IEI Integration Corp.

MODEL:

FLEX-BX210

2U AI Box PC with Intel® Xeon® W or 10th Gen. Intel® Core™ i9/i5 Processor, DDR4, Accelerator Card, Wi-Fi, Triple GbE, M.2, PCIe 3.0, Four SSD Bays, HDMI, DP, RoHS Compliant

User Manual

Rev. 1.00 – June 18, 2021

RoHS Lead Free

Revision

Date	Version	Changes
June 18, 2021	1.00	Initial release

Safety Instructions

en Warning! Read the user manual before connecting the system to the power source.

de Vorsicht! Bitte lesen Sie die Bedienungsanleitung, bevor Sie das System an eine Stromquelle anschließen.

fr Attention! Avant de brancher le système à la source d'alimentation, consultez le mode d'emploi.

it Avvertenza! Consultare il manuale utente prima di collegare il sistema all'alimentatore.

es Atención! Lea atentamente este manual del usuario antes de operar la fuente de alimentación.

zh 警告！在將系統連接到電源之前，請仔細閱讀使用手冊。

cn 警告！在将系统连接到电源之前，请仔细阅读使用手冊。

---

en Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.

de Vorsicht! Um eine Überhitzung des Systems zu vermeiden, betreiben Sie es ausschließlich im zulässigen Betriebstemperaturbereich. Dieser ist in der Bedienungsanleitung vermerkt.

fr Attention! Pour éviter la surchauffe du système, ne l'utilisez pas dans une zone dont la température dépasse les limites décrits dans le mode d'emploi.

it Avvertenza! Per evitare che il sistema si surriscaldi, non utilizzarlo in aree che superino la temperatura massima d'esercizio descritta nel manuale utente.

es Atención! Para evitar el excesivo calentamiento del sistema, no opere en las condiciones de temperatura superior a lo recomendado en este manual del usuario.

zh 警告！為防止系統過熱，不要在使用手冊上記載的產品工作溫度範圍之外操作此系統。

cn 警告！为防止系统过热，不要在使用手冊上记载的产品工作温度范围之外操作此系统。

---

en Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

de Vorsicht! Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

fr Attention! La mise au rebut ou le recyclage de ce produit sont généralement soumis aux lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

it Avvertenza! Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e i regolamenti locali.

es Atención! La disposición final de residuos de este producto se debe cumplir con las normativas y leyes del país.

zh 警告！本產品的廢棄處理應根據該國家的法律和規章進行。

cn 警告！本产品的废弃处理应根据该国家的法律和规章进行。

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TRADEMARKS

Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: FLEX-BX210 Series Box PC

The FLEX-BX210 box PC is powered by Intel® Xeon® W or 10th Generation Intel® Core™ i9/i5 processor. It can be used as an inference computing system for AI applications as it is pre-installed with one Mustang-V100-MX8 accelerator card.

The FLEX-BX210 also includes three low-profile PCIe slots for various expansions, one of them is a PCIe 3.0 x8 slot for adding additional GPU cards or image processing cards for high-performance Artificial Intelligence computing.

Four 2.5" SATA SSD bays with RAID function are protected in a lockable cover to ensure security of data and disks. The system is also equipped with one M.2 M-key (2280) slot to support PCIe SSD and NVMe, providing a variety of storage interfaces for users to choose.

Wi-Fi capabilities and three RJ-45 Ethernet connectors provide the system with smooth connection to an external LAN. Moreover, the FLEX-BX210 also supports WWAN communication via an optional M.2 WWAN module.

1.2 Model Variations

The model variations the FLEX-BX210 box PC series are listed in **Table 1-1** below.

	Processor	Chipset	Preinstalled Memory & HDD	Preinstalled Accelerator Card
FLEX-BX210AI-XE/32G/V	Intel® Xeon® W-1290TE	Intel® W480	32 GB + 1TB HDD	Yes
FLEX-BX210AI-XE/32G	Intel® Xeon® W-1290TE	Intel® W480	32 GB + 1TB HDD	No
FLEX-BX210AI-i9/16G/V	Intel® Core™ i9-10900TE	Intel® Q470	16 GB + 1TB HDD	Yes
FLEX-BX210AI-i9/16G	Intel® Core™ i9-10900TE	Intel® Q470	16 GB + 1TB HDD	No
FLEX-BX210AI-i5/8G/V	Intel® Core™ i5-10500TE	Intel® Q470	8 GB + 1TB HDD	Yes
FLEX-BX210AI-i5/8G	Intel® Core™ i5-10500TE	Intel® Q470	8 GB + 1TB HDD	No

Table 1-1: Model Variations

1.3 Features

The FLEX-BX210 has the following features

- Intel® Xeon® W or 10th Gen. Intel® Core™ i9/i5 processor
- 2U chassis for 19-inch rack mount
- Support up to 64 GB of 2933 MHz DDR4 memory
- Pre-installed one Mustang-V100-MX8 accelerator card which is equipped with Intel® Movidius™ Myriad™ X Vision Processing Unit
- Three PCIe 3.0 slots for expansion
- Four hot-swappable 2.5" SATA HDD/SSD bays
- Two M.2 slots support NVMe SSD and WWAN connection
- Three GbE LAN
- Wi-Fi 802.11ac and Bluetooth v5.1 supported
- Various I/O interfaces, including six USB 3.2 Gen 1 (5 Gb/s) ports, two RS-232 ports, DisplayPort output, HDMI output, audio line-out and mic-in
- RoHS compliant design

1.4 Front Panel

The front panel of the FLEX-BX210 has the following button and indicator:

- 1 x Power button with power LED indicator (power on: solid blue)
- 1 x HDD LED indicator (HDD activity: blinking red)

Figure 1-2: Front Panel

1.5 Rear Panel

An overview of the rear panel is shown in **Figure 1-3**.

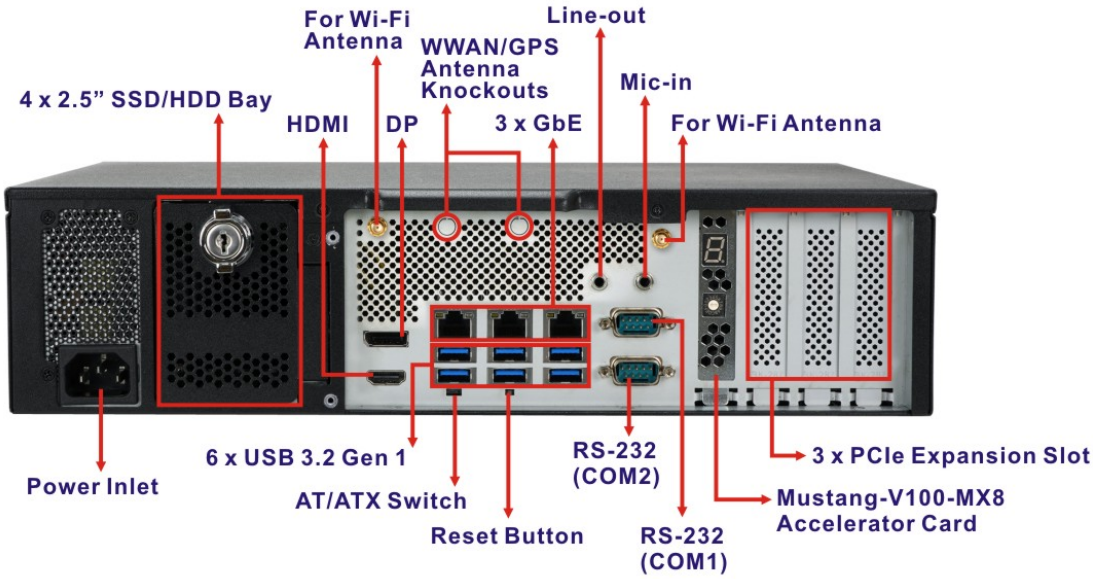


Figure 1-3: Rear Panel

NOTE:

Each USB 3.2 Gen 1 port on the FLEX-BX210's rear panel can supply 900mA power. However, if these six USB ports are all connected to devices when booting up, the system could fail to startup due to the sudden load increase.

To solve this problem, it is recommended to set **USB Power SW1** to [**+5V**] in BIOS (Chipset → PCH-IO Configuration). Refer to **Section 4.4.2**.

1.6 Technical Specifications

The specifications for the FLEX-BX210 box PCs are listed below.

	FLEX-BX210
CPU	Intel® Xeon® W-1290TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W) 10th Generation Intel® Core™ i9-10900TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W) 10th Generation Intel® Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W)
Chipset	Intel® Q470 / Intel® W480
BIOS	AMI UEFI BIOS
Memory	Two 288-pin 2933/2666 MHz dual-channel unbuffered DDR4 SDRAM DIMM slots (system max. 64 GB) - Xeon W SKU with 32 GB RAM pre-installed - Core i9 SKU with 16 GB RAM pre-installed - Core i5 SKU with 8 GB RAM pre-installed
Graphics Engine	-Intel® HD Graphics Gen 9 Engines with low power 16 execution units, supports DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0
Ethernet	LAN1: Intel® I219LM Ethernet controller with Intel® AMT 11.0 LAN2 & LAN3: Intel® I210 Ethernet controller
Storage	4 x Rear-accessible 2.5" SATA 6G/s HDD/SSD bay (support RAID 0/1/5/10) (pre-installed with one 2.5" 1TB HDD) 1 x M.2 M-key (2280, PCIe 3.0 x4) supports NVMe SSD
Wi-Fi	Intel® AC 9260 (802.11ac, 2.5GHz/5GHz, 2T2R) via M.2 2230
Bluetooth	Bluetooth v5.1

WWAN and GPS	M.2 3042 B-key WWAN/GPS module (optional)
USB	6 x USB 3.2 Gen 1 (5 Gb/s) Type-A
COM	2 x RS-232 (DB-9, COM1 & COM2)
Audio	1 x Line out 1 x Mic in
Display	1 x DisplayPort output 1 x HDMI output
Buttons and Indicators	1 x HDD LED (front panel) 1 x Power button with LED indicator (front panel) 1 x Reset button (rear panel) 1 x AT/ATX mode switch (rear panel)
Expansions	2 x PCIe 3.0 x8 (max. card size: 68 mm x 167 mm) - One pre-installed with one Mustang-V100-MX8 accelerator card 2 x PCIe 3.0 x4 (max. card size: 68 mm x 167 mm) 1 x M.2 3042 B-Key socket (with SIM slot for WWAN, supports PCIe 3.0 x1 & USB 3.2 Gen1) 1 x M.2 2280 M-Key socket (supports PCIe 3.0 x4)
Thermal	3 x System fan 1 x CPU fan
Power supply	AC input ATX power supply 350 W power supply - Input: 90VAC~264VAC, 50/60Hz - Output (max.): 3.3V@14A, 5V@16A, 12V@29A, -12V@0.3A
	Support AT/ATX mode
Chassis Construction	Metal housing

Mounting	Wall mount, rack mount
Color	Black C
Dimensions (LxDxH)	357 mm x 230 mm x 88 mm
Net Weight	4 kg
Watchdog Timer	Software programmable support 1~255 sec. system reset
Vibration	5~17Hz, 0.1 double amplitude displacement 17~640Hz 1.5G acceleration peak to peak
Shock	10G acceleration part to part (11ms)
Operating Temperature	-10°C ~ 50°C
Storage Temperature	-20°C ~ 60°C
Operating Humidity	5% ~95%, non-condensing
Safety/EMC	CE, FCC, RoHS

Table 1-2: Technical Specifications

1.7 Dimensions

The dimensions of the FLEX-BX210 are listed below and shown in **Figure 1-4**.

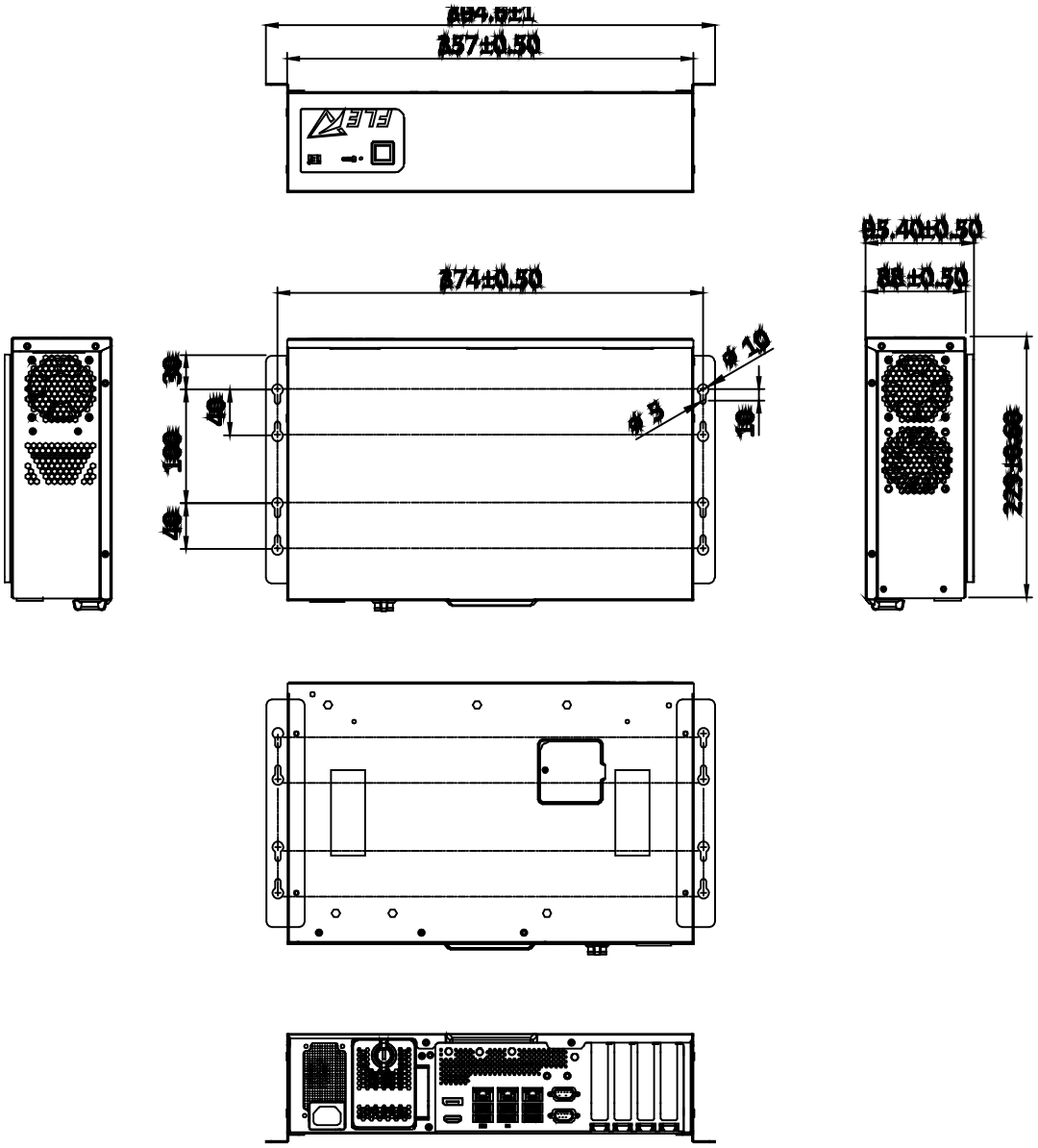


Figure 1-4: FLEX-BX210 Dimensions with Wall Mount Brackets (mm)

Chapter

2

Unpacking

2.1 Unpacking

To unpack the box PC, follow the steps below:

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.

Step 4: Lift the system out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Make sure all the components listed in the packing list are present.

2.2 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the FLEX-BX210 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The FLEX-BX210 box PC is shipped with the following components:

Quantity	Item	Image
1	FLEX-BX210 box PC	
1	Power cord	

2	Keys for locking HDD cover	
2	Wall mount bracket	
4	Screws (M4*6) for mounting brackets	
16	Screws (M3*4) for HDD installation	
2	Antenna	
4	Foot pad	

Table 2-1: Package List

2.3 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Rack mount bracket (**P/N**: FLEX-BXRK-R10)	

Chapter

3

Installation

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the maintenance of the FLEX-BX210 may result in permanent damage to the FLEX-BX210 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER series motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the FLEX-BX210 is opened and any electrical component handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the FLEX-BX210, place it on an anti-static pad. This reduces the possibility of ESD damaging the FLEX-BX210.

3.2 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the FLEX-BX210, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the FLEX-BX210 must be disconnected during the installation process. Failing to disconnect the power may cause severe injury to the body and/or damage to the system.
- **Qualified Personnel**: The FLEX-BX210 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may

only be carried out by qualified personnel who are familiar with the associated dangers.

- **Air Circulation**: Make sure there is sufficient air circulation when installing the FLEX-BX210. The FLEX-BX210's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the FLEX-BX210. Leave at least 5 cm of clearance around the FLEX-BX210 to prevent overheating.
- **Grounding**: The FLEX-BX210 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the FLEX-BX210.

3.3 Installation Procedure

To properly install the FLEX-BX210, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking the FLEX-BX210 box PC

Step 2: Install SATA SSD

Step 3: Install M.2 SSD (optional)

Step 4: Install expansion cards (optional)

Step 5: Mount the FLEX-BX210

Step 6: Connect the peripheral devices

Step 7: Power the system up

3.4 Solid-State Drive Installation

Four 2.5” SATA drives can be installed in the FLEX-BX210. The SATA drives are installed into the removable hard drive trays protected by a lockable cover on the rear panel. To install the SSD into the system, please follow the steps below.

Step 1: Turn the lock knob 90° counterclockwise by hand to unlock the HDD cover on the rear panel.

Figure 3-1: Unlock HDD Cover

Step 2: Open the HDD cover, and you will see four drive trays (**Figure 3-2**). Pull out one of the drive trays.

Figure 3-2: Drive Tray Removal

Step 3: Place an SSD onto the drive tray and secure the SSD with the bracket by inserting four retention screws (M3*4) into the bottom of the SSD (**Figure 3-3**).

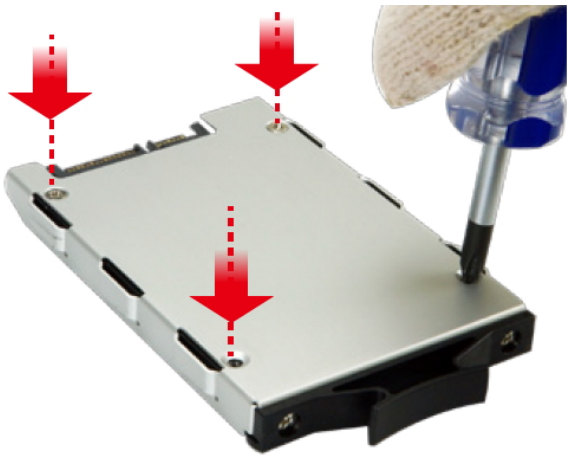


Figure 3-3: SSD Retention Screws

Step 4: Carefully insert the SSD into the slot on the rear panel. Make sure the SATA connector on the SSD is securely connected to the SATA connector inside the chassis.

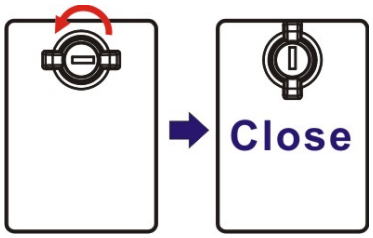
Figure 3-4: SSD Installation

Step 5: Repeat **Step 2 ~ Step 4** described above to install another SSD.

Step 6: Close the HDD cover. Turn the lock knob 90° clockwise by hand, and lock it with the key if necessary.

NOTE:

To temporarily close the HDD cover, turn the lock knob 90° counterclockwise by hand to secure the cover.



3.5 Removing the Top Cover

WARNING:

Before any internal installation procedures are carried out on the system, make sure the system is turned off and cooled down for 15 minutes. Failing to turn off the system before opening it can cause permanent damage to the system and serious or fatal injury to the user.

To access the FLEX-BX210 internally the top cover must be removed. To remove the top cover, please follow the steps below.

Step 1: Remove the six retention screws, two on the rear and two on each side.

Figure 3-5: Top Cover Retention Screw Removal

Step 2: Slide the top cover towards the I/O panel until it is disengaged from the locking mechanism. Then, lift the top cover off the chassis. See **Figure 3-6**.

Figure 3-6: Remove the Top Cover

3.6 M.2 Module Installation (Optional)

The two M.2 slots allow installation of M.2 2280 M-key cards and M.2 3042 B-key cards. To install an M.2 card, please follow the steps below.

Step 1: Remove the top cover. See Section 3.5 above.

Step 2: Locate the M.2 slot as shown in Figure 3-7.

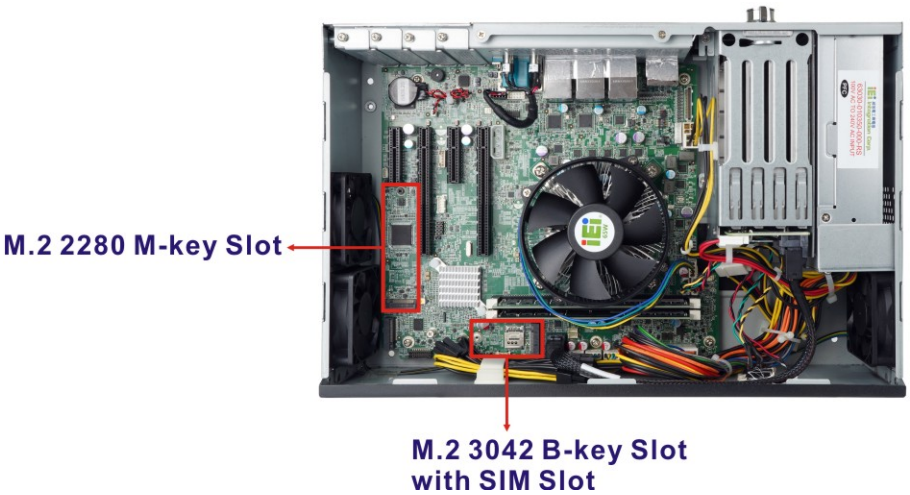


Figure 3-7: M.2 Slot Locations

Step 3: Remove the on-board retention screw as shown in Figure 3-8.

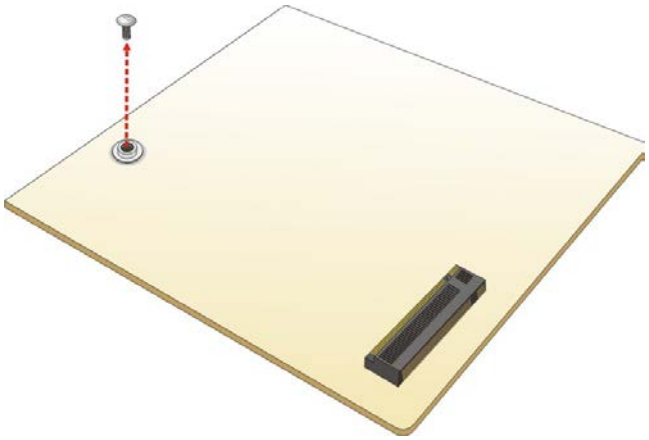


Figure 3-8: Removing the M.2 Module Retention Screw

Step 4: Line up the notch on the module with the notch on the slot. Slide the M.2 module into the socket at an angle of about 20º (**Figure 3-9**).

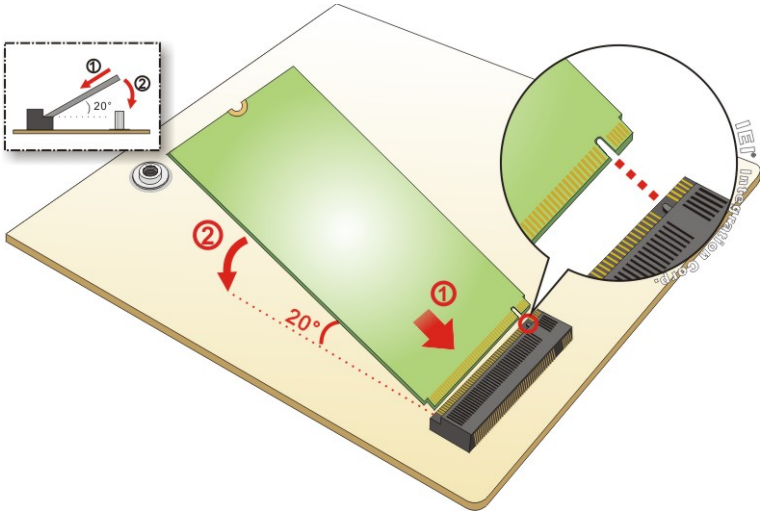


Figure 3-9: Inserting the M.2 Module into the Slot at an Angle

Step 5: Push the M.2 module down and secure it with the previously removed retention screw (**Figure 3-10**).

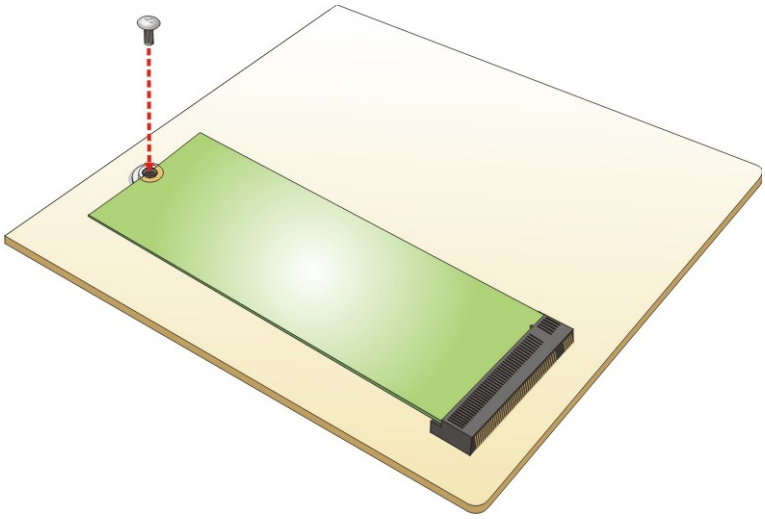


Figure 3-10: Securing the M.2 Module

Step 6: Re-install the top cover and secure it with the six retention screws previously removed.

3.7 Expansion Card Installation (Optional)

The FLEX-BX210 supports multiple PCIe slots which are compatible with standard low-profile add-on cards, including one PCIe 3.0 x16 (x8 mode) slot and two PCIe 3.0 x4 slots. To install an expansion card, follow the steps below.

Step 1: Remove the top cover. See Section 3.5 above.

Step 2: Locate an empty PCIe slot.

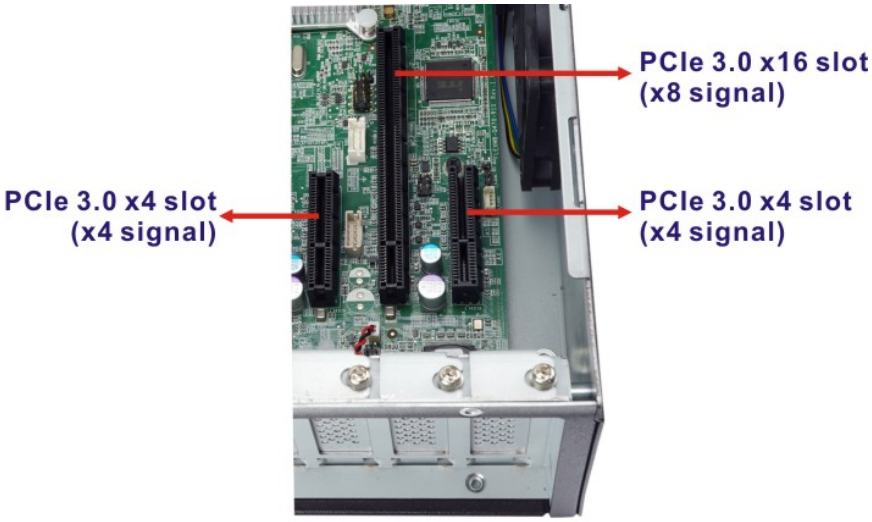


Figure 3-11: PCIe Slot Locations

Step 3: Remove the blank bracket panel on the back of the FLEX-BX210 that aligns with the empty PCIe slot. Save this bracket screw.

Step 4: Align the expansion card to a PCIe slot. Press down gently, but firmly, to seat the expansion card correctly in the slot.

Step 5: Install the bracket screw to secure the expansion card to the system chassis.

Step 6: Re-install the top cover and secure it with the six retention screws previously removed.

3.8 Mounting the System

The following sections describe the mounting methods supported by the FLEX-BX210.

3.8.1 Wall Mount

To mount the box PC onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the box PC over.

Step 2: Align the two retention screw holes in each bracket with the retention screw holes on the sides of the bottom surface.

Step 3: Secure the brackets to the system by inserting two retention screws (M4*6) into each bracket (**Figure 3-12**).

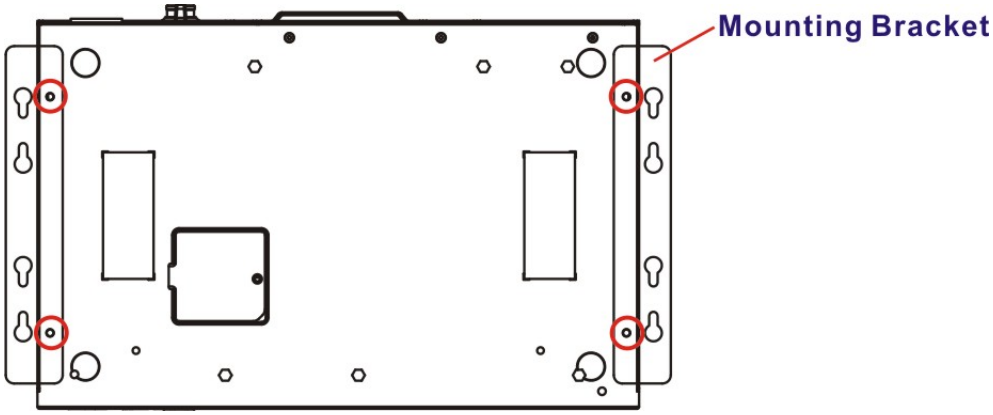


Figure 3-12: Mounting Bracket Retention Screws

Step 4: Drill holes in the intended installation surface according to the bracket dimensions listed below.

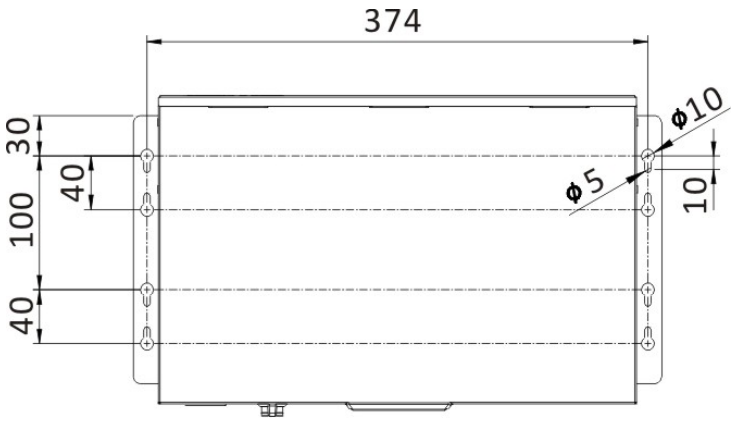


Figure 3-13: Mounting Bracket Retention Screws

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert retention screws into each bracket to secure the system to the wall.

3.8.2 Rack Mount (Optional)

The 2U chassis of the box PC is designed to support 19” rack mount. To mount the box PC onto a rack by using the optional rack mount brackets, please follow the steps below.

Step 1: Secure the optional rack mount brackets to the system by inserting two retention screws (M4*6) into each bracket.

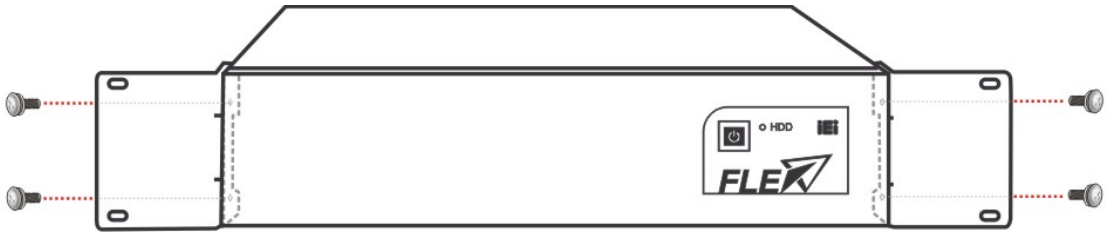


Figure 3-14: Install Rack Mount Bracket

Step 2: Slide the box PC with the attached rack mount brackets into a rack.

Step 3: Once the box PC has been properly inserted into the rack, secure the front of the rack mount bracket to the front of the rack.

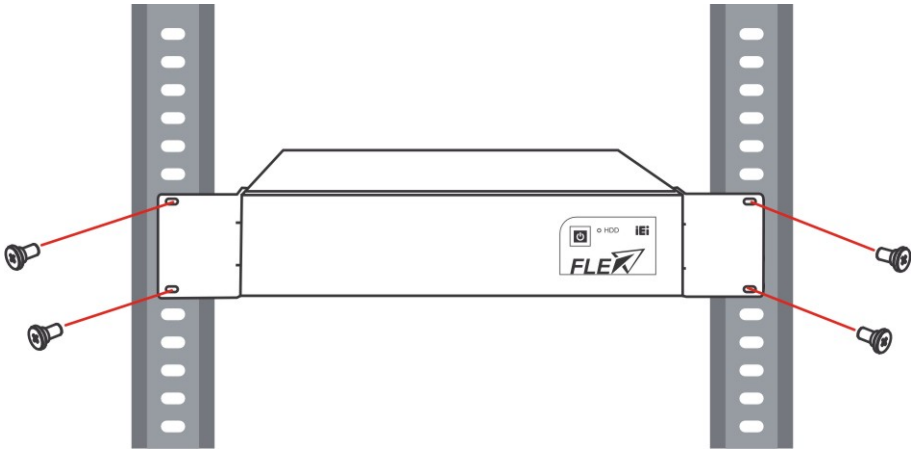


Figure 3-15: Mounting Bracket Retention Screws

3.9 COM Port Connection

The FLEX-BX210 has two DB-9 connectors for RS-232 serial port connection. The pinouts for the RS-232 connectors (COM1and COM2) are listed in the figure and table below.

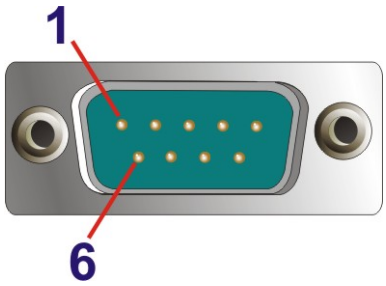


Figure 3-16: RS-232 Connector (COM1, COM2)

PIN NO.	DESCRIPTION
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Table 3-1: RS-232 Connector Pinouts

3.10 Power-On Procedure

3.10.1 Installation Checklist

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

To power on the box PC please make sure of the following:

- The top cover is installed
- All peripheral devices are connected
- The power cables are plugged in
- The system is securely mounted

3.10.2 Power-on Procedure

To power-on the FLEX-BX210 please follow the steps below:

Step 1: Connect the power source to the power inlet on the rear panel. **Ensure to connect the power cord to a socket-outlet with earthing connection.**

Step 2: Short-press the power button on the front panel to power up the system. The power LED lights on in blue (**Figure 3-17**).

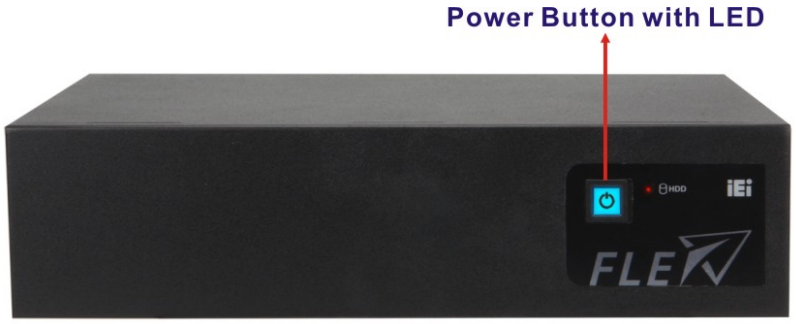


Figure 3-17: Power Button

3.11 Software Installation

All the drivers for the FLEX-BX210 are available on IEI Resource Download Center (https://download.ieiworld.com). Type FLEX-BX210 and press Enter to find all the relevant software, utilities, and documentation.

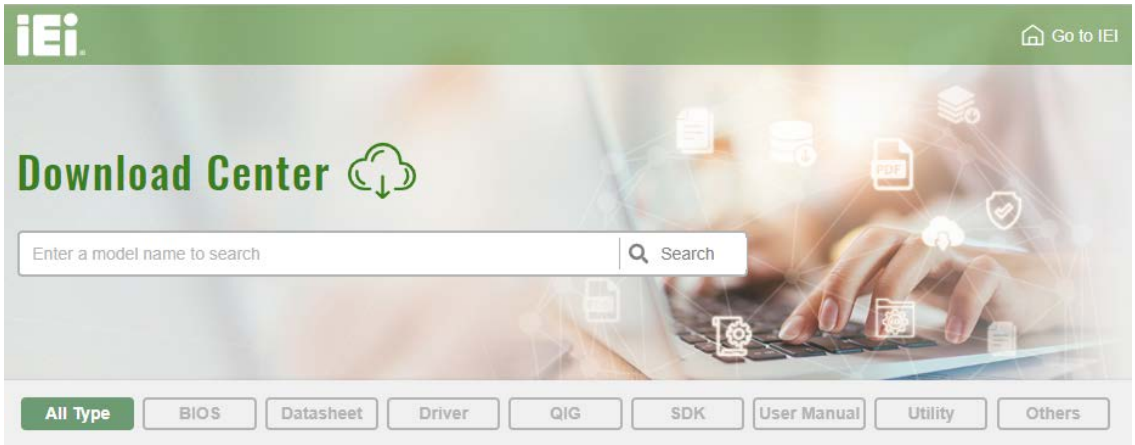
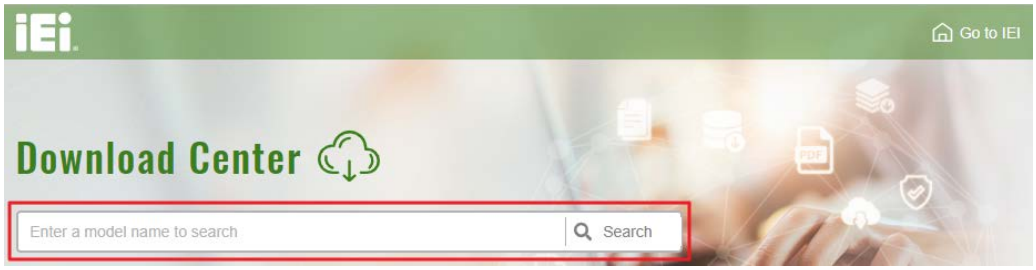


Figure 3-18: IEI Resource Download Center

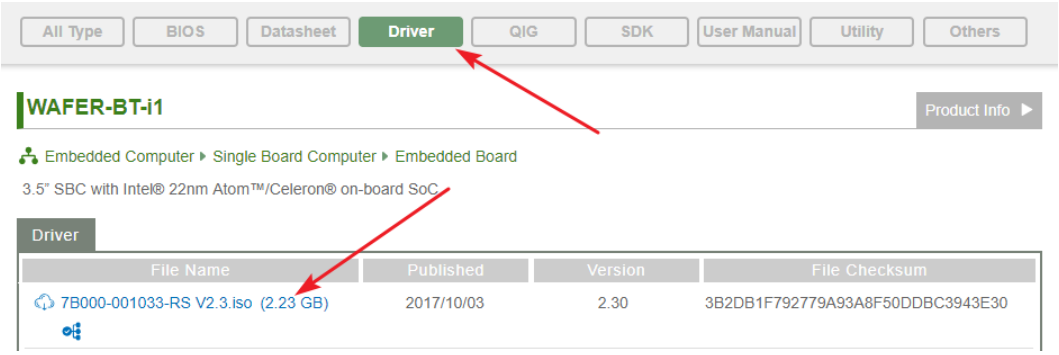
3.11.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

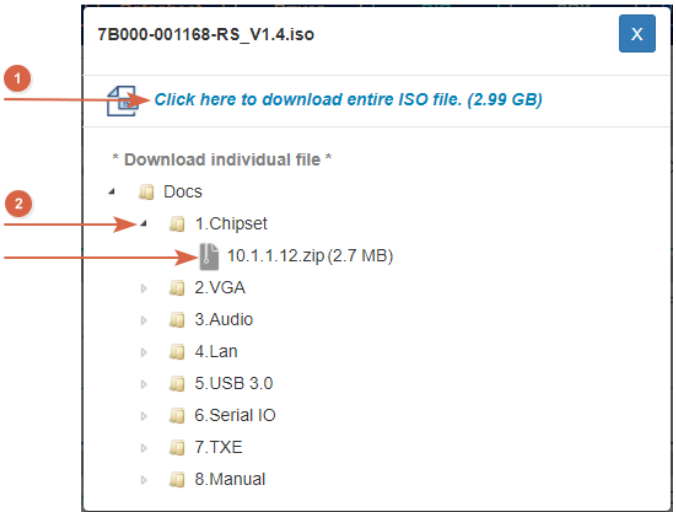
Step 1: Go to https://download.ieiworld.com. Type FLEX-BX210 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

3.12 RAID Configuration

The **FLEX-BX210** can provide data protection for serial ATA (SATA) disks via the Intel® Rapid Storage Technology. To access the Intel® Rapid Storage Technology, please follow the steps below.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

Step 1: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the BIOS setup program. Go to **Chipset → PCH-IO Configuration → SATA and RST Configuration → SATA Mode Selection**. Enable RAID support for all SATA devices.

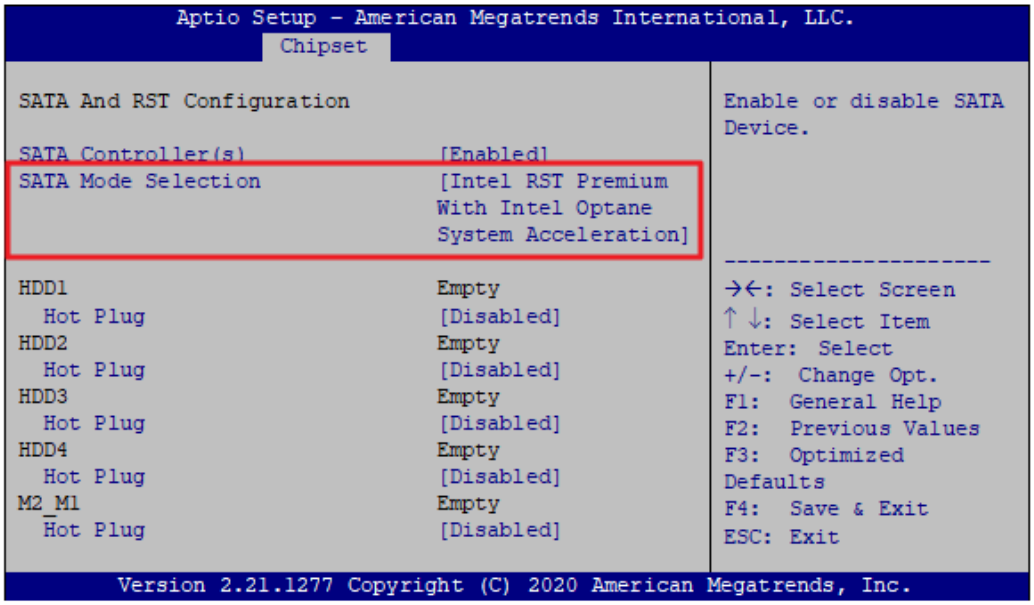


Figure 3-19: RAID Configuration–BIOS Setting

Step 3: **Save and Exit BIOS**. After the SATA support option is enabled, save and exit the BIOS.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the BIOS.

Step 5: **Press Ctrl+I. during the system boot process**, press Ctrl+I when prompted to enter the RAID configuration software.

```
Intel(R) Rapid Storage Technology – Option ROM – 15.2.0.2740
Copyright (C) Intel Corporation. All rights reserved.

  RAID Volumes:
  None defined.

  Physical Devices:
  ID Device Model        Serial #                     Size Type/Status(Vol ID)
  1  256GB SATA Flash    076616F100208548        23.4GB Non-RAID Disk
  2  256GB SATA Flash    077302EF00503528        23.4GB Non-RAID Disk
Press <CTRL+I> to enter Configuration Utility…
```

Step 6: **Configure the RAID settings**. Use the Intel® Rapid Storage Technology to configure the RAID array.

A) Select the option to **Create RAID Volume** from the Main Menu and press Enter.

```
     Intel(R) Rapid Storage Technology - Option ROM - 15.2.0.2748
        Copyright (C) Intel Corporation. All rights reserved.
=============================[MAIN MENU]============================
          1. Create RAID Volume        4. Recovery Volume Options
          2. Delete RAID Volume        5. Acceleration Options
          3. Reset Disks to Non-RAID   6. Exit
======================[DISK/VOLUME INFORMATION]======================
RAID Volumes:
None defined.
```

B) Press the up/down arrows on the keyboard to choose the **RAID Level** and press Enter. Select the hard drives for the RAID configuration and press Enter when done.

```
     Intel(R) Rapid Storage Technology - Option ROM - 15.2.0.2748
        Copyright (C) Intel Corporation. All rights reserved.
=========================[CREATE VOLUME MENU]=======================
                      Name:  Volume1
                RAID Level:  RAID0(Stripe)
                     Disks:  Select Disks
                Strip Size:  16KB
                  Capacity:  238.5 GB
                      Sync:  N/A
                             Create Volume
```

Step 7: **Create RAID Volume.** Highlight **Create Volume** and press Enter, then choose Y when the warning prompt appears to create volume.

```
     Intel(R) Rapid Storage Technology - Option ROM - 15.2.0.2748
        Copyright (C) Intel Corporation. All rights reserved.
=========================[CREATE VOLUME MENU]=======================
                      Name:  Volume1
                RAID Level:  RAID0(Stripe)
                     Disks:  Select Disks
                Strip Size:  16KB
                  Capacity:  238.5 GB
                      Sync:  N/A
                             Create Volume
```

Chapter

4

BIOS

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Delete to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

Key	Function
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

```
                Aptio Setup – American Megatrends International, LLC.
  Main    Advanced   Chipset   Security    Boot    Save & Exit

BIOS Information                                   Set the Date. Use Tab to
BIOS Vendor                    American Megatrends switch between Data
Core Version                   5.17                elements.
Compliancy                     UEFI 2.7; PI 1.6
Project Version                Z667AR10.ROM
Build Date and Time            07/15/2020 12:02:10

iWDD Vender                    iEi
iWDD Version                   B595ET09.bin

Processor Information
Name                           CometLake DT
Type                           Intel(R) Core(TM) CPU
                               i7-10700TE CPU @ 2.00GHz
Speed                          2000 MHz
ID                             0XA0654
Stepping                       P1
Package                        LGA1200
Number of Processors           8Core(s) / 16Thread(s)
Microcode Revision             C6
GT Info                        GT2 (0x9BC5)

IGFX GOP Version               9.0.1107
Memory RC Version              0.0.0.70
Total Memory                   16384 MB
Memory Frequency               2667 MHz

PCH Information
Name                           CML PCH-H           ---------------------
PCH SKU                        Q470
Stepping                       A0                  →←: Select Screen
                                                   ↑ ↓: Select Item
ME FW Version                  14.0.37.1165        Enter:  Select
ME Firmware SKU                Corporate SKU       +/-:  Change Opt.
                                                   F1:   General Help
Access Level                   Administrator       F2:   Previous Values
                                                   F3:   Optimized Defaults
System Date                    [Mon 08/17/2020]    F4:   Save & Exit
System Time                    [11:10:27]          ESC:  Exit

Access Level                   Administrator

          Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 1: Main

The **Main** menu has two user configurable fields:

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

```
              Aptio Setup – American Megatrends International, LLC.
   Main    Advanced  Chipset   Security    Boot    Save & Exit

 > CPU Configuration                              CPU Configuration
 > PCH-FW Configuration                           Parameters
 > Trusted Computing
 > ACPI Settings                                  ----------------------
 > F81966 Super IO Configuration
 > iWDD H/M Monitor                               →←: Select Screen
 > RTC Wake Settings                              ↑ ↓: Select Item
 > Serial Port Console Redirection                Enter:  Select
 > NVMe Configuration                             +/-:  Change Opt.
                                                  F1:   General Help
                                                  F2:   Previous Values
                                                  F3:   Optimized Defaults
                                                  F4:   Save & Exit
                                                  ESC:  Exit
        Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

4.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications or enable the Intel Virtualization Technology.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

CPU Configuration                                   When enabled, a VMM can
                                                    utilize the additional
Type                              Intel(R) Core(TM) CPU  hardware capabilities
                                  i7-10700TE CPU @  provided by Vanderpool
                                  2.00GHz           Technology.
ID                                0x9A0654
Speed                             2000 MHz
L1 Data Cache                     32 kB x 8
L1 Instruction Cache              32 kB x 8
L2 Cache                          256 kB x 8
L3 Cache                          16 MB
L4 Cache                          N/A               ----------------------
VMX                               Supported         →←: Select Screen
SMX/TXT                           Supported         ↑ ↓: Select Item
                                                    Enter:  Select
Intel (VMX) Virtualization        [Disabled]        +/-:  Change Opt.
Technology                                          F1:  General Help
Active Processor Cores            [All]             F2:  Previous Values
Hyper-Threading                   [Enabled]         F3:  Optimized Defaults
Intel Trusted Execution Technology [Disabled]       F4:  Save & Exit
Intel(R) SpeedStep(tm)            [Enabled]         ESC: Exit
C states                          [Disabled]

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```

BIOS Menu 3: CPU Configuration

➔ **Intel (VMX) Virtualization Technology [Disabled]**

Use the **Intel (VMX) Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**	**DEFAULT**	Disables Intel Virtualization Technology.
➔ **Enabled**		Enables Intel Virtualization Technology.

➔ **Active Processor Cores [All]**

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

➔ **All**	**DEFAULT**	Enable all cores in the processor package.
➔ **1**		Enable one core in the processor package.
➔ **2**		Enable two cores in the processor package.
➔ **3**		Enable three cores in the processor package.
➔ **4**		Enable four cores in the processor package.
➔ **5**		Enable five cores in the processor package.
➔ **6**		Enable six cores in the processor package.
➔ **7**		Enable seven cores in the processor package.

➔ **Hyper-threading [Enabled]**

Use the **Hyper-threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

➔ **Disabled**		Disables the Intel Hyper-Threading Technology.
➔ **Enabled**	**DEFAULT**	Enables the Intel Hyper-Threading Technology.

➔ **Intel(R) SpeedStep(tm) [Enabled]**

Use the **Intel(R) SpeedStep(tm)** option to enable or disable the Intel® SpeedStep Technology which allows more than two frequency ranges to be supported.

➔ **Disabled**		Disables Intel® SpeedStep Technology
➔ **Enabled**	**DEFAULT**	Enables Intel® SpeedStep Technology

➔ **C states [Disabled]**

Use the **C states** option to enable or disable CPU power management which allows CPU to go to C states when it is not 100% utilized.

➔ **Disabled** **DEFAULT** Disables CPU power management

➔ **Enabled** Enables CPU power management

4.3.2 PCH-FW Configuration

The **PCH-FW Configuration** menu (**BIOS Menu 4**) allows Intel® Active Management Technology (AMT) options to be configured.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

AMT BIOS Features                [Enabled]        When disabled AMT BIOS
Unconfigure ME                   [Disabled]       Features are no longer
                                                  supported and user is no
> PTT Configuration                               longer able to access MEBx
                                                  Setup.
                                                  Note:
                                                  This option does not
                                                  disable Manageability
                                                  Features in FW.

                                                  ---------------------
                                                  ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  EnterSelect
                                                  F1   General Help
                                                  F2   Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save
                                                  ESC   Exit
Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 4: PCH-FW Configuration

➔ **AMT BIOS Features [Enabled]**

Use **AMT BIOS Features** option to enable or disable the Intel® AMT function.

➔ **Disabled** Intel® AMT is disabled

➔ **Enabled** **DEFAULT** Intel® AMT is enabled

➔ **Unconfigure ME [Disabled]**

Use the **Unconfigure ME** option to perform ME unconfigure without password operation.

➔ **Disabled**	**DEFAULT**	Not perform ME unconfigure
➔ **Enabled**		To perform ME unconfigure

4.3.2.1 PTT Configuration

Use the **PTT Configuration** menu (**BIOS Menu 5**) to configure settings related to the Trusted Platform Module (TPM).

```
                Aptio Setup – American Megatrends International, LLC.
            Advanced

PTT Capability / State          1/0                  Select TPM device: PTT or
                                                     dTPM. PTT- Enables PTT in
TPM Device Selection            [dTPM (If supported)] SkuMgr dTPM 1.2 –
                                                     Disables PTT in SkuMgr
                                                     Warning! PTT/dTPM will
                                                     be disabled and all data
                                                     saved on it will be lost.

                                                     ----------------------

                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     EnterSelect
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3    Optimized
                                                     Defaults
                                                     F4    Save
                                                     ESC   Exit
          Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 5: PTT Configuration

➔ **TPM Device Selection [dTPM (If supported)]**

Use the **TPM Device Selection** option to configure support for the TPM.

➔ **dTPM (If supported)**	**DEFAULT**	Disable PTT in SkuMgr.
➔ **PTT**		Enable PTT in SkuMgr

4.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 6**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

```
                Aptio Setup – American Megatrends International, LLC.
            Advanced

Configuration                                   Enables or Disables BIOS
  Security Device Support        [Disable]      support for security
  NO Security Device Found                      device. O.S. will not
                                                show Security Device.
                                                TCG EFI protocol and
                                                INT1A interface will not
                                                be available.

                                                ----------------------
                                                →←: Select Screen
                                                ↑ ↓: Select Item
                                                Enter:  Select
                                                +/-:  Change Opt.
                                                F1:   General Help
                                                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit

          Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 6: Trusted Computing

➔ **Security Device Support [Disable]**

Use the **Security Device Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

4.3.4 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 7**) configures the Advanced Configuration and Power Interface (ACPI) options.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

ACPI Settings                                   Select the highest ACPI
                                                sleep state the system
ACPI Sleep State                [S3(Suspend to  will enter when the
                                RAM)]           SUSPEND button is
                                                pressed.

                                                ----------------------

                                                →←: 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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```

BIOS Menu 7: ACPI Configuration

➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S3 (Suspend to RAM)**	**DEFAULT**	The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.5 F81966 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the parallel ports and serial ports.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

F81966 Super IO Configuration                    Set Parameters of Serial
                                                 Port 1 (COMA)
Super IO Chip                    F81966
> Serial Port 1 Configuration                    ---------------------
> Serial Port 2 Configuration                    →←: Select Screen
> Serial Port 3 Configuration                    ↑ ↓: Select Item
> Serial Port 4 Configuration                    Enter:  Select
                                                 +/-:  Change Opt.
                                                 F1:   General Help
                                                 F2:   Previous Values
                                                 F3:   Optimized Defaults
                                                 F4:   Save & Exit
                                                 ESC:  Exit
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```

BIOS Menu 8: F81966 Super IO Configuration

4.3.5.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

Serial Port n Configuration                      Enable or Disable Serial
                                                 Port (COM)
Serial Port                      [Enabled]
Device Settings                  IO=3F8h; IRQ=4
                                                 ---------------------
                                                 →←: 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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```

BIOS Menu 9: Serial Port n Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

4.3.6 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 10**) contains the fan configuration submenu, and displays the system temperature and CPU fan speed.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

PC Health Status                                  Smart Fan Mode Select

CPU temperature                  :+56 °C
System temperature               :+30 °C

CPU_FAN1 Speed                   :2811 RPM
SYS_FAN1 Speed                   :1530 RPM
SYS_FAN2 Speed                   :1555 RPM        ---------------------
SYS_FAN3 Speed                   :2065 RPM        →←: Select Screen
                                                  ↑ ↓: Select Item
+5V                              :+4.900 V        Enter:  Select
+12V                             :+11.935 V       +/-:  Change Opt.
+DDR                             :+1.161 V        F1:  General Help
+5VSB                            :+4.991 V        F2:  Previous Values
+3.3V                            :+3.248 V        F3:  Optimized Defaults
+3.3VSB                          :+3.328 V        F4:  Save & Exit
                                                  ESC: Exit
> Smart Fan Mode Configuration

Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 10: iWDD H/W Monitor

➔ **PC Health Status**

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature

- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - +5V
  - +12V
  - DDR
  - +5VSB
  - +3.3V
  - +3.3VSB

4.3.6.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 11**) to configure the CPU/system fan temperature and speed settings.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

Smart Fan Mode Configuration                          Smart Fan Mode Select

CPU_FAN1 Smart Fan Control        [Auto Mode]
Auto mode fan start temperature   40
Auto mode fan off temperature     20
Auto mode fan start PWM           30
Auto mode fan slope PWM           2
SYS_FAN1 Smart Fan Control        [Auto Mode]
Auto mode fan start temperature   30
Auto mode fan off temperature     20
Auto mode fan start PWM           40
Auto mode fan slope PWM           3                   ---------------------
SYS_FAN2 Smart Fan Control        [Auto Mode]         →←: Select Screen
Auto mode fan start temperature   30                  ↑ ↓: Select Item
Auto mode fan off temperature     20                  Enter:  Select
Auto mode fan start PWM           40                  +/-:  Change Opt.
Auto mode fan slope PWM           3                   F1:  General Help
SYS_FAN3 Smart Fan Control        [Auto Mode]         F2:  Previous Values
Auto mode fan start temperature   30                  F3:  Optimized Defaults
Auto mode fan off temperature     20                  F4:  Save & Exit
Auto mode fan start PWM           40                  ESC: Exit
Auto mode fan slope PWM           3

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```

BIOS Menu 11: Smart Fan Mode Configuration

➔ **CPU_FAN1 Smart Fan Control/SYS_FAN Smart Fan Control [Auto Mode]**

Use the **CPU_FAN1 Smart Fan Control/SYS_FAN Smart Fan Control** option to configure the CPU/System Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings.
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto Mode settings.

The following options can only be set if the CPU/SYS Smart Fan Control option is set to Auto Mode.

➔ **Auto mode fan start temperature**

If the CPU temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan off temperature**

If the CPU temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan start PWM**

Use the **Auto mode fan start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan slope PWM**

Use the **Auto mode fan slope PWM** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. Use the + or – key to change the value or enter a decimal number between 1 and 8.

4.3.7 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 12**) enables the system to wake at the specified time.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

Wake system with Fixed Time      [Disabled]          Enable or disable System
                                                     wake on alarm event. When
                                                     enabled, System will
                                                     wake on the
                                                     date::hr::min::sec
                                                     specified
                                                     ----------------------
                                                     →←: 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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```

BIOS Menu 12: RTC Wake Settings

➔ **Wake system with Fixed Time [Disabled]**

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

4.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 13**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

```
              Aptio Setup – American Megatrends International, LLC.
          Advanced

  COM1                                          Console Redirection
  Console Redirection            [Disabled]     Enable or Disable
> Console Redirection Settings

  COM2
  Console Redirection            [Disabled]
> Console Redirection Settings

  COM3
  Console Redirection            [Disabled]     ---------------------
> Console Redirection Settings                  →←: Select Screen
                                                ↑ ↓: Select Item
  COM4                                          Enter:  Select
  Console Redirection            [Disabled]     +/-:  Change Opt.
> Console Redirection Settings                  F1:   General Help
                                                F2:   Previous Values
  iAMT SOL                                      F3:   Optimized Defaults
  COM5(Pci Bus0, Dev0, Func0) (Disabled)        F4:   Save & Exit
  Console Redirection            Port Is Disabled ESC:  Exit

  Legacy Console Redirection
> Legacy Console Redirection Settings

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```

BIOS Menu 13: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled**	**DEFAULT**	Disabled the console redirection function
➔ **Enabled**		Enabled the console redirection function

The following options are available in the **Console Redirection Settings** submenu when the **Console Redirection** option is enabled.

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** option to specify the remote terminal type.

➔ **VT100**		The target terminal type is VT100
➔ **VT100+**		The target terminal type is VT100+
➔ **VT-UTF8**		The target terminal type is VT-UTF8
➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

➔ **9600**		Sets the serial port transmission speed at 9600.
➔ **19200**		Sets the serial port transmission speed at 19200.
➔ **57600**		Sets the serial port transmission speed at 57600.
➔ **115200**	**DEFAULT**	Sets the serial port transmission speed at 115200.

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

➔ **7**		Sets the data bits at 7.
➔ **8**	**DEFAULT**	Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

➔ **None**	**DEFAULT**	No parity bit is sent with the data bits.
➔ **Even**		The parity bit is 0 if the number of ones in the data bits is even.
➔ **Odd**		The parity bit is 0 if the number of ones in the data bits is odd.
➔ **Mark**		The parity bit is always 1. This option does not provide error detection.
➔ **Space**		The parity bit is always 0. This option does not provide error detection.

➔ **Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

➔ **1**	**DEFAULT**	Sets the number of stop bits at 1.
➔ **2**		Sets the number of stop bits at 2.

4.3.8.1 Legacy Console Redirection Settings

```
Aptio Setup – American Megatrends International, LLC.
Advanced

Legacy Serial Redirection Port   [COM1]

Select a COM port to
display redirection of
Legacy OS and Legacy
OPROM Messages.

---------------------
→←: Select Screen
↑ ↓: Select Item
Enter:  Select
+/-:  Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 14: Legacy Console Redirection Settings

➔ **Legacy Serial Redirection Port [COM1]**

Use the **Legacy Serial Redirection Port** option to select a COM port to display redirection of legacy OS and legacy OPROM messages. Configuration options are listed below.

- COM1 **Default**
- COM2
- COM3
- COM4
- COM5(Pci Bus0, Dev0, Func0) (Disabled)

4.3.9 NVMe Configuration

Use the **NVMe Configuration** (**BIOS Menu 15**) menu to display the NVMe controller and device information.

```
Aptio Setup – American Megatrends International, LLC.
Advanced

NVMe Configuration                          ---------------------
                                            →←: Select Screen
No NVMe Device Found                        ↑ ↓: Select Item
                                            Enter:  Select
                                            +/-:  Change Opt.
                                            F1:   General Help
                                            F2:   Previous Values
                                            F3:   Optimized Defaults
                                            F4:   Save & Exit
                                            ESC:  Exit

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```

BIOS Menu 15: NVMe Configuration

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the PCH IO and System Agent (SA) configuration menus.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
              Aptio Setup – American Megatrends International, LLC.
  Main    Advanced  Chipset  Security    Boot    Save & Exit

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

                                                 ---------------------
                                                 →←: 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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```

BIOS Menu 16: Chipset

4.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 17**) to configure the System Agent (SA) parameters.

```
Aptio Setup – American Megatrends International, LLC.
                    Chapset
System Agent (SA) Configuration                    VT-d capability

VT-d                              Supported
VT-d                              [Disabled]       ---------------------
                                                   →←: Select Screen
> Memory Configuration                             ↑ ↓: Select Item
> Graphics Configuration                           Enter:  Select
> PEG Port Configuration                           +/-:  Change Opt.
                                                   F1:  General Help
                                                   F2:  Previous Values
                                                   F3:  Optimized Defaults
                                                   F4:  Save & Exit
                                                   ESC: Exit
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```

BIOS Menu 17: System Agent (SA) Configuration

➔ **VT-d [Disabled]**

Use the **VT-d** option to enable or disable VT-d support.

➔	**Disabled**	DEFAULT	Disables VT-d support.
➔	**Enabled**		Enables VT-d support.

4.4.1.1 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 18**) to view memory information.

```
Aptio Setup – American Megatrends International, LLC.
Chipset

Memory Configuration

CHA_DIMM0                       Populated & Enabled
    Size                        8192 MB (DDR4)
    Number of Ranks             1
    Manufacturer                UnKnown
CHB_DIMM0                       Populated & Enabled
    Size                        8192 MB (DDR4)
    Number of Ranks             1
    Manufacturer                UnKnown

---------------------
→←: 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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```

BIOS Menu 18: Memory Configuration

4.4.1.2 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 19**) menu to configure the video device connected to the system.

```
Aptio Setup – American Megatrends International, LLC.
                    Chipset

Graphics Configuration                          Select which of
                                                IGFX/PEG/PCI Graphics
Primary Display                  [Auto]         device should be Primary
Internal Graphics                [Enabled]      Display Or select SG for
DVMT Pre-Allocated               [64M]          Switchable Gfx.
DVMT Total Gfx Mem               [MAX]          ----------------------
> LCD 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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```

BIOS Menu 19: Graphics Configuration

➔ **Primary Display [Auto]**

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto **Default**
- IGFX
- PEG
- PCIE

➔ **Internal Graphics [Enabled]**

Use the **Internal Graphics** option to configure whether to keep IGFX enabled. If user wants to support dual display by internal graphics and external graphics, this Internal Graphics option should be set to Enabled and the above Primary Display option should be set to IGFX.

➔ **Auto**		Auto mode
➔ **Disabled**		Disables IGFX.
➔ **Enabled**	**DEFAULT**	Enables IGFX.

➔ **DVMT Pre-Allocated [64M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M **Default**

➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

4.4.1.2.1 LCD Control

Use the **LCD Control** submenu (**BIOS Menu 20**) to select a display device which will be activated during POST.

```
Aptio Setup – American Megatrends International, LLC.
Chipset

LCD Control                                   Select the Video Device which
                                              will be activated during POST.
Primary IGFX Boot Display        [VBIOS Default]  This has no effect if external
                                              graphics present. Secondary
Backlight Control                [LED(PWM)]   boot display selection will
                                              appear based on your
                                              selection. VGA modes will be
                                              supported only on primary
                                              display.

                                              ----------------------
                                              →←: 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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```

BIOS Menu 20: LCD Control

➔ **Primary IGFX Boot Display [VBIOS Default]**

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots**. Configuration options are listed below.**

- VBIOS Default **Default**
- HDMI
- LVDS
- DP1

➔ **Backlight Control [LED (PWM)]**

Use the **Backlight Control** option to specify the backlight control mode. Configuration options are listed below.

- LED (PWM) **Default**
- CCFL (DC)

4.4.1.3 PEG Port Configuration

```
Aptio Setup – American Megatrends International, LLC.
Chipset

PEG Port Configuration                          Enable or Disable the
                                                Root Port
PCIEX8_1                        Not Present
  Enable Root Port              [Enabled]       ----------------------
  Max Link Speed                [Auto]          →←: Select Screen
PCIEX8_2                        Not Present     ↑ ↓: Select Item
  Enable Root Port              [Enabled]       Enter:  Select
  Max Link Speed                [Auto]          +/-:  Change Opt.
                                                F1:   General Help
> PEG Port Feature Configuration                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit

Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 21: PEG Port Configuration

➔ **Enable Root Port [Enabled]**

Use the **Enable Root Port** option to enable or disable the PCI Express (PEG) controller.

➔ **Disabled**		Disables the PCI Express (PEG) controller.
➔ **Enabled**	**DEFAULT**	Enables the PCI Express (PEG) controller.

➔ **Max Link Speed [Auto]**

Use the **Max Link Speed** option to select the maximum link speed of the PCI Express slot. The following options are available:

- Auto **Default**
- Gen1
- Gen2
- Gen3

4.4.1.3.1 PEG Port Feature Configuration

Use the **PEG Port Feature Configuration** submenu (**BIOS Menu 22**) to configure the SA PCIe settings.

```
Aptio Setup – American Megatrends International, LLC.
Chipset

PEG Port Feature Configuration                    Detect Non-Compliance
                                                  PCI Express Device in PEG
Detect Non-Compliance Device     [Disabled]

                                                  ---------------------
                                                  ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  Enter Select
                                                  + -   Change Opt.
                                                  F1    General Help
                                                  F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 22: PEG Port Feature Configuration

➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to detect non-compliance PCIe device in PEG.

➔ **Disabled**	**DEFAULT**	Do not detect non-compliance PCIe device in PEG
➔ **Enabled**		Detect non-compliance PCIe device in PEG

4.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 23**) to configure the PCH parameters.

```
Aptio Setup – American Megatrends International, LLC.
                    Chipset

PCH-IO Configuration                                  Select AC power state
                                                      when power is re-applied
Auto Power Button Status          [Disable (ATX)]     after a power failure.

Restore AC Power Loss             [Last State]        ---------------------
                                                      →←: Select Screen
Power Saving Function(ERP)        [Disabled]          ↑ ↓: Select Item
                                                      Enter:  Select
USB Power SW1                     [+5V DUAL]          +/-:  Change Opt.
USB Power SW2                     [+5V DUAL]          F1:   General Help
                                                      F2:   Previous Values
> PCI Express Configuration                           F3:   Optimized Defaults
> SATA And RST Configuration                          F4:   Save & Exit
> HD Audio Configuration                              ESC:  Exit

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```

BIOS Menu 23: PCH-IO Configuration

➔ **Restore AC Power Loss [Last State]**

Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Saving Function(ERP) [Disabled]**

Use the **Power Saving Function(ERP)** BIOS option to enable or disable the power saving function.

➔ **Disabled**	**DEFAULT**	Power saving function is disabled.
➔ **Enabled**		Power saving function is enabled. It will reduce power consumption when the system is off.

➔ **USB Power SW1 [+5V DUAL]**

Use the **USB Power SW1** BIOS option to configure whether to provide power to the four external USB 3.2 Gen 1 connectors (LAN1_USB1 & LAN2_USB2) when the system is in S3/S4 sleep state. This option is valid only when the above **Power Saving Function (ERP)** BIOS option is disabled.

➔ **+5V DUAL**	**DEFAULT**	Power is provided to the external USB 3.2 connectors when the system is in S3/S4 sleep state
➔ **+5V**		Power is not provided to the external USB 3.2 connectors when the system is in S3/S4 sleep state

➔ **USB Power SW2 [+5V DUAL]**

Use the **USB Power SW2** BIOS option to configure whether to provide power to the two external USB 3.2 Gen 1 connectors (LAN_USB3) and the four internal USB 2.0 connectors when the system is in S3/S4 sleep state. This option is valid only when the above **Power Saving Function (ERP)** BIOS option is disabled.

➔ **+5V DUAL**	**DEFAULT**	Power is provided to the USB connectors when the system is in S3/S4 sleep state
➔ **+5V**		Power is not provided to the USB connectors when the system is in S3/S4 sleep state

4.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 24**) to configure the PCI Express and M.2 slots.

```
Aptio Setup – American Megatrends International, LLC.
                    Chipset

PCI Express Configuration                    PCI Express Root Port
                                             Settings.
> M2_A1                                      ----------------------
> M2_B1                                      →←: Select Screen
> PCIEX4_2                                   ↑ ↓: Select Item
> M2_M1                                      Enter:  Select
> PCIEX4_1                                   +/-:  Change Opt.
                                             F1:   General Help
                                             F2:   Previous Values
                                             F3:   Optimized Defaults
                                             F4:   Save & Exit
                                             ESC:  Exit

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```

BIOS Menu 24: PCI Express Configuration

4.4.2.1.1 PCIEX4_1 Slot, PCIEX4_2 Slot and M.2 Slots

```
Aptio Setup – American Megatrends International, LLC.
                    Chipset

PCIe Speed                      [Auto]       Configure PCIe Speed
Detect Non-Compliance Device    [Disabled]

                                             ----------------------
                                             →←: 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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```

BIOS Menu 25: PCIe Slot Configuration Submenu

➔ **PCIe Speed [Auto]**

Use this option to select the support type of the PCI Express slots. The following options are available:

- Auto **Default**
- Gen1
- Gen2
- Gen3

➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to detect non-compliance PCIe device in PEG.

➔ **Disabled**	**DEFAULT**	Do not detect non-compliance PCIe device in PEG
➔ **Enabled**		Detect non-compliance PCIe device in PEG

4.4.2.2 SATA And RST Configuration

Use the **SATA and RST Configuration** menu (**BIOS Menu 26**) to change and/or set the configuration of the SATA devices installed in the system.

```
Aptio Setup – American Megatrends International, LLC.
                    Chipset

SATA And RST Configuration                      Enable or disable SATA
                                                Device.
SATA Controller(s)              [Enabled]
SATA Mode Selection             [AHCI]

HDD1                            Empty
  Hot Plug                      [Disabled]      ---------------------
HDD2                            Empty           →←: Select Screen
  Hot Plug                      [Disabled]      ↑ ↓: Select Item
HDD3                            Empty           Enter:  Select
  Hot Plug                      [Disabled]      +/-:  Change Opt.
HDD4                            Empty           F1:  General Help
  Hot Plug                      [Disabled]      F2:  Previous Values
M2_M1                           Empty           F3:  Optimized Defaults
  Hot Plug                      [Disabled]      F4:  Save & Exit
                                                ESC: Exit
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```

BIOS Menu 26: SATA and RST Configuration

➔ **SATA Controller(s) [Enabled]**

Use the **SATA Controller(s)** option to configure the SATA controller(s).

➔ **Enabled** **DEFAULT** Enables the on-board SATA controller(s).

➔ **Disabled** Disables the on-board SATA controller(s).

➔ **SATA Mode Selection [AHCI]**

Use the **SATA Mode Selection** option to determine how the SATA devices operate.

➔ **AHCI**	**DEFAULT**	Configures SATA devices as AHCI device.
➔ **Intel RST Premium With Intel Optane System Acceleration**		Configures SATA devices to the Intel RST Premium With Intel Optane System Acceleration mode.

➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the hot plug function.

➔ **Disabled**	**DEFAULT**	Disables the hot plug function.
➔ **Enabled**		Enables the hot plug function.

4.4.2.3 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 27**) to configure the PCH Azalia settings.

```
Aptio Setup – American Megatrends International, LLC.
Chipset

HD Audio Subsystem Configuration Settings

HD Audio                          [Enabled]

Control Detection of the
HD-Audio device.
Disable = HDA will be
unconditionally
disabled
Enabled = HDA will be
unconditionally enabled

----------------------
→←: Select Screen
↑ ↓: Select Item
Enter:  Select
+/-:  Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

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```

BIOS Menu 27: HD Audio Configuration

➔ **HD Audio [Enabled]**

Use the **HD Audio** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled.

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller is enabled.

4.5 Security

Use the **Security** menu (**BIOS Menu 28**) to set system and user passwords.

```
              Aptio Setup – American Megatrends International, LLC.
   Main    Advanced   Chipset   Security    Boot    Save & Exit

Password Description                                  Set Administrator
                                                      Password
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         →←: Select Screen
boot or enter Setup. In Setup the User will           ↑ ↓: Select Item
have Administrator rights.                            Enter:  Select
The password length must be:                          +/-:  Change Opt.
Minimum length                  3                     F1:  General Help
Maximum length                  20                    F2:  Previous Values
                                                      F3:  Optimized Defaults
Administrator Password                                F4:  Save & Exit
User Password                                         ESC: Exit
          Version 2.21.1277 Copyright (C) 2020 American Megatrends, Inc.
```

BIOS Menu 28: Security

➔ **Administrator Password**

Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

4.6 Boot

Use the **Boot** menu (**BIOS Menu 29**) to configure system boot options.

```
              Aptio Setup – American Megatrends International, LLC.
  Main    Advanced   Chipset   Security   Boot    Save & Exit

Boot Configuration                                  Select the keyboard
Bootup NumLock State              [On]              NumLock state
Quiet Boot                        [Enabled]
                                                    ---------------------
Launch PXE OpROM                  [Disabled]        →←: Select Screen
Option ROM Messages               [Force BIOS]      ↑ ↓: Select Item
                                                    Enter:  Select
Boot Option Priorities                              +/-:  Change Opt.
                                                    F1:   General Help
                                                    F2:   Previous Values
                                                    F3:   Optimized Defaults
                                                    F4:   Save & Exit
                                                    ESC:  Exit
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```

BIOS Menu 29: Boot

➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**	**DEFAULT**	Ignore all PXE Option ROMs
➔ **Enabled**		Load PXE Option ROMs.

➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**	**DEFAULT**	Sets display mode to force BIOS.
➔ **Keep Current**		Sets display mode to current.

4.7 Save & Exit

Use the **Safe & Exit** menu (**BIOS Menu 30**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
Aptio Setup – American Megatrends International, LLC.
Main   Advanced   Chipset   Security   Boot   Save & Exit

Save Changes and Reset                    Exit the system after
Discard Changes and Reset                 saving the changes.

Restore Defaults                          ---------------------
Save as User Defaults                     →←: Select Screen
Restore User Defaults                     ↑ ↓: Select Item
                                          Enter:  Select
                                          +/-:  Change Opt.
                                          F1:  General Help
                                          F2:  Previous Values
                                          F3:  Optimized Defaults
                                          F4:  Save & Exit
                                          ESC: Exit

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```

BIOS Menu 30: Save & Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

5

Troubleshooting and Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 3.1**.

5.1 FLEX-BX210 System Maintenance Overview

NOTE:

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the FLEX-BX210 box PC, the system must be properly maintained. If box PC components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

5.2 System Troubleshooting

This section provides some simple troubleshooting suggestions.

5.2.1 The System Doesn't Turn On

If after turning the system on, there is no power (indicated by the power LED on the front panel not turning on) please do the following:

Step 1: Check that the power cable connector is properly connected to the system rear panel.

Step 2: Check that the power cable connector is properly plugged into the power source.

Step 3: Make sure the power button is turned on.

Step 4: Plug the system into a monitor and check to see if anything appears on the screen. If the boot-up screen appears it means the power LED has failed. To fix this problem, contact an IEI sales representative directly.

5.2.2 The System Doesn't Boot Up

If the system doesn't boot up please do the following:

Step 1: Check the power is turned on. See Section 5.2.1 above.

Step 2: Make sure the SO-DIMM modules are properly installed.

5.2.3 More Troubleshooting

Nothing appears on the monitor after booting up the system: Make sure the monitor is properly connected to the system and the monitor is connected to a power supply and turned on.

WARNING!

If all troubleshooting measures have been taken and the system still fails to start, contact the IEI reseller or vendor you purchased the FLEX-BX210 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

5.3 Component Replacement

WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the FLEX-BX210 box PC. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the FLEX-BX210 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

Chapter

6

Interface Connectors

6.1 Peripheral Interface Connectors

The FLEX-BX210 box PC motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1** and **Figure 6-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams. The connector pinouts for these connectors are listed in the following sections.

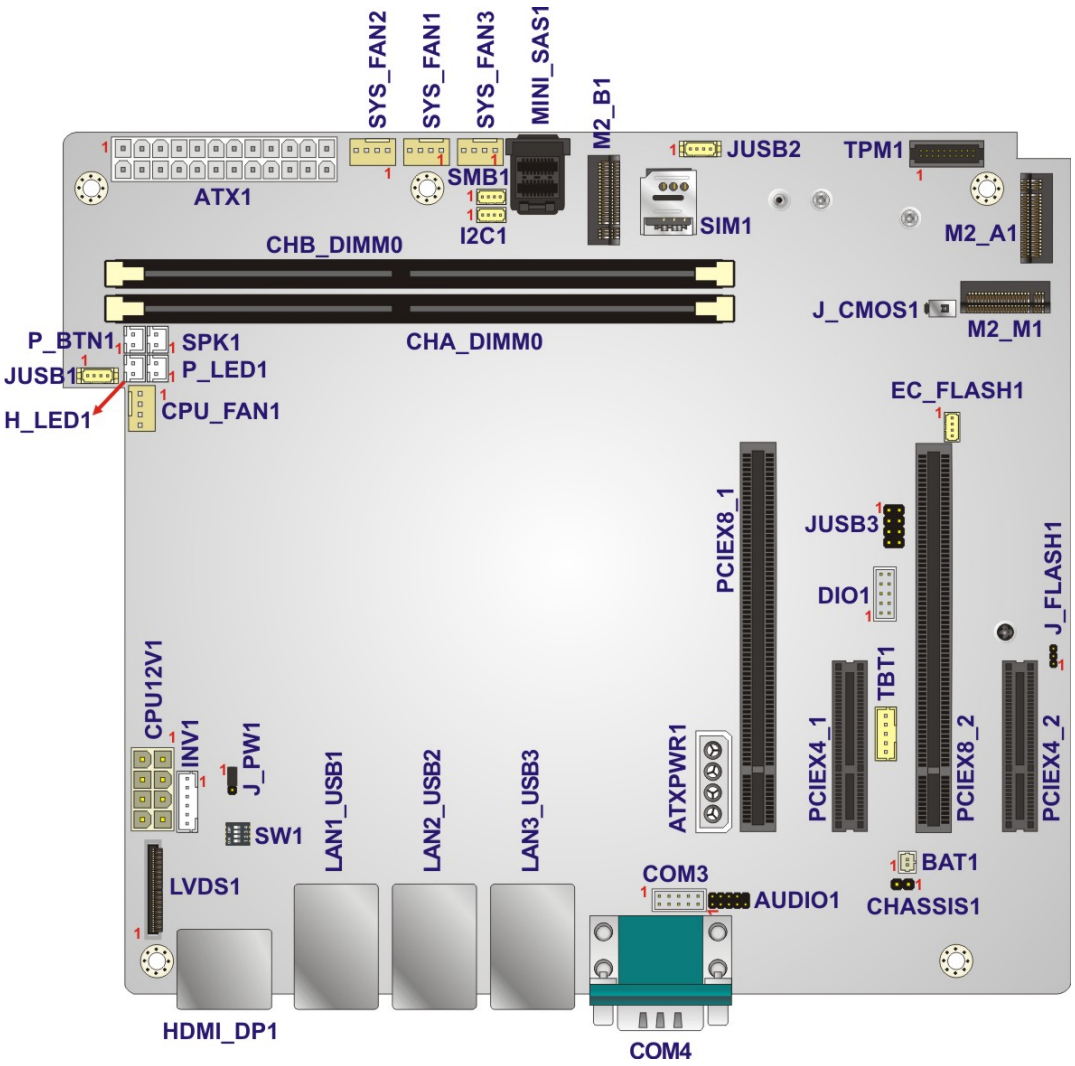

Figure 6-1: Main Board Layout Diagram (Front Side)

6.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the FLEX-BX210 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
ATX power input connector	24-pin Molex	ATX1
Additional power connector	4-pin connector	ATXPWR1
Audio connector	10-pin header	AUDIO1
Battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
CPU power connector	8-pin Molex	CPU12V1
DIMM sockets	DDR4 DIMM socket	CHA_DIMM0, CHB_DIMM0
DIO connector	10-pin box header	DIO1
EC debug connector	4-pin wafer	EC_FLASH1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	4-pin wafer	SYS_FAN1, SYS_FAN2, SYS_FAN3
I^2C connector	4-pin wafer	I2C1
LED connector, HDD	2-pin wafer	H_LED1
LED connector, power	2-pin wafer	P_LED1
LVDS connector	40-pin wire-to-board	LVDS1
LVDS backlight connector	6-pin wafer	INV1
Mini SAS connector	Mini SAS	MINI_SAS1
M.2 M-key slot	M.2 2280 M-key	M2_M1
M.2 B-key slot	M.2 3042 B-key	M2_B1
M.2 A-key slot	M.2 2230 A-key	M2_A1
PCIe x4 slots	PCIe x4 slot	PCIEX4_1, PCIEX4_2
PCIe x8 slots	PCIe x16 slot	PCIEX8_1, PCIEX8_2
Power button connector	2-pin wafer	P_BTN1
RS-422/485 connector (dual)	10-pin box header	COM3

Connector	Type	Label
SIM card slot	Micro SIM slot	SIM1
SMBus connector	4-pin wafer	SMB1
Speaker connector	2-pin wafer	SPK1
TPM connector	20-pin box header	TPM1
USB 2.0 connectors (single)	4-pin wafer	JUSB1, JUSB2
USB 2.0 connector (dual)	8-pin header	JUSB3

Table 6-1: Peripheral Interface Connectors

6.2.1 ATX Power Input Connector (ATX1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC3V	13	VCC3V
2	VCC3V	14	-VCC12V
3	GND	15	GND
4	VCC5V	16	PS_ON
5	GND	17	GND
6	VCC5V	18	GND
7	GND	19	GND
8	PWR_OK	20	NC
9	SB5V	21	VCC5V
10	VCC12V	22	VCC5V
11	VCC12V	23	VCC5V
12	VCC3V	24	GND

Table 6-2: ATX Power Input Connector (ATX1) Pinouts

6.2.2 Additional Power Connector (ATXPWR1)

PIN NO.	DESCRIPTION
1	VCC12V
2	GND
3	GND
4	VCC5V

Table 6-3: Additional Power Connector (ATXPWR1) Pinouts

6.2.3 Audio Connector (AUDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FRONT-R	2	LINE-R
3	GND	4	GND
5	FRONT-L	6	LINE-L
7	GND	8	GND
9	MIC1-CONN-R	10	MIC-CONN-L

Table 6-4: Audio Connector (AUDIO1) Pinouts

6.2.4 Battery Connector (BAT1)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 6-5: Battery Connector (BAT1) Pinouts

6.2.5 Chassis Intrusion Connector (CHASSIS1)

PIN NO.	DESCRIPTION
1	VCC3V
2	CHASSIE

Table 6-6: Chassis Intrusion Connector (CHASSIS1) Pinouts

6.2.6 CPU Power Connector (CPU12V1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	VCC12V
2	GND	6	VCC12V
3	GND	7	VCC12V
4	GND	8	VCC12V

Table 6-7: CPU Power Connector (CPU12V1)

6.2.7 DIO Connector (DIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

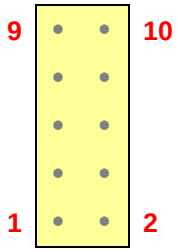

Table 6-8: DIO Connector (DIO1) Pinouts

6.2.8 EC Debug Connector (EC_FLASH1)

PIN NO.	DESCRIPTION
1	GND
2	EC_FLASH_DATA
3	EC_FLASH_CLK
4	NC

Table 6-9: EC Debug Connector (EC_FLASH1) Pinouts

6.2.9 Fan Connector, CPU (CPU_FAN1)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FANIO
4	PWM

Table 6-10: CPU Fan Connector (CPU_FAN1) Pinouts

6.2.10 Fan Connectors, System (SYS_FAN1, SYS_FAN2, SYS_FAN3)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FANIO
4	PWM

Table 6-11: System Fan Connectors (SYS_FAN1, SYS_FAN2, SYS_FAN3) Pinouts

6.2.11 I^2C Connector (I2C1)

PIN NO.	DESCRIPTION
1	GND
2	I2C_DATA
3	I2C_CLK
4	+5V

Table 6-12: I^2C Connector (I2C1) Pinouts

6.2.12 LED Connector, HDD (H_LED1)

PIN NO.	DESCRIPTION
1	VCC5V
2	SATA_LED#

Table 6-13: HDD LED Connector (H_LED1) Pinouts

6.2.13 LED Connector, Power (P_LED1)

PIN NO.	DESCRIPTION
1	VCC5V
2	GND

Table 6-14: Power LED Connector (P_LED1) Pinouts

6.2.14 LVDS Connector (LVDS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_VCC	2	LCD_VCC
3	LCD_VCC	4	LCD_VCC
5	LCD_VCC	6	NC
7	NC	8	GND
9	GND	10	GND
11	GND	12	CLK2P
13	CLK2M	14	GND
15	A7P	16	A7M
17	GND	18	A6P
19	A6M	20	GND
21	A5P	22	A5M
23	GND	24	A4P
25	A4M	26	GND
27	A3P	28	A3M
29	GND	30	CLK1P
31	CLK1M	32	GND
33	A2P	34	A2M
35	GND	36	A1P
37	A1M	38	GND
39	A0P	40	A0M

Table 6-15: LVDS Connector (LVDS1) Pinouts

6.2.15 LVDS Backlight Connector (INV1)

PIN NO.	DESCRIPTION
1	VCC12V
2	VCC12V
3	Backlight ON/OFF
4	Backlight Brightness Control
5	GND
6	GND

Table 6-16: LVDS Backlight Connector (INV1) Pinouts

6.2.16 Mini SAS Connector (MINI_SAS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	NC	B1	NC
A2	NC	B2	NC
A3	GND	B3	GND
A4	SATA_RX1+	B4	SATA_RX0+
A5	SATA_RX1-	B5	SATA_RX0-
A6	GND	B6	GND
A7	SATA_RX3+	B7	SATA_RX2+
A8	SATA_RX3-	B8	SATA_RX2-
A9	GND	B9	GND
C1	NC	D1	NC
C2	NC	D2	NC
C3	GND	D3	GND
C4	SATA_TX1+	D4	SATA_TX0+
C5	SATA_TX1-	D5	SATA_TX0-
C6	GND	D6	GND
C7	SATA_TX3+	D7	SATA_TX2+
C8	SATA_TX3-	D8	SATA_TX2-
C9	GND	D9	GND

Table 6-17: Mini SAS Connector (MINI_SAS1) Pinouts

6.2.17 Power Button Connector (P_BTN1)

PIN NO.	DESCRIPTION
1	PWRBTN_SW#
2	GND

Table 6-18: Power Button Connector (P_BTN1) Pinouts

6.2.18 RS-422/485 Connector (COM3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM3_TX-	2	COM4_TX-
3	COM3_TX+	4	COM4_TX+
5	COM3_RT-	6	COM4_RT-
7	COM3_RX+	8	COM4_RX+
9	GND	10	GND

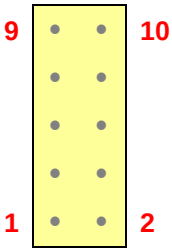

Table 6-19: RS-422/485 Connector (COM3) Pinouts

6.2.19 SMBus Connector (SMB1)

PIN NO.	DESCRIPTION
1	GND
2	SMB_DATA
3	SMB_CLK
4	VCC5V

Table 6-20: SMBus Connector (SMB1) Pinouts

6.2.20 Speaker Connector (SPK1)

PIN NO.	DESCRIPTION
1	VCC5V
2	PC_BEEP

Table 6-21: Speaker Connector (SPK1) Pinouts

6.2.21 TPM Connector (TPM1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CLOCK	2	GND
3	FRAME	4	NC
5	RESET	6	VCC5V
7	LAD3	8	LAD2
9	VCC3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN
19	LPCPD	20	DRQ

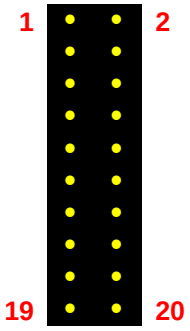

Table 6-22: TPM Connector (TPM1) Pinouts

6.2.22 USB 2.0 Connectors, Single (JUSB1, JUSB2)

PIN NO.	DESCRIPTION
1	SB5V
2	DATA-
3	DATA+
4	GND

Table 6-23: Single USB 2.0 Connectors (JUSB1, JUSB2) Pinouts

6.2.23 USB 2.0 Connectors, Dual (JUSB3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SB5V	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	SB5V

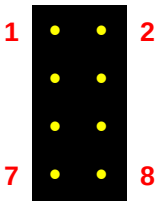

Table 6-24: Dual USB 2.0 Connector (JUSB3) Pinouts

6.3 Jumpers

The following table shows a list of jumpers on the FLEX-BX210 motherboard.

Jumper Name	Type	Label
Clear CMOS	Button	J_CMOS1
Flash descriptor security override	3-pin header	J_FLASH1
LVDS panel resolution selection	DIP switch	SW1
Panel voltage selection	3-pin header	J_PW1

Table 6-25: Jumpers

6.3.1 Clear CMOS Jumper (J_CMOS1)

Status	Description
Normal	Keep current BIOS setup (Default)
Push	Clear BIOS

Table 6-26: Clear CMOS Jumper (J_CMOS1) Settings

6.3.2 Flash Descriptor Security Override Jumper (J_FLASH1)

Pin	Description
Short 1-2	Disabled (default)
Short 2-3	Enabled

Table 6-27: Flash Descriptor Security Override Jumper (J_FLASH1) Settings

To update the ME firmware, please follow the steps below.

Step 1: Before turning on the system power, short pin 2-3 of the Flash Descriptor Security Override jumper.

Step 2: Update the BIOS and ME firmware, and then turn off the system power.

Step 3: Remove the metal clip on the Flash Descriptor Security Override jumper or return to its default setting (short pin 1-2).

Step 4: Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

6.3.3 Panel Voltage Selection Jumper (J_PW1)

Pin	Description
Short 1-2	Keep VCC3V Panel Setup
Short 2-3	Keep VCC5V Panel Setup

Table 6-28: Panel Voltage Selection Jumper (J_PW1) Settings

6.3.4 LVDS Panel Resolution Selection Switch (SW1)

4-3-2-1 (ON=0, OFF=1;)	Description
0000	800x600 18-bit Single (Default)
0001	1024x768 18-bit Single
0010	1024x768 24-bit Single
0011	1280x768 18-bit Single
0100	1280x800 18-bit Single
0101	1280x960 18-bit Single
0110	1280x1024 24-bit Dual
0111	1366x768 18-bit Single
1000	1366x768 24-bit Single
1001	1440x960 24-bit Dual
1010	1400x1050 24-bit Dual
1011	1600x900 24-bit Dual
1100	1680x1050 24-bit Dual
1101	1600x1200 24-bit Dual
1110	1920x1080 24-bit Dual
1111	1920x1200 24-bit Dual

Table 6-29: LVDS Panel Resolution Selection Switch (SW1) Settings

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment is in conformity with the following EU directives:

- EMC Directive 2014/30/EU
- Low-Voltage Directive 2014/35/EU
- RoHS II Directive 2015/863/EU

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the R&TTE Directive 1999/5/EC.

English IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Български [Bulgarian] IEI Integration Corp. декларира, че този оборудване е в съответст□ие със съществените изисквания и другите приложими правила на Директива 1999/5/EC.
Česky [Czech] IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/□S.
Dansk [Danish] IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav c øvrige relevante krav i direktiv 1999/5/EF.
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Español [Spanish] IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek] IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French] IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5□CE.
Italiano [Italian] IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
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Português [Portuguese] IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras□disposições da Directiva 1999/5/CE.

Româna [Romanian] IEI Integration Corp declară că acest echipament este in conformitate cu cerinţele esenţiale şi cu celelalte prevederi relevante ale Directivei 1999/5/CE.
Slovensko [Slovenian] IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak] IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 199□/5/ES.
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ROHS STATEMENT

The label on the product indicates this product complies to European (EU) Restriction of Hazardous Substances (RoHS) that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.

CHINA ROHS

The label on the product indicates the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/ components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Appendix

B

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the FLEX-BX210.

B.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the device is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the FLEX-BX210 is being installed, moved or modified.
- ***To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.*** To fully disengage the power to the unit, please disconnect the power cord from the power outlet. Refer servicing to qualified service personnel. The power outlet shall be readily available and accessible.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
- ***Electric shocks can occur*** if the FLEX-BX210 chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
- ***Do not drop or insert any objects*** into the ventilation openings of the FLEX-BX210.

- ***If considerable amounts of dust, water, or fluids enter the* device**, turn off the power supply immediately, unplug the power cord, and contact the FLEX-BX210 vendor.
- ***This equipment is not suitable for use in locations where children are likely to be present.***
- **DO NOT**:
  - Drop the device against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the FLEX-BX210 may result in permanent damage to the FLEX-BX210 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the FLEX-BX210. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the FLEX-BX210 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

B.1.3 Product Disposal

CAUTION:

Risk of explosion if the battery is replaced by an incorrect type;

Replacement of a battery with an incorrect type that can defeat a safeguard (for example, in the case of some lithium battery types);

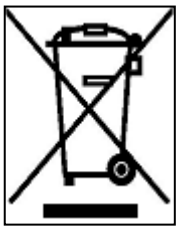
Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;

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;

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the FLEX-BX210, please follow the guidelines below.

WARNING:

- For safety reasons, turn-off the power and unplug the box PC before cleaning.
- If you dropped any material or liquid such as water onto the box PC when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the FLEX-BX210, please read the details below.

- Never spray or squirt liquids directly onto any other components. To clean the box PC, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the device does not require cleaning. Keep fluids away from the device interior.
- Be cautious of all small removable components when vacuuming the device.
- Never drop any objects or liquids through the openings of the device.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the device.
- Avoid eating, drinking and smoking within vicinity of the device.

B.2.2 Cleaning Tools

Some components in the FLEX-BX210 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the FLEX-BX210.

- ***Cloth***– Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the device.

- ***Water or rubbing alcohol***–A cloth moistened with water or rubbing alcohol can be used to clean the device.
- ***Using solvents***–The use of solvents is not recommended when cleaning the device as they may damage the plastic parts.
- ***Vacuum cleaner***–Using a vacuum specifically designed for computers is one of the best methods of cleaning the device. Dust and dirt can restrict the airflow in the device and cause its circuitry to corrode.
- ***Cotton swabs***–Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- **Foam swabs**–Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

BIOS Menu Options

Below is a list of BIOS configuration options described in **Chapter 4**.

- ☐ **System Date [xx/xx/xx]** 37
- ☐ **System Time [xx:xx:xx]** 37
- ☐ **Intel (VMX) Virtualization Technology [Disabled]** 38
- ☐ **Active Processor Cores [All]** 39
- ☐ **Hyper-threading [Enabled]** 39
- ☐ **Intel(R) SpeedStep(tm) [Enabled]** 39
- ☐ **C states [Disabled]** 39
- ☐ **AMT BIOS Features [Enabled]** 40
- ☐ **Unconfigure ME [Disabled]** 41
- ☐ **TPM Device Selection [dTPM (If supported)]** 41
- ☐ **Security Device Support [Disable]** 42
- ☐ **ACPI Sleep State [S3 (Suspend to RAM)]** 43
- ☐ **Serial Port [Enabled]** 45
- ☐ **PC Health Status** 45
- ☐ **CPU_FAN1 Smart Fan Control/SYS_FAN Smart Fan Control [Auto Mode]** 47
- ☐ **Auto mode fan start temperature** 47
- ☐ **Auto mode fan off temperature** 47
- ☐ **Auto mode fan start PWM** 47
- ☐ **Auto mode fan slope PWM** 47
- ☐ **Wake system with Fixed Time [Disabled]** 48
- ☐ **Console Redirection [Disabled]** 50
- ☐ **Terminal Type [ANSI]** 50
- ☐ **Bits per second [115200]** 50
- ☐ **Data Bits [8]** 50
- ☐ **Parity [None]** 51
- ☐ **Stop Bits [1]** 51
- ☐ **Legacy Serial Redirection Port [COM1]** 52
- ☐ **VT-d [Disabled]** 55
- ☐ **Primary Display [Auto]** 57
- ☐ **Internal Graphics [Enabled]** 58
- ☐ **DVMT Pre-Allocated [64M]** 58
- ☐ **DVMT Total Gfx Mem [MAX]** 58
- ☐ **Primary IGFX Boot Display [VBIOS Default]** 59

- Backlight Control [LED (PWM)] 59
- Enable Root Port [Enabled] 60
- Max Link Speed [Auto] 60
- Detect Non-Compliance Device [Disabled] 61
- Restore AC Power Loss [Last State] 62
- Power Saving Function(ERP) [Disabled] 63
- USB Power SW1 [+5V DUAL] 63
- USB Power SW2 [+5V DUAL] 63
- PCIe Speed [Auto] 65
- Detect Non-Compliance Device [Disabled] 65
- SATA Controller(s) [Enabled] 66
- SATA Mode Selection [AHCI] 67
- Hot Plug [Disabled] 67
- HD Audio [Enabled] 68
- Administrator Password 69
- User Password 69
- Bootup NumLock State [On] 70
- Quiet Boot [Enabled] 71
- Launch PXE OpROM [Disabled] 71
- Option ROM Messages [Force BIOS] 71
- Save Changes and Reset 72
- Discard Changes and Reset 72
- Restore Defaults 72
- Save as User Defaults 72
- Restore User Defaults 72

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE      W_LOOP     ;No, restart the application

        MOV    AX, 6F02H     ;disable Watchdog Timer
        MOV    BL, 0         ;
        INT      15H
;
; EXIT ;
```

Appendix

E

Error Beep Code

E.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

E.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

F

Hazardous Materials Disclosure

F.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Display	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.

F.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在SJ/T11364-2014與GB/T26572-2011标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。