

CPC/MITX7ixy-AzzzS

Document Ordercode: DOC/MITX7ixy-AzzzS



Revision	Date	Author	Modification
0.1	02.02.2018	D. Lagler	Preliminary
1.0	25.05.2018	D. Lagler	Initial version
1.1	30.05.2018	D. Lagler	Technical Data added
1.2	13.06.2018	D. Lagler	Clarification on Ethernet ports
2.0	11.02.2019	D. Lagler	Completely revised
2.1	27.03.2019	D. Lagler	Use cases defined

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1 Introduction

1.1 General Remarks

The content and presentation of this document has been carefully checked. No responsibility is accepted for any errors or omissions in the documentation.

Note that the documentation for the products is constantly revised and improved. The right to change this documentation at any time without notice is therefore reserved.

Syslogic is grateful for any help referring to errors or for suggestions for improvements.

The following registered trademarks are used:

IBM-PC, PC/AT, PS/2	trademarks of IBM Corporation
SPI	trademark of Motorola
PC	trademark of Philips Corporation
Intel Core ix	trademark of Intel Corporation
Windows 10 IOT	trademark of Microsoft Corporation

All other trademarks appearing in this document are the property of their respective company.

1.2 Explanation of Symbols

1.2.1 Danger warnings

The following information is for your personal safety and the prevention of damage to the product described or connected devices.

Safety instructions and warnings for the prevention of danger to the life and health of users or service personnel and for the prevention of damage are highlighted in this document by the pictograms specified below. *Warning* and *Information* pictograms are shown in this document.

1.2.2 Warnings indicate the following:

Death, serious injury or substantial material damage may occur if the related safety measures are not implemented.

The individual *Warning* pictograms have the following meaning:



Attention! General!

Is an instruction that must be observed in order to ensure protection before, while and after using the device. The correct procedure must be observed.



Attention! Electric shock!

Persons may be exposed to dangerous voltages in electrical installations. There is a danger of electric shock if a live part is touched.



Attention! Observe ESD measures!

Electrostatic discharge may destroy electronic components.



Attention! Hot surfaces

Keep clear of surfaces. They may be hot.

1.2.3 Information pictograms indicate the following:

Important information about the product or the relevant section of the document requiring the particular attention of the reader is marked as followed:



Indicates important and instructional information.

1.3 Copyright note

This documentation is the intellectual property of Syslogic Datentechnik AG, which also has the exclusive copyright. Any modification of the content, duplication or reprinting of this documentation, as well as any distribution to third parties can only be made with the express permission of Syslogic Datentechnik AG.

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1.4 Contents of this Documentation

This document addresses to system integrators, programmers and instructed installation and maintenance personal working with the Industrial PC COMPACT C7 system. It provides all information needed to configure setup and program the product.

1.5 Additional Products and Documents

1.5.1 Hardware Products



The following hardware products are mandatory together with this documentation:

PSU/DT24V60W-3A - 24V Desktop Power Supply 60W - 3 pole
or an equivalent CE-compliant AC/DC power supply

The following hardware products are useful together with the Industrial PC COMPACT C7 system:

- Syslogic USB I/O boards
- mPCIe extension cards

1.5.2 Software Products

There are no additional software products except operating systems:

- Operating Systems: check chapter 5.4 for a list of supported implementations

1.5.3 Documents

The following additional documents are useful for correct installation and operation of the Industrial PC COMPACT C7 system:

– Syslogic USB I/O board user documentation

The following documents are useful for additional information about MiniPCIe:

– PCIe Base Specification Version 1.1

– PCIe Mini Card Electromechanical Specification Version 1.2

The MiniPCIe Specification may be downloaded from the Internet (see address below).

– PCI-SIG Consortium www.pcisig.com/specifications/pciexpress/base

1.6 Items delivered

- 1x CPC/MITX7ixy-AzzzC
- 1x Power supply connector Weidmüller BCZ 3.81/04/180F SN SW (1792970000)
- 2x DIN Rail mounting clips
- 4x Countersunk screw M4x6 for DIN Rail mounting clips

1.6.1 To be purchased separately

- CE-compliant power supply
e.g. PSU/DT24V60W-3A - 24V Desktop Power Supply 60W - 3 pole

1.7 Installation

The installation of the system is described in chapter 3 of this documentation

1.8 Safety Recommendations and Warnings

The products are intended for measurement, control and communications applications in industrial environments. The products must be assembled and installed by specially trained people. The strict observation of the assembly and installation guidelines is mandatory.

The use of the products in systems in which the life or health of persons is directly dependent (e.g. life support systems, patient monitoring systems, etc.) is not allowed.

The use of the products in potentially explosive atmospheres requires additional external protection circuitry which is not provided with the products.

In case of uncertainty or of believed errors in the documentation please immediately contact the manufacturer (address see chapter 7.1). Do not use or install the products if you are in doubt. In any case of misuse of the products, the user is solely liable for the consequences.

1.8.1 General warnings



Important note

Ensure that the power supply is disconnected from the device before working on the device (connecting interfaces, replacing flash cards, batteries, opening the enclosure, etc.).



Important note

The output voltage of the external power supply shall be SELV and shall be limited power source according to clause 2.5 EN 60950-1.
Please read the safety instructions of the power supply before installing/connecting the device.

1.8.2 EMC



Important note

This is a Class A product and not intended to be used in domestic environment. The product may cause electromagnetic interference. Appropriate measures must be taken.



Important note

To fulfill class A of EN55032 and EN55024 a CE-compliant AC/DC power supply must be used. Cable length between power supply and device is limited to 3m.

1.8.3 Electro Static Discharge



Electronic boards are sensitive to Electro-Static Discharge (ESD). Please ensure that the product is handled with care and only in an ESD protected environment. Otherwise a proper operation is not guaranteed.

1.8.4 Battery



Changing batteries

Danger of explosion if the battery is not correctly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.



Maintenance of battery

Empty batteries may leak.

Never short the battery.

1.8.5 Hot surface



Attention! Hot surfaces

Make sure the device is not hot before mounting or changing the installation. The device may be hot and may cause burns.

1.9 Life Cycle Information

1.9.1 Transportation and Storage

During transportation and storage, the products must be in their original packing. It is recommended, to keep the original packing in case of return of the product to the factory for repair. Note that the packing is recyclable.

1.9.2 Assembly and Installation

Observe the EMI-precautions against static discharge. Carefully read the installation documentation before unpacking the product. The installation procedures must be strictly observed. Note that deviations from the installation guidelines may result in degraded operational reliability or in unfavourable EM-radiation or EM-susceptibility.

1.9.3 Operation

The operating environment must guarantee the environmental parameters (temperature, power supply, etc.) specified in the technical specification section of this document.

The main functionality of the product is defined by the application program. The application program is not part of the delivery by Syslogic but is defined, developed and tested by the customer or a system-integrator for each specific application. Refer to the respective documentation for more information.

1.9.4 Maintenance and Repair

In the rare case of a product hardware-failure or malfunction, the complete product should be exchanged. The faulty product must be returned to the factory for repair. Please use whenever possible the original packing for return of the product (EMI and mechanical protection).

1.9.5 Disposal

At the end of the lifespan the Industrial PC COMPACT C7 products must be properly disposed. Industrial PC COMPACT C7 products contain a multitude of elements and must be disposed like computer parts. The Industrial PC COMPACT C7 products contain batteries which should be properly disposed.

1.9.6 RoHS

The products of the Industrial PC COMPACT C7 family are designed and produced according to the Restriction of Hazardous Substances (RoHS) Directive (2011/65/EU).

1.9.7 WEEE

The products of the Industrial PC COMPACT C7 family are not designed ready for operation for the end-user and are not intended for consumer applications. According to Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) Syslogic takes back defective devices for proper disposal at the point of sale.

2 Product Description

2.1 Features

The Industrial PC COMPACT C7 system is a x86 based industrial PC designed for use with the IPC line of communications and I/O boards. Its many different variants allow to build up various industrial controls based on the standard PC/AT architecture.

The Industrial PC COMPACT C7 offers the following main features:

- mITX-Board
 - High performance 7th Generation Intel® Core™ Mobile SoC U-Processors.
 - up to 2.8 GHz processor clock
 - High Definition Audio Interface (Realtek ALC 888S)
 - Improved Graphics Performance with Intel HD Graphics HD620
 - Multi-Stage watchdog
 - battery backup for Real Time Clock
 - 2x SO DIMM Socket (dual channel DDR4 up to 2133 MT/s; max. 2x 16GB)

- External connectors
 - Audio IN, Line OUT
 - Two GBit Ethernet LAN interfaces
 - Four USB 3.0 ports
 - Two serial RS232 ports (COM1/2)
 - Two independent DisplayPort++ ports supporting up to 4096 x 2160@60 Hz

- Internal connectors
 - 1x M.2 interface (already used for hard drive memory)
 - 1x mPCIe slot
 - 2x SATA interfaces (6Gbps)
 - 4x USB 2.0

2.2 Device Variants

The Industrial PC COMPACT C7 is available in different functional variants and enclosures.

Bold printed functions are available at the front; italic printed functions are available as internal interfaces only.

Function	CPC/MITX7i3H-A101S	CPC/MITX7i5H-A101S	CPC/MITX7i7H-A101S
CPU	<i>Intel i3-7100U 2.4 GHz</i>	<i>Intel i5-7300U 2.6 GHz</i>	<i>Intel i7-7600U 2.8 GHz</i>
Memory	<i>4GB (Up to 32GB)</i>	<i>8GB (Up to 32GB)</i>	<i>16GB (Up to 32GB)</i>
LAN1	LAN1	LAN1	LAN1
LAN2	LAN2	LAN2	LAN2
COM1	X1 (RS232)	X1 (RS232)	X1 (RS232)
COM2	X2 (RS232)	X2 (RS232)	X2 (RS232)
USB1/2	USB1/2	USB1/2	USB1/2
USB3/4	USB3/4	USB3/4	USB3/4
USB7/8	<i>USB7/8</i>	<i>USB7/8</i>	<i>USB7/8</i>
USB9/10	<i>USB9/10</i>	<i>USB9/10</i>	<i>USB9/10</i>
DP 1	DP++	DP++	DP++
DP 2	DP++	DP++	DP++
Audio	Out / Mic	Out / Mic	Out / Mic
SATA0	<i>SATA0 (X51)</i>	<i>SATA0 (X51)</i>	<i>SATA0 (X51)</i>
SATA1	<i>SATA1 (X52)</i>	<i>SATA1 (X52)</i>	<i>SATA1 (X52)</i>
M.2	<i>m.2 type B (X10)</i>	<i>m.2 type B (X10)</i>	<i>m.2 type B (X10)</i>
mPCIe	<i>PCIe (X8)</i>	<i>PCIe (X8)</i>	<i>PCIe (X8)</i>
RTC Backup	Li battery	Li battery	Li battery

Tab. 1 Product Variants

2.3 Accessories

The following accessories are not necessarily supplied with the device. These parts could be ordered additionally or downloaded under www.syslogic.com:

Order code	Type designation	Description
Operating systems	x64 based operating system	Preconfigured Windows or Linux distribution
PSU/DT24V60W-3A	Power supply	24V Desktop Power Supply 60W - 3 pole
Wireless modules		Different wireless modules (LTE, GPS, WLAN)

Tab. 2 Industrial PC COMPACT C7 accessories

2.4 Features

2.4.1 Connectors

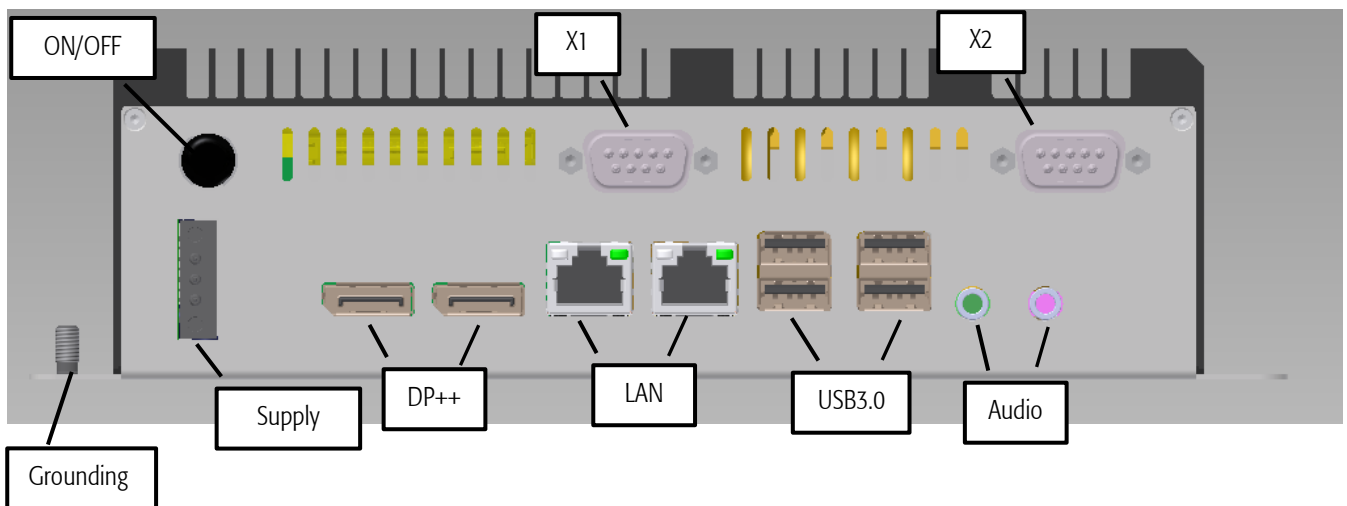


Fig. 1 Front

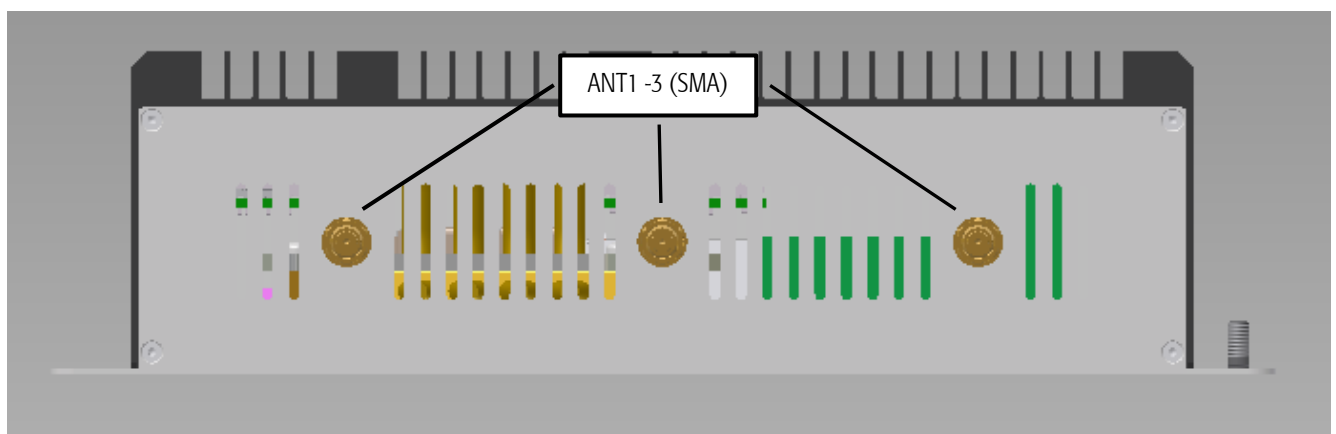


Fig. 2 Back

2.4.2 Power supply

The processor and its peripherals are powered by a non-isolated, integrated power supply which generates all the necessary voltages.

Device Connection

Weidmueller BCZ 3.81/03/180F SN BK (Ordercode 1792960000)



Power Supply requirements:

- The power supply used must fulfil CE and safety normative according to the application.
- Always use a short circuit protected power supply.
- Do not use power supplies wires or cables longer than 3m.

Pin	Signal	Marking	Remarks
1	NC		
2	+24VDC	VDC	+12V..+24V
3	GND	GND	GND (/shield)

Tab. 3 Power supply connector (1x3 pin)

2.4.3 Power button

Push the button to turn on the system after power is applied.

When the system is turned on the button is illuminated in green colour. The behaviour of the power button can be configured depending on the operating system used.

2.4.4 Serial Ports (X1, X2)

X1 and X2 provide two fully featured RS232 interfaces (COM1 and COM2). The COM ports support data rates up to 250 kbps with worst-case loads of 3kΩ, in parallel with 1nF.

Device Connection

The Serial Ports X1 and X2 are available on DSUB-9

Pin Number	RS232
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Tab. 4 Serial Port X1, X2

Important Note



Maximum cable length allowed for X1 connection is 2.9 m. If longer cables are used, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI CE certification. Only use high quality industrial devices with sufficient EMI compatibility.

2.4.5 USB Interface

The Industrial PC COMPACT C7 is equipped with four USB 3.0 ports

Device Connection

The USB interface uses a standard A type double USB connector



Important Note

Each double stacked connector has a maximum current of 1A each
Drawing excessively power might disturb operation



Important Note

No direct connection to cables leaving the building are aloud. If the application makes it necessary to connect the interface directly to cables leaving the building, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI *CE* certification. Only use high quality industrial devices with sufficient EMI compatibility.
Use shielded cables for maximum EMI protection.

2.4.6 Ethernet LAN Interface

The Industrial PC COMPACT C7 features two Gigabit Ethernet ports with two separate NICs. The Ethernet interface drives two LED's (yellow and green) integrated into the RJ45 connector for status information.

LAN1 (Intel i219 Ethernet controller) and LAN2 (Intel i211 Ethernet controller) both support 10/100/1000Mb/s, Auto Negotiation and Auto MDIX functions.

Device Connection

The Ethernet interface uses the standard RJ45 Gigabit connector on the front for 100Ω shielded or unshielded Twisted Pair cabling.



Important Note

Only LAN1 supports Wake-on-LAN from S5 under Windows 10

2.4.7 Display

The DisplayPort signals (DP++) are available on the DisplayPort connectors DP1 and DP2 for direct connection of DisplayPort compatible monitors. These connectors support DP/HDMI/DVI displays with a resolution of up to 4096 x 2160@60 Hz.

Device Connection

The Displayport interfaces use the standard DP++ connector



Important Note

No direct connection to cables leaving the building are aloud. If the application makes it necessary to connect the interface directly to cables leaving the building, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI *CE* certification. Only use high quality industrial devices with sufficient EMI compatibility.
Use shielded cables for maximum EMI protection.

2.4.8 High definition audio

The Industrial PC COMPACT C7 has a high definition audio codec (Realtek ALC888S) mounted on it. The line output signals and the MIC signals are routed to connectors Line-OUT and Mic-IN.

Mic-IN

Pin Number	Jack	Signal	Remarks
1	Tip	MIC1_L	Microphone - left channel
2	Ring	MIC1_R	Microphone - right channel
3	Sleeve	A_GND	Analog ground

Device Connection: 3-pin, 3.5 mm single audio jack

Line-OUT

Pin Number	Jack	Signal	Remarks
1	Tip	SDATA_IN	Line-OUT - left channel
2	Ring	SDATA_OUT	Line-OUT - right channel
3	Sleeve	Analog ground	Analog ground

Device Connection: 3-pin, 3.5 mm single audio jack

Important Note



No direct connection to cables leaving the building are aloud. If the application makes it necessary to connect the interface directly to cables leaving the building, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI *CE* certification. Only use high quality industrial devices with sufficient EMI compatibility.
Use shielded cables for maximum EMI protection.

2.4.9 Antennas (only on selected products)

If the device is equipped with a radiotelecommunication device the respective signals are available on standard SMA or SMA-RP connectors, depending on the radiotelecommunication technology.

Important Note



Maximum cable length allowed for antenna connections is 2.8m and no direct connection to cables leaving the building are aloud. If longer cables are used or the application makes it necessary to connect the interface directly to cables leaving the building, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI *CE* certification. Only use high quality industrial devices with sufficient EMI compatibility.

2.4.10 Internal connectors

SO-DIMM

Two memory sockets each support up to 16GB 260pin SODIMM non-ECC DDR4 modules with data rates up to 2133 MT/s

CMOS battery

The CMOS battery supplies the necessary power required to maintain the CMOS settings and configuration data in the UEFI flash chip. The specified battery type is CR2032 (3V, 230mAh)

Because the self-discharge of all lithium batteries increases rapidly at high temperatures the battery life time decreases by a great amount. To prevent battery leakage scheduled service/replacement is recommended. Please contact the battery manufacturer for further details and calculation assistance for battery life time calculation.

Fuse

The main fuse protects the system against destruction in case of high energy distortions on the power line. For replacement, the system must be opened in an ESD protected environment. Only an entitled instructed person is allowed for this operation. Replacement fuse type is Littelfuse 452004.MRL (4A slow-blow).

USB 2.0

The motherboard offers four USB2.0 ports on two 2.54mm pin headers X15 (USB 9/10) and X16 (USB7/8)

USB 7		USB 8		USB 9		USB 10	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+5V	2	+5V	1	+5V	2	+5V
3	USB7-	4	USB8-	3	USB9-	4	USB10-
5	USB7+	6	USB8+	5	USB9+	6	USB10+
7	GND	8	GND	7	GND	8	GND
9	no Pin	10	NC	9	no Pin	10	NC

Tab. 5 Pinout 2.54mm pin header USB

Connector X16 supports Wake-on-USB feature



Important Note

Each port has a maximum current of 0.5A each

SATA 3

The motherboard provides two standard SATA connectors X51 and X52 which support data rates up to 6Gbps

SATA0 (X51) supports eSATA devices

SATA1 (X52) supports SATADOM devices

SATA Power

Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3V	6	GND	11	GND
2	+3.3V	7	+5V	12	GND
3	+3.3V	8	+5V	13	12V
4	GND	9	+5V	14	12V
5	GND	10	GND	15	12V

Tab. 6 Pinout 15-pin standard SATA power connector



Important Note

Do not power more than two devices at the same time

The +3.3V, +5V and +12V voltage rails have maximum current of 2A each

m.2 slot

The motherboard offers an m.2 type 3042/2242 slot (X10) for connecting SATA or PCIe x2 SSDs and WWAN devices

Pin	Signal	Pin	Signal
1	CONFIG_3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FULL_CARD_PWROFF#
7	USB_D+	8	W_DISABLE_1#
9	USB_D-	10	LED1 (optional)
11	GND	12	Key
13	Key	14	
15		16	
17		18	
19		20	
21	CONFIG_0	22	NC
23	WoWWAN#	24	NC
25	NC	26	W_DISABLE_2#
27	GND	28	NC
29	PER1-	30	UIM_RESET ¹
31	PER1+	32	UIM_CLK ¹
33	GND	34	UIM_DATA ¹
35	PET1-	36	UIM_PWR ¹
37	PET1+	38	DEVSLP
39	GND	40	GNSS_SCL
41	PER0-/SATA_B+	42	GNSS_SDA
43	PER0+/SATA_B-	44	GNSS_IRQ
45	GND	46	NC
47	PET0-/SATA_A-	48	NC
49	PET0+/SATA_A+	50	RESET#
51	GND	52	CLKREQ#
53	REFCLK-	54	PEWAKE#
55	REFCLK+	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	RESET#	68	SUSCLK
69	CONFIG_1	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	CONFIG_2		

Tab. 7 Pinout m.2 slot



Important Note

By default, an m.2 2242 flash memory module is mounted on this port

¹ A microSIM card slot is connected to these pins. In default configuration this option is not available.

mPCIe slot

The motherboard offers a mPCIe slot (X8) for inserting different removable mPCIe cards

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	LED_WLAN#
45	CL_CLK	46	NC
47	CL_DATA	48	+1.5V
49	CL_RST#	50	GND
51	NC	52	+3.3V
53	GND	54	GND

Tab. 8 Pinout mPCIe slot

2.5 Maintenance

To replace the battery, fuse or data storage it is required to open the device.



Shutdown the system and disconnect from power supply and all other connections



Make sure the device has cooled down to room temperature

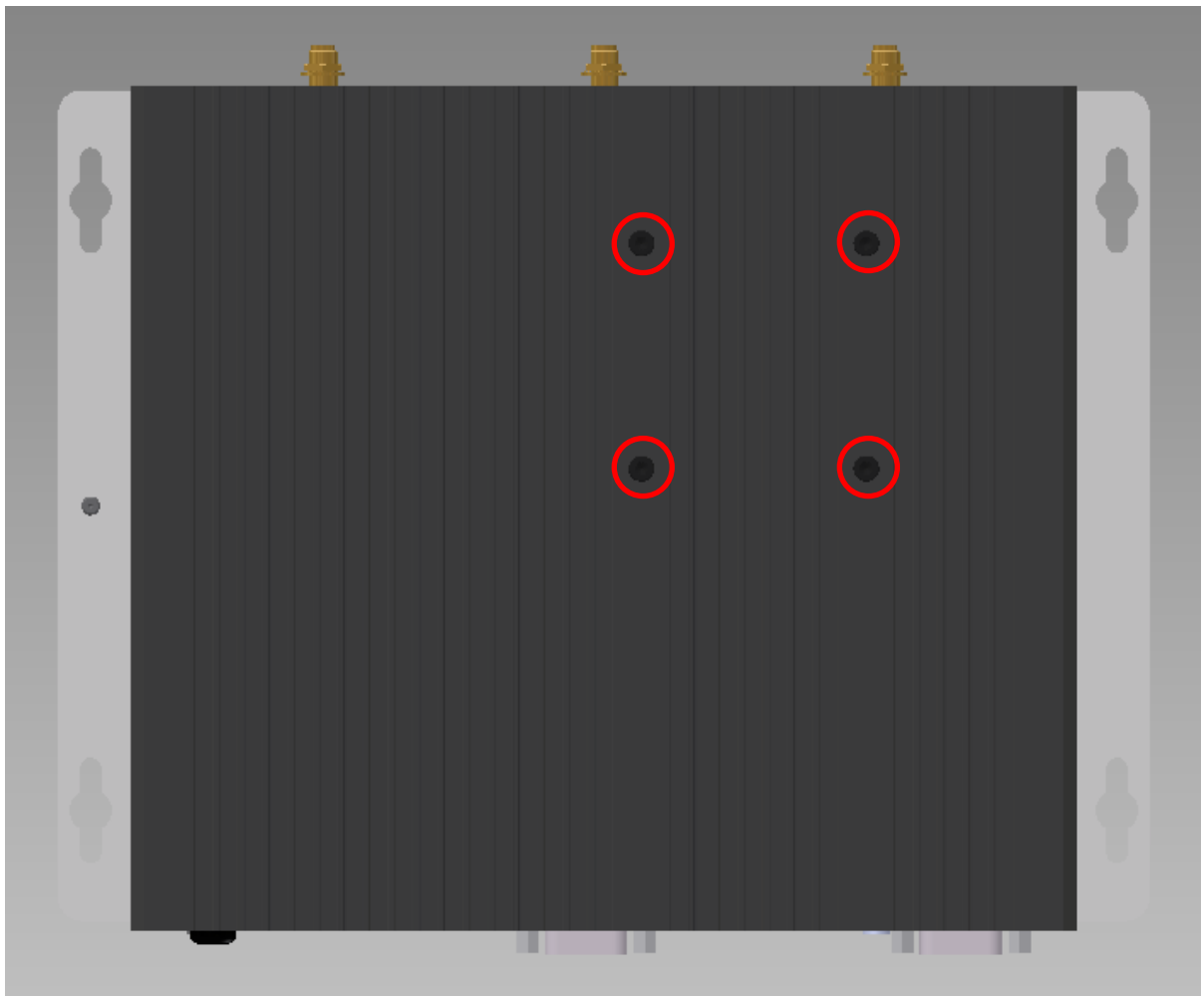


Only open the device in an ESD protected area

2.5.1 Opening the device

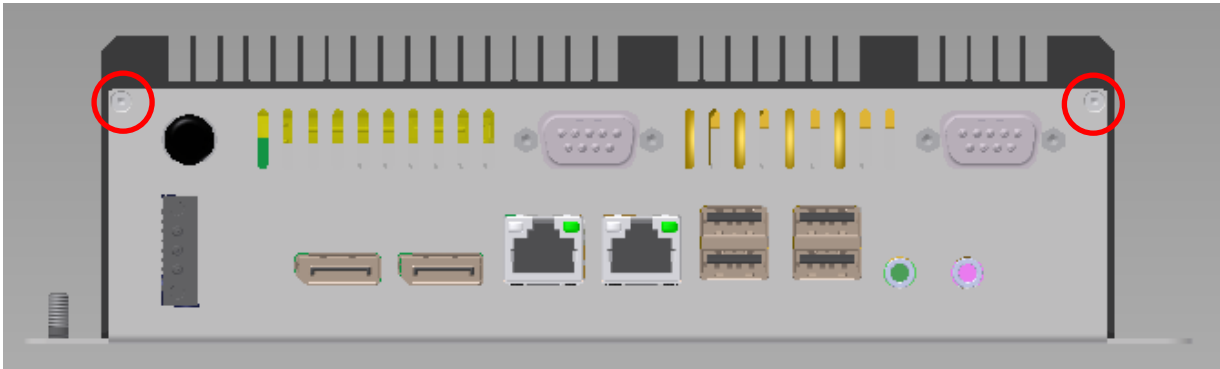
1. Loosen the four screws on top

Tool: Hexagon socket screwdriver number 2



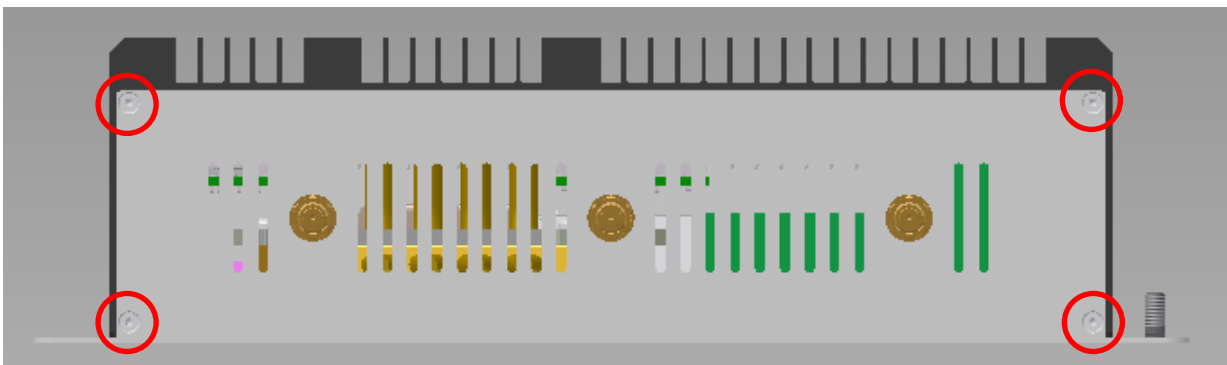
2. Loosen the two screws at the front

Tool: Torx screwdriver T6



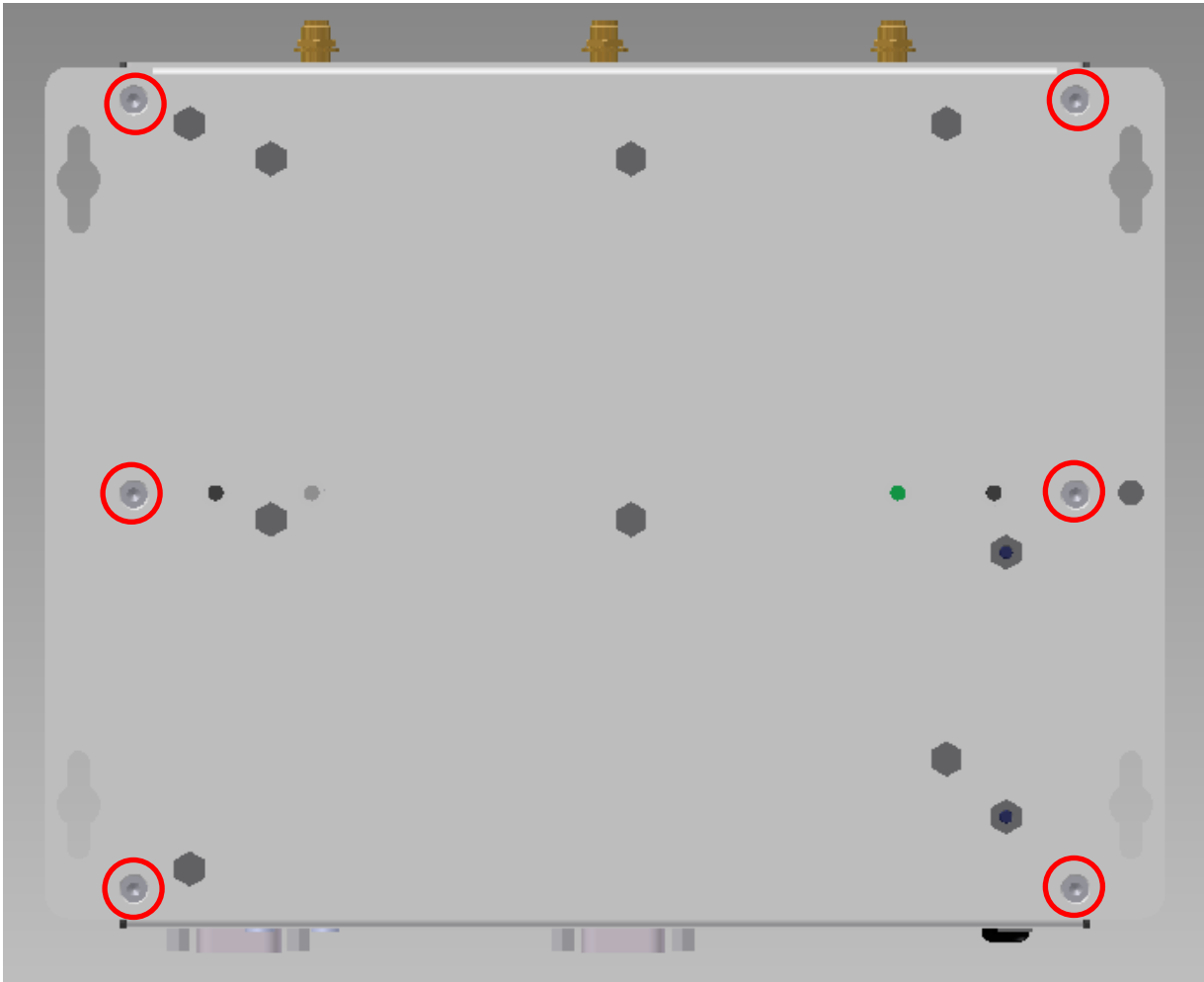
3. Loosen four screws at the back and remove the cover

Tool: Torx screwdriver T6



4. Loosen six screws at the bottom

Tool: Torx screwdriver T10



5. Now gently remove the housing

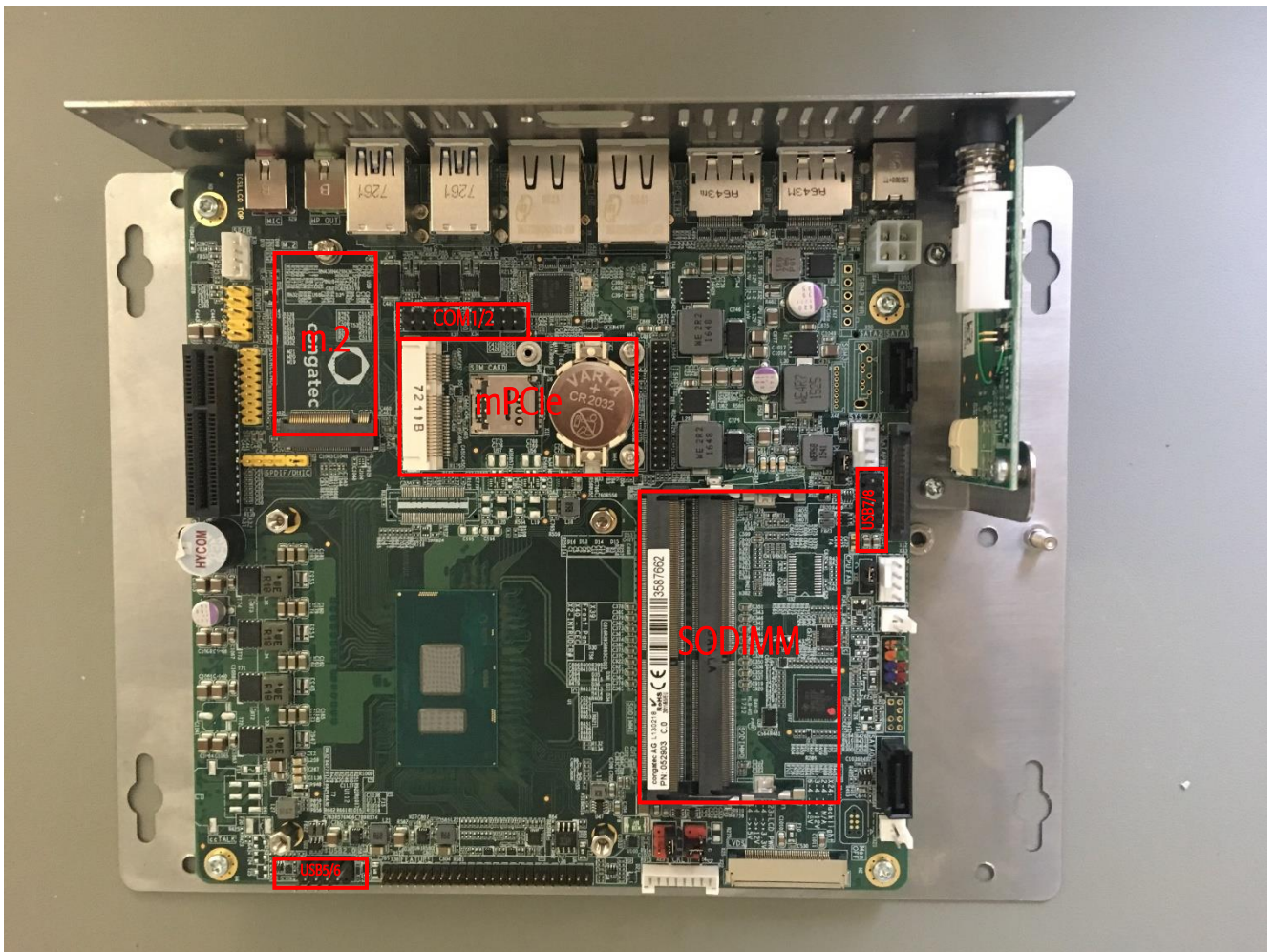
2.5.2 Re-assemble the device

To re-assemble the device, follow 2.5.1 in reverse order



If the gap pad on the housing is damaged, replace with a new one according to 2.5.9
Without an intact gap pad proper function of the device cannot be guaranteed!

2.5.3 Internal overview

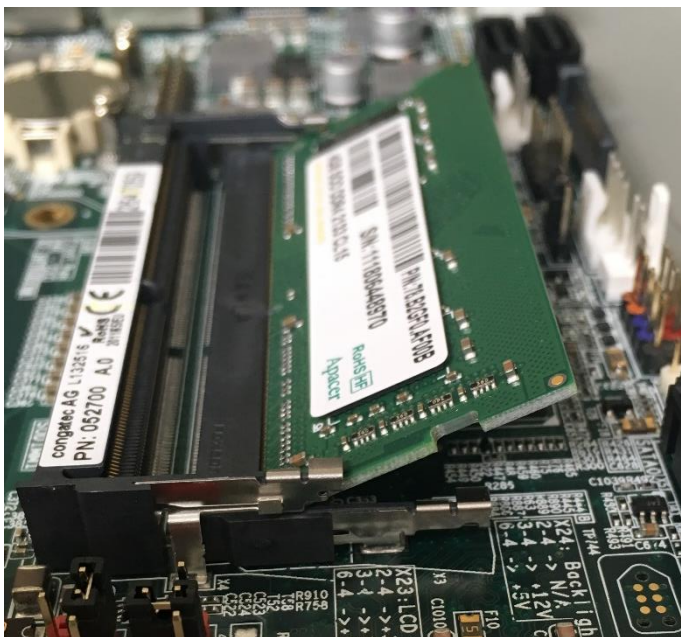


2.5.4 Replace SODIMM

1. Gently push the locking of the connector aside and slide the memory module out of the connector



2. Slide the replacement module into the connector in a slight angle



3. Push the module down holding it on both edges until the locking secures the module firmly

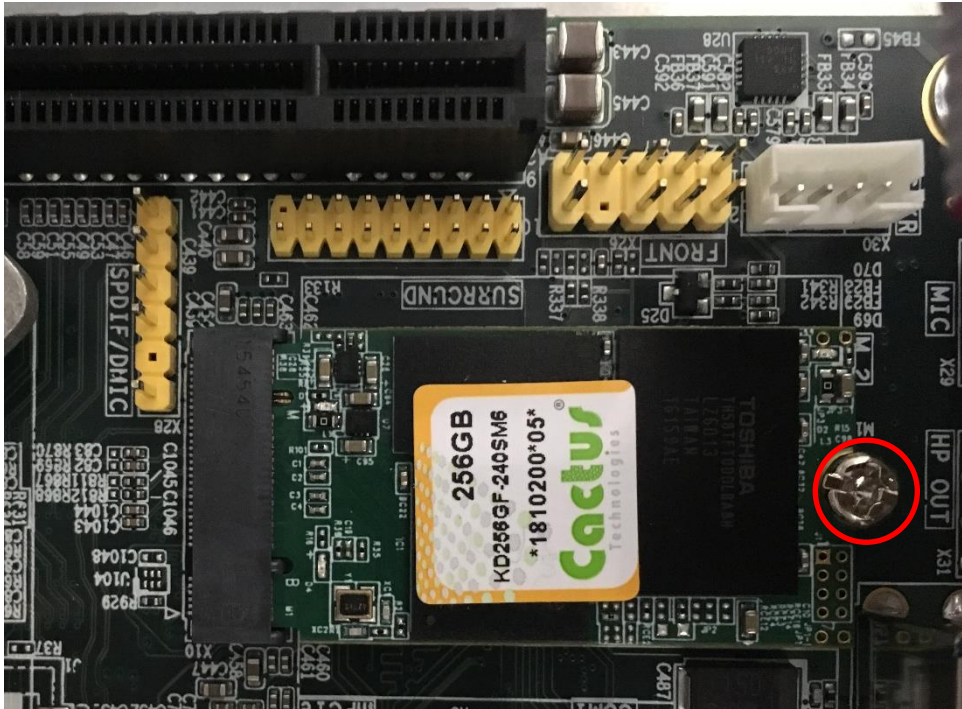


Important Note

Only replace with module with correct specifications according to 2.4.10 on page 16

2.5.5 Replace m.2 flash memory

1. Loosen the screw which holds the m.2 module down
Tool: Philips screwdriver PH1



2. Slide the m.2 module out of the connector
3. Slide replacement module into to connector, gently push it down and fix it on the board with the screw

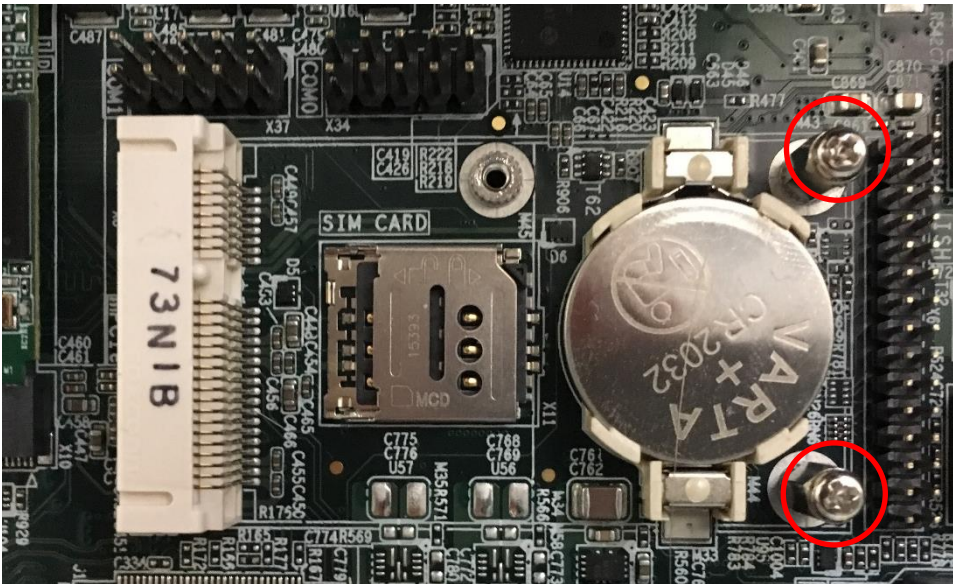


Important Note

Only replace with module with correct pinout according to 2.4.10 on page 18

2.5.6 Mount/replace mPCIe module

1. Loosen the screws which hold the mPCIe module down
Tool: Philips screwdriver PH0



2. Slide old module out and mount new or replacing module
3. Gently push the module down and fix it on the board with the screw



Important Note

Only replace with module with correct pinout according to 2.4.10 on page 18

2.5.7 Replace CMOS battery

1. If mounted, remove mPCIe module according to 2.5.6
2. Pull battery out and replace with new battery
3. Re-mount mPCIe module



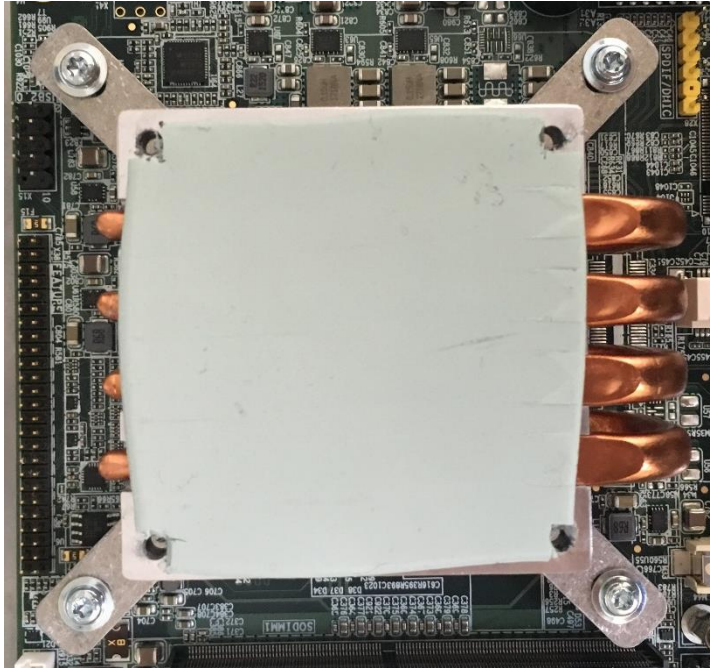
Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

2.5.8 Replace fuse

1. Locate the fuse right behind the power connector
2. Extract with tweezers and replace with same type (Littelfuse 452004.MRL)

2.5.9 Replace gap pad

1. Remove transparent foil from the gap pad and put centred onto the metal plate of the thermal riser
2. Cut out the edges so that the threaded holes stay free
3. Remove the opaque foil just before mounting the cooling case



2.5.10 Cleaning the metal housing

For cleaning the metal housing please use a soft cloth and a metal polish.



Do not use a coarse scouring cloth, scouring powder or solvent.

Cleaning should only be carried out when the device is switched off!



Make sure the device has cooled down to room temperature

2.5.11 Spare parts

Designation	Type	Order number
Power supply	24V Desktop Power Supply 60W - 3 pole	PSU/DT24V60W-3A
SODIMM DDR4 4GB	260pin SODIMM DDR4 2133 MT/s 4GB	78.B2GF0.AF00B
SODIMM DDR4 8GB	260pin SODIMM DDR4 2133 MT/s 8GB	78.C2GF0.AF10B
Flash module	M.2 2242 Flash Memory xxGB	KDxxGF-240SM6
CMOS battery	CR2032 3.0V 225mAh	CPN/CR2032
Thermal Gap Pad	Gap Pad 50x50x2.54mm, 5W/mK	CPN/SILICPAD5-50x50F
Fuse	4A slow-blow	Littelfuse 452004.MRL

Tab. 9 Spare parts

3 Installation Description

3.1 Mounting

3.1.1 Desktop mode

In Desktop mode the device is laid flat on the mounting plate onto a table or similar. No fixation is needed.



Cooling

In terms of thermal management this is the worst mounting method since there is no possibility that a convectional airflow through the cooling fins is built-up.

Please ensure a wide room of free air around the device and if possible, a forced air flow.

3.1.2 Wall mount

The device can be fixed onto a wall using four screws M4 with the designated mounting holes

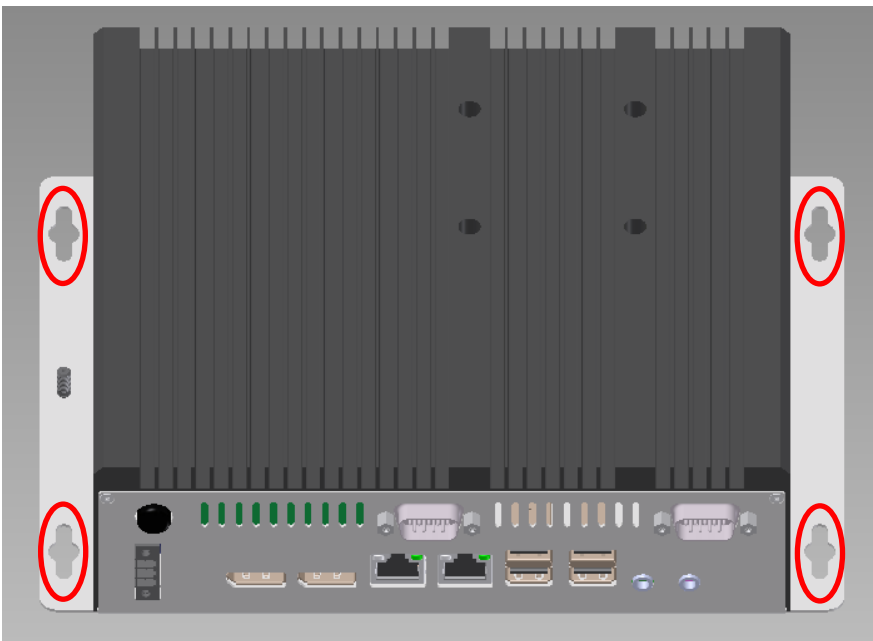


Fig. 3 Mounting holes



Cooling

Make sure the wall isn't transferring heat from another source into the mounting plate.

Please ensure a wide room of free air around the device and if possible, a forced air flow.

3.1.3 DIN rail

The included DIN rail mounting clips can be attached on the back of the device.

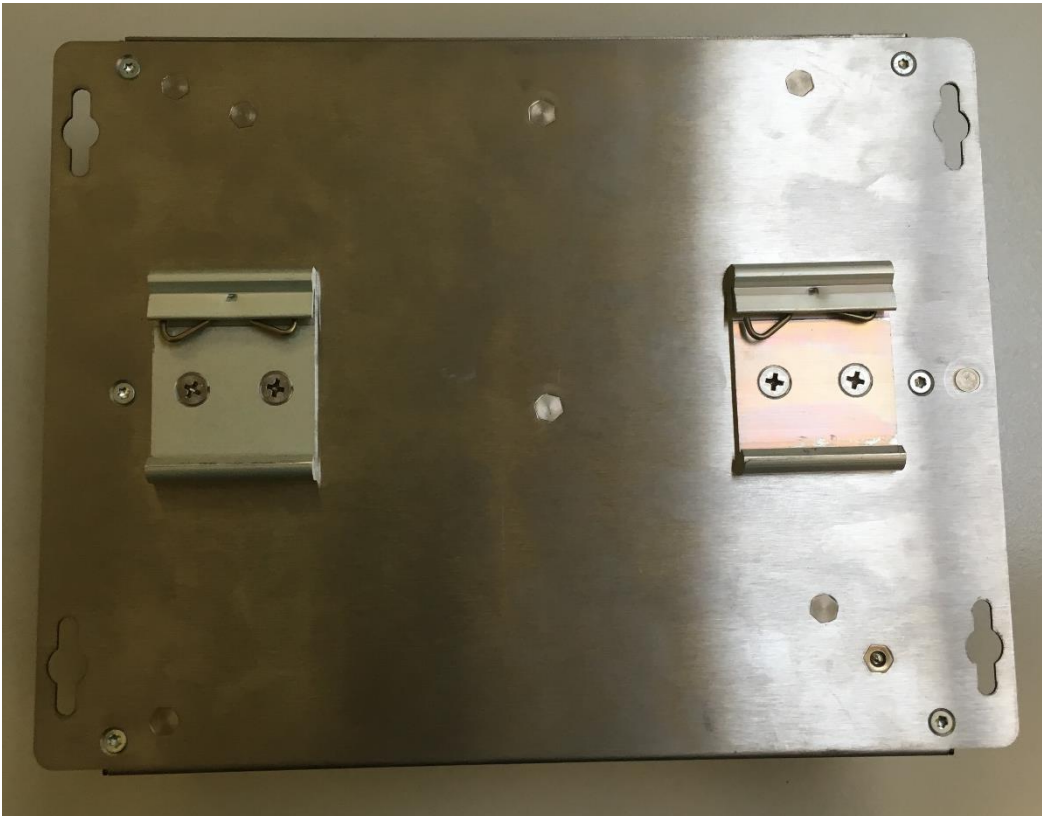


Fig. 4 DIN rail clips



Cooling

Please ensure a wide room of free air around the device and if possible, a forced air flow.

3.2 Installation and cabling

3.2.1 Introduction

Installation and cabling of the Industrial PC COMPACT C7 system has to be done with great care; the correct cabling is essential for high operational reliability and the correct grounding is necessary for protection and EMC. To meet the requirements of CE-certification all cables must be shielded. The enclosure must be connected to ground via the DIN-rail or the designated ground bolt (see 4.3 for details).



Important Note

To meet the requirements of EMI/RFI CE-certification, correct mounting, installation and cabling of the Industrial PC COMPACT C7 system according to these guidelines is absolutely necessary.

3.2.2 Powering the Industrial PC COMPACT C7 System

The *logic supply voltage*, i.e. the power driving the electronic circuits (motherboard and extensions) is internally generated from the 12/24VDC power supply input. Remember that the power supply is non-isolated. The power supply has to be connected according to paragraph 2.4.2 . Maximum allowed cable length between AC/DC power supply and system power input is 3m. If the cable is longer than 3m or routed outside the building, special overvoltage and filtering elements have to be installed to comply with the requirements of EMI/RFI CE-certification. When selecting the external power supply, the maximum power dissipation of the system has to be considered.



The Industrial PC COMPACT C7 system must only be operated indoors and must be connected to an indoor power supply. Maximum cable length allowed for power supply connection is 3m. If longer cables are used, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI CE-certification.



Please make sure that the input voltage does not exceed the recommended operating range otherwise the electronics board could get damaged and correct operation cannot be guaranteed.
Use an overload protected power supply to prevent damage in case of a short inside the system.
The AC/DC power supply must fulfil the requirements for EMI/RFI CE-certification.

3.2.3 Cabling the interfaces

Use appropriate cabling for all interfaces. Shielded cabling is required to meet the EMI/EMC limits.

3.2.4 Grounding

The system can either be grounded using the designated grounding bolt with appropriate M4 washer and nut or the DIN rail mounting clips. In some cases, it is recommended to connect the shields of the cables to chassis potential at the entry point into the housing cabinet as shown in Fig. 5. If the cables enter a hermetically closed cabinet, use special 360-degree metal clamps (EMI/RFI protected types which contact to the cable shield).



Important Note

Grounding of the cable's shields using *pig-tail wires* are not recommended because of their high impedance at high frequencies. It is better to clamp the shields onto a grounded copper rail.

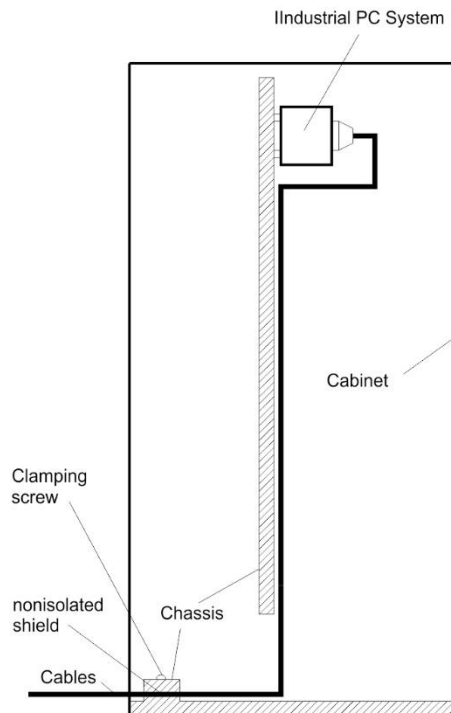


Fig. 5 Additional grounding of the cable shields at the entry point of a cabinet

3.2.5 Cabling of communication links

If the communication ports are non-isolated ports, cable shields have to be connected to chassis potential on both sides of the interconnection cable. If the cable is very long, a thick copper wire (10 mm²) for potential adjustment is highly recommended. Fig. 7 shows a non-isolated system with common chassis ground.

Some of the communication ports are galvanically isolated ports. In such cases the shield of the interconnection cable must be wired to chassis potential only on one side of the cable.

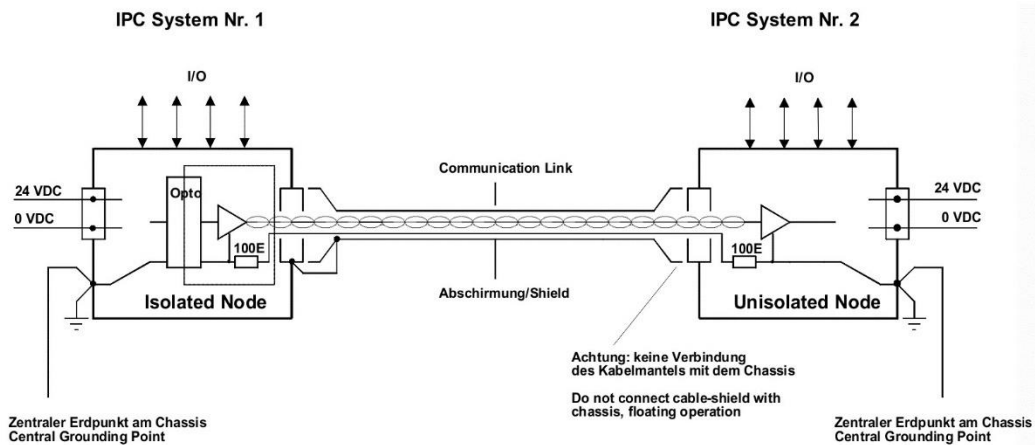


Fig. 6 shows an isolated system with independent grounds.

! Important Note

Grounding of the cable's shields using *pig-tail wires* are not recommended because of their high impedance at high frequencies. It is better to clamp the shields onto a grounded copper rail.

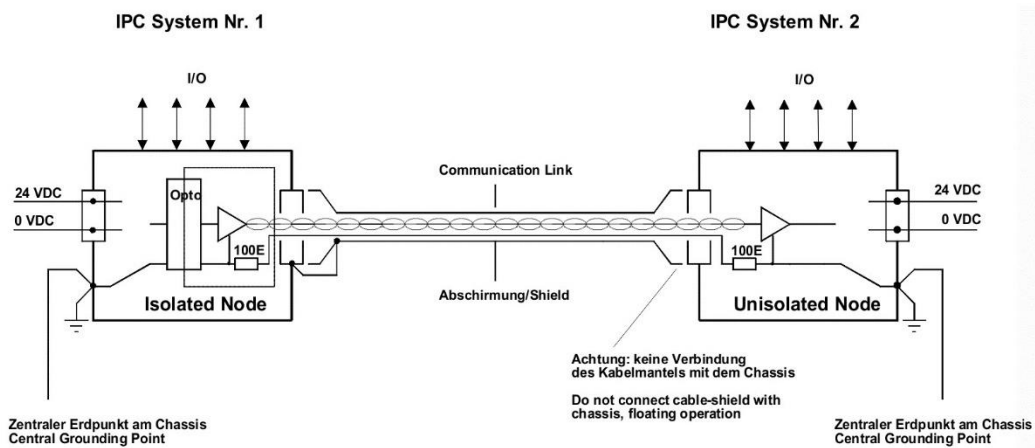


Fig. 6 Isolated communication link

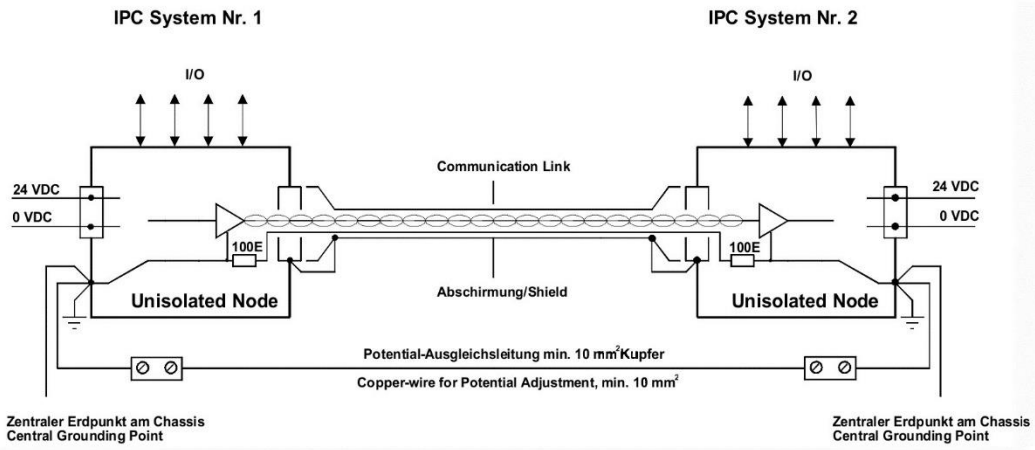


Fig. 7 Non-isolated communication link with common chassis potential

4 Technical Data

4.1 General Electrical Data

Important Note



Do not operate the Industrial PC COMPACT C7 outside of the recommended operating conditions. Otherwise lifetime and performance will degrade. Operating the board outside of the absolute maximum ratings may damage the hardware.

Absolute Maximum Ratings

Parameter	Symbol	min	nom	max	Unit
supply voltage	Vcc	11.8	12/24	25.2	VDC
storage temperature range ²	Tst	-20	25	70	°C
operating temperature range	Ta	-10 ³		50 ⁴	°C
operating humidity (not condensing)	Rh	10		90	%

Tab. 10 General Absolute Maximum Ratings

Recommended Operating Conditions

Parameter	Symbol	Min	nom	max	Unit
supply voltage	Vcc	13	24	24	VDC
operating temperature range	Ta	0	25	30	°C

Tab. 11 General Recommended Operating Conditions

Maximum cable length

Interface	Maximum Length	Comment
Power ⁵	<3m	CE conformal AC/DC power supply must be used
LAN	<100m	
USB 3.0 ⁵	<5m	according to USB specification
Displayport ⁵	<15m	according to Displayport specification; video quality might suffer if longer cables are used
Audio ⁵	<10m	Audio quality might suffer if long cables are used
RS232 ⁵	<2.9m	

Tab. 12 Maximum cable length

² Due to the large effect of self-discharge at high temperature of the lithium battery it is recommended to store the device at around +25°C

³ Cold start up: 0°C

⁴ depending on installed CPU and specific use case; see 4.3.2

⁵ Do not connect to lines directly leaving a building without additional safety measures

Electrical Characteristics

(over recommended operating range, unless otherwise noted)

Parameter	Symbol	min	typ	max	Unit
Power consumption⁶					
Power Consumption Standby	Ptot		0.8		W
Power Consumption CPC/MITX7i7J-A101S, T _A =0°C ⁷	Ptot		19		W
Power Consumption CPC/MITX7i7J-A101S, T _A =0°C ⁸	Ptot		24		W
Power Consumption CPC/MITX7i7J-A101S, T _A =20°C ⁷	Ptot		19		W
Power Consumption CPC/MITX7i7J-A101S, T _A =20°C ⁸	Ptot		24		W
Power Consumption CPC/MITX7i7J-A101S, T _A =45°C ⁷	Ptot		19		W
Power Consumption CPC/MITX7i7J-A101S, T _A =45°C ⁸	Ptot		24		W
RTC backup battery					
Vbatt loading (Vcc=off)	Ibat(off)	1.5		2	µA
Vbatt loading (Vcc=on)	Ibat(on)		0.7		µA
Backup time with new CR2032 battery (T _A =25°C) ⁹	t(rtcbuf)		8	10	years
Backup time with new CR2032 battery (T _A =50°C) ⁹	t(rtcbuf)		6	8	years

Tab. 13 General Electrical Characteristics

Switching Characteristics (nominal conditions)

Parameter	Symbol	min	nom	max	
processor clock (CPC/MITX7i3H-A101S)	fcpu		2.4		GHz
processor clock (CPC/MITX7i5I-A101S)	fcpu		2.6	3.5	GHz
processor clock (CPC/MITX7i7J-A101S)	fcpu		2.8	3.9	GHz

Tab. 14 General Switching Characteristics

4.2 EMI / EMC Specification

The Industrial PC COMPACT C7 system fulfils the following standards:

Emission: EN55032 / CISPR 32 Class A

Immunity: EN55035 / CISPR 35 Class A



Important note

This is a Class A product and not intended to be used in domestic environment. The product may cause electromagnetic interference. Appropriate measures must be taken.



Important note

To fulfill class A of EN55032 and EN55024 a CE-conformal AC/DC power supply must be used. Cable length between power supply and device is limited to 3m.

⁶ Power consumption highly depends on configuration of the device

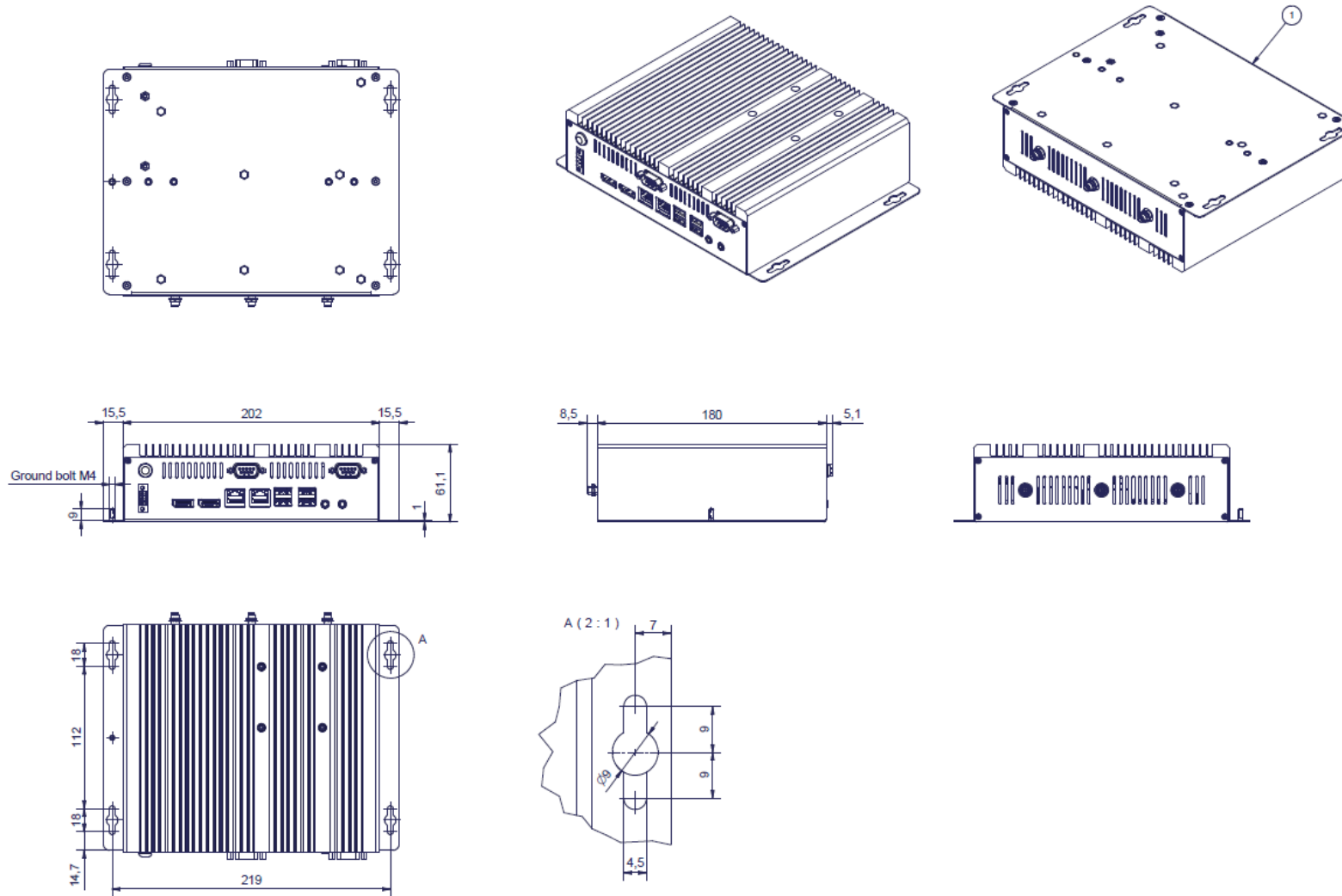
⁷ 2x LAN, 1x DP++, 2x USB, idle mode

⁸ 2x LAN, 1x DP++, 2x USB, 100% CPU load

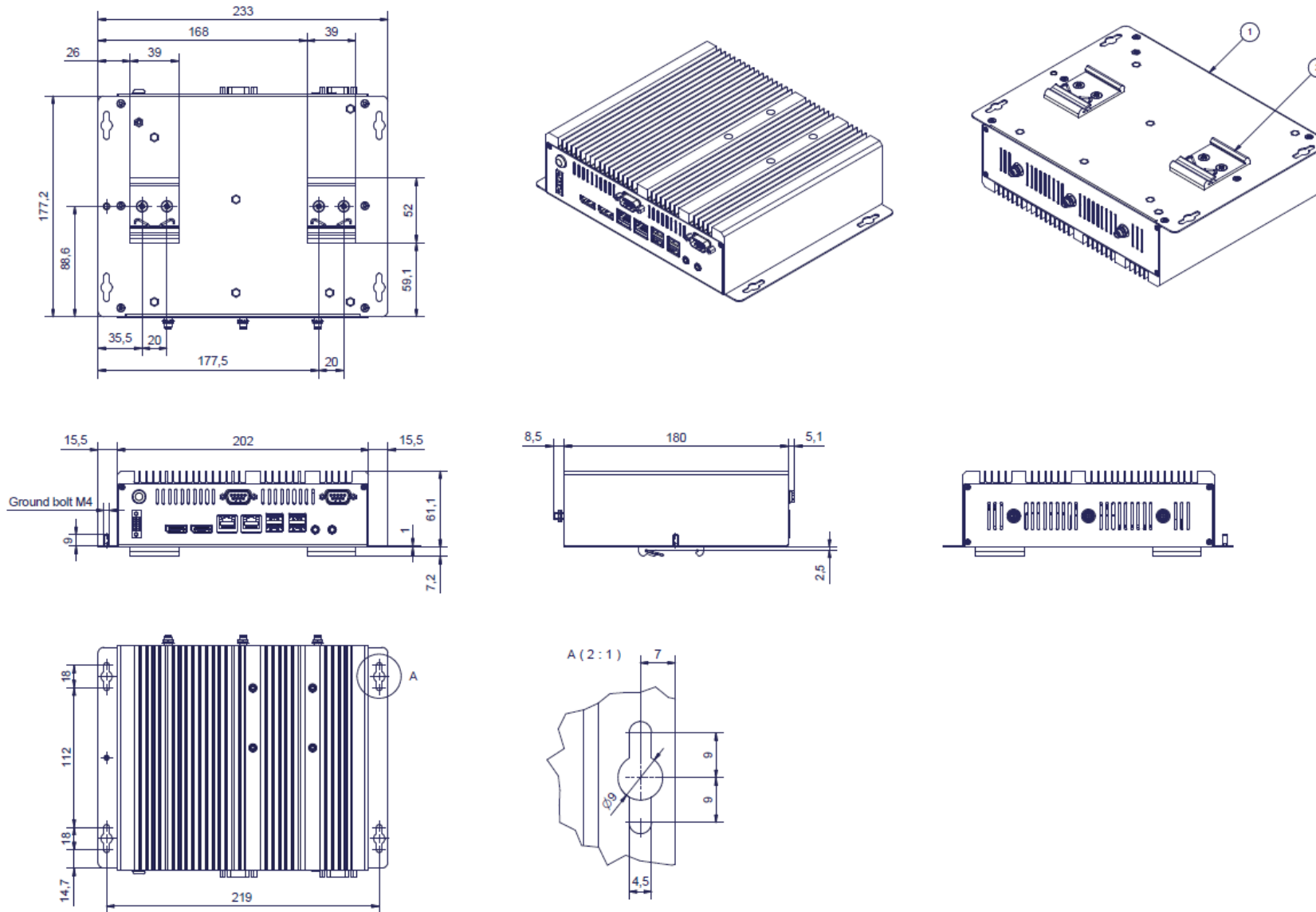
⁹ Battery lifetime is highly dependent on installation and ambient conditions

4.3 Mechanical Data

4.3.1 Without DIN rail mounting clips



4.3.2 With DIN rail mounting clips



4.4 Use cases

To give an idea on how to operate the device in good condition several use cases have been defined to help system integrators choose the best way on how to install the Industrial PC COMPACT C7

Mounting position	CPU load	GPU load	Airflow through device	max. ambient temperature
90°	100% ¹⁰	100%	none	44°C
90°	100%	100%	1m/s	50°C
90°	50%	20%	2.5m/s	55°C



To ensure proper operation of the device keep inside temperature below $60 \pm 0.5^\circ\text{C}$

For this an onboard temperature sensor is available. Please contact technical support for assistance.



Important Note

Maximum ambient temperature is highly dependent on mounting, air flow and CPU/GPU load; with the *Intel Thermal Monitoring Technologies* the processor automatically reduces the internal CPU clock down to 800MHz when the critical thermal trip points are reached to prevent damage.

¹⁰ No turbo mode possible

5 Firmware

5.1 Software Structure

The x86 CPU board based system is based on the following software structure:

BIOS (Basic Input/Output System)

- Power On Self Test (POST)
- Initialization of standard peripheral devices
- Boot procedure for the Operating System

OS (Operating System)

- Initialization of additional peripheral devices
- Start procedure for the Application Programs

Note : Refer to the OS documentation for detailed information

Application Programs

- Initialization of system, communications and external devices
- Start procedure for the Control Tasks

Note : Refer to the Application Programs documentation for detailed information

5.2 Firmware Functions

The PC board is setup with BIOS firmware. Some standard PC/AT peripheral devices (e.g. Keyboard/Mouse) are directly supported by the BIOS, BIOS extensions and Operating Systems. Some peripheral devices (e.g. Ethernet) are directly supported by standard communication software (e.g. TCP/IP stacks, TCP packet drivers) others need special programming. Please refer to the appropriate documentation for detailed information.

5.3 Application Programming Interface (API)

By default, the system does not contain any special API beside the installed BIOS. Please contact technical support for assistance.

5.4 Supported Operating System

The device only supports 64bit operating systems

Syslogic offers and supports Windows and Linux Debian operating systems. Please visit www.syslogic.com for the latest releases.

6 Product Revision History

6.1 Hardware

This paragraph lists the different hardware revisions of the Industrial PC COMPACT C7 delivered beginning with the first production lot. Note that prototypes are not included and must be returned to factory for upgrade or replacement. All information listed in this document relies on definitive state hardware. Therefore, this information may be incompatible with the prototyping hardware.

Important Note



This document always covers the newest product revision listed in Tab. 15. Please contact the manufacturer's technical support for upgrade options.

Board Identification (see product label)	Product Revision	Remarks
CPC/MITX7i3H-A101S	#1.0	Original release
CPC/MITX7i5I-A101S	#1.0	Original release
CPC/MITX7i7J-A101S	#1.0	Original release

Tab. 15 Hardware Revision State

6.2 Firmware

This paragraph lists the different firmware versions of the Industrial PC COMPACT C7 systems delivered beginning with the first production lot. Note that prototyping boards are not included and must be returned to factory for upgrade or replacement. All information listed in this document relies on definitive state hardware. Therefore, this information may be incompatible with the prototyping board hardware.

Board Identification (see product label)	Version	Build Date	Remarks
CPC/MITX7ixx-A101S	IVSYS002	11.02.2019	BIOS
CPC/MITX7ixx-A101S	BCFW436		Boardcontroller Firmware

Tab. 16 Firmware Revision State

6.3 Errata

This paragraph lists some important errata of the current boards to enable workarounds in user software. Additional errata might be present, but a workaround is already implemented in the BIOS. It is important therefore that neither the application software nor the operating systems reprograms the processor chipset's configuration registers.

Note that prototype board errata (boards with revision #0) are not listed here. Contact Syslogic technical support for prototype board information.

Additional errata of the processor chipset can be found at:

<https://ark.intel.com>

Display flashing	
Problem	The display(s) connected to the Displayport output(s) turns black for a second and the image re-appears immediately
Implication	Display output not shown
Workaround	Use high quality cables Use another monitor Avoid converters Avoid long cables
Correction	ongoing



Important Note

This document always covers the latest product revision listed in Tab. 15
Please contact the manufacturers technical support for upgrade options.

7 Manufacturer Information

7.1 Contact

Our distributors and system integrators will gladly give you any information about our products and their use. If you want to contact the manufacturer directly, please send an email message containing a short description of your application and your request to the following address or use one of the information or technical support request forms on our internet homepage:

Syslogic Datentechnik AG
Taefernstrasse 28
CH-5405 Baden-Daettwil/Switzerland

e-mail: support@syslogic.com

Web: www.syslogic.com

T: +41 56 200 90 40

F: +41 56 200 90 50

7.2 Warranty

Our products are covered by a world-wide manufacturer's warranty. The warranty period starts at the delivery time from our official distributor to the customer. The duration of the warranty period is specified in the respective product catalogues and the offers. All products carry a job number for identification. The manufacturing data and deliveries are registered in a high-level quality management system. The warranty covers material and manufacturing defects. All products must be returned via the official distributor to the factory for repair or replacement. The warranty expires immediately if the products are damaged or operation outside of the specified recommended operating conditions. The warranty also expires if the date code or job number listed on the product is altered or rendered unintelligible. The warranty does not include damage due to errors in firmware or software delivered with the products.

7.3 RMA Service

Syslogic offers a Return Material Authorization process to simplify handling of devices that needs to be returned to the manufacturer. Please follow the instructions on our web page: <https://www.syslogic.com> to get best service.