ETAS

DRIVING EMBEDDED EXCELLENCE

ETAS ES921.1 CAN Module

User Guide

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ES921.1 - User Guide R08 EN - 03.2021

Contents

1 About this Document

1.1 Classification of Safety Messages

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

 **DANGER**

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

 **WARNING**

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

 **CAUTION**

indicates a hazardous situation of low risk which may result in minor or moder-ate injury if not avoided.

NOTICE

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

1.2 Presentation of Instructions

The target to be achieved is defined in the heading. The necessary steps for his are in a step-by-step guide:

Target definition

1. Step 1
2. Step 2
3. Step 3

> Result

1.3 Typographical Conventions

Hardware

Bold	Menu commands, buttons, labels of the product
Italic	Emphasis on content and newly introduced terms

1.4 Presentation of Supporting Information

NOTE

Contains additional supporting information.

2 About this Manual

This chapter contains information about the following topics:

2.1 Scope of Supply

Prior to the initial commissioning of the module, please check whether the module was delivered with all required components and cables (see chapter 9.1 on page 38).

Additional cables and adapters can be obtained separately from ETAS. A list of available accessories and their order designation is located in chapter “Accessories” on page 38 of this manual or in the ETAS product catalog.

2.2 Additional Information

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

3 Basic Safety Notices

This chapter contains information about the following topics:

3.1 General Safety Information

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

NOTE

Carefully read the documentation (Product Safety Advice and this User's Guide) that belongs to the product prior to the startup.

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

3.2 Requirements for Users and Duties for Operators

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

General safety at work

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

3.3 Intended Use

The ES910.3-A has a simulation controller and the ECU interfaces CAN, LIN, ETK and XETK and also one interface for Daisy Chain modules (ES4xx/ES63x/ES93x modules).

If additional interfaces are required, the extension slot of the ES910.3-A can be used with the ES920.1 FlexRay Module, the ES921.1 CAN Module or with the ES922.1 CAN FD Module.

Application area of the product

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

Requirements for the technical state of the product

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

Requirements for operation

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

Electrical safety and power supply

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

Power supply

- The power supply for the product must be safely disconnected from the supply voltage. For example, use a car battery or a suitable lab power supply.
- Use only lab power supplies with double protection to the supply network (with double insulation/reinforced insulation (DI/ RI)).
- The lab power supply must be approved for an operating altitude of 5000 m and for an ambient temperature of up to 70 °C.
- In regular operation of the modules as well as very long standby operation, a discharge of the vehicle battery is possible.

Connection to the power supply

- The power cable must not be connected directly to the vehicle battery or lab power supply, but via a fuse of up to 20 A.
- Ensure that the connections of the lab power supply, the power supply at the module and the vehicle battery are easily accessible!
- Route the power cable in such a way that it is protected against abrasion, damages, deformation and kinking. Do not place any objects on the power cable!

DANGER

Dangerous electrical voltage!

Connect the power cable only with a suitable vehicle battery or with a suitable lab power supply! The connection to power outlets is not allowed!

To prevent an inadvertent insertion in power outlets, ETAS recommends to equip the power cables with safety banana plugs in areas with power outlets.

Approved power supply cables

Power supply cables suitable for the ES910.3-A module can be delivered in two designs:

- power supply cable CBP120 with standard banana plugs (current design)
- power supply cable CBP1205 with safety banana plugs (new design)

NOTE

Power supply cables with safety banana plug are suitable only for connection to voltage sources with safety socket.

NOTE

Application, permissible voltages and all the other technical data of the power supply cables are identical for both designs.

De-energizing the module

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

- Disconnecting the cables from the measurement inputs

and

- Disconnecting the module from the power supply
  - Disconnecting the module from the lab power supply

    Separating device is the lab plug of the power cable or the plug of the power cable at the connection of the module

  or

– Disconnecting the module from the vehicle battery
  Separating device is the lab plug of the power cable or the plug of the power cable at the connection of the module

or

– Disconnecting the vehicle battery.

Approved cables

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

Requirements for the location

- Position the module or the module stack on a smooth, level and solid underground.
- The module or the module stack must always be securely fastened.

Fixing the modules on a carrier system

- When selecting the carrier system, observe the static and dynamic forces that could be created by the module or the module stack on the carrier system.

Requirements on the ventilation

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

CAUTION

Heat concentration in the module possible!

The electronics can be damaged due to overheating.

Do not cover ventilation slits when setting up, assembling or connecting the ES910.3-A module.

Adhere to the minimum distances at the sides and above.

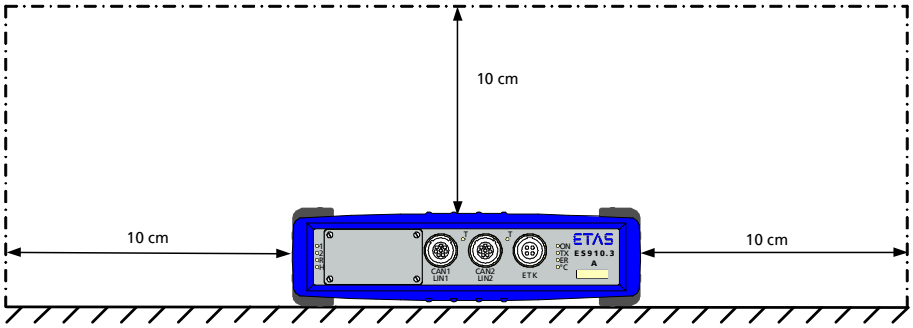
- Do not stand the module on its long sides.
- Do not stand the module on its top side.
- Never place objects on top of the module.
- The free space above and behind the module must be selected so that sufficient air circulation is ensured. Adhere to the minimum distances of at least 10 centimeters on the sides and above the module.
- Do not operate the module in completely enclosed containers.

CAUTION

Heat concentration on the long sides of the module.

The electronics can be damaged due to overheating.

Do not cover ventilation slits when setting up, assembling or connecting with other modules. Adhere to the minimum distance at the sides.



CAUTION

Heat concentration on the top of the module.

The electronics can be damaged due to overheating.

Do not stack several ES910.3-A modules on top of each other.

When stacking the ES910.3-A with other ETAS modules, it always has to be on top.

Assembling (interconnecting) the modules

- Prior to assembling (interconnecting) or separating a module stack, the modules must be disconnected from the supply voltage or they have to be in the standby operating mode.

Transport

- Stack and connect the modules only at the location of the startup!
- Do not transport the modules at the cable of the module or any other cables.

Maintenance

The product is maintenance-free.

Repair

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

Cleaning the module housing

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

Ambient conditions

The housing and the connectors of the module as well as the plug connectors of the cables meet the degree of protection IP30.

Opening the module

CAUTION

Damage to the module and loss of properties based on IP30!

Do not open or change the module housing!

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

Potential equalization

CAUTION

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

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

Cabling

For detailed information about cabling, see the User's Guide of the module.

4 Hardware Description

This chapter provides an overview of the CAN Module ES921.1 and provides you with information on its properties, connectors and the LED.

4.1 Overview

The complexity of systems in automotive electronics is constantly on the increase due to the increasing number, growing function scope and networking of electronic ECUs in vehicles. This in turn increases the requirements made of communication interfaces between electronic ECUs and other electronic components in the vehicle.

Serial communication buses such as the CAN bus (Controller Area Network) play a significant role in this data exchange. The CAN bus is also an important standard in the networking of on-board components. Modern vehicles not only have CAN buses but also other bus types which are connected to networks via gateways.

CAN applications are divided into the two categories Low-Speed CAN (max. 125 kBaud) and High-Speed CAN (125 kBaud to 1 MBaud).

4.2 ES921.1

The ES921.1 CAN Module is an extension module for the ES910 Rapid Prototyping Module.

NOTE

Operating the ES921.1 is possible in the extension slot of the ES910.2 and the ES910.3-A.

The CAN module ES921.1 has two CAN bus interfaces (High- and Low-Speed). Each of these CAN bus interfaces can be configured independently of the other either as a High-Speed CAN or as a Low-Speed CAN. The physical CAN layers (CAN Transceiver) are switched in this case.

When it is accommodated in the extension slot of the ES910 module, you can, for example, use CAN-IO with the first interface with the ES921.1 while you monitor CAN messages with the second one.

Together with the ES910, the ES921.1 module is part of a highly efficient, compact development and experimental platform with high computing and simulation performance. A target-similar and fast floating-point processor is used. The AUTOSAR-compatible RTA-OSEK operating system of the ES910 guarantees simple transition from the finished function prototype to ECU software development.

4.2.1 General Features

General features of the ES921.1:

- Extension of the ES910 with CAN interfaces for rapid prototyping
- Two independent CAN interfaces (High Speed or Low Speed)
- Physical layer/ transceiver
  - Philips TJA1040 for CAN High-Speed (max. 1 MBaud)
  - Philips TJA1054 for CAN Low-Speed (max. 125 kBaud)
- CAN IP Controller
- CAN protocols
  - CAN V2.0a (Standard Identifier with 11-bit)
  - CAN V2.0b (Extended Identifier with 29-bit)
- Baud rate can be configured by software
- LED for displaying communication on the CAN interface
- “Wake-Up” function in the operating mode High-Speed CAN
- Galvanic isolation of the interfaces from the device ground and the supply voltage
- Part of the ETAS tool suite – supported by INCA/INCA-EIP, INTECRIO, ASCET-RP, HSP

4.2.2 Rapid Prototyping Functions

The CAN interfaces of the ES910 and ES921.1 are comparable in terms of their functions.

Important rapid prototyping functions of the ES921.1:

- CAN-IO
- XCP on CAN Bypass

For the complete technical data of the ES921.1, refer to the chapter “Technical Data” on page 28.

4.2.3 View of the Module

The following figure shows the ES921.1 CAN Module with the position of the ports and the LED.

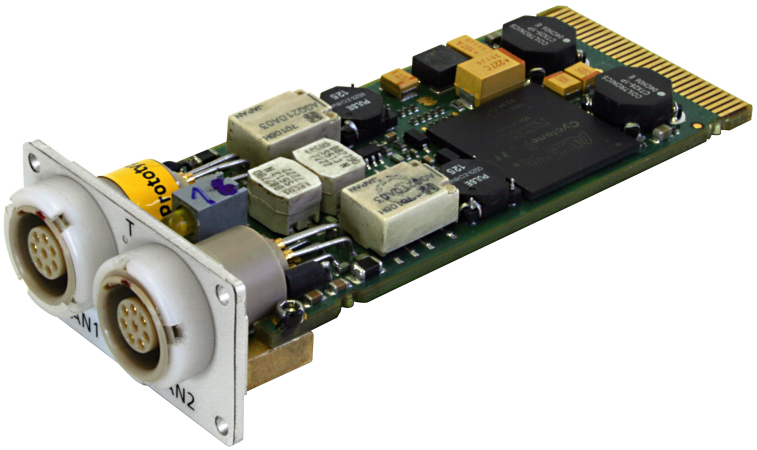


Fig. 4-1 ES921.1 Module

4.2.4 Ports

The CAN ports CAN1 and CAN2 are on the front of the ES921.1.

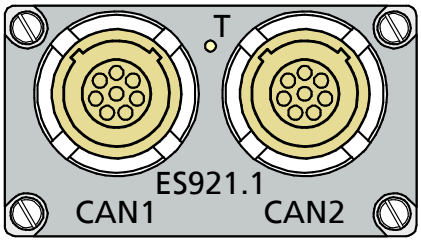


Fig. 4-2 ES921.1Ports

4.2.5 LED

A common LED **T** is assigned to the interfaces CAN1 and CAN2. When the ES910 is powered on, this LED displays the following functional states:

LED	Display	Functional State
T	Yellow	Communication on at least one of the two interfaces
	Off	Communication interrupted

5 Functional Description

This chapter describes the block diagram, the operating modes and the termination of the CAN interfaces, the “Wake-Up” and “Sleep” functions as well as the firmware update.

5.1 Block Diagram

The ES910 has a slot for extension modules (extension slot). This slot can, for example, accommodate the ES921.1 CAN Module.

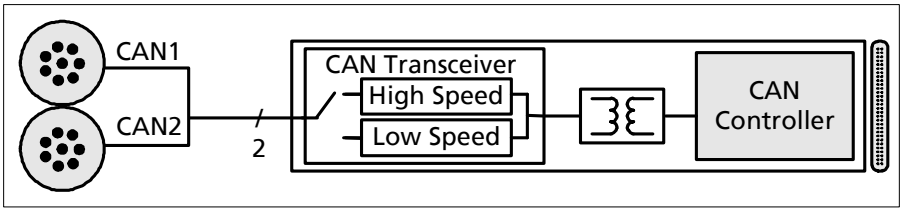


Fig. 5-1 Block Diagram of the ES921.1

5.2 CAN Interface (CAN1, CAN2)

The ES921.1 has two CAN interfaces. One of the CAN interfaces is routed to the two 8-pin CAN1 and CAN2 connectors (Lemo sockets) on the front panel.

CAN1 and CAN2 are independent CAN interfaces with independent connections and CAN controllers. The CAN interfaces establish a simple and direct connection between the ES921.1 and the CAN network.

The interfaces are galvanically isolated from each other.

5.2.1 Operating Modes

The CAN interfaces of the ES921.1 can be operated in High-Speed CAN link (ISO 11898-2) or Low-Speed CAN link (ISO 11898-3). Switching between the two operating modes is controlled by software. The operating mode can be selected individually for each interface.

5.2.2 Feature

The connection to the external device takes place with a maximum transfer rate of 1 MBaud (ISO-Highspeed Norm). The baud rates can be configured in the calibration software.

The following CAN applications are supported:

- CAN-IO with INTECRIO
- XCP on CAN Bypass with INTECRIO
- “Wake-Up” function (only for High-Speed CAN)

The functions are extended successively both for measuring and calibration and for rapid prototyping.

5.2.3 Bus Termination Resistor

Low-Speed CAN

In the ES921.1, two relatively high-impedance termination resistors of 2.26 kOhm each (RTH, RTL) are integrated for the Low-Speed CAN link.

This guarantees that, in a terminated CAN network, the ES921.1 does not have a great influence on the sum of the terminations of the overall system. This should, however, be checked regardless particularly with lab networks or with tests in existing networks.

In a Low-Speed CAN network, the individual nodes are typically terminated with 500 Ohm to 6 kOhm. To ensure optimum system conditions, the CAN network should be terminated with around 100 Ohm (parallel connection of all terminations).

For more details on the Low-Speed CAN network, consult the ISO/DIS 11898 “Road vehicles — Controller area network (CAN) — Part 3: Low-speed, fault-tolerant, medium dependent interface”.

NOTE

The bus termination resistors intended for High-Speed CAN can **not** be used in this operating mode!

High-Speed CAN

The High-Speed operating mode of the CAN interface requires the use of bus termination resistors.

In accordance with the CAN specification, a bus termination resistor of 120 Ohm is required at each of the two open ends of the bus. This has to be connected to the cable or to the connector. ETAS supplies cables and termination resistors of 120 Ohm for setting up CAN networks.

The terminations have to be connected to the cable or to the connector.

5.3 “Wake-Up” and “Sleep” Function

The ES921.1 module supplements the “Wake-Up” function of the ES910 module with further control possibilities. The ES921.1 can control the activation of the overall system ES910/ ES921.1 in the vehicle.

The overall system ES910/ ES921.1 can effectively be in three different states: Off, Standby and On.

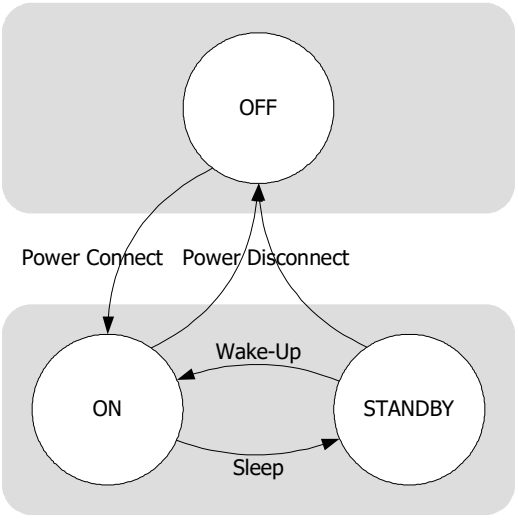


Fig. 5-2 Operating Modes

For more detailed information on the operating modes refer to the ES910 manual.

NOTE

The **ON/AUTO** switch of the ES910 must be switched to **AUTO** for this function to be able to be used.

5.3.1 “Wake-Up” Function

NOTE

The “Wake-Up” function is only supported if at least one CAN interface of the ES921.1 is configured as High-Speed CAN.

The “Wake-Up” condition is fulfilled as soon as signals are transferred on at least one of the CAN buses of the ES921.1 module.

5.3.2 “Sleep” Function

The “Sleep” condition is fulfilled as soon as no signals are transferred on the CAN buses.

5.3.3 Configuration

The “Wake-Up” and “Sleep” behavior of the ES921.1 is configured in the web interface of the ES910 module (see section 6.4.2 on page 27).

5.4 Firmware

5.4.1 ES921.1 Firmware

NOTE

As delivered, the ES910 module contains *no* firmware to support the modules mountable in the extension slot.

The required firmware will be loaded additionally when the extension module is plugged in and the ES910 firmware is updated by the HSP service software. This firmware update is esssential in following cases:

- after the first-time installation of an extension module
- after every module type replacement in the extension slot (e.g. ES920 replaces the ES921)

If immediate successively different examplares of the same module type (e.g. ES920) are used in the same ES910 module no additional firmware update is necessary.

5.4.2 Firmware Update

The firmware of the ES921.1 can be updated by the user so that future versions of the module can also be implemented. The firmware update is executed on the connected PC using the HSP service software.

6 Getting Started

The “Getting Started” chapter contains a description of how to install the ES921.1 in and remove it from the ES910 module, the applications, wiring, configuration and notes on troubleshooting for the ES921.1.

6.1 Assembly

The extension slot on the front of the ES910 has a removable front panel. You have to replace this front panel with the ES921.1 module if you want to use the CAN interfaces.

6.1.1 Removing the Front Panel of the ES910 Extension Slot

To install the ES921.1 in the ES910, you need a flat-bladed screwdriver (width of edge 2 mm).

CAUTION

Some components may be damaged or even destroyed by static discharge!

Leave the module in its transport package until you want to install it.

The module should only be taken from its package and installed at a working place that is protected against static discharge.

To remove the front panel of the ES910 extension slot:

1. Switch off the power supply to the ES910 module.
2. Make sure that all devices connected to the module with cables are powered off.
3. Place the ES910 on a solid surface.

CAUTION

Damage to the ES910 possible!

The ES910 module must not be stood on its back when removing the front panel.

The mounting screws of the extension slot must not fall into the module.

4. Unscrew and remove the four screws from the corners of the front panel of the extension slot.
5. Keep the screws in a safe place. They are needed to secure the ES921.1 module.
6. Remove the front panel.

   Four threads for the screws which will secure the ES921.1 module become visible under the front panel.
7. Keep the front panel in a safe place. You need it if you want to operate the ES910 without the ES921.1.

6.1.2 Installing the ES921.1 in the ES910 Module

There are guide rails on the right and left in the extension slot of the ES910 for accommodating the ES921.1. The mechanical connection of the modules simultaneously establishes all necessary electrical connections between the modules.

CAUTION

Some components may be damaged or even destroyed by static discharge!

Leave the module in its transport package until you want to install it.

The module should only be taken from its package and installed at a working place that is protected against static discharge.

To install the ES921.1 into the ES910 module:

1. Place the ES910 on a solid surface.

CAUTION

Damage to the ES910 possible!

The ES910 module must not be stood on its back when the ES921.1 is installed in the ES910 module.

2. Position the ES921.1 in front of the extension slot of the ES910 module.

   Align the back of the ES921.1 with the front of the housing of the ES910.

NOTE

The labeling on the fronts of both modules must be pointing in the same direction!

3. Slide the module into the guide rails without getting it off-line.

NOTE

The contact spring in the extension slot of the ES910 must not be damaged when the ES921.1 is installed.

4. Press on the front panel of the ES921.1 from the front.

   The connectors of the ES921.1 and the ES910 click into place.

CAUTION

Damage to the ES910 possible!

The mounting screws of the extension slot must not fall into the module.

5. Screw the four screws with which the front panel was attached into the front panel of the ES910 module.
6. Screw the two modules together.

   ES921.1 and ES910 are now mechanically connected. All necessary electrical connections between the ES921.1 and ES910 were established at the same time.

6.2 Disassembly

6.2.1 Removing the ES921.1 from the ES910 Module

To remove the ES921.1 from the ES910, you need a flat-bladed screwdriver (width of edge 2 mm). To make removing the device simpler, make sure you have two K106 CAN cables readily available.

CAUTION

Some components may be damaged or even destroyed by static discharge!

Leave the module in its transport package until you want to install it.

The module should only be taken from its package and installed at a working place that is protected against static discharge.

To remove the ES921.1 from the ES910 module:

1. Switch off the power supply to the ES910 module.
2. Make sure that all devices connected to the module with cables are powered off.
3. Place the ES910 on a solid surface.

CAUTION

Damage to the ES910 possible!

The ES910 module must not be stood on its back when the ES921.1 is being removed.

The mounting screws of the extension slot must not fall into the module.

4. Unscrew and remove the four screws from the corners of the front panel of the extension slot.

   Keep the screws in a safe place. They are needed to attach the front panel.
5. Connect one CAN cable to each of the CAN interfaces.
6. Get hold of the cables as near as possible to the module.
7. Slide the ES921.1 module out of the ES910 without getting it off-line.

8. Remove the two cables from the ES921.1.
9. Store the ES921.1 in accordance with the ESD regulations.

6.2.2 Attaching the Front Panel of the ES910 Extension Slot

To attach the front panel of the ES910 extension slot:

1. Position the front panel in front of the extension slot of the ES910 module.

   Align the back of the front panel with the front of the housing of the ES910.

2. Use the screws the ES921.1 was attached with to screw on the front panel.

CAUTION

Damage to the ES910 possible!

The ES910 module must not be stood on its back when the front panel is being attached.

The mounting screws of the extension slot must not fall into the module.

3. Tighten the four screws on the front panel of the ES910 module.

   The ES910 and the front panel are now mechanically connected.

6.3 Wiring

NOTE

Make sure you carefully check the names of the cables used. Using the wrong cables can keep your ES921.1 from functioning properly or damage the ES921.1 and any devices connected to it.

ETAS supplies special connecting cables which can be ordered separately if required. An overview is contained in the chapter “Accessories” on page 38.

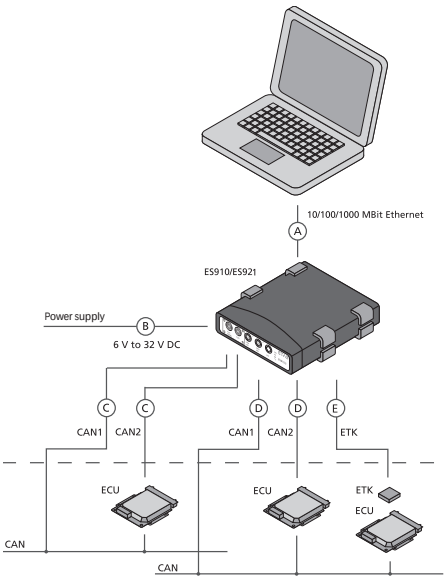


Fig. 6-1 Wiring the ES921.1 and ES910 Modules

Cable in Fig. 6-1	Function	Short Name
A	PC connecting cable	CBE200
B	Power supply cable	CBP120, CBP1205
C, D	CAN connecting cable	K106, K107, K95, CBAC140, CBCX130
E	ETK connecting cable	CBM150

6.4 Configuring the ES921.1

The ES921.1 is configured on your PC in the application program; the “Wake Up” function of the ES921.1 is configured in the web interface of the ES910 module.

6.4.1 Web Interface

The web interface of the ES910 consists of a home page, a page for customized configuration of the ES921.1 for the “Wake Up” function and other pages.

6.4.2 Configuring the “Wake Up” Function of the ES921.1 Module

To launch the ES910 web interface:

1. Connect the ES910 to the PC.
2. Start the HSP program on the PC.
3. Click **Hardware Search**.
4. Highlight the ES910 to be configured in the “Hardware” window.
5. Right-click **System Configuration**.

   The default web browser launches the web interface for configuring the ES910 with the current IP address of the module in the address field.

   The home page of the ES910 web interface is displayed.

To configure the “Wake Up” function:

1. Click **Config**.
2. Click **Wake Up**.

   The page for configuring the “Wake Up” function is displayed.
3. Configure the interfaces of the ES921.1 for the “Wake Up” function.

6.5 Troubleshooting

Please observe the LEDs which provide information on the functions of the ports and the ES921.1 (see the section “LED” on page 16) to be able to judge the operational state of the ES921.1 as well as troubleshooting measures.

The following table lists one possible problem with a remedy.

Problem	Diagnostic Questions	Possible Solutions
The ES921.1 is not found in HSP with “Search for Hardware”.	Is the hardware connected to the PC with the CBE100 cable?	Check that the connection is undamaged.

If you have any further questions, please contact our Customer Support (see chapter 10 on page 39).

7 Technical Data

This chapter describes the pin assignment, general data and electrical data of the ES921.1.

7.1 General Data

This section contains general data on the ES921.1.

7.1.1 Identifications on the product

The following symbols are used for identifying the product:

Symbol	Description
	The User's Guide must be read prior to the startup of the product!
SN: 1234567	Serial number (7-digit)
Vx.yz	Hardware version of the product
F 00K 123 456	Order number of the product (see chapter 9.1 on page 38)
	Marking for CE conformity (Chapter 7.3 on page 29)
	Marking for UKCA conformity (Chapter 7.4 on page 29)
	Marking for KCC conformity (Chapter 7.5 on page 29)
	Marking for WEEE, see chapter 7.6 on page 30
	Marking for China RoHS, see chapter on page 29

7.1.2 Fulfilled Standards and Norms

CE Norms

The module adheres to the following standards and norms:

Norm	Test
EN 61326	Electrical equipment for measurement, control and laboratory use - EMC requirements
EN 61000-6-2	Immunity (industrial environments)
EN 61000-6-4	Emission standard (industrial environments)

The module is designed only for use in industrial environments in accordance with EN 61000-6-4. When using the module outside of industrial environments avoid possible radio disturbances by additional shielding measures!

WARNING

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

7.2 RoHS conformity

European Union

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

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

China

ETAS confirms that the product meets the "China RoHS" (Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation) guidelines applicable to the People's Republic of China with a China RoHS label attached to the product or its packaging.

7.3 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.

7.4 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.

7.5 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.

7.6 Product return and recycling

The European Union (EU) has issued the guideline on waste electric and electronic equipment (Waste Electrical and Electronic Equipment - WEEE) in order to ensure the institution of systems for collection, handling, and disposal of all electronic scrap.

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. 7-1 WEEE symbol

The WEEE symbol (see Fig. 7-1 on page 30) 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 separate the waste equipment and to provide it to the WEEE return system for reuse.

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 10 on page 39).

7.7 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 shall 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" at the ETAS website www.etas.com.

7.8 System Requirements

7.8.1 Hardware

To operate the modules, an ES910 Rapid Prototyping Module is necessary.

NOTE

Operating the ES921.1 is possible in the extension slot of the ES910.2 and the ES910.3-A.

7.8.2 Software

ES921.1 mounted in the ES910.2

To configure the ES921.1 mounted in the ES910.2 and for control and data acquisition, you need software in the following versions and higher:

			Support in Application Software		
Application	Classification [1]	HSP	INCA	INTECRIO	ASCET-RP
CAN-IO	RP	V6.1	no	V3.0	V6.1 [3]
XCP on CAN Bypass	RP	V6.1	no	V3.0	V6.1 [3]
CAN Monitoring	MC	V7.0	V6.2.0 [2]	no	no
CCP	MC	V7.1.0	V6.2.1 [2]	no	no
CAN-Output	MC	V7.1.0	V6.2.1 [2]	no	no
XCP on CAN MC	MC	V7.1.0	V6.2.1 [2]	no	no
KWP2000	MC	V7.1.0	V6.2.1 [2]	no	no
UDS	MC	V7.1.0	V6.2.1 [2]	no	no

[1]: RP: Rapid Prototyping, MC: Measurement and Calibration
[2]: no Hotfix and no additionally INCA-ES9xx Add-On V6.2.2 necessary
[3]: with HSP V8.1.0 and higher

ES921.1 mounted in the ES910.3-A

To configure the ES921.1 mounted in the ES910.3-A and for control and data acquisition, you need software in the following versions and higher:

			Support in Application Software		
Application	Classification [1]	HSP	INCA	INTECRIO	ASCET-RP
CAN-IO	RP	V8.0.0	no	V3.1.1	V6.1 [3]
XCP on CAN Bypass	RP	V8.0.0	no	V3.1.1	V6.1 [3]
CAN Monitoring	MC	V8.0.0	V6.2.1 [2]	no	no
CCP	MC	V8.0.0	V6.2.1 [2]	no	no
CAN-Output	MC	V8.0.0	V6.2.1 [2]	no	no
XCP on CAN MC	MC	V8.0.0	V6.2.1 [2]	no	no
KWP2000	MC	V8.0.0	V6.2.1 [2]	no	no
UDS	MC	V8.0.0	V6.2.1 [2]	no	no

[1]: RP: Rapid Prototyping, MC: Measurement and Calibration
[2]: INCA V6.2.1 with Hotfix 7 and additionally INCA-ES9xx Add-On V6.2.1 and higher
[3]: with HSP V8.1.0 and higher

7.8.3 ES921.1 Firmware

NOTE

As delivered, the ES910 module contains *no* firmware to support the modules mountable in the extension slot.
The required firmware has to be loaded additionally (see chapter 5.4 on page 20).

7.8.4 Environmental Conditions

Temperature range (operation)	Complies with ES910.3-A: -40 °C to +50 °C / -40 °F to +122 °F
Temperature range (storage)	-40 °C to +85 °C
	-40 °F to +185 °F

NOTE

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

7.8.5 Mechanical Data

Dimensions (H x W x D)	20 mm x 35 mm x 83 mm 0.79 in x 1.38 in x 3.27 in
Weight	Approx. 50 g / 0.11 lb

7.9 Electrical Data

7.9.1 Power Supply

Operating voltage	Power supply via extension slot of the ES910
Input voltage	3.3 V; 5 V
Power consumption (operation)	0.8 W (typ.); 1.0 W (max.)
Current consumption (standby)	< 0.62 mA

7.9.2 CAN Interfaces

CAN1 and CAN2	2 independent interfaces, galvanically isolated from each other, every interface can be configured individually (High-Speed / Low-Speed CAN)
Protocols	CAN V2.0a (Standard Identifier), CAN V2.0b (Extended Identifier)
Controller	IP-Core (FPGA)

Low-Speed CAN

Transceiver (physical layer)	TJA1054
Transfer speed	Max. 125 kBaud

High-Speed CAN

Transceiver (physical layer)	TJA1040
Transfer speed	Max. 1 MBaud with a bus length of 20 m
Differential internal resistor Ri	10 kOhm

High-Speed CAN “Wake-Up” Signal Conditions

Differential input voltage (min.)	V_diff,min = 0.2 V
Signal edge increase rate	t/dV < 150 ns/V
Differential input resistor	R i,diff = 10 kOhm

At least two signal edges of the same polarity must be within a time of 100 ms.

Miscellaneous

Functions	Wake-Up, Sleep
LED	Status display of CAN bus

7.10 Pin Assignment

NOTE

All ports are shown with a view of the ports of the ES921.1.
All shields are at case potential.

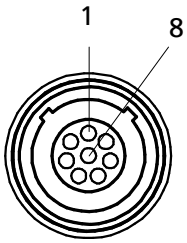


Fig. 7-2 CAN Interface (CAN1 and CAN2)

Pin	Signal	Meaning
1	-	Reserved
2	CAN_LOW	
3	CAN_GND	
4	-	Reserved
5	-	Reserved
6	CAN_GND	
7	CAN_HIGH	
8	-	Reserved

8 Cables and Accessories

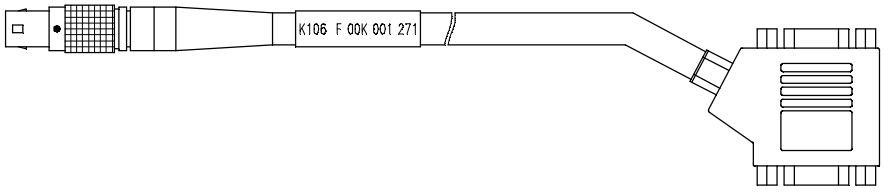
The “Cables and Accessories” chapter contains an overview of the available cables and accessories.

NOTE

Only use ETAS cables at the interfaces of the ES921.1. The maximum admissible cable lengths must be adhered to.

8.1 CAN Cable

8.1.1 K106 Cable

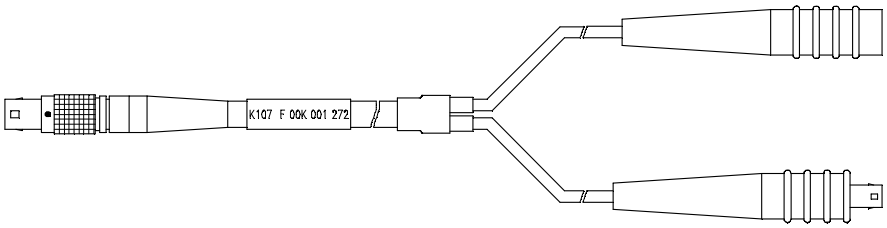


Side A Side B

Fig. 8-1 K106 Cable

Order Name	Short Name	Order Number
CAN Interface Cable (ES1222), Lemo 1B - 9-pin SUB-D socket, 2 m	K106	F 00K 001 271

8.1.2 K107 Cable

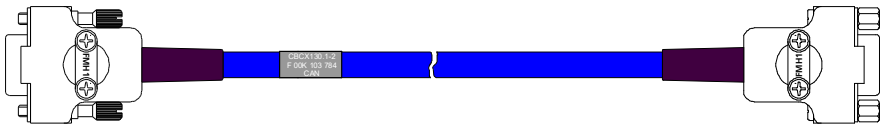


Side A Side B

Fig. 8-2 K107 Cable

Order Name	Short Name	Order Number
CAN Interface Cable (ES1222), Lemo 1B - Lemo OS, 2 m	K107	F 00K 001 272

8.1.3 CBCX130 Cable

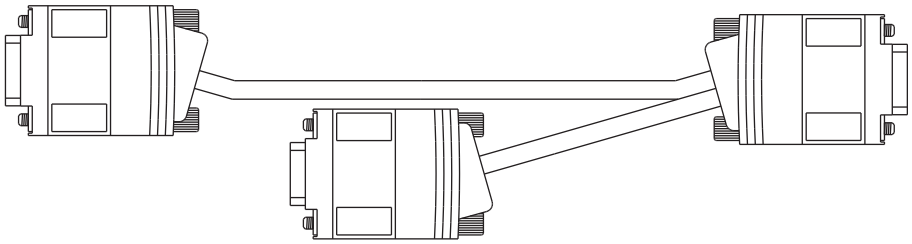


Side A Side B

Fig. 8-3 CBCX130 Cable

Order Name	Short Name	Order Number
Cable SubD - SubD (9fc-9mc, 2 m)	CBCX130-2	F 00K 103 784
Cable SubD - SubD (9fc-9mc, 5 m)	CBCX130-5	F 00K 103 785

8.1.4 K95 Cable



Side A Side B Side C

Fig. 8-4 K95 Cable

Order Name	Short Name	Order Number
Cable for CAN, SIC, DSUB, 2 m	K95	F 00K 000 384

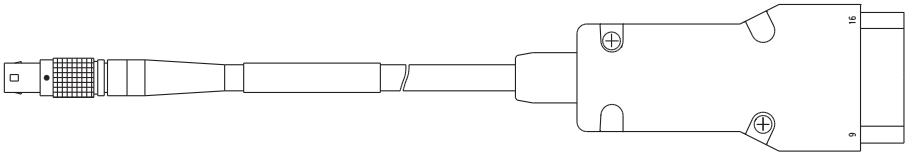
8.1.5 CBAC140 Cable

Side A Side B

Fig. 8-5 CBAC140 Cable

Order Name	Short Name	Order Number
Cable SubD - Lemo 2B FGG (9fc-10mc, 3 m)	CBAC140-3	F 00K 103 783

8.1.6 CBAC150 Cable

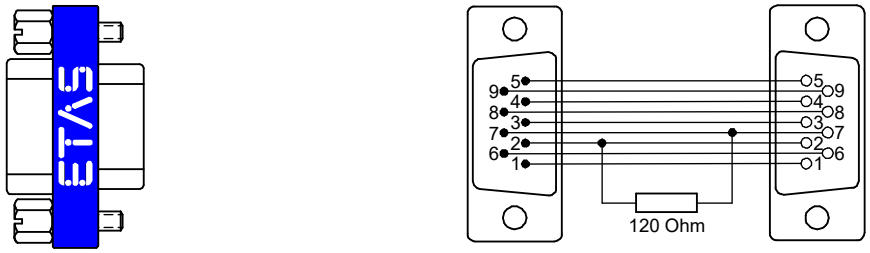


Side A Side B

Fig. 8-6 CBAC150-2m5 Cable

Order Name	Short Name	Order Number
Cable CARB - Lemo 1B FGC (16mc - 8mc, 2.5 m)	CBAC150-2m5	F 00K 104 159

8.2 CAN Termination Resistor



Side A Side B

Fig. 8-7 CBCX131-0 Termination Resistor

Order Name	Short Name	Order Number
Cable SubD - SubD (9fc-9mc, 0 m), 120 Ohm Resistor	CBCX131-0	F 00K 103 786

9 Ordering Information

9.1 ES921.1

Order Name	Short Name	Order Number
ES921.1 CAN Module (2-CH)	ES921.1	F 00K 105 672
Package Contents		
ES921.1 CAN Module (2-CH), Cable: 2 x K106, Termination resistor: 2 x CBCX131-0, ES900_Screws) List "Content of this Package", FlexRay Bosch IPCore Licence, ES910 Safety Advice, China-RoHS-leaflet_Compact_green_cn		

9.2 Accessories

9.2.1 Spare Screws

Order Name	Short Name	Order Number
ES900 Spare Screws for Extension Slot	ES900_Screws	F 00K 105 362

10 Contact Information

ETAS Headquarters

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ETAS Subsidiaries and Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the ETAS website:

ETAS subsidiaries	Internet:	www.etas.com/en/contact.php
ETAS technical support	Internet:	www.etas.com/en/hotlines.php

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