AXIOMTEK

NA860

Network Appliance

User's Manual

RoHS

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

Safety Approvals

◆ CE Marking

◆ FCC Class A

◆ **FCC Compliance**

This equipment has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measurers:

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult the dealer or an experienced radio/TV technician for help.

■ Shielded interface cables must be used in order to comply with emission limits.

Safety Precautions

Before getting started, read the following important cautions.

1. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.

2. Disconnect the power cords from the NA860 Series before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the NA860 Series is properly grounded.

3. Do not open the system's top cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

    ■   Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.

    ■   When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

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Table of Contents

Chapter 1
Introduction

This chapter contains general information and detailed specifications of the NA860 Series Network Appliance Server. It contains the following sections:

- General Description
- Features
- Specifications
- Dimensions and Outlines
- I/O Outlets

1.1   General Description

The NA860 is a 2U rack mountable network security hardware platform for VPN, firewall and other network security applications. It supports next generation Intel$^®$ dual LGA3647 Socket Intel Skylake sever processors and Intel$^®$ C62x chipset with twelve DDR4 2400 RDIMM memory up to 384GB.

For storing event log data, the NA860 utilizes two 2.5" SATA HDD. For greater flexibility and easier maintenance, the NA860 has eight front-accessible expansion slots that allow developers to configure different LAN modules based on their solution requirements.

The NA860 is designed especially for enterprise sized business. NA860 not only provides high performance processor, memory, storage interface and LAN connection, but also includes outstanding management capability.

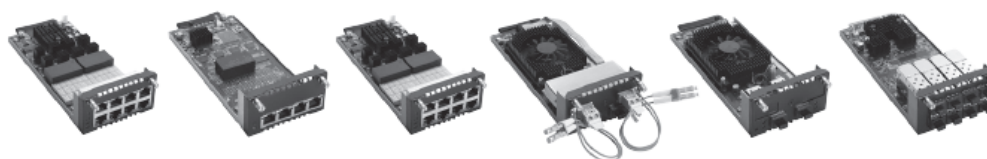## 1.2   Features

- **Intel® Dual Xeon processor Scalable Family (Skylake-SP)   Socket LGA3647**
- **Twelve DIMM Socket support RDIMM DDR4 2400 max up to 384GB.**
- **Supports eight LAN modules expansion**
- **Supports BIOS redirected to COM port**
- **Supports two 2.5" SATA HDD (hot swappable)**
- **Suitable for VPN, network bandwidth controller, firewall applications**
- **Supports redundant power**

1.3 Specifications

System

- **System CPU**
  - Intel Dual ® Xeon® Processor Scalable Family (Skylake-SP)
- **System Chipset**
  - Intel® C621

- **System Memory**
  - Twelve DIMM Socket support DDR4 RDIMM 2400 max up to 384GB.

- **BIOS**
  - AMI 256Mbit PnP Flash BIOS with function of BIOS redirected to COM port

- **HDD Tray**
  - Two 2.5" Trays for SATA HDD, support hot swappable.

- **LAN**
  - The default is two 10/100/1000Mbps LAN ports(Intel® i210AT) Expandable up to 66 LAN ports via 8 expendable LAN modules (Dual CPUs only).

- **LAN module**

Slim Module	Ports	Ethernet Controller	LAN Bypass	NA860	NA850	NA720	NA580	NA570	NA552	NA362R	NA361R
40GbE Fiber Modules											
AX93331-2QFI	2	Intel® XL710	0	√	√	√	√	√	√	√	√
25GbE Fiber Modules											
AX93332-25FI	2	Intel® XXV710	0	√	√	√	√	√	√	√	√
10GbE Fiber Modules											
AX93307-2FI	2	Intel® 82599ES	0	√	√	√	√	√	√	√	√
AX93307-2FIL	2	Intel® 82599ES	1	√	√	√	√	√	√	√	√
AX93327-4FI	4	XL710	0	√	√	√	√	√	√	√	√
10GbE Copper Modules											
AX93317-2GIL	2	Intel® X540	1	√	√	√	√	√	√	√	√
GbE Mix Modules											
AX93322-8MIL	8	Intel® 82580EB	2	√	√	√	√	√	√	√	√
GbE Fiber Modules											
AX93322-8FI	8	Intel® 82580EB	0	√	√	√	√	√	√	√	√
AX93336-4FI	4	Intel® i350	0	√	√	√	√	√	√	√	√
GbE Copper Modules											
AX93316-8GI	8	Intel® 82580EB	0	√	√	√	√	√	√	√	√
AX93316-8GIL	8	Intel® 82580EB	4	√	√	√	√	√	√	√	√
AX93326-8GIL	8	Intel® i210	4	√	√	√	√			√	√
AX93336-4GIL	4	Intel® i350	2	√	√	√	√	√	√	√	√
AX93336-4GI	4	Intel® i211	0	√	√	√	√	√	√	√	√

> *Limitation: Single CPU only supports 4 LAN modules (Slot 1~4)*

Note: NA860 can support total 8 slots of LAN module, but for LAN Bypass feature can be supported 5 slots only.

- **SSD**
  - 1 x mSATA
  - 2 x 2.5HDD hot swappable

- **I/O Interface**
  - AX93341:One console RJ-type connector, Two USB3.0 connectors and 2 gigabyte LAN ports ,1 x 4 LED for Power、HDD、GPIO1/GPIO2,TACT switchx1 (Default is HW reset)
  - 8 x LAN modules (optional)up to 66 LAN ports (Dual CPUs only)
  - 1X LCM module

- **Watchdog Timer**
  - One for System Reset: 255 levels, 1-255 sec
  - LAN bypass: 7 levels, 1-64 sec for each slot

    Note: NA860 can support total 8 slots of LAN module, but for LAN Bypass feature can be supported 5 slots only.

- **Hardware Monitoring**
  - Controller Nuvoton NCT6102D & NCT7802Y
  - CPU temperature, system temperature, power and fan speed detection

- **Expansion Slot**
  - One PCI Express Mini Card socket
  - Two PCI Express*8 Slot through AX96709 riser card(optional)
- **Graphics**
  - One VGA port

- **Power Supply**
  - 800W Redundant Power Supply

- **OS Compatibility**
  - Linux Kernel

Mechanical/Environmental

- **Form Factor**
  - 2U rack mount

- **LED**
  - Power, HDD, GPIO LEDs and LAN bypass LEDs depend on LAN module.

- **Operation Temperature**
  - 0°C ~ 40°C (32°F ~ 104°F)

- **Humidity**
  - 10% - 95% RH, non-condensing

- **Chassis Material**
  - Steel

- **Dimensions**
  - 88mm (3.46") (H) x 430mm (16.92") (W) x 562mm (") (D)

- **Certificate**
  - FCC class A / CE class A

*<u>Note</u>:   **All specifications and images are subject to change without notice.***

1.4   Dimensions and Outlines

The following diagram shows you dimensions and outlines of the NA860 Series.
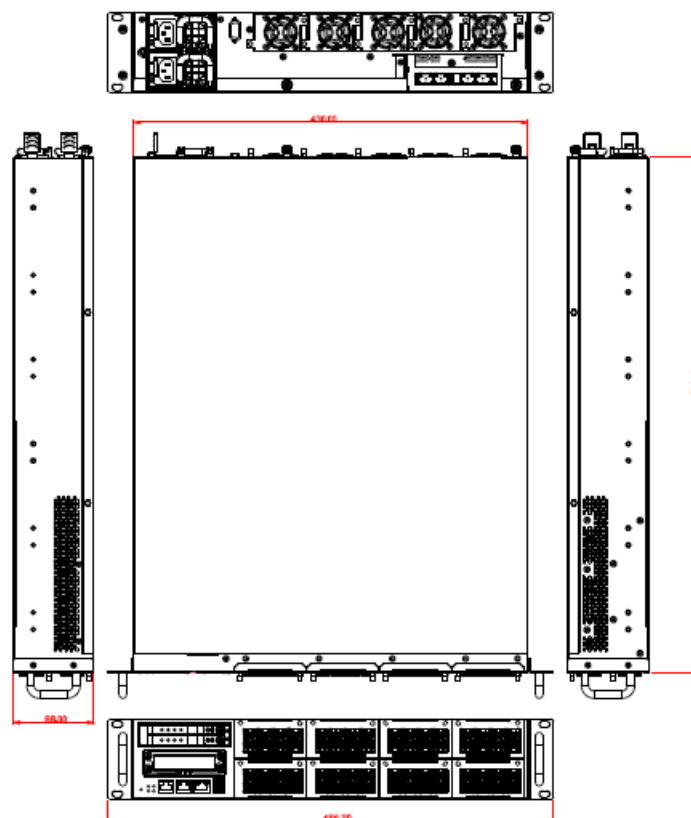
Default: 2 LAN ports / Expandable up to 66 LAN ports

1.5   I/O Outlets

Locate front and rear panel I/O outlets on the NA860 Series server to connect serial and Ethernet interface devices.

1.5.1   Front Panel

LCM   USB3.0   LAN modules

Console

2x2.5 HDD   2xMgmt port

Front Side I/O   2.5" HDD Tray(2in1)   Slot-5   Slot-6   Slot-7   Slot-8

LCM + Key Pad

Power /GPO LED1
HDD /GPO LED2

Slot-1   Slot-2   Slot-3   Slot-4

Reset Tact Switch   Console   LAN1/2   USB 0/1
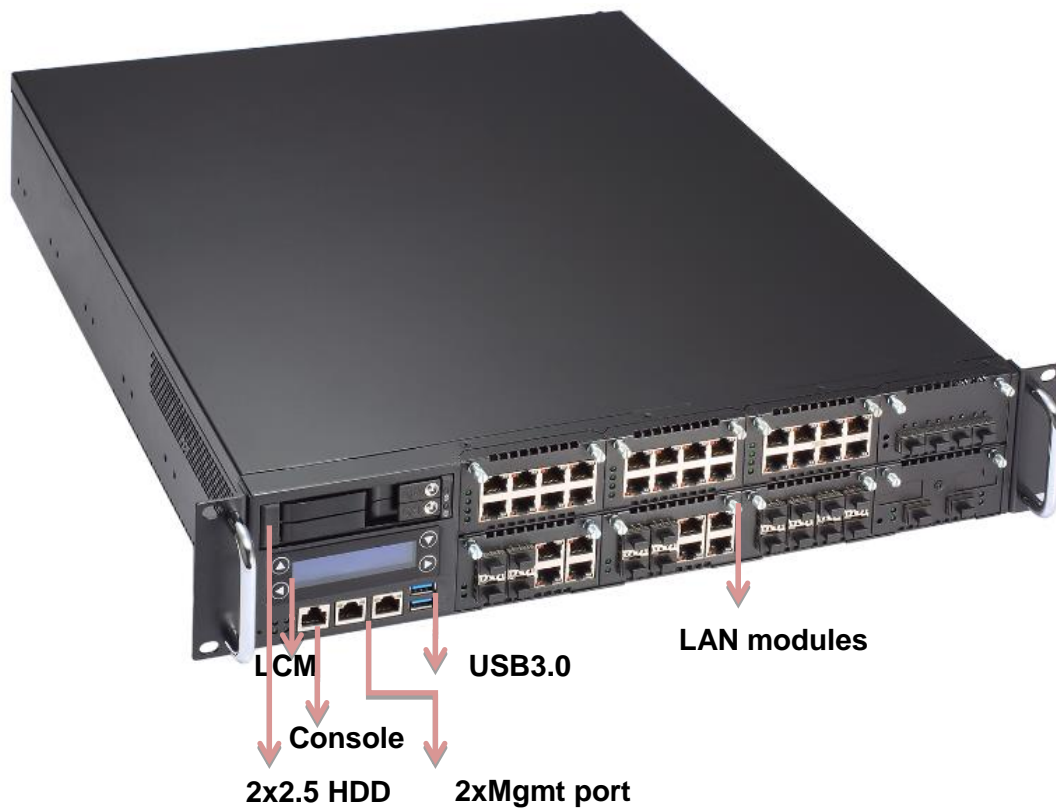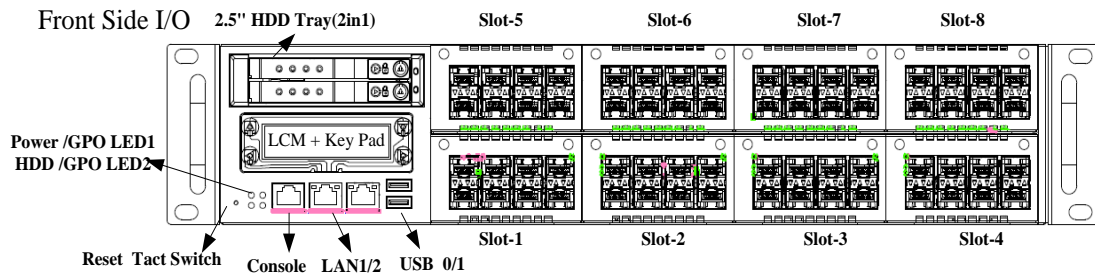
- ● **GPIO LEDs (Green)**

  The GPIO1 and GPIO2 LEDs are controlled by programmable GPIO. A sample code will be provided that allow users to define their own function.

- ● **HDD LED (Green)**

  LED flashes when HDD is transmitting or receiving data.

- ● **Power LED (Green)**

  LED flashes when the server is powered on to perform diagnostic tests and proper operation checking.

- ● **Console Port**

  This is a RJ-type connector console port for command line interface and diagnostic support by P.O.S.T (Power On Self-Test).

- ● **USB Ports**

  Two USB 3.0 ports supported.

- ● **"Reset" Tact Switch (default)**

  It is for reset the system to reboot your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply, or GPI/power bottom by jumper setting.

- ● **Transfer Rate for LAN port**

  The double-color LED light indicates 10/100/1000Mbps transfer rate.

LED Light Color	Transfer Rate
Dark	10Mbps
Green	100Mbps
Orange	1000Mbps

- ■ If the LED is dark and Active/Link LED is lighting on flashing, the transfer rate should be 10Mbps.
- ■ When the green-color LED light is radiating, the transfer rate should be 100Mbps.
- ■ When the orange-color LED light is radiating, the transfer rate should be 1000Mbps.
- ■ When this LED and Link/Active LED both are dark, no networking devices are attached.

● **Active/Link LED for LAN Port**
   ■ The orange LED is on when the LAN port connection is working.
   ■ The LED flashes when transmitting or receiving any signals to or from the appliance.
   ■ The LED is dark when the appliance is off.

Note: ***Optional LAN module LED definition in Appendix C.***

1.5.2   Rear Panel

Rear Side I/O
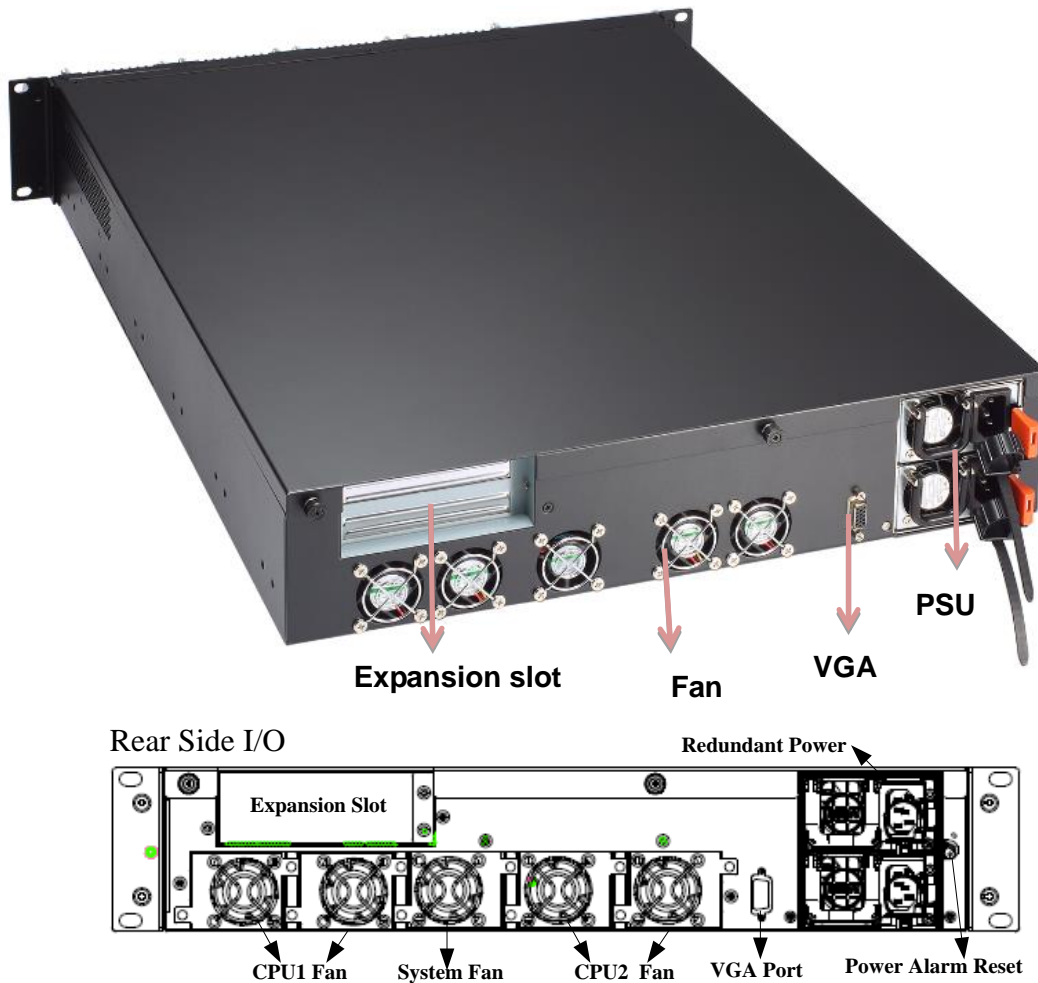
- ● **Power Supply**
  Redundant power supply; use power cord to connect this power supply to electrical outlet (AC)and also provide an alarm reset for power supply, when one of power has damage.

- ● **Power Alarm Reset**
  Alarm reset is used to clear fail status by shorting circuit activities.
  Buzzer should alarm if signal goes low.

- ● **VGA**
  This is a standard D-Sub connector commonly used for VGA display.

- ● **CPU & System Fan**
  These are fans for cooling down system& CPU temperature.

- ● **Expansion Slot**(optional)
  Through AX96709 rise card can support 2x PCIEx8 slot.

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Chapter 2
Hardware and Installation

The NA860 Series are convenient for your various hardware configurations. This chapter will help you get familiar with the hardware.

2.1   Check List

The package bundled with your NA860 Series should contain the following items:

● **The NA860 Series network appliance hardware platform**
● **Power cord x2 (redundant power 1+1)**
● **Mounting brackets for rack installation (left/right) x 2**
● **Screw for mounting bracket x4**
● **Plastic stand for stack–up x 4**
● **Console cable (RJ-type connector) x 1 for optional**
● **Passive CPU heat sink x2**
● **Processor Clip x2**

If you cannot find this package or any items are missing, please contact Axiomtek distributors immediately. If you order any optional components, the package might contain those additional hardware or documents accordingly.

2.2   Board Layout

TOP
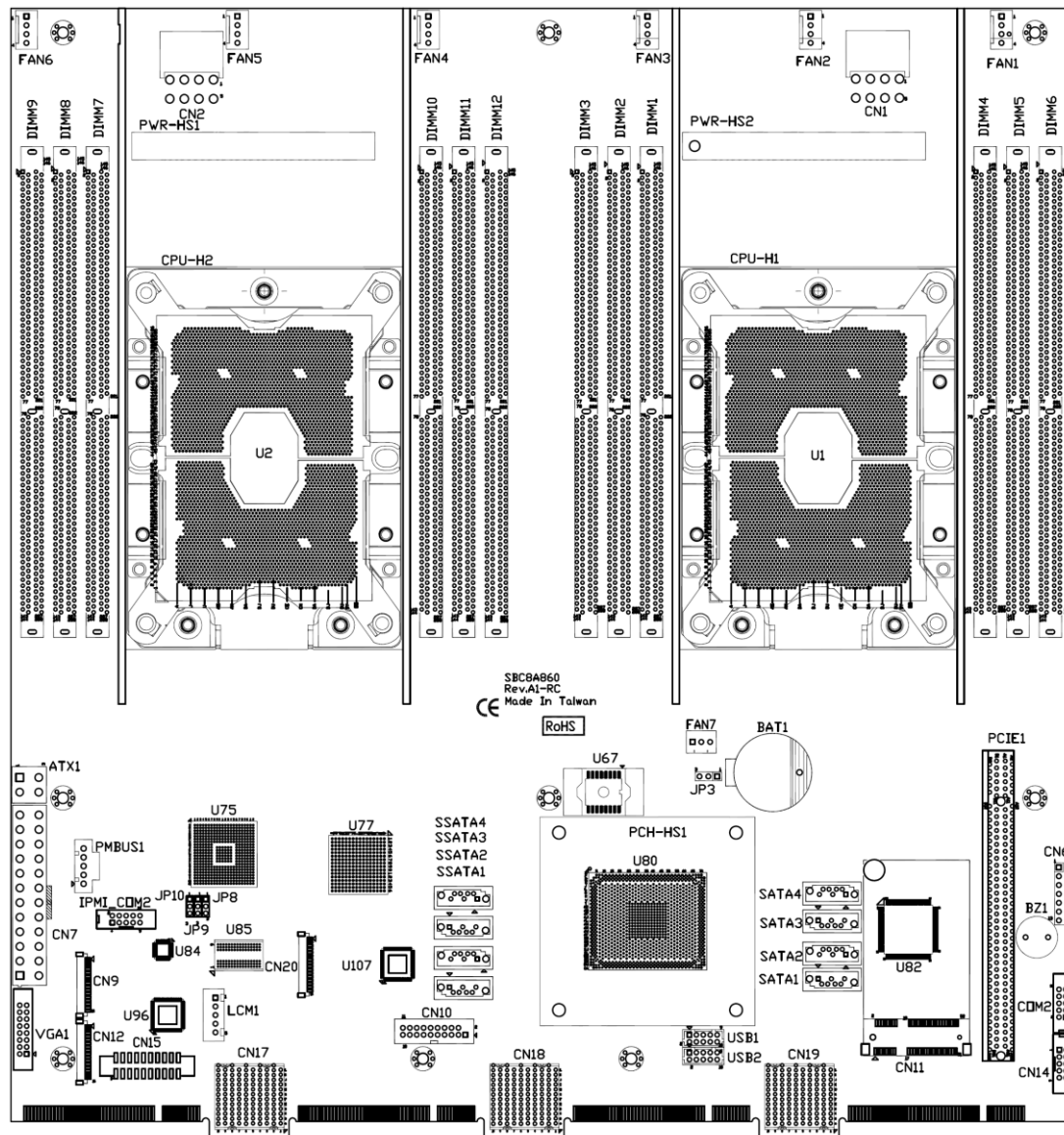
BOTTOM
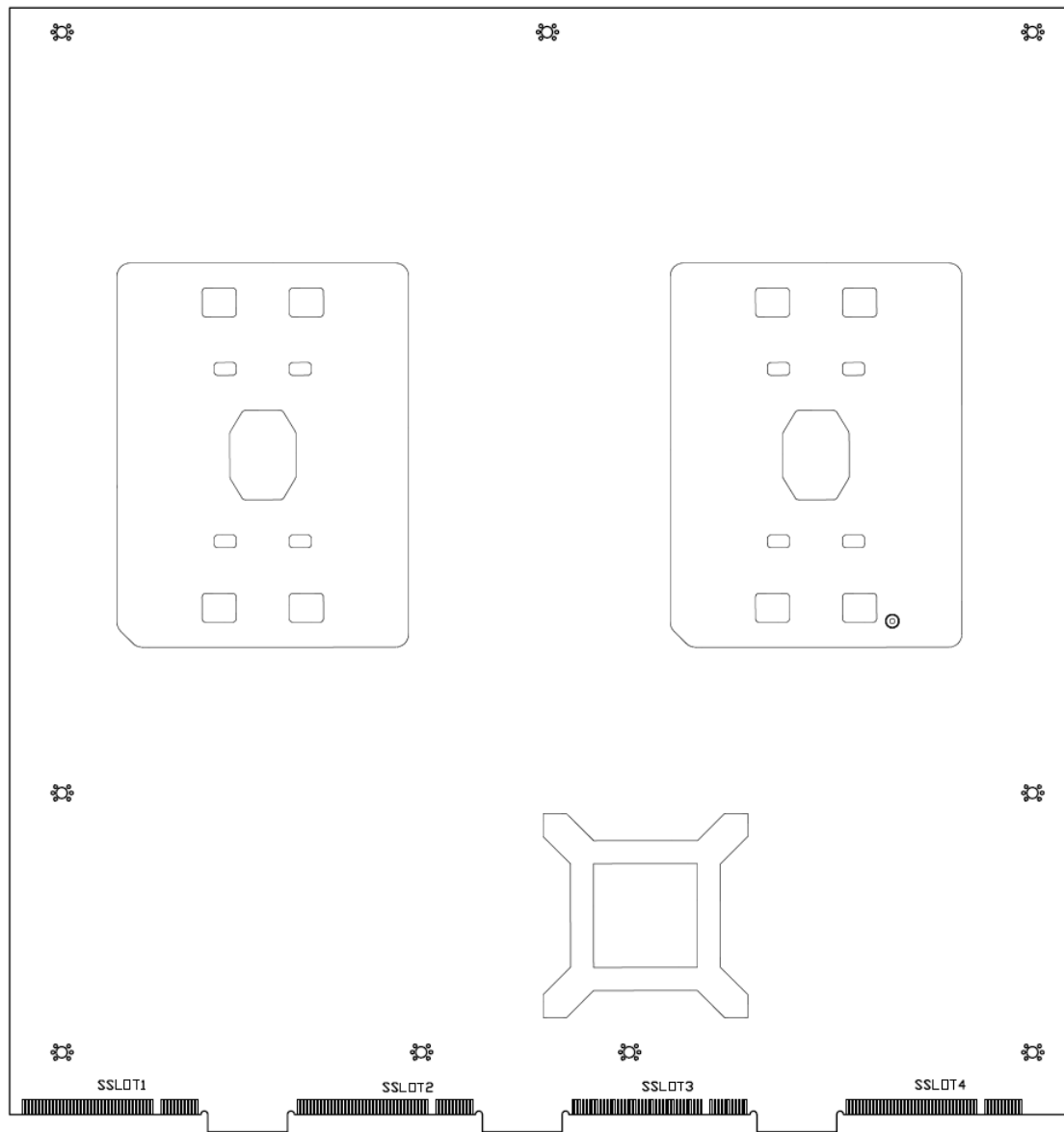
2.3   Jumper Settings for SBC8A860

Jumper is a small component consists of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.
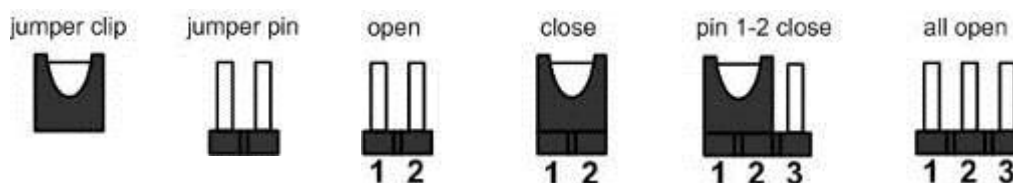
This section provides the information about jumpers and connectors of NA570 Series. Properly configure jumper settings on the main board in this appliance to meet your application purpose. Below we list a summary table of all jumpers and default settings for onboard devices.

Jumper	Definition	Jumper Setting
JP3	Clear CMOS Setting	1-2 : Normal (Default)
		2-3 : Clear CMOS

2.3.1   CMOS Clear Jumper (JP3)

Use this jumper to erase and restore CMOS memory and BIOS setting. Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. By doing this procedure CMOS data resets to its safe default settings.

Description	Function	Jumper Setting
COMS Clear	Normal (Default)	
	Clear CMOS	

2.4 Jumper Settings for AX93341

Jumper is a small component consists of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.
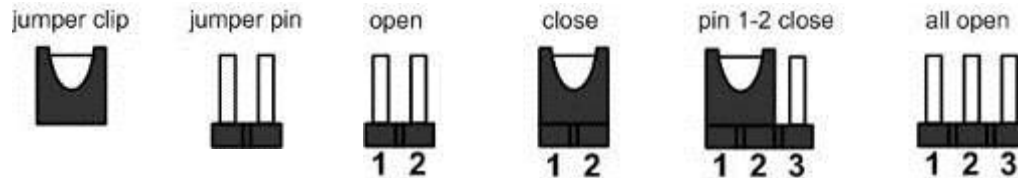
This section provides the information about jumpers and connectors of NA570 Series. Properly configure jumper settings on the main board in this appliance to meet your application purpose. Below we list a summary table of all jumpers and default settings for onboard devices.

Jumper	Definition	Jumper Setting
JP1	TACT Switch(Down) Selection	1-2：Power button 3-4：Reset(Default) 5-6：GPIO

2.4.1 TACT Switch Selection (JP1)

Description	Function	Jumper Setting
TACT Switch(Down) Selection	Power button	
	Reset(Default)	
	GPIO	

2.5   Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connectors	Label
FAN Connector	FAN1~6
ATX +12V CPU Power Connector	CN1,CN2
Front Panel Bezel Connector	CN6
ATX Power Connector	CN7
LAN Connector optional for IPMI Management port	CN9
Mini PCIe Card Connector(Full)	CN11
LAN Connector(for I210 port)	CN12,CN20
General Purpose Input / Output Connector	CN14
I/O board connector (for AX93341)	CN15
LAN Connector(for I210 port1)	CN20
VGA Connector	VGA1
LCM Connector	LCM1
Serial Port Connector for optional(for BMC)	IPMI_COM2
Serial Port Connector(for Super I/O)	COM2
USB2.0 Connector	USB1,USB2
Serial ATA Connector	SSATA1~4
Serial ATA Connector	SATA1~4
PCIeX16 Gen3 connector	PCIE1
DDR4 DIMM Socket	DIMM1~12
ATX 4 Pin 12V In Connector	ATX1
PMBUS connector	PMBUS1

2.5.1   FAN Connector (FAN1~FAN6)

The system fan connector FAN1~FAN6

Pin	Signal
1	GND
2	+12V
3	SENSOR
4	CONTROL

FAN1~FAN6

2.5.2   ATX +12V CPU Power Connector (CN1、CN2)

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

CN1/CN2
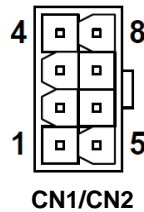
2.5.3   Front Panel Bezel Connector (CN6)
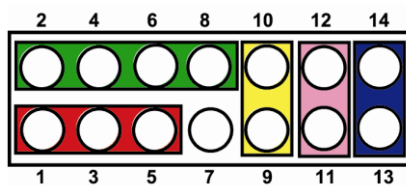
Power LED：
This 3-pin connector (Pin 1, 3, 5) connects a LED indicator to the system power switch on the case. Pin 1 is assigned as +, and Pin 3, Pin 5 as -. The Power LED lights up when the system is powered ON.

External Speaker and Internal Buzzer Connector：
This 4-pin connector (Pin 2, 4, 6, 8) can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

ATX Power On/Off Button：
This 2-pin connector (Pin 9, 10) connects the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

System Reset Switch：
This 2-pin connector (Pin 11, 12) can be connected to the case-mounted reset switch that reboots your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

HDD Activity LED：
This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. The 2-pin connector (Pin 13, 14) connects the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.5.4 ATX Power Connector (CN7)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector.

Pin	Signal	Pin	Signal
1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PWR_OK
9	5VSB	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	GND	16	PS_ON
17	GND	18	GND
19	GND	20	-12V
21	+5V	22	+5V
23	+5V	24	GND

CN7

2.5.5　　　LAN Connector(CN9)

The IPMI Management port pin assignments are listed on the following table.

Pin	Signal
1	1000M speed signal
2	100M speed signal
3	Ground (GND)
4	MDI3-
5	MDI3+
6	MDI2-
7	MDI2+
8	MDI1-
9	MDI1+
10	MDI0-
11	MDI0+
12	Ground (GND)
13	3.3V standby power
14	LINK signal
15	3.3V main power
16	Ground (GND)

CN9

2.5.6 MINI PCIe SLOT (CN11)

A PCI-Express Mini Card can be applied to either m-SATA and USB 2.0.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	Ground (GND)
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	Ground (GND)	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	Ground (GND)	16	No use
17	No use	18	Ground (GND)
19	No use	20	W_DISABLE#
21	Ground (GND)	22	PERST#
23	PE_RXN3	24	+3.3VSB
25	PE_RXP3	26	Ground (GND)
27	Ground (GND)	28	+1.5V
29	Ground (GND)	30	SMB_CLK
31	PE_TXN3	32	SMB_DATA
33	PE_TXP3	34	Ground (GND)
35	Ground (GND)	36	USB_D3-
37	Ground (GND)	38	USB_D3+
39	+3.3VSB	40	Ground (GND)
41	+3.3VSB	42	LED_WWAN#
43	Ground (GND)	44	LED_WLAN#
45	No use	46	LED_WPAN#
47	No use	48	+1.5V
49	No use	50	Ground (GND)
51	No use	52	+3.3VSB
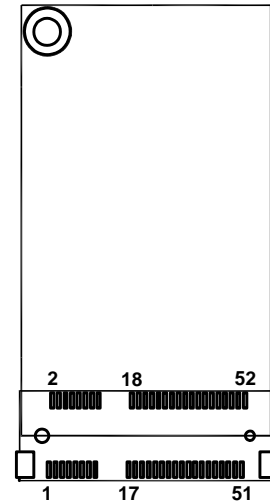
CN11

2.5.7 LAN Connector (CN12)

The I210 Management port pin assignments are listed on the following table.

Pin	Signal
1	1000M speed signal
2	100M speed signal
3	Ground (GND)
4	MDI3-
5	MDI3+
6	MDI2-
7	MDI2+
8	MDI1-
9	MDI1+
10	MDI0-
11	MDI0+
12	Ground (GND)
13	3.3V standby power
14	LINK signal
15	3.3V main power
16	Ground (GND)

CN12

2.5.8 Digitial Input/Output Connector (CN14)

The board is equipped with an 8-channel digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals.

Pin	Signal
1	Ground (GND)
2	Ground (GND)
3	SIO_GPIO7
4	SIO_GPIO3
5	SIO_GPIO6
6	SIO_GPIO2
7	SIO_GPIO5
8	SIO_GPIO1
9	SIO_GPIO4
10	SIO_GPIO0

CN14
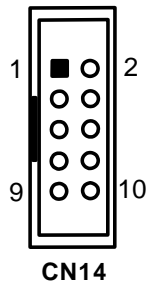
2.5.9 I/O board connector (CN15)

The I/O board connector assignments are listed on the following table.

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	GPO1 signal
3	Receive Date(RXD)	4	GPO2 signal
5	Transmit Data(TXD)	6	S3 signal
7	Data Terminal Ready(DTR)	8	3.3V main power
9	5V standby power	10	Ground (GND)
11	Data Set Ready(DSR)	12	HDD LED signal
13	Request to Send(RTS)	14	Power button signal
15	Clear to Send(CTS)	16	Reset signal
17	Ring Indicator(RI)	18	GPI signal
19	Ground (GND)	20	Ground (GND)

CN15
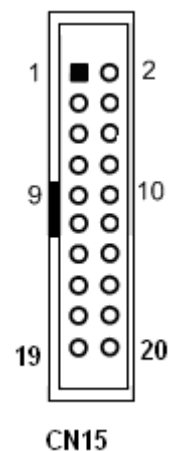
2.5.10   LAN Connector (CN20)

The I210 Management port pin assignments are listed on the following table.

Pin	Signal
1	1000M speed signal
2	100M speed signal
3	Ground (GND)
4	MDI3-
5	MDI3+
6	MDI2-
7	MDI2+
8	MDI1-
9	MDI1+
10	MDI0-
11	MDI0+
12	Ground (GND)
13	3.3V standby power
14	LINK signal
15	3.3V main power
16	Ground (GND)

CN20

2.5.11 VGA Connector (VGA1)

The board supports CRT/ VGA with a 15-pin D-Sub connector for the CRT VGA display.

Pin	Signal
1	VGA_R
2	CRT_DETECT
3	VGA_G
4	NC
5	VGA_B
6	GND
7	VCC +5V
8	VGADDCDATA
9	GND
10	GND
11	GND
12	DAC_L_HSYNC
13	GND
14	DAC_L_VSYNC
15	VGADDCCLK
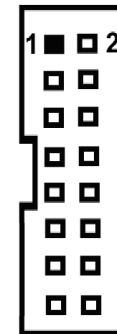
VGA1

2.5.12 LCM Power Connector (LCM1)

This is a 5-pin connector for LCM.

Pin	Signal
1	+5V
2	RX
3	N.C
4	TX
5	GND
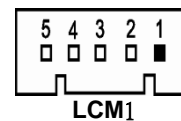
LCM1

2.5.13　　　Serial Port Connector (COM1,COM2)

The COM port pin assignments are listed on the following table.

Pin	Signal
1	Data Carrier Detect (DCD)
2	Data Set Ready(DSR)
3	Receive Date(RXD)
4	Request to Send(RTS)
5	Transmit Data(TXD)
6	Clear to Send(CTS)
7	Data Terminal Ready(DTR)
8	Ring Indicator(RI)
9	GND
10	NC

COM1,COM2
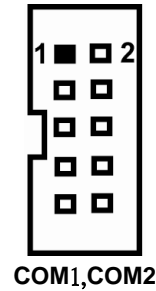
2.5.14　　　USB 2.0Connectors (USB1, USB2)

The 10-pin standard Universal Serial Bus (USB) connector on this board is for installing versatile USB interface peripherals.

Pin	Signal	Pin	Signal
1	USB_POWER	2	USB_POWER
3	USB_PN1	4	USB_PN2
5	USB_PP1	6	USB_PP2
7	GND	8	GND
9	GND	10	GND

USB1,USB2
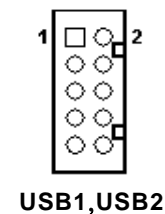
2.5.15　　　Serial ATA Connectors (SSATA1~SSATA4)

These Serial Advanced Technology Attachment (SATA) connectors are for high-speed SATA interface ports. They are computer bus interfaces for connecting to devices such as serial ATA hard disk drives. Each SATA connector supports a single SATA device.

Pin	Signal	Pin	Signal
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		
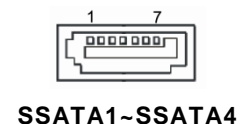
SSATA1~SSATA4

2.5.16 Serial ATA Connectors (SATA1~SATA4)

These Serial Advanced Technology Attachment (SATA) connectors are for high-speed SATA interface ports. They are computer bus interfaces for connecting to devices such as serial ATA hard disk drives. Each SATA connector supports a single SATA device.

Pin	Signal	Pin	Signal
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

SATA1~SATA4
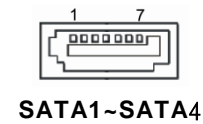
2.5.17 ATX 4 Pin 12V In Connector (ATX1)

You can connect it to the ATX12V power supply for LAN module Voltage.

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

ATX1
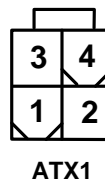
2.5.18 PMBUS Connector (PMBUS1)

The PMBUS pin assignments are listed on the following table.

Pin	Signal
1	PMBUS CLOCK
2	PMBUS DATA
3	PMBUS ALEAR
4	GND
5	N/A

PMBUS1
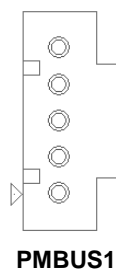
2.6   Hardware Installation

This section provides information of how to install the NA850Series.

2.6.1   Installing the CPU

Before installing the processor, please access Intel® website for more detail information of Processor Integration Video (LGA3647)**:**
https://www.intel.com.tw/content/www/tw/zh/support/articles/000023869/processors/intel-xeon-processors.html
.
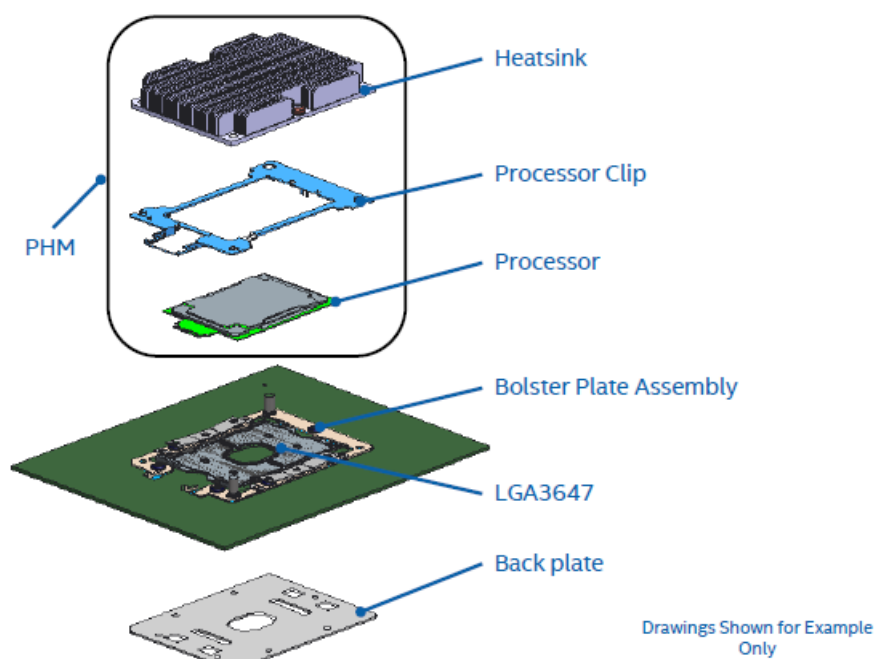
The LGA3647 processor socket comes with a cover to protect the processor. Please install the processor into the CPU socket step by step as below:

Remove the socket protective cover:

● Press the load lever and release it from the retention tab. There are two levers for each CPU socket. Follow the sequence as instructed on the right to release both of them.
● Lift the load lever and then plate
● Align the cut edge of the CPU and the notch on the socket, the CPU can fit the socket in only one direction.
● Close the plate and push the load lever to lock it back to the retention tab.

Open this lever first
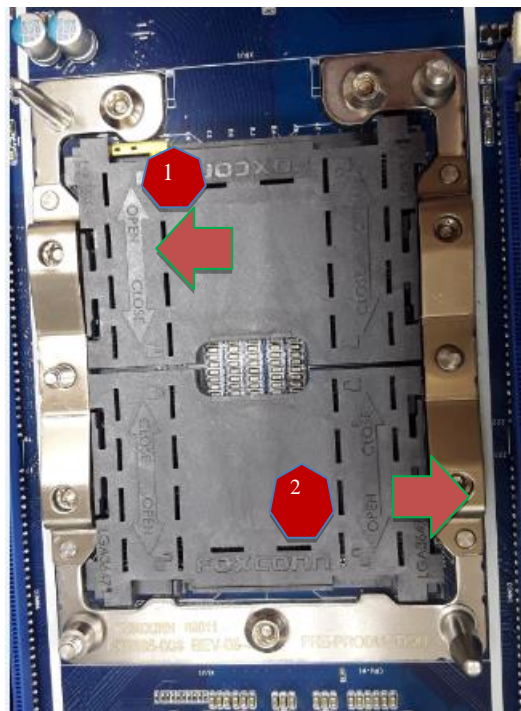
And then open
this lever
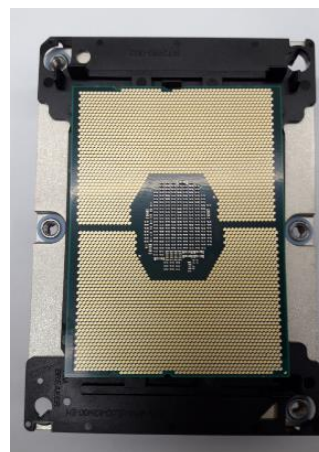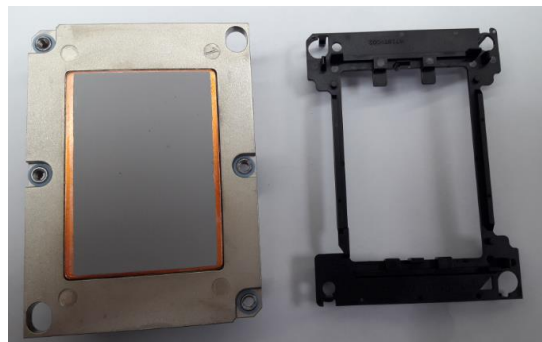
Note: **To protect the CPU socket pins,do not remove the CPU cap when the CPU is not installed.**

2.6.2   **Install the Memory**

The board supports twelve 288-pin DDR4 RDIMM memory sockets with maximum memory capacity up to 384GB.

Please follow steps below to install the memory modules:

1. Push down latches on each side of the DIMM socket.
2. Align the memory module with the socket that notches of memory module must match the socket keys for a correct installation.
3. Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.
4. Install any remaining DIMM modules.
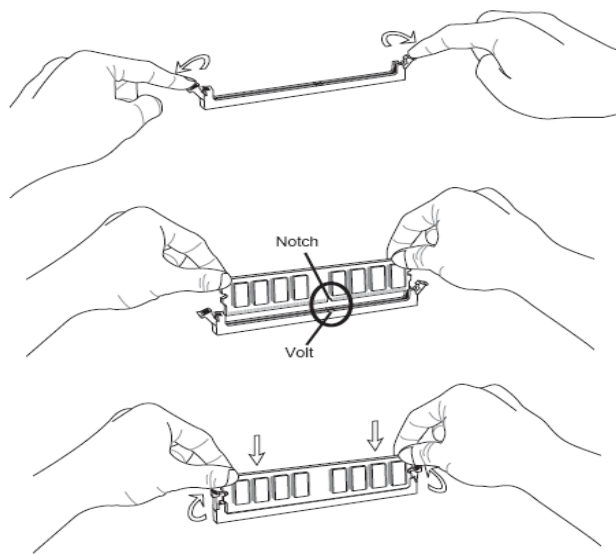
2.6.3   Install the Expansion Slot (optional)

When install the riser card, should remove the air dock's screws (CPU1) then using sticker to firm the air duck.
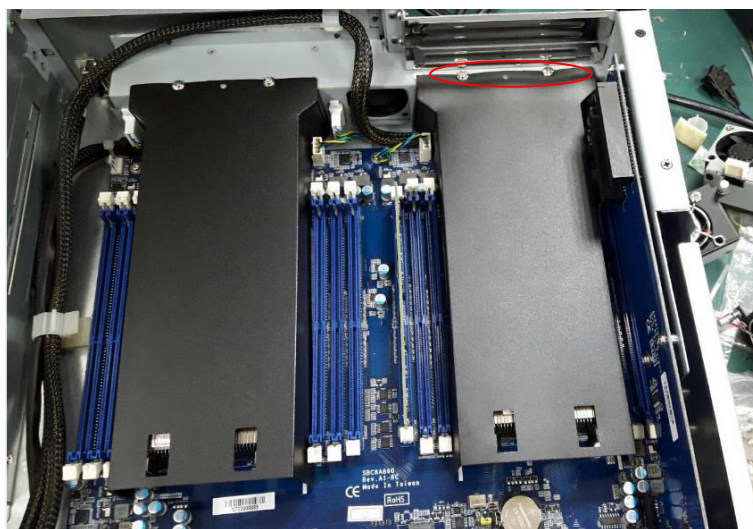
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Chapter 3
AMI BIOS Setup Utility

The AMI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

3.1   Starting

To enter the setup screens, follow the steps below:

Turn on the computer and press the<DEL> or <ESC>key immediately.
After you press the <DEL> or <ESC> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

3.2   Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

Note: Some of the navigation keys differ from one screen to another.

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the general help screen.
F2	The <F2> key allows you to load previous values.
F3	The <F3> key allows you to load optimized defaults.
F4	The <F4> key allows you to save any changes you have made and exit setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

3.3   Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
 Main  Advanced  Platform Configuration  Socket Configuration  Server Mgmt  ►

 BIOS Information                                      Set the Date. Use Tab
 BIOS Vendor             American Megatrends           to switch between Date
 Core Version            5.12                          elements.
 Compliancy              UEFI 2.5; PI 1.4              Default Ranges:
 Project Version         SBC8A860 X007                Year: 2005-2099
 Build Date and Time     08/08/2017 13:45:25          Months: 1-12
 Access Level            Administrator                Days: dependent on month

 Platform Information
 Processor               50654 - SKX H0
 PCH                     LBG QS/PRQ - T - B1          ><: Select Screen
 RC Revision             135.R03                      ↑↓: Select Item
                                                      Enter: Select
 Memory Information                                   +/-: Change Opt.
 Total Memory            393216 MB                    F1: General Help
                                                      F2: Previous Values
 System Date             [Fri 08/06/8117]             F3: Optimized Defaults
 System Time             [06:01:32]                   F4: Save & Exit
                                                      ESC: Exit

           Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **System Language**
Use this item to choose the BIOS language.

● **System Date/Time**
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

3.4   Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

> ► Trusted Computing
> ► AST2500SEC Super IO Configuration
> ► NCT6102D Super IO Configuration
> ► HW Monitor
> ► Serial Port Console Redirection
> ► CSM Configuration
> ► USB Configuration

For items marked with " ► ", please press <Enter> for more options.

● **Trusted Computing**

This screen provides function for specifying the TPM settings.
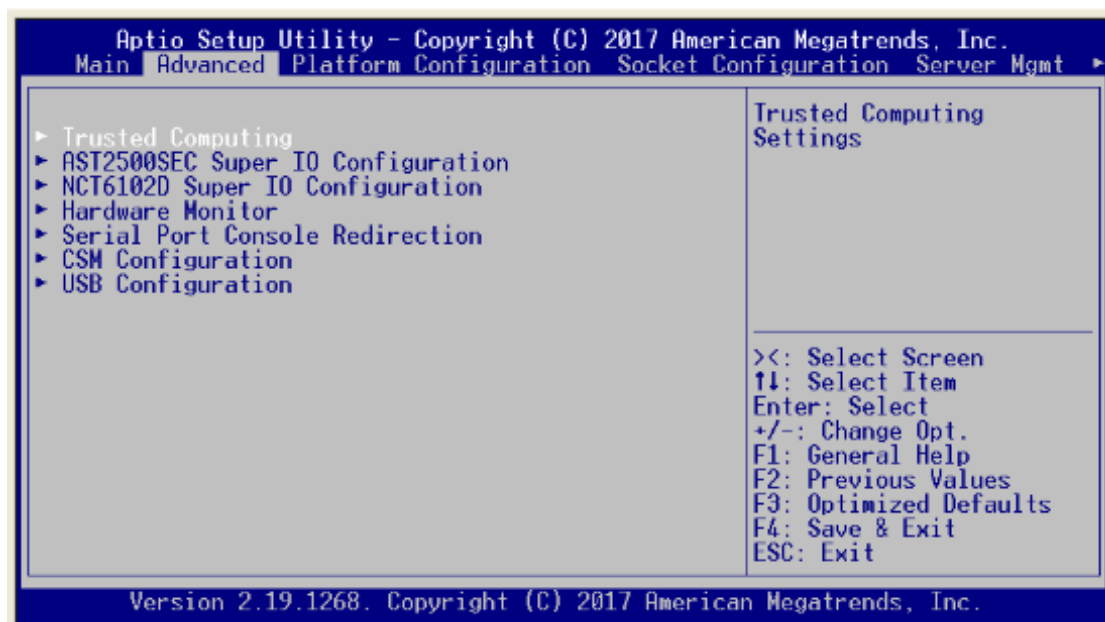
● **Security Device Support**

This item allows you to select the security device support. Configuration options: Enabled or Disabled.
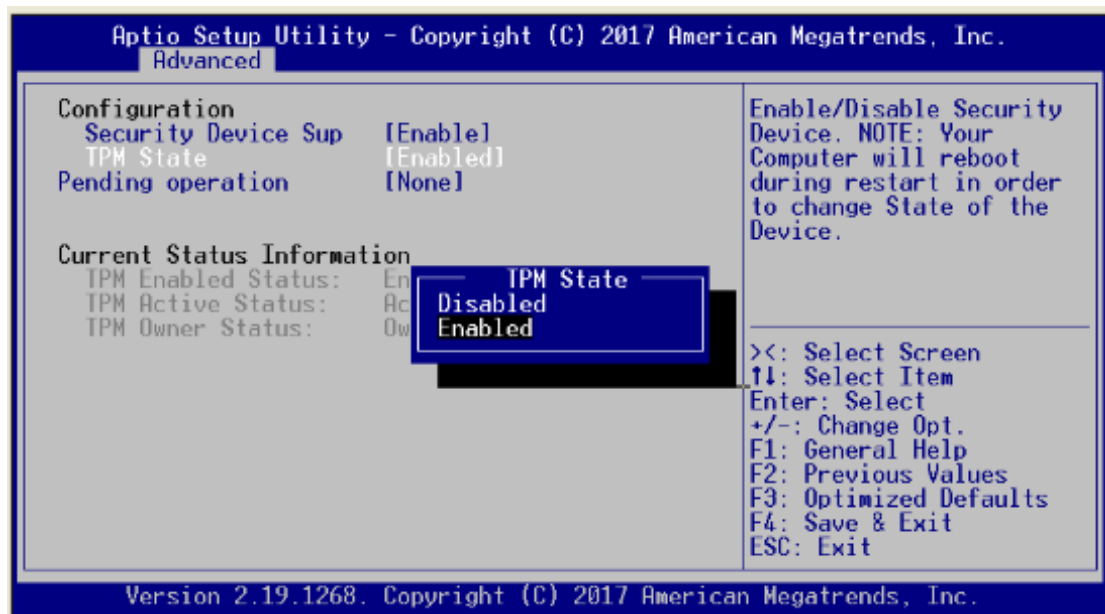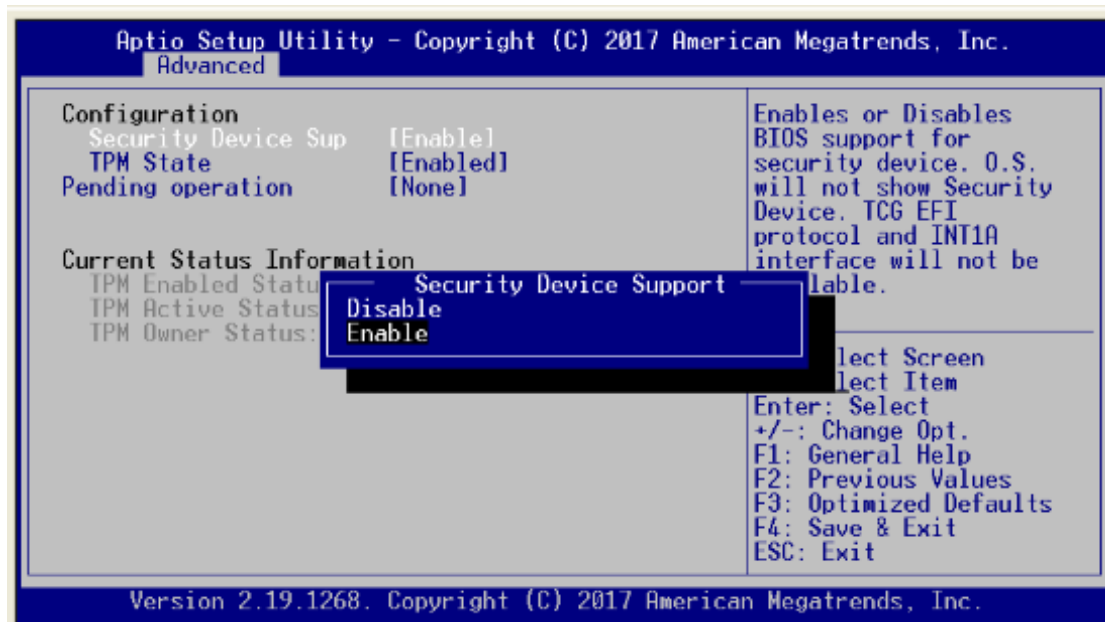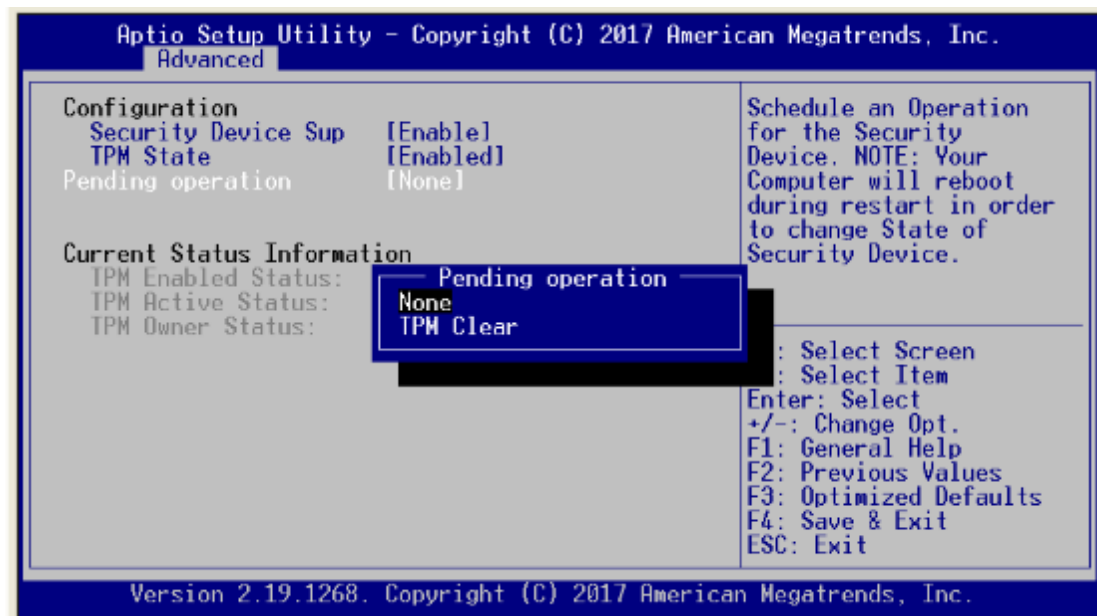
● **AST2500SEC Super IO Configuration**

You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Advanced

  AST2500SEC Super IO Configuration              Set Parameters of
                                                 Serial Port 1 (COMA)
  Super IO Chip            AST2500SEC
▶ Serial Port 1 Configuration
▶ Serial Port 2 Configuration




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

            Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **Serial Port 1 Configuration**

This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 240h/IRQ4.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Advanced

  Serial Port 1 Configuration                    Enable or Disable
                                                 Serial Port (COM)
  Serial Port            [Enabled]
  Device Settings        IO=240h; IRQ=4;


                       ┌─── Serial Port ───┐
                       │ Disabled          │
                       │ Enabled           │
                       └───────────────────┘
                                                 ><: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

            Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **Serial Port 2 Configuration**

This option specifies the base I/O port address and Interrupt Request address of serial port 2. The Optimal setting is 248h/IRQ10

● **NCT6102 Super IO Configuration**

This screen to select options for the Super IO Configuration

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

Serial Port 1 Configuration                        Enable or Disable
                                                   Serial Port (COM)
Serial Port              [Enabled]
Device Settings          IO=3F8h; IRQ=4;


              ┌──── Serial Port ────┐
              │ Disabled            │
              │ Enabled             │
              └─────────────────────┘          ><: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit

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```

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

Serial Port 2 Configuration                        Enable or Disable
                                                   Serial Port (COM)
Serial Port              [Enabled]
Device Settings          IO=2F8h; IRQ=3;


              ┌──── Serial Port ────┐
              │ Disabled            │
              │ Enabled             │
              └─────────────────────┘          ><: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit

      Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

NCT6102D Super IO Configuration

Super IO Chip   NCT6102D
▶ Serial Port 2 Configuration

Chassis Opened Warnin   [Disabled]

┌──── Chassis Opened Warning ────┐
│ Disabled   │
│ Enabled   │
└────────────────────────────────┘

Select whether to
enable Chassis
Intrusion Detection.
Chassis Intrusion
Detection is a utility
that can tell whether
someone has opened the
se (intruded into the

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

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● **HW Monitor**

This screen monitors hardware health status

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
Main  Advanced  Platform Configuration  Socket Configuration  Server Mgmt  ►

  ► Trusted Computing                                Go to Hardware Monitor
  ► AST2500SEC Super IO Configuration                Page
  ► NCT6102D Super IO Configuration
  ► Hardware Monitor
  ► Serial Port Console Redirection
  ► CSM Configuration
  ► USB Configuration


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

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Advanced

  Hardware Monitor                                 NCT7802Y Hardware
                                                   Monitor Page
  ► NCT7802Y Hardware Monitor
  ► NCT6102D Hardware Monitor




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

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```
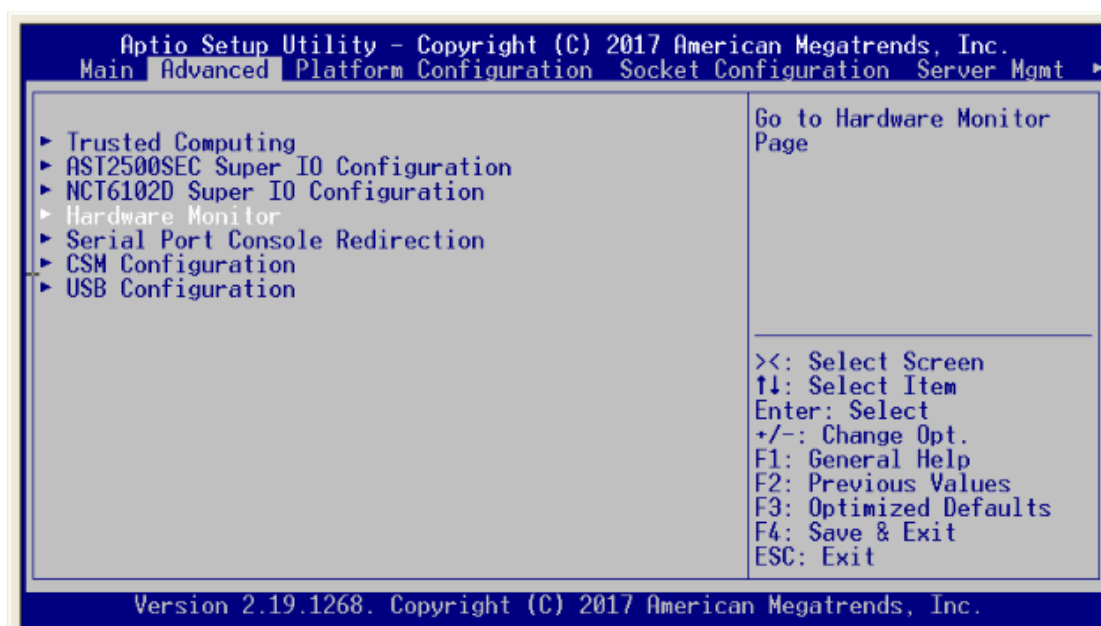
● **This screen displays the fan speed in RPM**

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
 Advanced

Pc Health Status

CPU1 Temperature        : +51 C
FAN1 Speed              : 9712 RPM
FAN2 Speed              : 9712 RPM
FAN3 Speed              : 9642 RPM_

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

       Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
 Advanced

Hardware Monitor                              NCT6102D Hardware
                                              Monitor Page
► NCT7802Y Hardware Monitor
► NCT6102D Hardware Monitor

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

       Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

```
    Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
     Advanced

 Pc Health Status

 System Temperature2      : +31 C
 CPU2 Temperature         : +47 C
 FAN4 Speed               : 9712 RPM
 FAN5 Speed               : 9574 RPM_
 FAN6 Speed               : N/A
 VCORE                    : +1.784 V
 VDDQ                     : +1.190 V
 +12V                     : +12.000 V
 +3.3S                    : +3.328 V
                                                ><: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **Serial Port Console Redirection**

```
       Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Main  Advanced  Platform Configuration  Socket Configuration  Server Mgmt  ▶

                                                Serial Port Console
                                                Redirection
  ▶ Trusted Computing
  ▶ NCT6102D Super IO Configuration
  ▶ Hardware Monitor
  ▶ Serial Port Console Redirection_
  ▶ CSM Configuration
  ▶ USB Configuration

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

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **Console Redirection**

Use this item to enable or disable console redirection. The settings specify how the host computer and remote computer (which the user is using) will exchange data. Both computers should have the same or compatible setting.
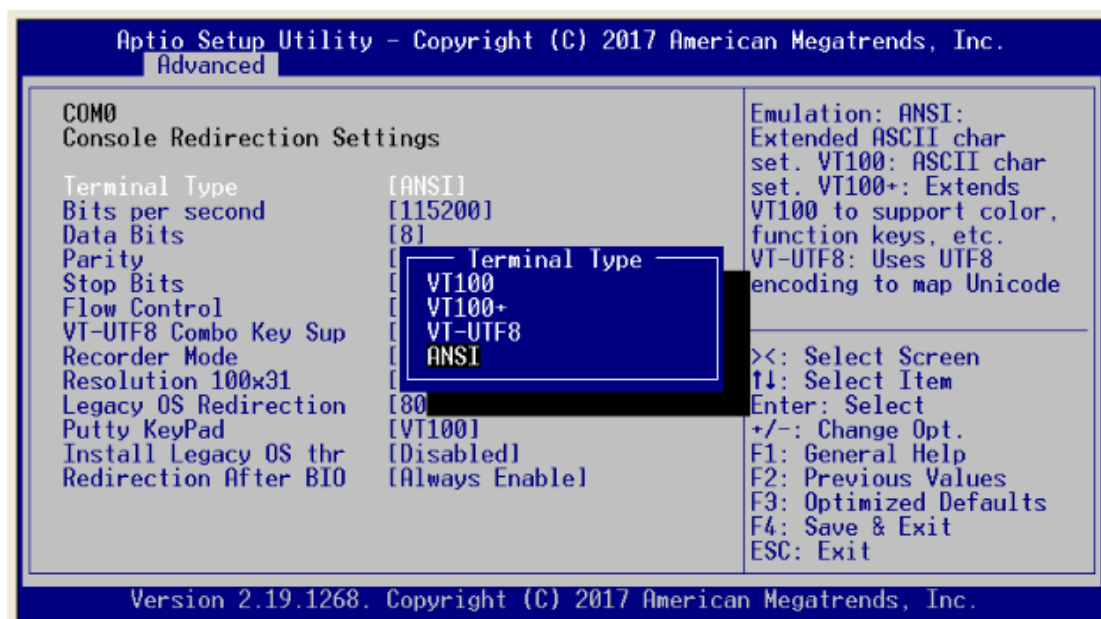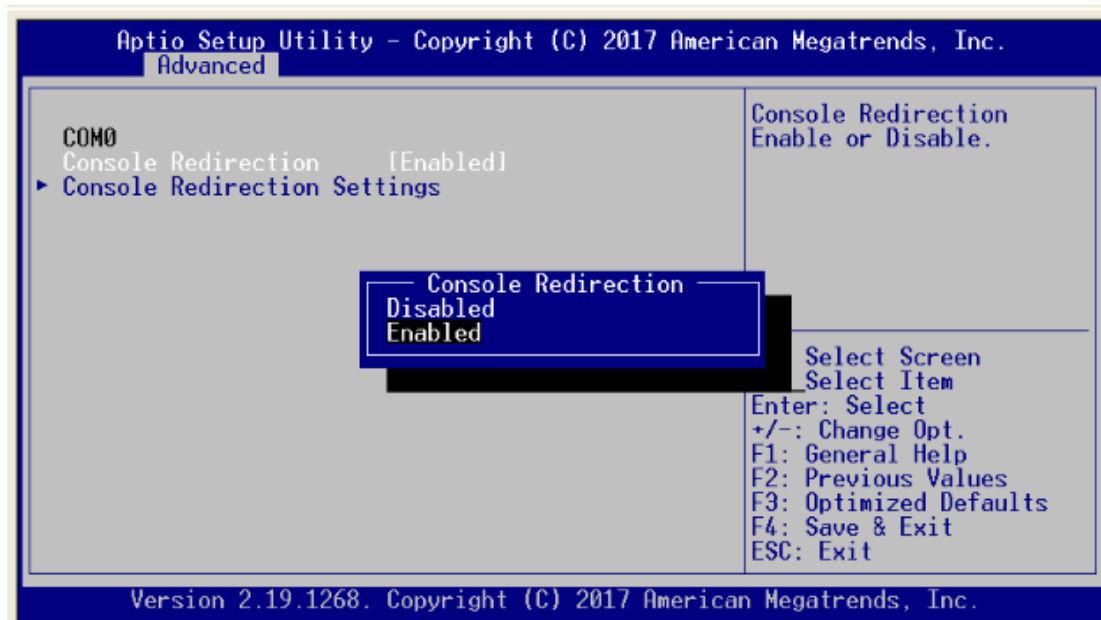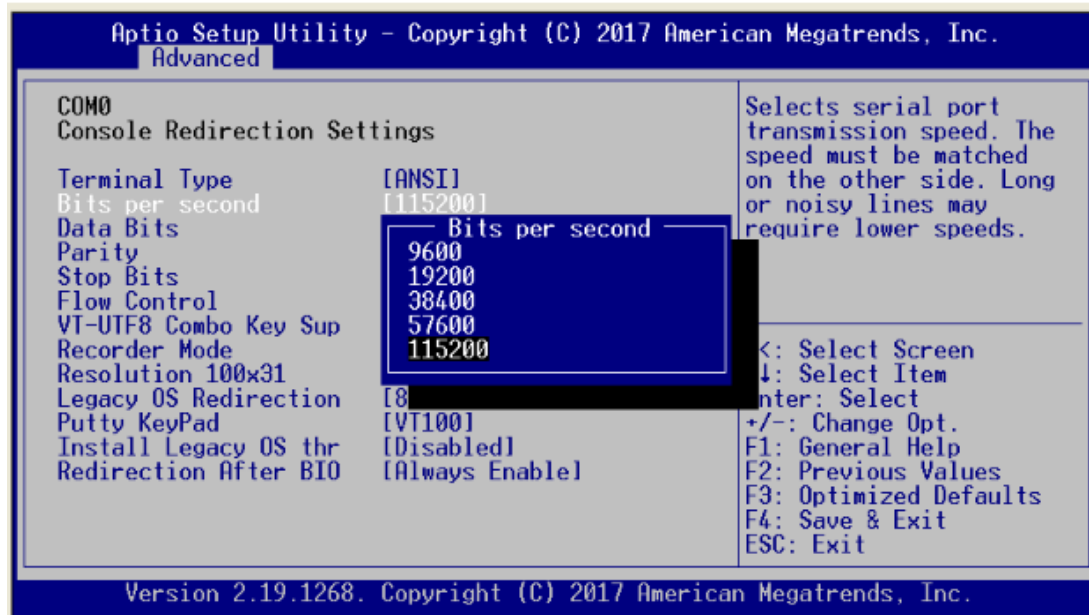
Terminal Type
This item allows you to select the target terminal type. Configuration options: ANSI, VT100, VT100+ and VT-UTF8.

Bits per second
This item allows you to setup the data transfer rate for the console port. The default value is 115200. Available options are "*9600*", "*19200*", "*38400*", "*57600*" and "*115200*".

Flow Control
This item allows you to select flow control for console redirection. The configuration options: None and Hardware RTS/CTS.

VT-UTF8 Combo Key Support
Use this item to Enabled and Disabled VT-UTF8 combination key supports for ANSI / VT100 terminals.

Recorder Mode
This item allows you to select the recorder mode. The configuration options: Enabled and Disabled.

Resolution 100x31
This item allows you to select the data bits. The configuration options: 7 and 8.

Legacy OS Redirection
This item allows you to select the legacy OS redirection. The configuration options: 80x24 and 80x25.

Putty KeyPad
This item allows you to select the putty keypad . The configuration options: VT100, LINUX, XTERMR6, SCO, ESCN and VT400.

Install Legacy OS through Remote
This item allows you to select the install legacy os through remote. The configuration options: "Enabled" or "Disabled".

Redirection After BIOS POST
Use this item to enable or disable the function of Console Redirection, which allows you maintain a system from a remote location. The default setting is *Always*.

● **CSM Configuration**

This screen shows the CSM Configuration, and you can enable/disable option ROM execution settings.
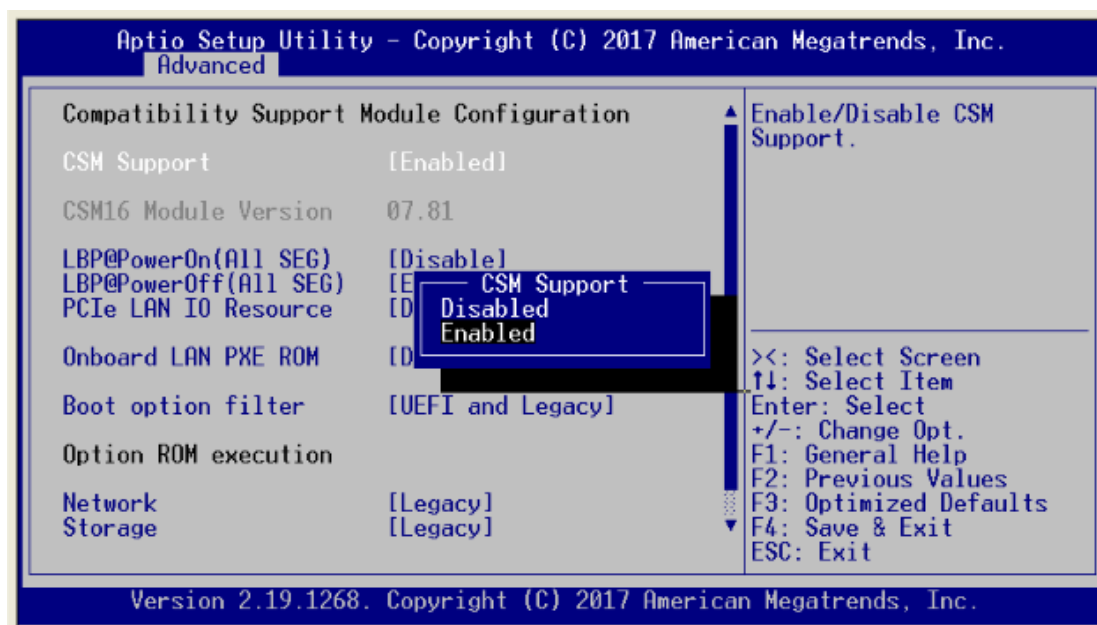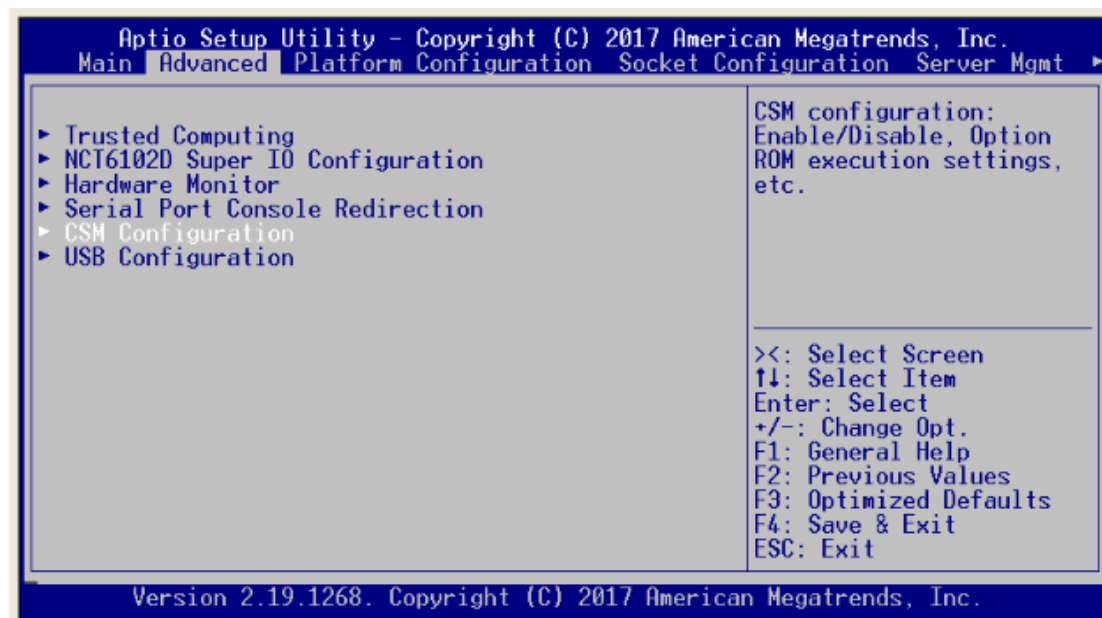
● **LBP @PowerOn (All SEG)**

For Power On LAN Bypass setting, use LBP @PowerOn item to "Disabled" ,"Enabled" or "Last State" for LAN Bypass all segments.
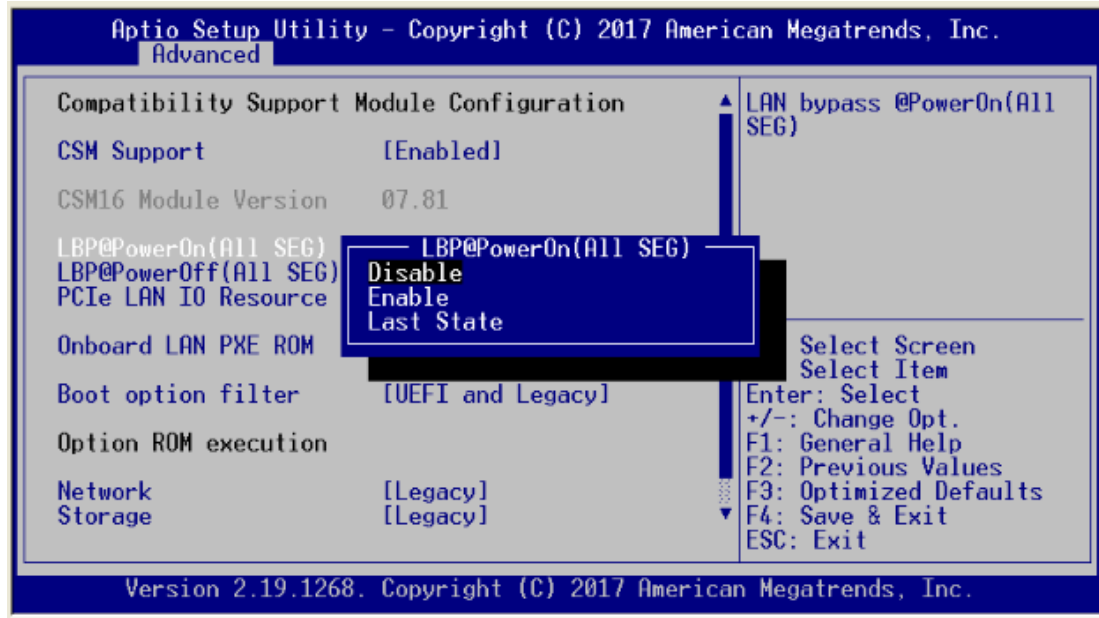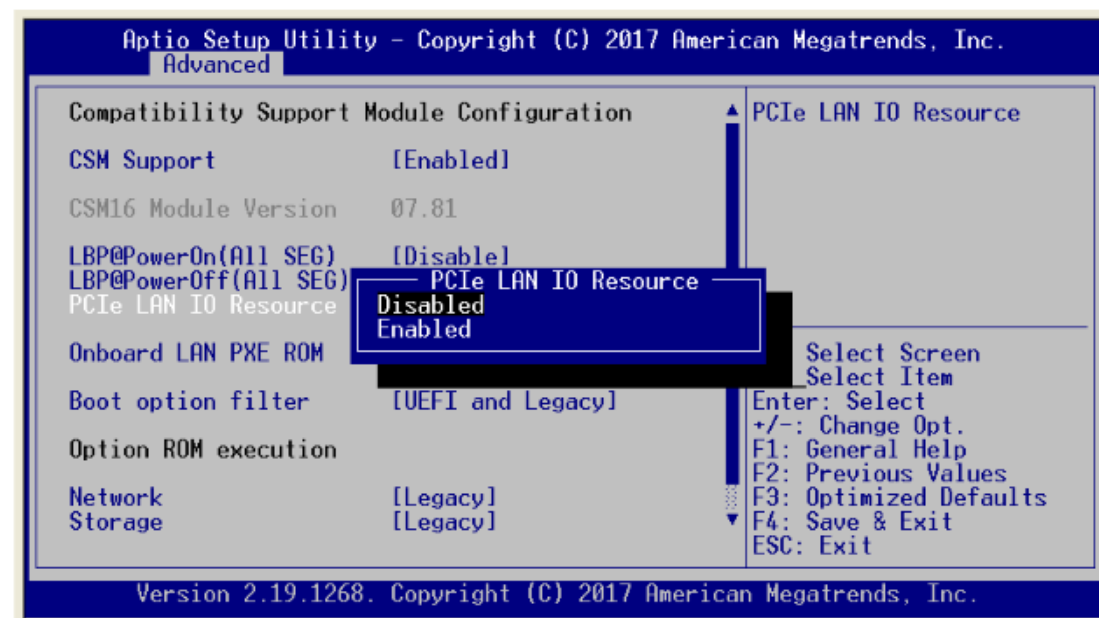
● **LBP @Power Off (All SEG)**

For Power off LAN Bypass setting, use LBP @PowerOff item to "Disabled" ,"Enabled" or "Last State" for LAN Bypass all segments.
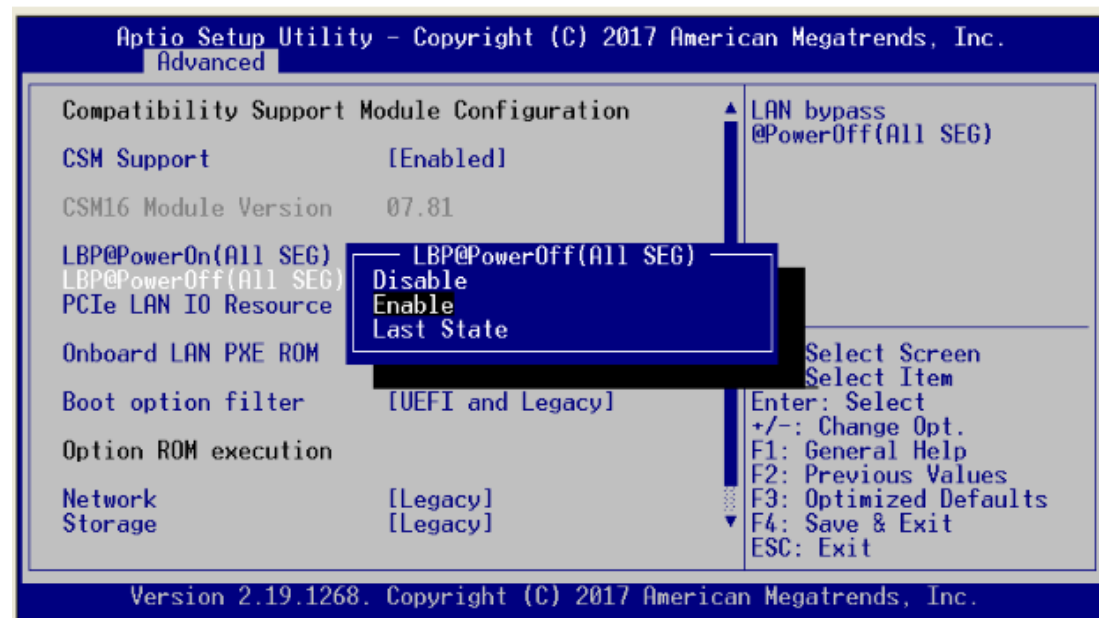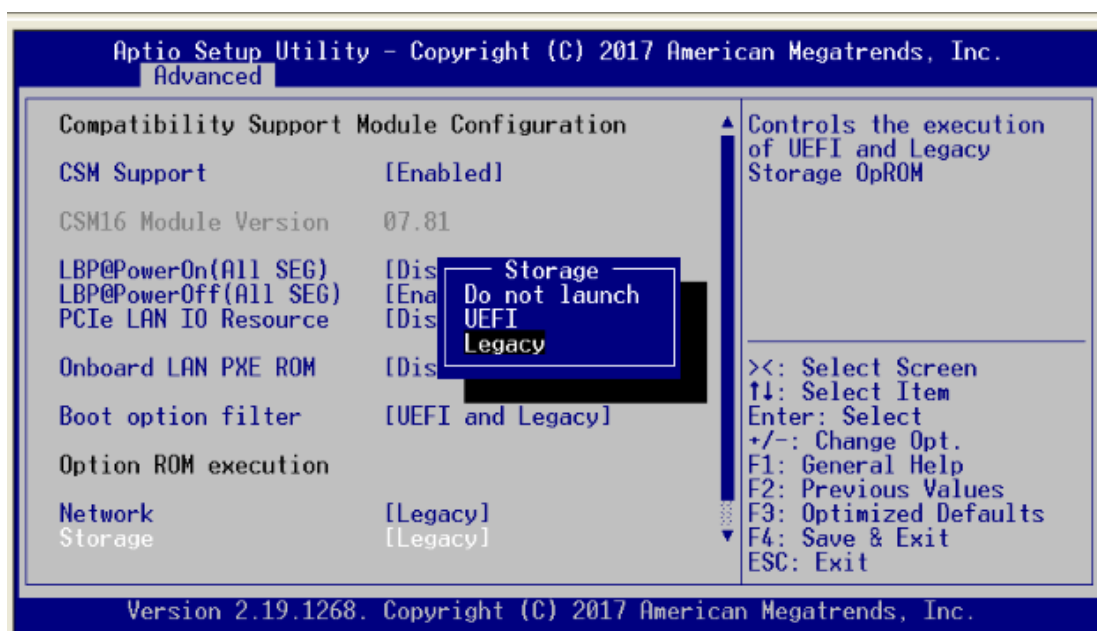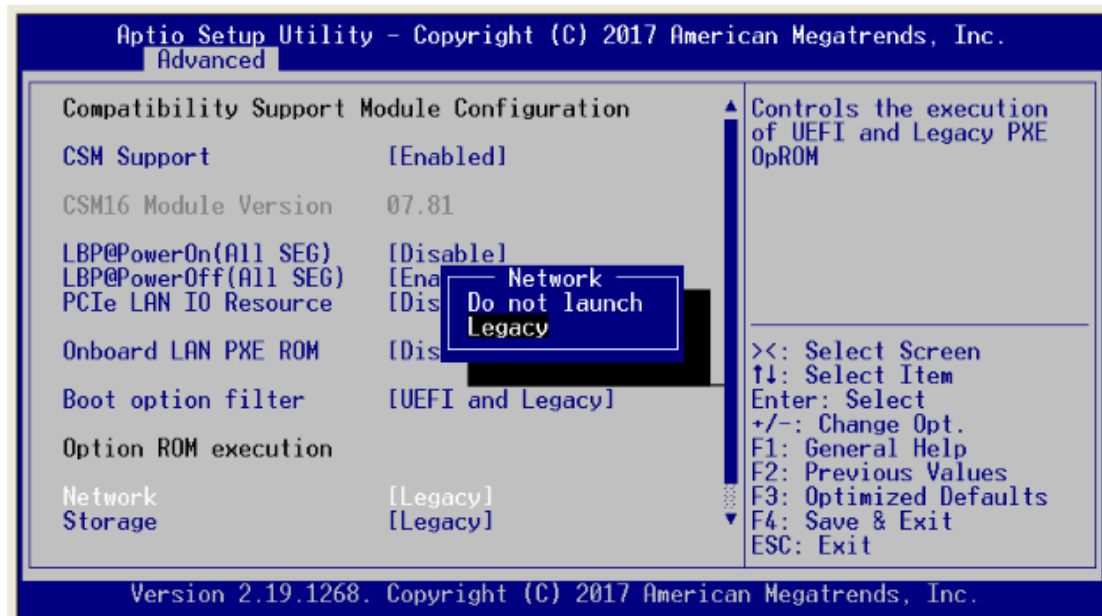

● **PCIe LAN IO Resourece**

For LAN IO Resource setting, use item to select "Disabled" or "Enabled" mode.

● **Network/ Storage**

For Network setting, use Network item to "Do not launch" or "UEFI" or"legacy" mode.

● **USB Configuration**

Use this item for further setting USB port configuration.
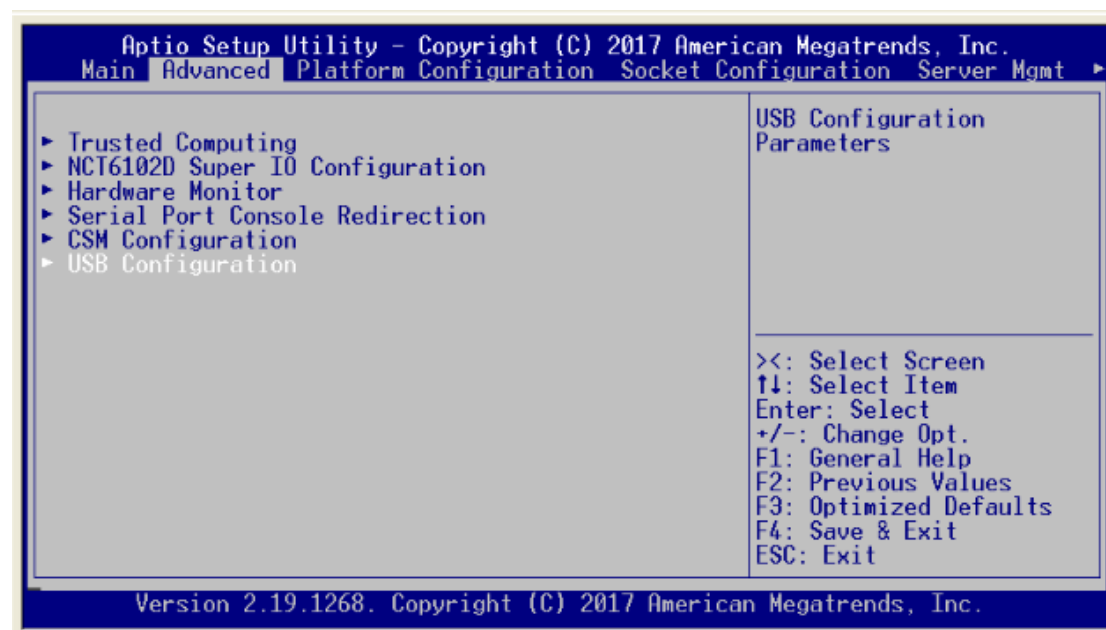
Legacy USB Support

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices. Configuration options: Auto, Enabled and Disabled.
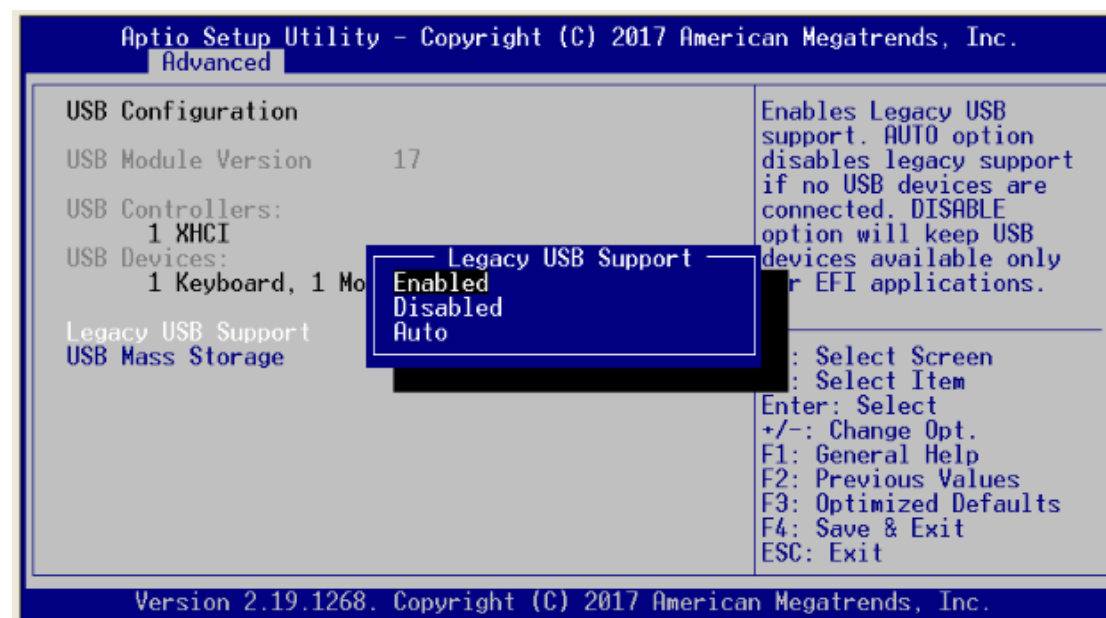
3.5   Platform Configuration

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:
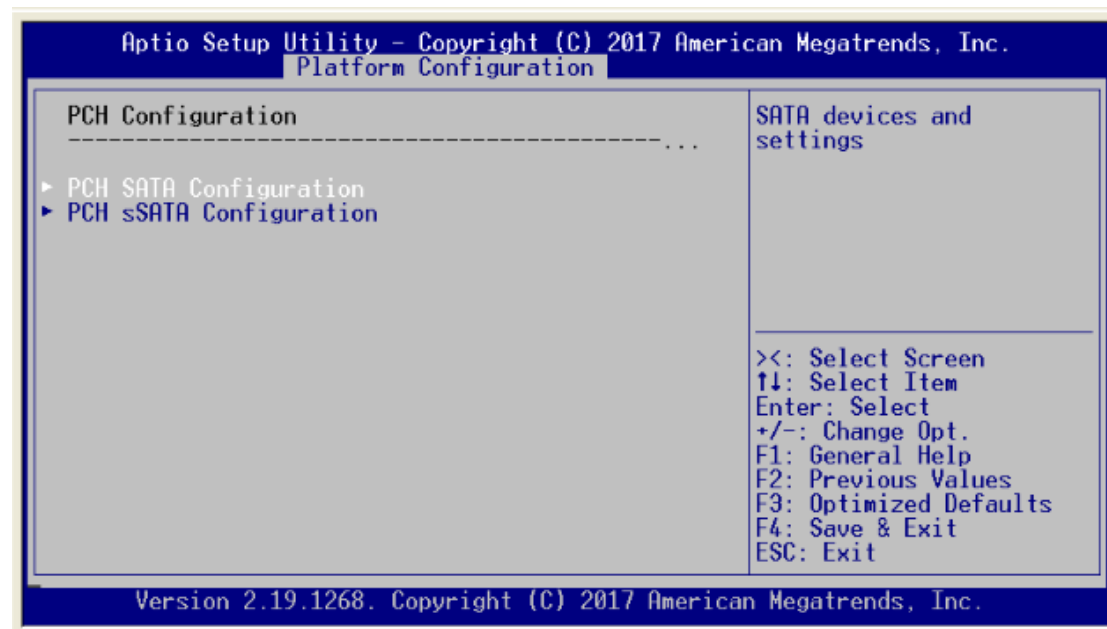
   ►   PCH Configuration
   ►   Server ME Configuration

For items marked with "►", please press <Enter> for more options.
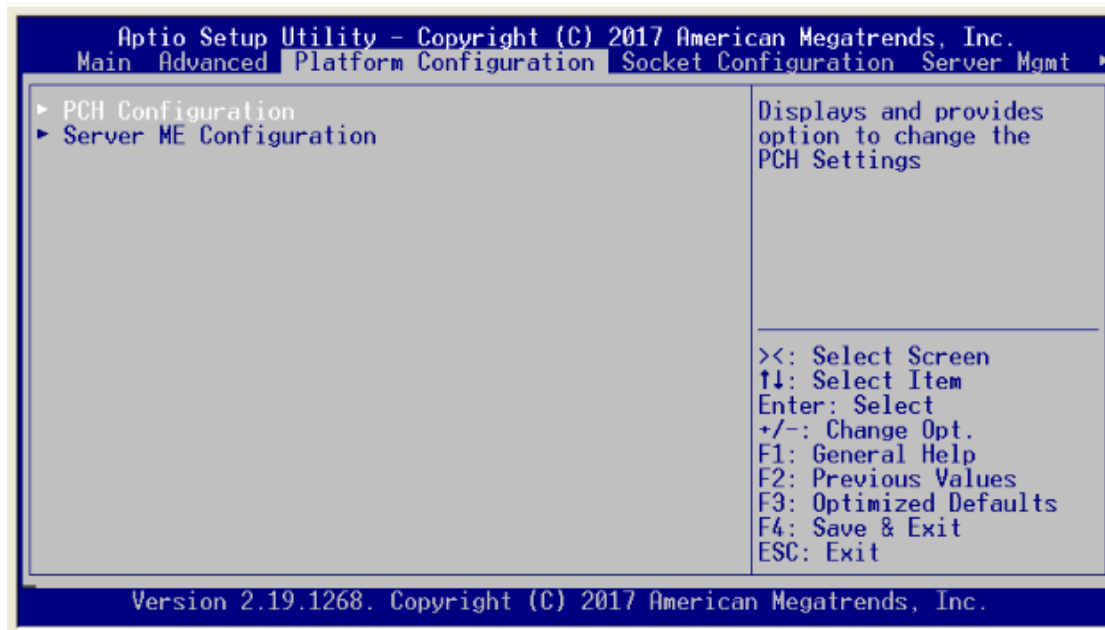
● **PCH Configuration**

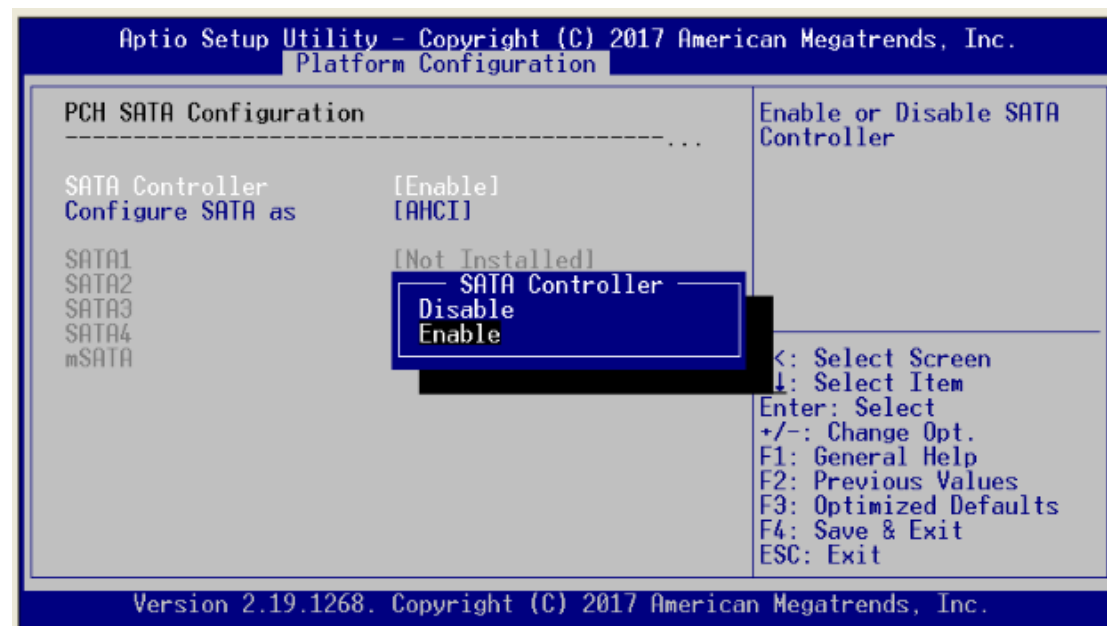You can select any of the items in the screen:

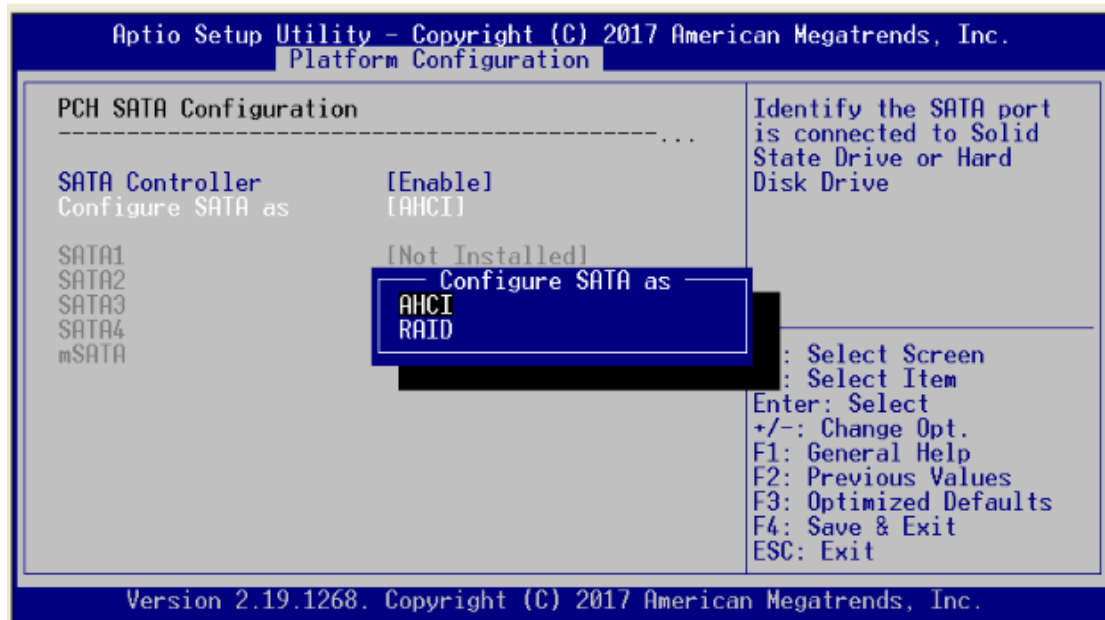   ►   PCH SATA Configuration
    ►   USB Configuration

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                    Platform Configuration

PCH Configuration                                SATA devices and
-----------------------------------------...     settings

► PCH SATA Configuration
► PCH sSATA Configuration



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

       Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

● **PCH SATA Configuration**

● **SATA Controller**

This item allows you to select the SATA controller. Configuration options: "Enabled" or "Disabled".

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                    Platform Configuration

PCH SATA Configuration                           Enable or Disable SATA
-----------------------------------------...     Controller

SATA Controller          [Enable]
Configure SATA as        [AHCI]

SATA1                    [Not Installed]
SATA2                    ┌── SATA Controller ──┐
SATA3                    │ Disable             │
SATA4                    │ Enable              │
mSATA                    └─────────────────────┘
                                                 <: Select Screen
                                                 ↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

       Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```
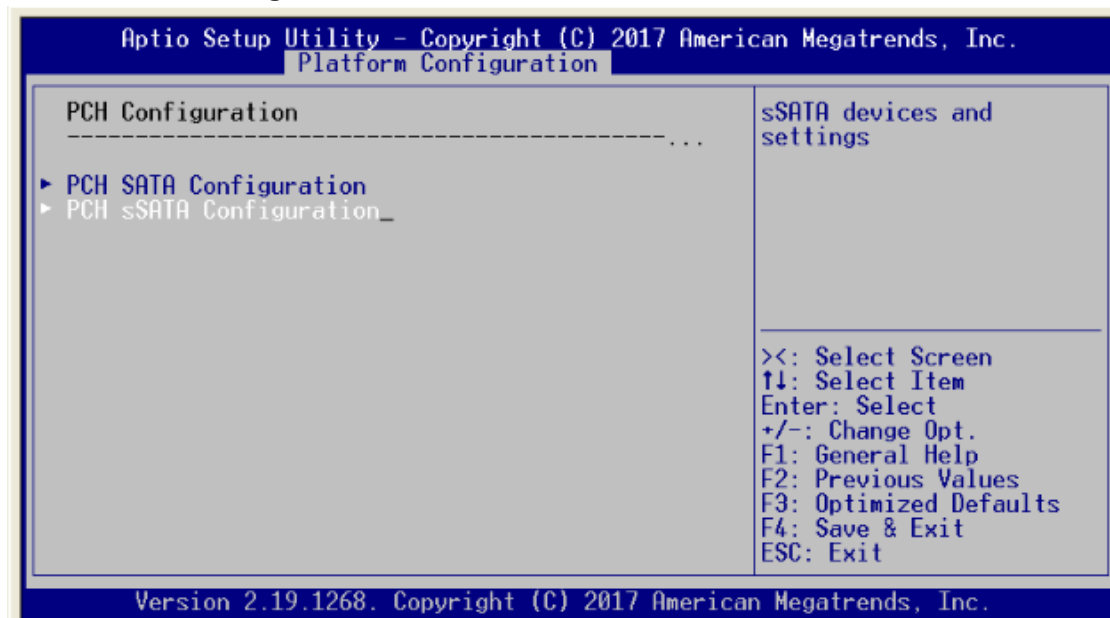
● **Configure SATA**

The item allows you to select the configure SATA. Configuration options: AHCI. & RAID mode. AHCI mode allows the onboard storage driver to enable advanced SATA features that increases storage performance or workloads where multiple simultaneous read/ write requests are outstanding, most often occurring in server-type applications.
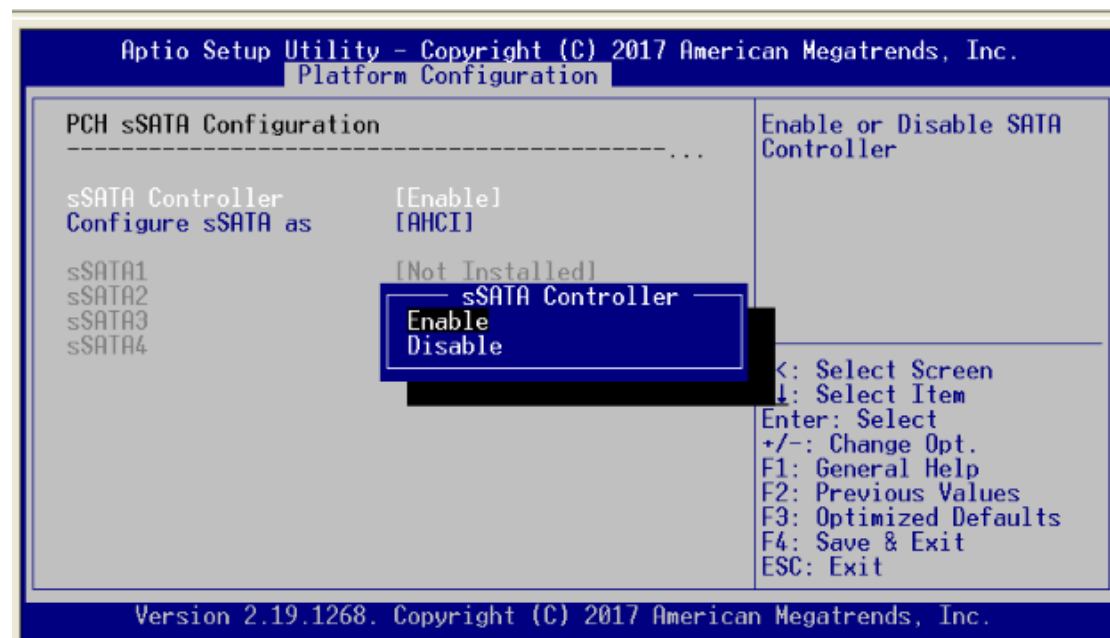

● **PCH SATA Configuration**

● **SATA Controller**

This item allows you to select the SATA controller. Configuration options: "Enabled" or "Disabled".

● **Configure SATA**

The item allows you to select the configure SATA. Configuration options: AHCI and RAID. AHCI mode allows the onboard storage driver to enable advanced SATA features that increases storage performance or workloads where multiple simultaneous read/ write requests are outstanding, most often occurring in server-type applications. RAID mode supports software RAID by using the Intel® Matrix Storage Manager software.
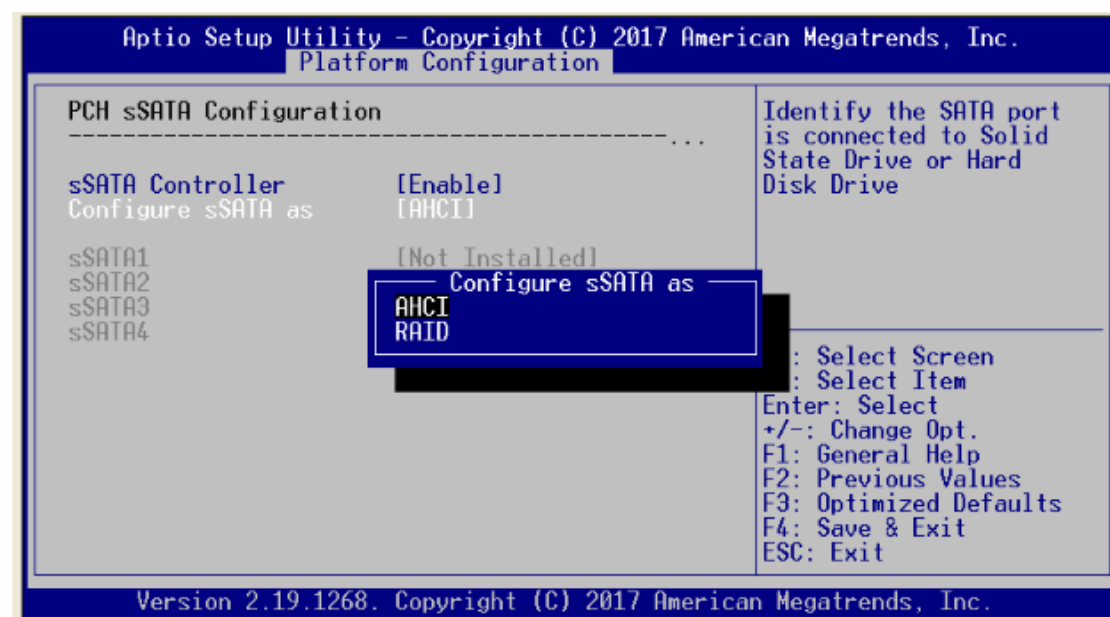
● **Server ME Configuration**
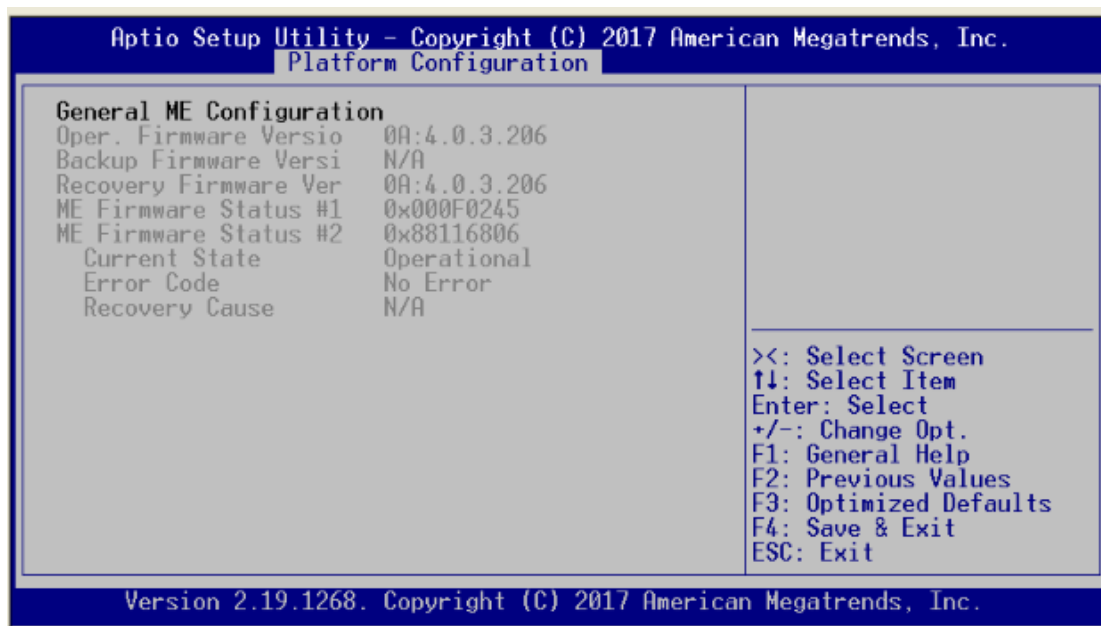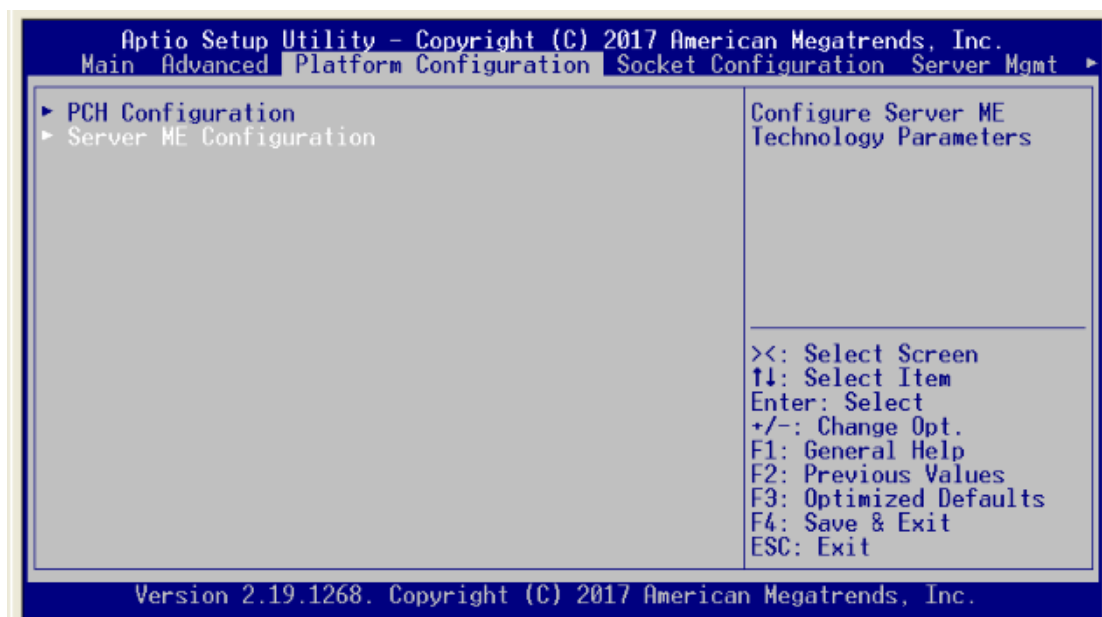
3.6 Socket Configuration

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

> ► Processor Configuration
> ► IIO Configuration

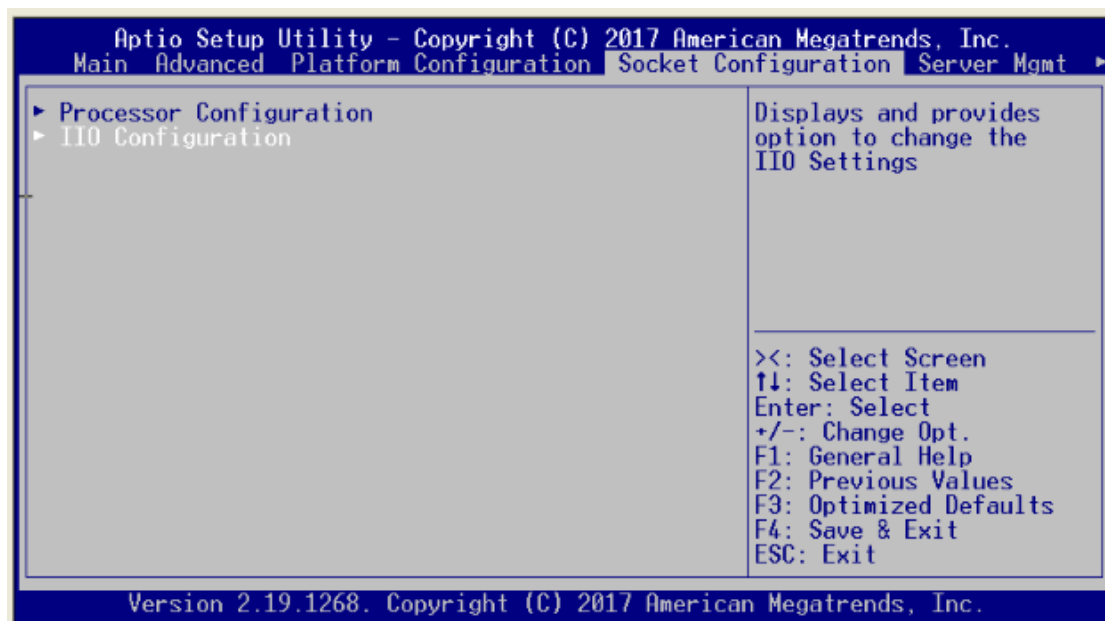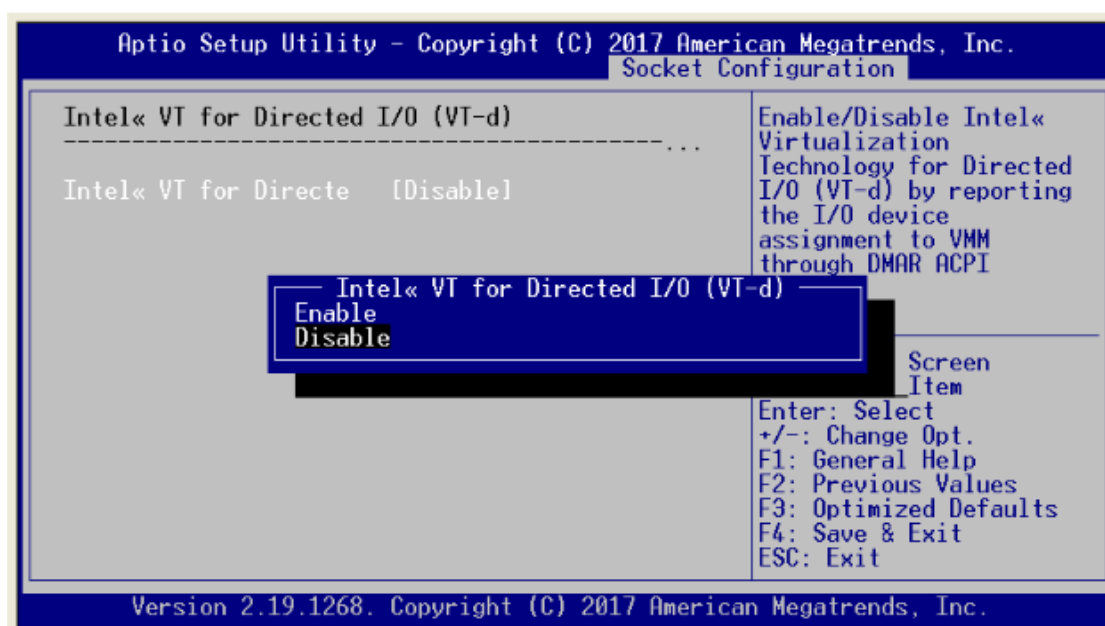For items marked with "►", please press <Enter> for more options.
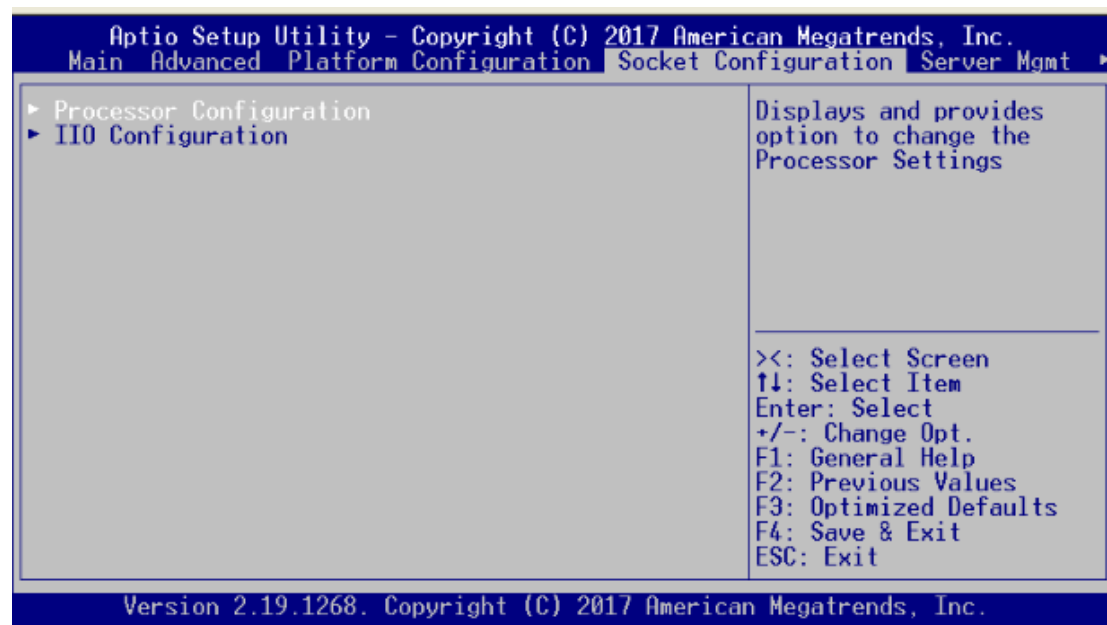
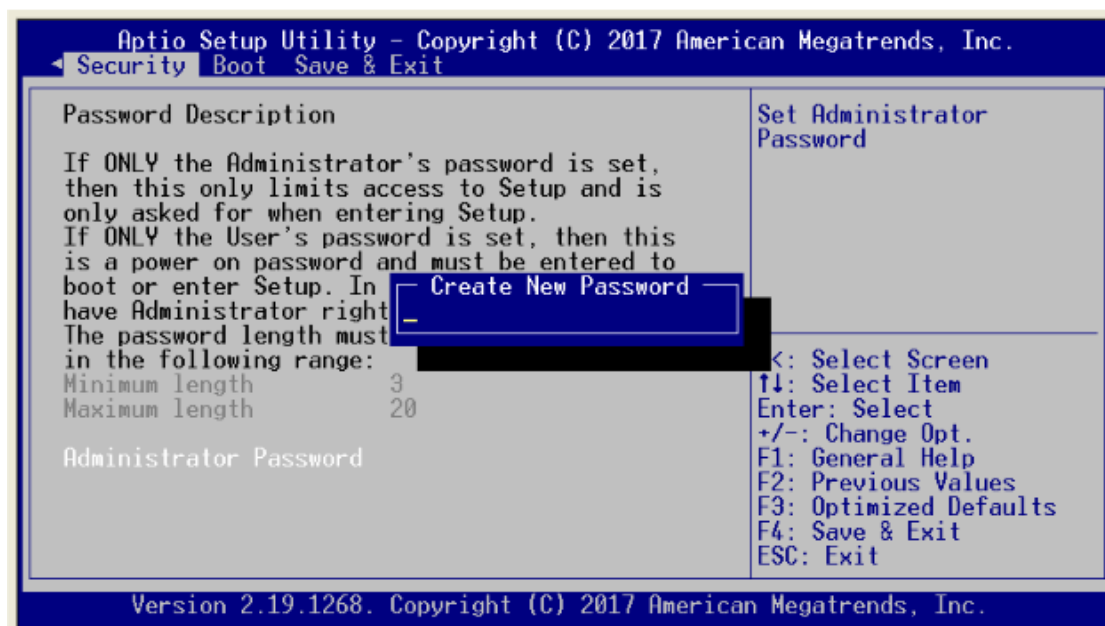● **Processor Configuration**
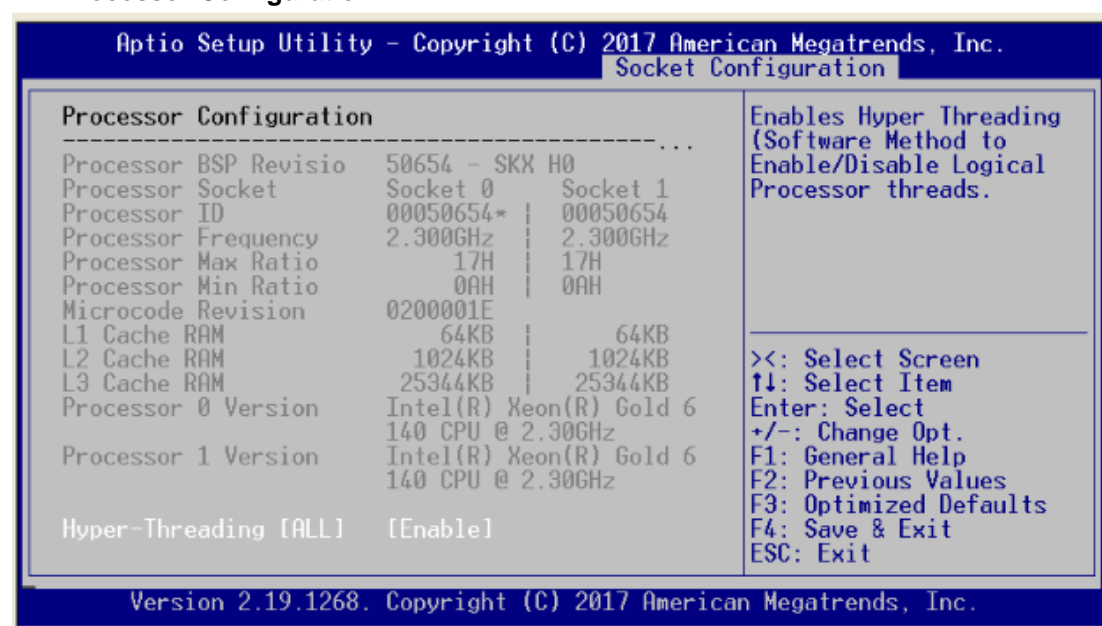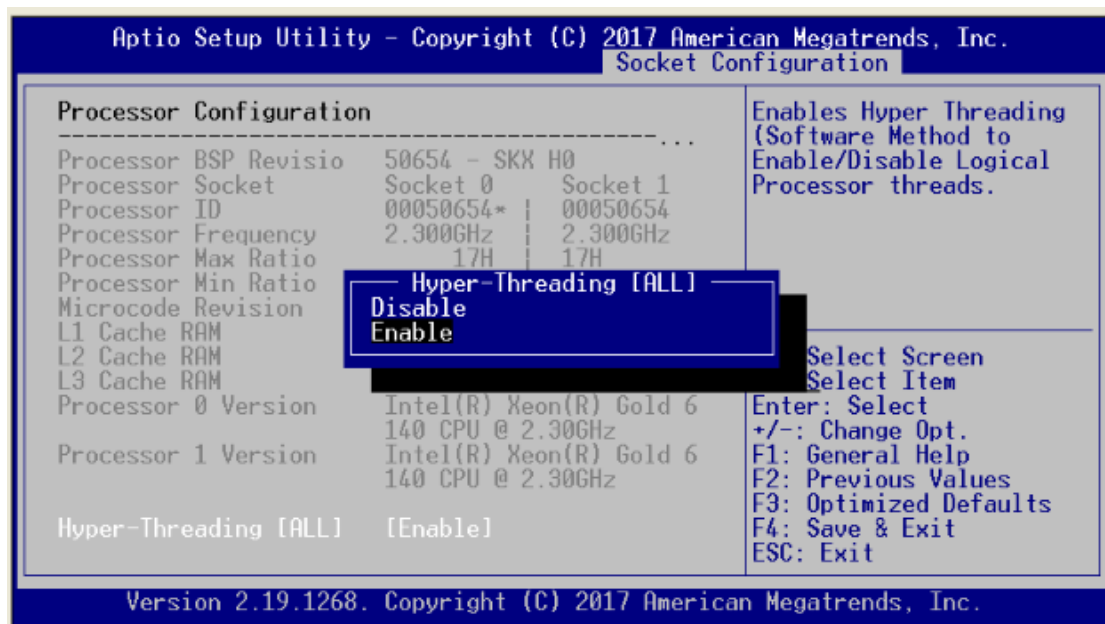
● **IIO Configuration**

3.7   Security Menu

The Security menu allows users to change the security settings for the system.

● **Administrator Password**

This item indicates whether an administrator password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.
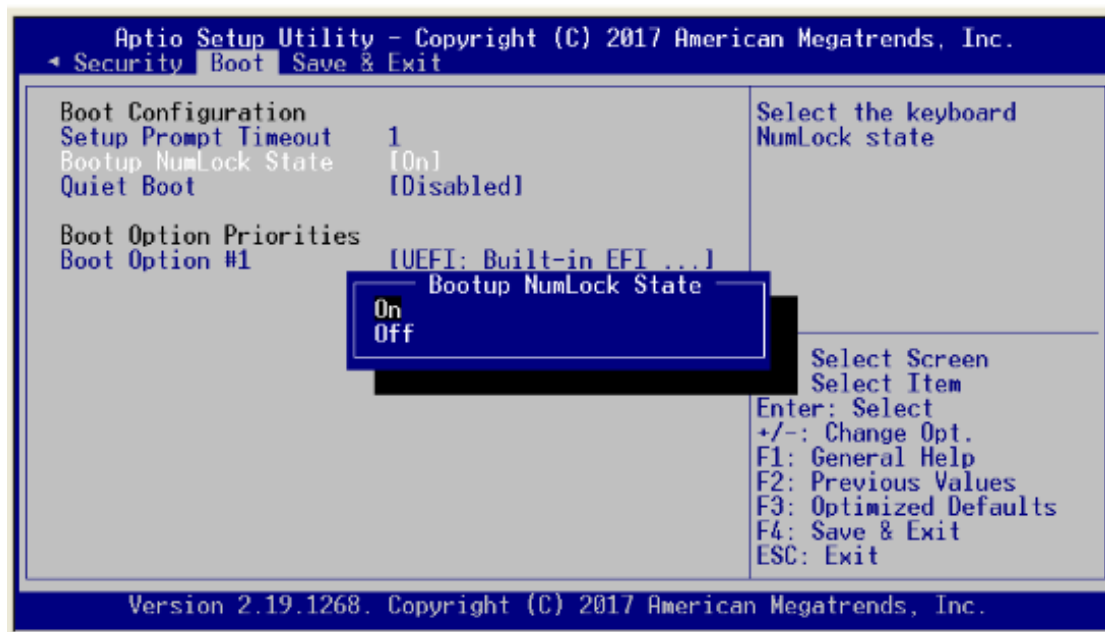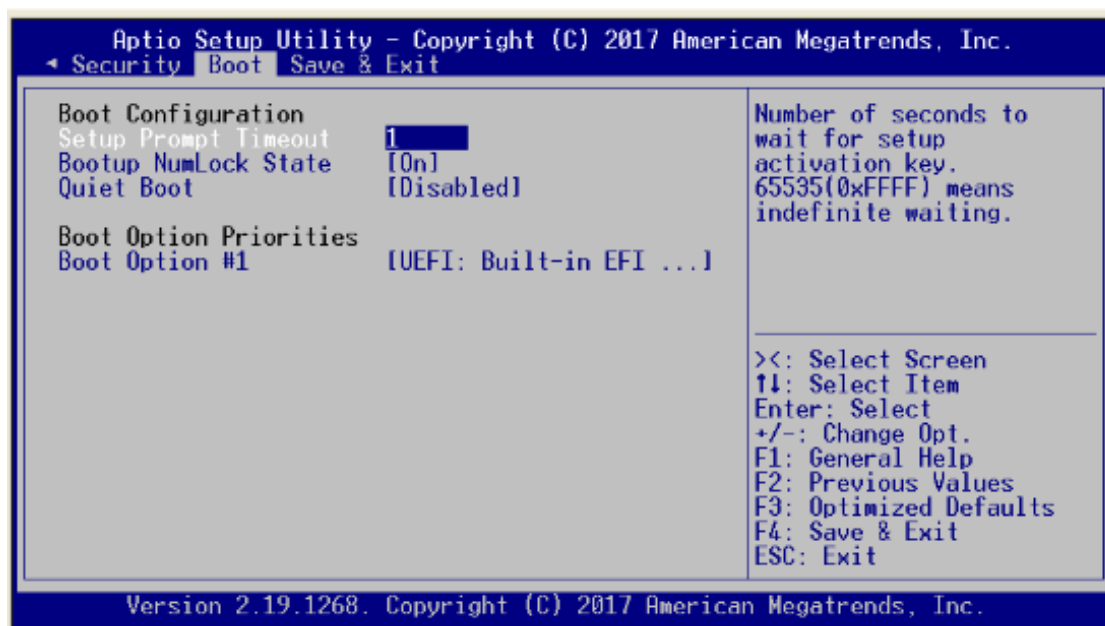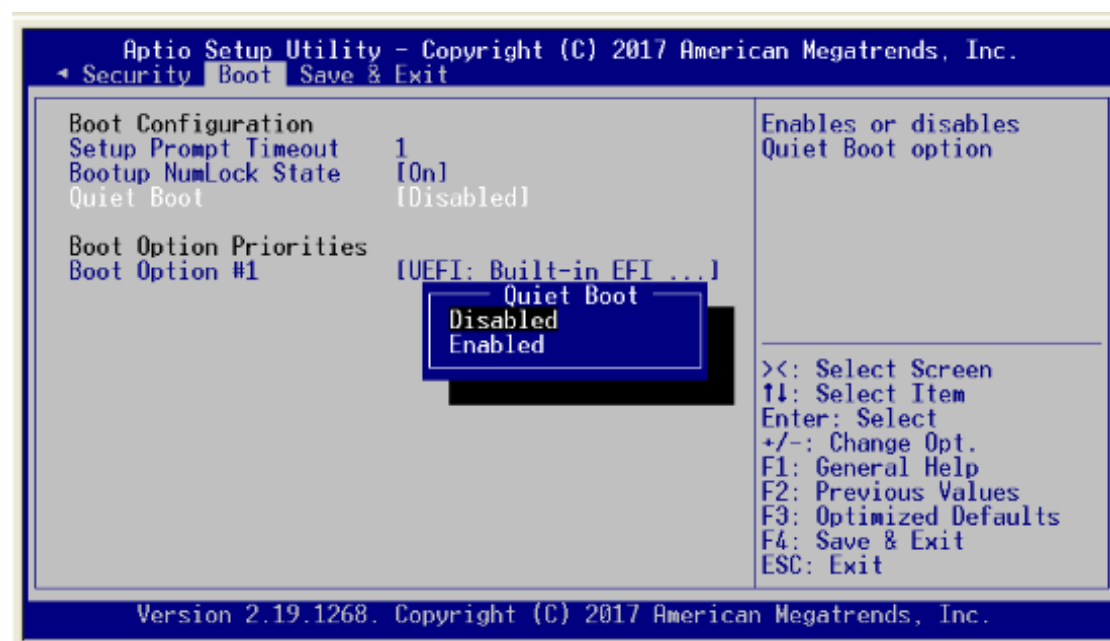
3.8 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:
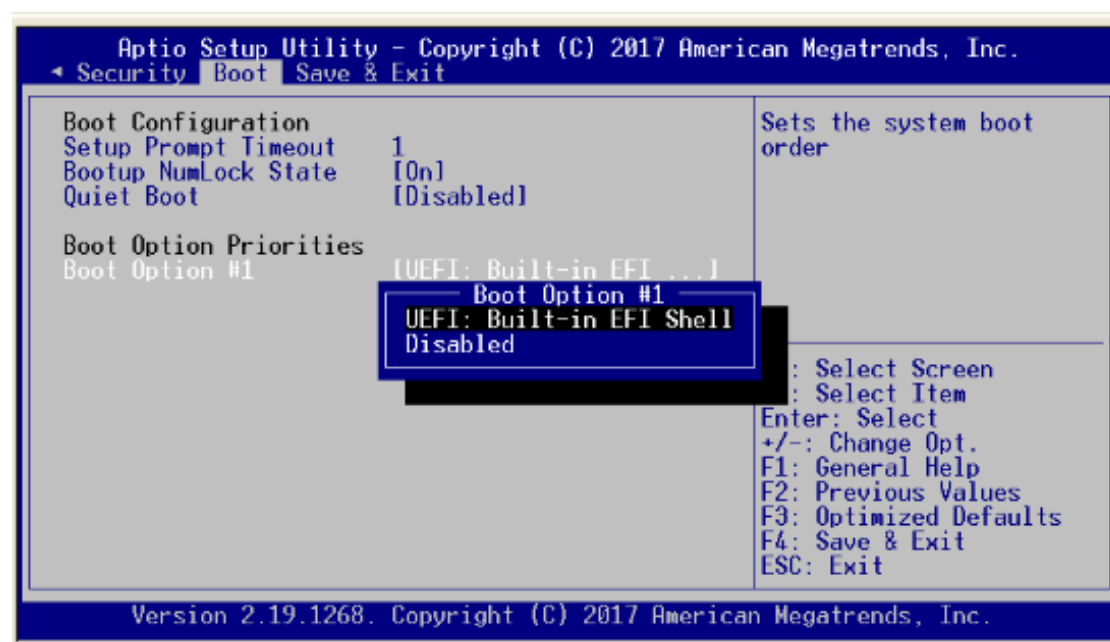
● **Setup Prompt Timeout**

Number of seconds to wait for setup activation key.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
◄ Security  Boot  Save & Exit

 Boot Configuration                            Enables or disables
 Setup Prompt Timeout      1                   Quiet Boot option
 Bootup NumLock State      [On]
 Quiet Boot                [Disabled]

 Boot Option Priorities
 Boot Option #1            [UEFI: Built-in EFI ...]
                            ┌───── Quiet Boot ─────┐
                            │ Disabled             │
                            │ Enabled              │
                            │                      │
                            └──────────────────────┘ ><: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

- **Boot Option Priorities**

You could set the system boot order of the legacy devices in this group. You could set the system boot order in option #1 UEFI or Disabled

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
◄ Security  Boot  Save & Exit

 Boot Configuration                            Sets the system boot
 Setup Prompt Timeout      1                   order
 Bootup NumLock State      [On]
 Quiet Boot                [Disabled]

 Boot Option Priorities
 Boot Option #1            [UEFI: Built-in EFI ...]
                         ┌───── Boot Option #1 ─────┐
                         │ UEFI: Built-in EFI Shell │
                         │ Disabled                 │
                         │                          │
                         └──────────────────────────┘
                                              : Select Screen
                                              : Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit

        Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

3.9 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.

● **Save Changes and Exit**

When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
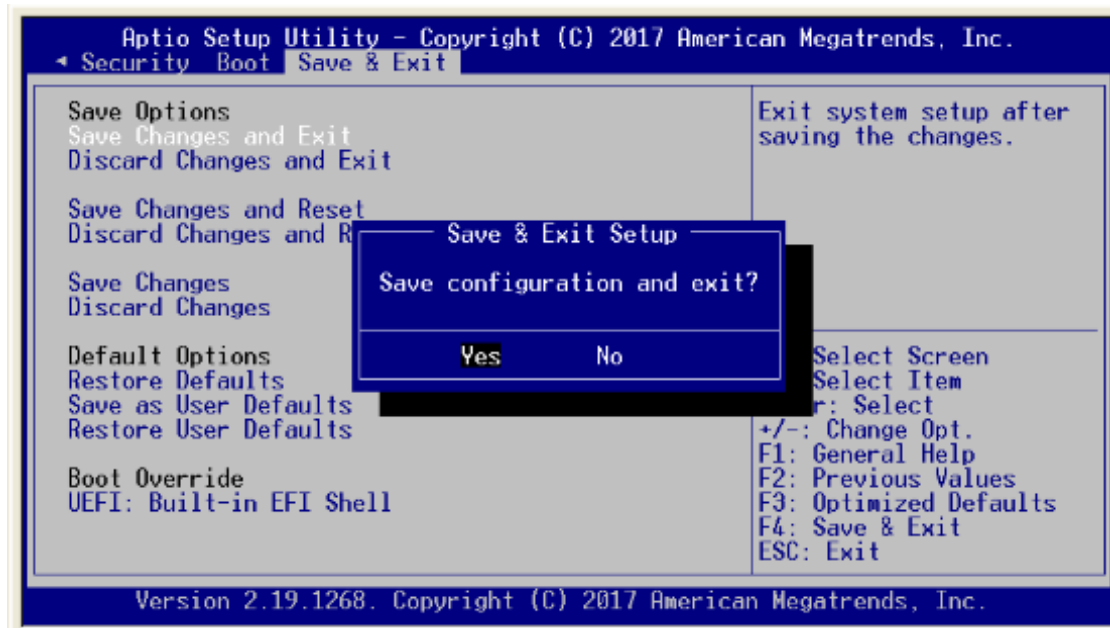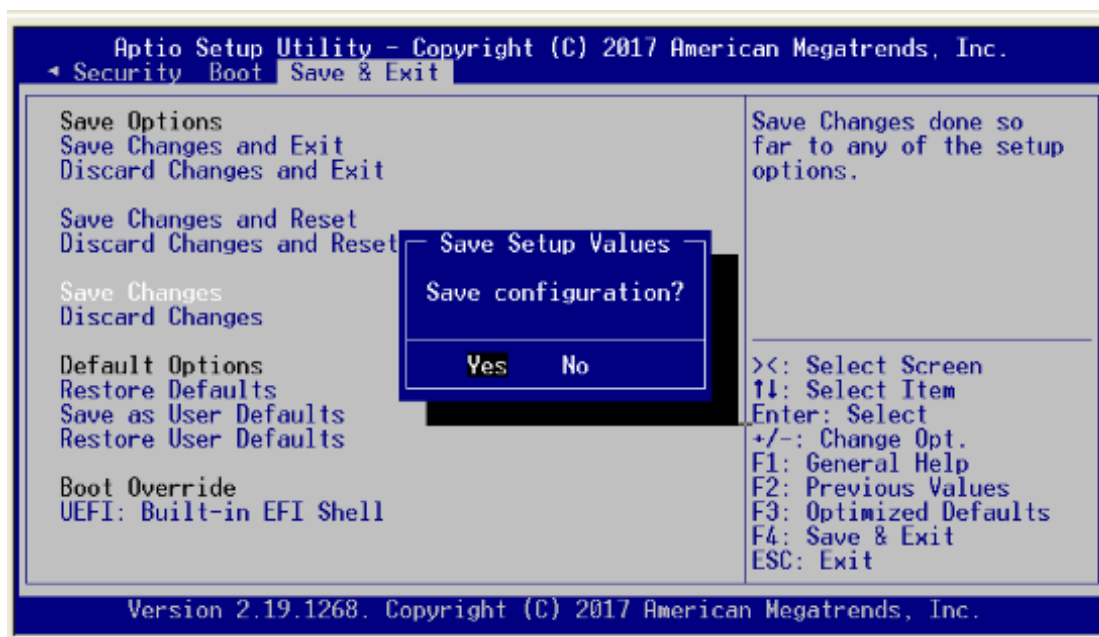
● **Discard Changes and Exit**

Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select   Yes to discard changes and exit.

● **Save Changes**

When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

● **Discard Changes**

Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
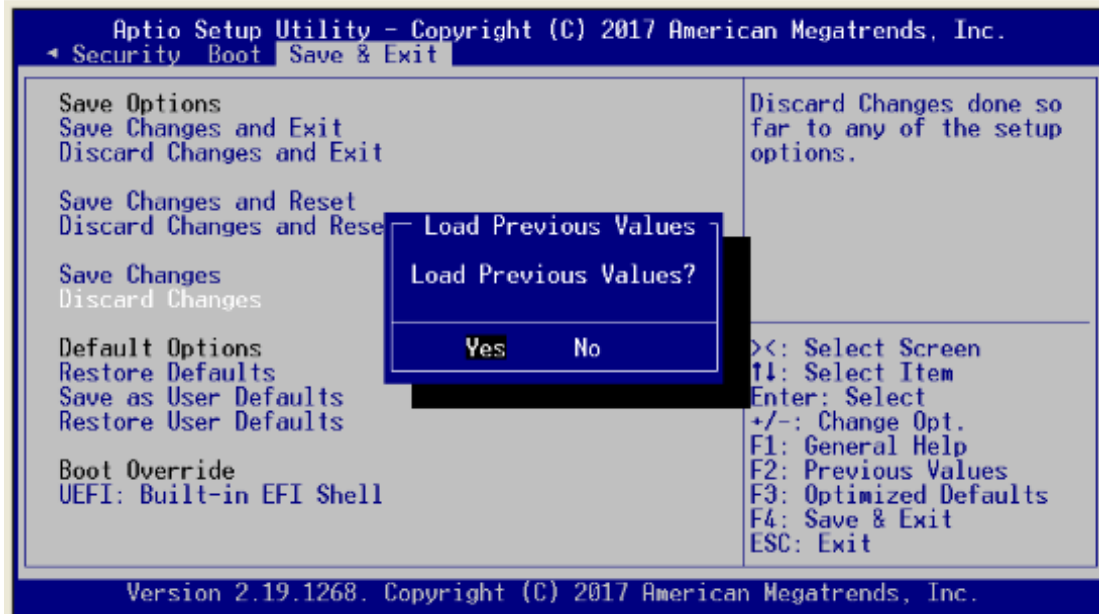
● **Restore Defaults**

It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Restore Defaults from the Save & Exit menu and press <Enter>.
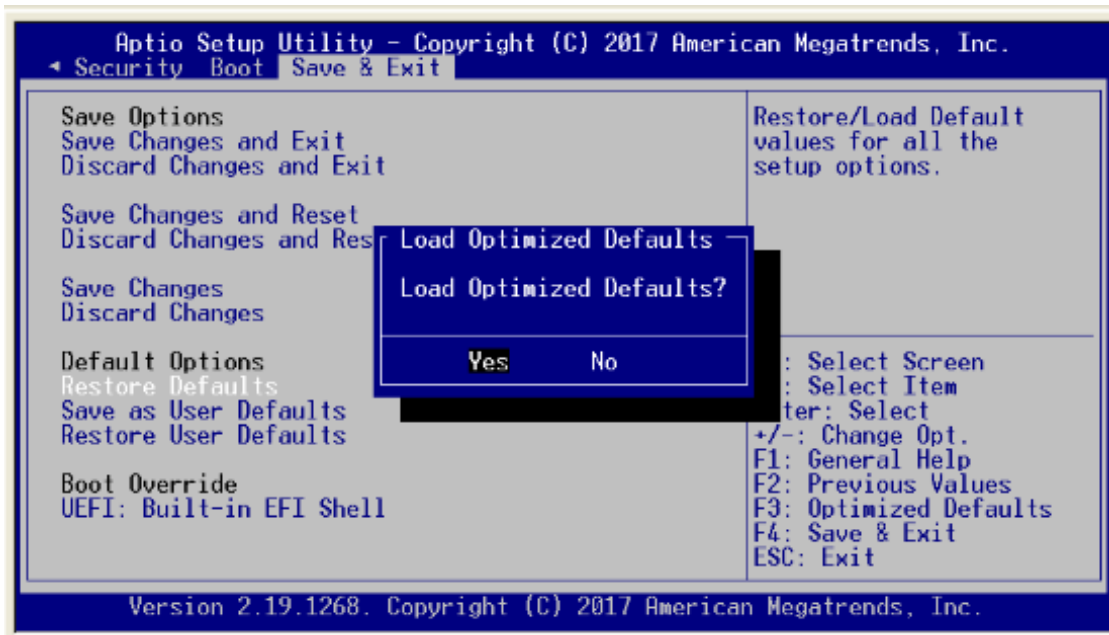
● **Save as User Defaults**

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
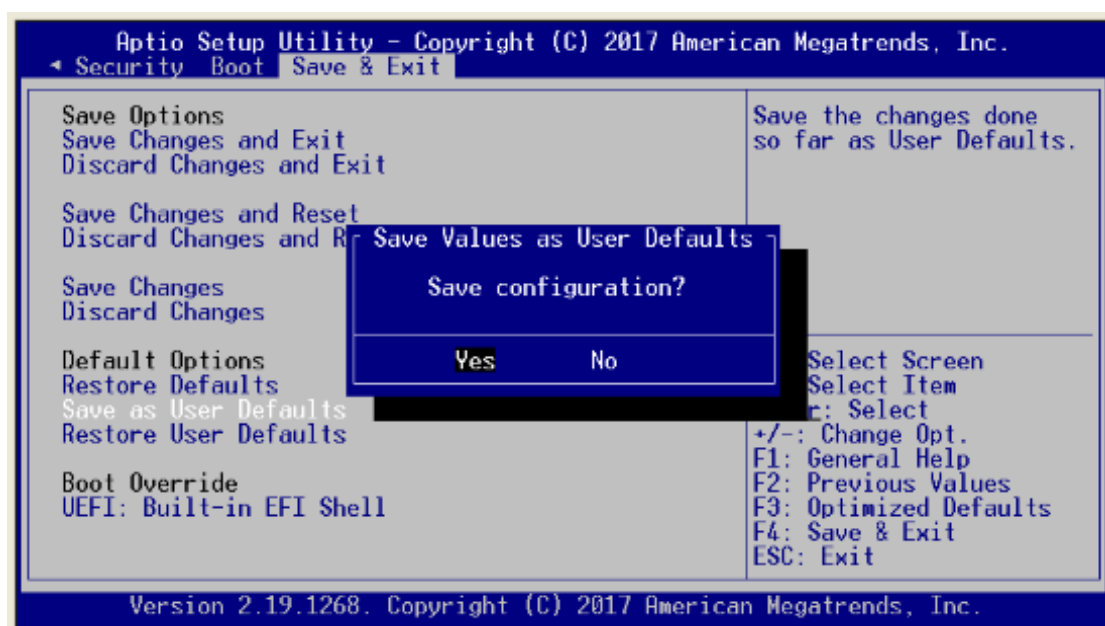
● **Restore User Defaults**

It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
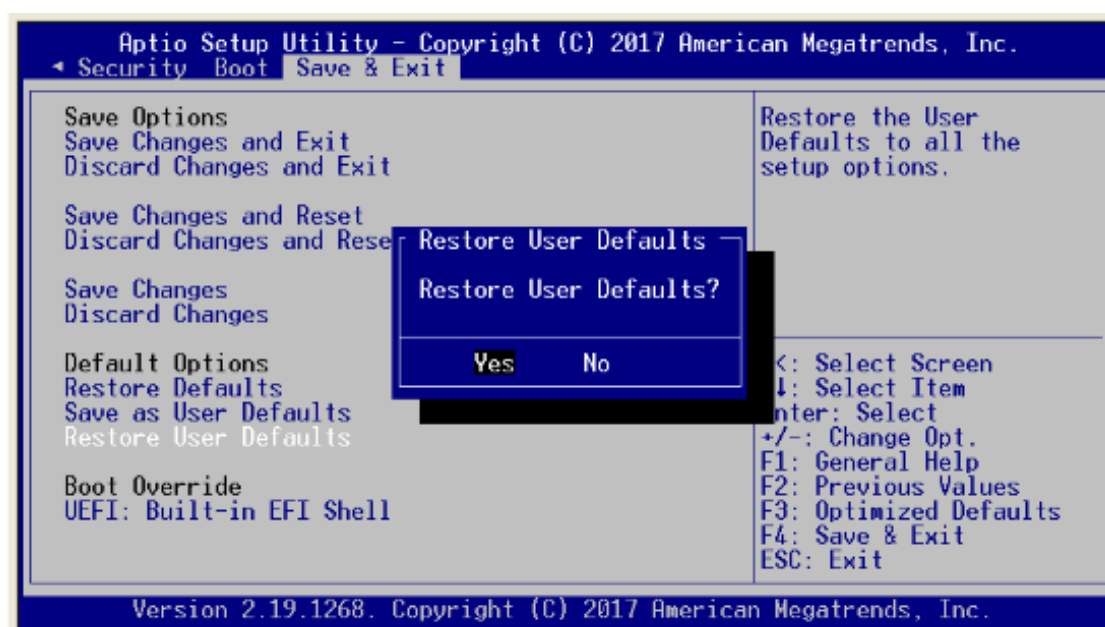
Appendix A
LAN Bypass Configuration

About LAN Bypass

In network security application, it is very important to ensure that network traffic to continue passing through the device even if hardware failure occurs or operating system crashes. LAN bypass gives us a solution for this problem.

The NA860 series LAN bypass function is very flexible. It can be selected at any time and any stage. You can enable LAN bypass for power on state by BIOS, or by software program when entering into the OS.

Moreover, for power off state, you can set up LAN Bypass through BIOS, or use software program when entering into the OS. If you don't do any change, the state will keep the previous power off state.

The NA860 has LAN bypass capability with the special designed latch relay circuitry. When LAN bypass function is enabled, a relay closes to act as a bridge to route network data flow between module's LAN port 0 and LAN port 1 (or LAN port 2 and LAN port 3…..), see below image. The bypass feature can be activated immediately or according to timer which is configurable from 1 up to 64 seconds. You can write a software program to control bypass operation behavior to fit your requirement.

Note: *If you need sample codes, please contact our FAE directly. And they are for reference purposes only.*
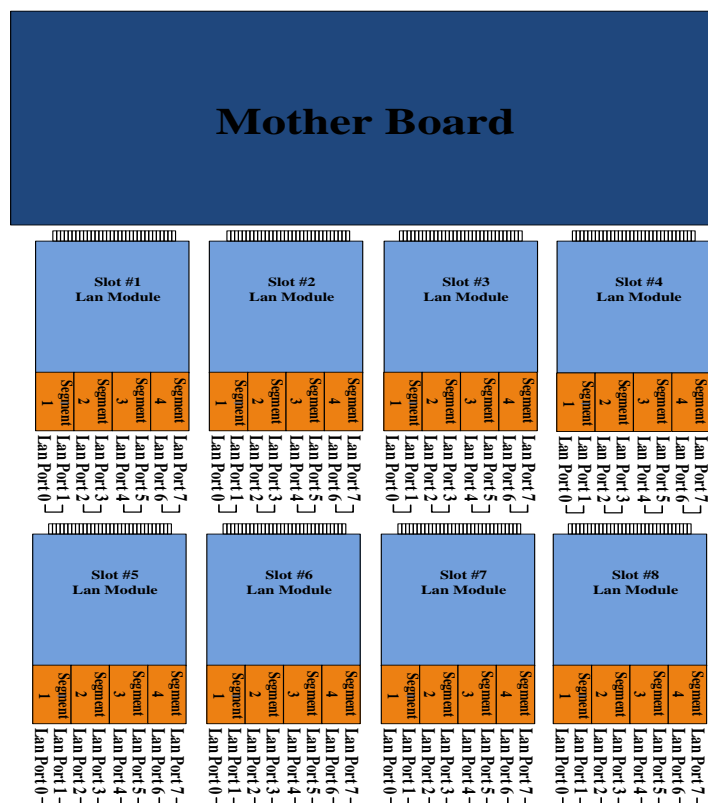
LAN Bypass Register Configuration

● **Power ON Bypass Control Register**

Address:

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
0x8E0	0x8E4	0x8E8	0x8EC	0x8F0	0x8F4	0x8F8	0x8FC

7	6	5	4	3	2	1	0
BYM1	BYM0	X	X	SEGN4	SEGN3	SEGN2	SEGN1
W	W	--	--	W	W	W	W

Default value: 00000000

Bit 7~6   BYM1~0
These bits are used to set bypass mode.
00   Not used.
01   Force bypass enable
Relay closes immediately to form LAN bypass on selected segment when power on.
10   Force bypass disable
LAN bypass is disabled immediately on selected segment when power on.
11   Timer enable
When power on, the selected segments are controlled by the setting of LAN bypass Timer Control register.

Bit 5~4   Not used.

Bits 3~0   SEGN4~1
Select each segment by setting the corresponding bit to 1. When the bit is set to 0, no action happens upon the segment.

Data read back from this register is not defined and therefore must be ignored. Reading from this register makes no effect on LAN bypass function. All data in this register will be cleared when system is turned off. If you still want to use power on LAN bypass function, turn on the system and make sure to rewrite the register. Otherwise, if you don't rewrite the register, the status will be kept on power off bypass state.

● **Power OFF Bypass Control Register**

Address:

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
0x8E1	0x8E5	0x8E9	0x8ED	0x8F1	0x8F5	0x8F9	0x8FD

7	6	5	4	3	2	1	0
X	X	X	X	SEGF4	SEGF3	SEGF2	SEGF1
--	--	--	--	W	W	W	W

Default value: 00000000

Bit 7~4   Not used.

Bits3~0   SEGF4~1
Use the corresponding bit to configure each segment. Setting the bit to 1 enables LAN bypass on the segment when power off. Clearing the bit to 0 disables LAN bypass on the segment when power off.

Data read back from this register is not defined and therefore must be ignored. Reading from this register makes no effect on LAN bypass function. When system is turned off, last data written onto this register will be kept. If you want to make any change, turn on the system and make sure to reconfigure the register.

● **LAN Bypass Timer Control Register**

Address:

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
0x8E2	0x8E6	0x8EA	0x8EE	0x8F2	0x8F6	0x8FA	0x8FE

7	6	5	4	3	2	1	0
TEXP	X	X	X	X	TVAL2	TVAL1	TVAL0
R	--	--	--	--	W	W	W

Default value: 00000000

Bit 7   TEXP (Read Only)
This bit indicates status of hardware timer.
0   Timer has not expired
1   Timer has expired

Bits 6~3   Not used.

Bits 2~0   TVAL2~0
These bits determine the amount of count value in second(s).
001   1 (sec)
010   2 (sec)
011   4 (sec)
100   8 (sec)
101   16 (sec)
110   32 (sec)
111   64 (sec)
000   Timer is not activated.

Writing a value to these bits will reset the hardware timer. The counting process begins again according to the new written value. Software must write count value periodically to ensure that timer will never expire. If timer timeout occurs, relay(s) automatically close to form LAN bypass on selected segment(s) based on the setting of Power On Bypass Control register (SEGN4~SEGN1).

Data (bits 6~0) read back from this register is not defined and therefore must be ignored. A read operation upon this register should not refresh the hardware timer.

● **LAN Bypass Status / Firmware Version Register**

Address:

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
0x8E3	0x8E7	0x8EB	0x8EF	0x8F3	0x8F7	0x8FB	0x8FF

7	6	5	4	3	2	1	0
VER3	VER2	VER1	VER0	BY4	BY3	BY2	BY1
R	R	R	R	R	R	R	R

Bit3~0   Lan Bypass Seg.1 status ➔ Disable=0; Enable=1
Bit 7~4   Firmware version
                Without Lan bypass function=1111

Appendix B
WDT Timer for System Reset

WDT (Watchdog Timer)

The hardware supports the WDT (Watchdog Timer) function. While time-out happens after a defaulted period, the WDT will reset the system.

Note: *If you need sample codes, please contact our FAE directly. And they are for reference purposes only.*

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Appendix C
LAN Module Expansion

You can install LAN module(s) into NA860's front-accessible expansion slots to meet your application requirement. Here are some LAN module configurations for your selection:

Slim Module	Ports	Ethernet Controller	LAN Bypass	NA860	NA850	NA720	NA580	NA570	NA552	NA362R	NA361R
40GbE Fiber Modules											
AX93331-2QFI	2	Intel® XL710	0	√	√	√	√	√	√	√	√
25GbE Fiber Modules											
AX93332-25FI	2	Intel® XXV710	0	√	√	√	√	√	√	√	√
10GbE Fiber Modules											
AX93307-2FI	2	Intel® 82599ES	0	√	√	√	√	√	√	√	√
AX93307-2FIL	2	Intel® 82599ES	1	√	√	√	√	√	√	√	√
AX93327-4FI	4	XL710	0	√	√	√	√	√	√	√	√
10GbE Copper Modules											
AX93317-2GIL	2	Intel® X540	1	√	√	√	√	√	√	√	√
GbE Mix Modules											
AX93322-8MIL	8	Intel® 82580EB	2	√	√	√	√	√	√	√	√
GbE Fiber Modules											
AX93322-8FI	8	Intel® 82580EB	0	√	√	√	√	√	√	√	√
AX93336-4FI	4	Intel® i350	0	√	√	√	√	√	√	√	√
GbE Copper Modules											
AX93316-8GI	8	Intel® 82580EB	0	√	√	√	√	√	√	√	√
AX93316-8GIL	8	Intel® 82580EB	4	√	√	√	√	√	√	√	√
AX93326-8GIL	8	Intel® i210	4	√	√	√	√			√	√
AX93336-4GIL	4	Intel® i350	2	√	√	√	√	√	√		
AX93336-4GI	4	Intel® i211	0	√	√	√	√	√	√	√	√

> ➢ *Limitation: Single CPU only supports 4 LAN modules (Slot 1~4)*
> ➢ *Note : NA860 can support total 8 slots of LAN module, but for LAN Bypass feature can be supported 5 slots only.*

Use this jumper to select the LAN Bypass Function .

Description	Function	Jumper
LAN Bypass Trigger when Power On	All SEG. Bypass as same as Power Off status	**JP3** [1-2] 1 2 3 / **JP2** [1-2] 1 2 3
	All SEG Bypass Disable(Default)	**JP3** [2-3] 1 2 3 / **JP2** [1-2] 1 2 3
	All SEG Bypass Enable	**JP3** [2-3] 1 2 3 / **JP2** [2-3] 1 2 3

Note: **When the system is turned on, you can select LAN bypass function by Jumper and Bios when power on state, when enter the OS, you can select   LAN pass function at power on/ off   state by software ,the detail information please refer to the appendix A.**
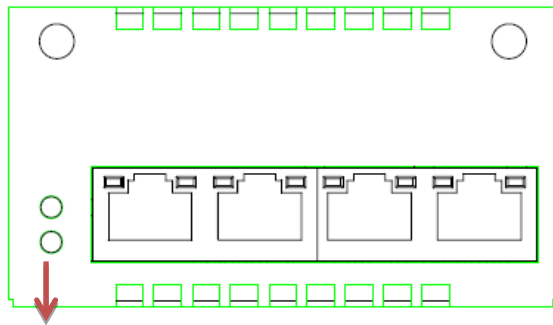
LED Definition

AX93316/AX93326

LAN bypass LED

- **LAN bypass LED**
  While running the LAN By-Pass function, the LED always lights up.

- **Active LED (Single color)for for LAN port #1, port#2, port#3, port#4, port #5, port#6, port#7, port#8**
  - ➢ The orange LED is on when the LAN port connection is working.
  - ➢ The LED flashes when transmitting or receiving any signals to or from the appliance.
  - ➢ The LED is dark when the appliance is off.

- **Link LED for LAN port #1, port#2, port#3, port#4, port#5 and port#6, port#7, port#8**
  - ➢ The double-color LED light indicates 10/100/1000Mbps transfer rate.
  - ➢ When the orange-color LED light is radiating, it should be 1000Mbps transfer rate.
  - ➢ When the green-color LED light is radiating, it should be 100Mbps transfer rate.
  - ➢ If the Link LED is dark and Active LED is light on or flashing, it should be 10Mbps transfer rate.

When this LED and Link/Active LED both are dark. No networking devices are attached

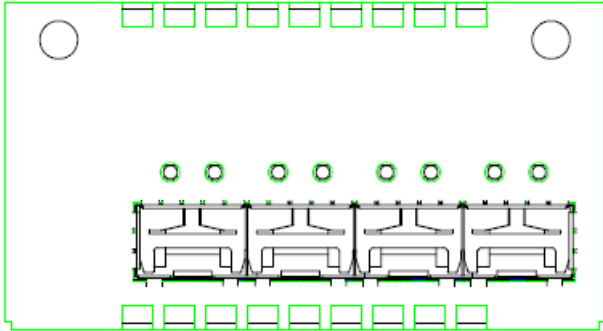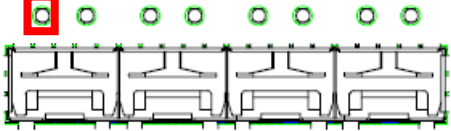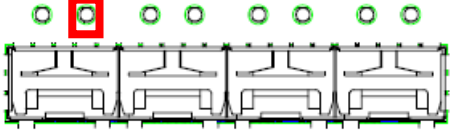| Transfer Rate	LED Light Color
10Mbps	Dark
100Mbps	Green
1000Mbps	Orange

AX93336-4GIL

LAN bypass LED

- **LAN bypass LED**
  While running the LAN By-Pass function, the LED always lights up.

- **Active LED (Single color)for for LAN port #1, port#2, port#3, port#4**
  - ➢ The orange LED is on when the LAN port connection is working.
  - ➢ The LED flashes when transmitting or receiving any signals to or from the appliance.
  - ➢ The LED is dark when the appliance is off.

- **Link LED for LAN port #1, port#2, port#3, port#4**
  - ➢ The double-color LED light indicates 10/100/1000Mbps transfer rate.
  - ➢ When the orange-color LED light is radiating, it should be 1000Mbps transfer rate.
  - ➢ When the green-color LED light is radiating, it should be 100Mbps transfer rate.
  - ➢ If the Link LED is dark and Active LED is light on or flashing, it should be 10Mbps transfer rate.

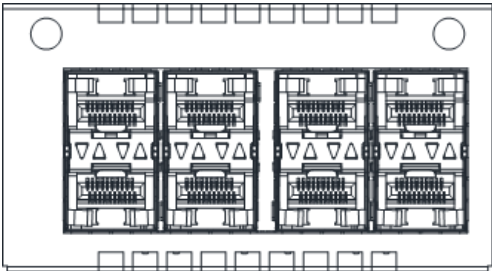When this LED and Link/Active LED both are dark. No networking devices are attached

Transfer Rate	LED Light Color
10Mbps	Dark
100Mbps	Green
1000Mbps	Orange

AX93336-4FI

Transfer Rate	LED Light Color
	Fiber port Active: Orange
	Fiber port Link: Orange

AX93322-8FI

Transfer Rate	LED Light Color
	Down Fiber port Active: Orange
	Up Fiber port Active: Orange
	Down Fiber port Link: Orange
	Up Fiber port Link: Orange

AX93322-8MIL
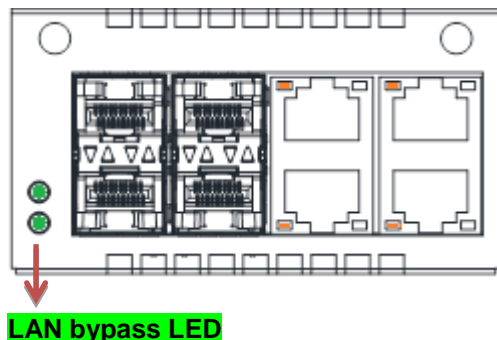
LAN bypass LED

FIBER:

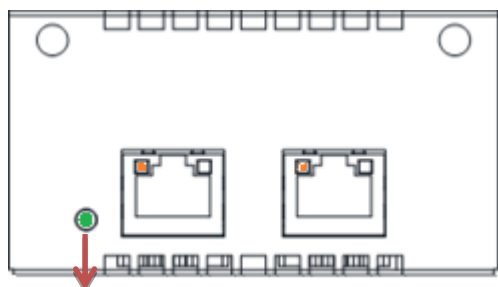| Transfer Rate	LED Light Color
	Down Fiber port Active: Orange
	Up Fiber port Active: Orange
	Down Fiber port Link: Orange
	Up Fiber port Link: Orange

Copper:

- **LAN bypass LED**
  While running the LAN By-Pass function, the LED always lights up.

- **Active LED (Single color)for for LAN port #1, port#2, port#3, port#4**
  - ➢ The orange LED is on when the LAN port connection is working.
  - ➢ The LED flashes when transmitting or receiving any signals to or from the appliance.
  - ➢ The LED is dark when the appliance is off.

- **Link LED for LAN port #1, port#2, port#3, port#4**
  - ➢ The double-color LED light indicates 10/100/1000Mbps transfer rate.
  - ➢ When the orange-color LED light is radiating, it should be 1000Mbps transfer rate.
  - ➢ When the green-color LED light is radiating, it should be 100Mbps transfer rate.
  - ➢ If the Link LED is dark and Active LED is light on or flashing, it should be 10Mbps transfer rate.

When this LED and Link/Active LED both are dark. No networking devices are attached

Transfer Rate	LED Light Color
10Mbps	Dark
100Mbps	Green
1000Mbps	Orange

AX93317

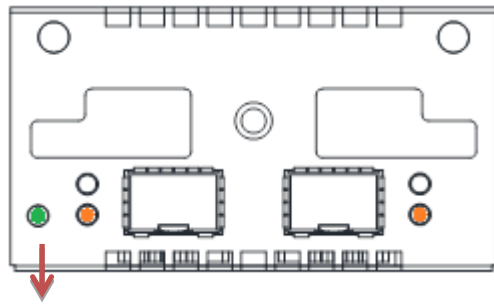**LAN bypass LED**

● **LAN bypass LED**
  While running the LAN By-Pass function, the LED always lights up.

● **Active LED (Single color)for for LAN port #1, port#2**
  ➢ The orange LED is on when the LAN port connection is working.
  ➢ The LED flashes when transmitting or receiving any signals to or from the appliance.
  ➢ The LED is dark when the appliance is off.

● **Link LED for LAN port #1, port#2**
  ➢ The double-color LED light indicates 1000/10000Mbps transfer rate.
  ➢ When the orange-color LED light is radiating, it should be 10000Mbps transfer rate.
  ➢ When the green-color LED light is radiating, it should be 1000Mbps transfer rate.

When this LED and Link/Active LED both are dark. No networking devices are attached

Transfer Rate	LED Light Color
1000Mbps	Green
10000Mbps	Orange

AX93307

LAN bypass LED

- **LAN bypass LED**
  While running the LAN By-Pass function, the LED always lights up.

- **Active LED (Single color)for for LAN port #1, port#2**
  - ➢ The orange LED is on when the LAN port connection is working.
  - ➢ The LED flashes when transmitting or receiving any signals to or from the appliance.
  - ➢ The LED is dark when the appliance is off.

- **Link LED for LAN port #1, port#2**
  - ➢ The double-color LED light indicates 1000/10000Mbps transfer rate.
  - ➢ When the orange-color LED light is radiating, it should be 10000Mbps transfer rate.
  - ➢ When the green-color LED light is radiating, it should be 1000Mbps transfer rate.

When this LED and Link/Active LED both are dark. No networking devices are attached

Transfer Rate	LED Light Color
1000Mbps	Green
10000Mbps	Orange

Appendix D
Warning

- This is a class A Product. In a domestic Environment this Product may cause radio interference in which case the user may be required to take adequate measures.

- It will be danger if battery is incorrectly replaced. Replacing only with the same or equivalent type is highly recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- **Warning for Hard Disk Drive Selection:**
  TUV approved Hard Disk Drive is preferred for TUV compliance Hard Disk drive-Optional, (NWGQ2), generic, Input Voltage rated 5V DC/1.0A, 12V DC/1.8A maximum. Minimum clearance from uninsulated live parts 4.0 mm.

- The equipment is to be installed in an environment with maximum ambient temperature must not exceed 40°C

- The openings on the enclosure are for air convection hence protected the equipment from overheating. DO NOT COVER THE OPENINGS.

- Lay this equipment on a reliable surface when install. A drop or fall could cause injury.

- The equipment shall be installed according to specification as nameplate. Make sure the voltage of the power source when connect the equipment to the power outlet.

- The current of load and output power of loads shall be not over the specification.

- This equipment must be connected to the reliable earthling before using.

⚠ **Electric shock hazard inside the redundant power supply.**
The exchange of modules shall be done by service person.

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