

Network Computing Platforms



**NCA-1210**

## **User Manual**

Rev 1.1

November 9, 2017

## Revision History

Rev	Date	Descriptions
0.1	2016/08/09	Preliminary
0.2	2016/08/22	Added notes about rubber pads
1.0	2016/09/12	Official release
1.1	2017/11/09	Modified Connector Pin Assignments

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## Online Resources

The listed websites are links to the online product information and technical support.

Resource	Website
Lanner	<a href="http://www.lannerinc.com">www.lannerinc.com</a>
Product Resources	<a href="http://www.lannerinc.com/support/download-center">www.lannerinc.com/support/download-center</a>
RMA	<a href="http://eRMA.lannerinc.com">http://eRMA.lannerinc.com</a>

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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

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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 the explosion could occur if the 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 another 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

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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)."

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## 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 vos yeux.
- N'effectuez aucune action qui pourrait creer un danger pour 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 considerez jamais que l'alimentation est coupee d'un circuit, verifiez toujours le circuit. Cet appareil genere, utilise et emet une energie radiofrequency et, s'il n'est pas installe et utilise conformement aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interferences dans les communications radio.

## Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacee par une autre d'un mauvais type.
- Jetez les piles usagees conformement aux instructions.
- L'installation doit etre effectuee par un electricien forme ou une personne formee a l'electricite connaissant toutes les specifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le cable d'alimentation lorsque vous deplacez l'appareil.
- La machine ne peut etre utilisee qu'a un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

## Sécurité de fonctionnement

- L'équipement électrique genere de la chaleur. La temperature ambiante peut ne pas etre adequate pour refroidir l'équipement a une temperature de fonctionnement acceptable sans circulation adaptee. Verifiez que votre site propose une circulation d'air adequate.
- Verifiez que le couvercle du chassis est bien fixe. La conception du chassis permet a l'air de refroidissement de bien circuler. Un chassis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destine aux composants internes.
- Les decharges electrostatiques (ESD) peuvent endommager l'équipement et gener les circuits electriques. Des degats d'ESD surviennent lorsque des composants electroniques sont mal manipules et peuvent causer des pannes totales ou intermittentes. Suivez les procedures de prevention d'ESD lors du retrait et du remplacement de composants.  
- Portez un bracelet anti-ESD et veillez a ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps a la terre en touchant la partie metallique du chassis. Verifiez regulierement la valeur de resistance du bracelet antistatique, qui doit etre comprise entre 1 et 10 megohms (Mohms).

## Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le cable de mise a la terre de l'équipement a la terre.
- Une bonne mise a la terre (connexion a la terre) est tres importante pour proteger l'équipement contre les effets nefastes du bruit externe et reduire les risques d'electrocution en cas de foudre.
- Pour desinstaller l'équipement, debranchez le cable de mise a la terre apres avoir eteint

l'appareil.

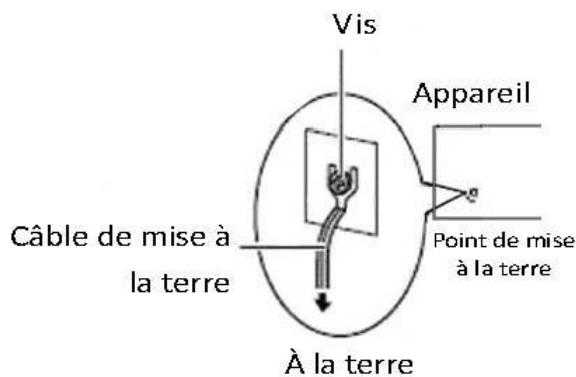
- Un cable de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm<sup>2</sup> ou 10 AWG.

## 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 NCA-1210. Lanner's NCA-1210 is a value combination of form factor and computing processor. The compact desktop empowered by Intel Atom C2358/C2558 CPU proves to be the cost-effective network gateway for small and medium enterprises, retail, branch office and other edge security applications. The processor delivers ideal performance and power balance and is programmed with Intel QuickAssist Technology for accelerated cryptographic engine. Though in compact desktop form factor, NCA-1210 supports DDR3 1333 or 1600 MHz up to 16GB, offering high memory efficiency.

Regarding the I/O interface, NCA-1210 comes with four RJ-45 GbE LAN ports, one RJ-45 console port, two USB 2.0 Type-A ports and four SMA antenna holes. The LAN ports are programmed with one pair of LAN bypass. Internally, the system integrates Marvell 88E1543 Quad PHY for improved networking capability. For wireless connectivity, NCA-1210 supports dual mini PCIe slots.

For cooling purpose, NCA-1210 supports one cooling fan.

Here is the summary of the key features:

- Intel® Atom™ processor C2358 (2-core) /C2558 (4-core)
- Marvell 88E1543 PHY integrated
- 4 x RJ45 GbE LAN ports, 2 x USB 2.0 ports, 1 x RJ45 console port
- 1 pair of LAN Bypass
- 1 x DDR3L SODIMM max. up to 16GB memory
- 2 x Mini-PCIe sockets with SIM readers
- 4 x SMA antenna holes
- 1 x SATA 2.5" SSD tray or 1 x SATADOM socket

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

## System Specification

<b>Processor Options</b>	Intel® Atom™ processor C2358 (2-core) /C2558 (4-core)
<b>Core Number</b>	2 or 4
<b>Chipset</b>	SoC
<b>BIOS</b>	AMI SPI BIOS

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<b>System Memory</b>		1 x DDR3 1333 or 1600 MHz, 204-pin, Non-ECC up to 16GB
<b>USB</b>		2 x USB 2.0 Type-A ports
<b>Console</b>		1 x RJ-45 Console port
<b>Storage</b>		1 x 2.5" SATA SSD tray or 1 x SATADOM (the drive nor DOM is not included)
<b>Networking</b>	LAN	4 x RJ-45 10/100/1000 Mbps LAN ports
	Controller	Intel SoC Integrated with Marvell 88E1543 PHY
	Bypass	1 pair of LAN bypass
<b>Expansion</b>		2x MINI-PCIe with SIM slot
<b>Antenna</b>		4 x SMA antenna holes
<b>Thermal</b>		1 x cooling fan
<b>Physical Characteristics</b>	Form Factor	Desktop
	Weight	1 kg
	Dimensions	185.4 mm x 44.0 mm x 137.1 mm (W x D x H)
	Mounting Options	Rackmount
<b>Environment</b>	Operating Temperature	0 ~ 40°C
	Non-operating Temperature	-40 ~ 70°C
	Ambient Humidity	5~90%, non-condensing
<b>Power</b>	Adapter	36W power adapter
	Power supply	100~240 V @50~60 Hz
<b>Reliability</b>	Watchdog	Yes
	Internal RTC with Li-battery	Yes
<b>Operating System</b>		Windows 7/8 Linux Kernel 2.6 or above
<b>Certifications</b>	EMC	CE/FCC Class A, RoHS

## Ordering Information

<b>NCA-1210A</b>	Network Security Appliance with Intel® Atom™ processor C2558, 1x DDR3 SODIMM slot, 1x RJ45 Console, 2x USB, 2x Mini PCI-E, 4x Gbe RJ45 with 1 pair bypass, optional 1x 2.5" HDD support / SATA DOM
<b>NCA-1210B</b>	Network Security Appliance with Intel® Atom™ processor C2358, 1x DDR3 SODIMM slot, 1x RJ45 Console, 2x USB, 2x Mini PCI-E, 4x Gbe RJ45 without bypass, optional 1x 2.5" HDD support / SATA DOM
<b>NCA-1210C</b>	Network Security Appliance with Intel® Atom™ processor C2358, 1x DDR3 SODIMM slot, 1x RJ45 Console, 2x USB, 2x Mini PCI-E, 4x Gbe RJ45 with 1 pair bypass, optional 1x 2.5" HDD support / SATA DOM

## Package Contents

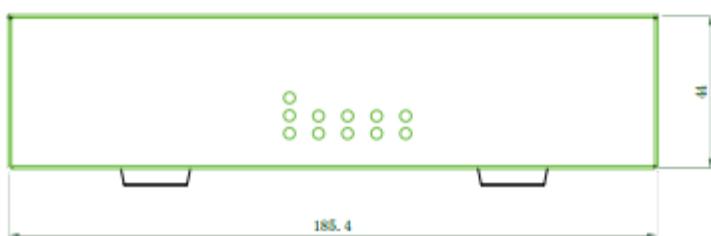
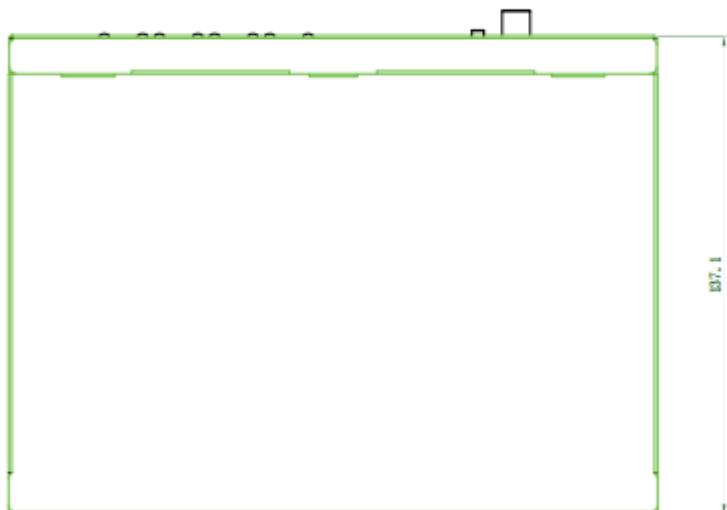
Please unpack your package carefully and inspect all the following items

- 1 – NCA-1210 Network Appliance
- 1 – Power adaptor
- 1 – Console cable
- 1 – Power cord
- 1 – Ethernet cable

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

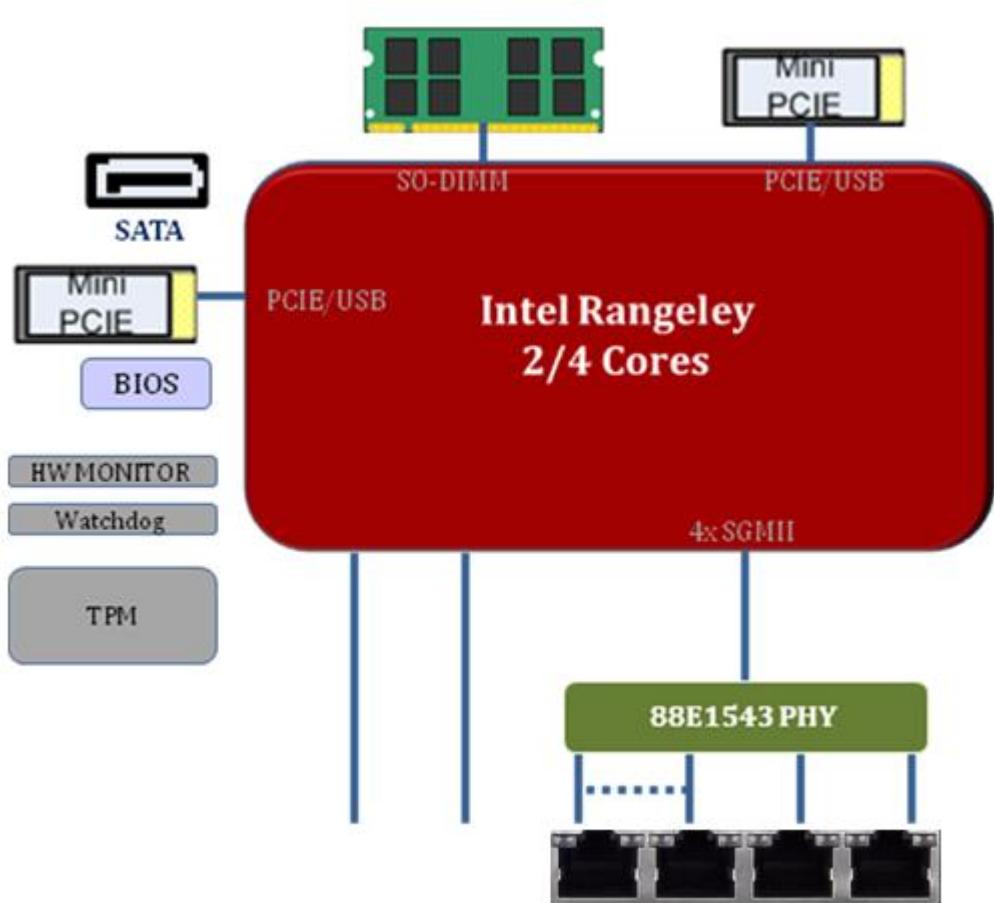
## Chapter 2: System Overview

### Mechanical Drawing

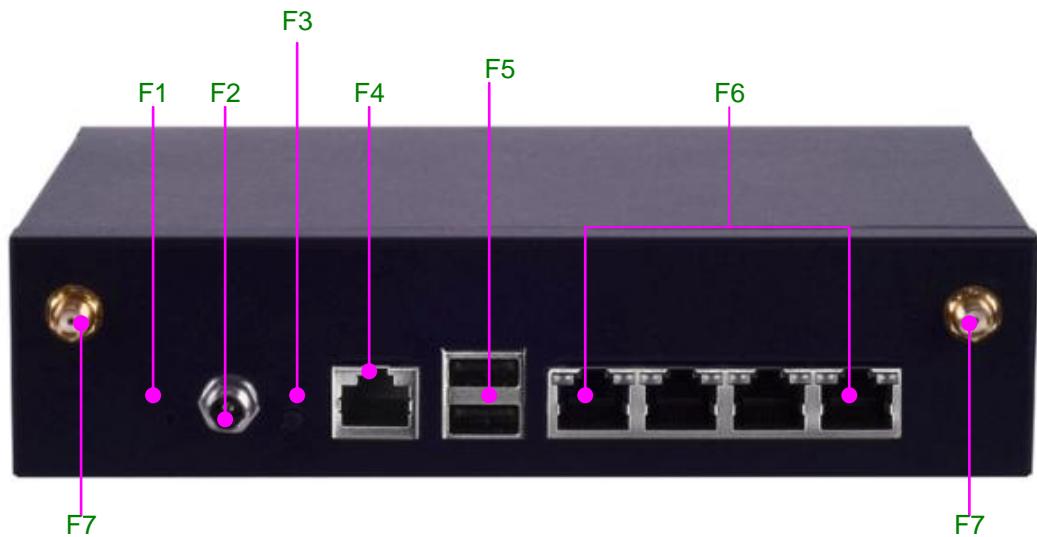


Unit: mm

## Block Diagram

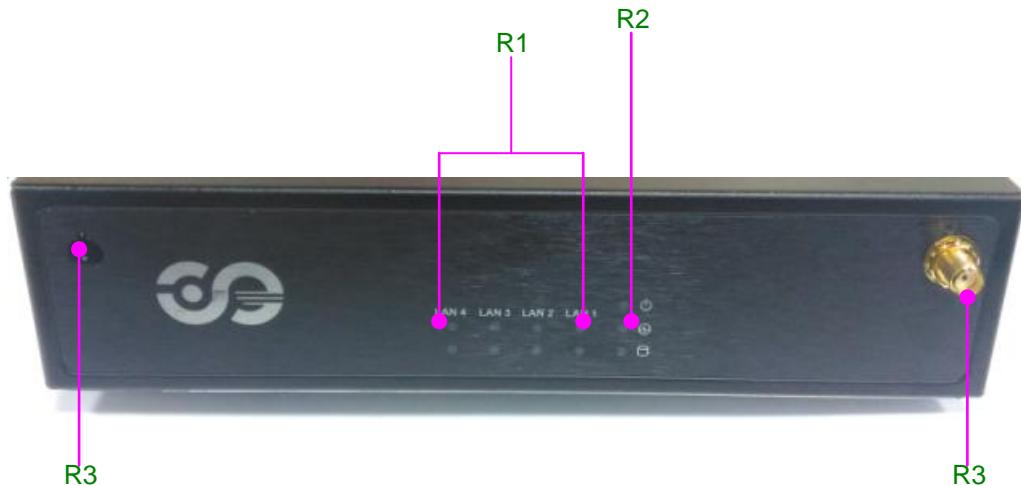


## Front I/Os



F1 Power	1 x Power on/off switch
F2 DC Jack	1 x DC input jack with lock
F3 Reset	1 x reset pin
F4 Console	1 x RJ-45 console port
F5 USB	2 x USB 2.0 Type-A ports
F6 LAN	4 x RJ-45 GbE LAN ports
F7 Antenna	2 x SMA antenna holes (antennas not included)

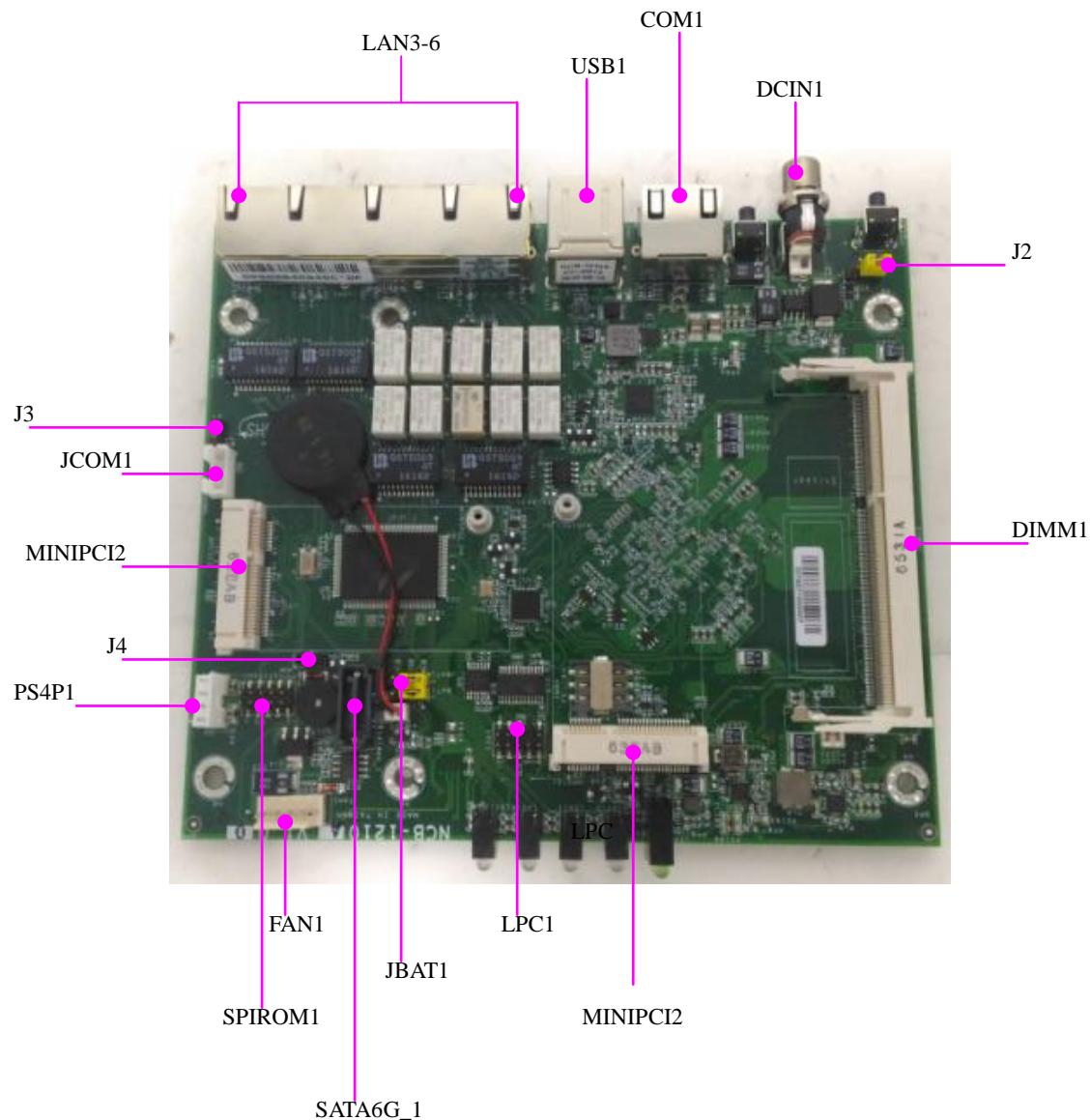
## Rear I/Os



<b>R1 LAN LED</b>	8 x LAN LED for speed and Link/ACT, 2 per RJ-45 port
<b>R2 System LED</b>	1 x POWER/BYPASS/SSD status LED set
<b>R3 Antenna</b>	2 x SMA antenna holes (antennas not included)

# Chapter 3: Board Layout

## Jumpers and Connectors on the Motherboard



## Jumper Setting and Connector Pin-out

### Jumper Settings

**J2 Reset Mode:** set the Reset Mode as Hardware (HW) Reset or Software (SW) Reset. Default “short pins” are 2-3 as Software Reset (1x3-pin 2.54mm 3P DIP).



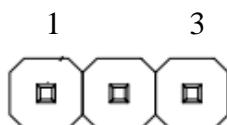
Pin	Description
1	HW Reset
<b>2</b>	<b>Switch input (default 1-2)</b>
<b>3</b>	<b>SW Reset</b>

**JBAT1:** CMOS Clear. The default “Short Pins” are 1-2 as “Normal”. When pins 2-3 are short, CMOS clear will be activated. ( 1x3-pin, 2.54mm 3P DIP )



Pin	Description
<b>1</b>	<b>VBAT</b>
<b>2</b>	<b>PCH_RTCRST_N</b>
3	GND

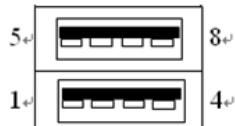
**J4 SATA DOM:** 3-pin jumper to enable or disable SATA DOM function. ( 1x3-pin 2.54mm 3P DIP ). The default “short pins” are Pin1-2.



Pin	Description
<b>1</b>	<b>P5V</b>
<b>2</b>	<b>SATA_DOM_SEL</b>
3	GND

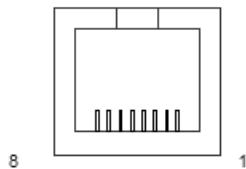
## Connector Pin Assignments

**USB1:** Dual USB 2.0 Type-A ports in double-stacked form factor



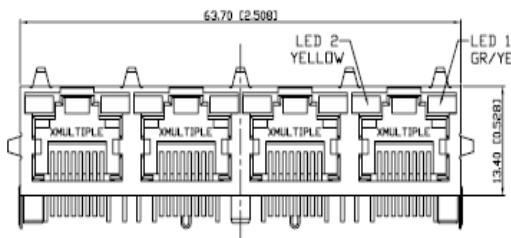
Pin	Description	Pin	Description
1	+P5V_USB0_L	5	+P5V_USB0_L
2	USB0_SB_L_DN	6	USB1_SB_L_DN
3	USB0_SB_L_DP	7	USB1_SB_L_DP
4	GND	8	GND

**COM1:** RJ-45 console port for serial console



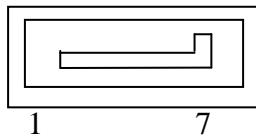
Pin	Description	Pin	Description
1	NC	5	GND
2	NC	6	LNSINA
3	LSSOUTA	7	NC
4	GND	8	NC

**LAN:** 4 x RJ45 10/100/1000 LAN Connectors



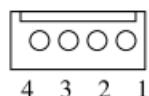
Pin	Description	
	Fast E-Net	Giga Net
1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
9	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	

**SATA6G\_1:** 7-pin SATA signal connector for SATA storage device



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

**PS4P1:** 4-pin SATA power connector at 2.54mm for SATA storage device



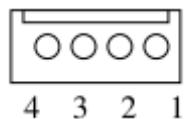
Pin	Description
1	12V
2	GND
3	GND
4	5V

**J3: GEN3 LAN Bypass Flash jumper setting**



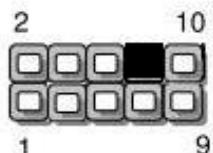
Function Description	Select Pin
Normal	1-2
Flash	2-3

**JCOM1: GEN3 LAN Bypass Flash pin header**



Pin	Description
1	P3VSB
2	NXP_RXD
3	GND
4	NXP_TXD

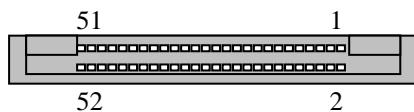
**LPC1: 2x10-pin low pin count at 2.0mm Pin header DIP**



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

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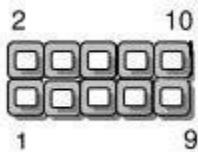
### MPCIE1/2: 2 x mini-PCIe socket



<b>Pin</b>	<b>Description</b>	<b>Pin</b>	<b>Description</b>
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

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**SPIROM1:** 2x10-pin SPIROM at 2.0mm Pin header SMD for debugging 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

# 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 NCA-1210 completely and remove all power connections.
2. Remove the screws from the bottom and two sides, as circled in the figures below.



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



Notes: the four rubber pads at the bottom compartment are designed and pre-installed for desktop usages. The rubber pads may affect rackmount installation. You may remove them for rackmount purposes, but the screw holes will be exposed.

## Installing the System Memory

The motherboard supports DDR3 1333 or 1600 MHz, 204-pin, Non-ECC up to 16GB. Please follow the steps below to install the DIMM memory modules.

Notes: you may have to remove the SSD installation bracket first.

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 at a diagonal angle and press it down until it's firmly seated by the clips at both sides.

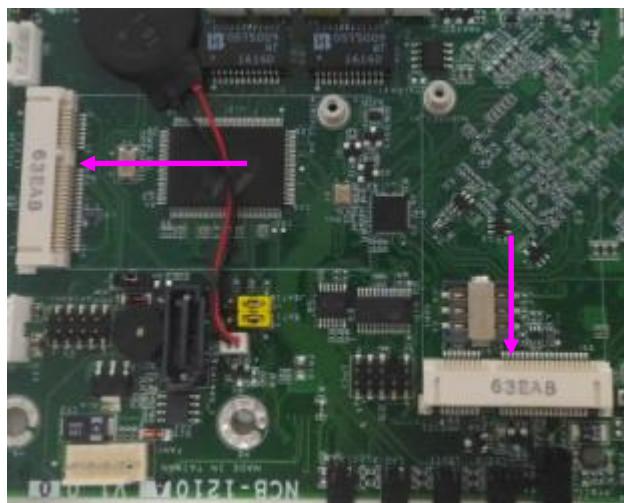


## Installing Mini-PCIe Modules

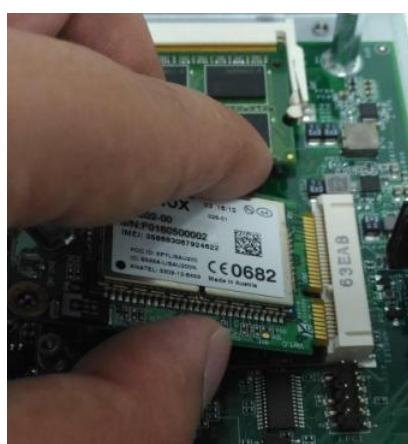
The motherboard provides two mini-PCIe sockets. Please follow the procedures below for installation.

Notes: you may have to remove the SSD installation bracket first.

1. Locate the mini-PCIe sockets.



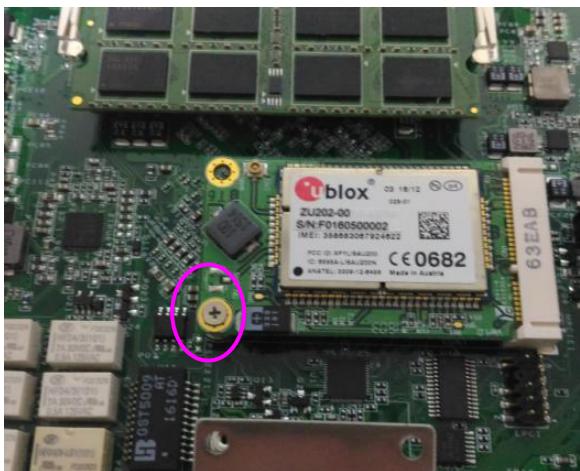
2. Insert modules as shown in the image below.



## Network Computing Platforms



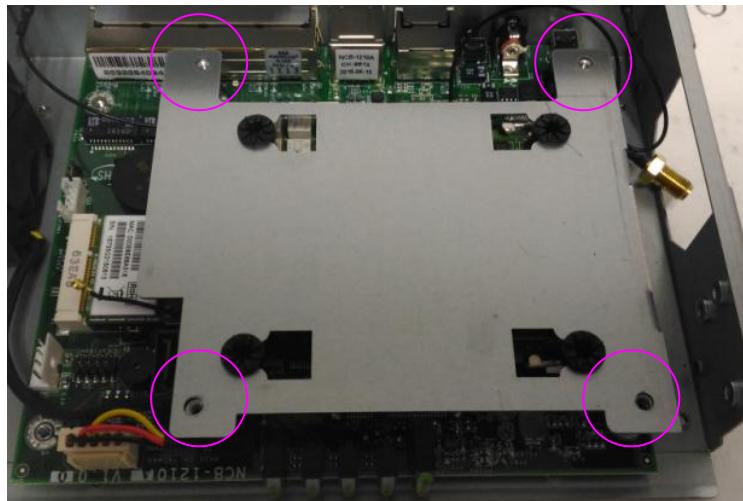
3. Press the module down and apply screws to secure it.



## Installing Disk Drives

The system supports 1 x 2.5" SATA SSD as data storage (SSD is recommended due to heat and vibration concerns). Please follow the steps below for installation.

1. Remove the four screws of the disk tray.

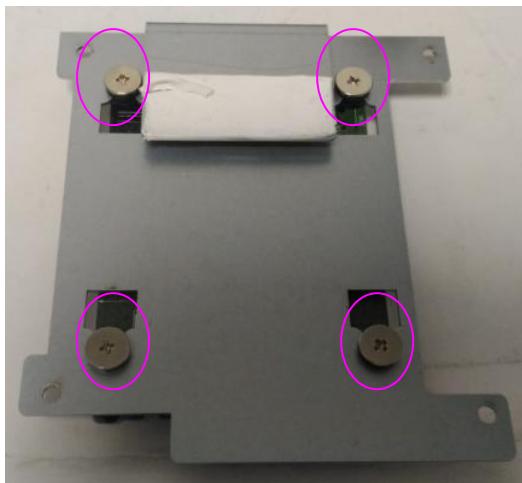


2. Take the tray out.
3. Turn the tray upside-down and place the SSD onto the tray. Please make sure the SATA connectors face the arrow of direction below.



## Network Computing Platforms

4. Turn the tray with SSD upside down and apply four screws.



5. Place the SSD-installed tray back onto the system. Apply four screws back.
6. Connect the SATA 7-pin signal cable and the SATA 4-pin power cable to their corresponding connectors on the motherboard.
7. Plug the standard 7+15 SATA connector to the SSD.



## Installing SMA Antenna (optional)

The system can be customized to enable SMA antenna connectivity. Please follow the steps below to install the antenna.

1. Plug the female connector of the SMA antenna cable to the "MAIN" and "ALT" connectors (antenna connector of a wireless network module), as shown in the image below.



2. Plug the male connector of the SMA antenna onto the designated port as shown in the image below.



3. Use the supplied rings to secure the male connector from the front panel.



## Network Computing Platforms

4. Tighten the rings and install the antenna. When installing the antenna, rotate it until it is tightened.

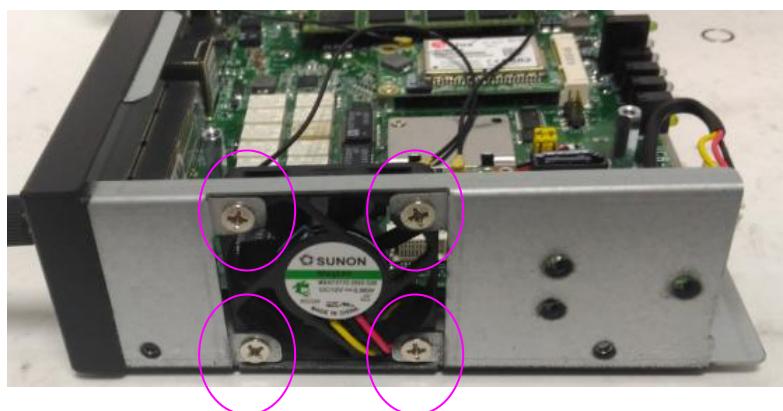


## Replacing Cooling Fans

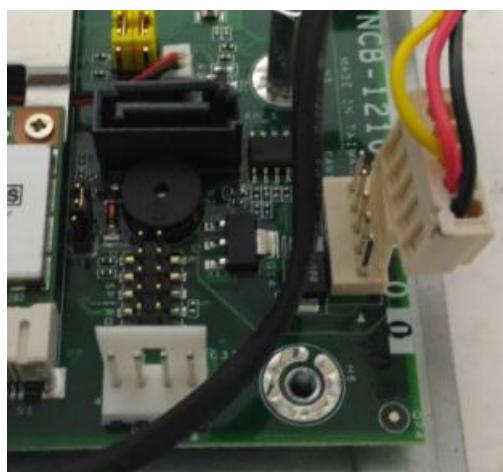
The system supports one cooling fan. To replace a worn-down fan, please follow the steps below.

Notes: make sure the power is completely off and unplugged.

1. Remove the screws circled below.



2. Remove the fan connector.



3. Take the fan out and install a new one.

# Chapter 5: BIOS Setup (TBD)

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 for 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

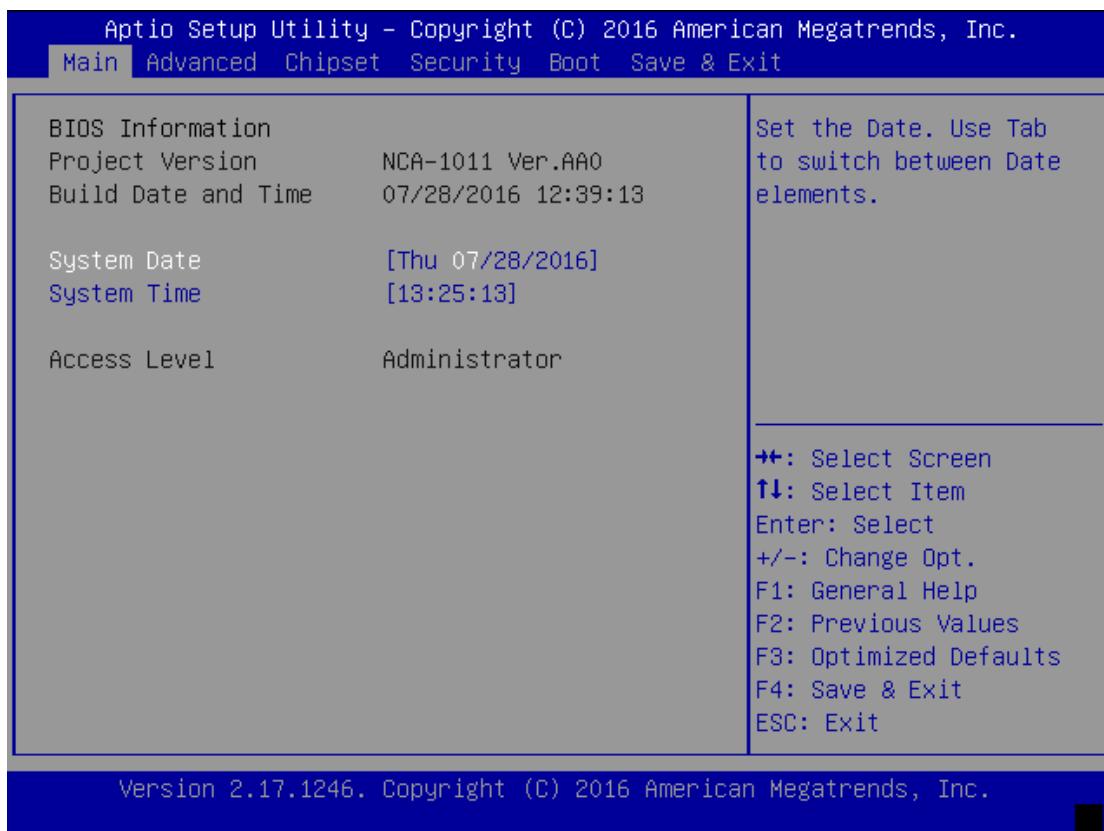
**+/-** = to adjust values for the selected setup item/option

**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

**Project Version:** displays version information

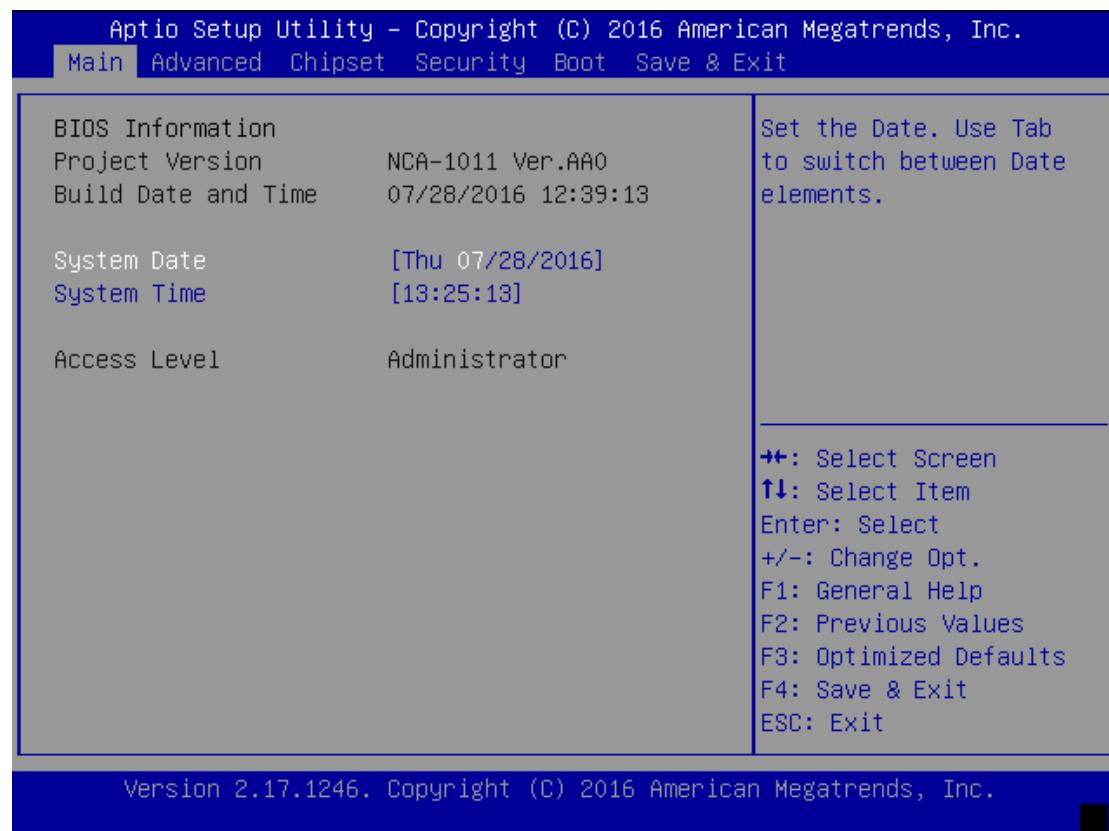
**Build Date and Time:** displays the date and time the BIOS was built.

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

**System Date:** Day/Month/Year

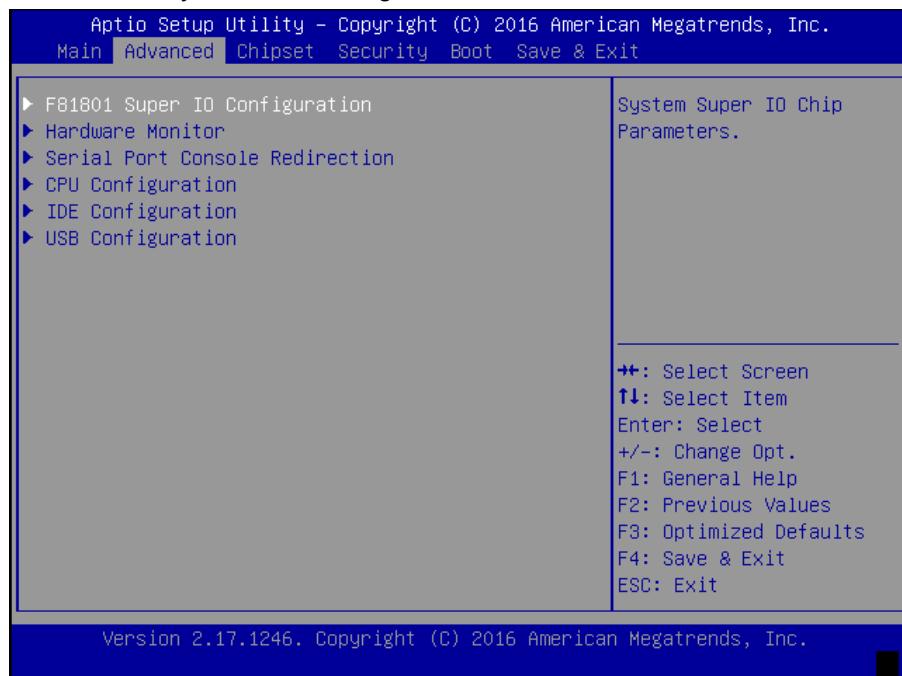
**System time:** Hour/Minutes/Seconds

**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.



### F81801 Super IO Configuration

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



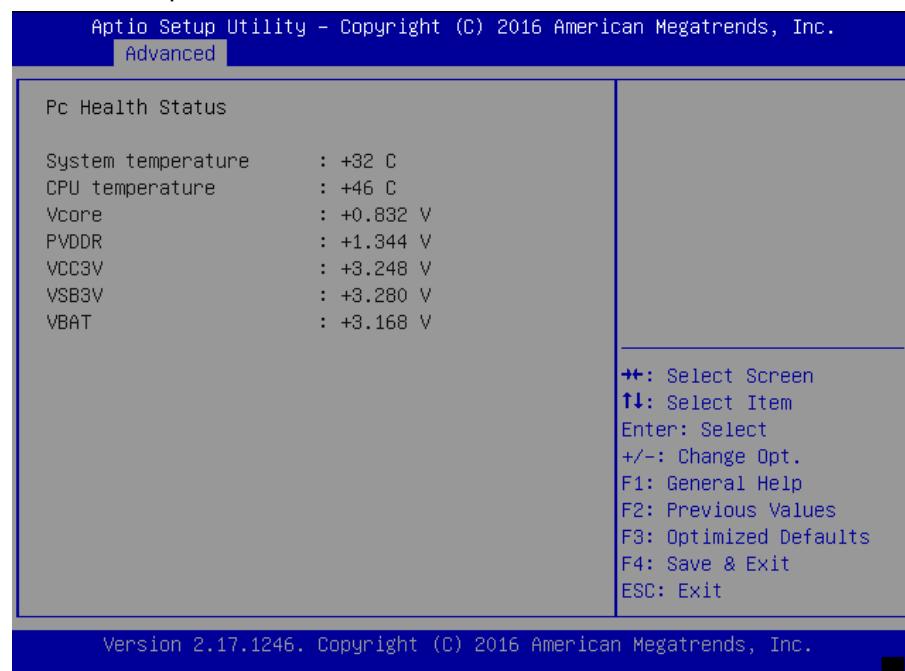
## Network Computing Platforms

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



## HW Monitor

This option allows you to view hardware health status. you may use [ $\uparrow$ ][ $\downarrow$ ] to select "Hardware Monitor" and press "Enter".

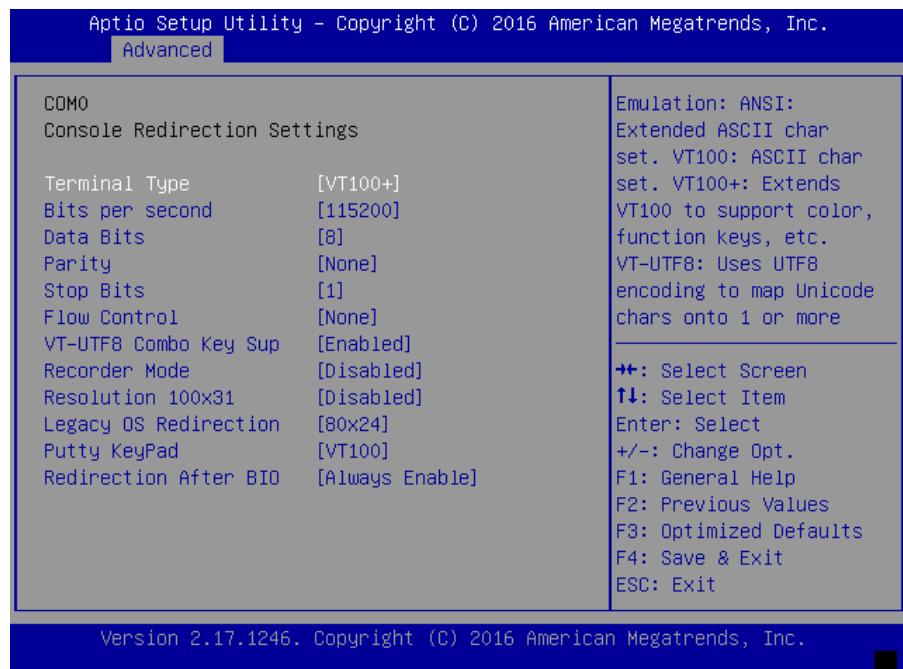
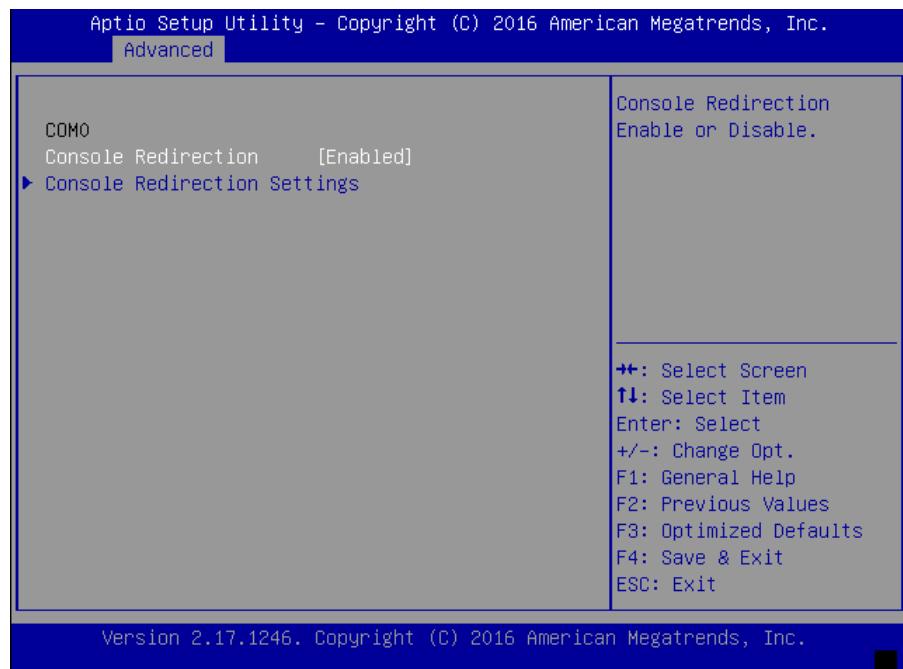


## Network Computing Platforms

### 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

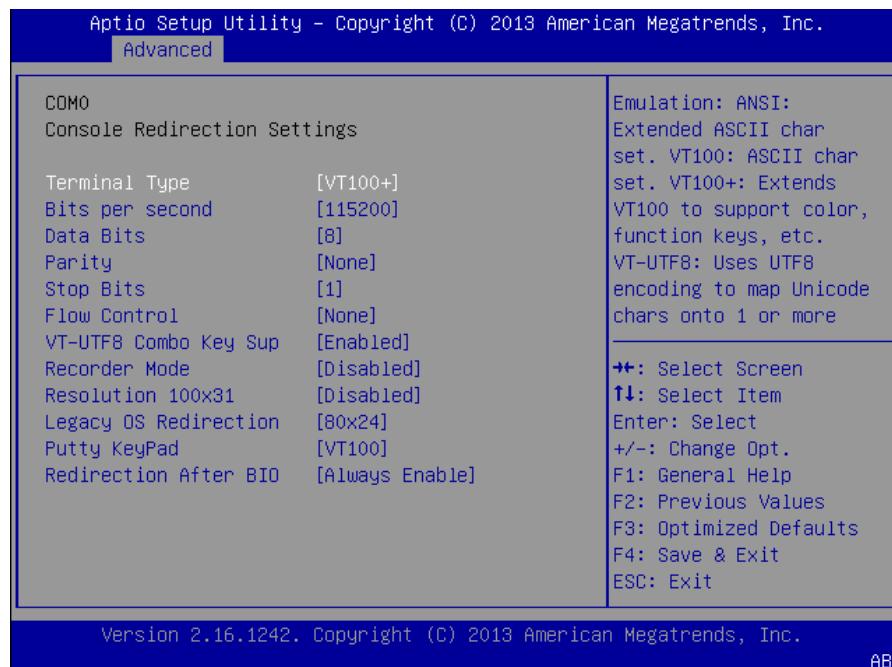
**Terminal Type:** the emulation configuration. Select “VT100”, “VT100+”, “VT-UTF8” or “ANSI”.

VT100: ASCII character set

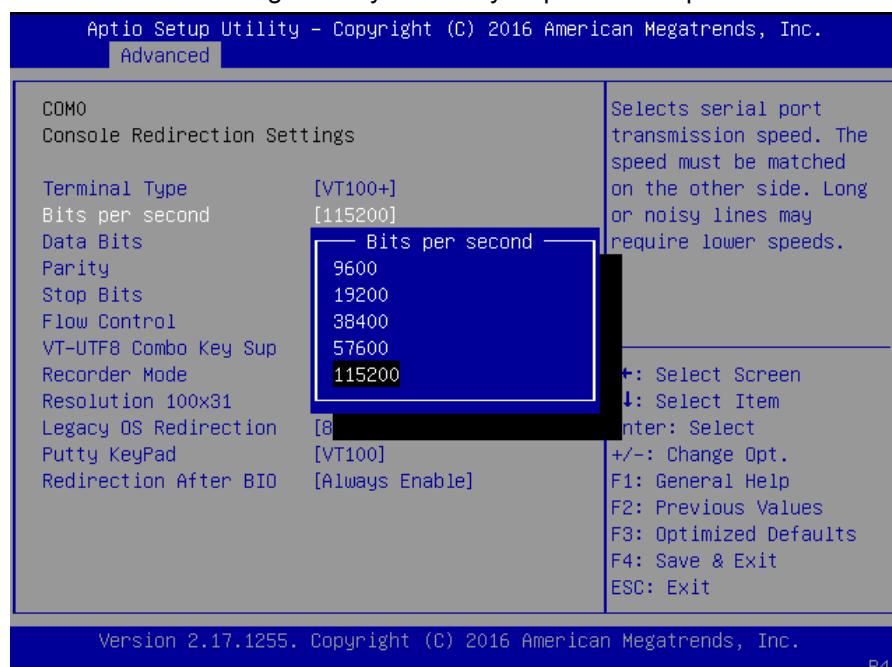
VT100+: extends VT100 to support color function keys

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

ANSI: Extended ASCII character set

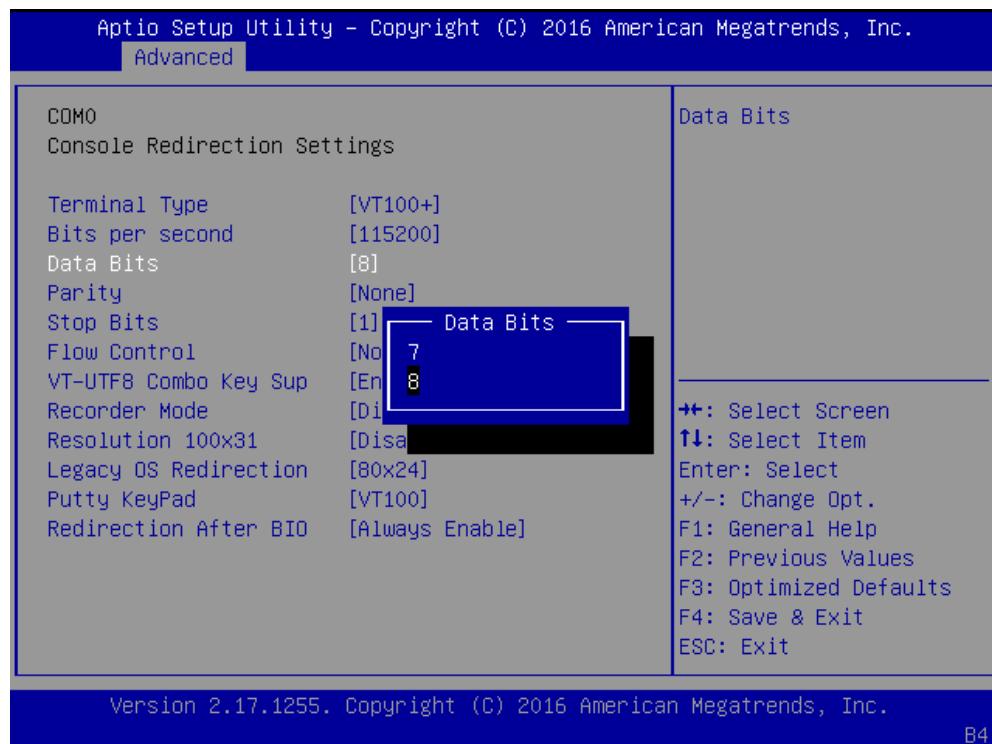


**Bits per second:** select “9600”, “19200”, “38400”, “57600”, or “115200” for bits per second. The Bps will determine serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds



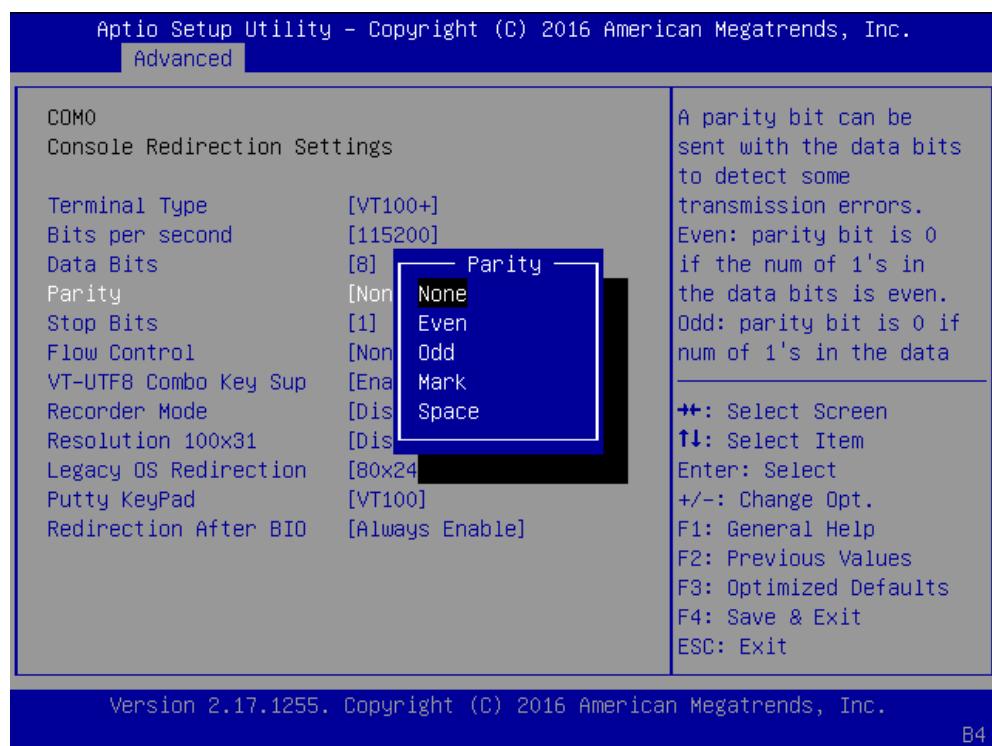
## Network Computing Platforms

**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.

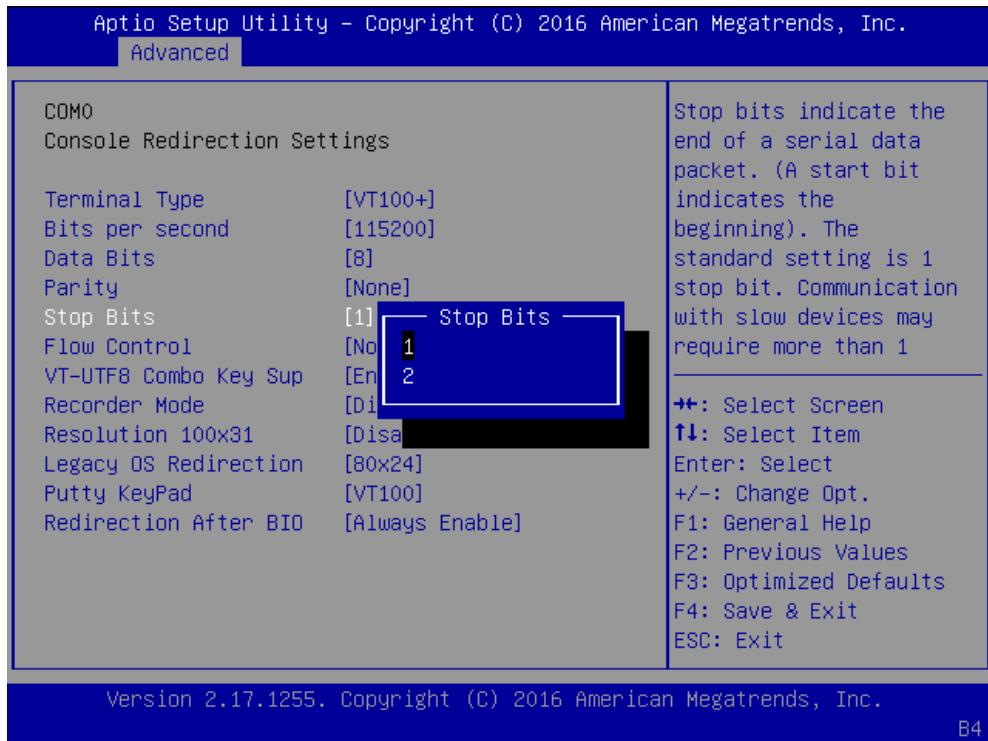
Select “None”, “Even”, “Odd”, “Mark” or “Space”.



## Network Computing Platforms

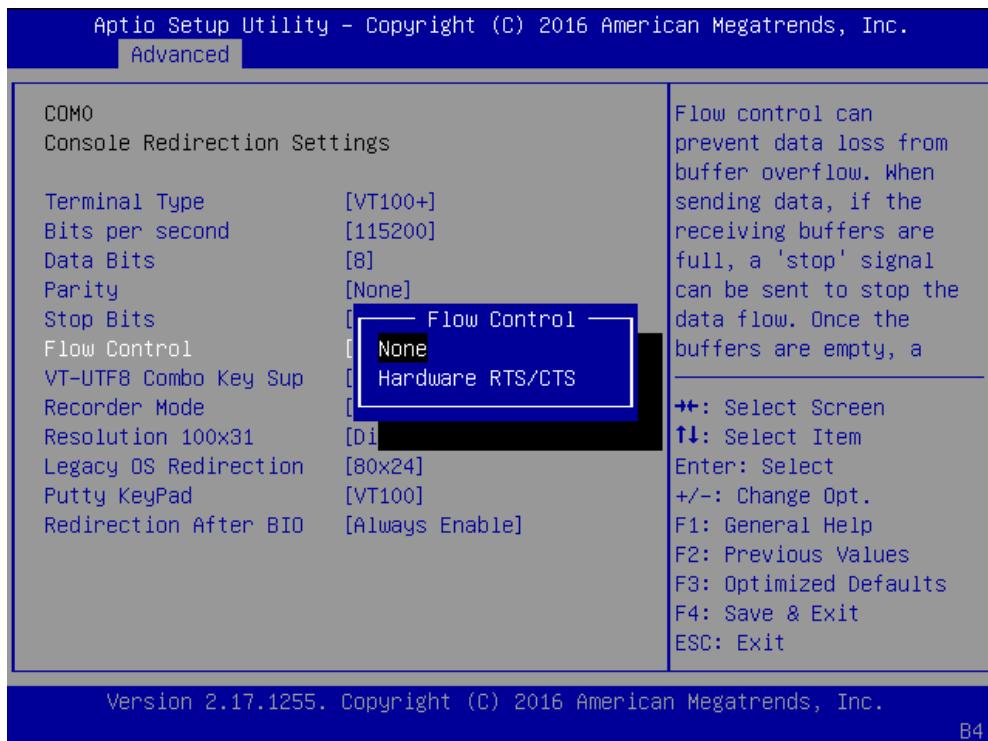
**Stop Bits:** stop bits indicate the end of a serial data packet. The standard is 1 stop bit.

Communication with slow devices may require more than 1.



B4

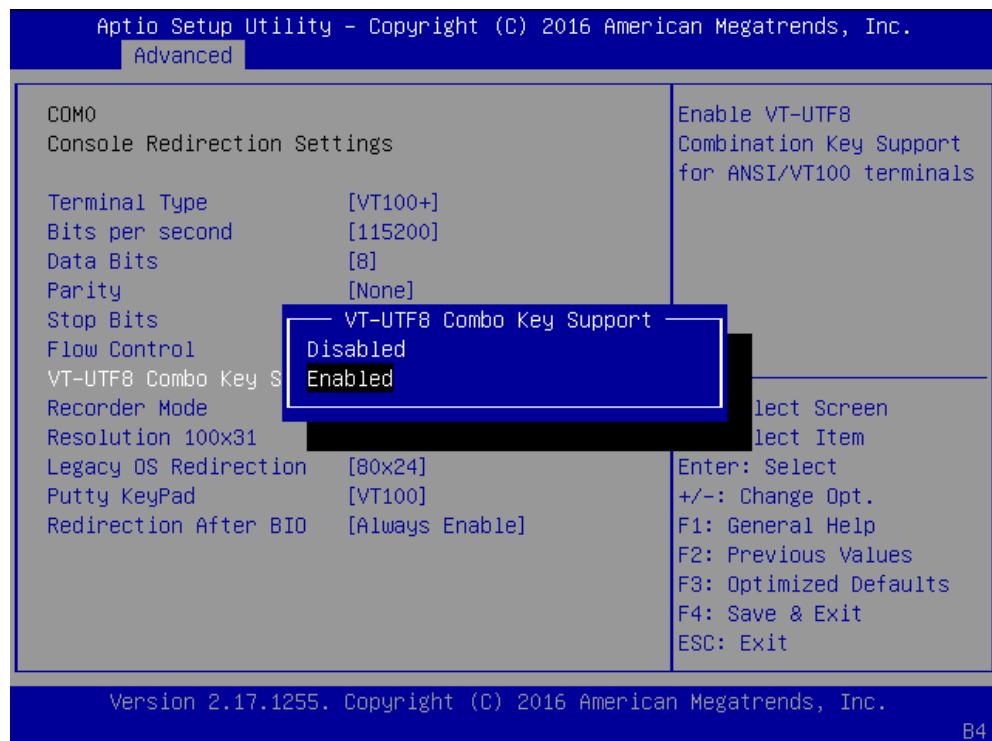
**Flow Control:** flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. You may select "None" or "Hardware RTS/CTS", depending on the circumstances.



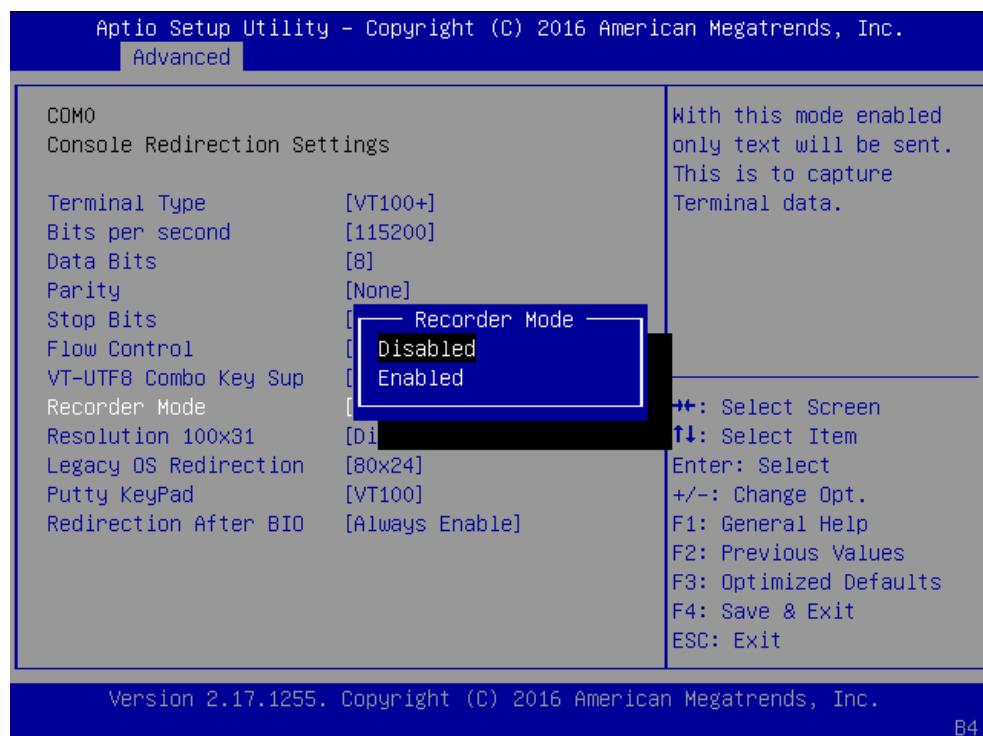
B4

## Network Computing Platforms

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

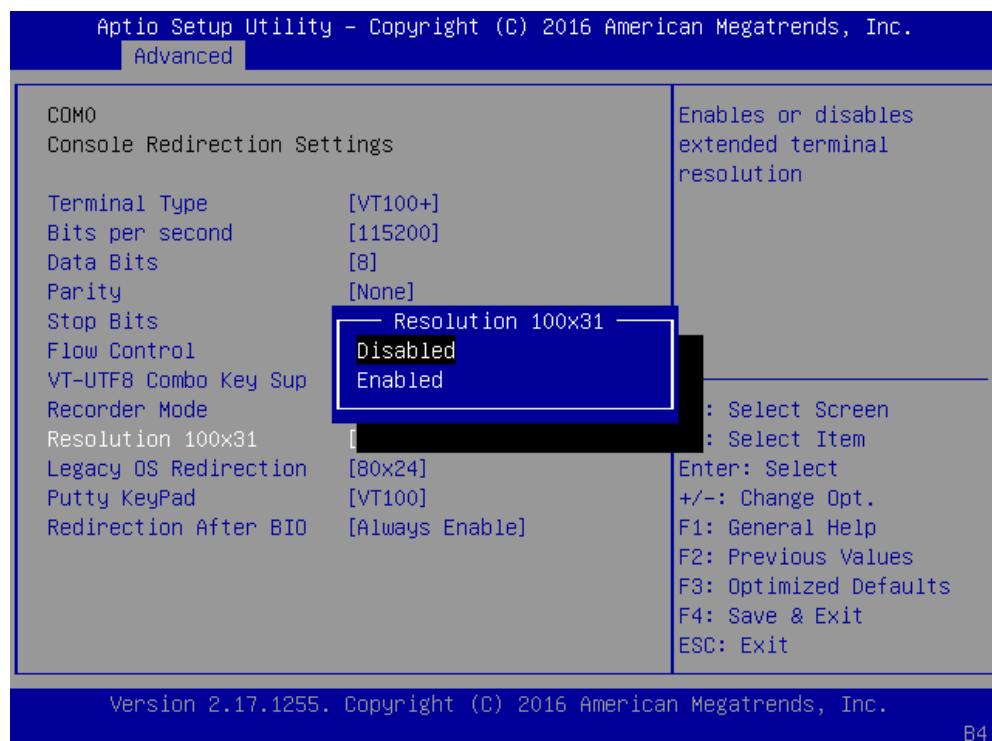


**Recorder Mode:** in this mode, when “Enabled”, only text will be sent. This is to capture terminal data.

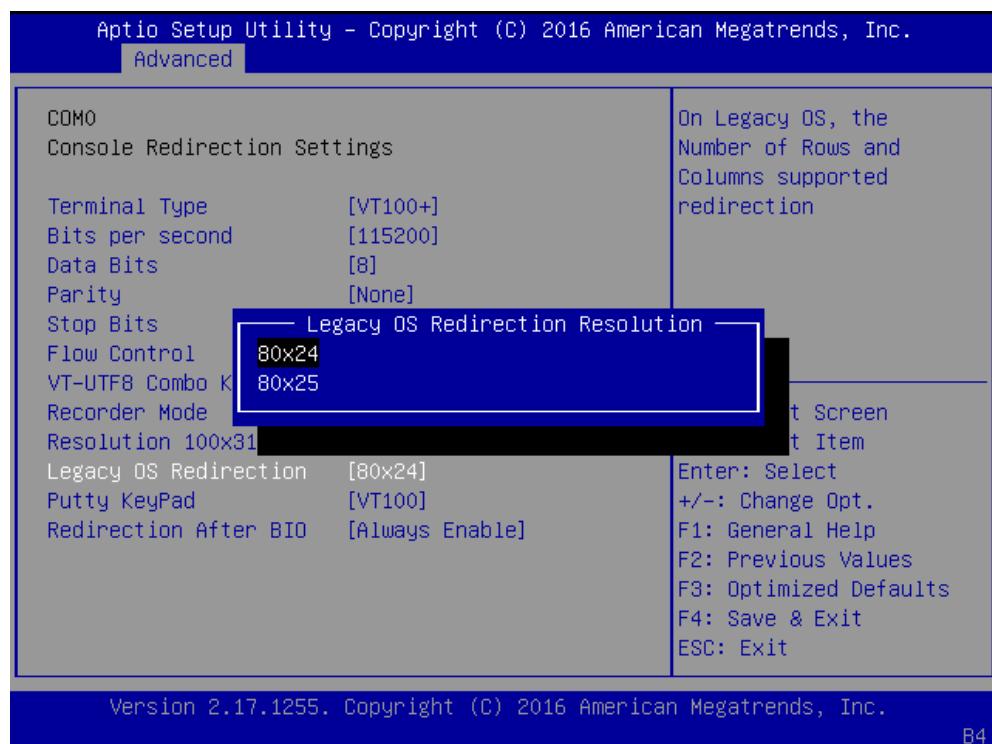


## Network Computing Platforms

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

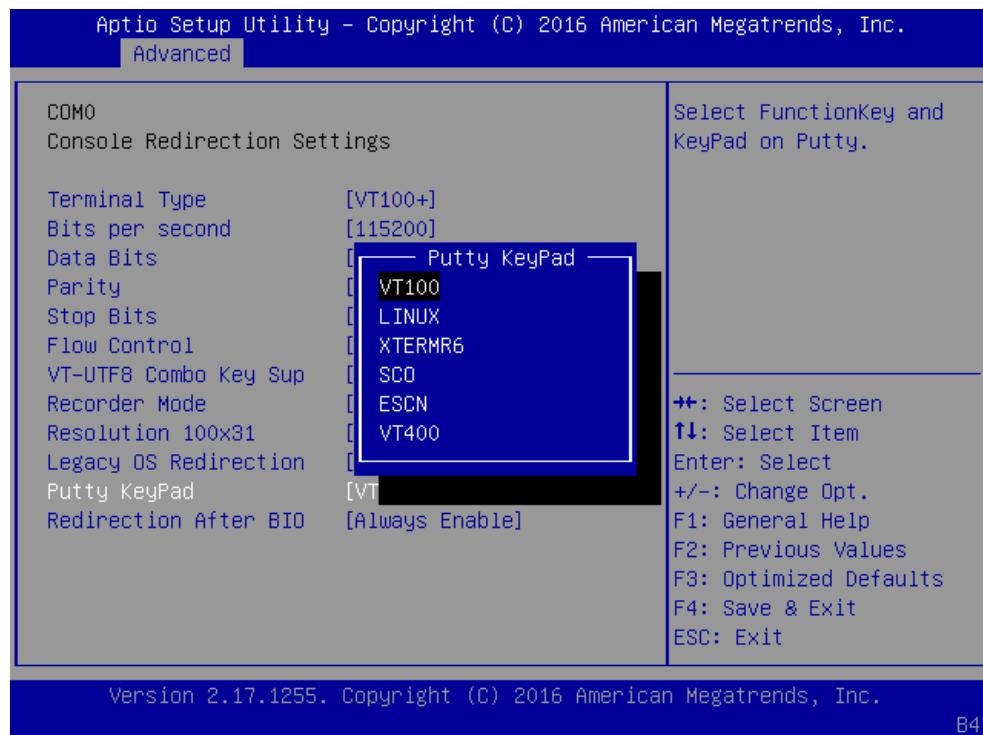


**Legacy OS Redirection Resolution:** select “80x24” or “80x25”. The default for this case is “80x24”.



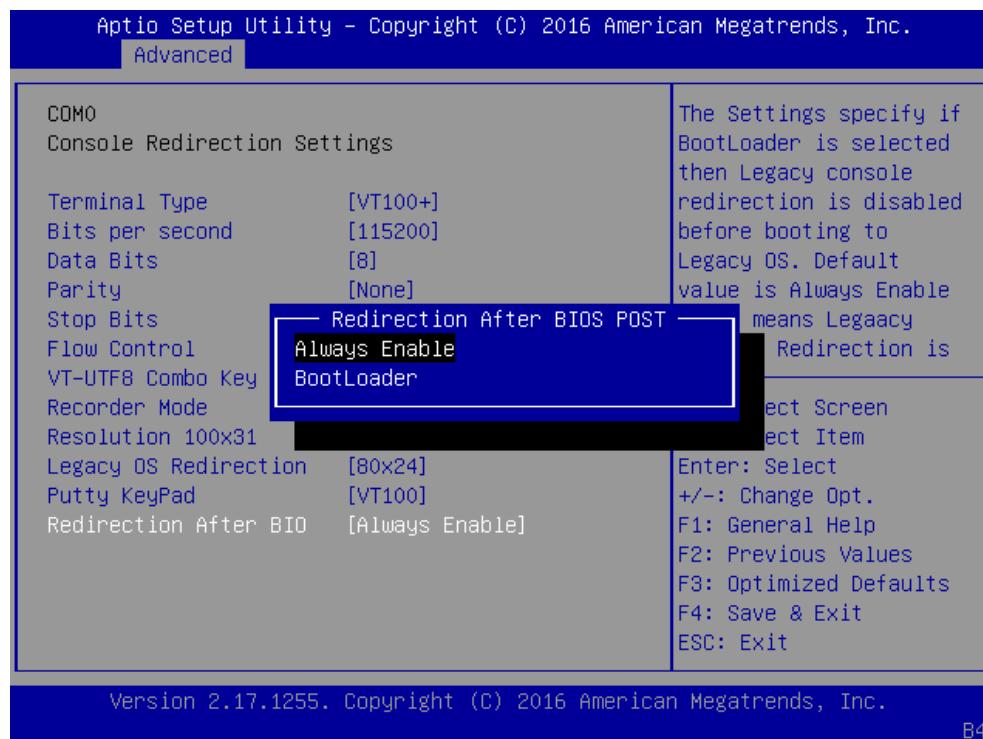
## Network Computing Platforms

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



B4

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



B4

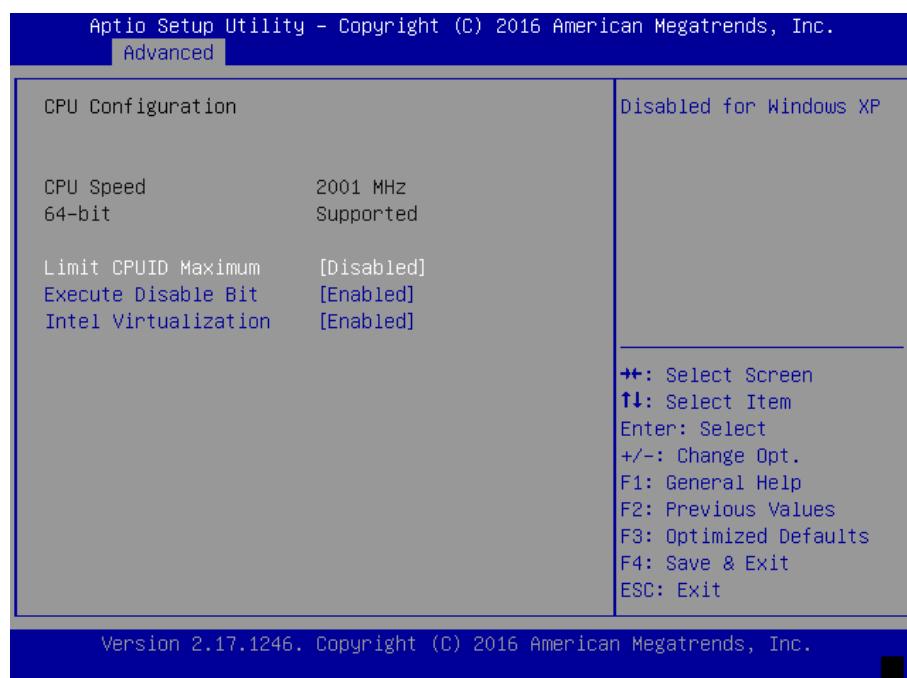
### CPU Configurations

This option allows you to configure CPU parameters.

**Limit CPUID Maximum:** When “Enabled”, the CPU will limit its maximum CPUID input value to 3 when the processor is queried. When “Disabled”, the CPU will function with its actual maximum CPUID values. For this case, leave it as “Disabled”.

**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.

**Intel Virtualization:** Enables or disables Intel Virtualization Technology. On a server or firewall/UTM/IPS operating mode, it is recommended to enable this feature so that multiple operating systems and applications will run in independent partitions.



## IDE Configuration

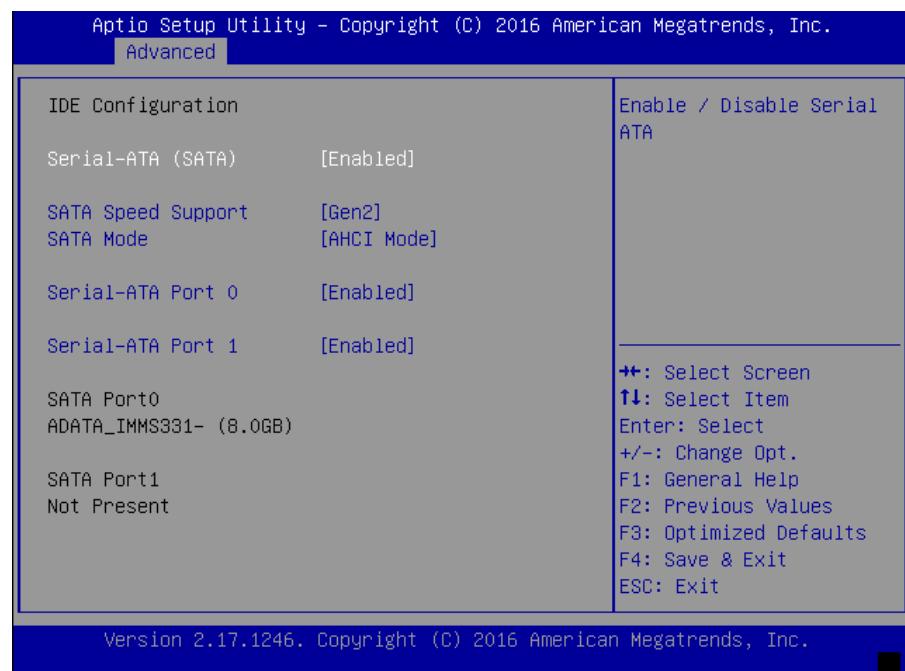
Press Enter to access items for SATA devices and settings.

**Serial-ATA (SATA):** enable or disable SATA function

**SATA Speed Support:** select SATA speed based on the generations defined by SATA specifications.

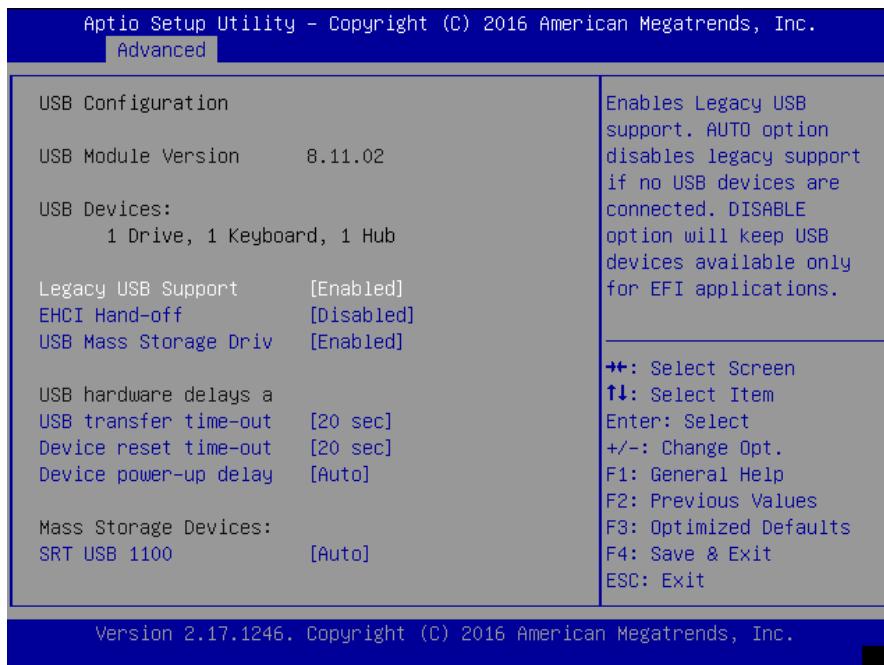
**SATA Mode:** the selection to determine the SATA mode for your storage devices. You may select “IDE” or “AHCI” mode.

**Serial-ATA Port 0/1:** enable or disable the SATA0/1 port



### 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 Driv:** 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 the default value. For example, it is 100ms as a root port.

## Chipset

Use [<--] / [-->] to select [Chipset] setup screen. Under this screen, you may use [↑][↓] to select "North Bridge" or "South Bridge" to configure the parameters.

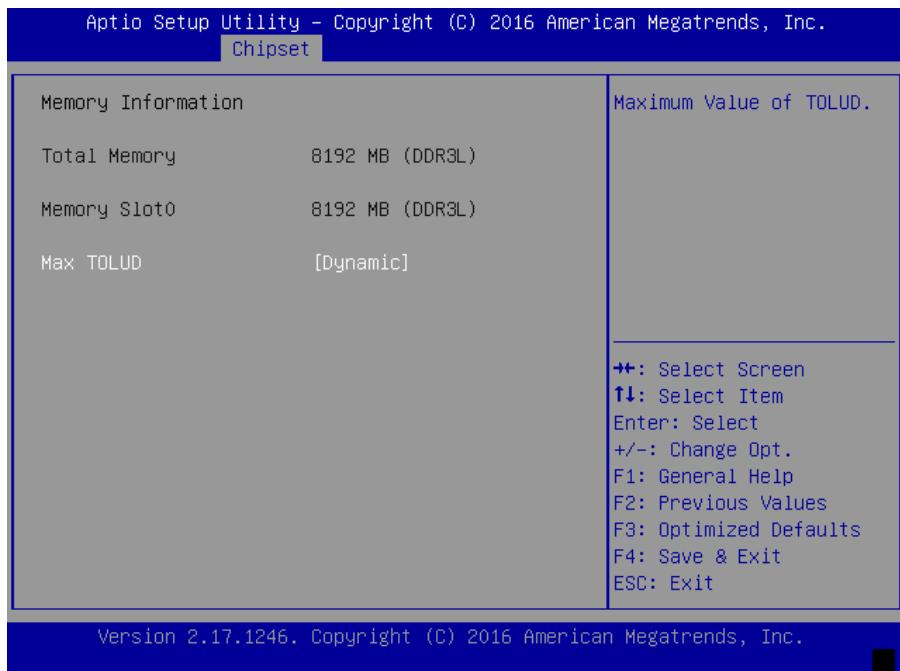


## North Bridge

### Memory Information

**Total Memory:** displays total memory

**Max TOLUD:** set the maximum value of TOLUD.

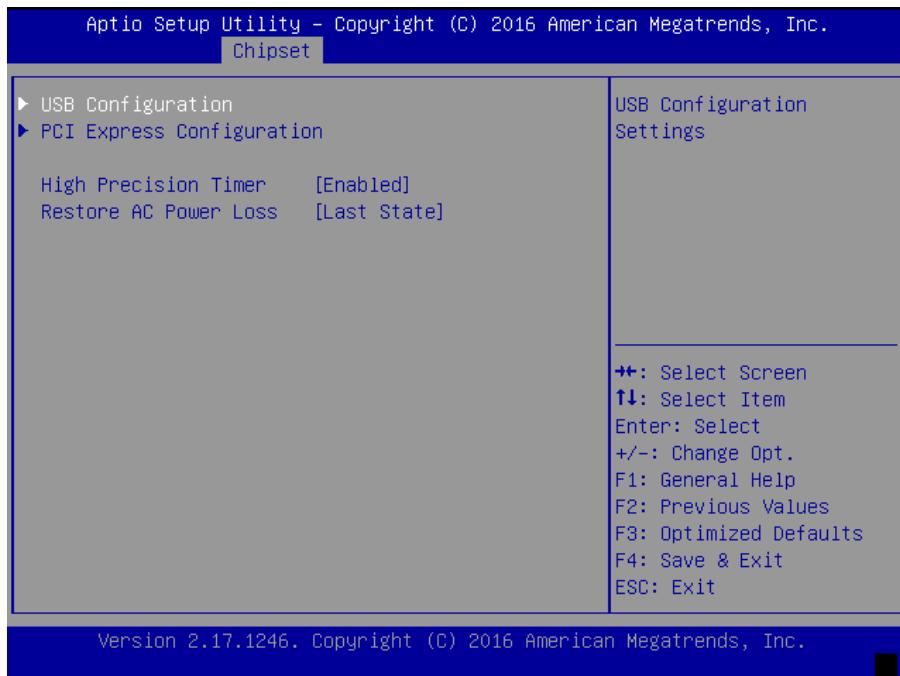


## Network Computing Platforms

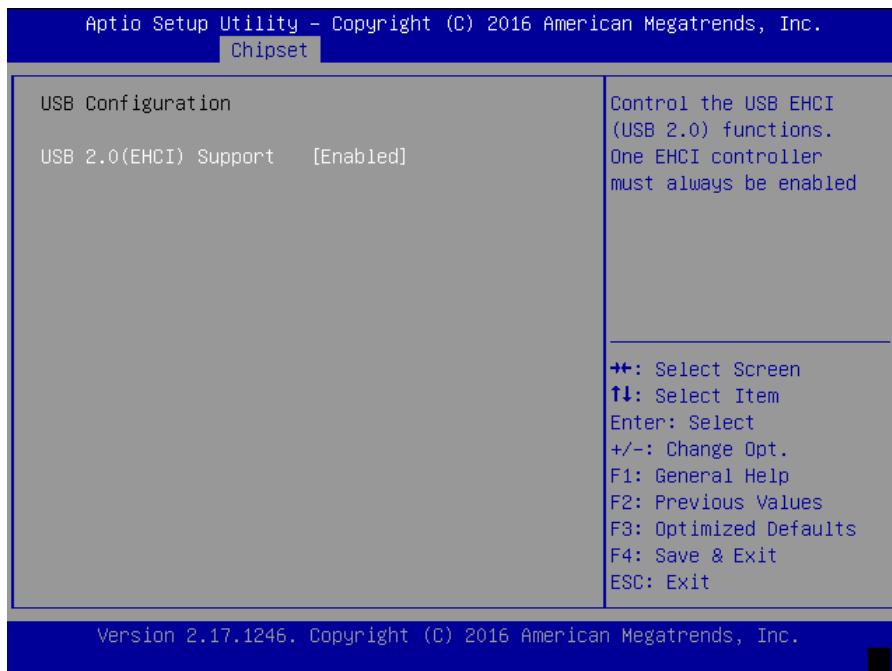
### South Bridge

Once entered South Bridge setting, you may configure USB, PCI Express, high precision timer and restore AC Power Loss states.

**Restore On Power Loss:** restore on AC power loss options.



**USB 2.0 (EHCI) Support:** control the USB EHCI (USB2.0) functions. One EHCI controller must always be enabled.



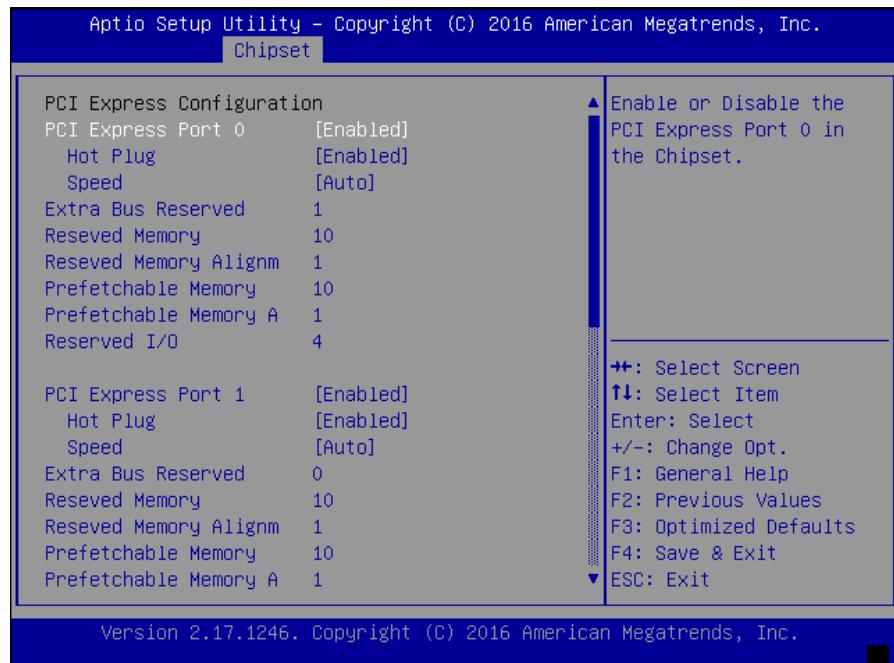
## PCI Express Configuration

You may configure PCI Express Port, Hot Plug and Speed for the PCI Express and also view the information about Extra Bus Reserved, Reserved Memory, Reserved Memory Alignment, Prefetchable Memory, Prefetchable Memory Alignment and Reserved I/O.

**PCI Express Port 0/1:** enable or disable the PCI Express port 0 in the chipset

**Hot Plug:** enable or disable hot-plug function

**Speed:** set the speed for the PCI Express port



## Security

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

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

**User Password:** set the 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

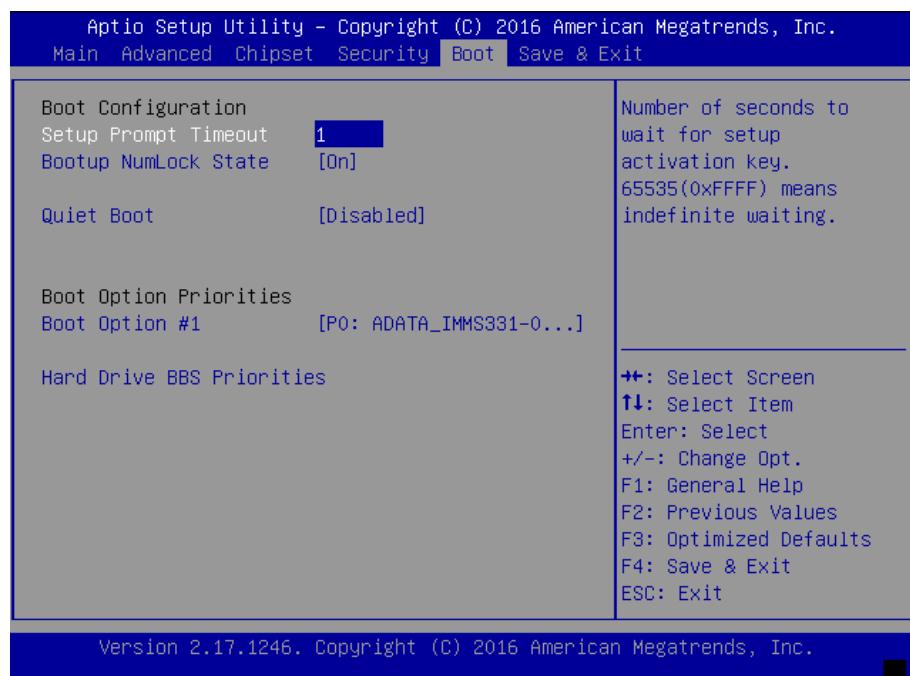
Use [←] / [→] to select [Boot] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

**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:** 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

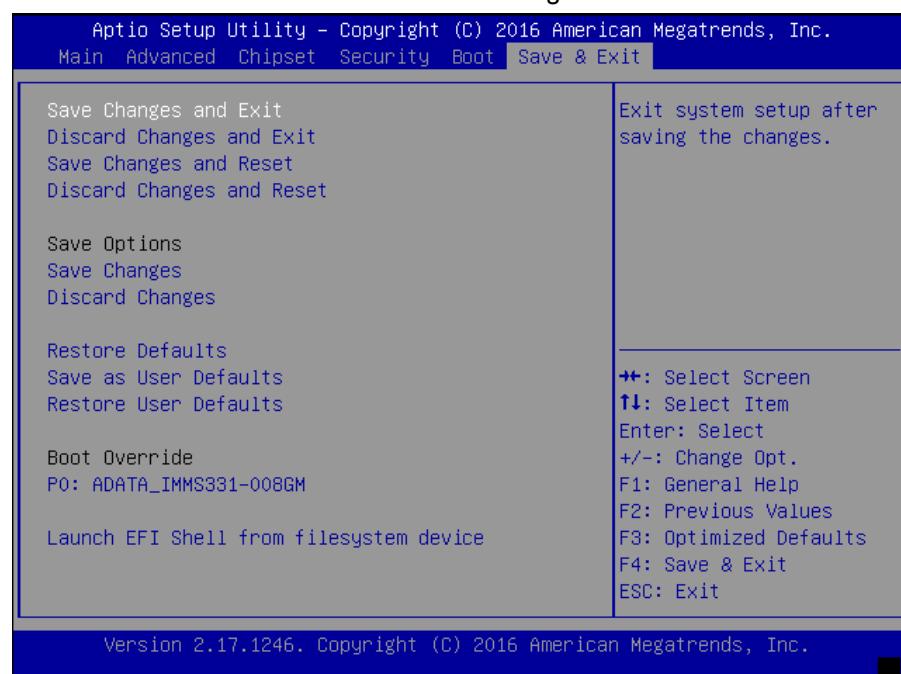
**Save Changes and Exit:** exit system setup after saving the configuration changes

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

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

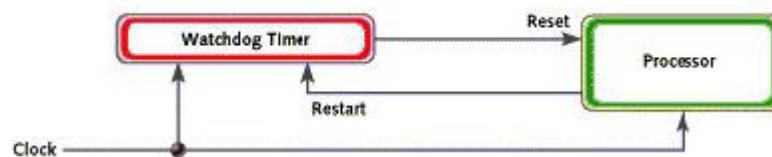
**Save as User Defaults:** save changes as user default

**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.



## 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 the 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

Lanner bypass possesses 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 thorough implementation information of Lanner Bypass and Watchdog functionalities, go to Lanner Support website at <http://www.lannerinc.com/category/1202-network-appliances> to download *Lanner Bypass Watchdog module user guide*

## Appendix D: Programming the LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system.

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 Graphics-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 -xzvf 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

## Network Computing Platforms

— 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:

—**rmmmod 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)

—**rmmmod 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

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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.

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```
# 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 the 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 reversal • engineering of the product Operation outside of the environmental specifications for the product.

### Requesting an RMA#

1. To obtain an 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.

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## RMA Service Request Form

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

\*Problem Code:

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

*Request Party*

*Confirmed By Supplier*

**Authorized Signature / Date**

**Authorized Signature / Date**