ES582.1
CAN FD Bus Interface USB Module
User’s Guide
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ES582.1 - User’s Guide R02 EN - 02.2017
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1 About this Manual

This chapter contains information about the following topics:

- “Identification of Safety Notices” on page 5
- “Presentation of Information” on page 6
- “Scope of Supply” on page 6
- “Additional Information” on page 6

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.

**DANGER!**
indicates an immediate danger with a high risk of death or serious injury, if not avoided.

**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.
1.2 Presentation of Information

All activities to be performed by the user are presented in a “Use Case” format. That is, the goal to be accomplished is briefly defined in the heading, and the respective steps required for reaching this goal are then presented in a list. The presentation looks as follows:

**Goal definition:**

any advance information...

- Step 1
  Any explanation for step 1...
- Step 2
  Any explanation for step 2...
- Step 3
  Any explanation for step 3...

Any concluding comments...

**Typographical conventions**

The following typographical conventions are used:

- **Bold**
  Labels of the device
- **Italic**
  Particularly important text passages

Important notes for the user are presented as follows:

**Note**

*Important note for the user.*

1.3 Scope of Supply

Prior to the initial commissioning of the module, please check whether the module was delivered with all required components and cables (see chapter 8.1 on page 41).

Additional cables and adapters can be obtained separately from ETAS. A list of available accessories and their order designation is located in chapter 8.2 on page 41 of this manual or in the ETAS product catalog.

1.4 Additional Information

The configuration instructions for the module under INCA can be found in the corresponding software documentation.
2 Basic safety notices

This chapter contains information about the following topics:

- „General safety information“ on page 7
- „Requirements for users and duties for operators“ on page 7
- „Intended use“ on page 7

2.1 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.

Hinweis

Carefully read the documentation (Product Safety Advice and this User’s Guide) that is part of this product before the commissioning.

ETAS GmbH does not assume any liability for damages due to improper use and non-compliance with the safety precautions.

2.2 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.

The safety of systems using the product is the responsibility of the system integrator.

General safety at work

The existing regulations for safety at work and accident prevention must be followed. All applicable regulations and statutes regarding operation must be strictly followed when using this product.

2.3 Intended use

Application area of the product

This product was developed and approved for applications in the automotive sector. The module is suitable for use in interiors, in the passenger cell or in the trunk of vehicles. The module is not suitable for installation in the engine compartment and similar environments. For use in other application areas, please contact your ETAS contact partner.

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.
Requirements for operation

- Use the product only according to the specifications in the corresponding User’s Guide. With any deviating operation, the product safety is no longer ensured.
- Observe the requirements on the ambient conditions.
- Do not use the product in a wet or damp environment.
- Do not use the product in potentially explosive atmospheres.

Electrical safety and power supply

- Observe the regulations applicable at the operating location concerning electrical safety as well as the laws and regulations concerning work safety!
- Connect only current circuits with safety extra-low voltage in accordance with EN 61140 (degree of protection III) to the connections of the module.
- Ensure that the connection and setting values are being followed (see the information in the chapter “Technical data”).
- Do not apply any voltages to the connections of the module that do not correspond to the specifications of the respective connection.

Power supply

- The power supply of the product is connected via the USB port of a PC or a drive recorder.
- An external power supply for the module is not required.
- The module must be operated directly on the USB port at a PC, a drive recorder or an active hub.
- The use of USB cables for extending the connection between module and PC or drive recorder is not allowed.
- Operating a module on USB 1.0 interfaces is not supported.

De-energizing the module

The module does not have an operating voltage switch. It can be de-energized as follows:

- Disconnect the cable from the signal inputs of the module and
  - Disconnect the USB connector of the PC or
  - Disconnect the USB connector of the drive recorder module or
  - Switch off the drive recorder module.
Approved cables

- Use exclusively ETAS cables at the connections of the module!
- Adhere to the maximum permissible cable lengths!
- Do not use any damaged cables! Cables may be repaired only by ETAS!
- Never apply force to insert a plug into a socket. Ensure that there is no contamination in and on the connection, that the plug fits the socket, and that you correctly aligned the plugs with the connection.

Requirements for the location

- Position the module or the module stack on a smooth, level and solid underground.

Requirements on the ventilation

- Keep the module away from heat sources and protect it against direct exposure to the sun.

Transport

- Do not transport the modules at the cable of the module or any other cables.

Maintenance

The product is maintenance-free.

Repair

If an ETAS hardware product should require a repair, return the product to ETAS.

Cleaning the module housing

- Use a dry or lightly moistened, soft, lint-free cloth for cleaning the module housing.
- Do not use any sprays, solvents or abrasive cleaners which could damage the housing.
- Ensure that no moisture enters the housing. Never spray cleaning agents directly onto the module.
Opening the module

**VORSICHT!**

*Damage to the module and loss of properties based on the degree of protection!*

Do not open or change the module housing!

Work on the module housing may only be performed by ETAS.

Potential equalization

**VORSICHT!**

*Potential equalization in the vehicle is possible via the shield of the connecting cables of the modules!*

Install the modules only at locations with the same electrical potential or isolate the modules from the installation location.
3 Hardware Description

This chapter contains information about the following topics:

- „Overview“ on page 11
- „Application areas“ on page 12
- „Properties“ on page 12
- „Interfaces“ on page 13
- „Power supply“ on page 14
- „Display of operating state“ on page 15
- „Update of the firmware“ on page 16

3.1 Overview

The ES582.1 CAN FD Bus Interface USB Module is part of the family of compact ETAS bus interface modules. It is equipped with two CAN/CAN FD interfaces for connection to the CAN bus of a vehicle or an ECU as well as with a USB port for the connection with a PC or a drive recorder.

Abb. 3-1 ES582.1

The ES582.1 modules supports CAN FD (CAN Flexible Data Rate) and is suitable for numerous applications in the classic CAN as well as in the CAN FD environment.

In conjunction with the application software INCA and ODX LINK from ETAS, the ES582.1 enables access to the CAN bus for measurement, calibration and diagnostics.

With the diagnostics service interface, the ES582.1 can be connected with the CAN bus of a vehicle.

When validating the vehicle diagnostics, the module can be used together with ODX LINK, the INCA add-on for ECU diagnostics, as interface for OBD-on-CAN as well as for reading and deleting diagnostics error codes (DTCs). A separate diagnostics service tool is not required in these cases.

The ES582.1 module offers an open SAE J2534-compliant pass-thru interface for the vehicle diagnostics and flash programming.
The module supports all protocols used by INCA, such as CCP, XCP, KWP-on-CAN and UDS. The protocols CCP and KWP-on-CAN (ISO14230/ISO15765) are supported only in the classic CAN mode.

The effort for installing and configuring the cost-efficient module is minimal, an external voltage supply is not needed.

3.2 Application areas

The ES582.1 can be used for the following tasks:

- Recording and acquiring calibration communication data from ECUs via the CAN bus interface
- Diagnostics of ECUs via the CAN bus interface and J2534 pass-thru interface
- Vehicle diagnostics and reprogramming via a J2534 pass-thru interface using application software from third parties
- Flash programming of ECUs
- Connection of ETAS ES3xx modules as well as third-party modules to an INCA PC via their CAN interface (e.g. Ipetronik or csm modules)
- Integration of the module in the BUSMASTER open source software or via EBI-IP in application software from third-party manufacturers

3.3 Properties

The most important properties of the ES582.1 CAN FD Bus Interface USB Module at a glance:

- 2 independent CAN/CAN FD interfaces:
  - CAN High-Speed operating mode CAN FD operating mode
  - CAN protocols CAN V2.0a (standard identifier with 11 bit) and CAN V2.0b (extended identifier with 29 bit)
  - Support of ISO-compliant CAN FD and ISO non-compliant CAN FD
  - CAN channels isolated from the USB port
  - Multi-client access to the same CAN channel (max. four clients can access the device; two clients per channel)
- Synchronization of measuring channels with INCA
- DSUB connector according to "CAN in Automation" (CiA)
- Simple and direct connection to a USB port
- No external voltage supply required
- Completely integrated in INCA, part of the ETAS tool suite
- Immune to ambient conditions (temperature, EMC)
- Automotive-qualified module, suitable for use in the development environment and in the passenger compartment of motor vehicles
- High level of mechanical stability and robustness

Additional technical data of ES582.1 is located in chapter 6 on page 27.
3.4 Interfaces

**Abb. 3-2**  ES582.1 block diagram

### 3.4.1 CAN interfaces (CAN1/CAN2)

CAN FD (CAN Flexible Data Rate) is an improved, downward-compatible CAN protocol. The main differences to CAN are in the extension of the user data per message from 8 to 64 bytes, higher transmission rates of up to 8 Mbit/s and longer checksums, which increase the reliability of the transmission. CAN FD covers the demand for higher bandwidth for networks in the automotive industry. At the same time, CAN FD nodes can easily be integrated into the existing CAN infrastructure.

The ES582.1 CAN FD Bus Interface USB Module features the CAN interfaces CAN1 and CAN2 at the 9-pin socket. The two CAN interfaces are independent CAN channels with separate CAN controllers. They are isolated from the USB port of the ES582.1.

**Operating modes**

Each CAN interface can optionally be operated in the CAN high-speed operating mode or in the CAN FD (CAN Flexible Data Rate) operating mode. The ES582.1 module supports ISO-compliant CAN FD as well as non-ISO-compliant CAN FD.

The interfaces CAN1 and CAN2 can be configured independently of each other in the application software for the following operating modes:

- CAN
- ISO-compliant CAN FD
- Non-ISO-compliant CAN FD

**Hinweis**

*The two interfaces CAN1 and CAN2 can be used independently of each other in different operating modes.*

**Multi-client support**

Each of the CAN channels of the module ES582.1 can support two clients (application tools) at the same time. On each of the CAN channels, simultaneous access, e.g. by an application tool (e.g. INCA) and a diagnostics tool (e.g. DiagRa) is possible.

Overall, each individual ES582.1 module connected to the PC can operate four (different) clients or application tools.
timestamp

The ES582.1 assigns a timestamp to the CAN messages. The measured data acquired by the ES582.1 module is synchronized by the INCA application software with signals of other ECUs and measuring modules at high speed.

feature

The CAN applications supported by the ES582.1 are located in an overview in chapter 6.6.2 on page 33.

bus terminating resistor

The CAN interface requires the use of bus terminating resistors in both operating modes. According to the CAN specification, one bus terminating resistor each of 120 ohm is required at the two open ends of the bus. It must be connected to the cable or the plug. ETAS offers cables and terminating resistors of 120 ohm to set up CAN networks.
Some CAN networks are already terminated (e.g. inside a vehicle), so that no additional termination is required.

minimum requirements for the CAN connections

At least the following connections are required for a connection to the CAN network:

- Pin 2 CAN Low
- Pin 7 CAN High
- Pin 6 or Pin 3 GND (one of the pins can optionally be connected)

The ground connection (GND) must be identical with the ground connection of the other CAN nodes on the bus.

Y-cable

A Y-cable (CBCF100, see also 7.1 on page 37) allows access of both CAN interfaces to the CAN bus.

3.4.2 USB port

The module is firmly connected with a cable with USB connector type A for connection to a USB 2.0 port of a PC or a drive recorder.

Hinweis

The module must be operated directly on the USB 2.0 connection of a PC, a drive recorder or an active hub whose USB interface meets the requirements listed in the table in chapter 6.6.1 on page 31.
The use of USB cables for extending the connection between ES582.1 and PC or drive recorder is not allowed.

3.5 Power supply

The power supply of the ES582.1 module is connected via the USB 2.0 port of a PC or a drive recorder. An external power supply is not required for the module.
Notes about the requirements for the USB port of the PC are located in chapter 6.6.1 on page 31.
### 3.6 Display of operating state

The ES582.1 is equipped with five LEDs to display the operating state of the module as well as the function of both CAN interfaces CAN1 and CAN2 (see Abb. 3-3 on page 15):

<table>
<thead>
<tr>
<th>LED</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAN1</strong></td>
<td>Flashing yellow</td>
<td>Communication at the CAN1 interface</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Communication at the CAN1 interface interrupted</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>Communication error at the CAN1 interface</td>
</tr>
<tr>
<td><strong>BUSY</strong></td>
<td>Blue</td>
<td>Module is in the boot phase or a firmware update is being performed. Do not disconnect the module from the PC!</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Normal operation</td>
</tr>
<tr>
<td><strong>ON</strong></td>
<td>Green</td>
<td>Module is switched on</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Module is switched off</td>
</tr>
<tr>
<td><strong>ER</strong></td>
<td>Red</td>
<td>Booting was not successful or software error of module. Restart the module.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No error</td>
</tr>
<tr>
<td><strong>CAN2</strong></td>
<td>Flashing yellow</td>
<td>Communication at the CAN2 interface</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Communication at the CAN2 interface interrupted</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>Communication error at the CAN2 interface</td>
</tr>
</tbody>
</table>
3.7 Update of the firmware

The firmware of the ES582.1 can be updated by the user so that future versions of the module can also be used. The update of the firmware is done with the help of the ETAS service software "Hardware Service Pack" (HSP) from the connected PC.

**Hinweis**

*During an update of the firmware, the USB connection to the PC must not be disconnected!*  
*While the module is being used by HSP, other clients cannot access the module.*
4 Commissioning

This chapter contains information about the following topics:

- “ES582.1 USB driver” on page 17
- “Preparing to Install” on page 17
- “Installing the USB driver” on page 18
- “Verifying the installation of the USB driver” on page 21
- “Establishing the USB connection” on page 22
- “Updating the USB driver” on page 22
- “Uninstalling the USB driver” on page 23
- “ES582.1 J2534 driver” on page 24
- “Establishing the USB connection” on page 22

4.1 ES582.1 USB driver

A specific USB driver must be installed on the PC for operating the ES582.1 module.

The ES582.1 can be installed under plug & play-compatible operating systems (Windows 7, Windows 8 and Windows 10). After installing the drivers, the ES582.1 module can be inserted/removed at any time.

4.2 Preparing to Install

4.2.1 Checking system requirements

Check whether your PC meets the system requirements (see also 6.6 on page 31). Administrator rights are required for the installation of the USB driver on the PC. If necessary, contact your system administrator.

4.2.2 CD-ROM

The supplied DVD includes:

- USB driver for the ES582.1 with installation wizard
- Hardware Service Pack (HSP) for updating the firmware
- OSS attributions
- Open source software BUSMASTER
- Documentation: ES582.1 User’s Guide (this document)

The application for installing the USB drivers is located on the DVD as the executable file `autostart.exe`.

As an alternative, you can install the driver for the ETAS service software “Hardware Service Pack” (HSP).
## 4.2.3 Installation procedure

**ACHTUNG!**

*The drivers have to be installed first before you connect the ES582.1 with the USB port of your computer.*

Commissioning the ES582.1 must be done in the following order:

1. Installing the USB drivers (ES582.1 not connected to the PC),
2. Establishing the USB connection,
3. Establishing the CAN connection.

## 4.3 Installing the USB driver

The procedure for installing the ES582.1 USB driver from the DVD or via a network drive is identical.

**Installing the USB driver for the ES582.1**

- Insert the DVD into your PC.
- In the main window of the DVD, select the **Drivers** option.
  
  The **Drivers** window opens.
- Select **Install ES582.1 - USB Drivers**.
  
  The program for installing the USB driver for the ES582.1 starts.

- Select the desired language for the installation program.
- Click on **Next** and follow the instructions of the installation program.
• Read and accept the end user license agreement.
• Click the **Continue** button.
  
The installation of the USB driver starts.

• Wait until the USB driver is installed.
• Click on **Exit**.

The installation of the USB driver for the ES582.1 is finished.
4.4 Verifying the installation of the USB driver

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

**Verifying the installation of the USB driver:**

- Connect the ES582.1 module with the USB port of the PC or the drive recorder.
- Select **Start** → **Control Panel** → **Device Manager**.
  The **Device Manager** window opens.
- Select **ETAS Bus Interfaces**.
- Check whether the ES582.1 module not shows the new entry **ES582.1 CAN-USB**.

![Device Manager of Windows](image)

**Abb. 4-1**  Device Manager of Windows

If the ES582.1 USB driver was not correctly installed/uninstalled, and Windows recognizes the module as connected, a symbol with an exclamation mark is shown next to the device. Execute the installation program for the driver again to correct this problem.
4.5 Establishing the USB connection

After successful driver installation, the ES582.1 module can be connected to the PC. Windows should recognize the device and install the corresponding driver. Windows displays an information note in the start bar. Abb. 4-2 on page 22 shows a representation of the information notes that are displayed.

![Abb. 4-2 Windows information note](image)

4.6 Updating the USB driver

Updating the ES582.1 must be done in the following order:
1. Ensure that the ES582.1 is disconnected from the PC.
2. Ensure that the client software applications are closed.
3. Uninstall the existing installation before starting the installation program.
4.7 Uninstalling the USB driver

The USB driver for the ES582.1 can be uninstalled in the Control Panel of Windows.

Uninstalling the USB driver for the ES582.1:

- Disconnect the ES582.1 module from the USB port of the PC or the drive recorder.
- Select Start → Control Panel → Programs and Features.
  The Programs and Features window opens.
- Select the entry ES582.1 USB-CAN Driver.
- Right-click and select Uninstall.
  The program for uninstalling the USB driver for the ES582.1 starts.

- Select the desired language for the uninstallation program.
• Click on **Next** and follow the instructions of the uninstallation program.
  The uninstallation of the USB driver starts.
• Wait until the USB driver is uninstalled.

![Uninstallation of USB driver](image)

• Click on **Exit**.
  The uninstallation of the USB driver for the ES582.1 is finished.

4.8 ES582.1 J2534 driver

**Hinweis**

*The ES582.1 does not require the installation of a J2534 driver.*

The packets from the INCA application software required for the support of the J2534 interface are automatically installed.
5 Troubleshooting Problems

This chapter gives some information of what you can do when problems arise with the ES582.1 and when general problems arise that are not specific to a certain software or hardware product.

5.1 Displays of the LEDs

For assessing the operating states and for removing errors of the ES582.1, observe the display of the LEDs which provide information about the function of the interfaces and the ES582.1 (see chapter 3.6 on page 15).

5.2 Problems with the ES582.1

The following table lists several possible problems and their corresponding solution attempts. In case of further questions, please contact our technical service (see chapter 9 on page 43).

<table>
<thead>
<tr>
<th>Problem</th>
<th>Diagnostics questions</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The computer does not install the drivers when the module is connected for the first time.</td>
<td>Has the USB driver already been installed?</td>
<td>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 4.4 on page 21.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is the USB port of the PC defective?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restart the PC.</td>
</tr>
<tr>
<td>The USB driver is not being installed.</td>
<td></td>
<td>Ensure that you are logged in with the required authorizations for installing the driver (administrator rights).</td>
</tr>
<tr>
<td>Problem</td>
<td>Diagnostics questions</td>
<td>Possible solution</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>The ES582.1 module is not being recognized with the &quot;Find hardware&quot; function.</td>
<td>Did you install INCA with the required version?</td>
<td>Check whether the INCA version installed on your PC meets the requirements in chapter 6.6.2 on page 33.</td>
</tr>
<tr>
<td></td>
<td>Did you install the INCA ODX add-on with the required version?</td>
<td>Check whether the INCA ODX add-on version installed on your PC meets the requirements in chapter 6.6.2 on page 33.</td>
</tr>
<tr>
<td></td>
<td>Did you install the required firmware on the module?</td>
<td>Check with HSP whether the required firmware is installed on the module.</td>
</tr>
<tr>
<td></td>
<td>Is the hardware connected to the PC?</td>
<td>Check whether the cabling is intact.</td>
</tr>
<tr>
<td>The measurements are not being started.</td>
<td>Does the INCA monitor log ask you to perform an update?</td>
<td>Update the firmware of the module with HSP.</td>
</tr>
<tr>
<td></td>
<td>Does the module provide no data?</td>
<td>Check whether your measurement setup meets the requirements.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check whether the cabling of the hardware to the PC is correct and intact.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check whether the LED &quot;ER&quot; flashes: The baud rate may not be supported by the module. Information about the supported baud rates is located in chapter 6.7.2 on page 34.</td>
</tr>
</tbody>
</table>
6 Technical Data

This chapter contains information about the following topics:
- "General data" on page 27
- "RoHS conformity" on page 29
- "CE marking" on page 29
- "Return and recycling of the product" on page 29
- "Mechanical data" on page 30
- "System requirements" on page 31
- "Electrical data" on page 34
- "Terminal assignment" on page 35

6.1 General data

6.1.1 Identifications on the product

The following symbols are used for identifications of the product:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning]</td>
<td>The User’s Guide must be read prior to the startup of the product!</td>
</tr>
<tr>
<td>SN: 1234567</td>
<td>Serial number (7-digit)</td>
</tr>
<tr>
<td>F 00K 107 731</td>
<td>Order number of the product, see chapter 8.1 on page 41</td>
</tr>
<tr>
<td>5 V-===</td>
<td>Operating voltage (DC voltage)</td>
</tr>
<tr>
<td>350 mA</td>
<td>Current consumption, max.</td>
</tr>
<tr>
<td>ES582.1</td>
<td>Product designation</td>
</tr>
<tr>
<td></td>
<td>Manufacturer’s address</td>
</tr>
<tr>
<td>![China RoHS]</td>
<td>Marking for China RoHS, see also 6.2.2 on page 29</td>
</tr>
<tr>
<td>![RoHS]</td>
<td>Marking for RoHS, see chapter 6.2.1 on page 29</td>
</tr>
<tr>
<td>![CE]</td>
<td>Marking for CE conformity, see also 6.3 on page 29</td>
</tr>
</tbody>
</table>
6.1.2 Standards

The module corresponds to the following Standards:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 61326-1</td>
<td>Electrical equipment for measurement, control and laboratory use - EMC requirements</td>
</tr>
<tr>
<td>EN 61010-1</td>
<td>Safety requirements for electrical equipment for measurement, control and laboratory use</td>
</tr>
<tr>
<td>EN 60529</td>
<td>Degree of protection through housing (IP code)</td>
</tr>
<tr>
<td>EN 60068-2-32</td>
<td>Environmental testing - Part 2: Tests; Test ed: free falling</td>
</tr>
</tbody>
</table>

6.1.3 Ambient conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range (operation)</td>
<td>-40 °C to +70 °C</td>
</tr>
<tr>
<td></td>
<td>-40 °F to +158 °F</td>
</tr>
<tr>
<td>Temperature range (storage)</td>
<td>-40 °C to +85 °C</td>
</tr>
<tr>
<td></td>
<td>-40 °F to +185 °F</td>
</tr>
<tr>
<td>Relative humidity, non-condensing</td>
<td>15% to 95% (operation)</td>
</tr>
<tr>
<td></td>
<td>0% to 95% (storage)</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>max. 5,000 m / 16,400 ft</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP52</td>
</tr>
<tr>
<td>Contamination level</td>
<td>2</td>
</tr>
</tbody>
</table>

**Hinweis**

The module is suitable for use in interiors, in the passenger compartment or in the trunk of vehicles. The module is not suitable for installation in the engine compartment and similar environments.

6.1.4 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.

6.1.5 Cleaning the product

We recommend cleaning the product with a dry cloth.
6.2 RoHS conformity

6.2.1 European Union
The EU guideline 2002/95/EU limits the use of certain dangerous materials for electric and electronic devices (RoHS conformity).
ETAS confirms that the product meets this directive applicable in the European Union.

6.2.2 China
With the China RoHS identification attached to the product or its packaging, ETAS confirms that the product meets the guidelines of the "China RoHS" (Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation) applicable in the People’s Republic of China.

6.3 CE marking
With the CE mark attached to the product or its packaging, ETAS confirms that the product corresponds to the applicable product-specific European Directives.
The CE Declaration of Conformity for the product is available upon request.

6.4 Return and recycling of the product
The European Union (EU) released the Directive for (Waste Electrical and Electronic Equipment - WEEE) to ensure the creation of systems for the collection, treatment and utilization of electronic waste in all states of the EU.
This ensures that the devices are recycled in a resource-friendly way that does not represent any risk to personal health and the environment.

Abb. 6-1 WEEE symbol
The WEEE symbol (see Abb. 6-1 on page 29) on the product or its packaging indicates that the product may not be disposed of together with the remaining trash.

The user is obligated to separately collect old devices and provide them to the WEEE return system for recycling.
The WEEE Directive applies to all ETAS devices, but not to external cables or batteries.
Additional information about the recycling program of ETAS GmbH is available from the ETAS sales and service locations (see chapter 9 on page 43).
6.5 Mechanical data

Abb. 6-2 Dimensions

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing dimensions (H x W x D)</td>
<td>24 mm x 48 mm x 86.7 mm&lt;br&gt;0.8 in x 1.6 in x 2.52 in</td>
</tr>
<tr>
<td>Length of integrated USB cable</td>
<td>1.5 m / 4.9 ft</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 150 g / 5.291 oz (with USB cable)</td>
</tr>
<tr>
<td>Housing</td>
<td>Nylon, rubberized</td>
</tr>
<tr>
<td>Connection on the PC side</td>
<td>USB connector type A</td>
</tr>
<tr>
<td>Connection on the bus side</td>
<td>9-pin DSUB connector (DIN 41652)</td>
</tr>
</tbody>
</table>
6.6 System requirements

6.6.1 Hardware

**PC with USB port**

<table>
<thead>
<tr>
<th>PC</th>
<th>IBM-compatible PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB port</td>
<td>USB 2.0 Full Speed (480 Mbit/s)</td>
</tr>
<tr>
<td></td>
<td>USB 2.0 High Power (500 mA)</td>
</tr>
<tr>
<td></td>
<td>USB 3.0</td>
</tr>
<tr>
<td></td>
<td>USB socket type A</td>
</tr>
<tr>
<td>Operating system</td>
<td>Windows 7</td>
</tr>
<tr>
<td></td>
<td>Windows 8</td>
</tr>
<tr>
<td></td>
<td>Windows 10</td>
</tr>
<tr>
<td>Driver</td>
<td>ES582.1 USB driver</td>
</tr>
<tr>
<td>Configuration</td>
<td>Plug &amp; Play</td>
</tr>
</tbody>
</table>

**Power supply**

The power supply of the product is connected via the USB port of a PC or a drive recorder. An external power supply is not required for the module.

**Hinweis**

*The module must be operated directly on the USB 2.0 connection of a PC, a drive recorder or an active hub whose USB interface meets the requirements listed in the table. The use of USB cables for extending the connection between ES582.1 and PC or drive recorder is not allowed.*

**Hinweis**

*Operating a module on USB 1.0 interfaces is not supported.*

**Prerequisite for the successful initialization of the module**

**Hinweis**

*A specific USB driver must be installed on the PC for operating the ES582.1 module (see chapter 4.3 on page 18).*

**Windows user rights**

Ensure that you have the required Windows user rights for the installation of the USB driver (administrator rights).

**Additional requirements**

The PC must meet the minimum requirements of the application program used (e.g. INCA). Information about the minimum requirements for INCA is located in the corresponding software documentation.
General notes

The INCA application software supports up to four ES582.1 modules at the same time.

Power Manager

Almost all notebooks and many desktops feature a power management function (Power Manager). Power managers deactivate the CPU for a certain time. However, this affects the accuracy of the time management of your application.

Hinweis

*If there are high demands on the time management of your application (time-controlled transmission of messages, time-controlled analyses), this Power Manager must be deactivated.*

The settings for the power management are made:
- in the BIOS setup
- in the Control Panel of Windows (e.g. Power Options icon).

Hinweis

*This document does not discuss in detail how the Power Manager can be deactivated.*

ES720.1 Drive Recorder

The ES582.1 module can be operated on the USB port of the ES720.1 drive recorder.

The minimum requirements on the software are INCA V7.2 and Windows 7.
6.6.2 Software

Supported applications and software prerequisites

For the operation of ES582.1 and for data acquisition, the software must have the following versions or higher:

<table>
<thead>
<tr>
<th>Application / Protocol</th>
<th>Classification</th>
<th>HSP</th>
<th>INCA</th>
<th>Add-On ODX-LINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN monitoring</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td></td>
</tr>
<tr>
<td>CAN output</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>-</td>
</tr>
<tr>
<td>CCP</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>-</td>
</tr>
<tr>
<td>KWP on CAN</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>-</td>
</tr>
<tr>
<td>UDS</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>-</td>
</tr>
<tr>
<td>XCP on CAN</td>
<td>MC 1)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>-</td>
</tr>
<tr>
<td>OBD-on-CAN</td>
<td>MC, DS 2)</td>
<td>V11.3.0</td>
<td>V7.2.3</td>
<td>V7.2.x 3)</td>
</tr>
</tbody>
</table>

1): MC: Measurement and calibration
2): MC, DS: ECU diagnostics
3): INCA V7.2.3 and higher and additionally INCA Add-On ODX-LINK V7.2.x and higher

Hinweis

Operating the ES582.1 with older software versions is not possible.

Driver

ES582.1 USB driver

Supported software interfaces

For the integration of the ES582.1 module and the J2534 interface in application software from third-party manufacturers, ETAS provides the software development kit "ECU and Bus Interfaces - Integration Package" (EBI-IP).

The software development kit can be downloaded free of charge on the ETAS website.
## 6.7 Electrical data

### 6.7.1 Voltage supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>4.75 V to 5.25 V DC</td>
</tr>
<tr>
<td>Supply via the USB port</td>
<td>(see chapter 6.6.1 on page 31)</td>
</tr>
<tr>
<td>Current consumption, max. (operation)</td>
<td>350 mA at 5.0 V DC</td>
</tr>
</tbody>
</table>

### 6.7.2 CAN interface (CAN1 and CAN2)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN1 and CAN2</td>
<td>2 independent interfaces, isolated from the USB port, each channel can be configured separately.</td>
</tr>
<tr>
<td>Protocols</td>
<td>CAN V2.0a (standard identifier), CAN V2.0b (extended identifier)</td>
</tr>
<tr>
<td></td>
<td>CAN FD (ISO/CD 11898-1:2015; Bosch CAN FD Specification V1.0 [Non-ISO])</td>
</tr>
<tr>
<td>Transmission speed</td>
<td>High-speed CAN/ CAN FD header: max. 1 Mbaud at 20 m bus length</td>
</tr>
<tr>
<td></td>
<td>CAN FD (data): max. 5 Mbit/s (operating temperature range)</td>
</tr>
<tr>
<td></td>
<td>CAN FD (data): max. 8 Mbit/s (room temperature)</td>
</tr>
<tr>
<td>Controller</td>
<td>ARM Cortex MCU</td>
</tr>
<tr>
<td>Transceiver (physical layer)</td>
<td>TJA1044G</td>
</tr>
</tbody>
</table>
6.8 Terminal assignment

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

The connection of the CAN bus to the ES582.1 CAN FD Bus Interface USB Module is carried out via the 9-pin DSUB connector (see Abb. 6-3).

---

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>Not connected</td>
</tr>
<tr>
<td>2</td>
<td>CAN 1 Low</td>
<td>CAN 1 Low</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>CAN 2 Low</td>
<td>CAN 2 Low</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>Not connected</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>CAN 1 High</td>
<td>CAN 1 High</td>
</tr>
<tr>
<td>8</td>
<td>CAN 2 High</td>
<td>CAN 2 High</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

---

A 9-pin DSUB connector is plugged into the "CAN1/CAN2" socket.
7 Cables and Accessories

7.1 Cable CBCF100

Abb. 7-1 Cable CBCF100
Y-cable for connecting the second CAN or FlexRay channel.

Abb. 7-2 Cable CBCF100: DSUB connection "1" and "2"

<table>
<thead>
<tr>
<th>Pin</th>
<th>DSUB connection &quot;1&quot;</th>
<th>Pin</th>
<th>DSUB connection &quot;2&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not connected</td>
<td>1</td>
<td>Not connected</td>
</tr>
<tr>
<td>2</td>
<td>CAN 1, low</td>
<td>2</td>
<td>CAN 2, low</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>Not connected</td>
<td>4</td>
<td>Not connected</td>
</tr>
<tr>
<td>5</td>
<td>Shield</td>
<td>5</td>
<td>Shield</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>CAN 1, high</td>
<td>7</td>
<td>CAN 2, high</td>
</tr>
<tr>
<td>8</td>
<td>Not connected</td>
<td>8</td>
<td>Not connected</td>
</tr>
<tr>
<td>9</td>
<td>Not Used</td>
<td>9</td>
<td>Not Used</td>
</tr>
</tbody>
</table>

Order designation | Short name | Order number |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN and FlexRay Interface Y-Cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3</td>
<td>CBCF100.1-0m3</td>
<td>F-00K-107-939</td>
</tr>
</tbody>
</table>
7.2  Cable CBAC180

Abb. 7-3  Cable CBAC180-2
OBDII (J1962) adapter cable for the CAN Interfaces of ES582.1

<table>
<thead>
<tr>
<th>DSUB connection</th>
<th>OBD2 connection</th>
<th>Signal</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td>Pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>CAN1 High</td>
<td>CAN1 High and CAN1 Low in a shielded twisted pair</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>CAN1 Low</td>
<td>CAN1 High and CAN1 Low in a shielded twisted pair</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>CAN2 High</td>
<td>CAN2 High and CAN2 Low in a shielded twisted pair</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>CAN2 Low</td>
<td>CAN2 High and CAN2 Low in a shielded twisted pair</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
<td>Power V+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>GND</td>
<td></td>
</tr>
</tbody>
</table>

Order designation | Short name | Order number |
------------------|------------|--------------|
CAN Interface Cable, OBDII J1962 - DSUB (16mc-9fc), 2 m | CBAC180.0-2 | F-00K-107-300 |
7.3 Cable CBH500

Abb. 7-4 Cable CBH500

**Hinweis**

*The cable CBH500 supports only one CAN channel.*

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Short name</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN, LIN, and FlexRay Interface Cable, DSUB-DSUB (9fc - 9mc + 9fc), 2 m</td>
<td>CBH500-2</td>
<td>F-00K-106-276</td>
</tr>
</tbody>
</table>

7.4 Cable CBCX130

Abb. 7-5 Cable CBCX130

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Short name</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN Interface Cable, DSUB – DSUB (9fc-9mc), 2 m</td>
<td>CBCX130-2</td>
<td>F-00K-103-784</td>
</tr>
</tbody>
</table>
7.5 Adapter CBCX131.1-0

Abb. 7-6 Terminating resistor CBCX131.1-0
CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Short name</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)</td>
<td>CBCX131-0</td>
<td>F-00K-103-786</td>
</tr>
</tbody>
</table>
## 8 Ordering Information

### 8.1 ES582.1 CAN FD Bus Interface USB Module

<table>
<thead>
<tr>
<th>Order name</th>
<th>Short name</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES582.1 CAN FD Bus Interface USB Module</td>
<td>ES582.1</td>
<td>F-00K-110-731</td>
</tr>
</tbody>
</table>

**Scope of supplies**
- ES582.1 CAN FD Bus Interface USB Module,
- Cable CBCF100.1, ES582.1_DVD,
- List "Content of this Package",
- ES58x_ETAS_Safety_Advice,
- China-RoHS-leaflet_Compact_green_cn

### 8.2 Accessories

<table>
<thead>
<tr>
<th>Order name</th>
<th>Short name</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN and FlexRay Interface Y-Cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3</td>
<td>CBCF100.1-0m3</td>
<td>F-00K-107-939</td>
</tr>
<tr>
<td>CAN, LIN, and FlexRay Interface Cable, DSUB-DSUB (9fc - 9mc + 9fc), 2m</td>
<td>CBH500-2</td>
<td>F-00K-106-276</td>
</tr>
<tr>
<td>CAN Interface Cable, OBDII J1962 - DSUB (16mc-9fc), 2m</td>
<td>CBAC180.0-2</td>
<td>F-00K-107-300</td>
</tr>
<tr>
<td>CAN Interface Cable, DSUB – DSUB (9fc-9mc), 2 m</td>
<td>CBCX130-2</td>
<td>F-00K-103-784</td>
</tr>
<tr>
<td>CAN 120 Ohm Termination Resistor, 2xDSUB (9fc+9mc)</td>
<td>CBCX131-0</td>
<td>F-00K-103-786</td>
</tr>
</tbody>
</table>
9  ETAS Contact Addresses

**ETAS HQ**

ETAS GmbH

Borsigstraße 14  
70469 Stuttgart  
Germany

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Fax: +49 711 3423-2106  
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  
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