USER GUIDE

KBox B-202-CFL

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KBOX B-202-CFL - USER GUIDE

Disclaimer

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Intended Use

This embedded Box PC, sold by Kontron, is part of Kontron's B-Series intended for high performance, low noises needs with 24/7 operation and long-term availability. The product can operate in a temperature range from 0°C to plus 45°C; and when stored can withstand temperatures from minus 20°C to plus 80°C; a humidity of 10 to 93 percent does not affect the function of the product. The KBox B-202-CFL is a high performance BoxPC designed for demanding applications such as high-end image processing, SCADA/MES applications, artificial intelligence and machine learning. In addition, the KBox B-202-CFL meets Class B meets stricter RFI limits makes it suitable not only for use in industrial environments, but also for use in residential and business areas or in their immediate vicinity, making the KBox B-202-CFL the ideal computer for architecture and graphics offices as well as music studios.

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	2020-May-13	CW
1.1	Changed BIOS Update procedure	2020-Jul-06	CW
1.2	Updated Ch. 8.2 Mounting Bracket, Ch. 3.4: Accessories, Ch. 3.5 Type label and General Safety Instructions	2020-Dec-17	CW
1.3	Added the Smart Storage, memory and AC power option Added the 24 VDC variant and changed the name of the ground pin to potential equalization stud.	2021-Feb-16	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 for IT Equipment" 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

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 repack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit http://www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

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

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- Reduce waste arising from electrical and electronic equipment (EEE)
- Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- Improve the environmental performance of all those involved during the lifecycle of EEE

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

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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 disconnect able
- 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) Precautions

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

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

1. Transport boards in ESD-safe containers such as boxes or bags.
2. Keep electrostatic sensitive parts in their containers until they arrive at the ESD-safe workplace.
3. Always be properly grounded when touching a sensitive board, component, or assembly.
4. Store electrostatic-sensitive boards in protective packaging or on antistatic mats.

1.2. Grounding Methods

By observing 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. Switch 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.

1.3. Instructions for the Lithium Battery

The KBox B-202-CFL's motherboard is equipped with a lithium battery. When replacing the battery observe the instructions described in Chapter 15.3.1: Replacing the Lithium Battery.

⚠CAUTION

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

Do not dispose of lithium batteries in general trash collection. Dispose of the battery according to the local regulations dealing with the disposal of these special materials.

2/ Introduction

This user guide describes the KBox B-202-CFL made by Kontron and focuses on describing the KBox B-202-CFL's special features. New users are recommended to study the instructions within this user guide before switching on.

Figure 1: KBox B-202-CFL

The KBox B-202-CFL is a high performance PC Box with 8th / 9th generation Intel® Core™ platforms with mini ITX motherboard variants Smart and Value interfaces on the rear panel. Extensive system expansion is achieved using an internal M.2 socket and mPCIe socket, two external PCIe slots and drive bay. A Smart Storage variant supports additional internal or removable mass storage or power options.

KBox B-202-CFL	Smart	Value
Processor:	8th / 9th Gen. Intel® Core™ i3/i5/i7	
Chipset:	Intel® Q370	Intel® H310
System Memory:	▸ DDR4-2666 UDIMM ▸ Up to 32 GB with dual SODIMM sockets	
Mass Storage (removable):	▸ 1x 2.5" SSD or 1x 2.5" SSD M.2 dual RAID Module ▸ Up to 2x 2.5" SSDs without or with RAID option (Smart Storage only)	
Mass Storage (internal):	▸ 1x M.2 SSD module on motherboard ▸ 1x 3.5 " HDD or up to 2x 2.5" SSDs (both Smart Storage only)	
mPCI:	1x mPCIe x1 (full or half size) on motherboard	
PCIe:	2x PCIe slots (1x PCIe x16 or 2x PCIe x8)	1x PCIe slot x16
Rear Connectors:	▸ 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 1xAudio line-out ▸ 1x PS/2 keyboard & PS/2 mouse ▸ 1x Serial port	▸ 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 & PS/2 mouse ▸ 1x Serial port
Front Connectors:	2x USB 3.1 Gen 1	
Cooling:	Active fan cooling	
Noise:	Low noise	
Security:	TPM V2.0 and Kontron APPROTECT (option)	
Wi-Fi:	Wi-Fi: Dual band (2.4/5 GHz), BT 4.1 (option)	
Power:	▸ DC-IN 12 VDC ▸ DC-IN 24 VDC with wired cable (option) ▸ 3-pin 240/100 VAC (option Smart Storage only)	

3/ Scope of Delivery

3.1. Packaging

The KBox B-202-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-202-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 your 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 that users 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 KBox B-202-CFL Variants

Product	Description
KBox B-202-CFL Smart 12 VDC	KBox B -202-CFL with D3633-S mITX motherboard, Intel® Q370 chipset 1x External 12 VDC AC/DC external power supply & regional mains power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (supplied with Wi-Fi option)
KBox B-202-CFL Value 12 VDC	KBox B-202-CFL with D3634-S mITX motherboard, Intel® H310 chipset 1x External 12 VDC AC/DC external power supply & regional mains power cable 4x Adhesive chassis feet 2x Wi-Fi antenna (supplied with Wi-Fi option)
KBox B-202-CFL Smart 24VDC	KBox B -202-CFL with D3633-S mITX motherboard and Intel® Q370 chipset 1x External 24 VDC wired power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (with Wi-Fi option only)
KBox B-202-CFL Value 24 VDC	KBox B -202-CFL with D3633-S mITX motherboard and Intel® H310 chipset 1x External 24 VDC wired power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (with Wi-Fi option only)

Product	Description
KBox B-202-CFL Smart Storage 12 VDC	KBox B -202-CFL with D3633-S mITX motherboard, Intel® Q370 chipset, rear side storage bay with drives 1x External 12 VDC AC/DC external power supply & regional mains power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (supplied with Wi-Fi option)
KBox B-202-CFL Smart Storage 24 VDC	KBox B -202-CFL with D3633-S mITX motherboard, Intel® Q370 chipset, rear side storage bay with drives 1x 24 VDC wired power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (With Wi-Fi option only)
KBox B-202-CFL Smart Storage AC	1x KBox B -202-CFL with D3633-S mITX motherboard, Intel® Q370 chipset 1x 3-pin regional mains power cable 4x Adhesive Chassis feet 2x Wi-Fi antenna (with Wi-Fi option only)

⚠CAUTION Power the KBox B-202-CFL 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.

⚠CAUTION Power the KBox B-202-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.

3.4. Accessories

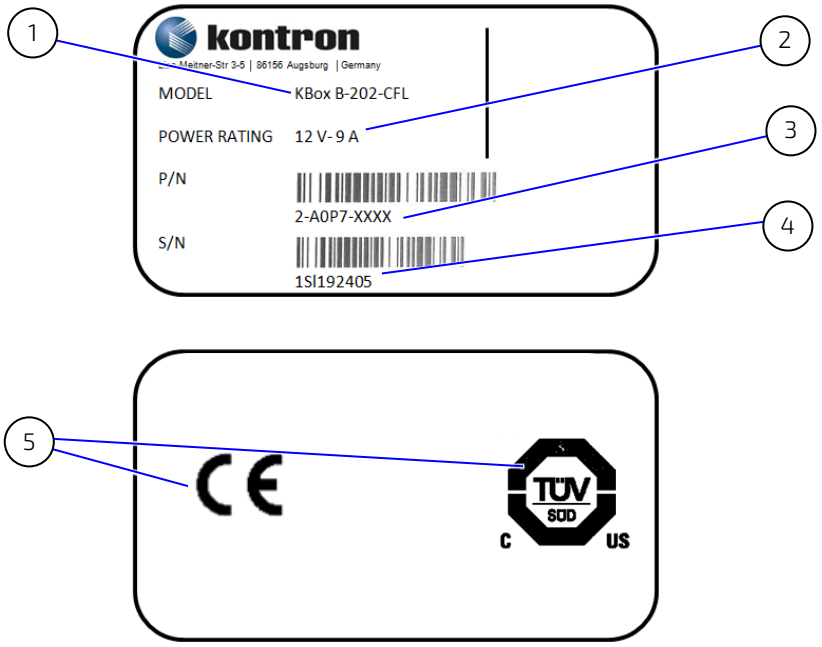
Table 2: Accessories

Part Number	Part	Description
1065 3430	Wall mount Set	Two wall mount brackets and four screw (M3x6)

3.5. Product Identification Type Label

The type label defines the product's motherboard variants 'Smart' or 'Value' and the power variant DC-IN 12 VDC, DC-IN 24 VDC or AC-IN 240/100 VAC, and contains specific product information (Model, Power Product Number, Serial Number, Electrical Specification and Compliance.).

Figure 2: Type Labels



1 Product family KBoxB-202-CFL

2 Electrical Specification
12 VDC, 24 VDC or 240/100 VAC

3 Part number with bar code
2-AOP8-xxxx Smart variant
2-AOP7-xxxx Value variant

4 Serial number and bar code

5 Certification label (separate for all KBox B-202-CFL variants)

4/ Product Features

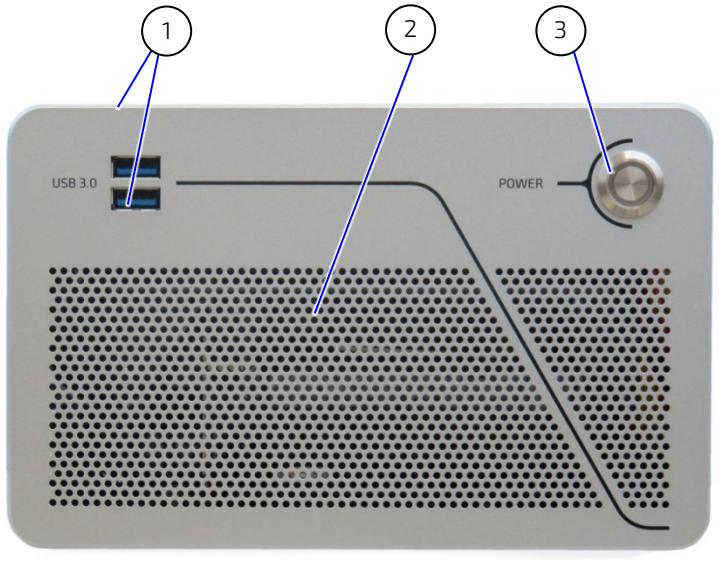
Before working with the KBox B-202-CFL, Kontron recommends that users take a few minutes to learn about the various parts of the product.

All product variants are available in a robust metal chassis that guarantees flexibility in multiple user applications.

4.1. Front Side Features

The front panel features the power button, two USB 3.1 ports, and ventilation openings for air-output.

Figure 3: Front Panel (Smart, Value and Smart Storage)



1 2x USB 3.1 Gen 1

2 Ventilation openings (air-output)

3 Power button with power LED

4.2. Front Side Connectors

4.2.1. Power Button

The power button switches on/off the KBox B-202-CFL the integrated blue LED indicates the power on. Pressing the power 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!

4.2.2. USB 3.1 Gen 1 Port

The two front panel USB 3.1 Gen 1 ports are USB 2.0 backward compatible allowing for the connection of both USB 3.0 or USB 2.0 devices. Further USB ports are available on the rear panel, see Chapter: 4.3: Rear Panel Features.

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

4.3. Rear Panel Features

The rear panel features the motherboard Smart and Value I/O interfaces, slots for PCI cards or additional mass storage drives, Wi-Fi antenna or breakouts and power connectors. The rear panel variants are:

Figure 4: Rear Panel (Smart, Value and Smart Storage variants)

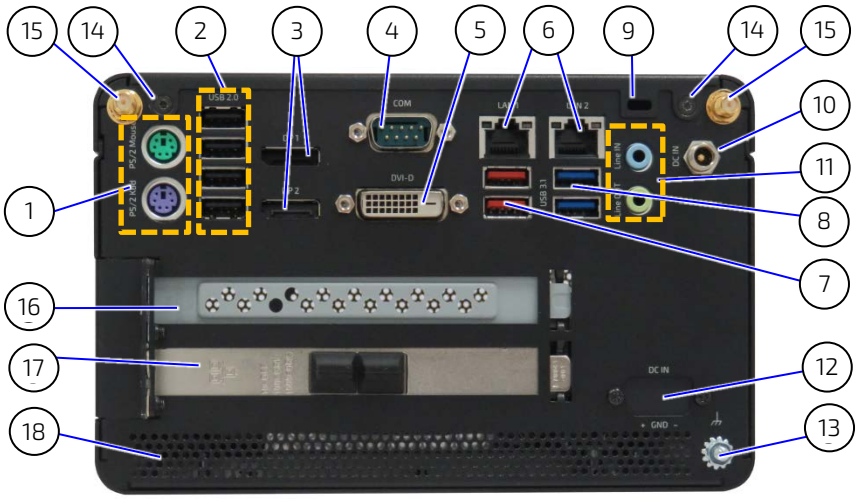
KBox B-202-CFL Smart

KBox B-202-CFL Value

KBox B-202-CFL Smart Storage with Storage Bay

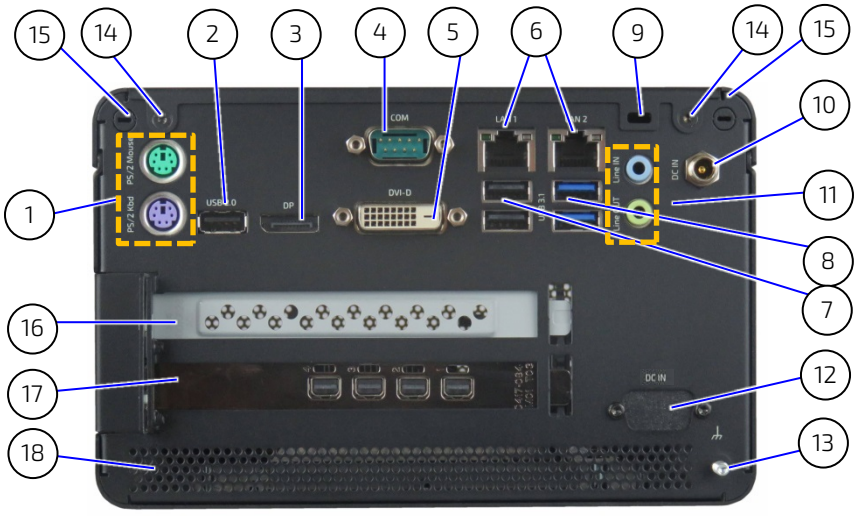
KBox B-202-CFL Smart Storage with AC Power Connector

Figure 5: Rear Panel KBox B-202-CFL Smart



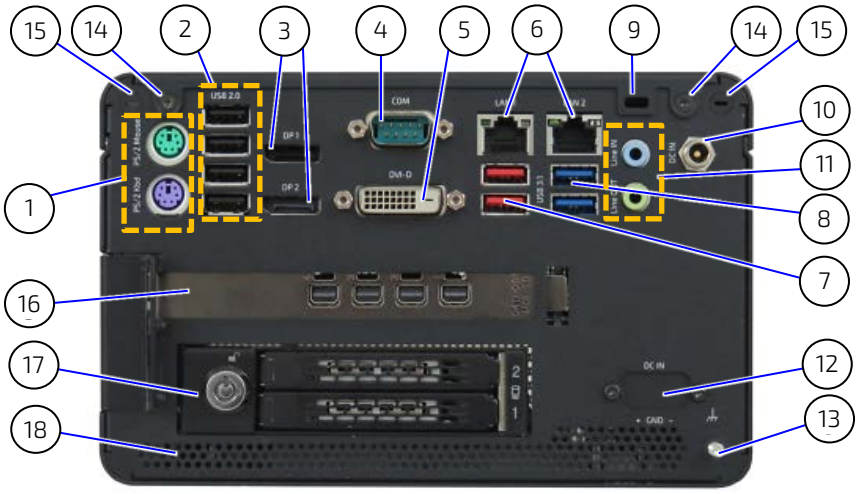
1	PS/2 Keyboard/mouse	7	2x USB 3.1 Gen 2(red)	13	Potential equalization stud
2	4x USB 2.0	8	2x USB 3.1 Gen 1 (blue)	14	2x Top cover fastening screws
3	2x DP	9	Kensington lock	15	2x Wi-Fi antenna
4	Serial port	10	DC-IN (12 VDC or 24 VDC)	16	PCIe Slot 2
5	DVI-D	11	Audio Line-in/Line-out	17	PCIe slot 1
6	2x LAN ports (GbE)	12	24 VDC(future option)	18	Ventilation openings (air-output)

Figure 6: Rear Panel KBox B-202-CFL Value



1	PS/2 Keyboard/mouse	7	2x USB 2.0 (black)	13	Potential equalization stud
2	1x USB 2.0	8	2x USB 3.1 Gen 1 (blue)	14	2x Top cover fastening screws
3	1x DP	9	Kensington lock	15	2x Breakouts for Wi-Fi antenna
4	Serial port	10	DC-IN (12 VDC or 24 VDC)	16	PCIe Slot 2
5	DVI-D	11	Audio Line-in/Line-out	17	PCIe slot 1
6	2x LAN ports (GbE)	12	24 VDC(future option)	18	Ventilation openings (air-output)

Figure 7: Rear Panel KBox B-202-CFl Smart Storage



1	PS/2 Keyboard/mouse	7	2x USB 3.1 Gen 2(red)	13	Potential equalization stud
2	4x USB 2.0	8	2x USB 3.1 Gen 1 (blue)	14	2x Top cover fastening screws
3	2x DP	9	Kensington lock	15	2x Breakouts for Wi-Fi antenna
4	Serial port	10	DC-IN (12VDC or 24 VDC)	16	PCIe Slot 2
5	DVI-D	11	Audio Line-in/Line-out	17	Storages bay for SSD drives or 3-pin AC power connector
6	2x LAN ports (GbE)	12	24 VDC(future option)	18	Ventilation openings (air-output)

4.4. Rear Panel Connectors

4.4.1. Keyboard/Mouse PS/2 Connectors

The standard 6-pin mini-DIN PS/2 purple connector enables the connection of a keyboard and green connector enables the connection of a mouse.

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

4.4.2. USB 2.0 Ports

The USB 2.0 ports enable the connection of USB 2.0 devices only. The available USB 3.1 ports are USB 2.0 backward compatible.

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

4.4.3. Display Port (DP)

The Display Port enables the connection of digital displays directly or with an adapter. The DP V1.2 port(s) are Dual mode/ Display Port ++ compatible and depending on the required resolution can support the following maximum number of displays.

Display Resolution (60 frame/sec refresh rate)	Number of Displays (Max.)
1680 x 1050 (WSXGA)	5
1920 x 1080 (1080p) or 1920 x 1200	4
2560 x 1600 (WQXGA)	2
3840 x 2160 (Ultra HD, 4K or 4096 x 2160 (4K x 2K)	1

The KBox B 202-CFL Smart supports two DP V 1.2 ports and the KBox B 202-CFL Value supports one DP V 1.2 port

KBox B-202-CFL Smart -supports up to three displays(2x DP+1x DVI-D)
KBox B-202-CFL Value -supports up to two displays (1x DP+1x DVI-D)

Using an adapter to convert a DP signal to DVI or HDMI may cause disturbance.

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

4.4.4. DVI-D Connector

The DVI-D connector enables the connection of a digital display directly or with an adapter.

DVI	DVI-D (single link only)
Resolution	1920x1200 @ 60 Hz
Adapters	DVI to HDMI or DVI to VGA

KBox B-202-CFL Smart -supports up to three displays (2x DP+1x DVI-D)
KBox B-202-CFL Value -supports up to two displays (1x DP+1x DVI-D)

Using an adapter to convert DVI to HDMI or DVI to VGA adapters may cause disturbance.

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

4.4.5. COM Port

The serial port (COM) 9-pin D_SUB connector enables the connection of a RS232 serial device.

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

4.4.6. LAN Ports

The LAN ports support Gigabit Ethernet (10/100/1000 Mbps), based on the Intel® i219LM & i210AT chips. The two RJ45 LAN connectors include speed and link activity status LEDs.

Technical Specification	Intel® i219M	Intel® i210AT
Single port	✓	✓
1 GbE date rate per port	✓	✓
System interface type Proprietary	✓	✓
Network Controller Sideband Interface (NC-SI)		✓
Support for jumbo frames	✓	✓
IEEE 1588	✓	✓
1000Base-T supported interface	✓	✓

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

4.4.7. USB 3.1 Gen 2 Ports

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

To enhance USB compatibility, in the BIOS setup **Advanced>USB Configuration>USB 3.1 Gen 2 Speed,** reduce the speed from 10 Gbits/s to 5 Gbits/s.

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

USB 3.1 Gen 2 is only supported by the KBox B-202-CFL-Smart variant.

4.4.8. USB 3.1 Gen 1 Ports

The USB 3.1 Gen 1 ports are backwards compatible enabling the connection of USB 3.0 or USB 2.0 compatible devices.

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

4.4.9. Line-IN, Line-OUT Connectors

The two audio connectors audio Line-in (blue jack) and audio Line-out (green jack) enable the connection of High Definition (HD) devices. Legacy audio is not supported.

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

4.4.10. DC-IN Connector

The standard DC-IN power jack connects to the supplied AC/DC external power supply (240/100 VAC to 12 VDC). The 24 VDC variant connects to the DC-IN power jack with the supplied 24 VDC wired power cable.

For more, see Chapter 10.6: Power Specification.

⚠CAUTION	**Power the KBox B-202-CFL 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.**
⚠CAUTION	**Power the KBox B-202-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.**

4.4.11. AC-IN (option -Smart Storage only)

The AC-IN power connector is only available on the Smart Storage variant, where the rear panel storage bay is populated with a 3-pin power connector for direct connection to a 240/100 VAC mains power outlet.

4.4.12. 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.

i	**The potential equalization stud is not a ground connection**

4.4.13. Wi-Fi Antenna Connectors (option)

The Wi-Fi antennas screw directly on to the Wi-Fi connectors and supporting 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.

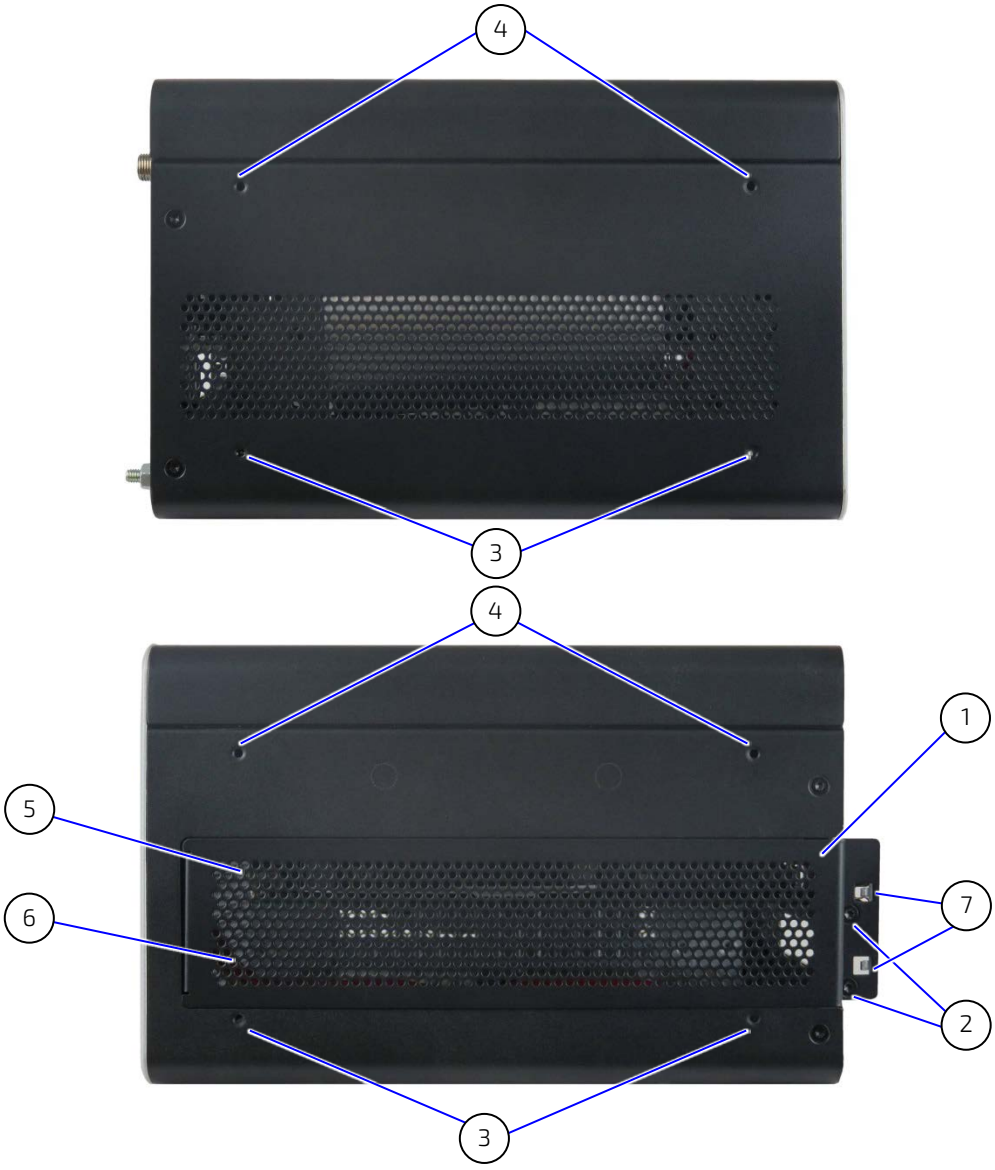
Figure 8: Wi-Fi Antenna

4.5. Left and Right Side Features

The sides feature ventilation openings for air-output. The ventilation openings on the right side are contained within a removable expansion door.

Two pairs of threaded screw holes (Figure 9, pos. 3) lower and (Figure 9, pos. 4) upper are used to attach wall mount brackets, see Chapter 8.2: Mounting Brackets (option).

Figure 9: Left Side and Right Side

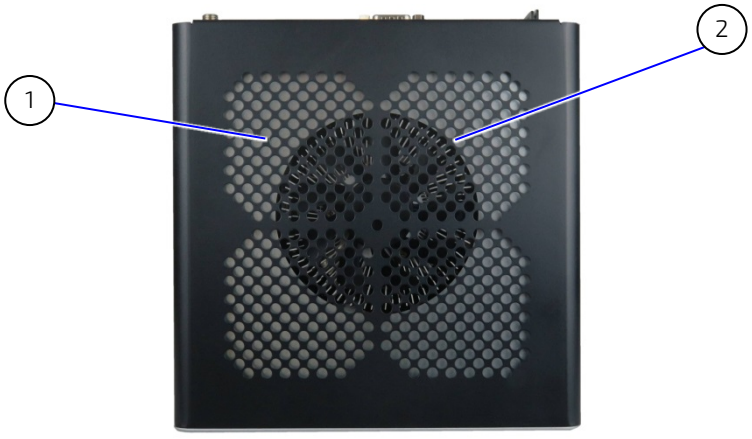


1 Expansion door (removable) with ventilation openings for air-output
2 Expansion door screws
3 Lower pair of threaded screw holes for wall mount brackets
4 Upper pair of threaded screw holes for wall mount brackets
5 PCIe slot 2
6 PCIe slot 1
7 PCIe cards' front pins

4.6. Top Cover and Bottom Side Features

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

Figure 10: Top View

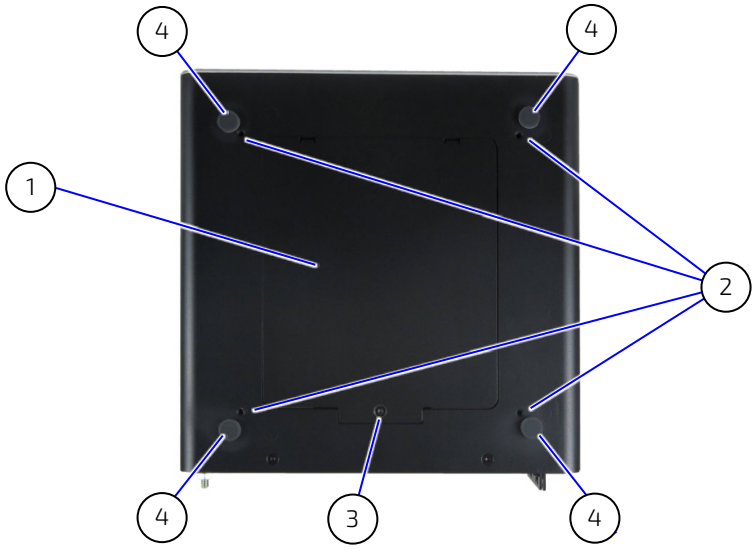


1 Ventilation openings (air-intake)

2 Circular opening on metal plate

The bottom side features a drive bay with cover that opens or closes using a single screw (Figure 11, pos. 3).

Figure 11: Bottom View



1 2.5" SSD drive bay cover

2 4 x Threaded holes (extra mounting option)

3 Drive bay cover screw

4 4x Rubber feet

5/ Options

5.1. Expansion Options

The supported drives and expansion cards depend on the motherboard specification and chassis space limitation. Kontron recommends expanding the KBox B-202-CFL, before installation in the end environment.

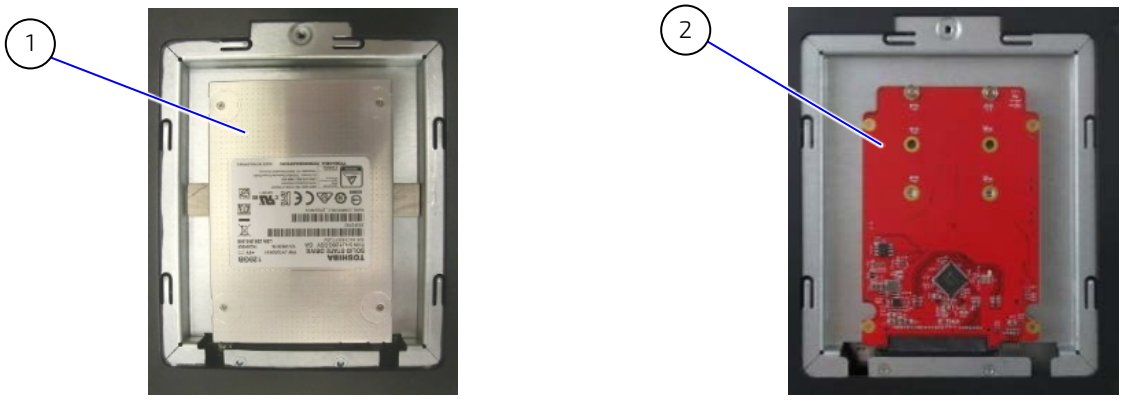
Table 3: KBox B-202-CFL Expansion Option

Smart			
Location		**Expansion Device**	**Combinations**
Internal	M.2 socket	1x 2280 module or 1x 2242 module	1x M.2 2280 only or 1x M.2 2242 + mPCIe (half or full size)
	mPCIe socket	1x mPCIe half size or 1x mPCIe full size	1x mPCIe (half or full size) + M.2 2242 module or 1x mPCIe (half or full size) only
External	Drive bay	1x 2.5" SSD or 1x 2.5" SSD dual M.2 RAID	1x removable 2.5" SSD only
	PCIe slot 2	1x PCIe x 16 card or 1x PCIe x8	1x PCIe x16 (if populated, slot 1 must remain empty) 1x PCIe x8 (if populated, slot 1 may use PCIe x8 only)
	PCIeslot 1	1x PCIe x 16 card or 1x PCIe x8 card	1x PCIe x16 (if populated, slot 2 must remain empty) 1x PCIe x8 (if populated, slot 2 may use PCIe x8 only)
Value			
Location		**Expansion Device**	**Combinations**
Internal	M.2 socket	1x 2280 module or 1x 2242 module	1x M.2 2280 only or 1x M.2 2242 + mPCIe (half or full size)
	mPCIe socket	1x mPCIe half size or 1x mPCIe full size	1x mPCIe (half or full size) + M.2 2242 module or 1x mPCIe (half or full size) only
External	Drive bay	1x 2.5" SSD or 1x 2.5" SSD dual M.2 RAID	1x removable 2.5" SSD only
	PCIe slot 2	1x PCIe x 16 card	1x PCIe x16 (If populated ,slot 1 must remain empty)
	PCIe slot 1		1x PCIe x16 (If populated ,slot 2 must remain empty)
Smart Storage			
Location		**Expansion Device**	**Combinations**
Internal	M.2 socket	1x 2280 module or 1x 2242 module	1x M.2 2280 only or 1x M.2 2242 + mPCIe (half or full size)
	mPCIe socket	1x mPCIe half size or 1x mPCIe full size	1x mPCIe (half or full size) + M.2 2242 module or 1x mPCIe (half or full size) only
	Storage bay	2x 2.5" SSD or 1x 3.5" HDD	Not removable, factory installed, return to change RAID option available for 2x 2.5" SSD
External	Drive bay	1x 2.5" SSD or 1x 2.5" SSD dual M.2 RAID	1x removable 2.5" SSD (only)
	Storage bay	2x 2.5" SSD	Without or with integrated RAID controller (0/1/ JBOD)
		Power bay	3-pin AC power connector (populates slot 1)

5.1.1. Drive Bay Options

One removable 2.5" SSD may be installed in the KBox B-202-CFL's drive bay on the bottom side.

Figure 12: Drive Day Options



1 2.5" SSD drive

2 2.5" SSD dual M.2 Raid Module

Table 4: Drive Bay Options

Drives	Drive Access	Description
2.5" SSD	Removable	One 2.5" SSD drive with SATA III, 6 Gb/s interface
2.5" SSD dual M.2 RAID module		One 2.5" SSD dual M.2 RAID module with up to two M.2 SSD modules with SATA III, 6 Gb/s interface, and either RAID 0/1.

5.1.2. Storage Bay Options

Up to two removable 2.5" SSDs without or with RAID (0/1/ JBOD) may be installed in the KBox B-202-CFL's storage bay on the rear panel or internally two 2.5" SSD with RAID option or one 3.5" HDD may be factory installed.

The storage bay is only available on the KBox B-202-CFL Smart Storage variant.

Figure 13: Storage Bay with Dual Removable 2.5" SSDs

Table 5: Storage Bay Options

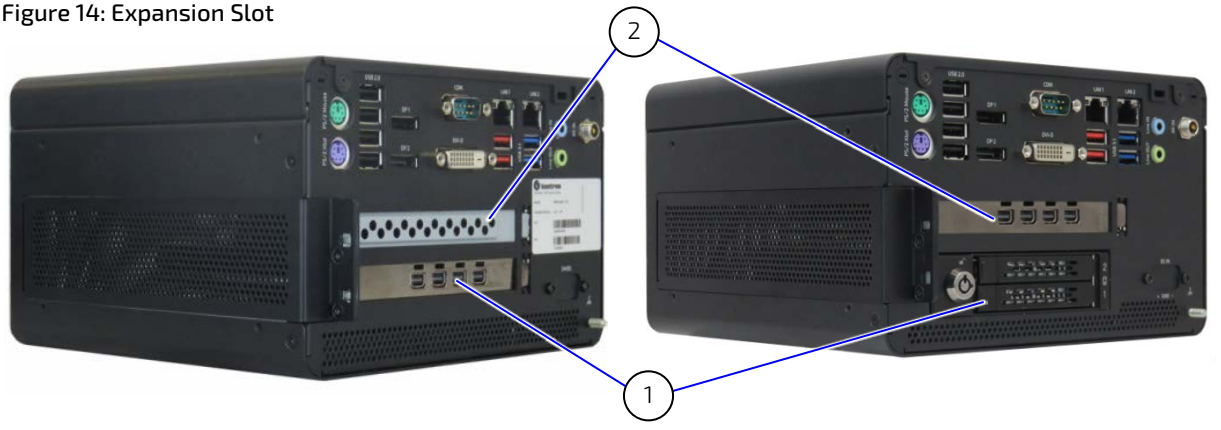
Storage Bay Drive	Drive Access	Description
2.5" SSD/HDD	External	Up to two 2.5" SSD/HDD removable drives with lock using SATA III 6 Gb/s interface and supporting single channel, hot swap tray mount. Without or with integrated RAID controller (0/1/JBOD)
2.5" SSD	Internal	Up to two factor installed, non-removable 2.5" SSDs using SATA III 6 Gb/s. RAID option available for 2 x 2.5" SSD
3.5" HDD	Internal	One factor installed, non-removable 3.5" SATA HDD using SATA III 6 Gb/s.

The Storage bay may be used as a power bay with a 3-pin AC connector for direct connection to a mains power outlet, see Chapter 5.2: Power Options.

5.1.3. PCIe Slot Options

The maximum number of available PCIe slots is two where the Smart variant may populate both and the Value and Smart Storage variants populate a single PCI slot only.

Figure 14: Expansion Slot



1 Slot 1

2 Slot 2

Table 6: Expansion Slot Options

KBox B-202-CFL Variant	Expansion Card Option	Location
Smart	1x PCIe x 16 or 2x PCIe x8	Slot 1 populated by default for single PCIe card
Value	1x PCIe x16	Slot 1 populated by default
Smart Storage	1x PCIex16 or 1x PCIex8	Slot 2 populated by default. Slots 1 is not available

⚠CAUTION **The total power consumption with PCIe cards must not exceed the PSU's rating of 150 W.**

5.1.4. Internal Options

The internal expansion options are an M.2 socket and a mPCIe socket on the mother board. 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.

Not every mPCIe card and M.2 SSD module combination is possible, see Table 7

Table 7: On-board Expansion Options

KBox B-202-CFL Variants	M.2 SSD	mPCIe card	Interface
Smart	2280		M.2: PCIe (Gen 3) @ 4 lanes interface mPCIe: PCIe Gen 3 interface
	2242	+ mPCIe x1 (full or half size)	
Value	2280		M.2: PCIe (Gen 2) @ 2 lanes interface mPCIe: PCIe Gen 2 interface
	2242	+ mPCIe x1 (full or half size)	
Smart Storage	2280		M.2: PCIe (Gen 3) @ 4 lanes interface mPCIe: PCIe Gen 3 interface
	2242	+ mPCIe x1 (full or half size)	

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-202-CFL supports 12 VDC or an optional 24 VDC. Due to different internal components, the 12 VDC and optional 24 VDC are not interchangeable. The KBox B-202-CFL Smart Storage option may implement a 3-pin AC-IN connector for direct connection to a 240/100 VAC mains power outlet.

Consult the KBox B-202-CFL's type label for the electrical specification, to confirm the power specification.

Figure 15: Power Connections Options

KBox B-202-CFL 12 VDC

KBox B-202-CFL 24 VDC

KBox B-202-CFL Smart Storage AC-IN

⚠CAUTION Power the KBox B-202-CFL 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.

⚠CAUTION Power the KBox B-202-CFL 24 VDC variant with the supplied 24 VDC wire only.

⚠CAUTION Power the KBox B-202-CFL AC variant with the supplied AC power cable for your region.

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

6/ Accessing Components

This chapter contains important information that users must read before opening the KBox B-202-CFL to access internal components. Additionally, read and observe the General Safety Instructions contained in this user guide. Kontron recommends expanding the KBox B-202-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 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.

Follow the electrostatic discharge (ESD) precautions for components that are sensitive to ESD and use a clean, flat and ESD-safe surface when handling the product. 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 or removing third party components.

6.1. Top Cover (opening and closing)

Before opening the top cover, to access internal components, observe the safety instructions within 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.

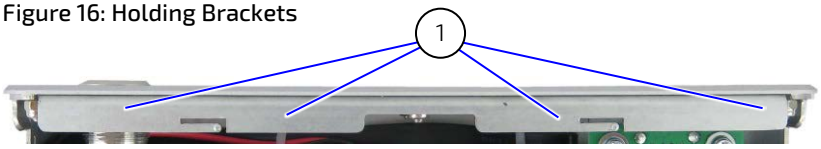
To open the top cover, perform the following:

1. Close all applications. Switch off the product properly using the power button and disconnect the power. Disconnect all peripherals.
2. Place the KBox B-202-CFL on a flat, clean and ESD-safe surface.
3. Unlock and remove the Kensington lock if installed.

4. Remove the two top cover screws on the rear panel and retain the screws for later use.

5. 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 16, pos. 1) on the front panel.

Figure 16: Holding Brackets



1 Holding brackets

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

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 lifting the top cover vertically.

7. Close the top cover, by proceeding in the reverse order and 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 an On-board mPCIe Expansion Card

To install an mPCIe card on the motherboard, perform the following:

1. Open the top cover.
2. Locate the mPCIe socket and the corresponding nut on the motherboard.
3. Insert and push the mPCIe card into the socket gently and at a slight angle, until the fixing hole on the mPCIe card aligns with the corresponding motherboard's nut.
4. Secure the mPCIe card 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.

NOTICE

Do not use force when fastening the mounting screw. Too much force may damage the motherboard's nut. Recommended torque for 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 carefully.
4. Close the top cover.

6.1.2. Installing and Removing an On-board M.2 SSD Module

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

1. Open the top cover
2. Locate the M.2 socket and the corresponding nut on the motherboard.
3. Insert and push the M.2 module into the socket gently and at a slight angle, until the fixing hole on the M.2 module aligns with the corresponding motherboard's nut.
4. Secure the M.2 SSD 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.

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.

5. Close the top cover.

To remove an M.2 SSD module, perform the following:

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

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

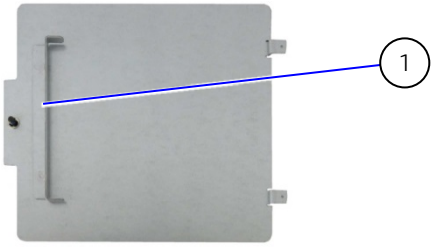
6.2. Drive Bay (opening and closing)

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

To open the drive bay cover, perform the following:

1. Close all applications. Shut down the product properly using the power button and disconnect the power. Disconnect all peripherals.
2. Place the product on a flat, clean and ESD-safe surface with the bottom side facing upwards.
3. Release the drive bay cover's screw using a torx (08 x 60) screwdriver (Figure 11, pos. 3).
4. Lift up the drive bay cover a few centimeters to release the internal device from the holding plate on the cover's rear side (Figure 17, pos. 1).

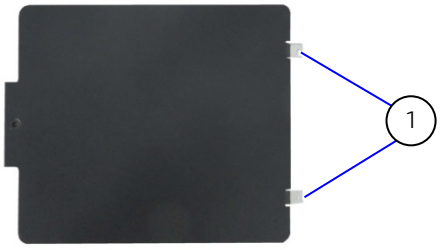
Figure 17: Drive Bay Cover Rear Side



1 Holding plate

5. Slide the drive bay cover forward, to release the two aligning tabs (Figure 18, pos. 1).

Figure 18: Drive Bay Cover Top Side



1 Aligning Tabs

6. Lift to remove the drive bay cover from the drive bay.
7. Close the 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.

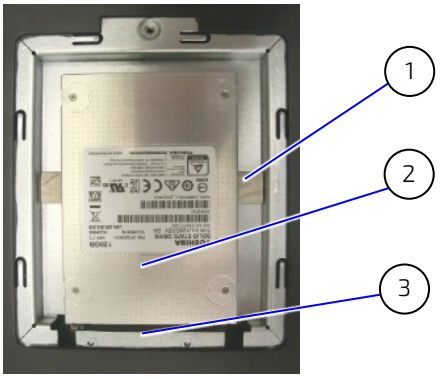
6.2.1. Installing and Removing a 2.5" SSD Drive

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

To install a 2.5" SSD in the drive bay, perform the following:

1. Open the drive bay cover.
2. Position the SSD in the drive bay on an ESD strip (Figure 19, pos. 1) with the SSD's connector facing SATA connector in the drive bay (Figure 19, pos. 3).

Figure 19: 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 SATA connector in the drive bay.
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.

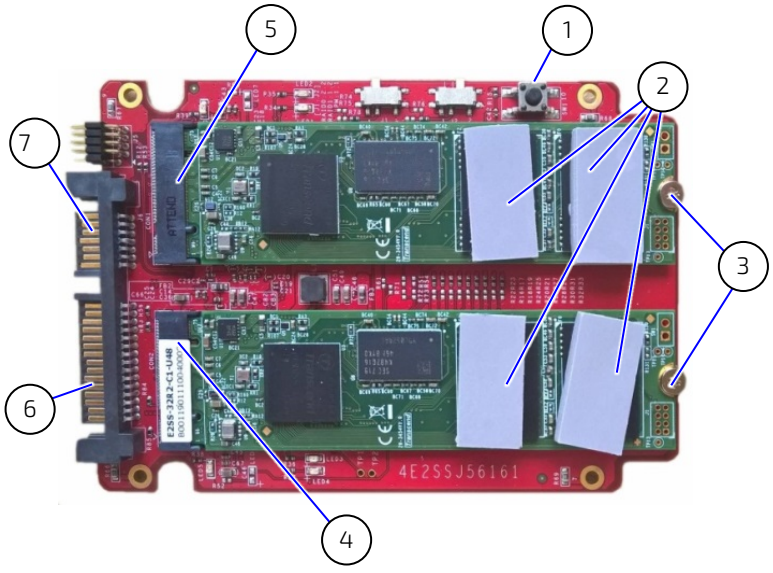
NOTICE

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 20: 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

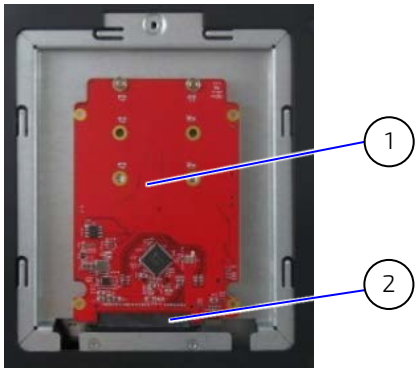
To install a 2.5" SSD dual M.2 RAID module, perform the following:

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 20, 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 20, pos. 3).
4. Place self-adhesive form buffers on each of the M.2 SSD modules (Figure 20, 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 21)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 21: 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 13.2: 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 13.2.1.1: iRAID Utility Settings.
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 21).
7. Close and secure the drive bay cover.
8. Switching on the KBox B-202-CFL automatically configures new M.2 SSD with the previous RAID Array.

6.3. Expansion Door (opening and closing)

Before opening the expansion door, observe the safety instructions within this chapter.

⚠WARNING **Operate only when the expansion door is closed and secured; to ensure that users do not have access to internal components during operation.**

To open the expansion door, perform the following:

1. Close all applications shut down the product properly using the power button and disconnect the power cable. Disconnect all peripherals.
2. Place the chassis on a flat, clean and ESD-safe surface with the left side facing upwards.
3. Loosen the two screws holding the expansion door (Figure 22, Pos. 1). Retain the screw for later use.

Figure 22: PCIe Expansion Card Screws

1 2x expansion door screws

4. Move the expansion door outwards at the free end and slide towards the rear of the chassis to release the door's holding plate (Figure 26, pos. 1).
5. Close the expansion door, by proceeding in the reverse order (steps 4 to 3).

6.3.1. Installing and Removing PCIe Expansion Cards

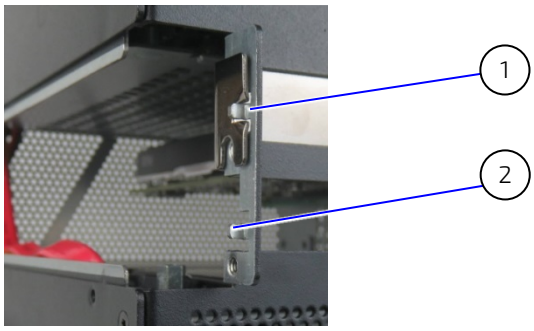
To install a PCIe expansion card, perform the following:

1. Open the expansion door and retain the 2 screws for later use.
2. To install a PCIe expansion card, in an empty PCIe slot remove the slot bracket by first releasing the slot bracket from the front pin (Figure 24, pos. 1 or 2) and then sliding the slot bracket's front end out of the holding latch (Figure 25, pos. 1).

Figure 23: Removing Expansion Door

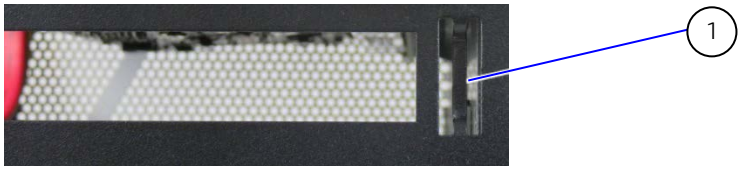
1 Expansion door
2 PCIe slot 2 (empty with a slot bracket)
3 PCIe slot 1 (default slot, populated)

Figure 24: PCIe Slot Front Pin



1 Front pin slot 2
2 Front pin slot 1

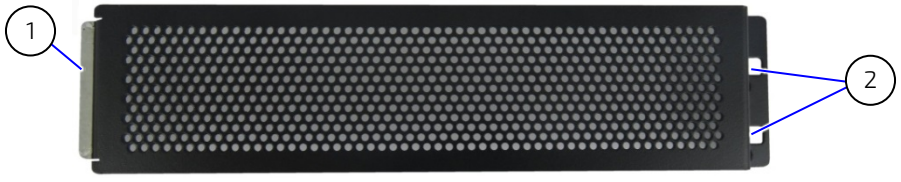
Figure 25: PCIe Expansion Slot Holding Latch



1 Holding latch for PCIe card's bracket tab

3. Aline the expansion card with the corresponding internal PCIe slot. Push the expansion card carefully into the PCIe slots connector, while ensuring the expansion card's bracket inserts into the holding latch (Figure 25, pos. 1). Position the other end of the expansion card's bracket on the corresponding front pin (Figure 24, pos. 1 or 2).

Figure 26: Expansion Door



1 Holding plate
2 2x fixing screw holes

4. Secure the expansion door by positioning the holding plate (Figure 26, pos. 1) in the inside of the chassis. Push the door until the two screw holes (Figure 26, pos. 2) align with the screw holes on the chassis. (Figure 22, pos. 1).
5. Close and secure the door with the screws retained in step 1.

To remove a PCIe expansion card, perform the following:

1. Open the expansion door, and retain the two screws for later use.
2. Remove the expansion card by releasing the expansion card's bracket from the front pin (Figure 24, pos. 1 or 2) and sliding the expansion card's front end out of the holding latch (Figure 25, pos. 1). Continue to pull the expansion card outward to remove the expansion card from the PCIe slot.
3. Place the PCIe expansion card on an ESD-safe surface.
4. Insert an empty slot bracket if the PCIe slot is to remain unused, else install a new PCIe expansion card.
5. Secure the expansion door by positioning the holding plate (Figure 26, pos. 1) in the inside of the chassis. Push the door until the two screw holes (Figure 26, pos. 2) align with the screw holes on the chassis. (Figure 22, pos. 1).
6. Close and secure the door, with the screws retained in step 1.

6.4. Storage Bay

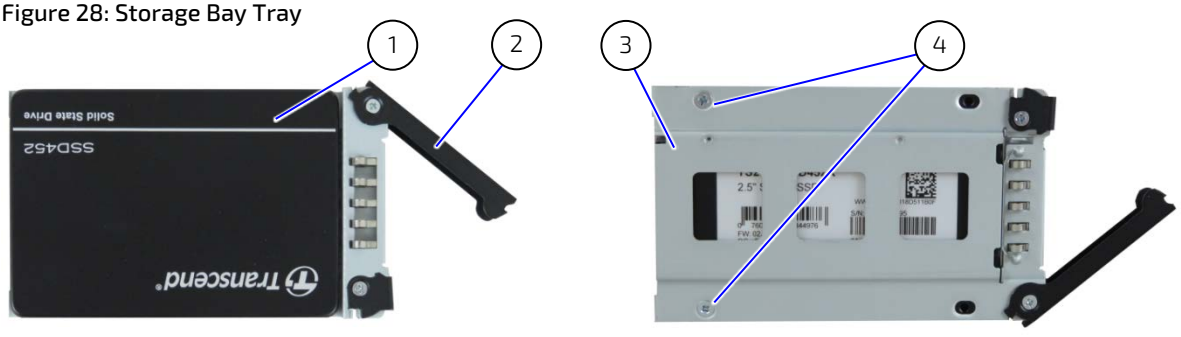
The storage bay is accessible on the rear panel with up to two removable 2.5" SSDs. Alternatively, up to two non-removable internal 2.5" SSD or a single 3.5" HDD may be factory installed.

6.4.1. Installing and Removing Storage Bay Drives

Figure 27: Storage Bay with Removable Drives

1 Storage bay for dual drives
2 Lock
3 Removable tray

Figure 28: Storage Bay Tray



1 2.5" SSD
2 Tray arm
3 Tray
4 Fixing screws (min. two)

To install a 2.5" Removable SSD, perform the following:

1. Unlock the storage bay using the key supplied.
2. Press the tab on the left side of the tray arm towards the left and the arm swings open.

3. Pull out the empty tray and position and fasten the 2.5" SDD to the tray using a minimum of two screws.
4. Push the tray with SSD into the empty storage bay and press the arm to close.
5. Remove a 2.5" SSD, by proceeding in the reverse order.

7/ Thermal Considerations

7.1. Active Cooling

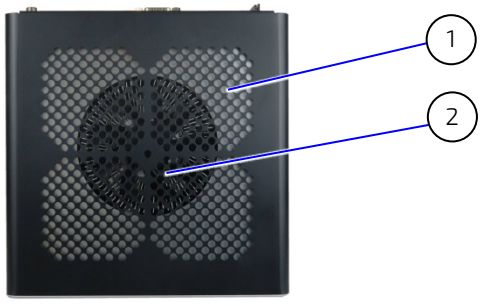
The KBox B-202-CFL is actively fan cooled. An internal fan draws in air through the top cover's air-intake ventilation openings (Figure 29 , pos. 1) and distributes the incoming air over the motherboard and other internal components before the air exits the ventilation openings on the right, left, front and rear sides (Figure 30, pos. 1, 2 & 3).

⚠CAUTION

Obstructing ventilation openings may cause overheating

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

Figure 29: Air-intake Ventilation Openings



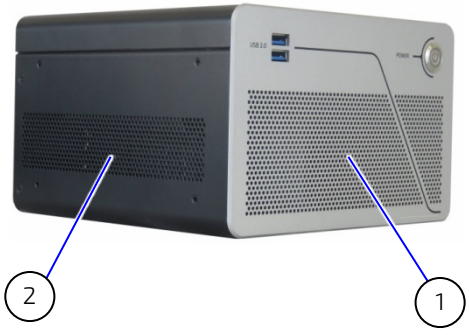
1 Ventilation openings (air-intake)
2 Fan

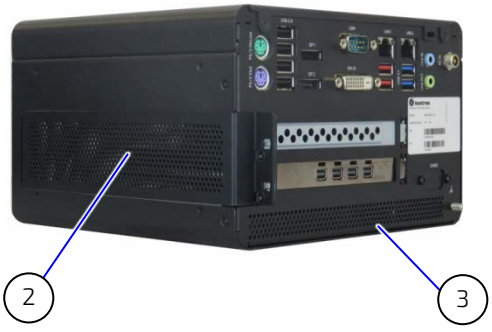
⚠CAUTION

Avoid damaging the motherboard

Do not attach or remove fans while the KBox B-202-CFL is switched on.

Figure 30: Air-output Ventilation Openings





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

7.2. Mount Orientation

When mounted underneath a desktop, on the wall, or in a control cabinet, the permitted mounting orientations are horizontal (top side facing upward) and vertical (all possible mount orientations).

Do not mount the KBox B-202-CFL with the top cover facing downwards. When the top cover faces downwards not enough air enters to cool the processor adequately; causing overheating and/or melting. Hence, this creates a possible fire hazard due to hot substances exiting through the top cover's ventilation openings.

⚠WARNING

Danger of Fire

Mounting the KBox B 202-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:

- **Do not mount with the top cover facing downward**
- **Only use the permitted mount orientations:**
  - **Horizontally (with top cover facing upwards)**
  - **Vertically (all possible mount orientations)**

7.3. Minimum Clearance (Keep Out Area)

To provide maximum airflow through and around the chassis, a minimum distances to surrounding parts must be observed. Before mounting the product, consider the keep out areas required for the mounting method and the orientation to be used.

⚠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)**

7.4. Third Party Components

When expanding with third party components such as mPCIe expansion cards, PCIe expansion cards, M.2 SSDs, 2.5" SSD drives and 2.5" SSD dual M.2 RAID module, an approximate internal temperature rise is given and should be taken into consideration.

8/ Installation Instructions

Operate the KBox B-202-CFL horizontally with the top side facing upward or vertical in all possible mount orientations. Before Installing the KBox B-202-CFL, observe the following instructions.

⚠WARNING

Danger of Fire

Mounting the KBox B 202-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:

- Do not mount with the top cover facing downward
- Only use the permitted mount orientations:
  - Horizontally (top cover facing upwards only)
  - Vertically (all possible mount orientations)

⚠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.

⚠CAUTION

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

⚠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

Ensure the product's weight can be supported by mounting on a flat, solid surface using suitable screws.

NOTICE

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

Ensure sufficient clearance for user to:

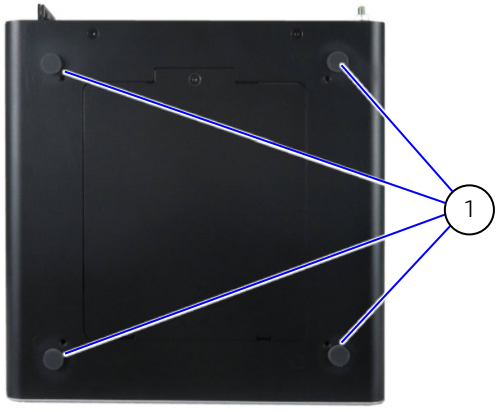
- Connect cables on the rear I/O panel
- Access power button on the front panel
- Install PCIe cards on the right side (clearance 110 mm)
- Install Wi-Fi antennas on rear panel (Wi-Fi hinge clearance: 45 mm and 130 mm)

8.1. Chassis Feet

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

1. Ensure the bottom surface is clean and free from dust and dirt.
2. Remove the self-adhesive cover from the back of each of the rubber chassis feet and carefully press onto the bottom side (Figure 31, pos. 1).

Figure 31: Position of Chassis Feet



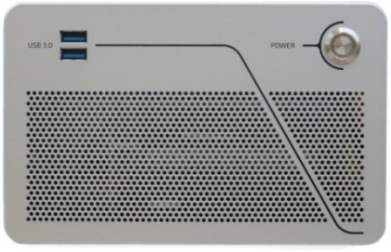
1 Position of four rubber feet

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

8.1.1. Chassis Feet Mount (option)

Operate the KBox B-202-CFL with chassis feet in the upwards horizontal position only.

Figure 32: Chassis Feet Mount Option



⚠WARNING

Danger of Fire

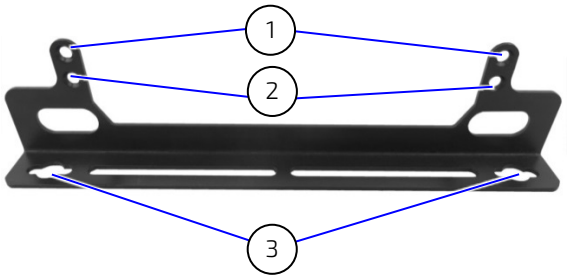
Mounting the KBox B 202-CFL with the top cover facing downward, may cause overheating or melting and hence may causing a fire hazard or personal injury.
To avoid risk of fire and personal injury, observe the following:

- Do not mount with the top cover facing downward
- Only use the permitted mount orientations:
  - Horizontally (top cover facing upwards only)
  - Vertically (all possible mount orientations)

8.2. Mounting Brackets (option)

To mount on a wall (vertically or horizontally) or fix on a desktop (underneath or topside) use the designated mounting brackets, provided in the Wall Mount Set, see Table 2: Accessories.

Figure 33: Mounting Bracket



1 Upper mounting holes (10 mm keep out area)

2 Lower mounting holes

3 Key mounting holes for mount surface

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

- Top cover faces the mount surface:
  - 10 mm keep out area is required between top cover and mount surface.
  - Use only the upper mounting holes shown in Figure 33, pos. 1
- Bottom side faces the mounting surface:
  - No keep out area is required between bottom cove and mount surface
  - Use the lower mounting holes shown in Figure 33, pos. 2.

⚠CAUTION

Obstructing the ventilation openings may cause overheating.

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

⚠CAUTION

Leave sufficient clearance (keep out area) to prevent the device from 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 required)**

To mount the KBox B-202-CFL using mounting brackets, perform the following:

1. Consider which set of mounting brackets holes is required for the mounting option:
   - Top cover facing mounting surface, use upper mounting holes Figure 33, pos. 1
   - Bottom side facing mounting surface, use lower mounting holes Figure 33, pos. 2
2. Locate the lower and upper sets of mounting holes on the right side and left side of the chassis:
   - Lower set enables mounting options Figure 36 and Figure 38
   - Upper set enables mounting options Figure 37 and Figure 39
3. Align the mounting bracket hole (step 1) with the corresponding mounting holes (step 2).
4. Fasten using the screw provided in Wall Mount Set and a Torx (08 X 60) screwdriver.

5. Use the mounting bracket's key mounting holes (Figure 33, pos. 3), to mount on a wall or desktop. Observe compliance to keep out area 10 mm clearance, see Figure 34 and Figure 35.

Figure 34: Keep Out Areas – with Top Cover facing the Mount Surface

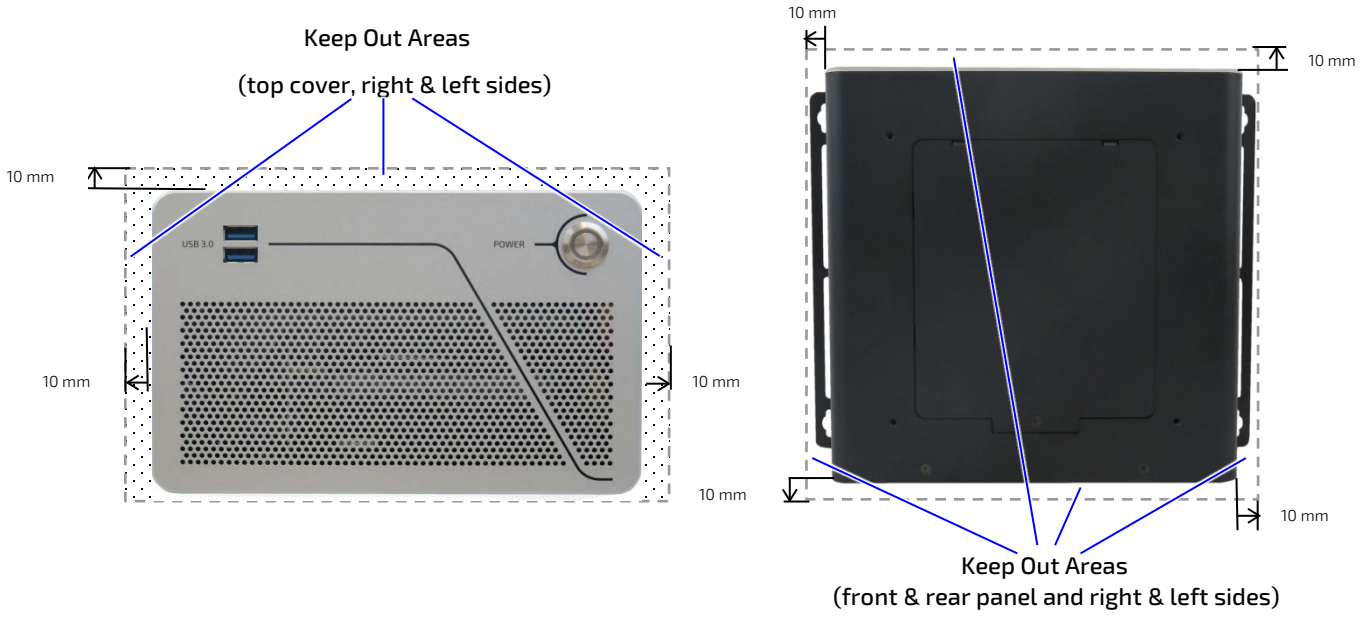
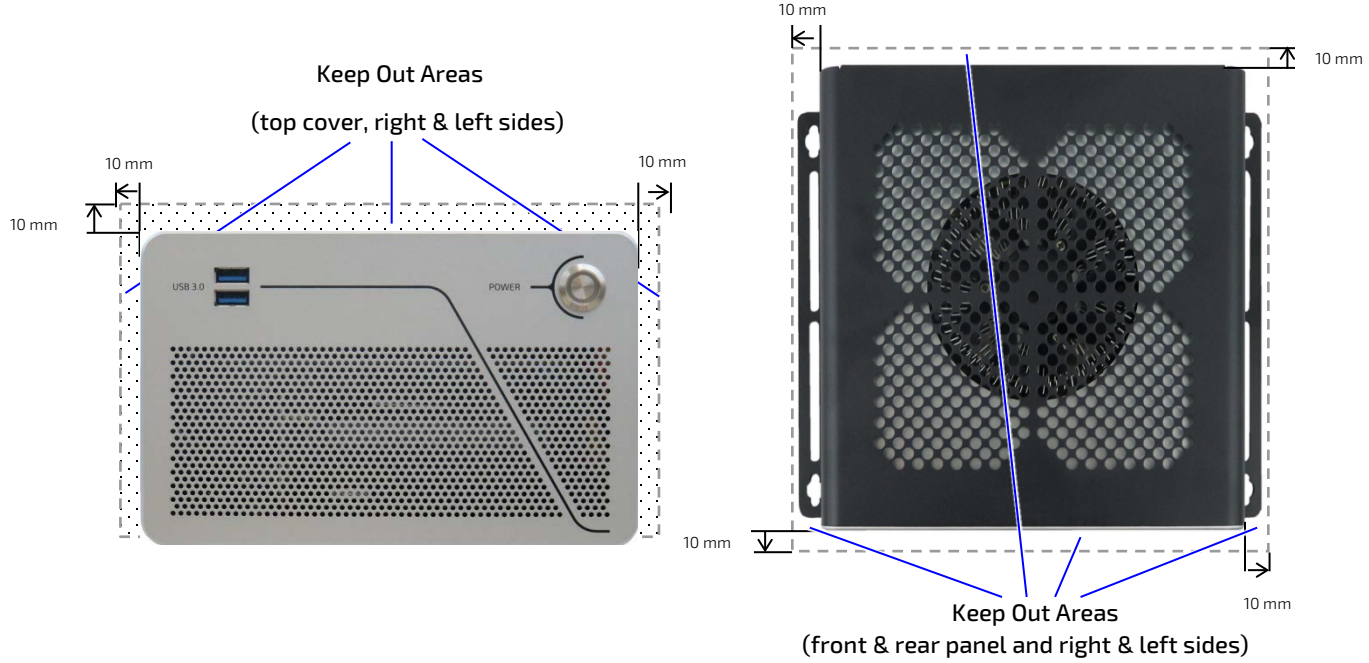


Figure 35: Keep Out Areas – with Bottom Side facing the Mount Surface

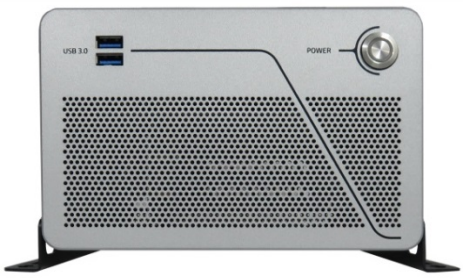


Installing the dual Wi-Fi antennas on the rear panel increases the keep out clearance to 45 mm and 130 mm from Wi-Fi hinge.

8.2.1. Mounting On or Underneath a Desktop

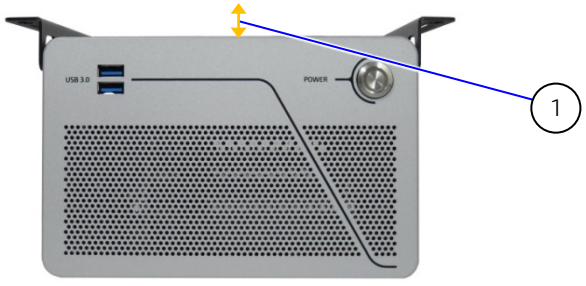
To mount on a desktop/mount surface use the Wall Mount Set, see Table 2: Accessories. Use the lower set of mounting holes on the left and right sides of the chassis (Figure 9, Pos. 3) and use the lower mounting holes on the bracket shown in Figure 33, pos. 2.

Figure 36: Mounting Brackets on a Desktop/Mount Surface



To mount underneath a desktop/mount surface, use the Wall Mount Set, see Table 2: Accessories. Use the upper pair of mounting holes on the left and right sides of the chassis(Figure 9, Pos. 4) and use the upper mounting holes on the bracket shown in Figure 33, Pos. 1 with the required 10 mm keep out area, to ensure air-intake is not restricted.

Figure 37: Mounting Brackets -Underneath a Desktop/Mount Surface



1 Required 10 mm keep out area for air –intake between the mount surface and the top cover.

⚠WARNING

Danger of Fire

Mounting the KBox B 202-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:

- Do not mount with the top cover facing downward
- Only use the permitted mount orientations:
  - Horizontally (top cover facing upwards only)
  - Vertically (all possible mount orientations)

⚠CAUTION

When mounting the product with the top cover facing the mount surface (desktop or wall), always provide a keep out area of 10 mm to ensure adequate air-intake. If airflow to the top cover is obstructed the product will overheat.

⚠CAUTION

Both mounting brackets must be used to mount the product to the mount surface.

Install the mounting brackets on the product before mounting on the mount surface.

8.2.2. Mounting on a Wall

To mount on a wall use the Wall Mount Set, see Table 2: Accessories. With the top cover facing outwards, use the lower pair of mounting holes on the left and right sides of the chassis (Figure 9, pos. 3) and use the mounting bracket holes (Figure 33, pos. 2).

Figure 38: Mounting Brackets Wall Mount Options with Bottom Side facing the Mounting Surface

Front panel (above) Front panel (below) Front panel (right) Front panel (left)

To mount on a wall with use the Wall Mount Set, see Table 2: Accessories. With the top cover facing the mount surface, use the upper pair of mounting holes on the left and right sides of the chassis (Figure 9, pos. 4). To provide the required 10 mm keep out area to ensure air-intake is not restricted, use the upper mounting holes on the bracket s (Figure 33, pos. 1).

Figure 39: Mounting Brackets Wall Mount Options with Top Cover facing the Mounting Surface

Front panel (above) Front panel (below) Front panel (right) Front panel (left)

⚠CAUTION	**When mounting the product with the top cover facing the mount surface (desktop or wall), always provide a keep out area of 10 mm to ensure adequate air-intake. If airflow to the top cover is obstructed the product may overheat.**
⚠CAUTION	**Both mounting brackets must be used to mount the product to the mount surface.**
	Install the mounting brackets on the product before mounting on the mount surface.

8.3. Connecting the Wi-Fi Antenna (option)

Operate the KBox B-202-CFL with Wi-Fi feature by installing the two Wi-Fi antennas included in the delivery to the two Wi-Fi antenna connectors. Note that installing the Wi-Fi antenna increases the original keep out area on the rear side 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 (Figure 5, pos. 15)
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-202-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 connected to power and switched on for the first time.

⚠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 different internal components, the 12 VDC and optional 24 VDC variant are not interchangeable.
i	The DC-IN 12 VDC connects to the supplied 12 VDC AC/DC external power supply and the DC-IN 24 VDC connects uses the supplied wired 24 VDC cable to connect to an external DC power supply.

9.1. Connecting the 12 VDC AC/DC Power Supply

The KBoxB-202-CFL 12 VDC is powered using the supplied 12 VDC AC/DC external power supply.

To connect the 12 VDC AC/DC External power supply, perform the following:

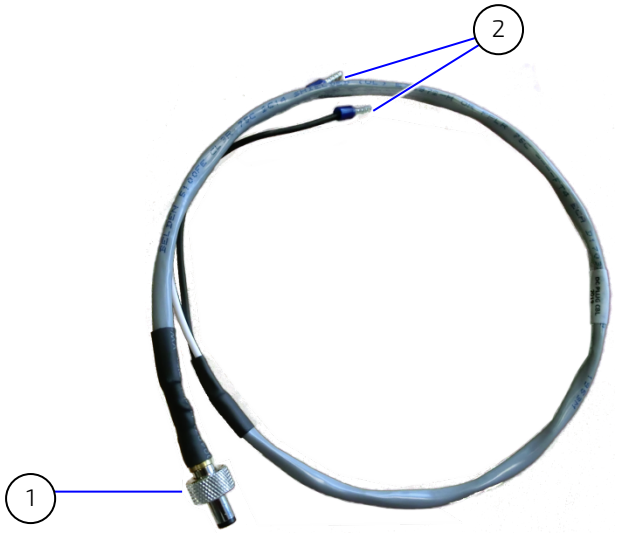
1. Install any expansion devices and SSDs.
2. Check that the top cover, expansion door and drive bay cover are closed securely.
3. Connect the potential equalization stud and I/O cables on the rear panel.
4. Screw the power supply's DC cable to the DC-IN power jack on the rear panel (Figure 5, pos. 10).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

9.2. Connecting the 24 VDC Wired Power Cable (option)

The KBoxB-202-CFL optional 24 VDC variant uses a 24 VDC wired power cable to connection 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 10.6.4: 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 SSDs.
2. Check that the top cover, expansion door and drive bay cover are closed securely.
3. Connect the potential equalization stud and I/O cable on the rear panel.
4. Screw the 24 VDC power cable (Figure 40, pos. 1) to the DC-IN power jack (Figure 5, pos. 10).
5. Connects 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. Connecting to the AC Connector (option)

To connect the supplied power cable to the AC power connector, perform the following:

1. Install any expansion devices and SSDs.
2. Check that the top cover, expansion door and drive bay cover are closed securely.
3. Connect the potential equalization stud and I/O cables on the rear panel.
4. Insert the supplied power supply cable into AC-IN 3-pin connector on the rear panel.
5. Connect the other end of the cable to the mains power supply outlet for your region.

9.4. Power On/Off Procedure

To switch on the KBox B-202-CFL, connect to the power and briefly press the power button (Figure 4, pos. 3). The power button lights up blue to indicate the powered on state.

To switch off the KBoxB-202-CFL, close all open applications and briefly press the power button. The power button dims to indicate the powered off state. The KBoxB-202-CFL is only completely disconnected from power when the supplied power supply/cable is disconnected from the DC-IN or AC-IN power connector or from the main power source.

⚠CAUTION

Switching off only using the power button may leave internal parts energized. Disconnect the power completely by disconnecting the power cable connected to DC-IN or AC-IN or disconnect the cable from the main power source.

9.4.1. Forced Shutdown

Pressing the power 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 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.

9.5. Operating System (OS) and Hardware Component Drivers

The KBox B-202-CFL supports flexible software options with different Operating Systems (OS) and driver support for factory configured hardware components.

When ordered with a pre-installed OS and all appropriate drivers (in accordance with the ordered hardware configuration) the product is operational when switched on for the first time.

When ordered without a pre-installed OS, users must install the OS and the appropriate drivers (in accordance with the ordered hardware configuration) before switching on for the first time. Pay attention to the manufacturer's OS specifications for integrated hardware components.

For information regarding supported software, see Table 15: Software Specification.

To download drivers for factory-installed hardware components, visit Kontron's Customer Section.

10/ Technical Data

10.1. Block Diagrams

Figure 41: Block Diagram of KBox B-202-CFL Smart Variant without Wi-Fi

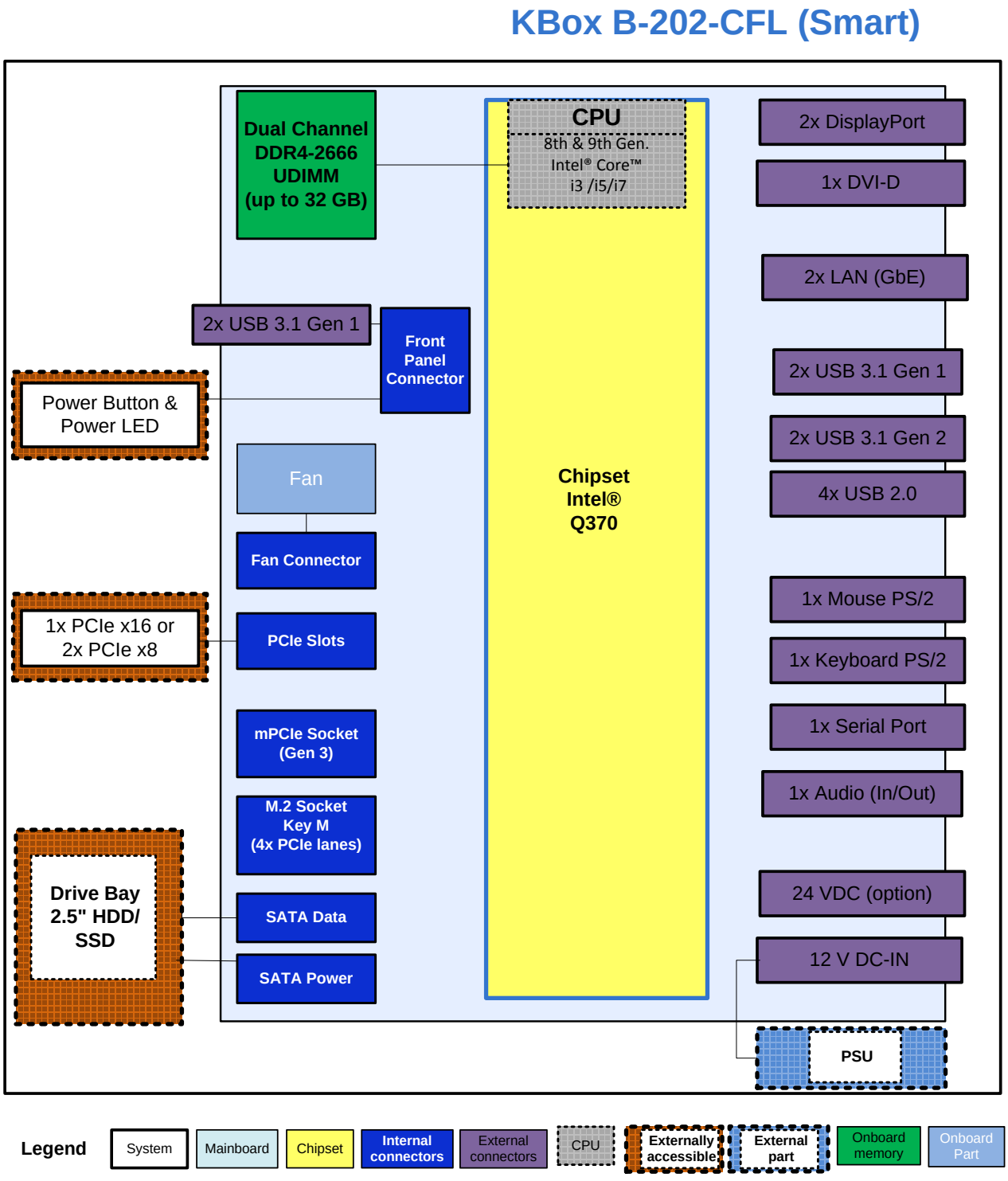
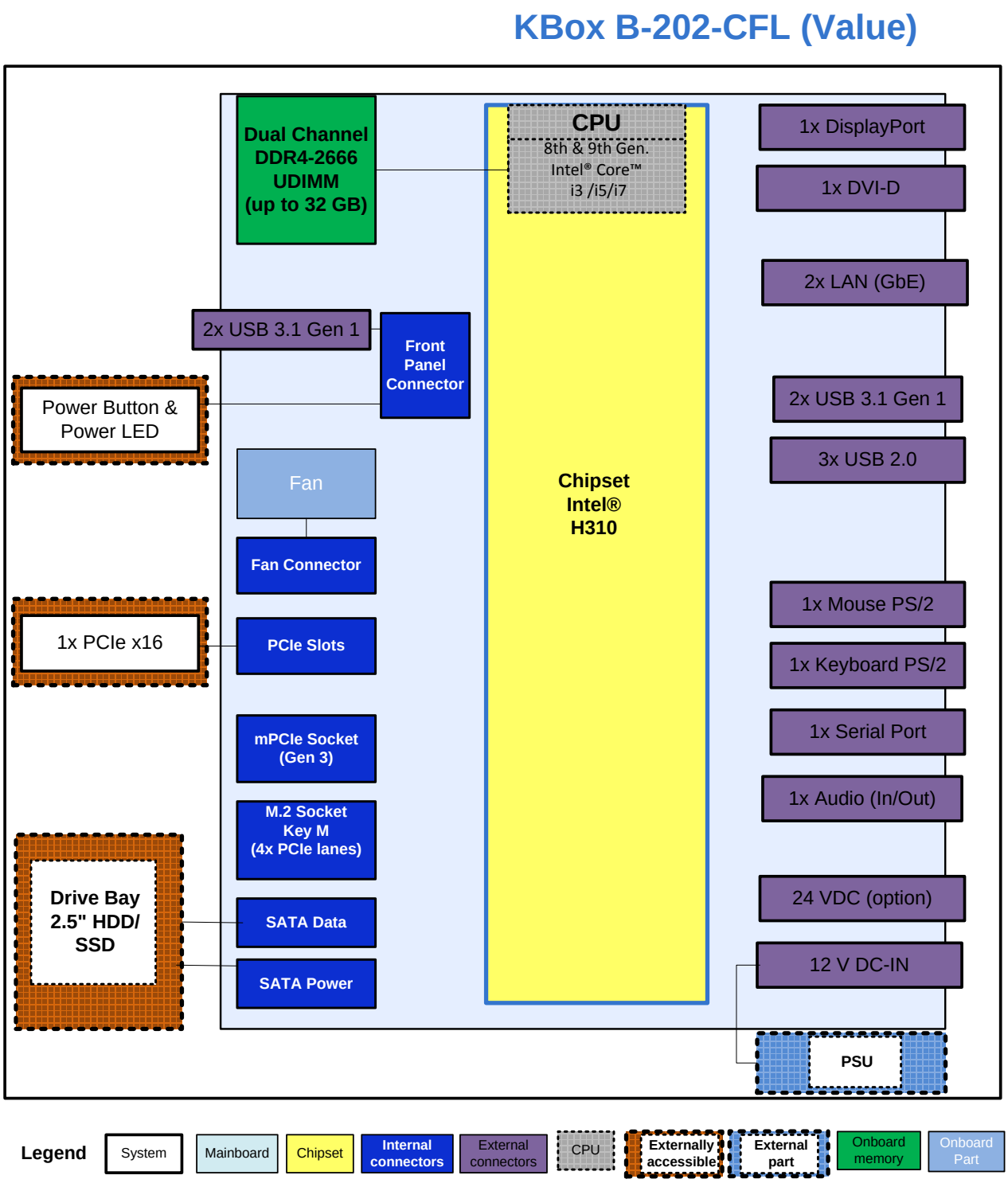


Figure 42: Block Diagram of KBox B-202-CFL Value Variant without Wi-Fi



10.2. Technical Specification

Table 8: Motherboard Specification

	KBox B-202-CFL (Smart) / (Smart Storage)	KBox B-202-CFL (Value)
Motherboard Type	D3633-S	D3634-S
Form Factor	Mini-ITX (170mm x 170 mm) (6.7" x 6.7")	
Processor	8th /9th Gen. Intel® Core™ i3/i5/i7	
Platform Controller Hub	Intel® Q370 Express Chipset	Intel® H310 Express Chipset
Memory (on-board)	DDR4 – 2666 UDIMM, dual channel, unbuffered, non-ECC Up to 32 GB max. with 4 GB, 8 GB or 16 GB, Dual SODIMM sockets	

Table 9: Processor Specification

Processor Type 8th Gen.	Intel® i3-8100	Intel® i5-8500	Intel® i7-8700
Core	4	6	6
Cache	6 MB Smart cache	9 MB Smart cache	12 MB Smart
Processor Base Freq.	3.96 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 9th 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 10: Storage Specification

Drive Bay		KBox B-202-CFL (Smart)	KBox B-202-CFL (Value)	KBox B-202-CFL (Smart Storage)
Removable[1]	Type	2.5" SSD Drive		
	Quantity	1x		
	Capacity	512 GB, 1 TB, 2 TB		
	Interface	SATA III, 6Gb/s		
	Installed	Removable		
Removable[1]	Type	2.5" SSD dual M.2 RAID module with up to two M.2 SSD Key B (2242, 2260, 2280)		
	Quantity	1x		
	RAID	With two M.2 SSDs (RAID 0/1)		
	Capacity	2 x 256 GB		
	Interface	SATA III, 6Gb/s		
	Installed	Removable		

[1] Due to space restrictions, only one removable device may be installed in the external drive bay 2.5"SSD drive or 2.5" SSD dual M.2 RAID Module.

Storage bay		KBox B-202-CFL (Smart Storage) only
Internal	Type	2.5“ SSD Drive
	Quantity	Up to 2
	Capacity	128 GB, 256 GB, 512 GB, 1 TB, 2 TB
	Interface	SATA III, 6Gb/s
	Installed	Internal cage
	RAID	RAID option with 2x 2.5” SSD
Internal	Type	3.5” HDD Drive
	Quantity	1
	Capacity	1 TB, 2 TB, 4 TB, 6 TB, 8 TB, 12 TGB
	Interface	SATA III 6 Gb/s
	Installed	Internal cage
External	Type	2.5” SSD Drive
	Quantity	Up to 2
	Hot swap	Supported
	Capacity	128 GB, 256 GB, 512 GB, 1 TB, 2 TB
	Interface	SATA III 6 Gb/s
	Installed	Removable
	RAID	Without or with integrated RAID controller (0/1/JBOD)

Table 11: External Interface Specifications

		KBox B-202-CFL (Smart / Smart Storage)	KBox B-202-CFL (Value)
Front side	USB 3.0	2x USB 3.1 Gen 1	
Rear Panel	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)	
	LAN	2x LAN (GbE) 100/100/1000 Mbps (Intel ® i219LM and i210AT)	
	Serial Port	1x COM1 (RS232)	
	Audio	Mic-Line-in & Line-out with HD Audio (Realtek ALC671)	
	PS/2	Mouse & Keyboard	
	Wi-Fi	2x Antenna (option) Factory configured with mPCIe Wi-Fi expansion card (half-size)	
	Power	DC-IN +12 VDC with AC/DC power supply	
		DC-IN +24 VDC with wired power cable	
		AC-IN with mains power cable (240/100 VAC, 50/60 Hz)	
		Industrial 24 VDC (future option)	

Table 12: Internal Expansion Sockets

	KBox B-202-CFL (Smart / Smart Storage)	KBox B-202-CFL (Value)
Type	mPCIe	
Quantity	1	
Size	half-size or full-size mPCIe	
Interface	PCIe Gen 3	PCIe Gen 2
mPCIe (reference option)	802.11ac/abgn Dual-band 2T2R Wi-Fi + Bluetooth 4.0 technology Fi (mPCIe half-size)	
	KBox B-202-CFL (Smart / Smart Storage)	KBox B-202-CFL (Value)
Type	M.2	
Quantity	1	
Capacity	2280, 2242	
Interface	M.2: PCIe (Gen 3) @ 4 lanes interface	M.2: PCIe (Gen 2) @ 2 lanes interface

Table 13: External Expansion Slots

	KBox B-202-CFL (Smart)	KBox B-202-CFL (Value)	KBox B-202-CFL (Smart Storage)
Quantity & Type	1x PCIe x16 or 2x PCIe x8 [1]	1x PCIe x16	1x PCIe x16 or 1x PCIe x8 [1]
Size	full height, half-length PCIe	full height, half-length PCIe	full height, half-length PCIe
Interface	PCIe Gen 3	PCIe Gen 2	PCIe Gen 3

Table 14: Software Specification

	KBox B-202-CFL (Smart)	KBox B-202-CFL (Value)	KBox B-202-CFL (Smart Storage)
Operating System (OS)	Windows® 10 or Linux-64		
BIOS	AMI Aptio 5.x (UEFI) BIOS (Modified and adapted for the motherboard)		

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

Table 15: Chassis Specification

	KBox B-202-CFL (Smart)	KBox B-202-CFL (Value)	KBox B-202-CFL (Smart Storage)
Chassis	Hot-dip zinc coated steel sheet (Black grey (RAL 7021))		
Dimensions (D x W x H)	190 mm x 190 mm x 120 mm (7.48" x 7.48") x 4.72")		
Front Panel	Aluminum (Pearl light grey (RAL 9022))		
Cooling	Fan cooled, axial fan, silent fan		

10.3. Mechanical Specification

Table 16: Mechanical Specifications

	Dimensions
Depth	190 mm (7.48")
Width	190 mm (7.48")
Height	120 mm (4.72")
Weight (Without package)	2.8 kg (6.17 1 lbs.) approx.
Mounting Bracket (D x W x H)	187 mm x 45 mm x 20 mm (7.36" x 1.77" x 0.79")

10.3.1. Dimension Diagrams

For more 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

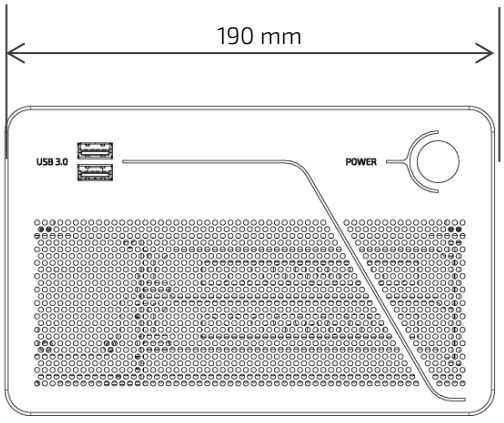


Figure 44: Dimensions Rear Panel

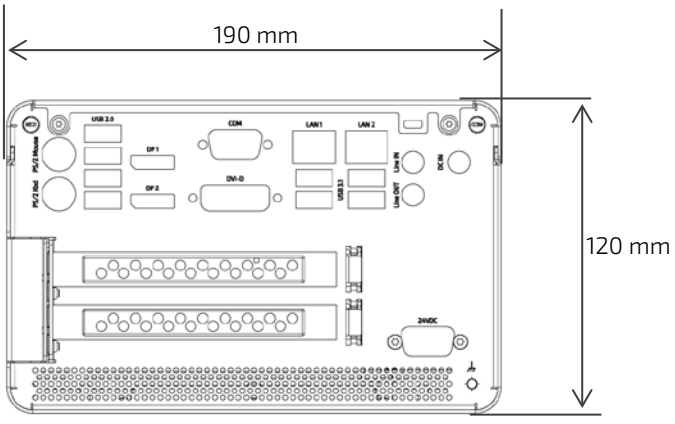


Figure 45: Dimensions Top Cover

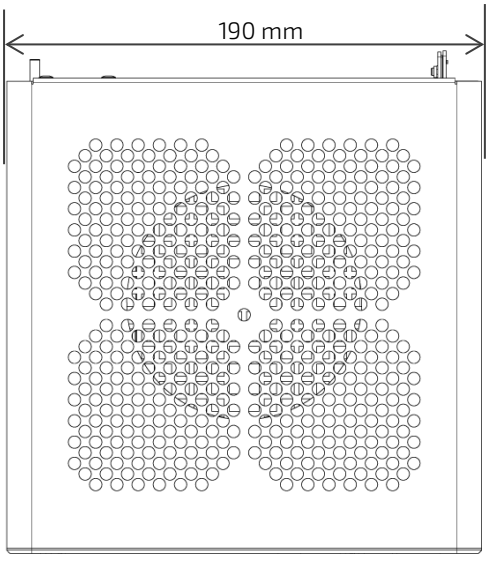


Figure 46: Dimensions Bottom Side

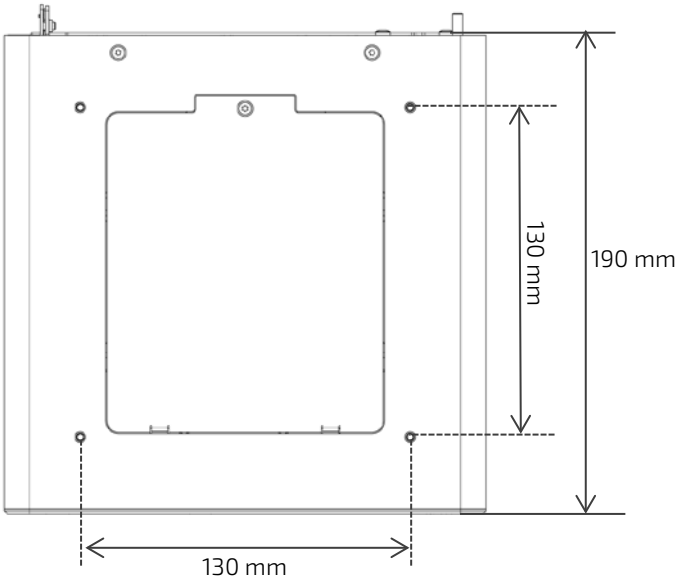


Figure 47: Dimensions Right Side

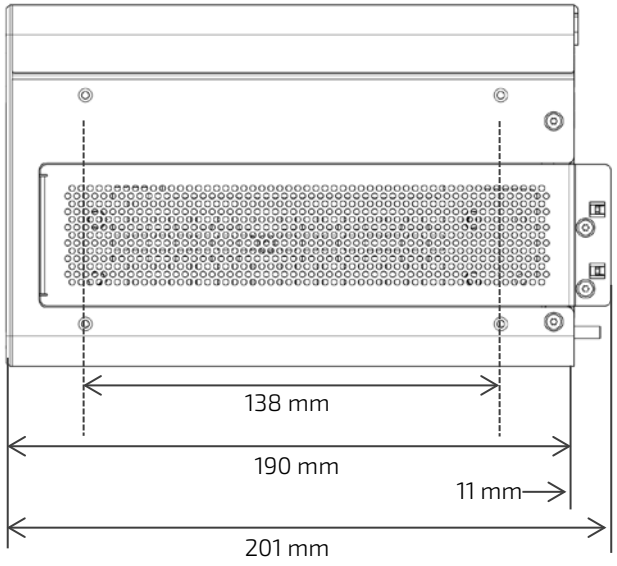


Figure 48: Dimensions Left Side

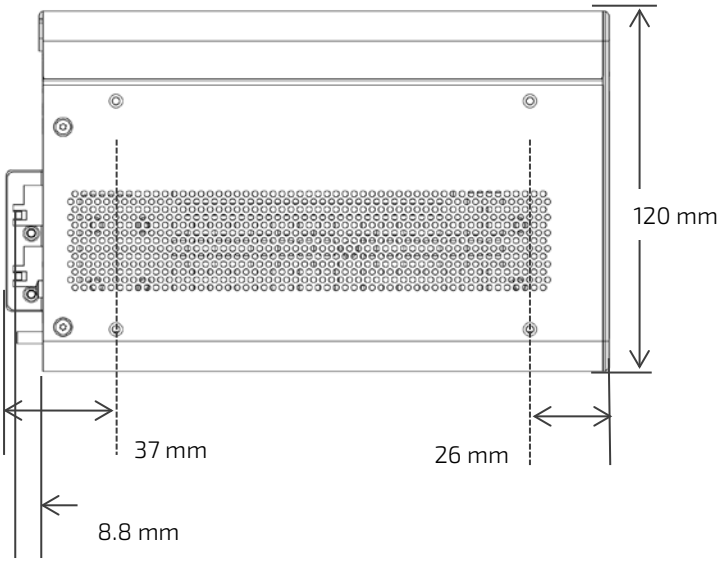
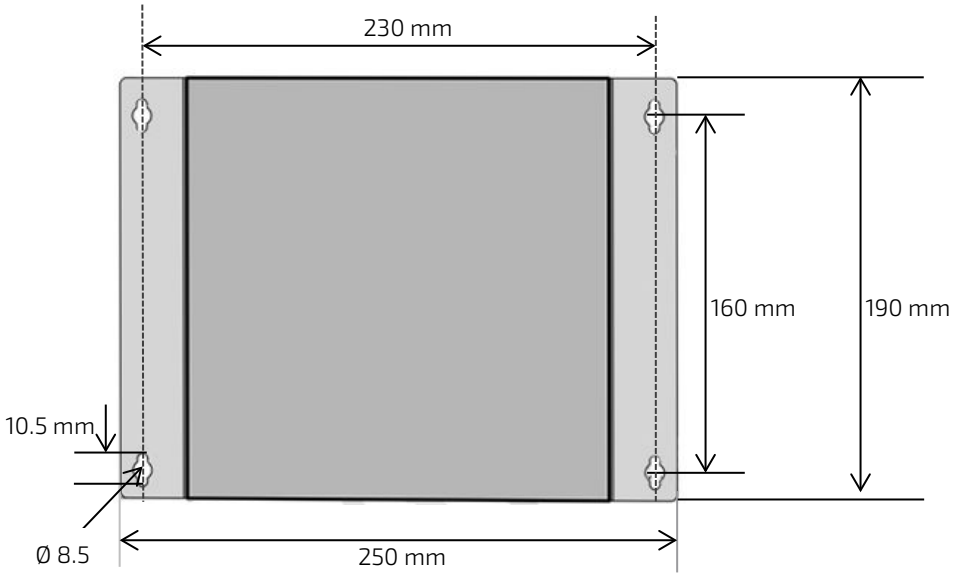


Figure 49: Dimensions with Mounting Brackets



10.4. Environmental Specification

Table 17: Environmental Specification

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

10.5. Directives and Standards

The KBox B-202-CFL complies with the European Council Directive and the approximation of the laws of the member states. When supplied with optional Wi-Fi variant complies with the Radio Equipment Directive (RED) and the approximation of the laws of the member states. If modified, prerequisites for specific approvals may no longer apply.

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

Failure to use the supplied power connection may invalidate the FCC compliance and class. Use shielded I/O cables when connecting to peripheral or host devices. Failure to do so may violate FCC/ICES rules.

Failure to use the supplied power connection may invalidate the FCC compliance and class. Use shielded I/O cables when connecting to peripheral or host devices. Failure to do so may violate FCC/ICES rules

Table 18: Directives and Standards Compliance

CE (for KBox B-202-CFL- without Wi-Fi)		
Council Directive		93/68/EEC
RED (for KBox B-202-CFL with Wi-Fi)		
Draft ETSI EN 301 489-01 V2.2.0		EMC standard for radio equipment and services - Part 1: Common Technical Requirements
Final ETSI EN 301 489-17 V3.2.0		EMC standard for radio equipment and services – Part 17: Specific Conditions for Broadband Data Transmission Systems
ETSI EN 300 328 V2.1.1		Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques
ETSI EN 301 893 V2.1.1		5 GHz RLAN
EMC		
Emission (Class B)	EN 55032:2012 / CISPR 32 Edition 2.0	Electromagnetic compatibility of multimedia equipment- Emission requirements
	EN 61000-3-2:2014	Limits for harmonic currents emissions
	EN 61000-3-3:2013	Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems
Immunity (Industrial Equipment)	EN 55024:2010 / CISPR 24 Edition 2.1	Information technology equipment- Immunity characteristics
Safety		
Europe	EN 62368-1:2014	Audio/video, information and communication technology equipment – Safety requirements
CB Scheme	CB Certificate - IEC 62368-1:2014	
USA & Canada	NRTL -UL 62368-1:2014 CAN/CSA-C22.2 No. 62368-1:2014	
FCC		
FCC 47 CFR Part 15B/ ICES-003	Complies with the requirements of Federal Communications Commission (FCC) rules and regulations of title 47 of the Code of Federal Regulations (CFR) Part 15B and ICES-003:2017 & 2016 rules to limit the potential of harmful interference	

Environment	
WEEE	Compliant with the Waste Electrical and Electronic Equipment (WEEE) 2012/19/EU directive; to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers
Environment	
RoHS II	Compliant with the Restriction of Hazardous Substances (RoHS) 2011/65/EU directive or the late status thereof, to reduce hazardous substances in electrical and electronic equipment
REACH	Compliant with the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation No. 1907/2006 to identify the intrinsic properties of chemical substances earlier

10.6. Power Specification

The KBox B-202-CFL power connection variants (12 VDC and optional 24 VDC) both connected to the DC-IN power connector. Due to different internal components, the KBox B-202-CFL power variants are not interchangeable. The required input voltage is on the product's type label.

⚠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 different internal components, 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!

10.6.1. DC-IN, 12 VDC

The KBox B-202-CFL 12 VDC is supplied with an external AC/DC 150 W power supply with a nominal output voltage of 12 VDC. Only use the supplied AC/DC power supply chosen to meet the product's power specification, power consumption and power protection requirements.

Table 19: Power supply 12 VDC AC/DC

Power Source	12 VDC AC/DC Power Supply
Input Voltage Range	240/100 VAC (50/60 Hz)
Output Voltage	+12 VDC
Output Current	9 A to 12.5 A max.
Power Rating	150 W

NOTICE Power the 12 VDC variant with the supplied 12 VDC AC/DC external power supply only.

10.6.2. DC-IN, 24 VDC (option)

The KBoxB-202-CFL optional 24 VDC variant is supplied with a 24 VDC wired power cable that connects to a separate external 24VDC power source. Only connect to an external DC power source that meets the KBox B-202-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 20: Power Supply 24 VDC (variant)

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

NOTICE Power the 24 VDC variant with the supplied 24 VDC wired power cable only.

10.6.3. AC-IN (option)

The KBoxB-202-CFL Smart Storage supports an internal power supply with an AC-IN power connector on the rear panel that connect directly to a mains power outlet, using the supplied power cable for your region.

Table 21: Power supply AC-IN (variant)

Power Source	AC/DC Power Supply
Input Voltage Range	240/100 VAC (50/60 Hz)
Power Rating	150 W

NOTICE Power the KBox B-202-CFL Smart Storage AC power option using the AC-IN connector and the supplied AC power cable only. The DC-IN connector is not available.

10.6.4. Power Protection

The 12 VDC AC/DC external power supply and the AC-IN power option 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 22: Power Supply Protection Features (12 VDC and AC-IN)

	Amount	Condition	Description
Holdup Time	≥10 sec	@ 100 VAC or 240 VAC / full load, output voltage remains regulated	Time power supply can bridges drops in mains power without output voltage fluctuations.
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.

10.6.5. Power Consumption

The power supply must provide the level of power required to meet the KBox B-202-CFL's maximum power consumption. The maximum power consumption depends on the motherboard capacity, system memory and system expansion devices/cards. If the use of system expansion device/cards increases the power consumption above the maximum power rating of the power supply (see Table 19, Table 20 and Table 21), contact Kontron Support.

Table 23: Power Consumption Estimation

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

10.6.6. 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 screw on barrel jack (5.5 mm/ 2.5 mm) with center pole. The power connection variants (12 VDC and optional 24 VDC) both connected to the DC-IN power connector. Due to different internal components, the KBox B-202-CFL power variants are not interchangeable. The required input voltage is on the product's type label.

Table 24: DC Power Jack Pin Assignment

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

NOTICE

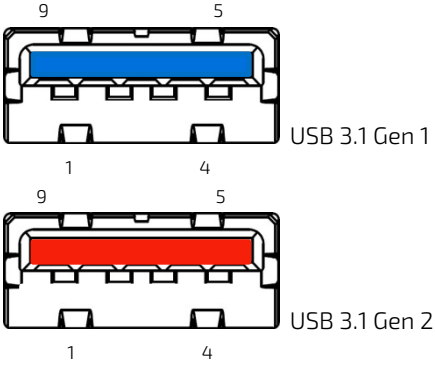
Due to different internal components, the 12 VDC and optional 24 VDC variant are not interchangeable.

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

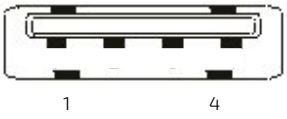
Table 25: USB 3.1 Connector Pin Assignment

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

Low-active signals are indicated by a minus sign.

11.3. USB 2.0 Port Pin Assignment

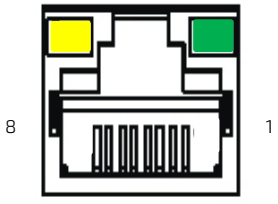
Table 26: USB 2.0 Connector Pin Assignment

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

Low-active signals are indicated by a minus sign.

11.4. LAN Connector Pin Assignment

Table 27: LAN (GbE) Connector Pin Assignment

Pin	Signal Name (10/100/1000)	Signal Name (10/100)	LAN1 and LAN2 Connector (RJ45)
1	MX1+	TX+	
2	MX1-	TX-	
3	MX2+	RX+	
4	MX3+	TERMPLANE	
5	MX3-	TERMPLANE	
6	MX2-	RX-	
7	MX4+	TERMPLANE	
8	MX4-	TERMPLANE	

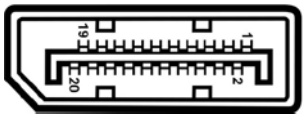
Low-active signals are indicated by a minus sign.

Table 28: LAN Link Activity

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

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

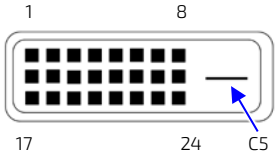
Table 29: Display Port (DP) Connector Pin Assignment

Pin	Signal Name	Pin	Signal Name	DP1 and DP 2 Connector
1	Link0+	2	GND	
3	Link0-	4	Link1+	
5	GND	6	Link1-	
7	Link2+	8	GND	
9	Link2-	10	Link3+	
11	GND	12	Link3-	
13	DVI dongle detect	14	GND	
15	AUX+	16	GND	
17	AUX-	18	Hot Plug detect	
19	GND (return)	20	+3.3V (fuse protested)	

Low-active signals are indicated by a minus sign.

11.6. DVI-D Connector Pin Assignment

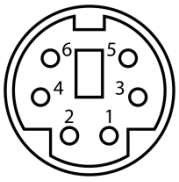
Table 30: DVI-D Connector Pin Assignment

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.

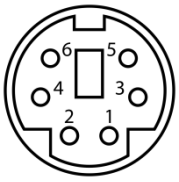
11.7. PS/2 Keyboard Connector Pin Assignment

Table 31: PS/2 Keyboard Connector Pin Assignment

Pin	Signal Name	PS/2 KBD 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 32: 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

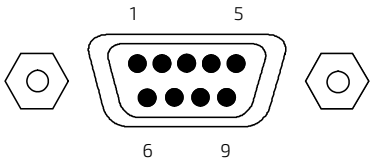
Table 33: Audio Line-OUT Audio Line-IN Pin Assignment

Connector	Signal Name	Audio Barrel Connector
Green	Line-OUT	
Blue	Line-IN	

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

11.10. Serial Port Connector Pin Assignment

Table 34: Serial Interface COM port (RS232) Connector Pin Assignment

Pin	Signal Name	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	

11.11. AC-IN Power Connector Pin Assignment (option)

The AC power connector uses a standard 3-pin AC (240/100 VAC, 50/60 Hz) connector.

Middle pin is protective earth.

12/ BIOS

The KBox B-202-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-202-CFL's hardware features:

- Recovery BIOS
- SM-BIOS (DMI)
- BIOS and CPU Microcode Update
- Quick boot
- LOGO boot
- Quite boot
- Plug & Play
- Automatic DRAM and PCIE configuration
- BIOS support for S.M.A.R.T.
- Advanced Power Management
- ACPI S3/S4
- Wake on time from S5
- HW watchdog support & BIOS integrated HW Diagnostic tool
- Silent fan

For security, the following BIOS features are available:

- System and BIOS password
- Boot sequence control
- Serial /USB-port access protection
- Boot sector virus warning
- Write protection for FLASH BIOS
- Erase Disk
- Intel® Integrated TPM V2.0

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

BIOS features in this user guide are open to change and may not be available in the latest version of the motherboard's BIOS, see Chapter 12.2: BIOS Update.

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.

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 repeatedly.
4. Enter the User Password or Supervisor Password, and press <RETURN>, if the uEFI BIOS is password protected.

5. The setup menu appears.

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

The KBox B-202-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 35: Navigation Hot Keys Available in the Legend Bar

Sub-screen	Description
<F1>	<F1> key invokes the General Help window
<->	<Minus> key selects the next lower value within a field
<+>	<Plus> key selects the next higher value within a field
<F2>	<F2> key loads previous values
<F3>	<F3> key loads optimized defaults
<F4>	<F4> key Saves and Exits
<→> or <←>	<Left/Right> arrows selects major setup menus on menu bar, for example, Main or Advanced
<↑> or <↓>	<Up/Down> arrows select fields in the current menu, for example, setup function or sub-screen
<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 OS, hardware, software or to integrate new BIOS functions Kontron recommends regular BIOS updates. Additionally, if a problem cannot be solved using a new driver, Kontron recommends updating the BIOS. To check if a BIOS update is available for the KBox B-202-CFL Smart or KBox B-202-CFL Value, visit Kontron's Customer Section.

The BIOS update required depends on the motherboard. For the motherboard product names for the KBox B-202-CFL Smart or Value, see Table 8: Motherboard Specification.

Before updating the BIOS, make a backup of the current BIOS setting.
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.

If the product fails to boot after a BIOS update, the updated BIOS maybe damaged.
For more information, contact Kontron Support.

13/ RAID

The KBox B-202-CFL supports the following RAID arrays options:

- Storage bay RAID Array (Smart Storage only)
- Drive bay RAID Array
- Internal RAID Array (Smart Storage only)

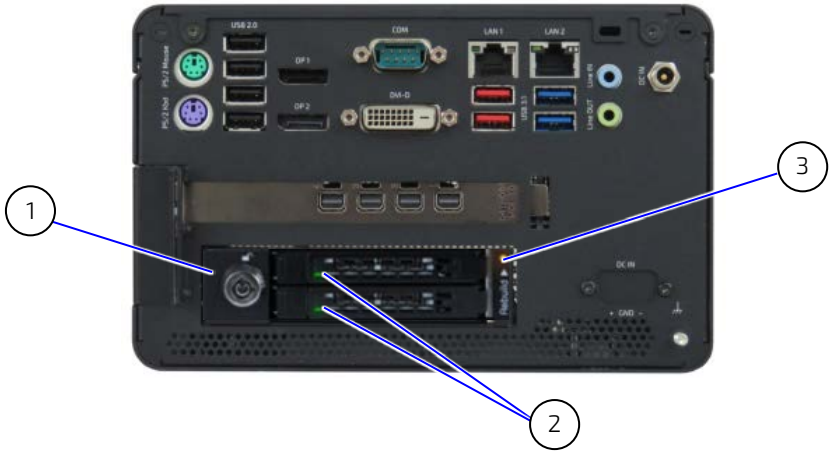
13.1. Storage Bay RAID Array

The KBox B-202-CFL with Storage bay RAID Array is factory installed as RAID 1 by default.

Table 36: Storage Bay RAID Array

RAID Drive type	Quantity	Interface	Position	RAID Type	RAID Monitoring
2.5" SSDs hot swap Tray mounted	Up to 2	SATA III 6Gb/s	Storage bay on rear panel	Integrated RAID controller hardware configurable with RAID (0/1/JBOD)	LED

Figure 50: KBox B-202-CFL Smart Storage RAID



1 Storage bay with integrated RAID
2 2.5" SSD activity LEDs
3 RAID Rebuild LED

13.1.1. Storage Bay RAID Configuration

The storage bay's integrated RAID controller supports RAID (0/1JBOD) on up to two 2.5" SSDs. The RAID array type is hardware configured on the rear side of the internal storage bay by adjusting a switch to the required RAID array type.

The LEDs on the storage bay's front side indicate RAID operation, where:

- LED off is NO SSD
- LED green is ACTIVE
- LED red is ERROR

An additional 'Rebuild >' LED (Figure 51, pos. 3) is yellow during configuration of the RAID array.

13.2. Drive Bay RAID Array

The KBox B-202-CFL with drive bay RAID array is factory installed with RAID 1 by default.

Table 37: 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

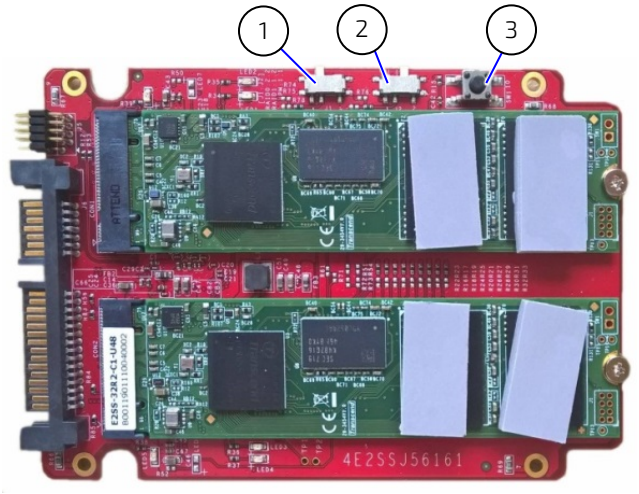
Do not reset the RAID module without considering if a backup of the data is required. Pressing the reset switch configures the RAID array and data on both drives will be lost.

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.

13.2.1. Drive Bay RAID Configuration

Figure 51: 2.5" SSD dual RAID M.2 Module Settings



1 Jumper (J1) in position 1
2 Jumper (J2) in position 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 51, pos. 1 and 2) to the setting required for the RAID array type.

Table 38: 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-202-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-202-CFL. Place a small non-conductive blunt-utensil underneath the 2.5" SSD dual M.2 RAID module where the rest switch is positioned (Figure 51, 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 202-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)**

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 51, 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.

13.2.2. 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.

13.2.2.1. 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 38: S.M.A.R.T. Information Memory Attributes.

Table 39: 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

13.2.2.2. 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 40: 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

13.2.2.3. Events

Events lists important RAID events and gives more detailed information:

Table 41: 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

13.3. Internal RAID Array

The internal RAID array is only available for the Smart Storage variant using the internal storage bay factory installed with two non-removable 2.5" SSDs.

Table 42: Internal RAID

RAID Drive type	Number of M.2 SSDs	Interface	Position	RAID Type	RAID Monitoring
2.5" SSD	Up to 2	SATA III 6Gb/s	Storage bay-Internal (not user accessible)	Chipset RAID (software configured)	Intel® RST Monitoring

13.3.1. Internal RAID Array Configuration

The two internal 2.5" SSDs are configured using Chipset RAID, to configure the RAID array perform the following:

1. Enter the BIOS setup menu, see Chapter 12.1: Starting the uEFI BIOS.
2. Navigate to the **Advance > Drive Configuration** and change from **AHCI to RAID**.
3. Navigate to **Save &Exit > Save Changes and Exit**.
4. Restart and re-enter the BIOS setup menu.
5. Navigate to the newly created RAID Submenu **Advanced>RAID** and enter the RAID array type: **RAID 1** or **RAID 0**.
6. Navigate to **Save &Exit > Save Changes and Exit.**
7. To monitor the Chipset RAID array, download and install the motherboard's Intel® Rapid Storage Technology driver.

14/ Technical Support

Should a problem occur that cannot be solved using the trouble shooting information above contact Kontron's Support Department:

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

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

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

The serial number can be found on the products type label.

Be ready to explain the nature of your problem to the service technician.

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

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

4. 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.

15/ Storage, Transportation and Maintenance

15.1. Storage

If the product is not in use for an extended period time, disconnect the product from the main power supply .If it is necessary to store the product then repack 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 trained personnel authorized by Kontron. Kontron products require only minimum servicing and maintenance for problem-free operation.

To clean the surface of the chassis, carefully remove dust using a clean soft brush and for light soiling clean the product with a dry cloth. Remove stubborn dirt using a mild detergent and a soft cloth.

⚠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. Replacing the Lithium Battery

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

1. Remove the lithium battery from the holder by pulling the ejector spring outwards.
2. Place a new lithium battery into the battery holder.
3. Pay attention to the polarity of the battery.

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

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

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 for IT equipment within this user guide.
- Warning labels on the product and warning symbols within this user guide.
- Information and hints within this user guide.

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

Due to their limited service life, parts that 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 43: 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 embedded computing technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall. For more information, please visit: **www.kontron.com**

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