

ETAS XETK-S30.0

Emulator Probe for Infineon AURIX
MCU Family



User Guide

Copyright

The data in this document may not be altered or amended without special notification from ETAS GmbH. ETAS GmbH undertakes no further obligation in relation to this document. The software described in it can only be used if the customer is in possession of a general license agreement or single license. Using and copying is only allowed in concurrence with the specifications stipulated in the contract.

Under no circumstances may any part of this document be copied, reproduced, transmitted, stored in a retrieval system or translated into another language without the express written permission of ETAS GmbH.

© Copyright 2024 ETAS GmbH, Stuttgart

The names and designations used in this document are trademarks or brands belonging to the respective owners.

XETK-S30.0 | User Guide R16 EN - 03.2024

Contents

1	Safety Information.....	7
1.1	Intended Use.....	8
1.2	Classification of Safety Messages.....	8
1.3	Safety Information.....	9
1.3.1	Assembly.....	9
1.3.2	Operation.....	9
1.3.3	Electrical Connection.....	9
1.3.4	Cables and Accessories.....	10
1.3.5	Transport.....	11
1.3.6	Maintenance.....	11
1.4	Identifications on the Product.....	11
1.5	Taking the Product Back and Recycling.....	12
1.6	Declaration of Conformity.....	12
1.6.1	CE Declaration of Conformity (European Union).....	12
1.6.2	UKCA Declaration of Conformity (Great Britain).....	12
1.7	RoHS Conformity.....	12
1.7.1	European Union.....	12
1.7.2	People's Republic of China.....	13
1.8	Declarable Substances.....	13
1.9	Use of Open Source Software.....	13
2	Introduction.....	14
2.1	Applications.....	14
2.2	Features.....	15
3	Hardware Description.....	16
3.1	Architecture.....	16
3.2	ECU Interface.....	18
3.3	XETK Ethernet Interface.....	19
3.4	Power Supply.....	20
3.5	ECU Voltage Supervisor.....	21
3.6	Data Emulation and Data Measurement.....	22
3.6.1	Page Switching.....	22
3.7	DAP Interface.....	24
3.8	Trigger Modes: Overview.....	25
3.9	Pinless Triggering.....	25
3.9.1	Startup Handshake.....	25
3.9.2	XETK Trigger Generation.....	25
3.10	Timer Triggering.....	26
3.11	Reset.....	26
3.12	Pull CalWakeUp until Startup Handshake.....	26
4	Installation.....	27
4.1	Connection to the ECU.....	27

4.2	Wiring	29
4.2.1	XETK Ethernet Interface	29
4.2.2	Power Supply	30
5	XETK Configuration	32
5.1	Overview	32
5.2	Configuration Parameter	33
6	Troubleshooting	34
6.1	Problems and Solutions	34
6.1.1	No communication between the ECU and ETK	34
7	Technical Data	35
7.1	System Requirements	35
7.1.1	ETAS Compatible Hardware	35
7.1.2	PC with one Ethernet Interface	35
7.1.3	Software Support	36
7.2	Data Emulation and Measurement Memory	37
7.2.1	Data Emulation Memory and Microcontroller Support	37
7.2.2	Measurement Data Memory	37
7.3	Configuration	37
7.4	XETK Ethernet Interface	38
7.5	Environmental Conditions	38
7.6	Power Supply	39
7.7	Microcontroller Interface	40
7.8	Test Characteristics	40
7.9	DAP Timing Characteristics	41
7.9.1	DAP Timing Diagram	41
7.9.2	DAP Timing Diagram DAP Timing Parameter	41
7.10	Electrical Characteristics	42
7.10.1	ECU Interface Connector	42
7.11	Pin Assignment	43
7.11.1	XETK-S30.0 Interface Location	43
7.11.2	XETK Ethernet Interface Connector CON1	43
7.11.3	ECU Interface Connector CON2	44
7.11.4	VDDSTBY_SENSE Connector CON3	44
7.11.5	Power Supply Connector CON4	45
7.12	Mechanical Dimensions	46
7.12.1	Top View	46
7.12.2	Side View	47
8	Cables and Accessories	48
8.1	Overview and Classification	48
8.2	Requirements for failsafe Operation	48
8.3	CBAM230 Cable	49
8.3.1	Usage	49
8.3.2	Mechanical Dimensions	49
8.3.3	Panel Cut-Out	49
8.3.4	Assembling	49

8.3.5	Temperature Range	50
8.3.6	Ordering Information.....	50
8.4	CBAM240 Cable	51
8.4.1	Usage	51
8.4.2	Mechanical Dimensions.....	51
8.4.3	Mounting Proposal with an EMC safe Cable Gland	51
8.4.4	Temperature Range	52
8.4.5	Ordering Information.....	52
8.5	CBAM271 Cable	53
8.5.1	Usage	53
8.5.2	Mechanical Dimensions.....	53
8.5.3	Mounting	53
8.5.4	Temperature Range	53
8.5.5	Ordering Information.....	53
8.6	ETAM2 ECU Adapter	54
8.6.1	Pin Assignment	54
8.6.2	ECU Signals.....	54
8.6.3	Ordering Information.....	54
8.7	ETAM3 ECU Adapter	55
8.7.1	Usage	55
8.7.2	Mechanical Dimensions.....	55
8.7.3	Pin Assignment	55
8.7.4	ECU Signals.....	56
8.7.5	Temperature Range	56
8.7.6	Ordering Information.....	56
8.8	ETAM5 ECU Adapter	57
8.8.1	Usage	57
8.8.2	Mechanical Dimensions.....	57
8.8.3	Connectors and Positions	57
8.8.4	ECU Signals.....	58
8.8.5	Temperature Range	58
8.8.6	Ordering Information.....	58
8.9	ETAM9 ECU Adapter	59
8.9.1	Usage	59
8.9.2	ECU Signals.....	59
8.9.3	Temperature Range	59
8.9.4	Ordering Information.....	59
8.10	ETAM10 ECU Adapter	60
8.10.1	Usage	60
8.10.2	Mechanical Dimensions.....	60
8.10.3	ECU Signals.....	60
8.10.4	Temperature Range	61
8.10.5	Ordering Information.....	61
8.11	ETAM12 ECU Adapter	62
8.11.1	Usage	62
8.11.2	Mechanical Dimensions.....	62
8.11.3	ECU Signals.....	62
8.11.4	Temperature Range	63
8.11.5	Ordering Information.....	63
8.12	CBE200 Cable	64
8.12.1	Usage	64
8.12.2	Ordering Information.....	64

8.13	CBAE200 Cable	65
8.13.1	Usage	65
8.13.2	Mechanical Dimensions.....	65
8.13.3	Tightness.....	65
8.13.4	Temperature Range	65
8.13.5	Ordering Information.....	65
8.14	CBE230 Cable	66
8.14.1	Usage	66
8.14.2	Mechanical Dimensions.....	66
8.14.3	Tightness.....	66
8.14.4	Temperature Range	66
8.14.5	Ordering Information.....	66
8.15	CBAE330 Cable	67
8.15.1	Usage	67
8.15.2	Mechanical Dimensions.....	67
8.15.3	Temperature Range	67
8.15.4	Ordering Information.....	67
8.16	CBAM270 Cable	68
8.16.1	Usage	68
8.16.2	Mechanical Dimensions.....	68
8.16.3	Mounting	69
8.16.4	Wiring.....	69
8.16.5	Temperature Range	70
8.16.6	Ordering Information.....	70
8.17	K70.1 Cable	71
8.17.1	Usage	71
8.17.2	Mechanical Dimensions.....	71
8.17.3	Wiring.....	72
8.17.4	Temperature Range	72
8.17.5	Ordering Information.....	72
8.18	KA50 Cable	73
8.18.1	Usage	73
8.18.2	Mechanical Dimensions.....	73
8.18.3	Wiring.....	73
8.18.4	Ordering Information.....	74
9	Ordering Information	75
9.1	XETK-S30.0.....	75
9.2	Cables and Adapter	75
9.3	XETK - ECU Adapter	75
9.3.1	ECU Adapter Cables	76
9.3.2	Combined ECU Adapter and Power Supply Cables	76
9.3.3	Ethernet Cables	76
9.3.4	Power Supply Cables	77
9.4	Power Supply	77
10	Contact Information	78
	Figures	79
	Index	81

1 Safety Information

This chapter contains information about the following topics:

- Intended Use 8
- Classification of Safety Messages 8
- Safety Information 9
- Identifications on the Product 11
- Taking the Product Back and Recycling 12
- Declaration of Conformity 12
- RoHS Conformity 12
- Declarable Substances 13
- Use of Open Source Software 13

Refer to the following safety instructions and the technical documentation available to download from the ETAS website www.etas.com. Keep the information provided in a safe place.

Failure to comply with the safety instructions may lead to the risk of damage to life and limb or property. The ETAS Group and its representatives shall not be liable for any damage or injury caused by improper operation or use of the product.

Only use the product if you have read and understood the information concerning safe operation and have the required qualifications and training for this product. If you have questions about safe operation, contact ETAS:

- Technical Support: www.etas.com/hotlines
- ETAS contact partners by region: 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 (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).

1.1 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 ECUs.

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.

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.

1.2 Classification of Safety Messages

The safety messages used here 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 property.

1.3 Safety Information

1.3.1 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.

Installation Location

NOTICE

Damage to the electronics due to potential equalization

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

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

1.3.2 Operation

Only operate the product with the latest 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.

1.3.3 Electrical Connection

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 Data" on page 35).
- The power supply for the product must be safely disconnected from the mains power. For example, use a car battery or a suitable lab power supply.
- Only use lab power supplies with dual protection for the supply network (with double/reinforced insulation (DI/RI)).
- The power supply must be suitable for use according to the ambient conditions for the product.

- It is possible to discharge the vehicle battery in regular operation and long standby operation.
- Central load-dump protection is required for operation.

Connection to the power supply



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

1. Disconnect the product from the power supply in one of the following ways:
 - Switch off the laboratory power supply for the test setup.
 - Disconnect the test setup's connection to the vehicle battery.
 - Remove the power cord.
2. Remove all cables from the product.

1.3.4 Cables and Accessories

Cables

- Only use ETAS cables, cables recommended by ETAS or other cables certified for the application.
- Route the cables such that they are protected against abrasion, damage, deformation and kinking.
- Do not place any objects on the cables.
- Do not use any damaged cables.
- The connector and connection must not be dirty.
- The connector and connection must be compatible.
- Correctly align the connector with the connection.
- Do not connect the connector and connection by force.

Accessories

Use ETAS accessories, accessories recommended by ETAS or other accessories certified for the application. For detailed information about accessories, see "Cables and Accessories" on page 48.

1.3.5 Transport

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

1.3.6 Maintenance







The product is maintenance-free.

Cleaning

- Only clean the product when it is de-energized.
- Make sure that no moisture enters the product.
- Carefully vacuum off dust particles and loose foreign bodies.

1.4 Identifications on the Product

The following symbols are used for identifications of the product:

Symbol	Description
	The User Guide must be read prior to the startup of the product!
	Symbol for WEEE, see chapter 1.5 on page 12
	Symbol for CE conformity, see chapter 1.6.1 on page 12
	UKCA conformity symbol (Great Britain), see chapter 1.6.2 on page 12)
	Symbol for China RoHS, see chapter 1.7.2 on page 13
	Symbol for electrostatic sensitive components
XETK-S14.0A	Product designation (example)
F 00K 110 722	Order number of the product (example)
SN: yyxxxxx	Serial number (7-digit)
XXXX/YY	Product version
ZZZZ	Year of manufacture
ETAS GmbH,...	Manufacturer's address



NOTE

For symbols and product information one or several adhesive labels can be used.

1.5 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. 1-1 WEEE-Symbol

The WEEE symbol (see Fig. 1-1 on page 12) 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.

1.6 Declaration of Conformity

1.6.1 CE Declaration of Conformity (European Union)

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

1.6.2 UKCA Declaration of Conformity (Great Britain)

With the UKCA mark attached to the product or its packaging, ETAS confirms that the product corresponds to the product-specific, applicable standards and directives of Great Britain. The UKCA declaration of conformity for the product is available on request.

1.7 RoHS Conformity

1.7.1 European Union

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

This product does not contain any of the restricted substances specified in the EU Directive 2011/65/EU or exceeds the maximum concentrations stipulated therein. For individual electronic components used in our products, there are currently no equivalent alternative substances, which is why we make use of the exceptions 7A and 7C-I in Annex III of this Directive.

ETAS confirms that the product corresponds to this directive which is applicable in the European Union.

1.7.2 People's Republic of China

ETAS confirms that the product meets the product-specific applicable guidelines of the China RoHS (Management Methods for Controlling Pollution. Caused by Electronic Information Products Regulation) applicable in China with the China RoHS marking affixed to the product or its packaging.

1.8 Declarable Substances

European Union

Some products from ETAS GmbH (e.g. modules, boards, cables) use components with substances that are subject to declaration in accordance with the REACH regulation (EU) no.1907/2006.

Detailed information is located in the ETAS download center in the customer information "REACH Declaration" (www.etas.com/Reach). This information is continuously being updated.

1.9 Use of Open Source Software

The product uses Open Source Software (OSS). This software is installed in the product at the time of delivery and does not have to be installed or updated by the user. Reference shall be made to the use of the software in order to fulfill OSS licensing terms. Additional information is available in the document "OSS Attributions List" at the ETAS website (www.etas.com).

2 Introduction

This chapter contains information about the following topics:

- Applications 14
- Features 15

2.1 Applications

The XETK-S30.0 Interface Board is an emulator test probe (ETK) for the Infineon AURIX microcontroller family. It is a typical serial XETK.



NOTE

For supported Infineon AURIX microcontrollers, refer to chapter 7.1.3 on page 36.

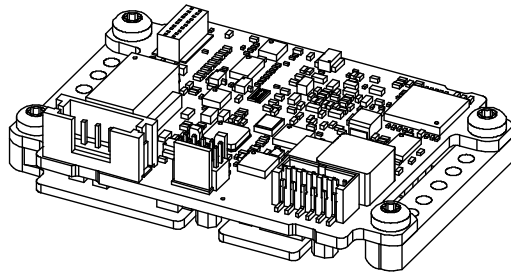


Fig. 2-1 XETK-S30.0

	XETK-S30.0
XETK ECU interface connector	10 pin SAMTEC
XETK power supply connector	6 pin MOLEX
Power supply for ED devices (VDDS-BRAM)	min. 1.25 V
SBRAM sense	Yes, on board or external sense
Pinless triggering	Yes
Timer triggering	Yes

The XETK-S30.0 supports the standard full duplex 100Base-T Ethernet interface and can be connected directly or via ES59x/ES600/ES8xx modules to the PC. No additional ETAS modules are required for the access to the ECU. The XETK-S30.0 can be used for rapid prototyping applications (bypass) as well as for measurement and calibration applications. In addition it is possible to use the XETK-S30.0 as an debugger interface.

2.2 Features

- Measurement interface:
 - DAP1 mode (2-pin DAP) useable only
 - 3.3 V DAP output levels, 5.0 V tolerant DAP input
 - Configurable DAP interface clock speed: 50 MHz, 100 MHz
 - Pinless startup protocol for XETK recognition and data acquisition triggering
- Calibration:
 - Microcontroller capability of internal Flash emulation can be used
 - 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
- Fast Ethernet Interface:
 - Direct connection to PC
 - Open XCP on Ethernet Protocol
 - Supports a variety of standard applications
- “ETK Drivers and 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
- Mounting possibilities inside or on top of ECU
- Temperature range suitable for automotive application

For more technical data on the XETK-S30.0 consult the chapter “Technical Data” on page 35.

3 Hardware Description

This chapter contains information about the following topics:

- Architecture 16
- ECU Interface 18
- XETK Ethernet Interface 19
- Power Supply 20
- ECU Voltage Supervisor 21
- Data Emulation and Data Measurement 22
- DAP Interface 24
- Trigger Modes: Overview 25
- Pinless Triggering 25
- Timer Triggering 26
- Reset 26
- Pull CalWakeUp until Startup Handshake 26

3.1 Architecture

Fig. 3-1 shows the block diagram of the XETK-S30.0.

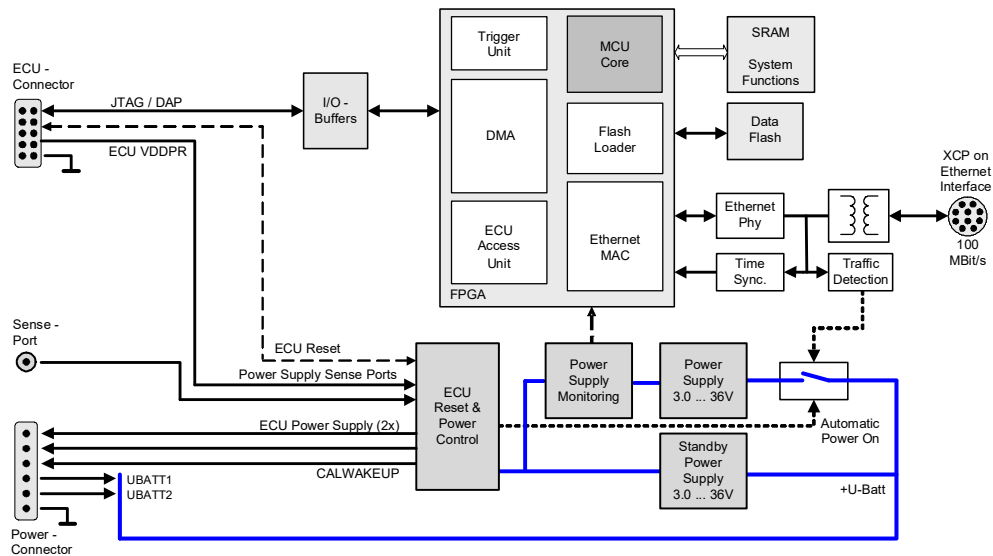


Fig. 3-1 XETK-S30.0 Architecture

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 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 provide data to the calibration and development system by buffering the data (DISTAB13 or DISTAB17) and triggering the XETK to read the data via DAP. The XETK then reads, buffers, processes and sends this measured data to the PC.

If no additional measurement data memory is available, the XETK-S30.0 can alternatively read the data to be measured directly from the microcontroller's memory. This process is Triggered Direct Measurement (TDM) with DISTAB13 or DISTAB17. The 100 Mbit/s XETK Ethernet interface provides communication with the PC.

ETK Connector	Description
CON1	XETK Ethernet interface (ETAS module or PC)
CON2	ECU Interface
CON3	ECU EDRAM Sense port
CON4	Power supply

3.2 ECU Interface

The XETK-S30.0 is connected via connectors CON2 and CON4 to the ECU with two adapter cables (refer to Fig. 3-2 on page 18). 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 (refer to chapter 3.4 on page 20)
- 1 Reset line which allows the XETK to control the system reset of the ECU
- 1 Reset line which allows the XETK to monitor the system reset of the ECU
- 5 Debug line interfaces for the communication between the XETK-S30.0 and the microcontroller
- 2 ground lines for proper shielding of the ECU interface lines

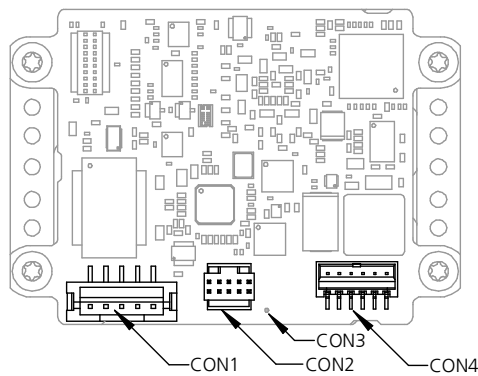


Fig. 3-2 Location of the ECU Interfaces CON2 and CON4

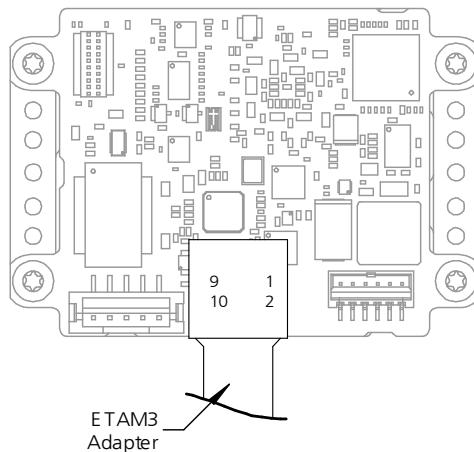


Fig. 3-3 ETAM3 Adapter mounted at the ECU Interface CON2

3.3 XETK Ethernet Interface

The XETK Ethernet interface can be directly connected to the PC via CON1 (refer to Fig. 3-4). No additional ETAS module is required for the access to the ECU.

The interface is a standard full duplex 100Base-TX Ethernet interface using the XCP protocol. 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 for connecting to the XETK-S30.0 with third party application software.



NOTE

The XETK Ethernet interface is not compatible with the ETK interfaces in modules like e.g. ES910, ES590, ES591, ES592, ES593-D, ES595, ES1232-A. The XETK Ethernet interface is compatible with the ECU interface of the ES910 module and the Ethernet interfaces of the ES51x/ ES592/ ES593-D/ ES595/ ES600 modules.



NOTE

Please see chapter 7.1.2 on page 35 for additional information regarding PC requirements for the Ethernet interface.

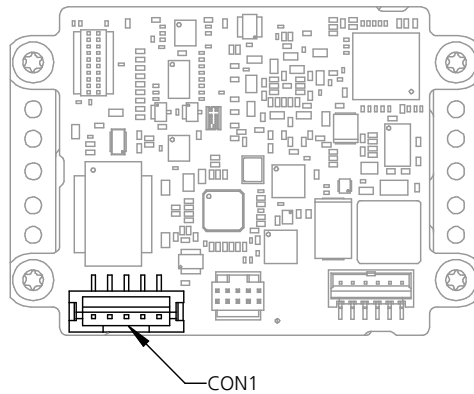


Fig. 3-4 Location of the XETK Ethernet Interface connector (CON1)

3.4 Power Supply

The XETK-S30.0 requires a permanent power supply. It is typically powered directly from the car battery. The input voltage may vary between 4.3 V and 36 V. In case of higher input voltages to the XETK, additional voltage protection is required. The XETK-S30.0 will also accept voltage dips down to 3 V, for a maximum duration of 15 ms (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 XETK-S30.0. The power supply of the ECU is not affected by the XETK-S30.0. An automatic switch ensures that the power supply of the XETK-S30.0 is automatically switched on and off when the XETK enters and leaves its standby (sleep) mode.

The XETK-S30.0 is supplied with power through the connector CON4.

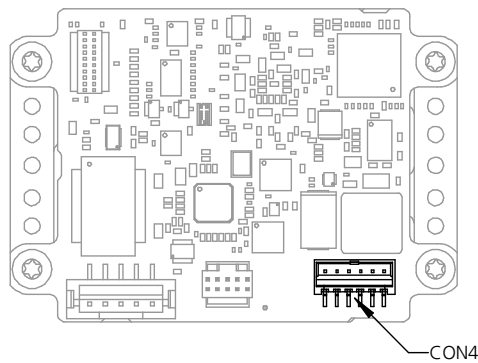


Fig. 3-5 Location of the XETK-S30.0 Power Supply Connectors

3.5 ECU Voltage Supervisor

The ECU voltage (VDDP) is monitored by the XETK to recognize whether the ECU is switched on or off. Additionally the ECU RAM standby voltage (VDDSB RAM) is monitored to determine if the standby RAM content is still valid. These two signals are only used for monitoring therefore the load current is negligible.



NOTE

The XETK-S30.0 only allows switching between reference page and working page if there is a valid voltage at the sense pin and the working page has been initialized by the calibration and development system.

The XETK-S30.0 provides two possibilities to supply and supervise the ECU RAM standby voltage:

- The XETK-S30.0 monitors the VDDSB RAM supply on board the XETK. The microcontroller's standby power supply pin must be connected to the XETK pin VDDSB RAM.
- At the through-hole solder pad CON3 the XETK-S30.0 can additionally monitor the VDDSB RAMsense voltage if it is provided by the ECU. The microcontroller's standby power supply pin must be connected to the XETK pin VDDSB RAMsense. The microcontroller's standby power supply may be provided by the ECU or by the XETK.

3.6 Data Emulation and Data Measurement

The XETK-S30.0 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 can not 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 it's contents. When enabling data emulation, the XETK establishes a basic start-up configuration of the data in the Working Page by copying the corresponding data in the Flash to the emulation space.



NOTE

With serialETKs such as the XETK-S30.0, there is an important restriction that no access to the memory is possible, while the ECU is not running. To enable a cold start measurement (measurement during ECU power-up) in spite of this restriction, the cold start 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 cold start measurement procedure.

3.6.1 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 XETK-S30.0 supports two methods of page switching; however one method is only available for certain controllers.

The XETK-S30.0 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 page switching methods are described next.

Protocol Based Page Switching

The XETK-S30.0 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 XETK-S30.0 does not directly control the microcontroller overlay registers. Instead, the XETK-S30.0 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 XETK-S30.0 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 XETK-S30.0 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 XETK-S30.0 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.

3.7 DAP Interface

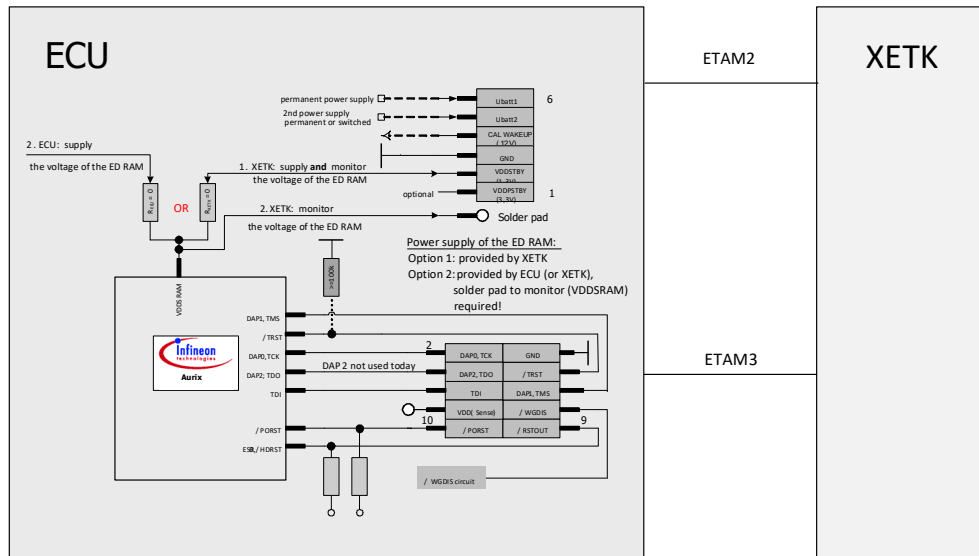


Fig. 3-6 Equivalent Circuitry of the ECU DAP Interface (ECU)

The XETK-S30.0 operates the Device Access Port (DAP) interface in the 2-pin mode. The XETK hardware incorporates 22 Ohm series termination resistors for the output ports DAP0, DAP1, DAP2 and /TRST.

Similar termination should be considered on the ECU board - depending both on the layout and on the DAP interface clock rate.

3.8 Trigger Modes: Overview

The XETK-S30.0 supports the following trigger modes:

- Pinless triggering
- Timer triggering

The trigger mode "Pinless Triggering" uses the microcontroller's internal Development Trigger Semaphore (DTS) for triggering. See also chapter "Pinless Triggering" on page 25.

The trigger mode "Timer Triggering" uses four internal timers of the XETK for triggering. See also chapter "Timer Triggering" on page 26.

3.9 Pinless Triggering

3.9.1 Startup Handshake

The COMDATA trigger register is used to generate an ETK startup handshake. The ECU must ensure that all memory ECC initializations have been completed prior to the start-up handshake.

3.9.2 XETK Trigger Generation

Initialization

After the startup handshake and measurement is enabled, the XETK is waiting for triggers from the ECU software.

Application running

To generate triggers, the ECU software sets bits in the trigger register "CBS_TRIG" by writing the associated bits in the trigger setting register "CBS_TRIGS".

Each bit of the trigger setting register "CBS_TRIGS" corresponds to a bit in the same position in the trigger register "CBS_TRIG", each of them corresponding to an XETK hardware trigger.

The XETK periodically polls the trigger register "CBS_TRIG" via IO_READ_TRIG for detecting triggers. The polling rate is determined by the fastest measurement raster and is configurable with a 50 μ s default.

Active bits in trigger register "CBS_TRIG" are automatically cleared by the CPU when the register is read by the XETK-S30.0 via IO_READ_TRIG. For generating triggers, the ECU software sets bits in the trigger register "CBS_TRIG" by writing the associated bits in the trigger setting register "CBS_TRIGS".

3.10 Timer Triggering

The trigger mode "Timer Triggering" uses four internal timers of the XETK-S30.0 for triggering. A fixed configurable period is used for triggering.

The time intervals between trigger events are in accordance with the configured timer values. These values and their resolution have to be defined in the A2L file.

Available settings are:

- Minimum time interval 100 μ s
- Maximum period duration 1 s
- Timer resolution 1 μ s

The timers work in an asynchronous manner to the ECU.

3.11 Reset

The requirement for the XETK-S30.0 reset mechanism is to ensure that power-up and power-down behavior of ECU is clean and smooth.

The XETK-S30.0 normally drives /PORST low during XETK power up or upon INCA request. The signals /PORST and /ESR0 of the microcontroller are used by the XETK-S30.0 to detect when the ECU is in reset.

The XETK-S30.0 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.

3.12 Pull CalWakeUp until Startup Handshake

The XETK has the ability to wake up the ECU by applying voltage to the CalWakeUp pin of the ECU connector. This allows the XETK to configure a measurement while the ECU is off.

When waking up the ECU via the CalWakeUp pin, it can be configured if the pin is driven high until the microcontroller core voltage (VDDP) is high or if the pin should be driven high until the start-up handshake between ECU and XETK is complete.

4 Installation

This chapter contains information about the following topics:

- Connection to the ECU..... 27
- Wiring..... 29

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.

4.1 Connection to the ECU

***i* NOTE**

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 connecting the XETK-S30.0 to the ECU two XETK adapter cables are recommended:

- at CON2 adapter ETAM3
- at CON4 adapter ETAM2 or ETAM5

Adapter cables ETAM2, ETAM5, ETAM9, ETAM10, and ETAM12 are also available. The adapter cables are to be ordered separately (refer chapter "Ordering Information" on page 75).

The suitable connectors SAMTEC-10 (CON2) and MOLEX-6 (CON4) should have been populated onto the ECU PCB for adapters ETAM3 and ETAM2/ ETAM5 (see Fig. 4-2 for additional connector details).

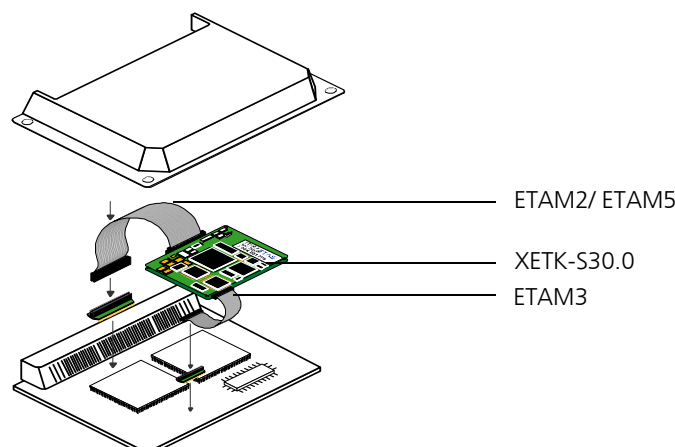


Fig. 4-1 XETK-S30.0 Connection to the ECU

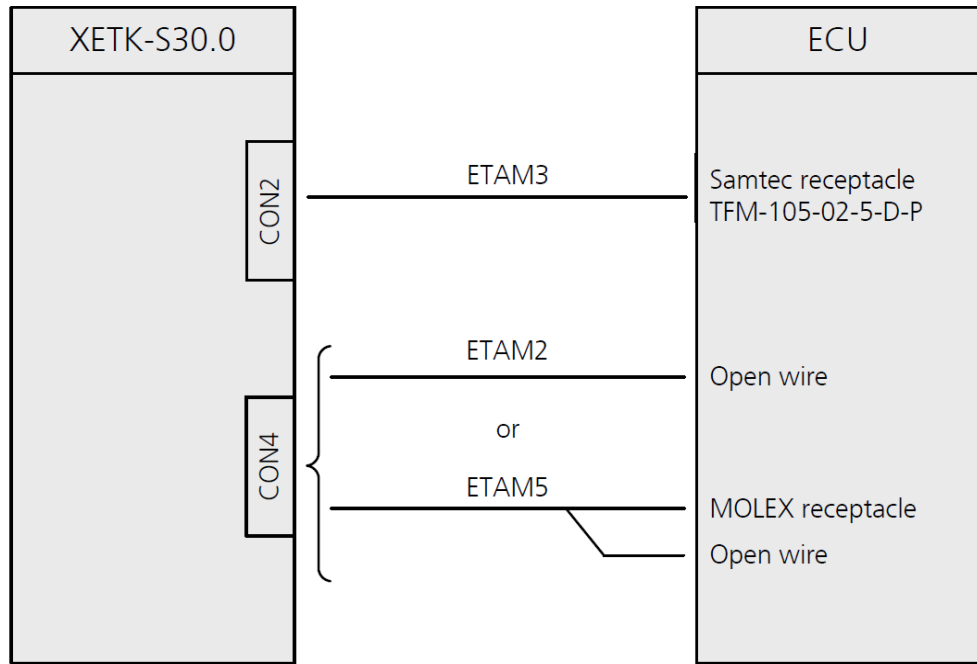


Fig. 4-2 XETK-S30.0 Connection to the ECU

4.2 Wiring

4.2.1 XETK Ethernet Interface

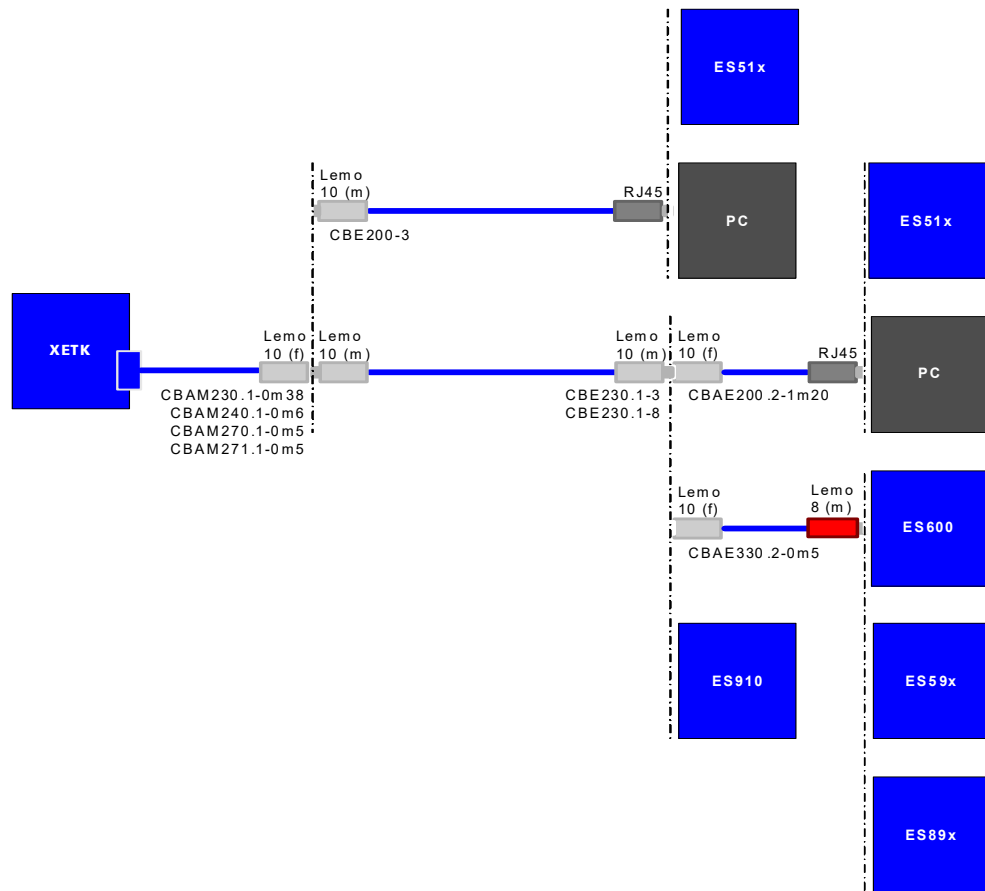



Fig. 4-3 Wiring - XETK Ethernet Interface

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

i NOTE

The XETK Ethernet interface is compatible with the Ethernet interfaces of the ES51x/ES59x/ES600/ES8xx/ES910 module.


4.2.2 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.

The XETK-S30.0 needs a permanent power supply (refer chapter “Power Supply” on page 20). Refer to figures Fig. 4-4, Fig. 4-5, or Fig. 4-6 for recommendations on permanent power supply connection.

Permanent Power Supply inside ECU available

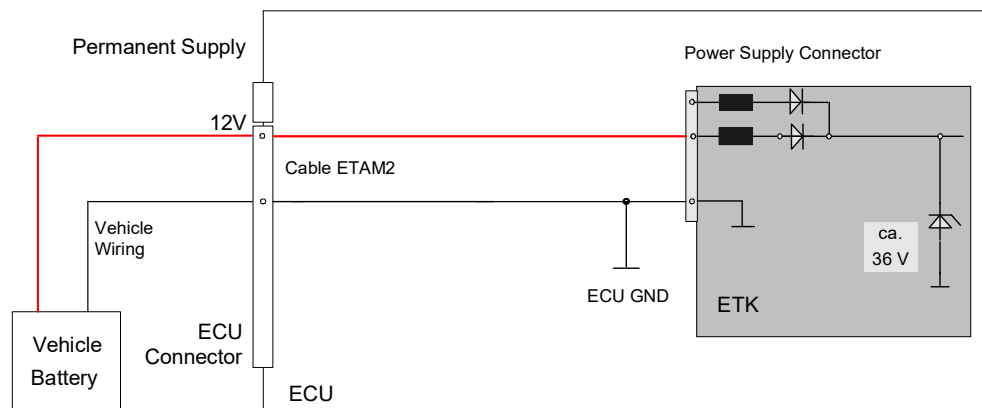


Fig. 4-4 Permanent Power Supply inside ECU available

Permanent Power Supply inside ECU not available

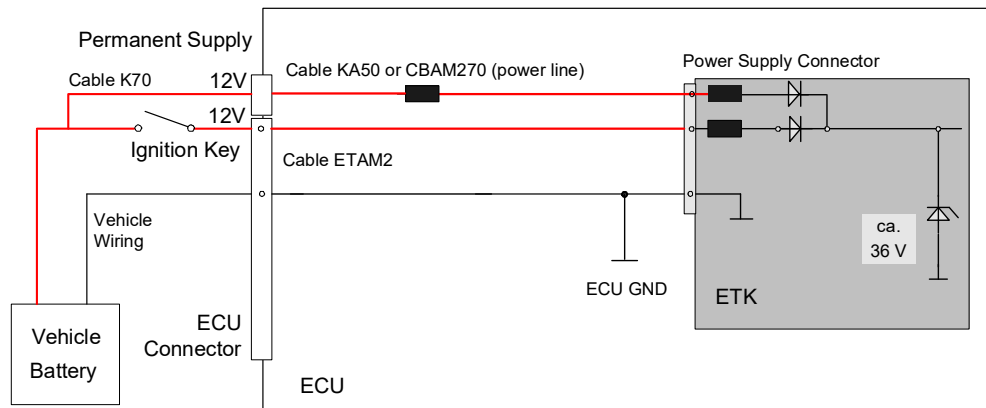


Fig. 4-5 Permanent Power Supply inside ECU not available

Isolated Power Supply inside ECU

The XETK-S30.0 does not require a galvanically isolated power supply. For special applications ETAS offers the isolated power supply ETP2.

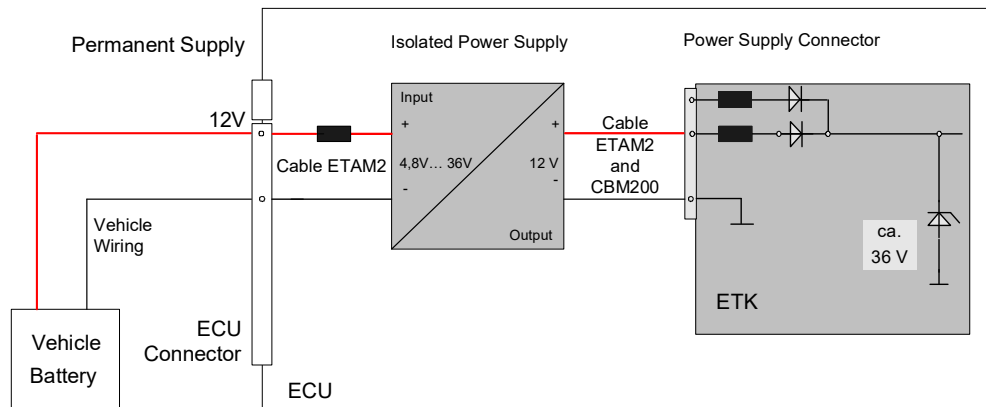


Fig. 4-6 Isolated Power Supply inside ECU

5 XETK Configuration

This chapter contains information about the following topics:

- Overview 32
- Configuration Parameter 33

5.1 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 "(X)ETK Configuration Tool" (XCT Tool). The XCT Tool contains information on all available XETKs. 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.
2. Connection of the XETK to the ECU.
The ECU hardware developer defines the connection of the XETK 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 XETK 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
- XETK 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 XETK is checked for the appropriate configuration. If necessary, the XETK will be configured appropriately to the corresponding project.

5.2 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.
2. Select in the menu bar > **Contents**.
The XCT Tool help window opens.
3. Choose **Reference to User Interface > (X)ETK Hardware Configuration Parameters**.
4. Choose the topic **XETK-S30.0**.
 - > The topic **XETK-S30.0** contains information about the XETK-S30.0 hardware configuration parameters and their possible values.

6 Troubleshooting

6.1 Problems and Solutions

6.1.1 No communication between the ECU and ETK

Cause: No permanent powersupply at the XETK-S30.0.

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 XETK-S30.0 requires a permanent power supply. It is typically powered directly from the car battery. Refer to chapter "Power Supply" on page 30.

7 Technical Data

This chapter contains information about the following topics:

- System Requirements 35
- Data Emulation and Measurement Memory 37
- Configuration 37
- XETK Ethernet Interface 38
- Environmental Conditions 38
- Power Supply 39
- Microcontroller Interface 40
- Test Characteristics 40
- DAP Timing Characteristics 41
- Electrical Characteristics 42
- Pin Assignment 43
- Mechanical Dimensions 46

7.1 System Requirements

7.1.1 ETAS Compatible Hardware

ES592, ES593-D, ES595, ES600, ES8xx, ES910

7.1.2 PC with one Ethernet Interface

A PC with one open Ethernet interface (1 Gbit/s or 100 Mbit/s, full duplex) with RJ-45 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 power-saving 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"

7.1.3 Software Support

You need following software versions to support the XETK-S30.0:



NOTE

Operating the XETK-S30.0 with older software versions is not possible.

Use case: Measurement & Calibration, ECU Flash Programming

Microcontroller	HSP	INCA	INCA-MCE	ETK Tools
TC23x-PD	V11.10.0	V7.2.10	V7.2.10	V4.1.11
TC26x-PD	V11.2.0	V7.2.2	V2.0	V4.1.3
TC26x-ED	V11.2.0	V7.2.2	V2.0	V4.1.3
TC27x-PD	V11.2.0	V7.2.2	V2.0	V4.1.3
TC27x-ED	V10.9.0	V7.1.9	V2.0	V4.0.5
TC29x-ED	V10.9.0	V7.1.9	V2.0	V4.0.5
TC29x-PD	V11.8.0	V7.2.8	V7.2.8	V4.1.9
TC33x-PD	V12.0.0	V7.3.0	V7.3.0	V4.2.0
TC36x-PD	V11.15.0	V7.2.15	V7.2.15	V4.1.16
TC37x-ED	V11.12.0	V7.2.12	V7.2.12	V4.1.13
TC37x-PD	V11.15.0	V7.2.15	V7.2.15	V4.1.16
TC38x-PD	V11.8.0	V7.2.8	V7.2.8	V4.1.9
TC39x-ED (A-Step)	V11.2.1	V7.2.2	V2.0	V4.1.3
TC39x-ED (B-Step)	V11.8.0	V7.2.8	V7.2.8	V4.1.9
TC37x-XX	V12.3.0	V7.3.3	V7.3.3	V4.2.3
TC39x-XX	V12.3.0	V7.3.3	V7.3.3	V4.2.3

Use case: Rapid Prototyping

Item	Description
Supported microcontroller	All microcontrollers listed in chapter on page 36
ASCET-RP	V6.4
INTECRIO	V4.6
Supported Bypass methods	Service Based Bypass SBB V2.1



NOTE

The XETK-S30.0 supports the bypass procedure with DISTAB17. Classical Hook Based Bypass (HBB) method is not supported. This can be realized via "Hooked Service Points" (with the help of a SBB Service Point and DISTAB17).

7.2 Data Emulation and Measurement Memory

7.2.1 Data Emulation Memory and Microcontroller Support

The XETK-S30.0 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 microcontrollers, the size of the ED RAM, and states if the ED RAM is capable of being powered using a standby supply.

Microcontroller	Max. ED RAM	Standby powered
TC26x-ED	0.5 MByte	Yes
TC27x-ED	1 MByte	Yes
TC29x-ED	2 MByte	Yes
TC37x-ED	3 MByte	Yes
TC39x-ED	4 MByte	Yes

7.2.2 Measurement Data Memory

Item	Characteristics
Location	Typically located within the emulation memory when using DISTAB13 or DISTAB17 hooks. Measurement data memory can be located in internal RAM if the entire ED RAM is needed for calibration.

7.3 Configuration

Item	Characteristics
Configuration	Typically located within the emulation memory when using DISTAB13 hooks. Measurement data memory can be located in internal RAM if EMEM is needed for calibration.
Update	Logic devices updated using HSP software

7.4 XETK Ethernet Interface

Item	Characteristics
Connection	<ul style="list-style-type: none"> - 100 Mbit/s Ethernet, Full Duplex - PC Card 32 bit
Protocol	XCP on TCP/IP or UDP/IP
IP address	<ul style="list-style-type: none"> - Dynamic (standard, for INCA) or - Static (e.g. for Rapid Prototyping) by using the XETK Configuration Tool (default IP address: 192.168.40.16)
Cable length	max. 30 m / 100 ft
Ethernet Interface	DC decoupling Max. Isolation Voltage 60 V DC, according IEC 61010-1 ("Limit values for accessible parts" in normal, dry condition)



NOTE

To ensure successful initialization of the network card of your PC, refer to chapter 7.1.2 on page 35

7.5 Environmental Conditions

Item	Characteristics
Temperature range (operation)	- 40 °C to +110 °C/ - 40 °F to +230 °F
Temperature range (storage)	0 °C to +50 °C/ - 18 °F to +122 °F
Relative humidity (non-condensing)	0 to 95%
Operating altitude	max. 5000 m/ 16400 ft
Contamination level	2
Degree of protection	Determined by installation in ECU
Overvoltage category (AC mains supply)	II

7.6 Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Permanent power supply (car battery)	U_{Batt}	Vehicle usage ¹⁾	4.3	12	36	V
[all values $\pm 0\%$]						
Cranking voltage	U_{Batt}	< 3 seconds	3			V
Standby current	I_{STBY}	$U_{\text{Batt}} = 12 \text{ V}$; ECU off; no load from ECU; $T = 20 \text{ }^\circ\text{C}$	15	28	40	mA
Operating current	I_{Batt}	$U_{\text{Batt}} = 12 \text{ V}$; no load from ECU; $T = 20 \text{ }^\circ\text{C}$	70	135	250	mA
Power dissipation	P_{Batt}	$U_{\text{Batt}} = 12 \text{ V}$; $I = 0 \text{ mA}$ at pin ECU_SBRAM; $T = 20 \text{ }^\circ\text{C}$		1.62		W
Power dissipation	P_{Batt}	$U_{\text{Batt}} = 12 \text{ V}$; $I = 500 \text{ mA}$ at pin VDDSTBY; $I = 80 \text{ mA}$ at pin VDDPSTBY; $T = 20 \text{ }^\circ\text{C}$		3		W
Fuse in the ETK Ubatt supply line. Only required if the power supply or ECU is not protected accordingly.			MINI, 2 A 58 V DC (Littelfuse 0997002.WXN)			

¹⁾ The XETK-S30.0 implements reverse voltage protection in the same range and may be used only with central load dump protection.
24 V vehicles require U_{Batt} disturbing pulse reduction to 12 V vehicle system.
12 V vehicles don't require special disturbing pulse reductions.

**NOTE**

The XETK-S30.0 will accept permanent power supply voltage dips (for additional details of 3 V low voltage operation, see ISO standard 16750).

7.7 Microcontroller Interface

	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	VDDP-STBY	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 (3.3 V selected)	VDDP	ECU on	2.48	2.58	2.68	V
		ECU off	2.33	2.43	2.53	V
	IDDP	VDDP 3.3 V			200	μA
ECU Power Supply Supervision Voltage (5.0 V selected)	VDDP	ECU on	2.98	3.08	3.18	V
		ECU off	2.83	2.93	3.03	V
	IDDP	VDDP 5.0 V			300	μA
ECU Standby RAM Supervision Voltage	VDDSTBY / VDDSTBY_-SENSE	VDDSTBY \uparrow	1.02	1.12	1.22	V
		VDDSTBY \downarrow	1	1.1	1.2	V
	IDDSTBY	VDDSTBY 1.30 V			77	μA

7.8 Test Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Reset delay 1 ¹⁾	t_{Reset1}	$U_{Batt} = 12 \text{ V}$ VDDP = 0 V \uparrow 3.3 V / 5.0 V without transferring FPGA	17		33	ms
Reset delay 2 ²⁾	t_{Reset2}	$U_{Batt} = 0 \text{ V} \uparrow 12 \text{ V}$ transfer FPGA	200		340	ms

¹⁾ Delay of ECU reset through ETK without transferring the FPGA (U_{Batt} present, VDDP will be switched on)

²⁾ max. delay of ECU reset through ETK (U_{Batt} and VDDP will be switched on)

7.9 DAP Timing Characteristics

The following diagrams show the timings the XETK-S30.0 can process.

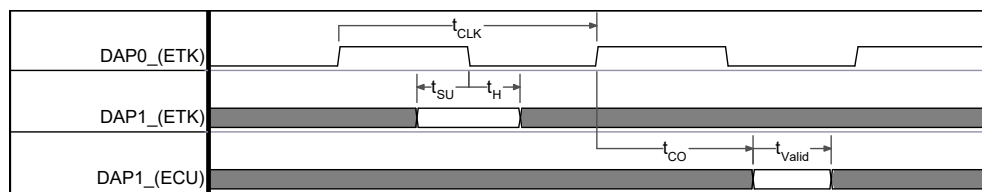


NOTE

DAP timing parameters in this chapter refer to the DAP interface (CON2) of the XETK-S30.0. The DAP wiring to the ECU (ETAM2) must be taken account additionally.

All timings are measured at a reference level of 1.5 V. Output signals are measured with 20 pF to ground and 50 Ω to 1.5 V.

7.9.1 DAP Timing Diagram



7.9.2 DAP Timing Diagram DAP Timing Parameter

Parameter	Symbol	Value [ns]	Comment
DAP0 Clock Period (ETK --> Target)	t_{CLK}	10	100 MHz DAP Clock Frequency
		20	50 MHz DAP Clock Frequency
DAP1 Set-Up Time (ETK --> Target)	t_{SU}	4	
DAP1 Hold Time (ETK --> Target)	t_H	2	
DAP1 Clock-to-Out Time (Target --> ETK)	t_{CO}	~	Undetermined, ETK automatically determines optimum sampling point
DAP1 Valid Window (Target --> ETK)	t_{Valid}	8	

7.10 Electrical Characteristics

7.10.1 ECU Interface Connector

Signal	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 (min) / (max) [μA]	Additional load by ETK ¹⁾ (typ) [pF]
DAP0	XO ²⁾	0.7	2.3	3.3	-	-	-	+3340 / +2360	15
DAP1	IXO ²⁾	0.7	2.3	3.3	0.8	2	5.5	+3340 / +2360	15
DAP2	IXO ²⁾	0.7	2.3	3.3	0.8	2	5.5	+40 / -40	15
Reserved	XO ²⁾	0.7	2.3	3.3	-	-	-	+20 / -20	10
/TRST	XO ²⁾	0.7	2.3	3.3	-	-	-	+20 / -20	10
/ESR0	IXOD ³⁾	0.7	-	-	0.8	2	5.5	+25 / -20	22
/PORST	IXOD ³⁾	0.7	-	-	0.8	2	5.5	+25 / -20	22
WGDIS	XO ²⁾	0.7	2.3	3.3	-	-	-	+20 / -20	10

Pin Type:

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

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

²⁾ max 12 mA

³⁾ max 0.2 A

7.11 Pin Assignment

7.11.1 XETK-S30.0 Interface Location

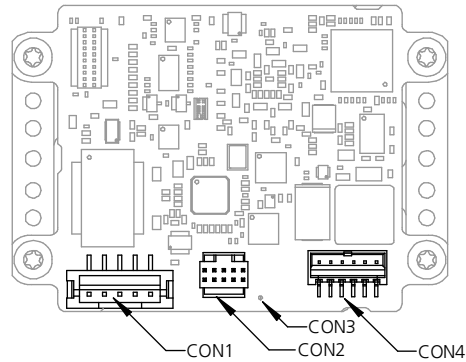


Fig. 7-1 XETK-S30.0 Interface Location

7.11.2 XETK Ethernet Interface Connector CON1

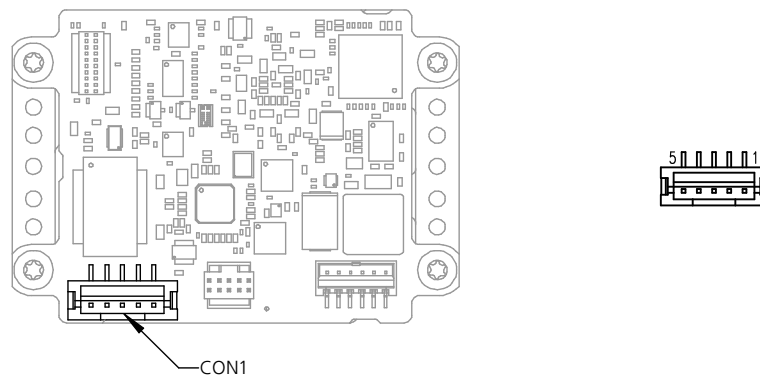


Fig. 7-2 XETK Ethernet Interface Connector CON1 Location

The interface is a standard full duplex 100Base-TX Ethernet interface using the XCP protocol.

7.11.3 ECU Interface Connector CON2

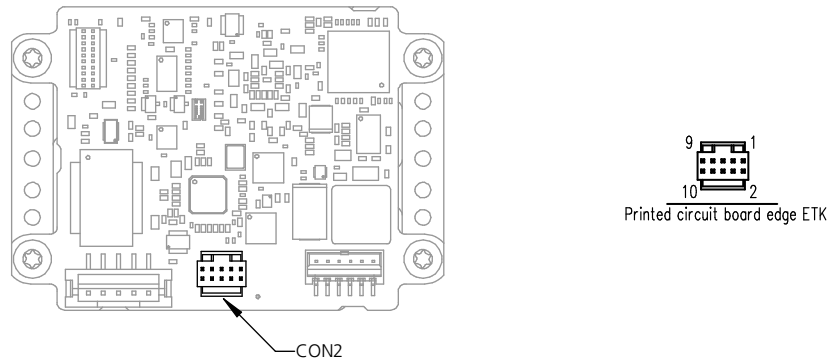


Fig. 7-3 ECU Interface Connector CON2 Location

Pin	Signal	Direction	Comment
1	DAP0	Output	DAP signal
2	GND	Power	Signal Ground
3	/TRST	Output	DAP signal
4	DAP2	Bidir	DAP signal
5	WDGIS	Output	Watchdog disable Signal
6	DAP1	Bidir	DAP signal
7	RESERVED	Output	DAP signal
8	VDDP (Sense)	Input	Sense for Switched power supply of ECU (ignition)
9	/ESR0	Bidir	ECU Reset signal (open drain) for Reset assertion and supervision
10	/PORST	Bidir	ECU Power On Reset signal (open drain) for Reset assertion and supervision

7.11.4 VDDSTBY_SENSE Connector CON3

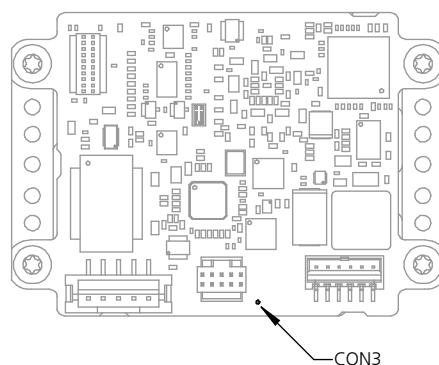


Fig. 7-4 VDDSTBY_SENSE Connector CON3 Location

Pin	Signal	Direction	Comment
1	VDDSTBY_SENSE	Input	ECU EDRAM Sense Pin

7.11.5 Power Supply Connector CON4

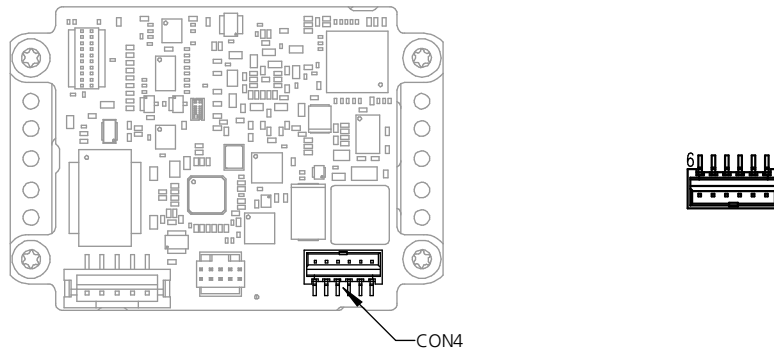


Fig. 7-5 Power Supply Connector CON4 Location

Pin	Signal	Direction	Comment
1	VDDPSTBY (3.3 V supply)	Output	Permanent power supply of ECU DAP Interface, 3.3 V
2	VDDSTBY (1.30 V supply)	Output	Permanent power supply of ECU EDRAM, 1.30 V
3	GND	Input	Power GND
4	CalWakeup	Output	Switch to Ubatt. ECU wake-up signal (for measurement preparation)
5	Ubatt2	Input	Vehicle battery
6	Ubatt1	Input	Vehicle Battery



NOTE

VDDSTBY may not be used as power supply of the microcontroller core. VDDSTBY is permanently available and must be used as power supply of the EDRAM, only.

7.12 Mechanical Dimensions

The reference measure for all drawings is millimeters.

7.12.1 Top View

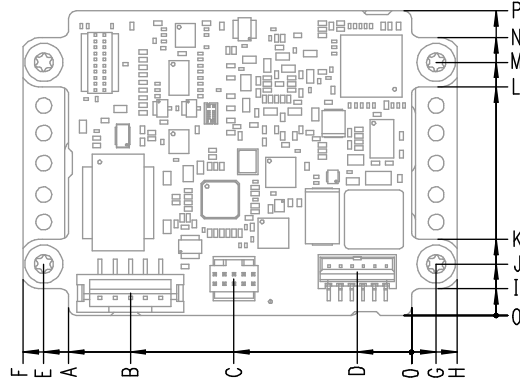


Fig. 7-6 XETK-S30.0 Dimensions - Top View (1)

Item	Dimension [Millimeters]	Tolerance [Millimeters]	Dimension [Inches]	Tolerance [Inches]
A	45.00	+/- 0.20	1.772	+/- 0.008
B	36.90	+/- 0.20	1.453	+/- 0.008
C	23.30	+/- 0.20	0.917	+/- 0.008
D	7.10	+/- 0.20	0.280	+/- 0.008
E	48.25	+/- 0.20	1.900	+/- 0.008
F	51.00	+/- 0.20	2.008	+/- 0.008
G	3.25	+/- 0.10	0.128	+/- 0.004
H	6.00	+/- 0.20	0.236	+/- 0.008
I	3.50	+/- 0.10	0.138	+/- 0.004
J	6.75	+/- 0.20	0.266	+/- 0.008
K	10.00	+/- 0.20	0.394	+/- 0.008
L	30.00	+/- 0.20	1.181	+/- 0.008
M	33.25	+/- 0.20	1.309	+/- 0.008
N	36.50	+/- 0.20	1.437	+/- 0.008
P	40.00	+/- 0.20	1.575	+/- 0.008

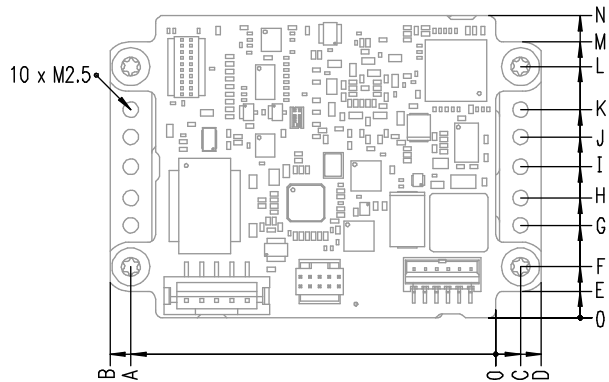


Fig. 7-7 XETK-S30.0 Dimensions - Top View (2)

Item	Dimension [Millimeters]	Tolerance [Millimeters]	Dimension [Inches]	Tolerance [Inches]
A	48.25	+/- 0.20	1.900	+/- 0.008
B	51.00	+/- 0.20	2.008	+/- 0.008
C	3.25	+/- 0.10	0.128	+/- 0.004
D	6.00	+/- 0.20	0.236	+/- 0.008
E	3.50	+/- 0.10	1.900	+/- 0.004
F	6.75	+/- 0.20	0.266	+/- 0.008
G	12.25	+/- 0.20	0.482	+/- 0.008
H	15.85	+/- 0.20	0.624	+/- 0.008
I	20.00	+/- 0.20	0.787	+/- 0.008
J	23.95	+/- 0.20	0.943	+/- 0.008
K	27.55	+/- 0.20	1.085	+/- 0.008
L	33.25	+/- 0.20	1.309	+/- 0.008
M	36.50	+/- 0.20	1.437	+/- 0.008
N	40.00	+/- 0.20	1.575	+/- 0.008

7.12.2 Side View

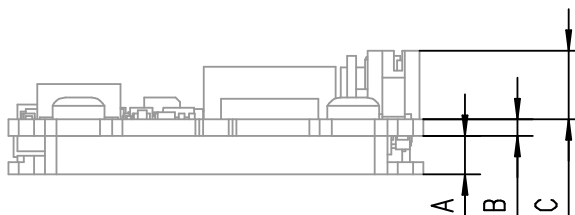


Fig. 7-8 XETK-S30.0 Dimensions - Side View

Item	Dimension [Millimeters]	Tolerance [Millimeters]	Dimension [Inches]	Tolerance [Inches]
A	3.70	+/- 0.10	0.146	+/- 0.004
B	1.50	+/- 0.16	0.059	+/- 0.006
C	6.60	+/- 0.10	0.260	+/- 0.004

Fig. 7-9

8 Cables and Accessories

8.1 Overview and Classification

This chapter contains information about the following cables and accessor



NOTE

See chapter "Connection to the ECU" on page 27 for details on wiring the ECU interface adapters.

- Overview and Classification 48
- Requirements for failsafe Operation 48
- CBAM230 Cable 49
- CBAM240 Cable 51
- CBAM271 Cable 53
- ETAM2 ECU Adapter 54
- ETAM3 ECU Adapter 55
- ETAM5 ECU Adapter 57
- ETAM9 ECU Adapter 59
- ETAM10 ECU Adapter 60
- ETAM12 ECU Adapter 62
- CBE200 Cable 64
- CBAE200 Cable 65
- CBE230 Cable 66
- CBAE330 Cable 67
- CBAM270 Cable 68
- K70.1 Cable 71
- KA50 Cable 73

8.2 Requirements for failsafe 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.

8.3 CBAM230 Cable

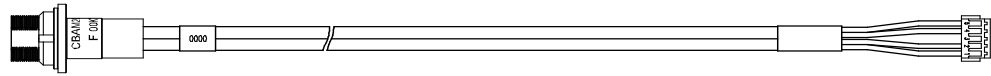


Fig. 8-1 CBAM230 Cable

8.3.1 Usage

XETK ECU adapter cable, 100 Mbit/s, suitable for ECU flush mounting (M12), shield connected to socket. The cable is usable for ECUs with shielded housing.

8.3.2 Mechanical Dimensions

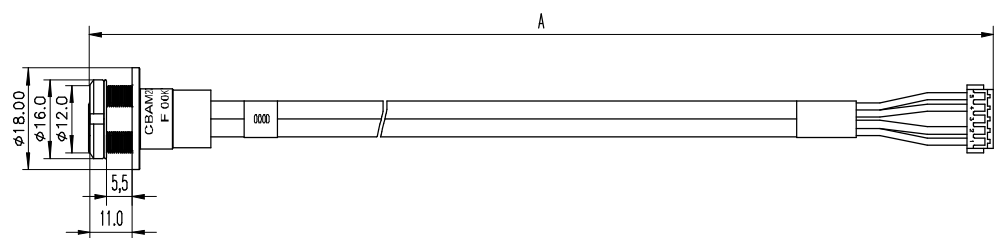


Fig. 8-2 CBAM230 Cable Dimensions

8.3.3 Panel Cut-Out

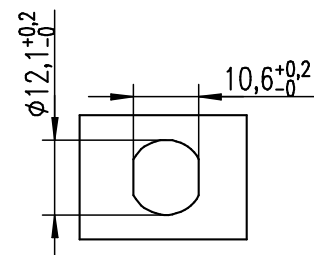


Fig. 8-3 Dimension Panel Cut-Out

8.3.4 Assembling



Fig. 8-4 Lemo Spanner

i **NOTE**

The Lemo tool type spanner DCH.91.161.PA is needed for assembling the connector. It is not part of the cable delivery, For detailed information on mounting accessories contact the ETAS technical support.

8.3.5 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.3.6 Ordering Information

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

8.4 CBAM240 Cable

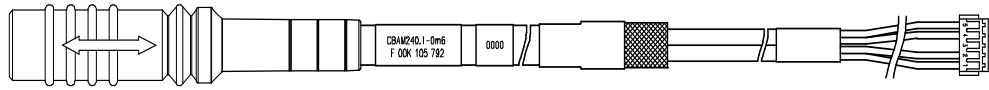


Fig. 8-5 CBAM240 Cable

8.4.1 Usage

XETK ECU adapter cable, 100 MBit/s, 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. The cable is usable for ECUs with shielded housing.

8.4.2 Mechanical Dimensions

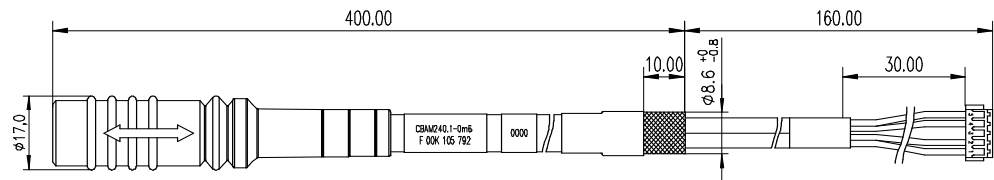


Fig. 8-6 CBAM240 Cable Dimensions

8.4.3 Mounting Proposal with an EMC safe Cable Gland

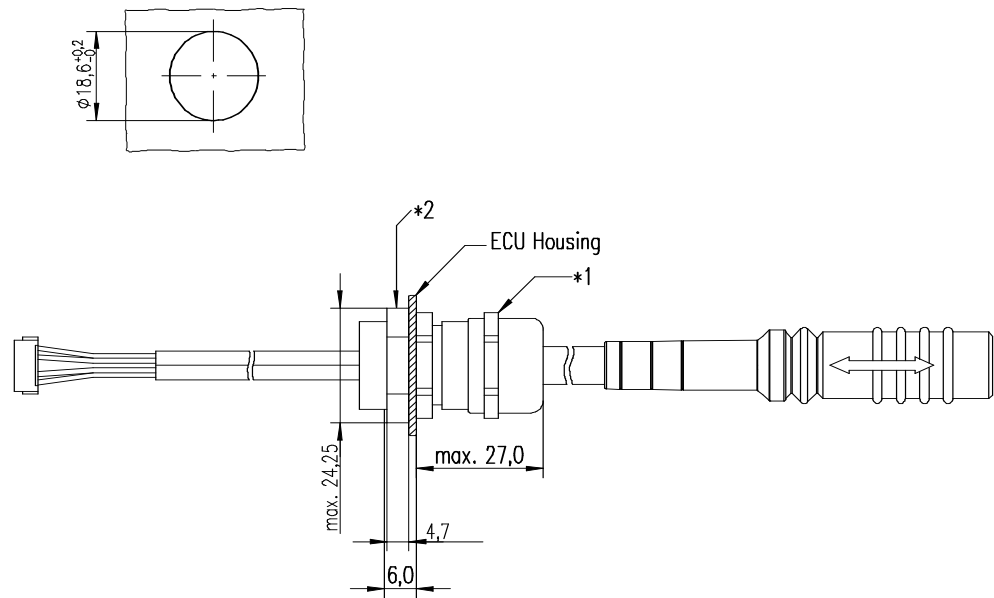


Fig. 8-7 Long Thread

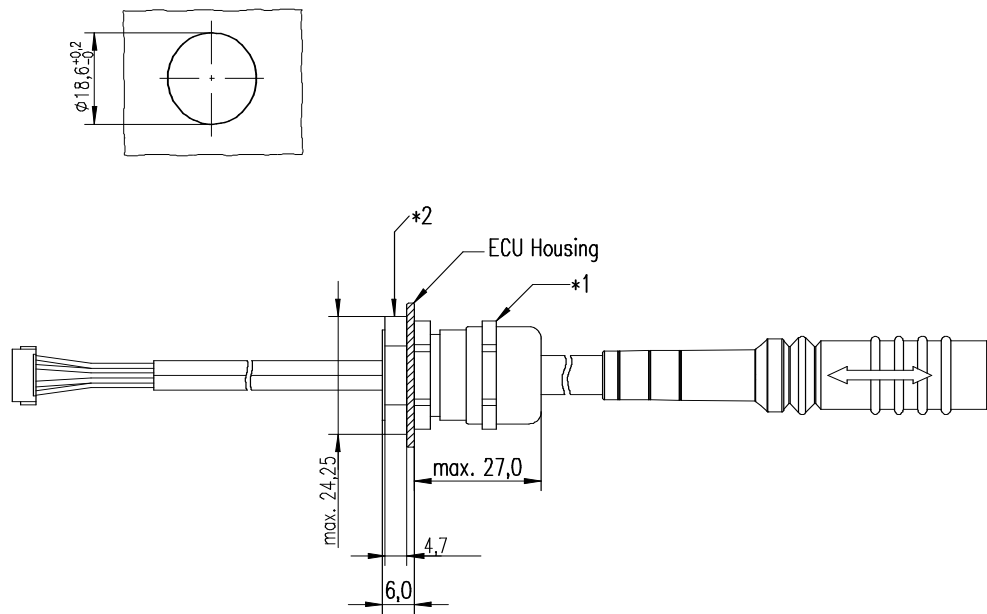


Fig. 8-8 Short Thread

Remark in Fig. 8-7,	Mounting Material
Remark in Fig. 8-8	
*1	SKINTOP compact screwing; Manufacturer: Lapp; Description: MS-SC 11; Order-No.: 5311 2320 (long thread) or 5311 2220 (short thread)
*2	Nut for compact screwing; Manufacturer: Lapp; Description: SM-PE 11; Order-No.: 5210 3220

i NOTE
 Cable glands are not part of the CBAM240 cable delivery.

8.4.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.4.5 Ordering Information

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

8.5 CBAM271 Cable

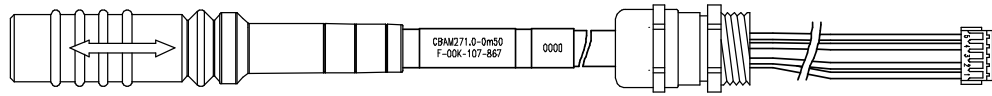


Fig. 8-9 CBAM271 Cable

8.5.1 Usage

100 Mbit/s XETK ECU adapter cable, pre-assembled into PG9 screwing, shield on ECU housing, Lemo 1B PHE - JST PHR (10fc-5fc), 0m50

8.5.2 Mechanical Dimensions

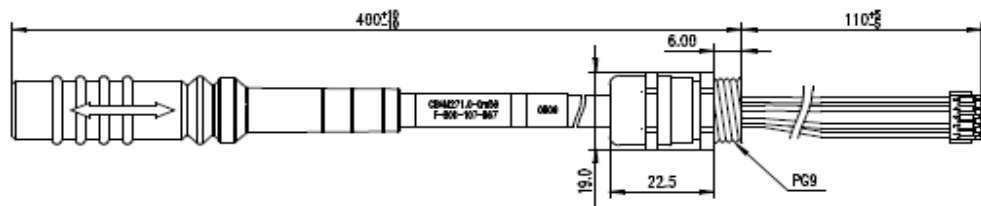


Fig. 8-10 CBAM271 Cable Dimensions

8.5.3 Mounting



NOTE

For mounting the CBAM271 cable, cut a PG9 thread into the ECU housing. For thin walled housings use a nut SM-PE 9. Available from Lapp, Order number: 52103210.



NOTE

Cable glands are not part of the CBAM271 cable delivery.

8.5.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.5.5 Ordering Information

Order Name	Short Name	Order Number
XETK ECU Adapter Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1B PHE - JST PHR (10fc-5fc), 0m50	CBAM271.0-0m5	F 00K 107 867

8.6 ETAM2 ECU Adapter

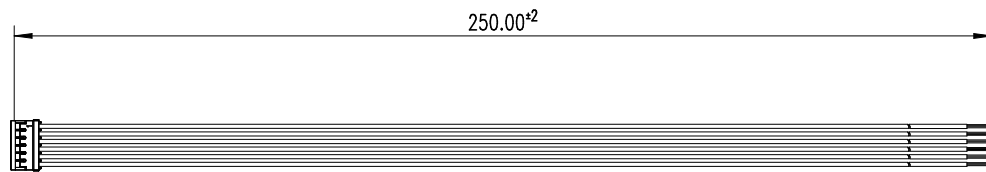


Fig. 8-11 FETK/ XETK - ECU Adapter ETAM2

8.6.1 Pin Assignment



Fig. 8-12 ETAM2 Connector

8.6.2 ECU Signals

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

8.6.3 Ordering Information

Order Name	Short Name	Order Number
ETAM2 XETK/FETK ECU Adapter, MOLEX - open wires (6fc - 6c), 0m25	ETAM2	F 00K 109 306

8.7 ETAM3 ECU Adapter

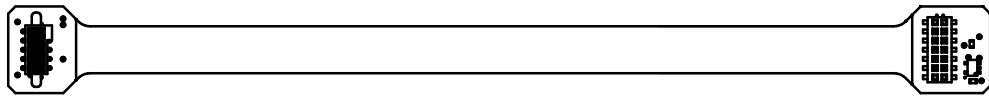


Fig. 8-13 ETAM3 ECU Adapter

8.7.1 Usage

The ETAM3 adapts a ECU with an 10 pin SAMTEC TFM-105 connector to an ETK. The ETABR3 cable requires on the ECU side an 10 pin SAMTEC connector (e.g. TFM-105-02-S-D-P).

8.7.2 Mechanical Dimensions

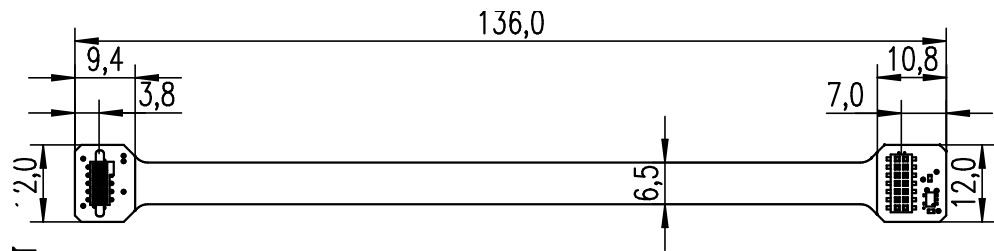


Fig. 8-14 ETAM3 Adapter (top view)

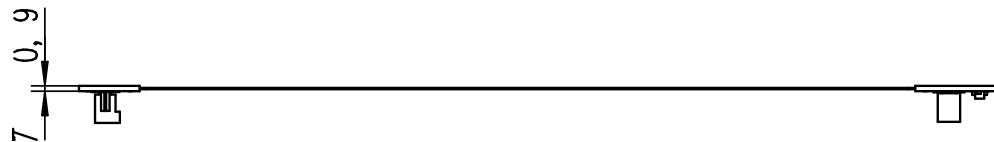


Fig. 8-15 ETAM3 Adapter (side view)

i NOTE

Please note that the ETAM3 flex foil has an minimum bending radius of 3 mm.

8.7.3 Pin Assignment

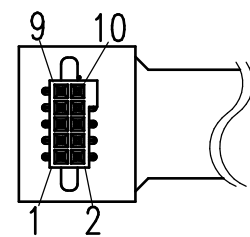


Fig. 8-16 ETAM3 Adapter (pin numbering)

8.7.4 ECU Signals

JTAG and DAP Mode



NOTE

LFAST mode is not possible with the ETAM3 adapter.

Pin	JTAG Mode	DAP Mode
1	GND	GND
2	TCK	DAP0
3	/TRST	/TRST
4	TDO	DAP2
5	TMS	DAP1
6	TDI	-
7	WDGDIS	WDGDIS
8	VDD (Sense)	VDD (Sense)
9	/RESETOUT	/RESETOUT
10	/PORESET	/PORESET

/TRST Signal Characteristics

A buffer in the /TRST line increases the signal-noise ratio in this line. It is supplied by the VDD(Sense) voltage.

/TRST Buffer Supply

Signal	Condition	VIHmin	VIHmax
VDD(Sense)	ECU on	3.0V	5.5V

/TRST Output Signal

Signal	Condition	VOHmin	VOHmax	VOLmax
/TRST	VDD(Sense) = 3 V, IOH = 4mA	2.34 V	VDD(Sense)	0.52 V
/TRST	VDD(Sense) = 4.5 V, IOH = 8mA	3.66 V	VDD(Sense)	0.52 V

8.7.5 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +110 °C

8.7.6 Ordering Information

Order Name	Short Name	Order Number
ETAM3 XETK/FETK ECU Adapter, SAM-TEC FFSD - SAMTEC SFM (10fc - 10fc), 0m11	ETAM3	F 00K 109 673

8.8 ETAM5 ECU Adapter

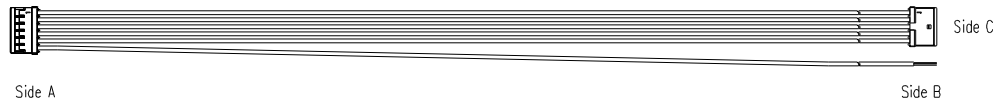


Fig. 8-17 FETK/ XETK - ECU Adapter ETAM5

8.8.1 Usage

The ETAM5 adapts the XETK / FETK power signals (Molex 6 pin connector) to an ECU with a 5 pin Molex Pico Spox connector. The ECU connector is available as Vertical SMT Header [87437-0543] or Right Angle SMT Header [87438-0543]. The red open wire cable is an additional FETK Ubatt input. This wire can connect to an CBAMXXX cable with Ubatt input or to a K50 Ubatt adapter.

8.8.2 Mechanical Dimensions

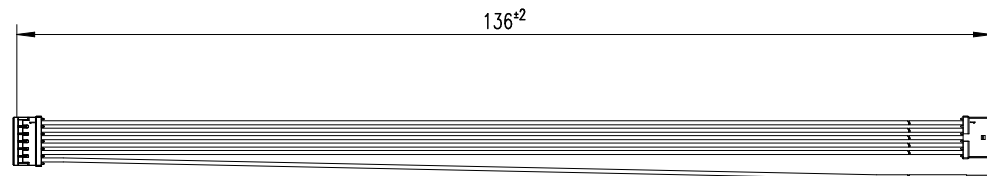


Fig. 8-18 FETK/ XETK - ECU Adapter ETAM5

8.8.3 Connectors and Positions

Molex Housing	Wire	5 mm stripped and signed	Molex Housing signed
87439-0600	PTFE-5Y		87439-0500
Molex Terminal			
87421-0000			
Side A		Side B	Side C

Side A	Wire	Side B	Side C
1	Blue		1
2	Yellow		2
3	Brown		3
4	Green		4
5	Red		5
6	Red	Open wire	

8.8.4 ECU Signals

Pin	Color	Signal	Description
1	Blue	VDDPSTBY (Supply)	Permanent power supply of ECU interface
2	Yellow	VDDSTBY (Supply)	Permanent power supply of ECU ED RAM
3	Brown	Ground	Power ground
4	Green	Cal_Wakeup	Switch to Ubatt. ECU wake-up signal (for measurement preparation)
5	Red	SGUBATT1	Car battery

8.8.5 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +110 °C

8.8.6 Ordering Information

Order Name	Short Name	Order Number
ETAM5 FETK ECU Adapter, MOLEX - MOLEX (6fc - 5fc+1c), 0m136	ETAM5	F 00K 110 101

8.9 ETAM9 ECU Adapter

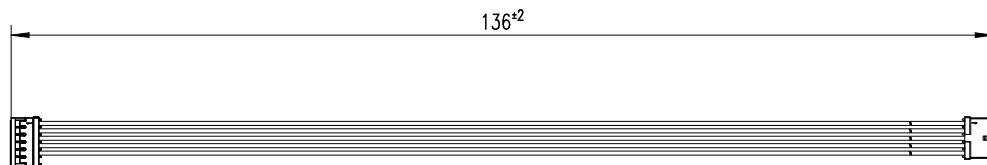


Fig. 8-19 FETK/ XETK - ECU Adapter ETAM9

8.9.1 Usage

The ETAM9 adapts the FETK/ XETK power signals (Molex 6 pin connector) to the ECU with an 5 pin Molex Pico Spox 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].

8.9.2 ECU Signals

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

8.9.3 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +110 °C

8.9.4 Ordering Information

Order Name	Short Name	Order Number
ETAM9 F/XETK-S ECU Adapter, MOLEX - MOLEX (6fc - 5fc), 0m136	ETAM9	F 00K 111 043

8.10 ETAM10 ECU Adapter

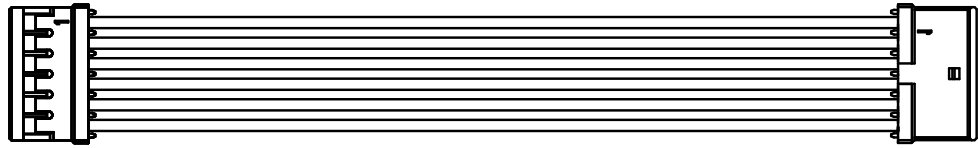


Fig. 8-20 FETK/ XETK - ECU Adapter ETAM10

8.10.1 Usage

The ETAM10 adapts the ETK power signals (Molex 6 pin connector) to an ECU with an 6 pin Molex Pico Spox connector. The ECU connector is available as Vertical SMT Header [87437-0643] or Right Angle SMT Header [87438-0643].

8.10.2 Mechanical Dimensions

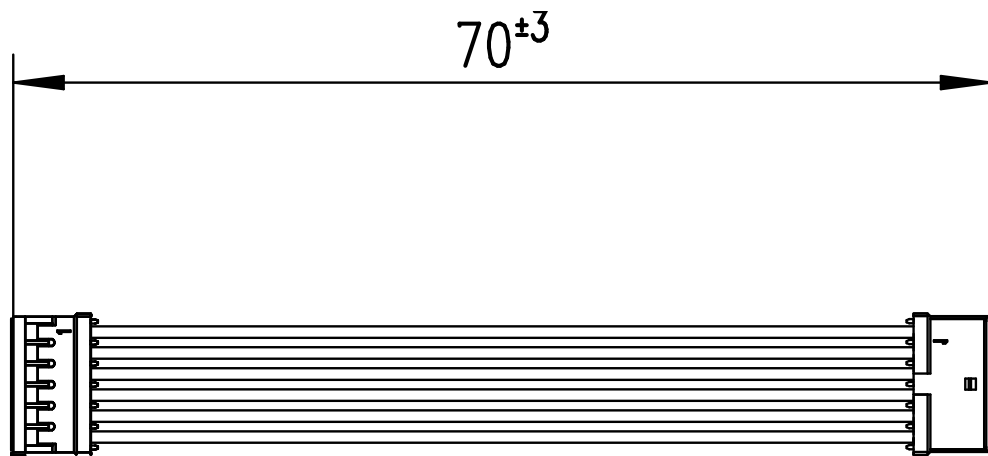


Fig. 8-21 ETAM10 Adapter Dimensions

8.10.3 ECU Signals

Pin	Color	Signal	Description
1	Blue	VDDPSTBY (Supply)	Permanent power supply of ECU interface
2	Yellow	VDDSTBY (Supply)	Permanent power supply of ECU ED RAM
3	Brown	Ground	Power ground
4	Green	CaI_Wakeup	Switch to Ubatt. ECU wake-up signal (for measurement preparation)
5	Red	SGUBATT2	Car battery
6	Red	SGUBATT1	Car battery

8.10.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +110 °C

8.10.5 Ordering Information

Order Name	Short Name	Order Number
ETAM10 F/XETK-S ECU Adapter, MOLEX - MOLEX (6fc - 6fc), 0m07	ETAM10	F 00K 111 814

8.11 ETAM12 ECU Adapter

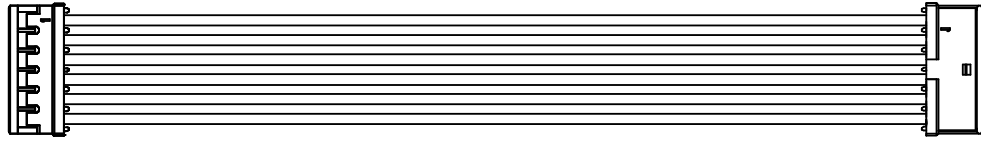


Fig. 8-22 FETK / XETK - ECU Adapter ETAM12

8.11.1 Usage

The ETAM12 adapts FETK and XETK power signals (Molex 6 pin connector) to an ECU with an 6 pin Molex connector.

8.11.2 Mechanical Dimensions

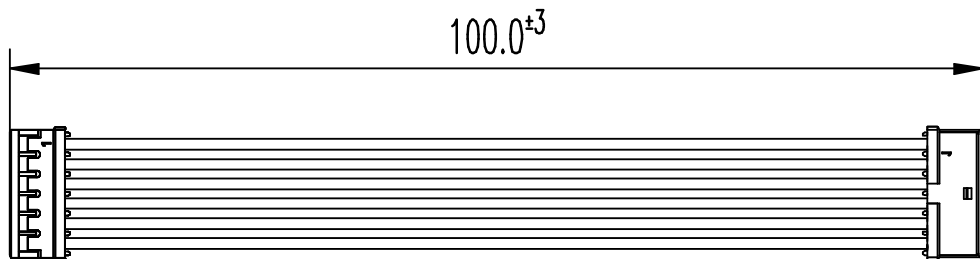


Fig. 8-23 ETAM12 Adapter Dimensions

8.11.3 ECU Signals

The ETAM12 adapts the ETK power signals (Molex 6pin connector) to an ECU with an 6 pin Molex Pico Spox connector. The ECU connector is available as Vertical SMT Header [87437-0643] or Right Angle SMT Header [87438-0643].

Pin	Color	Signal	Description
1	Blue	VDDPSTBY (Supply)	Permanent power supply of ECU interface
2	Yellow	VDDSTBY (Supply)	Permanent power supply of ECU ED RAM
3	Brown	Ground	Power ground
4	Green	Cal_Wakeup	Switch to Ubatt. ECU wake-up signal (for measurement preparation)
5	Red	SGUBATT2	Car battery
6	Red	SGUBATT1	Car battery

8.11.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +110 °C

8.11.5 Ordering Information

Order Name	Short Name	Order Number
MOLEX - MOLEX (6fc - 6fc) adapter cable ETAM12 (0,1 m / 0,33 ft) for connecting an F/ XETK to the ECU	ETAM12	F 00K 112 457

8.12 CBE200 Cable



Fig. 8-24 CBE200 Cable

8.12.1 Usage

XETK Ethernet to HOST (PC) connection cable, 1 Gbit/s

8.12.2 Ordering Information

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
Ethernet PC Connection Cable 1Gbit/s, Lemo 1B FGE - RJ45 (10mc-8mc), 8 m	CBE200-8	F 00K 104 374

8.13 CBAE200 Cable

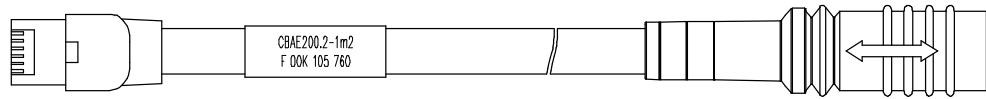


Fig. 8-25 CBAE200 Cable

8.13.1 Usage

Cable adapter to connect the CBE230 cable to the PC over an RJ45 connector. The CBAE200 cable supports Gigabit Ethernet.

8.13.2 Mechanical Dimensions

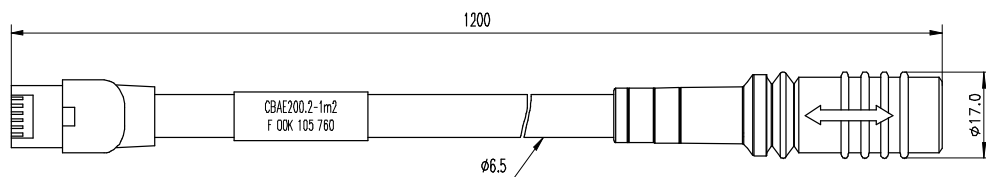


Fig. 8-26 CBAE200 Cable Dimensions

8.13.3 Tightness

Condition	Protection Class
Lemo connector	IP65

8.13.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +105 °C

8.13.5 Ordering Information

Order Name	Short Name	Order Number
Ethernet Connection Adapter Cable 1 GBit/s, Lemo 1B PHE - RJ45 (10fc- 8mc), 1m2	CBAE200-1m20	F 00K 105 760

8.14 CBE230 Cable

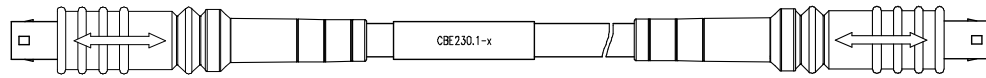


Fig. 8-27 CBE230 Cable

8.14.1 Usage

Gigabit Ethernet cable with power supply for ETAS devices.

8.14.2 Mechanical Dimensions

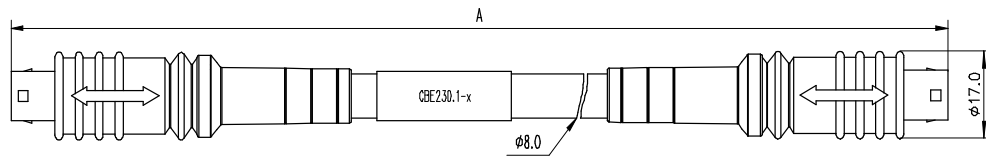


Fig. 8-28 CBE230 Cable Dimensions

8.14.3 Tightness

Condition	Protection Class
Lemo connector	IP67

8.14.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.14.5 Ordering Information

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

8.15 CBAE330 Cable

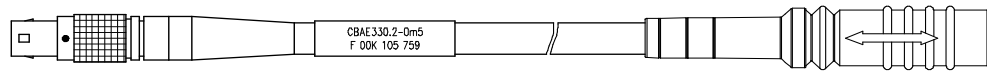


Fig. 8-29 CBAE330 Cable

8.15.1 Usage

Gigabit Ethernet to 100 MBit/s Ethernet adapter to connect the CBE230 cable to the ES600 module.

Power supply from ETAS modules as like as the ES600 through the CBAE330 cable adapter is not supported.

8.15.2 Mechanical Dimensions

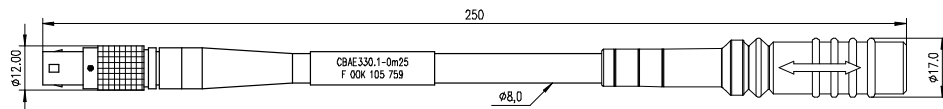


Fig. 8-30 CBAE330 Cable Dimensions

8.15.3 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.15.4 Ordering Information

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

8.16 CBAM270 Cable

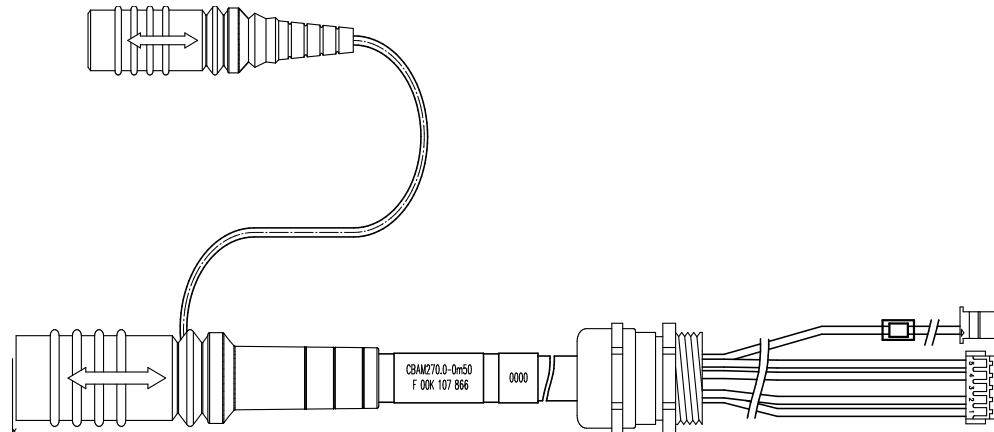


Fig. 8-31 CBAM270 Cable

8.16.1 Usage

XETK ECU adapter and power supply cable, pre-assembled into PG9 screwing, shield on ECU housing, Lemo 1B PHE - JST PHR (10fc-5fc) / Lemo 0B PHG - JST PAP (2fc-2fc), 0.5 m and 0.7 m length.



NOTE

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

8.16.2 Mechanical Dimensions

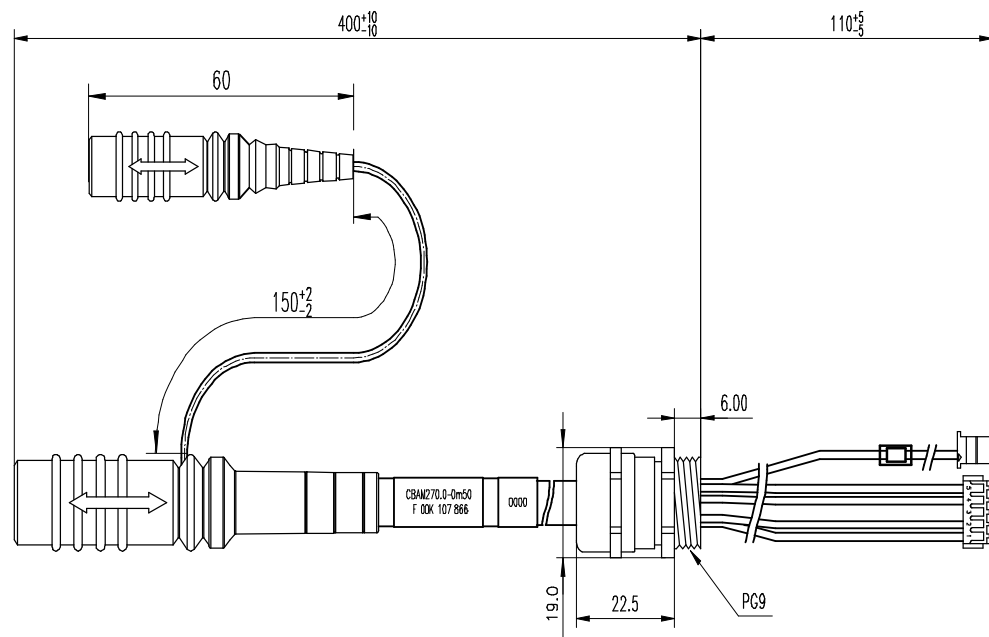


Fig. 8-32 CBAM270 Cable (0.5 m length)

8.16.5 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +125 °C

8.16.6 Ordering Information

Order Name	Short Name	Order Number
XETK ECU Adapter and Power Supply Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1BPHE - JST PHR (10fc-5fc) / Lemo 0BPHG - JST PAP (2fc-2fc), 0m50	CBAM270.0-0m5	F 00K 107 866
XETK ECU Adapter and Power Supply Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1BPHE - JST PHR (10fc-5fc) / Lemo 0BPHG - JST PAP (2fc-2fc), 0m70	CBAM270.0-0m7	F 00K 108 479

8.17 K70.1 Cable

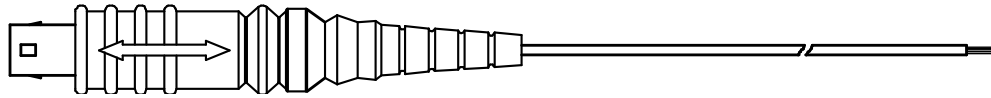


Fig. 8-35 K70.1 Cable

8.17.1 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 !

8.17.2 Mechanical Dimensions

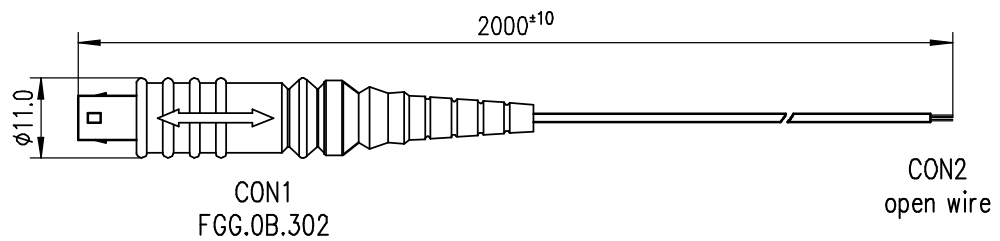


Fig. 8-36 K70.1 Cable Dimensions

Dimension	Millimeters	Inches
A	2000	78.74

8.17.3 Wiring

Wiring using K70.1 with KA50 Cable

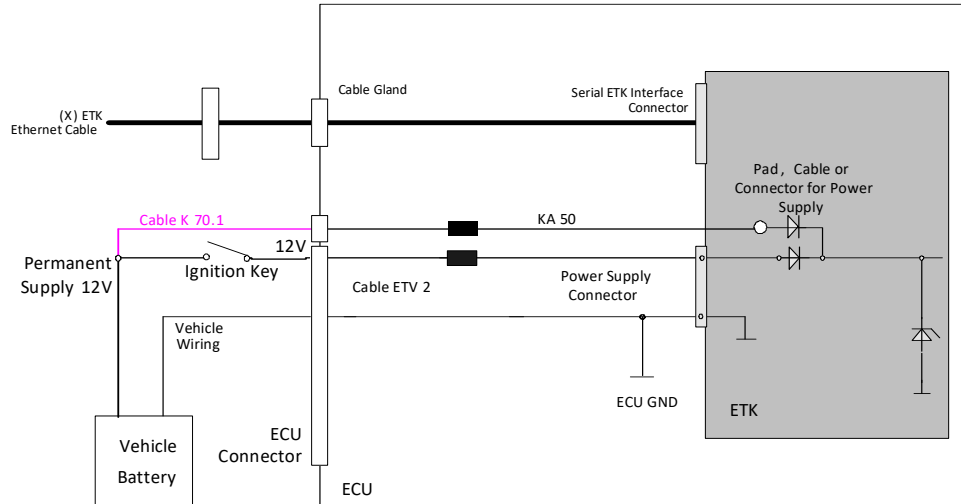


Fig. 8-37 Wiring using K70.1 Cable with KA50 Cable

Wiring using ETK Pig Tail

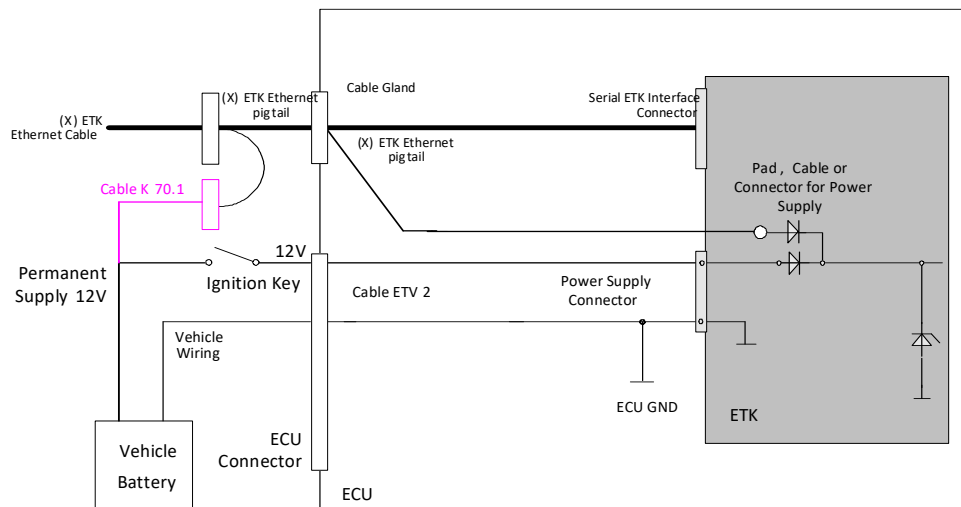


Fig. 8-38 Wiring using K70.1 Cable with ETK Pig Tail (external Power Supply)

8.17.4 Temperature Range

Condition	Temperature Range
Operating temperature	-40 °C to +120 °C, litz wire up to 150 °C

8.17.5 Ordering Information

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

8.18 KA50 Cable



Fig. 8-39 KA50 Power Supply Cable

8.18.1 Usage

External power supply cable for ETKs. It is used for ETKs without permanent power supply inside the ECU. Counterpart is the K70 cable. Using the cable with an ETK with solder pad for the additional UBat input, cut the power connector and solder the wire direct to the solder pad.

i **NOTE**

For safety reasons it is recommended to connect the external permanent voltage and the switched voltage inside the ECU.

8.18.2 Mechanical Dimensions

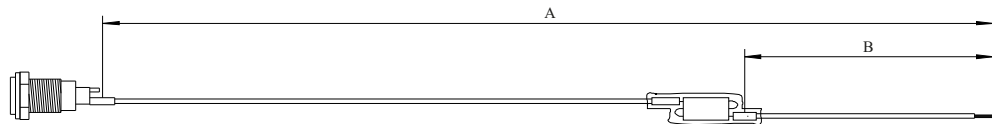


Fig. 8-40 KA50 Cable Dimensions

Dimension	Millimeters	Inches
A	200	7.87
B	50	1.97

8.18.3 Wiring

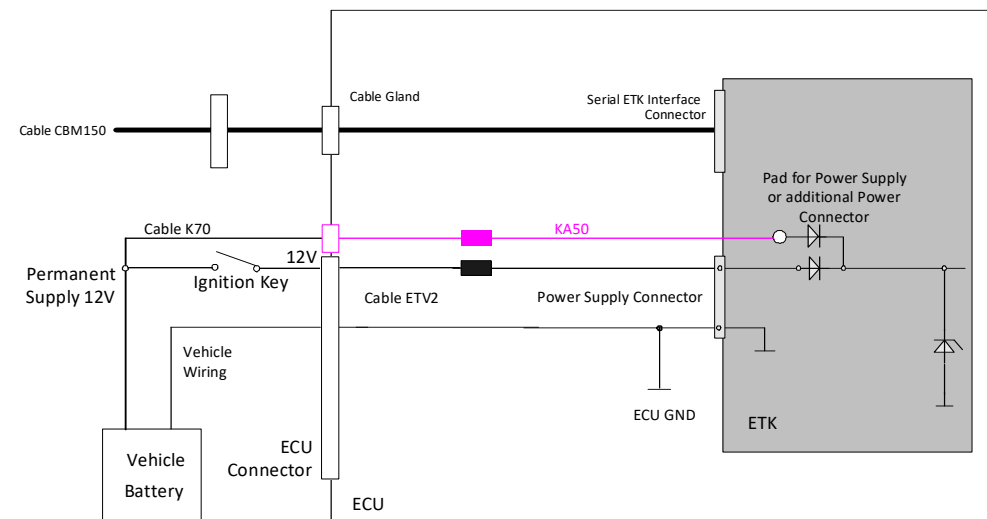


Fig. 8-41 Wiring using K50 Cable with K70.1 Cable

8.18.4 Ordering Information

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

9 Ordering Information

9.1 XETK-S30.0

Order Name	Short Name	Order Number
XETK-S30.0C Emulator Probe for the Infineon AURIX MCU family	XETK-S30.0C	F 00K 109 303
Package Contents		
<ul style="list-style-type: none"> - XETK-S30.0C Emulator Probe for the Infineon AURIX MCU family, - List "Content of this Package", - ETK Safety Advice, including China RoHS leaflet 		

9.2 Cables and Adapter



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.

Please contact your local ETAS representative for further cable information.

9.3 XETK - ECU Adapter

Order Name	Short Name	Order Number
ETAM2 XETK/FETK ECU Adapter, MOLEX - open wires (6fc - 6c), 0m25	ETAM2	F 00K 109 306
ETAM3 XETK/FETK ECU Adapter, SAMTEC FFSD - SAMTEC SFM (10fc - 10fc), 0m11	ETAM3	F 00K 109 673
ETAM5 FETK ECU Adapter, MOLEX - MOLEX (6fc - 5fc+1c), 0m136	ETAM5	F 00K 110 101
ETAM9 F/XETK-S ECU Adapter, MOLEX - MOLEX (6fc - 5fc), 0m136	ETAM9	F 00K 111 043
ETAM10 F/XETK-S ECU Adapter, MOLEX - MOLEX (6fc - 6fc), 0m07	ETAM10	F 00K 111 814
MOLEX - MOLEX (6fc - 6fc) adapter cable ETAM12 (0,1 m / 0,33 ft) for connecting an F/XETK to the ECU	ETAM12	F 00K 112 457

9.3.1 ECU Adapter Cables



NOTE

The hardware for mounting ECU adapter cable CBAM240.1 is not included in the cable delivery, they need to be ordered separately. For detailed information on mounting accessories contact ETAS technical support.

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
XETK ECU Adapter Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1B PHE - JST PHR (10fc-5fc), 0m50	CBAM271.0-0m5	F 00K 107 867

9.3.2 Combined ECU Adapter and Power Supply Cables

Order Name	Short Name	Order Number
XETK ECU Adapter and Power Supply Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1B PHE - JST PHR (10fc-5fc) / Lemo 0B PHG - JST PAP (2fc-2fc), 0m50	CBAM270.0-0m5	F 00K 107 866
XETK ECU Adapter and Power Supply Cable, pre-assembled into PG9 screwing, shield on ECU-Housing, Lemo 1B PHE - JST PHR (10fc-5fc) / Lemo 0B PHG - JST PAP (2fc-2fc), 0m70	CBAM270.0-0m7	F 00K 108 479

9.3.3 Ethernet Cables

PC Interface 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
Ethernet Connection Adapter Cable 1 Gbit/s, Lemo 1B PHE - RJ45 (10fc- 8mc), 1m2	CBAE200-1m20	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

9.3.4 Power Supply Cables

Order Name	Short Name	Order Number
External Power Supply Cable for ETKs, Lemo 0B FGG - open wire (2mc-1c), 2m	K70.1	F 00K 109 270
XETK Power Supply Cable for External Supply, with Filter Coil, Lemo 0B EGG - open wire (2fc-1c), 0m2	KA50	F 00K 000 940

9.4 Power Supply

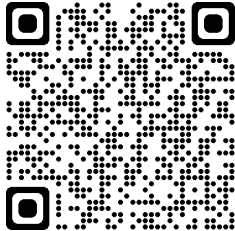
Order Name	Short Name	Order Number
Isolated Power Supply Interface for XETK	ETP2	F 00K 104 010

10 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/en/hotlines.php



ETAS Headquarters

ETAS GmbH

Borsigstraße 24
70469 Stuttgart
Germany

Phone: +49 711 3423-0
Fax: +49 711 3423-2106
Internet: www.etas.com

Figures

Fig. 1-1	WEEE-Symbol	12
Fig. 2-1	XETK-S30.0	14
Fig. 3-1	XETK-S30.0 Architecture	16
Fig. 3-2	Location of the ECU Interfaces CON2 and CON4	18
Fig. 3-3	ETAM3 Adapter mounted at the ECU Interface CON2	18
Fig. 3-4	Location of the XETK Ethernet Interface connector (CON1)	19
Fig. 3-5	Location of the XETK-S30.0 Power Supply Connectors	20
Fig. 3-6	Equivalent Circuitry of the ECU DAP Interface (ECU)	24
Fig. 4-1	XETK-S30.0 Connection to the ECU	27
Fig. 4-2	XETK-S30.0 Connection to the ECU	28
Fig. 4-3	Wiring - XETK Ethernet Interface	29
Fig. 4-4	Permanent Power Supply inside ECU available	30
Fig. 4-5	Permanent Power Supply inside ECU not available	31
Fig. 4-6	Isolated Power Supply inside ECU	31
Fig. 7-1	XETK-S30.0 Interface Location	43
Fig. 7-2	XETK Ethernet Interface Connector CON1 Location	43
Fig. 7-3	ECU Interface Connector CON2 Location	44
Fig. 7-4	VDDSTBY_SENSE Connector CON3 Location	44
Fig. 7-5	Power Supply Connector CON4 Location	45
Fig. 7-6	XETK-S30.0 Dimensions - Top View (1)	46
Fig. 7-7	XETK-S30.0 Dimensions - Top View (2)	47
Fig. 7-8	XETK-S30.0 Dimensions - Side View	47
Fig. 7-9		47
Fig. 8-1	CBAM230 Cable	49
Fig. 8-2	CBAM230 Cable Dimensions	49
Fig. 8-3	Dimension Panel Cut-Out	49
Fig. 8-4	Lemo Spanner	49
Fig. 8-5	CBAM240 Cable	51
Fig. 8-6	CBAM240 Cable Dimensions	51
Fig. 8-7	Long Thread	51
Fig. 8-8	Short Thread	52
Fig. 8-9	CBAM271 Cable	53
Fig. 8-10	CBAM271 Cable Dimensions	53
Fig. 8-11	FETK/ XETK - ECU Adapter ETAM2	54
Fig. 8-12	ETAM2 Connector	54
Fig. 8-13	ETAM3 ECU Adapter	55
Fig. 8-14	ETAM3 Adapter (top view)	55

Fig. 8-15	ETAM3 Adapter (side view)	55
Fig. 8-16	ETAM3 Adapter (pin numbering)	55
Fig. 8-17	FETK/ XETK - ECU Adapter ETAM5	57
Fig. 8-18	FETK/ XETK - ECU Adapter ETAM5	57
Fig. 8-19	FETK/ XETK - ECU Adapter ETAM9	59
Fig. 8-20	FETK/ XETK - ECU Adapter ETAM10	60
Fig. 8-21	ETAM10 Adapter Dimensions	60
Fig. 8-22	FETK / XETK - ECU Adapter ETAM12	62
Fig. 8-23	ETAM12 Adapter Dimensions	62
Fig. 8-24	CBE200 Cable	64
Fig. 8-25	CBAE200 Cable	65
Fig. 8-26	CBAE200 Cable Dimensions	65
Fig. 8-27	CBE230 Cable	66
Fig. 8-28	CBE230 Cable Dimensions	66
Fig. 8-29	CBAE330 Cable	67
Fig. 8-30	CBAE330 Cable Dimensions	67
Fig. 8-31	CBAM270 Cable	68
Fig. 8-32	CBAM270 Cable (0.5 m length)	68
Fig. 8-33	CBAM270 Cable (0.7 m length)	69
Fig. 8-34	Wiring: Permanent Power Supply inside ECU not available	69
Fig. 8-35	K70.1 Cable	71
Fig. 8-36	K70.1 Cable Dimensions	71
Fig. 8-37	Wiring using K70.1 Cable with KA50 Cable	72
Fig. 8-38	Wiring using K70.1 Cable with ETK Pig Tail (external Power Supply)	72
Fig. 8-39	KA50 Power Supply Cable	73
Fig. 8-40	KA50 Cable Dimensions	73
Fig. 8-41	Wiring using K50 Cable with K70.1 Cable	73

Index

A	
Adapter	
ETAM10	60
ETAM12	62
ETAM2	54, 57
ETAM3	55
ETAM5	57
ETAM9	59
Applications	14
Architecture	16
B	
Blockdiagram	16
C	
Cable	
CBAE330	67
CBAM230	49
CBAM240	51
CBAM270	68
CBAM271	53
CBE200-x	64
CBE230	66
Overview and Classification	48
Power Supply	76, 77
Configuration	37
Parameter	33
Connector	
Power Supply	20
XETK Ethernet Interface	19
D	
DAP Interface	24
Data	
Emulation	22
Emulation Memory	37
Measurement	22
Measurement Memory	37
E	
ECU Interface	18
ECU Voltage Supervisor	21
Electrical Characteristics	42
Emulation Data	22
Environmental Conditions	38
Ethernet Interface	19
ETK Configuration	32
F	
Features	15
H	
Hardware Description	16
I	
Identifications on the product	11
Interface	
ECU	18
Introduction	14
Isolated Power Supply	31
L	
LED	22
M	
Measurement	
Data	22
Data Memory	37
Mechanical Dimension	46
O	
Ordering Information	75
P	
Parameter	
Configuration	33
PC Network Adapter	35
Pin Assignment	43
Power Supply	20, 21, 30, 77
Cable	76, 77
Connector	20
Product Back	12
R	
REACH regulation (EU)	13
Recycling	12
Reset	26
RoHS conformity	
China	13
European Union	12
S	
Software Support	36
Status LED	22
System Requirements	35
T	
Test Characteristics	40
Troubleshooting	34
U	
UKCA conformity	12
V	
Voltage Supervisor	21
W	
Waste Electrical and Electronic Equipment	12
WEEE	12
WEEE take-back system	12
X	
XETK Ethernet Interface	19