



MODEL:
PUZZLE-IN003B

Desktop Network Appliance with Intel® Atom® C3000 Series Processor, Four DDR4, Six GbE Ports, Two 10GbE SFP+, Two M.2, PCIe Mini, Rack Mount, and RoHS Compliant

User Manual



Revision

| Date | Version | Changes |
|------------------|---------|--|
| December 2, 2020 | 1.01 | Detailed Table 1-2: Technical Specifications Updated Table 3-2: RJ-45 1GbE Connector LEDs |
| June 9, 2020 | 1.00 | Initial release |



Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

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.

Table of Contents

| | |
|--|-----------|
| 1 INTRODUCTION..... | 1 |
| 1.1 OVERVIEW..... | 2 |
| 1.2 MODEL VARIATIONS | 2 |
| 1.3 FEATURES..... | 3 |
| 1.4 FRONT PANEL | 4 |
| 1.5 REAR PANEL..... | 4 |
| 1.6 TECHNICAL SPECIFICATIONS | 5 |
| 1.7 DIMENSIONS..... | 7 |
| 2 UNPACKING | 8 |
| 2.1 ANTI-STATIC PRECAUTIONS | 9 |
| 2.2 UNPACKING PRECAUTIONS..... | 9 |
| 2.3 PACKING LIST..... | 10 |
| 2.4 OPTIONAL ITEMS | 11 |
| 3 INSTALLATION | 12 |
| 3.1 INSTALLATION PRECAUTIONS | 13 |
| 3.2 TOP COVER REMOVAL | 14 |
| 3.3 DIMM INSTALLATION | 14 |
| 3.4 M.2 MODULE INSTALLATION..... | 16 |
| 3.5 PCIe MINI CARD INSTALLATION | 17 |
| 3.5.1 <i>Half-size PCIe Mini Card Installation</i> | 18 |
| 3.5.2 <i>SIM Card Installation</i> | 18 |
| 3.6 EXTERNAL INTERFACE CONNECTION | 21 |
| 3.6.1 <i>LAN Connection - 1GbE</i> | 22 |
| 3.6.2 <i>LAN Connection - 10GbE SFP+</i> | 23 |
| 3.6.3 <i>Console Connection</i> | 24 |
| 3.6.3.1 <i>Enable Console Port When Booting</i> | 24 |
| 3.7 MOUNTING THE SYSTEM | 27 |
| 3.8 POWER-ON PROCEDURE..... | 27 |
| 3.9 RESOURCE DOWNLOAD..... | 29 |



- 3.10 SYSTEM CONFIGURATION 29
 - 3.10.1 Jumper Settings..... 30
 - 3.10.1.1 Clear CMOS..... 30
 - 3.10.1.2 Flash Descriptor Security Override Jumper..... 31
- 4 BIOS 32**
 - 4.1 INTRODUCTION..... 33
 - 4.1.1 Starting Setup..... 33
 - 4.1.2 Using Setup..... 33
 - 4.1.3 Getting Help..... 34
 - 4.1.4 Unable to Reboot after Configuration Changes 34
 - 4.1.5 BIOS Menu Bar..... 34
 - 4.2 MAIN..... 35
 - 4.3 ADVANCED 36
 - 4.3.1 Trusted Computing..... 37
 - 4.3.2 IT8528 Super IO Configuration 38
 - 4.3.2.1 Serial Port 1 Configuration 38
 - 4.3.3 iWDD H/W Monitor..... 39
 - 4.3.3.1 Smart Fan Mode Configuration (C0 SKU Only)..... 40
 - 4.3.4 Serial Port Console Redirection 42
 - 4.3.4.1 Legacy Console Redirection Settings 44
 - 4.3.5 NVMe Configuration..... 45
 - 4.4 INTELRCSETUP 45
 - 4.4.1 Processor Configuration 46
 - 4.4.2 North Bridge Chipset Configuration 47
 - 4.4.3 South Bridge Chipset Configuration..... 48
 - 4.4.3.1 SATA Configuration..... 48
 - 4.4.3.2 PCIE IP Configuration 49
 - 4.5 SECURITY 50
 - 4.6 BOOT..... 51
 - 4.7 SAVE & EXIT 53
- 5 INTERFACE CONNECTORS 54**
 - 5.1 PERIPHERAL INTERFACE CONNECTORS..... 55
 - 5.2 INTERNAL PERIPHERAL CONNECTORS 56



PUZZLE-IN003B

| | |
|--|-----------|
| 5.2.1 Battery Connector (BAT1) | 57 |
| 5.2.2 CPLD Programmer Connector (J8) | 57 |
| 5.2.3 Debug Port (DBG_PORT1)..... | 57 |
| 5.2.4 Fan Connectors (CPU_FAN1/2 & SYS_FAN1) | 58 |
| 5.2.5 M.2 A-key Slot (M2_CN1)..... | 58 |
| 5.2.6 M.2 M-key Slot (M2_M1)..... | 59 |
| 5.2.7 PCIe Mini Card Slot (MINI_PCIE1) | 61 |
| 5.2.8 Power Button Connector (PWR_BTN1) | 62 |
| 5.2.9 SATA Connector (SATA1)..... | 62 |
| 5.2.10 SATA Power Connector (SATA_PWR1)..... | 62 |
| 5.2.11 SPI Flash Connector (J1)..... | 62 |
| 5.2.12 SPI Flash Connector - EC (J7)..... | 63 |
| 5.2.13 TPM Connector (TPM1)..... | 63 |
| A REGULATORY COMPLIANCE | 64 |
| B SAFETY PRECAUTIONS | 69 |
| B.1 SAFETY PRECAUTIONS..... | 70 |
| B.1.1 General Safety Precautions | 70 |
| B.1.2 Anti-static Precautions | 71 |
| B.1.3 Product Disposal | 72 |
| B.2 MAINTENANCE AND CLEANING PRECAUTIONS | 73 |
| B.2.1 Maintenance and Cleaning..... | 73 |
| B.2.2 Cleaning Tools..... | 73 |
| C HAZARDOUS MATERIALS DISCLOSURE | 74 |
| C.1 RoHS II DIRECTIVE (2015/863/EU) | 75 |
| C.2 CHINA RoHS | 76 |



List of Figures

| | |
|---|----|
| Figure 1-1: PUZZLE-IN003B Series | 2 |
| Figure 1-2: Front Panel | 4 |
| Figure 1-3: Rear Panel..... | 4 |
| Figure 1-4: Physical Dimensions (millimeters)..... | 7 |
| Figure 3-1: Top Cover Removal | 14 |
| Figure 3-2: DIMM Slot Locations..... | 15 |
| Figure 3-3: PCIe Mini Slot Location | 17 |
| Figure 3-4: SIM Card Slot Location..... | 19 |
| Figure 3-5: Unlock SIM Card Slot Cover | 19 |
| Figure 3-6: SIM Card Installation..... | 20 |
| Figure 3-7: Lock SIM Card Slot Cover | 20 |
| Figure 3-8: RJ-45 1GbE Connector | 22 |
| Figure 3-9: 10GbE SFP+ Connector..... | 23 |
| Figure 3-10: Rack Mounting Bracket Installation | 27 |
| Figure 3-11: Power-on..... | 28 |
| Figure 3-12: IEI Resource Download Center..... | 29 |
| Figure 3-13: Clear CMOS Jumper Location | 30 |
| Figure 3-14: Flash Descriptor Security Override Jumper Location | 31 |

List of Tables

| | |
|--|----|
| Table 1-1: PUZZLE-IN003B Model Variations | 2 |
| Table 1-2: Technical Specifications..... | 6 |
| Table 3-1: 1GbE Port Pinouts | 22 |
| Table 3-2: RJ-45 1GbE Connector LEDs | 22 |
| Table 3-3: 10GbE Port Pinouts | 23 |
| Table 3-4: RJ-45 Serial Port Pinouts..... | 24 |
| Table 3-5: Clear BIOS Jumper Settings..... | 30 |
| Table 3-6: Flash Descriptor Security Override Jumper Settings..... | 31 |
| Table 4-1: BIOS Navigation Keys | 34 |
| Table 5-1: Battery Connector (BAT1) Pinouts | 57 |
| Table 5-2: CPLD Programmer Connector (J8) Pinouts..... | 57 |
| Table 5-3: Debug Port (DBG_PORT1) Pinouts..... | 57 |
| Table 5-4: Fan Connectors (CPU_FAN1/2 & SYS_FAN1) Pinouts | 58 |
| Table 5-5: M.2 A-key Slot (M2_CN1) Pinouts | 59 |
| Table 5-6: M.2 M-key Slot (M2_M1) Pinouts | 60 |
| Table 5-7: PCIe Mini Card Slot (MINI_PCIE1) Pinouts..... | 61 |
| Table 5-8: Power Button Connector (PWR_BTN1) Pinouts..... | 62 |
| Table 5-9: SATA 6Gb/s Connector (SATA1) Pinouts | 62 |
| Table 5-10: SATA Power Connector (SATA_PWR1) Pinouts | 62 |
| Table 5-11: SPI Flash Connector (J1) Pinouts..... | 62 |
| Table 5-12: SPI Flash Connector (J7) Pinouts..... | 63 |

Chapter

1

Introduction



1.1 Overview



Figure 1-1: PUZZLE-IN003B Series

The PUZZLE-IN003B is a compact desktop network appliance series powered by Intel® Atom® C3758/C3558 processor. It is optimized to host VNFs (Virtual Network Functions) and is ideal for SD-WAN.

The PUZZLE-IN003B supports six copper GbE ports and two 10GbE SFP+ connections for high-speed network applications. WWAN capability provided by the on-board PCIe Mini slot and the SIM card slot ensures smooth network connectivity.

It is also equipped with one M.2 M-key (2260/2280) slot to support PCIe SSD and one SATA 6Gb/s connector to support SATADOM, providing a variety of storage interfaces for users to choose.

1.2 Model Variations

The model variations of the PUZZLE-IN003B are listed below.

| | CPU | Thermal Solution |
|---------------------|---|------------------|
| PUZZLE-IN003B-C0/8G | Intel® Atom® C3758 (up to 2.20 GHz, 16M cache) | Two system fans |
| PUZZLE-IN003B-C1/8G | Intel® Atom® C3558 (up to 2.20 GHz, 8M cache) | Fanless |

Table 1-1: PUZZLE-IN003B Model Variations



PUZZLE-IN003B

1.3 Features

The PUZZLE-IN003B features are listed below:

- Powered by Intel® Atom® C3000 series processor
- Support four 2133 MHz DDR4 ECC/non-ECC UDIMMs/RDIMMs (UDIMM up to 64 GB / RDIMM up to 128 GB)
- Supports up to six GbE connections via Intel® I211-AT Ethernet controllers and Marvell 88E1512 PHY
- Supports up to two 10GbE SFP+ via CPU
- Upgradable with future expansion cards by one M.2 M-key slot, one M.2 A-key slot and one PCIe Mini card slot
- One RJ-45 console port
- Supports one USB 3.2 Gen 1 (5Gb/s) port and one USB 2.0 port
- Supports SATADOM
- RoHS compliant

1.4 Front Panel

The overview of the front panel is shown in **Figure 1-2**.

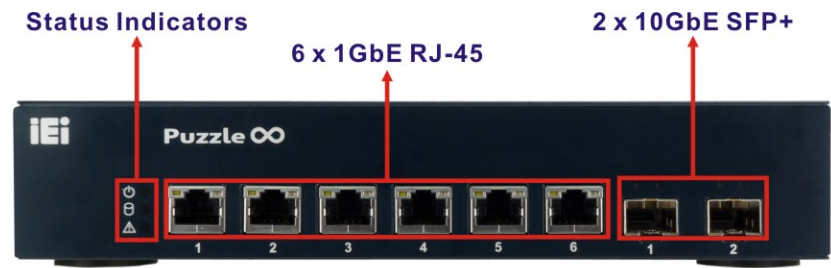


Figure 1-2: Front Panel

The states of the LED indicators located on the front panel are listed below.

| | | |
|--|----------------|---------------------------|
|  Power LED | Off | The system is turned off. |
| | Blue | The system is turned on. |
|  SSD Status LED | Off | No SSD activity |
| | Blinking Green | SSD activity |
|  Alert LED | Off | No alert |
| | Red | Alert message |

1.5 Rear Panel

An overview of the PUZZLE-IN003B rear panel is shown in **Figure 1-3** below.



Figure 1-3: Rear Panel

PUZZLE-IN003B

1.6 Technical Specifications

The PUZZLE-IN003B technical specifications are listed in **Table 1-2**.

| System | |
|--|---|
| CPU (SoC) | Intel® Atom® C3000 series processor C0: Intel® Atom® C3758 (up to 2.20 GHz, 16M cache) C1: Intel® Atom® C3558 (up to 2.20 GHz, 8M cache) |
| Chipset | Integrated in CPU |
| Memory | Four 288-pin 2133 MHz DDR4 ECC/non-ECC UDIMM/RDIMM slots (UDIMM up to 64 GB / RDIMM up to 128 GB) Pre-installed with one 8 GB memory |
| Networking | 6 x Copper 1GbE LAN port (by Intel® I211-AT Ethernet controllers and Marvell 88E1512 PHY) 2 x 10GbE SFP+ (by CPU) |
| Network Acceleration and Security | C0: <ul style="list-style-type: none">• Intel® AES New Instructions• Intel® Software Guard Extensions (Intel® SGX)• Intel® Memory Protection Extensions (Intel® MPX) C1: <ul style="list-style-type: none">• Intel® AES New Instructions• Intel® Software Guard Extensions (Intel® SGX)• Intel® Boot GuardNo• Intel® QuickAssist Technology (Intel® QAT) |
| Storage | 1 x SATA 6Gb/s connector (with one 5 V SATA power connector) for SATADOM 1 x M.2 2260/2280 M-key slot (supports PCIe 3.0 x4 nVME) |
| eMMC | 32 GB eMMC |
| Expansions | |
| PCIe Mini | 1 x Full-size/Half-size PCIe Mini slot (USB 2.0, PCIe 3.0 x1) with SIM card slot |
| M.2 | 1 x M.2 2230 A-key slot (USB 2.0, PCIe x1) |



| I/O and Indicators | | |
|------------------------------|---|---|
| Console | 1 x RJ-45 | |
| USB | 1 x USB 3.2 Gen 1 (5 Gb/s) port (external, Type A) 1 x USB 2.0 port (external, Type A) | |
| Indicator | Power status (blue) SSD status (green) Alert LED (programmable, red) | |
| Switch/Button | Power switch Reset button | |
| TPM | 1 x TPM 2.0 (2x10 pin header) | |
| Antenna Connector | 2 x Knockout hole for Wi-Fi/WWAN antenna connector | |
| Power | | |
| Power Input | 1 x DC-in jack | |
| Type/Watt | 12 V DC-in, 60 W | |
| Thermal Solution | CPU | 1 x Passive heat sink for CPU |
| | System | C0: two system fans C1: fanless system |
| Environmental and Mechanical | | |
| Mounting | Desktop, rack mount | |
| Operating Temperature | 0°C~40°C (32°F~104°F) | |
| Storage Temperature | -20°C~75°C (-4°F~167°F) | |
| Operating Humidity | 5%~90%, non-condensing | |
| Safety | CE, FCC | |
| Weight | 2 kg | |
| Physical Dimensions | 225.0 mm x 206.0 mm x 44.2 mm (W x D x H) | |
| Operating System | Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10 | |

Table 1-2: Technical Specifications



PUZZLE-IN003B**1.7 Dimensions**

The physical dimensions are shown below:

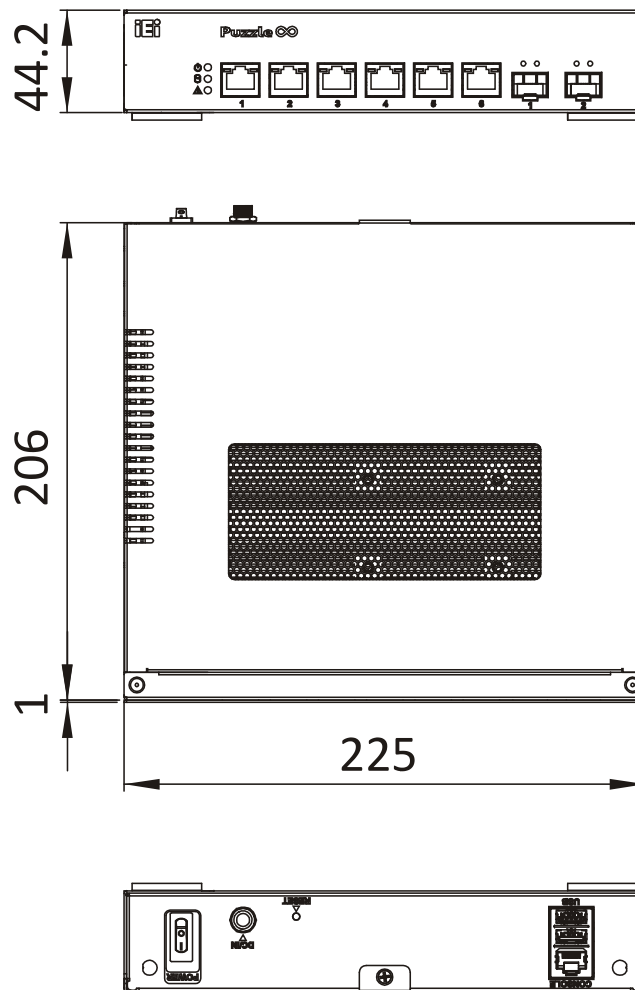


Figure 1-4: Physical Dimensions (millimeters)

Chapter

2

Unpacking

PUZZLE-IN003B

2.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during installation may result in permanent damage to the PUZZLE-IN003B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PUZZLE-IN003B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PUZZLE-IN003B or any other electrical component is 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 PUZZLE-IN003B, place it on an anti-static pad. This reduces the possibility of ESD damaging the PUZZLE-IN003B.

2.2 Unpacking Precautions

When the PUZZLE-IN003B is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the PUZZLE-IN003B does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.






2.3 Packing List




NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PUZZLE-IN003B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

The PUZZLE-IN003B is shipped with the following components:


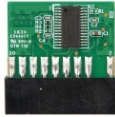
| Quantity | Item | Image |
|----------|---|--|
| 1 | PUZZLE-IN003B |  |
| 1 | Power cord |  |
| 1 | Power adapter |  |
| 1 | USB to console cable (only for SKUs with memory) |  |
| 2 | Rack mounting bracket |  |

PUZZLE-IN003B

| Quantity | Item | Image |
|----------|-------------------------------|--|
| 6 | Mounting bracket screw (M4*6) |  |

2.4 Optional Items

The following table lists the optional items that can be purchased separately.

| Optional Item | Image |
|---|--|
| RS-232 to console cable (P/N: 32005-005100-100-RS) |  |
| 20-pin Infineon SPI TPM 2.0 module, software management tool, firmware v7.63 (P/N: TPM-IN03-R10) |  |

Chapter

3

Installation

PUZZLE-IN003B

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual:** The user manual provides a complete description of the PUZZLE-IN003B, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the PUZZLE-IN003B 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 PUZZLE-IN003B 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 PUZZLE-IN003B. The PUZZLE-IN003B's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the PUZZLE-IN003B. Leave at least 5 cm of clearance around the PUZZLE-IN003B to prevent overheating.
- **Grounding:** The PUZZLE-IN003B 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 PUZZLE-IN003B.

3.2 Top Cover Removal

Before installing or maintaining the internal components, the top cover must be removed from the PUZZLE-IN003B. Follow the steps below to complete the task.

Step 1: Remove the retention screw indicated in **Figure 3-1**.

Step 2: Slide the top cover towards the rear side and gently lift the top cover (Figure 3-1).



Figure 3-1: Top Cover Removal

3.3 DIMM Installation



CAUTION:

1. Be sure to install the memory modules in the **blue** slots first.
2. For multi-channel configuration, always install the identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

PUZZLE-IN003B

To install the DIMM module, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-IN003B. Please follow the instruction described in **Section 3.2**.

Step 2: Locate the DIMM slots on the motherboard.

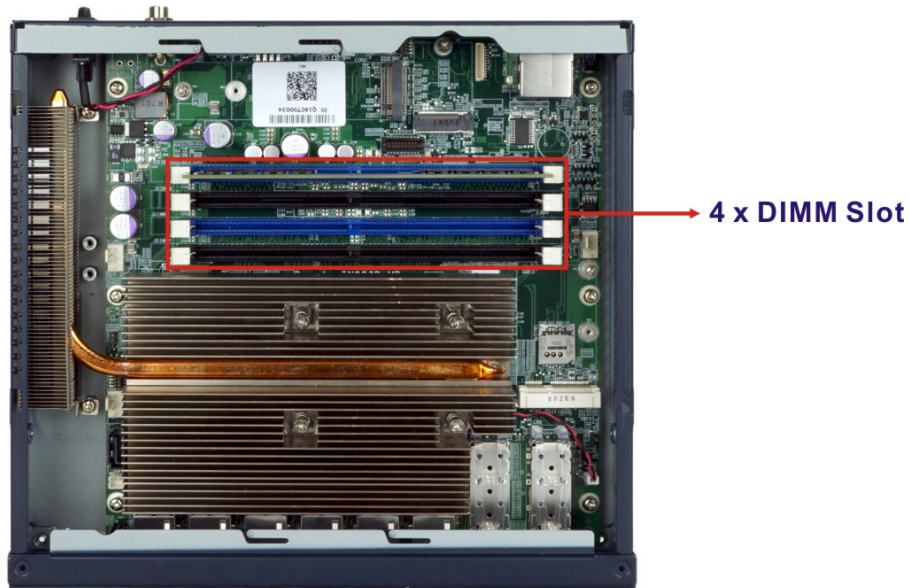


Figure 3-2: DIMM Slot Locations

Step 3: Open the DIMM socket handles. Open the two handles outwards as far as they can.

Step 4: Align the DIMM so the notch on the memory lines up with the notch on the memory socket.

Step 5: Once aligned, press down until the DIMM is properly seated. Clip the two handles into place.

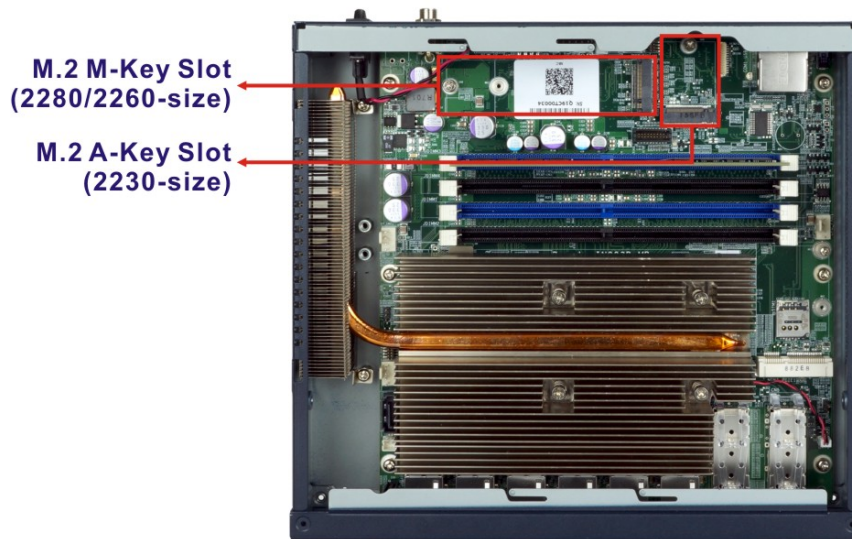
Step 6: To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

3.4 M.2 Module Installation

To install an M.2 module, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-IN003B. See **Section 3.2**.

Step 2: Locate the M.2 slots on the motherboard.



Step 3: Remove the on-board 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 20°.

Step 5: Push the M.2 module down and secure it with the previously removed retention screw.

PUZZLE-IN003B**3.5 PCIe Mini Card Installation**

The PUZZLE-IN003B has one full-size/half-size PCIe Mini slot on the motherboard. To install a full-size module, follow the instructions below.

Step 1: Remove the top cover from the PUZZLE-IN003B. See **Section 3.2**.

Step 2: Locate the PCIe Mini slot on the motherboard (**Figure 3-3**).

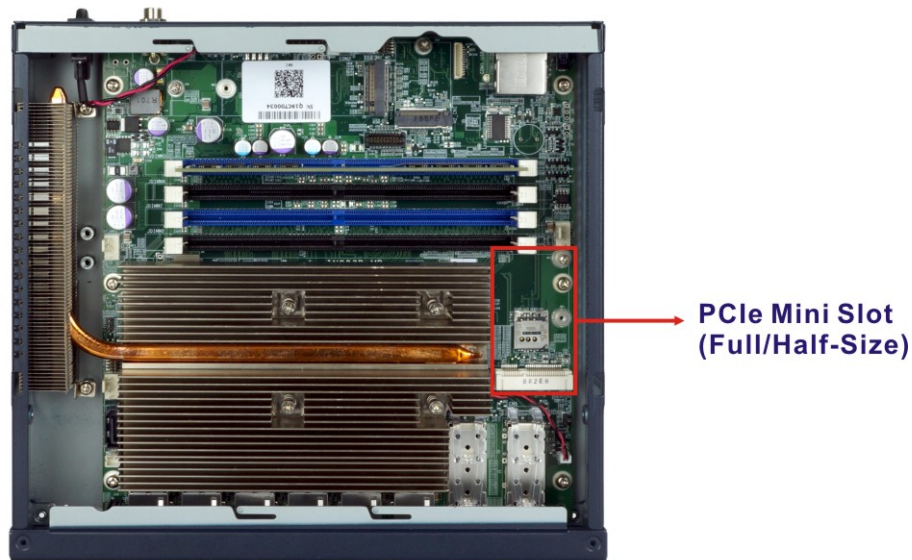


Figure 3-3: PCIe Mini Slot Location

Step 3: Remove the pre-installed retention screw from the standoff for a full-size PCIe Mini card.

Step 4: Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20°.

Step 5: Secure the full-size PCIe Mini card with the retention screw previously removed.



3.5.1 Half-size PCIe Mini Card Installation

The PCIe Mini slot also allows installation of a half-size PCIe Mini card. To install a half-size PCIe Mini card, please follow the steps below.

- Step 1:** Unscrew and remove the screw and the standoff secured on the motherboard for the full-size PCIe Mini card installation.
- Step 2:** Install the previously removed standoff to the screw hole for the half-size PCIe Mini card.
- Step 3:** Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 4:** Secure the half-size PCIe Mini card with the retention screw previously removed.

3.5.2 SIM Card Installation



NOTE:

A WWAN module must be installed in the PCIe Mini slot (MINI_PCIE1) to provide WWAN communication.

To install a SIM card, please follow the steps below.

- Step 1:** Remove the top cover from the PUZZLE-IN003B. See **Section 3.2**.
- Step 2:** Locate the SIM card slot on the motherboard (**Figure 3-4**).

PUZZLE-IN003B

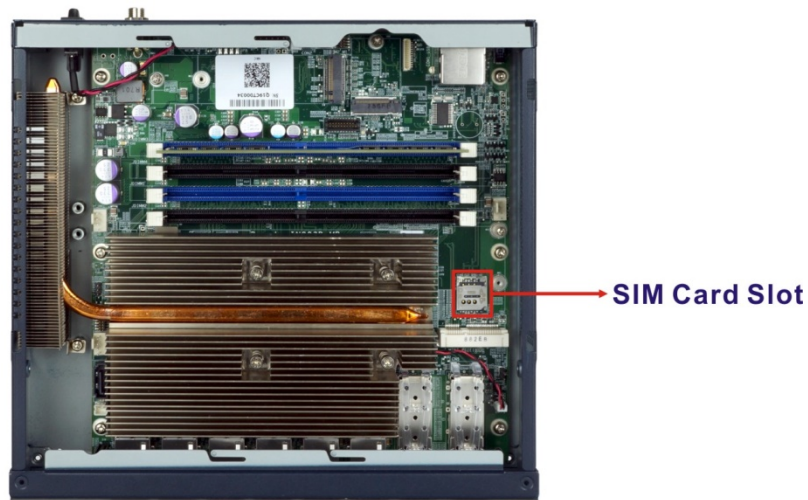


Figure 3-4: SIM Card Slot Location

Step 3: Unlock the SIM card slot cover by sliding the cover in the direction as shown by the arrow in **Figure 3-5**.



Figure 3-5: Unlock SIM Card Slot Cover

Step 4: Open the slot cover and place a SIM card onto the slot. The cut mark on the corner should be facing away from the slot as shown in **Figure 3-6**.

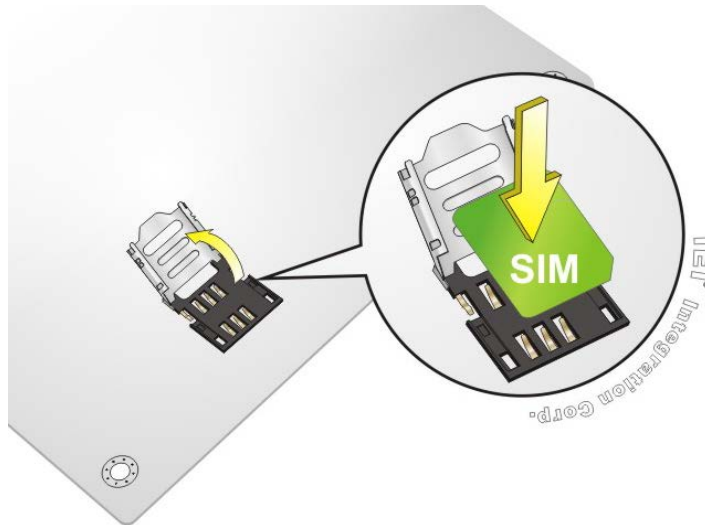


Figure 3-6: SIM Card Installation

Step 5: Close the slot cover and lock it by sliding it in the direction as shown by the arrow in **Figure 3-7**.



Figure 3-7: Lock SIM Card Slot Cover

PUZZLE-IN003B**3.6 External Interface Connection**

The front panel has several external I/O ports. The pinouts of these I/O ports are listed in the following sections.



3.6.1 LAN Connection - 1GbE

The 1GbE LAN connectors on the front panel allow connection to an external network. The pinouts of the LAN connectors are listed below.

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | MDIA3- | 5 | MDIA1+ |
| 2 | MDIA3+ | 6 | MDIA2+ |
| 3 | MDIA2- | 7 | MDIA0- |
| 4 | MDIA1- | 8 | MDIA0+ |

Table 3-1: 1GbE Port Pinouts

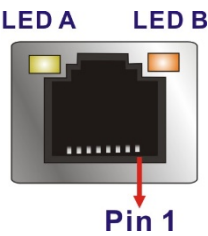


Figure 3-8: RJ-45 1GbE Connector

The RJ-45 Ethernet connector has two status LEDs. The left LED (yellow) indicates activity on the port and the right LED indicates the speed. See Table 3-2.

| LAN 1 | LED | Description | LED | Description |
|-------|-----|-------------------------|-----|-------------------|
| LAN 2 | A | on: linked | B | off: 10 Mb/s |
| LAN 3 | | blinking: data is being | | green: 100 Mb/s |
| LAN 4 | | sent/received | | orange: 1000 Mb/s |
| | LED | Description | LED | Description |
| LAN 5 | A | on: linked | B | orange: 1000 Mb/s |
| LAN 6 | | blinking: data is being | | |
| | | sent/received | | |

Table 3-2: RJ-45 1GbE Connector LEDs

PUZZLE-IN003B**3.6.2 LAN Connection - 10GbE SFP+**

The 10GbE SFP+ connectors on the front panel allow transfer rate of up to 10 gigabits per second. The pinouts of the 10GbE LAN connectors are listed below.

| Pin | Description | Pin | Description |
|-----|-----------------|-----|-------------|
| 1 | GND | 11 | GND |
| 2 | SFP+_TX_FAULT | 12 | SFP+_RX- |
| 3 | SFP+_TX_DISABLE | 13 | SFP+_RX+ |
| 4 | SFP+_SDA | 14 | GND |
| 5 | SFP+_SCL | 15 | SFP+_VCCR |
| 6 | SFP+_MOD_ABS | 16 | SFP+_VCCT |
| 7 | SFP+_RS0 | 17 | GND |
| 8 | SFP+_LOS | 18 | SFP+_TX+ |
| 9 | SFP+_RS1 | 19 | SFP+_TX- |
| 10 | GND | 20 | GND |

Table 3-3: 10GbE Port Pinouts

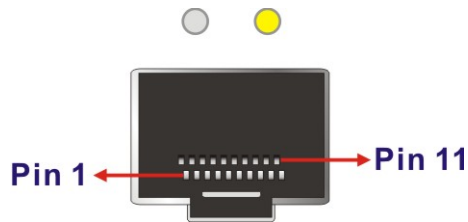


Figure 3-9: 10GbE SFP+ Connector


**NOTE:**

The yellow LED of the 10GbE port indicates the network connection is linked.

3.6.3 Console Connection

The PUZZLE-IN003B has one RJ-45 serial device connector on the front panel. The RJ-45 connector for the serial port can be identified easily as the RJ-45 for the network has two LEDs on the port, while the connectors for the serial cables don't. The pinouts of the serial port are listed below.

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | NRTS1 | 5 | GND |
| 2 | NDTR1 | 6 | NSIN1 |
| 3 | NSOUT1 | 7 | NDSR1 |
| 4 | GND | 8 | NCTS1 |



Pin 1

Table 3-4: RJ-45 Serial Port Pinouts

The serial device slot (RJ-45) connects to a cable with a standard D-sub 9 connector or a USB connector (varied from SKU) at the other end.

3.6.3.1 Enable Console Port When Booting

To configure the PUZZLE-IN003B to make it auto enable the console port when booting, follow the steps below.

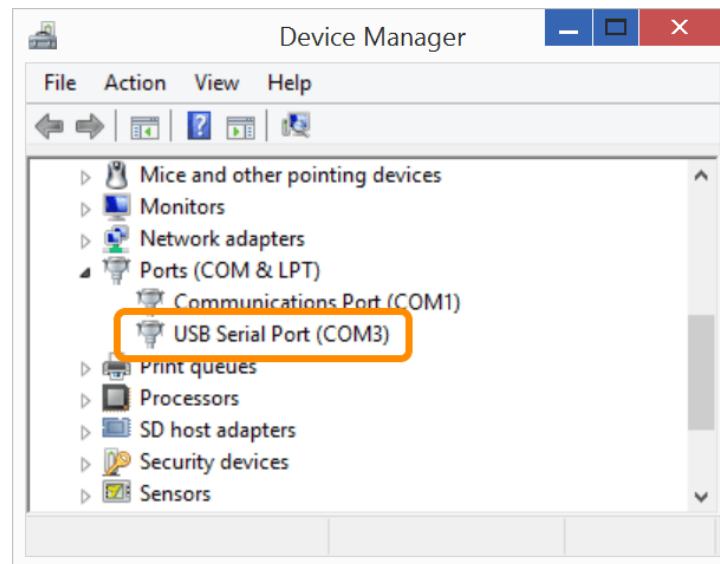


NOTE:

This method only works in Linux Ubuntu, the default operating system.

- Step 1:** Use the console cable shipped with the product to connect the RJ-45 console port of the PUZZLE-IN003B with your PC.
- Step 2:** In your PC, go to Windows **Device Manager** and check for the serial line of the connected USB serial port. In this case, it is COM3.

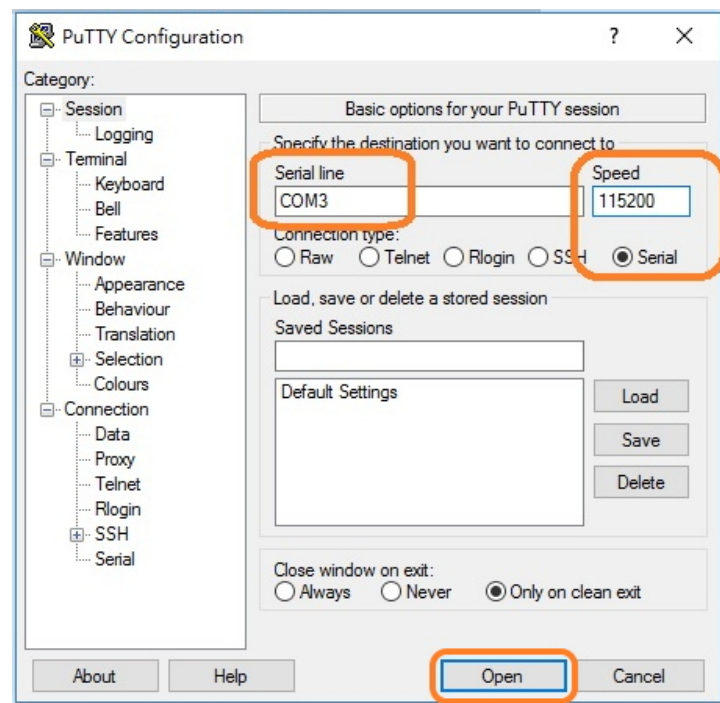
PUZZLE-IN003B



Step 3: Open a serial console application, PuTTY, as an example.

Step 4: Set the speed of the serial connection to “115200”, and choose “Serial” for Connection Type.

Step 5: Click “Open” on PuTTY.



Step 6: Enter the following command:

```
sudo vi /lib/systemd/system/ttyS0.service
```

Step 7: Ensure the information shown match the followings:

[Unit]

Description=Serial Console Service

[Service]

ExecStart=/sbin/getty -L 115200 ttyS0 vt102

Restart=always

[Install]

WantedBy=multi-user.target

Step 8: Run the following commands one by one:

```
sudo systemctl daemon-reload
```

```
sudo systemctl enable ttyS0
```

```
sudo systemctl start ttyS0
```

PUZZLE-IN003B

3.7 Mounting the System

The PUZZLE-IN003B is shipped with two mounting brackets that support 1U rack mount. To install the mounting brackets, please follow the steps below.

- Step 1:** Align the three retention screw holes in each bracket with the corresponding retention screw holes on the sides of the PUZZLE-IN003B.
- Step 2:** Secure the brackets to the system by inserting three retention screws (M4*6) into each bracket (**Figure 3-10**). Make sure the screws are tight and on the right positions.



Figure 3-10: Rack Mounting Bracket Installation

3.8 Power-On Procedure



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.

**NOTE:**

Due to the limitation of Intel® Atom® C3000 processor, the **first boot time** after installing/re-installing a memory module can be greatly affected by the capacity of the installed memory module(s). The bigger the capacity, the longer it takes. Please wait patiently.

To power-on the PUZZLE-IN003B please follow the steps below:

- Step 1:** Connect the power adapter shipped with the PUZZLE-IN003B to the power jack on the rear panel.
- Step 2:** Use a power cord to connect the power adapter and the power source. **Ensure to connect the power cord to a socket-outlet with earthing connection.**
- Step 3:** Turn on the power switch to power up the system.
- Step 4:** The power LED indicator on the front panel turns to green.
- Step 5:** Use the following information when prompted for the username and password for login to the system.

Username: puzzle

Password: admin



Figure 3-11: Power-on

PUZZLE-IN003B

3.9 Resource Download

All the resources for the PUZZLE-IN003B are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type PUZZLE-IN003B and press Enter to find all the relevant software, utilities, and documentation.

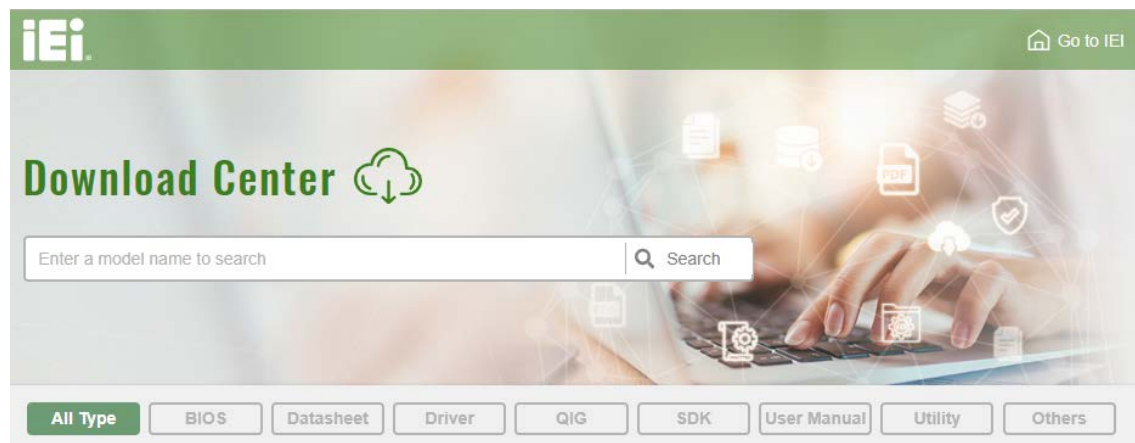


Figure 3-12: IEI Resource Download Center

3.10 System Configuration



WARNING:

The following instructions should only be performed by an authorized and trained technician.

Before starting, please ensure that you turn off the PUZZLE-IN003B, disconnect the power cords, network cable(s), and also remove any other device/cable that is attached to the server.

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 2.1**.

3.10.1 Jumper Settings

To configure the jumper settings, please follow the steps below.

- Step 1: Remove the top cover. See **Section 3.2**.
- Step 2: Locate the jumper/switch on the embedded motherboard.
- Step 3: Make the jumper settings in accordance with the settings described and defined in the following sections.

3.10.1.1 Clear CMOS

If the PUZZLE-IN003B fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, short the jumper for 3 seconds or more, then remove the jumper clip.

| Setting | Description |
|---------|-------------------------|
| Open | Keep current BIOS setup |
| Short | Clear BIOS |

Table 3-5: Clear BIOS Jumper Settings

The clear CMOS jumper location is shown in **Figure 3-13** below.

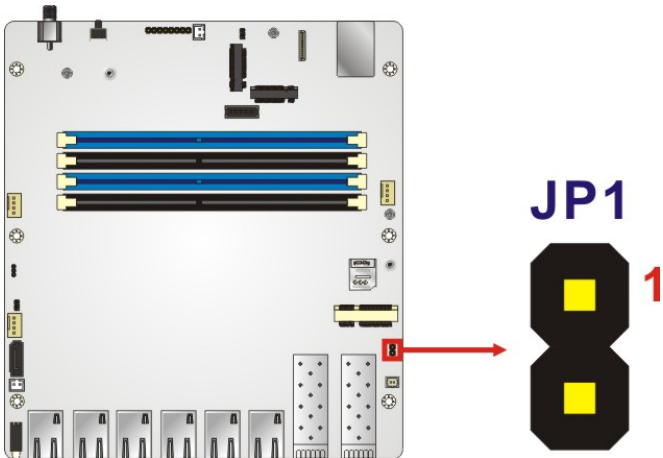


Figure 3-13: Clear CMOS Jumper Location

PUZZLE-IN003B

3.10.1.2 Flash Descriptor Security Override Jumper

The Flash Descriptor Security Override jumper (J_FLASH1) allows to enable or disable the ME firmware update.

| Setting | Description |
|-----------|--------------------|
| Short 1-2 | Disabled (default) |
| Short 2-3 | Enabled |

Table 3-6: Flash Descriptor Security Override Jumper Settings

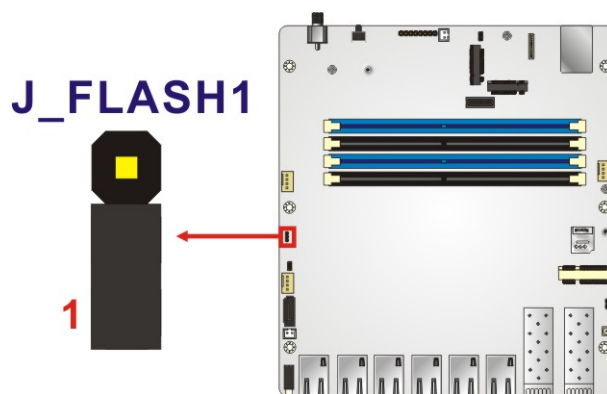


Figure 3-14: Flash Descriptor Security Override Jumper Location

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

- Step 1:** Before turning on the system power, short 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.
- Step 4:** Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

Chapter

4

BIOS

PUZZLE-IN003B

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 **DEL** key as soon as the system is turned on or
2. Press the **DEL** key when the “**Press DEL to enter SETUP**” message appears on the screen.

If the message disappears before the **DEL** 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 **Table 4-1**.

| Key | Function |
|-------------|--|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |
| 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 |
| Esc key | Main Menu – Quit and 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 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the clear CMOS button described in **Chapter 3**.

4.1.5 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.
- IntelRCSetup – Changes the CPU and chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings



PUZZLE-IN003B

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 Utility - Copyright (C) 2019 American Megatrends, Inc. | | |
|--|---------------------|--|
| Main | Advanced | IntelRCSetup Security Boot Save & Exit |
| BIOS Information | | Set the Date. Use Tab to switch between Date elements. |
| BIOS Vendor | American Megatrends | Default Ranges: |
| Core Version | 5.13 | Year: 2005-2099 |
| Compliance | UEFI 2.6; PI 1.4 | Months: 1-12 |
| Project Version | Z590AR11.BIN | Days: dependent on month |
| Build Date and Time | 12/05/2019 10:12:36 | ----- |
| iWDD Vendor | iEi | →←: Select Screen |
| iWDD Version | Z590ER12.bin | ↑ ↓: Select Item |
| Access Level | Administrator | Enter: Select |
| Memory Information | | +/-: Change Opt. |
| Total Memory | 8192 MB (DDR4) | F1: General Help |
| | | F2: Previous Values |
| System Date | [Thu 01/16/2020] | F3: Optimized Defaults |
| System Time | [07:10:27] | F4: Save & Exit |
| | | ESC: Exit |
| Version 2.19.1266. Copyright (C) 2019 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.

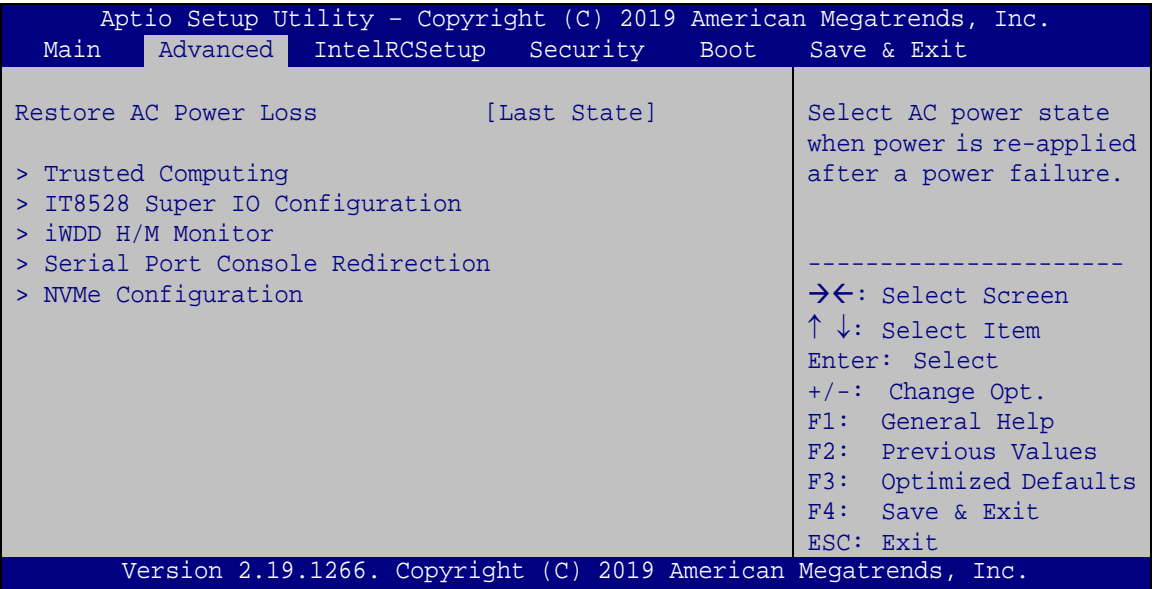
4.3 Advanced

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.



BIOS Menu 2: Advanced

➔ **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

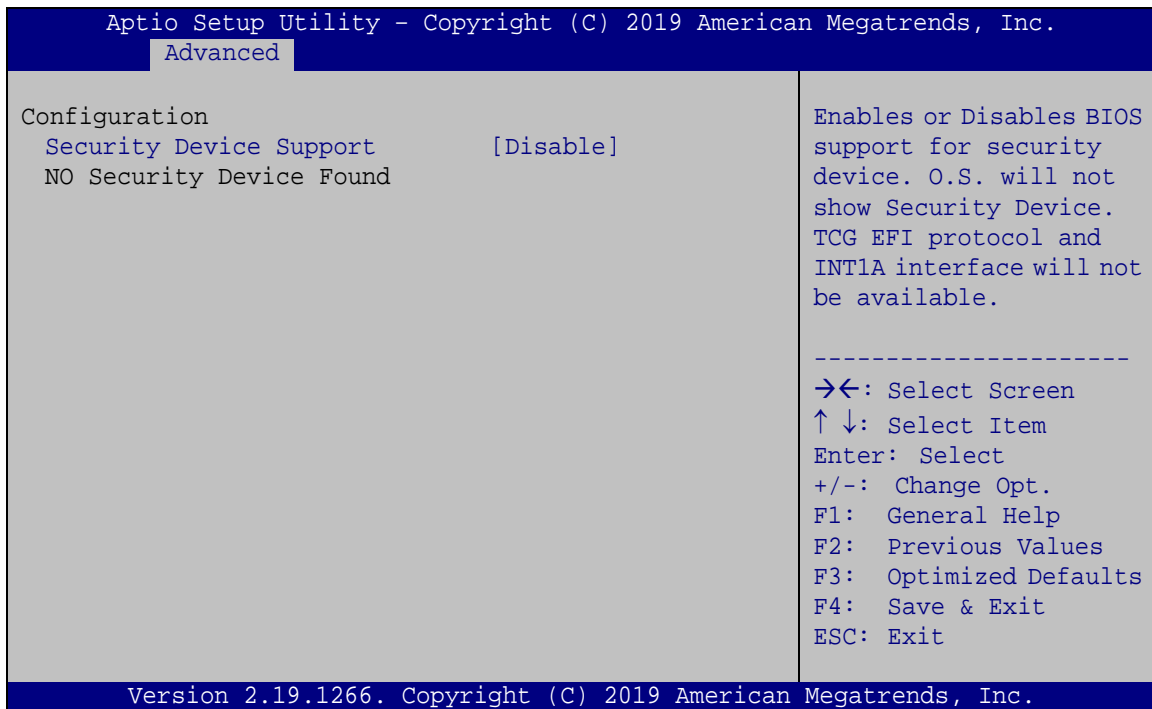
DEFAULT

The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

PUZZLE-IN003B

4.3.1 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 3**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

**BIOS Menu 3: Trusted Computing**➔ **Security Device Support [Disable]**

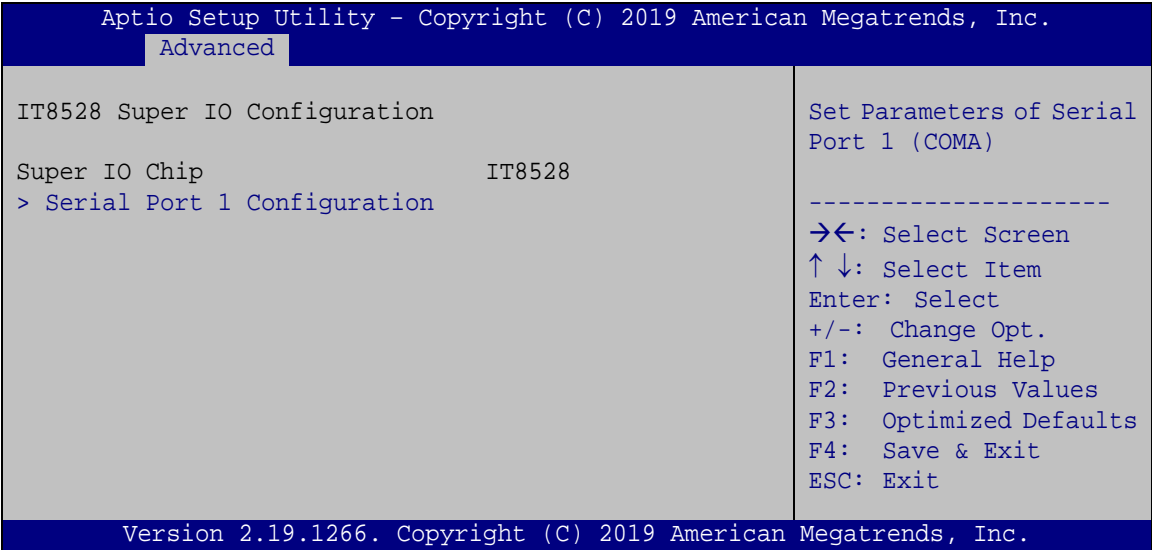
Use the **Security Device Support** option to configure support for the TPM.

- ➔ **Disable** **DEFAULT** TPM support is disabled.
- ➔ **Enable** TPM support is enabled.



4.3.2 IT8528 Super IO Configuration

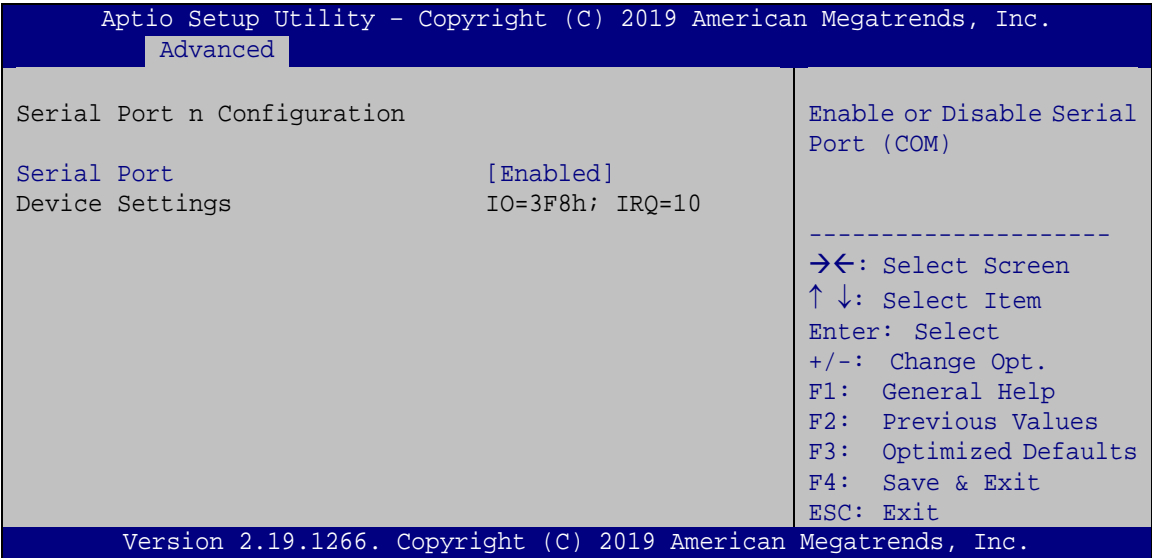
Use the **IT8528 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the parallel ports and serial ports.



BIOS Menu 4: IT8528 Super IO Configuration

4.3.2.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 5**) to configure the serial port n.



BIOS Menu 5: Serial Port 1 Configuration Menu



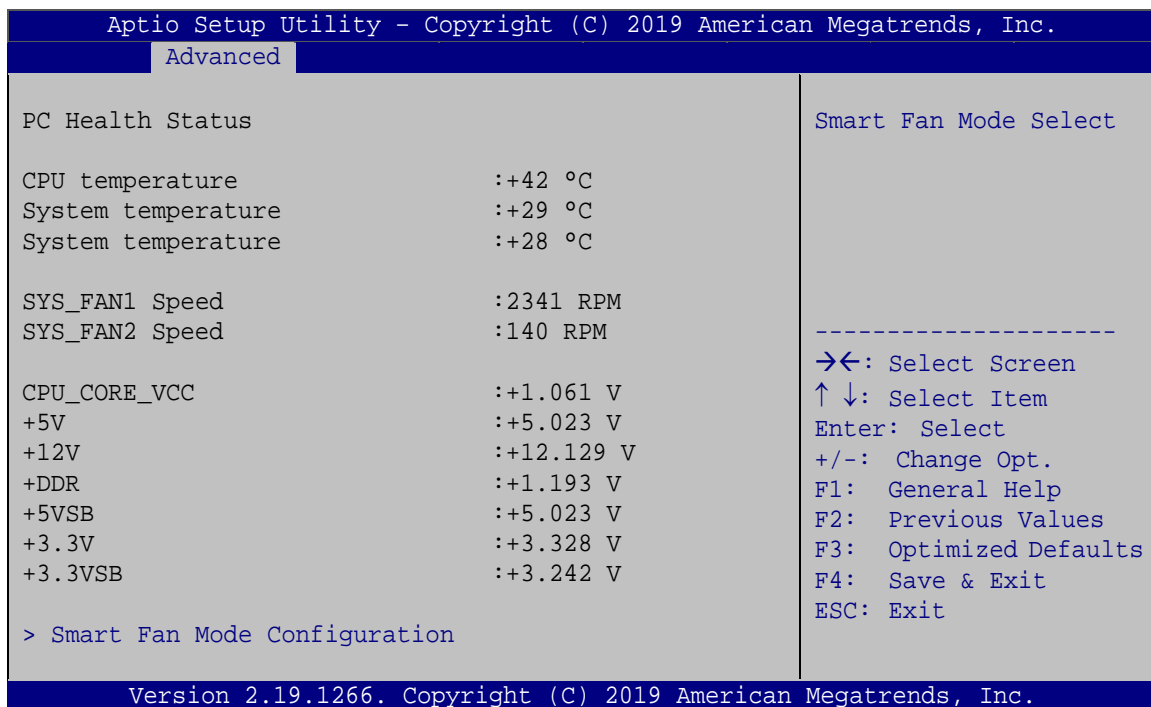
PUZZLE-IN003B**➔ Serial Port [Enabled]**

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

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

4.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 6**) contains the fan configuration submenu, and displays the system temperature and CPU fan speed.

**BIOS Menu 6: iWDD H/W Monitor****➔ PC Health Status**

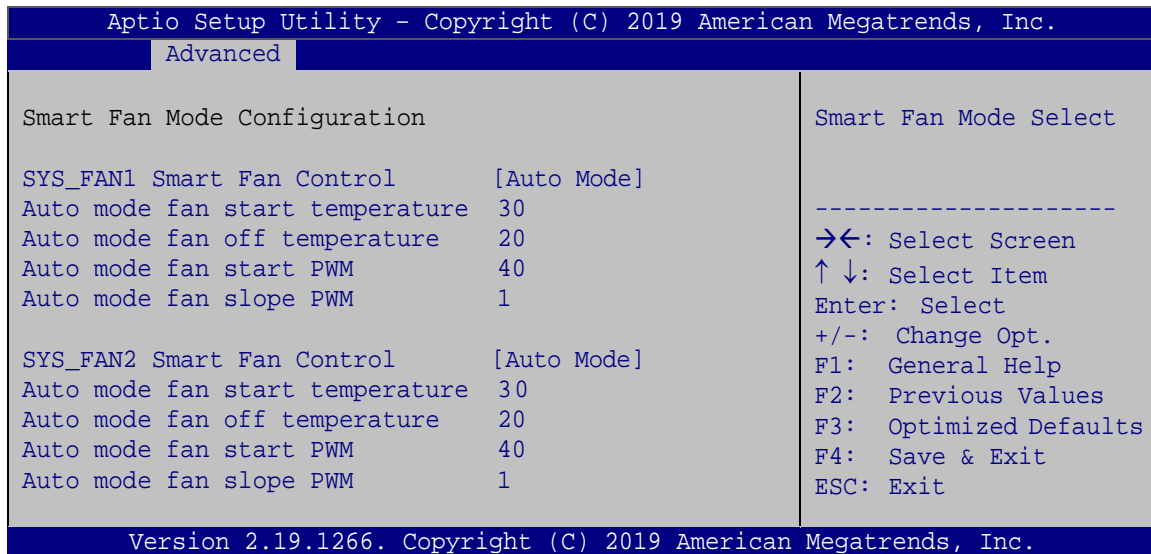
The following system parameters and values are shown. The system parameters that are monitored are:

- Temperatures:
 - CPU Temperature

- System Temperature
- System Fan Speeds (C0 SKU only)
- Voltages:
 - CPU_CORE_VCC
 - +5V
 - +12V
 - DDR
 - +5VSB
 - +3.3V
 - +3.3VSB

4.3.3.1 Smart Fan Mode Configuration (C0 SKU Only)

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 7**) to configure the CPU/system fan temperature and speed settings. **NOTE:** This submenu is only available in C0 SKU.



BIOS Menu 7: Smart Fan Mode Configuration

PUZZLE-IN003B**→ SYS_FAN Smart Fan Control [Auto Mode]**

Use the **CPU_FAN Smart Fan Control** options to configure the CPU Smart Fans.

- | | | |
|----------------------|----------------|---|
| → 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 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.

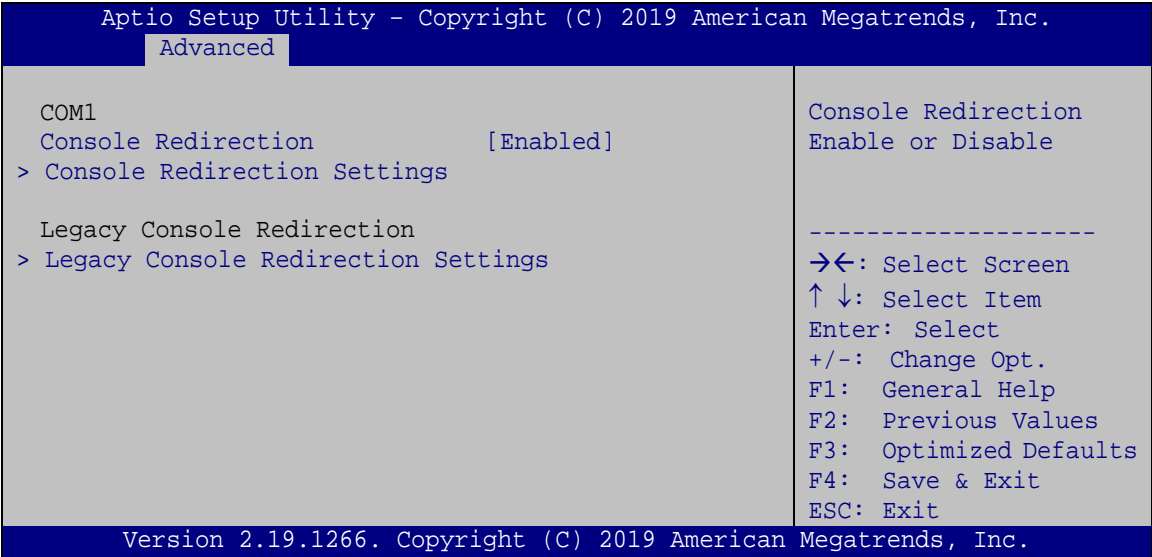
→ Auto mode fan slope PWM

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.



4.3.4 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 8**) 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.



BIOS Menu 8: Serial Port Console Redirection

➔ Console Redirection [Enabled]

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

- ➔ Disabled Disabled the console redirection function
- ➔ Enabled DEFAULT 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+



PUZZLE-IN003B

- ➔ **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.
- ➔ **38400** Sets the serial port transmission speed at 38400.
- ➔ **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]**

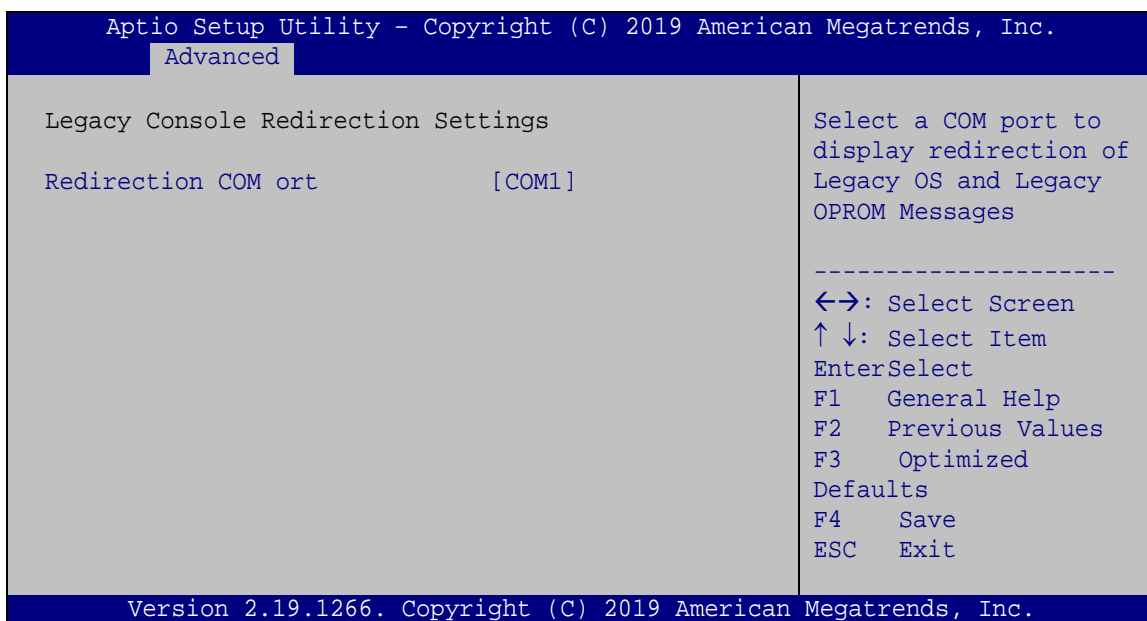
Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

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

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

4.3.4.1 Legacy Console Redirection Settings

The **Legacy Console Redirection Settings** menu (**BIOS Menu 9**) allows the legacy console redirection options to be configured.



BIOS Menu 9: Legacy Console Redirection Settings

➔ **Redirection COM Port [COM1]**

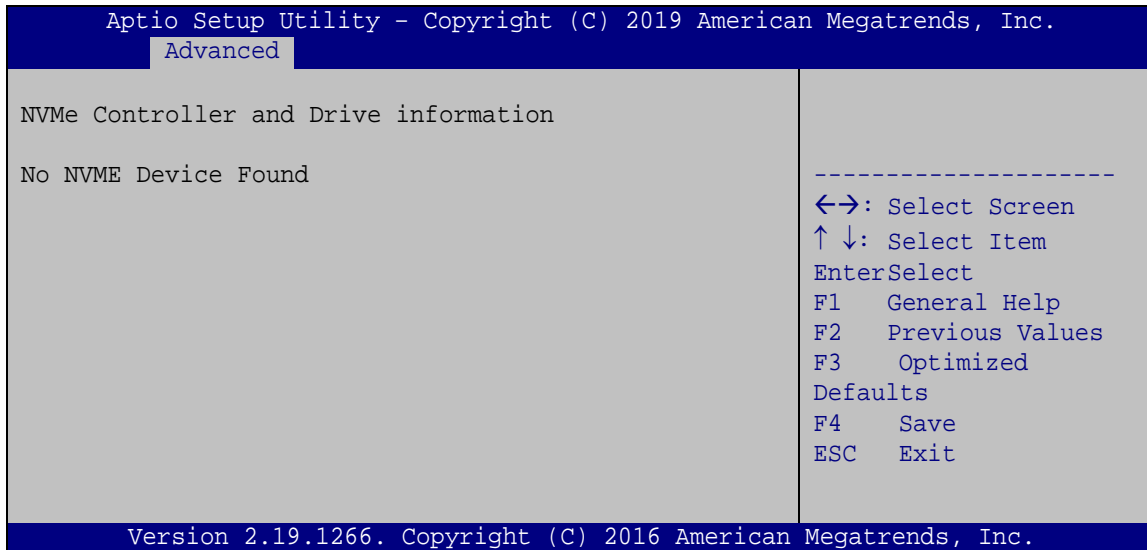
Use the **Redirection COM Port** option to specify a COM port to display redirection of legacy OS and legacy OPRM messages. The options include:

- **COM1** **DEFAULT**

PUZZLE-IN003B

4.3.5 NVMe Configuration

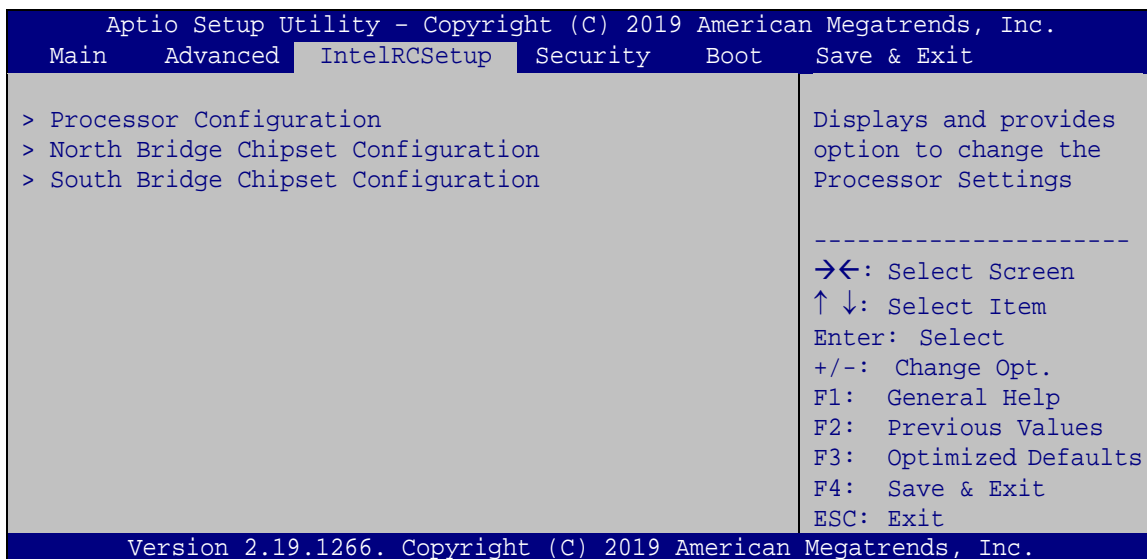
Use the **NVMe Configuration** menu (**BIOS Menu 10**) to change and/or set the configuration of the NVMe devices installed in the system.



BIOS Menu 10: NVMe Configuration

4.4 IntelRCSetup

Use the **IntelRCSetup** menu (**BIOS Menu 11**) to configure the CPU and the chipset through the following sub-menus:

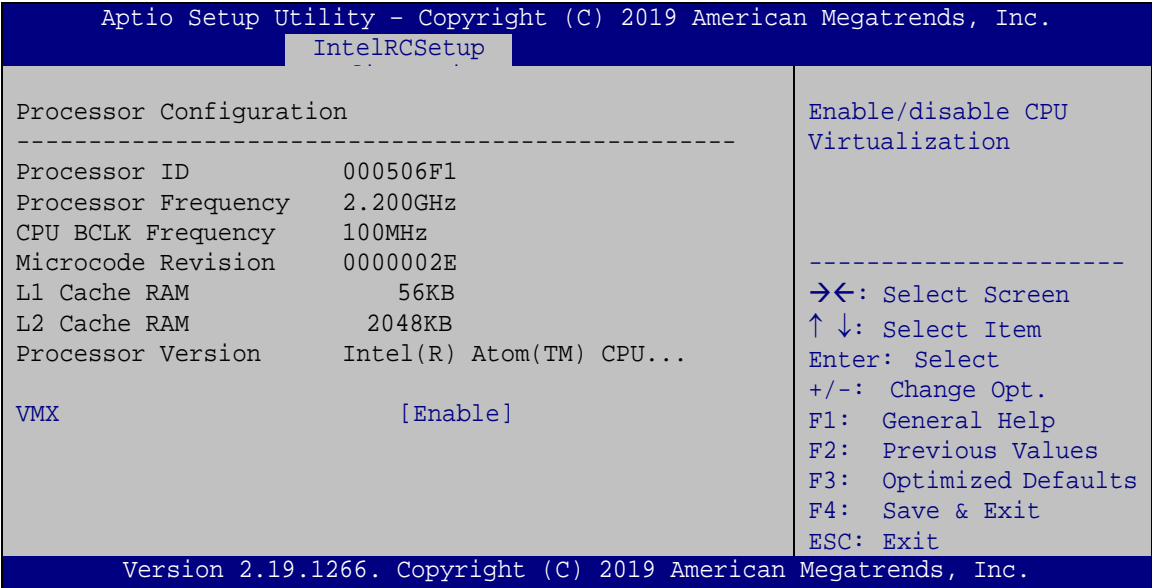


BIOS Menu 11: IntelRCSetup



4.4.1 Processor Configuration

Use the **Processor Configuration** menu (**BIOS Menu 12**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



BIOS Menu 12: Processor Configuration

➔ **VMX [Enable]**

Use the **VMX** 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.

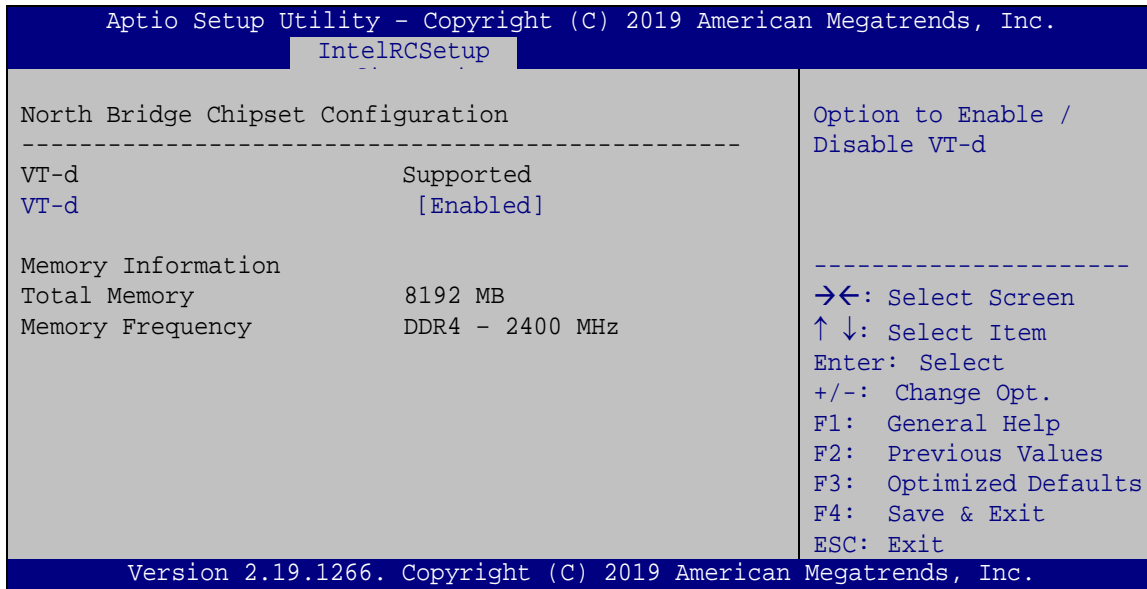
- ➔ **Disable** Disables Intel® Virtualization Technology.
- ➔ **Enable** **DEFAULT** Enables Intel® Virtualization Technology.



PUZZLE-IN003B

4.4.2 North Bridge Chipset Configuration

Use the **North Bridge Chipset Configuration** menu (**BIOS Menu 13**) to view detailed memory specifications or enable/disable Intel VT-d.



BIOS Menu 13: North Bridge Chipset Configuration

→ VT-d [Enabled]

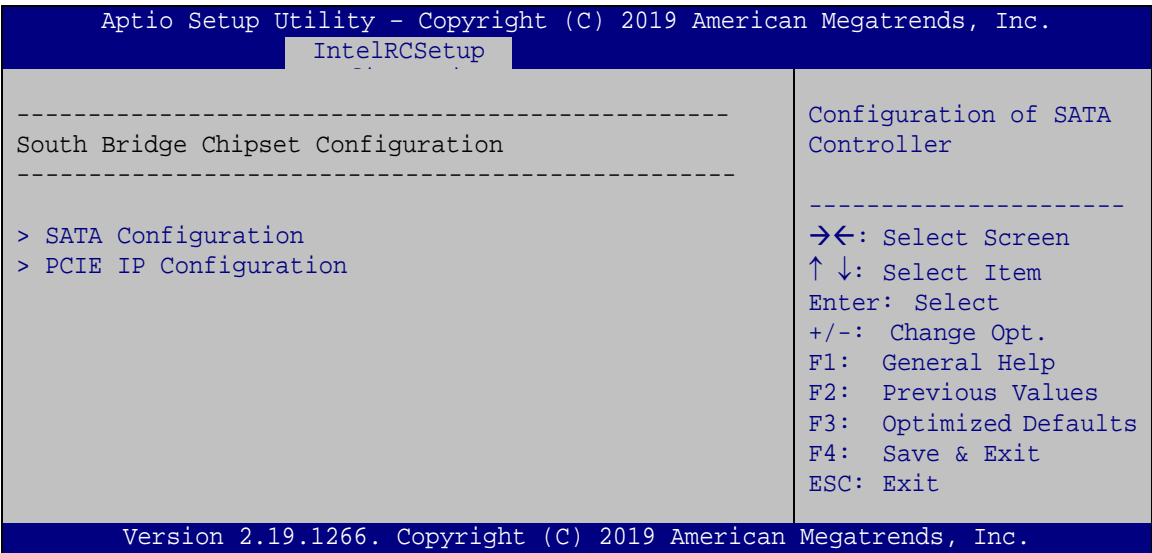
Use the **VT-d** option to enable or disable VT-d support.

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



4.4.3 South Bridge Chipset Configuration

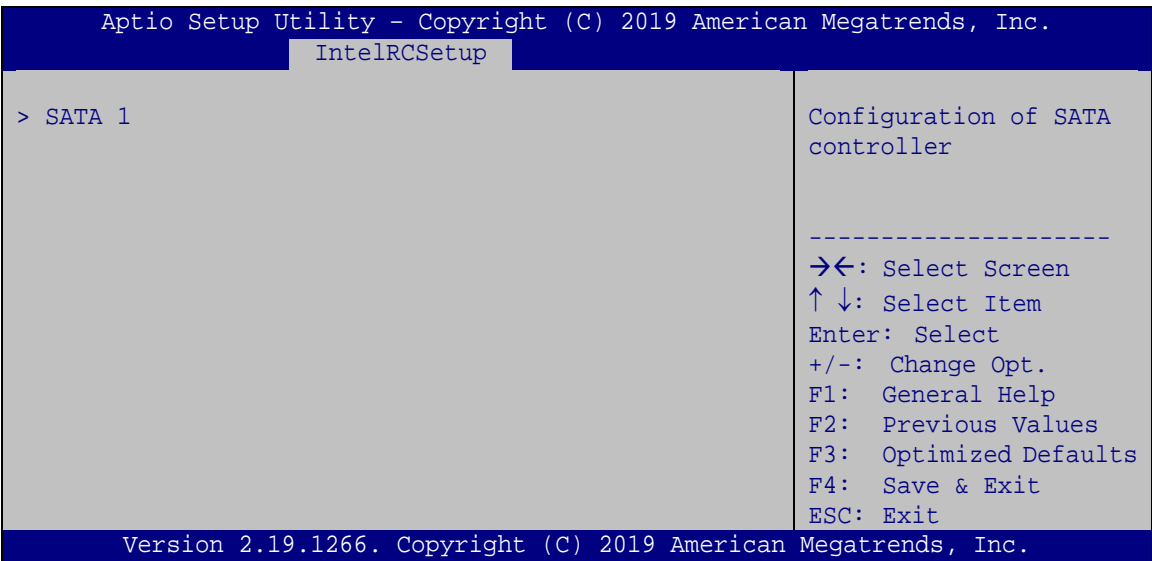
Use the **South Bridge Chipset Configuration** menu (**BIOS Menu 14**) to configure SATA devices or PCIe interfaces.



BIOS Menu 14: South Bridge Chipset Configuration

4.4.3.1 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 15**) to change and/or set the configuration of the SATA device installed in the system.



BIOS Menu 15: SATA Configuration



PUZZLE-IN003B**→ Enable/disable port [Enabled]**

Use the **Enable/disable port** option to configure the SATA controller.

- Enabled** **DEFAULT** Enables the on-board SATA controller.
- Disabled** Disables the on-board SATA controller.

→ Hot Plug [Disabled]

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

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

4.4.3.2 PCIE IP Configuration

Use the **PCIE IP Configuration** menu (**BIOS Menu 16**) to change and/or set the configuration of the PCIe interfaces.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  IntelRCSetup

> M2_CN1
> MINI_PCIE1
> M2_M1

Configuration of PCI
Express Root Port

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

Version 2.19.1266. Copyright (C) 2019 American Megatrends, Inc.

```

BIOS Menu 16: PCIE IP Configuration

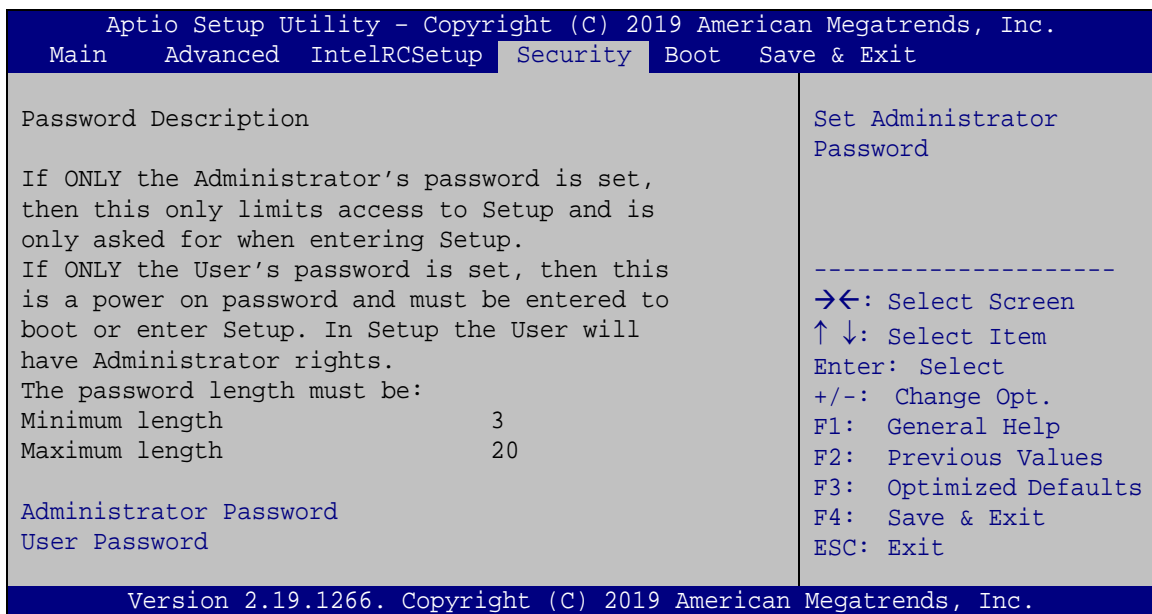
➔ Link Speed [Gen3]

Use the **Link Speed** option to configure the PCIe slot speed.

- Gen1
- Gen2
- Gen3 **DEFAULT**

4.5 Security

Use the **Security** menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: Security

➔ Administrator Password

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

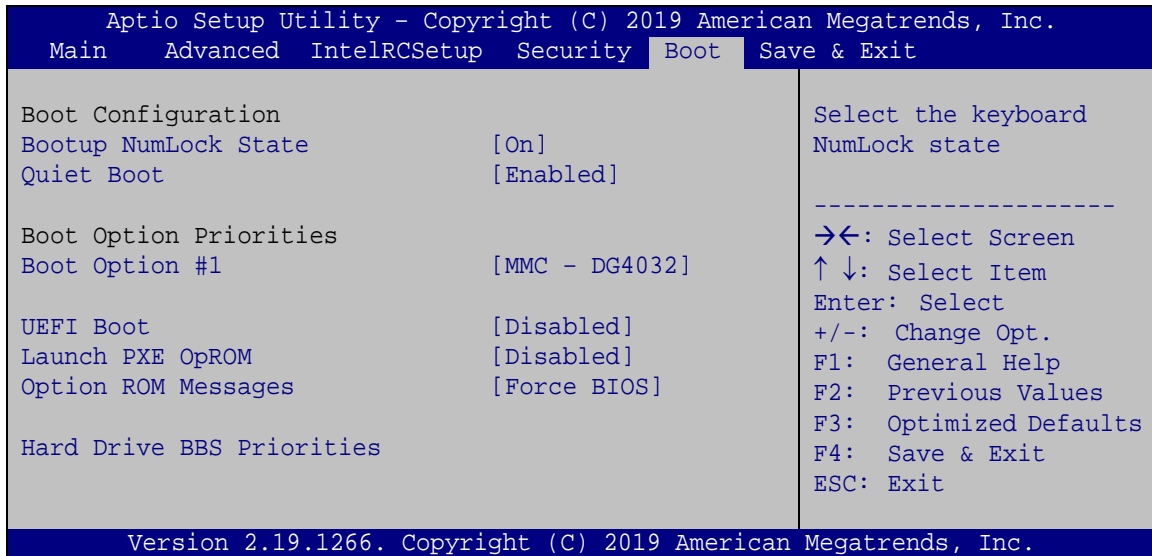
➔ User Password

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

PUZZLE-IN003B

4.6 Boot

Use the **Boot** menu (**BIOS Menu 18**) to configure system boot options.

**BIOS Menu 18: 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 |

➔ **UEFI Boot [Disabled]**

Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

- | | | | |
|---|-----------------|----------------|-------------------------------------|
| ➔ | Disabled | DEFAULT | Boot from UEFI devices is disabled. |
| ➔ | Enabled | | Boot from UEFI devices is enabled. |

➔ **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.

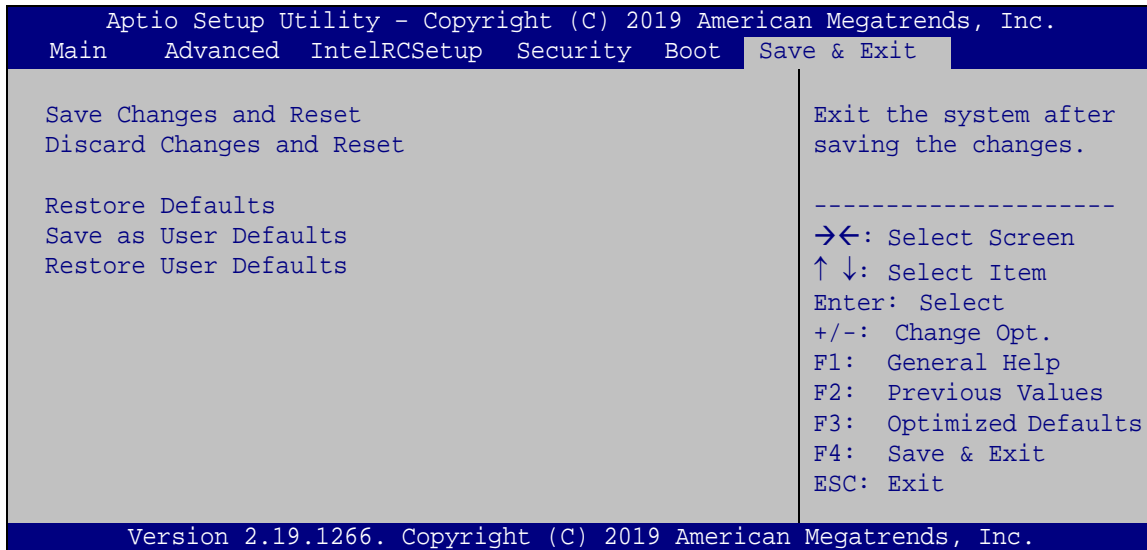
- | | | | |
|---|---------------------|----------------|----------------------------------|
| ➔ | Force BIOS | DEFAULT | Sets display mode to force BIOS. |
| ➔ | Keep Current | | Sets display mode to current. |



PUZZLE-IN003B

4.7 Save & Exit

Use the **Safe & Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 19: 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

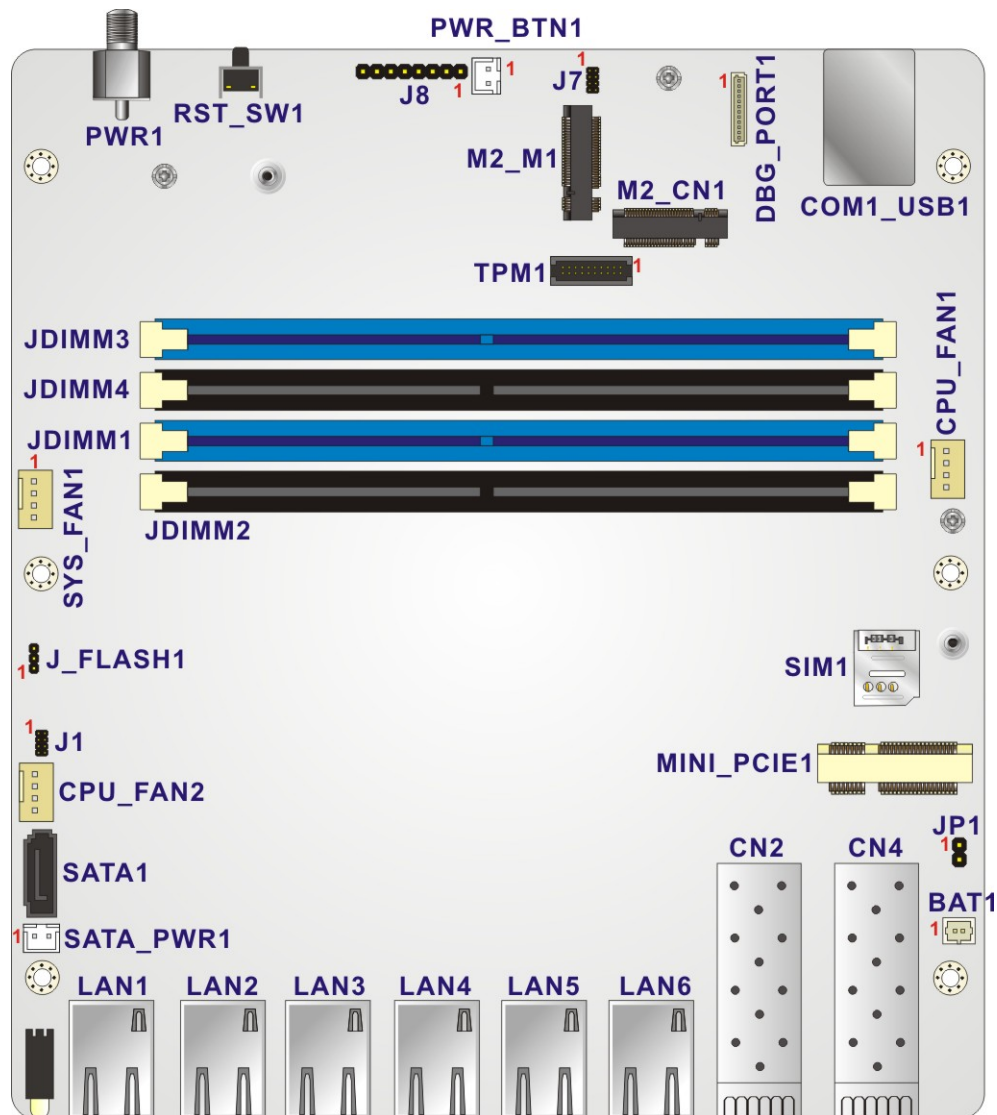
5

Interface Connectors

PUZZLE-IN003B

5.1 Peripheral Interface Connectors

The connector locations of the PUZZLE-IN003B's motherboard are shown below. The connector pinouts for these connectors are listed in the following sections.





5.2 Internal Peripheral Connectors

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

| Connector | Type | Label |
|---------------------------|--------------------------|-----------------------------------|
| Battery connector | 2-pin wafer | BAT1 |
| CPLD programmer connector | 8-pin header | J8 |
| Debug port | 12-pin wafer | DBG_PORT1 |
| Fan connectors | 4-pin wafer | CPU_FAN1, CPU_FAN2, SYS_FAN1 |
| M.2 A-key slot | M.2 2230 A-key | M2_CN1 |
| M.2 M-key slot | M.2 2280/2260 M-key | M2_M1 |
| Memory slots | DDR4 DIMM slot | JDIMM1, JDIMM2, JDIMM3, JDIMM4 |
| PCIe Mini slot | Full/Half-size PCIe Mini | MINI_PCIE1 |
| Power button connector | 2-pin wafer | PWR_BTN1 |
| SATA 6Gb/s connector | 7-pin socket | SATA1 |
| SATA power connector | 2-pin wafer | SATA_PWR1 |
| SIM card slot | Micro SIM slot | SIM1 |
| SPI flash connector | 8-pin header | J1 |
| SPI flash connector (EC) | 8-pin header | J7 |
| TPM connector | 20-pin connector | TPM1 |



PUZZLE-IN003B**5.2.1 Battery Connector (BAT1)**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | Battery+ |
| 2 | GND |

Table 5-1: Battery Connector (BAT1) Pinouts**5.2.2 CPLD Programmer Connector (J8)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | VCC3 | 5 | NC |
| 2 | TDO | 6 | TMS |
| 3 | TDI | 7 | GND |
| 4 | NC | 8 | TCK |

Table 5-2: CPLD Programmer Connector (J8) Pinouts**5.2.3 Debug Port (DBG_PORT1)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | NC | 7 | LPC_AD1 |
| 2 | VCC3V | 8 | LPC_ADO |
| 3 | GND | 9 | FRAME |
| 4 | SERIRQ | 10 | RESET |
| 5 | LPC_AD3 | 11 | CLK |
| 6 | LPC_AD2 | 12 | GND |

Table 5-3: Debug Port (DBG_PORT1) Pinouts



5.2.4 Fan Connectors (CPU_FAN1/2 & SYS_FAN1)

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

Table 5-4: Fan Connectors (CPU_FAN1/2 & SYS_FAN1) Pinouts

5.2.5 M.2 A-key Slot (M2_CN1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | +3.3V |
| 3 | USB_D+ | 4 | +3.3V |
| 5 | USB_D- | 6 | N/C |
| 7 | GND | 8 | N/C |
| 9 | N/C | 10 | N/C |
| 11 | N/C | 12 | N/C |
| 13 | N/C | 14 | N/C |
| 15 | N/C | 16 | N/C |
| 17 | N/C | 18 | GND |
| 19 | N/C | 20 | N/C |
| 21 | N/C | 22 | N/C |
| 23 | N/C | 24 | Notch |
| 25 | Notch | 26 | Notch |
| 27 | Notch | 28 | Notch |
| 29 | Notch | 30 | Notch |
| 31 | Notch | 32 | N/C |
| 33 | GND | 34 | N/C |
| 35 | PETPO | 36 | N/C |
| 37 | PETNO | 38 | N/C |
| 39 | GND | 40 | N/C |
| 41 | PERPO | 42 | N/C |



PUZZLE-IN003B

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 43 | PERNO | 44 | N/C |
| 45 | GND | 46 | N/C |
| 47 | REFCLKP0 | 48 | N/C |
| 49 | REFCLKN0 | 50 | SUSCLK |
| 51 | GND | 52 | PERST0# |
| 53 | CLKREQ0# | 54 | N/C |
| 55 | PEWAKE0# | 56 | N/C |
| 57 | GND | 58 | N/C |
| 59 | N/C | 60 | N/C |
| 61 | N/C | 62 | N/C |
| 63 | GND | 64 | N/C |
| 65 | N/C | 66 | N/C |
| 67 | N/C | 68 | N/C |
| 69 | GND | 70 | WAKE |
| 71 | N/C | 72 | +3.3V |
| 73 | N/C | 74 | +3.3V |
| 75 | GND | | |

Table 5-5: M.2 A-key Slot (M2_CN1) Pinouts**5.2.6 M.2 M-key Slot (M2_M1)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | +3.3V |
| 3 | GND | 4 | +3.3V |
| 5 | PCIE_RXN3 | 6 | N/C |
| 7 | PCIE_RXP3 | 8 | N/C |
| 9 | GND | 10 | DAS/DSS# |
| 11 | PCIE_TXN3 | 12 | +3.3V |
| 13 | PCIE_TXP3 | 14 | +3.3V |
| 15 | GND | 16 | +3.3V |
| 17 | PCIE_RXN2 | 18 | +3.3V |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 19 | PCIE_RXP2 | 20 | N/C |
| 21 | GND | 22 | N/C |
| 23 | PCIE_TXN2 | 24 | N/C |
| 25 | PCIE_TXP2 | 26 | N/C |
| 27 | GND | 28 | N/C |
| 29 | PCIE_RXN1 | 30 | N/C |
| 31 | PCIE_RXP1 | 32 | N/C |
| 33 | GND | 34 | N/C |
| 35 | PCIE_TXN1 | 36 | N/C |
| 37 | PCIE_TXP1 | 38 | DEVSLP |
| 39 | GND | 40 | N/C |
| 41 | PCIE_RXN0 | 42 | N/C |
| 43 | PCIE_RXP0 | 44 | N/C |
| 45 | GND | 46 | N/C |
| 47 | PCIE_TXN0 | 48 | N/C |
| 49 | PCIE_TXP0 | 50 | PERST# |
| 51 | GND | 52 | CLKREQ# |
| 53 | REFCLKN | 54 | PEWAKE |
| 55 | REFCLKP | 56 | N/C |
| 57 | GND | 58 | N/C |
| 59 | Notch | 60 | Notch |
| 61 | Notch | 62 | Notch |
| 63 | Notch | 64 | Notch |
| 65 | Notch | 66 | Notch |
| 67 | N/C | 68 | SUSCLK |
| 69 | PEDET | 70 | +3.3V |
| 71 | GND | 72 | +3.3V |
| 73 | GND | 74 | +3.3V |
| 75 | GND | | |

Table 5-6: M.2 M-key Slot (M2_M1) Pinouts

PUZZLE-IN003B

5.2.7 PCIe Mini Card Slot (MINI_PCIE1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|--------------------|---------|-------------|
| 1 | N/C | 2 | +3.3V |
| 3 | N/C | 4 | GND |
| 5 | N/C | 6 | 1.5V |
| 7 | MPCIE_M.2_CLKREQ# | 8 | SIM_VCC |
| 9 | GND | 10 | SIM_IO |
| 11 | CLK_MPCIE_N | 12 | SIM_CLK |
| 13 | CLK_MPCIE_P | 14 | SIM_RST |
| 15 | GND | 16 | SIM_VPP |
| 17 | PLTRST_PCIE_WIFI_N | 18 | GND |
| 19 | N/C | 20 | +3.3V |
| 21 | GND | 22 | PLTRST_N |
| 23 | MPCIE_RXN_C | 24 | +3.3V |
| 25 | MPCIE_RXP_C | 26 | GND |
| 27 | GND | 28 | 1.5V |
| 29 | GND | 30 | SMB_CLK |
| 31 | MPCIE_TXN_C | 32 | SMB_DATA |
| 33 | MPCIE_TXP_C | 34 | GND |
| 35 | GND | 36 | USB_DATA- |
| 37 | GND | 38 | USB_DATA+ |
| 39 | +3.3V | 40 | GND |
| 41 | +3.3V | 42 | N/C |
| 43 | +3.3V | 44 | N/C |
| 45 | N/C | 46 | N/C |
| 47 | N/C | 48 | 1.5V |
| 49 | N/C | 50 | GND |
| 51 | N/C | 52 | +3.3V |

Table 5-7: PCIe Mini Card Slot (MINI_PCIE1) Pinouts

5.2.8 Power Button Connector (PWR_BTN1)

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | PWR_BTN |
| 2 | GND |

Table 5-8: Power Button Connector (PWR_BTN1) Pinouts

5.2.9 SATA Connector (SATA1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 5 | RX- |
| 2 | TX+ | 6 | RX+ |
| 3 | TX- | 7 | GND |
| 4 | GND | 8 | N/C |

Table 5-9: SATA 6Gb/s Connector (SATA1) Pinouts

5.2.10 SATA Power Connector (SATA_PWR1)

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | +5V |
| 2 | GND |

Table 5-10: SATA Power Connector (SATA_PWR1) Pinouts

5.2.11 SPI Flash Connector (J1)


| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |  |
|---------|-------------|---------|-------------|---|
| 1 | CS | 2 | +3.3V | |
| 3 | MISO | 4 | N/C | |
| 5 | WP | 6 | CLK | |
| 7 | GND | 8 | MOSI | |

Table 5-11: SPI Flash Connector (J1) Pinouts

PUZZLE-IN003B

5.2.12 SPI Flash Connector - EC (J7)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | EC_CS | 2 | +3.3V |
| 3 | EC_MISO | 4 | N/C |
| 5 | EC_WP | 6 | EC_CLK |
| 7 | GND | 8 | EC_MOSI |

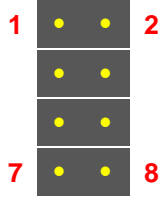


Table 5-12: SPI Flash Connector (J7) Pinouts

5.2.13 TPM Connector (TPM1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------------|---------|---------------|
| 1 | N/C | 2 | TPM_SPI_CS0_N |
| 3 | SPI_TPM_GPIO | 4 | TPM_SPI_CS1_N |
| 5 | GND | 6 | +3V3_SB |
| 7 | TPM_SPI_CLK | 8 | TPM_SPI_DQ2 |
| 9 | TPM_SPI_DQ3 | 10 | TPM_SPI_MISO |
| 11 | TPM_HOLD# | 12 | TPM_SPI_MOSI |
| 13 | SPI_TPM_CS_N_GP12 | 14 | GND |
| 15 | TPM_WP# | 16 | TPM_SERIRQ |
| 17 | TPM_PIRQ | 18 | +3V3_SB |
| 19 | PLT_GATED_RST#_X4 | 20 | +3V3_SB |

TPM Connector (TPM1) Pinouts

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 това оборудване е в съответствие 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/ES.

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

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/EK.

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.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands [Dutch]

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.

Magyar [Hungarian]

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

PUZZLE-IN003B

Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și 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 1999/5/ES.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

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.

ROHS STATEMENT

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

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

B.1 Safety Precautions



WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the PUZZLE-IN003B.

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.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range.***
Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- ***This equipment is not suitable for use in locations where children are likely to be present.***
- **DO NOT:**
 - Drop the system against a hard surface.
 - In a site where the ambient temperature exceeds the rated temperature

PUZZLE-IN003B

B.1.2 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the PUZZLE-IN003B may result in permanent damage to the PUZZLE-IN003B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PUZZLE-IN003B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PUZZLE-IN003B 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);

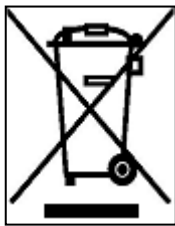
Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;

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:



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.

PUZZLE-IN003B

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the PUZZLE-IN003B, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the PUZZLE-IN003B, please read the details below.

- 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.
- Turn the device off before cleaning 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 PUZZLE-IN003B 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 PUZZLE-IN003B.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the PUZZLE-IN003B.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the PUZZLE-IN003B.
- **Using solvents** – The use of solvents is not recommended when cleaning the PUZZLE-IN003B 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 PUZZLE-IN003B. Dust and dirt can restrict the airflow in the PUZZLE-IN003B and cause its circuitry to corrode.
- **Swabs** - Swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas. Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

Hazardous Materials Disclosure

PUZZLE-IN003B

C.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 |
| <p>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.</p> <p>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.</p> | | | | | | | | | | |



C.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。 | | | | | | |

