XETK-T2.1
Emulator Probe for Infineon TC1792/ TC1796/ TC1796ED/ TC1797/ TC1797ED

User's Guide

Copyright

Document R1.0.2 EN

Contents

1 General Information

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

1.1 Basic Safety Instructions

Please adhere to the Product Liability Disclaimer (ETAS Disclaimer) and to the following safety instructions to avoid injury to yourself and others as well as damage to the device.

1.1.1 Correct Use

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

1.1.2 Labeling of Safety Instructions

The safety instructions contained in this manual are shown with the standard danger symbol shown in Fig. 1-1 on page 7:

Fig. 1-1 Standard Danger Symbol

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

WARNING!

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

CAUTION!

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

1.1.3 Demands made re the Technical State of the Product

The following requirements are made to ensure safe operation of the module:

- Ensure you observe the notes on environmental conditions (see section 6.3 on page 43).

- Ensure you adhere to the port and setting values (see section 6.4 on page 43).

CAUTION!

The XETK can be damaged or destroyed!
Some components of the XETK board may be damaged or destroyed by electrostatic discharges. Please keep the XETK in its storage package until it is installed.
The board should only be taken from its package, configured, and installed at a work place that is protected against static discharge.

CAUTION!

Risk of short circuiting the internal signals of the XETK!
When you mount the XETK to the ECU, you must ensure that the screws and washers used will not penetrate the XETK printed circuit board.

CAUTION!

Potential equalization in the vehicle over the shield of the Ethernet connecting cables of modules may occur!
Mount the modules only to components with the same electrical potential or insulate the modules from the components.

1.2 Taking the Product Back and Recycling

The European Union has passed a directive called Waste Electrical and Electronic Equipment, or WEEE for short, to ensure that systems are setup throughout the EU for the collection, treating and recycling of electronic waste.

This ensures that the devices are recycled in a resource-saving way representing no danger to health or the environment.

Fig. 1-2 WEEE-Symbol

The WEEE symbol (see Fig. 1-2 on page 8) on the product or its packaging shows that the product must not be disposed of as residual garbage.

The user is obliged to collect the old devices separately and return them to the WEEE take-back system for recycling.

The WEEE directive concerns all ETAS devices but not external cables or batteries.

For more information on the ETAS GmbH Recycling software, contact the ETAS sales and service locations (see chapter 9 on page 71).

1.3 About This Manual

This manual describes the startup and technical data of the XETK-T2.1 module.

1.3.1 Structure

This manual consists of nine chapters and an index.

- **Chapter 1: “General Information”**

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

- **Chapter 2: "Introduction"**

  The chapter "Introduction" contains information about the basic features and applications of the XETK-T2.1 Interface Board.

- **Chapter 3: “Hardware Description”**

  In the "Hardware Description" chapter the function blocks and the interfaces of the XETK-T2.1 are explained in detail.

- **Chapter 4: “Installation”**

  The “Installation” chapter describes the hardware installation of the XETK-T2.1.

- **Chapter 5: “ETK Configuration”**

  The “ETK Configuration” chapter includes a description of important XETK-T2.1 configuration parameters.

- **Chapter 6: “Technical Data”**

  The “Technical Data” chapter contains a summary of all technical data, pin assignments and hints to system requirements for operating the XETK-T2.1.

- **Chapter 7: “Cables and Accessories”**

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

- **Chapter 8: "Ordering Information"**

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

- **Chapter 9: "Version History"**

  The "Version History" chapter contains a summary of the changes in this document version.

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

1.3.2 Using this Manual

Representation of Information

All activities to be executed by the user are presented in what is referred to as a "Use-Case" format. I.e. the aim is defined in brief as a title and the relevant steps necessary to achieve this aim are then listed. The information is displayed as follows:

Target definition:

Any introductory information...

- Step 1

  Possibly an explanation of step 1...
- Step 2

  Possibly an explanation of step 2...
- Step 3

  Possibly an explanation of step 3...

Any concluding remarks...

Typographic Conventions

The following typographic conventions are used:

Bold	Device labels
Italics	Crucial text

Important notes for the user are shown as follows:

Note

Important note for the user.

2 Introduction

This section contains information about the basic features and applications of the XETK-T2.1 Interface Board (ETK = Emulator Test Probe), hints to system requirements for operating the XETK-T2.1, and other details.

2.1 Applications

The XETK-T2.1 is an emulator probe especially for the Infineon TC1792/ TC1796/ TC1797 "series microcontroller" and TC1796ED/ TC1797ED "emulation devices".

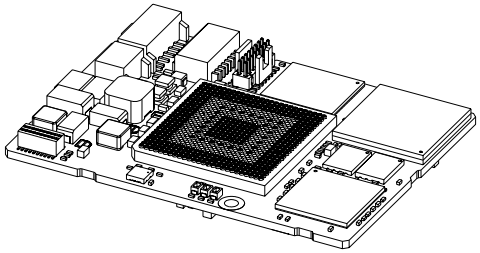

Fig. 2-1 XETK-T2.1A/ XETK-T2.1B and XETK-T2.1C

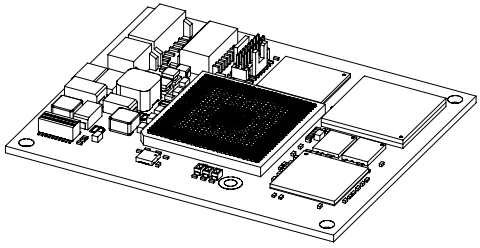

Fig. 2-2 XETK-T2.1D

The XETK-T2.1 is a parallel XETK and supports the standard full duplex 100Base-T Ethernet interface. The XETK-T2.1 can be connected directly or via ES510/ ES592/ ES595/ ES600 modules to the PC or directly to the ES910 module (see chapter 3.12 on page 24). No additional ETAS modules are required for the access to the ECU.

The XETK-T2.1 features the opportunity to perform measurement of variables via the JTAG debug interface. Additionally the JTAG interface can be used for flash programming. The XETK-T2.1 parallel interface can be used for measurement and calibration.

Note

The XETK-T2.1 can be ordered in different functional and in two mechanical versions (refer to chapter 6.1 on page 41 and to chapter 6.13 on page 55).

2.2 Features

Note

The XETK-T2.1 is designed for ECU's with Infinion microcontrollers TC1792, TC1796, TC1796ED, TC1797 and TC1797ED.
The XETK-T2.1C and the XETK-T2.1D versions not supports the TC1796ED (416 pin socket) microcontroller.

Note

The system release test was done with TC1796 and TC1797ED microcontrollers.

- Parallel interface
  - designed for TC1792, TC1796, TC1796ED, TC1797 and TC1797ED microcontrollers
- Measurement interface
  - Adress-/ data bus and
  - JTAG interface (runs at 3.3 V or below)
- Measurement memory
  - Two pages of data emulation/measurement data memory available, each with 1 MByte
  - Permanent storage of emulation data in flash memory
  - RAM adaptor mode
  - CPU bus interface voltage 3.3 V
- Trigger interface
  - Triggered direct measurement (TDM)
  - 48 hardware trigger

  - 4 trigger generated by internal timer to transfer measurement data via JTAG
  - 64 measurement raster
- Fast Ethernet interface
  - Direct connection to PC
  - XCP protocol
  - Supports a variety of standard applications
- Debugger interface
  - Arbitration possible (e. g. with debuggers of Lauterbach Datentechnik GmbH (Power Trace and Power Debug) and with debuggers of pls Programmierbare Logik und Systeme GmbH (UAD2 and UAD2+)
  - JTAG compliant Samtec connector for external debug hardware
  - ECU flashing via XETK
  - Braindead flashing under ProF control
- High speed measurement and calibration performance
  - Performance similar to appropriate ETK
  - Hardware synchronization and time stamping
  - Supports fast measurement rasters
- Can drive "Boot configuration" to configure the CPU
- Permanent storage of configuration in Flash
- Configurable XETK chip select (by solder bridges)
- Enable or disable the XETK by ECU software
- Firmware update (programming of the logic device) through software HSP; removal of XETK or ECU not necessary

For more technical data on the XETK-T2.1 consult the chapter "Technical Data" on page 41.

3 Hardware Description

In this chapter, the function blocks and the interfaces of the XETK-T2.1 are explained in detail.

Note

The XETK-T2.1 can be ordered in different functional and in two mechanical versions (refer to chapter 6.1 on page 41 and to chapter 6.13 on page 55).

3.1 Architecture

Fig. 3-1 "XETK-T2.1 Architecture" shows the block diagram of the XETK-T2.1. The connection to the ECU is made by an BGA connector.

The microcontroller can read via the BGA connector from one of the two pages of the data emulation memory and can write its data directly to the measurement data memory. These two memories (data emulation memory, measurement data memory) are using the same address space and are realized inside the same DPRs.

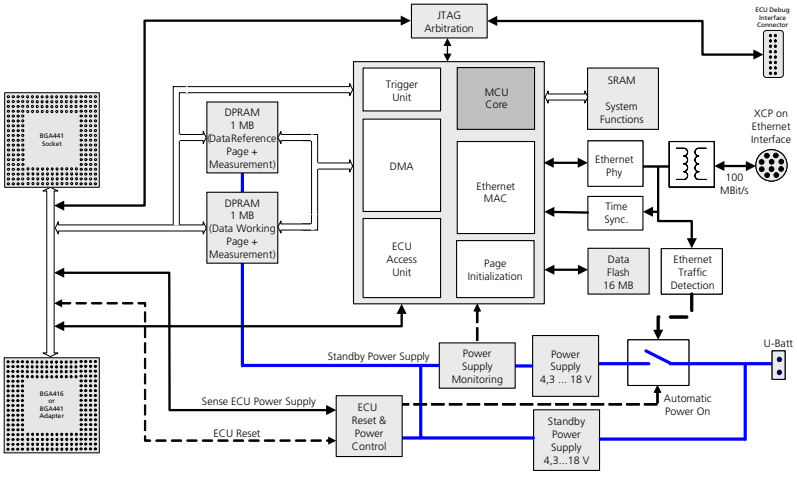

Fig. 3-1 XETK-T2.1 Architecture

Through the BGA connector the microcontroller can communicate with other external memories or peripheral components too. All microcontroller signals are accessible on the BGA connector.

While the microcontroller accesses the program data (not the program code) out of the data emulation memory, the content of the data emulation memory can simultaneously be modified by the calibration and development system through the XETK 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 send data to the calibration and development system which receives, buffers and processes this measured data.

A flash memory is available for permanent storage of the adjusted parameters (program data). The XETK Ethernet interface provides communication with the PC. The power supply for the XETK-T2.1 is provided by a switched mode power supply to minimize power dissipation.

3.2 BGA Connector

The BGA connector interfaces the XETK-T2.1 with the ECU. All signals of the microcontroller are directly connected to the BGA connector. Also the clock signal must be provided through the connector to the microcontroller.

3.3 Microcontroller Interface

The whole microcontroller interface to the calibration and development system memories has a 32 bit wide data bus and uses only one chip select for read and write accesses. The microcontroller can read and write its data directly from or to the data emulation and measurement data memory.

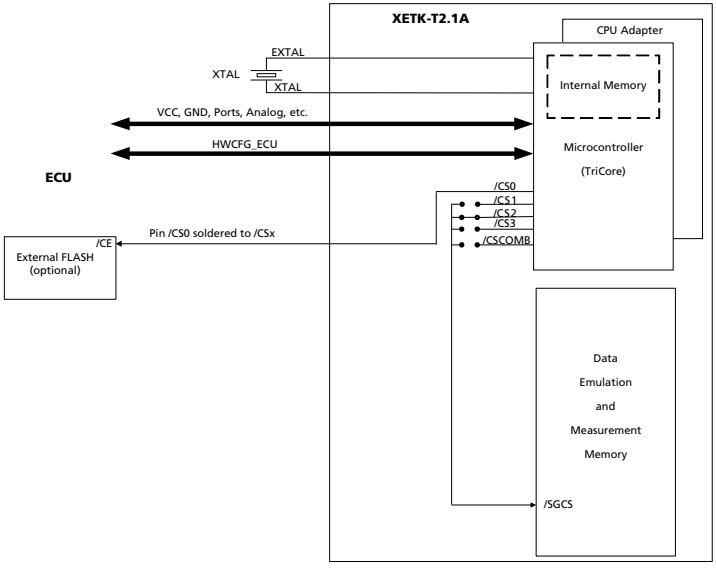

Fig. 3-2 XETK-T2.1A: internal and external Memory

Fig. 3-2 on page 16 and Fig. 3-3 on page 17 show an overview of the system with "on chip" Flash and RAM and external Flash and RAM memory. It also show the possibilities to access the different memories with its chip selects. The chip select of the data emulation and measurement data memory can be choosen (/CS1, /CS2, /CS3 or /CSCOMB) by soldering the respective bridge on the PCB (see chapter 3.15 on page 28).

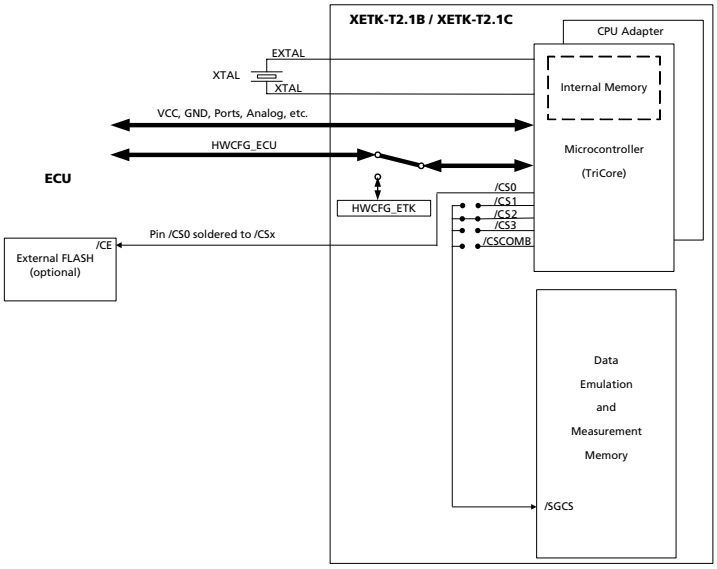

Fig. 3-3 XETK-T2.1B, XETK-T2.1C: internal and external Memory

3.4 Data Emulation and Data Measurement

The complete data emulation and measurement data memory consists of two 1024 kByte pages (Fig. 3-4 "Data Emulation and Measurement Data Memory: 2 Pages with 1024 kByte each"). The address range of the used chip select to address the data emulation and measurement memory must be 1024 kByte and it must be defined at a 1024 kByte boundary. A XETK-T2.1 configuration option gives the possibility to reduce the memory to 512 kByte.

Data emulation memory and measurement data memory must be located inside this 1024 kByte address range. The segmentation of this address range between both memory parts is variable. The measurement data memory and data emulation memory can have variable size and offset addresses inside this fixed address range.

3.4.1 Data Emulation Memory

During operation of the ECU, only program data, not program code, can be modified by using the data emulation memory. Modification of program code would inevitably lead to a system crash. The program code is continuously processed out of the internal or external memory.

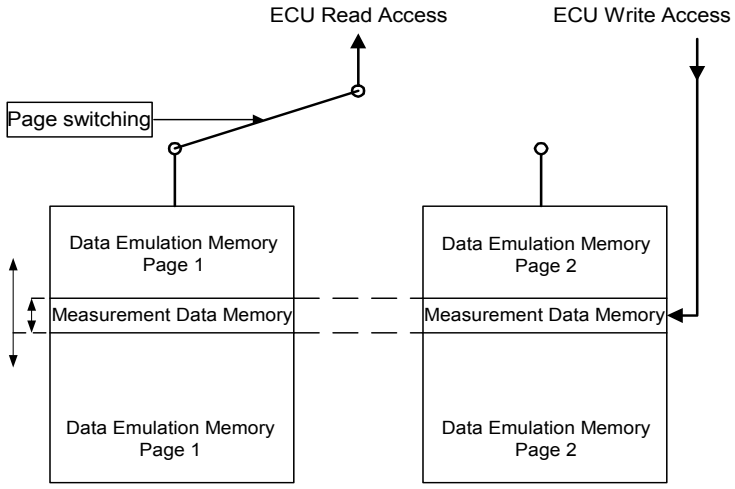

Fig. 3-4 Data Emulation and Measurement Data Memory: 2 Pages with 1024 kByte each

Reference data can be stored on one page ("Reference page") while the data on the other page ("Working page") can be modified. It is possible to switch between the two pages during operation through the application software.

3.4.2 Measurement Data Memory

The measurement data memory must be located within the address space of the data emulation and measurement data memory. It can have variable size. The measured data stored here can be transferred to the calibration and development system via the Ethernet XETK interface.

Note

Because there is no write protection of the data emulation memory possible, care must be taken not to overwrite any emulation data since the data emulation memory XETK-T2.1 is not write protected.

3.4.3 Triggering of Measurement Data Capture

The exact procedure for capturing measured data is explained in the documentation Display Tables 12 and 13; only the hardware-specific features are mentioned here. The ECU microcontroller initiates a data acquisition task by writing an arbitrary value to the trigger address at the so called trigger segment. The software of the ECU is able to start different data acquisition tasks by writing different trigger addresses (trigger 1 to trigger 48).

+ 0xFC	Trigger 48
+ 0xF8	Trigger 47
..	
+ 0xBC	Trigger 32
+ 0xB8	Trigger 31
..	
+ 0x7C	Trigger 16
+ 0x78	Trigger 15
..	
+ 0x44	Trigger 2
+ 0x40	Trigger 1
+ 0x3C	reserved
..	
+ 0x14	reserved
+ 0x10	reserved
+ 0x0C	reserved
+ 0x08	reserved
+ 0x04	disable XETK
+ 0x00	enable XETK

Fig. 3-5 Division of the 256 Byte Trigger Segment

The XETK-T2.1 contains a trigger comparator which selects a segment of 256 Byte out of the measurement data memory address space (at a 256 Byte limit). This limit is known as the trigger segment address. Fig. 3-5 "Division of the 256 Byte Trigger Segment" shows the configuration of the 256 Byte trigger segment. The XETK-T2.1 supports up to 48 direct hardware triggers by providing 48 trigger addresses within the trigger segment.

Note

The unused address areas within the trigger segment are reserved for future applications and must not be used for other purposes.

3.4.4 Data Retention in Data Emulation Memory

The data emulation and measurement data memory physically consists of a static Dual Port RAM and is permanently supplied with power from the car battery, to guarantee that data is preserved even when the ignition is switched off. If the ECU with XETK is isolated from the battery, all data will be lost. For brief power interruptions, e.g. during a cold start procedure, buffering is guaranteed through capacitors for several milliseconds.

3.5 Data Flash Memory

Flash memory is provided on the XETK-T2.1 for permanent storage of emulation data. Users can copy the contents of the data emulation and measurement data memory into the flash memory using the operating software. It is recommended that an updated data set is always stored in the flash memory.

The XETK-T2.1 has a circuit which recognizes and stores power failures. If this circuit detects power failures, and therefore a possible inconsistency of the emulation data, the XETK microcontroller initiates a copying procedure from Flash memory to DPR upon restart. The Flash memory data is copied to both emulation pages. A green LED on the XETK displays the status. The operating software announces the procedure by a message in the status line.

3.6 Code Flash Memory

The program code is not emulated by the XETK-T2.1. The program code is stored in the ECU Flash memory ("on chip" and/or external) and is not modified by the XETK-T2.1. Only the accessible emulation data areas are emulated by the XETK-T2.1. The ECU Flash memory can be programmed with the normal Flash memory programming tools.

3.7 Braindead Flashing

Braindead Flashing (BDF) means programming of the non-volatile memory of the ECU (i.e. internal or external flash) by using the JTAG debug interface, regardless of the current memory contents. A running ECU software is not required - the non volatile memory may be empty or corrupted.

The XETK-T2.1 supports Braindead Flashing via JTAG debug interface for Infineon TC1792/TC1796/TC1797 and TC1796ED/TC1797ED microcontrollers.

It is recommended to use Braindead Flashing as the standard method for all new projects.

3.7.1 Braindead Flashing via JTAG Debug Interface

This method uses the JTAG interface of the MCU's microcontroller to enable the debug mode of microcontroller and to download a flash programming driver into the microcontroller's internal scratch pad RAM.

After download, the microcontroller is given a resume/go command. It executes the programming driver which receives data via the XETK mailbox and programs it into the microcontroller's flash. When flash programming is done, a reset is issued and the microcontroller executes the recently programmed code.

The following steps are sequenced by a ProF control flow:

- Put ECU's microcontroller into reset
- Initiate microcontroller's debug mode and halt state
- Download flash programming driver into the internal scratch pad RAM region of the controller that contains communication and flash routines
- Set Program Counter to point to the beginning of the boot code
- Resume microcontroller code execution by issuing a go/resume command
- Program the new ECU software to the non-volatile memory (internal or external flash)
- Reset the microcontroller (release JTAG debug interface control)

CAUTION!

During Braindead Flashing via JTAG, external debugger should be removed.

3.8 XETK-T2.1 Deactivation

For ECU setup and debugging purposes, the XETK-T2.1 can be disabled by writing an arbitrary value to the approriate address (XETK_Disable) in the trigger segment. When disabled, write accesses to the XETK data emulation and measurement memory are not performed (with exception to the trigger segment). The XETK-T2.1 data lines are in tristate mode, even during read accesses. Writing to XETK_Enable enables the XETK.

Note

The time between two directly consecutive write accesses to the trigger segment must be greater than 100 ns.

The disable/enable state is volatile, i.e. after power up, the XETK boots up in the state defined by the "XETK Configuration Tool" (XETK state after power up).

3.9 Reset

The requirement for XETK reset mechanism is to ensure that power-up and power-down behavior of ECU is clean and smooth and to prevent corruption of data stored in the XETK.

To accomplish this the XETK-T2.1 senses the U_{SVDD} of the ECU. 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 if the PC is off or unplugged.

Furthermore, the XETK-T2.1 senses the status of the /PORST and /HDRST lines to generate a write protect signal for its memory.

Finally, the XETK-T2.1 generates a reset signal by pulling /PORST to keep the ECU in reset while the XETK is in power save mode and to prevent the microcontroller from starting until the XETK is ready to work.

The XETK is ready to work when it has has finished its initialization after leaving power save mode or after initial power-up. This feature allows it also to reset the ECU under tool control (required for INCA and ProF) and to perform an emergency stop of the ECU in case of XETK failure. The XETK is ready to work when it has has finished its initialization after leaving power save mode or after initial power-up.

3.10 RAM Adapter Mode

The XETK-T2.1 offers the option to be used as a RAM adapter without measurement and calibration capabilities. RAM Adapter modes can be selected in the XETK Configuration Tool.

3.11 Power Supply

The XETK-T2.1 needs a permanent power supply. It is powered directly from the car battery. The input voltage may vary between 4.3 V and 18 V.

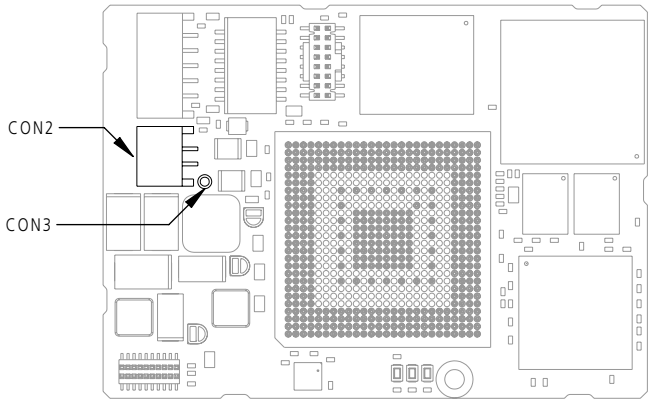

Fig. 3-6 Power Supply Connectors CON2 and CON3

In case of higher input voltages to the XETK an additional voltage converter is required. All necessary voltages are created through switching power supplies which minimizes heat build-up. The power supply of the ECU is not affected by the XETK-T2.1. An automatic switch ensures that the power supply of the XETK-T2.1 is automatically switched on and off.

The ECU voltage (U_{SVDD}) is monitored by the XETK to recognize whether the ECU is switched on or off.

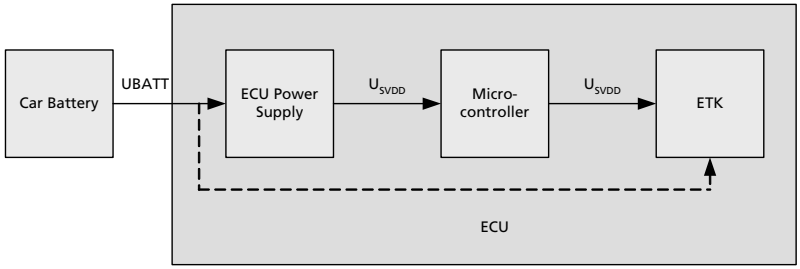

Fig. 3-7 Power Supply monitoring

The XETK-T2.1 can be supplied with power through the 2-pin power supply connector CON2. Additionally the through-hole solder pad CON3 can be used to connect a power supply U_{Batt2}. The power supply on CON3 must use the GND of CON2.

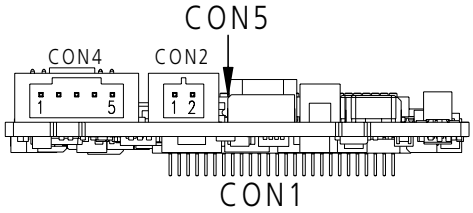

Fig. 3-8 Power Supply Connector CON2

3.12 XETK Ethernet Interface

The XETK Ethernet interface can directly connected to the PC. No additional ETAS module or other hardware is required for the access to the ECU.

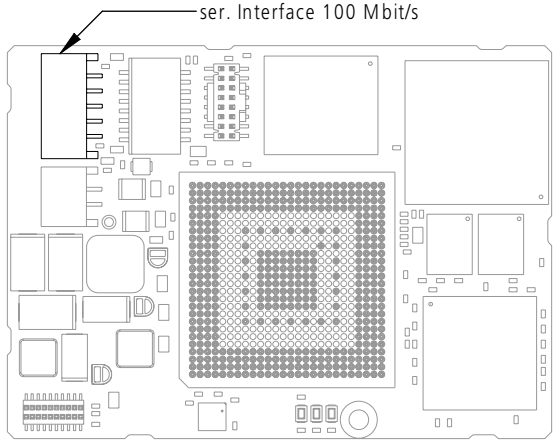

Fig. 3-9 Location of the Ethernet Interface

The interface is a standard full duplex 100Base-TX Ethernet interface. The XETK Ethernet interface is integrated in the ETAS IP world 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 to connect the XETK-T2.1 in third party application software.

Note

The XETK Ethernet interface is not compatible with the standard ETK interfaces in modules like e.g. ES910, ES590, ES1232-A.
The XETK Ethernet interface is compatible with the ECU interface of the ES910 module and the Ethernet intefaces of the ES510/ ES592/ ES595/ ES600 module.

The maximum length of the interface cable is specified for 30 m.

3.13 Debugger Interface

The XETK-T2.1 features a JTAG debugging interface connector (Samtec 16 pin).

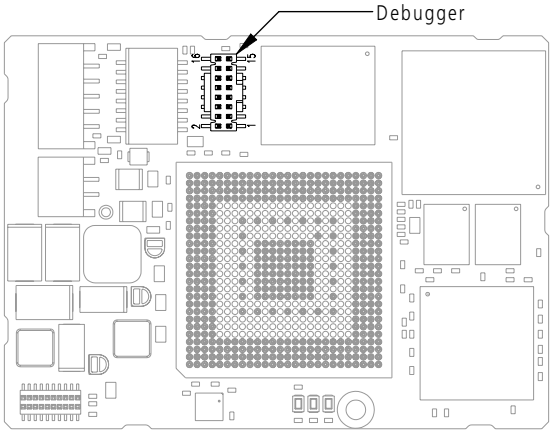

Fig. 3-10 Location of the Debugger Interface

This connector can be used to attach debug and trace tools (e.g. Lauterbach or PLS debugger for Infineon TC17xx).

For connecting the XETK-T2.1 to the debugger the ETK adapter ETAF5 (including ETAF5 PCB and ETAF5 flatcable) is required. Its needs to be ordered separately (refer chapter "Ordering Information" on page 67). A debugger specific cable has to be used to connect the debugger with the ETAF5 PCB.

3.14 Status LEDs

There are three LEDs displaying the operating status of the XETK-T2.1 (Fig. 3-11 on page 28).

LED	State	Meaning
Red	On	XETK-T2.1 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 XETK-T2.1)
Green	On	When the power supply voltage drops below 3.5 V, the data retention of the DPRs is not longer ensured. As soon as the XETK is switched on again, the content of the XETK-Flash will be copied into reference and working page RAM. The green LED stays lit until the calibration and development system copies new data into RAM.
	Flashing	XETK-T2.1 is in RAM adapter mode. Measurement and calibration are not possible (in all "ETK usage as" modes except "ETK mode initialized")
	Off	Working page may be different to reference page. Working page and reference page may be different to the XETK-Flash.
Yellow	On	100 Mbit/s communication to calibration system established
	Flashing	Communication active

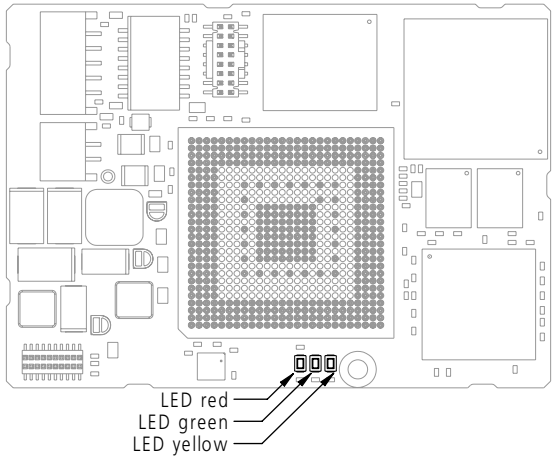

Fig. 3-11 Status LEDs

3.15 Chip Select Configuration Bridge

R108 to R112 are alternately assembled to select the XETK chip select signal.

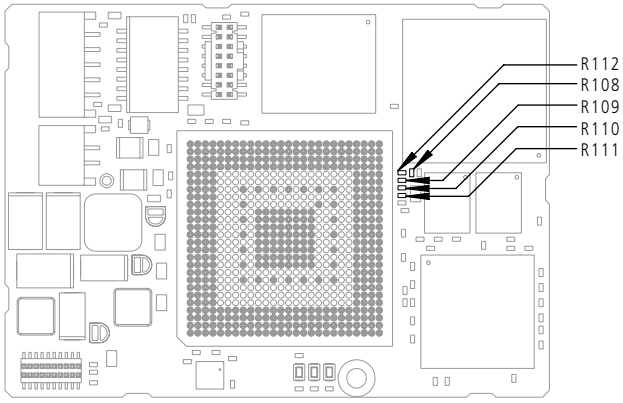

Fig. 3-12 Chip Select Configuration Bridge

Solder bridge	Meaning
R108	XETK-T2.1 uses /CS1
R109	XETK-T2.1 uses /CS2 (used as default)
R110	XETK-T2.1 uses /CS3
R111	XETK-T2.1 uses /CSCOMB
R112	XETK-T2.1 uses /CS0

4 XETK Configuration

The “XETK Configuration” chapter includes a description of important XETK-T2.1 configuration parameters.

4.1 Overview

As already mentioned in previous chapters, some project-specific adjustments are necessary. Configuration data is stored permanently in a serial Flash. Generating a valid configuration data set is supported by the "XETK Configuration Tool". The "XETK Configuration Tool" contains information on all available XETKs. The user is supported through a graphical interface.

4.2 Configuration Parameter

The configuration of the XETK-T2.1 is possible with the "XETK Configuration Tool". Not all combinations of parameters make sense. The "XETK Configuration Tool" provides support concerning the configuration parameters. The following is a list with configuration parameters:

- **CPU Type** (TC1796, TC1797, TC1796ED, TC1797ED)

  Defines the microcontroller type of the connected ECU. The possible states are:

  – TC1796:

    The XETK will be configured for the TC 1796 microcontroller.

  – TC1797:

    The XETK will be configured for the TC 1797 microcontroller.

  – TC1796ED:

    The XETK will be configured for the TC 1796 (Emulation Device) microcontroller.

  – TC1797ED:

    The XETK will be configured for the TC 1797 (Emulation Device) microcontroller.

  The default value is "TC1796".

Note

The TC1792 will be supported by the XETK-T2.1. Since this microcontroller behaves like the TC1796 it cannot be selected for configuration. TC1796 must be selected instead.

- **Memory Usage** (1 Mega Byte, 512 Kilo Byte)

  Defines the size of the DPR regions used for Reference and Working Page. The possible state are:

  – 1 Mega Byte:

    This is the normal page size of the XETK-T2.1.

  – 512 Kilo Byte

    This is the normal page size of the ETK-T1.x. This setting can be used to easily port ECU projects for the ETK-T1.x to the XETK-T2.1.

  The default value is "1 Mega Byte".

- **XETK Application mode** (XETK mode initialized, XETK mode not initialized, RAM adaptor not initialized, RAM adaptor initialized)

  In all "XETK Application mode" modes except "XETK mode initialized" the XETK-T2.1 is not in its normal operation mode, i.e. measurement and calibration are not possible.

Note

Do not use the XETK-T2.1 together with INCA with any another state than "XETK mode initialized". Always reconfigure the XETK after is was used as RAM adaptor to avoid unexpected behaviour of INCA.

This feature allows it to use the XETK-T2.1 as a RAM extension. The possible states are:

– RAM Adapter intitialized:

  The XETK device is used as RAM extension for the ECU. If a XETK power fail occurs the XETK RAM is loaded with the content of the backup flash.

– RAM Adapter not initialized:

  The XETK device is used as RAM extension for the ECU. If a XETK power fail occurs the XETK RAM contains random data.

– XETK Mode initialized:

  The XETK is used as a measurement and calibration device. If a XETK power fail occurs the XETK RAM is loaded with the content of the backup flash. When running the XETK device together with INCA this mode is set during hardware initialisation.

– XETK Mode not initialized:

  The XETK is used as a measurement and calibration device, but when a power fail occurs the XETK RAM contains random data. This mode is only useful for special cases.

The default value is "XETK mode initialized".

Note

If you want to use the XETK device together with INCA the "XETK mode initialized" is the only appropriate mode.

- **Power-On State** (Active,Inactive)
  – Active:

    The XETK is enabled at ECU power on.

  – Inactive:

    The XETK is inactive when the ECU power on.

  The default value is "Active".
- **JTAG Clock Speed** (20, 40)

  Defines the JTAG clock speed in MHz that will be set after the hand-shake has been performed or the post reset timeout is reached (see below). The possible states are:

  – 20

  – 40

  The default value is "40".
- **Post Reset Timeout** (0, n, -1)

  The XETK-T2.1 uses a timeout after ECU reset/ECU on instead of a start up handshake. The timeout in milliseconds is used for switching the JTAG clock speed and enabling timer trigger. The possible states for the timeout are

  – 0:

    No delay. The JTAG clock speed is switched immediately and and timer trigger are enabled.

  – n (1 - 65534):

    The XETK waits n milliseconds before switching the JTAG clock speed. If a trigger is set before timeout, it is assumed that the ECU is completely initialized. The JTAG clock speed is switched and timer trigger is enabled.

– -1:

The XETK waits until the first trigger is set. Then it is is assumed that the ECU is completely initialized. JTAG clock speed is switched and timer trigger are enabled.

The default value is "100".

- **Debugger Arbitration** (Static, Dynamic)

  Defines whether the JTAG is reserved for debugger which can't do arbitration. Then no JTAG access is possible for the XETK. The possible states are

  – Static:

  JTAG access is reserved for debuggers. Will be disabled during BDF.

  – Dynamic:

  The JTAG access is arbitrated between debuggers and the XETK.

  The default value is "Dynamic".

- **Page Switch Method** (Last Active Page, Always Working Page, Always Reference Page)

  Defines the autostart behavior of the XETK and sets the used starting page. The possible states are

  – Last Active Page:

  The XETK starts with the Last Active Page.

  – Always Working Page:

  The XETK starts with the Working Page.

  – Always Reference Page:

  The XETK starts with the Reference Page.

  The default value is "Last Active Page".

5 Installation

In this chapter, the hardware installation of the XETK-T2.1 is described.

CAUTION!

The XETK can be damaged or destroyed!
Some components of the XETK board may be damaged or destroyed by electrostatic discharges. Please keep the XETK in its storage package until it is installed.
The board should only be taken from its package, configured, and installed at a work place that is protected against static discharge.

5.1 Connection to the ECU

CAUTION!

Risk of short circuiting the internal signals of the XETK!
When you mount the XETK to the ECU, you must ensure that the screws and washers used will not penetrate the XETK printed circuit board.

For mounting the XETK-T2.1 on the ECU an Advanced Interconnect socket is required. It needs to be ordered separately (refer chapter "Ordering Information" on page 67).

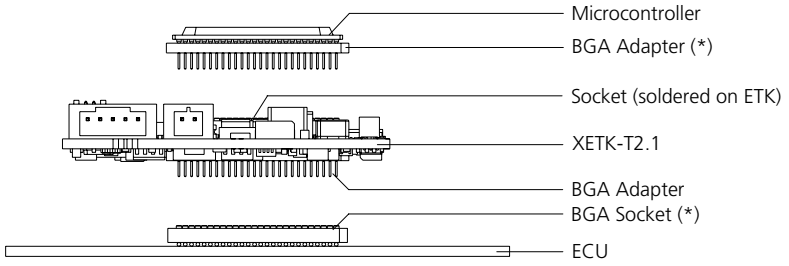

Fig. 5-1 XETK-T2.1 soldered Connection to the ECU

The XETK-T2.1 board fitted with a "BGA adapter" connector allows connection and removal from an ECU development PCB which has been fitted with a compatible "BGA receiver" socket (see Fig. 5-1).

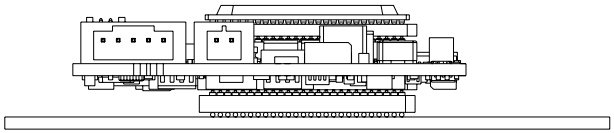

Fig. 5-2 XETK-T2.1 with Microcontroller mounted on ECU

5.2 Wiring

5.2.1 XETK Ethernet Interface

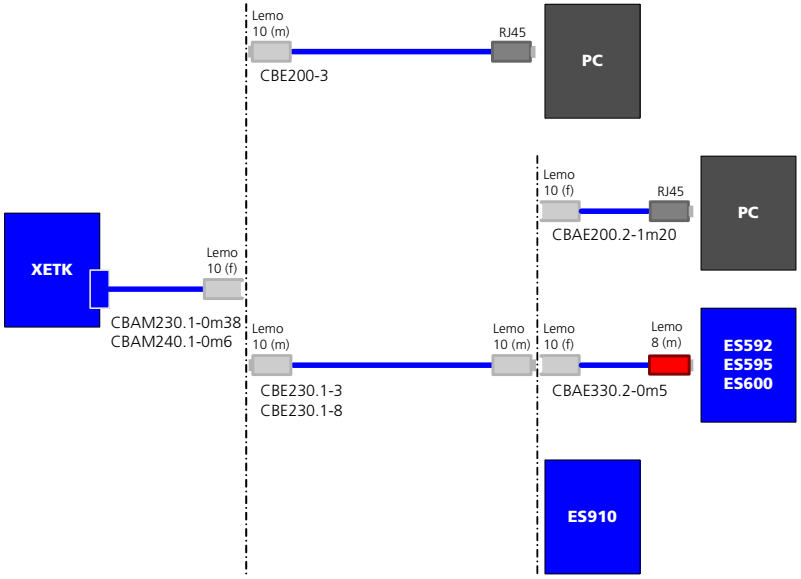

Fig. 5-3 Wiring - XETK Ethernet Interface

The XETK Ethernet interface can directly connected to the PC. No additional ETAS module is required for the access to the ECU.

Note

The XETK Ethernet interface is not compatible with the standard ETK interfaces in modules like e.g. ES910, ES590, ES1232-A.
The XETK Ethernet interface is compatible with the ECU interface of the ES910 module and the Ethernet intefaces of the ES510/ ES592/ ES595/ ES600 module.

5.2.2 Debugger Interface

For connecting the XETK-T2.1 to the debugger the ETK adapter ETAF9 (including ETAF9 PCB and ETAF9 flatcable) or the ETK adapter ETAF5 (including ETAF5 PCB and ETAF5 flatcable) is required. Its needs to be ordered seperately (refer chapter "Ordering Information" on page 67).

A debugger specific cable has to be used to connect the debugger with the ETAF5 PCB or ETAF9 PCB.

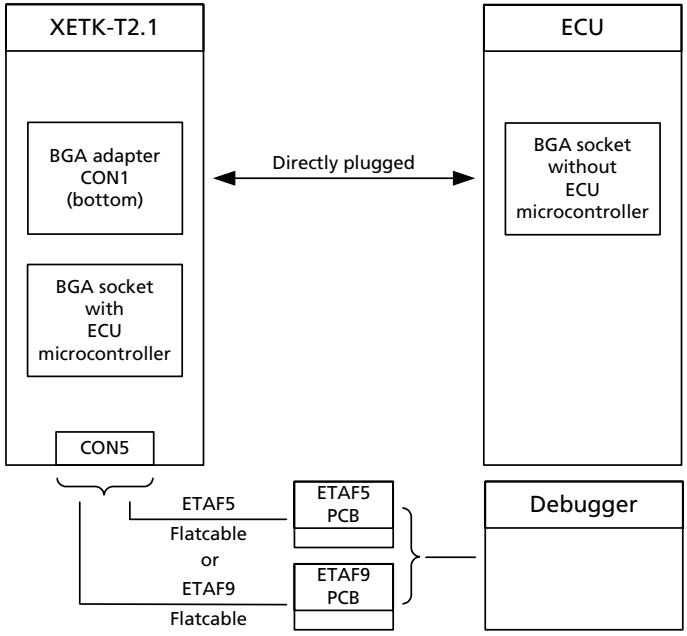

Fig. 5-4 XETK-T2.1 Connection to the ECU and to the Debugger

5.2.3 Power Supply

The XETK-T2.1 needs a permanent power supply (refer chapter "Power Supply" on page 22). There are different versions to ensure it.

Permanent Power Supply inside ECU available

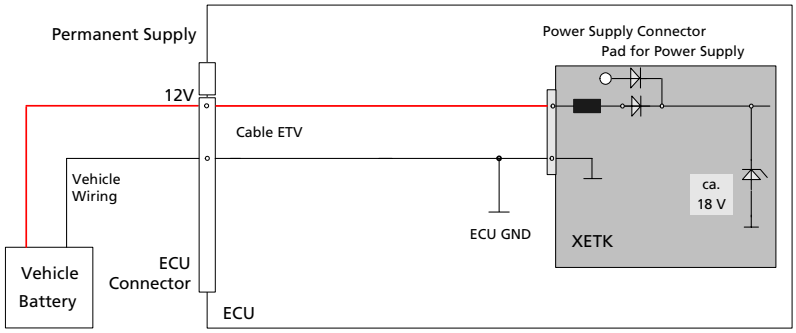

Fig. 5-5 Wiring - Permanent Power Supply inside ECU available

Permanent Power Supply inside ECU not available

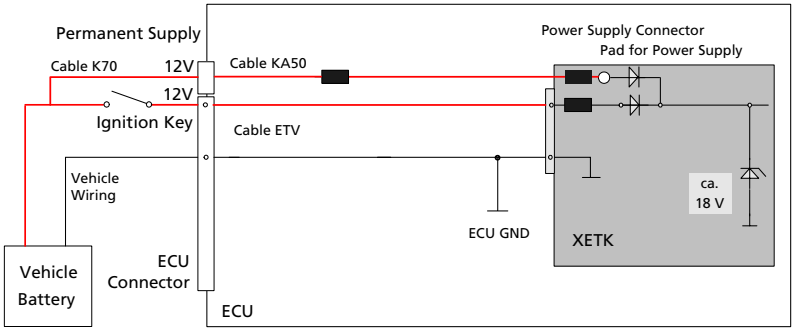

Fig. 5-6 Wiring - Permanent Power Supply inside ECU not available

The XETK-T2.1 does not require a galvanically isolated power supply. For special applications ETAS offers the isolated power supply ETP2.

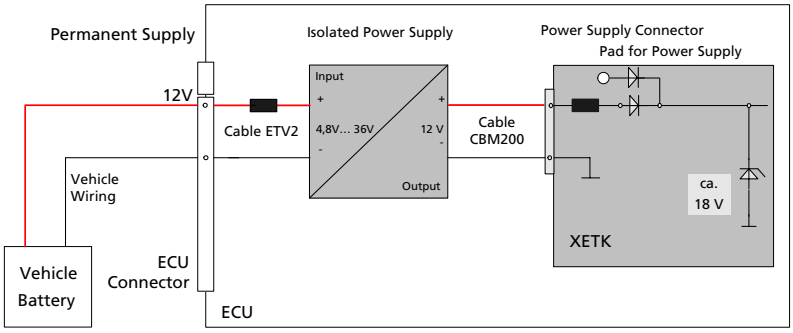

Fig. 5-7 Wiring - Isolated Power Supply inside ECU

6 Technical Data

Note

The XETK-T2.1 can be ordered in different functional and in two mechanical versions (refer to chapter 6.1 on page 41 and to chapter 6.13 on page 55).

6.1 XETK-T2.1 Versions

The XETK-T2.1 can be ordered in different functional and in two mechanical versions:

	XETK-T2.1A	XETK-T2.1B	XETK-T2.1C	XETK-T2.1D
Emulation RAM	1 MByte	1 MByte	1 MByte	1 MByte
ECU adapter	441 pin	441 pin	416 pin	416 pin
BDF support	Enabled by ECU	Yes, via JTAG	Yes, via JTAG	Yes, via JTAG
PCB with mounting holes	No	No	No	Yes

6.2 System Requirements

6.2.1 ETAS Hardware

Compact Hardware: ES510, ES600 (INCA)

Compact Hardware: ES910 (INCA, INTECRIO)

6.2.2 Ethernet Interface of the PC

A PC with a free Ethernet interface (1 GBit/s or 100 Mbit/s, Full Duplex) with an RJ-45 connection is required. Ethernet interfaces realized by an additional PCMCIA network card in the PC must have a 32-bit data bus (card bus).

Note

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

The manufacturers of the network cards have different names for this function.
Example: "Link down Power saving

6.2.3 Software and supported Microcontrollers

Note

The XETK-T2.1 is designed for ECU's with Infinion microcontrollers TC1792, TC1796, TC1796ED, TC1797 and TC1797ED.
The XETK-T2.1C and the XETK-T2.1D versions not supports the TC1796ED (416 pin socket) microcontroller.

Note

The system release test was done with TC1796 and TC1797ED microcontrollers.

You need following software versions to support the XETK-T2.1:

Micro-controller	HSP	INCA	ETK Drivers and Tools	XETK Configu-ration Tool	ASCET-RP	INTECRIO
TC1792	V7.1.1	V6.2.1	V2.1.1	V2.1.1	n.a.	V3.1.0
TC1796	V7.1.1	V6.2.1	V2.1.1	V2.1.1	n.a.	V3.1.0
TC1796ED	V7.1.1	V6.2.1	V2.1.1	V2.1.1	n.a.	V3.1.0
TC1797, TC1797ED	V7.1.1	V6.2.1	V2.1.1	V2.1.1	n.a.	V3.1.0

Operating the XETK-T2.1 with older software versions is not possible.

The configuration instructions for the XETK-T2.1 under INCA, ASCET-RP or INTECRIO are contained in the relevant software documentation.

6.3 Environmental Conditions

Item	Characteristics
Temperature range	- 40 °C to +110 °C - 40 °F to +230 °F

6.4 Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Permanent power supply (car battery)	U_{Batt}		4.3	12	18	V
Standby current	I_{STBY}	U_{Batt} = 12 V; ECU off; T = 20 °C	1	10	30	mA
Operating current	I_{Batt}	U_{Batt} = 12 V; ECU on; T = 20 °C	50	100	180	mA
Power dissipation	P_{Batt}	U_{Batt} = 12 V; ECU on; T = 20 °C		1.2		W

6.5 Memory and Configuration

Item	Characteristics
Emulation Memory	Two memory pages with 1024 kB data memory each
Measured Memory	Within the Emulation Memory, free configurable
Flash Memory	1024 kB Flash (data)
Configuration	Project-specific; stored in EEPROM for different microcontrollers and memory configurations
Update	Logic devices updated through software

6.6 XETK Ethernet Interface

Item	Characteristics
Connection	100 Mbit/s Ethernet, Full Duplex
	PC Card 32 bit
Protocol	XCP on UDP
IP address	Dynamic via INTECRIO or INCA
Cable length	max. 30 m / 100 ft
Ethernet interface	DC decoupling

Note

To ensure successful initialization of the network card of your PC, refer to chapter 6.2.2 on page 41.

6.7 Microcontroller Bus Interface

Parameter	Symbol	Condition	Min	Typ	Max	Unit
ECU Supply Voltage - Power Detect	U_{SVDD}	ECU on	1.12	1.22	1.32	V
		ECU off	0.92	1.02	1.12	V
Max. load	I_{DD}				0.1	mA
Max. load V_{DDEBU}	I_{DDEBU}				2	mA

6.8 Testcharacteristics

Parameter	Symbol	Condition	Min	Max	Unit
Reset delay 1	t_{Reset1}	U_{Batt} = 12 V U_{SVDD} = 0 V ↑ 1.5 V	18	41	ms
Reset delay 2	t_{Reset2}	U_{Batt} = 0 V ↑ 12 V	359	692	ms

Note

t_{Reset1}: delay of ECU reset through XETK without transferring the Flash (U_{Batt} present, U_{SVDD} will be switched on)
t_{Reset2}: max. delay of ECU reset through XETK (U_{Batt} and U_{SVDD} will be switched on)

6.9 Electrical Characteristics

6.9.1 XETK-T2.1 Signals

Signal	Condition	Pin Type	V_{OL} (max) [V]	V_{OH} (min) [V]	V_{OH} (max) [V]	V_{IL} (max) [V]	V_{IH} (min) [V]	V_{IH} (max) [V]	Leakage current [µA]	Additional Load by XETK (typ) [pF] [1)]
ADDR[1...0]		I	-	-	-	0.8	2	3.6	-10/+10	15
ADDR[19...2]		I	-	-	-	0.8	2	3.6	-30/+30	31
DATA[31..0]	XETK is not accessed	I	-	-	-	-	-	3.6	-1/+1	7
	XETK is accessed; I_{OH} = 4 mA; I_{OL} = 4 mA	I/O	0.4	2.2	2.9	0.8	2	3.6	-22/+22	40
/CS[3..0], /CSCOMB	Used by ECU	I	-	-	-	-	-	-	-	1
	Used for XETK	I	-	-	-	0.8	2	3.6	-300/ -360	30
RD_/WR; /BC[3..0]		I	-	-	-	0.8	2	3.6	-30/+30	28
/RD		I	-	-	-	0.8	2	3.6	-680/ -710	34

Signal	Condition	Pin Type	V_{OL} (max) [V]	V_{OH} (min) [V]	V_{OH} (max) [V]	V_{IL} (max) [V]	V_{IH} (min) [V]	V_{IH} (max) [V]	Leakage current [µA]	Additional Load by XETK (typ) [pF] [1)]
HWCFG96[3..0]	Without BDF option	-	-	-	-	-	-	-	-	4
	CPU side activ: I_{OH} = 4 mA; I_{OL} = 4 mA	O	0.45	2.4	3.3	-	-	-	-	20
	ECU side activ	I	-	-	-	-	-	3.6	-1/+1	10
	Inactiv	I	-	-	-	-	-	3.6	-12/+12	25
HWCFG97[7..6]	Without BDF option	-	-	-	-	-	-	-	-	5
	CPU side activ: I_{OH} = 4 mA; I_{OL} = 4 mA	O	0.45	2.4	3.3	-	-	-	-	25
	ECU side activ	I	-	-	-	-	-	3.6	-1/+1	10
	Inactiv	I	-	-	-	-	-	3.6	-12/+12	30
/PORESET	I_{Dmax} = 0.2A	I/OD	0.4	-	-	0.8	2	3.6	-20/+20	40
/HDRESET		I	-	-	-	0.8	2	3.6	-100/ -160	15
/BRKIN	I_{OH} = 4 mA; I_{OL} = 4 mA	O	-	2.3	3.3	-	-	-	+10/-10	15

Signal	Condition	Pin Type	V_{OL} (max) [V]	V_{OH} (min) [V]	V_{OH} (max) [V]	V_{IL} (max) [V]	V_{IH} (min) [V]	V_{IH} (max) [V]	Leakage current [µA]	Additional Load by XETK (typ) [pF][1)]
/BRKOUT		I	-	-	-	0.7	1.7	3.6	-340/ -230	15
TDI, /TRST	I_{OH} = 4 mA; I_{OL} = 4 mA	O	0.45	2.3	3.3	-	-	-	-345/ -225	20
TMS, TCK	I_{OH} = 4 mA; I_{OL} = 4 mA	O	0.45	2.3	3.3	-	-	-	+3300/ +2400	20
TDO		I	-	-	-	0.7	1.7	3.6	+15/-15	25

[1)] CPU and plug not considered; PCB 1 pF/cm

6.9.2 Debugger Connector Signals

Signal	Condition	Pin Type	V_{OL} (max) [V]	V_{OH} (min) [V]	V_{OH} (max) [V]	V_{IL} (max) [V]	V_{IH} (min) [V]	V_{IH} (max) [V]	Leakage current [µA]	Additional Load by XETK (typ) [pF] [1)]
DBG_VOUT	$I_{OH\ (max)}$ = 10 mA	O	0.45	2.3	3.3	-	-	-	-	-
DBG_TMS, DBG_TCK		I	-	-	-	0.7	1.7	3.6	+720/ +495	20
DBG_TDI		I	-	-	-	0.7	1.7	3.6	-345/ -225	25
/DBG_TRST		I	-	-	-	0.7	1.7	3.6	-720/ -495	25
DBG_TDO	$I_{OH\ (max)}$ = 4 mA	O	0.45	2.3	3.3	-	-	-	-345/ -225	25
/DBG_BRKIN		I	-	-	-	0.7	1.7	3.6	-340/ -230	15
/DBG_BRKOUT	$I_{OH\ (max)}$ = 4 mA	O	0.45	2.3	3.3	-	-	-	+10/ -10	15
/DBG_BREQ		I	-	-	-	0.7	1.7	3.6	-340/ -330	15

Signal	Condition	Pin Type	V_{OL} (max) [V]	V_{OH} (min) [V]	V_{OH} (max) [V]	V_{IL} (max) [V]	V_{IH} (min) [V]	V_{IH} (max) [V]	Leakage current [µA]	Additional Load by XETK (typ) [pF] [1]
/DBG_BGRANT	$I_{OH\ (max)}$ = 4 mA	O	0.45	2.3	3.3	-	-	-	-340/ -330	15
DBG_RSV0		I	-	-	-	0.7	1.7	3.6	-340/ -230	15
DBG_RSV1		I	-	-	-	0.7	1.7	3.6	+720/ +500	15

[1] CPU and plug not considered; PCB 1 pF/cm

6.10 Switching Characteristics

The following diagrams show the timings the XETK-T2.1 can process.

Para.	Description	Min	Max	Unit
t_1	Address access time		15	ns
t_2	Chip select access time		15	ns
t_3	Read access time		10	ns
t_4	Byte enable access time		10	ns
t_5	Data to Chip select hold time		8	ns
t_6	Data to Read hold time		8	ns
t_7	Data to Byte enable hold time		8	ns
t_{10}	Chip select setup to end of write	18		ns
t_{11}	Write pulse width	12		ns
t_{12}	Data setup to end of write	10		ns
t_{13}	Data hold from end of write	2		ns

Note

All timings are measured at a reference level of 1.5 V. Output signals are measured with 10 pF to ground and 50 Ω to 1.5 V.

6.10.1 Read Timing: Data Emulation and Measurement Data DPR

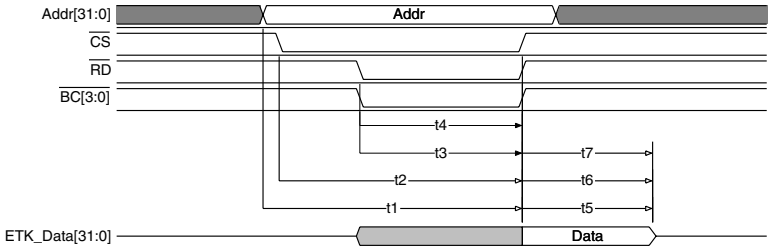

Fig. 6-1 Read Cyle: Data Emulation and Measurement Data DPR

6.10.2 Write Timing: Data Emulation and Measurement Data DPR

.

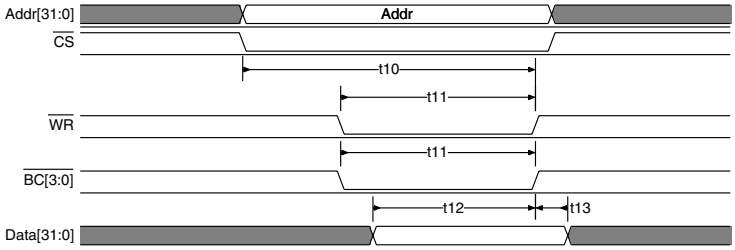

Fig. 6-2 Write Cycle: Data Emulation and Measurement Data DPR

6.11 Power Supply Connector CON2

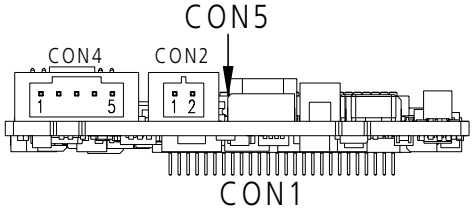

Fig. 6-3 Power Supply Connector CON2

Pin CON2	Signal	Description
1	U_{Batt1}	Battery supply voltage for XETK
2	GND	Ground

6.12 Pin Assignment XETK - Microcontroller - ECU

XETK-T2.1 Pin Name	TC1792 Pin Name	TC1796 Pin Name	TC1797 Pin Name	Microcontroller Pin Number	Description
ADDR[1..0]	A[1..0]	A[1..0]	A[23..22]	J25; J24	EBU Address Bus (not used by XETK-T2.1)
ADDR[19..2]	A[19..2]	A[19..2]	A[17..0]	P24; P26; N25; N24; N23; N26; L24; M24; M25; M26; K23; L26; L25; K24; J23; K26; K25; J26	EBU Address Bus
DATA[31..0]	D[31..0]	D[31..0]	D[31..0]	AD24; AE24; AE25; AC24; AD25;AE26; AC25;AD26; AC26;AA24; AB24; AB25; AA23; Y24; AA25; W24; AB26; Y25; V24; W25; AA26; Y26; U24; V25; W26; U23; U25;V26; T25; U26; T24; T26	EBU Data Bus Lines

XETK-T2.1 Pin Name	TC1792 Pin Name	TC1796 Pin Name	TC1797 Pin Name	Microcontroller Pin Number	Description
/CS[3..0]	/CS[3..0]	/CS[3..0]	/CS[3..0]	AD19; AD20; AD21; AE21	Chip Select
/CSCOMB	/CSCOMB	/CSCOMB	/CSCOMB	AE19	Combined Chip Select
RD_/WR	RD_/WR	RD_/WR	RD_/WR	AF21	Write Control Line
/BC[3..0]	/BC[3..0]	/BC[3..0]	/BC[3..0]	AE18; AF18; AD17; AE17	Byte Control Lines
/RD	/RD	/RD	/RD	AF20	Read Control Line
HWCFG96 [3..0]	HWCFG[3..0]	HWCFG[3..0]	P9.[12..9]	D21; C21; B21; A21	Hardware Configuration Pins TC1796
HWCFG97 [7..6]	P0.[7..6]	P0.[7..6]	HWCFG[7..6]	C8; B6	Hardware Configuration Pins TC1797
/PORESET	/PORST	/PORST	/PORST	B22	Power-on Reset
/HDRESET	/HDRST	/HDRST	/ESR0	A23	Hardware Reset
/BRKIN	/BRKIN	/BRKIN	/BRKIN	C26	OCDS Break Signal
/BRKOUT	/BRKOUT	/BRKOUT	/BRKOUT	D26	OCDS Break Signal
/TRST	/TRST	/TRST	/TRST	F23	JTAG Module Reset
TDI	TDI	TDI	TDI	E25	JTAG Module Signal
TMS	TMS	TMS	TMS	F24	JTAG Module Signal

XETK-T2.1 Pin Name	TC1792 Pin Name	TC1796 Pin Name	TC1797 Pin Name	Microcontroller Pin Number	Description
TCK	TCK	TCK	TCK	E24	JTAG Module Signal
TDO	TDO	TDO	TDO	D25	JTAG Module Signal
SVDD	VDD	VDD	VDD	B26; C25; D9; D16; D24; E23; H4; P23; R4; V23; AB23; AC11; AC20	Core Power Supply (1.5 V)

6.13 Mechanical Dimensions

The reference measure for all drawings is millimeter.

Dimensions	Millimeters	Inches
Thickness of PCB	1.70	0.067
Height of component (upper side)	5.36	0.211
Height of component (lower side)	2.00	0.079

6.13.1 XETK-T2.1A/ XETK-T2.1B/ XETK-T2.1C

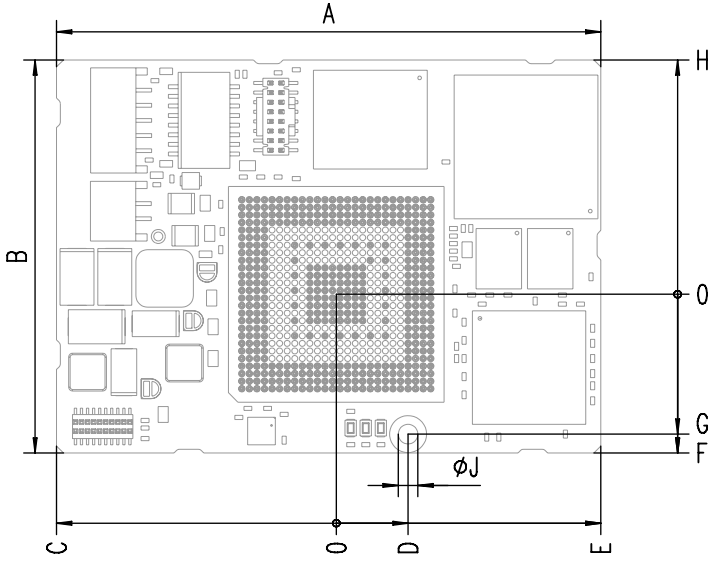

Fig. 6-4 Dimensions - Top View

Dim	Millimeters	Inches	Dim	Millimeters	Inches
A	72.00	2.835	F	21.00	0.827
B	52.00	2.047	G	18.50	0.728
C	37.00	1.457	H	31.00	1.220
D	9.50	0.374	J	2.70	0.106
E	35.00	1.378			

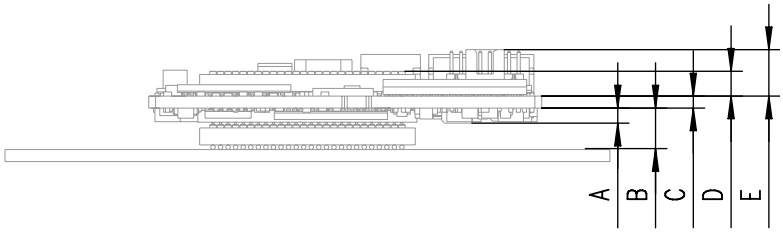

Fig. 6-5 Microcontroller with Socket Adapter mounted

For mounting the XETK on the ECU, and for mounting the microcontroller on the XETK, the Advanced Interconnect Socket is required (see ordering information).

Dim	Millimeters	Inches
A	2.00	0.079
B	5.36	0.211
C	1.70	0.067
D	3.28	0.129
E	6.12	0.241

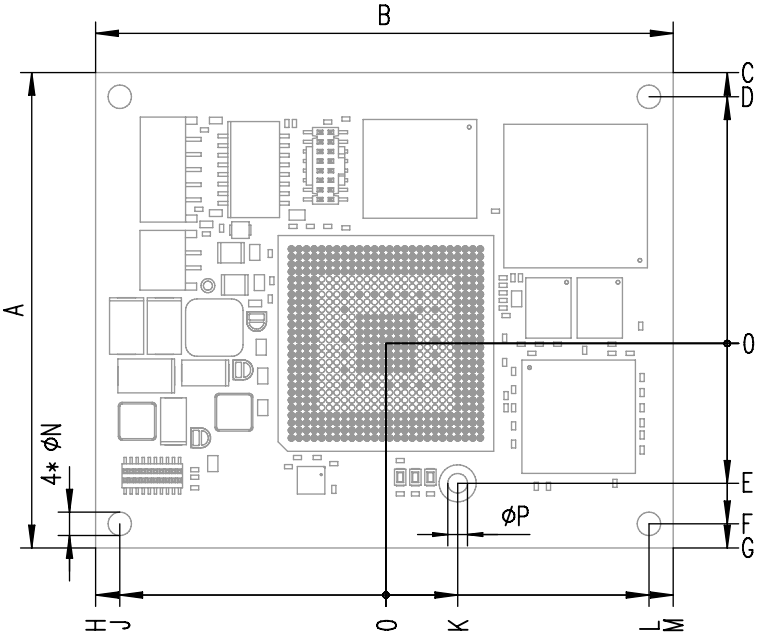

Fig. 6-6 Dimensions - Top View

Dim	Millimeters	Inches	Dim	Millimeters	Inches
A	62.90	2.476	H	38.40	1.512
B	76.40	3.008	J	35.20	1.386
C	35.84	1.411	K	9.5	0.374
D	32.64	1.285	L	34.80	1.370
E	18.50	0.728	M	38.00	1.496
F	23.86	0.939	N	3.20	0.126
G	27.06	1.065	P	2.70	0.106

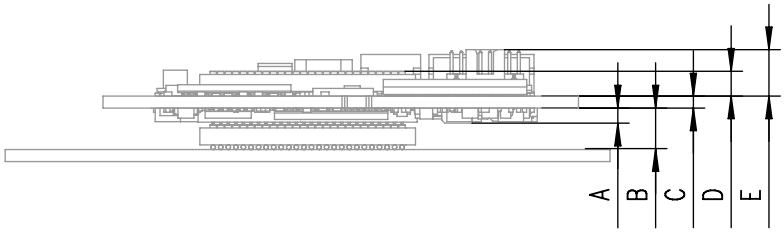

Fig. 6-7 Microcontroller with Socket Adapter mounted

For mounting the XETK on the ECU, and for mounting the microcontroller on the XETK, the Advanced Interconnect Socket is required (see ordering information).

Dim	Millimeters	Inches
A	2.00	0.079
B	5.36	0.211
C	1.70	0.067
D	3.28	0.129
E	6.12	0.241

7 Cables and Accessories

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

7.1 ECU Adapter Cable

7.1.1 CBAM230.1 Adapter Cable

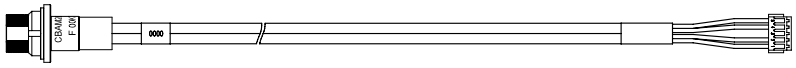

Fig. 7-1 CBAM230.1 Adapter Cable

XETK ECU adapter cable, suitable for ECU flush mounting (M12), 0m38 length, shield connected to socket. Usable for ECUs with shielded housing.

Order Name	Short Name	Order Number
XETK ECU Adapter Cable, 100 Mbit/s, Shield on ECU-Housing, Lemo 1B HME - JST PHE (10fc-5fc), 0m38	CBAM230.1-0m38	F 00K 105 791

7.1.2 CBAM240.1 Adapter Cable

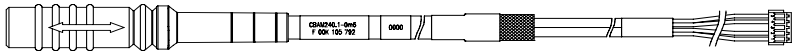

Fig. 7-2 CBAM240.1 Adapter Cable

XETK ECU adapter cable, shield connected to ECU-housing (lead-through diameter for cable: 10 mm), 0.6 m length, shield bare for cable gland, isolated to the XETK. Usable for ECUs with shielded housing.

Order Name	Short Name	Order Number
XETK ECU Adapter Cable, 100 MBit/s, Lemo 1B HME - JST PHE (10fc-5fc), 0m6	CBAM240.1-0m6	F 00K 105 792

7.2 PC Interface Cable

7.2.1 CBE200-x Cable

Fig. 7-3 CBE200-x Cable

Order Name	Short Name	Order Number
Ethernet PC Connection Cable 1GBit/s, Lemo 1B FGE - RJ45 (10mc-8mc), 3 m	CBE200-3	F 00K 104 373

7.2.2 CBAE200.2 Adapter Cable

Fig. 7-4 CBAE200.2 Adapter Cable

PC interface adapter cable to connect the CBE200-x cable to the PC. The CBAE200.2-1m20 adapter cable supports Gigabit Ethernet.

Order Name	Short Name	Order Number
Ethernet Connection Adapter Cable 1 GBit/s, Lemo 1B PHE - RJ45 (10fc- 8mc), 1m2	CBAE200-1m2	F 00K 105 760

7.3 ETAS Module Interface Cable

7.3.1 CBE230.1 Cable

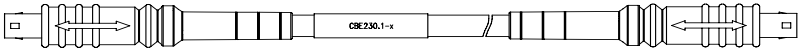

Fig. 7-5 CBE230.1 Cable

Gigabit Ethernet connection cable for ETAS modules. IP67 rated Lemo connectors on both sides. Gigabit Ethernet cable with power supply.

Order Name	Short Name	Order Number
Ethernet Connection Cable 1 GBit/s, Lemo 1B FGE - Lemo 1B FGE (10mc- 10mc), 3 m	CBE230.1-3	F 00K 105 757
Ethernet Connection Cable 1 GBit/s, Lemo 1B FGE - Lemo 1B FGE (10mc- 10mc), 8 m	CBE230.1-8	F 00K 105 758

7.3.2 CBAE330.2 Adapter Cable

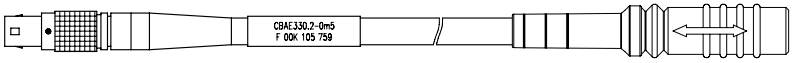

Fig. 7-6 CBAE330.2 Adapter Cable

Adapter cable Gigabit to 100 MBit/s Ethernet between CBE230 and ES600.

Order Name	Short Name	Order Number
Ethernet Connection Adapter Cable 1 GBit/s to 100 MBit/s, Lemo 1B PHE - Lemo 1B FGF (10fc-8mc), 0m5	CBAE330.2-0m5	F 00K 105 759

7.4 Power Supply Cables

7.4.1 Cable ETV

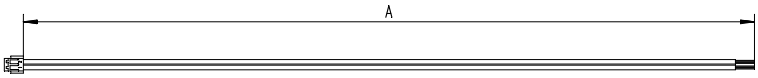

Fig. 7-7 Power Supply Cable ETV

Dim	Millimeters	Inches
A	190.00	7.480

Order Name	Short Name	Order Number
ETK Power Supply Cable, JST PHR - open wires (2fc-2c) 0m19	ETV	Y 261 A24 446

7.4.2 Cable K70

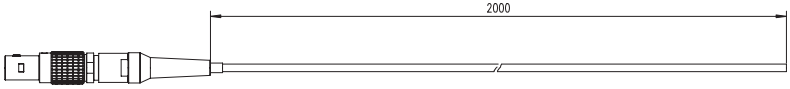

Fig. 7-8 Power Supply Cable K70

Dim	Millimeters	Inches
A	2000	78.74

Order Name	Short Name	Order Number
External Power Supply Cable for ETKs, Lemo 0B FGG # open wires (2fc-1c), 2 m	K70	Y 261 A24 942

7.4.3 Cable KA50

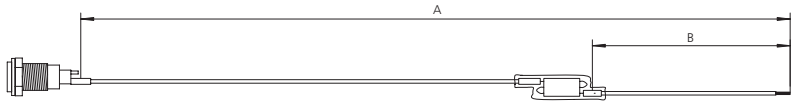

Fig. 7-9 Power Supply Cable KA50

Dim	Millimeters	Inches
A	200	7.87
B	50	1.97

Order Name	Short Name	Order Number
ETK Power Supply Cable for External Supply, with Filter Coil, Lemo 0B EGG # open wire (2fc-1c), 0m2	KA50	F 00K 000 940

7.4.4 Cable CBM200

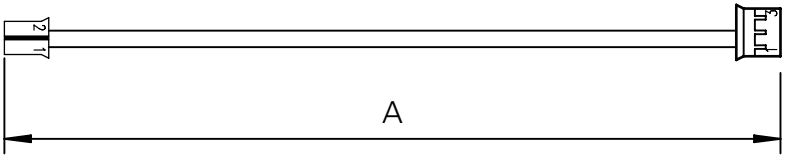

Fig. 7-10 Power Supply Cable CBM200

Dim	Millimeters	Inches
A	100	3.94

Order Name	Short Name	Order Number
Cable JST PHR - JST PHR (2fc-3fc), 0m1	CBM200-0m1	F 00K 900 052

7.5 Debug Adapter

7.5.1 Debug Adapter ETAF5

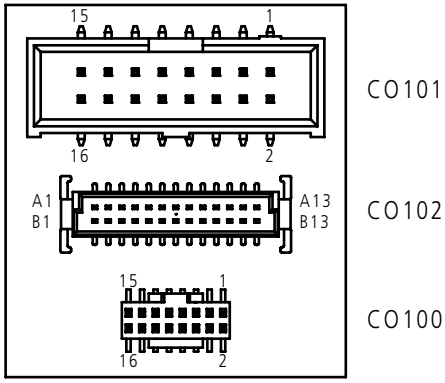

Fig. 7-11 ETAF5 PCB - Component Placement

Connector	Description
C0100	To ETK Debug Connector
C0101	To Debugger
C0102	To ECU

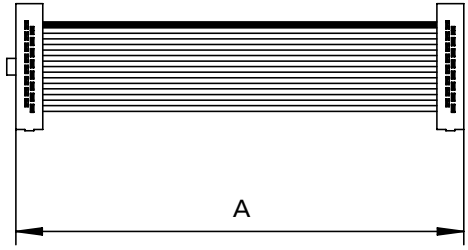

Fig. 7-12 ETAF5 Flatcable

Dim	Millimeters	Inches
A	50.80	2.00

7.5.2 Debug Adapter ETAF9

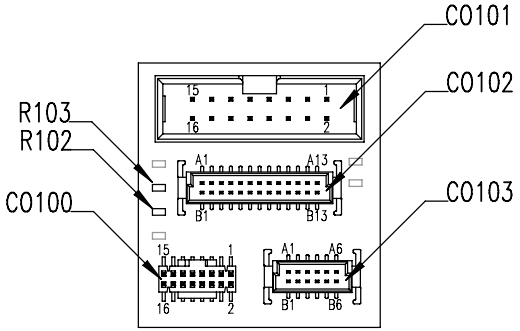

Fig. 7-13 ETAF9 Component Placement

Connector	Description
C0100	To ETK Debug Connector
C0101	To Debugger
C0102	To ECU
C0103	To ECU

Resistor	Description
R102	Configuration for /WDGIS
R103	Configuration for GND

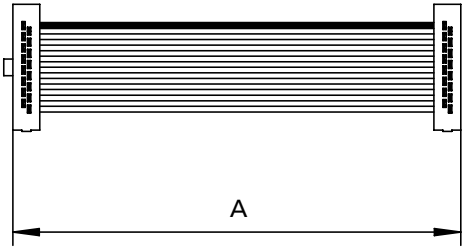

Fig. 7-14 ETAF9 Flatcable

Dim	Millimeters	Inches
A	50.80	2.00

8 Ordering Information

8.1 XETK-T2.1

Type	Order-No.	Note
XETK-T2.1A	F-00K-106-348	XETK-T2.1A emulator probe for ECUs with Infineon microcontroller TC179x with 1 MByte emulation RAM and a 441 pin ECU adapter, with limited BDF support
XETK-T2.1B	F-00K-106-349	XETK-T2.1B emulator probe for ECUs with Infineon microcontroller TC179x with 1 MByte emulation RAM and a 441 pin ECU adapter, with BDF support via HWCFG
XETK-T2.1C	F-00K-106-350	XETK-T2.1C emulator probe for ECUs with Infineon microcontroller TC179x with 1 MByte emulation RAM and a 416 pin ECU adapter, with BDF support via HWCFG
XETK-T2.1D	F-00K-107-026	XETK-T2.1D emulator probe for ECUs with Infineon microcontroller TC179x with 1 MByte emulation RAM and a 416 pin ECU-adapter, with BDR support via JTAG and additional holes for mounting inside the ECU housing

8.2 ETK/ECU Sockets and Adapters

Sockets are available from local Advanced Interconnect distributors.

8.2.1 BGA Adapter XETK - Microcontroller

Adapter Type	Pb-Sn and RoHS
441 Pin Outline 29mm SQ.	3FHA441-715G
441 Pin Outline 31mm SQ.	3FHAX441-715G
416 Pin Outline 29mm SQ.	5FHA416-715G
416 Pin Outline 31mm SQ.	5FHAX416-715G

8.2.2 Socket ECU - XETK

Socket Type	Pb-Sn	RoHS
441 Pin Outline 29 mm SQ.	3FHSB441-716GG	3FHSB441-816GG
441 Pin Outline 27 mm SQ.	3FHS441-716GG	3FHS441-816GG
416 Pin Outline 29 mm SQ.	5FHSB416-716GG	5FHSB416-816GG
416 Pin Outline 27 mm SQ.	5FHS416-716GG	5FHS416-816GG

8.3 Debug Adapter

Order Name	Short Name	Order Number
Debug Adapter from Infineon OCDS1-Plug to ETK (ETAF5 PCB and ETAF5 Flat Cable)	ETAF5	F00K 104 220
Debug Adapter from Infineon OCDS1-Plug to ETK (ETAF9 PCB and ETAF9 Flat Cable)	ETAF9	F00K 105 897

8.4 Power Supply

Order Name	Short Name	Order Number
ETK power supply for 6 - 36 V DC input	ETP1	F 00K 000 624
Power Supply Interface for ETK	ETP2	F 00K 104 010

8.5 Cables

Note

The cables showed in chapter "Cables and Accessories" on page 59 are not included in the XETK-T2.1 delivery.

Note

The screws for mounting ECU adapter cables are not included in the cable delivery. They need to be ordered separately.

Note

Custom cables can be produced according to your specifications. For more information on custom cables, please contact your local ETAS sales representative.

8.5.1 ECU Adapter Cables

Order Name	Short Name	Order Number
XETK ECU Adapter Cable, 100 Mbit/s, Shield on ECU-Housing, Lemo 1B HME - JST PHE (10fc-5fc), 0m38	CBAM230.1-0m38	F 00K 105 791
XETK ECU Adapter cable, 100 MBit/s, Lemo 1B HME - JST PHE (10fc-5fc), 0m6	CBAM240.1-0m6	F 00K 105 792

8.5.2 Ethernet Cables

PC Interface Cables

Order Name	Short Name	Order Number
Ethernet PC Connection Cable 1GBit/s, Lemo 1B FGE - RJ45 (10mc-8mc), 3 m	CBE200-3	F 00K 104 373

PC Interface Adapter Cable

Order Name	Short Name	Order Number
Ethernet Connection Adapter Cable 1 GBit/s, Lemo 1B PHE - RJ45 (10fc- 8mc), 1m2	CBAE200-1m2	F 00K 105 760

ES600 / ES910 Interface Cable

Order Name	Short Name	Order Number
Ethernet Connection Cable 1 GBit/s, Lemo 1B FGE - Lemo 1B FGE (10mc- 10mc), 3 m	CBE230.1-3	F 00K 105 757
Ethernet Connection Cable 1 GBit/s, Lemo 1B FGE - Lemo 1B FGE (10mc- 10mc), 8 m	CBE230.1-8	F 00K 105 758

ES600 Interface Adapter Cable

Order Name	Short Name	Order Number
Ethernet Connection Adapter Cable 1 GBit/s to 100 MBit/s, Lemo 1B PHE - Lemo 1B FGF (10fc-8mc), 0m5	CBAE330.2-0m5	F 00K 105 759

8.5.3 Power Supply Cables

Order Name	Short Name	Order Number
Cable JST PHR - JST PHR (2fc-3fc), 0m1	CBM200-0m1	F 00K 900 052
ETK Power Supply Cable, JST PHR - open wires (2fc-2c) 0m19	ETV	Y 261 A24 446
External Power Supply Cable for ETKs, Lemo 0B FGG # open wires (2fc-1c), 2 m	K70	Y 261 A24 942
ETK Power Supply Cable for External Supply, with Filter Coil, Lemo 0B EGG # open wire (2fc-1c), 0m2	KA50	F 00K 000 940

9 ETAS Contact Addresses

ETAS HQ

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70469 Stuttgart	Fax:	+49 711 89661-106
Germany	WWW:	www.etas.com

ETAS Subsidiaries and Technical Support

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

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

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