GIGABYTE[™] R184-A90-AAJ1

Rack Server - Intel® Xeon® 6 Processors - 1U DP 4-Bay Gen5 NVMe/SATA/SAS-4

User Manual

Rev. 1.0

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Documentation Classifications

In order to assist in the use of this product, Giga Computing provides the following types of documentation:

- User Manual: detailed information & steps about the installation, configuration and use of this product (e.g. motherboard, server barebones), covering hardware and BIOS.
- User Guide: detailed information about the installation & use of an add-on hardware or software component (e.g. BMC firmware, rail-kit) compatible with this product.
- Quick Installation Guide: a short guide with visual diagrams that you can reference easily for installation purposes of this product (e.g. motherboard, server barebones).

Please see the support section of the online product page to check the current availability of these documents.

For More Information

For related product specifications, the latest firmware and software, and other information please visit our website at http://www.gigabyte.com/Enterprise

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Conventions

The following conventions are used in this user's guide:

Ē	NOTE! Gives bits and pieces of additional information related to the current topic.
	CAUTION! Gives precautionary measures to avoid possible hardware or software problems.
	WARNING! Alerts you to any damage that might result from doing or not doing specific actions.

Server Warnings and Cautions

Before installing a server, be sure that you understand the following warnings and cautions.

To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- · Unplug all the power cords from the power supplies to disconnect power to the equipment.



- · Shock Hazard! Disconnect all power supply cords before servicing.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular
 attention to the plug, electrical outlet, and the point where the cord extends from the server.

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

WARNING!

This server is equipped with high speed fans. Keep away from hazardous moving fan blades during servicing.



This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person. Only authorized by well trained professional person can access the restrict access location.

The equipment should only be repaired, maintained or replaced by skilled personnel.

- Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.
- Danger of explosion if battery is incorrectly replaced.
- · Replace only with the same or equivalent type recommended by the manufacturer.
- · Dispose of used batteries according to the manufacturer's instructions.

Risk of explosion if battery is replaced incorrectly or with an incorrect type. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Electrostatic Discharge (ESD)

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTI-STATIC WRIST STRAP AT-TACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

System power on/off: To remove power from system, you must remove the system from rack. Make sure the system is removed from the rack before opening the chassis, adding, or removing any non hot-plug components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and disconnect the cables attached to the system before servicing it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface on the server) when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

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Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the service guide and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- · Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications



NOTE:

We reserve the right to make any changes to the product specifications and product-related information without prior notice.

Sustan 111	
Dimension • 438mm (W) x 43.5mm (H) x 815mm (D)	
CPU Intel® Xeon® 6 Processors	
- Intel® Xeon® 6900-Series Processors	
 Dual processor TDP up to 500W 	
^[Note] If only 1 CPU is installed, some PCIe or memory functions mig	ht be
unavailable.	
Socket • 2 x LGA 7529	
Socket BR	
Chipset	
System on onip	
Security • UEFI Secure Boot	
Silicon root of trust (Option)	
SNMP Support: V3	
Memory	
DDR5 memory supported	
 12-Channel memory architecture 	
MRDIMM supported [1]	
DDIMM: Up to 6400 MT/c	
III MRDIMMs are only supported with Intel® Xeon® 6 Processors	with P-cores
LAN Rear (I/O board - CDCR010):	
 2 x 1Gb/s LAN (1 x Intel® I350-AM2) 	
- Support NCSI function	
1 x 10/100/1000 Mbps Management LAN	
Video Integrated in Aspeed® AST2600	
- 1 x Mini-DP	

Storage	Front hot-swap:					
	 4 x 3.5"/2.5" Gen5 NVMe/SATA/SAS-4 ^[1] 					
	- (NVMe from CPLL_0)					
	(
	Internal M 2					
	 2 x M 2 (2280/22110) PCIe Gen5 x4 from CPU_0 					
	Internal M.2 (I/O board - CDCR010):					
	 1 x M.2 (2280), PCIe Gen5 x2, from CPU_0 					
	^[1] Storage card is required to support SATA and SAS drives.					
SAS	Require SAS add-in cards					
RAID	Require RAID add-in cards					
	Onboard VROC key header					
Expansion Slot	Riser Card CRS101J:					
	 1 x FHHL x16 (Gen5 x16), from CPU_0 					
	Riser Card CRS101K:					
	- 1 x FHHL x16 (Gen5 x16), from CPU_1					
	 1 x OCP NIC 3.0 (Gen5 x16), from CPU_0 					
	- Supports NCSI function					
	 1 x OCP NIC 3.0 (Gen5 x16), from CPU_1 					
	- Supports NCSI function					
Front I/O	2 x USB 3.2 Gen1 ports (Type-A)					
	 1 x Power button with LED 					
	1 x ID button with LED					
	 1 x NMI button 					
	1 x Reset button					
	2 x LAN activity LEDs					
	1 x Storage activity LED					
	1 x System status LED					
Rear I/O	I/O board - CDCR010:					
	- 2 x USB 3.2 Gen1 ports (Type-A)					
	- 1 x Mini-DP					
	- 2 x RJ45 ports					
	- 1 x MLAN port					
	- 1 x ID LED					
Backplane	Speed and bandwidth: PCIe Gen5 x4 or SATA 6Gb/s or SAS-4 24Gb/s					
Board						
Security	1 x TPM header with SPI interface					
Modules	- Ontional TPM2 0 kit: CTM012					
Modules	1 x PRoT connector (only enabled on RoT SKII)					

Power Supply • 2 x 2000W 80 PLUS Titanium redundant power supply

- AC Input:
 - 100-127V~/ 13A, 50-60Hz
 - 200-220V~/ 10A, 50-60Hz
 - 220-240V~/ 10A, 50-60Hz
- DC Input: (Only for China)
 240Vdc/ 10A
- DC Output:
 - Max 1000W/ 100-127V~
 - +12.2V/ 82A
 - +12.2Vsb/ 3A
 - Max 1800W/ 200-220V~
 - +12.2V/ 148A
 - +12.2Vsb/ 3A
 - Max 2000W/ 220-240V~ or 240Vdc Input
 - +12.2V/ 164A
 - +12.2Vsb/ 3A

^[Note] GIGABYTE offers PSUs with various efficiency ratings and power outputs. Full redundancy may depend on your server configuration, and alternative PSU options may be needed. Please contact our sales representatives for the best power solution.

System	 Aspeed® AST2600 Baseboard Management Controller
Management	 GIGABYTE Management Console web interface
	Dashboard
	 HTML5 KVM
	 Sensor Monitor (Voltage, RPM, Temperature, CPU Statusetc.)
	 Sensor Reading History Data
	FRU Information
	 SEL Log in Linear Storage / Circular Storage Policy
	Hardware Inventory
	Fan Profile
	System Firewall
	Power Consumption
	Power Control
	Advanced power capping
	 LDAP / AD / RADIUS Support
	 Backup & Restore Configuration
	Remote BIOS/BMC/CPLD Update
	Event Log Filter
	User Management
	Media Redirection Settings
	PAM Order Settings
	SSL Settings
	SMTP Settings
Operating	 Operating temperature: 10°C to 35°C
Properties	 Operating humidity: 8%-80% (non-condensing)
	 Non-operating temperature: -40°C to 60°C
	 Non-operating humidity: 20%-95% (non-condensing)

1-3 System Block Diagram



Chapter 2 System Appearance

2-1 Front View





Please Go to Chapter 2-3 Front Panel LED and Buttons for detail description of function LEDs.



No.	Description
1.	Mini DisplayPort
2.	ID LED
3.	USB 3.2 Gen1 Port x 2
4.	Data LAN Port x 2
5.	Management LAN Port
6.	OCP 3.0 Slot (Option/SFF)
7.	PCIe Card Slot



Remove the LAN Cable. See 3-12 Removing the LAN Cable on page 40.

2-3 Front Panel LEDs and Buttons



No.	Name	Color	Status	Description
1.	Reset Button			Press the button to reset the system.
2.	NMI button			Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server.
3	Power button	Green	On	System is powered on
5.	with LED	N/A	Off	System is not powered on or in ACPI S5 state (power off)
4.	ID Button(Note)			Press the button to activate system identification
	·	0	On	HDD locate
		Green	Blink	HDD access
5.	HDD Status	Amber	On	HDD fault
	LED	Green/ Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
	Suctom	Green	On	System is operating normally.
		Amber	On	Critical condition, may indicate: System fan failure System temperature
			Blink	Non-critical condition, may indicate:
6.	Status			Redundant power module failure
	LED(Note)			Temperature and voltage issue
				Chassis intrusion
				System is not ready, may indicate:
		N/A	Off	NMI error
				Processor or terminator missing
	LAN 1/2	Green	On	Link between system and network or no access.
7/8.	Active/Link	Green	Blink	Data transmission or receiving is occuring
L	LEDs	N/A	Off	No data transmission or receiving is occuring

(Note) If your server features RoT function, please see the following section for detail LED behavior.

2-3-1 RoT LEDs

Status LED 7			г١	D LED		
O NMI	O rst	O C L1 L		SYS		o

State	LED on I	LED on PRoT Module			
	ID LED	Status LED	Live LED		
AST1060 FW Active A	uthentication fail				
AST1060 : Recovering active 4Hz region		Green and Amber Blink alternately at 4Hz [Green, Amber, Green, Amber, and so on]	4Hz		
AST1060 FW Active a	nd Recovery Authentic	ation fail			
Endless attempts to boot from active or recovery.	On	Off	Off		
Authenticating BMC/I	BIOS Images	С			
Authenticating Images Off		Off	2Hz		
BMC/BIOS Images Authentication Pass					
BMC : Authentication pass BIOS : Authentication pass	Off	Off	0.5Hz		

State	LED on I	LED on PRoT Module	
	ID LED	Status LED	Live LED
Recovering BMC/BIO	S Images		
BMC : Recovering active region	4Hz	Green Blink at 4Hz	4Hz
BIOS : Recovering active region	4Hz	Amber Blink at 4Hz	4Hz
BMC : Recovering recovery region (If the staging region exists)	4Hz	Green On	4Hz
BIOS : Recovering recovery region (If the staging region exists)	4Hz	Amber On	4Hz
BMC/BIOS Images Ac	tive and Recovery regi	on Authentication Fail	
BMC : Active and Recovery authentication fail	On	Green On	2Hz
BIOS : Active and Recovery authentication fail	On	Amber On	2Hz

NOTE!

1. When the BMC/BIOS starts, the LEDs will be controlled by the BMC/BIOS.

2-4 Rear System LAN LEDs



No.	Name	Color	Status	Description				
		Yellow	On	1 Gbps data rate				
1.	1GDE Speed I ED	Green	100 Mbps data rate					
		N/A	Off	10 Mbps data rate				
	1015		On	Link between system and				
	1GbE	Green		network or no access				
2.	LINK/		Blink	Data transmission or receiving is occurring				
	I FD	N/A	Off No data transmission or					
				receiving is occurring				

2-5 Power Supply Unit (PSU) LED



NOTE!

The power supply may be vary based on the system configuration.



State	Description
OFF	No AC power to all power supplies
1Hz Green Blinking	AC present / only standby on / Cold redundant mode
2Hz Green Blinking	Power supply firmware updating mode
Ambar	AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power
Amber	Power supply critical event causing shut down: failure, OCP, OVP, fan failure and UVP
1Hz Amber Blinking	Power supply warning events where the power supply continues to operate: high temp, high power, high current and slow fan

2-6 Hard Disk Drive LEDs

3.5" Drives



RAID	LED #1	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)	
	Disk LED (LED	Green	ON(*1)	OFF		BLINK (*2)	OFF
No RAID	on Back Panel)	Amber	OFF	OFF		OFF	OFF
configuration (via PCH, HBA)	Removed HDD	Green	ON(*1)	OFF			
	Back Panel)	Amber	OFF	OFF			
RAID		Green	ON	OFF		BLINK (*2)	OFF
configuration (via HW RAID Card or SW RAID Card)	Disk LED	Amber	OFF	ON	(Low Speed: 2 Hz)	OFF	OFF
	Removed	Green	ON(*1)	OFF	(*3)		
	HDD Slot	Amber	OFF	ON	(*3)		

LED #2	HDD Present	No HDD
Green	ON	OFF

NOTE:

*1: Depends on HBA/Utility Spec.

*2: Blink cycle depends on HDD's activity signal.

*3: If HDD is pulled out during rebuilding, the disk status of this HDD is regarded as faulty.

Chapter 3 System Hardware Installation



Pre-installation Instructions

Computer components and electronic circuit boards can be damaged by electrostatic discharge. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your computer or injury to yourself.

- Always disconnect the computer from the power outlet whenever you are working inside the computer 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 system of the computer 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. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging until you are ready to use the component
 for the installation.

3-1 Removing Chassis Cover



Before you remove or install the system cover

· Make sure the system is not turned on or connected to AC power.

Follow these instructions to remove the chassis cover:

- Remove the screws on both sides of the back chassis cover. (Note: For safe shipping, installation screws are added and should be removed before deployment/putting it in the server cabinet.)
- 2. Remove the screw securing the back chassis cover.
- 3. Push button to unlock the handle.
- 4. Pull the grip handle to open the panel cover.
- Slide the back chassis cover towards the rear and remove the chassis cover in the direction indicated.
- 6. Remove the screws securing the front chassis cover.
- Slide the front chassis cover towards the rear and remove the chassis cover in the direction indicated.
- 8. To reinstall the chassis cover reverse steps 2-7.



3-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

- 1. Lift up to remove the fan duct
- 2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until it is firmly seated.



3-3 Removing and installing the Heat Sink



Read the following guidelines before you begin to remove/install the heat sink:

- Always turn off the computer and unplug the power cord from the power outlet before installing the heat sink to prevent hardware damage.
- Unplug all cables from the power outlets.
- · Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- · Open the system according to the instructions.



WARNING!

Failure to turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

Follow these instructions to remove/install the heat sink:

- 1. Loosen the captive screws securing the heat sink in place in reverse order $(4 \rightarrow 3 \rightarrow 2 \rightarrow 1)$.
- 2. Move the rotating wires into the unlatch position.
- 3. Lift and remove the heat sink from the system.
- To reinstall the heat sink reverse steps 1-3 while ensuring that you tighten the captive screws in sequential order (1→2→3→4).



When installing the Heatsink to CPU, use T30-Lobe driver to tighten 4 captive nuts in sequence as 1-4. Please refer to the Heatsink Label for the screw tightening torque value.

To ensure the system operates properly, make sure the heat sink is seated on the processor firmly.

3-4 Installing the CPU

Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- · Disconnect all telecommunication cables from their ports.
- · Place the system unit on a flat and stable surface.
- Open the system according to the instructions.



WARNING!

Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

Follow these instructions to Install the CPU:

- Align and install the processor on the carrier. NOTE: Apply thermal compound evenly on the top of the CPU. Remove the protective cover from the underside of the heat sink.
- 2. Carefully flip the heat sink cover. Then install the carrier assembly on the bottom of the heat sink and make sure the gold arrow is located in the correct direction.
- Remove the CPU cover.
 NOTE: Save the CPU cover in the event that you need to remove the CPU from the socket.
- 4. Align the heat sink with the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heat sink onto the top of the CPU socket.
- 5. Position the rotating wires into the latch position. Tighten the screws in sequential order $(1\rightarrow 2\rightarrow 3\rightarrow 4)$.

NOTE: When dissembling the heat sink, loosen the screws in reverse order $(4 \rightarrow 3 \rightarrow 2 \rightarrow 1)$ and then move the rotating wires into the unlatch position.





NOTE!

- When installing the Heatsink to CPU, use T30-Lobe driver to tighten 4 captive nuts in sequence as 1-4.
- Please refer to the Heatsink Label for the screw tightening torque value.



Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

3-5-1 Twelve Channel Memory Configuration

This motherboard provides 24 DDR5 memory slots and supports 12-Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



3-5-2 Installing the Memory



Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR5 DIMMs on this motherboard.

Make sure your DIMM slots have a single latch or a double latch.

Follow these instructions to install a DIMM module with Single Latch :

1. Open the plastic latch of the memory slot, then place the memory module as pre-inserted vertically position.



 Hold it with both hands, insert the memory module into the movable end first, and then insert the memory module into the fixed end.



 Then use both hands to insert the memory module vertically into the DIMM slot and push it down. Close the plastic latch at the edge of the DIMM slots to lock the memory module.



4. Reverse the installation steps when you want to remove the memory module.

Follow these instructions to install a DIMM module with Double Latch:

- 1. Insert the DIMM memory module vertically into the DIMM slot and push it down.
- 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
- 3. Reverse the installation steps when you want to remove the DIMM module.



3-5-3 DIMM Population Table Intel Xeon 6900E-Series Memory Support

	Туре	Ranks Per DIMM and Data Width	DIM	M Capacity	(GB)	Channel Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel (DPC)				
			D	RAM Densi	ty	1DPC/2SPC				
			16Gb	24Gb	32Gb	1.1V				
	PDIMM	1Rx4	32GB	48GB						
	RUIIVIIVI	2Rx4	64GB	96GB	128GB	6400, 6000, 5600,5200, 4800				
	RDIMM 3DS	8Rx4	256GB			(DDR5-6400 rated RDIMMS only)				

Intel Xeon 6900E-Series CXL Memory Support

Native	DDR5 Men	nory Per	Socket		CXL Memory Per Socket								
Slot 0 DIMM Ranks	Slot 0 DIMM Capacity (GB)	DIMM DRAM Type Density (Gb)		CXL Memory Channels	CXL Memory Type	CXL Capacity Per Device/ Module	CXL Interleave	CXL Mode					
2Rx4	64	10x4	16	1+1	DDR5 x16	2ch 64 GB	Hetero x 16	Hetero					
1Rx4	32	10x4	16	1+1+1	DDR5 x16	2ch 64 GB	1x3 (BIOS)	1LM+Intel® Flat Memory Mode					

NOTE:

- Intel Xeon 6900E-series CXL memory configs are 1DPC only for native DDR5
- CXL Memory Channel notation: # of devices per root port, with root ports separated by "+". i.e. 2+2+2+2
 = four root ports populated with two devices per root port
- CXL Interleave notation: sets x ways. i.e. 2x4 = two sets of four-way interleaves
- CXL Modes:
 - 1LM+Vol = DDR5 and CXL memory visible to SW as separate tiers, separately interleaved
 - Hetero = DDR5 and CXL memory interleaved together in one 16-way set
 - Flat2LM = HW manages data movement between DDR5 and CXL memory, total capacity visible to SW

Intel Xeon 6900P-Series Memory Support

Туре	Ranks Per DIMM and Data Width	DIM	M Capacity DRAM Densi	(GB) ty	Channel Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel Density (DPC) 1DPC/1SPC
	2414 111411	16Gb	24Gb	32Gb	1.1V
	1Rx4	32GB	48GB		
RDIMM	2Rx8	32GB	48GB		6400, 6000, 5600, 5200, 4800
	2Rx4	64GB	96GB	128GB	(DDR5-6400 rated RDIMMS only)
RDIMM 3DS	8Rx4	256GB			
	2Rx8	32GB	ĺ		
	2Rx4	64GB	48GB		8800 8000 7200
MRDIMM	4Rx8	64GB	96GB	128GB	(MDDIMM 9900 arks)
	4Rx4 (2U)	128GB	96GB		(WIRDIWIW-0000 Only)
	4Rx4 (2U)			256GB	

Intel Xeon 6900P-Series CXL Memory Support

Nativ	ve DDR5 M Soc	emory ket	Per		CXL Memory Per Socket							
Slot0 DIMM Ranks	Slot0 DIMM Capacity (GB)	DIMM Type	DRAM Density (Gb)	CXL Memory Channels	CXL Memory Type	CXL Capacity Per Device/ Module	CXL Interleave	CXL Mode				
2Rx4	64	10x4	16	1+1	DDR5 x16	2ch 64 GB	hetero x16	Hetero				
2Rx4	64	10x4	16	2+2+2+2	DDR5 x8	64 GB	1x8*, 2x4, 4x2	1LM+Vol				
2Rx4	64	10x4	16	1+1+1	DDR4 x8	128 GB 1x3 (BIOS		1LM+Intel® Flat Memory Mode				

NOTE:

- Intel Xeon 6900P-series processors CXL memory configs are 1DPC only ('Slot 0') for native DDR5
- CXL Memory Channel notation: # of devices per root port, with root ports separated by "+". i.e. 2+2+2+2
 = four root ports populated with two devices per root port
- CXL Interleave notation: sets x ways. i.e. 2x4 = Set of two modules, interleaved four-way
- CXL Modes:
 - 1LM+Vol = Native DDR5 ('1LM') and (volatile) CXL memory visible to SW as separate tiers, separately interleaved
 - Hetero x16 = DDR5 and (volatile) CXL memory interleaved together in one 16-way set (See graphic in next slide)
 - Flat Memory Mode = HW manages data movement between DDR5 and CXL memory, total capacity visible to SW

3-5-4 Processor and Memory Module Matrix Table

Memory Q'ty		CPU0											CPU1											
for each CPU	LO	к0	JO	10	HO	G0	A0	B0	C0	D0	E0	FO	X0	wo	V0	U0	т0	SO	М0	N0	00	P0	Q0	R0
1 DIMM							v											v						
	v	v	v	v					v	v	v	v	v	v	v	v					v	v	v	v
8 DIMM		v	v		v	v	v	v		v	v			v	v		v	v	v	v		v	v	
	v			v	v	v	v	v	v			v	v			v	v	v	v	v	v			v
12 DIMM	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v

3-6 Installing the PCI Expansion Card



Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCle card.

Failure to observe these warnings could result in personal injury or damage to equipment.



The PCIe riser assembly does not include a riser card or any cabling as standard. To install a PCIe card, a riser card must be installed.

Follow these instructions for a PCI Expansion card:

- 1. Loosen the thumbscrew securing the riser bracket.
- 2. Lift up the riser bracket out of system.
- 3. Remove the screw securing the slot cover from the riser bracket.
- 4. Remove the slot covers from the riser bracket.
- Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.
- 6. Secure the PCIe card with the screw.
- 7. Reverse the previous steps to install the riser bracket.



3-7 Installing the Mezzanine Card

3-7-1 OCP 3.0

Use of the following type of OCP 3.0 NIC is recommended:

- OCP 3.0 SFF with Pull Tab
 - OCP 3.0 SFF with Ejector Latch

Follow these instructions to install an OCP 3.0 mezzanine card:

- 1. Remove the two screws securing the mezzanine card slot cover.
- 2. Remove the slot cover from the system.
- 3. Insert the OCP 3.0 mezzanine card into the card slot ensuring that the card is firmly connected to the connector on the motherboard.
- 4. Tighten the thumbnail screw to secure the OCP 3.0 mezzanine card in place.
- 5. Reverse the previous steps to replace the OCP 3.0 mezzanine card.



3-8 Installing the Hard Disk Drive

Read the following guidelines before you begin to install the HDD:

- Take note of the drive tray orientation before sliding it out.
- The tray will not fit back into the bay if inserted incorrectly.
- Make sure that the HDD is connected to the HDD connector on the backplane.

Follow these instructions to install a 3.5" HDD:

- 1. Press the release button.
- 2. Extend the locking lever.
- 3. Pull the locking lever in the direction indicated to remove the HDD tray.
- 4. Align the hard disk drive with the positioning stud on the HDD tray.
- 5. Slide the hard disk drive into the HDD tray.
- 6. Reinsert the HDD tray into the slot and close the locking lever.



Follow these instructions to install 2.5" hard disk drive into 3.5" HDD Tray:

- 1. Press the release button.
- 2. Extend the locking lever.
- 3. Pull the locking lever in the direction indicated to remove the HDD tray.
- 4. Align the hard disk drive with the positioning screw on the HDD tray.
- 5. Secure the hard disk drive with five screws.
- 6. Reinsert the HDD tray into the slot and close the locking lever.


3-9 Installing the M.2 Device and Heat Sink



CAUTION

The position of the stand-off screw will depend on the size of the M.2 device. The stand-off screw is pre-installed for 22110 cards as standard. Refer to the size of the M.2 device and change the position of the stand-off screw accordingly.

Follow these instructions to install the M.2 device:

- 1. Insert the M.2 SSD module into the slot.
- 2. Secure it with the screw, tightening as necessary to fasten the M.2 SSD module in place.



3-9-1 M.2 device with Heatsink



WARNING:

Please ensure a heatsink is attached to any M.2 device installed into the system. Installing an M.2 device without any heatsink may result in the system overheating or system performance being throttled.

Please go to <u>4-1 Motherboard Component</u> for specific M.2 Slot location.

 To install/remove the M.2 module and Heatsink use a No. 1 Phillips-head screwdriver with a screw torque of 1.5 ± 0.2 kgf*cm

Follow these instructions to install the M.2 device and heat sink:

- 1. Insert the M.2 device into the M.2 connector.
- 2. Press down on the M.2 device.
- 3. Install the thermal pad of the M.2 device to the M.2 device.
- 4. Press down on the thermal pad.
- 5. Secure the M.2 device and its thermal pad to the motherboard with a single screw.
- 6. Reverse steps 1-2 to remove the M.2 device.



3-10 Replacing the Fan Assembly



Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to replacing a system fan.

· Failure to observe these warnings could result in personal injury or damage to equipment.

Follow these instructions to replace the fan assembly:

- 1. Lift up the fan assembly from the chassis.
- 2. Reverse the previous steps to install the replacement fan assembly.



3-11 Replacing the Power Supply



CAUTION!

• In order to reduce the risk of injury from electric shock, disconnect AC power from the power supply before removing the power supply from the system

Follow these instructions to replace the power supply:

- 1. Flip and then grasp the power supply handle.
- 2. Press the retaining clip on the top side of the power supply in the direction indicated.
- 3. Pull out the power supply using the handle.
- 4. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.



3-12 Removing the LAN Cable

Follow these instructions to remove the LAN cable:

1. Press the release latch while simultaneously pulling out the LAN cable.



3-13 Cable Routing



A	Front Switch/LED Cable	Motherboard: FP_1
		Front IO Board: FP_1
В	Front USB 3 Cable	Motherboard: F_USB1
		Front IO Board: F_USB3



A	NVMe 0-1 Cable	Motherboard: U2_P0_4AC
		Backplane Board: U.2 0/ U.2 1
В	NVMe 2-3 Cable	Motherboard: U2_P0_4EG
		Backplane Board: U.2 2/ U.2 3
С	Backplane Board Signal Cable	Motherboard: BP_1
		Backplane Board: BP_1
D	Backplane Board Power Cable	Motherboard: ATX1
		Backplane Board: BP_2X7

Chapter 4 Motherboard Components

4-1 Motherboard Components



Item	Description
1	2 x 3 Pin ATX Power Connector (ATX3)
2	2 x 7 Pin ATX Power Connector (ATX1)
3	MCIO Connector (U2_P1_4EG/4AC/PCIe Gen5)
4	P12V Fan Power Connector (P12V_FAN4)
5	P12V Fan Power Connector (P12V_FAN3)
6	MCIO Connector (U2_P1_5AC/5EG/PCIe Gen5)
7	MCIO Connector (U2_P0_4EG/4AC/PCIe Gen5)
8	P12V Fan Power Connector (P12V_FAN2)
9	HDD Backplane Board Connector
10	P12V Fan Power Connector (P12V_FAN1)
11	MCIO Connector (U2_P0_5AC/5EG/PCIe Gen5)
12	2 x 3 Pin ATX Power Connector (ATX2)
13	Front Panel USB 3.2 Gen1 Connector
14	Front Panel Connector
15	MCIO Connector (U2_P0_3EG/3CA/PCIe Gen5)
16	P12V GPU Power Connector (P12V_S6)
17	PCIe Power Connector (PCIE1/2/3/4_PWR)
18	Power Supply Connector#1 (Primary)
19	Riser Connector (GENZ1/PCIe Gen5)
20	IPMB Connector
21	OCP 3.0 Connector (OCP1/PCIe Gen5 x16)

Motherboard Components

Item	Description
22	PRoT Module Connector (M.2 M-Key/only enabled on RoT SKU)
23	TPM Module Connector (SPI Interface)
24	Serial port cable connector
25	System Battey Socket
26	IO Card Connector
27	BMC Readiness LED
28	OCP 3.0 Connector (OCP2/PCIe Gen5 x16)
29	Riser Connector (GENZ2/PCIe Gen5)
30	Power Supply Connector#2 (Secondary)
31	PCIe Power Connector (PCIE5/6/7/8_PWR/for GENZ2)
32	P12V GPU Power Connector (P12V_S11)
33	MCIO Connector (U2_P1_0AC/0EG/PCIe Gen5)
34	MCIO Connector (U2_P1_2CA/2GE/PCIe Gen5)
35	VROC Module Connector
36	M.2 Slot (PCIe Gen5 x4, NGFF-22110/Supports heatsink)
37	M.2 Slot (PCIe Gen5 x4, NGFF-22110/Supports heatsink)

4-2 Jumper Setting



J1		ON	OFF
	S3_MASK	Stop initial power on when BMC is not ready	Normal [Default]
2	BIOS_RCVR	BIOS Recovery Mode	Normal [Default]
	BIOS_PWD	Clear Supervisor Password	Normal [Default]
4	RST BMC_EN	ID button to enable BMC reset	Normal [Default]

J2		
SW.1	SW.2	
ON	OFF	Slot#1 OCP3.0
ON	ON	Slot#2 OCP3.0
OFF		I/O Module

4-3 Backplane Board Storage Connector

4-3-1 CBP1048



Chapter 5 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters, loading the operating system etc. The BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the key during the POST when the power is turned on.



BIOS flashing is potentially risky, if you do not encounter any problems when using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.

It is recommended that you not alter the default settings (unless you need to) to prevent system
instability or other unexpected results. Inadequately altering the settings may result in system's
failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values.
(Refer to the Exit section in this chapter or introductions of the battery/clearing CMOS jumper in
Chapter 4 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

nus

Main

This setup page includes all the items of the standard compatible BIOS.

Advanced

This setup page includes all the items of AMI BIOS special enhanced features.

(ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)

Chipset

This setup page includes all the submenu options for configuring the functions of the Platform Controller Hub.

Server Management

Server additional features enabled/disabled setup menus.

Security

Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.

A supervisor password allows you to make changes in BIOS Setup.

A user password only allows you to view the BIOS settings but not to make changes.

Boot

This setup page provides items for configuration of the boot sequence.

Save & Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)

Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

5-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

Main Menu Help

The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.



When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.

The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

Main Advanced Chipset	Aptio Setup – AMI Server Mgmt Security Boot Save & Exit	
BIOS Information Project Name Project Version Build Date and Time	MA94-FS0-000 D19c 07/30/2024 17:55:40	
BMC Information BMC Firmware Version	13.06.07	
Processor Information CPU 0 Brand String CPU 1 Brand String Max CPU Speed CPU Signature	Genuine Intel(R) 0000 Genuine Intel(R) 0000 1900 MHZ	
Processor Core Microcode Patch	93873 384 83000180	++: Select Screen 14: Select Item K/M: Scroll Help Area
Platform Information Processor RC Revision	A06F3 - SRF-AP CO 003218.D03	Up/Down. Enter: Select +/-: Change Opt. F1: General Help
Memory Information Total Memory Usable Memory Memory Frequency	65536 MB 65536 MB 4800 MHz	F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1294 Copyright (C) 2024 AMI	84

Main Advanced Chipset Server	Aptio Setup – AMI Mgmt Security Boot Save & E	xit
Project Version	D19c	▲ Set the Time. Use Tab to
Build Date and Time	07/30/2024 17:55:40	switch between Time elements.
BMC Information		
BMC Firmware Version	13.06.07	
Processor Information		
CPU 0 Brand String	Genuine Intel(R) 0000	
CPU 1 Brand String	Genuine Intel(R) 0000	
Max CPU Speed	1900 MHz	
CPU Signature	A06F3	
Processor Core	384	
Microcode Patch	83000180	
		++: Select Screen
Platform Information		T↓: Select Item
Processor	A06F3 - SRF-AP CO	K/M: Scroll Help Area
RC Revision	003218.D03	Up/Down.
		Enter: Select
Memory Information		+/-: Change Opt.
Total Memory	65536 MB	F1: General Help
Usable Memory	65536 MB	F3: Previous Values
Memory Frequency	4800 MHz	F9: Optimized Defaults
Anno and a second		F10: Save & Exit
System Date	[Wed 07/31/2024]	ESC: Exit
System Time	[18:01:00]	
Versio	n 2.22.1294 Copyright (C) 2024	AMI B4

Parameter	Description	
Project Name	Displays the project name information.	
Project Version	Displays version number of the BIOS setup utility.	
Build Date and Time	Displays the date and time when the BIOS setup utility was created.	
BMC Information		
BMC Firmware Version	Displays BMC firmware version information.	
Processor Information		
CPU Brand String/ Max CPU Speed / CPU Signature / Processor Core / Microcode Patch	Displays the technical information for the installed processor(s).	
Platform Information		
Processor/RC Revision	Displays the information of the installed processor(s).	
Memory Information ^(Note)		
Total Memory	Displays the total memory size of the installed memory.	
Usable Memory	Displays the usable memory size of the installed memory.	
Memory Frequency	Displays the installed memory frequency information.	

(Note) This section will display capacity and frequency information of the memory that the customer has installed.

Parameter	Description
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

5-2 Advanced Menu

The Advanced Menu displays submenu options for configuring the function of various hardware components. Select a submenu item, then press <Enter> to access the related submenu screen.

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Server Mgmt Security Boot Save & Exit	
 Trusted Computing Serial Port Console Redirection SID Configuration PCI Subsystem Settings USB Configuration Network Stack Configuration Post Report Configuration KMIP Server Configuration NVMe Configuration Chipset Configuration 	Trusted Computing Settings
 T1s Auth Configuration iSDSI Configuration INTei(R) ISSO Gigabit Network Connection - 10:FF:E0:30:A8:D2 VLAN Configuration (MAC:10FFE030A8D2) MAC:10FFE030A8D2-IPv6 Network Configuration MAC:10FFE030A8D2-IPv6 Network Configuration Intel(R) ISSO Gigabit Network Connection - 10:FF:E0:30:A8:D3 VLAN Configuration (MAC:10FFE030A8D3) MAC:10FFE030A8D3-IPv6 Network Configuration MAC:10FFE030A8D3-IPv6 Network Configuration MAC:10FFE030A8D3-IPv4 Network Configuration Driver Health 	<pre>++: Select Screen tl: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Version 2.22.1294 Copyright (C) 2024 AMI	84

5-2-1 Trusted Computing

Advanced	Aptio Setup – AMI	
Configuration TPM v1.2 Support NO Security Device Found	[Enabled]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INITA interface will not be available.
	version 2.22.1294 Copyright (C) 2024 AM	++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit I B4
Parameter	Description	

Configuration	
TPM v1.2 Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Disable, Enable. Default setting is Enable .

5-2-2 Serial Port Console Redirection

Advanced	Aptio Setup – AMI	
COM1 Console Redirection Serial Port for Out-of-Band Manageme Windows Emergency Management Service Console Redirection EMS Console Redirection Settings	[Disabled] nt/ s (EMS) [Disabled]	Console Redirection Enable or Disable.
		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Dpt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2	.22.1294 Copyright (C) 2024 AMI	84

Parameter	Description
COM1 Console Redirection ^(Note)	Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is Disabled .
COM1 Console Redirection Settings	 Press [Enter] to configure advanced items. Please note that this item is configurable when COM1 Console Redirection is set to Enabled. Terminal Type Selects a terminal type to be used for console redirection. Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is VT100PLUS. Bits per second Selects the transfer rate for console redirection. Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200. Data Bits Selects the number of data bits used for console redirection. Options available: 7, 8. Default setting is 8.

(Note) Advanced items prompt when this item is defined.

Parameter	Description		
COM1 Console Redirection Settings (continued)	 Parity A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. Options available: None, Even, Odd, Mark, Space. Default setting is None. Stop Bits Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. Options available: 1, 2. Default setting is 1. Flow Control Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. Options available: None, Hardware RTS/CTS. Default setting is None. VT-UTF8 Combo Key Support Enable/Disable the VT-UTF8 Combo Key Support. Options available: Enabled, Disabled. Default setting is Disabled. Recorder Mode When this mode enabled, only texts will be send. This is to capture Terminal data. Options available: Enabled, Disabled. Default setting is Disabled. Resolution 100x31 Enable/Disable extended terminal resolution. Options available: Enabled, Disabled. Default setting is		

Description
EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: Enabled, Disabled. Default setting is Disabled .
 Press [Enter] to configure advanced items. Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled. Out-of-Band Mgmt Port Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. Default setting is COM1. Terminal Type EMS Selects a terminal type to be used for console redirection. Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is VT100PLUS. Bits per second EMS Selects the transfer rate for console redirection. Options available: 9600, 19200, 57600, 115200. Default setting is 115200. Flow Control EMS Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. Options available: None, Hardware RTS/CTS, Software Xon/Xoff.

5-2-3 SIO Configuration

Aptio Setup - AMI Advanced	
AMI SID Driver Version : A5.19.00 Super ID Chip Logical Device(s) Configuration > [*Active*] Serial Port WARNING: Logical Devices state on the left side of the control, reflects the current Logical Device state. Changes made during Setup Session will be shown after you restart the system.	View and Set Basic properties of the SIO Logical device. Like IO Base, IRQ Range, DMA Channel and Device Mode.
	<pre>++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Version 2.22.1294 Copyright (C) 2024 AMI	

Parameter	Description	
AMI SIO Driver Version	Displays the AMI SIO driver version information.	
Super IO Chip Logical Device(s) Configuration		
[*Active*] Serial Port	 Press [Enter] to configure advanced items. Use This Device When set to Enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port. Options available: Enabled, Disabled. Default setting is Enabled. Logical Device Settings/Current: Displays the serial port base I/O address and IRQ. Possible: Configures the serial port base I/O address and IRQ. Use Automatic Settings IO=3F8h; IRQ=4; DMA; IO=3E8h; IRQ=4; DMA; IO=3E8h; IRQ=4; DMA; 	

5-2-4 PCI Subsystem Settings

Advanced	Aptio Setup — AMI	
PCI Bus Driver Version SLOT1 1/0 ROM SLOT1 Lanes SLOT1 Max Link Speed	A5.01.32 [Enabled] [Auto] [Auto]	▲ Enable/Disable SLOT1 I/O ROM
SLOT2 I/O ROM SLOT2 Lanes SLOT2 Max Link Speed	[Enabled] [Auto] [Auto]	
SLOT3 I/O ROM SLOT3 Lanes SLOT3 Max Link Speed	(Enabled) (Auto) (Auto)	
SLOT4 I/O ROM SLOT4 Lanes SLOT4 Max Link Speed	[Enabled] [Auto] [Auto]	++: Select Screen 11: Select Item K/M: Scroll Help Area
SLOT6 I/O ROM SLOT6 Lanes SLOT6 Max Link Speed	[Enabled] [Auto] [Auto]	Enter: Select +/-: Change Opt. F1: General Help E3: Previous Values
SLOT7 I/O ROM SLOT7 Lanes SLOT7 Max Link Speed	[Enabled] [Auto] [Auto]	F9: Optimized Defaults F10: Save & Exit ESC: Exit
Ver	rsion 2.22.1294 Copyright (C) 2024 AMI 84



Parameter	Description	
PCI Bus Driver Version	Displays the PCI Bus Driver version information.	
SLOT_# I/O ROM ^(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled .	
SLOT_# Lanes ^(Note1)	Change the PCIe lanes. Default setting is Auto.	
SLOT_#_Max Link Speed ^(Note1)	Configure PCle max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .	
M2A/B I/O ROM ^(Note2)	Enable/Disable M2A I/O ROM. Options available: Enabled, Disabled. Default setting is Enabled .	
M2A/B Lanes ^(Note2)	Change the M2 PCIe lanes. Default setting is Auto.	
M2A/B_Max Link Speed ^(Note1)	Configure M2 PCIe max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .	
LAN I/O ROM ^(Note3)	Enable/Disable the LAN devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled .	
M2C I/O ROM	Enable/Disable M2A I/O ROM. Options available: Enabled, Disabled. Default setting is Enabled .	
PCI Devices Common Settings		
Re-Size BAR Support	If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support. Options available: Enabled, Disabled. Default setting is Disabled .	
SR-IOV Support	If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Enabled, Disabled. Default setting is Enabled .	

(Note1) This section is dependent on the available PCIe Slot.

(Note2) This section is dependent on the available M2 Slot.

(Note3) This section is dependent on the available LAN controller.

5-2-5 USB Configuration

Advanced	Aptio Setup – AMI	
USB Configuration USB Devices: 8 Drives, 2 Keyboards, 3 Mice, XHCI Hand-off USB Mass Storage Driver Support	6 Hubs [Enabled] [Enabled]	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
		<pre>++: Select Screen 11: Select Item K/M: Scroll Help Area Uy/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Version 2.	22.1294 Copyright (C) 2024 AMI	84

Parameter	Description
USB Configuration	
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled, Disabled. Default setting is Enabled .
USB Mass Storage Driver Support ^(Note)	Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled, Disabled. Default setting is Enabled .

5-2-6 Network Stack Configuration

Advanced	Aptio Setup – AMI	
Network Stack IPv4 PXE Support IPv4 HTTP Support IPv6 PXE Support IPv5 HTTP Support PXE boot wait time Media detect count	[Enabled] [Enabled] [Disabled] [Disabled] [Disabled] 0 1	Enable/Disable UEFI Network Stack
		★: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select */-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Vers.	ion 2.22.1294 Copyright (C) 2024 A	AMI 84

Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 PXE Support	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 HTTP Support	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 PXE Support	Enable/Disable the Ipv6 PXE feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 HTTP Support	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
PXE boot wait time	Wait time in seconds to press ESC key to abort the PXE boot. Press the <+> / <-> keys to increase or decrease the desired values.
Media detect count	Number of times the presence of media will be checked. Press the <+> / <-> keys to increase or decrease the desired values.

5-2-7 Post Report Configuration

Advanced	Aptio Setup – AMI	
Post Report Configuration		Post Error Message Support Enabled/Disabled
Error Message Report Post Error Message Halt On	(Enabled) [No Error]	
		<pre>++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Version	2.22.1294 Copyright (C) 2024 AM	84

Parameter	Description
Post Report Configuration	
Error Message Report	
Post Error Message	Enable/Disable the POST Error Message support. Options available: Enabled, Disabled. Default setting is Enabled .
Halt On	Options available: No Error, All Error. Default setting is No Error.

5-2-8 KMIP Server Configuration

Advanced	Aptio Setup – AMI	
<pre>KMIP Server IP address KMIP TOP Port number Time Zone Client Credentials Client UserName Client Password KMS TLS Certificate 0 > Ch Certificate 0 > Client Certificate 0</pre>	5696 [GMT +8] [Enabled]	Enter IP4 address in dotted-decimal notation Example: 192.168.10.12
▶ Client Private Key 0		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Versi	on 2.22.1294 Copyright (C)	2024 AMI 84

Parameter	Description
KMIP Server IP address	
KMIP TCP Port Number	
Time Zone	Enter the correct time zone for this server. Default setting is GMT+8 .
Client Credentials	Use User and password credentials to authenticate the Client. Options available: Enabled, Disabled, Clear. Default setting is Enabled .
Client UserName	Enter Client identify: UserName. Name Length: 0-63 characters.
Client Password	Enter Client identify: Password. Password Length: 0-31 characters.
KMS TLS Certificate / Size	
CA Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Private Key	Enroll factory defaults or load the KMS TLS certificates from the file.

5-2-9 NVMe Configuration



NVMe Configuration Displays the NVMe devices connected to the system.

5-2-10 Chipset Configuration

Advanced	Aptio Setup — AMI	
Restore AC Power Loss P2P Bridge IO Size SATA HOD Security Frozen NVME SSD Security Frozen NVME OPROM Select NVME LED Control	[Last State] [0×1000] [Enabled] [Enabled] [8105 8uild=In] [Disable]	Specify what state when power is re-applied after a power failure (G3 state).
v	ersion 2.22.1294 Copyrigh <u>i (C) 20</u>	++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit 24 AMI B4
arameter	Description	
	Defines the power state to resu due to an interruption in AC pow	ime to after a system shutdown tha wer. When set to Last State, the sys

Restore on AC Power Loss ^(Note)	will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
P2P Bridge IO Size	Specifies P2P Bridge IO aligned to the size. Options available: 0x100, 0x150, 0x1000. Default setting is 0x1000 .
SATA HDD Security Frozen	Enable/Disable this item to send freeze lock command to SATA HDD. Options available: Enabled, Disabled. Default setting is Enabled .
NVMe SSD Security Frozen	Attempt to send freeze lock command to NVMe SSDs during boot. Options available: Enabled, Disabled. Default setting is Enabled .
NVMe OPROM Select	BIOS Build-In is default setting. Select Device Itself, then this NVMe page will not display any device. Unless the device doesn't have OPROM. Options available: BIOS Build-In, NVMe Device, Disables. Default setting is BIOS Build-In .
NVMe LED Control	Enable/Disable allow user control NVMe LED. It only available the NVMe device direct connect to CPU. Default setting is Disable .

(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

5-2-11 TIs Auth Configuration

Advanced	Aptio Setup – AMI	
▶ Server CA Configurati	on	Press <enter> to configure Server CA.</enter>
▶ Client Cert Configura	tion	
	Version 2.22.1294 Copyright (C) 200	++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
ameter	Description	
	Press [Enter] for configuration of ac	lvanced items.
ver CA Configuration	 Enroll Cert Press [Enter] to enroll a certi Enroll Cert Using File Cert GUID	ficate 1111-2222-3333-4444-1234567890

5-2-12 iSCSI Configuration

Aptio Setup -	AMI
▶ Host ISCSI Configuration	Host iSCSI Configuration
	++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doum. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.22.1294 Copyri	ght (C) 2024 AMI

Parameter	Description
Host iSCSI Configuration	 Press [Enter] to configure advanced items. iSCSI Initiator Name Only IQN format is accepted. Range: from 4 to 223 Add an Attempt Delete Attempts Change Attempt Order

5-2-13 Intel(R) i350 Gigabit Network Connection

Advanced	Aptio Setup — AMI	
 NIC Configuration Blink LEDs 	0	Click to configure the network device port.
UEFI Driver	Intel(R) PRO/1000 9.1.12	
Adapter PBA Device Name Chip Type PCI Device ID PCI Address	106300-000 Intel(R) I350 Gigabit Network Connection Intel I350 I521 10:00:00	
Link Status MAC Address Virtual MAC Address	[Disconnected] 10:FF:E0:30:A8:D2 00:00:00:00:00	++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
Version	2.22.1294 Copyright (C) 2024 AM	I B4
Advanced	Aptio Setup – AMI	
Link Speed Wake On LAN	[Auto Negotiated] [Enabled]	Specifies the port speed used for the selected boot protocol.
		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
NIC Configuration	 Press [Enter] to configure advanced items. Link Speed Allows for automatic link speed adjustment. Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is Auto Negotiated. Wake On LAN Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states. Options available: Enabled, Disabled. Default setting is Enabled.
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

5-2-14 VLAN Configuration

Advanced	Aptio Setup – AMI	
Create new VLAN VLAN ID Priority Add VLAN Configured VLAN List Remove VLAN	0 0	VLAN ID of new VLAN or existing VLAN, valid value is 0~4094
		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1294 Copyright	

Parameter	Description
Enter Configuration Menu	 Press [Enter] to configure advanced items. Create new VLAN VLAN ID Sets VLAN ID for a new VLAN or an existing VLAN. Press the <+> / <-> keys to increase or decrease the desired values. The valid range is from 0 to 4094. Priority Sets 802.1Q Priority for a new VLAN or an existing VLAN. Press the <+> / <-> keys to increase or decrease the desired values. The valid range is from 0 to 7. Add VLAN Press [Enter] to create a new VLAN or update an existing VLAN. Configured VLAN List Remove VLAN Press [Enter] to remove an existing VLAN.

5-2-15 MAC IPv6 Network Configuration

Advanced		Aptio Setup – AMI	
Interface Name	:	eth0	The 64 bit alternative
MAC address		10 EE EO OF PE PD	douise. The steping is
Host addresses		10-11-20-00-82-88	colon separated e ơ
nost dddresses		FE80::12FF:E0FF:FE0C:BE8D/64	ff:dd:88:66:cc:1:2:3
Route Table	:		
		FE80::/64 >>::	
Gateway addresses	s :		
DNS addresses	:		
Interface ID			
DAD Transmit Cour	nt	1 Sectore tip	
POILCY		[automatic]	
Save Changes and	Exit		<pre>++: Select Screen fl: Select Item K/M: Scroll Help Area Uu/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
	Version 3	2 22 1294 Conucidat (C) 2024 AMT	

Parameter	Description
Enter Configuration Menu	 Press [Enter] to configure advanced items. Displays the MAC Address information. Interface ID The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3. DAD Transmit Count The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed. Policy Options available: automatic, manual. Default setting is automatic. Save Changes and Exit Press [Enter] to save all configurations.

5-2-16 MAC IPv4 Network Configuration

Advanced	Aptio Setup - AMI	
Configured Enable DHCP Local IP Address Local NetMask Local Gateway Local DNS Servers Save Changes and Exit	(Enabled) [Disabled]	Indicate whether network address configured successfully or not.
		★: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
Configured	Indicates whether network address is configured successfully or not. Options available: Enabled, Disabled. Default setting is Disabled.
Enable DHCP	Options available: Enabled, Disabled. Default setting is Disabled.
Local IP Address	Press [Enter] to configure local IP address.
Local NetMask	Press [Enter] to configure local NetMask.
Local Gateway	Press [Enter] to configure local Gateway
Local DNS Servers	Press [Enter] to configure local DNS servers
Save Changes and Exit	Press [Enter] to save all configurations.
5-2-17 Driver Health

Advanced	Aptio Setup – AMI	
 Intel(R) PR0/1000 8.5.21 PCI-E Intel(R) PR0/1000 9.1.12 PCI-E Intel(R) PR0/1000 9.1.12 PCI-E 	Healthy Healthy Healthy	Provides Health Status for the Drivers/Controllers
		++: Select Screen 14: Select Item K/W: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Versi	on 2.22.1294 Copyright (C)	2024 AMI 84

Parameter	Description
Driver Health	Displays driver health status of the devices/controllers if installed

5-3 Chipset Menu

The Chipset Setup menu displays submenu options for configuring the chipset functions. Select a submenu item, then press <Enter> to access the related submenu screen.

Chipset	Aptio Setup – AMI	
Processor Configuration		Change Per-Socket Settings
 Per-Socket Configuration Processor Socket Processor Due Processor Frequency Processor Max Ratio Processor Min Ratio Microcode Revision L1 Cache RAM(Per Dore) L2 Cache RAM(Per Package) L3 Cache RAM(Per Package) L3 Cache RAM(Per Package) Processor 0 Version Processor 1 Version Handware Prefetcher 	Socket 0 Socket 1 000A06F3* 000A06F3 1.900GHz 1.900GHz 13H 13H 08H 8300180 96KB 96KB 196608KB 196608KB 196608KB 196608KB Genuine Intel(R) 0000 Genuine Intel(R) 0000	++: Select Screen T1: Select Item K/M: Scroll Help Area Up/Down. Enter: Select
Adjacent Cache Prefetch DCU Streamer Prefetcher DCU IP Prefetcher Li Next Page Prefetcher Enable Intel(R) TXT VMX Enable SMX	[Enable] [Auto] [Enable] [Enable] [Disable] [Enable] [Disable]	+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit ▼
Ver	sion 2.22.1294 Copyright (C) 202	4 AMI B4

5-3-1 Processor Configuration

Chipset	Aptio Setup – AMI	
Processor Configuration		▲ Change Per-Socket Settings
 Per-Socket Configuration Processor Socket Processor ID Processor Frequency Processor Max Ratio Processor Min Ratio Microcode Revision L1 Cache RAM(Per Core) L2 Cache RAM(Per Package) L3 Cache RAM(Per Package) Processor 0 Version Processor 1 Version Handware Prefetcher Adjacent Cache Prefetcher DCU Streamer Prefetcher DCU Streamer Prefetcher DCU Streamer Prefetcher Enable Intel(R) TXT VMX Enable SMX 	Socket 0 Socket 1 000A06F3* 000A06F3 1.9006H2 1.9006H2 1.9006H2 1.9006H2 00H 06H 83000180 83000180 96KB 96K8 196608KB 196608KB 196608KB 196608KB Genuine Intel(R) 0000 Genuine Intel(R) 0000 Genuine Intel(R) 0000 [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Disable] [Disable]	++: Select Screen 1: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
0.000		
A64,210U 5	.22.1294 Copyright (C) 20	24 HMI 64
Chipset	Aptio Setup – AMI	
Processor Reserved Memory (Outputs) PRMRR Size per domain	 16 MiB	▲ In Field Scan (IFS)
PRM Size per socket PRM Size per system	16 MiB 16 MiB	
Software Guard Extension (SGX) [Outp	 uts]	
SGX activation state SGX memory population for SGX enabli your memory population. SGX error code [HEX]	Deactivated ng is not POR. Please che 16	eck
Software Guard Extension (SGX) [Inpu	ts]	t↓: Select Item
SGX Factory Reset SW Guard Extensions (SGX) SGX Package Info In-Band Access SGX PRMRR Size Requested	[Disabled] [Disabled] [Disabled] [Auto]	Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values
In Field Scan (IES)		F9: Optimized Defaults
		F10: Save & Exit
▶ In Field Scan (IFS)		F10: Save & Exit ESC: Exit

Parameter	Description
Processor Configuration	
Pre-Socket Configuration	 Press [Enter] to configure advanced items. CPU Socket 0/1 Configuration Core Disable Bitmap(Hex) Number of Cores to enable. 0 means all cores. FFFFFFF means to disable all cores. The maximum value depends on the number of CPUs available. Press the numeric keys to adjust desired values.
Processor Socket / Processor ID / Processor Frequency / Processor Max Ratio / Processor Min Ratio / Microcode Revision / L1 Cache RAM(Per Core) / L2 Cache RAM(Package) / L3 Cache RAM(Per Package) / Processor # Version	Displays the technical specifications for the installed processor(s).
Hardware Prefetcher	Select whether to enable the speculative prefetch unit of the processor. Options available: Enable, Disable. Default setting is Enable .
L2 RF0 Prefetch Disable	Options available: Enable, Disable. Default setting is Disable .
Adjacent Cache Prefetch	When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Enable, Disable. Default setting is Enable .
DCU Streamer Prefetcher	Enable/Disable DCU streamer prefetcher. Options available: Enable, Disable. Default setting is Enable .
DCU IP Prefetcher	Enable/Disable DCU IP Prefetcher. Options available: Enable, Disable. Default setting is Enable .
Enable Intel(R) TXT	Enable/Disable the Intel Trusted Execution Technology support function. Options available: Enable, Disable. Default setting is Disable.
VMX	Enable/Disable the Vanderpool Technology. This will take effect after rebooting the system. Options available: Enable, Disable. Default setting is Enable .
Enable SMX	Enable/Disable the Safer Mode Extensions (SMX) support function. Options available: Enable, Disable. Default setting is Disable .
AES-NI	Enable/Disable the AES-NI support. Options available: Enable, Disable. Default setting is Enable .
Debug Consent	Options available: Enable, Disable. Default setting is Disable .
Memory Encryption (TME) ^(Note)	Enable/Disable memory encryption (TME). Options available: Enabled, Disabled. Default setting is Disabled .
Total Memory Encryption Multi-Tenant (TME-MT)	Options available: Enabled, Disabled. Default setting is Disabled .
Memory integrity	Options available: Enabled, Disabled. Default setting is Disabled .

Advanced items prompt when this item is defined. BIOS Setup (Note)

Parameter	Description	
Trust Domain Extension (TDX)	Options available: Enabled, Disabled. Default setting is Disabled .	
SGX error code [HEX]	Shows hexadecimal SGX internal error code.	
SGX Factory Reset	Perform SGX Factory Reset, on subsequent boot: delete all registration data, if SGX enabled will force Initial Platform Establishment flow. Options available: Enabled, Disabled. Default setting is Disabled .	
SW Guard Extension (SGX)	Options available: Enabled, Disabled. Default setting is Disabled .	
SGX Package Info In-Band Access	Options available: Enabled, Disabled. Default setting is Disabled .	
SGX PRMRR Size Requested	Options available: Enabled, Disabled. Default setting is Auto.	
In-Field Scan (IFS)	Press [Enter] to configure advanced items. Enable SAF Options available: Disabled, Enabled. Default setting is Disabled . SAF PRMRR Size Requested Default setting is 8M .	

5-3-2 Common RefCode Configuration

Chipset	Aptio Setup – AMI	
Common RefCode Configuratio	ın	Divide physical NUMA nodes
Virtual Numa	[Disable]	<pre>into evenly sized virtual NUMA nodes in ACPI table. This may improve Kindows performance on CPUs with more than 64 logical processors. ++: Select Screen T4: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F1: Save Exit ESC: Exit</pre>
	Version 2.22.1294 Copyright (C)	2024 AMI

Parameter	Description
Common RefCode Configuration	
Virtual Numa ^(note)	Divide physical NUMA nodes into evenly sized virtual NUMA nodes in ACPI table. This may improve Windows performance on CPUs with more than 64 logical processors. Options available: Enable, Disable. Default setting is Disable .
Number of Virtual Numa Nodes	The number of virtual NUMA nodes per physical NUMA nodes. 0 means automatically set the number of virtual NUMA nodes base on system configuration. 1 equals disabling virtual NUMA.

5-3-3 UPI Configuration

Chipset	Aptio Setup — AMI	
Chipset Uncore General Configuration • Uncore Status Link Frequency Select ID Directory Cache (IDDC) SNC Stale AtoS LLC dead line alloc MMCFG Base MMCFG Size MMIO High Granularity Size Limit CPU PA to 46 bits Reduce LLC Age-Bit Default	(Auto) (Auto) (Auto) (Auto) (Enable) (Auto) (Auto) (Auto) (Auto) (Disable) (Auto)	Uncore Status Help +-: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Versio	n 2.22.1294 Convright (C) 2024 (TME

Parameter	Description
UPI General Configuration	 Press [Enter] to configure advanced items. Uncore Status Press [Enter] to view the Uncore status. Link Frequency Select Selects the UPI link frequency. Options available: 16.0GT/s, 20.0GT/s, 24.0GT/s, Auto, Use Per Link Setting. Default setting is Auto. SNC Default setting is Auto. Stale AtoS Enable/Disable Stale A to S directory optimization. Options available: Disable, Enable, Auto. Default setting is Auto. LLC dead line alloc Enable/Disable fill dead lines in LLC. Options available: Disable, Enable, Auto. Default setting is Enable. MMCFG Base Options available: 1G, 1.5G, 1.75G, 2G, 2.25G, 3G, Auto. Default setting is Auto.

Parameter	Des	scription
	٠	MMIO High Base
		- Options available: 248T, 120T, 88T, 60T, 30T, 56T, 40T, 32T, 24T, 16T,
		4T, 2T, 1T, 512G, Auto. Default setting is Auto.
	•	MMIO High Granularity Size
		 Selects the allocation size used to assign mmioh resources.
UPI General Configuration		$- \ \ {\rm Options} \ \ {\rm available:} \ \ 1G, \ \ 4G, \ \ 16G, \ \ 32G, \ \ 64G, \ \ 256G, \ \ 1024G, \ \ 4096G,$
		Auto. Default setting is Auto.
	•	Limit CPU PA to 46 bits
		- Options available: Disable, Enable, Auto. Default setting is Disable.
	•	Reduce LLC Age-Bit Default
		- Options available: Disable, Enable, Auto. Default setting is Auto.

5-3-4 Memory Configuration

Chipset	Aptio Setup – AMI		
Integrated Memory Controller (IMC)		Enforces Plan Of Record restrictions for DDR frequency programming, Because [Disable] option is over spec and depend on	
Enforce DDR Memory Frequency PDR Host Memory Frequency • Memory Topology • Memory Wap • Memory RAS Configuration	[Enforce POR] [Auto]	<pre>is over spec and depend on memory quality. ++: Select Screen T4: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>	
Version 2	.22.1294 Conuright (C) 2024 AMT		

Parameter	Description
Integrated Memory Controller (iMC)	
Enforce DDR Memory Frequency POR	When set to Enable, the system enforces Plan Of Record restrictions for DDR frequency programming. Options available: Enforce POR, Enforce Stretch Goals, Disable. Default setting is Enforce POR .
Host Memory Frequency	Maximum Host DDR Memory Frequency Selections in MT/s. If the AUTO option has been selected, a frequency is chosen automatically based on the minimum tCK given by the SPD. Options available: Auto, 4800, 5200, 5600, 6000, 6400. Default setting is Auto .
Memory Topology	Press [Enter] to view memory topology with DIMM population information.
Memory Map	 Press [Enter] to configure advanced items. Intel(R) Flat Memory Mode Support. Options available: Enabled, Disabled. Default setting is Disabled. DDR CXL Heterogeneous Interleave support. Options available: Enabled, Disabled. Default setting is Disabled.

Parameter	Description		
	Press [Enter] to configure advanced items.		
	Mirror Mode		
	 Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Enables the Mirror Mode will disable the XPT Prefetch. Options available: Disabled, Full Mirror Mode. Default setting is Disabled. 		
	 Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket. 		
	 Press the <+> / <-> keys to increase or decrease the desired values. 		
	 Leaky bucket time window based interface^(Note) 		
	 Enable/Disable leaky bucket time window based interface. Options available: Disabled, Enabled. Default setting is Disabled. 		
	 Leaky bucket time window based interface Hour 		
	 Leaky bucket time window based interface hour used for DDR (0-24). 		
Memory RAS Configuration	 Press the <+> / <-> keys to increase or decrease the desired values. 		
, ,	 Leaky bucket time window based interface Minute 		
	 Leaky bucket time window based interface minute used for DDR (0-60). 		
	 Press the <+> / <-> keys to increase or decrease the desired values. 		
	Leaky bucket low bit		
	 Configures leaky bucket low bit (0x1 - 0x29). 		
	 Press the <+> / <-> keys to increase or decrease the desired values. 		
	Leaky bucket high bit		
	 Configures leaky bucket high bit (0x1 - 0x29). 		
	 Press the <+> / <-> keys to increase or decrease the desired values. 		
	 ADDDC Sparing^(Note) 		
	 Enable/Disable ADDDC Sparing. 		
	 Options available: Disabled, Enabled. Default setting is Disabled. 		
	Enable ADDDC Error Injection		
	 Options available: Disabled, Enabled. Default setting is Enabled. 		

(Note) Advanced items prompt when this item is defined.

Parameter	De	Description	
	•	Patrol Scrub Interval	
		 Selects the number of hours (1-24) required to complete full 	
Memory RAS Configuration		scrub. A value of zero means auto.	
(continued)	•	DDR5 ECS	
		- Options available: Disabled, Enabled, Enable ECS with Result	
		Collection. Default setting is Enabled.	

5-3-5 IIO Configuration

Chipset	Aptio Setup – AMI	
IIO Configuration		Enable/Disable Intel VMD technology.
Intel VMO Configuration ▶ Intel VT for Directed I/O (VT-d) ▶ Global Configuration		++: Select Screen
		<pre>t4: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
-Version 2) 22 1294 Conuright (C) 2024 AMT	

Parameter	Description	
IIO Configuration		
Intel VMD Configuration	Enable/Disable Intel VMD technology. Options available: Enable, Disable. Default setting is Disable .	
Intel VT for Directed I/O (VT-d)	 DMA Control Opt-In Flag Enable/Disable DMA_CTRL_PLATFORM_OPT_IN_FLAG in DMAR table in ACPI. Not compatible with Direct Device Assignment (DDA). Options available: Enable, Disable. Default setting is Enable. Pre-boot DMA Protection Options available: Enable, Disable. Default setting is Enable. Pre-boot DMA Protection Options available: Enable, Disable. Default setting is Enable. PCIe ACSCTL Options available: Enable, Disable. Default setting is Disable. Source Validation^(Note) Options available: Disabled, Enabled. Default setting is Disabled. Translation Blocking^(Note) Options available: Disabled, Enabled. Default setting is Disabled. P2P Request Redirect^(Note) Options available: Disabled, Enabled. Default setting is Enabled. P2P Request Redirect^(Note)	

(Note) This item is available when PCIe ACSCTL is set to Enable.

Parameter	Description
Intel VT for Directed I/O (VT-d)	 Upstream Forwarding Enable^(Note) Options available: Disabled, Enabled. Default setting is Enabled. Cache Allocation Options available: Enable, Disable. Default setting is Enable.
Global Configuration	 Press [Enter] to configure advanced items. Max Read Request Size Options available: Auto, 128B, 256B, 512B, 1024B, 2048B, 4096B. Default setting is Auto. Relaxed Ordering Options available: Enable, Disable. Default setting is Enable.

5-3-6 Advanced Power Management Configuration

Aptio Setup - AMI Chipset		
Advanced Power Management CPU P State Control Hardware PM State Control CPU C State Control Package C State Control CPU - Advanced PM Tuning SOCKET RAPL Config	Configuration	P State Control Configuration Sub Menu, include Turbo and etc.
	Version 2.22,1294 Copyright (C) 20	++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit D24 AMI
ameter	Description	
	Press [Enter] to configure advance Intel SST-PP – Intel SST-PP Select allow – Options available: Auto, I SpeedStep (Pstates) – Conventional Intel Speed and frequency in tandem to processor load. – Options available: Enable EIST PSD Function	ced items. vs user to choose level. Level 0, Level 1. Default setting is Auto dStep Technology switches both voltage between high and low levels in response e, Disable. Default setting is Enable .

CPU P State Control

Boot performance mode

Default setting is HW_ALL.

- Select the performance state that the BIOS will set before OS hand off.
- Options available: Max Performance, Max Efficiency. Default setting is Max Performance.
- Turbo Mode
 - When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core.
 - Options available: Enable, Disable. Default setting is Enable.

Parameter	Description
	Press [Enter] to configure advanced items.
	Hardware P-States
	 When this item is disabled, the processor hardware chooses a
	P-state based on OS Request (Legacy P-States).
	- In Native mode, the processor hardware chooses a P-state based
	on OS guidance.
	 In Out of Band mode, the processor hardware autonomously
	chooses a P-state (with no OS guidance).
Hardwara DM State Control	- Options available: Disable, Native Mode, Out of Band Mode, Native
Hardware FW State Control	Mode with No Legacy Support. Default setting is Native Mode.
	Hardware PM Interrupt
	 Enable/Disable Hardware PM Interrupt.
	 Options available: Disable, Enable. Default setting is Disable.
	Native ASPM
	 Enable: OS controlled ASPM.
	 Disable: ASPM off.
	 Auto: BIOS controlled ASPM.
	 Options available: Auto, Disable, Enable. Default setting is Auto.
	Press [Enter] to configure advanced items.
	Monitor MWAIT
	 Options available: Disable, Enable. Default setting is Enable.
	ACPI C1 Enumeration
CPU C State Control	 Options available: C1, C1e . Default setting is C1e.
	ACPI C6x Enumeration
	 Options available: Disable, C6S as ACPI C2, C6S as ACPI C3,
	C6S-P as ACPI C2, C6S-P as ACPI C3, Auto.
	 Default setting is Auto.
	Press [Enter] to configure advanced items.
	Package C State
Package C State Control	 Configures the state for the C-State package limit.
	 Options available: C0/C1 state, C2 state, C6(non Retention) state,
	C6(Retention) state, No Limit, Auto. Default setting is Auto.
	Press [Enter] to configure advanced items.
	Energy Perf BIAS
CPU - Advanced PM Tuning	 Press [Enter] to configure advanced items.
	» Power Performance Tuning
	 Options available: OS Controls EPB, BIOS Controls EPB,
	PECI Controls EPB. Default setting is OS Controls EPB .
	» Energy_PERF_BIAS_CFG mode ^(Note)
	Options available: Performance, Balanced Performance,
	Balanced Power, Power. Default setting is Balanced
	Performance.

Press [Enter] to configure advanced items.

- PL1 Power Limit
 - Press the <+> / <-> keys to increase or decrease the desired values.

SOCKET RAPL Config

- PL1 Time Window
 - Default setting is 1.
- PL2 Power Limit
 - Press the <+> / <-> keys to increase or decrease the desired values.
- PL2 Time Window
 - Default setting is 0.012.

5-3-7 Miscellaneous Configuration

Chipset	Aptio Setup — AMI	
Miscellaneous Configuration		ISCLK Setup Knob
▶ ISCLK Configuration Active Video VGA Device Count (DO NOT modify) VGA Device Address	[Auto] 1 FFFFFF	++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
Miscellaneous Configuration	
ISCLK Configuration	 Press [Enter] to configure advanced items. SSC1 Enable Options available: Enable, Disable. Default setting is Enable. SSC2 Enable Options available: Enable, Disable. Default setting is Enable.
Active Video	Selects the active video type. Options available: Auto, Onboard Device, PCIE Device, Specific PCIE Device. Default setting is Auto .
VGA Device Count (NOT modify)	Default setting is 1.
VGA Device Address	VGA Device Address

5-3-8 Runtime Error Logging Settings

Chipset	Aptio Setup – AMI	
Runtime Error Logging		System Error Enable/Disable setup
System Errors Whea Settings Memory Error Enabling IIO Error Enabling PCIe Error Enabling	(Enable)	<pre>++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Ve	rsion 2.22.1294 Copyright (C)	2024 AMI 84

Parameter	Description	
Runtime Error Logging		
System Errors	Enable/Disable system error logging function.	
	Options available: Enable, Disable. Default setting is Enable.	
	Press [Enter] to configure advanced items.	
Whee Settings	WHEA (Windows Hardware Error Architecture) Support	
whea Settings	 Enable/Disable WHEA Support. 	
	 Options available: Enable, Disable. Default setting is Enable. 	
	Press [Enter] to configure advanced items.	
	Memory Corrected Error	
	 Enable/Disable Memory Corrected Error. 	
Memory Error Enabling	 Options available: Enable, Disable. Default setting is Enable. 	
	Uncorrected Error disable Memory	
	 Enable/Disable the Memory that triggers Uncorrected Error. 	
	 Options available: Enable, Disable. Default setting is Disable. 	
	Press [Enter] to configure advanced items.	
	OS Native AER Support	
IIO Error Enghling	 Select FFM or OS native for AER error handling. If select OS 	
IIO Error Enabling	native, BIOS also initialize FFM first until handshake, which	
	depends on OS capability.	
	- Options available: Enable, Disable. Default setting is Disable .	

Parameter	Description
Parameter PCIe Error Enabling	Description Press [Enter] to configure advanced items. Corrected Error Enables and escalates correctable Errors to error pins. Options available: Enable, Disable. Default setting is Disable. Uncorrected Error Enables and escalates Uncorrectable/Recoverable Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Fatal Error Enable Enables and escalates Fatal Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Fatal Error Enable Enables and escalates Fatal Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Assert NMI on SERR Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. Options available: Enabled, Disabled. Default setting is Enabled. Assert NMI on PERR Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs
PCIe Error Enabling	 Enables and escalates Fatal Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Assert NMI on SERR Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. Options available: Enabled, Disabled. Default setting is Enabled. Assert NMI on PERR Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. Options available: Enabled, Disabled. Default setting is Enabled. Assert NMI on PERR Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs. Options available: Enabled, Disabled. Default setting is Enabled.

5-3-9 Power Policy

Chipset	Aptio Setup - AMI	
Power Policy Quick Settings SpeedStep (Pstates) Monitor MHAIT Turbo Mode ACPI Cox Enumeration ACPI C1 Enumeration Package C State Handware Prefetcher Adjacent Cache Prefetch DCU JF Prefetcher L1 Next Page Prefetcher Handware P-States Stale AtoS LLC dead line alloc Power Performance Tuning ENERGY_PERF_BIAS_CFG mode	[Standard] [Enable] [Enable] [Enable] [Auto] [Cite] [Auto] [Enable] [Enable] [Enable] [Enable] [Auto] [Auto] [Enable] [Auto] [Enable] [OS Controls EPB] [Balanced Performance]	Select a Power Policy Quick Setting(The following items will be set based on the selected power policy) ++: Select Screen 14: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. Fi: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
	Selects a Power Policy Quick Setting.
Power Policy Quick Settings	Options available: Standard, Best Performance, Energy Efficient. Default
	setting is Standard.
	Conventional Intel SpeedStep Technology switches both voltage and
SpeedStop (Detates)	frequency in tandem between high and low levels in response to processor
SpeedStep (Fstates)	load.
	Options available: Enable, Disable. Default setting is Enable .
Monitor MM/AIT	Allows Monitor and MWAIT instructions.
WOHILOF WWWATT	Options available: Enable, Disable. Default setting is Enable .
	When this item is enabled, the processor will automatically ramp up the
Turba Mada	clock speed of 1-2 of its processing cores to improve its performance.
	When this item is disabled, the processor will not overclock any of its core.
	Options available: Enable, Disable. Default setting is Enable .
	Options available: Disable,C6S as ACPI C2, C6S as ACPI C3,
ACPI C6x Enumeration	C6S-P as ACPI C2, C6S-P as ACPI C3, Auto.
	Default setting is Auto .
ACDI C1 Enumeration	Options available: C1, C1e.
ACPICIEnumeration	Default setting is C1e.
	Configures the C-State package limit.
Package C State	Options available: C0/C1 state, C2 state, C6(non Retention) state,
	C6(Retention) state, No Limit, Auto. Default setting is Auto.

Parameter	Description
Hardware Prefetcher	Options available: Enable, Disable. Default setting is Enable .
Adjacent Cache Prefetch	Options available: Enable, Disable. Default setting is Enable.
DCU Streamer Prefetcher	Options available: Enable, Disable. Default setting is Enable.
L1 Next page Prefetcher	Options available: Enable, Disable. Default setting is Enable.
Hardware P-States	Options available: Disable, Native mode, Out of Band mode, Native Mode with No Legacy Support. Default setting is Native Mode .
Stale AtoS	Options available: Auto, Enable, Disable. Default setting is Auto.
LLC dead line alloc	Options available: Auto, Enable, Disable. Default setting is Enable .
Power Performance Tuning	Options available: OS Controls EPB, BIOS Controls EPB, PECI Controls EPB. Default setting is BIOS Controls EPB .
ENERGY_PERF_BIAS_CFG mode	Performance, Balanced Performance, Balanced Power, Power. Default setting is Balanced Performance .

5-4 Server Management Menu

Main Advanced Chipset Serve	Aptio Setup – AMI Mgmt Security Boot Save & Exi	
FRB-2 Timer FRB-2 Timer folicy GS Watchdog Timer OS Wid Timer Timeout OS Wid Timer Timeout OS Wid Timer Policy Wait BMC Ready > System Event Log > View FRU information > BMC VLAN Configuration > BMC retwork configuration	[Disabled] 30 [Do Nothing] [Disabled] 10 [Reset] [2 minutes]	Enable or Disable FRB-2 timer(POST timer)
▶ IPv6 BMC Network Configuration		++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Enabled .
FRB-2 Timer ^(Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down, Power Cycle. Default setting is Do Nothing .
OS Watchdog Timer	Enable/Disable OS Watchdog Timer function. Options available: Enabled, Disabled. Default setting is Disabled .
OS Wtd Timer Timeout ^(Note2)	Configures OS Watchdog Timer. The value is between 1 to 30 minutes. Default setting is 10 minutes .
OS Wtd Timer Policy ^(Note2)	Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down, Power Cycle. Default setting is Reset .
Wait BMC Ready	POST wait BMC ready and reboot system. Options available: Disabled, 2 minutes, 4 minutes, 6 minutes. Default setting is 2 minutes .

(Note1) This item is configurable when **FRB-2 Timer** is set to **Enabled**.

(Note2) This item is configurable when OS Watchdog Timer is set to Enabled.

Parameter	Description
System Event Log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the FRU information.
BMC VLAN Configuration	Press [Enter] to configure advanced items.
BMC network Configuration	Press [Enter] to configure advanced items.
IPv6 BMC Network Configuration	Press [Enter] to configure advanced items.

5-4-1 System Event Log

Server Mg	Aptio Setup – AMI mt	
Enabling/Disabling Options		Change this to enable or
SEL Components		disable event logging for error/progress codes
Erasing Settings		during boot.
Enase SEL	[No]	
When SEL 15 Full	[Do Nothing]	
Custom EFI Logging Options		
Log EFI Status Codes	[Error code]	
NOTE: All values changed here do not take effect until computer is restarted.		
		↔+: Select Screen
		†↓: Select Item
		K/M: Scroll Help Area
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
Vancion 2 92 1204 Conuniabt (C) 2024 AWT		

Parameter	Description
Enabling / Disabling Options	
SEL Components	Change this item to enable or disable all features of System Event Logging during boot. Options available: Enabled, Disabled. Default setting is Enabled .
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: No, Yes, On next reset, Yes, On every reset. Default setting is No .
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately, Delete Oldest Record. Default setting is Do Nothing .
Custom EFI Logging Options	
Log EFI Status Codes	Enable/Disable the logging of EFI Status Codes (if not already converted to legacy). Options available: Disabled, Both, Error code, Progress code. Default setting is Error code .

5-4-2 View FRU Information

The FRU page is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.

	Aptio Setup – AMI Server Mgmt	
FRU Information System Manufacturer System Product Name System Version System Serial Number Board Manufacturer Board Part Number Board Serial Number Chassis Manufacturer Chassis Part Number Chassis Serial Number	Server Mgmt Giga Computing MA94-FS0-000 Giga Computing MA94-FS0-000 Giga Computing	++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1294 Copyright (C) 2024 AMI	B4

5-4-3 BMC VLAN Configuration

	Aptio Setup – AMI Server Mgmt	
BMC VLAN Configuration BMC VLAN ID BMC VLAN Priority	0 0	VLAN ID of new VLAN or existing VLAN, valid value is 0~4094, 0 is disable VLAN
		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
BMC VLAN Configuration	
	Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When
DIVIC VLAIN ID	set to 0, BMC VLAN ID will be disabled.
	Select to configure BMC VLAN Priority. The valid range is from 0 to 7.
BIVIC VLAN PHOFILY	When BMC VLAN ID is set to 0, BMC VLAN Priority will not be selected.

5-4-4 BMC Network Configuration

Aptio Setup – AMI Server Mgmt			
BMC network configuration Select NCSI and Dedicated LAN Lan channel 1 Configuration Address source Station IP address Subnet mask Router IP address Station MAC address	[Mode3 (Failover)] [DynamicBmcDhcp] 10.1.6.95 255.255.255.0 10.1.6.253 10-FF-E0-30-9E-78	Select to configure LAN channel parameters statically or dynamically(DHCP). Do nothing option will not modify any BMC network parameters during BIOS phase	
Real-time get BMC network address		++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	
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Parameter	Description
BMC network configuration	
Select NCSI and Dedicated LAN	Options available: Do Nothing, Model1(Dedicated), Model2(NCSI), Mode3(Failover). Default setting is Do Nothing .
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (DHCP). Options available: Unspecified, Static, DynamicBmcDhcp. Default setting is DynamicBmcDhcp .
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001.
Router IP address	Displays the Router IP Address information.
Station MAC address	Displays the MAC Address information.
Real-time get BMC network address	Press [Enter] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address.

5-4-5 IPv6 BMC Network Configuration

Aptio Setup - AMI Server Mgmt			
IPv6 BMC Network Configuration IPv6 BMC Lan Octoon IPv6 BMC Lan IP Address Source IPv6 BMC Lan IP Address → [::] IPv6 BMC Lan IP Address → [::] IPv6 BMC Lan IP Prefix Length IPv6 BMC Lan Default Gateway → [::] IPv6 BMC Lan Default Router	[Enable] [DynamicBmcDhcp] :: 0 ::	Enable/Disable IPv6 BMC LAN channel function. Disable option will not modify any BMC network during BIOS Phase	
→ [::]		++: Select Screen t1: Select Item K/M: Scroll Help Area Uµ/Doun. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	

Parameter	Description
IPv6 BMC network configuration	
IPv6 BMC Lan Channel 1	
IPv6 BMC Lan Option	Enable/Disable IPv6 BMC LAN channel function. When this item is disabled, the system will not modify any BMC network during BIOS phase. Options available: Unspecified, Disable, Enable. Default setting is Enable .
IPv6 BMC Lan IP Address Source	Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Options available: Unspecified, Static, Dynamic-Obtained by BMC running DHCP. Default setting is Dynamic-Obtained by BMC running DHCP .
IPv6 BMC Lan IP Address/ Prefix Length	Check if the IPv6 BMC LAN IP address matches those displayed on the screen.

5-5 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.

Main Advanced Chipset Serv	Aptio Setup – AMI ver Mgmt <mark>Security Bo</mark> ot Sa	ve & Exit
Password Description		Set Administrator Password
If ONLY the Administrator's pa then this only limits access to only asked for when entering S If ONLY the User's password is is a power on password and mus boot or enter Setup. In Setup have Administrator rights.	assword is set, to Setup and is setup. s set, then this t be entered to the User will	
in the following range:		
Minimum length	3	
Maximum length	20	→+: Select Screen
		î↓: Select Item
Administrator Password		K/M: Scroll Help Area
User Password		Up/Down. Enter: Select +/-: Change Opt.
▶ Media Sanitization		F1: General Help F3: Previous Values
Secure Boot		F9: Optimized Defaults
Secure Flash Update		F10: Save & Exit
		ESC: Exit

There are two types of passwords that you can set:

Administrator Password

Entering this password will allow the user to access and change all settings in the Setup Utility.

User Password

Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

Parameter	Description
Administrator Password	Press [Enter] to configure the administrator password.
User Password	Press [Enter] to configure the user password.
Media Sanitization	Press [Enter] to configure advanced items.
Secure Boot	Press [Enter] to configure advanced items.
Secure Flash Update	Press [Enter] to configure advanced items.

5-5-1 Secure Boot

The Secure Boot feature is applicable if supported by your Operating System.

If your Operating System is not supporting Secure Boot, the system will hang when starting the Operating System.

	Aptio Setup – AMI Security	
System Mode	Setup	Secure Boot feature is Active if Secure Boot is
Secure Boot	[Disabled] Not Active	Enabled, Platform Key(PK) is appelled and the Suctom is
Secure Boot Mode • Restore Factory Keys • Reset To Setup Mode • Expert Key Management	[Custom]	in User mode. The mode change requires platform reset
		++: Select Screen f4: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt.
		F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, Disabled. Default setting is Disabled .
Secure Boot Mode ^(Note)	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all files being loaded before the Operating System loads to the login screen have not been tampered with. When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases. When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database. Options available: Standard, Custom. Default setting is Standard .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset To Setup Mode	Reset the system to Setup Mode.

(Note) Advanced items prompt when this item is set to Custom.

Parameter	Description
Key Management	 Press [Enter] to configure advanced items. Please note that this item is configurable when Secure Boot Mode is set to Custom. Factory Key Provision Allows to provision factory default Secure Boot keys when system is in Setup Mode. Options available: Enabled, Disabled. Default setting is Disabled. Restore Factory Keys Installs all factory default keys. It will force the system in User Mode. Options available: Yes, No. Reset To Setup Mode Reset To Setup Mode Reset the system to Setup Mode. Options available: Yes, No. Enroll Efi Image Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). Export Secure Boot variables Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device. Secure Boot variable Displays the current status of the variables used for secure boot. Platform Key (PK) Displays the current status of the Rey Exchange Key Database (KEK). Press [Enter] to configure a new PK. Options available: Update. Key Exchange Keys (KEK) Displays the current status of the Key Exchange Key Database (KEK). Press [Enter] to configure a new KEK or load additional KEK from storage devices. Options available: Update, Append. Authorized Signatures (DB) Displays the current status of the Authorized Signature Database. Press [Enter] to configure a new DB or load additional DB from storage devices. Options available: Update, Append. Forbidden Signatures (DBX) Displays the current status of the Forbidden Signature Database. Press [Enter] to configure a new dbs or load additional dbs from storage devices. Options available: Update, Append.

Parameter	Description		
Key Management (continued)	 Authorized TimeStamps (DBT) Displays the current status of the Authorized TimeStamps Database. Press [Enter] to configure a new DBT or load additional DBT from storage devices. Options available: Update, Append. OsRecovery Signatures Displays the current status of the OsRecovery Signature Database. Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices. Options available: Update, Append. 		

5-6 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.

Aptio Setup – AMI Main Advanced Chipset Server Mgmt Security <mark>Boot</mark> Save & Exit			
Boot Configuration Setup Promot Timeout Bootup NumLock State Quiet Boot	1 [On] [Enabled]	Set the default timeout before system boot. A value of 65535 will disable the timeout completely.	
Endless Retry Boot Setup Flash Dump full Setup Data Dump non-default Setup Data Restore Setup Data	[Disəble]		
FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4	[Hard Disk] (CD/DVD] [USB Device] [Network:UEFI: PXE IPv4 Intel(R) I350 Gigabit Network Connection 10:FF:50:30:A8:02]	++: Select Screen 14: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values	
Boot Option #5 ▶ UEFI NETWORK Drive BBS Priorities	(UEFI AP:UEFI: Built-in EFI Shell)	F9: Optimized Defaults F10: Save & Exit ESC: Exit	

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Main Advanced Chipset Server Mg	Aptio Setup – AMI mt Security <mark>Boot</mark> Save & Exit	
Bootup NumLock State Quiet Boot	[On] [Enabled]	Specifies the Boot Device Priority sequence from
Endless Retry Boot	[Disable]	avallable OEFI Application.
Setup Flash Dump full Setup Data Dump non-default Setup Data Restore Setup Data		
FIXED BOOT ORDER Priorities Boot Option #1	[Hard Disk]	
Boot Option #2	[CD/DVD]	→+: Select Screen
Boot Option #3	[USB Device]	↑↓: Select Item
BOOT Uption #4	[Network:UEF1: PXE IPv4 Intel(R) I350 Gigabit Network Connection	K/M: Scroll Help Area Up/Down. Enter: Select
Boot Option #5	[UEFI AP:UEFI: Built-in EFI Shell]	F1: General Help F3: Previous Values F9: Optimized Defaults
UEFI NETWORK Drive BBS Priorities		F10: Save & Exit
 UEFI Application Boot Priorities 		ESC: Exit
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Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is On .
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is Enabled .
Endless Retry Boot	Options available: Disable, Enable. Default setting is Disable .
Setup Flash	Press [Enter] to run setup flash.
Dump full Setup Data	Press [Enter] to dump full setup data to file.
Dump non-default Setup Data	Press [Enter] to dump non-default setup data to file.
Restore Setup Data	Press [Enter] to restore setup data from file.
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot order priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI Network Drive BBS Priorities	Press [Enter] to configure the boot priority.
UEFI Application Boot Priorities	Press [Enter] to configure the boot priority.

5-7 Save & Exit Menu

The Save & Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press <Enter>.

Aptio Setup – AMI Main Advanced Chipset Server Mgmt Security Boot Save & Exit	
Save Options Save & Exit Discard changes & exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes	Exit system setup without saving any changes.
Default Options Restore Defaults Save the User Default Values Restore the User Default Values Boot Device Priority UEFI: PXE IPV4 Intel(R) I350 Gigabit Network Connection 10:FF:E0:30:A8:02 UEFI: PXE IPV4 Intel(R) I350 Gigabit Network Connection 10:FF:E0:30:A8:03 UEFI: Built-in EFI Shell Launch EFI Shell	<pre>++: Select Screen 11: Select Item K/M: Scroll Help Area Up/Doum. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>

Parameter	Description
Save Options	
Save and Exit	Saves changes made and closes the BIOS setup. Options available: Yes, No.
Discard changes and exit	Discards changes made and exits the BIOS setup. Options available: Yes, No.
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes, No.
Discard Changes and Reset	Restarts the system without saving any changes. Options available: Yes, No.
Save Changes	Saves changes done so far to any of the setup options. Options available: Yes, No.
Discard Changes	Discards changes made and closes the BIOS setup. Options available: Yes, No.
Default Options	

Parameter	Description
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No.
Save the User Default Values	Saves the changes made as the user default settings. Options available: Yes, No.
Restore the User Default Values	Loads the user default settings for all BIOS setup parameters. Options available: Yes, No.
Boot Device Priority	Press [Enter] to configure the device as the boot-up drive.
Launch EFI Shell	Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.
5-8 BIOS Recovery

The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

- 1. Copy the XXX.rom to USB diskette.
- 2. Setting BIOS Recovery jump to enabled status.
- 3. Boot into BIOS recovery.
- 4. Run Proceed with flash update.
- 5. BIOS updated.

