



Control Unit CU 6x Series

User Guide Rev. 0.A

Doc. ID 90227 (EN)

This page has been intentionally left blank

This page has been intentionally left blank

Control Unit CU 6x Series – User Guide

Disclaimer

Kontron would like to point out that the information contained in this user guide may be subject to alteration, particularly as a result of the constant upgrading of Kontron products. This document does not entail any guarantee on the part of Kontron with respect to technical processes described in the user guide or any product characteristics set out in the user guide. Kontron assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright or mask work rights to these products and makes no representations or warranties that these products are free from patent, copyright or mask work right infringement unless otherwise specified. Applications that are described in this user guide are for illustration purposes only. Kontron makes no representation or warranty that such application will be suitable for the specified use without further testing or modification. Kontron expressly informs the user that this user guide only contains a general description of processes and instructions which may not be applicable in every individual case. In cases of doubt, please contact Kontron.

This user guide is protected by copyright. All rights are reserved by Kontron. No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the express written permission of Kontron. Kontron points out that the information contained in this user guide is constantly being updated in line with the technical alterations and improvements made by Kontron to the products and thus this user guide only reflects the technical status of the products by Kontron at the time of publishing.

Brand and product names are trademarks or registered trademarks of their respective owners.

©2026 by Kontron Electronics AG

YOUR CONTACT

Kontron Electronics AG
Riedstrasse 1
6343 Rotkreuz
Switzerland
www.kontron-electronics.com

GLOBAL HEADQUARTERS

Kontron Europe GmbH
Gutenbergstr. 2
85737 Ismaning
Germany
www.kontron.com

Intended Use

This device and associated software are not designed, manufactured or intended for use or resale for the operation of nuclear facilities, the navigation, control or communication systems for aircraft or other transportation, air traffic control, life support or life sustaining applications, weapons systems, or any other application in a hazardous environment, or requiring fail-safe performance, or in which the failure of products could lead directly to death, personal injury, or severe physical or environmental damage (collectively, “high risk applications”).

You understand and agree that your use of Kontron devices as a component in High Risk Applications is entirely at your risk. To minimize the risks associated with your products and applications, you should provide adequate design and operating safeguards. You are solely responsible for compliance with all legal, regulatory, safety, and security related requirements concerning your products. You are responsible to ensure that your systems (and any Kontron hardware or software components incorporated in your systems) meet all applicable requirements. Unless otherwise stated in the product documentation, the Kontron device is not provided with error-tolerance capabilities and cannot therefore be deemed as being engineered, manufactured or setup to be compliant for implementation or for resale as device in High Risk Applications. All application and safety related information in this document (including application descriptions, suggested safety measures, suggested Kontron products, and other materials) is provided for reference only.

NOTICE

You find the most recent version of the “General Safety Instructions“ online in the download area of this product.

NOTICE

This product is not intended for use or suited for storage or operation in corrosive environments, in particular under exposure to sulfur and chlorine and their compounds.

Revision History

REVISION	BRIEF DESCRIPTION OF CHANGES	DATE OF ISSUE	AUTHOR
0.A	Initial version	07.04.2026	KEPRA

Terms and Conditions

Kontron warrants products in accordance with defined regional warranty periods. If you have bought the product from Kontron Electronics in Switzerland or Germany, you will find the information on the warranty and other conditions of sale associated with the national company at: <https://www.kontron-electronics.com/downloads/>

In case this product was bought through Kontron's worldwide distribution channels, please visit www.kontron.com/terms-and-conditions for applicable terms and conditions and warranty period.

For contact information, refer to the corporate offices contact information on the last page of this user guide or visit our website [CONTACT US](#).

Customer Support

For technical support, please contact our support team by email: support@kontron-electronics.ch

For all other issues, our sales team will be happy to help you: <https://www.kontron-electronics.com/contact/#contact-101>

Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

Customer Comments

If you have any difficulties using this user guide, discover an error, or just want to provide some feedback, contact our support team: support@kontron-electronics.ch. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user guide on our website.

Symbols

The following symbols may be used in this user guide



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



NOTICE indicates a property damage message.



CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
ATTENTION indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures mineures ou modérées.



Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.



ESD Sensitive Device!

This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.



This symbol indicates general information about the product and the user guide.
 This symbol also indicates detail information about the specific product configuration.



This symbol precedes helpful hints and tips for daily use.

General Safety Instructions

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines. If the following guidelines are not observed, it could lead to injuries to the operator and/or damage to the product; in cases of non-observance of the instructions Kontron is exempt from accident liability, even during the warranty period.

⚠ WARNING All operations on this product must be carried out by sufficiently skilled personnel only.

⚠ WARNING If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Special Handling and Unpacking Instruction

NOTICE



ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. It is not allowed to open the protective housing of your device unless you have obtained a special permission by Kontron and have the skills and environment to perform all manipulations on the device in a manner that is ESD-safe and complies with all applicable regulations.

⚠ CAUTION

Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled. Follow the “General Safety Instructions” supplied with the product.

Installation and operation of the device

The product has been built and tested according to the basic safety requirements for low voltage (LVD) applications and has left the manufacturer in safety-related, flawless condition. To maintain this condition and to also ensure safe operation, the operator must not only observe the correct operating conditions for the product but also the following general safety instructions:

- › The product must be used as specified in the product documentation, in which the instructions for safety for the product and for the operator are described. These contain guidelines for setting up, installation and assembly, maintenance, transport or storage.
- › The on-site electrical installation must meet the requirements of the country's specific local regulations.
- › To guarantee that sufficient air circulation is available to cool the product, please ensure that the ventilation openings are not covered or blocked. If a filter mat is provided, this should be cleaned regularly. Do not place the product close to heat sources or damp places. Make sure the product is well ventilated.
- › Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label and meeting the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1 .
- › Only products or parts that meet the requirements for Power Source (PS1) of UL/IEC 62368-1 may be connected to the product's available interfaces (I/O).
- › Do not try to open the product or remove any part of the enclosure unless specifically instructed to do so by Kontron. If the product is being opened, it must be disconnected from any power supply.

- ▶ Please note: safe operation is no longer possible when any of the following applies:
 - ▶ the product has visible damages or
 - ▶ the product is no longer functioning
In this case the product must be disconnected from any power supply and it must be ensured that the product can no longer be operated.
- ▶ Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled.
- ▶ This product is not suitable for use in locations where children are likely to be present

Additional Safety Instructions for DC Power Supply Circuits

- ▶ To guarantee safe operation, please observe that:
 - ▶ the external DC power supply must meet the criteria for LPS and PS2 (UL/IEC 62368-1)
 - ▶ no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
 - ▶ a reliable functional earth connection is provided
 - ▶ a suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the product itself can not be easily disconnected from power supply.
 - ▶ interconnecting power circuits of different products cause no electrical hazards
- ▶ A sufficient dimensioning of the power cable wires must be selected – according to the maximum electrical specifications on the product label – as stipulated by EN62368-1 or VDE0100 or EN60204 or UL61010-1 regulations or simply adhere to the recommendations in chapter 3.2.2.

Instructions générales de sécurité

Votre nouveau produit Kontron a été développé et testé avec soin pour fournir toutes les fonctionnalités nécessaires et assurer sa conformité aux exigences de sécurité électrique. Il a également été conçu pour une longue durée de vie sans faille. Cependant, la durée de vie de votre produit peut être considérablement réduite par un mauvais traitement lors du déballage et de l'installation. Par conséquent, dans l'intérêt de votre propre sécurité et du fonctionnement correct de votre nouveau produit Kontron, vous êtes invité à vous conformer aux directives suivantes. Si les directives suivantes ne sont pas respectées, cela pourrait entraîner des blessures pour l'opérateur et/ou des dommages au produit ; en cas de non-respect des instructions, Kontron est exempté de responsabilité en cas d'accident, même pendant la période de garantie.

⚠ WARNING

Toutes les opérations sur ce produit doivent être effectuées uniquement par du personnel suffisamment qualifié.

⚠ WARNING

Si l'équipement est utilisé d'une manière non spécifiée par le fabricant, la protection fournie par l'équipement peut être compromise.

Instructions Spéciales de Manipulation et de Déballage

NOTICE**Dispositif sensible à l'ESD !**

Les cartes électroniques et leurs composants sont sensibles à l'électricité statique. Il n'est pas permis d'ouvrir le boîtier de protection de votre appareil à moins d'avoir obtenu une permission spéciale de Kontron et d'avoir les compétences et l'environnement pour effectuer toutes les manipulations sur l'appareil de manière sûre pour l'ESD et conforme à toutes les réglementations applicables.

⚠ CAUTION

La manipulation et l'opération du produit sont autorisées uniquement pour le personnel formé dans un lieu de travail contrôlé en accès. Suivez les "Instructions Générales de Sécurité" fournies avec le produit.

Installation et fonctionnement de l'appareil

Le produit a été construit et testé selon les exigences de sécurité de base pour les applications à basse tension (LVD) et a été mis à votre disposition dans un état sans défaut lié à la sécurité. Pour maintenir cet état et assurer également un fonctionnement sûr, l'opérateur doit non seulement observer les conditions d'exploitation correctes pour le produit mais aussi les instructions générales de sécurité suivantes :

- › Le produit doit être utilisé tel que spécifié dans sa documentation du produit, dans laquelle les instructions de sécurité pour le produit et pour l'opérateur sont décrites. Celles-ci contiennent des directives pour l'installation, l'installation et l'assemblage, la maintenance, le transport ou le stockage.
- › L'installation électrique sur site doit répondre aux exigences des réglementations locales spécifiques du pays.
- › Afin de garantir une circulation d'air suffisante pour refroidir le produit, veuillez vous assurer que les ouvertures de ventilation ne sont pas couvertes ou obstruées. Ne placez pas le produit à proximité de sources de chaleur ou d'endroits humides. Veillez à ce que le produit soit bien ventilé.
- › Connectez uniquement le produit à une alimentation externe fournissant le type de tension (AC ou DC) et la puissance d'entrée (courant max.) spécifiés sur l'étiquette du produit Kontron et répondant aux exigences de la source d'alimentation limitée (LPS) et de la source d'alimentation (PS2) de l'UL/IEC 62368-1.
- › Ne tentez pas d'ouvrir le produit ou d'enlever une partie du boîtier à moins que Kontron ne vous y ait spécifiquement invité. Si le produit est ouvert, il doit être déconnecté de toute source d'alimentation.
- › Veuillez noter : un fonctionnement sûr n'est plus possible lorsque l'un des éléments suivants s'applique :
 - › le produit a des dommages visibles ou
 - › le produit ne fonctionne plus

Dans ce cas, le produit doit être déconnecté de toute source d'alimentation et il doit être assuré que le produit ne peut plus être utilisé.

- › La manipulation et l'opération du produit sont autorisées uniquement pour le personnel formé dans un lieu de travail contrôlé en accès.
- › Ce produit n'est pas adapté à une utilisation dans des lieux où des enfants sont susceptibles d'être présents

Instructions de Sécurité Supplémentaires pour les Circuits d'Alimentation en Courant Continu

Pour garantir un fonctionnement sûr, veuillez observer que:

- › l'alimentation externe en courant continu doit répondre aux critères pour LPS et PS2 (UL/IEC 62368-1)
- › aucun câble ou partie sans isolation dans les circuits électriques avec une tension ou une puissance dangereuses ne doit être touché directement ou indirectement
- › une connexion à la terre fonctionnelle et fiable est fournie
- › un dispositif de déconnexion facilement accessible est utilisé dans l'installation générale (par exemple, un dispositif de protection contre les surintensités), si le produit lui-même ne peut pas être facilement déconnecté de l'alimentation.
- › les circuits d'alimentation interconnectés de différents produits ne causent pas de dangers électriques
- › Une dimension suffisante des fils du câble d'alimentation doit être sélectionnée – selon les spécifications électriques maximales sur l'étiquette du produit – comme stipulé par les réglementations EN62368-1 ou VDE0100 ou EN60204 ou UL61010-1 ou simplement adhérer aux recommandations au chapitre 3.2.2

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements.

For installation and operation always follow the instructions provided by this manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to comply with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

Kontron's products are manufactured to satisfy environmental protection requirements. Many of the components can be recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state and local laws and regulations.

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- › Reduce waste arising from electrical and electronic equipment (EEE)
- › Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- › Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- › Improve the environmental performance of all those involved during the lifecycle of EEE



Environmental protection is a high priority with Kontron.

Kontron follows the WEEE directive

You are encouraged to return your products for proper disposal.

Mandatory Information about SVHC

The Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals EC 1907/2006, commonly referred to as REACH, is a European regulation on chemicals and their safe use. With the publication of candidate lists for authorization, the European Chemicals Agency (ECHA) identifies several substances of very high concern (SVHC) that manufacturers must disclose to their customers if used in articles above 0.1% by weight.

Based on the current version (as of 4 February 2026) of the candidate list for authorization, this product contains the following SVHCs above the disclosure threshold.

Table 1: SVHCs present above threshold

PART NO.	PART	SVHC	CAS-NO.	USE
All	Electronic components on PCBA	Lead	7439-92-1	High melting point solder within the encapsulated part, RoHS compliant (Ex. 7(a))
All	Brass spacers	Lead	7439-92-1	Brass containing lead with a concentration of approx. 3%, RoHS compliant (Ex. 6(c))

The SVHCs used in these products do not pose a safety risk under regular usage.

Table of Contents

Symbols	7
General Safety Instructions	8
Special Handling and Unpacking Instruction	8
Installation and operation of the device	8
Instructions générales de sécurité.....	10
Instructions Spéciales de Manipulation et de Déballage.....	10
Installation et fonctionnement de l'appareil	11
Instructions de Sécurité Supplémentaires pour les Circuits d'Alimentation en Courant Continu	11
General Instructions on Usage	12
Quality and Environmental Management	12
Disposal and Recycling.....	12
WEEE Compliance.....	12
Mandatory Information about SVHC.....	13
Table of Contents	14
List of Tables.....	15
List of Figures.....	15
1/ Product overview	16
2/ Technical data	18
2.1. Operating system.....	18
2.2. Dimensions and weight	18
2.3. Environmental conditions.....	18
2.4. Power supply	19
2.5. Materials.....	19
2.6. Type Label and Product Identification	20
2.7. User Guides	20
3/ Design and function	21
3.1. Description of the function.....	21
3.1.1. Processor board.....	21
3.1.2. MicroSD card	21
3.1.3. RTC with SuperCap	21
3.1.4. HDMI.....	21
3.1.5. Ethernet NET1	22
3.1.6. Ethernet NET2	22
3.1.7. USB 2.0 Host	22
3.1.8. RS-485.....	22
3.1.9. CAN	22
3.1.10. RS-232.....	22
3.2. Pin assignment, control and display elements	23
3.2.1. Functional earth	24
3.2.2. Power supply Connector X1.....	24
3.2.3. Ethernet connector X5 and X6.....	24
3.2.4. CAN / RS485 connector X2 and X8.....	25
3.2.5. RS-232 connector X12	25
3.2.6. HDMI connector X4	26
3.2.7. Control- and display elements.....	26
4/ Assembly and installation.....	27
4.1. DIN rail mounting	28
5/ Commissioning	29
5.1. Power supply	29
5.2. Grounding.....	29

5.3. QIWI System Configuration	29
5.4. Backup/Restore des Systems (Live System).....	30
6/ Maintenance	31
6.1. Cleaning	31
7/ Malfunctions	32
8/ Standards, Certifications and Directives.....	33
9/ Decommissioning and disposal	34
10/ Device views, technical drawings	35
10.1. Control Unit CU 6x series.....	35
11/ Technical Support.....	37
11.1. Warranty.....	37
11.2. Returning Defective Merchandise	38
Appendix: List of Acronyms	39

List of Tables

Table 1: SVHCs present above threshold.....	13
Table 2: Versions	16
Table 3: Detail configuration of the product versions	17
Table 4: Dimensions and weight:.....	18
Table 5: User Guides for the Control Unit CU 6x Series.....	20
Table 6: Signalling Gigabit Ethernet interface status.....	22
Table 7: Signalling Gigabit Ethernet interface status.....	22
Table 8: Overview of connections	23
Table 9: Power supply Connector X1	24
Table 10: Gigabit Ethernet connector X5.....	24
Table 11: CAN / RS485 connector X2 and X8	25
Table 12: RS232 connector X12	25
Table 13: HDMI connector X4 (Type A)	26
Table 14: Control- and display elements	26
Table 15: Malfunctions	32
Table 16: Standard, certifications and directives - product compliance.....	33

List of Figures

Figure 1: Type Label and Product Identification	20
Figure 2: MicroSD card	21
Figure 3: Interfaces bottom view.....	23
Figure 4: Interfaces side view	23
Figure 5: Mounting and removing the Control Unit from a DIN rail.....	28
Figure 6: CU 6x series technical drawings.....	35

1/Product overview

The Control Unit CU 6x series is designed for use as control unit in industrial and building automation applications. They are powered by a Quad Core™ Arm® i.MX8M Plus processor.

Embedded Linux (Yocto Distribution) is used as the operating system. The intelligent software package QIWI Toolkit offers a user-friendly way to configure the unit via TCP/IP.

This series of devices is based on the proven electronics of the CP 6x control panel series. The modular design also allows easy adaptation to customer-specific requirements.

This manual is applicable to the following versions:

Table 2: Versions

PART NO.	NAME	VERSION
11838	Control Unit CU 64-1500-46521	Control Unit i.MX8M Plus with one RS485/CAN interface and HDMI 2 GB RAM, 8 GB eMMC
11839	Control Unit CU 64-1560-46521	Control Unit i.MX8M Plus with two RS485/CAN interfaces and HDMI 2 GB RAM, 8 GB eMMC
11955	Control Unit CU 64-1560-46520	Control Unit i.MX8M Plus with two RS485/CAN interfaces 2 GB RAM, 8 GB eMMC
11960	Control Unit CU 64-1560-58520	Control Unit i.MX8M Plus with two RS485/CAN interfaces 4 GB RAM, 32 GB eMMC
11961	Control Unit CU 64-1560-58521	Control Unit i.MX8M Plus with two RS485/CAN interfaces and HDMI 4 GB RAM, 32 GB eMMC

Table 3: Detail configuration of the product versions

VERSION	11838	11839	11955	11960	11961
Arm® i.MX8M Plus, 4x 1.6 GHz	X	X	X	X	X
4 GByte eMMC Flash					
8 GByte eMMC Flash	X	X	X		
32 GByte eMMC Flash				X	X
1 GByte DDR4 RAM					
2 GByte DDR4 RAM	X	X	X		
4 GByte DDR4 RAM				X	X
2 MByte serial NOR Flash	X	X	X	X	X
128 KByte FRAM (NV-RAM)	X	X	X	X	X
microSD card slot	X	X	X	X	X
RTC with SuperCAP (<20 days)	X	X	X	X	X
TPM 2.0					
NET1 10/100/1000 MBit ETH	X	X	X	X	X
NET2 10/100/1000 MBit ETH (TSN)	X	X	X	X	X
2x USB Host (USB1, USB2)	X	X	X	X	X
1x RS-485 (isolated)	X				
2x RS-485 (isolated)		X	X	X	X
1x CAN FD (isolated)	X				
2x CAN FD (isolated)		X	X	X	X
RS232	X	X	X	X	X
HDMI	X	X			X
Linux Yocto distribution	X	X	X	X	X
QIWI software toolkit	X	X	X	X	X
CODESYS-Image available	X	X	X	X	X
Kontron OS available	X	X	X	X	X
Operating Temperature 0°C ... +55°C	X	X	X	X	X
Operating Temperature -20°C ... +55°C					
Mounting type vertical (book form)	X	X	X	X	X
Mounting type flat-lying					

2/Technical data

2.1. Operating system

The operating system is embedded Linux (Yocto Distribution). Optionally Kontron OS is available as secure OS.

2.2. Dimensions and weight

Table 4: Dimensions and weight:

PART NO	NAME	EXTERNAL DIMENSIONS (BXHXT)	WEIGHT
11838	Control Unit CU 64-1500-46521	27 x 165 x 78 mm	0.32 kg
11839	Control Unit CU 64-1560-46521	27 x 165 x 78 mm	0.32 kg
11955	Control Unit CU 64-1560-46520	27 x 165 x 78 mm	0.32 kg
11960	Control Unit CU 64-1560-58520	27 x 165 x 78 mm	0.32 kg
11961	Control Unit CU 64-1560-58521	27 x 165 x 78 mm	0.32 kg

2.3. Environmental conditions

The allowable ambient conditions for the operation of the product are:

- › Ambient temperature operation: 0 ... +55 °C (-20°C ... +55°C for CU 64-xxx1)
- › Ambient temperature storage: -20 ... +70 °C
- › Humidity: 10 - 95 % (non-condensing)
- › Pollution degree 2 acc. IEC 61010-1
- › Operating Altitude: max. 3000m above sea level
- › Atmosphere: free of corrosive or explosive gases
- › Protection class acc. IEC60529: IP20

EMC with correct wiring and shielding of the interfaces:

- › according to EN 61000-6-2 Immunity (Industrial sector)
- › according to EN 61000-6-4 Emission (Industrial sector)

⚠ WARNING

This device is intended exclusively for use in industrial environments. In domestic environments this device may cause radio interference. In this case the user must take appropriate measures.

⚠ DANGER

No use in potentially explosive areas!

Use in hazardous areas can result in death, serious injury or considerable damage to property.

The device is not designed for use in hazardous areas and does not have the appropriate approvals.

2.4. Power supply

Supply voltage: +24 VDC \pm 20 %

Current consumption¹: 0.10 A – 0.7 A (Power Off / Standby <1 mA)

Power consumption¹: 2 W – 17 W

Internal fusing: 2A melting fuse

External fusing with max.40A fuse required

On primary side overvoltage category II max. 300V

Recommended design of the power supply unit: Voltage/ output power: 24 VDC / min. 30 W

¹depending on processor load and interface activity

⚠ WARNING

The output of the power supply unit must meet the criteria of a safety extra-low voltage (SELV) according to IEC 60664-1.

The use of an unsuitable power supply unit can result in danger of electric shock.

⚠ CAUTION

The power cable must be rated for a temperature of +75° C or higher.

The cable can become damaged over time or potentially harmful plasticizers could be released in the surrounding air if cables with a lower temperature rating are being used.



The power consumption depends on the display size and brightness as well as the type and number of active interfaces.



The internal fuse is not replaceable. Defective fuses must be replaced by qualified Kontron service.



USB devices connected to USB 2.0 interfaces may consume a maximum of 0.5A per interface.

2.5. Materials

The housing of the CU 6x control unit is made of anodized aluminum.



This product complies with the RoHS Directive 2011/65/EU and the Delegate Directive (EU) 2015/863 amending Annex II of Directive 2011/65/EU (RoHS 3)



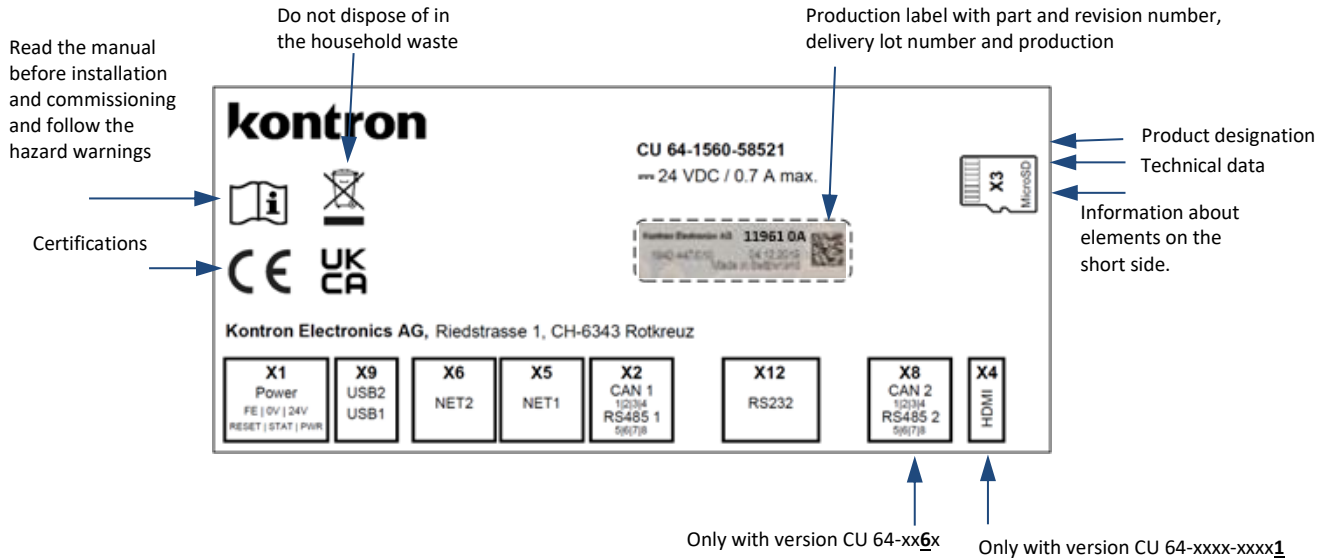
With regard to the REACH regulation, POP regulation or California Prop 65, please refer to the information on our website at:

<https://www.kontron.com/en/group/product-responsibility/material-compliance>

2.6. Type Label and Product Identification

The type plate is located on the upper side of the control unit.

Figure 1: Type Label and Product Identification



2.7. User Guides

Table 5: User Guides for the Control Unit CU 6x Series

PART NO.	DESIGNATION	COMMENT
90226	Benutzerhandbuch Control Unit CU 6x (DE)	German User Manual
90227	User Guide Control Unit CU 6x (EN)	English User Manual
90208	Online System manual QIWI Toolkit, see https://wiki.kontron.ch/kchqiwi/manual	English User Manual
90232	Quickstart Guide Control-Unit CU-3x/4x/5x/6x	English User Manual

3/Design and function

3.1. Description of the function

3.1.1. Processor board

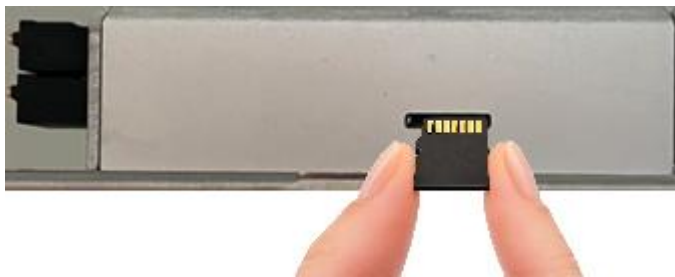
The processor board is designed as a single board and contains all interfaces available on the control unit directly on board.

eMMC memory, fast boot serial NOR Flash, DDR4 DRAM main memory are used as standard. All components are soldered down for high reliability.

3.1.2. MicroSD card

The microSD card slot X3 integrated on the base module allows the use of SD cards up to SDXC format

Figure 2: MicroSD card



The microSD card must be inserted as shown on the type label and in the illustration above.

3.1.3. RTC with SuperCap

A real-time clock is installed on the processor board. The maximum deviation is 10 seconds per month. The real-time clock is buffered by a SuperCap (capacitor with particularly high capacity). This allows the real-time clock to continue running for up to 20 days without a power supply. The SuperCap cannot be replaced.



At high storage or operating temperatures, the SuperCap may lose capacity. In this case, the time that the RTC continues to run without an external power supply may be significantly reduced. Kontron therefore recommends operating and storing the device at the lowest possible temperatures.

3.1.4. HDMI

The HDMI port supports displays with a resolution of up to 1080p (Full HD). The HDMI port supports DDC and CEC. HEC is not supported.

NOTICE

Kontron is HDMI Adopter (Version 1.4) and pays the corresponding license fees to HDMI Licensing Administrator Inc.

HDCP (High-bandwidth Digital Content Protection) is not supported.

3.1.5. Ethernet NET1

The Gigabit Ethernet interface NET1 is operated via an Ethernet controller of the processor. The electrically isolated 10/100/1000 Mbit Ethernet interface is available on a RJ45 (8P8C) connector. LEDs signal the respective interface status.

Table 6: Signalling Gigabit Ethernet interface status

LED GREEN (ACTIVITY)		LED YELLOW (LINK1000)	
off:	no activity, no link	off:	no link1000
blink:	activity, link	on:	link1000

3.1.6. Ethernet NET2

The Gigabit Ethernet interface NET2 is operated via an Ethernet controller of the processor. The electrically isolated 10/100/1000 Mbit Ethernet interface is available on a RJ45 (8P8C) connector. The interface NET2 supports TSN. LEDs signal the respective interface status.

Table 7: Signalling Gigabit Ethernet interface status

LED GREEN (ACTIVITY)		LED YELLOW (LINK1000)	
off:	no activity, no link	off:	no link1000
blink:	activity, link	on:	link1000

3.1.7. USB 2.0 Host

The pin assignment corresponds to the USB 2.0 standard, connector type A. The connected USB cable must be shielded and have a cable length of less than 3m.

3.1.8. RS-485

The serial interface provides the D+ and D- signals at RS485 level. This interface is galvanically isolated. It is equipped with AC termination ($R = 120 \text{ ohms}$, $C = 2.2 \text{ nF}$) and biasing resistors ($R = 560 \text{ ohms}$). Depending on the version, one or two RS-485 interfaces are available.

3.1.9. CAN

The galvanically isolated CAN interface provides the CANL and CANH signals in accordance with ISO 11898-1:2015 (CAN FD). The interface is terminated internally with a terminating resistor ($R = 120 \text{ ohms}$). Depending on the version, one or two CAN interfaces are available.

3.1.10. RS-232

The serial interface provides the RxD, TxD, CTS, and RTS signals at RS232 level. This interface is not galvanically isolated.

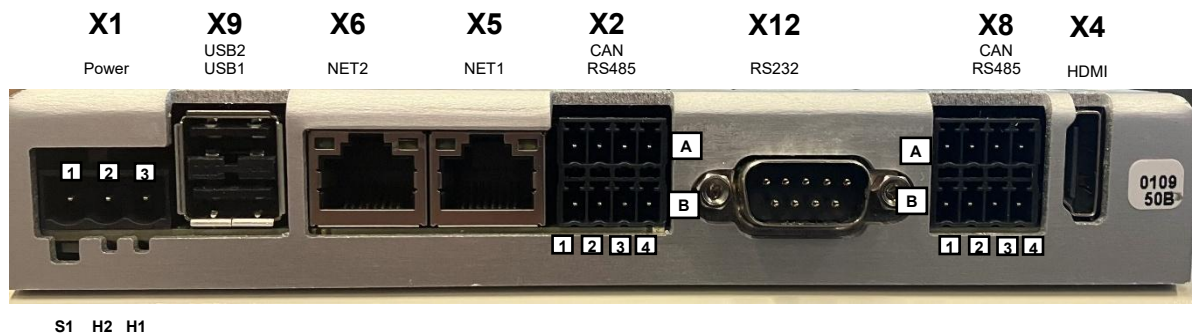
3.2. Pin assignment, control and display elements

The Control Unit has the following connectors:

Table 8: Overview of connections

CONNECTOR	TYPE	PURPOSE
X1	3-pole pluggable terminal pitch 5.08 mm for 24 VDC supply	Power
X3	microSD card slot	microSD
X5	RJ45 (8P8C) Connector for Gigabit Ethernet	Ethernet
X6	RJ45 (8P8C) Connector for Gigabit Ethernet, supports TSN	Ethernet
X9	2 port USB Host connector type A	USB 2.0
X2.A	4-pole pluggable terminal for CAN	CAN
X2.B	4-pole pluggable terminal for RS485	RS485
X8.A	4-pole pluggable terminal for CAN	CAN
X8.B	4-pole pluggable terminal for RS485	RS485
X12	D-SUB9 connector for RS232	RS232
X4	HDMI connector type A	HDMI

Figure 3: Interfaces bottom view



A description of S1, H1 and H2 can be found in chapter 3.2.7.

Figure 4: Interfaces side view



3.2.1. Functional earth

For the grounding of the device see notes in chapter 5.2 Grounding.

3.2.2. Power supply Connector X1

Table 9: Power supply Connector X1

PIN	SIGNAL	COMMENT
1	FE	Functional earth
2	0V	Power supply 0 Volt DC
3	24V	Power supply +24 VDC ±20%

Cable: Shorter than 3 m, unshielded

Connector Type: Phoenix MSTBA 2.5/3-G-5.08 – 1740518

Mating connector: Phoenix FKCN 2.5/ 3-ST 5.08 – 1703573 (included in delivery)

Associated permissible cable cross-sections:

- › Rigid conductor cross-section: 0,2 mm² ... 1,5 mm²
- › Flexible conductor cross-section: 0,2 mm² ... 2,5 mm²
- › Conductor cross section AWG / kcmil: 24 ... 16
- › Conductor cross-section flexible with wire end ferrule: 0,25 mm² ... 1,5 mm²
- › Stripping length: 10 mm

The control unit must be grounded via the functional earth connection of the power supply connector X1 with low impedance. See chapter 5.2 Grounding.

⚠ CAUTION

The power cable must be rated for a temperature of +75° C or higher.

The cable can become damaged over time or potentially harmful plasticizers could be released in the surrounding air if cables with a lower temperature rating are being used.

3.2.3. Ethernet connector X5 and X6

Table 10: Gigabit Ethernet connector X5 and X6

PIN	SIGNAL	PIN	SIGNAL
1	TX0+	5	TX2-
2	TX0-	6	TX1-
3	TX1+	7	TX3+
4	TX2+	8	TX3-

Cable: Shorter than 100m, shielded, min. Cat-5e

3.2.4. CAN / RS485 connector X2 and X8

Table 11: CAN / RS485 connector X2 and X8

ROW	PIN	SIGNAL	TYPE	COMMENT
A	1	SHIELD	SHLD	Should be connected to cable shield
A	2	CAN H	I/O	CAN TxRx+
A	3	CAN L	I/O	CAN TxRx-
A	4	GND_CAN	GND	Galvanically isolated
B	1	SHIELD	SHLD	Cable shield
B	2	A	I/O	RS485 TxRx+
B	3	B	I/O	RS485 TxRx-
B	4	GND_RS485	GND	Galvanically isolated

Cable: 100m max. length, shielded

- ▶ Connector type: Phoenix MCDN 1.5/ 4-G1-3.5 – 1953732
- ▶ Mating connector: Phoenix FMC 1.5/ 4-ST-3.5 – 1704999 (included in delivery)

⚠ CAUTION

Don't compromise galvanic isolation.

Never connect GND_RS485 and GND_CAN to GND or SHIELD. Pay attention to internal connections of other devices connected to the bus.

3.2.5. RS-232 connector X12

A DSUB9 connector is used for RS232.

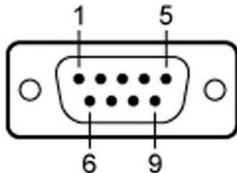


Table 12: RS232 connector X12

PIN	SIGNAL	TYPE	COMMENT
1	-		
2	RxD	IN	RS232 Receive Data
3	TxD	OUT	RS232 Transmit Data
4	-		
5	GND	GND	Elektronics ground (not isolated)
6	-		
7	RTS	OUT	RS232 Request to Send
8	CTS	IN	RS232 Clear to Send
9	-		
CASE	SHIELD	SHLD	Cable shield

Cable: 3m max. length, shielded

3.2.6. HDMI connector X4

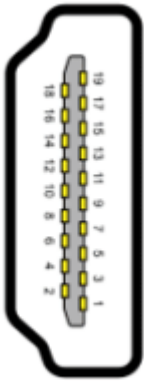


Table 13: HDMI connector X4 (Type A)

PIN	SIGNAL	PIN	SIGNAL
1	TDMS Data 2+	2	TDMS Data 2 Shield
3	TDMS Data 2-	4	TDMS Data 1+
5	TDMS Data 1 Shield	6	TDMS Data 1-
7	TDMS Data 0+	8	TDMS Data 0 Shield
9	TDMS Data 0-	10	TDMS Clock+
11	TDMS Clock Shield	12	TDMS Clock-
13	CEC	14	nc
15	DDC SCL	16	DDC SDA
17	DDC/CEC GND	18	+5V, max. 50 mA
19	Hotplug Detect		

Cable: 3 m max. length, shielded

⚠ WARNING

Use a high-quality HDMI cable that is double-shielded and less than 3 meters long.

Otherwise, compliance with the applicable EMC standards cannot be guaranteed.

Kontron recommends using a certified “Premium High Speed HDMI” cable bearing the appropriate label from HDMI Licensing Administrator Inc.

3.2.7. Control- and display elements

The operating and display elements are located below the power supply connector X1.

Table 14: Control- and display elements

ELEMENT	TYP	FUNKTION
S1	Switch	On/Off switch. Press and hold for approx. 3 seconds to switch off.
H1	LED green	Indicates whether power is present and the device is switched on.
H2	LED blue	Status LED, see: https://wiki.kontron.ch/kchlinux/status-led

4/Assembly and installation

Prior to commissioning, the temperature of the unit must be adjusted to the room temperature.

⚠ WARNING**Observance of the standards and regulations of the country of destination**

Improper installation may result in death, serious injury or serious damage to property. The device must be installed in machines or systems in compliance with all standards and regulations applicable in the countries of destination and may only be installed by a trained specialist who is familiar with the respective regulations.

⚠ WARNING**Malfunctions due to improper grounding of the device.**

The device must be properly grounded. Compliance with the prescribed EMC limit values can only be guaranteed if the device is properly grounded.

NOTICE**Damage to plugs or cables due to improper handling when plugging in and plugging out**

Material damage to cables, plugs and other plant components can result. Always hold the plug when plugging and unplugging a cable.

NOTICE**Observe correct installation position**

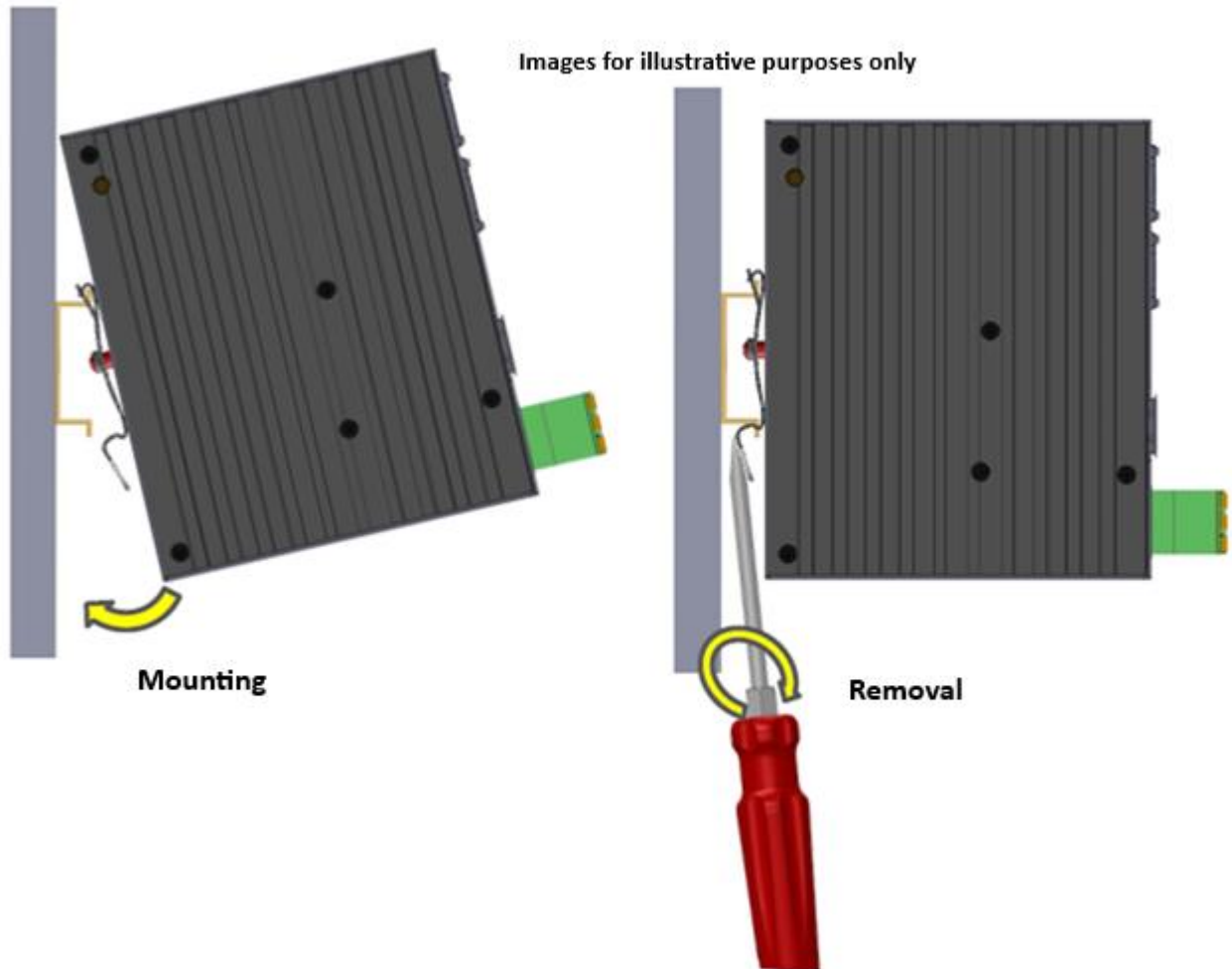
The device is intended exclusively for operation when mounted on a DIN rail in accordance with the installation instructions in Section 4.1. The specified minimum clearances from other devices mounted on the DIN rail must be observed. If the device is not installed in accordance with the instructions, proper heat dissipation cannot be guaranteed.

In particular, it is not permitted to operate the unit when it is placed on a tabletop or on the floor, for example.

4.1. DIN rail mounting

Installation and removal from the DIN rail are performed as described in Figure 5. A minimum distance of 10 cm must be maintained from other devices or objects on either side of the DIN rail. If necessary, this distance must be increased if the installation instructions for the adjacent device require a greater distance.

Figure 5: Mounting and removing the Control Unit from a DIN rail



5/Commissioning

5.1. Power supply

The unit is operated with 24 VDC. The power supply must be connected to connector X1. The unit starts automatically when the power supply is switched on.

For pin assignment and conductor cross-sections, see chapter 3.2.2 Power supply Connector X1.

Voltage level and power consumption see chapter 2.4 Power supply.

5.2. Grounding

The grounding of the unit dissipates interference that is transmitted via external signal cables or cables from external assemblies. The panel must therefore be grounded via the functional earth connection of the power supply connector X1 with sufficiently low impedance.

Recommended cable cross-section is 1.5 mm².

5.3. QIWI System Configuration

The integrated software package **QIWI Toolkit** provides an easy to use interface for setting up the device. This can be called via a web browser on another device that is connected to the Panel via Ethernet.

The clear menu structure makes it possible to quickly find the numerous setting options such as network settings, URL, CODESYS, display, FTP, IP-Tables, screensaver, web browser settings, passwords, diagnostics, etc.

Default IP addresses for panel access:

Ethernet 1: 192.168.1.100 (Subnet: 255.255.255.0)

Ethernet 2: 192.168.2.100 (Subnet: 255.255.255.0)

Default passwords (factory setting):

- › **User: root**
- › **Password: root**

NOTICE**Change of default password**

To protect your system from unauthorized access, please change the default password to a secure password.

A detailed description of the settings and functions can be found in the System Manual QIWI Toolkit.

The system manual is integrated in the system configuration in the unit or can also be downloaded via the WIKI portal: <https://wiki.kontron.ch/kchqiwi/manual>

Further support in the WIKI portal: Quick Start Guide, FAQ, Blog, Support, RSS feed registration, Images and much more.

5.4. Backup/Restore des Systems (Live System)

The Backup/Restore function (Live System) allows easy backup and restore of the complete device via USB stick or SD card.

With a backup of the system, the devices can be reset to a defined state or even cloned.

The backup/restore function is integrated in the system configuration and can be accessed directly via the selection menu.

The live system for the backup/restore function can also be requested free of charge from Kontron Electronics AG at <http://www.kontron-electronics.com>

6/Maintenance

There is no maintenance interval prescribed by the manufacturer of the product.

6.1. Cleaning

The device can be cleaned as required. There is no cleaning interval prescribed by the manufacturer of the product.

NOTICE**Penetration of liquids during cleaning**

Damage to property or destruction of the device may result.

7/Malfunctions

Table 15: Malfunctions

MALFUNCTION	POSSIBLE CAUSE	RECOMMENDED ACTION
No function	No or incorrect power supply to the device	Check whether the power supply cable is correctly plugged in. Check pin assignment. Measure supply voltage.
Interface function impaired	Interface cable not plugged in correctly	Check whether all interface cables are plugged in correctly and the pin assignment is correct.

NOTICE

Loss of warranty due to manipulation of the device

Repairs and other manipulations of the device may only be carried out by the manufacturer. In particular, opening the device is prohibited. Otherwise any warranty will become void.

8/Standards, Certifications and Directives

The Control Unit CU 6x series complies with the requirements of the standards listed in Table 16: Standard, certifications and directives - product compliance.

Table 16: Standard, certifications and directives - product compliance

Category	Directive or Standard	Detail
CE-Mark Compliant with EU Directives	Electromagnetic Compatibility	Directive 2014/30/EU
	RoHS II	Directive 2011/65/EU +EN IEC 63000:2016
EMC 2014/30/EU Immunity/ Emission	IEC 61000-6-2:2016 EN 61000-6-2:2019	Electromagnetic compatibility (EMC), part 6-2: Generic standards- Immunity in industrial environments
	IEC 61000-6-4:2019 EN 61000-6-4:2007/A1:2011	Electromagnetic compatibility (EMC), part 6-4: Generic standards- Emission in industrial environments
WEEE 2012/19/EU	Waste Electrical and Electronic Equipment Directive (WEEE Directive)	Compliant with the Waste Electrical and Electronic Equipment (WEEE) directive to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers.

9/Decommissioning and disposal

NOTICE

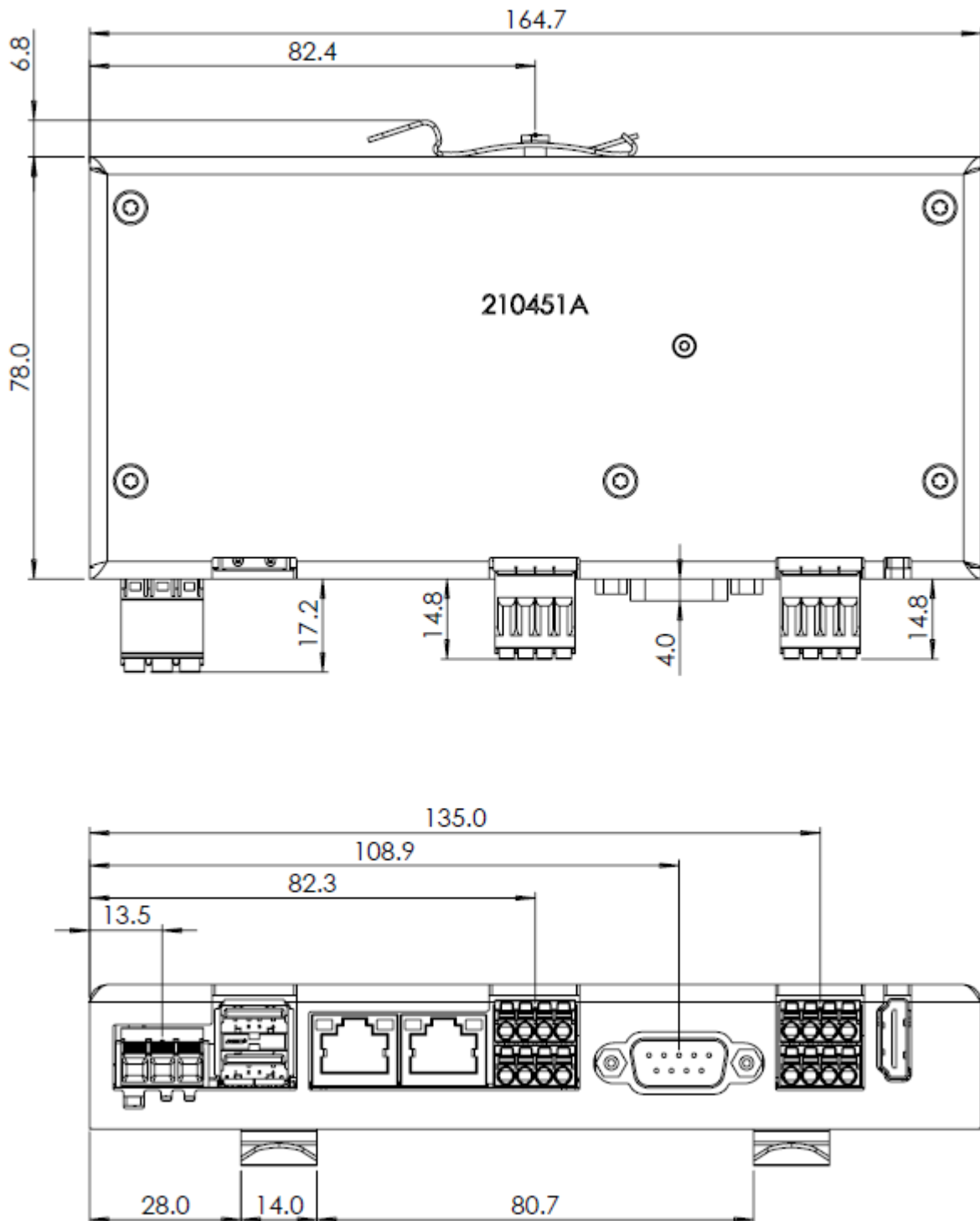
Disposal of electrical material and batteries

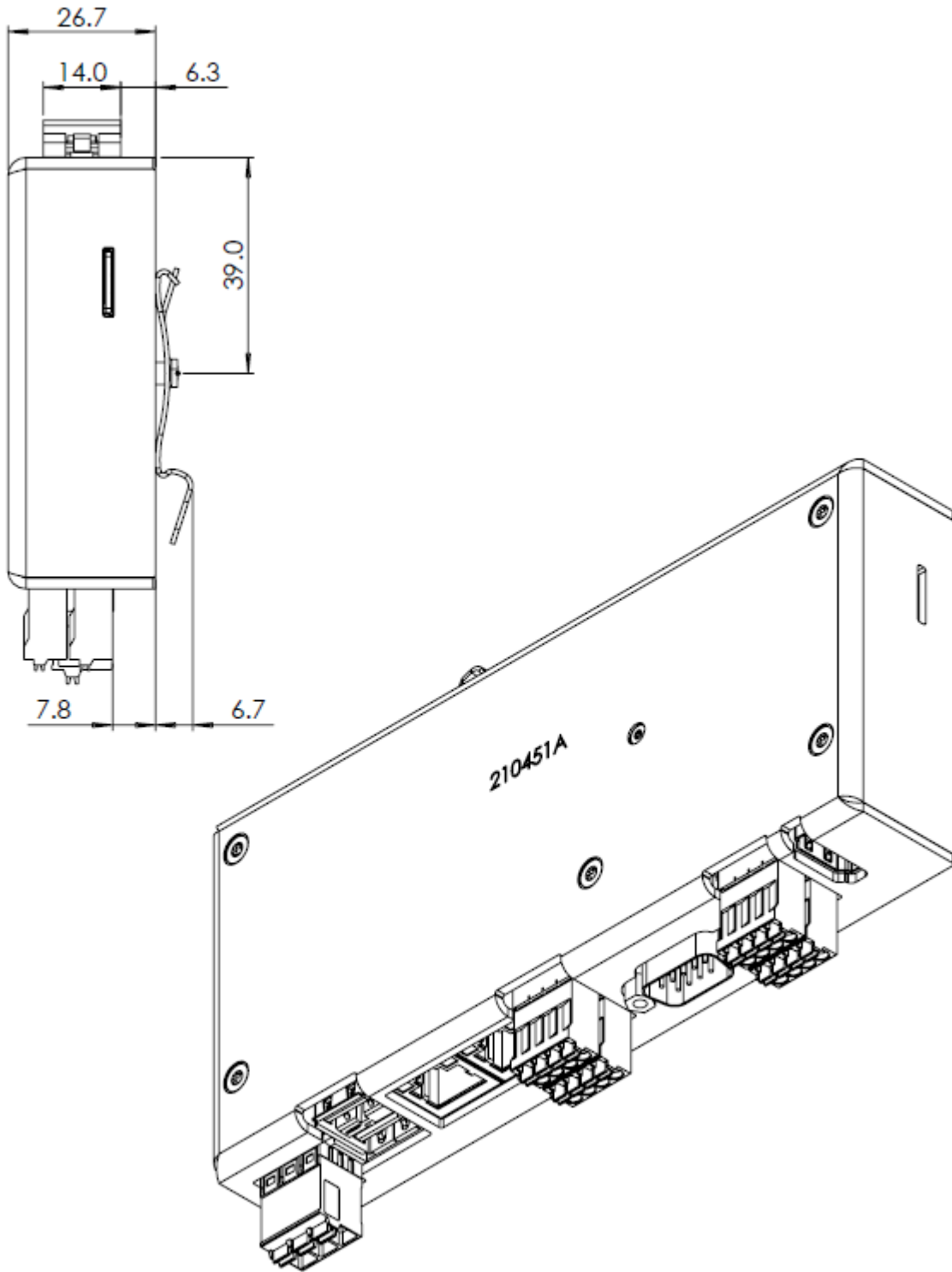
Electrical appliances and batteries must be disposed of in accordance with local regulations. If necessary, contact your local waste disposal company for information. Do not throw devices into the household waste and do not burn them.

10/ Device views, technical drawings

10.1. Control Unit CU 6x series

Figure 6: CU 6x series technical drawings





11/ Technical Support

For technical support contact our support department:

- › Email: support@kontron.com
- › Phone: +49-821-4086-888

Make sure you have the following information available when you call:

- › Part number or product ID number (PN),
- › Production batch or Serial Number (SN)



The numbers are located on a small label on the nameplate.

Be ready to explain the nature of your problem to the service technician.

11.1. Warranty

Due to their limited service life, parts that by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law. This applies to the backup battery, for example.

11.2. Returning Defective Merchandise

All equipment returned to Kontron must have a Return of Material Authorization (RMA) number assigned exclusively by Kontron. Kontron cannot be held responsible for any loss or damage caused to the equipment received without an RMA number. The buyer accepts responsibility for all freight charges for the return of goods to Kontron's designated facility. Kontron will pay the return freight charges back to the buyer's location in the event that the equipment is repaired or replaced within the stipulated warranty period. Follow these steps before returning any product to Kontron.

1. Visit the RMA Information website:

<https://www.kontron.com/en/support/rma-information>

Download the RMA Request sheet for Kontron Europe GmbH and fill out the form. Take care to include a short detailed description of the observed problem or failure and to include the product identification Information (Name of product, Product number and Production batch or Serial number). If a delivery includes more than one product, fill out the above information in the RMA Request form for each product.

2. Send the completed RMA-Request form to the fax or email address given below at Kontron Europe GmbH. Kontron will provide an RMA-Number.

Kontron Europe GmbH
RMA Support
Phone: +49 (0) 821 4086-0
Fax: +49 (0) 821 4086 111
Email: service@kontron.com

3. The goods for repair must be packed properly for shipping, considering shock and ESD protection.



Goods returned to Kontron Europe GmbH in non-proper packaging will be considered as customer caused faults and cannot be accepted as warranty repairs.

4. Include the RMA-Number with the shipping paperwork and send the product to the delivery address provided in the RMA form or received from Kontron RMA Support .

Appendix: List of Acronyms

AC	Alternating Current
CE	Conformité Européenne
COM	Communication port
CP	Control Panel
DC	Direct Current
EMMC	embedded Multimedia Card
EMC	ElectroMagnetic compatibility; interference immunity to electrical or electromagnetic influences
ESD	ElectroStatic Discharge; electrostatic discharge, high electrical voltage pulse
ETH	Ethernet interface
FCC	Federal Communications Commission
GBE	Giga Bit Ethernet
HD	High Definition
HDMI	High Definition Multimedia Interface
HMI	Human Machine Interface; Interface between machine and user
IOT	Internet of Things
LED	Light Emitting Diode
MTBF	Mean Time Before Failure
PS	Power Source
RMA	Return of Material Authorization
ROHS	Restriction of Hazardous Substances
RTC	Real Time Clock
SD CARD	Secure Digital Card
SELV	Safety Extra Low Voltage
SVGA	Super Video Graphics Array
TFT	Thin-Film Transistors
TPM	Trusted Platform Module
TSN	Time Sensitive Networking
UL	Underwriters Laboratories
USB	Universal Serial Bus
UV	Ultra Violet
VESA	Video Electronics Standards Association
VGA	Video Graphics Array
WP	Web Panel
WXGA	Wide Extended Graphics Array
XGA	Extended Graphics Array



About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT) and offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

For more information, please visit: www.kontron.com

Your Contact

Kontron Electronics AG

Riedstrasse 1
6343 Rotkreuz, Switzerland
Tel.: + 41 41 799 47 99
info@kontron.ch

www.kontron-electronics.ch



Global Headquarters

Kontron Europe GmbH

Gutenbergstraße 2
85737 Ismaning, Germany
Tel.: +49 8214 4086-0
info@kontron.com

www.kontron.com