

Instructions for Use

COMBICONTROL C6

C6 E32 Rail

Translation of the original manual - Pre-Series

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1 Introduction

The described devices, accessories, hardware and/or software are products of KEB Automation KG. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

1.1 Warning Signs and Key Symbols

This document describes procedures which may pose safety risks during installation or operation.

When carrying out these procedures, please observe the safety instructions in this document. Where applicable, safety instructions may also be displayed directly on the appliance. A safety notice is indicated by one of the following warning symbols:

⚠ DANGER



Nature and/or source of the hazard.

Indicates a hazard which, if ignored, could result in death or serious injury.

a) Measures to prevent the risk.

b) May be supplemented by an additional hazard sign or symbol.

⚠ WARNING



Nature and/or source of the hazard.

Indicates a hazard which, if ignored, may result in death or serious injury.

a) Measures to prevent the risk.

b) May be supplemented by an additional hazard sign or symbol.

⚠ CAUTION



Nature and/or source of the hazard.

Indicates a hazard which, if ignored, may result in minor or moderate injury.

a) Measures to prevent the risk.

b) May be supplemented by an additional hazard sign or symbol.

NOTICE



Nature and/or source of the hazard.

Indicates a hazard which, if ignored, may result in damage to the product or other property.

a) Measures to prevent the risk.

b) An additional symbol may be added.



Note, prerequisite or recommended course of action.



This is a reference to further documentation. The barcode is for smartphones, the following link is for online users or for typing.

(🌐► https://www.keb-automation.com/search)



This symbol indicates equipment, assemblies, printed circuit boards or components that are sensitive to static electricity.



This symbol warns of the risk of electric shock (>60 V) if products or product parts are touched.



This symbol indicates hot surfaces. Please follow the instructions to avoid injury.



This symbol indicates measures and functions designed to protect devices, networks and information against cyber threats, and to ensure the confidentiality, integrity and availability of data.

1.2 More Symbols

✓	Condition
a)	Action step
⇨	Result or intermediate result
(≡► Refe [▷ 6])	Reference to a chapter, table or picture with page reference
ru21	Parameter name or parameter index
(🌐►)	Hyperlink
<Strg>	Control code
COMBIVERT	Glossary entry

1.3 Laws and guidelines

KEB Automation KG confirms with the CE mark and the EU declaration of conformity that our device complies with the essential safety requirements.

The EU declaration of conformity can be downloaded on demand via our website.

1.4 Warranty

KEB provides a limited warranty on all products. This warranty can be found in the terms and conditions at our website.



General sales conditions for Europe.

(🌐► https://www.keb-automation.com/de/agb)

Further agreements or specifications require written confirmation between the zwischen den contracting parties.

1.5 Support and Liability

It is not possible to cover every potential application of our device in a single manual. If further information is required or if problems occur which are not covered in this document, the necessary information can be requested via the local KEB Automation KG agency.

The use of KEB products in the target application is beyond KEB control. Therefore responsibility lies exclusively with the machine manufacturer, system integrator or customer.

The information contained in this document, as well as any user-specific advice in spoken or written form or generated through testing, is provided to the best of KEB knowledge and is considered for informational purposes only. KEB bears no re-

sponsibility or liability for the accuracy of the information listed above, nor for any violation of industrial property rights committed by a third-party in relation to this information.

Selection of the most suitable product for any given application is the responsibility of the machine manufacturer, system integrator or customer.

Evaluation of the product can only be performed by the machine manufacturer in combination with the application. Any tests performed must be repeated every time any part of the hardware or software is modified, or any time the unit adjustment is changed.

1.6 FOSS (Free and Open Source Software)

This product contains licensed software components.

- In accordance with the GNU General Public Licence v2.0 (GPL v2.0).
- In accordance with the GNU LESSER General Public Licence, Version 2.1 (LGPL V2.1)
- FOSS (Free and Open Source Software) components that are not covered by the licences mentioned above.

a) We are obliged to point out that the following disclaimer applies to the GPL and LGPL components with regard to the rights holders:

This program is published in the hope that it will be useful, but **without any guarantee**; even without the implied warranty of **marketability** or **usability for a specific purpose**.

Further information can be found in the GNU General Public Licence and the GNU Lesser General Public Licence.

For other open-source components, the disclaimers of liability set out by the rights holders in the relevant licence texts apply.

The software components contained in this product that are licensed by the rights holder as free software or open source software under a GNU General Public Licence version or a GNU Lesser General Public Licence version or under another open source licence gives you the right to obtain the source code for the binary file. The copyright and the corresponding licence information can be found in the /usr/share/common-licenses folder on the device. The folder is shared and can be accessed from any other PC via the network. The licence information can be accessed via the integrated web interface.

You can obtain the source code for these software components from us on a data carrier (CD, DVD or USB stick) at cost price by sending a request with the order number **00C6DD0-CS01** to the following address within three years of delivery of the product by us:

KEB Automation KG
Legal Department
Südstrasse 38
32683 Barntrup
Germany

Please provide the following information:

Device name, software version information, serial number of the device, delivery date.

We will then send you an invoice. Once payment has been received, you will receive the data storage medium containing the source code.

1.7 Validity of this manual

These instructions for use are valid for the units specified in the product description. It can be supplemented by corresponding options or special designs. It contains:

- Safety instructions to be observed
- Information on intended use
- Description of the device
- Technical Data
- Installation
- Connection
- Operation
- Maintenance, service and disposal

2 General Safety Instructions

The products are developed and built according to the state of the art and recognized safety rules. Nevertheless, their use may create dangers to life and limb of the user or third parties or damage to the machine and other material property.

The following safety instructions have been created by the manufacturer for the area of electric drive technology. They can be supplemented by local, country- or application-specific safety instructions. This list is not exhaustive. Non-observance of the safety instructions by the customer, user or other third party leads to the loss of all resulting claims against the manufacturer.

The product has been manufactured and tested in accordance with the essential safety requirements for low-voltage applications (LVD) and left the manufacturer's premises in a safe and fault-free condition. In order to maintain this condition and ensure safe operation, the operator must not only observe the correct operating conditions for the product, but also follow the general safety instructions set out below.

NOTICE



Stay safe! Stay informed!

✓ Prior any work on the device

a) Read the instruction manual.

b) Follow all safety and warning instructions.

c) If you are unsure of any part of these instructions, please contact KEB prior to operating the device.

⚠ DANGER



Electrical voltage in the vicinity of the device!

Danger to life due to electric shock !

✓ This device is intended for installation in control cabinets or machines that can be operated under dangerous voltages. For any work on the device

a) Switch off the supply voltage of the control cabinet or machine.

b) Secure it against switching on.

c) Wait until all drives has been stopped in order that no regenerative energy can be generated.

d) Never bridge upstream protective devices. Also not for test purposes.

⚠ CAUTION



The product's heat sink can become very hot

Touching the heat sink may result in burns or injury.

a) Do not touch the heat sink whilst the device is in operation

b) Allow the appliance to cool down before carrying out any work on it.

c) Wear protective gloves.

NOTICE



Electronic devices and their components are sensitive to static electricity.

Failure to follow these instructions may result in damage to the device.

a) Only trained personnel are authorised to handle and operate the product.

b) This product must not be touched whilst outside its protective casing when it is not being used for operational purposes, unless it is otherwise protected.

c) Where possible, please only unpack or repack this product at EOS/ESD-safe workstations.

d) If a safe working environment cannot be guaranteed, the user must discharge any static electricity before touching the product with their hands or tools. The easiest way to do this is to touch a metal part of the system casing.

Only products or components that meet the requirements for power sources (PS1) as set out in UL/IEC 62368-1 may be connected to the product's available interfaces (I/O).

Switching off the product using the power switch does not disconnect it from the mains. A complete disconnection is only possible if the mains cable is removed from the socket or from the product. Please ensure that there is unobstructed and easy access for disconnecting the connection.

2.1 Additional safety instructions for DC power supplies

- An external DC power supply must meet the criteria for LPS and PS2 as set out in DIN EN IEC 62368-1.
- Cables or uninsulated parts in circuits carrying dangerous voltages or currents must not be touched, either directly or indirectly.
- There must be a reliable functional earth connection.
- In the application, a suitable, easily accessible isolating device (e.g. an overcurrent protection device) must be used if the product itself cannot be disconnected.
- A disconnecting device, where present in or as part of the product, must disconnect both poles simultaneously.
- Connecting the electrical circuits of different products must not give rise to any electrical hazards.
- The power cables must be sized in accordance with the maximum electrical specifications stated on the type plate. See also the following standards: DIN EN IEC 62368-1, VDE0100, EN 60204-1 or EN 61010-1.

2.2 Instructions for lithium batteries

⚠ DANGER



Your product contains a lithium battery.

Lithium batteries may explode or catch fire if handled incorrectly.

a) When replacing, use only the same type.

b) Dispose of used batteries in accordance with the instructions.

The product is fitted with a lithium battery and is not designed to operate without a lithium battery. If the lithium battery is flat or disconnected, the BIOS settings will be reset to their factory defaults. If the lithium battery is replaced incorrectly (short circuit, reverse polarity or incorrect battery type), there is a risk of explosion or fire.

The BR2032 lithium battery must be replaced with an identical 3-volt lithium battery. To replace the lithium battery, follow the instructions (≡► Replacing the RTC lithium battery [▸ 42]).

Once you have removed the lithium battery, dispose of it in accordance with local regulations.

3 Product description

The C6 E32 Rail is a compact and robust industrial PC designed for automation tasks. Equipped with the latest Intel® processor, it offers good computing power and long-term industrial availability – ideal for real-time applications, machine learning and IIoT processes.

The concept is based on a Linux operating system and offers an open microservices architecture. Thanks to container-based technology, a range of software functions can be integrated and organised via NOA. The system is future-proof thanks to the use of the latest industrial technology, which is designed to ensure long-term availability. The real-time-capable controller can be programmed using IEC 61131 and enables the synchronised and coordinated movement of machines via the existing EtherCAT master.

Thanks to its fanless, industrial-grade design, the C6 E32 Rail operates reliably even in harsh environmental conditions. It is designed to ensure a long service life and high availability in 24/7 continuous operation.

3.1 Product features

C6 E32 Rail	Standard	Retain
CPU	Intel® Atom™ 7433RE (Quad-core 1.5 / 3.4 GHz Turbo, 9 W)	
Operating system	Linux Debian	
Main memory: LPDDR5 RAM	8 GB	
Internal memory (flash)	20 GB eMMC	
SSD (solid-state drive)	None	128 GB M.2
Graphics / maximum resolution	Intel® UHD Graphics 4096 x 2190 @ 60 Hz	
Graphical interface	1 x DisplayPort	
USB interfaces	2 x USB 3.2 (Type A), 1 x USB-C with USB and DP signals	
Ethernet interfaces 2.5 GbE	2	2
Miscellaneous	Power switch and status LED	
TPM	2.0	
RTC	3V lithium battery	
Voltage supply	24 V DC (9–36 V DC)	
Operating system (OS)	Linux Debian	
BIOS	AMI Aptio V	
Material number	00C6KA1-1000	00C6KA1-1010

3.2 Product identification



The product is configured at the factory in accordance with the customer's requirements and then sealed with a protective label. Opening the product will invalidate the warranty and any agreed guarantee.

3.2.1 Nameplate

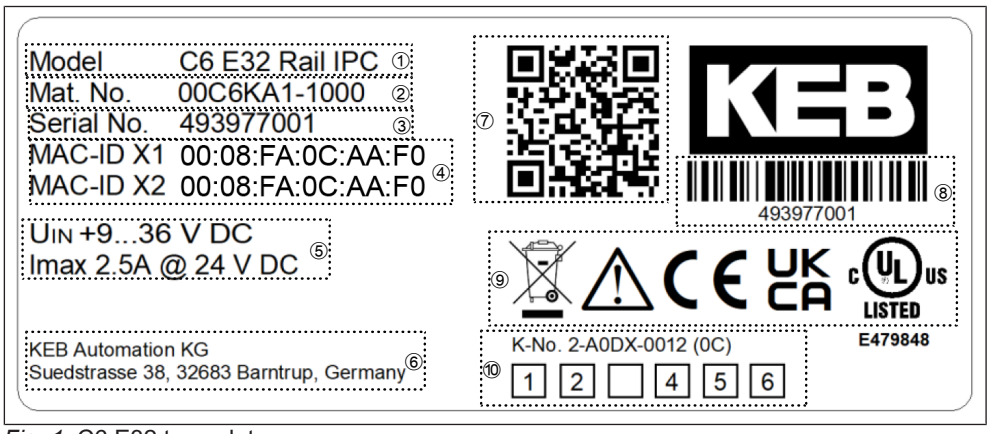


Fig. 1: C6 E32 type plate

① Model	② KEB part number
③ Serial number	④ MAC addresses
⑤ Supply voltage	⑥ Manufacturer address
⑦ QR code showing the product, serial number and material number	⑧ Barocde Interleave 2/5 with serial number
⑨ Notes, explanations and approvals	⑩ Identification features and revision

3.2.2 Model code

3. and 4. digit	**Series**
C6	Industry automation

9./10./11. position	**Variant**
000	Standard version
010	Retain

3.3 Revision notes

The following list sets out changes to hardware and software that are relevant to users. The revision number is shown on the type plate. If the revision number printed on the device is not listed, the changes did not apply to your device or model.

Revision	Description of the hardware/change
0A	Pre-series

Tab. 1: Release Notes

3.4 Intended Use

The device and the accompanying software are intended for installation in industrial electrical systems or machinery. The instructions for assembly and installation must be followed, and the specified limits for storage, transport and operation must be observed.

The used semiconductors and components of the KEB Automation KG are developed and dimensioned for the use in industrial products.

Restriction

The device does not have fault-tolerance features and cannot therefore be considered suitable for implementation or resale for high-risk applications.

If the product is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

The use of this device as a component in high-risk applications is entirely at your own risk. To minimise the risks associated with your products and applications, you should ensure that appropriate safety measures are in place in both design and operation. You are solely responsible for complying with all legal, regulatory, safety-related and security-related requirements relating to your products. You are responsible for ensuring that your systems comply with all applicable requirements.

3.5 Unintended use

This device and the accompanying software are not intended for use or resale in connection with the operation of nuclear power stations, navigation, control or communication systems for aircraft or other means of transport, air traffic control, life-support or life-sustaining applications, weapon systems or other applications in hazardous environments that require fail-safe performance or where product failure could directly result in death, personal injury or serious physical or environmental damage (collectively referred to as ‘high-risk applications’).

Operation of the devices outside the limits specified in the technical data, as well as use in potentially explosive atmospheres or environments containing aggressive corrosive gases, will result in the loss of all warranty and liability claims, as well as any stated approvals and certifications.

3.6 Scope of delivery

The C6 E32 Rail is supplied with all its components in product-specific cardboard packaging that provides adequate protection and absorbs shocks.

To unpack the product, follow these steps:

- Remove the packaging.
- Please do not throw away the original packaging. Please keep the original packaging for future transport or storage.
- Check the package content for visible signs of transport damage and for completeness.
- Please check that the delivery is complete by comparing it with the original order.
- Please keep the relevant documents. They contain important information on how to use the product.
- Check the product for any visible damage caused during transit.
- If you notice any damage caused in transit or discrepancies between the contents and your original order, please contact your retailer.

The scope of delivery consists of:

- C6 E32 Rail
- Terminal block X6

In the case of damaged parts, contact your KEB representative. Do not install parts damaged during shipment.

3.7 Description of the device

3.7.1 Block diagram

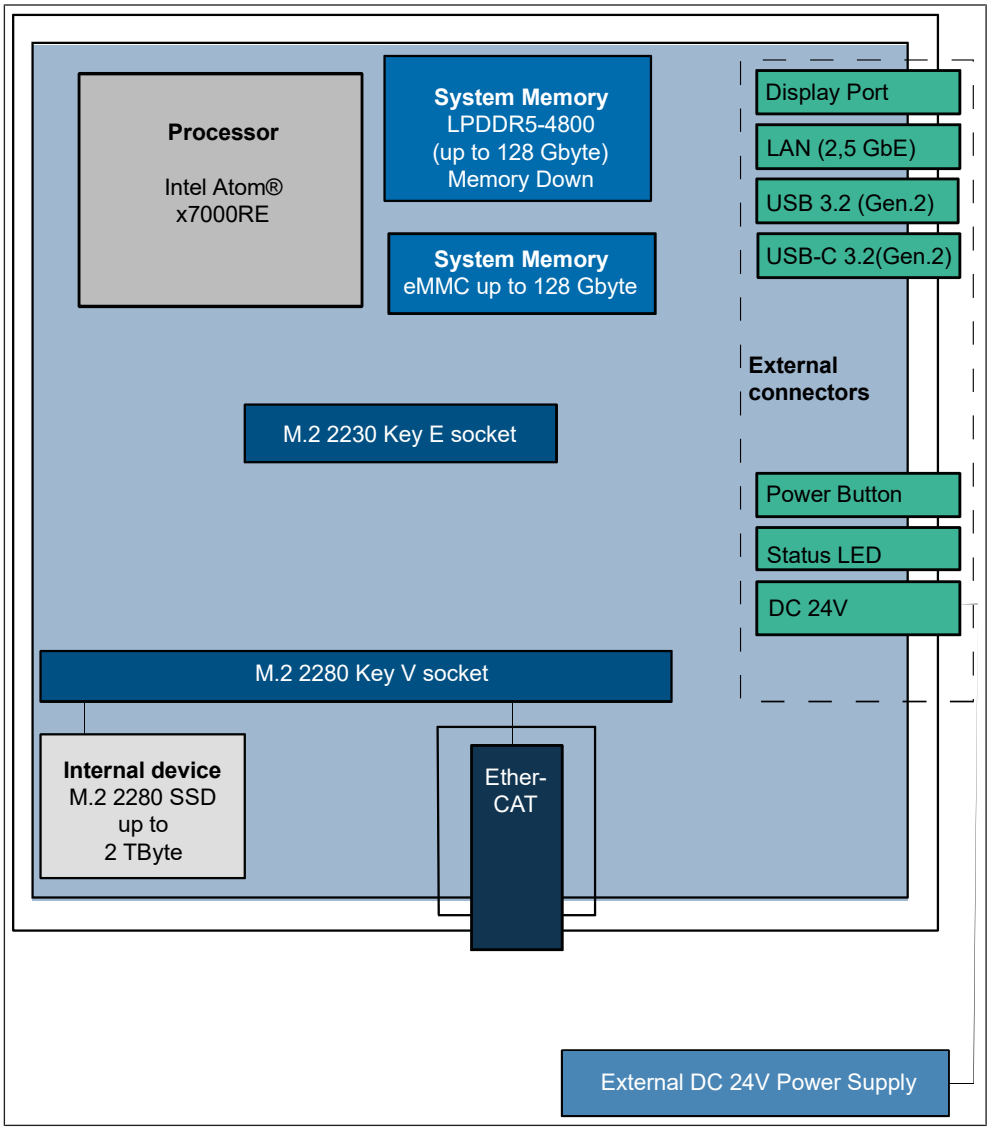


Fig. 2: Block diagram C6 E32 Rail

3.7.2 Front view

The front panel features I/O interfaces, status LEDs, a functional earth pin and a power connection (24 V DC).

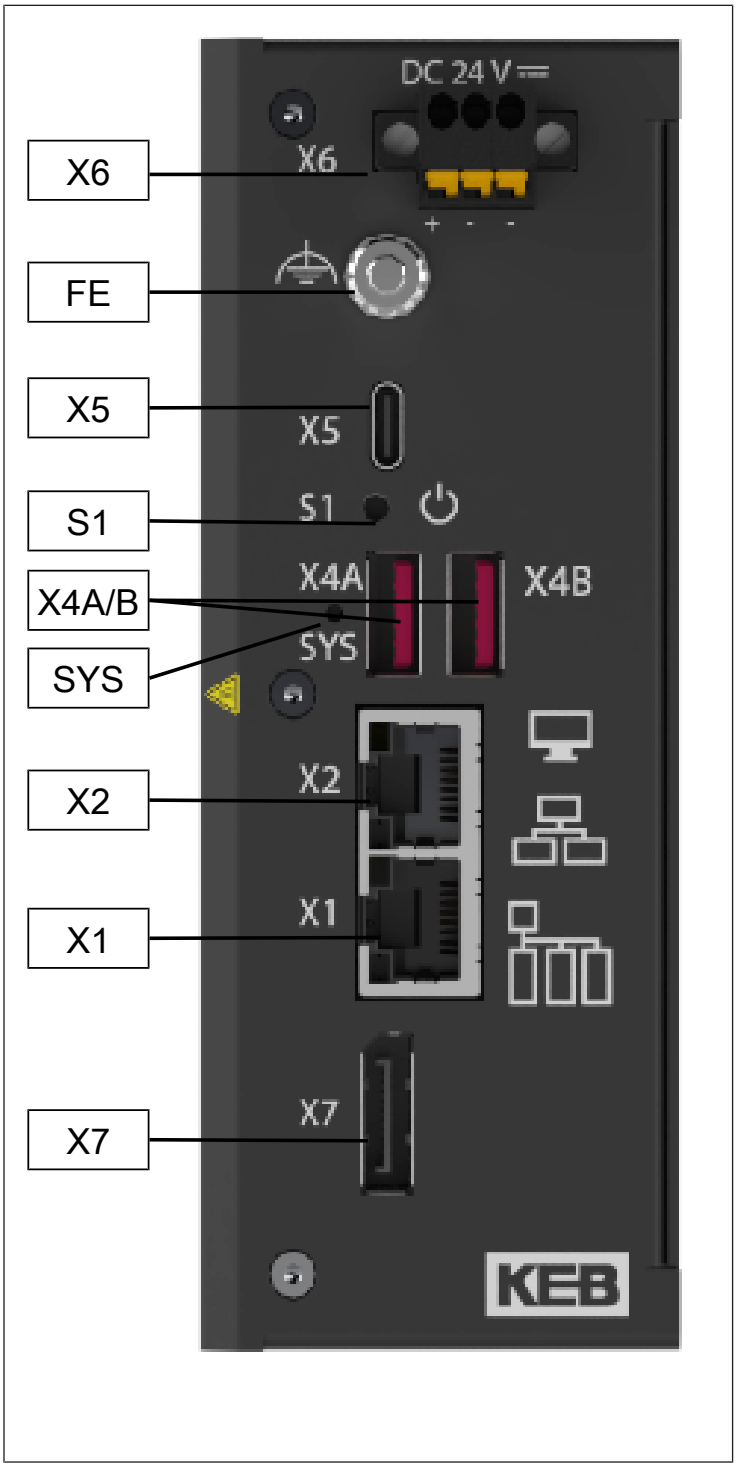


Fig. 3: Front view of the C6 E32 – 1000

X6	Supply voltage DC 24V	FE	Functional earth
X5	USB-C	S1	On/off switch
X4A /B	USB 3.2	SYS	System LED
X2	EtherCAT interface	X1	Ethernet interface
X7	Display Port		

3.7.2.1 Power supply: 24 V DC (X6)

The 3-pin 24 V DC Power IN (X6) connector is connected to an external 24 V DC power supply. The power supply must comply with the electrical specifications set out in this user manual regarding power consumption, current limiting and current protection.

The appropriate power supply plug (3-pin, 1.5/3-STF-3.5) is supplied with the product and must be fitted by the user in accordance with (≡► Power supply: 24 V DC (X6) [▸ 25]) be wired up.

3.7.2.2 Functional earth bolt

The functional earth bolt is connected to the internal housing earth. There is no insulation between the Power IN GND (-) and the system housing. Always use a functioning earth connection.

3.7.2.3 Power switch (S1)

Pressing the power switch for more than four seconds switches the product from the ‘On’ state to the ‘Off’ state and initiates a forced shutdown.

3.7.2.4 Status LED (SYS)

The status LED indicates the current status of the product.

LED SYS (green)	Description
Lit (green)	Switched on (fully operational)
Flashing (green)	Sleeping mode/paused
Off	Off

Tab. 2: **Description of the LED SYS**

3.7.2.5 USB-C port (X5)

The USB-C port (X5) supports USB 3.2 Gen 1 as well as DisplayPort Alternate Mode for the transmission of video, audio, data and power (PD 5 V/3 A) via a single port, enabling a monitor to be connected directly.

You can find the pin configuration for the USB-C port in (≡► USB-C port (X5) [▸ 32])

3.7.2.6 USB 3.2 Gen 2 ports (X4A, X4B)

The two USB 3.2 ports (X4A and X4B) support USB 3.2 Gen 2-compatible devices.

You can find the pin configuration for the USB 3.2 Gen 2 ports (≡► USB 3.2 Gen 2 ports (X4A, X4B) [▸ 33]).

The USB 3.2 Gen 2 ports are backwards compatible with USB 3.2 Gen 1 and USB 2.0 ports. To achieve the specified performance for USB 3.2 Gen 2, use cables that comply with the USB 3.2 standard.

3.7.2.7 EtherCAT connection (X2)

The EtherCAT® Port (X2) supports one channel with 10/100/1000/2500 Mbit Ethernet. To achieve the specified performance of the Ethernet ports, Category 5 twisted-pair cables must be used for 10/100 Mbit networks, and Category 5E, 6 or 6E cables for 1 GbE/2.5 GbE networks.

You can find information on the pin assignments for the status LEDs (≡► EtherCAT connection (X2) [▸ 29]).

3.7.2.8 Ethernet port (X1)

The Ethernet port (X1) supports a 10/100/1000/2500 Mbit Ethernet channel. To achieve the specified performance of the Ethernet ports, Category 5 twisted-pair cables must be used for 10/100 Mbit networks, and Category 5E, 6 or 6E cables for 1 GbE/2.5 GbE networks.

The pin configuration of the Ethernet LAN port and information on the Ethernet status LEDs can be found (≡► Ethernet port (X1) [▶ 29]).

3.7.2.9 Monitor connection (X7)

The monitor connection (X7) is a DisplayPort (DP). It supports full-size DP with a resolution of 4096 x 2160 at 60 Hz. You can find the pin configuration for the DP connector (≡► DisplayPort ports (X7) [▶ 31]).

3.7.3 Side view (right)

The product is configured at the factory in accordance with the customer's requirements and then sealed with a protective label. Opening the product will invalidate the warranty and any agreed guarantee.

The product's type plate is located on the right-hand side.



Fig. 4: E32 – right-hand side view

3.7.4 Side view (left)

The right-hand side of the device is a heat sink and may become hot. There is a ‘Hot Surface’ warning sign on the front panel to warn users.

⚠ CAUTION



The product’s heat sink can become very hot

Touching the heat sink may result in burns or injury.

a) Do not touch the heat sink whilst the device is in operation

b) Allow the appliance to cool down before carrying out any work on it.

c) Wear protective gloves.



Fig. 5: E32 – left-hand side view

❶ Mounting bracket for DIN top-hat rail	❷ Passive heat sink
❸ X6 power supply connector	❹ Functional earth

4 Technical data

4.1 Operating conditions

4.1.1 Climatic ambient conditions

Storage	Standard	Value	Notes
Surrounding temperature	EN 60068-2-1	-40…85 °C	-
Relative humidity	DIN EN IEC 60068-2-78	10…93 %	without condensation
Installation height	-	10000 m	

Operation	Norm	Value	Notes
Surrounding temperature	EN 60068-2-1	-40…60 °C	-
Relative humidity	DIN EN IEC 60068-2-78	10…93 %	without condensation
Degree of protection	EN 60529	IP20	Only suitable for indoor use
Installation height	-	3000 m	
Pollution degree	EN 61131-2	2	May require installation of the control in a housing with appropriate degree of protection, e.g. IPx4

4.1.2 Mechanical ambient conditions

Operation	Norm	Class	Notes
Vibration limits	EN 60068-2-6	10…150 Hz	1 g (all 3 axes)
Shock limit values	EN 60068-2-27	15 g, 11 ms	3 pulses per axis and direction

Operation	Norm	Class	Notes
Vibration limits	EN 60068-2-6	10…150 Hz	1 g (all 3 axes)
Shock limit values	EN 60068-2-27	30 g, 11 ms	3 pulses per axis and direction

4.1.3 Electrical operating conditions

4.1.3.1 Device classification

Requirement	Standard	Value	Notes
Overvoltage category	EN 61131-2	Cat. II	-
Protection class	IEC 61010-2	III	-
MTBF	-	200,000 h	At 30 °C; not particular about the ground (GB)-

4.2 Electrical data

C6 32 Rail	Notes
Input rated voltage	24 V DC PELV
Input voltage range	DC 9.6 V bis 36 V
Input rated current	max. 2.5 A
Power input	Max. 60 W
Hedging	2.5 A (slow-blow)
24 V galvanic isolation to communication interfaces	DC 1200 V
Basic insulation between 0V and functional earth	no
Real-time clock (RTC)	3 V RTC lithium battery

5 Assembly

5.1 Assembly instructions

Before installing the C6 E32 Rail on site, ensure that the operating environment complies with the specifications set out in this user manual and that the power supply connection and the front panel are sufficiently accessible. The product is designed for vertical installation in an industrial control cabinet.

The C6 E32 Rail is passively cooled and fanless, utilising a heat sink. The critical internal components either have their own passive cooling solutions or are directly connected to the outer casing to optimise heat transfer. The heat sink on the surface can become very hot, so precautions must be taken before handling or touching it.

Do not obstruct the airflow around the heat sink, as this may cause it to overheat. Please maintain a minimum distance around the product.

To prevent damage to the product, please follow these instructions:

- Do not put the product into operation if it has any mechanical faults. Non-compliance with the applicable standards.
- Do not install the device near heat sources or in damp places.
- Please observe the minimum installation clearances from surrounding components.
- Install the product in accordance with the required protection class (e.g. control cabinet).
- Make sure that no small parts fall into the device during assembly and wiring (drilling chips, screws etc.). This also applies to mechanical components, which can lose small parts during operation.
- Protect the connection cables from mechanical stress (tension, vibrations) in order to minimise the strain on the product's connections.
- Only install the product in a well-ventilated area where the airflow over the heat sink is not obstructed and the product's heat dissipation is not impeded.

5.2 Montage

The product is fitted directly onto a DIN rail inside an industrial control cabinet. The DIN rail allows the product to be fitted inside a control cabinet with the heat sink (as viewed from the front) on the left-hand side. This promotes vertical airflow within a control cabinet and ensures maximum heat dissipation.

- The permitted types of top-hat rail are TH35/7.5 and TH35/15 in accordance with EN 60715.
- To prevent problems with vibration, the top-hat rail should be connected to the mounting bracket at intervals of no more than 200 mm.
- Ensure that heat does not build up in multi-storey structures.

5.3 Minimum installation distances

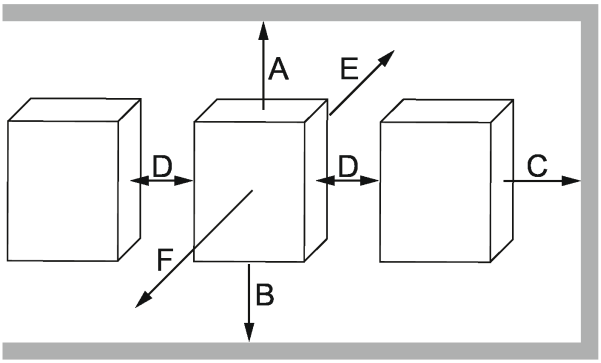


Fig. 6: Installation spacing

Measure	Distance	
A	100 mm	4 inches
B	100 mm	4 inches
C	0 mm	0 inches
D	12 mm	0 inches
E	0 mm	0 inches
F [1)]	50 mm	2 inches
1) Clearance from control elements located in front of it in the control cabinet door.		

5.4 Dimensions

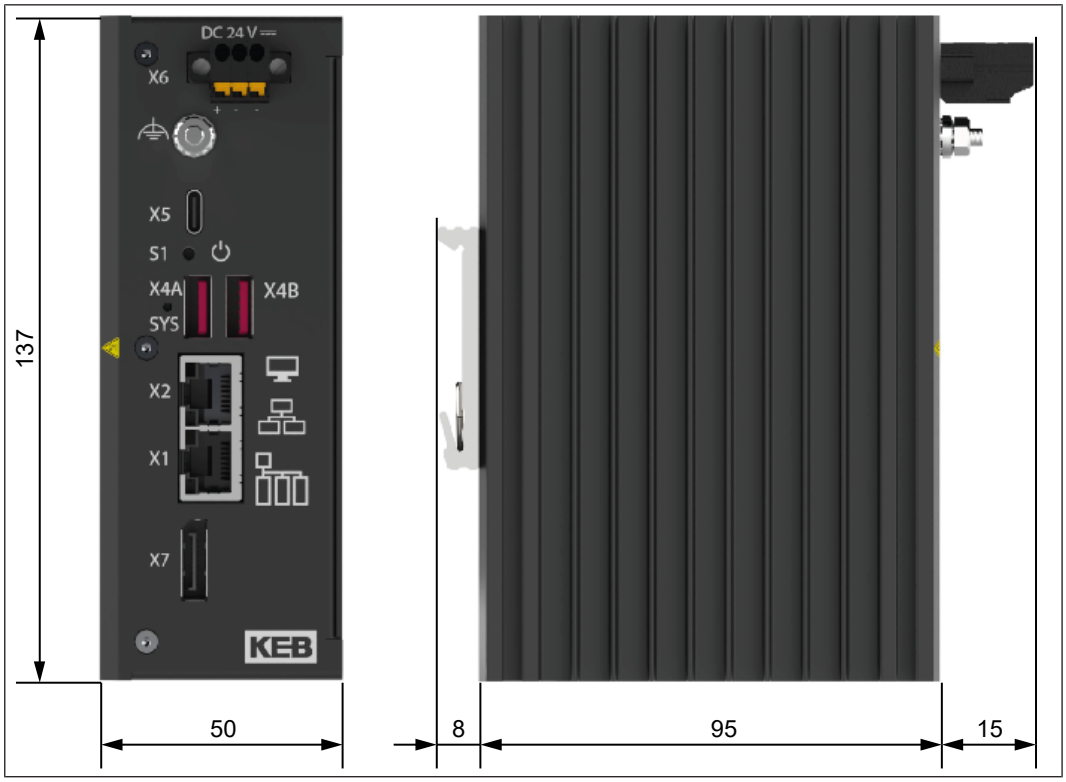


Fig. 7: Dimensions IPC E32

5.5 Weight

Variant C6 E32 Rail	Weight
Standard	720 g
Retain	730 g

Tab. 3: Weight

6 Electrical installation

⚠ DANGER



Electrical voltage in the vicinity of the device!

Danger to life due to electric shock !

✓ This device is intended for installation in control cabinets or machines that can be operated under dangerous voltages. For any work on the device

a) Switch off the supply voltage of the control cabinet or machine.

b) Secure it against switching on.

c) Wait until all drives has been stopped in order that no regenerative energy can be generated.

d) Never bridge upstream protective devices. Also not for test purposes.

- Lay the control and power cables separately (approx. 10–20 cm (4"-8") distance).
- Lay junctions with power cables at right angles.
- Electromagnetic interference can be prevented by taking the following measures:
  - Always apply the shielding over as large an area as possible.
  - Position the shield as close as possible to the terminal.
  - Always use twisted-pair, shielded cables for analogue control lines. Connect the shield to the source on one side.
  - Twist digital control cables. Shielding may be required for distances of 3 metres or more. In this case, hang up on both sides.
- The 24 V supply must not fall below or exceed the input voltage range specified in the technical data, regardless of the operating condition.
- The wiring, as well as the short-circuit and overcurrent protection, must be carried out in accordance with the applicable standards and regulations, taking into account the product's electrical specifications.
- If power cuts are to be bridged, an external UPS must be used.

6.1 Functional earth

The functional earthing bolt is connected to the internal enclosure earth (PELV). There is no insulation between the GND (-) power connection and the system housing. 's functional earth serves as an equipotential bonding and reference potential, as well as for general EMC purposes.

To avoid malfunctions or damage to the product, please observe the following instructions:

- Connect the functional earthing over a large area to the control cabinet earth via the functional earthing bolt. Do not use a pigtail connection.
- Only connect the product to an earth connection that complies with all applicable local, national and international earthing requirements.
- When installing the product, connect the earth cable first; when removing it, disconnect it last.

6.2 Power supply: 24 V DC (X6)

The 3-pole terminal X6 is connected to an external 24 V DC supply via the matching plug supplied. Only connect the appliance to a mains power supply that falls within the specified voltage range, complies with the product's electrical specifications as set out in this user manual and on the product's rating plate, and provides the necessary safety and protection features.

⚠ WARNING



Power supply during operation and in the event of a fault

Risk of electric shock or fire.

a) Power supply in accordance with DIN EN IEC 62368-1; use LPS and PS2.

b) Use the voltage specified on the type plate in accordance with PELV.

c) is capable of supplying the required power as stated on the type plate.

d) In the event of a short circuit, it can only supply a limited amount of current.

e) Cannot supply more than 100 kVA of continuous power under any load condition.



The on/off switch (S1) does not disconnect the unit from the power supply. Ensure that a suitable isolating device (fuse/circuit breaker) is fitted, which is rated for the cross-sectional area of the supply cable.

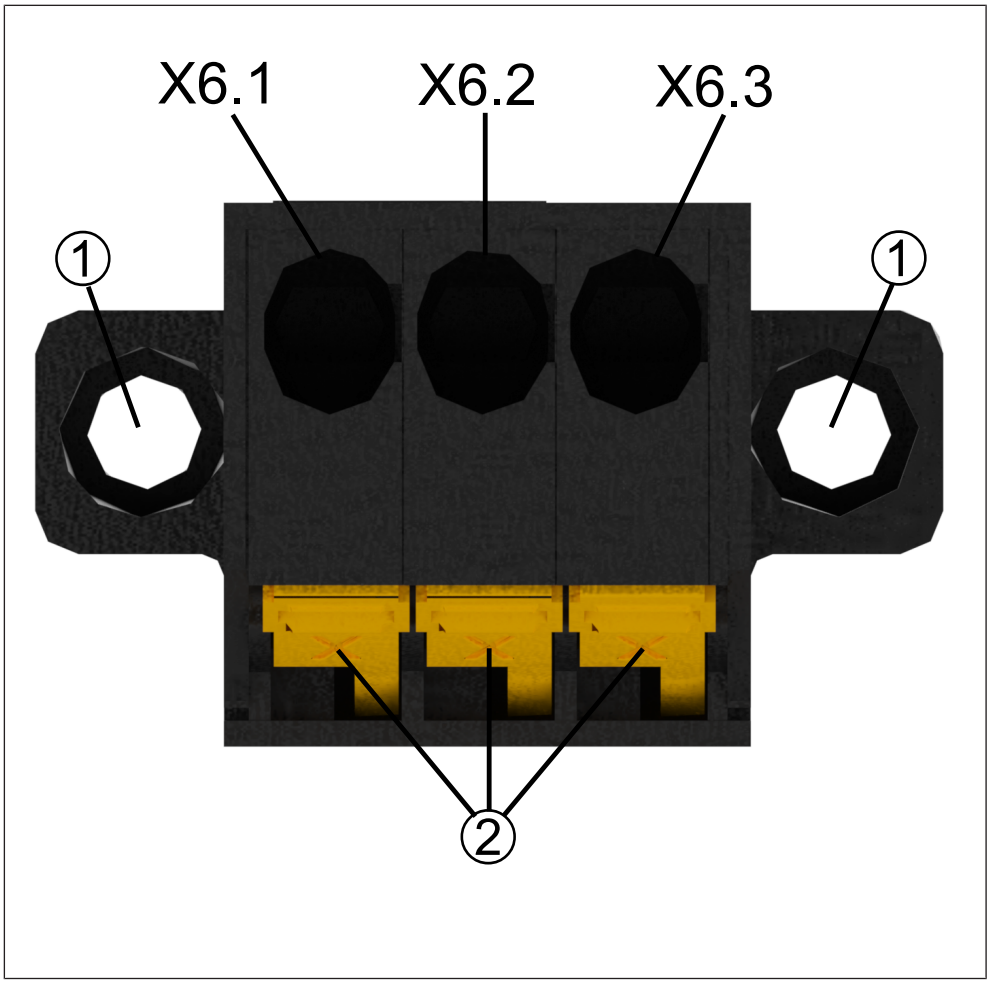


Fig. 8: Terminal block X6 voltage suypply

X6.1	DC +24V	X6.2	GND
X6.3	GND	①	Fixing screw
①	Fixing screw	②	Locking lever for releasing the cables

NOTICE

Loose and slack cable connections!

Malfunctions due to loose contacts.

a) Observe metal sleeve length and stripping length according to table.

b) Use a suitable pressing tool.

c) Make sure that all wires are inserted into the wire-end sleeve.

d) After inserting the cable into the terminal, check that it is firmly seated.

Cross-section	wire end ferrule	Metal sleeve length	Stripping length
0.25–0.75 mm² (23–19 AWG)	With a plastic collar	10 mm	10 mm

Cross-section	wire end ferrule	Metal sleeve length	Stripping length
0.5…1.5 mm² (20…16 AWG)	Without a plastic collar	10 mm	10 mm

Tab. 4: Wire ferrules and strip length

NOTICE

Malfunction and fire hazard due to incorrect wiring

Cabling is not included in the scope of delivery and must be provided by the user.

a) To protect the product and any connected peripherals, ensure that the power cables are of the correct diameter to withstand the maximum available current.

b) Clearly label the supply lines (+/-) to ensure safe connection to the external 24 V DC power supply.

c) Use only copper conductors for a minimum temperature of 105 °C.

- Wire up the X6 terminal block supplied with the unit(🌐► .) To do this, insert the ends of the prepared wires into the corresponding openings in the mating connector until they click into place and the wires are secured.
- Connect the wired mating plug to the 3-pin voltage input X6. Ensure the connections are correctly polarised and secure them with the two screws (tightening torque 0.3 Nm).
- Connect the other end of the wired mating connector to the 24 V DC power supply.
- Check that the cables are securely connected.

NOTICE! To disconnect a cable, press down on the relevant orange locking lever using a suitable tool.

6.2.1 Power supply requirements

The external 24 V DC power supply must be equipped with protection and supply functions such as overcurrent protection, inrush current protection, overvoltage protection and undervoltage protection (brownout protection) in order to protect the product from fluctuations and interruptions in the power supply. Please note that the power supply must be capable of handling peak currents for several seconds.

NOTICE

Malfunctions caused by a power-on reset that is too short

a) If a brownout occurs, the power supply unit must remain in the ‘off’ state for long enough to allow the internal voltages to discharge sufficiently. Failure to observe this ‘off’ state may result in parts of the product or peripheral devices no longer functioning properly, or may reduce the MTBF.

b) The minimum ‘off’ state required to allow the internal voltages to discharge sufficiently depends on the power supply and other electrical factors. In order to determine the required ‘off state’, each case must be considered individually.

NOTICE



Connection not compliant with the manufacturer's specifications.

a) Ensure that the external 24 V DC power supply is used in accordance with the manufacturer's instructions.

b) Check that the minimum requirements for the immunity of the mains supply, as set out in EN 55024, are met.

6.2.2 Power consumption

The external power supply must be capable of supplying the product with the specified power consumption of 60 W. The product's standby power consumption of 35.6 W depends on factors such as a 2.5-inch SBC board, a processor and standard board interfaces. The total available power consumption is 24.4 W.

		Power
Capacity	C6 E32 Rail	60 W
Power input	2.5-inch SBC board, processor, DC/DC, 1x LAN, 1x ECAT, 1x DP	35.6 W
Total available capacity		24.4 W

Tab. 5: Power consumption

It is the user's responsibility to ensure that the power consumption of the additional interfaces and system expansion modules does not exceed the theoretically available total power of 24.4 W. In some cases, this may require the power consumption of the USB ports to be limited. The following table contains details of the power consumption of the additional interfaces and system expansion modules.

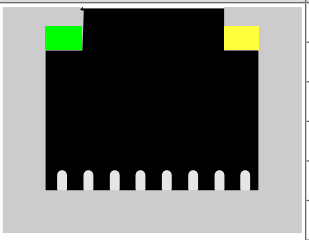
Expansion option	Electricity consumption
USB Type A port	4.5 W per port
USB Type-C port	15 W
M.2 2280 SSD module	1.40 W

Tab. 6: **Power consumption of interfaces and system expansion modules**

6.3 EtherCAT connection (X2)

Connection	Description
EtherCAT port (X1)	• Automatic crossover function and switching between RX and TX. • Power input max. 2.15 W (at 3.3 V/650 mA) • Implements the CIFX M3042100BM-RE/F (M.2 3042 Key B module) • EtherCAT RJ45 connectors must only be used for LAN. It cannot be used for telecommunications.

Tab. 7: EtherCAT Specification

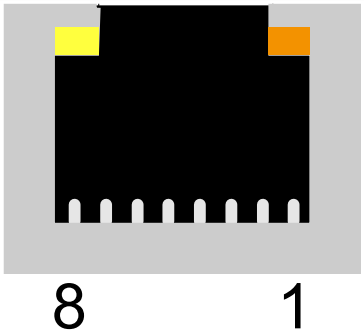
RJ45 port (socket)	PIN	Signal name	Description
	1	TX+	Data transmission + channel
	2	TX-	Send data – Channel
	3	RX+	Receive data + channel
	4	Term 1	Bypassed and terminated via an RC connection with PE
	5	Term 1	
	6	RX-	Receive data + channel
	7	Term 2	Bypassed and terminated via an RC connection with PE
	8	Term 2	

Tab. 8: **Pin configuration of the EtherCAT port**

Left LED: Green connection		Right-hand LED: Yellow (active)	
Off	No connection to the Ethernet	Off	The LED is not in use
Green	Connected to Ethernet, but does not send or receive frames		
Green on blinking	Activity: Connected to the Ethernet and sends/receives Ethernet frames		

6.4 Ethernet port (X1)

The two RJ45 sockets for Ethernet ports (X1, X2) support 10/100/1000/2500 Mbit Ethernet. Each RJ45 Ethernet port has two LEDs that indicate speed and activity.

RJ45 (socket) X1/X2	PIN	Signal name
	1	BI_D1+
	2	BI_D1-
	3	BI_D2+
	4	BI_D3+
	5	BI_D3-
	6	BI_D2-
	7	BI_D4+
	8	BI_D4-

LED connection status (left)		LED speed (right)	
Off	Connection lost	Off	10/100 Mbit/s connection established
Yellow on blinking	Connection established and active	Orange	1000 Mbit/s connection established
Yellow	Connection established, but no activity	Green	2.5 Gbit/s connection established

Signal	Description
BI_D1+ / BI_D1-	In MDI mode, this is the first pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DA+/- pair, and it is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair functions as a BI_DB+/- pair and acts as the receiving pair in 10Base-T and 100Base-TX.

Signal	Description
BI_D2+ / BI_D2-	In MDI mode, this is the first pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DA+/- pair, and it is the transmit pair in 10Base-T and 100Base-TX. Im MDI-Crossover-Modus fungiert dieses Paar als BI_DA+/-Paar und ist das Sendepaar in 10Base-T und 100Base-TX.
BI_D3+ / BI_D3-	In MDI mode, this is the third pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DC+/- pair. In MDI crossover mode, this pair functions as a BI_DD+/- pair.
BI_D4+ / BI_D4-	In MDI mode, this is the fourth pair in 2.5GBase-T and 1000Base-T, i.e. the BI_DD+/- pair. In MDI crossover mode, this pair functions as a BI_DD+/- pair.



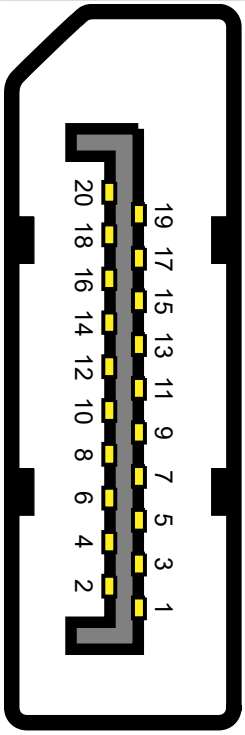
To achieve the specified performance of the Ethernet port, Category 5 twisted-pair cables must be used for 10/100 MByte networks, and Category 5E, 6 or 6E cables for 1 Gbit/2.5 Gbit LAN networks.



The product is only connected to internal Ethernet networks without leaving the system and being exposed to TNVs.

6.5 DisplayPort ports (X7)

The DisplayPort (DP) port (X7) is a standard DP port.

20-pin standard DP connector (female)	PIN	Signal name	PIN	Signal name
	1	ML_Lane0p	11	GND
	2	GND	12	ML_Lane3n
	3	ML_Lane0n	13	Config1
	4	ML_Lane1p	14	Configuration 2
	5	GND	15	AUX_CHp
	6	ML_Lane1n	16	GND
	7	ML_Lane2p	17	AUX CHn
	8	GND	18	Hot-plug
	9	ML_Lane2-	19	GND
	10	ML_Lane3p	20	DP_PWR

Tab. 9: **Pin configuration of the DisplayPort connector**

Signal name	Description
ML_Lane#p/n	DisplayPort lane number Transmitter differential pair (+/-)
Aux +/-	Auxiliary channel differential pair (+)
Hot-plug	Hot-plug detection
Config#	Connect to earth either directly or via a pull-down device
GND	Earth signal
DP_PWR	Power supply signal for connectors

Tab. 10: Signal description

6.6 USB-C port (X5)

The USB-C port can supply power to a device at 5 V and 3 A.

The USB-C port supports DisplayPort Alternate Mode to transmit video, audio, data and power via a single port.

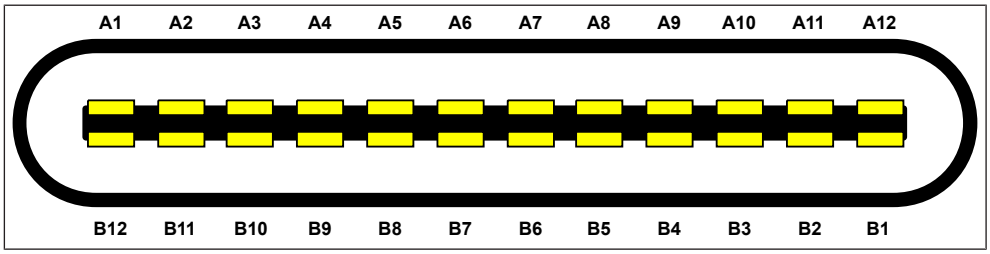


Fig. 9: USB-C port

PIN	Signal	PIN	Signal
A1	GND	B12	GND
A2	CON_TX1P_C	B11	CON_RX1P_C
A3	CON_TX1N_C	B10	CON_RX1N_C
A4	+5 V_VBus	B9	+5 V_VBus
A5	CC1	B8	SBU2
A6	USB2_P	B7	USB2_N
A7	USB2_N	B6	USB2_P
A8	SBU1	B5	CC2
A9	+5 V_VBUS	B4	+5 V_VBUS
A10	CON_RX2N_C	B3	CON_TX2N_C
A11	CON_RX2P_C	B2	CON_TX2P_C
A12	GND	B1	GND

Tab. 11: **Pin configuration of the USB-C port**

Signal name	Description
CON_TX#P/N_C	USB3_TX#+/-/DP Lane # TX+/-
CON_RX#P/N_C	High-speed data path (RX (+/-) for USB or TX for DP Alt mode)
USB2_P/N	USB 2.0 interface, differential pair (+/-)
CC#	Configuration channel signal for cable alignment, dedicated Biphase Mark Code (BMC) configuration data channel and VCONN +5 V power supply for active cables. Used for USB Power Delivery (PD) communication.
SBU#	Sideband usage signal #. DP auxiliary channel differential pair (+/-)
+5 V_VBus	+5 V bus power supply
GND	Ground

Tab. 12: USB-C description

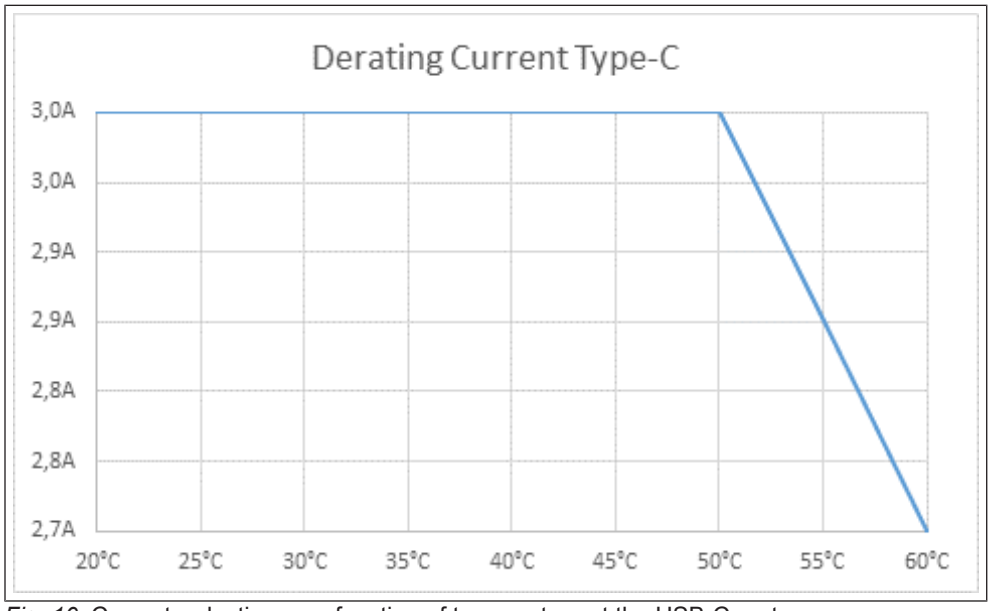
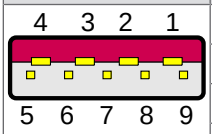


Fig. 10: Current reduction as a function of temperature at the USB-C port

6.7 USB 3.2 Gen 2 ports (X4A, X4B)

The two USB 3.2 ports (X4A and X4B) support USB 3.2 Gen 2-compatible devices.

USB Type A	PIN	Signal name	Description
	1	+USB_VCC	+5 V power supply for USB device
	2	USB_D-	USB 2.0 differential pair (-)
	3	USB_D+	USB 2.0 differential pair (+)
	4	GND	Ground
	5	USB_RX-	USB 3.2 receiver differential pair (-)
	6	USB_RX+	USB 3.2 receiver differential pair (-)
	7	GND	Ground
	8	USB_TX-	USB 3.2 transmitter differential pair (-)
	9	USB_TX+	USB 3.2 transmitter differential pair (+)

Tab. 13: USB 3.2 pin configuration

The USB 3.2 Gen 2 ports are backwards compatible with USB 3.2 Gen 1 and USB 2.0 ports.

7 Operation

7.1 Commissioning

Before putting the C6 E32 Rail into operation, please check the following checklist:

- The (≡► General Safety Instructions [▸ 9]) have been read and taken into account.
- All instructions regarding the (≡► Montage [▸ 21]) have been implemented.
- All the necessary components are in accordance with (≡► Electrical installation [▸ 24]) connected.
- The wiring and short-circuit/overcurrent protection have been installed in accordance with the applicable standards and regulations, and taking into account the product's electrical specifications.
- The final connection was made to the power supply to prevent undefined states upon power-up.

7.1.1 BIOS

The C6 E32 Rail uses the AMI Aptio V uEFI BIOS, which is based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI. The uEFI BIOS settings are pre-configured and do not need to be adjusted further for operation.



The UEFI BIOS setup menus and the available options may vary and are subject to change. The BIOS only supports UEFI! No legacy support and no Master Boot Record (MBR) installation.

7.1.1.1 Booting the UEFI BIOS

The uEFI BIOS setup programme provides quick and easy access to the individual functions in the BIOS sub-menus for controlling or changing the uEFI BIOS configuration.

Use the navigation hotkeys to navigate through the BIOS.

Sub-screen	Description
<F1>	<F1> opens the 'General Help' window
<->	The ' <Minus> ' key selects the next lower value within a field
<+>	The ' <Plus> ' key is used to select the next higher value within a field.
<F2>	The button loads previous values
<F3>	This button loads optimised default settings
<F4>	<F4> Key Saves and exits
<→> or <←>	<Left/Right arrow keys> Select key settings menus from the menu bar, e.g. 'Main' (Main menu) or 'Advanced' (Advanced)
<↑> or <↓>	<Up/Down arrows> select options in the current menu, e.g. 'Settings' or 'Sub-screen'
<ESC>	The ' <ESC> ' button exits the main setup menu and opens the 'Exit Setup' menu. Pressing the ' <ESC> ' button in a sub-menu takes you to the next higher menu level
The button <RETURN>	The ' <RETURN> ' button executes a command or selects a submenu.

Tab. 14: Hotkeys in the BIOS

To launch the uEFI BIOS setup programme, follow these steps:

- Switch the product on.
- Wait until the first characters appear on the screen (POST messages or the welcome screen).
- Press the BIOS access key <DEL> repeatedly until the BIOS setup screen appears.
- If the uEFI BIOS is password-protected, a password prompt will appear. Enter either the ‘user password’ or the ‘supervisor password’ and press ‘ <RETURN> ’.

The BIOS Setup utility is displayed in the main menu.

- Use the arrow keys on the navigation hotkeys to navigate to the desired setup menu and ‘change’ or ‘reset’ the settings.
- Use the arrow keys on the navigation pad to navigate to the ‘Save & Exit’ setup menu and select ‘Save changes’.

7.1.1.2 Setup menus

The setup menus in the product’s BIOS selection bar are:

- Main
- Advanced
- Chipset
- Safety
- Boat
- Save & Exit

The currently active menu and the active BIOS setup entry are highlighted in white. Use the left and right arrow keys to select the setup menus.

Each setup menu consists of two main windows. The left-hand pane displays all the available functions. Configurable functions are shown in blue. Functions shown in grey provide information on the status or operational configuration. A help window on the right-hand side displays an explanation of the relevant function.

⚠ WARNING



Malfunctions caused by incorrect settings in the advanced setup.

a) Only change settings if you are aware of the consequences.

You can find an overview of the main functions of the product’s BIOS setup menu in the BIOS setup screens. Access the product’s Automated BIOS Description (ABD) to navigate through the BIOS and display the setup menu screen. You can find information on automated BIOS description (≡► Automated BIOS description [▸ 35])

7.1.1.3 Automated BIOS description



The automated BIOS description enables users to walk through a virtual BIOS setup for a specific product processor and interface version. Users can navigate through the automated BIOS description to view the various BIOS setup menus, but no changes can be made.

The automated BIOS description contains setup menus which are examples of a specific product configuration. Depending on your product’s configuration, features may vary or be hidden.

To access the automated BIOS description, please contact KEB at(🌐► .)

To navigate through the automated BIOS description, proceed as follows:

- Click on the required setup menu item with the mouse.
- Click on the sub-menu item you want.
- A black sub-menu item is read-only and contains no further information.
- When you click on a blue sub-menu item, it turns white and a help window appears in the right-hand pane, displaying an explanation of the function and the options available for that sub-menu.
- Return to the setup menu by pressing the ‘ <Esc> ’ button.

7.1.1.4 BIOS update

To ensure compatibility with new operating systems, hardware and software, or to incorporate new BIOS functions, KEB recommends regular BIOS updates. If a problem cannot be resolved with a new driver, KEB also recommends a BIOS update.

You can find the latest BIOS downloads and information on new versions on the KEB website at(🌐► .) Select the latest version of the BIOS update and your preferred method for updating the BIOS, along with the relevant instructions.

7.2 Device recovery

A device restore is required to return the device to a defined and fully functional state following a software error, system failure, incorrect configuration or other malfunctions. This involves reinstalling the operating system, application programmes, drivers and project-specific settings from a recovery image.

What you’ll need:

- A USB stick with a capacity of at least 32 GB.
- Installer image (can be downloaded from the KEB website > E32 Rail product page).
- Rufus or balenaEdger to create a bootable disc.

7.2.1 Preparing a USB stick

"(🌐► Rufus)" or "balenaEdger" are free, open-source tools for Windows that allow you to easily create bootable USB sticks and memory cards.

In the following example, the USB stick is made bootable using the Rufus programme:

- Under ‘ ’ (Drive), select the USB stick.
- If you are using the start option, go to ‘ ’ Select ‘ ’ to choose the desired boot image.
- Set all other options as shown.
- Start the image creation process by typing ‘ Start ’.

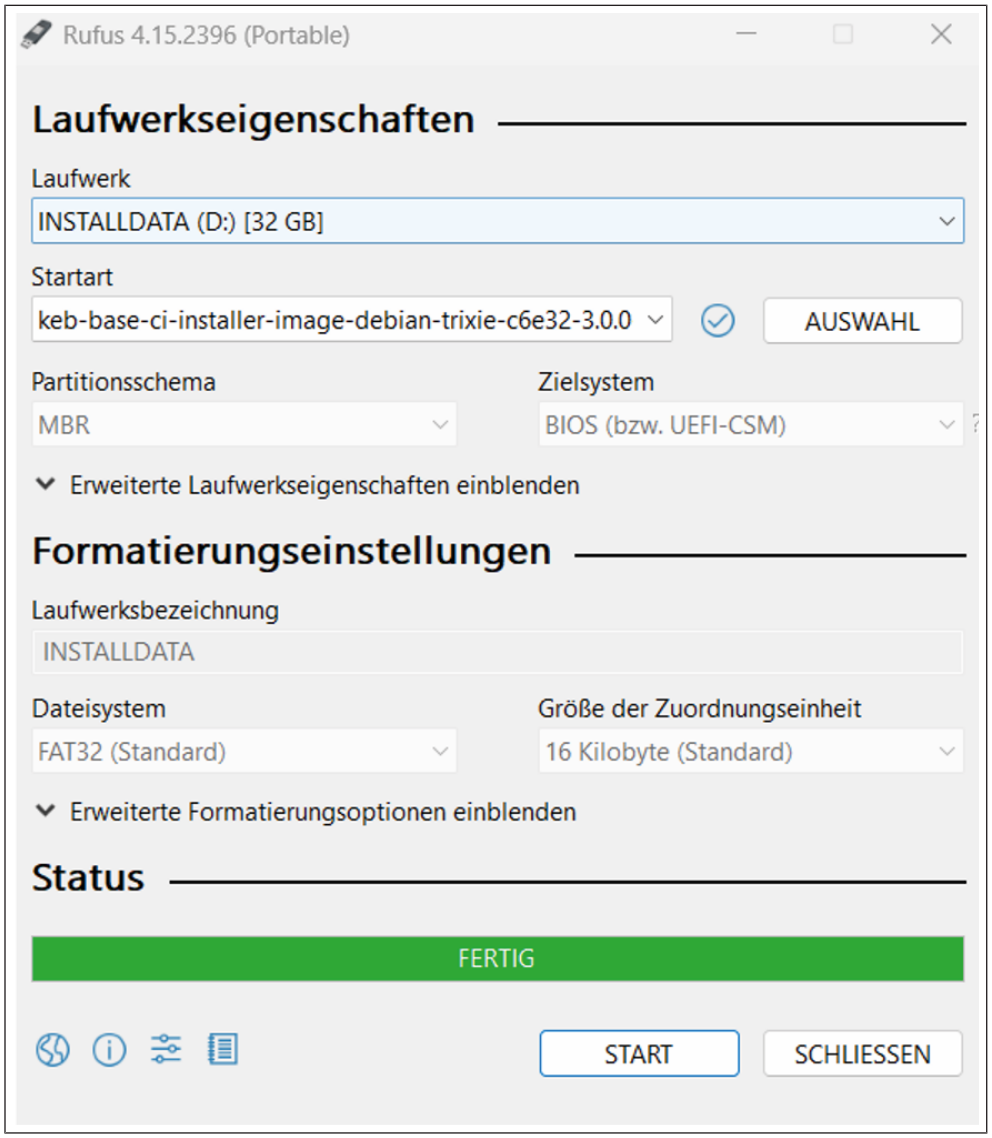


Fig. 11: Creating an image with Rufus

7.2.2 Restore image

NOTICE

A new image will delete all data, including user data and licences.

a) Make a backup of all the data and programmes you need.

b) Please return any existing software licences before installing the new device image. This ensures that the licence is properly released and can be reactivated once the system has been restored. This prevents the loss of licences and ensures that the licensed software can continue to be used.

Preparations:

- Connect the keyboard to the USB port.
- Connect the monitor.
- Plug the USB stick into a free USB port on the device.
- Switch on the device and hold down the ESC key to enter the BIOS.
- Select the tab `'Boot'` and set the USB stick as the first boot device.

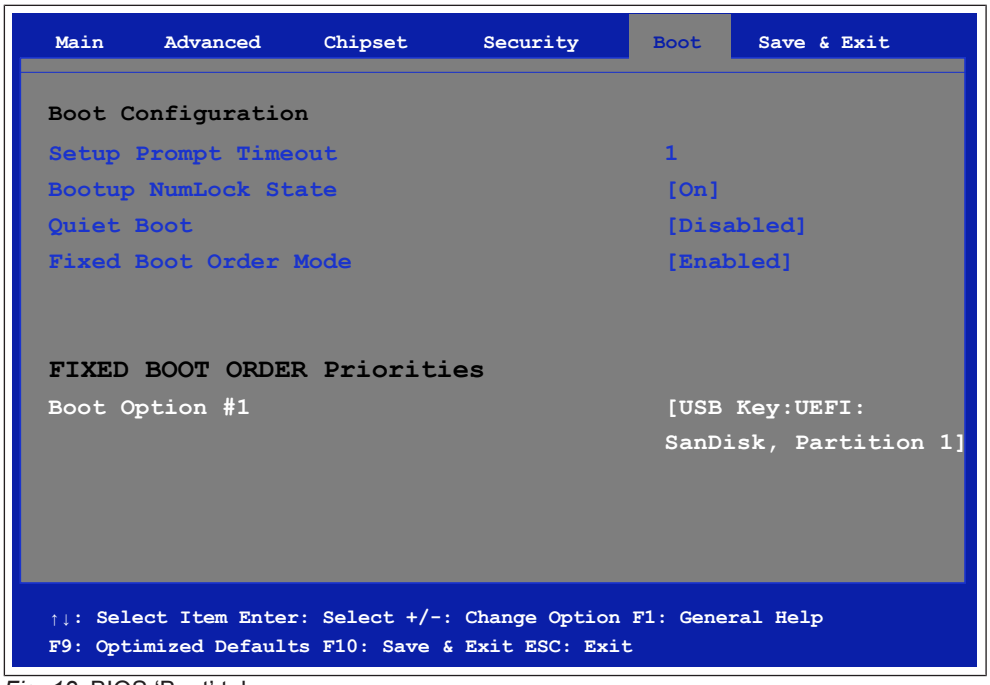


Fig. 12: BIOS 'Boot' tab

Select the tab 'Save & Exit'. Select 'Save Changes and Reset', then confirm by pressing ENTER after entering to save the changes and restart the device.

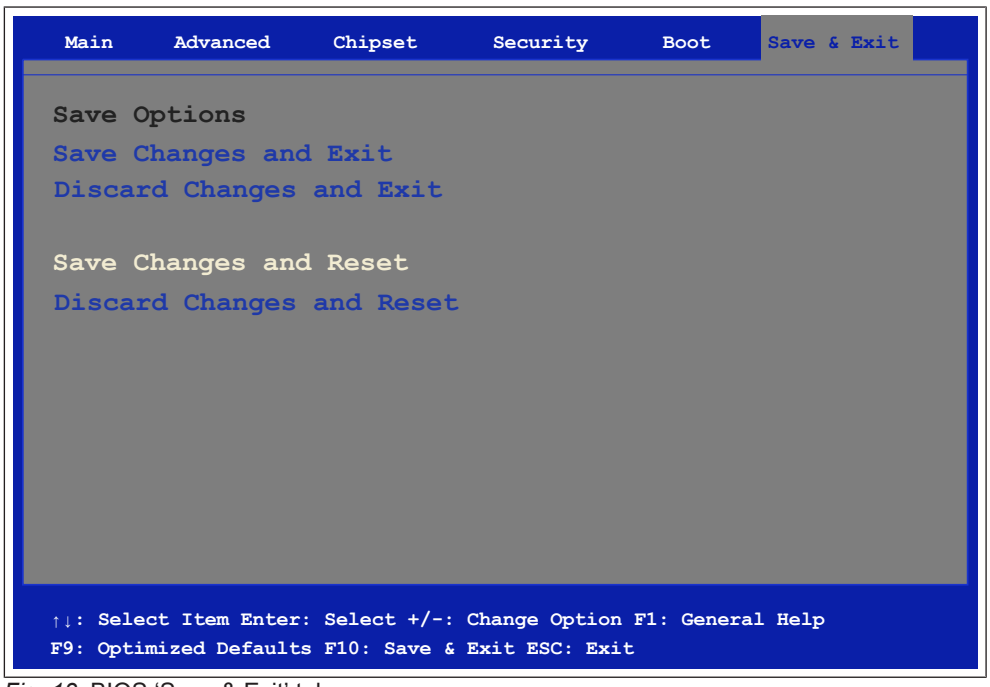


Fig. 13: BIOS 'Save & Exit' tab

If a black screen appears, carry out a power-on reset.

Select the drive containing the image and confirm by pressing ' OK.

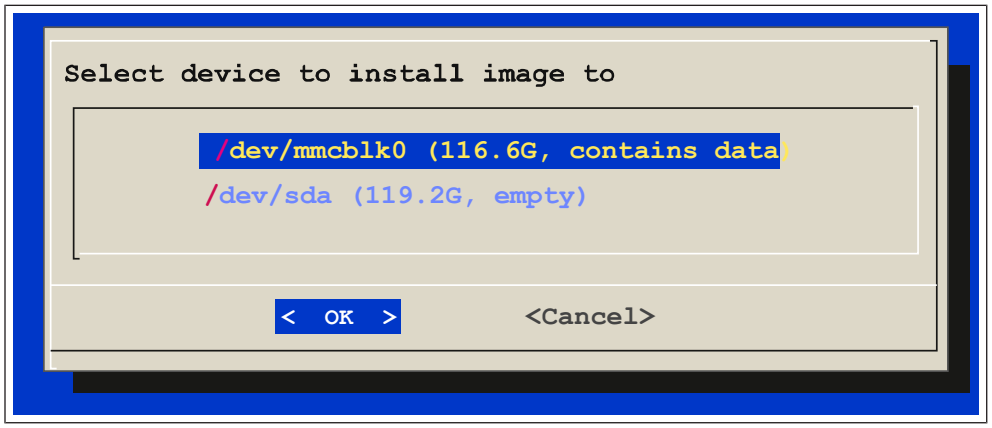


Fig. 14: Select an image

Please confirm that the correct image is being installed.

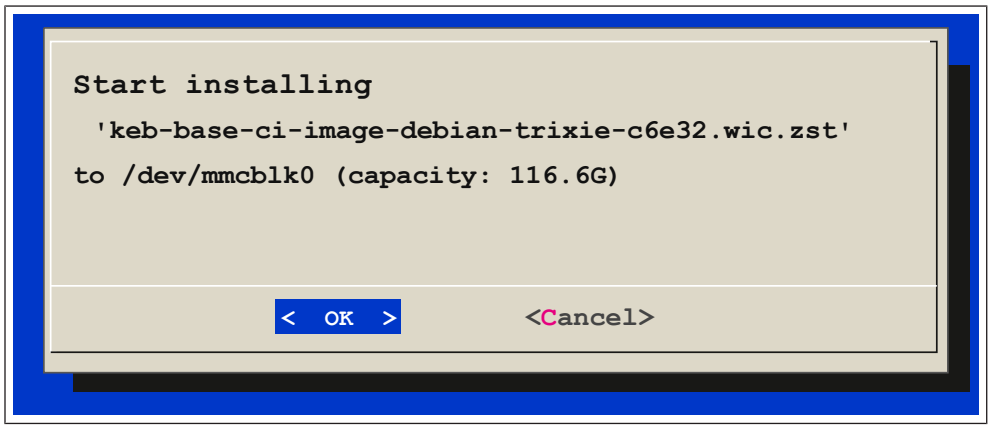


Fig. 15: Start installation

Please only proceed once you are certain that all data has been backed up and licences have been returned.

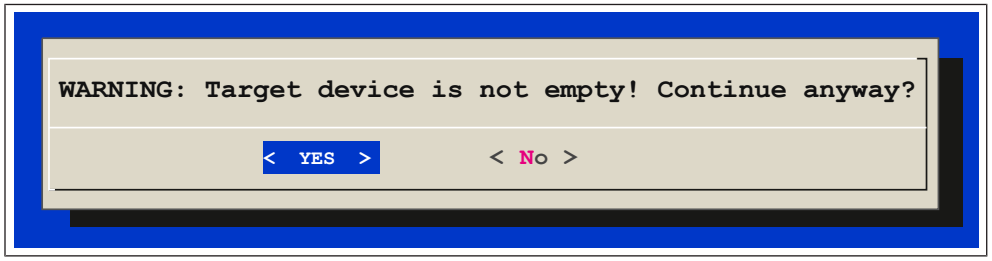


Fig. 16: Warning: the target device is not empty.

Once the installation is complete, click OK and then remove the USB stick straight away.

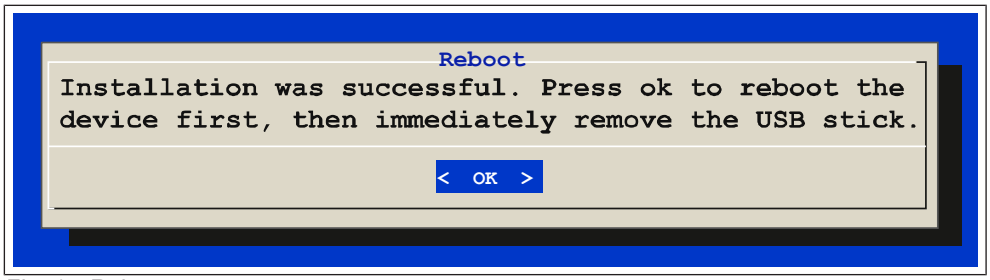


Fig. 17: Reboot

Press ESC to return to the BIOS.

Set the hard disk as the first boot device.

Save the settings and restart by selecting ‘ `Save Changes and Reset`.

You have now completed the installation of the base image.

The next steps:

Use the NOAInstaller or the commissioning tools to install the required services and licences.

7.3 Taking out of Service

NOTICE



Disconnect the power supply whilst the unit is in operation.

May result in data loss or other undesirable consequences.

a) Always switch off the appliance using the on/off switch.

Even if the appliance has been switched off using the power switch, parts of the product may still be live. The product is only completely de-energised once the device has been switched off using the on/off switch and the mains supply has been disconnected.

8 Maintenance, service and disposal

⚠ DANGER



Electrical voltage in the vicinity of the device!

Danger to life due to electric shock !

✓ This device is intended for installation in control cabinets or machines that can be operated under dangerous voltages. For any work on the device

a) Switch off the supply voltage of the control cabinet or machine.

b) Secure it against switching on.

c) Wait until all drives has been stopped in order that no regenerative energy can be generated.

d) Never bridge upstream protective devices. Also not for test purposes.

8.1 Maintenance

The following maintenance work is to be carried out as required, but at least once a year, by authorised and trained personnel.

- Check unit for loose screws and plugs and tighten if necessary.
- Clean dirt and dust from the devices.
- Checking and cleaning the ventilation inlets and outlets.
- Examine and clean extracted air filter and cooling air filter of the control cabinet.

8.1.1 Cleaning

⚠ CAUTION



The product's heat sink can become very hot

Touching the heat sink may result in burns or injury.

a) Do not touch the heat sink whilst the device is in operation

b) Allow the appliance to cool down before carrying out any work on it.

c) Wear protective gloves.

To clean the surface of the product, proceed as follows:

- Close all applications. Shut down the device correctly using the power switch and disconnect it from the mains. Disconnect all peripheral devices.
- Allow the product to cool down before handling it, and do not touch the heat sink whilst the product is in operation.
- Carefully remove dust with a clean, soft brush and, if the product is slightly soiled, clean it with a dry cloth.
- Remove stubborn dirt using a mild cleaning product and a soft cloth.

8.2 Service

In case of malfunction, unusual noises or smells inform a person in charge!



The product is configured at the factory in accordance with the customer's requirements and then sealed with a protective label. Opening the product will invalidate the warranty and any agreed guarantee.



Wear parts are excluded from the warranty on account of their service life or wear and tear.

Technical support and repairs

KEB offers wide-ranging, complete after-sales technical support. The staff who deal with this handle questions on the entire range of products skilfully, quickly, and efficiently.

You can phone our staff in the service department, and they will give you complete, prompt advice on how to resolve your problems.

Telephone: +49 (0) 5263 401-0

Fax: +49 (0) 5263 401-116

E-Mail: (🌐► service@keb.de)

8.2.1 Replacing the RTC lithium battery

The product is not designed to operate without a lithium battery. If the lithium battery is flat or disconnected, the BIOS settings will be reset to their factory defaults.

⚠ DANGER

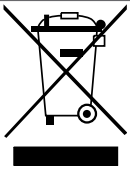


Your product contains a lithium battery.

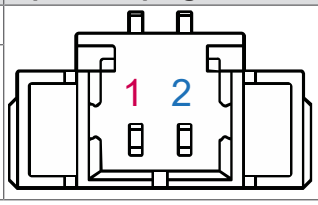
Lithium batteries may explode or catch fire if handled incorrectly.

a) When replacing, use only the same type.

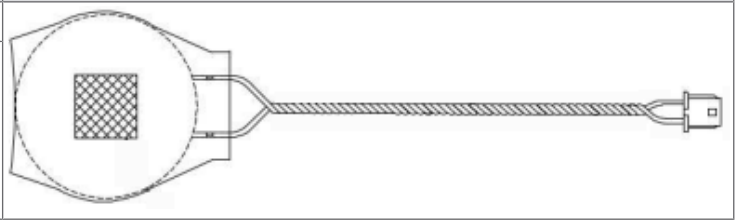
b) Dispose of used batteries in accordance with the instructions.



Do not dispose of lithium batteries in ordinary household waste. Dispose of the lithium battery in accordance with local regulations governing the disposal of this type of hazardous waste (e.g. at battery recycling points).

Pins	State	2-pin BAT plug
1	VBAT +	
2	GND (-)	

Tab. 15: Connector for a lithium battery

PIN	State	3V BR2032
Red	+	
Black	-	

Tab. 16: **BR2032 lithium battery with connector**

To replace the lithium battery at the end of its service life, proceed as follows:

- Make sure the product is switched off and disconnected from the mains by unplugging the power lead.
- Place the product on a soft ESD mat with the heat sink facing downwards.

- Remove the two screws securing the cover plate to the underside of the main housing. Keep the screws for future use.
- Lift the cover plate slightly and slide it out of the retaining clip.
- Unplug the lithium battery from the connector.
- Pull gently to detach the adhesive pad on the lithium battery from the internal connector housing.
- Insert the plug of the new lithium battery into the connector. Make sure the polarity is correct.
- Secure the new lithium battery to the internal connector housing using a new adhesive pad.
- Close the product by refitting the cover plate on the underside and securing it with the two screws from step 2.

see also

Replacing the RTC lithium battery [▸ 42]

8.3 Storage

If the product is not going to be used for a prolonged period, disconnect it from the mains. If the product needs to be stored, repackage it in the same way as it was originally delivered to prevent damage. The storage area must comply with the product's storage conditions as specified in this user manual. KEB recommends keeping the original packaging for future storage or warranty returns.

8.4 Transport

Please use the original packaging to post the product; it should be sturdy enough to withstand knocks and provide adequate protection for the product. When unpacking and repacking the product, always take care to ensure protection against impact and ESD, and use an EOS/ESD-safe work area.

8.5 Data cleaning

Data erasure is the process of permanently deleting or destroying sensitive data on the product's storage devices in order to prevent unauthorised access to business-critical data and/or confidential/protected data stored on those storage devices.

When developing a system, the user must plan for data cleansing and incorporate storage devices that are easier to cleanse, as well as storage devices from manufacturers that offer an effective data erasure tool or a command to reset the device to its factory settings.

When carrying out data erasure, the user must consider whether the product's storage devices contain sensitive data and draw up a data erasure plan to delete all sensitive data in accordance with national, regional or local regulations and requirements regarding data erasure, or as part of your waste disposal and decommissioning policies.



Users are responsible for erasing sensitive data from storage devices in accordance with national, regional or local regulations and requirements regarding data erasure, or as part of their disposal and decommissioning policies.



Remove all removable storage devices and delete any sensitive data before reusing them, using the following methods:

- A certified third-party software tool.
- The manufacturer's data erasure tool or the 'Reset to factory settings' command (if available).
- If the removable storage device is not to be reused, physically destroy it in accordance with the data erasure guidelines.



In the event of the physical destruction of the storage device:

- Please follow the relevant safety instructions.
- Break the chip containing the silicon die into two or more pieces, each measuring <= 6 mm.
- Check both sides, as storage devices may be located on the back.
- Engage an external waste disposal company that issues certificates of destruction.

KEB recommends data erasure if the product is to be reused in a different user environment, sent in for repair, disposed of or taken out of service.

General guidelines for data erasure on storage devices containing business-critical and/or confidential/protected data:

- Before switching off, check whether power is required to clear the data on the product's storage devices.
- If the device is disconnected from the mains, remove all removable storage devices from the product and delete any sensitive data.
- Volatile storage devices store data only temporarily. Data stored on volatile memory can be easily erased by cutting off the power supply or removing the battery for around 24 hours.
- Non-volatile storage devices store data permanently and retain information even after being disconnected from the power supply. Data stored on non-volatile storage media must be actively erased using one of the following methods:
- Use a certified third-party software tool that provides an audit trail and is capable of performing a full data clean-up, including areas such as hidden data and faulty blocks that standard service-based utilities cannot access.
- Use physical destruction methods for storage devices that cannot be securely erased using software. The aim of the destruction is to break the silicon chip inside the chip package into two or more pieces in order to prevent data from being read from the chip. The fragments should be no longer than 6 mm. If this service is carried out by a third party, ask them to issue you with certificates of destruction as confirmation.
- Use the manufacturer's data erasure tool to wipe the device, or reset it to its factory settings (if this option is provided by the manufacturer). The manufacturers' tools and commands have been developed to meet the manufacturers' data cleansing requirements for their specific storage devices.
- Always check that all sensitive data has been effectively redacted.

8.6 Disposal

Electronic devices of KEB Automation KG are intended for professional, commercial processing (so-called B2B devices).

Manufacturers of B2B devices are obliged to take back and recycle devices manufactured after 14.08.2018. In principle, these devices may not be left at public or communal recycling or collection points.



Unless otherwise agreed between the customer and KEB or unless there is a deviating mandatory legal regulation, KEB products labelled in this way can be returned. Company and keyword for the return point can be found in the list below.

Shipping costs are at the expense of the customer. The devices are then professionally recycled and disposed of.

The entry numbers are listed country-specifically in the following table. KEB addresses can be found on our website.

Withdrawal by	WEEE registration no.	Keyword
Germany		
KEB Automation KG	EAR: DE12653519	Keyword: "Withdrawal WEEE"
France		
RÉCYLUM – Recycle point	ADEME: FR021806	Mots clés "KEB DEEE"
Italy		
COBAT	AEE: (IT) 19030000011216	Parola chiave "Ritiro RAEE"
Austria		
KEB Automation GmbH	ERA: 51976	Keyword: "Withdrawal WEEE"
Spain		
KEB Automation KG	RII-AEE: 7427	Palabra clave "Retirada RAEE"
Czech republic		
KEB Automation KG	RETELA: 09281/20-ECZ	Kličové slovo "Zpětný odběr OEEZ"
Slovakia		
KEB Automation KG	ASEKOL: RV22EEZ0000421	Kľúčové slovo: "Spätný odber OEEZ

The packaging must be sent for paper and cardboard recycling.

9 Certifications and approvals

Current certificates, declarations and revision lists for your product can be viewed or downloaded from our website at the following link:

(🌐► keb-automation.com/search)

By entering the article number, you will receive a list of the corresponding documents in the "Certificates" drop-down menu.

If you need help or further documentation, please contact our customer service.

9.1 CE marking

Conformity with the EU directives and guidelines applicable on the production date is confirmed by the CE mark on the nameplate.

The current EU Declaration of Conformity for this product is available via the link above.

9.2 UK marking

The UKCA mark on the type plate confirms that the product complies with the relevant UK regulations in force on the date of manufacture.

The current UK Declaration of Conformity for this product is available via the link provided above.

9.3 UL certification

UL (Underwriters Laboratories) approval ensures that a product fulfils the safety-related requirements for the North American market. UL is an independent organisation that tests and certifies products, components and systems for safety, quality and conformity with applicable standards.

Products that have received UL approval are marked with the UL logo on the nameplate. This symbol indicates that the product has been successfully tested in accordance with UL specifications and is approved for use in the USA or Canada. Depending on the type of approval, the logo with the UL file can also be marked with additional information (e.g. "cULus" for Canada and the USA).

The approval is linked to certain requirements. These are marked accordingly in this and/or further instructions. Only the assemblies/components described in the approval may be used.

A deviation from the tested specifications or the use of non-certified parts can lead to the loss of UL approval and thus jeopardise the operating permit in the target market.

9.4 Further markings

Other markings and approvals not listed here are identified by a corresponding logo on the rating plate or device, if applicable. The corresponding certificates are available on our website.

10 Cyber security

Cyber security is an important consideration during the installation, operation, maintenance and disposal of the product. This chapter contains cybersecurity guidelines for users.

NOTICE

KEB has no knowledge of the final end-user environment in which the product will be operated.

KEB is therefore unable to provide precise guidance on your cybersecurity measures.

a) KEB aims to provide guidance for your threat analysis and to highlight specific security mechanisms that are implemented in our products.



Security guidelines on how to protect your product from potential cyber security threats can be found on our website under ‘General/Security Guidelines’.

10.1 Security Strategy

When developing your security strategy, bear in mind the following guidelines to protect the product effectively:

- Policies and procedures developed in relation to the safety of the product/end environment.
- Instructions and recommendations for regular safety maintenance procedures and the reporting of product safety incidents.
- Security controls and settings for networks, e.g. firewall rules.
- Third-party software tools that provide additional protection for the product.
- Authentication for access to the product, restriction of user rights and management of user accounts.
- Data encryption.
- A reduced number of potential security access points.
- BIOS, operating system and security updates that do not affect the operation of the product or the overall security strategy.
- User accounts with requirements regarding length and complexity.
- The default passwords supplied will be changed.
- Restricted network access (IP address range).
- Installation of anti-virus and anti-malware software.
- Network access requirements such as VPN.

11 Revision History

Edition	Ver.	Note	Upgrade ☑ / ☐	Valid from revision
2026-10	00	Pre-production version	☐	0A

Upgrade:

☐ Changes in the specified version are made solely to rectify errors or improve the description.

☑ These changes describe a feature extension that is not backwards-compatible. Changes take effect from the specified revision ((≡► Revision notes [▸ 12])).

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Glossary

COMBIVERT

Proper name for a KEB Drive Controller.

DIN EN IEC 60068-2-78

Environmental influences - Part 2-78: Test procedure – Cab test: Damp heat, constant (international version IEC 60068-2-78:2025).

DIN EN IEC 62368-1

Equipment for audio/video, information and communications technology – Part 1: Safety requirements.

EN 55024

Information technology equipment – Immunity characteristics – Limits and test methods. International Standard IEC/CISPR 24.

EN 60068-2-1

Environmental influences - Part 2-1: Test method - Test A: Cold. German version VDE 0468-2-1.

EN 60068-2-27

Environmental influences - Part 2-27: Test method - Test Ea and guideline: Shock. German version VDE 0468-2-27

EN 60068-2-6

Environmental influences - Part 2-6: Test method - Test Fc: Oscillation (sinusoidal). German version VDE 0468-2-6.

EN 60204-1

Safety of machinery - Electrical equipment of machines - Part 1: General requirements (VDE 0113-1, IEC 44/709/CDV).

EN 60529

Degrees of protection provided by enclosures (IP-Code).

EN 61131-2

Programmable controllers - Part 2: Equipment requirements and tests. German version VDE 0411-500.

EN IEC 61010-2-201

Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2: Particular requirements for control equipment. German version VDE 0411-2-201.

EN 60715

Dimensions of low-voltage switchgear and controlgear -Standardized mounting on rails for mechanical support of electrical devices in switchgear and controlgear installations. German version VDE 0660-520.

EN 61010-1

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements.

EtherCAT®

EtherCAT is a real-time Ethernet bus system. EtherCAT is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Functional earth

Functional earth is used exclusively to dissipate interferences. It offers no contact protection for persons.

PELV

Safe protective extra-low voltage (earthed).

RTC

Real Time Clock

UPS

Uninterruptible power supply for bridging power failures or to bring the device into a defined state.

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