

User Manual

X21

**21.5" Fanless Multi-touch Panel PC
with Intel® Celeron® J1900 Processor**

Record of Revision

Version	Issued Date	Description	Author
v0.1	2017.1.26	First Release	Derek

Acknowledgements

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Safety Instructions

1. Read these safety instructions carefully.
 2. Keep this User Manual for later reference.
 3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
 4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
 5. Keep this equipment away from humidity.
 6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
 7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
 8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
 9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
 10. All cautions and warnings on the equipment should be noted.
 11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
 12. Never pour any liquid into an opening. This may cause fire or electrical shock.
 13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to

- the user's manual.
- The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
14. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -0° C (32° F) OR ABOVE 50° C (122° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
15. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter1. General Introduction

1.1 Overview

Novakon's X21 is a new 21.5" Multi-touch Panel PC equipped with an Intel® Celeron® J1900 processor. The new Bay Trail CPU offers the advantage of desktop performance with low power consumption. The fanless design increases reliability. With dual GbE LAN, 4 serial ports, 4 USB ports and 9-36VDC input, the X21 makes connecting multiple devices easy when integrating solutions.



(Front Cover)



(Back Cover)



(I/O Cover)

1.2 Key Features

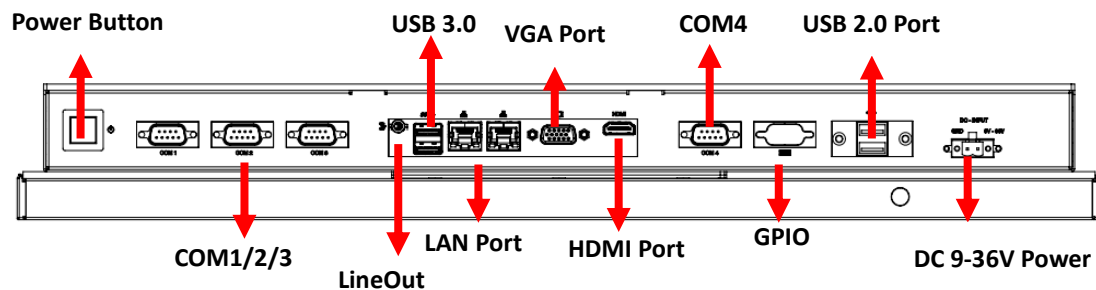
- 21.5" HD LED panel with Projected Capacitive touch display (X21-A1)
- Embedded Intel® Celeron® J1900 2.0 GHz Processor
- System memory up to 8 GB DDR3L 1066/1333 SDRAM
- Internal SATA 2.5" HDD and mSATA socket
- 2 GbE, HD Audio, 4 USB, 4 COM, Mini PCIe, VGA & HDMI
- VESA & Panel mounting
- 9-36 V DC Power Input
- 0~50° C Operating Temperature

1.3 Hardware Specification

Model		X21-P
Processor System	CPU	Intel® Celeron® Processor J1900
	Frequency	2.0 GHz / 2.42 GHz (Boost), 4 Cores / 4 Threads
	L2 Cache	2 MB
	System Chipset	N/A
	BIOS	UEFI
Memory	Technology	DDR3L 1333 MHz SDRAM (1.35 V only)
	Max. Capacity	8 GB
	Socket	1, 204-pin SO-DIMM
Display	Panel Size	21.5" LED Panel
	Resolution	1920x1080
	Viewing Angle	89 x 89 (H) x 89 x 89 (V)
	Brightness	250(cd/m2)
	Color Support	16.7M
	Contrast Ratio	1000:1
	Response Time	5(msec)
	VGA	Up to 1920 x 1200
	HDMI	HDMI 1.4a up to 1920 x 1200
	Dual Display	LCD + VGA or LCD + HDMI
Touch screen	Touch screen Type	Projected Capacitive
	Surface Hardness	6H
	Durability	100 millions times
	Transparency	90%(±3%)

I/O Interface	USB	2 USB 3.0, 2 USB 2.0
	Serial Port	4 COM ports (3/ RS-232, 1 RS-232/422/485 for COM1)
	GPIO(option)	8 Pin GPIO 3.3V (DP-9 Connect)
Ethernet	Controller	Dual GbE, 10/100/1000 Mbps (Realtek RTL8111G-CG)
Audio	Chipset	Realtek ALC662 High Definition Audio (HD)
	Connector	Line out
Expansion	Mini PCIe	1 Full-size Mini PCIe or mSATA, selected by jumper setting, 1 Half-size Mini PCIe
Storage	SATA II	1 Internal 2.5" HDD/SSD
	mSATA	Supports either mSATA or full-size Mini PCIe, selected by jumper setting
Power	Power Supply Voltage	Supports 9-36 V DC input (Phoenix Connector)
	Power Adaptor	AC-to-DC, 12 V @ 5.417 A(65 W) DC-output
	Power Input	9-36 V DC-input, 6.6A - 1.6A
	Power Consumption	Typical: 19.2W @12V DC-input Full Load: 23.1W @ 12V DC-input
Environment	Operational Temp	0~50° C (32~122° F) w/ 2.5" SSD
	Non-Operational	-20~60° C (-4~140° F)
	Humidity	5~95% @ 40° C, non-condensing
	Vibration	5-500 Hz, 0.026 G ² /Hz, 2.16 Grms, X, Y, Z, 1 hour per axis
	EMC	CE, FCC Class A
General	Dimensions (L x H x D)	455 x 284.2 x 59.1 mm (17.91" x 11.19" x 2.32")
	Weight	4.2 kg (9.26 lb)
	Operating System	Windows 7/8.1/10, WES7 E/P, WE8S Linux kernel above 3.0
	Front Panel Waterproof	IP 54

1.4 I/O Arrangement



■ Power Button

Press this button to turn on the system.

(Orange light: Stand By / Blue light : Power On)

■ DC 9-36V Power Input Connector

This System supports DC 9-36V input power voltage.

This connector must be connected to DC 9 to 36 V power adaptor.

After plugging phoenix connector , be sure to fasten the two screws to lock the connector.

■ HDMI Port

This port can be connected to the HDMI monitor.

Notice that users cannot use HDMI and VGA as video output at the same time, because the "dual display" function is set for HDMI+LCD or VGA+LCD.

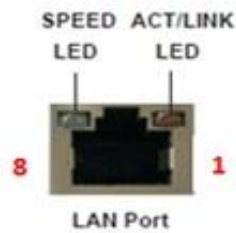
■ VGA Port

This port can be connected to the VGA monitor.

Notice that users cannot use HDMI and VGA as video output at the same time, because the "dual display" function is set for HDMI+LCD or VGA+LCD.

■ LAN Port

This port can be connected to the Ethernet via RJ-45 connector .



10/100BASE-T:

Pin	Definition	Pin	Definition
1	TX_D0+	5	NC
2	TX_D0-	6	RX_D1-
3	RX_D1+	7	NC
4	NC	8	NC

1000BASE-T:

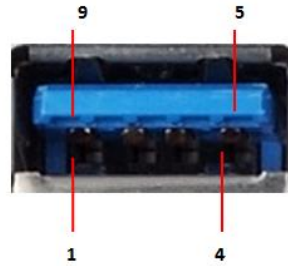
Pin	Definition	Pin	Definition
1	TX_D0+	5	BI_D2-
2	TX_D0-	6	RX_D1-
3	RX_D1+	7	BI_D3+
4	BI_D2+	8	BI_D3-

Activity/Link LED	
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED	
Status	Description
Off	10Mbps connection
Green	100Mbps connection
Orange	1Gbps connection

■ USB 3.0 Port

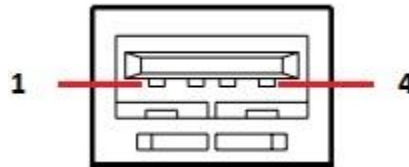
Pin	Definition
1	+5
2	USB-
3	USB+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+



Each USB3.0 port supports 900mA @ 5 V

■ USB 2.0 Port

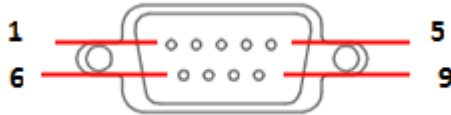
Pin	Definition
1	+5
2	USB-
3	USB+
4	GND



Each USB2.0 port supports 500mA @ 5 V

■ COM 1 Ports (RS-232/422/485)

Users can change the configuration of COM1 by using BIOS setup utility.



Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

(RS-232)

Pin	Definition	Pin	Definition
1	TX-	6	N/A
2	RX+	7	N/A
3	TX+	8	N/A
4	RX-	9	N/A
5	GND		

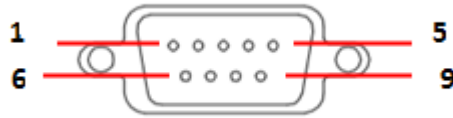
(RS-422)

Pin	Definition	Pin	Definition
1	RTX-	6	N/A
2	N/A	7	N/A
3	RTX+	8	N/A
4	N/A	9	N/A
5	GND		

(RS-485)

NOTE: Please refer to [Chapter4 BIOS Setting - 4.2.5 COM1 Configuration \(page\)](#) to set parameters of COM1

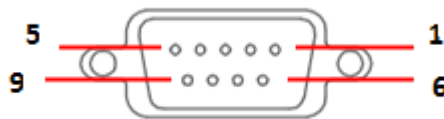
■ **COM 2-3-4 (RS-232 only)**



Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI

(RS-232)

■ **GPIO Ports (Option)**



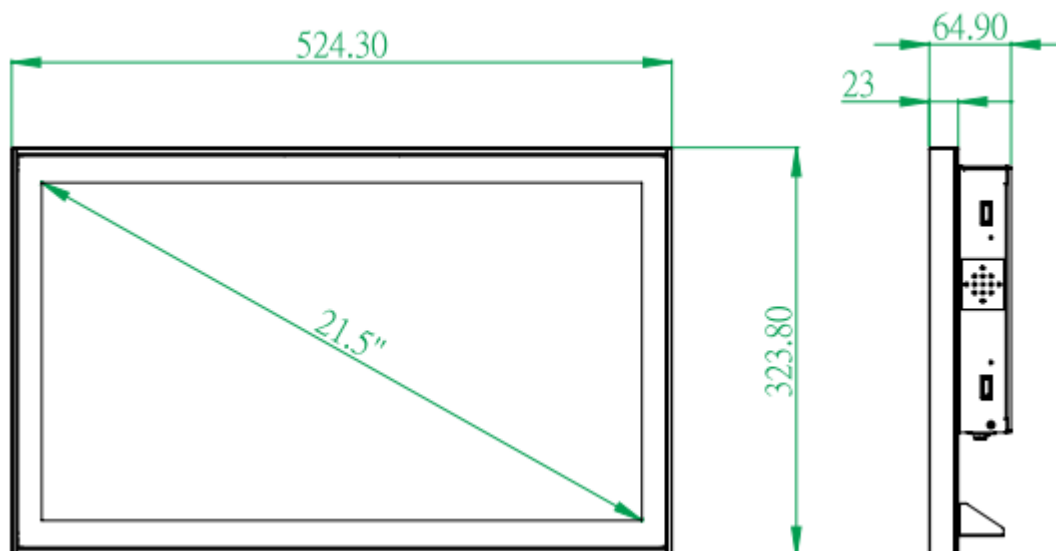
Pin	Definition
1	SIO_GP1
2	SIO_GP2
3	SIO_GP3
4	SIO_GP4
5	SIO_GP5
6	SIO_GP6
7	SIO_GP7
8	SIO_GP8
9	VCC(12V default / 5V)
Shielding	GND

■ **Audio Port**

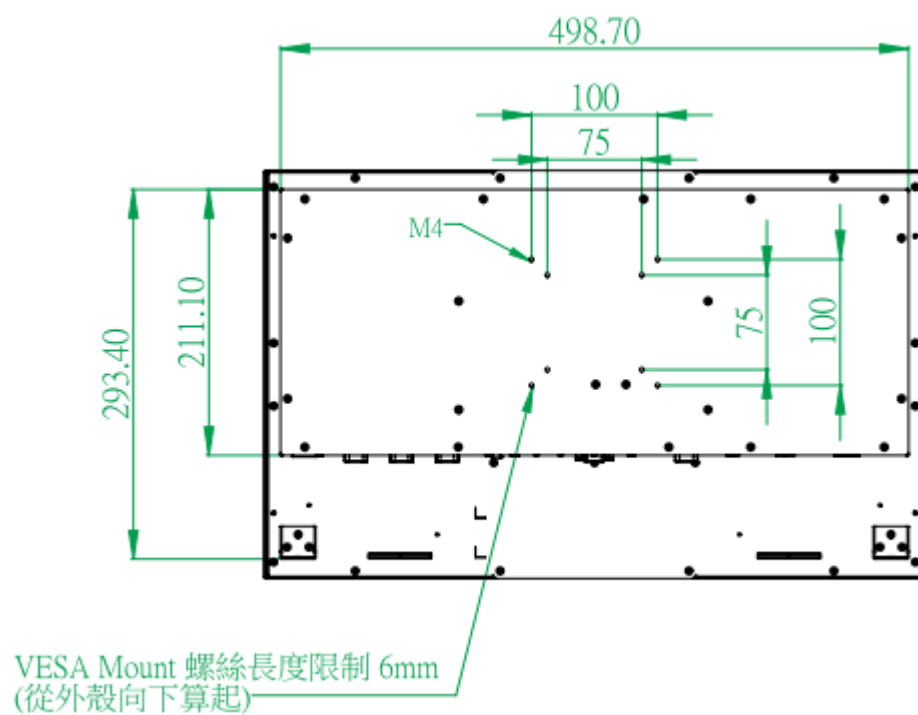
Green connector means **LINE OUT**

1.5 Mechanical Dimension

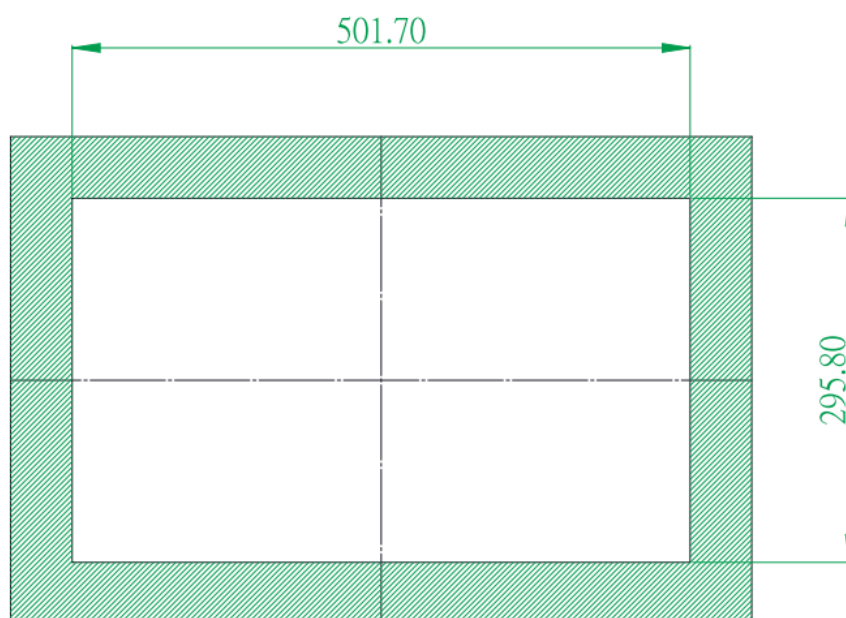
■ Panel PC Dimension



■ Panel PC Dimension (Back side)



■ Cut Out

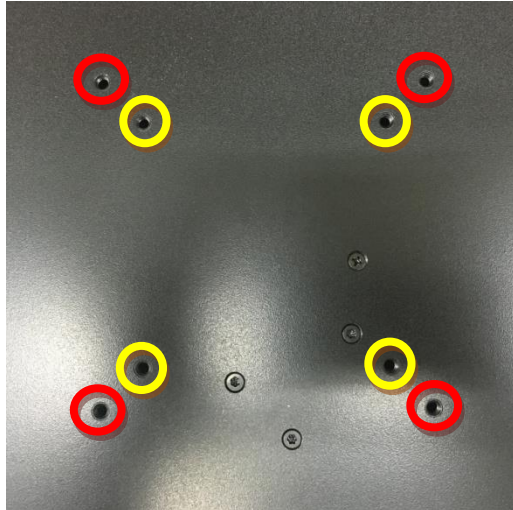


Chapter 2. VESA Mounting

2.1 VESA Mounting

Step1. Check the VASA mount dimension on the back cover .

There are two choice : 100 x 100mm or 75 x 75 mm



- 1. Screw Length Limitation: 6mm
(Calculated from monitor's back cover)
- 2. Screw Spec Limitation: M4 size

Step2. Fasten the four screws to bond **monitor** to **VESA Stand**

Warning !



- 1. The length of VASA mount screw cannot exceed 6mm.
(Calculated from monitor's back cover)
- 2. Any wrong installation will cause monitor's great damage.
- 3. The Spec of VASA mount screw is M4 size.

2.2 Panel mount

Accessory Kit screw (M4*30) lock wall fasteners. As shown below.



Chapter3. System Setup

3.1 Power Installation Procedure

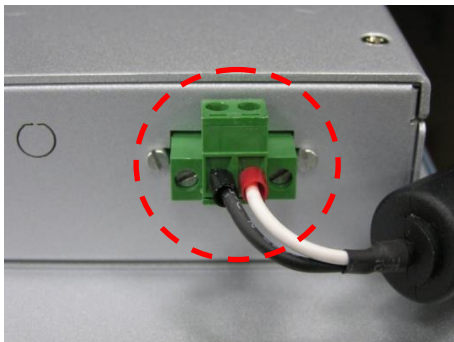


Step 1. Connect a power cord to the **power adaptor**.

■ **AC to DC power adaptor specification**

1. Input support voltage: 110V ~ 240V AC power , 50~60Hz
2. Output support voltage: 12V DC power @5.17A MAX
3. 0~40 degree C operating temperature

Step 2. Connect another male plug of the power cord to an electrical outlet.



Step 3. Connect the **Phoenix Connector Terminal** into the system's **Power Input Connector**.

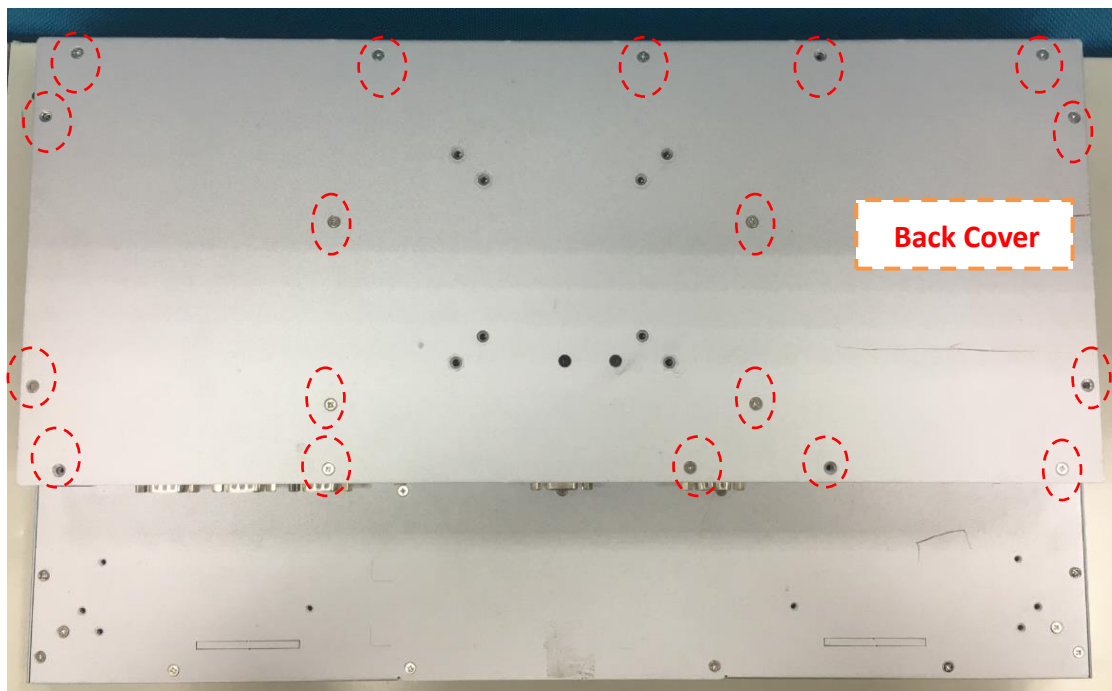


WARNING:

1. After plugging phoenix connector , be sure to fasten the two screws to lock the connector.
2. White cable stands for 12V , black cable stand for GND. Make sure you plug connector in correct direction.

3.2 Installing 2.5" HDD

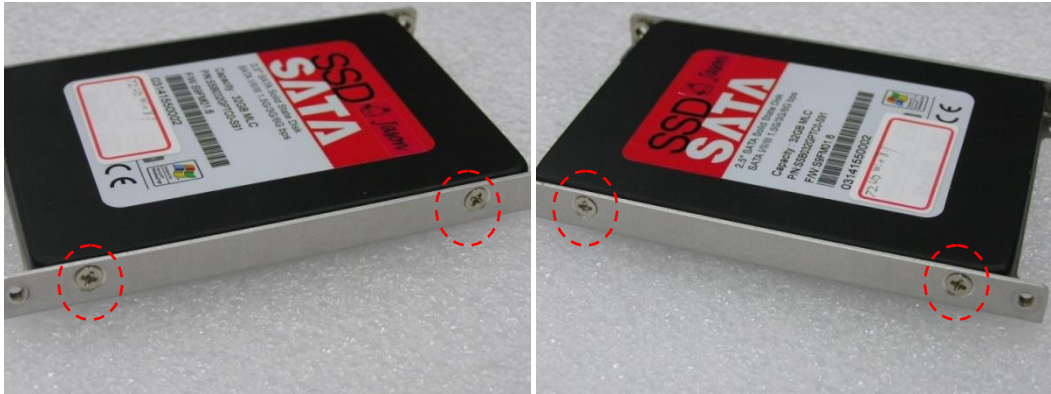
Step 1. Loosen the 18 screws on the " **Back Cover**" , and open the cover.



Step 2.

(1) You will see a "**HDD Bracket**" for 2.5" size HDD/SSD (7mm or 9mm thickness).

(2) Pick up the "**HDD Bracket**", and Loosen/tighten the 4 screws on it.



Step 3.

(1) Pick up the "**HDD Bracket**", and Loosen/tighten the 4 screws on it.

(2) Install a new HDD, and plug in SATA cable and SATA power cable.



Notice that the bracket supports only 7mm and 9mm HDD/SSD.

Step 4.

(1) Replace the system cover

Chapter 4. BIOS Setting

The BIOS (Basic Input/output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system. The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility.

When you turn on the computer, the BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility.

When you enter the BIOS Setup utility, the top of the screen has a menu bar with the following selections:

- Main **To set up the system time/date information**
- Advanced **To set up the advanced UEFI features**
- H/W Monitor **To display current hardware status**
- Security **To set up the security features**
- Boot **To set up the default system device to locate and load the
Operating System**
- Exit **To exit the current screen or the UEFI SETUP UTILITY**

Use ← key or → key to choose among the selections on the menu bar.

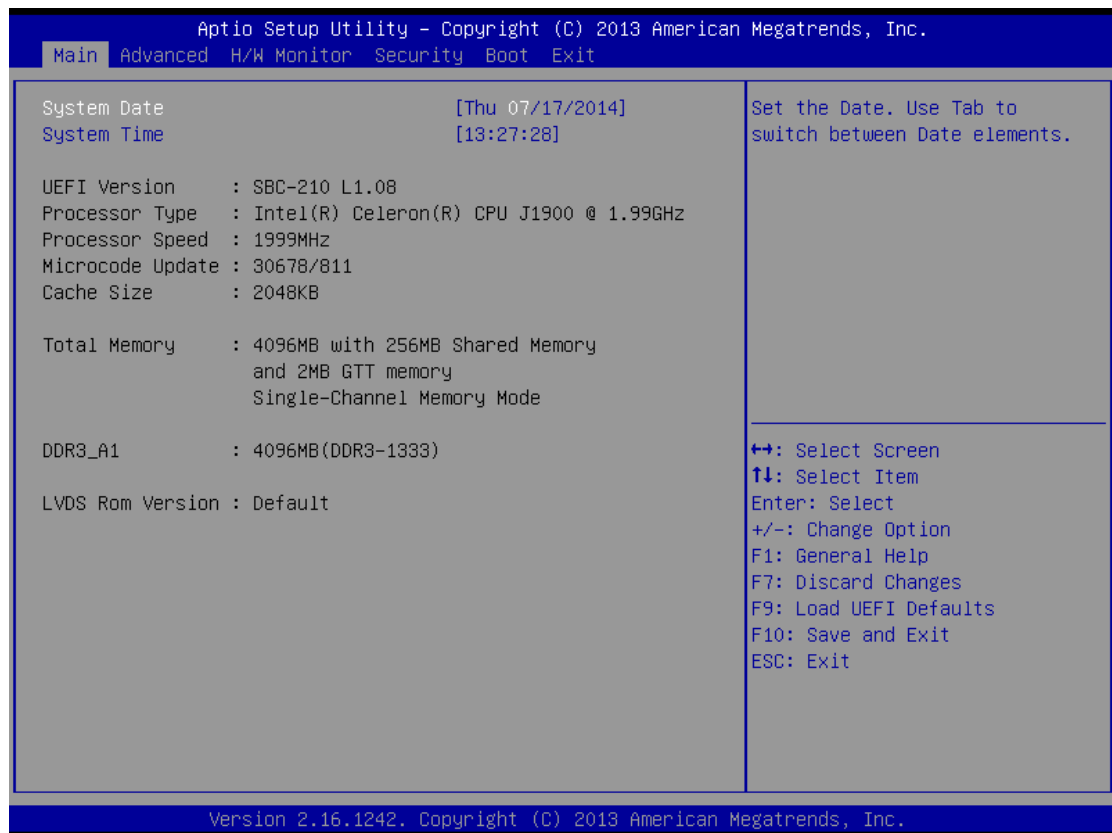
Use <Enter> key to get into the sub screen or an item.

Use ↓key or ↑ key to move cursor down or up to select items.

Use <Exit> key to exit current screen

4.1 Main

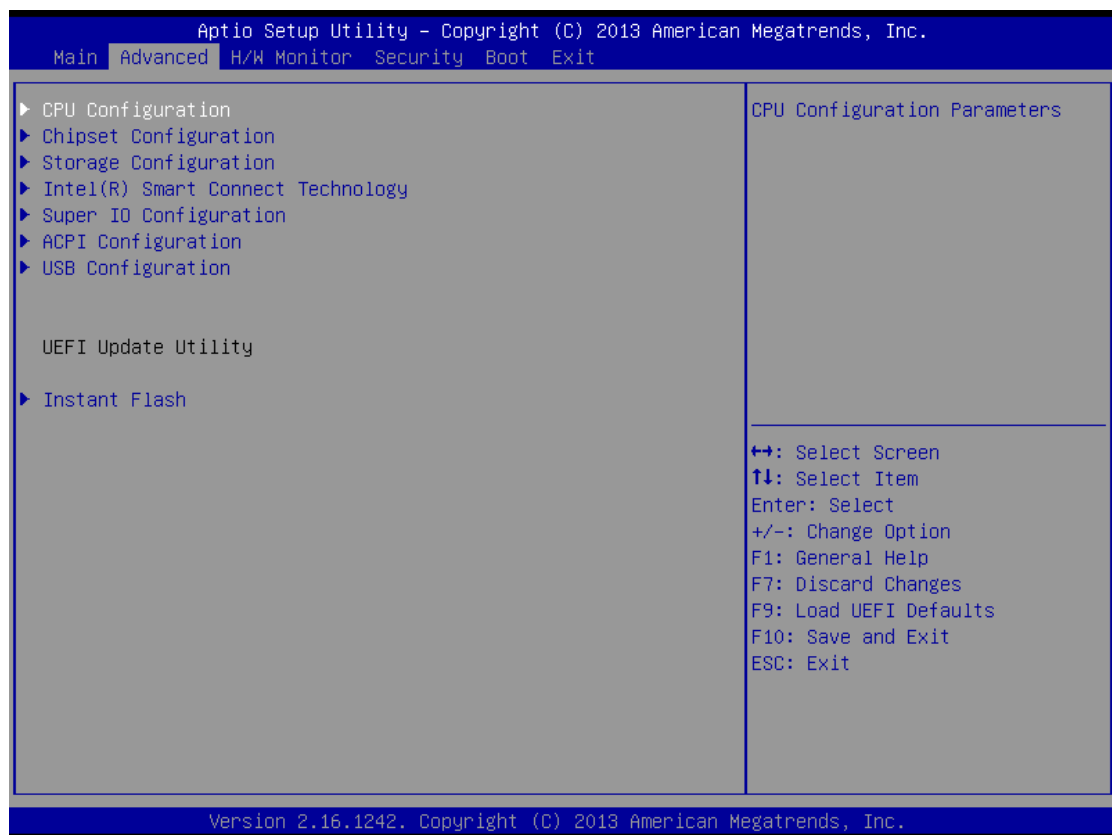
This section (Main screen) displays the system overview.



4.2 Advanced

This section allows users to set the configurations for the following items:

- CPU Configuration,
- Chipset Configuration,
- Storage Configuration,
- Intel(R) Smart Connect Technology,
- Super IO Configuration,
- ACPI Configuration and USB Configuration.
- USB Configuration
- Instant Flash



NOTE:

Setting wrong values in this section may cause the system to malfunction.

4.2.1 CPU Configuration



Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving.

If you install Windows 7 / 8 and want to enable this function, please set this item to [Enabled].

****NOTE:** Enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3 enabled, C6 and C7 disabled.

Enhanced Halt State (C1E)

This item allows users to enable or disable Enhanced Halt State (C1E) for lower power consumption.

No-Execute Memory Protection

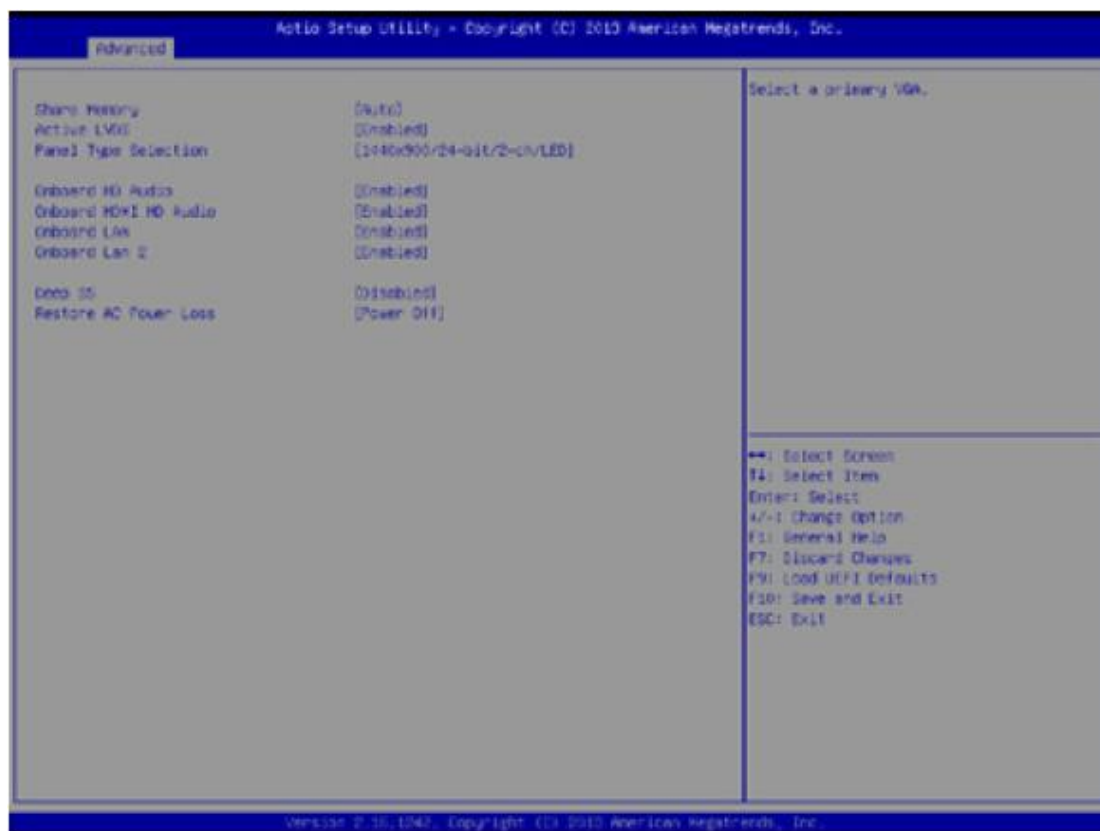
No-Execution(NX) Memory Protection Technology is an enhancement to the

IA-32 Intel Architecture. An IA-32 processor with “No Execute (NX) Memory Protection” can prevent data pages from being used by malicious software to execute code.

Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology.

4.2.2 Chipset Configuration



Share Memory

This item allows users to configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Active LVDS

This item allows users to enable or disable the LVDS.

Panel Type Selection

This item allows users to select panel type.

Onboard HD Audio

This item allows users to enable or disable the onboard HD Audio.

Onboard HDMI HD Audio

This item allows users to enable or disable the Onboard HDMI HD Audio.

Onboard LAN 1

This item allows users to enable or disable the Onboard LAN 1.

Onboard LAN 2

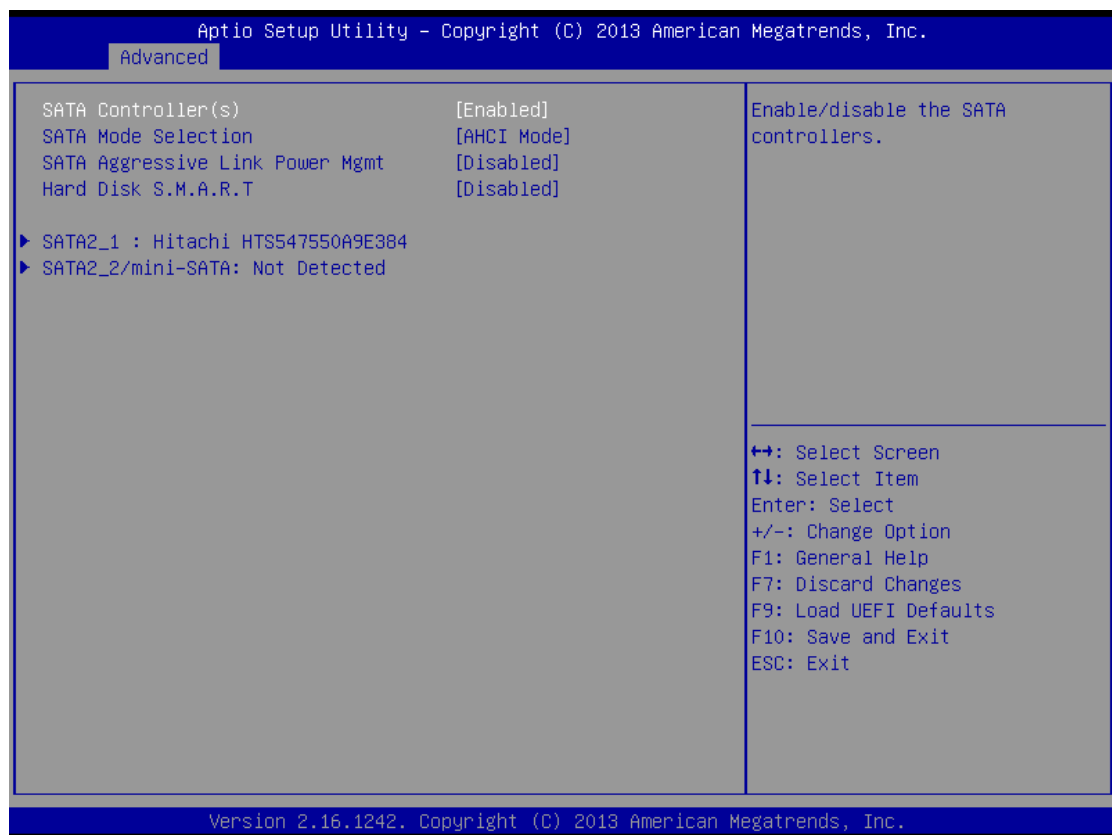
This item allows users to enable or disable the Onboard LAN 2.

Deep S5

This item allows users to enable or disable Deep S5.

[Auto] will disable the deep S5 configuration if RTC/LAN/USB device power on settings enabled.

4.2.3 Storage Configuration



SATA Controller(s)

This item allows users to enable or disable the SATA Controller.

SATA Mode Selection

This item allows users to select SATA mode.

IDE: For better compatibility.

AHCI: Supports new features that improve performance.

****NOTE: AHCI(Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.**

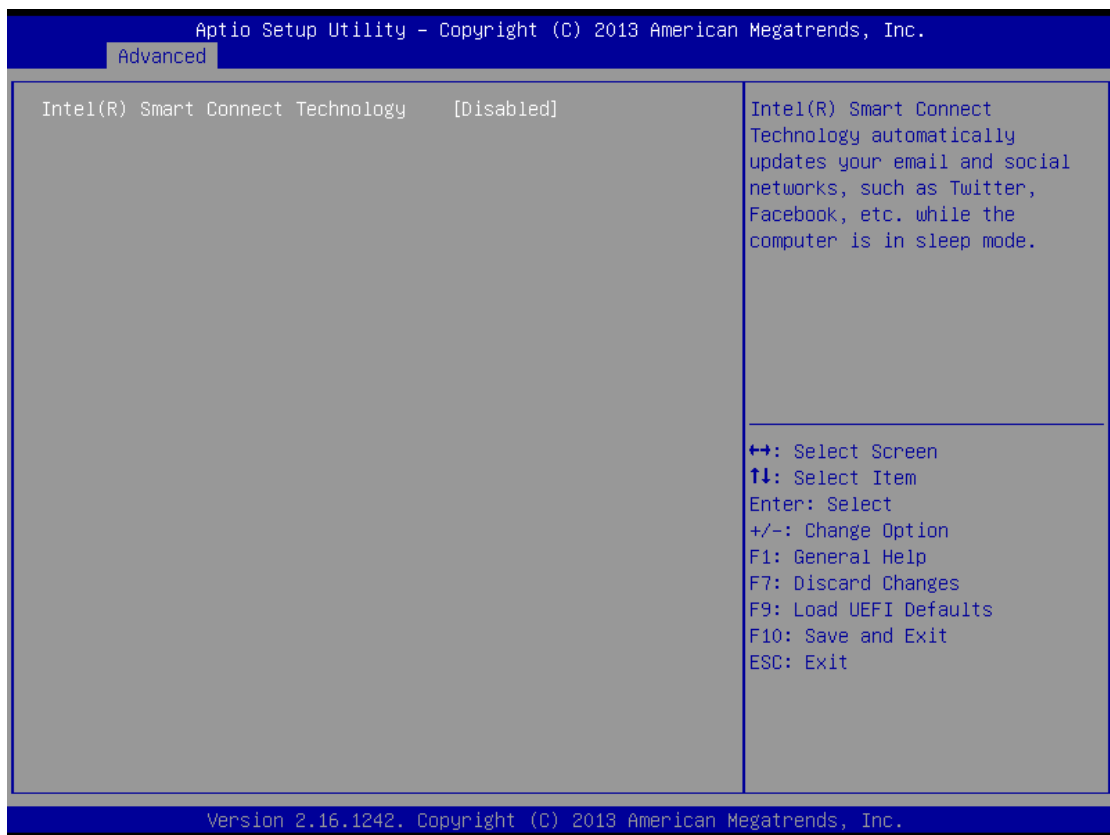
SATA Aggressive Link Power Management

This item allows users to enable or disable SATA Aggressive Link Power Management.

Hard Disk S.M.A.R.T.

This item allows users to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) .

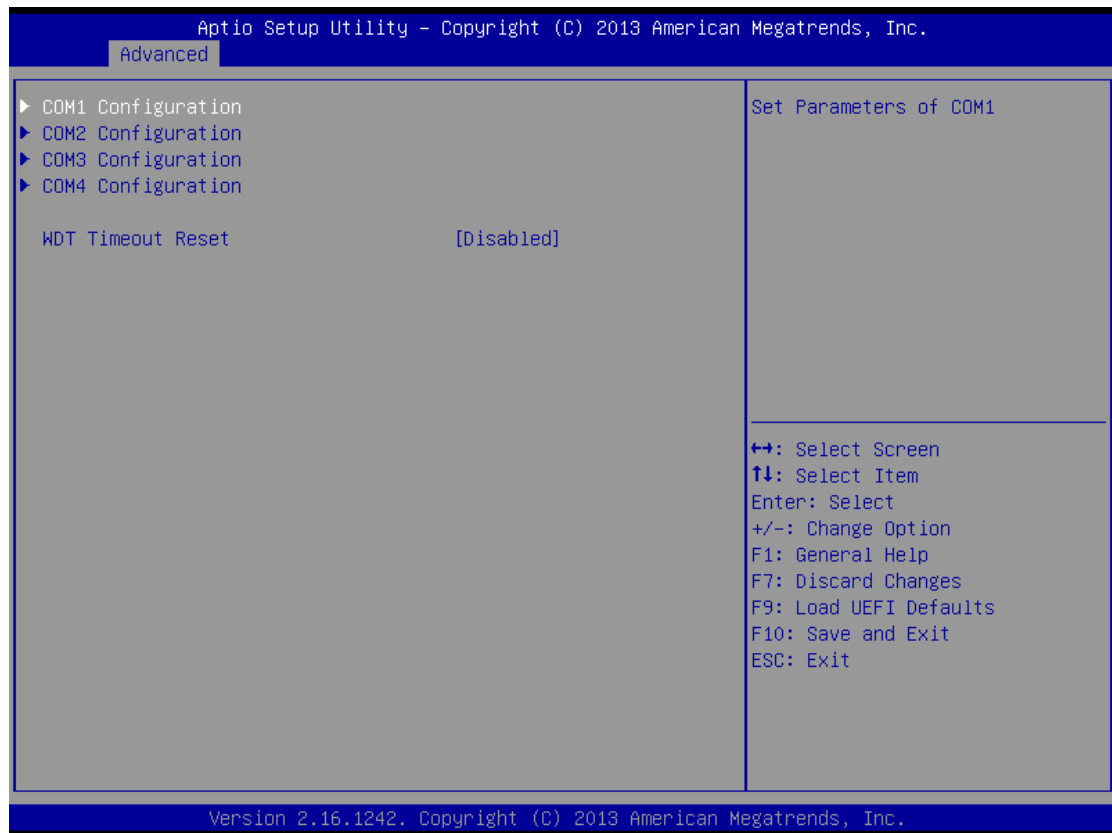
4.2.4 Intel(R) Smart Connect Technology



Intel(R) Smart Connect Technology

This item allows users to enable or disable Intel(R) Smart Connect Technology. Intel(R) Smart Connect Technology keeps your e-mail and social networks, such as Twitter, Facebook, etc. updated automatically while the computer is in sleep mode.

4.2.5 Super IO Configuration



COM1 Configuration

This item allows users to set parameters of COM1.

Select COM1 port type: [RS232], [RS422] , [RS485] or [Disabled].

COM2 Configuration

This item allows users to enable or disable COM2.

COM3 Configuration

This item allows users to enable or disable COM3.

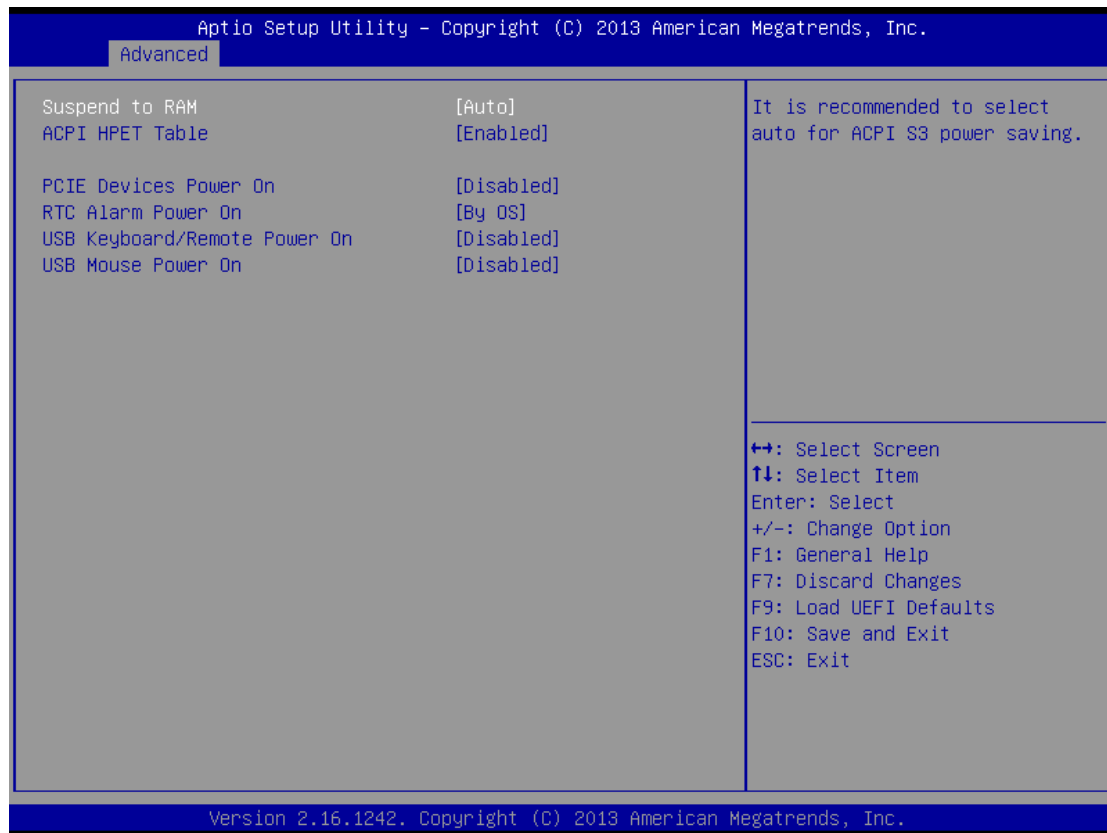
COM4 Configuration

This item allows users to enable or disable COM4.

WDT Timeout Reset

This item allows users to enable or disable the Watch Dog Timer timeout to reset system.

4.2.6 ACPI Configuration



Suspend to RAM

This item allows users to select whether to auto-detect or disable the Suspend-to-RAM feature.

Select [Auto] will enable this feature if the OS supports it.

ACPI HPET Table

This item allows users to enable or disable ACPI HPET Table.

Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

PCIE Devices Power On

This item allows users to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

RTC Alarm Power On

This item allows users to enable or disable RTC (Real Time Clock) to power on the system.

When users sets it to [By OS] , system wake-up will be handled by your operating system.

USB Keyboard/Remote Power On

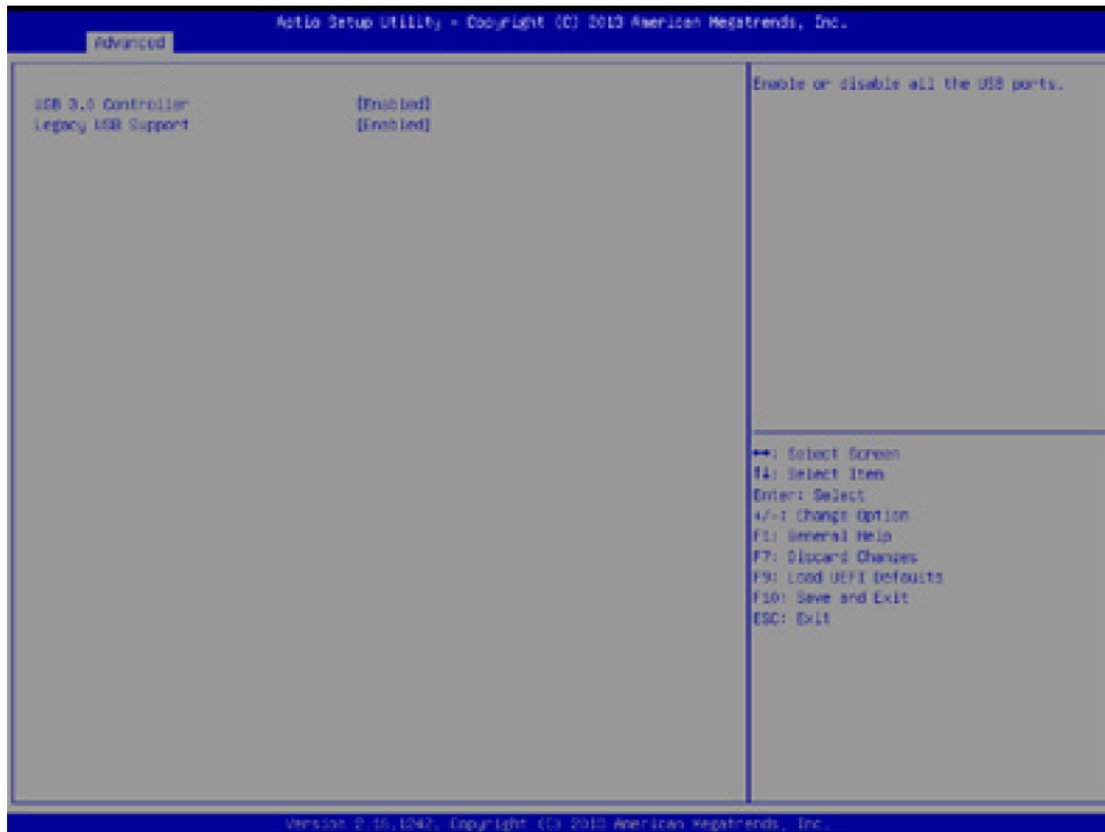
This item allows users to enable or disable USB Keyboard/Remote to power on

the system.

USB Mouse Power On

This item allows users to enable or disable USB Mouse to power on the system.

4.2.7 USB Configuration



USB 3.0 Controller

This item allows users to enable or disable the use of USB 3.0 controller.

Legacy USB Support

This item allows users to select legacy support for USB devices.

There are four configuration options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

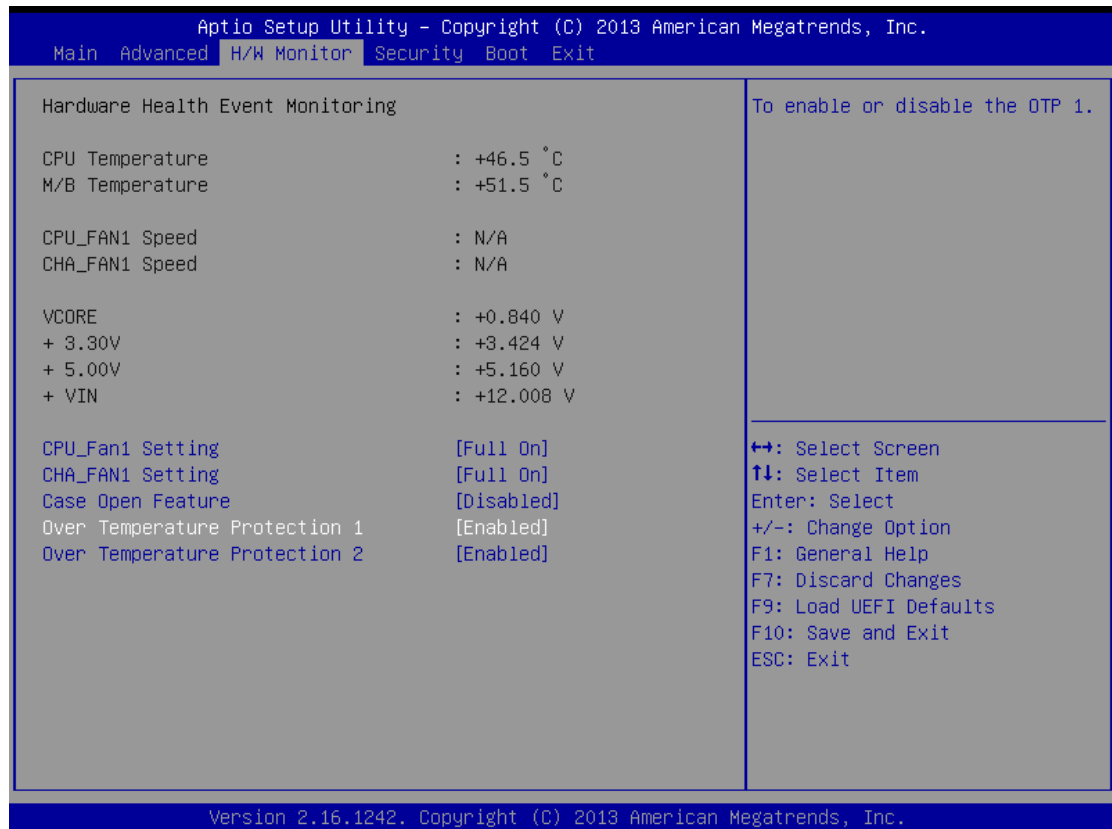
[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

4.2.8 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

4.3 H/W Monitor

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



CPU_FAN1 Setting

This item allows users to set CPU fan 1's speed.

The default value is [Full On].

CHA_FAN1 Setting

This item allows users to set chassis fan 1's speed.

The default value is [Full On].

Case Open Feature

This item allows users to enable or disable case open detection feature. The default is value [Disabled].

Over Temperature Protection 1

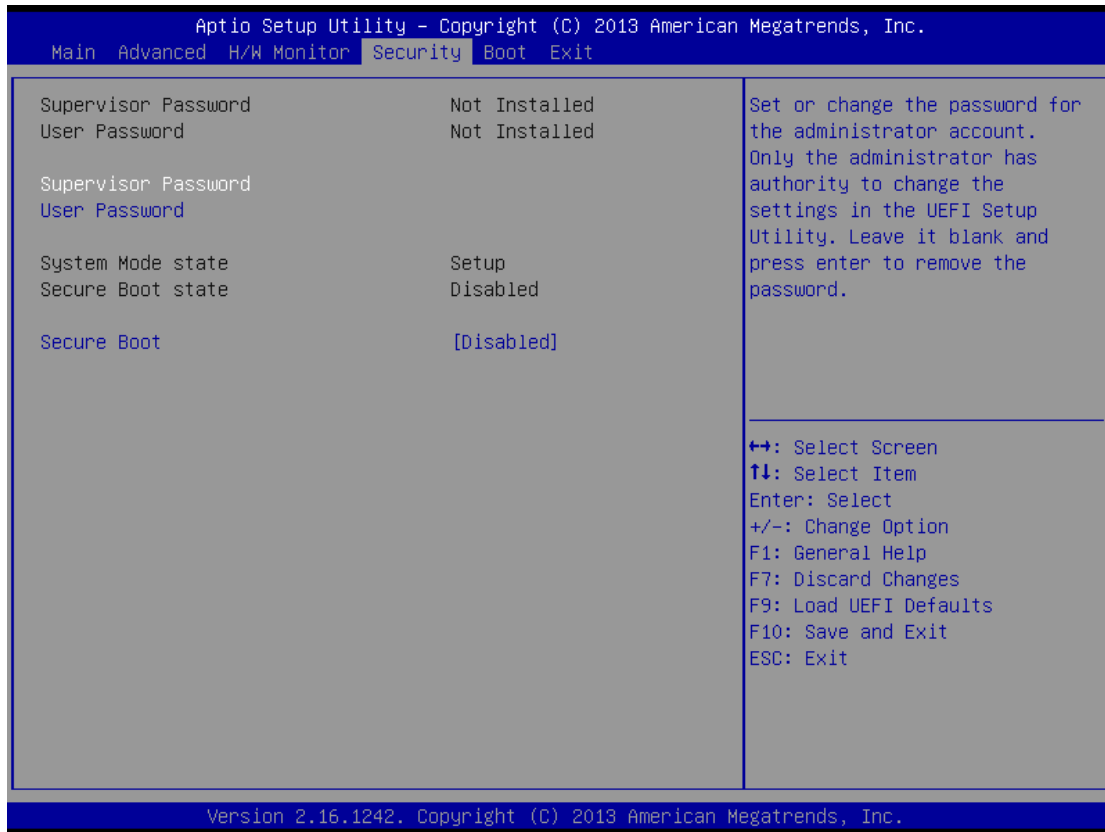
This item allows users to enable or disable the OPT 1.

Over Temperature Protection 2

This item allows users to enable or disable the OPT 2.

4.4 Security

In this section, you may set, change or clear the supervisor/user password for the system.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

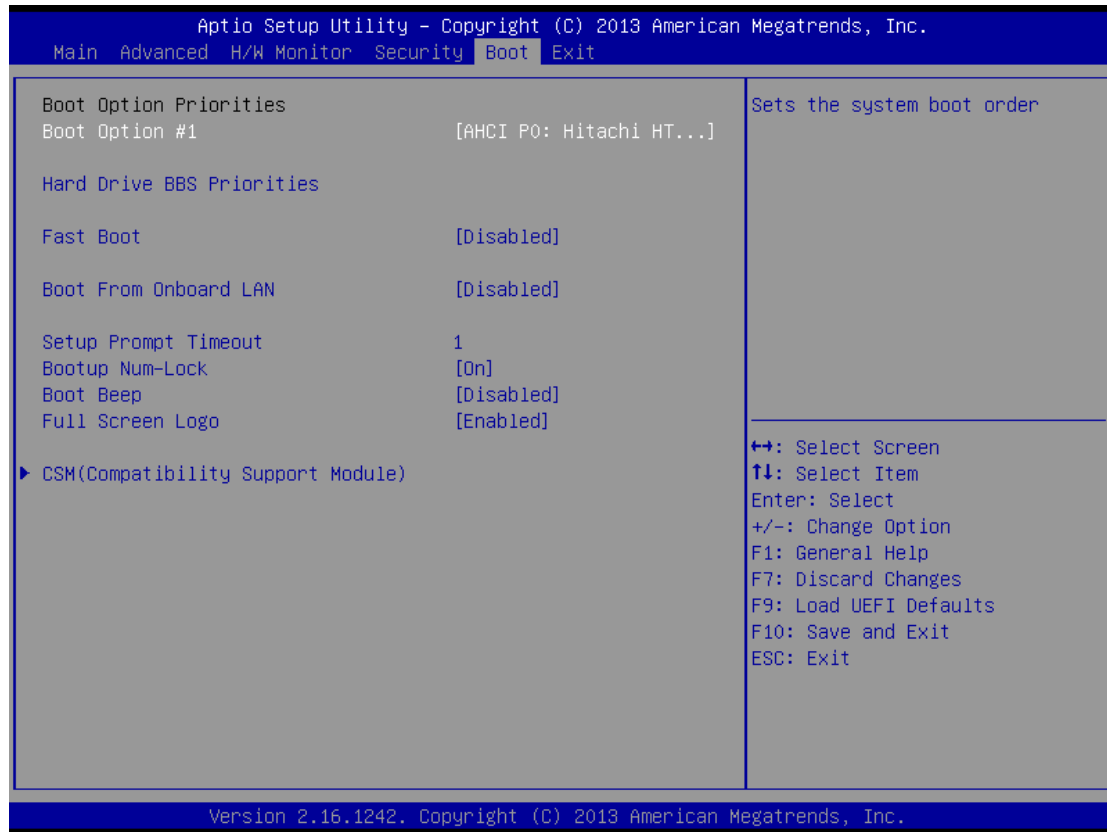
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Set [Enabled] to support Windows 8 Secure Boot.

4.5 Boot

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

This item allows users to set the system boot order.

Hard Drive BBS Priorities

This item allows users to set the order of the legacy devices in this group.

Fast Boot

Fast Boot minimizes your computer's boot time.

In [fast mode] you may not boot from an USB storage device.

[Ultra Fast mode] is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card.

Boot From Onboard LAN

This item allows users to enable or disable the Boot From Onboard LAN.

Setup Prompt Timeout

This item allows users to configure the number of seconds to wait for setup activation key.

[65535(0XFFFF)] means indefinite waiting.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Boot Beep

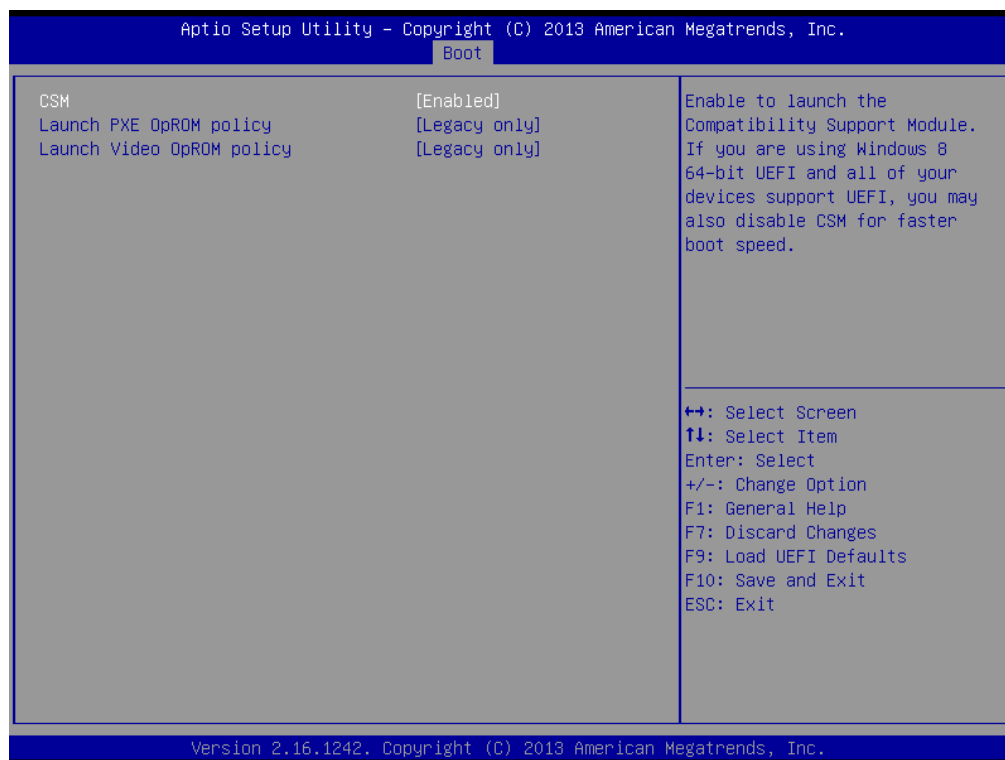
This item allows users to select whether the Boot Beep should be turned on or off when the system boots up.

Please note that a buzzer is needed.

Full Screen Logo

This item allows users to enable or disable OEM Logo.

4.5.1 CSM (Compatibility Support Module)



CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows® 8 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

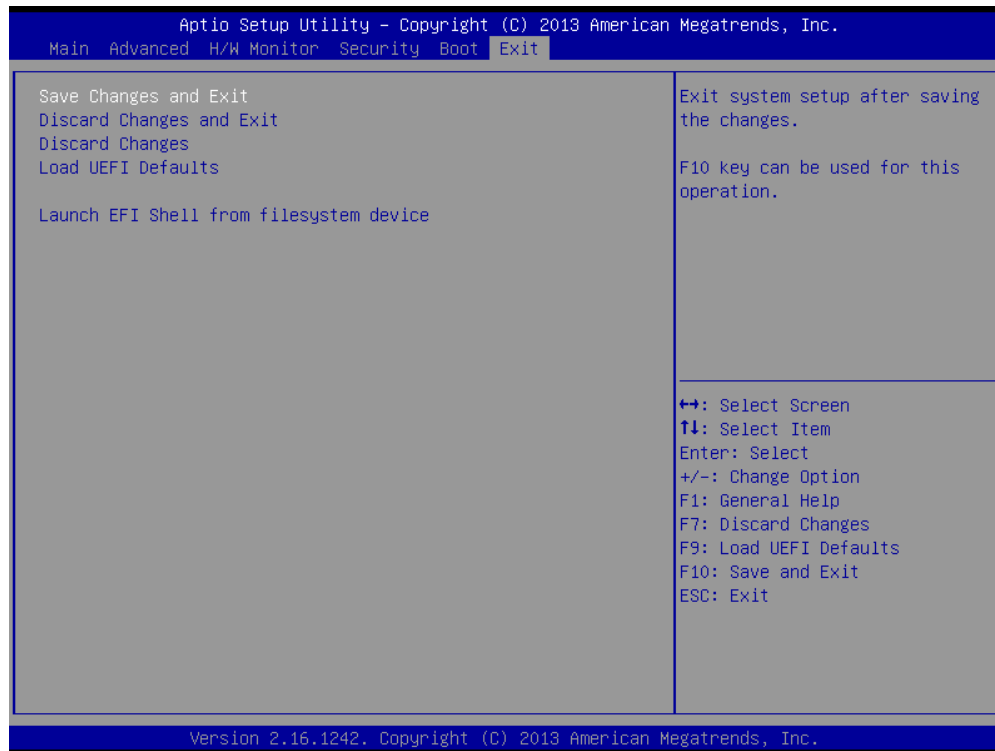
Launch PXE OpROM Policy

Select [UEFI only] to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only.

Launch Video OpROM Policy

Select [UEFI only] to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only.

4.6 Exit



Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?”

Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, “Discard changes and exit setup?”

Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, “Discard changes?”

Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions.

Launch EFI Shell from file system device

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.