ETAS

ES581.4
CAN Bus Interface USB Module
User's Guide

DRIVING | EMBEDDED EXCELLENCE

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ES581.4 - User's Guide R04 EN - 03.2015

Contents

1 General Information

The introductory chapter provides information about the basic safety notices, product return and recycling, use of this manual, system requirements for operating the module, scope of supply and additional information.

1.1 Basic Safety Instructions

1.1.1 Identification of Safety Notices

The safety notices contained in this manual are identified with the danger symbol shown below:

The safety notices shown below are used for this purpose. They provide notes to extremely important information. Please read this information carefully.

WARNING!

indicates a possible danger with moderate risk of death or (serious) injury, if not avoided.

CAUTION!

identifies a hazard with low risk that could result in minor or medium physical injuries or property damages if not avoided.

1.1.2 General Safety Information

Please observe the Product Safety Notices ("ETAS Safety Notice") and the following safety notices to avoid health issues or damage to the device.

Note

Carefully read the documentation that belongs to the product prior to the startup.

ETAS GmbH does not assume any liability for damages resulting from improper handling, unintended use or non-observance of the safety precautions.

1.1.3 Requirements for Users and Duties for Operators

The product may be assembled, operated and maintained only if you have the necessary qualification and experience for this product. Improper use or use by a user without sufficient qualification can lead to damages or injuries to one's health or damages to property.

General Safety at Work

The existing regulations for safety at work and accident prevention must be followed.

1.1.4 Intended Use

This product was developed and approved for automotive applications. For use in other application areas, please contact your ETAS contact partner.

Requirements for Operation

The following requirements are necessary for safe operation of the module:

- Observe the notes for the ambient conditions (see chapter 5.1.2 on page 31).
- Ensure compliance with the connection and settings values (see chapter 5.3 on page 35).
- The USB/CAN ports shall not be connected to any hazardous voltage/ energy sources.

Opening the Module

CAUTION!

Damage or destruction of module is possible!
Do not open or change the module housing!
Work on the module housing may only be performed by qualified personnel.

Requirements for the technical State of the Product

The product is designed in accordance with state-of-the-art technology and recognized safety rules. The product may be operated only in a technically flawless condition and according to the intended purpose and with regard to safety and dangers as stated in the respective product documentation. If the product is not used according to its intended purpose, the protection of the product may be impaired.

Maintenance

The product is maintenance-free. Servicing will be done at ETAS only. After the servicing is complete, if the same module has to be delivered, then the module will be verified again for safety conformity.

Cleaning

For cleaning, use a clean and dry cloth.

1.2 RoHS Conformity

1.2.1 European Union

The EU Directive 2002/95/EU limits the use of certain dangerus materials for electrical and electronic devices (RoHS conformity).

ETAS confirms that the product corresponds to this directive which is applicable in the European Union.

1.2.2 China

ETAS confirms that the product meets the product-specific applicable guidelines of the China RoHS (Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation) applicable in China with the China RoHS marking affixed to the product or its packaging.

1.3 CE Labeling

ETAS confirms that the product meets the product-specific, applicable European guideline with a CE label on the product or its packaging. CE conformity declaration for the product is available upon request.

1.4 Taking the Product Back and Recycling

The European Union has passed a directive called Waste Electrical and Electronic Equipment, or WEEE for short, to ensure that systems are setup throughout the EU for the collection, treating and recycling of electronic waste.

This ensures that the devices are recycled in a resource-saving way representing no danger to health or the environment.

Fig. 1-1 WEEE-Symbol

The WEEE symbol (see Fig. 1-1 on page 9) on the product or its packaging shows that the product must not be disposed of as residual garbage.

The user is obliged to collect the old devices separately and return them to the WEEE take-back system for recycling.

The WEEE directive concerns all ETAS devices but not external cables or batteries.

For more information on the ETAS GmbH Recycling Program, contact the ETAS sales and service locations (see chapter 8 on page 43).

1.5 Identifications on the Product

The following symbols are used for identifying the product:

Symbol	Description
	The User's Guide must be read prior to the startup of the product!
1: NC	Terminal assignment (see chapter "Pin Assignment" on page 36)
2: CAN 1 Low	
3: GND	
4: CAN 2 Low	
5: NC	
6: GND	
7: CAN 1 High	
8: CAN 2 High	
9: NC	
SN: 1234567	Serial number (seven-digit)
F 00K 107 771	Ordering number of the product, see chapter 7.1 on page 41
5 V ⎓	Operating voltage (DC voltage)
0.1 A	Current consumption
CE	Marking for CE conformity, see chapter 1.3 on page 9
	Marking for RoHS, see chapter 1.2.1 on page 9

Please observe the information in the chapter "Technical Data" on page 31.

1.6 About This Manual

This manual describes the startup and technical data of the ES581.4 CAN Bus Interface USB Module.

1.6.1 Structure

This manual consists of eight chapters and one index.

- **Chapter 1: “General Information”**

  This introductory chapter provides you with information on basic safety instructions, returning the product and recycling, and how to use this manual.

- **Chapter 2: “Hardware Description”**

  The “Hardware Description” chapter describes the features, functions, areas of application, interfaces and indicators, and the block diagram of the ES581.4 CAN Bus Interface USB Module.

- **Chapter 3: “Getting Started”**

  The “Getting Started” chapter describes general preparatory steps for installation and how to install the ES581.4 drivers on Windows. This chapter describes also the USB and the CAN connection of the ES581.4.

- **Chapter 4: “Troubleshooting”**

  The “Troubleshooting” chapter contains suggestions on how to rectify any faults the ES581.4 may have.

- **Chapter 5: “Technical Data”**

  The “Technical Data” chapter contains a summary of the pin assignments and all technical data of the ES581.4 CAN Bus Interface USB Module.

- **Chapter 6: “Cables and Accessories”**

  The “Cables and Accessories” chapter contains an overview of the available cables and accessories.

- **Chapter 7: “Ordering Information”**

  The “Ordering Information” chapter contains the ordering information on the available cables and accessories.

- **Chapter 8: “ETAS Contact Addresses”**

  The final chapter, “ETAS Contact Addresses”, gives you information on ETAS’ international sales and service locations.

1.6.2 Using this Manual

Representation of Information

All activities to be executed by the user are presented in what is referred to as a “Use-Case” format i.e., the aim is defined in brief as a title and the relevant steps necessary to achieve this aim are then listed. The information is displayed as follows:

Target definition:

Any introductory information...

- Step 1

  Possibly an explanation of step 1...
- Step 2

  Possibly an explanation of step 2...
- Step 3

  Possibly an explanation of step 3...

Any concluding remarks...

Typographic Conventions

The following typographic conventions are used:

Click **OK**.	Buttons are shown in boldface.
Press <ENTER>.	Keyboard commands are shown in angled brackets in block capitals.
The "Open File" dialog box appears.	Names of program windows, dialog boxes, fields etc. are shown in quotation marks.
Bold	Device labels
Italics	Crucial text

Important notes for the user are shown as follows:

Note

Important note for the user.

1.7 Package Contents

Before using your ES581.4 for the first time, check that the module has been delivered with all required parts (see section 7.1 on page 41).

Additional cables and adapters can be ordered separately from ETAS. A list of available accessories and ordering information can be found in the section "Accessories" on page 41 of this manual or in the ETAS product catalog.

1.8 Additional Information

Take a look at the relevant software documentation for details on how to configure the ES581.4 under INCA.

2 Hardware Description

The "Hardware Description" chapter describes the features, functions, areas of application, interfaces and indicators, and the block diagram of the ES581.4 CAN Bus Interface USB Module.

2.1 Overview

The ES581.4 is a dual-channel, compact and cost-effective solution for connecting the PC to a vehicle CAN (Controller Area Network) bus or the CAN port of an individual electronic control unit (ECU). It is a easy-to-handle solution for CAN access for PC measurement, calibration and diagnostics.

Used in conjunction with ETAS' INCA and ODX-LINK applications, the ES581.4 provides a single solution, eliminating the need to deploy several different tools for ECU calibration and diagnostics applications.

Fig. 2-1 ES581.4

The ES581.4 connects with a PC over USB and establishes a direct CAN connection. The included Y cable (see chapter 6.1 on page 37) enables the access of both CAN interfaces to the CAN bus.

There is only minimum installation and configuration effort and no external power supply is needed.

2.2 Features

The ES581.4 is part of the family of compact ETAS bus interface modules and is involved in the process of continuous firmware and software upgrades.

2.2.1 General Features

General features of the ES581.4 are:

- Process an average 96% bus load on both channels up to 500 kBaud
- No external supply voltage necessary
- Part of the ETAS tool suite – supported by INCA

- Runs under Windows XP, Windows Vista and Windows 7 (Plug & Play installation)
- Provides two CAN channels
- Supports Measurement and Calibration and Flash programming on different CAN ports
- Multi-client access to the same CAN channel (max. four clients can access the device; two clients per channel)
- Comes with a more robust housing

2.2.2 CAN Features

Important CAN functions of the ES581.4 are:

- ES581.4 CAN concept for different CAN buses
  - CAN transceiver integrated into the ES581.4
  - Galvanically isolated connection to the CAN network
- DSUB connector in accordance with "CAN in Automation" (CiA)
- Protocols (supported by INCA)
  - CCP,
  - XCP,
  - KWP-on-CAN (ISO14230/ISO15765),
  - UDS (ISO14229/ISO15765),
  - CAN Monitoring, OBD-on-CAN and CAN output
- Protocols (supported by ODX-LINK)
  - OBD-on-CAN (ISO15765-4)
- SAE J2534-1 Pass Thru Interface
  - CAN
  - ISO15765
- Monitoring without CAN bus influence
- Time synchronization
- Exact time stamp
  - 500 ns timing resolution for one channel usage
  - 13 µs timing resolution for two channel usage

For more technical data on the ES581.4 consult chapter 5 on page 31.

2.3 Applications

The ES581.4 can be used for the following tasks:

- Connection of external devices to INCA PC using the CAN interface
- ECU calibration with CAN bus interface
- ECU diagnostics with CAN bus interface and J2534 Pass Thru Interface
- Flash programming of ECUs
- Recording and acquisition of communication data with application software

For example, the ES581.4 can be connected to a vehicle CAN via the diagnostics service port. So it's fully capable for powertrain as well as body electronics, driver assistance, and chassis ECU calibration projects.

For vehicle validation, either before or after start-of production, ODX-LINK, the INCA add-on for ECU diagnostics, can use the ES581.4 to access OBD-on-CAN functionality as well as to read and clear Diagnostic Trouble Codes (DTCs), effectively eliminating the need for the use of a separate diagnostic service tool.

ES581.4 also provides a J2534 Pass Thru Interface for vehicle diagnostics and reprogramming with third party applications.

2.4 Interfaces

The front of the ES581.4 Module features a DSUB connector to integrate CAN interfaces. The back of the module features a cable to connected at the USB port of a PC.

2.5 Serial Number

The serial number is on the bottom side of the ES581.4.

2.6 Block Diagram

The block diagram of the ES581.4 CAN Bus Interface USB Module is shown in Fig. 2-2.

The ES581.4 is a compact USB module which fits into a standard USB2.0 or USB1.1 slot. The two independent CAN interfaces of the ES581.4 establish an easy and direct connection between the PC and the CAN network. Data is exchanged with the PC via the USB interface.

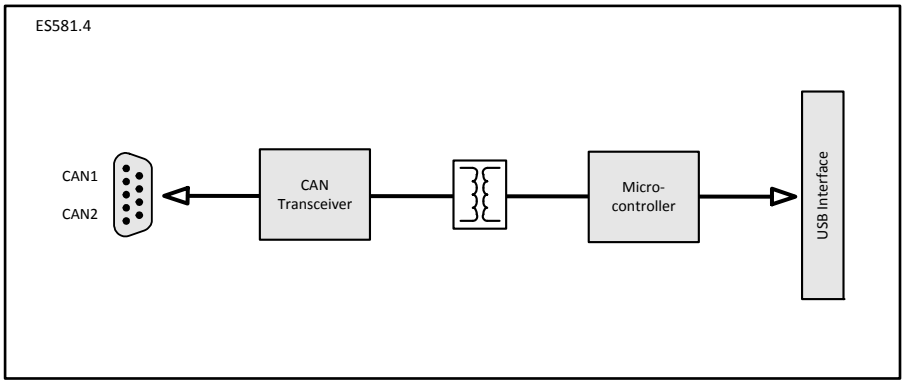


Fig. 2-2 ES581.4 Block Diagram

CAN signals are transferred to a microcontroller by the CAN transceiver inside the ES581.4. Upon receipt of a CAN message, the CAN microcontroller time-stamps and sends the message to the PC across USB. The reverse steps are taken when the PC application is sending messages to the CAN bus. The microcontroller is capable of accommodating on an average of 96% bus load up to 500 kBaud rate. The ES581.4 electrically isolates the CAN connection from the PC to protect the connected devices from damages that may occur due to potential differences and to avoid any communication drop outs.

Compared to low-cost diagnostic J2534 devices, the ES581.4 is superior in terms of supported baud rates. Two J2534 applications can access both the channels of the same device. J2534 devices are limited by their specifications to 500 kBaud and a driver which is optimized for measurement and calibration purposes.

2.7 LEDs

The ES581.4 is equipped with two LEDs to display the operating state of the module and with one LED to display the function of both CAN interfaces CAN1 and CAN2:

- LED "**ON**": operating state of the module
- LED "**ER**": error or firmware update states of the module
- LED "**CAN**": communication states of the CAN interfaces

2.7.1 Flashing Codes

The following flashing codes are used for the LEDs:

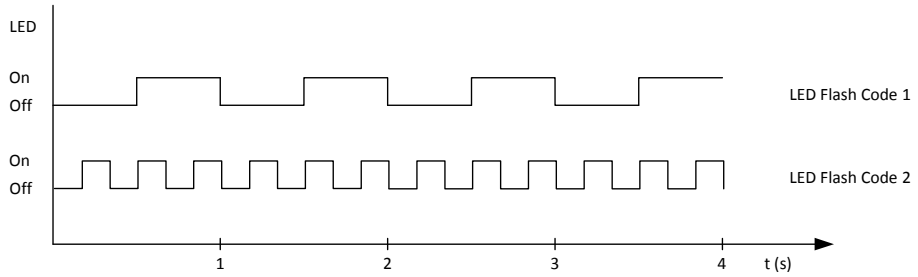


Fig. 2-3 LED flashing codes

2.7.2 Operating States of the Module (LED "ON")

The LED **ON** is used to indicate the following operating states:

Meaning	LED ON	State	Description
Power	Off	Off	Module is not powered
	Green	Normal operating mode	Active, operational

2.7.3 Error and Firmware update States of the Module (LED "ER")

The LED **ER** is used to indicate the following error and firmware update states:

Meaning	LED ER	State	Description
ER	Off	No error	Error-free function
	Flashing red (code 1)	Functional error	CAN error in application or error in firmware upgrading on boot loader
	Flashing red (code 2)	Software update is active	Firmware update is being performed. Do not disconnect the module from the PC!
	On	Booting	Module is currently booting or booting was unsuccessfully

2.7.4 Communication States of CAN Interfaces (LED "CAN")

The LED **CAN** is used to indicate the following CAN communication states:

Meaning	LED CAN	State	Description
CAN communication	Off	Off	No communication on CAN interfaces
	Flashing yellow	Normal operating mode	Communication either on CAN1 or CAN2 or on both

2.8 Firmware Update

The firmware of the ES581.4 can be updated by the user so that future versions of the module can also be used. The firmware update is done with the help of the service software "Hardware Service Pack" (HSP) from the connected PC.

Note

During a firmware update, the USB connection to the PC must not be disconnected!
While HSP is using the device, other clients cannot have access to the same device.

3 Getting Started

The "Getting Started" chapter describes the preparation of the installation, the installation, the uninstallation as well as checking the installation of the USB drivers and the J2534 drivers for the ES581.4. This chapter describes also the USB and the CAN connection of the ES581.4.

3.1 Preparation

3.1.1 USB and J2534 Drivers

Note

A specific USB driver and an J2534 driver must be installed on the PC for operating the ES581.4 module.

3.1.2 Checking System Requirements

Verify that your PC meets the system requirements (see chapter 5.2 on page 33). To install the USB driver on the PC, you require the user rights of an administrator. If necessary, contact your system administrator.

3.1.3 CD-ROM

The supplied CD-ROM includes:

- USB driver for the ES581.4 with installation wizard
- J2534 driver for the ES581.4 with installation wizard
- Hardware Service Pack (HSP) for updating the firmware
- Documentation: ES581.4 User's Guide (this document)

The application for installing the USB driver is in the root directory of the CD-ROM as executable **`autostart.exe`** file.

Or you can install the driver via the supplement contained in the HSP (HSP V10.4.0 and higher).

3.1.4 Installing Sequence

CAUTION!

Before connecting the ES581.4 to the USB port of your computer, the driver install application must be run first.

Installing the ES581.4 you have to work in this sequence:

1. USB driver installation (ES581.4 not connected on PC),
2. J2534 driver installation (For the first time installation it is not necessary that the ES581.4 module should be unplugged from the PC. Once when the module was detected by the PC, installation/un-installation cannot proceed unless the device was disconnected.),
3. USB connection,
4. CAN connection.

3.1.5 Upgrading Sequence

Upgrading the ES581.4 you have to work in this sequence:

1. Ensure that the ES581.4 is be disconnected from the PC,
2. Ensure that client software applications are closed,
3. Uninstall the previous installation before running the installer.

3.1.6 Plug & Play

The ES581.4 can be installed on Plug & Play compatible operating systems (Windows XP, Windows Vista and Windows 7). After installing the drivers you can insert/ remove your ES581.4 whenever you like.

3.2 ES581.4 USB Drivers

3.2.1 Installing the ES581.4 USB Drivers

There is no difference in procedure between ES581.4 installation from a CD-ROM and from a network drive.

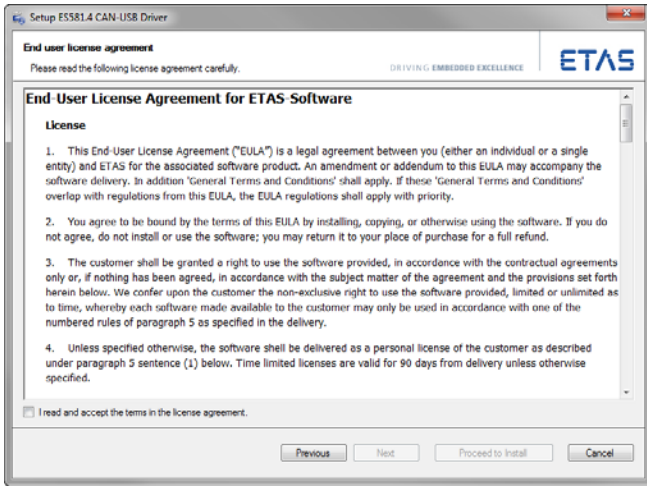
Installing the ES581.4 USB driver:

- From the Main window, select **Drivers**.

  The **Drivers** window opens.
- Select **Install ES581.4 - USB Drivers**.

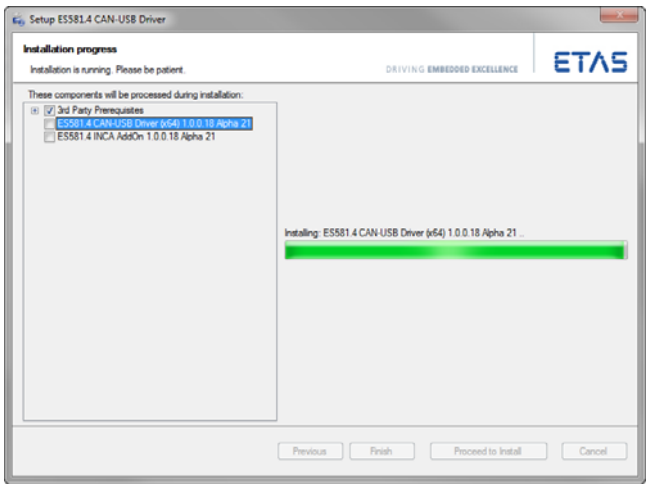
  The ETAS program for installing the ES581.4 USB drivers is started.

- Select your preferred setup language (English or German).
- Click **Next** and follow the ETAS ES581.4 USB Driver Installer instructions.

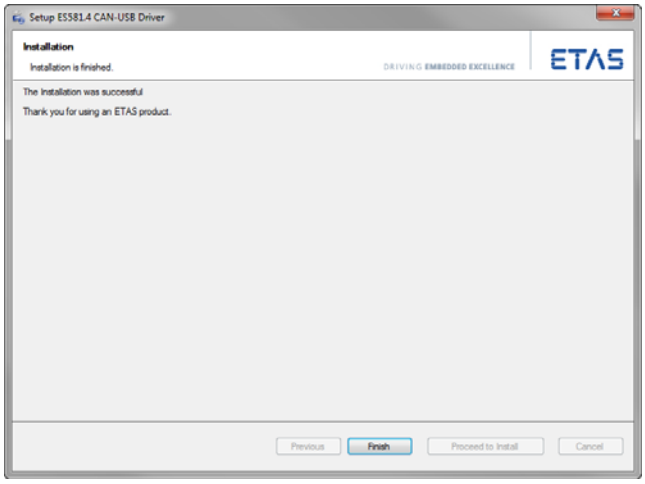


- Read and accept the End User License Agreement for ETAS Software.
- Click **Next**.

  The installation of the USB driver starts.



- Wait until the USB driver is installed.



- Click **Finish**.

  The installation of the ES581.4 USB driver is finished.

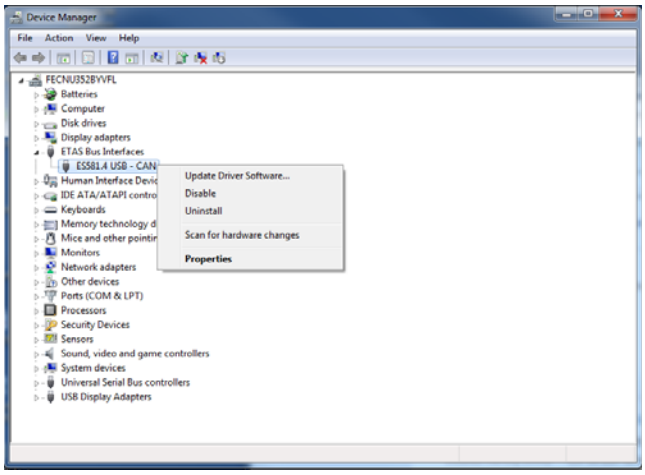
3.2.2 Uninstalling the ES581.4 USB Drivers

The USB driver for the ES581.4 can be uninstalled in the Device Manager of Windows.

Uninstalling the ES581.4 USB driver:

- Select **Start** → **Control Panel** → **Device Manager** to start the Windows Device Manager.

  The **Device Manager** window opens.
- Under **ETAS Bus Interfaces**, select the entry **ES581.4 USB - CAN**



- Right-click and select **Uninstall**.

- Select **Delete the driver software for this device** and click on **OK**.

  The system uninstalls the USB drivers for ES581.4.

3.3 ES581.4 J2534 Drivers

3.3.1 Installing the ES581.4 J2534 Drivers

There is no difference in procedure between ES581.4 installation from a CD-ROM and from a network drive.

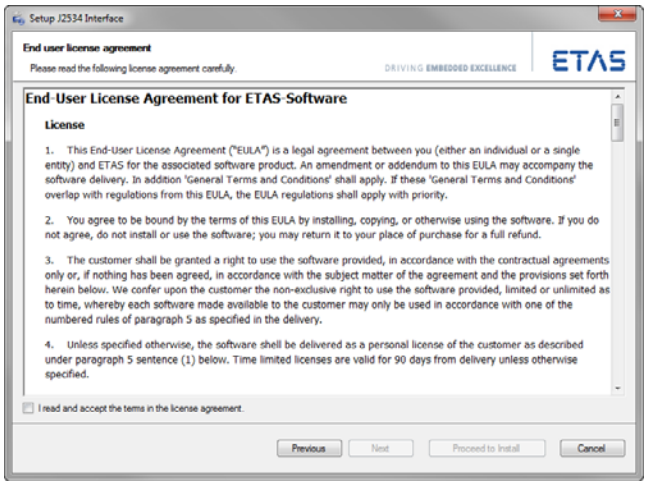
Installing the ES581.4 J2534 driver:

- From the Main window, select **Drivers**.

  The **Drivers** window opens.
- Select **Install ES581.4 - J2534 Drivers.**

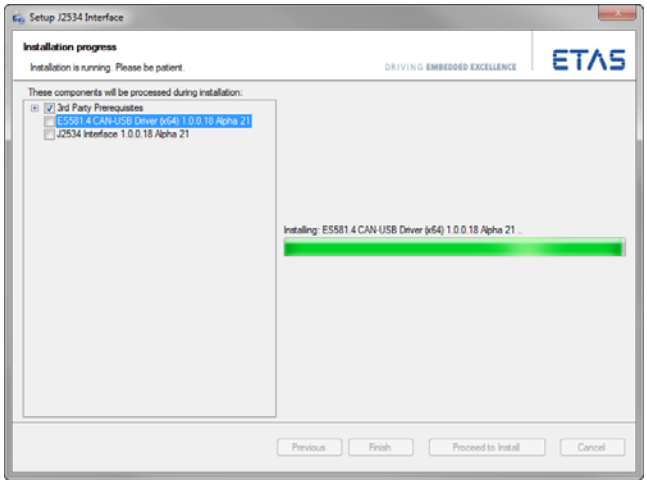
  The ETAS program for installing the ES581.4 J2534 drivers is started.

- Select your preferred setup language (English or German).
- Click **Next** and follow the ETAS ES581.4 J2534 Driver Installer instructions.

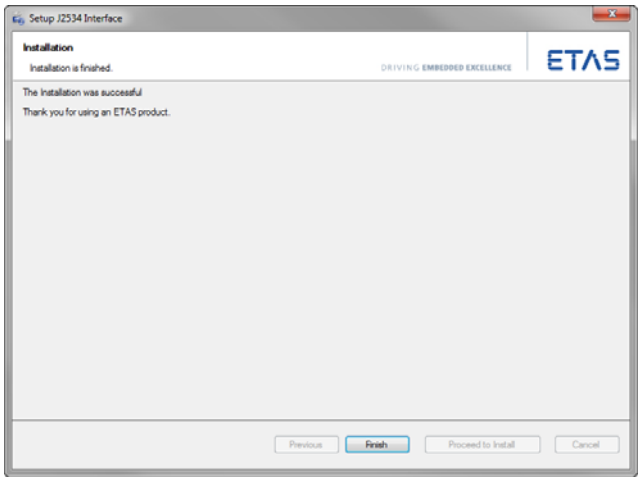


- Read and accept the End User License Agreement for ETAS Software.
- Click **Next**.

  The installation of the J2534 driver starts.



- Wait until the J2534 driver is installed.



- Click **Finish**.

  The installation of the ES581.4 J2534 driver is finished.

3.3.2 Uninstalling the ES581.4 J2534 Drivers

There is no difference in procedure between ES581.4 installation from a CD-ROM and from a network drive.

To start the ES581.4 J2534 drivers uninstallation:

- Select **Start →Control Panel**.
  The **Control Panel** window opens.
- Select the **Programs and Features** entry.
  The **Programs and Features** window opens.
- Select the **ES581.4 J2534 Driver** entry.
- Click the **Uninstall/Change** tab.
  The system uninstalls the ES581.4 J2534 drivers.

3.4 Verifying the Installation of the USB Driver

In the Windows Device Manager, you can check which hardware drivers are installed and which status they have.

Verifying the USB driver installation:

- Select **Start** → **Control Panel** → **Deice Manager** to start the Device Manager of Windows.

  The **Device Manager** window opens.
- Select **ETAS Bus Interfaces**.
- Verify that the ES581.4 module features the new entry **ES581.4 USB - CAN**.

  The figure below identifies the entry with a red arrow.

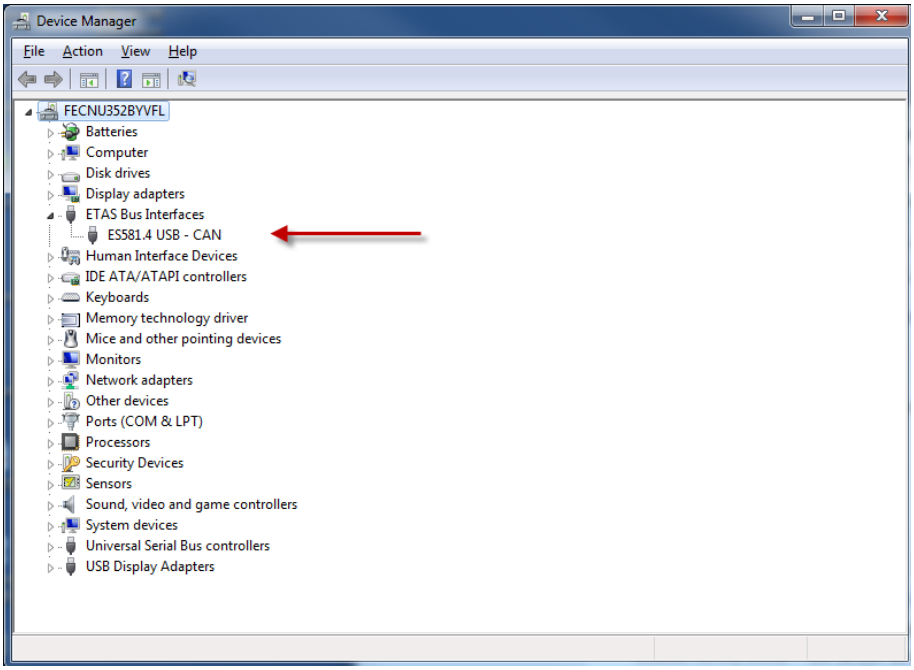


Fig. 3-1 Windows Device Manager

If the ES581.4 drivers are not properly installed/ uinstalled and Windows detects the device as plugged in, an exclamatory icon will appear next to the device. Run the Driver Install application again to try and fix this problem.

3.5 USB Connection

After the drivers have been installed, the ES581.4 can be plugged into the PC. Windows should recognize the device and install the proper drivers for the unit. Windows informational balloons should appear in the Start bar. Fig. 3-2 on page 28 shows the balloons that appear.

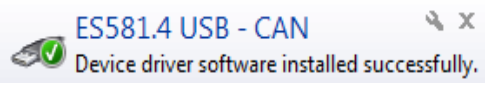


Fig. 3-2 Windows informational ballon

3.6 CAN Connection

The next thing to setup is the connection on the CAN side of the unit.

The ES581.4 connects to the CAN network with standard pinout of the DSUB connector. The pin assignment for the 9 pin DSUB connector can be found on the label of the unit and in chapter 5.4 on page 36.

3.6.1 Minimum CAN Connections

The minimum connections needed for connecting to a CAN network are:

- Pin 2 CAN Low
- Pin 7 CAN High
- Pin 6 or Pin 3 GND (either pin will work)

The ground (GND) connection needs to be the same ground as the other CAN nodes on the bus.

3.6.2 CAN Network Termination

The next thing to connect, if needed, is termination to the CAN network. Normally a 120 ohm resistor is added to each end of the network. Fig. 3-3 on page 28 shows a simple diagram. Some CAN networks are already terminated, for example in a vehicle, and extra termination is not needed.

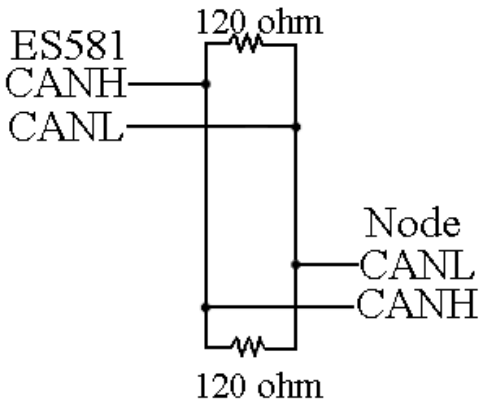


Fig. 3-3 CAN Network

4 Troubleshooting Problems

This chapter gives some information of what you can do when problems arise with the ES581.4 and when general problems arise that are not specific to an individual software or hardware product.

4.1 Displays of the LEDs

For assessing the operating states and for removing errors of the ES581.4, observe the display of the LEDs which provide information about the function of the interfaces and the ES581.4 (see chapter 2.7 on page 16).

4.2 Problems with the ES581.4

The following table lists some of the possible problems together with a possible solution. In case of further questions, please contact our technical service (see chapter 8 on page 43).

Problem	Diagnostics questions	Possible solutions
The computer does not install the drivers when the module is connected for the first time.	Has the USB driver already been installed?	Check whether the module is listed in the Windows Device Manager. It may already be installed, or it was installed by the operating system. Additional information concerning the Device Manager settings is located in chapter 3.4 on page 27.
	Is the USB port of the PC defective?	Try using a different USB port of the computer.
		Restart the PC.
The USB driver is not being installed.		Ensure that you are logged in with the required authorizations for installing the driver (administrator rights).

Problem	Diagnostics questions	Possible solutions
The ES581.4 module is not found using "Search for hardware".	Did you install INCA with the required version?	Check whether the INCA version installed on your PC meets the requirements in chapter 5.2.2 on page 34.
	Did you install INCA ES5xx Add-On with the required version?	Check whether the INCA ES5xx Add-On version installed on your PC meets the requirements in chapter 5.2.2 on page 34.
	Did you install the required firmware on the module?	Check with HSP whether the required firmware is installed on the module.
	Is the hardware connected to the PC?	Check whether the cabling is intact.
The measurements are not being started.	Does the INCA monitor log ask you to perform an update?	Update the firmware of the module with HSP.
	Does the module provide no data?	Check whether your measurement setup meets the requirements.
		Check whether the cabling of the hardware to the PC is correct and intact.
		Check the LED "**ER**" for blinking: the baud rate could be unsupported by the module. For supported baud rates refer to chapter 5.3.2 on page 35.

Note

In case the ES581.4 module is malfunctioning, disconnect the USB and CAN connectors and contact the ETAS support (refer to 8 on page 43).

5 Technical Data

The "Technical Data" chapter contains a summary of the pin assignments and all technical data of the ES581.4 CAN Bus Interface USB Module.

5.1 General Technical Data

5.1.1 Fulfilled Standards and Norms

The module meets the following standards:

Standard	Test
EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements
EN 61000-6-2	Immunity (for industrial environments)
EN 61000-6-3	Interference emissions (living area, business and commercial areas as well as small enterprises)
EN 60529	Degree of protection through housing (IP code)
EN 60068-2-32	Environmental testing - Part 2: Tests; Tested: free falling

5.1.2 Environmental Conditions

Operating temperature range	-40 °C to +70 °C
	-40 °F to +158 °F
Storage temperature range	-40 °C to +85 °C
	-40 °F to +185 °F
Relative humidity	15% to 95%, non-condensing
Operating altitude	max. 5,000 m / 16,400 ft
Degree of protection	IP42

5.1.3 Maintenance of the Product

Do not open or change the module housing! Work on the module may only be performed by qualified personnel. Return defective modules to ETAS for repair.

5.1.4 Cleaning the Product

We recommend cleaning the product with a dry cloth.

5.1.5 Mechanical Data

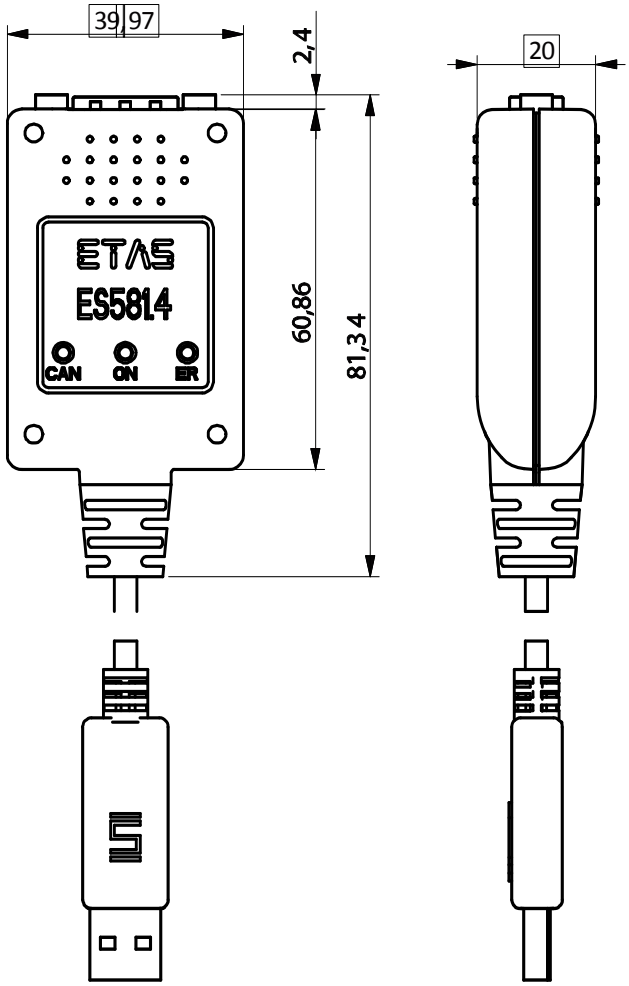


Fig. 5-1 Dimensions

Dimensions Housing (H x W x D)	20 mm x 40 mm x 64 mm
	0.8 in x 1.6 in x 2.52 in
Integrated USB cable length	1 m / 3.3 ft
Weight	Approx. 75 g / 2.646 oz.
Housing	Nylon, rubber overlay
Connection PC-side	USB plug type A
Connection bus-side	9-pin DSUB plug (DIN 41652)

5.2 System Requirements

5.2.1 Hardware

PC with USB Port

PC	IBM-compatible PC
USB port	USB 2.0 Full Speed (480 Mbit/s)
	USB 2.0 High Power (500 mA)
	USB socket type A
Operating system	Windows XP, SP2 (32 bit) or higher
	Windows Vista (32 bit)
	Windows 7 (32 bit, 64 bit)
Driver	ES581.4 USB driver
Configuration	Plug & Play

The ES581.4 module may be operated only directly on the PC or on an active hub whose USB port meets the requirements listed in the table.

Prerequisite for successful initialization of the Module

Note

A specific USB driver and a J2534 driver must be installed on the PC for operating the ES581.4 module (see chapter 3.2 on page 20 and chapter 3.3 on page 24).

Windows User Rights

Ensure that you have the required Windows user rights for installing the USB driver and J2534 driver (administrator rights).

Additional Requirements

The PC must also meet the minimum requirements of the application program used (e.g. INCA). For the minimum requirements for INCA, please see the corresponding software documentation.

General Notes

The INCA application software supports up to four ES581.4 modules at the same time.

Power Managers

Almost all notebook computers and many desktop PCs have power managers. Power managers disable the CPU for a certain amount of time. This impairs time management accuracy in your application.

Note

If you have stringent requirements for your application time management (time-driven transmission of messages, time-driven evaluations), you must deactivate these power managers.

Options for power management may be included in:

- the BIOS setup
- the Windows Control Panel (e.g. Power object).

Note

This document does not look at the deactivation of power managers in any further detail.

5.2.2 Software

Supported Applications and Software Prerequisites

To operate the ES581.4 and for data acquisition purposes software in the following versions or higher is required:

Application / Protocol	Classification	INCA	INCA	Add-On ODX-LINK
CAN Monitoring	MC [1)]	V7.0.0 HF25	V7.1.5	-
CAN Output	MC [1)]	V7.0.0 HF25	V7.1.5	-
CCP	MC [1)]	V7.0.0 HF25	V7.1.5	-
KWP on CAN	MC [1)]	V7.0.0 HF25	V7.1.5	-
UDS	MC [1)]	V7.0.0 HF25	V7.1.5	-
XCP on CAN	MC [1)]	V7.0.0 HF25	V7.1.5	-
OBD-on-CAN	MC, DS [2)]	V7.0.0 HF25	V7.1.5	V1.4.2 [4)], V1.5.5 [5)]
CAN	MC, PTI [3)]	V7.0.0 HF25	V7.1.5	-
ISO15765	MC, PTI [3)]	V7.0.0 HF25	V7.1.5	-

[1)]: MC: Measurement and Calibration
[2)]: MC, DS: ECU Diagnosis
[3)]: MC, PTI: SAE J2534-1 Pass Thru Interface
[4)]: INCA V7.0.0 HF25 and higher and additional INCA Add-On ODX-LINK V1.4.2 and higher
[5)]: INCA V7.1.5 and higher and additional INCA Add-On ODX-LINK V1.5.5 and higher

General

- HSP V10.4.0
- ES581.4 USB driver
- J2534 driver

Supported Software Interfaces

ETAS Basic Open API (BOA) is supported.

Customers using their own application software can integrate the ES581.4 module into their software via the BOA interface.

Note

Operating the ES581.4 with older software versions is not possible.

5.3 Electrical Data

5.3.1 Power Supply

Operating voltage	4.75 V to 5.25 V DC
	Supply via the USB port (see chapter 5.2.1 on page 33)
Current consumption, typ. (operation)	100 mA at 5.0 V DC

5.3.2 CAN Interface (CAN1 and CAN2)

CAN port	2 channels, software-configurable, with DSUB 9 connector (according to CiA standard)
CAN transceiver	High-speed transceiver (TI-ISO1050DUB) Standard (V2.0a) or Extended Format (V2.0b), ISO High-speed mode
Microcontroller	60 MHz operation; 100 DMIPS Performance
Baud rate (max.)	1 MBaud
Baud rate (supported)	50 kBaud, 83.3 kBaud, 100 kBaud, 125 kBaud, 250 kBaud, 500 kBaud, 666.666 kBaud, 800 kBaud, 1 MBaud
Electrical isolation	Interface is galvanically isolated

5.4 Pin Assignment

Note

All connections are represented with view onto the interfaces of the module.

The CAN bus is connected to the ES581.4 CAN Bus Interface USB Module by the 9-pin DSUB connector (see Fig. 5-2).

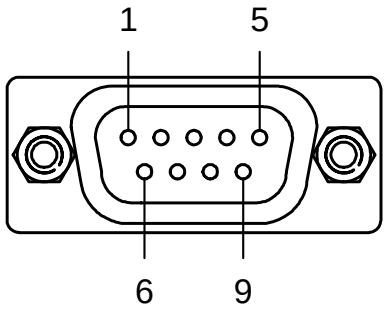


Fig. 5-2 ES581.4 DSUB Connector

Pin	Signal	Meaning
1	Trigger Pin	Not connected
2	CAN 1 Low	CAN 1 Low
3	GND	Ground
4	CAN 2 Low	CAN 2 Low
5	GND (Shield)	Ground (Shield)
6	GND	Ground
7	CAN 1 High	CAN 1 High
8	CAN 2 High	CAN 2 High
9	Not connected	Not connected

A 9-pin DSUB plug is connected to the "CAN1/ CAN2" socket.

6 Cables and Accessories

The "Cables and Accessories" chapter contains an overview of the available cables and accessories.

6.1 Cable CBCF100

Fig. 6-1 CBCF100 Cable

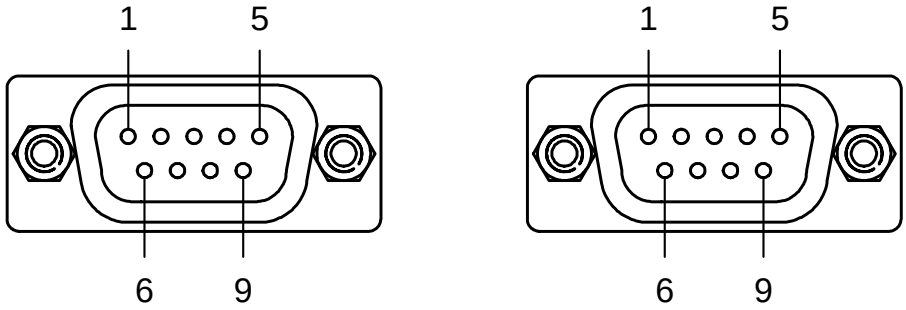


Fig. 6-2 CBCF100 Cable: DSUB Connector "1" and "2"

DSUB Connector „1“		DSUB Connector „2“	
Pin	**Signal (CAN 1)**	**Pin**	**Signal (CAN 2)**
1	Not connected	1	Not connected
2	CAN 1 Low	2	CAN 2 Low
3	Ground	3	Ground
4	Not connected	4	Not connected
5	Ground (Shield)	5	Ground (Shield)
6	Ground	6	Ground
7	CAN 1 High	7	CAN 2 High
8	Not connected	8	Not connected
9	Not used	9	Not used

Order Name	Short Name	Order Number
CAN and FlexRay Interface Y-Cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3	CBCF100.1-0m3	F-00K-107-939

6.2 Cable CBAC180

Adapter cable to connect OBDII J1962 to ES581.4.

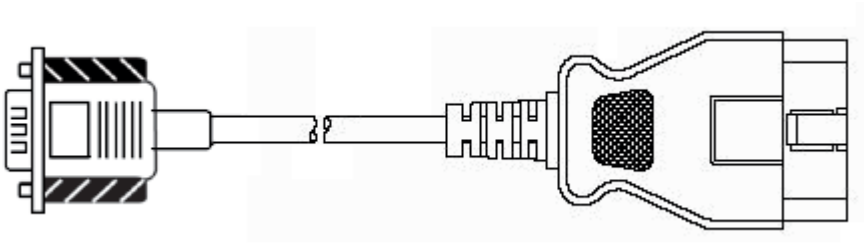


Fig. 6-3 CBAC180-2 Cable

Signal	9 Pin DSub	OBD2	Note
CAN1 High	7	6	CAN1 High and CAN1 Low are in a shielded Twist Pair
CAN1 Low	2	14	CAN1 High and CAN1 Low are in a shielded Twist Pair
CAN2 High	8	3	CAN2 High and CAN2 Low are in a shielded Twist Pair
CAN2 Low	4	11	CAN2 High and CAN2 Low are in a shielded Twist Pair
Power V+	9	16	
GND	3	5	

Order Name	Short Name	Order Number
CAN Interface Cable, OBDII J1962 - DSUB (16mc-9fc), 2m	CBAC180.0-2	F-00K-107-300

6.3 Adapter CBCX131.1-0

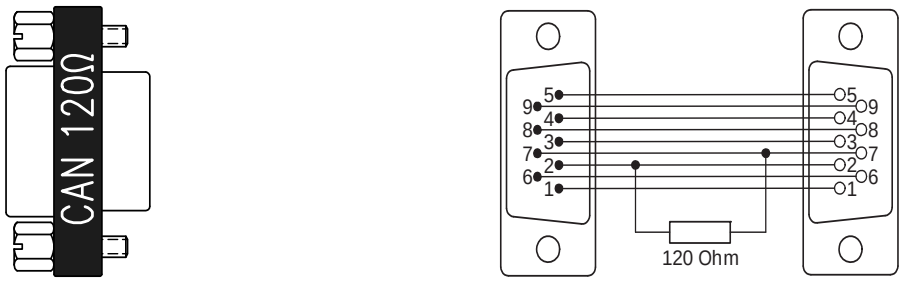


Fig. 6-4 CBCX131.1-0 Termination Resistor

Order Name	Short Name	Order Number
CAN 120 Ohm Termination Resistor, 2xDSUB (9fc+9mc)	CBCX131-0	F-00K-103-786

7 Ordering Information

7.1 ES581.4 CAN Bus Interface USB Module

Order name	Short name	Order number
ES581.4 CAN Bus Interface USB Module	ES581.4	F 00K 107 770
Package Contents		
ES581.4 CAN Bus Interface USB Module, cable CBCF100.1, CD-ROM ES581.4_CD (CD-ROM with drivers and manuals for ES581.4), ETAS Safety Advice, China-RoHS-leaflet_Compact_green_cn, ETAS Customer Information		

7.2 Accessories

Order Name	Short Name	Order Number
CAN and FlexRay Interface Y-Cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3	CBCF100.1-0m3	F-00K-107-939
CAN Interface Cable, OBDII J1962 - DSUB (16mc-9fc), 2m	CBAC180.0-2	F-00K-107-300
CAN 120 Ohm Termination Resistor, 2xDSUB (9fc+9mc)	CBCX131-0	F-00K-103-786

8 ETAS Contact Addresses

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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

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