GA-C621-SU8

User's Manual

Rev. 1001

GIGABYTE™

Giga-Byte Technology B.V.

Declaration of Conformity

We, Manufacturer/Importer,

Giga-Byte Technology B.V

Address: **Steenoven 24, 5626 DK, Eindhoven, The Netherlands**

Declare that the product

Product Type: **Server board**

Product Name: **GA-C621-SU8**

conforms with the essential requirements of the following directives:

☒ **EMC Directive 2014/30/EU:**

☒ Conduction & Radiated Emissions:	EN 55032:2012+AC:2013
☒ Immunity:	EN 55024:2010+A1:2015
☒ Power-line harmonics:	EN 61000-3-2:2014
☒ Power-line flicker:	EN 61000-3-3:2013

☒ **Low Voltage Directive 2014/35/EU:**

☒ Safety:	EN60950-1:2006+A11:2009+A12:2011+A2:2013

☒ **RoHS Directive 2011/65/EU:**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature:

Date: **Aug. 13,2018** Name: Lien, Chih-Hsin

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EURO : CITIBANK AMSTERDAM SWIFT: CITINL2X IBAN: NL70CITI0266022650

Federal Communications Commission
Supplier's Declaration of Conformity

This supplier's declaration of conformity is hereby for

Product: SERVER BOARD

Model Number(s): GA-C621-SU8

Brand/Trade: GIGABYTE

We declare under our sole responsibility that the above mentioned device has been tested and found in compliance with CFR 47 PART 15 REGULATION.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND,
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

Responsible Party – U.S. Contact Information

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Representative of Responsible Party for SDoC

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For product-related information, check on our website at: https://www.gigabyte.com

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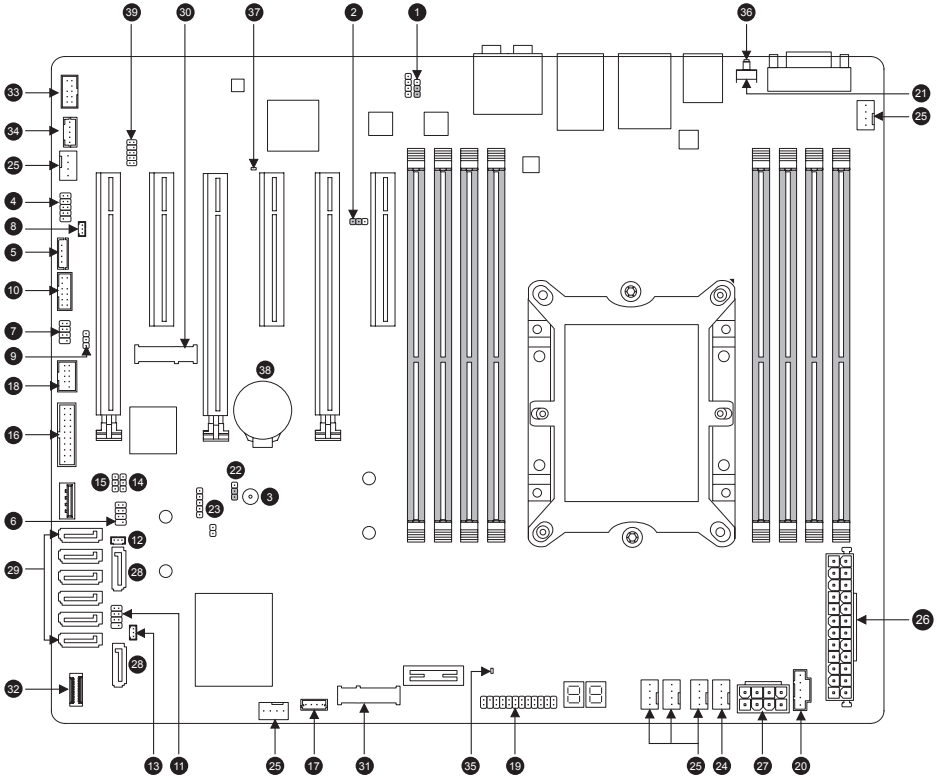
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GA-C621-SU8 Motherboard Layout



1	BMC_VGA	11	S_SGPIO	21	UID	31	PCIEX2_M2
2	BMC_WATCHD	12	SATA_DOM0	22	CLR_CMOS	32	F_USB30C
3	Buzzer	13	SATA_DOM1	23	CI	33	F_AUDIO
4	COMB	14	VRM_SCL	24	CPU_FAN1	34	THB_C
5	SMB_IPMB	15	VRM_SDA	25	SYS_FAN1~6	35	F_LED1
6	I_SGPIO1	16	FUSB30	26	ATX	36	F_LED2
7	I_SGPIO2	17	VROC	27	ATX8P	37	BMC_LED1
8	WOL	18	FUSB2	28	S-SATA0~1	38	BAT
9	SMB	19	F_PANEL	29	I-SATA0~5	39	SMB_VMD
10	TPM	20	PMBUS	30	PCIEX4_M2		

Box Contents

- ☑ GA-C621-SU8 motherboard
- ☑ Motherboard driver disk
- ☑ Quick Installation Guide
- ☑ Six SATA cables
- ☑ I/O Shield

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- 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 connecting or 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 or wet 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.
- If you use an adapter, extension power cable, or power strip, ensure to consult with its installation and/or grounding instructions.

1-2 Product Specifications

CPU	◆ Support for Intel® Xeon® Scalable Processors in the LGA 3647 package. ◆ Single Socket P (Narrow), CPU TDP support up to 165w. ◆ L3 cache varies with CPU
Chipset	◆ Intel® C621 Chipset
Memory	◆ 8 x DDR4 DIMM sockets supporting up to 1 TB of system memory ◆ 6 channel memory architecture ◆ Support for DDR4 2666 MHz memory modules if use a Skylake CPU ◆ Support for DDR4 2933 MHz memory modules if use a Cascade lake CPU ◆ Support for ECC RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS memory modules
Onboard Graphics	◆ ASPEED® AST2500: - 1 x D-Sub port, supporting a maximum resolution of 1920x1200@60 Hz
Audio	◆ Realtek® ALC1220-VB2 codec * The back panel line out jack supports DSD audio. ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF Out
LAN	◆ 1 x Realtek RTL8211E chip (10/100/1000 Mbit) (LAN1) ◆ 2 x Intel® 210AT GbE LAN chips (10/100/1000 Mbit) (LAN2, LAN3)
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16_5) * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. ◆ 2 x PCI Express x16 slots, running at x8 (PCIEX8_1, PCIEX8_3) ◆ 2 x PCI Express x8 slots, running at x8 (PCIEX8_4, PCIEX8_6) ◆ 1 x PCI Express x8 slot, running at x4 (PCIEX4_2) (All of the PCI Express slots conform to PCI Express 3.0 standard.)
Storage Interface	◆ Chipset: - 1 x M.2 connector (Socket 3, M key, type 2260/2280 SATA and PCIe x2 SSD support) (PCIEX2_M2) - 1 x M.2 connector (Socket 3, M key, type 2242/2260/2280 PCIe x4/x2 SSD support) (PCIEX4_M2) - 2 x SATA 6Gb/s connectors (S-SATA0~1) - 6 x SATA 6Gb/s connectors (I-SATA0~5) - Support for RAID 0, RAID 1, RAID 5, and RAID 10
USB	◆ Chipset+ ASMedia® USB 3.1 Gen 2 Controller: - 2 x USB 3.1 Gen 2 Type-A ports (red) on the back panel ◆ Chipset: - 5 x USB 3.1 Gen 1 ports (2 ports on the back panel, 1 port onboard, 2 ports available through the internal USB header) - 2 x USB 2.0/1.1 ports available through the internal USB header

Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 1 x CPU fan header ◆ 6 x system fan headers ◆ 8 x SATA 6Gb/s connectors ◆ 2 x SATA DOM power headers ◆ 2 x M.2 Socket 3 connectors ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x USB Type-C™ port, with USB 3.1 Gen 1 support ◆ 1 x USB 3.1 Gen 1 header ◆ 1 x USB 2.0/1.1 header ◆ 1 x Thunderbolt™ add-in card connector ◆ 1 x Trusted Platform Module (TPM) header ◆ 1 x serial port header ◆ 1 x chassis intrusion header ◆ 1 x Clear CMOS jumper ◆ 3 x SATA SGPIO headers ◆ 1 x BMC_VGA jumper ◆ 1 x BMC_WATCHD jumper ◆ 1 x wake on LAN header ◆ 1 x IPMB connector ◆ 1 x SMB jumper ◆ 1 x VRM SMB Clock jumper ◆ 1 x VRM SMB Data jumper ◆ 1 x Intel® VROC Upgrade Key header ◆ 1 x NVMe SMBus (I2C) header ◆ 1 x buzzer ◆ 1 x NVMe SMBUS Control header
Back Panel Connectors	◆ 1 x D-Sub port ◆ 1 x serial port ◆ 1 x UID button ◆ 2 x USB 3.1 Gen 2 Type-A ports (red) ◆ 2 x USB 3.1 Gen 1 ports ◆ 3 x RJ-45 ports ◆ 1 x optical S/PDIF Out connector ◆ 5 x audio jacks

I/O Controller	◆	ASPEED® AST2500 BMC chip
Hardware Monitor	◆ ◆ ◆ ◆	Voltage detection Temperature detection Fan speed detection Fan speed control * Whether the fan speed control function is supported will depend on the fan you install.
BIOS	◆ ◆ ◆	1 x 256 Mbit flash Use of licensed AMI BIOS PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
Operating System	◆	Support for Windows 10 64-bit
Form Factor	◆	ATX Form Factor; 30.5cm x 24.4cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

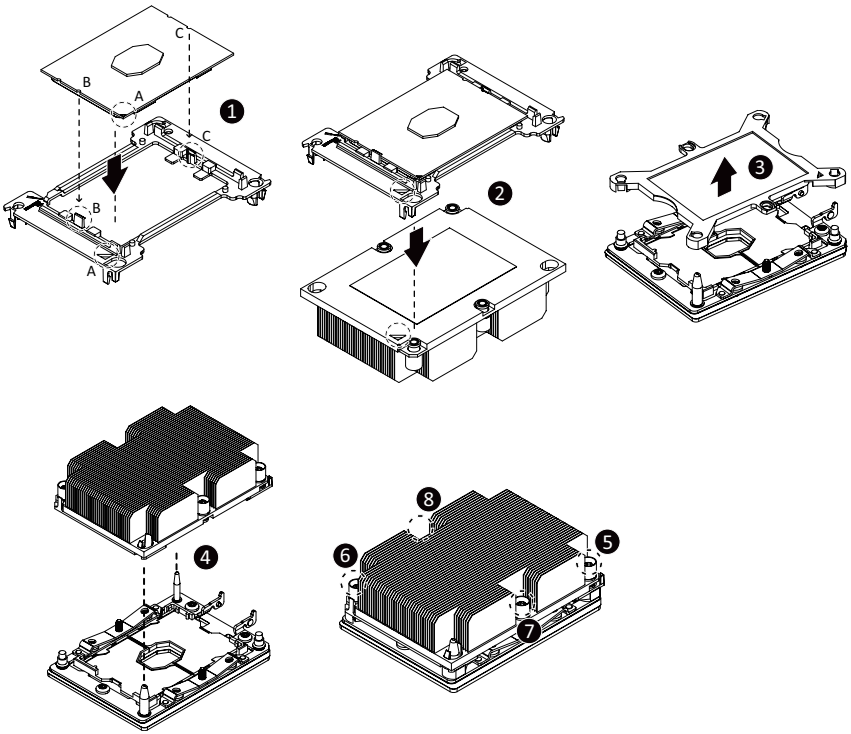
1-3 Installing the CPU

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.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

Installing the CPU

Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



1-4 Installing the Memory

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.
  (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- 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.

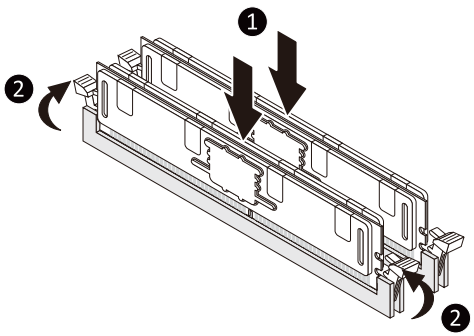
6 Channel Memory Configuration

This motherboard supports 6 Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.
The eight DDR4 memory sockets are divided into 6 channels as following:

- Channel 1: DIMM-A1, DIMM-A2
- Channel 2: DIMM-B1
- Channel 3: DIMM-C1
- Channel 4: DIMM-D1, DIMM-D2
- Channel 5: DIMM-E1
- Channel 6: DIMM-F1

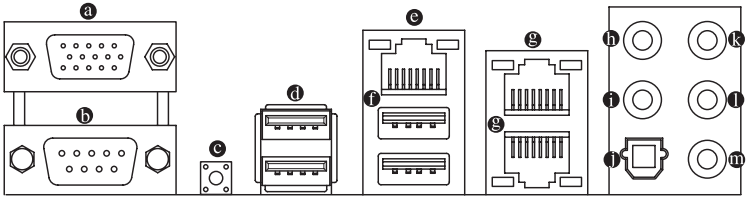
Due to CPU limitations, read the following guidelines before installing the memory in 6 Channel mode.

1. 6 Channel mode cannot be enabled if only one memory module is installed.
2. It is recommended that memory of the same capacity, brand, speed, and chips be used.



Note: When installing the memory in Channel 1 or Channel 4, make sure to begin with DIMM-A1 or DIMM-D1, or the system will not boot properly.

1-5 Back Panel Connectors



a D-Sub Port

The D-Sub port supports a 15-pin D-Sub connector and supports a maximum resolution of 1920x1200@60 Hz (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports D-Sub connection to this port.

b Serial Port

Use the serial port to connect devices such as a mouse, modem or other peripherals.

c UID Button

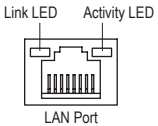
The UID button.

d USB 3.1 Gen 2 Type-A Port (Red)

The USB 3.1 Gen 2 Type-A port supports the USB 3.1 Gen 2 specification and is compatible to the USB 3.1 Gen 1 and USB 2.0 specification. Use this port for USB devices.

e IPMI Port (LAN1)

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



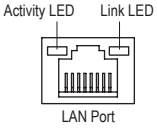
LED	State	Description
Link (Left)	Solid Green	100 Mbps data rate
	Solid Amber	1 Gbps data rate
Activity (Right)	Blinking Yellow	Active

f USB 3.1 Gen 1 Port

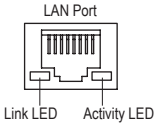
The USB 3.1 Gen 1 port supports the USB 3.1 Gen 1 specification and is compatible to the USB 2.0 specification. You can use this port for USB devices.

g GbE LAN Port (LAN2)(LAN3)

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



LED	State	Description
Link (Right)	Solid Green	100 Mbps data rate
	Solid Amber	1 Gbps data rate
Activity (Left)	Blinking Yellow	Active



LED	State	Description
Link (Right)	Solid Green	100 Mbps data rate
	Solid Amber	1 Gbps data rate
Activity (Left)	Blinking Yellow	Active

⓱ **Center/Subwoofer Speaker Out**

Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration.

⓲ **Rear Speaker Out**

This jack can be used to connect rear speakers in a 4/5.1/7.1-channel audio configuration.

⓳ **Optical S/PDIF Out Connector**

This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector.

⓴ **Line In**

The line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

㉑ **Line Out**

The line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

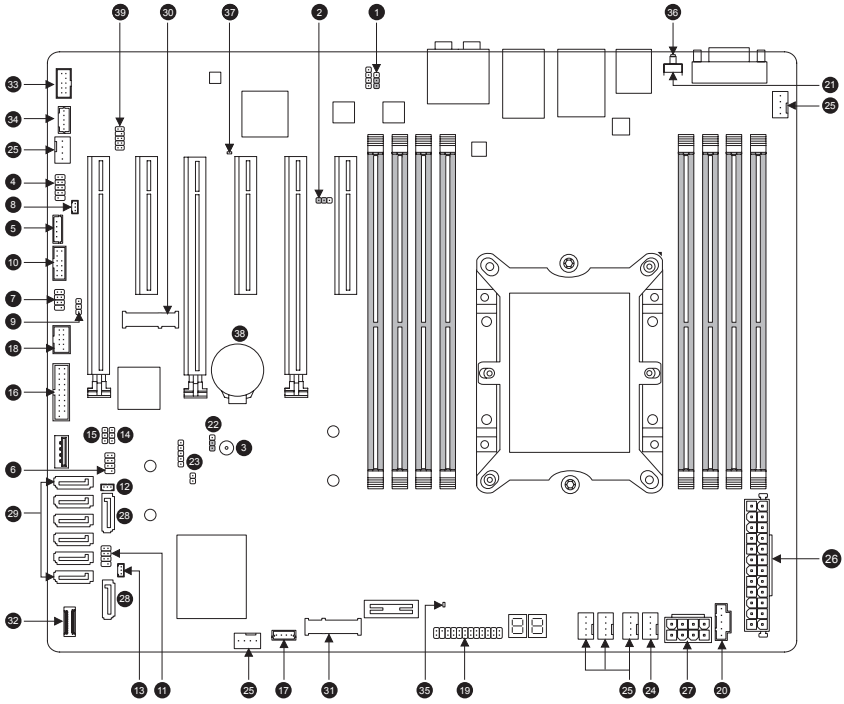
㉒ **Mic In**

The Mic in jack.



- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-6 Internal Connectors



1	BMC_VGA	11	S_SGPIO	21	UID	31	PCIEX2_M2
2	BMC_WATCHD	12	SATA_DOM0	22	CLR_CMOS	32	F_USB30C
3	Buzzer	13	SATA_DOM1	23	CI	33	F_AUDIO
4	COMB	14	VRM_SCL	24	CPU_FAN1	34	THB_C
5	SMB_IPMB	15	VRM_SDA	25	SYS_FAN1~6	35	F_LED1
6	I_SGPIO1	16	FUSB30	26	ATX	36	F_LED2
7	I_SGPIO2	17	VROC	27	ATX8P	37	BMC_LED1
8	WOL	18	FUSB2	28	S-SATA0~1	38	BAT
9	SMB	19	F_PANEL	29	I-SATA0~5	39	SMB_VMD
10	TPM	20	PMBUS	30	PCIEX4_M2		

Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

1) BMC_VGA



Pin	Definition
1-2	Enable (Default)
2-3	Disable

2) BMC_WATCHD



Pin	Definition
1-2	Enable
2-3	Disable (Default)

3) Buzzer



4) COMB (Serial Port Header)



Pin	Definition	Pin	Definition
1	NDCD-	2	NSIN
3	NSOUT	4	NDTR-
5	GND	6	NDSR-
7	NRTS-	8	NCTS-
9	NRI-	10	-

5) SMB_IPMB



Pin	Definition
1	SMB_DATA
2	GND
3	SMB_CLK
4	NA

6) I_SGPIO1 (For I-SATA0~2)
7) I_SGPIO2 (For I-SATA3~5)



Pin	Definition	Pin	Definition
1	NA	2	-
3	SATA_DATA	4	GND
5	GND	6	SATA_LOAD
7	NA	8	SATA_CLK

8) WOL (Wake On Lan)



Pin	Definition
1	P5V_AUX
2	GND
3	WAKE_EN

9) SMB



Pin	Definition
1	SMB_DATA
2	GND
3	SMB_CLK

10) TPM (Trusted Platform Module/Port 80 Header)



Pin	Definition	Pin	Definition
1	LPC_IO0	2	P3V3
3	LPC_IO1	4	-
5	LPC_IO2	6	TPM_CLK
7	LPC_IO3	8	GND
9	LFRAME#	10	NA
11	SERIRQ	12	TPM_RST

11) S_SGPIO (For S-SATA0~1)



Pin	Definition	Pin	Definition
1	NA	2	-
3	SATA_DATA	4	GND
5	GND	6	SATA_LOAD
7	NA	8	SATA_CLK

12) SATA_DOM0 (SATA DOM0 Power Header)
13) SATA_DOM1 (SATA DOM1 Power Header)



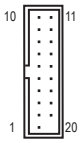
Pin	Definition
1	P5V
2	GND
3	NA

14) VRM_SCL (For VRM SMB_CLK)
15) VRM_SDA (For VRM SMB_DATA)



Pin	Definition
1-2	SMB to PCH
2-3	SMB to BMC

16) FUSB30



Pin	Definition	Pin	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	-

17) VROC (RAID Key for CPU NVMe SSD)



Pin	Definition
1	GND
2	P3V3_AUX
3	GND
4	PCH RAID KEY

18) FUSB2



Pin	Definition	Pin	Definition
1	Power (5V)	2	Power (5V)
3	USB DX-	4	USB DY-
5	USB DX+	6	USB DY+
7	GND	8	GND
9	-	10	NC

19) F_PANEL



Pin	Definition	Pin	Definition
1	Power LED+	2	5V Standby
3	-	4	ID LED+
5	Power LED-	6	ID LED-
7	HDD LED+	8	System Status LED+
9	HDD LED1	10	System Status LED-
11	Power Button	12	LAN1 Active LED+
13	GND	14	LAN1 Link LED-
15	Reset Button	16	SMBus Data
17	GND	18	SMBus Clock
19	ID Button	20	Case Open
21	GND	22	LAN2 Active LED+
23	NMI Switch	24	LAN2 Link LED-

20) PMBUS (Power Supply I2C Connector)



Pin	Definition
1	SMB_CLK
2	SMB_DATA
3	PSU_ALERT
4	GND
5	P3V3

21) UID



Pin	Definition
1	UID_BTN
2	GND
3	GND
4	GND

22) CLR_CMOS



Pin	Definition
1-2	NA (Default)
2-3	Clear CMOS

23) CI



Pin	Definition
1	Intrusion Input
2	GND

24) CPU_FAN1



Pin	Definition
1	GND
2	P12V
3	FAN_TACH
4	FAN_PWM

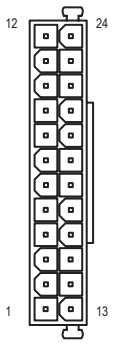
25) SYS_FAN1~6



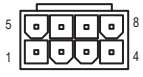


Pin	Definition
1	GND
2	P12V
3	FAN_TACH
4	FAN_PWM

26) ATX (2x12 Main Power Connector)



27) ATX8P (2x4, 12V Power Connector)



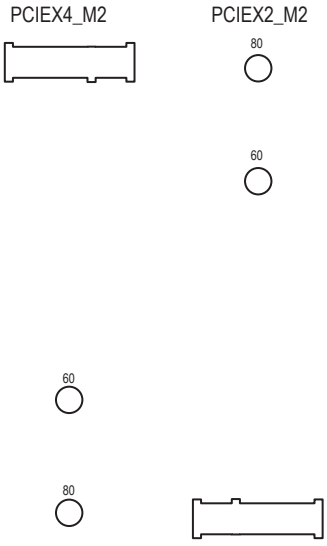
28) S-SATA0~1 (SATA 6Gb/s Connectors, Supported by the Intel® PCH)



29) I-SATA0~5 (SATA 6Gb/s Connectors, Supported by the Intel® SCU)



30/31) PCIEX4_M2/PCIEX2_M2 (M.2 Socket 3 Connectors)



32) F_USB30C (USB Type-C™ Header with USB 3.1 Gen 1 Support)



Pin	Definition	Pin	Definition
1	VBUS	11	VBUS
2	TX1+	12	TX2+
3	TX1-	13	TX2-
4	GND	14	GND
5	RX1+	15	RX2+
6	RX1-	16	RX2-
7	VBUS	17	GND
8	CC1	18	D-
9	NC	19	D+
10	NC	20	CC2

33) F_AUDIO



34) THB_C



Pin	Definition
1	FORCE_POWER
2	SCI_EVENT
3	SLP_S3
4	SLP_S4
5	GND

35) F_LED1 (Onboard Power LED)

36) F_LED2 (UID LED, Unit Identifier LED)

F_LED1

State	Description
Solid Red	Standby
Solid Green	Power On

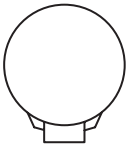
F_LED2

State	Description
Solid Blue	Unit Identified

37) BMC_LED1 (BMC Heartbeat LED)

State	Description
Blinking Yellow	BMC Normal

38) BAT



39) SMB_VMD (NVMe SMBUS Control Header)



Pin	Definition
1	SMB_CPU1_NVME_CLK
2	SMB_CPU1_NVME_DATA
3	GND
4	GND
5	SMB_CPU2_NVME_CLK
6	SMB_CPU2_NVME_DATA
7	GND
8	-
9	SMB_PCH_NVME_CLK
10	SMB_PCH_NVME_DATA

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. 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 <Delete> key during the POST when the power is turned on.

- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not 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 "Restore Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.



2-2 Main

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 a sub-menu.

Main Menu Help

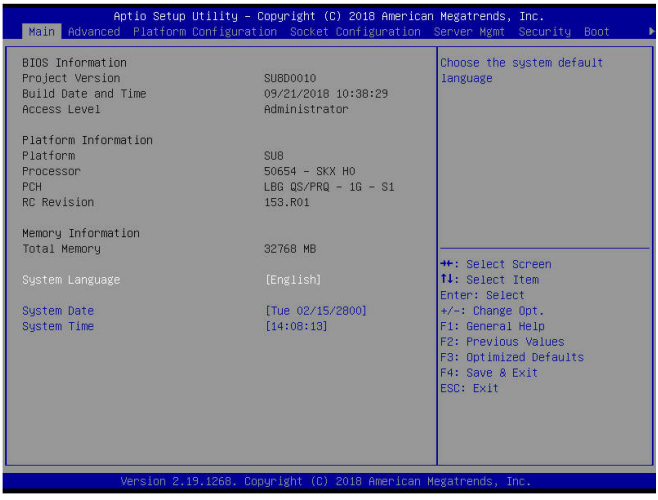
The on-screen description of a highlighted setup option is displayed on the right of the Main Menu.

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.

(Sample BIOS Version: SU8E0007)

- 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.



This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ **System Language**

Selects the default language used by the BIOS.

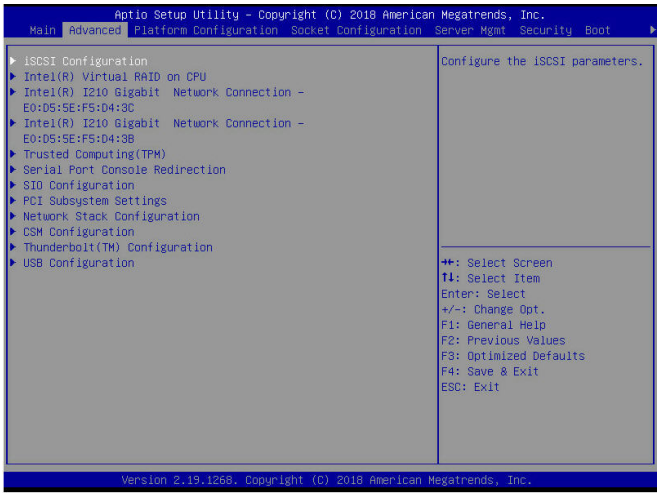
☞ **System Date**

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <+> or <-> key to set the desired value.

☞ **System Time**

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:00:00. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <+> or <-> key to set the desired value.

2-3 Advanced



▶ iSCSI Configuration
Configure the iSCSI parameters.

▶ Intel(R) Virtual RAID on CPU
This sub-menu allows the user to manage Intel(R) Virtual RAID on CPU.

▶ Intel(R) I210 Gigabit Network Connection (Dual_Lan)
This sub-menu provides information on LAN configuration and related configuration options.

▶ Intel(R) I210 Gigabit Network Connection (Dual_Lan)
This sub-menu provides information on LAN configuration and related configuration options.

▶ Trusted Computing
Enables or disables Trusted Platform Module (TPM).

▶ Serial Port Console Redirection
This section allows you to enable/disable serial port console redirection for remote server management through a serial port.

▶ SIO Configuration

☞ Serial Port 1/2
Enables or disables the onboard serial port.

PCI Subsystem Settings

Above 4G Decoding

Enables or disables 64-bit capable devices to be decoded in above 4 GB address space (only if your system supports 64-bit PCI decoding). Set to **Enabled** if more than one advanced graphics card are installed and their drivers are not able to be launched when entering the operating system (because of the limited 4 GB memory address space).

Network Stack Configuration

Network Stack

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server.

Ipv4 PXE Support

Enables or disables IPv4 PXE Support. This item is configurable only when **Network Stack** is enabled.

Ipv4 HTTP Support

Enables or disables HTTP boot support for IPv4. This item is configurable only when **Network Stack** is enabled.

Ipv6 PXE Support

Enables or disables IPv6 PXE Support. This item is configurable only when **Network Stack** is enabled.

Ipv6 HTTP Support

Enables or disables HTTP boot support for IPv6. This item is configurable only when **Network Stack** is enabled.

PXE boot wait time

Allows you to configure how long to wait before you can press <Esc> to abort the PXE boot. This item is configurable only when **Network Stack** is enabled.

Media detect count

Allows you to set the number of times to check the presence of media. This item is configurable only when **Network Stack** is enabled.

CSM Configuration

CSM Support

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

- Enabled — Enables UEFI CSM.
- Disabled — Disables UEFI CSM and supports UEFI BIOS boot process only.

GateA20 Active

- Upon Request — GA20 can be disabled using BIOS services.
- Always — GA20 cannot be disabled.

This option is useful when any RT code is executed above 1MB. This item is configurable only when **CSM Support** is set to **Enabled**.

Option ROM Message

Set display mode for Option ROM. Options available: Force BIOS, Keep Current.

This item is configurable only when **CSM Support** is set to **Enabled**.

INT19 Trap Response

Configures BIOS reaction on INT19 trapping by Option ROM.

- Immediate — The system executes the trap right away.
- Postponed — The system executes the trap during legacy boot.

This item is configurable only when **CSM Support** is set to **Enabled**.

Boot option filter

Controls Legacy/UEFI ROMs priority.

- UEFI and Legacy — Disables option ROM.
- Legacy only — Enables legacy option ROM only.
- UEFI only — Enables UEFI option ROM only.

This item is configurable only when **CSM Support** is set to **Enabled**.

Network

Allows you to select whether to enable the legacy option ROM for the LAN controller.

- Legacy — Enables legacy option ROM only.
- UEFI — Enables UEFI option ROM only.

This item is configurable only when **CSM Support** is set to **Enabled**.

Storage

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

- Legacy — Enables legacy option ROM only.
- UEFI — Enables UEFI option ROM only.

This item is configurable only when **CSM Support** is set to **Enabled**.

Video

Allows you to select whether to enable the UEFI or Legacy option ROM for the graphics controller.

- Legacy — Enables legacy option ROM only.
- UEFI — Enables UEFI option ROM only.

This item is configurable only when **CSM Support** is set to **Enabled**.

Other PCI devices

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

- Legacy — Enables legacy option ROM only.
- UEFI — Enables UEFI option ROM only.

This item is configurable only when **CSM Support** is set to **Enabled**.

Thunderbolt(TM) Configuration

TBT Root port Selector

Allows you to select Thunderbolt AIC location.

USB Configuration

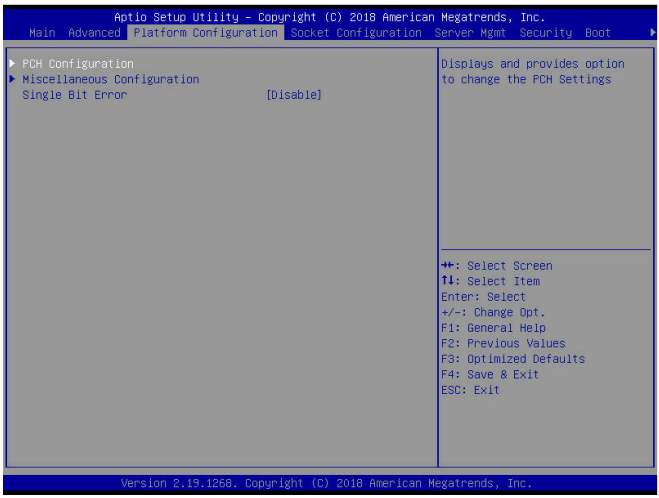
Legacy USB Support

Allows USB keyboard/mouse to be used in MS-DOS.

USB Mass Storage Driver Support

Enables or disables support for USB storage devices.

2-4 Platform Configuration



- **PCH Configuration**
- **PCH Devices**
- **PCH state after G3**

  Allows you to select S0 or S5 for ACPI state after a G3.
- **PCH SATA Configuration (I-SATA0~5 Connectors)**
- **SATA Controller**

  Enables or disables the integrated SATA controllers.
- **Configure SATA as**

  Enables or disables RAID for the SATA controllers integrated in the Chipset or configures the SATA controllers to AHCI mode.

▸▸ RAID	Enables RAID for the SATA controller.
▸▸ AHCI	Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug.

- **SATA Mode options**
- **SATA HDD Unlock**

  Enables or disables hard drive password unlock in the OS.
- **SATA Led locate**

  If enabled, LED/SGPIO hardware is attached.
- **Support Aggressive Link Power Management**

  Enables or disables the power saving feature, ALPM (Aggressive Link Power Management), for the Chipset SATA controllers.
- **Load EFI Driver for RAID**

  Allows you to select whether to load EFI driver in RAID mode. If disabled, loads legacy OPROM.

☞ **SATA Port 0/1/2/3/4/5/x2 M.2 SATA Port**
Enables or disables each SATA port.

▶ **PCH sSATA Configuration**

☞ **sSATA Controller (S-SATA0~1 Connectors)**
Enables or disables the integrated SATA controllers.

☞ **Configure sSATA as**
Enables or disables RAID for the SATA controllers integrated in the Chipset or configures the SATA controllers to AHCI mode.

▸▸ RAID	Enables RAID for the SATA controller.
▸▸ AHCI	Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug.

▶ **SATA Mode options**

☞ **SATA HDD Unlock**
Enables or disables hard drive password unlock in the OS.

☞ **SATA Led locate**
If enabled, LED/SGPIO hardware is attached.

☞ **Support Aggressive Link Power Management**
Enables or disables the power saving feature, ALPM (Aggressive Link Power Management), for the Chipset SATA controllers.

☞ **Load EFI Driver for RAID**
Allows you to select whether to load EFI driver in RAID mode. If disabled, loads legacy OPROM.

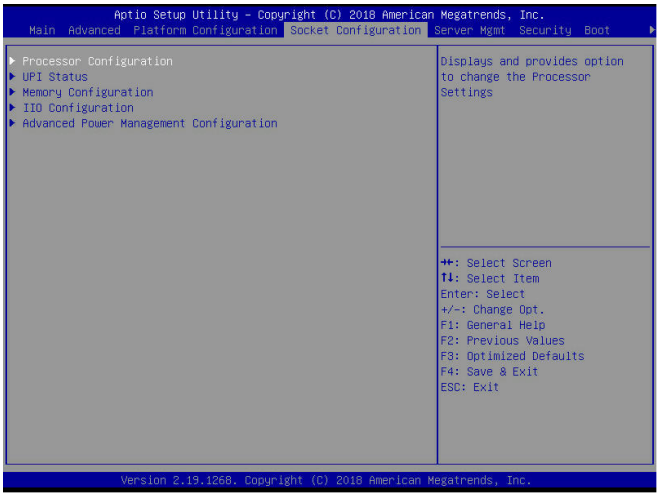
☞ **sSATA Port 0/1**
Enables or disables each SATA port.

▶ **Miscellaneous Configuration**

☞ **Active Video**
Allows you to select the active video type. Options are Auto, Onboard Device, PCIE Device.

☞ **Single Bit Error**
Enables or disables Single Bit Error selection.

2-5 Socket Configuration



▶ **Processor Configuration**
The sub-menu displays and provides options to change the processor settings.

☞ **Hyper-Threading [ALL]**
The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their.

☞ **VMX**
Enables or Disables the Vanderpool Technology. This will take effect after rebooting the system.

☞ **PPIN Control**
Select **Unlock/Enable** to use the Protected-Processor Inventory Number (PPIN) in the system.

☞ **Hardware Prefetcher**
Select whether to enable the speculative prefetch unit of the processor.

☞ **Adjacent Cache Prefetch**
When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched.

☞ **DCU Streamer Prefetcher**
Prefetches the next L1 data line based upon multiple loads in same cache line.

☞ **DCU IP Prefetcher**
Prefetches the next L1 data line based upon sequential load history.

☞ **LLC Prefetch**
Enables or disables LLC prefetch on all threads.

☞ **Extended APIC**
Enables or disables APIC support.

☞ **AES-NI**
Enables or disables AES-NI support.

▶ **UPI Status**
The sub-menu displays UPI status.

▶ **Memory Configuration**
The sub-menu displays and provides options to change the memory settings.

▶ **Memory Topology**
Displays memory topology with DIMM population information.

▶ **Memory RAS Configuration**
Displays and provides option to change the memory RAS settings.

☞ **Single Bit Error ECC Threshold**
Correctable Error Threshold (1-7fff) used for sparing, tagging, and leaky bucket.

▶ **IIO Configuration**
The sub-menu displays and provides options to change the IIO settings.

▶ **Socket0 Configuration**
Press [Enter] for configuration of advanced items.

▶ **IIO General Configuration**
The sub-menu provides options enable or disable the IIO IOAPIC Stacks 0~5.

▶ **Intel® VT for Directed I/O (VT-d)**
Enables or disables Intel® Virtualization Technology for Directed I/O.

▶ **Intel® VMD technology**
Enables or disables Intel® Volume Management Device (Intel® VMD) technology.

▶ **Advanced Power Management Configuration**
The sub-menu displays and provides options to change the power management settings.

☞ **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.

▶ **CPU C State Control**

☞ **Autonomous Core C-State**
Enables or Disables Autonomous Core C-State Control.

☞ **CPU C6 Report**
Allows you to determine whether to let the CPU enter C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt. **Auto** lets the BIOS automatically configure this setting.

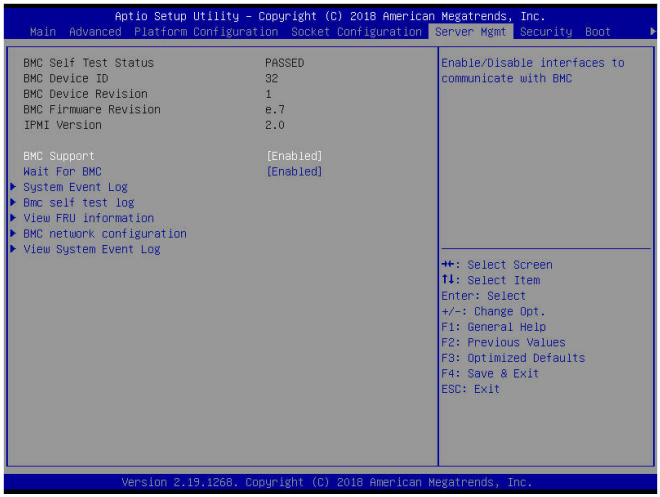
☞ **Enhanced Halt State (C1E)**
Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption.

☞ **OS ACPI Cx**
Reports CPU C3/C6 to OS ACPI C2 or ACPI C3.

▶ **Package C State Control**

☞ **Package C State**
Configures the state for the C-State package limit. Options are C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, No Limit, Auto.

2-6 Server Mgmt



☞ **BMC Support**
Enables or disables interfaces to communicate with BMC.

☞ **Wait For BMC**
Allows you to determine whether to wait for BMC response for specified time out. In PILOTII, BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize Host to BMC interfaces.

▶ **System Event Log**
Press [Enter] to change the SEL event log configuration.

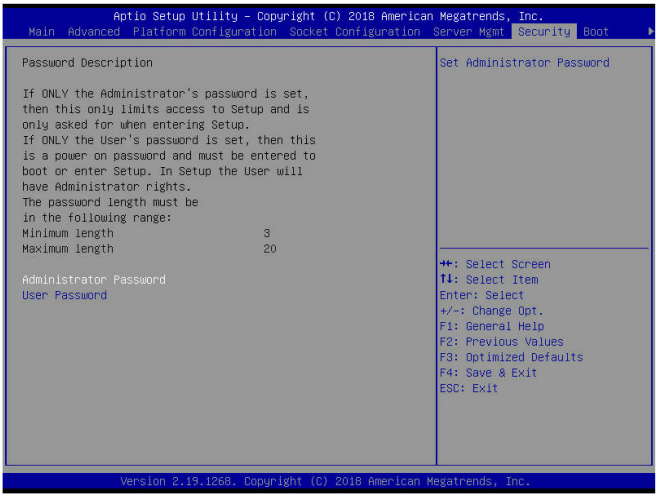
▶ **Bmc self test log**
Logs the report returned by BMC self test command.

▶ **View FRU information**
Press [Enter] to view FRU information.

▶ **BMC network configuration**
Press [Enter] to configure BMC network parameters.

▶ **View System Event Log**
Press [Enter] to view the system event log records.

2-7 Security



☞ **Administrator Password**

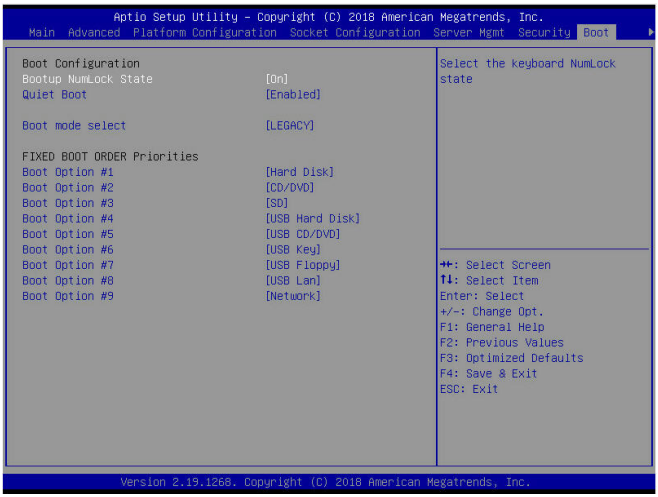
Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all. To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

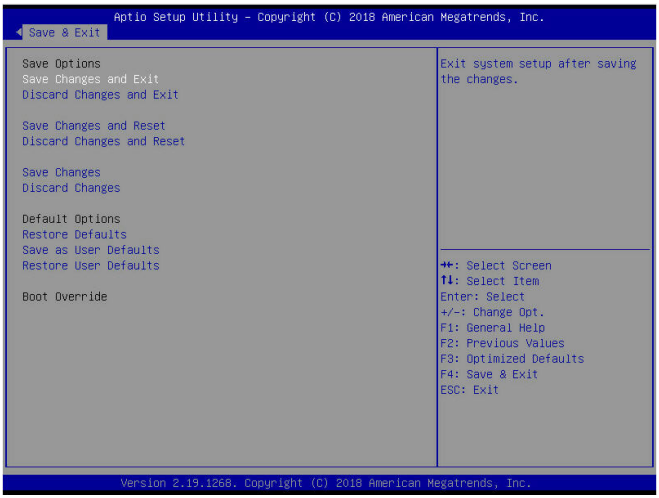
NOTE: Before setting the User Password, be sure to set the Administrator Password first.

2-8 Boot



- **Bootup NumLock State**
  Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST.
- **Quiet Boot**
  Allows you to determine whether to display the GIGABYTE Logo at system startup.
- **Boot mode select**
  Selects the boot mode. Options are LEGACY/UEFI.
- **Boot Option #1/2/3/4/5/6/7/8/9**
  Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

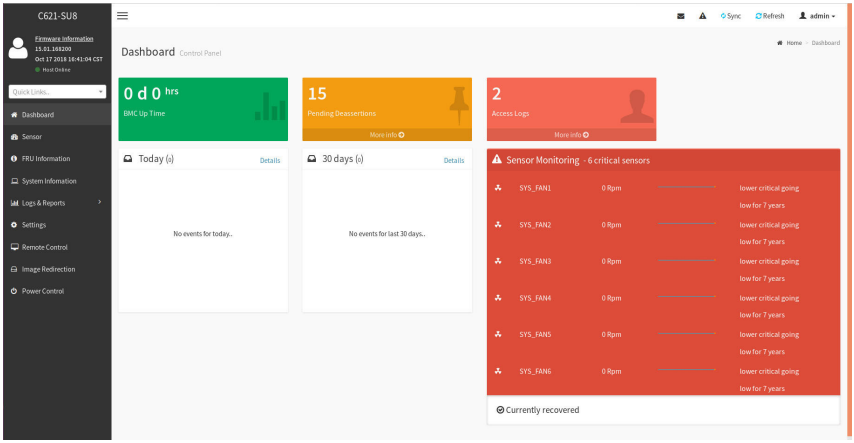
2-9 Save & Exit



- **Save Changes and Exit**
  Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Discard Changes and Exit**
  Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Save Changes and Reset**
  Press <Enter> on this item and select **Yes** to save the changes to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu. Reboot the system after saving the changes.
- **Discard Changes and Reset**
  Press <Enter> on this item and select **Yes** to cancel the BIOS changes. Select **No** or press <Esc> to return to the BIOS Setup Main Menu. Reboot the system without saving any changes.
- **Save Changes**
  Press <Enter> on this item and select **Yes** to save the changes to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Discard Changes**
  Press <Enter> on this item and select **Yes** to cancel the BIOS changes. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Restore Defaults**
  Press <Enter> on this item and select **Yes** to load the BIOS factory default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.
- **Save as User Defaults**
  Save to current BIOS settings as user-defined default settings.
- **Restore User Defaults**
  Load the user-define default settings for all BIOS options.
- **Boot Override**
  Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

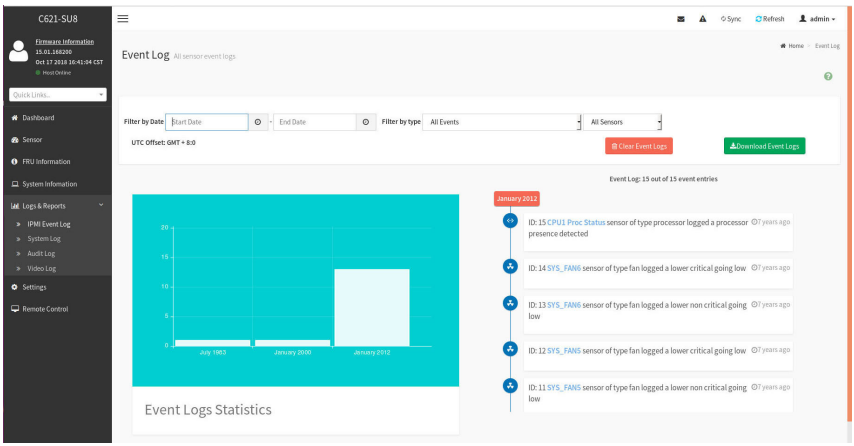
Chapter 3 Application

Dashboard



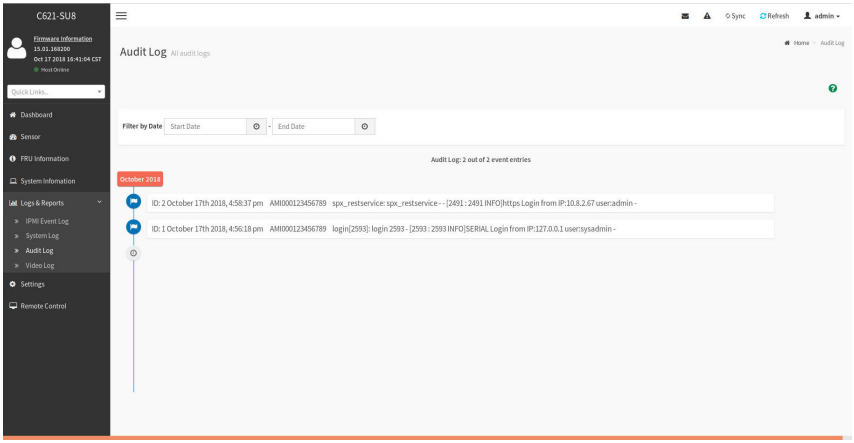
This page shows the summary monitoring information of the board.

Dashboard- Event Log



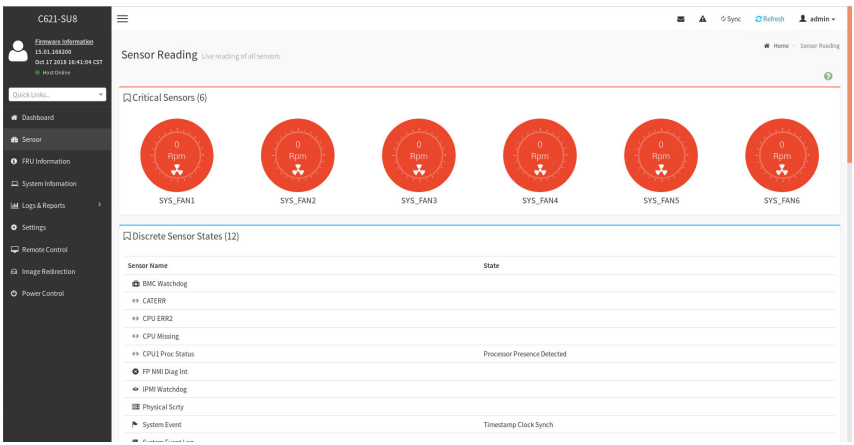
This page displays the list of events incurred by the different sensors on this device. Click on a record to see the details of that entry. With your cursor, hover over the graph to view the number of events by date. You can also select between BMC or Client Time zone. You can use the date range, sensor type, or sensor name filter options to view those specific events. Click **Clear Event Logs** option to delete all existing records for all sensors. Click **Download Event Logs** option to download the logs in a text file format.

Dashboard- Audit Log



This page displays audit events for this device (if configured).
Note: For configuration, go to "Settings/Log Settings/Advanced Log Settings."

Sensor

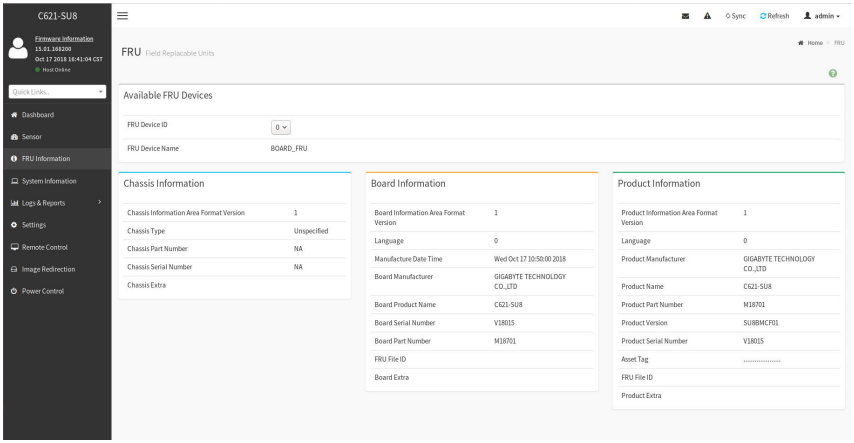


On this page, details for all the available sensors e.g. Name, Type, Status, Current Reading and Behavior are displayed The sensor readings are available for Temperature, Fan, Watchdog and Voltage Sensors as well as for supported Discrete Sensors. This page will refresh automatically with the latest data retrieved from the database. Please note that there may be some delay in retrieving this live data. Sensors are organized by their Type and State (Critical, Discrete, Normal and Disabled).

Sensor Details

Click on any sensor to view more information about it. For each sensor, thresholds (if supported) and graphical representation of all associated events (read-only) are shown. If you select a sensor from the Normal Sensors sections, a Live Widget is also displayed showing its behavior over time.

FRU Information



This page displays Basic Information, Chassis Information, Board Information, and Product Information for the BMC's FRU devices.

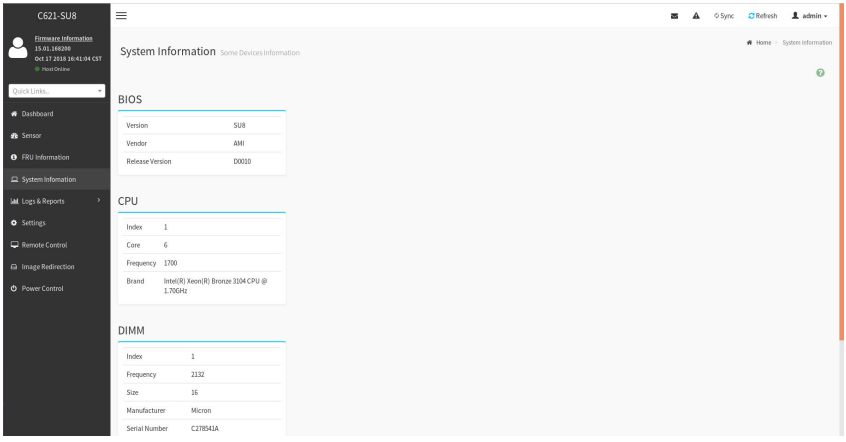
FRU Device ID

Select a FRU Device ID from the drop-down list to view the details of that device.

FRU Device Name

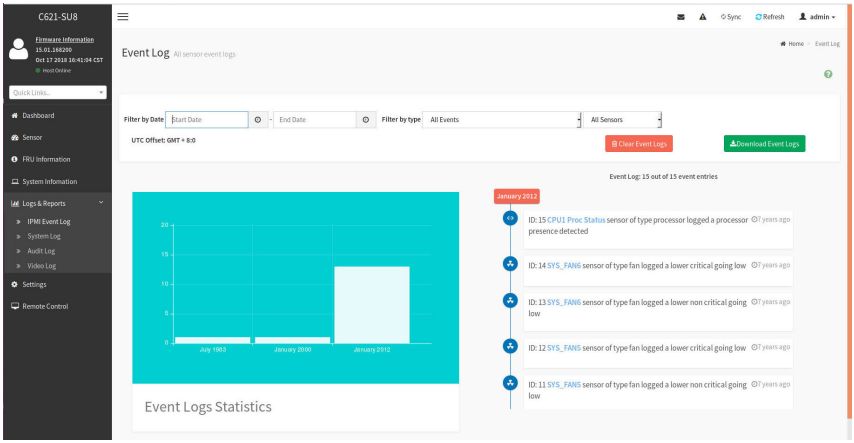
The device name of the selected FRU will be displayed.

System Information



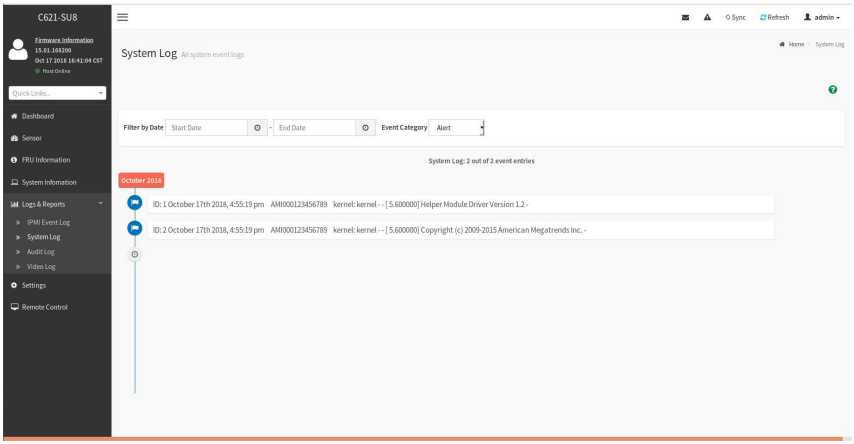
The BIOS, CPU and DIMM Device information list.

Logs & Reports- IPMI Event Log



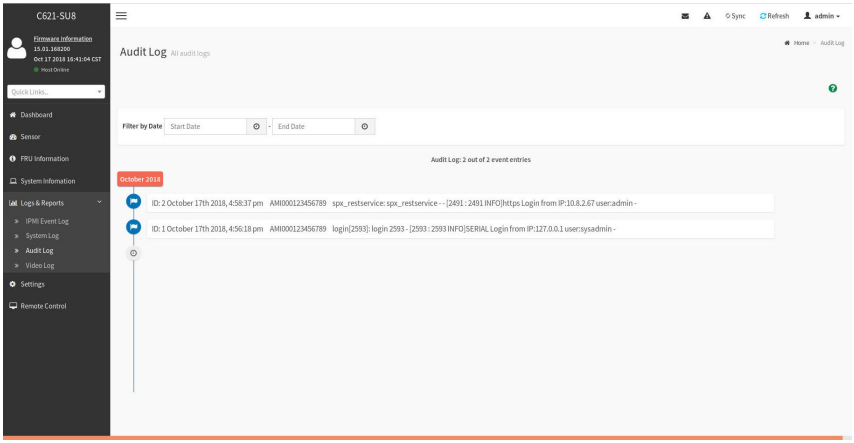
This page displays the list of events incurred by the different sensors on this device. Click on a record to see the details of that entry. With your cursor, hover over the graph to view the number of events by date. You can also select between BMC or Client Time zone. You can use the date range, sensor type, or sensor name filter options to view those specific events. Click **Clear Event Logs** option to delete all existing records for all sensors. Click **Download Event Logs** option to download the logs in a text file format.

Logs & Reports- System Log



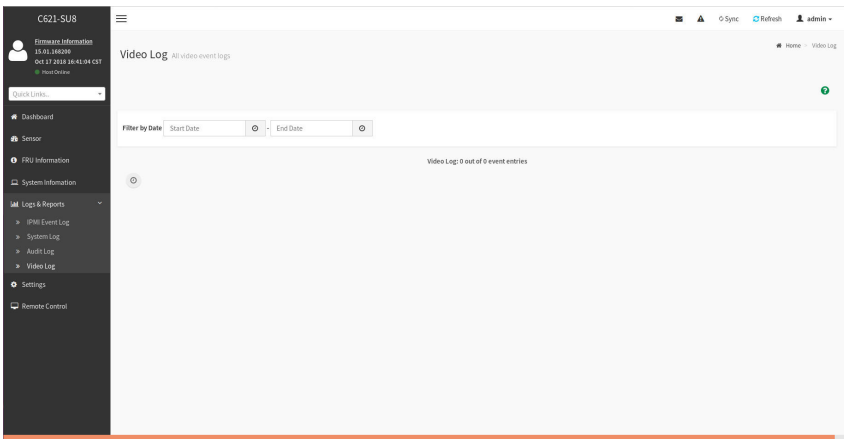
This page displays logs of system events for this device (if the options have been configured).
Note: Logs must be configured under "Settings/Log Settings/Advanced Log Settings" to display any entries. Filtering options are also available for this and all logs in this section.

Logs & Reports- Audit Log



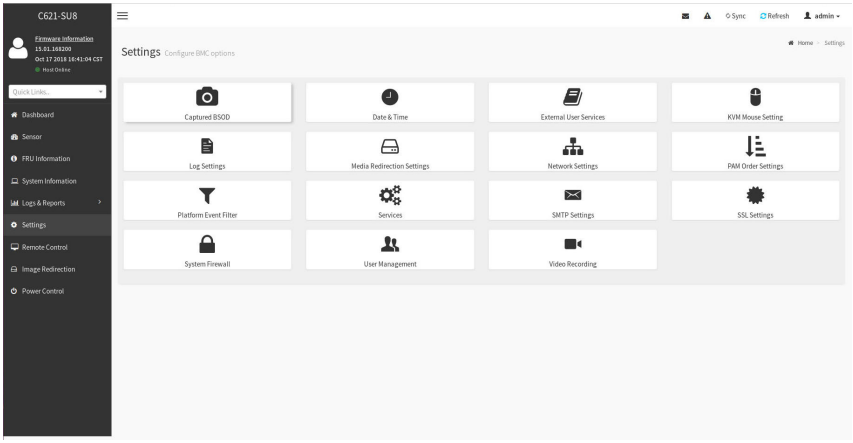
This page displays audit events for this device (if configured).
Note: For configuration, go to "Settings/Log Settings/Advanced Log Settings."

Logs & Reports- Video Log



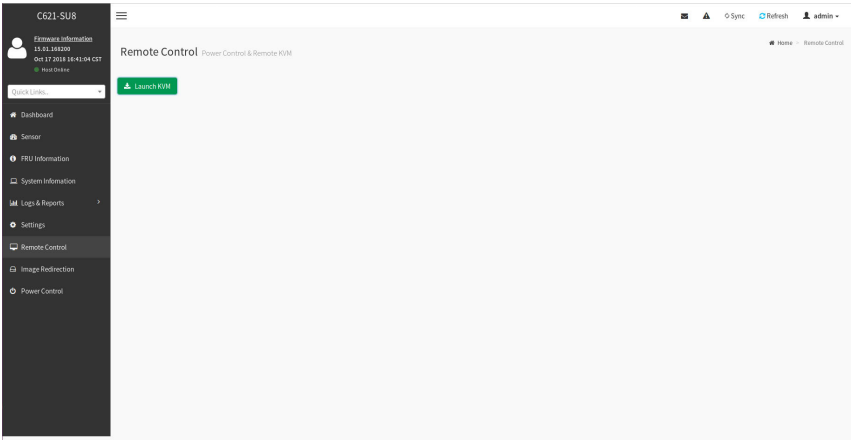
This page displays available recorded video files (if the options have been configured).
Note: For configuration, go to "Settings/Video Recording/Auto Video Settings/Video Trigger Settings."

Settings



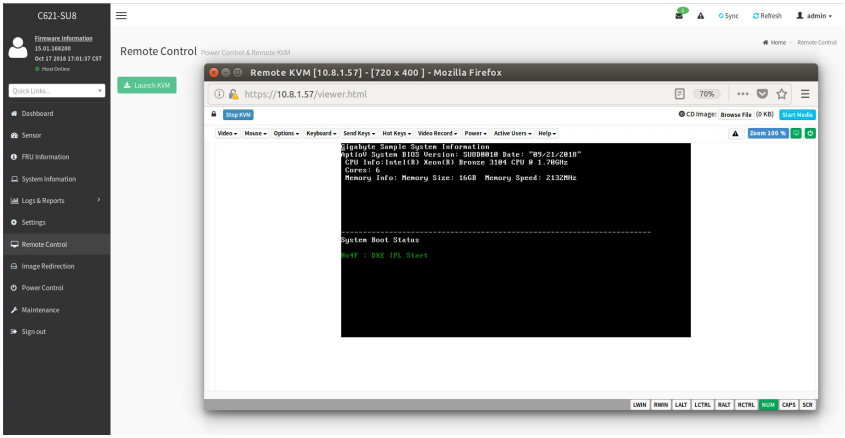
This page allows you to configure BMC options. The options are: Captured BSOD, Date & Time, External User Services, KVM Mouse Setting, Log Settings, Media Redirection Settings, Network Settings, PAM Order Settings, Platform Event Filter, Services, SMTP Settings, SSL Settings, System Firewall, User Management, and Video Recording.

Remote Control



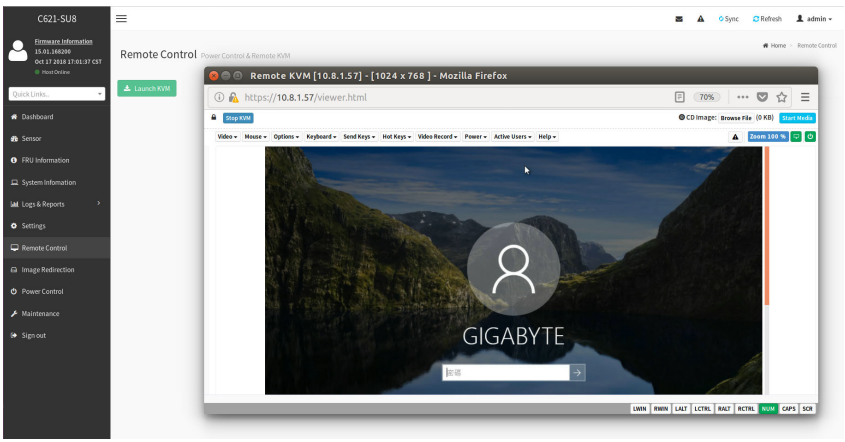
On this page, you can remote control your host system on BIOS Setup or Operating System.

Remote Control- Example 1



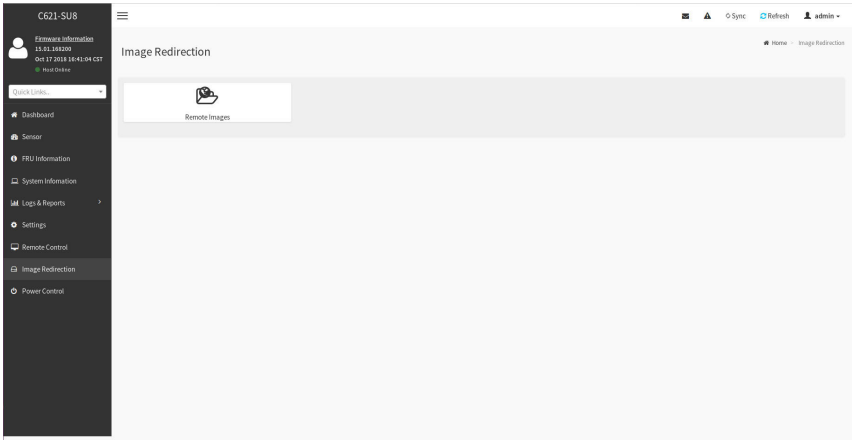
This page shows the BIOS Setup settings.

Remote Control- Example 2



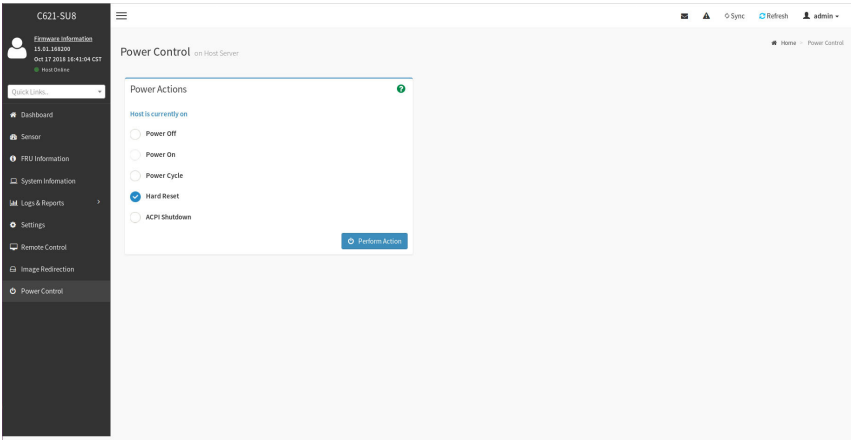
This page shows the operating system settings.

Image Redirection



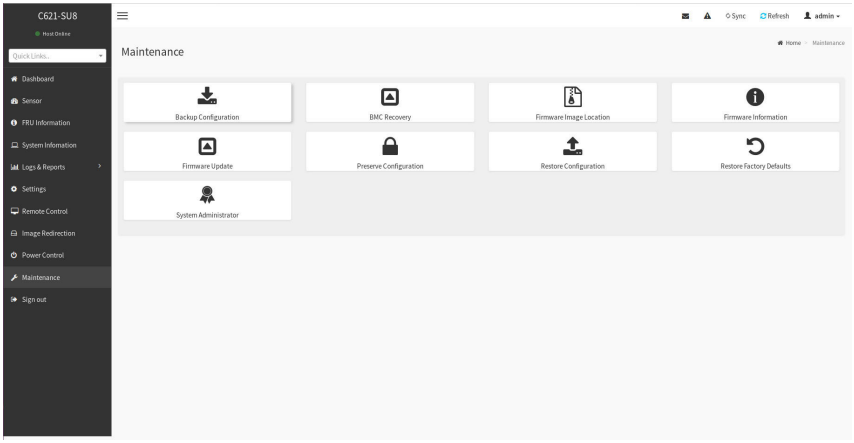
The displayed table shows remote images available to the BMC. You can start redirection or clear the images from here. Up to 4 images can be added for each image type, depending on your configuration.

Power Control



On this page, you can remote control the power of your host system.

Maintenance



This page allows you to configure BMC options. The options are Backup Configuration, BMC Recovery, Firmware Image Location, Firmware Information, Firmware Update, Preserve Configuration, Restore Configuration, Restore Factory Defaults, and System Administrator.

Regulatory Statements

Regulatory Notices

This document must not be copied without our written permission, and the contents there of must not be imparted to a third party nor be used for any unauthorized purpose.
Contravention will be prosecuted. We believe that the information contained herein was accurate in all respects at the time of printing. GIGABYTE cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by GIGABYTE.

Our Commitment to Preserving the Environment

In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement



The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

Battery Information

European Union—Disposal and recycling information
GIGABYTE Recycling Program (available in some regions)



This symbol indicates that this product and/or battery should not be disposed of with household waste. You must use the public collection system to return, recycle, or treat them in compliance with the local regulations.

Contact Us

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- **GIGABYTE eSupport**

  To submit a technical or non-technical (Sales/Marketing) question, please link to:
  https://esupport.gigabyte.com

