KBox B-202-RPL

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kontron

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▶ KBOX B-202-RPL - USER GUIDE

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NOTICE	You find the most recent version of the "General Safety Instructions" online in the download area of this product.

NOTICE	This product is not suited for storage or operation in corrosive environments, in particular under exposure to sulfur and chlorine and their compounds. For information on how to harden electronics and mechanics against these stress conditions, contact Kontron Support.

Revision History

Revision	Brief Description of Changes	Date of Issue	Author/ Editor
1.0	Initial version	2024-Apr-22	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 https://www.kontron.com/terms-and-conditions.

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Customer Support

Find Kontron contacts by visiting: https://www.kontron.com/en/support-and-services.

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.

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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 informs 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 lithium battery.

⚠ CAUTION	CAUTION: Risk of Explosion if the lithium battery is replaced by an incorrect type. Dispose of used lithium batteries according to the Instructions. ATTENTION: Risque d'explosion si la pile au lithium est remplacée par une pile de type incorrect. Éliminez les piles au lithium usagées conformément aux 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/ Introduction

This user guide describes the KBox B-202-RPL series of high performance Box PC also known as product within this user guide, and the products two variants Smart Performance and Smart Storage. This user guide focuses on describing the product's special features, including how to assemble, install, operate and maintain the product properly. Kontron recommends users to study the instructions within this user guide before switching on the product.

Figure 1: KBox B-202-RPL

The KBox B-202-RPL is equipped with powerful 14th/13th Gen Intel® Core™ processors with up to 24 processor cores. The product is characterized not only by its powerful computing performance, but also by maximum expandability in a compact design and a low noise level ('Whisper Quiet Operation') with a maximum of 34 dB(A).

At the heart of the KBox B-202-RPL is the Kontron mITX motherboard K3833-Q, designed and manufactured in Germany that supports 14th/13th Gen Intel® Core™ i3/i5/i7/i9 processors. The motherboard is equipped with the Intel® Q670E chipset and offers two DIMM sockets for high-performance DDR5 memory with up to 64 GBytes. Fast NVMe SSDs with up to 1 TByte are used as mass storage. In addition, the product offers an easily accessible drive bay, allowing for the integration of a 2.5-inch SSD or two M.2 SSDs (RAID 1) drives.

With two GbE ports, of which one offers up to 2.5 GbE, and ten USB ports (including USB-C), the KBox B-202-RPL ensures high data throughput and connectivity. The product also features four Display Ports, a serial interface, and supports an input voltage of 230 VAC or 24 VDC. Furthermore, fast wireless connections can be enabled via Wi-Fi 6.

For versatile expansions, the KBox B-202-RPL offers one or two PCIe slots (1x PCIe x16 or 2x PCIe x8). This allows network cards with up to 10 GbE or PCIe graphics cards to be integrated. Alternatively, a 3.5-inch hard disk with up to 12 TByte or two 2.5-inch removable drives can be used.

The KBox B-202-RPL can be used in a variety of ways thanks to various mounting options and the compact design. The product can be operated on a table (vertically and horizontally), under a table, on a wall or in a control cabinet using special mounting brackets.

The thermal concept with a low-noise fan ensures smooth operation at temperatures up to +45°C and thus permanent, high-availability use around the clock.

General features overview:

▶ Kontron mITX K3833-Q
▶ Processors
  ▶ 14th/13th Generation Intel Core™ Processors
  ▶ Pentium® Gold Processors
▶ Chipset
  ▶ Intel® Q670E

- System Memory
  - 2x SODIMM sockets for DDR5 up to 64 GB
- Storage:
  - 1x 2.5" SATA SSD 1x 2.5" SSD RAID module with dual SSDs (M.2 2280) (option)
  - 1x SSD (M.2 2242 Key M, PCIe x4/NVME) (option)
- Rear Interfaces:
  - 4x DP
  - 3x USB 3.2 Gen 2
  - 1x USB-C 3.2 Gen 2
  - 2x USB 3.2 Gen 1
  - 2x USB 2.0
  - 1x 2.5 GbE
  - 1x 1 GbE
  - 1x Audio
  - 1x COM
- Front Interfaces:
  - 2x USB 3.2 Gen 1
- System Expansion
  - 1x Wi-Fi /Bluetooth M.2 2230 Key E Module (option)
- Software
  - Windows 10 LTSC
  - Linux

Smart Performance features:

- 2x PCIe x16 or 2x PCIe x8

- Power Supply (PSU)
  - 100/240 VAC (150 W, default PSU)
  - 100/240 VAC (240 W, optional PSU)
  - 24 VDC power supply (option)

Smart Storage features:

- 1x PCIe x8 slot for system expansion
- Dual storage bay
  - Up to 12 TByte
  - Up to four RAID storage devices

- Power Supply (PSU)
  - 100/240 VAC (150 W, default PSU)
  - 24 VDC power supply (option)
  - AC Power Cable 100/240 VAC (option)

2/ 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 lithium battery is replaced incorrectly (short-circuited, reverse-poled, wrong lithium battery type). Dispose of used batteries according to the manufacturer's instructions.

▶ This product is not suitable for use in locations where children are likely to be present.

Additional Safety Instructions for DC Power Supply Circuits

▶ To guarantee safe operation, please observe that:

    ▶ the external DC power supply must meet the criteria for LPS and PS2 (UL/IEC 62368-1)

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

▷ a reliable protective earthing connection is provided

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

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

▷ interconnecting power circuits of different products cause no electrical hazards

▷ A sufficient dimensioning of the power cable wires must be selected – according to the maximum electrical specifications on the product label – as stipulated by EN62368-1 or VDE0100 or EN60204 or UL61010-1 regulations.

2.1. Instructions générales de sécurité

Veuillez lire attentivement ce passage et prendre bonne note des instructions, qui ont été compilées pour votre sécurité et pour assurer une application conforme aux réglementations prévues. Le non-respect des consignes de sécurité générales suivantes peut entraîner des blessures pour l'utilisateur et/ou des dommages pour le produit. En cas de non-respect des consignes, Kontron Europe est exonéré de la responsabilité en cas d'accident, ceci s'applique également pendant la période de garantie.

Le produit a été construit et testé conformément aux exigences de sécurité de base pour les applications basse tension (DBT) et a quitté le fabricant dans un état impeccable en matière de sécurité. Pour maintenir cet état et pour garantir également un fonctionnement sûr, l'opérateur doit non seulement respecter les conditions d'utilisation correctes du produit, mais aussi les consignes de sécurité générales suivantes :

▷ Le produit doit être utilisé conformément à la documentation du produit, dans laquelle sont décrites les instructions de sécurité pour le produit et pour l'opérateur. Celles-ci contiennent des directives pour la mise en place, l'installation et le montage, la maintenance, le transport ou le stockage.

▷ L'installation électrique sur place doit répondre aux exigences des réglementations locales spécifiques du pays.

▷ Si un câble d'alimentation est fourni avec le produit, seul ce câble doit être utilisé. N'utilisez pas de rallonge pour connecter le produit.

▷ Afin de garantir une circulation d'air suffisante pour refroidir le produit, veuillez vous assurer que les ouvertures de ventilation ne sont pas couvertes ou obstruées. Si un élément filtrant est fourni, celui-ci doit être nettoyé régulièrement. Ne placez pas le produit à proximité de sources de chaleur ou d'endroits humides. Veillez à ce que le produit soit bien ventilé.

▷ Ne connectez le produit qu'à une alimentation externe fournissant le type de tension (AC ou DC) et la puissance d'entrée (courant max.) spécifiés sur le Label Produit Kontron et répondant aux exigences de la source d'alimentation limitée (LPS) et de la source d'alimentation (PS2) de la norme UL/IEC 62368-1 .

▷ Seuls les produits ou les pièces qui répondent aux exigences de la source d'alimentation (PS1) de la norme UL/IEC 62368-1 peuvent être connectés aux interfaces (E/S) disponibles du produit.

▷ Avant d'ouvrir le produit, assurez-vous qu'il est bien débranché du secteur.

▷ Le fait d'éteindre le produit par son bouton de mise en marche ne le déconnecte pas du secteur. Une déconnexion complète n'est possible que si le câble d'alimentation est retiré de la prise murale ou du produit. Veillez à ce que l'accès soit libre et facile pour permettre la déconnexion.

▷ Le produit ne peut être ouvert que pour l'insertion ou le retrait de cartes supplémentaires (selon la configuration du produit). Cette opération ne peut être effectuée que par des opérateurs qualifiés.

▷ Si des extensions sont effectuées, les points suivants doivent être respectés :

▷ toutes les réglementations légales en vigueur et toutes les données techniques sont respectées

▷ la consommation électrique d'une carte supplémentaire ne dépasse pas les limites spécifiées

▷ la consommation actuelle du produit ne dépasse pas la valeur indiquée sur l'étiquette du produit.

▷ Seuls les accessoires d'origine approuvés par Kontron Europe peuvent être utilisés.

▷ Veuillez noter que la sécurité des opérations n'est plus possible lorsque l'une des conditions suivantes s'applique.

> ▶ le produit présente des dommages visibles ou
> ▶ le produit ne fonctionne plus. Dans ce cas, le produit doit être éteint et il faut s'assurer que le produit ne puisse plus être utilisé.

▶ La manipulation et le fonctionnement du produit ne sont autorisés que pour le personnel formé dans un lieu de travail dont l'accès est contrôlé.

▶ ATTENTION: Risque d'explosion si la pile au lithium est remplacée par une pile de type incorrect. Éliminez les piles au lithium usagées conformément aux instructions.

▶ Ce produit n'est pas adapté à une utilisation dans des endroits où des enfants sont susceptibles d'être présents

Instructions de sécurité supplémentaires pour les circuits d'alimentation en courant continu

▶ Pour garantir un fonctionnement sûr, veuillez observer ce qui suit:
> ▶ l'alimentation électrique externe en courant continu doit répondre aux critères des LPS et PS2 (UL/IEC 62368-1)
> ▶ aucun câble ou pièce non isolée dans les circuits électriques ayant une tension ou une puissance dangereuse ne doit être touché directement ou indirectement
> ▶ une connexion fiable à la terre de protection est fournie
> ▶ un dispositif de déconnexion approprié et facilement accessible est utilisé dans l'application (par exemple, un dispositif de protection contre les surintensités), si le produit lui-même n'est pas en mesure d'être déconnecté.
> ▶ un dispositif de déconnexion, s'il est prévu dans le produit ou s'il en fait partie, doit déconnecter les deux pôles simultanément
> ▶ l'interconnexion des circuits électriques de différents produits ne présente aucun risque électrique

▶ Un dimensionnement suffisant des fils du câble d'alimentation doit être choisi - en fonction des spécifications électriques maximales figurant sur l'étiquette du produit - comme stipulé par les réglementations EN62368-1 ou VDE0100 ou EN60204 ou UL61010-1.

2.2. Electrostatic Discharge (ESD)

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

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

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

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

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

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

2.3. Grounding Methods

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

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

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

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

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

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

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

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

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

2.4. Instructions for the Lithium Battery

The product is equipped with a CR2032 lithium battery and is not designed to operate without a lithium battery. If the lithium battery is empty or disconnected, the BIOS settings will be set to the factory defaults. Replace the Kontron specific lithium battery assembly only with the same type of lithium battery or with a Kontron recommended lithium battery type.

To replace the lithium battery observe the instructions described in Chapter 14.2: Replacing the Lithium Battery.

⚠CAUTION	**Danger of Explosion if the lithium battery is incorrectly placed!**
	▶ Replace only with the same or equivalent type recommended by the manufacturer
	▶ Dispose of used batteries according to the manufacture's instructions
	VORSICHT- Explosionsgefahr bei unsachgemäßem Austausch der Batterie!
	▶ Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ
	▶ Entsorgung gebrauchter Batterien nach Angaben des Herstellers
	ATTENTION- Risque d'explosion avec l'échange inadéquat de la batterie!
	▶ Remplacement seulement par le même ou un type équivalent recommandé par le producteur
	▶ L'évacuation des batteries usagées conformément à des indications du fabricant
	PRECAUCION- Peligro de explosión si la batería se sustituye incorrectamente!
	▶ Sustituya solamente por el mismo o tipo equivalente recomendado por el fabricante
	▶ Disponga las baterías usadas según las instrucciones del fabricante
	ADVARSEL- Lithiumbatteri -- Eksplosionsfare ved fejlagtig håndtering!
	▶ Udskiftning må kun ske med batteri af samme fabrikat og type
	▶ Levér det brugte batteri tilbage til leverandøren
	ADVARSEL- Eksplosjonsfare ved feilaktig skifte av batteri!
	▶ Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten
	▶ Brukte batterier kasseres i henhold til fabrikantens instruksjoner
	VARNING- Explosionsfara vid felaktigt batteribyte!
	▶ nvänd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren
	▶ assera använt batteri enligt fabrikantens instruktion
	VAROITUS- Paristo voi räjähtää, jos se on virheellisesti asennettu!
	▶ Vaihda paristo ainoastaan lalteval- mistajan suosittelemaan tyyppiln
	▶ Hävitä käytetty paristo valmistajan ohjeiden mukaisesti

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

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

	The product is not designed to operate without a lithium battery. If the lithium battery is empty or disconnected, the BIOS settings will be set to the factory defaults.

3/ Shipment and Unpacking

3.1. Packaging

The KBox B-202-RPL 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-RPL, 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 shipping damage or inconsistencies between the contents and the original order, contact your dealer.

3.3. Scope of Delivery

The scope of delivery describes the parts included in your delivery. Check that the delivery is complete, and contains the items listed in the pack list. If damaged or missing items are discovered, contact the dealer.

Table 1: Scope of Delivery

Product	Description
KBox B-202-RPL Smart Performance	KBox B -202-RPL with K3833-Q mITX motherboard, Intel® Q670E chipset and requested PCIe, M.2 and SSD configuration with either: • AC/DC 150 W PSU • AC/DC 240 W PSU • 24 VDC mating power connector
KBox B-202-RPL Smart Storage	KBox B -202-RPL with K3833-Q mITX motherboard, Intel® Q670E chipset and requested PCIe, M.2, SSD and HDD configuration with either: • AC/DC 150 W PSU • 24 VDC mating power connector • AC-IN power cable for your region

3.4. Accessories

Table 2: Accessories

Part Number	Part	Part Description
1064-8948	AC/DC Power Supply	External AC/DC (100/240 VAC/12 VDC, 150 W) power supply
0-0062-3268	3-pin Power Connector	3-pin Phoenix power connector (PSC 1.5/3-F)
0-0064-2173	Power Cord EU	Euro (Type A), 2.5 m
0-0064-4173	Power Cord UK	UK (Type C), 2.5 m
0-0064-4317	Power Cord US	US, 2m

Part Number	Part	Part Description
1065 3430	Wall Mount Set	Two wall mount brackets and four screws (M3x6)
0-0067-006	Chassis feet	Four round adhesive rubber chassis feet

3.5. Product Identification -Type Label

The type label includes information product specific information such as the electrical specification and product compliance for the ordered configuration.

Figure 2: Type Labels Examples
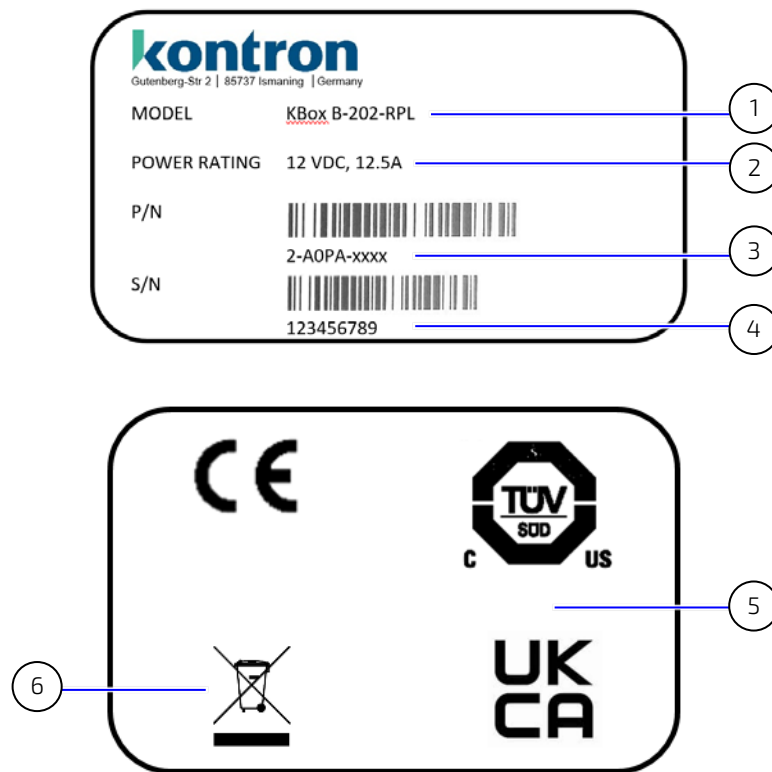
1	Product family	4	Serial number and bar code
2	Electrical Specification	5	Compliance label (separate)
3	Part number with bar code	6	Disposal

4/ Product Features

Before working with the KBox B-202-RPL, Kontron recommends that users take a few minutes to study this chapter and learn about the various parts and features.

4.1. Front Panel

The front panel features the power button, two USB 3.2 Gen 1 ports, and ventilation openings for air-output.

Figure 3: Front Panel
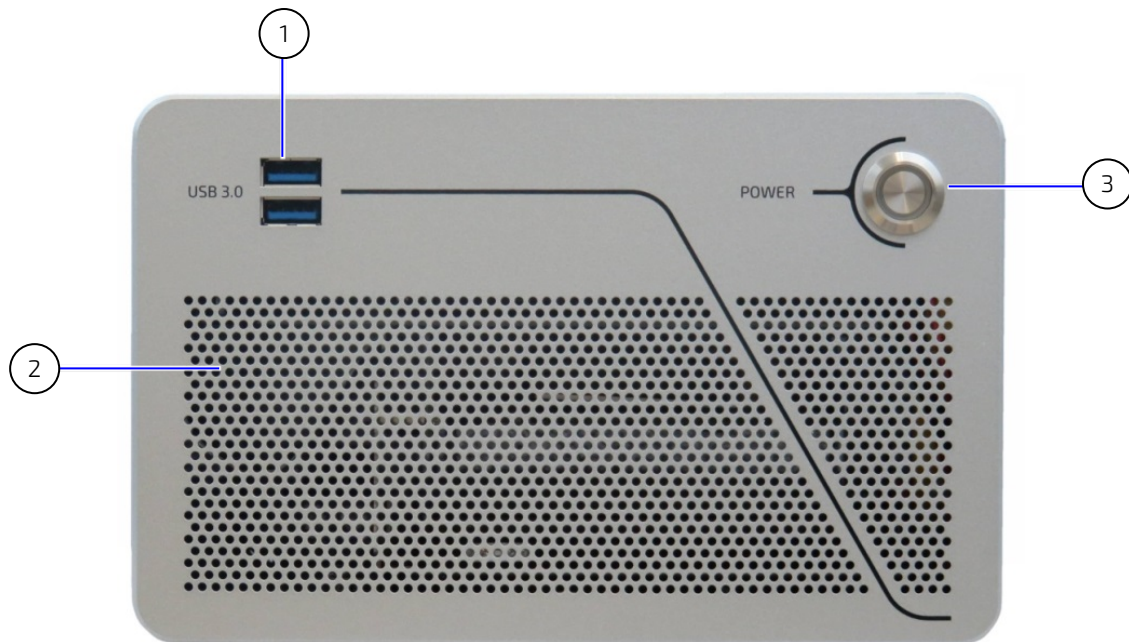
1	2x USB 3.2 Gen 1 ports	3	Power button with LED
2	Ventilation openings (air-output)		

4.1.1. Power Button (POWER)

The power button switches on or switches off the product and includes an integrated power LED that illuminates blue in the 'on' state. Pressing the power button for longer than four seconds initiates a forced system shutdown, and switches the product from the 'on' to the 'off' state.

> **NOTICE**   Performing a forced shut down can lead to loss of data or other undesirable effects!
> To shutdown without data loss, use the power button.

4.1.2. USB 3.2 Gen 1 Ports (USB 3.0)

The two front panel USB 3.2 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.

For the USB 3.2 Gen 1 pin assignment, see Chapter 13.5: USB 3.2 Gen2/Gen1 Port Pin Assignment.

4.2. Rear Panel

The Smart Performance rear panel supports two PCIe expansion slots and three possible power connectors.

Figure 4: Rear Panel (Smart Performance)
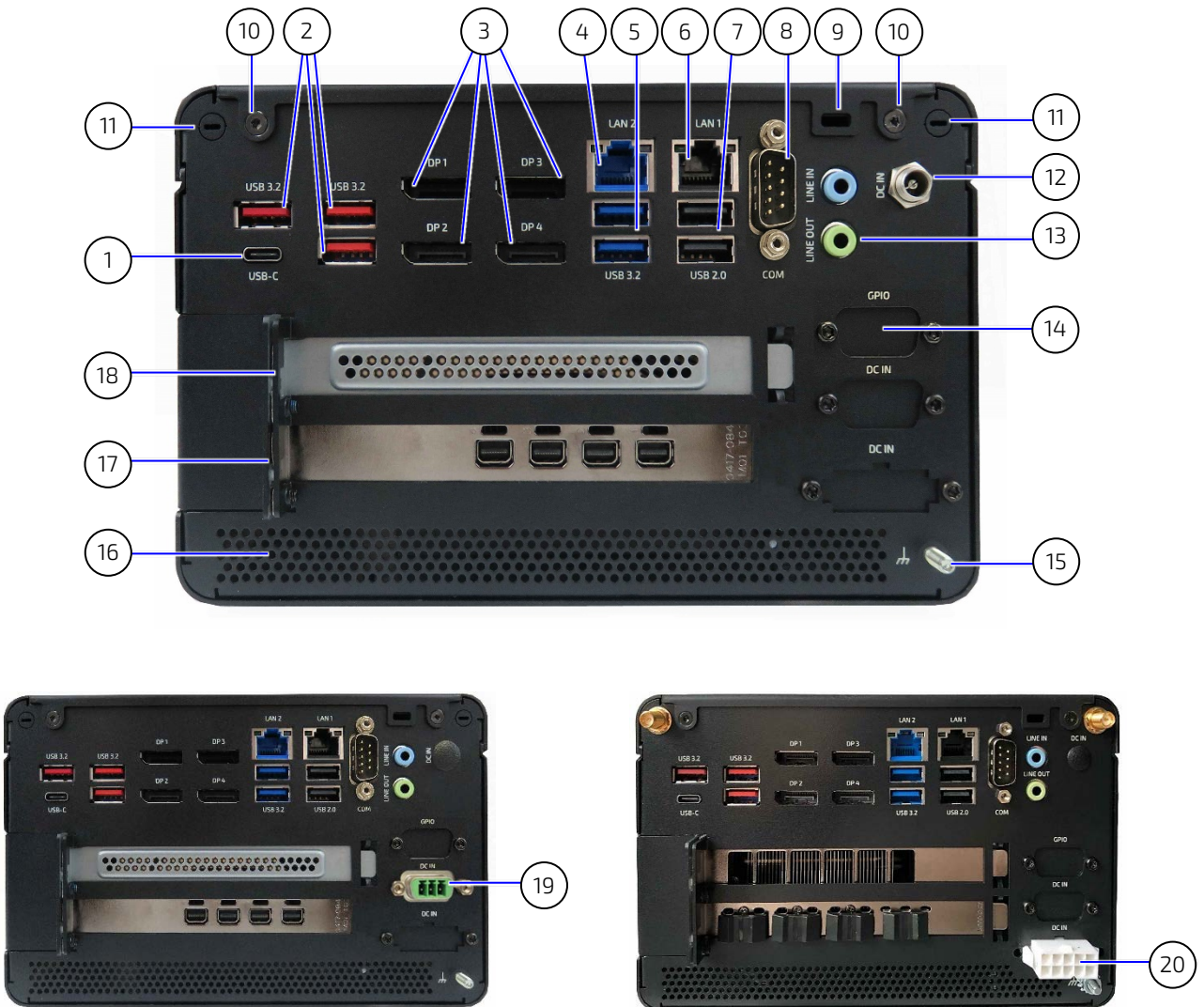
1	1x USB-C 3.2	8	1x Serial Port	15	Potential Equalization stud
2	3x USB 3.2 Gen 2	9	1x Kensington lock	16	Ventilation openings (air-output)
3	4x DP	10	2x Cover fastening screws	17	PCIexpress slot 1
4	1x LAN 2.5 GbE	11	2x Antenna/Antenna breakouts	18	PCIexpress slot 2
5	2x USB 3.2 Gen 1	12	DC IN (12 VDC) (default)	19	3-pin DC IN (24 VDC)
6	1x LAN 1 GbE	13	1x Audio (In & Out)	20	10-pin DC IN for (AC/DC 240 W PSU)
7	2x USB 2.0	14	1x GPIO		

The Smart Storage rear panel supports a dual storage bay or AC-IN Power connector, and one PCIe expansion slot.

Figure 5: Rear Panel (Smart Storage)
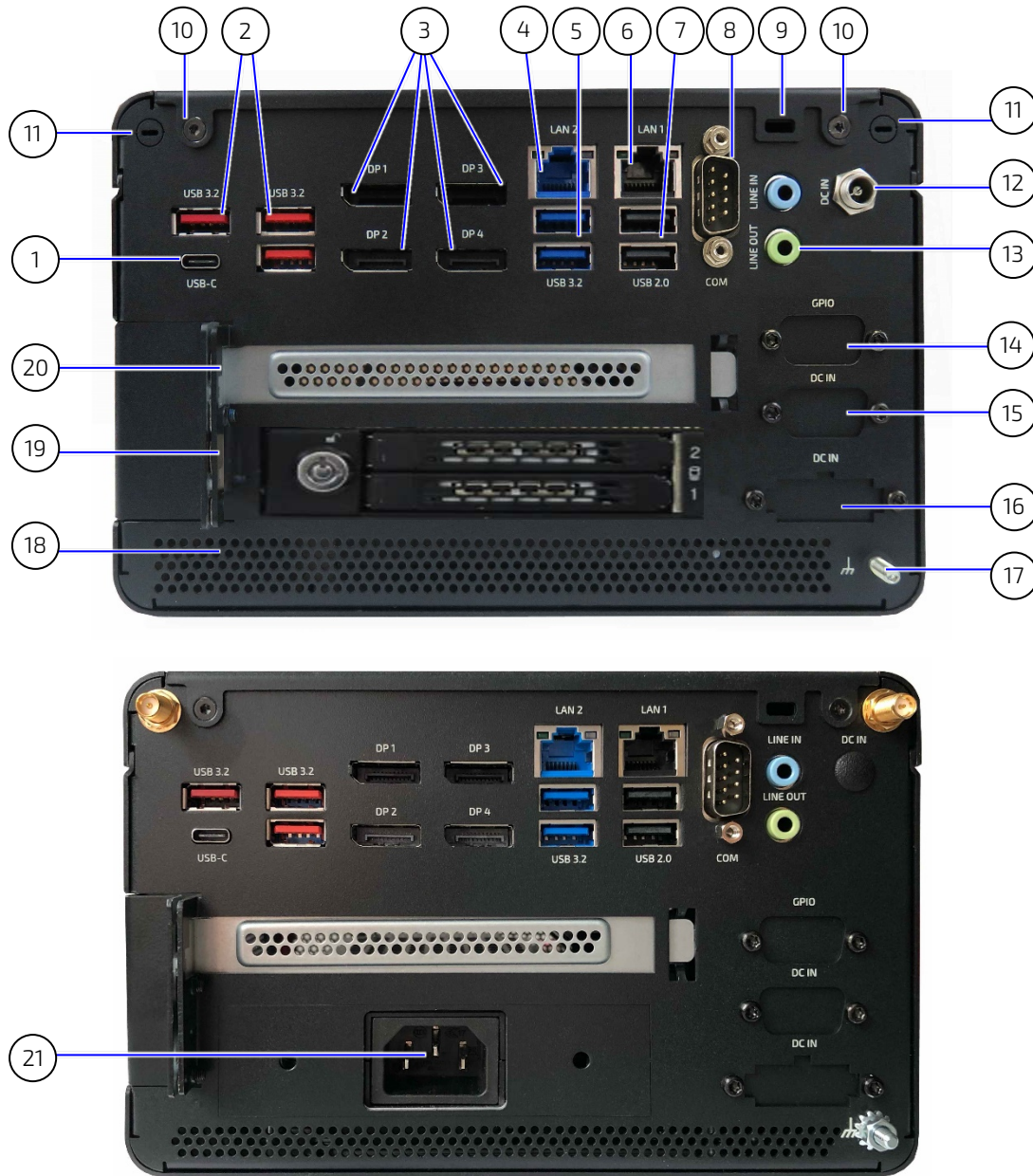
1	1x USB-C 3.2	8	1x Serial port	15	3-pin DC IN (24 VDC option) shown empty
2	3x USB 3.2 Gen 2	9	1x Kensington lock	16	Not used (Smart performance only)
3	4x DP	10	2x Cover fastening screws	17	Potential equalization stud
4	1x LAN 2.5 GbE	11	2x Antenna/Antenna breakouts	18	Ventilation openings (air-output)
5	2x USB 3.2 Gen 1	12	DC IN (12 VDC) (default)	19	Dual storage bay
6	1x LAN 1 GbE	13	1x Audio (In & Out)	20	PCIexpress slot 2
7	2x USB 2.0	14	Not available	21	AC-IN power connector (option)

4.2.1. USB 3.2 Gen 2/Gen1 Ports (USB 3.2)

The three USB 3.2 Gen 2 and two USB 3.2 Gen 1 port (Figure 4 and Figure 5, pos. 2 & 5) are backward compatible enabling the connection of USB 3.0 or USB 2.0 devices. Kontron recommends the use of USB 3.2 Gen 2/1 compliant devices and cables only. The use of devices and cables that violate the USB 3.2 Gen 2/1 specification may cause non-recognition of the device or read/write errors.

For the pin assignment, see Chapter 13.5: USB 3.2 Gen2/Gen1 Port Pin Assignment

4.2.2. USB-C 3.2 Gen 2 Port (USB-C)

The USB Type-C port (Figure 4 & Figure 5, pos. 1) supports USB 3.2 Gen 2. Power delivery not supported.

For the pin assignment, see Chapter 13.6: USB-C 3.2 Gen2 Pin Assignment.

4.2.3. USB 2.0 Ports (USB 2.0)

The two USB 2.0 ports (Figure 4 & Figure 5, pos. 7) enable the connection of USB 2.0 devices only.

For the pin assignment, see Chapter 13.7: USB 2.0 Port Pin Assignment.

4.2.4. Display Port (DP1, DP2, DP3, DP4)

The four DP V1.4 ports (Figure 4 & Figure 5, pos. 3)are Dual mode/ Display Port ++ compatible with a maximum resolution of 7680 x 4320 @ 60 Hz and enable the connection of up to four digital displays directly or with an adapter.

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

i	Display Port adapters: • DP to HDMI (passive/active) • DP to DVI (passive/active) • DP to VGA (active)

Depending on the required resolution, the product supports the following maximum number of simultaneous displays.

Display Resolution	Number of Simultaneous Displays (max.)
8k @ 60Hz HDR or 5k @ 120Hz HDR	1
8k @ 60Hz SDR or 5k @ 60Hz HDR	2
4k @ 60Hz HDR	4

The display output priority order is DP1 > DP2 > DP3 > DP4.

For the pin assignment, see Chapter 13.8: Display Port (DP) V1.4a Pin Assignment.

4.2.5. LAN Ports (LAN1, LAN2)

The LAN ports (Figure 4 & Figure 5, pos. 6, 4) support one 2.5 GbE port implemented using the Intel® i226LM Ethernet controller and one GbE port implemented using the Intel® i219LM Ethernet controller. The two RJ45 LAN connectors include speed and link activity status LEDs, and support Teaming and Time Sensitive Networking (TSN).

For the pin assignment, see Chapter 13.9: LAN 2.5 GbE/1GbE Connector Pin Assignment.

4.2.6. Audio (LINE-IN, LINE-OUT)

The two audio connectors (Figure 4 & Figure 5, pos. 13) audio Line-input (LINE-IN/MIC) and Headphone output (LINE-OUT) enable the connection of full High Definition (HD) devices.

	Line-Input Supports:
i	• Line: stereo max. 1.3 Vrms (Gain=0 dB) input voltage
	• Microphone:electr. microphones with 1,3Vrms (Gain=0dB) or 0,13Vrms (Gain=20dB) Headphone Output Supports
	• Stereo max. 1.2 Vrms output voltage at 32 Ohm load

For the pin assignment, see Chapter 13.11: Audio LINE-OUT and LINE-IN Connector Pin Assignment.

4.2.7. COM Port (COM)

The serial COM port (Figure 4 & Figure 5, pos. 8) enables the connection of a RS232 compatible serial device.

For the pin assignment, see Chapter 13.10: COM1 Port (RS232) Pin Assignment.

4.2.8. Wi-Fi Antenna Connector (option)

The Wi-Fi option supports up to two antenna connectors (Figure 4 & Figure 5, pos. 11) and features:

▶ Dual band frequencies (2.4 GHz, 5 GHz and 6 GHz)

▶ Wi-Fi 6E (IEEE802.11 ax) with a PCIe Interface

▶ Bluetooth (BT) 5.3 with a USB Interface

i	The Wi-Fi option populates the 2230 Key E socket. When installed the 2230 Key E socket is not available for other M.2 modules.

4.2.9. GPIO (option)

The GPIO port option is available on the Smart Performance variant only. For more information, contact your Kontron sales representative.

4.2.10. DC IN 12 VDC (150 W) (default)

The DC IN power connector (Figure 4 & Figure 5, pos. 12) connects to the supplied external AC/DC (100/240 VAC/ 12 VDC, 150 W) power supply.

For the power specification, see Chapter 12.4.1: AC/DC (150 W) Power Supply and for the pin assignment, see Chapter 13.1: DC IN 12 VDC, Power Connector Pin Assignment (default).

⚠CAUTION	Power the product with the supplied external AC/DC power supply only.

NOTICE	Due to different external connectors and/or internal components, the DC IN 12 VDC (default) DC IN 240 W (option) and, DC IN 24 VDC (option) are not interchangeable and each requires the individual power solution supplied by Kontron.

4.2.11. DC IN 12 VDC (240 W) (option-Smart Performance only)

For high performance requirements, (Smart Performance only) DC IN is a 10-pin DC IN connector (Figure 4 pos. 20) that connects directly to the supplied external AC/DC (100/240 VAC/12 VDC, 240 W) power supply.

For more information, see Chapter 12.4.2: AC/DC (240 W) Power Supply (option) and for the pin assignment, see Chapter 13.2: DC IN 10-Pin Power Connector Pin Assignment (option- Smart Performance only).

⚠CAUTION	Power the product with the delivered external AC/DC power supply only.

NOTICE	Due to different external connectors and internal components, the DC IN 12 VDC (default) DC IN 240 W (option) and, DC IN 24 VDC (option) are not interchangeable and each requires the individual power solution supplied by Kontron.

4.2.12. DC IN 24 VDC (option)

The optional 3-pin DC IN 24 VDC power connector (Figure 4 pos. 19 & Figure 5, pos. 15) connects to a user defined external 24 VDC power supply using the supplied mating power connector and wiring supplied by the user.

For the power specification, see Chapter 12.4.3: 24 VDC Connector (option) and for the pin assignment, see Chapter 13.3: DC IN 24 VDC Pin Assignment (option).

⚠CAUTION	Only connect to an external 24 VDC power supply that meets the product's electrical specification displayed on the product type label, and the power consumption, power limitation and power protection requirements specified in this user guide. The 24 VDC power supply must automatically recover from AC power loss and startup under peak loading.

NOTICE	Due to different external connectors and/or internal components, the DC IN 12 VDC (default) DC IN 240 W (option) and, DC IN 24 VDC (option) are not interchangeable and each requires the individual power solution supplied by Kontron.

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

The optional 3-pin AC-IN connector (Figure 4 pos. 21) connects directly to the main power supply for your region using the supplied power cable. The AC-IN connector is available with the Smart Storage only.

For more information, see Chapter 12.4: Power Specification and for the pin assignment, see 13.4: AC IN Power Connector Pin Assignment (option- Smart Storage only).

⚠CAUTION	Power the product with the delivered AC power cable suitable for your region only.

4.2.14. 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. The potential equalization stud ensures that all connected systems share a common potential.

4.3. Left and Right Side

The sides feature ventilation openings for air-output. The ventilation openings on the right side are contained within a removable expansion door that enables access to the PCIe slot for easy installation of PCIe expansion cards. For more information regarding supported PCIe expansion cards, see Chapter 5.4: PCIe Slot.

Two pairs of threaded screw holes (Figure 6, pos. 3) lower and (Figure 6, pos. 4) upper are available to attach wall mount brackets, see Chapter 8.3: Mounting Brackets (option).

Figure 6: Left Side and Right Side
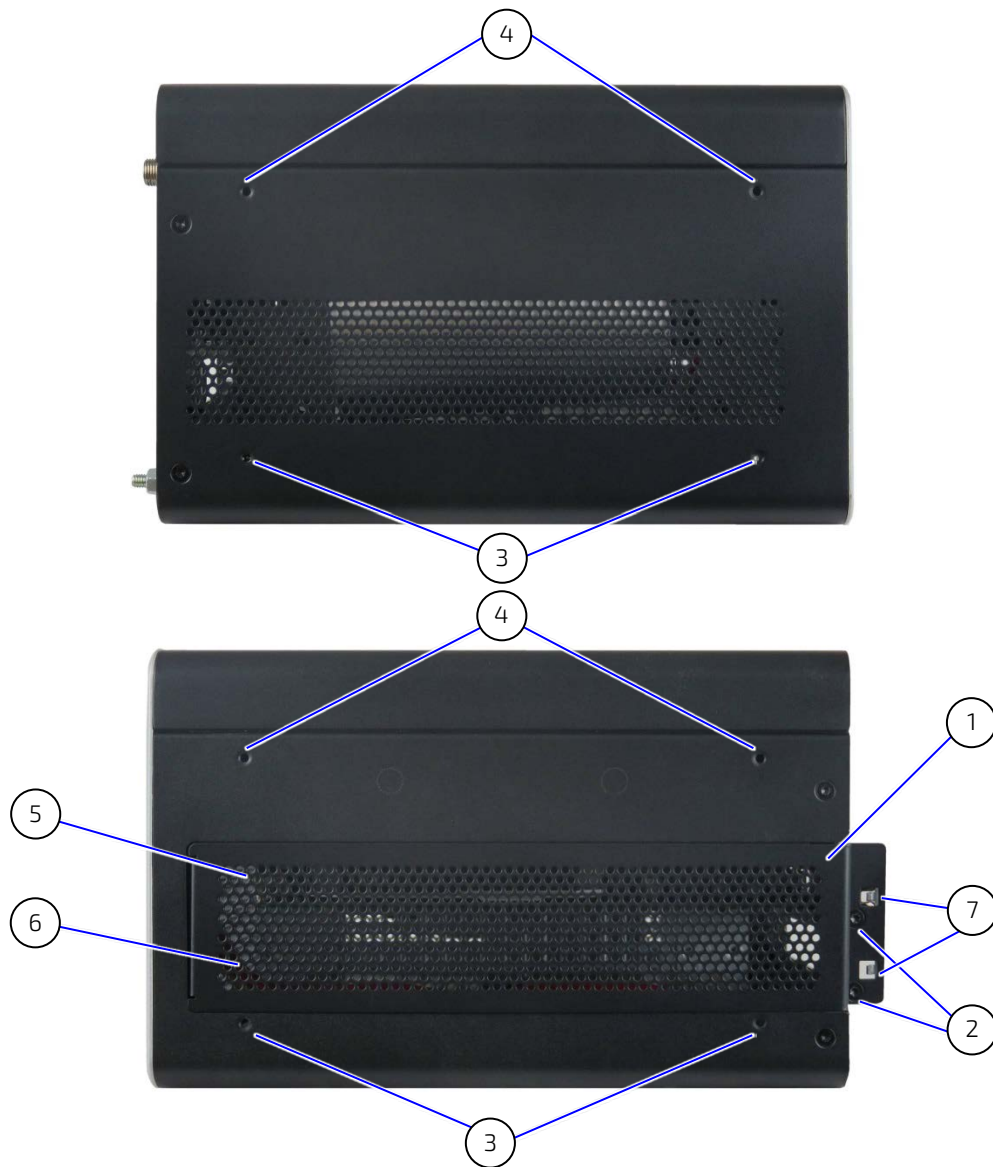
1	Expansion door (removable) with ventilation openings for air-output	4	Upper pair of threaded screw holes for wall mount brackets
2	Expansion door screws	5	PCIe slot 2
3	Lower pair of threaded screw holes for wall mount brackets	6	PCIe slot 1
		7	Front pins of PCIe cards

4.4. Top Cover and Bottom Side

The top cover features ventilation openings, a metal mesh and a metal plate with a circular opening. The circular opening's position above the internal fan aids ventilation and the metal mesh prevents unwanted items from entering the product.

Figure 7: Top Cover

1	Ventilation openings with metal mesh (air-intake)	2	Circular opening above internal fan

The bottom side features a 2.5" SSD drive bay accessed using a single screw. For more information regarding available drives, see Chapter 5.2: Drive Bay. The supplied four self-adhesive rubber chassis feet may be attached to the bottom side for use in desktop applications.

Figure 8: Bottom Side
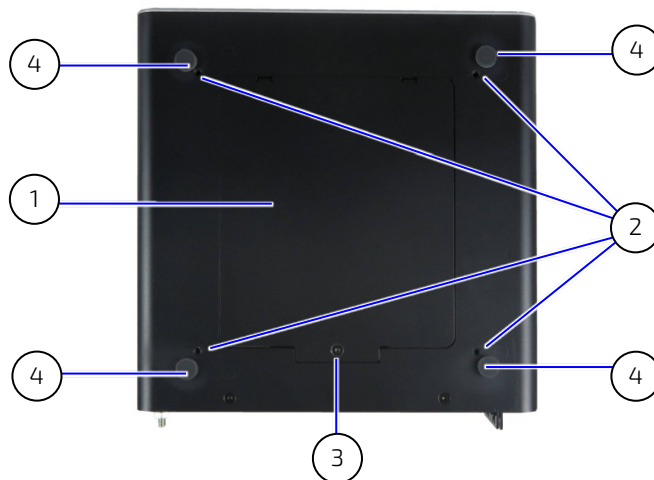
1	1x 2.5" SSD drive bay cover	3	1x Drive bay cover screw
2	4 x Threaded screw holes (extra mounting option)	4	4x Rubber chassis feet

> **i** When mounting the product using the four threaded screw holes remove any attached rubber chassis feet, to enable the product to rest flush against the mounting surface

5/ System Expansion

5.1. Before Expanding

Before expanding the KBox B-202-RPL, users must consider the product's maximum allowed power consumption and take cooling into consideration.

5.2. Overview

Table 3: Overview

Smart Performance			
Location		**Expansion Device**	**Comment**
Internal	M.2 socket	1x 2242 Key M module	Used for the M.2 SSD storage option
	M.2 socket	1x 2230 Key E Module	Used for the Wi-Fi / Bluetooth option
External	Drive bay	1x 2.5" SSD or 1x 2.5" SSD dual M.2 RAID	Removable 2.5" SSD
	PCIe slot 2	1x PCIe x 16 card	Prerequisite: PCIe slot 1 must remain empty
		1x PCIe x8	Prerequisite: PCIe slot 1 uses PCIe x8 only
	PCIe slot 1	1x PCIe x 16 card	Prerequisite: PCIe slot 2 must remain empty
		1x PCIe x8 card	Prerequisite: PCIe slot 2 uses PCIe x8 only
Smart Storage			
Location		**Expansion Device**	**Comment**
Internal	M.2 socket	1x 2242 Key M module	Used for the M.2 SSD storage option
	M.2 socket	1x 2230 Key E Module	Used for the Wi-Fi / Bluetooth option
	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	Removable 2.5" SSD Prerequisite: Storage bay and drive bay share the available two SATA connectors.
	Storage bay	2x 2.5" SSD	With/without integrated RAID controller Prerequisite: Storage bay and drive bay share the available two SATA connectors.
	PCIe slot 2	1x PCIe x 16 card	Prerequisite: PCIe slot 1 must remain empty

5.3. Drive Bay

The Smart Performance and Smart Storage both include an external drive bay. The external drive bay supports one removable 2.5" SSD drive or 2.5" SSD dual M.2 RAID (RAID 0/1) module.

Table 4: Drive Bay Options

Location	Type	Interface	Removable	RAID	Expansion Device
External Drive bay	Storage	SATA III 6Gb/s	✓		2.5" SSD (up to 4 TByte)
	Storage	SATA III 6Gb/s	✓	✓	2.5" SSD dual M.2 RAID (RAID 0/1) with two M.2 2280 SSD modules (2x up to 1 TB)

Figure 9: Drive Bay Options
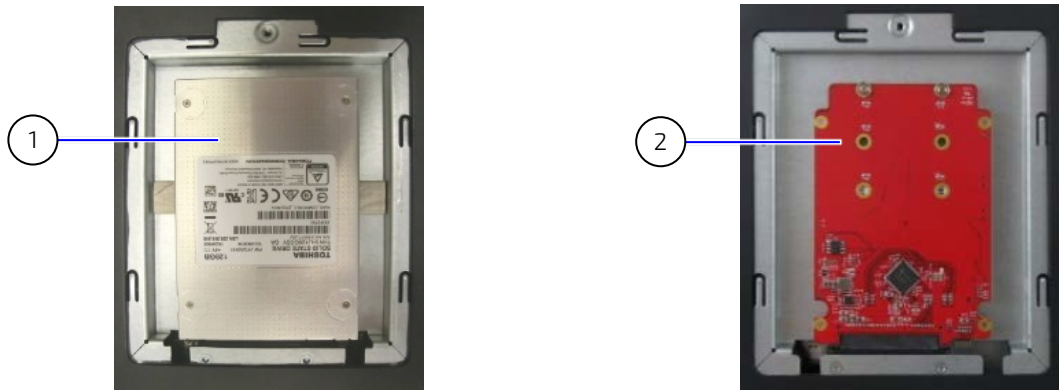
1	2.5" SSD drive

2	2.5" SSD dual M.2 module with two M.2 2280 SSD modules on the underside

5.4. Internal Expansion

The Smart Performance and Smart Storage both include two internal M.2 sockets. The two internal M.2 sockets support system expansion.

Table 5: Internal Expansion Options

Socket	Type	Interface	Expansion Device
M.2 2242 Key M	Storage	PCIe x4 /NVME	SSD (up to 1 TByte)
M.2 2230 Key E	Wi-Fi/BT	PCIEx1 /USB2.0	Dual band frequencies (2.4 GHz, 5 GHz and 6 GHz) Wi-Fi 6E (IEEE802.11 ax) / BT 5.3

> **i** No support for SATA based M.2 modules on the motherboard.

5.5. PCIe Slots

The Smart Performance supports two single or one dual slot PCIe expansion card(s). The Smart Storage supports one single slot PCIe expansion card.

Figure 10: PCIe Expansion Slots

Smart Performance   Smart Storage

	1	PCIe Slot 1		3	Storage Bay
	2	PCIe Slot 2			
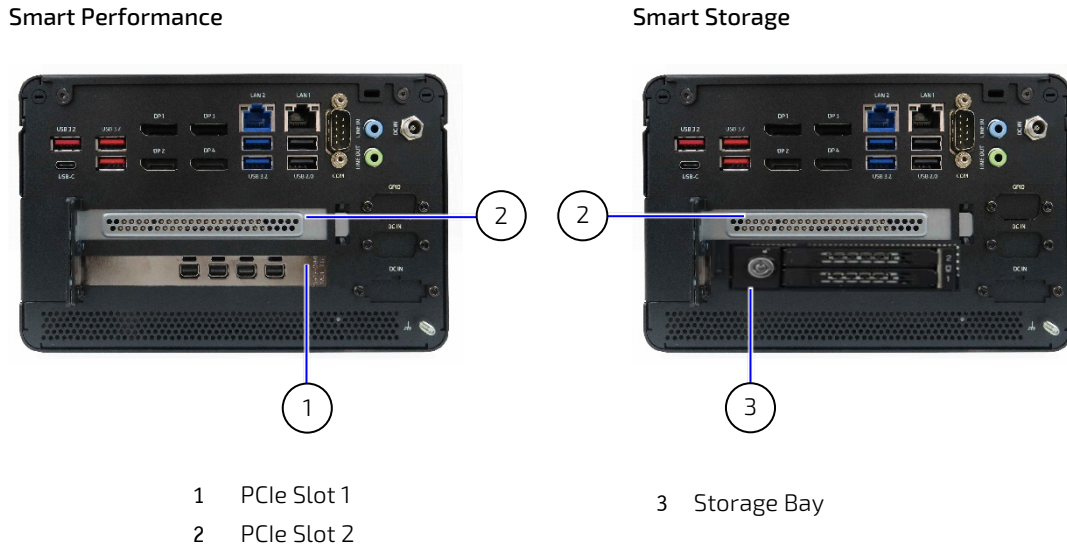
Table 6: PCIe Expansion Card Slot Options

KBox B-202-RPL	Expansion Card Option	Location
Smart Performance	1x PCIe x 16 or 2x PCIe x8	Slot 1 (default) for a single PCIe card
Smart Storage	1x PCIex8	Slot 2 (default). Slot 1 is not available,

> Before expanding the product with additional PCIe cards, observe that the specified maximum power consumption supported by the PSU is not exceeded.

5.6. Storage Bay (Smart Storage only)

The Smart Storage supports a bay on the rear panel as shown in Figure 11. The drive bay supports for up to two removable 2.5" SSDs with/without RAID (0/1/ JBOD) on the rear panel, two internal factory installed 2.5" SSDs with RAID or one internal factory installed 3.5" HDD.

> All internal drives are factory installed.

Figure 11: Storage Bay with Dual Removable 2.5" SSDs

Table 7: Storage Bay Options

Drive Access	Storage Bay Drive	Description
External	2x 2.5" SSD	Factory installed drives with lock SATA III 6 Gb/s interface Single channel, Hot swap tray mount. With/without integrated RAID controller (0/1/JBOD)
Internal	2x 2.5" SSD	Factory installed internal drives SATA III 6 Gb/s. RAID option available for 2 x 2.5" SSD
	1x 3.5" HDD	Factory installed internal drive SATA III 6 Gb/s.

5.7. Reference Expansion Devices

Before expanding the KBox B-202-RPL Smart Performance and Smart Storage, users must consider the product's maximum allowed power consumption, and take cooling into consideration. Kontron configures the product with all ordered allowed PCIe expansion card(s) combinations, and including (if required) additional hardware such as system fans and all appropriate drivers. Kontron is not responsible for problems occurring after the installation of PCIe expansion cards that have not been factory installation and configured by Kontron.

The Smart Performance and Smart Storage variants both support PCIe expansion card(s). The Smart Performance supports two single PCIe expansion cards or one dual slot PCIe expansion card and the Smart Storage support one single slot PCIe expansion card.

For more information on the reference PCIe cards available for the Smart Performance or Smart Storage, see Table 8: Reference PCIe Expansion Cards. The list of reference PCIe expansion cards includes important prerequisite requirements that must be considered when installing a PCIe expansion cards within the Smart Performance or Smart Storage.

Others PCIe expansion card options are available on request. For more information, contact Kontron Support

> **i** When installing PCIe cards users must adhere to the manufactures requirements and any prerequisite requirements stated in Table 8: Reference PCIe Expansion Cards.

> **i** Kontron is not responsible for problems occurring after the installation of PCIe expansion card(s) that have not been factory installed and configured by Kontron.

Table 8: Reference PCIe Expansion Cards

Reference Card	Description
Dual LAN 1 GbE Single Slot	Device: LREC9712HT Speed: 10/100/1000 Mbps Bus type: PCIe* V2.1 (5 GT/S) Bus width: 4-lane PCIe (operable in x4, x8 and x16 slots) Ethernet controller: Intel® I350 Connector: 2x RJ45 Power consumption: 6 W
Dual LAN 10 GbE Single Slot	Device: LREC9812BT Speed: 10GbE/1GbE /100MbE Bus type: PCIe V3.0 (8.0 GT/S) (2.0 and 1.1 compatible) Bus width: 4-lane PCIe (operable in x8 and x16 slots) Ethernet controller: X550AT Connector: 2x RJ45 Power consumption: 13 W **Prerequisite:** **Installation is permitted only with a factory installed internal fan assembly.**
Quad LAN 1 GbE Single Slot	Device: LREC9714HT Speed: 10/100/1000 Mbps Bus type: PCIe V2.1 (5 GT/S) Bus width: x4-lane PCIe (operable in x8 and x16 slots) Ethernet controller: Intel® I350 Connector: 4x RJ45 Power consumption: 5.04 W
Graphics Card 4x mini DP Single Slot	Device: Nvidia T1000 Single slot Power consumption: 50 W Max. Max. simultaneous displays: ▶ 4x 3840x2160@120Hz ▶ 4x 5120x2880@60Hz ▶ 2x 7680x4320@60Hz
Graphics Card 3x DP, 1x HDMI Dual Slot	Device: GEforce RTX 3050 Power Consumption: 130 W max. Resolution: 7680x4320@60H Intergrated Fan **Prerequisite:** **Installation is only possible in the Smart Performance, due to dual slot requirement.**

⚠ **CAUTION** System Fan Assembly

Installation of the reference dual LAN 10 GbE Single Slot PCIe expansion card is permitted only with a factory installed internal fan assembly.

6/ Thermal Management

6.1. Active Cooling

The KBox B-202-RPL is actively fan cooled. An internal processor fan draws in air through the top cover's ventilation openings and distributes the incoming air over critical internal components before the air exits the through the ventilation openings on the right, left, front and rear sides.

> **⚠ 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 12: Ventilation Openings (intake)
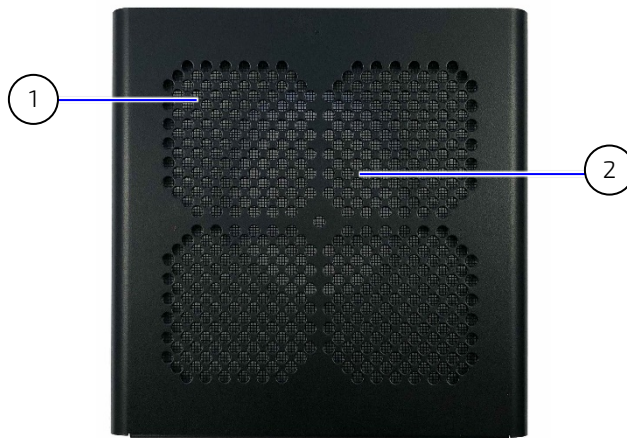
1	Ventilation openings with metal mesh (air-intake)	2	Circular internal fan opening

Figure 13: Ventilation Openings (output)
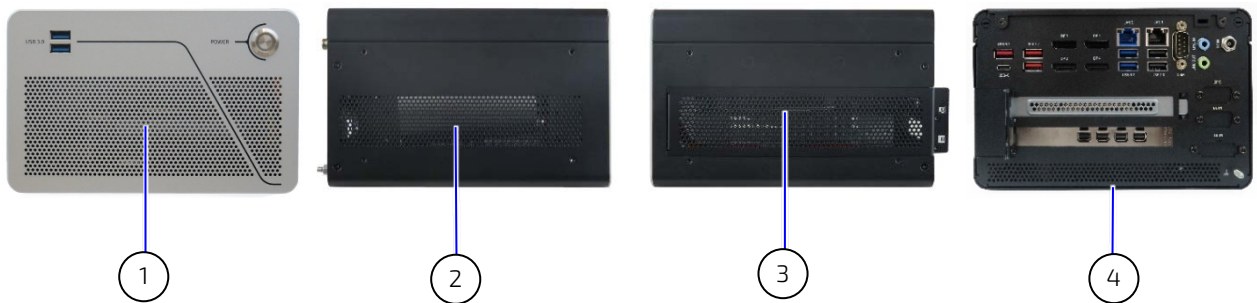
1	Front panel air-output	3	Right side air-output
2	Left side air-output	4	Rear panel air-output

6.2. Mount Orientation

The permitted mounting orientations are horizontal with the top side facing upward and vertical in all mount orientations.

Mounting the product with the top cover facing downwards is not permitted. If the top cover faces downwards, not enough air enters the product to cool the processor adequately. This may cause overheating or melting, and hence is a possible fire hazard due to hot substances exiting through the top cover's ventilation opening.

⚠WARNING	Danger of Fire
	Mounting the product with the top cover facing downward in not permitted and may cause overheating or melting, and hence may cause 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 (only top cover facing upwards)
	• Vertically (all mount orientations)

6.3. Minimum Clearance (Keep out Area)

To provide maximum airflow through and around the product a minimum distance to the surrounding environment must be observed know as keep out area in this user guide. Before installing product, ensure that the keep out areas have been taken into consideration.

Consider additional clearance requirements such as access to the installed PCIe cards on the right side of the chassis (clearance 110 mm) and clearance requirements due to installed Wi-Fi antennas on the rear panel, where the Wi-Fi hinge clearance is approximately depth 45 mm and height 130 mm.

⚠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)

6.4. Third Party Components

When configured with third party components such as PCIe expansion cards, M.2 modules and hard drives (SSD), an approximate internal temperature rise is given and should be taken into consideration.

7/ Assembly

7.1. Before Assembling

Before opening the KBox B-202-RPL to access internal components, observe the safety instructions within this chapter and the safety instructions in Chapter 2/General Safety Instructions. For third party products, consult the documentation provided by the components manufacturer. Kontron recommends expanding the product, before installation.

⚠ WARNING	Before opening the product, make sure that the product is disconnected from the mains by disconnecting the power cable from the DC IN/AC IN socket or the mains.

⚠ 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 safety instructions for components that are sensitive to Electrostatic Discharge (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.

7.2. Opening the Product

⚠ WARNING	Before opening the product, make sure that the product is disconnected from the mains by disconnecting the power cable from the DC IN/AC IN socket or the mains.

To open the product to gain access to internal components, perform the following:

1. Close all applications. Switch off the product properly using the power button and disconnect the power cable from the power source. Disconnect all peripherals.

2. Place the product on a flat, clean and ESD-safe surface.

3. Unlock and remove the Kensington lock if installed. Remove the two top cover screws on the rear panel and retain the screws for later use.

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 pull the top cover gently away from the front panel to release the top cover from the front-panel-holding-brackets.

6. Lift the top cover vertically to avoid damaging the internal fan assembly. Do not slide the top cover off the chassis.

NOTICE

Do not slide the top cover off or onto the chassis!

To avoid contact and/or possible damage between the top cover and the internal fan, do not slide the top cover along the chassis. Moving the top cover vertically upwards or downwards on to or off the chassis.

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

NOTICE

Do not slide the top cover off or onto the chassis!

To avoid contact and/or possible damage between the top cover and the internal fan, do not slide the top cover along the chassis. Moving the top cover vertically upwards or downwards on to or off the chassis.

7.2.1. Installing and Removing an M.2 Module

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

1. Open the top cover, as described in Chapter 7.2: Opening the Product, steps 1 to 6.

2. Locate the M.2 socket and the corresponding nut on the motherboard. The M.2 2230 key E socket is used for M.2 Wi-Fi modules and the M.2 2242 Key M socket is used for M.2 SSD modules.
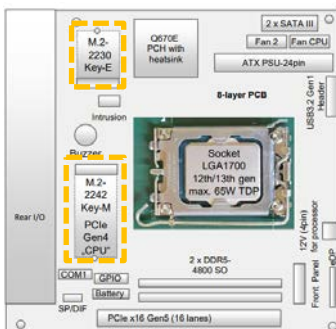
3. Insert the M.2 module into the M.2 socket gently and at an angle, until the fixing hole on the M.2 module aligns with the corresponding motherboard's nut.

4. Secure the M.2 module by pressing down on the free end, and carefully fixing with a screw to the corresponding nut on the motherboard, until flat with the motherboard.

> **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, as described in Chapter 7.2: Opening the Product, step 7.

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

1. Open the top cover, as described in Chapter 7.2: Opening the Product, step 1 to 6.

2. Locate the M.2 module and the corresponding nut on the motherboard. The M.2 2230 key E socket is used for M.2 Wi-Fi modules and the M.2 2242 Key M socket is used for M.2 SSD modules.
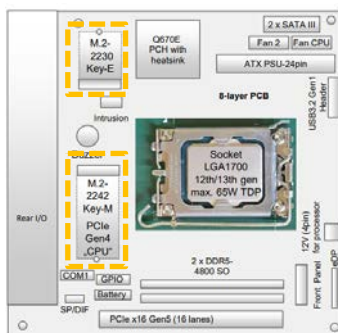
3. Loosen and remove the fixing screw securing the M.2 module to the motherboard. The M.2 module springs up at the free end.

4. Gently pull the M.2 module out of the M.2 socket.

5. Close the top cover, as described in Chapter 7.2: Opening the Product, step 7.

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

7.3. Opening the Drive Bay

Before opening the drive bay cover, observe the safety instructions within this chapter.

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

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 cable from the power source. 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.

4. Lift up the drive bay cover a few centimeters to release the internal device from the holding-plate on the drive bay cover's rear side.

5. Slide the drive bay cover forward, to release the two 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 device.

7.3.1. Installing and Removing 2.5" SSD Drive

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

Figure 14: External Drive Bay with 2.5" SSD Drive

1	2.5" SSD Drive
2	SATA Connector

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

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

2. Open the drive bay cover, as described in Chapter 7.3: Opening the Drive Bay, steps 1 to 6.

3. Position the SSD in the drive bay with the SSD's connector facing the SATA connector in the drive bay.

4. Align the SSD's connector with the SATA connector in the drive bay.

5. Press down and gently push the SSD into the SATA connector.

6. Close and secure the drive bay cover, as described in Chapter 7.3: Opening the Drive Bay, step 7.

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

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

2. Open the drive bay cover, as described in Chapter7.3: Opening the Drive Bay, steps 1 to 6.

3. Pull out the 2.5" SSD from the SATA connector gently.

4. Place the 2.5" SSD on an ESD-safe surface.

5. Close the drive bay cover, as described in Chapter 7.3: Opening the Drive Bay, step 7.

7.3.2. Installing and Removing 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. To avoid loss of data, observe the information and warnings within this section

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	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.

i	RAID 1 is the default setting.

Figure 15: 2.5" SSD Dual RAID M.2 Module
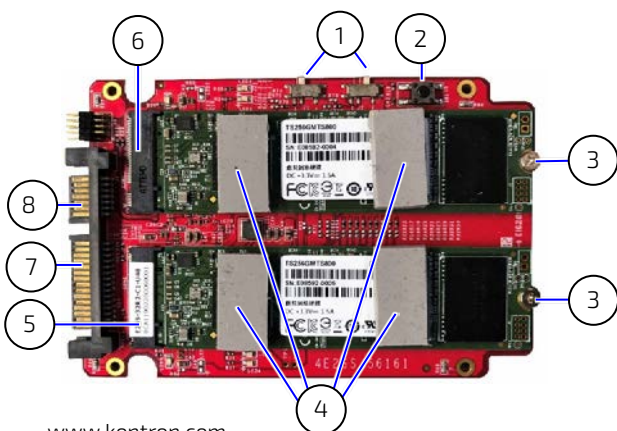
1. Jumper switches
2. Rest switch (do not press!)
3. 2x Screws M.2 SSD module
4. 4x Foam buffer
5. M.2 Socket 2
6. M.2 Socket 1
7. SATA power connector
8. SATA data connector

Figure 16: Drive Bay with 2.5" SSD dual M.2 RAID Module
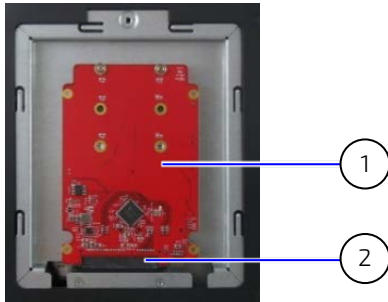
1. 2.5" SSD dual M.2 RAID module with two M.2 SSD modules (installed bottom side up)

2. SATA connector

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

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

2. Open the drive bay cover as described in Chapter 7.3: Opening the Drive Bay, steps 1 to 6.

3. Place the 2.5" SSD dual M.2 RAID module on an ESD-safe surface.

4. Assemble the 2.5" SSD Dual M.2 RAID module with memory by inserting the two M.2 SSD modules at a slight angle gently into the two M.2 sockets (Figure 15, pos. 5 and 6). Press down on the M.2 SSD module's free end to align the screw hole with the 2.5" SSD dual RAID module's nut and secure each M.2 SSD module with a screw (Figure 15, pos. 3).

5. Place self-adhesive form buffers on each of the M.2 SSD modules (Figure 15, pos. 4).

6. 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 16) and proceed with step 8.

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.

7. If the 2.5" SSD dual M.2 RAID module's RAID array is not configured or the configuration must be changed, see Chapter 11.1: Drive Bay RAID, to set the RAID array and then proceed with step 7.

8. Close and secure the drive bay cover as described in Chapter 7.3: Opening the Drive Bay, step 8.

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

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

2. Open the drive bay cover as described in Chapter 7.3: Opening the Drive Bay, steps 1 to 6.

3. 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.

4. Place the 2.5" SSD dual M.2 RAID Module on an ESD-safe surface.

5. Close and secure the drive bay cover as described in Chapter 7.3: Opening the Drive Bay, step 7.

7.3.2.1. Installing and Removing M.2 SSDs

Before installing a new M.2 SSD in the M.2 dual RAID module, observe the SSD drive manufacturer's instructions. 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. Close all applications. Shut down the product properly using the power button and disconnect the power cable from the power source. Disconnect all peripherals.

2. Open the drive bay cover as described in Chapter 7.3: Opening the Drive Bay, steps 1 to 6.

3. Remove the 2.5" SSD dual M.2 RAID module by holding the 2.5" SSD dual M.2 RAID module on the sides and gently pulling the 2.5" SSD dual M.2 RAID module away from the SATA connectors.

4. Place the 2.5" SSD dual M.2 RAID module on an ESD safe surface.

5. Locate the faulty M.2 SSD(s) by using the serial number in the iRAID notification email, see Chapter 11.1.2.1: iRAID Utility Settings.

6. 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.

7. 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.

i	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.

8. Place a self-adhesive foam buffers on the new M.2 SSD(s).

9. 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 16).

10. Close and secure the drive bay cover, see Chapter 7.3: Opening the Drive Bay, step 7.

11. Switching on the product automatically configures the new M.2 SSD with the previous RAID Array.

7.4. Opening the Expansion Door

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. Retain the screw for later use.

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.

5. Close the expansion door, by proceeding in the reverse order (steps 4 to 3).

7.4.1. Installing and Removing PCIe Expansion Cards

Figure 17: Removing Expansion Door

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

To install a PCIe expansion card, perform the following:

1. Open the expansion door as described in Chapter 7.4: Opening the Expansion Door, and retain the two 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. The default first PCIe slot is slot 1.
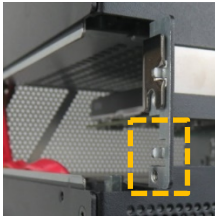
3. Sliding the slot bracket's front end out of the holding latch.
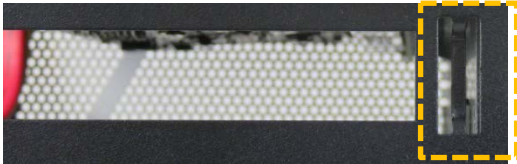
4. To install an expansion card, aline the expansion card with the corresponding internal PCIe slot. Push the expansion card carefully into the PCIe slots connector, while ensuring the expansion card's bracket inserts into the holding latch. Position the other end of the expansion card's bracket on the corresponding front pin.

5. Secure the expansion door by positioning the holding plate in the inside of the chassis.
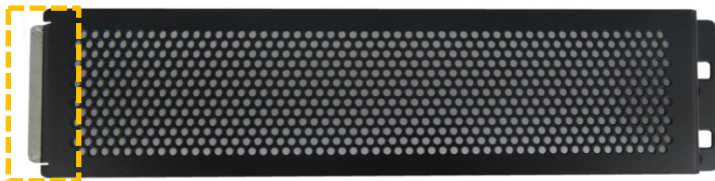
6. Push the door until the two screw holes align with the screw holes on the chassis.
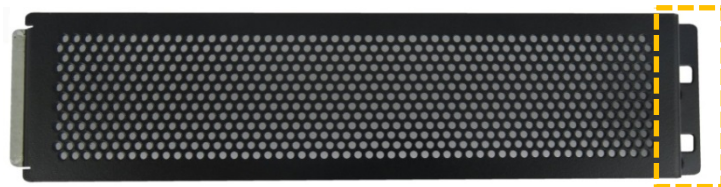
7. Close and secure the door with the screws retained in step 1 , as described in Chapter 7.4: Opening the Expansion Door.

To remove a PCIe expansion card, perform the following:

1. Open the expansion door as described in Chapter 7.4: Opening 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 (see previous step 2) and sliding the expansion card's front end out of the holding latch (see previous step 3). 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 (see previous step 5) in the inside of the chassis. Push the door until the two screw holes (see previous step 6) align with the screw holes on the chassis.

6. Close and secure the door, with the screws retained in step 1 as described in Chapter 7.4: Opening the Expansion Door.

7.5. Opening the Storage Bay

The storage bay is available on the Smart Storage only. The storage bay provides up to two removable 2.5" SSDs or alternatively, up to two non-removable internal 2.5" SSD or a single 3.5" HDD may be factory installed.

7.5.1. Installing and Removing Storage Bay Drives

Figure 18: Storage Bay with Dual Removable 2.5" SSD Drives

1	Lock	2	Removable tray
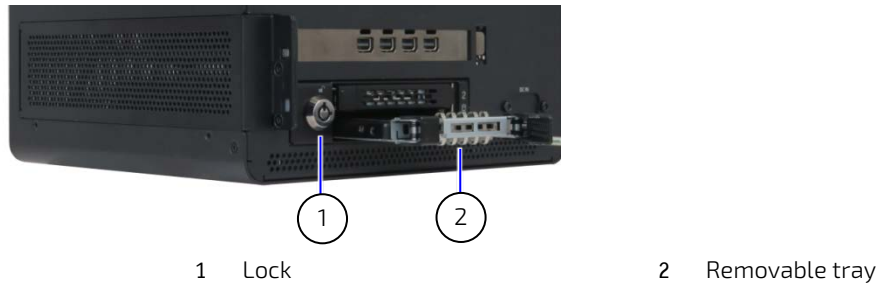
Figure 19: Storage Bay Tray

1	2.5" SSD	3	Tray
2	Tray arm	4	Fixing screws (min. two)
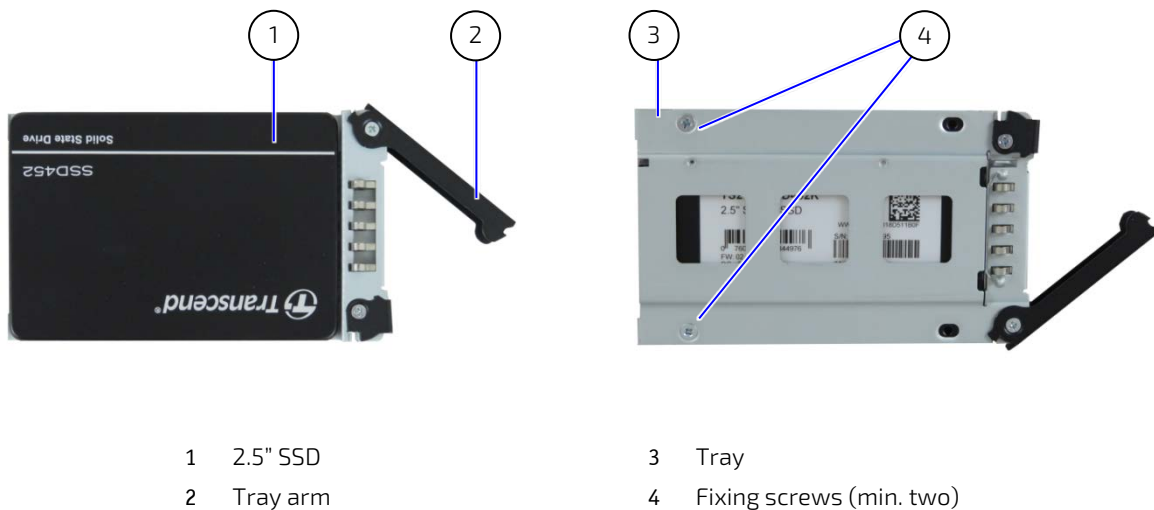
To install a 2.5" Removable SSD, perform the following:

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.

4. Position and fasten the 2.5" SDD to the tray using a minimum of two screws.

5. Push the tray with installed 2.5" SSD into the empty storage bay and press the arm to close.

6. Remove a 2.5" SSD, by proceeding in the reverse order.

7.6. Connecting the Wi-Fi Antenna (option)

To use the Wi-Fi features, install 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 supplied Wi-Fi antenna on to the Wi-Fi antenna connector (Figure 4 and Figure 5, pos. 11).

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

> **i**   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/ Installation

8.1. Before Installing

Before installing the KBox B-202-RPL in the operating environment, ensure that the operating environment meets the specification stated within this user guide, and that there is sufficient access to the product's power connector, the front and rear panel I/O connectors and the installed PCIe cards.

Install and operate the product only horizontally (top side facing upward) or vertically (all directions). It is not permitted, to operate the product with the top side facing downwards. Leave sufficient clearance (keep out area) to prevent the product from overheating by using the specified clearance (keep out areas), see Chapter 6.3: Minimum Clearance (Keep out Area).

Kontron recommends expanding the product with expansion cards and storage, before installing the product in the end environment.

⚠WARNING	Danger of Fire
	Mounting the product with the top cover facing downward in not permitted and may cause overheating or melting, and hence may cause a fire hazard or personal injury.
	To avoid risk of fire and personal injury, observe the following:
	• DO NOT mount horizontally with the top cover facing downward
	• Only use the allowed mount orientations:
	• Horizontally (only top cover facing upwards)
	• Vertically (all mount orientations)

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

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

⚠CAUTION	Obstructing the ventilation openings may cause overheating. To avoid overheating:
	• Do not to place items directly in front of the top cover ventilation openings
	• Observed that all ventilation openings are not covered or obstructed by objects

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

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

⚠CAUTION	Ensure 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.

i | Ensure there is clearance for users to:
- Connect cables on the rear I/O panel
- Access the power-on button on the front panel
- Install Wi-Fi antenna on the rear panel (clearance 45 mm and 130 mm from Wi-Fi hinge)

8.2. Chassis Feet

To use in environments that do not require mounting such as on a desktop, install the four self-adhesive rubber chassis feet on the product's bottom side.

Figure 20: Chassis Feet

| 1 | 4x Rubber Chassis feet | | 2 | Bottom side |

To install the supplied four self-adhesive rubber chassis feet, perform the following:

1. Ensure the bottom surface is clean and free from dust and dirt.

2. Remove the paper cover from the back of each of the self-adhesive chassis feet and carefully press onto the bottom side (Figure 20, pos. 1).

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

8.3. Mounting Brackets (option)

To mount on a surface vertically, horizontally, underneath or topside use the mounting brackets.

Figure 21: Mounting Bracket

1	Mounting holes (10 mm clearance)	3	Key holes for mount surface
2	Mounting holes (no clearance)		

Each mounting bracket contains two sets of mounting holes. The set of mounting holes used depends on whether a clearance 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 21, 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 21, pos. 2.

⚠CAUTION Obstructing the ventilation openings may cause overheating. To avoid overheating:
- Do not to place items directly in front of the top cover ventilation openings
- Observed that all ventilation openings are not covered or obstructed by objects

⚠CAUTION Leave sufficient clearance (keep out area) to prevent the device from 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 attach the mounting brackets and mount the product, perform the following:

1. Consider which set of mounting brackets holes is required for the mounting option:
   ▶ Top cover facing mounting surface, use the mounting holes in Figure 21, pos. 1, with 10 mm clearance.
   ▶ Bottom side facing mounting surface, use the mounting holes in Figure 21, pos. 2, with no clearance.

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 24 and Figure 26
   ▶ Upper set enables mounting options Figure 25 and Figure 27

3. Fasten each mounting bracket using the two M3x6 screws supplied in the Wall Mount Set and a torx (08x60) screwdriver to the corresponding set of mounting holes (step 2) on the right and left side of the chassis.

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

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

Keep Out Areas
(top cover, right & left sides)

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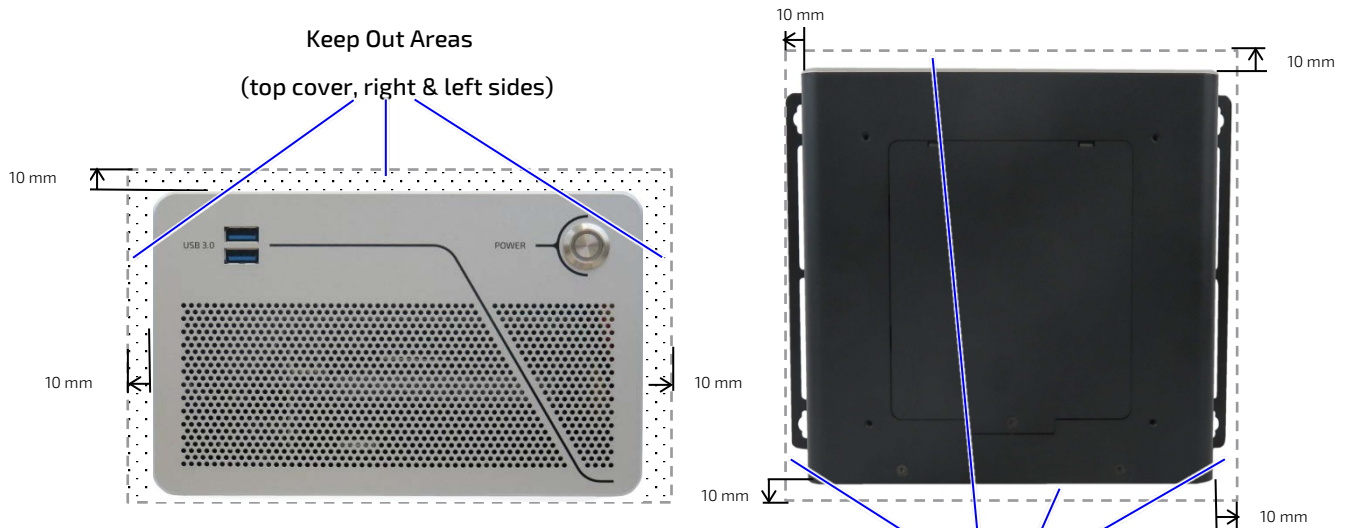
Figure 23: Keep Out Areas – with Bottom Side facing the Mount Surface
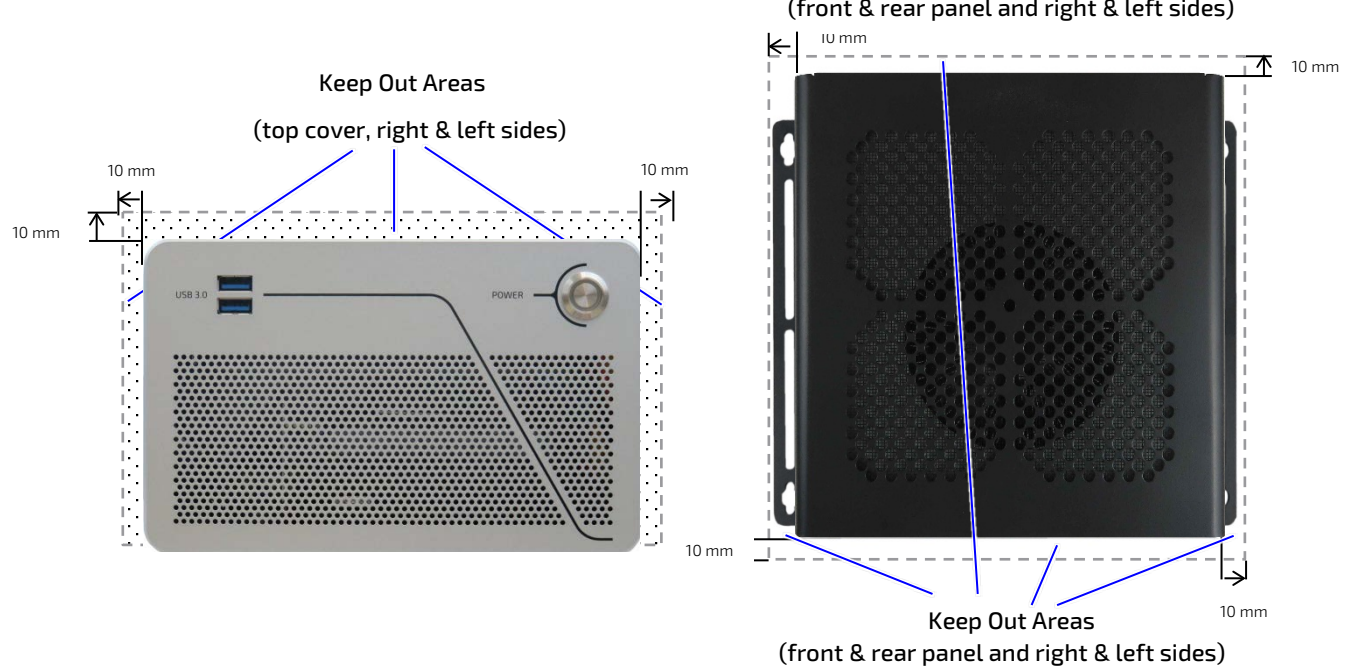
Keep Out Areas
(top cover, right & left sides)

Keep Out Areas
(front & rear panel and right & left sides)

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

8.3.1. Mounting Brackets Desktop

To mount the product 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 6, Pos. 3) and the mounting holes on the bracket (Figure 21, pos. 2).

To mount the product 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 6, Pos. 4) and the mounting holes on the bracket (Figure 21, Pos. 1) with 10 mm clearance, to ensure air-intake is not restricted.

Figure 24: Mounting Brackets on a Desktop/Mount Surface

Figure 25: Mounting Bracket- Underneath a Desktop/Mount Surface
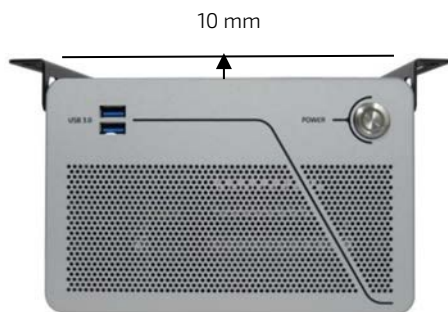
⚠WARNING	Danger of Fire
	Mounting the product with the top cover facing downward in not permitted and may cause overheating or melting, and hence may cause a fire hazard or personal injury.
	To avoid risk of fire and personal injury, observe the following:
	• DO NOT mount horizontally with the top cover facing downward
	• Only use the allowed mount orientations:
	• Horizontally (only top cover facing upwards)
	• Vertically (all mount orientations)

⚠CAUTION	When mounting the product with the top cover facing the mount surface (desktop or wall), always provide a clearance 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.

8.3.2. Mounting on a Wall

To mount the product 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 6, pos. 3) and use the mounting bracket holes (Figure 21, pos. 2).

Figure 26: Mounting Brackets Wall Mount Options with Top Cover facing Outwards

| Front panel (above) | Front panel (below) | Front panel (right) | Front panel (left) |
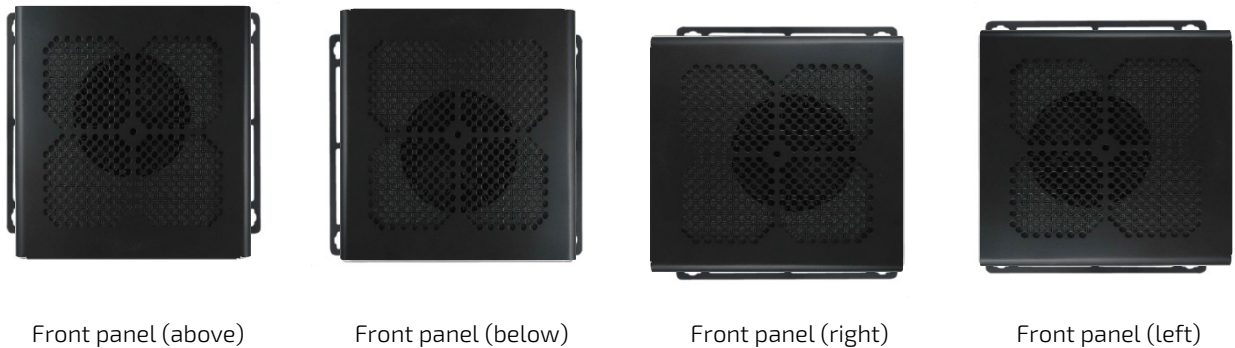
To mount the product on a wall with use the Wall Mount Set, see Table 2: Accessories. With the top cover facing the mount surface, use the upper pair of mounting holes on the left and right sides of the chassis (Figure 6, pos. 4). To provide the required 10 mm keep out area to ensure air-intake is not restricted, use the upper mounting holes on the brackets (Figure 21, pos. 1).

Figure 27: Mounting Brackets Wall Mount Options with Top Cover facing the Mounting Surface
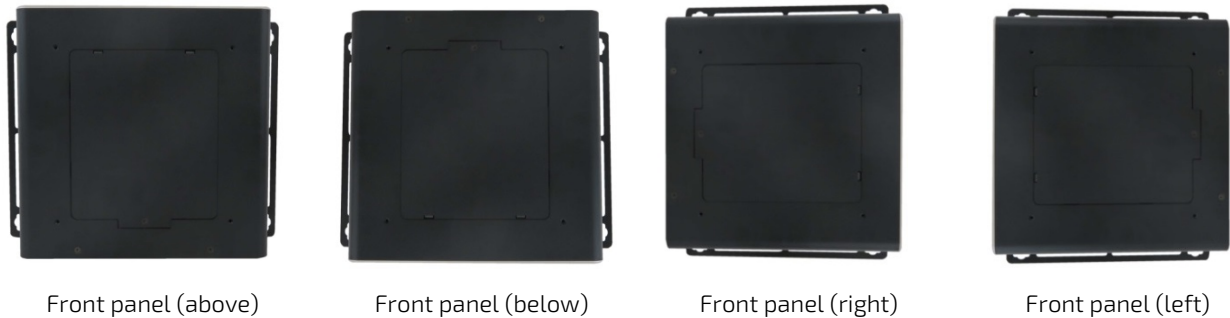
| Front panel (above) | Front panel (below) | Front panel (right) | Front panel (left) |

> ⚠ **CAUTION**   When mounting the product with the top cover facing the mount surface (desktop or wall), always provide a clearance 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.

9/ Starting Up

9.1. Before Starting

Before connecting the KBox B-202-RPL to power, read the instructions in this user guide and observe the safety instructions in Chapter 2/General Safety Instructions.

The product 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.

⚠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.
⚠CAUTION	Even when switched off using the power button, parts of the product are still energized. The product is only completely switched off when the power has been switched off using the power button and the power cable is disconnected from either the mains or the DC IN (or AC IN) power connector.
⚠CAUTION	Only connect the product to the delivered external power solution 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	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.
⚠CAUTION	Ensure that the power supply and power cables/wires have no visible damage.
⚠CAUTION	Ensure the product is closed without foreign objects inside the chassis before connecting the power.
NOTICE	Following a proper cabling procedure prevents a false power-on condition, that could result in operational failure. When installing/disconnecting the product ensure that: • The potential equalization stud connection is made first and disconnected last. • The last connection made to the product is the power wiring.
NOTICE	Mark the supply wires (+/-) clearly to ensure the correct connection from the supplied 3-pin mating power connector to the DC power supply, when using an external 24 VDC power supply.
NOTICE	Support the power and I/O cables to minimize the strain on the product's connectors.
NOTICE	**Do not disconnect the power cable during operation** Performing a forced shut down can lead to loss of data or other undesirable effects! To shutdown without data loss, use the power button.

9.2. Connecting the AC/DC (150 W) External Power Supply

The DC IN power connector (Figure 28) connects to the supplied external AD/DC (100/240 VAC/12 VDC, 150 W) power supply (Figure 29, pos. 1) that meets the product's electrical specification as stated on the type label and provides the required safety and protection features, see Chapter 12.4: Power Specification.

⚠**CAUTION** | **Only connect the product to the supplied 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.**

To connect the supplied AC/DC (150 W) power supply, perform the following:

1. Ensure the product is closed securely.

2. Screw the power supply's cable to the DC IN power connector.

Figure 28: DC IN Power Connector

3. Connect the other end of the power supply to the mains power outlet using the correct plug for your region.

Figure 29: External AC/DC (100/240 VAC/12 VDC, 150 W) Power Supply

| 1 | DC IN power connector | 2 | AC/DC (150 W) Power Supply |

9.3. Connecting the AC/DC (240 W) Power Supply (option)

The DC IN power connector (Figure 30) connects to the supplied external AC/DC (100/240 VAC/12 VDC, 240 W) power supply (Figure 31, pos. 1) that meets the product's electrical specification as stated on the type label and provides the required safety and protection features, see Chapter 12.4: Power Specification.

⚠CAUTION	Only connect the product to the supplied 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.

To connect the supplied AC/DC (240 W) power supply, perform the following:

1. Ensure the product is closed securely.

2. Connect the power supply's DC cable to the 10-pin DC IN connector on the rear panel.

Figure 30: DC IN 10-pin Connector

3. Connect the other end of the power supply to the mains power outlet using the correct plug for your region.

Figure 31: External AC/DC (100/240 VAC/12 VDC, 240 W) Power Supply

1	10-pin DC IN power connector	2	AC/DC (240 W) Power Supply

9.4. Connecting to a 24 VDC Power Supply (option)

The DC IN 3-pin 24 VDC power connector option (Figure 32, pos. 1) connects to the supplied 3-pin mating power connector PSC 1.5/ 3-F (Figure 32, pos. 5). The user is responsible for wiring the product correctly to the external 24 VDC power supply by marking the wires clearly with (+/-) to ensure the correct connection to the DC IN 3-pin power connector.

⚠CAUTION	Only connect to an external 24 VDC power supply that meets the product's electrical specification displayed on the product type label, and the power consumption, power limitation and power protection requirements specified in this user guide. The 24 VDC power supply must automatically recover from AC power loss and startup under peak loading.

i	To connect to the 3-pin DC IN power connector use the supplied corresponding 3-pin mating power connector only.

9.4.1. Wiring the 3-pin Mating Power Connector

Figure 32: DC IN 3-pin Power Connector and 3-pin Mating Power Connector
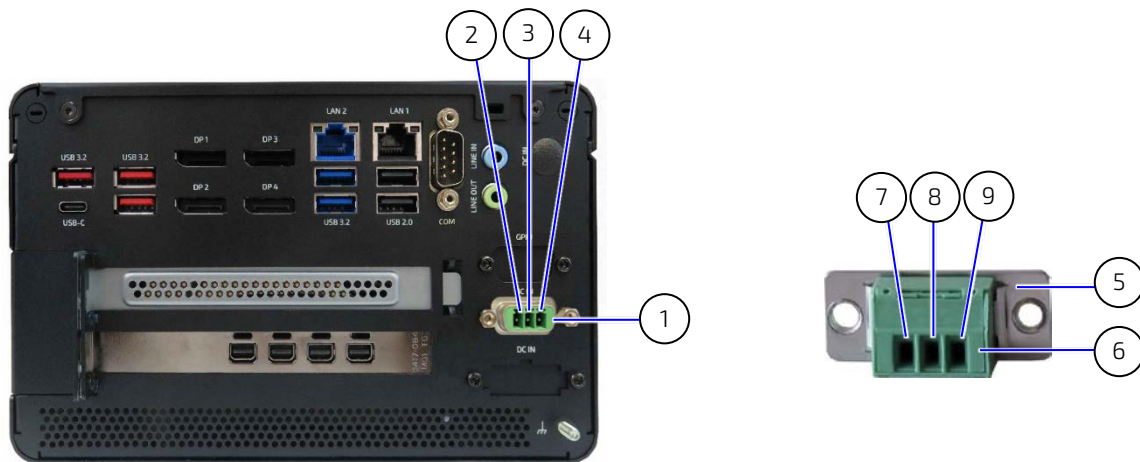
1	3-pin power connector (PSC 1.5/ 3-M)	5	3-pin mating power connector (PSC 1.5/ 3-F)
2	+24 VDC	6	Cover over the slotted pan head screws
3	NC	7	+24 VDC wire clamp
4	GND (-)	8	NC
		9	GND (-) wire clamp

NOTICE	Mark the supply wires (+/-) clearly to ensure the correct connection from the supplied 3-pin mating power connector to the external 24 VDC power supply.

i	The wiring is not part of the delivery and must be provided by the user. • Use copper wire only if the field wiring terminal is for copper wire connection only • Minimum temperature rating of the field wiring terminals is 75° C.

To wire the supplied 3-pin mating power connector (PSC 1.5/ 3-F), perform the following:

1. Cut three (1 mm²) AWG18 isolated wires to the required length and strip each end 5 mm to 7 mm.

2. Twist the striped wire-ends and provide them with ferrules.

3. Access the slotted pan head screws by opening the mating power connector's cover.

4. Loosen the slotted pan head screws far enough so that you can insert the end of the prepared wires.

5. Insert the wires into the corresponding clamp of the mating power connector. Make sure that you have the right polarity of the connection.

6. Fasten the screws to secure the wires into the mating power connector's clamps.

7. Close the mating power connector's cover.

9.4.2. Connecting to a DC Power Supply

To connect to an external 24 VDC power supply, perform the following:

1. Ensure the product is closed securely.

2. Wire the 3-pin Mating Power Connector /terminal (PSC 1.5/3-F) as described in Chapter 9.4.1: Wiring the 3-pin Mating Power Connector.

3. Switch off the external 24 VDC power supply via a disconnecting device (fuse/circuit breaker), to ensure that no power flows during the connection procedure.

4. Connect the potential equalization stud to an appropriate common earth connection.

5. Connect the wired 3-pin mating power connector (PSC 1.5/3-F) to the DC IN power connector (Figure 32, pos. 1). Pay attention to the polarity of the connections.

6. Connect the other end of the wired 3-pin mating power connector to the external 24 VDC power supply.

9.5. Connecting to AC Mains (option)

To connect the supplied AC-IN power cable, perform the following:

1. Connect the potential equalization stud to an appropriate common earth connection.

2. Connect the supplied AC cable to the 3-pin AC-IN connector on the rear panel.

Figure 33: AC-IN 3-pin Connector

3. Connect the other end of the power supply to the mains power outlet for your region.

9.6. Switching On/Off

To switch on, connect to the power source as described in this user guide, and briefly press the power button (Figure 3, pos. 3) .The power button illuminates blue to indicate the powered on state.

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

⚠CAUTION	Even when switched off using the power button, parts of the product are still energized. The product is only completely switched off when the power has been switched off using the power button and the power cable is disconnected from either the DC IN or AC-IN power connector, and the power source.

9.6.1. 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 restarted by pressing the power button.

NOTICE	Performing a forced shut down can lead to loss of data or other undesirable effects! To shutdown without data loss, use the power button.

9.7. Operating System (OS) and Hardware Component Drivers

The product supports flexible software options and delivered with pre-installed OS and all appropriate drivers (according to with ordered hardware configuration) and is fully operational when switched on for the first time.

For supported software information, see Table 20: Software Specification.

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 20: Software Specification.

i ▶	To download relevant drivers for hardware components visit Kontron's Customer Section.

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

10/ BIOS

The KBox B-202-RPL uses the AMI Aptio 5.x (UEFI) BIOS supported by the motherboard. This chapter informs users how to start the BIOS, use the BIOS setup to configure, and perform a BIOS update. Note that BIOS features are open to change and may not be available in the latest version of the motherboard's BIOS.

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

> **i** Only use the Kontron provided tools!

10.1. 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 during the Power On Self-Test (POST) messages or splash screen.

3. Press the <DEL> or <F2> keys during the POST.

4. If the BIOS is password protected, enter the User Password or Supervisor Password, and press <RETURN> to start the BIOS.

5. The BIOS displays the Main setup menu.

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

10.2. BIOS Setup Menus

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 BIOS configuration. The setup program allows for access to various menus that provide functions or access to sub-menus with further specific functions. At the top of the displayed BIOS screen is the menu bar to the setup menus:

▶ Main

▶ Advanced

▶ H/W Monitor

▶ Security

▶ Boot

▶ Exit

To navigate between the setup menus use the BIOS navigation keys described in Chapter 10.3 BIOS Navigation.

> **i** Observe that setting wrong values within the Advanced setup menu may cause the product to operate incorrectly.

10.3. BIOS Navigation

The 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 9: 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

10.4. 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.

10.4.1. Updating the BIOS

Before updating the BIOS, Kontron's recommends making a backup of the current BIOS setting.

For the latest BIOS updates and BIOS release information, visit Kontron's Customer Section **Website and select: Motherboards & SBC > Mini-ITX > BIOS_K383x > BIOS_K3833 >**

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

After a BIOS update, additional modifications must be made manually.

After a BIOS update If the product fails to boot, the updated BIOS maybe damaged, see Chapter 10.5: Recover BIOS.

For the latest BIOS downloads and release information, visit <u>Kontron's Customer Section</u> and access the mini-ITX K3833 Motherboard's FTP server's BIOS section (. Users can choose the preferred method to update the BIOS and follow the instructions provided.

Figure 34). Users can choose the preferred method to update the BIOS and follow the instructions provided.

Figure 34: BIOS FTP Server Example

10.5. Recover BIOS

> **i** All BIOS settings and some data is lost during the BIOS recovery process!

To recover BIOS perform the following:

1. Close all applications. Shut down the product properly and disconnect the power cable from the power source.

2. Copy the BIOS ZIP package content (K3833-Q1.ROM file) in Kontron's Customer Section to a FAT32 formatted USB stick.

3. Connect the USB stick to the product. Disconnect all other drives.

4. Open the product as described in Chapter 7.2: Opening the Product, steps 1 to 6.

5. Locate the Recover BIOS jumper on the motherboard's front panel header (see Chapter 13.12.1: Recovery BIOS Jumper). Change the recovery jumper to the "Recovery position" indicated in orange on the front panel header.

6. Switch on the product, the BIOS bootloader automatically initiates recovery and restores the BIOS contents from the ROM file.

7. System enters a "BIOS setup"-like user interface. Confirm "Proceed with flash update" message.

8. Wait until "Updating main firmware" indicates the success of the recovery procedure.

> **i** IMPORTANT: Do not interrupt power or press any key during update!

9. Shut down the product properly as performed in step 1 and set the BIOS recovery jumper back to the default position on the front panel header.

10. Switch on the product and press any key to reset and check if the BIOS is working properly.

11. Reconfigure the BIOS with your requirements.

11/ RAID

The KBox B-202-RPL supports the following RAID Array options:

▶ Drive bay RAID Array (Smart Performance and Smart Storage)

▶ Storage bay RAID Array (Smart Storage only)

▶ Internal RAID Array (Smart Storage only)

11.1. Drive Bay RAID Array

The drive bay RAID array is factory installed and RAID 1 by default.

Table 10: 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 M.2 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.

11.1.1. Drive Bay RAID Configuration

Figure 35: 2.5" SSD dual RAID M.2 Module Settings
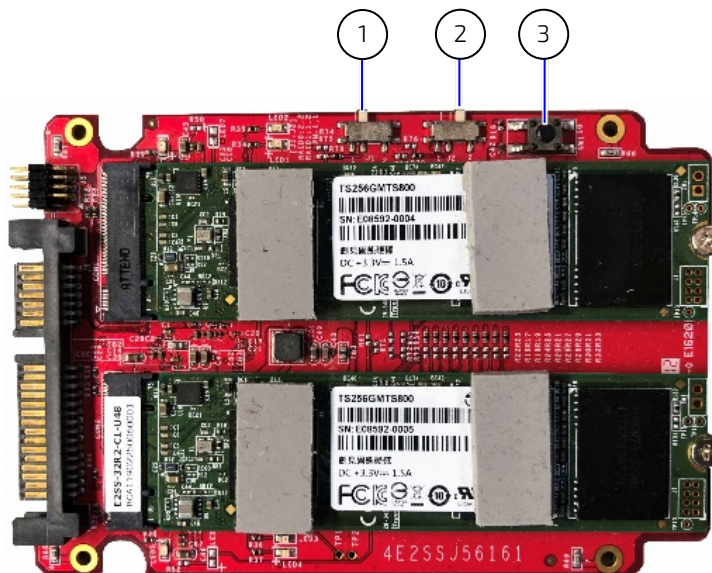
1   Jumper (J1) in position 1
2   Jumper (J2) in position 2
3   Reset switch

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. Insert the two M.2 SSDs on the RAID modules and secure with screw.

4. Set the jumpers J1 and J2 (Figure 35, pos. 1 and 2) to the setting required for the RAID array type (Table 11: RAID Module Jumper Settings)

Table 11: RAID Module Jumper Settings

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

5. To configure the RAID array the 2.5" SSD dual M.2 RAID module must be powered on using either the product's drive bay (refer to step 6) or an external SATA adapter from a SATA source (refer to step 7).

6. 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 product. Place a small non-conductive blunt-utensil underneath the 2.5" SSD dual M.2 RAID module where the rest switch is positioned (Figure 35, 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 RAID array type set by the jumpers. Close and secure the drive bay cover. After configuring the RAID module, immediately return the product to an allowed orientation!

⚠WARNING   **Danger of Fire**

Mounting the product with the top cover facing downward in not permitted and may cause overheating or melting, and hence may cause a fire hazard or personal injury.
To avoid risk of fire and personal injury, observe the following:

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

---

7. 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 35, 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 RAID array type set by the jumpers. 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.

11.1.2. Drive Bay RAID Software

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

11.1.2.1. iRAID Utility Settings

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

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

The S.M.A.R.T health check helps predict memory failures by counting how often memory-attribute problems occur, see Table 12: S.M.A.R.T. Information Memory Attributes.

Table 12: 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

11.1.2.2. Notifications

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

Table 13: 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

11.1.2.3. Events

Events lists important RAID events and gives more detailed information:

Table 14: 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

11.2. Storage Bay RAID Array

The storage bay RAID array is factory installed as RAID 1 by default.

Table 15: 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 36: Storage RAID (external)
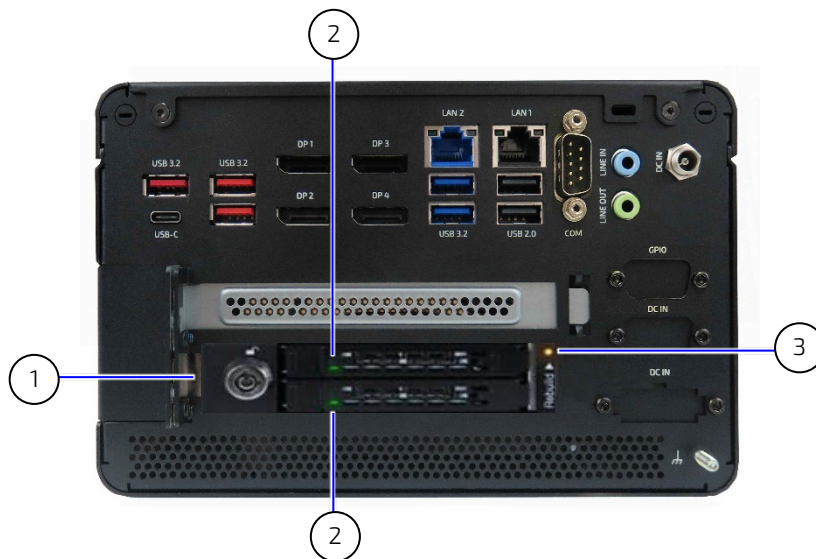
1	Storage bay with integrated RAID	3	RAID Rebuild LED
2	2.5" SSD activity LEDs		

11.2.1. 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 internally on the rear side of the storage bay by adjusting a switch to the required RAID array type.

The LEDs on the storage bay's front side indicate RAID operation (Figure 36, pos. 2) where:

▶ LED off indicates NO SSD

▶ LED green indicates ACTIVE

▶ LED red Indicated is ERROR

An additional 'Rebuild >' LED (Figure 36, pos. 3) yellow during configuration of the RAID array.

11.3. Internal RAID Array

The internal RAID array uses two 2.5" SSDs, factory installed in an internal storage cage. Internal RAID is only available for the Smart Storage.

Table 16: 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

11.3.1. Internal RAID Array Configuration

The two internal 2.5" SSDs are configured using Chipset RAID by navigating within the BIOS setup menus to RAID and setting the RAID array type.

12/   Product Specification

12.1. Block Diagrams

Figure 37: Block Diagram of KBox B-202-RPL Smart Performance
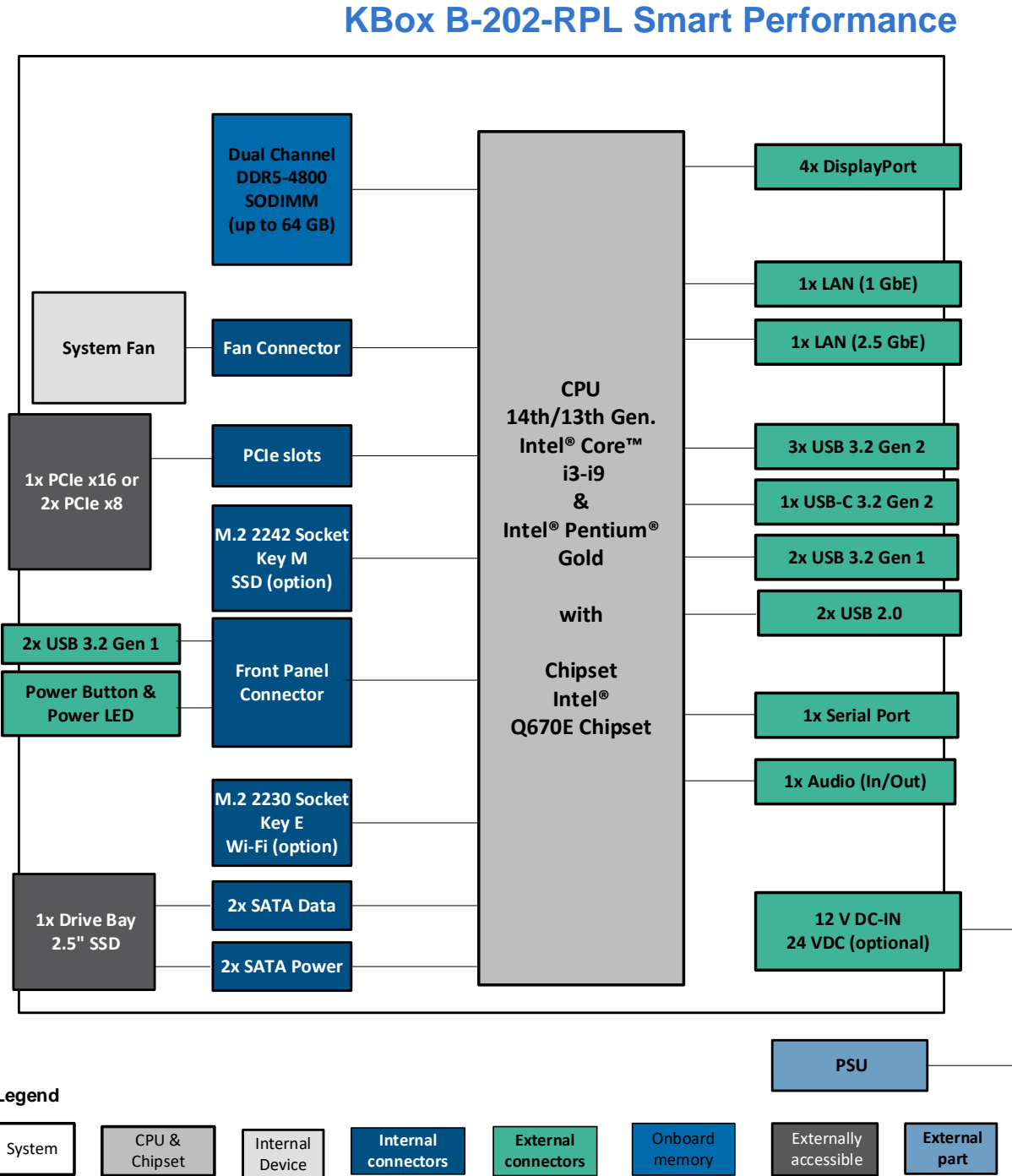
Figure 38: Block Diagram of KBox B-202-RPL Smart Storage
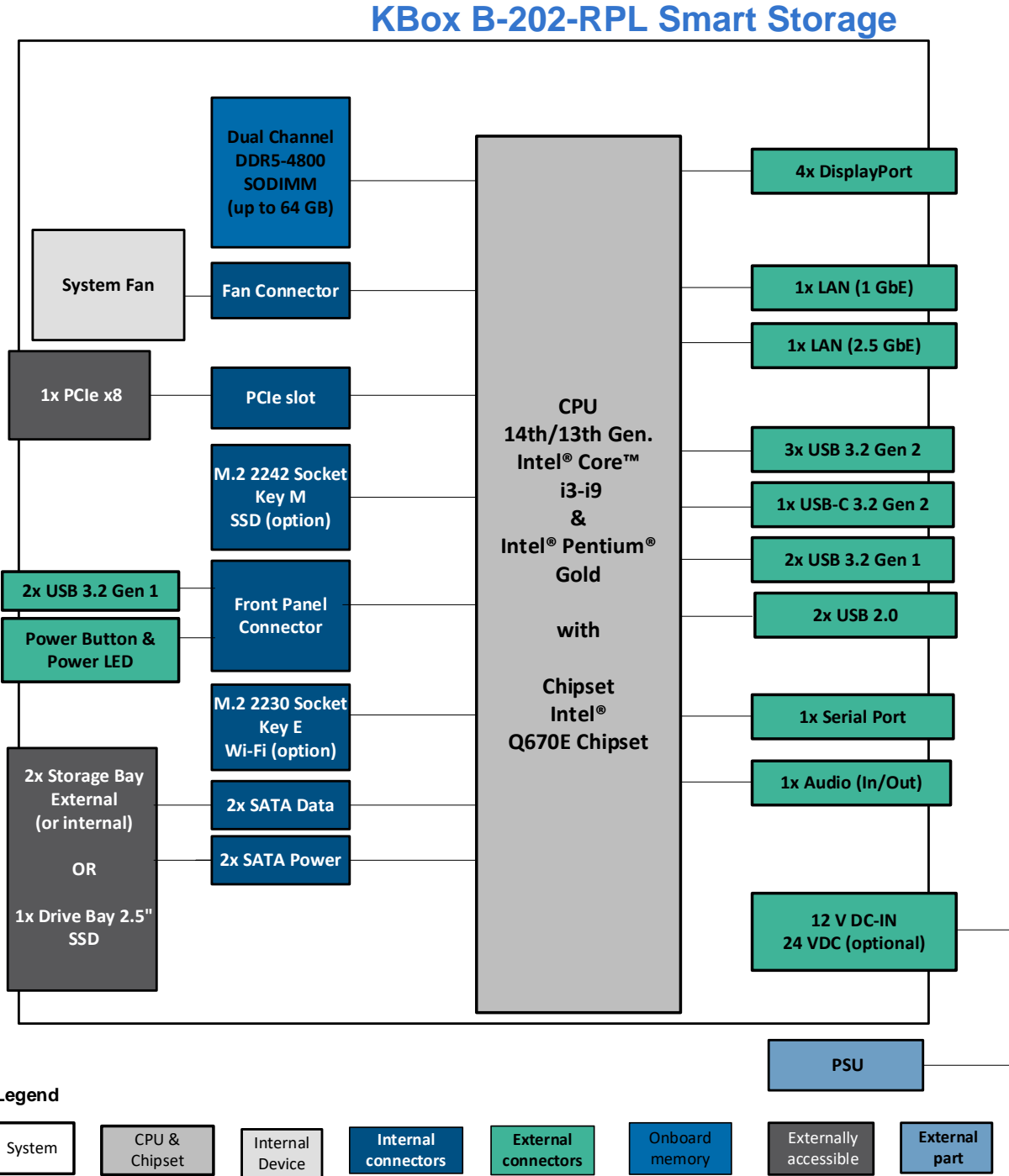
12.2. Hardware Specification

Table 17: Hardware Specification

KBox B-202-RPL		Smart Storage & Smart Performance				
Motherboard	Type	K3833-Q mini-ITX				
	Processors	Intel® 13th Gen Core™ processors and Pentium® Gold processor				
		Processors	Cores	Base Freq.	Turbo Freq.	Base Power
		i9-13900E	24	1.8 Ghz	5.2 GHz	65 W
		i7-13700E	16	1.9 GHz	5.1 GHz	65 W
		i5-13500E	14	2.4 GHz	4.6 GHz	65 W
		i3-13100E	4	3.3 GHz	4.4 GHz	65 W
		Gold G7400E	2	3.60 GHz	-	46 W
	Chipset	Intel® Q670 Express				
	Memory	2x DDR5 SODIMMs Up to 64 GBytes				
	Graphics	Intel® UHD Graphics 770 (Intel® Core™ i5/i7/i9) Intel® UHD Graphics 730 (Intel® Core™ i3) Intel® UHD Graphics 710 (Intel® Pentium® Gold) 7680 x 4320 @ 60Hz resolution (max.)				
Front I/O	USB Button/LED	2x USB 3.2 Gen 1 Power Button with integrated power LED				
Rear I/O	USB	1x USB-C 3.2 Gen 2 3x USB 3.2 Gen 2 2x USB 3.2 Gen 1 2x USB 2.0				
	LAN	1x 2.5 GbE (10/100/1000/2500 Mbps): Intel® i226LM (Wake-on-LAN) 1x 1 GbE (10/100/1000 Mbps) Intel® i219LM (Wake-on-LAN)				
	Displays	4x DP V1.4a @4K				
	Audio	LINE-IN, LINE-OUT				
	Serial Port	2x COM (RS232)				
Expansion	M.2 Module (Wi-Fi)	1x 2230 Key E Wi-Fi 6E (6GHz),Bluetooth® 5.3 Interface: Wi-Fi: PCIe/Bluetooth: USB 2.0				
Storage	Drive Bays	2x M.2 SSD (RAID) or 1x 2.5" SSD SATA III / SATA-600				
	M.2 Module (SDD)	1x 2242 Key M Interface: PCIe/NVME				

Table 18: Storage Specification

Drive Bay (removable) [1]	Smart Storage	Smart Performance
Type	2.5" SSD Drive	
Quantity	1x	
Capacity	512 GB, 1 TB, 2 TB	
Interface	SATA III, 6Gb/s	
Installed	Removable	
Drive Bay (removable) [1]	**Smart Storage**	**Smart Performance**
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	
Storage Bay (internal) [2]	**Smart Storage**	**Smart Performance**
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	-
Storage Bay (internal) [2]	**Smart Storage**	**Smart Performance**
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	-
Storage Bay (removable)	**Smart Storage**	**Smart Performance**
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)	-

[1]Due to space restrictions, only one drive type may be installed in the external drive bay (2.5" SSD with/without RAID).

[2]Due to space restrictions, only one drive type may be installed in the internal drive bay (2x 2.5" or 1x 3.5 ").

Table 19: External Expansion Slots

Expansion Slots	Smart Storage	Smart Performance
Quantity & Type	1x PCIe x16 or 2x PCIe x8	1x PCIe x16
Size	full height, half-length PCIe	2x PCIe x8
Interface	PCIe Gen 3	Full-height, half-length PCIe

> **i** For a list of reference PCIe cards, see Chapter 5.7: Reference Expansion Devices.

> **i** When the high performance GPU card is installed in the Smart Performance, both PCIe slots are populated and not available to the user

12.3. Software Specification

Table 20: Software Specification

KBox B-202-RPL	Smart Storage & Smart Performance
Operating System (OS)	Windows® 10 IOT Enterprise LTSC or Linux
BIOS	AMI Aptio 5.x (UEFI)

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

12.4. Power Specification

The electrical specifications of the product's power options are defined in this chapter. Only connect the product to a power source using the power option supplied with the product that meets the product's electrical specification, and power consumption and power protection requirements.

12.4.1. AC/DC (150 W) Power Supply

The AC/DC 150 W power supply connects to the 12 VDC DC IN power connector. Only use the AC/DC power supply supplied with the product and chosen to meet the product's electrical specification (as specified in this user guide and on the product's type label), power consumption and power limitations and power protection requirements.

Table 21: AC/DC (150 W) Power Supply Electrical Specification

Power Source	External AC/DC (150 W) Power Supply
Input Voltage	100/240 VAC, (50/60 Hz) ±10%
Output Voltage	12 VDC
Output Current	9 A (12.5 A max.)
Power Rating	150 W

⚠ **CAUTION**

Only connect the product to the external AC/DC power supply supplied by Kontron and 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.

12.4.2. AC/DC (240 W) Power Supply (option)

The AC/DC, 240 W power supply (Smart performance only) connects to the 12 VDC 10-pin DC IN power connector. Only use the AC/DC power supply supplied with the product and chosen to meet the product's electrical specification (as specified in this user guide and on the product's type label), power consumption and power limitations and power protection requirements.

Table 22: AC/DC (240 W) Power Supply Electrical Specification

Power Source	External AC/DC (240 W) Power Supply
Input Voltage	100/240 VAC (50/60 Hz) ±10%
Output Voltage	12 VDC
Output Current	6.5 A (20 A max.)
Power Rating	240 W

⚠ **CAUTION**

Only connect the product to the external AC/DC power supply supplied by Kontron and 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.

ℹ The DC IN AC/DC (240 W) power supply is available for the Smart Performance only.

12.4.3. 24 VDC Connector (option)

The 24 VDC 3-pin power connector connects to an external 24 VDC power supply using the supplied 3-pin mating power connector wired correspondingly by the user. Only connect the product to an external 24 VDC power supply that meets the product's electrical specification (as specified in this user guide and on the product's type label), and the power consumption, power limitation and power protection requirements specified in this user guide. The 24 VDC power supply must automatically recover from AC power loss and startup under peak loading.

Table 23: 24 VDC Connector Electrical Specification

Power Source	24 VDC Connector
Input Voltage	24 VDC (Range: 6 VDC to 36 VDC)
Input Current	5 A max. (fuse protected)
Power Rating	120 W

⚠CAUTION	Only connect the product to an external 24 VDC power supply providing 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	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.
NOTICE	Ensure that the external 24 VDC power supply is used according to the manufacturer's instructions.
NOTICE	Ensure the external 24 VDC power supply has been fully tested to meet the minimum immunity of AC inputs requirements, as stipulated in IEC 55024. Including power supplies marketed with a separate AC/DC power converter.
NOTICE	To protect the product and any connected peripherals, make sure that the power cables have the right diameter to withstand the maximum available current.

12.4.4. AC-IN (option)

The AC-IN option with AC Power cable (Smart Storage only) connects the product directly to a mains power outlet.

Table 24: AC-IN Power Supply Electrical Specification (option)

Power Source	AC IN Connector
Input Voltage Range	100/240 VAC (50/60 Hz)
Input Current	2 A
Power Rating	150 W

⚠CAUTION	Only connect the product to a main power outlet using the supplied power cable for your region that meets the requirements of the Limited Power Source (LPS) and Power Source (PS2) of UL/IEC 62368-1.

i   The AC-IN option is available for the Smart Storage only.

12.4.5. Power Protection

The power source supplied by Kontron 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 25: Power Supply Protection Features of the AC/DC (150 W) and AC/DC (240 W)

Protection Feature	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.

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.

12.4.6. Power Consumption

The chosen power supply option must provide the level of power required to meet the product's maximum power consumption. The maximum power consumption depends on the motherboard capacity, system memory, storage, and system expansion devices/cards. The overall power consumption must not exceed the product's maximum power supply rating.

If the use of system expansion device/cards increases the total power consumption above the maximum power rating of the power supply, contact Kontron Support.

12.4.7. Potential Equalization

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. The potential equalization stud ensures that all connected systems share a common potential.

12.5. Environmental Specification

Table 26: Environmental Specification

KBox B-202-RPL		Smart Storage & Smart Performance
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
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
MTBF		86026 hours @ 30°C For the KBox B-202 with 32 GByte memory, dual port 10 GB PCIe card, 1 TByte M.2 SSD and 4 TByte 2.5" SSD storage.

12.6. Mechanical Specification

Table 27: Mechanical Specifications

KBox B-202-RPL	Smart Storage & Smart Performance
Dimensions (D x W x H)	190 mm x 190 mm x 120 mm (7.48" x 7.48" x 4.72")
Weight	2.8 kg (6.17 1 lbs.) approx.
Chassis	Zinc coated steel sheet (Black grey ,RAL 7021)
Front Panel	Aluminum (grey, RAL 9022)
Cooling	Fan cooled, axial fan, silent fan
Mounting Bracket (D x W x H)	187 mm x 45 mm x 20 mm (7.36" x 1.77" x 0.79")

> **i** For the products 3D STEP data, visit Kontron's Customer Section and select the product KBoxB> KBox B-202-RPL> KBox B-202-RPL Documentation.

12.6.1. 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 39: Dimensions Front Panel
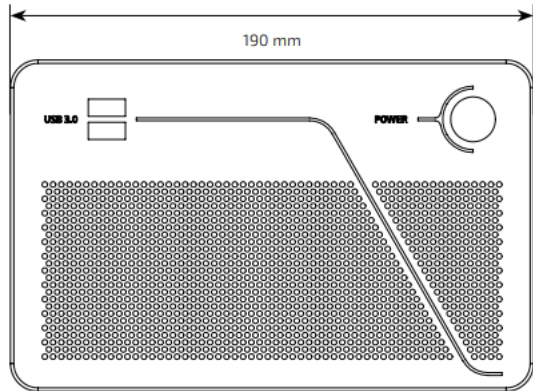
Figure 40: Dimensions Rear Panel
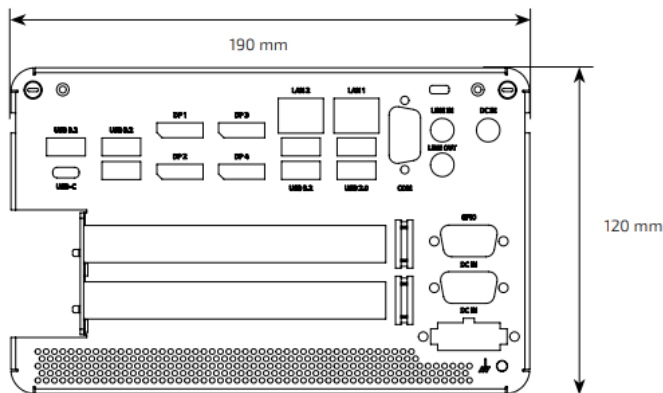
Figure 41: Dimensions Top Cover
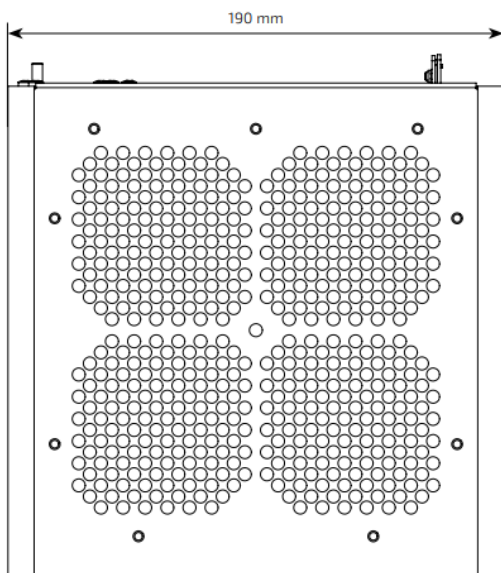
Figure 42: Dimensions Bottom Side
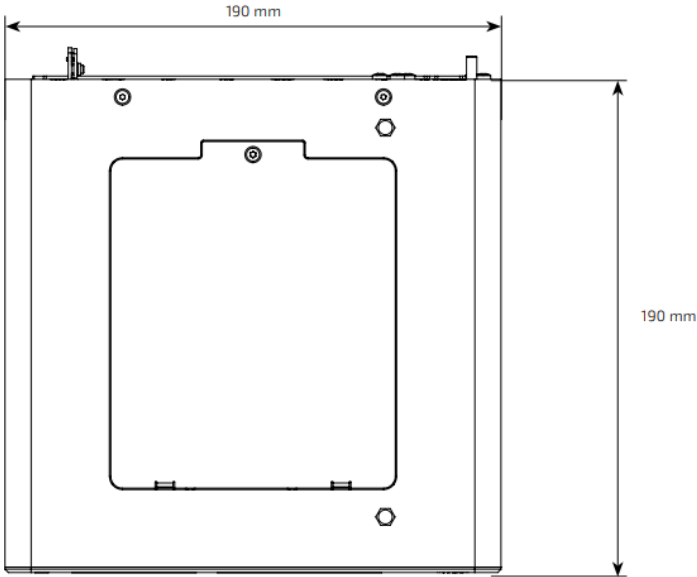
Figure 43: Dimensions Right Side
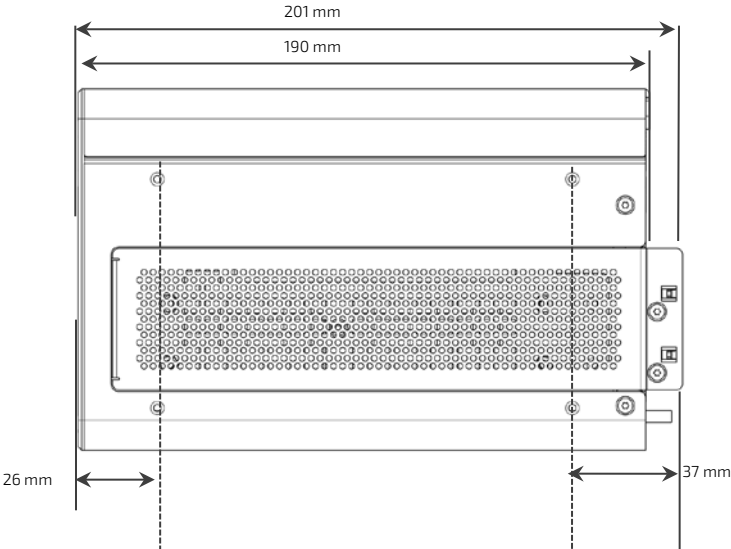
Figure 44: Dimensions Left Side
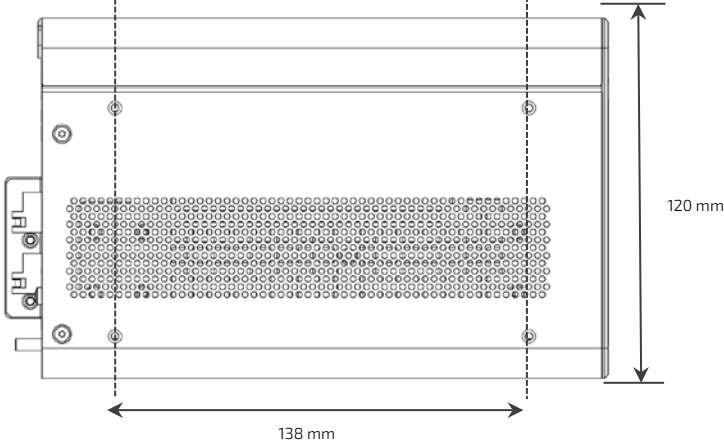
> **i** For the products 3D STEP data, visit Kontron's Customer section and select the product KBoxB> KBox B-202-RPL> KBox B-202-RPL Documentation

12.6.2. Dimension Diagrams- Wall Mount Brackets

The dimension drawing shows the main mounting bracket mechanical dimension.

Figure 45: Dimensions with Mounting Brackets
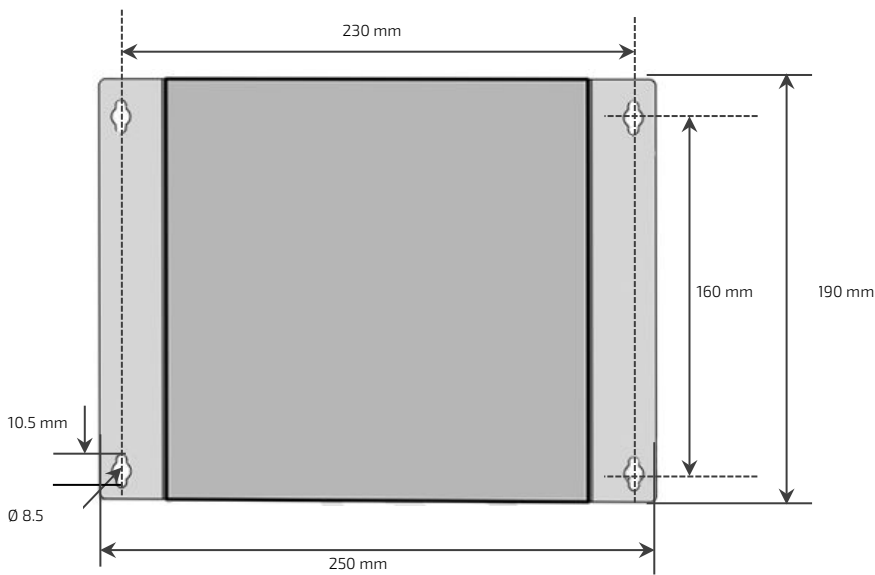
> **i** For the products 3D STEP data, visit Kontron's Customer section and select the product KBoxB> KBox B-202-RPL> KBox B-202-RPL Documentation

12.7. Compliance

The KBox B-202-RPL (Smart Storage and Smart Performance) comply with the relevant requirements and the approximation of the laws relating to the CE Mark for non-Wi-Fi variants and CE Radio Equipment Directive (RED) for Wi-Fi variants, and the standards that are constitutional parts of the declaration.

Table 28: Compliance

| Europe – CE Mark	
Directives	2014/30/EU Electromagnetic compatibility 2014/35/EU Low Voltage 2011/65/EU RoHS II
EMC	**EN 55032** Electromagnetic compatibility of multimedia equipment- Emission Requirements **EN 55035** Electromagnetic compatibility of multimedia equipment - Immunity requirements **EN 61000-6-2** Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments **EN 61000-3-2** Electromagnetic compatibility (EMC) – Part 3-2: Limits- Limits for harmonic currents emissions (equipment input current <= 16A per phase) **EN 61000-3-3** Electromagnetic compatibility (EMC) – Part 3-3: Limits-Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current <=16A per phase and not subject to conditional connection
Safety	**EN 62368** Audio/video, information and communication technology equipment – Safety requirements

Europe – CE RED Mark	
Directives	2014/53/EU Radio Equipment Directive (RED) 2011/65/EU RoHS II
EMC	**EN 55032** Electromagnetic compatibility of multimedia equipment- Emission Requirements **EN 55035** Electromagnetic compatibility of multimedia equipment - Immunity requirement **EN 61000-6-2** Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments **EN 61000-3-2** Electromagnetic compatibility (EMC) – Part 3-2: Limits- Limits for harmonic currents emissions (equipment input current <= 16A per phase) **EN 61000-3-3** Electromagnetic compatibility (EMC) – Part 3-3: Limits-Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current <=16A per phase and not subject to conditional connection

Europe – CE RED Mark	
EMC	**EN 301 489-01 V2.2.3**
	Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
	EN 301 489-1 V1.9.2
	Electromagnetic Compatibility and Radio Spectrum Matters
	EN 300 328 V2.2.2
	Wideband transmission systems - Data transmission equipment operating in the 2,4 GHz band ISM band and using wide band modulation techniques
	EN 301 893-2 V2.1.1
	5 GHz RLAN
Safety	**EN 62368-1**
	Audio/video, information and communication technology equipment – Safety requirements
Health and Safety	**EN 62311**
	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

The KBox B-202-RPL complies with the following country specific certifications.

Table 29: International Compliance

USA/CANADA	
EMC	**FCC 47 CFR Part 15 (Class B) and ICES-003**
	Complies with part 15 FCC rules and regulations of title 47 of the CFR rules for class B products; under which an unintentional radiator may be operated, administrated and other conditions relating to the marketing of part 15 devices.
Safety	**UL 62368-1 and CSA-C22.2 No. 62368-1**
	Audio/video, information and communication technology equipment – Safety requirements

UK CA (UK Conformity Assessed)	
EMC	**EN 55032**
	Electromagnetic compatibility of multimedia equipment- Emission Requirements
	EN 55035
	Electromagnetic compatibility of multimedia equipment - Immunity requirements
	EN 61000-6-2
	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
	EN 61000-3-2
	Electromagnetic compatibility (EMC) – Part 3-2: Limits- Limits for harmonic currents emissions (equipment input current <= 16A per phase)
	EN 61000-3-3
	Electromagnetic compatibility (EMC) – Part 3-3: Limits-Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current <=16A per phase and not subject to conditional connection
Safety	**EN 62368-1**
	Audio/video, information and communication technology equipment – Safety requirements

International Certifications	
EMC	IEC 61000-6-2
	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
Safety	IEC 62368-1
	Audio/video, information and communication technology equipment – Safety requirements

For the product's Declaration of Conformity (DoC), visit <u>Kontron's Customer Section</u> and select the product KBoxB> KBox B-202-RPL> KBox B-202-RPL Documentation

If the product is modified, the prerequisites for specific approvals may no longer apply. Kontron is not responsible for any radio television interference caused by unauthorized modifications of the delivered product or the substitution or attachment of connecting cables and equipment other than those specified by Kontron. The correction of interference caused by unauthorized modification, substitution or attachment is the user's responsibility.

Failure to use the following may violate FCC/ICES rules:

shielded I/O cables when connecting to peripheral devices

the supplied power supply

13/ Connectors and LEDs

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

13.1. DC IN 12 VDC, Power Connector Pin Assignment (default)

The supplied external AC/DC, 150 W power supply connects to the 12 VDC DC IN power connector.

Table 30: DC IN 12 VDC, 150 W Power Connector Pin Assignment

Pin	Signal Name	Barrel Jack with (5.5 mm/ 2.5 mm)Center Pole
Centre pole	+12 VDC	
Outer ring	Ground	

> **⚠ CAUTION** Power the product with the supplied external AC/DC power supply only.

> **NOTICE** Do not disconnect the power cable during operation
>
> Performing a forced shut down can lead to loss of data or other undesirable effects!
> To shutdown without data loss, use the power button.

13.2. DC IN 10-Pin Power Connector Pin Assignment (option- Smart Performance only)

The AC/DC, 240 W power supply (Smart performance only) connects directly to the 12 VDC DC IN 10-pin power connector.

Table 31: DC IN 12 VDC, 240 W Power Connector Pin Assignment

Pin	Signal Name	Pin	Signal Name	10-pin Power Connector
1	+12 VDC	6	Ground	
2		7		
3		8		
4		9		
5		10		

> **⚠ CAUTION** Power the product with the delivered external AC/DC power supply only.

> **NOTICE** Do not disconnect the power cable during operation
>
> Performing a forced shut down can lead to loss of data or other undesirable effects!
> To shutdown without data loss, use the power button.

13.3. DC IN 24 VDC Pin Assignment (option)

The supplied 3-pin mating power connector (PSC 1.5/ 3-F), with the corresponding wiring, connects to the DC IN 3-pin Phoenix PSC 1.5/3-M connector.

Table 32: DC IN 24 VDC 3-pin Power Connector Pin Assignment

Pin	Signal Name	3-Pin Phoenix PSC 1.5/3-M
1	+ 24 VDC	
2	NC	
3	Ground (-)	1 2 3

⚠ CAUTION — Only connect the product to an external 24 VDC power supply providing 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.
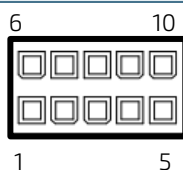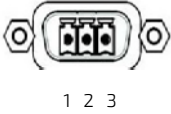
NOTICE — Do not disconnect the power cable during operation

Performing a forced shut down can lead to loss of data or other undesirable effects!
To shutdown without data loss, use the power button.

NOTICE — Mark the supply wires (+/-) clearly to ensure a safe connection from the supplied 3-pin mating power connector to the DC power supply, when using an external 24 VDC power supply.

i — To connect to the 3-pin DC IN power connector use the supplied corresponding 3-pin mating power connector only.

i — The wiring is not part of the delivery and must be provided by the user.
- Use copper wire only if the field wiring terminal is for copper wire connection only
- Minimum temperature rating of the field wiring terminals is 75° C.

13.4. AC IN Power Connector Pin Assignment (option- Smart Storage only)

The AC power connector (Smart Storage only) uses a standard 3-pin AC (240/100 VAC, 50/60 Hz) connector that connects directly to the main power supply.
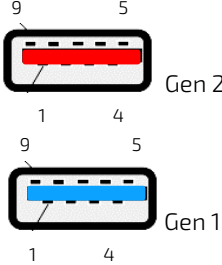
⚠ CAUTION — Power the product with the delivered AC power cable suitable for your region only

13.5. USB 3.2 Gen2/Gen1 Port Pin Assignment
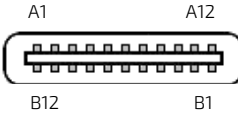
All USB 3 connectors provide separate signal lines for USB 3.2 and USB 2.0.

Table 33: USB 3.1 Gen 2/1 Port (Type-A) Pin Assignment

Pin	Signal Name	Pin	Signal Name	9-pin USB 3.2 (Type A) Port
1	+5V (fused protected)	5	RX–	
2	Date–	6	RX+	
3	Data+	7	GND	
4	GND	8	TX–	
		9	TX+	

13.6. USB-C 3.2 Gen2 Pin Assignment

Table 34: USB-C 3.2 Port Pin Assignment

Pin	Signal Name	Pin	Signal Name	USB Type-C Connector
1	GND	12	GND	
2	USB3_TX1+	11	USB3_RX+	
3	USB3_TX1–	10	USB3_RX1–	
4	VCC	9	VCC	
5	CC1[1]	8	SBU2[2]	
6	USB2_Data1+	7	USB2_Data2–	
7	USB2_Data1–	6	USB2_Data2+	
8	SBU1[2]	5	CC2[1]	
9	VBUS Power	4	VBUS Power	
10	USB3_RX2–	3	USB3_TX2–	
11	USB3_RX2+	2	USB3_TX2+	
12	GND	1	GND	

[1] Configuration channel

[2] Sideband use

Power delivery not supported.

13.7. USB 2.0 Port Pin Assignment

Table 35: USB 2.0 Port (Type-A) Pin Assignment

Pin	Signal Name	4-pin USB 2.0 (Type A) Connector
1	+5 V (fused protected)	
2	Data-	
3	Data+	
4	GND	
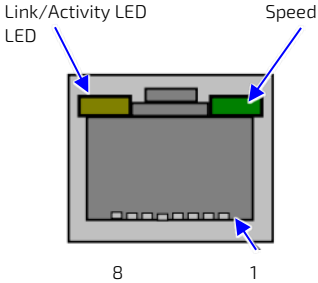
13.8. Display Port (DP) V1.4a Pin Assignment
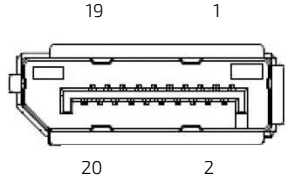
Table 36: Display Port (DP) Connector Pin Assignment

Pin	Signal Name	Pin	Signal Name	DP 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)	

13.9. LAN 2.5 GbE/1 GbE Connector Pin Assignment

Table 37: LAN (GbE) Connector Pin Assignment

Pin	Signal Name (10/100/1000/2500 Mbps)	Signal Name (10/100)	RJ45 (female) Connector
1	MX1+	TX+	
2	MX1-	TX-	
3	MX2+	RX+	
4	MX3+		
5	MX3-	T	
6	MX2-	RX-	
7	MX4+		
8	MX4-		

Link/Activity LED		Speed LED	
LED Status	Description	LED Status	Description
Green	Link	Green	2.5 GBE
Green Flashing	Activity	Yellow	1 GBE
		Off	10/100 Mbps

13.10. COM1 Port (RS232) Pin Assignment

Table 38: Serial Interface COM port (RS232) Connector Pin Assignment

Pin	RS232	Pin	RS232	D89 Connector
1	DCD	6	DSR	
2	RxD	7	RTS	
3	TxD	8	CTS	
4	DTR	9	RI	
5	GND			

13.11. Audio LINE-OUT and Audio LINE-IN Connector Pin Assignment

Table 39: Audio LINE-OUT and Audio LINE-IN Pin Assignment

Jack	Signal Name
Blue	Line input (LINE-IN)
Green	Headphone output (LINE-OUT)

13.12. Jumpers

13.12.1. Recovery BIOS Jumper

The recover BIOS jumper is located on the motherboard's front panel header. To recover the BIOS, move the recover BIOS jumper from the default position (Figure 46, pos. 2) to the recover BIOS position (Figure 46, pos. 1) on the front panel header.

Figure 46: Recover BIOS Jumper
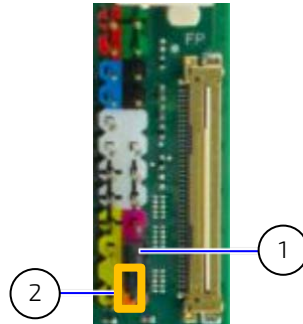
| 1 | Default jumper setting | 2 | Recover position (orange) |

Table 40: Recover BIOS Jumper

Pins	State	24-pin Front Panel Header
20-22	Default	
22-24	Recover BIOS	

For further motherboard information, visit Kontron's K3833-Q mITX motherboard website.

14/ Maintenance

Kontron products require only minimum servicing and maintenance for problem-free operation. Product maintenance or repair may only be carried out by qualified personnel authorized by Kontron.

> **⚠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.

14.1. Cleaning the Product

> **NOTICE** Do not use steel wool, metallic threads or solvents like abrasives, alcohol, acetone or benzene when cleaning the product.

> **NOTICE** When using a damp cloth, only use a mild detergent.

To clean the product's surface, perform the following:

1. Close all applications. Shut down properly using the power button and disconnect the power cable from the Power connector or the DC power supply. Disconnect all peripherals.
2. Allow the product to cool before handling.
3. Remove dust using a clean soft brush.
4. Wipe the product with a soft dry cloth.
5. Remove stubborn dirt using a mild detergent and a soft cloth.

14.2. Replacing the Lithium Battery

> **⚠CAUTION** Caution: Risk of Explosion if lithium Battery is replaced by an incorrect type. Dispose of Used lithium batteries According to the Instructions.
> ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions.

> **NOTICE** Do not use metal tools such as tweezers to grab the lithium battery. This shortcuts both terminals, and can damage the lithium battery! Only use suitable (non-metal) tools.

> **NOTICE** Do not use a screwdriver to remove the battery from the socket. Using a screwdriver could damage the solder pads, metal brackets or plastic noses and lead to malfunction of the battery contact, RTC reset or BIOS battery voltage error message.

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

> **The product is not designed to operate without a lithium battery. If the lithium battery is empty or disconnected, the BIOS settings will be set to the factory defaults.**

The CR2032 lithium battery must be replaced with an identical 3 Volt lithium battery or a Kontron recommended lithium battery. To replace the on-board Lithium battery, perform the following:

1. Close all applications. Shut down properly using the power button and disconnect the power cable from the DC IN connector. Disconnect all peripherals.

2. Open the product as described in Chapter 7.2: Opening the Product, steps 1 to 6

3. Gently push the metal clamp away from battery, as shown by the arrow in Figure 47.

Figure 47: Vertical Battery Holder
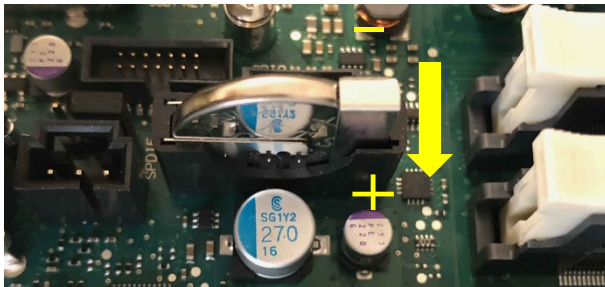
4. Remove the battery using your fingers or a suitable (non-metal) tool to pull the lithium battery out of the battery holder.

5. Insert the lithium battery into the battery holder. Ensure correct polarity with the PLUS side of the battery facing towards the metal clamp, as shown by the + and – symbols in Figure 47.

6. Gently push the battery downwards until the metal clamp locks the battery.

7. Close the product as described in Chapter 7.2: Opening the Product, step 7.

15/ Storage and Transportation

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.

16/ 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.

16.1. 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, visit Kontron Support's 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. Send the completed RMA-Request form to the fax or email address given on the RMA Request sheet and Kontron will provide an RMA-Number.

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

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

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

16.2. Warranty

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

1. Visit Kontron's Term and Conditions webpage.

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

16.2.1. 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 41: List of Acronyms

BIOS	Basic Input Output System		OS	Operating System
BT	BlueTooth		PSU	Power Supply Unit
CFR	Code of Federal Regulations		RAID	Redundant Array of Independent Disks
COM	Communication port		REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
DP	Display Port		RED	Radio Equipment Directive
DVI	Digital Video Interface		RMA	Return of Material Authorization
ECT	Embedded Computer Technology		ROHS	Restriction Of Hazardous Substances
EEE	Electrical and Electronic Equipment		RTC	Real Time Clock
ESD	Electro Static Device		SATA	Serial AT Attachment
FCC	Federal Communications Commission		SDR	Standard-Dynamic-Range
GbE	Giga bit Ethernet		S.M.A.R.T	Self-Monitoring, Analysis and Reporting Technology
HD	High Definition		SN	Serial Number
HD/HDD	Hard Disk / Hard Disk Drive		SSD	Solid State Drive
HDMI	High-Definition Multimedia Interface		TSN	Time Sensitive Network
HDR	High Dynamic Range		UEFI	Unified Extensible Firmware Interface
ICES	Interference Causing Equipment Standard		USB	Universal Serial Bus
IOT	Internet of Things		VCC	Voltage Common Collector
ITE	Information Technology Equipment		VDC	Voltage Direct Current
LAN	Local Area Network		VGA	Video Graphics Array
LED	Light-Emitting Diode		WEEE	Waste Electrical and Electronic Equipment
LVDs	Low Voltage Device		Wi-Fi	Wireless
MTBF	Mean Time Before Failure			
PCIe	PCI-Express			

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About Kontron

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

For more information, please visit: **www.kontron.com**

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