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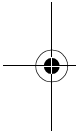
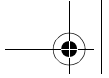
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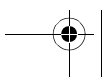
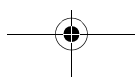
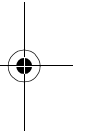
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ES1232.1-A

ETK Interface Board

User's Guide



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4 Contents

1 Introduction

This section contains information about the basic features and applications of the ES1232.1-A ETK Interface Board (ETK = Emulator Test Probe). A block diagram is also included here to show the schematic layout of the interface board.

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.

1.1 Applications

The ES1232.1-A ETK Interface Board is designed for VME64x systems with 3 U height. The ES1232.1-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.

Features

The ES1232.1-A has the following features and components:

- VME64x 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
 - 1 MByte SRAM (32-bit, burstable)
 - 1 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 ES1232.1-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

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

1.2 Front Panel



Fig. 1-1 Front View of the ES1232.1-A

2 Hardware

2.1 Block Diagram

Fig. 2-1 shows the block diagram of the ES1232.1-A with the major functional units.

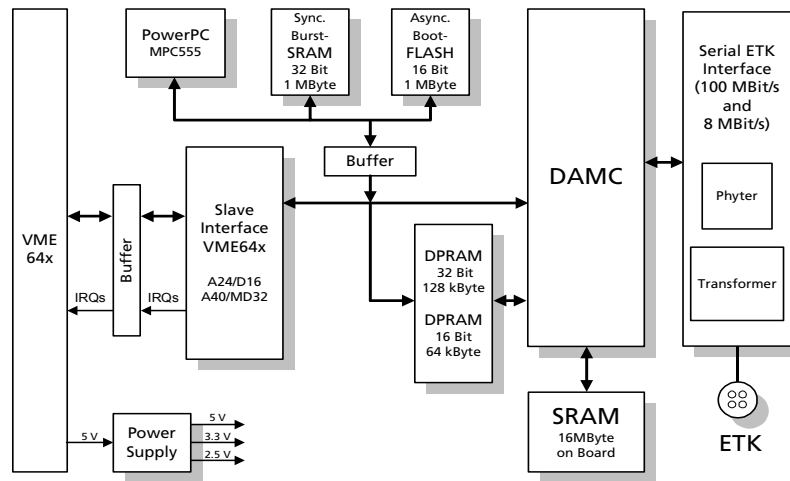


Fig. 2-1 Block Diagram of the ES1232.1-A

2.2 VMEbus Interface

The ES1232.1-A communicates with the ES1130 Simulation Controller or the ES1120 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 ES1232.1-A. Interrupts control the data transfer between the master CPU and ES1232.1-A.

It is possible to manipulate or preprocess the large amounts of data with the local CPU (MPC555). The local CPU can also be accessed via the VMEbus.

In addition to the A24/D16 modes, which make it possible to work with existing boards, an A40/MD32 access (multiplexed address and data accesses, VME64 extension) is used. The maximum bus transfer rate with A40/MD32 access in VMEbus block mode is approximately 40 MByte/s. A high data transfer rate can be attained using the VMEbus together with the ES1120 System Controller.

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

2.3 Power Supply

The power supply makes voltages of 5 V, 3.3 V and 2.5 V available. ICs with a low supply voltage are generally used to keep the power consumption down.

2.4 PowerPC (MPC555)

The PowerPC and the connected memory modules can be addressed via the VMEbus.

2.5 Data Acquisition Memory Controller (DAMC)

The Data Acquisition Memory Controller (DAMC) has a fast RISC processor designed for applications in real-time data acquisition and real-time addressing of external modules.

Measurement data is given a time stamp. The RISC processor 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 ES1232.1-A are reachable.

3 ETK Interface Operating Modes

3.1 Overview

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	ES1231, ES1232, ES690	ES1232, ES690

3.2 Basic Operating Mode

Using the Basic Operating Mode all current projects will be supported without any change. The advantage is that all ETK Interface hardware like MAC2, ES690, ES1200, ES1201, ES1231-A, and ES1232.1-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 ES1232.1-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 ES1232.1-A.

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 be used by ES1232-A and ES690.

3.5 Software Requirements

Minimal required software versions for ES1232-A:

- INCA V4.0
- ASCET-SD V4.2
- Target Integration Package Experimental V4.4.
- Hardware Service Pack V1.2.

4 Setup Hints

4.1 Recommended Layout when using Several ETK Interfaces

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

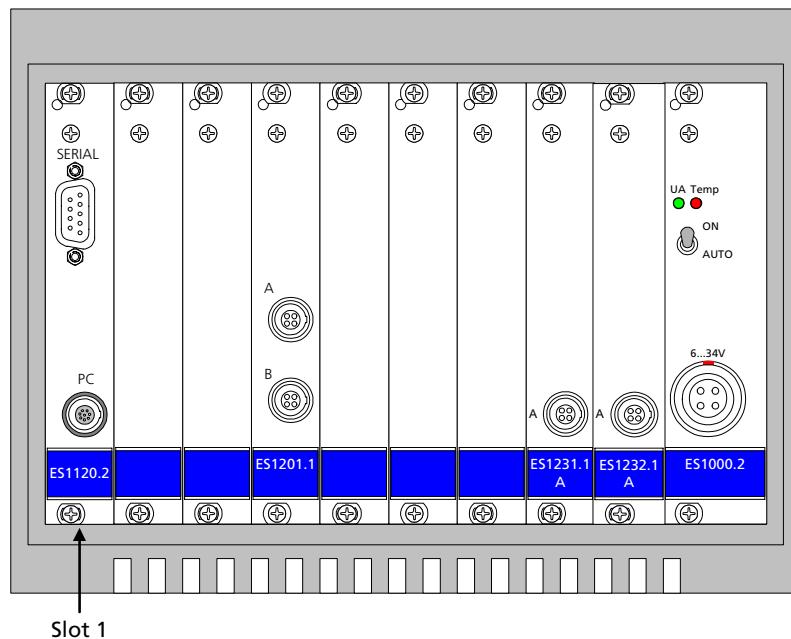


Fig. 4-1 Positioning of boards in ES1000.2 system

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

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



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

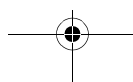
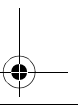
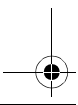
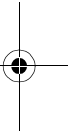
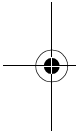
If you want to organize or change your Hardware Configuration manually, you must note how the ETK Controller (ETKC) counts as well as observing the order of installation in the ES1000.2 system recommended above:

- 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. 4-2 and Fig. 4-3).

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



Configuration Example 1

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 ¹⁾	ETKC-C
4	ES1232.1-A	A ²⁾	ETKC-D

¹⁾ ES1232.1-A board number 1; ²⁾ ES1232.1-A board number 2

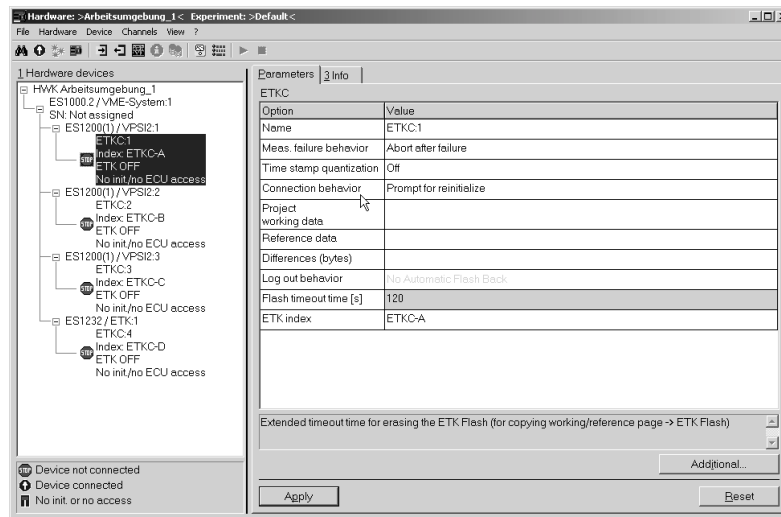


Fig. 4-2 INCA Hardware Configuration Editor (example 1)

Configuration Example 2

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	ES1232.1-A	A	ETKC-D

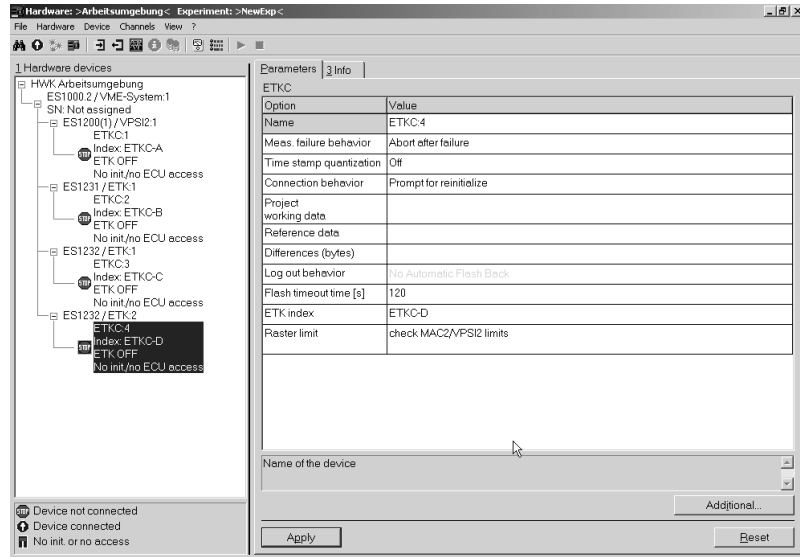


Fig. 4-3 INCA Hardware Configuration Editor (example 2)

5 Technical Data

5.1 Pin Assignments ETK Interface

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

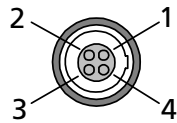


Fig. 5-1 Connector "A"

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

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

5.2 Firmware Update

The firmware of the ES1232.1-A ETK Interface board can be updated using a service software running on the connected PC while the board is mounted in the ES1000 system.

5.3 Electrical and Mechanical Data

Processor

Processor	Motorola PowerPC MPC555, 40 MHz
-----------	---------------------------------

Memory	1 MByte SRAM (32-bit, burstable) 1 MByte Flash (16-bit)
--------	--

Data Acquisition Memory

On-board	16 MByte
----------	----------

Memory Extension	Planned; memory slot exists
------------------	-----------------------------

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

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

Power Supply

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

Mechanical Data

Circuit board	100 x 160 mm ²
Front panel	Height: 3 U Width: 4 HP (20.4 mm)

5.4 Environmental Conditions

Ambient temperature during operation	-40 °C to +85 °C
Storage temperature	-55 °C to +85 °C
Relative humidity	0 to 95 %, no condensation

6 Interface Cable

ETK Interface Cable CBM150

A special cable is needed to connect the ES1232.1-A to the ETK.

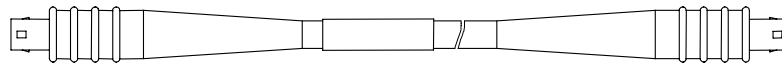


Fig. 6-1 ETK Interface Cable CBM150

7 Order Information

7.1 ES1232.1-A Board

note

Please note that the ES1232.1-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)	ES1232.1-A	F-00K-103-055

7.2 Upgrade ES1231-A to ES1232.1-A

ETAS has a special service for all owners of an ES1231-A board:

To upgrade ES1231-A to ES1232.1-A send your board to ETAS GmbH, ETAS/TEF, Stuttgart.

Label the package as a Repair/Upgrade ES1232.1_U1, please!

Order Name	Short Name	Order Number
Upgrade ES1231.1-A to ES1232.1-A	ES1232.1_U	F-00K-103-062

7.3 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

8 **ETAS Contact Addresses**

ETAS HQ

ETAS GmbH

Borsigstr. 14	Phone:	+49 (711) 8 96 61-0
70469 Stuttgart	Fax:	+49 (711) 8 96 61-105
Germany	E-mail:	sales@etas.de
	WWW:	www.etas.de

France

ETAS SAS

1, place des Etats-Unis	Phone:	+33 (1) 56 70 00 50
SILIC 310	Fax:	+33 (1) 56 70 00 51
94588 Rungis Cedex	E-mail:	sales@etas.fr
France	WWW:	www.etas.fr

Great Britain

ETAS Engineering Tools Application and Services Ltd.

Studio 3, Waterside Court	Phone:	+44 (0) 1283 - 546512
3rd Avenue, Centrum 100	Fax:	+44 (0) 1283 - 548767
Burton-upon-Trent	E-mail:	sales@etas-uk.net
Staffordshire DE14 2WQ	WWW:	www.etas-uk.net
England		

Japan

ETAS K.K.

9-1, Ushikubo 3-chome,	Phone:	+81 (45) 912-9550
Tsuzuki-ku	Fax:	+81 (45) 912-9552
Yokohama 224-0012	E-mail:	sales@etas.co.jp
Japan	WWW:	www.etas.co.jp

Korea

ETAS Korea Co. Ltd.

3F, Samseung Bldg.
61-1, Yangjae-dong
Seocho-gu
Seoul
Republic of Korea

Phone: +82 (2) 5747 016
Fax: +82 (2) 5747 120
E-mail: sungik.hong@etas.co.kr

North America

ETAS Inc.

3021 Miller Road
Ann Arbor, MI 48103
USA

Phone: +1 (888) ETAS INC
Fax: +1 (734) 997-9449
E-mail: sales@etasinc.com
WWW: www.etasinc.com

South America

UNIT

Av. Cel Amancio Bueno, 30
Jd. Chapadao
Campinas SP 13066 740
Brazil

Phone: +55 (19) 3242 0620
Fax: +55 (19) 3241 96 96
E-mail: unit@mpc.com.br

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