

ETAS ES584.2

CAN FD and LIN Bus Interface USB Module



User Guide

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1 Safety Notices

This chapter contains information about the following topics:

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Refer to the following safety instructions and the technical documentation available to download from the ETAS website www.etas.com. Keep the information provided in a safe place.

Failure to comply with the safety instructions may lead to the risk of damage to life and limb or property. The ETAS Group and its representatives shall not be liable for any damage or injury caused by improper operation or use of the product.

Only use the product if you have read and understood the information concerning safe operation and have the required qualifications and training for this product. If you have questions about safe operation, contact ETAS:

- Technical Support: www.etas.com/hotlines
- Regional ETAS Contact Partner: www.etas.com/contact

The product is only approved for the applications described in the technical documentation. When using and operating this product, all applicable regulations and laws must be observed.

ETAS products, made available as beta versions or prototypes of firmware, hardware and/or software, are to be used exclusively for testing and evaluation purposes. These products may not have sufficient technical documentation and not fulfill all requirements regarding quality and accuracy for market-released series products. The product performance may therefore differ from the product description. Only use the product under controlled testing and evaluation conditions. Do not use data and results from beta versions without prior and separate verification and validation and do not share them with third parties.

Before commissioning, check whether a Known Issue Report (KIR) is available for the current product version: www.etas.com/kir (Password: KETASIR). Note the information given in the report.

Program codes or program control sequences that are created or changed via ETAS products, as well as all types of data obtained through the use of ETAS products, must be checked for their reliability and suitability prior to use or distribution.

Only use these codes or sequences in public areas (e.g. in road traffic) if you have ensured that the application and product settings are safe through testing in self-contained and designated testing environments and circuits.

This ETAS product allows you to influence safety-relevant systems or data (e.g. in motor vehicles, vehicle components and test benches). In the event of a malfunction or a hazardous situation, it must be possible to put the system into a safe state (e.g. emergency stop or emergency operation).

1.1 Intended Use

The product was developed and approved for applications in the automotive sector. Only operate the product as per its specifications. If the product is used in any other way, product safety is no longer ensured.

The interface modules are designed for the following applications:

- Detecting signals from ETK and ECU interfaces, as well as from vehicle buses
- Flash programming of ECUs

Application Areas


- The product is approved for use in the following areas:
 - Interior
 - Passenger cell
 - Trunk
- Do not operate the product in a wet or damp environment.
- Do not operate the product in potentially explosive atmospheres.


Technical Condition

The product is designed in accordance with state-of-the-art technology. Only operate the product and its accessories if they are in perfect working order. Shut down a damaged product immediately. Do not open or alter the product. Only ETAS may make changes to the product.

1.2 Classification of Safety Messages

The safety messages warn of dangers that can lead to personal injury or damage to property:

 DANGER
DANGER indicates a hazardous situation with a high risk of death or serious injury if not avoided.

 WARNING
WARNING indicates a hazardous situation of medium risk, which could result in death or serious injury if not avoided.



CAUTION

CAUTION indicates a hazardous situation of low risk, which may result in minor or moderate injury if not avoided.

NOTICE

NOTICE indicates a situation, which may result in damage to property if not avoided.

1.3

Assembly

Only install, connect, disconnect and cable ETAS products and components when they are de-energized.

Installation location

Install the product on a smooth, level and firm surface.



WARNING

The following product is a Class A piece of equipment: ES584.2
This piece of equipment may cause radio interference in living areas. In this case, the user may be required to take appropriate measures.

NOTICE

Damage to the electronics due to potential equalization

The cables' shield may be connected to the housing, the ground or the ground for the product's power supply. If there are different ground potentials in the test setup, equalizing currents can flow between the products via the cables' shield. Take account of different electric potentials in your test setup and take appropriate measures to prevent equalizing currents.

Securing the Product

The housing must not be damaged while securing the product.



WARNING

Risk of injury due to inadequate fastening

- Secure the product so that it does not move uncontrollably.
- Only use carrier systems and fastening materials that can accommodate the static and dynamic forces of the product and are suitable for the ambient conditions.

Ventilation

- Protect the product against direct solar radiation and other sources of heat.
- Ensure that there is sufficient air circulation for efficient heat exchange.

1.4 Operation

Only operate the product with the latest firmware. You can find information about updating the firmware in the user manual.

If the firmware update is not completed successfully, try it again. If a new firmware update is not possible and the product is not functional, send the product to ETAS.



WARNING

Risk due to undefined vehicle behavior during an ECU reset

If you operate the product in combination with ETKs, the ECU must not be reset in an uncontrolled manner.

- Only make changes when the vehicle is stationary (e.g., changes to the test setup, changes to the ETK configuration, software updates).

1.5 Electrical Connection

Electrical Safety and Power Supply

- Only connect the product to electric circuits with safety extra-low voltage in accordance with IEC 61140 (devices of class III) within the voltage limits for accessible parts as per IEC 61010-1.
- Comply with the connection and setting values (see chapter Technical Data).
- The power supply for the product must be safely disconnected from the mains power. For example, use a car battery or a suitable lab power supply.
- Only use lab power supplies with dual protection for the supply network (with double/reinforced insulation (DI/RI)).
- The power supply must be suitable for use according to the ambient conditions for the product.
- It is possible to discharge the vehicle battery in regular operation and long standby operation.
- Central load-dump protection is required for operation.

Connection to the Power Supply

The product is powered via the USB. Connect the product directly to a computer's USB interface, ETAS drive recorders or active hubs that meet the USB 2.0 specifications, as a minimum.

De-energizing the product

1. Remove the USB cable.
2. Remove all cables from the product.

1.6 Cables and Accessories

Cables

- Only use ETAS cables, cables recommended by ETAS or other cables certified for the application.
- Route the cables such that they are protected against abrasion, damage, deformation and kinking.
- Do not place any objects on the cables.
- Do not use any damaged cables.
- The connector and connection must not be dirty.
- The connector and connection must be compatible.
- Correctly align the connector with the connection.
- Do not connect the connector and connection by force.

Accessories

Use ETAS accessories, accessories recommended by ETAS or other accessories certified for the application. For detailed information about accessories, see the product's user manual.

1.7 Transport

- Only transport the product individually.
- Remove all connected cables before transportation.
- Do not transport the product by the connected cables.

1.8 Maintenance

The product is maintenance-free.

Cleaning

- Only clean the product when it is de-energized.
- Do not use cleaning agents that could harm the product.
- Do not apply cleaning agents directly onto the product.
- Use a dry or slightly dampened, soft, lint-free cloth.
- Make sure that no moisture enters the product.

1.9 Repairs

If repairs are required, send the product to ETAS.

1.10 Shipment and Packaging

You can find the return form and information about this process on the ETAS website: www.etas.com/en/support/hw_return_form.php.

2 Hardware Description

This chapter contains information about the following topics:

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- Properties 11
- Function Groups 12
- CAN FD Interface 12
- LIN Interface 13
- USB Port 15
- Power Supply 15
- Y-Cable 15
- Operating State Display 15
- Multi-Client Support 16
- Updating the Firmware 16

2.1 Overview

The ES584.2 CAN FD and LIN Bus Interface USB Module is part of the range of compact ETAS bus interface modules. It is equipped with a CAN/CAN FD interface and with a LIN interface for connection to vehicle buses or ECUs, as well as a USB port for connection to a PC or a drive recorder.



Fig. 2-1 ES584.2

The ES584.2 module supports CAN FD (CAN flexible data rate) and is suitable for numerous applications, both in the classic CAN environment and in the CAN FD environment.

Together with the application software INCA and ODX-LINK from ETAS permits the ES584.2 access to the CAN and LIN bus for measurement, calibration and diagnostics.

The ES584.2 can be connected to a vehicle's CAN bus via the diagnostics service interface.

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

The ES584.2 module offers an open SAE J2534-compliant pass-through interface for vehicle diagnostics and flash programming.

The module supports all protocols used by INCA, such as CCP, XCP, KWP-on-CAN and UDS. The CCP and KWP-on-CAN (ISO 14230/ISO 15765) protocols are only supported in classic CAN mode.

The costs for installation and configuration of the affordable module are minimal, and an external voltage supply is not required.

2.2 Application Areas

The ES584.2 can be used for the following tasks:

- Recording and capturing communication data
- Calibration of ECUs via the CAN FD bus interface
- ECU diagnostics via the CAN bus interface and J2534 pass-through interface
- Vehicle diagnostics and reprogramming via a J2534 pass-through interface using application software from third-party providers
- Flash programming of ECUs
- Connection of third-party modules to the INCA PC via their CAN interface (e.g. Ipetronik or csm modules)
- Integration of the module into the BUSMASTER open source software or via EBI-IP into application software from third-party manufacturers

2.3 Properties

The most important properties of the ES584.2 CAN FD and LIN Bus Interface USB Module at a glance:

- 1 CAN/CAN FD interface
 - CAN operating modes
 - CAN high-speed
 - CAN FD SIC
 - CAN protocols
 - CAN V2.0a (standard 11-bit identifier)
 - CAN V2.0b (extended 29-bit identifier)
 - ISO-compliant CAN FD and non-ISO-compliant CAN FD
 - CAN channel isolated from the USB port
 - Multi-client access to the same CAN channel
 - Max. two clients can access the device
 - Two clients per channel
- DSUB connector in accordance with "CAN in Automation" (CiA)
- One LIN interface
- Simple and direct connection to a USB port

- No external voltage supply necessary
- Synchronization of the measuring channels with INCA
- Fully integrated in the ETAS tool chain – supported by INCA/INCA-EIP, INTE-CRIO, ASCET-RP, HSP
- Module compatible with vehicles, suitable for use in the development environment and in the passenger compartment of motor vehicles

Complete specifications for the ES584.2 module can be found in chapter 5 on page 25.

2.4 Function Groups

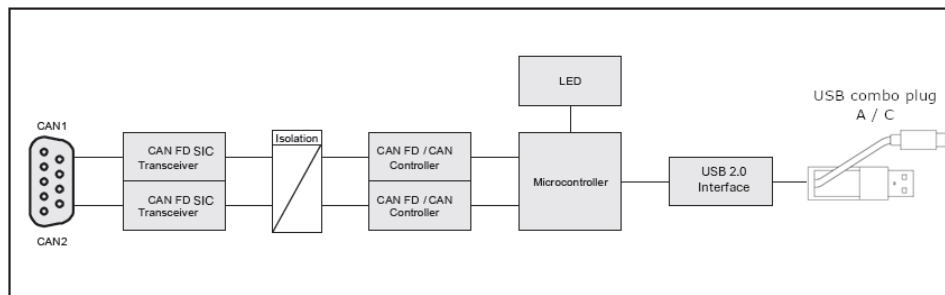


Fig. 2-2 ES584.2 block diagram

2.5 CAN FD Interface

CAN FD (CAN flexible data rate) is an improved, backward compatible CAN protocol. It differs from CAN mainly in the expansion of the useful 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 transmission. CAN FD covers the demand for a 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 ES584.2 CAN FD and LIN Bus Interface USB Module has a CAN interface CAN on its nine-pin DSUB socket. The CAN interface is an independent CAN channel with its own CAN controller. It is isolated from the USB port of the ES584.2.

2.5.1 Operating Modes

The CAN interface can be operated in high-speed CAN operating mode or in CAN FD operating mode (CAN flexible data rate). The ES584.2 module supports both ISO-compliant and non-ISO-compliant CAN FD.

The CAN interface can be configured in the application software for the following operating modes:

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

2.5.2 Time Stamp

The ES584.2 time stamps the CAN messages. The INCA application software synchronizes the measurement data recorded by the ES584.2 module with signals from other ECUs and measuring modules with high precision.

2.5.3 Feature

The CAN applications supported by the ES584.2 are located in an overview in chapter 5.10.2 on page 30.

2.5.4 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 of 120 ohm is required at each of the two open ends of the bus. It must be connected to the cable or the plug.



NOTE

ETAS offers cables and terminating resistors of 120 ohm to set up CAN networks.

Some CAN networks are already terminated (for example in a vehicle), so no additional termination is required.

2.5.5 Minimum Requirements for the CAN Connection

At least the following connections are required in order to establish a connection to the CAN network:

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

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

2.6 LIN Interface

The LIN interface is electrically isolated from the other interfaces of the module and also protected against overload or misuse.

2.6.1 Operating Modes

The two clients of the LIN interface (see chapter "Multi-Client Support" on page 16) can either be operated in the LIN master operating mode or in the LIN slave operating mode. The following configurations are possible:

- Client 1: LIN master or LIN slave and
- Client 2: LIN slave

The operating mode is selected in the application software.

2.6.2 Feature

The LIN applications supported by the module are listed in an overview in chapter 5.10.2 on page 30.

2.6.3 Voltage Supply on the LIN Bus

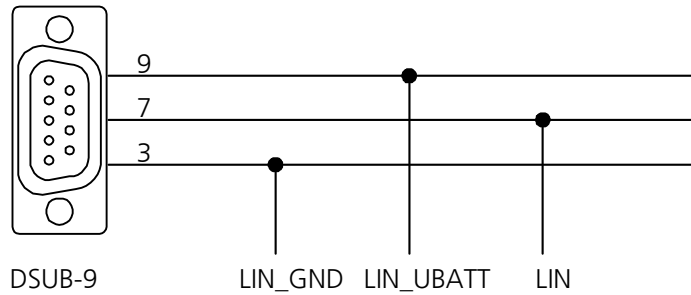


Fig. 2-1 Voltage supply on the LIN bus (pin assignment on the CBCF100 cable)

12 V LIN systems

In 12 V LIN systems, the LIN node of the ES584.2 module can either be supplied externally by the LIN bus or internally by the module with the LIN reference voltage V_{BAT} .

24 V LIN systems

In 24 V LIN systems, the LIN node of the ES584.2 module can only be supplied externally by the LIN bus with the LIN reference voltage V_{BAT} .

Supplying external LIN nodes

The module is not designed for the supply of external nodes on the LIN bus.

Selecting the voltage supply

An internal pull-up resistance can be switched to the LIN interface of the module as master resistance. Switching of the master resistance of the LIN interface can be configured in the application software.

Recommendation

To maintain the reference level (and thereby identical switching thresholds) at the individual nodes on the LIN bus, the LIN transceivers (physical layer) of all nodes on the bus should be operated with the same voltage.

We therefore recommend powering all nodes on the LIN bus with the external voltage that also powers the other bus participants (LIN V_{BAT} , see Fig. 2-1 on page 14).

At the same time, this ensure compliance with safe switching thresholds in each operating state of the LIN system (e.g. during vehicle cold starts).

If there is no access or no possibility of using the LIN V_{BAT} voltage as reference and supply voltage, the LIN transceivers of the dedicated LIN node of the ES584.2 can be supplied by a switchable internal voltage source of the module.

This internal supply voltage is not routed outside via the CAN/LIN plug connector.

2.7 USB Port

The module can be connected to a PC or drive recorder via a permanently connected cable with a USB combo plug.



NOTE

The module must be operated directly at the USB port of a PC, a drive recorder or an active hub, whose USB interface meets the requirements stated in the table in chapter 5.10.1 on page 29.

The use of USB cables to extend the connection between ES584.2 and the PC or drive recorder is not permitted.

2.8 Power Supply

The ES584.2 module is powered via the USB port of a PC or a drive recorder. The module does not require an external power supply. Information on the requirements for the PC's USB port can be found in chapter 5.10.1 on page 29.

2.9 Y-Cable

A Y-cable (CBCF100, see chapter 6.1 on page 35) allows the CAN and LIN interface of the ES584.2 module to access vehicle buses or ECUs.

2.10 Operating State Display



Fig. 2-3 ES584.2 LEDs

The ES584.2 is equipped with five LEDs for displaying the module's operating state, as well as for displaying the function of the two CAN and LIN interfaces (see Fig. 2-3 on page 15):

LED	Display	Description
CAN	Flashing yellow	Communication on the CAN interface
	Off	Communication on the CAN interface interrupted
	Red	Communication error on the CAN interface
BUSY	Blue	The module is currently in the boot phase or a firmware update is being performed. Do not disconnect the module from the PC!
	Off	Standard operation
ON	Green	The module is switched on
	Off	The module is switched off

LED	Display	Description
ER	Red	The boot process was not successful or the module encountered a software error. Restart the module.
	Off	No error
LIN	Flashing yellow	Communication on the LIN interface
	Off	Communication on the LIN interface interrupted
	Red	Communication error on the LIN interface

2.11 Multi-Client Support

The CAN channel and the LIN channel of the ES584.2 module can each support two clients at the same time (application tools):

- On the CAN channel, simultaneous access is for example possible using an application tool (e.g. INCA) and a bus analysis tool (e.g. BUSMASTER)
- On the LIN channel, simultaneous access is for example possible using an application tool (e.g. INCA) and a bus analysis tool (e.g. BUSMASTER).

In total, each ES584.2 module connected to the PC can serve four (different) clients or application tools.

2.12 Updating the Firmware

The firmware of the ES584.2 can be updated by the user so that future versions of the module can also be used. The firmware update is performed using the ETAS 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.

Other clients cannot access the module while it is being used by HSP.

3 Commissioning

This chapter contains information about the following topics:


- Assembly 17
- Preparing to Install 17
- Verifying the Installation of the USB Driver 19
- Establishing the USB Connection 19
- Updating the USB Driver 20
- Application 20

3.1 Assembly

NOTICE

Damage to the electronics due to potential equalization


The cables' shield may be connected to the housing, the ground or the ground for the product's power supply. If there are different ground potentials in the test setup, equalizing currents can flow between the products via the cables' shield. Take account of different electric potentials in your test setup and take appropriate measures to prevent equalizing currents.

 **WARNING**

Risk of injury due to inadequate fastening

- Secure the product so that it does not move uncontrollably.
- Only use carrier systems and fastening materials that can accommodate the static and dynamic forces of the product and are suitable for the ambient conditions.

3.2 Preparing to Install

 **NOTE**

The latest USB driver must be installed on the PC in order to operate the ES584.2 module.

The ES584.2 can be installed on plug & play-compatible operating systems (min. Windows 10). Following installation of the driver, you can use/remove the ES584.2 module at any time.

3.2.1 Checking the System Requirements

Check whether your PC fulfills the system requirements (see chapter 5.10 on page 29). The installation of the USB driver on the PC requires administrator rights. If necessary, contact your system administrator.

3.2.2 DVD

The supplied DVD includes:

- USB driver for the ES584.2 with installation wizard

- Hardware Service Pack (HSP) for updating the firmware
- OSS attributions
- Documentation: ES584.2 user manual
- ETAS Safety Advice ES52x_ES59x

The application for installing the USB driver is located on the DVD as an **auto-start.exe** executable file.

Alternatively, you can install the driver using the ETAS service software "Hardware Service Pack" (HSP).

3.2.3 Installation Procedure

Commissioning of the ES584.2 must be performed in the following sequence:

1. Installation of the USB drivers (ES584.2 not connected to the PC)
2. Establishing the USB connection
3. Establishing the CAN connection

3.3 Verifying the Installation of the USB Driver

In the Windows Device Manager, you can check which hardware drivers are installed and what their status is.



NOTE

For compatibility reasons, the ES584.2 is displayed in the device manager as "ES584.1".

Verifying the installation of the USB driver:

1. Connect the ES584.2 module to the USB port on the PC or drive recorder.
2. Select Start → **Control Panel** → **Device Manager**.
The **Device Manager** window opens.
3. Select **ETAS Bus Interfaces**.
4. Check whether the new entry **ES584.2** is displayed for the ES584.2 module.

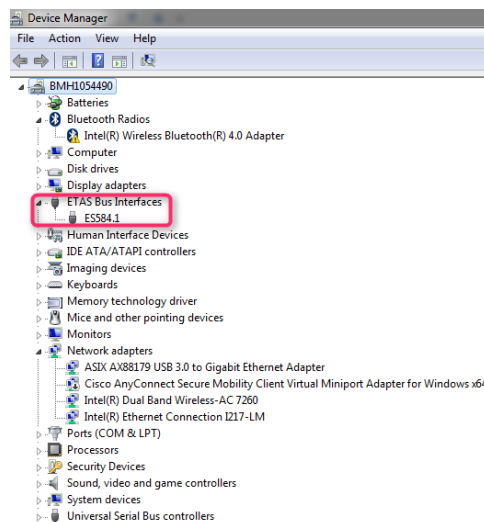


Fig. 3-1 Windows Device Manager

If the ES584.2 USB driver was not correctly installed/uninstalled and Windows detects the module as connected, a symbol with an exclamation mark is shown next to the device. Run the driver installation program again to resolve this issue.

3.4 Establishing the USB Connection

After successful driver installation, the ES584.2 can be connected to the PC. Windows should detect the device and install the accompanying driver. Windows displays an information note in the start bar. In Fig. 3-2 on page 20, you can see an image of the information notes that appear.

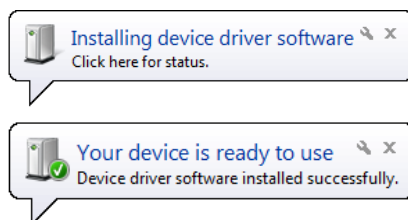


Fig. 3-2 Windows information note

3.5 Updating the USB Driver

The ES584.2 update must be performed in the following sequence:

1. Ensure that the client software applications are closed.
2. Start the installation program and uninstall the old driver.
3. Install the new driver.

3.6 Application



WARNING

Risk due to undefined vehicle behavior during an ECU reset

If you operate the product in combination with ETKs, the ECU must not be reset in an uncontrolled manner.

- Only make changes when the vehicle is stationary (e.g., changes to the test setup, changes to the ETK configuration, software updates).

4 Troubleshooting Problems

This chapter provides information on what you can do when problems arise with the ES584.2 and when general problems arise that are not specific to an individual software or hardware product.

4.1 Displays of the LEDs

When assessing the operating state and rectifying faults on the ES584.2, note the display of the LEDs which provide information about the function of the interfaces and the ES584.2 (see chapter 2.10 on page 15).

4.2 Problems with the ES584.2

The following table lists several potential problems, as well as their corresponding solutions. If you have any further questions, please contact our technical service (see chapter 8 on page 41).

Problem	Diagnostics questions	Possible solution
Device is detected but cannot be initialized.		Update the firmware.
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 appears in the Windows Device Manager. It may already be installed or was perhaps installed by the operating system. You can find further information on Device Manager settings in chapter 3.4 on page 20.
	Is the USB port on the PC defective?	Try using a different USB port on the computer. Restart the PC.
The USB driver is not being installed.		Ensure that you are logged in with the necessary authorizations for installing the driver (administrator rights).
The ES584.2 module is not detected when executing the "Scan for hardware" function.	Did you install the required version of INCA?	Check whether the INCA version installed on your PC meets the requirements in chapter 5.9.2 on page 31.
	Did you install the required version of INCA ODX add-on?	Check whether the INCA ODX add-on version installed on your PC meets the requirements in chapter 5.9.2 on page 31.
	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.

Problem	Diagnostics questions	Possible solution
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 measuring setup meets the requirements.
		Check whether the cabling of the hardware to the PC is correct and intact.
		Check whether the "ER" LED is flashing: In certain circumstances, the baud rate may not be supported by the module. You can find information on the supported baud rates in chapter 5.10.2 on page 32.

5 Technical Data






This chapter contains information about the following topics:




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5.1 General Data

5.1.1 Labeling on the Product

The following symbols are used to label the product:

Symbol	Description
	Read the user manual before starting up the product.
SN: 1234567	Serial number (seven-digit)
F 00K 110 831	Order number of the product (example), see chapter 7 on page 40)
	Operating voltage (DC)
350 mA	Current consumption, max.
ES584.2	Product designation
	Manufacturer's address
	Marking for China RoHS, see chapter on page 27
	Marking for RoHS, see chapter on page 27
	Marking for CE conformity (Chapter 5.3 on page 27)

Symbol	Description
	Marking for UKCA conformity (Chapter 5.4 on page 27)
	Marking for KCC conformity (Chapter 5.5 on page 27)
	Marking for CMIM conformity (Chapter 5.5 on page 27)

5.1.2 Standards

The module complies with the following standards:

Standard	Test
EN 61326-1	Electrical equipment for measurement, control and laboratory use. EMC requirements
EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use
EN 60529	Degrees of protection provided by enclosures (IP code)
EN 60068-2-32	Environmental testing – Part 2: Test methods. Test Ed. Free fall

5.1.3 Ambient Conditions

Operating temperature range	-40 °C to +70 °C -40 °F to +158 °F
Storage temperature range (without packaging)	-40 °C to +85 °C -40 °F to +185 °F
Max. relative humidity (non-condensing)	95%
Max. altitude	5000 m / 16400 ft
Degree of contamination (IEC 60664-1, IEC 61010-1)	2
Protection rating (when closed)	IP52

5.2 RoHS Conformity

European Union

The EU Directive 2011/65/EU restricts the use of certain hazardous substances in electrical and electronic equipment (RoHS conformity). ETAS confirms that the product meets this directive applicable in the European Union.

China

With the China RoHS marking 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.

5.3 CE conformity

With the CE mark attached to the product or its packaging, ETAS confirms that the product corresponds to the product-specific, applicable directives of the European Union.

The CE Declaration of Conformity for the product is available upon request.

5.4 UKCA conformity

With the UKCA mark attached to the product or its packaging, ETAS confirms that the product corresponds to the product-specific, applicable standards and directives of Great Britain.

The UKCA declaration of conformity for the product is available on request.

5.5 KCC conformity

With the KC mark attached to the product and its packaging, ETAS confirms that the product has been registered in accordance with the product-specific KCC guidelines of the Republic of Korea.

5.6 CMIM conformity

With the CMIM mark attached to the product or its packaging, ETAS confirms that the product corresponds to the product-specific, applicable directives of the Kingdom of Morocco.

The CMIM Declaration of Conformity for the product is available upon request.

5.7 Returning and Recycling the Product

The European Union (EU) released the Directive on waste electrical and electronic equipment (WEEE) to ensure the setup of systems for collecting, treating and recycling electronic waste in all countries 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.



Fig. 5-1 WEEE symbol

The WEEE symbol (see Fig. 5-1 on page 28) on the product or its packaging indicates that the product may not be disposed of together with residual trash.

The user is obligated to separately collect old devices and hand them over 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 5 on page 25).

5.8 Open Source Software

The product uses open source software (OSS). This software is installed in the product at the time of delivery and does not have to be installed or updated by the user. Reference must be made to the use of the software in order to fulfill OSS licensing terms. Additional information is available in the document "OSS AttributionsList" on the ETAS website www.etas.com.

5.9 Mechanical Data

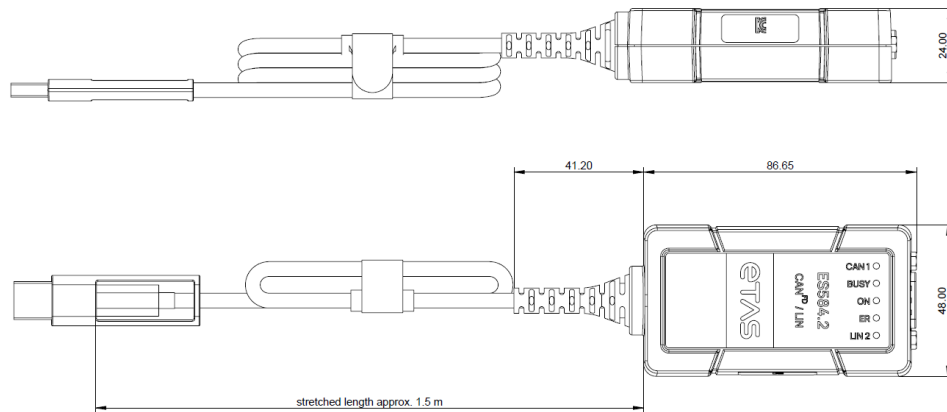


Fig. 5-2 Dimensions

Dimensions (H x W x D)	24 x 48 x 87 mm 0.95 x 1.89 x 3.42 in
Weight	0.14 kg / 0.33 lb

5.10 System Requirements

5.10.1 Hardware

PC with USB port

USB port	min. USB 2.0
	USB socket type A / C
Operating system	min. Windows 10
Driver	ES584.2 USB driver

Power supply

The product is powered via the USB port of a PC or a drive recorder. The module does not require an external power supply.



NOTE

The module must be operated directly at the USB port of a PC, a drive recorder or an active hub, whose USB interface meets the requirements stated in the table. The use of USB cables to extend the connection between ES584.2 and the PC or drive recorder is not permitted.

Prerequisite for successful initialization of the module



NOTE

A specific USB driver must be installed on the PC for operating the ES584.2 (see chapter 3.3 on page 19).

Windows user rights

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

Additional requirements

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

5.10.2 Software

Supported applications and software requirements

To operate the ES584.2, you need the following versions or higher:

Software requirements	INCA	HSP	Driver-Version
5 MBaud	from 7.2.6 - 7.5.0	14.1.0	from 2.0.0
8 MBaud	from 7.5.1	14.1.0	from 2.0.0

Supported software interfaces

ETAS offers the "ECU and Bus Interfaces – Integration Package" (EBI-IP) software development kit for integration of the ES584.2 module and the J2534 interface into application software from third-party manufacturers.

The software development kit can be downloaded free-of-charge from the download center on the ETAS website.

5.11 Electrical Data

5.11.1 Voltage Supply

Operating voltage range	4.75 to 5.25 V DC
Max. current consumption	0.35 A
Overvoltage category (mains supply, IEC 60664-1)	II

5.11.2 CAN Interface

CAN	One interface, isolated from the USB port, each channel can be configured separately
Standard	ISO 11898-1, ISO 15765-4, ISO 11898-2:2015
Protocols	CAN V2.0a (standard identifier), CAN V2.0b (extended identifier) CAN FD (ISO/CD 11898-1:2015; Bosch CAN FD specification V1.0 [non-ISO])
Transmission speed	High-speed CAN/CAN FD SIC header: Max. 1 MBaud for 20 m bus length CAN FD SIC (data): Max. 5 Mbit/s (oper- ating temperature range) CAN FD SIC (data): Max. 8 Mbit/s (room temperature)
CAN interface clients	Max. 2
Controller	ARM Cortex MCU
Transceiver (physical layer)	TJA1462BT

5.11.3 LIN Interface

LIN	One interface, isolated from the USB port
Standard	ISO 17987 Part 1-7; LIN V2.2A, compatible with LIN V1.3, LIN V2.0 and LIN V2.1
Controller	LIN core (FPGA)
Transceiver (physical layer)	TLE7259
LIN reference voltage V_{BAT}	12 V LIN systems: V_{BAT} internal from the module or external from the LIN bus, can be selected in the application soft- ware ¹⁾
	24 V LIN systems: V_{BAT} external from the LIN bus
LIN V_{BAT} (external)	12 V LIN systems: 8 V to 18 V
	24 V LIN systems: 16 V to 36 V
Operating modes	Master or slave, can be selected in the application soft- ware ²⁾
LIN interface clients	Max. 2
Clients and operating modes	Client 1: Master or slave, Client 2: Slave
Clients and LIN standard	Client 1: ISO 17987 Part 1-7, LIN V2.2A, LIN V1.3, LIN V2.0 or LIN V2.1
	Client 2: Compatible with the LIN standard used by Client 1
Electrical isolation	Interface separated from the other interfaces

¹⁾: Selection of internal LIN V_{BAT} by INCA currently in preparation

²⁾: Support for master operating mode by INCA currently in preparation

5.12 Terminal Assignment

**NOTE**

All connections are shown with view of the module interfaces.

The CAN bus is connected to the ES584.2 CAN FD and LIN Bus Interface USB Module via the nine-pin DSUB connector (see Fig. 5-3).

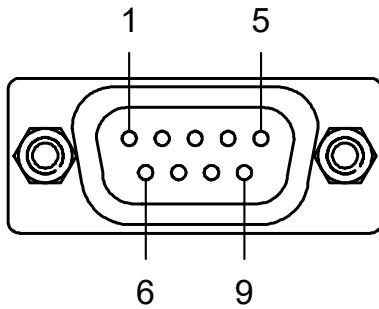


Fig. 5-3 ES584.2 DSUB connector

Pin	Signal	Meaning
1	N.C.	Not connected
2	CAN Low	CAN Low
3	GND 1	Ground 1
4	N.C.	Not connected
5	N.C.	Not connected
6	GND 2	Ground 2
7	CAN High	CAN High
8	LIN	LIN
9	LIN V _{BAT}	UBAT for LIN

A nine-pin DSUB connector is connected to the "CAN/LIN" socket.

6 Cables and Accessories

6.1 Cable CBCF100

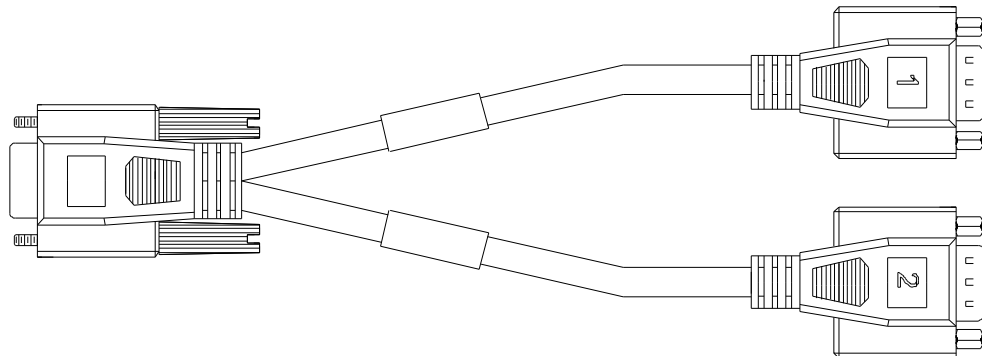


Fig. 6-1 CBCF100 cable

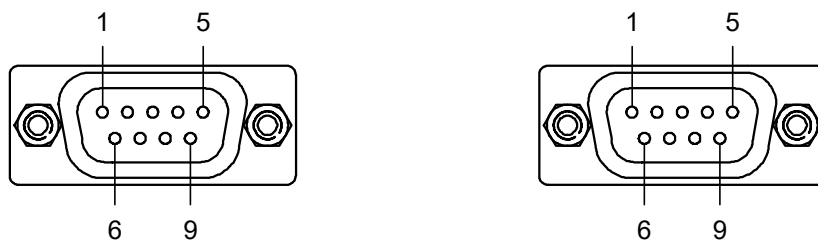


Fig. 6-2 CBCF100 cable: DSUB connection "1" and "2"

Assigning DSUB connectors "1" and "2" of the CBCF100 cable to the ES584.2

If a CBCF100 cable is used at the CAN/LIN interface of the ES584.2 module, the interfaces are assigned to DSUB connectors "1" and "2" of the cable as follows:

ES584.2	CBCF100 cable in Fig. 6-1	
Connection	Connector "1"	Connector "2"
CAN/LIN	CAN	LIN

Pin assignment of the CBCF100 cable at the CAN/LIN interface of the ES584.2

The signals of the CAN/LIN interface of the ES584.2 module are assigned to DSUB connectors "1" and "2" of the CBCF100 cable as follows:

DSUB connection "1"		DSUB connection "2"	
Pin	Signal (CAN 1)	Pin	Signal (LIN)
1	Not connected	1	Not connected
2	CAN 1, low	2	Not connected
3	Ground	3	GND
4	Not connected	4	Not connected
5	Shield	5	DSUB socket, pin 5
6	Ground	6	GND

DSUB connection "1"		DSUB connection "2"	
Pin	Signal (CAN 1)	Pin	Signal (LIN)
7	CAN 1, high	7	LIN
8	Not connected	8	Not connected
9	Not Used	9	LIN V _{BAT}

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 CBAC180 Cable

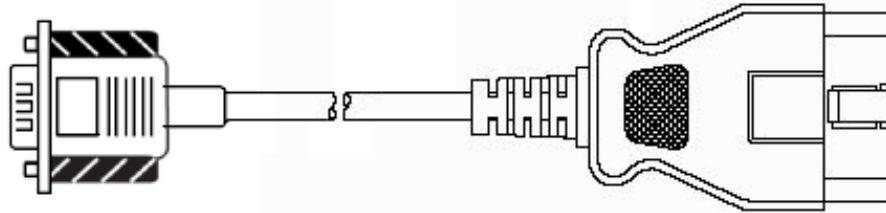


Fig. 6-3 CBAC180-2 cable

OBDII (J1962) adapter cable for the CAN interface of the ES584.2

DSUB connection	OBD2 connection	Signal	Note
Pin	Pin		
7	6	CAN High	CAN High and CAN Low in a shielded twisted pair
2	14	CAN Low	CAN High and CAN Low in a shielded twisted pair
8	3	LIN	LIN and LIN GND in a shielded twisted pair
4	11	LIN GND	LIN and LIN GND in a shielded twisted pair
9	16	LIN V _{BAT}	LIN UBAT
3	5	CAN GND	CAN GND

Order designation	Short name	Order number
CAN interface cable, OBDII J1962 - DSUB (16mc-9fc), 2 m	CBAC180.0-2	F 00K 107 300

6.3 CBH500 Cable

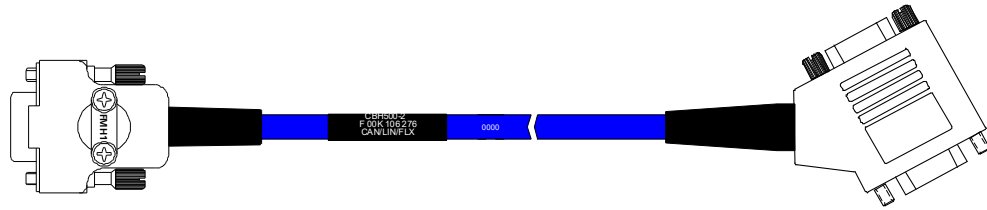


Fig. 6-4 CBH500 cable

i NOTE
 The CBH500 cable only supports one CAN channel.

Order designation	Short name	Order number
CAN, LIN and FlexRay interface cable, DSUB-DSUB (9fc - 9mc + 9fc), 2 m	CBH500-2	F 00K 106 276

6.4 CBCX130 Cable

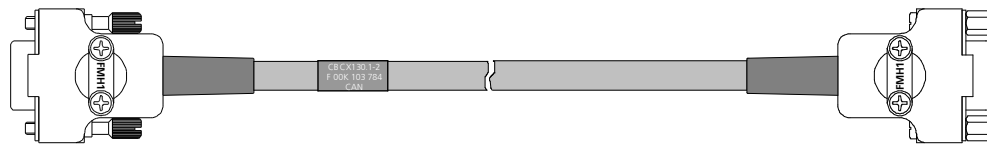


Fig. 6-5 CBCX130 cable

i NOTE
 The CBH500 cable only supports one CAN channel.

Order designation	Short name	Order number
CAN interface cable, DSUB - DSUB (9fc-9mc), 2 m	CBCX130-2	F 00K 103 784

6.5 CBCX131.1-0 Adapter

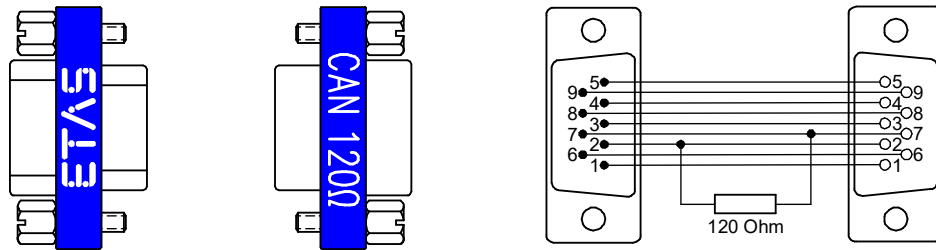


Fig. 6-6 CBCX131.1-0 terminating resistor

CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)

Order designation	Short name	Order number
CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)	CBCX131-0	F 00K 103 786

7 Order Information

7.1 ES584.2 CAN FD and LIN Bus Interface USB Module

Order name	Short name	Order number
ES584.2 CAN FD and LIN Bus Interface USB Module	ES584.2	F 00K 115 627
Scope of supply		
<ul style="list-style-type: none"> - ES584.2 CAN FD and LIN Bus Interface USB Module, - CBCF100.1 cable, - ES584.2_DVD, - "Content of this Package" list, - ES58x_ETAS_Safety_Advice 		

7.2 Accessories

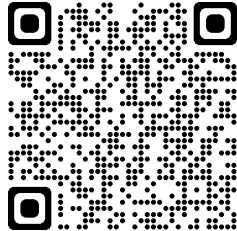
Order name	Short name	Order number
CAN and FlexRay interface Y-cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3	CBCF100.1-0m3	F 00K 107 939
CAN, LIN and FlexRay interface cable, DSUB-DSUB (9fc - 9mc + 9fc), 2 m	CBH500-2	F 00K 106 276
CAN interface cable, OBDII J1962 – DSUB (16mc-9fc), 2 m	CBAC180.0-2	F 00K 107 300
CAN interface cable, DSUB – DSUB (9fc-9mc), 2 m	CBCX130-2	F 00K 103 784
CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)	CBCX131-0	F 00K 103 786

8 Contact Information

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:

www.etas.com/en/hotlines.php



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