

Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-5210 User Manual

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About this Document



This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the [Lanner Download Center](#) page with a login account and password.

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

Icon		Usage
	Note or Information	This mark indicates that there is something you should pay special attention to while using the product.
	Warning or Important	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may 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 measures:

- ▶ 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.

FCC Caution

- ▶ Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- ▶ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Note

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



Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free 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 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.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- ▶ Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- ▶ Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- ▶ Portez des lunettes de sécurité pour protéger vos yeux.
- ▶ N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- ▶ Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- ▶ Ne travaillez pas seul si des conditions dangereuses sont présentes.
- ▶ 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.

Lithium Battery Caution

- ▶ There is risk of explosion if the battery is replaced by an incorrect type.
- ▶ Dispose of used batteries according to the instructions.
- ▶ Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures and device specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ Please conform to your local laws and regulations regarding safe disposal of lithium battery.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- ▶ Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

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.

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).

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 gêner 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).

Mounting Installation Precautions

The following should be put into consideration for rack-mount or similar mounting installations:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- ▶ Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- ▶ 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 (Tma) specified by the manufacturer.
- ▶ Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- ▶ Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- ▶ 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 overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable Grounding - Reliable grounding 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).

Electrical Safety Instructions

Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm² or 10 AWG.

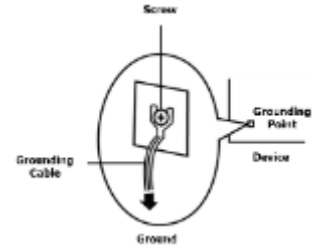
Consignes de sécurité électrique

- ▶ 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.

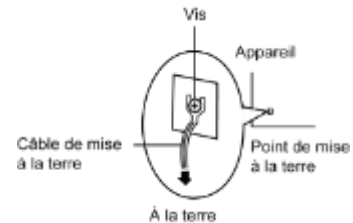
Grounding Procedure for DC Power Source

- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the DC power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before DC power.



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

- ▶ 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.



CAUTION: TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.

注意：要断开电源，请将所有电源线从本机上拔下。

WARNUNG: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

ATTENTION: DÉBRANCHER TOUS LES CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

- ▶ This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée

Instruction for the installation of the conductor to building earth by a skilled person.

- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

- ▶ The machine can only be used in a restricted access location and has installation instructions by a skilled person (for Fan side).
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

This product is intended to be used with a UL Listed Optical Transceiver product. Laser Class 1

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CHAPTER 1: PRODUCT OVERVIEW

NCA-5210 is the 6th generation Intel® 14nm microprocessor (codenamed Skylake), the new LGA 1151 socket, DDR4 memory support and the I/O boosting, comprehensive Intel® C236 series chipset, and flexible LAN configurations. NCA-5210 is structured in 1U rackmount form factor and supports up to 12 LAN ports and 4 SFP ports. Regarding networking bandwidth expansion, NCA-5210 provides 4x NIC module expansion (maximum 32 GbE RJ45 LAN ports) or 3 NIC modules + 1 x PCIE expansion.

Key Features

- ▶ 6th generation Intel® Core™ processor codenamed Skylake
- ▶ PCH: Intel® C236
- ▶ 4 x DDR4 ECC/UDIMM 288-pin sockets at 2400 MHz, maximum capacity up to 64GB (16GB each)
- ▶ LAN: 8 or 12 RJ-45 GbE ports
- ▶ SFP LAN: (SKU B only) 4x SFP LAN ports
- ▶ NIC Expansion: (SKU A/B) 2x NIC module slots or (SKU C) 4x NIC module slots
- ▶ 1 x 3.5" or 2 x 2.5" SATA HDD/SSD drive bays (disk drive is not included)
- ▶ 1 x mSATA socket
- ▶ 1 x OPMA socket for IPMI

Package Content

Your package contains the following items:

- ▶ 1x NCA-5210 Network Security Platform
- ▶ 2x Power Supply Cable
- ▶ 1x LAN Cable (Grey)
- ▶ 1x Console Cable
- ▶ 1x Short Ear Rackmount Kit with screws

Ordering Information

SKU No.	Main Features
NCA-5210A	C236 PCH, 8x GbE RJ45 (i210) w/ 4 pairs Gen3 bypass, 2x NIC Slots (PCIE8)
NCA-5210B	C236 PCH, 12x GbE RJ45 (i350) w/ 6 pairs Gen3 bypass, 4x SFP (i350), 2 NIC Slots (PCIE8)
NCA-5210C	C236 PCH, 2x NIC Slots (PCIE4) + 2x NIC Slots (1x PCIE8)

Optional Accessories

Model No.	Main Features
098W000300014	1U Rackmount Kit
NCS2-IGM428A	1x Intel i350 4port RJ45 w/ 2 pairs bypass
NCS2-IGM806A	2x Intel i350 8port RJ45 w/ 4pairs bypass
NCS2-ISM405A	1x Intel i350 4port SFP w/ bypass
NCS2-ISM406A	1x Intel i350 4port SFP w/o bypass
NCS2-ISM802A	2x Intel i350 8port RJ45 w/o bypass
NCS2-IQM201A	1x Intel X710-BM2 2port QSFP+ w/o bypass
NCS2-IXM407A	1x Intel X710-BM1 4port SFP+ w/o bypass

System Specifications

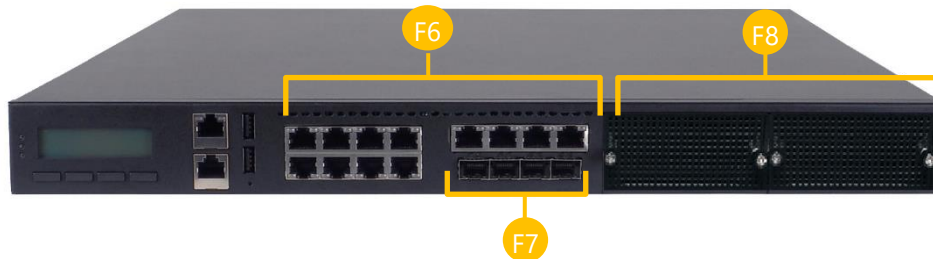
Form Factor		1U Rackmount
Platform	Processor Options	Intel® Core™ i7/i5/i3 or Xeon® E3-1200v5/v6 or Pentium® or Celeron® (Skylake/Kaby Lake)
	CPU Socket	1x LGA1151
	Chipset	Intel® C236
	Security Acceleration	N/A
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 2,400MHz ECC (by CPU) or non-ECC UDIMM
	Max. Capacity	64GB
	Socket	4x 288-pin DIMM
Networking	Ethernet Ports (By SKU)	1x GbE RJ45 SKU A: 8x GbE RJ45 SKU B: 12x GbE RJ45, 4x GbE SFP SKU C: 4x NIC Modules Slots
	Bypass	SKU A: 4x Gen3 bypass SKU B: 6x Gen3 bypass
	NIC Module Slot	SKU A & B: 2x NIC slots SKU C: 4x NIC slots
LOM	IO Interface	1x RJ45 (Optional)
	OPMA slot	Yes
I/O Interface	Reset Button	1x Reset Button
	LED	3x LED (Power, Status, Storage)
	Power Button	1x ATX Power Switch
	Console	1x RJ45 Console Port
	USB	2x USB 2.0
	LCD Module	2x 20 Character LCM, 4x Keypads
	IPMI via OPMA slot	Yes
Storage	Power input	AC Power Inlet
	HDD/SSD Support	1x 3.5" or 2x 2.5" SATA HDD/SSD
Expansion	Onboard Slots	1x mSATA
	PCIe	1x PCIe*4/8 FH/HL (By Project)
Miscellaneous	mini-PCIe	N/A
	Watchdog	Yes
	Internal RTC with Li Battery	Yes
Cooling	TPM	N/A (Default); Yes (Optional)
	Processor	Passive CPU Heatsink
Environmental Parameters	System	4x Cooling Fans with Smart Fan
	Temperature	0~40°C Operating -20~70°C Non-Operating
	Humidity (RH)	5-90°C Operating 5-95°C Non-Operating
System Dimensions	(WxDxH)	438 x 525 x 44 mm
	Weight	15kg
Package Dimensions	(WxDxH)	790 x 600 x 220 mm
	Weight	16kg
Power	Type/Watts	300W 1+1 ATX Redundant PSUs
	Input	AC 90V – 264V @47-64Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UL

Front Panel

NCA-5210A



NCA-5210B



NCA-5210C



No.	Description	
F1	LED Indicators	Power Status/System Status/Storage Activity
F2	LCM	LCM with 4x Keypads
F3	Management Port	1x RJ45 Management Port
F4	Console Port	1x RJ45 Console Port
F5	USB Port	2x USB 2.0 Type
F6	LAN Port	SKU A: 8x RJ45 GbE Ports SKU B: 12x RJ45 GbE Ports
F7	SFP Port	4x GbE SFP (SKU B only)
F8	NIC Slots	SKU A/B: 2x NIC Module SKU C: 4x NIC Module

Rear Panel

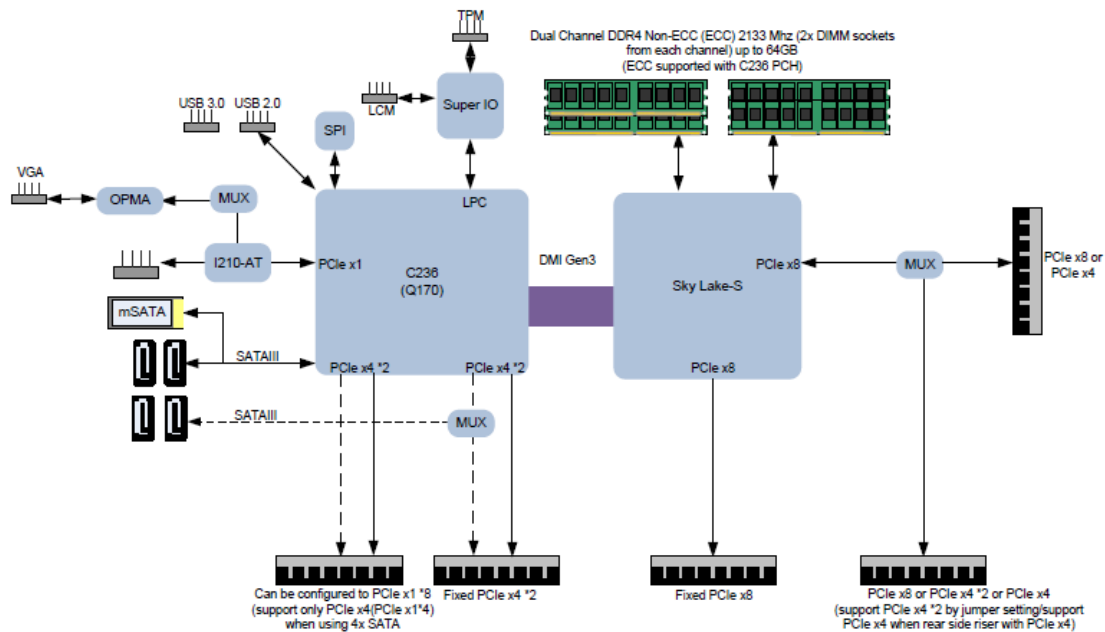


No.	Description	
R1	PCIe Expansion	PCIe Expansion Slots (By Project)
R2	Fan	4x Cooling Fans
R3	Power Switch	1x Power ON/OFF Switch
R4	Power Supply	2x Redundant Power Supply Units
R5	Power Jack	2x Power Jacks

CHAPTER 2: MOTHERBOARD INFORMATION

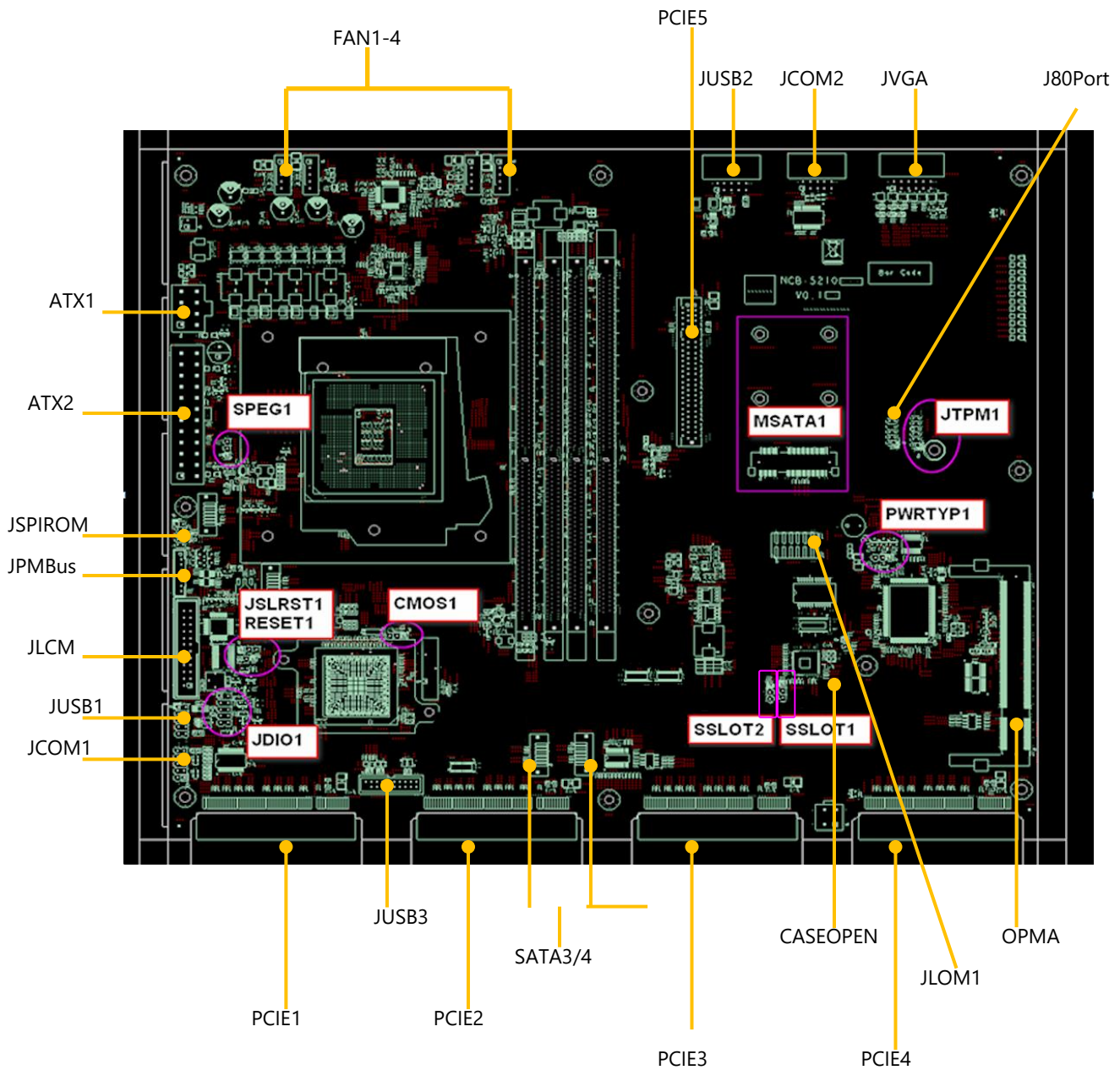
Block Diagram

The block diagram indicates how data flows among components on the motherboard. Please refer to the following figure for your motherboard's layout design.



Motherboard Layout

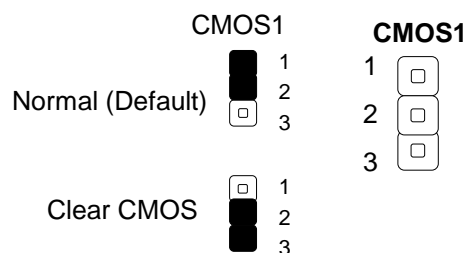
This layout shows the connectors and jumpers on the board, as a reference of the pin assignments and the internal connectors.



Jumper Setting and Connector Pin-Out

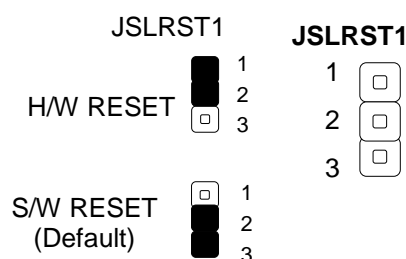
CMOS1: Clear CMOS setting

Description	Short Pins
Normal (Default)	1-2
Clear CMOS	2-3



JSLRST1 : Select RESET1 option

Description	Short Pins
Hardware RESET	1-2
Software RESET (Default)	2-3



SSLOTA1, SSLOTA2: Determine whether to enable SLOT4 or SLOT5.

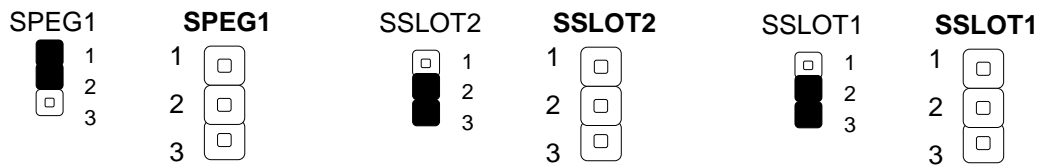
SPEG1: PCIe/PEG bus configuration

Scenario	Enabled Slots		Jumper Configuration			Remark
	SLOT 4	SLOT 5	SSLOTA1	SSLOTA2	SPEG1	
1	1 x8 ^[1] (Auto Switch)	N/A	2-3	2-3	1-2	Default
2	2 x4 ^[1] (Auto Switch)	N/A	2-3	2-3	1-2	Default
3	N/A	1 x8 ^[2]	1-2	1-2	1-2	With RC-52103A
4	N/A	2 x4 ^[2]	1-2	1-2	2-3	With RC-52103A
5	1 x4	1 x4 ^[3]	2-3	1-2	2-3	With RC-52104A

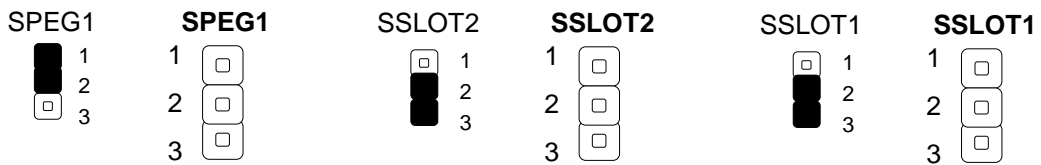
Note :

- (1) With SSLOTA1 and SSLOTA2 both set to 2-3 by default, SLOT4 is originally enabled (with SLOT5 disabled).
- (2) Install RC-52103A Riser Card on SLOT5 for using SLOT 5 only (with SLOT4 disabled).
- (3) Install RC-52104A Riser Card on SLOT5 for the use of PCIe x4 in SLOT4 with PCIE x4 in SLOT5.
- (4) Please use Lanner-manufactured I/O module for the auto configuration function that controls PCIe type on SLOT4 and SLOT 5.

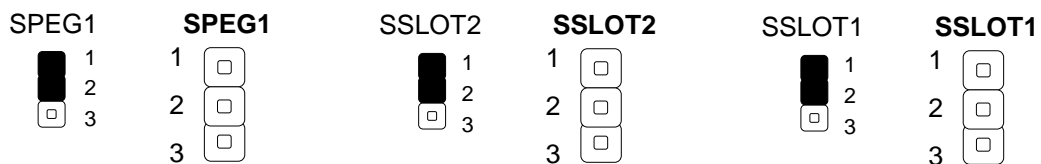
SLOT4 x8



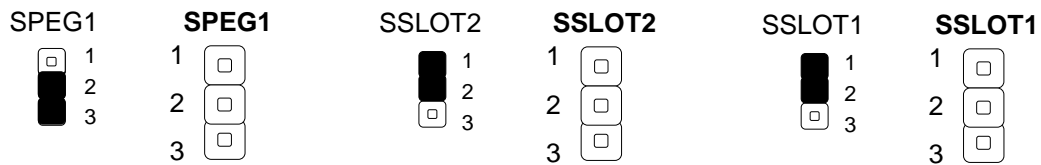
SLOT4 2 x4



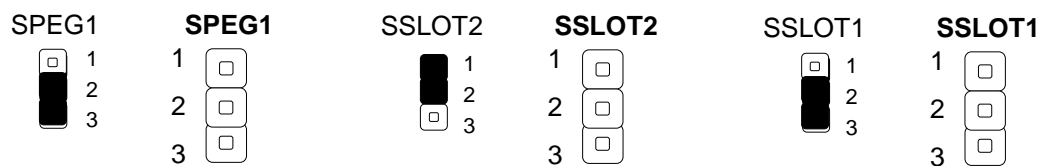
SLOT5 x8



SLOT5 2 x4

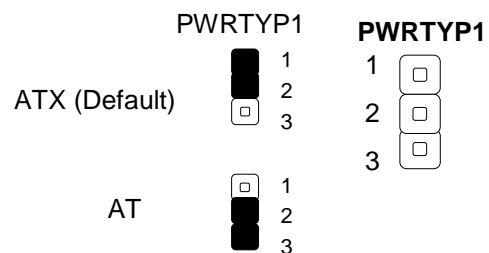


SLOT4 x4 + SLOT5 x4



PWRTYP1: Select PSU Type

Description	Short Pins
ATX (Default)	1-2
AT	2-3



Connector Pin Assignments

PWBT1: ATX Power ON switch

Pin	Description
1	GND
2	SWIN_IN



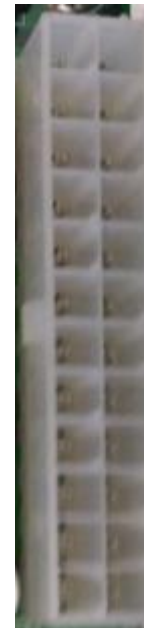
ATX1: 8-pin Power Connector

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



ATX2: 24-Pin ATX Power Connector

Pin	Description	Pin	Description
1	+3.3V	2	+3.3V
3	+3.3V	4	-12V
5	Ground	6	Ground
7	+5V	8	PSON-
9	Ground	10	Ground
11	+5V	12	Ground
13	Ground	14	Ground
15	Power Good	16	NC
17	Stand-By 5V	18	+5V
19	+12V	20	+5V
21	+12V	22	+5V
23	3.3V	24	GND

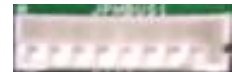


JSPIROM1: SPIROM BIOS Programming pin header

Pin	Description	Pin	Description
1	NC	2	NC
3	SPI_CS0-	4	+3.3V
5	SPI_MISO	6	HOLD-
7	Key	8	SPI_CLK
9	Ground	10	SPI_MOSI

**JPMBUS1:** Redundant PSU PMBUS Connector

Pin	Description
1	RDPW_TTL1
2	RDPW_TTL2
3	NC
4	GND
5	NC
6	PMBUS_CLK
7	PMBUS_DATA
8	+5V

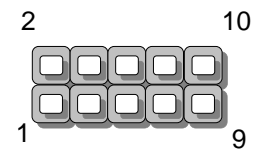
**JLCM1:** 24-Pin LCM w/key Connector

Pin	Description	Pin	Description
1	+5V	2	Ground
3	SLIN_N	4	+VEE
5	AFD_N	6	INT_N
7	FL_PD1_R	8	FL_PD0_R
9	FL_PD3_R	10	FL_PD2_R
11	FL_PD5_R	12	FL_PD4_R
13	FL_PD7_R	14	FL_PD6_R
15	LCM_LCD_N	16	+5V
17	KEY_UP	18	KEY_RIGHT
19	KEY_LEFT	20	KEY_DOWN
21	LCM_RST_N	22	CRT_GRN_R
23	CRT_YLW_R	24	HD_LED_N

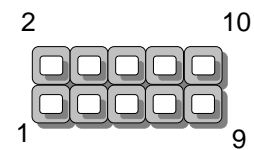


JUSB1: USB 2.0 Port1/2 internal pin header

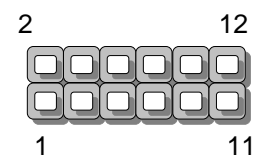
Pin	Description	Pin	Description
1	P5V	2	P5V
3	USB1_L_N	4	USB2_L_N
5	USB1_L_P	6	USB2_L_P
7	GND	8	GND
9	GND	10	GND

**JCOM1:** COM Port1 Console internal pin header

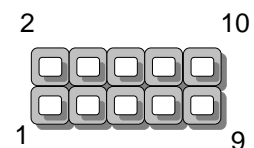
Pin	Description	Pin	Description
1	SP1_DCD_A	2	SP1_DSR_A
3	SP1_SIN_A	4	SP1_RTS_A
5	SP1_SOUT_A	6	SP1_CTS_A
7	SP1_DTR_A	8	SP1_RI_A
9	GND	10	FP_RESET_N

**JLOM1:** LOM port pin header

Pin	Description	Pin	Description
1	LAN_MDX0_P	2	LAN_MDX0_N
3	LAN_MDX1_P	4	LAN_MDX1_N
5	LAN_MDX2_P	6	LAN_MDX2_N
7	LAN_MDX3_P	8	LAN_MDX3_N
9	LAN_100_N	10	LAN_ACTR_N
11	LAN_1000_N	12	+3V_STANDBY

**JDIO1:** Digital I/O Connector (For LS only)

Pin	Description	Pin	Description
1	GPO_D_1	2	GPI_D_1
3	GPO_D_2	4	GPI_D_2
5	GPO_D_3	6	GPI_D_3
7	GPO_D_4	8	GPI_D_4
	GND	10	GND

**RESET1:** RESET Pin Header

Pin	Description
1	GND
2	FP_RST_IN



SATA1~SATA4: SATA 7-pin signal connectors

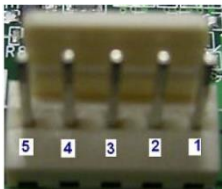
Pin	Description
1	GND
2	TX_P
3	TX_N
4	GND
5	RX_N
6	RX_P
7	GND



Note: SATA3/4 is reserved for customization requests. When all SATA ports are used, SLOT2's support for PCIe will be reduced to only PCIe x4 *1.

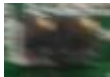
FAN1~4: 5-Pin CPU FAN connectors

Pin	Description
1	Ground
2	+12V
3	RPM Sense OUT1
4	RPM Sense OUT2
5	PWM Control IN



CASOPEN1: Case open detect Pin Header. This pin header is implemented to detect any action that opens the chassis.

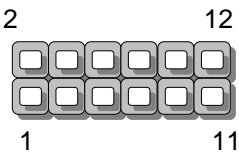
Pin	Description
1	GND
2	SIO_CSOPEN#



JTPM1: TPM (Trusted Computing) Module Pin Header.

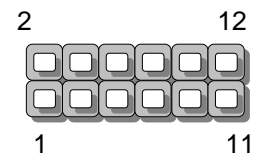
To enable TPM functions, the module must be installed on this pin header.

Pin	Description	Pin	Description
1	SERIRQ	2	+3V_STANDBY
3	LAD0	4	+3V_STANDBY
5	LAD1	6	Ground
7	LFRAME_N	8	KEY
9	LPCCLK_24M	10	TPMRST_N
11	LAD2	12	LAD3

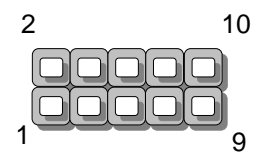


JVGA1: 12-Pin VGA Connector (enabled from the IPMI card)

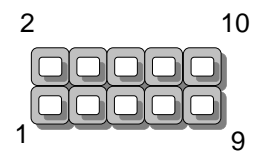
Pin	Description	Pin	Description
1	R	2	Ground
3	G	4	Ground
5	B	6	Ground
7	H-SYNC	8	Ground
9	V-SYNC	10	Ground
11	Detect-display Data	12	Detect-display CLOCK

**JCOM2:** COM PORT 2 internal pin header

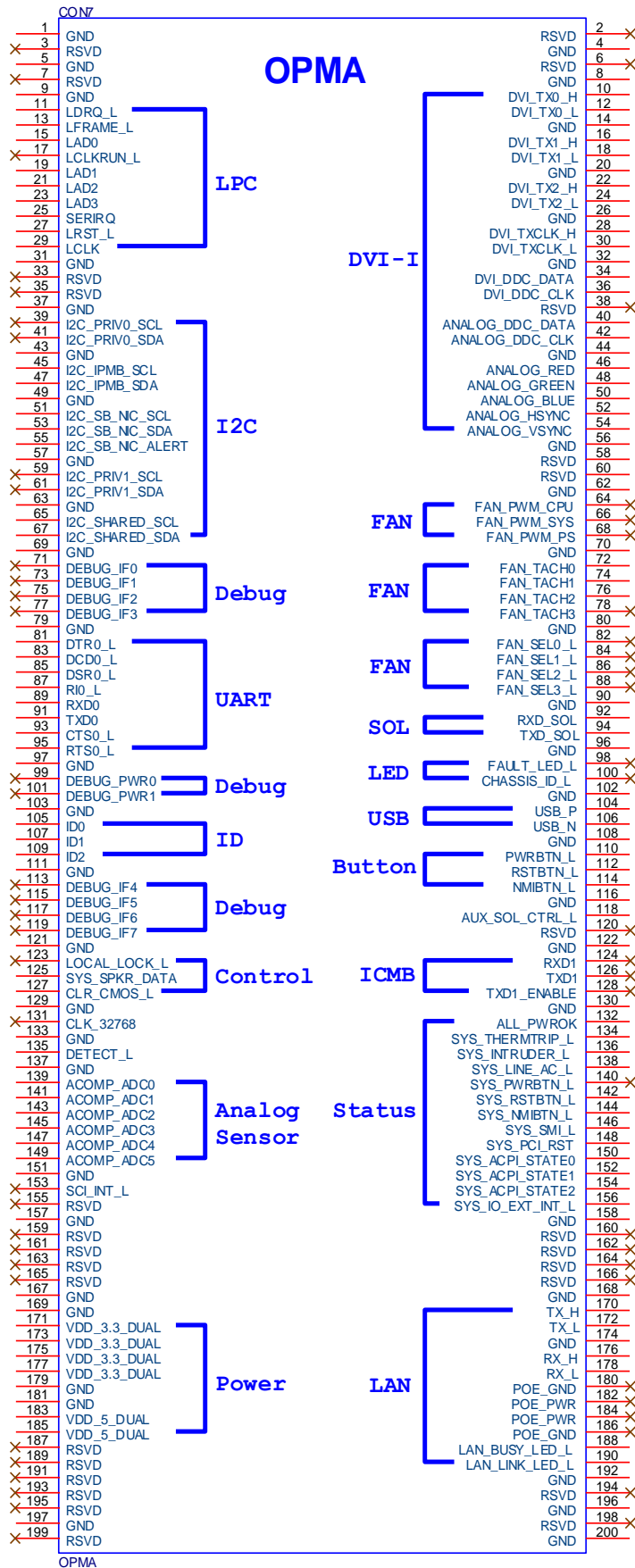
Pin	Description	Pin	Description
1	MDCDB_N-	2	MDSRB_N
3	MSINB	4	MRTSB_N
5	MSOUTB	6	MCTSB_N
7	MDTRB_N	8	NC
9	GND	10	NC

**JUSB2:** USB 2.0 Port3/4 pin header

Pin	Description	Pin	Description
1	USB_VCC	2	USB_VCC
3	USBD2-	4	USBD3-
5	USBD2+	6	USBD3+
7	Ground	8	Ground
9	USB Port#3Ground	10	USB Port#4 Ground



OPMA1: OPMA Socket



MSATA1: mSATA socket for storage devices

Pin	Description	Pin	Description
1	NC	2	+3.3V
3	NC	4	Ground
5	NC	6	NC
7	NC	8	NC
9	Ground	10	NC
11	NC	12	NC
13	NC	14	NC
15	Ground	16	NC
KEY		KEY	
17	NC	18	Ground
19	NC	20	NC
21	GND5	22	NC
23	SATA_RX_P	24	+3.3V
25	SATA_RX_N	26	Ground
27	Ground	28	NC
29	Ground	30	SMB_SLK
31	SATA_TX_N	32	SMB_DATA
33	SATA_TX_P	34	Ground
35	Ground	36	NC
37	Ground	38	NC
39	+3.3V	40	Ground
41	+3.3V	42	NC
43	Ground	44	NC
45	NC	46	NC
47	NC	48	NC
49	DA/DSS	50	Ground
51	Presence Detect	52	+3.3V



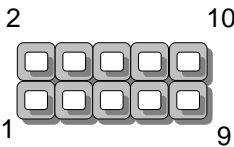
JUSB3: 2 x USB3.0 ports pin header

Pin	Description	Pin	Description
1	+5V	20	Key
2	USB3_RX1_N	19	+5V
3	USB3_RX1_P	18	USB3_RX2_N
4	Ground	17	USB3_RX2_P
5	USB3_TX1_N	16	Ground
6	USB3_TX1_P	15	USB3_TX2_N
7	Ground	14	USB3_TX2_P
8	USB5_N	13	Ground
9	USB5_P	12	USB6_N
10	NC	11	USB6_P



J80PORT1: 80 Port debug Connector (For Factory debug Only)

Pin	Description	Pin	Description
1	80PORTCLK_24M	2	LAD1
3	LPCRST_N	4	LAD0
5	LFRAME_N	6	+3.3V
7	LAD3	8	NC
	LAD2	10	Ground



CHAPTER 3: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely. Also, please wear ESD protection gloves when conducting the steps in this chapter

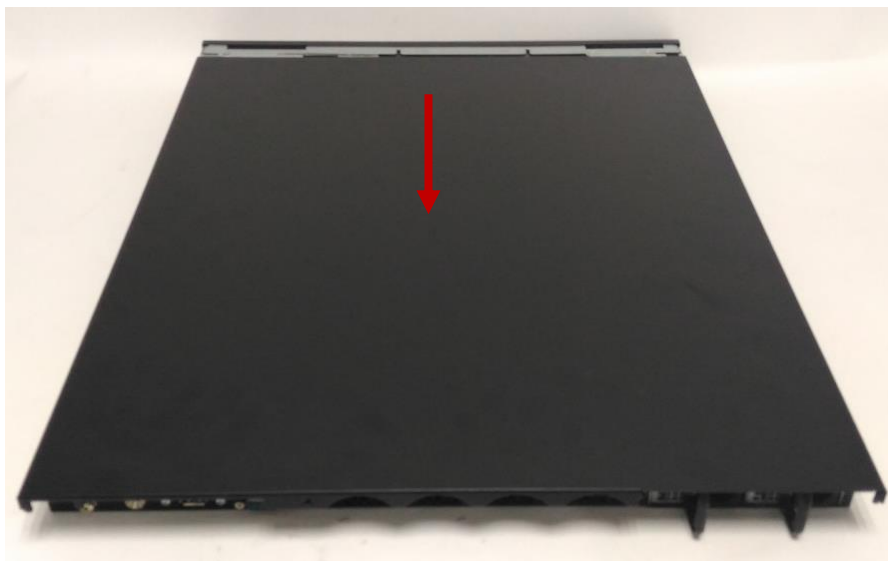
Opening the Chassis

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

1. Power off NCA-5210 completely.
2. Remove three (3) screws from each side and one (1) screw from the rear, as circled in the figures below.



3. Slide and pull the top cover backwards a little bit.



4. Lift the top compartment.



Installing the CPU, Heatsink and Fan Duct

The motherboard supports 1 x 6th Generation Intel CPU (codenamed Skylake) with LGA1151 socket. Please follow the steps below for installing the processor.

1. Locate and press the load lever.
2. Hold and drag the load lever outwards.



3. Drag the load lever out of the latch.



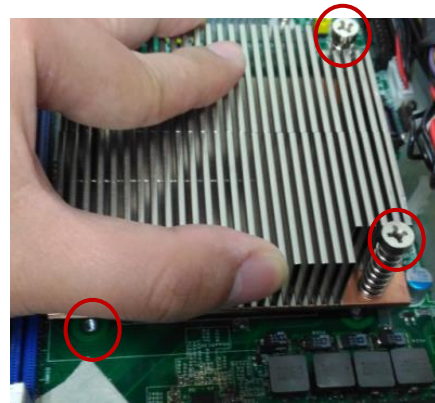
4. Move the load lever as shown in the image below.



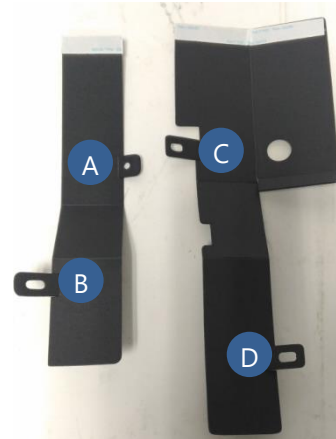
5. Once the cover is opened, you can install the CPU. Then, reverse the steps to securely lock the CPU socket



6. Prepare the heat sink.
7. Place the heat sink on top of the CPU socket.
8. Align the four screw holes around the socket.
9. Tighten the four (4) screws to secure the heat sink.



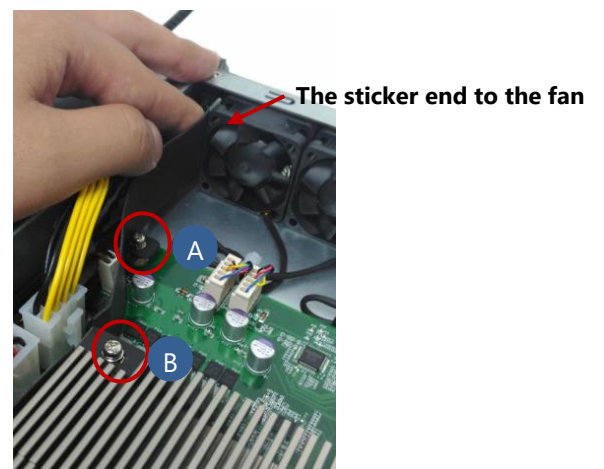
10. Prepare the fan duct.



11. Fold the smaller part as shown in the image.



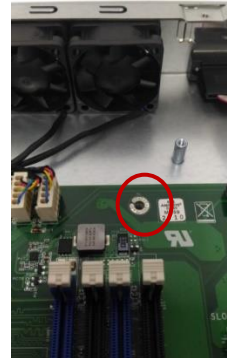
12. Place the fan duct part to the corner of the heatsink and attach the sticker end to the fan as well. Make sure the screw holes are aligned.



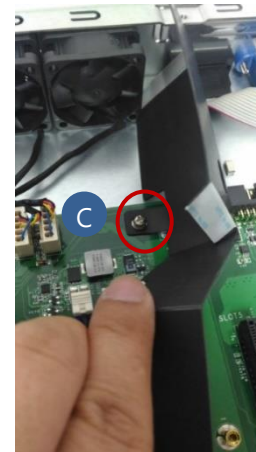
13. Fold another larger fan duct part as shown.



14. Remove the screw near the fan.



15. Attach C screw hole of the fan duct part to the screw hole near the fan. Secure with the previously removed screw.



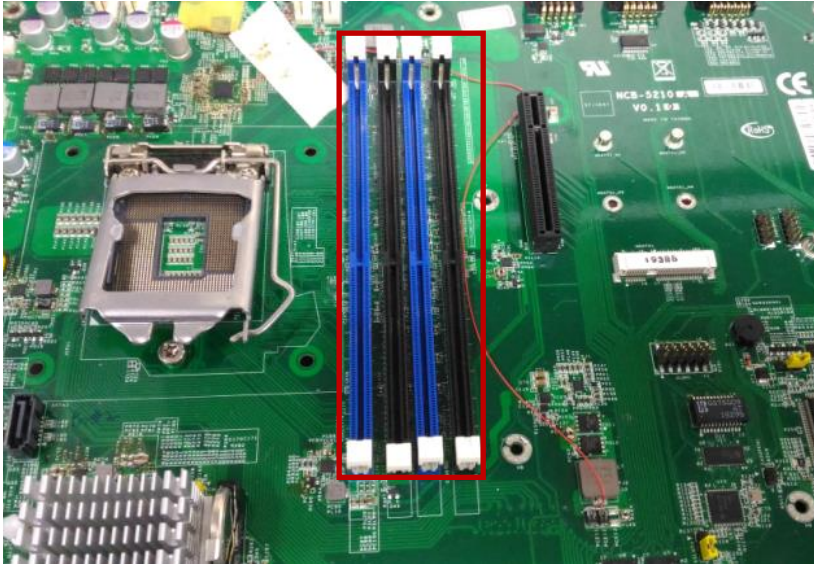
16. Place the rest of the fan duct part to the corner of the heatsink. Align to the screw hole and secure with screw.



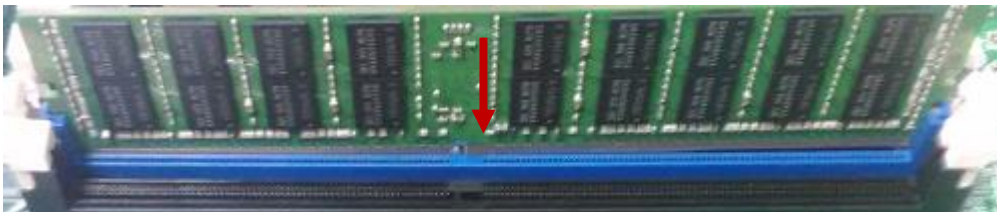
Installing System Memory

The motherboard supports DDR4 RDIMM/ECC/UDIMM up to 2,400MHz memory at max. 16GB per socket. Please follow the steps below to install the DIMM memory modules.

1. Power off the system and locate the DDR DIMM slot.



2. Pull open the DIMM slot latches (white tabs)
3. Align the DIMM module and make sure the notches of the module aligned with the socket keys in the slot.

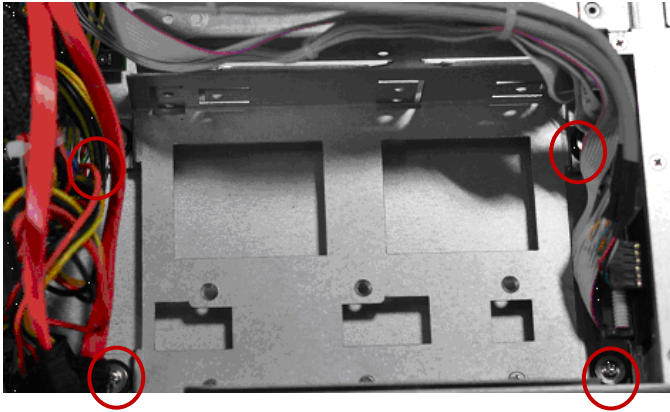


4. Insert the module into the slot until it's firmly seated and close the latches.

Installing Disk Drives

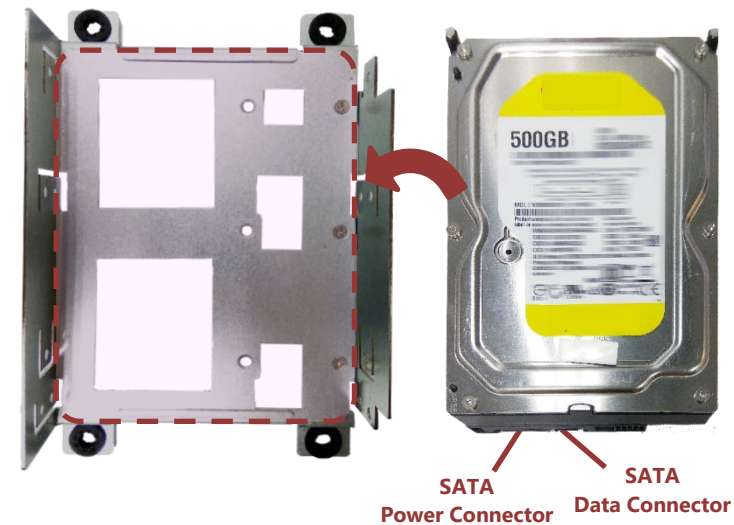
The system supports 1 x 3.5" or 2 x 2.5" SATA HDDs or SSDs as data storage. Please follow the steps below for installation.

1. Remove the 4 screws that secure the disk drive tray.

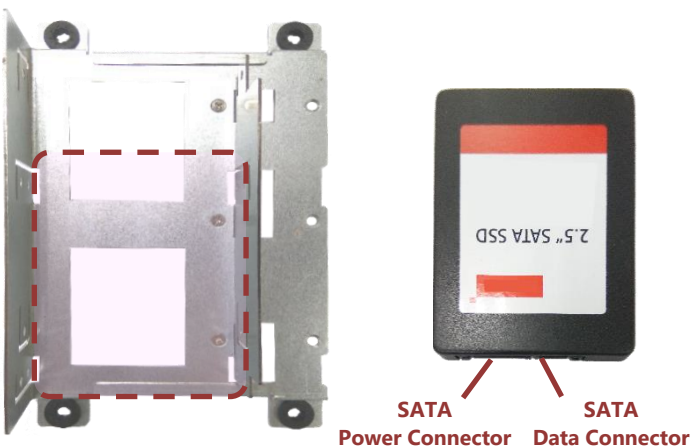


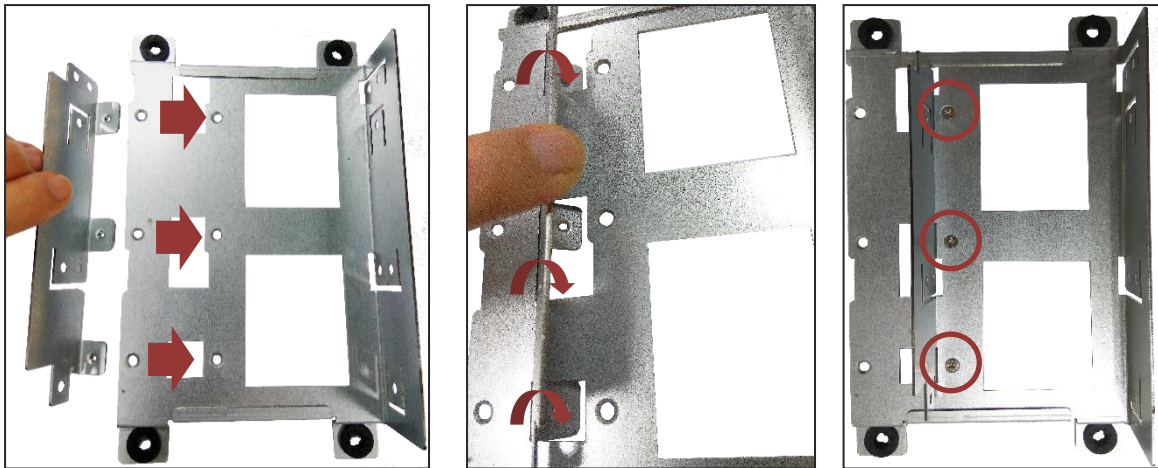
2. Remove the tray and mount the hard disk on the tray using the provided disk screws.

3.5" SATA HDD/SSD



2.5" SATA HDD/SSD



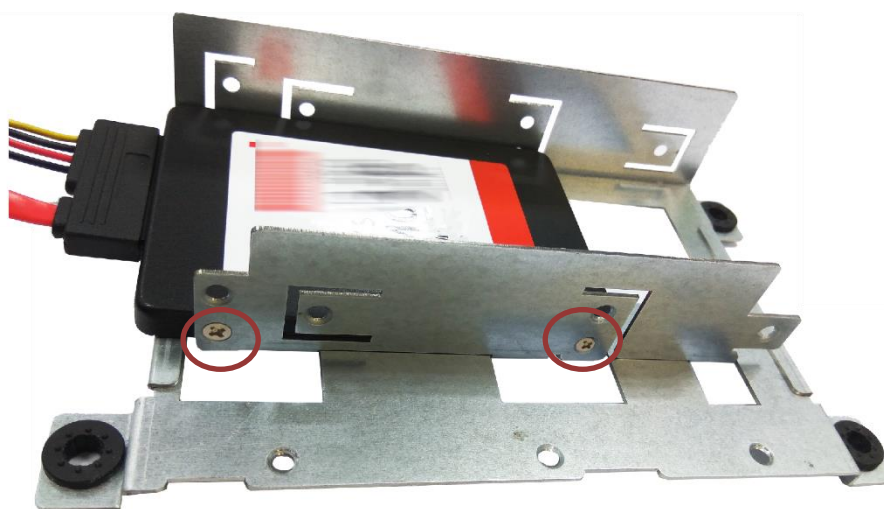


3. Secure the disk on the tray using the provided screws with two (2) screws on both sides, and then connect SATA 7-pin signal cable and SATA 15-pin power cable to the installed disk drives.

3.5" SATA HDD/SSD



2.5" SATA HDD/SSD



4. Place the HDD/SSD mounted disk drive tray back to the system.



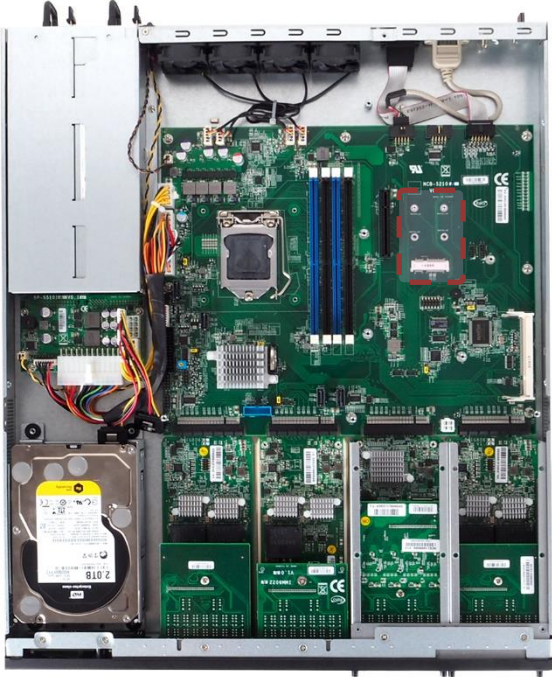
5. Please remember to establish SATA connections to the motherboard.



Installing mSATA Module

The motherboard provides one mSATA slot. Follow the procedures below for installing a mSATA card.

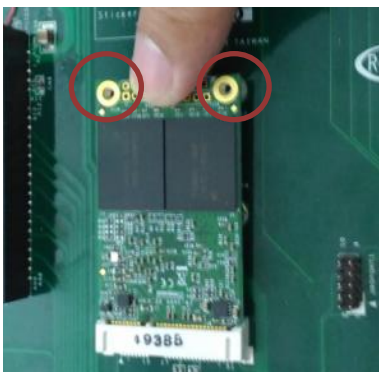
1. Locate the mSATA socket.



2. Insert a mSATA module as shown in the image below card. Remember to align the module keys between the module and the socket.



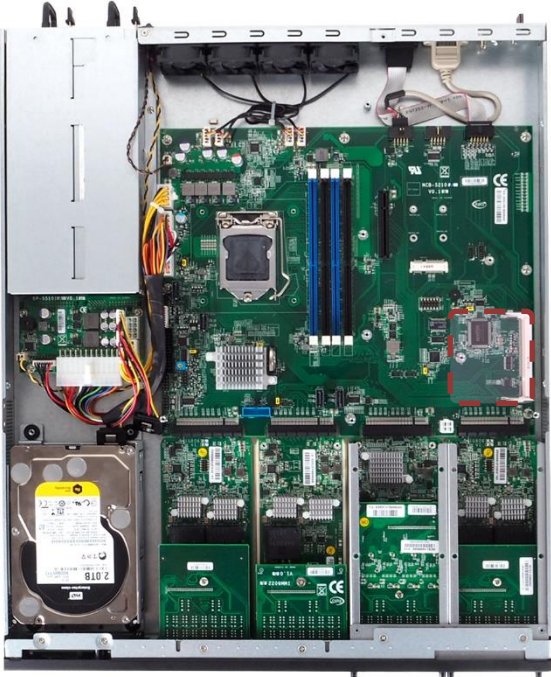
3. Press the module down and apply two screws to secure it.



Installing IPMI Card

The motherboard provides one OPMA socket which is used to install an IPMI card. Please follow the steps below for instructions.

1. Locate the OPMA socket.



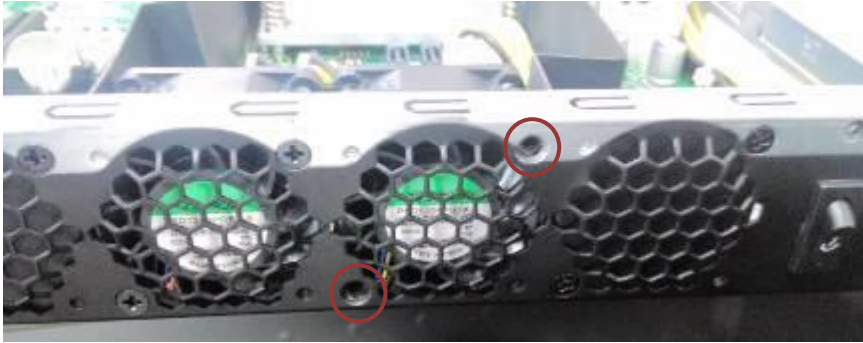
2. Insert an IPMI card into the socket and then gently press it down. Remember to align the gold fingers and make sure the two clips securely secure the card.
3. Apply a screw to secure the IPMI card.



Replacing Cooling Fans

NCA-5210 supports 2 cooling fans. To replace a worn-down fan, please follow the steps below.

1. Remove the screws circled below.



2. Apply gentle force and pull the fan out of its original place.



3. Install a new fan by reversing the above steps.

Replacing NIC modules

NCA-5210 supports one Ethernet NIC module space to expand its network throughput. Please follow the instructions below. For information about compatible modules, please refer to the "Ordering Information" and "Optional Accessories" sections, or contact Lanner for more details.

1. Remove the two lock-screws on the bezel of the module slot and open the bezel.



2. Position the gold finger of module as shown in the image below. When sliding the module into the slot, make sure the module stays within the guides of the expansion slot.



Notes:

If, for experimental purposes, you would like to replace the provided CPU with a **Kaby Lake** processor accompanied by the use of LAN module **IQM201**, please install this module on **SLOT 3** and configure BIOS settings following the instructions in [Appendix E: PEG Port Configuration for Alternative CPU](#) to ensure proper functionality of this system.

3. Slide the NIC module into the space, until it is firmly attached.
4. Secure the module with two (2) lock-screws on the bezel.



Mounting the System

The system can be installed in a rack, with the slidable rails allowing access to the system while solidly securing the system. Please follow the steps below for installation.

Attaching the Short Ear Brackets

The Ear Brackets come with six screws, as shown below.



Take an ear bracket, align the holes on it with those on the side of the system, and lock it onto the system with the three (3) provided screws. Do the same to the other ear bracket.



Attaching the Slide Rail

The slide rail kit shall include the following items:

1x pack screws

2x Slide-rails

Fully stretched slide rail:



Attaching Rail Brackets

1. Unpack a slide rail and slide the inner channel to its end.



2. Slide the rail bracket out to its end.



3. To detach the rail bracket from the channel, locate and push the Release Tab on the rail bracket while sliding it out.



4. Align the rail bracket to the side of the chassis and make sure the screw-holes are matched, and then secure the bracket onto the chassis with three (3) provided screws.

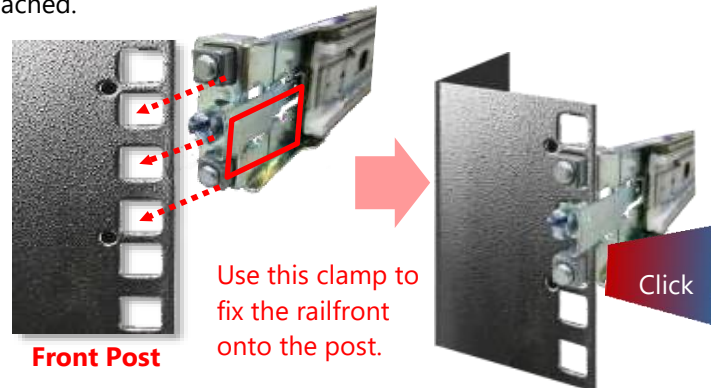


5. Repeat Steps 1~4 to attach the rail bracket to the other side of the chassis.

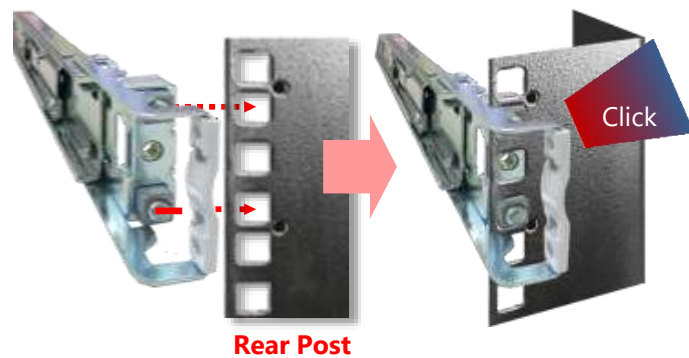


Installing the Slide Rail Assemblies

1. This slide-rail kit does NOT require screw-fixing. Aim at three (3) available screw holes on the rack front and lock it by clipping the rail's front end to the post, as shown in the image below. You should hear a "click" sound once it is firmly attached.



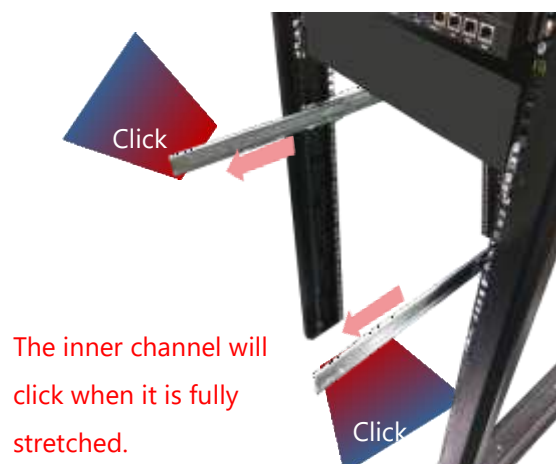
2. For the rear rack installation, slide the rail to aim and engage the bolts on the rail's rear end with the two (2) available holes on the post, and the rail assembly will click into place.



3. Repeat Steps 1~2 to install the other rail onto the post.

Installing the Chassis onto the Rack

1. Stretch both of the inner channels out to their fullest extent. You will hear a click sound when they are fully stretched and locked.



2. Hold the chassis with its front facing you, lift and gently insert it by aligning with the slide-rail assemblies as shown in the image, and then push the unit into the cabinet.



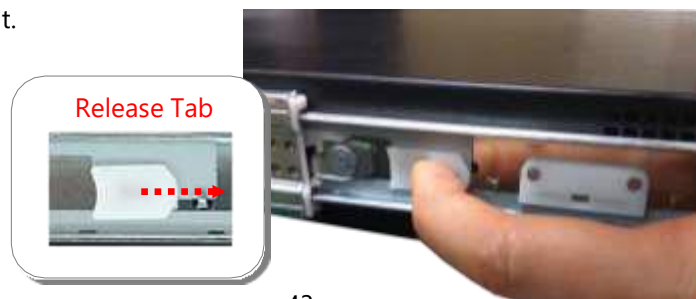
3. Keep sliding the rails in until they stop about halfway. Press down the metal clips on both inner channels and push them further into the cabinet.



4. To have the chassis completely inserted into the rack, pull and hold the Rail Lock tab on both brackets while pushing in the chassis.



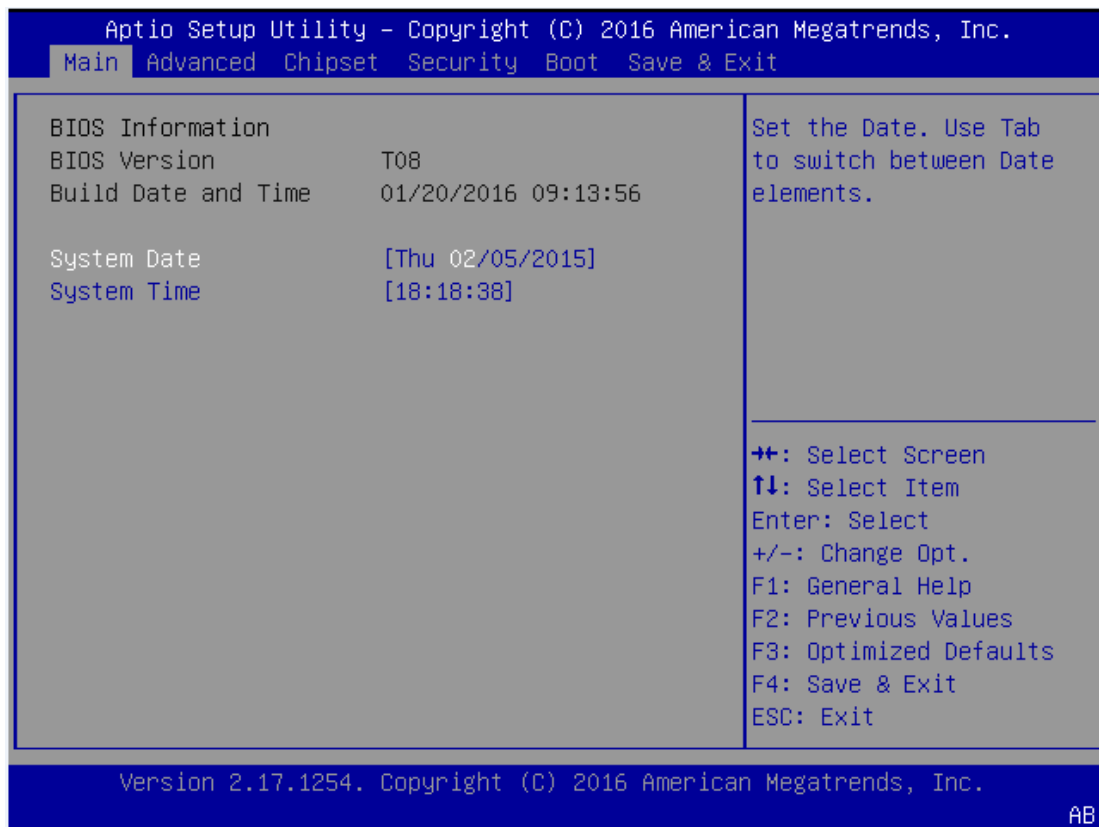
To detach the chassis from the rack, pull the Release Tabs on both sides of the brackets towards you while gently sliding the chassis out.



CHAPTER 4: 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], [Chipset], [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

BIOS Vendor: displays BIOS vendor information

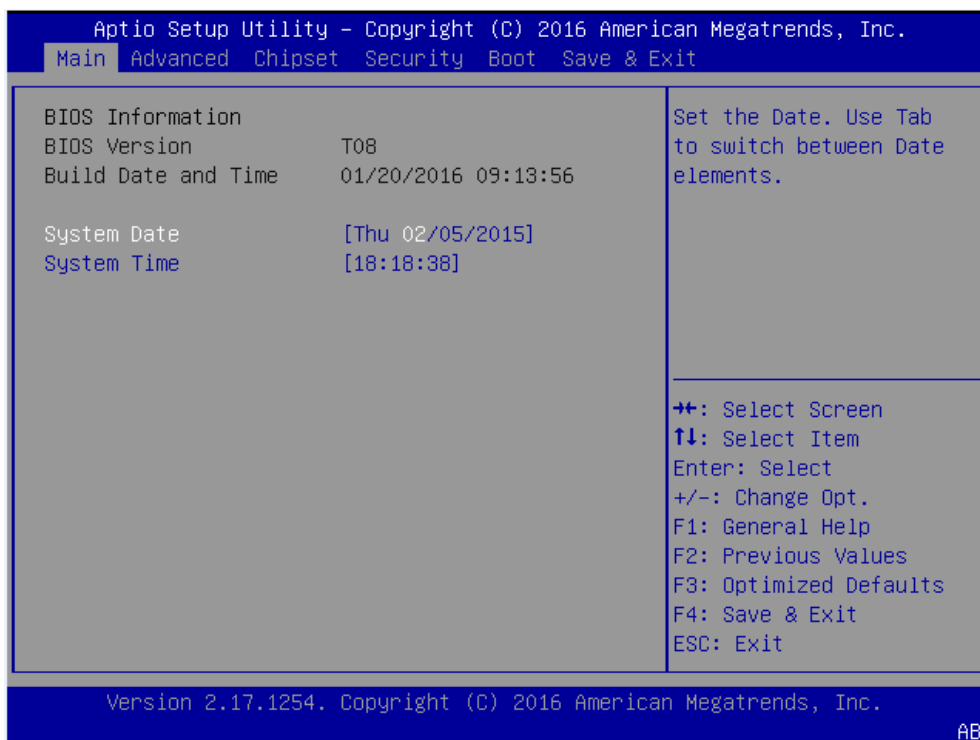
BIOS Version: displays BIOS version

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".

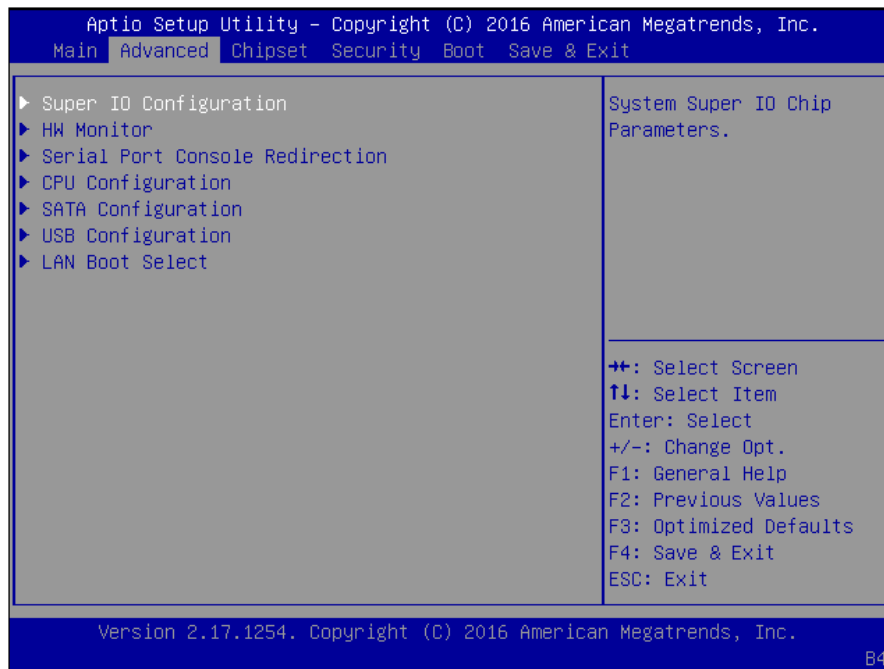
System Date: Day/Month/Year

System time: Hour/Minutes/Seconds



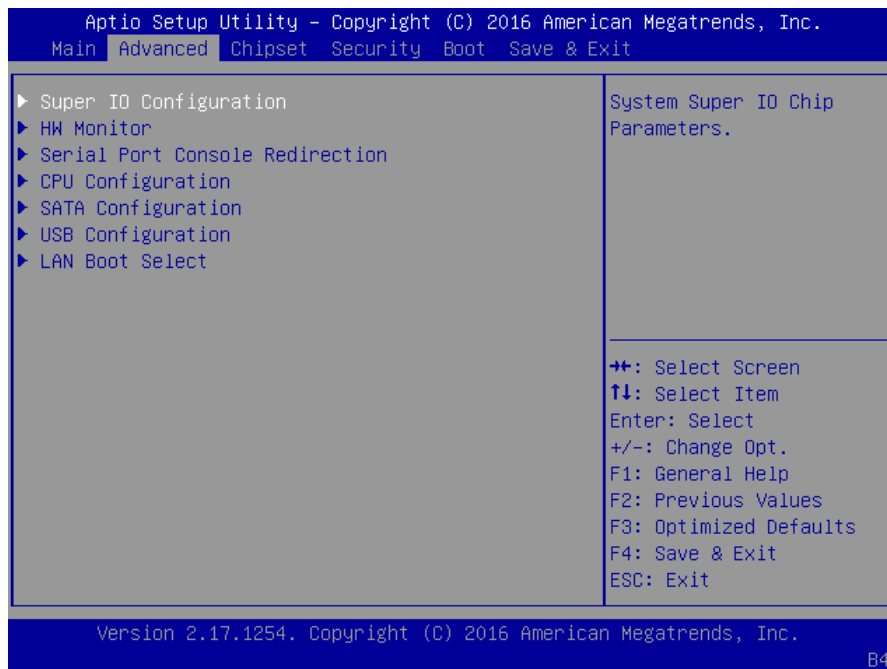
Advanced

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

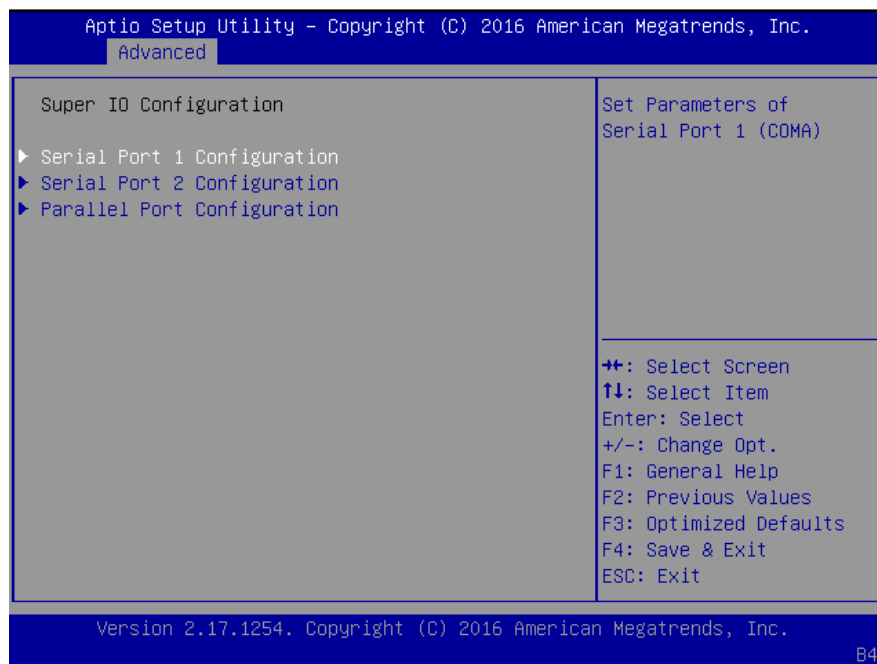


Super IO Configuration

Press "Enter" to access configuration sub-menu for super IO chip parameters. You may access settings for Serial Port 1 or 2 or the Parallel port.

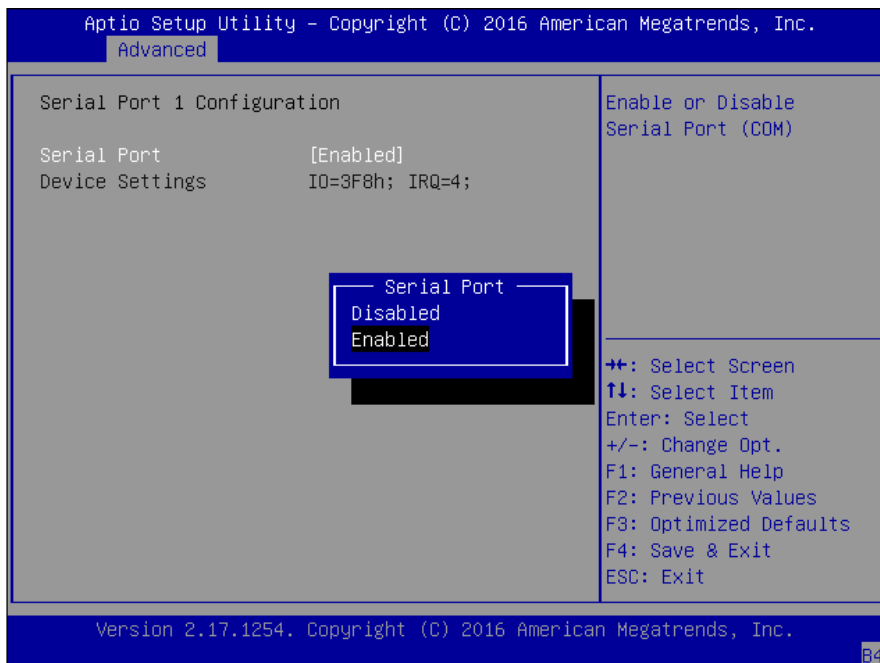


Once you have entered Super I/O configuration, you may choose to configure Serial Port 1 or 2, or the Parallel port.



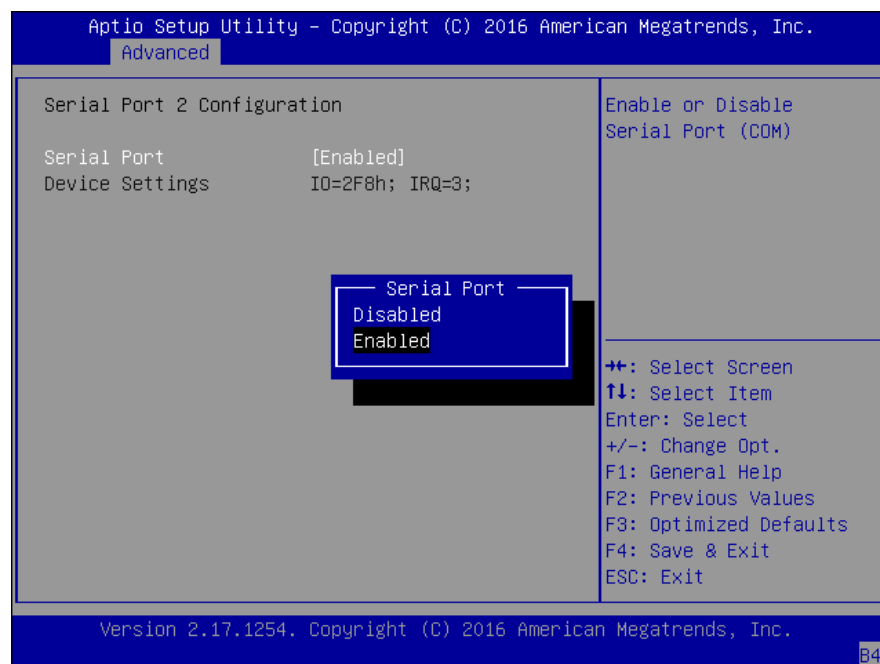
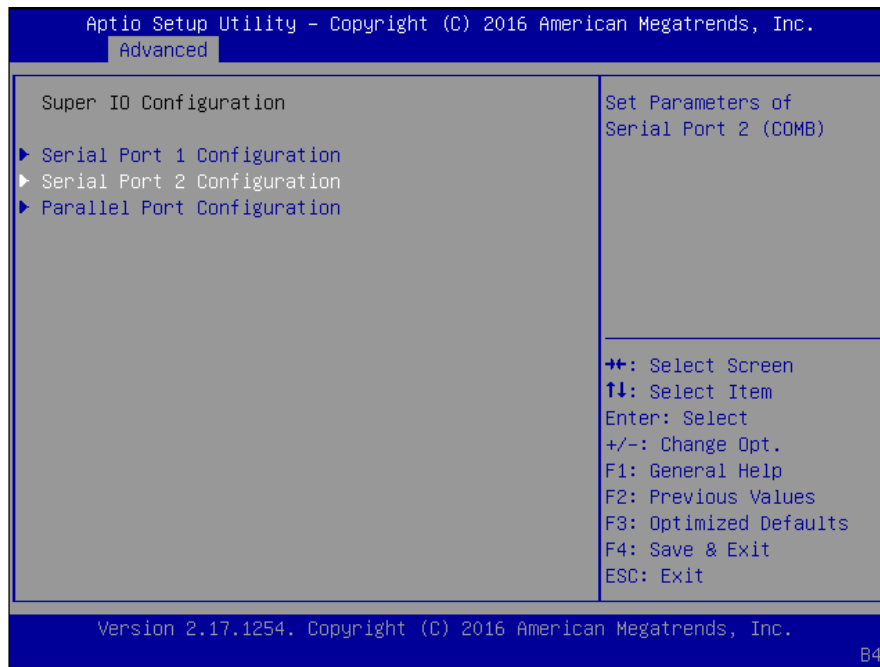
Super IO Configuration - Serial Port 1 Configuration

Press "Enter" to enable or disable the Serial Port 1 (COM). Device setting is fixed as default.



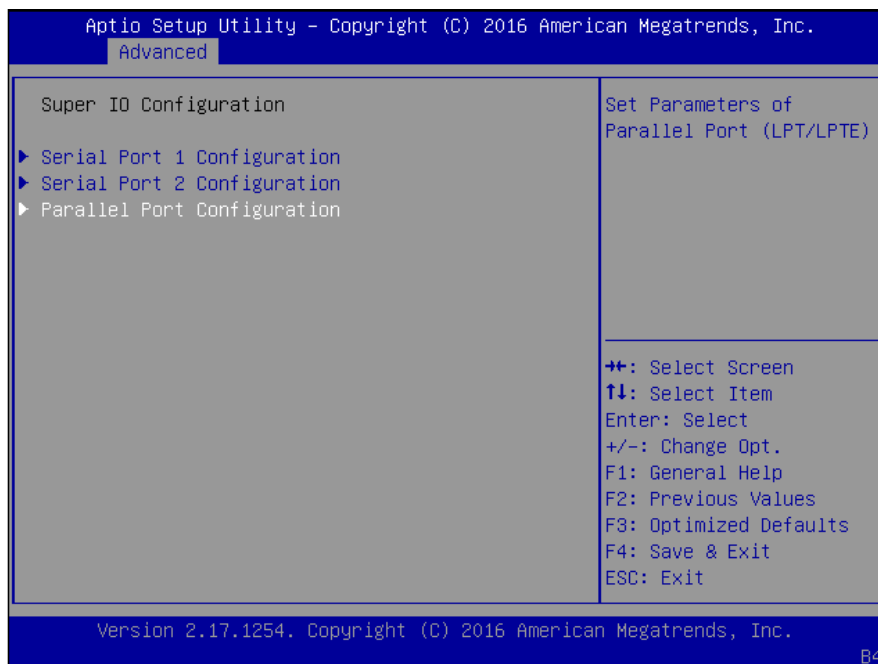
Super IO Configuration - Serial Port 2 Configuration

Once Serial Port 2 is accessed, you may press "Enter" to enable or disable the Serial Port 2 (COM). Device setting is fixed as default.

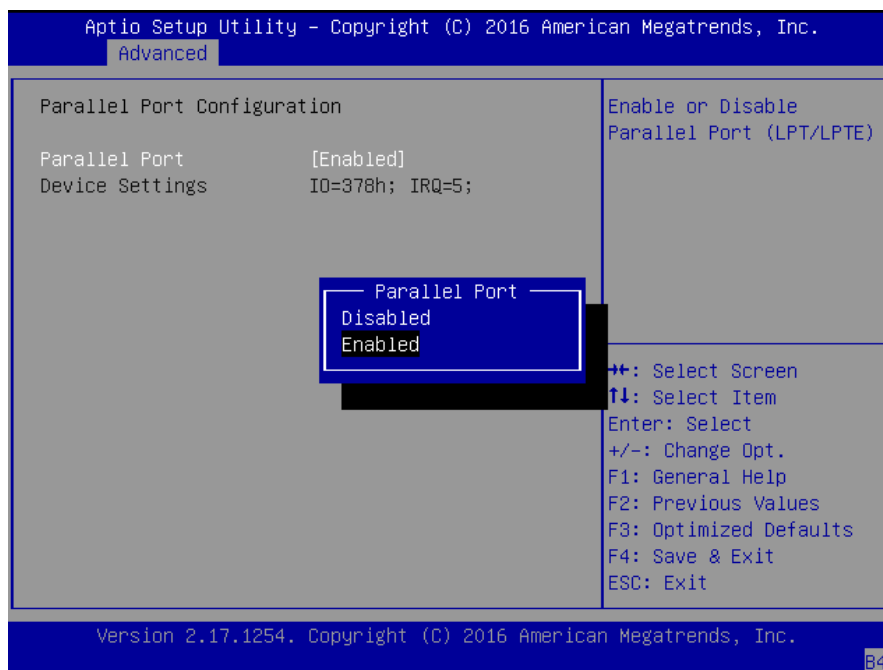


Parallel Port Configuration

This option allows you to set parameters for parallel port (LPT/LPTE).

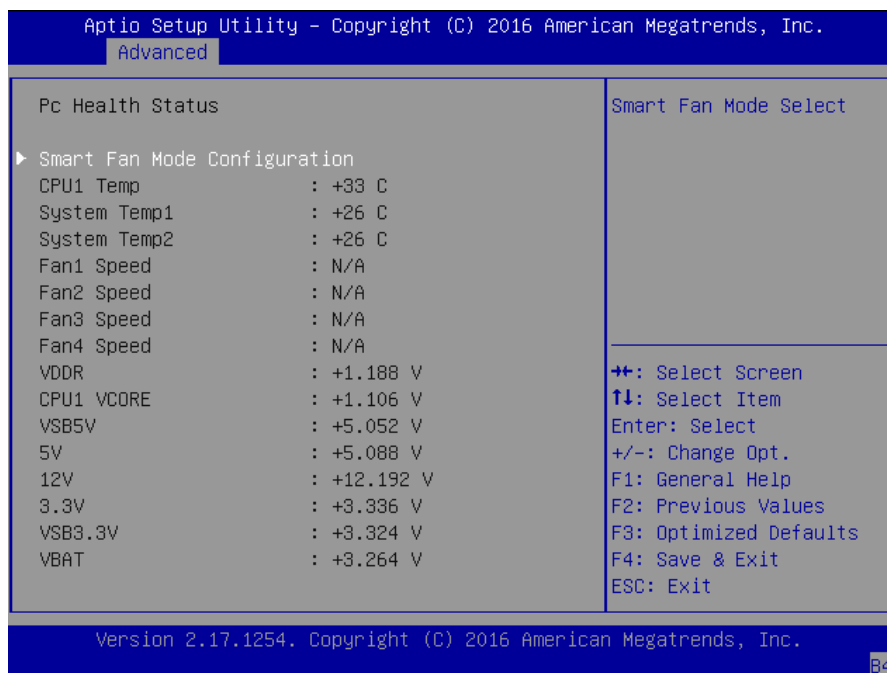
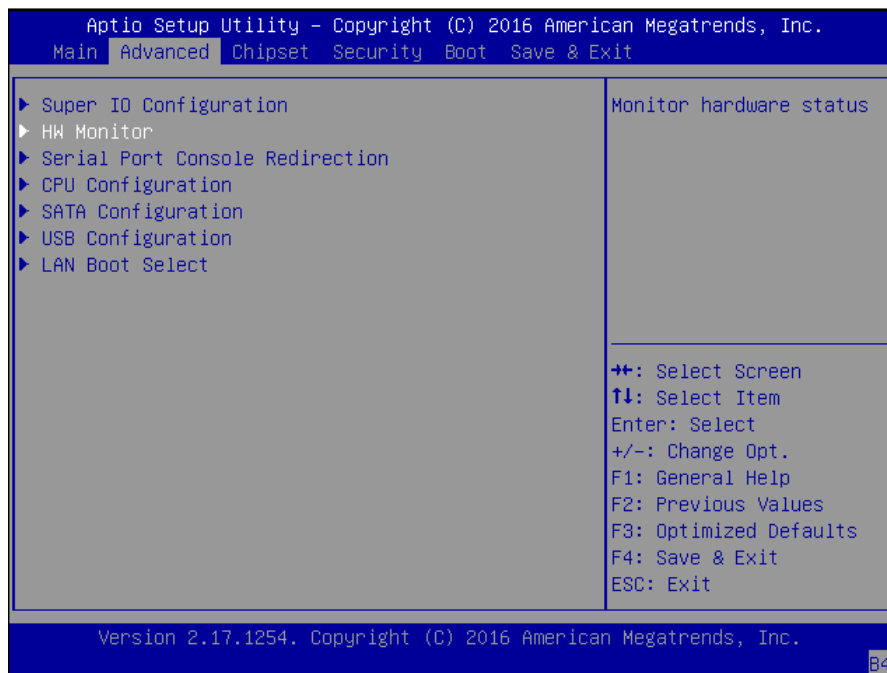


Once Parallel Port is accessed, you may press "Enter" to enable or disable the Parallel Port. Device setting is fixed as default.



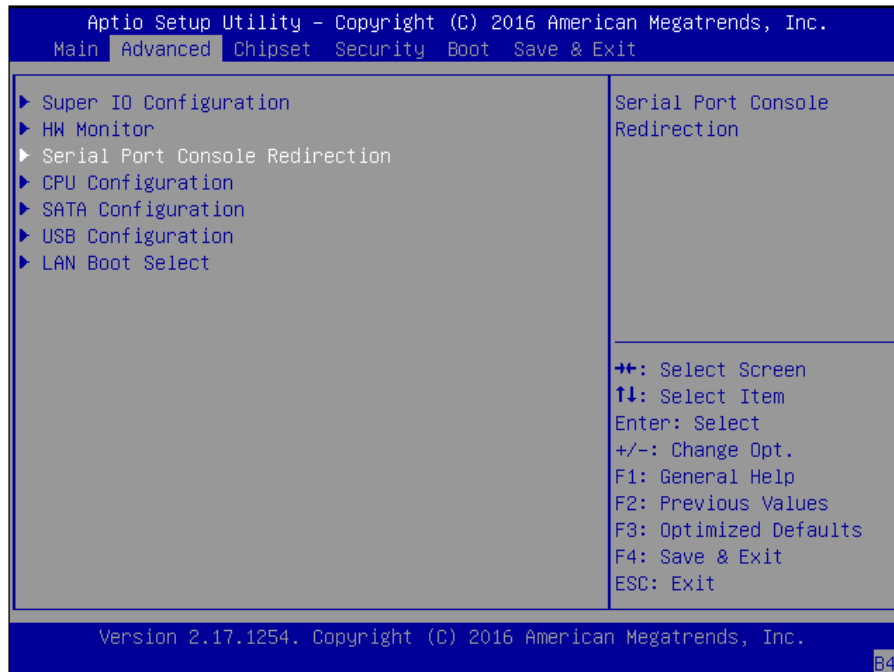
HW Monitor

This option allows you to view hardware health status.

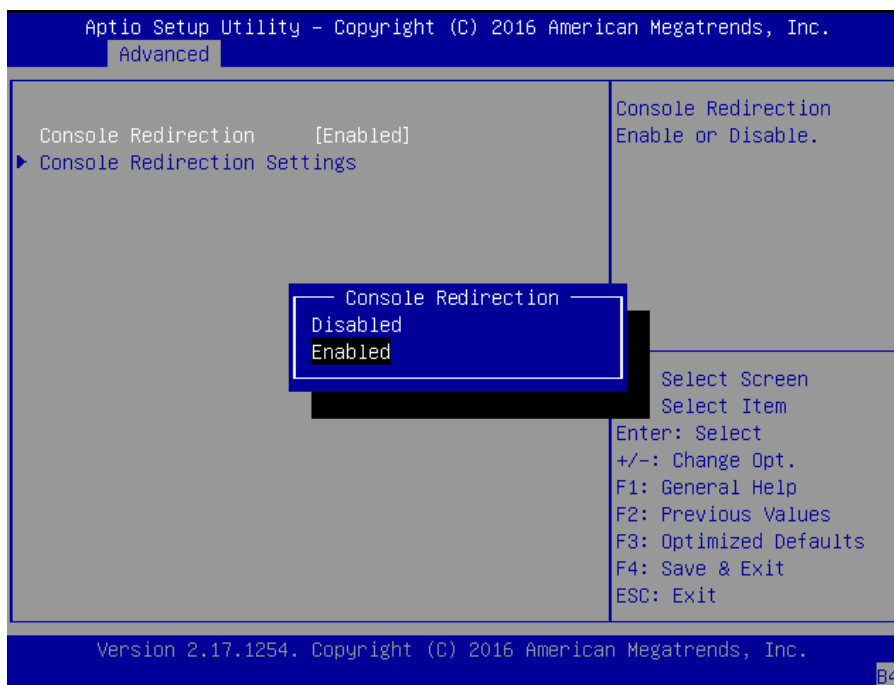


Serial Port Console Redirection

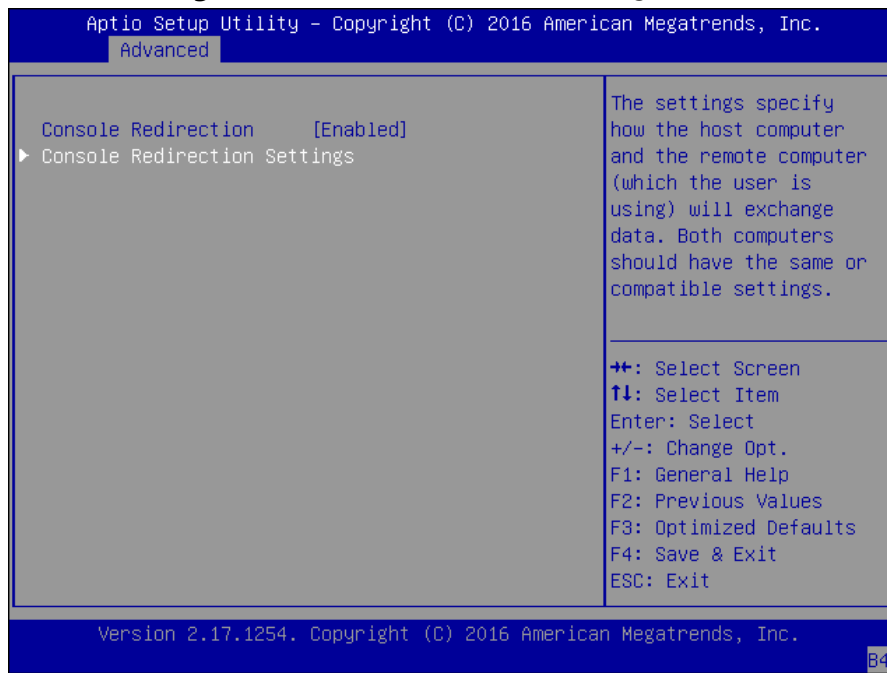
This option allows you to configure parameters about serial port console redirection. Press "Enter" to access the submenu.



Console Redirection: select "Enabled" or "Disable" for COM port console redirection. The default is "Enabled".



Console Redirection Settings: select this item to enter the setting sub-menu.



COM Console Redirection Settings

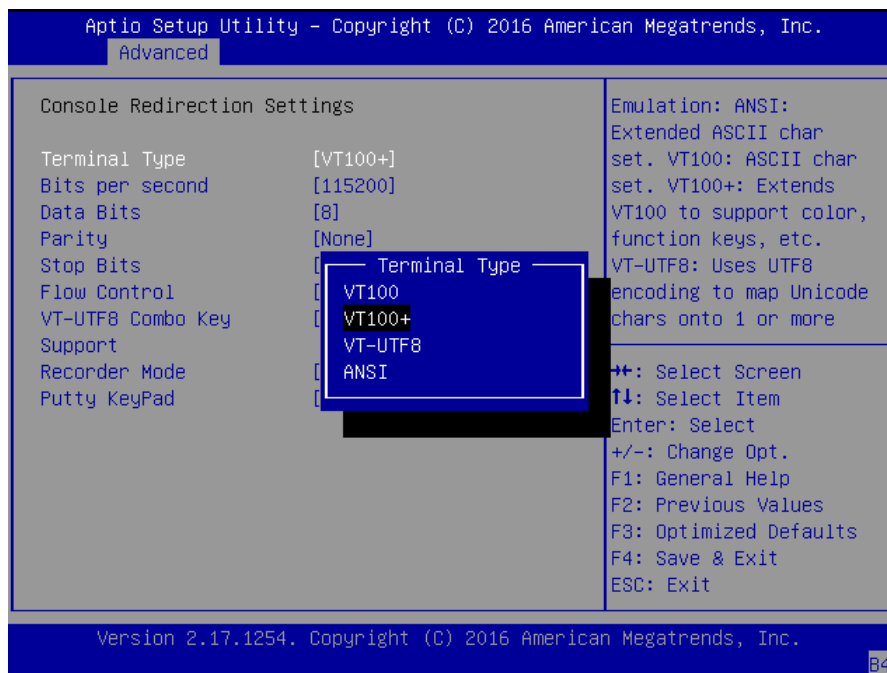
Terminal Type: the emulation configuration. Select "VT100", "VT100+", "VT-UTF8" or "ANSI".

VT100: ASCII character set

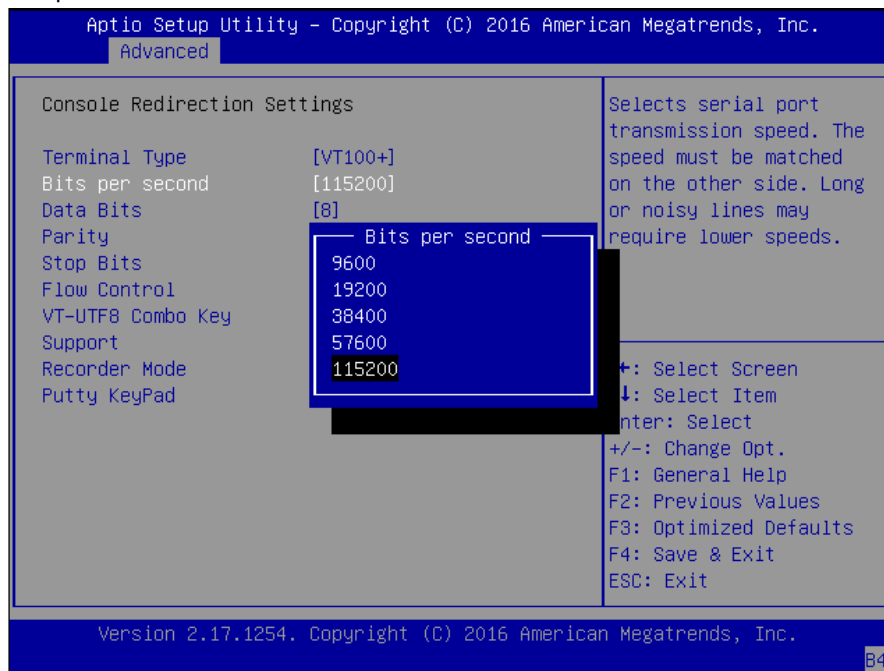
VT100+: extends VT100 to support color function keys

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

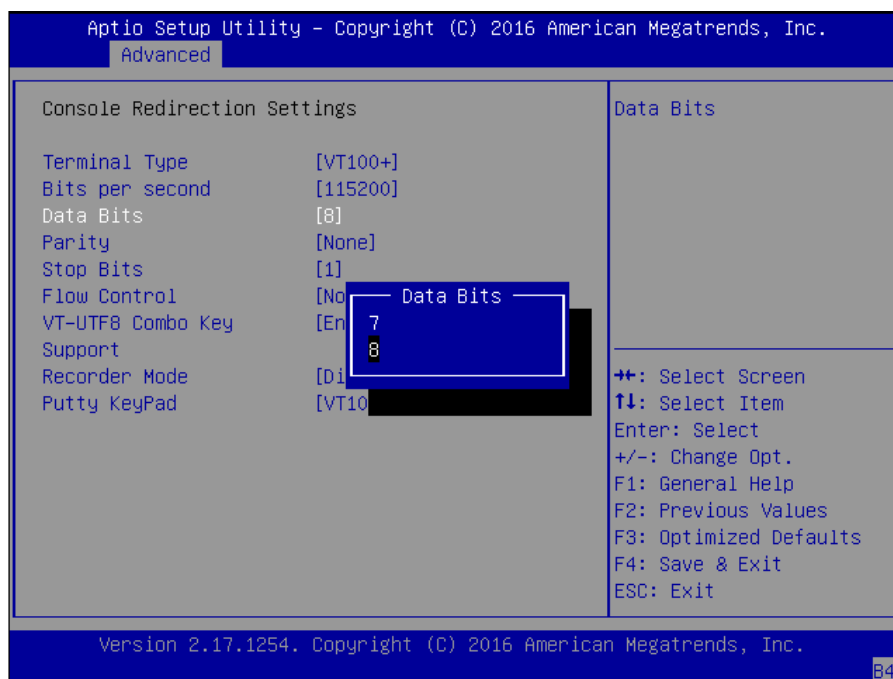
ANSI: Extended ASCII character set



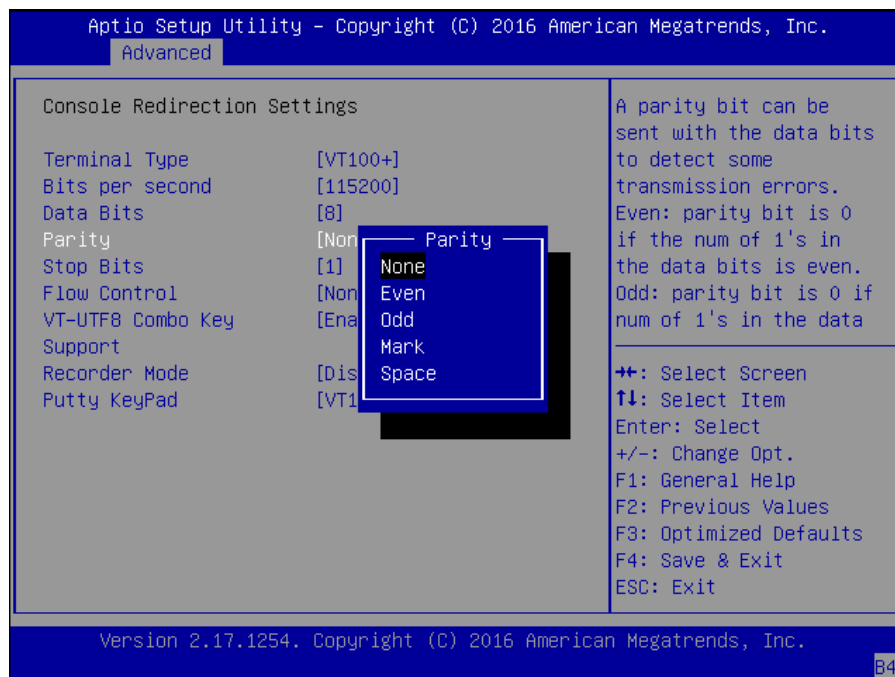
Bits per second: select "9600", "19200", "38400", "57600", or "115200" for bits per second. The Bps will determine serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds



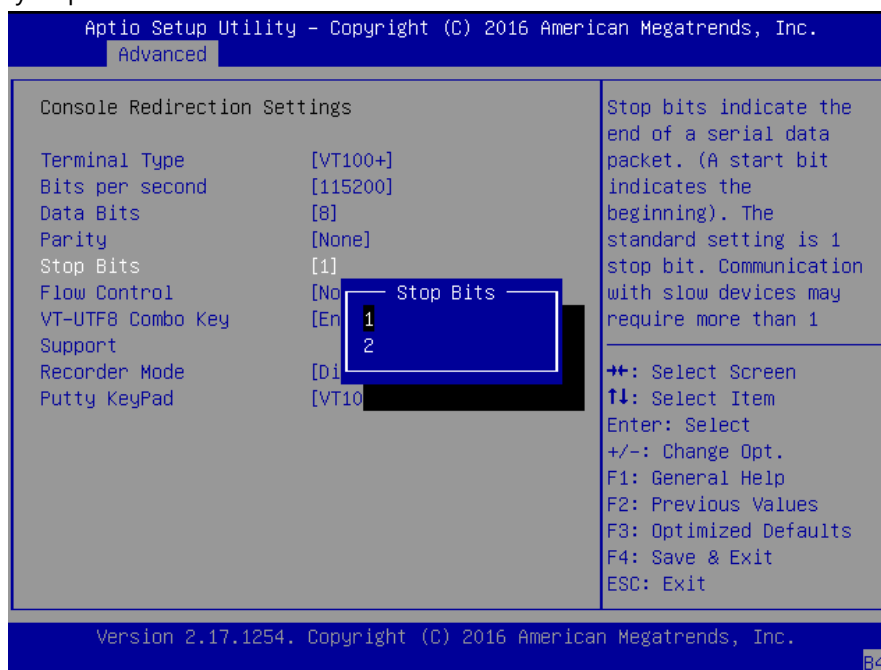
Data Bits: select the value for data bits. In this case, "7" or "8".



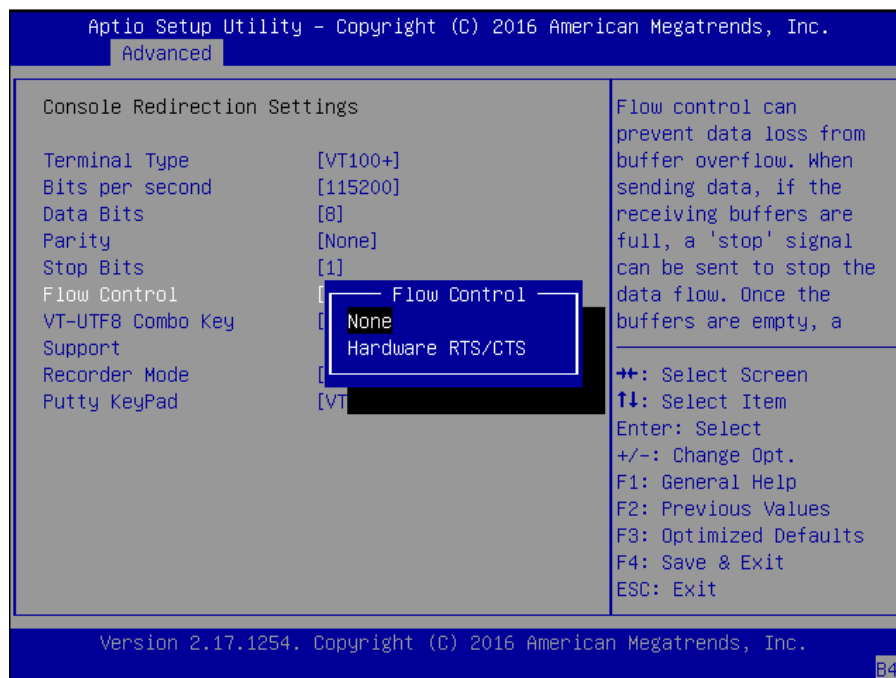
Parity Bits: a parity bit can be sent with the data bits to detect some transmission errors. Select "None", "Even", "Odd", "Mark" or "Space".



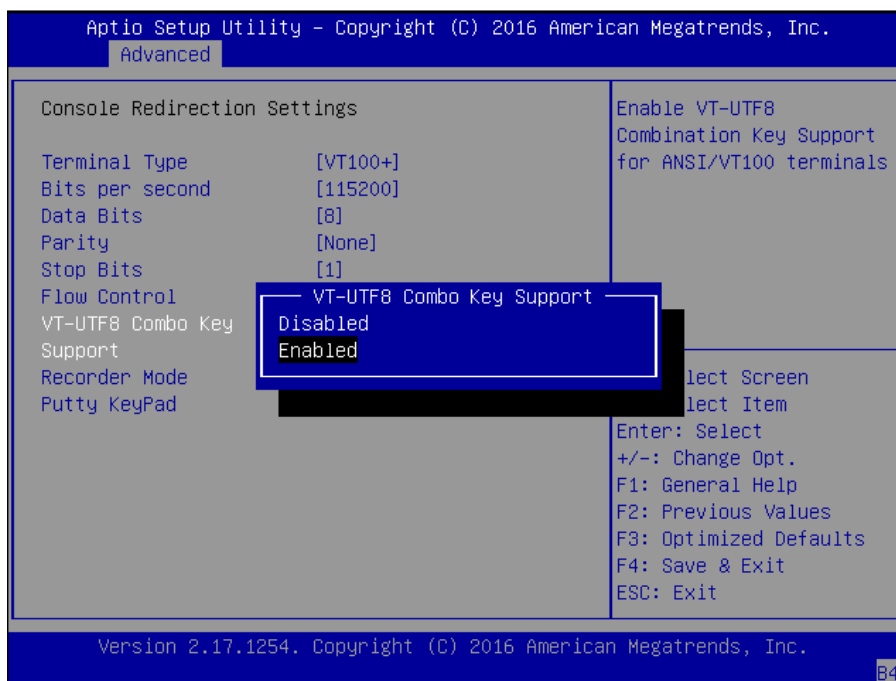
Stop Bits: stop bits indicate the end of a serial data packet. The standard is 1 stop bit. Communication with slow devices may require more than 1.



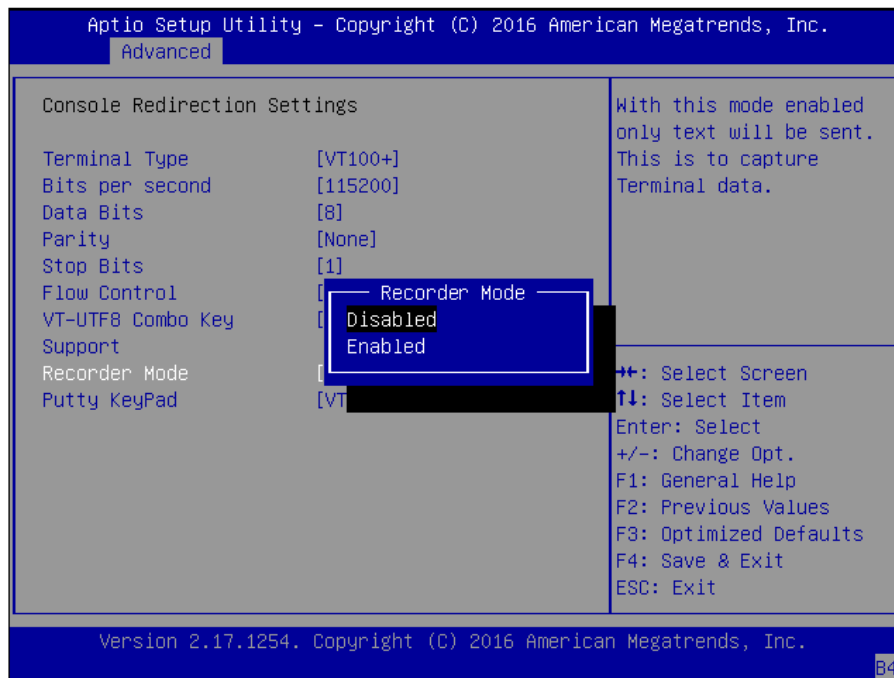
Flow Control: flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. You may select “None” or “Hardware RTS/CTS”, depending on the circumstances.



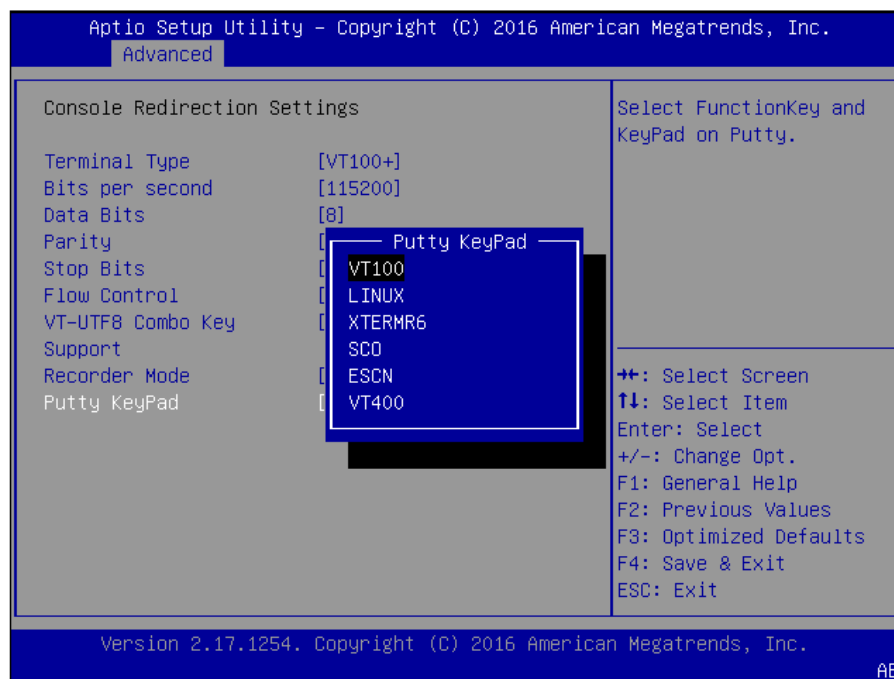
VT-UTF8 Combo Key Support: this option enables/disables VT-UTF8 combination key support for ANSI/VT100 terminals.



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

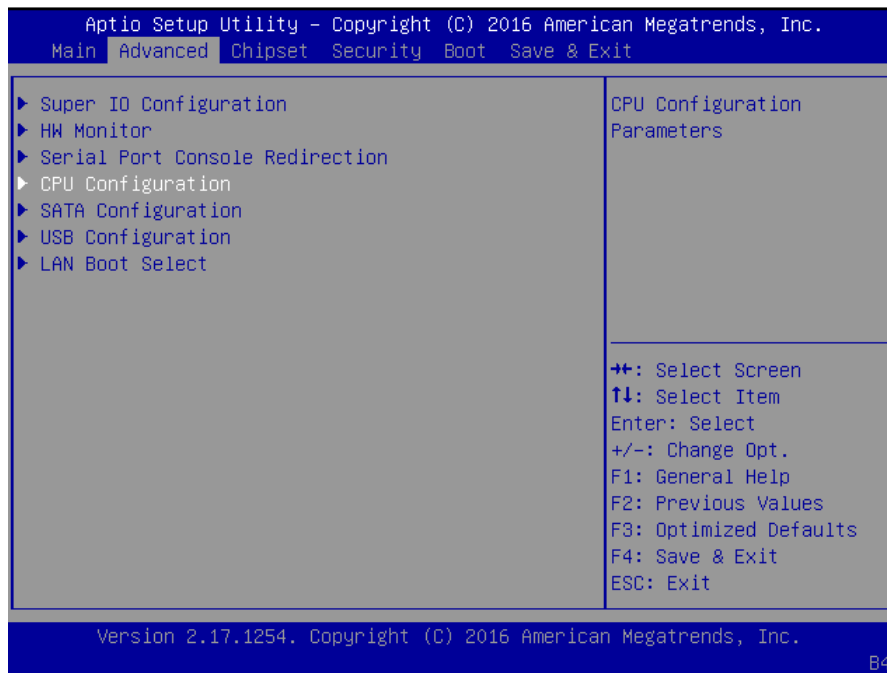


Putty KeyPad: select Function Key and Key Pad on Putty. You may select "VT100", "LINUX", "XTERMR6", "SCO", "ESCN", or "VT400".

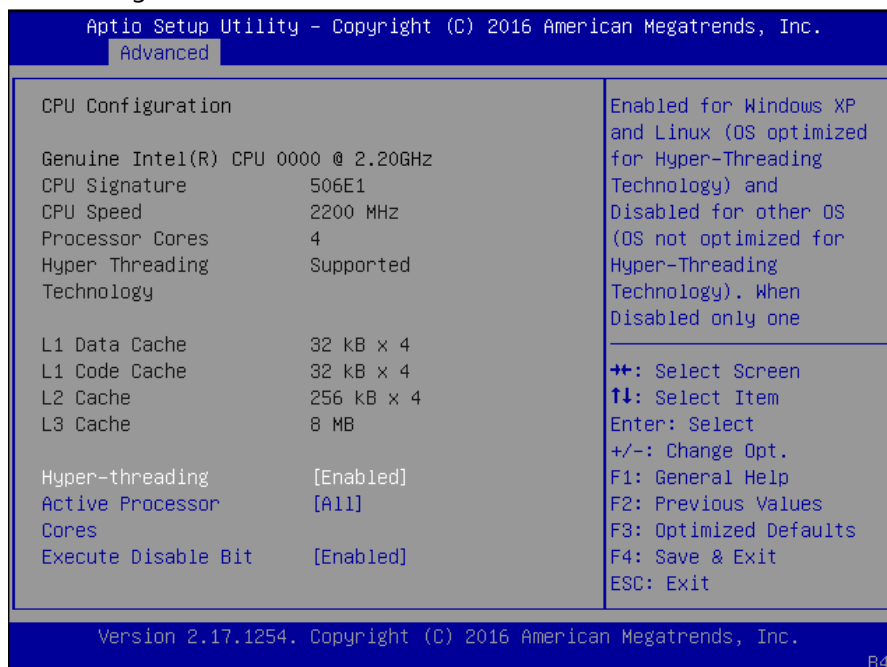


CPU Configuration

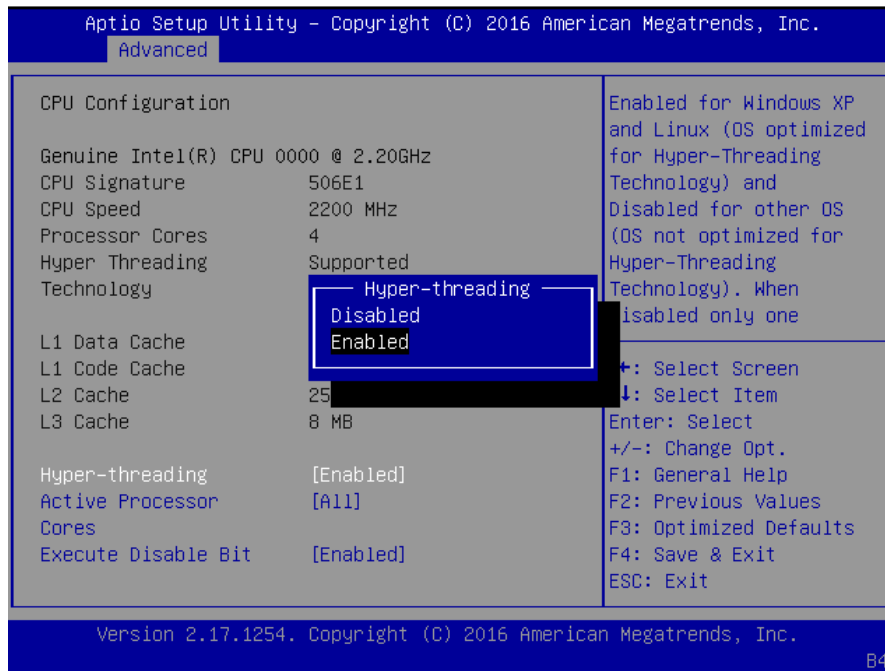
This option allows you to configure CPU parameters.



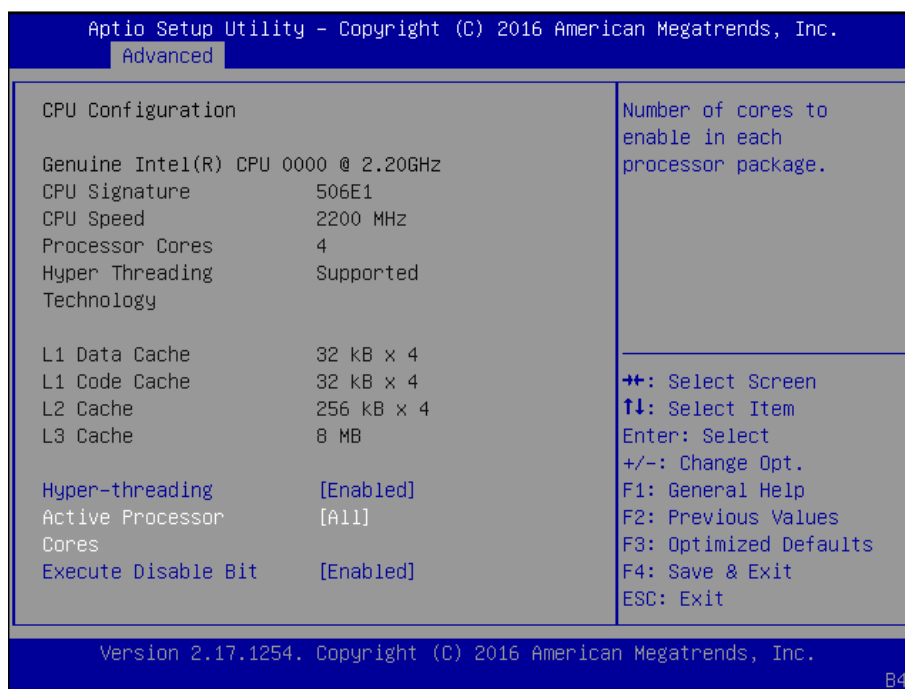
Hyper-threading: enabled for Windows XP and Linux (OS optimized for hyper-threading technology) and disabled for other OS that are not optimized for this feature. When enabled, multiple threads will run simultaneously on each logical core.



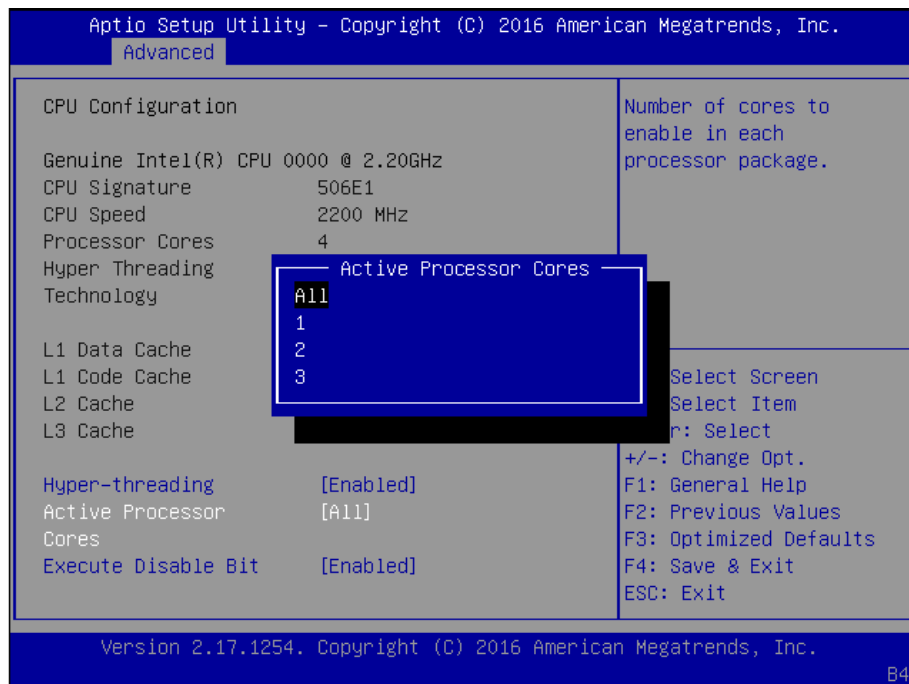
Press "Enter" to choose "Enabled" or "Disabled". It is recommended to select "Enabled".



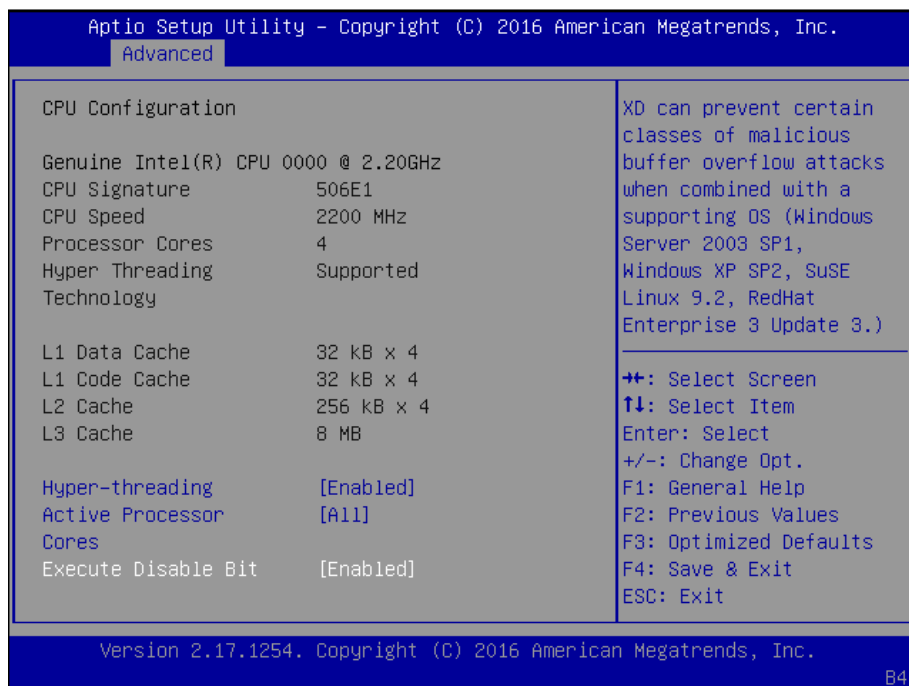
Active Processor Cores: number of cores to enable in each processor package. The default is "All" for optimization.



You may press "Enter" to select the number of cores to be enabled. It is recommended to select "All" for optimization.



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 (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3). When disabled, it forces the XD feature flag to always return 0.

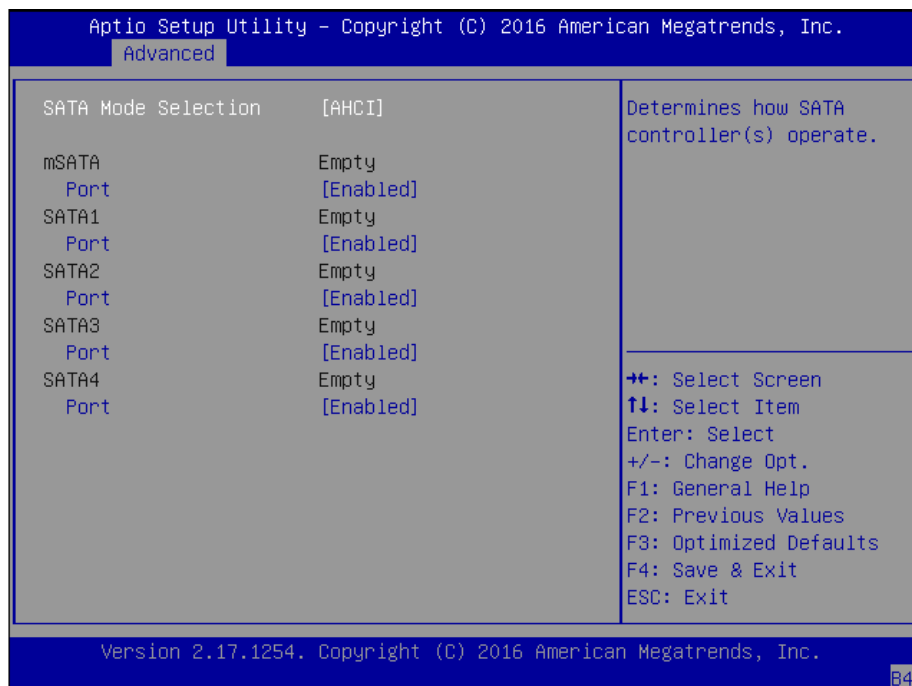


SATA Configuration

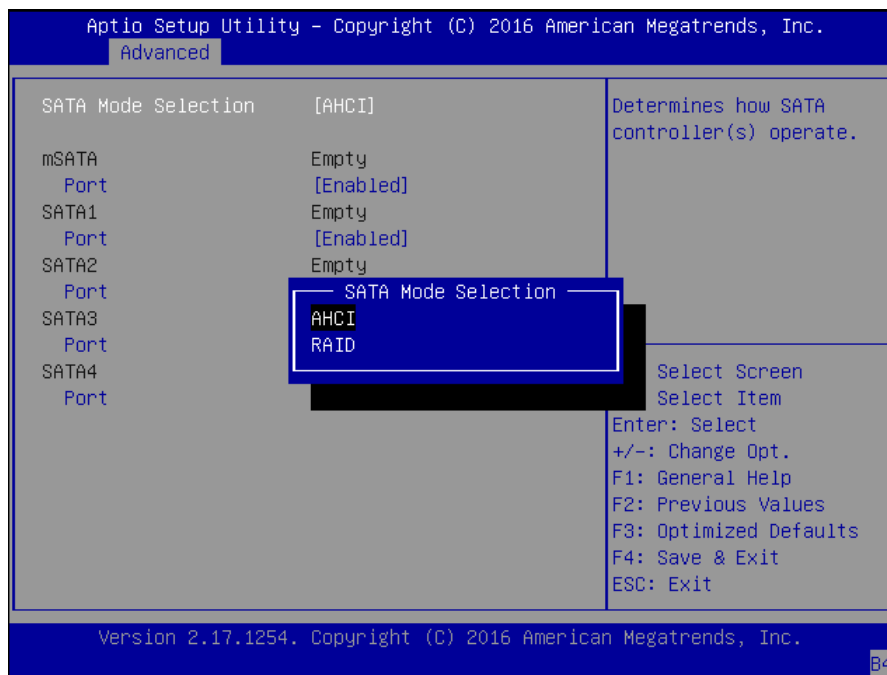
Press Enter to access items for SATA devices and settings.



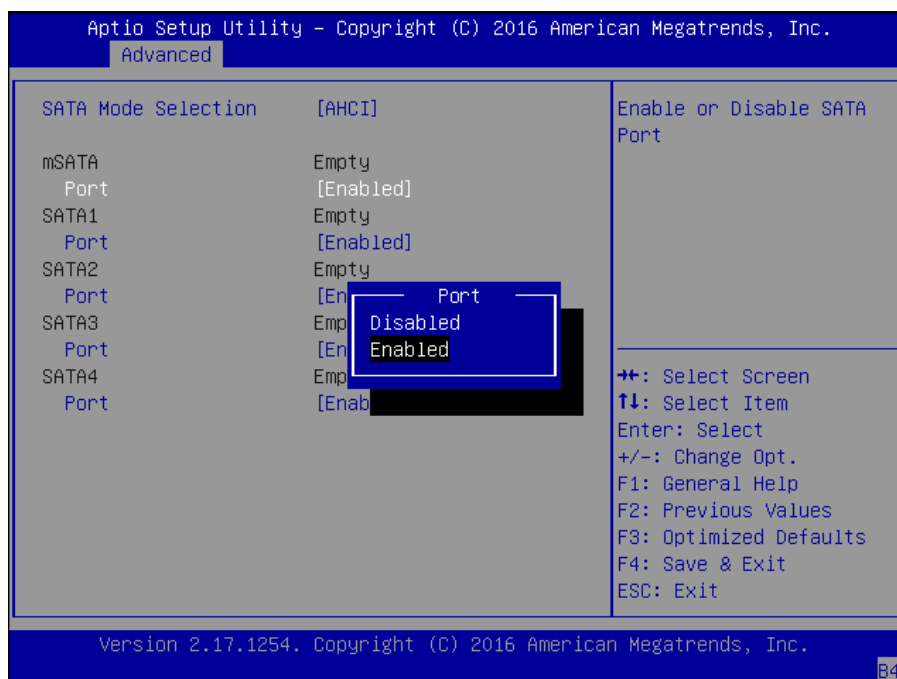
SATA Mode Selection: the selection to determine how SATA controllers operate.



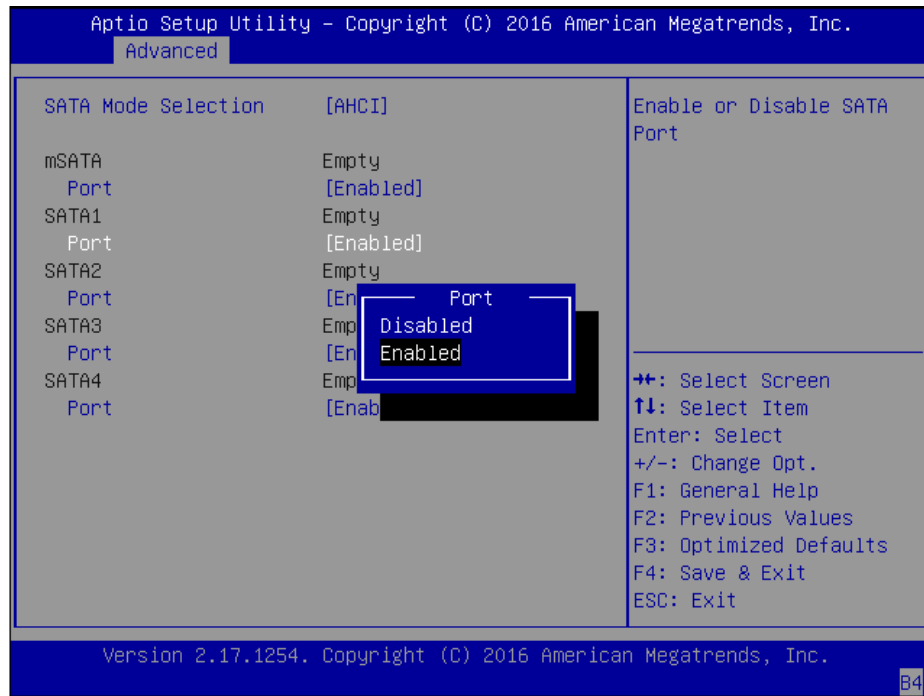
You may select "AHCI" or "RAID" mode. Please be noted that there must be two SATA disk drives installed in order to enable RAID mode.



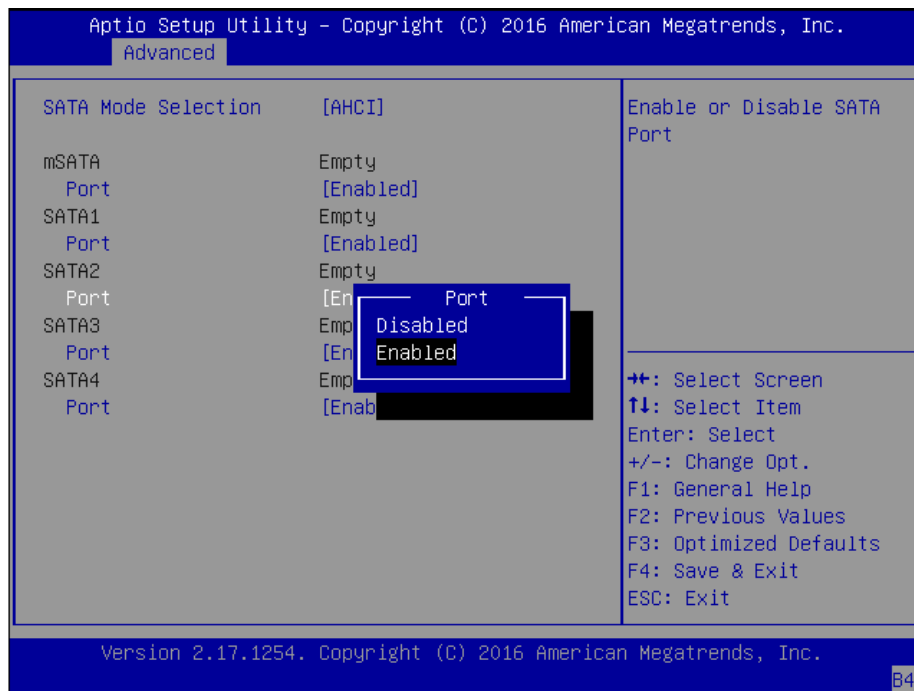
mSATA: enable or disable the mSATA port



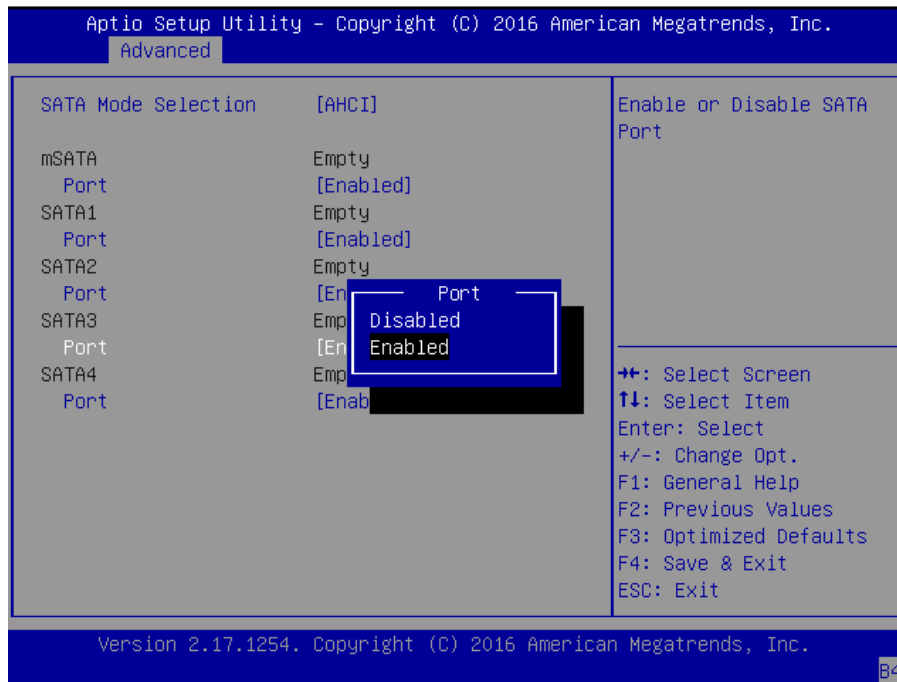
SATA1: enable or disable the SATA1 port



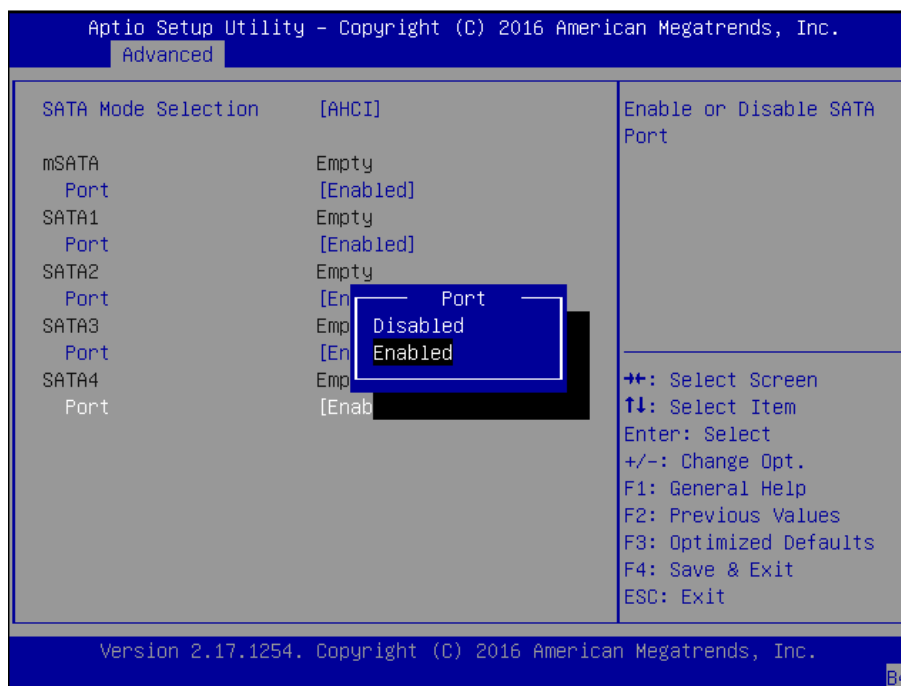
SATA2: enable or disable the SATA2 port



SATA3: enable or disable the SATA3 port

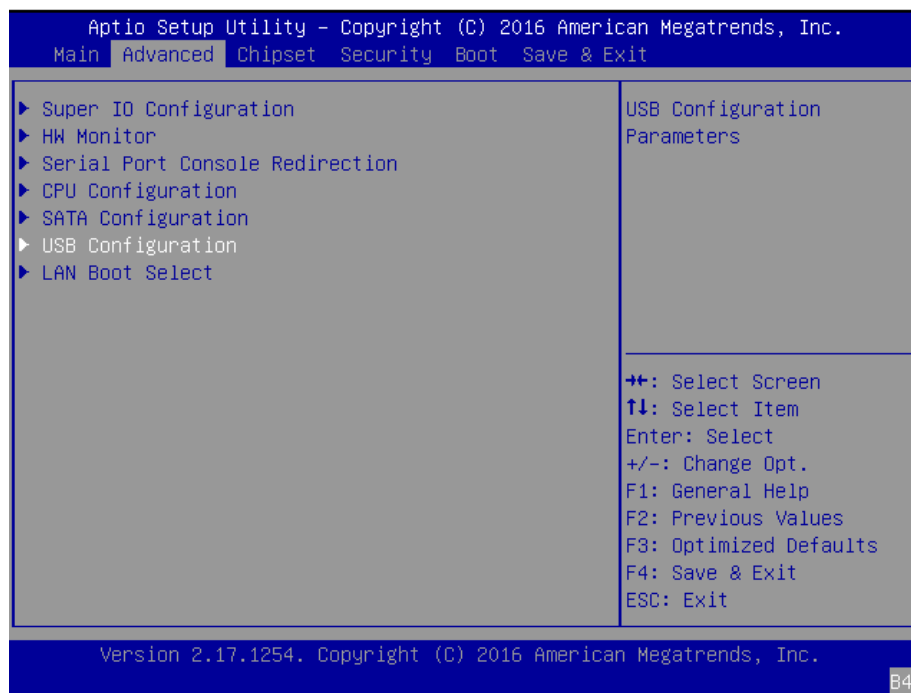


SATA4: enable or disable the SATA4 port



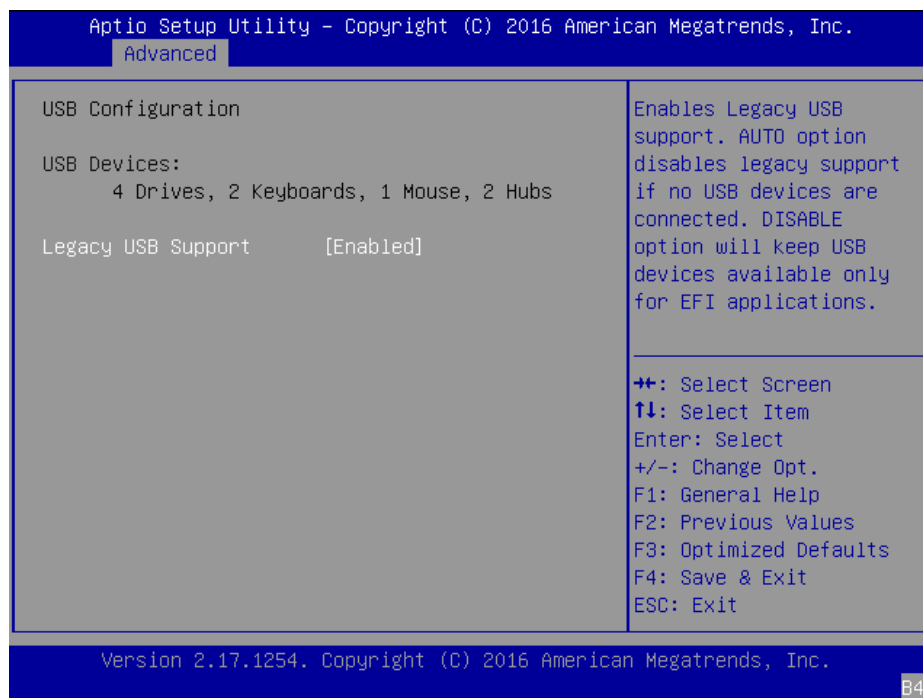
USB Configuration

This option allows you to configure USB device Settings.

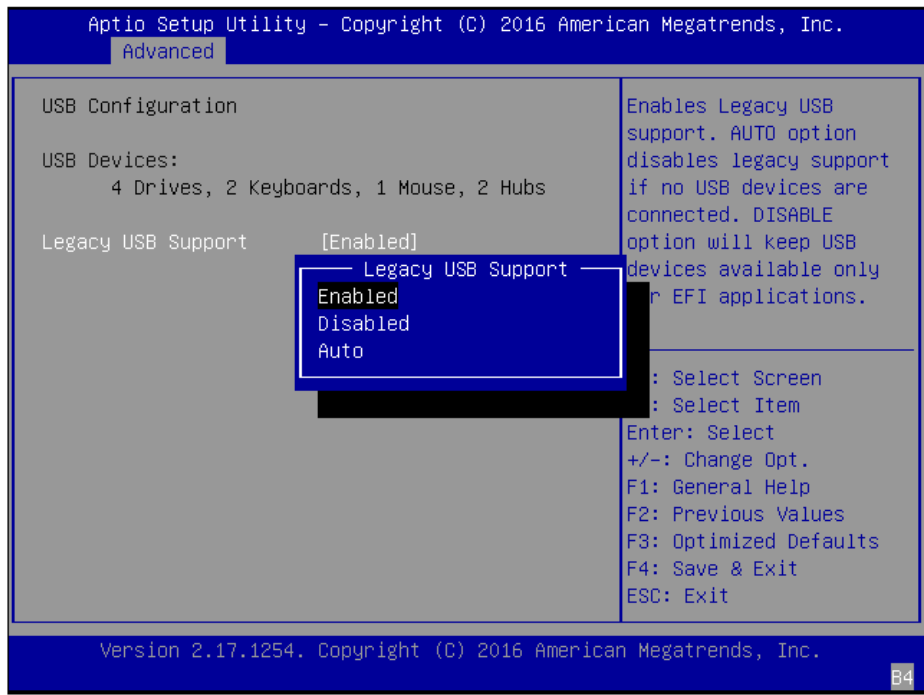


USB Devices: displays USB devices

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".



LAN Boot Select

This option allows you to select one of the onboard LAN boot. Press "Enter" to access the sub-menu.



On Board LAN Boot: the default is "Disabled"



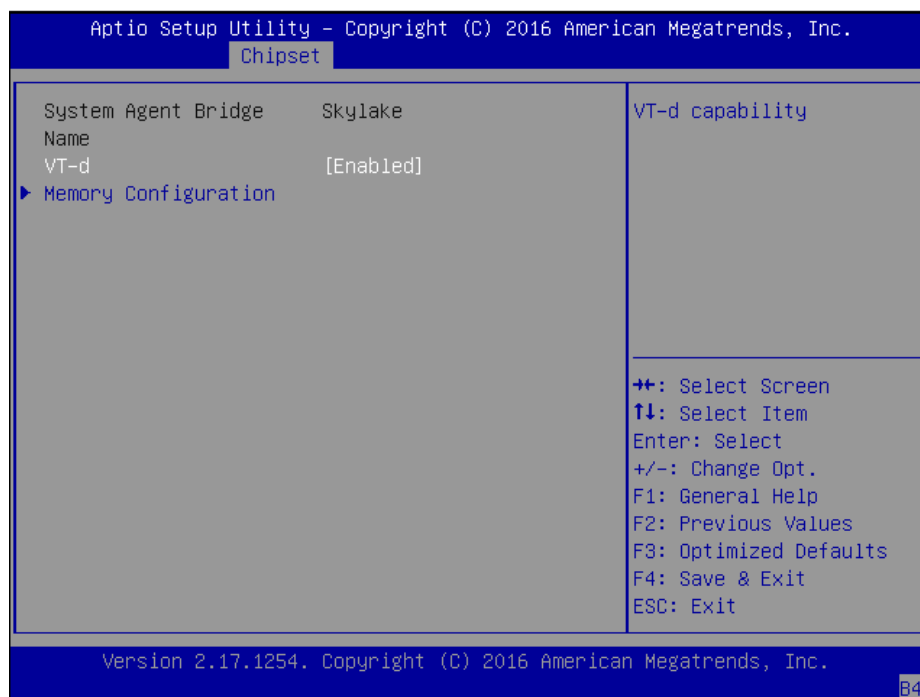
Chipset

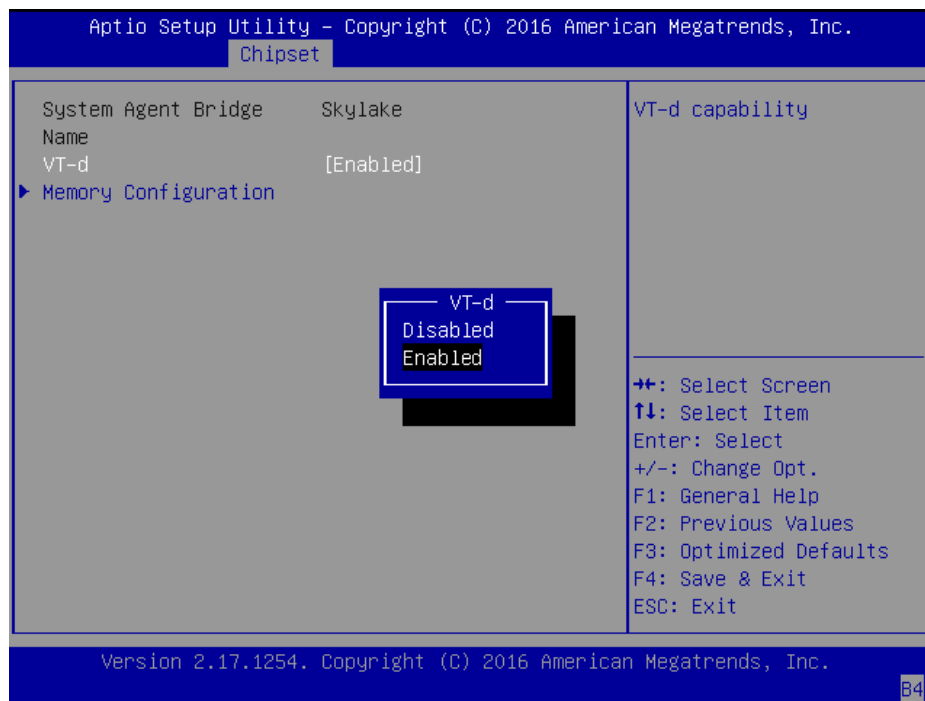
Use [←] / [→] to select [Chipset] setup screen. Under this screen, you may use [↑] [↓] to select “System Agent (SA) Configuration” or “PCH-IO Configuration”.

System Agent (SA) Configuration: displays and provides options to configure system agent (SA) parameters



VT-d: select “Enabled” or “Disabled” for Intel VT-d virtualization function.



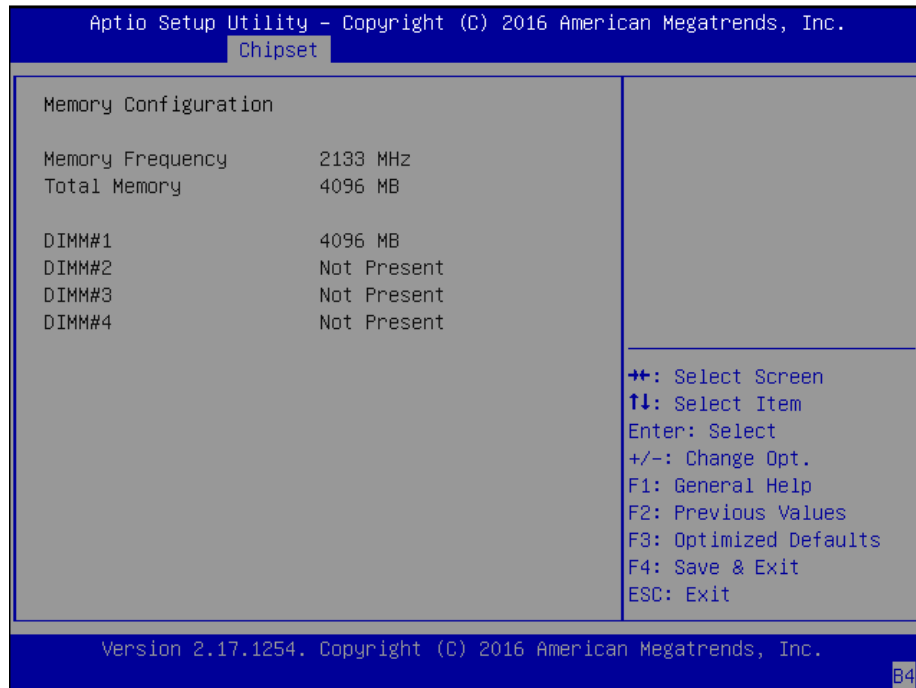


Memory Configuration

Memory Configuration provides memory configuration parameters.



Once accessed, information about memory frequency, total memory, and DIMM#1-4 status will be displayed.



PCH-IO Configuration

PCH-IO configuration provides PCH parameters.

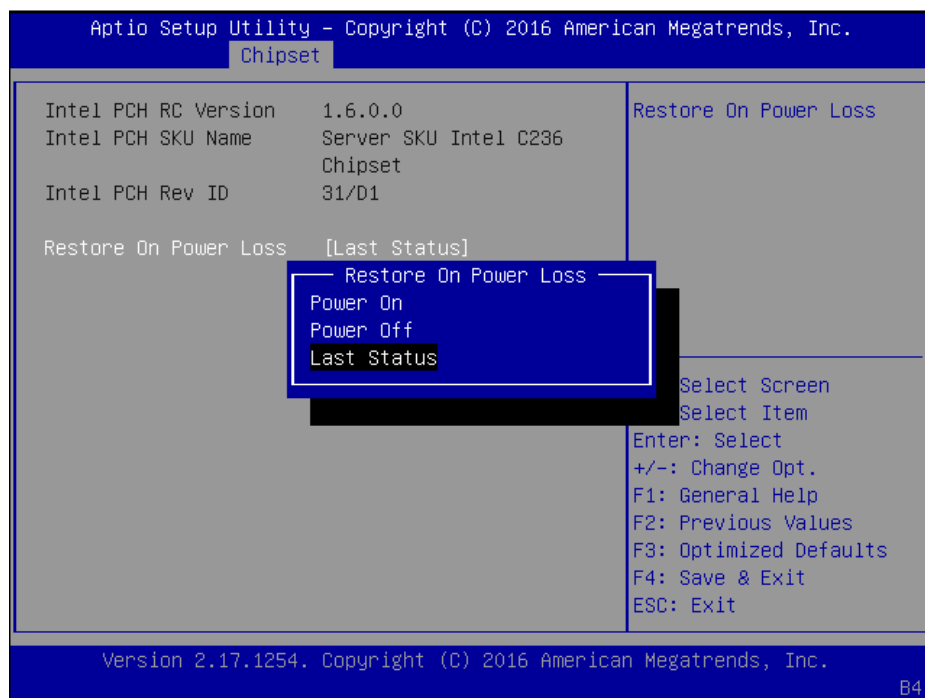
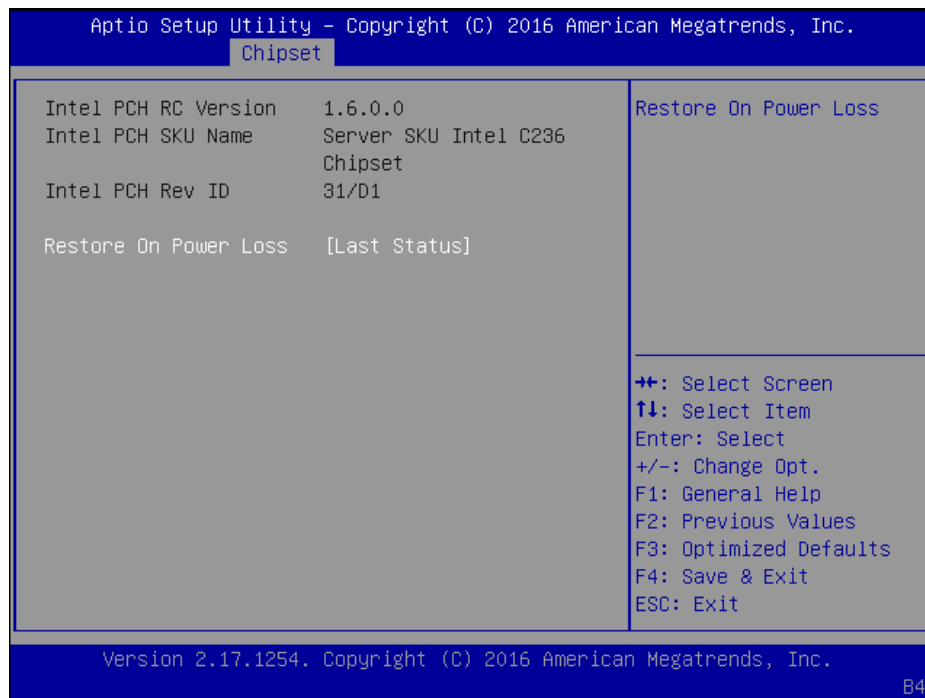


Intel PCH RC Version: displays Intel PCH RC version

Intel PCH SKU Name: displays PCH SKU name

Intel PCH Rev ID: displays Intel PCH revision ID

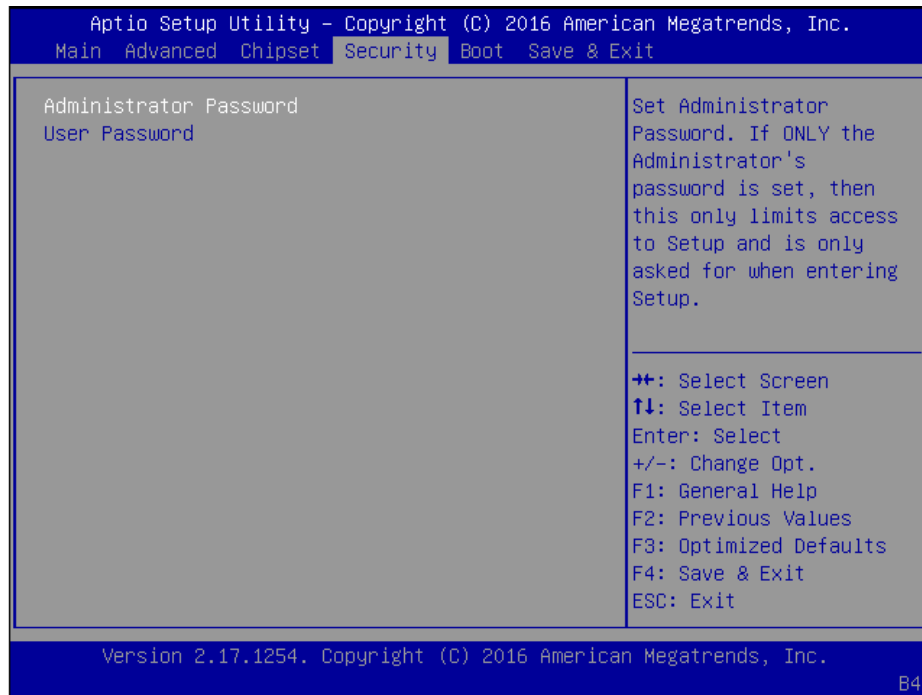
Restore On Power Loss: select "Restore On Power Loss" options: Power On, Power Off, or Last Status.



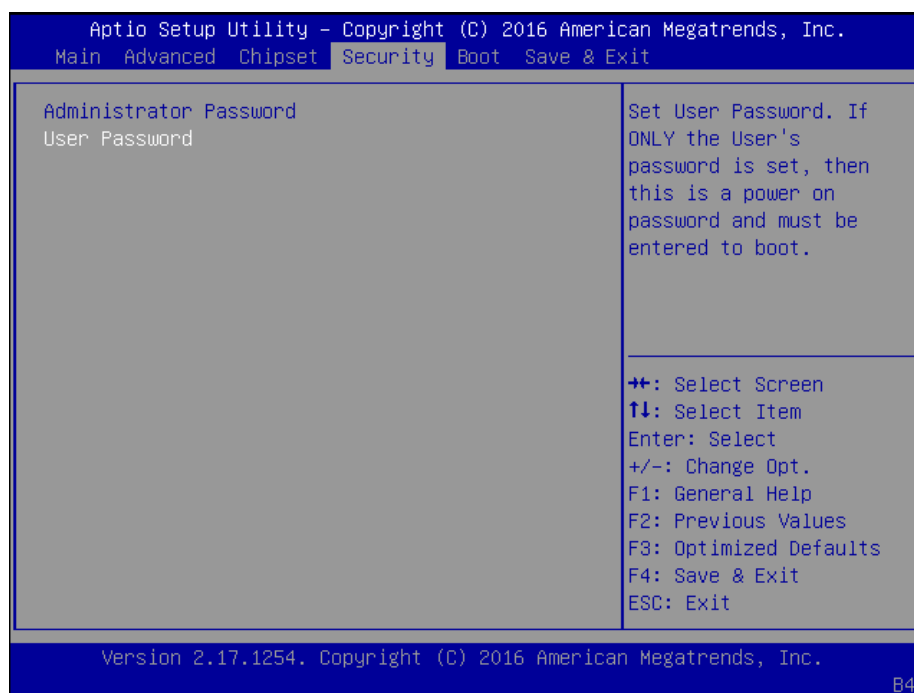
Security

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.



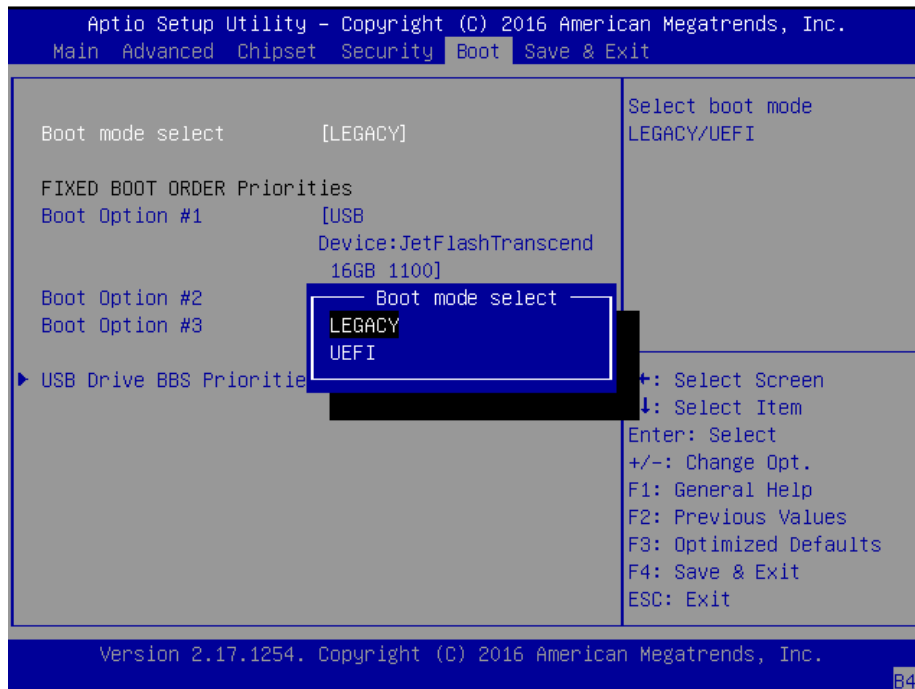
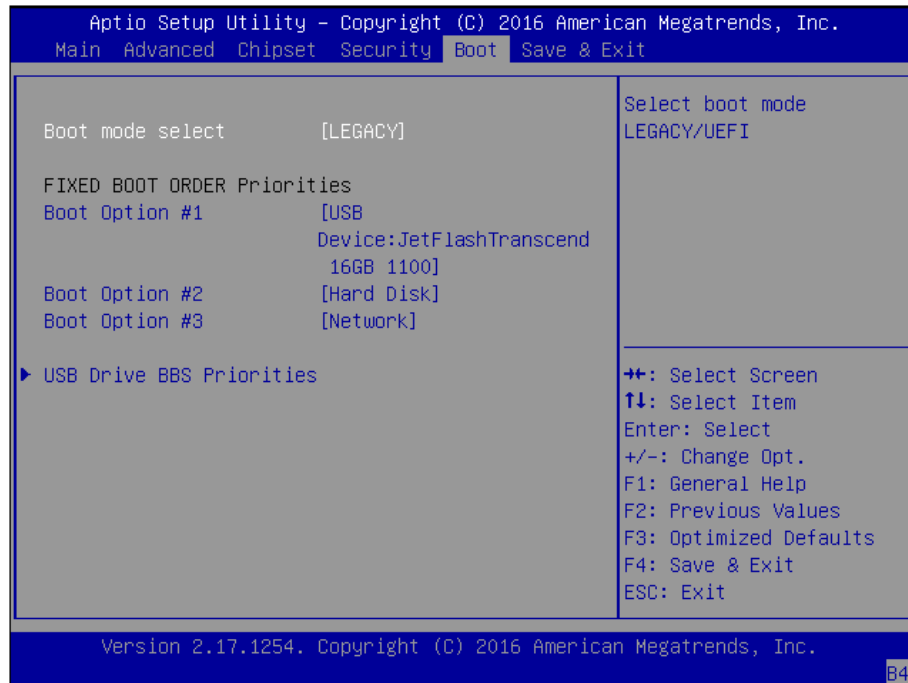
User Password: set user password. Once set, then this is a power-on password and must be entered to boot or enter Setup.



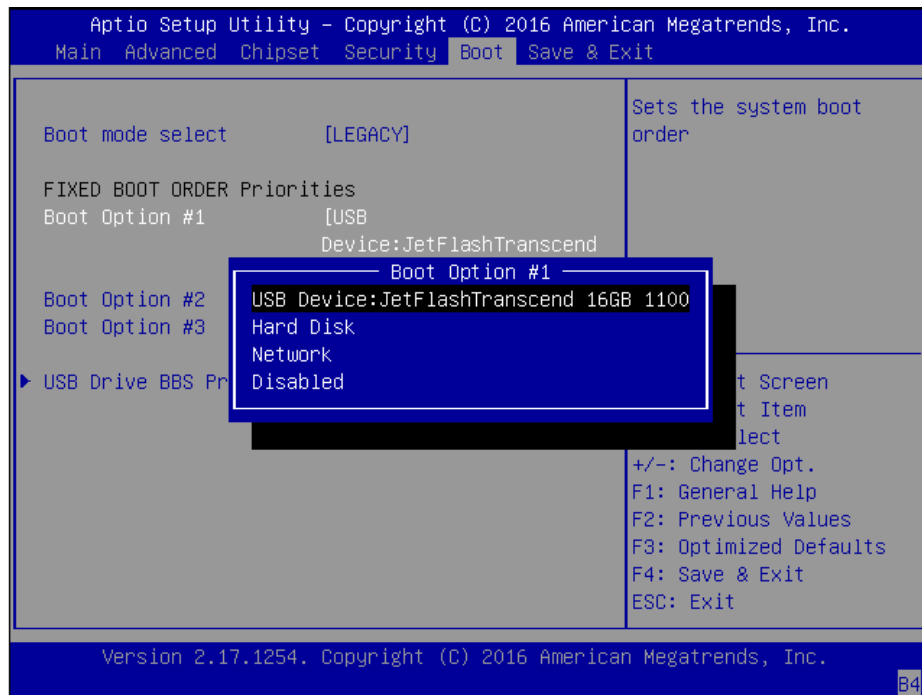
Boot

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

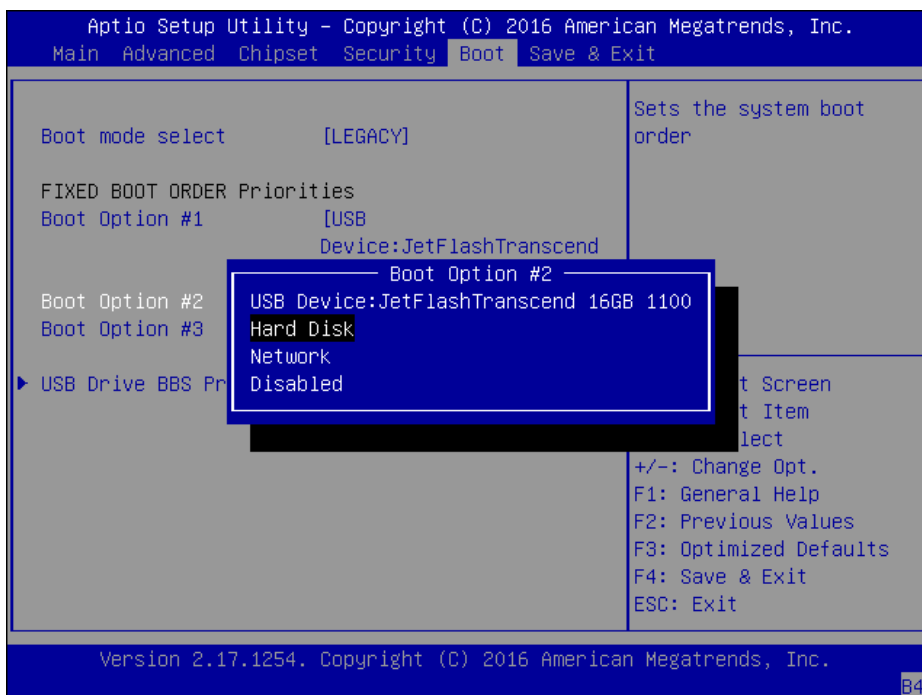
Boot mode select: select boot mode LEGACY or UEFI.



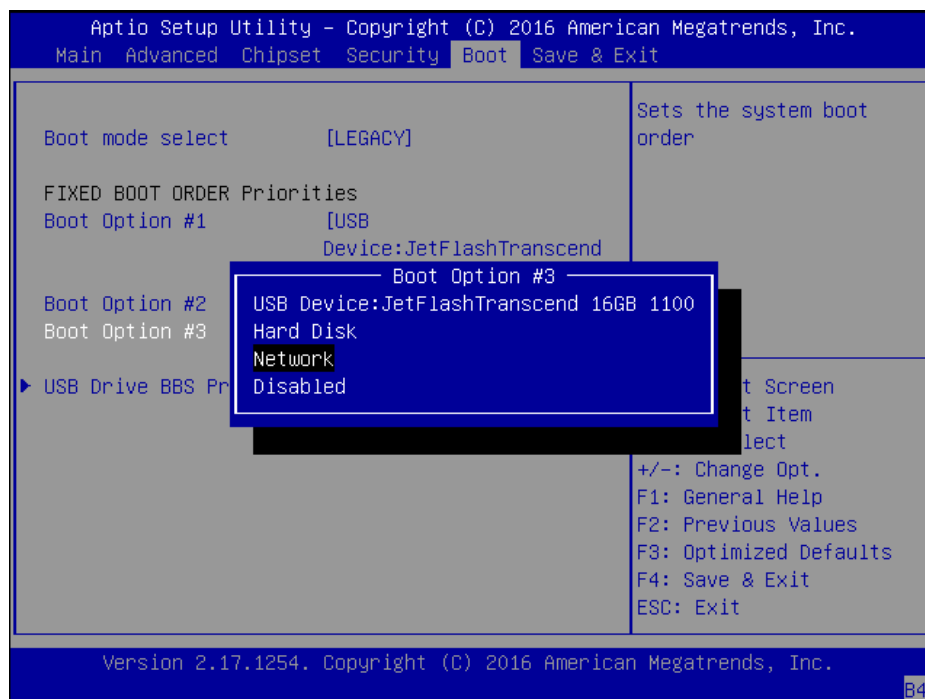
Boot Option #1: determine the device to be the first system boot device.



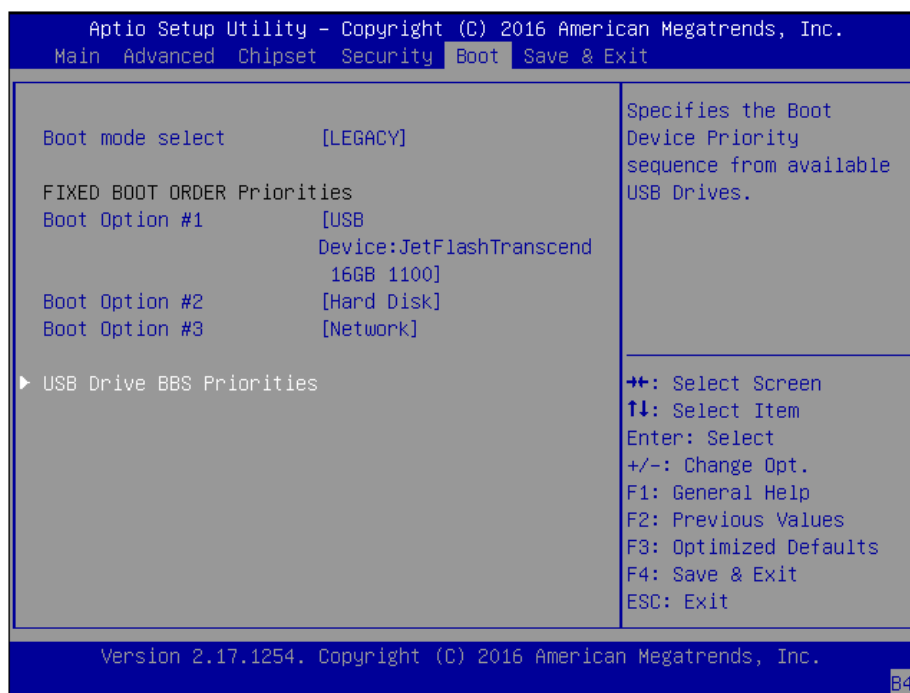
Boot Option #2: determine the device to be the second system boot device.



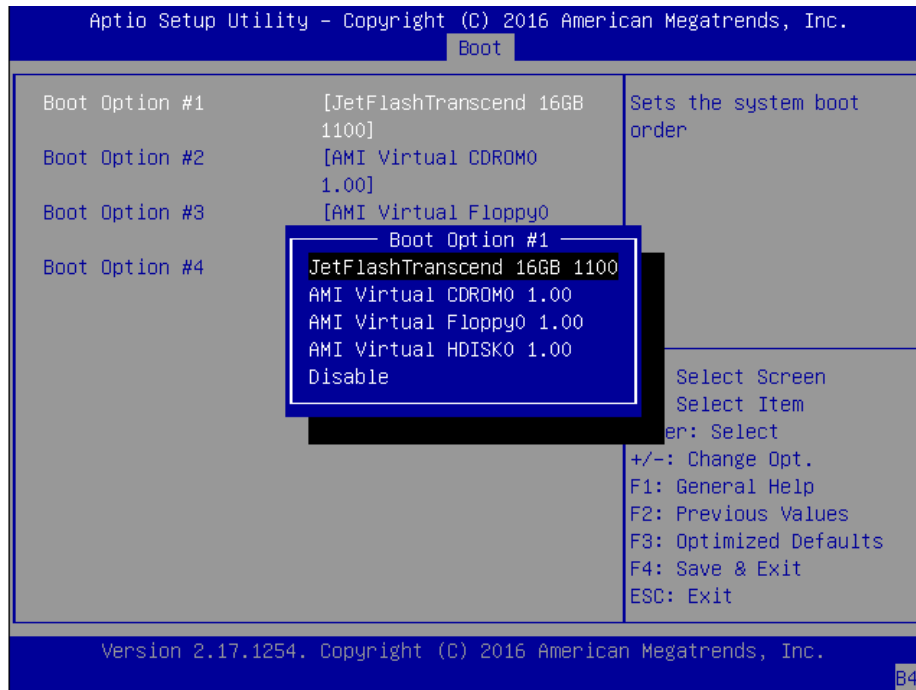
Boot Option #3: determine the device to be the third system boot device.



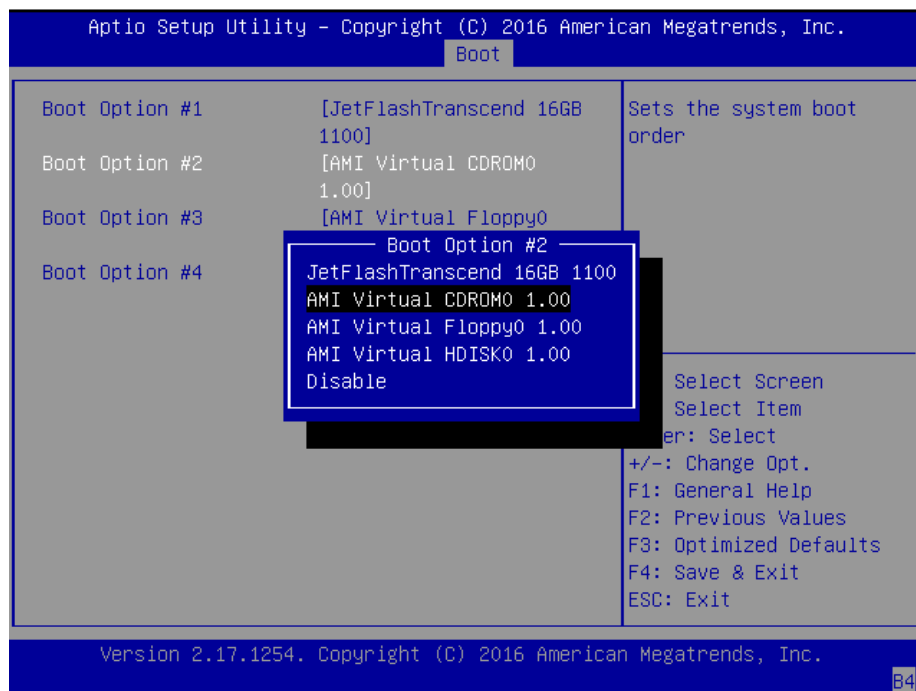
USB Device BBS Priorities: specifies the boot device priority sequence from available USB drives.



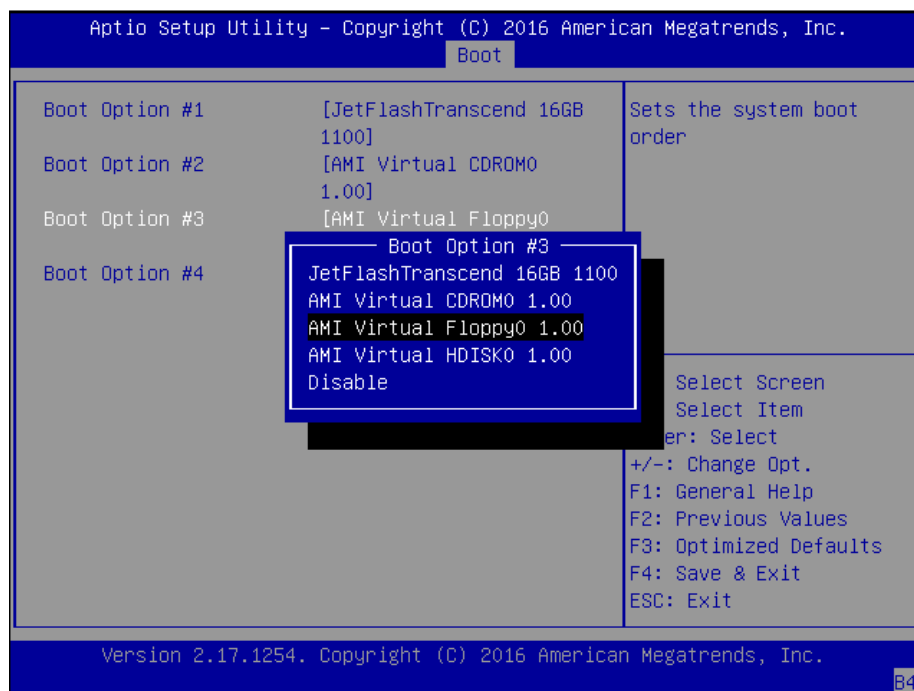
Boot Option #1: set the device to be the first system boot device.



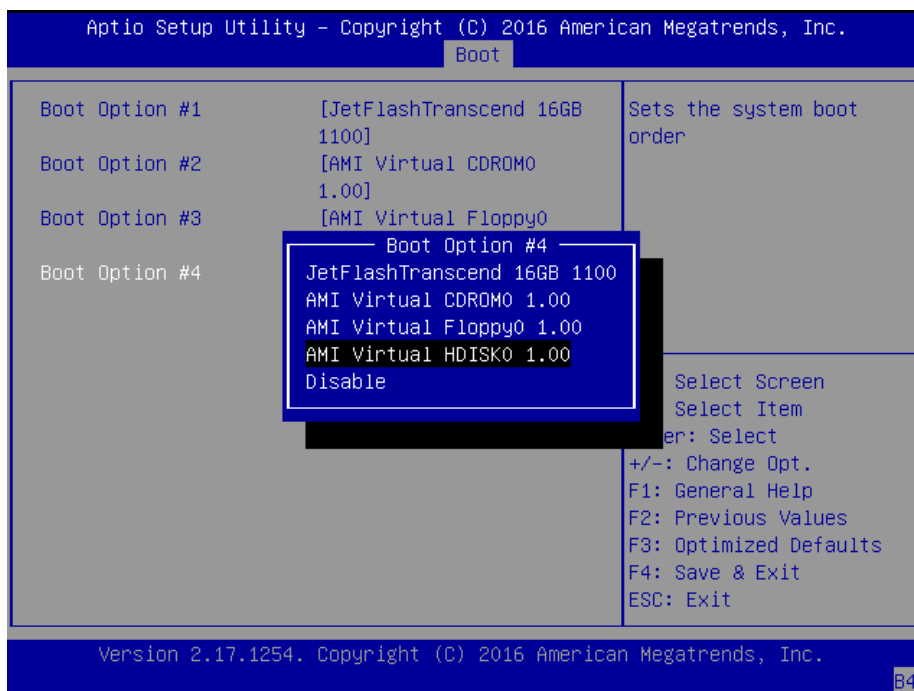
Boot Option #2: determine the device to be the second system boot device.



Boot Option #3: determine the device to be the third system boot device.



Boot Option #4: determine the device to be the fourth system boot device.



Save & Exit

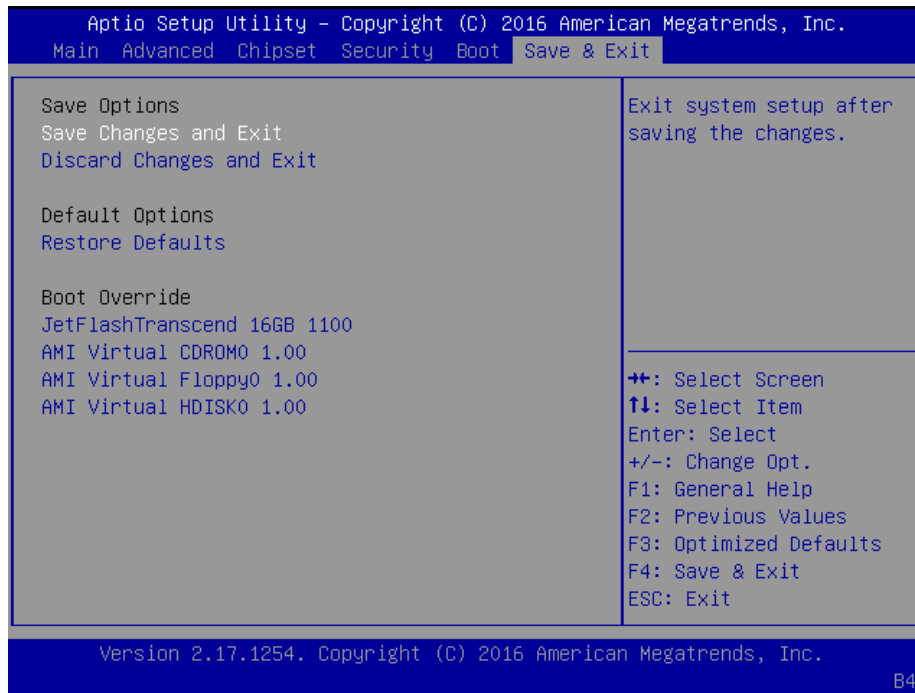
Use [←] / [→] to select [Save & Exit] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

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

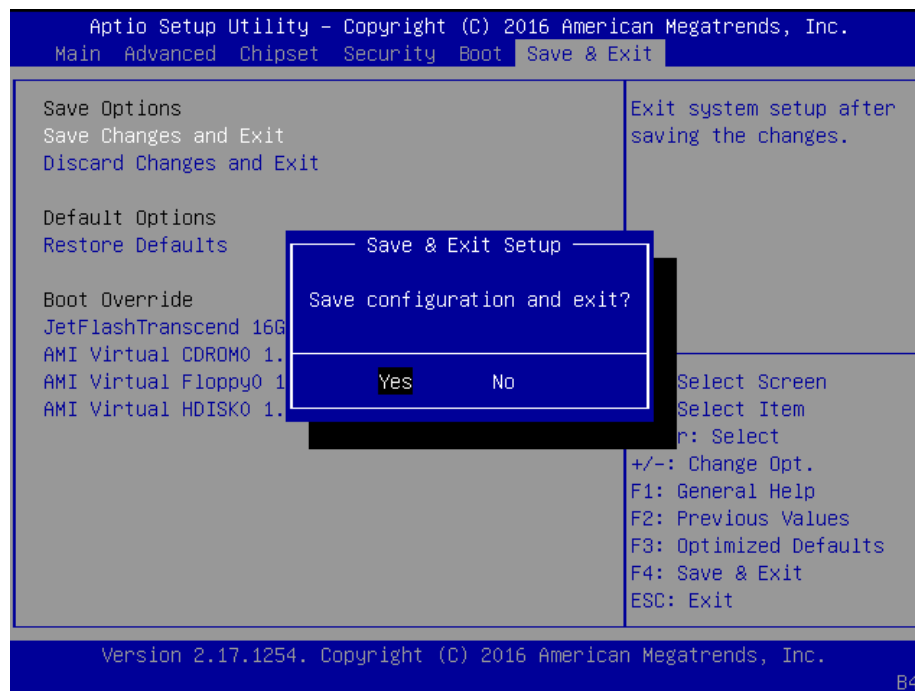
Discard Changes and Exit: exit system setup without saving the configuration changes

Restore Defaults: restore to factory default setting

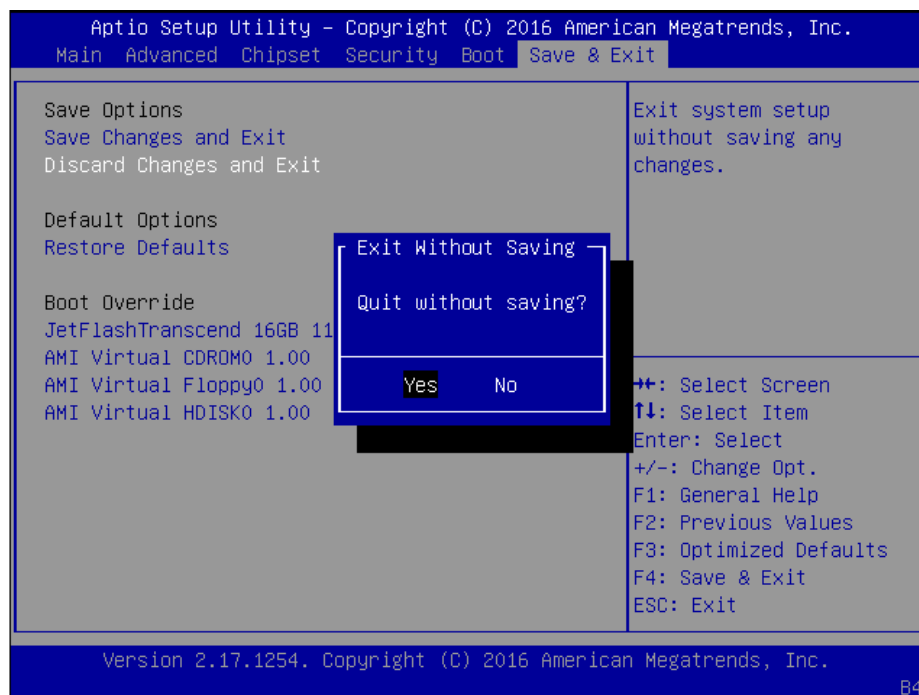
Boot Override



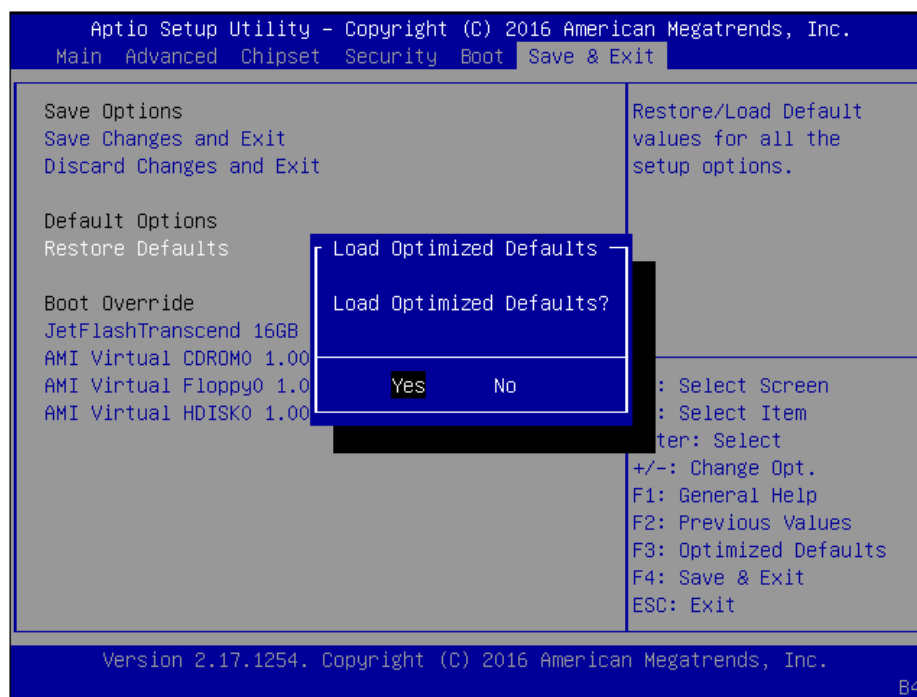
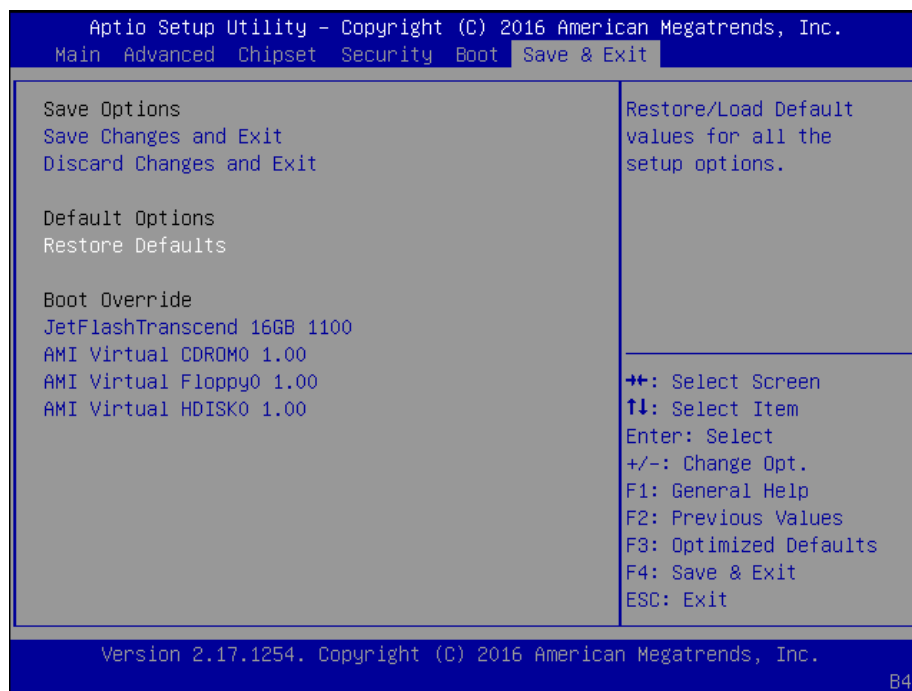
Save Changes and Exit: exit system setup after saving the configuration changes



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

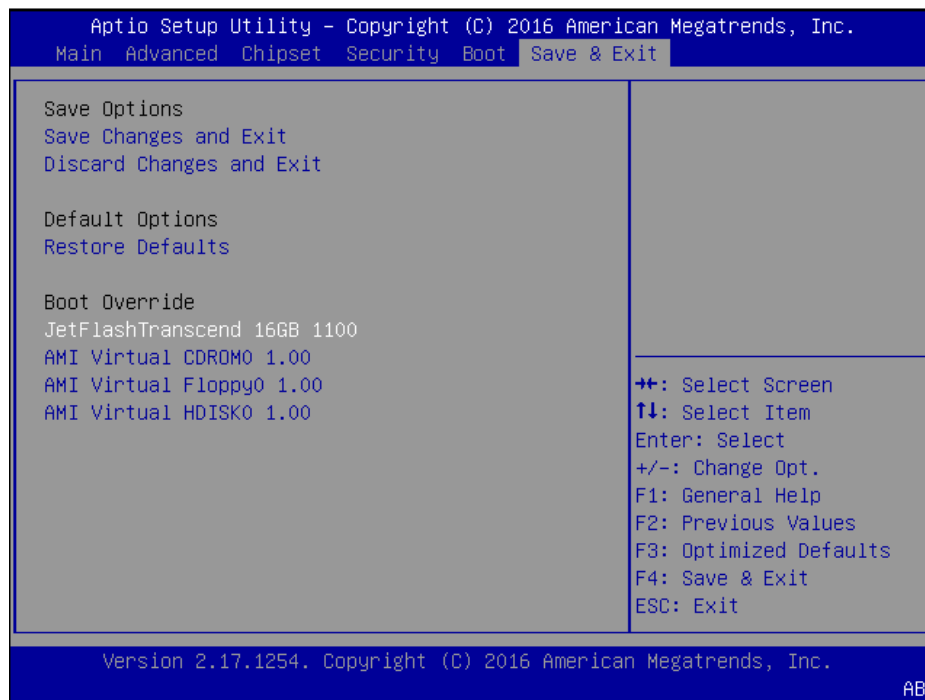


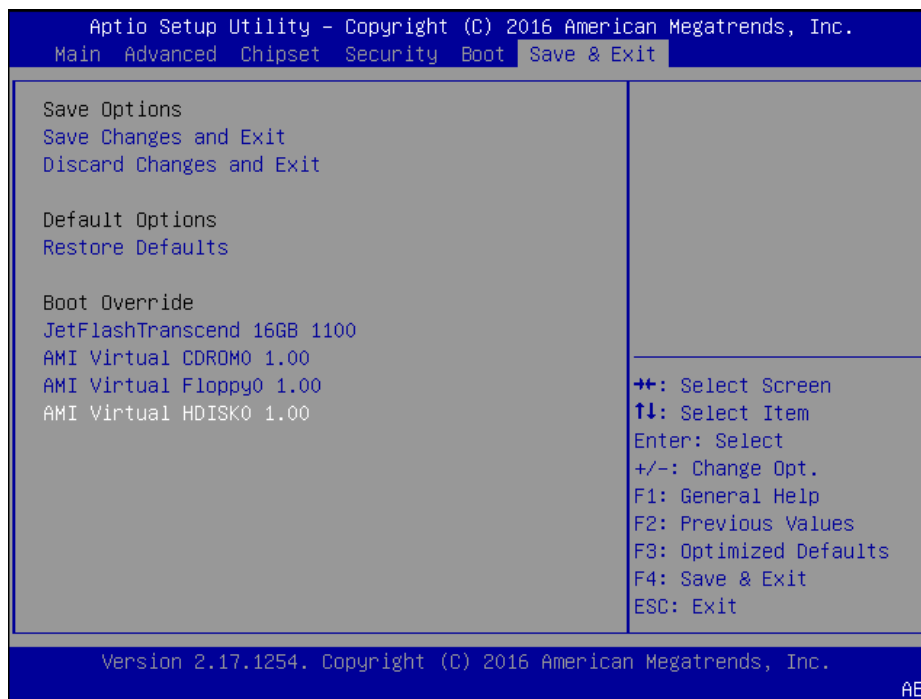
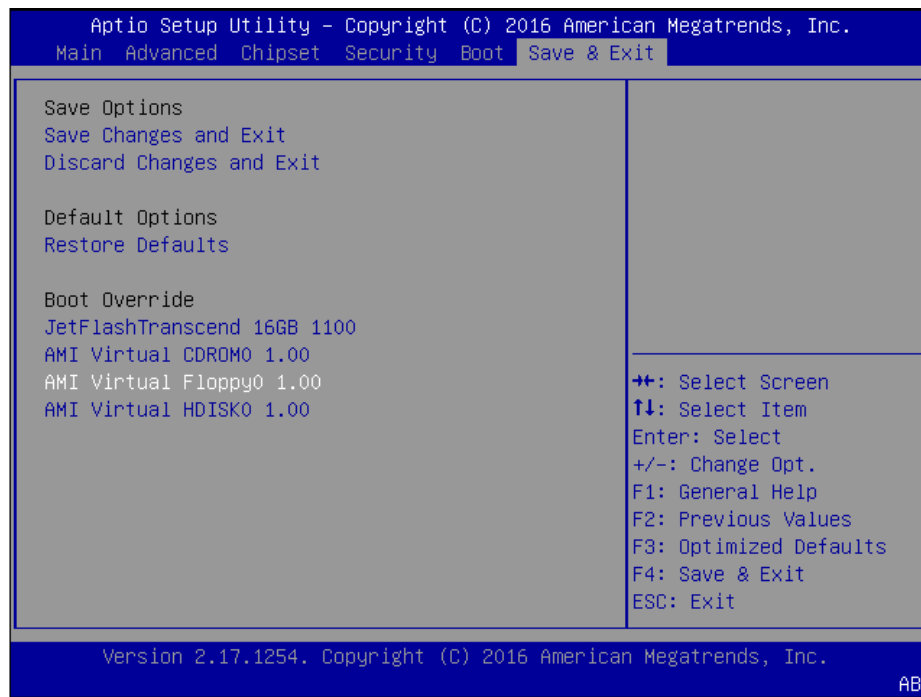
Restore Defaults: restore/load factory default setting for all setup parameters.



Boot Override

You may select a device under "Boot Override" for this function.



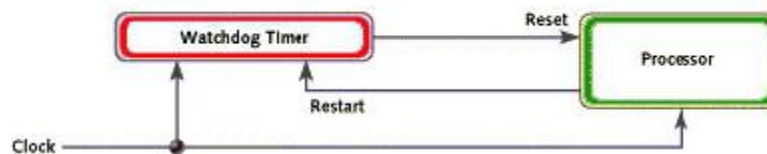


APPENDIX A: PROGRAMMING WATCHDOG TIMER

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 redirecting 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.

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 -xvzf 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.

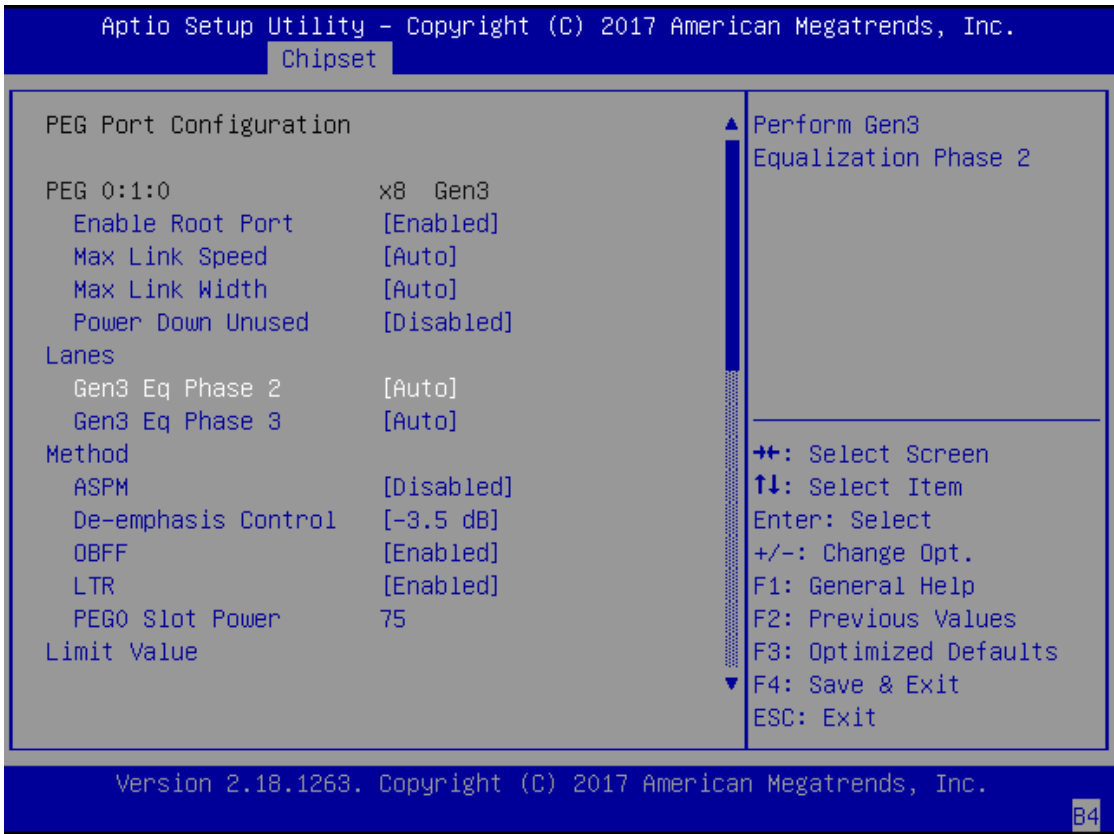
(5) Reboot the Guest OS.

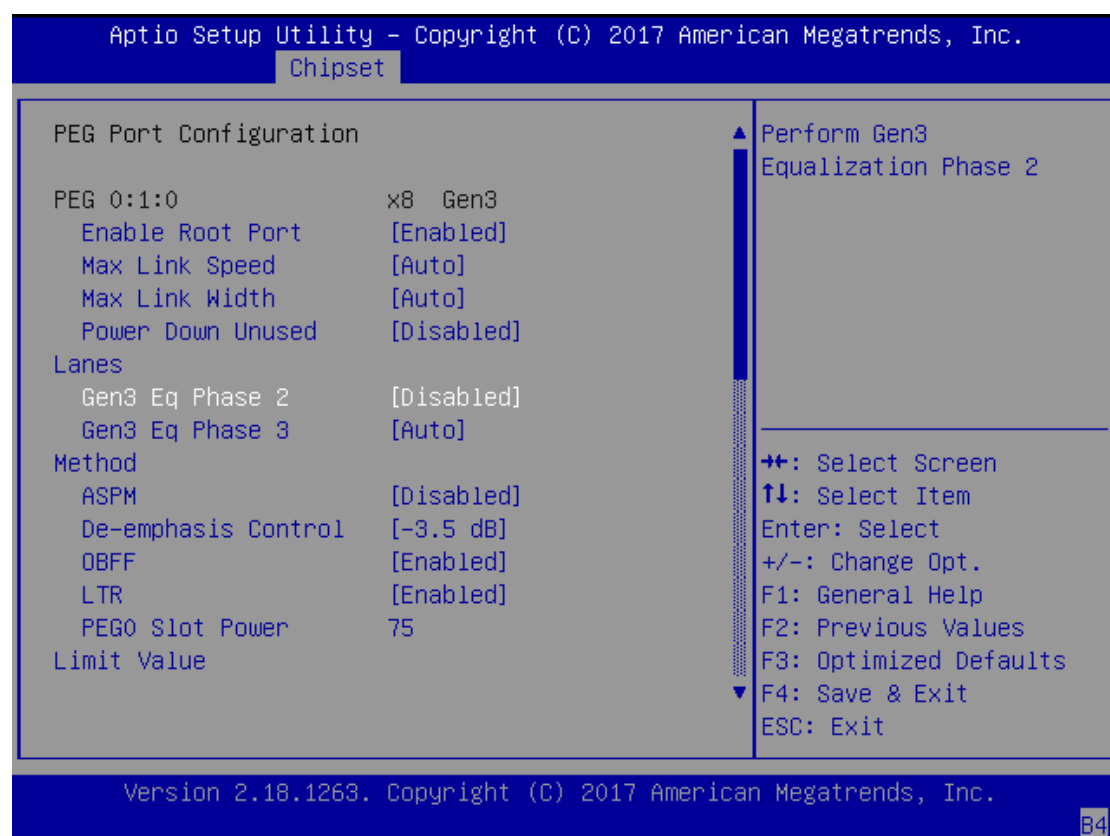
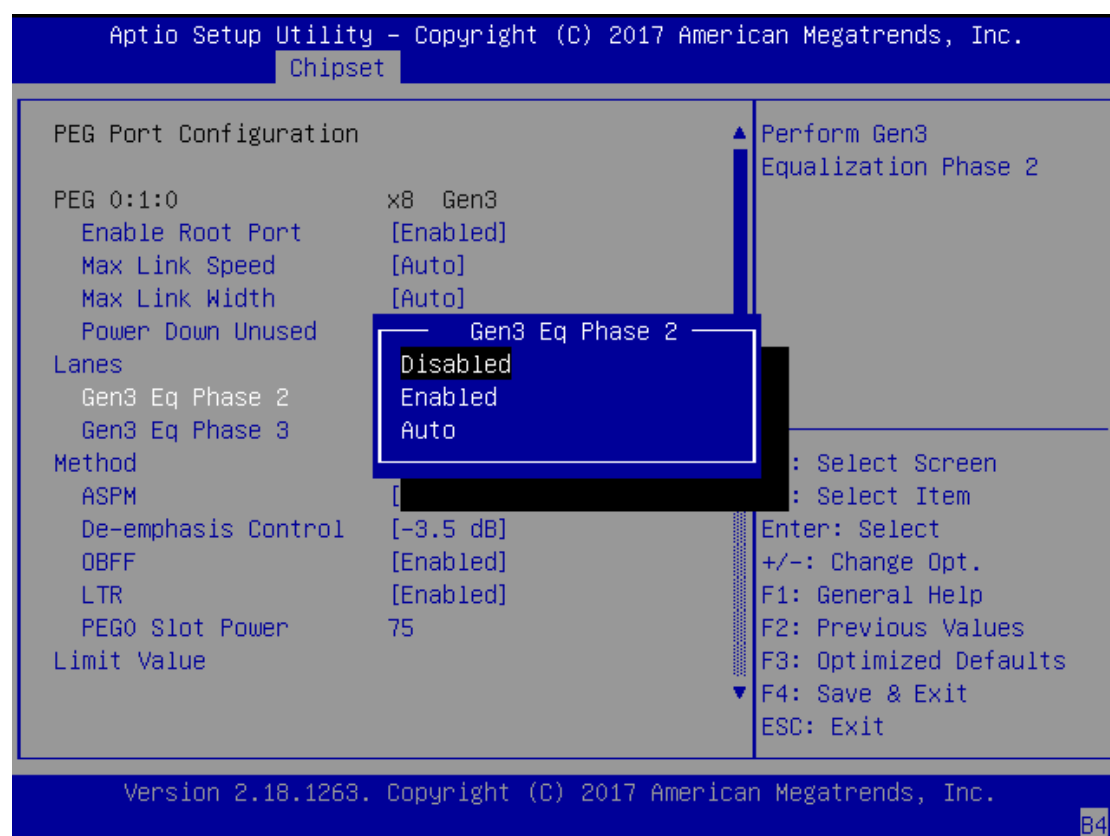
Note: It is still necessary for you to install "insmod parport.ko", "parport_pc.ko" and "ppdev.ko" Linux Kernel drivers in virtualization environment before executing the "ppdev_test" testing program.

APPENDIX E: PEG PORT CONFIGURATION FOR ALTERNATIVE CPU

This configuration is dedicated for a Kaby Lake processor going with LAN module IQM201.

- 1. Follow the instructions in [錯誤! 找不到參照來源。](#) to enter the BIOS setup utility.
- 2. Use [<-] / [>-] to select [Chipset] setup screen. Under this screen, use [↑] [↓] to select and enter "System Agent (SA) Configuration".
- 3. Select "PEG Port Configuration", enter "Gen3 Eq Phase 2" setting and change the value from "Auto" to "Disabled".





APPENDIX F: 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.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date