ES4434.1 Configurable Load Board

User's Guide

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Contents

4 Contents

1 Introduction

This User's Guide describes the ES4434.1 Configurable Load Board.

It consists of the following chapters:

- Introduction

  This chapter – here you will find general information on the ES4434.1 Configurable Load Board.

- "Hardware" on page 11

  This chapter describes the features of the ES4434.1 Configurable Load Board in more detail.

- "Technical Data" on page 19

  This section contains the technical data of the ES4434.1 Configurable Load Board.

> ⚠ **CAUTION!**
>
> *Some components of the ES4434.1 Configurable Load Board may be damaged or even destroyed by static discharge. Leave the board in its transport package until you want to install it.*
> *The ES4434.1 Configurable Load Board 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 ES4434.1 Configurable Load Board may carry dangerous voltages. These voltages may even exist if the ES4434.1 is not installed in the ES4408.1 Load Chassis or the ES4408.1 Load Chassis is powered off.*
> *Make sure the ES4434.1 is protected against contact during operation.*

1.1 Features

The ES4434.1 Configurable Load Board is a 3 U plug-in board for the ES4408.1 Load Chassis and is used to simulate low current loads in a LABCAR.

A total of seven boards of the type ES4434.1 Configurable Load Board or ES4435.1 Current Source Load Board can be used in the ES4408.1 Load Chassis.

The ES4434.1 Configurable Load Board has the following features:

- 24 configurable loads which are attached to the board with clips
- Assembled with 24 resistors of 510 Ω/3 W on delivery
- Each individual load can be configured to a specific battery node (via a jumper)
- Battery nodes are activated via a relay (with the corresponding status signal)

This makes the ES4434.1 Configurable Load Board suitable for projects in which rare reconfigurations are necessary – for frequent changes, we would recommend the ES4435.1 Current Source Load Board that has 24 current sources configurable via software.

Fig. 1-1 shows the block diagram of the ES4434.1 Configurable Load Board.
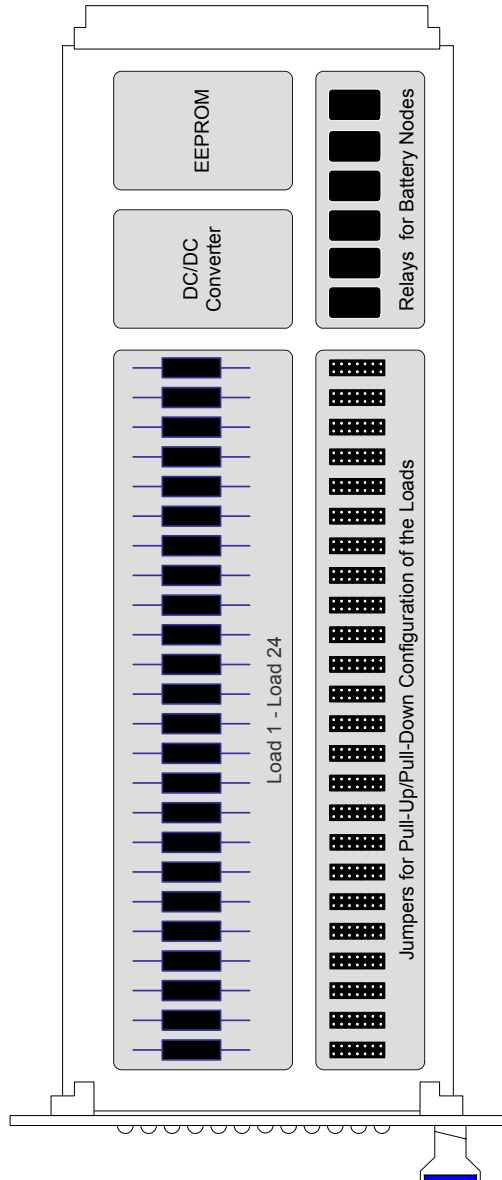

Fig. 1-1   Block Diagram of the ES4434.1 Configurable Load Board

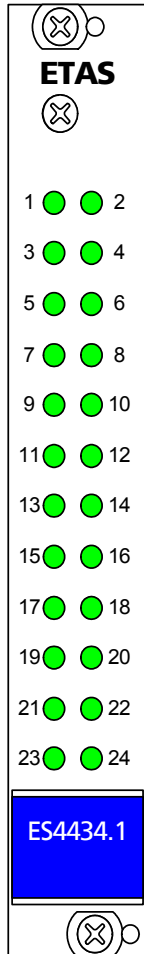The following figure shows the front panel of the ES4434.1 Configurable Load Board.

Fig. 1-2   Front Panel of the ES4434.1 Configurable Load Board

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. 1-3   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 21).

2 Hardware

This chapter describes the features of the ES4434.1 Configurable Load Board in more detail.

2.1 Function Units

Fig. 2-1 shows the function units of the ES4434.1 Configurable Load Board which are described in this chapter.
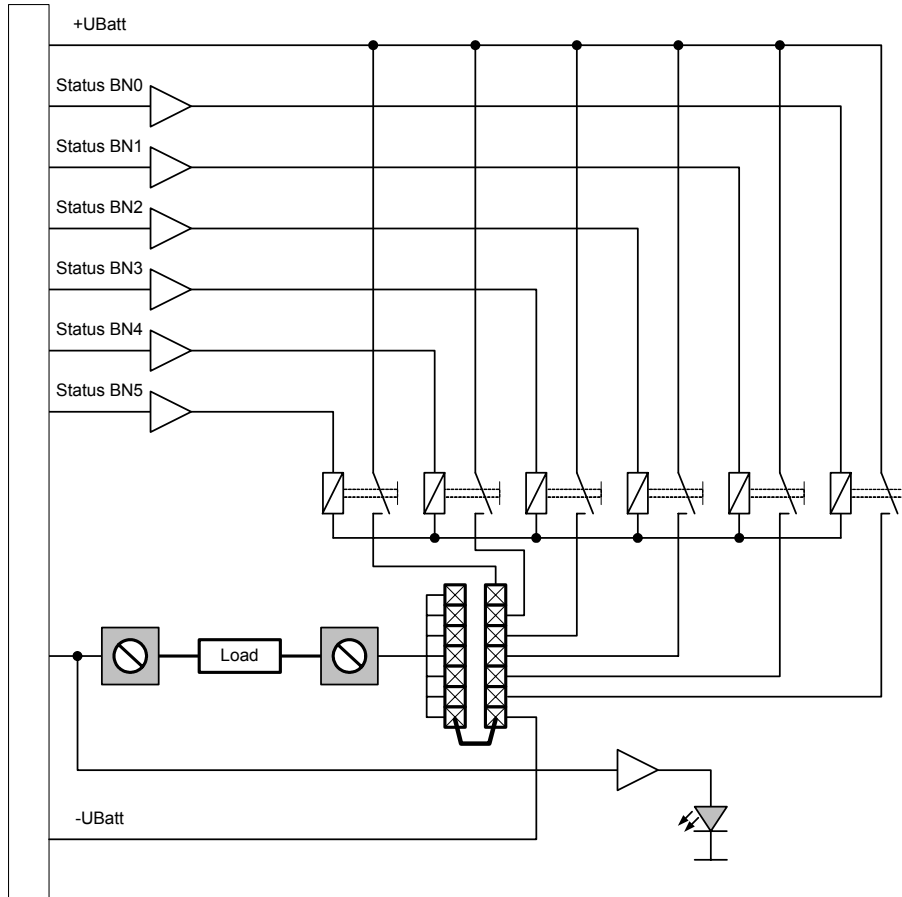

Fig. 2-1   The Function Units of the ES4434.1 Configurable Load Board

Connecting the Loads

The loads are connected at connectors Load 9...Load 15 – the relationship between the slot and the connector is described in the section "Assigning "Load in Slot x" to Connector "Load n"" on page 16.

Backplane

The signals are routed from these connectors to the backplane and then on to the relevant card slot (see "The Load Signals at the Backplane Connectors" on page 17.)

Battery Node Relay

The battery node status signals applied at the ES4408CON.1 Communication Interface (and also routed to the backplane) switch the relays for the battery nodes against which the loads can be configured.

Pull-Up/Pull-Down Configuration

Jumpers are used to configure a load against a specific battery node (see "Configuring Loads on Battery Nodes" on page 14).

Configuring Grounds

Use another jumper to select whether the AGND of the ES4434.1 is connected to -UBatt or not (see "Configuring Grounds" on page 15).

LEDs

The LEDs on the front panel indicate the potential of the ECU connector (see "LEDs" on page 15).

2.2 Configuration

This section describes possible configurations of the ES4434.1 Configurable Load Board.

These are:

Exchanging Load Resistors

The ES4434.1 Configurable Load Board is fully equipped with 24 510 Ω resistors on delivery. They can be replaced at any time with other resistors – please note that the maximum permissible power per load is 3 W.

To exchange resistors on the ES4434.1 Configurable Load Board, proceed as follows:

- If the board is installed in the ES4408.1 Load Chassis, switch off the power supply voltage to the housing.
- Remove the screws with which the ES4434.1 is attached in the housing and pull out the board.
- Remove the relevant resistors by pressing down the white clips.
- Insert the new resistors.

Configuring Loads on Battery Nodes

Every load can be switched against one of the six battery nodes or -UBatt – there are 24 jumpers "X1" to "X24" for loads 1 to 24 under the row of resistors.
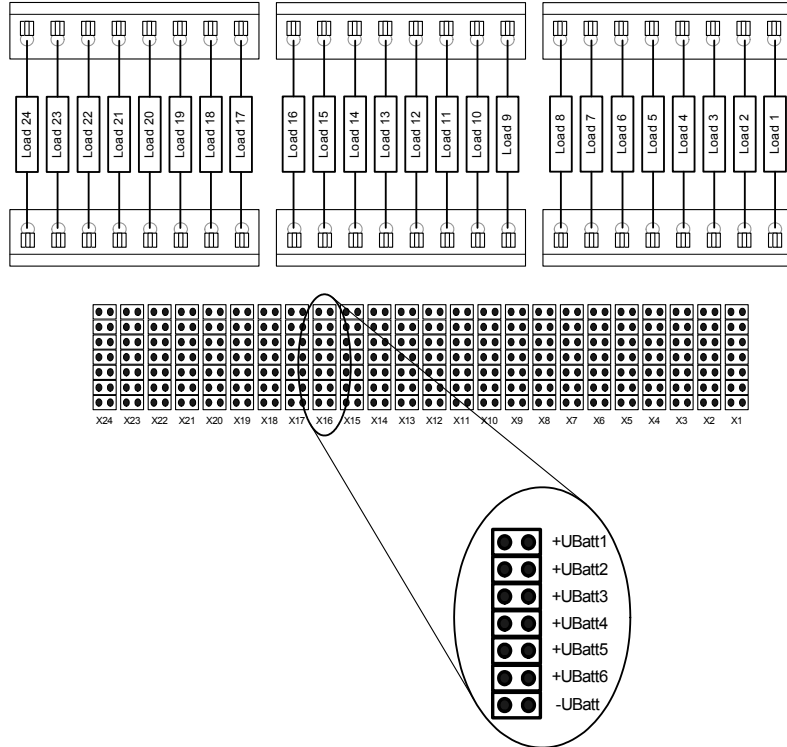

Fig. 2-2   Position of the Jumpers for the Battery Nodes and Possible Configurations

You can see which jumper position configures to which battery nodes thanks to the labeling next to the first jumper "X1" (on the right).

Configuring Grounds

To avoid unwanted interferences to the supply voltages of the ES4408.1 Load Chassis, the load side is isolated from the supply voltages via a DC/DC converter.

The actual load reference potential is the output ground of the DC/DC converter which can then be referred to battery ground -UBatt via jumper "X29".

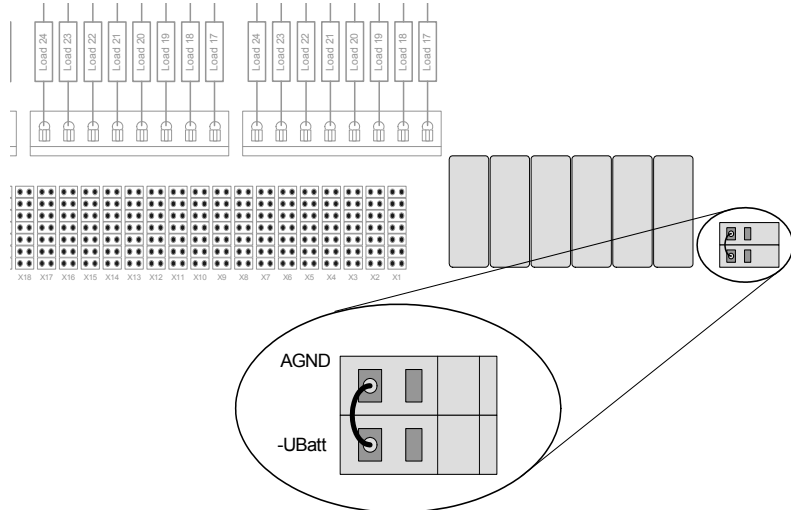

Fig. 2-3   Position of Jumper X29

LEDs

There is an LED on the front panel of the ES4434.1 Configurable Load Board for every load – it is addressed by comparators and always lights up when the voltage at the ECU pin is greater than 6 V.

2.3 Assigning "Load in Slot x" to Connector "Load n"

The loads in the various slots are routed to the connectors "Load n" as follows.

Slot:Load	Connector:Pin		Slot:Load	Connector:Pin
Slot x:load 1	Load n:1		Slot x:load 13	Load n:13
Slot x:load 2	Load n:2		Slot x:load 14	Load n:14
Slot x:load 3	Load n:3		Slot x:load 15	Load n:15
Slot x:load 4	Load n:4		Slot x:load 16	Load n:16
Slot x:load 5	Load n:5		Slot x:load 17	Load n:17
Slot x:load 6	Load n:6		Slot x:load 18	Load n:18
Slot x:load 7	Load n:7		Slot x:load 19	Load n:19
Slot x:load 8	Load n:8		Slot x:load 20	Load n:20
Slot x:load 9	Load n:9		Slot x:load 21	Load n:21
Slot x:load 10	Load n:10		Slot x:load 22	Load n:22
Slot x:load 11	Load n:11		Slot x:load 23	Load n:23
Slot x:load 12	Load n:12		Slot x:load 24	Load n:24

Tab. 2-1   Slot:Load → Connector:Pin

Note

Please note that the connector numbering does not correspond to the slot numbering (see the following table)!

Slot	6	7	8	9	10	11	12
Connector	Load 15	Load 14	Load 13	Load 12	Load 11	Load 10	Load 9

Tab. 2-2   Assignment: Slot x → Connector "Load *n*"

2.4 The Load Signals at the Backplane Connectors

The following table shows how the load signals are routed from the connector on the rear of the ES4408.1 Load Chassis to the backplane connectors.

Slot: Signal	Slot: Backplane Connector		Slot: Signal	Slot: Backplane Connector
Slot n:load 1	Slot n:a11		Slot n:load 14	Slot n:b15
Slot n:load 2	Slot n:b11		Slot n:load 15	Slot n:c15
Slot n:load 3	Slot n:c11		Slot n:load 16	Slot n:a16
Slot n:load 4	Slot n:a12		Slot n:load 17	Slot n:b16
Slot n:load 5	Slot n:b12		Slot n:load 18	Slot n:c16
Slot n:load 6	Slot n:c12		Slot n:load 19	Slot n:c17
Slot n:load 7	Slot n:a13		Slot n:load 20	Slot n:c17
Slot n:load 8	Slot n:b13		Slot n:load 21	Slot n:c17
Slot n:load 9	Slot n:c13		Slot n:load 22	Slot n:a18
Slot n:load 10	Slot n:a14		Slot n:load 23	Slot n:b18
Slot n:load 11	Slot n:b14		Slot n:load 24	Slot n:c18
Slot n:load 12	Slot n:c14		GND board	Slot n:c10
Slot n:load 13	Slot n:a15			

Tab. 2-3   Load Signals and Backplane Connectors

3   Technical Data

This section contains the technical data of the ES4434.1 Configurable Load Board.

Dummy Loads

Number	24
Assembly on delivery	510 Ω ±3%
Maximum permissible power per load	3 W
Signal level for addressing the relays	TTL

Environmental Conditions

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

Power Supply

Current consumption	+ 3.3 V: 30 mA + 5 V: 20 mA +24 V: 150 mA

Dimensions

Height	3 U
Width	4 HP
Depth	340 mm

4   ETAS Contact Addresses

ETAS HQ

ETAS GmbH

Borsigstraße 24

70469 Stuttgart

Germany

Phone:	+49 711 3423-0	
Fax:	+49 711 3423-2106	
WWW:	www.etas.com	

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

Index