USER GUIDE

KBox N-110 Series

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KBOX N-110 SERIES - USER GUIDE

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Revision History

Revision	Brief Description of Changes	Date of Issue
1.0	Initial Issue	2018-Dec-24
1.1	Update compliance class	2019-Jan-28
1.2	Update power connector type	2019-Feb-25
1.3	JP4 pin assignment update	2019-May-06
1.4	Add extended temperature support	2019-Jun-13

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

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

2/ 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 B 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 B 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 B digital apparatus complies with the Canadian ICES-003.

(French): Cet appareil numérique de la class B 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 N-110 Series
- 1x Power adapter
- 1x Power cord (plug type depending on country)

3.2.2. Optional Parts

- Memory module(s) (It may be pre-installed in the system depending on ordered configuration.)
- Internal 2.5" SATA HDD / SSD (It may be pre-installed in the system depending on ordered configuration.)
- mSATA SSD (It may be pre-installed in the system depending on ordered configuration.)
- mPCIe card (It may be pre-installed in the system depending on ordered configuration.)
- M.2 Key A expansion card (It may be pre-installed in the system depending on ordered configuration.)
- M.2 Key B SSD (It may be pre-installed in the system depending on ordered configuration.)
- M.2 Key B expansion card (It may be pre-installed in the system depending on ordered configuration.)

4/ System Overview

The KBox N-110 Series is a fanless system enclosed within a compact aluminum chassis with cooling fins, offering the superior qualities for network security controls.

It can be optionally factory-equipped with an mPCIe WLAN /3G / 4G card, an M.2 (Key A) WLAN card and / or an M.2 (Key B) 3G / 4G card. Users may choose the implementation of a 2.5" SATA HDD / SSD, an mSATA SSD card and / or an M.2 SSD (Key B) card as storage media.

The following interfaces are available with the KBox N-110 Series:

Standard Front Panel:

- 1x Power LED
- 1x Storage LED
- 6x Act / Link LED
- 6x Speed LED
- 2x Bypass LED
- 1x Status LED
- 1x Alarm LED
- 1x WLAN LED
- 2x User-defined LED
- 1x Programmable Switch Button
- 1x Clear CMOS Switch Button

Standard Rear Panel:

- 1x VGA
- 6x GbE LAN
- 2x USB 3.0
- 1x RS232
- 1x Lockable DC Jack
- 2x Wi-Fi Antenna Port
- 2x 3G / 4G Antenna Port

Standard Baseboard and System Expansion Capabilities:

- 1x DDR4 SO-DIMM memory socket (DIMM1, model w/ Atom® C3338)
- 2x DDR4 SO-DIMM memory socket (DIMM1 & DIMM2, model w/ Atom® C3538)
- 1x SATA connector for 2.5" SATA HDD / SSD (SATA1)
- 1x full-sized mSATA / mPCIe socket (MPCIE1)
- 1x M.2 Key A socket (M2A1, type 22x30)
- 1x M.2 Key B socket (M2B1, type 22x80 or type 22x42)
- 1x Micro SIM Card Cage (SIM1)

The device is designed to be operated in:

- Horizontal position: placed as a desktop unit.

NOTICE

When powering on the KBox N-110 Series, make sure that the cooling fins and ventilation slots 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 and ventilation slots of the KBox N-110 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 SATA Interface

The baseboard comes with one onboard SATA interface connector and corresponding power connector. Users can expand the KBox N-110 Series with a 2.5" SATA HDD / SSD drive.

4.1.2. System Expansion via mSATA / mPCIe Interface

The baseboard comes with an onboard mPCIe / mSATA interface connector. The switch between mPCIe and mSATA can be taken via the Jumper JP5. The connector is intended to be used to install an mPCIe WLAN card or mPCIe 3G / 4G modem card, which can be switched via BIOS, when mPCIe is enabled. It is used to install an mSATA SSD drive when mSATA is enabled.

4.1.3. 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 22x80 or type 22x42. An additional fixing bolt extension is required when the Key B socket is installed a type 22x42 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 drive or an M.2 3G / 4G modem card which can be switched via the Jumper JP4.

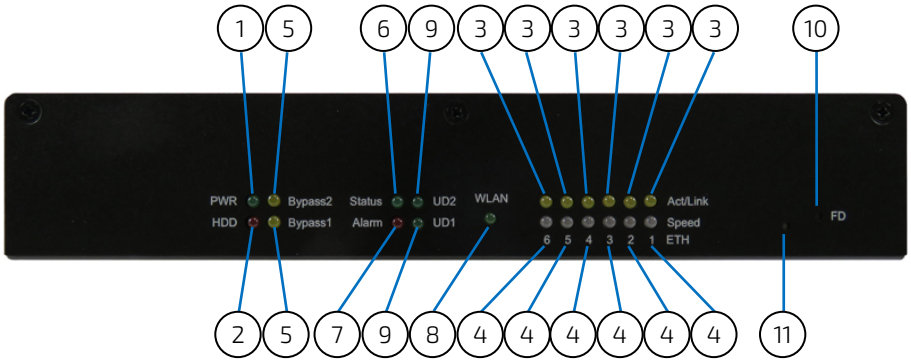
4.1.4. System Expansion via Micro SIM Socket

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 N-110 Series, which can be switched via BIOS.

4.2. Front I/O Panel

Figure 1: Front I/O Panel



1 Power LED (see Chapter 4.2.1)

2 Storage LED (see Chapter 4.2.2)

3 Act / Link LED (see Chapter 4.2.3)

4 Speed LED (see Chapter 4.2.4)

5 LAN Bypass LED (see Chapter 4.2.5)

6 Status LED (see Chapter 4.2.6)

7 Alarm LED (see Chapter 4.2.7)

8 Wireless LED (see Chapter 4.2.8)

9 User-defined LED (see Chapter 4.2.9)

10 Programmable Switch Button (see Chapter 4.2.10)

11 Clear CMOS Switch Button (see Chapter 4.2.11)

4.2.1. Power LED

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

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

4.2.2. Storage LED

The storage LED blinks red when data is being written into or read from the hard drive.

4.2.3. Act / Link LED

The act / link LED blinks yellow when the data is transferring over the LAN port.

4.2.4. Speed LED

The color that the speed LED lights up indicates the link speed of the Ethernet connection.

Table 1: Speed LED Status

LED Status	Description
Red LED On	1000 Mbit/s link established
Green LED On	100 Mbit/s link established
LED Off	10 Mbit/s link established

4.2.5. LAN Bypass LED

The LAN bypass LED lights up yellow when a pair of LAN ports is operating in bypass mode. The LED "Bypass1" is for the pair of LAN3 & LAN4 while the LED "Bypass2" for the pair of LAN5 & LAN6.

4.2.6. Status LED

The status LED lights up green when the output value of the port GP10 from Super I/O is high.

4.2.7. Alarm LED

The alarm LED lights up red when the output value of the port GP11 from Super I/O is high.

4.2.8. Wireless LED

The wireless LED blinks green when the data is transferring over the WLAN card or 3G / 4G card.

4.2.9. User-defined LED

The user-defined LED "UD1" and "UD2" light up green when the output value of the port GP12 and GP13 from Super I/O is high respectively.

4.2.10. Programmable Switch Button

The programmable switch button allows to activate one of three different functions. The function of the switch button can be selected in BIOS setup.

Table 2: Functions of Programmable Switch Button

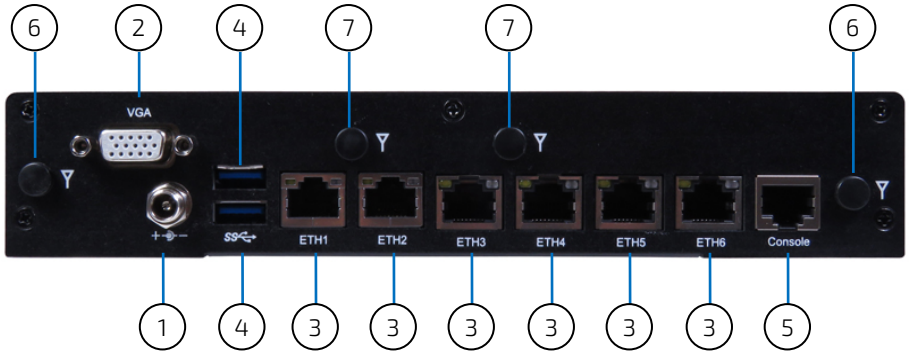
Function	Action	Description
Power Switch	Push On	Power on / off the system
Reset Switch	Push On	Reset the system
GPI Switch	Normal	Input High to the port GP20 of Super I/O
	Push On	Input Low to the port GP20 of Super I/O

4.2.11. Clear CMOS Switch Button

Find a paper clip or use the pin of a pen to press this button, allowing users to clear COMS.

4.3. Rear I/O Panel

Figure 2: Rear I/O Panel



1 DC-In Jack (see Chapter 4.3.1)

2 VGA (see Chapter 4.3.2)

3 GbE (see Chapter 4.3.3)

4 USB 3.0 (see Chapter 4.3.4)

5 RS232 (see Chapter 4.3.5)

6 Wi-Fi Antenna Port (see Chapter 4.3.6)

7 3G / 4G Antenna Port (see Chapter 4.3.7)

4.3.1. DC-In Jack

Users can connect the supplied power adapter to this jack for converting AC power to DC. To prevent damage to the PC, always use the supplied power adapter.

4.3.2. VGA

An external (analog) monitor can be plugged into this interface. The VGA port is provided as a 15-pin D-SUB socket.

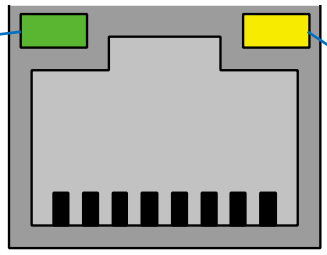
VGA Hot Plug works on Windows and Linux installation which have an appropriate driver installed. However, VGA Hot Plug does not work on the EFI shell, DOS or BIOS Setup.

Hot Removal and Re-Connect of a VGA display always works on BIOS Setup, EFI shell, DOS regardless of the OS Version, provided the VGA display is connected during power up of the KBox.

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



LED satatus:

Off - Link is down

Flasing Green - Link is up and active

Steady Green - Link is up, no activity

LED satatus:

Orange - 1000 Mbit/s link established

Green - 100 Mbit/s link established

Off - 10 Mbit/s link established

4.3.4. USB 3.0

The KBox N-110 Series provides two USB 3.0 / 2.0 interfaces on the rear I/O panel. These connectors allow connection of an USB 3.0 or USB 2.0 compatible device to the system.

4.3.5. RS232

The console port is provided as a 8-pin RJ45 connector; it is RS232 interface and allows remote device console management.

4.3.6. Wi-Fi Antenna Port

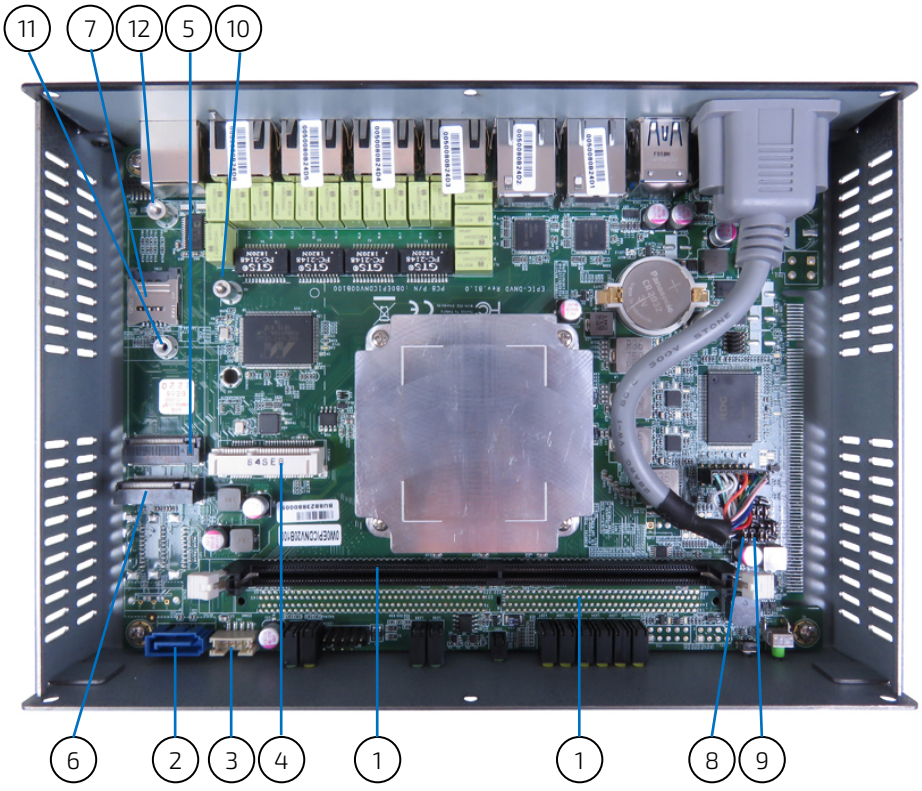
The KBox N-110 Series reserves two covered cutouts for the Reverse (RP) SMA connectors of the WLAN antennas (M.2 WLAN card or mPCIe WLAN card with 2 antennas is an option).

4.3.7. 3G / 4G Antenna Port

The KBox N-110 Series reserves two covered cutouts for the Reverse (RP) SMA connectors of the 3G / 4G antenna(s) (M.2 3G / 4G card or mPCIe 3G / 4G card with 1 / 2 antenna(s) is an option).

4.4. Internal View

Figure 4: Internal view (without cover)



1 DDR4 UDIMM Memory Socket (DIMM1 & DIMM2, see Chapter 4.4.1)

2 SATA Data Connector (SATA1, see Chapter 4.4.2)

3 SATA Power Output Wafer (CN1, see Chapter 4.4.2)

4 mSATA / mPCIe Socket (MPCIE1, see Chapter 4.4.3)

5 M.2 Key A Socket (M2A1, see Chapter 4.4.4)

6 M.2 Key B Socket (M2B1, see Chapter 4.4.4)

7 Micro SIM Card Cage (SIM1, see Chapter 4.4.5)

8 mPCIe / mSATA Selection Jumper (JP5, see Chapter 4.4.6)

9 M.2 Key B PCIe / SATA Selection Jumper (JP4, see Chapter 4.4.7)

10 mSATA / mPCIe fixing bolt

11 M.2 fixing bolt for Key A type 22x30 and / or Key B type 22x42

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

4.4.1. DDR4 UDIMM Memory Socket

The KBox N-110 Series provides one 288-pin DDR4 UDIMM socket for the models with Atom® C3338 processor or two 288-pin DDR4 UDIMM sockets for the models with Atom® C3538 processor to install memory RAM.

4.4.2. SATA Data Connector & SATA Power Output Wafer

The KBox N-110 Series provided one SATA data connector to install a 2.5" SATA HDD / SSD. A SATA power output wafer is provided to power the hard disk and a bracket is attached on the inner side of the access cover for holding and fixing the hard disk.

4.4.3. mSATA / mPCIe Socket

The KBox N-110 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 jumper setting at JP5 in Chapter 4.4.6.

4.4.4. M.2 Socket

The KBox N-110 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 or 3G / 4G card which can be switched via the Jumper JP4 (see Chapter 4.4.7).

The fixing bolt marked in Figure 4, pos. 11 can be used to fix either a Type 22x30 card installed in M.2 Key A socket and / or a Type 22x42 card installed in M.2 Key B socket with an additional fixing bolt extension.

4.4.5. Micro SIM Card Cage

The baseboard of the KBox N-110 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 BIOS setting (see Chapter 12.2.2).

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

4.4.6. mPCIe / mSATA Selection Jumper

The Jumper JP5 can switch the mPCIe / mSATA combo socket (MPCIE1) to mPCIe mode for 3G / 4G / Wi-Fi card installation or mSATA mode for mSATA SSD installation. The default setting is in "mPCIe" mode.

Figure 5: mPCIe / mSATA Selection Jumper (JP5)

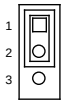


Table 3: Pin Assignment JP5

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	mPCIe

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
-	X	mSATA

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

4.4.7. M.2 Key B PCIe / SATA Selection Jumper

The Jumper JP4 can switch the M.2 Key B socket (M2B1) to PCIe & USB 3.0 mode for 3G / 4G modem card installation or SATA & USB 3.0 mode for M.2 SSD installation. The default setting is in "PCIe & USB 3.0" mode.

Figure 6: M.2 Key B PCIe / SATA Selection Jumper (JP4)

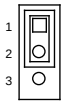
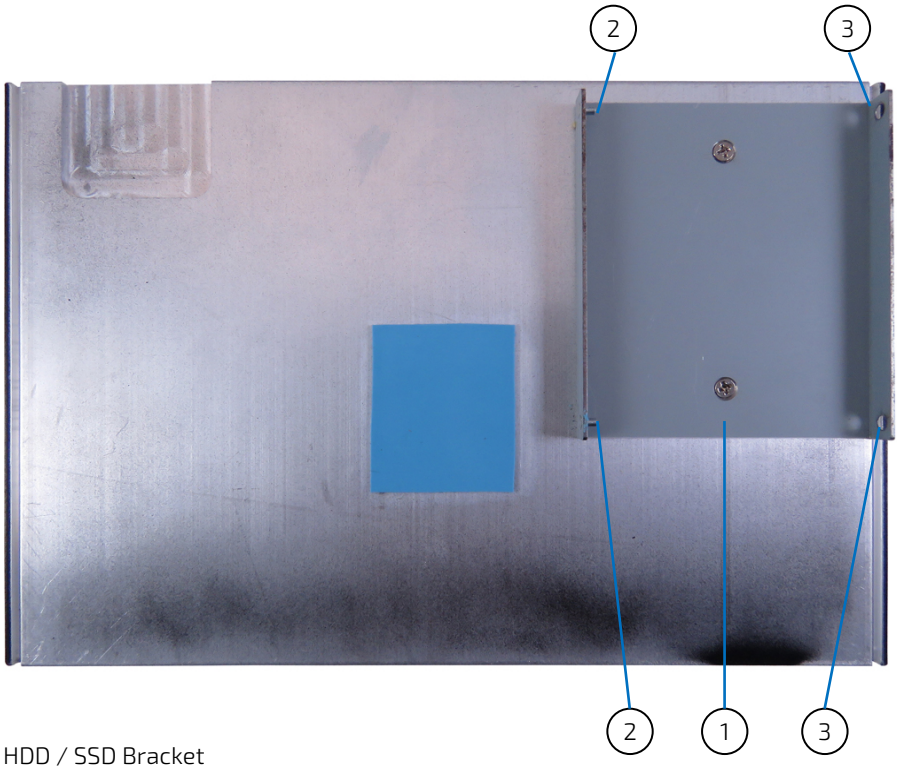


Table 4: Pin Assignment JP4

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	PCIe & USB 3.0
-	X	SATA & USB 3.0

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

Figure 7: Internal view - Inner side of the access cover



1 2.5" HDD / SSD Bracket

2 Fixing bolt for fixing HDD / SSD

3 Screw Hole for fixing HDD / SSD

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 storage / expansion cards 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 N-110 Series

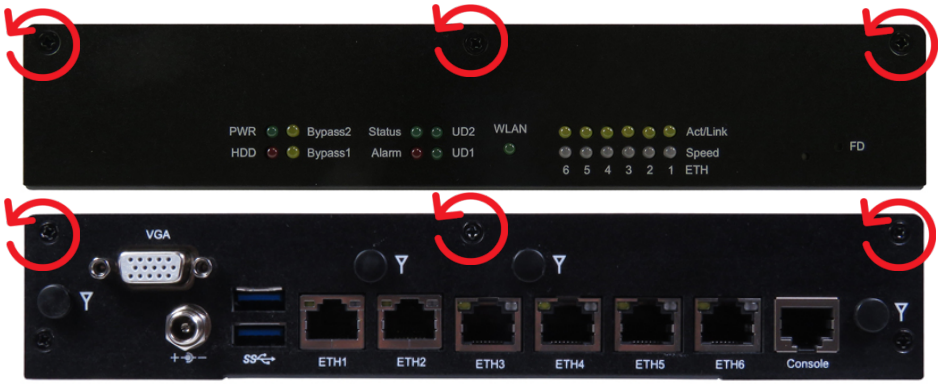
⚠CAUTION

Before opening the KBox N-110 Series, the system must be switched off and disconnected from the main power supply. Also, disconnect all peripheral devices from the KBox N-110 Series. Before you begin, ensure that you have a clean, flat and ESD-safe surface to work on.

For opening and closing the KBox N-110 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 N-110 Series should lay on a flat, clean surface with the access cover facing upwards.
3. Loosen and remove the six Phillips screws (three located on the front I/O panel and the other three on the rear), that secure the access cover to the chassis. Retain the screws for later use.

Figure 8: Descrewing the access cover of the KBox N-110 Series



4. Lift the access cover up.
5. Now you have access to the internal DDR4 UDIMM, SATA, mSATA / mPCIe, 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 N-110 Series is to operate only in closed condition. Only when the access cover is properly fixed with the screws, it is ensured that the user does not have access to the internal parts of the KBox N-110 Series.

5.1.1. Installing an HDD / SSD

To install an 2.5" HDD / SSD please proceed according to the steps described:

1. Open the device as described in the subsection 5.1 "Opening and Closing the KBox N-110 Series" (step 1-5).
2. Screw the HDD / SSD to the bracket (Figure 7) and connect the SATA cable to it.

3. Plus the SATA data cable into SATA data connector (SATA1) (Figure 4, pos. 2) and the SATA power cable into SATA power output wafer (CN1) (Figure 4, pos. 3).
4. In order to close the KBox N-110 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox N-110 Series".

5.1.2. 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 N-110 Series" (step 1-5).
2. Locate the mPCIe / mSATA socket (MPCIE1) (Figure 4, pos. 4) and the corresponding fixing bolt. (Figure 4, pos. 10).
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. 4) 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. 10).
5. In order to close the KBox N-110 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox N-110 Series".

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

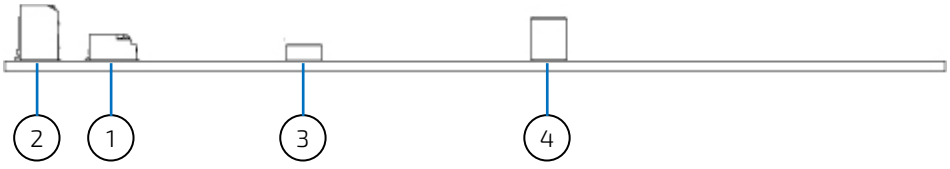
To have access the M.2 socket please proceed according to the steps described:

1. Open the device as described in the subsection 5.1 "Opening and Closing the KBox N-110 Series" (step 1-5).
2. Locate the M.2 socket (M2A1 / M2B1) (Figure 4, pos. 5 / pos. 6) which you intend to use for expansion and the corresponding fixing bolt. (Figure 4, pos. 11 / pos. 12). For configuration among card types, socket types, fixing bolts and fixing bolt extensions, view Chapter 4.1.3, Chapter 4.4.4, Table 5 and Table 6.

Table 5: Fixing bolt extensions and fastening screw

			
Item	A	B	C
Description	Fixing Bolt Extension	Fixing Bolt Extension	Fastening Screw
Dimensions	Nominal Size: M3 Length: 8.2 mm Head Height: 4.2 mm	Nominal Size: M3 Length: 7.2 mm Head Height: 3.2 mm	Nominal Size: M3 Length: 3.3 mm Head Height: 0.8 mm

Figure 9: Location of M.2 sockets and fix bolts



1 M.2 Key A Socket (see Figure 4, pos. 5)

2 M.2 Key B Socket (see Figure 4, pos. 6)

3 M.2 fixing bolt for Key A type 22x30 and / or Key B type 22x42 (see Figure 4, pos. 11)

4 M.2 fixing bolt for Key B type 22x80 (see Figure 4, pos. 12)

Table 6: Installation configuration of M.2 SSD / M.2 expansion card

Key A type 22x30	
Key B type 22x42	
Key B type 22x80	
Key A type 22x30 + Key B type 22x42	
Key A type 22x30 + Key B type 22x80	

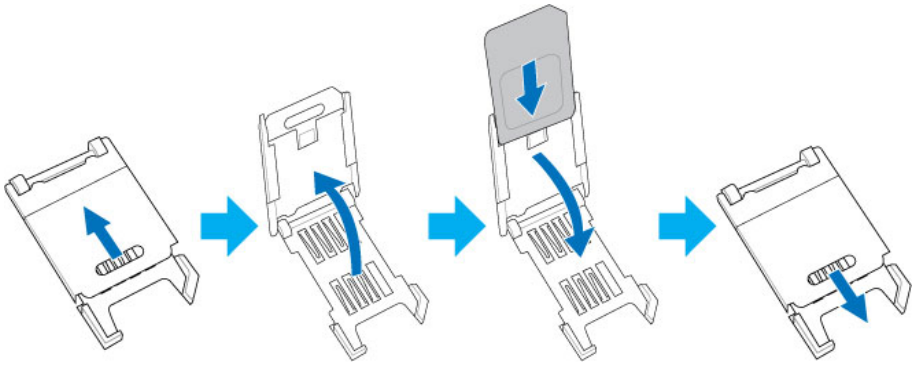
3. Align the notches on the M.2 SSD / M.2 expansion card with the notches in the M.2 socket (M2A1 / M2B1). Insert the M.2 SSD / M.2 expansion card into the corresponding socket (Figure 4, pos. 5 / pos. 6) and rotate it down with the fixing hole of the card over the fixing bolt.
4. Press the M.2 SSD / M.2 expansion card down on the side with the fixing hole and secure it with the available fastening screw (Figure 4, pos. 11 / pos. 12).
5. In order to close the KBox N-110 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox N-110 Series".

5.1.4. 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 N-110 Series" (step 1-5).
2. Locate the Micro SIM card socket (SIM1) (Figure 4, pos. 7).
3. To unlock the Micro SIM card socket slide the cover of the Micro SIM socket in the direction shown in Figure 10.
4. Lift gently the slot cover and open the slot cover as shown in Figure 10.
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 10.
6. After closing the cover, lock the cover by sliding the closed cover in the direction shown in Figure 10.

Figure 10: Installing the Micro SIM card



7. In order to close the KBox N-110 Series, proceed step 6 & 7 described in the subsection 5.1 "Opening and Closing the KBox N-110 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. The top side of the KBox N-110 Series consist of an aluminum chassis is with cooling fins. The cooling fins provide heat dissipation during operation.

To provide sufficient heat dissipation for the cooling of the KBox N-110 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 N-110 Series is extended and configured with third party components like 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 N-110 Series system is designed for operating:

- as desktop unit.

Expansion card installation should be performed before installing the KBox N-110 Series into control cabinet / custom enclosure / machine.

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 N-110 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 N-100 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 N-110 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”.

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 on the bottom side of the system.

It is recommended that the last cable attached to the system should be the power cable! Refer to the section 7.1 “DC Power Connection” and chapter 8/ “Starting Up”.

7.1. DC Power Connection

The KBox N-110 Series is connected by a DC power input jack (Figure 2, pos. 1) to a DC power source.

The KBox N-110 Series is delivered with a power adapter to convert AC voltage into a DC voltage within the range from 12V to 19V depending on the ordered configuration and a power cord to carry AC power to the power adapter.

8/ Starting Up

The KBox N-110 Series must be only operated with the nominal voltage of 12V ~ 19V DC of type SELV. For details refer to the chapter 10/ “Technical Specifications”.

8.1. Connecting to DC Power Supply

The DC power input jack (Figure 2, pos. 1) is located on the rear side of the KBox N-110 Series. The KBox N-110 Series will be connected to a AC-to-DC power adapter via the supplied male DC power plug and corresponding power cable attached to the adapter.

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 N-110 Series must be connected DC 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 N-110 Series.

The disconnecting device (fuse/circuit backer) rating must be in accordance with the wire cross-section and the rated current of the KBox N-110 Series.

The cables must have some form of support so as to minimize the strain on the unit’s connectors.

To connect the KBox N-110 Series to a corresponding DC power supply, please perform the following steps:

For model with DC jack:

1. Connect the power adapter cable to the DC jack (DC IN, Figure 2, pos. 1) of the KBox N-110 Series.
2. Connect the power cable to the power adapter.
3. Connect the power cable to a power outlet.

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 N-110 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. Please pay attention to the following note.

If you have ordered the KBox N-110 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 N-110 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 N-110 Series.

10/ Technical Specifications

Table 7: Technical Specifications

System	
Processor	▶ Intel® Atom® C3338 (Dual Core, 4M Cache, up to 2.20 GHz, FCBGA1310, 9 W TDP) ▶ Intel® Atom® C3538 (Quad Core, 8M Cache, up to 2.10 GHz, FCBGA1310, 15 W TDP)
Memory	▶ 1x DDR4 UDIMM (for Atom® C3338, low-profile RAM allowed) ▶ 2x DDR4 UDIMM (for Atom® C3538, low-profiled RAM allowed)
Video	
Display Interface	▶ 1x VGA (on rear)
Network Connection	
Ethernet	▶ 6x GbE LAN (on rear, LAN3 & LAN4 Bypass, LAN5 & LAN6 Bypass) ▶ LAN1 & LAN2: Intel® I210-AT ▶ LAN3 ~ LAN6: Intel® Denverton SoC Ethernet Controller
Peripheral Connection	
USB	▶ 2x USB 3.0 (Type A on rear)
Serial Port	▶ 1x RS232 (RJ45 on rear, console redirection support)
Storage & Expansion	
Storage & Expansion	▶ 1x 2.5" SATA HDD / SSD ▶ 1x mSATA / mPCIe (full size, mixed w/ PCIe x1, SATA & USB 2.0) ▶ 1x M.2 Key A (mixed w/ PCIe x1) ▶ 1x M.2 Key B (mixed w/ SATA & USB 2.0) ▶ 1x Micro SIM Card Holder
Power	
Input Voltage & Connector	▶ DC 12 V ~ 19 V for Lockable DC Jack (on rear)
Power Adapter	▶ AC to DC, 100 V ~ 240 V
Firmware	
BIOS	▶ AMI uEFI BIOS w/ 128 Mb SPI Flash
Watchdog	▶ Programmable WDT to generate system reset or LAN bypass
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 Programmable Switch Button (on front, GP input support) ▶ 1x Clear CMOS Switch Button (on front) ▶ 1x Power LED (on front, green) ▶ 1x HDD LED (on front, red) ▶ 1x Status LED for GP output (on front, green) ▶ 1x Alarm LED for GP output (on front, red) ▶ 2x Bypass LED (on front, yellow)

	▶ 6x Act / Link LED for LAN1 ~ LAN6 (on front, yellow) ▶ 6x Speed LED for LAN1~LAN6 (on front, 10: off/ 100: green/ 1000: orange) ▶ 1x WLAN LED (on front, green) ▶ 2x User-defined LED (on front, green)
Cooling	
Cooling Method	▶ Passive
Software	
OS Support	▶ Windows Server ▶ Linux

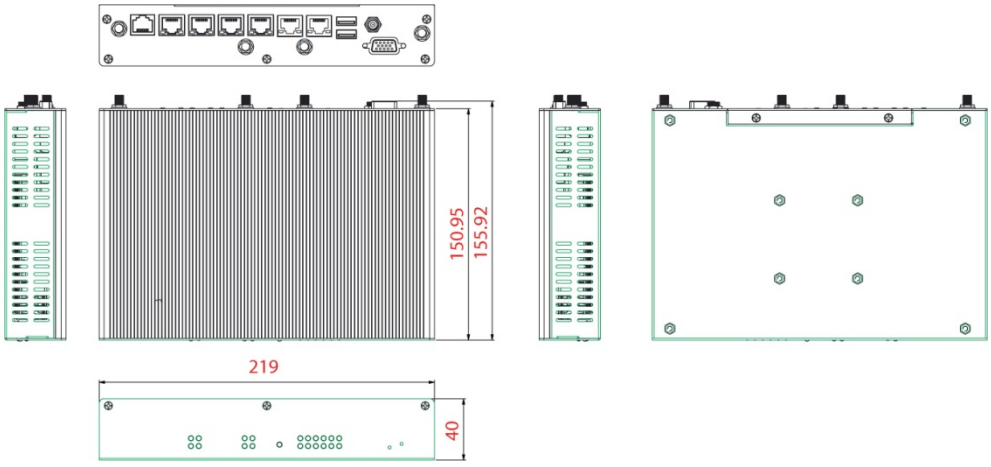
10.1. Mechanical Specifications

Table 8: Mechanical Specifications

Construction	Aluminum Chassis
Dimensions (W x D x H)	219 mm x 151 mm x 40 mm / 8.62" x 5.94" x 1.57"
Weight	1420 g / 3.13 lb

10.1.1. Mechanical Drawing

Figure 11: Mechanical Drawing



(unit: mm)

10.2. Environmental Conditions

Table 9: Environmental Conditions

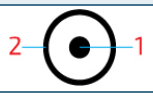
Operating Temperature	0 °C ~ 45 °C / 32 °F ~ 113 °F (Standard) 0 °C ~ 65 °C / 32 °F ~ 149 °F (Extended)
Storage Temperature	-20 °C ~ 80 °C / -4 °F ~ 176 °F
Humidity	0 % ~ 95 %

11/ Standard Interfaces – Pin Assignments

Low-active signals are indicated by a minus sign.

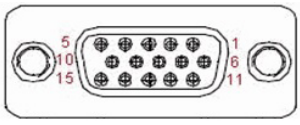
11.1.1. DC Jack

Table 10: DC Jack (see Figure 2, pos.1)

Pin	Signal Name	DC Jack (female)
1	+12~19Vin	
2	GND	

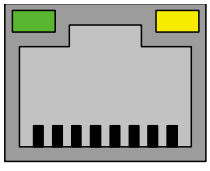
11.1.2. VGA Connector

Table 11: VGA Connector (see Figure 2, pos. 2)

Pin	Signal Name	VGA Connector (DB-15)
1	Red	
2	Green	
3	Blue	
4	NC	
5	GND	
6	GND	
7	GND	
8	GND	
9	VCC	
10	GND	
11	NC	
12	DDC data	
13	HSYNC	
14	VSYNC	
15	DDC clock	

11.1.3. Ethernet Connectors

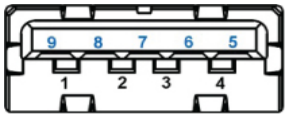
Table 12: Ethernet Connector (see Figure 2, pos. 3)

Pin	Signal Name	LAN1 ~ LAN6 (RJ45)
1	TX1+	
2	TX1-	
3	TX2+	
4	TX3+	
5	TX3-	
6	TX2-	

Pin	Signal Name	LAN1 ~ LAN6 (RJ45)
7	TX4+	
8	TX4-	

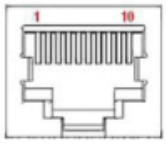
11.1.4. USB 3.0 Port

Table 13: USB 3.0 Port (see Figure 2, pos. 4)

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	+USB_VCC	5	USB_RX-	
2	USB_D-	6	USB_RX+	
3	USB_D+	7	GND	
4	GND	8	USB_TX-	
		9	USB_TX+	

11.1.5. RS232 Serial Port

Table 14: RS232 Serial Port (see Figure 2, pos. 5)

Pin	Signal Name	RJ45 Console Port
1	+5V	
2	DCD	
3	DSR	
4	RXD	
5	RTS	
6	TXD	
7	CTS	
8	DTR	
9	GND	
10	RI	

12/ uEFI BIOS

12.1. Starting the uEFI BIOS

The KBox N-110 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 N-110 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 N-110 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 12: BIOS Main Menu Screen System Data and Time

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Product Information					
Product Name		KBox N-110			
BIOS Version		R0.06 (x64)			
BIOS Build Date		11/05/2018			
ME FW Version		0B:4.0.4.181			
CPU Information					
Intel® Atom® CPU C3338 @ 1.50GHz					
Microcode Revision		24h			
Processor Cores		2/ 2		→ ←: Select Screen	
Memory Information				↑ ↓: Select Item	
Total Size		4096 MB (DDR4)		Enter: Select	
Frequency		1866 MHz		+/-: Change Opt.	
				F1: General Help	
System Date		[Fri 11/30/2018]		F2: Previous Values	
System Time		[15:32:12]		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 Configuration
- FIA HSIO10 Configuration
- CPU Chipset Configuration
- NVMe Configuration
- SATA Configuration
- USB Configuration
- Trusted Computing
- Network Stack Configuration
- Super IO Configuration
- Serial Port Console Redirection
- LAN By Pass Configuration
- H/W Monitor

NOTICE

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

Figure 13: BIOS Advanced Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Load Intel I210 UNDI		[Disabled]			
Load X553 1GbE UNDI		[Disabled]			
> FIA HSIO10 Configuration					
> CPU Chipset Configuration					
> NVMe Configuration				→ ←: Select Screen	
> SATA Configuration				↑ ↓: Select Item	
> USB Configuration				Enter: Select	
> Trusted Computing				+/-: Change Opt.	
> Network Stack Configuration				F1: General Help	
> Super IO Configuration				F2: Previous Values	
> Serial Port Console Redirection				F3: Optimized Defaults	
> LAN By Pass Configuration				F4: Save & Exit	
> H/W Monitor				ESC: Exit	
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Feature	Option	Description
Load Intel I210 UNDI	[Disabled], [Enabled]	Select whether to load onboard UNDI (Universal Network Driver Interface) for Intel I210.
Load X553 1GbE UNDI	[Disabled], [Enabled]	Select whether to load onboard UNDI (Universal Network Driver Interface) for X553 1GbE.

Figure 14: BIOS Advanced Menu - FIA HSIO10 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Flexible I/O Adapter HSIO10 Configuration					
HSIO10 I/O amount		Full Avtive			
Lane 8: PCIE-C6139 (VGA)		[PCIE Enabled]			
Lane 18: XHCI-A		[XHCI Enabled]			
Lane 19: XHCI-B		[XHCI Enabled]		→ ←: Select Screen	
Lane 0: I210-AT-1		[PCIE Enabled]		↑ ↓: Select Item	
Lane 2: I210-AT-2		[PCIE Enabled]		Enter: Select	
Lane 10: mPCIE1 / mSATA		[JP5 with mPCIE]		+/-: Change Opt.	
Lane 4: M.2 Key-A		[PCIE Enabled]		F1: General Help	
Lane 6: M.2 Key-B (SATA)		[JP4 with PCIE]		F2: Previous Values	
Lane 9: SATA1		[SATA Enable]		F3: Optimized Defaults	
				F4: Save & Exit	
SIM Switch Control		[To mPCIE1]		ESC: Exit	
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Feature	Option	Description
Lane 8: PCIE-C6139 (VGA)	[Lane Disabled], [PCIE Enabled]	Select Lane to work as Disabled or PCIE-C6139 (VGA).
Lane 18: XHCI-A	[Lane Disabled], [XHCI Enabled]	Select Lane to work as Disabled or XHCI-A.
Lane 19: XHCI-B	[Lane Disabled], [XHCI Enabled]	Select Lane to work as Disabled or XHCI-B.
Lane 0: I210-AT-1	[Lane Disabled], [PCIE Enabled]	Select Lane to work as Disabled or I210-AT-1.
Lane 2: I210-AT-2	[Lane Disabled], [PCIE Enabled]	Select Lane to work as Disabled or I210-AT-2.
Lane 10: mPCIE1 / mSATA	[Lane Disabled], [PCIE Enabled], [SATA Enabled], [JP5 with mPCIE]	Select Lane to work as Disabled, mPCIE1 or mSATA1.
Lane 4: M.2 Key-A	[Lane Disabled], [PCIE Enabled]	Select Lane to work as Disabled or M.2 Key-A.
Lane 6: M.2 Key-B (SATA)	[Lane Disabled], [PCIE Enabled], [SATA Enabled], [JP4 with PCIE]	Select Lane to work as Disabled or M.2 Key-B (SATA).
Lane 9: SATA1	[Lane Disabled], [SATA Enabled]	Select Lane to work as Disabled or SATA1.
SIM Switch Control	[To mPCIE1], [To M2 Key-B]	Control Micro SIM Card Holder for MPCIE1 or M2_KEY-B.

Figure 15: BIOS Advanced Menu - CPU Chipset Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
CPU Chipset Configuration					
EIST		[Enabled]			
Turbo Mode		[Enabled]			
CPU C State		[Enabled]		→ ←: Select Screen	
Active Processor Core		0		↑ ↓: Select Item	
VMX		[Enabled]		Enter: Select	
VT-d		[Enabled]		+/-: Change Opt.	
VT-d Interrupt Remapping		[Enabled]		F1: General Help	
Max CPUID Value Limit		[Disabled]		F2: Previous Values	
Execute Disable Bit		[Enabled]		F3: Optimized Defaults	
IQAT		[Enabled]		F4: Save & Exit	
Fast Boot		[Enabled]		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 CPU Turbo capability to allow the processor core to run faster.
CPU C State	[Disabled], [Enabled]	Select whether to enable or disable the enhanced Cx state of the CPU.
VMX	[Disabled], [Enabled]	Select whether to enable or disable the Vanderpool Technology
VT-d	[Disabled], [Enabled]	Select whether to enable or disable VT-d.
VT-d Interrupt Remapping	[Disabled], [Enabled]	Select whether to enable or disable VT-d Interrupt Remapping. If Interrupt Remapping is disabled, the XAPIC mode will be disabled.
Max CPUID Value Limit	[Disabled], [Enabled]	Select whether to limit CPUID maximum value. It should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.
Execute Disable Bit	[Disabled], [Enabled]	Select whether to enable or disable Execute Disable Bit functionality, which prevents malicious buffer overflow attacks. When disabled, forces the XD feature flag to always return 0.
IQAT	[Disabled], [Enabled]	Select whether to enable or disable Intel QuickAssist Technology device from an OS.
Fast Boot	[Disabled], [Enabled]	Select whether to enable or disable fast boot which skips memory training and attempts to boot using last known good configuration.

Figure 16: BIOS Advanced Menu - NVMe Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
NVMe controller and Drive information					
No NVME Device Found				→ ←: 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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Figure 17: BIOS Advanced Menu - SATA Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
SATA Configuration					
SATA Controller 0		[Enabled]		→←: Select Screen	
SATA-0 Port Multiplier		[Disabled]		↑ ↓: Select Item	
				Enter: Select	
Serial ATA 1		Empty		+/-: Change Opt.	
SATA 1		[Enabled]		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
SATA Controller 0	[Enabled], [Disabled]	Select whether to enable or disable SATA controller (D:19, F:0).
SATA-0 Port Multiplier	[Enabled], [Disabled]	Select whether to enable or disable SATA Controller 0 port multiplier support in CAP register of the controller.
SATA1	[Disabled], [Enabled]	Select whether to enable or disable SATA Controller 0 Port 1.

Figure 18: 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, 1 Hub				↑ ↓: 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 19: BIOS Advanced Menu - Trusted Computing

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Configuration					
Security Device Support		[Disabled]			
NO Security Device Found				→ ←: 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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Feature	Option	Description
Security Device Support	[Disabled], [Enabled]	Select whether to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Figure 20: BIOS Advanced Menu - Network Stack Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Network Stack Configuration					
LAN Boot I210-AT-1		[Disabled]		→ ←: Select Screen	
LAN Boot I210-AT-2		[Disabled]		↑ ↓: Select Item	
LAN Boot X553 1GbE-1		[Disabled]		Enter: Select	
LAN Boot X553 1GbE-2		[Disabled]		+/-: Change Opt.	
LAN Boot X553 1GbE-3		[Disabled]		F1: General Help	
LAN Boot X553 1GbE-4		[Disabled]		F2: Previous Values	
				F3: Optimized Defaults	
Ipv4 PXE Support		[Enabled]		F4: Save & Exit	
Ipv6 PXE Support		[Disabled]		ESC: Exit	
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Feature	Option	Description
LAN Boot I210-AT-1	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel I210-AT-1
LAN Boot I210-AT-2	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel I210-AT-2
LAN Boot X553 1GbE-1	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel X553 NIC with Marvell 88E1543 Port 1.
LAN Boot X553 1GbE-2	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel X553 NIC with Marvell 88E1543 Port 2.
LAN Boot X553 1GbE-3	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel X553 NIC with Marvell 88E1543 Port 3.
LAN Boot X553 1GbE-4	[Disabled], [Load PXE]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment) or uEFI-SNP (Simple Network Protocol). Intel X553 NIC with Marvell 88E1543 Port 4.
Ipv4 PXE Support	[Disabled], [Enabled]	Select whether to enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
Ipv6 PXE Support	[Disabled], [Enabled]	Select whether to enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

Figure 21: 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 ↑ ↓: 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 22: 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 ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Device Settings		IO=3F8h; IRQ=4;			
Change Setting		[Auto]			
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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.

Figure 23: BIOS Advanced Menu - Serial Port Console Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
COM1					
Console Redirection		[Enabled]			
> Console Redirection Settings					
COM2 (Disabled)				→ ←: Select Screen	
Console Redirection		Port Is Disabled		↑ ↓: Select Item	
				Enter: Select	
Legacy Console Redirection				+/-: Change Opt.	
> Legacy Console Redirection Settings				F1: General Help	
				F2: Previous Values	
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS)				F3: Optimized Defaults	
Console Redirection		[Disabled]		F4: Save & Exit	
> Console Redirection Settings				ESC: Exit	
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Feature	Option	Description
Console Redirection	[Disabled], [Enabled]	Select whether to enable or disable console redirection.

Figure 24: BIOS Advanced Menu - Serial Port Console Configuration - COM1 Console Redirection Settings

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
COM1					
Console Redirection Settings					
Terminal Type		[ANSI]			
Bits per second		[115200]		→ ←: Select Screen	
Data Bits		[8]		↑ ↓: Select Item	
Parity		[None]		Enter: Select	
Stop Bits		[1]		+/-: Change Opt.	
Flow Control		[None]		F1: General Help	
VT-UTF8 Combo Key Support		[Enabled]		F2: Previous Values	
Recorder Mode		[Disabled]		F3: Optimized Defaults	
Resolution 100x31		[Disabled]		F4: Save & Exit	
Putty KeyPad		[VT100]		ESC: Exit	
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Feature	Option	Description
Terminal Type	[VT100], [VT100+], [VT-UTF8], [ANSI]	VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc.

Feature	Option	Description
		VT-UTF8: Uses UTF8 encoding to map Unicode ANSI: Extended ASCII char set.
Bits per second	[9600], [19200], [38400], [57600], [115200]	Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	[7], [8]	Select data bits.
Parity	[None], [Even], [Odd], [Mark], [Space]	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0.
Stop Bits	[1], [2]	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. The options are 1 and 2 stop bits.
Flow Control	[None], [Hardware RTS/CTS]	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Software flow control uses start/stop ASCII chars, which slows down the data flow and can be problematic if binary data is being sent. The flow control options are: • None • Hardware CTS/RTS: HW flow control uses two wires to send start/stop signals.
VT-UTF8 Combo Key Support	[Disabled], [Enabled]	Select whether to enable or disable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
Recorder Mode	[Disabled], [Enabled]	With this mode enabled, only text will be sent. This is to capture terminal data.
Resolution 100x31	[Disabled], [Enabled]	Select whether to enable or disable extended terminal resolution.
Putty KeyPad	[VT100], [LINUX], [XTERMR6], [SCO], [ESCN], [VT400]	Select FunctionKey and KeyPad on Putty.

Figure 25: BIOS Advanced Menu - Serial Port Console Configuration - Legacy Console Redirection Settings

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Legacy Console Redirection Settings					
Redirection COM Port		[COM1]		→←: Select Screen	
Resolution		[80x24]		↑ ↓: Select Item	
Redirect After POST		[BootLoader]		Enter: Select	
				+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
				F3: Optimized Defaults F4: Save & Exit ESC: Exit	
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Feature	Option	Description
Redirection COM Port	[COM1], [COM2 (Disabled)]	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	[80x24], [80x25]	Select the number of rows and columns supported redirection on legacy OS.
Redirect After POST	[Always Enabled], [BootLoader]	When BootLoader is selected, the legacy console redirection is disabled before booting to legacy OS. When Always Enabled is selected, the legacy console redirection is enabled for legacy OS.

Figure 26: BIOS Advanced Menu - LAN By Pass Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
LAN By Pass Configuration					
LAN Bypass 1 Function		[Disabled]		→ ←: Select Screen	
LAN Bypass 2 Function		[Disabled]		↑ ↓: Select Item	
Switch Button Function		[Power On/Off]		Enter: Select	
				+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
LAN Bypass 1 Function	[Disabled], [Enabled]	Select whether to enable or disable load LAN1 By Pass function.
LAN Bypass 2 Function	[Disabled], [Enabled]	Select whether to enable or disable load LAN2 By Pass function.
Switch Button Function	[Power On/Off], [System Reset], [GPI to GP20]	Select switch button mode.

Figure 27: BIOS Advanced Menu - H/W Monitor

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
PC Health Status					
CPU Temperature-DTS		: +51 C		→ ←: Select Screen	
CPU Temperature-Thermal		: +49 C		↑ ↓: Select Item	
System Temperature		: +39 C		Enter: Select	
				+/-: Change Opt.	
+VCORE		: +1.053 V		F1: General Help	
+5V		: +5.106 V		F2: Previous Values	
+VDC		: +12.156 V		F3: Optimized Defaults	
+3.3V		: +3.376 V		F4: Save & Exit	
+VRTC		: +3.136 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 28: BIOS Power Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Power Configuration					
Restore AC Power Loss		[Power Off]			
Power Saving Mode		[Disabled]			
Resume Event Control				→ ←: Select Screen	
Resume LAN X553 1GbE-1		[Disabled]		↑ ↓: Select Item	
Resume LAN X553 1GbE-2		[Disabled]		Enter: Select	
Resume LAN X553 1GbE-3		[Disabled]		+/-: Change Opt.	
Resume LAN X553 1GbE-4		[Disabled]		F1: General Help	
Resume LAN I210-AT-1		[Disabled]		F2: Previous Values	
Resume LAN I210-AT-2		[Disabled]		F3: Optimized Defaults	
Resume By RTC Alarm		[Disabled]		F4: Save & Exit	
> WatchDog Timer Configuration				ESC: Exit	
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Feature	Option	Description
Restore AC Power Loss	[Power Off], [Power On], [Last State]	Select AC power state when power is re-applied after a power failure. 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 SOC Power]	Configure the power saving mode configuration. EUP SOC Power: Save power for USB, PCIE-Slot, LAN and chipset-SOC components.
Resume LAN X553 1GbE-1	[Disabled], [OS-Driver], [FW-MagicPacket]	Select whether to enable wake from LAN device Intel X553 NIC with Marvell 88E1543 Port 1.
Resume LAN X553 1GbE-2	[Disabled], [OS-Driver], [FW-MagicPacket]	Select whether to enable wake from LAN device Intel X553 NIC with Marvell 88E1543 Port 2.
Resume LAN X553 1GbE-3	[Disabled], [OS-Driver], [FW-MagicPacket]	Select whether to enable wake from LAN device Intel X553 NIC with Marvell 88E1543 Port 3.
Resume LAN X553 1GbE-4	[Disabled], [OS-Driver], [FW-MagicPacket]	Select whether to enable wake from LAN device Intel X553 NIC with Marvell 88E1543 Port 4.
Resume LAN I210-AT-	[Disabled], [OS-	Select whether to enable wake from LAN device Intel I210-AT-1.

Feature	Option	Description
1	Driver], [FW-MagicPacket]	
Resume LAN I210-AT-2	[Disabled], [OS-Driver], [FW-MagicPacket]	Select whether to enable wake from LAN device Intel I210-AT-2.
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 29: 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*		[Minute]		↑ ↓: Select Item	
WDT Timer*		3		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 30: 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			
Bootup NumLock State		[On]			
				→ ←: Select Screen	
CSM Support		[Enabled]		↑ ↓: Select Item	
Boot Option Filter		[EUFI and Legacy]		Enter: Select	
Boot up Available Beep		[Enabled]		+/-: Change Opt.	
Load built-in Shell		[Enabled]		F1: General Help	
File System Drivers		[Enabled]		F2: Previous Values	
LED8 Boot Status		[Driven Low]		F3: Optimized Defaults	
				F4: Save & Exit	
Boot Option Priorities				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	[Enabled]	Select whether to enable or disable CSM support.
Boot Option Filter	[UEFI and Legacy], [Legacy only], [UEFI only]	Control Legacy / UEFI ROMs priority.
Boot up Available Beep	[Enabled], [Disabled]	Select whether to enable or disable boot up available beep.
Load built-in Shell	[Enabled], [Disabled]	It controls installation of the boot option for a built-in shell.
File System Drivers	[Enabled], [Disabled]	Free software UEFI file system drivers, such as a read-only NTFS or exFAT EFI drivers, courtesy of the GRUB project.
LED8 Boot Status	[Driven High], [Driven Low]	LED8 (UGLED/DGLED) boot status when system BIOS boot ready.

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 N-110 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 31: 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	
HDD Security Configuration:				F4: Save & Exit	
HDD 0: WDC WD 1600BE				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 32: 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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