

User Guide



KBox E-250-AML/ADN

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KBox E-250-AML/ADN - User Guide

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Revision History

| Revision | Brief Description of Changes | Date of Issue | Author/Editor |
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| | | | |

Terms and Conditions

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

Kontron sells products worldwide and declares regional General Terms & Conditions of Sale, and Purchase Order Terms & Conditions. Visit <https://www.kontron.com/terms-and-conditions>.

For contact information, refer to the corporate offices contact information on the last page of this user guide or visit our website [CONTACT US](#).

Customer Support

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

Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

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Customer Comments

If you have any difficulties using this user guide, discover an error, or just want to provide some feedback, contact [Kontron support](#). Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user guide on our website.

Symbols

The following symbols may be used in this user guide

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

NOTICE indicates a property damage message.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.



Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.



ESD Sensitive Device!

This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.



HOT Surface!

Do NOT touch! Allow to cool before servicing.



Laser!

This symbol informs of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.



High Sound Pressure!

High sound pressure possible with headphones. There is a risk of hearing damage. Do NOT listen at high volume levels for long periods of time.



Security

This symbol indicates general information and guidelines regarding the product's cyber security to ensure secure installation, operation, maintenance and disposal of the product within the user's end environment.



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 <https://www.kontron.com/about-kontron/corporate-responsibility/quality-management>.

Disposal and Recycling

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

WEEE Compliance

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

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



Environmental protection is a high priority with Kontron.

Kontron follows the WEEE directive

You are encouraged to return our products for proper disposal.

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1/ General Safety Instructions for IT Equipment

⚠ WARNING

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

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

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

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

Additional safety instructions for DC power supply circuits

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

1.1. Electrostatic Discharge (ESD)



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

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

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

1.1.1. Grounding Methods

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

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

1.2. Lithium Battery Replacement

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

⚠ WARNING

Do not ingest battery, Chemical Burn Hazard

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

Keep new and used batteries away from children.

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

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

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

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

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

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



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

2/ Electromagnetic Compatibility

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

2.1. Electromagnetic Compatibility (EU)

This product has been designed for low level of radiated emission for residential, commercial and light industrial environments and high immunity level for industrial environmental. This product complies with the European Council Directive on the approximation of the laws of the member states relating to electromagnetic compatibility (EMC Directive 2014/30/EU) and Radio Equipment Directive (RED Directive 2014/53/EU).

▲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)

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

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 E-250-AML/ADN (corresponding to the ordered system configuration)
- 1x Quick installation guide
- 1x Driver CD

3.2.2. Optional Parts

- 1x Power adapter
- 1x Power cord (plug type depending on country)
- M.2 Key B expansion card or SSD (It may be pre-installed in the system depending on ordered configuration.)
- M.2 Key E expansion card (It may be pre-installed in the system depending on ordered configuration.)
- Antenna(s)
- DIN rail mount kit
- VESA mount kit

4/ System Overview

The KBox E-250-AML/ADN is a fanless system enclosed within a robust compact aluminum chassis with cooling fins, offering the superior qualities for operation in harsh environments.

It can be optionally factory-equipped with an M.2 Key B WWAN and /or M.2 Key E WLAN / Bluetooth card for two antennas. Besides a soldered eMMC storage module, users may choose the implementation of an additional M.2 Key B SSD card for increased storage capacity and file backup.

The following interfaces are available with the KBox E-250-AML/ADN:

Standard Front Panel:

- 2x 2.5 GbE LAN
- 1x DisplayPort
- 1x DisplayPort over USB 3.2 Gen 2 / Gen 1 Type C
- 2x USB 3.2 Gen 2 (Type A)
- 1x Lockable DC Jack
- 1x Power Switch
- 1x Power LED
- 1x Storage LED

Standard Rear Panel:

- 2x USB 2.0 (Type A)
- 2x RS232 (default) / 2x RS232/422/485 (optional)
- 1x 8-bit DIO
- 2x Antenna Port

Standard Baseboard and System Memory & Storage Capacities:

- 2x soldered LPDDR5 memory module
- 1x soldered eMMC storage module

Standard Baseboard and System Expansion Capabilities:

- 1x M.2 Key B socket (type 22x42 / 30x42 / 30x52 / 22x80, M2B1) for SSD / WWAN expansion
- 1x M.2 Key E socket (type 22x30, M2E1) for WLAN / Bluetooth expansion
- 1x SIM Card Wafer (CN13) with connection to M.2 Key B socket (M2B1)

The device is designed to be operated in:

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

NOTICE

When powering on the KBox E-250-AML/ADN, make sure that the cooling fins of the chassis are not obstructed (covered) by any objects.

To provide sufficient heat dissipation by the cooling of the device, do not cover the cooling fins of the KBox E-250-AML/ADN. Do not place any objects on the device. When installing the system, please keep clearance for air circulation.

4.1. System Memory & Storage Capacities

4.1.1. System Memory Support

The baseboard comes with two LPDDR5 memory chips soldered from factory. Kontron has defined three total capacity options: 4 GByte, 8 GByte and 16 GByte for standard system versions.

4.1.2. System Storage Support

The baseboard comes with an eMMC storage chip soldered from factory, Kontron has defined three capacity options: 32 GByte, 64 GByte and 128 GByte for standard system versions.

4.2. System Expansion Capabilities

4.2.1. System Expansion via M.2 Card Interface

The baseboard comes with two onboard M.2 interface connectors with Key B Type 2242 / 3042 / 3052 / 2280 and Key E Type 2230 support respectively. The Key B connector is intended to be used to install a M.2 WWAN expansion card or a M.2 SSD card drive, and the Key E connector to install a M.2 WLAN / Bluetooth / combo expansion card.

4.2.2. System Expansion via SIM Card Wafer

The baseboard comes with an onboard wafer connector to expand a SIM card holder module for accommodating a SIM card in case of no SIM card holder mounted on the M.2 WWAN expansion card.

In order to use the SIM card reader functionality, a corresponding M.2 WWAN expansion card must be installed to the M.2 Key B socket of your KBox E-250-AML/ADN.

4.3. Front I/O Panel

Figure 1: Front I/O Panel

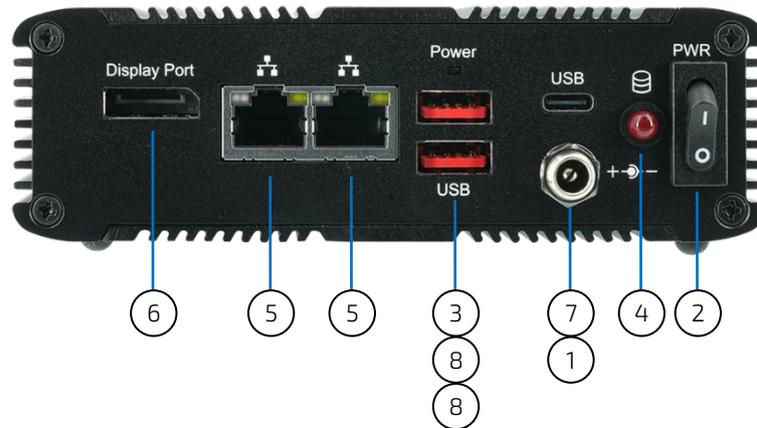
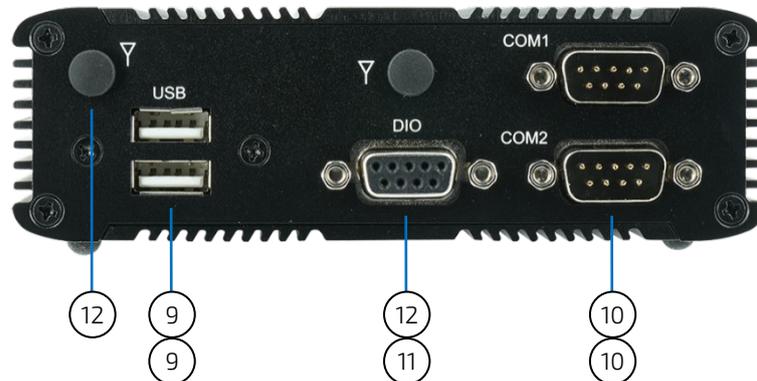


Figure 2: Rear I/O Panel



- 1 DC-In (see Chapter 4.3.1)
- 2 Power Switch (See Chapter 4.3.2)
- 3 Power LED (see Chapter 4.3.3)
- 4 Storage LED (see Chapter 4.3.4)
- 5 2.5 GbE (see Chapter 4.3.5)
- 6 DisplayPort (see Chapter 4.3.6)
- 7 DisplayPort over USB 3.2 Gen 2 / Gen 1 Type C (see Chapter 4.3.7)
- 8 USB 3.2 Gen 2 (see Chapter 4.3.8)
- 9 USB 2.0 (see Chapter 4.3.9)
- 10 RS232(/422/485) (see Chapter 4.3.10)
- 11 8-bit DIO (see Chapter 4.3.11)
- 12 Antenna Port (see Chapter 4.3.12)

4.3.1. DC-In (Lockable DC Jack)

For DC connection, users can use a power adapter to convert AC power to DC for use with this jack. Power supplied through this jack supplies power to the PC. To prevent damage to the PC, always use a DC 12 V power adapter.

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

4.3.2. Power Switch

Press this switch to turn the system on or off.

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

4.3.3. Power LED

System modes can be identified through the power LED. Refer to the below table for more details.

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

Table 1: Power LED & Status

| Power LED Status | Description |
|------------------|--|
| Green LED On | S0 (Full On) |
| Green LED Blink | S3 (Suspend-To-RAM) |
| LED Off | S4 (Suspend-To-Disk), S5 (Soft Off) or EUP Mode or G3 (Mechanical Off) |

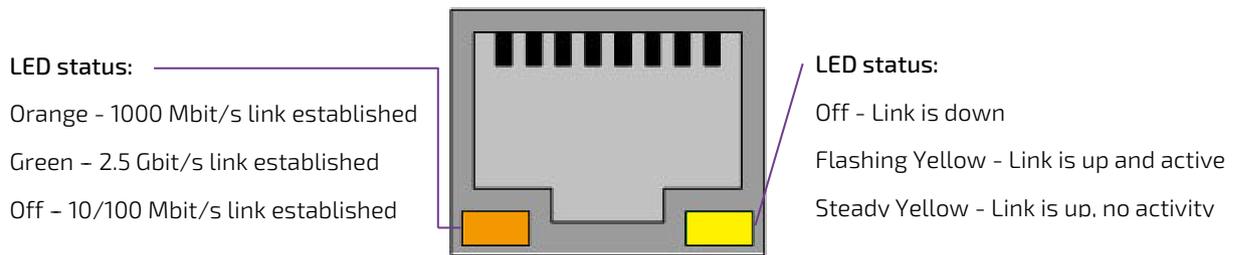
4.3.4. Storage LED

The Storage LED blinks red when the data is being written into or read from the M.2 SATA SSD drive (Key B).

4.3.5. 2.5 GbE LAN

The KBox E-250-AML/ADN provides two 2.5 GbE LAN ports on the front I/O panel. These connectors are 2.5 Gigabit Ethernet 10/100/1000/2500 Mbit/s, IEEE 1588 capable interfaces. The connectors are standard 8-pin RJ45 type connectors with status LEDs:

Figure 3: 2.5 Gigabit Ethernet LED Status



4.3.6. DisplayPort

An external (digital) display can be connected to this DisplayPort connector.

4.3.7. DisplayPort over USB 3.2 Gen 2 / Gen 1 Type C

The KBox E-250-AML/ADN provides a DisplayPort over USB 3.2 Type C connector on the front I/O panel. The connector supports USB DisplayPort Alternate mode for transmitting video signals, USB 3.2 Gen 2 (KBox E-250-ADN) / USB 3.2 Gen 1 (KBox E-250-AML) for high-speed data transfer and power delivery of up to 15 W (5 V at 3 A) for charging a connected device.

4.3.8. USB 3.2 Gen 2

The KBox E-250-AML/ADN provides two USB 3.2 Gen 2 interfaces on the front I/O panel. These connectors are backward compatible with USB 3.2 Gen 1 / USB 2.0 and allow connection of USB-compatible devices to the system.

4.3.9. USB 2.0

The KBox E-250-AML/ADN provides two USB 2.0 connector on the rear I/O panel. The connector allows connection of an USB-compatible device to the system.

4.3.10. RS232(/422/485)

COM 1 and COM 2 are provided as a 9-pin D-SUB connector and allow the connection of a serial peripheral. They are designed to support RS232 serial communication without hardware flow control.

They can support RS422 and RS485 serial communication additionally based on optional configurations. It must be stipulated when ordering, as appropriate signal routing must be applied at the factory.

4.3.11. DIO

The KBox E-250-AML/ADN provides an 8-bit DIO port. This interface is used to connect digital signals for input and output purposes.

4.3.12. Antenna Port

The KBox E-250-AML/ADN reserves two covered cutouts for the Reverse (RP) SMA connectors of the WLAN antennas (M.2 Key E WLAN card with one or two antennas is an option) and / or WWAN antenna (M.2 Key B WWAN card with one or two antennas is an option).

4.4. Internal View

Figure 4: Internal View (without bottom chassis)



- 1 M.2 Key B Socket (M2B1, see Chapter 4.4.1)
- 2 M.2 Key E Socket (M2E1, see Chapter 4.4.2)
- 3 SIM Card Wafer (CN13, see Chapter 4.4.3)
- 4 M.2 fixing bolt for Key B Type 22x42 / 30x42 (/30x52) & Key E Type 22x30
- 5 M.2 fixing bolt for Key B Type 22x80 (/30x52)

4.4.1. M.2 Key B Socket

The KBox E-250-AML/ADN reserves a M.2 Key B socket (Figure 4, pos. 1) with the support of PCIe x2, USB 2.0, SATA and UIM interfaces, allowing the expansion with a Type 22x42 / 30x42 / 22x80 M.2 WWAN module or M.2 SSD drive. Installation of a Type 30x52 module is possible with an appropriate adapter bracket. Kontron offers a matching adapter bracket optionally based on individual requests.

4.4.2. M.2 Key E Socket

The KBox E-250-AML/ADN reserves a M.2 Key E socket (Figure 4, pos. 2) with the support of PCIe x1, USB 2.0 and / or CNVi (only KBox E-250-ADN) signals, allowing the expansion with a Type 22x30 M.2 WLAN, Bluetooth or combo module.

4.4.3. SIM Card Wafer

The baseboard of the KBox E-250-AML/ADN is equipped with a SIM card wafer (Figure 4, pos. 3) to expand a SIM card holder within the system for accommodating a SIM card for WWAN service access in case of no SIM card holder mounted on the M.2 WWAN expansion card. It is connected to UIM signals on the M.2 Key B socket.



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

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 applicable expansion card(s) before it is installed into an equipment, machine or cabinet. Please consider following instruction when you install (or remove) an expansion card.

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

NOTICE

Protection Label

The product is factory configured to meet customer requirements and then sealed with a protection label. Opening the product invalidates the warranty.

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 Chassis



The KBox E-250-AML/ADN is factory configured to meet customer requirements. Kontron does not recommend opening the system as this may cause damage to internal components.

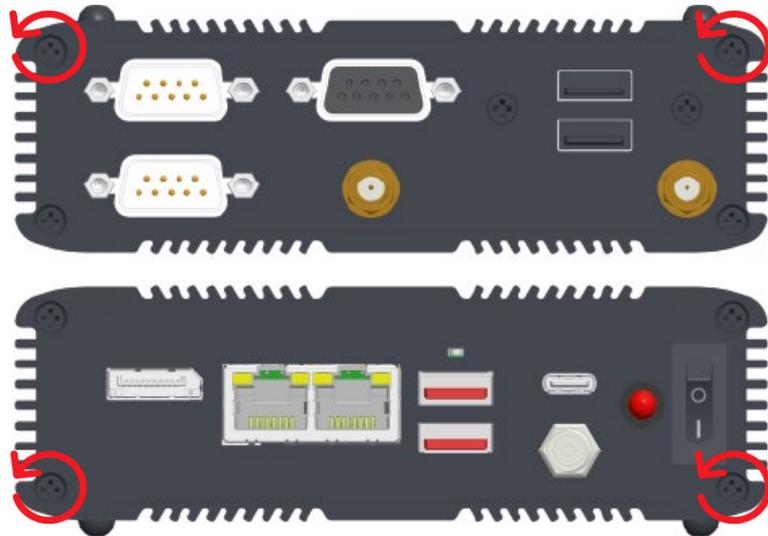
CAUTION

Before opening the KBox E-250-AML/ADN, the system must be switched off and disconnected from the main power supply. Also, disconnect all peripheral devices from the KBox E-250-AML/ADN. Before you begin, ensure that you have a clean, flat and ESD-safe surface to work on.

For opening and closing the KBox E-250-AML/ADN, please perform the following steps:

1. Close all applications. Shut down the system properly and disconnect the connection to the main power source. Disconnect all peripherals.
2. The KBox E-250-AML/ADN should lay on a flat, clean surface with the bottom side facing upwards.
3. Loosen and remove the Phillips screws (two located on the front I/O panel and two on the rear I/O panel), that secure the top and bottom chassis together. Retain the screws for later use.

Figure 5: Unscrewing Chassis



4. Lift the bottom chassis up.
5. Now you have access to the M.2 Key B socket, M.2 Key E socket and SIM card wafer respectively in order to remove or install hardware components.
6. For closing replace carefully the bottom chassis onto the top chassis and secure them together with the retained screws. Tighten the retained screws when both chassis are firmly in place.

NOTICE

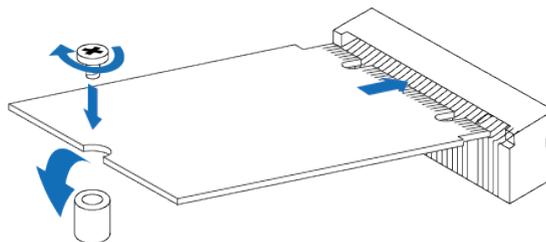
When used as intended, the KBox E-250-AML/ADN is to operate only in closed condition. Only when the chassis is properly fixed with the screws and the front side with WLAN and / or WWAN antenna(s) are properly installed and secured with the screws, it is ensured that the user does not have access to the internal parts of the KBox E-250-AML/ADN.

5.1.1. Installing M.2 Key B SSD / Expansion Card and / or M.2 Key E Expansion Card

To install a M.2 Key B SSD / expansion card and / or a M.2 Key E expansion card please proceed according to the steps described:

1. Open the device as described in the subsection 5.1 "Opening and Closing the Chassis" (step 1 - 5).
2. Locate the M.2 Key B socket (M2B1) (Figure 4, pos. 1) and / or M.2 Key E socket (M2E1) (Figure 4, pos. 2) which you intend to use for installation as well as the corresponding fixing bolt(s) (Figure 4, pos. 4 and / or 5 depending on the type of M.2 SSD / expansion card installed into the M.2 Key B socket; Figure 4, pos. 4 for securing the expansion card into the M.2 Key E socket). Depending on the ordered KBox E-250-AML/ADN configuration, Kontron may supply fixing bolt extension(s) and adapter bracket to facilitate the installation of different types of M.2 Key B SSD / expansion card.
3. Align the notch on the M.2 SSD / expansion card with the notch in the M.2 socket (M2B1 / M2E1). Insert the M.2 SSD / expansion card into the corresponding socket (Figure 4, pos. 1 / pos. 2) and rotate it down with the fixing hole of the M.2 SSD / expansion card over the corresponding fixing bolt (Figure 4, pos. 4 / pos. 5).
4. Press the M.2 SSD / expansion card down on the side with the fixing hole and secure it with the available fastening screw as well as fixing bolt extension and / or adapter bracket if necessary.

Figure 6: Installing M.2 SSD / Expansion Card



5. Repeat step 3 and step 4 in case of installing two cards in the M.2 Key B and M.2 Key E sockets respectively. Install the M.2 Key E expansion card first and then stack the M.2 Key B SSD / expansion card on it.
6. In order to close the device, proceed step 6 described in the subsection 5.1 "Opening and Closing the Chassis".

5.1.2. Installing SIM Card

To install a SIM card please proceed according to the steps described:

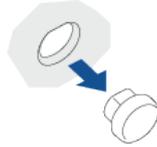
1. Open the device as described in the subsection 5.1 "Opening and Closing the Chassis" (step 1 - 5).
 2. Locate the SIM card wafer (CN13) (Figure 4, pos. 3).
 3. Plug the cable connected from SIM card holder module into the SIM card wafer.
 4. Secure or place the module in an appropriate location within the chassis.
 5. The installation of a SIM card depends on the SIM card holder type. Follow the instructions supplied by the manufacturer to install the SIM card.
 6. In order to close the device, proceed step 6 described in the subsection 5.1 "Opening and Closing the Chassis".
- In case of a SIM card holder mounted on the M.2 WWAN expansion card, proceed step 1 - 4 & 6 described in the subsection 5.1.1 "Installing M.2 Key B SSD / Expansion Card and / or M.2 Key E Expansion Card" and follow the instructions supplied by the manufacturer to install the SIM card.

5.1.3. Installing Antenna(s)

To install antenna(s) please proceed according to the steps described:

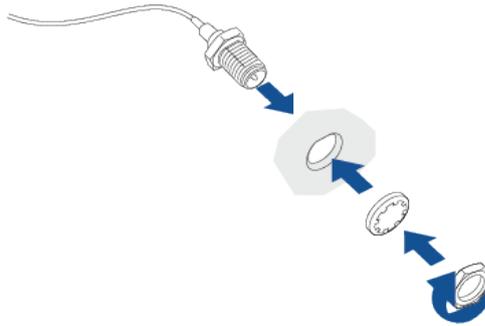
1. Open the device as described in the subsection 5.1 "Opening and Closing the Chassis" (step 1 - 5).
2. Locate the antenna hole (Figure 2, pos. 12).
3. Remove the rubber cap from the antenna hole.

Figure 7: Removing Rubber Cap



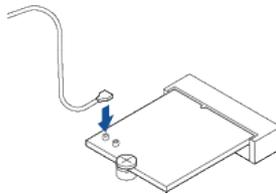
4. Insert the RP-SMA jack of antenna cable into the antenna hole from the inside of the chassis outwards. Ensure that the flat edge of the RP-SMA jack is properly aligned with the flat edge of the hole.
5. Insert the bundled O-ring over the RP-SMA jack.
6. Secure the RP-SMA jack with the bundled hex screw.

Figure 8: Securing RP-SMA Jack



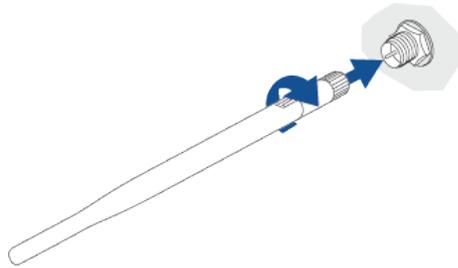
7. Connect the I-PEX end of the antenna cable to the M.2 Key B or Key E expansion card.

Figure 9: Connecting I-PEX End



8. Repeat Step 2 – 7 to install the second antenna cable in case two antennas are required and / or two wireless connections are required.
9. In order to close the device, proceed step 6 described in the subsection 5.1 "Opening and Closing the Chassis".
10. Screw the external antenna onto its corresponding RP-SMA jack on the front I/O panel.

Figure 10: Connecting I-PEX End



11. Repeat step 10 to install the second external antenna if any.
12. Position the antenna(s) for optimal signal reception.

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. Four sides of the KBox E-250-AML/ADN, consisting of two compact aluminum U-shaped chassis stacked and secured together, are with cooling fins. The cooling fins provide heat dissipation during operation.



To provide sufficient heat dissipation for the cooling of the KBox E-250-AML/ADN, never cover the cooling fins of the chassis. Do not place any objects on the device.

6.3. System Clearance

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

6.4. Maximum Temperatures



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

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



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

6.5. Third Party Components

When the KBox E-250-AML/ADN is extended and configured with third party components like M.2 expansion card(s), it has to be taken into account that the air temperature inside the system is higher than the ambient temperature. An approximately internal temperature rise is given for assistance.

7/ Installation Instructions

The KBox E-250-AML/ADN system is designed for operating:

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



Expansion card installation should be performed before installing the KBox E-250-AML/ADN into control cabinet / custom enclosure / machine, or onto wall / monitor.

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

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

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

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

Do not operate the KBox E-250-AML/ADN with foreign objects inside the chassis.

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

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

The KBox E-250-AML/ADN has to be installed and operated only by trained and qualified personnel.

Only personnel with appropriate qualifications, trainings and authorization are permitted to install and work with the Kontron KBox E-250-AML/ADN.

NOTICE

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

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

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

Refer also to section 10.1.2 "Mechanical Specifications".

The KBox E-250-AML/ADN must be firmly attached to a clean flat and solid mounting surface. Use proper fastening materials suitable for the mounting surface. Ensure that the mounting surface type and the used mounting solution safely support the load of the KBox E-250-AML/ADN and the attached components.

Please follow the local/national regulations for grounding.

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

The type label is located 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 7.2 "DC Power Connection" and chapter 8/ "Starting Up".

7.1. System Mounting

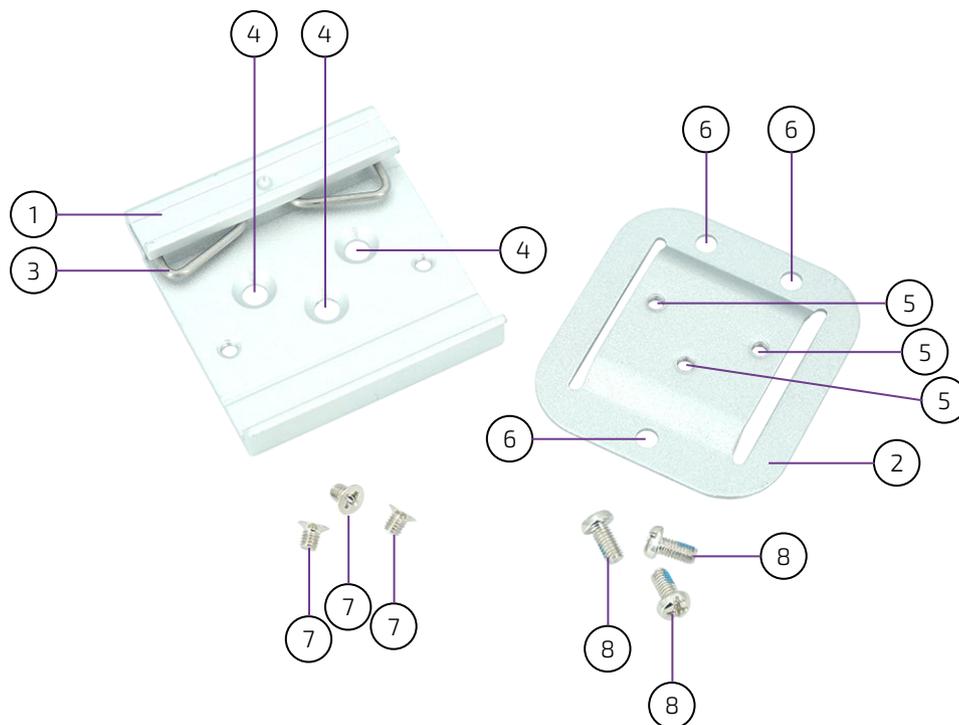
In order to adapt the KBox E-250-AML/ADN for mounting, Kontron offers different mounting solutions such as:

- KBox E-250-AML/ADN configuration with a DIN rail mounting kit for vertical installation into a control cabinet / custom enclosure / machine
- KBox E-250-AML/ADN configuration with a VESA mounting kit for vertical installation into a control cabinet / custom enclosure / machine / or onto a wall / the back of a monitor
- KBox E-250-AML/ADN configuration with four rubber feet as a desktop unit

7.1.1. DIN Rail Mounting

Depending on the ordered KBox E-250-AML/ADN configuration, your system may be supplied with a DIN rail mounting kit (Figure 11).

Figure 11: Optional DIN Rail Mounting Kit

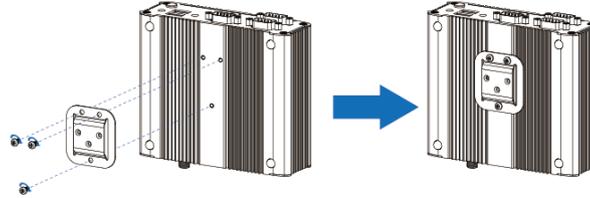


- 1 DIN Rail Clamp
- 2 Adapter Plate
- 3 DIN Rail Spring
- 4 Screw Hole on DIN rail clamp for securing DIN rail clamp to adapter plate
- 5 Screw Hole on adapter plate for securing DIN rail clamp to adapter plate
- 6 Screw Hole for securing adapter plate to KBox E-250-AML/ADN
- 7 Screw for securing DIN rail clamp to adapter plate
- 8 Screw for securing securing adapter plate to KBox E-250-AML/ADN

To mount the KBox E-250-AML/ADN please proceed according to the steps described:

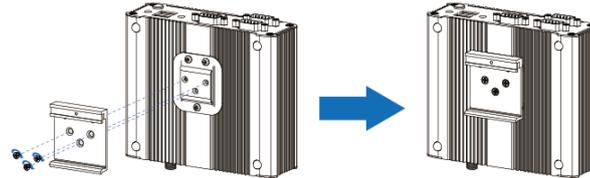
1. Secure the adapter plate (Figure 11, pos. 2) on the bottom side of the chassis with the supplied screws (Figure 11, pos. 8).

Figure 12: Securing Adapter Plate



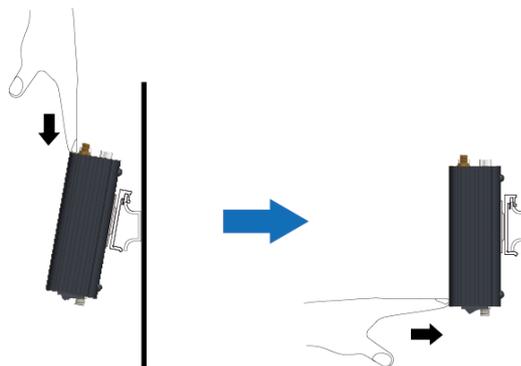
2. Secure the DIN rail clamp (Figure 11, pos. 1) on the adapter plate (Figure 11, pos. 2) with the supplied screws (Figure 11, Pos. 7).

Figure 13: Securing DIN Rail Clamp



3. Make sure that DIN rail clamp (Figure 11, pos. 1) is in the upright position.
4. Clip the top of the DIN rail clamp (Figure 11, pos. 1) into the DIN rail and push the bottom of the DIN rail clamp firmly until it clamps onto the bottom of the DIN rail.

Figure 14: Clamping KBox E-250-AML/ADN onto DIN Rail

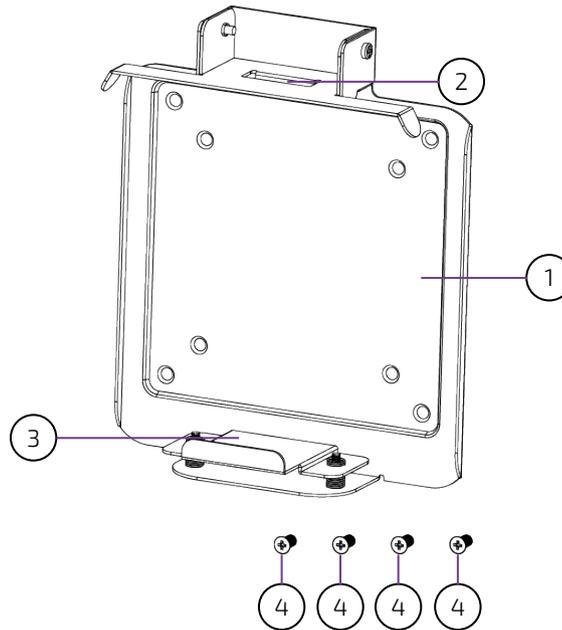


For a sufficient air circulation around the device, we recommend keep a proper clearance and not mount / operate any other devices within the clearance around the KBox E-250-AML/ADN.

7.1.2. VESA Mounting

Depending on the ordered KBox E-250-AML/ADN configuration, your system may be supplied with a VESA mounting kit (Figure 15). The kit consists of an adapter bracket (Figure 15, pos. 1) with a fixing hook (Figure 15, pos. 2) and spring cushion (Figure 15, pos. 3) to hold on the KBox E-250-AML/ADN to the adapter bracket and four screws (Figure 15, pos. 4) to permanently secure the adapter bracket on the mounting surface.

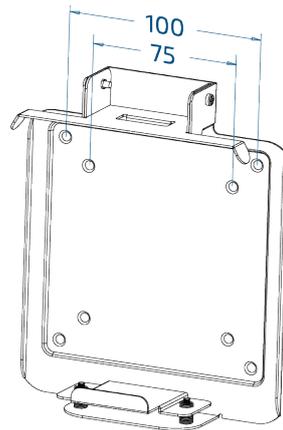
Figure 15: Optional VESA Mounting Kit



- 1 VESA Mount Adapter Bracket
- 2 Fixing Hook
- 3 Spring Cushion
- 4 Screw

The adapter bracket complies with VESA 75 and VESA 100 patterns (Figure 16). To fasten the bracket, the control cabinet / custom enclosure / machine / monitor / wall must have VESA 75 or VESA 100 screw pattern shown as Figure 16 for mounting.

Figure 16: Hole Pattern of Adapter Bracket

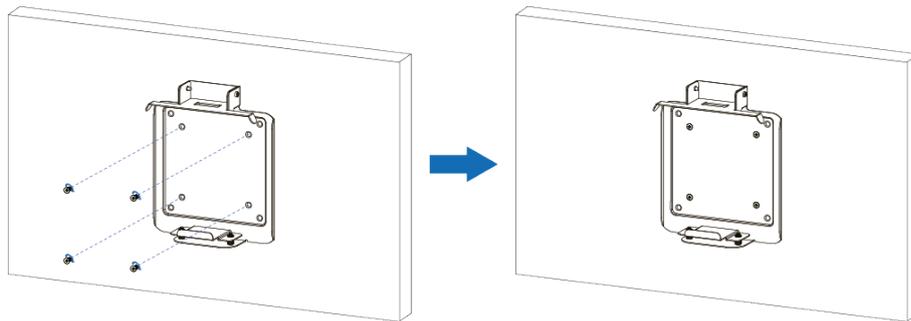


(unit: mm)

To mount the KBox E-250-AML/ADN please proceed according to the steps described:

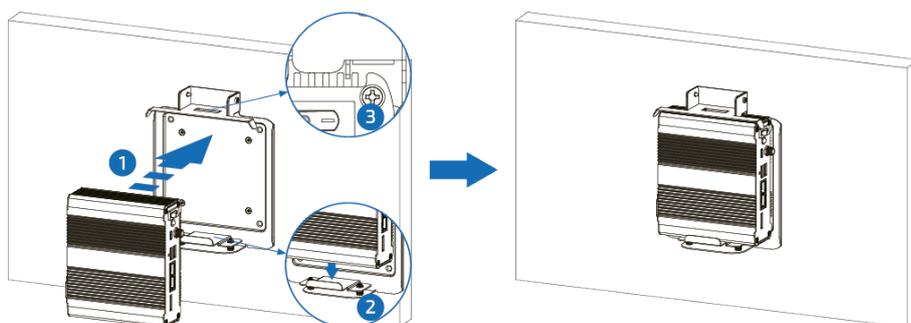
1. Prepare the mounting surface with supplied screws (Figure 15, pos. 4) and if necessary anchors (not supplied) corresponding to the mounting surface type if no VESA-compliant screw holes are available.
2. Secure the adapter bracket (Figure 15, pos. 1) to the mounting surface with screws (Figure 15, pos. 4).

Figure 17: Securing Adapter Bracket onto Mounting Surface



3. Place the KBox E-250-AML/ADN vertically sideways on the spring cushion (Figure 15, pos. 3) of the adapter bracket (Figure 18, step 1). Push down the spring cushion (Figure 18, step 2) until the KBox E-250-AML/ADN snaps into place and the fixing hook is well located in the gap between two cooling fins of the chassis (Figure 18, step 3). Release the spring cushion and the KBox E-250-AML/ADN will be solidly secured to the adapter bracket.

Figure 18: Securing KBox E-250-AML/ADN onto Adapter Bracket



7.2. DC Power Connection

The KBox E-250-AML/ADN is connected by a lockable DC power input jack (Figure 1, pos. 1) to a DC power source.

Depending on the ordered KBox E-250-AML/ADN configuration, your system may be delivered with a power adapter to convert AC voltage into DC 12 V and a power cord to carry AC power to the power adapter.

8/ Start Up



The KBox E-120-AML/ADN must be only operated with a nominal voltage of 12 V 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 1, pos. 1) is located on the front side of the KBox E-250-AML/ADN. The KBox E-250-AML/ADN will be connected to a AC-to-DC power adapter via the attached male DC power plug and corresponding power cable connected 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 E-250-AML/ADN must be connected DC main power supply complying with the SELV (Safety Extra Low Voltage) requirements of EN 60950-1 standard. It must be observed that wiring and short-circuit/overcurrent protection is performed according to the applicable standards, regulations and respect to the electrical specification of the KBox E-250-AML/ADN.

Even when the system is turned off via the power switch (Figure 1, pos. 2) parts of the system are still energized.

The disconnecting device (fuse/circuit breaker) rating must be in accordance with the wire cross-section and the rated current of the KBox E-250-AML/ADN.



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

To connect the KBox E-250-AML/ADN to a corresponding DC power supply, please perform the following steps:

1. Connect the power adapter cable to the DC jack (DC IN, Figure 1, pos. 1) of the KBox E-250-AML/ADN.
2. Connect the power cable to the power adapter.
3. Connect the other end of the power cable to a power outlet.
4. Press the power switch (Figure 1, pos. 2) on the front panel to turn on the system.

8.2. Operating System and Hardware Component Drivers

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

If you have ordered your KBox E-250-AML/ADN with a pre-installed operating system, all drivers are installed in accordance with the system configuration ordered (optional hardware components). Your system is fully operational when you switch it on for the first time.

If you have ordered the KBox E-250-AML/ADN without a pre-installed operating system, you will need to install the operating system and the appropriate drivers for the system configuration you have ordered (optional hardware components) yourself.



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

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

9/ Maintenance and Cleaning

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

- For light soiling, clean the KBox E-250-AML/ADN with a dry cloth. Carefully remove dust from the surface of the chassis using a clean, soft brush.
- Stubborn dirt should be removed using a mild detergent and a soft cloth.



Do not use steel wool, metallic threads or solvents like abrasives, alcohol, acetone or benzene for cleaning the KBox E-250-AML/ADN.

10/ Technical Specifications

Table 2: Technical Specifications

| | ➤ KBox E-250-AML | ➤ KBox E-250-ADN |
|--|---|--|
| System | | |
| Processor | ➤ Intel® Atom® x7000RE Series Processors | ➤ Intel® Core™ i3 N-Series Processors ➤ Intel® N-Series Processors |
| Memory | ➤ 4 GByte / 8 GByte / 16 GByte LPDDR5 4800 memory down | |
| Video | | |
| Display Interface | ➤ 2x DP (1x Full-size on front, 1x DP USB-C on front) | |
| Network Connection | | |
| Ethernet | ➤ 2x 2.5 GbE LAN (RJ45 on front, Intel® I226-IT, with TSN support) | ➤ 2x 2.5 GbE LAN (RJ45 on front, Intel® I226-V, without TSN support) |
| Peripheral Connection | | |
| USB | ➤ 2x USB 3.2 Gen 2 Type A (on front) ➤ 1x USB 3.2 Gen 1 Type C (on front, w/ DP & PD 5 V / 3 A) ➤ 2x USB 2.0 Type A (on rear) | ➤ 2x USB 3.2 Gen 2 Type A (on front) ➤ 1x USB 3.2 Gen 2 Type C (on front, w/ DP & PD 5 V / 3 A) ➤ 2x USB 2.0 Type A (on rear) |
| Serial Port | ➤ 2x RS232 (def.) / RS232/422/485 (opt.) (DB9 on rear, Tx/Rx only in RS232) | |
| DIO | ➤ 1x 8-bit DIO (DB9 Female on rear, 4x DI + 4x DO) | |
| Storage & Expansion | | |
| Storage & Expansion | ➤ 32 GByte / 64 GByte / 128 GByte eMMC ➤ 1x M.2 Key B (Type 2242 / 3042 / 3052 / 2280, with PCIe x2 / USB 2.0 / SATA / UIM) ➤ 1x M.2 Key E (Type 2230, with PCIe x1 / USB 2.0) ➤ 1x SIM Card Holder (optional, by wafer) | ➤ 32 GByte / 64 GByte / 128 GByte eMMC ➤ 1x M.2 Key B (Type 2242 / 3042 / 3052 / 2280, with PCIe x2 / USB 2.0 / SATA / UIM) ➤ 1x M.2 Key E (Type 2230, with PCIe x1 / USB 2.0 / CNVi) ➤ 1x SIM Card Holder (optional, by wafer) |
| Power | | |
| Input Voltage | ➤ DC 12 V | |
| Connector | ➤ Lockable DC Jack (on front) | |
| Firmware | | |
| BIOS | ➤ AMI uEFI BIOS w/ 256 Mb SPI Flash | |
| Watchdog | ➤ Programmable WDT to generate system reset event | |
| H/W Monitor | ➤ Voltages ➤ Temperatures | |
| Real Time Clock | ➤ Processor integrated RTC | |
| Security | ➤ TPM 2.0 support (Infineon SLB 9672) | |
| System Control & Monitoring | | |
| Button, Switch & Indicator | ➤ 1x Power Switch (on front) ➤ 1x Power LED (on front) | |

| | |
|-----------------|---------------------------------|
| | ▶ 1x Storage LED (on front) |
| Cooling | |
| Cooling Method | ▶ Passive |
| Software | |
| OS Support | ▶ Windows 11, Windows 10, Linux |

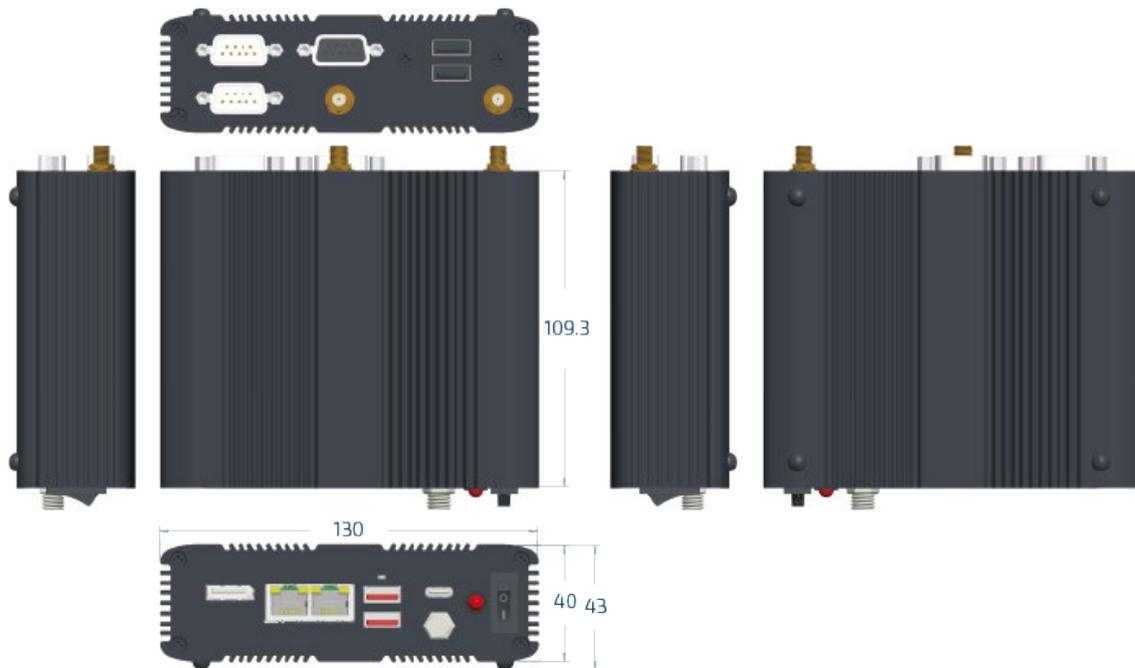
10.1. Mechanical Specifications

Table 3: Mechanical Specifications

| | |
|------------------------|---|
| Construction | ▶ Aluminum Chassis |
| Dimensions (W x D x H) | ▶ 130 mm x 109.3 mm x 40 mm / 5.12" x 4.30" x 1.57" |
| Weight | ▶ 750 g / 1.65 lb |
| Mounting | ▶ DIN Rail Mount |
| | ▶ VESA Mount (adapter required) |
| | ▶ Desktop |

10.1.1. Mechanical Drawing

Figure 19: Mechanical Drawing



(unit: mm)

10.2. Environmental Conditions

Table 4: Environmental Conditions

| | ➤ KBox E-250-AML | ➤ KBox E-250-ADN |
|-----------------------|--|---|
| Operating Temperature | ➤ -30 °C ~ 60 °C / -22 °F ~ 140 °F (Extended) | ➤ 0 °C ~ 50 °C / 32 °F ~ 122 °F (Standard) |
| Storage Temperature | ➤ -55 °C ~ 85 °C / -67 °F ~ 185 °F (Extended) | ➤ -20 °C ~ 80 °C / -4 °F ~ 176 °F (Standard) |
| Humidity | ➤ 0 % ~ 95 % | |

10.3. Standards and Certifications

Table 5: Standards and Certifications

| | |
|-------------------------------------|---|
| CE Class B UKCA | ➤ EN 55032: 2015 + A11: 2020, Class B |
| | ➤ BS EN 55032: 2015 + A11: 2020 |
| | ➤ CISPR 32: 2015 + COR1: 2016 |
| | ➤ EN 55032: 2015 + A1: 2020, Class B |
| | ➤ BS EN 55032: 2015 + A1: 2020 |
| | ➤ CISPR 32: 2015 + A1: 2019 |
| | ➤ EN 61000-3-2: 2014 |
| | ➤ EN IEC 61000-3-2: 2019 + A1: 2021 |
| | ➤ EN 61000-3-3: 2013 + A2: 2021 |
| | ➤ BS EN 61000-3-2:2014 |
| | ➤ BS EN IEC 61000-3-2: 2019 + A1: 2021 |
| | ➤ BS EN 61000-3-3: 2013 + A2: 2021 |
| | ➤ EN 55035: 2017 + A11: 2020 |
| | ➤ BS EN 55035: 2017 + A11: 2020 |
| | ➤ IEC 61000-4-2: 2008 |
| | ➤ IEC 61000-4-3: 2020 |
| | ➤ IEC 61000-4-4: 2012 |
| | ➤ IEC 61000-4-5: 2014 + A1: 2017 |
| | ➤ IEC 61000-4-6: 2023 |
| | ➤ IEC 61000-4-8: 2009 |
| ➤ IEC 61000-4-11: 2020 + COR2: 2022 | |
| ➤ EN IEC 61000-6-2: 2019 | |
| ➤ EN IEC 61000-6-4: 2019 | |
| FCC Class B ICES Class B | ➤ FCC CFR Title 47 Part 15 Subpart B, Class B |
| | ➤ ICES-003 Issue 7: 2020 Class B |
| | ➤ ANSI C63.4: 2014 |
| | ➤ ANSI C63.4a: 2017 |

11/Standard Interfaces – Pin Assignments

Low-active signals are indicated by a minus sign.

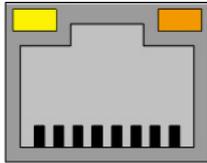
11.1. DC Jack

Table 6: DC Jack (see Figure 1, pos. 1)

| Pin | Signal Name | DC Jack (female) |
|-----|-------------|---|
| 1 | +12V DC |  |
| 2 | GND | |

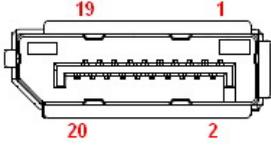
11.2. 2.5 Gigabit Ethernet Connector

Table 7: 2.5 Gigabit Ethernet Connector (see Figure 1, pos. 5)

| Pin | Signal Name | RJ45 |
|-----|-------------|--|
| 1 | BI_D1+ |  8 7 6 5 4 3 2 1 |
| 2 | BI_D1- | |
| 3 | BI_D2+ | |
| 4 | BI_D3+ | |
| 5 | BI_D3- | |
| 6 | BI_D2- | |
| 7 | BI_D4+ | |
| 8 | BI_D4- | |

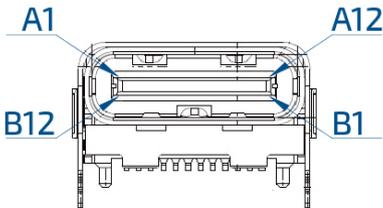
11.3. DisplayPort Connector

Table 8: DisplayPort Connector (see Figure 1, pos. 6)

| Pin | Signal Name | DisplayPort Connector |
|-----|-------------|---|
| 1 | ML_Lane0p |  <p>The diagram shows a top-down view of a DisplayPort connector. It is a rectangular connector with a central row of pins. Four specific pins are highlighted with red numbers: pin 19 is at the top-left corner, pin 1 is at the top-right corner, pin 20 is at the bottom-left corner, and pin 2 is at the bottom-right corner. The rest of the pins are arranged in a central row between these four corners.</p> |
| 2 | GND | |
| 3 | ML_Lane0n | |
| 4 | ML_Lane1p | |
| 5 | GND | |
| 6 | ML_Lane1n | |
| 7 | ML_Lane2p | |
| 8 | GND | |
| 9 | ML_Lane2n | |
| 10 | ML_Lane3p | |
| 11 | GND | |
| 12 | ML_Lane3n | |
| 13 | Config1 | |
| 14 | Config2 | |
| 15 | AUX_CHp | |
| 16 | GND | |
| 17 | AUX_CHn | |
| 18 | Hot_Plug | |
| 19 | GND | |
| 20 | DP_PWR | |

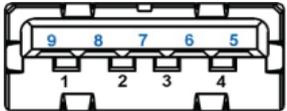
11.4. DisplayPort over USB 3.2 Gen 2 / Gen 1 Type C Connector

Table 9: DisplayPort over USB 3.2 Gen 2 / Gen 1 Type C Connector (see Figure 1, pos. 7)

| Pin | Signal Name | USB Type C Connector |
|-----|-------------|--|
| A1 | GND |  |
| A2 | CON_TX1P_C | |
| A3 | CON_TX1N_C | |
| A4 | +5V_VBUS | |
| A5 | CC1 | |
| A6 | USB2_P | |
| A7 | USB2_N | |
| A8 | SBU1 | |
| A9 | +5V_VBUS | |
| A10 | CON_RX2N_C | |
| A11 | CON_RX2P_C | |
| A12 | GND | |
| B1 | GND | |
| B2 | CON_TX2P_C | |
| B3 | CON_TX2N_C | |
| B4 | +5V_VBUS | |
| B5 | CC2 | |
| B6 | USB2_P | |
| B7 | USB2_N | |
| B8 | SUB2 | |
| B9 | +5V_VBUS | |
| B10 | CON_RX1N_C | |
| B11 | CON_RX1P_C | |
| B12 | GND | |

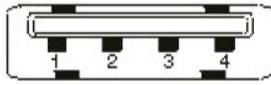
11.5. USB 3.2 Gen 2 Connector

Table 10: USB 3.2 Gen 2 Connector (see Figure 1, pos. 8)

| USB 2.0 Contact Pin | | USB 3.2 Gen 2 Contact Pin | | 9-pin USB Connector Type A Version 3.2 Gen 2 / 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+ | |

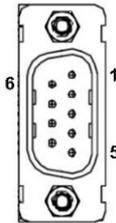
11.6. USB 2.0 Connector

Table 11: USB 2.0 Connector (see Figure 2, pos. 9)

| Pin | Signal Name | 4-pin USB Connector Type A Version 2.0 |
|-----|-------------|--|
| 1 | +USB_VCC |  |
| 2 | USB_D- | |
| 3 | USB_D+ | |
| 4 | GND | |

11.7. COM 1 & COM 2 RS232(/422/485) Serial Port

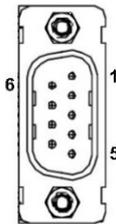
Table 12: COM 1 & COM 2 RS232(/422/485) Serial Port (see Figure 2, pos. 10)

| Pin | RS232 | RS422 | RS485 | 9-pin D-SUB Male Connector |
|-----|-------|-------|-------|--|
| 1 | N/A | TX- | DATA- |  |
| 2 | RXD | TX+ | DATA+ | |
| 3 | TXD | RX+ | N/A | |
| 4 | N/A | RX- | N/A | |
| 5 | GND | GND | GND | |
| 6 | N/A | N/A | N/A | |
| 7 | N/A | N/A | N/A | |
| 8 | N/A | N/A | N/A | |
| 9 | N/A* | N/A* | N/A* | |

* Kontron's default setting. Users can alternatively connect it to Pin 10 in the wafer for +5V signal.

11.8. Digital I/O Port

Table 13: Digital I/O Port (see Figure 2, pos. 11)

| Pin | Signal Name | 9-pin D-SUB Female Connector |
|-----|-------------|---|
| 1 | DIO_0 |  |
| 2 | DIO_1 | |
| 3 | DIO_2 | |
| 4 | DIO_3 | |
| 5 | DIO_4 | |
| 6 | DIO_5 | |
| 7 | DIO_6 | |
| 8 | DIO_7 | |
| 9 | +5V | |

12/ BIOS

12.1. Starting the uEFI BIOS

The KBox E-250-AML/ADN is provided with a Kontron-customized, pre-installed and configured version of AMI Aptio® V uEFI BIOS. AMI BIOS firmware is based on the Unified Extensible Firmware Interface (UEFI) specification and the Intel® Platform Innovation Framework for EFI. This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the KBox E-250-AML/ADN.

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 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 <ENTER>, and proceed with step 5.
5. A setup menu will appear.

The KBox E-250-AML/ADN 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 14: Hotkeys Table

| Signal | 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 select major setup menus on the menu bar. For example: Main, Advanced, Security, etc. |
| <↑> or <↓> | The <Up/Down> arrows select 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. |
| <ENTER> | The <ENTER> key executes a command or select a submenu. |

12.2. Starting the uEFI BIOS

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

- Main
- Advanced
- Chipset
- Security
- Boot
- 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 15: Main Setup Menu Sub-Screens and Functions

| Function | Description |
|-----------------------|---|
| Product Information | Read only field. Displays information about the product name |
| BIOS Information | Read only field. Displays information about the system BIOS |
| FSP Information | Read only field. Displays information about the FSP |
| Processor Information | Read only field. Displays information about the processor |
| Memory Information | Read only field. Displays information about the memory |
| PCH Information | Read only field. Displays information about the PCH |
| ME Information | Read only field. Displays information about Intel® Management Engine (ME) firmware |
| System Language | Read only field. [English] only |
| Platform Information | Sub-screen to the product and KSC information. |
| System Date | Set System Date |
| System Time | Set System Time |

Figure 20: BIOS Main Menu Screen System Data and Time

| Aptio Setup – AMI | | | | | |
|----------------------------------|-------------------------|---------|----------|------|-------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| Product Information | | | | | |
| Product Name | 2.5-SBC-AML | | | | |
| BIOS Information | | | | | |
| BIOS Vendor | American Megatrends | | | | |
| Core Version | 5.27 | | | | |
| Compliance | UEFI 2.8; PI 1.7 | | | | |
| Kontron BIOS Version | KE250ADN.100 (x64) | | | | |
| Access Level | Administrator | | | | |
| FSP Information | | | | | |
| FSP Version | 0C.02.89.40 | | | | |
| RC Version | 0C.E0.89.40 | | | | |
| Build Date | | | | | |
| FSP Mode | Dispatch Mode | | | | |
| Processor Information | | | | | |
| Name | Alder Lake ULX | | | | |
| Type | Intel® Atom® x7835RE | | | | |
| Speed | 1300 MHz | | | | |
| ID | 0xB06E0 | | | | |
| Stepping | A0 | | | | |
| Package | Not Implemented Yet | | | | |
| Number of Efficient-cores | 8 Core(s) / 8 Thread(s) | | | | |
| Microcode Revision | 18 | | | | |
| GT Info | 0x46D0 | | | | |
| IGFX GOP Version | 21.0.1063 | | | | |
| Memory RC Version | 0.0.4.74 | | | | |
| Total Memory | 16384 MB | | | | |
| Memory Frequency | 3600 MHz | | | | |
| PCH Information | | | | | |
| Name | PCH-N | | | | |
| PCH SKU | N ASL IOT INDU SKU | | | | |
| Stepping | A0 | | | | |
| Chipset Init Base Revision | 4 | | | | |
| Chipset Init OEM Revision | 0 | | | | |
| Package | Not Implemented Yet | | | | |
| TXT Capability of Platform / PCH | Unsupported | | | | |
| Production Type | Production | | | | |

| Aptio Setup – AMI | | | | | |
|--|------------------|---------|----------|------------------------|-------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| Dual Output Fast Read support | Supported | | | | |
| Read ID / Status Clock Freq | 50 MHz | | | | |
| Write and Erase Clock Freq | 50 MHz | | | | |
| Fast Read Clock Freq | 50 MHz | | | | |
| Fast Read support | Supported | | | | |
| Number of Components | 1 Component | | | | |
| SPI Component 0 Density | 32 MB | | | | |
| eSPI Flash Sharing Mode | G3 | | | | |
| EC PECl Mode | Legacy PECl mode | | | | |
| ME FW Version | 16.50.12.1453 | | | → ←: Select Screen | |
| ME Firmware SKU | Consumer SKU | | | ↑ ↓: Select Item | |
| PMC FW Version | 160.50.0.1010 | | | Enter: Select | |
| | | | | +/-: Change Opt. | |
| System Language | [English] | | | F1: General Help | |
| > Platform Information | | | | F2: Previous Values | |
| | | | | F3: Optimized Defaults | |
| System Date | [Wed 06/18/2025] | | | F4: Save & Exit | |
| System Time | [07:55:06] | | | ESC: Exit | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | | | | |

| Feature | Option | Description |
|-----------------|--------------|--|
| System Language | [English] | Read only item. |
| System Date | [dd/mm/yyyy] | Set the Date. Use Tab to switch between Data elements. Default Ranges: Year: 1998 - 9999 Months: 1 - 12 Days: Dependent on month Range of Years may vary. |
| System Time | [hh:mm:ss] | Set the Time. Use Tab to switch between Time elements. |

Figure 21: BIOS Main Menu Screen – Platform Information

| Aptio Setup – AMI | | |
|--|--------------------------------------|------------------------|
| Main | | |
| Board Information | | |
| Product Name | KBox E-250-ADN | |
| Serial # | Default string | |
| UUID | 00020003-0004-0005-0006-000700080009 | |
| KSC Information | | |
| Controller | KSC Main Controller | |
| Operating Mode | Normal | |
| Board Name | 2.5-SBC_AML | |
| Platform ID | 000B | → ←: Select Screen |
| KSC SW Spec. Version | 1.20 | ↑ ↓: Select Item |
| BIOS Protocol Version | 2.3.1 | Enter: Select |
| BIOS SW Spec. Version | 1.18 | +/-: Change Opt. |
| Core Firmware Version | 1.4.1 Release | F1: General Help |
| Board Firmware Version | 1.0.0 Release | F2: Previous Values |
| SCM Info | DB-8C-26-E2 | F3: Optimized Defaults |
| Boot Counter | N/A | F4: Save & Exit |
| | | ESC: Exit |
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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:

- cTDP, IB ECC, Compliance Test, Audio, Power Mode, ME FW Image Re-Flash & Intel® TCC Configuration
- Display Configuration
- Trusted Computing
- ACPI Settings
- Miscellaneous
- H/W Monitor
- S5 RTC Wake Settings
- Serial Port Console Redirection
- SIO Configuration
- USB Configuration
- Network Stack Configuration
- NVMe Configuration
- SDIO Configuration
- COM Configurations
- Intel® Ethernet Controller I226-IT – C0:EA:C3:D1:DD:30
- Intel® Ethernet Controller I226-IT – C0:EA:C3:D1:DD:31

NOTICE

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

Figure 22: BIOS Advanced Menu

| Aptio Setup – AMI | | | | | |
|--|----------|---------|-------------|------------------------|-------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| Configurable TDP Mode | | | [15W] | | |
| In-Band ECC Support | | | [Disabled] | | |
| Compliance Test Mode | | | [Disabled] | | |
| HD Audio | | | [Enabled] | | |
| Power Mode Selection | | | [ATX Mode] | | |
| Restore AC Power Loss | | | [Power Off] | | |
| Power Saving Mode | | | [Disabled] | | |
| ME FW Image Re-Flash | | | [Disabled] | | |
| Intel® TCC Mode | | | [Disabled] | | |
| > Display Configuration | | | | | |
| > Trusted Computing | | | | | |
| > ACPI Settings | | | | | |
| > Miscellaneous | | | | | |
| > H/W Monitor | | | | | |
| > S5 RTC Wake Settings | | | | | |
| > Serial Port Console Redirection | | | | | |
| > SIO Configuration | | | | | |
| > USB Configuration | | | | | |
| > Network Stack Configuration | | | | | |
| > NVMe Configuration | | | | | |
| > SDIO Configuration | | | | | |
| > COM Configurations | | | | | |
| > Intel® Ethernet Controller I226-IT – C0:EA:C3:D1:DD:30 | | | | | |
| > Intel® Ethernet Controller I226-IT – C0:EA:C3:D1:DD:31 | | | | | |
| | | | | → ←: 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 |
|-----------------------|--------------------------|--|
| Configurable TDP Mode | [15W] | Configurable Processor Base Power (cTDP) Mode as 15W (Nominal) / 9W (Level 1) / Deactivate TDP selection. Deactivate option will set MSR to Nominal and MMIO to Zero. This option is only available for CPU i3 SKUs. |
| In-Band ECC Support | [Disabled], [Enabled] | Enable / Disable In-Band ECC. Will be enabled if memory has symmetric configuration |
| Compliance Test Mode | [Disabled], [Enabled] | Enable when using Compliance Load Board |
| HD Audio | [Disabled], [Enabled] | Control Detection of the HD-Audio device. [Disabled] = HDA will be unconditionally disabled. [Enabled] = HDA will be unconditionally enabled. |
| Power Mode Selection | [ATX mode] | Read only item. |
| Restore AC Power | [Power Off], | Choose options for restoring AC power loss |

| Feature | Option | Description |
|----------------------|--------------------------|---|
| Loss | [Last State] | |
| Power Saving Mode | [Disabled], [Enabled] | Enable / Disable power saving mode |
| ME FW Image Re-Flash | [Disabled], [Enabled] | Enable / Disable ME FW Image Re-Flash function. |
| Intel® TCC Mode | [Disabled], [Enabled] | Enable or Disable Intel® TCC Mode. When enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel® TCC mode is enabled. |

Figure 23: BIOS Advanced Menu - Display Configuration

| Aptio Setup – AMI | | |
|--|-----------|--|
| Advanced | | |
| Display Configuration | | |
| VBT Select | [DP] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Primary Display | [IGFX] | |
| Internal Graphics | [Enabled] | |
| Aperture Size | [256MB] | |
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| Feature | Option | Description |
|-------------------|--|---|
| VBT Select | [DP], [HDMI] | Select VBT for GOP Driver Select VBT to MIPI if any of the Display has MIPI |
| Primary Display | [Auto], [IGFX], [PEG Slot], [PCH PCI] | Select which of IGFX / PEG / PCI Graphics device should be Primary Display or select HG for Hybrid Gfx. |
| Internal Graphics | [Enabled] | Read only item |
| Aperture Size | [128MB], [256MB], [512MB], [1024MB] | Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting > 2048MB aperture. To use this feature, please disable CSM Support. |

Figure 24: BIOS Advanced Menu - Trusted Computing

| Aptio Setup – AMI | | |
|--|----------------|--|
| Advanced | | |
| TPM 2.0 Device Found | | |
| Firmware Version: | 16.13 | |
| Vendor: | IFX | |
| Security Device Support | [Enabled] | |
| Active PCR banks* | SHA256 | |
| Available PCR banks* | SHA256, SHA384 | |
| SHA256 PCR Bank* | [Enabled] | |
| SHA384 PCR Bank* | [Disabled] | |
| Pending operation* | [None] | |
| Platform Hierarchy* | [Enabled] | |
| Storage Hierarchy* | [Enabled] | |
| Endorsement Hierarchy* | [Enabled] | |
| Physical Presence Spec Version* | [1.3] | |
| TPM 2.0 Interface Type* | [TIS] | |
| Device Select* | [Auto] | |
| | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when enabling Security Device Support.

| Feature | Option | Description |
|--------------------------------|--------------------------|---|
| Security Device Support | [Disabled], [Enabled] | Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. |
| SHA256 PCR Bank | [Disabled], [Enabled] | Enable or Disable SHA256 PCR Bank |
| SHA384 PCR Bank | [Disabled], [Enabled] | Enable or Disable SHA384 PCR Bank |
| Pending operation | [None], [TPM Clear] | Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device. |
| Platform Hierarchy | [Disabled], [Enabled] | Enable or Disable Platform Hierarchy |
| Storage Hierarchy | [Disabled], [Enabled] | Enable or Disable Storage Hierarchy |
| Endorsement Hierarchy | [Disabled], [Enabled] | Enable or Disable Endorsement Hierarchy |
| Physical Presence Spec Version | [1.2], [1.3] | Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3. |
| TPM 2.0 Interface Type | [TIS] | Read only item |

| Feature | Option | Description |
|---------------|------------------------------------|--|
| Device Select | [TPM 1.2], [TPM 2.0], [Auto] | TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated. |

Figure 25: BIOS Advanced Menu – ACPI Settings

| Aptio Setup – AMI | | |
|--|-----------------------|--|
| Advanced | | |
| ACPI Settings | | |
| Enable ACPI Auto Configuration | [Disabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Enable Hibernation* | [Enabled] | |
| ACPI Sleep State* | [S3 (Suspend to RAM)] | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when disabling Enable ACPI Auto Configuration.

| Feature | Option | Description |
|--------------------------------|--|--|
| Enable ACPI Auto Configuration | [Disabled], [Enabled] | Enables or Disables BIOS ACPI Auto Configuration. |
| Enable Hibernation | [Disabled], [Enabled] | Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems. |
| ACPI Sleep State | [Suspend Disabled], [S3 (Suspend to RAM)] | Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. |

Figure 26: BIOS Advanced Menu – Miscellaneous

| Aptio Setup – AMI | | |
|--|------------------|--|
| Advanced | | |
| Miscellaneous Configuration | | |
| <ul style="list-style-type: none"> > Preset DIO in BIOS > Control KSC firmware > Update KSC firmware > Generic eSPI Decode Ranges > Watchdog | | |
| Reset Button Behavior | [Chipset Reset] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| I2C Speed | [100 KHz] | |
| Onboard I2C Mode | [Multimaster] | |
| BIOS Test Mode | [Disabled] | |
| Last system reset through | [Power-on reset] | |
| Create GSPI ACPI dev | [Disabled] | |
| PCIe Wake | [Disabled] | |
| Onboard EEPROM Write Protect | [WP Enabled] | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

| Feature | Option | Description |
|------------------------------|--|--|
| Reset Button Behavior | [Chipset Reset], [Power Cycle] | Select Reset Button Behavior: Chipset Reset & Power Cycle. |
| I2C Speed | [100 KHz], [400 KHz], [1 MHz] | Select I2C Bus Speed in KHz. For a default system 100 KHz should be an appropriate value. |
| Onboard I2C Mode | [Multimaster], [Busclear] | MultiMaster / BusClear |
| BIOS Test Mode | [Disabled] | Read only item |
| Last system reset through | [Unknown Source] | Read only item |
| Create GSPI ACPI dev | [Disabled], [Kontron Linux BSP], [Win10 RhProxy style] | If set to 'Kontron Linux BSP' then a generic GSPI device will be created in ACPI space to be used by Kontron Linux BSP. 'Win10 RhProxy style' supports this driver type under Win10. |
| PCIe Wake | [Disabled], [Enabled] | Set to enable or disable PCIe wake. This would affect features such as Wake 0/1 and Wake from Lan (WOL). |
| Onboard EEPROM Write Protect | [WP Disabled], [WP Enabled] | Set WP enable or disable the Onboard EEPROM Write Protect |

Figure 27: BIOS Advanced Menu – Miscellaneous – Preset DIO in BIOS

| Aptio Setup – AMI |
|-------------------|
| Advanced |

| Aptio Setup – AMI | | |
|---|-------------------|--|
| Advanced | | |
| Allows to preset GPIOs during BIOS startup. | | |
| GPIO OS usable | [GPIO 0 – GPIO 7] | |
| Control DIO in BIOS | [Disabled] | |
| DIO #0* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #1* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #2* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #3* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #4* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #5* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #6* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| DIO #7* | [Skip] | |
| Output level ^{*(1)} | [Low] | |
| | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
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* These items appear only when enabling Control DIO in BIOS.

⁽¹⁾ This item appears only when selecting Output for DIO #0/1/2/3/4/5/6/7 respectively.

| Feature | Option | Description |
|---------------------|--|---|
| GPIO OS usable | [All available GPIO], [GPIO 0 – GPIO 7] | Set the GPIO OS usable |
| Control DIO in BIOS | [Disabled], [Enabled] | Enables or disables DIO GPIO control in BIOS. If set to 'disabled' then the GPIOs are not touched by BIOS. |
| DIO #0..7 | [Input], [Output], [Skip] | Determine the type of the DIO configuration. If this is set to 'Skip' then this GPIO will be left untouched. |
| Output level | [Low], [High] | Set the level of a DIO pin |

Figure 28: BIOS Advanced Menu – Miscellaneous – Control KSC firmware

| Aptio Setup – AMI | |
|--|--|
| Advanced | |
| Allows to control KSC firmware related settings. | |

| Aptio Setup – AMI | | |
|--|-----------|--|
| Advanced | | |
| Lock FW update access | [Enabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| > KSC OTP area control | | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

| Feature | Option | Description |
|-----------------------|--------------------------|---|
| Lock FW update access | [Disabled], [Enabled] | Locks access to KSC firmware area during runtime. |

Figure 29: BIOS Advanced Menu – Miscellaneous – Control KSC firmware – KSC OTP area control

| Aptio Setup – AMI | | |
|--|-----------|--|
| Advanced | | |
| Allows to control KSC OTP area related settings. | | |
| KSC OTP access lock | [Enabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| KSC OTP write lock* | [Enabled] | |
| KSC OTP area limit* | [Enabled] | |
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* These items appear only when disabling KSC OTP access lock.

| Feature | Option | Description |
|---------------------|--------------------------|--|
| KSC OTP access lock | [Disabled], [Enabled] | Locks access to KSC OTP area during runtime. |
| KSC OTP write lock | [Disabled], [Enabled] | Locks write access to KSC OTP area during runtime. |
| KSC OTP area limit | [Disabled], [Enabled] | Limit access to KSC OTP area during runtime. |

Figure 30: BIOS Advanced Menu – Miscellaneous – Update KSC firmware

| Aptio Setup – AMI | | |
|--|------------|--|
| Advanced | | |
| Allows to update KSC firmware from BIOS. | | |
| Auto update KSC FW | [Disabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

| Feature | Option | Description |
|--------------------|--------------------------|--|
| Auto update KSC FW | [Disabled], [Enabled] | Updates KSC firmware to BIOS internal version (best known config) on next system start. To update FW set item to 'Enabled' and exit the setup using 'Save changes and exit'. |

Figure 31: BIOS Advanced Menu – Miscellaneous – Generic eSPI Decode Ranges

| Aptio Setup – AMI | | |
|--|------------|--|
| Advanced | | |
| Generic eSPI Decode Ranges | | |
| Generic LPC via eSPI Decode 1 | [Disabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Base Address* | 100 | |
| Length* | 8 | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when enabling Generic LPC via eSPI Decode 1.

| Feature | Option | Description |
|-------------------------------|--------------------------|--|
| Generic LPC via eSPI Decode 1 | [Disabled], [Enabled] | Enable generic LPC via eSPI decode range. |
| Base Address | Value input | Base address of the generic decode range. Valid between 0100h – FFF0h. Must be 8-byte aligned. |

| Feature | Option | Description |
|---------|-------------|--|
| | | Please note that it also has to be length-aligned. |
| Length | Value input | Length of the generic decode range in hexadecimal notation. Valid between 0008h – 0100h. Must be multiple of 8h. |

Figure 32: BIOS Advanced Menu – Miscellaneous – Watchdog

| Aptio Setup – AMI | | |
|--|------------|---|
| Advanced | | |
| Watchdog Configuration. | | |
| Auto-reload | [Disabled] | |
| Global Lock | [Disabled] | |
| WDT Strobe | [Disabled] | |
| Stage 1 Mode | [Disabled] | |
| Assert WDT Signal ⁽¹⁾ | [Disabled] | |
| Stage 1 Timeout ⁽²⁾ | [1m] | → ←: Select Screen ↑ ↓: Select Item |
| Stage 2 Mode ⁽³⁾ | [Delay] | Enter: Select |
| Assert WDT Signal ⁽¹⁾ | [Disabled] | +/-: Change Opt. |
| Stage 2 Timeout ⁽²⁾ | [1m] | F1: General Help F2: Previous Values |
| Stage 3 Mode ⁽³⁾ | [Delay] | F3: Optimized Defaults |
| Assert WDT Signal ⁽¹⁾ | [Disabled] | F4: Save & Exit |
| Stage 3 Timeout ⁽²⁾ | [1m] | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

⁽¹⁾ This item appears only when selecting Reset or Delay for Stage 1/2/3 Mode.

⁽²⁾ This item appears only when selecting Reset, Delay or WDT Signal only for Stage 1/2/3 Mode.

⁽³⁾ This item appears only when selecting Delay or WDT Signal only for Stange N-1 Mode.

| Feature | Option | Description |
|---------------------|--|---|
| Auto-reload | [Disabled], [Enabled] | Enable automatic reload of watchdog timers on timeout. |
| Global Lock | [Disabled], [Enabled] | If set to enabled, all Watchdog registers (except WD_KICK) become read only until the board is reset. |
| WDT Strobe | [Disabled], [Enabled] | Enable / disable WDT Strobe input. |
| Stage 1/2/3 Mode | [Disabled], [Reset], [Delay], [WDT Signal only] | Select Action for this Watchdog stage |
| Assert WDT Signal | [Disabled], [Enabled] | Enable / disable assertion of WDT signal to baseboard on stage timeout. |
| Stage 1/2/3 Timeout | [1m], | Select Timeout value for this Watchdog stage |

| Feature | Option | Description |
|---------|--------------------------|-------------|
| | [3m], [10m], [30m] | |

Figure 33: BIOS Advanced Menu – H/W Monitor

| Aptio Setup – AMI | |
|--|------------|
| Advanced | |
| KSC based H/W Monitor | |
| Temperature sensors: | |
| #1: CPU Temp | : + 50.0 C |
| #2: PCH Temp | : + 50.0 C |
| #3: SYSTEM Temp | : + 49.7 C |
| Voltage sensors: | |
| #1: V_IN | : 12.3 V |
| #2: 12V_50 | : 12.3 V |
| #3: 5V_50 | : 5.2 V |
| #4: 3V3_50 | : 3.4 V |
| #5: 3V_BAT | : 2.9 V |
| Fan speed & control: | |
| → ←: 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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Read only sub-screen

Figure 34: BIOS Advanced Menu – S5 RTC Wake Settings

| Aptio Setup – AMI | | |
|--|------------|------------------------|
| Advanced | | |
| Wake system from S5 | [Disabled] | |
| Wake up hour ⁽¹⁾ | 0 | |
| Wake up minute ⁽¹⁾ | 0 | → ←: Select Screen |
| Wake up second ⁽¹⁾ | 0 | ↑ ↓: Select Item |
| Wake up minute increase ⁽²⁾ | 1 | Enter: Select |
| | | +/-: Change Opt. |
| | | F1: General Help |
| | | F2: Previous Values |
| | | F3: Optimized Defaults |
| | | F4: Save & Exit |
| | | ESC: Exit |
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⁽¹⁾ These items appear only when selecting Fixed Time for Wake system from S5.

⁽²⁾ This item appears only when selecting Dynamic Time for Wake system from S5.

| Feature | Option | Description |
|-------------------------|--|--|
| Wake system from S5 | [Disabled], [Fixed Time], [Dynamic Time] | Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, system will wake on the current time + Increase minute(s). |
| Wake up hour | Value input | Select 0 – 23 For example, enter 3 for 3 am and 15 for 3 pm. |
| Wake up minute | Value input | Select 0 – 59 for Minute |
| Wake up second | Value input | Select 0 – 59 for Second |
| Wake up minute increase | Value input | 1 – 5 |

Figure 35: BIOS Advanced Menu – Serial Port Console Redirection

| Aptio Setup – AMI | | |
|---|--|--|
| Advanced | | |
| COM1 Console Redirection [Disabled] > Console Redirection Settings* | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| COM2 Console Redirection [Disabled] > Console Redirection Settings* | | |
| Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection EMS [Disabled] > Console Redirection Settings* | | |
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* These items activate only when enabling Console Redirection (EMS).

| Feature | Option | Description |
|---------------------------|--------------------------|--|
| Console Redirection (EMS) | [Disabled], [Enabled] | Console Redirection Enable or Disable. |

Figure 36: BIOS Advanced Menu – Serial Port Console Redirection – COM1/2 Console Redirection Settings

| Aptio Setup – AMI | | |
|--|--|--|
| Advanced | | |
| COM1/2 Console Redirection Settings | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Terminal Type [ANSI] | | |
| Bits per second [115200] | | |
| Data Bits [8] | | |
| Parity [None] | | |
| Stop Bits [1] | | |
| Flow Control [None] | | |
| VT-UTF8 Combo Key Support [Enabled] | | |
| Recorder Mode [Disabled] | | |
| Resolution 100x31 [Disabled] | | |
| Putty KeyPad [VT100] | | |
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| Feature | Option | Description |
|---------------|----------|-------------|
| Terminal Type | [VT100], | Emulation: |

| Feature | Option | Description |
|---------------------------|--|---|
| | [VT100Plus], [VT-UTF8], [ANSI] | [ANSI]: Extended ASCII char set. [VT100]: ASCII char set. [VT100Plus]: Extends VT100 to support color, function keys, etc. [VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. |
| Bits per second | [9600], [19200], [38400], [57600], [115200] | Selects 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] | 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 num of 1's in the data bits is odd. [Mark]: parity bit is always 1. [Space]: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit. |
| 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. |
| 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. Hardware flow control uses two wires to send start / stop signals. |
| VT-UTF8 Combo Key Support | [Disabled], [Enabled] | Enable 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] | Enables or disables extended terminal resolution |
| Putty KeyPad | [VT100], [LINUX], [XTERMR6], [SCO], [ESCN], [VT400] | Select FunctionKey and KeyPad on Putty. |

Figure 37: BIOS Advanced Menu – Serial Port Console Redirection – Console Redirection EMS Settings

| Aptio Setup – AMI | | |
|-----------------------|-----------|--|
| Advanced | | |
| Out-of-Band Mgmt Port | [COM1] | |
| Terminal Type EMS | [VT-UTF8] | |

| Aptio Setup – AMI | | |
|--|----------|--|
| Advanced | | |
| Bits per second EMS | [115200] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Flow Control EMS | [None] | |
| Data Bits EMS | 8 | |
| Parity EMS | None | |
| Stop Bits EMS | 1 | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

| Feature | Option | Description |
|-----------------------|---|---|
| Out-of-Band Mgmt Port | [COM1], [COM2] | Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port. |
| Terminal Type EMS | [VT100], [VT100Plus], [VT-UTF8], [ANSI] | VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type / Emulation. |
| Bits per second EMS | [9600], [19200], [57600], [115200] | Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. |
| Flow Control EMS | [None], [Hardware RTS/CTS], [Software Xon/Xoff] | 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. Hardware flow control uses two wires to send start / stop signals. |

Figure 38: BIOS Advanced Menu – SIO Configuration

| Aptio Setup – AMI | |
|--|------------------------|
| Advanced | |
| AMI SIO Driver Version: A5.19.00 | |
| Super IO Chip Logical Devices(s) Configuration | → ←: Select Screen |
| > [*Active*] Serial Port 0 | ↑ ↓: Select Item |
| > [*Active*] Serial Port 1 | Enter: Select |
| WARNING: Logical Devices state on the left side of the control, reflects the current Logical Device state. Changes made during Setup Session will be shown after you restart the system. | +/-: Change Opt. |
| | F1: General Help |
| | F2: Previous Values |
| | F3: Optimized Defaults |
| | F4: Save & Exit |
| | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | |

Figure 39: BIOS Advanced Menu – SIO Configuration – [*Active*] Serial Port 0

| Aptio Setup – AMI | |
|--|------------------------|
| Advanced | |
| Serial Port 0 Configuration | |
| Use This Device [Enabled] | → ←: Select Screen |
| Logical Device Settings:* | ↑ ↓: Select Item |
| Current: IO=3F8h; IRQ=4;* | Enter: Select |
| Possible:* | +/-: Change Opt. |
| [Use Automatic Settings] | F1: General Help |
| WARNING: Disabling SIO Logical Devices may have unwanted side effects. PROCEED WITH CAUTION. | F2: Previous Values |
| | F3: Optimized Defaults |
| | F4: Save & Exit |
| | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | |

* These items appear only when enabling Use This Device.

| Feature | Option | Description |
|-----------------|--|--|
| Use This Device | [Disabled], [Enabled] | Enable or Disable this Logical Device. |
| Possible: | [Use Automatic Settings], [IO=3F8h; IRQ=4;], [IO=3F8h; IRQ=4;], [IO=2F8h; IRQ=3;] | Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |

Figure 40: BIOS Advanced Menu – SIO Configuration – [*Active*] Serial Port 1

| Aptio Setup – AMI | |
|---|--|
| Advanced | |
| Serial Port 1 Configuration | |
| Use This Device [Enabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Logical Device Settings:* Current: IO=2F8h; IRQ=3;* | |
| Possible:* [Use Automatic Settings] | |
| WARNING: Disabling SIO Logical Devices may have unwanted side effects. PROCEED WITH CAUTION. | |
| Version 2.22.1293 Copyright (C) 2025 AMI | |

* These items appear only when enabling Use This Device.

| Feature | Option | Description |
|-----------------|--|--|
| Use This Device | [Disabled], [Enabled] | Enable or Disable this Logical Device. |
| Possible: | [Use Automatic Settings], [IO=2F8h; IRQ=3;], [IO=2F8h; IRQ=3;], [IO=3F8h; IRQ=4;] | Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |

Figure 41: BIOS Advanced Menu – USB Configuration

| Aptio Setup – AMI | | |
|--|-----------|--|
| Advanced | | |
| USB Configuration | | |
| USB Module Version | 32 | |
| USB Controllers: 2 XHCIs | | |
| USB Devices: 1 Keyboard | | |
| Legacy USB Support | [Enabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| XHCI Hand-off | [Enabled] | |
| USB Mass Storage Driver Support | [Enabled] | |
| USB hardware delays and time-outs: | | |
| USB transfer time-out | [20 sec] | |
| Device reset time-out | [20 sec] | |
| Device power-up delay | [Auto] | |
| Device power-up delay in seconds* | 5 | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* This item appears only when selecting Manual for Device power-up delay in seconds.

| Feature | Option | Description |
|---------------------------------|---|---|
| Legacy USB Support | [Enabled], [Disabled], [Auto] | Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications. |
| XHCI Hand-off | [Enabled], [Disabled] | 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] | Enable / Disable USB Mass Storage Driver Support. |
| USB transfer time-out | [1 sec], [5 sec], [10 sec], [20 sec] | The time-out value for Control, Bulk, and Interrupt transfers. |
| Device reset time-out | [10 sec], [20 sec], [30 sec], [40 sec] | USB mass storage device Start Unit command time-out. |
| Device power-up delay | [Auto], [Manual] | Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub |

| Feature | Option | Description |
|----------------------------------|-------------|--|
| | | descriptor. |
| Device power-up delay in seconds | Value input | Delay range is 1..40 seconds, in one second increments |

Figure 42: BIOS Advanced Menu – Network Stack Configuration

| Aptio Setup – AMI | | |
|--|------------|--|
| Advanced | | |
| Network Stack | [Disabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| IPv4 PXE Support* | [Disabled] | |
| IPv4 HTTP Support* | [Disabled] | |
| IPv6 PXE Support* | [Disabled] | |
| IPv6 HTTP Support* | [Disabled] | |
| PXE boot wait time* | 0 | |
| Media detect count* | 1 | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when enabling Network Stack.

| Feature | Option | Description |
|--------------------|--------------------------|---|
| Network Stack | [Disabled], [Enabled] | Enable / Disable UEFI Network Stack |
| IPv4 PXE Support | [Disabled], [Enabled] | Enable / Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available. |
| IPv4 HTTP Support | [Disabled], [Enabled] | Enable / Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available. |
| IPv6 PXE Support | [Disabled], [Enabled] | Enable / Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available. |
| IPv6 HTTP Support | [Disabled], [Enabled] | Enable / Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available. |
| PXE boot wait time | Value input | Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value. |
| Media detect count | Value input | Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value. |

Figure 43: BIOS Advanced Menu – NVMe Configuration

| Aptio Setup – AMI | |
|--|--|
| Advanced | |
| NVMe Configuration | |
| 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 |
| Version 2.22.1293 Copyright (C) 2025 AMI | |

Figure 44: BIOS Advanced Menu – SDIO Configuration

| Aptio Setup – AMI | | |
|--|--------|--|
| Advanced | | |
| SDIO Configuration | | |
| SDIO Access Mode | [Auto] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Mass Storage Devices: | | |
| Bus 0 Dev 1A Func 0 | | |
| eMMC 0IM20G (127.3GB) | [Auto] | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when enabling Network Stack.

| Feature | Option | Description |
|------------------|--|---|
| SDIO Access Mode | [Auto], [ADMA], [SDMA], [PIO] | [Auto]: Access SD device in DMA mode if controller supports it, otherwise in PIO mode. [DMA]: Access SD device in DMA mode. [PIO]: Access SD device in PIO mode. |
| eMMC | [Auto], [Floppy], [Forced FDD], [Hard Disk] | Mass storage device emulation type. 'AUTO' enumerates devices less than 530MB as floppies. Forced FDD option can be used to force HDD formatted drive to boot as FDD. |

Figure 45: BIOS Advanced Menu – COM Configurations

| Aptio Setup – AMI | | | |
|--|---------------------------------|--|--|
| Advanced | | | |
| COM Configurations | | | |
| COM1 Mode Selection | [RS-232] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit | |
| COM1 Transceiver | [Normal mode] | | |
| COM1 Internal Terminator Switch Control | [Terminator switch is disabled] | | |
| COM1 External Terminator Switch Control | [Terminator switch is disabled] | | |
| COM2 Mode Selection | [RS-232] | | |
| COM2 Transceiver | [Normal mode] | | |
| COM2 Internal Terminator Switch Control | [Terminator switch is disabled] | | |
| COM2 External Terminator Switch Control | [Terminator switch is disabled] | | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | | |

| Feature | Option | Description |
|---|---|--|
| COM1/2 Mode Selection | [RS-422 Signal Master], [RS-232], [RS-485 with Auto Flow Control], [RS-422 Multi Master] | Mode selection for COM1/2 |
| COM1/2 Transceiver | [Shutdown mode], [Normal mode] | Shutdown the Transceiver of COM1/2 |
| COM1/2 Internal Terminator Switch Control | [Terminator switch is disabled], [Terminator switch is enabled] | Internal Terminator switch control for RS-422/RS-485 of COM1/2 |
| COM1/2 External Terminator Switch Control | [Terminator switch is disabled], [Terminator switch is enabled] | External Terminator switch control for RS-422/RS-485 of COM1/2 |

Figure 46: BIOS Advanced Menu – Intel® Ethernet Controller I226-IT – C0:EA:C3:D1:DD:30/31

| Aptio Setup – AMI | | |
|--|---|--|
| Advanced | | |
| UEFI Driver | Intel® 2.5G Ethernet Controller 0.10.06 | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Device Name | Intel® Ethernet Controller I226-IT | |
| Link Status | [Disconnected] | |
| MAC Address | C0:EA:C3:D1:DD:30/31 | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

Read only sub-screen

12.2.3. Chipset Setup Menu

The Chipset setup menu provides functions and a sub-screen for chipset configurations. The following sub-screen functions are included in the menu:

- System Agent (SA) Configuration
- PCH-IO Configuration

Figure 47: BIOS Chipset Setup Menu

| Aptio Setup – AMI | | | | | |
|---|----------|---------|----------|--|-------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| > System Agent (SA) Configuration > PCH-IO Configuration | | | | | |
| | | | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | | | | |

Figure 48: BIOS Chipset Setup Menu – System Agent (SA) Configuration

| Aptio Setup – AMI | | |
|--|-----------|--|
| Chipset | | |
| System Agent (SA) Configuration | | |
| VT-d | Supported | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| > Graphics Configuration | | |
| VT-d | [Enabled] | |
| Above 4GB MMIO BIOS assignment | [Enabled] | |
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| Feature | Option | Description |
|--------------------------------|--------------------------|---|
| VT-d | [Enabled], [Disabled] | VT-d capability |
| Above 4GB MMIO BIOS assignment | [Enabled], [Disabled] | Enable / Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB. |

Figure 49: BIOS Chipset Setup Menu – System Agent (SA) Configuration – Graphics Configuration

| Aptio Setup – AMI | | |
|---|---|---|
| Chipset | | |
| Graphics Configuration | | |
| Graphics Turbo IMON Current | 31 | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help |
| Skip Scanning of External Gfx Card | [Disabled] | |
| > External Gfx Card Primary Display Configuration | | |
| GTT Size | [8MB] | |
| PSMI SUPPORT | [Disabled] | |
| PSMI Region Size ⁽¹⁾ | [32MB] | |
| Intel Graphics Pei Display Peim | [Disabled] | |
| VDD Enable | [Enabled] | |
| Configure GT for use | [Enabled] | |
| RC1p Support ⁽²⁾ | [Disabled] | |
| PAVP Enable | [Enabled] | |
| Cdynmax Clamping Enable | [Disabled] | |
| Cd Clock Frequency | [Max CdClock freq based on Reference Clk] | |

| Aptio Setup – AMI | | |
|--|------------|------------------------|
| Chipset | | |
| Enable Display Audio Link in Pre-OS | [Disabled] | F2: Previous Values |
| IUER Button Enable | [Disabled] | F3: Optimized Defaults |
| > LCD Control | | F4: Save & Exit |
| > Intel® Ultrabook Event Support | | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

⁽¹⁾ This item appears only when enabling PSMI SUPPORT.

⁽²⁾ This item appears only when enabling Configure GT for use.

| Feature | Option | Description |
|-------------------------------------|---|--|
| Graphics Turbo IMON Current | Value input | Graphics turbo IMON current values supported (14 - 31) |
| Skip Scanning of External Gfx Card | [Disabled], [Enabled] | If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports |
| GTT Size | [2MB], [4MB], [8MB] | Select the GTT Size |
| PSMI SUPPORT | [Disabled], [Enabled] | PSMI Enable / Disable |
| PSMI Region Size | [32MB], [288MB], [544MB], [800MB], [1024MB] | Select the PSMI Region Size: Range from 32MB to 1024MB |
| Intel Graphics Pei Display Peim | [Enabled], [Disabled] | Enable / Disable Pei (Early) Display |
| VDD Enable | [Disabled], [Enabled] | Enable / Disable forcing of VDD in the BIOS |
| Configure GT for use | [Enabled], [Disabled] | Enable / Disable GT configuration in BIOS |
| RC1p Support | [Enabled], [Disabled] | Enable / Disable RC1p support. If RC1p is enabled, send a RC1p frequency request to PMA based other conditions being met |
| PAVP Enable | [Enabled], [Disabled] | Enable / Disable PAVP |
| Cdynmax Clamping Enable | [Enabled], [Disabled] | Enable / Disable Cdynmax Clamping |
| Cd Clock Frequency | [192 Mhz], [307.2 Mhz], [556.8 Mhz], [652.8 Mhz], [Max CdClock freq based on Reference Clk] | Select the highest Cd Clock frequency supported by the platform |
| Enable Display Audio Link in Pre-OS | [Disabled], [Enabled] | [Enabled]: Display Audio Link will be enabled in Pre-OS. [Disabled]: Display Audio Link will be disabled in Pre-OS. |

| Feature | Option | Description |
|--------------------|--------------------------|--|
| IUER Button Enable | [Disabled], [Enabled] | Enable / Disable IUER Button Functionality |

Figure 50: BIOS Chipset Setup Menu – System Agent (SA) Configuration – Graphics Configuration – External Gfx Card Primary Display Configuration

| Aptio Setup – AMI | |
|---|--|
| Chipset | |
| External Gfx Card Primary Display Configuration | |
| | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | |

Figure 51: BIOS Chipset Setup Menu – System Agent (SA) Configuration – Graphics Configuration – LCD Control

| Aptio Setup – AMI | |
|--|--|
| Chipset | |
| LCD Control | |
| LCD Panel Type | [VBIOS Default] |
| Panel Scaling | [Auto] |
| Backlight Control | [PWM Normal] |
| Active LFP | [eDP Port-A] |
| Panel Color Depth | [18 Bit] |
| Backlight Brightness | 255 |
| | → ←: 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 |
|----------------|---|--|
| LCD Panel Type | [VBIOS Default], [640x480 LVDS], [800x600 LVDS], [1024x768 LVDS], [1280x1024 LVDS], | Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item. |

| Feature | Option | Description |
|----------------------|---|---|
| | [1400x1050 LVDS1], [1400x1050 LVDS2], [1600x1200 LVDS], [1280x768 LVDS], [1680x1050 LVDS], [1920x1200 LVDS], [1600x900 LVDS], [1280x800 LVDS], [1280x600 LVDS], [2048x1536 LVDS], [1366x768 LVDS] | |
| Panel Scaling | [Auto], [Off], [Force Scaling] | Select the LCD panel scaling option used by the Internal Graphics Device. |
| Backlight Control | [PWM Inverted], [PWM Normal] | Back Light Control Setting |
| Active LFP | [No eDP], [eDP Port-A] | Select the Active LFP Configuration. [No LVDS]: VBIOS does not enable LVDS. [Int-LVDS]: VBIOS enables LVDS driver by Integrated encoder. [SDVO LVDS]: VBIOS enables LVDS driver by SDVO encoder. [eDP Port-A]: LFP Driven by Int-DisplayPort encoder from Port-A. [eDP Port-D]: LFP Driven by Int-DisplayPort encoder from Port-D (through PCH). |
| Panel Color Depth | [18 Bit], [24 Bit] | Select the LFP Panel Color Depth |
| Backlight Brightness | Value input | Set VBIOS Brightness. Range: 0 – 255. |

Figure 52: BIOS Chipset Setup Menu – System Agent (SA) Configuration – Graphics Configuration – Intel® Ultrabook Event Support

| Aptio Setup – AMI | | |
|--|---------------|--|
| Chipset | | |
| Intel® Ultrabook Event Support | | |
| IUER Slate Enable | [Disabled] | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Slate Mode boot value ⁽¹⁾ | [Laptop Mode] | |
| Slate Mode on S3 and S4 resume ⁽¹⁾ | [No change] | |
| IUER Dock Enable | [Disabled] | |
| Dock Mode boot value ⁽²⁾ | [Undocked] | |
| Dock Mode upon S3 and S4 resume ⁽²⁾ | [No change] | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

⁽¹⁾ These items appear only when enabling IUER Slate Enable.

⁽²⁾ These items appear only when enabling IUER Dock Enable.

| Feature | Option | Description |
|---------------------------------|--------------------------------|--|
| IUER Slate Enable | [Disabled], [Enabled] | Enable / Disable IUER Slate Functionality |
| Slate Mode boot value | [Slate Mode], [Laptop Mode] | Choose Slate or Laptop as boot mode. |
| Slate Mode on S3 and S4 resume | [No change], [Toggle] | Keep it the same as Sx entry or toggle it. |
| IUER Dock Enable | [Disabled], [Enabled] | Enable / Disable IUER Dock Functionality |
| Dock Mode boot value | [Undocked], [Docked] | Choose Docked or Undocked as boot mode. |
| Dock Mode upon S3 and S4 resume | [No change], [Toggle] | Keep it the same as Sx entry or toggle it. |

Figure 53: BIOS Chipset Setup Menu – PCH-IO Configuration

| Aptio Setup – AMI | | |
|--|---------------|--|
| Chipset | | |
| PCH-IO Configuration | | |
| > PCI Express Configuration > SATA Configuration > USB Configuration > TSN GBE Configuration# | | |
| PCH LAN Controller | No GbE Region | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Port 80h Redirection | [LPC Bus] | |
| Enhance Port 80h LPC Decoding* | [Enabled] | |
| Compatible Revision ID | [Disabled] | |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* This item activates only when selecting LPC Bus for Port 80h Redirection.

This sub-menu is not accessible.

| Feature | Option | Description |
|-------------------------------|--------------------------|--|
| Port 80h Redirection | [LPC Bus], [PCIe Bus] | Control where the Port 80h cycles are sent. |
| Enhance Port 80h LPC Decoding | [Disabled], [Enabled] | Support the word / dword decoding of port 80h behind LPC |
| Compatible Revision ID | [Disabled] | Read only item |

Figure 54: BIOS Chipset Setup Menu – PCH-IO Configuration – PCI Express Configuration

| Aptio Setup – AMI | | |
|---------------------------|-------------------------------------|--|
| Chipset | | |
| PCI Express Configuration | | |
| DMI Link ASPM Control | [Auto] | |
| Port8xh Decode | [Disabled] | |
| Port8xh Decode Port#* | 0 | |
| PCIe function swap | [Enabled] | |
| PCH PCIe Clock Gating | [Disabled] | |
| PCH PCIe Power Gating | [Disabled] | |
| > PCIe EQ settings | | |
| PCI Express Root Port 1 | Lane configured as USB / SATA / UFS | |
| PCI Express Root Port 2 | Lane configured as USB / SATA / UFS | |
| PCI Express Root Port 3 | Lane configured as USB / SATA / UFS | |

| Aptio Setup – AMI | | |
|--|-------------------------|------------------------|
| Chipset | | |
| > PCI Express Root Port 4 | | |
| PCI Express Root Port 5 | Not present in this SKU | |
| PCI Express Root Port 6 | Not present in this SKU | → ←: Select Screen |
| > PCI Express Root Port 7 | | ↑ ↓: Select Item |
| PCI Express Root Port 8 | Not present in this SKU | Enter: Select |
| > PCI Express Root Port 9 | | +/-: Change Opt. |
| PCI Express Root Port 10 | Shadowed by x2/x4 port | F1: General Help |
| > PCI Express Root Port 11 | | F2: Previous Values |
| PCI Express Root Port 12 | Shadowed by x2/x4 port | F3: Optimized Defaults |
| | | F4: Save & Exit |
| > PCIe clocks | | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* This item appears only when enabling Port8xh Decode.

| Feature | Option | Description |
|-----------------------|--|--|
| DMI Link ASPM Control | [Disabled], [L0s], [L1], [L0sL1], [Auto] | The control of Active State Power Management of the DMI Link. |
| Port8xh Decode | [Disabled], [Enabled] | PCI Express Port8xh Decode Enable / Disable. |
| Port8xh Decode Port# | Value input | Select PCI Express Port8xh Decode Root Port. User to ensure port availability |
| PCIe function swap | [Disabled], [Enabled] | When Disabled, prevents PCIe rootport function swap. If any function other than 0th is enabled, 0th will become visible. |
| PCH PCIe Clock Gating | [Disabled], [Enabled] | PCH PCI Express Clock Gating Enable / Disable for all port |
| PCH PCIe Power Gating | [Disabled], [Enabled] | PCH PCI Express Power Gating Enable / Disable for all port |

Figure 55: BIOS Chipset Setup Menu – PCH-IO Configuration – PCI Express Configuration – PCIe EQ settings

| Aptio Setup – AMI | | |
|---|-------------------------|--|
| Chipset | | |
| PCIe EQ override | [Disabled] | |
| PCIe EQ method* | [PCIe hardware EQ] | |
| PCIe EQ mode* | [Use presets during EQ] | |
| EQ PH1 downstream port transmitter present* | 0 | |
| EQ PH1 upstream port transmitter present* | 0 | |
| Enable EQ phase 2 local transmitter override* | [Disabled] | |
| Number of presents or coefficients used during phase 3* | 0 | |

| Aptio Setup – AMI | | |
|---|---|------------------------|
| Chipset | | |
| Preset 0 ^{*(1)} | 0 | |
| Preset 1 ^{*(1)} | 0 | |
| Preset 2 ^{*(1)} | 0 | |
| Preset 3 ^{*(1)} | 0 | |
| Preset 4 ^{*(1)} | 0 | |
| Preset 5 ^{*(1)} | 0 | |
| Preset 6 ^{*(1)} | 0 | |
| Preset 7 ^{*(1)} | 0 | |
| Preset 8 ^{*(1)} | 0 | |
| Preset 9 ^{*(1)} | 0 | |
| Preset 10 ^{*(1)} | 0 | |
| Pre-cursor coefficient 0 ^{*(2)} | 0 | |
| Post-cursor coefficient 0 ^{*(2)} | 0 | |
| Pre-cursor coefficient 1 ^{*(2)} | 0 | |
| Post-cursor coefficient 1 ^{*(2)} | 0 | |
| Pre-cursor coefficient 2 ^{*(2)} | 0 | |
| Post-cursor coefficient 2 ^{*(2)} | 0 | |
| Pre-cursor coefficient 3 ^{*(2)} | 0 | |
| Post-cursor coefficient 3 ^{*(2)} | 0 | |
| Pre-cursor coefficient 4 ^{*(2)} | 0 | |
| Post-cursor coefficient 4 ^{*(2)} | 0 | |
| Pre-cursor coefficient 5 ^{*(2)} | 0 | |
| Post-cursor coefficient 5 ^{*(2)} | 0 | → ←: Select Screen |
| Pre-cursor coefficient 6 ^{*(2)} | 0 | ↑ ↓: Select Item |
| Post-cursor coefficient 6 ^{*(2)} | 0 | Enter: Select |
| Pre-cursor coefficient 7 ^{*(2)} | 0 | +/-: Change Opt. |
| Post-cursor coefficient 7 ^{*(2)} | 0 | F1: General Help |
| Pre-cursor coefficient 8 ^{*(2)} | 0 | F2: Previous Values |
| Post-cursor coefficient 8 ^{*(2)} | 0 | F3: Optimized Defaults |
| Pre-cursor coefficient 9 ^{*(2)} | 0 | F4: Save & Exit |
| Post-cursor coefficient 9 ^{*(2)} | 0 | ESC: Exit |
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* These items appear only when enabling PCIe EQ override.

⁽¹⁾ These items appear only when selecting Use presets during EQ for PCIe EQ mode.

⁽²⁾ These items appear only when selecting Use coefficients during EQ for PCIe EQ mode.

| Feature | Option | Description |
|------------------|--|--|
| PCIe EQ override | [Disabled], [Enabled] | Choose your own PCIe EQ settings, only for users who have a thorough understanding of equalization process |
| PCIe EQ method | [PCIe hardware EQ], [PCIe fixed EQ] | Choose PCIe EQ method |
| PCIe EQ mode | [Use presets during | Choose EQ mode. |

| Feature | Option | Description |
|---|-----------------------------------|--|
| | EQ], [Use coefficients during EQ] | Preset mode – root port will use presets during EQ process, Coefficient mode – root port will use coefficients during EQ process |
| EQ PH1 downstream port transmitter preset | Value input | Choose the value of the preset that will be used during phase 1 of the equalization |
| EQ PH1 upstream port transmitter preset | Value input | Choose the value of the preset that will be used during phase 1 of the equalization |
| Enable EQ phase 2 local transmitter override | [Disabled], [Enabled] | EQ Phase 2 local transmitter override can be used to debug issues with PCI devices equalization. |
| Number of presets or coefficients used during phase 3 | Value input | Select how many presets or coefficients will be used during phase 3 of EQ. Please not that you have to set all of the list entries to valid values. The interpretation of this field depends on PCIe EQ mode |
| Preset 0..10 | Value input | Choose the target preset value |
| Pre-cursor coefficient 0..9 | Value input | Choose the target pre-cursor coefficient value |
| Post-cursor coefficient 0..9 | Value input | Choose the target post-cursor coefficient value |

Figure 56: BIOS Chipset Setup Menu – PCH-IO Configuration – PCI Express Configuration – PCI Express Root Port 4 / 7 / 9 / 11

| Aptio Setup – AMI | |
|--------------------------------------|---------------|
| Chipset | |
| PCI Express Root Port 4 / 7 / 9 / 11 | [Enabled] |
| Connection Type* | [Slot] |
| ASPM* | [Auto] |
| L1 Substates* | [L1.1 & L1.2] |
| L1 Low* | [Enabled] |
| ACS* | [Enabled] |
| PTM* | [Enabled] |
| DPC* | [Disabled] |
| EDPC* | [Enabled] |
| URR* | [Disabled] |
| FER* | [Disabled] |
| NFER* | [Disabled] |
| CER* | [Disabled] |
| SEFE* | [Disabled] |
| SENF* | [Disabled] |
| SECE* | [Disabled] |
| PME SCI* | [Enabled] |
| Hot Plug* | [Disabled] |
| Advanced Error Reporting* | [Enabled] |
| PCIe Speed* | [Auto] |

| Aptio Setup – AMI | | |
|---|------------|------------------------|
| Chipset | | |
| Transmitter Half Swing* | [Disabled] | |
| Detect Timeout* | 0 | |
| Extra Bus Reserved* | 0 | |
| Reserved Memory* | 10 | |
| Reserved I/O* | 4 | |
| PCH PCIe LTR Configuration* | | |
| LTR* | [Enabled] | |
| Snoop Latency Override** | [Auto] | → ←: Select Screen |
| Snoop Latency Value** ⁽¹⁾ | 60 | ↑ ↓: Select Item |
| Snoop Latency Multiplier** ⁽¹⁾ | [1024 ns] | Enter: Select |
| Non Snoop Latency Override** | [Auto] | +/-: Change Opt. |
| Non Snoop Latency Value** ⁽²⁾ | 60 | F1: General Help |
| Non Snoop Latency Multiplier** ⁽²⁾ | [1024 ns] | F2: Previous Values |
| LTR Lock* | [Disabled] | F3: Optimized Defaults |
| Peer Memory Write Enable* | [Disabled] | F4: Save & Exit |
| | | ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

* These items appear only when enabling PCI Express Root Port 4 / 7 / 9 / 11.

These items appear only when enabling LTR.

⁽¹⁾ These items appear only when selecting Manual for Snoop Latency Override.

⁽²⁾ These items appear only when selecting Manual for Mon Snoop Latency Override.

| Feature | Option | Description |
|--------------------------------------|---|---|
| PCI Express Root Port 4 / 7 / 9 / 11 | [Disabled], [Enabled] | Control the PCI Express Root Port. |
| Connection Type | [Bulit-in], [Slot] | [Built-in]: a built-in device is connected to this rootport. SlotImplemented bit will be clear. [Slot]: this rootport connects to user-accessible slot. SlotImplemented bit will be set. |
| ASPM | [Disabled], [L1], [Auto] | Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM |
| L1 Substates | [Disabled], [L1.1], [L1.1 & L1.2] | PCI Express L1 Substates settings. |
| L1 Low | [Disable], [Enabled] | PCI Express L1 Low Substate Enable / Disable. |
| ACS | [Disabled], [Enabled] | Enable / Disable Access Control Services Extended Capability |
| PTM | [Disabled], [Enabled] | Enable / Disable Precision Time Measurement |

| Feature | Option | Description |
|--------------------------|---|--|
| DPC | [Disabled], [Enabled] | Enable / Disable Downstream Port Containment |
| EDPC | [Disabled], [Enabled] | Enable / Disable Rootport extensions for Downstream Port Containment |
| URR | [Disabled], [Enabled] | PCI Express Unsupported Request Reporting Enable / Disable. |
| FER | [Disabled], [Enabled] | PCI Express Device Fatal Error Reporting Enable / Disable. |
| NFER | [Disabled], [Enabled] | PCI Express Device Non-Fatal Error Reporting Enable / Disable. |
| CER | [Disabled], [Enabled] | PCI Express Device Correctable Error Reporting Enable / Disable. |
| SEFE | [Disabled], [Enabled] | Root PCI Express System Error on Fatal Error Enable / Disable. |
| SENF | [Disabled], [Enabled] | Root PCI Express System Error on Non-Fatal Error Enable / Disable. |
| SECE | [Disabled], [Enabled] | Root PCI Express System Error on Correctable Error Enable / Disable. |
| PME SCI | [Disabled], [Enabled] | PCI Express PME SCI Enable / Disable. |
| Hot Plug | [Disabled], [Enabled] | PCI Express Hot Plug Enable / Disable. |
| Advanced Error Reporting | [Disabled], [Enabled] | Advanced Error Reporting Enable / Disable. |
| PCIe Speed | [Auto], [Gen1], [Gen2], [Gen3] | Configure PCIe Speed |
| Transmitter Half Swing | [Disabled], [Enabled] | Transmitter Half Swing Enable / Disable. |
| Detect Timeout | Value input | The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port. |
| Extra Bus Reserved | Value input | Extra Bus Reserved (0-7) for bridges behind this Root Bridge. |
| Reserved Memory | Value input | Reserved Memory for this Root Bridge (1-20) MB |
| Reserved I/O | Value input | Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge. |
| LTR | [Disabled], [Enabled] | PCH PCIE Latency Reporting Enable / Disable |
| Snoop Latency Override | [Disabled], [Manual], [Auto] | Snoop Latency Override for PCH PCIE. [Disabled]: Disable override. [Manual]: Manually enter override values. [Auto] (default): Maintain default BIOS flow. |
| Snoop Latency Value | Value input | LTR Snoop Latency value of PCH PCIE |
| Snoop Latency Multiplier | [1 ns], [32 ns], [1024 ns], | LTR Snoop Latency Multiplier of PCH PCIE |

| Feature | Option | Description |
|------------------------------|--|---|
| | [32768 ns], [1048576 ns], [33554432 ns] | |
| Non Snoop Latency Override | [Disabled], [Manual], [Auto] | Non Snoop Latency Override for PCH PCIE. [Disabled]: Disable override. [Manual]: Manually enter override values. [Auto] (default): Maintain default BIOS flow. |
| Non Snoop Latency Value | Value input | LTR Non Snoop Latency value of PCH PCIE |
| Non Snoop Latency Multiplier | [1 ns], [32 ns], [1024 ns], [32768 ns], [1048576 ns], [33554432 ns] | LTR Non Snoop Latency Multiplier of PCH PCIE |
| LTR Lock | [Disabled], [Enabled] | PCIE LTR Configuration Lock |
| Peer Memory Write Enable | [Disabled], [Enabled] | Peer Memory Write Enable / Disable |

Figure 57: BIOS Chipset Setup Menu – PCH-IO Configuration – PCI Express Configuration – PCIE clocks

| Aptio Setup – AMI | | |
|--|----------------|--|
| Chipset | | |
| Clock0 assignment | [Enabled] | |
| ClkReq for Clock0 | [Platform-POR] | |
| Clock1 assignment | [Enabled] | |
| ClkReq for Clock1 | [Platform-POR] | |
| Clock2 assignment | [Enabled] | |
| ClkReq for Clock2 | [Platform-POR] | |
| Clock3 assignment | [Enabled] | |
| ClkReq for Clock3 | [Platform-POR] | |
| Clock4 assignment | [Enabled] | |
| ClkReq for Clock4 | [Platform-POR] | |
| Clock5 assignment | [Enabled] | |
| ClkReq for Clock5 | [Platform-POR] | |
| Clock6 assignment | [Enabled] | |
| ClkReq for Clock6 | [Platform-POR] | |
| Clock7 assignment | [Enabled] | |
| ClkReq for Clock7 | [Platform-POR] | |
| Clock8 assignment | [Enabled] | |
| ClkReq for Clock8 | [Platform-POR] | |
| Clock9 assignment | [Enabled] | |
| ClkReq for Clock9 | [Platform-POR] | |
| | | → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Version 2.22.1293 Copyright (C) 2025 AMI | | |

| Feature | Option | Description |
|----------------------|---|---|
| Clock0..9 assignment | [Platform-POR], [Enabled], [Disabled] | [Platform-POR]: clock is assigned to PCIe port or LAN according to board layout. [Enabled]: keep clock enabled even if unused. [Disabled]: Disable clock. |
| ClkReq for Clock0..9 | [Platform-POR], [Disabled] | [Platform-POR]: CLKREQ signal is assigned to CLKSRC according to board layout. [Disabled]: CLKREQ will not be used. |

Figure 58: BIOS Chipset Setup Menu – PCH-IO Configuration – SATA Configuration

| Aptio Setup – AMI | |
|--|--------------------|
| Chipset | |
| SATA Configuration | |
| SATA Controller(s) | [Enabled] |
| SATA Mode Selection* | [AHCI] |
| SATA Test Mode* | [Disabled] |
| Aggressive LPM Support ^{*(1)} | [Enabled] |
| Serial ATA Port 0* | |
| Software Preserve* | Unknown |
| Port 0* | [Enabled] |
| Hot Plug* | [Disabled] |
| Configured as eSATA ^{*(3)} | Hot Plug supported |
| External* | [Disabled] |
| Mechanical Presence Switch ^{*(2)} | [Disabled] |
| Spin Up Device* | [Disabled] |
| SATA Device Type* | [Hard Disk Drive] |
| Topology* | [Unknown] |
| SATA Port 0 DevSlp* | [Disabled] |
| DITO Configuration* | [Disabled] |
| DITO Value ^{*(4)} | 625 |
| DM Value ^{*(4)} | 15 |
| Serial ATA Port 1* | |
| Software Preserve* | Unknown |
| Port 1* | [Enabled] |
| Hot Plug* | [Disabled] |
| Configured as eSATA ^{*(3)} | Hot Plug supported |
| External* | [Disabled] |
| Mechanical Presence Switch ^{*(2)} | [Disabled] |
| Spin Up Device* | [Disabled] |
| SATA Device Type* | [Hard Disk Drive] |
| Topology* | [Unknown] |

| Aptio Setup – AMI | | |
|--|--------------------|------------------------|
| Chipset | | |
| SATA Port 1 DevSlp* | [Disabled] | |
| DITO Configuration* | [Disabled] | |
| DITO Value*(4) | 625 | |
| DM Value*(4) | 15 | |
| Serial ATA Port 2* | Empty | |
| Software Preserve* | Unknown | |
| Port 2* | [Enabled] | |
| Hot Plug* | [Disabled] | |
| Configured as eSATA*(3) | Hot Plug supported | |
| External* | [Disabled] | → ←: Select Screen |
| Mechanical Presence Switch*(2) | [Disabled] | ↑ ↓: Select Item |
| Spin Up Device* | [Disabled] | Enter: Select |
| SATA Device Type* | [Hard Disk Drive] | +/-: Change Opt. |
| Topology* | [Unknown] | F1: General Help |
| SATA Port 2 DevSlp* | [Disabled] | F2: Previous Values |
| DITO Configuration* | [Disabled] | F3: Optimized Defaults |
| DITO Value*(4) | 625 | F4: Save & Exit |
| DM Value*(4) | 15 | ESC: Exit |
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* These items appear only when enabling SATA Controller(s).

(1) This item appears only when disabling SATA Test Mode.

(2) This item appears only when enabling Hot Plug.

(3) This item appears only when disabling External.

(4) These items activate only when enabling DITO Configuration.

| Feature | Option | Description |
|----------------------------|--------------------------|--|
| SATA Controller(s) | [Enabled], [Disabled] | Enable / Disable SATA Device. |
| SATA Mode Selection | [AHCI] | Read only item |
| SATA Test Mode | [Enabled], [Disabled] | Test Mode Enable / Disable (Loop Back). |
| Aggressive LPM Support | [Disabled], [Enabled] | Enable PCH to aggressively enter link power state. |
| Port 0..2 | [Disabled], [Enabled] | Enable or Disable SATA Port |
| Hot Plug | [Disabled], [Enabled] | Designates this port as Hot Pluggable. |
| External | [Disabled], [Enabled] | Marks this port as external. |
| Mechanical Presence Switch | [Disabled], [Enabled] | Controls reporting if this port has an Mechanical Presence Switch. Note: Requires hardware support. |

| Feature | Option | Description |
|-----------------------|--|---|
| Spin Up Device | [Disabled], [Enabled] | If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot. |
| SATA Device Type | [Hard Disk Drive], [Solid State Drive] | Identify the SATA port is connected to Solid State Drive or Hard Disk Drive |
| Topology | [Unknown], [ISATA], [Direct Connect], [Flex], [M2] | Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2 |
| SATA Port 0..2 DevSlp | [Disabled], [Enabled] | Enable / Disable SATA Port 0..2 DevSlp. For DevSlp to work, both hard drive and SATA port need to support DevSlp function, otherwise an unexpected behavior might happen. Please check board design before enabling it. |
| DITO Configuration | [Disabled], [Enabled] | Enable / Disable DITO Configuration |
| DITO Value | Value input | DITO Value |
| DM Value | Value input | DM Value |

Figure 59: BIOS Chipset Setup Menu – PCH-IO Configuration – USB Configuration

| Aptio Setup – AMI | |
|--------------------------------|------------|
| Chipset | |
| USB Configuration | |
| xHCI Support | [Disabled] |
| USB2 PHY Sus Well Power Gating | [Enabled] |
| USB PDO Programming | [Enabled] |
| USB Overcurrent | [Enabled] |
| USB Overcurrent Lock | [Enabled] |
| USB Audio Offload | [Enabled] |
| Enable HSII on xHCI | [Enabled] |
| USB3.1 Portx Speed Selection | 0 |
| USB Port Disable Override | [Disabled] |
| USB SW Device Mode Port #0* | [Disabled] |
| USB SW Device Mode Port #1* | [Disabled] |
| USB SW Device Mode Port #2* | [Disabled] |
| USB SW Device Mode Port #3* | [Disabled] |
| USB SW Device Mode Port #4* | [Disabled] |
| USB SW Device Mode Port #5* | [Disabled] |
| USB SW Device Mode Port #6* | [Disabled] |
| USB SW Device Mode Port #7* | [Disabled] |

| Aptio Setup – AMI | | |
|--|------------|------------------------|
| Chipset | | |
| USB SW Device Mode Port #8* | [Disabled] | |
| USB SW Device Mode Port #9* | [Disabled] | |
| USB SS Physical Connector #0* | [Enabled] | |
| USB SS Physical Connector #1* | [Enabled] | |
| USB SS Physical Connector #2* | [Enabled] | |
| USB SS Physical Connector #3* | [Enabled] | |
| USB HS Physical Connector #0* | [Enabled] | |
| USB HS Physical Connector #1* | [Enabled] | → ←: Select Screen |
| USB HS Physical Connector #2* | [Enabled] | ↑ ↓: Select Item |
| USB HS Physical Connector #3* | [Enabled] | Enter: Select |
| USB HS Physical Connector #4* | [Enabled] | +/-: Change Opt. |
| USB HS Physical Connector #5* | [Enabled] | F1: General Help |
| USB HS Physical Connector #6* | [Enabled] | F2: Previous Values |
| USB HS Physical Connector #7* | [Enabled] | F3: Optimized Defaults |
| USB HS Physical Connector #8* | [Disabled] | F4: Save & Exit |
| USB HS Physical Connector #9* | [Enabled] | ESC: Exit |
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* These items appear only when selecting Select Per-Pin for USB Port Disable Override.

| Feature | Option | Description |
|---------------------------------|---------------------------------|--|
| xDCI Support | [Disabled], [Enabled] | Enable / Disable xDCI (USB OTG Device). |
| USB2 PHY Sus Well Power Gating | [Disabled], [Enabled] | Select 'Enabled' to enable SUS Well PG for USB2 PHY. This option has no effect on PCH-H. |
| USB PDO Programming | [Disabled], [Enabled] | Select 'Enabled' if Port Disable Override functionality is used. |
| USB Overcurrent | [Disabled], [Enabled] | Select 'Disabled' for pin-based debug. If pin-based debug is enabled but USB overcurrent is not disabled, USB DbC does not work. |
| USB Overcurrent Lock | [Disabled], [Enabled] | Select 'Disabled' if Overcurrent functionality is used. Enabling this will make xHCI controller consume the Overcurrent mapping data |
| USB Audio Offload | [Disabled], [Enabled] | Enable / Disable USB Audio Offload functionality |
| Enable HSII on xHCI | [Disabled], [Enabled] | Enable / Disable HSII feature. It may lead to increased power consumption. |
| USB3.1 Portx Speed Selection | Value input | Port Selection value in decimal for Gen1; Default – Gen2; Bit 0 corresponds to Port 0 and so on. |
| USB Port Disable Override | [Disabled], [Select Per-Pin] | Selectively Enable / Disable the corresponding USB port from reporting a Device Connection to the controller. |
| USB SW Device Mode Port #0..9 | [Disabled], [Enabled] | Enable Connector Event for device subscription. |
| USB SS Physical Connector #0..3 | [Disabled], [Enabled] | Enable / Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not |

| Feature | Option | Description |
|---------------------------------|--------------------------|---|
| | | be detected by BIOS or OS. |
| USB HS Physical Connector #0..9 | [Disabled], [Enabled] | Enable / Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS. |

12.2.4. Security Setup Menu

The Security setup menu provides information about the passwords and functions for specifying the security settings. The passwords are case-sensitive. The KBox E-250-AML/ADN 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 <ENTER>. To set a password, enter it twice and acknowledge by pressing <ENTER>.

Figure 60: BIOS Security Setup Menu

| Aptio Setup – AMI | | | | | |
|---|----------|---------|--|------|-------------|
| Main | Advanced | Chipset | Security | Boot | 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: | | | | | |
| Minimum Length | | 3 | | | |
| Maximum length | | 20 | | | |
| Administrator Password | | | | | |
| User Password | | | | | |
| > Secure Boot | | | | | |
| | | | → ←: 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 | 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.

Figure 61: BIOS Security Setup Menu – Secure Boot

| Aptio Setup – AMI | | |
|--|-------------------------|---|
| Security | | |
| System Mode | Setup | |
| Secure Boot | [Enabled] Not Active | → ←: Select Screen ↑ ↓: Select Item Enter: Select |
| Secure Boot Mode | [Standard] | +/-: Change Opt. |
| > Restore Factory Keys* | | F1: General Help |
| > Reset To Setup Mode* | | F2: Previous Values |
| > Key Management* | | F3: Optimized Defaults |
| | | F4: Save & Exit |
| | | ESC: Exit |
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*These items are selectable only when selecting Custom for Secure Boot Mode.

| Feature | Option | Description |
|----------------------|--------------------------|--|
| Secure Boot | [Disabled], [Enabled] | Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset. |
| Secure Boot Mode | [Standard], [Custom] | Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication. |
| Restore Factory Keys | [Yes], [No] | Force System to User Mode. Install factory default Secure Boot key databases. |
| Reset To Setup Mode | [Yes], [No] | Delete all Secure Boot key databases from NVRAM |

Figure 62: BIOS Security Setup Menu – Secure Boot – Key Management

| Aptio Setup – AMI | | | | |
|--|------------|------|------------|--|
| Security | | | | |
| Vendor Keys | Valid | | | |
| Factory Key Provision | [Disabled] | | | |
| > Restore Factory Keys | | | | |
| > Reset To Setup Mode | | | | |
| > Enroll Efi Image | | | | |
| > Export Secure Boot variables | | | | |
| Secure Boot variable | Size | Keys | Key Source | |
| > Platform Key (PK) | 0 | 0 | No Keys | |
| > Key Exchange Keys (KEK) | 0 | 0 | No Keys | |
| > Authorized Signatures (db) | 0 | 0 | No Keys | |
| > Forbidden Signatures (dbx) | 0 | 0 | No Keys | |
| > Authorized TimeStamps (dbt) | 0 | 0 | No Keys | |
| > OsRecovery Signatures (dbr) | 0 | 0 | No Keys | |
| → ←: 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 |
|------------------------------|---|---|
| Factory Key Provision | [Disabled], [Enabled] | Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode. |
| Reset Factory Keys | [Yes], [No] | Force System to User Mode. Install factory default Secure Boot key databases. |
| Reset to Setup Mode | [Yes], [No] | Delete all Secure Boot key databases from NVRAM. |
| Enroll Efi Image | Select a File system | Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db). |
| Export Secure Boot variables | Select a File system | Save NVRAM content of Secure Boot variables to a file |
| Platform Key (PK) | [Details], [Export], [Update], [Delete] | Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: (a) EFI_SIGNATURE_LIST (b) EFI_CERT_X509 (DER) (c) EFI_CERT_RSA2048 (bin) (d) EFI_CERT_SHAXXX |
| Key Exchange Keys (KEK) | [Details], [Export], [Update], [Append], [Delete] | 2. Authenticated UEFI Variable 3. EFI PE / COFF Image (SHA256) Key Source: Factory, Modified, Mixed |
| Authorized Signatures (db) | [Details], [Export], [Update], [Append], | |

| Feature | Option | Description |
|-----------------------------|---|-------------|
| | [Delete] | |
| Forbidden Signatures (dbx) | [Details], [Export], [Update], [Append], [Delete] | |
| Authorized TimeStamps (dbt) | [Update], [Append] | |
| OsRecovery Signatures (dbr) | [Update], [Append] | |

12.2.4.1. 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 known, contact Kontron Support for further assistance.



HDD security passwords cannot be cleared using the above method.

12.2.5. Boot Setup Menu

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

Figure 63: BIOS Boot Setup Menu

| Aptio Setup – AMI | | | | | |
|--|----------|-------------------------------------|----------|------|------------------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| Boot Configuration | | | | | |
| Setup Prompt Timeout | | 1 | | | |
| Bootup NumLock State | | [On] | | | |
| Quiet Boot | | [Disabled] | | | |
| Fixed Boot Order Mode | | [Enabled] | | | |
| FIXED BOOT ORDER Priorities* | | | | | |
| Boot Option #1* | | [Hard Disk: Windows Boot Manager] | | | |
| Boot Option #2* | | [NVME] | | | |
| Boot Option #3* | | [CD/DVD] | | | |
| Boot Option #4* | | [SD] | | | |
| Boot Option #5* | | [USB Hard Disk] | | | |
| Boot Option #6* | | [USB CD/DVD] | | | → ←: Select Screen |
| Boot Option #7* | | [USB Key] | | | ↑ ↓: Select Item |
| Boot Option #8* | | [USB Floppy] | | | Enter: Select |
| Boot Option #9* | | [USB Lan] | | | +/-: Change Opt. |
| Boot Option #10* | | [Network] | | | F1: General Help |
| Boot Option #11* | | [UEFI AP: UEFI: Built-in EFI Shell] | | | F2: Previous Values |
| | | | | | F3: Optimized Defaults |
| > UEFI Hard Disk Drive BBS Priorities* | | | | | F4: Save & Exit |
| > UEFI Application Boot Priorities* | | | | | ESC: Exit |
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* These items appear only when enabling Fixed Boot Order Mode.

| Feature | Option | Description |
|-----------------------|--------------------------|--|
| Setup Prompt Timeout | Value Input | Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting. |
| Bootup NumLock State | [On], [Off] | Select the keyboard NumLock state [On]: The keys on the keypad will act as numeric keys. [Off]: The keys on the keypad will act as cursor keys. |
| Quiet Boot | [Disabled], [Enabled] | Enables or disables Quiet Boot option |
| Fixed Boot Order Mode | [Disabled], [Enabled] | If enabled then 'Fixed Order Boot Mode' is used, otherwise 'BCP boot order' (default). NOTE: If you changed this setting please immediately save & exit and re-enter setup to apply |

| Feature | Option | Description |
|---------------------|---|---------------------------------------|
| | | further changes on the boot settings! |
| Boot Option #1..#11 | [Hard Disk: Windows Boot Manager], [NVME], [CD/DVD], [SD], [USB Hard Disk], [USB CD/DVD], [USB Key], [USB Floppy], [USB Lan], [Network], [UEFI AP: UEFI: Built-in EFI Shell], [Disabled] | Sets the system boot order |

Figure 64: BIOS Boot Setup Menu – UEFI Hard Disk Drive BBS Priorities

| Aptio Setup – AMI | | Boot |
|--|------------------------|--|
| Boot Option #1 | [Windows Boot Manager] | |
| | | → ←: 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 |
|----------------|--|----------------------------|
| Boot Option #1 | [Hard Disk: Windows Boot Manager], [Disabled] | Sets the system boot order |

Figure 65: BIOS Boot Setup Menu – UEFI Application Boot Priorities

| Aptio Setup – AMI | | Boot |
|-------------------|----------------------------|---|
| Boot Option #1 | [UEFI: Built-in EFI Shell] | |
| | | → ←: Select Screen ↑ ↓: Select Item Enter: Select |

| Aptio Setup – AMI | |
|--|---|
| | Boot |
| | +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
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| Feature | Option | Description |
|----------------|---|----------------------------|
| Boot Option #1 | [UEFI: Built-in EFI Shell], [Disabled] | Sets the system boot order |

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 66: BIOS Save & Exit Setup Menu

| Aptio Setup – AMI | | | | | |
|---|----------|---------|----------|--|-------------|
| Main | Advanced | Chipset | Security | Boot | Save & Exit |
| Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes | | | | | |
| Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override Windows Boot Manager UEFI: Built-in EFI Shell | | | | → ←: 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 | Description |
|---------------------------|--|
| Save Changes and Exit | Exit system setup after saving the changes. |
| Discard Changes and Exit | Exit system setup without saving any changes. |
| Save Changes and Reset | Reset the system after saving the changes. |
| Discard Changes and Reset | Reset system setup without saving any changes. |
| Save Changes | Save Changes done so far to any of the setup options. |
| Discard Changes | Discard Changes done so far to any of the setup options. |
| Restore Defaults | Restore / Load Default values for all the setup options. |
| Save as User Defaults | Save the changes done so far as User Defaults. |
| Restore User Defaults | Restore the User Defaults to all the setup options. |
| Windows Boot Manager | This group of functions includes a list of tokens, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order. If booting to EFI Shell this way, an exit from the shell returns to Setup. |
| UEFI: Built-in EFI Shell | |



About Kontron

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

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

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