ETAS ES134.1

Interface Extension Module

User Guide

www.etas.com

ES134.1 | User Guide R02 EN | 04.2026

Contents

1 Introduction

1.1 About ES134.1 - Interface Extension Module

The ES134.1 Interface Extension Module is equipped with two LIN bus interfaces for connection to the LIN bus of a vehicle or an ECU and with a Lemo connector for connection of data acquisition and real-time control hardware modules.

1.1.1 Scope of application

The ES134.1 can be used for the following tasks:

- Recording and capturing of communication data as well as calibration of ECUs via the LIN bus interface
- ECU diagnostics via the LIN bus interface

1.1.2 Properties

The most important properties at a glance:

- Two independent LIN interfaces
- Targeted for ECU measurement
- Multi-Client Support
- Synchronization of the measuring channels with INCA
- No external power supply necessary
- Adaptable to ambient conditions (temperature, EMC)
- High level of mechanical stability and robustness

1.2 Target audience and intended use

Target audience

For the safe and efficient use of the product, the user is expected to have comprehensive expertise and practical experience in the following automotive domains:

- Electrical and electronic system architectures in motor vehicles
- Sensor technology and control engineering
- Bus systems and communication protocols
- Electronic control unit (ECU) development and calibration
- Safety guidelines and regulatory requirements for the development and validation of vehicle systems

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 compartment
  - 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.

1.3 Safety instructions and classification

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).

1.3.1 Classification of Safety Messages

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

DANGER

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation that, if not avoided, could result in damage to physical property.

ATTENTION

ATTENTION indicates a situation that, if not avoided, could result in damage to digital property like data loss, data corruption and system vulnerability.

1.3.2 Assembly

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

1.3.2.1 Assembly location

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.

1.3.2.2 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.

1.3.2.3 Ventilation

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

1.3.3 Operation

Only operate the product with the latest firmware. You can find information about updating the firmware in the chapter "Firmware and software update".

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).

1.3.4 Electrical connection

WARNING

If an unsuitable power supply is used, this may generate a hazardous electrical voltage.

- Use a power supply that is permitted for the product.
- Do not connect the product to power outlets.
- To prevent inadvertent connection to power outlets, use power cords with safety banana plugs in areas with power outlets.

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.
- 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.

1.3.5 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.

1.4 Unpacking

1. Prepare workspace

   Unpack in a clean, dry, well-lit area with enough space for the equipment and avoid static damage or physical harm.
2. Open package

   Use appropriate tools to carefully open the box without damaging the contents.
3. Verify contents

   Compare the items with the packing list "Contents of Package" to ensure all components are present.
4. Inspect for damage

   Visually check each item for physical damage. If found, document and report it on www.etas.com/hotlines.

2 Product overview

2.1 Graphical overview of elements

Fig.	Connection	Description
1	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	DSUB	Two independent LIN channels

2.2 Compatibility

2.2.1 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 7.5.3
HSP	starting with Version 14.3.0

2.2.2 Compatible products

The Interface Extension Module ES134.1 can be connected to the following ETAS modules:

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

3 Hardware setup

3.1 Transportation and packaging

Transport

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

3.2 Mounting and placement

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.

3.3 Connection to the power supply

WARNING

If an unsuitable power supply is used, this may generate a hazardous electrical voltage.

- Use a power supply that is permitted for the product.
- Do not connect the product to power outlets.
- To prevent inadvertent connection to power outlets, use power cords with safety banana plugs in areas with power outlets.

The ES134.1 is powered by a connected ETAS product.

3.4 Connection with other products

NOTICE

Damage to the electronics due to potential equalization

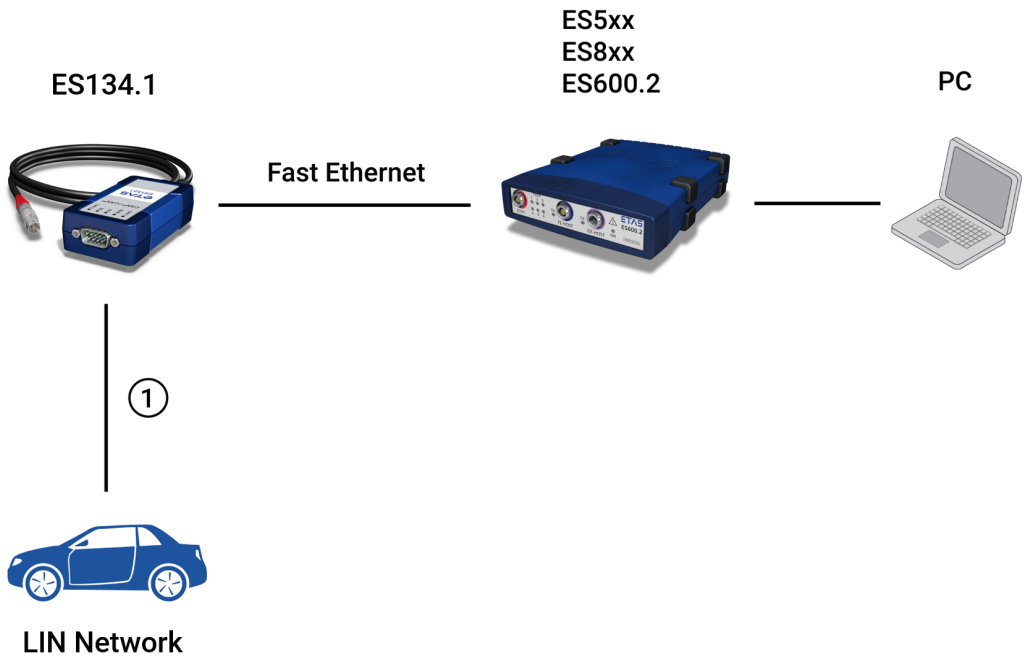
The cables' shield may be connected to the housing, the ground or the ground for the product's power supply. If there are different ground potentials in the test setup, equalizing currents can flow between the products via the cables' shield.
Take account of different electric potentials in your test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

Note

Please ensure that the device is installed and operated as described in the user manual to maintain the specified EMC properties in the respective application. Deviation from the specified installation and operation instructions or connecting the device with other devices may result in a deviation from the specified EMC properties.



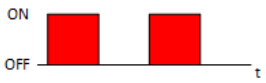
Cables in Fig.	Function	Short name
1	Connection to LIN Network	CBCF100.1-0m3
		CBH500-2

4 Basic operation

4.1 Status indicator

The ES134.1 is equipped with LEDs for displaying the module's operating state, as well as for displaying the function of the two LIN connections LIN 1 and LIN 2.

LIN 1

LED code	Display	State
	Off	Communication at LIN 1 interface interrupted
	Flashing yellow	Communication at LIN 1 interface
	Flashing red	Communication error at LIN 1 interface

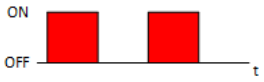
BUSY

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

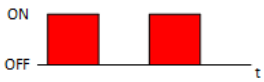
ON

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

ER

LED code	Display	State
	Off	No error
	Flashing red	Firmware update is being performed. Do not disconnect the power supply.
	Lit red	Boot process failed or software error. Restart the module.

LIN 2

LED code	Display	State
	Off	Communication at LIN 2 interface interrupted
	Flashing yellow	Communication at LIN 2 interface
	Flashing red	Communication error at LIN 2 interface

5 Overview of functions

5.1 LIN interface

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

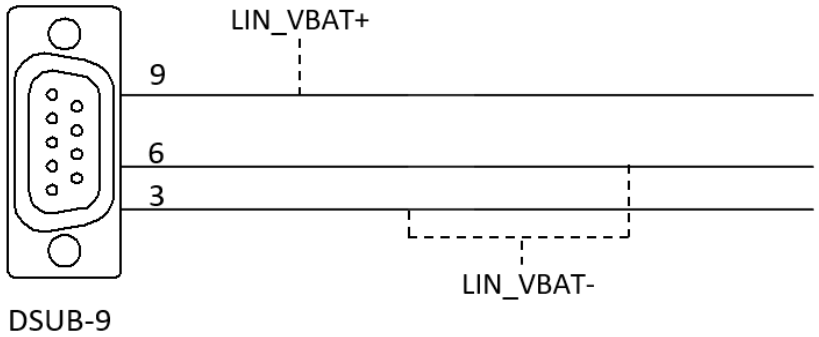
5.1.1 Operating modes

The four clients of the LIN interfaces (see chapter “Multi-Client Support”) 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
- Client 2 - 4: LIN slave

The operating mode is selected in the application software.

5.1.2 Voltage supply on the LIN bus



12 V LIN systems

In 12 V LIN systems, the LIN nodes of the ES134.1 module can either be supplied externally by the LIN bus or internally by the module with the LIN reference voltage VBAT.

24 V LIN systems

In 24 V LIN systems, the LIN node of the ES134.1 module can only be supplied externally by the LIN bus with the LIN reference voltage VBAT.

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 VBAT).

At the same time, this ensures 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 VBAT voltage as reference and supply voltage, the LIN transceivers of the dedicated LIN node of the ES134.1 can be supplied by a switchable internal voltage source of the module.

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

5.2 Multi-client support

The LIN channel of the ES134.1 module can support four clients at the same time (application tools):

- 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 ES134.1 module connected to the PC can serve two (different) clients or application tools.

6 Commissioning

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).

Note

If the ES134.1 is used as slave device, configure the ES134.1 like the master device of the LIN bus (e.g. LIN speed, LIN version etc.).

7 Technical specification

7.1 Hardware specifications

7.1.1 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 (IEC 60529) (when closed)	IP42

7.1.2 Electrical data

Operating voltage range	6 V to 32 V DC
Max. current consumption	0.5 A
Typical 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

7.1.3 Mechanical data

Dimensions (H x W x D)	92 x 48 x 24 mm 3.62 x 1.89 x 0.94 in
Dimensions (H x W x D) with cable	1592 x 48 x 24 mm 62.68 x 1.89 x 0.94 in
Weight	0.18 kg / 0.4 lb

7.2 Interface specifications

7.2.1 LIN interface

LIN	Two interfaces, isolated from the host connector
Standard	Compliant to LIN 2.0, LIN 2.1, LIN 2.2, LIN 2.2 A, and ISO/DIS 17987-4.2
Controller	LIN core (FPGA)
Transceiver (physical layer)	TLIN1029
LIN reference voltage VBAT	12 V LIN systems: V_{BAT} internal from the module or external from the LIN bus,can be selected in the application software [1)]
Operating modes	24 V LIN systems: Only V_{BAT} external from the LIN bus
Clients and operating modes	Master or slave, can be selected in the application software [2)]
Clients per LIN channel	Max. 4
Clients and LIN standard	Client 1: Master or slave Client 2 - 4: Slave
	Client 2 - 4: 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

Note

Multi-client simulation scenarios:
Turn on the LIN bus and configure all slave applications and PID responses before starting LIN communication.

7.3 Product markings

Symbol	Description
	Please read the user manual before starting up the product.
SN: xxxxxxx	Serial number
F 00K xxxxxxx	Order number
x-xx V⎓	Operating voltage range DC
xxx mA	Max. current consumption
	**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.

Symbol	Description
CE	**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 EU Declaration of Conformity for the product is available upon request. **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 7.a-I, 7.c-I and 6.c (for accessory cables) in Annex III of this Directive. ETAS confirms that the product meets this directive applicable in the European Union.
KC	**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.
CMIM	**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.

Symbol	Description
UK CA	**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.
CAN ICES / NMB	**CAN ICES conformity** This product complies with the Canadian standard: CAN ICES-003(*) / NMB-003(*) * The applicable class of the device is labeled on the product.
	**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. The WEEE symbol 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 www.etas.com/hotlines.

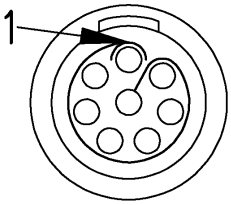
7.4 Connectors

Note

All connections are shown with view of the module interfaces.

7.4.1 Terminal assignment of cables

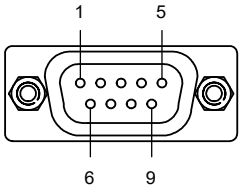
LEMO connector (male)



Pin	Signal
1	UBATTP1
2	UBATTP2
3	UBATTM
4	RX_D2+
5	TX_D1-
6	RX_D2-
7	UBATTM
8	TX_D1+
Housing	GND

7.4.2 Terminal assignment of sockets

DSUB Socket (male)



Pin	Signal
1	NC
2	NC
3	VBAT-
4	NC
5	NC

Pin	Signal
6	VBAT-
7	LIN 1
8	LIN 2
9	VBAT+

8 Maintenance

8.1 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.

8.2 Firmware and software update

8.2.1 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/HSP

8.3 Repair service

If repairs are required, send the product to ETAS.

9 Return form

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

10 Accessories and order information

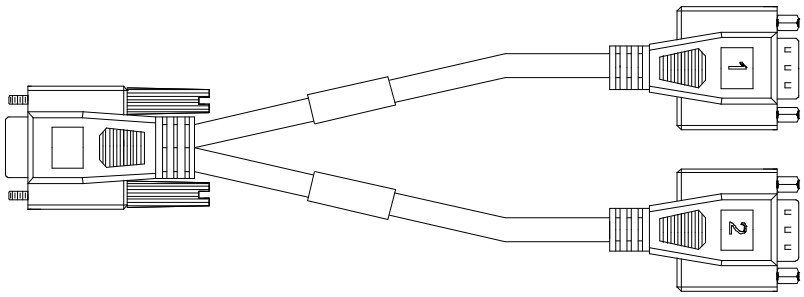
10.1 Module

Order name	Short name	Order number
ES134.1 LIN (2 x LIN) interface extension module with LEMO 1B FGC (8mc) Ethernet connection	ES134.1	F 00K 116 237

10.2 Cables

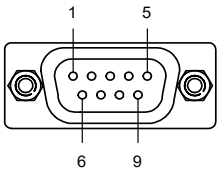
10.2.1 Data cables

10.2.1.1 CBCF100 Cable



Y-cable for connecting a second LIN channel

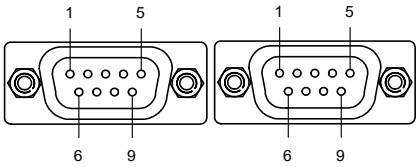
DSUB connection (female)



Pin	Signal
1	Not connected
2	Not connected
3	VBAT-
4	Not connected

Pin	Signal
5	Not connected
6	VBAT-
7	LIN 1
8	LIN 2
9	VBAT+

DSUB connection (male)



Pin	DSUB connection "1"	DSUB connection "2"
1	Connected to Pin 1 on device side	Not connected
2	Not connected	Not connected
3	VBAT-	VBAT-
4	Not connected	Not connected
5	Not connected	Connected to Pin 5 on device side
6	VBAT-	VBAT-
7	LIN1	LIN2
8	Not connected	Not connected
9	VBAT+	VBAT+

Order name	Short name	Order number
LIN and FlexRay interface Y-cable, DSUB – 2 x DSUB (9fc-9mc+9mc), 0m3	CBCF100.1-0m3	F 00K 107 939

10.2.1.2 CBH500 Cable

Note

The CBH500 cable only supports one LIN channel.

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

11 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/hotlines

ETAS offers trainings for its products:

www.etas.com/academy

ETAS headquarters

ETAS GmbH		
Borsigstraße 24	Phone:	+49 711 3423-0
70469 Stuttgart	Fax:	+49 711 3423-2106
Germany	Internet:	www.etas.com

12 Legal information

12.1 Use of Open Source Software

The product might use Open Source Software (OSS). This software is installed on the product at shipment and does not need to be installed or updated by the user. If OSS is used, see the accompanying "OSS Attributions Document" for more information.

12.2 Certification and conformity

12.2.1 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. The REACH Declaration is available online at www.etas.com/reach and is continuously updated.

12.3 Standards and norms

The ES134.1 complies with the following standards and norms:

Standards	Title	Further information
IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	
IEC 61326-1:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements	Electromagnetic environment: Industrial
CISPR 11:2015,CISPR 11:2015/AMD1:2016, CISPR 11:2015/AMD2:2019	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement	Class of the equipment: Class B Group of the equipment: 1

12.3.1 EMC Class B

USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Responsible Party – U.S. Contact Information
ETAS Inc.
15800 N. Hagerty Road
Plymouth, MI
48170
www.etas.com/US