

# ES1652.2 Carrier Board for Signal Conditioning Circuits

## User's Guide



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V2.0.0 R04 EN - 7.2018

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# 1 Introduction

This User's Guide describes the ES1652.2 Carrier Board for Signal Conditioning Circuits. This chapter contains information on the basic functions and the area of use of the ES1652.2 Carrier Board for Signal Conditioning Circuits.

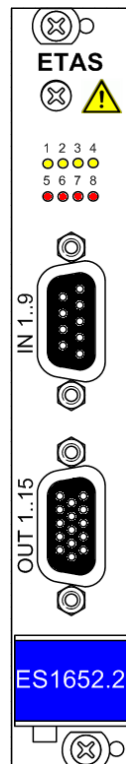


**CAUTION!**

*Some components of the ES1652.2 Carrier Board for Signal Conditioning Circuits can be damaged or destroyed by electrostatic discharge. Leave the board in the transport packaging until it is installed. The ES1652.2 Carrier Board for Signal Conditioning Circuits must always be removed from the transport packaging, configured and installed at a workstation that is protected from electrostatic discharge.*

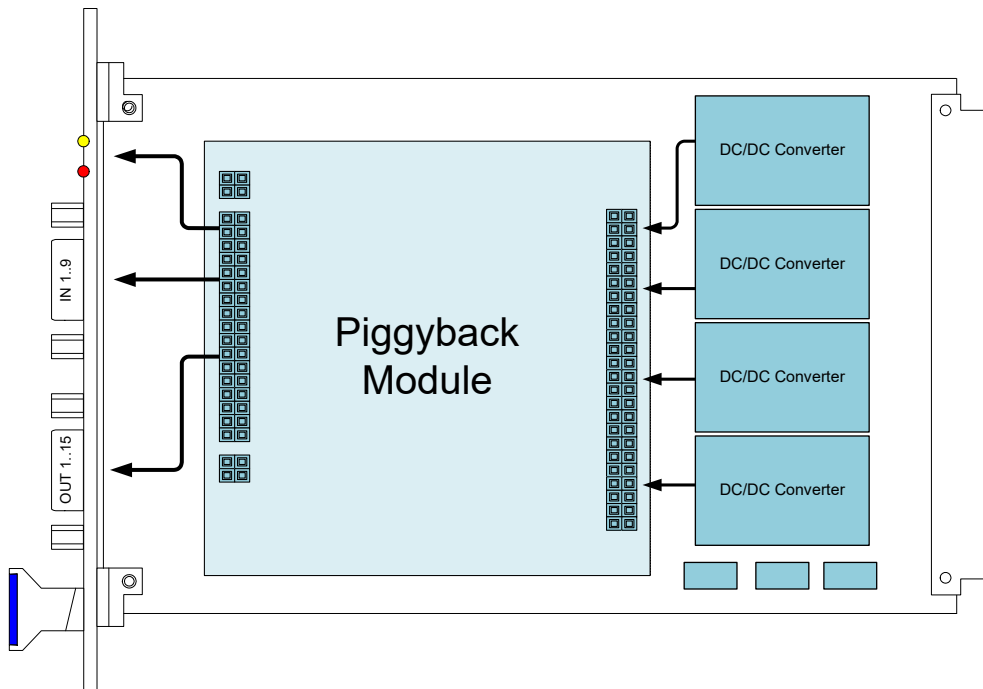
## 1.1 Features

The ES1652.2 Carrier Board for Signal Conditioning Circuits is used to accommodate modules for signal conditioning (example: PB1652LAMBDA.1-B Signal Conditioning for Lambda Sensor Simulation).



**Fig. 1-1** Front Panel of the ES1652.2 Carrier Board for Signal Conditioning Circuits

The functions of the ES1652.2 Carrier Board for Signal Conditioning Circuits are shown in the following block diagram:



**Fig. 1-2** Block Diagram

The input signals are supplied via the 9-pin "IN 1..9" connector and routed to the piggyback. From there, they are led back through connector "OUT 1..15" - once they have been processed. There are also eight LEDs on the front panel which can be addressed by the piggyback.



**CAUTION!**

*There is no protective circuit on the ES1652.2 Carrier Board for the inputs and outputs! If required, this must be ensured by the customer on the relevant piggyback.*

Up to four DC/DC converters can be installed on the ES1652.2 Carrier Board to power the piggyback. These can be supplied with either +5 V or +12 V from the VMEbus backplane.

There are three fuses on the carrier board that provide protection against voltages from the backplane.



## 1.2 Basic Safety Instructions

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Please adhere to the safety instructions in this manual to avoid injury to yourself and others as well as damage to the device.

### 1.2.1 Correct Use

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

### 1.2.2 Labeling of Safety Instructions

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The safety instructions contained in this manual are shown with the standard danger symbol shown below:



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

**CAUTION!**

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

**WARNING!**

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

**DANGER!**

*indicates a high-risk, immediate danger which could lead to serious or even fatal injuries if not avoided.*

## 1.3 RoHS conformity

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### 1.3.1 European Union

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The EU Directive 2002/95/EU limits the use of certain dangerous materials for electrical and electronic devices (RoHS conformity).

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

### 1.3.2 China

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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.

## 1.4 CE marking

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ETAS confirms that the product meets the product-specific applicable European Directives with the CE marking affixed to the product or its packaging. The CE Declaration of Conformity for the product is available upon request.

## 1.5 Taking the Product Back and Recycling

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The European Union has passed a directive called Waste Electrical and Electronic Equipment, or WEEE for short, to ensure that systems are set up throughout the EU for the collection, treatment 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. 1-3** WEEE-Symbol

The WEEE symbol 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 "ETAS Contact Addresses" on page 17).



## 2 Hardware Description

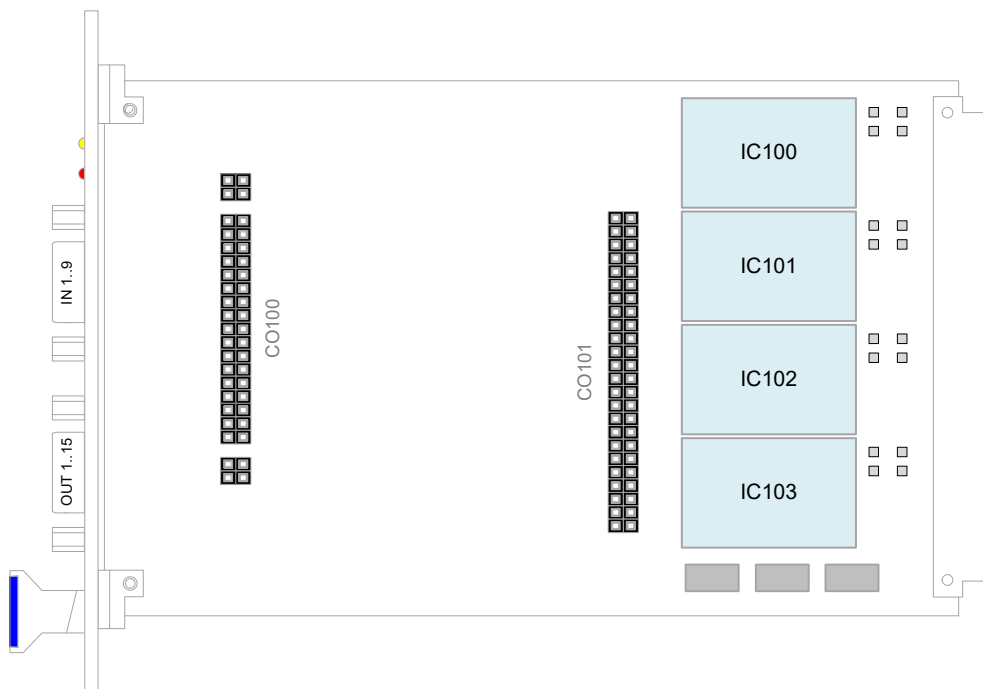
This chapter contains information on the following topics:

- "Power Supply" on page 9
  - "Configuration of the Input Voltage of the DC/DC Converters" on page 10
- "Fuses" on page 11
- "Addressing the LEDs on the Front Panel" on page 11

### 2.1 Power Supply

To power the piggybacks, up to four DC/DC converters can be accommodated on the ES1652.2 Carrier Board for Signal Conditioning Circuits for the purposes of voltage stabilization and galvanic isolation.

The output voltages DC1 - DC4 of the converters are connected with the connector strip CO101 (see "'CO101" Connector" on page 14) and can thus be used to power a piggyback. The converters are powered with voltages from the VMEbus backplane.



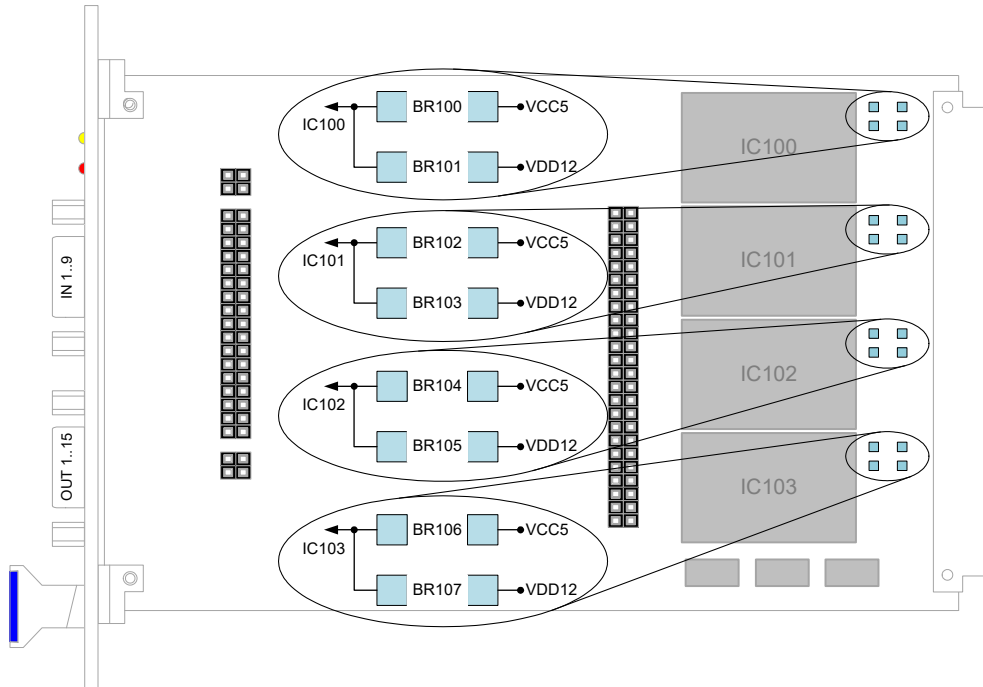
**Fig. 2-1** Position of the DC/DC Converters on the ES1652.2 Carrier Board

2.1.1 Configuration of the Input Voltage of the DC/DC Converters

It is possible to supply the converters either with +5 V or +12 V from the VMEbus backplane.

Please observe the correct mapping for the DC/DC converters with respect to the supply voltages +5 V and +12 V in Tab. 2-1.

The supply voltages are selected using solder straps next to the DC/DC converters.



**Fig. 2-2** Position of the Solder Straps

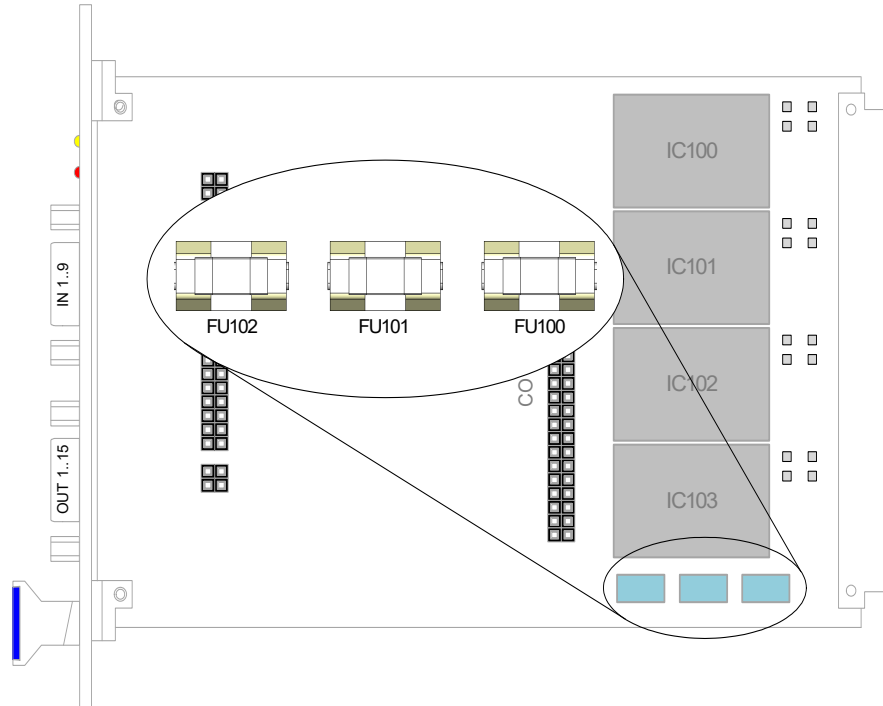
*Mapping of Supply Voltage and DC/DC Converter*

Supply Voltage	DC/DC Converter (Type)
+5 V	TEN3-0522N
+12 V	TEN3-1222

**Tab. 2-1** DC/DC Converters for the Supply Voltages +5 V and +12 V

## 2.2 Fuses

There are three fuses on the ES1652.2 Carrier Board that provide protection against the voltages from the VMEbus backplane.



**Fig. 2-3** Position of the Fuses on the ES1652.2 Carrier Board

The fuses are specified as follows:

Fuse	Type	Specification	Safeguarding (Backplane Connector)
FU100	NANO2® Slo-Blo® Fuse 452/454 Series	T 2 A	VCC5 (A32/B32/C32)
FU101	NANO2® Slo-Blo® Fuse 452/454 Series	T 1 A	VDD12 (C31)
FU102	NANO2® Slo-Blo® Fuse 452/454 Series	T 750 mA	VSS12 (A31)

**Tab. 2-2** Fuses

## 2.3 Addressing the LEDs on the Front Panel

The LEDs are addressed via the "CO100" connector (see "CO100" Connector" on page 13).

The LEDs require around 10 mA to light up and have dropping resistors of 825 Ω for operating with 5 V. If the LEDs are operated at another voltage, appropriate dropping resistors must be connected in series on the relevant module.



### 3 Pin Assignment

#### 3.1 "CO100" Connector

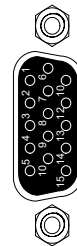
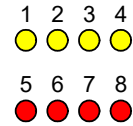
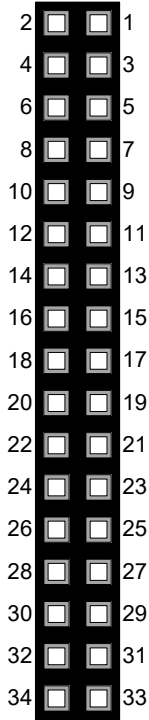
CO100		LEDs
1		LEDK8
2		LEDK7
3		LEDK6
4		LEDK5
5		LEDK4
6		LEDK3
7		LEDK2
8		LEDK1
9		LEDA

CO100		D-SUB 9
10		Pin 9: "IN 9"
11		Pin 8: "IN 8"
12		Pin 7: "IN 7"
13		Pin 6: "IN 6"
14		Pin 5: "IN 5"
15		Pin 4: "IN 4"
16		Pin 3: "IN 3"
17		Pin 2: "IN 2"
18		Pin 1: "IN 1"
19		n.c.

CO100		D-SUB 15
20		Pin 15: "OUT 15"
21		Pin 14: "OUT 14"
22		Pin 13: "OUT 13"
23		Pin 12: "OUT 12"
24		Pin 11: "OUT 11"
25		Pin 10: "OUT 10"
26		Pin 9: "OUT 9"
27		Pin 8: "OUT 8"
28		Pin 7: "OUT 7"
29		Pin 6: "OUT 6"
30		Pin 5: "OUT 5"
31		Pin 4: "OUT 4"
32		Pin 3: "OUT 3"
33		Pin 2: "OUT 2"
34		Pin 1: "OUT 1"



**Tab. 3-1** Connections from "CO100" to LEDs, "IN 1..9" and "OUT 1..15"

## 3.2 "CO101" Connector

Signal		CO101		Signal
DC1 VDD	2	2	1	DC1 GND
DC1 VSS	4	4	3	DC1 GND
DC2 VDD	6	6	5	DC2 GND
DC2 VSS	8	8	7	DC2 GND
DC3 VDD	10	10	9	DC3 GND
DC3 VSS	12	12	11	DC3 GND
DC4 VDD	14	14	13	DC4 GND
DC4 VSS	16	16	15	DC4 GND
Reserved	18	18	17	n.c.
Reserved	20	20	19	Reserved
/SYSRESET	22	22	21	Reserved
VSS12 *	24	24	23	Ground *
VDD12 *	26	26	25	Ground *
VDD12 *	28	28	27	Ground *
VCC5 *	30	30	29	Ground *
VCC5 *	32	32	31	Ground *
VCC5 *	34	34	33	Ground *
Reserved	36	36	35	Reserved
Reserved	38	38	37	Ground *
Reserved	40	40	39	Reserved
Reserved	42	42	41	Reserved
Reserved	44	44	43	Reserved
Reserved	46	46	45	Reserved
Ground*	48	48	47	Ground *

\* from the VMEbus backplane

**Tab. 3-2** Pin Assignment of Connector "CO101"

## 4 Technical Data

### *Voltages, Currents and Power Consumption*

Maximum voltage at inputs and outputs	60 V
Max. current per individual contact of the input/output connectors	1 A
Maximum sum current over input/output connectors	5 A
Maximum permissible power consumption per DC/DC converter	3 W
Maximum permissible power consumption from VMEbus backplane	10 W

### *Environmental Conditions*

Operating temperature	+5 °C to +50 °C (+41 °F to +122 °F)
Relative humidity	0 to 95% (non-condensing)
Storage temperature	+5 °C to +85 °C (+41 °F to +185 °F)
Relative humidity	0 to 95% (non-condensing)

### *Physical Dimensions*

Height	3 U
Width	4 HP

### 4.1 Fulfilled Standards and Norms

The ES1652.2 Carrier Board for Signal Conditioning Circuits complies with the following standards and norms:

Norm	Test
EN 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 61000-6-2	Immunity (industrial environments)
EN 61000-6-3	Emission standard (residential, commercial and light-industrial environments)



#### **WARNING!**

*The device conforms only with radio disturbances class A (only for industrial environment). This can cause radio disturbances in residential, commercial and light industry environment. In such a case the operator has to consider additional measures for shielding to avoid disturbances.*





## 5 **ETAS Contact Addresses**

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### *ETAS HQ*

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Borsigstraße 24

70469 Stuttgart

Germany

Phone: +49 711 3423-0

Fax: +49 711 3423-2106

WWW: [www.etas.com](http://www.etas.com)

### *ETAS Subsidiaries and Technical Support*

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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](http://www.etas.com/en/contact.php)

ETAS technical support WWW: [www.etas.com/en/hotlines.php](http://www.etas.com/en/hotlines.php)



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