ETK-S1.1
Emulator Probe for Serial Debug Interfaces
Data Sheet

Copyright

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

1.1.1 Product Liability Disclaimer (ETAS Disclaimer)

> **WARNING!**
>
> *The use and application of this product can be dangerous. It is critical that you carefully read and follow the instructions and warnings below and in the associated user manuals.*

This ETAS product enables a user to influence or control the vehicle's electronic systems. THE PRODUCT IS SPECIFICALLY DESIGNED FOR THE EXCLUSIVE USE BY PERSONNEL WHO HAVE SPECIAL EXPERIENCE AND TRAINING.

Improper use or unskilled application of this ETAS product may alter the vehicle performance in a manner that results in death, serious personal injury or property damage.

- **DO NOT USE THIS ETAS PRODUCT IF YOU DO NOT HAVE THE PROPER EXPERIENCE AND TRAINING.**

- **IT IS RECOMMENDED THAT IN-VEHICLE USE OF THE ETAS PRODUCT BE CONDUCTED ON ENCLOSED TEST TRACKS.**

- **USE OF THIS ETAS PRODUCT ON A PUBLIC ROAD SHOULD NOT OCCUR UNLESS THE SPECIFIC CALIBRATION AND SETTINGS HAVE BEEN PREVIOUSLY TESTED AND VERIFIED AS SAFE.**

- **WHEN USING THIS ETAS PRODUCT WITH VEHICLE SYSTEMS THAT INFLUENCE VEHICLE BEHAVIOR AND CAN AFFECT THE SAFE OPERATION OF THE VEHICLE, YOU MUST INSURE THAT THE VEHICLE CAN BE TRANSITIONED TO A SAFE CONDITION IF A MALFUNCTION OR HAZARDOUS INCIDENT SHOULD OCCUR.**

- **ALL LEGAL REQUIREMENTS, INCLUDING REGULATIONS AND STATUTES REGARDING MOTOR VEHICLES, MUST BE STRICTLY FOLLOWED WHEN USING THIS PRODUCT.**

IF YOU FAIL TO FOLLOW THESE INSTRUCTIONS, THERE IS A RISK OF DEATH, SERIOUS INJURY OR PROPERTY DAMAGE.

Any data acquired through the use of this ETAS product must be verified for reliability, quality and accuracy prior to use or distribution. This applies both to calibration data and to measurements that are used as a basis for calibration work.

THE ETAS GROUP OF COMPANIES AND THEIR REPRESENTATIVES, AGENTS AND AFFLICATED COMPANIES DENY ANY LIABILITY FOR THE FUNCTIONAL IMPAIRMENT OF ETAS PRODUCTS IN TERMS OF FITNESS, PERFORMANCE AND SAFETY IF NON-ETAS SOFTWARE OR MODEL COMPONENTS ARE USED WITH ETAS PRODUCTS OR DEPLOYED TO ACCESS ETAS PRODUCTS. ETAS PROVIDES NO WARRANTY OF MECHANTABILITY OR FITNESS OF THE ETAS PRODUCTS IF NON-ETAS SOFTWARE OR MODEL COMPONENTS ARE USED WITH ETAS PRODUCTS OR DEPLOYED TO ACCESS ETAS PRODUCTS.

THE ETAS GROUP OF COMPANIES AND THEIR REPRESENTATIVES, AGENTS AND AFFILIATED COMPANIES SHALL NOT BE LIABLE FOR ANY DAMAGE OR INJURY CAUSED BY IMPROPER USE OF THIS PRODUCT. ETAS PROVIDES TRAINING REGARDING THE PROPER USE OF THIS PRODUCT.

Also, if a product issue develops, ETAS will prepare a Known Issue Report (KIR) and post it on the internet. The report includes information regarding the technical impact and status of the solution. Therefore you must check the KIR applicable to this ETAS product version and follow the relevant instructions prior to operation of the product.

The Known Issue Report (KIR) can be found here:

http://www.etasgroup.com/kir

If you cannot agree with these limitations, you may return this product free of charge within a (1) month after receipt. You will immediately be refunded the full purchase price.

1.1.2 Correct Use

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

1.1.3 Labeling of Safety Instructions

The safety instructions contained in this manual are shown with the standard safety symbol shown in Fig. 1-1.

Fig. 1-1   Standard Safety 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.

1.1.4 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 5.1 on page 27).
- Ensure you adhere to the port and setting values (see section 5.6 on page 31).

CAUTION!

The ETK can be damaged or destroyed!
Some components of the ETK board may be damaged or destroyed by electrostatic discharges. Please keep the ETK 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 ETK!
When you mount the ETK to the ECU, you must ensure that the screws and washers used will not penetrate the ETK 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 10) 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 Program, contact the ETAS sales and service locations (see chapter 8 on page 55).

1.3 About This Manual

This manual describes the startup and technical data of the ETK-S1.1 Emulator Test Probe.

1.3.1 Structure

This manual consists of eight 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 ETK-S1.1 Interface Board (ETK = Emulator Test Probe).

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

  In the "Hardware Description" chapter the function blocks and the interfaces of the ETK-S1.1 are explained in detail.

- **Chapter 4: "Installation"**

  The "Installation" chapter describes the hardware installation of the ETK-S1.1.

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

  The "Technical Data" chapter contains a summary of all technical data and pin assignments of the ETK-S1.1.

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

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

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

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

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

1.3.2 Using this Manual

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 Overview

This section contains information about the basic features and applications of the ETK-S1.1 ETK Interface Board (ETK = Emulator Test Probe),

2.1 Applications

The ETK-S1.1 is an emulator probe for 2.5 V, 3.3 V and 5 V systems with a debug interface. It can support different microcontroller families. The ETK-S1.1 is configurable for unidirectional (JTAG) or bi-directional (AUD) microcontroller debug interfaces:

ETK-S1.1 Version	Serial Interface
ETK-S1.1B	Renesas JTAG interface with extended M32R debug functions
ETK-S1.1C	Infineon JTAG interface with extended debug functions (Infineon Cerberus)
ETK-S1.1D	Renesas Advanced User Debugger (AUD) interface with a 4-bit bi-directional data bus

2.2 Features

- Debug interface clock speed:
    - ETK-S1.1B: 10 MHz
    - ETK-S1.1C: 20 MHz
    - ETK-S1.1D: 10 MHz
- MCU capability of internal Flash emulation can be used
- Special startup protocol for ETK recognition and starting activation
- Serial interface for application system:
    - ETK-S1.1B: 8 MBit/s serial interface to (former) application system for M32170F6, 100 MBit/s serial interface to application system for all supported microcontrollers
    - ETK-S1.1C: serial interface with 8 MBit/s for application system, prepared for 100 MBit/s interface
    - ETK-S1.1D: 8/100 Mbit/s serial interface
- Coldstart functionality will be supported (refer to notes in chapter "System Requirements" on page 27)
- Permanent storage of multiple configurations for different microcontroller types

- Updates (programming of logic devices) through software; removal of ETK or ECU not necessary
- Selectable 2.5 V, 3.3 V and 5 V ECU interface voltage levels
- Power supply: 4.3 V to 18 V DC
- Temperature range: - 40 °C to +110 °C
- Mounting possibilities inside or on top of ECU
- Dimensions: 63 x 40 x 10 mm

3 Function

In this chapter, the individual function blocks of the ETK-S1.1 are explained in detail.

3.1 Architecture

The ETK-S1.1 is an emulator probe for calibration and data measurement via the debug interface by using the capabilities and resources of the microcontroller. The microcontroller can communicate with the memories or peripheral components of the development ECU. The ETK-S1.1 is connected to the serial debug and test interface of the microcontroller (JTAG/AUD). It converts these interface to the serial ETK interface and extends in this way the length of the connection line. The serial interface provides communication with the calibration and development system.

Fig. 3-1 on page 15 shows the block diagram which illustrates the ETK-S1.1D functional blocks.
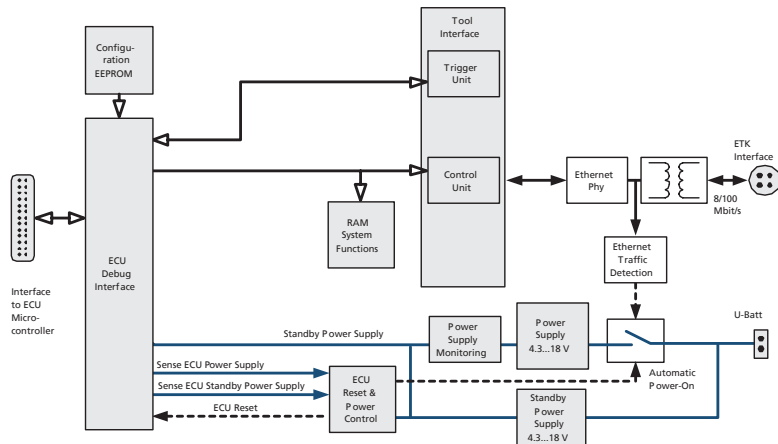

Fig. 3-1   ETK-S1.1 Architecture

The ETK-S1.1 consists of the blocks listed below. For a more detailed description of each block the user is referred to the corresponding chapters:

- for ECU Interface see section 3.2 on page 16
- for Configuration EEPROM see section 3.4 on page 17
- for Power Supply and ECU Voltage Supervisor see section 3.5 on page 17

- for Serial Interface see section 3.3 on page 17

Additionally the user is referred to the following chapter:

- for ETK Recognition and Data Acquisition see section 3.8 on page 19

The System Functions RAM are neither visible for the ECU nor for the software user. These blocks are reserved for internal use of the ETK-S1.1.

> **Note**
>
> *For integrating a serial ETK within the ECU please refer ETAS document "Application notes for serial ETKs".*

3.2 ECU Interface

The ETK-S1.1 is connected to the ECU via an adapter cable with up to 26 pins. The pin definition depends on the application and the used microcontroller type. In general the ECU interface consists of

- 2 ECU voltage lines, which are not used for ETK power supply but only for detection of the ECU status, therefore the power consumption on these lines is negligible (for a more detailed description the user is referred to section 3.5 on page 17)
- 2 Data Acquisition Interupt lines (DAI lines) which are used for ETK recognition at startup and for Data Acquisition (for a more detailed description the user is referred to section 3.8 on page 19)
- 1 Reset line which allows the ETK to control the system reset of the ECU
- Up to 9 Debug Interface lines for the communication between the ETK-S1.1 and the microcontroller
- 12 ground lines for a proper shielding of the ECU interface lines.

The ECU interface can be flexibly configured for several applications. For a firmware update, it is not necessary to unmount or disconnect the ETK-S1.1 from the ECU.

For currently supported microcontrollers refer to chapter "Supported Microcontroller" on page 29.

3.3 Serial ETK Interface

The serial ETK interface creates the link to the calibration and development system (connector C0103 in Fig. 5-4 "Connector Layout").

For ETAS hardware supporting the serial ETK interface refer to chapter "System Requirements" on page 27.

3.4 Configuration EEPROM

The Configuration EEPROM of the ETK is for the permanent storage of ETK-related and project-related data. For example if the MCU is capable of internal flash emulation the emulation parameters are stored in the Configuration EEPROM. Generating a valid configuration data set is supported by the "ETK Configuration Tool". The "ETK Configuration Tool" contains information on all available ETKs. The user of the "ETK Configuration Tool" is supported by a Graphical User Interface.

The "ETK Configuration Tool" can create the following output:

1. Direct ETK configuration
2. ETK_CFG section for the ECU description database (ASAM-MCD-2MC)

3.5 Power Supply

The ETK-S1.1 is directly powered from the vehicle battery (permanent power supply, connector C0102 in Fig. 5-4 "Connector Layout").

The input voltage can vary from 4,3 V to 18 V. In case of higher input voltages (e.g. HGV) to the ETK, an additional voltage converter is required. The required ETK-voltages are generated by a switching power supply which minimizes heat build-up and power consumption. The power supply of the ECU is not affected by the ETK-S1.1. An automatic power save mode ensures that the power consumption during standby is reduced considerably.

3.6 ECU Voltage Supervisor

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

3.7 Status LEDs

There are three LEDs displaying the operating status of the ETK-S1.1 (Fig. 3-2 on page 18).

| LED	State	Meaning
Red	On	ETK-S1.1 is supplied with power and either the ECU is switched on and/or the calibration and development system is connected and ready to communicate with the ETK-S1.1
Green	Off	Working page accessible
	On	Power supply of the ECU was disturbed with following consequences: - ECU RAM content is damaged - ECU is running from the reference page (ECU - flash), switching to the working page about the calibration software INCA is not possible
	Blinking	- ETK is in configuration mode (ex-factory state) - After first initialization with the calibration software INCA blinking stops
Yellow	On	ETK-S1.1 is using the 100 Mbit/s interface protocol
	Off	ETK-S1.1 is using the 8 Mbit/s interface protocol
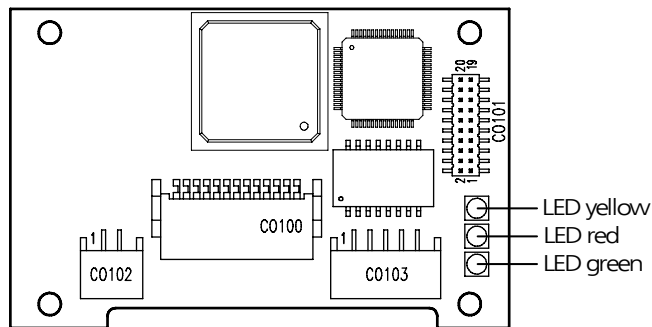
Fig. 3-2   Location of Status LEDs

3.8 ETK Recognition and Data Acquisition

The 2 DAI lines are used for data acquisition interrupts (so-called triggers) and ETK recognition. Immediately after power-up or an ECU reset the ETK-S1.1 notifies the ECU of the presence of an ETK. The ECU then automatically acknowledges the notification and the ETK returns to standard mode where the DAI lines are used for data acquisition interrupts. The details of this startup protocoll are microcontroller-specific.

> **Note**
>
> *Nevertheless, if it is intended that the ECU code runs independent from whether an ETK is present or not, the ECU code may also ignore the startup procedure.*

3.8.1 Prerequisites for proper Operation
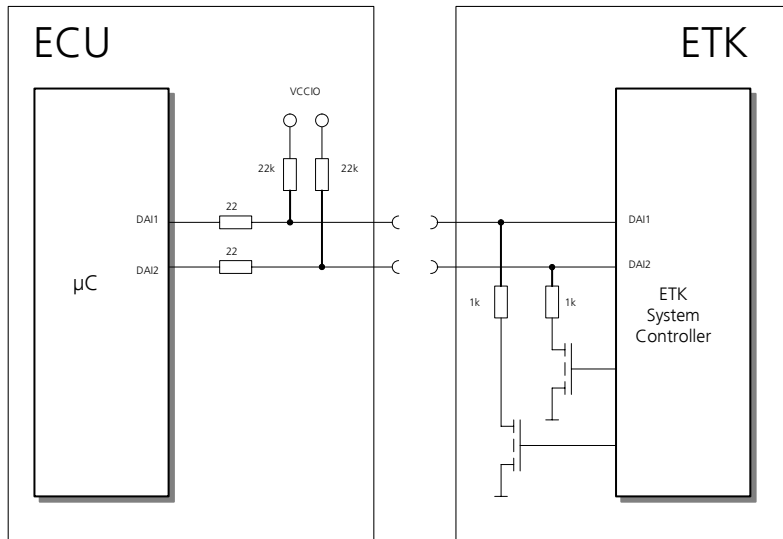

Fig. 3-3   Equivalent Circuitry of the DAI Interface

To ensure proper operation of the startup protocol between ECU and ETK the circuitry has to respect the following topics:

- Insert 22 kOhm pullup resistors and 22 Ohm series resistors on each of the 2 DAI signals (refer to Fig. 3-3).

- Connect the calibration RAM Standby power supply to the ETK connector to be monitored by the ETK.

- DAI1 and DAI2 must be general purpose I/O pins of the microcontroller that are configured to inputs by any reset.

- DAI1 and DAI2 must be configurable as outputs.

- Any reset of the microcontroller must be visible on the ETK connector reset signal.

3.8.2 Phases of the Startup Protocol

During the startup phase the ETK and the ECU exhibit a well defined startup procedure.

The DAI1 signal is dedicated to ETK detection, i.e. the ETK pulls DAI1 low. If no ETK is connected, DAI1 will be pulled weakly high via the 22 kOhm pullup resistor on the ECU. The DAI2 signal is dedicated to signal an ECU Standby power fail of the calibration RAM. DAI2 high indicates that a powerfail occurred and that the calibration RAM has not been restored by the ETK, while DAI2 low indicates no powerfail.
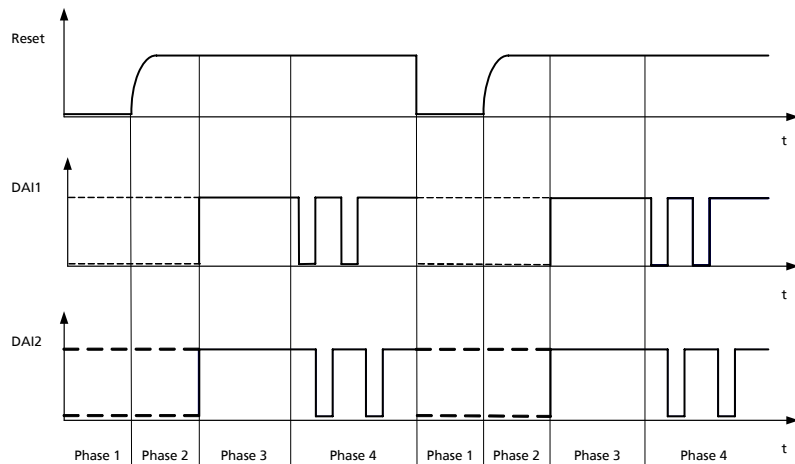
Fig. 3-4   Phases of the Startup Protocol

The four successive phases of the startup protocol are:

1. **Reset phase:** The ECU is in reset, the DAI ports are configured as inputs. The ETK pulls DAI1 low via 1 kOhm, DAI2 is pulled either weakly high (via the 22 kOhm pullup resistor) or low (via 1 kOhm).

2. **ECU Initialization phase:** The ECU performs internal initializations, the DAI ports are still inputs. The ETK behaviour is unchanged to the Reset phase.

3. **Initialization of ECU resources by ETK:** The ECU configures the DAI ports as outputs and drives a logical high to signal the transition from phase 2 to phase 3. Then the ETK removes any pulldown resistors and starts initialization of the ECU resources.

4. **Calibration and data acquisition:** The ECU pulls the appropriate DAI port low to signal a trigger condition to the ETK, i.e. a measurement raster is ready for acquisition.

4   Installation

In this chapter, the hardware installation of the ETK-S1.1 is described.

> ⚠️ **CAUTION!**
>
> ***The ETK can be damaged or destroyed!***
> *Some components of the ETK board may be damaged or destroyed by electrostatic discharges. Please keep the ETK 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.*

4.1   Connection to the ECU

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

For connecting the ETK-S1.1 to the ECU the ETK adapter ETAF1 or ETAF2 is recommended. It need to be ordered seperately (refer chapter "Ordering Information" on page 53). The suitable connector should have been populated onto the ECU PCB.
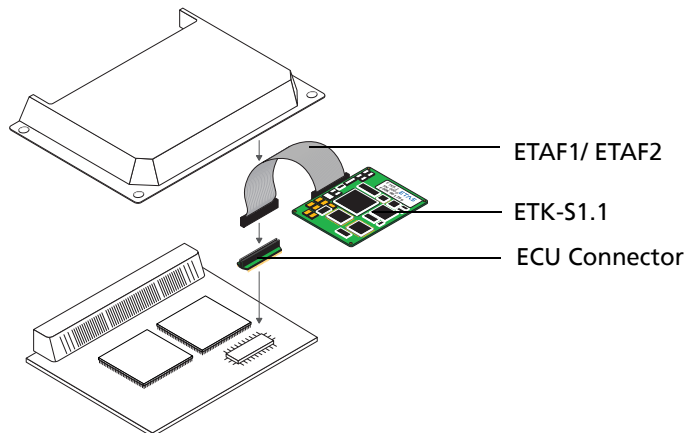
Fig. 4-1   ETK-S1.1 Connection to the ECU

4.2 Connecting to the Power Supply

The ETK-S1.1 needs a permanent power supply (refer chapter "Power Supply" on page 17). There are different versions to ensure it.

4.2.1 Permanent Power Supply inside ECU available

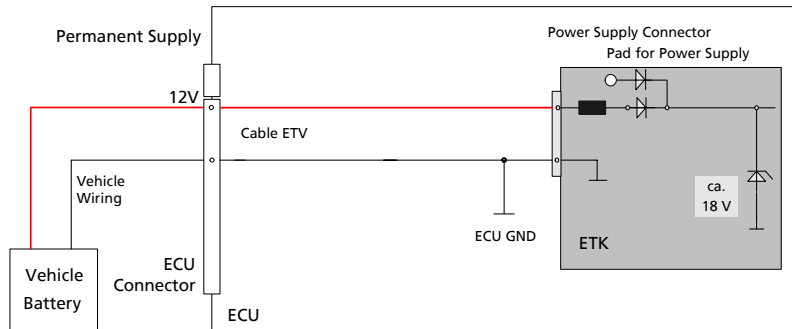**Fig. 4-2** Permanent Power Supply inside ECU available

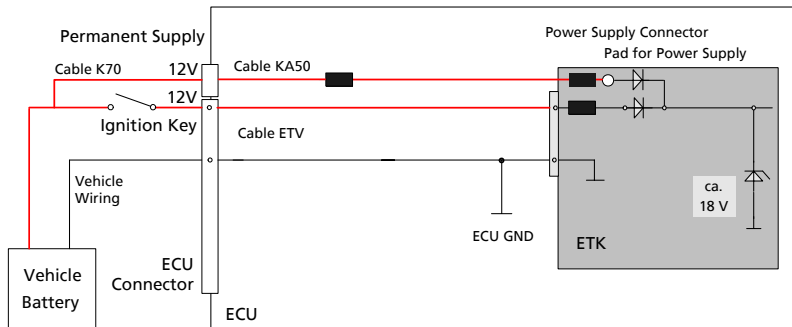### 4.2.2 Permanent Power Supply inside ECU not available

Fig. 4-3 Permanent Power Supply inside ECU not available

4.2.3 Isolated Power Supply inside ECU

The ETK-S1.1 does not require a galvanically isolated power supply. For special applications ETAS offers the isolated power supply ETP2.
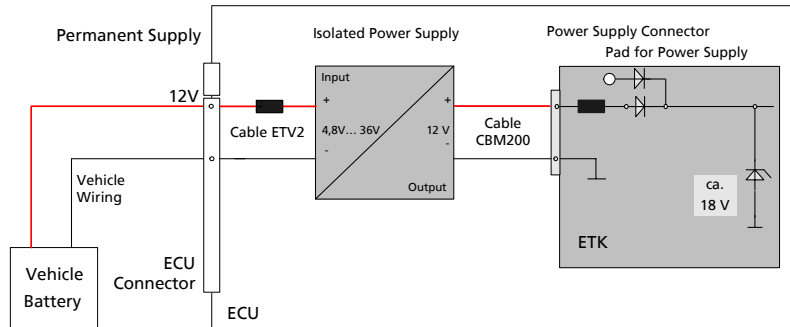

Fig. 4-4 Isolated Power Supply inside ECU

5 Technical Data

5.1 Environmental Conditions

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

5.2 System Requirements

This section tells you which hardware and software are needed to operate your ETK-S1.1.

> **Note**
>
> *Carefully check the software version numbers and cable names. Wrong software versions and cables could impair the proper functionality of your ETK-S1.1, damage the ETK-S1.1 and the connected devices.*

5.2.1 Software Support

You need following software versions to support the ETK-S1.1:

ETK-S1.1	Name	Needed Version	Remarks
ETK-S1.1B	HSP	V1.0	First version will support ETK-S1.1B
	INCA	V3.1.3	Basic mode
ETK-S1.1B	HSP	V2.2	Support coldstart [1]
	INCA	V4.0.3	Support coldstart [1]
ETK-S1.1B	HSP	V4.0	Support Renesas M32Fx microcontroller [2]
	INCA	V5.2.0	Support Renesas M32Fx microcontroller [2]
	ASCET-RP	V5.2	INCA in parallel to ASCET-RP V5; support Renesas M32Fx microcontroller [2]
ETK-S1.1C	HSP	V1.0	First version will support ETK-S1.1C
	INCA	V3.1.3	Basic mode
ETK-S1.1C	HSP	V2.2	Support coldstart [1]
	INCA	V4.0.3	Support coldstart [1]

ETK-S1.1	Name	Needed Version	Remarks
ETK-S1.1D	HSP	V1.0	First version will support ETK-S1.1D
	INCA	V3.1.3	Basic mode
	ASCET	V4.1.2	INCA in parallel to ASCET-SD V4.1.2; and TIPExp V4.3.0
ETK-S1.1D	HSP	V1.1	Support Renesas SH7058FCC microntroller and enable ETK-S1.1D2 configuration
	INCA	V3.2.2	Support Renesas SH7058FCC microntroller and enable ETK-S1.1D2 configuration
ETK-S1.1D	HSP	V4.1	Support Renesas SH7059FCC microntroller and enable ETK-S1.1D3 configuration
	INCA	V5.2.1	Support Renesas SH7059FCC microntroller and enable ETK-S1.1D3 configuration
ETK-S1.1D	HSP	V2.2	Support coldstart [1]
	INCA	V4.0.3	Support coldstart [1]
ETK-S1.1D	HSP	V2.2	Support Renesas SH7058RFCC microntroller and enable 100 MBit/s interface [3]
	INCA	V4.0.4	Basic, compatibility and advanced mode [3]

[1]: not supported by MAC2, ES1111
[2]: Renesas M32170 [F3/F4/F6], M32176 [F2/F3/F4], M32192 [F6]
(not supported by ES1000.2 + ES1200/1, ES1000.2/ES1000.3 + ES1200, ES1201, ES1231, and MAC2)
[3]: 100 MBit/s mode not supported by ES1111or ES1000.2 + ES1200/1, MAC2

5.2.2   Supported ETAS Hardware

Following ETAS hardware with ETK interface supports the ETK-S1.1:

Item	Characteristics
VME Hardware	ES1000.2/ES1000.3 with ES1232
Compact Hardware	ES59x, ES690

Note

See also chapter "Software Support" on page 27.

5.2.3 Not supported ETAS Hardware

Following ETAS hardware with ETK interface not supports the ETK-S1.1:

Item	Characteristics
VME Hardware	ES1000.1 with ES1111 and ES1200/ES1201; ES1000.2/ES1000.3 with ES1120 and ES1200/ES1201
Compact Hardware	MAC2

Note

See also chapter "Software Support" on page 27.

5.3 Supported Microcontroller

ETK-S1.1 Version	Supported microprocessors
ETK-S1.1B	Renesas M32170 [F3/F4/F6], Renesas M32176 [F2/F3/F4], Renesas M32186 [F8], Renesas M32192 [F6]
ETK-S1.1C	Infineon TC1775 (B-Step)
ETK-S1.1D1	Renesas SH7047F, Renesas SH7054F, Renesas SH7055F, Renesas SH7055MCM, Renesas SH7055MCM2, Renesas SH7058FCC, Renesas SH7058RFCC
ETK-S1.1D2	Renesas SH7058FCC with external RAM
ETK-S1.1D3	Renesas SH7059FCC

5.4 Configuration

Item	Characteristics
Configuration	Project-specific configuration for - different controllers or - memory configurations stored in EEPROM
Update	Logic devices updated through software

5.5 Serial ETK Interface

Item	Characteristics
Transmission performance (Serial ETK interface speed)	ETK-S1.1B: 8/ 100 Mbit/s
	ETK-S1.1C: 8 Mbit/s
	ETK-S1.1D1: 8/ 100 Mbit/s ETK-S1.1D2: 8 Mbit/s ETK-S1.1D3: 100 Mbit/s
Cable type	Double-shielded twisted-pair
Cable length	max. 30 m / 100 ft
Serial Interface	DC decoupling

5.6 Input/Output Pins - Operating Conditions

Type	Parameter	Conditions	Min	Max
Input	V_{IH}		2.0 V	5.3 V
	V_{IL}		-0.3 V	0.8 V
Output*	V_{OH} 5 V	I_{OH} = -24 mA	4.4 V	
	V_{OL} 5 V	I_{OL} = 24 mA		0.5 V
	V_{OH} 3.3 V	I_{OH} = -24 mA	2.4 V	
	V_{OL} 3.3 V	I_{OL} = 24 mA		0.5 V

> **Note**
>
> */SGRES: opendrain FET; I_{Dmax} = 0.2 A*

5.7 Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Permanent Power Supply from car battery	UBatt		4.3	12	18	V
Standby Current	ISTBY	U_{Batt1} = 12 V; ECU off; T = 20 °C		2	10	mA
Supply Current	IBatt	U_{Batt1} = 12 V; ECU on; T = 20 °C		90		mA

Parameter	Symbol	Nominal	off → on threshold	on → off threshold
Power Supply from ECU (sense)	USG	5 V 3.3 V 2.5 V	3.57 V 2.41 V 2.11 V	3.42 V 2.32 V 2.02 V
Permanent Power Supply from ECU (sense)	USG*	3.3 V 2.5 V	2.65 V 1.83 V	2.56 V 1.73 V

5.8   Mechanical Dimensions

5.8.1   ETK-S1.1
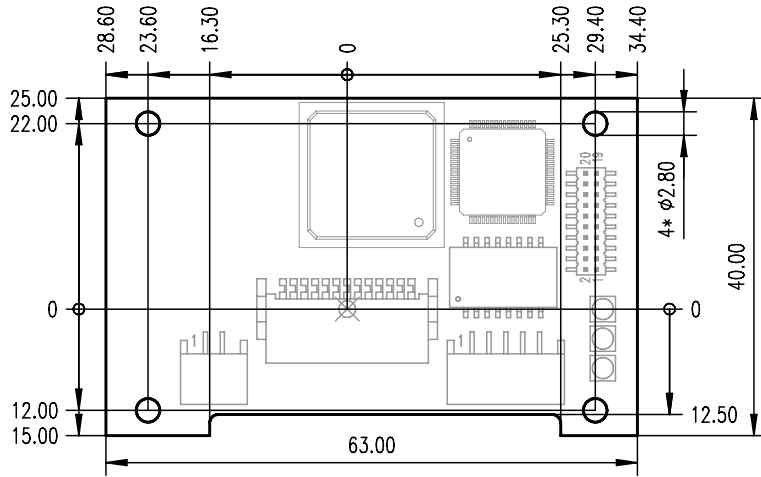
Fig. 5-1   ETK-S1.1 Dimensions - Top View

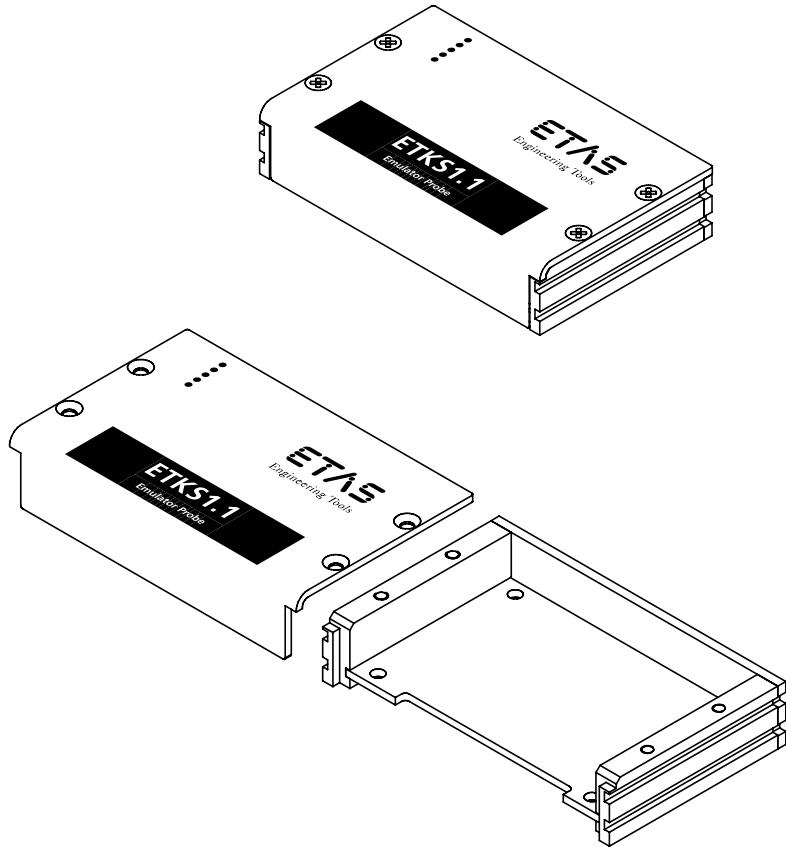| Dimensions	Millimeters	Inches
Length	63.0	2.481
Width	40.0	1.575
Height	max. 10.0	max. 0.394
Thickness of PCB	max. 1.7	max. 0.067
Height of components (upper side)	max. 6.0	max. 0.236
Height of components (lower side)	max. 2.0	max. 0.079

5.8.2 ETK-S1.1_H Case

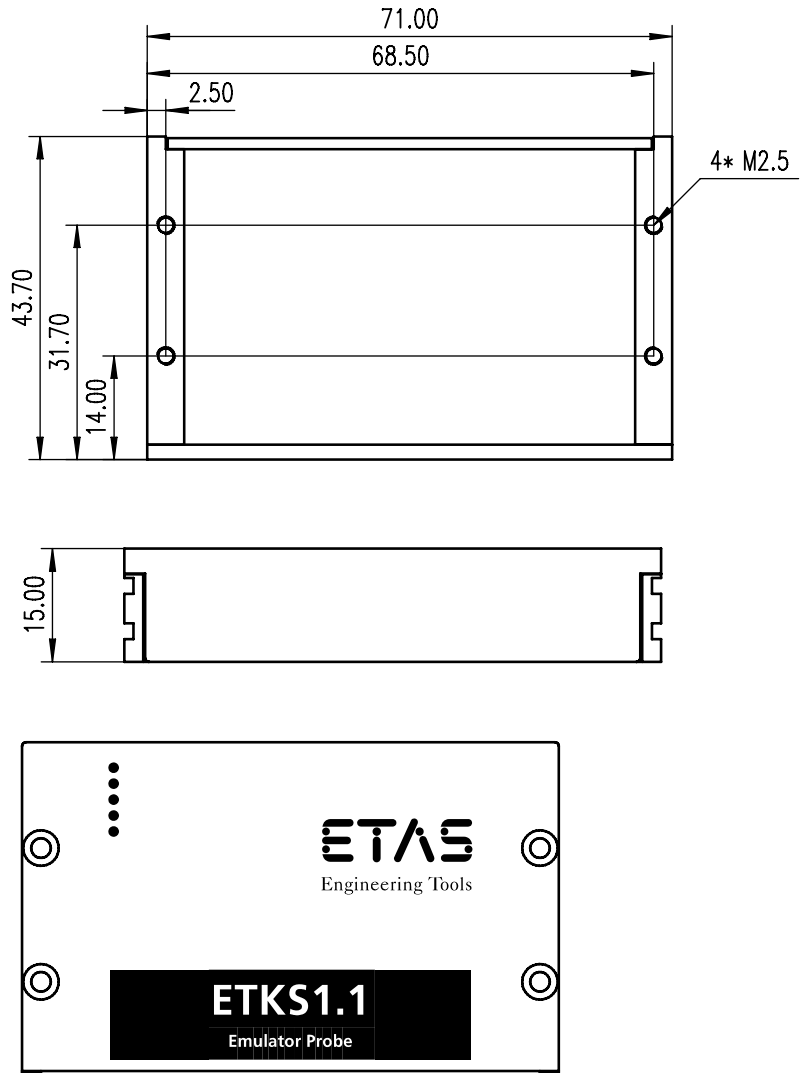

Fig. 5-2 ETK-S1.1_H Case

Fig. 5-3   ETK-S1.1_H Case Measurements
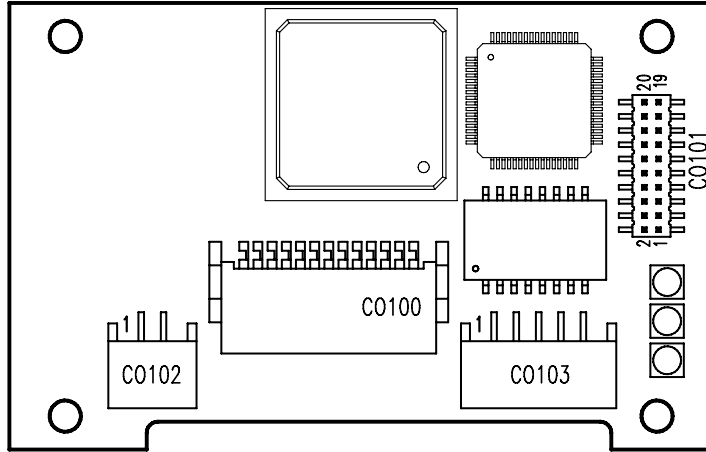
5.9 Interface Connectors

5.9.1 Connector Layout

Fig. 5-4   Connector Layout

Connector	Interface
C0100	ECU
C0101	Factory Test
C0102	ETK Power Supply
C0103	ETK Serial Interface

5.9.2   ECU Connector C0100 Pinout
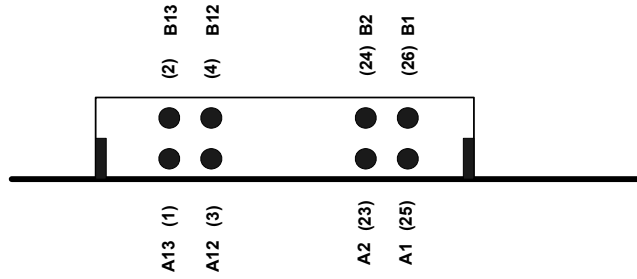
Fig. 5-5   ECU Connector Pinout, View to Pins

ETK-S1.1B			ERNI	Controller	
Pin	Signal	Description	Pin	Signal	Description
1	USG	Switched ECU Power Supply	A13	USG	Switched ECU Power Supply
2	USG*	Permanent ECU Power Supply	B13	USGSTBY	Permanent ECU Power Supply
3	DAI2	Data Acquisition Interrupt 2	A12	DAI2	Data Acquisition Interrupt 2
4	GND	Ground	B12	VSS	Ground
5	DAI1	Data Acquisition Interrupt 1	A11	DAI1	Data Acquisition Interrupt 1
6	GND	Ground	B11	VSS	Ground
7	DBI SDO	Debug Interface Serial Data Out	A10	JTDI, RTDRXD	JTAG Serial Input, Receive Debugger Data
8	GND	Ground	B10	VSS	Ground
9	DBI SDI	Debug Interface Serial Data In	A9	JTDO, RTDTXD	JTAG Serial Output, Transmit Debugger Data
10	GND	Ground	B9	VSS	Ground
11	DBI Reset	Debug Interface Reset	A8	JTRST	JTAG Test Reset
12	GND	Ground	B8	VSS	Ground
13	DBI Clock	Debug Interface Clock	A7	JTCK, RTDCLK	JTAG Clock, Clock Input Debugger
14	GND	Ground	B7	VSS	Ground
15	DBI Mode	Debug Interface Mode	A6	JTMS, RTDACK	JTAG Test Mode, Acknowledge Debugger
16	GND	Ground	B6	VSS	Ground
17	Reset	ECU Reset	A5	/SGRESET	ECU Reset
18	GND	Ground	B5	VSS	Ground

ETK-S1.1B			ERNI	Controller	
Pin	**Signal**	**Description**	**Pin**	**Signal**	**Description**
19	DBI Data0	Debug Interface Data0	A4	-	Reserved
20	GND	Ground	B4	VSS	Ground
21	DBI Data1	Debug Interface Data1	A3	-	Reserved
22	GND	Ground	B3	VSS	Ground
23	DBI Data2	Debug Interface Data2	A2	-	Reserved
24	GND	Ground	B2	VSS	Ground
25	DBI Data3	Debug Interface Data3	A1	-	Reserved
26	GND	Ground	B1	VSS	Ground

ETK-S1.1C

ETK-S1.1C			ERNI	Controller	
Pin	Signal	Description	Pin	Signal	Description
1	USG	Switched ECU Power Supply	A13	VCC	Switched ECU Power Supply
2	USG*	Permanent ECU Power Supply	B13	VDD	VDD (Permanent Power Supply)
3	DAI2	Data Acquisition Interrupt 2	A12	DAI2	Data Acquisition Interrupt 2
4	GND	Ground	B12	VSS	Ground
5	DAI1	Data Acquisition Interrupt 1	A11	DAI1	Data Acquisition Interrupt 1
6	GND	Ground	B11	VSS	Ground
7	DBI SDO	Debug Interface Serial Data Out	A10	TDI	JTAG Serial Data Input
8	GND	Ground	B10	VSS	Ground
9	DBI SDI	Debug Interface Serial Data In	A9	TDO	JTAG Module Serial Data Output
10	GND	Ground	B9	VSS	Ground
11	DBI Reset	Debug Interface Reset	A8	/TRST	JTAG Module Reset/ Enable Input
12	GND	Ground	B8	VSS	Ground
13	DBI Clock	Debug Interface Clock	A7	TCK	JTAG Module Clock Input
14	GND	Ground	B7	VSS	Ground
15	DBI Mode	Debug Interface Mode	A6	TMS	JTAG Module State Machine Control Input
16	GND	Ground	B6	VSS	Ground
17	Reset	ECU Reset	A5	/SGRESET	ECU Reset
18	GND	Ground	B5	VSS	Ground
19	DBI Data0	Debug Interface Data0	A4	-	Reserved

ETK-S1.1C			ERNI	Controller		
Pin	Signal	Description	Pin	Signal	Description	
20	GND	Ground	B4	VSS	Ground	
21	DBI Data1	Debug Interface Data1	A3	-	Reserved	
22	GND	Ground	B3	VSS	Ground	
23	DBI Data2	Debug Interface Data2	A2	-	Reserved	
24	GND	Ground	B2	VSS	Ground	
25	DBI Data3	Debug Interface Data3	A1	/OCDSE	OCDS Enable Input	
26	GND	Ground	B1	VSS	Ground	

ETK-S1.1D			ERNI	Controller	
Pin	Signal	Description	Pin	Signal	Description
1	USG	Switched ECU Power Supply	A13	USG	Switched ECU Power Supply
2	USG*	Permanent ECU Power Supply	B13	USGSTBY	Permanent ECU Power Supply
3	DAI2	Data Acquisition Interrupt 2	A12	DAI2	Data Acquisition Interrupt 2
4	GND	Ground	B12	VSS	Ground
5	DAI1	Data Acquisition Interrupt 1	A11	DAI1	Data Acquisition Interrupt 1
6	GND	Ground	B11	VSS	Ground
7	DBI SDO	Debug Interface Serial Data Out	A10	/AUDSYNC	AUD Sync Signal
8	GND	Ground	B10	VSS	Ground
9	DBI SDI	Debug Interface Serial Data In	A9	-	Reserved
10	GND	Ground	B9	VSS	Ground
11	DBI Reset	Debug Interface Reset	A8	/AUDRST	AUD Reset Input
12	GND	Ground	B8	VSS	Ground
13	DBI Clock	Debug Interface Clock	A7	AUDCK	AUD Clock
14	GND	Ground	B7	VSS	Ground
15	DBI Mode	Debug Interface Mode	A6	AUDMD	AUD Mode
16	GND	Ground	B6	VSS	Ground
17	Reset	ECU Reset	A5	/SGRESET	ECU Reset
18	GND	Ground	B5	VSS	Ground
19	DBI Data0	Debug Interface Data0	A4	AUDATA0	AUD Data0
20	GND	Ground	B4	GND	Ground

ETK-S1.1D			ERNI	Controller		
Pin	Signal	Description	Pin	Signal	Description
21	DBI Data1	Debug Interface Data1	A3	AUDATA1	AUD Data1
22	GND	Ground	B3	GND	Ground
23	DBI Data2	Debug Interface Data2	A2	AUDATA2	AUD Data2
24	GND	Ground	B2	VSS	Ground
25	DBI Data3	Debug Interface Data3	A1	AUDATA3	AUD Data3
26	GND	Ground	B15	VSS	Ground

Tab. 5-1   ECU Interface Connector Pin Description

5.9.3 ETK Power Supply Connector C0102 Pinout
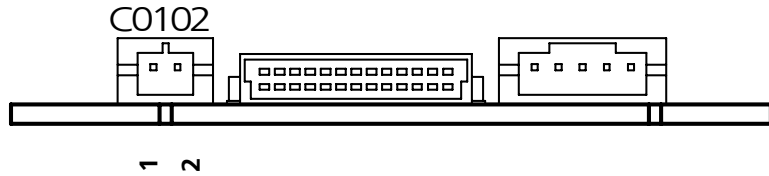
Fig. 5-6 Power Supply Connector C0102

Pin	Signal	Description
1	UBATT	Battery Supply Voltage for ETK
2	GND	Ground

Tab. 5-2 ETK Power Supply Connector C0102 Pin Description

6 Cables and Accessories

6.1 Interface Cables

6.1.1 Interface Cable KA54 (with PG Cable Gland)

> **Note**
>
> *Cable glands are not included in the delivery. Refer to the cable descriptions for manufacturers and order numbers.*

Interface Cable KA54, Proposal 1
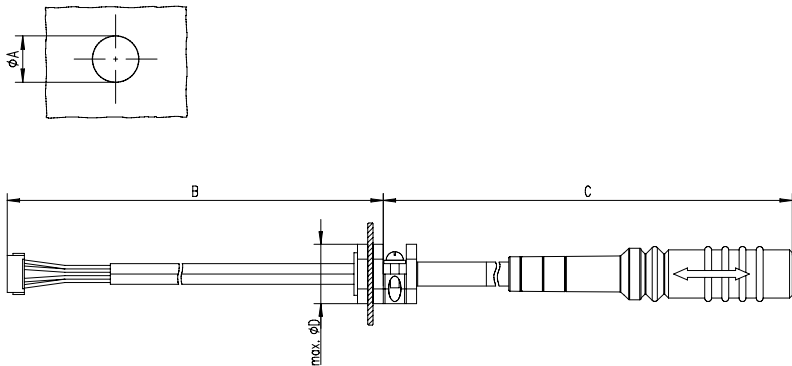
Fig. 6-1   Interface Cable KA54, Proposal 1

Dim	Millimeters	Inches	Dim	Millimeters	Inches
A	12.50	0.492	**C**	400.00	15.748
B	160.00	6.299	**D**	19.00	0.748

> **Note**
>
> *Shield **connected** to ECU housing.*

***SKINDICHT** compact screwing; **Manufacturer**: Lapp; **Description**: SH7; **Order-No.**: 5200 0830*

*Nut for compact screwing; **Manufacturer:** Lapp; **Description:** SM7; **Order-No.:** 5200 3490*

Fig. 6-2   Interface Cable KA54, Proposal 2

Dim	Millimeters	Inches
A	18.80	0.740
B	160.00	6.299
C	400.00	15.748
D	24.25	0.955
E	4.70	0.185
F	12.00	0.472
G	27.00	1.063

Note

*Shield **connected** to ECU housing.*

SKINTOP *compact screwing;* **Manufacturer:** *Lapp;* **Description:** *MS-SC 11 ;* **Order-No.:** *5311 2320*

Nut for compact screwing; **Manufacturer:** *Lapp;* **Description:** *SM-PE 11 ;* **Order-No.:** *5210 3220*

6.1.2   Interface Cable KA41

Interface Cable KA41, Proposal 1

Fig. 6-3   Interface Cable KA41, Proposal 1

Dim	Millimeters	Inches
A	13.90	0.547
B	12.30	0.484
C	140.00	5.512
D	20.00	0.787
E	16.20	0.636

Fig. 6-4   Interface Cable KA41, Proposal 2

Dim	Millimeters	Inches
A	12.10	0.476
B	10.60	0.417
C	140.00	5.512
D	20.00	0.787
E	16.20	0.636

Note

*Shield **connected** to ECU housing.*

6.1.3 Interface Cable KA55
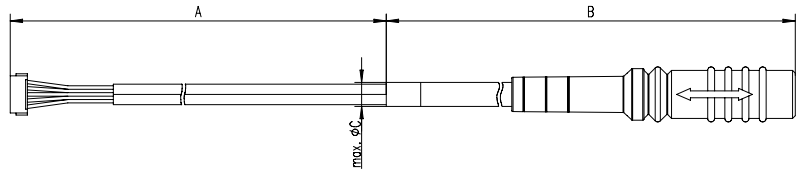
Fig. 6-5 Interface Cable KA55

Dim	Millimeters	Inches
A	160.00	6.299
B	400.00	15.748
C	9.00	0.3543

Note

*Strain relief on ECU cover necessary. Shield **not connected** to ECU housing.*

6.2 Power Supply Cables

6.2.1 Cable ETV
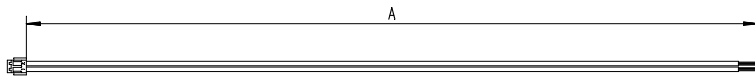
Fig. 6-6 Power Supply Cable ETV

Dim	Millimeters	Inches
A	190.00	7.480

6.2.2 Cable with Filtercoil ETV2
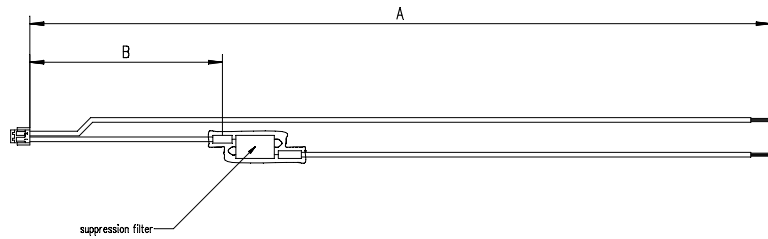
Fig. 6-7   Power Supply Cable with Filtercoil ETV2

Dim	Millimeters	Inches
A	190.00	7.480
B	50.00	1.969

6.2.3 Cable K70
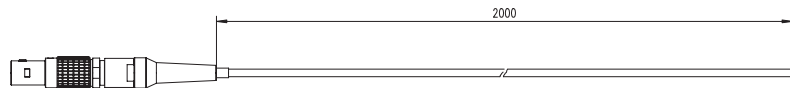
Fig. 6-8   Power Supply Cable K70

Dim	Millimeters	Inches
A	2000	78.74

6.2.4   Cable KA50
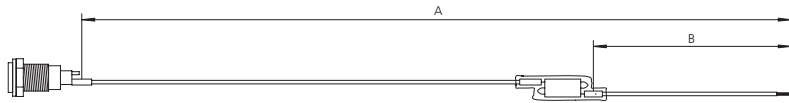
Fig. 6-9   Power Supply Cable KA50

Dim	Millimeters	Inches
A	200	7.87
B	50	1.97

6.2.5   Cable CBM200
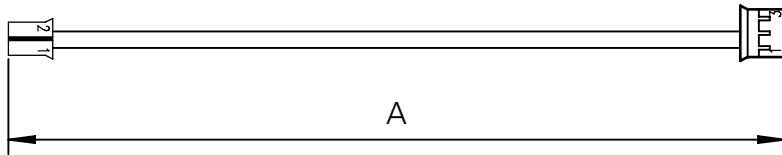
Fig. 6-10   Power Supply Cable CBM200

Dim	Millimeters	Inches
A	100	3.94

6.3 Adapters

6.3.1 ETK - ECU Adapter ETAF1
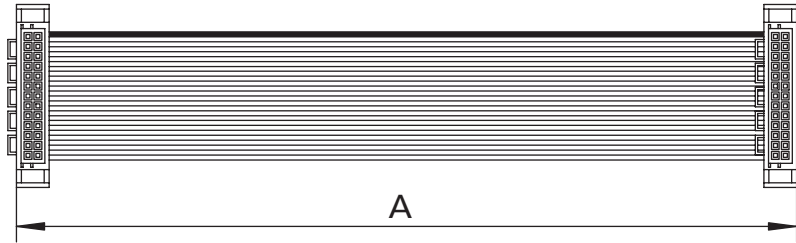
Fig. 6-11 ETK - ECU Adapter ETAF1

Dim	Millimeters	Inches
A	100.00	3.94

7 Ordering Information

7.1 ETK-S1.1

Type	Order-No.	Note
ETK-S1.1B	F 00K 102 972	ETK-S1.1 for Renesas JTAG Interface
ETK-S1.1C	F 00K 102 964	ETK-S1.1 for Infineon JTAG Interface
ETK-S1.1D	F 00K 001 859	ETK-S1.1 for Renesas AUD Interface

7.2 ETK-S1.1 Housing

Type	Order-No.	Note
ETK-S1.1_H	F 00K 102 813	

7.3 Cables

> **Note**
>
> *The cables showed in chapter "Cables and Accessories" on page 45 are not included in the ETK-S1.1 delivery. They need to be ordered separately. For order numbers refer to chapter 7 on page 53.*

> **Note**
>
> *The screws for mounting cables KA54 showed in chapter 6.1.1 on page 45 are not included in the KA54 delivery. They need to be ordered separately. For screw manufacturers and order numbers refer to the description of the cables.*

7.3.1 Interface Cables

Type	Order-No.	Note
KA41, Ver. 1 / Ver. 2	Y 261 A23 729	
KA54	F 00K 001 302	see note above
KA55	F 00K 001 303	

7.3.2 Power Supply Cables

Type	Order-No.	Note
ETV	Y 261 A24 446	Power supply cable for ETK
ETV2	F 00K 000 593	Power supply cable for ETK with filter coil
K70	Y 261 A24 942	External power supply cable for ETKs (connector)
KA50	F 00K 000 940	External voltage supply cable with jack and filter coil
CBM200-0m1	F 00K 900 052	Cable JST PH - JST PH (2fc-3fc, 0M1)

7.4 Adapters

Type	Order-No.	Note
ETAF1	F00K 001 373	ETK - ECU adapter, 26 pin ERNI-Plug

7.5 Connector ECU - ETK Adapter ETAF1

Connectors are available from local ERNI distributers.

Type	Order-No.	Note
	064320	26 pin ERNI-Connector

7.6 Power Supply

Type	Order-No.	Note
ETP1	F 00K 000 624	ETK power supply for 6 - 36 V DC input
ETP2	F 00K 104 010	Power Supply Interface for ETK

8   ETAS Contact Addresses

ETAS HQ

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70469 Stuttgart	Fax:	+49 711 89661-106
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ETAS Subsidiaries and Technical Support

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

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

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