Vela

Server Motherboard
User's Manual

UM_Vela_v1.3_030521

Table of Contents

Document Release History

Release Date	Version	Update Content
September 2019	1	User's Manual release to public.
November 2019	1.1	Specification update.
January 2021	1.2	Manual cover update.
March 2021	1.3	Connector update.

Preface

Copyright

Trademarks

Changes

The material in this document is for information purposes only and is subject to change without notice.

Warning

1. A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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Instruction Symbols

Special attention should be given to the instruction symbols below.

NOTE	This symbol indicates that there is an explanatory or supplementary instruction.
CAUTION	This symbol denotes possible hardware impairment. Upmost precaution must be taken to prevent serious harware damage.
WARNING	This symbol serves as a warning alert for potential body injury. The user may suffer possible injury from disregard or lack of attention.

Safety Instructions

When installing, operating, or performing maintenance on this equipment, the following safety precautions should always be taken into account in order to reduce the risk of fire, electric shock, and personal injury.

Carefully read the safety instructions below before using this product.

- Observe all of the warning and instruction signs distinctively marked on the product.
- Before performing system installations, please consult the User's Manual provided with this product.
- Do not place this product on an uneven or weak surface (unstable cart, stand, table, ect.) that might induce the product to fall and sustain serious damage.
- Install only the equipment or device identified in the User's Manual. Deploying other equipment or device with this motherboard could invoke improper connection of circuitry that leads to fire or personal injury.
- This product should only be operated with the type of power source indicated on the marked label. If you are questionable about which type of power supply is used in your area, consult your dealer or local Power Company.
- Disconnect the power supply module before removing power from the system.
- Unplug this product from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
- Do not use this product near a water source, including faucet and lavatory.
- Never spill liquids of any kind on this product.
- Never shove objects of any kind into this product's open slots, as they may touch dangerous voltage points or short out parts and could result in fire or electric shock.
- Do not block or cover slots and openings in this unit, as they were made for ventilation and prevent this unit from overheating. Do not place this product in a built-in installation unless proper ventilation is available.
- Do not disassemble this product. This product should only be taken apart by trained personnel. Opening or removing covers and circuit boards may expose you to electric shock or other risks. Incorrect reassembly can also cause electric shock when the unit is subsequently used.
- Risk of explosion is possible if battery is replaced with an incompatible type. Dispose of used batteries accordingly.
- This product is equipped with a three-wire grounding type plug, a plug with a third (grounding) pin. As a safety feature, this plug is intended to fit only into a grounding type power outlet. If you are unable to insert the plug into the outlet, contact your electrician to replace the outlet. Do not remove the grounding type plug or use a 3-Prong To 2-Prong Adapter to circumvent the safety feature; doing so may result in electric shock and/or damage to this product.

About This Manual

Thank you for selecting and purchasing the Vela server board.

This user's manual is provided for professional technicians to perform easy hardware setup, basic system configurations, and quick software startup. This document pellucidly presents a brief overview of the product design, device installation, and firmware settings for the Vela motherboard. For the latest version of this user's manual, please refer to the AIC website: https://www.aicipc.com/en/productdetail/51202.

Chapter 1 Product Features

This chapter delivers the overall layout of the product, including the fundamental components on the motherboard, design specifications, and noteworthy features. Vela is an ideal server grade motherboard that is specifically designed to accommodate diverse enterprises for managing heavy workloads, databases, nearline applications, and cloud deployments. This product supports the dual processor with Socket SP3 socket type with a memory support of 8 channel DDR4 RDIMM/LRDIMM/NVDIMM-N with EEC up to 2667 MHz.

Chapter 2 Hardware Setup

This chapter displays an easy installation guide for assembling the CPU (Central Processing Unit) and memory module. Utmost caution for proceeding to set up the hardware is highly advised. The components on the motherboard are highly fragile and vulnerable to exterior influence. Do not attempt to endanger the device by placing the device in a potentially unstable or hazardous surroundings, including positioning the device on an uneven grounds or humid environments.

Chapter 3 Motherboard Settings

This chapter elaborates the overall layout of the server motherboard, including multifarious connectors, jumpers, and LED descriptions. These descriptions assist users to configure different settings and functions of the motherboard, as well as to confirm the location of each connector and jumper.

Chapter 4 BIOS Configuration Settings

This chapter introduces the key features of BIOS, including the descriptions and option keys for diverse functions. These details provide users to effortlessly navigate and configure the input/output devices.

Chapter 5 BMC Configuration Settings

This chapter illustrates the diverse functions of IPMI BMC, including the details on logging into the web page and assorted definitions. These descriptions are helpful in configuring various functions through Web GUI without entering the BIOS setup. For more information of BMC configurations, please refer to IPMI BMC (Aspeed AST2500) User's Manual for a more detailed description.

Chapter 6 Technical Support

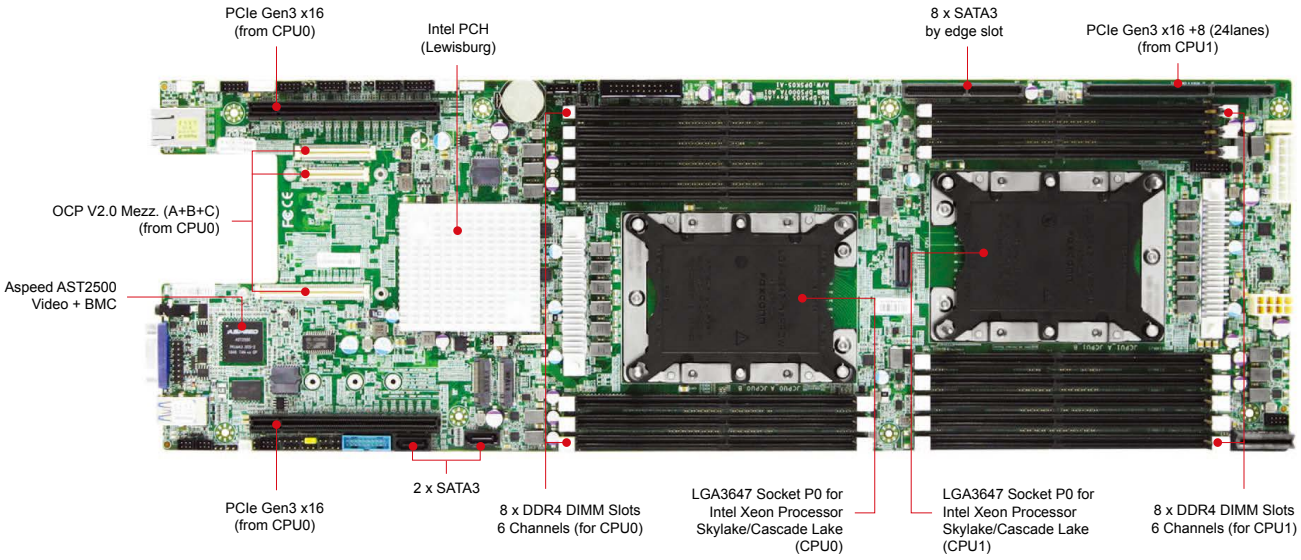
For more information or suggestion, please contact the nearest AIC® corporation representative in your district or visit the AIC® website: http://www.aicipc.com/tw/en. It is our greatest honor to provide the best service for our customers.

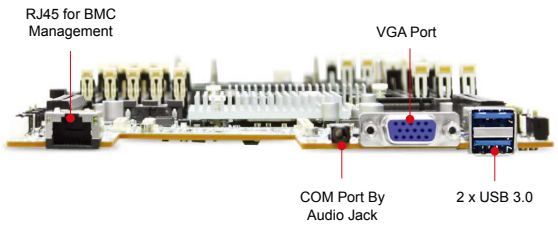
Chapter 1. Product Features

This section describes the hardware specifications and features of the Vela motherboard. The fundamental components of the Vela severboard are provided below.

1.1 Component

Vela Serverboard





Product specifications and features are subject to change without prior notice.

1.2 Specifications

System	Processor Support	Intel® Xeon® Scalable Processors (Skylake/Cascade Lake/Cascade Lake Refresh)
	CPU TDP	240W
	UPI Speeds	10.4 GT/s, 9.6 GT/s
	Socket Type	Socket P0 (LGA-3647 Socket)
	System Memory	• 6 x memory channels per CPU, 2 channels with 2DPC + 4 channels with 1DPC • 16 x DIMM slots support: DDR4 2933/2666MHz RDIMM/LRDIMM - up to 256GB RDIMM SRx4 - up to 512GB RDIMM DRx4 - up to 2048GB RDIMM 3DS 8Rx4 - up to 1024GB LRDIMM QRx4 - up to 2048GB LRDIMM 3DS 8Rx4 • Intel® Optane™ DC Persistent Memory (Apache Pass) support
	Expansion Slots	• 2 x PCIe Gen3 slots • 1 x OCP Mezz. V2.0 supports PCIe Gen3 x16 • 1 x high density connector supports 16 + 8 lanes of PCIe Gen3
System BIOS	BIOS Type	Insyde UEFI BIOS
	BIOS Features	• ACPI • PXE • WOL • AC loss recovery • IPMI KCS interface • SMBIOS • Serial console redirection • BIOS Boot Specification • BIOS Recovery Mode • SRIOV • iSCSI • TPM

On-board Devices	SATA	Intel ® Lewisburg PCH on-chip solution • 2 x SATA 6.0 Gb/s (by 2 x SATA 7 pin) • 8 x SATA 6.0 Gb/s by edge slot for extension
	BMC	Aspeed AST2500 Advanced PCIe Graphics & Remote Management Processor • Baseboard Management Controller • Intelligent Platform Interface 2.0 (IPMI 2.0) • iKVM, Media Redirection, IPMI over LAN, Serial over LAN • SMASH Support • HTML5 • Redfish
	Network Controller	• Via OCP Mezz. card/PCIe slots extension • Realtek RTL8211E GbE Ethernet for BMC dedicated management port
	Graphics	Aspeed AST2500 Advanced PCIe Graphics & Remote Management Processor • PCIe VGA/2D Controller • 1920x1200@60Hz 32bpp
Input/Output	SATA	10 x SATA 6.0 Gb/s ports • 2 x SATA 6.0 Gb/s (by 2 x SATA 7 pin) + 8 x SATA 6.0 Gb/s (by edge slot extension)
	LAN	1 x GbE RJ45 dedicated to BMC management
	USB	• 2 x USB 3.0 Type A connectors • 1 x USB internal pin-header to support 2 x USB3.0/USB2.0 • 1 x USB internal pin-header to support 2 x USB 2.0
	VGA	• 1 x external VGA port • 1 x internal VGA pin-header (share with external VGA port)
	Serial Port	• 1 x external COM port by 3.5mm phone jack • 2 x internal COM pin-headers
	Other	1 x TPM 2.0 onboard

1.3 Feature

The Vela server board offers the latest Xeon® Scalable Processors technology solutions with compelling performance and provides premium power efficiency, which is optimized for efficient performance platforms (storage, security and communications infrastructure).

By implementing Intel® Xeon® Scalable Processors, fully integrated microarchitecture supports up to 72 lanes of PCIE Gen3, providing six channels per CPU with total sixteen DIMM slots deployment which can support up to DDR4 2933/2666MHz, Vela server board can meet both cost efficiency and performance requirement for lots of applications.

Featured with ground breaking technologies including Intel® Next Generation Microarchitecture and Instruction Set (AVX-512, VMD, QAT - optional by PCH SKU), Speed Shift Technology, UPI link speeds up to 10.4GT/s, the Vela server board enable next generation server solutions with an incredible leap in performance.

- Supports Intel® Xeon® Scalable Processors for highest server performance and improved power efficiency
- Supports 16 DDR4 DIMM slots for maximum memory performance
- Supports up to 72 lanes of PCIe Gen3 extension

  (1) from CPU0: 1 x16 via OCP Mezz. V2.0;

  2 x16 via PCIe x16 slots;

  (2) from CPU1: the other 24 lanes via Max I/O®
- Onboard Baseboard Management Controller for system management and IPMI control
- Embedded components for 5+ year long life
- Rackmount Technology Extension (RTX) form factor utilizes full internal chassis volume for optimum I/O configurations

Chapter 2. Hardware Setup

This chapter provides the graphic detail and basic instruction for hardware installation. Turn off the system and unplug all peripheral devices before proceeding.

2.1 Central Processing Unit Setup

The serverboard supports dual Xeon scalable processors and Socket P0 (LGA-3647).

2.1.1 Processor Installation

To ensure a safe and easy setup, you need to prepare before installation:

☑ a T20 Torx screwdriver

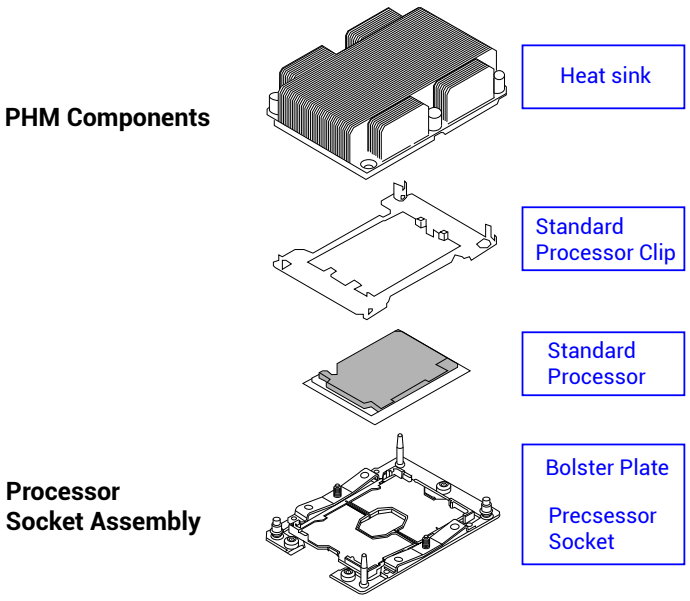
☑ ESD wrist strap/mat and conductive foam pad

☑ Safe and stable environment

CAUTION
The pins of the processor socket are vulerable and easily susceptible to damage if fingers or any foreign objects are pressed against them. Please keep the socket protective cover on when the processor is not installed.

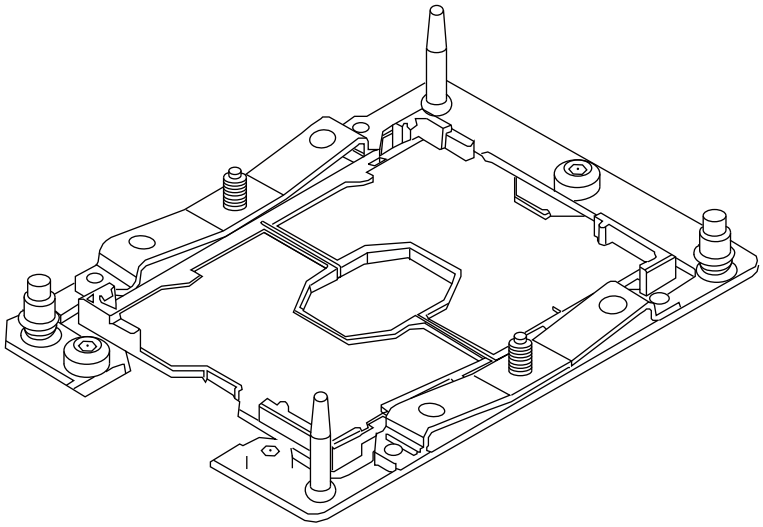
CAUTION
When unpacking a processor, hold the processor only by its edges to avoid touching the contacts.

Standard Processor Assembly:
A standard processor assembly is comprised of PHM(Processor Heatsink Module) components and processor socket assembly.

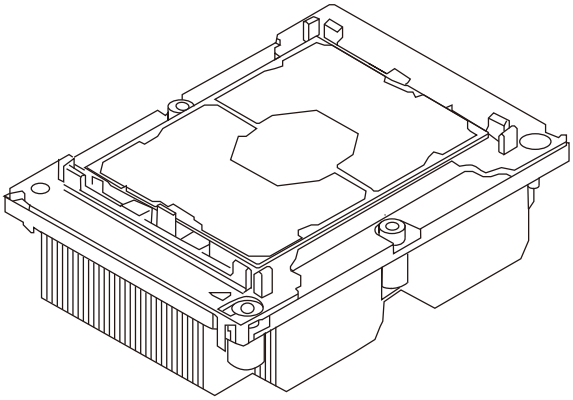


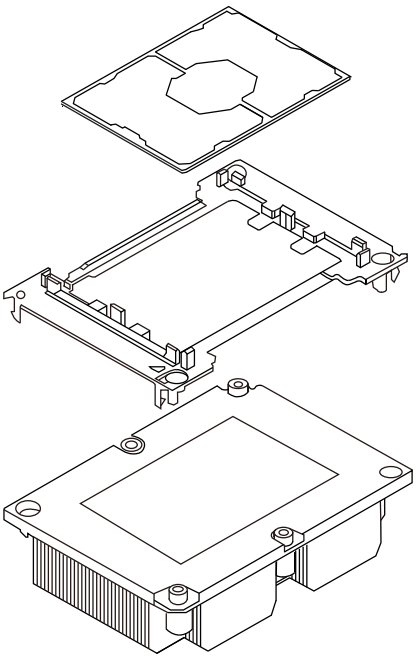
This information is provided for professional technicians only.

Processor Socket Assembly:
The server board includes two processor sockets (LGA-3647), supports one or two of the Intel® Xeon® Processor Scalable Family and has a Thermal Design Power (TDP) of up to 165W on selected models.



PHM (Processor Heatsink Module) Component:

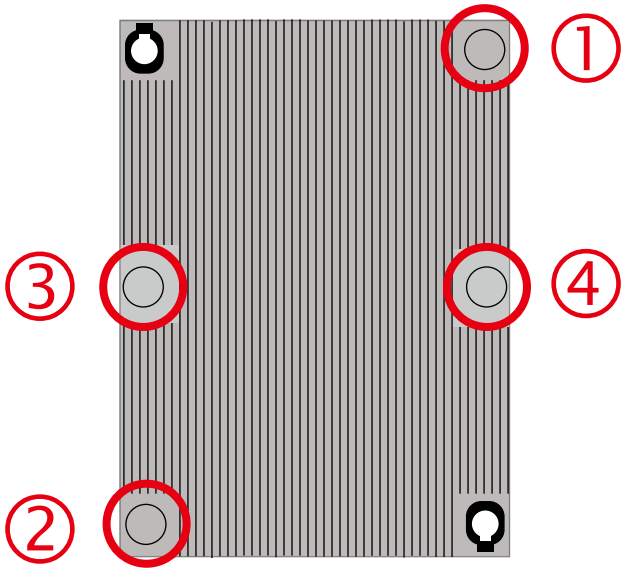




This information is provided for professional technicians only.

The PHM sits level with the processor socket assembly. The PHM is NOT installed properly if it does not sit level with the processor socket assembly. Once the PHM is seated over the processor socket assembly, the four heat sink torque screws must be tightened in order as shown below.

Processor Heat Sink – Top View with Screw Tightening Order



CAUTION

Failure to tighten the heatsink screws in the specified order may cause damage to the processor socket assembly. Heat sink screws should be tighted to 12 in-lbs torque according to the indicated order on the top of the heatsink label.

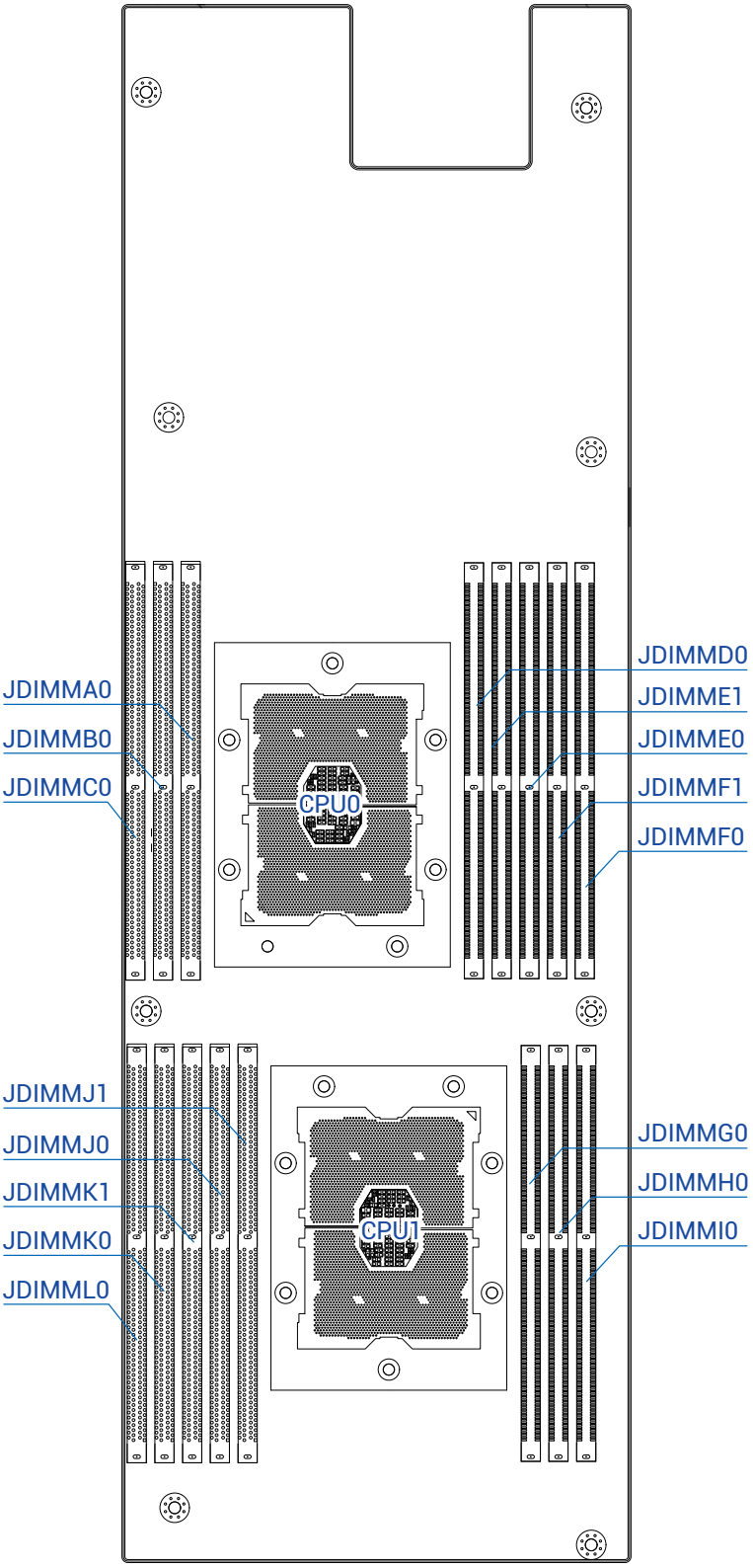
2.2 System Memory

2.2.1 Placement

The DIMMs are displayed on the Vela board as JDIMMC0/ JDIMMB0/JDIMMA0/JDIMMD0/ JDIMME1/ JDIMME0/JDIMMF1/ JDIMMF0/JDIMML0/JDIMMK0/ JDIMMK1/JDIMMJ0/JDIMMJ1/ JDIMMG0/JDIMMH0/JDIMMI0.

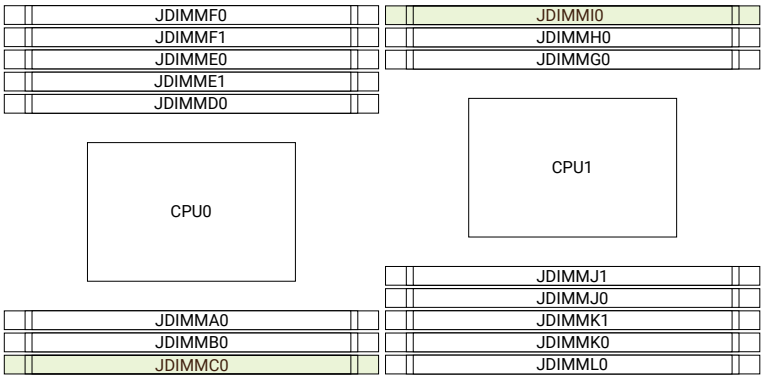
To ensure satisfactory performance, you need to:

- ☑ Verify the DIMM type: This product supports DDR4 RDIMM/LRDIMM with EEC (Error Correction Code).
- ☑ Verify if all of the DIMMs installed are of the same DIMM type to avoid memory failure and loss of performance speed.

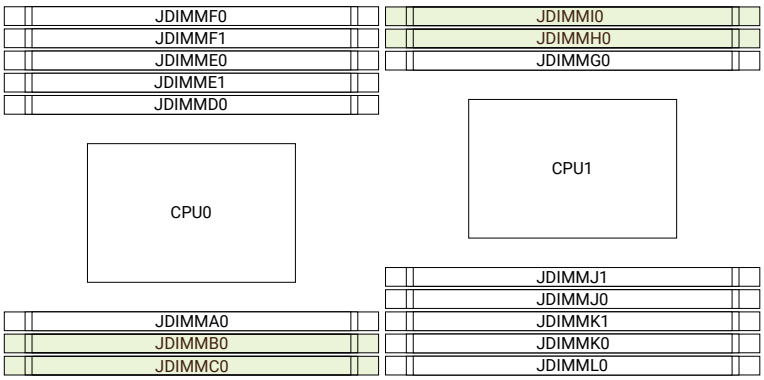


2.2.2 DIMM Population

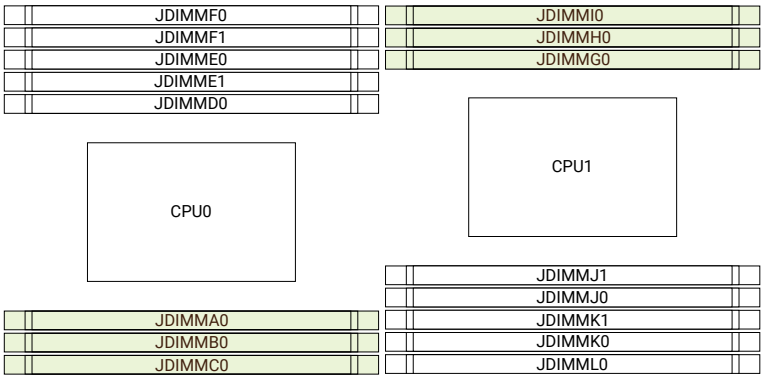
DIMM Number	DIMM Arrangement	
2 DIMMs	CPU0	CPU1
	JDIMMC0	JDIMMI0



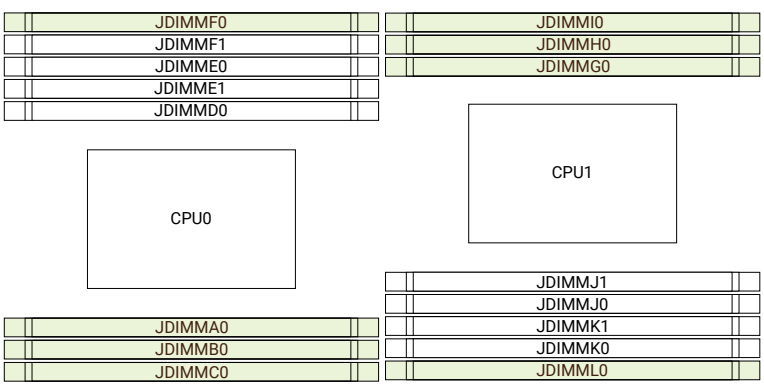
DIMM Number	DIMM Arrangement	
4 DIMMs	CPU0	CPU1
	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0



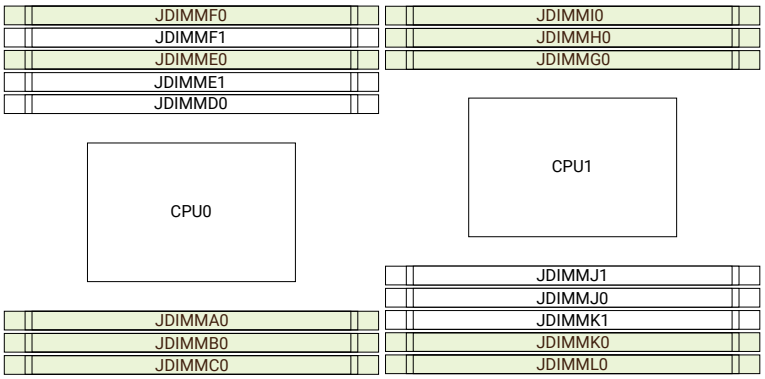
DIMM Number	DIMM Arrangement	
6 DIMMs	CPU0	CPU1
	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0



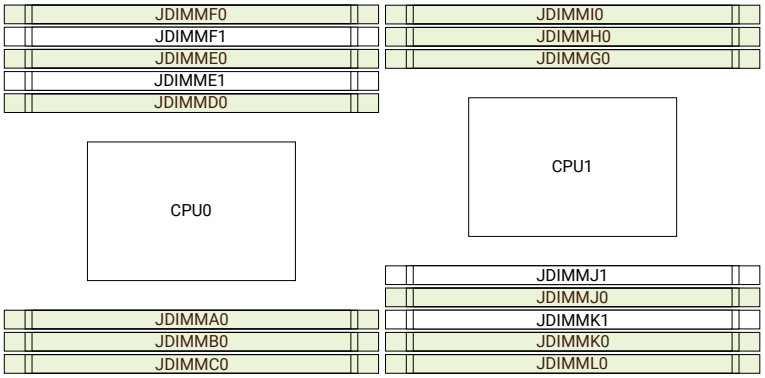
DIMM Number	DIMM Arrangement	
8 DIMMs	CPU0	CPU1
	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0
	JDIMMF0	JDIMML0



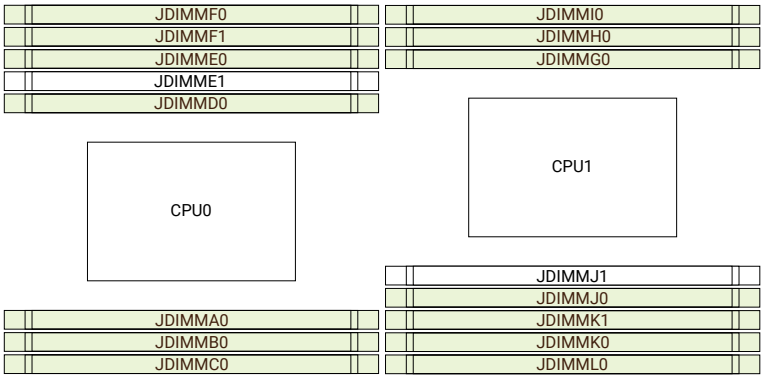
DIMM Number	DIMM Arrangement	
	CPU0	CPU1
10 DIMMs	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0
	JDIMMF0	JDIMML0
	JDIMME0	JDIMMK0



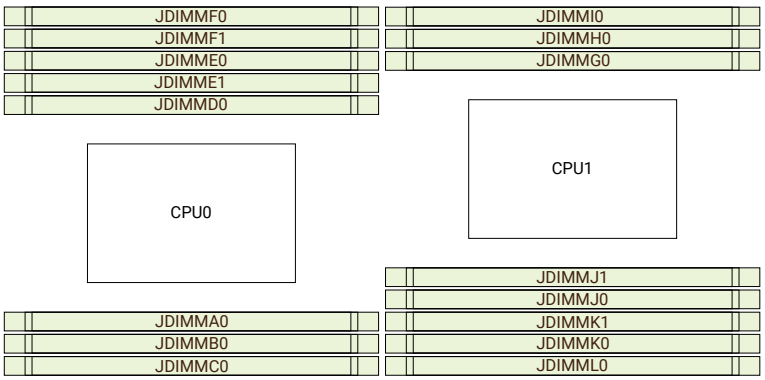
DIMM Number	DIMM Arrangement	
	CPU0	CPU1
12 DIMMs	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0
	JDIMMF0	JDIMML0
	JDIMME0	JDIMMK0
	JDIMMD0	JDIMMJ0



DIMM Number	DIMM Arrangement	
	CPU0	CPU1
14 DIMMs	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0
	JDIMMF0	JDIMML0
	JDIMME0	JDIMMK0
	JDIMMD0	JDIMMJ0
	JDIMMF1	JDIMMK1



DIMM Number	DIMM Arrangement	
	CPU0	CPU1
16 DIMMs	JDIMMC0	JDIMMI0
	JDIMMB0	JDIMMH0
	JDIMMA0	JDIMMG0
	JDIMMF0	JDIMML0
	JDIMME0	JDIMMK0
	JDIMMD0	JDIMMJ0
	JDIMMF1	JDIMMK1
	JDIMME1	JDIMMJ1



2.2.3 DCPMM DIMM Population

CPU0								
DIMM	JDIMMF0	JDIMMF1	JDIMME0	JDIMME1	JDIMMD0	JDIMMA0	JDIMMB0	JDIMMC0
App Direct Mode	DCPMM	DRAM1	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
Memory Mode	DCPMM	DRAM2	DCPMM	DRAM2	DRAM2	DCPMM	DRAM2	DRAM2
Mixed Memory Mode	DCPMM	DRAM3	DCPMM	DRAM3	DRAM3	DCPMM	DRAM3	DRAM3
App Direct Mode	DCPMM	DRAM1	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
Memory Mode	DCPMM	DRAM2	DCPMM	DRAM2	DRAM2	DCPMM	DRAM2	DRAM2
Mixed Memory Mode	DCPMM	DRAM3	DCPMM	DRAM3	DRAM3	DCPMM	DRAM3	DRAM3

CPU1								
DIMM	JDIMMK0	JDIMMK1	JDIMMJ0	JDIMMJ1	JDIMML0	JDIMMG0	JDIMMH0	JDIMMI0
App Direct Mode	-	-		-	-	-	-	
Memory Mode	-	-		-	-	-	-	
Mixed Memory Mode	-	-		-	-	-	-	
App Direct Mode	DCPMM	DRAM1	DCPMM	DRAM1	DCPMM	DRAM1	DRAM1	DRAM1
Memory Mode	DCPMM	DRAM2	DCPMM	DRAM2	DCPMM	DRAM2	DRAM2	DRAM2
Mixed Memory Mode	DCPMM	DRAM3	DCPMM	DRAM3	DCPMM	DRAM3	DRAM3	DRAM3

NOTE

DIMM Type	RDIMM	3DS RDIMM	LRDIMM	3DS LRDIMM	Capacity
DRAM1	✓	✓	✓	✓	Any Capacity
DRAM2	✓	✓	✓	✓	≥32GB
DRAM3	✓	✓	✓		Any Capacity
DCPMM	Any Capacity (Uniformly for all channels for system configuration)				

NOTE

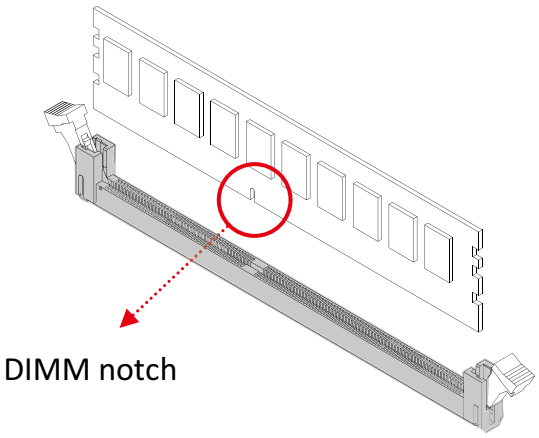
Please abide to the DCPMM population rules listed below for your system to function accordingly.

- There is only a maximun of 1 DCPMM in each channel.
- Populate DCPMM DIMM on IMC0 before IMC1.

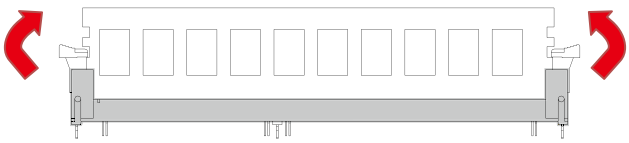
2.2.4 Installation

Step 1 Unlock the DIMM socket by pressing the retaining clips outward.

Step 2 Insert the memory module into the slot. Make sure that the DIMM notch is accurately positioned.



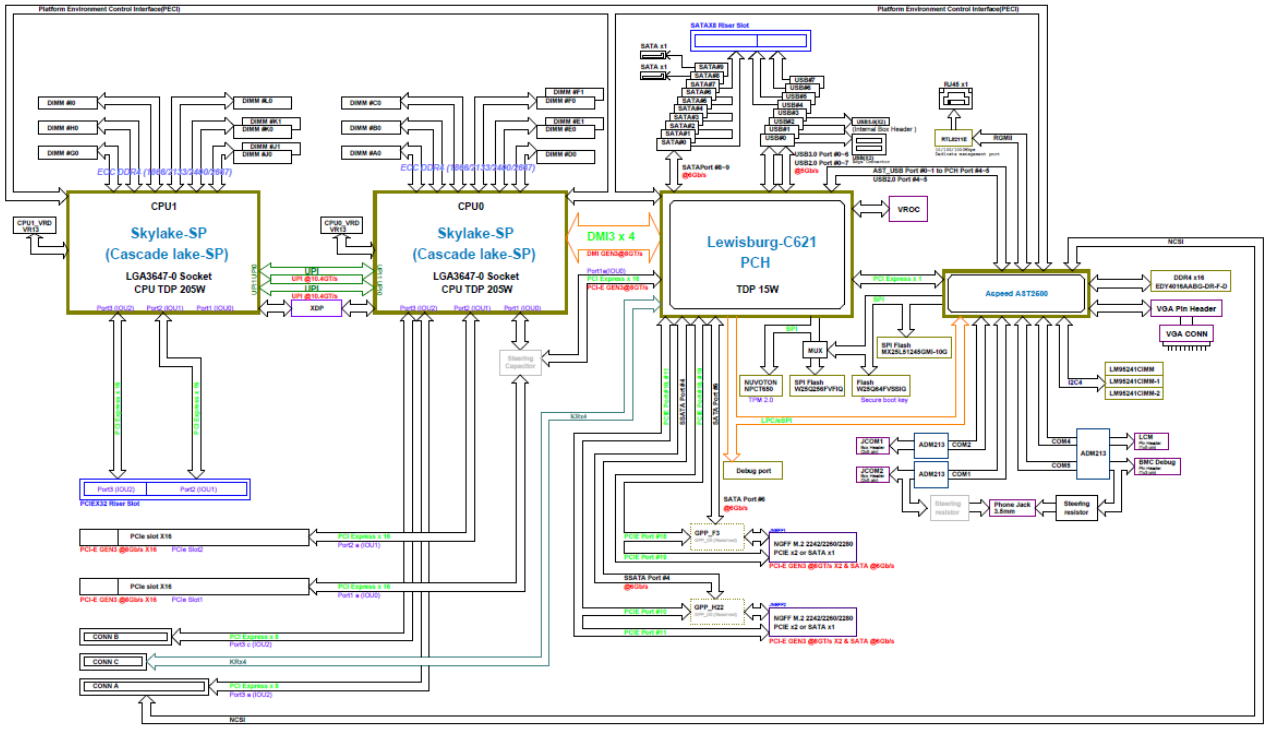
Step 3 Close the retaining clips to complete installation.



Chapter 3. Motherboard Settings

This section provides illustrations that display the internal jumpers, connectors, and system LED indicators on the Vela motherboard. The motherboard layout and essential connectors are listed below for your reference.

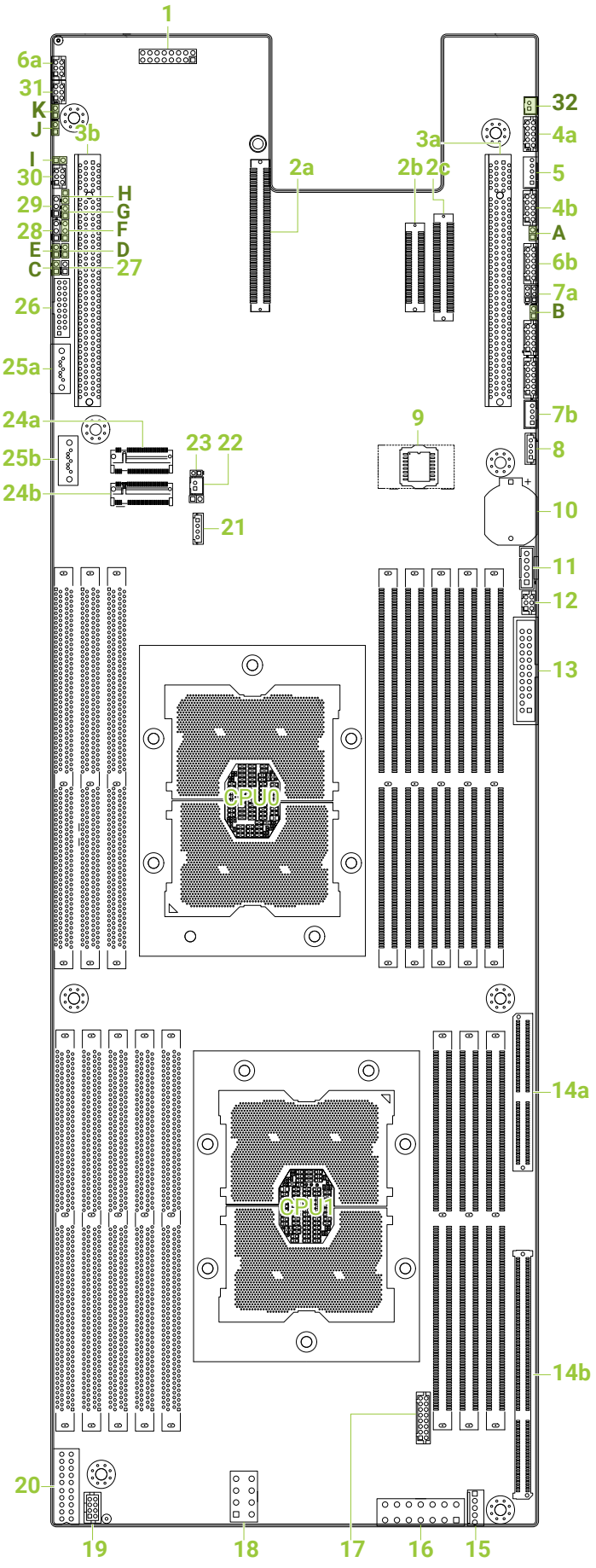
3.1 Block Diagram



3.2 Content List

Connector and Header		Placement	Connector and Header		Placement
1	VGA Connector	JVGA_INT	17	Rack Connector	JRACK
2a 2b 2c	OCP Mezzaine Connector	CN1~3	18	Power Supply Connector (2 x 4 pin)	JPWR1
3a 3b	PCIe Connector	PCIE1 PCIE2	19	LAN Header	JLAN2
4a 4b	COM Port Header	JCOM1 JCOM2	20	Power Supply Connector (2 x 10 pin)	J11
5	LCM Header	JLCM	21	VROC Key	JRAID_KEY
6a 6b	BMC GPIO Header	JBMC_GPIO1 JBMC_GPIO2	22	SATA DOM Power Header	JDOM_PWR
7a 7b	BMC I^2C Header	JBMC_I2C1 JBMC_I2C2	23	Buzzer	JBUZZER
8	Power Supply Connector (1 x 4 pin)	JPWR_OCP	24a 24b	JNGFF Connector	JNGFF1 JNGFF2
9	BIOS SPI ROM Socket	JSPI_BIOS	25a 25b	Serial ATA Header	SATA1 SATA2
10	Battery Socket	JBAT1	26	Front I/O USB Header	JUSB_INT1
11	PMBUS Header	JPMBUS	27	Speaker	JSPKR
12	PCIE Hot-Plug SMB Header	JPCIE_HP	28	PCH_GPIO Header	JPCH_GPIO
13	Front Panel Header	JFRNT_SSI	29	VRM SMB Connector	JSMB_VR
14a 14b	SAMTEC Connector	PCIE3 PCIE4	30	PCH SSGPIO Header	JSSGPIO
15	Power Supply Connector (1 x 5 pin)	J13	31	PCH SGPIO Header	JSGPIO
16	Power Supply Connector (2 x 7 pin)	JPWR2	32	Chassis Intrusion	JINTRUDER
Jumper		**Placement**	**Jumper**		**Placement**
A	NCSI_RXER	J5	G	NTB Jumper	JNTB
B	BMC Debug Port Configuration Jumper	J9	H	Power Good Lock Jumper	JPG_LOCK
C	Top Swap Override Jumper	J8	I	Flash Descriptor Security Override Jumper	J4
D	ME Force Recovery Mode Jumper	J7	J	BMC Reset Jumper	JBMC_RST
E	No Reboot Mode (Watch Dog) Jumper	J6	K	BMC Disable Jumper	JBMC_DIS
F	Clear CMOS Jumper	JCMOS			

3.3 Placement

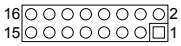


3.4 Connector and Jumper

3.4.1 Connector

1 VGA Connector (JVGA_INT)

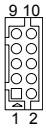
VGA abbreviates for Video Graphics Array. This is a standard 15-pin D-sub connector used for video output.



GND	1	2	DACROA
DACGOA	3	4	N.C.
DDC_DATAO	5	6	GND
GND	7	8	DACBOA
N.C.	9	10	AHSYNCO
AVSYNCO	11	12	DVO_5V
GND	13	14	GND
GND	15	16	DDC_CLKO

4a COM Port Header (JCOM1)

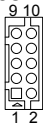
COM abbreviates for Communication. This header is a standard 9-pin RS-232 I/O interface that enables connection to peripheral devices.



DSRB	1	2	DCDB
RTSB	3	4	RXDB
CTSB	5	6	TXDB
RIB	7	8	DTRB
N.C.	9	10	GND

4b COM Port Header (JCOM2)

COM abbreviates for Communication. This header is a standard 9-pin RS-232 I/O interface that enables connection to peripheral devices.



DSRA	1	2	DCDA
RTSA	3	4	RXDA
CTSA	5	6	TXDA
RIA	7	8	DTRA
N.C.	9	10	GND

5 LCM Header (JLCM)

LCM stands forr Liquid Cystral Display Module. This header is a 5-pin used for LCD screen display.

1	SW_PWR_BTN#
2	SW_RST_BTN#
3	TXDC
4	RXDC
5	GND

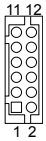
6a BMC GPIO Header (JBMC_GPIO1)

GPIO abbreviates for General Purpose Input and Output. This 6-pin header defines an input and output signal to the BMC.

GND	1	2	EXTRST_N#
I2C9SDA	3	4	BMC_GPY1
I2C9SCL	5	6	BMC_GPY0

6b BMC GPIO Header (JBMC_GPIO2)

GPIO abbreviates for General Purpose Input and Output. This 6-pin header defines an input and output signal to the BMC.



GND	1	2	PWM2
GPIOI3	3	4	PWM1
GPION7	5	6	FAN4_TACH
GPIOP3	7	8	FAN3_TACH
GPIOP2	9	10	FAN2_TACH
+3.3V_DUAL	11	12	FAN1_TACH

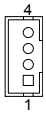
7a BMC I²C Header (JBMC_I2C1)

I²C abbreviates for Inter-Integrated Circuit. This 3-pin header is an I²C bus that provides a interconnection between the BMC and chassis devices.

1	I2C10SCL
2	I2C10SDA
3	GND

7b IPMB Header (JBMC_I2C2)

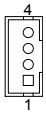
IPMB abbreviates for Intelligent Platform Management Bus. This 4-pin header is an I²C bus that provides a interconnection between the BMC and chassis devices.



1	I2C1SDA
2	GND
3	I2C1SCL
4	N.C.

8 Power Supply Connector (JPWR_OCP)

This 4-pin connector provides the OCP with power.



1	+12V_AUX
2	GND
3	GND
4	+12V_AUX

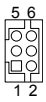
11 PMBus Header (JPMBUS)

PMBus abbreviates for Power Management Bus. This 5-pin header provides is used to control power supplies.

1	SMB_PMBUS_CLK
2	SMB_PMBUS_DATA
3	PMBUS_ALERT_N
4	GND
5	+3.3V

12 PCIE Hot-Plug SMB Header (JPCIE_HP)

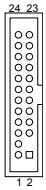
SMB abbreviates for System Management Bus. This is 6-pin header that communicates with PCIE hot-plug.



CPU0_HP_I2C_CLK	1	2	CPU1_HP_I2C_CLK
CPU0_HP_I2C_DAT	3	4	CPU1_HP_I2C_DAT
+3.3V	5	6	GND

13 Front Panel Header (JFRNT_SSI)

This 23-pin header is used to control the switch and LED indicators located in the front panel.



PWR_LED	1	2	+3.3V_DUAL
KEY (no pin)	3	4	+5V_AUX
PWR_LED#	5	6	UIDLED#
+3.3V	7	8	SYS_HEALTH2#
HD_LED#	9	10	SYS_HEALTH#
SW_PWR_BTN#	11	12	+3.3V_DUAL
GND	13	14	PHY_LED0
SW_RST_BTN#	15	16	I2C8SDA
GND	17	18	I2C8SCL
UID_SW_IN_N	19	20	INTRUDER_N
+3.3V_DUAL	21	22	+3.3V_DUAL
FP_NMI_BTN	23	24	PHY_LED1

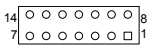
15 Power Supply Connector (J13)

This 5-pin connector provides the motherboard with power.

1	+5V_AUX
2	+5V_AUX
3	ATX_GD
4	PS_ON#
5	GND

16 Power Supply Connector (JPWR2)

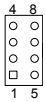
This 14-pin connector provides the motherboard with power.



GND	1	8	+12V
GND	2	9	+12V
GND	3	10	+12V
GND	4	11	+12V
GND	5	12	+12V
GND	6	13	+5V_AUX
PS_ON#	7	14	ATX_GD

18 Power Supply Connector (JPWR1)

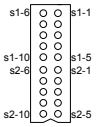
This 8-pin connector provides the motherboard with power.



GND	1	5	+12V
GND	2	6	+12V
GND	3	7	+12V
GND	4	8	+12V

20 Power Supply Connector (J11)

This 20-pin connector provides the motherboard with power.



+12V	S1-1	S1-6	+12V
+12V	S1-2	S1-7	+12V
+12V	S1-3	S1-8	+12V
+12V	S1-4	S1-9	+12V
+12V	S1-5	S1-10	+12V
GND	S2-1	S2-6	GND
GND	S2-2	S2-7	GND
GND	S2-3	S2-8	GND
GND	S2-4	S2-9	GND
GND	S2-5	S2-10	GND

21 VROC Key Header (JRAID_KEY)

VROC abbreviates for Intel® Virtual RAID on CPU. This key is used to control and created RAID data on NVMe SSDs.

1	GND
2	+3.3V_DUAL
3	GND
4	PCH_GPP_C10

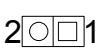
22 SATA DOM Power Header (JDOM_PWR)

This 2-pin header supplies power to SATA DOM.

1	+5V
2	GND

23 Buzzer (JBUZZER)

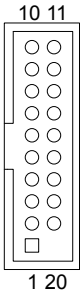
This is a 2-pin motherboard speaker.



1	+5V
2	BMC_BUZZER-

26 Front I/O Header (JUSB_INT1)

This is a 11-pin front I/O header.



+5V_USB23	1	20	KEY (no pin)
PCH_FP_USB3_RX_N2	2	19	+5V_USB23
PCH_FP_USB3_RX_P2	3	18	PCH_FP_USB3_RX_N3
GND	4	17	PCH_FP_USB3_RX_P3
PCH_FP_USB3_TX_N2	5	16	GND
PCH_FP_USB3_TX_P2	6	15	PCH_FP_USB3_TX_N3
GND	7	14	PCH_FP_USB3_TX_P3
PCH_FP_USB2_N2	8	13	GND
PCH_FP_USB2_P2	9	12	PCH_FP_USB2_N3
N.C.	10	11	PCH_FP_USB2_P3

28 PCH GPIO Header (JPCH_GPIO)

GPIO abbreviates for General Purpose Input and Output. This 6-pin header defines an input and output signal to the Platform Controller Hub.

1	PCH_GPP_C16
2	PCH_GPP_C17
3	GND

29 VRM SMB Connector (JSMB_VR)

VRM abbreviates for Voltage Regulator Module. This is a 3-pin connector that appropriates processors with different supply of voltage.

1	SMB_VR_DAT
2	GND
3	SMB_VR_CLK

30 PCH SSGPIO Header (JSSGPIO)

SGPIO abbreviates for Serial General Purpose Input and Output. This is a 6-pin connector used to control general device data.

GND	1	2	PCH_SSDATAOUT0
PCH_SSDATAOUT1	3	4	PCH_SSLOAD
+3.3V	5	6	PCH_SSCLOCK

31 PCH SGPIO Header (JSGPIO)

SGPIO abbreviates for Serial General Purpose Input and Output. This is a 6-pin connector used to control general device data.

GND	1	2	PCH_SDATAOUT0
PCH_SDATAOUT1	3	4	PCH_SLOAD
+3.3V	5	6	PCH_SCLOCK

32 Chassis Intrusion (JINTRUDER)

JINTRUDER	Setting	
Short	Case open	
Open	Enable	Default

3.4.2 Jumper

A NCSI_RXER (J5)

J5	Setting	
Short	Enable	
Open	Disable	Default

B BMC Debug port Configurations (J9)

J9	Setting	
Short	Disable	
Open	BMC Debug port	Default

C Top Swap Override Jumper (J8)

J8	Setting	
Short	Enable Top swap mode	
Open	Disable Top swap mode	Default

D ME Force Recovery Mode Jumper (J7)

J7	Setting	
Short	ME Forcce Recovery Mode	
Open	Normal	Default

E No Reboot Mode (Watch Dog) Jumper (J6)

J6	Setting	
Short	Disable	
Open	Enable	Default

F Clear CMOS Jumper (JCMOS)

JCMOS	Setting	
Pin 1-2	Normal	Default
Pin 2-3	Clear CMOS	

G NTB Jumper (JNTB)

JNTB	Setting	
Short	Downstream port	
Open	Upstream port	Default

H Power Good Lock Jumper (JPG_LOCK)

JPG_LOCK	Setting	
Short	Enable	
Open	Disable	Default

I Flash Descriptor Security verride Jumper (J4)

J4	Setting	
Short	Flash security override	
Open	Disable	Default

J BMC Reset Jumper (JBMC_RST)

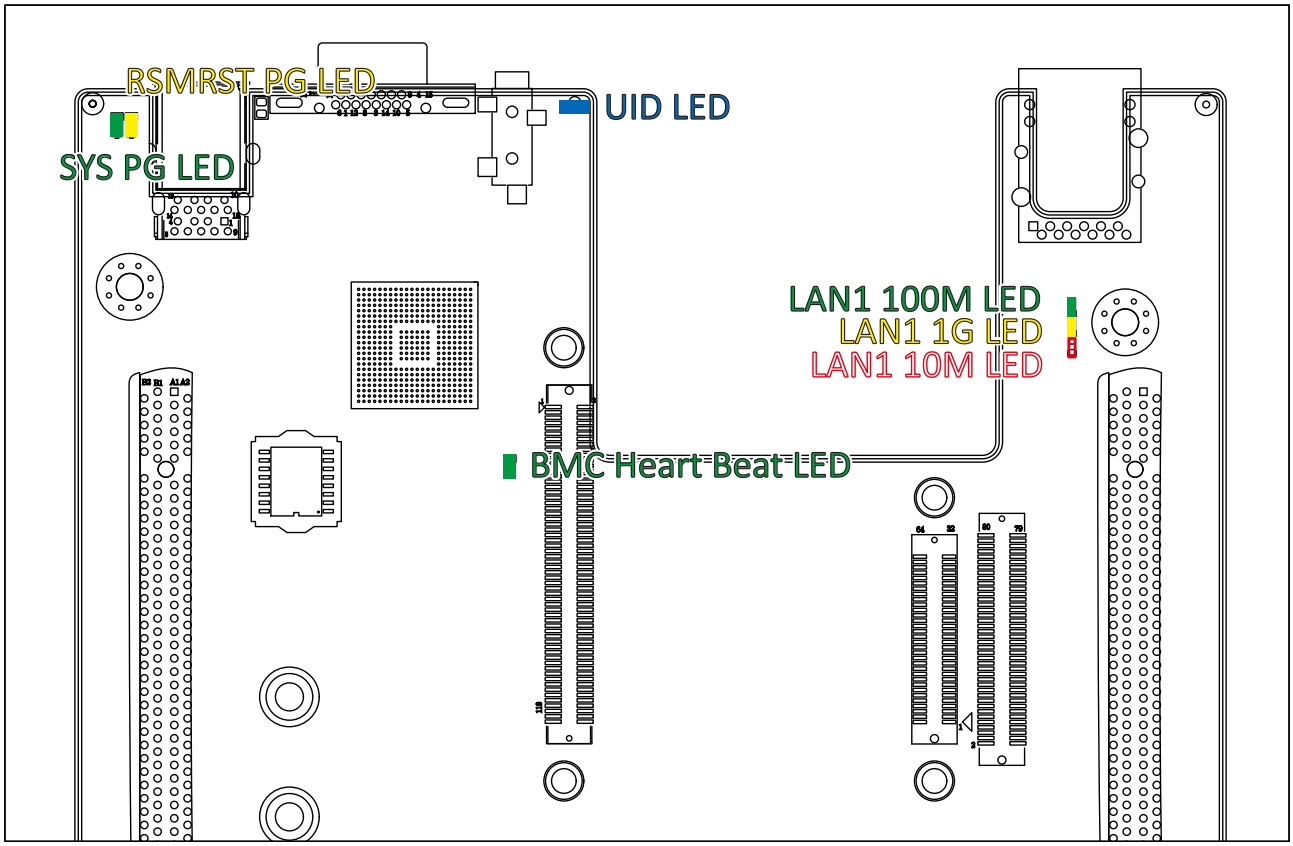
JBMC_RST	Setting	
Short	Reset BMC	
Open	Normal	Default

K BMC Disable Jumper (JBMC_DIS)

JBMC_DIS	Setting	
Short	Disable	
Open	Normal	Default

3.4.3 LED Indicator

BMC Heart Beat		Green (Blinking)	BMC activity is detected.
		Off	BMC is not active.
SYS PG LED		Green	System power good is ready.
		Off	System power good is not ready.
RSMRST PG LED		Yellow	Resume Well Reset is ready.
		Off	Resume Well Reset is not ready.
UID LED		Blue	UID activity is detected.
		Off	No UID activity is detected.
NGFF LED		Blue (Blinking)	NGFF activity is detected.
		Off	No NGFF activity is detected.
LAN LED	LED6	Green	Link.
	LED5	Yellow (Blinking)	1G.
	LED4	Green	Normal.
		Blinking	100M.



Chapter 4. BIOS Configuration Settings

This chapter demonstrates how to configure the UEFI BIOS settings in your system device. You can enter the BIOS screen during system startup.

To enter BIOS configuration settings,
- Press **Esc** key during the Power-On-Self-Test (POST)

To enter BIOS after POST, you have to restart the system by using one of the three methods:
- Press **Ctrl** + **Alt** + **Delete.**
- Press the reset button on the system chassis.
- Turn the system off and on.

NOTE
- The following pages provide the details of BIOS menu. Please be noted that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written.
- The default value for each BIOS option key may vary per system. The [default] key is for reference only.

4.1 Navigation Keys

The navigation keys are listed below.

Function Key	Description
< ↑ > < ← > < → > < ↓ >	Select item.
< Enter >	Select and enter sub-screen.
< + > < - >	Modify selected option.
< F1 >	General help.
< F2 >	Previous Value.
< F3 >	Optimized defaults.
< F4 >	Save & Exit.
< F5> < F6 >	Change values.
< F7 >	Discard Change and Exit.
< F9 >	Load Optimal Default for all values.
< F10 >	Save changes and exit.
< F12 >	Print Screen.
< Esc >	Exit the current menu screen.

4.2 BIOS Setup

4.2.1 Menu

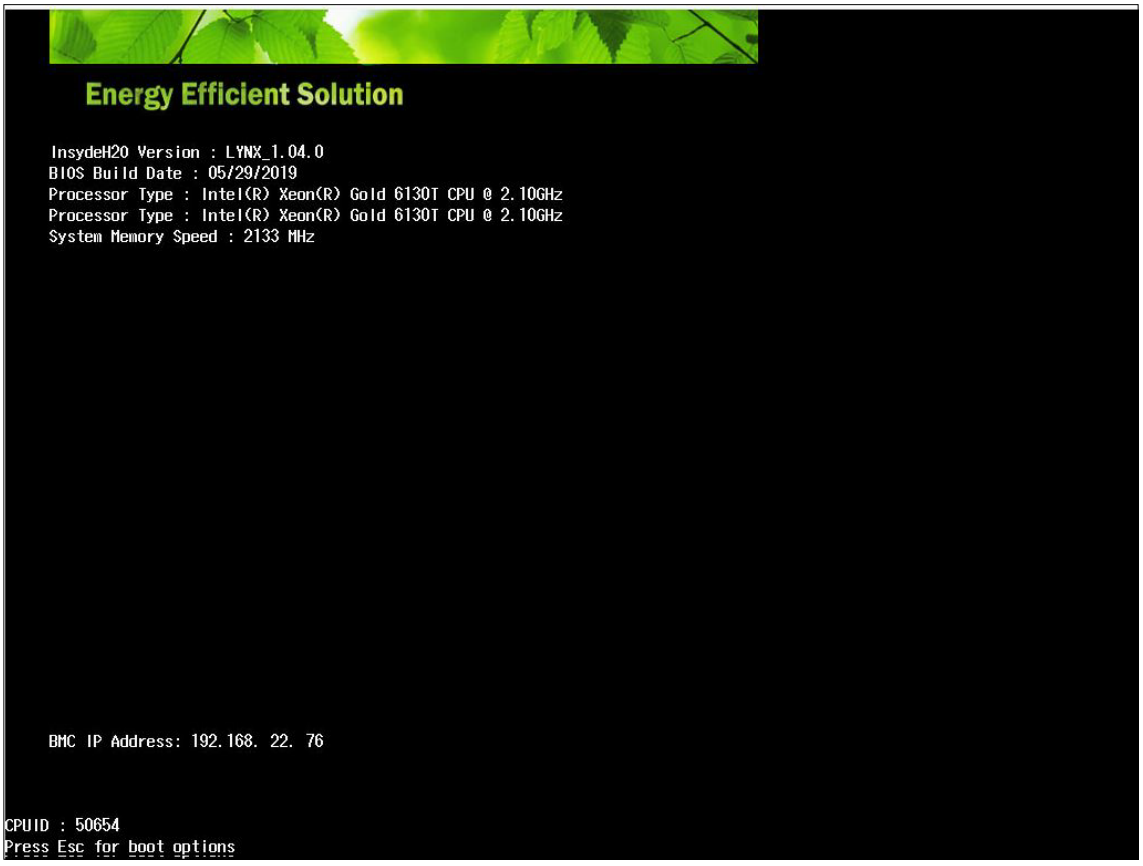
Press ⬅ and ➡ to select the options of the menu bar.
Press **Enter** to access the option screen.

Menu	Description
Main	Displays basic system information and date & time.
Advanced	Allows configuration of advanced system settings.
Security	Sets passwords and security functions.
Power	Sets the power management parameters.
Boot	Sets boot options, such as Quick Boot or USB Boot.

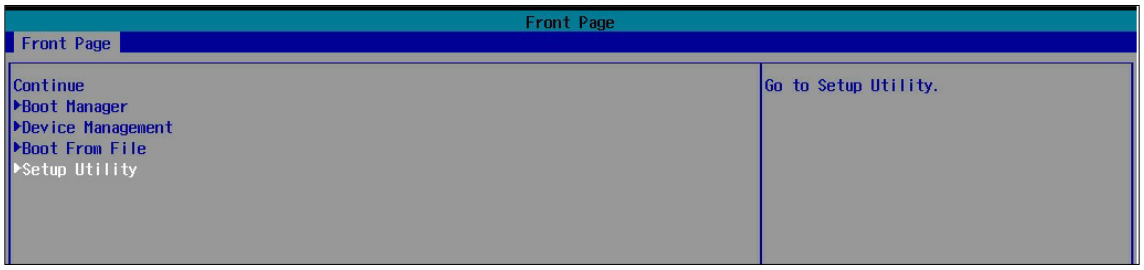
4.2.2 Startup

① Press **ESC** to run the BIOS setup procedure.

NOTE
When Quiet Boot is enables, OEM logo will be displayed instead of post messages.

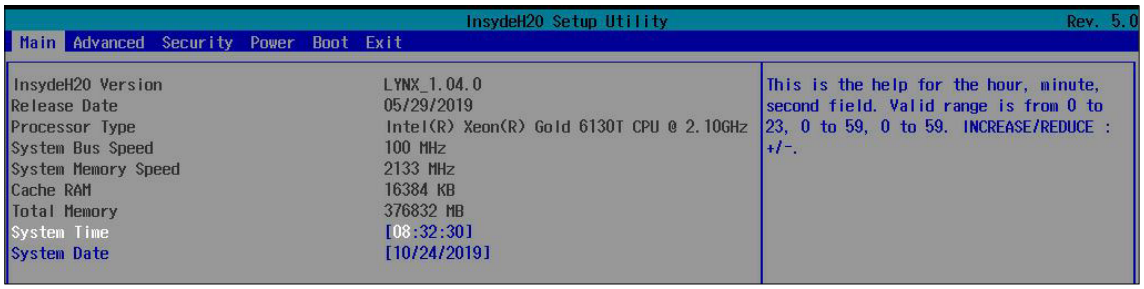


② There will be a message “Entering SETUP” displayed on the diagnostics screen.

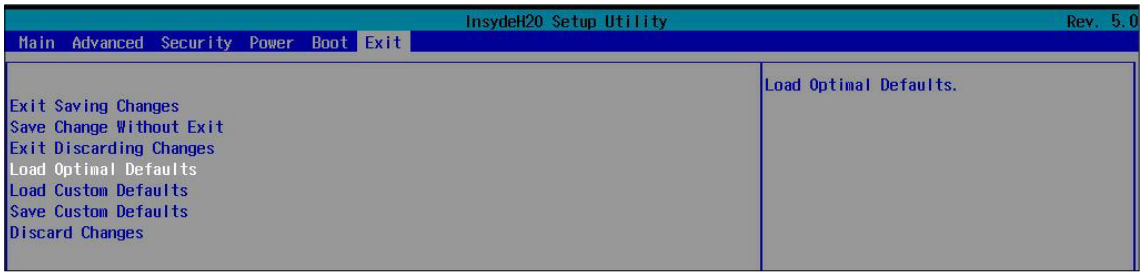


③ Identify the BIOS version.

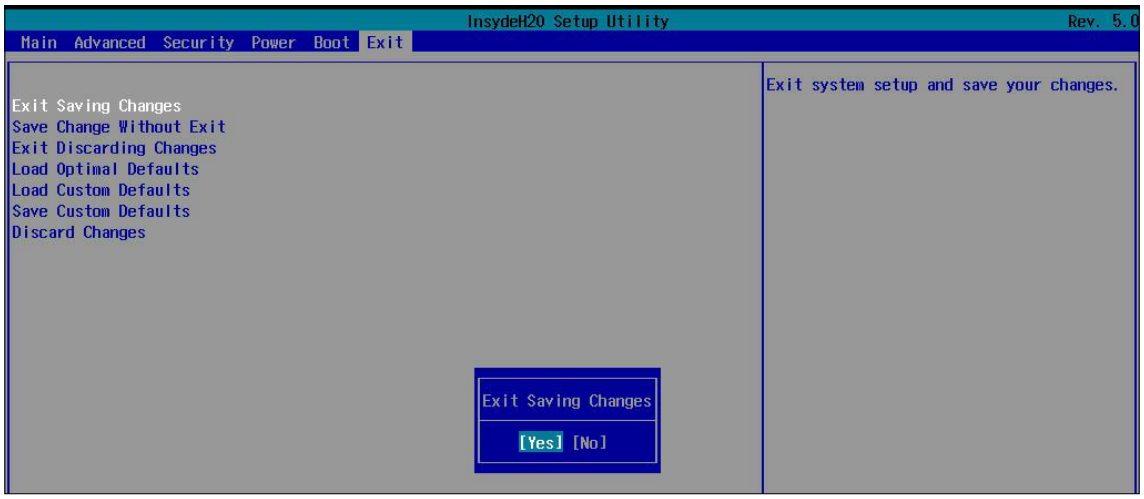
NOTE
For the official released version, the last digit of the BIOS version must end in a “0.“



④ Load Optimal Default Setting.

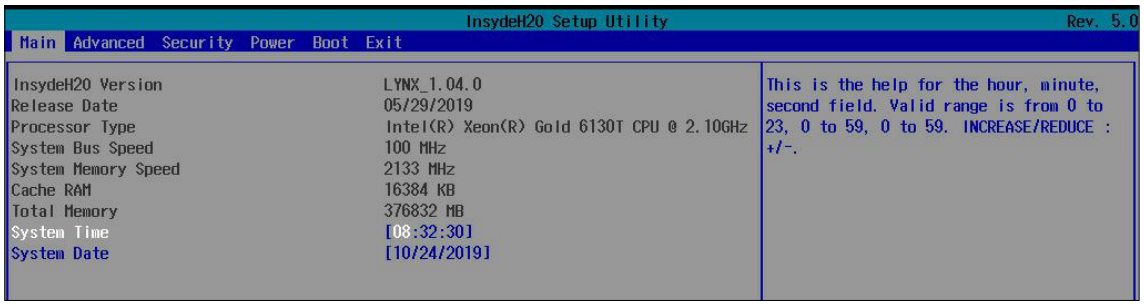


⑤ Save the setting and exit the BIOS setup utility.



4.2.3 Update

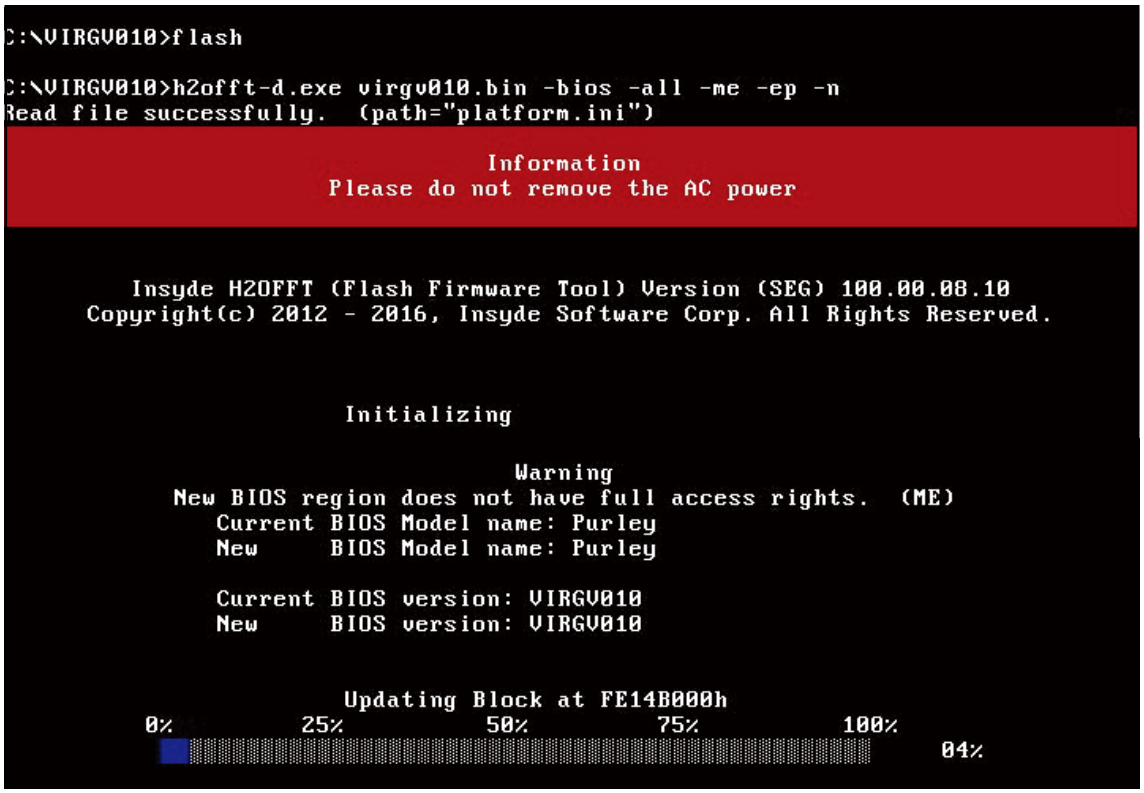
To identify the latest BIOS version, please check the BIOS setup.



Update BIOS by INSYDE H2OFFT-D utility under DOS environment

If you need to update Flash in the DOS environment, please use H2OFFT-D utility. To use this utility, you must include the flash.bat , H2OFFT-D.exe, and bin file in the same folder. Please follow the instructions to update flash:

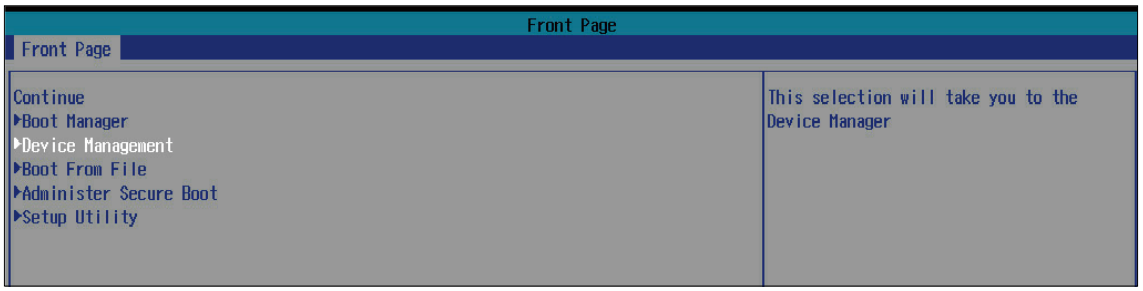
① Execute flash.bat to update Flash in the DOS environment.



② After the update is complete, please reboot the system.-

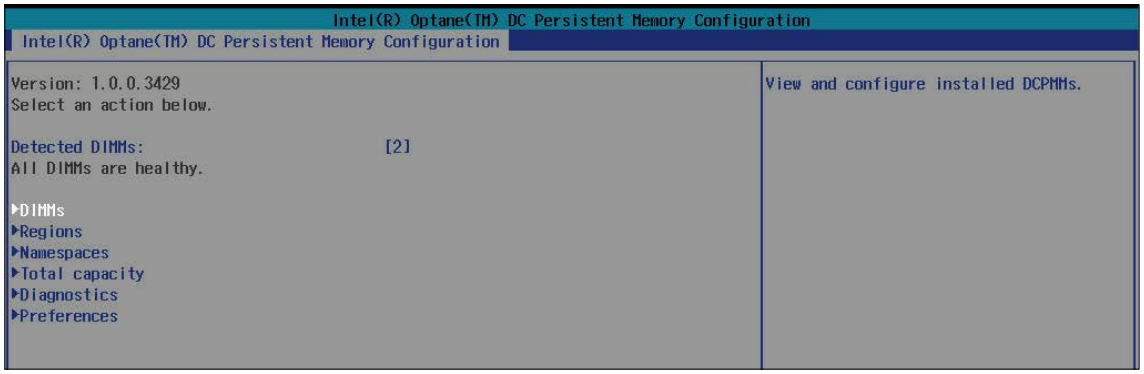
4.2.4 DCPMM Setup

① Refer to section 4.2.2 step 1 and 2 to enter the Front Page menu.
② Enter the option "Device Management."

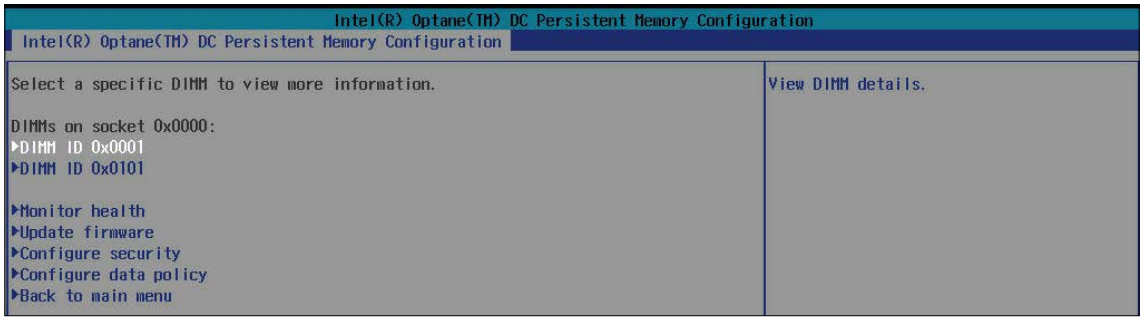


③ In "Device Management" page, enter "Intel(R) Optane(TM) DC Persistent Memory Configuration" to start your configurations.

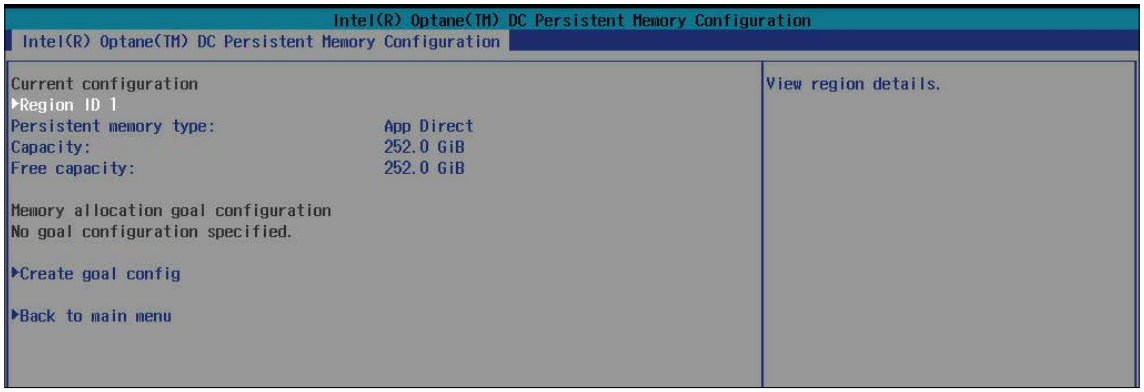
Intel(R) Optane(TM) DC Persistent Memory Configuration



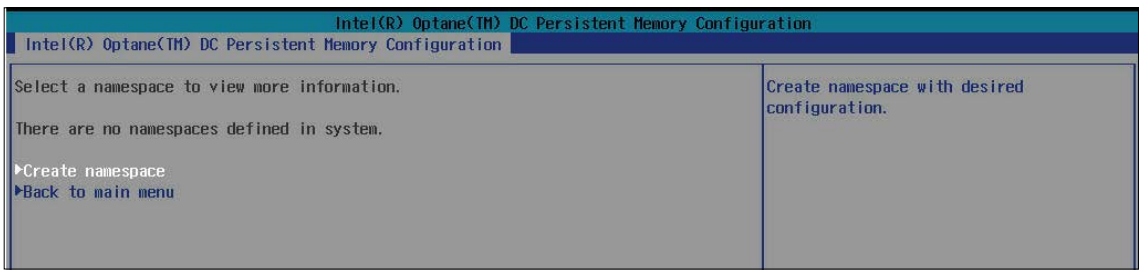
- **DIMMs**



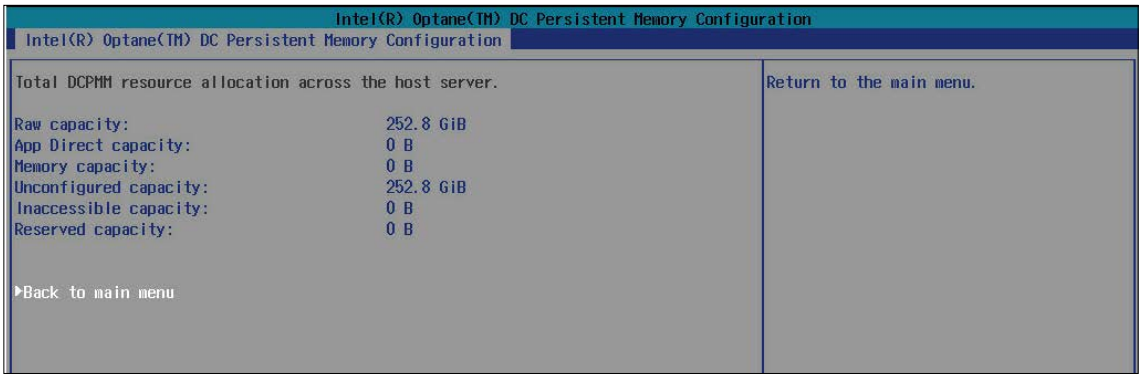
- **Regions**



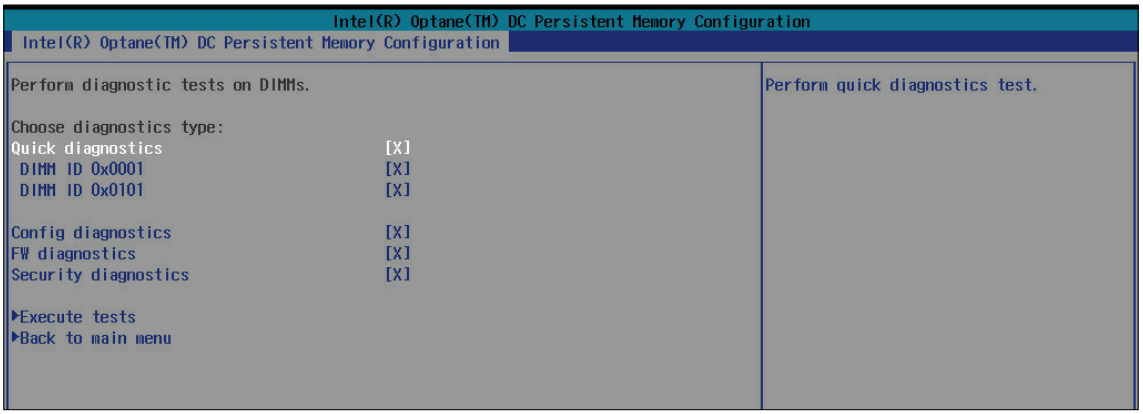
- **Namespaces**



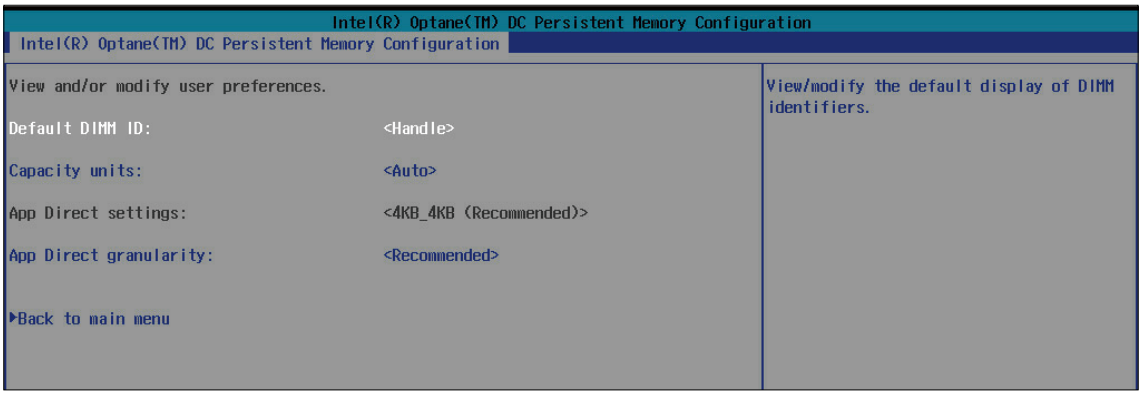
- **Total Capacity**



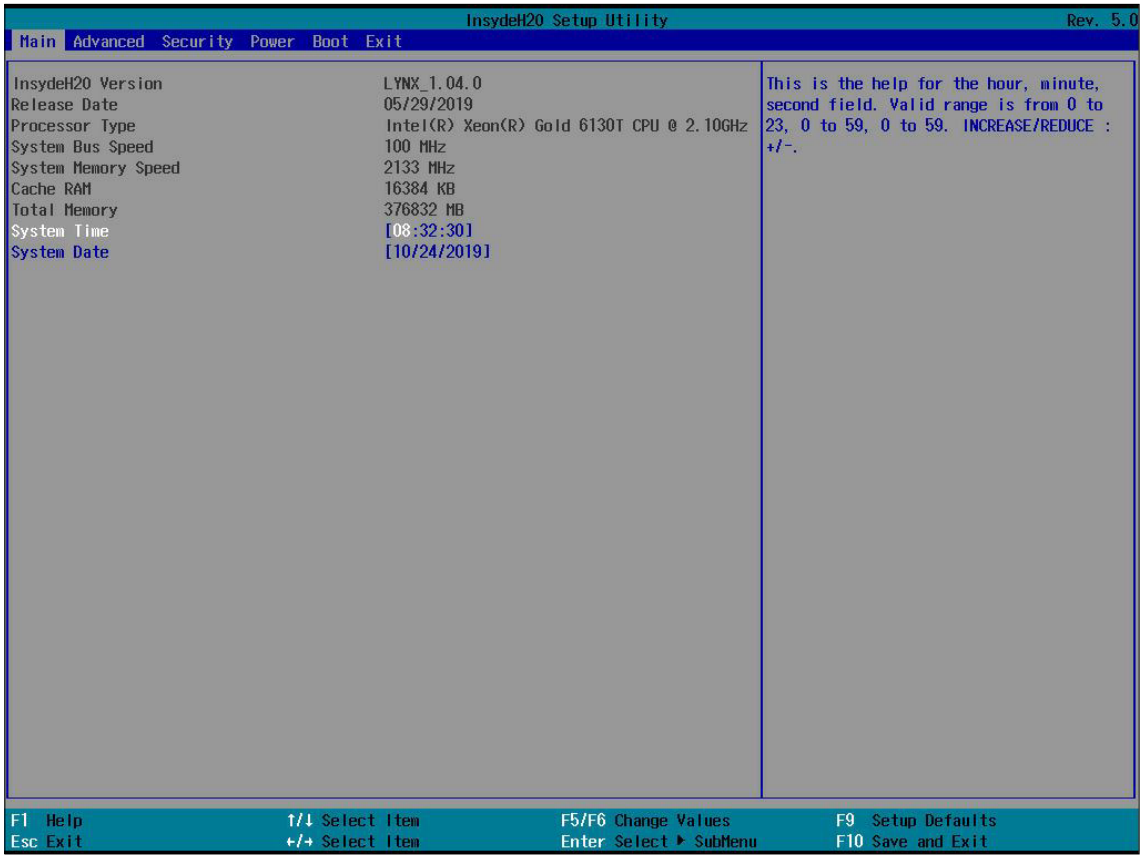
- **Diagnostics**



- **Preferences**



4.3 Main

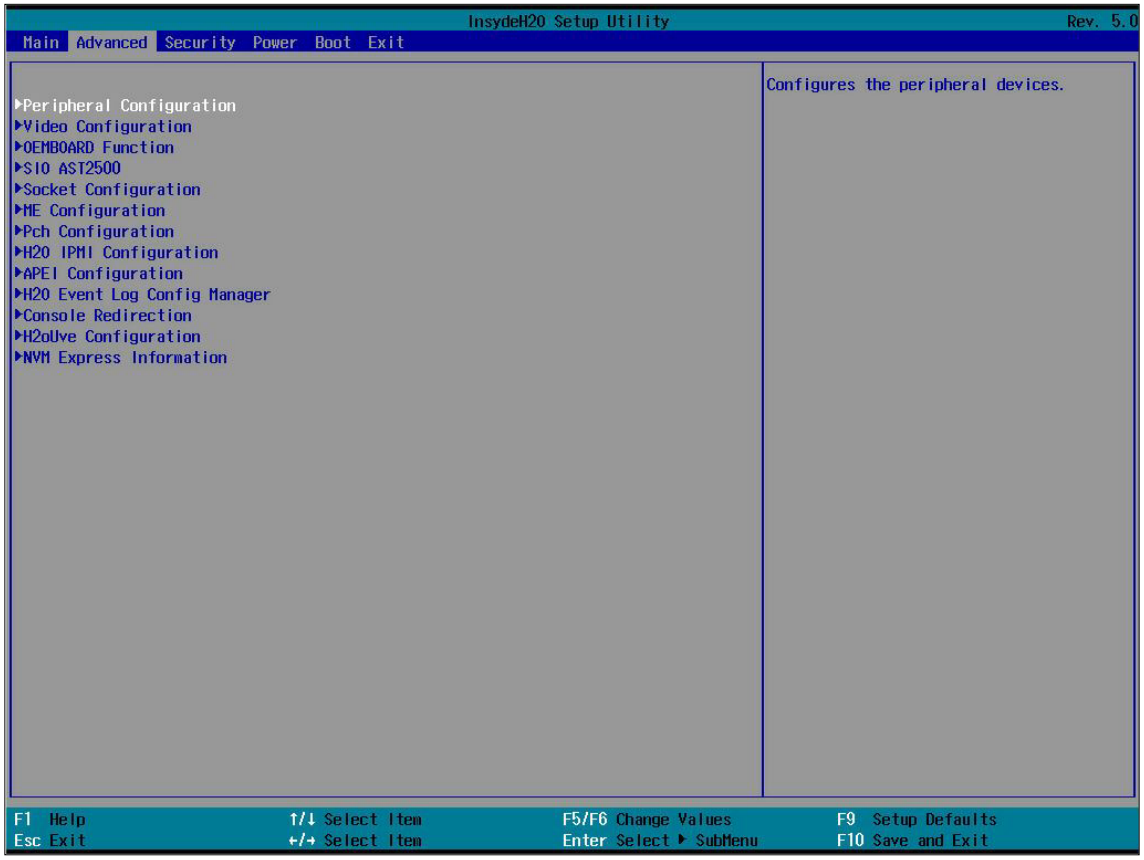


Main Option Key:

4.3.1 Main

Main	
System time	Configures the current time.
System date	Configures the current date.

4.4 Advanced



Advanced Option Key:

4.4.1 Peripheral Configuration

Peripheral Configuration		
PCIe SR-IOV	[Enable]	Disable
PCIe ARI	Enable	[Disable]
ARI Forward	Enable	[Disable]
Spread Spectrum	Enable	[Disable]

4.4.2 Video Configuration

Video Configuration		
Display Mode	Plug In First	[On Board First]

4.4.3 OEMBoard Function

OEMBOARD Function				
Messiah Function	SMBIOS Updated	SMBIOS Updated	[Auto]	By Utility
	SMBIOS TO BMC Redfish	Write SMBIOS to BMC	[Enable]	Disable
	Halt On Error Function	Halt On Error	[Enable]	Disable
	Manufacturing Function	Manufacturing Test Mode	Enable	[Disable]
		Dumped Storage	USB Storage	[SATA Storage]
		USB Test Function	Enable	[Disable]
		SATA Test Function	Enable	[Disable]

* [ ]: Default option key

4.4.4 SIO AST2500

SIO AST2500				
Serial Port A	Auto	[Enable]	Disable	
Base I/O Address	2E8	2F8	3E8	[3F8]
Interrupt	IRQ3		[IRQ4]	
Serial Port B	Auto	[Enable]	Disable	
Base I/O Address	2E8	[2F8]	3E8	3F8
Interrupt	[IRQ3]		IRQ4	
Serial Port D	Auto	Enable	[Disable]	
Base I/O Address	[2E8]	2F8	3E8	3F8
Interrupt	IRQ7		[IRQ10]	

4.4.5 Socket Configuration

Socket Configuration						
Processor Configuration	Per-Socket Information	Hyper-Threading[ALL]	[Enable]	Disable		
		VMX	[Enable]	Disable		
		Enable SMX	Enable	[Disable]		
		Extended APIC	Enable	[Disable]		
Common RefCode Configuration	MMCFG Size	64M	128M	[256M]		
		512M	1G	2G		
	MMIO High Base	[56T]	40T	24T		
		16T	4T	1T		
	MMIO High Granularity Size	[1G]	4G	16G		
		64G	256G	1024G		
	Serial Debug Message Level	Disable	[Minimum]			
		Normal	Maximum			
UPI Configuration	UPI General Configuration	UPI Status	Link Speed Mode	Slow	[Fast]	
			Link Frequency Select	[Auto]	9.6Gb/s	
				10.4Gb/s	Use Per Link Setting	
			Link L0p Enable	[Auto]	Enable	Disable
			Link L1 Enable	[Auto]	Enable	Disable
			Legacy VGA Socket	Min=0, Max=3, [0]		
			Legacy VGA Stack	Min=0, Max=6, [0]		
Memory Configuration	Integrated Memory Controller (iMC)	Enforce POR	[Auto]	POR	Disable	
		Memory Frequency	[Auto]	Selections in MHz		
		IMC BCLK	[Auto]	100 MHz	133 MHz	
		MRC Promote Warnings	[Enable]	Disable		
		Promote Warnings	[Enable]	Disable		
		Halt on mem Training Error	[Enable]	Disable		
		Attempt Fast Boot	[Auto]	Enable	Disable	
		Attempt Fast Cold Boot	[Auto]	Enable	Disable	
		MemTest On Fast Boot	[Auto]	Enable	Disable	
		Enable ADR	Enable	[Disable]		
		2x Refresh Enable	[Auto]	Enable	Disable	

Memory Configuration	Memory Map	Volatile Memory Mode	[Auto]	1LM	2LM	
		AppDirect cache	Auto	Enable	[Disable]	
		eADR Support	Auto	Enable	[Disable]	
		1LM Memory Interleave Granularity	[Auto]	256B Target, 256B Channel	64B Target, 64B Channel	
		IMC Interleaving	[Auto]	1-way Interleave	2-way Interleave	
		Channel Interleaving	[Auto]	1-way Interleave		
			2-way Interleave	3-way Interleave		
		Rank Interleaving	[Auto]	1-way Interleave	2-way Interleave	
			4-way Interleave	8-way Interleave		
		Socket Interleave Below 4GB	Enable	[Disable]		
	Memory RAS Configuration	Static Virtual Lockstep Mode	Enable	[Disable]		
		Mirror mode	Enable Mirror Mode (1LM)	[Disable]		
		Mirror TAD0	Enabled	[Disable]		
		Enable Partial Mirror	Partial Mirror Mode (1LM)	[Disable]		
		UEFI ARM Mirror	Enable	[Disable]		
		Memory Rank Sparing	Enable	[Disable]		
		Correctable Error Threshold	Min= 0x0, Max= 0x7fff, [0x7fff]			
		SDDC Plus One	Enable	[Disable]		
		ADDDC Sparing	Enable	[Disable]		
		Set NGN Die Sparing	Enable	[Disable]		
		Patrol Scrub	Enable	[Disable]		
		Patrol Scrub Interval	Min=0, Max=24, [24]			
		Patrol Scrub Address Mode	Reverse Address	[System Physical Address]		
	NGN Configuration	NGNVM DIMM Secure Erase Unit	NGN Factory Reset/Clear	Enable	[Disable]	
			Average Power Budget	Min=10000, Max=18000, [15000]		
			Publish ARS capability	[Auto]	Enable	Disable
			NGN CMD Time	[Auto]	1N	2N
			NGN ECC Read Check	[Auto]	Enable	Disable
			Thermal Throttling Thresholds Offset	[Auto]	Enable	
			CR Fast Go Configuration	[Auto]	Default	Option 1 ~ 5
			CR Latch System Shutdown State	[Enable]	Disable	
			Snoopy mode for 2LM	Enable	[Disable]	
			Extended Type 17 Structure	Enable	[Disable]	
			Enable power cycle policy	[Enable]	Disable	
			Snoopy mode for AD	Enable	[Disable]	

Memory Configuration	NGN Configuration	NGNVM DIMM Secure Erase Unit	App Direct Memory Hole	[Enable]	Disable	
			LSx implementation	SWSMI	[ASL]	
			SMBus Max Access Time	Min= 0, Max= 4294967295, [350]		
			SMBus Release Delay	Min= 0, Max= 4294967295, [150]		
			Erase All DIMMs	Enable	[Disable]	
			S0 CH0~5 S1 CH0~5 S2 CH0~5 S3 CH0~5	Enable	[Disable]	
	Memory Dfx Configuration	Load NGN DIMM Management Drivers	[Auto]	Enable	Disable	
		Memory Interleaving	[Auto]	NUMA	2-way Node Interleave	4-way Node Interleave
		Lock NGN CSRs	[Auto]	Enable	Disable	
		NGN ECC Correctable error	[Auto]	Enable	Disable	
		NGN ECC Write Check	[Auto]	Enable	Disable	
		NGN ECC Write Retry Flow Exit	[Auto]	Enable	Disable	
		C/A Parity Enable	[Auto]	Enable	Disable	
		High Address Region	[Auto]	Bit Postion 33~45		
		Low Mem Channel Config	[Auto]	Channel 0	Channel 1	Channel 2
		CLX A0 Starve Threshold	Enable	[Disable]		
		Configuration Mask for 2LM	[Normal]	Aggressive		
		CR Halt/Warn Mixed SKU	[Auto]	Enable	Disable	
		Crystal Ridge ACPI Debug Interface	[ACPI Debug Object]	COM1		
		NFIT debug logs	Enable	[Disable]		
		NFIT NVDIMM SKU Based	Enable	[Disable]		
		Publish NVDIMM DIMM Ctrl Region SPA	[Enable]	Disable		
		Skip ARS on Boot	Enable	[Disable		
		ECC Checking	[Auto]	Enable	Disable	
		2GB Short Stroke Configuration	Interleaved	Non-Interleaved	[Disable]	
		Force 1-Ch Way in FM 2-2-2 Configuration	[Enable]	Disable		

IIO Configuration	PCI 64-Bit Resource Allocation	[Enable]			Disable		
	PCIe Train by BIOS	[Yes]			No		
	PCIe Hot Plug	Auto	Manual		Enable	[Disable]	
	PCIe ACPI Hot Plug	Enable	[Disable]		Per-Port		
	PCI-E Completion Timeout (Global) Disable	Yes	[No]		Per-Port		
	PCI-E Global Timeout Value	50us to 10ms	16ms to 55ms		65ms to 210ms	[260ms to 900ms]	
		1s to 3.5s	4s to 13s		17s to 64s		
	PCI-E ASPM Support (Global)	L1 Only	Disable		[Per-Port]		
	IOAT Configuration	Sck0 IOAT Config	Disable TPH		Yes	[No]	
			Prioritize TPH		Enable	[Disable]	
			Relaxed Ordering		Enable	[Disable]	
			IOAT Function 0/1/2/3/4/5/6/7 Items		DMA	[Enable]	
						Disable	
					No Snoop	Enable	
						[Disable]	
	Intel® VT for Directed I/O (VT-d)	Intel® VT for Directed I/O (VT-d)	[Enable]		Disable		
		Interrupt Remapping	[Enable]		Disable		
		PassThrough DMA	[Enable]		Disable		
		ATS	[Enable]		Disable		
		Posted Interrupt	[Enable]		Disable		
		Coherency Support (Non-Isoch)	[Enable]		Disable		
		Access Control Services	[Enable]		Disable		
	Intel® VMD technology	Intel® VMD for Volume Management Device on Socket 0/1/2/3	Intel® VMD for Volume Management Device for PStack0~ PStack2		Enable	[Disable]	
			VMD port 1A~1D/ 2A~2D/ 3A~3D		Enable	[Disable]	
			Hot Plug Capable		Enable	[Disable]	
			CfgBar size		Min=20, Max=28, [25]		
			CfgBar attribute		32-bit non-prefetchable		
					64-bit non-prefetchable		
					[64-bit prefetchable]		
			MemBar1 size		Min=12, Max=47, [25]		
			MemBar1 attribute		[32-bit non-prefetchable]		
					64-bit non-prefetchable		
					64-bit prefetchable		
			MemBar2 size		Min=12, Max=47, [20]		

IIO Configuration	Intel® VMD technology	Intel® VMD for Volume Management Device on Socket 0	MemBar2 attribute	32-bit non-prefetchable		
				[64-bit non-prefetchable]		
				64-bit prefetchable		
Advanced Power Configuration	CPU P State Control	WFR Uncore GV Rate Reduction	Auto	Enable	[Disable]	
		Uncore Freq Scaling (UFS)	[Enable]	Disable		
		AVX ICCP pre-grant level	[128 Heavy]	256 Light	256 Heavy	
			512 Light	512 Heavy		
		SpeedStep (Pstates)	[Enable]	Disable		
		Config TDP	[Normal]	Level 1	Level 2	
		P State Domain	[All]	One		
		EIST PSD Function	[HW_ALL]	SW_ALL	SW_ANY	
		SINGLE_PCTL	Enable	[Disable]		
		Single Power Domain (SPD)	Enable	[Disable]		
		Boot performance mode	[Max Performance]	Max Efficient	Set by Intel Node Manager	
		Energy Efficient Turbo	[Enable]	Disable		
		Turbo Mode	[Enable]	Disable		
		CPU Flex Ratio Override	Enable	[Disable]		
		Perf P-Limit Differential	Min=0, Max=7, [1]			
		Perf P-Limit Clip	Min=0, Max=31, [31]			
		Perf P-Limit Threshold	Min=0, Max=31, [15]			
		Perf P Limit	[Enable]	Disable		
	Hardware PM State Control	Hardware P-States	Disable	[Native Mode]		
			Out of Band Mode	Native Mode with No Legacy Support		
		HardwarePM Interrupt	Enable	[Disable]		
		EPP Enable	[Enable]	Disable		
		APS rocketing	Enable	[Disable]		
		Scalability	Enable	[Disable]		
		RAPL Prioritization	Enable	[Disable]		
	Package C State Control	Package C State	C0/C1 state	C2 state		
			C6(non Retention)	C6(Retention) state		
			No Limit	[Auto]		
		C2C3TT	Min=0, Max=255, [0]			
		PKG C-state Lat. Neg.	Enable	[Disable]		
		LTR IIO Input	Take IIO LTR input	[Ignore IIO LTR input]		
		MDLL Off	[Auto]	Enable	Disable	
		Latency Tolerence Requirement	Snoop Latency Override	Enable	[Disable]	
			Force Snoop Latency Override	Enable	[Disable]	
			Snoop Latency Multiplier	Min=0, Max=7, [0]		

Advanced Power Configuration	Package C State Control	Latency Tolerence Requirement	Force Non-Snoop Latency Override	Min=0x0, Max=0x3ff, [0x0]	
			Non-Snoop Latency Override	Enable	[Disable]
			Non-Snoop Latency Multiplier	Min=0, Max=7, [0]	
			Non-Snoop Latency Value	Min=0x0, Max=0x3ff, [0x0]	
		Pkg C-state SA Power Management Control	CPU0 SAPMCTL_CFG/ CPU1 SAPMCTL_CFG/ CPU2 SAPMCTL_CFG/ CPU3 SAPMCTL_CFG	IIO0_PKGC_ CLK_GATE_ DISABLE	Enable
					[Disable]
				IIO1_PKGC_ CLK_GATE_ DISABLE	Enable
					[Disable]
				IIO2_PKGC_ CLK_GATE_ DISABLE	Enable
					[Disable]
				UPI01_PKGC_ CLK_GATE_ DISABLE	Enable
					[Disable]
				UPI23_PKGC_ CLK_GATE_ DISABLE	Enable
					[Disable]
				MC1 PKGC CLK GATE DISABLE	Enable
					[Disable]
				MC0 PKGC CLK GATE DISABLE	Enable
					[Disable]
				UPI01 PLL Shutdown En	[Enable]
					Disable
				UPI23 PLL Shutdown En	[Enable]
					Disable
				PCIe IIO0 PLL Shutdown En	[Enable]
					Disable
				PCIe IIO1 PLL Shutdown En	[Enable]
					Disable
				PCIe IIO2 PLL Shutdown En	[Enable]
					Disable
				MC0 PLLs Shutdown En	[Enable]
					Disable
				MC1 PLLs Shutdown En	[Enable]
					Disable
				SetVID Decay Disable	Enable
					[Disable]
				SAPMCTL_CFG LOCK	[Enable]
					Disable

4.4.6 ME Configuration

ME Configuration					
Server ME Configuration	General ME Configuration	Altitude	Min=0x0, Max=0xffff, [0x8000]		
		MCTP Bus Owner	Min=0x0, Max=0xffff, [0x0]		
Server ME Debug Configuration	Server ME General Configuration	ME Initialization Complete Timeout	Min=0, Max=12, [2]		
		Enable HSIO Messaging	[Enable]	Disable	
		DRAM Init Done Enable	0	[1]	None
		DRAM Initialization Status	[Auto - true status]	0 - Success	
			1 - No Memory in Channels	2 - Memory Init Error	
		Host Reset Warning	0	[1]	None
		Enable Pre-DramInit Done ME Reset	[0]	1	None
		HMRFPO_LOCK Message	[Enable]	Disable	
		HMRFPO_ENABLE Message	[Enable]	Disable	
		END_OF_POST Message	[Enable]	Disable	
		HECI-1 Enable HECI-2 Enable HECI-3 Enable	[Enable]	Disable	
		Core Bios Done Message	[Enable]	Disable	
	Override ICC Clock Settings	Override ICC Clock Settings	Override ICC Clock Settings	[0]	
				1	
				None	
			ICC Clock Spread Spectrum	[0]	
				1	
				None	
		NM Configuration	Boot Mode Override	[0]	
				1	
				None	
			Boot Mode	[Performance Optimized]	
				Power Optimized	
			Cores Disable Override	[0]	
				1	
				None	
			Cores To Disable	Min=0x0, Max=0x7f, [0x0]	
			Power Measurement Override	[0]	
				1	
				None	
			Power Measurement	Enable	
				[Disable]	
			Hardware Change Override	[0]	
				1	
				None	
			Hardware Changed	Yes	
				[No]	

4.4.7 PCH Configuration

PCH Configuration						
PCH Devices	PCH state after G3	S0	[S5]	Last State		
PCH SATA Configuration	SATA Controller	[Enable]	Disable			
	Configure SATA as	[AHCI]	RAID			
	Support Aggressive Link Power Management	[Enable]	Disable			
	Port 0~7	[Enable]	Disable			
	SATA Port 0 DevSlp	Enable	[Disable]			
	Hot Plug	Enable	[Disable]			
	Configure as eSATA	Enable	[Disable]			
	Mechanical Presence Switch	[Enable]	Disable			
	Spin Up Device	Enable	[Disable]			
	SATA Device Type	[Hard Disk Drive]	Sata State Drive			
	SATA Topology	[Unknown]	ISATA	Direct Connect	Flex	M2
PCH sSATA Configuration	sSATA Controller	[Enable]	Disable			
	Configure sSATA as	[AHCI]	[RAID]			
	Support Aggressive Link Power Management	[Enable]	Disable			
	Port 0~5	[Enable]	Disable			
	sSATA Port 0~5 DevSlp	Enable	[Disable]			
	Hot Plug	Enable	[Disable]			
	Configure as eSATA	Enable	[Disable]			
	Spin Up Device	Enable	[Disable]			
	sSATA Device Type	[Hard Disk Drive]	Sata State Drive			
	SATA Topology	[Unknown]	ISATA	Direct Connect	Flex	M2
USB Configuration	USB Precondition	Enable	[Disable]			
	USB Per-Connector Disable	Enable	[Disable]			
	USB XHCI MSI Disable WA	Enable	[Disable]			
	XHCI Over Current Pins	[Enable]	Disable			
	XHCI Wake On Usb Enable	Enable	[Disable]			
	Place XHCI BAR below 4GB	Enable	[Disable]			
ADR Configuration	Enable/Disable ADR	Platform-POR	Enable	[Disable]		
	ADR GPIO	[GPIO B]	GPIO C			
	Host Partition Reset ADR Enable	Platform-POR	Enable	[Disable]		
	Enable/Disable ADR Timer	[Platform-POR]	Enable	Held-off		
	ADR timer expire time	[Platform-POR]	0 uS	25 uS	50 uS	100 uS
	ADR timer multiplier	[Platform-POR]	x1, x8, x24, x40, x56, x64, x72, x80, x88, x96			

4.4.8 H2O IPMI Configuration

H2O IPMI Configuration			
IPMI Support	[Enable]	Disable	
BMC Warmup Time	Min=0, Max=240, [90]		
ACPI SPMI Table	[Enable]	Disable	
Boot Option Support	[Enable]	Disable	
Set BIOS version to BMC	[Enable]	Disable	
BMC Configuration	Watchdog Timer Support	Enable	[Disable]
	Not disable in OS	Enable	[Disable]
	Watchdog Timer Timeout	Min=2, Max=8, [5]	
	Watchdog Timer Action	No Action	[Hard Reset]
		Power Down	Power Cycle
	Power Cycle Time Support	Enable	[Disable]
	Power Cycle Time	Min=0, Max=255, [10]	
	Power Button	[Enable]	Disable
	Reset Button	[Enable]	Disable
	NMI Button	[Enable]	Disable
	LAN Port Configuration	[Dedicated]	Shared
	LAN Channel Number	Min=0, Max=15, [1]	
	IPv4 Source	Static	[DHCP]
	IPv6 Mode	Enable	[Disable]
	IPv6 Prefix Length	Min=0, Max=255, [0]	
SDR List	SDR List Support	Enable	[Disable]

4.4.9 APEI Configuration

APEI Configuration					
ACPI Platform Error Interface	APEI Support	[Enable]		Disable	
	APEI Error Injection	MEMORY_CE	MEMORY_UE_NON_FATAL	MEMORY_UE_FATAL	PCIE_CE
		PCIE_UE_NON_FATAL	PCIE_UE_FATAL	[Disable]	
	Defrag Level	[ROM Space under 1/4]	ROM Space under 1/3	ROM Space under 1/2	Every time When Error Occur
	APEI UEFI Revision	[UEFI 2.2]		UEFI 2.3.1	

4.4.10 Console Redirection

Console Redirection									
Console Serial Redirection Setup	Console Serial Redirect	Enable				[Disable]			
	Terminal Type	[VT_100]		VT_100+		VT_UTF8		PC_ANSI	
	Baud Rate	1200	2400	4800	9600	19200	38400	57600	[115200]
	Data Bits	7 Bits				[8 Bits]			
	Parity	Even		Odd		[None]			
	Stop Bits	[1 Bits]				2 Bits			
	Flow Control	RTS/CTS		XON/XOFF		[None]			
	Information Wait Time	0 Second	2 Second	[5 Second]	10 Second	30 Second			
	C.R. After Legacy Boot	[Yes]				No			
	Text Mode Resolution	AUTO	Force 80x25	Force 80x24 (DEL FIRST ROW)	Force 80x24 (DEL LAST ROW)	[Limit 128x40 (Default)]			
	Auto Refresh	[Enable]				Disable			
	Auto adjust Terminal resolution	[Enable]				Disable			

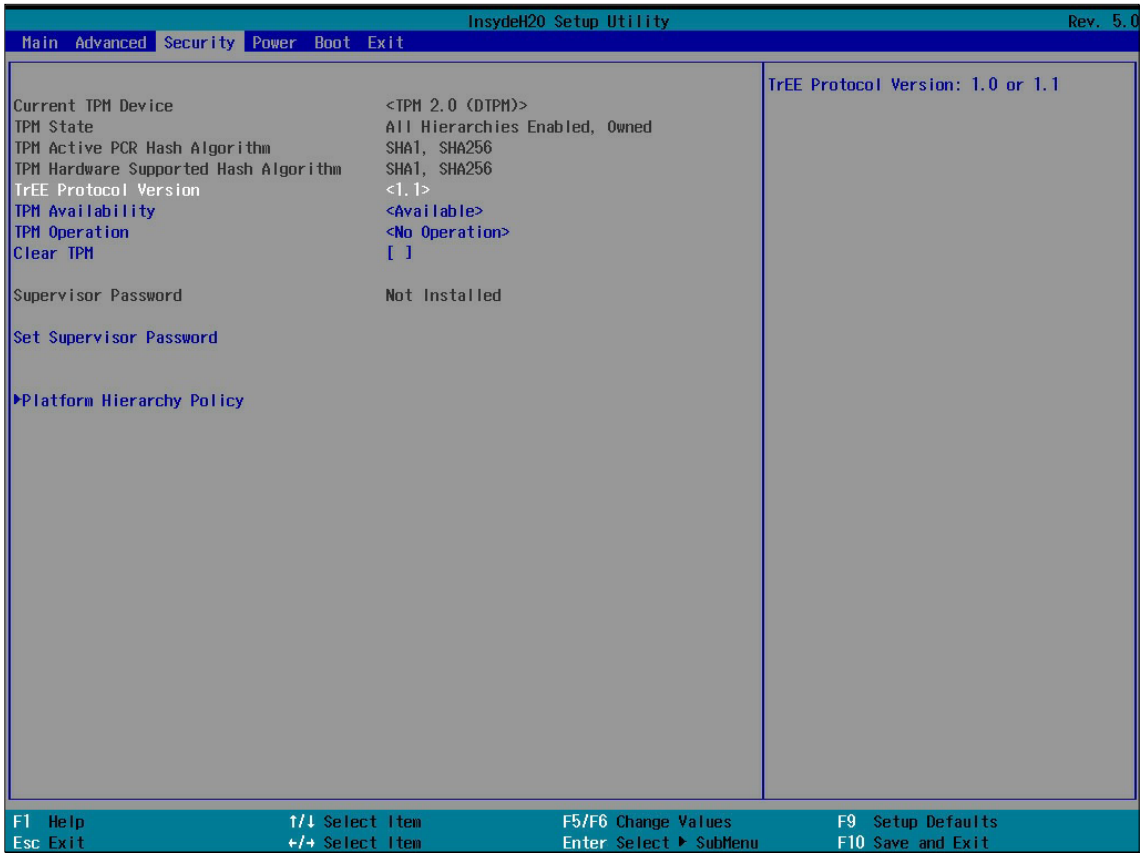
4.4.11 H2O Event Log Config Manager

H2O Event Log Config Manager							
Configuration Pages	BIOS Event Log Configuration	BIOS Event Log Viewer	Log Event To	ALL		BIOS	
				[BMC SEL]	Memory		Disable
			Event Log Full option	Overwrite	Clear All		[Stop Logging]
	POST Message Configuration	POST Message Configuration		Enable		[Disable]	
		Progress Code		Enable		[Disable]	
		Error Code		Enable		[Disable]	
		Debug Code		Enable		[Disable]	
		Log POST Message		Enable		[Disable]	
		Show POST Message		Enable		[Disable]	
	Serial Debug Message Configuration	EFI DEBUG Message Configuration	Advanced Mode	Enable		[Disable]	
			DEBUG_INIT	Enable		[Disable]	
			DEBUG_WARN	Enable		[Disable]	
			DEBUG_LOAD	Enable		[Disable]	
			DEBUG_FS	Enable		[Disable]	
			DEBUG_INFO	Enable		[Disable]	
			DEBUG_ DISPATCH	Enable		[Disable]	
			DEBUG_ VARIABLE	Enable		[Disable]	
			DEBUG_BM	Enable		[Disable]	
			DEBUG_BLKIO	Enable		[Disable]	
			DEBUG_NET	Enable		[Disable]	
			DEBUG_UNDI	Enable		[Disable]	
			DEBUG_ LOADFILE	Enable		[Disable]	
			DEBUG_EVENT	Enable		[Disable]	
			DEBUG_GCD	Enable		[Disable]	
			DEBUG_CACHE	Enable		[Disable]	
			DEBUG_ VERBOSE	Enable		[Disable]	
			DEBUG_ERROR	Enable		[Disable]	
			EFI DEBUG Message Level	Enable		[Disable]	
		Status Code Serial Message Configuration	Show Progress Code Serial Message	Enable		[Disable]	
			Show Error Code Serial Message	[Enable]		Disable	
			Show Debug Code Serial Message	Enable		[Disable]	
Event And Message Pages	BIOS Event Log Viewer	Show BIOS Event Log					
	Serial Debug Message Viewer						

4.4.12 H2oUve Configuration

H2oUve Redirection			
H2oUve Setup	H2OUVE Support	[Enable]	Disable

4.5 Security



Security Option Key:

4.5.1 Security

Security			
Current TPM Device	Not Detected	TPM 1.2	[TPM 2.0]
TPM Active PCR Hash Algorithm	[SHA1, SHA256]		
TPM Hardware Supported Hash Algorithm	[SHA1, SHA256]		
TrEE Protocol Version	1.0	[1.1]	
TPM Availability	[Available]	Hidden	
TPM Operation	[No operation]	Disable and Deactivate	Enable and Activate
Clear TPM	[0]	1	None
Power on Password	Enable	[Disable]	

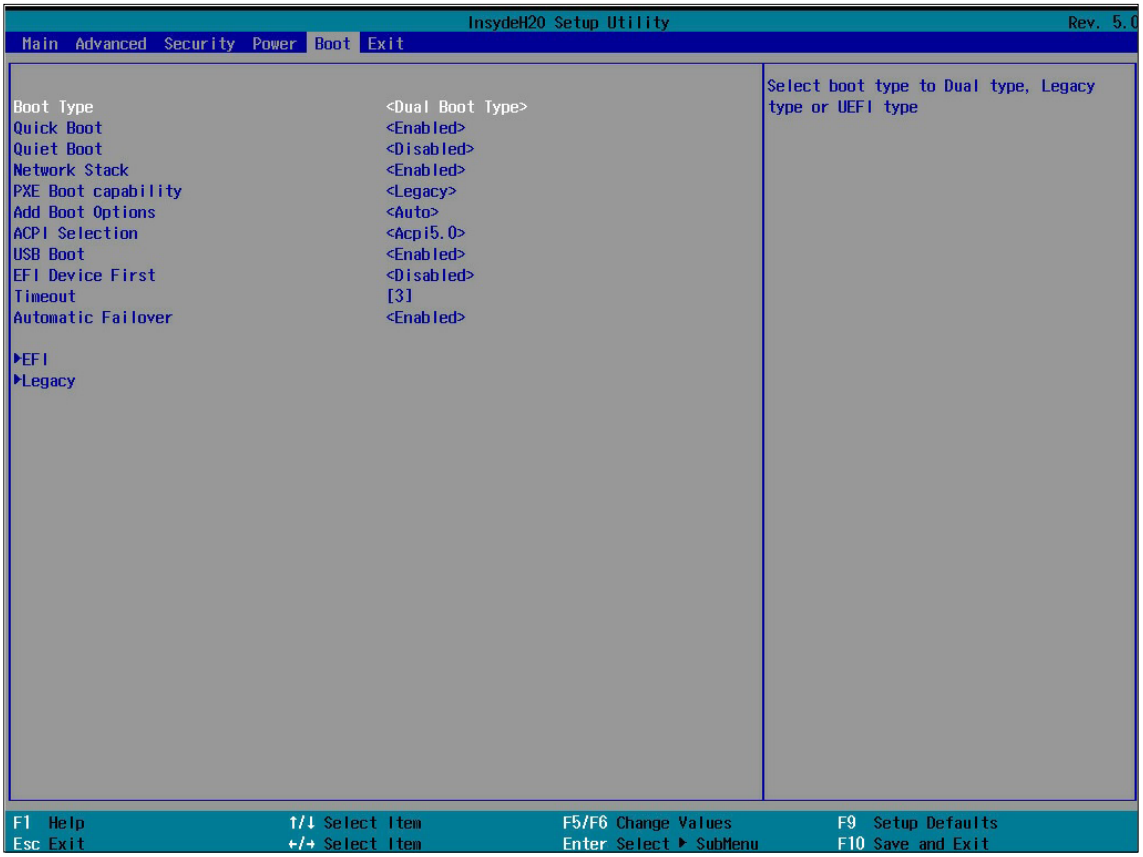
4.6 Power

Power Option Key:

4.6.1 Power

Power		
Wake on PME	Enable	[Disable]

4.7 Boot

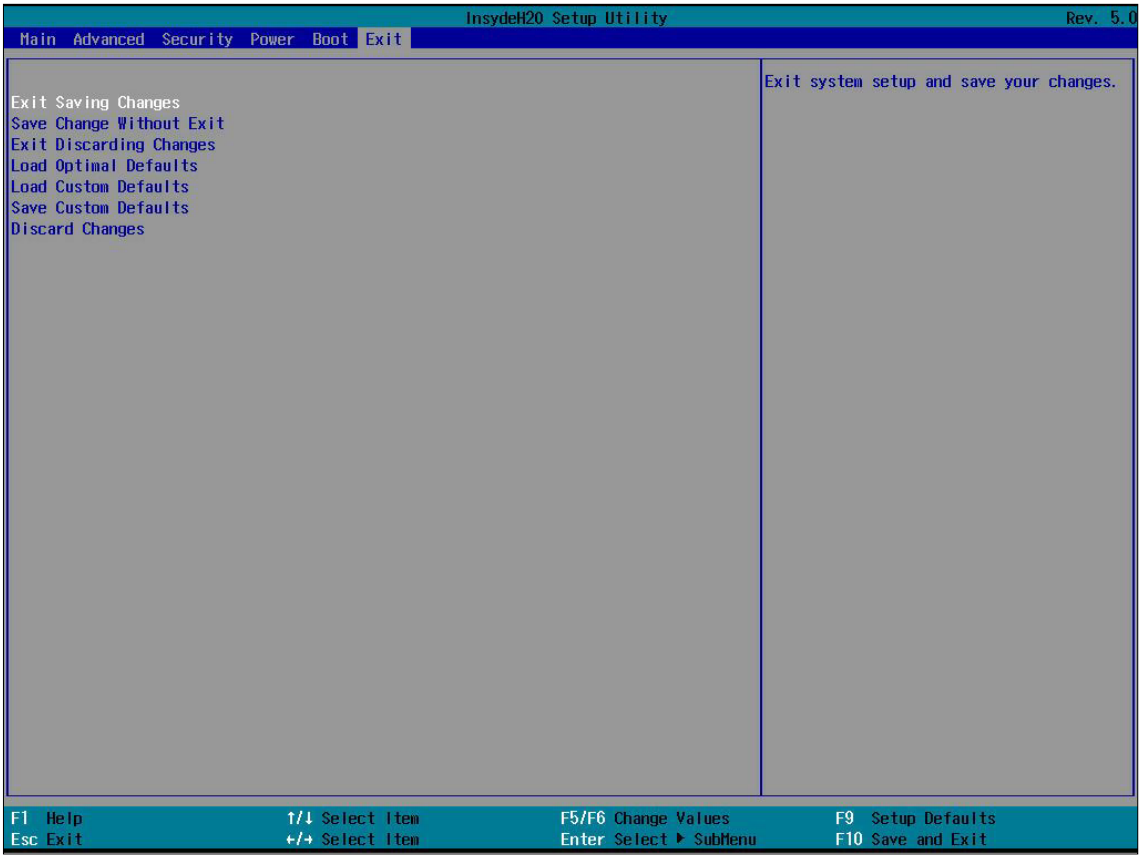


Boot Option Key:

4.7.1 Boot

Boot			
Boot Type	[Dual Boot Type]	Legacy Boot Type	UEFI Boot Type
Quick Boot	[Enable]	Disable	
Quiet Boot	Enable	[Disable]	
Network Stack	[Enable]	Disable	
PXE Boot capability	[Disable]	UEFI:IPv4	UEFI:IPv6
	UEFI:IPv4/UEFI:IPv6	[Legacy]	
Add Boot Options	First	Last	[Auto]
ACPI Selection	Acpi1.0B	Acpi3.0	Acpi4.0
	[Acpi5.0]	Acpi6.0	Acpi6.1
USB Boot	[Enable]	Disable	
EFI Device First	Enable	[Disable]	
Timeout	Min=0, Max=10, [3]		
Automatic Failover	[Enable]	Disable	
EFI	Normal Boot Menu	[Normal]	Advance
	Boot Type Order	Hard Disk Drive CD/DVD-ROM Drive USB PXE Other Device	
	Other Device		
Legacy	Boot Device Priority	Normal Boot Menu	[Normal] Advance
	Boot Type Order	Floppy Drive Hard Disk Drive CD/DVD-ROM Drive USB Others	
	USB		

4.8 Exit



Exit Option Key:

4.8.1 Exit

Save and Exit	
Exit Saving Changes	Exit system setup and save your changes.
Save Change Without Exit	Save your changes without exiting the system.
Exit Discarding Changes	Discard your changes when existing the system.
Load Optimal Defaults	Load optimal default items.
Load Custom Defaults	Resets the BIOS settings to the default values and overwrites any previously customized settings.
Save Custom Defaults	Saves the cumostomized defaults in BIOS settings.
Discard Changes	Discard your changes.

Chapter 5. BMC Configuration Settings

5.1 Login

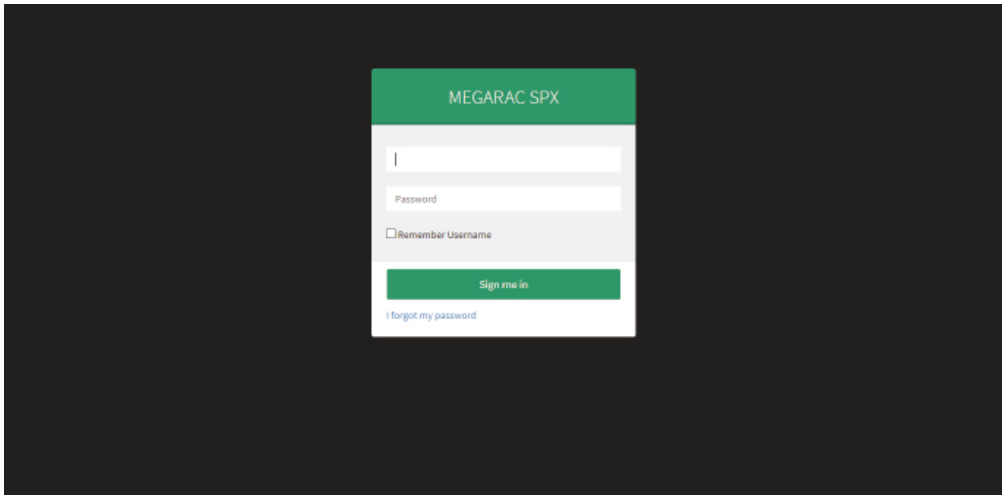
NOTE This feature works with the JAVA 6 run time installed console environment.

The BMC default IP source is DHCP. The IP address can be configured in H2O IPMI configuration as demonstrated by the example below.

Step 1 Open the browser and then type in the BMC IP address.
IP address example: 192.168.22.108

Step 2 Use the default user name and password for first-time BMC WEB GUI login.

Field:	Default
UserName:	admin
Password:	admin



NOTE
The default user name and password are in lower-case characters.
Users who login with the root user name and password will have full administrative power. The root password can be changed after login.

5.2 Web GUI

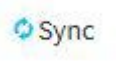
5.2.1 Menu Bar

Click to select the options of the menu bar.

Menu	Description
Dashboard	The Dashboard page gives the overall information about the status of a device.
Sensor	The Sensor Readings page displays all the sensor related information.
FRU Information	The FRU Information page displays the details for FRU devices in the system.
Logs and Reports	The Logs and Reports page monitors and reports on the status of IPMI event.
Settings	The Settings page allows you to configure various basic settings, such as date & time, KMV Mouse, Services and ect.
Remote Control	The Remote Control page allows you to remotely manage server hardware components.
Image Redirection	The Image Redirection page is used to configure the image into BMC for redirection.
Power Control	The Power Control page allows you to view and control the power of your server.
Maintenance	This group of pages allows you to do maintenance tasks on the device.
Sign out	The Sign out page allows you to log out of the web GUI.

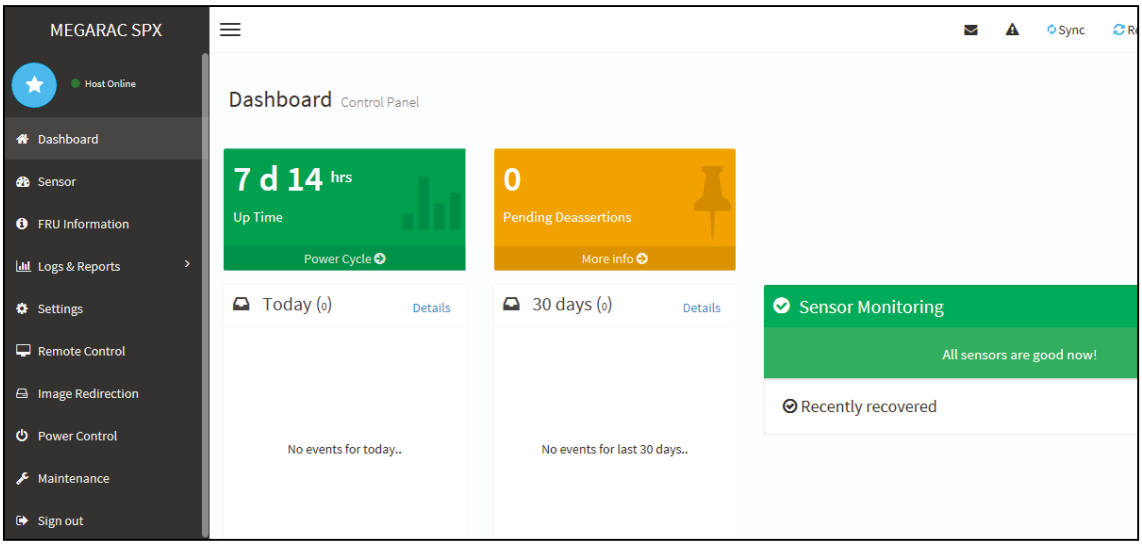
5.2.2 User Information and Quick Button

The user information and quick access buttons are located at the top right corner. It displays the logged-in user, his/her privilege and the four quick buttons allowing you to perform different functions.

Button		Description
User		Only valid commands are allowed.
Operator		All BMC commands are allowed except for the configuration commands that can change the behavior of the out-of-hand interfaces.
Administrator		All BMC commands are allowed.
No access		Login access denied.
	Notification	Click to view notification messages.
	Sync	Click to synchronize with the latest sensor and event log updates.
	Refresh	Click to reload the current page.
	Administrator	**Sign out**: Click to log out of the GUI **Profile:** Click to enter the User Management Configuration dialog box in figure xx.
	Help	Click to view more details on field descriptions.

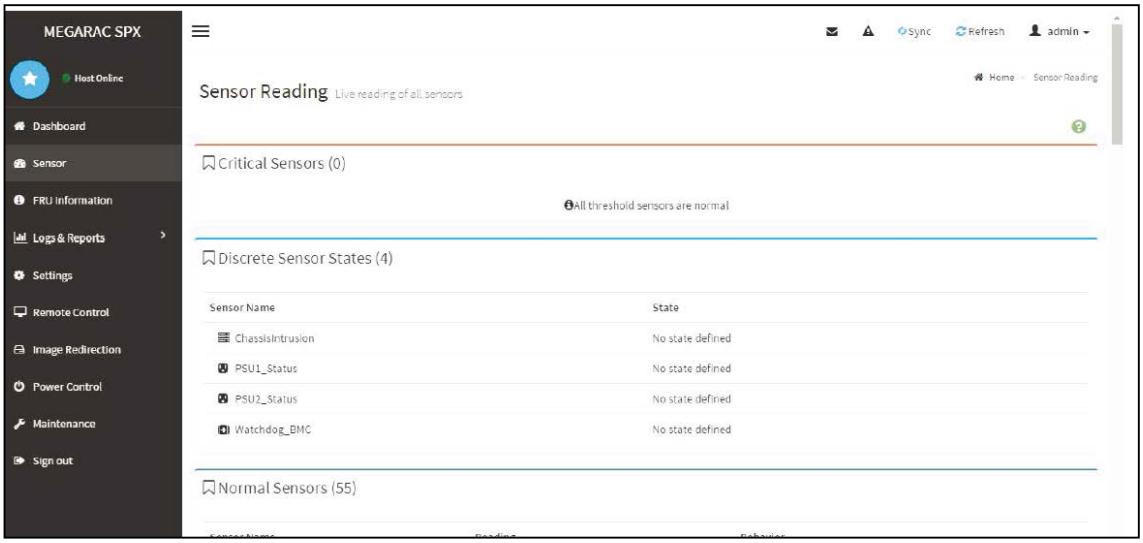
5.2.3 Dashboard

The Dashboord page displays device, system, and network information.
Click **Dashboard** on the menu bar to view the overall information of the server.



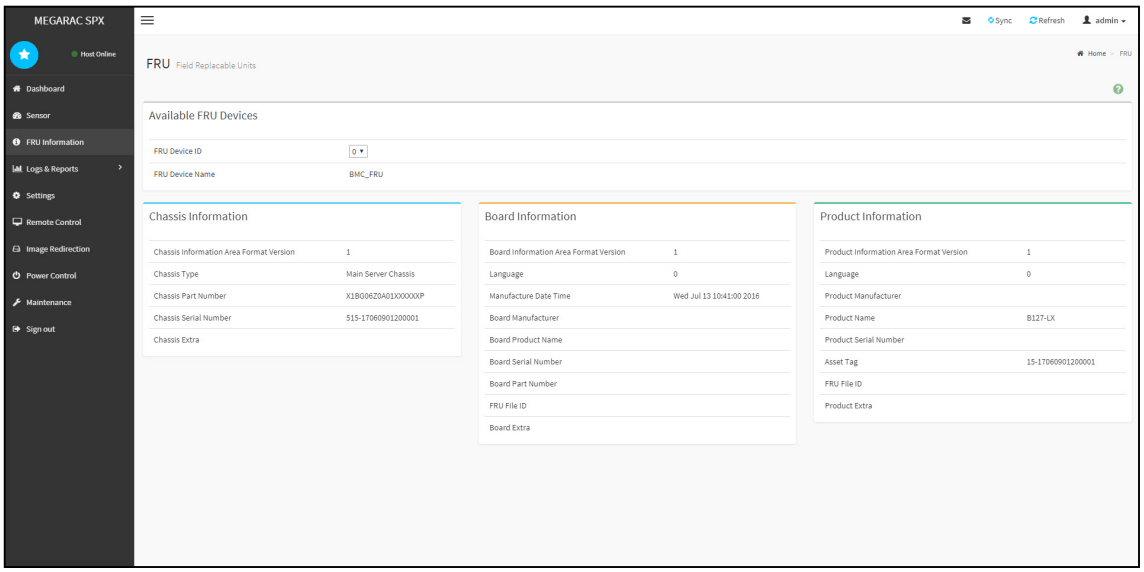
5.2.4 Sensor

The Sensor page displays the status and records on related sensors.
Click a record to view detailed information on a particular sensor.



5.2.5 FRU Information

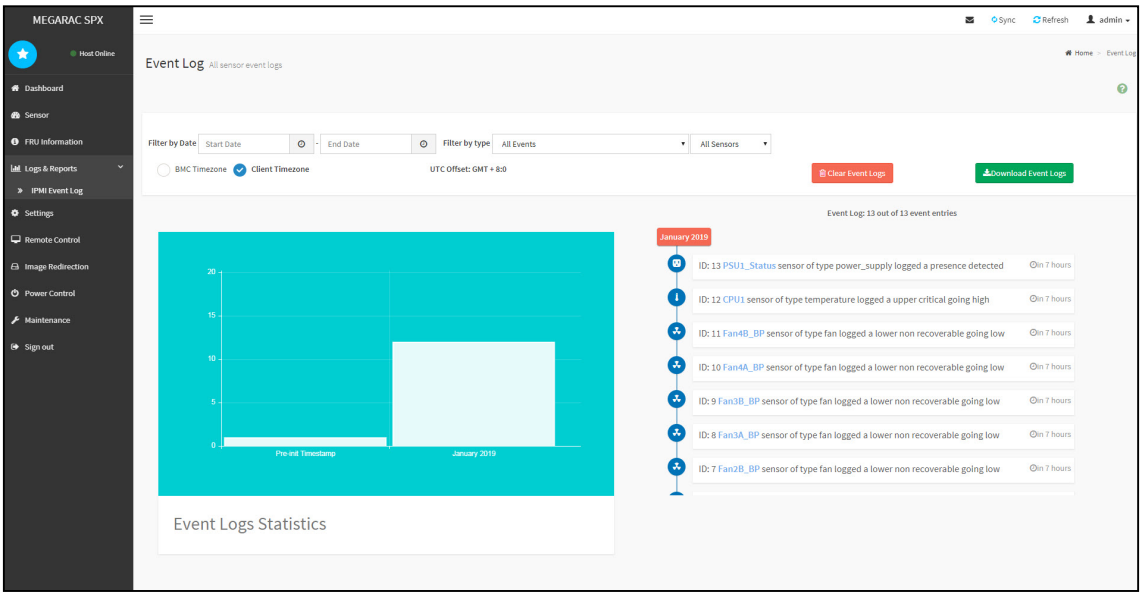
The FRU Information page displays Basic Information, Chassis Information, Board Information and Product Information of the FRU device. Click **FRU Information** on the menu bar to view the details of the selected device.



5.2.6 Logs and Reports

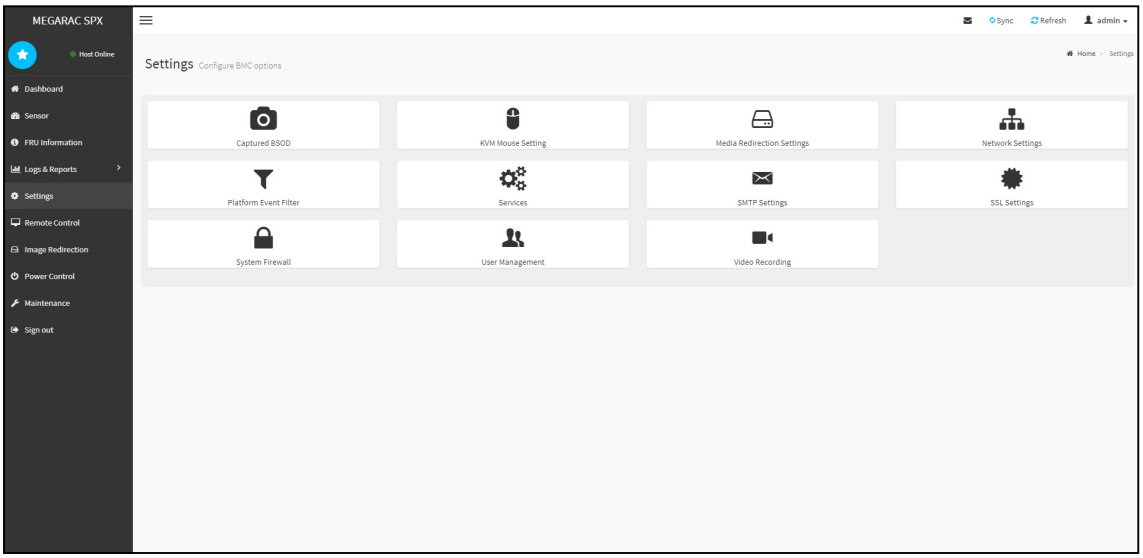
The System Inventory page displays IPMI Event Log and Video Log. Click **Logs and Reports** from the menu bar→ select **Event Log** or **Video Log** to view the contents.

Event Log



5.2.7 Settings

The Settings page displays the configuration settings for KVM Mouse Setting, Media Redirection Settings, Network Settings, Platform Event Filter, Services, SMTP Settings, SSL Settings, System Firewall, User Management, and Video Recording.



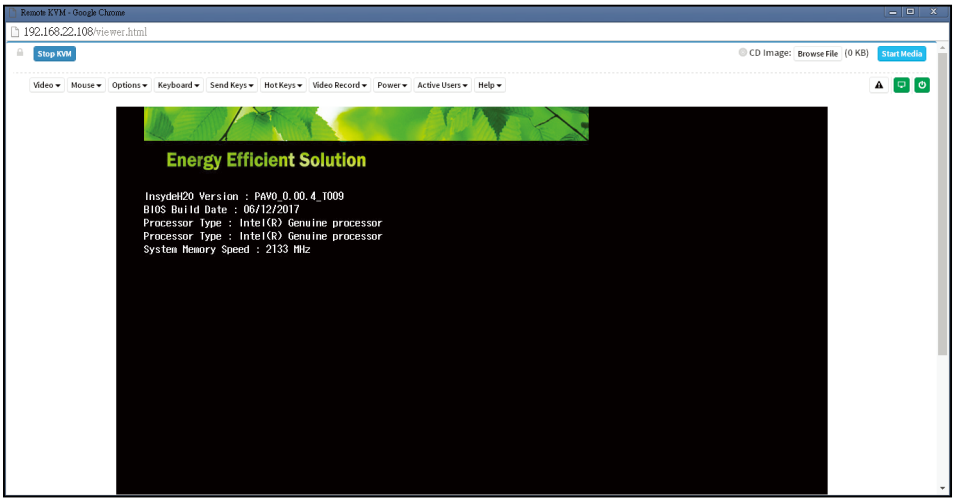
Settings Menu and Option Keys:

Settings						
KVM Mouse Setting	Mouse Mode Configuration • Relative Positioning (Linux) • Absolute Positioning (Windows) • Other Mode (SLES-11 OS Installation)					
Media Redirection Settings	General Settings		VMedia Instance Settings		Remote Session	
Network Settings	Network Settings	Network Link Configuration	DNS Configuration		Sideband Interface (NC-SI)	
Platform Event Filter	Event Filters		Alert Policies		LAN Destinations	
Services						
SMTP Settings	SMTP Settings					
SSL Settings	View SSL certificate		Generate SSL certificate		Upload SSL certificate	
System Firewall	Generate Firewall Settings		IP Address Firewall Rules		Port Firewall Rules	
	Existing Firewall Settings	Add Firewall Settings	Existing IP Rules	Add New IP rule	Existing Port Rules	Add New Port Rule
User Management						
Video Recording	Auto Video Settings					
	Video Trigger Settings		Video Remote Settings		Pre-Event Video Recordings	

5.2.8 Remote Control

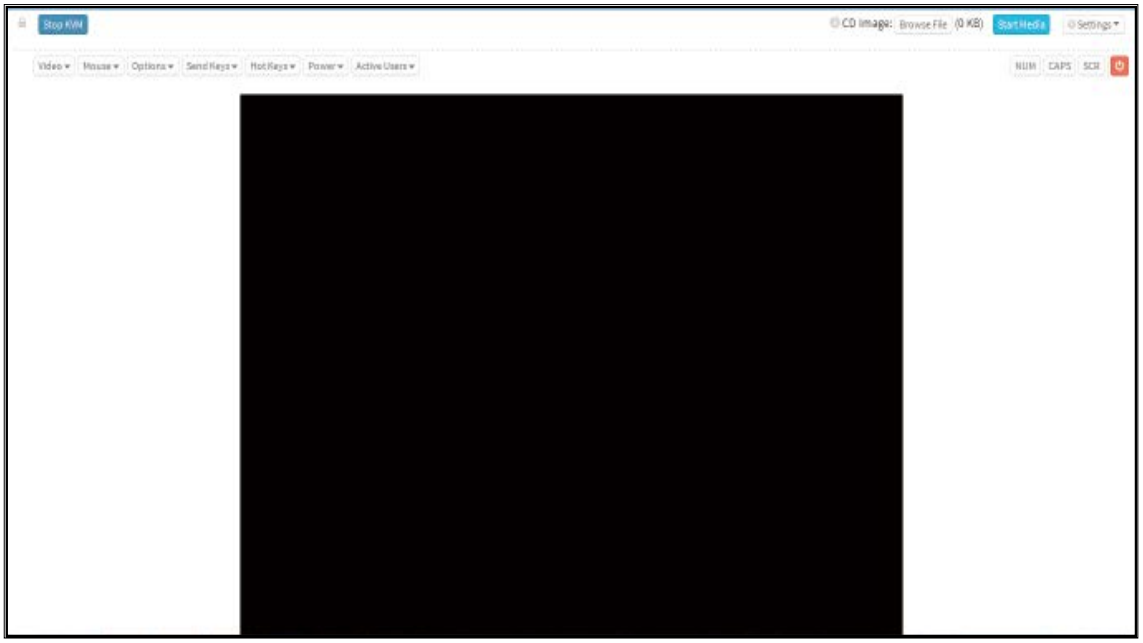
The Remote Control page displays the configuration for power control and remote KVM.

Launch KVM



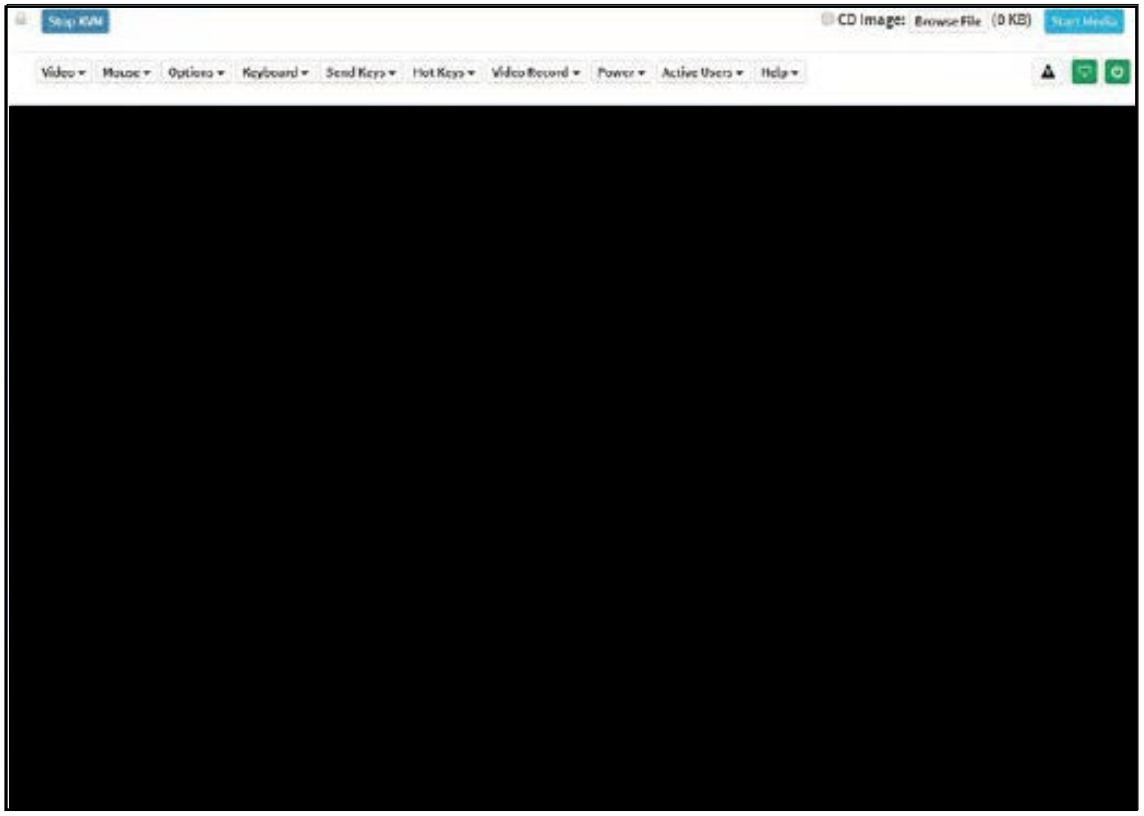
Procedure To Start KVM

Step 1 Click **Start KVM** to start the H5Viewer video redirection.



Step 2 Click **Browse** to select CD Image.

Step 3 Click **Start Media** to redirect the selected CD image file to the Host.



Step 4 To stop the recording, click **Stop Record**.

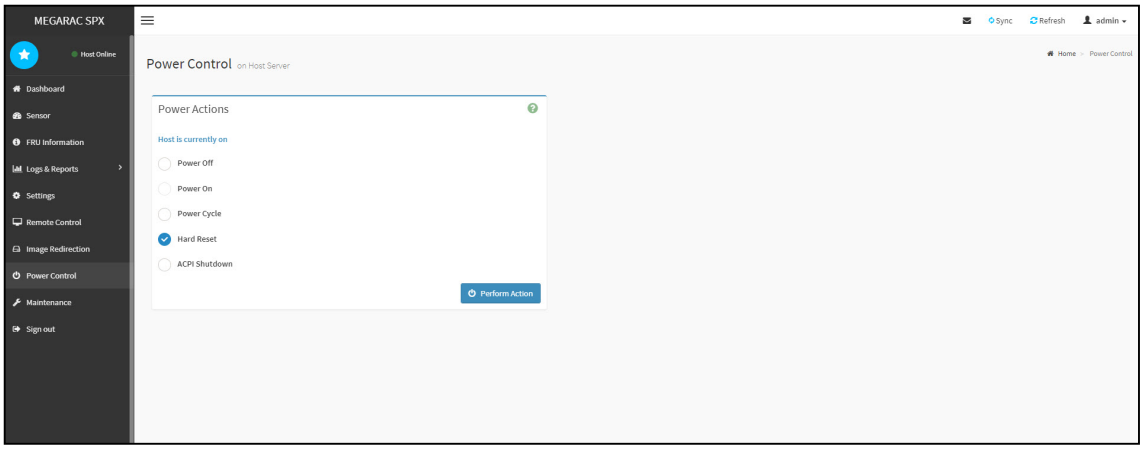
Remote KVM Menu and Option Key

<table>
<tr><th>Button</th><th colspan="3">Description</th></tr>
<tr><td>Start KVM</td><td colspan="3">Starts the H5Viewer video redirection.</td></tr>
<tr><td>Stop KVM</td><td colspan="3">Stops the H5Viewer video redirection.</td></tr>
<tr><td rowspan="5">Video Record</td><td>Pause Video</td><td colspan="2">This option is used for pausing Console Redirection.</td></tr>
<tr><td>Resume Video</td><td colspan="2">This option is used to resume the Console Redirection when the session is paused.</td></tr>
<tr><td>Refresh Video</td><td colspan="2">This option can be sued to update the display shown in the Console Redirection window.</td></tr>
<tr><td rowspan="2">Host Display</td><td>Display on</td><td>If you disable this option, the display will be shown on the screen in Console Redirection.</td></tr>
<tr><td>Display off</td><td>If you enable this option, the server display will be blank but you can view the screen in Console Redirection. If you disable this option, the display will be back in the server screen.</td></tr>
<tr><td>Capture Screen</td><td colspan="2">This option helps to take the screenshot of the host screen and save it in the client’s system.</td></tr>
<tr><td rowspan="3">Mouse</td><td>Show Client Cursor</td><td colspan="2">This menu item can be used to show or hide the local mouse cursor on the remote client system.</td></tr>
<tr><td>Mouse Mode</td><td colspan="2">This option handles mouse emulation from local window to remote screen using either of the two methods. Only ‘Administrator’ has the right to configure this option.
• Absolute mouse mode: The absolute position of the local mouse is sent to the server if this option is selected.
• Relative mouse mode: The Relative mode sents the calculated relative mouse potion displacement to the server if this option is selected.
• Other mouse mode: This mouse mode sets the client cursor in the middle of the client system and will send the deviation to the host. This mouse mode is specific for SUSE Linux installation.</td></tr>
<tr><td colspan="3">NOTE Client cursor will be hidden always. If you want to enable, use Alt + C to access the menu.</td></tr>
<tr><td rowspan="2">Options</td><td>Block Privilege Request</td><td colspan="2">To enable or disable the access privilege of the user.</td></tr>
<tr><td>Keyboard/ Mouse Encryption</td><td colspan="2">This option allows you to encrypt keyboard inputs and mouse movements sent between the connections</td></tr>
<tr><td>Keyboard</td><td>Keyboard Layout</td><td colspan="2">List of Host Physical Keyboard languages supported in H5Viewer.
1. English US
2. German
3. Japanese</td></tr>
<tr><td rowspan="3">Video Record</td><td>Record Video</td><td colspan="2">This option is to start recording the screen.</td></tr>
<tr><td>Stop Recording</td><td colspan="2">This option is used to stop the recording.</td></tr>
<tr><td>Record Settings</td><td colspan="2">This option is used to set Video Recording Duration.</td></tr>
</table>

Send Keys	Hold Down	Right <Ctrl>	This menu item can be used to act as the right-side <CTRL> key when in Console Redirection.
		Right <Alt>	This menu item can be used to act as the right-side <ALT> key when in Console Redirection.
		Right <Window>	This menu item can be used to act as the right-side <WIN> key when in Console Redirection.
		Left <Ctrl>	This menu item can be used to act as the left-side <CTRL> key when in Console Redirection.
		Left <Alt>	This menu item can be used to act as the left-side <ALT> key when in Console Redirection.
		Left <Window>	This menu item can be used to act as the left-side <WIN> key when in Console Redirection. You can also decide how the key should be pressed: Hold Down or Press and Release.
	Press and Release	<Ctrl> + <Alt> + <Del>	This menu item can be used to act as if you depressed the <CTRL>, <ALT> and <DEL> keys down simultaneously on the server that you are redirecting.
		Left <Windows>	This menu item can be used to act as the left-side <WIN> key when in Console Redirection. You can also decide how they key should be pressed: Hold Down or Press and Release.
		Right <Windows>	This menu item can be used to act as the right-side <WIN> key when in Console Redirection.
		<Context Menu>	This menu item can be used to act as the context menu key, when in Console Redirection.
		<Print Screen>	This menu item can be used to act as the print screen key, when in Console Redirection.
Hot Keys	Add Hot Keys	This menu is used to enable macros. Click Add to macros.	
Power	Power Reset	To reboot the system without powering off (warm boot).	
	Immediate Shutdown	Power Off the server immediately.	
	Orderly Shutdown	Soft power off.	
	Power On	To power on the server.	
	Power Cycle	To first power off, and then reboot the system (cold boot).	
Active Users	Read only. Displays active user and their system IP address.		
Help	Read only. Displays information about H5viewer		

5.2.9 Power Control

The Power Control page allows you to view and control the power of your server. To open Power Control, click **Power Control** from the menu bar.



The various options of Power Control are given below.

Power Off: To immediately power off the server.

Power On: To power on the server.

Power Cycle: This option will first power off, and then reboot the system (cold boot).

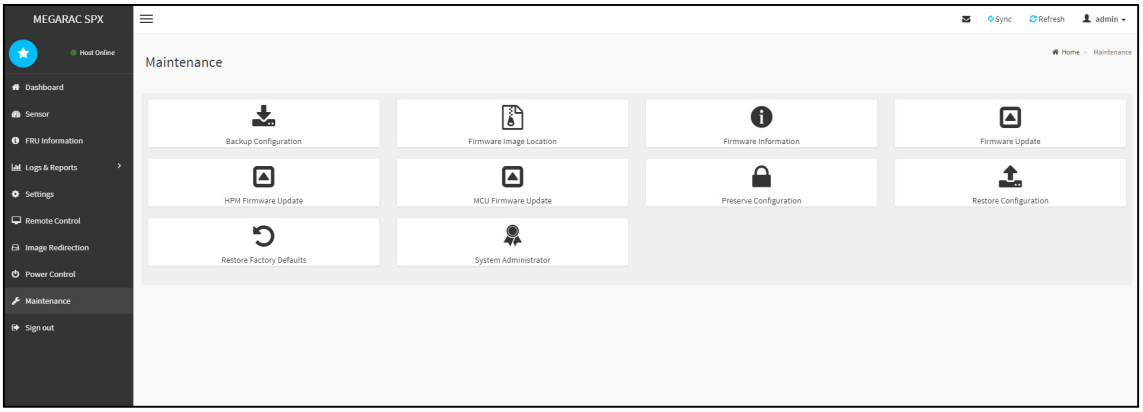
Hard Reset: This option will reboot the system without powering off (warm boot).

ACPI Shutdown: This option to initiate operating system shutdown prior to the shutdown.

Perform Action: Click this option to perform the selected operation.

5.2.10 Maintenance

This Maintenance page displays the configuration settings for Backup Configuration, Firmware Image Location, Firmware Information, Fimware Update, Preserve Configuration, Restore Configuration, Restore Configuration, and Restore Factory Defaults.

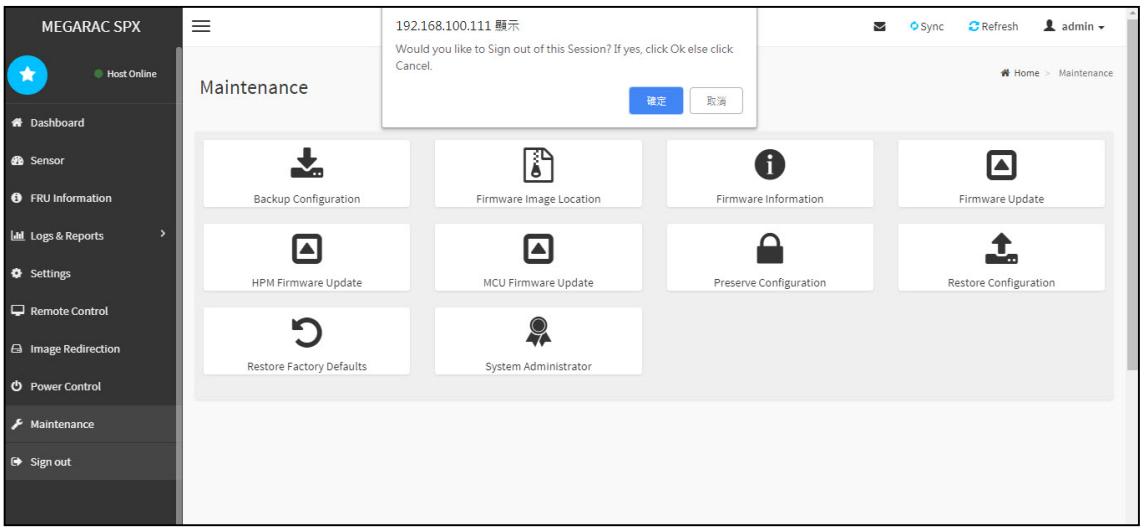


Maintenance	Procedure
Backup Configuration	1. Click Check All to backup the selected configuration items. The Backup Configuration page will appear **Click Download Config** to save the backup file to the client system 2. Click **OK** to perform the backup action. The Backup file will be saved in the client system. 3. Click **Cancel** to cancel the backup process.
Firmware Image Location	1. Click the configuration items on the list. 2. Click **Save** to save any changes made.
Firmware Information	Read only.
Firmware Update	This wizard takes you through the process of firmware upgradation. A reset of the box will automatically follow if the upgrade is completed or cancelled. An option to Preserve All Configuration is available. Enable it, if you wish to preserver configured settings through the upgrade. Click **Start Firmware Update** to start the firmware update process.
Preserve Configuration	This page allows the user to configure the preserve configuration items, which will be used by the Restore factory defaults to preserve the existing configuration without overwriting with defaults/Firmware Upgrade configuration. Click **Save** to save any changes made.
Restore Configuration	1. Click **Upload** to restore the backup files. 2. Click **OK** to upload the new configuration file and restore.
Restore Factory Defaults	1. Click the configuration items on the list to preserve the settings during restore factory default configuration. 2. Click Restore Factory Defaults to restore the factory defaults of the device firmware.

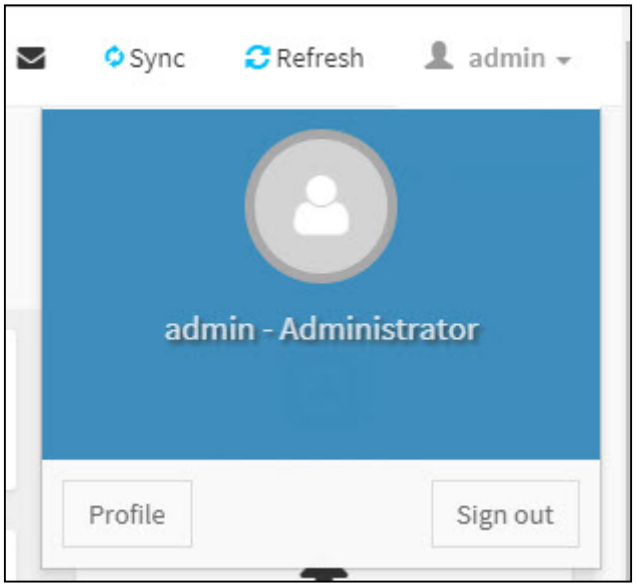
5.2.11 Sign out

To log out of the BMC:

Method 1: Click Sign out from the menu bar. The Logout dialog box will pop out.



Method 2: Click the root quick button on the top right corner of the screen.



5.3 Firmware Update

1. Boot to the DOS (MS-DOS or Free DOS is workable).
2. Enter BMC firmware directory [XXXXXVEOOOYYY_ARK];
   XXXXX: project name ;
   OOO: for Vela standard version
   YYY:firmware version;
   K: For auxiliary version
3. Execute a.bat batch file to update the BMC firmware.
   Example:
   A:>cd FB201VE010003_AR1
   A:\ FB201VE010003_AR1>a.bat
   This is just an example. The latest BMC firmware version is available from the FAE or AIC® website.
4. After updating the BMC firmware, please turn off and then turn on the system.

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