

# ETAS BR\_XETK-S3.0

Emulator Probe for Infineon AURIX MCU  
Family



User Guide

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## Contents

|          |                                                  |           |
|----------|--------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction</b>                              | <b>7</b>  |
| 1.1      | About BR_XETK-S3.0                               | 7         |
| 1.1.1    | Features                                         | 8         |
| 1.2      | Target audience and intended use                 | 9         |
| 1.2.1    | Target audience                                  | 9         |
| 1.2.2    | Intended use                                     | 9         |
| 1.3      | Safety instructions and classification           | 10        |
| 1.3.1    | Classification of Safety Messages                | 11        |
| 1.3.2    | Assembly                                         | 11        |
| 1.3.3    | Operation                                        | 12        |
| 1.3.4    | Electrical connection                            | 12        |
| 1.3.5    | Cables and accessories                           | 13        |
| 1.4      | Unpacking                                        | 14        |
| <b>2</b> | <b>Product overview</b>                          | <b>15</b> |
| 2.0.1    | System requirements                              | 15        |
| 2.0.2    | Compatible hardware                              | 15        |
| 2.0.3    | PC with one ethernet interface                   | 15        |
| 2.1      | Software requirements for BR_XETK-S3.0A          | 15        |
| 2.2      | Software requirements for BR_XETK-S3.0C          | 17        |
| 2.3      | Data emulation and measurement memory            | 17        |
| 2.3.1    | Data emulation memory                            | 17        |
| 2.3.2    | Measurement data memory                          | 18        |
| 2.3.3    | Trace memory                                     | 18        |
| 2.4      | Configuration                                    | 19        |
| <b>3</b> | <b>Hardware setup</b>                            | <b>20</b> |
| 3.1      | Transportation and packaging                     | 20        |
| 3.2      | Mounting and placement                           | 20        |
| 3.2.1    | Mounting the BR_XETK-S3.0 into the ECU housing   | 20        |
| 3.2.1.1  | How to attach the BR_XETK-S3.0                   | 20        |
| 3.2.1.2  | Fixing the BR_XETK-S3.0 with mounting bracket    | 21        |
| 3.2.1.3  | Fixing the BR_XETK-S3.0 without mounting bracket | 22        |
| 3.2.2    | Connection to the ECU                            | 23        |
| 3.3      | Connection to the power supply                   | 24        |
| 3.3.1    | Permanent power supply inside ECU available      | 25        |
| 3.3.2    | Permanent power supply inside ECU not available  | 26        |
| 3.4      | Connection with other products                   | 26        |

|          |                                                               |           |
|----------|---------------------------------------------------------------|-----------|
| 3.4.1    | Wiring to the computer .....                                  | 26        |
| 3.4.1.1  | Compatible hardware .....                                     | 26        |
| 3.4.1.2  | Requirements for failsafe automotive ethernet operation ..... | 26        |
| 3.4.1.3  | Example connection overview with media converter .....        | 27        |
| 3.4.1.4  | Example connection overview with media converter .....        | 27        |
| 3.4.1.5  | CBEB100.1 automotive ethernet media converter .....           | 28        |
| 3.4.1.6  | ES160.1 automotive ethernet media converter .....             | 28        |
| 3.4.1.7  | ES162.1 automotive ethernet media converter .....             | 29        |
| 3.4.1.8  | ES165.1 automotive ethernet media converter .....             | 29        |
| 3.4.1.9  | ES88x ECU and bus interface module .....                      | 30        |
| <b>4</b> | <b>Basic operation .....</b>                                  | <b>31</b> |
| 4.1      | Status indicator .....                                        | 31        |
| 4.1.1    | LED specification .....                                       | 31        |
| 4.2      | Menu and navigation .....                                     | 33        |
| 4.2.1    | Overview .....                                                | 33        |
| 4.2.2    | Configuration parameter .....                                 | 34        |
| <b>5</b> | <b>Overview of functions .....</b>                            | <b>35</b> |
| 5.1      | Architecture .....                                            | 35        |
| 5.2      | Data emulation and data measurement .....                     | 36        |
| 5.2.1    | Page switching .....                                          | 36        |
| 5.3      | Interfaces .....                                              | 38        |
| 5.3.1    | Automotive ethernet interface CON1 .....                      | 38        |
| 5.3.2    | ECU interface CON2 .....                                      | 39        |
| 5.3.3    | Power supply interface CON3 .....                             | 39        |
| 5.3.4    | DAP interface .....                                           | 40        |
| 5.4      | Pull CalWakeUp until startup handshake .....                  | 40        |
| 5.5      | Reset .....                                                   | 41        |
| 5.6      | Trace based measurement .....                                 | 41        |
| <b>6</b> | <b>Troubleshooting .....</b>                                  | <b>43</b> |
| 6.1      | Problems and solutions .....                                  | 43        |
| 6.1.1    | No communication between the ECU and ETK .....                | 43        |
| <b>7</b> | <b>Technical specifications .....</b>                         | <b>44</b> |
| 7.1      | Hardware specifications BR_XETK-S3.0 .....                    | 44        |
| 7.1.1    | Ambient conditions .....                                      | 44        |
| 7.1.2    | Electrical data .....                                         | 45        |
| 7.1.2.1  | Microcontroller interface .....                               | 47        |
| 7.1.2.2  | Power-on delay of ECU reset .....                             | 49        |

|           |                                                                   |           |
|-----------|-------------------------------------------------------------------|-----------|
| 7.1.2.3   | ECU interface connector .....                                     | 49        |
| 7.1.3     | DAP timing characteristics .....                                  | 51        |
| 7.1.3.1   | 2-pin DAP mode .....                                              | 51        |
| 7.1.3.2   | 3-pin DAP mode .....                                              | 52        |
| 7.1.4     | Mechanical data .....                                             | 52        |
| 7.1.4.1   | Top view .....                                                    | 52        |
| 7.1.4.2   | Side view .....                                                   | 53        |
| 7.2       | Interface specifications .....                                    | 54        |
| 7.2.1     | Automotive ethernet interface .....                               | 54        |
| 7.3       | Product markings .....                                            | 54        |
| 7.4       | Connectors .....                                                  | 57        |
| 7.4.1     | Pin assignment automotive ethernet interface connector CON1 ..... | 57        |
| 7.4.2     | Pin assignment ECU interface connector CON2 .....                 | 58        |
| 7.4.2.1   | Pin assignment power supply connector CON3 .....                  | 60        |
| <b>8</b>  | <b>Maintenance .....</b>                                          | <b>62</b> |
| 8.1       | Cleaning .....                                                    | 62        |
| 8.2       | Repair service .....                                              | 62        |
| <b>9</b>  | <b>Return form .....</b>                                          | <b>63</b> |
| <b>10</b> | <b>Accessories and order information .....</b>                    | <b>64</b> |
| 10.1      | Ordering information BR_XETK-S3.0 .....                           | 64        |
| 10.2      | Cables, adapters and accessories .....                            | 65        |
| 10.2.1    | Overview and classification .....                                 | 65        |
| 10.2.2    | Cables and adapter requirements for fail safe operation .....     | 65        |
| 10.2.3    | CBEB120 cable .....                                               | 65        |
| 10.2.4    | CBEB121 cable .....                                               | 66        |
| 10.2.5    | CBEB122.1-3 cable .....                                           | 67        |
| 10.2.6    | CBEB125 cable .....                                               | 67        |
| 10.2.7    | CBEB240 cable .....                                               | 68        |
| 10.2.8    | CBEB242 cable .....                                               | 70        |
| 10.2.9    | CBEB310 cable .....                                               | 72        |
| 10.2.10   | CBEB311 cable .....                                               | 72        |
| 10.2.11   | CBEB312 cable .....                                               | 73        |
| 10.2.12   | CBEB313 cable .....                                               | 74        |
| 10.2.13   | CON1: CBAM290 cable .....                                         | 75        |
| 10.2.14   | CON1: CBAM295 cable .....                                         | 76        |
| 10.2.15   | CON1: ETABR1 cable .....                                          | 78        |
| 10.2.16   | CON1: ETABR2 cable .....                                          | 79        |
| 10.2.17   | CON1: ETABR3 cable .....                                          | 80        |

|           |                                       |           |
|-----------|---------------------------------------|-----------|
| 10.2.18   | CON2: ETAM8 ECU adapter .....         | 81        |
| 10.2.19   | CON3: ETAM2 ECU adapter .....         | 83        |
| 10.2.20   | CON3: ETAM5 ECU adapter .....         | 84        |
| 10.2.21   | CON3: ETAM9 ECU adapter .....         | 84        |
| 10.2.22   | CON3: ETAM10_ETAM12 ECU adapter ..... | 86        |
| 10.2.23   | K70.1 cable .....                     | 87        |
| 10.2.24   | Waterproof case ETKS_C3 .....         | 87        |
| <b>11</b> | <b>Contact information .....</b>      | <b>90</b> |
| <b>12</b> | <b>Legal information .....</b>        | <b>91</b> |
| 12.1      | Use of open source software .....     | 91        |
| 12.2      | Certification and conformity .....    | 91        |
| 12.2.1    | Declarable substances .....           | 91        |
| <b>13</b> | <b>Index .....</b>                    | <b>92</b> |

# 1 Introduction

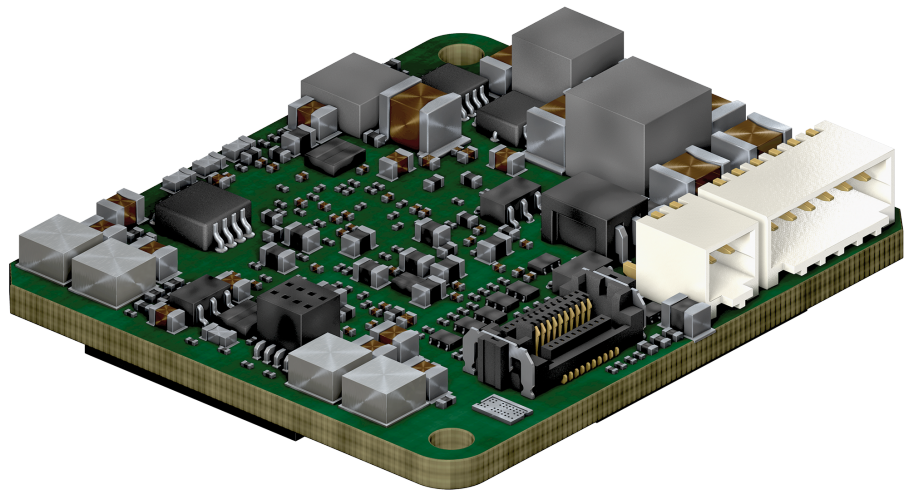
## 1.1 About BR\_XETK-S3.0

The BR\_XETK-S3.0 is an emulator probe for the Infineon AURIX microcontroller family. It is a serial XETK with an Automotive Ethernet (100BASE-T1) interface.



### Note

For supported Infineon AURIX microcontrollers, see "[Technical specifications](#)" on page 44



An Automotive Ethernet media converter is required for the access to the BR\_XETK-S3.0 by the standard full duplex 100Base-T Ethernet of the PC.

To connect the PC with the BR\_XETK-S3.0 and the Automotive Ethernet interface,

ETAS offers different modules:

- CBEB100.1, ES160.1, ES162.1, and ES165.1 Automotive Ethernet Media Converter.
- ES882.1 and ES886.x ECU Interface Module.

The BR\_XETK-S3.0 can be used for rapid prototyping applications (bypass) as well as for measurement and calibration applications.

| <b>BR_XETK-S3.0</b>                   |                                                                            |
|---------------------------------------|----------------------------------------------------------------------------|
| ECU interface connector               | 20 pin FCI                                                                 |
| Power supply connector                | 6 pin MOLEX                                                                |
| Power supply for ED devices (VDDSTBY) | 1.3 V or 0.95 V, see <a href="#">"Technical specifications" on page 44</a> |
| SBRAM sense                           | Yes, on board                                                              |
| Pinless triggering                    | Yes                                                                        |
| Timer triggering                      | Yes                                                                        |

### 1.1.1 Features

- Measurement interface:
  - Measurement via Trace2Ram for low ECU runtime impact and fast rasters (BR\_XETK-S3.0A only)
  - Fast measurements: ECU raster down to 10 µs (via Trace2Ram)
  - Configurable DAP interface modes:
    - 2-pin DAP mode, clock speed 50 MHz and 100 MHz
    - 3-pin DAP mode (wide mode), clock speed 100 MHz and 160 MHz\* (\*160MHz currently only supported by BR\_XETK-S3.0A)
  - 3.3 V DAP output levels, 5.0 V tolerant DAP input
  - Pinless startup protocol for XETK recognition and data acquisition triggering
- Calibration:
  - Microcontroller capability of internal Flash emulation can be used (BR\_XETK-S3.0A only)
  - XETK powers Emulation Device RAM (for calibration purpose)
  - Supports "Start on Any Page"
- Supports special coldstart mechanism ("Calibration Wake Up"):
  - Calibration Wake Up: Wake up mechanism to wake up the power supply of the ECU via the Calibration Wake up pin
  - Pull CalWakeUp until Startup Handshake: duration of the Wake up mechanism is configurable
- ECU flashing via XETK
  - Braindead flashing under ProF control
- Permanent storage of configuration in EEPROM

- Automotive Ethernet Interface 100BASE-T1:
  - Connection to PC via Automotive Ethernet to Standard Ethernet Media Converter
  - Open XCP on Ethernet Protocol
  - Supports a variety of standard applications
- “ETK Tools” update to support ETAS software tools (INCA, XCT)
- Firmware update (programming of the logic device) through HSP software service packs; removal of XETK or ECU is not necessary
- Temperature range suitable for automotive application

For more technical data on the BR\_XETK-S3.0, see ["Technical specifications" on page 44](#).

## 1.2 Target audience and intended use

### 1.2.1 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

### 1.2.2 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.

An emulator probe (ETK) is an electronic assembly that is installed in a vehicle control unit (ECU) to exchange data with a measurement and calibration tool (e.g. INCA).

#### ***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. The product cannot be repaired. Dispose of the product properly. Do not open or alter the product. Only ETAS may make changes to the product.

### ***Application areas***

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

## **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](http://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](http://www.etas.com/hotlines)
- ETAS contact partners by region: [www.etas.com/contact](http://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 starting up the product, check whether there is a Known Issue Report (KIR) for that product version: [www.etas.com/kir](http://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

The product must only be removed from the ESD packaging and installed in a workplace that is protected against static discharges.

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

When installing the product, make sure that the fastening elements do not damage the product's printed circuit board or cause a short circuit.

### 1.3.3 Operation

Only operate the product approved firmware. You can find information about updating the firmware in the user guide.

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.

### 1.3.4 Electrical connection

#### ***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.

#### **Electrical safety and power supply**

- Only connect the product to electric circuits with safety extra-low voltage in accordance with IEC 61140 (devices of class III) within the voltage limits for accessible parts as per IEC 61010-1.
- Comply with the connection and setting values (see "[Technical specifications](#)" on page 44).
- The power supply for the product must be safely disconnected from the mains power. For example, use a vehicle 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



### **DANGER**

#### **Undefined vehicle behavior due to an ECU reset**

If the external power supply to the ETK is interrupted (e.g. cut, disconnected, etc.), this may lead to the ECU being reset.

- Connect the internal power supply of the ECU to the ETK in addition to the external power supply.
- If this is not possible, ensure that the external power supply to the ETK is not interrupted during operation.



### **WARNING**

#### **Risk to life from electric shock**

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

Use a power supply that is permitted for the product.

Ensure that the connections of the power supply are easily accessible.

## De-energizing the product

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.
- Remove the power cord.
- Remove all cables from the product.

## 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.

For detailed information about Cables, see "[Cables, adapters and accessories](#)" on page 65.

## Accessories

Use ETAS accessories, accessories recommended by ETAS or other accessories certified for the application. For detailed information about accessories, see "[Cables, adapters and accessories](#)" on page 65.

## 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](http://www.etas.com/hotlines).

## 2 Product overview

### 2.0.1 System requirements

### 2.0.2 Compatible hardware

- CBEB100.1, ES160.1, ES162.1, and ES165.1 Automotive Ethernet Media Converter
- ES882.1 and ES886.x ECU Interface Module

### 2.0.3 PC with one ethernet interface

A PC with one open Ethernet interface (1 Gbit/s or 100 MBit/s, full duplex) with RJ45 connection is required. Ethernet interfaces that are implemented with an additional network card in the PC must feature a 32-bit data bus.



#### Note

Half Duplex mode and Half Duplex Ethernet interfaces are not supported.

### Requirement to ensure successful initialization of the module



#### Note

It is imperative you disable the function which automatically switches to powersaving mode on your PC network adapter when there is no data traffic on the Ethernet interface!

### To deactivate the power saving mode

Choose in Windows System Control Center / Device Manager / Network Adapter the used network adapter by double-click. Deactivate the "Allow the computer to turn off this device to save power" option in the "Power Management" register. Confirm your configuration.

The manufacturers of network adapter have different names for this function.

Example:

- "Link down Power saving".
- "Allow the computer to turn off this device to save power".

## 2.1 Software requirements for BR\_XETK-S3.0A



#### Note

Operating the BR\_XETK-S3.0 with older software versions is not possible.

| Microcontroller      | HSP      | INCA    | INCA-MCE | ETK Tools | Method    |
|----------------------|----------|---------|----------|-----------|-----------|
| TC23x-PD             | V11.10.0 | V7.2.10 | V7.2.10  | V4.1.11   | DISTAB17  |
| TC26x-ED             | V11.6.0  | V7.2.6  | V7.2.6   | V4.1.7    | DISTAB17  |
|                      | V11.6.0  | V7.2.6  | V7.2.6   | V4.1.7    | Trace2Ram |
| TC26x-PD             | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | DISTAB17  |
| TC27x-ED             | V11.5.0  | V7.2.5  | V7.2.5   | V4.1.6    | DISTAB17  |
|                      | V11.6.0  | V7.2.6  | V7.2.6   | V4.1.7    | Trace2Ram |
| TC27x-PD             | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | DISTAB17  |
| TC29x-ED             | V11.5.0  | V7.2.5  | V7.2.5   | V4.1.6    | DISTAB17  |
|                      | V11.6.0  | V7.2.6  | V7.2.6   | V4.1.7    | Trace2Ram |
| TC29x-PD             | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | DISTAB17  |
| TC33x-PD             | V12.0.0  | V7.3.0  | V7.3.0   | V4.2.0    | DISTAB17  |
| TC36x-PD             | V11.15.0 | V7.2.15 | V7.2.15  | V4.1.16   | DISTAB17  |
| TC37x-ED             | V11.12.0 | V7.2.12 | V7.2.12  | V4.1.13   | DISTAB17  |
|                      | V11.12.0 | V7.2.12 | V7.2.12  | V4.1.13   | Trace2Ram |
| TC37x-PD             | V11.15.0 | V7.2.15 | V7.2.15  | V4.1.16   | DISTAB17  |
| TC38x-PD<br>(A-Step) | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | DISTAB17  |
| TC39x-ED<br>(A-Step) | V11.5.0  | V7.2.5  | V7.2.5   | V4.1.6    | DISTAB17  |
|                      | V11.5.0  | V7.2.5  | V7.2.5   | V4.1.6    | Trace2Ram |
| TC39x-ED<br>(B-Step) | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | DISTAB17  |
|                      | V11.8.0  | V7.2.8  | V7.2.8   | V4.1.9    | Trace2Ram |
| TC37x-XX             | V12.3.0  | V7.3.3  | V7.3.3   | V4.2.3    | DISTAB17  |
| TC39x-XX             | V12.3.0  | V7.3.3  | V7.3.3   | V4.2.3    | DISTAB17  |
| TC3Ex-PD             | V14.2.0  | V7.5.2  | V7.5.2   | V4.4.2    | DISTAB17  |

## 2.2 Software requirements for BR\_XETK-S3.0C

| Microcontroller   | HSP     | INCA   | INCA-MCE | ETK Tools | Method                  |
|-------------------|---------|--------|----------|-----------|-------------------------|
| TC49x<br>(A-Step) | V13.2.0 | V7.4.2 | V7.4.2   | V4.3.0    | DISTAB17                |
| TC4Dx             | V13.4.0 | V7.5.2 | V7.5.2   | V4.4.2    | DISTAB17                |
| TC4DxED           | V13.6.0 | V7.4.6 | V7.4.6   | V4.3.6    | DISTAB17                |
|                   | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | Trace2Ram <sup>1)</sup> |
| TC49xED           | V14.7.0 | V7.5.7 | V7.5.7   | V4.4.7    | DISTAB17                |
|                   | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | Trace2Ram <sup>2)</sup> |
| TC49xPD           | V14.7.0 | V7.5.7 | V7.5.7   | V4.4.7    | DISTAB17                |
| TC48xED           | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | DISTAB17                |
|                   | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | Trace2Ram <sup>3)</sup> |
| TC46xED           | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | DISTAB17                |
|                   | V15.0.0 | V7.6.0 | V7.6.0   | V4.5.0    | Trace2Ram <sup>4)</sup> |

## 2.3 Data emulation and measurement memory

### 2.3.1 Data emulation memory



#### Note

Only the BR\_XETK-S3.0A supports external supply emulation memory.

The BR\_XETK-S3.0 uses a portion of or up to the entire size of the ED RAM, to emulate data in internal flash. The following table lists the supported micro-controllers, the size of the ED RAM, and states if the ED RAM is capable of being powered using a standby supply.

- 1) Not recommended for raster times < 1ms.
- 2) Not recommended for raster times < 1ms.
- 3) Not recommended for raster times < 1ms.
- 4) Not recommended for raster times < 1ms.

| Microcontroller | Max. ED RAM | Standby powered |
|-----------------|-------------|-----------------|
| TC26x-ED        | 512 kByte   | Yes             |
| TC27x-ED        | 1 MByte     | Yes             |
| TC29x-ED        | 2 MByte     | Yes             |
| TC37x-ED        | 3 MByte     | Yes             |
| TC39x-ED        | 4 MByte     | Yes             |
| TC46x-ED        | 512 kByte   | No              |
| TC48x-ED        | -           | No              |
| TC49x-ED        | 3 MByte     | No              |
| TC4Dx-ED        | 5 MByte     | No              |
| TC4Z-ED         | 3 MByte     | No              |

### 2.3.2 Measurement data memory

The ED RAM is also used to support other functionalities which reduces the amount of ED RAM available for data emulation. E.g., the page switch mail box and OMD requires typically one tile of ED RAM (64 KB for TC2xx-ED, 256 KB for TC3xx-ED). Trace2Ram requires two tiles of ED RAM (128 KB for TC2xx-ED, 512 KB for TC3xx-ED).

| Item     | Characteristics                                                                                                                                                                 |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location | Typically located within the emulation memory when using DISTAB17 hooks. Measurement data memory can be located in internal RAM if the entire ED RAM is needed for calibration. |

### 2.3.3 Trace memory

| Item              | Characteristics               |
|-------------------|-------------------------------|
| Trace mirror size | 103 measurement values (typ.) |

## 2.4 Configuration

| Item          | Characteristics                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configuration | <p>1Project-specific configuration for</p> <ul style="list-style-type: none"><li>— different microcontrollers or</li><li>— memory configurations stored in EEPROM.</li></ul> |
| Update        | Logic devices updated using HSP software                                                                                                                                     |

## 3 Hardware setup

### 3.1 Transportation and packaging

- Only transport and store the product in ESD packaging.
- Only transport the product individually.
- Do not transport the product by the connected cables.

### 3.2 Mounting and placement

#### 3.2.1 Mounting the BR\_XETK-S3.0 into the ECU housing

##### **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**

For all types of mounting the BR\_XETK-S3.0 on the ECU housing, the gap pad has to be used!

##### 3.2.1.1 How to attach the BR\_XETK-S3.0

There are different methods to attach the BR\_XETK-S3.0 on the ECU housing:

- Fixing the BR\_XETK-S3.0 with mounting bracket.
- Fixing the BR\_XETK-S3.0 without mounting bracket.



##### **Note**

ETAS recommends to attach the BR\_XETK-S3.0 on the ECU housing with mounting bracket.

### 3.2.1.2 Fixing the BR\_XETK-S3.0 with mounting bracket

#### *Mounting material*

For mounting the BR\_XETK-S3.0 on the ECU housing with mounting bracket following parts are needed:

- Adhesive (recommended adhesive: LOCTITE SI 5145).
- Mounting bracket for fixing on the ECU housing.
- Gap pad for the thermal mounting to the ECU housing (including BR\_XETKS3.0 delivery content or as spare part).
- 2 screws M2 x 4, Pan Head ISO 14583.

| Number in figures | Quantity | Order Name                                                                                                           | Order Number  |
|-------------------|----------|----------------------------------------------------------------------------------------------------------------------|---------------|
| 1                 | 1        | BR_XETK-S3.0A Emulator Probe for the Infineon AURIX microprocessor family, delivery includes gap pad (F 00K 110 752) | F 00K 110 751 |
|                   |          | or                                                                                                                   |               |
|                   |          | BR_XETK-S3.0C ECU interface for the Infineon AURIX TC4xx microcontroller family includes gap pad (F 00K 110 752)     | F 00K 113 470 |
| 2                 | 1        | Gap pad as spare part for BR_XETK-S3.0                                                                               | F 00K 110 752 |
| 3                 | 1        | Mounting bracket for BR_XETK-S3.0                                                                                    | F 00K 110 753 |
| 4                 | 2        | Screw M2 x 4, Pan Head ISO 14583                                                                                     | -             |

#### *Mounting steps*

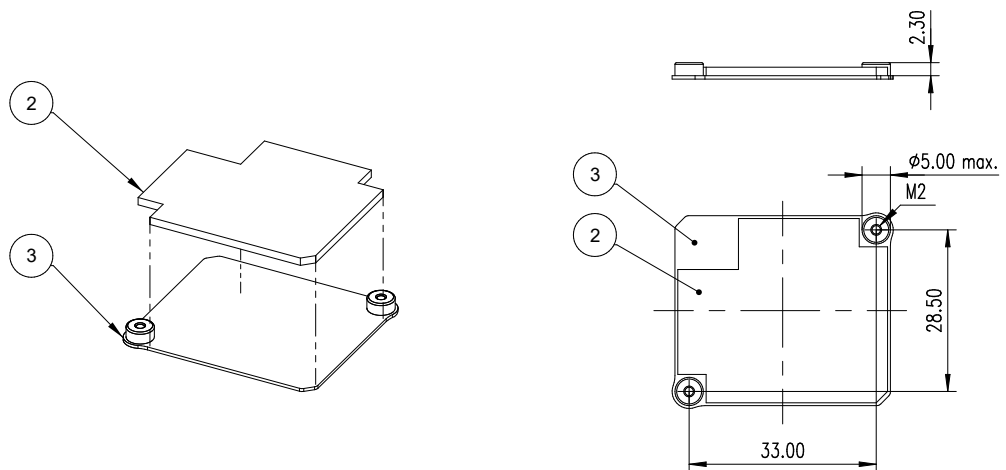
To mount the BR\_XETK-S3.0 into the ECU housing several mounting steps are required:



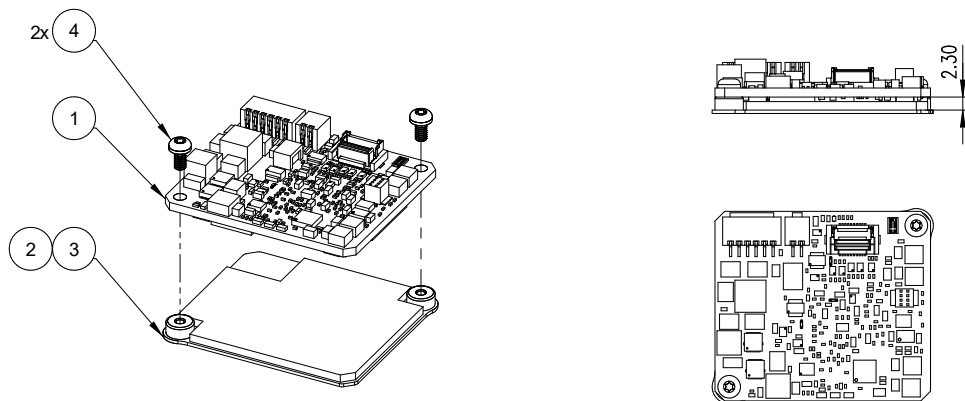
#### **Note**

Observe the instructions for use provided by the adhesive manufacturer. Treat the bonding area before and hold the drying times.

1. Apply the recommended adhesive on the mounting bracket.
2. Fit the mounting bracket at the intended location of the ECU housing.



3. The adhesive surfaces of the gap pad are protected with foils. Both foils must be removed before using the gap pad.
4. Fit the gap pad on the mounting bracket.  
Bring the cutout of the gap pad into line with the ETK connectors.  
The gap pad is self-adhesive.



5. Screw the BR\_XETK-S3.0 with the ECU housing..

### 3.2.1.3 Fixing the BR\_XETK-S3.0 without mounting bracket

This chapter describes an example to mount the BR\_XETK-S3.0 without the mounting bracket. Mounting material excluding the gap pad has to be provided by customer for the special use case.

#### *Mounting material*

For mounting the BR\_XETK-S3.0 on the ECU housing without mounting bracket following parts are needed:

- Gap pad for the thermal mounting to the ECU housing (including BR\_XETK-S3.0 delivery content or as spare part).
- 2 spacers (height = 2.30 mm, external diameter = 5.0 mm, M2 female)

thread).

- 2 screws M2 x 10, countersunk head.
- 2 nuts M2.

| Number in figures | Quantity | Order Name                                                                                                                       | Order Number  |
|-------------------|----------|----------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1                 | 1        | BR_XETK-S3.0A Emulator<br>Probe for the Infineon AURIX<br>microprocessor family, delivery<br>includes gap pad (F 00K 110<br>752) | F 00K 110 751 |
|                   |          | or                                                                                                                               |               |
|                   |          | BR_XETK-S3.0C ECU interface<br>for the Infineon AURIX TC4xx<br>microcontroller family includes<br>gap pad (F 00K 110 752)        | F 00K 113 470 |
| 2                 | 1        | Gap pad as spare part for BR_<br>XETK-S3.0                                                                                       | F 00K 110 752 |

### *Preparing the ECU housing*

1. Drill two holes through the ECU housing, see [on page 21](#).
2. Lower the holes on the outer side of the ECU housing.
3. Insert the screws through the holes in the housing.
4. Screw the screws from the inside of the housing with the spacers.
5. Seal the housing with the holes.

### *Attaching the BR\_XETK-S3.0 on the ECU housing*

1. Place the gap pad correctly between the spacers.
2. Set the BR\_XETK-S3.0 on the screws.
3. Attach the BR\_XETK-S3.0 with nuts M2.

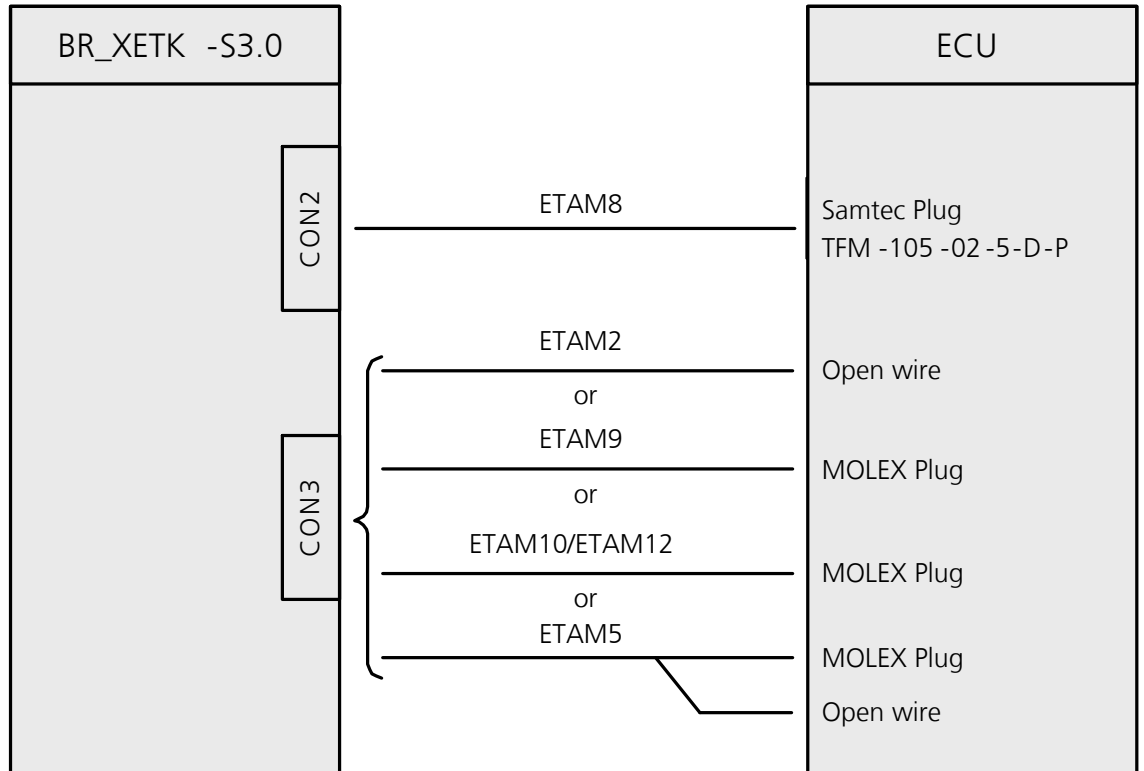
## 3.2.2 Connection to the ECU

For connecting the BR\_XETK-S3.0 to the ECU two XETK adapter cables are recommended:

- at CON2 adapter ETAM8A or ETAM8B
- at CON3 adapter ETAM2 or ETAM5 or ETAM9 or ETAM10/ETAM12

The adapter cables are to be ordered separately, see

The suitable connectors FCI-20 (CON2) and MOLEX-6 (CON3) should have been populated onto the ECU PCB for adapters ETAM8 and ETAM2/ ETAM5/ ETAM9/ETAM10/ETAM12



### 3.3 Connection to the power supply



#### **DANGER**

##### **Undefined vehicle behavior due to an ECU reset**

If the external power supply to the ETK is interrupted (e.g. cut, disconnected, etc.), this may lead to the ECU being reset.

- Connect the internal power supply of the ECU to the ETK in addition to the external power supply.
- If this is not possible, ensure that the external power supply to the ETK is not interrupted during operation.



## WARNING

### Risk to life from electric shock

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

- Use a power supply that is permitted for the product.

## NOTICE

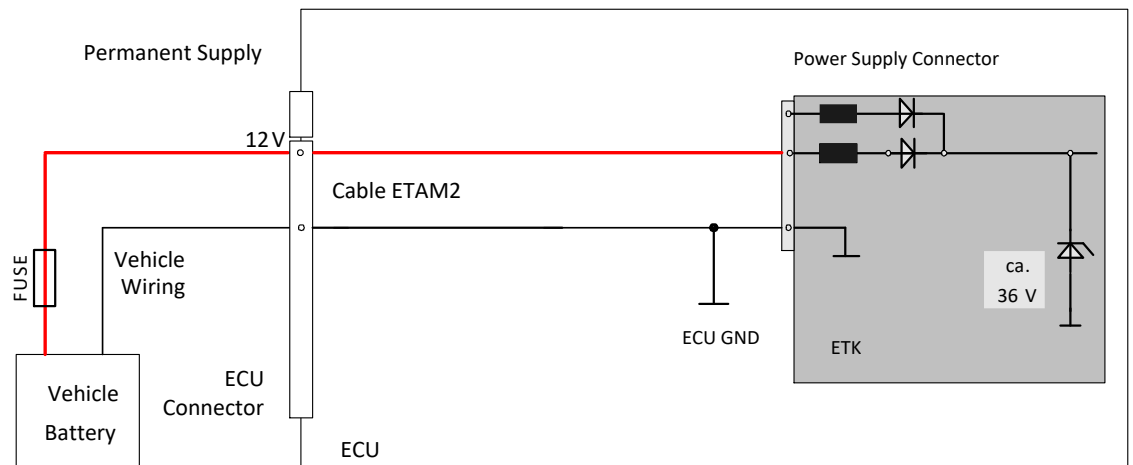
### Damage to the electronics due to potential equalization

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.

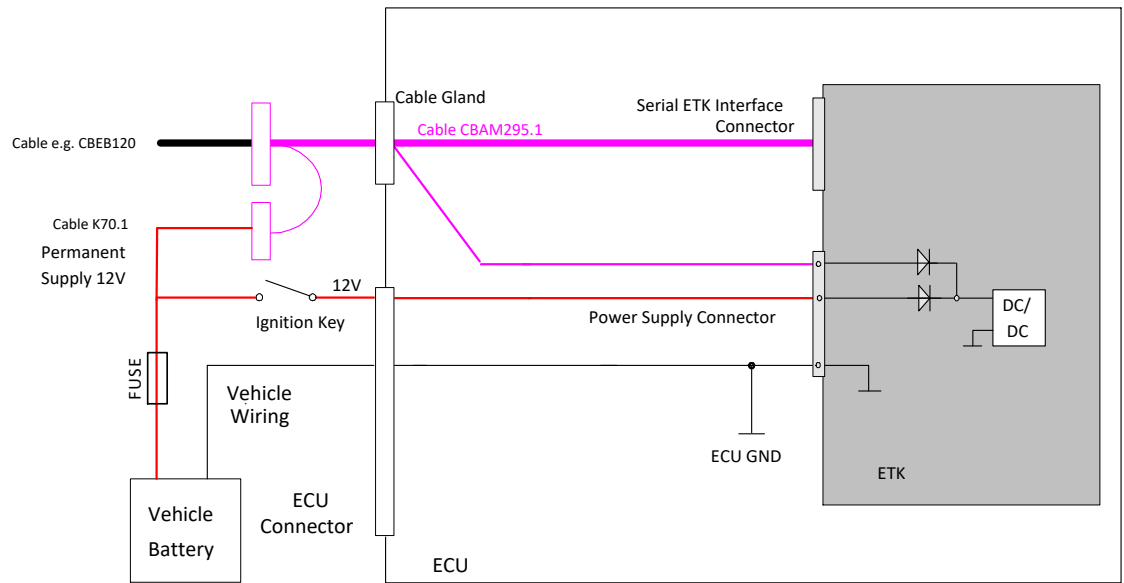
Take account of different electric potentials in your test setup and take appropriate measures to prevent equalizing currents.

The BR\_XETK-S3.0 needs a permanent power supply.

### 3.3.1 Permanent power supply inside ECU available



### 3.3.2 Permanent power supply inside ECU not available



## 3.4 Connection with other products

### 3.4.1 Wiring to the computer

#### 3.4.1.1 Compatible hardware



#### Note

The Automotive Ethernet interface is not compatible with the standard Ethernet interfaces of ETAS modules. A CBEB10x.1 Media Converter or an ES88x ECU Interface Module is needed to connect the BR\_XETK-S3.0 to the PC.

#### 3.4.1.2 Requirements for failsafe automotive ethernet operation

For failsafe operation of the Automotive Ethernet communication channel, all customer specific installations - including cables, connectors, and board adaptations have to be compliant to:

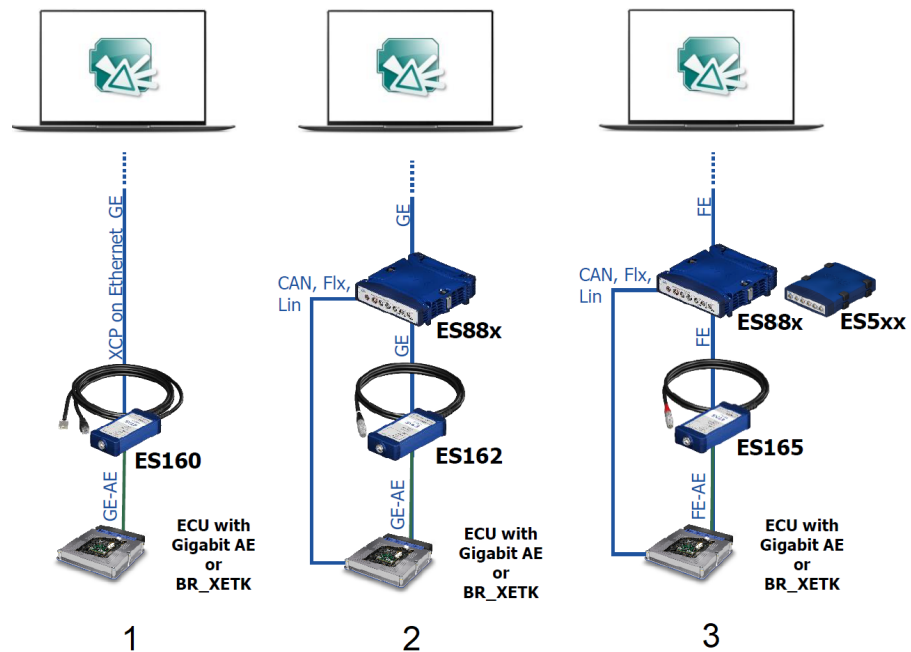
- IEEE Std. 802.3bwTM-2015, "Amendment 1: Physical Layer Specifications and Management Parameters for 100 Mb/s Operation over a Single Balanced Twisted Pair Cable (100BASE-T1)".
- Open Alliance, "BroadR-Reach® Definitions for Communication Channel, Version 2.0".

### Note

To achieve an appropriate channel performance all PCB board and cable segments have to be optimized with regard to line impedance matching, length matching within the differential net routing or twisted pair cabling and on the reduction of untwisted regions. Stub segments must be avoided for the Point-to-Point cable connection in favor of inline connectors and shielding measures shall be considered depending on the operation environment.

#### 3.4.1.3 Example connection overview with media converter

- For use with PC or standard Ethernet switches
- For use with GE ports together with ES8xx devices.

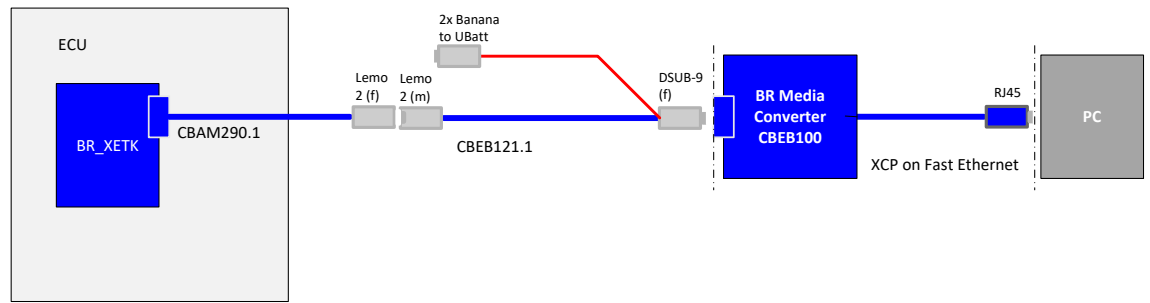


- For use with FE ports together with ES5xx, ES8xx devices.

#### 3.4.1.4 Example connection overview with media converter

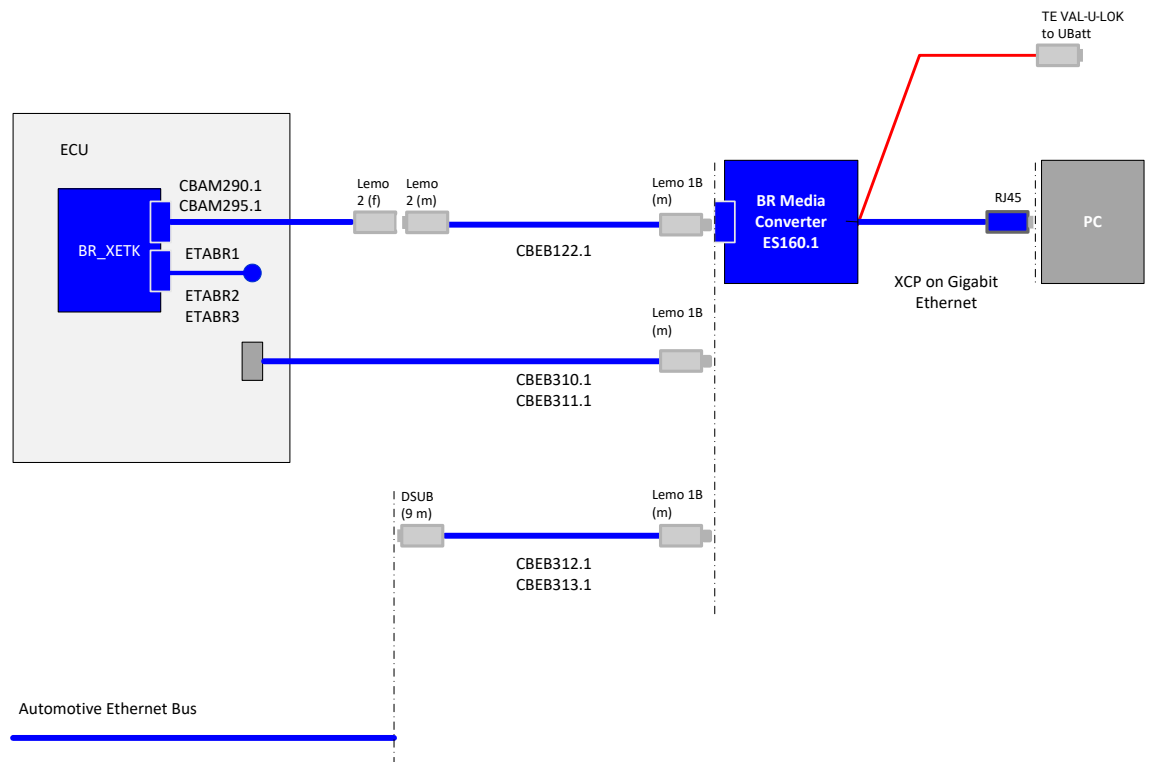
The Automotive Ethernet can be connected directly into a ES8xx with AE input (not on the picture).

### 3.4.1.5 CBEB100.1 automotive ethernet media converter



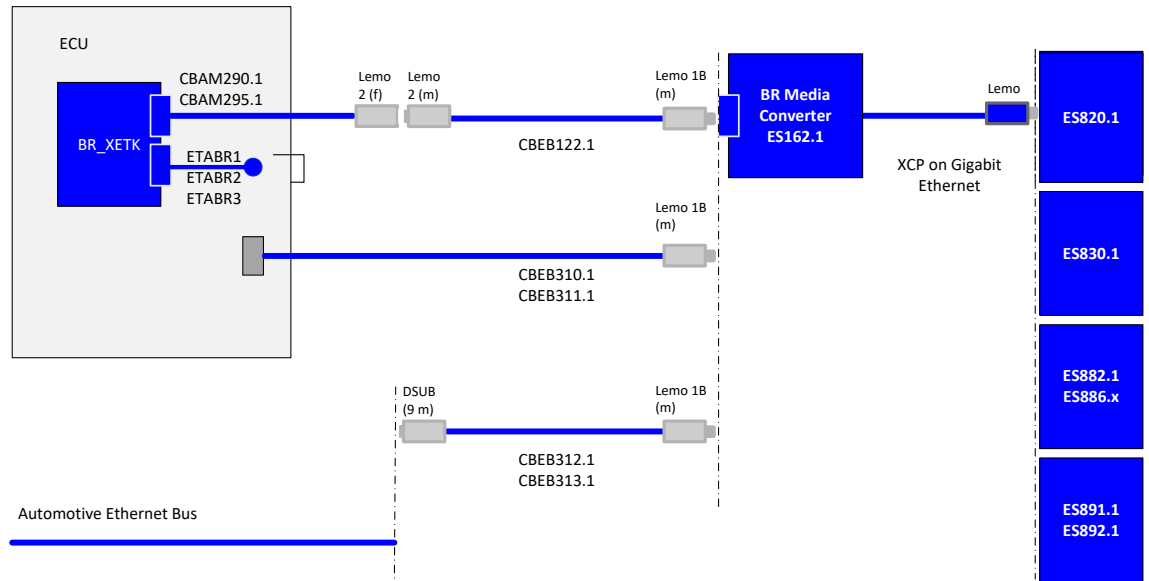
BR\_XETK-S3.0 connected with CBEB100.1 Automotive Ethernet Media Converter and ETAS Cable to PC.

### 3.4.1.6 ES160.1 automotive ethernet media converter



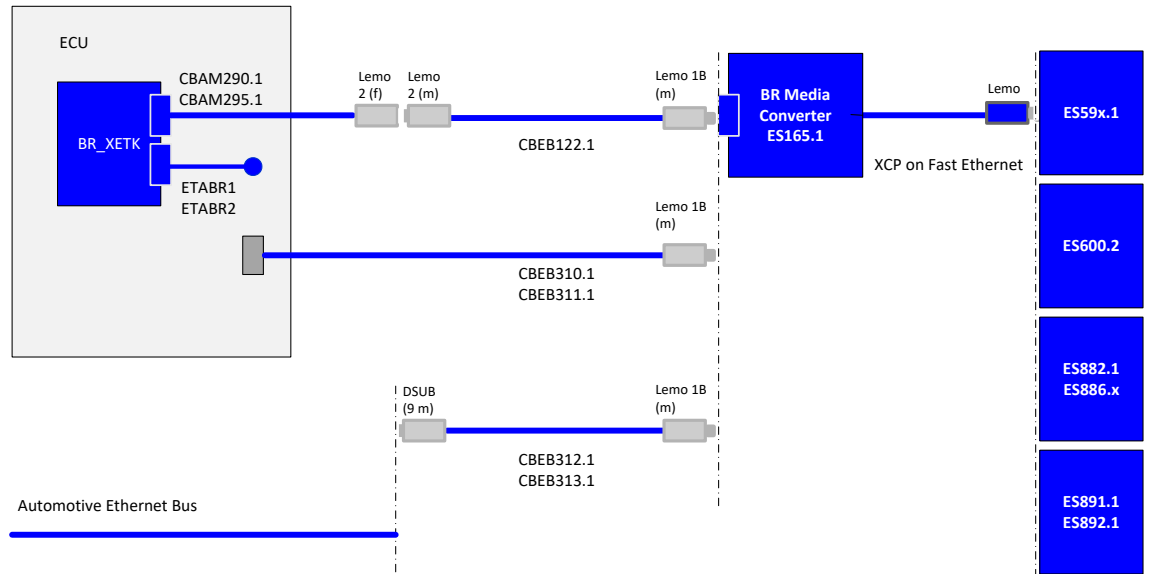
BR\_XETK-S3.0 connected with ES160.1 Automotive Ethernet Media Converter via Gigabit Ethernet Interface to PC.

### 3.4.1.7 ES162.1 automotive ethernet media converter



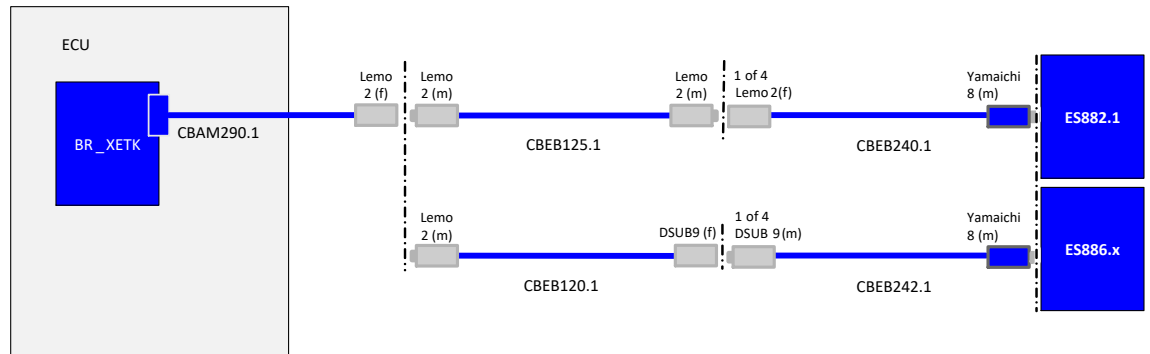
BR\_XETK-S3.0 connected with ES162.1 Automotive Ethernet Media Converter via Gigabit Ethernet Interface to ETAS Modules

### 3.4.1.8 ES165.1 automotive ethernet media converter



BR\_XETK-S3.0 connected with ES165.1 Automotive Ethernet Media Converter via Fast Ethernet Interface to ETAS Modules.

### 3.4.1.9 ES88x ECU and bus interface module



BR\_XETK-S3.0 connected via Gigabit Ethernet Interface to ES88x ECU and Bus Interface Modules with ETAS Cables.

## 4 Basic operation

### *Adapterboard connection*

- Align the M-ETK Adapterboard variant with the designated connector on the M-ETK-T Device.
- Gently push until it is securely seated.

### *Physical integration into ECU*

The M-ETK is designed for on premise integration. This typically involves connecting the M-ETK Device and its Adapterboard to the development ECU's hardware interfaces. Please note that the M-ETK must be mounted in the low-voltage area of the ECU.

### *Power connection*

Connect the M-ETK to the ECU's low voltage power supply or a suitable external power source according to its specified voltage requirements.

### *Software integration*

The required M-ETK software components (e.g., Distab, 2-page calibration handling, handshake mechanisms) need to be integrated into the ECU's software. This is typically performed by a HW/SW Integrator.

### *Network connection*

Connect the M-ETK's Automotive Ethernet XCP interface to your development network.

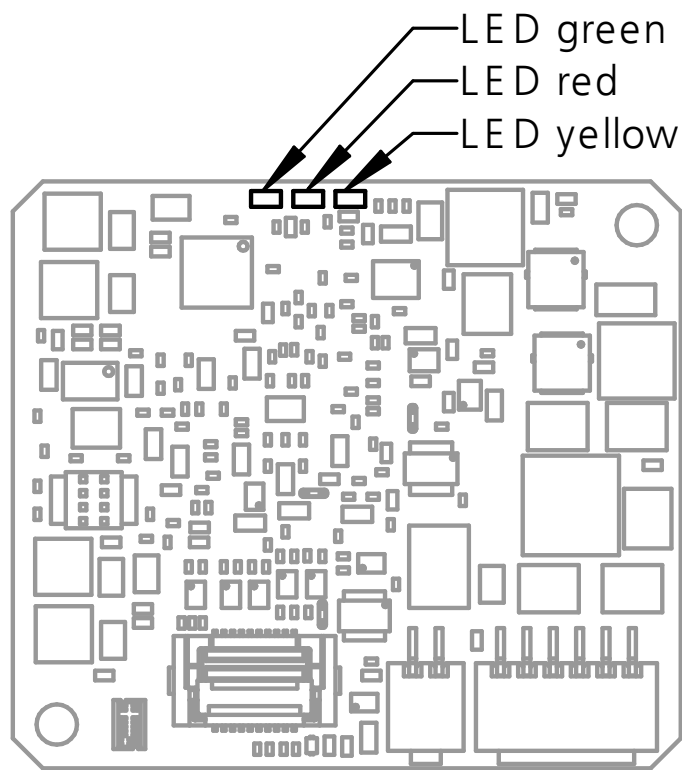
### *Feature license activation*

Activate any purchased feature licenses (e.g., Trace2Pin) through the provided software tools.

## 4.1 Status indicator

### 4.1.1 LED specification

There are three LEDs displaying the operating mode BR\_XETK-S3.0:



| LED   | State    | Definition                                                                                                                                                                                       |
|-------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Red   | On       | BR_XETK-S3.0 is supplied with power and active (i.e., the ECU is switched on or the ETAS calibration and development system is connected and ready to communicate with the BR_XETK-S3.0)         |
| Green | Off      | The Working contains data and is accessible from INCA.                                                                                                                                           |
|       | Flashing | BR_XETK-S3.0 is in boot configuration mode. <ul style="list-style-type: none"> <li>— measurement and calibration are not possible</li> <li>— BR_XETK-S3.0 update with HSP is required</li> </ul> |

|        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | On       | <p>Power supply has dropped under selected threshold:</p> <ul style="list-style-type: none"> <li>– data retention of the calibration data manager in the ECU is no longer ensured</li> <li>– as soon as the BR_XETK-S3.0 switches on again, the ECU switches to the Reference Page.</li> </ul> <p>Green LED stays lit until the calibration and development system downloads data into the calibration data memory. Otherwise switching to the Working Page is not possible.</p> |
| Yellow | Off      | BR_XETK-S3.0: no link to calibration system established.                                                                                                                                                                                                                                                                                                                                                                                                                         |
|        | On       | 100 Mbit/s communication to calibration system established.                                                                                                                                                                                                                                                                                                                                                                                                                      |
|        | Flashing | Communication active.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## 4.2 Menu and navigation

### 4.2.1 Overview

Configuration data is stored permanently in a serial Flash.

Generating a valid configuration data set is supported by the "(X)ETK Configuration Tool" (XCT Tool). The XCT Tool contains information on all available ETKs. The user is supported through a graphical interface.

The configuration is done in two steps:

1. Generation of the special address offset for the emulation and measurement data memory.
  - The location of data areas, measured data output areas, trigger segment addresses etc. are familiar to the ECU software developer, or can be generated automatically. If an ECU description database (ASAP, ...) with the corresponding input exists, these inputs can be downloaded from this database. If necessary, a plausibility check is performed.
3. Connection of the ETK to the ECU.

- The ECU hardware developer defines the connection of the ETK to the ECU. The corresponding signals usually have to be adjusted for each microcontroller. All inputs are checked for plausibility, to make sure that a valid configuration is generated.

The "(X)ETK Configuration Tool" can create the following output:

- Direct ETK configuration
- Storage of the configuration in a data file
- The corresponding ASAP2 input

The most important outputs are the entries for the ASAP2 file. All A2L definitions necessary for configuring an ETK will be created. These are:

- Overlay Region definitions
- Memory Segment definitions
- BR\_XETK-S3.0 configuration features
- Raster definitions

If these parameters are entered correctly in the corresponding ECU description file, it guarantees that every time the calibration system is started, the ETK is checked for the appropriate configuration. If necessary, the ETK will be configured appropriately to the corresponding project.

### 4.2.2 Configuration parameter

The XCT Tool provides support concerning hardware configuration parameters and their possible values.

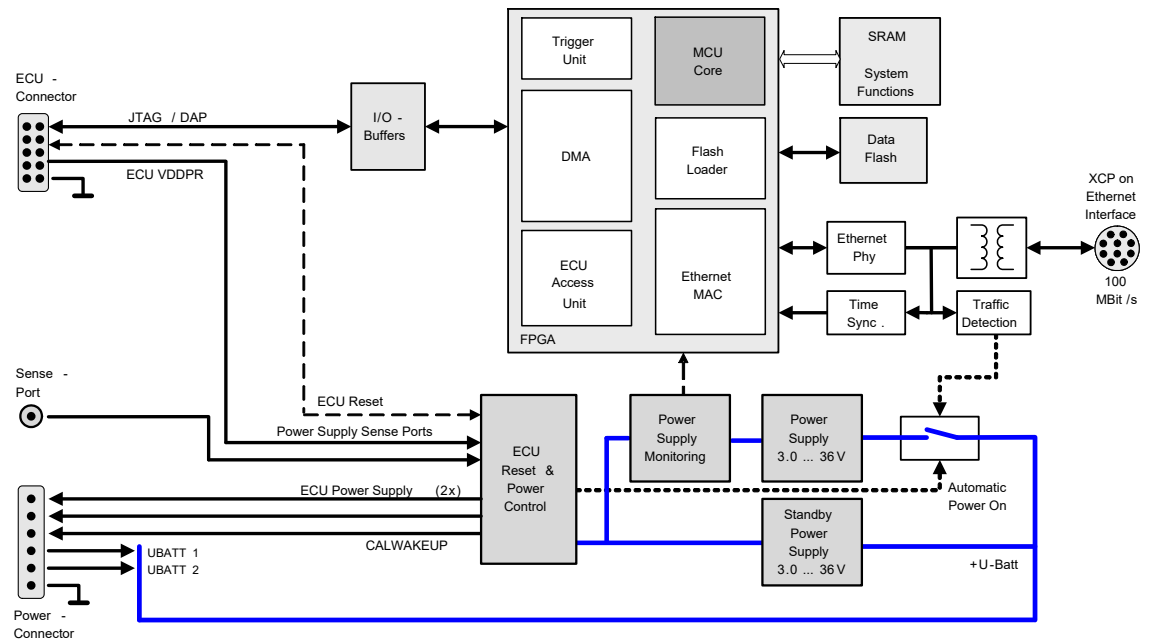
They are described for the different (X)ETK types in the help document of the "(X)ETK Configuration Tool".

#### Starting the "XCT Tool" help

1. Start the XCT Tool.
  - The main window of the XCT tool opens.
3. Select in the menu bar > **Contents**.
  - The XCT Tool help window opens.
5. Choose **Reference to User Interface > (X)ETK Hardware Configuration Parameters**.
6. Choose the topic BR\_XETK-S3.0.
  - The topic **BR\_XETK-S3.0** contains information about the BR\_XETK-S3.0 hardware configuration parameters and their possible values.

## 5 Overview of functions

### 5.1 Architecture



While the microcontroller accesses the program data (not the program code) out of the data emulation memory provided by the microcontroller, the content of the data emulation memory can simultaneously be modified by the calibration and development system through the Automotive Ethernet interface. This process enables adjustments of parameters, characteristic lines and maps through the calibration and development system. Using an additional measurement data memory area, the ECU microcontroller can provide data to the calibration and development system by buffering the data (DISTAB17) and triggering the BR\_XETK-S3.0 to read the data via DAP. The BR\_XETK-S3.0 then reads, buffers, processes and sends this measured data to the PC.

If no additional measurement data memory is available, the BR\_XETK-S3.0 can alternatively read the data to be measured directly from the microcontroller's memory. This process is Triggered Direct Measurement (TDM) with DISTAB17. The 100 Mbit/s XETK Ethernet interface provides communication with the PC.

| ETK Connector | Description                        |
|---------------|------------------------------------|
| CON1          | XETK Automotive Ethernet interface |
| CON2          | ECU Interface                      |
| CON3          | Power supply                       |

## 5.2 Data emulation and data measurement

The BR\_XETK-S3.0 is a serial XETK using DAP as the primary microcontroller interface. Typical of all serial (X)ETKs, the RAM used for data emulation and data measurement is not accessible by the XETK until the microcontroller is powered up and the startup handshake is performed.

Serial XETKs use the ETAS two-page concept, consisting of both a Reference and a Working page.

The Reference Page is located in the ECU flash and cannot be modified by a simple write access. All changes to the Reference Page must be done via Flash programming.

The Working Page is located within the microcontroller's ED RAM. The Working Page may be a portion of or the entire size of the ED RAM. The ED RAM used for the emulation of calibration data must not be used by the ECU software directly as general purpose RAM. It is recommended that the ED RAM is permanently powered by the XETK or ECU. The XETK/INCA has the complete control over the RAM used as Working Page and its contents. When enabling data emulation, the XETK establishes a basic startup configuration of the data in the Working Page by copying the corresponding data in the Flash to the emulation space.



### Note

With serial ETKs such as the BR\_XETK-S3.0, there is an important restriction that no access to the memory is possible, while the ECU is not running. To enable a coldstart measurement (measurement during ECU power-up) in spite of this restriction, the coldstart measurement procedure is defined to give the user the feeling of a parallel XETK. Please inquire further if you would like additional details for the coldstart measurement procedure.

### 5.2.1 Page switching

To enable calibration, the Working Page must be activated. The process of switching from the Reference Page to the Working Page and vice versa is known as page switching. The BR\_XETK-S3.0 supports two methods of page switching; however, one method is only available for certain controllers.

The BR\_XETK-S3.0 can access both the Reference Page and the Working Page, regardless of which is active from the microcontroller's point of view and which page switch method is used. The two types of page switching methods are described next.

#### *Protocol based page switching*

The BR\_XETK-S3.0 supports Protocol Based page switching for all supported microcontrollers. Page switching is implemented in microcontroller software by switching the overlay memory on (Working Page) and off (Reference Page) using microcontroller overlay registers. The BR\_XETK-S3.0 does not directly

control the microcontroller overlay registers. Instead, the BR\_XETK-S3.0 and microcontroller software use a simple communication method with a shared mailbox in RAM. The XETK uses this mailbox to request and monitor page switching; the microcontroller software is responsible to service this mailbox and perform the page switches.

Using an overlay modification description, also in RAM, the XETK provides the necessary information of how the overlay registers need to be modified to realize the page switch which is requested.

### ***Direct register access page switching***

The BR\_XETK-S3.0 supports Direct Register Access page switching for microcontrollers which provide additional internal registers for page switching. Switching between the Reference Page and Working Page is done in microcontroller hardware by redirecting accesses to calibration data between either the Flash (Reference Page) or the RAM (Working Page) using microcontroller internal registers.

The BR\_XETK-S3.0 has direct access to control these registers.

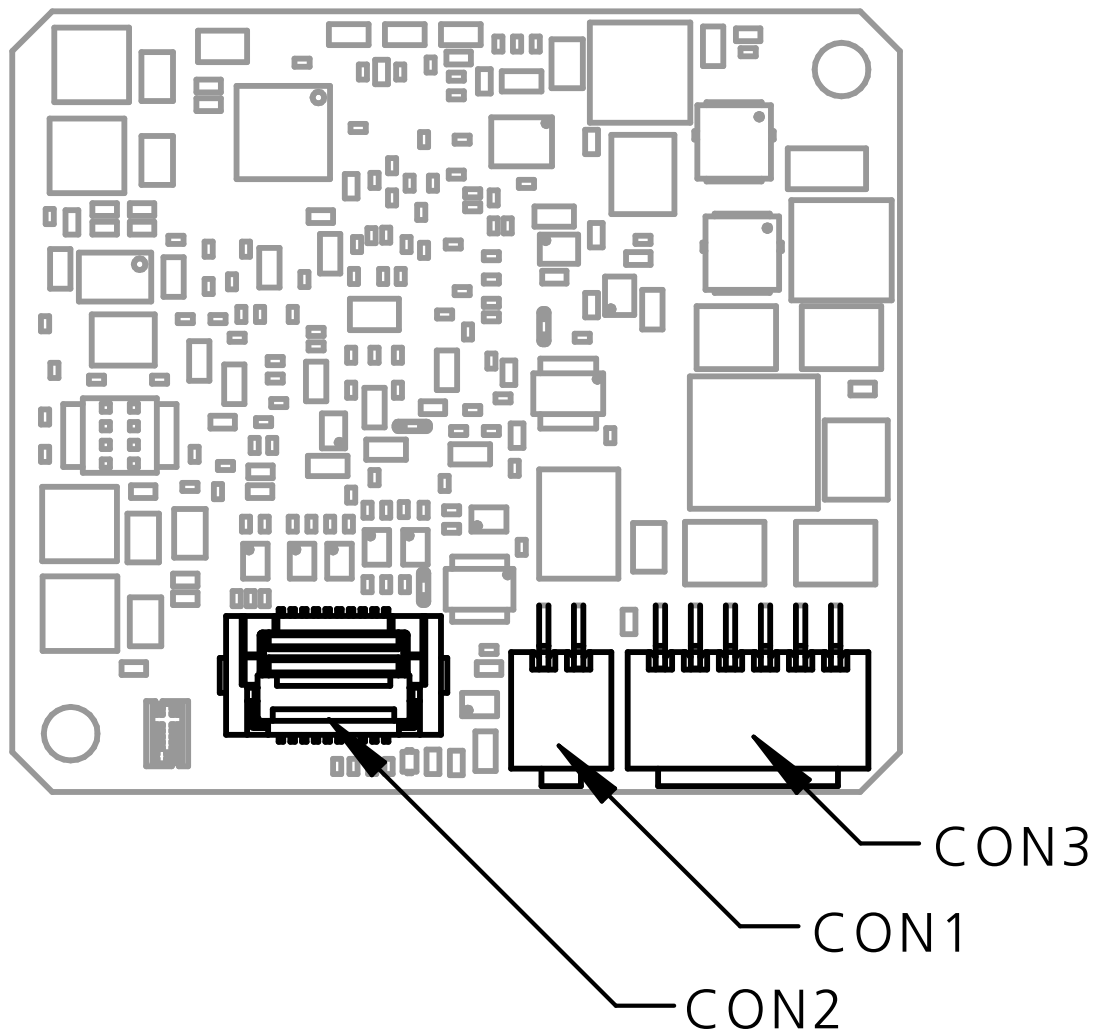
To use Direct Register Access page switching, the microcontroller software could initialize the necessary registers; however, it must not change the values after the XETK startup handshake has taken place.



#### **Note**

The BR\_XETK-S3.0 can use the Direct Register Access page switch method only with the TC3xx variants of the AURIX microcontrollers. Additional AURIX microcontrollers can be supported on request.

## 5.3 Interfaces



### 5.3.1 Automotive ethernet interface CON1

The Automotive Ethernet interface (100BASE-T1) of the BR\_XETK-S3.0 cannot be connected to a PC directly, but a media converter has to be inserted in between.

Its purpose is to transform the physical layers of Automotive Ethernet (1 differential pair / 2 wires) into Standard Ethernet (2 differential pairs/ 4 wires) and vice versa. The media converter has to be connected to CON1.

The combination of the BR\_XETK-S3.0 and the Automotive Ethernet media converter CBEB100.1, ES160.1, ES162.1, and ES165.1 is integrated in the ETAS IP worldb with automatic IP management and supports the open automotive "Universal Measurement and Calibration" standard "XCP on Ethernet" (TCP/IP, UDP/IP).

The open "XCP on Ethernet" interface allows for connecting to the BR\_XETK-S3.0 with third party application software.



#### Note

The Automotive Ethernet interface is not compatible with the standard Ethernet interfaces of ETAS modules. An Automotive Ethernet Media Converter or an ES88x ECU Interface Module is needed to connect the BR\_XETK-S3.0 to the PC.

### 5.3.2 ECU interface CON2

The BR\_XETK-S3.0 is connected via connector CON2 to the ECU with an adapter cable. The pin definition depends on the application and the microcontroller type. In general, the ECU interface consists of

- 1 ECU voltage line, which is not used for XETK power supply, but only for detection of the ECU status, therefore the power consumption on this line is negligible.
- 1 Reset line which allows the XETK to control and monitor the system reset of the ECU.
- 1 Reset line which allows the XETK to control and monitor the power-on reset of the ECU.
- 5 Debug lines for the communication between the BR\_XETK-S3.0 and the microcontroller.
- 5 ground lines for proper shielding of the ECU interface lines.

### 5.3.3 Power supply interface CON3

The BR\_XETK-S3.0 requires a permanent power supply. It is typically powered directly from the car battery. The input voltage may vary, see ["Technical specifications" on page 44](#). In case of higher input voltages to the XETK, additional voltage protection is required. The BR\_XETK-S3.0 will also accept voltage dips down to 3 V (for additional details of low voltage operation, see ISO standard 16750).

From the input battery voltage, switch-mode power supplies provide all necessary voltages on the BR\_XETK-S3.0. The power supply of the ECU is not affected by the BR\_XETK-S3.0. An automatic switch ensures that the power consumption of the BR\_XETK-S3.0 is reduced to a minimum, when the BR\_XETK-S3.0 enters its standby (sleep) mode.

The BR\_XETK-S3.0 is supplied with power through the connector CON3.



When waking up the ECU via the CalWakeUp pin, it can be configured if the pin is driven high until the microcontroller IO voltage (VDDPSTBY) is high or if the pin should be driven high until the startup handshake between ECU and XETK is complete. Löschen Sie diesen Text und ersetzen Sie ihn mit Ihrem eigenen.



#### Note

The CalWakeUp function is optional and not essential for the operation of BR\_XETK-S3.0. Use of this function requires support of ECU hardware.

## 5.5 Reset

The requirement for the BR\_XETK-S3.0 reset mechanism is to ensure that powerup and power-down behavior of ECU is clean and smooth. The BR\_XETK-S3.0 normally drives /PORST low during XETK power up or upon INCA request.

The signals /PORST and /ESR0 of the microcontroller are used by the BR\_XETK-S3.0 to detect when the ECU is in reset.



#### Note

The reset signal /PORST can be hold or pulled low while the BR\_XETK-S3.0 is booting depending on the use the adapter ETAM8A or the adapter ETAM8B. The BR\_XETK-S3.0 has to be configured in the XCT tool according to the needed reset signal characteristic during BR\_XETK-S3.0 standby.

The BR\_XETK-S3.0 senses the switched ECU power supply. This allows it to detect when the ECU is off and forward this information to INCA. In addition, it allows the XETK to enter the power save mode with the calibration system unplugged.

## 5.6 Trace based measurement



#### Note

Only the BR\_XETK-S3.0A supports trace based measurement.

The microcontroller ability to send trace messages is used to forward any write access to measurement data to CPU internal buffer (Trace2Ram / Trace to RAM). This buffer is automatically read by the BR\_XETK-S3.0 via the DAP interface.

The BR\_XETK-S3.0 combines the processing of this data trace messages with an initial direct read of the configured measurement data to an always up to

date mirror of the measurement data in the ECU. The current values will be sent from the XETK to INCA every time the ECU software issues the corresponding trace trigger.

For details on trace trigger, see [Trigger Modes](#).

TheBR\_XETK-S3.0 does the complete configuration of the microcontroller for trace based measurement. No ECU software is required for the configuration.

As trace based measurement has to transfer trace data, address and some bycatch via DAP interface it is less efficient compared to DISTAB17 non-trace measurement regarding DAP interface usage. But it has lower impact on ECU runtime and faster rasters are possible.

## 6 Troubleshooting

### 6.1 Problems and solutions

#### 6.1.1 No communication between the ECU and ETK

**Cause:** No permanent powersupply at the BR\_XETK-S3.0.

It is possible, that if ECU and ETK are switched-on simultaneously, no communication between the ECU and ETK can be established.

**Workaround:** Trigger an ECU reset by application tool.



#### Note

The BR\_XETK-S3.0 requires a permanent power supply. It is typically powered directly from the vehicle battery, see [Power Supply](#).

## 7 Technical specifications

### 7.1 Hardware specifications BR\_XETK-S3.0

#### 7.1.1 Ambient conditions

| Item                                               | Characteristics                          |
|----------------------------------------------------|------------------------------------------|
| Operating temperature range                        | - 40 °C to +110 °C<br>- 40 °F to +230 °F |
| Storage temperature range (without packaging)      | 0 °C to +50 °C<br>+32°F to +122 °F       |
| Max. relative humidity (non-condensing)            | 95%                                      |
| Max. altitude                                      | max. 5000 m/ 16400 ft                    |
| Degree of contamination (IEC 60664-1, IEC 61010-1) | 2                                        |
| Protection rating (IEC 60529)                      | Determined by installation in ECU        |
| Overvoltage category (mains supply)                | II                                       |

#### Note

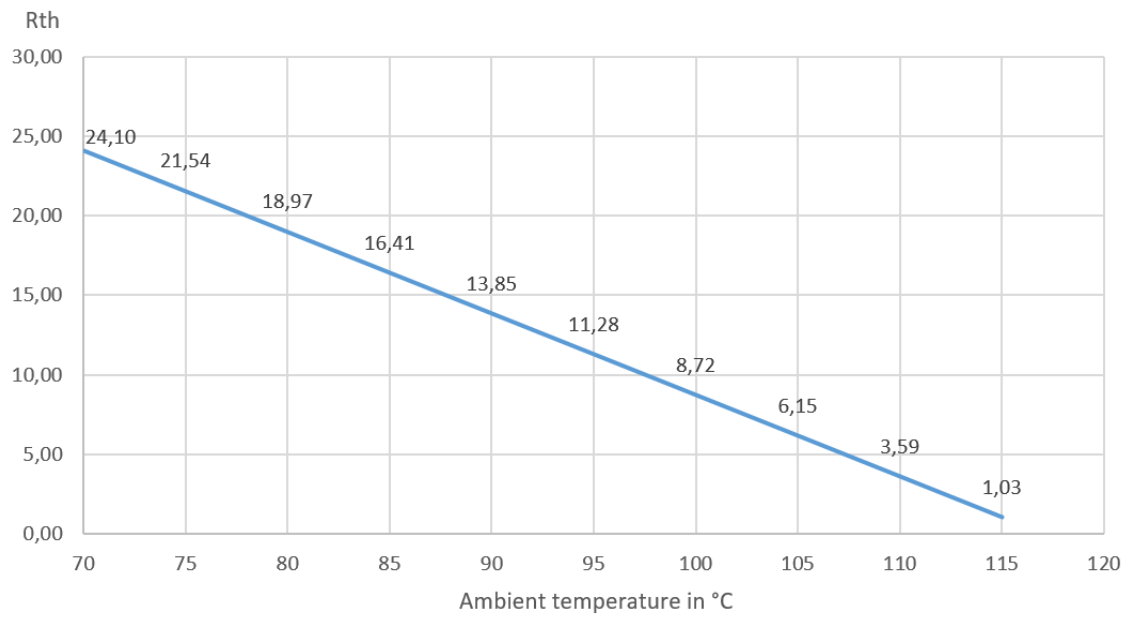
Maximum Voltage to Earth or to any accessible parts (e.g. ECU Housing, Vehicle Chassis): 60V DC / 30V AC.

Inside the ECU housing the maximum. temperature is specified with 110°C (230 °F), still air. Outside of the ECU housing the maximum ambient temperature is assumed to be 105°C (221 °F) at 1m/s airflow.

#### Note

It is recommended to mount the BR\_XETK-S3.0 via gap pad and mounting bracket directly to the ECU housing.

Maximum thermal Resistance (R<sub>th</sub>) BR\_XETK-S3.0 glued mounting bracket surface to ambient air [ K/W ].



$$R_{th} = (125 - 8 - T_{amb}) / 1.95 \text{ K/W}$$

$$T_{jmax} = 125^{\circ}\text{C} (257^{\circ}\text{F})$$

### 7.1.2 Electrical data

| Parameter                                | Symbol     | Condition                                                                               | Min | Typ | Max | Unit |
|------------------------------------------|------------|-----------------------------------------------------------------------------------------|-----|-----|-----|------|
| Permanent power supply (vehicle battery) | $U_{Batt}$ | Vehicle usage <sup>1)</sup>                                                             | 6   | 12  | 36  | V    |
| [all values $\pm 0\%$ ]                  |            |                                                                                         |     |     |     |      |
| Cranking voltage                         | $U_{Batt}$ | < 3 seconds                                                                             | 3   |     |     | V    |
| Standby current                          | $I_{STBY}$ | $U_{Batt} = 12 \text{ V};$<br>ECU off;<br>no load from ECU;<br>$T = 20^{\circ}\text{C}$ | 30  | 40  | 50  | mA   |
| Operating current                        | $I_{Batt}$ | $U_{Batt} = 12 \text{ V};$<br>no load from ECU;<br>$T = 20^{\circ}\text{C}$             | 90  | 135 | 250 | mA   |

| Parameter                                                                                                                | Symbol            | Condition                                                                                          | Min                                           | Typ  | Max | Unit |
|--------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------|------|-----|------|
| Power dissipation                                                                                                        | P <sub>Batt</sub> | U <sub>Batt</sub> = 12 V;<br>I=0mA at pin VDDSTBY;<br>T = 20 °C                                    |                                               | 1.62 |     | W    |
| Power dissipation                                                                                                        | P <sub>Batt</sub> | U <sub>Batt</sub> = 12 V;<br>I = 500 mA at pin VDDSTBY;<br>I = 80 mA at pin VDDPSTBY;<br>T = 20 °C |                                               | 2.7  |     | W    |
| Fuse in the ETK U <sub>Batt</sub> supply line.<br>Only required if the power supply or ECU is not protected accordingly. |                   |                                                                                                    | MINI, 2 A 58 V DC<br>(Littelfuse 0997002.WXN) |      |     |      |
| Over-voltage category<br>(AC mains supply)                                                                               |                   | II                                                                                                 |                                               |      |     |      |

<sup>1)</sup> The BR\_XETK-S3.0 implements reverse voltage protection in the same range and may be used only with central load dump protection.

24 V vehicles require U<sub>Batt</sub> disturbing pulse reduction to 12 V vehicle system.

12 V vehicles don't require special disturbing pulse reductions.

**Note**

The BR\_XETK-S3.0 will accept permanent power supply voltage dips (for additional details of 3 V low voltage operation, see ISO standard 16750).

**Note**

Maximum Voltage to Earth or to any accessible parts (e.g. ECU Housing, Vehicle Chassis): 60V DC / 30V AC.

### Maximum inrush current

It is highly recommended that the BR\_XETK-S3.0 be connected to a permanent power supply. When this is not possible, or the BR\_XETK-S3.0 must be powered off and back on in short intervals, time is required to reactivate the inrush limiting circuit of the BR\_XETK-S3.0.

If the time between powering the ETK off and on is less than 40 seconds a high current peak can occur. If the above-mentioned fuse is used, this inrush current will not trigger the fuse. If other protection mechanisms are in place, the inrush current must be considered in the ECU design.

| Time Between Powering Off and On |  | Inrush Current Pulse ( $U_{Batt} = 12\text{ V}$ ) |
|----------------------------------|--|---------------------------------------------------|
| > 40 s                           |  | 800 mA / 5 ms                                     |
| < 40 s                           |  | 18 A / 60 $\mu\text{s}$                           |

## 7.1.2.1 Microcontroller interface

### BR\_XETK-S3.0A

| Parameter                                                | Symbol            | Condition                                          | Min                    | Typ  | Max        | Unit          |
|----------------------------------------------------------|-------------------|----------------------------------------------------|------------------------|------|------------|---------------|
| ECU Standby RAM Output Voltage                           | VDDSTBY           | max 500 mA load                                    | 1.23                   | 1.3  | 1.34       | V             |
| VDDPSTBY Output Voltage                                  | VDDPSTBY          | max 80 mA load                                     | 3.14                   | 3.3  | 3.46       | V             |
| Cal_Wakeup Output Voltage                                | CAL_WAKEUP        | $U_{Batt} = 6 - 36\text{ V}$ ;<br>load = 0 - 50 mA | $U_{Batt} - 1\text{V}$ |      | $U_{Batt}$ | V             |
| ECU Power Supply Supervision Voltage<br>(3.3 V selected) | VDDP              | ECU on                                             | 2.70                   | 2.80 | 2.89       | V             |
|                                                          |                   | ECU off                                            | 2.44                   | 2.54 | 2.66       | V             |
|                                                          |                   | abs. max.                                          |                        |      | 5.50       |               |
|                                                          | IDDP              | VDDP 3.3 V                                         |                        |      | 200        | $\mu\text{A}$ |
| ECU Standby RAM Supervision Voltage                      | VDDSTBY           | VDDSTBY                                            | 1.02                   | 1.12 | 1.22       | V             |
|                                                          | /VDDSTBY-BY_SENSE | VDDSTBY $\downarrow$                               | 1                      | 1.1  | 1.2        | V             |
|                                                          | IDDSTBY           | VDDSTBY 1.25 V                                     |                        |      | 73         | $\mu\text{A}$ |

## BR\_XETK-S3.0C

| Parameter                                                | Symbol       | Condition                                        | Min                      | Typ    | Max        | Unit          |
|----------------------------------------------------------|--------------|--------------------------------------------------|--------------------------|--------|------------|---------------|
| ECU Standby RAM Output Voltage                           | VDDSTBY      | max 500 mA load                                  | 0.9                      | 0.95   | 1          | V             |
| VDDPSTBY Output Voltage                                  | VDDPSTBY     | max 80 mA load                                   | 3.14                     | 3.3    | 3.46       | V             |
| CAL_ Wakeup Output Voltage                               | CAL_ WAKEUP  | $U_{Batt} = 6 - 36 \text{ V}$ ; load = 0 - 50 mA | $U_{Batt} - 1 \text{ V}$ |        | $U_{Batt}$ | V             |
| ECU Power Supply Supervision Voltage<br>(3.3 V selected) | VDDP         | ECU on                                           | 2.70                     | 2.80   | 2.89       | V             |
|                                                          |              | ECU off                                          | 2.44                     | 2.54   | 2.66       | V             |
|                                                          |              | abs. max.                                        |                          |        | 5.50       |               |
|                                                          | IDDP         | VDDP 3.3 V                                       |                          |        | 200        | $\mu\text{A}$ |
| ECU Standby RAM Supervision Voltage                      | VDDSTBY      | VDDSTBY                                          | 0.84                     | 0.87   | 0.90       | V             |
|                                                          | /VDDSTBY-BY_ | VDDSTBY                                          |                          | 0.- 82 | 0.85       | 0.- V         |
|                                                          | SENSE        | ↓                                                |                          |        |            | 88            |
| ECU Standby RAM Supervision Voltage                      | IDDP         | VDDSTBY                                          |                          |        | 73         | $\mu\text{A}$ |
|                                                          |              | 0.95 V                                           |                          |        |            |               |

### 7.1.2.2 Power-on delay of ECU reset

| Parameter                                                                                                               | Symbol              | Condition                                              | Min | Typ | Max | Unit |
|-------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------|-----|-----|-----|------|
| Reset delay 1<br>Delay of ECU reset through ETK without transferring the FPGA (UBatt present, VDDP will be switched on) | $t_{\text{Reset1}}$ | $U_{\text{Batt}} = 12 \text{ V}$<br>ECU_VDDP goes high | 3   | 5   | 20  | ms   |
| Reset delay 1<br>max. delay of ECU reset through ETK (UBatt and VDDP will be switched on)                               | $t_{\text{Reset2}}$ | $U_{\text{Batt}}$ goes high                            | 100 |     | 240 | ms   |

### 7.1.2.3 ECU interface connector

| Signal | Pin Type          | $V_{\text{OL}}$ (max) [V] | $V_{\text{OH}}$ (min) [V] | $V_{\text{OH}}$ (max) [V] | $V_{\text{IL}}$ (max) [V] | $V_{\text{IH}}$ (min) [V] | $V_{\text{IH}}$ (max) [V] | Leakage current (min) / (max) [ $\mu\text{A}$ ] | Additional load by ETK <sup>1)</sup> (typ) [pF] |
|--------|-------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------------------------------|-------------------------------------------------|
| DAP0   | XO <sup>1)</sup>  | 0.7                       | 2.3                       | 3.3                       | -                         | -                         | -                         | +631                                            | 10                                              |
| DAP1   | IXO <sup>1)</sup> | 0.7                       | 2.3                       | 3.3                       | 0.8                       | 2                         | 5.5                       | +5000 / +3340                                   | 10                                              |
| DAP2   | IXO <sup>1)</sup> | 0.7                       | 2.3                       | 3.3                       | 0.8                       | 2                         | 5.5                       | +5000 / +3340                                   | 10                                              |

| Signal     | Pin Type           | V <sub>OL</sub><br>(max)<br>[V] | V <sub>OH</sub><br>(min)<br>[V] | V <sub>OH</sub><br>(max)<br>[V] | V <sub>IL</sub><br>(max)<br>[V] | V <sub>IH</sub><br>(min)<br>[V] | V <sub>IH</sub><br>(max)<br>[V] | Leakage current<br>(min) / (max)<br>[μA] | Additional load by ETK <sup>1)</sup><br>(typ)<br>[pF] |
|------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|------------------------------------------|-------------------------------------------------------|
| RESERVED   | XO <sup>1)</sup>   | 0.7                             | 2.3                             | 3.3                             | -                               | -                               | -                               | +20 / - 20                               | 10                                                    |
| /TRST      | XO <sup>2)</sup>   | 0.7                             | 2.3                             | 3.3                             | -                               | -                               | -                               | +20 / - 20                               | 10                                                    |
| /ESR0      | IXOD <sup>3)</sup> | 0.7                             | -                               | -                               | 0.8                             | 2                               | 5.5                             | +25 / - 20                               | 22                                                    |
| /PORST     | IXOD <sup>3)</sup> | 0.7                             | -                               | -                               | 0.8                             | 2                               | 5.5                             | +25 / - 20                               | 22                                                    |
| WDGDIS     | XO <sup>2)</sup> ) | 0.7                             | 2.3                             | 3.3                             | -                               | -                               | -                               | +20 / - 20                               | 10                                                    |
| DAPE0      | XO <sup>2)</sup> ) | 0.7                             | 2.3                             | 3.3                             | -                               | -                               | -                               | +631                                     | 10                                                    |
| DAPE1      | IXO <sup>1)</sup>  | 0.7                             | 2.3                             | 3.3                             | 0.8                             | 2                               | 5.5                             | +5000 / +3340                            | 10                                                    |
| DAPE2      | IXO <sup>1)</sup>  | 0.7                             | 2.3                             | 3.3                             | 0.8                             | 2                               | 5.5                             | +5000 / +3340                            | 10                                                    |
| GATE_PROST | I                  | 0.7                             | 2.3                             | 3.3                             | 0.8                             | 3                               | 3.8                             | +165                                     | 15                                                    |
| TDI        | XO <sup>2)</sup> ) | 0.7                             | 2.3                             | 3.3                             | -                               | -                               | -                               | +20 / - 20                               | 10                                                    |

Pin Type:

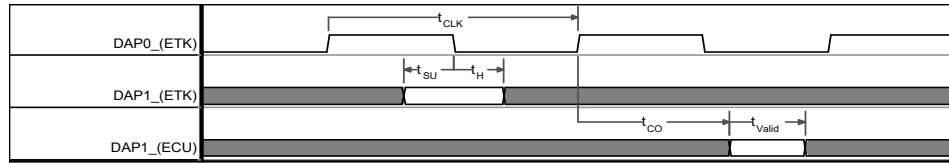
I: Input, X: Tristate, O: Output, OD: Open Drain

<sup>1)</sup> Adapter cable and Samtec connector not considered; PCB 1 pF/cm

<sup>2)</sup> max 12 mA

<sup>3)</sup> max 0.2 A

### 7.1.3 DAP timing characteristics



The BR\_XETK-S3.0 supports two DAP modes:

- 2-pin DAP mode: one data pin (direction via protocol), one clock pin
- 3-pin DAP mode: two data pins (bidirectional, direction via protocol), one clock pin

The 2-pin DAP mode is the BR\_XETK-S3.0 DAP interface default mode.



#### Note

DAP timing parameters in this chapter refer to the DAP interface (CON2) of the BR\_XETK-S3.0. The DAP wiring to the ECU (ETAM8) must be taken account additionally.

All timings are measured at a reference level of 1.5 V.

#### 7.1.3.1 2-pin DAP mode

| Parameter                                  | Symbol    | Value [ns] | Comment                                                           |
|--------------------------------------------|-----------|------------|-------------------------------------------------------------------|
| DAP0 Clock Period<br>(ETK --> Target)      | $t_{CLK}$ | 10         | 100MHz DAP Clock                                                  |
|                                            |           | 20         | 50 MHz DAP Clock Frequency                                        |
| DAP1 Set-Up Time<br>(ETK --> Target)       | $t_{SU}$  | 4          |                                                                   |
| DAP1 Hold Time<br>(ETK --> Target)         | $t_H$     | 2          |                                                                   |
| DAP1 Clock-to-Out Time<br>(Target --> ETK) | $t_{CO}$  | ~          | Undetermined, ETK automatically determines optimum sampling point |

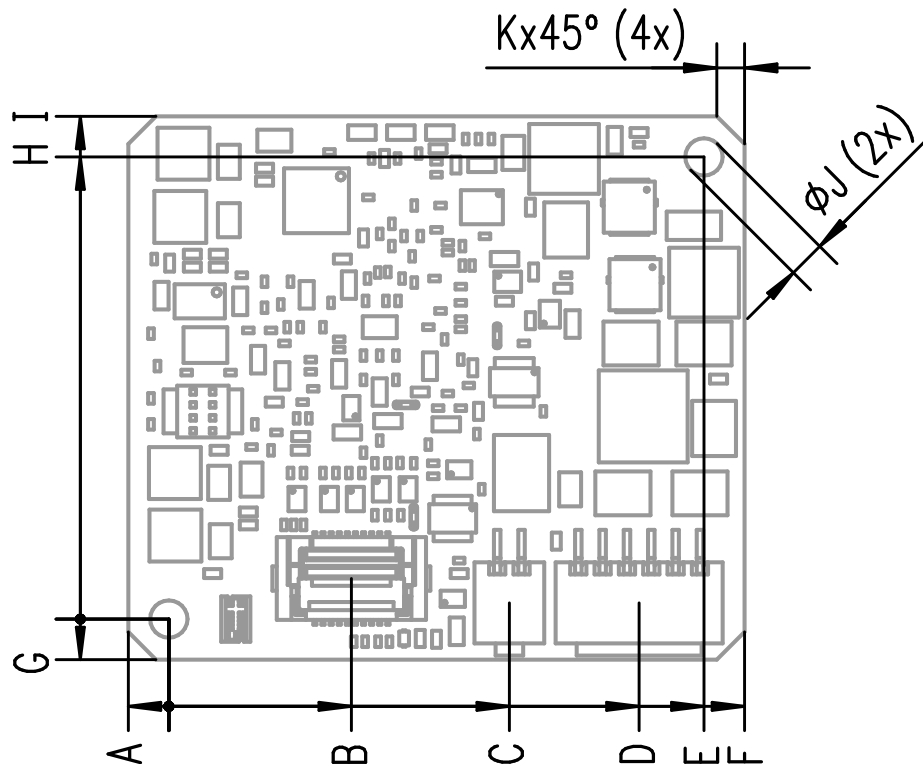
### 7.1.3.2 3-pin DAP mode

| Parameter                                  | Symbol   | Value [ns] | Comment                                                           |
|--------------------------------------------|----------|------------|-------------------------------------------------------------------|
| DAP0 Clock Period<br>(ETK --> Target)      |          | 6.25       | 160MHz DAP Clock Frequency                                        |
| $t_{CLK}$                                  |          | 10         | 100 MHz DAP Clock Frequency                                       |
|                                            |          | 20         | 50 MHz DAP Clock Frequency                                        |
| DAP1 Set-Up Time<br>(ETK --> Target)       | $t_{SU}$ | 4          |                                                                   |
| DAP1 Hold Time<br>(ETK --> Target)         | $t_H$    | 2          |                                                                   |
| DAP1 Clock-to-Out Time<br>(Target --> ETK) | $t_{CO}$ | ~          | Undetermined, ETK automatically determines optimum sampling point |

### 7.1.4 Mechanical data

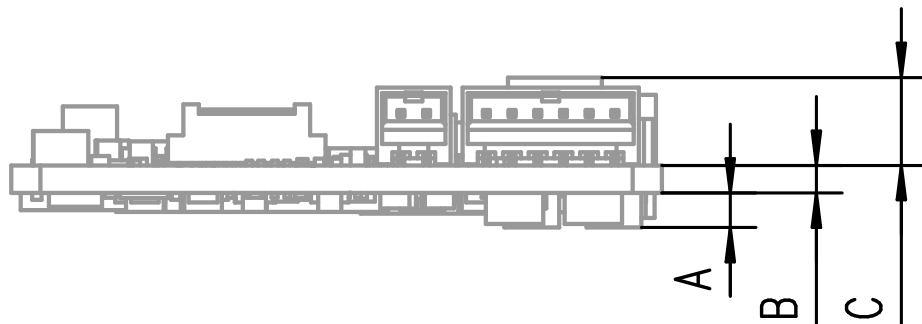
The reference measure for all drawings is millimeters.

#### 7.1.4.1 Top view



| Item | Dimension [mm] | Tolerance [mm] | Dimension [in] | Tolerance [in]    |
|------|----------------|----------------|----------------|-------------------|
| A    | 2.50           | +/- 0.1        | 0.098          | +/- 0.004         |
| B    | 11.25          | +/- 0.1        | 0.443          | +/- 0.004         |
| C    | 21.00          | +/- 0.2        | 0.827          | +/-0.008          |
| D    | 29.00          | +/- 0.2        | 1.142          | +/-0.008          |
| E    | 33.00          | +/- 0.2        | 1.299          | +/-0.008          |
| F    | 35.50          | +/- 0.2        | 1.398          | +/-0.008          |
| G    | 2.50           | +/- 0.1        | 0.098          | +/- 0.004         |
| H    | 28.50          | +/- 0.2        | 1.122          | +/-0.008          |
| I    | 31.00          | +/- 0.2        | 1.220          | +/-0.008          |
| J    | 2.30           | + 0.1 / - 0.0  | 0.091          | + 0.007 / - 0.000 |
| K    | 1.00           | +/- 0.1        | 0.039          | +/- 0.004         |

#### 7.1.4.2 Side view



| Item | Dimension [mm] | Tolerance [mm]  | Dimension [in] | Tolerance [in]    |
|------|----------------|-----------------|----------------|-------------------|
| A    | 2.00           | + 0.0 / - 0.2   | 0.079          | + 0.000 / - 0.008 |
| B    | 1.60           | + 0.16 / - 0.16 | 0.063          | + 0.006 / - 0.006 |
| C    | .510           | + 0.0 / - 0.2   | 0.201          | + 0.000 / - 0.008 |

## 7.2 Interface specifications

### 7.2.1 Automotive ethernet interface

| Item               | Characteristics                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection         | Automotive Ethernet 100 Base-T1                                                                                                                      |
| Protocol           | XCP on TCP/IP or UDP/IP                                                                                                                              |
| IP address         | Dynamic (standard, for INCA) or Static (e.g. for Rapid Prototyping) by using the BR_XETK-S3.0 Configuration Tool (default IP address: 192.168.40.16) |
| Cable length       | max. 15 m                                                                                                                                            |
| Ethernet Interface | DC decoupling<br>Max. Isolation Voltage 60 V DC, according IEC 61010-1 ("Limit values for accessible parts" in normal, dry condition)                |



#### Note

The Automotive Ethernet interface is not compatible with the standard Ethernet interfaces of ETAS modules. An Automotive Ethernet Media Converter or an ES88x ECU Interface Module is needed to connect the BR\_XETK-S3.0 to the PC.

## 7.3 Product markings

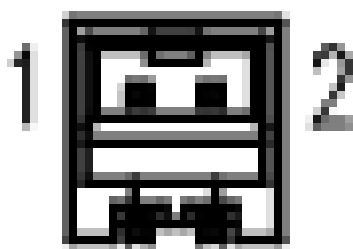
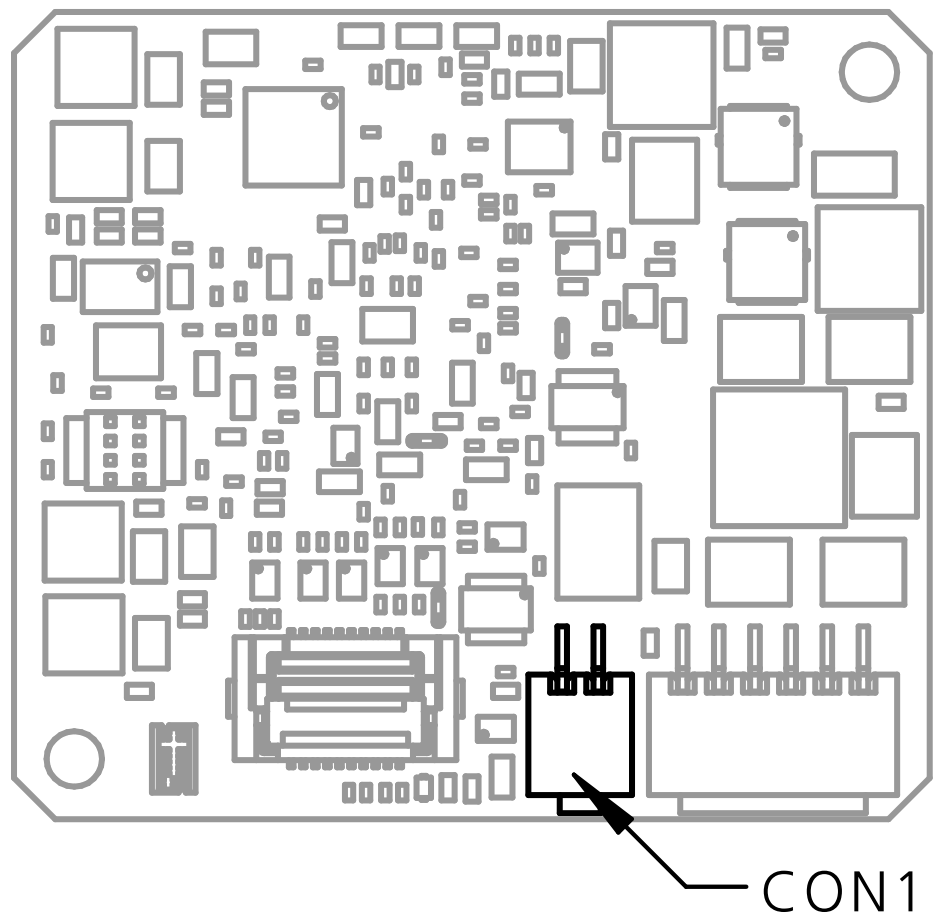
| Symbol           | Description                                                 |
|------------------|-------------------------------------------------------------|
|                  | Please read the user manual before starting up the product. |
| SN: xxxxxxxx     | Serial number                 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

| Symbol                                                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>China RoHS</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | <p><b>CE Conformity</b></p> <p>With the CE mark attached to the product or its packaging, ETAS confirms that the product corresponds to the applicable, product-specific Directives of the European Union. The CE Declaration of Conformity for the product is available upon request.</p> <p><b>European Union</b></p> <p>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 (for accessory, cables and hardware) in Annex III of this Directive. ETAS confirms that the product meets this directive applicable in the European Union.</p> |
|  | <p><b>UKCA Conformity</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Symbol                                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>KCC Conformity</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  | <p><b>CMIM conformity</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | <p><b>Product Return and Recycling</b></p> <p>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.</p> <p>This ensures that the devices are recycled in a resource-friendly way that does not represent any risk to personal health and the environment.</p> <p>The WEEE symbol (see Fig.4-2) on the product or its packaging identifies that the product may not be disposed of together with the remaining trash.</p> <p>The user is obligated to separately collect old devices and provide them to the WEEE return system for recycling.</p> <p>The WEEE Directive applies to all ETAS devices, but not to external cables or batteries.</p> <p>Additional information about the recycling program of ETAS GmbH is available from the ETAS sales and service locations.</p> |

7.4 Connectors

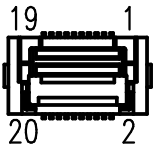
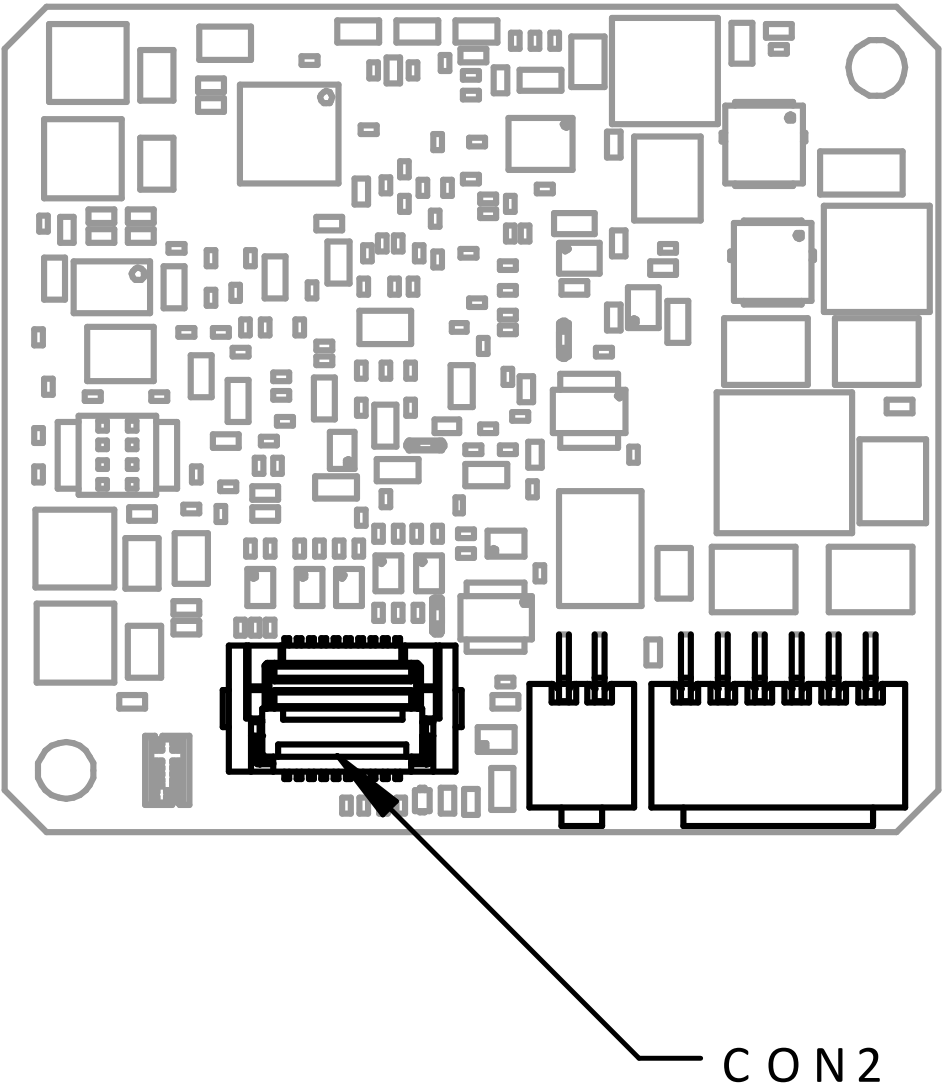
7.4.1 Pin assignment automotive ethernet interface connector CON1



| Pin | Signal | Comment                 |
|-----|--------|-------------------------|
| 1   | AE-    | Automotive Ethernet AE- |
| 2   | AE+    | Automotive Ethernet AE+ |

Connector: MOLEX\_87438-0243

7.4.2 Pin assignment ECU interface connector CON2

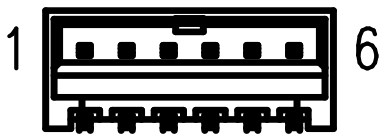
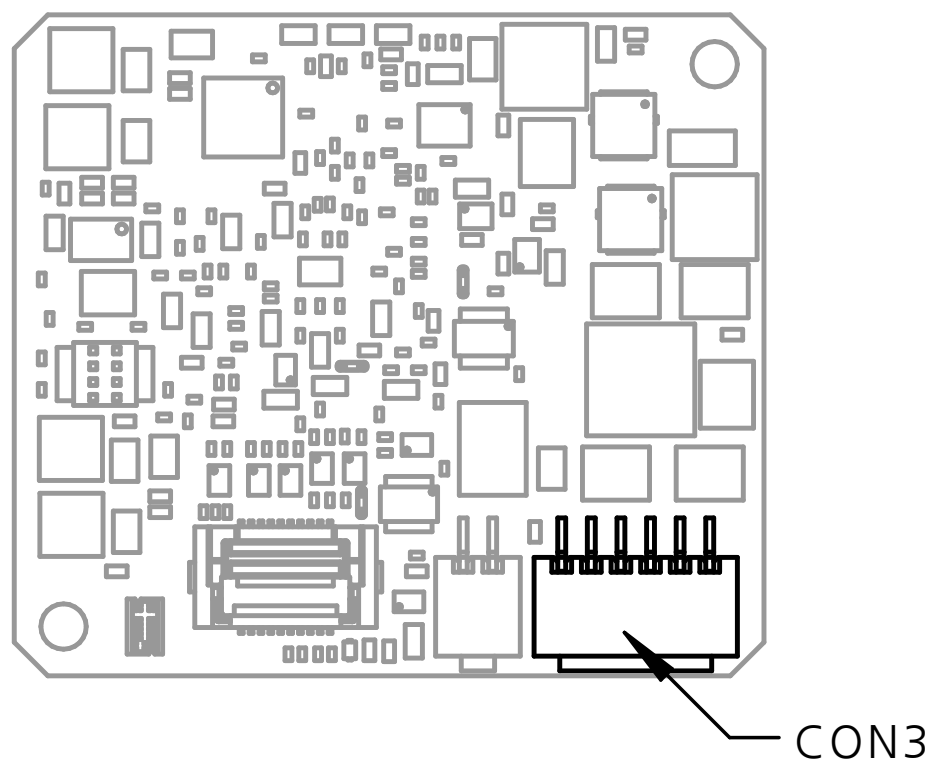


Printed circuit board edge ETK

| Pin | Signal | Direction | Comment       |
|-----|--------|-----------|---------------|
| 1   | DAP0   | Output    | DAP signal    |
| 2   | /TRST  | Output    | JTAG signal   |
| 3   | GND    | Power     | Signal ground |
| 4   | DAP2   | Bidir     | DAP signal    |

| Pin | Signal       | Direction | Comment                                                                    |
|-----|--------------|-----------|----------------------------------------------------------------------------|
| 5   | WDGIS        | Output    | Watchdog disable signal                                                    |
| 6   | GND          | Power     | Signal ground                                                              |
| 7   | VDDP (Sense) | Input     | Sense for switched power supply of ECU (ignition)                          |
| 8   | DAP1         | Bidir     | DAP signal                                                                 |
| 9   | GND          | Power     | Signal ground                                                              |
| 10  | TDI          | Output    | JTAG signal                                                                |
| 11  | /ESR0        | Bidir     | ECU reset signal (open drain) for reset<br>assertion and supervision       |
| 12  | GND          | Power     | Signal ground                                                              |
| 13  | /PORST       | Bidir     | ECU Power On Reset signal (open drain) for Reset assertion and supervision |
| 14  | RESERVED1    | Output    | DNU Mfr test signal                                                        |
| 15  | DAPE2        | Bidir     | Extended DAP signal                                                        |
| 16  | RESERVED2    | Output    | DNU Mfr test signal                                                        |
| 17  | DAPE1        | Bidir     | Extended DAP signal                                                        |
| 18  | GATE_PORST   | Input     | Overwrite /PORST status at Power On, 0V = /PORST inactive, 3.3V = active   |
| 19  | DAPE0        | Output    | Extended DAP signal                                                        |
| 20  | GND          | Power     | Signal ground                                                              |

7.4.2.1 Pin assignment power supply connector CON3



BR\_XETK-S3.0A

| Pin | Signal                     | Direction | Comment                                                           |
|-----|----------------------------|-----------|-------------------------------------------------------------------|
| 1   | VDDPSTBY<br>(3.3 V supply) | Output    | Permanent power supply of ECU DAP Interface, 3.3 V                |
| 2   | VDDSTBY<br>(1.3V supply)   | Output    | Permanent power supply of ECU ED RAM, 1.3 V                       |
| 3   | GND                        | Input     | Power ground                                                      |
| 4   | CalWakeUp                  | Output    | Switch to Ubatt. ECU wake-up signal (for measurement preparation) |
| 5   | Ubatt2                     | Input     | Vehicle battery                                                   |
| 6   | Ubatt1                     | Input     | Vehicle battery                                                   |

Connector: MOLEX\_87438-0643

**BR\_XETK-S3.0C**

| Pin | Signal                     | Direction | Comment                                                                                                                 |
|-----|----------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------|
| 1   | VDDPSTBY<br>(3.3 V supply) | Output    | Permanent power supply of ECU DAP Interface, 3.3 V                                                                      |
| 2   | VDDSTBY<br>(0.95V supply)  | Output    | Permanent power supply of ECU ED RAM, 0.95 V<br>Note: Do not connect for TC49x A-Step and for the TC4Dx microcontroller |
| 3   | GND                        | Input     | Power ground                                                                                                            |
| 4   | CalWakeUp                  | Output    | Switch to Ubatt. ECU wake-up signal (for measurement preparation)                                                       |
| 5   | Ubatt2                     | Input     | Vehicle battery                                                                                                         |
| 6   | Ubatt1                     | Input     | Vehicle battery                                                                                                         |

Connector: MOLEX\_87438-0643

## **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.
- Make sure that no moisture enters the product.
- Carefully vacuum off dust particles and loose foreign bodies.

### **8.2 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](http://www.etas.com/en/support/hw_return_form.php).

## 10 Accessories and order information

### 10.1 Ordering information BR\_XETK-S3.0

| Order Name                                                                                                                                                                                                                                                   | Short Name    | Order Number  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| <b>BR_XETK-S3.0A Emulator Probe for the Infineon AURIX microprocessor family</b>                                                                                                                                                                             | BR_XETK-S3.0A | F 00K 110 751 |
| <b>Package Contents</b>                                                                                                                                                                                                                                      |               |               |
| <ul style="list-style-type: none"> <li>— BR_XETK-S3.0A Emulator Probe for the Infineon AURIX microprocessor family including gap pad</li> <li>— List "Content of this Package"</li> <li>— ETK Safety Advice</li> <li>— China-RoHS-leaflet_Compact</li> </ul> |               |               |
| <b>BR_XETK-S3.0C ECU interface for the Infineon AURIX TC4xx microcontroller family (including gap pad)</b>                                                                                                                                                   | BR_XETK-S3.0C | F 00K 113 470 |
| <b>Package Contents</b>                                                                                                                                                                                                                                      |               |               |
| <ul style="list-style-type: none"> <li>— BR_XETK-S3.0C Emulator Probe for the Infineon AURIX microprocessor family including gap pad</li> <li>— List "Content of this Package"</li> <li>— ETK Safety Advice</li> <li>— China-RoHS-leaflet_Compact</li> </ul> |               |               |

## 10.2 Cables, adapters and accessories

### 10.2.1 Overview and classification

This chapter contains information about the following cables and accessory.



#### Note

See [Mounting and placement](#) for details on wiring the ECU interface adapters.

### 10.2.2 Cables and adapter requirements for fail safe operation



#### Note

We recommend to use ETAS cables or any other cables certified by the standards for the application. Adhere to the maximum permissible cable lengths!

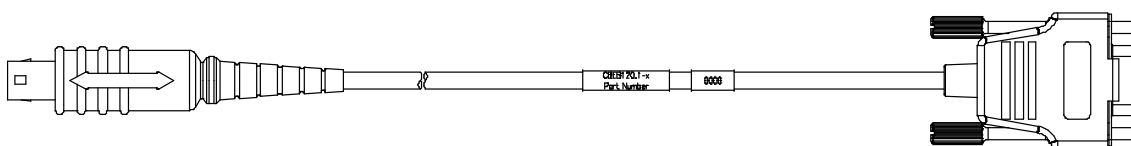


#### Note

Application-specific cables are available from ETAS. Please contact your ETAS contact partner or e-mail [sales.de@etas.com](mailto:sales.de@etas.com).

Please contact your local ETAS representative for further cable information.

### 10.2.3 CBEB120 cable



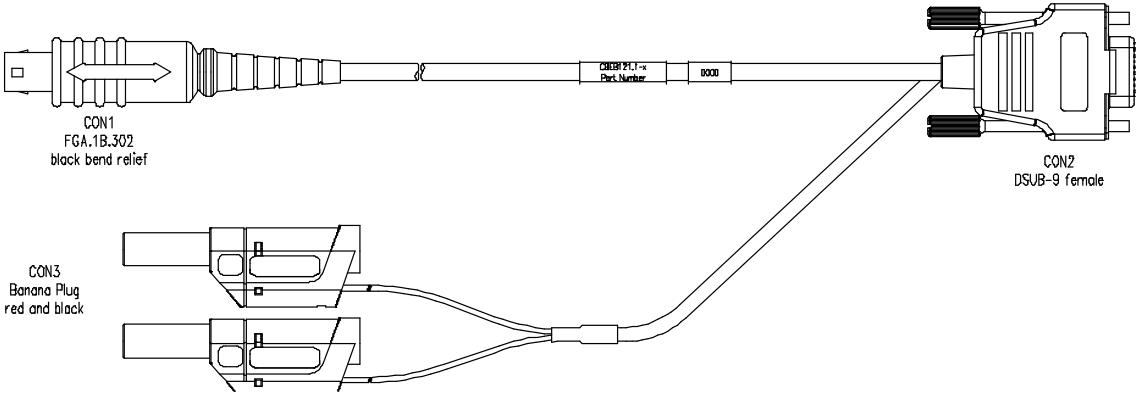
#### Usage

Used to connect a ES88x via a CBEB242.1.

Order information

| Product                                                                                             | Length | Order Number  |
|-----------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB120.1-3 100 Mbit/s Auto-motive Ethernet Interface Cable<br>Lemo 1B FGA - DSUB (2mc-9fc),<br>3 m | 3 m    | F 00K 111 111 |
| CBEB120.1-5 100 Mbit/s Auto-motive Ethernet Interface Cable<br>Lemo 1B FGA - DSUB (2mc-9fc),<br>5 m | 5 m    | F 00K 111 112 |

10.2.4 CBEB121 cable



Usage

The CBEB121.1 cable is a 100 MBit/s Automotive Ethernet cable to connect a CBEB100.1 Media Converter with a BR\_XETK cable adapter (e.g. CBAM290.1).

Pin assignment

| Connector | Target                    |
|-----------|---------------------------|
| CON1      | BR_XETK cable adapter     |
| CON2      | CBEB100.1 Media Converter |
| CON3      | Power supply              |

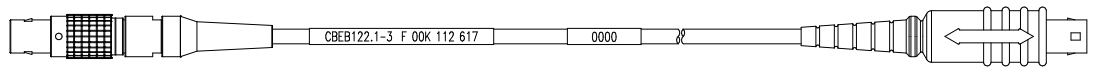
Mounting

Minimum cable bending radius: 16 mm.

## Order information

| Product                                                                                                                                     | Length | Order Number  |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB121.1-3 100 Mbit/s Auto-motive Ethernet Interface Cable plus Power for CBEB100, Lemo 1B FGA -DSUB plus banana connector (2mc-9fc), 3 m  | 3 m    | F 00K 111 113 |
| CBEB121.1-5 100 Mbit/s Auto-motive Ethernet Interface Cable plus Power for CBEB100, Lemo 1B FGA - DSUB plus banana connector (2mc-9fc), 5 m | 5 m    | F 00K 111 114 |

### 10.2.5 CBEB122.1-3 cabel



Shielded Automotive Ethernet connection cable with Lemo connector for connection to ES16x modules and a Lemo connector for connection to an ETAS BR\_XETK equipped with the adapter cable CBAM290.1 or similar.

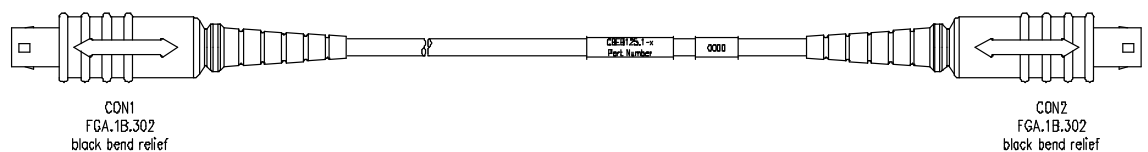
## Order information

| Product                                                                                                 | Length | Order Number  |
|---------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB122.1-3 Shielded Automotive Ethernet connection cable, Lemo 1B FGI- 1 x Lemo FGA 1B (7mc - 2fc), 3m | 3 m    | F 00K 112 617 |

### Note

Recommended maximum data transmission rate: 100 Mbit/s (100Base-T1). At higher data transfer rates, signal loss may occur.

### 10.2.6 CBEB125 cable



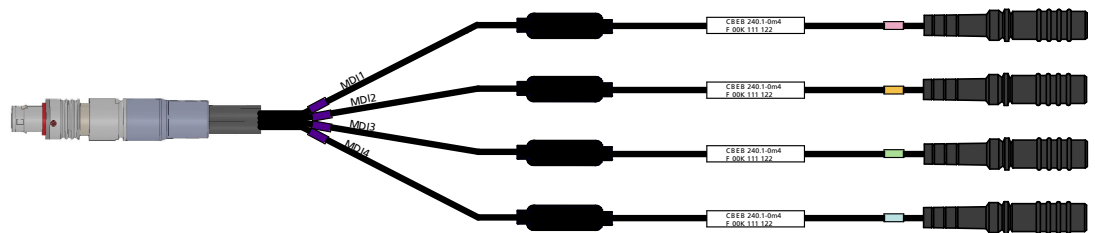
## Usage

The CBEB125.1 cable is a 100 MBit/s Automotive Ethernet cable (1:1) for connecting an BR\_XETK to the ES88x module.

## Order information

| Product                                                                                                     | Length | Order Number  |
|-------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB125.1 100 Mbit/s Automotive Ethernet Interface Cable for ES88x, Lemo 1B FGA - Lemo 1B FGA (2mc2mc), 3 m | 0.60 m | F 00K 111 115 |
| CBEB125.1 100 Mbit/s Automotive Ethernet Interface Cable for ES88x, Lemo 1B FGA - Lemo 1B FGA (2mc2mc), 5 m | 5 m    | F 00K 111 116 |

### 10.2.7 CBEB240 cable



## Usage

Cable for connecting the Automotive Ethernet interface (AE) of an ES800 module to BR\_XETKs, ECUs with Automotive Ethernet interfaces or Ethernet-based vehicle buses.

## Assignment of the automotive ethernet channels to the cable sections

The CBEB240.1 cable consists of four identical cable sections [n], each mapped to an Automotive Ethernet channel [n] of the Automotive Ethernet interface (AE) and wired in accordance with the same pattern. Each of the cable section is equipped with a LEMO connector.

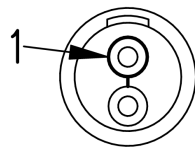
## Labeling of the automotive ethernet channels and the cable sections

The cable sections are labeled n=1 to n=4 and are also marked with the color of the LEDs corresponding to the channels [n] at the AE connection of the module. The colors of the channels [n] at the AE connection of the module and the cable sections are identical.

| ES800 module<br>"AE" LED | Color<br>"AE" LED/cable | Automotive Eth-<br>ernet channel<br>ES882.1 | Automotive Eth-<br>ernet channel<br>ES886.1 |
|--------------------------|-------------------------|---------------------------------------------|---------------------------------------------|
| 1                        | Purple                  | AE1                                         | AE1                                         |
| 2                        | Orange                  | AE2                                         | AE2                                         |
| 3                        | Green                   | AE3                                         | AE3                                         |
| 4                        | Blue                    | -                                           | AE4                                         |

When using the CBEB240.1 cable at the AE interface of the module ES882.1 (three Automotive Ethernet channels), three of the four cable sections are used in accordance with the assignment in the table.

## Assignment of the automotive ethernet signal to the LEMO connectors



The assignment of the connections of the LEMO connector of a cable section to the signals of an Automotive Ethernet channel [N] is represented in the table.

| Pin | Signal  | Meaning                                  |
|-----|---------|------------------------------------------|
| 1   | AE [n]+ | Automotive Ethernet, channel [n], BI_DA+ |
| 2   | AE [n]- | Automotive Ethernet, channel [n], BI_DA- |

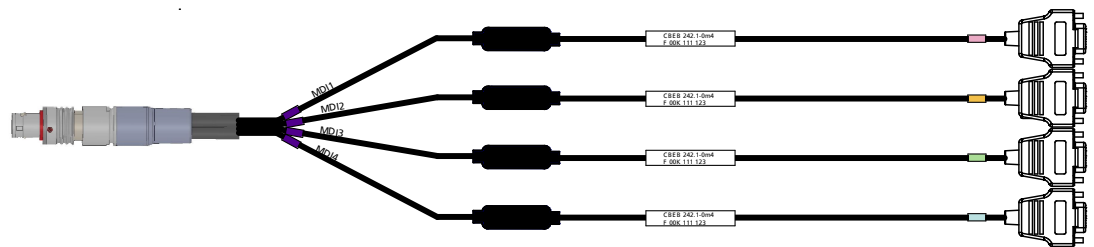
## Temperature range

| Condition             | Temperature Range                      |
|-----------------------|----------------------------------------|
| Operating temperature | -40 °C to +85 °C<br>-40 °F to + 185 °F |

## Order information

| Product                                                                                                            | Length | Order Number  |
|--------------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB240.1-0m4 Automotive Ethernet splitter cable 100 Mbit/s,<br>Yamaichi YCP - 4x Lemo PHA 1B<br>(8mc -4x2fc), 0m4 | 0.4 m  | F 00K 111 122 |

### 10.2.8 CBEB242 cable



## Usage

Cable for connecting the Automotive Ethernet interface (AE) of an ES800 module to BR\_XETKs.



### Note

The CBEB242.1 cable is designed for directly connecting BR\_XETKs. For other areas of application, ETAS recommends the CBEB240.1 Automotive Ethernet cable.

## Assignment of the automotive ethernet channels to the cable sections

The CBEB242.1 cable consists of four identical cable sections [n], each mapped to an Automotive Ethernet channel [n] of the Automotive Ethernet interface (AE) and wired in accordance with the same pattern. Each of the cable section is equipped with a DSUB9 connector.

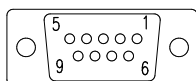
## Labeling of the automotive ethernet channels and the cable sections

The cable sections are labeled [n]=1 to [n]=4 and are also marked with the color of the LEDs corresponding to the channels [n] at the AE connection of the module. The colors of the channels [n] at the AE connection of the module and the cable sections are identical.

| ES800 module<br>"AE" LED | Color<br>"AE" LED/cable | Automotive Eth-<br>ernet channel<br>ES882.1 | Automotive Eth-<br>ernet channel<br>ES886.1 |
|--------------------------|-------------------------|---------------------------------------------|---------------------------------------------|
| 1                        | Purple                  | AE1                                         | AE1                                         |
| 2                        | Orange                  | AE2                                         | AE2                                         |
| 3                        | Green                   | AE3                                         | AE3                                         |
| 4                        | Blue                    | -                                           | AE4                                         |

When using the CBEB242.1 cable at the AE interface of the module ES882.1 (three Automotive Ethernet channels), three of the four cable harnesses are used in accordance with the assignment in the table.

### Assignment of the automotive ethernet signal to the DSUB9 connectors



The assignment of the connections of the DSUB9 connector of a cable section to the signals of an Automotive Ethernet channel [N] is represented in the table.

| Pin | Signal   | Meaning                                   |
|-----|----------|-------------------------------------------|
| 4   | AE [n] + | Automotive Ethernet, channel [n], BI_ DA+ |
| 5   | AE [n] - | Automotive Ethernet, channel [n], BI_ DA- |

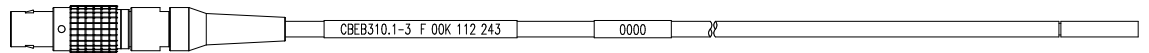
### Temperature range

| Condition             | Temperature Range                      |
|-----------------------|----------------------------------------|
| Operating temperature | -40 °C to +85 °C<br>-40 °F to + 185 °F |

### Order information

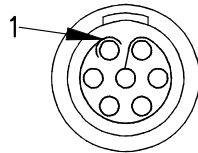
| Product                                                                                         | Length | Order Number  |
|-------------------------------------------------------------------------------------------------|--------|---------------|
| Automotive Ethernet Splitter<br>Cable 100 Mbit/s, Yamaichi YCP<br>- 4x DSUB (8mc - 4x 9mc), 0m4 | 0.4 m  | F 00K 111 123 |

### 10.2.9 CBEB310 cable



CBEB310.1-3 is a shielded Automotive-Ethernet cable with an open cable end for connection of the ES16x module to a shielded Automotive Ethernet Network.

#### Pin assignment



| LEMO 1B male |         |                  |
|--------------|---------|------------------|
| Pin          | Signal  | Description      |
| 1            | MDI+    | BR+ Cable, blue  |
| 6            | MDI-    | BR+ Cable, white |
| Housing      | GNDCASE | Shield           |

#### Order information

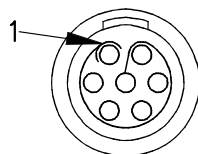
| Product                                                                                                 | Length | Order Number  |
|---------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB310.1-3 Gigabit Automotive Ethernet connection cable, Lemo 1B FGI - 1 x Open Wire (7mc - 1x 2c), 3m | 3 m    | F 00K 112 243 |

### 10.2.10 CBEB311 cable



CBEB311.1-3 is an unshielded Automotive-Ethernet cable with an open cable end for connection of the ES16x module to an unshielded Automotive Ethernet Network.

#### Pin assignment

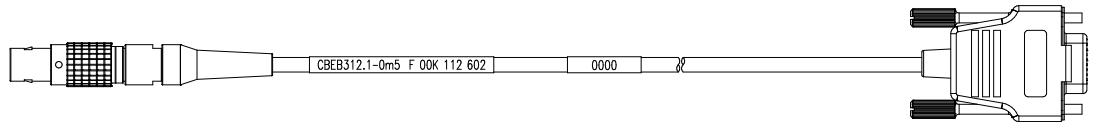


| LEMO 1B male |        |                  |
|--------------|--------|------------------|
| Pin          | Signal | Description      |
| 1            | MDI+   | BR+ Cable, blue  |
| 6            | MDI-   | BR+ Cable, white |

### Order information

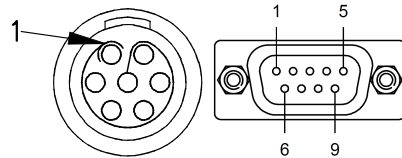
| Product                                                                                                    | Length | Order Number  |
|------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB311.1-3 Automotive Ethernet connection cable unshielded, Lemo 1B FGI - 1 x Open Wire (7mc - 1x 2c), 3m | 3 m    | F 00K 112 507 |

### 10.2.11 CBEB312 cable



Shielded Automotive Ethernet connection cable with Lemo connector for connection to an ES16x module and a 9 pin DSUB connector for connection to a signal source.

### Pin assignment



#### Note

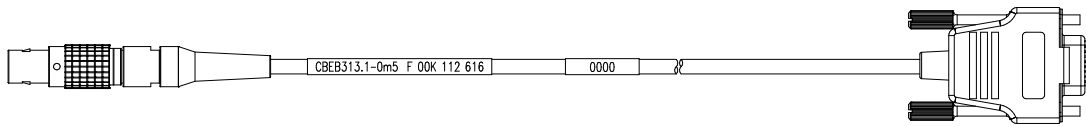
Recommended maximum data transmission rate: 100 Mbit/s (100Base-T1). At higher data transfer rates, signal loss may occur.

| LEMO 1B male |         | DSUB9 male |         |
|--------------|---------|------------|---------|
| Pin          | Signal  | Pin        | Signal  |
| 1            | MDI+    | 4          | BR+     |
| 6            | MDI-    | 5          | BR-     |
| Housing      | GNDCASE | Housing    | GNDCASE |

Order information

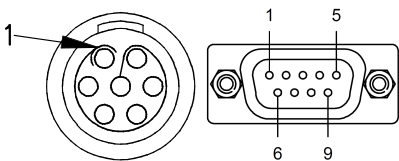
| Product                                                                                              | Length | Order Number  |
|------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB312.1-0m5 Automotive Ethernet connection cable shielded, Lemo 1B FGI - 1 x DSUB (7mc - 9mc), 0m5 | 0.5 m  | F 00K 112 602 |

10.2.12 CBEB313 cable



Unshielded Automotive Ethernet connection cable with Lemo connector for connection to an ES16x module and a 9 pin DSUB connector for connection to a signal source.

Pin assignment



 **Note**

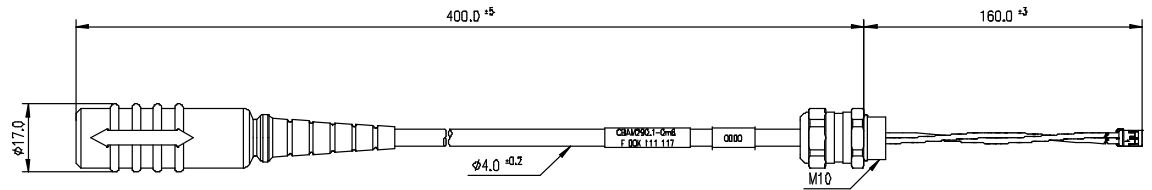
Recommended maximum data transmission rate: 100 Mbit/s (100Base-T1). At higher data transfer rates, signal loss may occur.

| LEMO 1B male |        | DSUB9 male |        |
|--------------|--------|------------|--------|
| Pin          | Signal | Pin        | Signal |
| 1            | MDI+   | 4          | BR+    |
| 6            | MDI-   | 5          | BR-    |

Order information

| Product                                                                                                    | Length | Order Number  |
|------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBEB313.1-0m5 Automotive Ethernet connection cable unshielded, Lemo 1B FGI - 1 x 1 x DSUB (7mc - 9mc), 0m5 | 0.5 m  | F 00K 112 616 |

### 10.2.13 CON1: CBAM290 cable



#### Usage

The CBAM290.1 cable is a 100 MBit/s Automotive Ethernet cable adapter for BR\_XETKs. The cable is passed through a M10 screw connection, the shield is connected to the screw.

#### Tightness

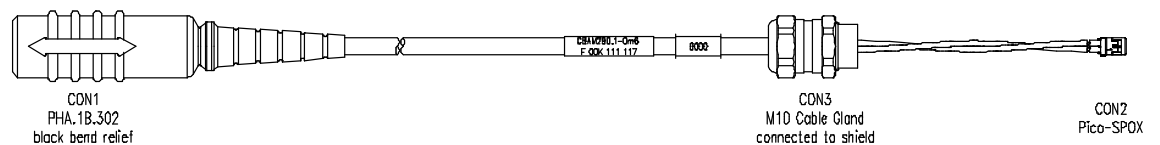
| Condition      | Degree of Protection |
|----------------|----------------------|
| M10 screwing   | IP67                 |
| CON1 (plugged) | IP65                 |

#### Mounting

For thin-walled housings, use a through boring with 10.2 mm in the housing and mount the cable with a nut. Cable delivery does not include the nut. The nut must be ordered separately by AGRO (AGRO order number 8000.10). For wall thickness more than 2.5 mm cut a thread into the housing.

The minimum bending radius for the cable is 16 mm.

#### Pin assignment



| Connector | Color | Target                                   |
|-----------|-------|------------------------------------------|
| CON1      | Black | Cable to Media Converter, e.g. CBEB120.1 |
| CON2      | White | BR_XETK interface connector              |
| CON3      | -     | Shield ECU housing                       |

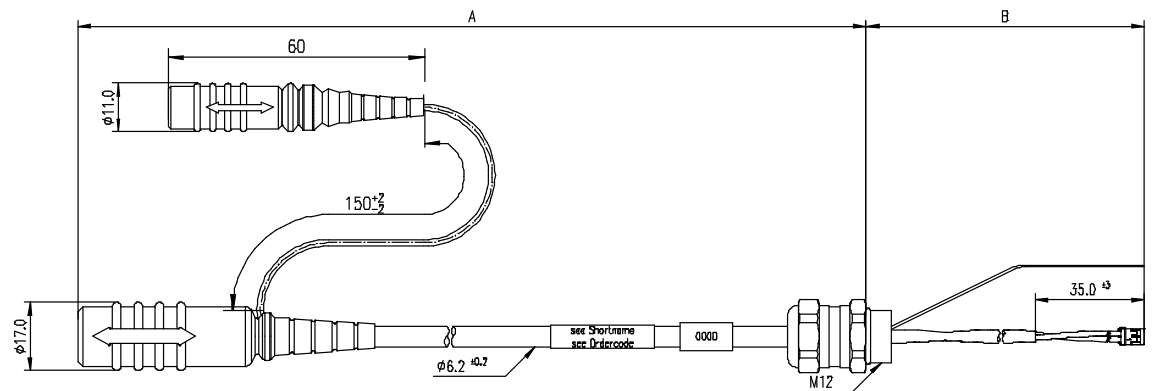
## Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +105 °C<br>-40 °F to + 221 °F |

## Order information

| Product                                                                                                                                     | Length | Order Number  |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBAM290.1 BR_XETK ECU<br>Adapter Cable, preassembled<br>into M10 screwing, shield on ECU<br>Housing, Lemo 1B PHA - MOLEX<br>(2fc-2fc), 0m60 | 0.60 m | F 00K 111 117 |

### 10.2.14 CON1: CBAM295 cable



## Usage

BR\_XETK ECU adapter and power supply cable for 100 MBit/s Automotive Ethernet and BR\_XETKs with external power supply. Usable for ECUs without permanent power supply inside.

## Mechanical dimension

| Product       | Length A [mm] | Length B [mm] |
|---------------|---------------|---------------|
| CBAM295.1-0m6 | 400           | 160           |
| CBAM295.1-1m8 | 1500          | 250           |

## Tightness

| Condition            | Degree of Protection |
|----------------------|----------------------|
| M12 screwing         | IP67                 |
| CON1, CON4 (plugged) | IP65                 |

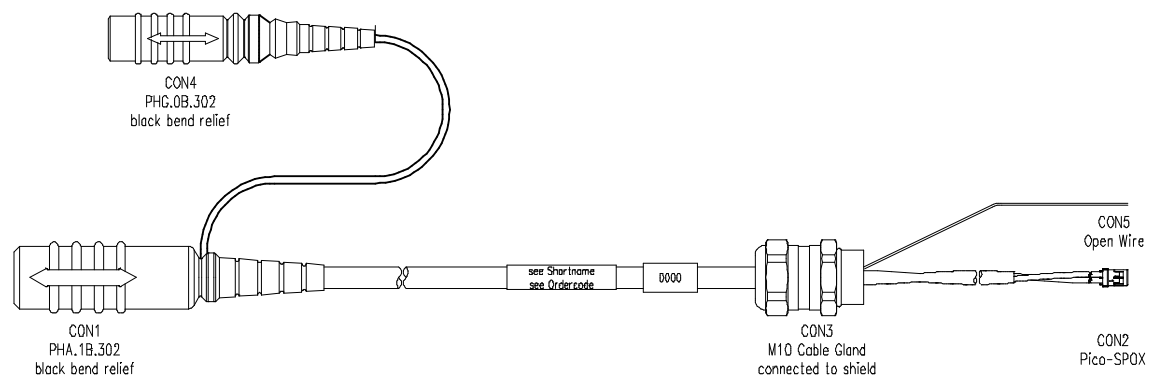
## Mounting

The CBAM295.1 cable is passed through a pre-assembled M12 screw connection.

The shield is connected to the screw. For thin-walled housings, use a through boring with 12.2 mm in the housing and mount the cable with a nut. Cable delivery does not include the nut. The nut must be ordered separately by AGRO (AGRO order number 8000.12). For wall thickness more than 2.5 mm cut a thread into the housing.

The minimum bending radius for the cable is 20 mm.

## Pin assignment



| Connector | Color    | Target                                              |
|-----------|----------|-----------------------------------------------------|
| CON1      | Black    | Cable to Media Converter, e.g. CBEB120.1            |
| CON2      | White    | BR_XETK interface connector                         |
| CON3      | -        | Shield ECU housing                                  |
| CON4      | Black    | Cable to connect permanent power supply, e.g. K70.1 |
| CON5      | Red wire | BR_XETK UBATT pin                                   |

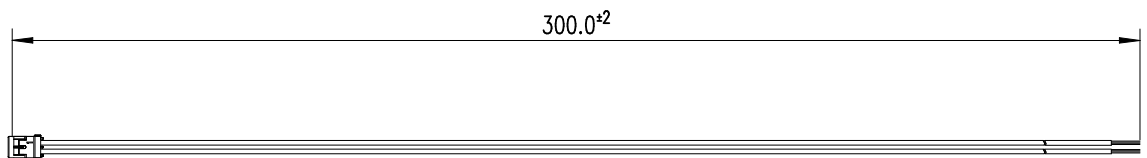
## Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +105 °C<br>-40 °F to + 221 °F |

## Order information

| Product                                                                                                                                                                                    | Length | Order Number  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------|
| CBAM295.1-0m6 BR_XETK ECU Adapter and Power Supply<br>Cable, pre-assembled into M12 screwing, shield on ECU housing, Lemo 1B PHA - MOLEX (2fc-2fc) / Lemo 1B PHG - open wire (2fc-1c), 0m6 | 0.60 m | F 00K 111 656 |
| CBAM295.1-1m8 BR_XETK ECU Adapter and Power Supply<br>Cable, pre-assembled into M12 screwing, shield on ECU housing, Lemo 1B PHA - MOLEX (2fc-2fc) / Lemo 1B PHG - open wire (2fc-1c), 1m8 | 1.80 m | F 00K 111 657 |

### 10.2.15 CON1: ETABR1 cable



## Usage

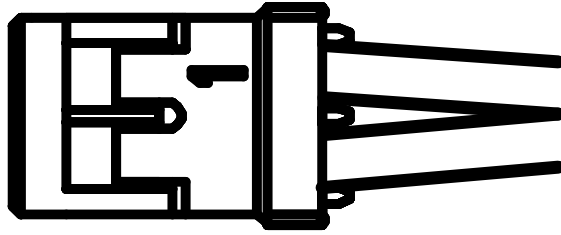
The ETABR1 cable is a 100 MBit/s Automotive Ethernet adapter cable with an 2-pin MOLEX connector (BR\_XETK-S3.0 side) and open wires (ECU side).



### Note

For failsafe operation of the Automotive Ethernet interface twist the ETABR1 cable 5 to 10 times at each 10 cm.

### Pin assignment

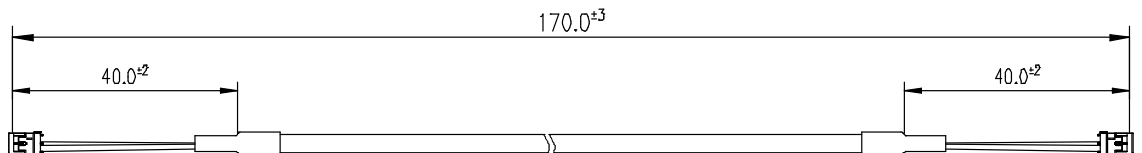


| Pin | Color  | Signal                         |
|-----|--------|--------------------------------|
| 1   | White  | Automotive Ethernet signal AE- |
| 2   | Violet | Automotive Ethernet signal AE+ |

### Order information

| Product                                                                   | Length | Order Number  |
|---------------------------------------------------------------------------|--------|---------------|
| ETABR1 Automotive Ethernet Interface Cable, MOLEX – open wire (2fc2c),0m3 | 0.3 m  | F 00K 109 771 |

#### 10.2.16 CON1: ETABR2 cable

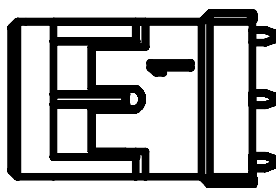


### Usage

The ETABR2 cable is a 100 MBit/s Automotive Ethernet adapter cable with a 2 pin MOLEX connector (BR\_XETK-S3.0) and a 2 pin MOLEX connector (ECU side).

The ETABR2 cable requires on the ECU side a 2 pin MOLEX vertical connector (87437-0243) or a 2 pin MOLEX right angle connector (87438-0243).

### Pin assignment



| Pin | Color | Signal                         |
|-----|-------|--------------------------------|
| 1   | White | Automotive Ethernet signal AE- |
| 2   | Green | Automotive Ethernet signal AE+ |

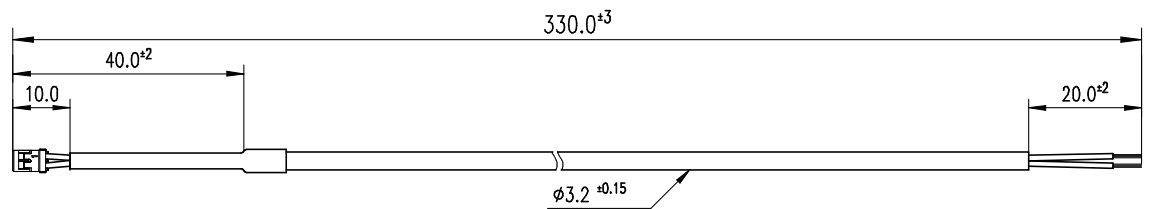
### Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +105 °C<br>-40 °F to + 221 °F |

### Order information

| Product                                                                  | Length | Order Number  |
|--------------------------------------------------------------------------|--------|---------------|
| ETABR2 Automotive Ethernet Interface Cable, MOLEX – MOLEX (2fc-2fc), 0m2 | 0.17 m | F 00K 111 118 |

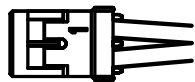
#### 10.2.17 CON1: ETABR3 cable



### Usage

The ETABR3 cable is a 100 MBit/s Automotive Ethernet adapter cable with a 2 pin MOLEX connector (BR\_XETK-S3.0 side) and open wires (ECU side).

### Pin assignment



| Pin | Color | Signal                         |
|-----|-------|--------------------------------|
| 1   | White | Automotive Ethernet signal AE- |
| 2   | Green | Automotive Ethernet signal AE+ |

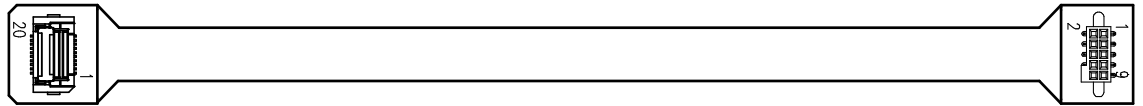
## Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +105 °C<br>-40 °F to + 221 °F |

## Order information

| Product                                                                      | Length | Order Number  |
|------------------------------------------------------------------------------|--------|---------------|
| ETABR3 Automotive Ethernet Interface Cable, MOLEX – open wire (2fc-2c), 0m33 | 0.33 m | F 00K 111 964 |

### 10.2.18 CON2: ETAM8 ECU adapter



## Usage

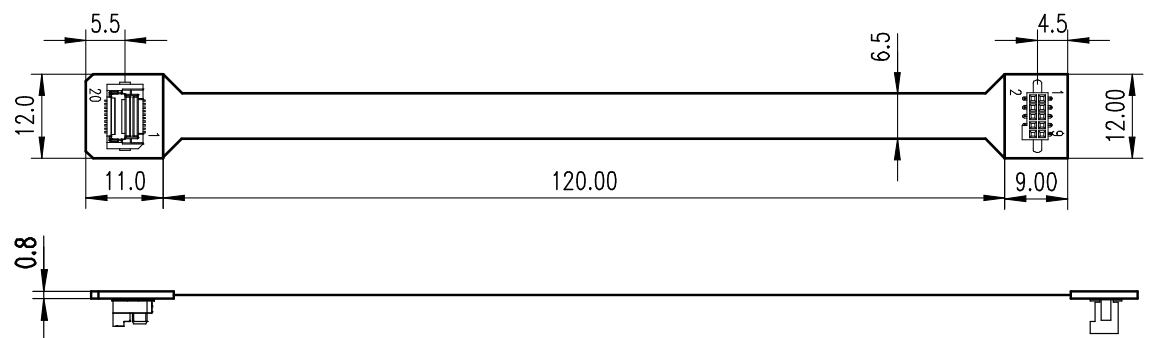
The ETAM8 adapts a 10 pin SAMTEC TFM-105 ECU connector to an BR\_XETK-S or FETK-S. The ETAM8 adapter supports JTAG, DAP or LFAST mode.

## Product variants

There are two variants for the ETAM8 adapter available:

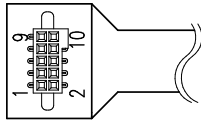
- ETAM8A hold the ECU in reset, while the ETK is booting.
- ETAM8B do not pull the reset signal low while booting.

## Mechanical dimensions



Depending on ECU connector lead style mated height is between 6.35 mm and 11.81 mm (distance between the PCBs).

## Pin assignment



| Pin | JTAG Mode  | LFAST MODE  | DAP Mode    | Description                                                                  |
|-----|------------|-------------|-------------|------------------------------------------------------------------------------|
| 1   | GND        | GND         | GND         | CPU Ground                                                                   |
| 2   | TCK        | DRCLK       | DAP0        | Microcontroller signals (uC drive: 3.3 V or 5.0 V; BR_XETK drive: 3.0 V TTL) |
| 3   | /TRST      | RXD-        | /TRST       |                                                                              |
| 4   | TDO        | RXD+        | DAP2        |                                                                              |
| 5   | TMS        | TXD+        | DAP1        |                                                                              |
| 6   | TDI        | TXD-        | -           |                                                                              |
| 7   | WDGDIS     | WDGDIS      | WDGDIS      | WDGDIS: Watch-dog disable                                                    |
| 8   | VDD Sense) | VDD (Sense) | VDD (Sense) | Supply of DAP Interface                                                      |
| 9   | /RESETOUT  | /RESETOUT   | /RESETOUT   | ECU Rest signal for Reset detection                                          |
| 10  | /PORSET    | /PORSET     | /PORSET     | Power On Reset (in)                                                          |

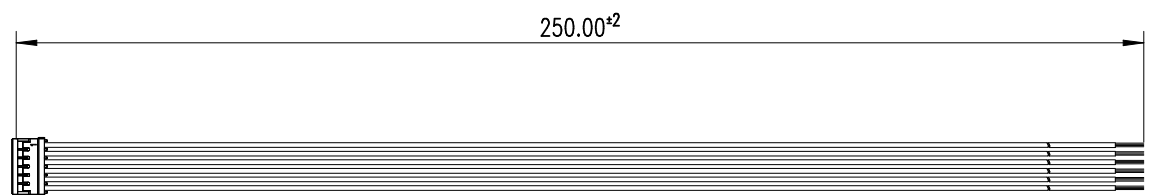
## Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +110 °C<br>-40 °F to + 230 °F |

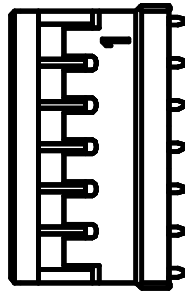
## Order information

| Product                                                                  | Length | Order Number  |
|--------------------------------------------------------------------------|--------|---------------|
| ETAM8A BR_XETK-S3 ECU<br>Adapter, FCI-SAMTEC SFM<br>(20c - 10fc), 0m11   | 0.11 m | F 00K 110 754 |
| ETAM8B BR_XETK-S3 ECU<br>Adapter, FCI - SAMTEC SFM<br>(20c - 10fc), 0m11 | 0.11 m | F 00K 110 881 |

## 10.2.19 CON3: ETAM2 ECU adapter



## Pin assignment

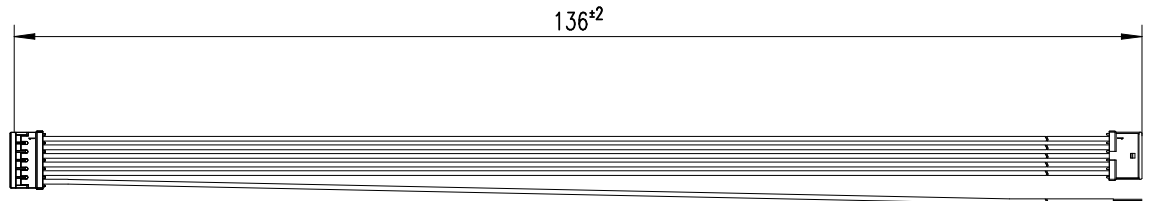


| Pin | Color  | Signal               | Description                                                               |
|-----|--------|----------------------|---------------------------------------------------------------------------|
| 1   | Blue   | VDDPSTBY<br>(Supply) | Permanent power to supply ECU interface (optional)                        |
| 2   | Yellow | VDDSTBY<br>(Supply)  | Permanent power to supply ECU ED RAM                                      |
| 3   | Brown  | GND                  | Power ground                                                              |
| 4   | Green  | CAL_WakeUp           | Switch to Ubatt. ECU wake-up signal<br>(for measurement pre-<br>paration) |
| 5   | Red    | SGUBATT2             | Car battery                                                               |
| 6   | Red    | SGUBATT1             | Car battery                                                               |

### Order information

| Product                                                          | Length | Order Number  |
|------------------------------------------------------------------|--------|---------------|
| ETAM2 XETK/FETK ECU Adapter, MOLEX - open wires (6fc - 6c), 0m25 | 0.25 m | F 00K 109 306 |

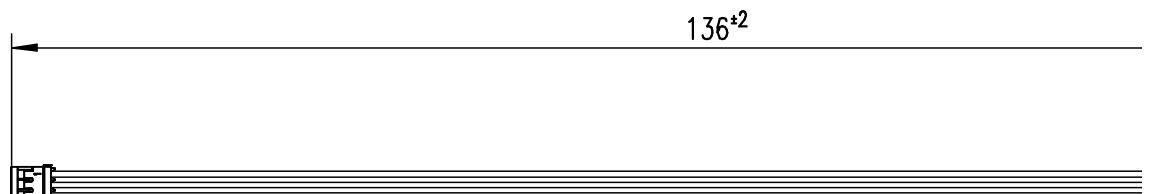
#### 10.2.20 CON3: ETAM5 ECU adapter



### Order information

| Product                                                     | Length  | Order Number  |
|-------------------------------------------------------------|---------|---------------|
| ETAM5 FETK ECU Adapter, MOLEX - MOLEX (6fc - 5fc+1c), 0m136 | 0.136 m | F 00K 110 101 |

#### 10.2.21 CON3: ETAM9 ECU adapter



### Usage

The ETAM9 adapts the FETK/ XETK power signals (Molex 6 pin connector) to the ECU with a 5 pin Molex PicoSpox connector.

The ETAM9 cable requires on the ECU side an Vertical SMT Header connector [87437-0543] or an Right Angle SMT Header connector [87438-0543].

## ECU signals

| Pin | Color  | Signal               | Description                                                          |
|-----|--------|----------------------|----------------------------------------------------------------------|
| 1   | Blue   | VDDPSTBY<br>(Supply) | Permanent power to supply ECU interface                              |
| 2   | Yellow | VDDSTBY<br>(Supply)  | Permanent power to supply ECU ED RAM                                 |
| 3   | Brown  | GND                  | Power ground                                                         |
| 4   | Green  | CAL_WakeUp           | Switch to Ubatt. ECU wake-up signal<br>(for measurement preparation) |
| 5   | Red    | SGUBATT1             | Car battery                                                          |
| 6   | -      | -                    | No Connect                                                           |

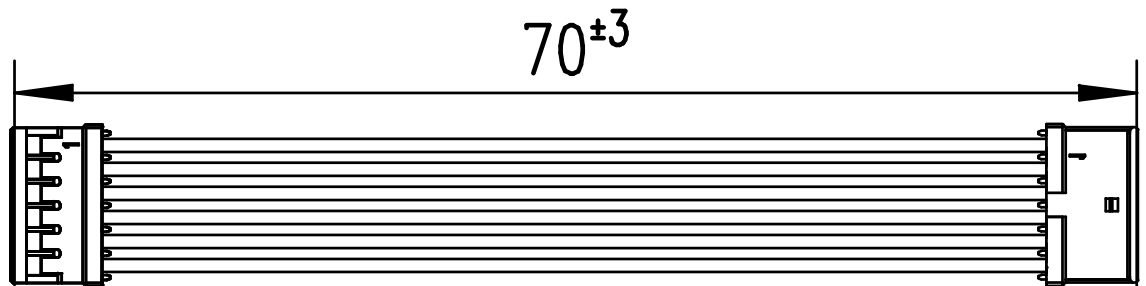
## Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +110 °C<br>-40 °F to + 230 °F |

## Order information

| Product                                                          | Length  | Order Number  |
|------------------------------------------------------------------|---------|---------------|
| ETAM9 F/XETK-S ECU Adapter,<br>MOLEX - MOLE (6fc- 5fc),<br>0m136 | 0.136 m | F 00K 111 043 |

### 10.2.22 CON3: ETAM10\_ETAM12 ECU adapter



#### Usage

ETAM10/ETAM12 adapts the ETK power signals (Molex 6 pin connector) to an ECU with a 6 pin Molex PicoSpox connector.

The ECU connector is available as Vertical SMT Header [87437-0643] or Right Angle SMT Header [87438-0643].

#### ECU signals

| Pin | Color  | Signal               | Description                                                               |
|-----|--------|----------------------|---------------------------------------------------------------------------|
| 1   | Blue   | VDDPSTBY<br>(Supply) | Permanent power to supply ECU interface                                   |
| 2   | Yellow | VDDSTBY<br>(Supply)  | Permanent power to supply ECU ED RAM                                      |
| 3   | Brown  | GND                  | Power ground                                                              |
| 4   | Green  | CAL_WakeUp           | Switch to Ubatt. ECU wake-up signal<br>(for measurement pre-<br>paration) |
| 5   | Red    | SGUBATT2             | Car battery                                                               |
| 6   | -      | -                    | No Connect                                                                |

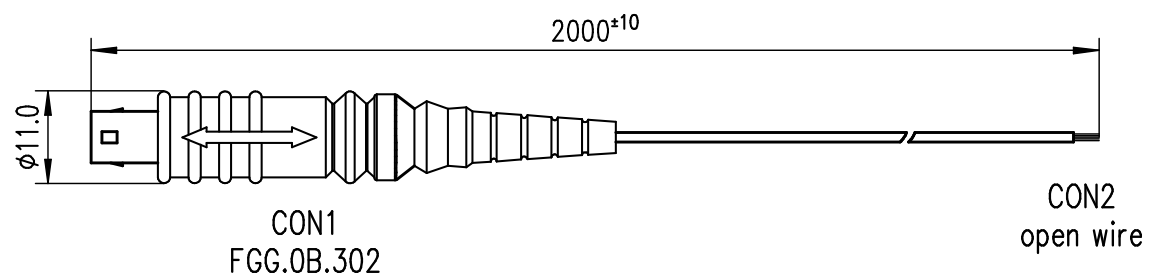
#### Temperature range

| Condition             | Temperature Range                       |
|-----------------------|-----------------------------------------|
| Operating temperature | -40 °C to +110 °C<br>-40 °F to + 230 °F |

### Order information

| Product                                                           | Length  | Order Number  |
|-------------------------------------------------------------------|---------|---------------|
| ETAM10 F/XETK-S ECU<br>Adapter, MOLEX - MOLEX (6fc-<br>6fc), 0m07 | 0.007 m | F 00K 111 814 |
| ETAM12 F/XETK-S ECU<br>Adapter, MOLEX - MOLEX (6fc-<br>6fc)       | 0.1 m   | F 00K 112 457 |

#### 10.2.23 K70.1 cable



### Usage

External power supply cable for ETKs. It is used for ETKs without permanent power supply inside the ECU. Counterpart is the KA50 or several ETK Ethernet pig tails with external power supply, mounted inside the ECU.



#### Note

It is recommended for safety reasons to connect the external permanent voltage and the switched voltage inside the ECU!

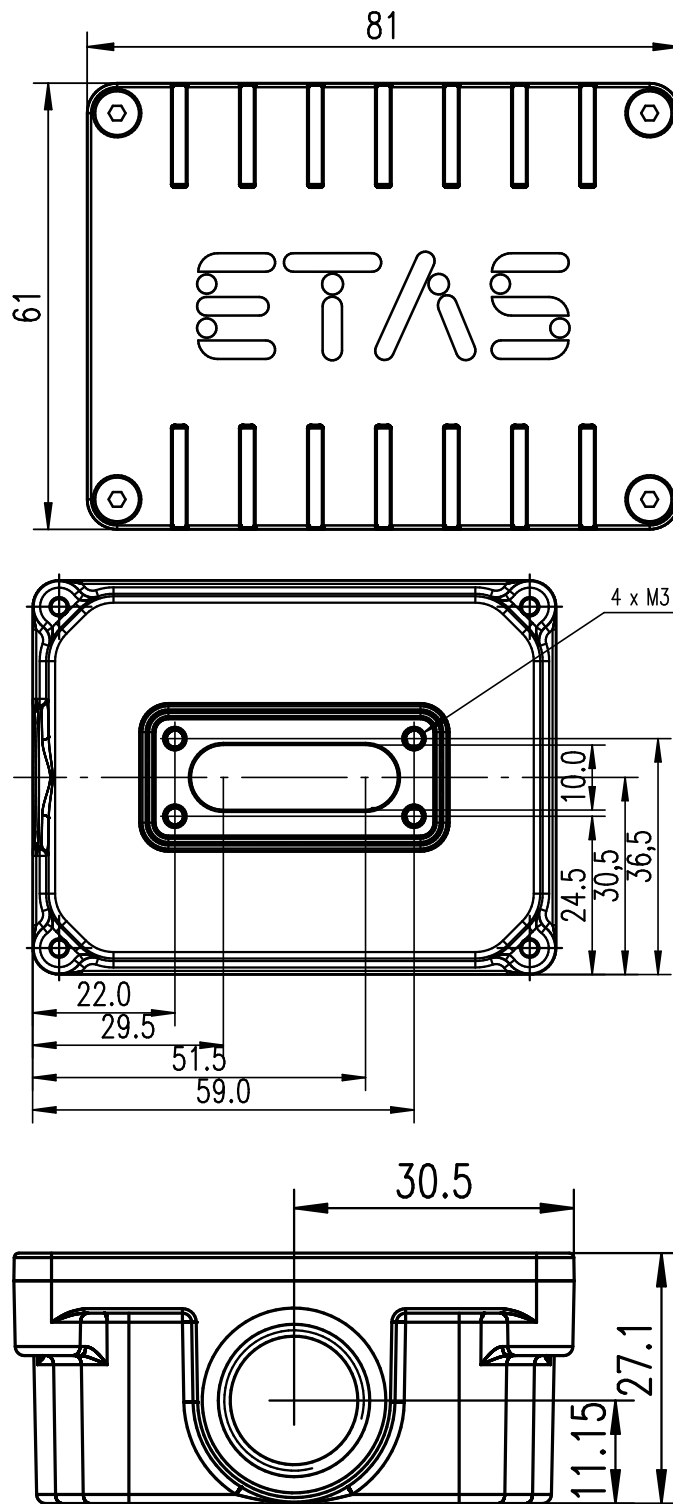
### Order information

| Product                                                                          | Short Name | Order Number  |
|----------------------------------------------------------------------------------|------------|---------------|
| External Power Supply Cable<br>for ETKs, Lemo 0B FGG - open<br>wire (2mc-1c), 2m | K70.1      | F 00K 109 270 |

#### 10.2.24 Waterproof case ETKS\_C3

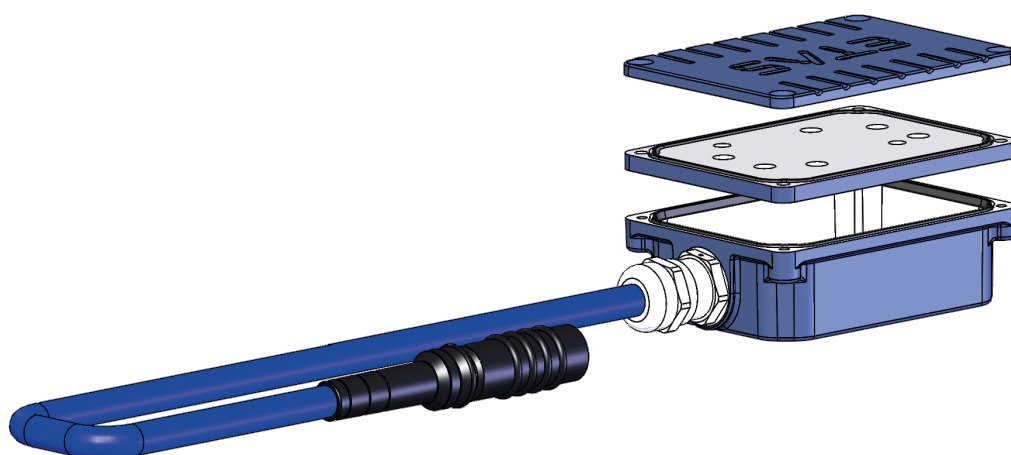
### Dimensions

For mounting the BR\_XETK-S3.0 on top of ECUs, an external case is available. It is small, robust and waterproof (IP65).



### Mounting plate

For the BR\_XETK-S3.0 a mounting plate for the waterproofed case is necessary.



### Order information

| Product                                                                 | Short Name    | Order Number  |
|-------------------------------------------------------------------------|---------------|---------------|
| Waterproof case, designed for ETK-S4.x, ETK-S6.x, ETK-S2x, and XETK-S2x | ETKS_C3       | F 00K 107 683 |
| AS_ETKS_C3_A1 adapter plate for ETKS_C3 water proofed case              | AS_ETKS_C3_A1 | F 00K 114 333 |



#### Note

To be able to use the BR\_XETK-S3.0 ECU adapter cables, an adapter ring from PG9 to M10/M12 is required.

Further information on request.

## 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](http://www.etas.com/hotlines)



ETAS offers trainings for its products:

[www.etas.com/academy](http://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](http://www.etas.com)

## 12 Legal information

### 12.1 Use of open source software

The device contains Open Source Software (OSS). The OSS documentation (OSS Attribution Document) is stored on the device and accessible via the standard web interface of the device. For further information, please see chapter "[Overview of functions](#)" on page 35.

### 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](http://www.etas.com/reach) and is continuously updated.

## 13 Index

### #

|                      |    |
|----------------------|----|
| 2-Pin DAP Mode ..... | 51 |
| 3-Pin DAP Mode ..... | 52 |

### A

|                                                                            |       |
|----------------------------------------------------------------------------|-------|
| About BR_XETK-S3.0 .....                                                   | 7     |
| Accessories .....                                                          | 14    |
| Accessories and order information .....                                    | 64    |
| Adapterboard Connection .....                                              | 31    |
| Ambient Conditions .....                                                   | 44    |
| Application Areas .....                                                    | 10    |
| Architecture .....                                                         | 35    |
| Assembly .....                                                             | 11    |
| Assignment of the Automotive Ethernet Channels to the Cable Sections ..... | 68,70 |
| Assignment of the Automotive Ethernet Signal to the LEMO Connectors .....  | 69,71 |
| Attaching the M-ETK-T1.0 to the ECU Housing .....                          | 23    |
| Automotive Ethernet Interface CON1 .....                                   | 38    |

### B

|                       |          |
|-----------------------|----------|
| Basic operation ..... | 31       |
| BR_XETK-S3.0A .....   | 47-48,60 |
| BR_XETK-S3.0C .....   | 61       |

### C

|                                                              |    |
|--------------------------------------------------------------|----|
| Cable                                                        |    |
| Overview and Classification .....                            | 65 |
| Cables .....                                                 | 13 |
| Cables and accessories .....                                 | 13 |
| Cables and Adapter Requirements for failsafe Operation ..... | 65 |
| CBEB100.1 Automotive Ethernet Media Converter .....          | 28 |
| CBEB120 Cable .....                                          | 65 |
| CBEB121 Cable .....                                          | 66 |
| CBEB122.1-3 Cabel .....                                      | 67 |
| CBEB125 Cable .....                                          | 67 |
| CBEB240 Cable .....                                          | 68 |
| CBEB242 Cable .....                                          | 70 |
| CBEB310 Cable .....                                          | 72 |
| CBEB311 Cable .....                                          | 72 |
| CBEB312 Cable .....                                          | 73 |
| CBEB313 Cable .....                                          | 74 |
| Certification and conformity .....                           | 91 |

|                                         |       |
|-----------------------------------------|-------|
| Classification of Safety Messages ..... | 11    |
| Cleaning .....                          | 62    |
| Compatible Hardware .....               | 15,26 |
| CON1                                    |       |
| CBAM290 Cable .....                     | 75    |
| CBAM295 Cable .....                     | 76    |
| CON1 ETABR1 Cable .....                 | 78    |
| CON1 ETABR2 Cable .....                 | 79    |
| CON1 ETABR3 Cable .....                 | 80    |
| CON2                                    |       |
| ETAM2 ECU Adapter .....                 | 83    |
| ETAM5 ECU Adapter .....                 | 84    |
| ETAM8 ECU Adapter .....                 | 81    |
| ETAM9 ECU Adapter .....                 | 84    |
| CON3                                    |       |
| ETAM10_ETAM12 ECU Adapter .....         | 86    |
| Configuration .....                     | 19    |
| Configuration Parameter .....           | 34    |
| Connect the ECU .....                   | 23    |
| Connection to the power supply .....    | 13,24 |
| Connectors .....                        | 57    |
| Contact Information .....               | 90    |

## D

|                                             |    |
|---------------------------------------------|----|
| DAP Interface .....                         | 40 |
| DAP Timing Characteristics .....            | 51 |
| Data Emulation and Data Measurement .....   | 36 |
| Data Emulation and Measurement Memory ..... | 17 |
| Data Emulation Memory .....                 | 17 |
| Declarable Substances .....                 | 91 |
| De-energizing the product .....             | 13 |
| Dimensions .....                            | 87 |
| Direct Register Access Page Switching ..... | 37 |

## E

|                                                   |       |
|---------------------------------------------------|-------|
| ECU Interface CON2 .....                          | 39    |
| ECU Interface Connector .....                     | 49    |
| ECU Signals .....                                 | 85-86 |
| Electrical connection .....                       | 12    |
| Electrical data .....                             | 45    |
| Electrical Safety and Power Supply .....          | 12    |
| ES88x ECU and Bus Interface Module .....          | 30    |
| ES160.1 Automotive Ethernet Media Converter ..... | 28-29 |
| ES165.1 Automotive Ethernet Media Converter ..... | 29    |
| ETAS                                              |       |
| Contact Information .....                         | 90    |

|                                                        |    |
|--------------------------------------------------------|----|
| Ethernet Interface .....                               | 54 |
| Example Connection Overview with media converter ..... | 27 |

## F

|                                                         |    |
|---------------------------------------------------------|----|
| Features .....                                          | 8  |
| Fixing the BR_XETK-S3.0 with Mounting Bracket .....     | 21 |
| Fixing the BR_XETK-S3.0 without Mounting Brackets ..... | 22 |

## H

|                                      |    |
|--------------------------------------|----|
| Hardware Setup .....                 | 20 |
| Hardware specifications .....        | 44 |
| How to attach the BR_XETK-S3.0 ..... | 20 |

## I

|                    |     |
|--------------------|-----|
| Interface .....    | 38  |
| Introduction ..... | 7,9 |

## K

|                   |    |
|-------------------|----|
| K70.1 Cable ..... | 87 |
|-------------------|----|

## L

|                                                                           |       |
|---------------------------------------------------------------------------|-------|
| Labeling of the Automotive Ethernet Channels and the Cable Sections ..... | 69-70 |
| LED Specification .....                                                   | 31    |
| Legal information .....                                                   | 91    |

## M

|                                         |          |
|-----------------------------------------|----------|
| Maintenance .....                       | 62       |
| Maximum Inrush Current .....            | 47       |
| Measurement Data Memory .....           | 18       |
| Mechanical data .....                   | 52       |
| Mechanical Dimension .....              | 76       |
| Mechanical Dimensions .....             | 81       |
| Menu and navigation .....               | 33       |
| Microcontroller Interface .....         | 47       |
| Mounting .....                          | 66,75,77 |
| Mounting and placement .....            | 20       |
| Mounting Material .....                 | 21-22    |
| Mounting plate .....                    | 88       |
| Mounting Steps .....                    | 21       |
| Mounting the into the ECU Housing ..... | 20       |

**N**

|                                                |    |
|------------------------------------------------|----|
| Network Connection .....                       | 31 |
| No communication between the ECU and ETK ..... | 43 |

**O**

|                                 |                                  |
|---------------------------------|----------------------------------|
| Operation .....                 | 12                               |
| Order Information CBEB130 ..... | 66-68,70-74,76,78-81,83-85,87,89 |
| Ordering Information .....      | 64                               |
| Overview .....                  | 33                               |
| Overview of functions .....     | 35                               |

**P**

|                                                                   |                         |
|-------------------------------------------------------------------|-------------------------|
| Page Switching .....                                              | 36                      |
| PC with one Ethernet Interface .....                              | 15                      |
| Permanent Power Supply inside ECU available .....                 | 25                      |
| Permanent Power Supply inside ECU not available .....             | 26                      |
| Physical Integration into ECU .....                               | 31                      |
| Pin Assignment .....                                              | 66,72-75,77,79-80,82-83 |
| Pin Assignment Automotive Ethernet Interface Connector CON1 ..... | 57-58,60                |
| Power Connection .....                                            | 31                      |
| Power Supply Interface CON3 .....                                 | 39                      |
| Power-on Delay of ECU Reset .....                                 | 49                      |
| Preparing the ECU Housing .....                                   | 23                      |
| Problems and Solutions .....                                      | 43                      |
| Product markings .....                                            | 54                      |
| Product Overview .....                                            | 15                      |
| Product Variants .....                                            | 81                      |
| Protocol Based Page Switching .....                               | 36                      |
| Pull CalWakeUp until Startup Handshake .....                      | 40                      |

**R**

|                                                               |    |
|---------------------------------------------------------------|----|
| Repair service .....                                          | 62 |
| Requirements for failsafe Automotive Ethernet Operation ..... | 26 |
| Reset .....                                                   | 41 |
| Return form .....                                             | 63 |

**S**

|                                               |       |
|-----------------------------------------------|-------|
| Safety instructions and classification .....  | 10    |
| Software Integration .....                    | 31    |
| Software Requirements for BR_XETK-S3.0A ..... | 15,17 |
| Status indicator .....                        | 31    |
| System Requirements .....                     | 15    |

**T**

|                                    |                         |
|------------------------------------|-------------------------|
| Target Audience .....              | 9                       |
| Technical Condition .....          | 9                       |
| Technical specifications .....     | 44                      |
| Temperature Range ETAM5 .....      | 69,71,76,78,80-82,85-86 |
| Tightness .....                    | 75,77                   |
| Top View .....                     | 52-53                   |
| Trace Based Measurement .....      | 41                      |
| Trace Memory .....                 | 18                      |
| Transportation and packaging ..... | 20                      |
| Troubleshooting .....              | 43                      |

**U**

|                                   |                                  |
|-----------------------------------|----------------------------------|
| Unpacking .....                   | 14                               |
| Usage CBEB130 .....               | 65-66,68,70,75-76,78-81,84,86-87 |
| Use of Open Source Software ..... | 91                               |

**W**

|                               |    |
|-------------------------------|----|
| Waterproof Case ETKS_C3 ..... | 87 |
| Wiring to the computer .....  | 26 |