USER GUIDE

KBox A-150-HSW

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KBOX A-150-HSW – USER GUIDE

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Revision History

Revision	Brief Description of Changes	Date of Issue	Author/ Editor
1.0	Initial Issue	2018-September-13	HJS

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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!

2/ Introduction

Kontron's KBox A-150-HSW is developed specifically for control cabinet applications. The new KBox A-150-HSW with a turnable heatsink offers flexible DIN Rail mounting positions even when space is limited. The fanless design ensures a significantly prolonged lifespan and high system availability.

The KBox A-150-HSW offers high processor performance at low power dissipation by an Intel® Core™ i5-4300U processor. Due to the varied amount of onboard interfaces such as GbE, USB 3.0, USB 2,0, DisplayPort, the KBox A-150-HSW enables connectivity for nearly all applications and supports memory expandability via mSATA SSD memory expansion.

General KBox A-150-HSW features are:

- Intel® Core™ i5-4300U
- up to 8 GB RAM DDR3L memory
- Additional 64 GB up to 512 GB memory storage via SSD (option)
- External Interfaces 2x DisplayPort, 3x GbE, 4x USB 3.0, 2x COM (RS232, RS422, RS485, BIOS configurable)
- Fanless passive cooling
- Supports Kontron APPROTECT optionally

The KBox A-150-HSW is intended for 24/7 continuous operation and longtime industrial applications. All components are selected to ensure a long lifetime.

This user guide describes the KBox A-150-HSW. New users are recommended to study the installation instructions within this user guide before switching on the power.

Figure 1: KBox A-150-HSW

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components..

3/ Standards and Approvals

The KBox A-150-HSW conforms to the requirements of the following standards.

If the user modifies the product, prerequisites for specific approvals such as CE conformity declaration (safety requirements) may no longer apply.

3.1. CE

This product is CE certified.

3.2. Electromagnetic Compatibility

This product has been designed for low level of radiated emission for residential, commercial and light-industrial environments and high immunity level for industrial environmental and complies with the EN 55022 class B specification for radiated and conducted emissions.

EN 55022 Class B	Emission of Information Technology Equipment (ITE), radio disturbance characteristics and limits and methods of measurement (Class B)

3.3. Safety

This product complies with the safety requirements for electrical equipment.

Safety	complies with the General Product Safety Directive 2001/95/EC

3.4. Electromagnetic Compatibility (EMV)/Low Voltage Directive

Electromagnetic Compatibility (EMV)	Complies with the European directive relating to Electromagnetic Compatibility 2014/30/EU
Low Voltage Directive	complies with the Low Voltage Directive 2014/35/EU

3.5. RoHS

RoHS II Directives	Compliant with the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

3.6. WEEE

WEEE Directive	Compliant with the Waste Electrical and Electronic Equipment (WEEE) Directive 2011/65/EU +2015/863/EU +2017/2102/EU to reduce waste of electrical and electronic equipment, encourage recycling and environmental disposal and increase the environmental awareness of producers

4/ Shipment and Unpacking

4.1. Packaging

All parts are delivered together in a product specific cardboard package designed to provide adequate protection to absorb shock. Kontron recommends keeping the packaging to store or transport the product.

4.2. 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, contact Kontron for help and information.

4.3. Scope of Delivery

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

Table 1: Scope of Delivery

Part	Qty.	Remark
KBox A-150 HSW	1	
AC power supply	1	option – order separately
AC power cord	1	option – order separately
Phoenix power connector	1	
Safety Instructions	1	in user guide

4.4. Product Variants

The following factory configured product variants are available for the KBox A-150-HSW product family.

KBox A-150-ccc-r-f-1-s-w-o

Table 2: Product Variants

Variant Code	Description	Options
KBox A-150	Product Family	KBox A -150 family of DIN Rail Industrial Computers
ccc	Chipset	BYT; HSW (Intel® Core™ i5-4300U); SKL; APL; KBL
r	Ram Size	1=4 GB; 2=8 GB
f	Flash mSATA	0=not installed; 1=32 GB; 2=64 GB; 3=128 GB; 4=256 GB; 5=512GB
h	2.5" SSD	0=no SSD; 1=SSD externally removable; 2=internal 2.5 inch SSD

Variant Code	Description	Options
s	Internal 2.5" SSD	0= not installed; 1=32 GB; 2=64 GB; 3=128 GB; 4=256 GB; 5=512 GB
o	Operating System	0=none; 1=W7P; 2=W7U; 3=W8.1; 4=W10; 5=LIN

Table 3: Product Versions

Product	Part Description
KBox A-150-HSW with SSD drive bay	KBox A-150-HSW/RE-Rail-PC; KEEX-5101 i5-4300U; 4 GB DDR-3-SODIMM, drive bay for SSD
KBox A-150-HSW (standard)	KBox A-150-HSW/RE-Rail-PC; KEEX-5101 i5-4300U; 4 GB DDR-3-SODIMM

4.4.1. Accessories

Table 4: Accessories

Part	Part Description
Power Supply	External power supply
Power Cord	230 V power Cord
7 mm – 9.5 mm Adapter/Spacer	7 mm – 9.5 mm Adapter/Spacer for 2.5 " HDD/SSD drives
Heatsink fins	External fins that attach to heat sink plate

4.5. Optional Parts (System Expansion)

- External accessible drive bay for 2.5"SATA HDD/SSDs
- Internal drive bay for 2.5"SATA HDD/SSDs

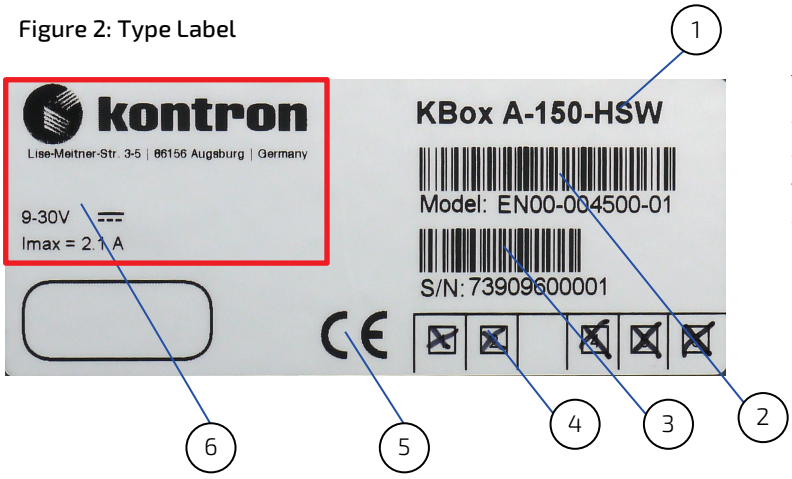
4.6. Optional System Extension

- 1x mPCIe card
- 1x mSATA

4.7. Type Label and Product Identification

The type label is position on the side of the chassis.

Figure 2: Type Label

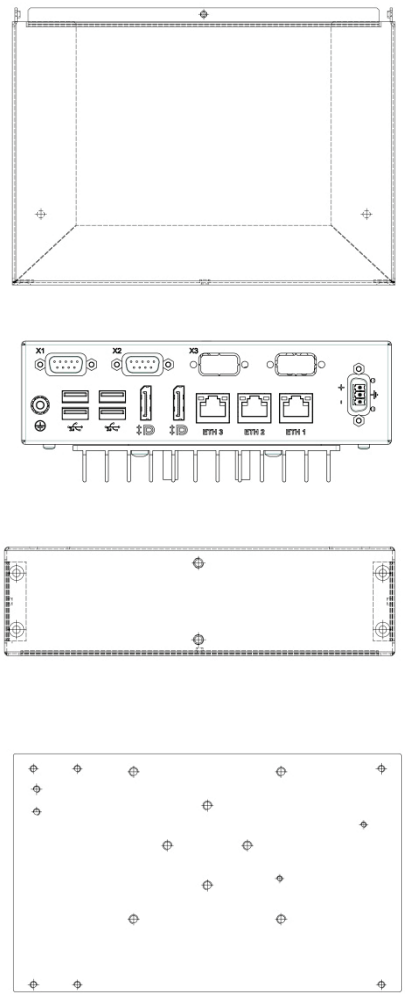


1. Product name (KBox A-150-HSW)
2. Model number with barcode
3. Serial Number (S/N) with barcode
4. For internal product use
5. Certification information
6. Technical data/Manufacturer/Address (red frame)

5/ Product Overview

The KBox A-150-HSW is based on the industrial grade box PC with Intel® ULT i5-4300U (option: w/ i7-4650) processor. The series is a fanless device with passive cooling. Operating systems are Windows 7, Windows 10 or Linux.

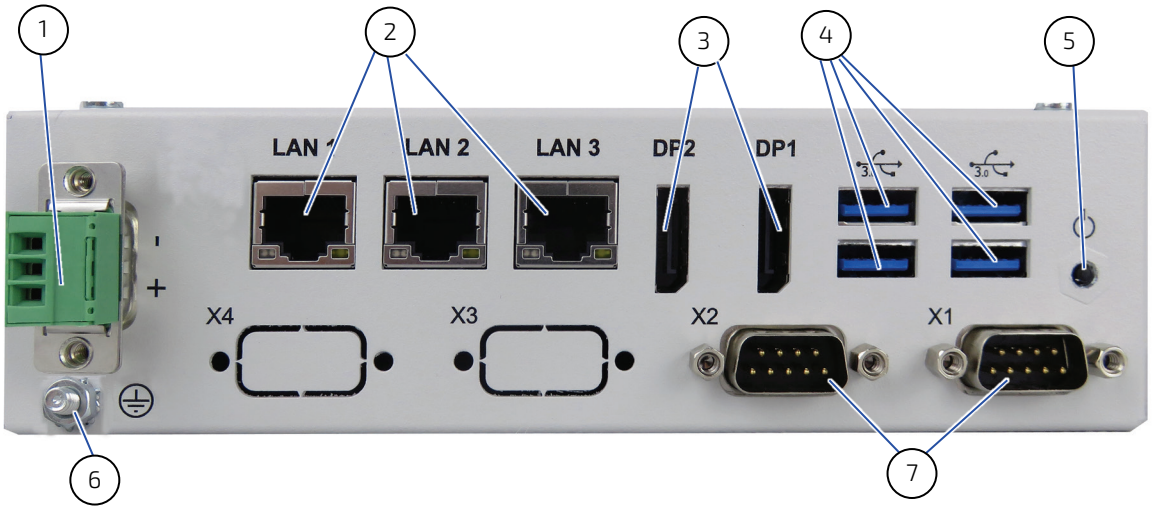
Figure 3: KBox A-150-HSW Overview



The KBox A-150-HSW is designed for operation in a DIN rail environment using either a horizontal and vertical orientation. For more information, see Chapter 9/ Installation Instructions.

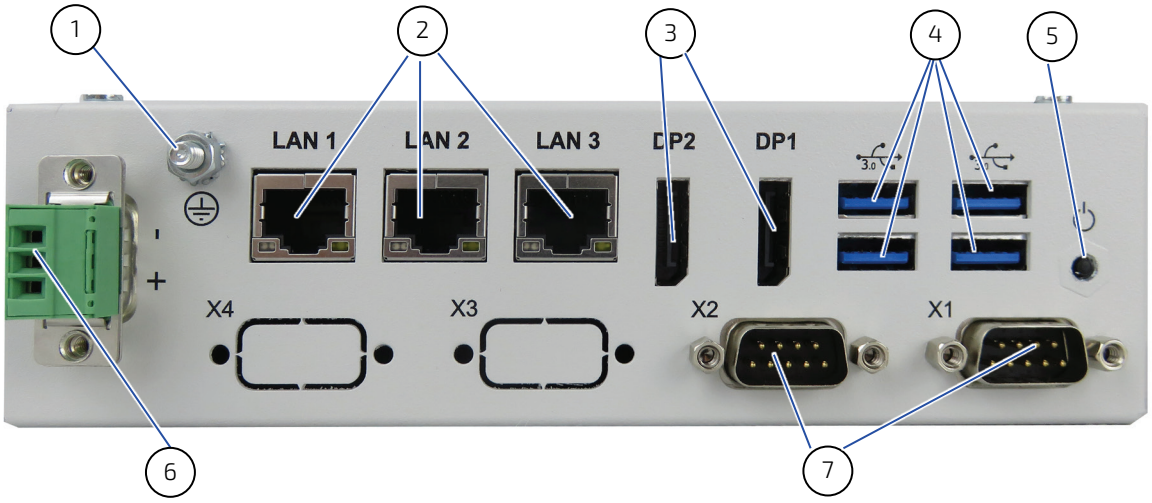
5.1. Front View

Figure 4: Front View (External HDD/SSD drive bay variant)



1 Power Connector
2 3x GbE
3 2x DisplayPort
4 4x USB 3.0
5 Power Button
6 Protective Earth stud bolt
7 2x COM

Figure 5: Front View (without external HDD/SSD drive bay variant)



1 Protective Earth stud bolt
2 3x GbE
3 2x DisplayPort
4 4x USB 3.0
5 Power Button
6 Power Connector
7 2x COM

5.1.1. Power Connector (PWR)

There is one 3-pin Phoenix power connector on the front panel supporting an input DC voltage range of 9 VDC to 30 VDC, see Figure 4 (pos. 6). The required mating connector, to connect the power connector to a DC main power source, is supplied with the KBox A-150-HSW.

5.1.2. Protective Earth

There is a Protective Earth stud bolt on the front panel connected to the chassis GND inside the system. The position of the ground pin varies depending on whether the KBox A-150-HSW is delivered with a HDD/SSD drive bay see Figure 4: Front View (External HDD/SSD drive bay variant)(pos. 6) or without a HDD/SSD drive bay, see Figure 5: Front View (without external HDD/SSD drive bay variant) (pos. 1).

5.1.3. Display Port (DP1, DP2)

There are two DP graphics ports for video only solutions, see Figure 4(pos.3).

5.1.4. Ethernet (LAN1, LAN2, LAN3)

There are three LAN ports LAN1, LAN2 and LAN3 supporting 10/100/1000 Mbit Ethernet, see Figure 4 (pos.2).

5.1.5. USB 3.0 Ports (USB0, USB1, USB2, USB3)

There are four USB 3.0 ports allowing for the connection of a USB 3.0/USB 2.0 compatible device, see Figure 4 (pos.4). For information regarding the pin assignment of the USB 3.0 connector, refer to Chapter 12.1.2: USB 3.0 Port.

5.1.6. Power Button

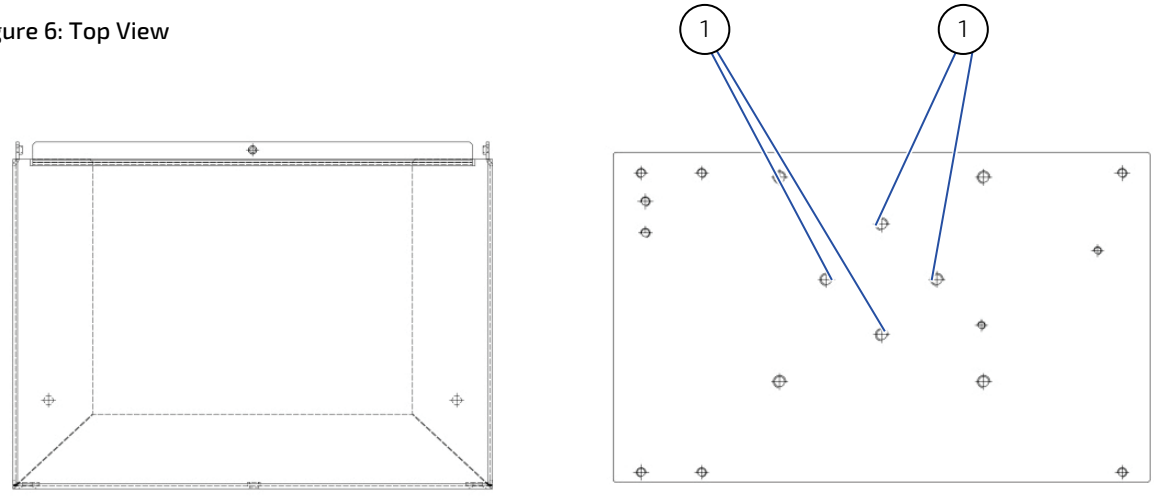
A power button is available on the front panel, see Figure 4 (pos.5). The power button performs an orderly system shut down with no loss of data and then reapplies power to resume operation.

5.1.7. Serial Port (X1, X2) optional (X3, X4)

There are two serial ports X1 and X2 both supporting RS232/422/485, .see Figure 4(pos.7). Two additional RS232 serial ports are optional using the front panel breakouts X3 and X4. X3 and X4 support RS232 only. For information regarding the pin assignment of the serial port connectors X1 and X2, refer to Chapter 12.1.3.

5.2. Views

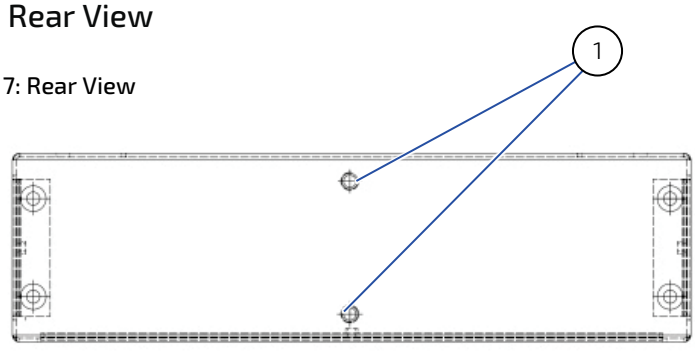
Figure 6: Top View



1 4x DIN rail mouting holes

5.2.1. Rear View

Figure 7: Rear View

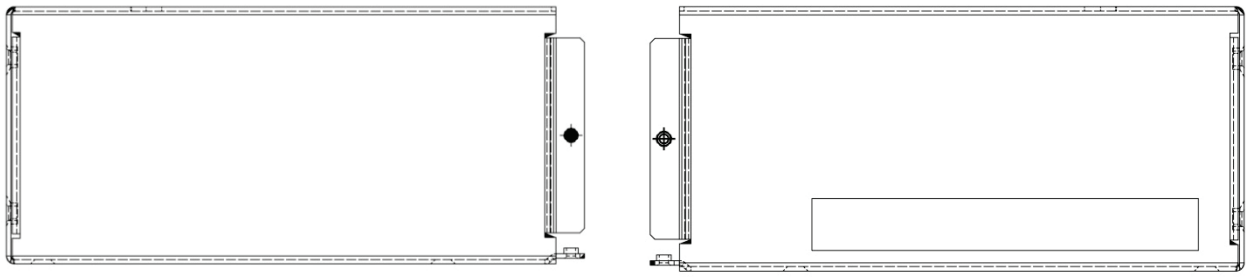


1 2x DIN rail mouning holes

5.2.2. Side views

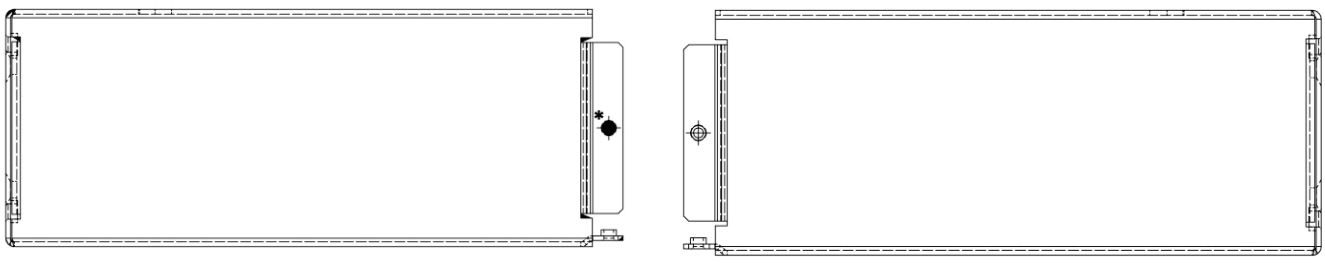
5.2.2.1. Side Views with HDD

Figure 8: Left and Right View



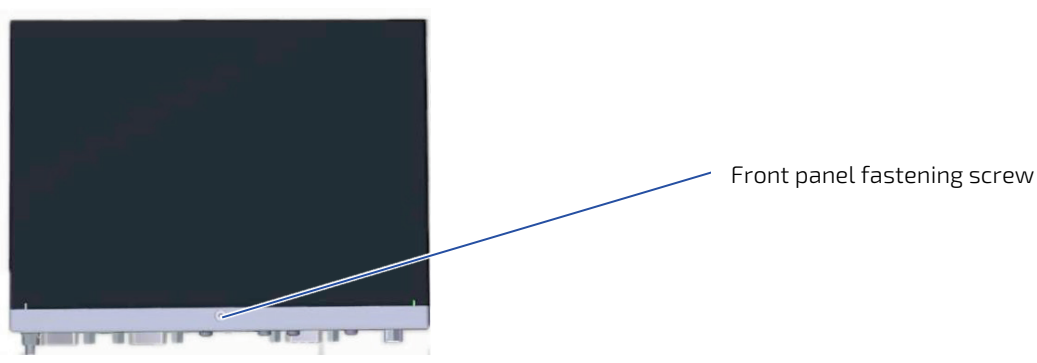
5.2.2.2. Side Views without HDD

Figure 9: Left and Right View



5.3. Bottom View

Figure 10: Bottom View



6/ System Extension

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

6.1. Storage

6.1.1. External HDD/SSD Drive Bay

To expand storage memory for variants with an external HDD/SSD Drive Bay, use a 2.5" slim SSD. Before installing or removing an existing external SSD, refer to Chapter 7.1: Accessing External Components.

Pay attention to the manufacturer's lifespan specification information. Due to the limited lifespan Kontron recommends checking the condition of the installed HDD/SSD drives via S.M.A.R.T.regularly.

6.1.2. Internal mSATA SSD

To expand storage memory an Internal mSATA SSD of up to 512 GB can be installed. Kontron recommends the use of Kontron reference SSDs from 32 GB to 512 GB. For more information, refer to Table 2: Product Variants

Before installing or removing an existing internal SSD, refer to Chapter 7.2.2: Installing and Removing Internal mSATA SSD.

Pay attention to the manufacturer's lifespan specification information. Due to the limited lifespan Kontron recommends checking the condition of the installed HDD/SSD drives via S.M.A.R.T. regularly.

6.2. Expansion Cards –mPCIe

There is one internal mini PCIE V 1.2 expansion socket (MPCIE1). For information regarding the pin assignment of MPCIE1, refer Chapter 0.

Before installing or removing an expansion card, refer to Chapter 7.2.3.

7/ Accessing Components

This chapter contains important information that users must read before accessing components. Follow these procedures properly when accessing or installing component to extend the system.

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

⚠WARNING

The installation/removal of system components may only be performed by a qualified persons. Observe the "General Safety Instructions for IT-Equipment" and the "installation instructions" contained within this user guide.

ESD Sensitive

Follow the safety instructions for components that are sensitive to electrostatic discharge (ESD). Failure to observe this warning notice may result in damage to the product or/and internal components.

Because of the limited predetermined lifespan of expansion devices, Kontron recommends checking the condition of installed expansion devices regularly and to pay attention to the manufacturer specifications for lifespan.

7.1. Accessing External Components

7.1.1. HDD/SSD Drive Bay

The KBox A-150-HSW variant including an external HDD/SSD drive bay supports the use of 9.5 mm high SSD drives and 7 mm SSD drives in the HDD/SSD drive bay. To insure that 7 mm high SSDs are correctly connected and to avoid damage to the internal SATA connectors an adapter/spacer must be attached to 7 mm SSD drives to enables the 7mm SSD drives to mount correctly in the drive bay's connection points.

To remove/install a removable HDD/SSD drive, perform the following steps:

1. Press the eject button on the right hand side of the HDD/SSD drive bay, to remove an existing HDD/SSD drive from the HDD/SSD Drive Bay.
2. The HDD/SSD drive bay springs open and the removable HDD/SSD drive automatically slides out a bit.
3. Remove the drive by holding the sides and carefully pulling the drive out of the HDD/SSD drive bay.

The HDD/SSD drive bay allows for the installation of 9.5 mm or 7 mm high SSDs. A 7 mm high SSD can only be used, when an adapter/spacer is attached to the drive. This ensures that the 7 mm high SSD drive is correctly alignment with the internal SATA data and SATA power connector mounting points.

4. For 9.5 mm high SSDs, carefully push the drive into the drive bay with the SSD contacts facing the drive bay and the drive facing downward until the connectors attach.

   For 7 mm high SSDs, attach the SSD to an 7mm – 9.5 mm adapter/spacer, then carefully push the SDD with adapter/spacer into the drive bay with the SSD contacts facing the SSD drive bay and the drive facing downward until the connectors attach.
5. The KBox A-150-HSW can now be powered up.

WARNING After changing the mSATA SSD the partitioning of the memory maybe different and require the system to be repartitioned.

7.2. Accessing Internal Components

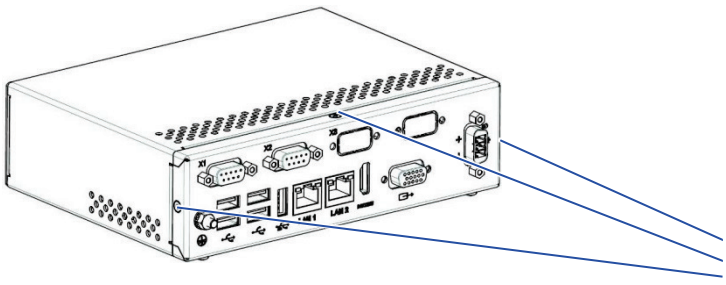
7.2.1. Opening the Chassis

To access the internal components open the KBox A-150-BT chassis by following the step below:

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

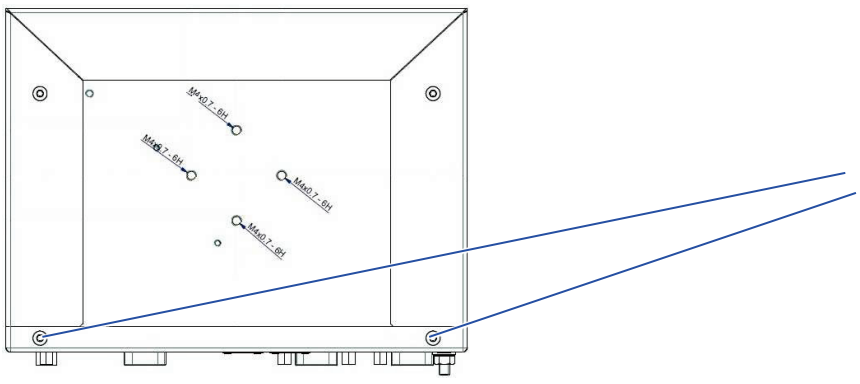
1. Close all applications. Shut down the system properly and disconnect the power cord from the power source. Disconnect all peripherals.
2. Place the KBox A-150 BT on a flat, clean and ESD-safe surface.
3. Remove the three screws at the top, right and left sides of the front panel, see Figure 11: Front Panel Fastening Screws

Figure 11: Front Panel Fastening Screws



4. Remove the two screws from the bottom side of the chassis.

Figure 12: Bottom Side fastening screws



5. Carefully side the cover of the chassis

6. To close the KBox A-150 BT, proceed in the reverse order. Align the front panel with the main chassis and push backwards (towards the rear side of the chassis) while making sure that the front panel remains aligned and goes back as far as it will go. Secure the cover with the screws removed in step 4 and step 3.

7.2.2. Installing and Removing Internal mSATA SSD

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

To install an mSATA SSD proceed according to the steps described:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.
2. Open the chassis as described in Chapter 7.2.1: Opening the Chassis(steps 1-6).
3. Locate the mSATA sockets and the corresponding fixing clips.
4. Insert the mSATA SSD card into the corresponding socket at an angle of approx. 45° and push it down until the fixing holes of the card are aligned with the fixing clips.
5. Press the mSATA SSD card down (on the side with the fixing holes) until the mSATA SSD card snaps in the fixing clips.
6. In order to close the KBox A-150-HSW, proceed in reverse order (step 6)of Chapter 7.2.1.

To remove an mSATA SSD proceed according to the steps described:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.
2. Open the Chassis as described in the Chapter 7.2.1: Opening the Chassis (steps 1-5).
3. Locate the mSATA SSD card installed into your system.
4. Release the fixing clips and the mSATA SSD springs up at an angle of approximately 45° on the fixing clips side.
5. Gently pull the mSATA SSD card out of the mSATA socket.
6. In order to close the KBox A-150-BT, proceed in reverse order (step 6) of Chapter 7.2.1.

WARNING **After changing the mSATA SSD the partitioning of the memory maybe different and require the system to be repartitioned.**

7.2.3. Installing and Removing mPCIE Expansion Cards

The KBox A-150-HSW is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

To install a mini PCIe cards follow the steps below:

1. Close all applications; shut down the system properly and disconnect the connection to the power source.
2. Disconnect all peripherals.

3. Open the device as described in the Chapter 7.2.1: (step 1-5).
4. Locate the mini PCIe card socket and the corresponding fixing clips.
5. Insert the mini PCIe card into the socket at an angle of approx.. 45° and push it down until the fixing holes of the card are aligned with the fixing clips.
6. Press the mini PCIe card down (on the side with the fixing holes) until the card snaps in the fixing clips.
7. In order to close the KBox A-150-HSW, proceed in reverse order (step 6) of Chapter 7.2.1.

To remove a mini PCIe card follow the steps below:

1. Close all applications; shut down the system properly and disconnect the connection to the power source. Disconnect all peripherals.
2. Open the device as described in the Chapter 7.2.1 Opening the Chassis(step 1-5).
3. Locate the mini PCIe card installed into your system.
4. Slide the fixing clips outwards in order to release the mini PCIe card. The mini PCIe card springs up at an angle of approx. 45° on the fixing clips side.
5. Gently pull the mini PCIe card out of the socket.
6. In order to close the KBox A-150-HSW, proceed in reverse order (step 6) of Chapter7.2.1Opening the Chassis.

8/ Thermal Considerations

⚠WARNING

Hot Surface – heatsink

Danger of burns. Heatsink can get very hot. To avoid burns and personal Injury:

- **Do not touch the heatsink when the product is in operation**
- **Allow the product to cool before handling**
- **Wear protective gloves**
- **Always turn the product off when not in use**

8.1. Heatsink

The KBox A-150-HSW is a fanless and passively cooled using a heatsink plate to dissipates heat from within the KBox A-150-HSW's chassis to the ambient environment. When mounting the KBox A-150-HSW in a DIN rail enclosure or housing take care not to obstruct the airflow over the heatsink plate, as this stops sufficient heat dispersing into the ambient environment and causes a build-up of heat.

Features of the heatsink plate are:

- Surface area of 171 mm x 105 mm

8.2. Heatsink Fins (Optional)

An optional turnable heatsink with cooling fins is available for installation on the heatsink plate. The heatsink cooling fins are tunable by 90° and can be fitted on the KBox A-150-HSW to suit each possible installation position by remain in the vertical position to support the direction of the air flow within the DIN rail enclosure or housing. The heatsink support the use of the DIN rail.

Figure 13: Heaksink Fins

Heatsink fin	Heatsink fin assembled with DIN rail

9/ Installation Instructions

9.1. DIN Rail Mounting

The KBox A-150-HSW is a rail mount PC box designed for use in a DIN rail enclosure or housing by attaching a DIN rail mounting clamp. The DIN rail mounting clamp can be attached on:

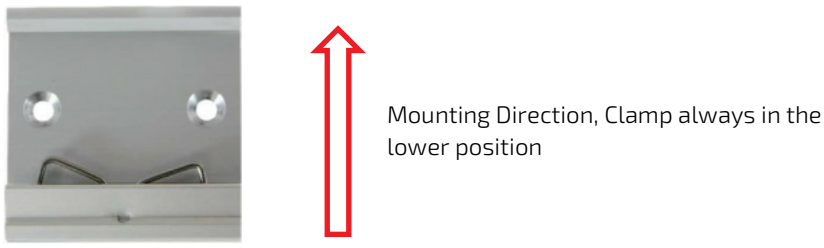
- Top side of the chassis
- Rear side of the chassis

The position and direction of the clamp decides the orientation of the product within the DIN rail enclosure or housing. When deciding on the KBoxA-150-HSW's orientation consider access to the front panel and to the external HDD/SDD drive bay, if available.

To attach the DIN Rail retaining clamp, follow the steps below:

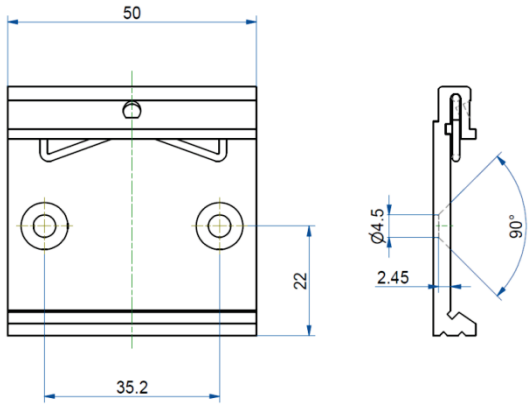
1. Make sure that the DIN Rail retaining clamp is in the upper position, for the required mounting option.

Figure 14: DIN Rail Position



2. Fasten the DIN rail mounting clamp firmly to the chassis using two M4x6 (Max. length) counter sunk screws.

Figure 15: DIN Rail Clamp Screw Dimensions



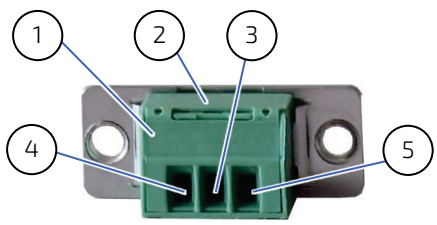
3. Clip the top of the DIN rail mounting clamp in to the DIN rail and push the bottom of the DIN rail firmly until it clamps on to the bottom of the DIN rail.

Figure 16: DIN Rail Mounting Options

9.2. Power Connector

The KBox A-150-HSW is connected by the Input power connector on the front panel to a DC power source via a DC power supply wiring consisiting of the Phoenix power mating connector (3 pin Phoenix PSC 1,5/ 3-F) delivered with the KBox A-150-HSW and the assembled wires. For information on how to assemble the wires, see Chapter 9.2.1.

Figure 17: Phoenix Power Mating Connector



1	3-pin Phoenix plug terminal	4	Location for inserting the 0 V wire
2	Cover over the slotted pan head screws	5	Location for inserting the 24 V wire
3	Location for inserting the functional earth wire		

9.2.1. Wiring the DC Mating Power Connector

To wire the supplied 3 pin Phoenix PSC 1,5/ 3-F power mating connector, following the step below.

1. Cut three (1 mm^2) AWG18 isolated wires to the required length and strip each end 5 mm – 7 mm.
2. Twist the striped wire-ends and provide them with ferrules.
3. Access the slotted pan head screws by opening the Phoenix Power Mating Connector cover (Figure 17, pos. 2).

4. Loosen the slotted pan head screws of the Phoenix power mating connector far enough so that you can insert the end of the prepared wires.
5. Insert the wires into the corresponding clamp of the Phoenix power mating connector. Make sure that you have the right polarity of the connection.
6. Fasten the screws to secure the wires into the Phoenix power mating connector's clamps.
7. Close the Phoenix Power Mating Connector cover (Figure 17, pos. 2).

The wires used for power connections must be clearly marked (+/-/functional earth) to ensure proper connection to the front panel input power connector and to the main power source. In addition, the cables must have some form of support to minimize the strain on the unit's connectors.

10/ Starting Up

Before using your system, become familiar with the system components and follow the startup instructions below.

10.1. Connecting to Power Supply

The KBox A-150-HSW connects to a DC main power supply via a Phoenix power connector on the KBox A-150 HSW's front panel and corresponding power cable.

When starting the KBox A-150-HSW, the functional earth connection must always be made first and disconnected last. Kontron recommended that the last connections attached to the system should be the power cable. Following a proper cabling procedure will prevent a false power-on condition, which could result in an operational failure.

⚠CAUTION

The KBox A-150-HSW must be connected to a DC mains 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 A-150-HSW. The disconnecting device (fuse/circuit breaker) rating must be in accordance with the KBox A-150-HSW's wire cross-section.

To start the KBox A-150-HSW follow the steps below:

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 ground pin to an appropriate common earth connection point.
3. Connect the supplied Phoenix PSC 1,5/3-F power connector with wiring (refer to Chapter9.2: Power Connector and Chapter 9.2.1: Wiring the DC Mating Power Connector) to the Input power connector located on the front panel, see Figure 4 (pos. 1). Pay attention to the polarity of the connections.
4. Connect the other end of the DC power cable to the DC main power supply.
5. Switch on the disconnecting device (circuit breaker) in order to apply voltage to the KBox-A-150-HSW.

10.1.1. Power Button

A power button is available on the front panel, see Figure 4 (pos.5). The power button performs an orderly system shut down with no loss of data and then reapplies power to resume operation.

NOTICE

Do not disconnect the power while KBox A-150-HSW is powered up!
Performing a forced shutdown can lead to loss of data or other undesirable effects!

10.2. Operating System (OS) and Drivers

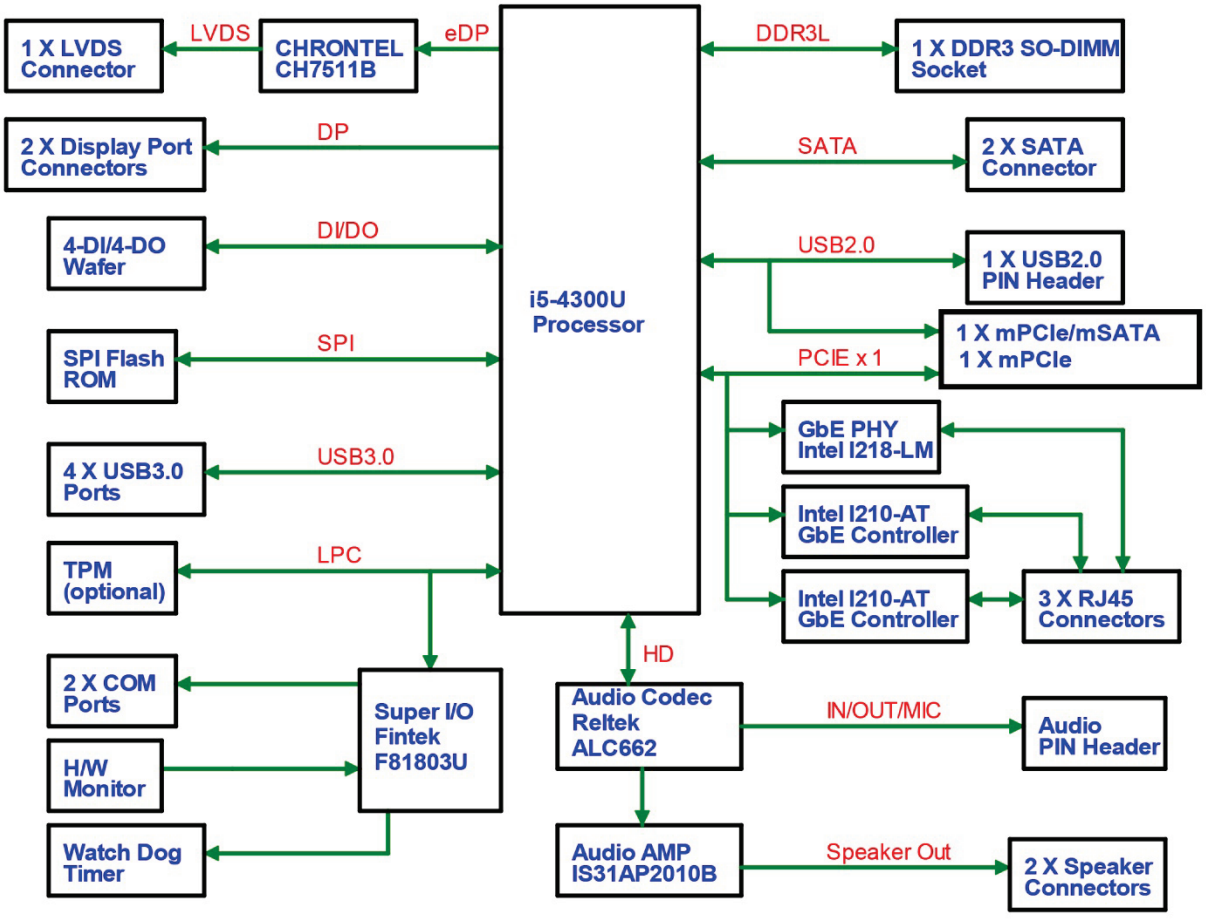
The standard KBox-A-150-HSW is fully operational when switched on for the first time with pre-installed OS and drivers. Drivers are available from Kontron's website (customer section).

If ordered without pre-installed OS you will need to install the operating system and the appropriate drivers for the system configuration ordered (optional hardware components), before starting the KBox-A-150-HSW.

11/ Technical Data

11.1. Block Diagram

Figure 18: Block Diagram



11.2. Technical Specification

Table 5: Technical Data

Designation	KBox A-150 HSW	
Processor	CPU	Intel® Core™ i5-4300U
	Speed	1.9/2.9 GHz (Burst)
	BIOS	AMI® Aptio V5
Memory	Technology	DDR3L
	Max. Capacity	8 GB
Interfaces	Graphics Ports	2x Display Port
	USB	4x USB 3.0
	Ethernet Serial	3x 10/100/1000
	Ports	2x RS232/422/485
Storage	mSATA	Max. 256 GB
Expansion	Mini PCIe/PCIe	1x mPCIe
Software Support	Microsoft Windows	Windows 7 Professional 32/64 Bit, Windows 7 Ultimate 32/64 Bit, Windows 7 Embedded Standard 64 Bit, Windows 8 32/64 Bit, Windows 10 IoT 64 Bit 2016
	Linux	Ubuntu 16.04 LTS
Power	Input Voltage Range	12 to 30 VDC direct
Mechanical	Construction	Aluminum housing
	Mounting	DIN Rail
	Dimensions (WxHxD)	180 x 50 x 130 mm
	Weight	1.0 kg
Environment	Cooling	Fanless passiv
	Operating Temperature	0 °C to 40 °C ambient for standard edition 0 °C to 50 °C ambient with cooling fins
	Relative Humidity	10 % - 90 % @ 39 °C, non condensing
Approvals	Certifications	CE, Safety EN60950, Emission EN55022 class B, RoHS, WEEE

11.3. Mechanical Specification

Table 6: Mechanical Specification

Dimensions	KBox A-150-HSW
Width	180.00 mm
Depth	130.25 mm
Height	version without swappable mounting frame: 50.00 mm without heatsink/68.00 mm with heatsink version with swappable mounting frame (HDD): 58.00 mm without heatsink/76.00 mm with heatsink
Chassis	RAL 7035 (front)/RAL7043 (housing) powder coated

For more detailed mechanical information, refer to the outline dimensions drawings within this chapter. Each dimension drawing shows the main external mechanical features such as the position and size of mounting holes for the DIN rail retaining clamp.

Figure 19: Dimensions Top Side

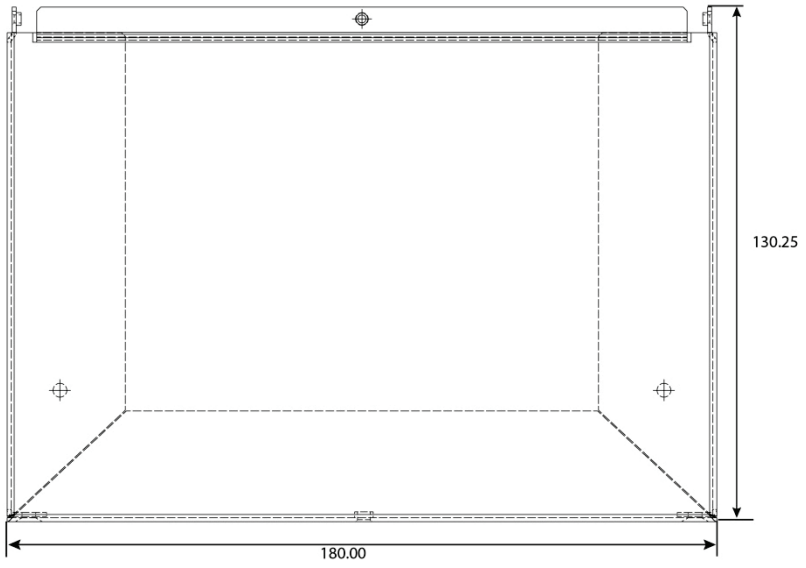


Figure 20: Dimension Bottom Side

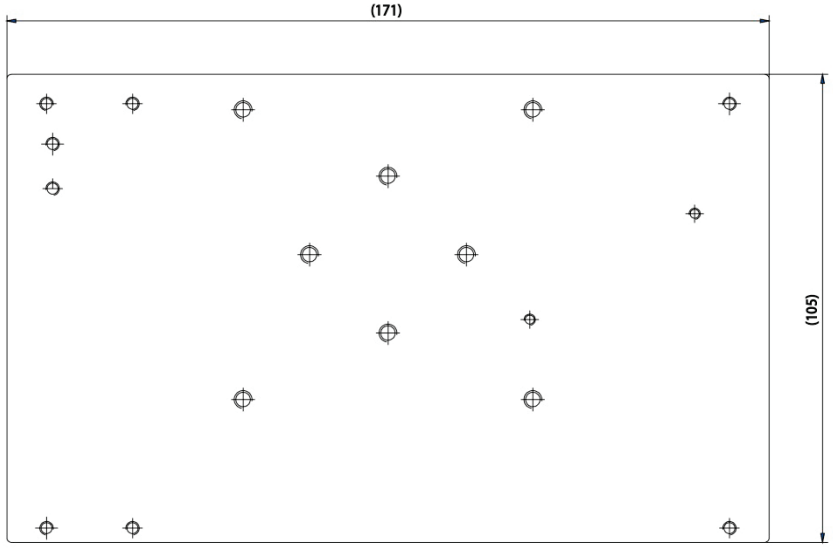


Figure 21: Dimensions Front Side (50.00 mm without HDD, with HDD height is 58.00 mm)

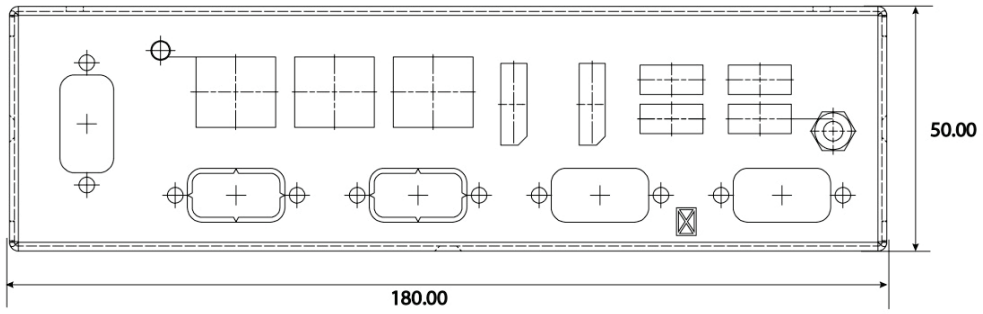


Figure 22: Dimensions Rear Side (50.00 mm without HDD, with HDD height is 58.00 mm)

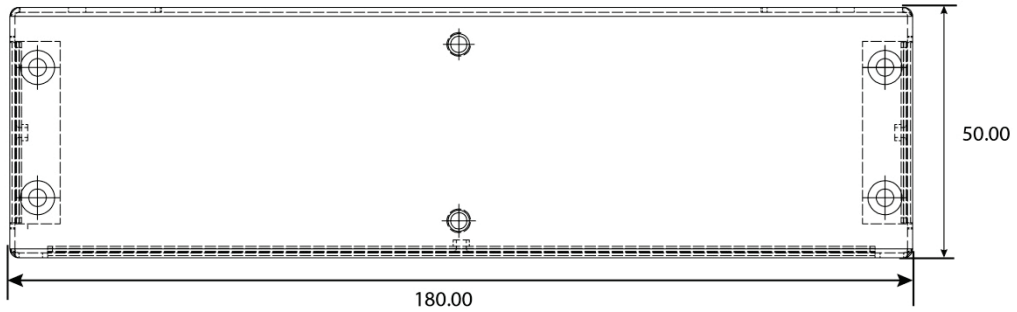
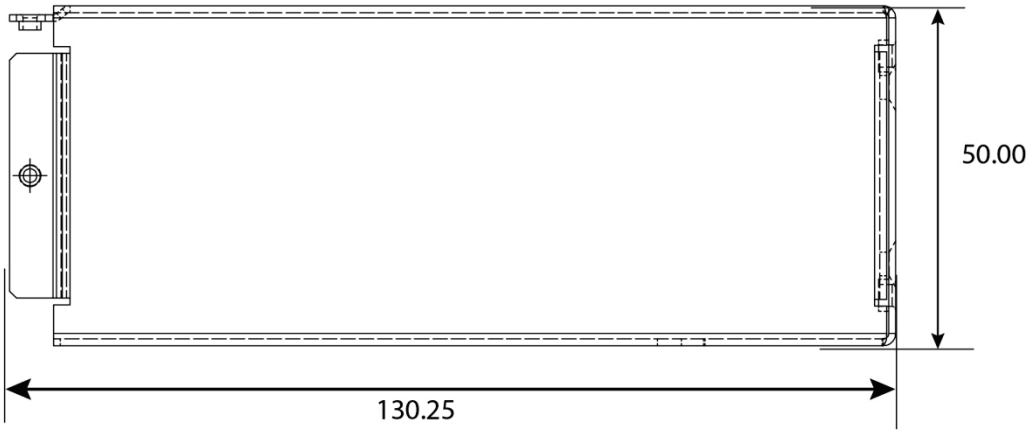


Figure 23: Dimensions Left and Right Sides (50.00 mm without HDD, with HDD height is 58.00 mm)



11.4. Power Specification

The KBox A-150-HSW has no internal power supply and is powered by a 3-pin DC connector on the front panel. The standard PSU voltage is 24 V DC which is converted using an internal 24 VDC to 12 VDC converter to supply the mainboard with +12 V DC.

NOTICE Hot Plugging the power supply is not supported. Hot plugging might damage the board.

Table 7: Power Specification

Nominal Input Voltage	24 V DC
Input Voltage Range	9 V DC to 30 V DC
Input Power Connector	3- pin Phoenix PSC 1.5/3-M

11.4.1. Power Consumption

The power consumption of the KBox A-150-HSW is specified for a device with Windows 7 Professional (64bit), 4 GB RAM and 60 GB mSATA.

Table 8: Power Consumption

Power Consumption	U_{IN}	I_{IN}	P_{IN}
Standby (Brightness 100 %)	23,92 V	0,019 A	0,454 W
Windows IDLE (Brightness 100 %)	23,85 V	0,518 A	12,354 W
Windows typical workload (BurnIn with Max. load) (Brightness 100 %)	23,76 V	1,219 A	28,963 W
Windows with CPU at TDP (Thermal Design Power selected in Thermal-analysis-tool) (Brightness 100 %)	23,68 V	1,753 A	41,511 W
Windows Idle (Brightness 50 %)	23,86 V	0,383 A	9,138 W

11.4.2. Protective Earth Stud Bolt

There is a protective Earth stud bolt on the front panel connected to the chassis GND inside the system. The position of the protective Earth stud bolt varies depending on whether the KBox A-150-HSW is delivered with a HDD/SSD drive bay.

11.5. Environmental Specification

Table 9: Environmental Specification

Temperature (Operating)	0°C – 50°C with heatsink, up to 40°C without heatsink
Relative Humidity (Operating)	93% @ 39°C non condensing

12/ Interface Pin Assignments

12.1. External Connector Pin Assignment

12.1.1. GBE LAN RJ45 Connector (CN11, CN12, CN13)

Table 10: GBE LAN Connector

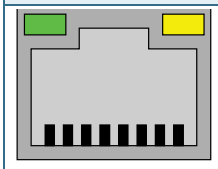
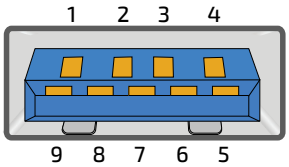
RJ45 (female)	Pin	Signal Name	Pin	Signal Name
 8 7 6 5 4 3 2 1	1	TX1+	5	TX3-
	2	TX1-	6	TX2-
	3	TX2+	7	TX4+
	4	TX3+	8	TX4+

Table 11: LED activity

Left LED: Activity / Link		Right LED: Link Speed	
Off	NO LAN connectivity	Off	10 Mbit
Yellow	Link	Green	100 Mbit
Blinking	Activity	Orange	1 Gbit

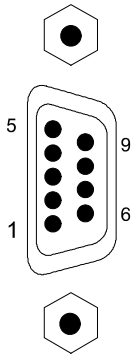
12.1.2. USB 3.0 Port

Table 12: USB Port

USB 3.0 Port	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+

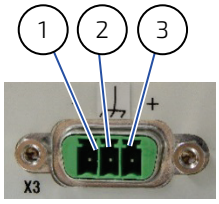
12.1.3. COM1, COM2 RS 232/422/485 Connectors (CN15, CN16)

Table 13: Serial Port

Serial port	Pin	RS232	RS422	RS 485 Half duplex	RS 385 Full Duplex
	1	DCD	Tx-	Data-	Tx-
	2	RxD	Tx+	Data+	Tx+
	3	TxD	Rx+		Rx+
	4	DTR	Rx-		Rx-
	5	GND	GND	GND	GND
	6	DSR			
	7	RTS			
	8	DCTS			
	9	RI			

12.1.4. Input Power Connector (PWR)

Figure 24: Input Power



1 GND
2 Functional Earth
3 VCC

Figure 25: Mating Connector

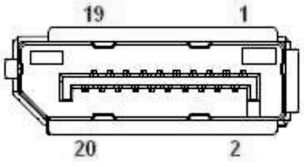
Manufacturer: Phoenix Contact

Product: PSC 1,5/ 3-F

Order#: 1841909

12.1.5. DisplayPort Port-1 Connector and Dual Mode Port-2 Connector

Table 14: DisplayPort

DisplayPort	Pin	Signal	Pin	Signal
	1	TX0+	11	GND
	2	GND	12	TX3-
	3	TX0-	13	GND
	4	TX1+	14	GND
	5	GND	15	AUX+
	6	TX1-	16	GND
	7	TX2+	17	AUX-
	8	GND	18	HPD
	9	TX2-	19	GND
	10	TX3+	20	PWR

The Dual-Mode DisplayPort source automatically detects the presence of a plugged-in Dual-Mode DisplayPort cable adaptor and provides the DVI or HDMI signal, as required, to support the connected DVI or HDMI monitor

12.2. Internal Connectors Overview

Figure 26: Mainboard Top View

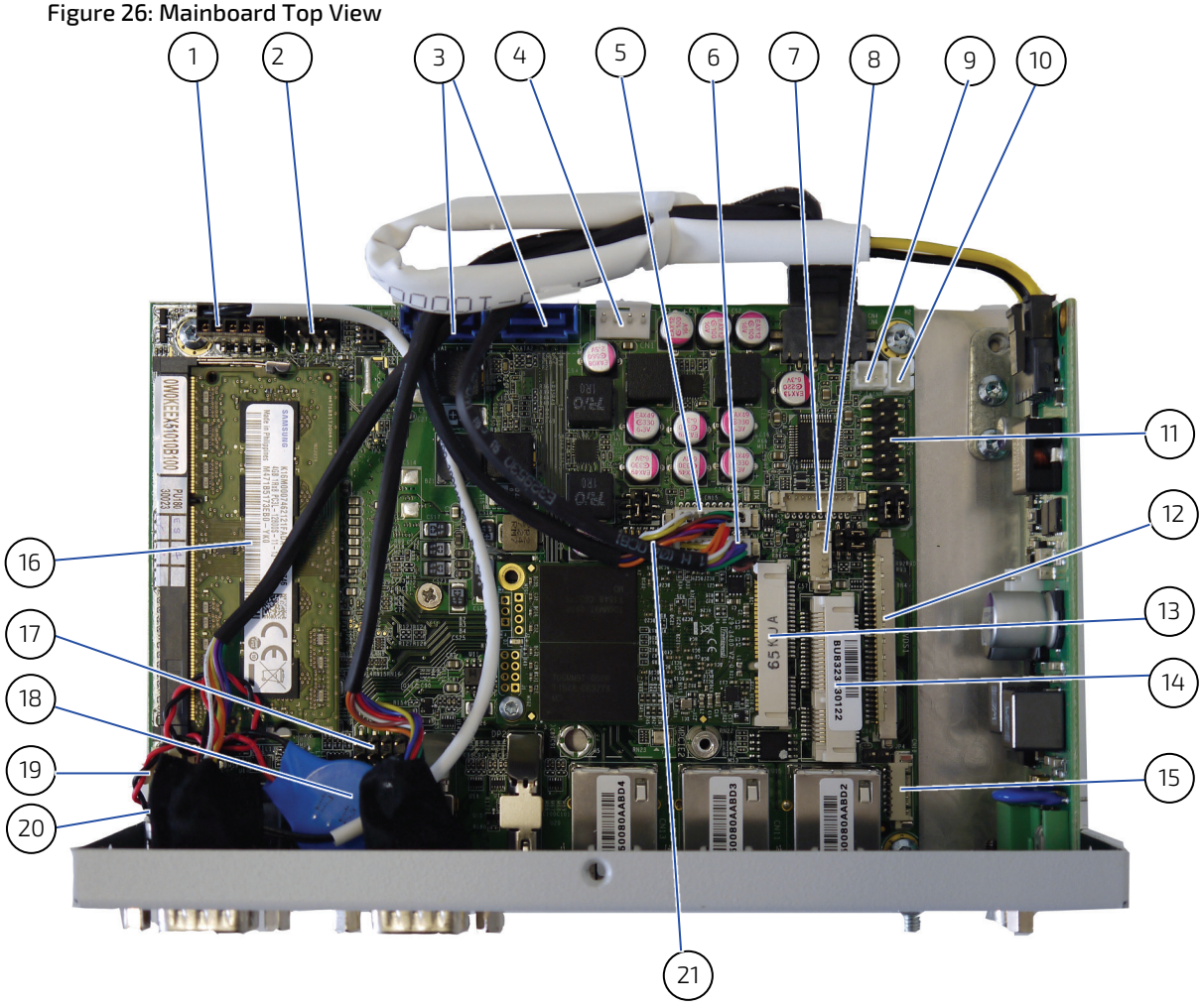


Table 15: Mainboard Internal Connectors

Number	Label	Description
1	FP2	Front Panel 2 Pin Header
2	FP1	Front Panel 1 Pin Header
3	SATA1/SATA2	2x SATA
4	CN1	SATA HDD Power
5	CN15	RS-232/422/485 Port 1 Wafer
6	CN16	RS-232/422/485 Port 2 Wafer
7	CN10	Digital Input/Output Pin Header
8	CN17	SIM Interface Wafer for MPCIE2
9	CN8	Left Channel 3 W Audio AMP Output Wafer
10	CN7	Right Channel 3 W Audio AMP Output Wafer
11	CN9	Audio Pin Header
12	LVDS1	24-bit, 2-channel LVDS Panel Connector
13	MPCIE1	Mini-PCIE Express v1.2 Socket (Full Size)

14	MPCIE2	Mini-PCIE Express v1.2 Socket (Half Size)
15	CN18	Backlight Power Output Wafer for LVDS1
16	DIMM1	DDR3 Memory SO-DIMM Socket Front Panel 1 Pin Header
17	CN5	USB2.0 Port 4, 5 Pin Header
18		CR2032 Battery
19	FAN1	CPU Fan Wafer
20	BAT1	CR2032 Battery Power Input
21	CN14	P80_Header

12.3. Internal Connector Pin Assignment

12.3.1. Battery Power Input Wafer (BAT1)

	Pin	Signal Name
	1	+VBAT
	2	GND

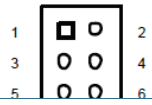
Pitch:1.25mm

12.3.2. SATA HDD Power Output Wafer (CN1)

	Pin	Signal Name
	1	+12 V
	2	GND
	3	GND
	4	+5V

Pitch:2.5mm

12.3.3. USB2.0 Port 10, 11 Pin Header (CN5)

	Pin	Signal Name	Pin	Signal Name
	1	+USBVCC	2	+USBVCC
	3	USB_A-	4	USB_B-

	5	USB_A+	6	USB_B+
	7	GND	8	GND
	9	KEY	10	GND

12.3.4. Right Channel 2W Audio AMP Output Wafer (CN7)

	Pin	Signal Name
	1	Speaker+
	2	Speaker-

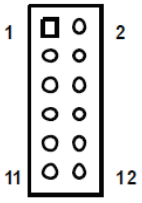
Pitch: 2.0 mm

12.3.5. Left Channel 2W Audio AMP Output Wafer (CN8)

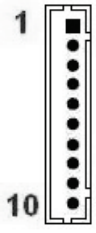
	Pin	Signal Name
	1	Speaker+
	2	Speaker-

Pitch: 2.0 mm

12.3.6. Audio Pin Header (CN9)

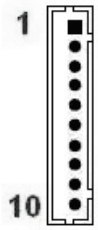
	Pin	Signal Name	Pin	Signal Name
	1	MIC_IN_L	2	MIC_IN_R
	3	MIC_IN_JD	4	GND
	5	LINE_IN_L	6	LINE_IN_R
	7	LINE_IN_JD	8	GND
	9	LINE_OUT_L	10	LINE_OUT_R
	11	LINE_OUT_JD	12	GND

12.3.7. Digital Input/Output Wafer (CN10)

	Pin	Signal Name
	1	+5V
	2	Digital Input 0
	3	Digital Output 0
	4	Digital Input 1
	5	Digital Output 1
	6	Digital Input 2
	7	Digital Output 2
	8	Digital Input 3
	9	Digital Output 3
	10	GND

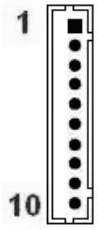
Pitch:1.5mm

12.3.8. RS-232/422/485 Port 1 Wafer (CN15)

	Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
	1	DCD	TX-	DATA-	TX-
	2	DSR	TX+	DATA+	TX+
	3	RXD	RX+	N/A	RX+
	4	RTS	RX-	N/A	RX-
	5	TXD	N/A	N/A	N/A
	6	CTS	N/A	N/A	N/A
	7	DTR	N/A	N/A	N/A
	8	RI	N/A	N/A	N/A
	9	GND	GND	GND	GND
	10	+5V	+5V	+5V	+5V

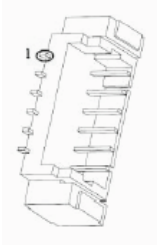
Pitch :1.25mm

12.3.9. RS-232/422/485 Port 2 Wafer (CN16)

	Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
	1	DCD	TX-	DATA-	TX-
	2	DSR	TX+	DATA+	TX+
	3	RXD	RX+	N/A	RX+
	4	RTS	RX-	N/A	RX-
	5	TXD	N/A	N/A	N/A
	6	CTS	N/A	N/A	N/A
	7	DTR	N/A	N/A	N/A
	8	RI	N/A	N/A	N/A
	9	GND	GND	GND	GND
	10	+5V	+5V	+5V	+5V

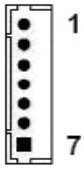
Pitch :1.25mm

12.3.10. SIM Interface Wafer for MPCIE2 (CN17)

	Pin	Signal Name
	1	UIM_PWR
	2	UIM_DATA
	3	UIM_RESET
	4	UIM_VPP
	5	UIM_CLK
	6	GND

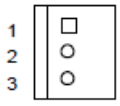
Pitch :1.25mm

12.3.11. Backlight Power Output Wafer for LVDS1 (CN18)

	Pin	Signal Name
	1	BL_ADJ_PWM *
	2	BL_ADJ_VOL *
	3	GND
	4	+5V / +12V **
	5	+5V / +12V **
	6	GND
		BL_EN***

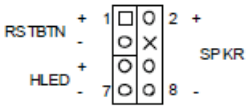
Pitch :1.25mm,
* : BL_ADJ can be set in BIOS setup.
** : Backlight Power can be selected by JP1.
*** : BL_EN can be selected by JP3

12.3.12. CPU Fan Wafer (FAN1)

	Pin	Signal Name
	1	GND
	2	+12V*
	3	FAN_RPM

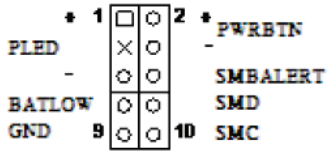
Pitch :2.54 mm,
* : PWM Fan control supported.

12.3.13. Front Panel 1 Pin Header (FP1)

	Pin	Signal Name	Pin	Signal Name
	1	Reset Button +	2	Speaker+
	3	Reset Button -	4	NC
	5	HDD LED+	6	Internal Speaker-
	7	HDD LED-	8	Speaker-

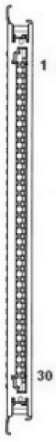
Pitch : 2.54 mm
Note: Internal buzzer enabled by shorting pin 6 and pin 8.

12.3.14. Front Panel 2 Pin Header (FP2)

	Pin	Signal Name	Pin	Signal Name
	1	Power LED +	2	Power Button +
	3	NC	4	Power Button -
	5	Power LED -	6	SMBALERT#
	7	BatLow#	8	SMBus DATA
	9	GND	10	SMBus Clock

Pitch : 2.54 mm

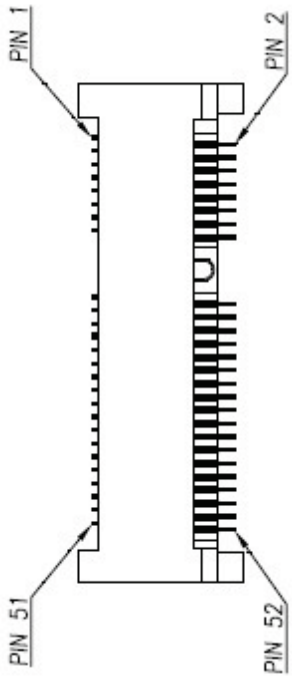
12.3.15. Primary 24-bit, 2-channel LVDS Panel Connector (LVDS1)

	Pin	Signal Name	Pin	Signal Name
	1	LVDS_A0-	16	LVDS_B1+
	2	LVDS_A0+	17	GND
	3	LVDS_A1-	18	LVDS_B2-
	4	LVDS_A1+	19	LVDS_B2+
	5	LVDS_A2-	20	LVDSBCLK-
	6	LVDS_A2+	21	LVDS_BCLK+
	7	GND	22	LVDS_B3-/NC
	8	LVDS_ACLK-	23	LVDS_B3+/NC
	9	LVDS_ACLK+	24	GND
	10	LVDS_A3-/NC	25	DDC_DATA
	11	LVDS_A3+/NC	26	VDDEN
	12	LVDS_B0-	27	DDC_CLK
	13	LVDS_B0+	28	+3.3V / +5V *
	14	GND	29	+3.3V / +5V *
	15	LVDS_B1-	30	+3.3V / +5V *

Pitch :1.0mm

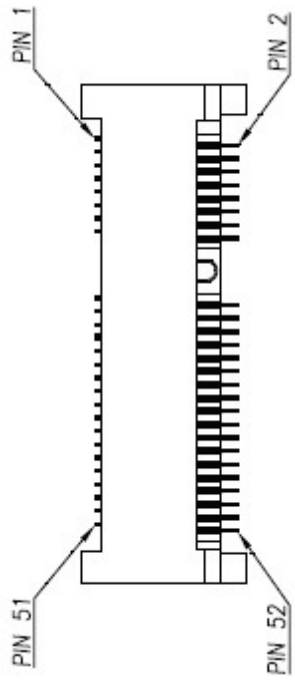
* : Panel Power can be selected by JP1.

12.3.16. mPCIe Express v 1.2 socket /mSATA (MPCIE1)



Signal Name	Pin	Pin	Signal Name
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	NC
Ground	9	10	NC
REFCLK-	11	12	NC
REFCLK+	13	14	NC
Ground	15	16	NC
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

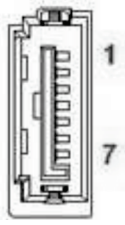
12.3.17. mPCIE Express V1.2 Socket (mPCIE2)



Pin	Signal Name	Pin	Signal Name
1	WAKE#	2	+3.3VSB
3	Reserved	4	Ground
5	Reserved	6	+1.5V
7	CLKREQ#	8	UIM_PWR(1)
9	Ground	10	UIM_DATA(1)
11	REFCLK-	12	UIM_CLK(1)
13	REFCLK+	14	UIM_RESET(1)
15	Ground	16	UIM_VPP(1)
17	Reserved	18	Ground
19	Reserved	20	W_Disable#
21	Ground	22	PERST#
23	PERn0	24	+3.3VSB
25	PERp0	26	Ground
27	Ground	28	+1.5V
29	Ground	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	Ground
35	Ground	36	USB_D-
37	Ground	38	USB_D+
39	+3.3VSB	40	Ground
41	+3.3VSB	42	LED_WWAN#
43	Ground	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	Ground
51	Reserved	52	+3.3VSB

(1) These pins are connected to CN17 directly.
MPCIE2 shared with CN11 GbE LAN1 and disabled by deafult

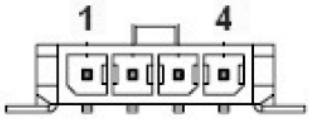
12.3.18. Serial ATA Port 0/1 Connector (SATA1 and SATA2)



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

12.3.19. 24V DC to 12V DC Converter

3-pin Power (external)	Pin	Signal Name
	1	GND
	2	Functional Earth
	3	VCC

4-pin Power (internal)	Pin	Signal Name
	1	+12 V
	2	GND
	3	GND
	4	+12V

12.4. Jumpers

12.4.1. Jumpers Overview

Figure 27: Mainboard Top View

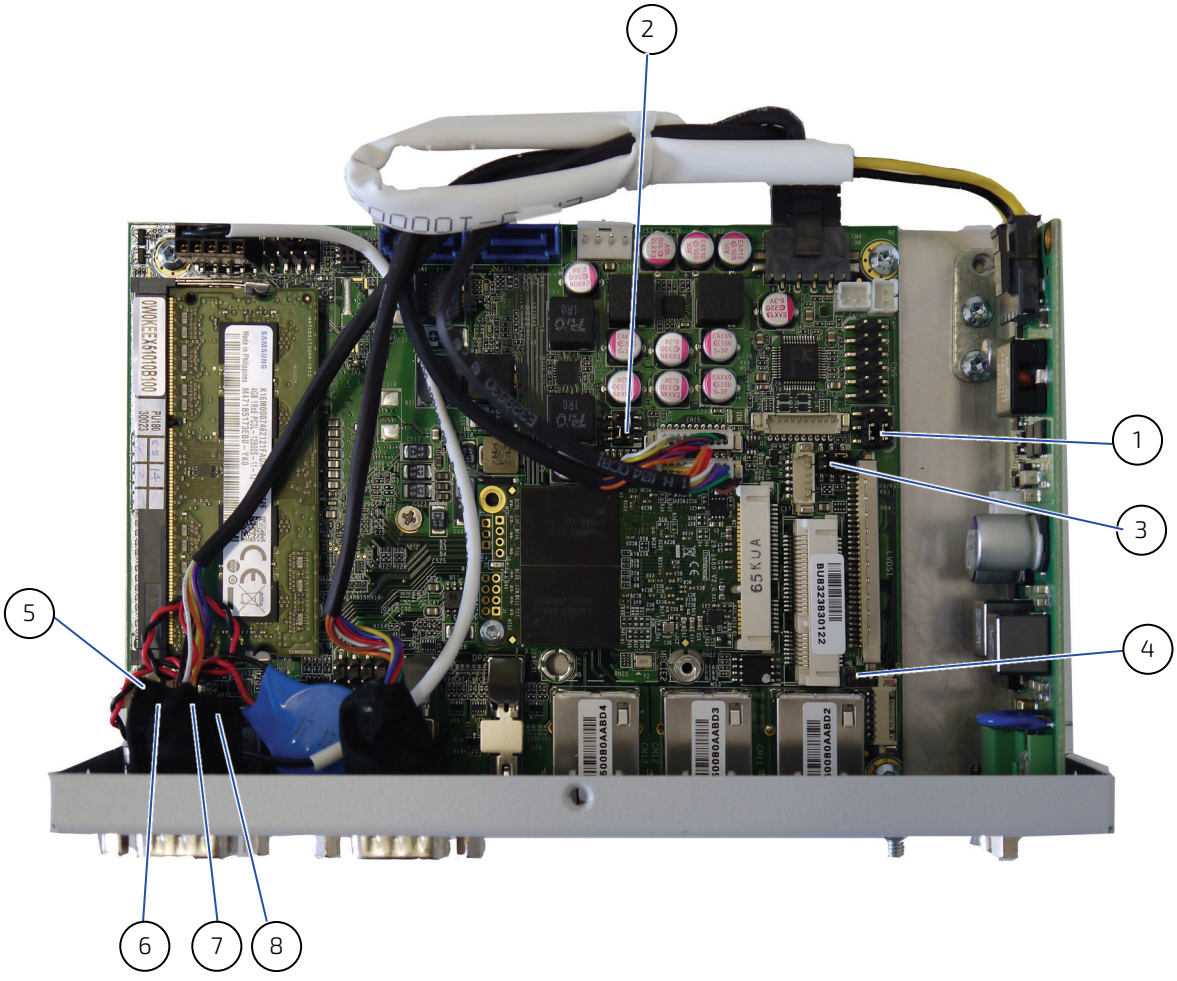
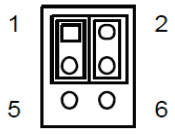


Table 16: Mainboard Jumpers

Number	Label	Function
1	JP1	Panel & Backlight Power Selection for LVDS1
2	JP2	AT_ATX Mode / MPCIE1 mSATA / mPCIE Selection
3	JP3	Backlight Power Enable Selection for LVDS1
4	JP4	MPCIE Activity LED Indication
5	JP5	USB Power Selection
6	JP6	Flash Description Security Over-ride
7	JP7	RT C Reset Selection
8	JP8	SRTC Reset Selection

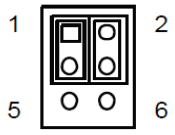
The on-board jumper can be set to configure the functions.

12.4.2. Panel & Backlight Power Selection for LVDS1 (JP1)

	Jumper	Setting	Status
	1	1-3	Backlight Power = +12 V
		3-5	Backlight Power = +5 V
	2	2-4	Panel Power = +3.3 V
		4-6	Panel Power = +5 V

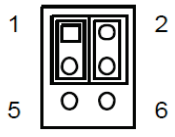
Pitch:2.54mm

12.4.3. AT_ATX Mode/MPCIE1 mSATA/mPCIE Selection (JP2)

	Jumper	Setting	Status
	1	1-3	ATX Mode (Default)
		3-5	AT Mode
	2	2-4	MPCIE1 mSATA Selected (Default)
		4-6	MPCIE1 mPCIE Selected

Pitch:2.0mm

12.4.4. Backlight Power Enable Selection for LVDS1 (JP3)

	Jumper	Setting	Status
	1	1-3	Backlight Enable Voltage = +3.3V
		3-5	Backlight Enable Voltage = +5V
	2	2-4	Active High
		4-6	Active Low

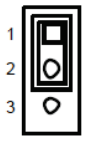
Pitch:2.0mm

12.4.5. MPCIE Activity LED Indication (JP4)

	Jumper	Status
	1-2 open	LED+
	1-2 short	LED-

Pitch 2.54 mm

12.4.6. USB Power Selection (JP5)

	Jumper	Status
	1-2	USB power will be cut off in S4 & S5 state.
	2-3	USB power will be cut off in deep S5 state.

Pitch 2.00 mm

12.4.7. Flash Description Security Override (JP6)

	Jumper	Status
	1-2 open	Disabled
	1-2 short	Enabled

Pitch 2.54 mm

12.4.8. RTC Reset (JP7)

	Jumper	Status
	1-2 open	Normal
	1-2 short	Clear RTC CMOS

Pitch 2.54 mm

12.4.9. SRTC Reset Selection (JP8)

	Jumper	Status
	1-2 open	Normal Operation
	1-2 short	Clear ME Registers

Pitch 2.54 mm

13/ BIOS

The AMI uEFI BIOS preferences are preset and do not require further adjustment for operation. The AMI BIOS setup menus and available selection may vary. For specific Information on the BIOS for your product, contact Kontron Support.

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. For the BIOS Information specific for your product, please contact Kontron Support.

The AMI's ROM BIOS Built-in Setup program allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data is retained even when the power is turned off. In general, the information saved in the CMOS RAM does not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which causes data loss in the CMOS only. If CMOS data is lost, then the BIOS settings need to be reconfigured.

The Setup program allows for access to various menus that provide functions or access to sub-menus with further specific functions of their own.

To start the Setup program, follow the steps below:

1. Power on the product
2. Wait until after first characters appears from the self-test (POST messages) begins but before the operating system (OS) boot begins to press <DEL>.
3. Bios Setup menu utility starts and the Main Menu appears.

The BIOS Setup program uses a hot key navigation system. The hot key legend bar is located at the bottom of the Setup screens. The following table provides a list of navigation hot keys available in the legend bar.

Table 17: Navigation Hot Keys Available in the Legend Bar

<→> or <←>	<Left/Right> arrows selects major Setup menus on menu bar, for example, Main or Advanced
<↑> or <↓>	<Up/Down> arrows select fields in the current menu, for example, Setup function or sub-screen
<ENTER>	<ENTER> selects the highlighted value
<->	<Minus> key selects the next lower value within a field
<+>	<Plus> key selects the next higher value within a field
<F1>	<F1> key invokes the General Help window
<F2>	<F2> key loads previous values
<F3>	<F3> key loads optimized defaults
<F4>	<F4> key Saves and Exits
<ESC>	<ESC> key exits a major Setup menu and enters the Exit Setup menu Pressing the <ESC> key in a sub-menu displays the next higher menu level
<RETURN>	<RETURN> key executes a command or selects a submenu

13.1. Setup Menus

The Setup utility features menus listed in the selection bar at the top of the screen are:

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

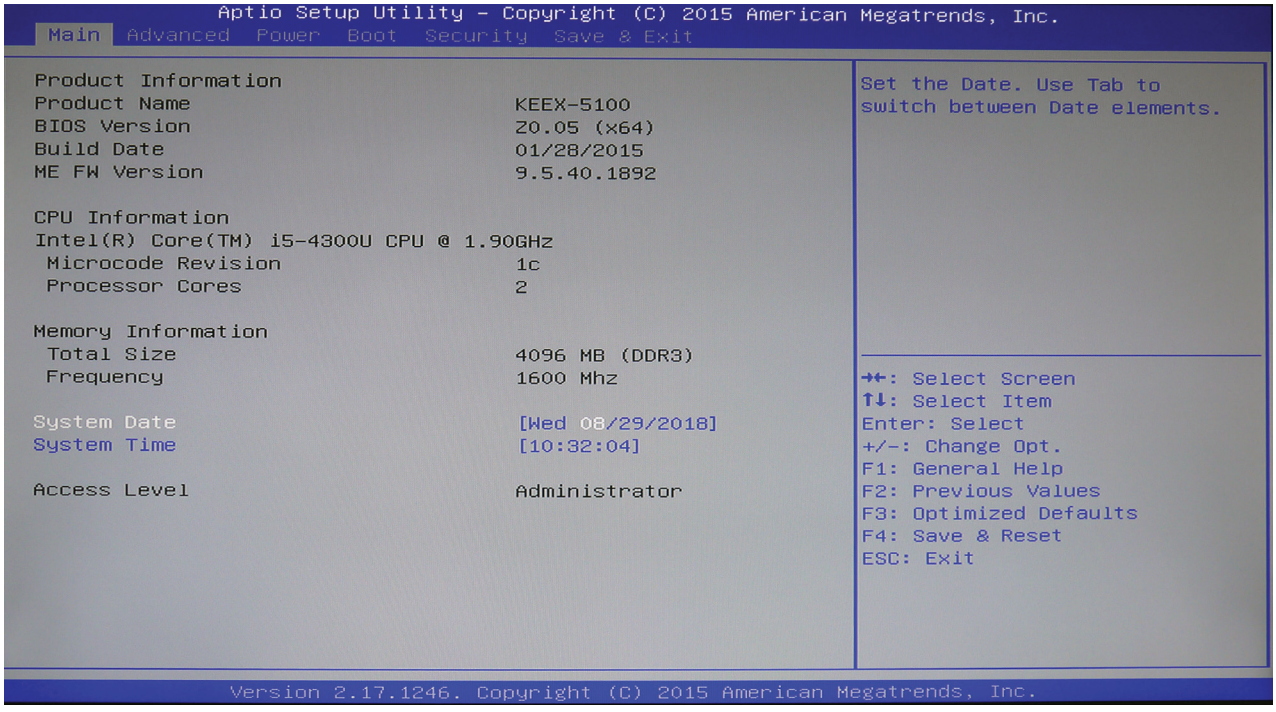
The currently active menu and the currently active BIOS Setup item are highlighted in white. Use the left and right arrow keys to select the Setup menus.

Each Setup menu provides two main frames. The left frame displays all available functions. Configurable functions are displayed in blue. Functions displayed in grey provide information about the status or the operational configuration. The right frame displays an explanation of the respective function in a help window.

13.2. Main Menu

The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the "<" and ">" cursor keys to navigate between menu screens.

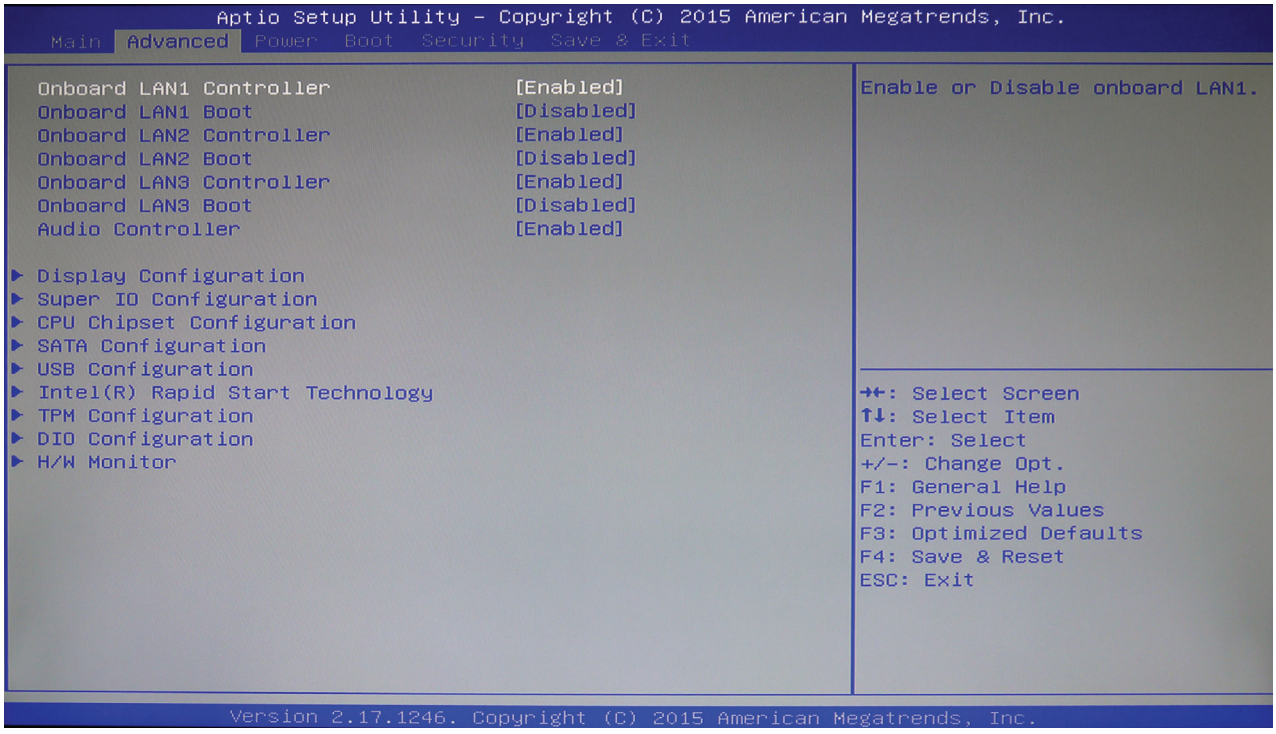
Figure 28: BIOS Main Menu



13.3. Advanced Menu

The Advanced Setup menu displays sub-screens and second level sub-screens with functions, for advanced configurations.

Figure 29: Advanced Menu



The following table gives more information for important setup options within the Advanced Menu. Default setting are displayed in **bold**.

Table 18: Advanced Menu

Sub-screen	Additional Sub-screens with Description	
Onboard LAN 1 Controller	[**Enabled**, Disabled]	
Onboard LAN 1 Boot	[Enabled, **Disabled**]	
Onboard LAN 2 Controller	[**Enabled**, Disabled]	
Onboard LAN 2 Boot	[Enabled, **Disabled**]	
Onboard LAN 3 Controller	[**Enabled**, Disabled]	
Onboard LAN 3 Boot	[Enabled, **Disabled**]	
Audio Controller	[**Enabled,** Disabled]	
Display Configuration>	UMA Frame Buffer Size>	[128MB, **256MB**, 512MB]

Sub-screen	Additional Sub-screens with Description		
	DVMT Pre-Allocated>	[**64M,** 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M]	
	DVMT Total Gfx Mem>	[128M, **256M**, MAX]	
	Primary IGFX Boot Display>	[**VBIOS Default**, CRT, HDMI, LVDS]	
	Active LVDS>	[Enabled**, Disabled**]	
Super IO Configuration>	Serial Port 1 Configuration >	Serial Port>	[**Enabled**, Disabled]
		Change Settings>	[**Auto**]
		Device Settings>	**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;
		Serial Port 1 Type>	[**RS232**, RS422, RS485]
	Serial Port 2 Configuration>	Serial Port>	[**Enabled,** Disabled]
		Change Settings>	[**Auto**]
		Device Settings>	**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
		Serial Port 2> Type	[**RS232**, RS422, RS485]
CPU Chipset Configuration>	EIST>	[**Enabled,** Disabled]	
	Turbo Mode>	[**Enabled,** Disabled]	
	VT-d	[**Enabled,** Disabled]	
	Active Processor Cores	[**All,** 1]	
	Limit CPUID Maximum>	[Enabled, **Disabled**]	
	Execute Disable Bit>	[**Enabled,** Disabled]	
	Intel ® Virtualization Tech	[Enabled, **Disabled**]	
	Intel TXT Support	[Enabled, **Disabled**]	
SATA Configuration>	SATA Controller>	[**Enabled,** Disabled]	
	SATA Mode Selection>	[IDE Mode, **AHCI Mode**]	
	SATA Controller Speed	[**Default**, Gen1, Gen2, Gen3]	
	Serial ATA Port 1		
	Port 1>	[**Enabled**, Disabled]	
	mSATA Port 1		
	Port 1	[**Enabled**, Disabled]	
USB	Legacy USB Support>	[**Enabled,** Disabled]	

Sub-screen	Additional Sub-screens with Description	
Configuration>	XHCI Legacy Support>	[**Enabled**, Disabled]
	XHCI hand-off>	[Enabled, **Disabled**]
	EHCI hand-off>	[**Enabled**, Disabled]
	USB Mass Storage Driver Support>	[**Enabled**, Disabled]
Intel Rapid Start		[Enabled, **Disabled**]
TPM Configuration	Security Device Support	[Enabled, **Disabled**]
DIO Configuration>	User Configuration	[Enabled, **Disabled**]
	DI-0>	[**Output Low**, Output High, Input]
	DI-1>	[**Output Low**, Output High, Input]
	DI-2>	[**Output Low**, Output High, Input]
	DI-3>	[**Output Low**, Output High, Input]
	DI-4>	[**Output Low**, Output High, Input]
	DO-1>	[**Output Low**, Output High, Input]
	DO-2>	[**Output Low**, Output High, Input]
	DO-3>	[**Output Low**, Output High, Input]
	DO-4>	[**Output Low**, Output High, Input]
H/W Monitor>	CPU FAN Configuration>	
	FAN Setting>	[**Manual Mode**, Auto Mode]
	Manual Duty	[0-**255**]

13.4. Power Menu

Figure 30: Power Menu

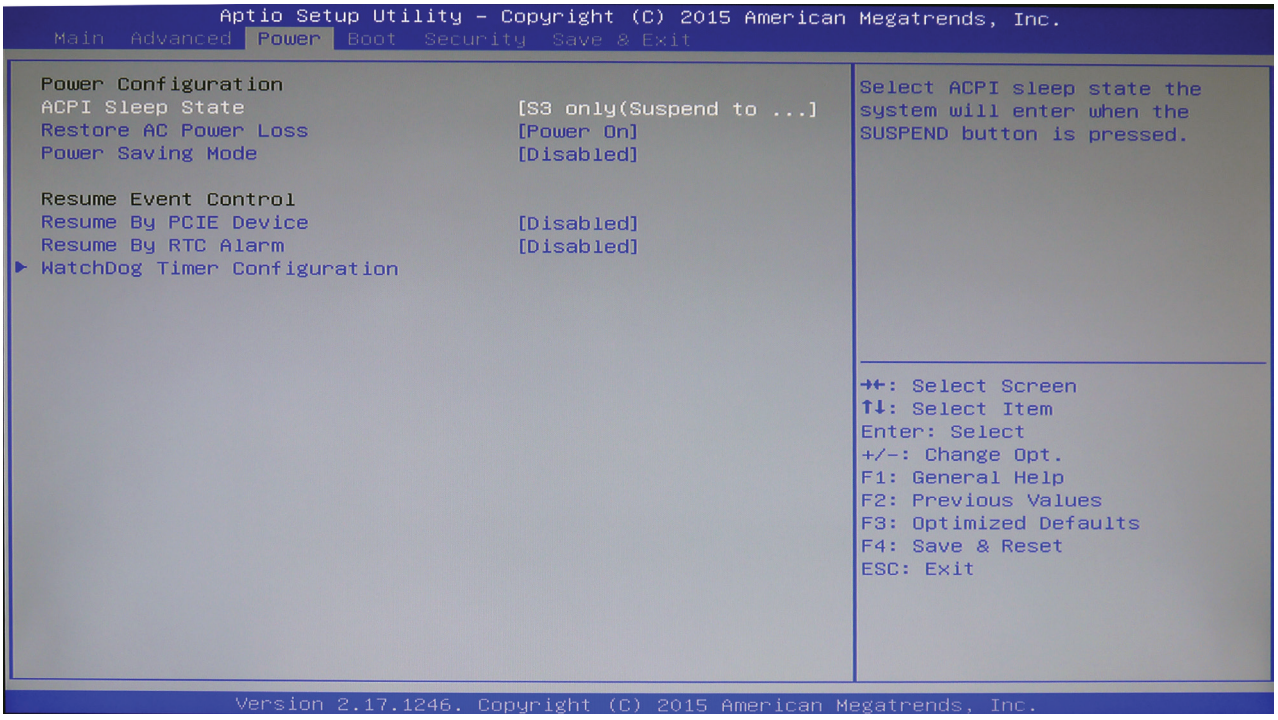


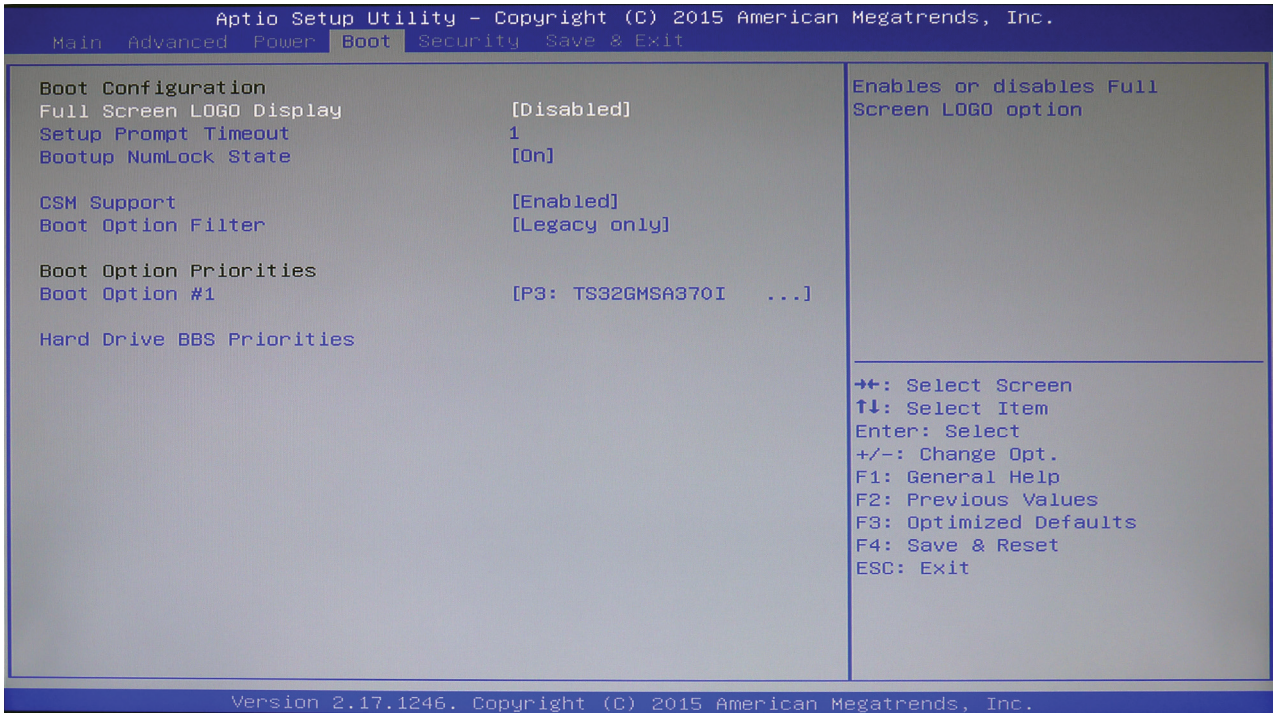
Table 19: Power Menu

Sub-screen	Additional Sub-screens with Description
ACPI Sleep State	[**S3 only**, Suspend disabled]
Restore AC Power Loss	[Power off, **Power on,** Last state]
Power Saving Mode	[Enabled, **Disabled**]
Resume by PCIE Device	[Enabled, **Disabled**]
Resume by RTC Alarm	[Enabled, **Disabled**]
Watchdog Timer Configuration	[Enabled, **Disabled**]

13.5. Boot Menu

The Boot Setup menu lists the dynamically generated boot-device priority order

Figure 31: Boot Menu



The following table gives more information for important setup options within the Boot Menu. Default setting are displayed in **bold**.

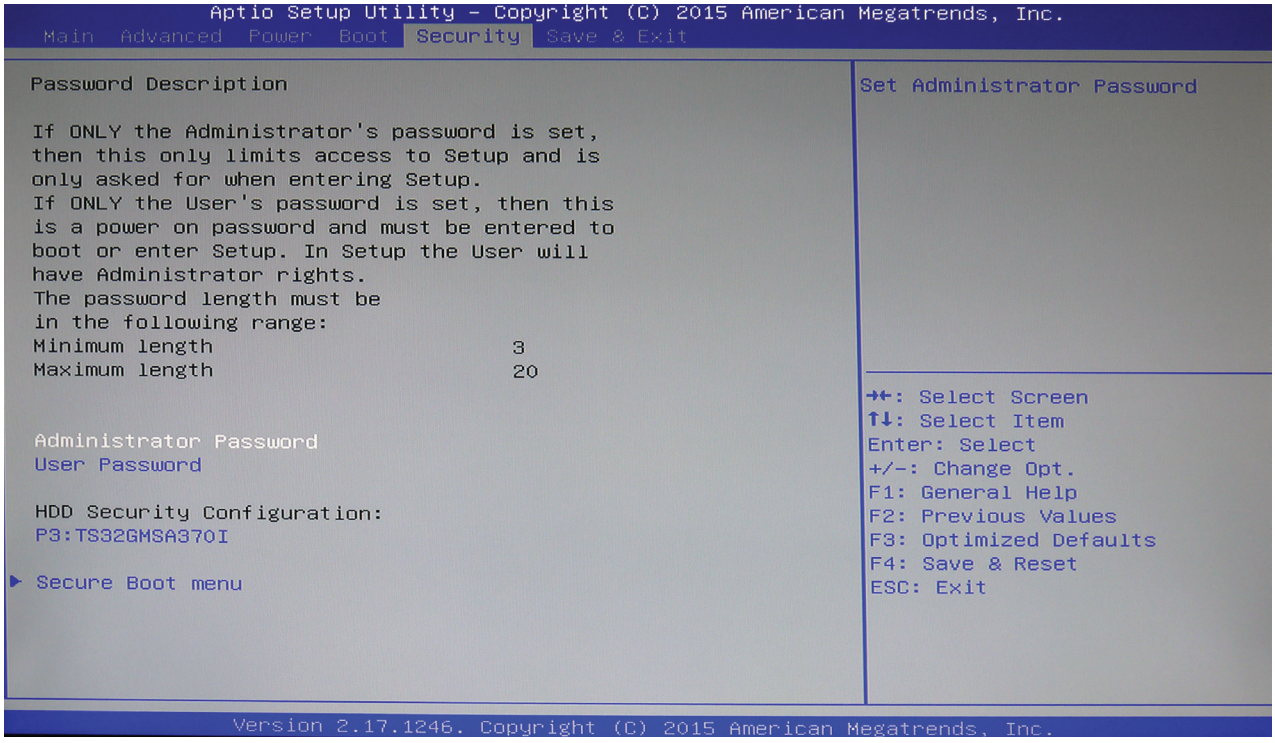
Table 20: Boot Setup Menu Sub-screens and Functions

Function	Description
Full Screen LOGO Display	Full Screen LOGO Display Options: [**Disabled**, Enabled]
Setup Prompt Timeout>	Displays number of seconds that the firmware waits for setup activation key The value 65535(0xFFFF) means an indefinite wait. [**1**]
Bootup NumLock State>	Selects keyboard NumLock state [**ON**, OFF]
Boot Option Filter	[UEFI and legacy, **Legacy only**, UEFI only]
Keyboard Detect Warning>	[**Enabled,** Disabled]
CSM Support>	[**Enabled**, Disabled]
Boot Option #1>	Sets the system boot order [UEFI and legacy, **Legacy only**, UEFI only, Disabled]
Hard Drive BBS Priorities	

13.6. Security Menu

The Security Setup menu provides information about the passwords and functions for specifying the security settings such as Hard Disk, user and master passwords.

Figure 32: Security Menu



The following table gives more information for important setup options within the Security Menu. Default setting are displayed in **bold**.

Table 21: Security Setup Menu Sub-screens and Functions

Function	Description		
Administrator Password>	Sets administrator password		
User Password>	Sets user password		
HDD Security Configuration>	Read Only Information Allows access to set, modify and clear Hard Disk user and master passwords. User Passwords need to be installed for Enabling Security. Master Password can be modified only when successfully unlocked with the Master Password in Post.		
Secure Boot Menu	System Mode	Set up	
	Secure Boot	Not active	
	Vendors Keys	Not active	
	Attempt secure Boot	[Enabled, Disabled]	
	Secure Boot Mode	[Standard, Custom]	
	Key Management	Provision Factory Defaults	[Enabled, **Disabled**]
		Install Factory Default keys	
		Enroll Efi Image	
		Save all Secure Boot variables	
		Platform Key (PK)	
		Key Exchange Keys	
		Authorized Signatures	
		Forbidden Signatures	
		Authorized TimeStamps	
		OsRecovery Signatures	

13.7. Save and Exit

Figure 33: Save and Exit Menu

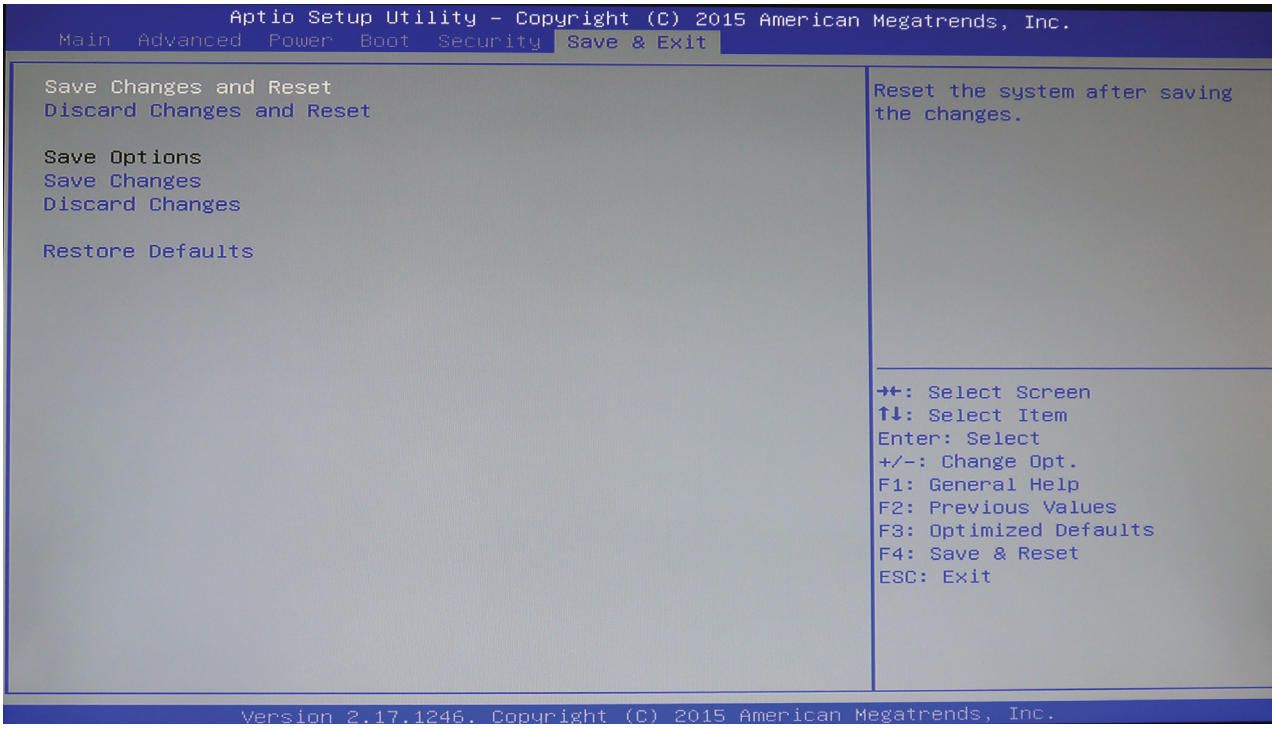


Table 22: Save and Exit Setup Menu Sub-screens and Functions

Function	Description
Save Changes and Reset>	Exits system after saving 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>	Exits system setup without saving 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 Options>	Saves changes made so far for any setup options
Save Changes>	Saves changes made so far for any setup options
Discard Changes	Discards changes made 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>	Restores/loads standard default values for all setup options Load Optimal Default values for all the setup values This option allows you to load **optima**l default values for each of the parameters on the Setup menus, that provides the **best performance** settings The F9 key can be used for this operation.

Function	Description
	Load Failsafe Default values for all the setup values This option allows you to load failsafe default values for each of the parameters on the Setup menus, that provides the most stable performance settings. The F8 key can be used for this operation.

14/ Technical Support

Before contacting Kontron for support of a technical problem, check the troubleshooting information below to find out more about possible solutions. If the troubleshooting table does not contain a solution for the technical problem, contact Kontron Support (http://www.kontron.com/support).

To request support via e-mail, report documentation errors, or general customer feedback, use Kontron's Contact Support Request Form by visiting:

http://www.kontron.com/about-kontron/company-overview/contact-us/forms/contact-support.

In case the request form does not work or you do not get a response within 48 hours, send a follow up email to support@kontron.com

Make sure you have the following product identification information on hand when you call:

- Product name,
- Product model number
- Serial number (SN) of the unit

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

The serial number can be found on the type Label, placed on the rear side of the system.

14.1. Returning Defective Merchandise

All equipment returned to Kontron must have a Return of Material Authorization (RMA) number assigned exclusively by Kontron. Kontron cannot be held responsible for any loss or damage caused to the equipment received without an RMA number. The buyer accepts responsibility for all freight charges for the return of goods to Kontron's designated facility. Kontron will pay the return freight charges back to the buyer's location in the event that the equipment is repaired or replaced within the stipulated warranty period. Visit the RMA Information website before returning any product to Kontron.

Kontron's RMA Information website can be found at:
http://www.kontron.com/support-and-services/support/rma-information

15/ Storage, Transportation and Maintenance

15.1. Storage

If the product is not in use for an extended period time, disconnect the power plug from the AC outlet .If it is necessary to store the product then re-pack the product as originally delivered to avoid damage. The storage facility must meet the products environmental storage requirements as stated within this user guide. Kontron recommends keeping the original packaging material for future storage or warranty shipments.

15.2. Transportation

To ship the product use the original packaging, designed to withstand impact and adequately protect the product. When packing or unpacking products always take shock and ESD protection into consideration and use an EOS/ESD safe working area.

15.3. Maintenance

Maintenance or repair on the open product may only be carried out by qualified personnel authorized by Kontron. Equipment from Kontron Europe requires only minimum servicing and maintenance for problem-free operation.

Cleaning

- For light soiling, clean the product 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

15.3.1. Replacing the Lithium Battery

If the on-board Lithium battery needs to be replaced, follow the steps below:

1. Remove the lithium battery from the holder by pulling it outwards.
2. Place a new lithium battery in the battery holder.
3. Pay attention to the polarity of the battery.
4. The lithium battery must only be replaced with the same type of battery or with a type of battery recommended by Kontron.

⚠CAUTION

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

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

16/ Warranty

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

1. Visit Kontron's Term and Conditions webpage.

   http://www.kontron.com/terms-and-conditions

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

Limitation/Exemption from Warranty Obligation

In general, Kontron shall not be required to honor the warranty, even during the warranty period, and shall be exempted from the statutory accident liability obligations in the event of damage caused to the product due to failure to observe the following:

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

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

Due to their limited service life, parts which by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law.

17/ Disposal

Final disposal of this product after the product's service life must be accomplished in accordance with the applicable country, state, or local laws or regulations.

Kontron manufactures products to satisfy environmental protection requirements where possible. Many of the components used are capable of being recycled.

Kontron follows the Waste Electrical and Electronic Equipment (WEEE) Directive that aims to reduce waste arising from Electrical and Electronic waste and therefore encourages customers to return Kontron products for proper disposal. For more information regarding WEEE compliance, see the Disposal and Recycling section at the start of this user guide.

Appendix A: List of Acronyms

Table 23: List of Acronyms

API	Application Programming Interface
BMC	Base Management Controller
CLI	Command-Line Interface
COM	Computer-on-Module
ECC	Error Checking and Correction
FRU	Field Replaceable Unit
GPU	Graphics Processing Unit
HD/HDD	Hard Disk /Drive
HPM	PICMG Hardware Platform Management specification family
IOL	IPMI-Over-LAN
IOT	Internet of Things
IPMI	Intelligent Platform Management Interface
KCS	Keyboard Controller Style
KVM	Keyboard Video Mouse
MEI	Management Engine Interface
PCIe	PCI-Express
PECI	Platform Environment Control Interface
PICMG®	PCI Industrial Computer Manufacturers Group
RTC	Real Time Clock
SEL	System Event Log
ShMC	Shelf Management Controller
SMBus	System Management Bus
SMWI	System Monitor Web Interface
SOL	Serial Over LAN
SSH	Secure Shell
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
VLP	Very Low Profile

About Kontron

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

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