SIGMATEK

PC 521

Data Recording PC

Operating Manual

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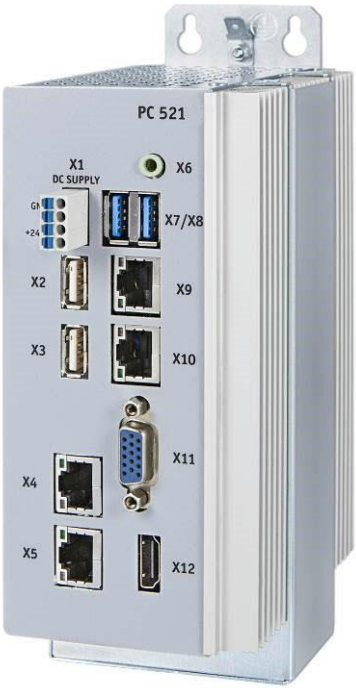
Translation from German

DATA RECORDING PC PC 521

The PC 521 is a data recording PC with an Intel® Celeron J1900 processor that is PC-compatible and operates with a standard PC BIOS.

For better heat dissipation, a ventilator can be mounted onto the PC 521.



Contents

1 Introduction

1.1 Target Group/Purpose of this Operating Manual

This operating manual contains all information required to operate this product.

This operating manual is intended for:

- Project planners
- Technicians
- Commissioning engineers
- Machine operators
- Maintenance/test technicians

General knowledge of automation technology is required.

Further help and training information, as well as the appropriate accessories can be found on our website www.sigmatek-automation.com

Our support team is happily available to answer your questions.
Please see our website for our hotline number and business hours.

1.2 Contents of Delivery

1x PC 521

2 Basic Safety Guidelines

2.1 Symbols Used

The following symbols are used in the operator documentation for warning and danger messages, as well as informational notes:

DANGER

Danger indicates that death or serious injury **will occur**, if the specified measures are not taken.

- ⇨ To avoid death or serious injuries, observe the all guidelines.
- ⇨ **Danger** indique une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

WARNING

Warning indicates that death or serious injury**can** occur, if the specified measures are not taken.

- ⇨ To avoid death or serious injuries, observe the all guidelines.
- ⇨ Avertissement d'une situation dangereuse qui, faute de prendre les mesures adéquates, entraînera des blessures graves, voire mortelles. Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

CAUTION

Caution indicates that moderate to slight injury **can** occur, if the specified measures are not taken.

- ⇨ To avoid moderate to slight injuries, observe all guidelines.
- ⇨ **Attention** indique une situation dangereuse qui, faute de prendre les mesures adéquates, **peut** entraîner des blessures assez graves ou légères.Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

INFORMATION

Provides important information on the product, handling or relevant sections of the documentation, which require particular attention. Fournit des recommendations importantes sur le produit, la manipulation ou sections relevantes de la documentation, qui nécessitent prêter une attention particulière.

Danger for ESD-sensitive components. Les signes de danger pour les composants sensibles aux décharges électrostatiques.

2.2 Disclaimer

The contents of this operating manual were prepared with the greatest care. However, deviations cannot be ruled out. This operating manual is regularly checked and required corrections are included in the subsequent versions. The machine manufacturer is responsible for the proper assembly, as well as device configuration. The machine operator is responsible for safe handling, as well as proper operation.

The current operating manual can be found on our website. If necessary, contact our support.

Subject to technical changes, which improve the performance of the devices. The following operating manual is purely a product description. It does not guarantee properties under the warranty.

Please thoroughly read the corresponding documentation and this operating manual before handling a product.

SIGMATEK GmbH & Co KG is not liable for damages caused through non-compliance with these instructions or applicable regulations.

2.3 General Safety Guidelines

The safety guidelines in the other sections of this operating manual must be observed. These instructions are visually emphasized by symbols.

According to EU Guidelines, the operating instructions are a component of a product.

This operating manual must therefore be accessible in the vicinity of the machine since it contains important instructions.

This operating manual should be included in the sale, rental or transfer of the product, or its online availability indicated.

Maintain this operating manual in readable condition and keep it accessible for reference.

Regarding the requirements for Safety and health connected to the use of machines, the manufacturer must perform a risk assessment in accordance with machine guidelines 2006/42/EG before introducing a machine to the market.

Before commissioning this product, check that conformance with the provisions of the 2006/42/EG guidelines is correct. As long as the machine with which the product should be used does not comply with the guideline, operating this product is prohibited.

Operate the unit with devices and accessories approved by SIGMATEK only.

3 Norms and Guidelines

3.1 Guidelines

The product was constructed in compliance with the following European Union guidelines and tested for conformity.

3.1.1 EU Declaration of Conformity

EU Conformity Declaration

The PC 521 conforms to the following European guidelines:

- **2014/35/EG** Low-voltage guideline
- **2014/30/EU** “Electromagnetic Compatibility” (EMC guideline)
- **2011/65/EU** “Restricted use of certain hazardous substances in electrical and electronic equipment” (RoHS Guideline)

The EU Conformity Declarations are provided on the SIGMATEK website. See Products/Downloads or use the search function and the keyword “EU Declaration of Conformity”.

4 Technical Data

4.1 Performance Data

Processor	Intel® Celeron J1900
Hard drive	128 GB Solid State Disk
Main memory (DDR-RAM)	4 GB DDR3 RAM (SODIMM)
Graphics	Intel® HD-graphic for Intel® Atom processors of the Z3700 series
Interfaces	4x Ethernet 10/100/1000 Mbit 2x USB 2.0/max. 0.5 A 2x USB 3.0/max. 0.9 A 1x VGA (max. 1920x1200 px @ 60 Hz) 1x Audio (Line Out) 1x HDMI 1.4a (max. 1920x1200 px @ 60 Hz)
Real-time clock	yes (battery buffered)

4.2 Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) [1)]	
Supply voltage (UL)	+18-30 V DC (NEC Class 2 or LVLC)	
Protection class	III	
Current consumption Power supply +24 V	typically 1 A (without externally connected devices)	maximum 1.6 A (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 12.5 A (for 108 µs, load-dependent)	
Inrush current without current-limiting supply	maximum 30 A (for 23.5 µs, load-dependent)	

(1) For USA and Canada:

The supply must be limited to:
a) max. 5 A at voltages from 0-20 V DC, or
b) 100 W at voltages from 20-30 V DC.

The limiting component (e.g. transformer, power supply or fuse) must be certified by an NRTL (Nationally Recognized Testing Laboratory).

Caution:

The +24 V supply must be buffered with an external power supply, since the PC does not have internal buffering!

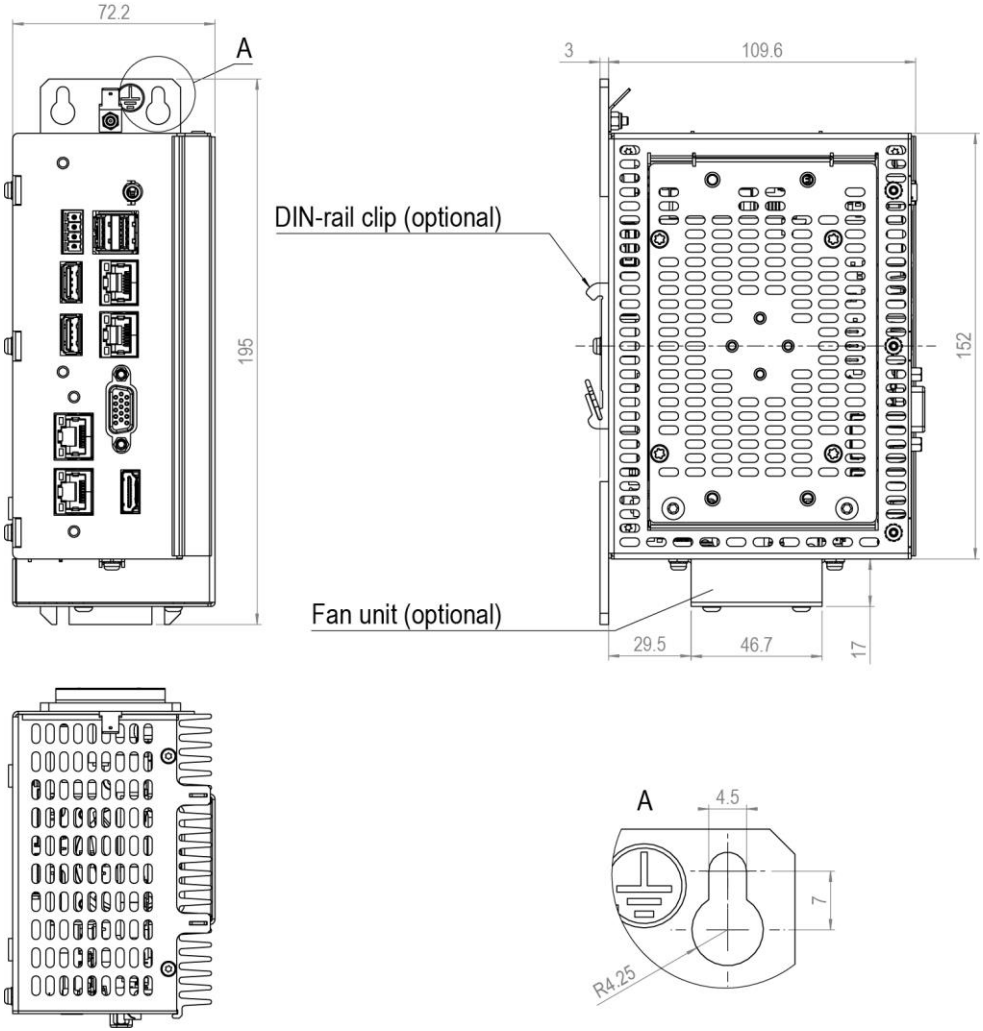
4.3 Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature (fanless)	0 ... +50 °C	
Environmental temperature (with fan)	0 ... +60 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz amplitude 3.5 mm amplitude 3.5 mm 9-200 Hz 1 g (10 m/s²) 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²)
Protection type	EN 60529: protected through the housing	IP20

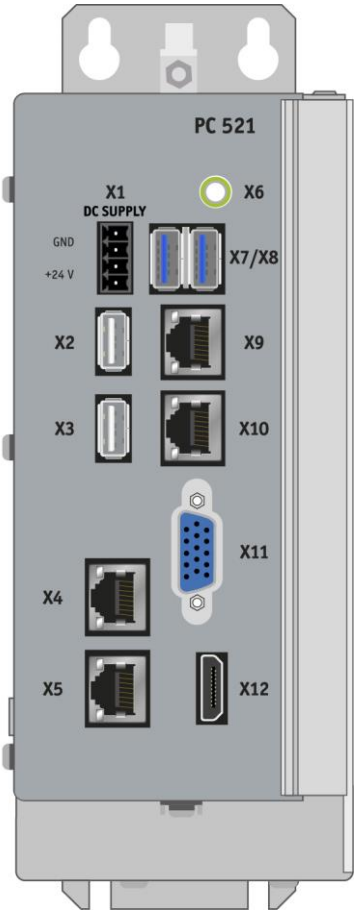
4.4 Miscellaneous

Article number	01-310-521
Hardware version	1.x
Dimensions incl. mounting set	72.2 x 195.0 x 112.6 mm (W x H x D)
Operating system	Windows 10 IoT
Standard	UL (E247993)
Approvals	CE, $_{c}$UL$_{US}$

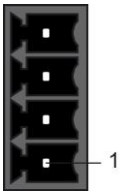
5 Mechanical Dimensions



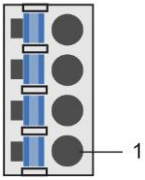
6 Connector Layout



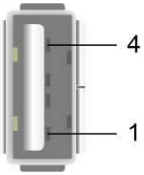
X1: Supply (4-pin Phoenix RM 3.5)



Pin	Function
1	+24 V DC supply
2	+24 V DC supply
3	GND
4	GND



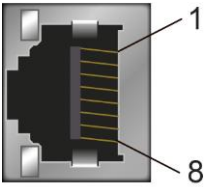
X2, X3: USB 2.0 (Type A)



Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

It should be noted that many of the USB devices on the market do not comply with USB specifications; this can lead to device malfunctions. This may cause the device to malfunction. It is also possible that these devices will not be detected at the USB port or function correctly. Therefore, it is recommended that every USB stick be tested before actual use.

X4, X5 and X9, X10: Ethernet 10/100/1000 (RJ45)



Pin	Function
1	DA+
2	DA-
3	DB+
4	DC+
5	DC-
6	DB-
7	DD+
8	DD-

Problems can arise if a control is connected to an IP network, which contains modules that do not contain a SIGMATEK operating system. With such devices, Ethernet packets could be sent to the control with such a high frequency (i.e. broadcasts), that the high interrupt load could cause a real-time runtime error or runtime error. By configuring the packet filter (Firewall or Router) accordingly however, it is possible to connect a network with SIGMATEK hardware to a third party network without triggering the error mentioned above.

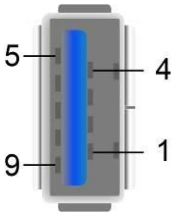
X6: Audio (Line Out)

Socket	Function
Green	Line Out

Line IN, Line OUT (3.5 mm Jack)

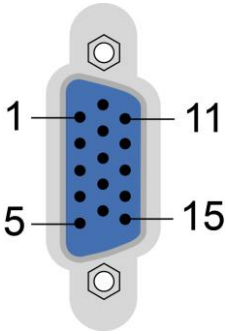
Pin	Function
L	Stereo left
R	Stereo right
GND	GND

X7, X8: USB 3.0 (Type A)



Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND
5	USB3 Rx-
6	USB3 Rx+
7	GND
8	USB3 Tx-
9	USB3 Tx+

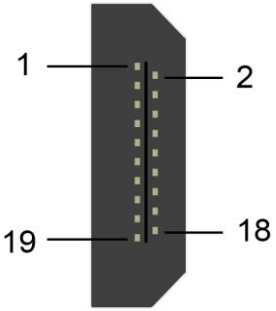
X11 VGA (15-pin)



Pin	Function
1	red
2	green
3	blue
4	n.c.
5	n.c.
6	GND
7	GND
8	GND
9	n.c.
10	GND
11	n.c.
12	n.c.
13	H-Sync
14	V-Sync
15	n.c.

n.c. = do not use

X12 HDMI



Pin	Function
1	TMDS Data2+
2	GND
3	TMDS Data2-
4	TMDS Data1+
5	GND
6	TMDS Data1-
7	TMDS Data0+
8	GND
9	TMDS Data0-
10	TMDS Clock+
11	GND
12	TMDS Clock-
13	CEC
14	n.c.
15	SCL
16	SDA
17	GND
18	+5 V
19	Hot Plug detection

6.1 Applicable Connectors

USB: Type A
VGA: 15-pin VGA connector
HDMI: 19-pin HDMI
Ethernet: 8-pin RJ45 CAT5e/CAT6
Audio: jack connector
Power supply: Connectors with spring terminals (included in delivery)

7 Assembly/Installation

7.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 1.2Contents of Delivery for more information.

On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

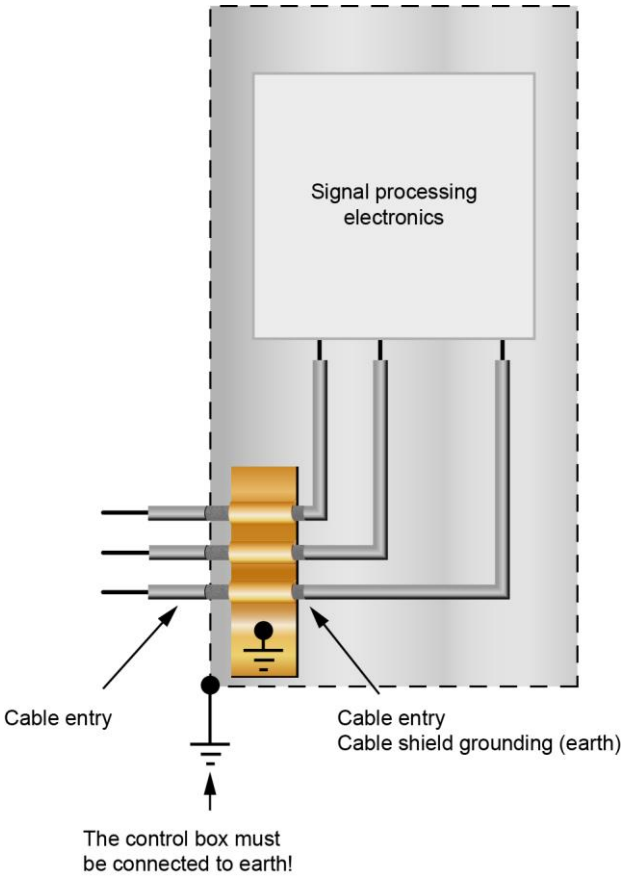
Damaged components can disrupt or damage the system.

8 Wiring Guidelines

8.1 Ground

The signal-processing electronics must be connected to ground via the mount on control cabinet or over the ground terminal provided. It is important to create a low-ohm ground connection, only then can error-free operation be guaranteed. The ground connection must be made with the maximum cross section and largest (electrical) surface possible.

Any noise signals that reach the signal-processing electronics over external cables must be filtered through the ground connection. High frequency noise can also be dissipated over a large (electrical) surface (skin effect).



8.2 Shielding

The wiring for the VGA, HDMI and Ethernet must be shielded. The low-ohm shielding is either connected at the entry to the control cabinet or directly before the PC 521 over a large, low-ohm surface (cable grommets, grounding clamps)!

Noise signals can therefore be prevented from reaching the electronics and affecting the function.

8.3 ESD Protection

Typically, USB devices (keyboard, mouse etc.) are not equipped with shielded cables. These devices are disrupted by electrostatic discharge and in some instances, no longer function.

Before any device is connected to- or disconnected from the product, the potential with ground must be equalized (by touching the control cabinet or ground terminal). Electrostatic loads (through clothing or shoes) can be thereby dissipated.

9 Mounting Instructions

The PC 521 has 4 mounting holes to allow mounting onto the back wall of the control cabinet.

For the passive variant, the modules must be mounted vertically (supply above) with a minimum clearance of 5 cm between the ventilation slots or heat sink and nearby components and/or the control cabinet wall.

This is required to provide optimal cooling and air circulation so that functionality is ensured at the maximum operating temperature.

Any other mounting position is only recommended in conjunction with the optional fan unit.

9.1 Fan Unit

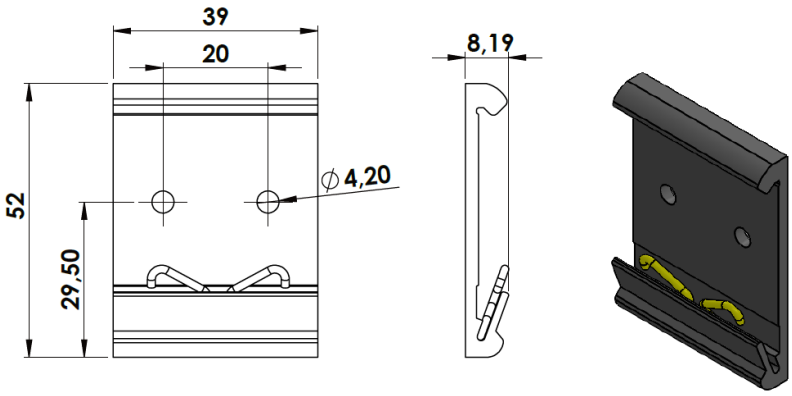
For certain mounting positions (e.g. horizontal or side mounting), the optional fan unit must be used to avoid exceeding the maximum operating temperature.

This also applies when the PC 521 is located in a heat pocket.

When using the fan unit, the square sheet metal cut-out (marked in yellow) must be carefully removed from the housing with a diagonal cutter. The fan unit is then mounted and secured with screws.

The optional fan unit for the PC 521 can be acquired under the article number 01-310-521-Z1.

9.2 DIN Rail Mounting Set



To mount the PC 521 on a DIN rail, a DIN rail clip can be acquired under the article number 01-310-521-E2.

9.3 Mounting Material

- Disks 7089-4-200HV
- Mounting screws: M4 – 8.8
- Min. screw-in depth 4 mm in steel

  8 mm in aluminum
- Torque: 2.6 Nm
- Use a screw-locking device (e.g. ratchet screws, thread-locking fluid, DIN 7980-compliant spring lock washer)

10 Transport/Storage

This device contains sensitive electronics. During transport and storage, high mechanical stress must therefore be avoided.

For storage and transport, the same values for humidity and vibration as for operation must be maintained!

During transport, temperature and humidity fluctuations may occur. Ensure that no moisture condenses within or on the device.

11 Storage

When not in use, store the operating panel according to the storage conditions. See chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

During storage, ensure that all protective covers are placed correctly, so that no contamination, foreign bodies or fluids enter the device.

12 Maintenance

During maintenance as well as servicing, observe the safety instructions from chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

12.1 Service

This product was constructed for low-maintenance operation.

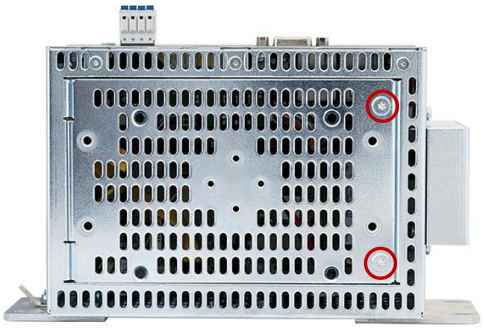
12.2 Repair

When sent for repair, the panel should be transported in the original packaging if possible. Otherwise packaging should be selected that sufficiently protects the product from external mechanical influences, such as cardboard filled with air cushioning.

In the event of a defect/repair, send the panel with a detailed error description to the address listed at the beginning of this document.

13 SSD (Solid State Disk) Exchange

To exchange the hard drive unit, follow the steps below:

	Disconnect, the PC 521 from the supply. To exchange the SSD, both mounting screws must be removed with a Tx 10 screwdriver. Carefully lift the plug-in.

Carefully open the hard drive plug-in upwards. Disconnect the two cables. Plug the new hard drive unit in, carefully press downward and install the two mounting screws.

A solid-state disk cannot be exchange while voltage is applied! (Disconnect 24 V DC supply)!

14 Buffer Battery

The exchangeable buffer battery ensures that the clock time and customer-defined BIOS settings are preserved in the absence of a supply voltage. A lithium battery is installed at the manufacturer.

The battery has enough capacity to preserve data in the absence of a supply voltage for approximately 5 years.

If the battery is empty, all BIOS settings and the clock time are reset to the factory defaults and existing SRAM data is deleted.

	TYPE	DATA
Lithium battery	CR2032	3.0 V/235 mAh

Battery order number: 01-310-521-E5

Use only the replacement battery provided by SIGMATEK.

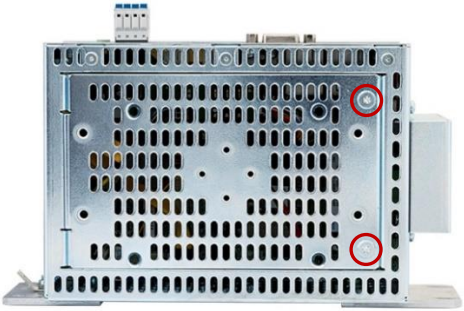
Disconnect the device from the supply before changing the battery.

WARNING

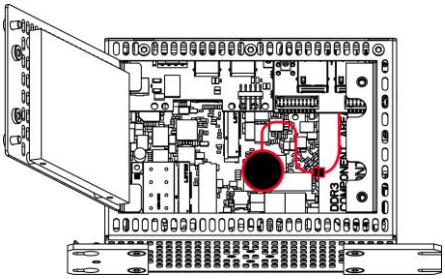
Danger of fire and explosion!

- ⇨ Slight to serious injuries can occur from incorrect use of the battery.
- ⇨ Do not recharge, disassemble or throw batteries into fire!

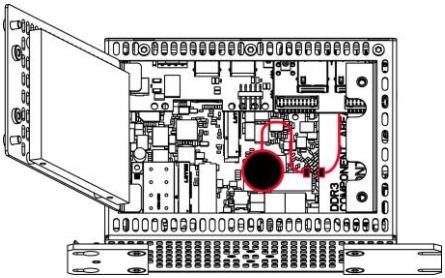
14.1 Exchanging the Battery



1. Turn off the device supply.
2. Create ESD-compliant conditions.
3. Remove the locking screws with a TX10 Torx screwdriver.
4. Carefully remove the cover (watch out for the connector cable).



5. Pull the battery and cable carefully from the connector of the extension cord.
6. Plug the replacement battery with and cable into the connected provided on the extension cord.



7. Remove the protective foil from the adhesive pad of the battery.
8. Stick the battery onto the appropriated location (the same place from which the old battery was removed).
9. Close the cover and tighten the locking screws.

15 Disposal

Should you need to dispose of the device, the national electronic scrap regulation must be observed.

The panel cannot be discarded with domestic waste.

Documentation Changes

Change date	Affected page(s)	Chapter	Note
16.05.2018	3 12	1.2 Electrical requirements 4.1 Fan Unit	Inrush current, Note image
17.08.2018	5	1.4 Miscellaneous	Approvals changed
01.04.2019	3	1.1 Performance Data	Table expanded
02.05.2019			General TÜV revision
06.05.2019	3	1.1 Performance Data	Table Graphics expanded
11.02.2021		12 Buffer Battery	Chapter added