



## 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 incorporate 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
1.1	Updated product figure (new power button), Ch. 10.2 added 9 <sup>th</sup> Gen. Intel® Core™ i3/i5/i7 and in Ch. 1 replaced EN 60950-1 with EN 62368-1, expanded Ch. 12.2.1 BIOS Update info & Included a uEFI BIOS only info note.	2020-Feb-18	CW
1.2	Include Ch. 8.5 Wi-Fi Antenna and Ch. 10.6.2 Power Protection information.	2020-Mar-05	CW
1.3	Added new 24 VDC variant and updated Ch. 3.4 Accessories, Ch. 3.5 Type Label and General Safety Instructions.	2020-Dec-16	CW
1.4	Added the 2.5" SSD dual M.2 RAID module and RAID information	2021-Feb-17	CW
1.5	Updated figure 6 and Figure 11 'Rear side USB 2.0 connectors', and Ch. 1.2 and 15.3.2 battery caution. Added new peripherals power notice in Ch. 10.6.	2021-Dec-27	CW
1.6	New rear panel Figure 3, 5, 6, 11, 12, 20 and 44. Potential equalization stud info Ch. 4.2.1.12 and Ch. 10.6.5.	2022-Apr-06	CW
1.7	Linux update and added new logo	2023-Sept-15	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.

#### **⚠ CAUTION**

Handling and operation of the product is permitted only for trained personnel aware of the associated dangers, within a work place that is access controlled and fulfills all necessary technical and environmental requirements. Follow the "General Safety Instructions" supplied with the product.

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

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**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




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**Environmental protection is a high priority with Kontron.  
Kontron follows the WEEE directive.**

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## 1/ General Safety Instructions

Please read this passage 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 non-observance of the instructions Kontron Europe 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 to also ensure safe operation, the operator must not only observe the correct operating conditions for the product but also the following general safety instructions:

- ▶ The product must be used as specified in the product documentation, in which the instructions for safety for the product and for the operator are described. These contain guidelines for setting up, installation and assembly, maintenance, transport or storage.
- ▶ The on-site electrical installation must meet the requirements of the country's specific local regulations.
- ▶ 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 a filter mat is provided, this should be cleaned regularly. Do not place the product close to heat sources or damp places. Make sure the product is well ventilated.
- ▶ Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label and meeting the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1.
- ▶ Only products or parts that meet the requirements for Power Source (PS1) of UL/IEC 62368-1 may be connected to the product's available interfaces (I/O).
- ▶ 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 product). 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 any add-on card does not exceed the specified limitations
  - ▶ the current consumption of the product does not exceed the value stated on the product label.
- ▶ Only original accessories that have been approved by Kontron Europe can be used.
- ▶ Please note: safe operation is no longer possible when any of the following applies:
  - ▶ the product has visible damages or
  - ▶ the product is no longer functioning
 In this case the product must be switched off and it must be ensured that the product can no longer be operated.
- ▶ Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled.
- ▶ CAUTION: Risk of explosion if the battery is replaced incorrectly (short-circuited, reverse-poled, wrong battery type). Dispose of used batteries according to the manufacturer's instructions.
- ▶ This product is not suitable for use in locations where children are likely to be present.

### Additional Safety Instructions for DC Power Supply Circuits

- ▶ To guarantee safe operation, please observe that:
  - ▶ the external DC power supply must meet the criteria for LPS and PS2 (UL/IEC 62368-1)
  - ▶ no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
  - ▶ a reliable protective earthing 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 product, 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 EN62368-1 or VDE0100 or EN60204 or UL61010-1 regulations.

## 1.1. Electrostatic Discharge (ESD)




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

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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 observe the instructions in Chapter 15.3.2: Replacing Lithium Battery.

### **▲ CAUTION**

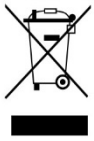
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Caution: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebut les batteries usagées selon les instructions.

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After removing the lithium battery, dispose of the lithium battery according to the regulations within your region.



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**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).**

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## 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 a small form factor high performance Box PC family with 8th / 9th Gen. Intel Core™ platforms and mini ITX mainboard variants 'Smart' and 'Value', both offering a wide variety of external interfaces on the rear panel. System expansion is achieved internally with a M.2 Key M socket and mPCIe full size/half size socket, and externally with a 2.5" SSD drive bay. A external 12 VDC AC/DC power supply powers the standard KBox B-201-CFL and for industrial applications a 24 VDC power supply variant is available. All product 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 1: KBox B-201-CFL



General Smart and Value features are:

### KBox B-201-CFL (Smart)

- ▶ 8<sup>th</sup> / 9<sup>th</sup> 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
- ▶ Power: 12 VDC with external AC/DC power supply

### 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

### Additional Variant:

- ▶ 24 VDC with wired cable

### Options:

- ▶ Wi-Fi Dual band (2.4 GHz/5 GHz), BT 4.1 with Dual Wi-Fi antenna
- ▶ Kontron APPROTECT



## 3/ Scope of Delivery

### 3.1. Packaging

The KBox B-201-CFL is packaged together with all parts, in a product specific cardboard package designed to provide adequate protection and absorb shock.

### 3.2. Unpacking

To unpack the KBox B-201-CFL, perform the following:

1. Remove packaging.
2. Do not discard the original packaging. Keep the original packaging for future transportation or storage.
3. Check the delivery for completeness by comparing the delivery with the original order.
4. Keep the associated paperwork. It contains important information for handling the product.
5. Check the product for visible shipping damage.

If you notice any shipping damage or inconsistencies between the contents and the original order, contact your dealer.

### 3.3. Scope of Delivery

Check that the delivery is complete, and contains the items listed below. If you discover damaged or missing items, contact your dealer. Each Kontron product is delivered with a General Safety Instructions sheet. Kontron recommends users to keep this sheet for future reference. Additionally, the General Safety Instructions are contained within this user guide and available as a download from the product's web page.

**Table 1: Scope of Delivery**

Product	Description
KBox B-201-CFL Smart 12 VDC	1x KBox B -201-CFL with D3633-S mITX mainboard and Intel® Q370 chipset 1x External 12 VDC Power Supply & regional mains power cable and 4x Adhesive Chassis feet
KBox B-201-CFL Value 12 VDC	1x KBox B-201-CFL with D3634-S mITX mainboard and Intel® H310 chipset and 1x External 12 VDC Power Supply & regional mains power cable 4x Adhesive chassis feet
KBox B-201-CFL Smart 24 VDC	1x KBox B -201-CFL with D3633-S mITX mainboard and Intel® Q370 chipset 1x External 24 VDC wired power cable 4x Adhesive Chassis feet
KBox B-201-CFL Value 24 VDC	1x KBox B -201-CFL with D3633-S mITX mainboard and Intel® Q370 chipset 1x External 12 VDC Power Supply & regional mains power cable 4x Adhesive Chassis feet

#### **NOTICE**

Due to additional internal components in the 24 VDC variant, the 12 VDC and optional 24 VDC variant are not interchangeable.

### 3.4. Accessories

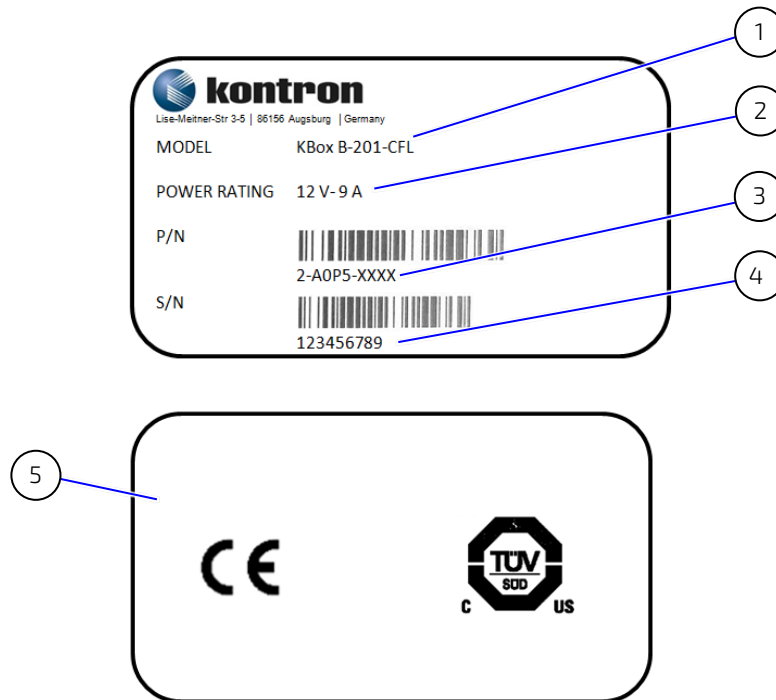
**Table 2: Accessories**

Part Number	Part	Part Description
1065 3431	Vertical Stand Kit	Metal stand and two screws (M3x6)
1065 3430	Wall Mount Set	Two wall mount brackets and four screws (M3x6)
1062 5317	VESA Mount Kit	VESA 100 mounting frame, hook & loop flexible band, 4x screws (M3x 8 mm), 4x screws (M4x 20 mm) and 4x spacers

### 3.5. Product Identification Type Label

The type label defines the product's mainboard variants Smart or Value and the power variant 12 VDC or 24 VDC, and contains specific product information (Model, Power Product Number, Serial Number, Electrical Specification and Compliance).

Figure 2: Type Label



- |   |   |   |   |
|---|---|---|---|
| 1 | Product Family KBoxB-201-CFL  | 4 | Serial number with barcode  |
| 2 | Electrical Specification<br>12 VDC or 24 VDC variant                                | 5 | Certification label (separate for all<br>KBox B-201-CFL variants) |
| 3 | Part Number with bar code<br>2-AOP5-xxxx Smart variant<br>2-AOP6-xxxx Value variant |   |   |

## 4/ Product Features

Before working with the KBox B-201-CFL, Kontron recommends that users take a few minutes to study this chapter and learn about the various parts and features.

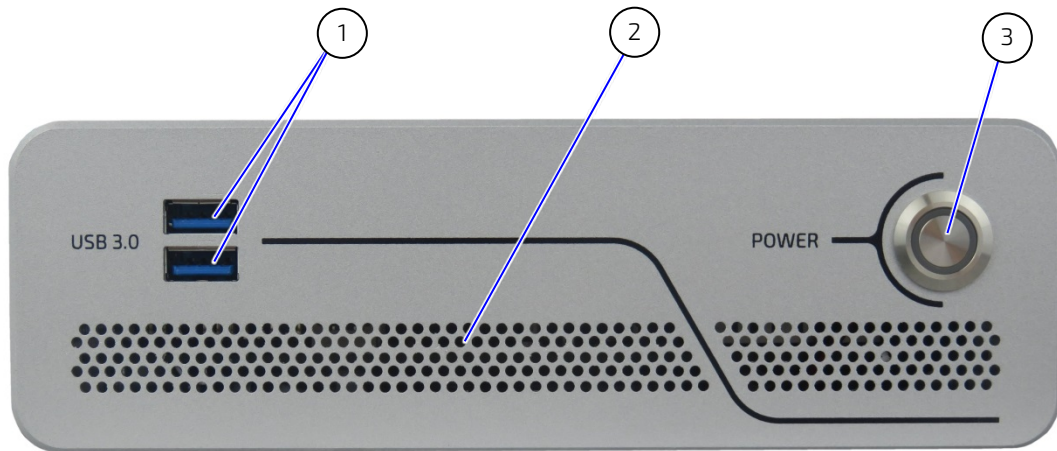
Figure 3: KBox B-201-CFL Overview



## 4.1. Front Side Features

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

Figure 4: Front Side



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

### 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 switching off the power.

#### **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 Panel Features.

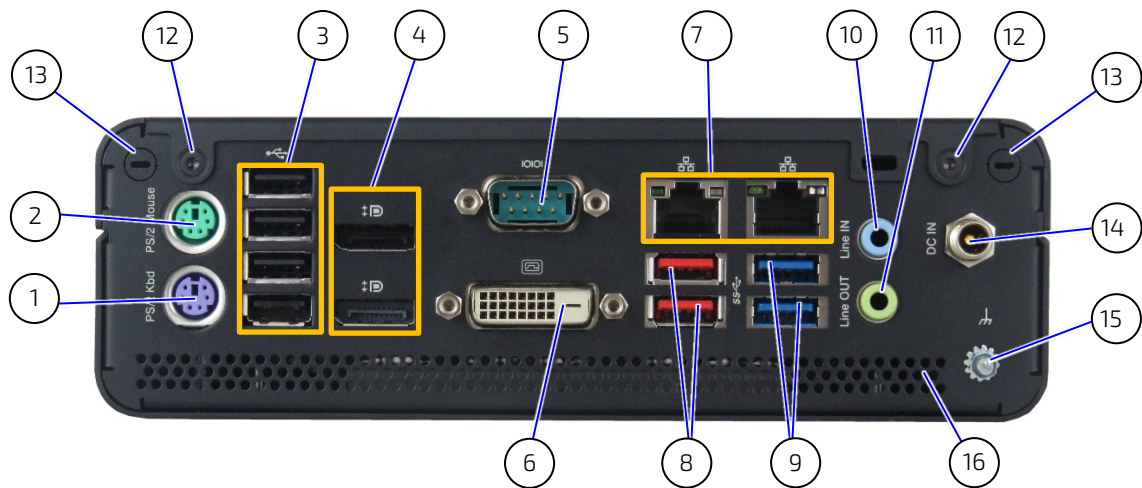
For the USB 3.0 pin assignment, refer to Chapter 11.2: USB 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment.

## 4.2. Rear Panel Features

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

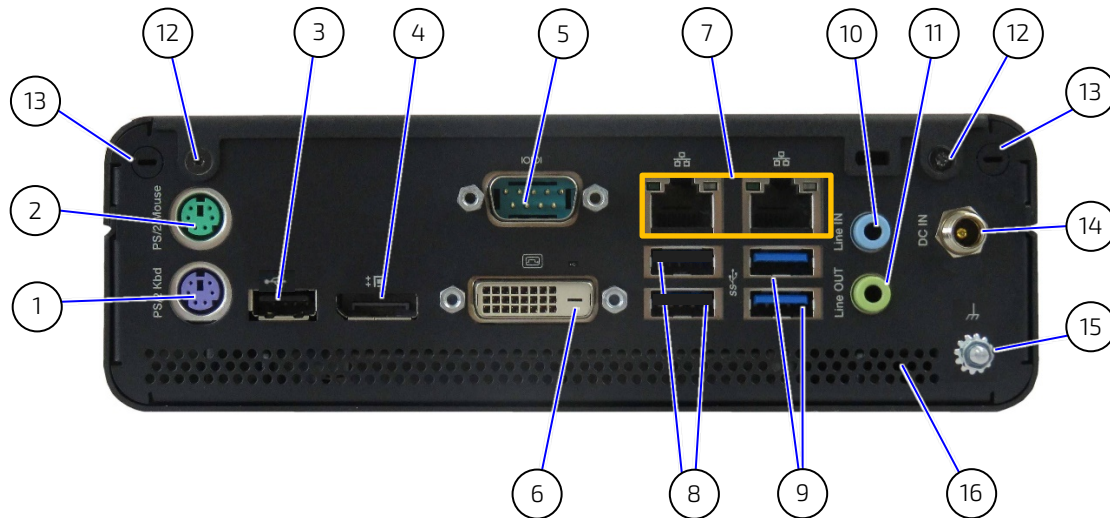
The KBox B-201-CFL 'Smart' and 'Value' mainboard variants support different rear panel I/O interfaces, see Figure 5 and Figure 6.

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



- |   |               |    |                     |    |  |
|---|---------------|----|---------------------|----|--|
| 1 | PS/2 Keyboard | 7  | 2x LAN (GbE)        | 13 | Breakout for Wi-Fi antenna   |
| 2 | PS/2 Mouse    | 8  | 2x USB 3.1 Gen 2    | 14 | DC-IN power connector<br>12 VDC (standard) or<br>24 VDC (optional) |
| 3 | 4x USB 2.0    | 9  | 2x USB 3.1 Gen 1    | 15 | Potential equalization stud  |
| 4 | 2x DP         | 10 | Audio Line-in       | 16 | Ventilation openings for<br>air-output                             |
| 5 | Serial port   | 11 | Audio line-out      |    |  |
| 6 | DVI-D         | 12 | 2x Top cover screws |    |  |

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



1	PS/2 Keyboard	7	2x LAN ports (GbE)	13	Breakout for Wi-Fi antenna
2	PS/2 Mouse	8	2x USB 2.0 ports	14	DC-IN power connector 12 VDC (standard) or 24 VDC (optional)
3	1x USB 2.0	9	2 x USB 3.1 Gen 1 ports	15	Potential equalization stud
4	1x DP	10	Audio line-in	16	Ventilation openings for air-output
5	Serial port	11	Audio line-out		
6	DVI-D	12	2x Top cover screws		

## 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 product. 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.

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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.

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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 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 product. 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 external AC/DC power supply (100/240 VAC to 12 VDC) or to a supplied 24 VDC wired power cable for the optional 24 VDC variant.

For more information, see Chapter 10.6: Power Specification.

##### **CAUTION**

Power the KBox B-201-CFL 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.

##### **CAUTION**

Power the KBox B-201-CFL 24 VDC variant with the supplied 24 VDC wire only.

##### **NOTICE**

Due to different internal components, the 12 VDC and optional 24 VDC variant are not interchangeable.

#### 4.2.1.12. Potential Equalization Stud

The potential equalization stud is not a ground connection. When connected the potential equalization stud ensures that all connected systems share a common potential.



The potential equalization stud is not a ground connection

#### 4.2.1.13. Wi-Fi Antenna Connectors (option)

The Wi-Fi antennas screw directly on to the Wi-Fi connectors and support the following features:

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



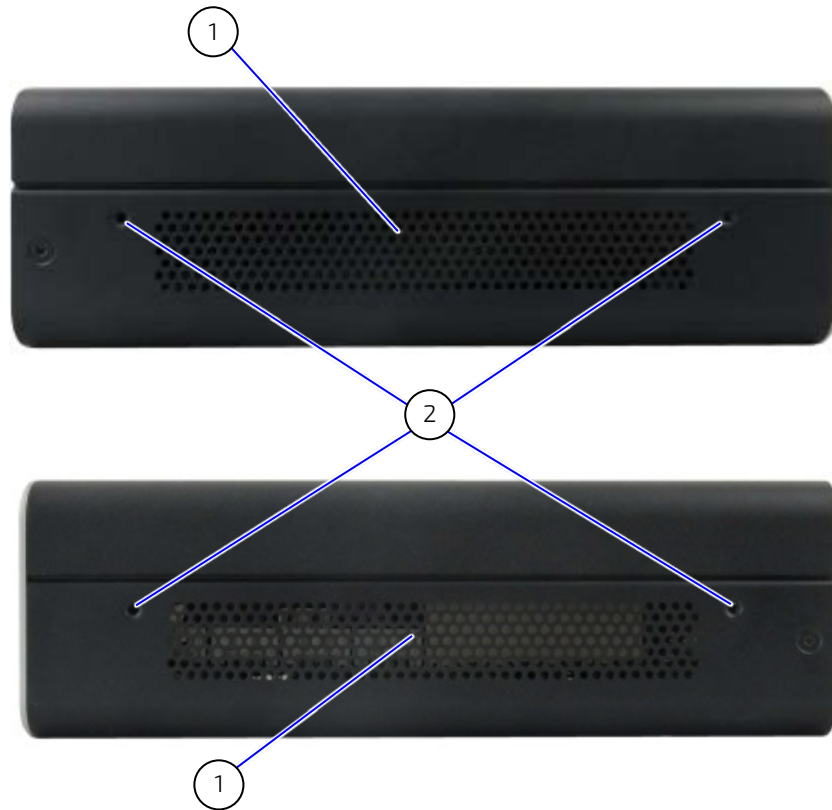
Wi-Fi option populates the internal mPCIe socket with a half-size mPCIe Wi-Fi card. The mPCIe socket is not available and the the M.2 socket is restricted to a 2242 M.2 SSD module.



### 4.3. Left and Right Side Features

The right and left sides contain ventilation openings 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

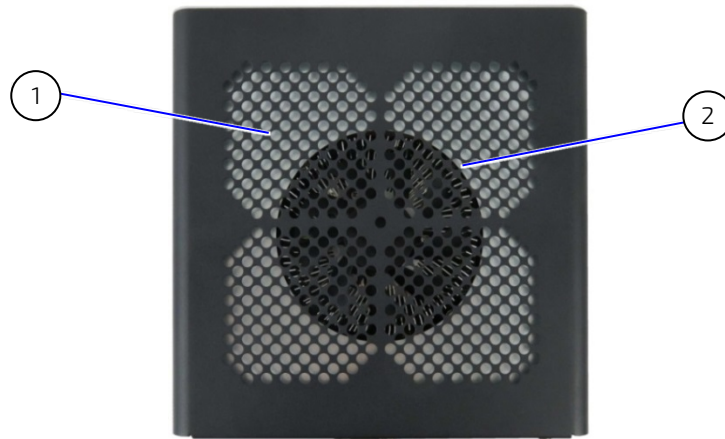


- 1 Ventilation openings (air-output)
- 2 2x threaded screw holes for wall mount brackets

#### 4.4. Top Cover and Bottom Side Features

The top cover features a metal plate with air-intake ventilation openings with a separate metal plate underneath with a circular opening above the internal fan.

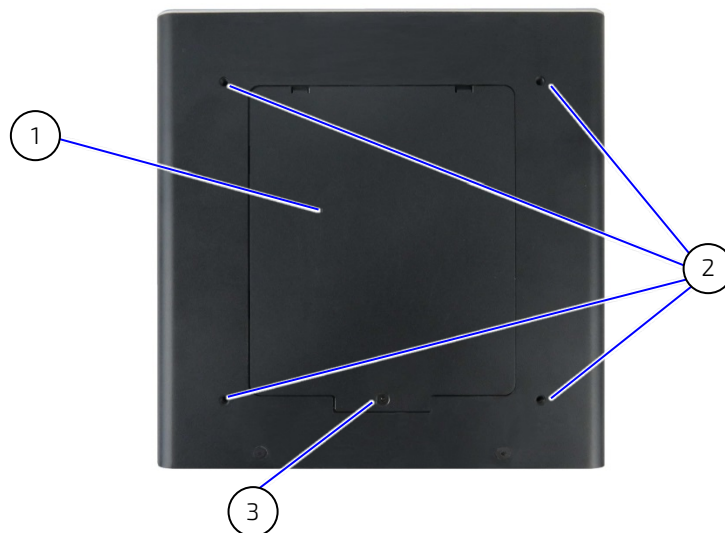
Figure 8: Top View



- 1 Ventilation openings (air-intake)
- 2 Circular opening on metal plate

The bottom side contains a 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 assembly
- 3 2.5" SSD drive bay cover screw (opens and closes 2.5" SSD drive bay)

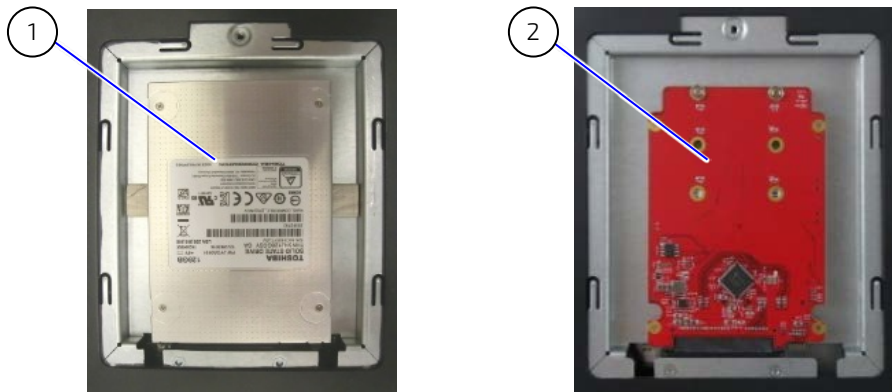
## 5/ Options

### 5.1. Expansion Options

#### 5.1.1. Drive Bay Options

One removable 2.5" SSD drive (512 GByte or 1 TByte) or 2.5" SSD dual M.2 RAID Module with the option of a RAID array (RAID 0/1) may be installed in the KBox B- 201-CFL's drive bay using the SATA III 6Gb/s interface.

Figure 10: Drive Bay Options



1 2.5" SSD drive

2 2.5" SSD dual M.2 Raid Module

#### 5.1.2. Internal Expansion

The internal expansion options are an M.2 socket and a mPCIe socket on the motherboard. Due to on-board space restrictions, not every M.2 SSD module or mPCIe card combination is possible. Before installing either an M.2 SSD module or mPCIe card users must consider which device populates the neighboring mPCIe socket or M.2 socket.

If an mPCIe card (half or full size) populates the mPCIe socket, a 2242 M.2 SSD module may be installed but no 2280 M.2 SSD module.

Table 3: On-board Expansion Options

KBox B-201-CFL Variants	M.2 SSD	mPCIe card	Interface
Smart	2280 Key M	+ mPCIe (PCIEx1) (full or half size)	M.2: PCIe-based SSD NVMe modules & 4x PCIe (Gen 3) lane interface / mPCIe: PCIe Gen 3 interface
	2242 Key M		
Value	2280 Key M	+ mPCIe (PCIEx1) (full or half size)	M.2: PCIe-based SSD NVMe modules & 2x PCIe (Gen 2) lane interface / mPCIe: PCIe Gen 2 interface
	2242 Key M		
	2242 Key M		



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



Wi-Fi option populates the mPCIe socket with a half-size mPCIe Wi-Fi card restricting the M.2 socket to a 2242 M.2 SSD module.

## 5.2. Power Options

The KBox B-201-CFL Smart or Value both supports 12 VDC or an optional 24 VDC. Due to different internal components, the 12 VDC and 24 VDC are not interchangeable.




---

Consult the KBox B-201-CFL's type label for the electrical specification, to confirm the power specification.

---

Figure 11: Power Connections Options

KBox B-201-CFL Smart/Value 12 VDC



KBox B-201-CFL Smart/Value 24 VDC



### CAUTION

Power the KBox B-201-CFL 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.

### CAUTION

Power the KBox B-201-CFL 24 VDC variant with the supplied 24 VDC wire only.

### NOTICE

Due to different internal components, the 12 VDC and optional 24 VDC variant are not interchangeable.

## 6/ Accessing Internal Components

This chapter contains important information that users must read before opening the KBox B-201-CFL to access internal components. Additionally, read and observe the General Safety Instructions contained in this user guide. Kontron recommends expanding the KBox B-201-CFL, before installing the product in the end environment.

### **⚠ WARNING**

Before opening the product by removing the top cover, make sure that the product is switched off using the power-on button and disconnected from the mains power supply. Disconnect all connected peripheral devices. Observe the General Safety Instructions within this user guide.

### **⚠ CAUTION**

Handling and operation of the product is permitted only for trained personnel aware of the associated dangers, within a work place that is access controlled and fulfills all necessary technical and environmental requirements.



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 product or/and internal components.



Pay attention to the manufacturer's instructions before installing/removing third party components.

### 6.1. Top Cover (opening and closing)

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**

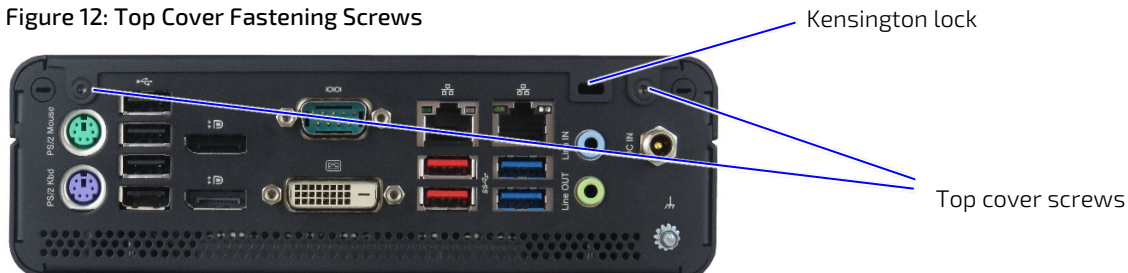
Operate in the closed condition only

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.

To open the top cover, perform the following:

1. Close all applications. Shut down the product 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. Unlock and remove the Kensington lock (Figure 12) if installed.
4. Remove the two top cover screws on the rear panel (Figure 12) and retain the screws to secure the top cover later.

Figure 12: Top Cover Fastening Screws



- 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 13) on the front panel.

Figure 13: Holding Brackets



- Once released from the holding brackets lift the top cover vertically to avoid damaging the internal fan assembly. Do not slide the top cover off the chassis.

**NOTICE**

**Do not slide the top cover off the chassis!**

**Avoid contact and possible damage between the top cover and the internal fan assembly by moving the top cover, when released from the holding brackets, vertically upwards.**

- Close the top cover, by proceeding in the reverse order (steps 6 to 3). Ensure that the top cover is almost in the correct position above the main chassis before moving the top cover down and tilting the front side of the top cover towards the front panel. The top cover is closed when, in-line with the front panel and secured on the rear panel with the two screws retained previously in step 4.

**NOTICE**

**Do not slide the top cover off/onto the chassis!**

**Avoid contact and possible damage between the top cover and the internal fan assembly by moving the top cover vertically downwards.**

### 6.1.1. Installing and Removing Internal M.2 SSD

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

- Open the top cover.
- Locate the M.2 socket and the corresponding nut on the motherboard.
- Insert the M.2 module into the M.2 socket gently and at an angle, until the fixing hole on the M.2 module aligns with the corresponding motherboard's nut.
- Secure the M.2 Module by pressing down on the free end, and carefully fixing with a screw to the corresponding nut on the motherboard, until flat with the motherboard.
- Close the top cover

**NOTICE**

**Do not use force when fastening the mounting screw. Too much force may damage the motherboard nut. Recommended torque for M.2 screw is 0.2 Nm.**

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

- Open the top cover.
- Locate the installed M.2 module.
- Remove the M3x4 screw. The M.2 module springs up at the free end.
- Gently pull the M.2 module out of the M.2 socket.
- Close the top cover



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

## 6.1.2. Installing and Removing Internal mPCIe Expansion Card

To install a mPCIe card, perform the following:

1. Open the top cover.
2. Locate the mPCIe socket and the corresponding nut on the motherboard.
3. Insert the mPCIe card into the socket gently and at a slight angle, until the fixing hole of the mPCIe card aligns with the corresponding motherboard's nut.
4. Secure the mPCIe by pressing down on the free end and carefully fixing with a screw and spacer (if required) to the corresponding nut on the motherboard, until flat with the motherboard.

**NOTICE**

---

Do not use force when fastening the mounting screw. Too much force may damage the motherboard's nut. Recommended torque for the mPCIe screw is 0.2 Nm.

---

5. Close the top cover.

To remove a mPCIe card, perform the following:

1. Open the top cover.
2. Locate the installed mPCIe card and remove the fixing screw. The mPCIe card springs up at the free end.
3. Pull the mPCIe card out of the socket.
4. Close the top cover.

## 6.2. Drive Bay (opening and closing)

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




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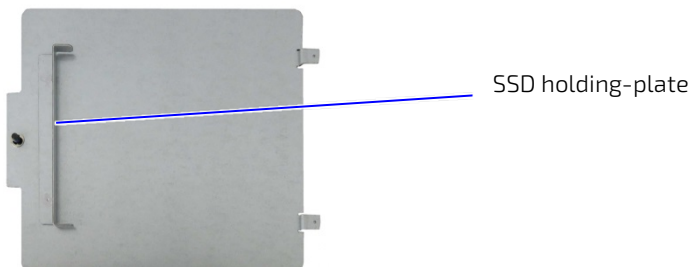
**Before installing a 2.5" SSD, observe the manufacturer's instructions.**

---

To open the SSD drive bay, perform the following:

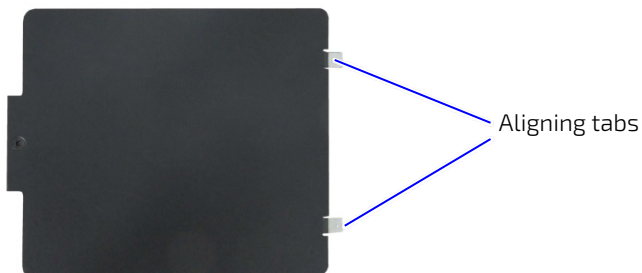
1. Close all applications. Shut down the product properly and disconnect the power cable from the power source. Disconnect all peripherals.
2. Place the KBox B-201-CFL on a flat, clean and ESD-safe surface with the bottom side facing upwards.
3. Remove the drive bay cover's screw using a torx (08 x 60) screwdriver (Figure 9, pos. 3).
4. Lift the drive bay cover a few centimeters to release the internal device from the holding-plate on the cover's rear side (Figure 14, pos.1).

**Figure 14: SSD Drive Bay Cover Rear Side**



5. Slide the SSD drive bay cover forward, to release the two aligning tabs (Figure 15, pos. 1).

**Figure 15: SSD Drive Bay Cover Top Side**



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

### **NOTICE**

---

To avoid damage, do not use force when closing the drive bay cover.

If the drive bay cover does not close easily, the metal holding plate may not be aligned correctly and pressing down with force may damage the installed 2.5" SSD drive or 2.5" SSD dual RAID Module.

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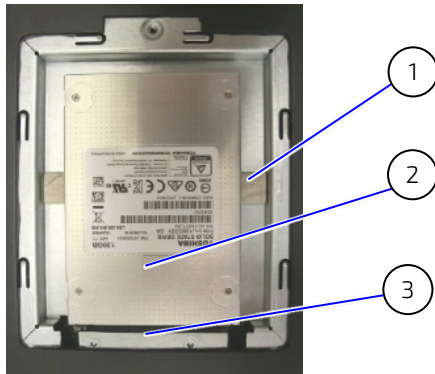
## 6.2.1. Installing and Removing Externally Accessible 2.5" SSD

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

To install a 2.5" SSD, perform the following:

1. Open the drive bay cover.
2. Position the SSD on the ESD strip (Figure 16) with the SSD's connector facing the SATA connector in the drive bay.

Figure 16: External Drive Bay with 2.5" SSD Drive



- 1 ESD strip
- 2 2.5" SSD drive
- 3 Drive bay SATA connector

3. Align the SSD's connector with the internal SATA connector.
4. Press down and gently push the SSD into the SATA connector.
5. Close the drive bay cover.

To remove a 2.5" SSD drive from the drive bay, perform the following:

1. Open the drive bay cover.
2. Pull out the 2.5" SSD from the SATA connector gently.
3. Place the 2.5" SSD on an ESD-safe surface.
4. Close the drive bay cover.

## 6.2.2. Installing and Removing the 2.5" SSD Dual M.2 RAID Module

Before installing a 2.5" SSD Dual M.2 RAID Module, observe the SSD drive manufacturer's instructions and to avoid loss of data, observe the information and warnings within this section.




---

RAID 1 is the default setting.

---

### NOTICE

---

Do not reset the RAID module without considering if a backup of the data is required. Pressing the reset switch configures the RAID array and data on both M.2 drives will be lost.

---

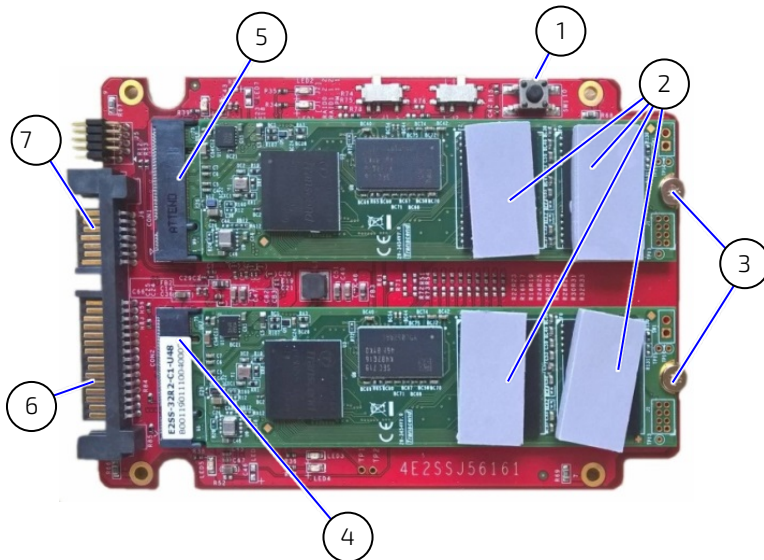
### NOTICE

---

Do not reset the RAID module. When the RAID module is powered on, the previous RAID configuration will be copied to the new M.2 SSD module automatically.

---

Figure 17: 2.5" SSD dual RAID M.2 Module



- 1 Reset switch (do not press!)
- 2 4x Foam buffer
- 3 2x screws for M.2 SSD module
- 4 M.2 socket 2
- 5 M.2 socket 1
- 6 SATA power connector
- 7 SATA data connector

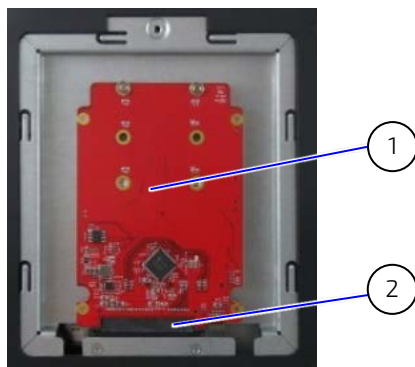
To install a 2.5" SSD dual M.2 RAID module, perform the following:

1. Open the drive bay cover.
2. Place the 2.5" SSD dual M.2 RAID module on an ESD-safe surface.
3. Inserting the M.2 SSD modules at a slight angle gently into the 2.5" SSD dual M.2 RAID module's M.2 sockets (Figure 17, pos. 4 and 5). Press down on the free end to align the M.2 SSD module's screw hole with the 2.5" SSD dual RAID module's nut and secure each M.2 SSD module with a screw (Figure 17, pos. 3).
4. Place self-adhesive form buffers on each of the M.2 SSD modules (Figure 17, pos. 2).
5. If the 2.5" SSD dual M.2 RAID module is already configured with a RAID array, insert the 2.5" SSD dual M.2 RAID module into the SATA connectors in the drive bay, with the two M.2 SSDs modules facing the inside of the drive bay (Figure 18 )and proceed with step 7.

### NOTICE

Do not reset the RAID module. When the RAID module is powered on, the previous RAID configuration will be copied to the new M.2 SSD module automatically.

Figure 18: Drive Bay with 2.5" SSD dual M.2 RAID Module



- 1 2.5" SSD dual M.2 RAID module with two M.2 SSD modules (installed bottom side up)
- 2 SATA connector

6. If the 2.5" SSD dual M.2 RAID module's RAID array is not configured or the configuration must be changed, see Chapter 13.1: Drive Bay RAID, to set the RAID array and then proceed with step 7.
7. Close and secure the drive bay cover.

To remove the 2.5" SSD dual M.2 RAID module from the drive bay, perform the following:

1. Open the drive bay cover.
2. Hold the 2.5" SSD dual M.2 RAID module on the sides and gently pull the 2.5" SSD dual M.2 RAID module away from the SATA connectors.
3. Place the 2.5" SSD dual M.2 RAID Module on an ESD-safe surface.
4. Close and secure the drive bay cover.

### 6.2.2.1. Installing and Removing a M.2 SSDs

Before installing a new M.2 SSD, observe the SSD drive manufacturer's instructions and to avoid loss of data, observe the information and warnings within this section. Note that after installing a new M.2 SSD and powering on the 2.5" SSD dual M.2 RAID module automatically copies the previous RAID array configuration to the new M.2 SSD.

#### NOTICE

Do not reset the RAID module without considering if a backup of the data is required. Pressing the reset switch configures the RAID array and data on both drives will be lost.

#### NOTICE

After replacing one of the M.2 SSD modules on the RAID module, do not reset the RAID module! When powered on for the first time, the previous RAID configuration will be copied to the new M.2 SSD module automatically.

To install a new M.2 SSD module on the 2.5" SSD dual M.2 RAID module, perform the following:

1. Remove the 2.5" SSD dual M.2 RAID module and place the 2.5" SSD dual M.2 RAID module on an ESD safe surface.
2. Locate the faulty M.2 SSD(s) by using the serial number in the iRAID notification email, see Chapter 13.1.2: Drive Bay RAID Software.
3. Remove the screw that secures the faulty M.2 SSD and retain for later use. The M.2 SSD flips upwards at a slight angle. Pull the M.2 SSD gently out of the M.2 socket.
4. Insert a new M.2 SSD at a slight angle gently into the M.2 socket and press down on the free end to align the M.2 SSD's screw hole with the 2.5" SSD dual RAID module's nut. Secure with the screw retained in step 3.



Kontron recommends replacing a faulty drive with a drive of the same capacity and type as the mirrored drive. When different capacity drives are used, the working capacity is only as large as the smallest drive's capacity.

5. Place a self-adhesive foam buffers on the new M.2 SSD.
6. Insert the 2.5" SSD dual M.2 RAID module into the SATA connector in the drive bay with the two M.2 SSDs modules faces the inside of the drive bay (Figure 18).
7. Close and secure the drive bay cover.
8. Switching on the KBox B-201-CFL automatically configures new M.2 SSD with the previous RAID Array.

## 7/ Thermal Considerations

### 7.1. Active Cooling

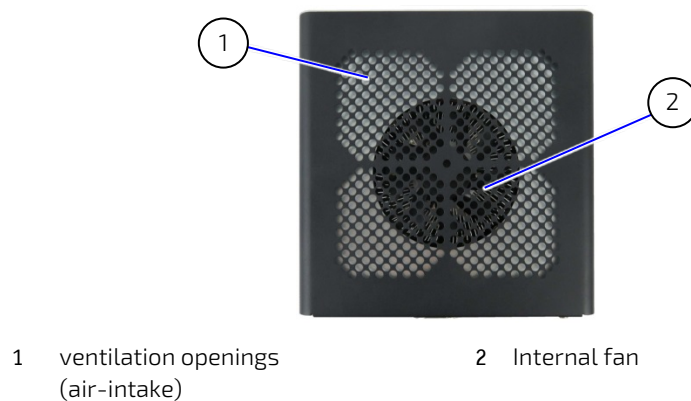
The KBox B-201-CFL is actively fan cooled. Air enters through the top cover's ventilation openings, (Figure 19, pos. 1) and is distributed over the motherboard by an internal fan before exiting ventilation openings on the right, left, front and rear sides (Figure 20, pos. 1, 2 and 3).

**CAUTION**

Obstructing the ventilation openings may cause overheating

Do not place items directly in front of the top cover ventilation openings and observed that all ventilation openings are not covered or obstructed by objects.

Figure 19: Air-intake Ventilation Openings



**CAUTION**

Avoid damaging the motherboard

Do not attach or remove fans while the product is switched on.

Figure 20: Air-output Ventilation Openings



## 7.2. Minimum System Clearance (Keep out Area)

To provide maximum airflow through and around the KBox B-201-CFL, a minimum distance to the surrounding environment must be observed known as keep out area in this user guide. Before installing the KBox B-201-CFL, ensure that the keep out areas (Figure 27 and Figure 28) have been taken into consideration.

### **▲ 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 product 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 delivered with four chassis feet. Optional installation accessories are a vertical stand, wall mount brackets, and a VESA 100 mount assembly. Before, installing, 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 openings 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 specification on the type label. Kontron recommends that the last cable attached to the product is the power cable.

### **⚠ CAUTION**

Obstructing the ventilation openings may cause overheating.

- Do not to place items directly in front of the top cover ventilation openings
- 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**

Install and operate the product only by trained and qualified personnel within an environment that fulfills all necessary technical and environmental requirements.

### **⚠ CAUTION**

Ensure support for the product's load by mounting on a flat, solid surface and use of the specified screws.

### **NOTICE**

Support the power and I/O cables to minimize the strain on the product's connectors.



Ensure there is clearance for users to

- Connect cables on the rear I/O panel
- Access the power-on button on the front panel
- Install PCIE cards on the right side (clearance 110 mm)
- Install Wi-Fi antenna on the rear panel (clearance 45 mm and 130 mm from Wi-Fi hinge)



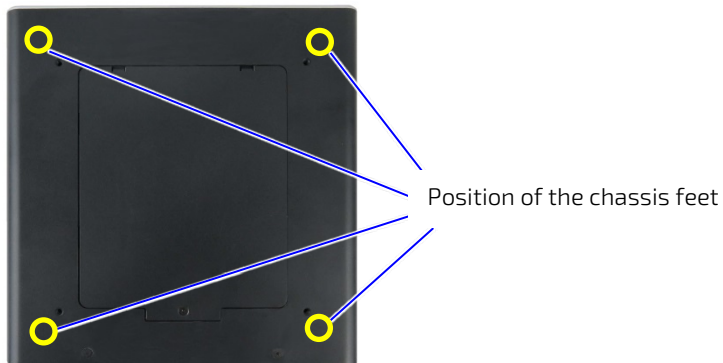
Expansion cards and memory installation should be performed before Installation.

## 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 21).

Figure 21: 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

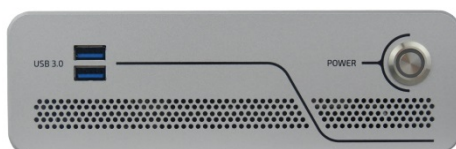
#### **⚠ WARNING**

#### 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 openings 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)
- 

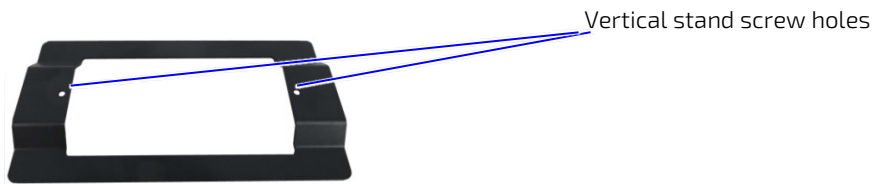
Figure 22: Chassis Feet Mount Option



## 8.2. Vertical Stand (Option)

The KBox B-201-CFL can be positioned vertically using a vertical stand (Figure 23).

Figure 23: 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. Align 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 and the screws provided with the stand, fasten the stand to the chassis, (Figure 24).

Figure 24: Vertical Stand Screws



4. Stand in the vertical position (Figure 25).

### 8.2.1. Vertical Stand Mount Options

The vertical stand mounts on either the right or the left side, depending on the required KBox B-201-CFL orientation.

Figure 25: Vertical Stand Mount Options

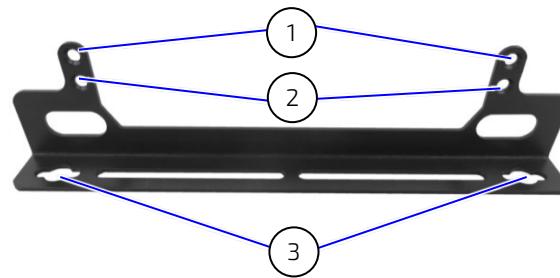




### 8.3. Mounting Brackets (Option)

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

Figure 26: Mounting Bracket



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

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 26, 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 openings and the mounting hole set shown in Figure 26, pos. 2 can be used.

#### ⚠ CAUTION

Obstructing the ventilation openings may cause overheating.

- Do not to place items directly in front of the top cover ventilation openings
- 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 openings use the mounting holes shown in Figure 26, 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 26, 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 26, 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 27 and Figure 28.

Figure 27: Keep Out Areas – with Top Cover facing the Mount Surface

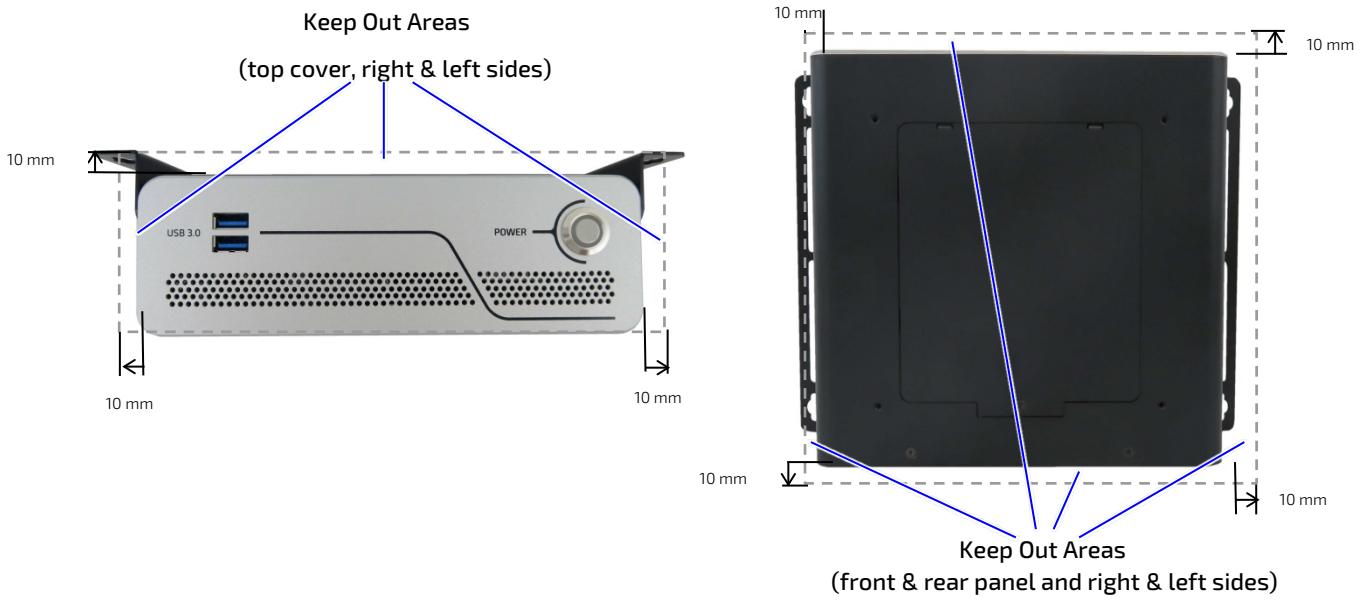
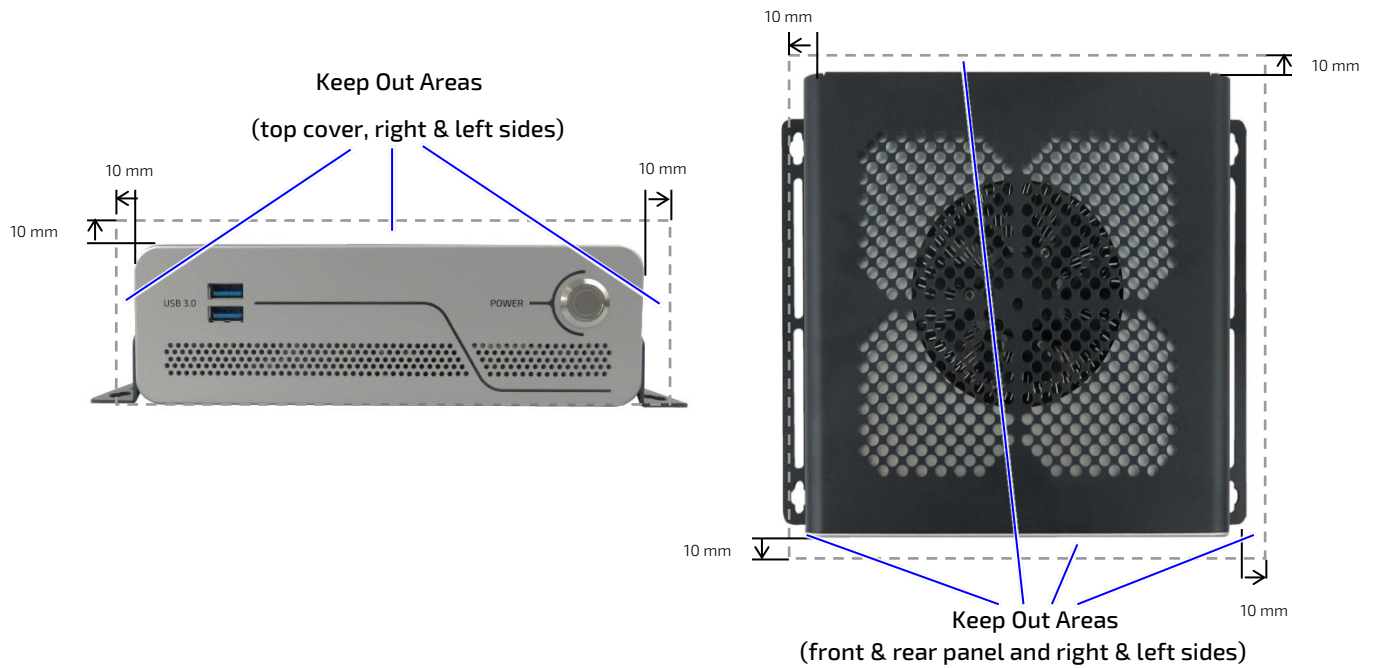


Figure 28: Keep Out Areas – with Bottom Side facing the Mount Surface



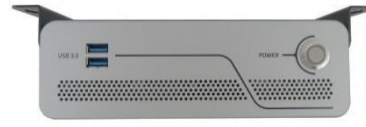
Installing the dual Wi-Fi antennas on the rear panel increases the keep out clearance to 45 mm and 130 mm from Wi-Fi hinge.

### 8.3.1. Mounting brackets Mount Options

Figure 29: 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 openings 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 30: 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 openings 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 power supply on the rear side of a VESA 100 monitor.

Figure 31: VESA Mounting Assembly Kit



The VESA 100 mount assembly kit contains:

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




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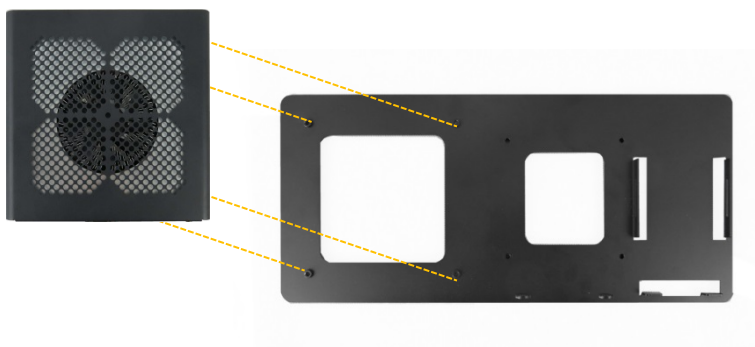
Using the VESA 100 mount assembly, only vertical mounting is possible.

---

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

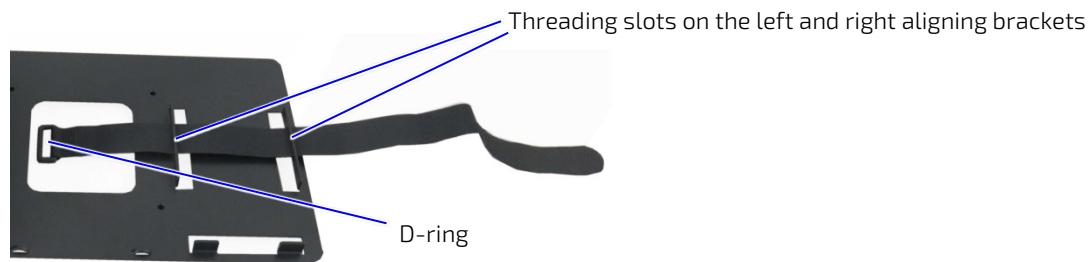
1. Check if chassis feet are installed on the bottom side of the chassis. If feet are installed, removed the feet before mounting on the VESA 100 mounting frame.
2. Align the four mounting holes on the bottom side of the chassis with the four mounting holes on the VESA 100 mounting frame.

Figure 32: KBox B-201-CFL Mounting Position



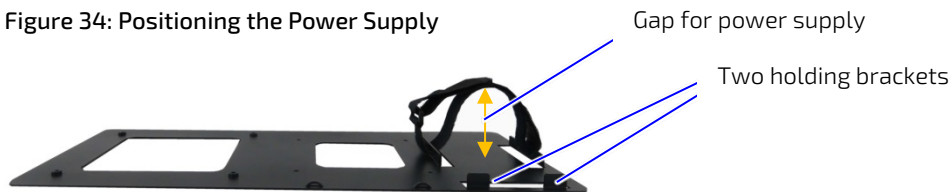
3. Insert the supplied four M3x 8 mm screws into the rear side of the VESA 100 mounting frame and using a Torx screwdriver (10) fasten the chassis to the VESA 100 mounting frame.
4. Open the flexible hook and loop band to the band's full length and with the rough fastening side facing downward feed the band through the threading slots on the left and right aligning brackets, (Figure 33).

Figure 33: Inserting the Band



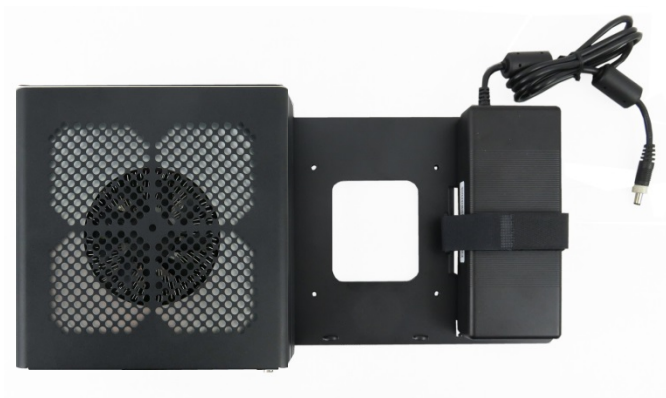
5. Double back with the flexible hook and loop band and feed the rough end through the band's D-ring. Pull the band through the D-ring and press approximately 30 mm to 50 mm of the self-gripping sides together to form a loose loop. Lift the bottom part of the loop to meet the top part to form a gap between the band and the VESA 100 mounting frame, as shown in Figure 34.

Figure 34: Positioning the Power Supply



6. Slot the power supply, 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 power supply between the left and right aligning brackets. Push down until the power supply rests on the two holding brackets at the bottom.
7. Secure the power supply 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 35: KBox B-201-CFL and Power Supply 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 monitor's stand, see Chapter 8.4.1.2: Mounting on Monitor with VESA 100 Stand.

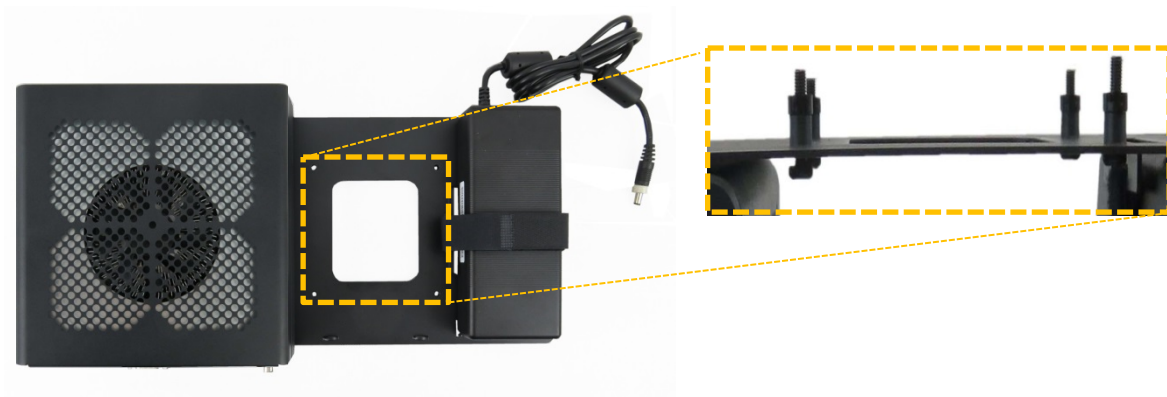


Using the VESA 100 mount assembly, only vertical mounting is possible.

### 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 36).

Figure 36: 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.

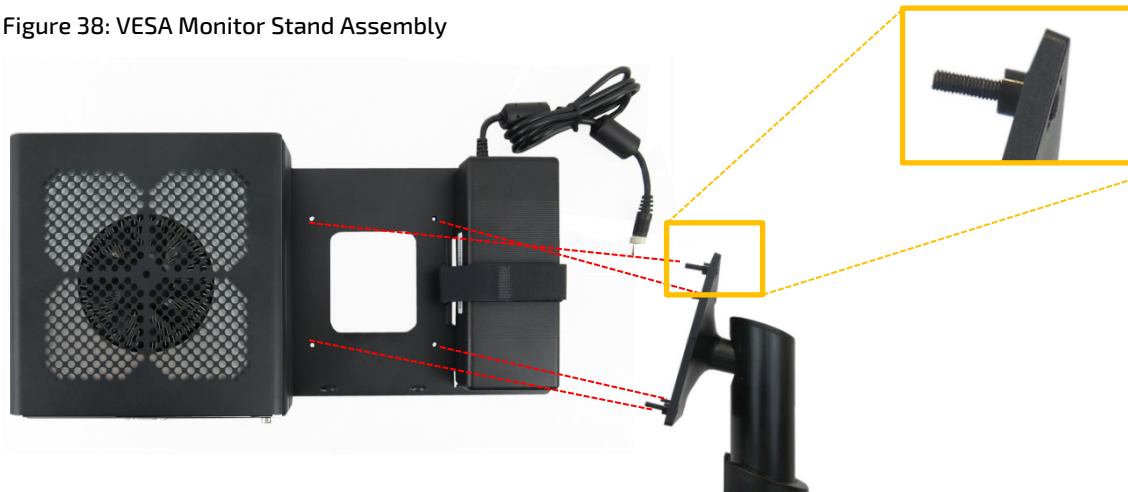
Figure 37: Installed VESA 100 Mount Assembly – non VESA Stand Monitor



### 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 38)

Figure 38: 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 39: Installed VESA 100 Mount Assembly – non VESA Stand Monitor



## 8.5. Connecting the Wi-Fi Antenna (option)

To use the Wi-Fi feature, install the two Wi-Fi antennas included in the scope of delivery to the two Wi-Fi antenna connectors on the rear panel of the KBox B-201-CFL. Note that installing the Wi-Fi antenna increases the original keep out area on the rear panel from 10 mm to approximately 45 mm.

To install the Wi-Fi antenna, perform the following:

1. Screw the Wi-Fi antenna on to the Wi-Fi antenna connector.
2. Position the Wi-Fi antenna, using the Wi-Fi antenna's hinge, in the direction required or allowed for by the installation environment.



---

**Installing the dual Wi-Fi antennas on the rear panel increases the keep out clearance to 45 mm and 130 mm from Wi-Fi hinge.**

---



## 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 switched on for the first time. When preparing to switch on, connecting to the power source should always be the last step. Before connecting the power supply and starting up the KBox B-201, install any expansion devices and check that cables are properly connected. In the powered on state the Power-on button lights up blue.

### ⚠ CAUTION

Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label and meeting the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1.

### ⚠ CAUTION

Ensure that the power supply and power cables have no visible damage.

### ⚠ CAUTION

Ensure the product is closed without foreign objects inside the chassis before connecting the power.

### NOTICE

Due to additional internal components in the 24 VDC variant, the 12 VDC and optional 24 VDC variant are not interchangeable.



The DC-In power connection depends KBox B-201-CFL'S power variant where the standard variant is a 12 VDC external AC/DC power supply and the optional variant is a wired 24 VDC.

## 9.1. Connecting the Power Supply

### 9.1.1. 12 VDC AC/DC Power Supply

The KBoxB-201-CFL Smart or Value standard variant is powered using the supplied 12 VDC external AC/DC power supply.

To connect the external AC/DC power supply, perform the following:

1. Install any expansion devices and storage.
2. Check that the top cover and drive bay cover are closed securely.
3. Connect the potential equalization stud and I/O cables.
4. Screw to connect the supplied power supply's cable to the DC-IN power jack, (Figure 5 & Figure 6, pos. 10).
5. Connect the other end of the power supply to the mains power outlet in your region.

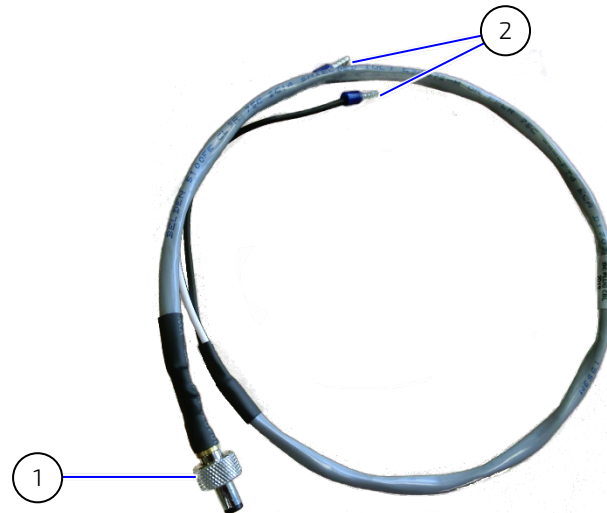
### 9.2. 24 VDC Wired Power Cable

The KBoxB-201-CFL Smart or Value 24 VDC variant is powered using a 24 VDC wired power cable that connects to a separate external DC power source. Only connect to an external 24 VDC power source that meets the product electrical specification and supports protection and supply features such as brownout to help to ensure operation without loss of data or damage to the product, see Chapter 10.6.3: Power Protection.

### ⚠ CAUTION

Observed that wiring and short-circuit/overcurrent protection is performed according to the applicable standards, regulations and product's electrical specification. The disconnecting device (fuse/circuit breaker) rating must support the product's wire cross-section.

Figure 40: 24 VDC Wired Power Cable



1 Mating connector to DC-IN

2 Wires ferrules for 24 VDC source.  
Black wire (-) & white wire (+)

To connect the 24 VDC power cable, perform the following:

1. Install any expansion devices and storage.
2. Check that the top cover and drive bay cover are closed securely.
3. Connect the potential equalization stud and I/O cables.
4. Screw to connect the 24 VDC power cable (Figure 40, pos. 1) to the DC-IN power jack (Figure 5 & Figure 6, pos. 10).
5. Connect the 24 VDC power cable's two-wired ferrules black wire (-) and white wire (+) (Figure 40, pos. 2) to a separate 24 VDC power source.

### **NOTICE**

Clearly mark the two-wired ferrules on the 24 VDC power cable to ensure proper connect, black wire (-) & white wire (+).

### 9.3. Power On/Off Procedure

To switch on the KBox B-201-CFL, connect to the power source as described in Chapter 9.1: Connecting to the Power Supply, and briefly press the power-on button (Figure 4, pos. 3). The power-on button lights up blue to indicate the powered on state.

To switch off the KBoxB-201-CFL, close all open applications and briefly press the power-on button. The power-on button dims to indicate the powered off state. The KBoxB-201-CFL is only completely in the powered off state when the power cable is disconnected from the DC-IN connector or the main power source.

#### **CAUTION**

Completely disconnect the power by disconnecting the power cable from the DC-IN connector or the main power source. Switching off only using the power-on button may leave internal parts energized.

#### 9.3.1. Forced Shutdown

Pressing the power-on button for longer than four seconds initiates a forced system shutdown, before switching off the power. If power is still applied to the DC-IN connector, the product can be restarted by pressing the power-on button.

#### **NOTICE**

Do not disconnect the power from the product while the product is switched on. Performing a forced shut down can lead to loss of data or other undesirable effects.

### 9.4. 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.

Ordered with a pre-installed OS and all appropriate drivers (according to with ordered hardware configuration) the product is fully operational when switched on for the first time. If ordered without a pre-installed OS, users need to install the OS and the appropriate drivers before switching on for the first time.

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



To download relevant KBox B-201-CFL drivers for factory installed hardware components visit Kontron's [Customer Section](#)



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

# 10/ Technical Data

## 10.1. Block Diagrams

Figure 41: Block Diagram of KBox B-201-CFL Smart Variant

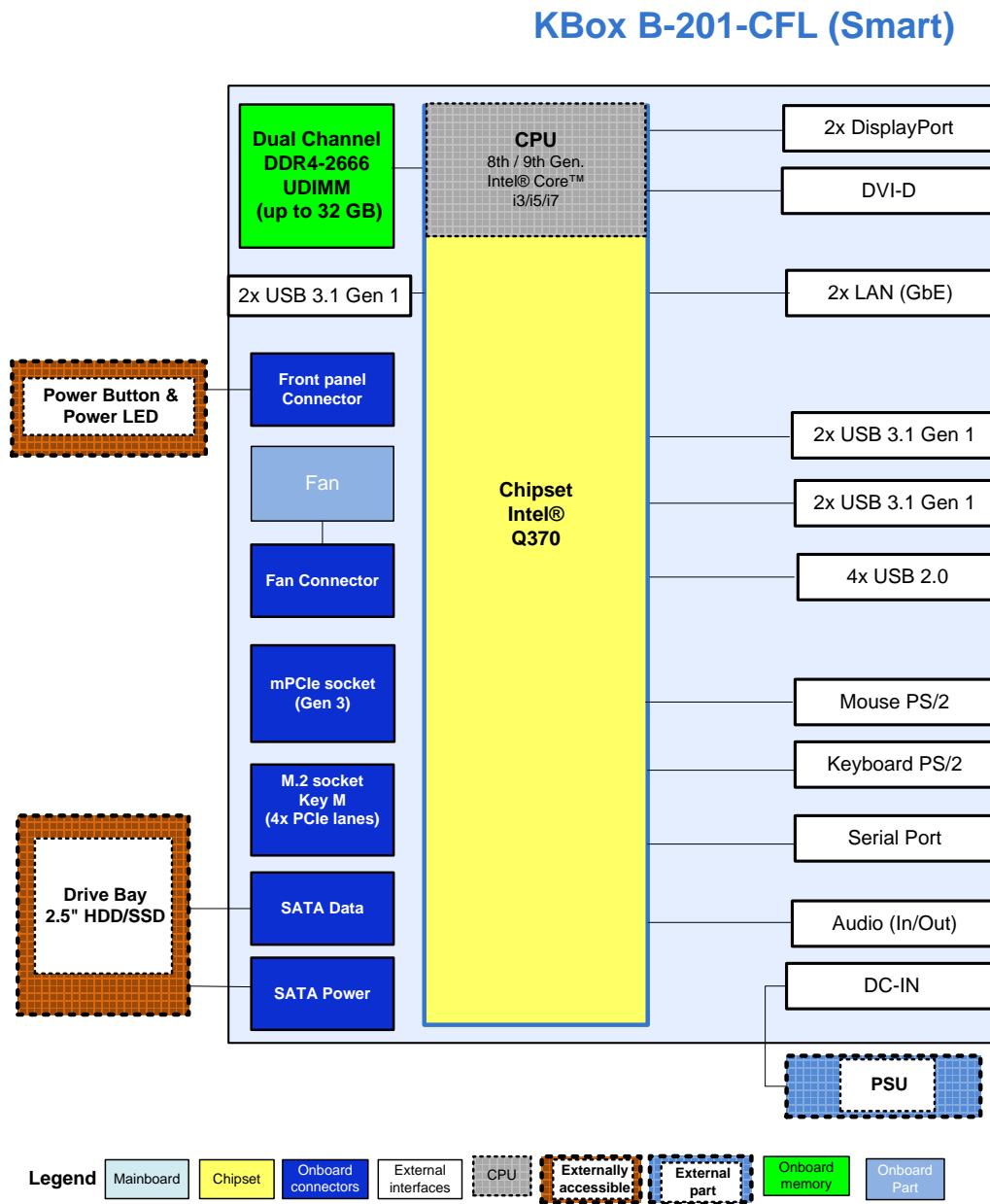
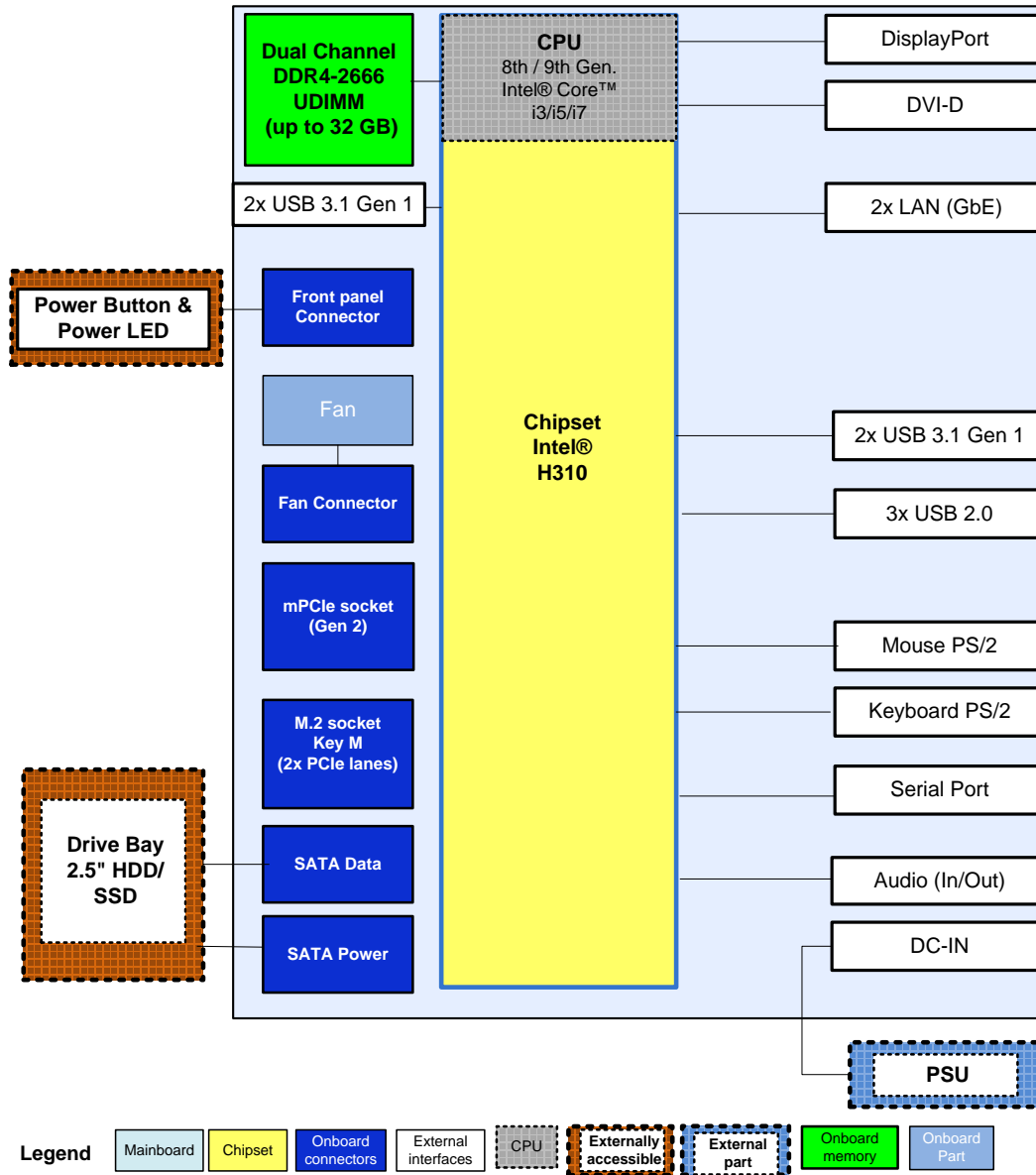


Figure 42: Block Diagram of KBox B-201-CFL Value Variant

### KBox B-201-CFL (Value)



## 10.2. Technical Specification

Table 4: Motherboard Specification

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
Motherboard 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	8 <sup>th</sup> / 9 <sup>th</sup> Gen. Intel® Core™ i3/i5/i7	8 <sup>th</sup> / 9 <sup>th</sup> 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 5: Processor Specification

Processor Type 8 <sup>th</sup> Gen.	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
Processor Type 9 <sup>th</sup> Gen.	Intel® i3-9100E	Intel® i5-9500E	Intel® i7-9700E
Core	4	6	8
Cache	6 MB Smart cache	9 MB Smart cache	12 MB Smart
Processor Base Freq.	3.1 GHz	3.0 GHz	2.6 GHz
TDP	65 W	65 W	65 W
Graphics	Intel® UHD-Graphic 630	Intel® UHD-Graphic 630	Intel® UHD-Graphic 630

Table 6: Storage Specification

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
SSD Drive Bay (external)		
Quantity	1x 2.5"	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) or M.2(2260/2242) + mPCIe (half size) or M.2(2242) + mPCIe (full size)

Table 7: Interface Specifications

	KBox B-201-CFL (Smart)	KBox B-201-CFL (Value)
<b>External Interfaces (front side)</b>		
USB 3.0	2x USB 3.1 Gen 1	2x USB 3.1 Gen 1
<b>External Interfaces (rear panel)</b>		
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 (standard)	+12 VDC (+24 VDC variant)	+12 VDC (+24 VDC variant)
<b>Options</b>		
Wi-Fi Antenna	Dual band (2.4 GHz/5 GHz), BT 4.1 <sup>[1]</sup>	Dual band (2.4 GHz/5 GHz), BT 4.1 <sup>[1]</sup>
<b>Expansion Sockets (internal)</b>		
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

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




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**Mechanically allowed mPCIe expansion card and M.2 storage card combinations are:**  
M.2(2280) or M.2(2260/2242) + mPCIe (half size) or M.2(2242) + mPCIe (full size)

---

Table 8: Software Specification

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




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**uEFI only! No legacy support and no Master Boot Record (MBR) installation.**

---

### 10.3. Mechanical Specification

The mechanical specification of the KBox B-201-CFL and the possible mounting options are shown in Table 9: Mechanical Specification.

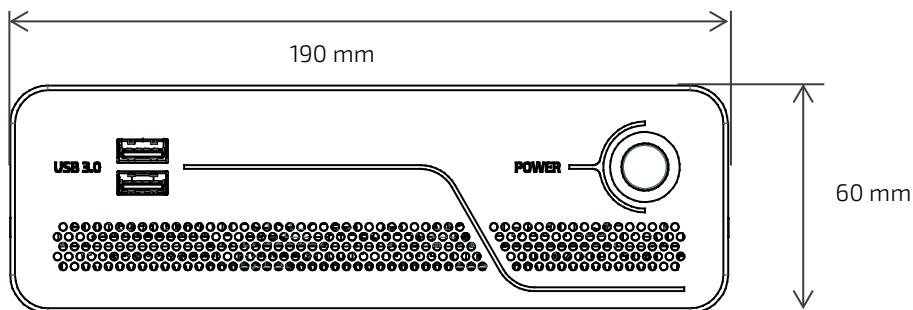
**Table 9: Mechanical Specifications**

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.)	
Chassis	Zinc coated steel sheet (RAL 7021)	
Front Panel	Aluminum (grey)	
Cooling	Fan cooled, axial fan, Silent fan	
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")
	VEESA 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 detailed mechanical information, refer to the outline dimension diagrams in this chapter. Each dimension drawing shows the main external mechanical dimensions.

**Figure 43: Dimensions Front Panel**



**Figure 44: Dimensions Rear Panel**

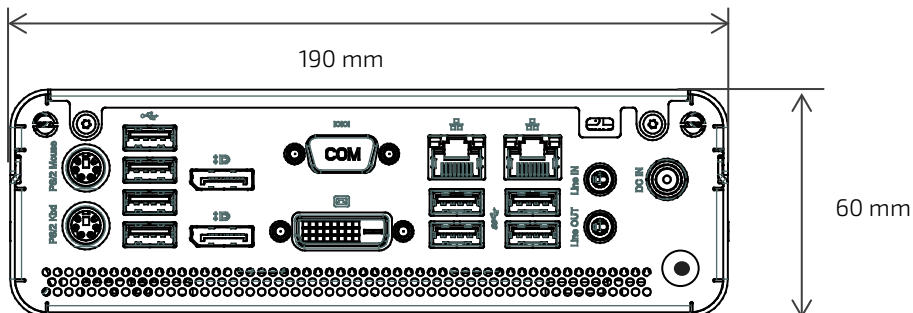




Figure 45: Dimensions Top Cover

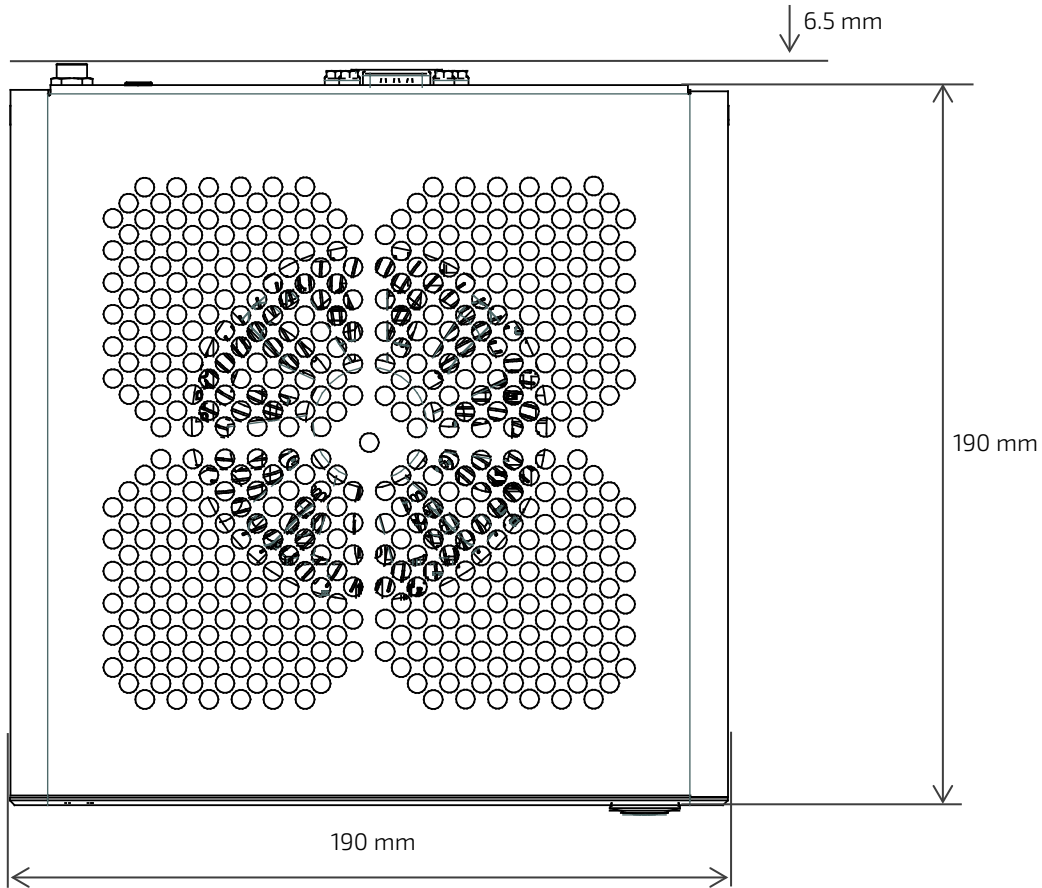


Figure 46: Dimensions Bottom Side

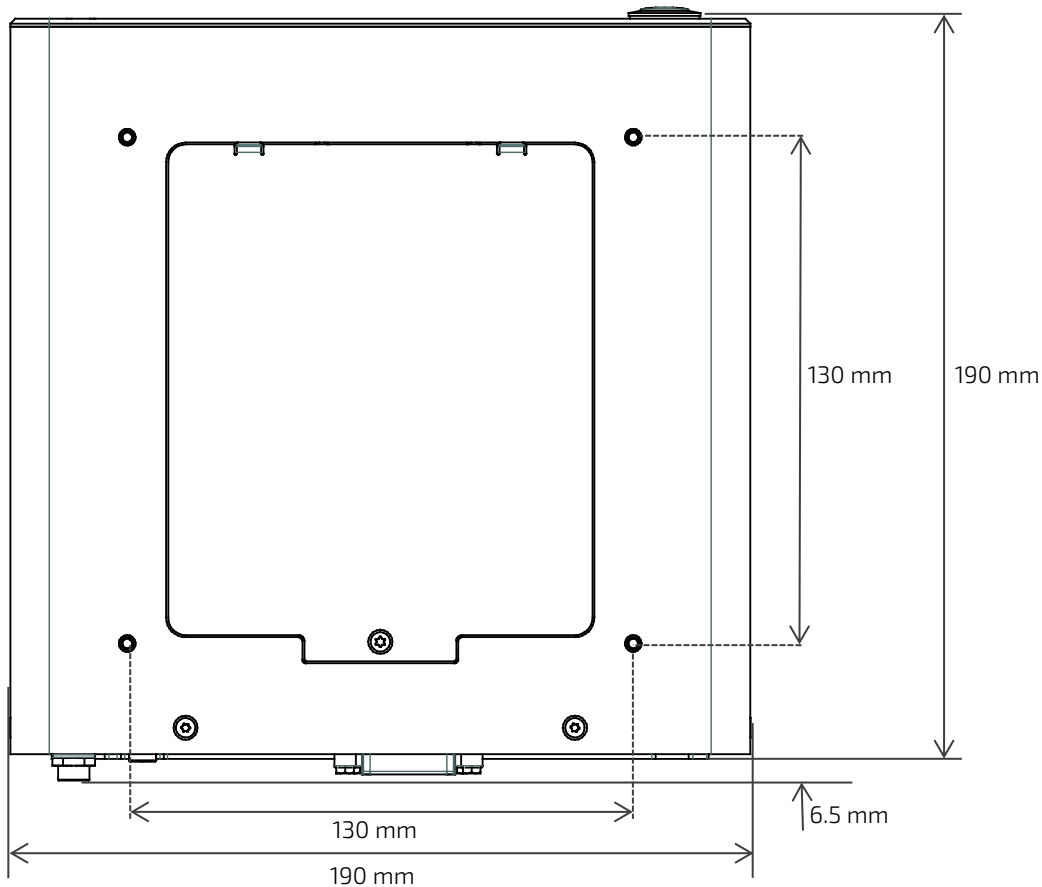
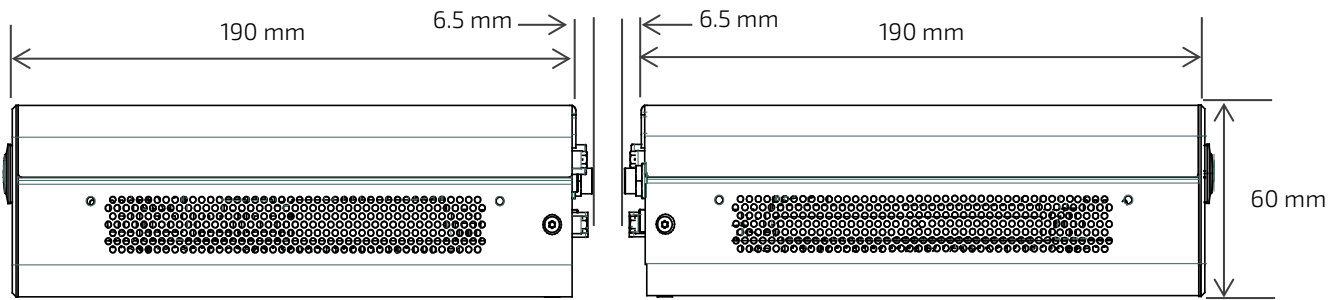


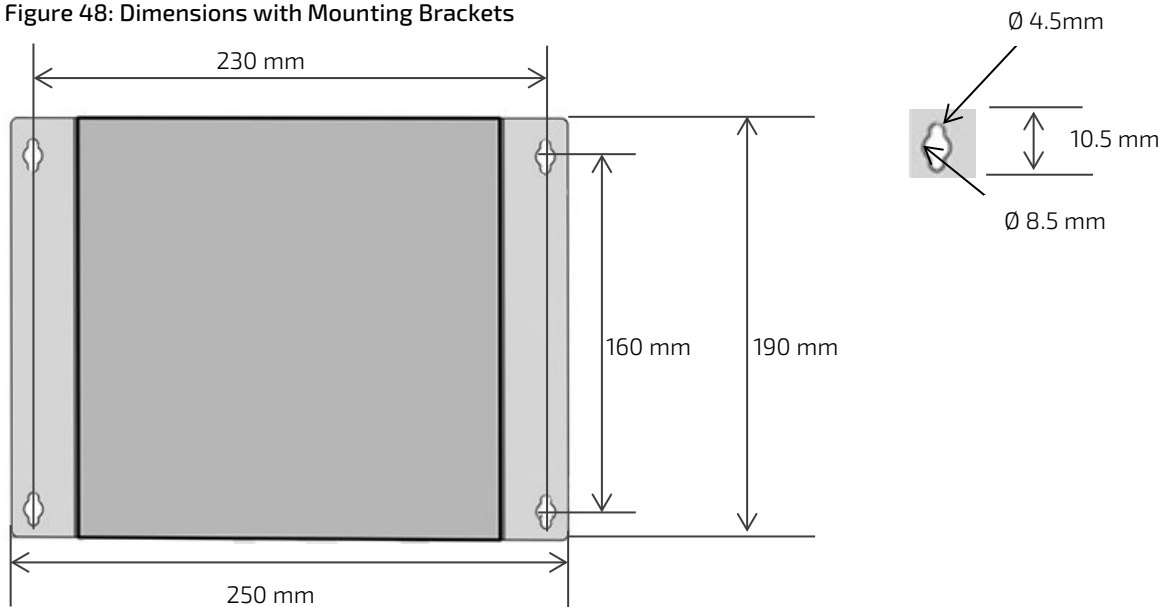
Figure 47: Dimensions Right Side and Left Side



### 10.3.2. Dimension Diagrams- Wall Mount Brackets

The dimension drawing shows the main mounting bracket mechanical dimension.

Figure 48: Dimensions with Mounting Brackets



## 10.4. Environmental Specification

Table 10: Environmental Specification

Temperature	Operating	0°C - 45°C (32°F - 113°F)
	Storage & Transit	-20°C - +80°C (-4°F - 176°F)
Relative Humidity	Operating	93% RH @ 40°C, non-condensing
	Storage & Transit	
Altitude (Operating)		5000 m Max. (approx. 16400 ft.)
Noise		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. Compliance

The KBox B-201-CFL complies with the relevant requirements and the approximation of the laws relating to 'CE' (for no Wi-Fi variant) and 'RED' (for Wi-Fi variant), and the standards that are constitutional parts of the declaration.

**Table 11: Compliance**

<b>CE (for KBox B-201-CFL – without Wi-Fi only)</b>		
Council Directive		93/68/EEC
<b>RED (for KBox B-201-CFL with Wi-Fi only)</b>		
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
<b>EMC</b>		
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
<b>Safety</b>		
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	
<b>FCC</b>		
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 <sup>[1]</sup>
<b>Environment</b>		
WEEE 2012/19/EU		Waste Electrical and Electronic Equipment (WEEE) directive; to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers
RoHS II 2011/65/EU		Restriction of Hazardous Substances (RoHS) directive or the late status thereof, to reduce hazardous substances in electrical and electronic equipment
REACH Regulation No. 1907/2006		Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation to identify the intrinsic properties of chemical substances earlier



If the product is 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 delivered product or the substitution or attachment of connecting cables and equipment other than those specified by Kontron. The correction of interference caused by unauthorized modification, substitution or attachment is the user's responsibility.



Use shielded I/O cables when connecting to peripheral or host devices. Failure to do so may violate FCC/ICES rules.



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All tests were performed with supplied external AC/DC power supply. Failure to use the supplied power supply may invalidate the FCC compliance & class.

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## 10.6. Power Specification

The KBox B-201-CFL power connection variants (12 VDC and optional 24 VDC) both connected to the DC-IN power connector. The KBox B-201-CFL power variants are not interchangeable, due to additional internal components in the 24 VDC variant. The type label states the required input voltage.

### ⚠ CAUTION

Only connect the product to an external power supply providing the voltage type (AC or DC) and the input power (max. current) specified on the Kontron Product Label and meeting the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1.

### NOTICE

Due to additional internal components in the 24 VDC variant, the 12 VDC and optional 24 VDC variant are not interchangeable.

### NOTICE

To protect external power lines of peripheral devices, make sure that the wires have the right diameter to withstand the maximum available current. The enclosure of the peripheral device fulfills the fire-protection requirements of IEC/EN62368.

### NOTICE

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

### 10.6.1. 12 VDC

The KBox B-201-CFL is delivered with an external AC/DC 150 W power supply with a nominal output voltage of 12 VDC. Only use the AC/DC power supply supplied in the delivery and chosen to meet the product's power specification, power consumption and power protection requirements.

Table 12: External AC/DC power supply

Power Source	External AC/DC Power Supply
Input Voltage Range	100/240 VAC
Output Voltage	+12 VDC
Output Current	9 A to 12.5 A max.
Power Rating	150 W
Size (D x W x H)	151.3 mm x 75.6 mm x 25.4 mm (5.96" x 2.98" x 1")

### 10.6.2. 24 VDC (optional variant)

The KBoxB-201-CFL optional 24 VDC variant is delivered with a 24 VDC wired power cable that connects to a separate external DC power source. Only connect to an external DC power source that meets the KBox B-201-CFL's electrical specification and meets protection and supply limitation requirements. The DC power source must automatically recover from AC power loss and startup under peak loading.

### ⚠ CAUTION

Observed that wiring and short-circuit/overcurrent protection is performed according to the applicable standards, regulations and in respect to the product's electrical specification. The disconnecting device (fuse/circuit breaker) rating must be in accordance with the product's wire cross-section.

Table 13: External Power Supply 24 VDC (variant)

Power Source	24 VDC Power Cable
Voltage	+24 VDC

Power Source	24 VDC Power Cable
Current	5 A max.
Power Rating	120 W
Length	620 mm approx.

### 10.6.3. Power Protection

The external power supply incorporates protection and supply features such as over current, over temperature, over voltage and brownout protection, to protect the product against fluctuations and interruptions in the delivered mains power supply and help to ensure operation without loss of data or damage to the product.

Table 14: External AC/DC Power Supply Protection Features

	Amount	Condition	Description
Holdup Time	≥10 sec	@ 100 VAC or 240 VAC / full load, output voltage remains regulated	Time the power supply can bridge drops in mains power without fluctuations in the output voltage.
Brownout	Set at 60 VAC to 70 VAC		Under voltage condition due to a drop in the mains power supply voltage

#### NOTICE

If there is an unintentional voltage drop in the mains power supply for longer than the specified holdup time (brownout), all supply voltages should be shut down and remain in the off state long enough to allow internal voltages to discharge sufficiently. During the off state time do not disconnect an add cables to/from the I/O connectors. Failure to observe the off state time means that parts of the product or attached peripherals may work incorrectly or suffer a reduction of MTBF.

The minimum off state time, to allow internal voltages to discharge, depends on the power supply used and additional electrical factors. To determine the required off state time, each case must be considered individually. For more information, contact [Kontron Support](#).

### 10.6.4. Power Consumption

The total power consumption depends on the motherboard capacity, system memory and system expansion. The overall power consumption must not exceed the product's maximum power supply rating; see Table 12 and Table 13. If the implemented expansion cards increase the total power consumption to a value above the maximum power supply rating, contact [Kontron Support](#).

Table 15: Power Consumption Estimation

Components	Maximum Power Consumption
Motherboard + Processor + RAM	132 W
SSD	4 W
Total	136 W

### 10.6.5. Potential Equalization

The potential equalization stud is located on the rear panel. The potential equalization stud is not a ground connection. When connected, the potential equalization stud ensures that all connected systems share a common potential.




The potential equalization stud is not a ground connection. The potential equalization stud ensures that all connected systems share a common potential.

## 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. Connect the supplied power connection method to the DC-IN connector. The DC-IN power connection depends KBox B-201-CFL'S power variant where the standard 12 VDC variant is an external AC/DC power supply and the optional variant is a wired 24 VDC.

Table 16: DC power Jack Pin Assignment

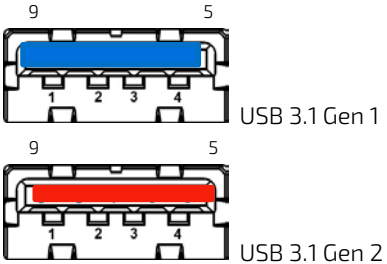
Pin	Signal	Power Jack
Centre pole	+12 VDC (Standard) +24 VDC (optional variant)	
Outer ring	Ground	

**NOTICE** Due to additional internal components in the 24 VDC variant, the 12 VDC and optional 24 VDC variant are not interchangeable.

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

### 11.2. USB 3.1 Gen 1 Port & USB 3.1 Gen 2 Pin Assignment

Table 17: USB 3.1 Gen 1 (Type A) Pin Assignment

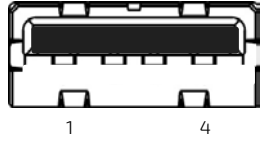
Pin	Signal Name	Pin	Signal Name	9-pin USB 3 (Type A) Port
1	+5V (fused protected)	5	RX-	
2	Date-	6	RX+	
3	Data+	7	GND	
4	GND	8	TX-	
		9	TX+	



Low-active signals are indicated by a minus sign.

### 11.3. USB 2.0 Port Pin Assignment

Table 18: USB 2.0 Connector Pin Assignment

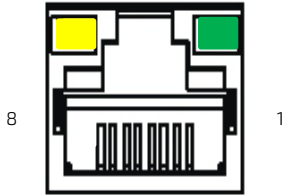
Pin	Signal Name	4-pin USB 2.0 (Type A) Connector
1	+5 V (fused protected)	
2	Data-	
3	Data+	
4	GND	



Low-active signals are indicated by a minus sign.

### 11.4. LAN GbE Connector Pin Assignment

Table 19: LAN (GbE) Connector Pin Assignment

Pin	Signal (10/100/1000)	Signal (10/100)	RJ45 (female)
1	MX1+	TX+	
2	MX1-	TX-	
3	MX2+	RX+	
4	MX3+	TERMPANE	
5	MX3-	TERMPANE	
6	MX2-	RX-	
7	MX4+	TERMPANE	
8	MX4-	TERMPANE	



Low-active signals are indicated by a minus sign.

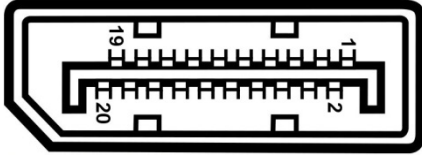
Table 20: LAN Link Activity

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 21: Display Port (DP) Connector Pin Assignment

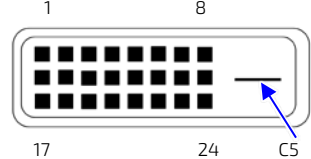
Pin	Signal Name	Display Port Connector	Signal Name	Pin
1	Link0+		GND	2
3	Link0-		Link1+	4
5	GND		Link1-	6
7	Link2+		GND	8
9	Link2-		Link3+	10
11	GND		Link3-	12
13	DVI dongle detect		GND	14
15	AUX+		GND	16
17	AUX-		Hot Plug detect	18
19	GND (return)		+3.3V (fuse protected)	20



Low-active signals are indicated by a minus sign.

## 11.6. DVI-D Connector Pin Assignment

Table 22: DVI-D Connector Pin Assignment

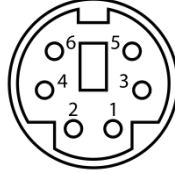
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	DVI-D Connector	
1	Data2-	9	Data1-	17	Data0-		
2	Data2+	10	Data1+	18	Data0+		
3	GND	11	GND	19	GND		
4	NC	12	NC	20	NC		
5	NC	13	NC	21	NC		
6	DDC Clock	14	+5 V (fuse protected)	22	GND		
7	DDC Data	15	GND	23	Clk +		
8	NC	16	Hot Plug Detect	24	Clk -		
				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



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

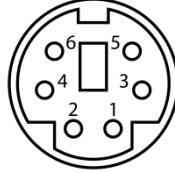
## 11.7. PS/2 Keyboard Connector Pin Assignment

Table 23: PS/2 Keyboard Connector Pin Assignment

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



## 11.8. PS/2 Mouse Connector Pin Assignment

Table 24: PS/2 Mouse Connector Pin Assignment

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

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

Table 25: Audio Line-out Audio Line-in Pin Assignment

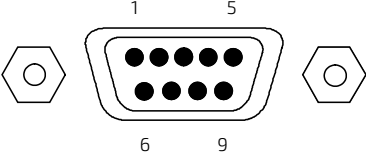
Connector	Signal	Audio Barrel Connectors
Green	Line-out	
Blue	Line-in	



Supports HD audio and legacy audio, select the legacy option in the BIOS setup menus

## 11.10. Serial Port Connector Pin Assignment

Table 26: 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 D3634-S motherboards and featuring 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




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**uEFI only! No legacy support and no Master Boot Record (MBR) installation.**

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

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### 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 product.
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.




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

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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. The following table provides a list of navigation hot keys available in the legend bar.

**Table 27: Navigation Hot Keys Available in the Legend Bar**

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 regularly .If a problem cannot be solved using a new driver, Kontron recommends performing a BIOS update.

### 12.2.1. Performing a BIOS Update



Kontron recommends making a backup of the current BIOS setting before performing a BIOS update. After a BIOS update, additional modifications must be made manually.



During a BIOS update, do not switch off, reset or interrupt the process. If interrupted, the BIOS update process must be restarted.

To access the BIOS updates:

1. Visit <http://support.ts.fujitsu.com/> and enter the motherboard's product name in the search bar at the top right hand side of the screen and click on the search icon. The displayed website shows the available "Drivers", "BIOS", "Documents", "FAQs" and "Application Information".



To find the motherboard's product name, refer to Table 4: Motherboard Specification.

2. Click on "BIOS" to access the "Downloads Section" with the latest BIOS updates.

To update the BIOS, use one of the following methods:

- ▶ Windows DeskFlash program
- ▶ FAT 32 formatted USB stick

To update the BIOS using the Windows DeskFlash program, perform the following:

1. Click on "BIOS Update-Windows".
2. Download the "Flash BIOS Update – Desk Flash Instant" update file.
3. Run the update file "Flash BIOS Update – Desk Flash Instant".
4. Perform the on-screen instructions.



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**If the product fails to boot, the updated BIOS maybe damaged, contact [Kontron Support](#).**

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To update the BIOS using a FAT32 formatted USB stick, perform the following:

1. Click on "BIOS Update – Admin Pack".
2. Download the "Admin Package-Compressed Flash files" ZIP file from the website to a PC.
3. Unzip and copy the file to a FAT32 formatted USB stick.
4. Locate the following files on the USB stick:
  - a. EfiFlash.efi in the folder EFI/FUJITSU
  - b. D1234-A1.UPD (BIOS Update file) in the USB stick's root directory
5. Reboot and press <f12> to open the Boot menu.
6. Use the navigation hotkeys to select the "Fujitsu Update Utility" and confirm with <Enter>.
7. Confirm the update process with <Y> when prompted. This performs a reset and starts the update.



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**If the product fails to boot, the updated BIOS maybe damaged, contact [Kontron Support](#).**

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## 13/ RAID

The KBox B-201-CFL supports a RAID array in the Drive Bay.

### 13.1. Drive Bay RAID Array

The KBox B-201-CFL with drive bay RAID array is factory installed with RAID 1 by default.

Table 28: Drive Bay RAID

RAID Drive type	Number of M.2 SSDs	Interface	Position	RAID Type	RAID Monitoring
2.5" SSD dual M.2 RAID Module with 2x M.2 Key B SSD modules	Up to 2	SATA III 6Gb/s	Drive bay - bottom side	RAID 0/1 hardware configured	iRAID utility software (pre-installed)

#### NOTICE

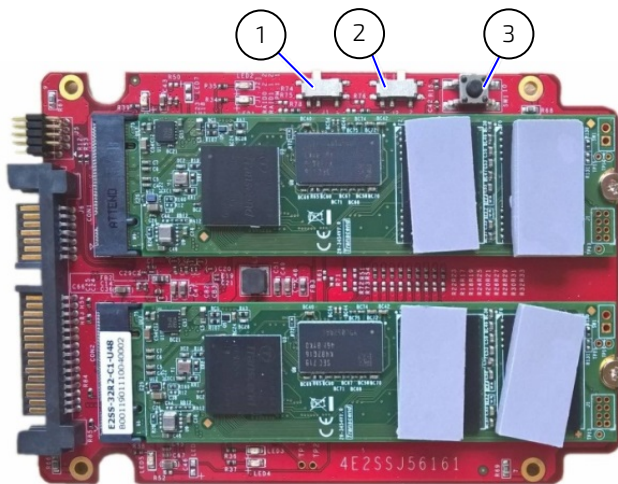
Do not reset the RAID module without considering if a backup of the data is required. Pressing the reset switch configures the RAID array and data on both drives will be lost.

#### NOTICE

After replacing one of the M.2 SSD modules on the RAID module, do not reset the RAID module! When the RAID module is powered on again, the previous RAID configuration is copied to the new M.2 SSD module automatically.

#### 13.1.1. Drive Bay RAID Configuration

Figure 49: 2.5" SSD dual RAID M.2 Module Settings



- 1 Jumper (J1) in setting 1
- 2 Jumper (J2) in setting 2
- 3 Reset switch

To configure the 2.5" SSD dual M.2 RAID module, perform the following:

1. Open the drive bay cover.
2. Place the 2.5" SSD dual M.2 RAID module on an ESD-safe surface.
3. Install the M.2 SSD(s) on the RAID module and set the jumpers J1 and J2 (Figure 49, pos. 1 and 2) to the setting required for the RAID array type.

Table 29: RAID Module Jumper Settings

RAID Array Type	J1 Setting	J2 Setting
RAID 0	2	2
RAID 1	1	2

4. To configure the RAID array the 2.5" SSD dual M.2 RAID module must be powered on using either the KBox B-201-CFL's drive bay (refer to step 5) or an external SATA adapter from a SATA source (refer to step 6).
5. Insert into the drive bay with the side of the 2.5" SSD dual M.2 RAID module with the two M.2 SSDs modules facing the inside of the drive bay. Switch on the KBox B-201-CFL. Place a small non-conductive blunt-utensil underneath the 2.5" SSD dual M.2 RAID module where the reset switch is positioned (Figure 49, pos. 3). Press down gently on the 2.5" SSD dual M.2 RAID module's free end for approximately 3 seconds or until a click tone confirms the reset switch has been activated. The 2.5" SSD dual M.2 RAID module automatically configures to the jumper set RAID array type. Close and secure the drive bay cover

### **⚠ WARNING**

#### **Danger of Fire**

Configuring the KBox B 201-CFL with the top cover facing downward, may cause overheating or melting and hence may causing a fire hazard or personal injury.

To avoid risk of fire and personal injury, observe the following:

- ▶ After configuring the RAID module, immediately return the product to an allowed orientation!
  - ▶ Horizontally (with top cover facing upwards)
  - ▶ Vertically (all possible mount orientations)

Or connect a SATA adapter cable (power and data) to a SATA source. Connect the other end of the adapter cable to the 2.5" SSD dual M.2 RAID module's SATA power and data connectors. Press the reset switch (Figure 49, pos. 3) for three seconds or until a click tone confirms the reset switch has been activated. The 2.5" SSD dual M.2 RAID module automatically configures to the jumper set RAID array type. Switch off the SATA power source and remove the SATA adapter cable from the 2.5" SSD dual M.2 RAID module. Insert the 2.5" SSD dual M.2 RAID module into the SATA connectors in the drive bay with the side of the 2.5" SSD dual M.2 RAID module with the two M.2 SSDs modules facing the inside of the drive bay. Close and secure the drive bay cover.

## 13.1.2. Drive Bay RAID Software

The manufacture's iRAID Utility software is pre-installed to monitor the status of the RAID module's individual drives and enables users to access data regarding the RAID settings, receive notifications, and find out about memory events that occurred and could lead to a possible drive failure.

### 13.1.2.1. iRAID Utility Settings

The iRAID Utility software displays the main RAID data for both drives:

- ▶ Drive model
- ▶ Serial number (SN)
- ▶ Firmware
- ▶ Memory capacity
- ▶ S.M.A.R.T health check information

The S.M.A.R.T health check helps predict memory failures by counting how often memory-attribute problems occur, see Table 30: S.M.A.R.T. Information Memory Attributes.



**Table 30: S.M.A.R.T. Information Memory Attributes Examples**

Memory-attributes		
Later bad	Average erase	Unexpected power loss
Power on hours	Device Life	Temperature
Power cycle	Spare block	Flash ID
Total bad block	Program fail	Later bad block read
Maximum erase	Erase fail	Later bad block write

### 13.1.2.2. Notifications

Notifications enables users to set an email address to receive notification emails for typical RAID events, when a specified threshold level is reached.

**Table 31: Notifications Examples**

Notifications		
RAID Broken	RAID Created	RAID 1 Rebuild Finished
RAID Degrade	RAID Deleted	RAID 1 Rebuild Suspend
RAID Recovery	RAID 1 Rebuild	RAID 1 Rebuild Error

### 13.1.2.3. Events

Events lists important RAID events and gives more detailed information.

**Table 32: Event List Examples**

Events	Description
List number	Lists in the order of occurrence
Type	Type of event Info./ Alert / Error
Time	Time the event took place
Event	Event's RAID notification tag
Message	Describes the error in more detail e.g. H/W RAID 1 DISK 1 plugged out or DISK one plugged in

## 14/ 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)




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

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### 14.1. 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.




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

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## 15/ Storage, Transportation and Maintenance

### 15.1. 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.

### 15.2. 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.

### 15.3. 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.

#### **CAUTION**

Handling and operation of the product is permitted only for trained personnel aware of the associated dangers, within a work place that is access controlled and fulfills all necessary technical and environmental requirements.

#### 15.3.1. Cleaning

To clean the surface of the chassis:

- ▶ 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.

#### 15.3.2. Replacing Lithium Battery

The lithium battery CR 2032 must be replaced with an identical 3 V 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**

Caution: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebut les batteries usagées selon les instructions.



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).

## 16/ Warranty

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

1. Visit Kontron's Term and Conditions webpage.  
<http://www.kontron.com/terms-and-conditions>
2. Click on your region's General Terms and Conditions of Sale.

### 16.1. 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 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.

## List of Acronyms

Table 33: List of Acronyms

ACPI	Advanced Configuration Power Interface
AHCI	Advanced Host Controller Interface
BIOS	Basic Input Output System
BT	BlueTooth
CFR	Code of Federal Regulations
COM	Communication port
DP	Display Port
DRAM	Dynamic RAM
DVI	Digital Video Interface
ECC	Error Checking and Correction
ECT	Embedded Computer Technology
EEE	Electrical and Electronic Equipment
ESD	Electro Static Device
FCC	Federal Communications Commission
GbE	Giga bit Ethernet
GPU	Graphics Processing Unit
HD	High Definition
HD/HDD	Hard Disk /Drive
ICES	Interference Causing Equipment Standard
IOT	Internet of Things
ITE	Information Technology Equipment
KBD	Keyboard
LAN	Local Area Network
LED	Light-Emitting Diode
LVDs	Low Voltage Device
MTBF	Mean Time Before Failure
NC-SI	Network Controller Sideband Interface
PCIe	PCI-Express
mPCIe	Mini PCI-Express
OS	Operating System
PSU	Power Supply Unit
RAID	Redundant Array of Independent Disks
RAM	Random Access memory
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
RED	Radio Equipment Directive
RMA	Return of Material Authorization
ROHS	Restriction Of Hazardous Substances
RTC	Real Time Clock
SATA	Serial AT Attachment

mSATA	Mini SATA
SELV	Separate Extra Low Voltage
S.M.A.R.T	Self-Monitoring, Analysis and Reporting Technology
SN	Serial Number
S/PDIF	Sony/Philips Digital Interface
SSD	Solid State Drive
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
USB	Universal Serial Bus
VCC	Voltage Common Collector
VDC	Voltage Direct Current
WEEE	Waste Electrical and Electronic Equipment
Wi-Fi	Wireless
WSXGA	Wide Super eXtended Graphics Array
WQXGA	Wide Quad eXtended Graphics Array
XGA	eXtended Graphics Array



## About Kontron

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

For more information, please visit: [www.kontron.com](http://www.kontron.com)



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