
ES4408CON.1 Communication Interface

User's Guide

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1

Introduction

This User's Guide describes the ES4408CON.1 Communication Interface.

It consists of the following chapters:

- "Introduction" on page 5
This chapter – here you will find general information on the ES4408CON.1 Communication Interface.
- "Hardware" on page 11
This chapter describes the function units of the ES4408CON.1 Communication Interface.
- "Pin Assignment and Display Elements" on page 17
This chapter contains a description of the connectors and LEDs of the ES4408CON.1 Communication Interface.
- "Accessories" on page 21
This chapter contains a description of the cables which are necessary for integrating the ES4408.1CON into the overall system.

Safety Instructions

Before you install the ES4408CON.1 Communication Interface in the ES4408.1 Load Chassis, please observe the following safety instructions.



CAUTION!

Some components of the ES4408CON.1 Communication Interface may be damaged or even destroyed by static discharge. Leave the board in its transport package until you want to install it.

The ES4408CON.1 Communication Interface should only be taken from its package, configured and installed at a working place that is protected against static discharge.



WARNING!

The components, connectors and conductors of the ES4408CON.1 Communication Interface may carry dangerous voltages. These voltages may even exist if the ES4408.1CON is not installed in the ES4408.1 Load Chassis or the ES4408.1 Load Chassis is powered off.

Make sure the ES4408.1CON is protected against contact during operation. Disconnect all connectors to the ES4408.1CON before removing the board.

1.1 Features

The ES4408CON.1 Communication Interface is used in the ES4408.1 Load Chassis to communicate with the boards in the chassis, whether to query status signals, for software control purposes (e.g. of the ES4435.1 Current Source Load Board) or to calibrate these boards.

100-MBit Ethernet Interface

The ES4408.1 Load Chassis is incorporated into the HIL system by the ES4408CON.1 Communication Interface with the LABCAR-OPERATOR software, the simulation target with LABCAR-RTPC and the relevant hardware such as the ES4100.1 Chassis, an ES4440.1 Compact Failure Simulation Module etc.

The Ethernet interface can also be used to control a standalone ES4408.1 Load Chassis with SCPI commands.

SPI Master

Internally, the ES4408CON.1 Communication Interface acts as the SPI master for all boards in the chassis.

Status Signals for Battery Nodes

The signals from the ES1391.1 Power Supply Controller Board to the ES1392.2 High Current Switch Board for controlling the battery nodes can be supplied and led through again at the ES4408CON.1 Communication Interface.

The status signals BN0...BN5 are routed to the backplane of the ES4408.1 Load Chassis and from there to the slots of the low current loads.

Monitoring the Battery Voltage

The ES4408CON.1 Communication Interface is also used to monitor the battery voltage – if there is too much power at the current sources of an ES4435.1 Current Source Load Board, a message is sent to LABCAR-OPERATOR.

Monitoring the Supply Voltages

The ES4408CON.1 Communication Interface also monitors the status of the supply voltages of the ES4408.1 Load Chassis and returns the status to the software (LABCAR-RTC).

The function units described above are also shown in the "Block Diagram of the ES4408CON.1 Communication Interface" on page 8.

Front Panel

The following figure shows the front panel of the ES4408CON.1 Communication Interface.

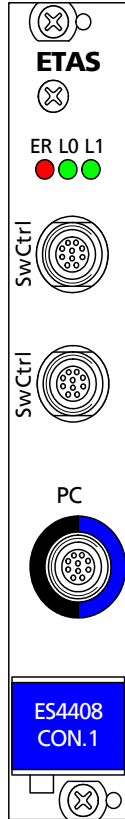


Fig. 1-1 Front Panel of the ES4408CON.1 Communication Interface

The connectors/pin assignment and LEDs are described in the chapter "Pin Assignment and Display Elements" on page 17.

1.2 Block Diagram

Fig. 1-2 shows the block diagram of the ES4408CON.1 Communication Interface.

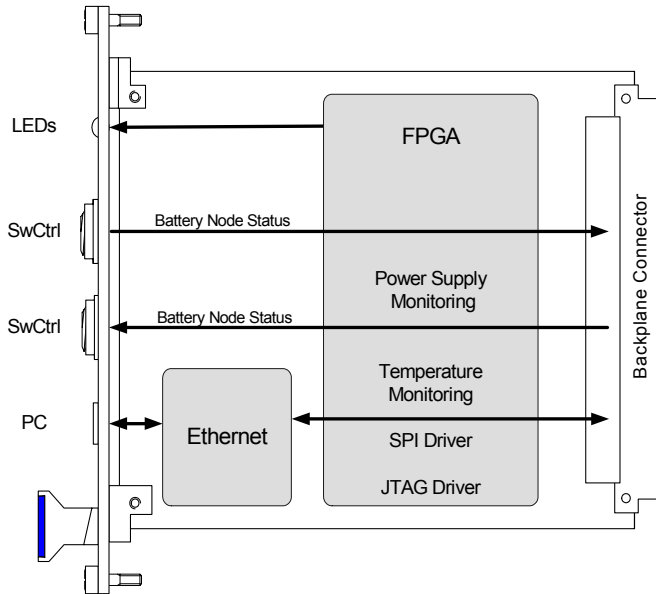


Fig. 1-2 Block Diagram of the ES4408CON.1 Communication Interface

1.3 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. 1-3 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 25).

2 Hardware

This chapter describes the function units of the ES4408CON.1 Communication Interface.

These are:

- "Connecting the Signals to the Battery Node Control" on page 11
- "Settings in LABCAR-RTC" on page 12
- "Voltage and Temperature Monitoring" on page 14
- "Communication via SCPI" on page 15

2.1 Connecting the Signals to the Battery Node Control

The signal from the ES1391.1 Power Supply Controller Board to the ES1392.2 High Current Switch Board for controlling the battery nodes can be supplied and then led through again. The two "SwCtrl" connectors are identical and can act both as an input as well as an output for the signals from the ES1391.1 and to the ES1392.2.

Only the five control signals for the battery nodes are tapped internally – these are used by the ES4434.1 Configurable Load Board and the ES4435.1 Current Source Load Board as status signals.

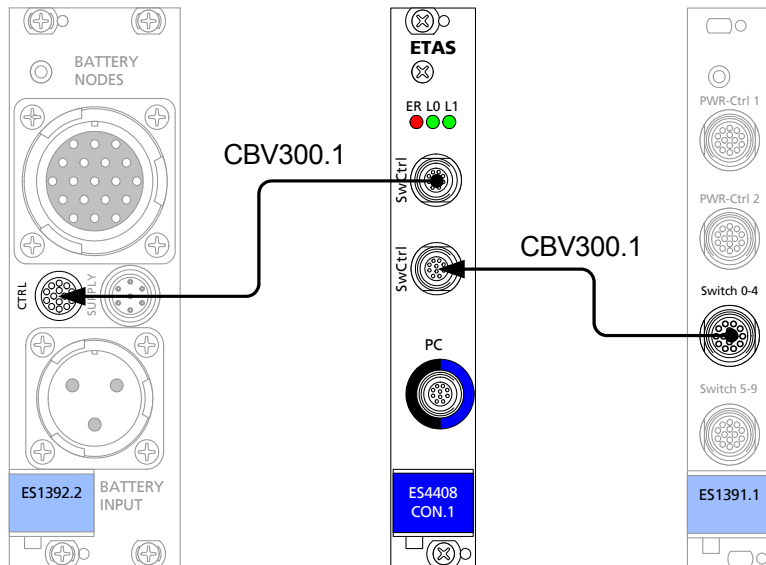


Fig. 2-1 Supplying the Battery Node Status

Connecting Cables and Pin Assignment

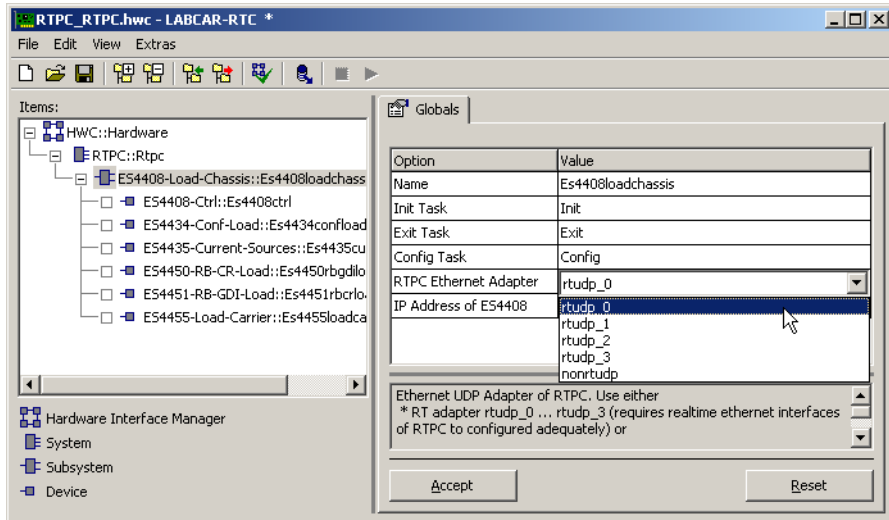
The cable for supplying/leading through the battery node status (required twice) is described in the section " "CBV300.1-1" Cable" on page 21. The pin assignment of the "SwCtrl" connectors can be found in the section " "SwCtrl" Connector" on page 17.

2.2 Settings in LABCAR-RTC

When the ES4408.1 Load Chassis is connected to a LABCAR Real-Time PC via Ethernet (via the ES4408CON.1 Communication Interface), a few settings have to be made in LABCAR-RTC (Real-Time Execution Connector).

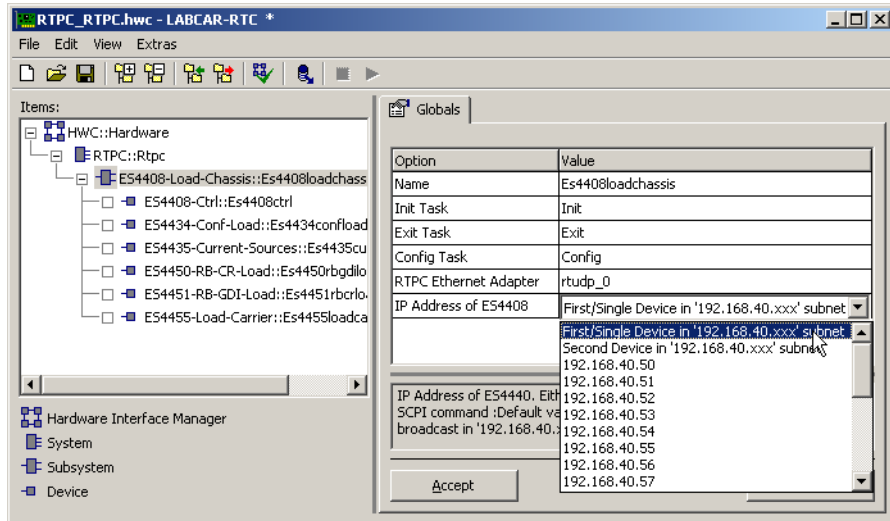
To select the Ethernet adapter of the Real-Time PC

- Open the hardware configuration in LABCAR-RTC.
- Select the ES4408-Load-Chassis Subsystem.
- In the "Globals" tab, select the option "RTPC Ethernet Adapter".
- Under "Option" select the Ethernet adapter of the Real-Time PC you are using.



To determine the IP address of the ES4408.1 Load Chassis

- In the same tab, select the option “IP Address of ES4408”.
- Select one of the settings offered in the “Value” column.



To make further settings

- Select **View** → **Show All**.
Four further options for configuring the Ethernet connection are displayed.
 - UDP Port
 - UDP Response Timeout
 - Invocation Divider used for Signal Groups
 - Level of Debug Messages

These are described in the LABCAR-RTC V4.1 - User's Guide.

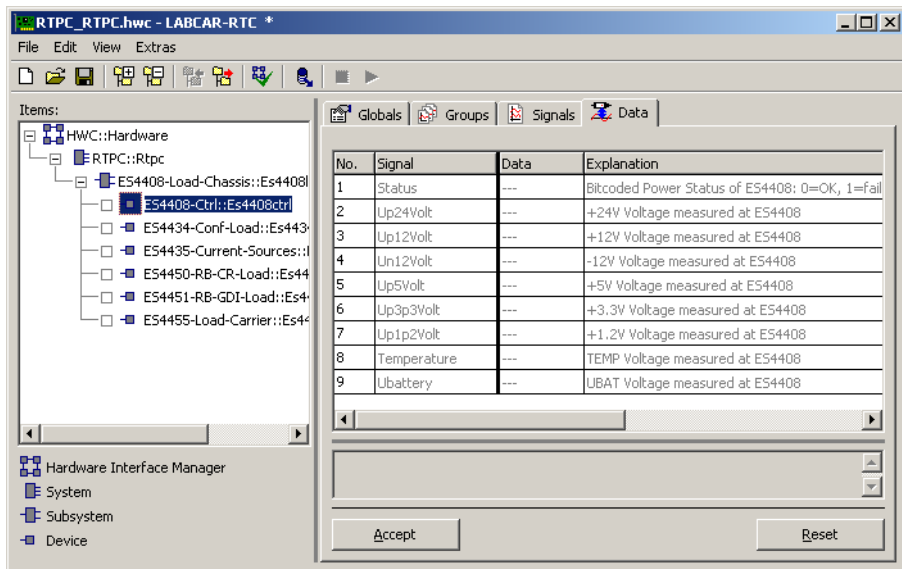
2.3 Voltage and Temperature Monitoring

The ES4408CON.1 Communication Interface also monitors the supply voltages for the boards installed (+24 V, +12 V, -12 V, +5 V, +3.3 V and +1.2 V), the battery voltage and the temperature in the housing.

The general status of the supply voltages (apart from 1.2 V) is displayed on the front panel via the LEDs – more detailed information can be obtained in LABCAR-RTC.

To determine supply voltages and temperature

- Open the hardware configuration.
- Select the ES4408-Ctrl Device.
- Select the “Data” tab.



The screenshot shows the LABCAR-RTC software interface. The title bar reads "RTPC_RTPC.hwc - LABCAR-RTC *". The menu bar includes "File", "Edit", "View", and "Extras". The "Items:" tree on the left shows a hierarchy: "HWC::Hardware" > "RTPC::Rtpc" > "ES4408-Load-Chassis::Es4408" > "ES4408-Ctrl::Es4408ctrl". The "Data" tab is selected, displaying a table with the following data:

No.	Signal	Data	Explanation
1	Status	---	Bitcoded Power Status of ES4408: 0=OK, 1=Fail
2	Up24Volt	---	+24V Voltage measured at ES4408
3	Up12Volt	---	+12V Voltage measured at ES4408
4	Un12Volt	---	-12V Voltage measured at ES4408
5	Up5Volt	---	+5V Voltage measured at ES4408
6	Up3p3Volt	---	+3.3V Voltage measured at ES4408
7	Up1p2Volt	---	+1.2V Voltage measured at ES4408
8	Temperature	---	TEMP Voltage measured at ES4408
9	Ubattery	---	UBAT Voltage measured at ES4408

At the bottom of the window, there are "Accept" and "Reset" buttons.

In addition to general status information (“Status” signal), the measured supply voltages, temperature and battery voltage are output (with a running experiment).

2.4 Communication via SCPI

SCPI (Standard Commands for Programmable Instruments) is a standardized command syntax in the form of ASCII commands. The ES4408CON.1 Communication Interface can communicate with every system that can process UDP frames and that can send the relevant SCPI commands and queries.

3 Pin Assignment and Display Elements

This chapter contains a description of the connectors and LEDs of the ES4408CON.1 Communication Interface.

3.1 “SwCtrl” Connector

The “SwCtrl” signal from the ES1391.1 Power Supply Controller Board (see “Connecting the Signals to the Battery Node Control” on page 11) is supplied and led through at these connectors.

The connector is a LEMO ECG.1B.314.NLV connector.

Fig. 3-1 shows the pin assignment (view from the plug-in side).

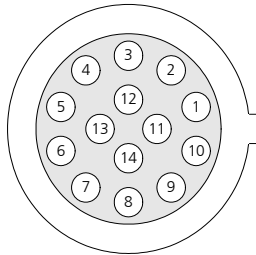


Fig. 3-1 “SwCtrl” Connector (View from the Plug-In Side)

The pin assignment is as follows:

Pin	Signal
1	Control signal switch 0
2	Control signal switch 1
3	Control signal switch 2
4	Control signal switch 3
5	Control signal switch 4
6	Not assigned
7	Output signal switch error
8	Output +UBatt
9	Output -UBatt
10	Control signal for MRC pull-up/pull-down
11	Output MRC signal
12	Ground switches 0 - 4
13	ES1392.2 EEPROM signal
14	ES1392.2 EEPROM ground
Housing	Protective earth

Tab. 3-1 "SwCtrl" Pin Assignment

A special cable is available (see "CBV300.1-1" Cable" on page 21) for connecting to the "SwCtrl0" or "SwCtrl1" output of the ES1391.1 Power Supply Controller Board and to the "CTRL" input of the ES1392.2 High Current Switch Board.

3.2 "PC" Connector

The Ethernet cable is connected at this connector.

The connector is a LEMO EPD.1B.308.YLN connector.

Fig. 3-2 shows the pin assignment (view from the plug-in side).

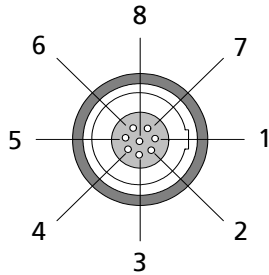


Fig. 3-2 "PC" Connector (View from the Plug-In Side)

The pin assignment is as follows:

Pin	Signal
1	n.c.
2	n.c.
3	n.c.
4	RX+
5	TX-
6	RX-
7	n.c.
8	TX+
Housing	Protective earth

Tab. 3-2 "PC" Pin Assignment

A special cable is available for connecting the Ethernet connection (see "CBE100-X" Cable" on page 21)

3.3 LEDs for Status Display

There are three LEDs on the front panel of the ES4408CON.1 Communication Interface.

ER L0 L1



Fig. 3-3 LEDs on the Front Panel

The LEDs have the following meaning:

LED	Display	Meaning
ER	Showing red	Error
L0	Flashing green	Ethernet link OK
L1	Flashing green	Communication

Tab. 3-3 Meaning of the LEDs

4 Accessories

This chapter contains a description of the cables which are necessary for integrating the ES4408.1CON into the overall system.

4.1 "CBV300.1-1" Cable

This cable is used to supply signals to the battery node control (from the ES1391.1 Power Supply Controller Board) and to transfer them to the ES1392.2 High Current Switch Board.

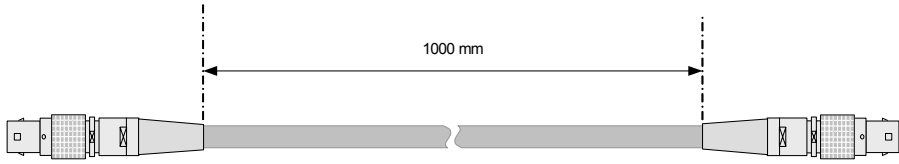


Fig. 4-1 "CBV300.1-1" Cable

The wiring is 1:1.

The order data is shown below:

Product	Length	Order Number
CBV300.1-1	1 m	F-00K-106-173

Tab. 4-1 Ordering Information for the "CBV300.1-1" Cable

4.2 "CBE100-X" Cable

This cable is used to connect the Ethernet connection to the ES4408.1CON.



Fig. 4-2 "CBE100-X" Cable

The order data is shown below:

Product	Length	Order Number
CBE100-3	3 m	F-00K-102-559
CBE100-8	8 m	F-00K-102-571
CBE100-20	20 m	F-00K-102-570

Tab. 4-2 Ordering Information for the "CBE100-X" Cable

5 **Technical Data**

This chapter contains the technical data of the ES4408CON.1 Communication Interface.

Ethernet Interface

Data rate	100 MBit
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Power Supply

Current consumption	+ 3.3 V: 500 mA + 5 V: 100 mA +12 V: 50 mA -12 V: 50 mA
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Dimensions

Height	3 U
Width	4 HP
Depth	106 mm

Environmental Conditions

Operating temperature	5 °C to 35 °C (41 °F to 95 °F)
Relative humidity	0 to 95% (non-condensing)

6 **ETAS Contact Addresses**

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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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