

ES4100.1 Chassis VME64x
User's Guide



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V1.0.0_R07DE - 07.2018

TTN F 00K 700 314

Contents

1	Introduction	5
1.1	Basic Safety Instructions	5
1.1.1	Labeling of Safety Instructions	5
1.1.2	General Safety Information	5
1.1.3	Connecting/Removing Devices	6
1.1.4	Opening the Housing	6
1.1.5	Requirements made of the User and Obligations of the Operator	6
1.1.6	Correct Use	6
1.2	Identifications on the Product	8
1.3	CE Marking	8
1.4	RoHS Conformity	8
1.4.1	European Union	8
1.4.2	China	8
1.5	Taking the Product Back and Recycling	9
1.6	About This Manual	10
1.6.1	Using This Manual	10
2	Functional Description	13
2.1	Features	13
2.2	Applications	14
2.3	Mechanical Structure	14
2.4	Display Elements	14
2.5	Slots	15
2.6	Backplane	15
2.7	Power Supply Unit	15
2.8	Ventilation Fan	15
3	Operation	17
3.1	Installation of VMEbus Boards	17

3.2	Removal of VMEbus Boards	17
3.3	Fuses	18
4	Connections and Connectors	21
4.1	VME64x	21
4.2	Power Cables	22
5	Technical Data	23
5.1	Fulfilled Standards and Norms	25
5.2	Ordering Data	25
6	ETAS Contact Addresses	27
	Index	29

1 Introduction

This chapter contains information on the following topics:

- "Basic Safety Instructions" on page 5
- "Identifications on the Product" on page 8
- "CE Marking" on page 8
- "RoHS Conformity" on page 8
- "Taking the Product Back and Recycling" on page 9
- "About This Manual" on page 10

1.1 Basic Safety Instructions

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

1.1.1 Labeling of Safety Instructions

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.

1.1.2 General Safety Information

Please read the following safety instructions to avoid injury to yourself and others as well as damage to the device.

Note

Please read the documentation accompanying the product carefully before using the product.

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

1.1.3 Connecting/Removing Devices

Please take the following precautionary measures to avoid any injuries and damage to hardware:

- Do not apply any voltages to the ports of the ES4100.1 Chassis VME64x which do not correspond to the specifications of the relevant port. Refer to the corresponding boards' manuals for the exact specification of the I/O hardware.
- Do not connect or disconnect any devices while the ES4100.1 Chassis VME64x or external devices are powered on. First, power off the ES4100.1 Chassis VME64x by using the on/off switch on the front of the device, and detach all power plugs.
- When inserting any connectors, please make sure they are absolutely straight and that none of the pins are bent.

1.1.4 Opening the Housing

The ES4100.1 Chassis VME64x must only be opened by qualified technical personnel!

**DANGER!**

As long as the ES4100.1 Chassis VME64x is not completely disconnected, there is a danger of electrocution! Disconnect the device from the mains by removing the mains cable – then wait a few minutes until all components (e.g. power pack, capacitors) are discharged.

1.1.5 Requirements made of the User and Obligations of the Operator

Make sure you only assemble, operate and maintain the product if you have the relevant qualification for and experience with this product. Incorrect usage or operation by users without an appropriate qualification can lead to serious or even fatal injuries as well as damage to property.

Note

Responsibility for the safety of the system into which the ES4100.1 Chassis VME64x was integrated lies with the person who assembled the system!

General Occupational Health and Safety

The existing regulations on occupational health and safety as well as accident prevention must be adhered to.

1.1.6 Correct Use

The ES4100.1 Chassis VME64x is a system housing creating a hardware-in-the-loop test system. The ES4100.2-based hardware-in-the-loop test system consists of:

- Digital and analog interfaces to the ECU, which can be integrated into the ES4100.1 Chassis VME64x as VME-based boards.
- Battery node simulation (e.g. K15, K30, ...) for connecting to the ECU which can be integrated into the ES4100.1 Chassis VME64x in the form of VME-based boards.

- The simulation of the vehicle battery itself is not a component part of the ES4100.1 Chassis VME64x and cannot be integrated here.

The ES4100.1 Chassis VME64x must always be integrated in an ETAS casing specially designed for this purpose (i.e. ES4015.2 Housing 9U) or in a 19" rack system and must not be used as a "standalone" unit.

The ES4100.1 Chassis VME64x is intended to be used as follows:

- In industrial lab facilities or at industrial workplaces,
- As a hardware interface for ECUs in a Hardware-in-the-Loop test system,
- In conjunction with ETAS software supported by the ES4100.1 Chassis VME64x,
- As an interface together with software programs that serve the standardized, documented and open APIs of ETAS software products.

The ES4100.1 Chassis VME64x is not intended to be used:

- In a vehicle on the road,
- As part of a life support system,
- As part of a medical application,
- In applications in which misuse can lead to injury or damage,
- In environments with conditions outside the specified ranges (see "Environmental Conditions" on page 25).

Demands made of Operation

The following requirements are made to ensure safe operation:

- Only use the product in accordance with the specifications in the relevant User's Guide. Product safety is not guaranteed if the device is used other than intended.
- Observe all applicable regulations on site concerning electrical safety as well as the rules and regulations on occupational health and safety!
- Never use the product in a wet or damp environment.
- Never use the product in areas subject to explosions.
- Make sure you keep the surface of the product clean and dry.

Demands made re the Technical State of the Product






This state-of-the-art product adheres to all recognized safety-related regulations. The product must only be used if it is in full working order, with the relevant personal only using the device as it was intended, taking all security issues and risks into account as well as taking into consideration the relevant documentation at all times. If the product is not used correctly, the protection of the product may be impaired.

Maintenance and Cleaning

To clean the outside of the device, use a clean, dry cloth.

1.2 Identifications on the Product

The following symbols are used for identifying the product:

Symbol	Description
	Before using the product, carefully read the user's guide!
	Identification for CE (see "CE Marking" on page 8)
	Identification for China RoHS (see "RoHS Conformity" on page 8)
 	Identification for WEEE directive (see "Taking the Product Back and Recycling" on page 9)

Observe the information in chapter "Technical Data" on page 23.

1.3 CE Marking

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.

1.4 RoHS Conformity

1.4.1 European Union

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.

1.4.2 China

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.

The concluding chapter "ETAS Contacts" gives you information about the international ETAS sales and service branch offices.

1.5 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 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. 1-1 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 27).

1.6 About This Manual

This manual consists of the following chapters:

- "Introduction" on page 5
This chapter
- "Functional Description" on page 13
This section contains detailed information about the features and applications of the ES4100.1 Chassis VME64x.
- "Operation" on page 17
This section provides information about the installation and removal of the VMEbus boards, fuse replacement.
- "Connections and Connectors" on page 21
This section contains information about the pin allocation of the connectors and about the power cord.
- "Technical Data" on page 23
This section contains the technical data of the ES4100 Chassis in tabular form and information on fulfilled standards and norms.

1.6.1 Using This Manual

Representation of Information

All activities to be carried out by the user are shown in what we call a "Use-Case" format, i.e. the target to be achieved is defined briefly in the title and the individual steps necessary to achieve this target are then listed. The information is displayed as follows:

Target definition

Any introductory information...

- Step 1
Possibly an explanation of step 1...
- Step 2
Possibly an explanation of step 2...

Any concluding remarks...

Concrete example:

To create a new file

If you want to create a new file, no other file may be open.

- Select **File** → **New**.
The "Create file" dialog box appears.
- Enter a name for the file in the "File name" field.
The file name must not exceed 8 characters.
- Click **OK**.

The new file is created and saved under the name specified. You can now work with the file.

Typographic Conventions

The following typographic conventions are used:

Select File → Open .	Menu commands are shown in boldface/blue.
Click OK .	Buttons are shown in boldface/blue.
Press <ENTER>.	Keyboard commands are shown in angled brackets in block capitals.
The "Open File" dialog box appears.	Names of program windows, dialog boxes, fields etc. are shown in quotation marks.
Select the file <code>setup.exe</code> .	Text in drop-down lists, program code, as well as path and file names are shown in the <code>Courier</code> font.
A conversion between the file types logical and arithmetic is <i>not</i> possible.	Content markings and newly introduced terms are shown in <i>italics</i> .

Important notes for the user are shown as follows:

Note

Important note for the user.

2 Functional Description

This section contains detailed information about the features and applications of the ES4100.1 Chassis VME64x.

2.1 Features

The ES4100.1 Chassis VME64x is designed to hold the VME boards. It is responsible for the mechanical mounting of the boards, the connection of the boards with the VMEbus, the power supply, and the cooling of the boards.

The chassis has the following features:

- 21 slots
- standard VMEbus and VME64x boards
- slots for standard eurocards (100 mm x 160 mm)
- slots separated at 4 HP intervals (22.3 mm)
- 160-pin backplane
- +3.3 V, +5 V, +12 V, and -12 V power supply
- power adapter with wide input voltage range
- controlled fan with fault indication
- 19"-geometry for case or cabinet mounting
- 4 U front panel height
- power switch, fuses, and fault indications on the front panel

The following figure shows the front panel and the position of the controls and displays.

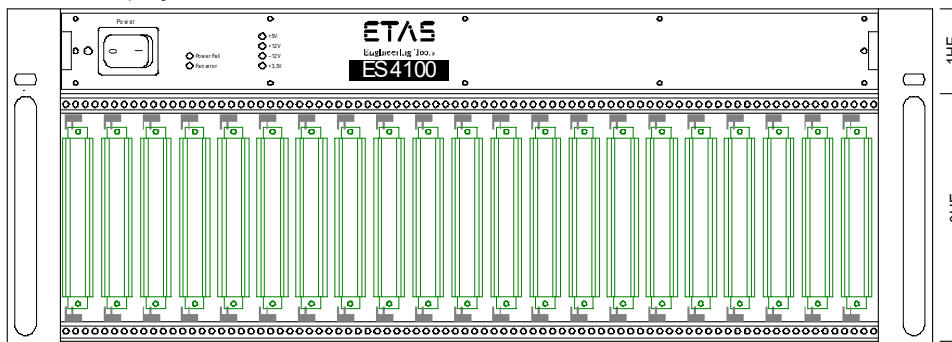


Fig. 2-1 Front Panel

2.2 Applications

The ES4100.1 Chassis VME64x is designed to allow the construction of large VMEbus systems. Its active cooling system makes it suitable also for installing boards with high heat emission.

The chassis can be combined with all ES4000 series rack systems.



CAUTION!

The ES4100.1 Chassis VME64x may be installed and operated by trained technical personnel only. Improper installation and operation may damage the chassis and boards, and may cause a health hazard.

2.3 Mechanical Structure

The ES4100.1 Chassis VME64x is designed with 19" geometry and 4 U front panel height. The power switch and displays are located on the front panel.

The figure below shows a cut-out section of the chassis.

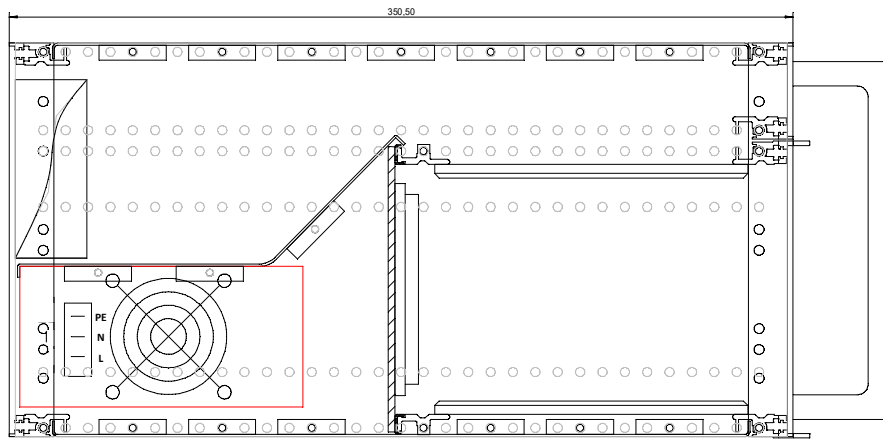


Fig. 2-2 Cut-out Section of the Chassis

2.4 Display Elements

The front panel of the chassis has six LEDs and a control lamp in the power switch that show you various operating and error statuses.

Display	Meaning
Power Switch	Power supply switched on and power voltage applied
Power Fail	The "ACFAIL" of the VME bus is active.
Fan Error	At least one fan has failed.
+5 V	The supply voltage +5 V is active.
+12 V	The supply voltage +12 V is active.
-12 V	The supply voltage -12 V is active.
+3.3 V	The supply voltage +3.3 V is active.

Tab. 2-1 Display on the Front Panel

2.5 Slots

The chassis provides 21 slots at intervals of 4 HP. The slots are designed for standard eurocards in 100 mm x 160 mm size. The front panel height of the plug-in boards measures 4 Us.



CAUTION!

Please observe, that the maximum current consumption for the respective supply voltages (3,3 V, 5 V, +/- 12 V, see Tab. 3-1 on page 19) is not exceeded in case of subsequently installed boards. You can find the information on the current consumption of a board in the corresponding User's Guide for the board. In case of nonobservance the ES4100.1 and built in boards may be damaged and there is the danger of fire through overheating.

2.6 Backplane

The backplane of the chassis has 160 pins. The pin allocation complies with the extended VMEbus standard VME64x. Both VME-standard boards and extended VME64x-standard boards can be inserted.

2.7 Power Supply Unit

The power supply unit provides the voltages +3.3 V, +5 V, +12 V, and -12 V. The power supply unit is designed as a wide range unit with an input voltage range of 100...240 V AC and a frequency range of 50...60 Hz.

The supply voltages of the ES4100.1 Chassis VME64x backplane are protected by fuses (see "Fuses" on page 18).

The regional requirements for power cords and order number are listed in Tab. 4-2 on page 22.

2.8 Ventilation Fan

The chassis is equipped with thermo-controlled ventilation fans. The air mass flow adapts automatically to the heat emission of the boards and the ambient air temperature.

A visible alert on the front panel lights up if at least one fan has failed.

3 **Operation**

This section provides information about the installation and removal of the VMEbus boards, fuse replacement.

3.1 **Installation of VMEbus Boards**

Some VMEbus boards need to be configured before they can be installed. The corresponding information can be found in the manuals of the VMEbus board.

Note

The boards may only be configured and installed at a workplace that is protected against electrostatic discharges!

To install a board

- Turn off the power to the chassis. Check that all devices connected with the chassis by cables have also been powered off.
- If the slot in which you want to install the board is protected by a cover, remove this cover.
- Insert the board into the slot. Make sure that the top and bottom of the board smoothly slide in the guide rails.
- Push the board in until the connector securely locks into place.
- Fasten the mounting screws for the front panel of the board.
- Connect the required cables with the front panel connectors.

3.2 **Removal of VMEbus Boards**

Note

The boards may only be removed at a workplace that is protected against electrostatic discharges!

To remove a board

- Turn off the power to the chassis. Check that all devices connected with the chassis by cables have also been powered off.
- Disconnect all connectors from the board you want to remove.
- Loosen the mounting screws at the top and bottom edge of the board's front panel.
- Grasp the handle of the board and pull the board carefully out.

- Insert the board into its storage package or an anti-static bag.
- Secure the slot with a protective cover.

3.3 Fuses

The supply voltages of the backplane of the ES4100.1 Chassis VME64x are protected with fuses (Tab. 3-1).

In case of a fuse defect, we recommend sending the ES4100.1 Chassis VME64x to ETAS for further testing. For this purpose, the device should be sent to ETAS (see "ETAS Contact Addresses" on page 27).

If a fuse trips multiple times, the device must be sent to ETAS.

**WARNING!**

*Failure to observe the fuse specification can lead to excess currents, short circuits and fires.
Use only fuses that meet the specification in Tab. 3-1 on page 19!
Never bridge defective fuses!*

**CAUTION!**

Replace fuses only while the ES4100.1 is switched off.

To protect the power supply voltage there are two mains fuses on the backside of the ES4100.1 at the bottom right (for specification see Tab. 3-2).

**DANGER!**

The mains fuses may only be replaced by ETAS. In case a mains fuse trips the ES4100.1 must be further tested by ETAS. For this purpose send the device to ETAS (see "ETAS Contact Addresses" on page 27). Nonobservance may cause damage to the ES4100.1 and the therein installed boards and it may lead to excess currents, short circuits and fires.

Specification of the Fuses F100 - F103 (Manufacturer: Littelfuse, Inc.)

The specification of the fuses F100 - F103 is as follows:

Fuse	Type	Spezification	Protection of
FU103	506 Series Fast-Acting 0506015.MXP Order Number: 1903015	15 A	+3,3 V
FU102	313 Series Slo-Blo® 0313012.MXP Order Number: 1596757	12 A	+5 V
FU100	313 Series Slo-Blo® 0313005.MXP Order Number: 1596751	5 A	+12 V
FU101	313 Series Slo-Blo® 0313005.MXP Order Number: 1596751	5 A	-12 V

Tab. 3-1 Specification of the Fuses F100 - F103 and Order Numbers

To replace the fuses F100 - F103

The fuses are located inside the ES4100.1 housing next to the power supply unit.

- Turn off the power to the ES4100.1. Check that all devices connected to the ES4100.1 by cables have also been powered off.
- Disconnect the power cable of the ES4100.1.
- Remove the base plate of the ES4100.1 housing. For this purpose loosen six small cross-head screws on the right side and six small cross-head screws on the left side.
- Mount the fuses in the respective fuse holders. The fuse holders are marked according to the value of the fuse.

Specification of the Mains Fuses (Manufacturer: SIBA)

The specification of the mains fuses is as follows:

Fuse	Type	Spezification	Protection of
Mains Fuse 1	SIBA 70-065-065	6,3 A	500 V
Mains Fuse 2	SIBA 70-065-065	6,3 A	500 V

Tab. 3-2 Specification of the Mains Fuses

4 Connections and Connectors

This section contains information about the pin allocation of the connectors and about the power cord.

4.1 VME64x

The boards are connected using 160-pin VG multi-point connectors. The pins in rows a, b, and c correspond to the standard VMEbus.

Pin	Row z	Row a	Row b	Row c	Row d
1	MPR	D00	/BBSY	D08	VPC
2	GND	D01	/BCLR	D09	GND
3	MCLK	D02	/ACFAIL	D10	n.c.
4	GND	D03	/BG0IN	D11	n.c.
5	MSD	D04	/BG0OUT	D12	RsvU
6	GND	D05	/BG1IN	D13	n.c.
7	MMD	D06	/BG1OUT	D14	n.c.
8	GND	D07	/BG2IN	D15	RsvU
9	MCTL	GND	/BG2OUT	GND	/GAP
10	GND	SYSCLK	/BG3IN	/SYSFAIL	/GA0
11	/RESP	GND	/BG3OUT	/BERR	/GA1
12	GND	/DS1	/BR0	/SysReset	+3.3 V
13	RsvBus	/DS0	/BR1	/LWORD	/GA2
14	GND	/WRITE	/BR2	AM5	+3.3 V
15	RsvBus	GND	/BR3	A23	/GA3
16	GND	/DTACK	AM0	A22	+3.3 V
17	RsvBus	GND	AM1	A21	/GA4
18	GND	/AS	AM2	A20	+3.3 V
19	RsvBus	GND	AM3	A19	RsvBus
20	GND	/IACK	GND	A18	+3.3 V
21	RsvBus	/IACKIN	SERA	A17	RsvBus
22	GND	/IACKOUT	SERB	A16	+3.3 V
23	RsvBus	AM4	GND	A15	RsvBus
24	GND	A07	/IRQ7	A14	+3.3 V
25	RsvBus	A06	/IRQ6	A13	RsvBus
26	GND	A05	/IRQ5	A12	+3.3 V
27	RsvBus	A04	/IRQ4	A11	LI-/I
28	GND	A03	/IRQ3	A10	+3.3 V
29	RsvBus	A02	/IRQ2	A09	LI-/O

Tab. 4-1 Pin Allocation VME64x

Pin	Row z	Row a	Row b	Row c	Row d
30	GND	A01	/IRQ1	A08	+3.3 V
31	RsvBus	-12 V	+5 V Stby	+12 V	GND
32	GND	+5 V	+5 V	+5 V	VPC

Tab. 4-1 Pin Allocation VME64x (Forts.)

4.2 Power Cables

Due to regional differences in the power supply, ETAS does not supply power cord cables with the ES4100.1 Chassis VME64x. The following table contains details of the relevant requirements and the ETAS order numbers.

Region	Description	Order Number
General	AC supply cable with IEC 60320 C13 plug on one end and a non-locking plug approved by the national safety standards (with earth contacts) on the other end. Plugs and cable must be rated for min. 250 VAC/10 A or 125 VAC/15 A.	-
China	AC supply cable China for various ETAS devices with PRC/3 and IEC 60320 C13 plug. Rated for 250 VAC/10 A, 2.50 m length	F-04A-109-512
Europe / Korea	AC supply cable for Europe and Korea for various ETAS devices with CEE7/7 and IEC_60320 C13 plug. Rated for 250 VAC/10 A, 2.50 m length	F-04A-109-513
India	AC supply cable India for various ETAS devices with IS 1293 (D) and IEC 60320 C13 plug. Rated for 250 VAC/10 A, 2.50 m length	F-04A-109-514
Japan	AC supply cable Japan for various ETAS devices with JIS C 8303 and IEC 60320 (C)13V plug. Rated for 125 VAC/15 A, 2.50 m length	F-04A-109-515
North America	AC supply cable North America for various ETAS devices with NEMA 5/15 - IEC 60320 C13M plug. Rated for 125 VAC/15 A, 2.50 m length	F-04A-109-445
United Kingdom	Power cord cable UK for various ETAS devices with BS 1363/A and IEC 60320 C13 plug. Rated for 250 VAC/10 A, 2.50 m length	F-04A-109-516

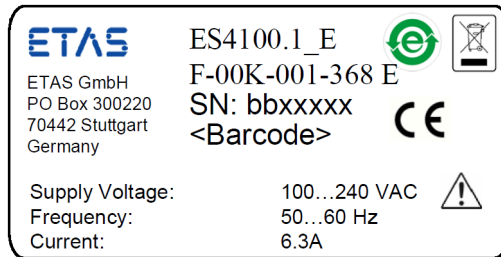
Tab. 4-2 Power Cords According to Region

5 Technical Data

This section contains the technical data of the ES4100 Chassis in tabular form and information on fulfilled standards and norms.

Labeling of the product

The nameplate is on the rear of the device.



It contains the following information:

- ETAS logo
- Product name
- Type part number
- Serial number
- Barcode for serial number
- Permissible input voltage range
- Permissible input voltage frequency
- Max. current consumption (with the corresponding input voltage)
- China RoHS
- WEEE Symbol
- CE marking
- A warning symbol that indicates that the User's Guide must be read before operating and opening the ES4100.1 Chassis VME64x!

General Data

Mechanical structure	19" chassis for cabinet mounting
Slots	21 slots at 4 HP intervals for standard eurocards (100 mm x 160 mm)

Mechanical Data

Height	4 U (177.2 mm)
Width	19" (482.6 mm)
Depth	350.0 mm w/o front handles 382.0 mm incl. front handles
Weight (slots empty)	13,5 kg / 30 lbs

Power Supply Unit

For the power supply unit the overvoltage category II applies.

Output voltages	+3.3 V, max. 15 A +5 V, max. 12 A +12 V, max. 5 A -12 V, max. 5 A
Input voltage range	100...240 VAC 50...60 Hz
Connection	3-pin rubber panel plug
Fuses	2x T6.3 A/250 V (6.3x32 mm)

Backplane

Standard	VME64x
Number of pins	160 per slot
Compatibility	Standard VMEbus, VME64x

Ventilation Fan

Control	Temperature sensor in the vicinity of the boards
Fault indication	Front panel LED

Environmental Conditions

Environment	Only use inside closed and dry rooms
Pollution degree	2
Permissible ambient temperature during operation	5 °C to 40 °C (41 °F to 104 °F)
Permissible storage temperature	-20 °C to +65 °C (-4 °F to 149 °F)
Relative humidity	0 to 95% (non-condensing)
Implementation altitude	Max. 2000 m / 6500 ft

5.1 Fulfilled Standards and Norms

The ES4100.1 Chassis VME64x complies with the following standards and norms:

Standard	Testing
IEC 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements (industrial environments)
iEC 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

The module is designed only for use in industrial environments in accordance with IEC 61326-1. When using the module outside of industrial environments avoid possible radio disturbances by additional shielding measures!



WARNING!

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

5.2 Ordering Data

The ordering data of the ES4100.1 Chassis VME64x is as follows:

Ordering Name	Short Name	Order Number
ES4100.1 Chassis VME64x	ES4100.1	F-00K-001-368

6 **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

A

Accident prevention 6
Applications 14

B

Backplane 24
Board
 installation 17

C

CE Declaration of Conformity 8
Cleaning 7
Connecting devices 6
Correct use 6

D

Data
 mechanical 24
 technical 23
Devices
 connecting 6
Documentation 5

E

Electrical safety 7
ETAS Contact Addresses 27

F

Features 13
Front panel 13

I

Identifications on the product 8
Incorrect use 6

O

Occupational health and safety 6, 7
Opening the housing 6
Operation 17
Output voltage 24

P

Power supply unit 24
Product Back 9

Q

Qualification, required 6

R

Recycling 9
Removal
 board 17
RoHS conformity
 China 8
 European Union 8

S

Safety instructions 5
Safety instructions, labeling 5
Standards and norms 25
Supply voltage 24

T

Technical data 23

U

Use, correct 6

V

Ventilation fan 24

W

Waste Electrical and Electronic Equip-
ment 9

WEEE take-back system 9