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ES1232.2-A
ETK Interface Board

User's Guide

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1 Introduction

This section contains general safety instructions, information about the basic features and applications of the ES1232.2-A ETK Interface Board (ETK = Emulator Test Probe), hints to system requirements, the structure of this manual, and the delivery scope.

1.1 General Safety Instructions

This manual addresses qualified personnel working in the fields of automobile control unit development and calibration. Specialized knowledge in the areas of measurement and control unit technology is required.

Please be aware that this board interacts with the application system. These interactions alter the application system behavior. Failures or unexpected operational results may be critical to the application system behavior.



Attention

Using the board is only allowed in application systems with additional safe or redundant systems (e.g. emergency stop, backup system).
Using the board in any way other than described in this documentation is not permissible and can lead to connected products being damaged or destroyed.
The safety instructions must be heeded at all times!

Liability cannot be accepted for damage caused by non adherence to the instructions contained in this document!

note

Some components of the interface board may be damaged or destroyed by electrostatic discharges. Please keep the board 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.

1.2 Applications

The ES1232.2-A ETK Interface Board is designed for VME64x systems with 3 U height. The ES1232.2-A realizes a high performance ETK emulator test probe integration into the ES1000 system for measurement and calibration, as well as for rapid prototyping applications. This board covers sophisticated requirements concerning real time performance, huge data throughput and comfortable user handling.

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Features

The ES1232.2-A has the following features and components:

- VME64x slave interface
- High performance interface board to an ETK
- ETK Interface Operating Modes: Basic, Compatibility, Advanced
- ETK Protocol Speed: 100 MBit/s and 8 MBit/s
- ETK Protocol Transfer: Single Mode and Block Mode
- Up to 32 rasters for measurement and rapid prototyping
- ETK Support: automatic detection and configuration
- ETK Interface galvanic isolated
- Motorola MPC555 40-MHz processor
  - 4 MByte SRAM (32-bit, burstable)
  - 2 MByte Flash (16-bit)
- Data Acquisition Memory Controller (DAMC) for linking the ETK to the ES1000 system in real time
- 16 MByte Data Acquisition Memory on board
- Up to 4 ETK interfaces (e.g. four ES1232.2-A boards) can be operated simultaneously on an ES1000
- Firmware update with service software on PC
- Extended temperature range from -40 °C to +85 °C / -40 °F to +185 °F

These features guarantee that the real-time requirements are fulfilled when the ES1000 is used.

1.3 System Requirements

1.3.1 Hardware

An ES1000.2 system or an ES1000.3 system is required for the ES1232.2-A ETK Interface Board.

1.3.2 Software

The following software versions (or higher) support the ES1232.2-A board:

- INCA V5.2
- ASCET-SD V5.1.1
- ASCET-RP V5.4
- INTECRIO V1.0

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- Hardware Service Pack V4.0

1.4 Delivery Scope

Make sure the package is complete before using the device. The following components are part of the delivery scope of the ES1232.2-A:

- ES1232.2-A ETK Interface Board
- ETK interface cable (CBM150-3)
- One User's Guide.

Connecting cables in other length can be ordered separately (see the chapter "Order Information" on page 27).

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2 Hardware Description

This chapter describes the front panel connector, a blockdiagram with the schematic layout of the interface board, the VMEbus interface, the PowerPC, the Data Acquisition Memory Controller and the serial ETK interface.

2.1 Front Panel

Fig. 2-1 shows the front panel of the ES1232.2-A board with the ETK interface (connector A).

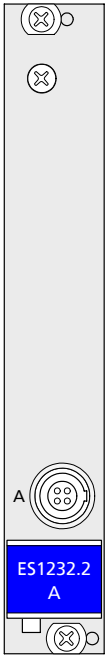


Fig. 2-1 Front Panel of the ES1232.2-A

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2.2 Block Diagram

Fig. 2-2 shows the block diagram of the ES1232.2-A with the major functional units.

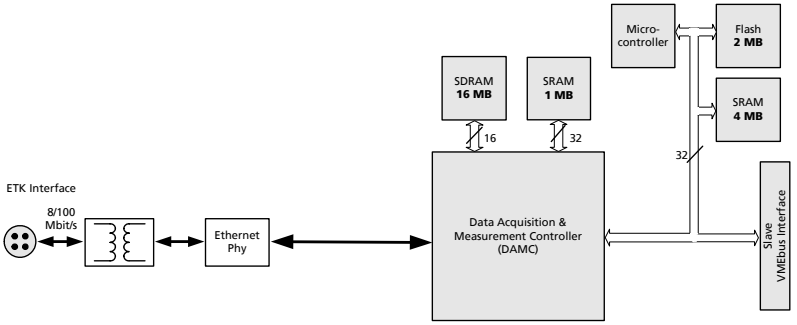


Fig. 2-2 Block Diagram of the ES1232.2-A

2.3 VMEbus Interface

The ES1232.2-A communicates with the ES1130 Simulation Controller or the ES1120/ES1135 System Controller via the VMEbus. A VME64x slave interface which supports A24:D16 and A40:MD32 master board accesses has been implemented to ensure high system performance. The slave interface converts accesses to the VMEbus into accesses to corresponding memory areas on the board.

The processor board has direct access to the Data Acquisition Memory Controller (DAMC) via the VMEbus. The DAMC is responsible for the communication between ETK and ES1232.2-A. Interrupts control the data transfer between the master CPU and ES1232.2-A.

Type	Slave
Access types	A24:D16; A40:MD32
Interrupters	16 interrupters; level and vector can be programmed
Configuration	Auto-ID configuration

2.4 PowerPC (MPC555)

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2.5 Data Acquisition Memory Controller (DAMC)

The Data Acquisition Memory Controller (DAMC) is designed for applications in real-time data acquisition and real-time addressing of external modules.

Measurement data is given a time stamp. The controller is controlled by interrupts and can also be addressed from the VMEbus.

Data is exchanged via the memory connected to the DAMC. The connected memory (SDRAM) is also managed by the DAMC. The VMEbus and the PowerPC can access this memory simultaneously.

2.6 Serial ETK Interface

The serial ETK interface is dc decoupled from the board. Distances up to 20 meters between ETK and ES1232.2-A are reachable.

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3 Functional Description

This chapter describes the ETK Interface Operating Modes and the support by ETAS hardware.

3.1 Overview ETK Interface Operating Modes

Three ETK Interface Operating Modes with different features provide optimal solution for different applications:

	ETK Interface Operating Mode		
	Basic	**Compatibility**	**Advanced**
No. of Variables	29/45/45	extended	configurable
Rasters	3 + 2	3 + 2	16 + 16
ETK Speed	8 MBit/s	8/100 MBit/s	100 MBit/s
ETK Transfer	single	block	block
A2L File	existing	existing	new
ETAS Hardware	ES1200, ES1201, ES1231,ES1232, MAC2, ES690, ES590, ES591	ES1231, ES1232, ES690, ES590, ES591	ES1232, ES690, ES590, ES591

3.2 Basic Operating Mode

Using the Basic Operating Mode older projects will be supported without any change. The advantage is that all ETK Interface hardware like MAC2, ES590, ES591, ES690, ES1200, ES1201, ES1231.1-A, ES1232.1-A, and ES1232.2-A can be used in the manner customary.

3.3 Compatibility Operating Mode

The Compatibility Operating Mode is essential characterized by the Block Transfer. The activation of Block Transfer happens automatically between ETK and ES1232.2-A. In result, you will have this advantages:

- extended No. of Variables per measurement raster
- much faster download times for code and data to ECU
- essentially improved transfer times for rapid prototyping raster

To use these advantages immediately for your daily work, you just have to replace the ES1200/ES1201 with the ES1232.2-A.

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3.4 Advanced Operating Mode

The Advanced Operating Mode opens even more possibilities. The 100 MBit/s Block ETK Protocol offers a totally new ETK interface performance. The most important benefits in comparison to the Compatibility Operating Mode are:

- 16 rasters for measurement and
- 16 rasters for rapid prototyping
- configurable number of variables per measurement raster.

The Advanced Operating Mode can only used by ES1232-A, ES590, ES591, and ES690.

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4 Hardware Configuration

This chapter describes the steps to configure the ES1232.2-A board.

4.1 Hardware Configuration

4.1.1 Firmware Update

The firmware can be updated by the user. It means that future firmware versions can also be used on the ES1232.2-A board. The update takes place using service software from the connected PC.

HSP V4.0 or higher is required for the firmware update of the ES1232.2-A board.

4.1.2 Jumpers and Solder Straps

The ES1232.2-A does not have any jumpers or solder straps which have to be configured by the user. The board is configured using software.

4.1.3 VMEbus Address and ID

The ES1232.2-A board has a VME64 interface. The address spaces and interrupts are identified and configured by the system controller once the VMEbus system has been switched on.

4.1.4 Slot

The ES1232.2-A board has to be installed to the right of the bus master board. Up to four ES1232.2-A can be used in one VMEbus system. ID1 to ID4 are assigned to the ES1232.2-A boards from left to right depending on the installation order in the VMEbus system.

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4.1.5 Recommended Layout when using Several ETK Interfaces

If you are using several different ETK interfaces in your ES1000.2/ES1000.3 system, please observe the order of installation shown in the figure below to ensure the hardware configuration remains clear.

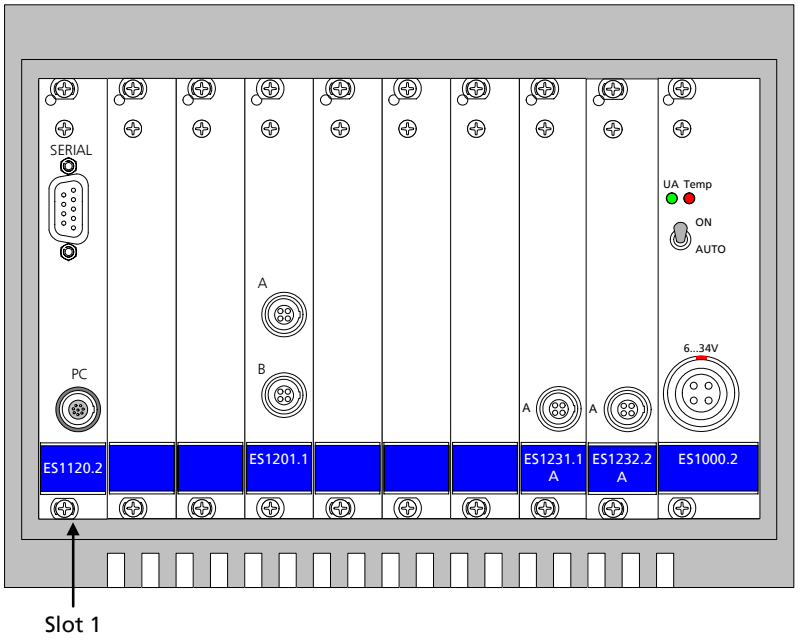


Fig. 4-1 Positioning of boards in ES1000.2 system

Slot 1 is reserved for the system controller. The other positions are standard positions which can used by any board in compliance with the following rule:

snb (ES1201.1) < snb (ES1200.1) < snb (ES1231.1-A) < snb (ES1232.x-A)

snb = slot number

The following is also true for the ES1200.1 and ES1201.1:

ID1 slot number < ID2 slot number

note

Please note that there must not be more than four ETK ports in the system. Further, there can only be one ES1200.1 in the system.

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4.2 Parameterizing the Hardware Configuration (HWC) in INCA

4.2.1 Automatic Hardware Configuration

It is recommend to have the Hardware Configuration generated automatically. Use the menu **Hardware** → **Search for Hardware** for this operation.

It will be searched for connected hardware by interrogating all interfaces. All hardware that is physically connected will be added to the hardware configuration.

4.2.2 Manually Hardware Configuration

If you want to organize or change your Hardware Configuration manually, you must note how the ETK Controller (ETKC) counts as well as observing the order of installation in the ES1000.2/ES1000.3 system recommended above:

- starting from the left, the ETK ports are referred to as ETKC-A through ETKC-D. The system controller can operate a maximum of 4 ETK controllers,
- the ETK ports are always numbered consecutively by the system controller,
- this numbering has to be reflected exactly in the HWC.

The **ETK index** parameter can be selected accordingly in the Hardware Configuration with the ETKC device.

The following tables show two configuration examples as specified in the Hardware Configurations shown below (Fig. 4-2and Fig. 4-3).

The description of the ETK ports in the HWC has to correspond **exactly** to where the hardware is installed.

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Hardware			INCA Hardware Configuration Editor
Board	**Type**	**Port**	**Parameter: ETK index**
1	ES1200.1	A	ETKC-A
1	ES1200.1	B	not assembled
2	ES1231.1-A	A	ETKC-B
3	ES1232.1-A	A	ETKC-C
4	ES1232.2-A	A	ETKC-D

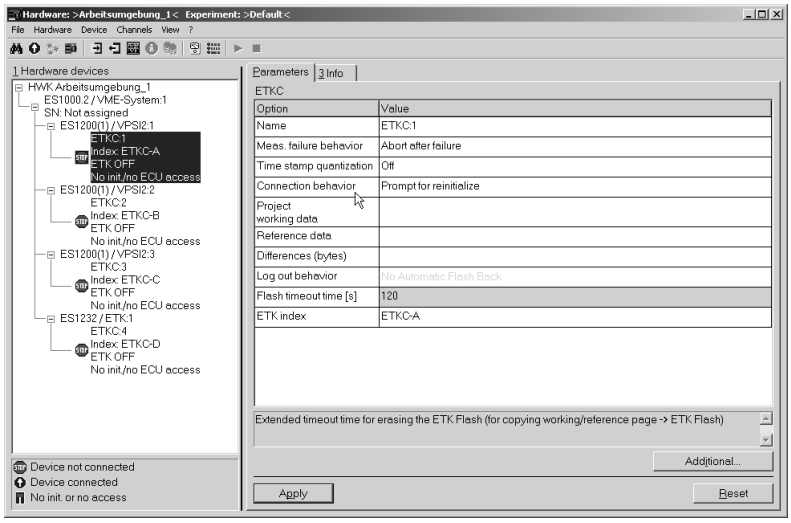


Fig. 4-2 INCA Hardware Configuration Editor (example 1)

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Hardware			INCA Hardware Configuration Editor
Board	**Board Type**	**Port**	**Parameter: ETK index**
1	ES1201.1	A	ETKC-A
1	ES1201.1	B	ETKC-B
2	ES1200.1	A	ETKC-C
2	ES1200.1	B	not assembled
3	ES1232.2-A	A	ETKC-D

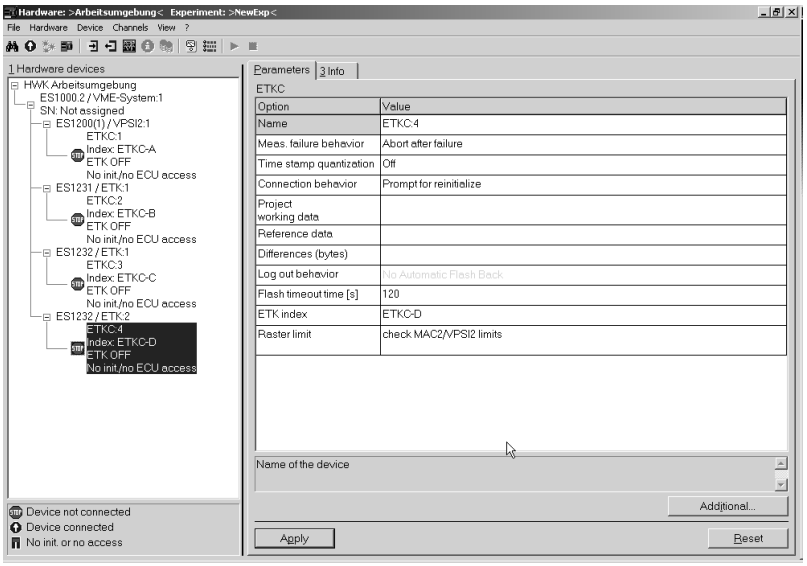


Fig. 4-3 INCA Hardware Configuration Editor (example 2)

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5 Technical Data

5.1 Pin Assignment

This chapter describes the pin assignment of the front-facing connector, the backplane connector electrical data, and general data of the ES1232.2-A board.

5.1.1 ETK Interface

A four-pin Lemo socket (1B dimensions) is used as a connector for the ETK Interface.

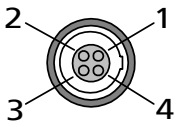


Fig. 5-1 Connector "A"

Pin	Function	Pin	Function
1	TX+	3	RX+
2	TX-	4	RX-

Fig. 5-2 Pin Assignment ETK Interface "A"

5.1.2 VMEbus Backplane

The following table shows the assignment of the 160-pin backplane connector. The signals marked "/" are low-active.

Pin	Row Z	Row A	Row B	Row C	Row D
1	Open	D00	/BBSY	D08	Open
2	VME64	D01	/BCLR	D09	Open
3	Open	D02	/ACFAIL	D10	Open
4	GND	D03	/BG0IN	D11	Open
5	Open	D04	/BG0OUT	D12	Open
6	GND	D05	/BG1IN	D13	Open
7	Open	D06	/BG1OUT	D14	Open
8	GND	D07	/BG2IN	D15	Open
9	Open	GND	/BG2OUT	GND	Open
10	GND	SYSCLK	/BG3IN	/SYSFAIL	Open

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Pin	Row Z	Row A	Row B	Row C	Row D
11	Open	GND	/BG3OUT	/BERR	Open
12	GND	/DS1	/BR0	/SysReset	Open
13	Open	/DS0	/BR1	/LWORD	Open
14	GND	/WRITE	/BR2	AM5	Open
15	Open	GND	/BR3	A23	Open
16	GND	/DTACK	AM0	A22	Open
17	Open	GND	AM1	A21	Open
18	GND	/AS	AM2	A20	Open
19	Open	GND	AM3	A19	Open
20	GND	/IACK	GND	A18	Open
21	Open	/IACKIN	Res.	A17	Open
22	GND	/IACKOUT	Res.	A16	Open
23	Open	AM4	GND	A15	Open
24	GND	A07	/IRQ7	A14	Open
25	Open	A06	/IRQ6	A13	Open
26	GND	A05	/IRQ5	A12	Open
27	Open	A04	/IRQ4	A11	Open
28	GND	A03	/IRQ3	A10	Open
29	Open	A02	/IRQ2	A09	Open
30	GND	A01	/IRQ1	A08	Open
31	Open	-12 V	+5 V Stby	+12 V	Open
32	GND	+5 V	+5 V	+5 V	Open

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5.2 Electrical Data

5.2.1 Processor

Processor	Motorola PowerPC MPC555, 40 MHz
Memory	4 MByte SRAM (32-bit, burstable) 2 MByte Flash (16-bit)

5.2.2 Data Acquisition Memory

On-board	16 MByte

5.2.3 VMEbus Interface

Type	Slave
Address and data lines	A24:D16, A40:MD32
Interrupters	16 interrupters; level and vector programmable
Configuration	Standard Auto-ID configuration
Connector	160-pin DIN 41612

5.2.4 ETK Interface

Operating Modes	Basic, Compatibility, Advanced
ETK Protocol Speed	8 MBit/s / 100 MBit/s
ETK Protocol Transfer	Single mode / Block mode
Connector	4-pin Lemo, 1B dimensions
Cable	Double-shielded, twisted pair

5.2.5 Power Consumption

Power consumption (standard/maximum)	5 W / 7 W

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5.3 General Data

5.3.1 Physical Dimensions

Circuit board	100 mm x 160 mm / 3.94 in x 6.30 in
Front panel	128.2 mm x 20.3 mm / 5.05 in x 0.80 in

5.3.2 Environmental Conditions

Operating temperature	-40 °C to +85 °C / -40 °F to +185 °F
Storage temperature	-55 °C to +85 °C / -67 °F to +185 °F
Relative humidity	0 % to 95 %, non-condensing

5.3.3 Fulfilled Standards and Norms

EN 55022 B

EN 61000-4-2

EN 61000-4-3

EN 61000-4-4

EN 61000-4-6

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6 Cable

This chapter provides a list of the available ETK interface cables.

6.1 ETK Interface Cable CBM150

A special cable is needed to connect the ES1232.2-A to the ETK.

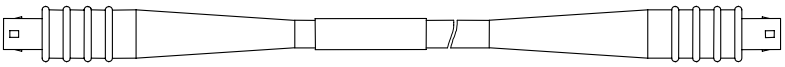


Fig. 6-1 Cable CBM150

Product	Length	Order Number
CBM150-3	3 m	F 00K 102 556
CBM150-5	5 m	F 00K 102 557
CBM150-10	10 m	F 00K 102 553
CBM150-15	15 m	F 00K 102 554
CBM150-20	20 m	F 00K 102 555

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7 Order Information

This chapter contains the information you need to order the ES1232.2-A board or cables.

7.1 ES1232.2-A Board

note

Please note that the ES1232.2-A ETK Interface Board includes in delivery an ETK Interface Cable CBM150-3.

Order Name	Short Name	Order Number
ETK Interface Board (1-CH, 100 MBit/s)	ES1232.2-A	F 00K 103 572

7.2 ETK Interface Cable CBM150

Order Name	Short Name	Order Number
Lemo 1B FFG - Lemo 1B FFG (4mc-4mc, 3m)	CBM150-3	F 00K 102 556
Lemo 1B FFG - Lemo 1B FFG (4mc-4mc, 5m)	CBM150-5	F 00K 102 557
Lemo 1B FFG - Lemo 1B FFG (4mc-4mc, 10m)	CBM150-10	F 00K 102 553
Lemo 1B FFG - Lemo 1B FFG (4mc-4mc, 15m)	CBM150-15	F 00K 102 554
Lemo 1B FFG - Lemo 1B FFG (4mc-4mc, 20m)	CBM150-20	F 00K 102 555

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8 ETAS Contact Addresses

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ETAS SAS

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SILIC 310	Fax:	+33 (1) 56 70 00 51
94588 Rungis Cedex	E-mail:	sales@etas.fr
France	WWW:	www.etas.fr

Great Britain

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