



FW-7526

User Manual

Rev 1.0

August 8, 2016

Revision History

Rev	Date	Descriptions
0.1	2016/08/05	Preliminary
1.0	2016/08/08	Official release

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Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	www.lannerinc.com
Product Resources	www.lannerinc.com/support/download-center
RMA	http://eRMA.lannerinc.com

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Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A Certification

This equipment has been tested and found to comply 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 when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

This equipment has been tested and found to comply 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if

not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Safety Guidelines

- Follow these guidelines to ensure general safety:
- Keep the chassis area clear and dust-free before, during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses/goggles if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in

complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Mounting Installation Environment Precaution

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Consignes de sécurité

Suivez ces consignes pour assurer la securite generale :

- Laissez la zone du chassis propre et sans poussiere pendant et apres l'installation.
- Ne portez pas de vetements amples ou de bijoux qui pourraient etre pris dans le chassis. Attachez votre cravate ou echarpe et remontez vos manches.
- Portez des lunettes de securite pour proteger vosmyeux.
- N'effectuez aucune action qui pourrait creer un dangermpour d'autres ou rendre l'equipement dangereux.
- Coupez completement l'alimentation en eteignant l'alimentation et en debranchant le cordon d'alimentation avant d'installer ou de retirer un chassis ou de travailler a proximite de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont presentes.

- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.
- La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
 - Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
 - Les décharges électrostatiques (ESD) peuvent endommager l'équipement et générer les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis. Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.

- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm² ou 10 AWG.

Procédure de mise à la terre pour source

d'alimentation CC Procédure de mise à la terre pour source d'alimentation CC

- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation

CC doit fournir 30 A de courant. Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.

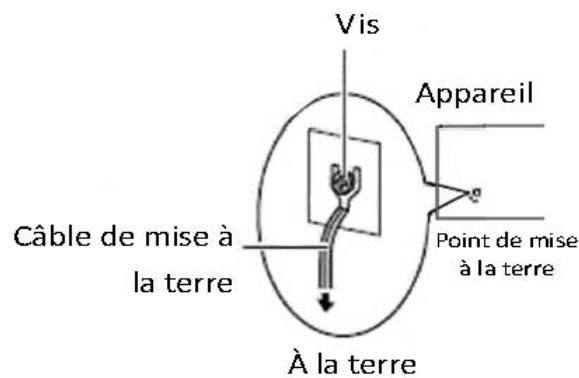


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Chapter 1: Introduction

Thank you for choosing FW-7526. Lanner's FW-7526 is driven by Intel Atom C2358 or C2518 CPU (dual-core or quad-core), ideal for entry-level UTM, firewall, VPN and virtual CPE in small-medium enterprise settings due to its low power consumption and steady performance. The platform is accompanied by Intel QuickAssist Crypto Acceleration technology for cryptographic boost. In addition, the processor is built in with Intel AES-NI (Advanced Encryption Standard – New Instruction) to further enhance the network data encryption for higher security level.

Functioning as a virtual CPE, FW-7526 comes with four RJ-45 GbE ports and two SFP GbE ports for network connections. The device also features one pair of Lanner's Gen2 LAN bypass for network traffic reliability.

Memory wise, FW-7526 supports up to 16GB DDR3 memory. Regarding other I/O connectivity, the device features 1 x mini-PCIe slot with SIM reader, mSATA storage socket, 1 x console and 2 x USB ports. In addition, FW-7526 supports nano-SIM card for wireless 3G/4G/LTE network.

Here is the summary of the key features:

- Intel Atom 22nm 2-core C2358 or 4-core 2518 CPU
- Fanless design
- 4 x RJ45 GbE LAN ports, 2 x SFP GbE port, 1 x RJ45 console port
- 1 pair Gen.2 LAN Bypass
- 1 x DDR3L SODIMM up to 16GB memory
- 1 x full-length mini-PCIe slot
- 1 x mSATA slot
- 1 x Nano SIM card slot

Please refer to the following chart for a detailed description of the system's specifications.

System Specification

Processor Options	Intel® Atom™ 22nm 2-core C2358 or 4-core C2518 CPU
Core Number	2 or 4
Chipset	SoC
BIOS	AMI SPI BIOS
System Memory	1 x DDR3 1333MHz (non-ECC) SO-DIMM Single channel up to 16GB

USB		2 x USB 2.0 Type-A ports
Console		1 x RJ-45 Console port
Storage		1 x 2.5" SATA SSD tray (optional) 1 x mSATA socket
Networking	LAN	4 x RJ-45 10/100/1000 Mbps LAN ports 2 x SFP GbE ports
	Console	1 x RJ-45 Console port
	Controller	1 x Intel i210-IS
	PHY	1 x Marvell 88E1543 PHY
	Bypass	1 pair of LAN bypass
Expansion		1 x mini-PCIe socket with PCIe and USB signals
SIM		1 x Nano SIM
Thermal		Heatsink and fanless
Physical Characteristics	Form Factor	Desktop
	Weight	1.2kg
	Dimensions	177 mm x 44 mm x 145.5 mm (W x D x H)
	Mounting Options	Rackmount
Environment	Operating Temperature	0 ~ 40°C
	Non-operating Temperature	-20 ~ 70°C
	Ambient Humidity	5~90%, non-condensing
Power	Adapter	36W/60W power adapter
	Power supply	100~240 V @50~60 Hz
Certifications	EMC	CE/FCC Class A, RoHS

Ordering Information

FW-7526A	Fanless Network Security Appliance with Intel® Atom processor C2358 (Codename "Rangeley"), 4 x GbE + 2 x SFP LAN ports with Gen.2 Bypass and 36W power adapter
FW-7526B	Fanless Network Security Appliance with Intel® Atom™ processor C2518 (Codename "Rangeley"), 4 x GbE + 2 x SFP LAN ports with Gen.2 Bypass and 60W power adapter

Package Contents

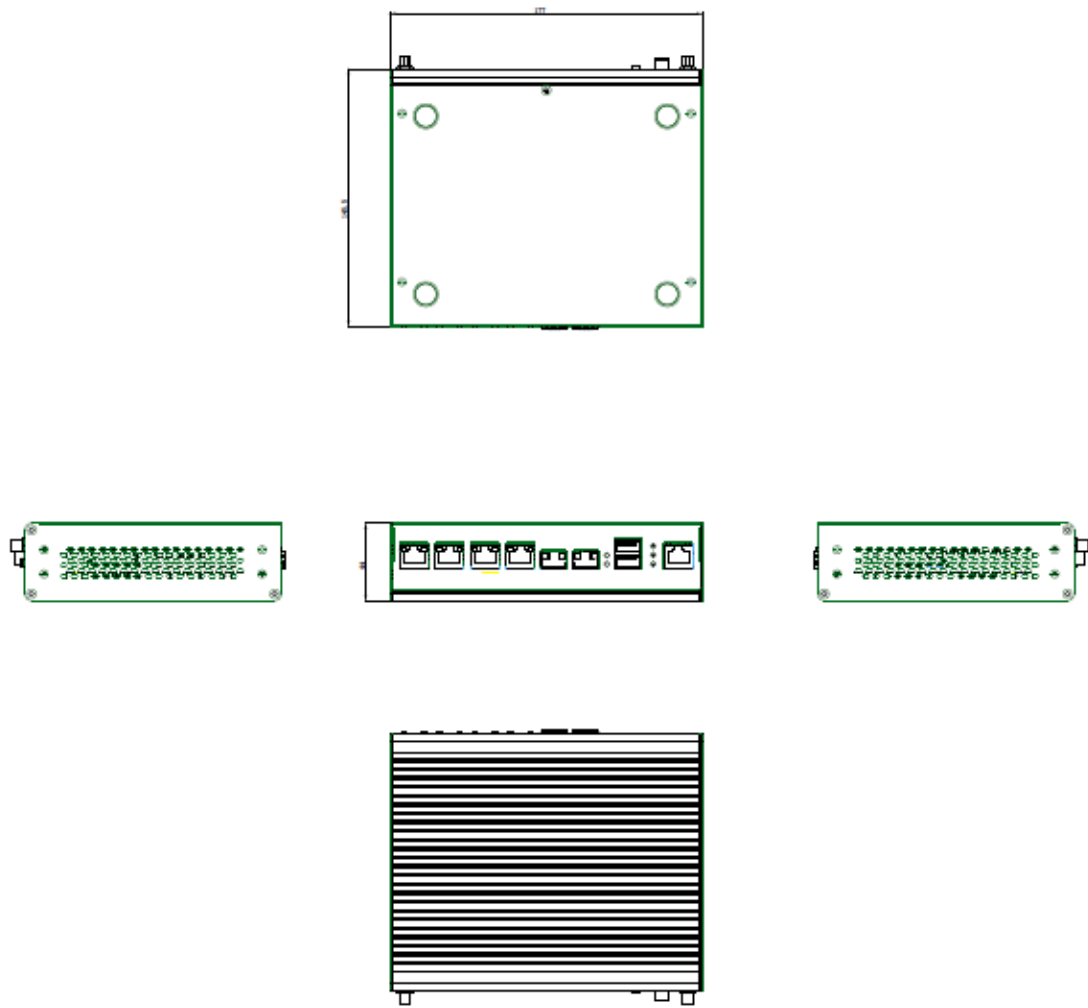
Please unpack your package carefully and inspect all the following items

- 1 – FW-7526 Network Appliance
- 1 – 36W/60W Power adaptor
- 1 – Console cable
- 1 – Power cord
- 1 – Screw pack

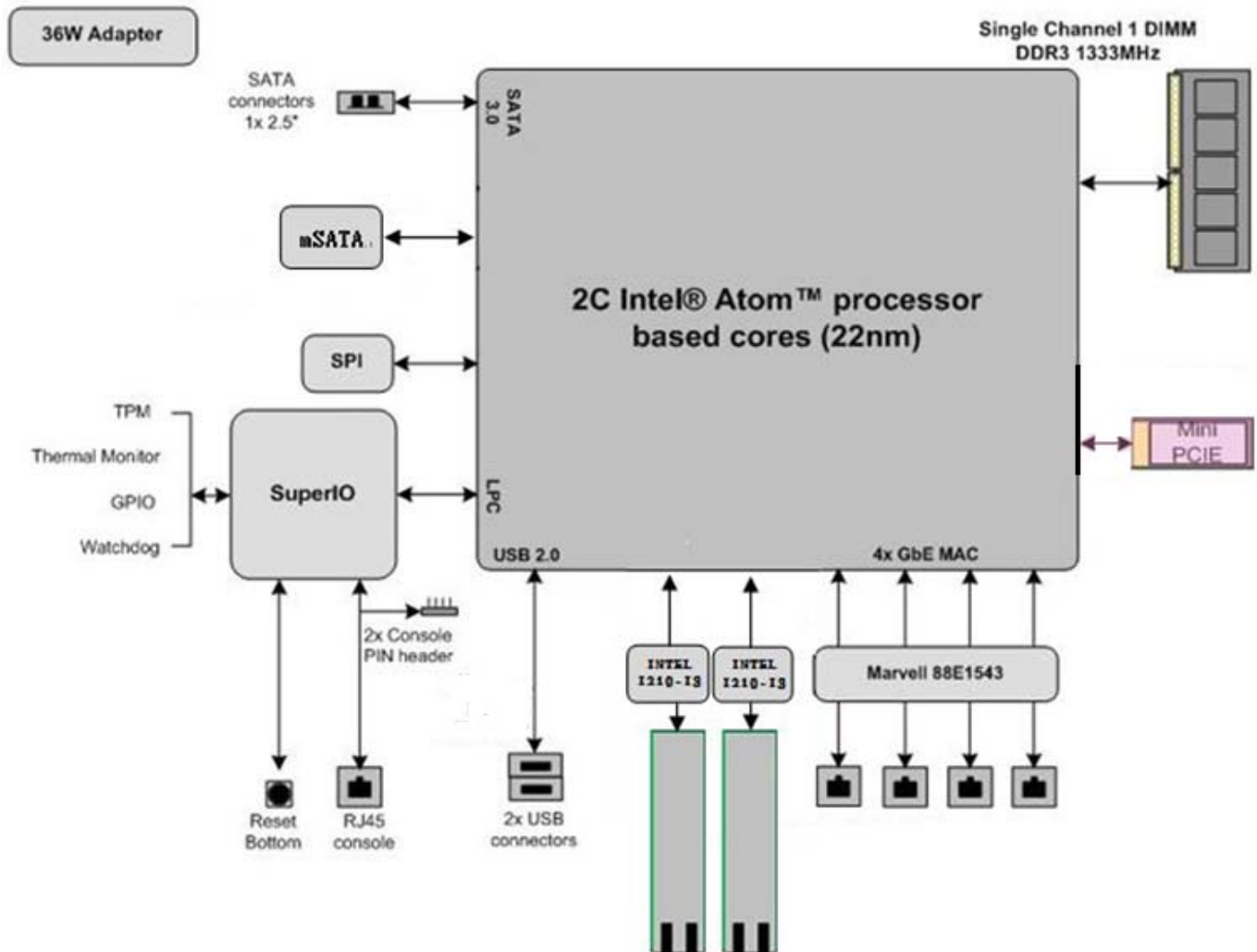
Note : If you should find any components missing or damaged, please contact your dealer immediately for assistance

Chapter 2: System Overview

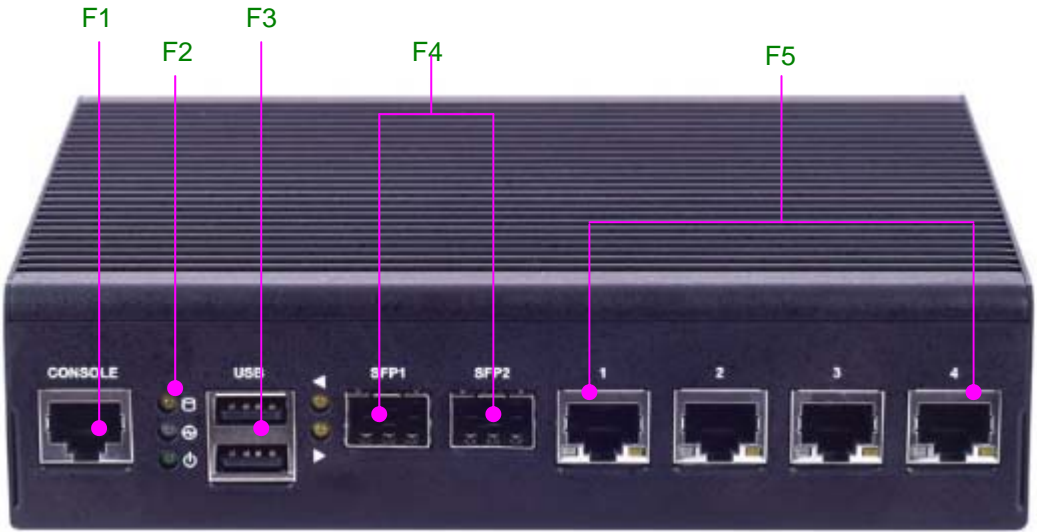
Mechanical Drawing



Block Diagram



Front I/Os



F1 Console	1 x RJ-45 console port
F2 LED	1 x Power/status/storage LED set
F3 USB	2 x USB 2.0 Type-A ports
F4 SFP	2 x SFP ports
F5 LAN	4 x RJ-45 GbE LAN ports

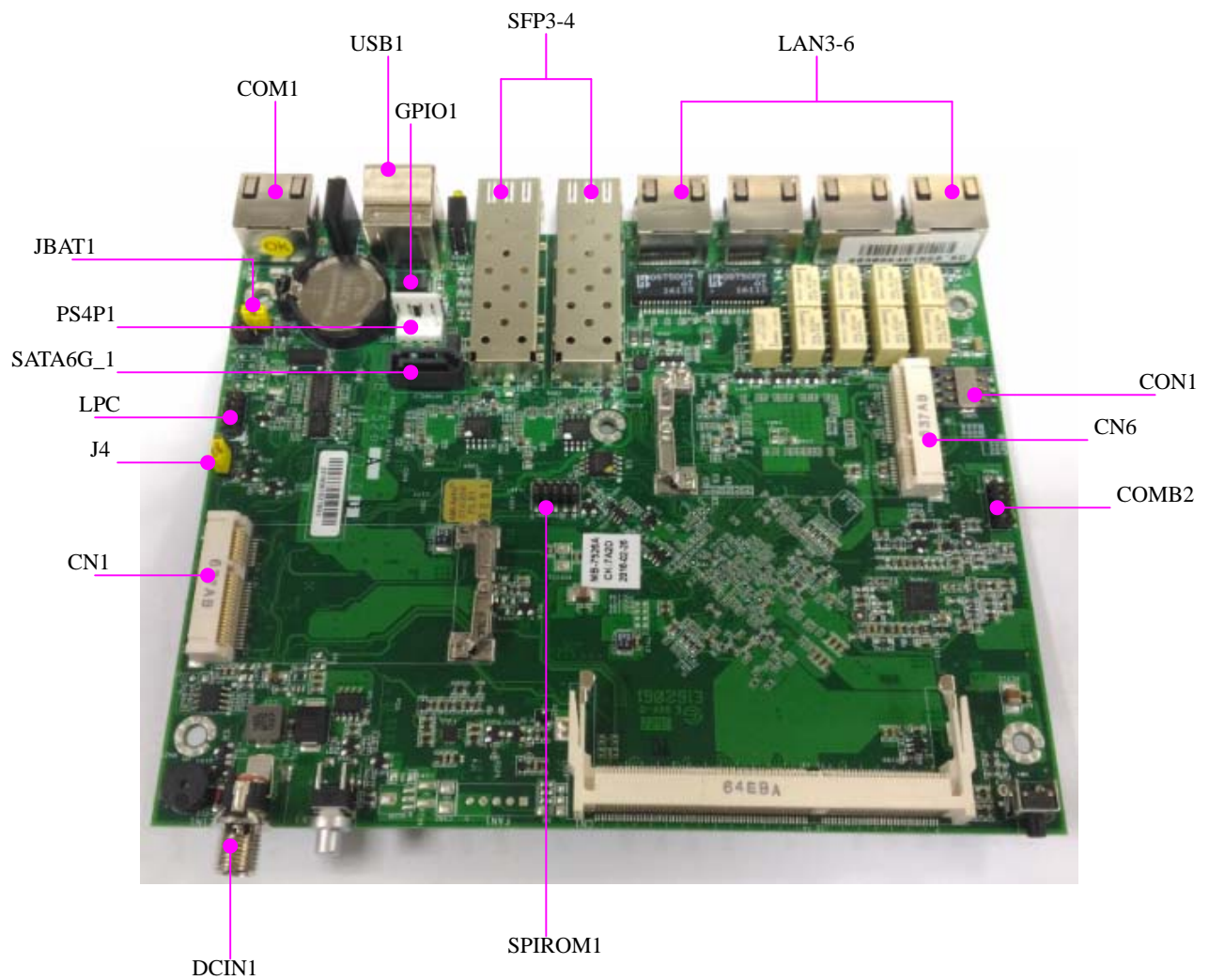
Rear I/Os



F1 Reset	1 x Reset button
F2 Power switch	1 x Power On/Off switch
F3 DC Power	1 x DC Jack with lock

Chapter 3: Board Layout

Jumpers and Connectors on the Motherboard



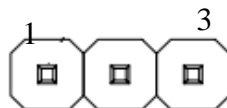
Jumper Setting and Connector Pin-out

J4: set the Reset Mode as Hardware (HW) Reset or Software (SW) Reset. (form : 1X3 2.54mm 3P DIP). Default “short pins” are 2-3 as Software Reset



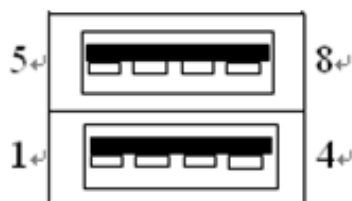
1	HW Reset
2	Switch input (default 1-2)
3	SW Reset

JBAT1: CMOS Clear. The default “Short Pins” are 1-2 as “Normal”. (1X3 2.54mm 3P DIP). When pins 2-3 are short, CMOS clear will be activated.



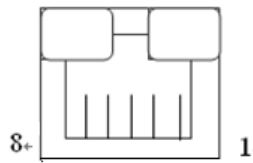
Pin	Description
1	VBAT
2	PCH_RTCRST_N
3	GND

USB1: Dual USB connectors in double-stacked form



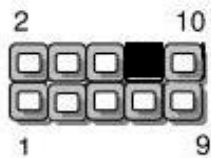
Pin	Description	Pin	Description
1	+P5V_USB0_L	5	+P5V_USB0_L
2	USB0_SB_L_DN	6	USB1_SB_L_DN
3	USB0_SB_L_DP	7	USB1_SB_L_DP
4	GND	8	GND

COM1: RJ45 Console port for serial console redirection purpose



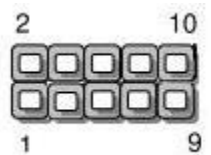
Pin	Description	Pin	Description
1	LNRTSA#	5	GND
2	LNDTRA#	6	LNSINA
3	LNSOUTA	7	LNDSRA#
4	GND	8	LNCTSA#

LPC1: 2x10-pin low pin count at 2.0mm Pin header DIP



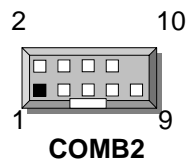
Pin	Description	Pin	Description
1	CLK_33M_P80	2	LPC_AD1
3	PLTRST_PORT80_N	4	LPC_AD0
5	LPC_FRAME_N	6	P3V3
7	LPC_AD3	8	Key ping
9	LPC_AD2	10	GND

GPIO1: 2x10-pin GPIO (General Purpose Input Output) at 2.0mm Pin header DIP



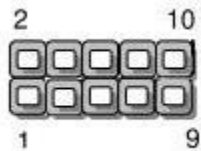
Pin	Description	Pin	Description
1	SIO_GP20	2	SIO_GP21
3	SIO_GP32	4	SIO_GP33
5	SIO_GP53	6	SIO_GP54
7	SIO_GP56	8	SIO_GP57
9	P5V	10	GND

COMB2: internal COM pin header



Pin	Description	Pin	Description
1	NDCD2-	2	NDSR2-
3	NSIN2	4	NRTS2-
5	NSOUT2	6	NCTS2-
7	NDTR2-	8	NRI2-
9	COMGND2	10	

SPIROM1: 2x10-pin SPIROM at 2.0mm Pin header SMD for debug purpose



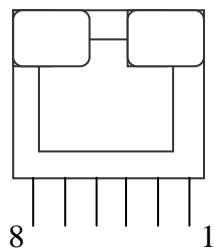
Pin	Description	Pin	Description
1	SPI_HOLD0_L	2	NC
3	PMU_AVN_SPI_R_CS0	4	V_3P3_SPI
5	PMU_AVN_SPI_MISO	6	NC
7	NC	8	PMU_AVN_SPI_R_CLK
9	GND	10	PMU_AVN_SPI_R_MOSI

CON1: Nano SIM card slot



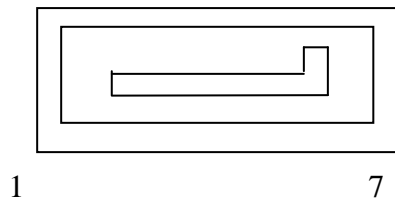
Pin	Description
C1	VCC
C2	RST
C3	CLK
C5	GND
C6	VPP
C7	I/O
PAD1	GND
PAD2	GND

LAN3~6: RJ45 Ethernet connectors without transformer



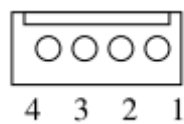
Pin	Description
1	MDX0+
2	MDX0-
3	MDX1+
4	MDX2+
5	MDX2-
6	MDX1-
7	MDX3+
8	MDX3-

SATA6G_1: SATA 7-pin signal connector



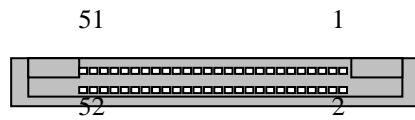
Pin	Description	Pin	Description
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

PS4S1: SATA 4-pin power connector



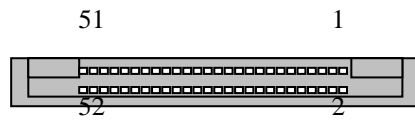
Pin	Description
1	12V
2	GND
3	GND
4	5V

CN6: Mini-PCle Socket



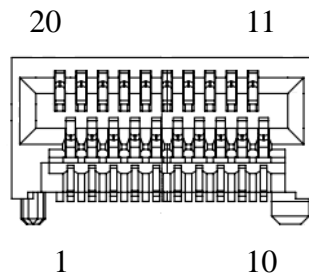
Pin	Description	Pin	Description
1	PMU_WAKE#	27	GND
2	VCC3	28	1.5V
3	NC_RSV1	29	GND
4	GND	30	SMB_CLK
5	NC_RSV2	31	MINI_PCIE_TXN0
6	1.5V	32	SMB_DATA
7	MINI_CLKREQ_N1	33	MINI_PCIE_TXP0
8	NC_UIM_PWR	34	GND
9	GND	35	GND
10	NC_UIM_DATA	36	USB_IO3_DN
11	MINIPCIE_REFCLKN	37	GND
12	NC_UIM_CLK	38	USB_IO3_DP
13	MINIPCIE_REFCLKP	39	VCC3
14	NC_UIM_RST	40	GND
15	GND	41	VCC3
16	NC_UIM_VPP	42	NC_LED_WWAN#
17	NC_RSV3	43	GND
18	GND	44	NC_LED_WLAN#
19	NC_RSV4	45	NC_RSV9
20	RF_KILL_N2_R	46	NC_LED_WPAN#
21	GND	47	NC_RSV10
22	PLTRST_MINIPCIE_N	48	1.5V
23	MINI_PCIE_RXN0	49	NC_RSV11
24	P3VSB	50	GND
25	MINI_PCIE_RXP0	51	NC_RSV12
26	GND	52	VCC3

CN1: Mini-PCIe socket functions as mSATA



Pin	Description	Pin	Description
1	N/A	27	GND
2	P3V3	28	N/A
3	N/A	29	GND
4	GND	30	SMB_HOST_3V3_CLK
5	N/A	31	mSATA_TX0_DN
6	N/A	32	SMB_HOST_3V3_DAT
7	N/A	33	mSATA_TX0_DP
8	N/A	34	GND
9	GND	35	GND
10	N/A	36	N/A
11	N/A	37	GND
12	N/A	38	N/A
13	N/A	39	P3V3
14	N/A	40	GND
15	GND	41	P3V3
16	N/A	42	mSATA_LED
17	N/A	43	GND
18	GND	44	N/A
19	N/A	45	N/A
20	N/A	46	N/A
21	GND	47	N/A
22	PLTRST_mSATA_N	48	N/A
23	mSATA_RX0_DP	49	N/A
24	P3V3	50	GND
25	mSATA_RX0_DN	51	N/A
26	GND	52	P3V3

SFP1~2: SFP GbE ports



Pin	Description
1	GND
2	TX Fault
3	TX Disable
4	MOD_DEF2/SDA (DATA)
5	MOD_DEF1/SCL (CLK)
6	MOD_DEF0
7	GND
8	RX_LOS
9	GND
10	GND
11	GND
12	RD-
13	RD+
14	GND
15	VCC_R1 (PWR2)
16	VCC_T1 (PWR1)
17	GND
18	TD+
19	TD-
20	GND

Chapter 4: Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

WARNING:

- To reduce the risk of personal injury, electric shock, or damage to the equipment, please remove all power sources.
- Please wear ESD protected gloves before conducting the following steps.
- Do NOT pile any object onto the system.

1. Power off FW-7526 completely and remove all power connections.
2. Remove the screws from the bottom and two sides, as circled in the figures below.





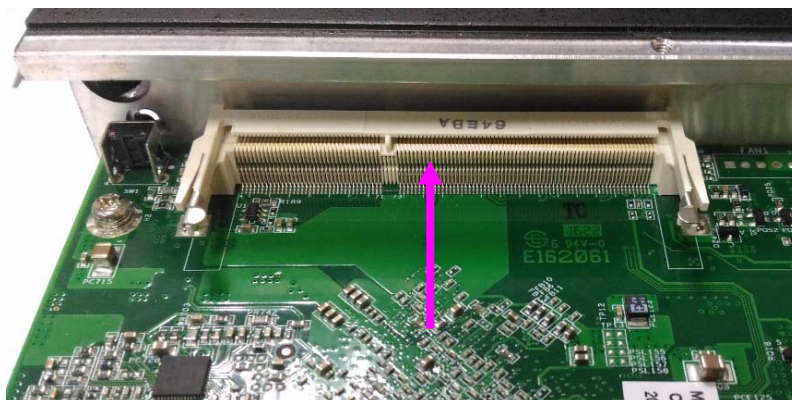
3. Slide the compartment as the arrows of directions below to access the inside of the system.



Installing the System Memory

The motherboard supports DDR3 1333MHz (non-ECC) SO-DIMM Single channel up to 16GB. Please follow the steps below to install the DIMM memory modules.

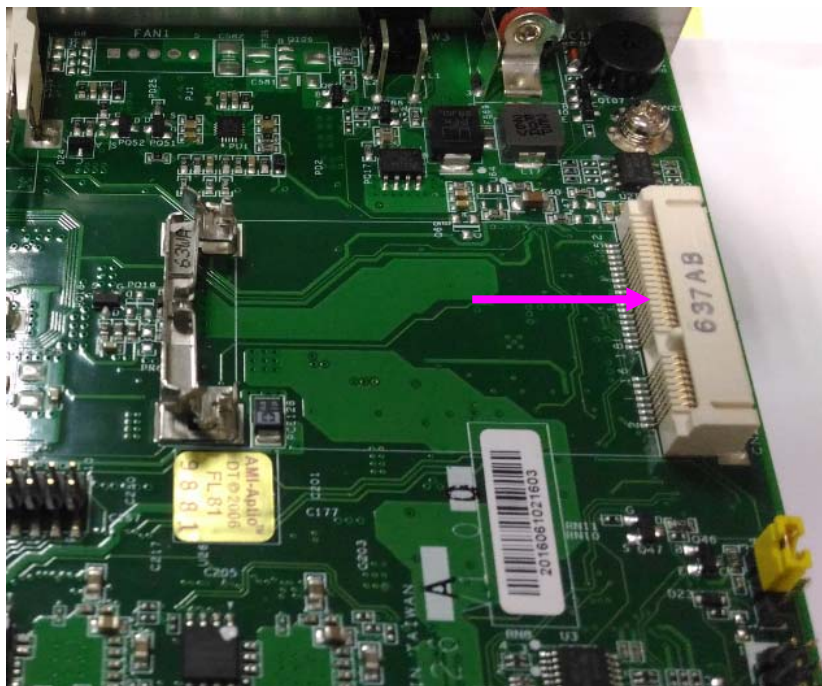
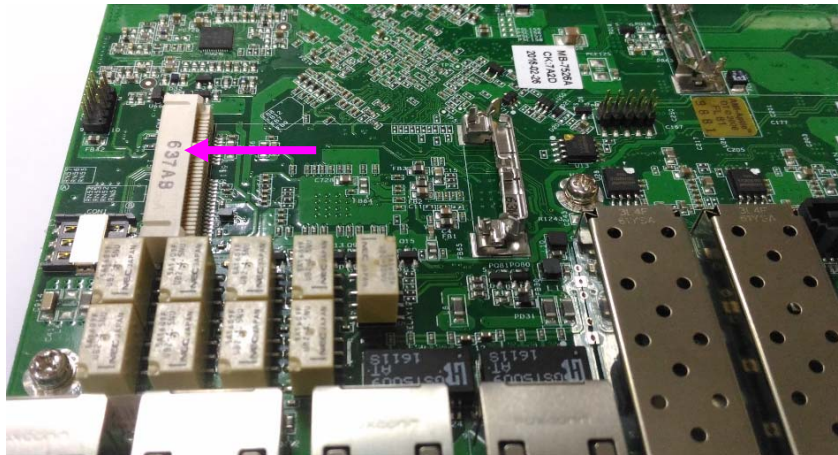
1. Power off the system and locate the DDR DIMM slot.
2. Align the DIMM module and make sure the notches of the module aligned with the socket keys in the slot.
3. Insert the module into the slot in a diagonal angle and press it down until it's firmly seated by the clips at both sides.



Installing mSATA and Mini-PCIe Modules

The motherboard provides a mSATA mini socket and a mini-PCIe socket. Please follow the procedures below for installation.

1. Locate the mSATA mini and mini-PCIe sockets.
2. Insert modules as shown in the image below.
3. Press the module down and apply screws to secure it.



Chapter 5: BIOS Setup

To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Press <Delete> during the boot-up. Your system should be running POST (Power-On-Self-Test) upon booting up.
3. Then you will be directed to the BIOS main screen.
4. Instructions of BIOS navigations:

[<-] [-->]: select a setup screen, for instance, [Main], [Advanced], [IntelRCSetup], [Boot], [Security], and [Save & Exit]

[↑] [↓]: select an item/option on a setup screen

Enter: select an item/option or enter a sub-menu

ESC: exit the current screen

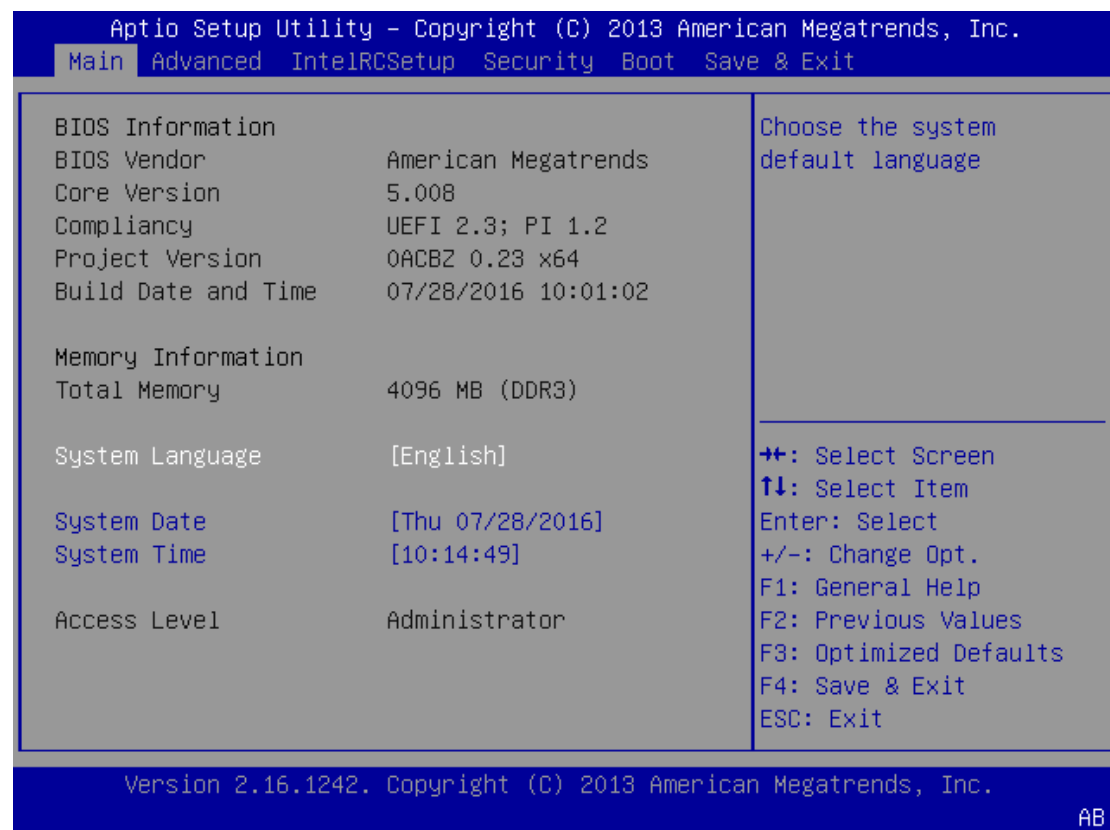
+/- = to adjust values for the selected setup item/option

F1 = to display General Help screen

F2 = to retrieve previous values, such as the parameters configured the last time you had entered BIOS.

F3 = to load optimized default values

F4 = to save configurations and exit BIOS



Notes: the images in the following section are for reference only.

Main

The [Main] is the first setup screen when you enter BIOS. The [Main] displays general system and BIOS information and you may configure “System Date”, and “System Time”.

BIOS Information

Core Version: displays core version information

Project Version: displays version information

Compliance: displays compliance information

Build Date and Time: displays the date and time the BIOS was built.

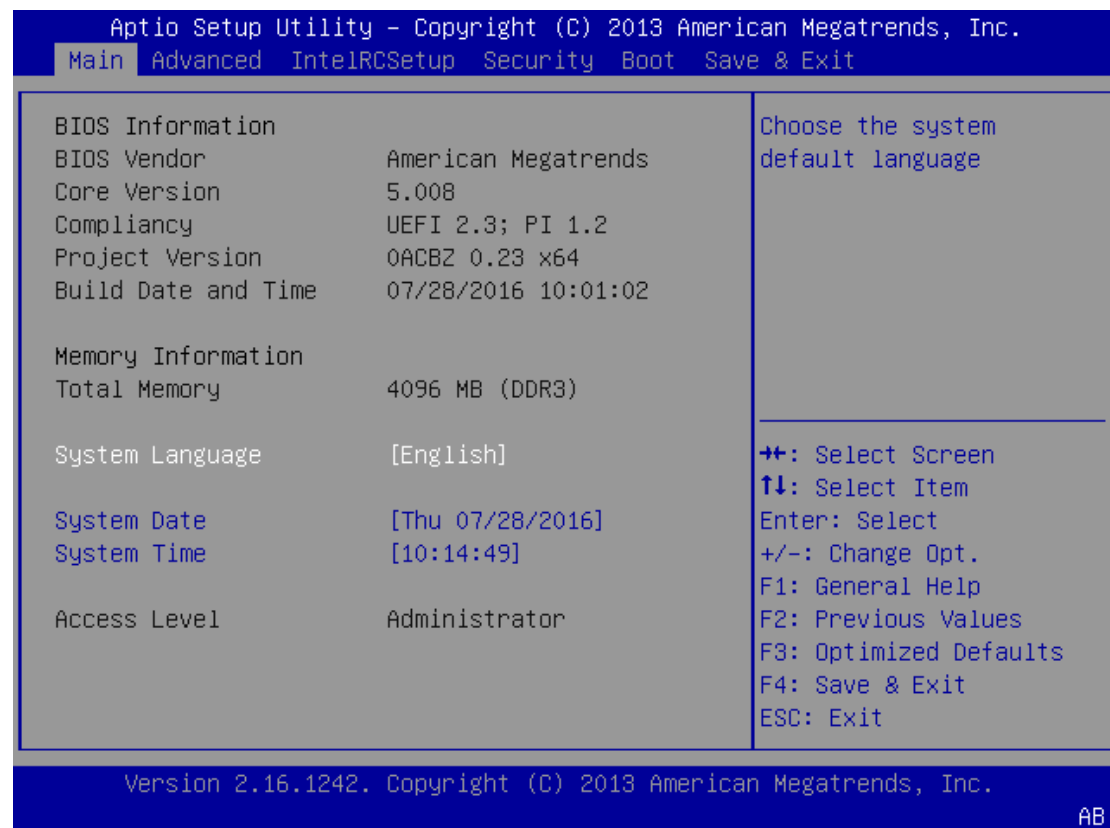
Press “Enter” if you want to configure “System Language”, “System Date”, and “System Time”.

System Language: choose the system default language

System Date: Day/Month/Year

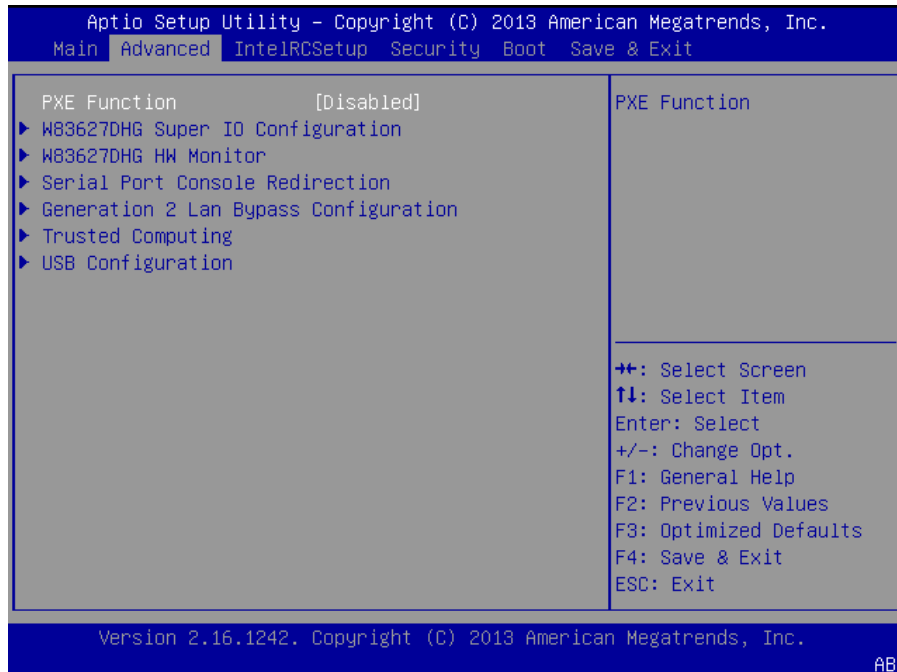
System time: Hour/Minutes/Seconds

Access Level: Administrator by default



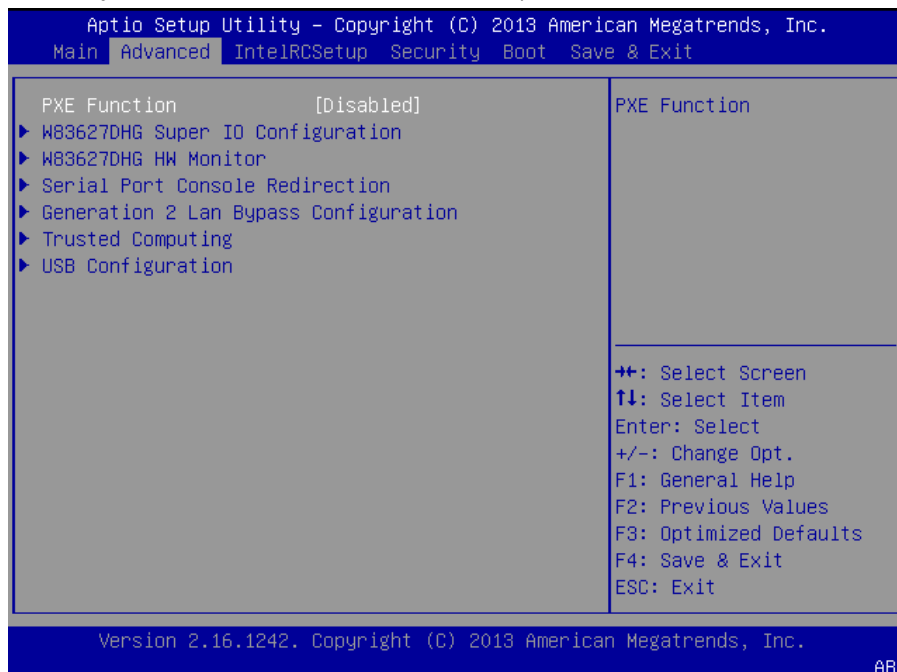
Advanced

Use [←] / [→] to select [Advanced] setup screen. Under this screen, you may use [↑] [↓] to select an item you wish to configure.

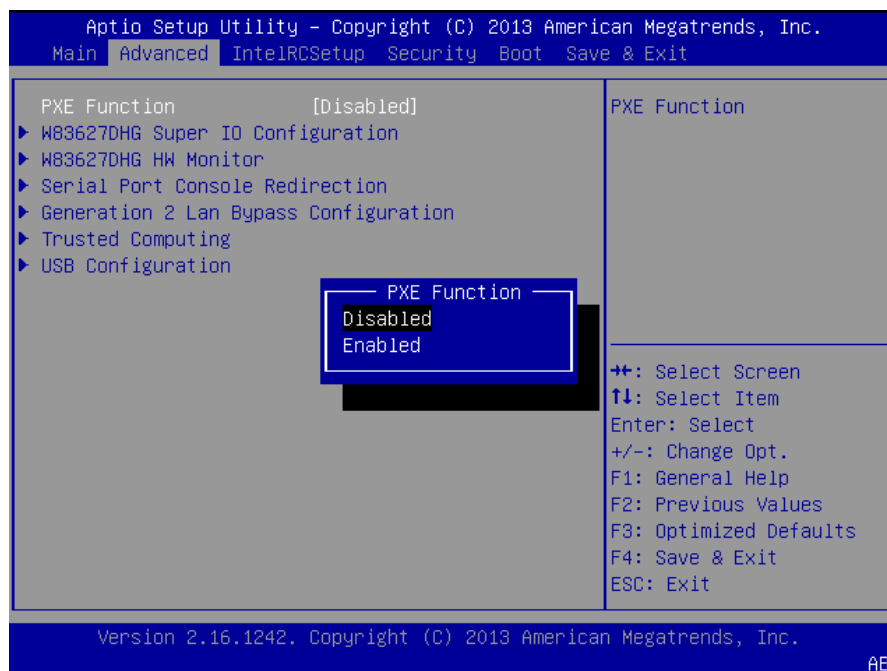


PXE Function

You may choose to enable or disable PXE (Preboot Execution Environment) function.

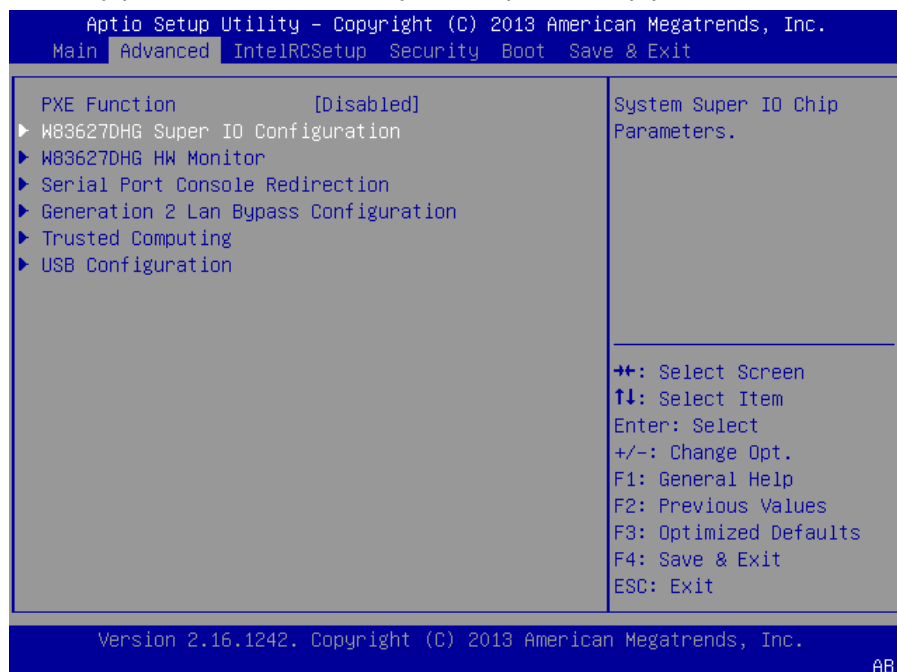


Press Enter to enable or disable the PXE function.



W836270HG Super IO Configuration

You may press Enter to access system super I/O chip parameters.



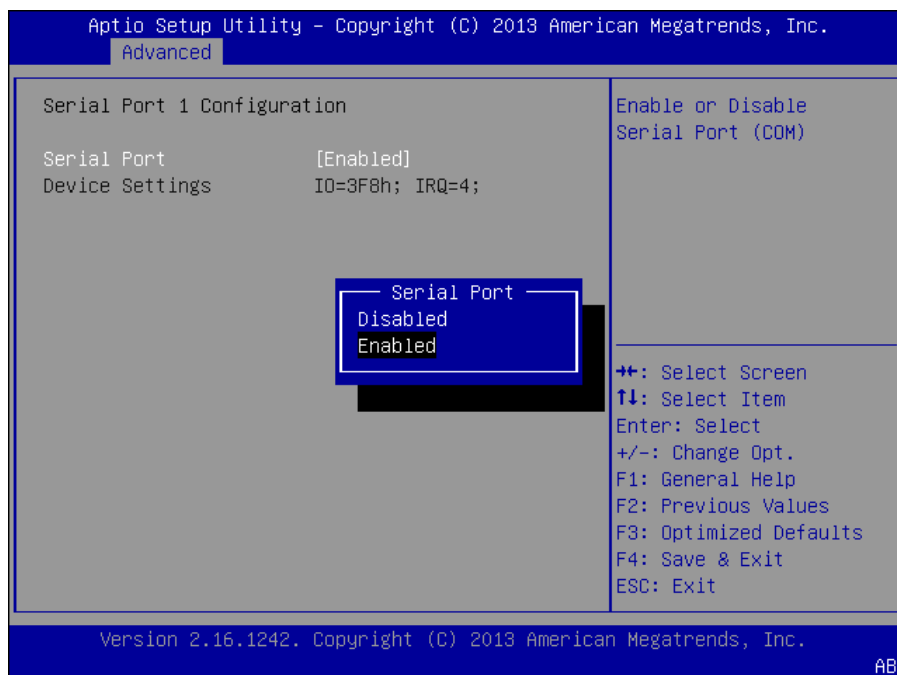
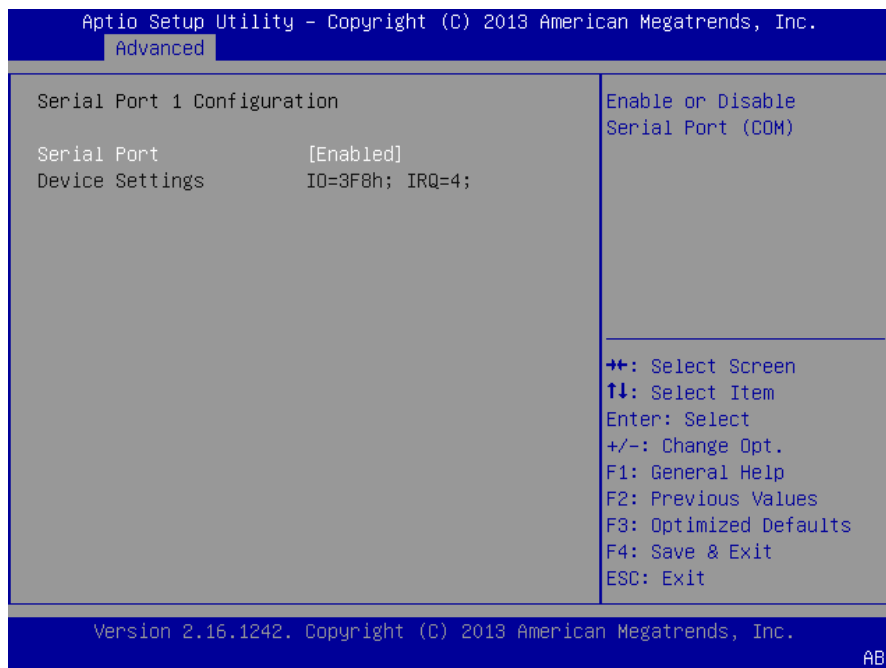
Serial Port 1/2 Configuration

You may press Enter to configure serial port 1/2 parameters.

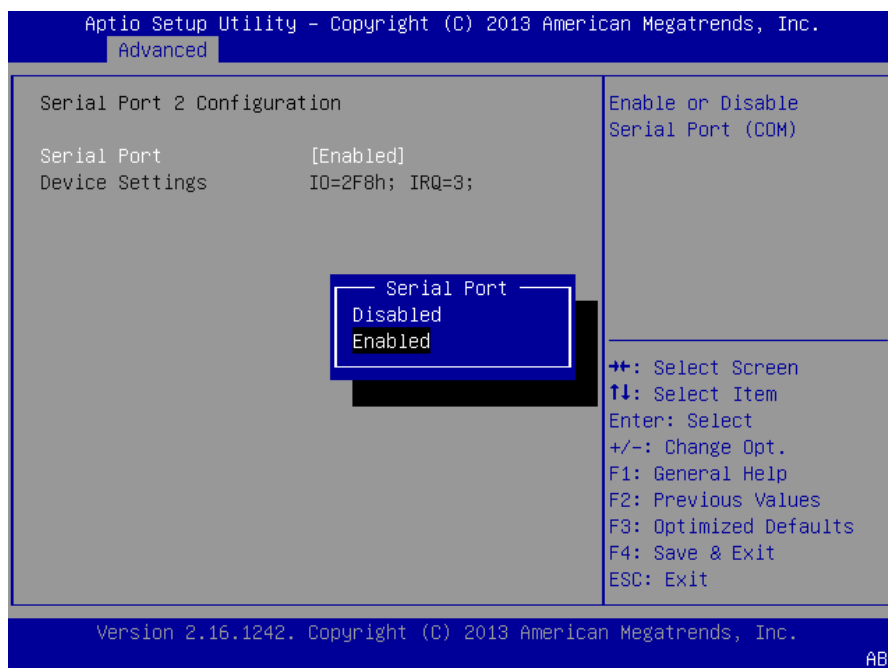
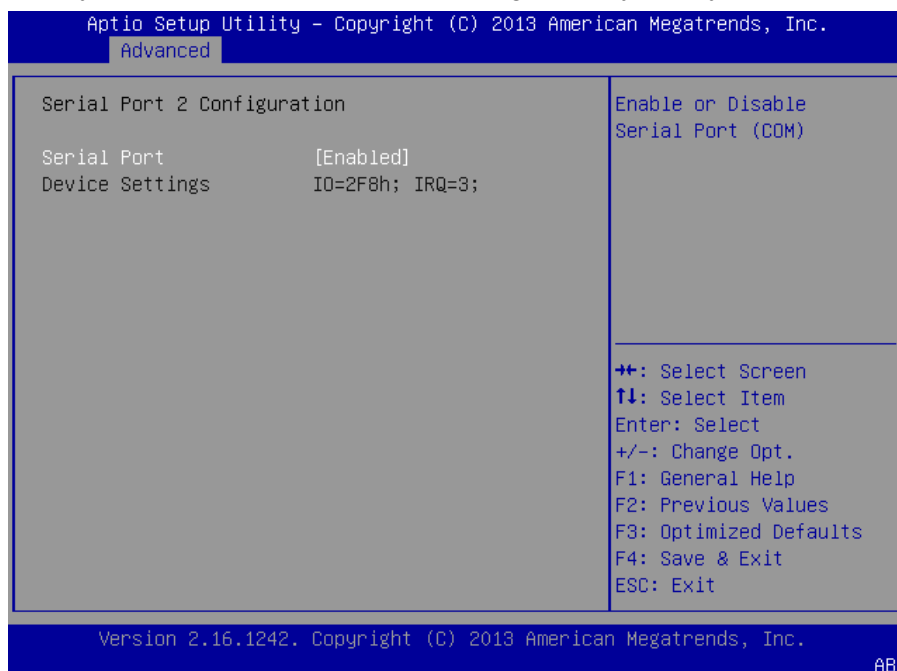
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Advanced	
W83627DHG Super IO Configuration	Set Parameters of Serial Port 1 (COMA)
Super IO Chip W83627DHG	
▶ Serial Port 1 Configuration	
▶ Serial Port 2 Configuration	
	↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.	
AB	

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Advanced	
W83627DHG Super IO Configuration	Set Parameters of Serial Port 2 (COMB)
Super IO Chip W83627DHG	
▶ 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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.	
AB	

Once you have entered Serial Port 1 Configuration, you may enable or disable this serial port.

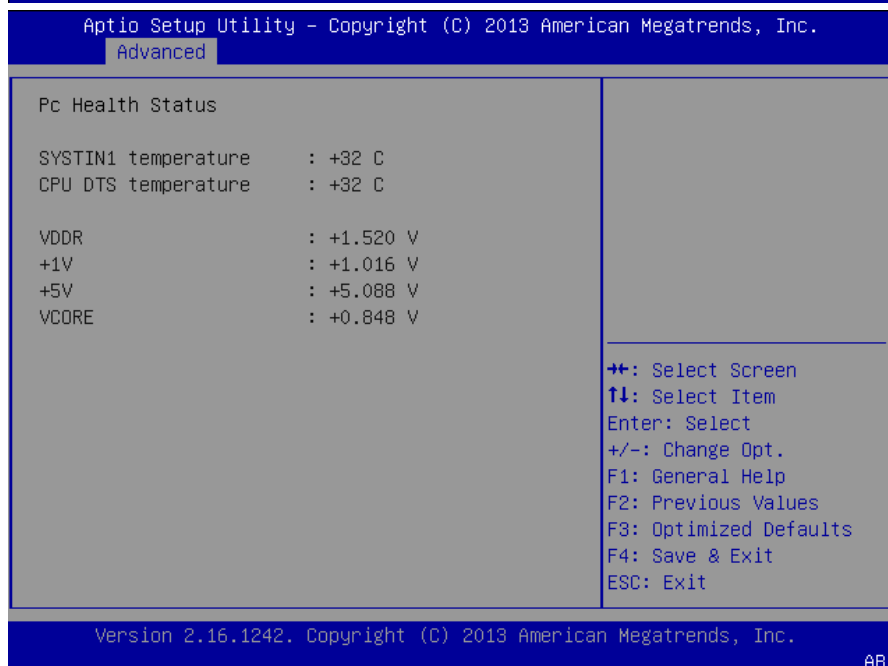
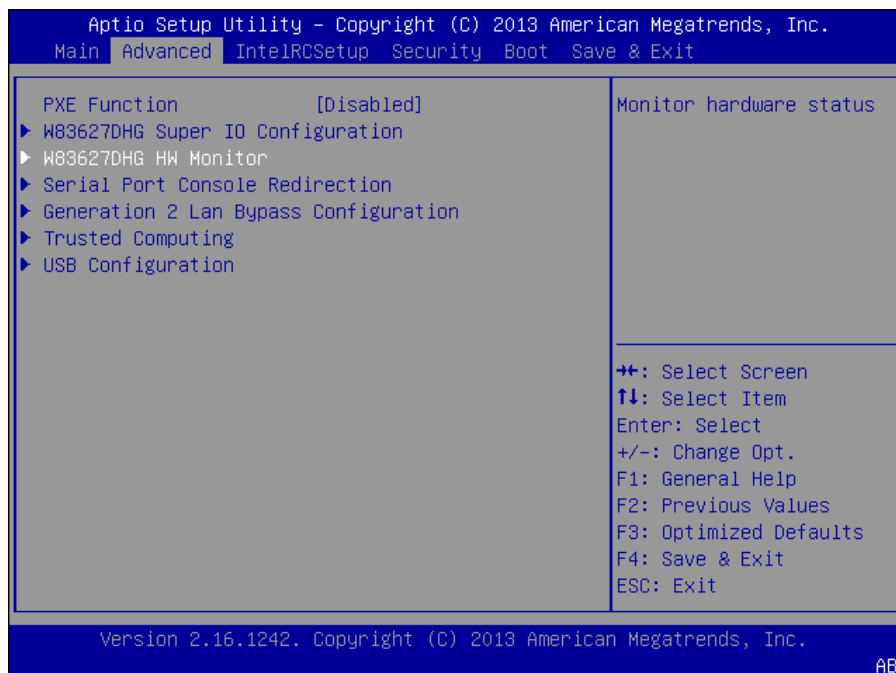


Once you have entered Serial Port 2 Configuration, you may enable or disable this serial port.



W836270HG HW Monitor

This option allows you to view hardware health status. you may use [↑][↓] to select “Hardware Monitor” and press “Enter”.

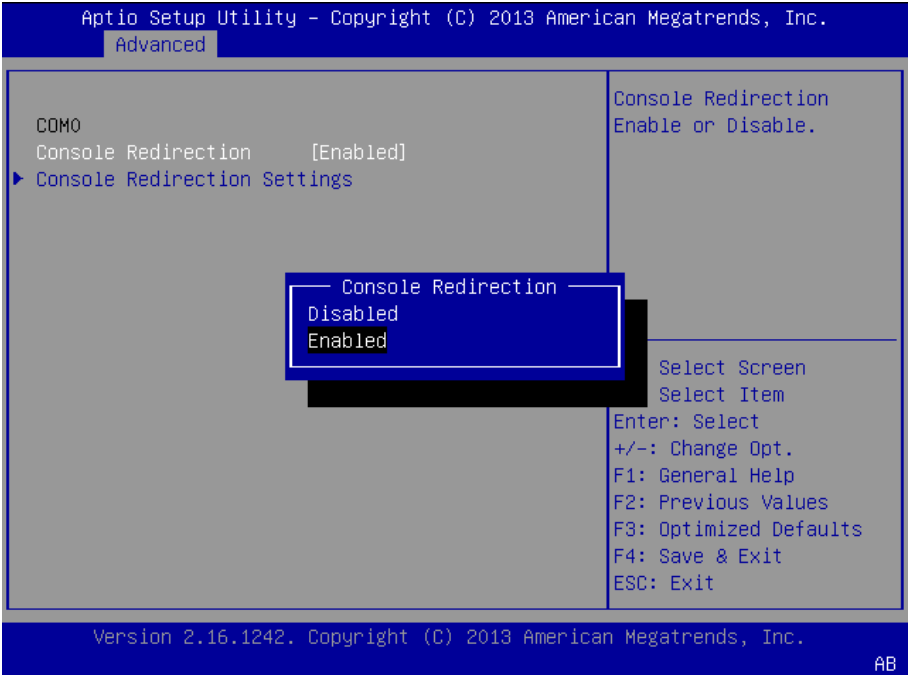


Serial Port Console Redirection

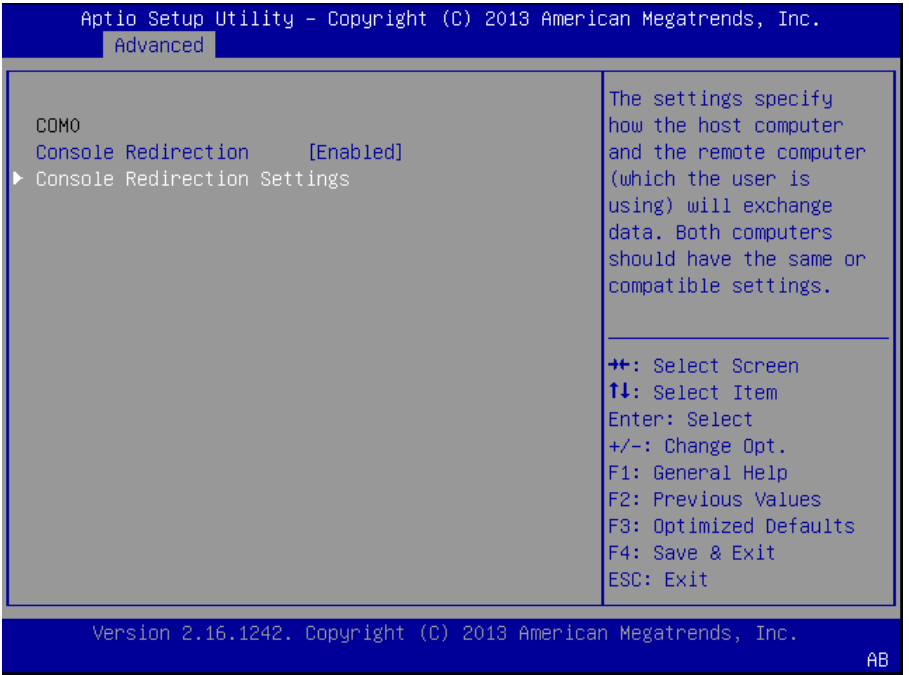
This option allows you to configure parameters about serial port console redirection. Press “Enter” to access the submenu.

Console Redirection: select “Enabled” or “Disable” for an available COM port to set up the console redirection. Then you may use [↑][↓] to enter “Console Redirection Settings”.

Notably, the “Console Redirection Settings” is only available for COM0.



COM Console Redirection Settings



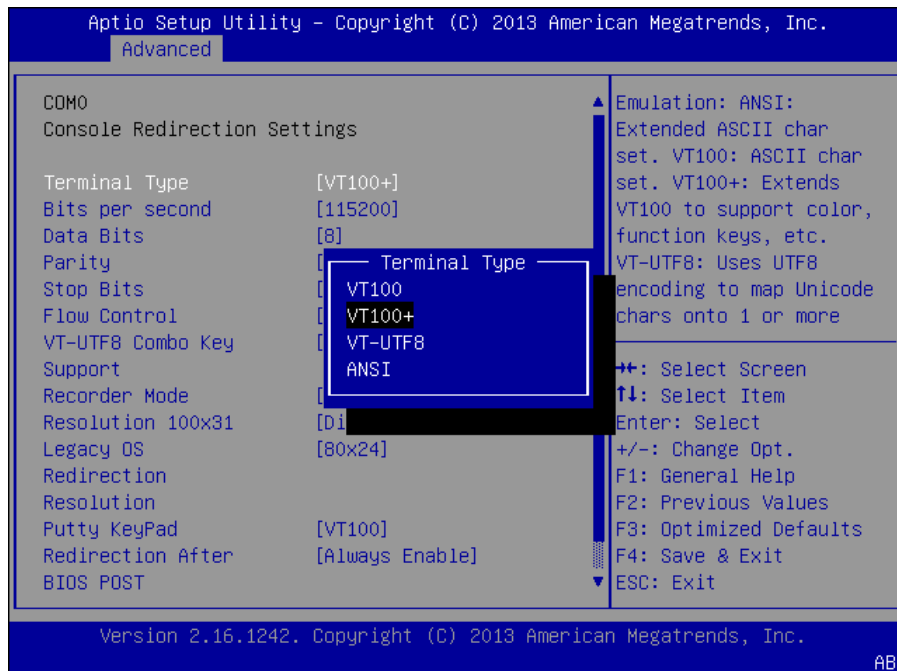
Terminal Type: the emulation configuration. Select “VT100”, “VT100+”, “VT-UTF8” or “ANSI”.

VT100: ASCII character set

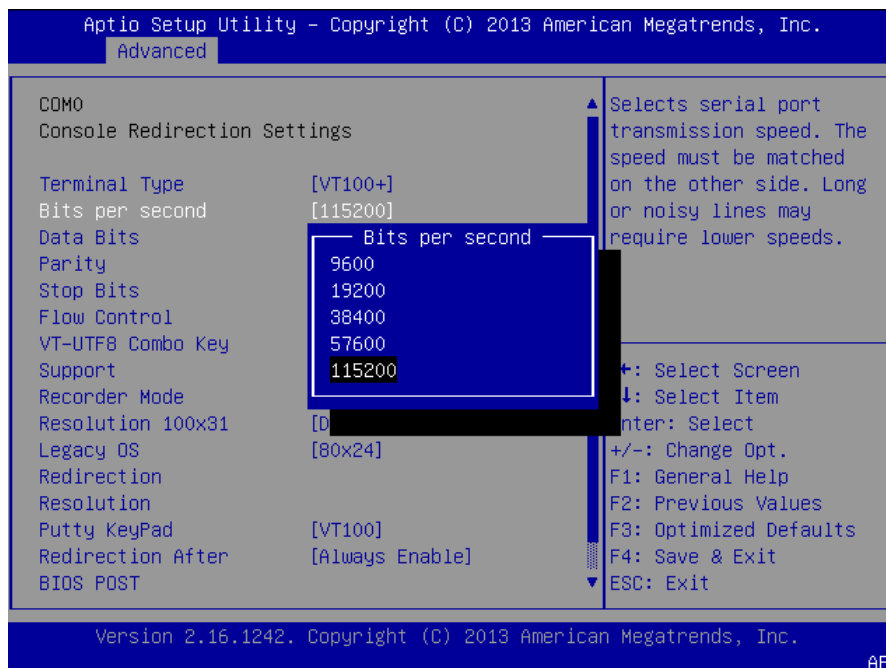
VT100+: extends VT100 to support color function keys

VT-UTF8: uses UTF8 encoding to map Unicode characters onto 1 or more

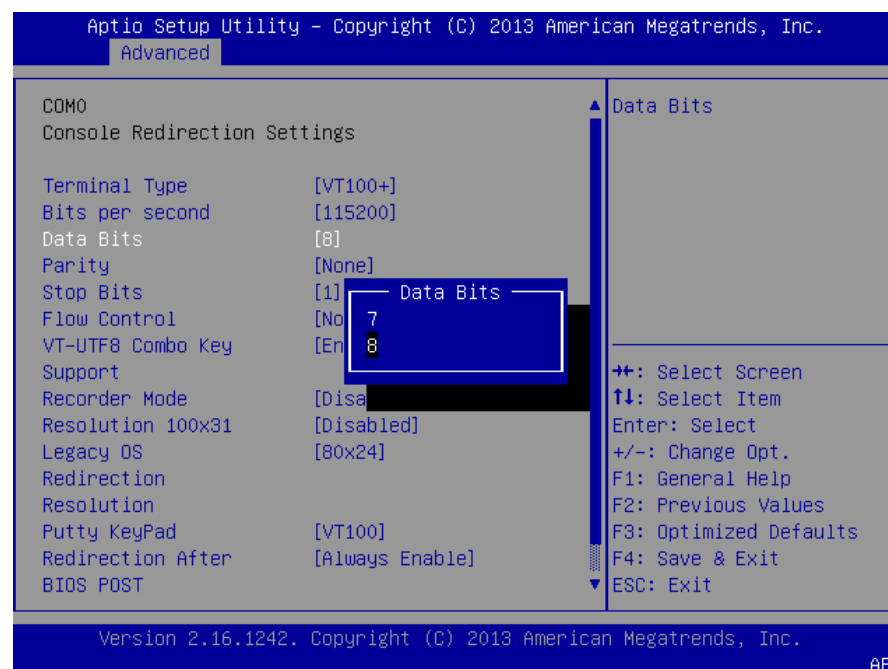
ANSI: Extended ASCII character set



Bits per second: select “9600”, “19200”, “38400”, “57600”, or “115200” for bits per second. The Bps will determine serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds

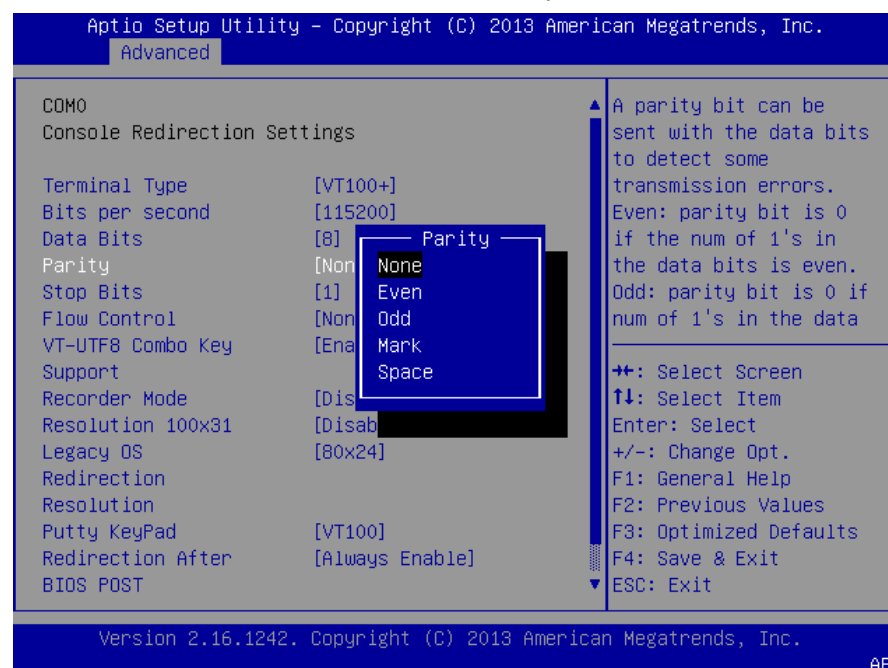


Data Bits: select the value for data bits. In this case, “7” or “8”.



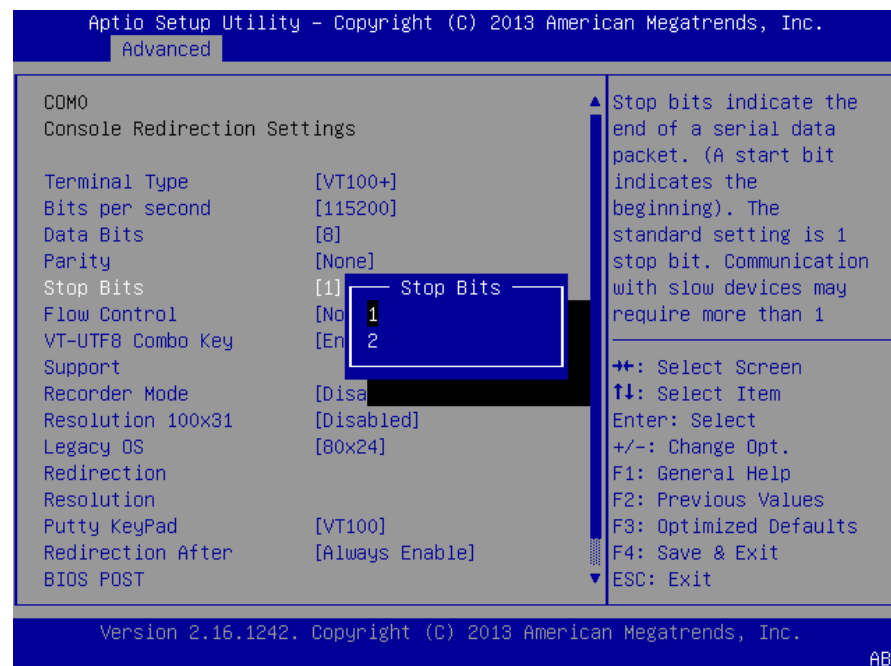
Parity Bits: a parity bit can be sent with the data bits to detect some transmission errors.

Select “None”, “Even”, “Odd”, “Mark” or “Space”.

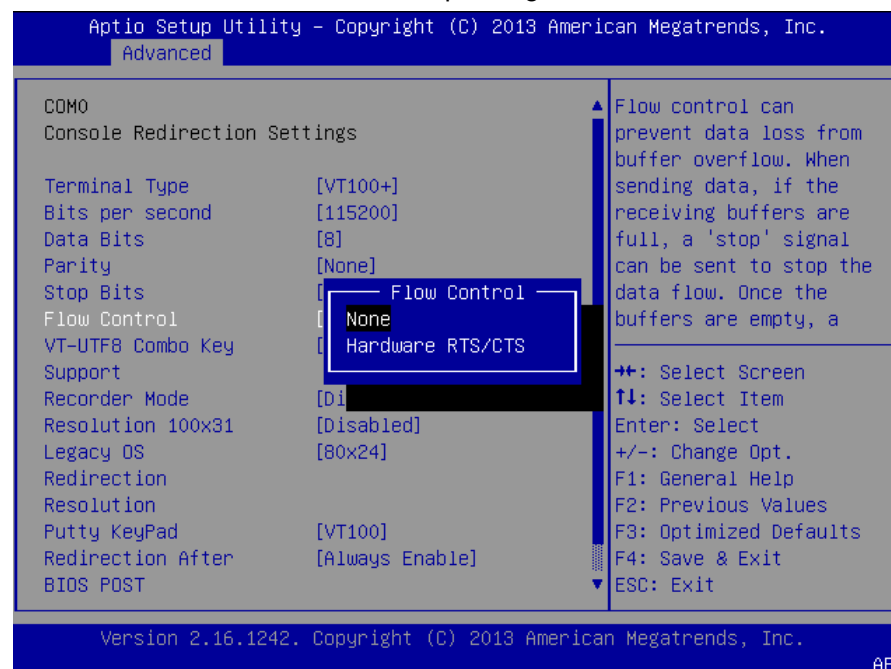


Stop Bits: stop bits indicate the end of a serial data packet. The standard is 1 stop bit.

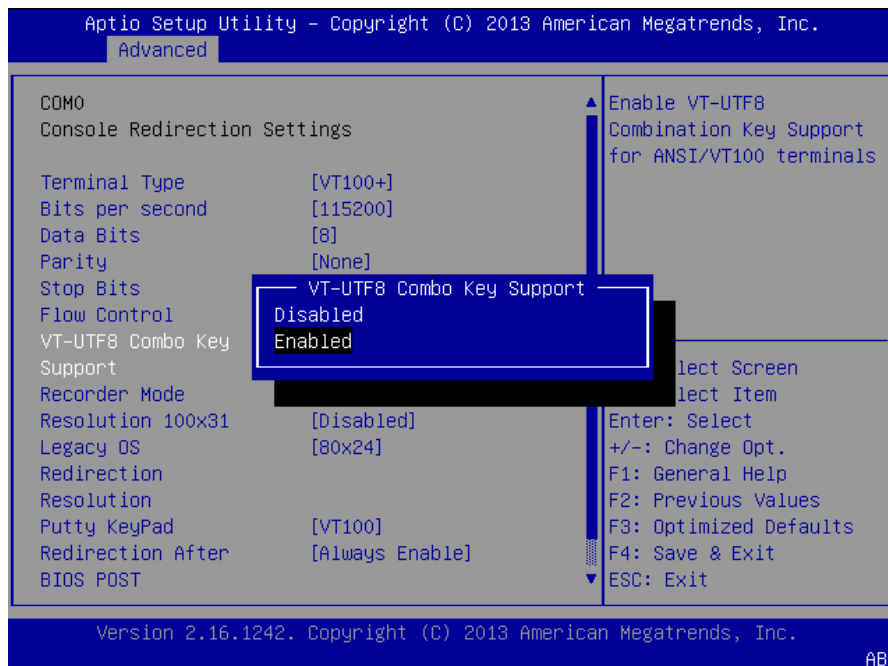
Communication with slow devices may require more than 1.



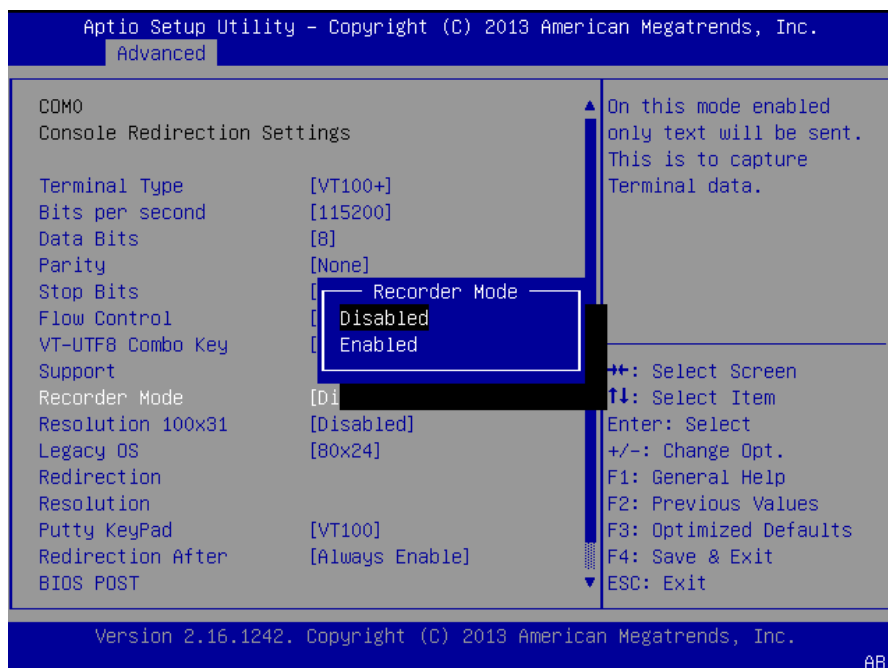
Flow Control: flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. You may select “None” or “Hardware RTS/CTS”, depending on the circumstances.



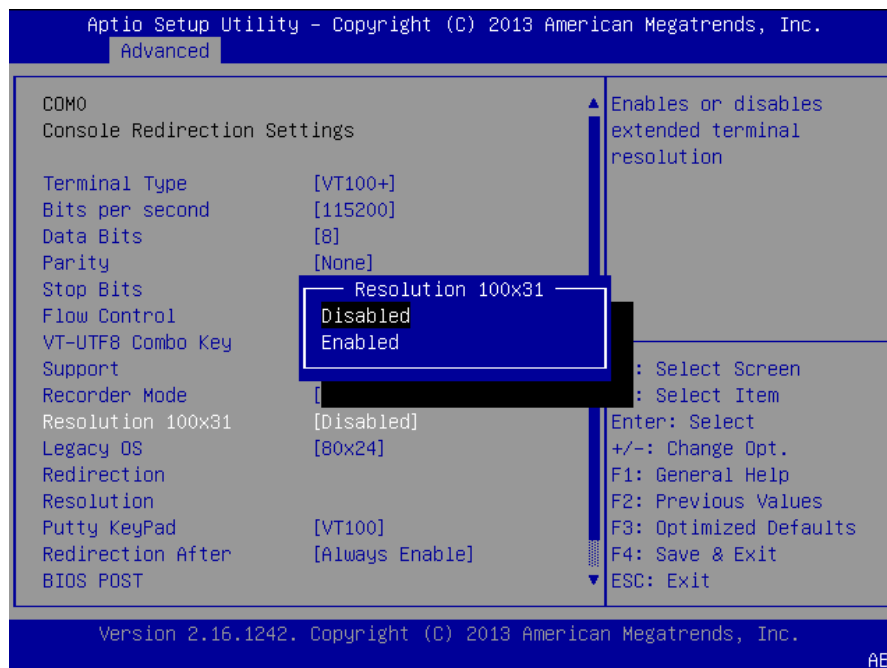
VT-UTF8 Combo Key Support: this option enables/disables VT-UTF8 combination key support for ANSI/VT100 terminals.



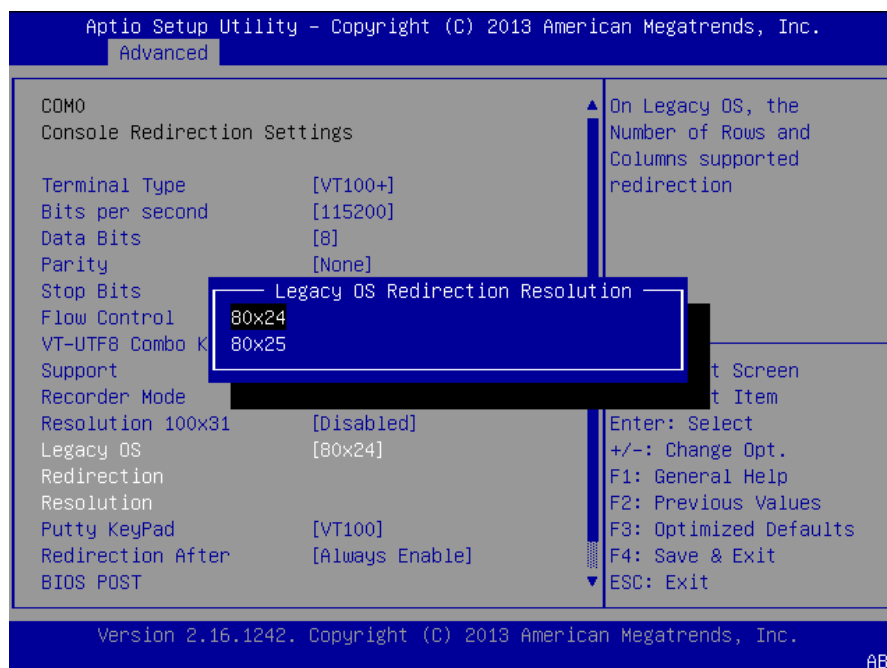
Recorder Mode: on this mode, when "Enabled", only text will be sent. This is to capture terminal data.



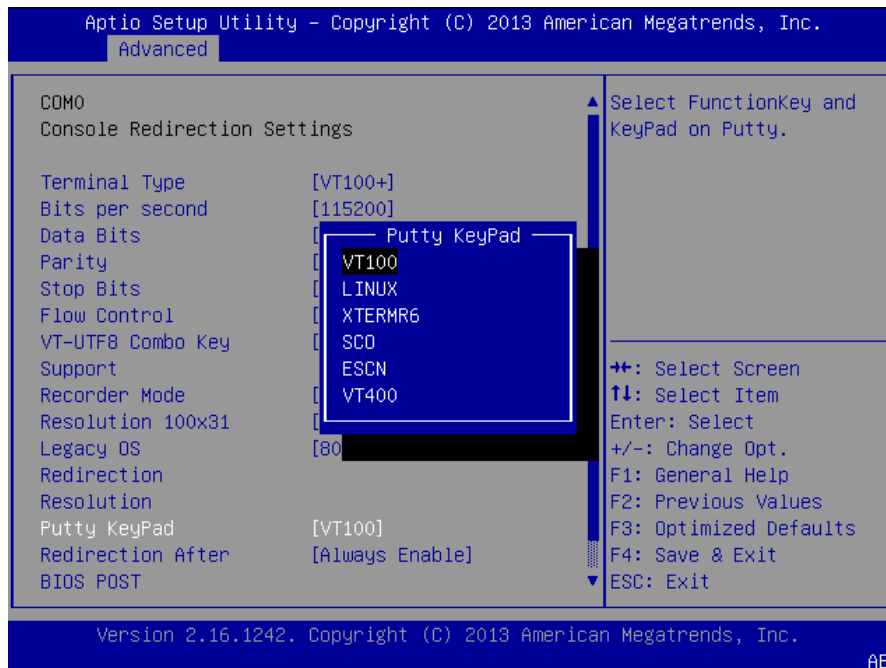
Resolution 100 x 31: select “Enable” or “Disable” for extended terminal resolution.



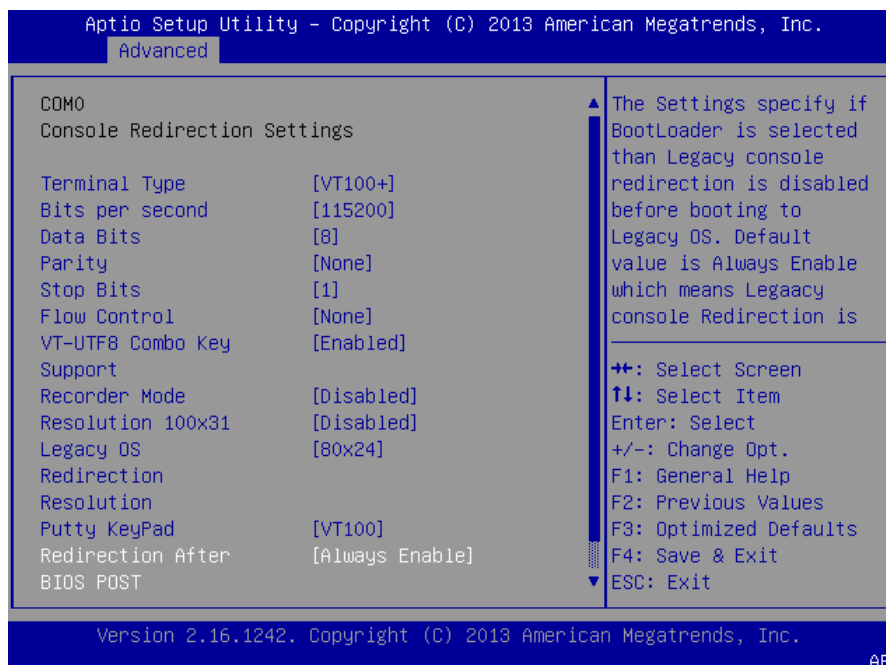
Legacy OS Redirection Resolution: select “80x24” or “80x25”. The default for this case is “80x24”.



Putty KeyPad: select Function Key and Key Pad on Putty. You may select “VT100”, “LINUX”, “XTERM6”, “SCO”, “ESC”, or “VT400”.

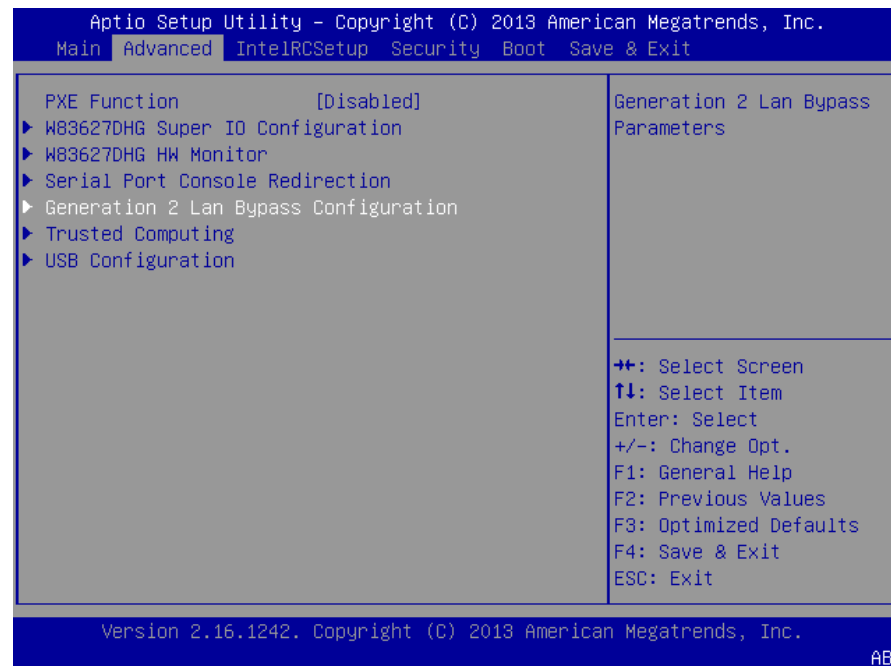


Redirection After BIOS POST: The settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is “Always Enable” which means Legacy OS console redirection is always enabled after BIOS.

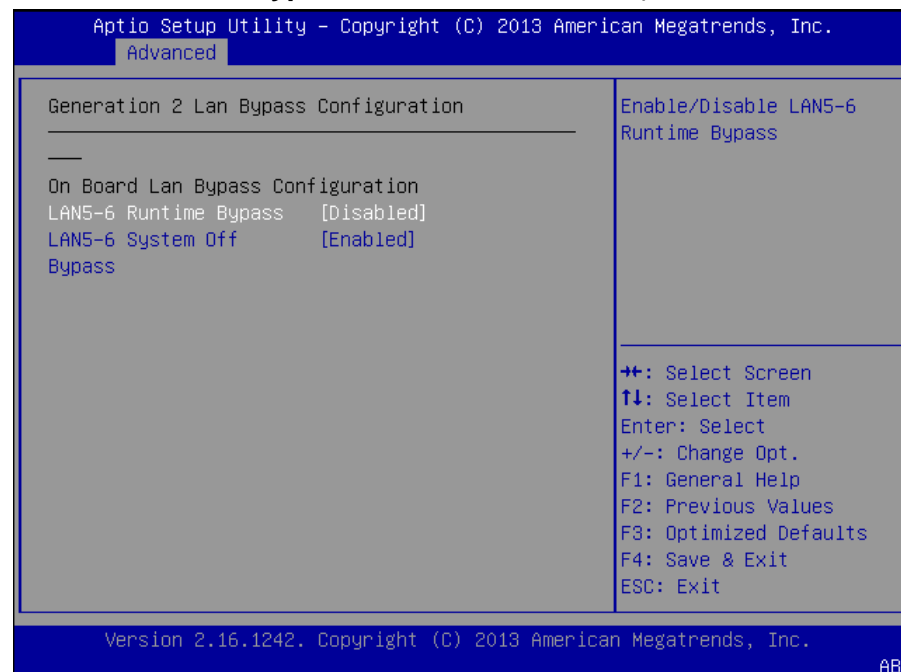


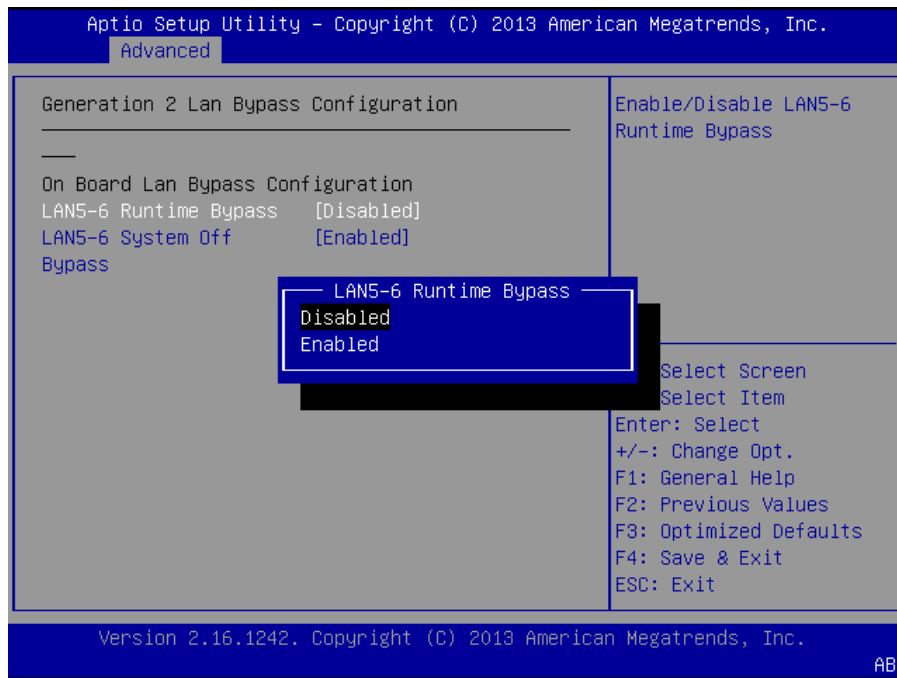
Generation 2 LAN Bypass Configurations

This option allows you to configure Generation 2 LAN bypass parameters.

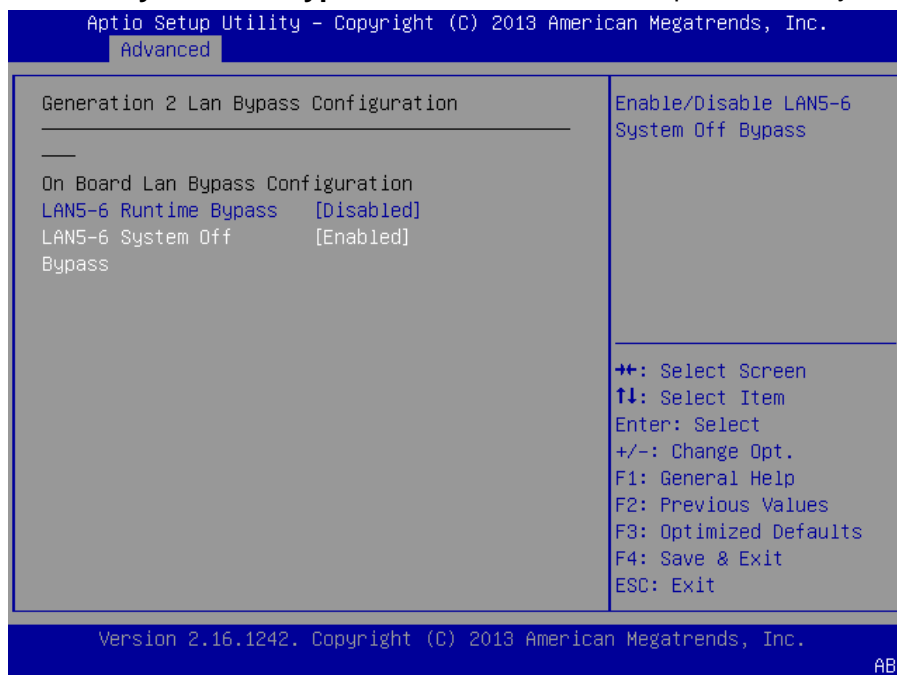


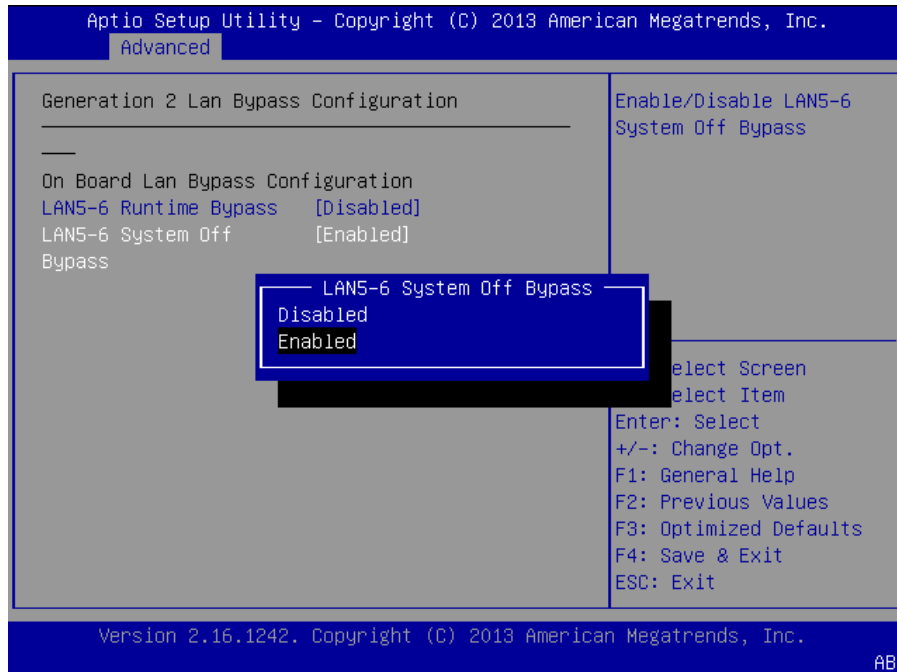
LAN5-6 Runtime Bypass: enable or disable LAN port 5 and 6 runtime bypass





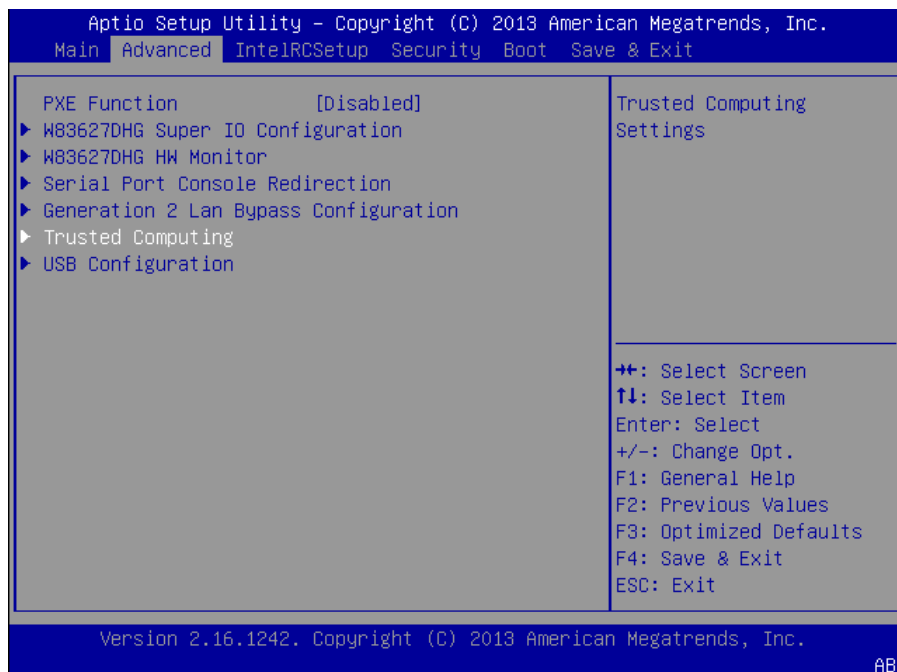
LAN5-6 System Off Bypass: enable or disable LAN port 5 and 6 system-off bypass



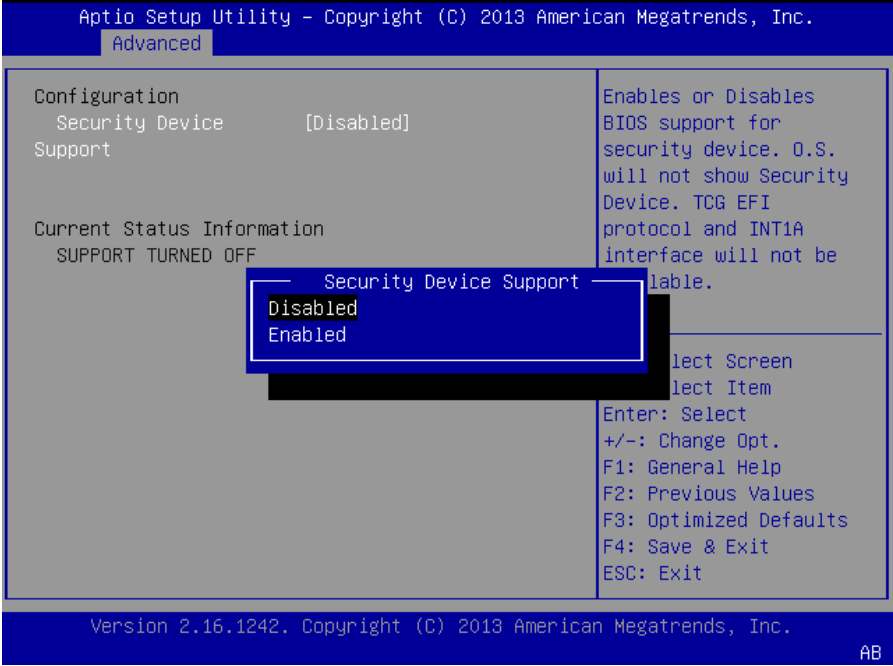
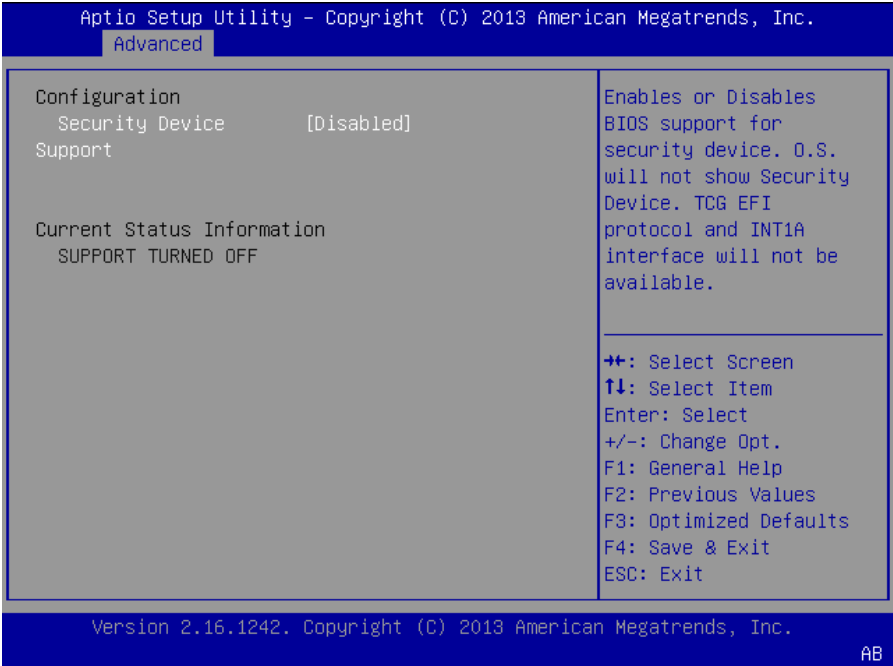


Trusted Computing

This option allows you to configure Trusted Computing settings.

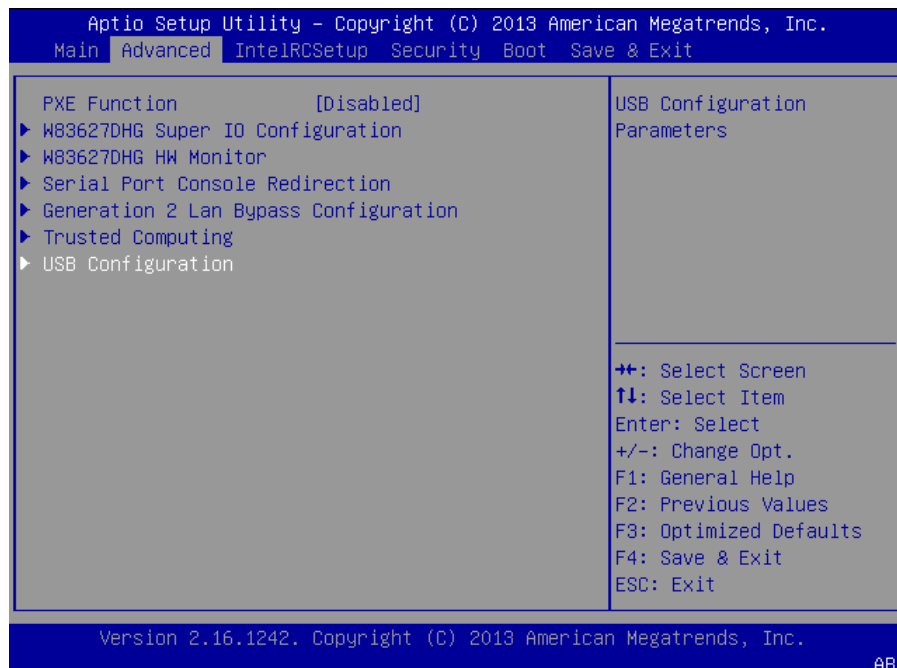


Security Device Support: enable or disable BIOS support for security device. The operating system will not show security device. TCG EFI protocol and INT1A interface will not be available.



USB Configuration

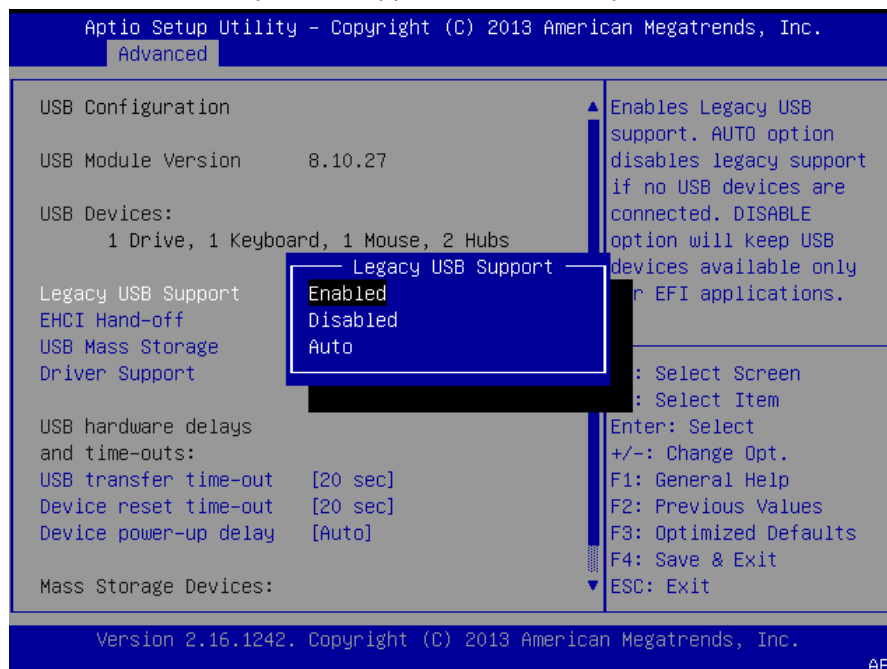
This option allows you to configure USB device Settings.



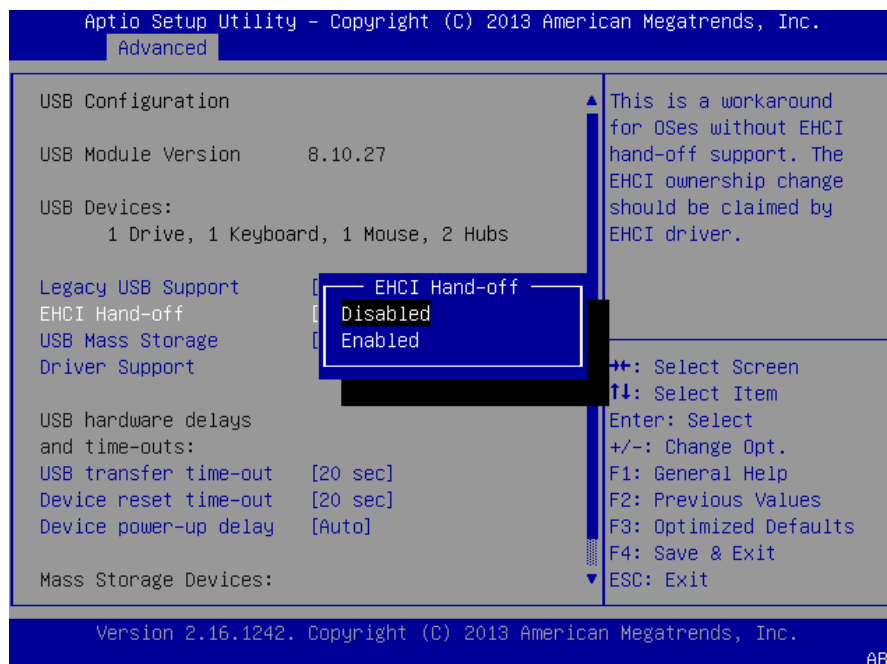
USB Module Version: displays information about USB module version

USB Devices: displays USB devices

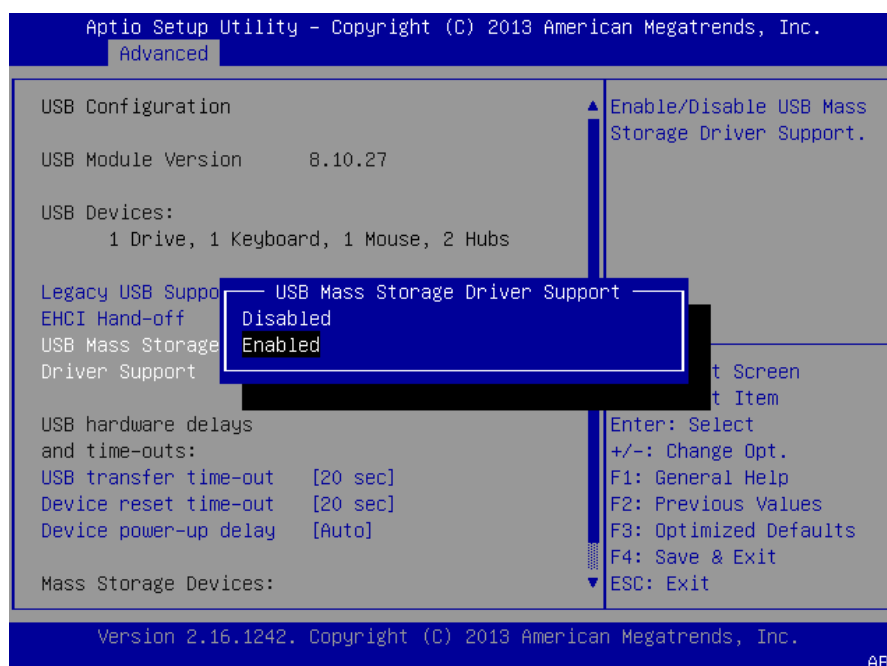
Legacy USB Support: this function enables or disables legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications. You may select "Enabled", "Disabled" or "Auto".



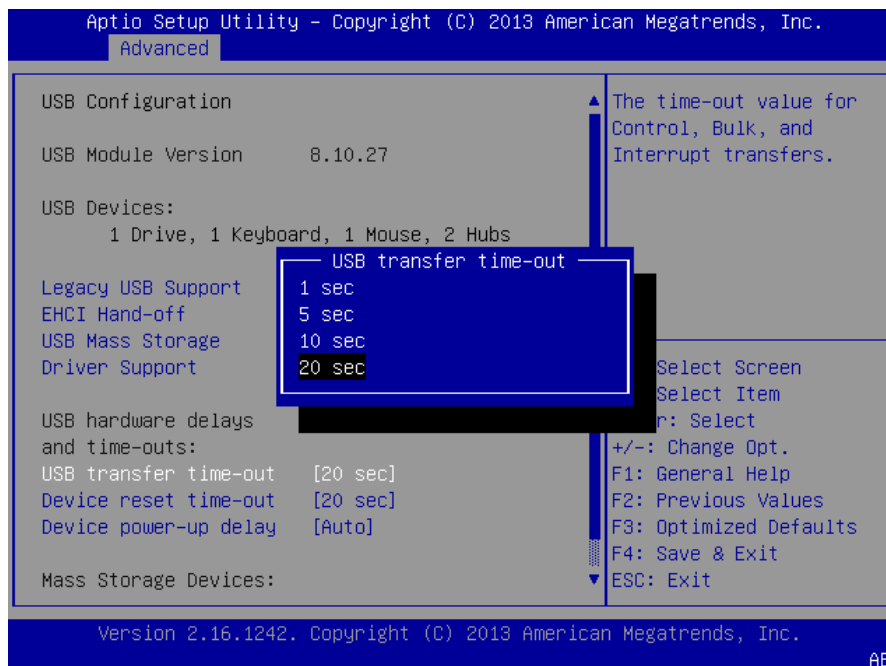
EHCI Hand-off: enables or disables EHCI Hand-off function. This is a workaround for operating systems without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.



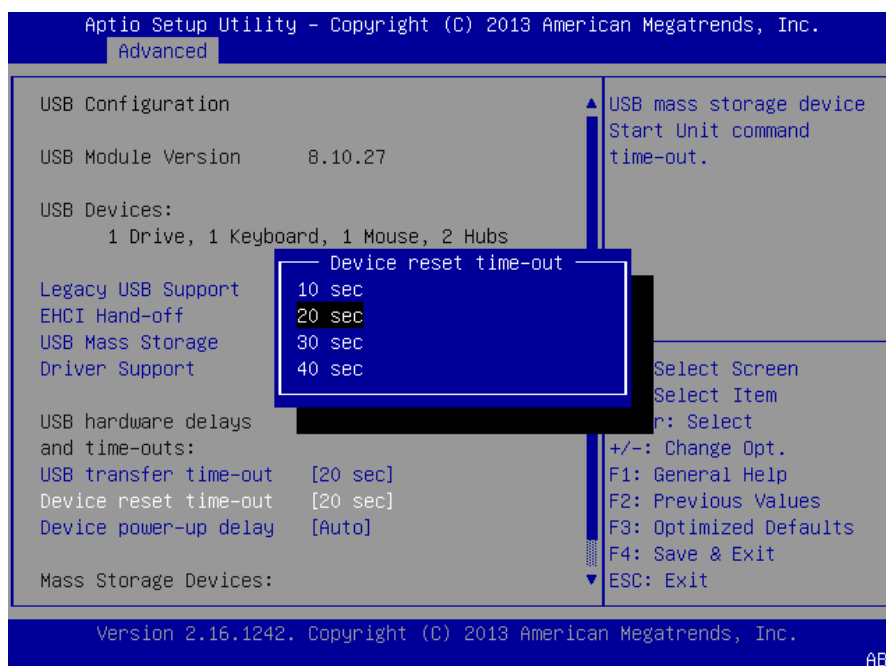
USB Mass Storage Driver Support: this option allows you to enable or disable USB mass storage driver. The default is "Enabled".



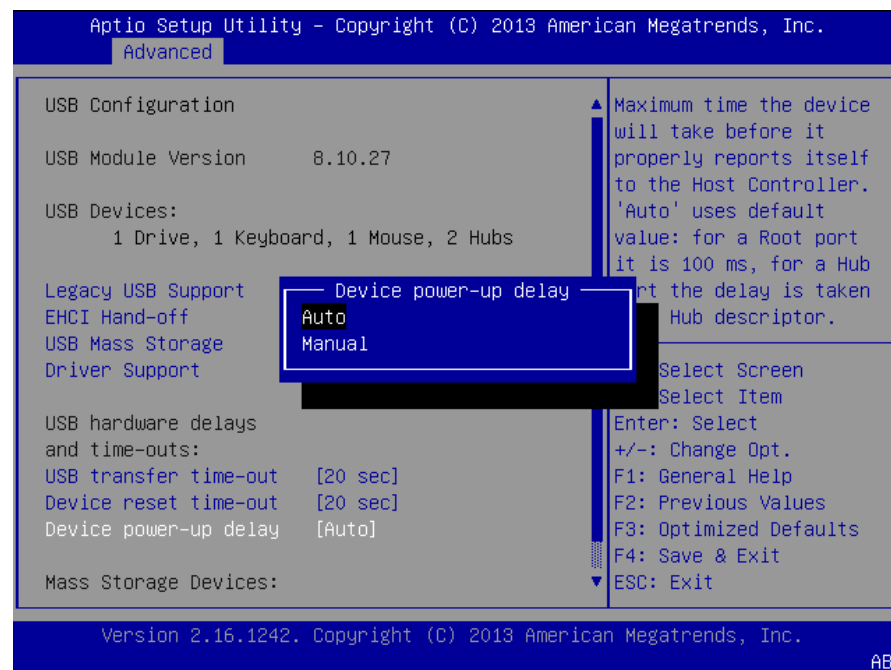
USB transfer time-out: set USB time-out value (1, 5, 10 or 20 seconds) for Control, Bulk and Interrupt transfers.



Device reset time-out: set USB mass storage device Start Unit command time-out (10, 20, 30 or 40 seconds).

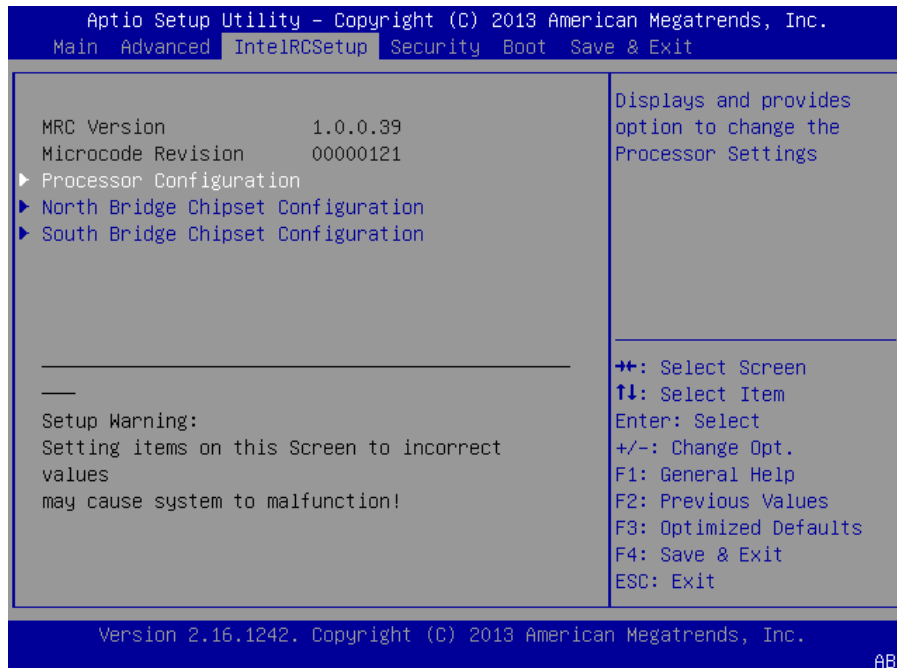


Device power-up delay: set the maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses default value. For example, it is 100ms as a root port.



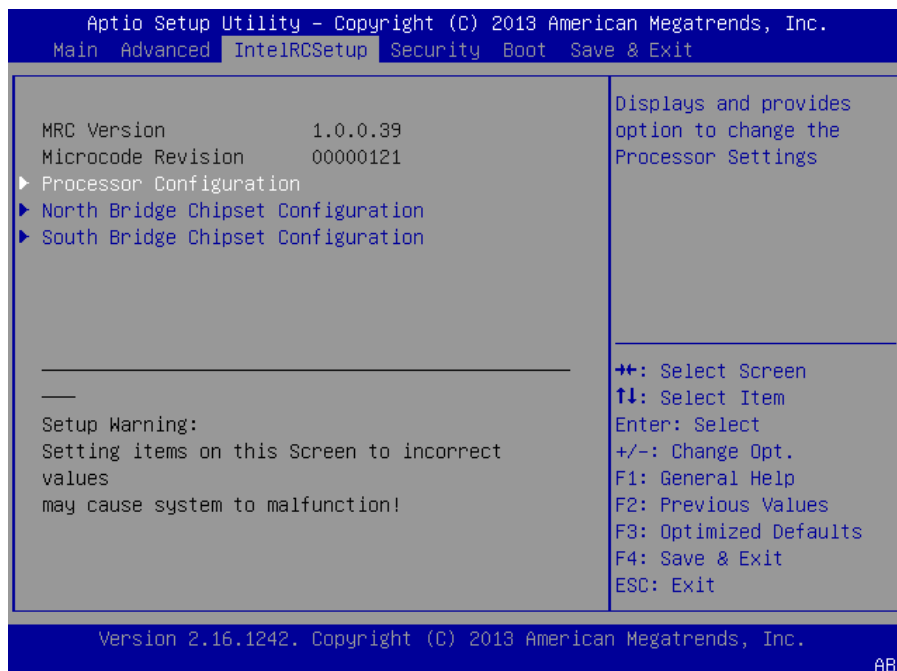
IntelRCSetup

Use [←] / [→] to select [IntelRCSetup] setup screen. Under this screen, you may use [↑] [↓] to select "Processor Configuration", "North Bridge" or "South Bridge" to configure the parameters.

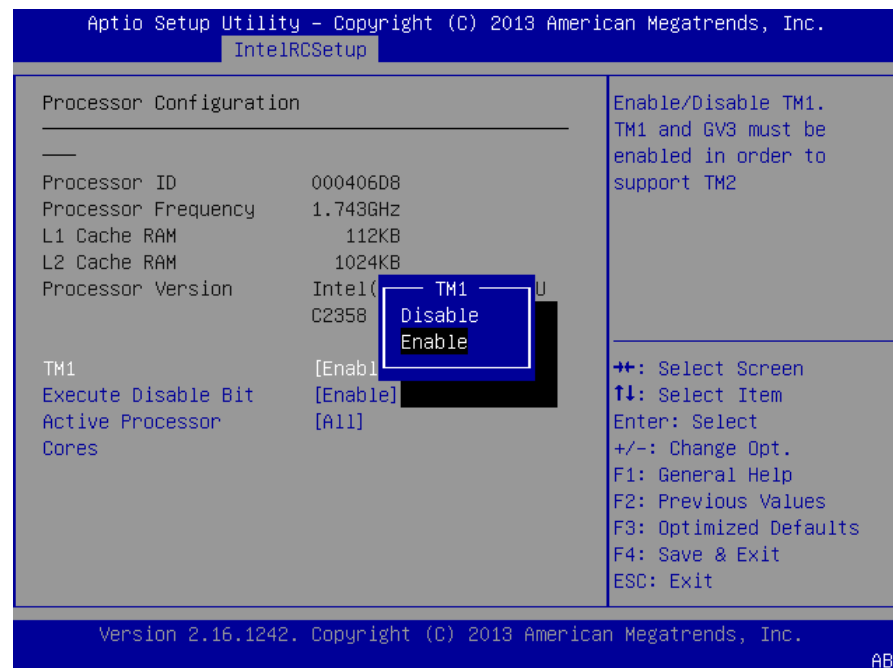


Processor Configuration

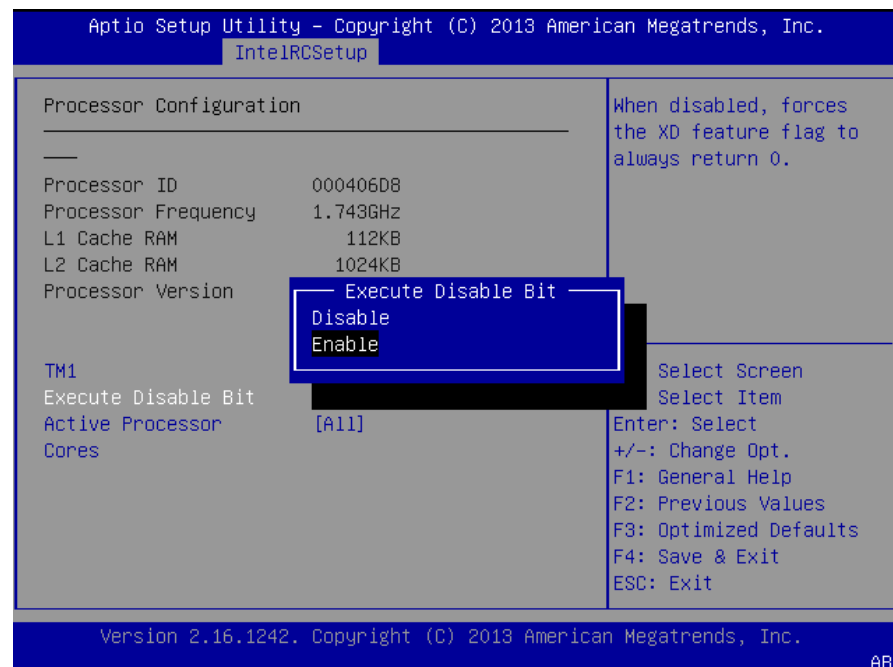
Press Enter to access options about processor settings.



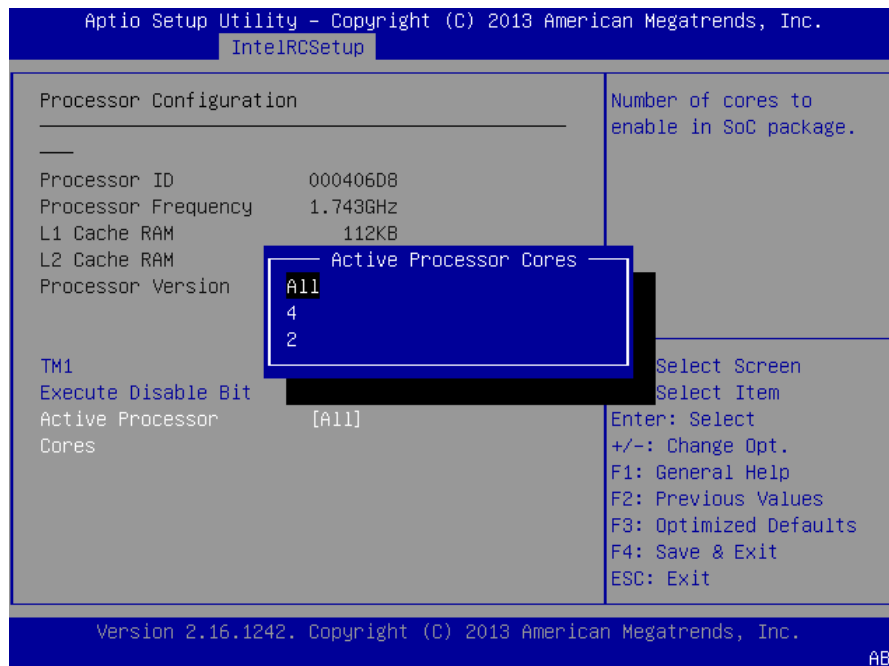
TM1: this option allows users to enable or disable TM1. TM1 and GV3 must be enabled in order to support TM2. (TM: Thermal Monitor)



Execute Disable Bit: an Intel hardware-based protection against malicious code. It will detect the memory in which a code can be executed or not. When enabled, it will prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS. When disabled, it forces the XD feature flag to always return 0.



Active Processor: set the number of cores to enable in the SoC package. You may set “All”, “4”, or “2”. The default is “All”.

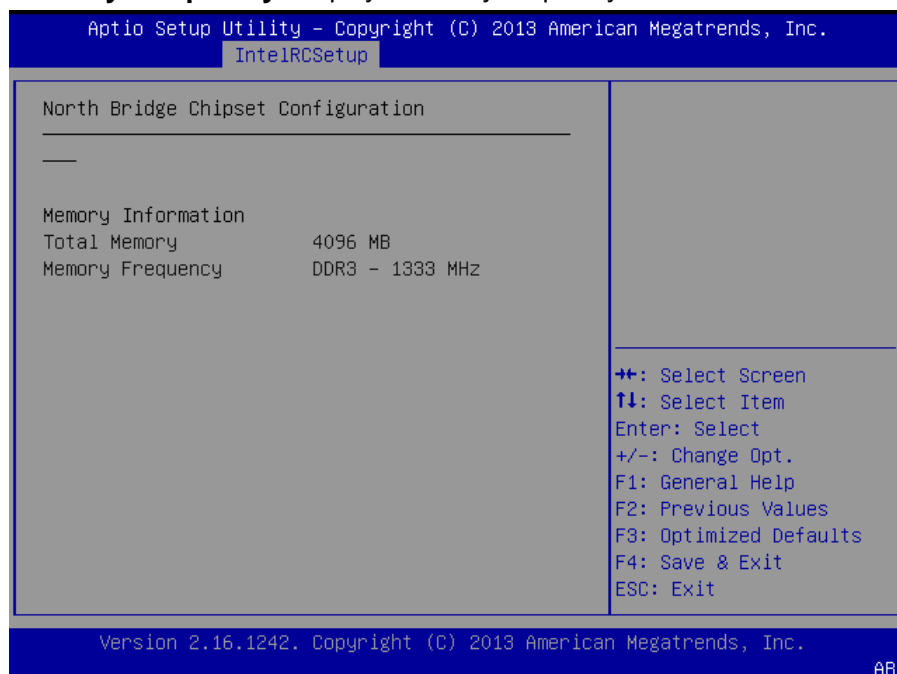


North Bridge Chipset Configuration

Memory Information

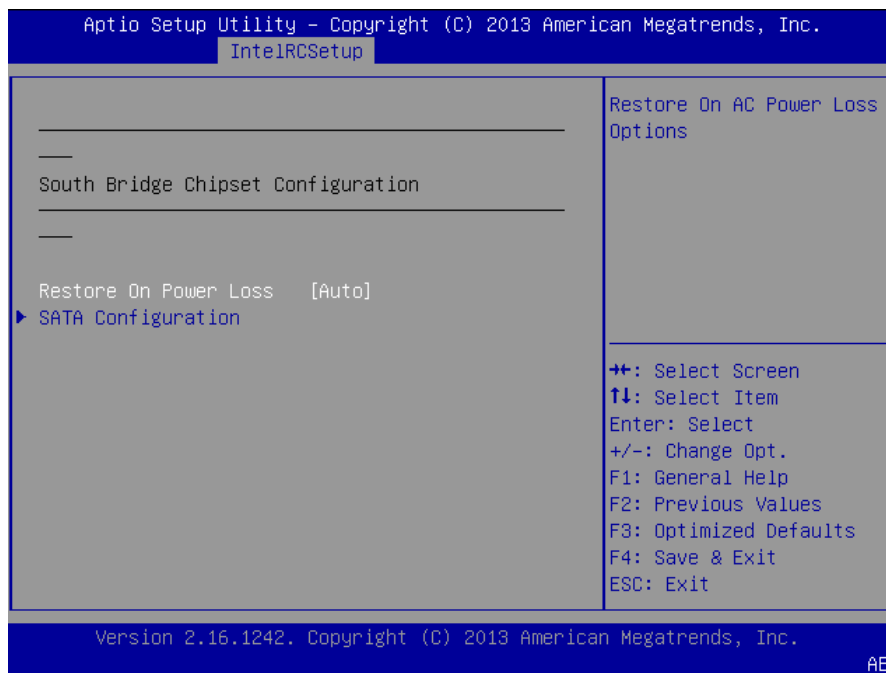
Total Memory: displays total memory

Memory Frequency: displays memory frequency

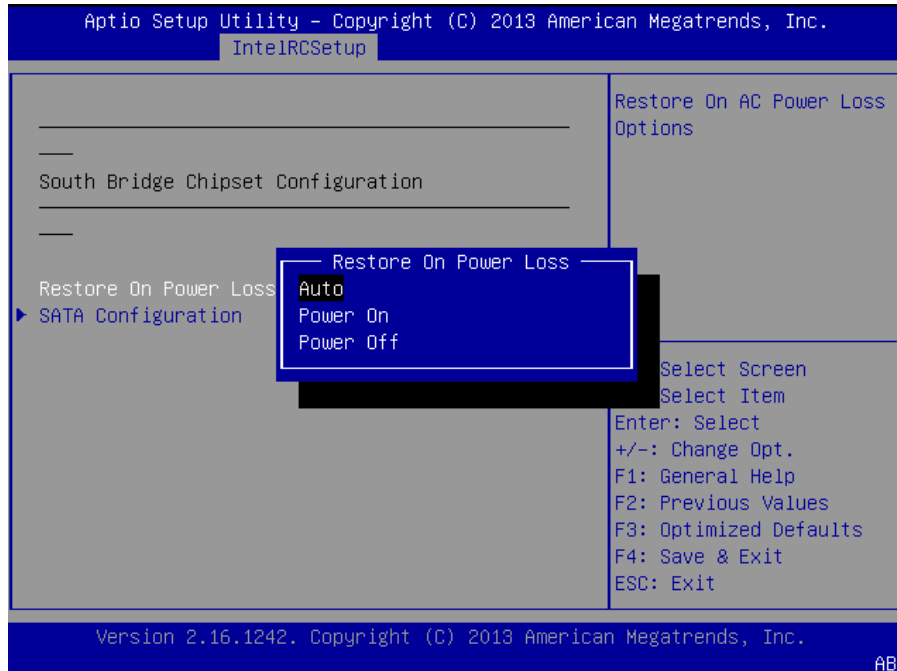


South Bridge Chipset Configuration

Once entered South Bridge setting, you may configure restore AC Power Loss states and SATA parameters.

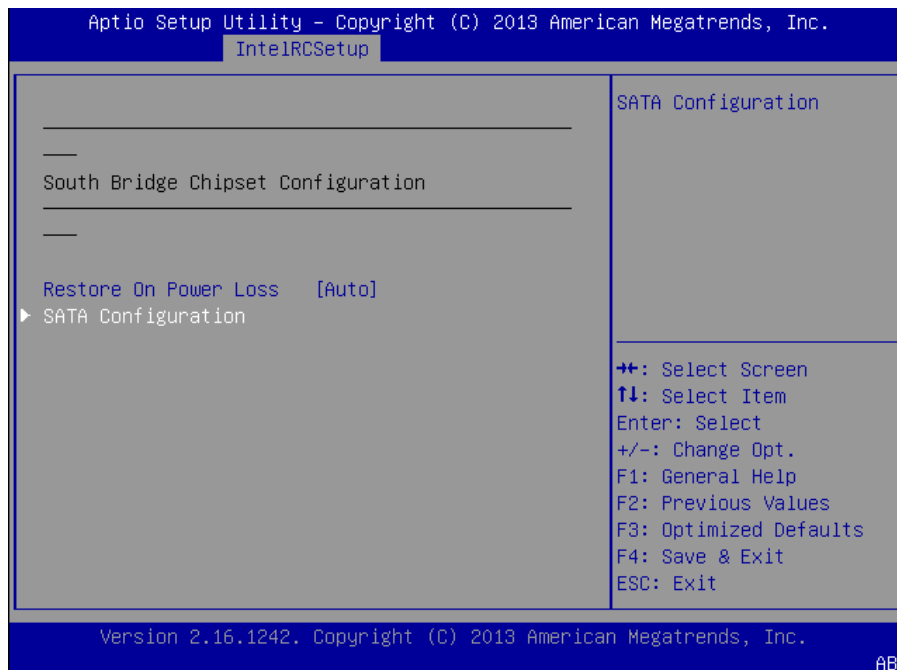


Restore On Power Loss: restore on AC power loss options. You may select “Auto”, “Power On” or “Power Off”.

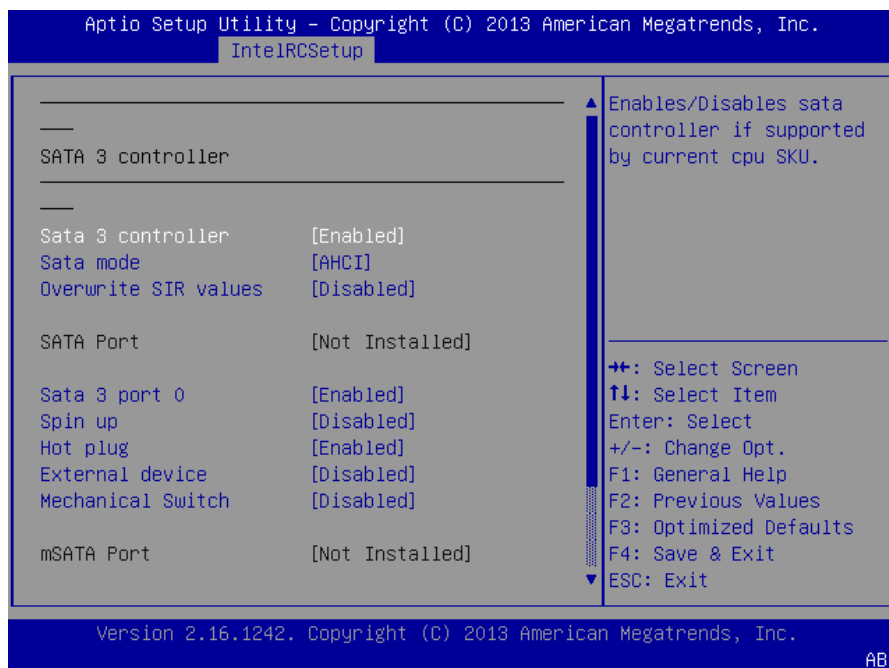


SATA Configuration

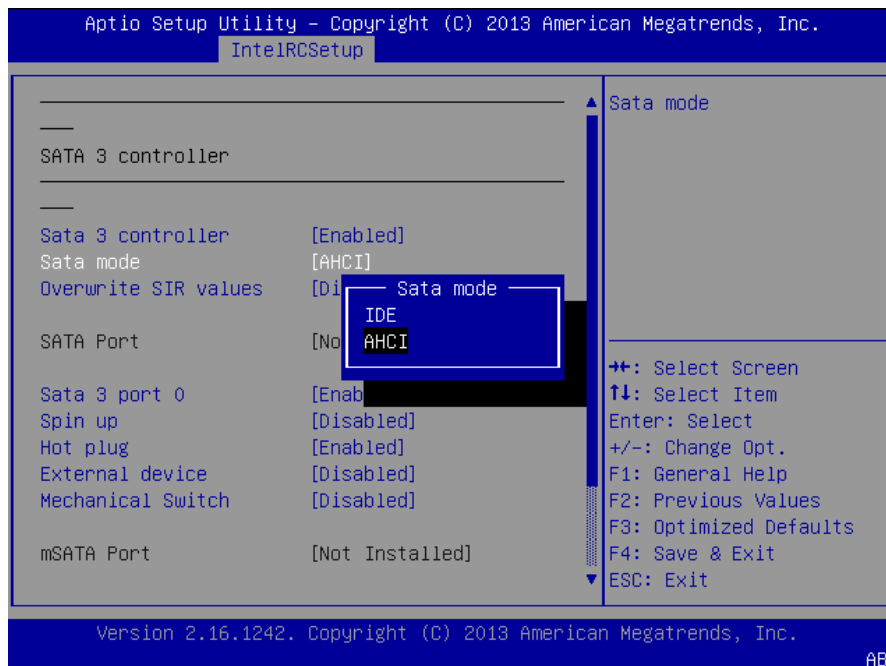
Press Enter to access items for SATA devices and settings.



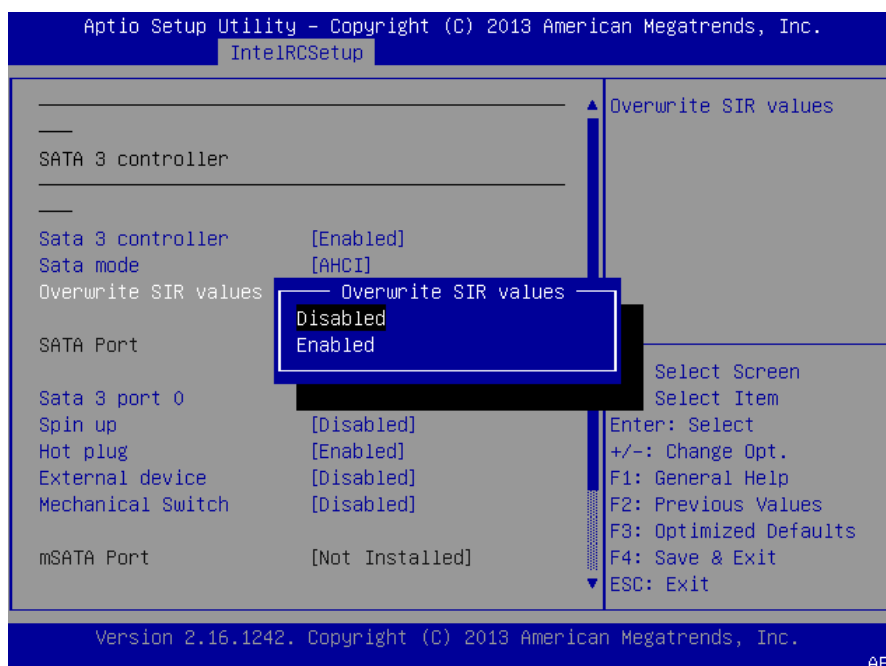
SATA 3 Controller: enable or disable SATA controller if supported by current CPU SKU



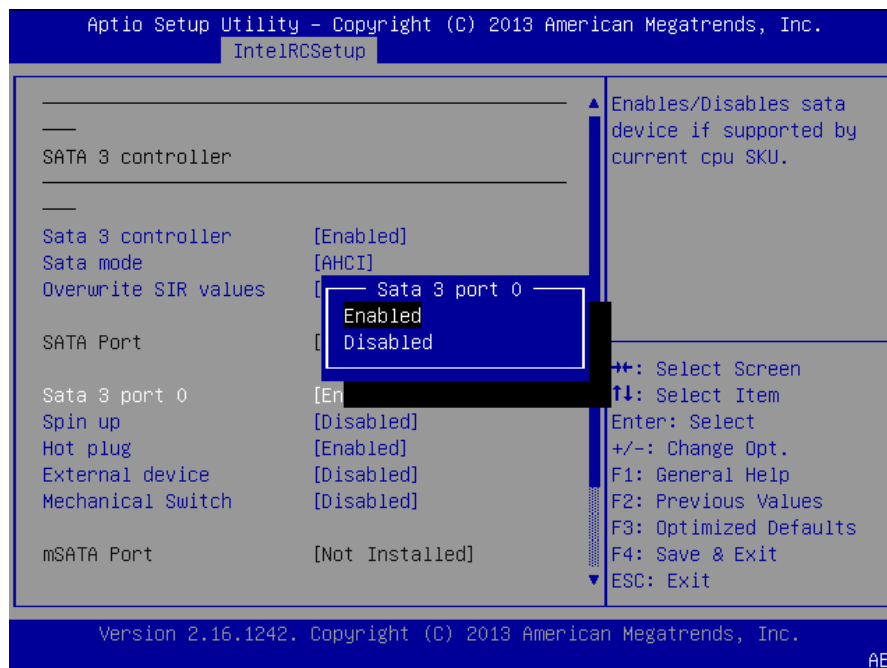
SATA Mode: the selection to determine the SATA mode for your storage devices. You may select “IDE” or “AHCI” mode.



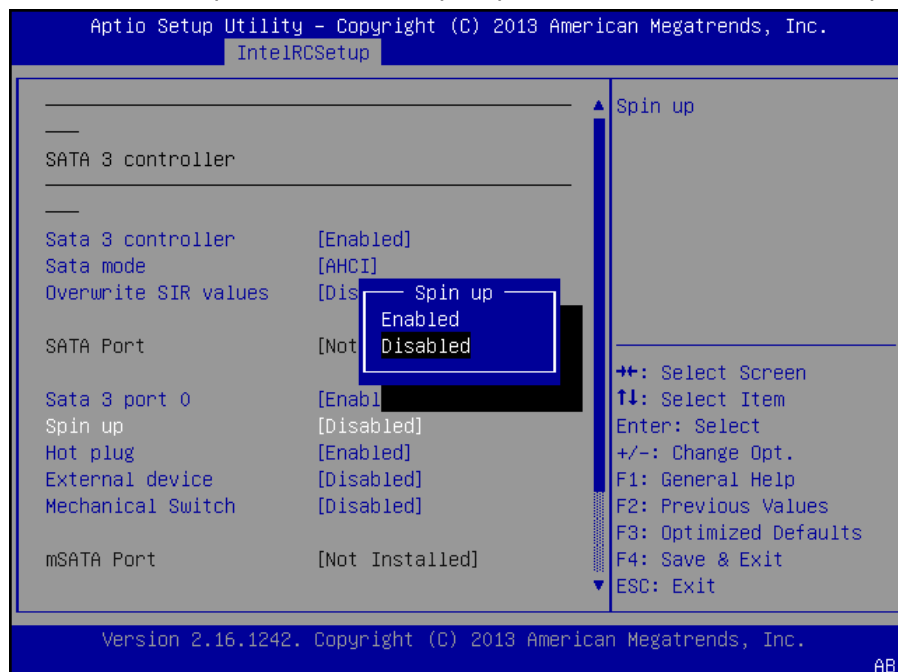
Overwrite SIR Values: enable or disable the function of overwriting SIR (SATA Index Register) values.



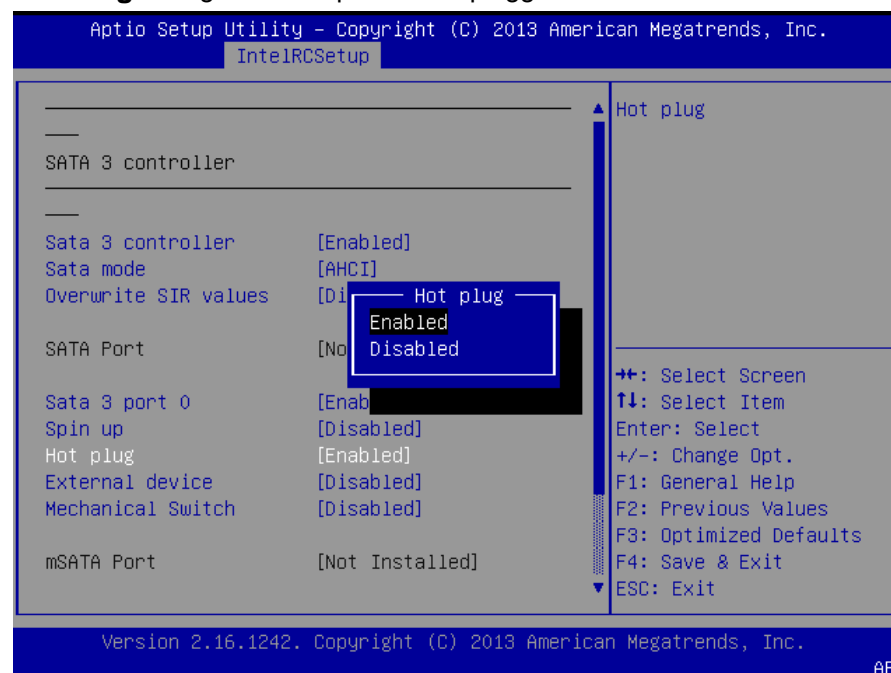
SATA 3 Port 0: enable or disable the SATA device of this SATA port



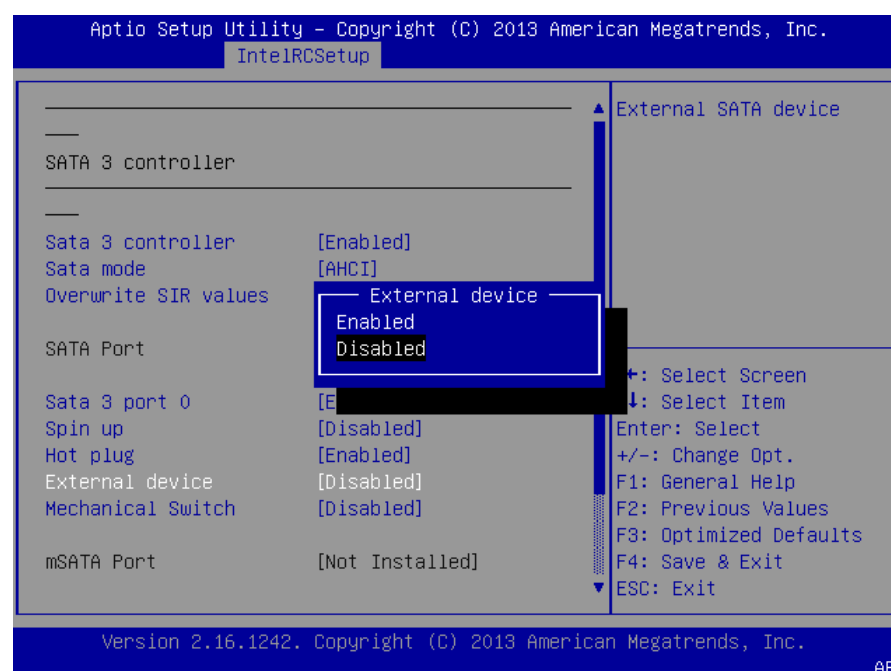
Spin Up: if enabled for any of ports, Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.



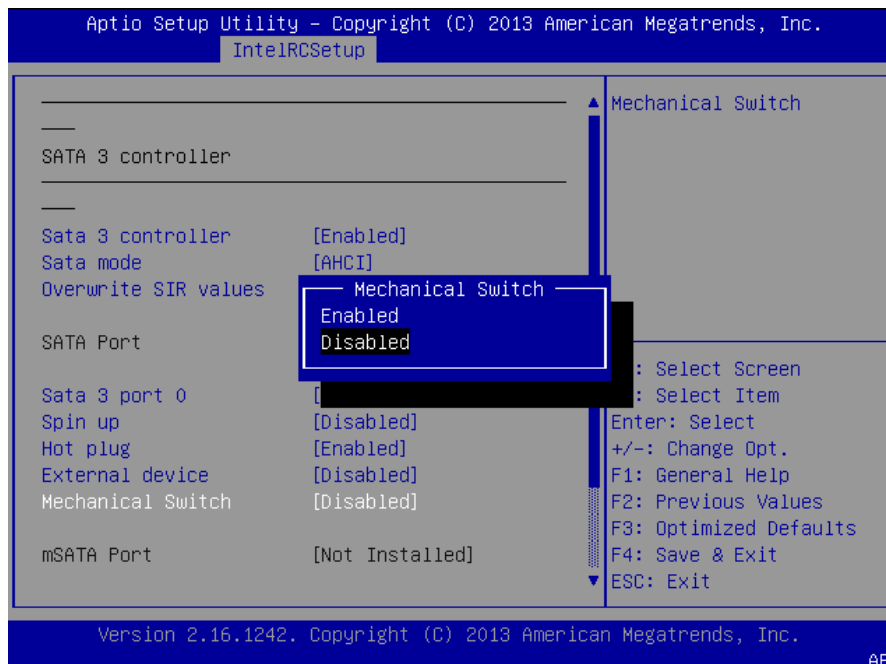
Hot Plug: designates this port as hot pluggable



External Device: enable or disable external SATA device



Mechanical Switch: enable or disable mechanical switch function for connected SATA device



Security

Use [←] / [→] to select [Security] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

Administrator Password: set administrator password. Once set, then this only limits access to Setup and is only asked for when entering Setup.

User Password: set user password. Once set, then this is a power-on password and must be entered to boot or enter Setup.

Notes: please make sure the password range follow this BIOS definition. For instance, the minimum length of a password is "3", while the maximum length is "20".



Boot

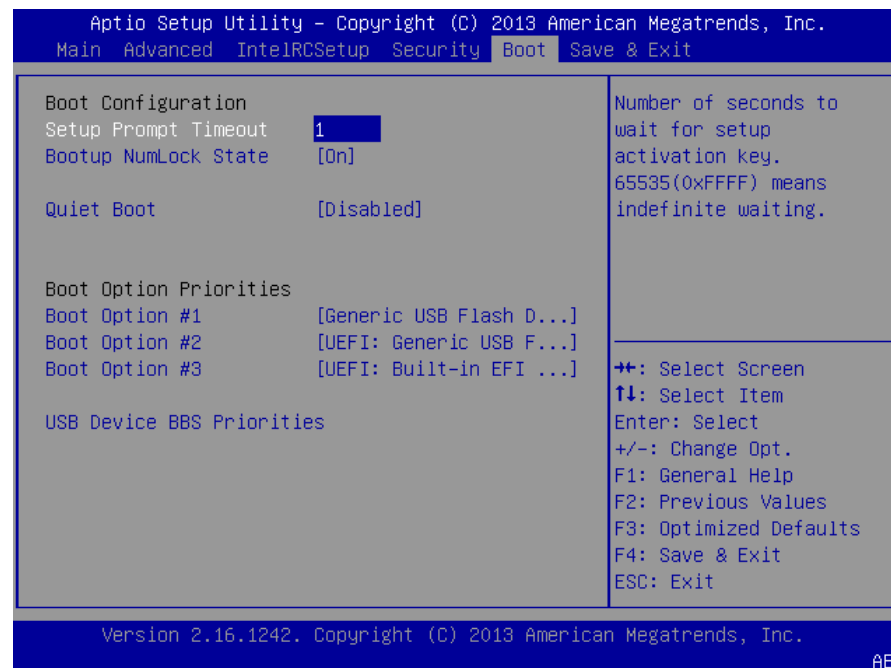
Use [←] / [→] to select [Boot] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

Setup Prompt Timeout: set the number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State: select “On/Off” for the keyboard NumLock state.

Quiet Boot: enable or disable “Quiet Boot” option.

Boot Option #1/2/3: determine the device to be the device boot priority



Save & Exit

Use [←] / [→] to select [Save & Exit] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

Save Changes and Exit: exit system setup after saving the configuration changes

Discard Changes and Exit: exit system setup without saving the configuration changes

Restore Defaults: restore to factory default setting

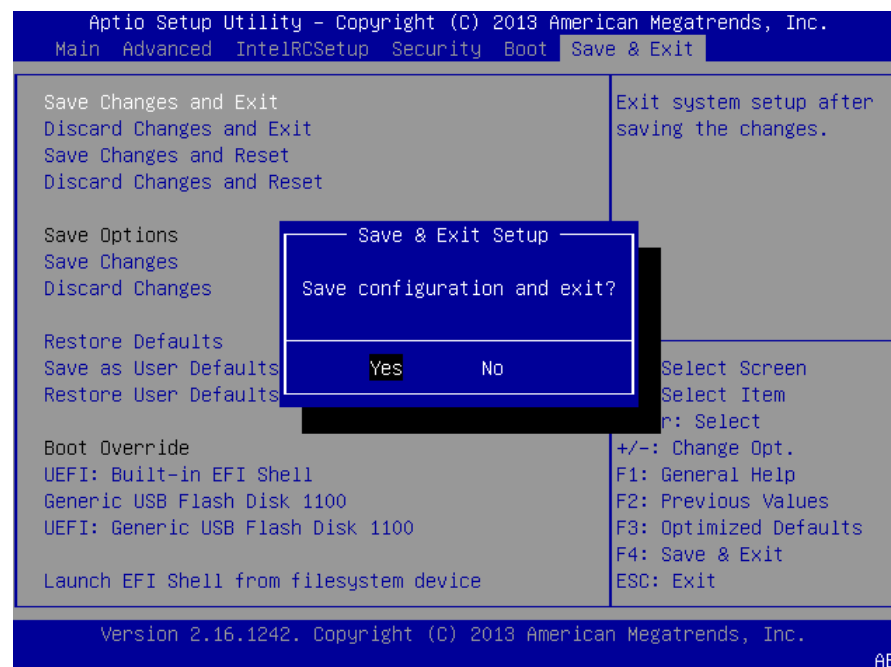
Save Changes and Exit: exit system setup after saving the configuration changes

Discard Changes and Exit: exit system setup without saving the configuration changes

Restore Defaults: restore/load factory default setting for all setup parameters.

Save as User Defaults: save changes as user default

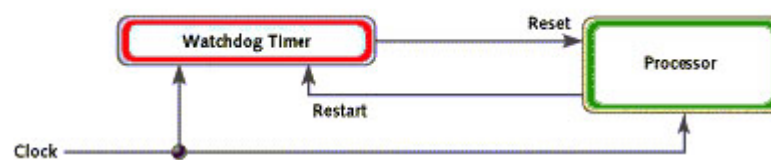
Restore User Defaults: restore the existing user default



Appendix A: Programming Watchdog Timer

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

For sample watchdog code, see *WD* folder under Driver and Utility on the *Driver and Manual CD*.



Appendix B: Setting up Console Redirection

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing keyboard input and text output through the serial port. These following steps illustrate how to use this feature. The BIOS of the system allows the redirection of console I/O to a serial port. With this configured, you can remotely access the entire boot sequence through a console port.

1. Connect one end of the console cable to console port of the system and the other end to serial port of the Remote Client System.

2. Configure the following settings in the BIOS Setup menu:

BIOS > Advanced > Remote Access Configuration > Serial Port Mode > [115200, 8 , n , 1]

3. Configure Console Redirection on the client system. The following is an example on Windows platform:

- a. A. Click the start button, point to Programs > Accessories > Communications and select Hyper Terminal.

- b. B. Enter any name for the new connection and select any icon.

- c. Click OK.

- d. From the "Connect to". Pull-down menu, select the appropriate Com port on the client system and click OK.

- e. Select 115200 for the Baud Rate, None. for Flow control, 8 for the Data Bit, None for Parity Check, and 1 for the Stop Bit.

For items on the setup, please refer to the console redirection of the BIOS menu.

Appendix C: Programming Generation 3

LAN Bypass

The bypass function is used to link two independent Ethernet ports when the system crashes or powers off. This means if your system is equipped with a LAN Bypass function, a condition in your system will not interrupt your network traffic. Different from the previous two generations (Gen1 and Gen2), the Lanner Bypass Gen 3 employs a programming method to control the bypass function by software. There are typically two communication status for the bypass function, one is "Normal" and another is "Bypass" status. Furthermore, the Lanner Bypass software is capable to control the bypass status in the following 3 instances.

1. When the system powers off, it can be forced to enable the LAN Bypass function.
2. When the system is in the just-on state which is a brief moment when it powers up.
3. When the system is running

Please refer to the LAN_Bypass_Watchdog folder on the Driver and Manual CD.

Lanner bypass possess the following features:

1. Communication through SMBUS (I2C)
2. Independent bypass status control for each pair up to a total of 4 pairs
3. Lanner Bypass Modules can bypass systems Ethernet ports on a host system during three instances: Just-on (Just-on is the brief moment when the internal power supply turns on and booting process starts), System off, or upon software request (during run-time).
4. Software programmable bypass or normal mode
5. Software programmable timer interval:
 - JUST-ON watchdog timer, used during JUST-ON, has timer setting of 5~1275 seconds of timer interval.
 - Run-Time watchdog timer, used during run-time, has setting of 1~255 seconds of timer interval.
6. Multiple Watchdog Timers:
 - Two for run-time: It is designed to give you a more variety of controls of the bypass on port basis. By using dedicated watchdogs for different pairs of bypass, you have the flexibility to manage the bypass status for them differently.
 - One for just-on: It is designed to give you the precise control of the bypass during this phase. You can use this timer to delay enabling the bypass in just-on state.

For sample LAN bypass code and the Bypass Manual, see the *LAN_Bypass* folder on the *Driver and Manual CD* or the *Lanner Support Website* at

<http://www.lannerinc.com/download-center/> and browse the *download center* and look for *Lanner LAN Bypass Watchdog User Manual* under the *Accessories* folder.

For a description of the physical LAN ports equipped with this function, refer to *Front Panel Features* in *Chapter1 Introduction*.

Appendix D: Programming the LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system. For sample LCM code, see *LCM* folder in the *Driver and Manual CD*. The driver and the program library can also be found in the folder.

The system supports the following 2 kinds of LCM:

- **Parallel Text-based LCM:** The LCM connects to the motherboard's parallel port. The LCD screen can display 2 lines, 16 (or 20) characters per line.
- **USB and Serial Text or Graphic-based LCM:** Our next generation LCM. Lanner engineers design a common source code to be deployed on these two differently interfaced LCM modules. Jumpers are used to select between text and graphic types. See next section.

For Parallel Text-based LCM

Build

To build program source code on Linux platform, please use the following steps as a guideline:

1. Extract the source file:

```
# tar -xzf plcm_drv_v0XX.tgz
```

(0XX is the version of the program.)

2. Change directory to the extracted folder:

```
# cd plcm_drv_v0XX
```

(0XX is the version of the program.)

Note: Apply our Parallel Text-based LCM to the environment of virtualization, please use the version 013 or above of the program.

3. Type "make" to build source code:

```
# make
```

After compiling, the executable programs (plcm_test, plcm_cursor_char, ppdev_test, Test) and the driver (plcm_drv.ko) will appear in the program's folder.

Note: The OS supported by Parallel Text-based LCM function includes platforms based on Linux Kernel series 2.4.x, Linux Kernel series 2.6.x and Linux Kernel series 3.0.x or above.

Install

Install the driver and create a node in the /dev directory by:

```
#insmod plcm_drv.ko
```

```
#mknod /dev/plcm_drv c 248 0
```

Note:

If you cannot install the driver, check whether you have enabled the parallel port in the BIOS setting . Once the message of “insmod”: error inserting ‘plcm_drv.ko’: -1

Input/output

error” appears, please check that whether the major number is repeated or not. The major number needed with the “mknod” command varies with different software versions; please look up the Readme file for this value.

Execute

This section contains sample executable programs that you could test on your platform. It demonstrates some useful functionality that the LCM provides. Note that the installation needs to be completed before proceeding with these executions.

To execute, run the command:

#./plcm_test

Backlight Off/On turning off/on the backlight of the LCM display

Display Off turning off the LCM display

Cursor Off/On NOT showing/showing the cursor on the LCM display

Blinking off/On turning off/on the cursor blinking

Writing “Lanner@Taiwan” displaying the specific sentences

Reading “Lanner@Taiwan” reading the specific sentence

CGram Test displaying the user-stored characters

Keypad Testing Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down)

Corresponding Commands for “plcm_test”

You can directly input the specific command to have its corresponding function worked on your LCM. This will be much more convenient once you would like to merely execute the keypad testing.

-On

— Turn on the backlight of the LCM display.

— To execute, please type:

#./plcm_test -On

-Off

— Turn off the backlight of the LCM display.

— To execute, please type:

#./plcm_test -Off

-LCM1

— Writing “Lanner@Taiwan” in line1.

— To execute, please type:

#!/plcm_test -LCM1

-LCM2

— Writing “2013-11-05” in line 2.

— To execute, please type:

#!/plcm_test -LCM2

Keypad

— Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down.

— To execute, please type:

#!/plcm_test -Keypad

Commands for plcm_cursor_char

This Run this command for cursor shift & single text update

./plcm_cursor_char

Please read the options below

Insert line select Item 1 to set the starting line as either line 1 or line 2

Move cursor right select Item 2 to move the cursor to the right

Move cursor left select Item 3 to move the cursor to the left

Add a char select Item 4 to display a character on the
LCM screen

Clean display select Item 5 to clear up the LCM display

Leave select Item 6 to exit the program

Test

This program is a testing script and runs through the following procedures in sequence:

— **rmmod plcm_drv** (remove the kernel mode driver module)

— **insmod plcm_drv.ko** (install the kernel mode driver module)

— **./plcm_test** (execute the driver testing program)

— **./plcm_test -stop** (stop executing the driver testing program)

— **rmmod plcm_drv** (remove the kernel mode driver module)

To execute, please type:

#!/Test

Virtualization Implemented by Parallel

Port Pass Through

By the utilization of the parallel port pass through, the Parallel Text-based LCM implements the following three kinds of virtualization in the Guest OS.

- QEMU/KVM
- Xen
- VMWare Player

Here, we take the Fedora 20 x86_64 operation system for instance to explain 3 virtualization respectively for parallel port pass through. Use the procedures listed below for step-by-step instructions separately based on your case.

In case of QEMU/KVM or Xen, please use the following steps as a guideline to implement the virtualization :

- (1) Make sure that the Guest OS has been installed.
- (2) Add the following 4 lines into the xml file (for example, add to /etc/libvirt/qemu/<yourvirtualmachine>.xml in linux KVM):

```
<parallel type='dev'>  
<source path='/dev/parport0'>  
<target port='0'>  
</parallel>
```
- (3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.

```
# modprobe parport  
# modprobe parport_pc  
# modprobe ppdev
```
- (4) Check that whether the /dev/parport0 exists or not. You may not find proper /dev/parport0 in the device list, please reconfirm the setup of xml file in the Guest OS.
- (5) Reboot the Guest OS.

Note: It is necessary for you to install “insmod parport.ko”, “parport_pc.ko” and “ppdev.ko” Linux Kernel drivers in virtualization environment before executing the “ppdev_test” testing program.

In case of VMWare Player, please use the following steps as a guideline to implement the virtualization:

- (1) Make sure that the Guest OS has been installed.
- (2) To set up the parallel port pass through, please enter VMWare Player's --> Virtual Machine

Setting --> VMWare Player's setting page to select /dev/parport0 as parallel port device.

(3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.

```
# modprobe parport
```

```
# modprobe parport_pc
```

```
# modprobe ppdev
```

4) Check that whether the /dev/parport0 exists or not. You may not find proper "/dev/parport0" in the device list, please reconfirm the setup of VMWare Player's setting page described in Step 2.

(5) Reboot the Guest OS.

Note: It is still necessary for you to install "insmod parport.ko", "parport_pc.ko" and "ppdev.ko" Linux Kernel drivers in virtualization environment before executing the "ppdev_test" testing program.

Appendix E: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
 - Improper or inadequate maintenance by the • customer
 - Unauthorized modification, misuse, or reversed • engineering of the product Operation outside of the environmental specifications for the product.

Requesting a RMA#

1. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box. 4.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details) <input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01: D.O.A.

02: Second Time

R.M.A.

03: CMOS Data Lost

04: FDC Fail

05: HDC Fail

06: Bad Slot

07: BIOS Problem

08: Keyboard Controller Fail

09: Cache RMA Problem

10: Memory Socket Bad

11: Hang Up Software

12: Out Look Damage

13: SCSI

14: LPT Port

15: PS2

16: LAN

17: COM Port

18: Watchdog Timer

19: DIO

20: Buzzer

21: Shut Down

22: Panel Fail

23: CRT Fail

24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date

