NEXCOM International Co., Ltd.

Network and Communication Solutions
Desktop Network Appliance
DNA 140
User Manual

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PREFACE

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Acknowledgements

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

▪ Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.

▪ Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.

▪ Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.

▪ Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."

▪ Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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System Level

▪ Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.

▪ Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.

▪ Replace with 3rd party products if needed.

▪ If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

▪ Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.

▪ If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

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Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.

- Do not place the unit on an unstable surface, cart, or stand.

- Follow all warnings and cautions in this manual.

- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.

- Avoid using the system near water, in direct sunlight, or near a heating device.

- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver

- A flat-tipped screwdriver

- A grounding strap

- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the DNA 140 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Description
1	5044440031X00	RUBBER FOOT KANG YANG:RF20-5-4P
2	6023309081X00	CABLE EDI:232091081804-RS
3	7400065034X00	POWER ADAPTER FSP:FSP065-DHAN3

Ordering Information

The following below provides ordering information for DNA 140.

DNA 140 (P/N: 10L00014000X0)
Intel Atom® x7433RE processor, 4 cores, 4 x 2.5GbE RJ45 ports, 1 x 65W 12V DC-in power adapter

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CHAPTER 1: PRODUCT INTRODUCTION

Overview

DNA 140

Key Features

- Intel Atom® x7000RE/E/C processor

- 1 x SO-DIMM slot for DDR5, 4800 MT/s , ECC/non-ECC, up to 16 GB
  eMMC 32GB onboard

- 4 x 2.5GbE RJ45 ports
  - 2 x PoE+ ports, supports up to 30W (802.3at) (optional)

- 1 x 1GbE management port

- 2 x M.2 3042/3052 for LTE/5G FR1 modules

- 1 x mini-PCIe for AI card or Wi-Fi module

- 1 x M.2 2242 SATA SSD

- TPM 2.0 onboard

Hardware Specifications

Main Board

- Intel Atom® x7433RE CPU, 4 cores
  - Compatible with Intel Atom® x7000RE/C (formerly Amston Lake) and x7000E (formerly Alder Lake-N) CPU, up to 8 cores, 12W
- TPM 2.0 onboard

Main Memory

- 1 x SO-DIMM slot for DDR5, 4800 MT/s , ECC/non-ECC, up to 16 GB

Storage Device

- eMMC 32GB onboard
- 1 x M.2 2242 for SATA SSD

Interface External

- Button: Power/Reset/NEXBOOT
- LED: PWR/Sys/Storage/NEXBOOT/LAN/MGNT
- 1 x USB 2.0 port
- 1 x RJ45 console port
- 4 x 2.5GbE RJ45 ports
  - 2 x PoE+ ports, supports up to 30W (802.3at) (optional)
- 1 x 1GbE management port
- 2 x SIM slots

Interface Internal

- 1 x M.2 3052 Key B slot for LTE/5G FR1 module
- 1 x M.2 3042/3052 Key B slot for LTE/5G FR1 module
- 1 x mini-PCIe slot for AI card or Wi-Fi module
- 1 x M.2 2242 Key M slot for SATA SSD

Power

- 1 x 65W 12V DC-in power adapter
- 1 x 72W 54W DC-in power adapter for PoE (optional)

Dimensions and Weight

- Chassis dimension: 255 x 150 x 44 mm
- Carton dimension: 343 x 258 x 212 mm
- Without packing: 1.5 kg
- With packing: 2.5 kg

Environment

- Operating temperature: 0°C~40°C
- Storage temperature: -20°C~80°C
- Relative humidity: 10%~90% non-condensing

Certifications

- CE/FCC Class B (without Wi-Fi, 5G modules)

Knowing Your DNA 140

Front Panel

1 **SIM Card Slots**

2 **LED Indicators**

LED	Indicator	Behavior	Description
LAN 0~3	Link/Act (Left)	Blinking green	LAN is active with traffic
		Steady green	LAN is connected
	Speed (right)	Steady green	2.5GbE link
		Steady orange	1GbE link
		Off	10/100MbE link
MGMT	Link/Act (Left)	Blinking green	LAN is active with traffic
		Steady green	LAN is connected
	Speed (right)	Steady green	1GbE link
		Steady orange	100MbE link
		Off	10MbE link
SSD	Storage	Blinking green	Blinking during access
PWR	Power	Steady green	System power is in S0 state
		Steady orange	System power is in S5 state
		Off	Power off
SYS	S/W Programmable	On/Off/Blinking	Green and Orange dual color LED

3 NEXB∞T LED Indicator

LED Color	Primary OS running	Primary OS ready	Golden OS running	Golden OS ready	Disable 2xFM / Power off	Fail (200ms)
Green	Blinking	Steady	N/A	N/A	N/A	Blinking / Blinking (Blinking in switching green and orange)
Orange	N/A	N/A	Blinking	Steady	N/A	

Refer to Appendix A for more detailed configurations.

Rear Panel
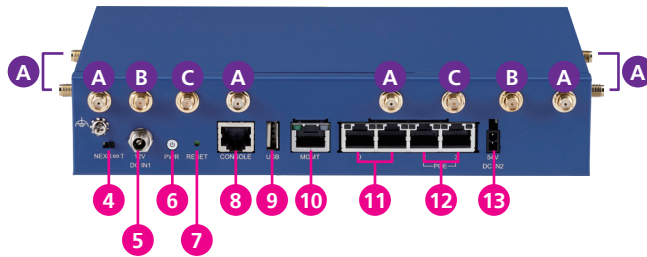
A 5G/LTE Antenna Connectors

B Wi-Fi 7 Antenna Connectors

C Wi-Fi 6 Antenna Connectors

4 **NEXB∞T Switch**
Enable or disable NETBOOT, refer to Appendix A for more detailed configurations.

5 **12V DC-IN 1 Connector**

6 **Power Button**

7 **Reset Pin Hole**

8 **RJ45 Console Connector**

9 **USB 2.0 Connector**

10 **1GbE RJ45 Management Port**

11 **2.5GbE RJ45 LAN Port**

12 **2.5GbE RJ45 PoE LAN Port (supports up to 30w, 802.3at, optional)**

13 **54V DC-IN 2 Connector**
Plug in this power adapter for additional power supply when using PoE functionality. Note that to power the system, the original power adapter (**5**) must remain connected.

CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the DNA 140 motherboard.

Before You Begin

▪ Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

▪ Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  – A Philips screwdriver
  – A flat-tipped screwdriver
  – A set of jewelers screwdrivers
  – A grounding strap
  – An anti-static pad

▪ Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

▪ Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:
▪ Always disconnect the unit from the power outlet whenever you are working inside the case.

▪ If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

▪ Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

▪ Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.

▪ Use correct screws and do not over tighten screws.

Jumper Settings

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)
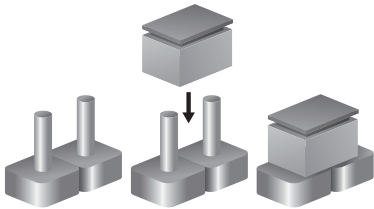
Three-Pin Jumpers: Pins 1 and 2 are Short
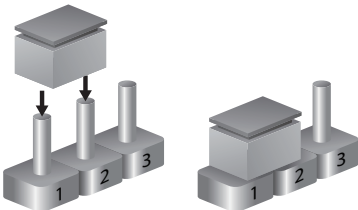
Locations of the Jumpers and Connectors

The following figure shows the motherboard of DNA140 and indicates the locations of jumpers and connectors. Refer to this chapter for detailed pin setting and definitions of connectors marked in pink on this figure.
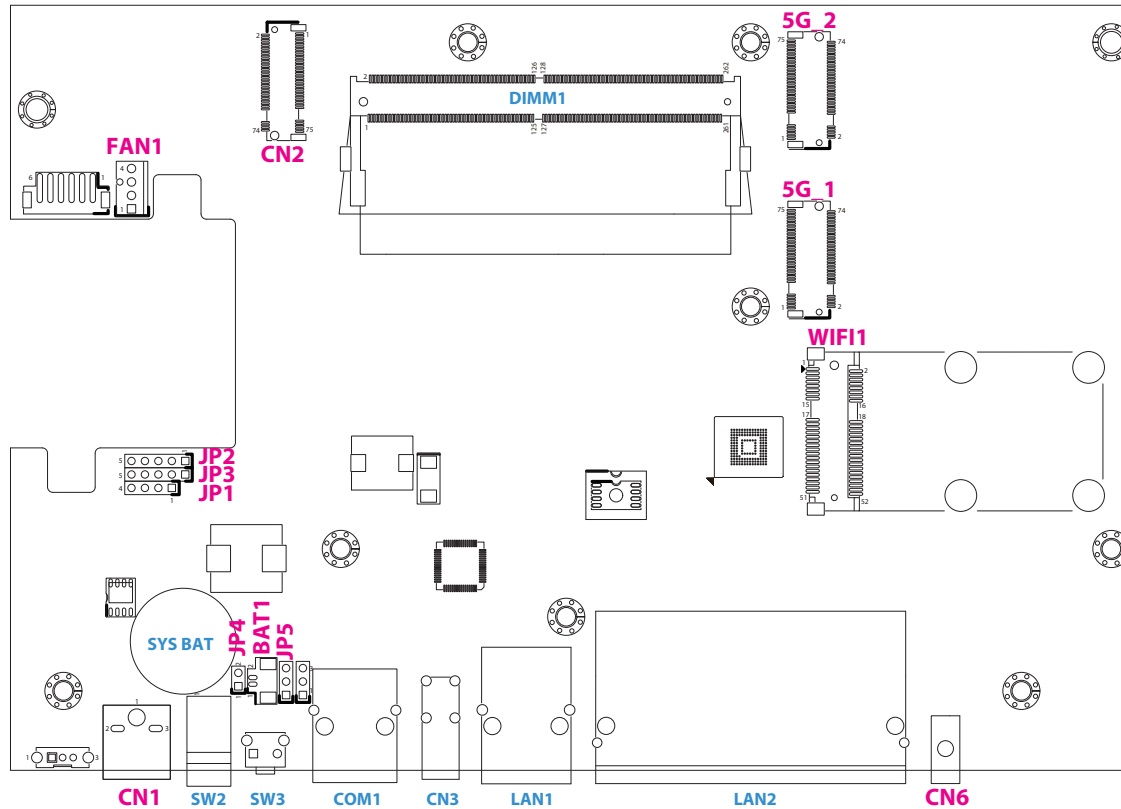
Connector Pin Definitions

External Connectors

12V Power Connector

Connector location: CN1
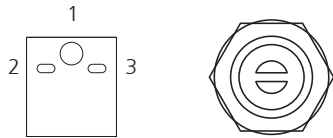
Pin	Definition
1	DC_IN
2	PGND
3	PGND

54V Power Connector

Connector location: CN6
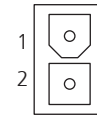
Pin	Definition
1	POE_AGND
2	P54V_POE

Connector Pin Definitions

Internal Connectors

M.2 Key B Conector

Connector type: M.2 3042/3052 Key B slot for LTE/5G FR1 module
Connector location: 5G_1

Pin	Definition	Pin	Definition
1	5G_1_CONFIG_3	2	+P3V3_5G
3	GND	4	+P3V3_5G
5	GND	6	5G_1_POWER_OFF_R_N
7	USB2_P7_5G_C_DP	8	5G_1_WWAN_DIS_N
9	USB2_P7_5G_C_DN	10	NC
11	GND	12	-
13	-	14	-
15	-	16	-
17	-	18	-

Pin	Definition	Pin	Definition
19	-	20	NC
21	5G_1_CONFIG_0	22	NC
23	5G_1_WAKE_N	24	NC
25	NC	26	5G_1_GNSS_DIS_N
27	GND	28	NC
29	USB32_P1_5G_RXN	30	5G_1_SIM1_RST
31	USB32_P1_5G_RXP	32	5G_1_SIM1_CLK
33	GND	34	5G_1_SIM1_DATA
35	USB32_P1_5G_TXN	36	5G_1_SIM1_VDD_F

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Pin	Definition	Pin	Definition
37	USB32_P1_5G_TXP	38	NC
39	GND	40	5G_1_SIM2_DET
41	NC	42	5G_1_SIM2_DATA
43	NC	44	5G_1_SIM2_CLK
45	GND	46	5G_1_SIM2_RST
47	NC	48	5G_1_SIM2_VDD_F
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC

Pin	Definition	Pin	Definition
57	GND	58	NC
59	PIN59	60	NC
61	NC	62	NC
63	NC	64	NC
65	PIN65	66	5G_1_SIM1_DET
67	5G_1_OD_RST_N	68	NC
69	5G_1_CONFIG_1	70	+P3V3_5G
71	GND	72	+P3V3_5G
73	GND	74	+P3V3_5G
75	5G_1_CONFIG_2		

M.2 Key B Conector

Connector type: M.2 3042/3052 Key B slot for LTE/5G FR1 module
Connector location: 5G_2
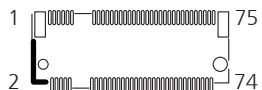
Pin	Definition	Pin	Definition
1	5G_2_CONFIG_3	2	+P3V3_5G
3	GND	4	+P3V3_5G
5	GND	6	5G_2_POWER_OFF_R_N
7	USB2_P5_5G_C_DP	8	5G_2_WWAN_DIS_N
9	USB2_P5_5G_C_DN	10	NC
11	GND	12	-
13	-	14	-
15	-	16	-
17	-	18	-

Pin	Definition	Pin	Definition
19	-	20	NC
21	5G_2_CONFIG_0	22	NC
23	5G_2_WAKE_N	24	NC
25	NC	26	5G_2_GNSS_DIS_N
27	GND	28	NC
29	USB32_P2_5G_RXN	30	5G_2_SIM1_RST
31	USB32_P2_5G_RXP	32	5G_2_SIM1_CLK
33	GND	34	5G_2_SIM1_DATA
35	USB32_P2_5G_TXN	36	5G_2_SIM1_VDD_F

Continued on next page

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Pin	Definition	Pin	Definition
37	USB32_P2_5G_TXP	38	NC
39	GND	40	5G_2_SIM2_DET
41	NC	42	5G_2_SIM2_DATA
43	NC	44	5G_2_SIM2_CLK
45	GND	46	5G_2_SIM2_RST
47	NC	48	5G_2_SIM2_VDD_F
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC

Pin	Definition	Pin	Definition
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	5G_2_SIM1_DET
67	5G_2_OD_RST_N	68	NC
69	5G_2_CONFIG_1	70	+P3V3_5G
71	GND	72	+P3V3_5G
73	GND	74	+P3V3_5G
75	5G_2_CONFIG_2		

Battery Conector

Connector location: BAT1

Pin	Definition
1	GND
2	BATT

M.2 Key M Conector

Connector type: M.2 2242 Key M slot for SSD module
Connector location: CN2

Pin	Definition	Pin	Definition
1	GND	2	+P3V3
3	GND	4	+P3V3
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	NC

Pin	Definition	Pin	Definition
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC

Continued on next page

Pin	Definition	Pin	Definition
37	NC	38	M.2_SSD_DEVSLP
39	GND	40	NC
41	SATA_P0_M.2_RXP	42	NC
43	SATA_P0_M.2_RXN	44	NC
45	GND	46	NC
47	SATA_P0_M.2_C_TXN	48	NC
49	SATA_P0_M.2_C_TXP	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC

Pin	Definition	Pin	Definition
57	GND	58	NC
59	-	60	-
61	-	62	-
63	-	64	-
65	-	66	-
67	NC	68	NC
69	NC	70	+P3V3
71	GND	72	+P3V3
73	GND	74	+P3V3
75	GND		

Fan Conector

Connector location: FAN1

4 ○
  ○
  ○
1 □

Pin	Definition
1	GND
2	+P12V
3	SIO_FAN_TACH_R
4	SIO_FAN_PWM_R

MCU UART Header

Connector location: JP1

4 ○ ○ ○ □ 1
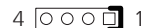
Pin	Definition	Pin	Definition
1	+P3V3_AUX	2	MCU_UART2_TX
3	MCU_UART2_RX	4	GND

2xFM MCU Programm Header

Connector location: JP2

5 ⬚⬚⬚⬚⬚ 1

Pin	Definition	Pin	Definition
1	+P3V3_AUX	2	SWCLK
3	GND	4	SWDIO_2xFM
5	2xFM_MCU_RST_B		

MCU Programm Header

Connector location: JP3

5 ⬚⬚⬚⬚⬚ 1

Pin	Definition	Pin	Definition
1	+P3V3_AUX	2	SWCLK
3	GND	4	SWDIO
5	MCU_RST_B		

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Power Button Header (for debug)

Connector location: JP4

2 ⬜
1 ⬜

Pin	Definition
1	FP_PWRBTN_N_R
2	GND

Clear CMOS

Connector location: JP5

3 ⬜
⬜
1 ⬜

Pin	Definition
1	RTC_RST_N
2	GND
3	NC

Mini PICe Conector

Connector type: Mini PCIe slot for Wi-Fi module
Connector location: WIFI1
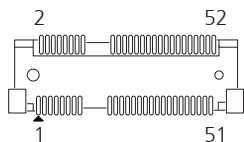
Pin	Definition	Pin	Definition
1	WLAN_WAKE_N	2	+P3V3
3	NA	4	GND
5	NA	6	NA
7	CLKREQ2_WIFI_R_N	8	NA
9	GND	10	NA
11	CLK2_WIFI_DN	12	NA
13	CLK2_WIFI_DP	14	NA
15	GND	16	NA
17	NA	18	GND
19	NA	20	WLAN_DIS_R_N
21	GND	22	WIFI_RST_N
23	PCIE3_WIFI_RXN	24	+P3V3
25	PCIE3_WIFI_RXP	26	GND

Pin	Definition	Pin	Definition
27	GND	28	NA
29	GND	30	NA
31	PCIE3_WIFI_C_TXN	32	NA
33	PCIE3_WIFI_C_TXP	34	GND
35	GND	36	USB2_P1_WIFI_R_DN
37	GND	38	USB2_P1_WIFI_R_DP
39	+P3V3	40	GND
41	+P3V3	42	NA
43	GND	44	NA
45	NA	46	NA
47	NA	48	NA
49	NA	50	GND
51	NA	52	+P3V3

Chapter 3: System Setup

Removing the Chassis Cover

CAUTION! Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. Remove the screws located on the side panels and bottom, then place them in a safe location for later use.

2. With the screws removed, gently slide the cover outwards then lift up the cover to remove it.

3. Loosen the screws on the heatsink module, place them in a safe location for later use, then lift up the heatsink module.
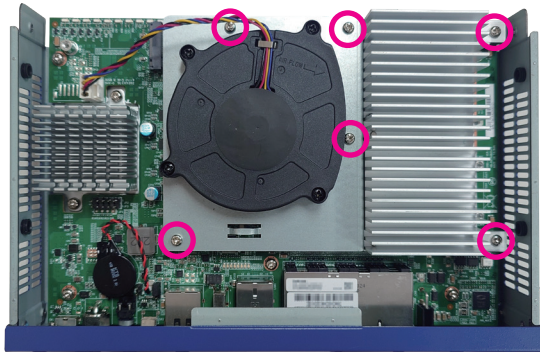
4. Once the chassis and heatsink module have been removed, the system should resemble the image below and be ready for installing extension modules.
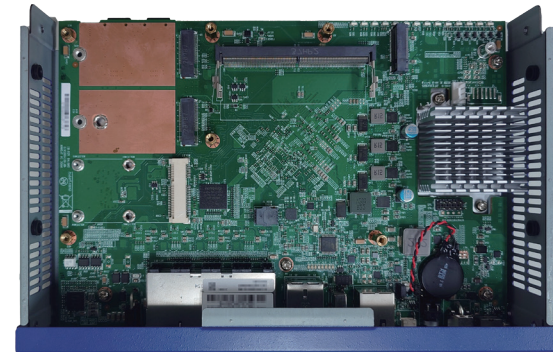
Installing a SO-DIMM Memory Module

1. Locate the SO-DIMM socket on the motherboard and insert the module into the socket at an approximately 30 degrees angle. Push the module down until the clips on both sides of the socket lock into position. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.

2. Ensure the memory module is secured properly into the socket.
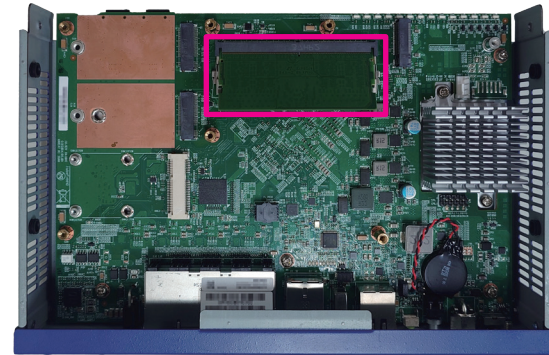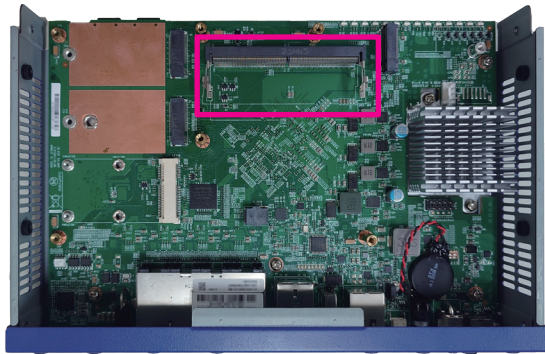
Installing an M.2 Key M Module

1. Locate the M.2 Key M slot on the motherboard.
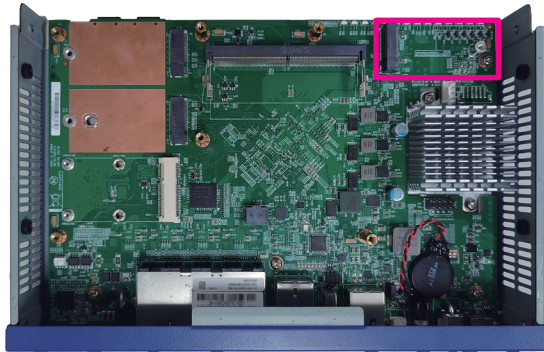
2. Insert the M.2 module into the M.2 slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot.
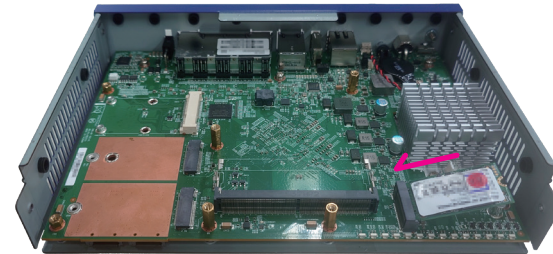
3. Push the M.2 module down and fasten an M.2 mounting screw into the mounting hole to secure the module.
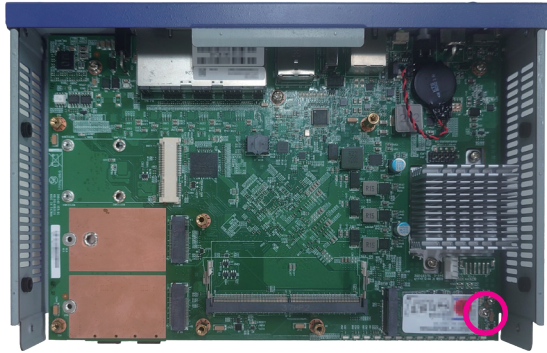
Installing M.2 Key B Module(s)

1. Locate the M.2 Key B slots on the motherboard.
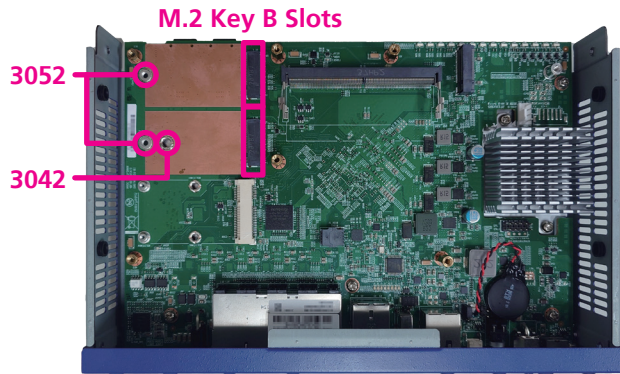
M.2 Key B Slots

2. Insert the M.2 module into the M.2 slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot.
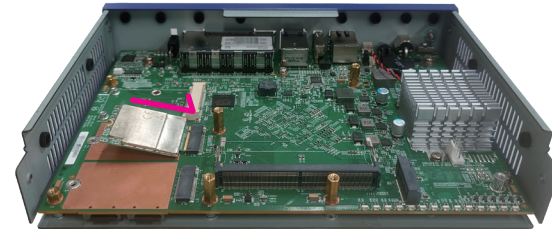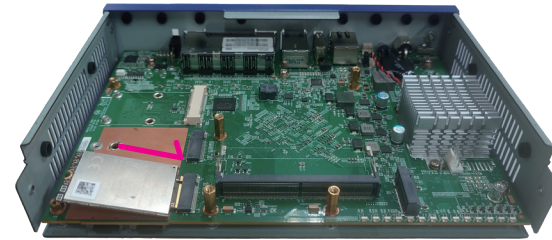
This system is equipped with two M.2 Key B slots, allowing simultaneous installation of two M.2 modules. The flexibility of these slots accommodates M.2 modules of sizes 3042 and 3052, enabling versatile usage depending on specific requirements and form factor constraints.

3. Push the M.2 module down and fasten an M.2 mounting screw into the mounting hole to secure the module.

3042

3052
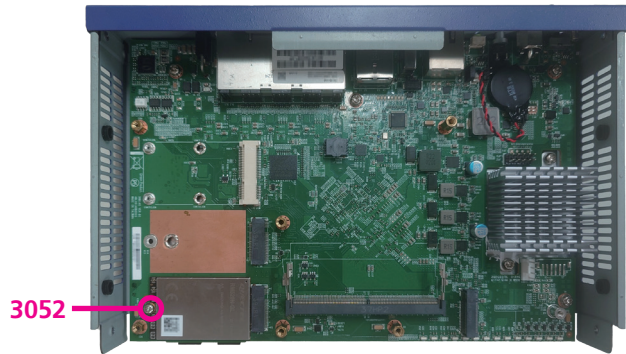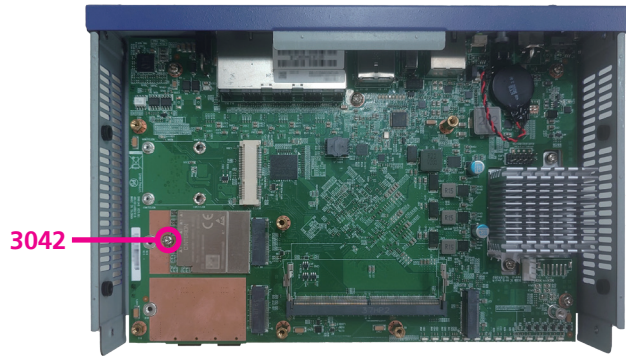
Installing a Mini PCIe Module

1. Locate the mini PCIe slot on the motherboard.
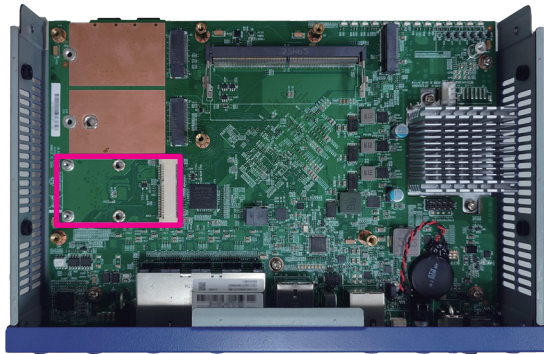
2. Insert the mini PCIe module into the mini-PCIe slot at a 45-degree angle until the gold-plated connector on the edge of the module completely disappears into the slot.
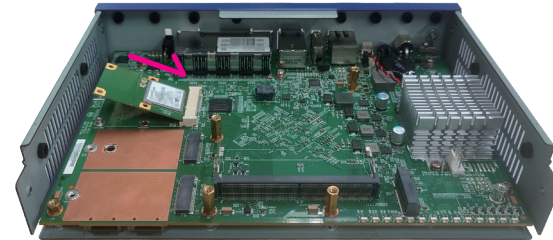
3. Push the module down and secure it with a screw.
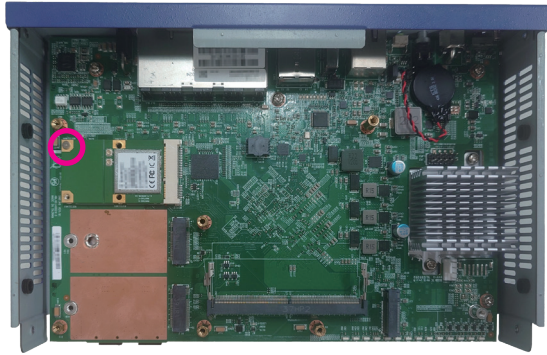
Installing Antenna Cables and Jacks

Once the module(s) (Wi-Fi or LTE) have been installed, follow the steps below to assemble the RF antenna cables from the module(s) to the antenna holes on the chassis.

1. Remove the gaskets (ring 1 and ring 2) on the SMA antenna jack of the RF cable.

Ring 2   **Ring 1**

SMA Antenna Jack   **Antenna Connector**

2. Attach the antenna connector to the module's antenna connector.

Antenna Connector
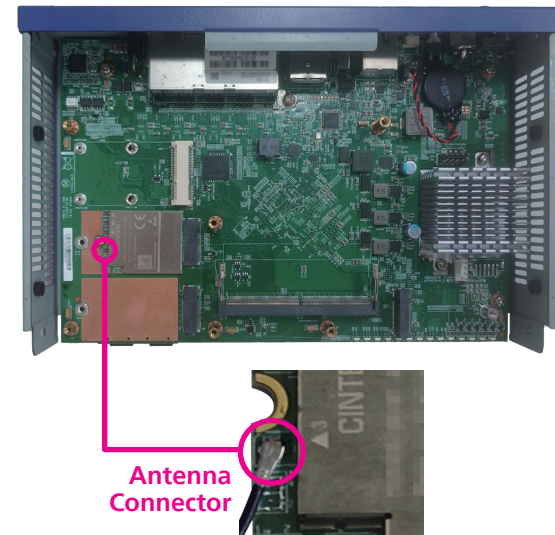
3. Remove the antenna cover from the chassis.

4. Insert the SMA antenna jack through the antenna hole of the chassis, then secure it using the two rings removed in step 1.

Ring 2

Ring 1
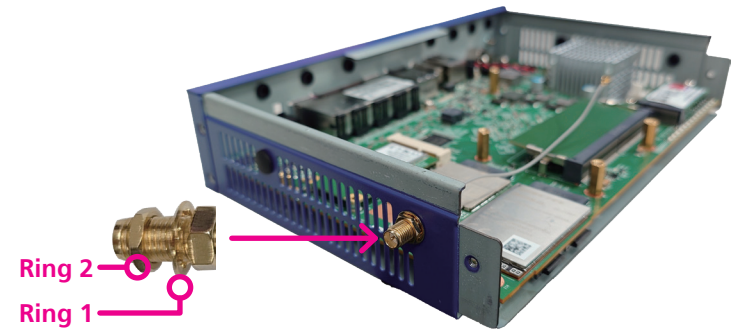
5. Repeat the previous steps to install the other SMA antenna jacks and follow the numbers indicated below to install them into the

corresponding antenna holes.
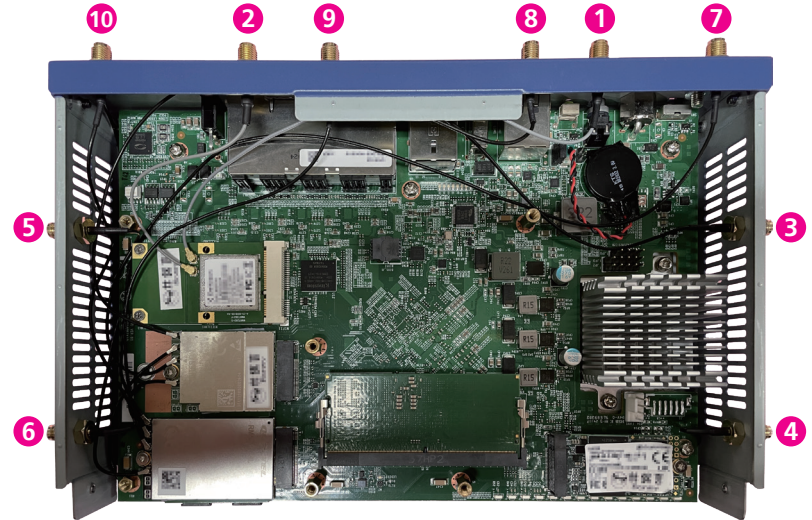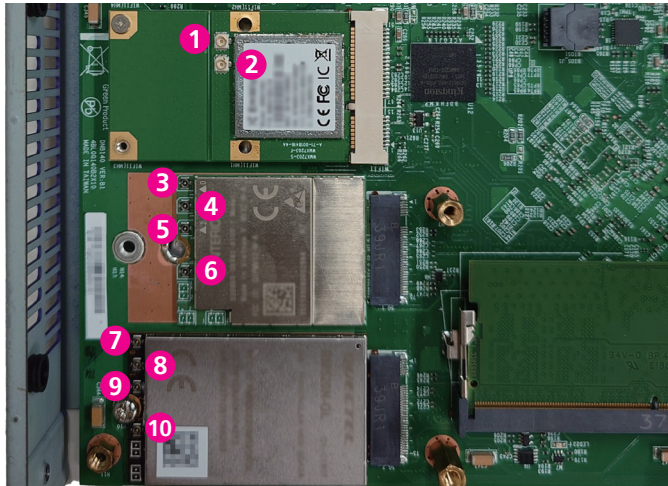
CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for the DNA 140. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:
▪ Hard drives, diskette drives, and peripherals
▪ Video display type and display options
▪ Password protection from unauthorized use
▪ Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

▪ This program should be executed under the following conditions:
▪ When changing the system configuration
▪ When a configuration error is detected by the system and you are prompted to make changes to the setup program
▪ When resetting the system clock
▪ When redefining the communication ports to prevent any conflicts
▪ When making changes to the Power Management configuration
▪ When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.

- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing Del allows you to enter Setup.

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menu or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
−	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press Enter .

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press `Enter,` to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 2005 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

```
                         Aptio Setup - AMI
     Main  Advanced  Security  Boot  Save & Exit
/-------------------------------------------------+------------------------\
|  BIOS Information                                |Set the Date. Use Tab   |
|  BIOS Vendor              American Megatrends    |to switch between Date   |
|  Product Name             DNA-140                |elements.               |
|  BIOS Version             G126T016 x64           |Default Ranges:         |
|  Build Date and Time      06/27/2024 09:48:14    |Year: 1998-9999         |
|                                                  |Months: 1-12            |
|  Intel(R) Atom(TM) x7835RE                       |Days: Dependent on month|
|  Speed                    1300 MHz               |Range of Years may vary.|
|  Stepping                 A0                      |                        |
|  Microcode Revision       15                     |------------------------|
|                                                  |                        |
|                                                  |><: Select Screen       |
|  ME FW Version            16.50.10.1351          |^v: Select Item         |
|  Total Memory             8192 MB                |Enter: Select           |
|  Memory Frequency         4800 MHz               |+/-: Change Opt.        |
|                                                  |F1: General Help        |
|                                                  |F2: Previous Values     |
|  System Date              [Fri 02/02/2024]       |F3: Optimized Defaults  |
|  System Time              [18:37:01]             |F4: Save & Exit         |
|                                                  |ESC: Exit               |
\-------------------------------------------------+------------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

⚠ Setting incorrect field values may cause the system to malfunction.

```
                         Aptio Setup - AMI
      Main  Advanced  Security  Boot  Save & Exit
/--------------------------------+-----------------------\
|> CPU Configuration             |CPU Configuration       |
|> Power & Performance           |Parameters              |
|> System Agent (SA) Configuration|                        |
|> PCH-IO Configuration          |                        |
|> SATA Configuration            |                        |
|> Trusted Computing             |                        |
|> Hardware Monitor              |                        |
|> Smart Fan1 Configuration      |                        |
|> Serial Port Console Redirection|                        |
|> NVMe Configuration            |                        |
|                                |------------------------|
|                                |><: Select Screen       |
|                                |^v: Select Item         |
|                                |Enter: Select           |
|                                |+/-: Change Opt.        |
|                                |F1: General Help        |
|                                |F2: Previous Values     |
|                                |F3: Optimized Defaults  |
|                                |F4: Save & Exit         |
|                                |ESC: Exit               |
\--------------------------------+-----------------------/
           Version 2.22.1289 Copyright (C) 2024 AMI
```

CPU Configuration

This section is used to configure the CPU.

```
                         Aptio Setup - AMI
      Advanced
/--------------------------------+-----------------------\
| CPU Configuration              |When enabled, a VMM can |
| ID                0xB06E0      |utilize the additional  |
| Brand String      Intel(R) Atom(TM)|hardware capabilities   |
|                   x7835RE      |provided by Vanderpool  |
| VMX               Supported    |Technology.             |
|                                |                        |
| Intel (VMX)       [Enabled]    |                        |
| Virtualization                 |                        |
| Technology                     |                        |
| Active Efficient-cores  [All]  |------------------------|
| BIST              [Disabled]   |><: Select Screen       |
| AP threads Idle Manner [MWAIT Loop]|^v: Select Item         |
| AES               [Enabled]    |Enter: Select           |
| MachineCheck      [Enabled]    |+/-: Change Opt.        |
| MonitorMWait      [Enabled]    |F1: General Help        |
|> CPU SMM Enhancement           |F2: Previous Values     |
|                                |F3: Optimized Defaults  |
|                                |F4: Save & Exit         |
|                                |ESC: Exit               |
\--------------------------------+-----------------------/
           Version 2.22.1289 Copyright (C) 2024 AMI
```

Intel (VMX) Virtualization Technology
Enable or disable Intel Virtualization technology. When enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Efficient-cores
This is allows you to select the number of E-cores to enable in each processor package.

BIST
Enable or disable BIST (Built-in Self Test) on reset.

AP Threads Idle Manner
AP Threads Idle Manner for waiting signal to run.

AES

Enable or Disable AES (Advanced Encryption Standard).

MachnineCheck

Enable or disable Machine Check.

MonitorMwait
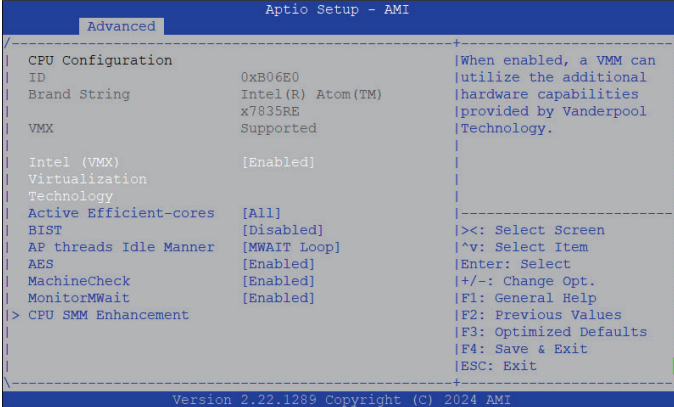
Enable or disable MonitorMwait; If disable MonitorMwait, the AP threads Idle Manner should not set in MWAIT Loop.

CPU SMM Enhancement

Enter the CPU SMM Enhancement submenu.

Power & Performance Configuration

This section is used to configure the CPU power management features.

```
                        Aptio Setup - AMI
        Advanced
/------------------------------------------+----------------------\
|  CPU Configuration                       |When enabled, a VMM can |
|  ID                    0xB06E0           |utilize the additional  |
|  Brand String          Intel(R) Atom(TM) |hardware capabilities   |
|                        x7835RE           |provided by Vanderpool  |
|  VMX                   Supported         |Technology.             |
|                                          |                        |
|  Intel (VMX)           [Enabled]         |                        |
|  Virtualization                          |                        |
|  Technology                              |                        |
|  Active Efficient-cores [All]            |------------------------|
|  BIST                  [Disabled]        |><: Select Screen       |
|  AP threads Idle Manner [MWAIT Loop]     |^v: Select Item         |
|  AES                   [Enabled]         |Enter: Select           |
|  MachineCheck          [Enabled]         |+/-: Change Opt.        |
|  MonitorMWait          [Enabled]         |F1: General Help        |
|> CPU SMM Enhancement                     |F2: Previous Values     |
|                                          |F3: Optimized Defaults  |
|                                          |F4: Save & Exit         |
|                                          |ESC: Exit               |
\------------------------------------------+----------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```

CPU - Power Management Control

Enter the CPU - Power Management Control submenu.

GT - Power Management Control

Enter the GT - Power Management Control submenu.

CPU - Power Management Control

This section is used to configure the CPU power management features.

```
                        Aptio Setup - AMI
    Advanced
/--------------------------------+------------------------\
| CPU - Power Management Control      ^|Select the performance |
|                                     *|state that the BIOS     |
| Boot performance mode   [Turbo Performance] *|will set starting from |
| Intel(R) SpeedStep(tm)  [Enabled]   *|reset vector.           |
| Race To Halt (RTH)      [Enabled]   *|                        |
| Intel(R) Speed Shift    [Enabled]   *|                        |
| Technology                          *|                        |
| Per Core P State OS     [Disabled]  *|                        |
| control mode                        *|                        |
| HwP Autonomous Per      [Enabled]   +|------------------------|
| Core P State                        +|><: Select Screen       |
| HwP Autonomous EPP      [Enabled]   +|^v: Select Item         |
| Grouping                            +|Enter: Select           |
| EPB override over PECI  [Disabled]  +|+/-: Change Opt.        |
| HwP Lock                [Enabled]   +|F1: General Help        |
| HDC Control             [Enabled]   +|F2: Previous Values     |
|   Turbo Mode            [Enabled]   +|F3: Optimized Defaults  |
|>  View/Configure Turbo Options      v|F4: Save & Exit         |
|                                      |ESC: Exit               |
\--------------------------------+------------------------/
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```

Boot performnce mode
Select the performance state that the BIOS will set starting from reset vector.

Intel(R) SpeedStep(tm)
Enable or disable Intel Speedstep technology.

Race To Halt (RTH)
Enable or disable RTH feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power.

Intel(R) Speed Shift Technology
Enable or disable Intel Speed Shift Technology support. Enabling it will expose the CPPC v2 interface to allow hardware controlled P-states.

Per Core P State OS control mode
Enable or disable Per Core P State OS control mode.

HWP Autonomous Per Core P State
Enable or disable HWP Autonomous Per Core P State.

HWP Autonomous EPP Grouping
Enable or disable HWP Autonomous EPP Grouping.

EPB override over PECI
Enable or disable EPB override over PECI.

HWP Lock
Enable or disable HWP Lock.

HDC Control
Enable or disable HDC Control.

Turbo Mode
Enable or disable turbo mode.

View/Configuration Turbo Options
Enter the View/Configuration Turbo Options submenu.

CPU VR Settings
Enter the CPU VR Settings submenu.

Platform PL1 Enable
Enable or disable platform power limit 1 programming. If this option is enabled, it activates the PL1 value to be used by the processor to limit the average power of given time window.

Platform PL2 Enable
Enable or disable platform power limit 2 programming. If this option is disabled, the BIOS will program the default values for platform power limit 2.

Power Limit 4 Override
Enable or disable power limit 4 override. If this option is disabled, the BIOS will leave the default values for power limit 4..

C State
Enable or disable C-States support for power saving.

Thermal Monitor
Enable or disable thermal monitor.

Interrupt Redirection Mode Selection
Configure the Interrupt Redirection Mode for logical interrupts.

Timed MWAIT
Enable or disable Timed MWAIT support.

Custom P-state Table
Enter the Custom P-state Table submenu.

EC turbo control mode
Enable or disable EC turbo control mode.

Energy Performance Gain
Enable or disable Energy Performance Gain.

Power limit 3 settings
Enter the Power limit 3 settings submenu.

CPU Lock Configuration
Enter the CPU Lock Configuration submenu.

GT - Power Management Control

This section is used to configure the CPU power management features.

```
                          Aptio Setup - AMI
       Advanced
/----------------------------------------+-----------------------\
|  GT - Power Management Control          |Check to enable render  |
|                                         |standby support.        |
|  RC6(Render Standby)      [Enabled]     |                        |
|  Maximum GT frequency     [Default Max  |                        |
|                           Frequency]    |                        |
|  Disable Turbo GT         [Disabled]    |                        |
|  frequency                              |                        |
|                                         |                        |
|                                         |                        |
|                                         |------------------------|
|                                         |><: Select Screen       |
|                                         |^v: Select Item         |
|                                         |Enter: Select           |
|                                         |+/-: Change Opt.        |
|                                         |F1: General Help        |
|                                         |F2: Previous Values     |
|                                         |F3: Optimized Defaults  |
|                                         |F4: Save & Exit         |
|                                         |ESC: Exit               |
\----------------------------------------+-----------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```
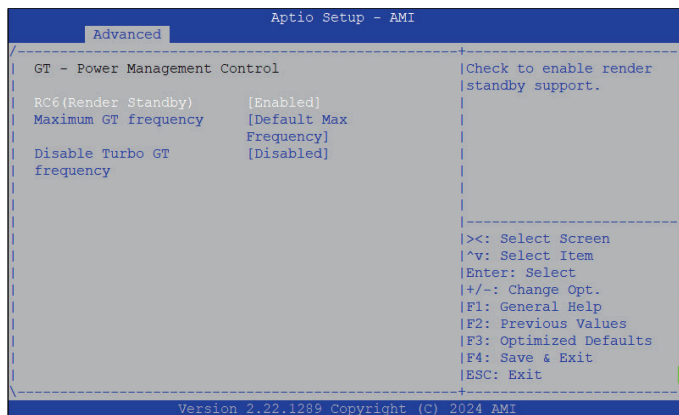
RC6 (Render Standby)
Check to enable render standby support.

Maximum GT frequency
Configure the Maximum GT frequency.

Disable Turbo GT frequency
Enable or disable Disable Turbo GT frequency.

System Agent (SA) Configuration

This section is used to configure the CPU power management features.

```
                          Aptio Setup - AMI
        Advanced
/-------------------------------------------+-----------------------\
| System Agent (SA) Configuration           ^|Memory Configuration   |
|                                           *|Parameters             |
| VT-d                        Supported     *|                       |
|                                           *|                       |
|> Memory Configuration                     *|                       |
|> Graphics Configuration                   *|                       |
|> DMI/OPI Configuration                    *|                       |
|> TCSS setup menu                          *|                       |
|> Display setup menu                       *|                       |
|> PCI Express Configuration                *|-----------------------|
|                                           *|><: Select Screen      |
| Stop Grant             [Auto]             +|^v: Select Item        |
| Configuration                             +|Enter: Select          |
| VT-d                   [Enabled]          +|+/-: Change Opt.       |
| Control Iommu          [Enable IOMMU during +|F1: General Help     |
| Pre-boot Behavior      boot]              +|F2: Previous Values    |
| X2APIC Opt Out         [Disabled]         +|F3: Optimized Defaults |
| DMA Control Guarantee  [Enabled]          v|F4: Save & Exit        |
|                                            |ESC: Exit              |
\-------------------------------------------+-----------------------/
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```

Memory Configuration
Enter the Memory Configuration submenu.

Graphics Configuration
Enter the Graphic Configuration submenu.

DMI/OPI Configuration
Enter the DMI/OPI Configuration submenu.

TCSS setup menu
Enter the TCSS setup menu submenu.

Display setup menu
Enter the Display setup menu submenu.

PCI Express Configuration
Enter the PCI Express Configuration submenu.

VT-d
Enable or disable VT-d function.

Control IOMMU Pre-boot Behavior
Enable or disable the IOMMU in pre-boot environment.

X2APIC Opt Out
Enable or disable X2APIC Opt Out.

DMA Control Guarantee
Enable or disable DMA Control Guarantee.

Memory Configuration

```
                      Aptio Setup - AMI
       Advanced
/-----------------------------------------+------------------------\
|> Memory Thermal Configuration           ^|Memory Thermal         |
|> Memory Training Algorithms             *|Configuration Options  |
|  Memory Configuration                   *|                       |
|                                         +|                       |
|  Memory RC Version        0.0.4.74      +|                       |
|  Memory Frequency          4800 MHz     +|                       |
|  tCL-tRCD-tRP-tRAS        40-39-39-77   +|                       |
|  MC 0 Ch 0 DIMM 0         Populated & Enabled +|                 |
|    Size                   8192 MB (DDR5)+|                       |
|    Number of Ranks        1             +|-----------------------|
|    Manufacturer           UnKnown       +|><: Select Screen      |
|                                         +|^v: Select Item        |
|  Debug Value              0             +|Enter: Select          |
|  MRC ULT Safe Config      [Disabled]    +|+/-: Change Opt.       |
|  LPDDR DqDqs              [Enabled]      +|F1: General Help       |
|  Re-Training                            +|F2: Previous Values    |
|  Safe Mode Support        [Disabled]    v|F3: Optimized Defaults |
|                                          |F4: Save & Exit        |
|                                          |ESC: Exit              |
\-----------------------------------------+------------------------/
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```

Memory Thermal Configuration
Enter the Memory Thermal Configuration submenu.

Memory Train Algorithms
Enter the Memory Train Algorithms submenu.

Debug Value
Configure a debug value.

MRC ULT Safe Config
Enable or disable MRC ULT Safe Config.

LPDDR DqDqs
Enable or disable LPDDR DqDqs.

Re-Training Safe Mode Support
Enable or disable Re-Training Safe Mode Support.

Graphics Configuration

```
                          Aptio Setup - AMI
           Advanced
/-----------------------------------------+-----------------------\
| Graphics Configuration                  ^|Graphics turbo IMON   |
|                                         *|current values        |
| Graphics Turbo IMON      31             *|supported (14-31)     |
| Current                                 *|                      |
| Skip Scaning of          [Disabled]     *|                      |
| External Gfx Card                       *|                      |
|                                         *|                      |
| Primary Display          [Auto]         *|                      |
|> External Gfx Card Primary Display Configuration *|-----------------------|
| Internal Graphics        [Disabled]     *|                      |
| GTT Size                 [8MB]          +|><: Select Screen     |
| Aperture Size            [256MB]        +|^v: Select Item       |
| PSMI SUPPORT             [Disabled]     +|Enter: Select         |
| DVMT Pre-Allocated       [60M]          +|+/-: Change Opt.      |
| Intel Graphics Pei       [Disabled]     +|F1: General Help      |
| Display Peim                            +|F2: Previous Values   |
| VDD Enable               [Enabled]      +|F3: Optimized Defaults|
| Configure GT for use     [Enabled]      v|F4: Save & Exit       |
|                                          |ESC: Exit             |
\-----------------------------------------+-----------------------/
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```

Graphic Turbo IMON Current
Graphic turbo IMON current values supported (14-31)

Skip Scanning of External Gfx Card
Enable or disable Skip Scanning of External Gfx Card.

Primary Display
Configure the primary display.

External Gfx Card Primaty Display Configuration
Enter the External Gfx Card Primaty Display Configuration submenu.

Internal Graphics
Enable or disable the internal graphics.

GTT Size
Configure the GTT memory size.

Aperture Size
Configure the Aperture size.

PSMI Support
Enable or disable PSMI support.

DVMT Pre-Allocated
Configure the DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

Intel Graphics Pei Display Peim
Enable or disable Intel Graphics Pei Display Peim.

VDD Enable
Enable or disable VDD enable function.

Configure GT for use
Enable or disable the Configure GT for use.

DMI/OPI Configuration

```
                        Aptio Setup - AMI
        Advanced
/--------------------------------+-----------------------\
|  DMI/OPI Configuration         |Enable/Disable CDR     |
|                                |Relock                 |
|  CDR Relock for CPU DMI   [Disabled]|                  |
|  DMI Gen3 Eq Phase 2      [Auto]    |                  |
|  DMI Gen3 Eq Phase 3      [Auto]    |                  |
|  Method                        |                       |
|  DMI Gen3 ASPM            [ASPM L1] |                  |
|  DMI ASPM                 [ASPM L1] |                  |
|  DMI Gen3 L1 Exit         4         |                  |
|  Latency                       |-----------------------|
|  New FOM for CPU DMI      [Disabled]|><: Select Screen |
|> DMI Advanced Menu             |^v: Select Item        |
|                                |Enter: Select          |
|                                |+/-: Change Opt.       |
|                                |F1: General Help       |
|                                |F2: Previous Values    |
|                                |F3: Optimized Defaults |
|                                |F4: Save & Exit        |
|                                |ESC: Exit              |
\--------------------------------+-----------------------/
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```

CDR Relock for CPU DMI
Enable or disable CDR Relock for CPU DMI.

DMI Gen3 Eq Phase 2
Configure the DMI Gen3 Eq Phase 2.

DMI Gen3 Eq Phase 3
Configure the DMI Gen3 Eq Phase 3.

DMI Gen3 ASPM
Configure DMI Gen3 ASPM.

DMI ASPM
Configure DMI ASPM.

DMI Gen3 L1 Exit
Configure DMI Gen3 L1 Exit.

New FOM for CPU DMI
Enable or disable New FOM for CPU DMI.

DMI Advanced Menu
Enter the DMI Advanced Menu.

TCSS setup menu

```
                        Aptio Setup - AMI
         Advanced
/---------------------------------------+------------------------\
| TCSS Configuration                    |Enable/Disable TCSS xHCI|
|                                       |                        |
| IOM FW version: 23000800              |                        |
|                                       |                        |
| PHY FW version: 0000                  |                        |
|                                       |                        |
| TBT FW IMR Status: 00000000           |                        |
| TBT FW version: N/A                   |                        |
| Deepest TC state: 0000                |                        |
|                                       |------------------------|
| TCSS xHCI Support      [Disabled]     |><: Select Screen       |
|                                       |^v: Select Item         |
|                                       |Enter: Select           |
|                                       |+/-: Change Opt.        |
|                                       |F1: General Help        |
|                                       |F2: Previous Values     |
|                                       |F3: Optimized Defaults  |
|                                       |F4: Save & Exit         |
|                                       |ESC: Exit               |
\---------------------------------------+------------------------/
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```

TCSS xHCI Support
Enable or disable TCSS xHCI.

Display Configuration

```
                        Aptio Setup - AMI
         Advanced
/---------------------------------------+------------------------\
| Display Configuration                 |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |                        |
|                                       |------------------------|
|                                       |><: Select Screen       |
|                                       |^v: Select Item         |
|                                       |Enter: Select           |
|                                       |+/-: Change Opt.        |
|                                       |F1: General Help        |
|                                       |F2: Previous Values     |
|                                       |F3: Optimized Defaults  |
|                                       |F4: Save & Exit         |
|                                       |ESC: Exit               |
\---------------------------------------+------------------------/
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```

PCI Express Configuration

```
                         Aptio Setup - AMI
        Advanced
/-----------------------------------------+------------------------\
|  PCI Express Configuration              |Load Fia Configuration  |
|                                         |if Enabled for each     |
|  Fia Programming        [Enabled]       |root port.              |
|  Compliance Test Mode   [Disabled]      |                        |
|  CDR Relock             [Enabled]       |                        |
|  Assertion on Link      [Disabled]      |                        |
|  Down GPIOs                             |                        |
|  PCI Express Slot       [M2]            |                        |
|  Selection                              |                        |
|> PCI Express Root Port 1                |------------------------|
|> PCI Express Root Port 2                |><: Select Screen       |
|> PCI Express Root Port 3                |^v: Select Item         |
|                                         |Enter: Select           |
|                                         |+/-: Change Opt.        |
|                                         |F1: General Help        |
|                                         |F2: Previous Values     |
|                                         |F3: Optimized Defaults  |
|                                         |F4: Save & Exit         |
|                                         |ESC: Exit               |
\-----------------------------------------+------------------------/
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```

Fia Programming
Load Fia Configuration if enabled for each root port.

Compliance Test Mode
Enable or disable Compliance Test Mode.

CDR Relock
Enable or disable CDR Relock.

Assertion on Link Down GPIOs
Enable or disable Assertion on Link Down GPIOs.

PCI Express Slot Selection
Select a PCI express slot.

PCI Express Root Port 1/2/3
Enter the PCI Express Root Port 1/2/3/ submenu.

PCI Express Configuration > PCI Express Root Port 1/2/3

```
                      Aptio Setup - AMI
    Advanced
/------------------------------------+--------------------------\
| PCI Express Root Port   [Enabled]         ^|Control the PCI Express |
| 1                                          *|Root Port.              |
| Connection Type         [Slot]             *|                        |
| PCI Express Clock       [Enabled]          *|                        |
| Gating                                     *|                        |
| PCI Express Power       [Enabled]          +|                        |
| Gating                                     +|                        |
| ASPM                    [L1]               +|                        |
| L1 Substates            [L1.1 & L1.2]      +|------------------------|
| Gen3 Eq Phase3 Method   [Hardware]         +|                        |
| Gen4 Eq Phase3 Method   [Hardware]         +|><: Select Screen       |
| ACS                     [Enabled]          +|^v: Select Item         |
| PTM                     [Enabled]          +|Enter: Select           |
| DPC                     [Disabled]         +|+/-: Change Opt.        |
| FOM Scoreboard          [Auto]             +|F1: General Help        |
| Control Policy                             +|F2: Previous Values     |
| Multi-VC                [Disabled]         +|F3: Optimized Defaults  |
| EDPC                    [Enabled]          v|F4: Save & Exit         |
|                                             |ESC: Exit               |
\------------------------------------+--------------------------/
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```

PCI Express Root Port 1/2/3
Control the PCI Express Root Port.

Connection Type
Select a connection type.

PCI Express Clock Gating
Enable or disable PCI Express Clock Gating.

PCI Express Power Gating
Enable or disable PCI Express Power Gating.

ASPM Support
Select the ASPM level.

L1 Substates
Configure the L1 Substates settings.

Gen3 Eq Phase 3 Method
Configure a Gen3 Eq Phase 3 Method.

Gen4 Eq Phase 3 Method
Configure a Gen4 Eq Phase 3 Method.

ACS
Enable or disable the ACS.

PTM
Enable or disable the PTM.

DCP
Enable or disable the DCP.

FOM Scoreboard Control Policy
Configure the FOM Scoreboard Control Policy.

Multi-VC
Enable or disable Multi-VC.

EDPC
Enable or disable the EDPC.

PCH-IO Configuration

```
                    Aptio Setup - AMI
        Advanced
/-----------------------------------------------+------------------------\
|  PCH-IO Configuration                         ^|PCI Express            |
|                                               *|Configuration settings |
|> PCI Express Configuration                    *|                       |
|> USB Configuration                            *|                       |
|> Security Configuration                       *|                       |
|> HD Audio Configuration                       +|                       |
|> THC Configuration                            +|                       |
|> SerialIo Configuration                       +|                       |
|> SCS Configuration                            +|                       |
|> ISH Configuration                            +|-----------------------|
|> Pch Thermal Throttling Control               +|><: Select Screen      |
|  Skip VCCIN_AUX           [Disabled]          +|^v: Select Item        |
|  Configuration                                +|Enter: Select          |
|> FIVR Configuration                           +|+/-: Change Opt.       |
|> PMC Configuration                            +|F1: General Help       |
|                                               +|F2: Previous Values    |
|> TSN GBE Configuration                        +|F3: Optimized Defaults |
|                                               v|F4: Save & Exit        |
|                                                |ESC: Exit              |
\-----------------------------------------------+------------------------/
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```

PCI Express Configuration /
USB Configuration / Security Configuration /
HD Audio Configuration /
THC Configuration /
Seriallo Configuration /
SCS Configuration /
ISH Configuration /
Pch Thermal Throttling Control /
FIVR Configuration /
PMC Configuration /
TSN GBE Configuration
Select a desired option and then press <Enter> to enter their respective submenu.

Skip VCCIN AUX Configuration
Enable or disable the Skip VCCIN AUX Configuration.

PCI Express Configuration

```
                        Aptio Setup - AMI
         Advanced
/--------------------------------------------+------------------------\
| PCI Express Configuration               ^|The control of Active   |
|                                         *|State Power Management   |
| DMI Link ASPM Control    [Disabled]     *|of the DMI Link.         |
| Port8xh Decode           [Disabled]     *|                         |
| Compliance Test Mode     [Disabled]     *|                         |
| PCIe function swap       [Enabled]      *|                         |
|> PCIe EQ settings                        *|                         |
|                                          *|                         |
| PCI Express Root Port    Lane configured as *|-----------------------|
| 1                        USB/SATA/UFS   *|                         |
| PCI Express Root Port    Lane configured as *|><: Select Screen     |
| 2                        USB/SATA/UFS   +|^v: Select Item          |
|> PCI Express Root Port 3                 +|Enter: Select           |
|> PCI Express Root Port 4                 +|+/-: Change Opt.         |
| PCI Express Root Port    Not present in this SKU +|F1: General Help |
| 5                                        +|F2: Previous Values      |
| PCI Express Root Port    Not present in this SKU +|F3: Optimized Defaults |
| 6                                        v|F4: Save & Exit          |
|                                           |ESC: Exit                |
\--------------------------------------------+------------------------/
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```

DMI Link ASPM Control
The control of Active State Power Management of the DMI Link.

Port8xh Decode
Enable or disable Port8xh Decode.

Compliance Test Mode
Enable or disable the Compliance Test Mode.

PCI function swap
Enable or disable PCI function swap.

PCI EQ settings
Enter PCI EQ setting submenu.

PCI Express Root Port 3 /4
Enter PCI Express Root Port 3/4 submenu.

USB Configuration

```
                      Aptio Setup - AMI
        Advanced
/--------------------------------------+------------------------\
|                                      |Enable/Disable xDCI     |
|  USB Configuration                   |(USB OTG Device).       |
|                                      |                        |
|  xDCI Support         [Disabled]     |                        |
|  USB2 PHY Sus Well     [Enabled]     |                        |
|  Power Gating                        |                        |
|                                      |                        |
|  USB PDO Programming   [Enabled]     |                        |
|  USB Overcurrent       [Enabled]     |                        |
|  USB Overcurrent Lock  [Enabled]     |                        |
|  USB Audio Offload     [Enabled]     |------------------------|
|  Enable HSII on xHCI   [Enabled]     |><: Select Screen       |
|                                      |^v: Select Item         |
|  USB3.1 Portx Speed    0             |Enter: Select           |
|  Selection                           |+/-: Change Opt.        |
|  USB Port Disable      [Disabled]    |F1: General Help        |
|  Override                            |F2: Previous Values     |
|                                      |F3: Optimized Defaults  |
|                                      |F4: Save & Exit         |
|                                      |ESC: Exit               |
\--------------------------------------+------------------------/
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```

xDCI Support
Enable or disable xDCI (USB OTG Device).

USB2 PHY Sus Well Power Gating
Enable or disable USB2 PHY Sus Well Power Gating.

USB PDO Programming
Enable or disable USB PDO Programming.

USB Overcurrent
Enable or disable USB Overcurrent.

USB Overcurrent Lock
Enable or disable USB Overcurrent Lock.

USB Audio Offload
Enable or disable USB Audio Offload.

Enable HSII on xHCI
Enable or disable HSII on xHCI.

USB3.1 Portx Speed Selection
Configure the USB3.1 Portx Speed.

USB Port Disable Override
Enable or disable USB Port Disable Override.

Security Configuration

```
                        Aptio Setup - AMI
        Advanced
/------------------------------------------+------------------------------\
|  Security Configuration                  |Enable will lock bytes    |
|                                          |38h-3Fh in the            |
|  RTC Memory Lock          [Enabled]      |lower/upper 128-byte      |
|  BIOS Lock                [Disabled]     |bank of RTC RAM           |
|  Force unlock on all      [Disabled]     |                          |
|  GPIO pads                               |                          |
|                                          |                          |
|                                          |                          |
|                                          |                          |
|                                          |--------------------------|
|                                          |><: Select Screen         |
|                                          |^v: Select Item           |
|                                          |Enter: Select             |
|                                          |+/-: Change Opt.          |
|                                          |F1: General Help          |
|                                          |F2: Previous Values       |
|                                          |F3: Optimized Defaults    |
|                                          |F4: Save & Exit           |
|                                          |ESC: Exit                 |
\------------------------------------------+--------------------------/
            Version 2.22.1289 Copyright (C) 2024 AMI
```
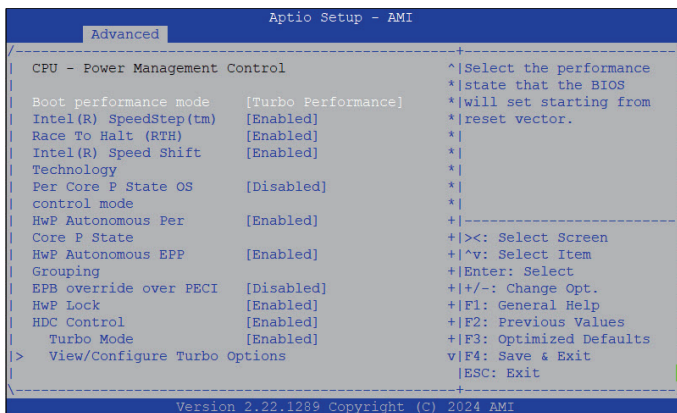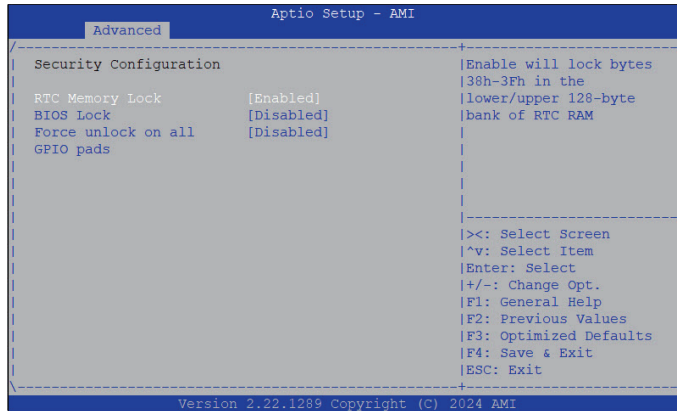
RTC Memory Lock
Enable or disable RTC Memory Lock.

BIOS Lock
Enable or disable BIOS Lock.

Force unlock on all GPIO pads
Enable or disable Force unlock on all GPIO pads.

HD Audio Configuration

```
                     Aptio Setup - AMI
       Advanced
/------------------------------------------+------------------------\
| HD Audio Subsystem Configuration Settings  ^|Control Detection of   |
|                                            *|the HD-Audio device.   |
| HD Audio                 [Enabled]         *|Disabled = HDA will be |
|  Audio DSP               [Enabled]         *|unconditionally disabled|
|  Audio DSP Compliance    [UAA (HDA         *|Enabled = HDA will be  |
| Mode                     Inbox/IntelSST)]  *|unconditionally enabled.|
|   HDA Link               [Enabled]         *|                       |
|   DMIC #0                [Disabled]        *|                       |
|   DMIC #1                [Disabled]        *|                       |
|   SSP #0                 [Disabled]        *|-----------------------|
|   SSP #1                 [Disabled]        *|><: Select Screen      |
|   SSP #2                 [Disabled]        *|^v: Select Item        |
|   SSP #3                 [Disabled]        +|Enter: Select          |
|   SSP #4                 [Disabled]        +|+/-: Change Opt.       |
|   SSP #5                 [Disabled]        +|F1: General Help       |
|   SNDW #0                [Disabled]        +|F2: Previous Values    |
|   SNDW #1                [Disabled]        +|F3: Optimized Defaults |
|   SNDW #2                [Disabled]        v|F4: Save & Exit        |
|                                             |ESC: Exit              |
\------------------------------------------+----------------------/
           Version 2.22.1289 Copyright (C) 2024 AMI
```

HD Audio
Control Detection of the HD-Audio device.
Disable: HDA will be unconditionally disabled.
Enable: HDA will be unconditionally enable.

Audio DSP
Enable or disable Audio DSP.

Audio DSP Compliance Mode
Configure the Audio DSP Compliance Mode.

HDA Link
Enable or disable HDA Link.

DMIC #0 / #1
Enable or disable DMIC #0 / #1.

SSP #1 / #5
Enable or disable SSP #1 / #5.

THC Configuration

```
                          Aptio Setup - AMI
        Advanced
/------------------------------------------+--------------------------\
| Touch Host Controller Configuration Settings  |Assign Port to THC       |
|                                          |                         |
| THC Port Configuration    [None]         |                         |
| THC Port Configuration    [None]         |                         |
|                                          |                         |
|                                          |                         |
|                                          |                         |
|                                          |                         |
|                                          |------------------------ |
|                                          ||><: Select Screen       |
|                                          ||^v: Select Item         |
|                                          ||Enter: Select           |
|                                          ||+/-: Change Opt.        |
|                                          ||F1: General Help        |
|                                          ||F2: Previous Values     |
|                                          ||F3: Optimized Defaults  |
|                                          ||F4: Save & Exit         |
|                                          ||ESC: Exit               |
\------------------------------------------+--------------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```
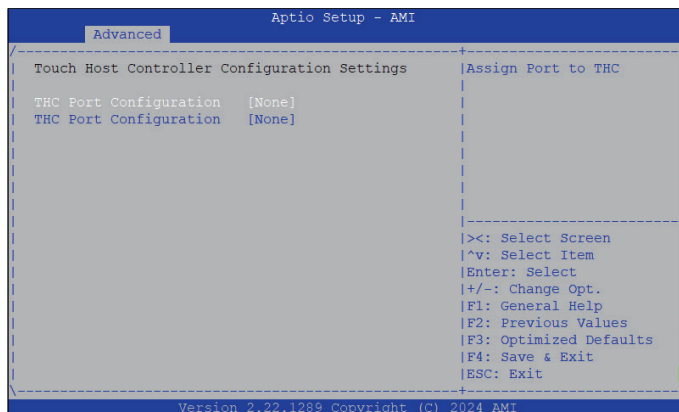
THC Port Configuration
Assign Port to THC.

SerialIO Configuration

```
                          Aptio Setup - AMI
        Advanced
/------------------------------------------+--------------------------\
| SerialIo Configuration                   ^|Enables/Disables        ^|
| I2C0 Controller        [Enabled]         *|SerialIo Controller     *|
| I2C1 Controller        [Disabled]        *|If given device is      *|
| I2C2 Controller        [Disabled]        *|Function 0 PSF          +|
| I2C3 Controller        [Disabled]        *|disabling is skipped.   +|
| I2C4 Controller        [Disabled]        *|PSF default will remain +|
| I2C5 Controller        [Disabled]        *|and device PCI CFG      +|
| I2C6 Controller        [Disabled]        *|Space will still be     v|
| I2C7 Controller        [Disabled]        *|                         |
| SPI0 Controller        [Disabled]        *|------------------------ |
| SPI1 Controller        [Disabled]        +|><: Select Screen       |
| SPI2 Controller        [Disabled]        +|^v: Select Item         |
| SPI3 Controller        [Disabled]        +|Enter: Select           |
| SPI4 Controller        [Disabled]        +|+/-: Change Opt.        |
| SPI5 Controller        [Disabled]        +|F1: General Help        |
| SPI6 Controller        [Disabled]        +|F2: Previous Values     |
| UART0 Controller       [Disabled]        +|F3: Optimized Defaults  |
| UART1 Controller       [Disabled]        v|F4: Save & Exit         |
|                                           |ESC: Exit               |
\------------------------------------------+--------------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```

I2C0 / I2C1 / I2C2 / I2C3 / I2C4 / I2C5 / I2C6 / I2C7 / SPI0 / SPI1 / SPI2 / SPI3 / SPI4 / SPI5 / SPI6 / UART0 / UART1 Controller
Enable or disable the selected item above.

SCS Configuration

```
                      Aptio Setup - AMI
      Advanced
/--------------------------------------+----------------------\
| eMMC 5.1 Controller      [Enabled]   |Enable or Disable SCS  |
| eMMC 5.1 HS400 Mode      [Enabled]   |eMMC 5.1 Controller    |
| Enable HS400 software    [Disabled]  |                       |
| tuning                               |                       |
| Driver Strength          [40 Ohm]    |                       |
| UFS 2.0 Controller 1     [Disabled]  |                       |
|                                      |                       |
|                                      |                       |
|                                      |-----------------------|
|                                      |><: Select Screen      |
|                                      |^v: Select Item        |
|                                      |Enter: Select          |
|                                      |+/-: Change Opt.       |
|                                      |F1: General Help       |
|                                      |F2: Previous Values    |
|                                      |F3: Optimized Defaults |
|                                      |F4: Save & Exit        |
|                                      |ESC: Exit              |
\--------------------------------------+----------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```
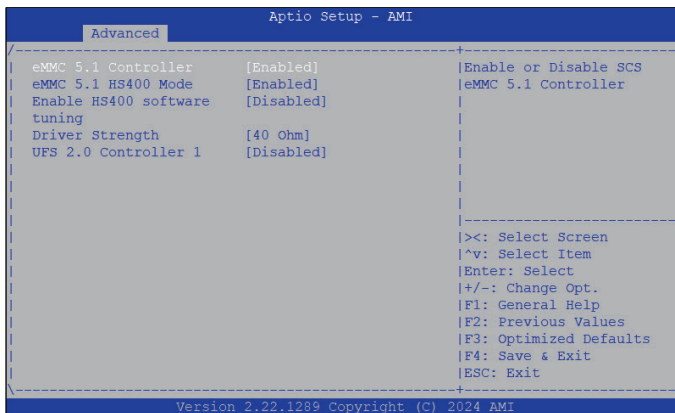
eMMC 5.1 Controller
Enable or disable eMMC 5.1 controller.

eMMC HS400 Mode
Enable or disable eMMC HS400 mode.

Enable HS400 software turning
Enable or disable the Enable HS400 software turning.

Driver Strength
Configure the Driver Strength.

UFS 2.0 Controller 1
Enable or disable UFS 2.0 Controller 1.

ISH Configuration

```
                      Aptio Setup - AMI
      Advanced
/--------------------------------------+----------------------\
| ISH Controller           [Disabled]  |Enables/Disables       |
|                                      |Integrated Sensor Hub  |
|                                      |(ISH) Device           |
|                                      |                       |
|                                      |                       |
|                                      |                       |
|                                      |                       |
|                                      |                       |
|                                      |-----------------------|
|                                      |><: Select Screen      |
|                                      |^v: Select Item        |
|                                      |Enter: Select          |
|                                      |+/-: Change Opt.       |
|                                      |F1: General Help       |
|                                      |F2: Previous Values    |
|                                      |F3: Optimized Defaults |
|                                      |F4: Save & Exit        |
|                                      |ESC: Exit              |
\--------------------------------------+----------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```
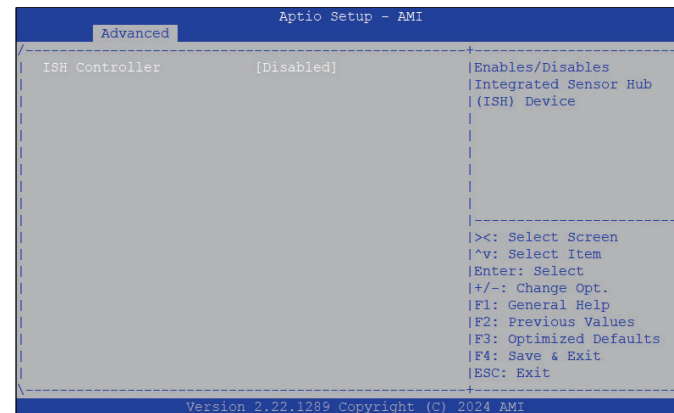
ISH Controller
Enable or disable integrated sensor hub (ISH) device.

Pch Thermal Throttling Control

```
                           Aptio Setup - AMI
        Advanced
/----------------------------------------+------------------------\
| Thermal Throttling       [Suggested Setting]  |Determine if use Intel  \
| Level                                         |suggested setting       |
| DMI Thermal Setting      [Suggested Setting]  |                        |
| SATA Thermal Setting     [Suggested Setting]  |                        |
|                                               |                        |
|                                               |                        |
|                                               |                        |
|                                               |                        |
|                                               |                        |
|                                               |------------------------|
|                                               |><: Select Screen       |
|                                               |^v: Select Item         |
|                                               |Enter: Select           |
|                                               |+/-: Change Opt.        |
|                                               |F1: General Help        |
|                                               |F2: Previous Values     |
|                                               |F3: Optimized Defaults  |
|                                               |F4: Save & Exit         |
|                                               |ESC: Exit               |
\----------------------------------------+------------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```
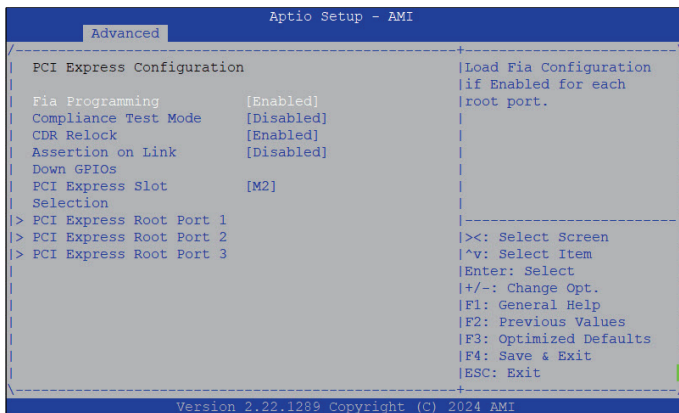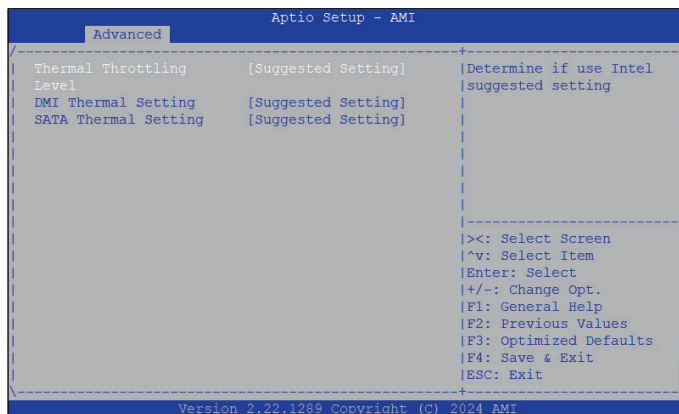
Thermal Throttling Level /
DMI Thermal Setting /
SATA Thermal /
Determine if use Intel suggested setting.

FIVR Configuration

```
                           Aptio Setup - AMI
        Advanced
/----------------------------------------+------------------------\
| External V1P05 Rail                           ^|Enables External V1P05  \
| Sx/S0ix Configuration                         *|Rail in corresponding   |
| Enable Rail in           [Disabled]           *|Sx/S0ix                 |
| S0i1/S0i2                                      *|                        |
| Enable Rail in S0i3      [Disabled]           *|                        |
| Enable Rail in S3        [Disabled]           *|                        |
| Enable Rail in S4        [Disabled]           *|                        |
| Enable Rail in S5        [Disabled]           +|                        |
| Enable Rail in S0        [Disabled]           +|                        |
|                                               +|------------------------|
| External Vnn Rail                             +|><: Select Screen       |
| Sx/S0ix Configuration                         +|^v: Select Item         |
| Enable Rail in           [Disabled]           +|Enter: Select           |
| S0i1/S0i2                                      +|+/-: Change Opt.        |
| Enable Rail in S0i3      [Disabled]           +|F1: General Help        |
| Enable Rail in S3        [Disabled]           +|F2: Previous Values     |
| Enable Rail in S4        [Disabled]           +|F3: Optimized Defaults  |
| Enable Rail in S5        [Disabled]           v|F4: Save & Exit         |
|                                                |ESC: Exit               |
\----------------------------------------+------------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```

Enable Rail in Sx/S0ix
Enable external V1P05/Vnn Rail in corresponding Sx/S0ix.

PMC Configuration

```
                          Aptio Setup - AMI
        Advanced
/---------------------------------------+------------------------------\
|  ADR enable           [Platform-POR]  |Enable asynchronous           |
|  Host Partition Reset [Enabled]       |DRAM refresh                  |
|  ADR Enable                           |                              |
|  ADR timer 1 expire   32              |                              |
|  time                                 |                              |
|  ADR timer 1 time unit [1s]           |                              |
|                                       |                              |
|                                       |                              |
|                                       |                              |
|                                       |------------------------------|
|                                       |><: Select Screen             |
|                                       |^v: Select Item               |
|                                       |Enter: Select                 |
|                                       |+/-: Change Opt.              |
|                                       |F1: General Help              |
|                                       |F2: Previous Values           |
|                                       |F3: Optimized Defaults        |
|                                       |F4: Save & Exit               |
|                                       |ESC: Exit                     |
\---------------------------------------+------------------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```
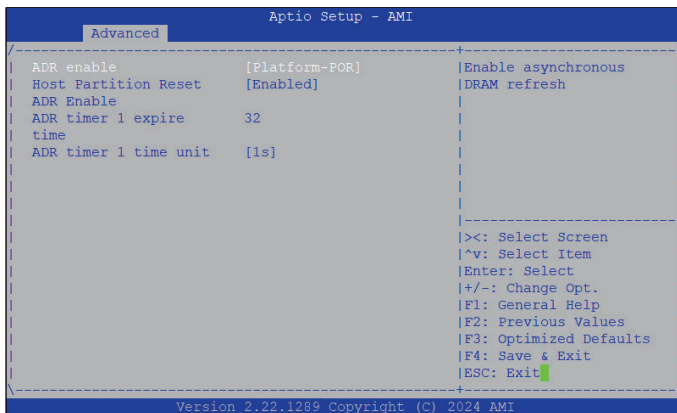
ADR enable
Enable asynchronous DRAM refresh.

Host Partition Reset
Enable or disable Host Partition Reset.

ADR timer 1 expire time
Configure a ADR timer 1 expire time.

ADR timer 1 time unit
Configure a ADR timer 1 time unit.

TSN GBE Configuration
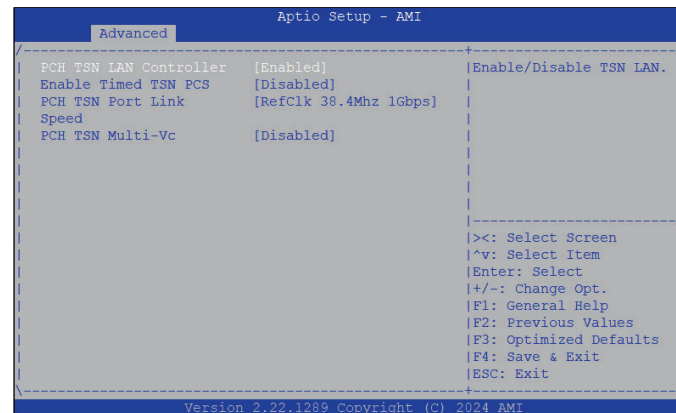
```
                          Aptio Setup - AMI
        Advanced
/---------------------------------------+------------------------------\
|  PCH TSN LAN Controller  [Enabled]    |Enable/Disable TSN LAN.       |
|  Enable Timed TSN PCS    [Disabled]   |                              |
|  PCH TSN Port Link       [RefClk 38.4Mhz 1Gbps]                      |
|  Speed                                |                              |
|  PCH TSN Multi-Vc        [Disabled]   |                              |
|                                       |                              |
|                                       |                              |
|                                       |                              |
|                                       |                              |
|                                       |------------------------------|
|                                       |><: Select Screen             |
|                                       |^v: Select Item               |
|                                       |Enter: Select                 |
|                                       |+/-: Change Opt.              |
|                                       |F1: General Help              |
|                                       |F2: Previous Values           |
|                                       |F3: Optimized Defaults        |
|                                       |F4: Save & Exit               |
|                                       |ESC: Exit                     |
\---------------------------------------+------------------------------/
          Version 2.22.1289 Copyright (C) 2024 AMI
```

PCH TSN LAN Contoller
Enable or disable TSN LAN.

Enable Timed TSN PCS
Enable or disable the Enable Timed TSN PCS.

PCH TSN Port Link Speed
Configure the PCH TSN Port Link Speed.

PCH TSN Multi-Vc
Enable or disable PCH TSN Multi-Vc.

SATA Configuration

```
                       Aptio Setup - AMI
        Advanced
/---------------------------------------+------------------------\
|  SATA Configuration                   |Enable/Disable SATA     |
|                                       |Device.                 |
|  SATA Controller(s)      [Enabled]    |                        |
|  SATA Test Mode          [Disabled]   |                        |
|                                       |                        |
|  Serial ATA Port 0       Empty        |                        |
|  Serial ATA Port 1       Empty        |                        |
|                                       |                        |
|                                       |                        |
|                                       |------------------------|
|                                       |><: Select Screen       |
|                                       |^v: Select Item         |
|                                       |Enter: Select           |
|                                       |+/-: Change Opt.        |
|                                       |F1: General Help        |
|                                       |F2: Previous Values     |
|                                       |F3: Optimized Defaults  |
|                                       |F4: Save & Exit         |
|                                       |ESC: Exit               |
\---------------------------------------+------------------------/
         Version 2.22.1289 Copyright (C) 2024 AMI
```
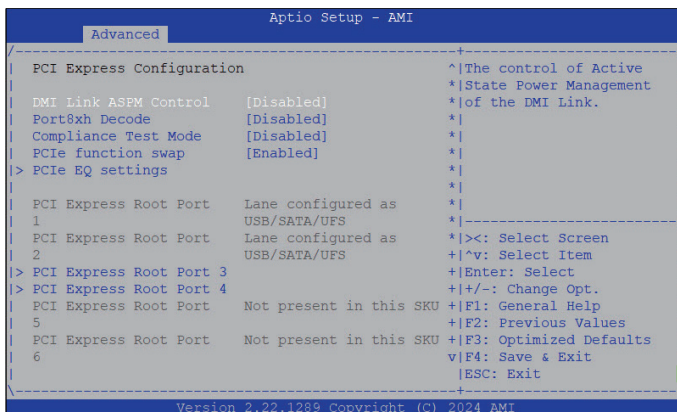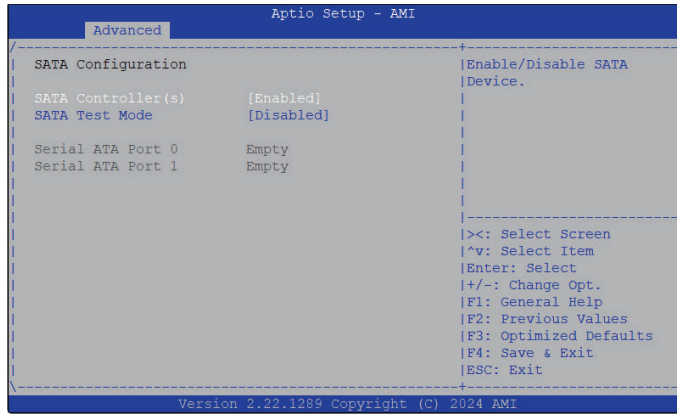
SATA Controller
Enable or disable SATA device.

SATA Test Mode
Enable or disable the SATA test mode.

Trusted Computing

This section is used to configure Trusted Platform Module (TPM) settings.

```
                        Aptio Setup - AMI
      Advanced
/-----------------------------------+------------------------\
|   TPM 2.0 Device Found             |Enables or Disables     |
|   Firmware Version:     7.62       |BIOS support for        |
|   Vendor:               IFX        |security device. O.S.   |
|                                    |will not show Security   |
|   Security Device      [Enable]    |Device. TCG EFI         |
| Support                            |protocol and INT1A      |
|   Active PCR banks      SHA256     |interface will not be   |
|   Available PCR banks   SHA256     |available.              |
|                                    |                        |
|   SHA256 PCR Bank      [Enabled]   |------------------------|
|                                    |><: Select Screen       |
|   Pending operation    [None]      |^v: Select Item         |
|   Platform Hierarchy   [Enabled]   |Enter: Select           |
|   Storage Hierarchy    [Enabled]   |+/-: Change Opt.        |
|   Endorsement          [Enabled]   |F1: General Help        |
| Hierarchy                          |F2: Previous Values     |
|                                    |F3: Optimized Defaults  |
|                                    |F4: Save & Exit         |
|                                    |ESC: Exit               |
\-----------------------------------+------------------------/
            Version 2.22.1289 Copyright (C) 2024 AMI
```

Security Device Support
Enable or disable BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

SHA256 PCR Bank
Enable or disable SHA256 PCR Bank.

Pending operation
Schedule an operation for the security device.

Platform Hierarchy
Enable or disable platform hierarchy.

Storage Hierarchy
Enable or disable storage hierarchy.

Endorsement Hierarchy
Enable or disable endorsement hierarchy.

Hardware Monitor

This section is used to monitor hardware status such as temperature, fan speed, and voltages.

```
                        Aptio Setup - AMI
        /-----------------------------------------+----------------------\
        |  Pc Health Status                        |                      |
        |                                          |                      |
        |  CPU Temperature        : +71 .          |                      |
        |  CPU FAN Speed          : 2712 RPM       |                      |
        |                                          |                      |
        |  VCORE Voltage          : +1.176 V       |                      |
        |  P5V (VCC5)             : +4.976 V        |                      |
        |                                          |                      |
        |                                          |                      |
        |                                          |--------------------->|
        |                                          |><: Select Screen     |
        |                                          |^v: Select Item       |
        |                                          |Enter: Select         |
        |                                          |+/-: Change Opt.      |
        |                                          |F1: General Help      |
        |                                          |F2: Previous Values   |
        |                                          |F3: Optimized Defaults|
        |                                          |F4: Save & Exit       |
        |                                          |ESC: Exit             |
        \-----------------------------------------+----------------------/
                Version 2.22.1289 Copyright (C) 2024 AMI
```
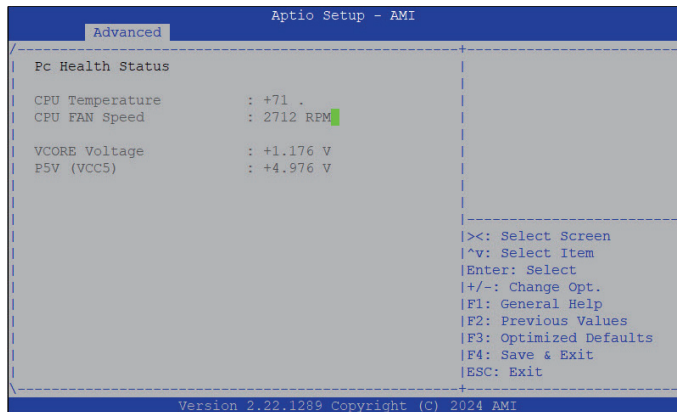
CPU Temperature
Detect and display the current CPU temperature.

CPU FAN Speed
Detect and display the current CPU fan speed.

Vcore Voltage
Detect and display the output voltages.

P5V (VCC5)
Detect and display 5V voltages.

Smart Fan1 Configuration

```
                        Aptio Setup - AMI
        /-------------------------------------------+--------------------\
        |  Fan 1 Setting                            |FAN1 Output Type    |
        |  FAN_TYPE            [PWM(Intel 4-wire)]   |Selection           |
        |  FAN_MODE            [Auto - Duty Cycle]   |                    |
        |  Boundary 1          95                    |                    |
        |  Boundary 2          90                    |                    |
        |  Boundary 3          70                    |                    |
        |  Boundary 4          45                    |                    |
        |  Speed 1             100                   |                    |
        |  Speed 2             95                    |                    |
        |  Speed 3             90                    |--------------------|
        |  Speed 4             40                    |><: Select Screen   |
        |  Speed 5             30                    |^v: Select Item     |
        |                                            |Enter: Select       |
        |                                            |+/-: Change Opt.    |
        |                                            |F1: General Help    |
        |                                            |F2: Previous Values |
        |                                            |F3: Optimized Defaults|
        |                                            |F4: Save & Exit     |
        |                                            |ESC: Exit           |
        \-------------------------------------------+--------------------/
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```

FAN_TYPE
Fan1 output type selection.

FAN_MODE
Configure a fan mode.

Boundary 1/2/3/4
Configure the Boundary 1/2/3/4.

Speed 1/2/3/4/5
Configure the speed 1/2/3/4/5.

Serial Port Console Redirection

This section is used to configure the serial port that will be used for console redirection.

```
                        Aptio Setup - AMI
        Advanced
/------------------------------------------+------------------------\
|                                          |Console Redirection     |
|  COM0                                    |Enable or Disable.      |
|  Console Redirection     [Enabled]       |                        |
|> Console Redirection Settings            |                        |
|                                          |                        |
|  Legacy Console Redirection              |                        |
|> Legacy Console Redirection Settings     |                        |
|                                          |                        |
|  Serial Port for Out-of-Band Management/ |                        |
|  Windows Emergency Management Services (EMS) |--------------------|
|  Console Redirection     [Disabled]      |><: Select Screen       |
|  EMS                                     |^v: Select Item         |
|> Console Redirection Settings            |Enter: Select           |
|                                          |+/-: Change Opt.        |
|                                          |F1: General Help        |
|                                          |F2: Previous Values     |
|                                          |F3: Optimized Defaults  |
|                                          |F4: Save & Exit         |
|                                          |ESC: Exit               |
\------------------------------------------+--------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```

Console Redirection
Enable or disable the console redirection.

Console Redirection Settings
Enter the Console Redirection Settings submenu.

Legacy Console Redirection Settings
Enter the Legacy Console Redirection Settings submenu.

NVMe Configuration

This section is used to configure the NVMe devices installed. The options will become available upon installation of the NVMe device.

```
                        Aptio Setup - AMI
        Advanced
/------------------------------------------+------------------------\
|  NVMe Configuration                      |                        |
|                                          |                        |
|  No NVME Device Found                    |                        |
|                                          |                        |
|                                          |                        |
|                                          |                        |
|                                          |                        |
|                                          |                        |
|                                          |--------------------|
|                                          |><: Select Screen       |
|                                          |^v: Select Item         |
|                                          |Enter: Select           |
|                                          |+/-: Change Opt.        |
|                                          |F1: General Help        |
|                                          |F2: Previous Values     |
|                                          |F3: Optimized Defaults  |
|                                          |F4: Save & Exit         |
|                                          |ESC: Exit               |
\------------------------------------------+--------------------/
              Version 2.22.1289 Copyright (C) 2024 AMI
```

Security

```
                        Aptio Setup - AMI
     Main  Advanced  Security  Boot  Save & Exit
/--------------------------------------------+------------------------\
|  Password Description                       |Set Administrator       |
|                                             |Password                |
|  The password length must be                |                        |
|  in the following range:                    |                        |
|  Minimum length        3                    |                        |
|  Maximum length        20                   |                        |
|                                             |                        |
|  Administrator Password                     |                        |
|                                             |                        |
|                                             |------------------------|
|                                             |><: Select Screen       |
|                                             |^v: Select Item         |
|                                             |Enter: Select           |
|                                             |+/-: Change Opt.        |
|                                             |F1: General Help        |
|                                             |F2: Previous Values     |
|                                             |F3: Optimized Defaults  |
|                                             |F4: Save & Exit         |
|                                             |ESC: Exit               |
\--------------------------------------------+------------------------/
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```

Setup Administrator Password
Select this to reconfigure the administrator's password.

Boot

```
                        Aptio Setup - AMI
     Main  Advanced  Security  Boot  Save & Exit
/------------------------------------------------+-----------------------\
| Boot Configuration                             ^|Select the keyboard   |
| Bootup NumLock State      [On]                 *|NumLock state         |
|                                                *|                      |
| NEXBOOT                   [Disabled]           *|                      |
|                                                *|                      |
|                                                *|                      |
| FIXED BOOT ORDER Priorities                    *|                      |
| Boot Option #1            [Hard Disk:ubuntu    *|                      |
|                           (eMMC TX2932)]       *|                      |
| Boot Option #2            [UEFI AP:UEFI:        *|----------------------|
|                           Built-in EFI Shell]  *|><: Select Screen     |
| Boot Option #3            [CD/DVD]              *|^v: Select Item       |
| Boot Option #4            [SD]                  +|Enter: Select         |
| Boot Option #5            [USB Hard Disk]       +|+/-: Change Opt.      |
| Boot Option #6            [USB CD/DVD]          +|F1: General Help      |
|                                                +|F2: Previous Values   |
|                                                +|F3: Optimized Defaults|
|                                                v|F4: Save & Exit       |
|                                                 |ESC: Exit             |
\------------------------------------------------+-----------------------/
                Version 2.22.1289 Copyright (C) 2024 AMI
```

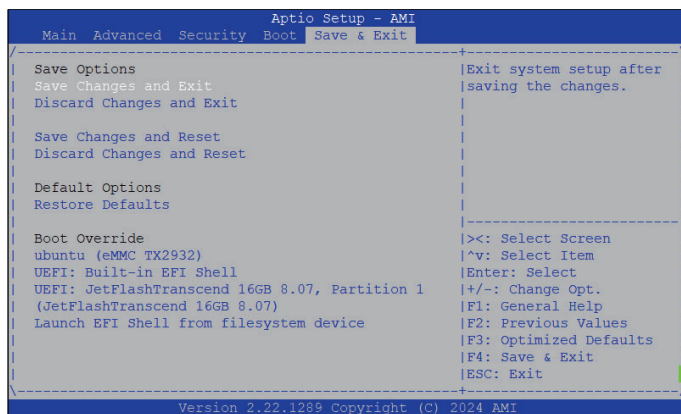**Bootup NumLock State**
Select the keyboard NumLock state.

NEXBOOT
Enable or disable NEXBOOT. Once enabled, more options will be available for configuration. For more detailed configurations, refer to Appendix A.

FIXED BOOT ORDER Priorities
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

Save & Exit

```
                        Aptio Setup - AMI
    Main  Advanced  Security  Boot  Save & Exit
/--------------------------------------+-----------------------\
|  Save Options                        |Exit system setup after |
|  Save Changes and Exit               |saving the changes.     |
|  Discard Changes and Exit            |                        |
|                                      |                        |
|  Save Changes and Reset              |                        |
|  Discard Changes and Reset           |                        |
|                                      |                        |
|  Default Options                     |                        |
|  Restore Defaults                    |                        |
|                                      |------------------------|
|  Boot Override                       |><: Select Screen       |
|  ubuntu (eMMC TX2932)                |^v: Select Item         |
|  UEFI: Built-in EFI Shell            |Enter: Select           |
|  UEFI: JetFlashTranscend 16GB 8.07, Partition 1 |+/-: Change Opt. |
|  (JetFlashTranscend 16GB 8.07)       |F1: General Help        |
|  Launch EFI Shell from filesystem device |F2: Previous Values |
|                                      |F3: Optimized Defaults  |
|                                      |F4: Save & Exit         |
|                                      |ESC: Exit               |
\--------------------------------------+-----------------------/
            Version 2.22.1289 Copyright (C) 2024 AMI
```

Save Changes and Exit

After save all the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting "Yes" and then exit the system setup.

Discard Changes and Exit

To exit the Setup utility and reboot the system without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Save Changes and Reset

To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Reset

To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Restore Defaults

To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecing Yes.
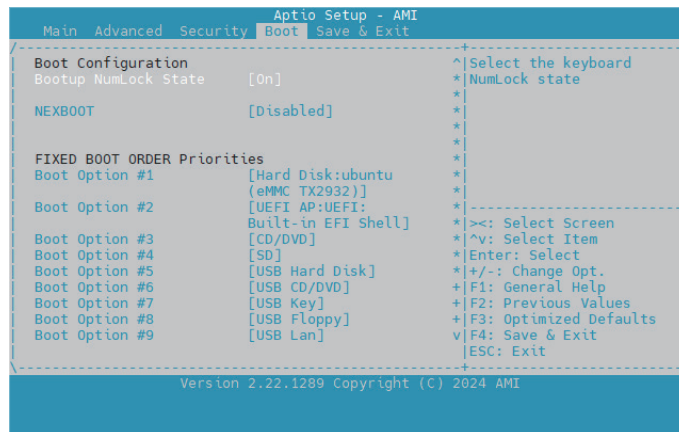
Boot Override

To bypass the boot sequence from the Boot Option List and boot from a particular device, select the desired device and press <Enter>.
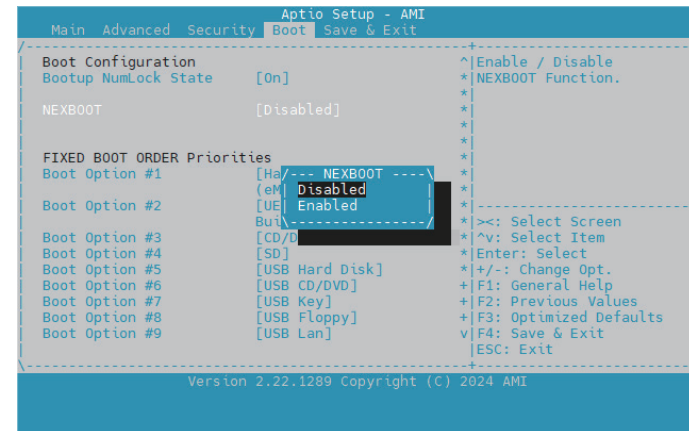
APPENDIX A: NEXBOOT CONFIGURATION

NEXBOOT is a feature designed to prevent issues by automatically resetting the system if the clear WDT function fails. Follow the steps below to enable and configure it in the BIOS.

1. Immediately press the <Del> button when powering on the system, then navigate using the arrow keys to select the **BOOT** section.

```
                      Aptio Setup - AMI
      Main  Advanced  Security  Boot  Save & Exit
/--------------------------------+-----------------------\
| Boot Configuration             ^|Select the keyboard   |
| Bootup NumLock State   [On]     *|NumLock state         |
|                                 *|                      |
| NEXBOOT               [Disabled]*|                      |
|                                 *|                      |
|                                 *|                      |
| FIXED BOOT ORDER Priorities     *|                      |
| Boot Option #1   [Hard Disk:ubuntu*|                    |
|                  (eMMC TX2932)] *|                      |
| Boot Option #2   [UEFI AP:UEFI: *|----------------------|
|                  Built-in EFI Shell]*|><: Select Screen |
| Boot Option #3   [CD/DVD]       *|^v: Select Item       |
| Boot Option #4   [SD]           *|Enter: Select         |
| Boot Option #5   [USB Hard Disk]*|+/-: Change Opt.      |
| Boot Option #6   [USB CD/DVD]   +|F1: General Help      |
| Boot Option #7   [USB Key]      +|F2: Previous Values   |
| Boot Option #8   [USB Floppy]   +|F3: Optimized Defaults|
| Boot Option #9   [USB Lan]      v|F4: Save & Exit       |
|                                  |ESC: Exit             |
\--------------------------------+-----------------------/
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```

2. Navigate with the up or down keys to select the feature of NEXBOOT. By default, the feature is disabled. Press the <Enter> button to enable it.

```
                      Aptio Setup - AMI
      Main  Advanced  Security  Boot  Save & Exit
/--------------------------------+-----------------------\
| Boot Configuration             ^|Enable / Disable      |
| Bootup NumLock State   [On]     *|NEXBOOT Function.     |
|                                 *|                      |
| NEXBOOT               [Disabled]*|                      |
|                                 *|                      |
|                                 *|                      |
| FIXED BOOT ORDER Priorities     *|                      |
| Boot Option #1   [Ha/--- NEXBOOT ----\*|               |
|                  (eM|Disabled      |  *|---------------|
| Boot Option #2   [UE|Enabled       |  *|><: Select Screen|
|                  Bui\--------------/  *|^v: Select Item |
| Boot Option #3   [CD/D]          *|Enter: Select        |
| Boot Option #4   [SD]            *|+/-: Change Opt.     |
| Boot Option #5   [USB Hard Disk] *|F1: General Help     |
| Boot Option #6   [USB CD/DVD]    +|F2: Previous Values  |
| Boot Option #7   [USB Key]       +|F3: Optimized Defaults|
| Boot Option #8   [USB Floppy]    +|F4: Save & Exit      |
| Boot Option #9   [USB Lan]       v|ESC: Exit            |
\--------------------------------+-----------------------/
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```

3. Once the NEXBOOT is enabled, relative settings become available for configuration. Note that the FIXED BOOT ORDER Priorities in the **BOOT** section and BOOT Override in the **Save & Exit** section will gray out and become unavailable for configuration.

```
                           Aptio Setup - AMI
      Main  Advanced  Security  Boot  Save & Exit
/--------------------------------------------+------------------------\
| Boot Configuration                        ^|Enable / Disable        |
| Bootup NumLock State      [On]            *|NEXBOOT Function.       |
|                                           *|                        |
| NEXBOOT                   [Enabled]       *|                        |
| NEXBOOT WDT Minutes       [ 2 Minutes]    *|                        |
| NEXBOOT WDT Seconds       [ 0 Second]     *|                        |
| Primary Device            [EFI-SSD    ]   *|                        |
| Golden Device             [eMMC      ]    *|                        |
| MCU Version               0x05            *|                        |
|                                           *|------------------------|
|                                           *|><: Select Screen       |
| FIXED BOOT ORDER Priorities               *|^v: Select Item         |
| Boot Option #1            [Hard Disk:ubuntu +|Enter: Select         |
|                           (eMMC TX2932)]   +|+/-: Change Opt.       |
| Boot Option #2            [UEFI AP:UEFI:    +|F1: General Help       |
|                           Built-in EFI Shell] +|F2: Previous Values  |
| Boot Option #3            [CD/DVD]          +|F3: Optimized Defaults |
| Boot Option #4            [SD]             v|F4: Save & Exit        |
|                                            |ESC: Exit               |
\--------------------------------------------+------------------------/
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```
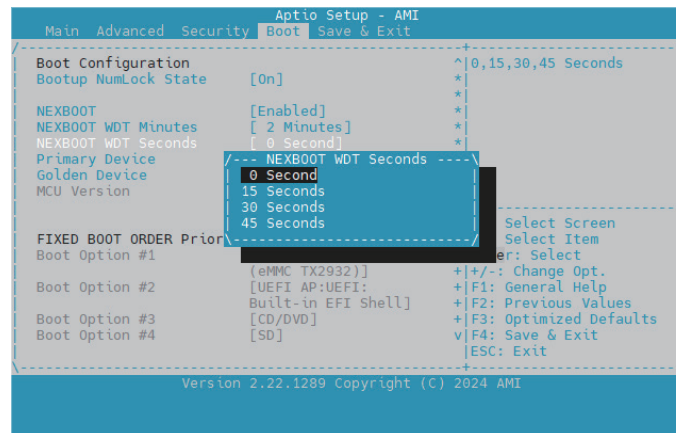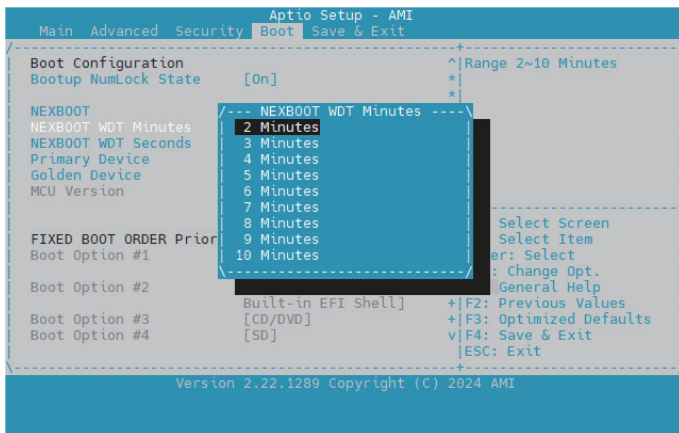
## NEXBOOT WDT Minutes & NEXBOOT WDT Seconds

NEXBOOT WDT Minutes & NEXBOOT WDT Seconds are features designed
to set a timer for triggering NEXBOOT WDT when entering the OS without
clearing the WDT. You can adjust the minutes and seconds separately.

Primary Device & Golden Device

Specify the primary and golden device for the system. The primary device is the system will attempt to boot from that drive first. If the clear WDT is failed to work in the operating system on the primary device, the NEXBOOT WDT will be triggered to reboot the system into the golden device.
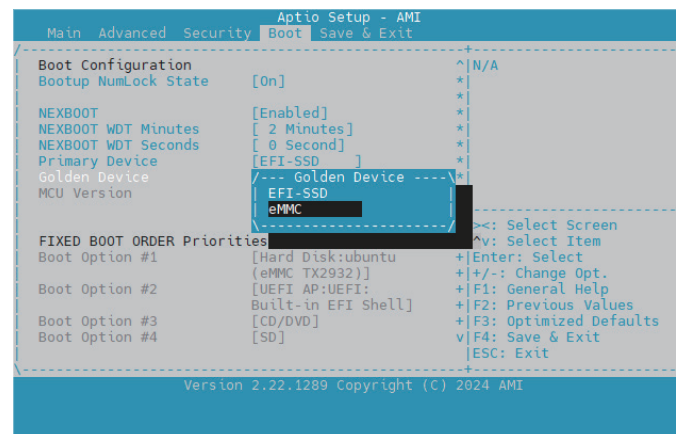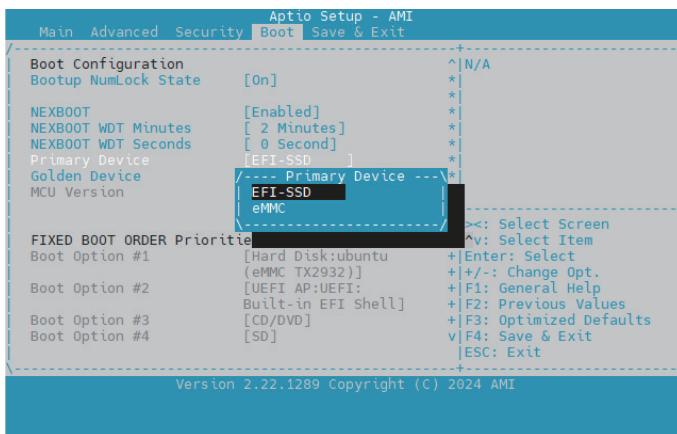
If there is only one disk available on the system and the WDT is not cleared in the OS on that device, it will trigger a boot into the Built-in Shell by default.