

ETAS ES132.1

Interface Extension Module



User Guide

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Contents

1	Safety Notices.....	5
1.1	Intended Use.....	6
1.2	Classification of Safety Messages.....	6
1.3	Assembly.....	7
1.4	Operation.....	7
1.5	Electrical Connection.....	8
1.6	Cables and Accessories.....	8
1.7	Transport.....	9
1.8	Maintenance.....	9
1.9	Repairs.....	9
1.10	Shipment and Packaging.....	9
2	Hardware Description.....	10
2.1	Overview.....	10
2.1.1	Description.....	10
2.1.2	Scope of Application.....	10
2.1.3	Properties.....	10
2.2	Connections.....	11
2.3	LEDs.....	12
2.4	Updating the Firmware.....	13
2.5	Functions.....	14
2.5.1	Block Diagram.....	14
3	Commissioning.....	15
3.1	Cabling.....	15
3.2	Operation.....	16
4	Technical Data.....	17
4.1	General Data.....	17
4.1.1	Identification on the Product.....	17
4.1.2	Norms and Standards.....	18
4.1.3	Ambient Conditions.....	18
4.1.4	Mechanical Data.....	18
4.2	RoHS Conformity.....	18
4.2.1	European Union.....	18
4.2.2	China RoHS.....	19
4.3	Declarable Substances.....	19
4.4	CE Conformity.....	19
4.5	UKCA Conformity.....	19
4.6	KCC Conformity.....	19
4.7	Product Return and Recycling.....	19
4.8	Use of Open Source Software.....	20
4.9	System Requirements.....	20

4 | Contents

4.10	Terminal Assignment	21
4.10.1	Terminal Assignment of Cables	21
4.10.2	Terminal Assignment of CAN interface	21
4.11	Electrical Data	22
4.11.1	CAN Interfaces (CAN 1 / CAN 2)	22
5	Cables and Accessories	23
5.1	CBCF100 Cable	23
5.2	CBH500 Cable	25
5.3	CBCX131.1-0 Adapter	25
5.4	Cable CBAC180	25
6	Order Information	27
6.1	ES132.1	27
6.2	Accessories	27
6.2.1	Cable	27
7	Contact Information	28
	Index of Drawings	29
	Index	30

1 Safety Notices

This chapter contains information about the following topics:

• Intended Use	6
• Classification of Safety Messages	6
• Assembly	7
• Operation	7
• Electrical Connection	8
• Cables and Accessories	8
• Transport	9
• Maintenance	9
• Repairs	9
• Shipment and Packaging	9

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.

Assembly location

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

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.
- Observe the connection and setting values ("Electrical Data" on page 22).
- The power supply for the product must be safely disconnected from the supply voltage. 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 an ETAS module in the test setup.

To de-energize the Product

1. Disconnect the product from the power supply in one of the following ways:
 - Switch off the laboratory power supply for the test setup.
 - Disconnect the test setup's connection to the vehicle battery.
 - Disconnect the product from the ETAS module supplying the power.
2. Disconnect the product from all interfaces.

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.

For detailed information about cables, see the user manual for the product.

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:

- Overview 11
- Setup 12
- LEDs 13
- Functions 15

2.1 Overview

2.1.1 Description

The Interface Extension Module ES132.1 is equipped with two CAN / CAN FD interfaces for connection to the CAN bus of a vehicle or an ECU and with a Lemo interface for connection of the following products:

- ES523.1
- ES592.1
- ES593-D
- ES595.1
- ES600.2
- ES88x
- ES89x.

2.1.2 Scope of Application

The ES132.1 can be used for the following tasks:

- Recording and capturing communication data and calibration of ECUs via the CAN 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

2.1.3 Properties

The most important properties at a glance:

- Two independent CAN/CAN FD interfaces:
 - CAN high-speed or CAN FD operating mode (SIC)
 - CAN protocols CAN V2.0a (standard identifier with 11 bit) and CAN V2.0b (extended identifier with 29 bit)
 - Support for ISO-compliant CAN FD and non-ISO-compliant CAN FD
 - Multi-client access to the same CAN channel (max. four clients can access the device; two clients per channel)
- Synchronization of the measuring channels with INCA
- DSUB connector in accordance with "CAN in Automation" (CiA)
- No external power supply necessary

- Adaptable to ambient conditions (temperature, EMC)
- High level of mechanical stability and robustness

Complete technical data for the Interface Extension Module can be found in chapter 17.

2.2 Connections



Fig. 2-1 Connections ES132.1

Fig. 2-1	Connection	Description
1	DSUB	Two independent CAN channels with separate CAN / CAN FD controllers
2	LEMO 1B	Combined connection for power supply and 10/100 BASE-T Ethernet (IEEE 802.3) via connected ETAS module (e.g. ES5xx and ES8xx)

2.3 LEDs

The ES132.1 is equipped with 5 LEDs for displaying the module's operating state, as well as for displaying the function of the two CAN connections CAN1 and CAN2.

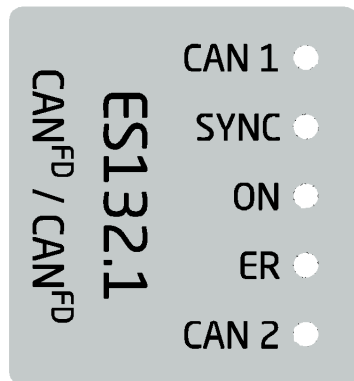


Fig. 2-2 LED layout of the ES132.1

CAN 1

LED code	Display	State
ON	Off	Communication at the CAN 1 interface interrupted
OFF		
ON	Flashing yellow	Communication at the CAN 1 interface
OFF		

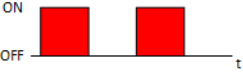

SYNC

LED code	Display	State
ON	Off	No synchronization
OFF		
ON	Flashing blue	The module is synchronized.
OFF		


ON

LED code	Display	State
ON	Off	The module is switched off.
OFF		
ON	Flashing green	The module is on standby.
OFF		
ON	Lit green	The module is switched on.
OFF		

ER

LED code	Display	State
ON OFF	Off	No error
	flashing red	Firmware update is being performed. Do not disconnect the module from the power supply.
	Lit red	The boot process was not successful or the module encountered a software error. Restart the module.

CAN 2

LED code	Display	State
ON OFF	Off	Communication at the CAN 2 interface interrupted
	Flashing yellow	Communication at the CAN 2 interface

2.4

Updating the Firmware

The firmware for the product can be updated using the ETAS "Hardware Service Pack" (HSP) service software. You can find the software in the Download Center on the ETAS website: www.etas.com

2.5 Functions

2.5.1 Block Diagram

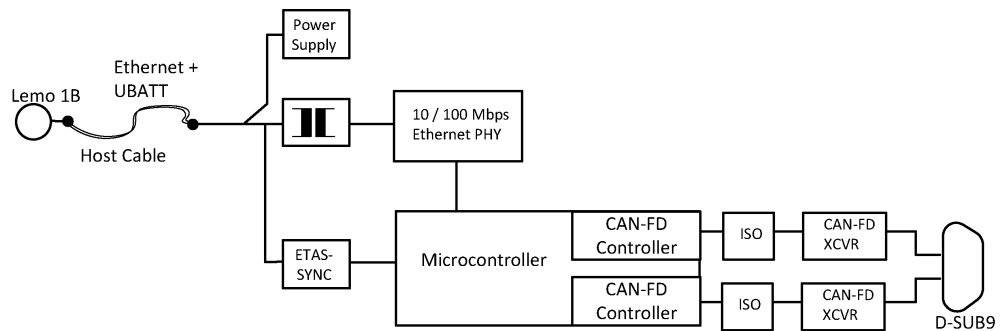


Fig. 2-3 Block diagram

The Interface Extension Module ES132.1 has two CAN interfaces (CAN1 and CAN2) at the nine-pin D-SUB connection and a LEMO connection with a standard Ethernet interface (10/100 Mbit/s in accordance with IEEE 802.3) and an integrated power supply via the connected ETAS module. The two CAN interfaces are independent CAN channels with separate CAN FD controllers.

Operating Modes

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

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

Bus Terminating Resistor

According to the CAN specification, one bus terminating resistor of 120 ohm is required at each of the two 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 (for example in a vehicle), so no additional termination is required.

Minimum Requirements for the CAN Connections

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.

3 Commissioning

This chapter contains information about the following topics:

- Cabling 15
- Operation 16

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.

3.1 Cabling

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.



NOTE

Ensure that the test setup is EMC-compliant. A test setup that uses shielded and unshielded components at the same time can lead to impairment of the signal quality and is not recommended by ETAS.

The ES132.1 is a two-channel CAN FD module with an Ethernet connection and is intended for the measurement, calibration, diagnostics and flash programming of ECUs. The power is supplied via the connected ETAS product.

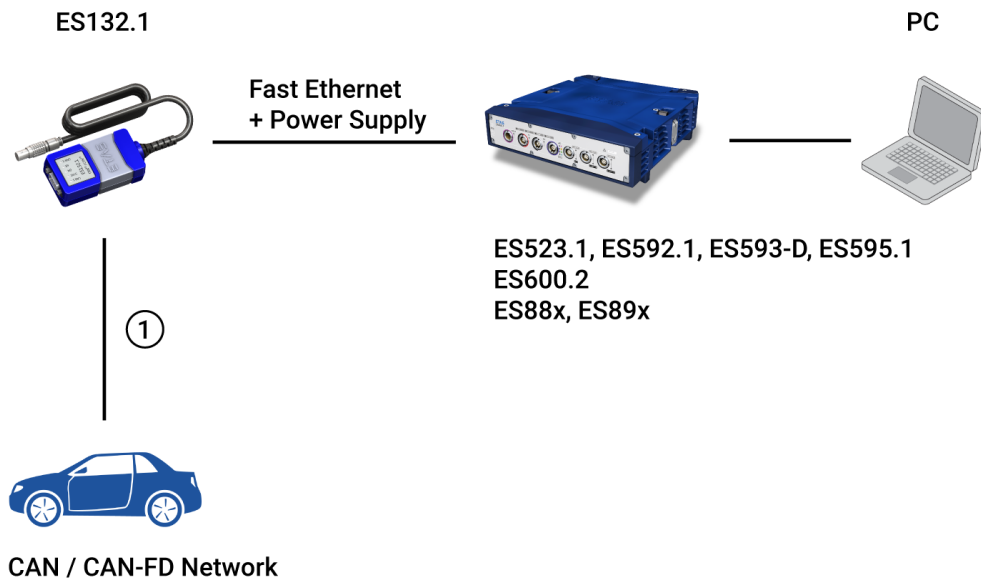



Fig. 3-1 CablingES132.1

Cables in Fig. 3-1	Function	Short name
1	CAN and FlexRay interface Y-cable	CBCF100.1-0m3
	CAN, LIN and FlexRay interface cable, DSUB-DSUB	CBH500-2
	CAN 120 ohm termination resistor	CBCX131-0
	CAN Interface Cable, OBDII J1962 - DSUB	CBAC180.0-2

3.2 Operation



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 Technical Data








This chapter contains information about the following topics:

- General Data 17
- RoHS Conformity 18
- Declarable Substances 19
- CE Conformity 19
- UKCA Conformity 19
- KCC Conformity 19
- Product Return and Recycling 19
- Use of Open Source Software 20
- System Requirements 20
- Terminal Assignment 21
- Electrical Data 22

4.1 General Data

4.1.1 Identification on the Product

The following symbols are used for identifying the product:

Symbol	Description
	Please read the user manual before starting up the product.
SN: xxxxxxx	Serial number (seven digits)
F 00K xxx xxx	Order number (chapter 6 on page 27)
x-xx V 	Operating voltage range DC
xxx mA	Max. current consumption
	Marking for RoHs conformity (chapter 4.2 on page 18)
	Marking for CE conformity (chapter 4.4 on page 19)
	Marking for UKCA conformity (chapter 4.5 on page 19)
	Marking for KCC conformity (chapter 4.6 on page 19)
	Marking for WEEE (chapter 4.7 on page 19)

4.1.2 Norms and Standards

The Interface Extension Module complies with the following standards and norms:

Standard	Test
IEC 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use
IEC 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements

4.1.3 Ambient Conditions

Operating temperature range	-40 °C to +60 °C -40 °F to +140 °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)	IP42

4.1.4 Mechanical Data

Dimensions

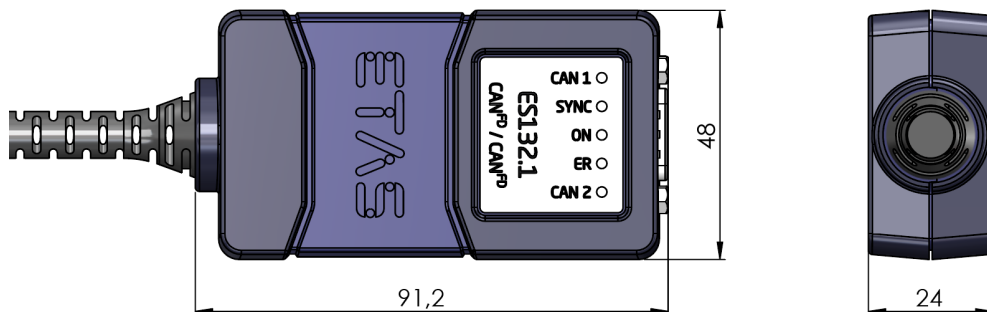


Fig. 4-1 Dimensions without cable

Dimensions (H x W x D)	92 x 48 x 24 mm 3.62 x 1.89 x 0.95 in
Dimensions (H x W x D) with cable	1592 x 48 x 24 mm 62.68 x 1.89 x 0.95 in
Weight with cable	0.18 kg / 0.4 lb

4.2 RoHS Conformity

4.2.1 European Union

The EU Directive 2011/65/EU limits the use of certain dangerous materials for electric and electronic devices (RoHS conformity).

This product does not contain any of the prohibited substances listed in EU Directive 2011/65/EU and does not exceed the maximum authorized concentrations specified. There are currently no equivalent alternative substances for individual electronic components used in our products. We are therefore making use of exemptions 7A, 7C-I and 6C (for accessory cables) in Annex III of this Directive.

ETAS confirms that the product meets this directive applicable in the European Union.

4.2.2 China RoHS

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.

4.3 Declarable Substances

European Union

Some products from ETAS GmbH (e.g. modules, boards, cables) use components with materials that are subject to declaration in accordance with the REACH regulation (EC) no.1907/2006.

Detailed information is located in the ETAS download center in the customer information "REACH Declaration" (www.etas.com/Reach). This information is continuously updated.

4.4 CE Conformity

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

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

4.5 UKCA Conformity

With the UKCA mark attached to the product or its packaging, ETAS confirms that the product meets the applicable, product-specific British standards and directives.

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

4.6 KCC Conformity

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

4.7 Product Return and Recycling

The European Union (EU) released the Directive for 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. 4-2 WEEE symbol

The WEEE symbol (see Fig. 4-2) on the product or its packaging identifies 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 7 on page 28).

4.8 Use of 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 Attributions List" on the ETAS website www.ETAS.com.

4.9 System Requirements

For the configuration of the product as well as the control and data acquisition, you need ETAS software in the following versions:

INCA	starting with Version 7.4.4
HSP	starting with Version 13.4.1

4.10 Terminal Assignment

	NOTE All connections are shown with view of the module interfaces.
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4.10.1 Terminal Assignment of Cables

LEMO connector (male)

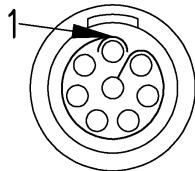


Fig. 4-3 Terminal assignment of LEMO connector

Pin	Signal	Description
1	UBATTP1	Supply voltage, positive
2	UBATTP2	Supply voltage, positive
3	UBATTM	Supply voltage, negative
4	RX_D2+	Receiving data, positive
5	TX_D1-	Transmitting data, negative
6	RX_D2-	Receiving data, negative
7	UBATTM	Supply voltage, negative
8	TX_D1+	Transmitting data, positive
Housing	GND	Shielding

4.10.2 Terminal Assignment of CAN interface

DSUB (male)

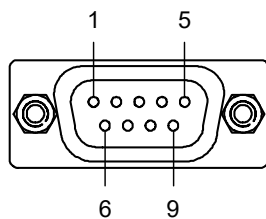


Fig. 4-4 ES132.1 DSUB connection

Pin	Signal	Description
1	-	Not connected
2	CAN 1 Low	CAN 1 Low
3	GND	Ground
4	CAN 2 Low	CAN 2 Low
5	-	Not connected
6	GND	Ground

Pin	Signal	Description
7	CAN 1 High	CAN 1 High
8	CAN 2 High	CAN 2 High
9	-	Not connected

4.11 Electrical Data

Operating voltage range	6 V to 32 V DC
Max. current consumption	0.5 A
Current consumption (standby)	approx. 0.5 mA (at 12 V DC)
Maximum voltage to ground or to all accessible parts (e.g. ECU housing, vehicle chassis)	60 V DC / 30 V AC
Overvoltage category (mains supply, IEC 60664-1)	II

4.11.1 CAN Interfaces (CAN 1 / CAN 2)

CAN	Two independent interfaces, galvanically isolated from each other and the other interfaces, each channel can be configured separately
Default	ISO11898-1:2015, ISO15765-4, ISO11898-2:2016, CiA601-4 v2.0.0
Protocols	CAN FD (ISO11898-1:2015, Bosch CAN FD specification V1.0 [non-ISO])
Transmission speed	CAN 1 Mbit/s (ISO11898-2:2016) CAN FD 5 Mbit/s (ISO11898-2:2016) CAN FD 8 Mbit/s (CiA601-4 v2.0.0)
Controller	Bosch M_CAN
Transceiver (physical layer)	TJA1462 (max. 8 Mbit/s)
Differential internal resistance Ri	10 kOhm



NOTE

The CAN/CAN FD network topology may affect the maximum transmission speed.

5 Cables and Accessories

This chapter contains information about the following accessories:

- CBCF100 Cable 23
- CBH500 Cable 25
- CBCX131.1-0 Adapter 25
- Cable CBAC180 25

5.1 CBCF100 Cable



Fig. 5-1 CBCF100 cable

Y-cable for connecting a second CAN or FlexRay channel.

DSUB connection (female)

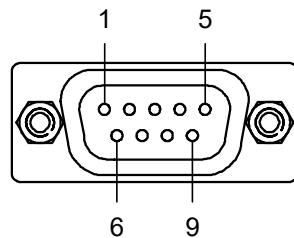


Fig. 5-2 DSUB connection (female) to the ETAS module

Pin	Description
1	Not connected
2	CAN 2 Low
3	Ground
4	Not connected
5	Shield
6	Ground
7	CAN 2 High
8	Not connected
9	Not Used

DSUB connection (male)

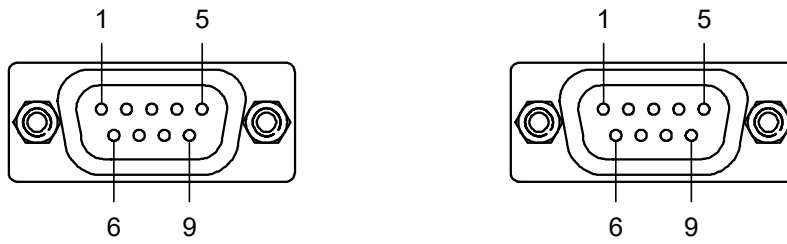
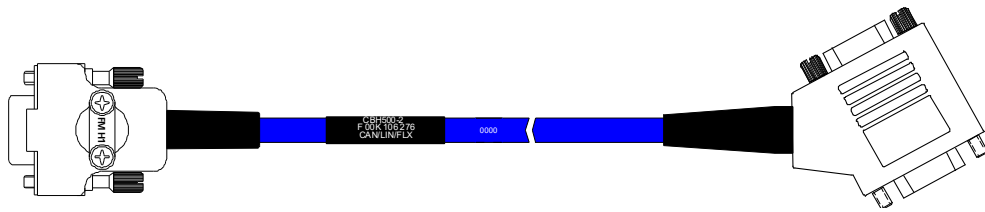


Fig. 5-3 DSUB connection (male) "1" and "2" to the CAN bus

Pin	DSUB connection "1"	DSUB connection "2"
1	Not connected	Not connected
2	CAN 1 Low	CAN 2 Low
3	Ground	Ground
4	Not connected	Not connected
5	Shield	Shield
6	Ground	Ground
7	CAN 1 High	CAN High
8	Not connected	Not connected
9	Not Used	Not Used

Order designation	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

5.2 CBH500 Cable



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

5.3 CBCX131.1-0 Adapter

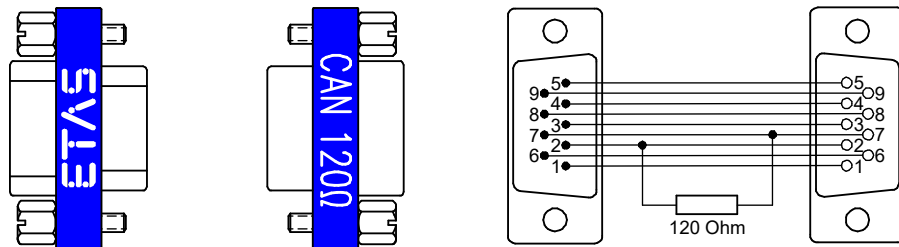


Fig. 5-4 CBCX131.1-0 terminating resistor

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

NOTE
The CBCX131.1-0 terminating resistor terminates only one of the two CAN channels. If you connect the CBCX131.1-0 terminating resistor directly to the ES132.1 the second CAN channel is not terminated.

5.4 Cable CBAC180

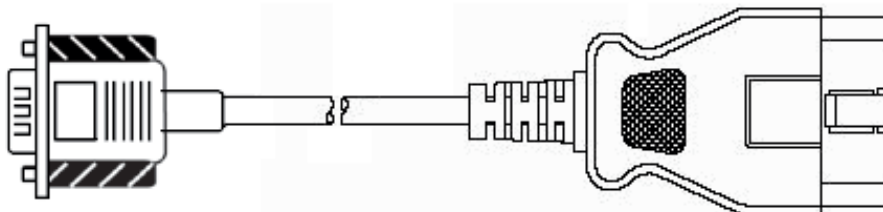


Fig. 5-5 Cable CBAC180-2

OBDII (J1962) adapter cable for the CAN Interfaces of ES132.1

DSUB connection	OBD2 connection	Signal	Note
Pin	Pin		
7	6	CAN1 High	CAN1 High and CAN1 Low in a shielded twisted pair
2	14	CAN1 Low	CAN1 High and CAN1 Low in a shielded twisted pair
8	3	CAN2 High	CAN2 High and CAN2 Low in a shielded twisted pair
4	11	CAN2 Low	CAN2 High and CAN2 Low in a shielded twisted pair
9	16	Power V+	
3	5	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 Order Information

This chapter contains information about the following topics:

- ES132.1 27
- Accessories 27

6.1 ES132.1

Order name	Short name	Order number
ES132.1 CAN FD (2 x CAN FD) interface extension module with LEMO1BFGC (8mc) Ethernet connection.	ES132.1	F-00K-112-341

Package Contents

- ES132.1 Interface Extension Module
- List "Content of this Package"
- CBCF100.1-0m3
- ETAS Safety Advice ES13x
- China-RoHS-leaflet_ES4xx_orange_cn

6.2 Accessories



NOTE

Adhere to the maximum permissible cable length.

6.2.1 Cable

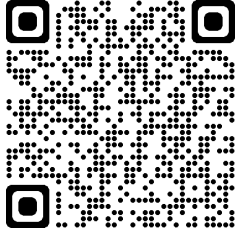
Order name	Short name	Order number
CAN and FlexRay interface Y-cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3	CBCF100.1-0m3	F-00K-107-939
CAN, LIN and FlexRay interface cable, DSUB-DSUB (9fc - 9mc + 9fc), 2 m	CBH500-2	F-00K-106-276
CAN 120 ohm terminating resistor, 2xDSUB (9fc+9mc)	CBCX131-0	F-00K-103-786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

7 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:

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Index of Drawings

Fig. 2-1	Connections ES132.1	11
Fig. 2-2	LED layout of the ES132.1	12
Fig. 2-3	Block diagram	14
Fig. 3-1	Cabling ES132.1	16
Fig. 4-1	Dimensions without cable	18
Fig. 4-2	WEEE symbol	20
Fig. 4-3	Terminal assignment of LEMO connector	21
Fig. 4-4	ES132.1 DSUB connection	21
Fig. 5-1	CBCF100 cable	23
Fig. 5-2	DSUB connection (female) to the ETAS module	23
Fig. 5-3	DSUB connection (male) "1" and "2" to the CAN bus	24
Fig. 5-4	CBCX131.1-0 terminating resistor	25
Fig. 5-5	Cable CBAC180-2	25

Index

A	
Ambient conditions	18
B	
Block Diagram	14
Bus Terminating Resistor, CAN	14
C	
Cable	
CBCF100	23
CBH500	25
Cables and Accessories	23
Cabling	15
CAN Bus Terminating Resistor,	14
CBCX131.1-0 Adapter	25
CE conformity	19
Commissioning	15
Connections	11
D	
Data	
electrical	22
mechanical	18
Dimensions	18
F	
Firmware	13
Functions	14
I	
Identification on the Product	17
K	
KCC conformity	19
L	
LED	12
M	
Mechanical data	18
N	
Norms	18
O	
Operating Modes	
CAN Interface	14
Order Information	27
P	
Product return	19
Properties	10
R	
REACH regulation	19
Recycling	19
RoHS	19
RoHS conformity	
China	19
European Union	18
S	
Scope of Application	10
Standards	18
Symbols	17
System requirements	20
T	
Technical Data	17
general	17
Terminal assignment	21
U	
UKCA conformity	19
Use, intended	6