KBox B-201

Doc. Rev. 1.2

Doc. ID: 1062-7377

POSSIBILITIES START HERE

kontron
S&T Group

This page has been intentionally left blank

▶   # KBOX B-201 – 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.

©2018 by Kontron S&T AG

Kontron S&T AG

Lise-Meitner-Str. 3-5
86156 Augsburg
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.

Revision History

Revision	Brief Description of Changes	Date of Issue	Author/ Editor
1.0	Initial version	2018-Aug-16	CW
1.1	Changed Figure 24	2018-Dec-03	CW
1.2	FCC Information changed and additional BIOS information for updates.	2019-Mar-20	CW

Terms and Conditions

Kontron warrants products in accordance with defined regional warranty periods. For more information about warranty compliance and conformity, and the warranty period in your region, visit http://www.kontron.com/terms-and-conditions.

Kontron sells products worldwide and declares regional General Terms & Conditions of Sale, and Purchase Order Terms & Conditions.   Visit http://www.kontron.com/terms-and-conditions.

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

Find Kontron contacts by visiting: http://www.kontron.com/support.

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.

For more details on Kontron's service offerings such as: enhanced repair services, extended warranty, Kontron training academy, and more visit http://www.kontron.com/support-and-services/services.

Customer Comments

If you have any difficulties using this user guide, discover an error, or just want to provide some feedback, contact Kontron support. 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	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	NOTICE indicates a property damage message.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

	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.

	HOT Surface!
	Do NOT touch! Allow to cool before servicing.

	Laser!
	This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.

	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.

For Your Safety

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.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

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

⚠ CAUTION	Electric Shock!
	Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.
	Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE	ESD Sensitive Device!
	Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

Lithium Battery Precautions

If your product is equipped with a lithium battery, take the following precautions when replacing the battery.

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

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. This also applies to the operational temperature range of the specific board version that must not be exceeded.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

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 complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit http://www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

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

Table of Contents

List of Tables

List of Figures

1/ General Safety Instructions for IT Equipment

⚠WARNING	Read this chapter carefully and take careful note of the instructions, which have been compiled for your safety and to ensure to apply in accordance with intended regulations. If the following general safety instructions are not observed, it could lead to injuries to the operator and/or damage of the product; in cases of nonobservance of the instructions Kontron is exempt from accident liability, this also applies during the warranty period.

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 also to 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.

▶ If a power cable comes with the product, only this cable should be used. Do not use an extension cable to connect the product.

▶ To guarantee that sufficient air circulation is available to cool the product, please ensure that the ventilation openings are not covered or blocked. If an air filter is provided, this should be cleaned regularly. Do not place the system close to heat sources or damp places. Make sure the system is well ventilated.

▶ Only devices or parts which fulfill the requirements of SELV circuits (Safety Extra Low Voltage) as stipulated by IEC 60950-1 may be connected to the available interfaces.

▶ Before opening the device, make sure that the device is disconnected from the mains.

▶ Switching off the device by its power button does not disconnect it from the mains. Complete disconnection is only possible if the power cable is removed from the wall plug or from the device. Ensure that there is free and easy access to enable disconnection.

▶ The device may only be opened for the insertion or removal of add-on cards (depending on the configuration of the system). This may only be carried out by qualified operators.

▶ If extensions are being carried out, the following must be observed:

  ▶ All effective legal regulations and all technical data are adhered to.
  ▶ The power consumption of the system and add-on card does not exceed the specified limitations.
  ▶ The current consumption of the system does not exceed the value stated on the product label.

▶ Only original accessories that have been approved by Kontron can be used.

▶ Please note: safe operation is no longer possible when any of the following applies:

  ▶ The device has visible damages.
  ▶ The device is no longer functioning.

In this case the device must be switched off and it must be ensured that the device can no longer be operated.

Additional safety instructions for DC power supply circuits

▶ To guarantee safe operation of devices with DC power supply voltages larger than 60 volts DC or a power consumption larger than 120 VA, please observe that:

    ▶ the device is set up, installed and operated in a room or enclosure marked with "RESTRICTED ACCESS", if there are no safety messages such as safety signs and labels on the device itself.

    ▶ no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly

    ▶ a reliable protective earthing connection is provided

    ▶ a suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the device itself is not disconnectable

    ▶ a disconnect device, if provided in or as part of the equipment, shall disconnect both poles simultaneously

    ▶ interconnecting power circuits of different devices 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 EN60950-1 or VDE0100 or EN60204 or UL508 regulations.

▶ The devices do not generally fulfill the requirements for "centralized DC power systems" (UL 60950-1, Annex NAB; D2) and therefore may not be connected to such devices!

1.1. Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can destroy static-sensitive devices or micro-circuitry.

Proper packaging and grounding techniques are necessary precautions to prevent damage. Always take the following precautions:

1. Transport boards in ESD-safe containers such as boxes or bags.

2. Keep electrostatic sensitive parts in their containers until they arrive at the ESD-safe workplace.

3. Always be properly grounded when touching a sensitive board, component, or assembly.

4. Store electrostatic-sensitive boards in protective packaging or on antistatic mats.

1.1.1. Grounding Methods

By adhering to the guidelines below, electrostatic damage to the device can be avoided:

1. Cover workstations with approved antistatic material. Always wear a wrist strap connected to workplace. Always use properly grounded tools and equipment.

2. Use antistatic mats, heel straps, or air ionizers for more protection.

3. Always handle electrostatically sensitive components by their edge or by their casing.

4. Avoid contact with pins, leads, or circuitry.

5. Turn off power and input signals before inserting and removing connectors or connecting test equipment.

6. Keep work area free of non-conductive materials such as ordinary plastic assembly aids and Styrofoam.

7. Use only field service tools that are conductive, such as cutters, screwdrivers, and vacuum cleaners.

8. Always place drives and boards PCB-assembly-side down on the foam.

1.2. Instructions for the Lithium Battery

The KBox B-201's mainboard is equipped with a lithium battery. When replacing the battery please observe the instructions described in Chapter 14.3.1: Replacing Lithium Battery.

⚠WARNING	Danger of explosion when replacing with wrong type of battery. Replace only with the same or equivalent type recommended by the manufacturer. The lithium battery type must be UL recognized.

	Do not dispose of lithium batteries in general trash collection. Dispose of the battery according to the local regulations dealing with the disposal of these special materials, (e.g. to the collecting points for dispose of batteries).

2/ Introduction

This user guide describes the KBox B-201 made by Kontron and focuses on describing the KBox B-201's special features. New users are recommended to study the installation instructions within this user guide before switching on the power.

The KBox B-201 is part of Kontron's Box PC family designed for high performance needs in a small form factor. Based on the Intel® embedded 6th and 7th generation platforms with mini ITX mainboard, the KBox B-201 features high processing capability and long-term availability.

Various mounting options guarantees flexibility in multiple user applications such as behind a monitor, wall mount (horizontal and vertical), or as a desktop version (horizontal and vertical). Additionally, the KBox B-201's extensive onboard interfaces and additional memory expandability enables connectivity for nearly all applications.

General features are:

- 7th Gen. Intel® Core™ i3/i5/i7
- Chipset Intel® Q170
- Up to 32 GB DDR4-2400 with SODIMM
- Memory Expansion:
  - 2.5" SSD drive bay (external)
  - M.2 (internal)
- External Interfaces
  - 2x LAN,
  - 6x USB 3.0,
  - 4x USB 2.0,
  - 2x DP,
  - 1x DVI-D,
  - 1x Audio line In/Out,
  - 1x PS/2 keyboard,
  - 1x PS/2 mouse
  - 1x Serial port
- Active fan cooling
- Low noise
- Security features
  - TPM V2.0
  - Kontron APPROTECT (option)

The KBox B-201 is intended for 24/7 continuous operation and longtime industrial applications. All components are selected to ensure a long lifetime.

Figure 1: KBox B-201

3/ Scope of Delivery

Check that your delivery is complete, and contains the items below. If you discover damaged or missing items, contact your dealer.

Table 1: Scope of Delivery

Part	Qty.	Part Description
KBox B-201	1	High performance PC box with mITX mainboard
AC power supply	1	External Power Supply Unit (PSU) 100 VAC to 240 VAC +/-5%
AC power cable	1	External power cable (PSU to mains power socket)
Chassis feet	4	Self-adhesive chassis feet
Safety instructions	1	Safety Instructions for IT equipment

Table 2: Accessories

Part	Part Description
Vertical Stand	Metal stand to position the KBox B-201 vertically on a desktop
Mounting Brackets	Two mounting brackets that attach to the KBox B-201's sides for wall mounting
VESA 100 Mount Assembly	VESA 100 mounting frame, hook and loop flexible band, two sets of 4x mounting screws and 4x spacers used to mount the KBox B-201 and PSU on the back of a VESA 100 monitor

3.1. Packaging

The KBox B-201 is packaged together with all standard parts listed in Table 1: Scope of Delivery, in a product specific cardboard package designed to provide adequate protection to according the EN 60068-2-31 and absorb shock.

3.2. Type Label and Product Identification

The type label is positioned on the bottom side of the chassis.

Figure 2: Type Label

4/ Product Overview

Before working with the KBox B-201, Kontron recommends that users take a few minutes to learn about the various parts of the KBox B-201. The following chapter provides information regarding KBox B-201 features

The KBox B-201 is a small form factor Box PC family designed for high performance needs with 6th Gen. or 7th Gen. Intel Core™ platforms with a mini ITX mainboard and extensive interfaces on the rear panel. A M.2 Key B socket and a shared mSATA/mPCIe full-size/half-size socket enable internal expansion. Additionally, an external 2.5" SSD drive bay supports further memory expansion.

All variants are available in a robust metal chassis that guarantees flexibility in multiple user applications such as behind a monitor, horizontal and vertical wall mounting, or as a movable or fixed desktop version.

Figure 3: KBox B-201 Overview

4.1. Front View

The front side contains the power-on button, two additional USB 3.0 ports, and ventilation holes for air-output.

Figure 4: Front View
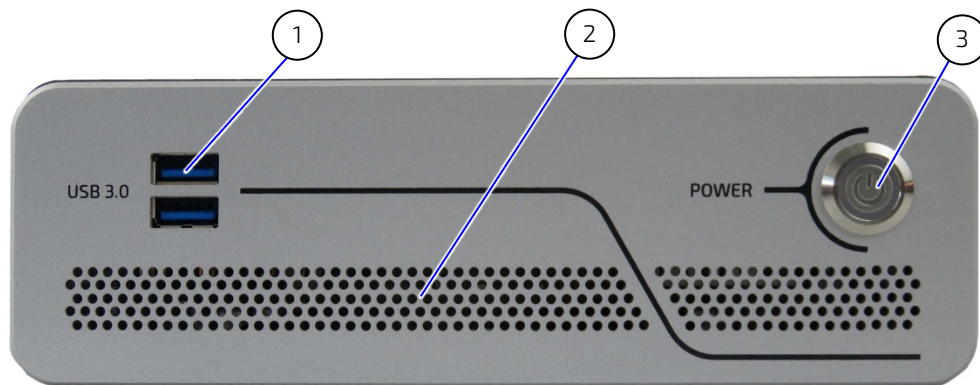
1	2x USB 3.0	3	Power-on button with power LED
2	Ventilation holes (air-output)		

4.1.1. Front Connectors and Buttons

4.1.1.1. Power-On Button

The power-on button powers on and off the KBox B-201. The power-on button includes an integrated power LED that lights up blue to indicate the powered on state. By pressing the power-on button for longer than four seconds a forced system shutdown will be initiated, before the power to the system is turned off.

> **NOTICE** **Performing a forced shut down can lead to loss of data or other undesirable effects!**

4.1.1.2. USB 3.0

The two front panel USB 3.0 ports are USB 2.0 backward compatible allowing for the connection of both USB 3.0 or USB 2.0 compatible devices. A further four USB 3.0 ports are located on the rear panel.

For the USB 3.0 pin assignment, refer to Chapter 11.2: USB 3.0 Connector Pin Assignment.

4.2. Rear View

The rear panel contains the main I/O interfaces and includes the power in connector (DC IN), ventilation holes for air-output, and two fastening screws for the top cover.

Figure 5: Rear View
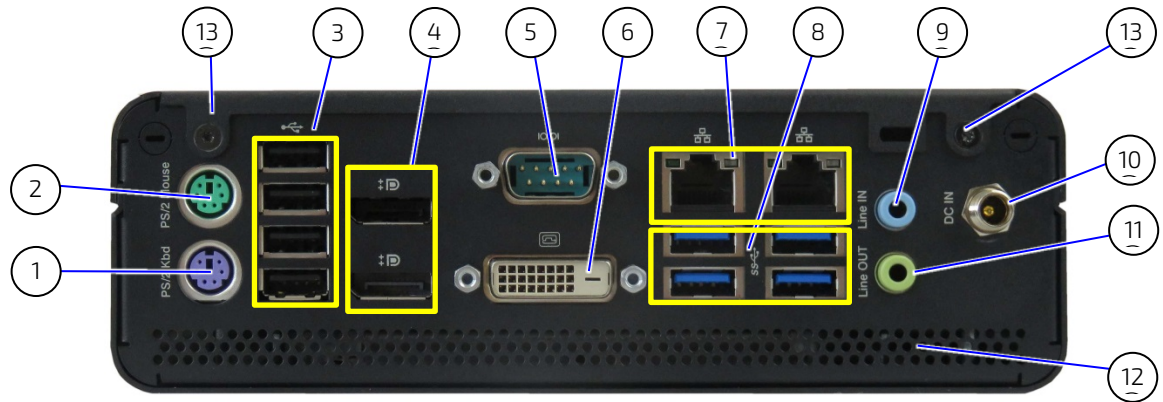
1	PS/2 Keyboard	5	Serial Port	9	Audio line-in
2	PS/2 Mouse	6	DVI-D	10	DC IN
3	4x USB 2.0 ports	7	2x LAN ports (GbE)	11	Audio line-out
4	2x DP	8	4x USB 3.0 ports	12	Ventilation holes (air-output)
				13	2x Top cover fastening screws

4.2.1. Rear Panel Connectors

4.2.1.1. PS/2 Keyboard

The standard 6-pin mini-DIN PS/2 connector enables the connection of a keyboard. The PS/2 connectors are color coded where the purple connector is the keyboard connector.

For the pin assignment, refer to Chapter 11.7: PS/2 Keyboard Connector Pin Assignment.

4.2.1.2. PS/2 Mouse

The standard 6-pin mini-DIN PS/2 connector enables the connection of a mouse. The PS/2 connectors are color coded where the green connector is the mouse connector.

For the pin assignment, refer to Chapter 11.8: PS/2 Mouse Connector Pin Assignment.

4.2.1.3. USB 2.0 Ports

The four USB 2.0 interfaces enable the connection of USB 2.0 compatible devices to the system.

For the pin assignment, refer to Chapter 11.3: USB 2.0 Connector Pin Assignment.

4.2.1.4. DP

Up to two external digital displays can be connected to the two Display Port (DP) V1.2 20-pin female connectors. The display ports are compatible with Dual mode/ Display Port ++ and support adapters.

For the pin assignment, refer to Chapter 11.5: Display Port (DP) V1.2 Connector Pin Assignment.

> To avoid disturbances, it is recommended not to use any adapters such as DP/VGA, DP/DVI or DP/HDMI adapter at the DisplayPort connectors.

> The KBox B-201 supports up to three independent digital displays (2x DP + 1x DVI-D)

4.2.1.5. Serial Ports

The RS232 serial port 9-pin D_SUB connector enables the connection of a serial device to the system.

For the pin assignment, refer to Chapter 11.10: Serial Port Connector Pin Assignment.

4.2.1.6. DVI-D

The DVI-D digital connector supports single link only and enables a digital display to be connection to the system using the DVI-D 24-pin female connector directly or with an adapter.

For the pin assignment, refer to Chapter 11.6: DVI-D Connector Pin Assignment.

> The KBox B-201 supports up to three independent digital displays (2x DP + 1x DVI-D)

4.2.1.7. LAN Ports

The two LAN ports are Gigabit Ethernet (10/100/1000 Mbit/s), IEEE 1588 capable with a standard 8-pin RJ45 connector including two status LEDs for speed (10/100/1000 Mbit/s), link and activity.

For the pin assignment, refer to Chapter 11.4: LAN GbE Connector Pin Assignment.

4.2.1.8. USB 3.0 Ports

The four USB 3.0 ports are USB 2.0 backward compatible enabling the connection of both USB 3.0 or USB 2.0 compatible devices. There are two additional USB 3.0 ports on the front panel, for a maximum of up to six USB 3.0 ports.

For the pin assignment, refer to Chapter 11.2: USB 3.0 Connector Pin Assignment

4.2.1.9. Audio Connectors (Line-In, Line-Out)

The two audio connectors are audio Line-in (blue jack) and audio Line-out (green jack) enable the connection of High Definition (HD) devices to the system.

For the pin assignment, refer to Chapter 11.9: Audio Line-out and Audio Line-in Connector Pin Assignment.

4.2.1.10. DC-IN

The Power Jack connector is a standard 5.5. mm to 2.5 mm Jack that supplies 12 V DC only.

For the pin assignment, refer to Chapter 11.1: DC IN Power Connector Pin Assignment.

4.3. Left and Right Side Views

The right and left sides of the chassis contain ventilation holes for air-output. The threaded screw holes (Figure 6, pos. 2) are used to attach mounting brackets (see Chapter 8.3: Mounting Brackets (Option)) or to attach a vertical stand (see Chapter 8.2: Vertical Stand (Option)).

Figure 6: Left Side and Right Side Views
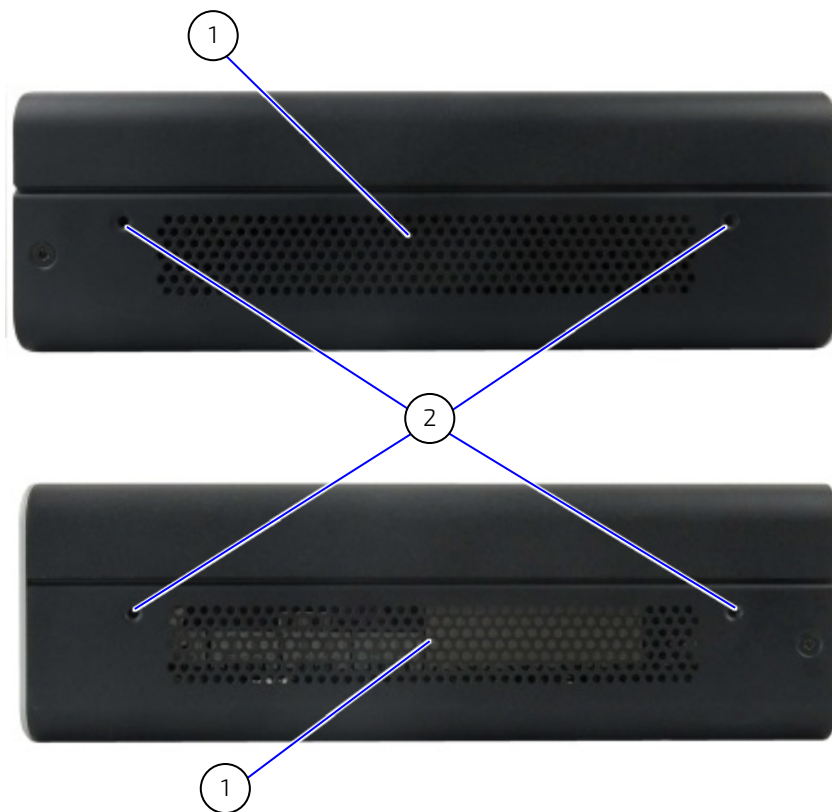
1	Ventilation holes (air-output)	2	2x Threaded screw holes for wall mount brackets

4.4. Top Cover and Bottom Views

The top cover consisting of a metal plate with ventilation holes for air-intake and a separate metal plate underneath with a circular opening above the internal fan.

Figure 7: Top View
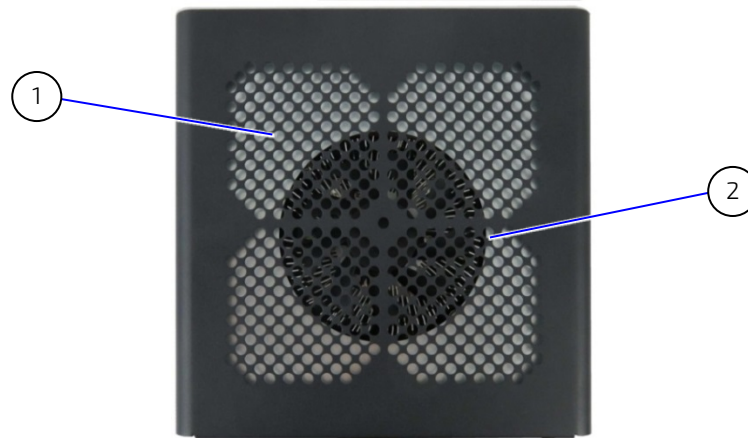
1	Ventilation holes (air-intake)	2	Circular opening on metal plate underneath

The bottom side contains an external 2.5" SSD drive bay that opens or closes using a single screw (Figure 8, pos. 3). The four threaded holes (Figure 8, pos. 2) enable the KBox B-201 to be mounted on the back of a VESA 100 compatible monitor using Kontron's VESA 100 mount assembly, see Chapter 8.4: VESA 100 Mount Assembly (Option).

Figure 8: Bottom View
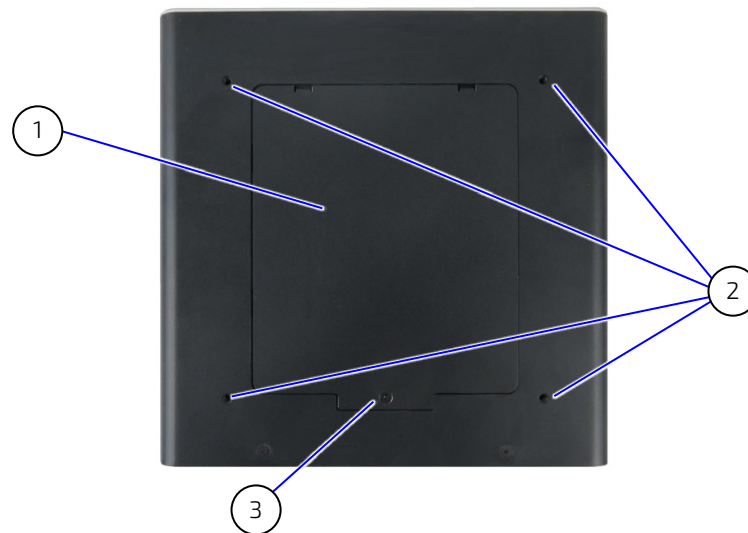
1	2.5" SSD drive bay cover	3	2.5" SSD drive bay cover screw (opens and closes 2.5" SSD drive bay)
2	4 x threaded holes for VESA 100 Mount frame		

5/ System Extension

5.1. External Storage

5.1.1. 2.5" SSD Drive Bay

The external 2.5" SSD drive bay uses the SATA interface (SATA III / SATA-600 compliant) for 512 GByte or 1 TByte 2.5" SSD memory expansion.

5.2. Internal Expansion

It is possible to install a full-size/half-size mSATA or mPCIe expansion card in a shared socket, and an M.2 (2242/2262) expansion card. Due to space limitations, and a possible mechanical collision, not every expansion card and M.2 card combination is possible.
The possible mSATA/mPCIe expansion cards and M.2 card combinations are:

1. mSATA/mPCIe full-size + M.2(2242)

2. mSATA/mPCIe half-size + M.2(2260)

3. mSATA/mPCIe half-size + M.2(2242)

5.2.1. mSATA /mPCIe Shared Socket (option)

A shared mSATA (SATA III/ SATA-600 compliant) or mPCIe socket is available for (full-size/half-size) expansion cards. When considering whether to install a full-size/half-size mSATA or mPCIe expansion card users must take into consideration whether a M.2 (2242) or M.2 (2260) form factor card is installed in the neighboring M.2 socket. .

To configure the shared mSATA /mPCIe socket in the BIOS setup, perform the following:

1. Use the BIOS hot key navigation system to go to the following setup menu function:

    Advanced> Onboard device Configuration> Minicard mode>

2. Select the required mode:

    [mSATA/mPCIe/Auto]

For the possible mSATA/mPCIe and M.2 socket combinations, see Chapter 5.2: Internal Expansion.

5.2.2. M.2 (option)

The M.2 socket supports M.2 (2242/2260) form factor cards for PCIe (2-lanes) or SATA based M.2 modules, AHCI / NVME Boot support. When considering whether to install a M.2 card with (2242/2260) form factor users must take into consideration whether a full-size or half-size mSATA/mPCIe expansion card is installed in the neighboring shared mSATA/mPCIe socket.

For the possible mSATA/mPCIe and M.2 socket combinations, see Chapter 5.2: Internal Expansion.

6/ Accessing Internal Components

This chapter contains important information that you must read before accessing internal components. Care must be taken to follow these procedures properly when accessing or installing internal components. It is recommended to expand your system with additional cards before mounting the system.

Consider the following instructions before accessing internal components:

⚠WARNING	Observe the General Safety Instructions for IT-Equipment and the installation instructions contained in this user guide.
	Only personnel with appropriate qualifications, trainings and authorization are permitted to install and work with the KBox B-201 system.
	The installation/removal of SSDs and/or expansion cards may only be performed by a qualified person, according to the description in this user guide.
	Before removing the cover of the device, make sure that the device is powered off and disconnected from the power supply.
	Before you upgrade the KBox B-201 with expansion cards, pay attention to the power specification and ensure that the overall power consumption does not exceed the PSU power specification of 150 W.

	Please follow the safety instructions for components that are sensitive to electrostatic discharge (ESD). Failure to observe this warning notice may result in damage to the device or/and internal components.

i	Pay attention to the manufacturer's instructions before installing/removing additional components (drives, expansion cards and M.2 modules.)

6.1. Opening and Closing the Chassis

To gain access to internal components users must remove the top cover. Before removing the top cover pay attention to the safety instructions at the start of this chapter.

⚠WARNING	Operate the KBox B-201 only in the closed condition.
	It is only ensured that users do not have access to the KBox B-201's internal components during operation when the top cover is properly installed and secured with two fastening screws (Figure 5 pos. 13).

⚠WARNING	Before opening the KBox B-201, the system must be powered off, and disconnected from the mains power supply. Ensure that you have a clean, flat and ESD-safe surface to work on and disconnect all connected peripheral devices. Observe the General Safety Instructions for IT Equipment within this user guide.

To open the chassis, perform the following:

1. Close all applications. Shut down the system properly and disconnect the power cable from the power source. Disconnect all peripherals.

2. Place the KBox B-201 on a flat, clean and ESD-safe surface.

3. Remove the two top cover screws on the rear panel (Figure 9) and retain the screws to close the top cover later.

Figure 9: Top Cover Fastening Screws

Top cover screws

4. Lift the top cover a few centimeters at the rear of the chassis and then pull the top cover gently away from the front panel to release the top cover from the front panels holding brackets (Figure 10).

Figure 10: Holding Brackets
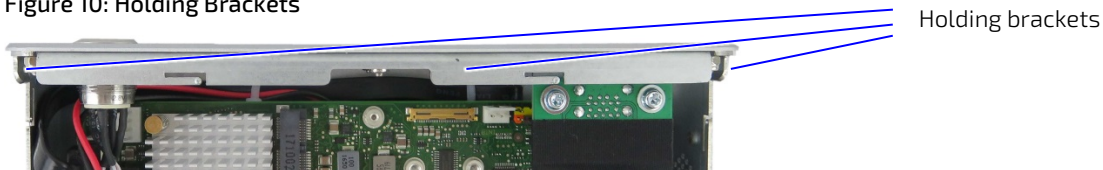
Holding brackets

5. To avoid contact between the top cover and the internal fan assembly by gently releasing the top cover from the holding brackets and once free, lift the top cover vertically.

NOTICE	**Do not slide the top cover off the chassis**
	To avoid contact between the top cover and the internal fan assembly, once the top cover is free from the holding brackets on the front panel, lift the top cover vertically.

6. The internal components inside the chassis are now accessible.

To close the chassis, perform the following:

1. Place the KBox B-201 on a flat, clean and ESD-safe surface.

2. Hold the top cover a few centimeters above the main chassis almost in the correct position.

NOTICE	**Do not slide the top cover off the chassis**
	To avoid contact between the top cover and the internal fan assembly, once the top cover is free from the holding brackets on the front panel, lift the top cover vertically.

3. Tilt the front of the top cover downwards towards the front panel and the push the top cover onto holding brackets (Figure 10) on the front panel, until the top cover is in-line with the front panel.

4. Move the top cover's opposite side down onto the rear panel and secure by fasten the two screws removed in the previous step 3.

6.2. Opening and Closing SSD Drive Bay Cover

Before opening the SSD drive bay cover pay attention to the safety instructions at the start of this chapter.

> **Before installing a 2.5" SSD, observe the manufacturer's instructions.**

To open the SSD drive bay cover, perform the following:

1. Close all applications. Shut down the system properly and disconnect the power cable from the power source. Disconnect all peripherals.

2. Place the KBox B-201 on a flat, clean and ESD-safe surface with the bottom side facing upwards.

3. Using a torx screwdriver (08 x 60), remove the screw that secures the SSD drive bay cover (Figure 8, pos. 3).

4. Lift the SSD drive bay cover a few centimeters to release the SSD from SSD holding-plate on the rear side of the SSD drive bay cover (Figure 11).

Figure 11: SSD Drive Bay Cover Rear Side

SSD holding-plate
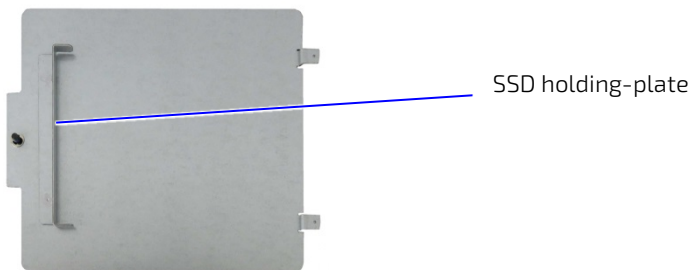
5. Slide the SSD drive bay cover forward, to release the two aligning tabs (Figure 12).

Figure 12: SSD Drive Bay Cover Top Side

Aligning tabs
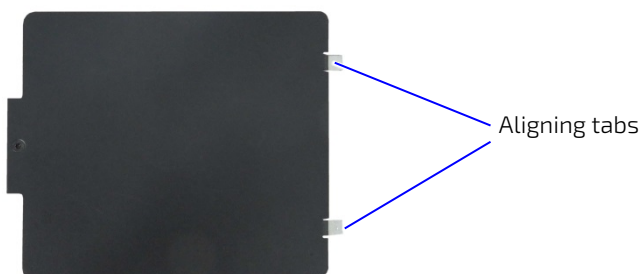
6. Lift to remove the SSD drive bay cover.

7. To close the SSD drive bay cover, proceed in the reverse order of steps 3 to 6.

> **To avoid damaging the SSD drive do not force when closing the SSD drive bay cover**
> Do not use force when closing the SSD drive bay cover. If the cover does not close easily, the metal SSD holding-plate on the rear side may not be aligned correctly and could put pressure on the SSD and damage the SSD.

6.2.1. Installing and Removing External 2.5" SSD

To install a 2.5" SSD, perform the following:

1. Open the SDD drive bay cover by following the instructions in Chapter 6.2: Opening and Closing SSD Drive Bay Cover (steps 1 to 6).

2. Position the 2.5" SSD on the two ESD strips (Figure 13) in the SSD drive bay with the SSD's connector facing the internal SATA connector.

Figure 13: SSD Drive Bay with SSD

ESD strips
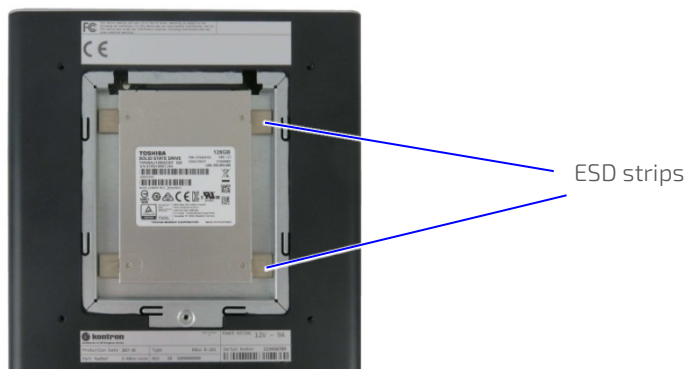
3. Align the SSD's connector with the internal SATA connector.

4. Lift the SSD's free end to an angle of approx. 30° and gently pushing the SSD into the SATA connector.

5. Close the SSD drive bay cover by, proceeding as described Chapter 6.2: Opening and Closing SSD Drive Bay Cover (step 7).

> **i** After installing or removing a 2.5" SSD, the partitioning of the memory maybe different.

To remove a 2.5" SSD, perform the following:

1. Open the SSD drive bay cover by follow the instructions in Chapter 6.2: Opening and Closing SSD Drive Bay Cover (steps 1 to 6).

2. Hold the sides of the SSD and pulling out the SDD from the internal SATA connector carefully.

3. If the SSD does not release easily, move the SDD slightly from side to side while gently pulling out the SSD from the SATA connector.

4. To install a new SDD, proceed as described Chapter 6.2.1: Installing and Removing External 2.5" SSD (steps 2 to 4).

5. Close the SSD drive bay cover by, proceeding as described in Chapter 6.2: Opening and Closing SSD Drive Bay Cover (step 7).

> **i** After installing or removing a 2.5" SSD, the partitioning of the memory maybe different.

6.3. Installing and Removing Internal M.2 SSD Card

To install an M.2 card, perform the following:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.

2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis (steps 1 to 6).

3. Locate the M.2 socket and the corresponding fastening screw.

4. Insert the M.2 card into the corresponding socket, at an angle of approx. 30°. Move the M.2 card slightly from side to side to ease the card carefully into the socket.

5. Secure the M.2 card by pressing down on the free end, and carefully fasten the M.2 card to the mainboard with fastening screw, until flat with the mainboard.

6. Close the Chassis as described in Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

> **i** After installing or removing a M.2 SSD the partitioning of the memory maybe different.

To remove an M.2 card, perform the following:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.

2. Open the Chassis as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 6).

3. Locate the M.2 card installed into your system.

4. Remove the fastening screw and the M.2 card springs up at an angle of approximately 30° at the free end.

5. Gently pull the M.2 card out of the M.2 socket.

6. Close the Chassis as described in Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

> **i** After installing or removing a M.2 SSD the partitioning of the memory maybe different.

6.4. Installing and Removing Internal mSATA Expansion Card

To install an mSATA expansion card in the shared mSATA/mPCIe socket, perform the following

1. Close all applications, shut down the system properly, and disconnect the connection to the power source. Disconnect all peripherals.

2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis (steps 1 to 6).

3. Locate the shared mSATA/mPCIe sockets and the corresponding solder nut.

4. Insert the mSATA card into the sockets at an angle of approx. 30° and push the mSATA card into the socket until the fixing holes on the card align with the mainboard's solder nut.

5. Secure the mSATA card by pressing down on the free end and carefully fasten the mSATA card to the mainboard with a mounting screw and spacer (if required) between the mSATA card and the mainboard.

NOTICE Do not use too much force when fastening the mSATA expansion card's mounting screw. Too much force may damage the mainboard's solder nut.

6. Close the chassis, as described in Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

i After installing or removing an mSATA SSD the partitioning of the memory maybe different.

To remove an mSATA expansion card from the shared mSATA/mPCIe socket, perform the following:

1. Close all applications, shut down the system properly, and disconnect the connection to the power source. Disconnect all peripherals.

2. Open the Chassis as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 6).

3. Locate the mSATA card installed into your system.

4. Remove the mounting screw and spacer, and the mSATA card springs up at an angle of approximately 30° at the free end.

5. Gently pull the mSATA card out of the mSATA socket.

6. Close the Chassis, as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

i After installing or removing an mSATA SSD the partitioning of the memory maybe different.

6.5. Installing and Removing Internal mPCIe Expansion Card

To install an mPCIe card in the shared mSATA/mPCIe socket, perform the following:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.

2. Open the device as described in the Chapter 6.1 Opening and Closing the Chassis (steps 1 to 6).

3. Locate the mPCIe card socket and the corresponding solder nut.

4. Insert the mPCIe card into the socket at an angle of approx. 30° and push the mPCIe card down until the fixing holes of the card are aligned with the solder nut.

5. Secure the mPCIe by pressing down on the free end and carefully fasten the mPCIe card to the mainboard with a mounting screw and spacer (if required) between the mPCIe card and the mainboard.

NOTICE Do not use too much force when fastening the mPCIe expansion card's mounting screw. Too much force may damage the mainboard's solder nut.

6. Close the Chassis, as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

To remove a mPCIe card from the shared mSATA/mPCIE socket, proceed as follows:

1. Close all applications; shut down the system properly and disconnect the power source. Disconnect all peripherals.

2. Open the device as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 6).

3. Locate the mPCIe card installed into your system.

4. Remove the mountings screw and spacer, and the mPCIe card springs up at an angle of approximately 30° at the free end.

5. Gently pull out the mPCIe card from the socket.

6. Close the chassis, as described in the Chapter 6.1: Opening and Closing the Chassis (steps 1 to 4).

7/ Thermal Considerations

7.1. Active Cooling

The KBox B-201 is an active fan cooled system. Air enters through the top cover's ventilation holes (Figure 14, pos. 1) and the fan distributes the air over the mainboard before the air exits by the ventilation holes on the right, left, front and rear sides (Figure 15, pos. 1, 2 & 3).

Figure 14: Air-intake Ventilation Holes
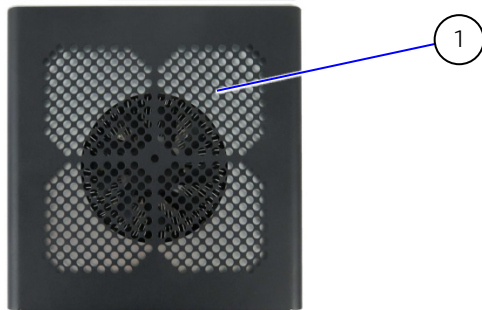
1   Top cover ventilation holes (air-intake)

⚠CAUTION   Avoid damaging the mainboard
Do not attach or remove fans while the KBox-B-201 is powered-on.

Figure 15: Air-output Ventilation Hole

| 1 | Front panel air-output | 3 | Rear panel air-output |
| 2 | Right and left side air-output | | |

7.2. Minimum System Clearance (Keep out Area)

To provide the maximum airflow through and around the box, a minimum distances to surrounding parts must be observed. Before installing, observe the thermal considerations mentioned in Chapter 8/ Installation Instructions, such as keep out areas and correct mount orientation (Figure 22 and Figure 23). and the correct mount orientation

7.3. Third Party Components

When configuring with third party components such as mPCIe expansion cards, mSATA expansion cards, M.2 cards and hard drives (HDD or SSD), the air temperature inside the system is higher than the ambient temperature. An approximate internal temperature rise is given.

8/ Installation Instructions

The KBox B-201 operates horizontally (upward orientation) and vertically when mounted on a desk, wall or the rear side of a monitor.

The various mounting accessories are chassis feet (supplied in the delivery) and optionally vertical stand, wall mount brackets, and VESA 100 mount assembly. Before, installing the KBox B-201, observe the following:

⚠ WARNING	Danger of Fire
	If mounted horizontally with top cover facing downward, the KBox B 201 may overheat and hot substances may exit through the top cover's ventilation holes causing a fire hazard. To avoid risk of fire observe the following:
	▶ Do not mount with the top cover facing downward. (inverted orientation)
	▶ Use the allowed mount orientations only:
	▶ Horizontally top cover facing upwards
	▶ Vertically (all possible mount orientations)

⚠ CAUTION	
	Do not handle the product if there is any damage visible.

⚠ CAUTION	
	Prior to any installation work ensure that there are no live wires on the installation site and follow the local/national regulations for grounding. The voltage feeds must not be overloaded. Adjust the cabling and the overcurrent protection to correspond with the electrical figures indicated on the type label located on the bottom side of the system. Kontron recommends that the last cable attached to the system is the power cable.

⚠ CAUTION	
	Obstructing the ventilation holes may cause overheating. Do not to place items directly in front of the top cover ventilation holes and observed that all ventilation openings are not covered or obstructed by objects.

⚠ CAUTION	
	Leave sufficient clearance (keep out area) to prevent the product from overheating! To ensure proper operation use the specified recommended keep out areas of :
	▶ Top cover: 10 mm (0.394")
	▶ Left and right sides: 10 mm (0.394")
	▶ Front and rear panel: 10 mm (0.394")
	▶ Bottom side: (no restriction)

⚠ CAUTION	
	Installed and operated the KBox B-201 only by trained and qualified personnel within an environment that fulfills all necessary technical and environmental requirements.

⚠ CAUTION	
	Ensure support for the KBox B-201 load by mounting on a flat, solid surface and using suitable screws.

ℹ	
	Ensure that there is sufficient space to connect cables to the rear I/O panel and to operating the power-on button.

i Expansion cards and memory installation should be performed before Installation.

8.1. Chassis Feet

To use the KBox B-201 on a desktop, install the supplied four self-adhesive chassis feet as follows:

1. Ensure that the KBox B-201's bottom surface is clean and free from dust and dirt.

2. Remove the cover from the back of each of the self-adhesive chassis feet and carefully press the chassis feet onto the KBox B-201 (Figure 16).

Figure 16: Position of Chassis Feet

Position of the chassis feet
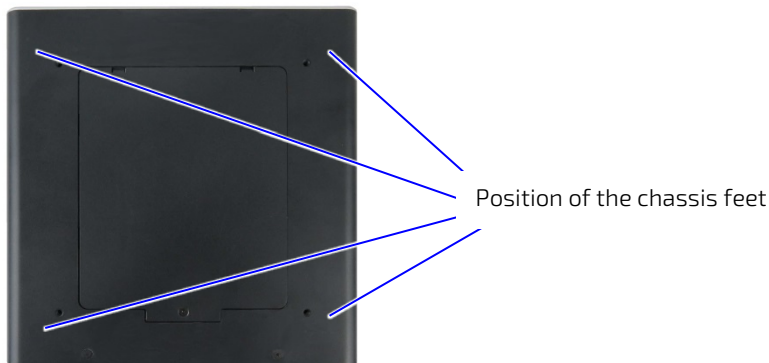
To improve stability, positioning the chassis feet between the mounting hole and the edge of the KBox B-201.

8.1.1. Mount Option

The KBox B-201 with chassis feet can be operated in the upwards horizontal position only as shown in Figure 17.

Figure 17: Chassis Feet Mount Option

⚠ WARNING

Danger of Fire

If mounted horizontally with top cover facing downward, the KBox B 201 may overheat and hot substances may exit through the top cover's ventilation holes causing a fire hazard.
To avoid risk of fire observe the following:

▶ Do not mount with the top cover facing downward (inverted orientation)

▶ Use the allowed mount orientations only:

    ▶ Horizontally top cover facing upwards
    ▶ Vertically (all possible mount orientations)

8.2. Vertical Stand (Option)

For desktop use, the KBox B-201 can be positioned vertically using a vertical stand, see Figure 18: Vertical Stand.

Figure 18: Vertical Stand

Vertical stand screw holes
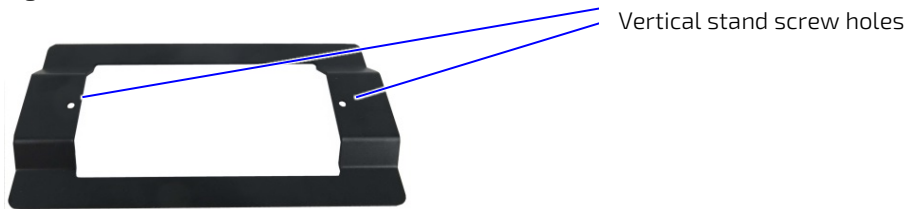
To mount the KBox B-201 on the vertical stand:

1. Position the KBox B-201 with the chassis side on which the vertical stand is to be fastened facing upwards.

2. Aline the two vertical stand screw holes with the two threaded screw holes on the chassis's side.

3. Using a torx (08 x60) screwdriver, fasten the vertical stand to the chassis (Figure 19).

Figure 19: Vertical Stand Screws

Two mounting holes
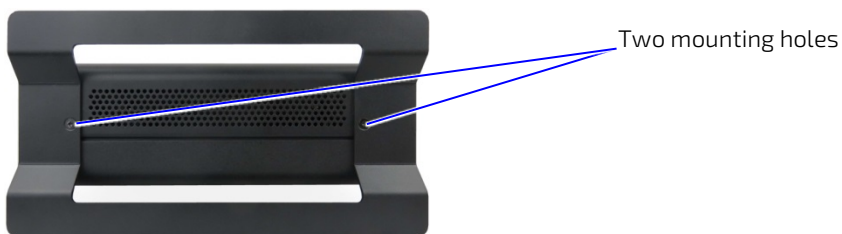
4. Stand the KBox B-201 in the vertical position, as shown in Figure 20.

8.2.1. Mount Options

The vertical stand can be implemented on the KBox B-201's right side or the left side as shown in Figure 20.

Figure 20: Vertical Stand Mount Options

8.3. Mounting Brackets (Option)

To wall mount (vertically or horizontally) as shown in Figure 25, or fixed desktop (underneath or on top) of a desktop use the mounting brackets as shown in Figure 24.

Each mounting bracket contains two sets of mounting holes to fasten to the KBox B-201.

Figure 21: Mounting Bracket
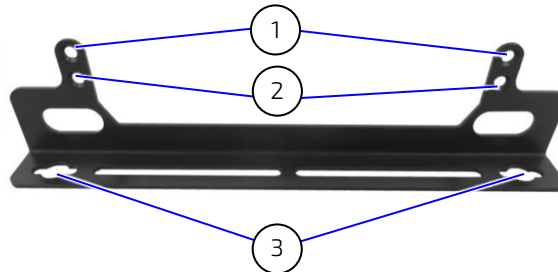
1	Mounting holes (10 mm keep out area)		3	Key mounting holes for mount surface
2	Mounting holes (no keep out area)			

The set of mounting holes used depends on whether the top cover with ventilation holes or the bottom side without ventilation holes faces the mounting surface:

▶ If the top cover ventilation holes face the mounting surface, a 10 mm keep out area is required between the top cover and the mounting surface to ensure adequate ventilation. The mounting holes shown in Figure 21, pos. 1 must be used.

▶ If the bottom side faces the mounting surface, no keep out area is required and it is possible to use the mounting holes shown in Figure 21, pos. 2.

| ⚠CAUTION	Obstructing the ventilation holes may cause overheating. Do not to place items directly in front of the top cover ventilation holes and observed that all ventilation openings are not covered or obstructed by objects.

⚠CAUTION	Leave sufficient clearance (keep out area) to prevent the device from possibly overheating! To ensure proper operation, use the specified recommended keep out areas of:
	▶ Top cover: 10 mm (0.394")
	▶ left and right side: 10 mm (0.394")
	▶ Front and rear panel: 10 mm (0.394")
	▶ Bottom side (no keep out area)

To mount using mounting brackets:

1. Consider which set of mounting holes is required for the mounting option.

   If mounting with the top cover ventilation holes facing the mounting surface, use the mounting holes shown in Figure 21, pos. 1.

   If mounting with the bottom side facing the mounting surface, use the mounting holes as shown in Figure 21, pos. 2.

2. With either the right or left sides facing upwards, align the mounting bracket's mounting holes with the correct mounting-hole pair on the KBox B-201's side.

3. Fasten the first mounting bracket to KBox B-201's side using a torx (08 x 60) screwdriver.

4. Attach the second mounting brackets on the opposite side, as in step 2 to 3.

5. Use the wall mount's key mounting holes Figure 21, (pos. 3), to mount on a wall or desktop while observing the specified clearance of 10 mm (keep out area) shown in Figure 22 and Figure 23.

Figure 22: Keep Out Areas – with Top Cover facing the Mount Surface

Keep Out Areas

(top cover, right & left sides)

10 mm

10 mm

10 mm

10 mm

10 mm

10 mm

10 mm

Keep Out Areas

(front & rear panel and right & left sides)
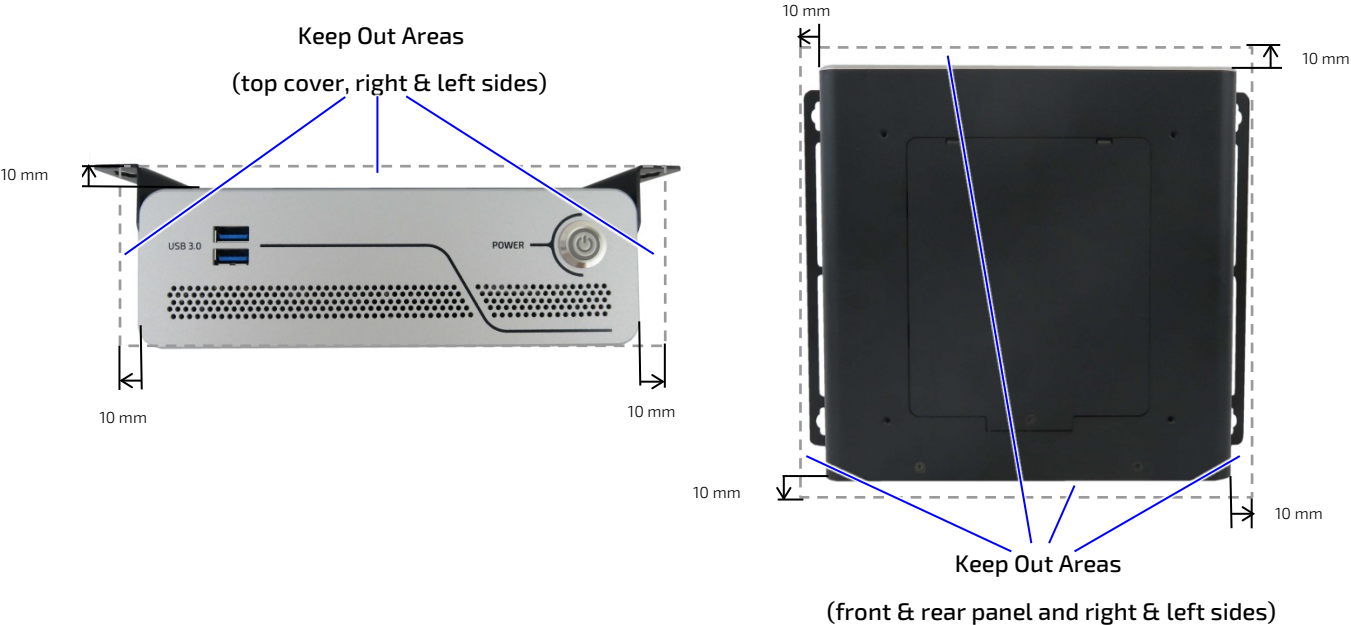
Figure 23: Keep Out Areas – with Bottom Side facing the Mount Surface

Keep Out Areas

(top cover, right & left sides)

10 mm

10 mm

10 mm

10 mm

10 mm

10 mm

10 mm

Keep Out Areas

(front & rear panel and right & left sides)
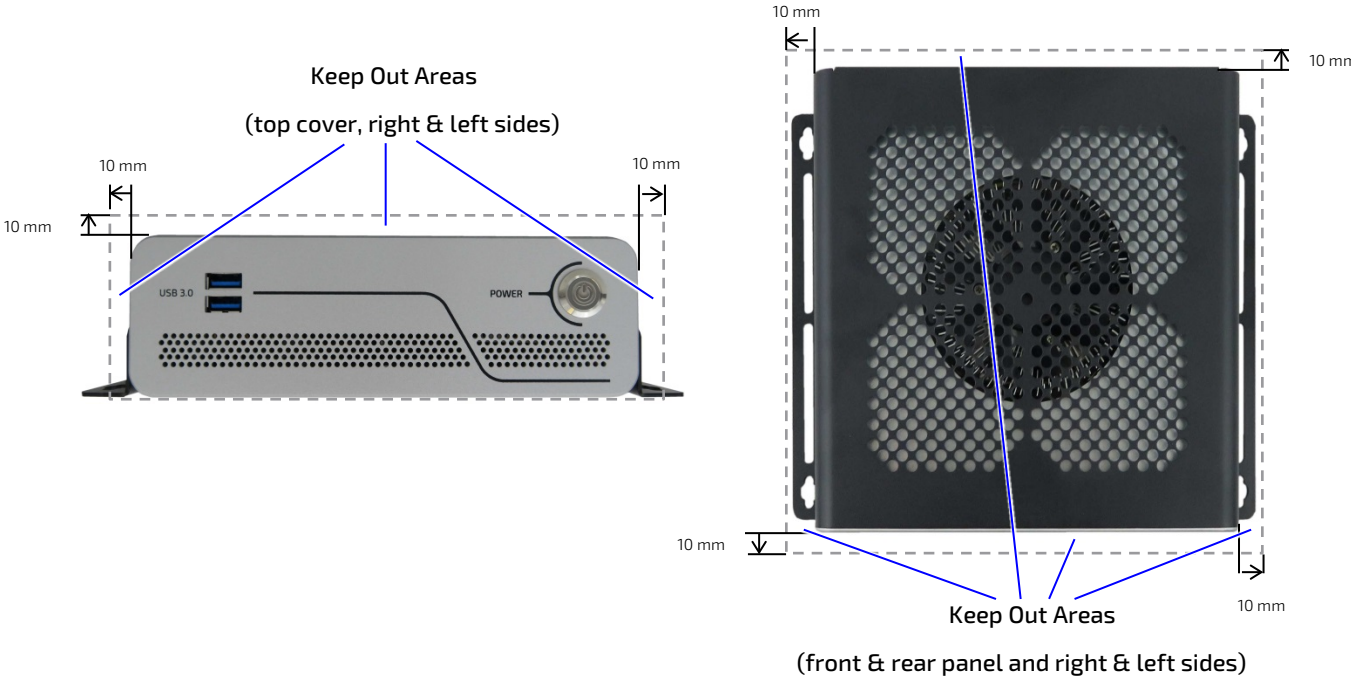
8.3.1. Mount Options

Figure 24: Mounting Brackets Desktop Mount Options

Mounted (fixed) on a desktop
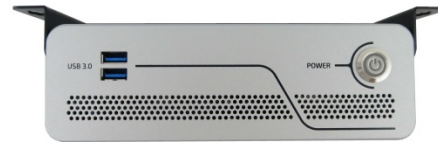
Mounted (fixed) underneath a desktop

| **⚠WARNING** | **Danger of Fire** |

If mounted horizontally with the top cover facing downward, the KBox B 201 may overheat and hot substances may exit through the top cover's ventilation holes causing a fire hazard. To avoid risk of fire observe the following:

▶ Do not mount with the top cover facing downward.(inverted orientation)

▶ Use the allowed mount orientations only:
   ▶ Horizontally top cover facing upwards
   ▶ Vertically top cover facing the mount surface
   ▶ Vertically bottom side facing the mount surface

Figure 25: Mounting Brackets Wall Mount Options

KBox B-201 mounted with bottom side facing the mounting surface (four mount options)

Front panel (above)

Front panel (below)

Front panel (right)

Front panel (left)

KBox B-201 mounted with top cover ventilation holes facing the mounting surface (four mount options)

Front panel (above)

Front panel (below)

Front panel (right)

Front panel (left)

8.4. VESA 100 Mount Assembly (Option)

The VESA mount assembly mounts the KBox B-201 and external PSU on the back of a monitor supporting VESA 100.

Figure 26: VESA Mounting Assembly Kit

The VESA 100 mount assembly kit contains:

1. VESA 100 mounting frame

2. Hook and loop band (length 40 mm, width 25 mm)

3. 4x screws (M4x 20 mm)

4. 4x screws (M3x 8 mm)

5. 4x spacers (4 mm)

> **i**   Using the VESA 100 mount assembly, only vertical mounting is possible.

To mount the KBox B-201 with PSU on the VESA 100 mounting frame, perform the following:

1. View the KBox B-201's bottom side to check that no chassis feet are installed. If feet are installed, removed the feet before mounting the KBox B-201 on the VESA 100 mounting frame.

2. Align the four mounting holes on the KBox B-201's bottom side with the four mounting holes on the VESA 100 mounting frame.

Figure 27: KBox B-201 Mounting Position
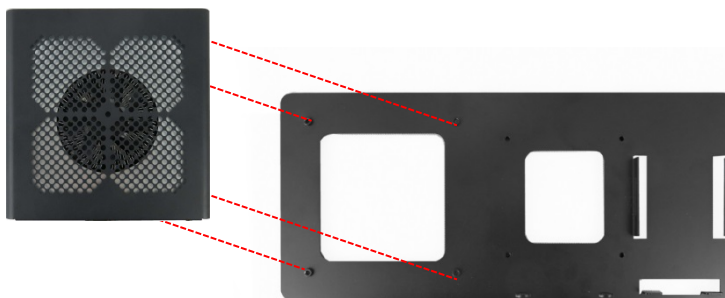
3. Insert the supplied four M3x 8 mm screws into the rear side of the VESA 100 mounting frame and using a torx screwdriver (10) fasten the KBox B-201 to the VESA 100 mounting frame.

4. Open the flexible hook and loop band to the band's full length and with the rough fastening side facing downward feed the band through the threading slots on the left and right PSU aligning brackets as shown in Figure 28.

Figure 28: Inserting the Band

Threading slots on the left and right PSU aligning brackets
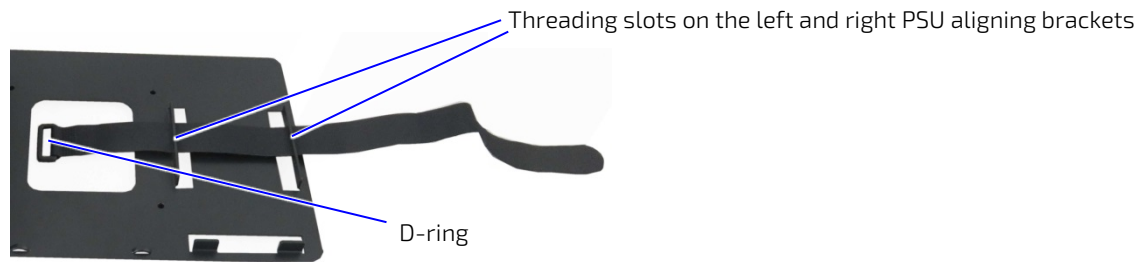
D-ring

5.   Double back with the flexible hook and loop band and feed the rough end through the band's D-ring. Pull the band through the D-ring and press approximately 30 mm to 50 mm of the self-gripping sides together to form a loose loop. Lift the bottom part of the loop to meet the top part to form a gap between the band and the VESA 100 mounting frame, as shown in

Figure 29: Positioning the PSU   Gap for the PSU

Two holding brackets
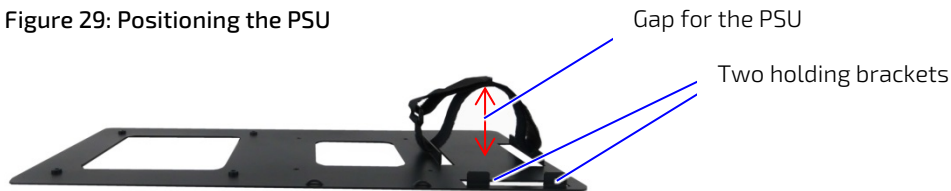
6.   Slot the PSU, with the 3-pin AC connector facing towards the bottom of the VESA 100 mounting frame, into the gap made in step 5 and feed the PSU between the left and right PSU aligning brackets. Push down until the PSU rests on the two holding brackets at the bottom.

7.   Secure the PSU by opening the self-gripping sides and pulling the band away from the D-ring as far as possible and re-securing the band tightly.

Figure 30: KBox B-201 and PSU Mounting Position
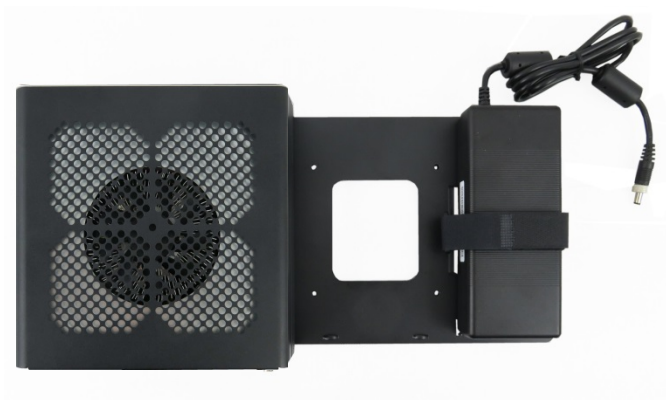
8.4.1. Mount Options

The VESA 100 mount assembly mounts either directly on the rear side of the monitor, see Chapter 8.4.1.1: Mounting on non VESA Mount Stand Monitor or on the rear side of the monitor using the monitors stand, see Chapter 8.4.1.2: Mounting on Monitor with VESA 100 Stand.

> **i**   Using the VESA 100 mount assembly, only vertical mounting is possible.

8.4.1.1. Mounting on non VESA Mount Stand Monitor

1. Feed the four supplied (M4x 20 mm) screws through the four-mount hole on the VESA mount frame and attach one of the supplied spacers on the screw's free end (Figure 31).

Figure 31: Non-VESA Stand Monitor Assembly
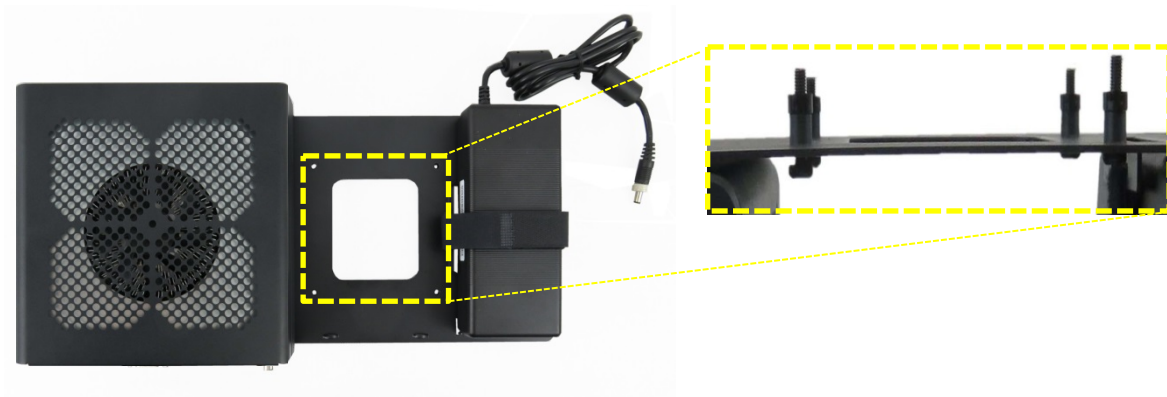
2. Align the free end of the screw with the VESA 100 mount holes on the back of the monitor.

3. Fasten the four screws to secure the VESA 100 mount assembly to the back of the monitor.

Figure 32: Installed VESA 100 Mount Assembly on a non-VESA Stand Monitor

8.4.1.2. Mounting on Monitor with VESA 100 Stand

1. Remove the monitor's stand.

2. Feed the supplied four supplied (M4x 20 mm) screws through the four mounting holes on the monitor's stand and attach one of the supplied spacers to the screw's free end (Figure 33).

Figure 33: VESA Monitor Stand Assembly
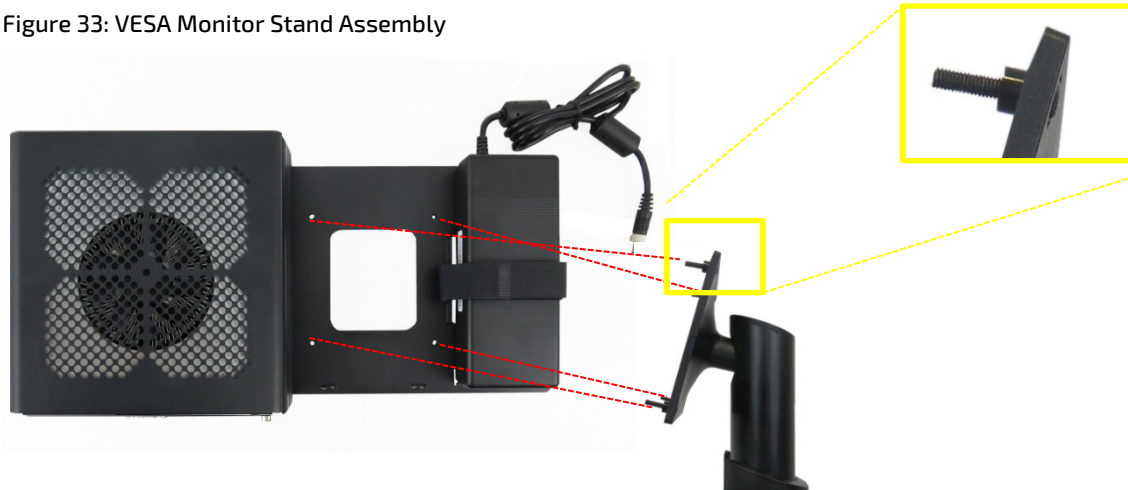
3. First insert the free end of the screw (with spacer) through the four mount hole on the VESA mount frame and then onto the VESA 100 mount hole on the back of the monitor.

4. Fasten the four screws to secure the VESA 100 mount assembly to the back of the monitor.

Figure 34: Installed VESA 100 Mount Assembly with VESA Stand Monitor

9/ Starting Up

The KBox B-201 comes hardware configured, and on request with a pre-installed Operating System (OS) and all the necessary drivers (in accordance with the ordered hardware configuration); enabling full operation when powered on for the first time.

9.1. Connecting to DC Power Supply

⚠CAUTION	Only use the supplied DC mains PSU when powering up the KBox B-201. The KBox B-201 must be connected DC mains power supply with the delivered PSU with nominal voltage of +12 V DC of type SELV (Safety Extra Low Voltage) meeting the requirements of EN 60950-1 standard.

Connecting to the DC power supply should always be the last step before starting up the KBox B-201. Install any expansion devices and check that cables are properly connected, before connecting to the PSU.

To power up the KBox B-201, perform the following:

1. Set up the system with any expansion devices and SSDs.
2. Check that the I/O connections on the rear side are correctly connected.
3. Check that the top cover and SSD drive bay cover are secured.
4. Connect the supplied PSU to the DC-IN connector on the rear panel, see Figure 5 (pos. 10)
5. Connect the other end of the PSU to a mains power source.
6. Press the front panel Power-on button, see Figure 4 (pos. 3).
7. The KBox B-201 is now in the powered on state and the Power-on button lights up blue.

9.2. Power On/Off Procedure

The power-on button powers on and off the KBox B-201. The power-on button includes an integrated power LED that lights up blue to indicate the powered on state. By pressing the power-on button for longer than four seconds initiates a forced system shutdown, before turning off the power to the system.

Once the system has been shut down, it can restarted by pressing the power-on button, if power is still applied to the main input power connector, DC-IN.

⚠CAUTION	The KBox B-201 is only completely powered off by disconnecting the power cable from the mains power socket or system's DC-IN connector. The power-on button can still leave parts of the KBox B-201 energized.

⚠CAUTION	Do not operate the KBox B-201 with foreign objects inside the chassis. Kontron rejects all liability for damages resulting from operation with foreign objects inside the chassis.

NOTICE	Do not disconnect the power from your system while the system is in the powered on state! Performing a forced shutdown can lead to loss of data or other undesirable effects!

9.3. Operating System (OS) and Hardware Component Drivers

The KBox B-201 supports flexible software options with different Operating System (OS) and drivers support for factory configured hardware components.

If ordered with a pre-installed OS and all appropriate drivers (in accordance with the ordered hardware configuration) the system is fully operational when powered on for the first time.

If ordered without a pre-installed OS, users need to install the OS and the appropriate drivers (in accordance with the ordered hardware configuration) before powering on for the first time.

For information regarding supported software, see Table 8: Software Specification.

> **i** To download relevant KBox B-201 drivers for the factory installed hardware components visit Kontron's EMD customer section at https://emdcustomersection.kontron.com.

> **i** Pay attention to the manufacturer OS specifications relating to the integrated hardware components.

10/ Technical Data

10.1. Block Diagram- KBox B-201

Figure 35: KBox B-201 System Block Diagram
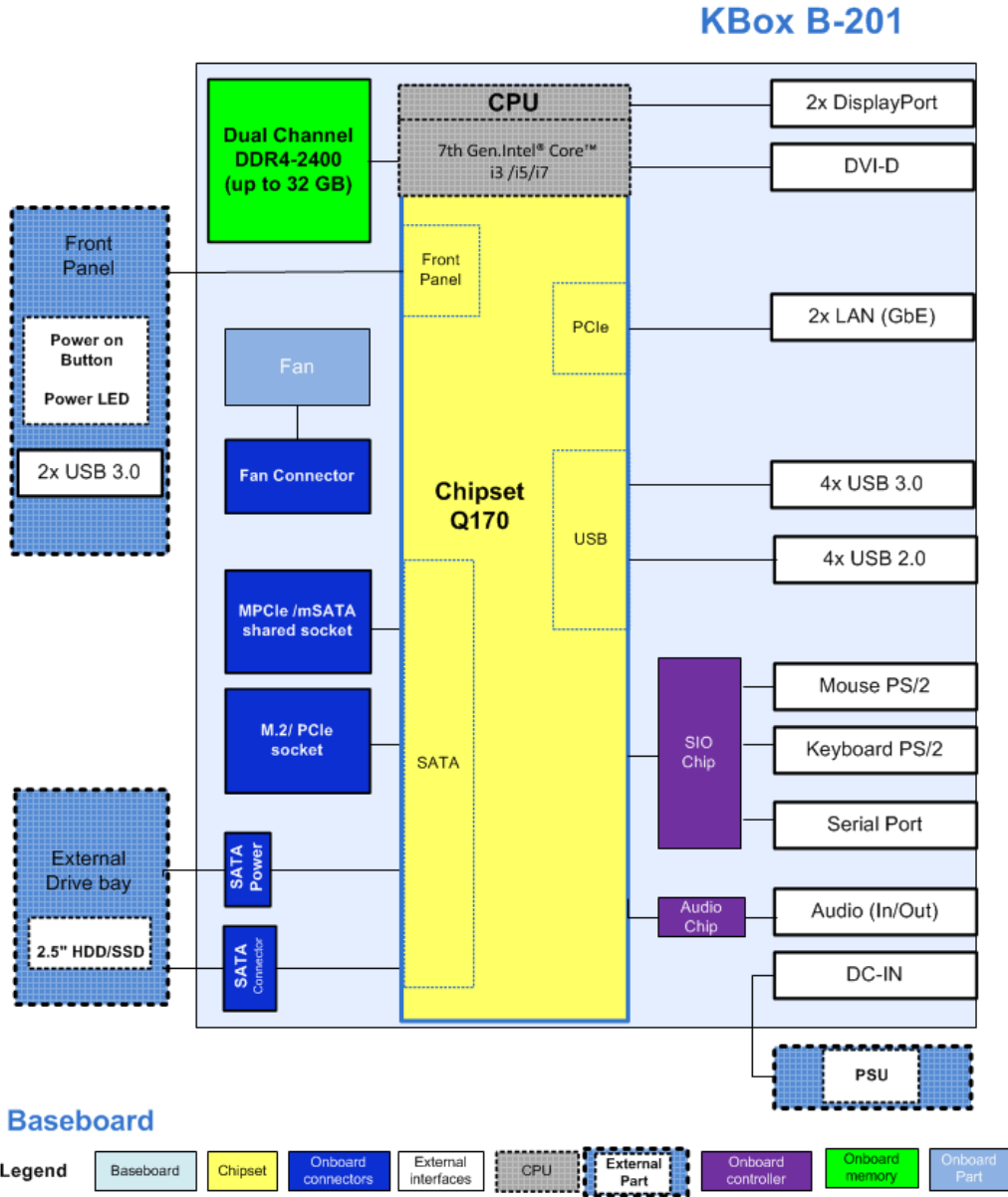
10.2. Technical Specification

Table 3: Mainboard Specification

Type/Product Name	D3433-S2
Form factor	Mini-ITX (170mm x 170 mm) (6.7" x 6.7")
Processor	7th Gen. Intel® Core™ i3/i5/i7 Max. 65W TDP
Chipset	Intel® Q170
Memory	DDR4 – 2400 Up to 32 GB with SO DIMM
Expansion	1x M.2 socket for 2242/2260 for PCIe (2-lanes) or SATA based M.2 modules 1x shared mSATA /mPCIe (half-size/full-size) and Incl. USB 2.0
Power	+12 VDC Only

Table 4: Processor Specification

Type	Intel® i3-7101E	Intel® i5-7500	Intel® i7 - 7700
Core	2	4	4
Cache	3 MB	6 MB	8 MB Smart
Processor Base Frequency	3.9 GHz	3.4 GHz	3.6 GHz
TDP	54 W	65 W	65 W
Graphics	Intel® HD Graphics, DX12	Intel® HD Graphics, DX12	Intel® HD Graphics, DX12

Table 5: Memory Specification

Quantity	2x
Form Factor	SO DIMM socket (1.2V)
Capacity	Max. 32 GB (8 GB, 16 GB, 32 GB)
Type	DDR4 - 2400 SDRAM, unbuffered, non-ECC

Table 6: Storage Specification

External SSD Drive Bay	
Quantity	1x
Size	2.5"
Capacity	512 GB, 1 TB
Interface	SATA III / SATA-600
Internal M.2 Storage	
Quantity	1x
Size	2242 (22 mm x 42 mm)
Capacity	128 GB, 256 GB, 512 GB
Interface	SATA III / SATA-600

Table 7: Interface Specifications

External Interfaces – Front side	
USB 3.0	2x USB 3.0
External Interfaces – Rear side	
USB 3.0	4x USB 3.0
USB 2.0	4x USB 2.0
Display Port	2x DP V 1.2 (Resolution: 4096 x 2304 @ 60 Hz Max.)
DVI-D	1x DVI-D (single link or dual link)
LAN	2x LAN (GbE)
Serial Port	1x COM1 (RS232)
Audio	Line in & Line out
PS/2	Mouse & Keyboard
DC-In	1x 15 A power Jack
Internal Sockets	
mSATA/mPCIe (shared)	1x shared mSATA /mPCIe (half-size/full-size) SATA III Configured via BIOS setup
M.2	1x M.2 (2242/ 2260) 22-pin, length 42 mm / length 60 mm

> **i**
>
> It is possible to install the following expansion cards combinations together:
> - ▶ mSATA /mPCIe full-size + M.2 (2242)
> - ▶ mSATA/mPCIe half-size + M.2 (2260 or 2240)

Table 8: Software Specification

Operating System (OS)	Windows® 10 IOT LTSB Linux
BIOS	AMI Aptio 5.x (UEFI) BIOS

Table 9: Chassis Specification

Chassis	Zinc coated steel sheet (RAL 7021)
Dimensions (D x W x H)	190 mm x 190 mm x 60 mm (7.48" x 7.48", 2.36")
Front Panel	Aluminum (grey)
Cooling	Fan cooled, axial fan, Silent fan

Table 10: Power Supply Specification

Input Voltage Range	100 VAC – 240 VAC
Output Voltage	+12 VDC
Input / Output Current	2 A max. / 12.5 A max. (150 W)

10.3. Mechanical Specification

The mechanical specification of the KBox B-201 and the possible mounting options is shown in Table 11: Mechanical Specification.

Table 11: Mechanical Specifications

KBox B-201	Dimensions	
Depth	190 mm (7.48")	
Width	190 mm (7.48")	
Height	60 mm (2.36")	
Weight (without packaging)	Approx. 2 kg (4.41 lbs.)	
Mounting Options	Mounting bracket (depth x width x height)	187 mm x 45 mm x 20 mm (7.36" x 1.77" x 0.79")
	Vertical stand (depth x width x height)	187 mm x 100 mm x 12 mm (7.36" x 3.94" x 0.47")
	VESA 100 mount assembly (depth x width x height)	10.4 mm x 402.9 mm x 180 mm (0.41" x 15.86" x 7.09")

10.3.1. Dimension Diagrams – KBox B-201

For more detailed mechanical information, refer to the outline dimensions diagrams in this chapter. Each dimension drawing shows the main external mechanical dimensions.
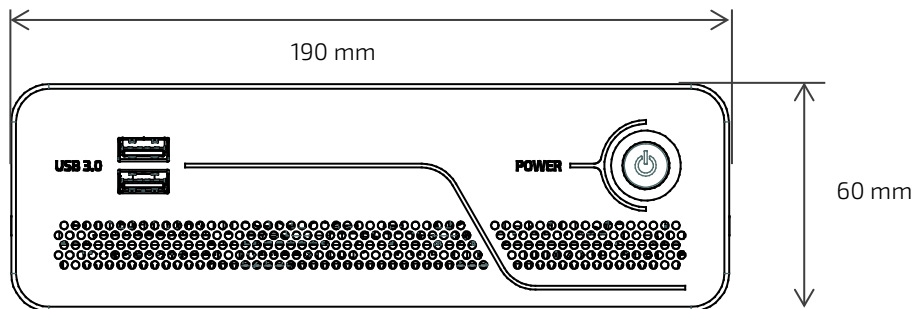
Figure 36: Dimensions Front Panel

Figure 37: Dimensions Rear Panel
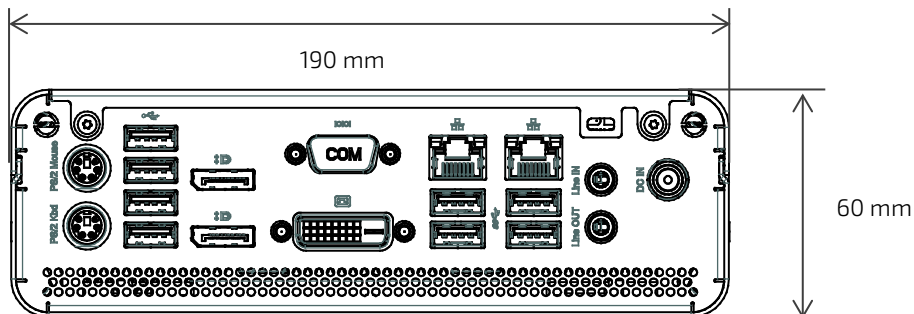
Figure 38: Dimensions Top Cover

6.5 mm

190 mm

190 mm
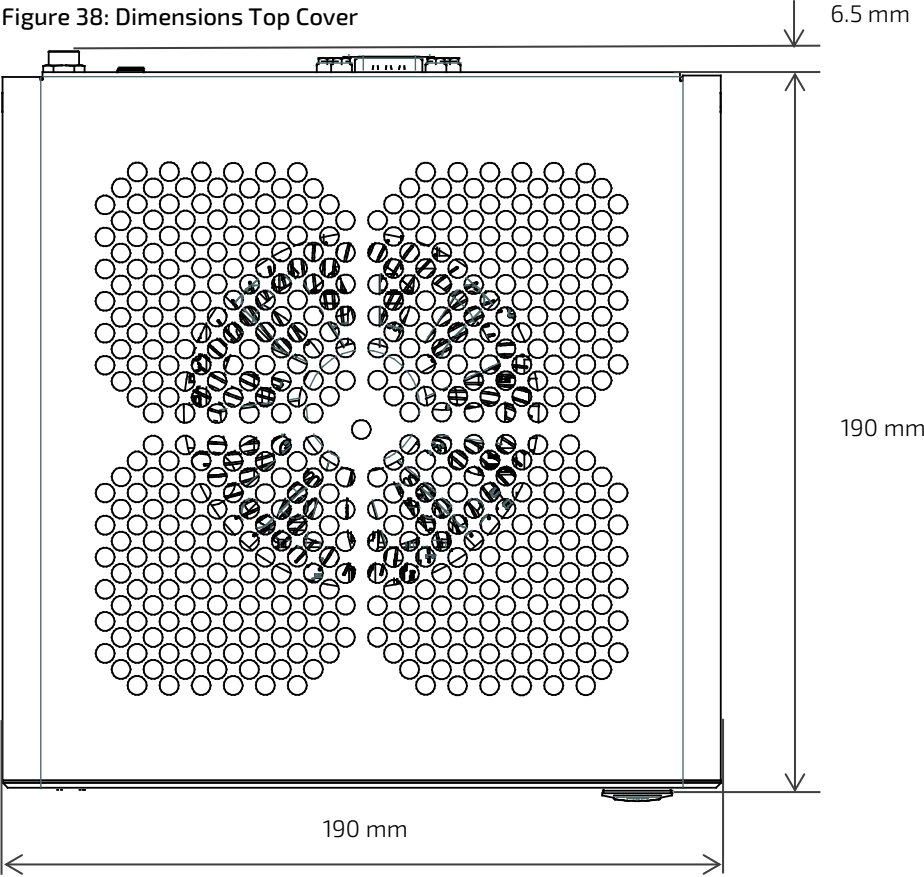
Figure 39: Dimensions Bottom Side

190 mm

190 mm
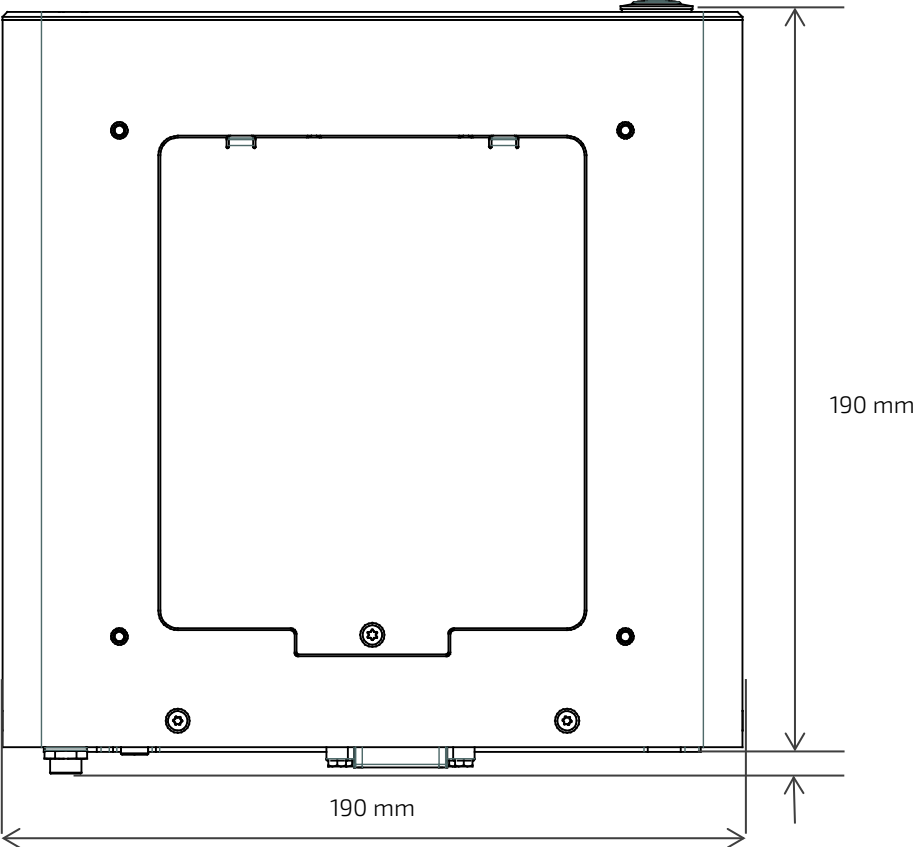
Figure 40: Dimensions Right Side and Left Side
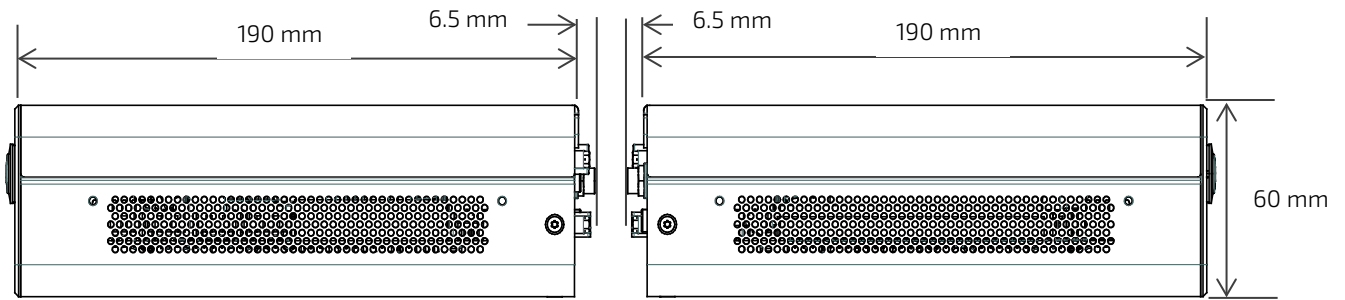
10.3.2. Dimension Diagrams- Wall Mount Brackets

The dimension drawing shows the main mounting bracket mechanical dimension.

Figure 41: Dimensions with Mounting Brackets
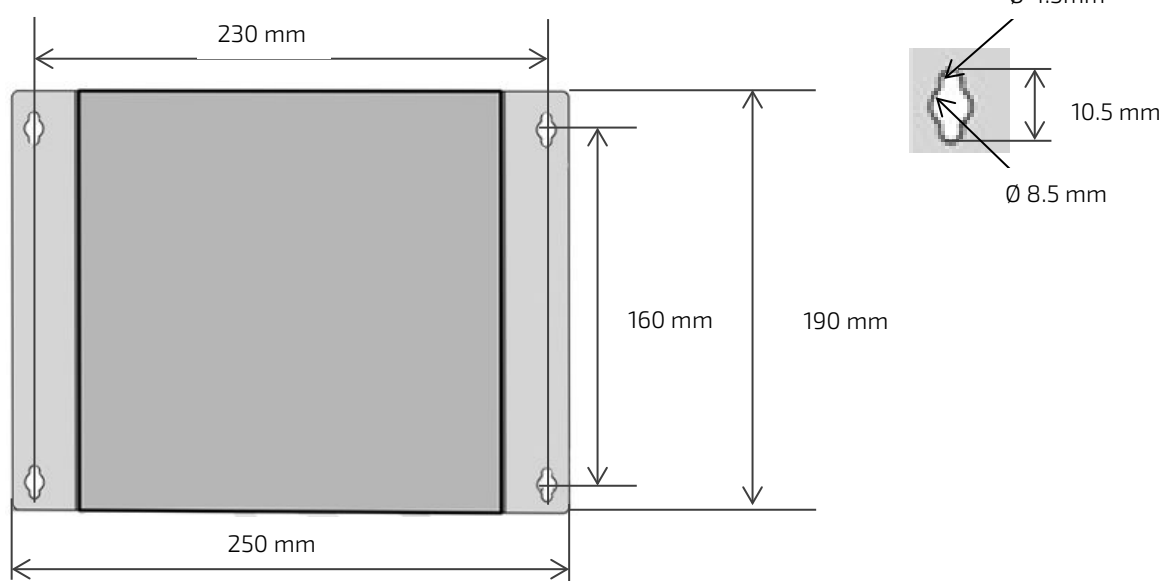
10.4. Environmental Specification

Table 12: Environmental Specification

Temperature (Operating)	0°C - 45°C (32°F – 113°F)
Temperature (Non-Operating)	-20°C - +80°C (-4°F - 176°F)
Relative Humidity (Operating)	93% RH @ 40°C, non condensing
Relative Humidity(Non-Operating)	93% RH @ 40°C, non condensing
Altitude (Operating)	5000 m Max. (approx. 16400 ft.)
Noise (dB)	34 dB (A) at 25°C Sea level, 1 m, Full CPU/GPU load
Shock (Operating)	Half sine, 15 g, 11 ms, half sine, acc. to IEC 60068-2-27
Vibration (Operating)	5 Hz - 500 Hz, 1 G acceleration, acc. to IEC 60068-2-6

10.5. Directives and Standards

 All tests were made with the Power Supply Unit (PSU) supplied with the KBox B-201.

Table 13: Directives and Standards Compliance

CE	Council Directive 93/68/EEC	
EMC	Emission (Class B)	EN 55032 EN 6100-3-2 EN 61000-3-3
	Immunity	EN 55024
Safety	CB certificate - IEC 62368-1 NRTL - UL 62368-1 / CAN/CSA-C22.2 No. 62368-1	
FCC	Compliant with the regulations of the Federal Communications Commission (FCC) 47 CFR part 15 / ICES-003 rules to limit the potential of harmful interference. [1] The FCC class is dependent on the implemented PSU.	
Environment	WEEE Directive	Directive 2002/96/EC 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
	RoHS II Directives	Compliant with the Restriction of Hazardous Substances (RoHS) directive in electrical and electronic equipment
	REACH	Compliant with the Registration, Evaluation, Authorization and restriction of Chemicals (REACH) directive to identify the intrinsic properties of chemical substances earlier
MTBF	62257 hours @ 40°C, based on Telcordia SR-332 Issue 3 For KBox B-201 assembly with 8 GB system memory, SSD and processor fan.	

[1] The use of shielded I/O cables is required when connecting the KBox B-201 to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

10.6. Power Specification

The KBox B-201 has no internal power supply and is powered only via the supplied power supply Unit (PSU) connected to the + 12 V DC Jack (DC-IN) on the rear panel. The mainboard is supplied by +12 V DC and generates all other required voltages.

> **NOTICE**   Hot Plugging the power supply is not supported. Hot plugging may damage the mainboard.

10.6.1. External Power Supply Unit (PSU)

The KBox B-201 is supplied by an external 12 V only PSU.

Table 14: Power Supply Unit (PSU) Specification

PSU	AC Input, 150 W (external)
PSU Size (D x W x H)	171 mm x 72 mm x 40 mm
Input Voltage Range	100 VAC – 240 VAC
Input Current	2 A Max.
Efficiency	86% min. (100 VAC, 12.5 A Load)
Output Voltage	+12 V DC
Output Current	12.5 A max. (150 W)

10.6.2. Power Consumption

The estimated power consumption of the KBox B-201 in a standard configuration and with and without external 2.5" SSD is shown in Table 15: Power Consumption.

Table 15: Power Consumption

Components	Maximum Power Consumption
Mainboard + Processor + RAM	96 W
SSD	4 W
Mainboard + Processor + RAM + SSD	100 W

If expansion cards are added, the overall power consumption increases. User must ensure that the overall power consumption of the system does not exceed the PSU power specification of 150 W.

10.6.3. Ground

Signal ground is connected to the chassis GND inside the system.

11/ External Interface - Pin Assignments

11.1. DC IN Power Connector Pin Assignment

The DC IN power connector is a barrel jack (5.5 mm/ 2.5 mm) with center pole and an input voltage of 12 V only.

Table 16: DC power Jack Pin Assignment
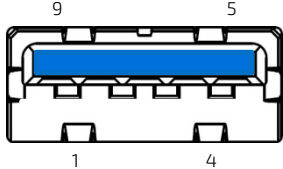
Pin	Signal	Power Jack
Centre pole	12 V	
Outer ring	Ground	

NOTICE Hot plugging the power connectors might damage the board and is not allowed.

When connecting to the mainboard, turn off the mains supply to make sure all power lines are turned off.

11.2. USB 3.0 Connector Pin Assignment

Table 17: USB 3.0 Connector Pin Assignment

PIN	Signal Name	Pin	Signal Name	9-pin USB 3 (Type A) Port
1	+5V (fused protected)	5	RX–	
2	Date–	6	RX+	
3	Data+	7	GND	
4	GND	8	TX–	
		9	TX+	

i Low-active signals are indicated by a minus sign.

11.3. USB 2.0 Connector Pin Assignment

Table 18: USB 2.0 Connector Pin Assignment
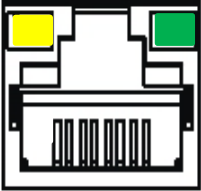
Pin	Signal Name	4-pin USB Connector Type A Version 2.0
1	+5 V (fused protected)	
2	Data–	
3	Data+	
4	GND	

> ℹ Low-active signals are indicated by a minus sign.

11.4. LAN GbE Connector Pin Assignment

Table 19: LAN (GbE) Connector Pin Assignment

Pin	Signal (10/100/1000)	Signal (10/100)	RJ45 (female)
1	MX1+	TX+	
2	MX1–	TX–	
3	MX2+	RX+	
4	MX3+	TERMPLANE	
5	MX3–	TERMPLANE	
6	MX2–	RX–	
7	MX4+	TERMPLANE	
8	MX4–	TERMPLANE	
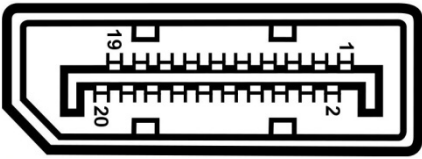
> ℹ Low-active signals are indicated by a minus sign.

Table 20: LAN Link Activity

Speed (Mbps)		LINK/ACT	
		LINK	Link and Activity
10	off	on	blinking
100	green	on	blinking
1000	Yellow	on	blinking

11.5. Display Port (DP) V1.2 Connector Pin Assignment

Table 21: Display Port (DP) Connector Pin Assignment
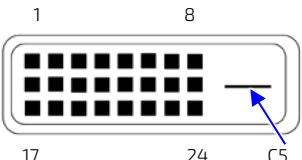
Pin	Signal Name	Display Port Connector	Signal Name	Pin
1	Link0+		GND	2
3	Link0-		Link1+	4
5	GND		Link1-	6
7	Link2+		GND	8
9	Link2-		Link3+	10
11	GND		Link3-	12
13	DVI dongle detect		GND	14
15	AUX+		GND	16
17	AUX-		Hot Plug detect	18
19	GND (return)		+3.3V (fuse protested)	20

> **i** Low-active signals are indicated by a minus sign.

11.6. DVI-D Connector Pin Assignment

Table 22: DVI-D Connector Pin Assignment
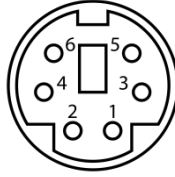
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	DVI-D Connector	
1	Data2-	9	Data1-	17	Data0-		
2	Data2+	10	Data1+	18	Data0+		
3	GND	11	GND	19	GND		
4	NC	12	NC	20	NC		
5	NC	13	NC	21	NC		
6	DDC Clock	14	+5 V (fuse protected)	22	GND		
7	DDC Data	15	GND	23	Clk +		
8	NC	16	Hot Plug Detect	24	Clk -	C5	GND

> **i** DVI-D dual Link connector supports single link only.
> Low-active signals are indicated by a minus sign.
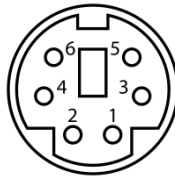
11.7. PS/2 Keyboard Connector Pin Assignment

Table 23: PS/2 Keyboard Connector Pin Assignment

Pin	Signal Name	PS/2 Keyboard Connector
1	Data	
2	NC	
3	GND	
4	+5V (fuse protected)	
5	Clock	
6	Keyboard_On (low asserted pulse)	

11.8. PS/2 Mouse Connector Pin Assignment

Table 24: PS/2 Mouse Connector Pin Assignment

Pin	Signal Name	PS/2 Mouse Connector
1	Data	
2	NC	
3	GND	
4	+5V (fuse protected)	
5	Clock	
6	NC	

11.9. Audio Line-out and Audio Line-in Connector Pin Assignment

The audio female barrel connector supports audio line-out (green) and audio line-in (blue) high definition audio signals or legacy audio signals selectable in the BIOS setup menus.
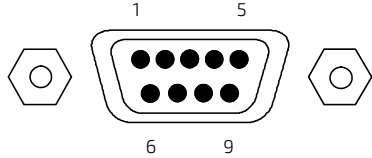
Table 25: Audio Line-out Audio Line-in Pin Assignment

Connector	Signal	Audio Barrel Connectors
Green	Line-out	
Blue	Line-in	

11.10. Serial Port Connector Pin Assignment

Table 26: Serial Interface COM1 port (RS232) Connector Pin Assignment

Pin	Signal Name- RS232		9-pin D-SUB Connector
1	DCD	(Data Carrier Detect)	
2	SIN	(Signal In)	
3	SOUT	(Signal out))	
4	DTR	(Data Terminal Ready)	
5	GND		
6	DSR	(Data Set Ready)	
7	RTS	(Request to Send)	
8	CTS	(Clear to Send)	
9	RI	(Ring Indicator)	

12/ BIOS

The KBox B-201 uses the AMI Aptio 5.x (UEFI) BIOS supported by the D3433-S2 mainboard. The uEFI BIOS features a variety of enhanced functions specifically tailored to the KBox B-201's hardware features:

▶ Recovery BIOS

▶ BIOS and CPU Microcode Update

▶ Plug & Play

▶ Boot support for M.2 SSD (PCIe-based or SATA-based modules, AHCI / NVME)

▶ Silent Fan

▶ Multi Boot

▶ Always On

▶ Never Off

> ℹ️ **The BIOS features listed in this user guide are open to change and may not be available in the latest version of the mainboard's BIOS.**

12.1. Starting the uEFI BIOS

The uEFI BIOS comes with a Setup program that provides quick and easy access to the individual function settings for control or modification of the uEFI BIOS configuration. The Setup program allows for access to various menus that provide functions or access to sub-menus with further specific functions of their own.

To start the uEFI BIOS Setup program, perform the following:

1. Power-up the board.

2. Wait until the first characters appear on the screen (POST messages or splash screen).

3. Press the <DEL> key.

4. If the uEFI BIOS is password-protected, a request for password will appear. Enter either the User Password or the Supervisor Password, press <RETURN>, and proceed with step 5.

5. A Setup menu appears.

The KBox B-201 uEFI BIOS Setup program uses a hot key navigation system. The hot key legend bar is located at the bottom of the Setup screens. The following table provides a list of navigation hot keys available in the legend bar.

Table 27: Navigation Hot Keys Available in the Legend Bar

Sub-screen	Description
<F1>	<F1> key invokes the General Help window
<->	<Minus> key selects the next lower value within a field
<+>	<Plus> key selects the next higher value within a field
<F2>	<F2> key loads previous values
<F3>	<F3> key loads optimized defaults
<F4>	<F4> key Saves and Exits
<→> or <←>	<Left/Right> arrows selects major Setup menus on menu bar, for example, Main or Advanced
<↑> or <↓>	<Up/Down> arrows select fields in the current menu, for example, Setup function or sub-screen

Sub-screen	Description
<ESC>	<ESC> key exits a major Setup menu and enters the Exit Setup menu
	Pressing the <ESC> key in a sub-menu displays the next higher menu level
<RETURN>	<RETURN> key executes a command or selects a submenu

12.2. BIOS Update

To ensure compatibility with new operating systems (OS), hardware or software and to integrate new BIOS functions Kontron recommends updating the BIOS.

For information regarding KBox B-201 mainboard BIOS updates, visit http://support.ts.fujitsu.com/ and enter the mainboard's product name for direct access to the mainboard's "Product Support" website including a "Downloads" section with the latest BIOS update.

> **For the implemented mainboard's product name, see Table 3: Mainboard Specification.**

13/   Technical Support

In order to request technical support, please send an email with the information below to support@kontron.com

▶   Product name
▶   Product model number
▶   Serial number of the unit
▶   Brief problem description
▶   Complete company address

Customers with service portal access may maintain their tickets directly in the service portal.

> **The serial number can be found on the type label, placed on the bottom side of the chassis.**

13.1. 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:

> **Kontron's RMA Information website can be found at:**
> **http://www.kontron.com/support-and-services/support/rma-information**

Download the RMA Request sheet for Kontron Europe GmbH, Augsburg 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 (product name, material number and serial-number). If more than one product is sent in a delivery. Fill out the above information in the RMA Request form for each product.

2.   Send the completed RMA-sheet to the given fax or email address at Kontron Europe GmbH. Kontron Europe GmbH will provide an RMA-Number within one business day.

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

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

4. Add the RMA-sheet to the relevant delivery address and include the RMA-No with the shipping paperwork. Sent the product to the following delivery address:

Kontron Europe GmbH
RMA Support
Lise-Meitner-Str. 3-5
86156 Augsburg
Germany

Phone: +49 (0) 821 4086-0
Fax: +49 (0) 821 4086 111
Email: service@kontron.com

5. After Kontron Europe GmbH receives the product, a confirmation of the order is sent via email to the address named on the RMA sheet.

14/ Storage, Transportation and Maintenance

14.1. Storage

If the product is not in use for an extended period time, disconnect the power plug from the mains power source .If it is necessary to store the product then re-pack the product as originally delivered to avoid damage. The storage facility must meet the products environmental storage requirements as stated within this user guide. Kontron recommends keeping the original packaging material for future storage or warranty shipments.

14.2. Transportation

To ship the product use the original packaging, designed to withstand impact and adequately protect the product. When packing or unpacking products always take shock and ESD protection into consideration and use an EOS/ESD safe working area.

14.3. Maintenance

Maintenance or repair on the open product may only be carried out by qualified personnel authorized by Kontron. Equipment from Kontron Europe requires only minimum servicing and maintenance for problem-free operation.

Cleaning

▶ For light soiling, clean the product with a dry cloth. Carefully remove dust from the surface of the chassis using a clean, soft brush.

▶ Stubborn dirt should be removed using a mild detergent and a soft cloth

14.3.1. Replacing Lithium Battery

The lithium battery CR 2032 must be replaced with an identical 3 Volt battery or a Kontron recommended battery. If the on-board Lithium battery needs to be replaced, perform the following:

1. Remove the lithium battery from the holder by pulling the ejector spring outwards.

2. Place a new lithium battery into the battery holder

3. Pay attention to the polarity of the battery.

⚠CAUTION	Danger of explosion when replaced with wrong battery type. Replace only with the same or equivalent type recommended by the manufacturer. The lithium battery type must be UL recognized.

	Do not dispose of lithium batteries in general trash collection. Dispose of the battery according to the local regulations dealing with the disposal of these special materials, (e.g. to the collecting points for dispose of batteries).

15/ Warranty

Kontron defines product warranty in accordance with regional warranty definitions. Claims are at Kontron's discretion and limited to the defect being of a material nature. To find out more about the warranty conditions and the defined warranty period for your region, following the steps below:

1. Visit Kontron's Term and Conditions webpage.

   http://www.kontron.com/terms-and-conditions

2. Click on your region's General Terms and Conditions of Sale.

15.1. Limitation/Exemption from Warranty Obligation

In general, Kontron shall not be required to honor the warranty, even during the warranty period, and shall be exempted from the statutory accident liability obligations in the event of damage caused to the product due to failure to observe the following:

▶ General safety instructions for IT equipment within this user guide

▶ Warning labels on the product and warning symbols within this user guide

▶ Information and hints within this user guide

Additionally, alterations or modifications to the product that are not explicitly approved by Kontron, described in this user guide, or received from Kontron Support as a special handling instruction will void your warranty.

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

Appendix A: List of Acronyms

Table 28: List of Acronyms (Example)

API	Application Programming Interface
BIOS	Basic Input Output System
COM	Communication port
DC	Direct Current+
DP	Display port
DVI	Digital Video Interface
ECC	Error Checking and Correction
ESD	Electro Static Device
FRU	Field Replaceable Unit
GbE	Giga bit Ethernet
GPU	Graphics Processing Unit
HD	High definition
HD/HDD	Hard Disk /Drive
IOT	Internet of Things
IPMI	Intelligent Platform Management Interface
KBD	Keyboard
LAN	Local Area Network
LED	Light-Emitting Diode
LVDs	Low Voltage Device
MTBF	Mean Time Before Failure
PCIe	PCI-Express
mPCIe	Mini PCI-Express
OS	Operating System
PCH	Platform Controller Hub
PS	Power Supply
PSU	Power supply Unit

RAM	Random Access memory
REACH	Registration, Evaluation, Authorization and restriction of Chemicals
RMA	Return of Material Authorization
ROHS	Restriction Of Hazardous Substances
RTC	Real Time Clock
SATA	Serial AT Attchment
mSATA	Mini SATA
SEL	System Event Log
SELV	Separate Extra Low Voltage
ShMC	Shelf Management Controller
SMBus	System Management Bus
SMWI	System Monitor Web Interface
SN	Serial Number
SOL	Serial Over LAN
S/PDIF	Sony/Philips Digital Interface
SSD	Solid State Drive
SSH	Secure Shell
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
USB	Universal Serial Bus
VCC	Voltage Common Collector
VESA	Video Electronics Standards Association
VLP	Very Low Profile
WEEE	Waste Electrical and Electronic Equipment

About Kontron

Kontron is a global leader in embedded computing technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall. For more information, please visit: **www.kontron.com**

▼

Global Headquarters

Kontron S&T AG

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: + 49 821 4086-0
Fax: + 49 821 4086-111
info@kontron.com