USER GUIDE

KBox B-201-CFL

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KBOX B-201-CFL - USER GUIDE

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Intended Use

This embedded Box PC, sold by Kontron, is part of Kontron's B-Series intended for high performance, small form-factor needs with long-term availability. The product can operate in a temperature range from 0°C to plus 45°C; the storage elements can withstand temperatures from minus 20°C to plus 80°C, and a humidity of 10 to 93 percent does not affect the function of the product. The KBox B-201-CFL's typical application areas are image processing tasks, plant data collection, as well as manufacturing executive systems (MES). This product's various mounting options guarantee flexibility for multiple user cases, behind a monitor, horizontal and vertical wall mounting or as desktop version as described in this user guide. Users must comply with all product specifications stated in the product documentation and this user guide. If it is intended, to incorporated the product into any total systems or applications, please carry out sufficient, compatibility and functions tests prior to any use or resale.

THIS PRODUCT IS NOT DESIGNED, MANUFACTURED OR INTENDED FOR USE OR RESALE FOR THE OPERATION OF 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 products as a component in High Risk Applications is entirely at your own risk. To minimize the risks associated with your systems and applications, you must provide adequate design and operating safeguards. You are responsible to ensure that your systems (and any Kontron hardware or software products incorporated in your systems) meet all applicable requirements. Unless otherwise stated in the product documentation, the Kontron product is not provided with error-tolerance capabilities and therefore cannot be deemed as being engineered, manufactured or setup to be compliant for implementation or for resale as a component 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	2019-June-14	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 product, make sure that the product is disconnected from the mains.
- Switching off the product 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 product. Ensure that there is free and easy access to enable disconnection.
- The product 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 product has visible damages.
  - The product is no longer functioning.

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

Additional safety instructions for DC power supply circuits

- To guarantee safe operation of product s with DC power supply voltages larger than 60 volts DC or a power consumption larger than 120 VA, please observe that:
  - The product 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 product itself.
  - No cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
  - A reliable protective earth connection is provided
  - A suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the product 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 products cause no electrical hazards
- A sufficient dimensioning of the power cable wires must be selected – according to the maximum electrical specifications on the product label – as stipulated by EN60950-1 or VDE0100 or EN60204 or UL508 regulations.
- The products does 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 product 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-CFL'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-CFL made by Kontron and focuses on describing the KBox B-201-CFL'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-CFL is part of Kontron's Box PC family designed for high performance needs in a small form factor. Based on the Intel® 8th generation platforms with mini ITX mainboard, the KBox B-201-CFL 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).

The KBox B-201-CFL family comprises of a Smart and Value variant, enabling users to choose the level of connectivity required for their application. Additional internal or externally accessible memory allows for quick and easy memory expandability.

General KBox B-201-CFL features are:

KBox B-201-CFL (Smart)

- 8th Gen. Intel® Core™ i3/i5/i7
- Chipset Intel® Q370
- Up to 32 GB DDR4-2666 UDIMM with dual SODIMM sockets
- Memory Expansion
  - 2.5" SSD drive bay (external)
  - M.2 (internal)
- External Rear Interfaces
  - 2x LAN
  - 4x USB 2.0
  - 2x USB 3.1 Gen 1
  - 2x USB3.1 Gen 2
  - 2x DP V1.2
  - 1x DVI-D
  - 1x Audio line-in, 1x Audio line-out
  - 1x PS/2 keyboard, 1x PS/2 mouse
  - 1x Serial port
- External front interfaces: 2x USB 3.1 Gen 1
- Active fan cooling
- Low noise
- Wi-Fi (option)
  - Dual band (2.4 GHz/5 GHz), BT 4.1
  - Dual Wi-Fi antenna
- Security features: TPM V2.0 and Kontron APPROTECT (option)

KBox B-201-CFL (Value)

or Chipset Intel® H310

or External Rear Interfaces

- 2x LAN
- 3x USB 2.0
- 2x USB 3.1 Gen 1
- 1x DP V1.2
- 1x DVI-D
- 1x Audio line In and 1x Audio line-out
- 1x PS/2 keyboard, 1x PS/2 mouse
- 1x Serial port

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

Figure 1: KBox B-201-CFL

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-CFL	1	High performance PC box Smart variant with D3633-S mITX mainboard & Intel® Q370 chipset or Value variant with D3634-S mITX mainboard & Intel® H310 chipset
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-CFL vertically on a desktop
Mounting Brackets	Two mounting brackets that attach to the KBox B-201-CFL'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-CFLand PSU on the back of a VESA 100 monitor

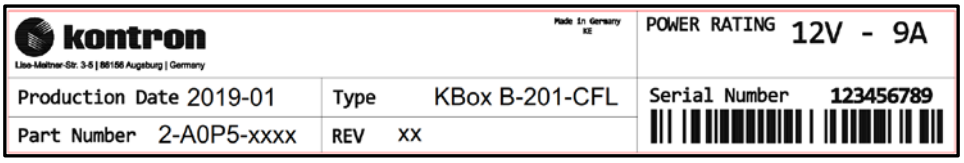
3.1. Packaging

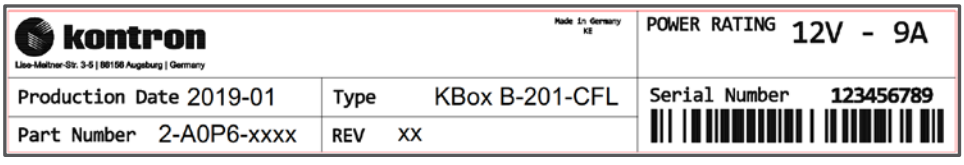
The KBox B-201-CFL is packaged together with all standard parts listed in Table 1: Scope of Delivery, in a product specific cardboard package designed to provide adequate protection and absorb shock.

3.2. Type Label and Product Identification

The type label on the KBox B-201-CFL contains important product information and indicates the product variants; where 2-A0P5-xxxx is the KBox B-201-CFL Smart and 2-A0P6-xxxx is the KBox B-201-CFL Value.

Figure 2: Type Label





4/ Product Overview

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

The KBox B-201-CFL is a small form factor Box PC family with 8th Gen. Intel Core™ platforms, mini ITX mainboard and extensive interfaces on the rear panel. Internal expansion is achieved with a M.2 Key M socket and mPCIe full size/half size socket. Additionally, an external 2.5" SSD drive bay supports further memory expansion.

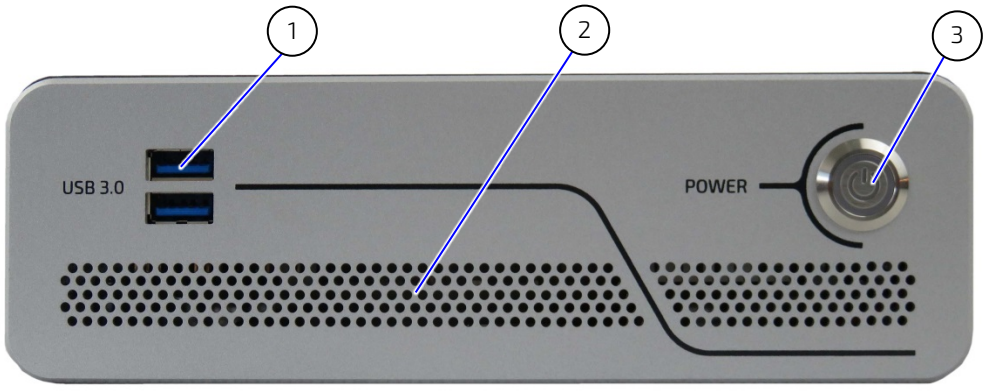
All variants are available in a robust metal chassis that guarantees flexibility in multiple user applications such as behind a monitor, horizontal and vertical wall mounting, or as a movable or fixed desktop version.

Figure 3: KBox B-201-CFL Overview

4.1. Front Side

The front side contains the power-on button, two USB 3.1 Gen 1 ports, and ventilation holes for air-output.

Figure 4: Front Side



1 2x USB 3.1 Gen 1 ports
2 Ventilation holes (air-output)
3 Power-on button with power LED

4.1.1. Front Connectors and Buttons

4.1.1.1. Power-On Button

The power-on button powers on/off the KBox B-201-CFL. 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.

NOTICE

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

4.1.1.2. USB 3.1 Gen 1

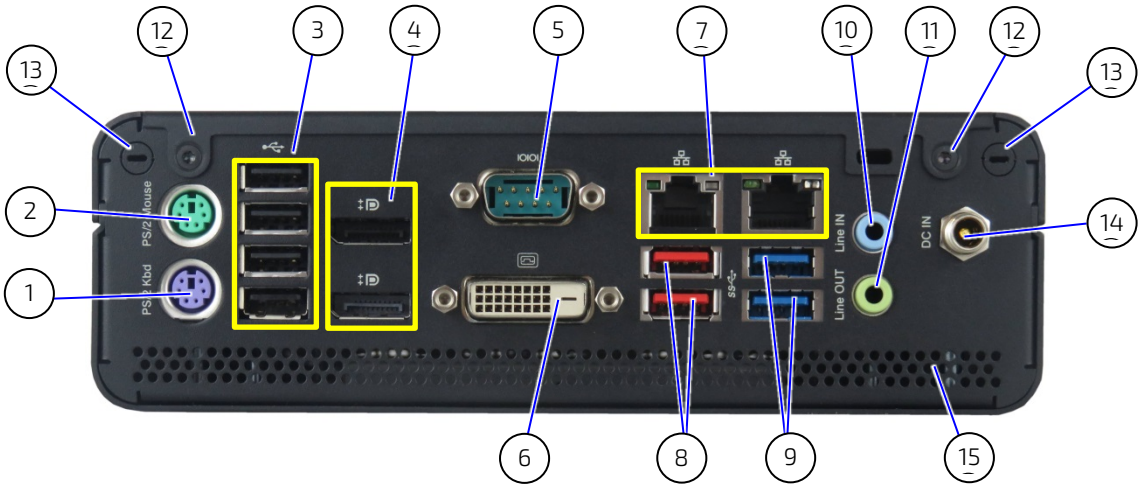
The two front panel USB 3.1 Gen 1 ports are backward compatible allowing for the connection of both USB 3.0 or USB 2.0 compatible devices. Further USB ports are available on the rear panel, see Chapter 4.2: Rear Side.

For the USB 3.0 pin assignment, refer to Chapter 11.2: USB 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment.

4.2. Rear Side

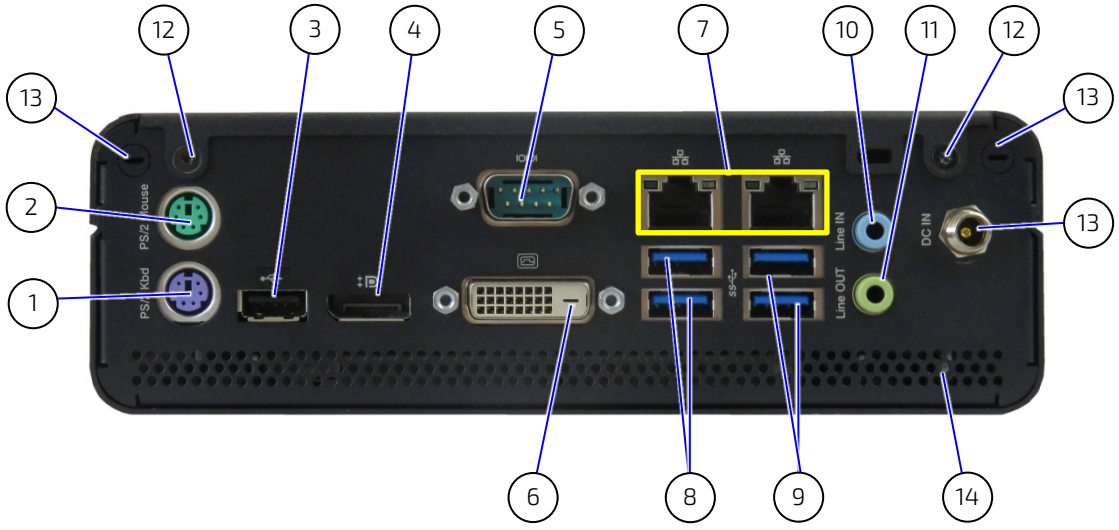
The rear panel contains the main I/O interfaces, power-in connector (DC-IN), ventilation holes for air-output and two top cover fastening screws. The KBox B-201-CFL (Smart and Value) variants support different rear panel I/O interfaces, as shown in Figure 5 and Figure 6.

Figure 5: Rear Panel KBox B-201-CFL (Smart)



1 PS/2 Keyboard
2 PS/2 Mouse
3 4x USB 2.0
4 2x DP
5 Serial port
6 DVI-D
7 2x LAN (GbE)
8 2x USB 3.1 Gen 2
9 2x USB 3.1 Gen 1
10 Audio line-in
11 Audio line-out
12 2x Top cover screws
13 Breakout for Wi-Fi antenna
14 DC-IN
15 Ventilation holes for air-output

Figure 6: Rear Panel KBox B-201-CFL (Value)



1	PS/2 Keyboard	6	DVI-D	11	Audio line-out
2	PS/2 Mouse	7	2x LAN ports (GbE)	12	2x Top cover screws
3	1x USB 2.0	8	2x USB 2.0 ports	13	Breakout for Wi-Fi antenna
4	1x DP	9	2 x USB 3.1 Gen 1 ports	14	DC-IN
5	Serial port	10	Audio line-in	15	Ventilation holes for air-output

4.2.1. Rear Panel Connectors

4.2.1.1. PS/2 Keyboard

The PS/2 Keyboard connector (purple) enables the connection of a keyboard.

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

4.2.1.2. PS/2 Mouse

The PS/2 mouse connector (green) enables the connection of a mouse.

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

4.2.1.3. USB 2.0 Ports

The USB 2.0 ports enable the connection of USB 2.0 compatible devices to the system. The number of USB 2.0 ports depends on the KBox B-201-CFL variant (Smart or Value) see Figure 5, pos. 3 and Figure 6, pos. 3 and 8.

For the pin assignment, see Chapter 11.3: USB 2.0 Port Pin Assignment.

4.2.1.4. DP

The Display Port (DP) enables the connection of external digital displays. The DP V 1.2 port is Dual mode/ DP++ compatible, enabling the support of DP to HDMI (passive + active), DP to DVI (passive + active) and DP to VGA (active only) adapters. The number of DP connectors depends on the KBox B-201-CFL variant (Smart or Value) see Figure 5, pos. 4 and Figure 6, pos. 4.

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

To avoid disturbances, it is recommended not to use DP/VGA, DP/DVI or DP/HDMI active adapters on the DP connectors.

Depending on the KBox B-201-CFL variant up to three digital displays (2x DP + 1x DVI-D) or up to two digital displays (1x DP + 1x DVI-D) digital displays are supported.

4.2.1.5. Serial Ports

The serial port connector enables the connection of a RS232 compatible serial device.

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

4.2.1.6. DVI-D

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

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

To avoid disturbances, it is recommended not to use DVI/VGA or DVI/HDMI adapters on the DVI-D connector.

Depending on the KBox B-201-CFL variant up to three digital displays (2x DP + 1x DVI-D) or up to two digital displays (1x DP + 1x DVI-D) digital displays are supported.

4.2.1.7. LAN Ports

The LAN ports are IEEE1588 capable and enable the connection of Gigabit Ethernet (10/100/1000 Mb/s) devices. The two standard RJ45 connectors including two status LEDs indicating speed and link activity.

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

4.2.1.8. USB 3.1 Gen 2 Ports

The USB 3.1 Gen 2 ports are backward compatible enabling the connection of both USB 3.0 or USB 2.0 compatible devices. Kontron recommends the use on USB 3.1 Gen 2 compliant devices or cables only. Using USB 3.1 Gen 2 devices and cables that violate the USB 3.1 Gen 2 specification may cause conditions such as non-recognition of the device or read/write errors.

To enhance the USB compatibility it is possible to reduce the USB 3.1 Gen 2 port default setting of 10 Gbits/s to 5 Gbits/s in the BIOS setup **Advanced>USB Configuration>USB 3.1 Gen 2 Speed.**

For the pin assignment, see Chapter 11.2: USB 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment.

4.2.1.9. USB 3.1 Gen 1 Ports

The USB 3.1 Gen 1 ports are backwards compatible enabling the connection of both USB 3.0 or USB 2.0 compatible devices. The number of USB 3.1 Gen 1 ports depends on the KBox B-201-CFL variant (Smart or Value) see Figure 5, pos. 9 and Figure 6, pos. 9.

For the pin assignment, see Chapter 11.2: USB 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment.

4.2.1.10. Audio (Line-In, Line-Out)

The audio barrel connectors are audio line-in (blue) and audio line-out (green) enable the connection of High Definition (HD) devices or legacy devices to be connected to the system. Legacy audio signals are selectable in the BIOS setup menus.

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

4.2.1.11. DC-IN

The DC-IN power Jack connects to the supplied +12 V DC Power Supply Unit (PSU) designed to meet the Power requirements of the KBox B-201-CFL. For more information regarding the PSU specification, see Chapter 10.6.1: External Power Supply Unit (PSU).

For the pin assignment, see Chapter 11.1: DC-IN Power Connector Pin Assignment.

4.2.1.12. Wi-Fi (option)

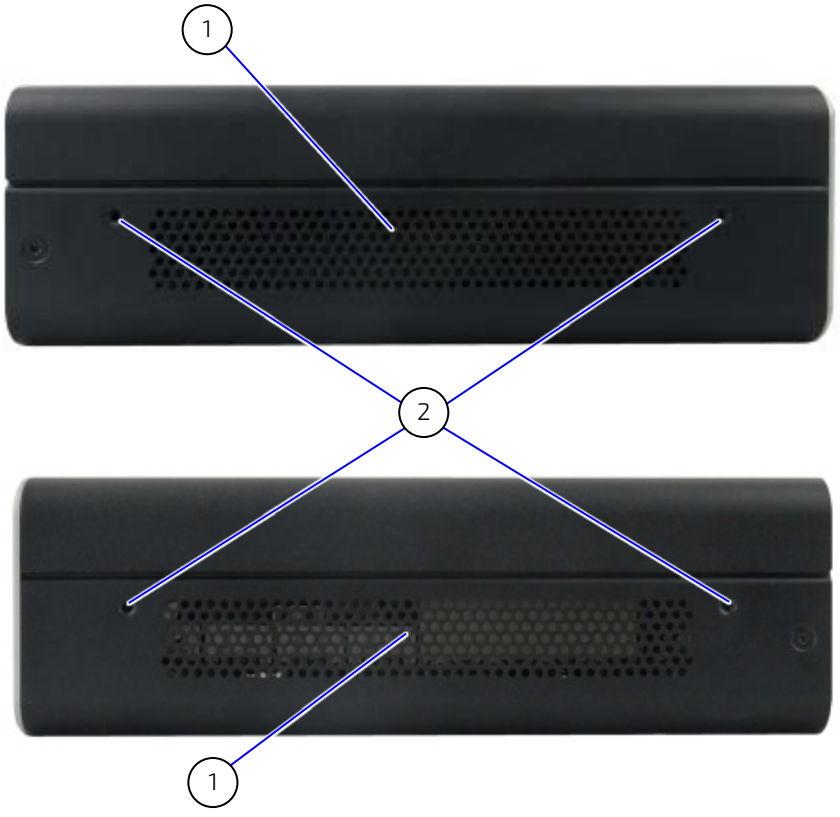
There are two breakouts for factory installed Wi-Fi antenna. The Wi-Fi/Bluetooth option populates the internal mPCIe socket and supports the following technical features:

- Dual band frequencies (2.4 GHz & 5 GHz)
- Bluetooth (BT) 4.1+HS
- IEEE802.11 ac/abgn Wi-Fi certified
- Max speeds 300 Mbps on N & 867 Mbps on AC

4.3. Left and Right Sides

The right and left sides contain ventilation holes for air-output. The two threaded screw holes available on both sides (Figure 7, pos. 2) are used to attach the mounting brackets, see Chapter 8.3: Mounting Brackets (Option) or alternatively to attach the vertical stand, see Chapter 8.2: Vertical Stand (Option).

Figure 7: Left Side and Right Side Views



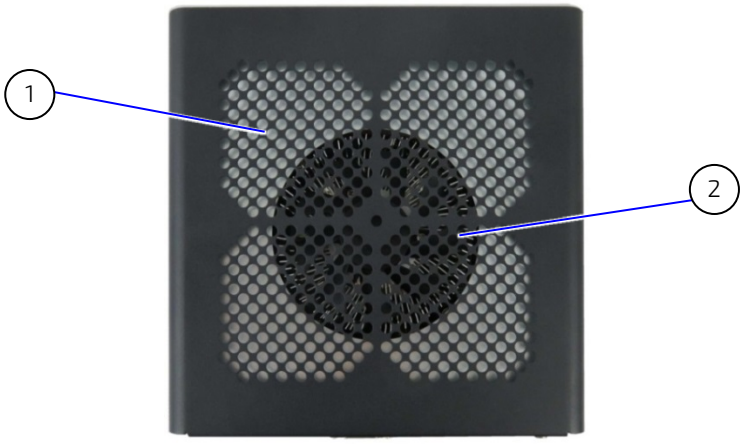
1 Ventilation holes (air-output)

2 2x threaded screw holes for wall mount brackets

4.4. Top Cover and Bottom Sides

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

Figure 8: Top View

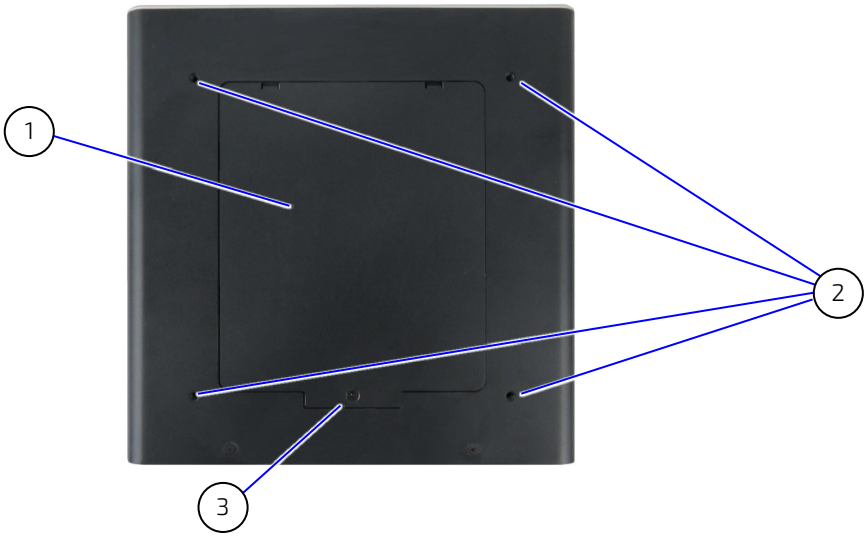


1 Ventilation holes (air-intake)

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 9, pos. 3). The four threaded holes (Figure 9, pos. 2) enable the KBox B-201-CFL 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 9: Bottom View



1 2.5" SSD drive bay cover

2 4 x threaded holes for VESA 100 Mount frame

3 2.5" SSD drive bay cover screw (opens and closes 2.5" SSD drive bay)

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 drives.

5.2. Internal Expansion

It is possible to install a full-size or half -size mPCIe expansion card and/or a M.2 (2242/2262/2280) memory module. Due to space limitations and a possible mechanical collision, not every mPCIe expansion card and M.2 module combination is possible.

The supported M.2 module and mPCIe expansion card combinations are:

- M.2(2280) module
- M.2(2260/2242) module + mPCIe (half-size)
- M.2(2242) module + mPCIe (full-size)

The KBox B-201-CFL (Smart or Value) variant with optional Wi-Fi is delivered with the mPCIe socket populate with a half-size mPCIe card. This must be taken into consideration when adding M.2 modules.

5.2.1. mPCIE Socket

The onboard mPCIe (PCIE x1) socket supports:

KBox B-201-CFL (Smart)

- 1x mPCIe expansion card
- Full-size or half-size
- Supporting PCIe Gen 3 & USB

KBox B-201-CFL (Value)

- 1x mPCIe expansion card
- Full-size or half-size
- Supporting PCIe Gen 2 & USB

When expanding the KBox B-201-CFL with a mPCIe expansion card (full- size or half-size), users must consider whether a 2242/2260/2280 form factor card M.2 module is installed in the neighboring M.2 socket. Due to space restrictions, not every M.2/mPCIe combination is possible. For the allowed M.2/mPCIe socket combinations, see Chapter 5.2: Internal Expansion.

The KBox B-201-CFL variants (Smart or Value) with the Wi-Fi option, are delivered with the mPCIe socket already populate.

5.2.2. M.2 Socket

The onboard M.2 Key M socket supports:

KBox B-201-CFL (Smart)

- 1x M.2 (Key-M) modules
- 2280/2260/2242 form factor
- PCIe-based SSD NVMW modules & 4x PCIe (Gen 3) lanes

KBox B-201-CFL (Value)

- 1x M.2(Key-M) modules
- 2280/2260/2242 form factor
- PCIe-based SSD NVMW modules & 2x PCIe (Gen 2) lanes

No support for SATA based M.2 modules.
HDD Password support for disk drives and M.2 SSD module access protection.

When expanding the KBox B-201-CFL with a M.2 module (2242/2260/2280 form factor), users must consider whether a full-size or half-size mPCIe expansion card is installed in the neighboring mPCIe socket. Due to space restrictions, not every M.2/mPCIe combination is possible. For the allowed M.2/mPCIe 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. Take care to follow these procedures properly when accessing or installing internal components. It is recommended to expand your system with expansion options before mounting the system.

Read and observe 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-CFL 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-CFL 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 system or/and internal components.

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 removing the top cover. Before removing the top cover, observe the safety instructions at the start of this chapter.

⚠WARNING

Operate in the closed condition only

It is only ensured that users do not have access to internal components during operation when the top cover is properly secured with the two top cover fastening screws.

⚠WARNING

Before opening the top cover the system must be powered off, and disconnected from the mains power supply. Disconnect all connected peripheral devices. Observe the General Safety Instructions for IT Equipment within this user guide.

To avoid damaging the system. Ensure that you have a clean, flat and ESD-safe surface to work on.

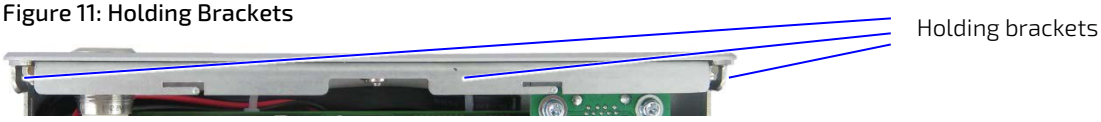
To open the chassis, perform the following:

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-CFL on a flat, clean and ESD-safe surface.
3. Remove the two top cover screws on the rear panel (Figure 10) and retain the screws to secure the top cover later.

Figure 10: Top Cover Fastening 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 holding brackets (Figure 11) on the front panel.

Figure 11: Holding Brackets



5. Once release from the holding brackets lift the top cover vertically away from the chassis to avoid damaging the internal fan assembly. Do not side the top cover off the chassis.

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.

To close the chassis, perform the following:

1. Place the KBox B-201-CFL 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 on to the chassis

To avoid contact between the top cover and the internal fan assembly, First position the top cover in the correct position above the main chassis before carefully moving the top cover downwards.

3. Tilt the front of the top cover downwards towards the front panel and carefully push the top cover onto the holding brackets (Figure 11) 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 with the two screws retained in the step 3 when opening the chassis.

6.2. Opening and Closing SSD Drive Bay Cover

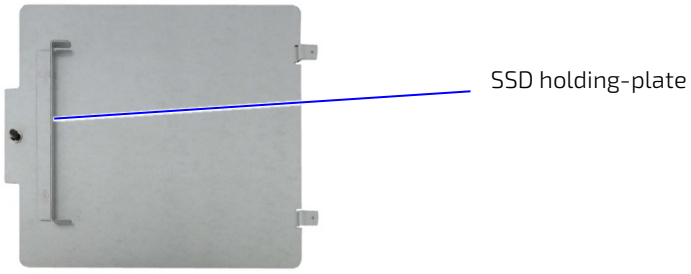
Before opening the SSD drive bay, observe to the safety instructions at the start of this chapter.

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

To open the SSD drive bay, perform the following:

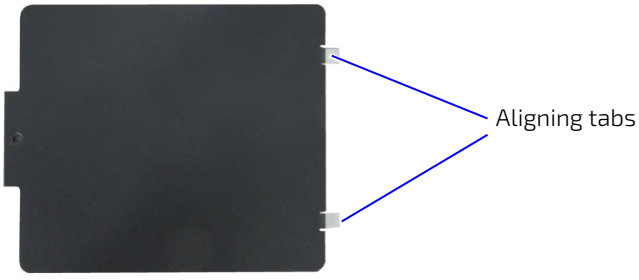
1. Close all applications. Shut down the system properly and disconnect the power cable from the power source. Disconnect all peripherals.
2. Place the KBox B-201-CFL on a flat, clean and ESD-safe surface with the bottom side facing upwards.
3. Remove the screw holding the SSD drive bay cover (use torx screwdriver (08 x 60)) (Figure 9, pos. 3).
4. Lift the SSD drive bay cover a few centimeters to release the SSD from internal SSD holding-plate on the rear side of the SSD drive bay cover (Figure 12).

Figure 12: SSD Drive Bay Cover Rear Side



5. Slide the SSD drive bay cover forward slightly, to release the two aligning tabs (Figure 13).

Figure 13: SSD Drive Bay Cover Top Side



6. Lift to remove the drive bay cover.
7. Close the SSD drive bay cover, by proceeding in the reverse order of steps 3 to 6.

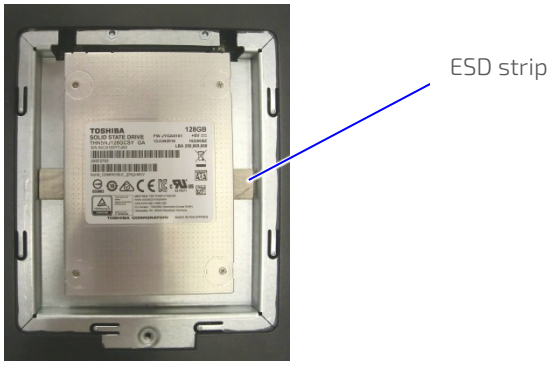
To avoid damaging the SSD drive do not force when closing the SSD drive bay cover
When closing the SSD drive bay cover do not use force. If the cover does not close easily, the metal SSD holding-plate on the rear side may not be aligned correctly and press on the SSD.

6.2.1. Installing and Removing Externally Accessible 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 ESD strip (Figure 14) in the SSD drive bay with the SSD's connector facing the internal SATA connector.

Figure 14: SSD Drive Bay with SSD



3. Align the SSD's connector with the internal SATA connector.
4. Press down on the SSD and gently push the SSD into the SATA connector.
5. Close the SSD drive bay cover as described Chapter 6.2: Opening and Closing SSD Drive Bay Cover (step 7).

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 pull 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 Externally Accessible 2.5" SSD (steps 2 to 4).
5. Close the SSD drive bay cover as described in Chapter 6.2:.Opening and Closing SSD Drive Bay Cover (step 7).

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

6.3. Installing and Removing Internal M.2 SSD

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

1. Close all applications, shut down the system properly, and disconnect the power source. Disconnect all peripherals.
2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis, to open the chassis (steps 1 to 5).
3. Locate the M.2 socket and the corresponding spacer bolt.
4. Insert the M.2 module into the M.2 socket, at an angle (approx. 30°). If required, ease the M.2 module into the socket by moving the module slightly from side to side.
5. Secure the M.2 Module by pressing down on the free end, and carefully fastening the free end to the mainboard with an M3x4 screw to the spacer bolt, until the M.2 module is flat with the mainboard.
6. Close the Chassis as described in Chapter 6.1: Opening and Closing the Chassis, to close the chassis (steps 1 to 4).

After installing or removing a M.2 SSD, the partitioning of the memory maybe different.

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

1. Close all applications, shut down the system properly, and disconnect the power source. Disconnect all peripherals.
2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis, to open the chassis (steps 1 to 5).
3. Locate the installed M.2 module.
4. Remove the M3x4 screw and the M.2 module springs up at the free end.
5. Gently pull the M.2 module out of the M.2 socket.
6. Close the Chassis as described in Chapter 6.1: Opening and Closing the Chassis, to close the chassis (steps 1 to 4).

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

6.4. Installing and Removing Internal mPCIe Expansion Card

To install a mPCIe card, perform the following:

1. Close all applications; shut down the system properly and disconnect the power source. Disconnect all peripherals.
2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis, to open the chassis (steps 1 to 5).
3. Locate the mPCIe card socket and the corresponding solder nut.

4. Insert the mPCIe card into the socket at an angle (approx. 30°) and push the mPCIe card into the socket until the fixing holes of the card align with the mainboard's 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 Chapter 6.1: Opening and Closing the Chassis, to close the chassis (steps 1 to 4).

To remove a mPCIe card, perform the following:

1. Close all applications; shut down the system properly and disconnect the power source. Disconnect all peripherals.
2. Open the chassis as described in Chapter 6.1: Opening and Closing the Chassis, to open the chassis (steps 1 to 5).
3. Locate the installed mPCIe card.
4. Remove the mountings screw and spacer, and the mPCIe card springs up at the free end.
5. Gently pull out the mPCIe card from the socket.
6. Close the chassis as described in Chapter 6.1: Opening and Closing the Chassis, to close the chassis (steps 1 to 4).

7/ Thermal Considerations

7.1. Active Cooling

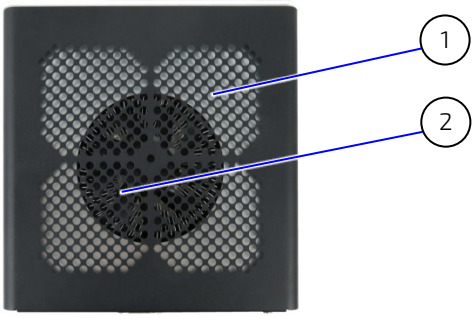
The KBox B-201-CFL is an active fan cooled system. Air enters through the top cover's ventilation holes, (Figure 15, pos. 1) and is distributed over the mainboard by an internal fan before exiting the chassis by the ventilation holes on the right, left, front and rear sides (Figure 16, pos. 1, 2 and 3).

⚠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.

Figure 15: Air-intake Ventilation Holes



1 Top cover ventilation holes (air-intake)
2 Fan

⚠CAUTION

Avoid damaging the mainboard

Do not attach or remove fans while the KBox-B-201-CFL is powered-on.

Figure 16: Air-output Ventilation Hole

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

7.2. Minimum System Clearance (Keep out Area)

To provide maximum airflow through and around the box, a minimum distances to the surrounding environment must be observed. Before installing the KBox B-201-CFL, observe thermal considerations such as keep out areas (Figure 23 and Figure 24).

⚠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)**

7.3. Third Party Components

When configured with third party components such as mPCIe expansion cards, M.2 modules and hard drives (HDD/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-CFL can operate horizontally (upward orientation only) and vertically when mounted on a desk, wall or rear side of a monitor. The KBox B-201-CFL is supplied with four chassis feet. Optional installation accessories are a vertical stand, wall mount brackets, and a VESA 100 mount assembly. Before, installing the KBox B-201-CFL, observe the following:

⚠WARNING

Danger of Fire

If mounted horizontally with top cover facing downward, the KBox B 201-CFL 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 horizontally with the top cover facing downward
- Only use the allowed mount orientations:
  - Horizontally (with top cover facing upwards)
  - Vertically (all possible mount orientations)

⚠CAUTION

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

⚠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-CFL 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-CFL's load by mounting on a flat, solid surface and use of the specified screws.

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

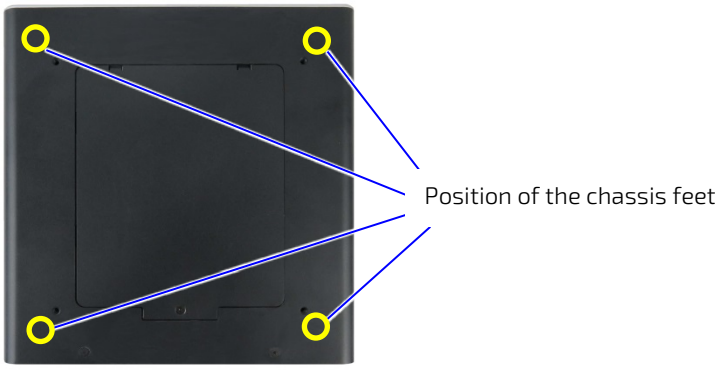
Expansion cards and memory installation should be performed before Installation.

8.1. Chassis Feet

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

1. Ensure that the 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 bottom side (Figure 17).

Figure 17: Position of Chassis Feet



To improve stability, positioning chassis feet between the mounting hole and the outside edge.

8.1.1. Chassis Feet Mount Option

The KBox B-201-CFL with chassis feet can be operated in the upwards horizontal position only as shown in Figure 18.

Figure 18: Chassis Feet Mount Option

⚠WARNING

Danger of Fire

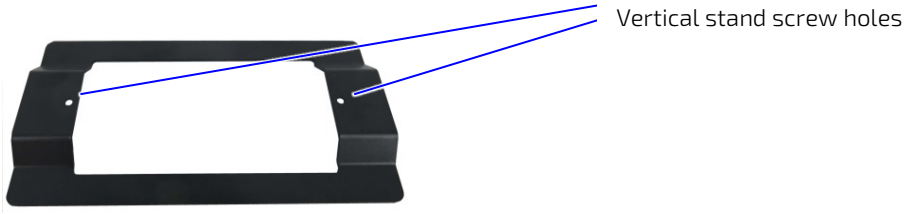
If mounted horizontally with top cover facing downward, the KBox B 201-CFL may overheat and hot substances may exit through the top cover's ventilation holes causing a fire hazard. To avoid risk of fire observe the following:

- DO NOT mount horizontally with the top cover facing downward
- Only use the allowed mount orientations:
  - Horizontally (with top cover facing upwards)
  - Vertically (all possible mount orientations)

8.2. Vertical Stand (Option)

The KBox B-201-CFL can be positioned vertically using a vertical stand (Figure 19).

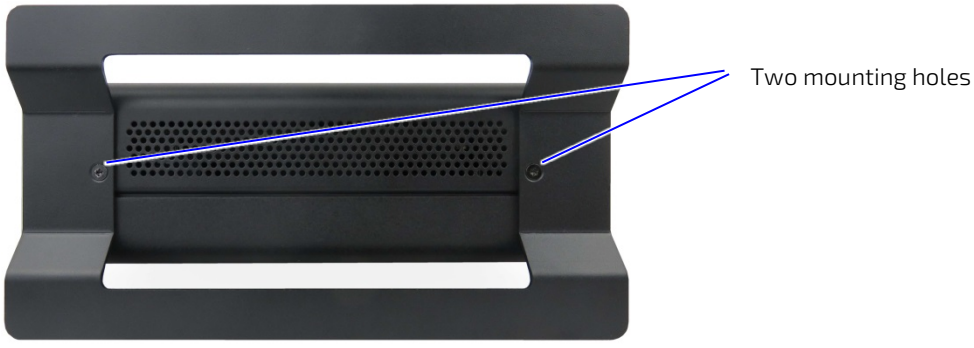
Figure 19: Vertical Stand



To mount the KBox B-201-CFL on the vertical stand:

1. Position 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 side of the chassis.
3. Using a torx (08 x60) screwdriver, fasten the vertical stand to the chassis, (Figure 20).

Figure 20: Vertical Stand Screws



4. Stand in the vertical position (Figure 21).

8.2.1. Vertical Stand Mount Options

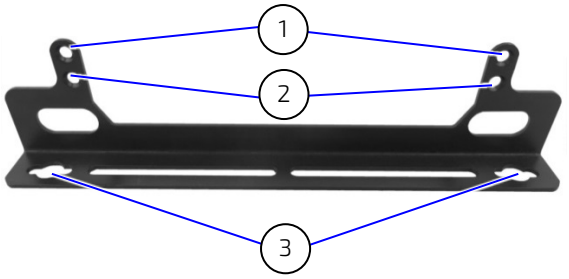
The vertical stand can be installed on either the right side or the left side, as shown in Figure 21.

Figure 21: Vertical Stand Mount Options

8.3. Mounting Brackets (Option)

To mount on a wall (vertically or horizontally) or fix on a desktop (underneath or topside) use the mounting brackets.

Figure 22: Mounting Bracket



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

Each mounting bracket supports two sets of holes. Which set of holes is used depends on whether a keep out area is required for ventilation:

- If the top cover faces the mounting surface, a 10 mm keep out area is required between the top cover and the mounting surface to ensure adequate ventilation and the mounting hole set shown in (Figure 22, pos. 1) must be used.
- If the bottom side faces the mounting surface, no keep out area is required between the bottom side and the mounting surface as the bottom side does not contain ventilation holes and the mounting hole set shown in Figure 22, pos. 2 can be used.

⚠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)**

Attaching the mounting brackets to the KBox B-201-CFL:

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

   If mounting with the top cover facing the mounting surface, to avoid obstructing the top cover's ventilation holes use the mounting holes shown in Figure 22, pos. 1, with a 10 mm keep out area.

   If mounting with the bottom side facing the mounting surface, it is possible to use the mounting holes shown in Figure 22, 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 side of the chassis.
3. Fasten the mounting brackets to the 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 22, pos. 3), to mount on the mounting surface (wall or desktop) while observing the specified clearance of 10 mm (keep out area) as indicated in Figure 23 and Figure 24.

Figure 23: Keep Out Areas – with Top Cover facing the Mount Surface

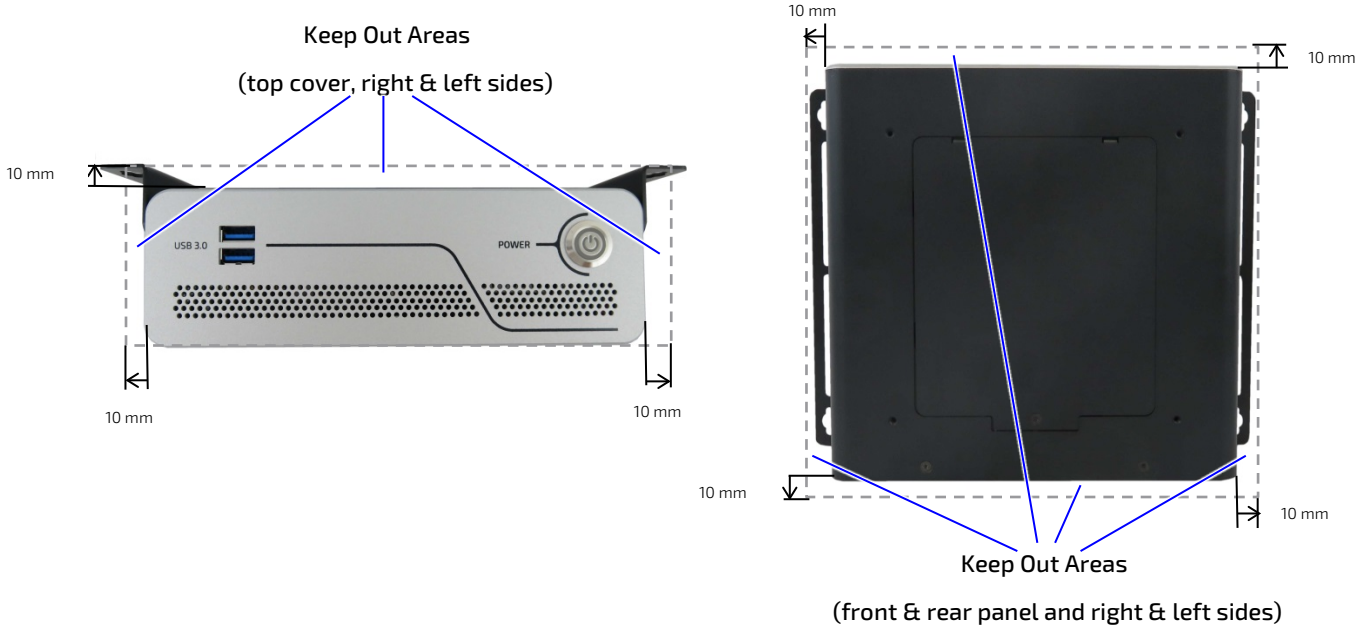
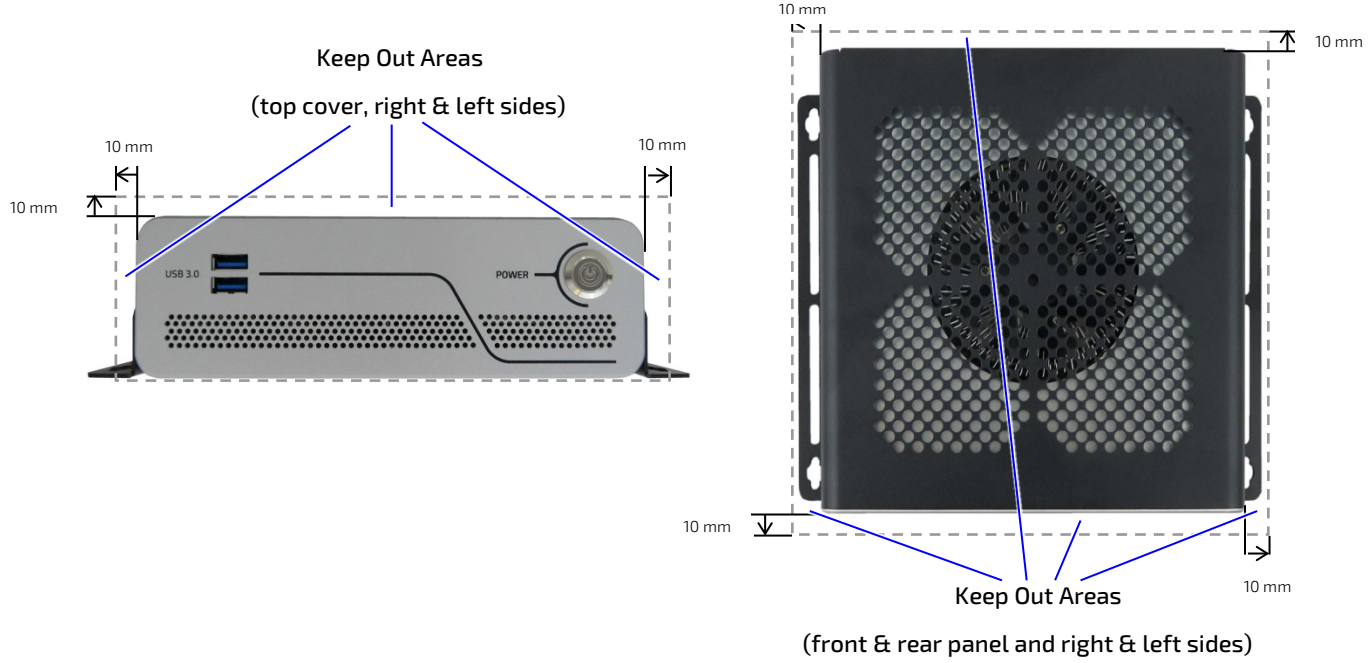
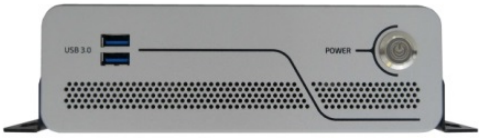


Figure 24: Keep Out Areas – with Bottom Side facing the Mount Surface



8.3.1. Mounting brackets Mount Options

Figure 25: Mounting Brackets Desktop Mount Options



Mounted (fixed) on a desktop

Mounted (fixed) underneath a desktop

⚠WARNING

Danger of Fire

If mounted horizontally with top cover facing downward, the KBox B 201-CFL 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 horizontally with the top cover facing downward**
- **Only use the allowed mount orientations:**
  - **Horizontally (with top cover facing upwards)**
  - **Vertically (all possible mount orientations)**

Figure 26: Mounting Brackets Wall Mount Options

KBox B-201-CFL 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-CFL 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-CFL and external PSU on the rear side of a VESA 100 monitor.

Figure 27: VESA Mounting Assembly Kit

The VESA 100 mount assembly kit contains:

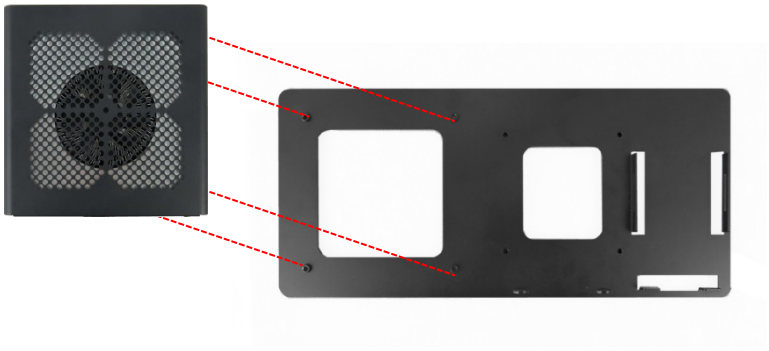
1. VESA 100 mounting frame
2. Hook and loop band (length 40 mm, width 25 mm)
3. 4x screws (M4x 20 mm)
4. 4x screws (M3x 8 mm)
5. 4x spacers (4 mm)

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

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

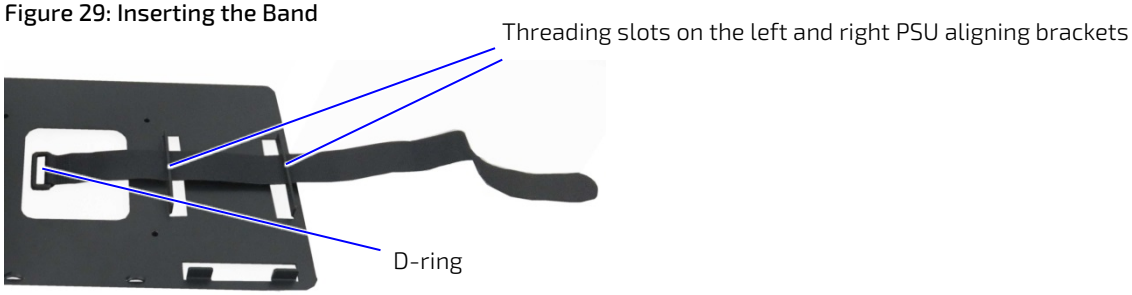
1. Check if chassis feet are installed on the bottom side of the chassis . If feet are installed, removed the feet before mounting on the VESA 100 mounting frame.
2. Align the four mounting holes on the bottom side of the chassis with the four mounting holes on the VESA 100 mounting frame.

Figure 28: KBox B-201-CFL Mounting Position



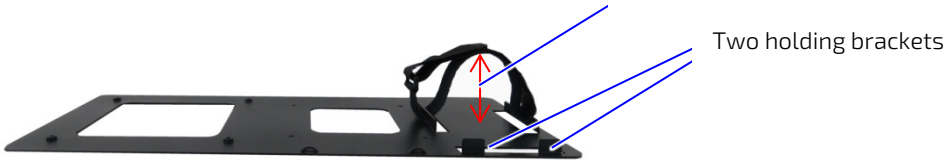
3. Insert the supplied four M3x 8 mm screws into the rear side of the VESA 100 mounting frame and using a Torx screwdriver (10) fasten the chassis to the VESA 100 mounting frame.
4. Open the flexible hook and loop band to the band's full length and with the rough fastening side facing downward feed the band through the threading slots on the left and right PSU aligning brackets, (Figure 29).

Figure 29: Inserting the Band



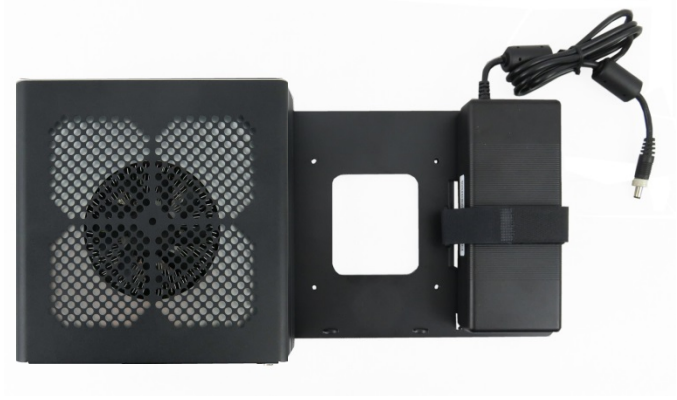
5. Double back with the flexible hook and loop band and feed the rough end through the band's D-ring. Pull the band through the D-ring and press approximately 30 mm to 50 mm of the self-gripping sides together to form a loose loop. Lift the bottom part of the loop to meet the top part to form a gap between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

Figure 30: Positioning the PSU



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 31: KBox B-201-CFL and PSU Mounting Position



8.4.1. VESA 100 Mount Options

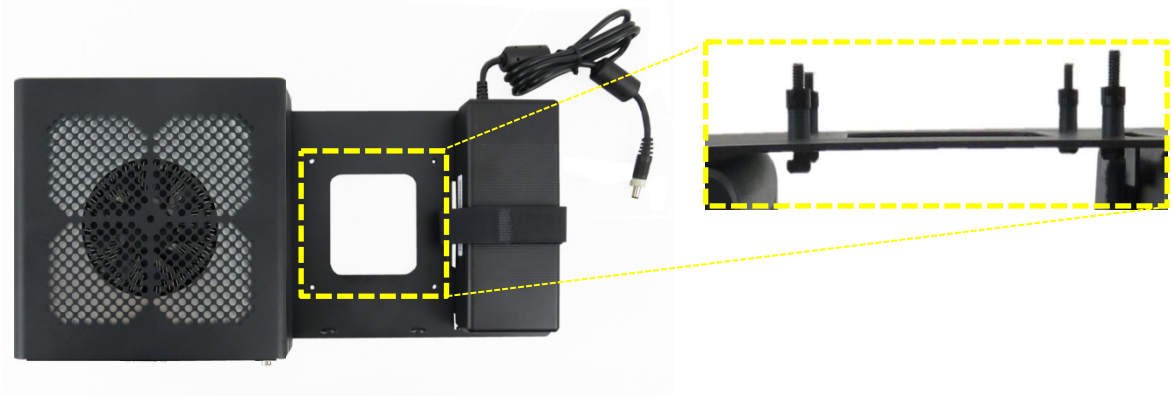
The VESA 100 mount assembly mounts either directly on the rear side of the monitor, see Chapter 8.4.1.1: Mounting on non VESA Mount Stand Monitor or on the rear side of the monitor using the monitors stand, see Chapter 8.4.1.2: Mounting on Monitor with VESA 100 Stand.

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 32).

Figure 32: Non VESA Stand Monitor Assembly



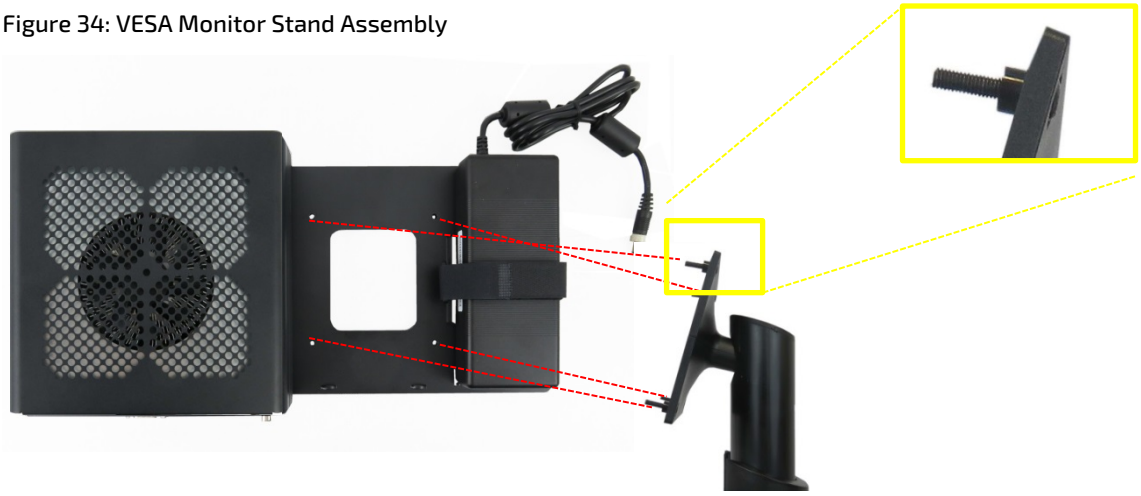
2. Align the free end of the screw with the VESA 100 mount holes on the back of the monitor.
3. Fasten the four screws to secure the VESA 100 mount assembly to the back of the monitor.

Figure 33: Installed VESA 100 Mount Assembly – 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 34)

Figure 34: 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 35: Installed VESA 100 Mount Assembly – non VESA Stand Monitor

9/ Starting Up

The KBox B-201-CFL 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-CFL.

The KBox B-201-CFL must be connected DC mains power supply with the delivered PSU with nominal output 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-CFL. Install any expansion devices and check that everything is properly connected, before connecting the PSU.

To power up the KBox B-201-CFL 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 (Figure 5, pos. 10).
5. Connect the other end of the supplied PSU to a mains power source.
6. Press the front panel Power-on button (Figure 4, pos. 3).
7. The KBox B-201-CFL is now in the powered on state and the Power-on button lights up blue.

As soon as power is applied the KBox B-201-CFL is ready to boot up and start the operating system and applications where available.

9.2. Power On/Off Procedure

The power-on button powers on/off the KBox B-201-CFL. The power-on button includes an integrated power LED that lights up blue to indicate the powered on state. 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-CFL is only completely powered off by disconnecting the power cable from the mains power socket or the DC-IN connector. The power-on button can still leave parts of the KBox B-201-CFL energized.

⚠CAUTION

Do not operate the KBox B-201-CFL 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-CFL 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 7: Software Specification.

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

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

10/ Technical Data

10.1. System Block Diagrams

Figure 36: KBox B-201-CFL (Smart) Block Diagram

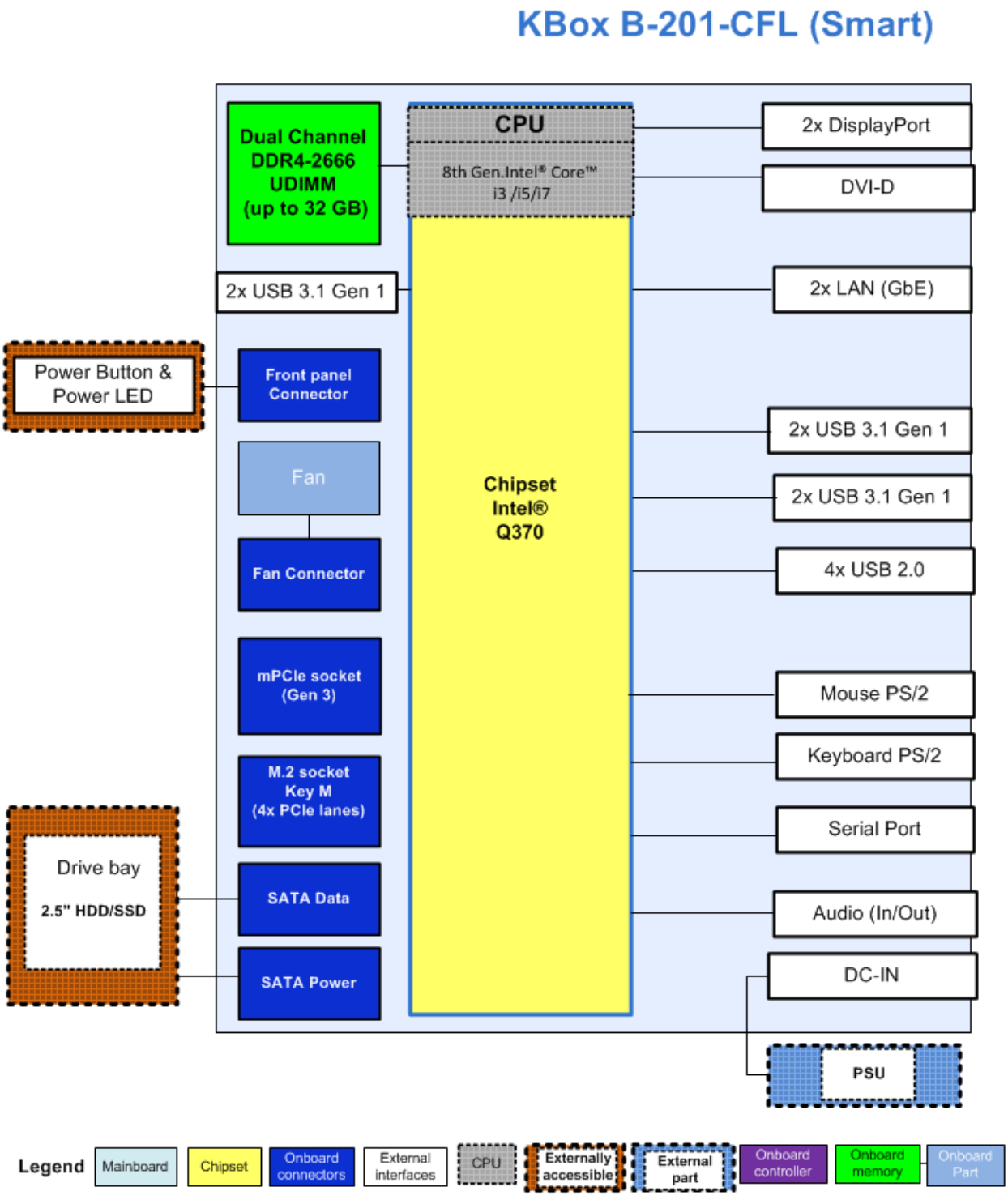
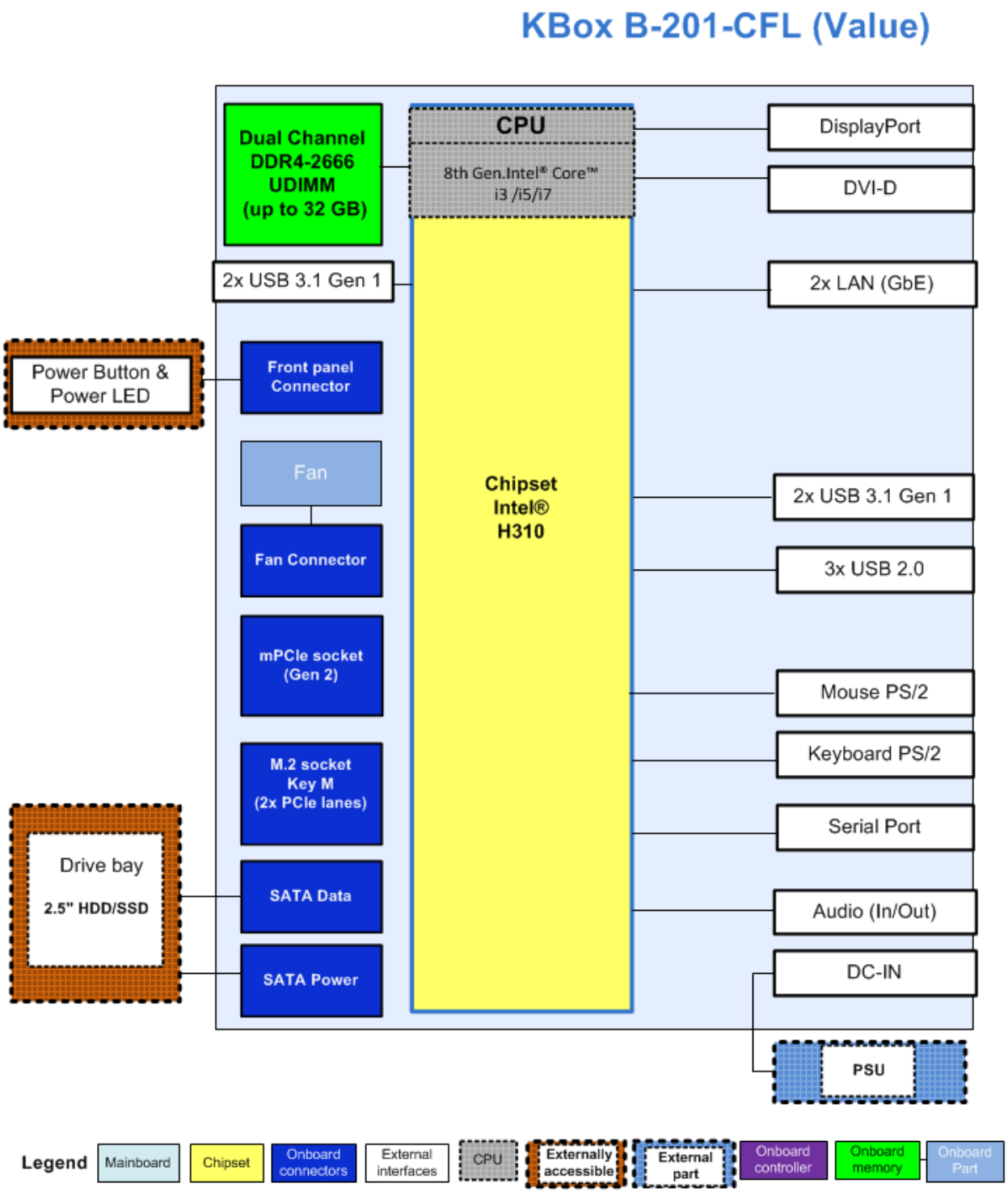


Figure 37: KBox B-201-CFL (Value) Block Diagram



10.2. Technical Specification

Table 3: Mainboard Specification

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
Mainboard Type	D3633-S	D3634-S
Form Factor	Mini-ITX (170mm x 170 mm) (6.7" x 6.7")	Mini-ITX (170mm x 170 mm) (6.7" x 6.7")
Processor	8th Gen. Intel® Core™ i3/i5/i7	8th Gen. Intel® Core™ i3/i5/i7
Platform Controller Hub	Intel® Q370 Express Chipset	Intel® H310 Express Chipset
Memory (onboard)	DDR4 – 2666 UDIMM Dual Channel, non-ECC SO-DIMM Up to 32 GB	DDR4 – 2666 UDIMM Dual Channel, non-ECC SO-DIMM Up to 32 GB

Table 4: Processor Specification

Processor Type	Intel® i3-8100	Intel® i5-8500	Intel® i7-8700
Core	4	6	6
Cache	6 MB Smartcache	9 MB Smartcache	12 MB Smart
Processor (Base Freq.)	3.6 GHz	3.0 GHz	3.2 GHz
TDP	65 W	65 W	65 W
Graphics	Intel® UHD-Graphic 630	Intel® UHD-Graphic 630	Intel® UHD-Graphic 630

Table 5: Storage Specification

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
SSD Drive Bay (external)		
Quantity	1x	1x
Size	2.5"	2.5"
Capacity	256 GB, 512 GB, 1 TB	256 GB, 512 GB, 1 TB
Interface	SATA III / SATA-600	SATA III / SATA-600
M.2 Socket (internal)		
Quantity	1x	1x
Size	2280 (22 mm x 80 mm) 2260 (22 mm x 40 mm) 2242 (22 mm x 42 mm)	2280 (22 mm x 80 mm) 2260 (22 mm x 40 mm) 2242 (22 mm x 42 mm)
Capacity	128 GB, 256 GB, 512 GB, 1 TB	128 GB, 256 GB, 512 GB, 1 TB
Interface	PCIe based SSD NVME modules; 4x PCIe (Gen 3) lanes	PCIe based SSD NVME modules; 2x PCIe (Gen 2) lanes

Mechanically allowed mPCIe expansion card and M.2 storage card combinations are:

- M.2(2280)
- M.2(2260/2242) + mPCIe (half size)
- M.2(2242) + mPCIe (full size)

Table 6: Interface Specifications

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
External Interfaces (front side)		
USB 3.0	2x USB 3.1 Gen 1	2x USB 3.1 Gen 1
External Interfaces (rear side)		
USB 3.0	2x USB 3.1 Gen 1 2x USB 3.1 Gen 2	2x USB 3.1 Gen 1
USB 2.0	4x USB 2.0	3x USB 2.0
Display Port	2x DP V 1.2 (Resolution: 4096 x 2304 @ 60 Hz Max.)	1x DP V 1.2 (Resolution: 4096 x 2304 @ 60 Hz Max.)
DVI-D	1x DVI-D (Supports single link only)	1x DVI-D (Supports single link only)
LAN	2x LAN (GbE) (Intel ® i219LM and i210AT) 100/100/1000 Mb/s	2x LAN (GbE) (Intel ® i219LM and i210AT) 100/100/1000 Mb/s
Serial Port	1x COM1 (RS232)	1x COM1 (RS232)
Audio	Line-in & Line-out with HD Audio	Line-in & Line-out HD Audio
PS/2	Mouse & Keyboard	Mouse & Keyboard
DC-In	+12 V DC	+12 V DC
Wi-Fi (option)	Dual band (2.4 GHz/5 GHz), BT 4.1[1]	Dual band (2.4 GHz/5 GHz), BT 4.1[1]
Expansion Sockets (internal)		
mPCIe	1x mPCIe (half-size or full-size) Supporting : PCIe Gen 3 & USB 2.0	1x mPCIe (half-size or full-size) Supporting : PCIe Gen 2 & USB 2.0

[1] Wi-Fi option populates the mPCIe socket with a half-size mPCIe card

Mechanically allowed mPCIe expansion card and M.2 storage card combinations are:

- **M.2(2280)**
- **M.2(2260/2242) + mPCIe (half size)**
- **M.2(2242) + mPCIe (full size)**

Table 7: Software Specification

Operating System (OS)	Windows® 10 IOT Enterprise LTSC Yocto
BIOS	AMI Aptio 5.x (UEFI) BIOS

Table 8: 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 9: Power Supply Specification

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

10.3. Mechanical Specification

The mechanical specification of the KBox B-201-CFL and the possible mounting options is shown in Table 10: Mechanical Specification.

Table 10: Mechanical Specifications

KBox B-201-CFL	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-CFL

For more detailed mechanical information, refer to the outline dimensions diagrams in this chapter. Each dimension drawing shows the main external mechanical dimensions.

Figure 38: Dimensions Front Panel

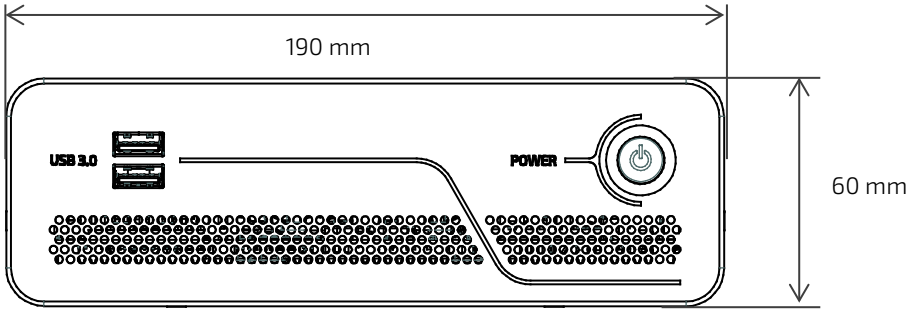


Figure 39: Dimensions Rear Panel

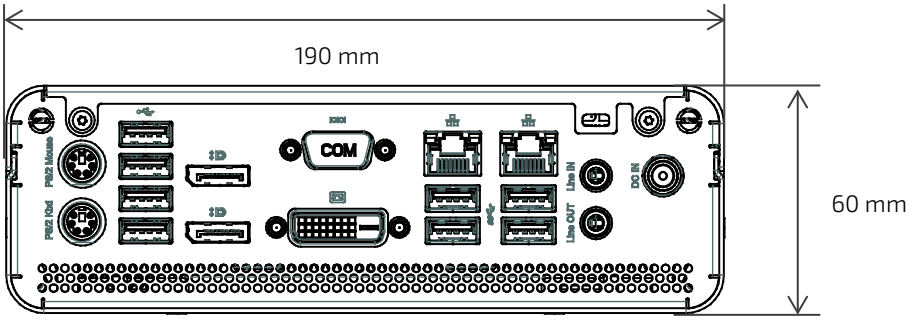


Figure 40: Dimensions Top Cover

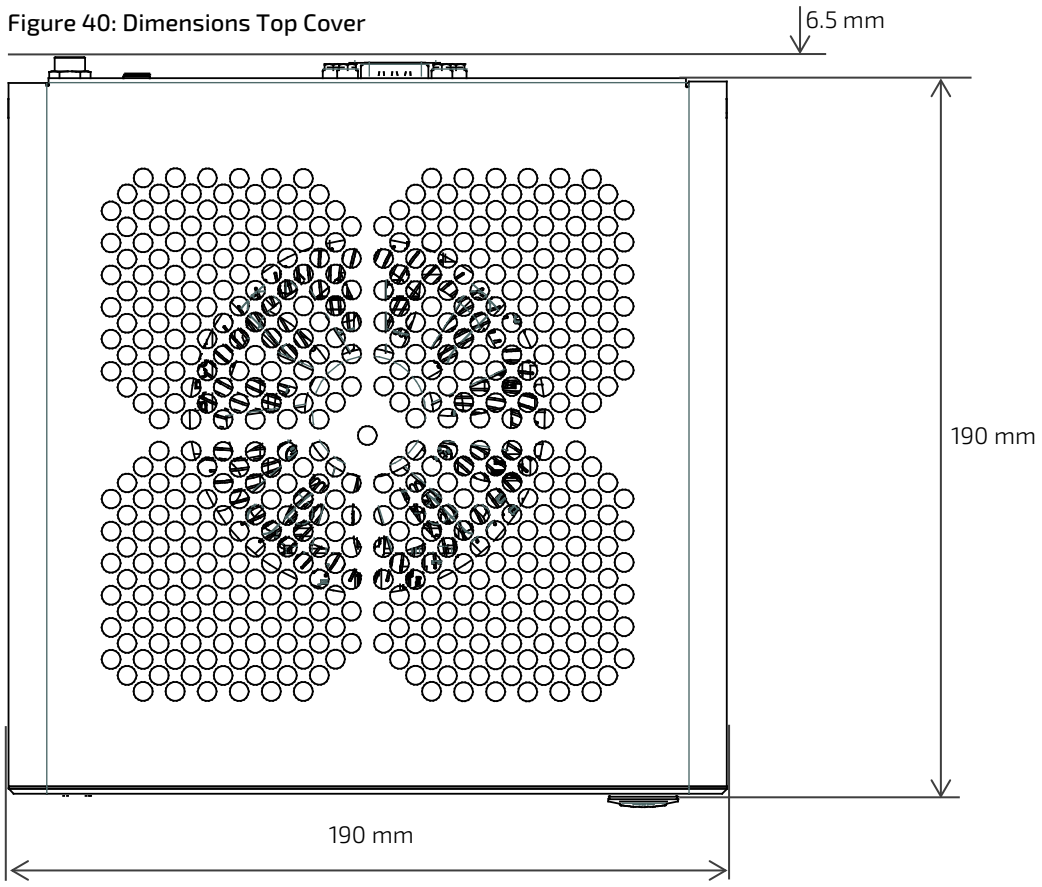


Figure 41: Dimensions Bottom Side

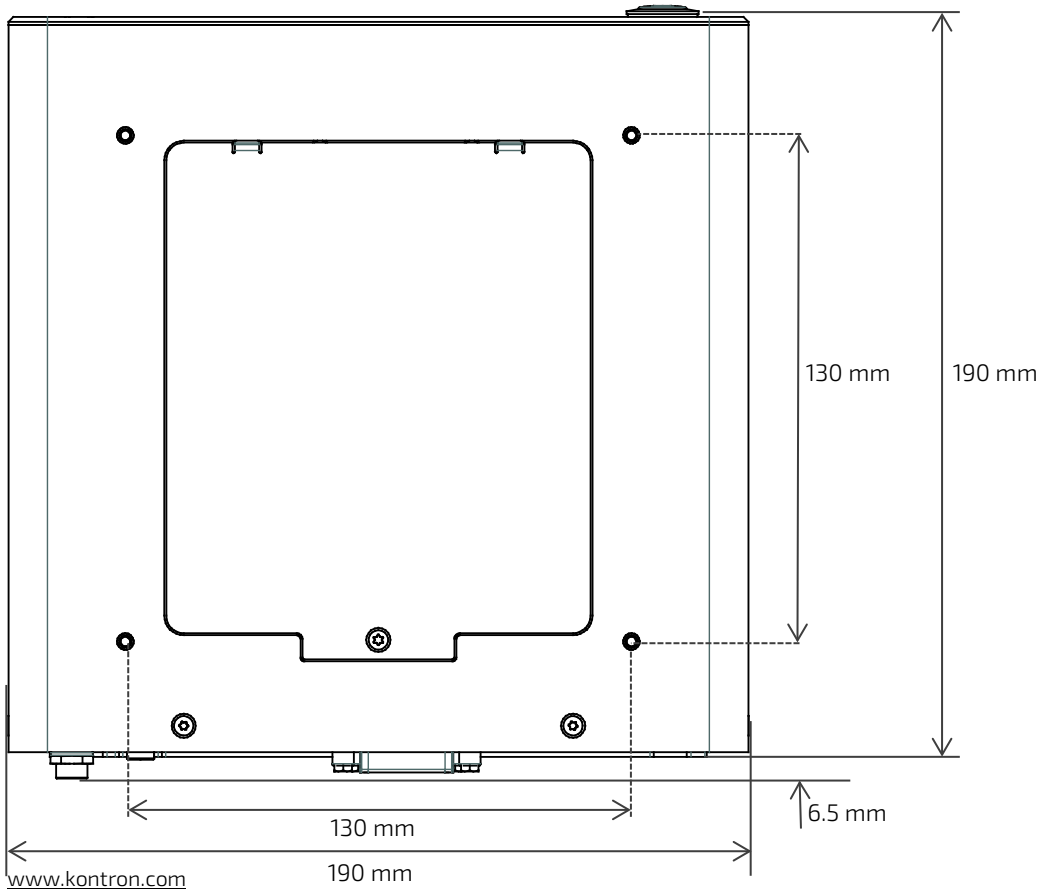
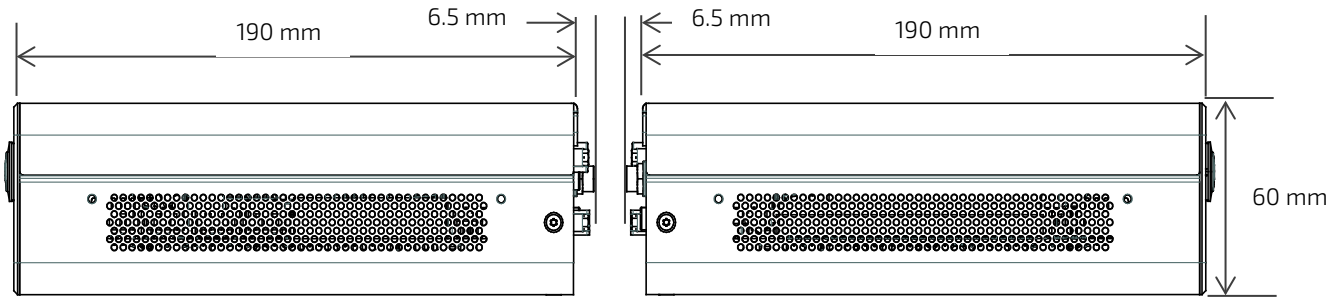


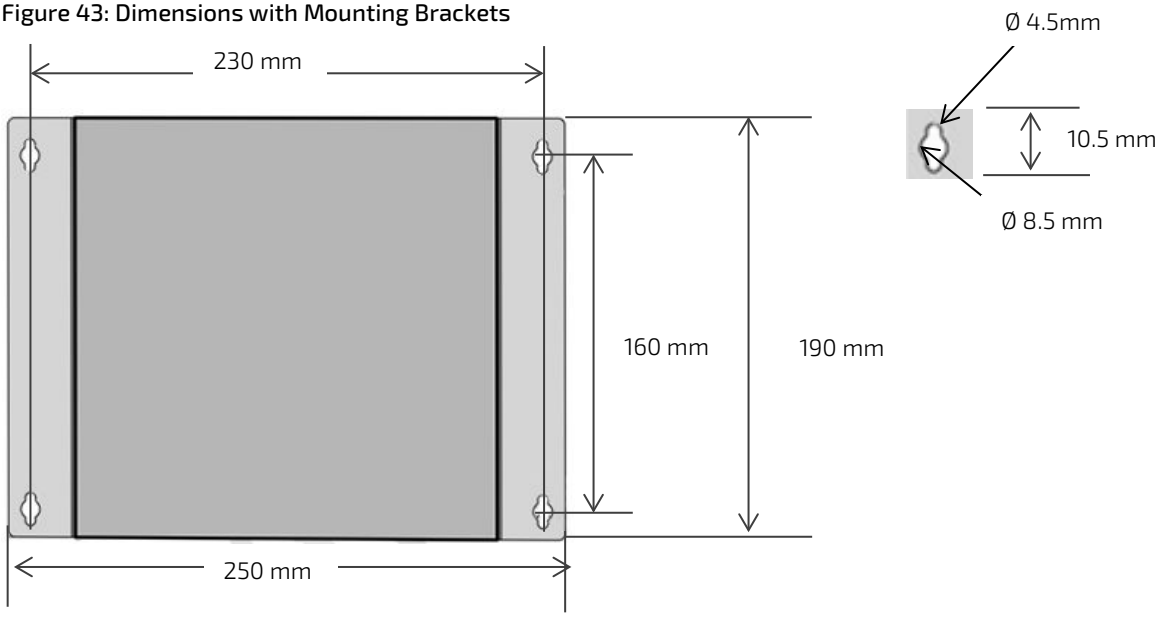
Figure 42: Dimensions Right Side and Left Side



10.3.2. Dimension Diagrams- Wall Mount Brackets

The dimension drawing shows the main mounting bracket mechanical dimension.

Figure 43: Dimensions with Mounting Brackets



10.4. Environmental Specification

Table 11: 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	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, acc. to IEC 60068-2-27
Vibration (Operating)	5 Hz - 500 Hz, 1 G acc. to IEC 60068-2-6
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.

10.5. Directives and Standards

The KBox B-201-CFL complies with the European Council Directive and the approximation of the laws of the member states. When supplied with optional Wi-Fi, the KBox B-201-CFL complies with the Radio Equipment Directive (RED) and the approximation of the laws of the member states. If modified, the prerequisites for specific approvals may no longer apply.

Kontron is not responsible for any radio television interference caused by unauthorized modifications of the product or the substitution or attachment of connecting cables and equipment other than those specified by Kontron. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Table 12: Directives and Standards Compliance for KBox B-201-CFL

CE		
Council Directive	93/68/EEC	
RED		
Draft ETSI EN 301 489-01 V2.2.0		EMC standard for radio equipment and services - Part 1: Common technical requirements
Final ETSI EN 301 489-17 V3.2.0		EMC standard for radio equipment and services – Part 17: Specific conditions for Broadband Data Transmission Systems
ETSI EN 300 328 V2.1.1		Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques
ETSI EN 301 893 V2.1.1		5 GHz RLAN
EMC		
Emission (Class B)	EN 55032:2012 CISPR 32 Edition 2.0	Electromagnetic compatibility of multimedia equipment- Emission requirements
	EN 61000-3-2:2014	Limits for harmonic currents emissions
	EN 61000-3-3:2013	limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems
Immunity (Industrial Equipment)	EN 55024:2010/ CISPR 24 Edition 2.1	Information technology equipment- immunity characteristics
Safety		
Europe	EN 62368-1:2014	Audio/video, information and communication technology equipment – Safety requirements
CB Scheme	CB certificate - IEC 62368-1:2014	
USA & Canada	NRTL - UL 62368-1:2014 / CAN/CSA-C22.2 No. 62368-1:2014	
FCC		
FCC 47 CFR Part 15B / ICES-003	Complies with the requirements of Federal Communications Commission (FCC) rules and regulations of title 47 of the Code of Federal Regulations (CFR) Part 15B and ICES-003:2017 & 2016 rules to limit the potential of harmful interference	
Environment		
WEEE	Compliant with the Waste Electrical and Electronic Equipment (WEEE) 2012/19/EU directive; to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers	

Environment	
RoHS II	Compliant with the Restriction of Hazardous Substances (RoHS) 2011/65/EU directive or the late status thereof, to reduce hazardous substances in electrical and electronic equipment
REACH	Compliant with the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation No. 1907/2006 to identify the intrinsic properties of chemical substances earlier

All tests were performed with supplied Power Supply Unit (PSU). Failure to use the supplied PSU may invalidate the FCC compliance and class. The use of shielded I/O cables is required when connecting to peripheral or host devices. Failure to do so may violate FCC/ICES rules.

10.6. Power Specification

The KBox B-201-CFL has no internal power supply and is powered only via the supplied external Power Supply Unit (PSU) connected to the + 12 V DC Jack (DC-IN) on the rear panel. The mainboard 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)

Table 13: Power Supply Unit (PSU) Specification

PSU	External AC Input, 150 W
PSU Size (D x W x H)	151.3 mm x 75.6 mm x 25.4 mm
Input Voltage Range	100 VAC - 240 VAC
Input Current	2 A Max.
Efficiency	87% (100 V AC, 12.5 A Load) / 88% (240 V AC, 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-CFL standard configuration is calculated by adding the power consumption values of the of the main components mainboard with processor and SATA (SSD). Adding expansion cards increases the overall power consumption. Users must ensure that the system's overall power consumption does not exceed the PSU power specification of 150 W.

Table 14: Power Consumption

Components	Maximum Power Consumption
Mainboard + Processor + RAM	132 W
SSD	4 W
Total	136 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 DC only.

Table 15: DC power Jack Pin Assignment

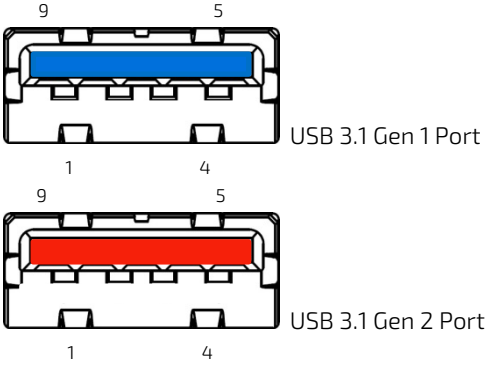
Pin	Signal	Power Jack
Centre pole	+12 V DC	
Outer ring	Ground	

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 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment

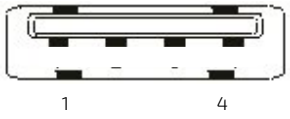
Table 16: USB 3 (Type A) Pin Assignment

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+	

Low-active signals are indicated by a minus sign.

11.3. USB 2.0 Port Pin Assignment

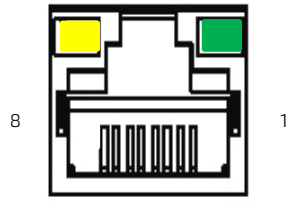
Table 17: USB 2.0 Connector Pin Assignment

Pin	Signal Name	USB 2.0 (Type A) Connector
1	+5 V (fused protected)	
2	Data-	
3	Data+	
4	GND	

Low-active signals are indicated by a minus sign.

11.4. LAN GbE Connector Pin Assignment

Table 18: 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	

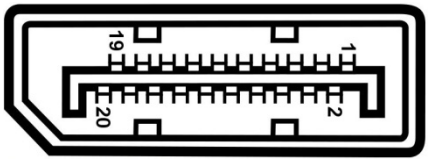
Low-active signals are indicated by a minus sign.

Table 19: LAN Link Activity

Speed (Yellow)		LINK/ACT (Green)	
		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

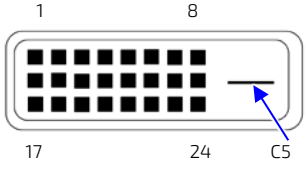
Table 20: Display Port (DP) Connector Pin Assignment

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

Low-active signals are indicated by a minus sign.

11.6. DVI-D Connector Pin Assignment

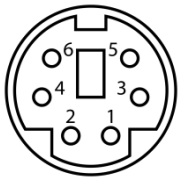
Table 21: DVI-D Connector Pin Assignment

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

DVI-D dual Link connector supports single link only.
Low-active signals are indicated by a minus sign.

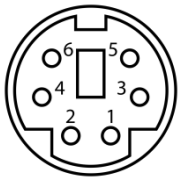
11.7. PS/2 Keyboard Connector Pin Assignment

Table 22: 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 23: 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

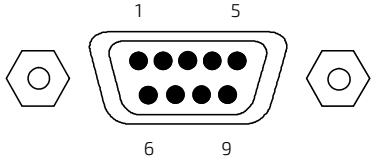
Table 24: Audio Line-out Audio Line-in Pin Assignment

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

Supports HD audio and legacy audio.
For legacy support select the legacy option in the BIOS setup menus

11.10. Serial Port Connector Pin Assignment

Table 25: Serial Interface COM1 port (RS232) Connector Pin Assignment

Pin	Signal Name- RS232	Description	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	Ground	
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-CFL uses the AMI Aptio 5.x (UEFI) BIOS supported by the D3633-S and D3436-S mainboards. The uEFI BIOS features a variety of enhanced functions specifically tailored to the KBox B-201-CFL's hardware features:

- Recovery BIOS
- BIOS and CPU Microcode Update
- Plug & Play
- Silent fan
- Multi Boot
- Always on
- Never off
- HDD password
- TPM V2.0

UEFI only! No legacy support and no Master Boot Repair (MBR) installation.

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. The Setup menu appears.

If the <DEL> key is not press the POST continues with the test routines

The KBox B-201-CFL uEFI BIOS Setup program uses a hot key navigation system. The hot key legend bar is located at the bottom of the Setup screens. For a list of the navigation hot keys available in the legend bar with a description, see Table 26: Navigation Hot Keys Available in the Legend Bar.

Table 26: Navigation Hot Keys Available in the Legend Bar

Hot key	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
<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.

Download the BIOS updates from the product support website by visiting http://support.ts.fujitsu.com/ and entering the mainboard's product name in the search bar at the top right hand side. The available drivers, BIOS updates, documents, FAQs and applications are listed Product Support" website includes a "Downloads" section with the latest BIOS updates.

The implemented mainboards' product name is given in:
Table 3: Mainboard Specification, in row Mainboard Type

Kontron recommends user to make a note of the current BIOS setting before performing a BIOS update. After a BIOS update, additional modifications must be made manually.

If the system fails to boot after a BIOS update, the BIOS maybe damaged, contact Kontron Support.

Do not switch off, reset or interrupt the system during a BIOS update. If interrupted the BIOS update process must be restarted.

13/ Technical Support

For technical support contact our Support department:

- E-mail: support@kontron.com
- Phone: +49-821-4086-888

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

- Product ID Number (PN)
- Serial Number (SN)

The serial number can be found on the product's type label.

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:

   http://www.kontron.com/support-and-services/support/rma-information

2. 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 Information (Name of product, Product number and Serial number). If a delivery includes more than one product, fill out the above information in the RMA Request form for each product.

3. Send the completed RMA-Request form to the fax or email address given on the RMA Request sheet and Kontron will provide an RMA-Number.

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

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

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

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.
2. http://www.kontron.com/terms-and-conditions
3. 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 27: 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
FCC	Federal Communicatons Commission
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
MBR	Master Boot Repair
MTBF	Mean Time Before Failure
PCIe	PCI-Express
NRTL	Nationally Recognized Test Laboratory
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
TDP	Thermal Design Power
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**

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