USER GUIDE

KBox E-300 Series

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KBOX E-300 SERIES - USER GUIDE

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Revision History

Revision	Brief Description of Changes	Date of Issue
1.0	Initial Issue	2018-Aug-28
1.1	Add VESA hole spec	2018-Nov-22
1.2	Update battery and DC power warning message	2018-Dec-13
1.3	Add polarity description of power adapter	2018-Dec-20
1.4	Add recommended screw length for VESA based mounting bracket	2019-Jan-15
1.5	Update spec table layout	2019-Mar-14
1.6	Add extended temperature support	2019-Dec-04
2.0	Add UL standards	2020-Jan-10
2.1	Add mPCIe card size info	2020-Jul-06
2.2	Remove UL certification	2021-May-25

Terms and Conditions

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

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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 inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.
	This symbol indicates general information about the product and the user guide. This symbol also indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

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

⚠CAUTION

Warning

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

⚠CAUTION

Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE

ESD Sensitive Device!

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

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

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

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

Lithium Battery Precautions

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

⚠CAUTION

Danger of explosion if the battery is replaced incorrectly.

- Replace only with same or equivalent battery type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

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

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

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

Quality and Environmental Management

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

Disposal and Recycling

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

WEEE Compliance

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

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

Environmental protection is a high priority with Kontron.

Kontron follows the WEEE directive

You are encouraged to return our products for proper disposal.

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1/ General Safety Instructions for IT Equipment

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

The product has been built and tested according to the basic safety requirements for low voltage (LVD) applications and has left the manufacturer in safety-related, flawless condition. To maintain this condition and also to ensure safe operation, the operator must not only observe the correct operating conditions for the product but also the following general safety instructions:

- The product must be used as specified in the product documentation, in which the instructions for safety for the product and for the operator are described. These contain guidelines for setting up, installation and assembly, maintenance, transport or storage.
- The on-site electrical installation must meet the requirements of the country's specific local regulations.
- If a power cable comes with the product, only this cable should be used. Do not use an extension cable to connect the product.
- To guarantee that sufficient air circulation is available to cool the product, please ensure that the ventilation openings are not covered or blocked. If an air filter is provided, this should be cleaned regularly. Do not place the system close to heat sources or damp places. Make sure the system is well ventilated.
- Only devices or parts which fulfill the requirements of SELV circuits (Safety Extra Low Voltage) as stipulated by IEC 60950-1 may be connected to the available interfaces.
- Before opening the device, make sure that the device is disconnected from the mains.
- Switching off the device by its power button does not disconnect it from the mains. Complete disconnection is only possible if the power cable is removed from the wall plug or from the device. Ensure that there is free and easy access to enable disconnection.
- The device may only be opened for the insertion or removal of add-on cards (depending on the configuration of the system). This may only be carried out by qualified operators.
- If extensions are being carried out, the following must be observed:
  - All effective legal regulations and all technical data are adhered to.
  - The power consumption of any add-on card does not exceed the specified limitations.
  - The current consumption of the system does not exceed the value stated on the product label.
- Only original accessories that have been approved by Kontron can be used.
- Please note: safe operation is no longer possible when any of the following applies:
  - The device has visible damages.
  - The device is no longer functioning.

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

Additional safety instructions for DC power supply circuits

- To guarantee safe operation of devices with DC power supply voltages larger than 60 volts DC or a power consumption larger than 240 VA, please observe that:
  - the device is set up, installed and operated in a room or enclosure marked with “RESTRICTED ACCESS”, if there are no safety messages on product as safety signs and labels on the device itself.
  - no cables or parts without insulation in electrical circuits with dangerous voltage or power should be touched directly or indirectly
  - a reliable protective earthing connection is provided
  - a suitable, easily accessible disconnecting device is used in the application (e.g. overcurrent protective device), if the device itself is not disconnectable
  - a disconnect device, if provided in or as part of the equipment, shall disconnect both poles simultaneously
  - interconnecting power circuits of different devices cause no electrical hazards
- A sufficient dimensioning of the power cable wires must be selected – according to the maximum electrical specifications on the product label – as stipulated by EN60950-1 or VDE0100 or EN60204 or UL508 regulations.
- The devices do not generally fulfill the requirements for "centralized DC power systems“ (UL 60950-1, Annex NAB; D2) and therefore may not be connected to such devices!

1.1. Electrostatic Discharge (ESD)

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

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

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

1.1.1. Grounding Methods

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

1. Cover workstations with approved antistatic material. Always wear a wrist strap connected to workplace. Always use properly grounded tools and equipment.
2. Use antistatic mats, heel straps, or air ionizers for more protection.
3. Always handle electrostatically sensitive components by their edge or by their casing.
4. Avoid contact with pins, leads, or circuitry.
5. Turn off power and input signals before inserting and removing connectors or connecting test equipment.
6. Keep work area free of non-conductive materials such as ordinary plastic assembly aids and Styrofoam.
7. Use only field service tools which are conductive, such as cutters, screwdrivers, and vacuum cleaners.
8. Always place drives and boards PCB-assembly-side down on the foam.

1.2. Lithium Battery Replacement

If replacing the lithium battery, follow the replacement precautions stated below.

⚠WARNING

Do not ingest battery, Chemical Burn Hazard

This product contains a coin / button cell battery. If the coin / button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.

Keep new and used batteries away from children.

If the battery compartment does not close securely, stop using the product and keep it away from children.

If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

Replacement of a battery with an incorrect type, that can result in an explosion. Replace only with the same or equivalent type recommended by the manufacturer. The lithium battery type must be UL recognized.

Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion.

Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas

A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas

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

2/ Electromagnetic Compatibility

For detailed information refer to section 10.3 “CE Directives and Standards”.

2.1. Electromagnetic Compatibility (EU)

This product is intended only for use in industrial areas. The most recent version of the EMC guidelines (EMC Directive 2004/108/EC) apply. If the user modifies and/or adds to the equipment (e.g. installation of add-on cards) the prerequisites for the CE conformity declaration (safety requirements) may no longer apply.

⚠WARNING **This is a class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.**

2.2. FCC Statement (USA)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.3. EMC Compliance (Canada)

The method of compliance is self-declaration to Canadian standard ICES-003:

(English): This Class A digital apparatus complies with the Canadian ICES-003.

(French): Cet appareil numérique de la class A est conforme à la norme NMB-003 du Canada.

3/ Shipment and Unpacking

Please check that your package is complete, and contains the items below (according to the ordered unit configuration). If you discover damaged or missing items, please contact your dealer.

3.1. Unpacking

Proceed as follows to unpack the unit:

1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping damage.
6. If you notice any shipping damage or inconsistencies between the contents and your order, please contact Kontron for help and information.

3.2. Scope of Delivery

3.2.1. Standard

- 1x KBox E-300 Series (corresponding to the ordered system configuration)

3.2.2. Optional Parts

- 1x Power adapter
- 1x Power cord
- Memory module(s)
- mSATA SSD card
- mPCIe card
- M.2 Key A card
- M.2 Key B card
- Antenna(s)
- VESA mounting kit

4/ System Overview

The KBox E-300 Series is a fanless system enclosed within a robust compact aluminum chassis with cooling fins, offering the superior qualities for operation in harsh environments.

It can be optionally factory-equipped with an mPCIe WLAN card for two antennas. Users may choose the implementation of a 2.5" SATA HDD / SSD and / or of an M.2 SSD card as storage media.

The following interfaces are available with the KBox E-300 Series:

Standard Front Panel:

- 4x USB 3.0
- 1x Line-Out / Mic-In
- 1x Micro-D Cage
- 1x Power Button with LED
- 1x Storage LED (for M.2 Key B)
- 1x Wireless LED (for mPCIe)
- 1x RTC Reset Button
- 1x Wafer for External Power Button
- 2x Wi-Fi Antenna Port
- 1x 3G / 4G Antenna Port

Standard Rear Panel:

- 2x HDMI
- 2x GbE LAN
- 2x RS232/422/485
- 1x 2-pin Phoenix Connector

Standard Baseboard and System Expansion Capabilities:

- 2x DDR3L SO-DIMM memory socket (DIMM1 & DIMM2)
- 1x full-sized mSATA / mPCIe socket (switchable via BIOS, MPCIE1)
- 1x M.2 Key A socket (type 22x30, SLOT1)
- 1x M.2 Key B socket (type 22x42 or type 22x80, CON2)
- 1x Micro SIM Card Cage (switchable for M.2 Key B and mPCIe, SIM1)

The device is designed to be operated in:

- Vertical position: mounted on the back of the monitor or inside a control cabinet / custom enclosure / machine (with a VESA mounting kit) or
- Horizontal position: placed as a desktop unit.

NOTICE

When powering on the KBox E-300 Series, make sure that the cooling fins of the chassis are not obstructed (covered) by any objects.

To provide sufficient heat dissipation by the cooling of the device, do not cover the cooling fins of the KBox E-300 Series. Do not place any objects on the device. When installing the system, please keep clearance for air circulation.

4.1. System Expansion Capabilities

4.1.1. System Expansion via mPCIe / mSATA Card Interface

The baseboard comes with an onboard mPCIe / mSATA interface connector. The switch between mPCIe and mSATA can be taken via BIOS. The default setting is mPCIe. The connector is intended to be used to install a full-sized mPCIe WLAN card or mPCIe 3G / 4G card when mPCIe is enabled. It is used to install a full-sized mSATA SSD card drive when mSATA is enabled.

4.1.2. System Expansion via M.2 Card Interface

The baseboard comes with two onboard M.2 interface connectors. One supports Key A Type 22x30 and the other supports Key B type 22x42 or type 22x80. An additional fixing bolt extension is required when the Key B socket is installed a type 22x42 card and at the same time the Key A socket will not be able to accommodate any card.

The Key A socket is intended to be used to install an M.2 WLAN card while the Key B socket is used to install an M.2 SSD card drive (M.2 3G / 4G card is acceptable at this socket.).

To optimize the system functionality, we suggest the following expansion configuration.
(1) In case the system has both Wi-Fi and 3G / 4G wireless capabilities, install

- **an M.2 Type 22x80 SSD card in M.2 Key B socket;**
- **an M.2 Type 22x30 Wi-Fi card in M.2 Key A socket; and**
- **a full-sized mPCIe 3G / 4G card in mPCIe socket.**

(2) In case the system has either Wi-Fi or 3G / 4G wireless capability, install

- **an M.2 Type 22x80 / Type 22x42 SSD card in M.2 Key B socket; and**
- **a full-sized mPCIe Wi-Fi or 3G / 4G card in mCIe socket.**

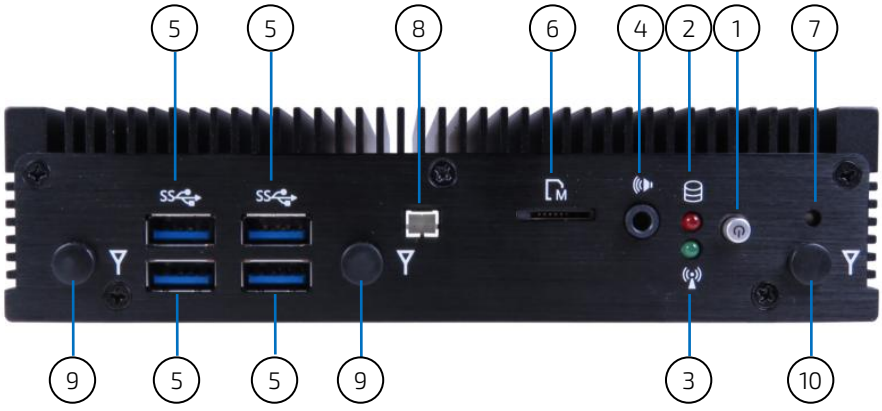
4.1.3. System Expansion via Micro SIM Socket

The baseboard comes with an onboard socket for a Micro SIM card.

In order to use the Micro SIM card reader functionality, a corresponding mPCIe modem card or M.2 modem card must be installed to the full-sized mPCIe socket or M.2 Key B socket of your KBox E-300 Series, which can be switched via the Jumper JP1. The default setting is to connect the Micro SIM card reader to mPCIe.

4.2. Front I/O Panel

Figure 1: Front I/O Panel



1 Power Button with LED (see Chapter 4.2.1)
2 Storage LED (see Chapter 4.2.2)
3 Wireless LED (see Chapter 4.2.3)
4 Line-Out / Mic-In (see Chapter 4.2.4)
5 USB 3.0 (see Chapter 4.2.5)
6 Micro SD Cage (see Chapter 4.2.6)
7 RTC Reset Button (see Chapter 4.2.7)
8 Wafer for External Power Button (see Chapter 4.2.8)
9 Wi-Fi Antenna Port (see Chapter 4.2.9)
10 3G / 4G Antenna Port (see Chapter 4.2.10)

4.2.1. Power Button with LED

Press this button to turn the system on or off.

The power LED lights up blue if the system powered on.

Prerequisite: The system must be attached by means of the power cord to an appropriate mains (DC).

⚠WARNING

Even when the system is turned off via the power button there is still a standby voltage on the baseboard. The unit is only completely disconnected from the DC mains, when the power is removed.

Table 1: Power LED Status

LED Status	Description
Blue LED On	S0 Power Status
Blue LED Blink	S1 Power Status
Red LED Blink	S3 Power Status

LED Status	Description
Red LED On	S4 / S5 Power Status
LED Off	EUP Power Status

4.2.2. Storage LED

The Storage LED blinks red when the data is being written into or read from the SSD which is installed in M.2 Key B socket. This is the default setting. For other settings see Chapter 4.1.2.

4.2.3. Wireless LED

The Wireless LED blinks green when the data is transferring over the mPCIe wireless card. The default setting is to install a 3G / 4G modem module or Wi-Fi module. For other settings see Chapter 4.1.1 and 4.1.3.

4.2.4. Line-Out / Mic-In

The Line-Out / Mic-In combo jack is used to (1) connect an amplified speaker or headphone to output the system's audio signal; (2) connect a microphone to capture sound from a source and then input it to the system; or (3) connect a headphone with microphone.

4.2.5. USB 3.0

The KBox E-300 Series provides four USB 3.0 / 2.0 interfaces. These connectors allow connection of USB 3.0 or USB 2.0 compatible devices to the system.

4.2.6. Micro SD Cage

The Micro SD Card Cage provides users with expandable memory space suitable for multimedia file retrieval, including images, animations and movie clips, as well as data logging applications.

4.2.7. RTC Reset Button

The RTC (Real Time Clock) reset button allows users to reset the BIOS to defaults. To initiate this function, use the tip of a pen to press the button briefly (for less than three seconds).

4.2.8. Wafer for External Power Button

This wafer allows integrators to locate an external power button / switch to easily power on and off the system in case the system is intended to be mounted / placed inside a cabinet, custom enclosure or machine.

4.2.9. Wi-Fi Antenna Port

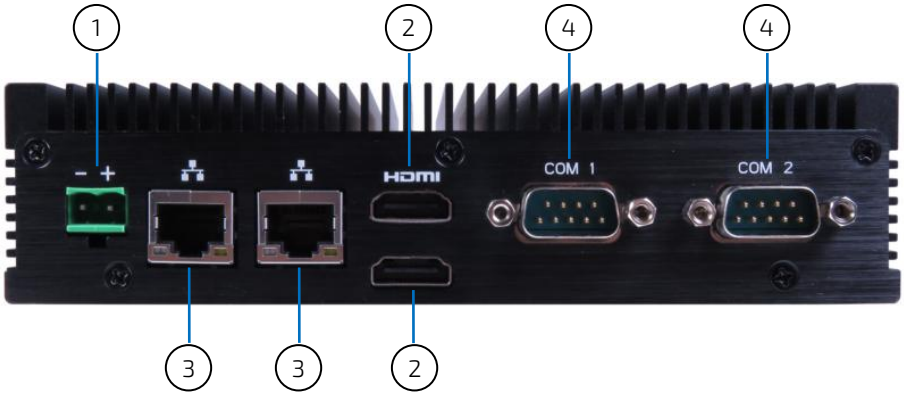
The KBox E-300 Series reserves two covered cutouts for the Reverse (RP) SMA connectors of the WLAN antennas (M.2 WLAN card or mPCIe WLAN card with 2 antennas is an option).

4.2.10. 3G / 4G Antenna Port

The KBox E-300 Series reserves one covered cutout for the Reverse (RP) SMA connector of the 3G / 4G antenna (M.2 3G / 4G card or mPCIe 3G / 4G card with 1 antenna is an option).

4.3. Rear I/O Panel

Figure 2: Rear I/O Panel



1 DC-In (see Chapter 4.3.1)

2 HDMI (see Chapter 4.3.2)

3 GbE (see Chapter 4.3.3)

4 RS232/422/485 (see Chapter 4.3.4)

4.3.1. DC-In (2-pin Phoenix Connector)

For DC connection, users should prepare the connecting wires using the supplied Phoenix plug terminal to plug into this connector.

⚠WARNING Adapter's power cord shall connected to a socket-outlet with earthing connection

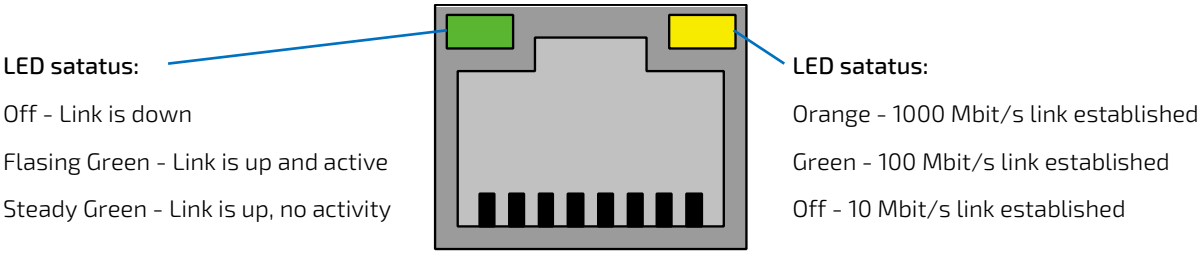
4.3.2. HDMI

Two external (digital) displays can be connected to these HDMI connectors.

4.3.3. GbE

These connectors are Gigabit Ethernet 10/100/1000 Mbit/s, IEEE 1588 capable interfaces. The connectors are standard 8-pin RJ45 type connectors with status LEDs:

Figure 3: Ethernet LED Status

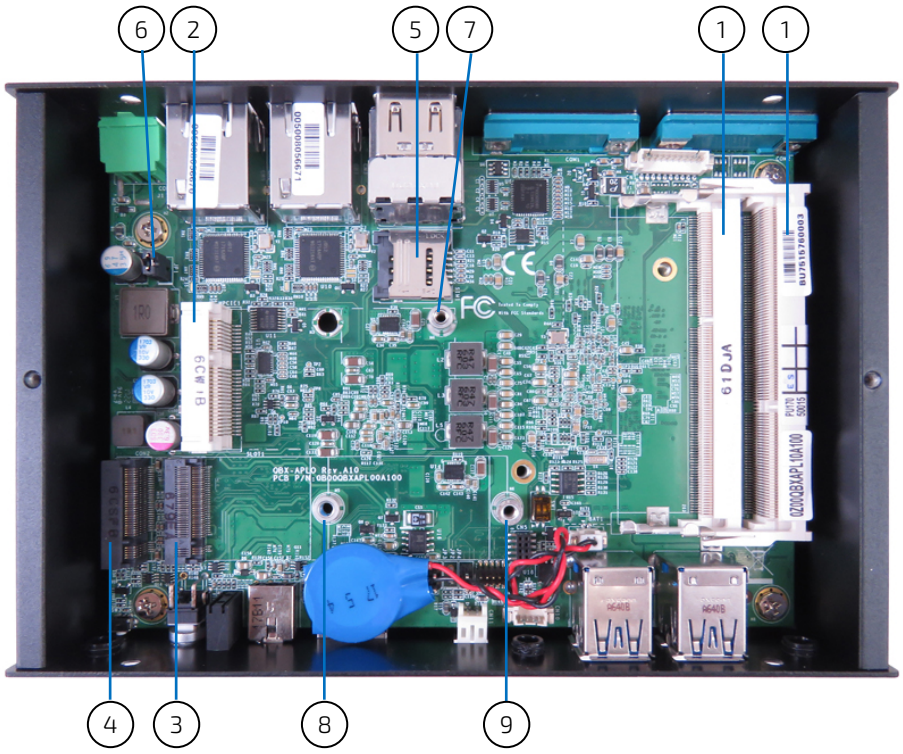


4.3.4. RS232/422/485

COM 1 and COM 2 are provided as a 9-pin D-SUB connector and allow the connection of a serial peripheral. They are designed to support RS232/422/485 serial communication which can be configured via BIOS setup.

4.4. Internal View

Figure 4: Internal view (without cover)



1 DDR3L SO-DIMM Memory Socket (DIMM1 & DIMM2, see Chapter 4.4.1)

2 mPCIe / mSATA Socket (MPCIE1, see Chapter 4.4.2)

3 M.2 Key A Socket (SLOT1, see Chapter 4.4.3)

4 M.2 Key B Socket (CON2, see Chapter 4.4.3)

5 Micro SIM Card Cage (SIM1, see Chapter 4.4.4)

6 Micro SIM Card Selection Jumper (JP1, see Chapter 4.4.5)

7 mPCIe fixing bolt

8 M.2 fixing bolt for Key A type 22x30 or Key B type 22x42

9 M.2 fixing bolt for Key B type 22x80

4.4.1. DDR3L SO-DIMM Memory Socket

The KBox E-300 Series provides two 204-pin DDR3L SO-DIMM socket to install memory RAM.

4.4.2. mPCIe / mSATA Socket

The KBox E-300 Series reserves one mPCIe / mSATA combo socket for expansion with a full-sized mPCIe 3G / 4G or WLAN card by default. To switch to mSATA for SSD installation, see BIOS setting in Chapter 12.2.2.

4.4.3. M.2 Socket

The KBox E-300 Series reserves two M.2 sockets. One is Key A allowing the expansion with a Type 22x30 Wi-Fi, Bluetooth, NFC and / or WiGig card. The other is Key B allowing the expansion with a Type 22x42 / Type 22x80 SSD card (suggested) or 3G / 4G card.

The fixing bolt marked in Figure 4, pos. 8 can be used to fix either a Type 22x30 card installed in M.2 Key A socket or a Type 22x42 card installed in M.2 Key B socket with an additional fixing bolt extension. In case the Key B socket is installed with a Type 22x42 card, the Key A socket will not accommodate any card.

4.4.4. Micro SIM Card Cage

The baseboard of the KBox E-300 Series is equipped with a Micro SIM card cage, which can be switched to connect to either the mPCIe socket or M.2 Key B socket via the jumper JP1 (see Chapter 4.4.5).

To avoid damage to the SIM card, insert the SIM card before you turn the power on and remove the SIM card after you turn the power off.

4.4.5. Micro SIM Card Selection Jumper

The jumper can select to which device the Micro SIM card is connected. The default setting is to connect to mPCIe.

Figure 5: Micro SIM Card Selection Jumper (JP1)

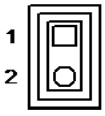


Table 2: Pin Assignment JP1

Jumper Position Pin 1-2	Description
X	mPCIe (Default)
-	M.2 Key B

"X" = Jumper set (short) and "-" = jumper not set (open)

5/ Accessing Internal Components

This section contains important information that you must read before accessing the internal components. You must follow these procedures properly when installing, removing or handling any board.

It is recommended to expand your system with additional mPCIe and / or M.2 card(s) before it is installed into an equipment, machine or cabinet. Please consider following instruction when you install (or remove) expansion cards.

Before installing/removing an add-on card, please pay attention to the following information:

⚠CAUTION

Please observe the "General Safety Instructions for IT-Equipment" provided with the system (refer to the chapter 1/) and the installation instructions in this manual.

Only personnel with appropriate qualifications, trainings and authorization are permitted to install and work with the device.

The installation/removal of HHD / SSD and/or expansion cards may only be performed by a qualified person, according to the description in this manual.

Before removing the cover of the device, make sure that the device is turned off and disconnected from the power supply.

Before you upgrade the device with add-on cards, pay attention to the power specifications in chapter 10/ "Technical Specifications" and make sure that the power consumption of the add-on cards does not exceed 5 W per card.

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

Please pay attention to the manufacturer's instructions before installing/removing an add-on card.

5.1. Opening and Closing the KBox E-300 Series

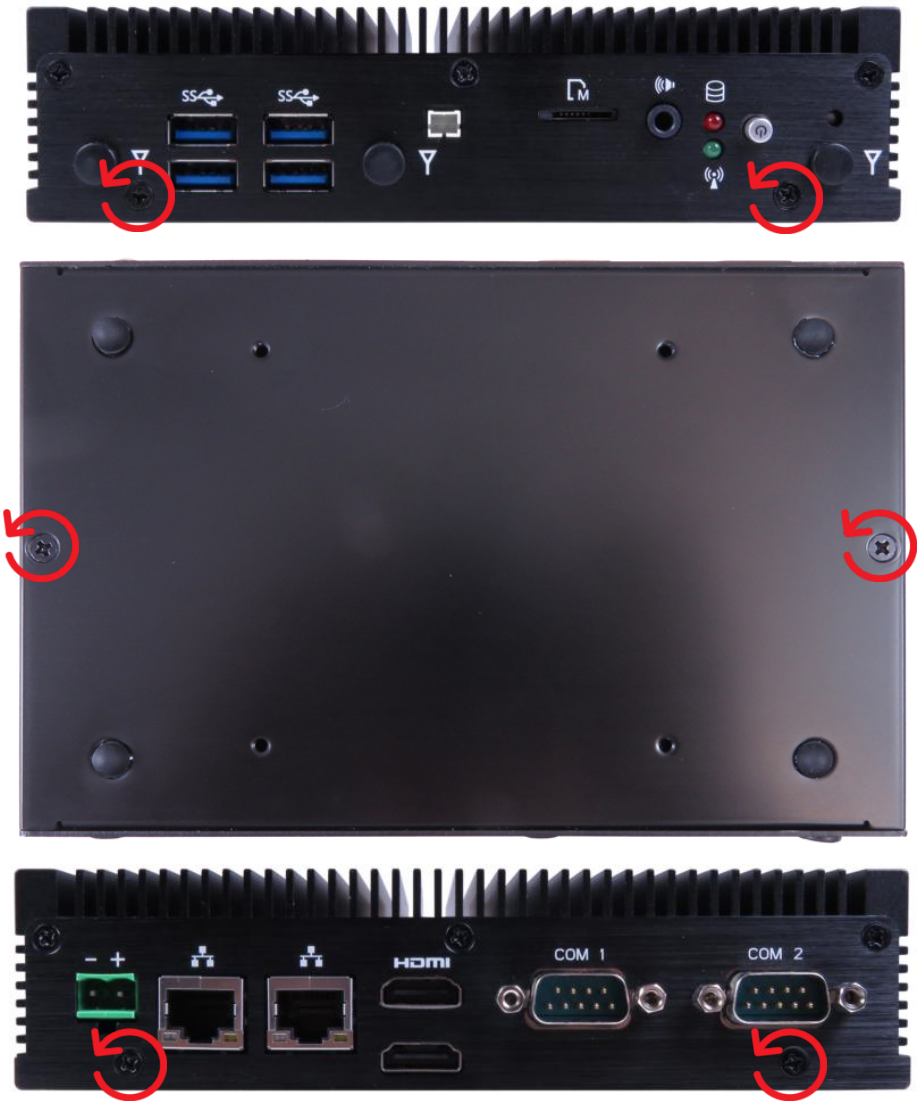
⚠CAUTION

Before opening the KBox E-300 Series, the system must be switched off and disconnected from the main power supply. Also, disconnect all peripheral devices from the KBox E-300 Series. Before you begin, ensure that you have a clean, flat and ESD-safe surface to work on.

For opening and closing the KBox E-300 Series, please perform the following steps:

1. Close all applications. Shut down the system properly and disconnect the connection to the main power source. Disconnect all peripherals.
2. The KBox E-300 Series should lay on a flat, clean surface with the access cover facing upwards.
3. Loosen and remove the Phillips screws (two located on front I/O panel, two on rear I/O panel and the other two on the bottom), that secure the access cover to the chassis. Retain the screws for later use.

Figure 6: Descrewing the access cover of the KBox E-300 Series



4. Lift the access cover up.
5. Now you have access to the internal DDR3L SO-DIMM, mPCIe / mSATA, M.2 and Micro-SIM card slots / sockets respectively in order to remove or install hardware components.
6. For closing replace carefully the access cover to the system and screw it on with the retained screws.
7. Tighten the retained screws when the cover is firmly in place.

NOTICE

When used as intended, the KBox E-300 Series is to operate only in closed condition. Only when the access cover is properly fixed with the screws and the front side with WLAN and / or 3G / 4G antennas are properly installed and secured with the screws, it is ensured that the user does not have access to the internal parts of the KBox E-300 Series.

5.1.1. Installing an mPCIe expansion card / mSATA SSD

To have access the mPCIe / mSATA socket please proceed according to the steps described:

1. Open the device as described in the subsection 5.1 "Opening and Closing the KBox E-300 Series" (step 1-5).
2. Locate the mPCIe / mSATA socket (MPCIE1) (Figure 4, pos. 2) and the corresponding fixing bolt. (Figure 4, pos. 7).
3. Align the notches on the mPCIe expansion card / mSATA SSD with the notches in the mPCIe / mSATA socket (MPCIE1). Insert the mPCIe expansion card / mSATA SSD into the corresponding socket (Figure 4, pos. 2) and rotate it down with the fixing hole of the card over the fixing bolt.
4. Press the mPCIe expansion card / mSATA SSD down on the side with the fixing hole and secure it with the available fastening screw (Figure 4, pos. 7).
5. In order to close the KBox E-300 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox E-300 Series".

5.1.2. Installing an M.2 SSD / M.2 expansion card

To have access the M.2 socket please proceed according to the steps described:

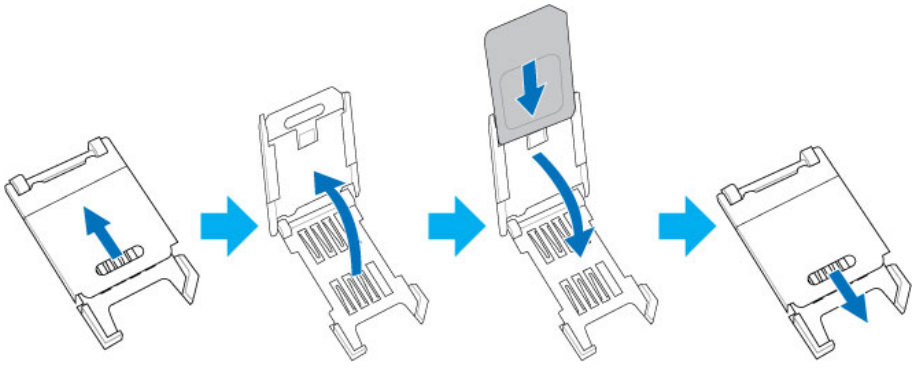
1. Open the device as described in the subsection 5.1 "Opening and Closing the KBox E-300 Series" (step 1-5).
2. Locate the M.2 socket (SLOT1 / CON2) (Figure 4, pos. 3 / pos. 4) which you intend to use for expansion and the corresponding fixing bolt. (Figure 4, pos. 8 / pos. 9). For configuration among card types, socket types and fixing bolts, view Chapter 4.1.2 or 4.4.3.
3. Align the notches on the M.2 SSD / M.2 expansion card with the notches in the M.2 socket (SLOT1 / CON2). Insert the M.2 SSD / M.2 expansion card into the corresponding socket (Figure 4, pos. 3 / pos. 4) and rotate it down with the fixing hole of the card over the fixing bolt.
4. Press the M.2 SSD / M.2 expansion card down on the side with the fixing hole and secure it with the available fastening screw (Figure 4, pos. 8 / pos. 9).
5. In order to close the KBox E-300 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox E-300 Series".

5.1.3. Installing the Micro SIM card

To have access the Micro SIM card socket please proceed according to the steps described:

1. Open the device as described in the subsection 5.1 "Opening and Closing the KBox E-300 Series" (step 1-5).
2. Locate the Micro SIM card socket (SIM1) (Figure 4, pos. 5).
3. To unlock the Micro SIM card socket slide the cover of the Micro SIM socket in the direction shown in Figure 7.
4. Lift gently the slot cover and open the slot cover as shown in Figure 7.
5. Slide the Micro SIM card into the left and right card guides of the socket cover and push down the cover in order to close the cover as shown in Figure 7.
6. After closing the cover, lock the cover by sliding the closed cover in the direction shown in Figure 7.

Figure 7: Installing the Micro SIM card



7. In order to close the KBox E-300 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox E-300 Series".

6/ Thermal Considerations

6.1. Available Processors

Please refer to the chapter 10/ "Technical Specifications".

The list of processors may be extended over the product lifetime.

6.2. Convection Cooling

The applied cooling method provides adequate cooling of the device during operation and performs a one-way thermal transfer to the chassis. Three sides of the KBox E-300 Series consist of a compact aluminum U-shaped chassis are with cooling fins. The cooling fins provide heat dissipation during operation.

To provide sufficient heat dissipation for the cooling of the KBox E-300 Series, never cover the cooling fins of the chassis. Do not place any objects on the device.

6.3. System Clearance

To provide a maximum of airflow through and around the box, proper distances to surrounding parts must be observed.

6.4. Maximum Temperatures

The maximum system ambient temperature depends mostly on the power consumption of the processor and the chipset.

For the temperature evaluation a specialised tool from Intel® was used to set the processor to a defined workload. Depending on the power consumption one or more cores were set to 75% workload. This includes the graphics core. The tool also handles the usage of the "Turbo Mode" of certain processor types.

The processor utilization depends highly on the software used. Software using multicore feature will run on several cores whereas standard software will only utilize one core. In this case the processor will use the "Turbo Mode" to increase the clock for the core with the highest workload, as long as the temperature is within limits.

6.5. Third Party Components

When the KBox E-300 Series is extended and configured with third party components like mPCIe expansion card, M.2 expansion card and hard drives (HDD or SSD), it has to be taken into account that the air temperature inside the system is higher than the ambient temperature. An approximately internal temperature rise is given for assistance.

7/ Installation Instructions

The KBox E-300 Series system is designed for operating:

- within a control cabinet/ custom enclosure / machine or onto a wall / the back of a monitor by use of a VESA mounting kit
- as desktop unit.

Expansion card installation should be performed before installing the KBox E-300 Series into control cabinet / custom enclosure / machine, or onto wall / monitor.

NOTICE

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 the system chassis.

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

Prior any installation work, ensure that there are no live wires on the installation site.

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

Do not operate the KBox E-300 Series with foreign objects inside the chassis.

Further do not insert any retrieval device into the device while it is connected to power.

Kontron rejects all liability for any and all damages resulting from operation of the unit with foreign objects inside the chassis.

The KBox E-300 Series has to be installed and operated only by trained and qualified personnel.

Only personnel with appropriate qualifications, trainings and authorization are permitted to install and work with the Kontron KBox E-300 Series.

This device shall only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements.

The unit must be placed such that there is sufficient space in front and rear of it for connecting the cables to the I/O interface connectors and for operating the power button.

Leave sufficient free space around the unit to prevent the device from possibly overheating!

Refer also to section 10.1.2 “Mechanical Specifications”.

The KBox E-300 Series must be firmly attached to a clean flat and solid mounting surface. Use proper fastening materials suitable for the mounting surface. Ensure that the mounting surface type and the used mounting solution safely support the load of the KBox E-300 Series and the attached components.

Please follow the local/national regulations for grounding.

The voltage feeds must not be overloaded. Adjust the cabling and the overcurrent protection to correspond with the electrical figures indicated on the type label.

The type label is located next to the access cover of the system.

It is recommended that the last cable attached to the system should be the power cable! Refer to the section 7.2 “DC Power Connection” and chapter 8/ “Starting Up”.

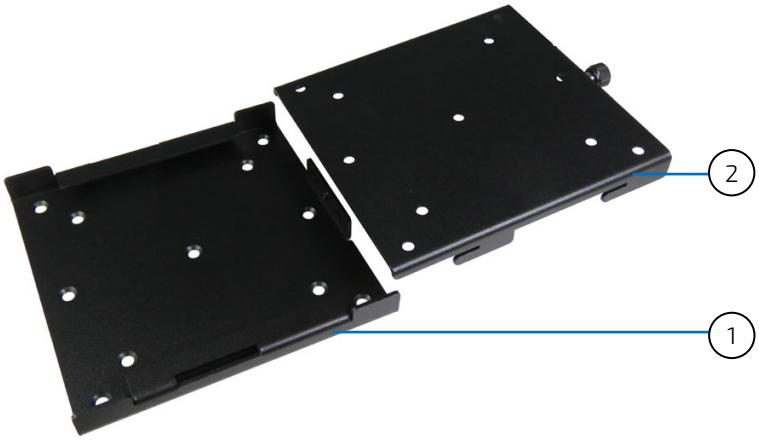
7.1. System Mounting

In order to adapt the KBox E-300 Series for mounting Kontron offers different mounting solution such as:

- KBox E-300 Series configuration with a VESA mounting kit for vertical installation into a control cabinet / custom enclosure / machine or onto a wall / the back of a monitor
- KBox E-300 Series as desktop unit

Depending on the ordered KBox E-300 Series configuration, your system may be supplied with a VESA mounting kit (Figure 8). The kit consists of two parts: a base bracket (Figure 8, pos. 1) to be fixed permanently on the mounting surface and another hooked bracket to hold the KBox E-300 Series with a hand-screw knob (Figure 8, pos. 2) to secure two brackets.

Figure 8: Optional VESA mounting kit

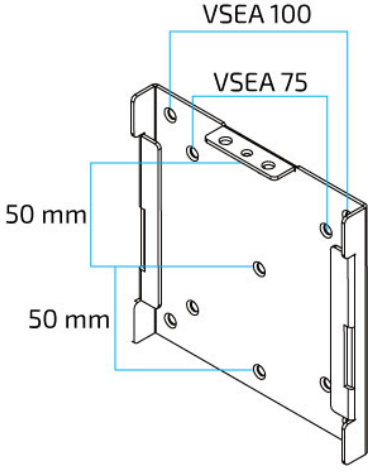


1 Base mounting bracket

2 Hooked mounting bracket with a hand-screw knob

The base mounting bracket complies with VESA 75 and VESA 100 patterns (Figure 9). To fasten the bracket, the control cabinet / custom enclosure / machine / monitor / wall must have VESA 75, VESA 100 or other screw pattern shown as Figure 9 for mounting.

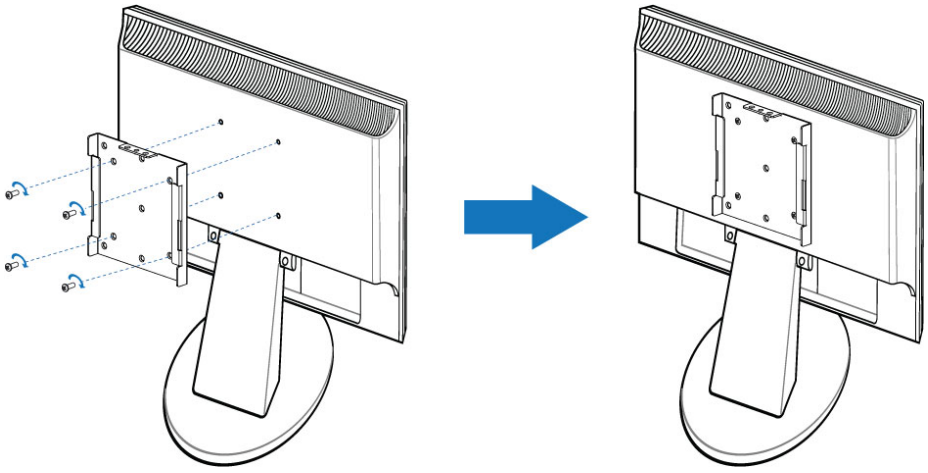
Figure 9: Hole pattern of base mounting kit for KBox E-300 Series



To mount the KBox E-300 Series please proceed according to the steps described:

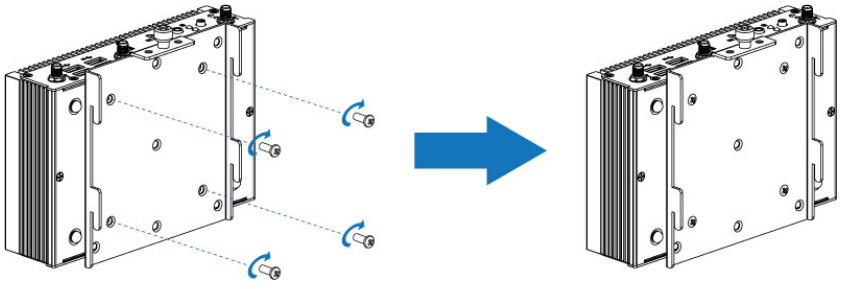
1. Prepare the mounting surface with sufficient screws (four screws for VESA mount) and if necessary anchors corresponding to the mounting surface type if no VESA-compliant screw holes are available. (The recommended screw size is M4 x 6 ~ 10 mm but it still depends on the available screw holes of the mounting surface and never be larger than M4 if any.)
2. Secure the base mounting bracket to the mounting surface with screws (Figure 10). The following figures take VESA mounting to a monitor as an example.

Figure 10: Securing the base mounting bracket



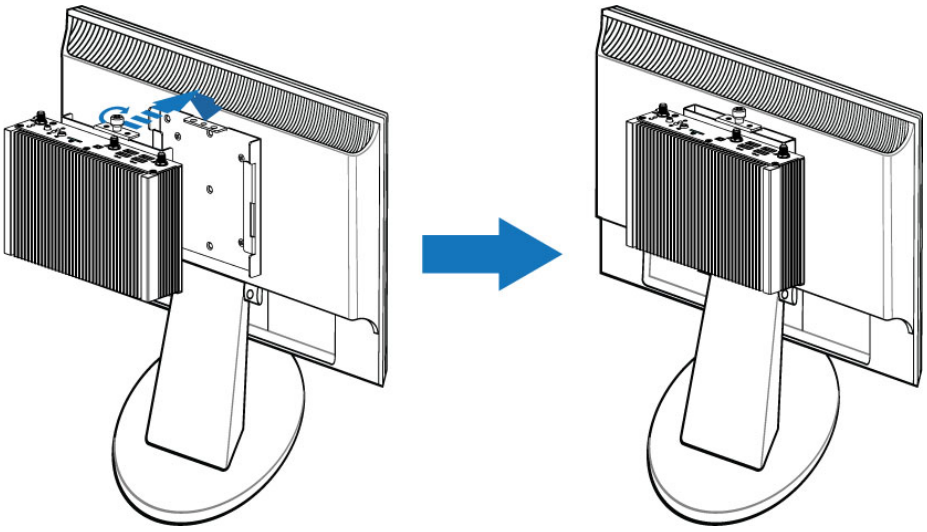
3. Secure the hooked mounting bracket onto the bottom side of the KBox E-300 (Figure 11) with M3 screws (6 mm long). The front I/O panel should be placed upward.

Figure 11: Securing the hooked mounting bracket onto the KBox E-300 Series



4. Place the KBox E-300 Series onto the mounting surface by sliding the hooked mounting bracket into the based mounting bracket (Figure 12).
5. Secure the hand-screw knob located on the hooked mounting bracket to fix two brackets (Figure 12).

Figure 12: Securing the KBox E-300 Series onto the mounting surface



For a sufficient air circulation around the device, we recommend keep a proper clearance and not mount / operate any other devices within the clearance around the KBox E-300 Series.

7.2. DC Power Connection

The KBox E-300 Series is connected by a 2-pin Phoenix connector via a DC power supply wiring (Figure 2, pos. 1, only the Phoenix power plug terminal is included) to a DC power source.

The KBox E-300 Series is delivered with a 2-pin Phoenix power plug terminal. For DC connection, prepare the connecting wires using the supplied Phoenix plug terminal.

Figure 13: Phoenix power plug terminal

1 Slotted pan head screw for securing the wire

2 Location for inserting the positive (+) input wire

3 Location for inserting the negative (-) input wire

7.2.1. Cabling

For the pin assignment Phoenix power plug terminal refer to the subsection 11.1.1 "Phoenix Connector".

1. Cut the required length two isolated wires (1mm2) AWG 18 and strip each end 5 ~ 7 mm.
2. Twist the striped wire-ends and provide them with ferrules.
3. Loosen the two slotted pan head screws of the DC plug terminal far enough so that you can insert the end of the prepared wires.
4. Insert the wires into the corresponding clamp of the Phoenix plug terminal. Make sure that you have the right polarity of the connection [refer to Figure 13 or subsection 11.1.1 "Phoenix Connector"].
5. Fasten the screws to secure the wires into the clamps of the plug terminal.

In case you order a power adapter from Kontron, the white wire of the supplied adapter carries the positive (+) end while the black one carries the negative (-) end.

8/ Starting Up

The KBox E-300 Series must be only operated with the nominal voltage of 9 V ~ 24 V DC of type SELV. For details refer to the chapter 10/ “Technical Specifications”.

8.1. Connecting to DC Power Supply

The Phoenix connector (Figure 2, pos. 1) is located on the rear side of the KBox E-300 Series. The KBox E-300 Series will be connected to a DC main power supply via the supplied Phoenix power plug terminal (see Figure 13) and corresponding power wires (prepared as described in the subsection 7.2.1 "Cabling")

Before using your system, become familiar with the system components and check that everything is connected properly. Following a proper cabling procedure will prevent a false power-on condition, which could result in unit operational failure.

When you install/disconnect the unit, the functional earth connection must always be made first and disconnected last.

Also, it is recommended that the last connections attached to the system should be the power wires!

NOTICE

The KBox E-300 Series must be connected DC main power supply complying with the SELV (Safety Extra Low Voltage) requirements of EN 60950-1 standard. It must be observed that wiring and short-circuit/overcurrent protection is performed according to the applicable standards, regulations and respect to the electrical specification of the KBox E-300 Series.

Even when the system is turned off via the power switch (Figure 1, pos. 1) parts of the system are still energized.

The disconnecting device (fuse/circuit backer) rating must be in accordance with the wire cross-section and the rated current of the KBox E-300 Series.

The wires used for power connections must be clearly marked (+/-/functional earth) to ensure that they will be proper connected to the DC IN connector of the KBox E-300 Series and to the main power source, corresponding to signals marked; refer to Figure 13 and Table 6.

In addition, the cables must have some form of support so as to minimize the strain on the unit's connectors.

To connect the KBox E-300 Series to a corresponding DC main power supply, please perform the following steps:

1. Ensure that the DC power source is switched off via a disconnecting device (circuit breaker), in order to ensure that no power is flowing from the external DC power source during the connection procedure.
2. Connect the Phoenix power plug terminal prepared as described in the subsection 7.2.1 "Cabling" to the DC input Phoenix connector (Figure 2, pos. 1) of the KBox E-300 Series. The DC input connector is located on the rear side.
3. Connect the other ends of the DC power wires to the connections of the DC main power supply. Pay attention to the polarity of the connections.
4. Switch on the disconnecting device (circuit breaker) in order to apply voltage to the terminals of the power wires.

8.2. Operating System and Hardware Component Drivers

Your system can be supplied optionally with a pre-installed operating system.

If you have ordered your KBox E-300 Series with a pre-installed operating system, all drivers are installed in accordance with the system configuration ordered (optional hardware components). Your system is fully operational when you switch it on for the first time.

If you have ordered The KBox E-300 Series without a pre-installed operating system, you will need to install the operating system and the appropriate drivers for the system configuration you have ordered (optional hardware components) yourself.

You can download the relevant drivers for the installed hardware from our web site at www.kontron.com by selecting the product.

Pay attention to the manufacturer specifications of the operating system and the integrated hardware components.

9/ Maintenance and Cleaning

Equipment from Kontron requires only minimum servicing and maintenance for proper operation.

- For light soiling, clean the KBox E-300 Series with a dry cloth. Carefully remove dust from the surface of the cooling fins of the chassis using a clean, soft brush.
- Stubborn dirt should be removed using a mild detergent and a soft cloth.

Do not use steel wool, metallic threads or solvents like abrasives, alcohol, acetone or benzene for cleaning the KBox E-300 Series.

10/ Technical Specifications

Table 3: Technical Specifications

System	
Processor	Intel® Atom® E3900 Series & Celeron® / Pentium® N-Series Processors
Memory	2x DDR3L SO-DIMM memory socket
Video	
Display Interface	2x HDMI (on rear)
Multiple Display	Dual
Audio	
Audio Codec	Realtek ALC662
Audio Interface	1x Line-out / Mic-In (on front)
Network Connection	
Ethernet	2x GbE LAN (RJ45 on rear, Intel® I210-AT)
Peripheral Connection	
USB	4x USB 3.0 (Type A on front)
Serial Port	2x RS232/422/485 (DB9 on rear)
Storage & Expansion	
Storage & Expansion	1x Micro-SD Cage (on front, w/o boot support) 1x mPCIe / mSATA (full size, switchable via BIOS) 1x M.2 Key A Type 22x30 1x M.2 Key B Type 22x42 or 22x80 1x Micro SIM Card Cage (switchable for M.2 Key B or mPCIe)
Power	
Input Voltage	DC 9 V ~ 24 V
Connector	2-pin Phoenix Connector (on rear)
Firmware	
BIOS	AMI uEFI BIOS w/ 128 Mb SPI Flash
Watchdog	Programmable WDT to generate system reset event
H/W Monitor	Voltages, Temperatures
Real Time Clock	SoC integrated RTC
TPM	Optional (Infineon SLB 9665 TPM 2.0)
System Control & Monitoring	
Button, Switch & Indicator	1x Power Button w/ LED (on front) 1x RTC Reset Button (on front) 1x Wafer for External Power Switch (on front) 1x M.2 Key B Activity LED (on front) 1x mPCIe Activity LED (on front)
Cooling	

Cooling Method	Passive
Software	
OS Support	Windows 10 Linux

10.1. Mechanical Specifications

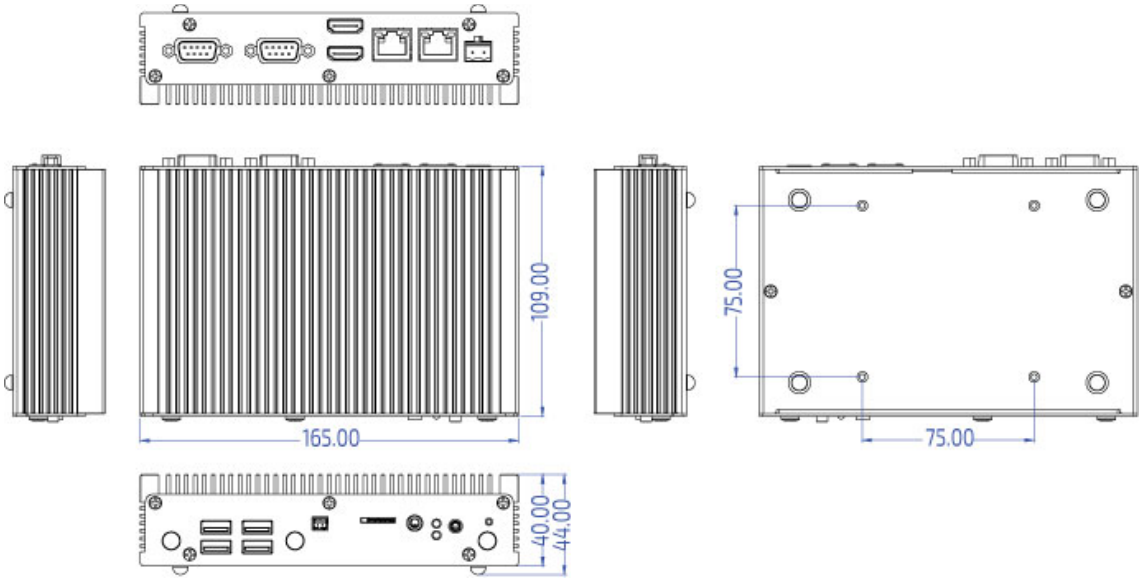
Table 4: Mechanical Specifications

Construction	Aluminum Chassis
Dimensions (W x D x H)	165 mm x 109 mm x 40 mm / 6.50" x 4.29" x 1.57" (Standard temperature model) 165 mm x 109 mm x 48 mm / 6.50" x 4.29" x 1.89" (Extended temperature model)
Weight	750 g / 1.65 lb
Mounting	VESA Mount

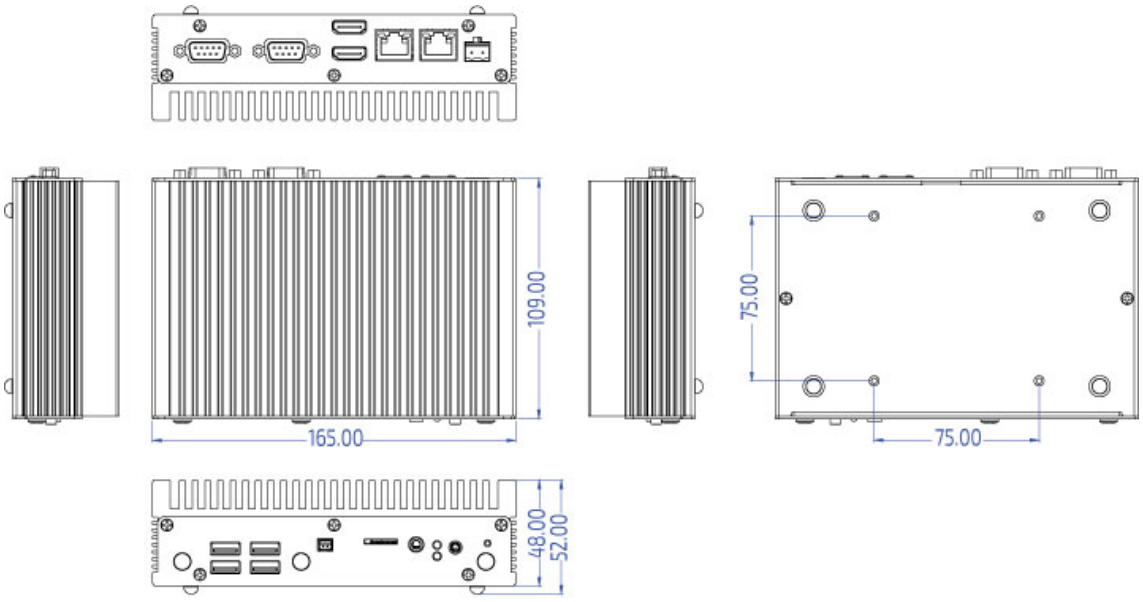
10.1.1. Mechanical Drawing

Figure 14: Mechanical Drawing

Standard Temperature Model



Extended Temperature Model



(unit: mm)

10.2. Environmental Conditions

Table 5: Environmental Conditions

Operating Temperature	0 °C ~ 50 °C / 32 °F ~ 122 °F (Standard) -20 °C ~ 70 °C / -4 °F ~ 158 °F (Extended)
Storage Temperature	-20 °C ~ 80 °C / -4 °F ~ 176 °F
Humidity	0 % ~ 90 %

10.3. Standards and Certifications

Table 6: Standards and Certifications

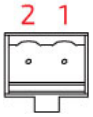
CE Class A	▶ EN 55032: 2015 + AC: 2016, CISPR 32: 2015 + COR1: 2016: Class A, AS/NZS CISPR 32: 2015: Class A ▶ EN 61000-3-2: 2014 and IEC 61000-3-2: 2014 ▶ EN 61000-3-3: 2013 and IEC 61000-3-3: 2013 ▶ EN 55024: 2010 + A1: 2015 and CISPR 24: 2010 + A1: 2015 ▶ EN 61000-4-2: 2009 and IEC 61000-4-2: 2008 ▶ EN 61000-4-3: 2006 + A1: 2008 + A2: 2010 and IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010 ▶ EN 61000-4-4: 2012 and IEC 61000-4-4: 2012 ▶ EN 61000-4-5: 2014 and IEC 61000-4-5: 2014 ▶ EN 61000-4-6: 2014 + AC: 2015 and IEC 61000-4-6: 2013 ▶ EN 61000-4-8: 2010 and IEC 61000-4-8: 2009 ▶ EN 61000-4-11: 2004 and IEC 61000-4-11: 2004
FCC Class A	▶ FCC CFR Title 47 Part 15 Subpart B: 2017 - Section 15.107 and 15.109 ▶ ANSI C63.4-2014 ▶ ICES-003 Issue 6: 2016 ▶ Class A

11/ Standard Interfaces – Pin Assignments

Low-active signals are indicated by a minus sign.

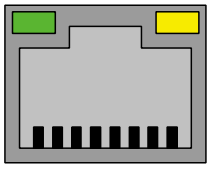
11.1.1. 9-24V DC Power Input

Table 7: 9-24V DC Power Input (see Figure 2, pos.1)

Pin	Signal Name	9-24V DC Power Input (2-pin Phoenix Connector)
1	+9-24V DC	
2	GND	

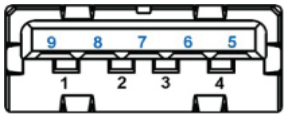
11.1.2. Ethernet Connectors

Table 8: Ethernet Connector (see Figure 2, pos. 3)

Pin	Signal Name	LAN1, LAN2 (RJ45)
1	TX1+	
2	TX1-	
3	TX2+	
4	TX3+	
5	TX3-	
6	TX2-	
7	TX4+	
8	TX4-	

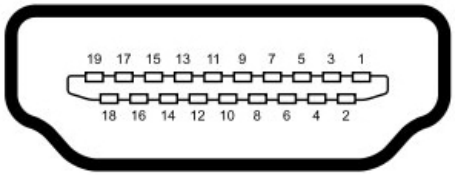
11.1.3. USB 3.0 Port

Table 9: USB 3.0 Port (see Figure 1, pos. 5)

USB 2.0 Contact Pins		USB 3.0 Contact Pins		9-pin USB Connector Type A Version 3.0 / 2.0
Pin	Signal Name	Pin	Signal Name	
1	+USBVCC	5	USB_RX-	
2	USB_D-	6	USB_RX+	
3	USB_D+	7	GND	
4	GND	8	USB_TX-	
		9	USB_TX+	

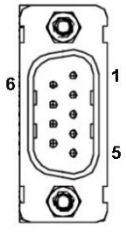
11.1.4. HDMI Connector

Table 10: HDMI Connector (see Figure 2, pos. 2)

Pin	Signal Name	HDMI Connector Type A Version 1.4
1	TMDS Data2+	
2	Ground	
3	TMDS Data2–	
4	TMDS Data1+	
5	Ground	
6	TMDS Data1–	
7	TMDS Data0+	
8	Ground	
9	TMDS Data0–	
10	TMDS Clock+	
11	Ground	
12	TMDS Clock–	
13	Reserved	
14	Reserved	
15	DDC_CLK	
16	DDC_DATA	
17	Ground	
18	+5 V Power	
19	Hot Plug Detect	

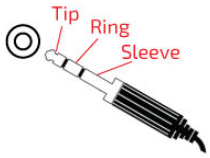
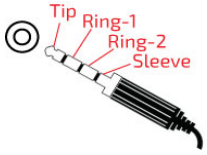
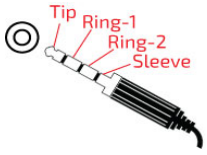
11.1.5. RS232/422/485 Serial Port

Table 11: RS232/422/485 Serial Port (see Figure 2, pos. 4)

Pin	RS232	RS422	RS485 Half Duplex	RS485 Full Duplex	COM1, COM2 (9-pin D-SUB Male Connector)
1	DCD	TX-	DATA-	TX-	
2	RXD	TX+	DATA+	TX+	
3	TXD	RX+	N/A	RX+	
4	DTR	RX-	N/A	RX-	
5	GND	GND	GND	GND	
6	DSR	N/A	N/A	N/A	
7	RTS	N/A	N/A	N/A	
8	CTS	N/A	N/A	N/A	
9	RI	N/A	N/A	N/A	

11.1.6. Line-Out / Min-In Combo Jack

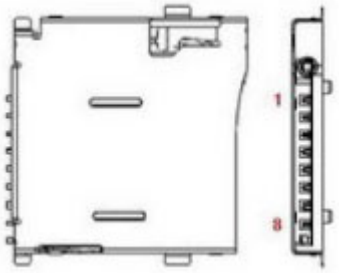
Table 12: Line-Out / Mic-In Combo Jack (see Figure 1, pos. 4)

Pin	Signal Name	Audio Connector & Corresponding Audio Jack Plug
TRS Type Headphone Jack Plug (support audio / headphone output only)		
Tip	Line-Out_L	
Ring	Line-Out_R	
Sleeve	GND	
Standard TRRS Type Headphone / Microphone Combo Jack Plug (support audio / headphone output and microphone input)		
Tip	Line-Out_L	
Ring-1	Line-Out_R	
Ring-2	GND	
Sleeve	Mic-In	
OMTP TRRS Type Headphone / Microphone Combo Jack Plug (support audio / headphone output only)		
Tip	Line-Out_L	
Ring-1	Line-Out_R	
Ring-2	Mic-in	
Sleeve	GND	

When plugging a microphone or combined headset into the audio combo jack, make sure the required connector type is correct, otherwise, the microphone will not work.

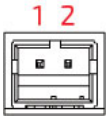
11.1.7. Micro-SD Card Cage

Table 13: Micro-SD Card Cage (see Figure 1, pos. 6)

Pin	Signal Name	Micro-SD Card Cage
1	DAT2	
2	CD/DAT3	
3	CMD	
4	VDD	
5	CLK	
6	GND	
7	DAT0	
8	DAT1	

11.1.8. Wafer for External Power Switch

Table 14: Wafer for External Power Switch (see Figure 1, pos. 8)

Pin	Signal Name	Wafer for External Power Switch
1	PWR_SW+	
2	PWR_SW-	

12/ uEFI BIOS

12.1. Starting the uEFI BIOS

The KBox E-300 Series is provided with a Kontron-customized, pre-installed and configured version of AMI Aptio® V uEFI BIOS. AMI BIOS firmware is based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI. This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the KBox E-300 Series.

The BIOS version covered in this document might not be the latest version. The latest version might have certain differences to the BIOS options and features described in this chapter.

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 the accessing of various menus that provide functions or access to sub-menus with more specific functions of their own.

To start the uEFI BIOS setup program, follow the steps below:

1. Power on the board.
2. Wait until the first characters appear on the screen (POST messages or splash screen).
3. Press the <DEL> key.
4. If the uEFI BIOS is password-protected, a request for password will appear. Enter either the User Password or the Supervisor Password (see Security menu), press <RETURN>, and proceed with step 5.
5. A setup menu will appear.

The KBox E-300 Series uEFI BIOS setup program uses a hot key-based navigation system. A hot key legend bar is located on the bottom of the setup screens.

The following table provides information concerning the usage of these hot keys.

Table 15: Navigation Hot Keys Available in the Legend Bar

Hotkeys	Description
<F1>	The <F1> key invokes the General Help window.
<->	The <Minus> key selects the next lower value within a field.
<+>	The <Plus> key selects the next higher value within a field.
<F2>	The <F2> key loads the previous values.
<F3>	The <F3> key loads the standard default values.
<F4>	The <F4> key saves the current settings and exit the uEFI BIOS setup.
<→> or <←>	The <Left/Right> arrows selects major setup menus on the menu bar. For example: Main, Advanced, Security, etc.
< ↑ > or < ↓ >	The <Up/Down> arrows selects fields in the current menu. For example: A setup function or a sub-screen.
<ESC>	The <ESC> key exits a major setup menu and enter the Exit setup menu. Pressing the <ESC> key in a sub-menu displays the next higher menu level.
<RERURN>	The <RETURN> key executes a command or select a submenu.

12.2. Setup Menus

The Setup utility features shows six menus in the selection bar at the top of the screen:

- Main
- Advanced
- Power
- Boot
- Security
- Save & Exit

The Setup menus are selected via the left and right arrow keys. The currently active menu and the currently active uEFI BIOS Setup item are highlighted in white. Each Setup menu provides two main frames. The left frame displays all available functions. Functions that can be configured are displayed in blue. Functions displayed in gray provide information about the status or the operational configuration. The right frame displays an Item Specific Help window providing an explanation of the respective function.

12.2.1. Main Setup Menu

Upon entering the uEFI BIOS Setup program, the Main Setup menu is displayed. This screen lists the Main Setup menu sub-screens and provides basic system information. Additionally functions for setting the system time and date are offered.

Table 16: Main Setup Menu Sub-Screens and Functions

Function	Description
BIOS Information	Read only field. Displays information about the system BIOS
Memory Information	Read only field. Displays information about total memory
ME Information	Read only field. Displays information about Intel Management Engine (ME) version
Firmware Information	Code version and firmware information
System Date	Set System Date
System Time	Set System Time

Figure 15: BIOS Main Menu Screen System Data and Time

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Product Information					
Product Name		KBox E-300			
BIOS Version		R0.02 (x64)			
BIOS Build Date		07/11/2017			
ME FW Version		3.0.20.1139			
CPU Information					
Intel® Celeron® CPU N3350 @ 1.10GHz					
Microcode Revision		28			
Processor Cores		2		→ ←: Select Screen	
Memory Information				↑ ↓: Select Item	
Total Size		2048 MB (DDR3L)		Enter: Select	
Frequency		1600 MHz		+/-: Change Opt.	
				F1: General Help	
System Date		[Tue 11/28/2017]		F2: Previous Values	
System Time		[17:19:47]		F3: Optimized Defaults	
				F4: Save & Exit	
Access Level		Administrator		ESC: Exit	
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Feature	Option	Description
System Date	[dd/mm/yyyy]	Set the Date. Use Tab to switch between Data elements.
System Time	[hh:mm:ss]	Set the Time. Use Tab to switch between Time elements.

12.2.2. Advanced Setup Menu

The Advanced setup menu provides sub-screens and functions for advanced configurations. The following sub-screen functions are included in the menu:

- LAN & Audio Configuration & MPCIE1 Slot Device Type Selection
- Display Configuration
- Super IO Configuration
- CPU Chipset Configuration
- SATA Configuration
- USB Configuration
- DIO Configuration
- Network Stack
- H/W Monitor

NOTICE

Setting items on this screen to incorrect values may cause the system to malfunction.

Figure 16: BIOS Advanced Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Onboard LAN1 Controller		[Enabled]			
Onboard LAN2 Controller		[Enabled]			
Audio Controller		[Enabled]			
MPCIE1 slot Device Type		[mPCI-E]			
				→←: Select Screen	
> Display Configuration				↑ ↓: Select Item	
> Super IO Configuration				Enter: Select	
> CPU Chipset Configuration				+/-: Change Opt.	
> SATA Configuration				F1: General Help	
> USB Configuration				F2: Previous Values	
> DIO Configuration				F3: Optimized Defaults	
> Network Stack				F4: Save & Exit	
> H/W Monitor				ESC: Exit	
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Feature	Option	Description
Onboard LAN1 Controller	[Disabled], [Enabled]	Select whether to enable or disable Onboard LAN1 Controller.
Onboard LAN2 Controller	[Disabled], [Enabled]	Select whether to enable or disable Onboard LAN2 Controller.
Audio Controller	[Disabled], [Enabled]	Select whether to enable or disable Audio Controller.
MPCIE1 slot Device Type	[mSATA], [mPCI-E]	Select the type of MPXIE1 slot. Default setting is "mPCI-E".

Figure 17: BIOS Advanced Menu - Display Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Display Configuration					
Primary Display		[IGD]		→←: Select Screen	
UWA Frame Buffer Size		[256MB]		↑ ↓: Select Item	
DVMT Pre-Allocated		[64M]		Enter: Select	
DVMT Total Gfx Mem		[256M]		+/-: Change Opt.	
				F1: General Help	
> AMI Graphic Output Protocol Policy				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Primary Display	[IGD], [PCIe]	Select which graphic controller to be used as the primary display device.
UWA Frame Buffer Size	[128MB], [256MB], [512MB]	Select the Aperture Size.
DVMT Pre-Allocated	[64M], [96M], [128M], [160M], [192M], [224M], [256M], [288M], [320M], [352M], [384M], [416M], [448M], [480M], [512M]	Select DVMT Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	[128M], [256M], [MAX]	Select DVMT Total Graphic Memory size used by the Internal Graphics Device.

Figure 18: BIOS Advanced Menu - Super IO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Super IO Configuration					
> Serial Port 1 Configuration				→ ←: Select Screen	
> Serial Port 2 Configuration				↑ ↓: Select Item	
				Enter: Select	
				+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Figure 19: BIOS Advanced Menu - Super IO Configuration - Serial Port 1 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 1 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=3F8h; IRQ=4;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
Serial Port 1 Type		[RS232]		F1: General Help	
RS485 Deplux Mode*		[Half Duplex]		F2: Previous Values	
RS485 Auto Flow Control*		[Disabled]		F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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* These items appear only when selecting RS485 for the Serial Port 1 Type.

Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=3F8h; IRQ=4;], [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Feature	Option	Description
Serial Port 1 Type	[RS232], [RS422], [RS485]	Select an appropriate type for Serial Port 1.
RS485 Duplex Mode	[Half Duplex], [Full Duplex]	Select an appropriate RS485 Duplex Mode.
RS485 Auto Flow Control	[Disabled], [Enabled]	Select whether to enable or disable RS485 Auto Flow Control.

Figure 20: BIOS Advanced Menu - Super IO Configuration - Serial Port 2 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 2 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=2F8h; IRQ=3;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
Serial Port 2 Type		[RS232]		F1: General Help	
RS485 Deplux Mode*		[Half Duplex]		F2: Previous Values	
RS485 Auto Flow Control*		[Disabled]		F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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* These items appear only when selecting RS485 for the Serial Port 2 Type.

Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=2F8h; IRQ=3;], [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.
Serial Port 2 Type	[RS232], [RS422], [RS485]	Select an appropriate type for Serial Port 2.
RS485 Duplex Mode	[Half Duplex], [Full Duplex]	Select an appropriate RS485 Duplex Mode.
RS485 Auto Flow Control	[Disabled], [Enabled]	Select whether to enable or disable RS485 Auto Flow Control.

Figure 21: BIOS Advanced Menu - CPU Chipset Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
CPU Chipset Configuration					
EIST		[Enabled]		→←: Select Screen	
Turbo Mode		[Enabled]		↑ ↓: Select Item	
Active Processor Cores		[Disabled]		Enter: Select	
Intel Virtualization Technology		[Enabled]		+/-: Change Opt.	
VT-d		[Disabled]		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
EIST	[Disabled], [Enabled]	Select whether to enable or disable Enhanced Intel SpeedStep Technology.
Turbo Mode	[Disabled], [Enabled]	Select whether to enable or disable turbo mode.
Active Processor Cores	[Disabled], [Enabled]	Select whether to enable or disable active processor cores.
Intel Virtualization Technology	[Disabled], [Enabled]	Select whether to enable or disable Intel Virtualization Technology.
VT-d	[Disabled], [Enabled]	Select whether to enable or disable VT-d capability.

Figure 22: BIOS Advanced Menu - SATA Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
SATA Configuration					
SATA Controller		[Enabled]		→ ←: Select Screen	
SATA Mode Selection		[AHCI]		↑ ↓: Select Item	
				Enter: Select	
mSATA Port 2		32GB SATA Flash (32.0GB)		+/-: Change Opt.	
Port 2		[Enabled]		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
SATA Controller	[Enabled], [Disabled]	Select whether to enable or disable SATA Controller(s).
SATA Mode Selection	[AHCI]	Determine how SATA controller(s) operate.
Port 1	[Disabled], [Enabled]	Select whether to enable or disable mSATA Port 2.

Figure 23: BIOS Advanced Menu - USB Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
USB Configuration					
USB Devices:				→ ←: Select Screen	
1 Keyboard, 1 Mouse				↑ ↓: Select Item	
				Enter: Select	
Legacy USB Support		[Enabled]		+/-: Change Opt.	
XHCI Hand-off		[Enabled]		F1: General Help	
USB Mass Storage Driver Support		[Enabled]		F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Legacy USB Support	[Enabled], [Disabled], [Auto]	Select whether to enable or disable Legacy USB support. AUTO option disables legacy support if no USB devices are connected.
XHCI Hand-off	[Enabled], [Disabled]	Select whether to enable or disable XHCI Hand-off function. This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	[Disabled], [Enabled]	Select whether to enable or disable USB Mass Storage Driver Support.

Figure 24: BIOS Advanced Menu - DIO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
DIO Configuration					
User Configuration		[Disabled]			
DIO_0*		[Output High]			
DIO_1*		[Output High]			
DIO_2*		[Output High]			
DIO_3*		[Output High]			
DIO_4*		[Output High]			
DIO_5*		[Output High]			
DIO_6*		[Output High]			
DIO_7*		[Output High]			
				→←: Select Screen	
DIO_0 Value		1		↑ ↓: Select Item	
DIO_1 Value		1		Enter: Select	
DIO_2 Value		1		+/-: Change Opt.	
DIO_3 Value		1		F1: General Help	
DIO_4 Value		1		F2: Previous Values	
DIO_5 Value		1		F3: Optimized Defaults	
DIO_6 Value		1		F4: Save & Exit	
DIO_7 Value		1		ESC: Exit	
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* These items appear only when enbling User Configuration.

Feature	Option	Description
User Configuration	[Enabled], [Disabled]	Select whether or not to allow user to set the DO pin output value.
DIO_0..7	[Output Low], [Output High], [Input]	Set up the DIO pin input / output value.

Figure 25: BIOS Advanced Menu - Network Stack

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Network Stack		[Disabled]			
Ipv4 PXE Support*		[Enabled]			
Ipv6 PXE Support*		[Enabled]		→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
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* These items appear only when enbling Network Stack.

Feature	Option	Description
Network Stack	[Disabled], [Enabled]	Select whether to enable or disable UEFI network stack.
Ipv4 PXE Support	[Disabled], [Enabled]	Select whether to enable or disable Ipv4 PXE Boot Support.
Ipv6 PXE Support	[Disabled], [Enabled]	Select whether to enable or disable Ipv6 PXE Boot Support.

Figure 26: BIOS Advanced Menu - H/W Monitor

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
PC Health Status					
CPU Temperature		: +36 C		→ ←: Select Screen	
System Temperature		: +40 C		↑ ↓: Select Item	
				Enter: Select	
+VCORE		: +0.765 V		+/-: Change Opt.	
+12V		: +12.268 V		F1: General Help	
+5V		: +5.106 V		F2: Previous Values	
+VMEM		: +1.325 V		F3: Optimized Defaults	
+3.3V		: +3.360 V		F4: Save & Exit	
+VRTC		: +3.264 V		ESC: Exit	
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12.2.3. Power Setup Menu

The Power setup menu provides functions and a sub-screen for power configurations. The following sub-screen function is included in the menu:

- WatchDog Timer Configuration

Figure 27: BIOS Power Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Power Configuration					
ACPI Sleep State		[S3 (Suspend to RAM)]			
Restore AC Power Loss		[Power Off]			
Power Saving Mode		[Disabled]			
				→ ←: Select Screen	
Resume Event Control				↑ ↓: Select Item	
Resume By LAN 1 Device		[Disabled]		Enter: Select	
Resume By LAN 2 Device		[Disabled]		+/-: Change Opt.	
Resume By MPCIE1 Device		[Disabled]		F1: General Help	
Resume By M2 Device		[Disabled]		F2: Previous Values	
Resume By Ring Device		[Disabled]		F3: Optimized Defaults	
Resume By RTC Alarm		[Disabled]		F4: Save & Exit	
> WatchDog Timer Configuration				ESC: Exit	
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Feature	Option	Description
ACPI Sleep State	[S3 (Suspend to RAM)]	Select whether to enable or disable suspend function and determine an appropriate suspend mode.
Restore AC Power Loss	[Power Off], [Power On], [Last State]	Control whether the system will stay on after AC power is removed and then restored. Select [Power Off] if you want the system to remain off after power restored. Select [Power On] if you use a power strip to turn the system on.
Power Saving Mode	[Disabled], [EUP Enabled]	Select whether to enable Power Saving Mode.
Resume By LAN 1 Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from LAN 1 Device.
Resume By LAN 2 Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from LAN 2 Device.
Resume By MPCIE1 Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from MPCIE1 Device.
Resume By M2 Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from M2 Device.
Resume By Ring Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from Ring Device.
Resume By RTC Alarm	[Disabled], [Enabled]	Select whether to enable or disable Wake Up on Alarm, to turn on your system on a special day of the month.

Figure 28: BIOS Power Setup Menu - WatchDog Timer Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
WatchDog Timer Configuration					
WDT Function		[Disabled]		→ ←: Select Screen	
WDT Count Mode*		[Second]		↑ ↓: Select Item	
WDT Timer*		30		Enter: Select	
				+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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* These items appear only when enbling WDT Function.

Feature	Option	Description
WDT Function	[Disabled], [Enabled]	Select whether to enable or disable WatchDog Timer function.
WDT Count Mode	[Second], [Minute]	Select WatchDog count mode: second or minute.

12.2.4. Boot Setup Menu

The boot setup menu lists the for boot device priority order, that is generated dynamically.

Figure 29: BIOS Boot Setup Menu

BIOS SETUP UTILITY					
Main	**Advanced**	**Power**	**Boot**	**Security**	**Save & Exit**
Boot Configuration					
Full Screen LOGO Display		[Disabled]			
Setup Prompt Timeout		1		→ ←: Select Screen	
Bootup NumLock State		[On]		↑ ↓: Select Item	
				Enter: Select	
CSM Support		[Disabled]		+/-: Change Opt.	
Boot Option Filter		[UEFI Only]		F1: General Help	
				F2: Previous Values	
Boot Option Priorities				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Full Screen LOGO Display	[Disabled], [Enabled]	Select whether to enable or disable to display logo screen.
Bootup NumLock State	[On], [Off]	Select the state of the NumLock feature of the keyboard after Startup. [On]: The keys on the keypad will act as numeric keys. [Off]: The keys on the keypad will act as cursor keys.
CSM Support	[Disabled]	Select whether to enable or disable CSM support.
Boot Option Filter	[UEFI only]	Control Legacy / UEFI ROMs priority.

12.2.5. Security Setup Menu

The Security setup menu provides information about the passwords and functions for specifying the security settings. The passwords are case-sensitive. The KBox E-300 Series provides no factory-set passwords.

NOTICE

If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing <RETURN>. To set a password, enter it twice and acknowledge by pressing <RETURN>.

Figure 30: BIOS Security Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Password Description					
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights The password length must be in the following range:				→ ←: Select Screen	
Minimum Length		3		↑ ↓: Select Item	
Maximum length		20		Enter: Select	
				+/-: Change Opt.	
Administrator Password				F1: General Help	
User Password				F2: Previous Values	
				F3: Optimized Defaults	
> Secure Boot				F4: Save & Exit	
				ESC: Exit	
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Feature	Description
Administrator Password	Set administrator password
User Password	Set user password

If only the administrator's password is set, then only access to setup is limited. The password is only entered when entering setup.

If only the user's password is set, then the password is a power on password and must be entered to boot or enter setup. Within the setup menu the user has administrator rights.

Password length requirements are maximum 20 characters and minimum 3 characters.

12.2.5.1. Remember the password

It is highly recommended to keep a record of all passwords in a safe place. Forgotten passwords results in being locked out of the system.

If the system cannot be booted because the User Password or the Supervisor Password are not know, contact Kontron Support for further assistance.

HDD security passwords cannot be cleared using the above method.

12.2.6. Save & Exit Setup Menu

The exit setup menu provides functions for handling changes made to the UEFI BIOS settings and the exiting of the setup program.

Figure 31: BIOS Save & Exit Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Save Changes and Reset					
Discard Changes and Reset					
				→ ←: Select Screen	
Save Options				↑ ↓: Select Item	
Save Changes				Enter: Select	
Discard Changes				+/-: Change Opt.	
				F1: General Help	
Restore Defaults				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Description
Save Changes and Exit	Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.
Discard Changes and Exit	Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.
Save Changes	Save changes done so far to any of the setup values. This option allows you to save the selections you made. After selecting this option, a confirmation appears. Select [Yes] to save any changes.
Discard Changes	Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.
Restore Defaults	Restore Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Appendix A: List of Acronyms

The following table does not contain the complete acronyms used in signal names, signal type definitions or similar. A description of the signals is included in the I/O Connector and Internal connector chapters within this user guide.

Table 17: List of Acronyms

2D	Two-Dimensional
3D	Three-Dimensional
AT	Advanced Technology
ATX	Advanced Technology eXtended
BGA	Ball Grid Array
BIOS	Basic Input / Output System
BSP	Board Support Package
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
DC	Direct Current
DDC	Display Data Channel
DIO	Digital Input / Output
ECC	Error-Correcting Code
EEE	Electrical and Electronic Equipment
EOS	Electrical OverStress
ESD	ElectroStatic Discharge
GbE	Gigabit Ethernet
HDD	Hard Disk Drive
HDMI	High Definition Multimedia Interface
LAN	Local Area Network
LED	Light Emitting Device
LVDS	Low-Voltage Differential Signaling
ME F/W	Management Engine Firmware
mPCIe	mini Peripheral Component Interconnect express
PC-AT	Personal Computer - Advanced Technology
PCB	Printed Circuit Board
PSU	Power Supply Unit
PVC	PolyViny Chloride
PWM	Pulse Width Modulation
RAM	Random Access Memory
ROM	Read-Only Memory
RTC	Real-Time Clock
SATA	Serial Advanced Technology Attachment
SDP	Serial Download Protocol
SELV	Safety Extra-Low Voltage
SIM	Subscriber Identity Module
SMBus	System Management Bus
SoC	System on Chip
SO-DIMM	Small Outline Dual In-line Memory Module
SPD	Serial Presence Detect
SPI	Serial Peripheral Interface
TDP	Thermal Design Power
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
USB	Universal Serial Bus
UTP	Update Transfer Protocol
VGA	Video Graphics Array
WDT	WatchDog Timer
WEEE	Waste Electrical and Electronic Equipment

About Kontron

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

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