CBEB100.1-1m0
MEDIA CONVERTER
Open Alliance BroadR Reach (OABR) to Standard Ethernet 100BASE-TX (FE)
User Guide

Copyright

CBEB100.1-1m0 User Guide R01 EN - 08.2015

Contents

1 General

The introductory chapter provides you with information on the basic safety instructions, returning the product and recycling, and how to use this manual.

1.1 Basic Safety Notices

Please adhere to the safety instructions to avoid injury to yourself and others as well as damage to the device. 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.

1.2 Correct Use

ETAS GmbH cannot be made liable for damage which is caused by incorrect use and not adhering to the safety instructions.

1.3 Labeling of Safety Instructions

The safety instructions contained in this manual are identified with the standard danger symbol shown below:

Fig. 1-1 Standard Danger Symbol

The following safety instructions are used. They provide extremely important information. Please read this information carefully.

DANGER!

Indicates a possible high-risk danger which could lead to fatal injuries if not avoided.

WARNING!

Indicates a possible medium-risk danger which could lead to serious or even fatal injuries if not avoided.

CAUTION!

Indicates a low-risk danger which could result in minor or less serious injury or damage if not avoided.

1.4 Requirements for the Technical State of the Product

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 the property.

1.5 RoHS Conformity

1.5.1 European Union

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

1.5.2 China

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

1.6 CE Marking

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

1.7 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. 1-2 WEEE-Symbol

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 the ETAS sales and service locations.

1.8 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!
1: NC 2: NC 3: Shielding 4: BroadR - Reach (+) 5: BroadR - Reach (-) 6: UBATT_P 7: Reserved 8: Reserved 9: UBATT_N	Pin Assignment. Refer to "Pin Assignment" on page 24
6V to 32V	Operating voltage range
200mA	Max operating current
	Marking for CE conformity, Refer to "CE Marking" on page 6
	Marking for RoHS, Refer to "RoHS Conformity" on page 6

Tab. 1-1 Identifications on the product

1.9 About this Manual

1.9.1 Using this Manual

Typographic Conventions
The following typographic conventions are used:

Bold	Labels of the devices
Italics	Crucial text

Important notes for the user are presented as follows:

Note
Important note for the user.

1.9.2 Structure

This manual consists of eight chapters and an index.

- **Chapter 1: "General Information"**

  The "General Information" chapter provides you with information on the basic safety instructions, returning the product and recycling, and how to use this manual.

- **Chapter 2: "Introduction"**

  The chapter "Introduction" contains information about the basic features and s of the product.

- **Chapter 3: "Hardware Description"**

  In the "Hardware Description" chapter, the function blocks and the interfaces of the CBEB100.1-1m0 are explained in detail.

- **Chapter 4: "Installation"**

  The "Installation" chapter describes the hardware installation of the CBEB100.1-1m0.

- **Chapter 5: "Technical Data"**

  The "Technical Data" chapter contains a summary of all technical data, pin assignments and hints to system requirements for operating the CBEB100.1-1m0.

- **Chapter 6: "Cables and Accessories"**

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

- **Chapter 7: "Ordering Information"**

  The "Ordering Information" chapter contains the ordering information on the available cables and accessories.

- **Chapter 8: "ETAS Contact Information"**

  The final chapter, "ETAS Contact Information", gives you information on ETAS' international sales and service locations.

2 Introduction

This section contains information about the basic features and applications of the CBEB100.1-1m0, hints to system requirements for operating the product, and other details.

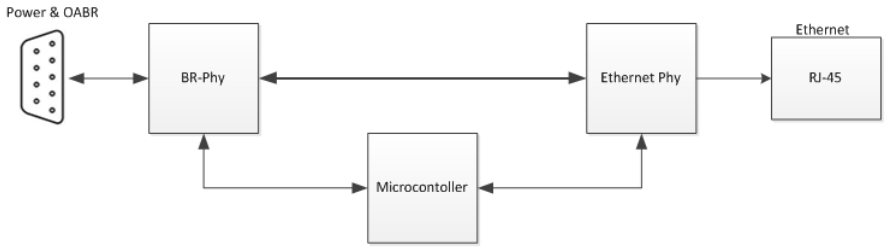


Fig. 2-1 Block Diagram

2.1 Application

The CBEB100.1-1m0 is a cable type device which converts Automotive Ethernet to standard Ethernet and vice-versa. The product can be connected to BR_XETK to perform measurement and calibration of ECU parameters. The product enables transparent usage of Open Alliance BroadR-Reach (OABR) based BR_XETK products with minimal latency inside the ETAS tool chain. The product facilitates a variety of applications such as Measurement, Calibration and ECU Flash Programming with BR_XETK and INCA.

Fig. 2-2 Application

2.2 Features

The product provides the following key features:

- Conversion of OABR to Standard Ethernet (IEEE802.3) and vice-versa
- Robust cable like realization for automotive usage
- LEDs to show BroadR reach Ethernet and Standard Ethernet traffic
- LED to show the power and product status information

- Easily accessible D-SUB connector provided to connect and disconnect the product
- Standby mode
- Operates as master
- Provides easy interface and drivers installation not required
- The product in combination with BR_XETK supports measurement, calibration and flash programming.

3 Hardware Description

The "Hardware description" chapter provides an overview of the CBEB100.1-1m0, interface, power supply, status LEDs, firmware update and master-slave configuration.

3.1 Overview

The CBEB100.1-1m0 is a cable type device which converts Automotive Ethernet to Standard Ethernet and vice versa. CBEB100.1-1m0 is used in various connection scenarios such as direct PC connection, switching modules (third party devices), or connection to ETAS modules (ES5XX / ES6XX).

Fig. 3-1 CBEB100.1-1m0

3.1.1 Intended use

The intended use of the product is to connect ETAS BR_XETK to a standard Ethernet port of the PC.

3.1.2 Application area of the product

This product is developed and approved for applications in the automotive sector. The product is suitable for use in interiors, in the passenger cell or in the trunk of vehicles. For using the product in other application areas, please contact your ETAS contact partner. Refer to "ETAS Contact Information" on page 31.

3.1.3 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.

3.1.4 Requirements for operation

- The product is suitable for use with ECUs of vehicles.
- 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 atmosphere.
- The product does not have an operating voltage switch.
- Switch on the product by connecting it to the power supply or by switching on the power supply.
- Switch off the product by disconnecting it from the power supply or by switching off the power supply.

3.1.5 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 align the plugs with the connection.

3.1.6 Requirements for the location

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

3.1.7 Requirements on the ventilation

- Keep the product away from heat sources and protect it against direct exposure to the sun.
- The free space above and behind the product must be ensured so that sufficient air circulation is available.

3.1.8 Maintenance

The product is maintenance-free.

3.1.9 Repair

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

3.1.10 Ambient conditions

The housing and the connectors of the module as well as the plug connectors of the cables meet the degree of protection IP40.

Opening the module

CAUTION!

Damage to the module and loss of properties based on IP40!
Do not open or change the module housing!
Work on the module housing may only be performed by ETAS.

3.1.11 Cabling

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

3.1.12 Transport

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

3.2 Product Interface

The CBEB100.1-1m0 supports the following Ethernet interfaces:

PC Interface (Host)	ECU side (towards BR_XETK)
Standard Ethernet 100BASE-TX	Open Alliance BroadR Reach (OABR) Ethernet

Tab. 3-1 Product Interface

3.3 Housing

The housing surface is made of blue color Thermoplastic Elastomer with rubber finish.

3.3.1 Packaging

The product with cable is secured with two Cable-ties and packaged inside an ESD Bag. The packaging label is as shown in the image below:

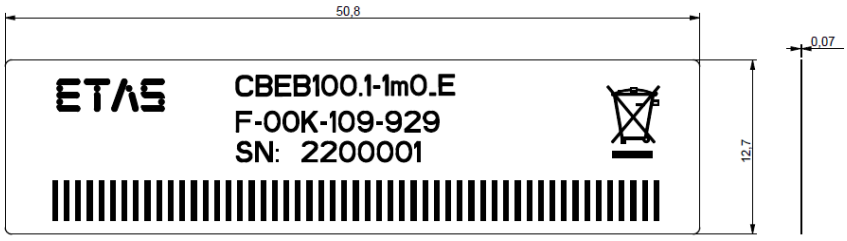


Fig. 3-2 Packaging Label

3.4 Power Supply

The product is powered by the vehicle's on-board power by using CBEB1105.1-3m0 or a custom made cable. The power supply specifications for various operating voltage states are provided under Electrical Data. Refer to "Electrical Data" on page 24.

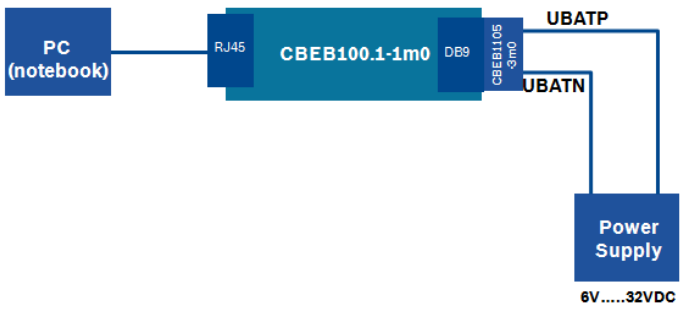


Fig. 3-3 Power Supply

3.4.1 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 product.
Ensure that the connection and setting values are being followed (see the information in the chapter "Technical Data" on page 21).
Do not apply any voltages to the connections of the product that do not correspond to the specifications of the respective connection.

3.4.2 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 laboratory power supply.
Use only laboratory power supply devices with dual protection to the premier (main) supply (with double isolation / with reinforced insulation) (DI / RI).
The laboratory power supply must be approved for an operating altitude of 5000m and at an ambient temperature up to 70 ° C.
In regular operation of the product as well as very long standby operation, a discharge of the vehicle battery is possible.

3.4.3 Connection to the power supply

The product shall only be used in vehicles with central load-dump protection.
The power supply connection may not be connected directly to the vehicle battery or laboratory supply. Use a fuse in between for protection (max 20A).
Ensure that the connections of the power supply are easily accessible!
Route the power cord in such a way that it is protected against abrasion, damages, deformation and kinking. Do not place any objects on the power cord!

DANGER!

Dangerous electrical voltage!
Connect the power cord only with a vehicle battery or with a suitable lab power supply! A connection to power outlets is prohibited!
To prevent accidental plugging into wall outlets, ETAS recommends to use in areas with electrical outlets and to use the power supply cable with safety banana plugs.

3.4.4 Disconnecting from the power supply

The product does not have an operating voltage switch. To de-energize the product:

- Switch off the lab power supply.

  or

- Disconnect the product from the lab power supply (the D-SUB plug of the power supply cable is the isolating device).

  or

- Disconnect the product from the vehicle battery (the D-SUB plug of the power supply cable is the isolating device).

  or

- Disconnect the vehicle battery.

3.5 Status LEDs

There are three LEDs for displaying the current operating status and the error states of the product. The following flashing codes are used for the LEDs:

Label	Color	Meaning	Mode	Indication
ON/ Error	Green	Power Indicator	OFF	OFF
			Standby	Blink
			Normal	ON
	Red	Error Indicator	Error, Non-Operational	Blink
	Red	Firmware Update	Firmware Update	ON

Tab. 3-2 Product Status LED

Label	Color	State	Indication
HOST	Yellow	Link inactive	OFF
		Link active	ON
		Network activity	Blink according to network activity

Tab. 3-3 Standard Ethernet Status LED

Label	Color	State	Indication
ECU	Yellow	Link inactive	OFF
		Link active	ON
		Network activity	Blink according to network activity

Tab. 3-4 OABR Ethernet Status LED

3.6 Firmware Update

The firmware update for the product is possible when there is a change in firmware. However, to update the firmware please contact ETAS support team. Refer to "ETAS Contact Information" on page 31.

3.7 Master - Slave Configuration

By default, the product is the master. To configure it as a slave, please contact ETAS support team. Refer to "ETAS Contact Information" on page 31.

3.8 Standby

The product enters the standby mode when there is no connection at the HOST side. The product checks for the Standard Ethernet connection at Host side for 5 minutes. If the connection is not available for more than 5 minutes, the product goes to the standby mode.

Note

The Product's entry to the standby mode does not depend on the OABR connection.

4 Installation

4.1 Connecting Product to BR_XETK

The CBEB100.1-1m0 can be connected to the BR_XETK inside the ECU by using CBEB1105.1-3m0 or custom made cable. The CBEB1105.1-3m0 comes with a three meter length jacketed cable and open wire at the end.
The product offers a generic and cost effective D-SUB 9 pin connector for connecting on the ECU side.
The product can be connected to PC through RJ45 connector cable of length 1m. The product connection to PC is indicated to the user by the 'HOST' LED.
The LED will be ON when the PC connection is detected and blinks based on the network activity at the PC side. No driver installation is required to connect the product to the PC. With the setup done as shown in the figure below , open INCA and click on the "search for hardware" icon. INCA detects BR_XETK hardware but not the product since the product acts as cable.

Fig. 4-1 Connecting Product to BR_XETK

4.2 Connecting Product to Power Supply

The product needs a permanent power supply. The CBEB100.1-1m0 is powered by the vehicle's on-board power by using CBEB1105.1-3m0 or a custom made cable. The CBEB1105.1-3m0 comes with Banana Connector with safety plug.

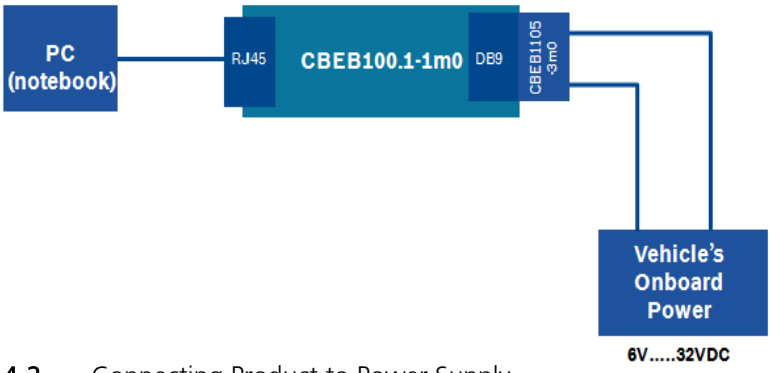


Fig. 4-2 Connecting Product to Power Supply

4.3 Connecting Product to PC (Notebook)

The CBEB100.1-1m0 comes with RJ45 connector cable of length 1m. It can be directly connected to the PC Ethernet port or Notebook. No additional cables are required.

Fig. 4-3 Connecting Product to PC (Notebook)

4.4 Connecting Product to ETAS ES59x Modules

The product is connected to ETAS ES59x module using the CBAE210.1-0m5. The CBAE210.1-0m5 has a RJ45 port at one end and a lemo connector at the other end. Connect the RJ45 cable from the product to the RJ45 port of the CBAE210.1-0m5. Connect the lemo connector of the CBAE210.1-0m5 to the 8- pin Ethernet port in the ES59X module.

Note

CBAE210.1-0m5 does not connect power to the device.

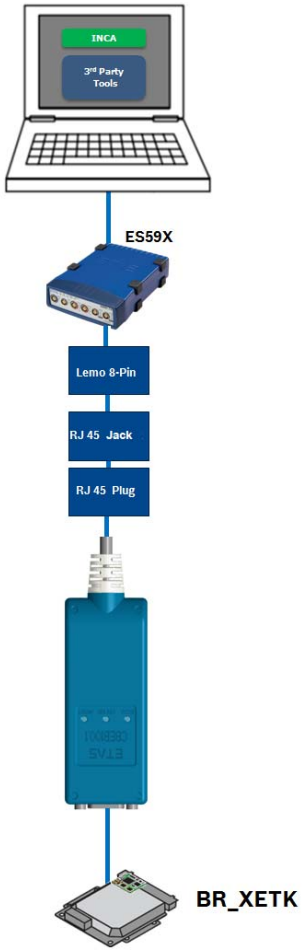


Fig. 4-4 Connecting Product to ETAS ES59x Modules

4.5 Connecting Product to ETAS ES910 Modules

The product can be connected to ETAS ES910 module using a ETAS ES600 switch in between for "Test Bed Measurement and Calibration". For Rapid Prototyping purpose the product needs to be connected to ETAS ES910 module directly. The image below explains the use case, "Test Bed Measurement and Calibration". The product is connected to ETAS ES600.2 module and BR_XETK. The ETAS ES910 module is connected to the ES600.2 module. The ES600.2 module is connected to the notebook (PC) with INCA and other required tools pre-installed.

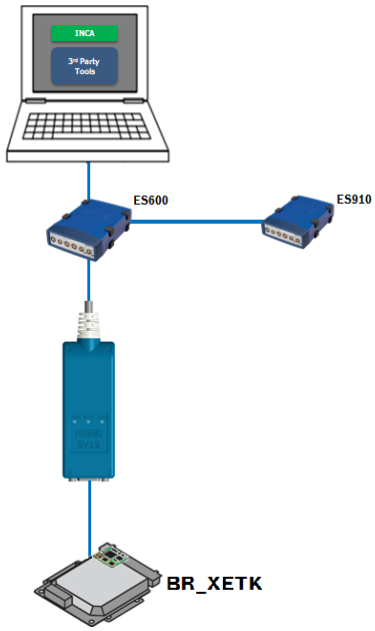


Fig. 4-5 Connecting Product to ETAS ES910 for "Test Bed Measurement and Calibration"

5 Technical Data

The "Technical Data" chapter contains a summary of the technical data and the terminal assignments of the product.

5.1 General Data

5.1.1 Standards

The product meets and fulfills the following standards:

Temperature Standards	Test
DIN EN 60068-2-1 (aging)	Premature fatigue cold test
DIN EN 60068-2-2 (aging)	Premature fatigue heat test
DIN EN 60068-2-13 (height)	Negative pressure
DIN EN 60068-2-14 Na	Temperature shock
DIN EN 60068-2-14 Nb	Temperature change

Tab. 5-1 Temperature Standards

Mechanical Standards	Test
DIN EN 60068-2-64, ISO 16750-3	Vibration, noise
ISO 16750-3, Sec. 4.2.2.2	Mechanical Shock
ISO 16750-3, Sec. 4.3	Drop test

Tab. 5-2 Mechanical Standards

Chemical Standards	Test
ISO 16750-5	Chemical resistance: For passenger compartment

Tab. 5-3 Chemical Standards

Safety (Voltages) Standards
IEC 61010-1:2010 + all national/group differences IEC 61010-2-30:2010 + all national/group differences CB certificate + test report from ETAS-approved CBTL
IEC 66/500/DC:2013-01 (draft for IEC 61010-1:2010/A1)

Tab. 5-4 Safety Standards

EMC Standards
IEC 61326-1:2012 EMV-ILA V1.03B ISO 7637-2:2011 IEC 61010-6-2 IEC 61010-6-3 ISO 16750-2:2012

Tab. 5-5 EMC Standards

5.1.2 Ambient conditions

Operating temperature range	-40 °C to +70 °C -40 °F to +158 °F
Storage temperature range	-40 °C to +85 °C -40 °F to +185 °F
Operating altitude	max. 5,000 m / 16,400 ft above sea level
Degree of protection	IP40
Humidity	15% to 95%, non-condensing

Tab. 5-6 Ambient Conditions

5.1.3 Maintaining the product

Do not open or change the housing of product! Work on the module may only be performed by ETAS. Return defective modules to ETAS for repair.

CAUTION!

Damage to the product and loss of properties based on IP40!
Do not open or change the housing of the product!

5.1.4 Cleaning the product housing

Use a dry or lightly moistened, soft, lint-free cloth for cleaning the product housing. Do not use any sprays, solvents or abrasive cleaners which could damage the housing. Also, never spray cleaning agents directly onto the product. Ensure that moisture does not enter the housing.

5.1.5 Mechanical data

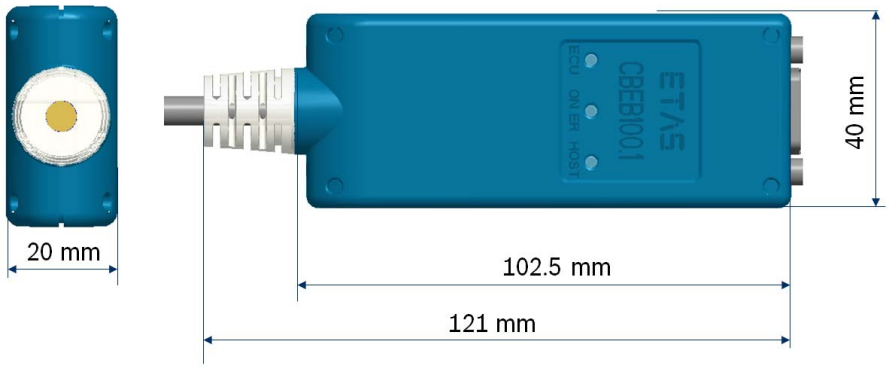


Fig. 5-1 Dimensions

Length (housing with cable)	1102.5mm
Dimensions	40mm x 20mm x 102.5mm
Weight	115gm (with cable)

Tab. 5-7 Mechanical Data

5.2 System Requirements

5.2.1 ETAS Hardware

The following ETAS hardwares are compatible with CBEB100.1-1m0:

- ES600 switch module (via cable CBAE210.1-0m5)
- ES592, ES593, ES595 "Ethernet connector" (via cable CBAE210.1-0m5)
- ES720 (via appropriate ES module or cable CBAE210.1-0m5)
- ES910 (via ES600)

5.2.2 ETAS Software

The product CBEB100.1-1m0 behaves as a communication protocol converter and is compatible with the software supported by BR_XETK. Examples are listed below:

- INCA for measurement data acquisition and analysis
- ES720 software configuration for measurement data acquisition and analysis (currently WinXP and INCA)

For software support, please contact ETAS support team. Refer to "ETAS Contact Information" on page 31.

5.3 Pin Assignment

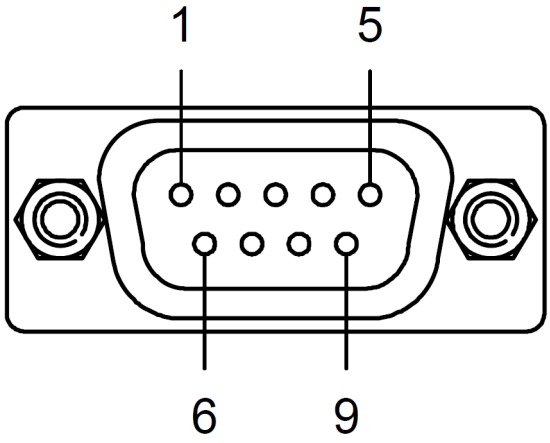


Fig. 5-2 CBEB100.1-1m0 plug connector

Pin	Signal	Meaning
1	NC	Not connected
2	NC	Not connected
3	Shielding	Shielding
4	BroadR - Reach (+)	BroadR - Reach Plus
5	BroadR - Reach (-)	BroadR - Reach Minus
6	UBATT_P	Battery Plus
7	Reserved	Reserved
8	Reserved	Reserved
9	UBATT_N	Battery Minus

Tab. 5-8 Pin Assignment

5.4 Electrical Data

Operating voltage	6V to 32V
Cranking voltage	3V
Over voltage 60 mins	36V
Current consumption	max 200mA
Current consumption (Operation)	Typ. 85mA at 12.0 VDC
Current consumption (Standby)	Typ. 5.5mA at 12.0 VDC
Protection	Against reverse polarity

Tab. 5-9 Electrical Data

6 Cables and Accessories

6.1 CBAE210.1-0m5

The CBAE210.1-0m5 can be used to connect the CBEB100.1-1m0 to the ETAS ES59x devices. This is achieved by connecting the (standard Ethernet) "host side" of the product to the "switch" connector of the ES59x devices through the CBAE210.1-0m5. The CBAE210.1-0m5 consists of Lemo 8 pin connector on one side and RJ45 jack on the other side. The standard Ethernet side of the product is connected to the robust RJ45 jack of the cable and the other side of the cable which is the Lemo 8 pin can be connected to the ES59x device side.

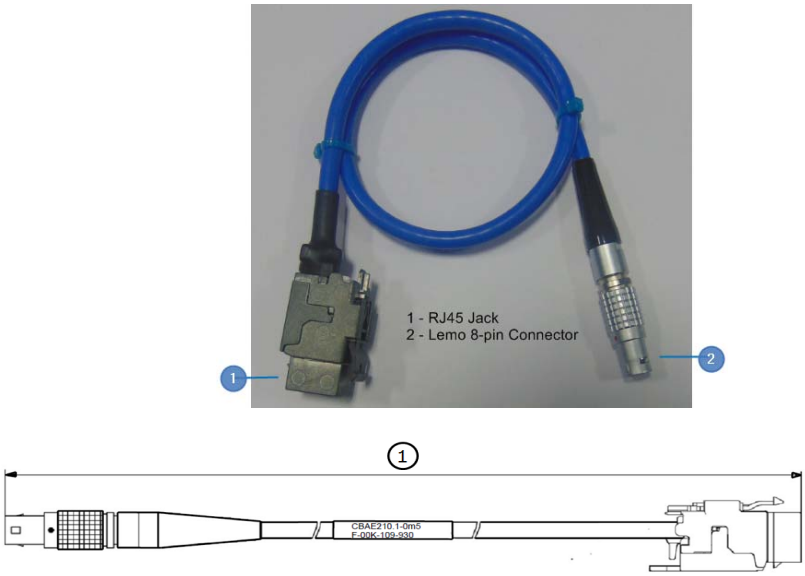


Fig. 6-1 CBAE210.1-0m5

Dimension Table		
Dim.No	**Dimension (mm)**	**Dimension (Inches)**
1	500 ±10	19.68 ± 0.4

Tab. 6-1 Dimension

6.2 CBEB1105.1-3m0

The CBEB1105.1-3m0 can be used to connect the CBEB100.1-1m0 to the customer specific environment. This is achieved by connecting the (OABR Ethernet) "ECU side" of the product to the CBEB1105.1-3m0.
One side of the CBEB1105.1-3m0 cable has D-SUB (9 pin female connector), which is connected to the product's D-SUB (9 pin male connector). The other side of the cable has two connections:

- OABR signals are wired out, connected to the BR_XETK
- Banana plugs (male) are connected to power supply.

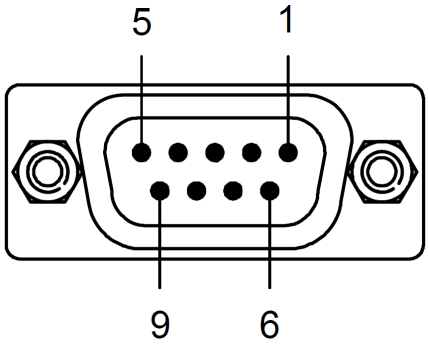
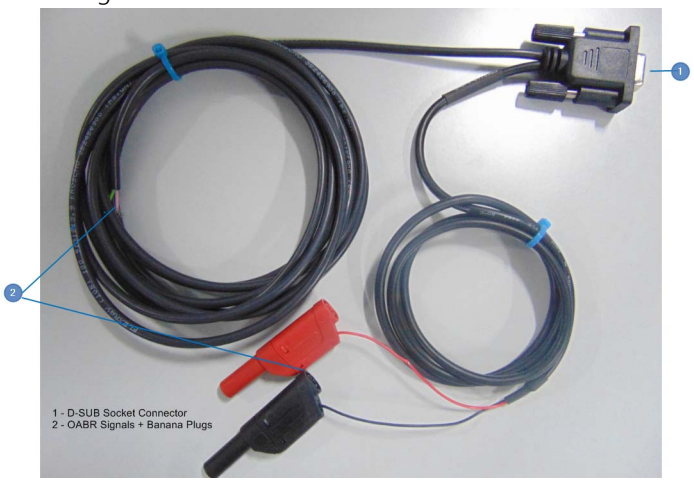


Fig. 6-2 Socket Connector

Location A DB9 Connector Female		Cable Details		Location B	
Pin No.	Signal	Pair	Color	Pin No.	SIgnal
4	BroadR - Reach (+)	1	Green	Open Wire	BroadR - Reach (+)
5	BroadR - Reach (-)		Pink		BroadR - Reach (-)
6	UBATT_P	2	Red	Banana Connector Red	UBATT_P
9	UBATT_N		Black	Banana Connector Black	UBATT_N
1	NC				
2	NC				
3	NC				
7	NC				
8	NC				

Tab. 6-2 Pin Assignment



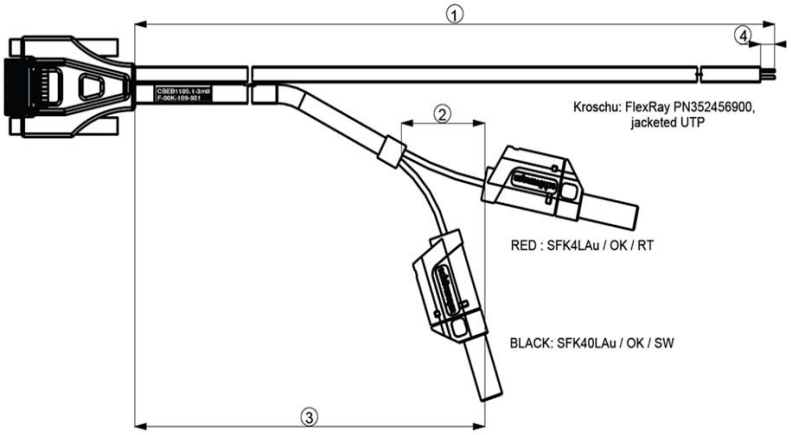


Fig. 6-3 CBEB1105.1-3m0

Dimension Table		
Dim.No	**Dimension (mm)**	**Dimension (Inches)**
1	3000 ±10	118.11 ± 0.4
2	80±10	3.14 ± 0.4
3	1000±10	39.37± 0.4
4	10± 2	0.4± 0.08

Tab. 6-3 Dimension

7 Ordering Information

7.1 CBEB100.1-1m0

Order name	Short name	Order number
Media-Converter cable, DSUB - RJ45 (9mc - 8mc), 1m	CBEB100.1-1m0	F-00K-110-094

Tab. 7-1 CBEB100.1-1m0

Note

Add-on cable is not included in the CBEB100.1-1m0 delivery. It has to be ordered separately.

7.2 Accessories

Order name	Short name	Order number
Ethernet Connection Adapter Cable 100MBit/s, RJ45 - Lemo 1B FGF (8fc-8mc), 0m5	CBAE210.1-0m5	F-00K-109-930

Tab. 7-2 Accessories

8 ETAS Contact Information

ETAS HQ

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

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