channel 6 −
2	2	2	2	External Ref. Channel 0	2	Digital Output Channel 6
3	3	3	3	Analog Output Channel 1	3	Analog Output Channel 7 −
4	4	4	4	External Ref. Channel 1	4	Digital Output Channel 7
5	5	5	5	Analog Output Channel 2	5	Digital Input Channel 0
6	6	6	6	External Ref. Channel 2	6	Digital Input Channel 1
7	7	7	7	Analog Output Channel 3	7	Digital Input Channel 2
8	8	8	8	External Ref. Channel 3	8	Digital Input Channel 3
9	9	9	9	Analog Output Channel 4	9	Digital Input Channel 4
10	10	10	10	External Ref. Channel 4	10	Digital Input Channel 5
11	11	11	11	Analog Output Channel 5	11	Digital Input Channel 6
12	12	12	12	External Ref. Channel 5	12	Digital Input Channel 7
13	13	13	13	n.c.	13	Digital Input Channel 8
14	14	14	14	Ground Channel 0	14	Digital Input Channel 9
15	15	15	15	Digital Output Channel 0	15	Digital Input Channel 10
16	16	16	16	Ground Channel 1	16	Digital Input Channel 11
17	17	17	17	Digital Output Channel 1	17	Digital Input Channel 12
18	18	18	18	Ground Channel 2	18	Digital Input Ground
19	19	19	19	Digital Output Channel 2	19	Analog Input Channel 0
20	20	20	20	Ground Channel 3	20	Analog Input Channel 1
21	21	21	21	Digital Output Channel 3	21	Analog Input Ground
22	22	22	22	Ground Channel 4	22	Analog Output Channel 6 +
23	23	23	23	Digital Output Channel 4	23	Excitation +
24	24	24	24	Ground Channel 5	24	Analog Output Channel 7 +
25	25	25	25	Digital Output Channel 5	25	Excitation −
26	26	26			26	Digital Input Channel 13
27	27	27			27	Digital Input Channel 14
28	28	28			28	Digital Input Channel 15
29	29	29			29	Digital Input Channel 16
30	30	30			30	Digital Input Channel 17
31	31	31			31	Digital Input Channel 18
32	32	32			32	Digital Input Channel 19
33	33	33			33	Digital Input Ground
34	34	34			34	Digital Input Ground
35	35	35			35	Digital Input Ground
36	36	36			36	Digital Input Ground
37	37	37			37	Digital Input Ground
38	38	38			38	Digital Input Ground
39	39	39			39	Analog Input Ground
40	40	40			40	Analog Input Channel 2
41	41	41			41	Analog Input Channel 3
42	42	42			42	Analog Input Ground
43	43	43			43	Analog Output Channel 6 AGND
44	44	44			44	Digital Output Channel 6 AGND
45	45	45			45	Analog Output Channel 7 AGND
46	46	46			46	Digital Output Channel 7 AGND
47	47	47			47	Digital Input Ground
48	48	48			48	Digital Input Ground
49	49	49			49	Digital Input Ground
50	50	50			50	Digital Input Ground
51	51	51			51	Digital Input Ground
52	52	52			52	Digital Input Ground
53	53	53			53	Digital Input Ground
54	54	54			54	Digital Input Ground
55	55	55			55	Digital Input Ground
56	56	56			56	Digital Input Ground
57	57	57			57	Digital Input Ground
58	58	58			58	Digital Input Ground
59	59	59			59	Digital Input Ground
60	60	60			60	Analog Input Ground
61 (n.c.)	61 (n.c.)	61 (n.c.)			61	Analog Input Ground
62 (n.c.)	62 (n.c.)	62 (n.c.)			62	Analog Input Ground

Fig. 6-2   ES5100 BOB, ES5340.2-ICE Pinning Overview

6.2 DESK-LABCAR Default Project Experiment Environment

The Experiment DESK-LABCAR Default Experiment Environment provides a basic hardware configuration.

ES5340.2-ICE Hardware Channel Configuration

The workspace includes preconfigured ES5340.2-ICE Hardware Channel Configuration.

- Digital Output Channels are preconfigured as Pull-up to a internal voltage of +5 V.
- Analog Output Channels are single ended, with an internal U_{ref} of 10 V.
- Analog Arbitrary Output Channels are single ended, with an internal U_{ref} of 10 V.
- Digital Input Channel Threshold
    - Lower Threshold: 1/3 $U_{ref\,A}$
    - Upper Threshold: 2/3 $U_{ref\,A}$
    - $U_{ref\,A}$=5V
- Analog Input Channel Range
    - Signal 0 and 2: [0 V, 5 V]
    - Signal 1 and 3: [0 V, 40 V]

ES5340.2-ICE Output Signals

The workspace includes preconfigured ES5340.2-ICE Output Signals:
- 4 Stroke combustion engine type
- 4 Served cylinders
- 4 x Direct Digital Output Signals
- 4 x PWM Digital Output Signals
- 6 x Direct Analog Outputs Signals
- 2 x Analog Arbitrary Waveform Signals : 1 x Sine, 1 x Square

Access to Generators in Experiment Environment

A module "DeskLabcarHwProxy" is provided to access the generators in the EE workspace. All relevant signals can be found under "CalibrationVariables" folder. A "Generation" Layer can be found where these signals can be configured.
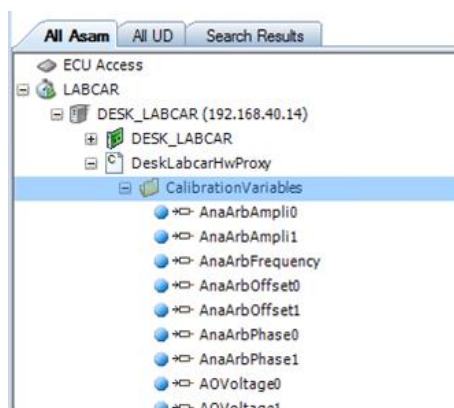
The ES5340.2-ICE Output Signals are visualized in the Generation Layer of the Experiement Environment.
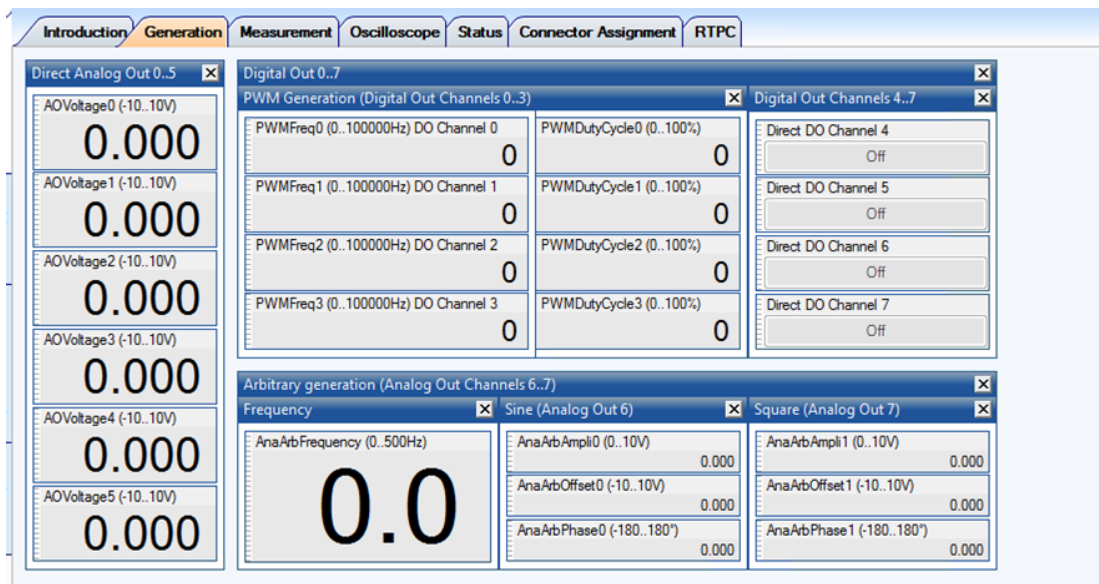
ES5340.2-ICE Input Signals

The workspace includes preconfigured ES5340.2-ICE Input Signals:

- 16 x Digital Input Level (active high) – State
- Digital PWM Waveform
    - 4 x Digital Input Level (active high) – State
    - 4 x Digital Input Signal – PWM Frequency and,
    - 4 x Digital Input Signal – Duty Cycle
- 4 x Analog Input Signal – MeasVoltage.
  Analog voltage inputs show an average value over 64 samples.

Access to Measurements in Experiment Environment

A module "DeskLabcarHwProxy" is provided to access the measurement signals in the EE workspace. All relevant signals can be found under "MeasureVariables" folder. A "Measurement" Layer can be found where these signals can be read.

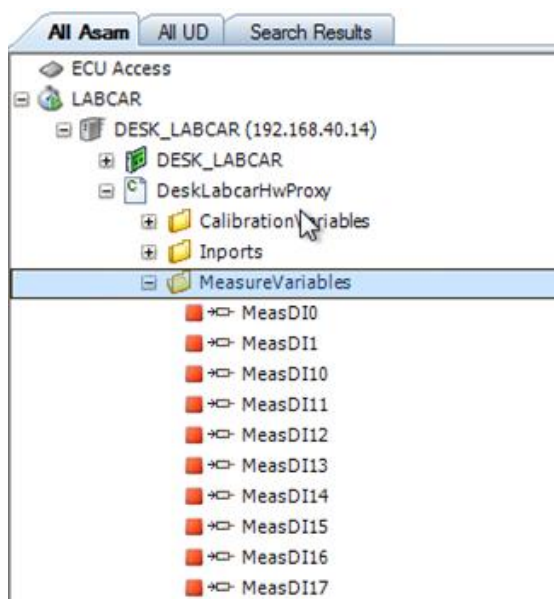The ES5340.2-ICE Input Signals are visualized in the Measurement Layer of the Experiement Environment.

The ES5340.2-ICE Input Signals of voltage measurements are visualized in the Oscilloscope Layer of the Experiement Environment.
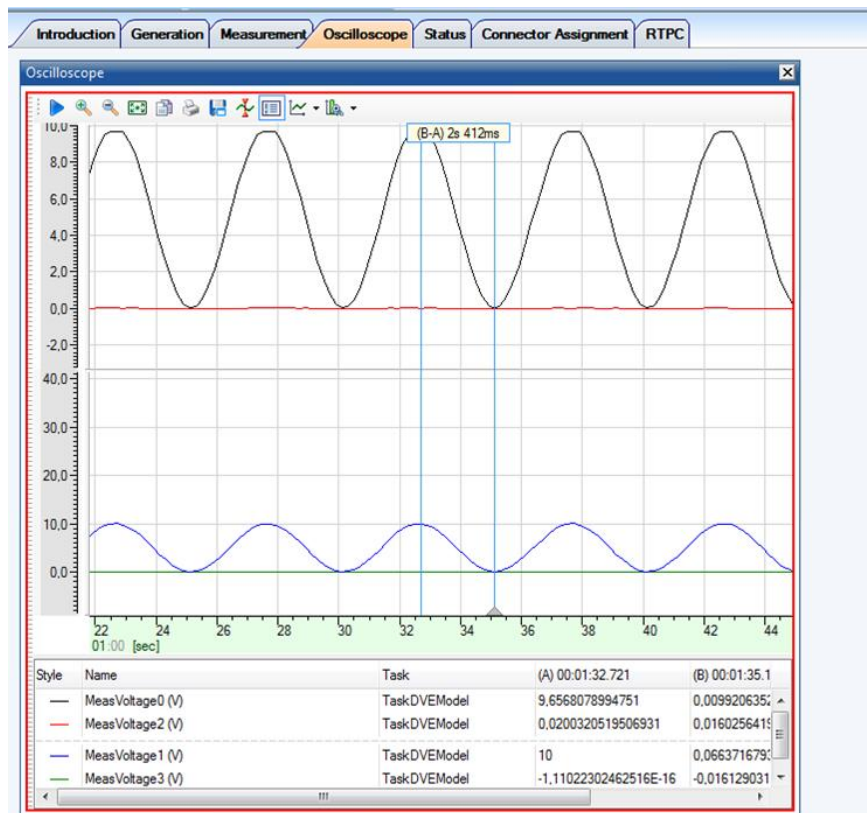
6.3 DESK-LABCAR Experiment Environment - ES5340.2-ICE Pin Usage

The Experiment DESK-LABCAR Default Experiment Environment provides a basic Hardware Configuration.

6.3.1 DESK-LABCAR Experiment Environment – Direct Digital Output Signals

Signal	Connector	Pin
Direct DO 4+	ES5340(1)	23
Direct DO 4-	ES5340(1)	22
Direct DO 5+	ES5340(1)	25
Direct DO 5-	ES5340(1)	24
Direct DO 6+	ES5340(2)	2
Direct DO 6-	ES5340(2)	44
Direct DO 7+	ES5340(2)	4
Direct DO 7-	ES5340(2)	46

6.3.2 DESK-LABCAR Experiment Environment – PWM Digital Output Signals

Signal	Connector	Pin
PWM DO 0+	ES5340(1)	15
PWM DO 0-	ES5340(1)	14
PWM DO 1+	ES5340(1)	17
PWM DO 1-	ES5340(1)	16
PWM DO 2+	ES5340(1)	19
PWM DO 2-	ES5340(1)	18
PWM DO 3+	ES5340(1)	21
PWM DO 3-	ES5340(1)	20

6.3.3 DESK-LABCAR Experiment Environment – Direct Analog Output Signals

Signal	Connector	Pin
DIRECT AO 0+	ES5340(1)	1
DIRECT AO 0-	ES5340(1)	14
DIRECT AO 1+	ES5340(1)	3
DIRECT AO 1-	ES5340(1)	16
DIRECT AO 2+	ES5340(1)	5
DIRECT AO 2-	ES5340(1)	18
DIRECT AO 3+	ES5340(1)	7
DIRECT AO 3-	ES5340(1)	20
DIRECT AO 4+	ES5340(1)	9
DIRECT AO 4-	ES5340(1)	22
DIRECT AO 5+	ES5340(1)	11
DIRECT AO 5-	ES5340(1)	24

6.3.4 DESK-LABCAR Experiment Environment – Arbitrary Analog Waveform Output Signals

Signal	Connector	Pin
Arb 0(sine)+	ES5340(2)	22
Arb 0(sine)-	ES5340(2)	1
Arb 1(square)+	ES5340(2)	24
Arb 1(square)-	ES5340(2)	3

6.3.5   DESK-LABCAR Experiment Environment – Measurement Signals

Digital Channel	Relevant Signals	Connector	Pin
DI0+	Level0, Freq0, DutyCycle0	ES5340(2)	5
DI1+	Level1, Freq1, DutyCycle1	ES5340(2)	6
DI2+	Level2, Freq2, DutyCycle2	ES5340(2)	7
DI3+	Level3, Freq3, DutyCycle3	ES5340(2)	8
DI4+	Level4	ES5340(2)	9
DI5+	Level5	ES5340(2)	10
DI6+	Level6	ES5340(2)	11
DI7+	Level7	ES5340(2)	12
DI8+	Level8	ES5340(2)	13
DI9+	Level9	ES5340(2)	14
DI10+	Level10	ES5340(2)	15
DI11+	Level11	ES5340(2)	16
DI12+	Level12	ES5340(2)	17
DI13+	Level13	ES5340(2)	26
DI14+	Level14	ES5340(2)	27
DI15+	Level15	ES5340(2)	28
DI16+	Level16	ES5340(2)	29
DI17+	Level17	ES5340(2)	30
DI18+	Level18	ES5340(2)	31
DI19+	Level19	ES5340(2)	32
DI-	Digital input ground	ES5340(2)	47, 48, 49, 50, …

Analog Channel	Relevant Signals	Connector	Pin
AI0+	Voltage0	ES5340(2)	19
AI1+	Voltage1	ES5340(2)	20
AI2+	Voltage2	ES5340(2)	40
AI3+	Voltage3	ES5340(2)	41
AI-	Analog input ground	ES5340(2)	21, 42, ...

7   ETAS Contact Addresses

ETAS HQ

ETAS GmbH

Borsigstraße 14	Phone:	+49 711 3423-0
70469 Stuttgart	Fax:	+49 711 3423-2106
Germany	WWW:	www.etas.com

ETAS Subsidiaries and 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:

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

8   List of abbreviations

AD	Analog - Digital
BoB	Break-out Box
DA	Digital - Analog
ECU	Electronic Control Unit
I/O	Input/Output
LC	LABCAR
LC-EE	LABCAR-Experiment Environment
LC-IP	LABCAR-Integration Platform
n. c.	not connected
PC	Personal Computer
PCI	Peripheral Component Interconnect
PWM	Pulse Width Modulation
RTPC	Real-Time PC
RTIO	Real-Time IO

Tab. 8-1   List of abbreviation