

# Network Application Platforms

Hardware platforms for next generation networking infrastructure



**FW-3210**  
**V1.0**



User's Manual

Publication date:2013-01-09

## Overview

### 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:



**NOTE:** This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.



**WARNING:** This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

### Online Resources

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

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

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### Compliances

#### CE

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

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.

### 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.



## **LITHIUM BATTERY CAUTION:**

Risk of Explosion if Battery is replaced by an incorrect type.  
Dispose of used batteries according to the instructions

## **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).

## **EMC Notice**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.



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### Chapter 1: Introduction

Thank you for choosing the FX-3210. The FX-3210 is a 2U system. It features hot-swappable HDD arrays and redundant power supply. The system also utilizes the most current Intel chipset - Sandy Bridge and the IVY Bridge CPU in LGA 1155 :

- 2nd Generation Intel Sandy Bridge/Ivy Bridge processors in LGA1155: Intel Xeon E3-1275 (Sandy Bridge)/E3-1275V2 (Ivy Bridge), E3-1225(Sandy Bridge)/E3-1225V2(Ivy Bridge), Core i7-2600(Sandy Bridge)/i7-3770(Ivy Bridge), Core i5-2400(Sandy Bridge)/i5-3550S(Ivy Bridge), i3-2120 (Sandy Bridge), G850 (Sandy Bridge)

- Intel C206 (Sandy Bridge)/ C216 (Ivy Bridge) chipset  
The system supports a total of 4 HDD modules (two of them support SATA 3.0 and the other two support SATA 2.0).

- Dual-Channel DDR3 DIMM support:  
It supports up to 32 GB of DDR3 system memory at 1066, 1333 or 1600MHz (only for IVY Bridge CPU) on dual-channel DIMM banks.

- Internal CompactFlash and Mini-PCI connector for LAN or Wireless connectivity

- Optional IPMI-compliant management port:  
An optional management port with IPMI interface to manage the system and monitor its operation.

- Customization and expansion opportunity with the number Ethernet modules as well as the RAID card:  
2 Ethernet Modules with 16 GbE Ports:

A total of 2 Ethernet module slots can be fitted to add up to 16 additional ports in the front of the system, providing a total of 20 LAN ports. The RAID card can be inserted through a expansion slot on the backside.

Refer to the chart below for a summary of the system's specifications.

### System Specification

<b>Form Factor</b>		2U Rackmount
<b>Platform</b>	Processor Options	Intel Xeon® E3-1275V2, Intel Xeon® E3-1225V2, Intel® Core™ i3-3220, and Intel® Pentium® G2120 in LGA 1155 package
	Chipset	Intel® C206 series chipset Cougar Point PCH
<b>BIOS</b>		AMI BIOS
<b>System Memory</b>	Technology	Dual channel DDR3 1333 1600 MHz ECC or non-ECC SDRAM
	Max. Capacity	32GB
	Socket	4 DIMM Sockets for dual-channel configuration
<b>OS Support</b>		Linux kernel 2.6 or above
<b>Storage</b>	HDD Bays	3.5" HDD x 4 (with HDD tray)
	CompactFlash	1 x Type II CompactFlash
<b>Networking</b>	Ethernet Ports	4 x GbE RJ45 default 20 GbE ports maximum
	Bypass	2 Pairs G3
	Controllers	4 x Intel 82574L or 2 x Intel I350
	Ethernet Modules	2 modules
	Management Port	1 GbE RJ45
	Security Acceleration	N/A
<b>I/O Interface</b>	Reset Button	1 x reset button Software reset by default
	Console	1 x RJ45
	USB	2 x USB 2.0
	IPMI via OPMA slot	Optional
<b>Expansion</b>	PCIe	2 x PCI-E x 8 expansion (via 1xPCI-E *4 signal)
	PCI	N/A
<b>Cooling</b>	Processor	2U CPU heatsink
	System	3 x 13000rpm System 2U fan
<b>Environmental Parameters</b>	Temperature, ambient operating / storage	0 ~ 40° C / -20~70° C
	Humidity (RH), ambient operating / ambient non-operating	5~90%, non-condensing /
<b>Miscellaneous</b>	LCD Module	2 x 20 characters
	Watchdog	Yes
	Internal RTC with Li Battery	Yes



<b>Physical Dimensions</b>	Dimensions (WxHxD)	444 x 550.2 x 87.8 mm
	Weight	20 kg
<b>Power</b>	Type / Watts	350W Redundant Power Supply
	Input	100~240V ~ 5-3A, 60-50Hz
<b>Approvals and Compliance</b>		CE, FCC Class A
<b>Ordering Information</b>		2U Rackmount network appliance with storage and Intel Sandy Bridge/Ivy Bridge processor in LGA 1155

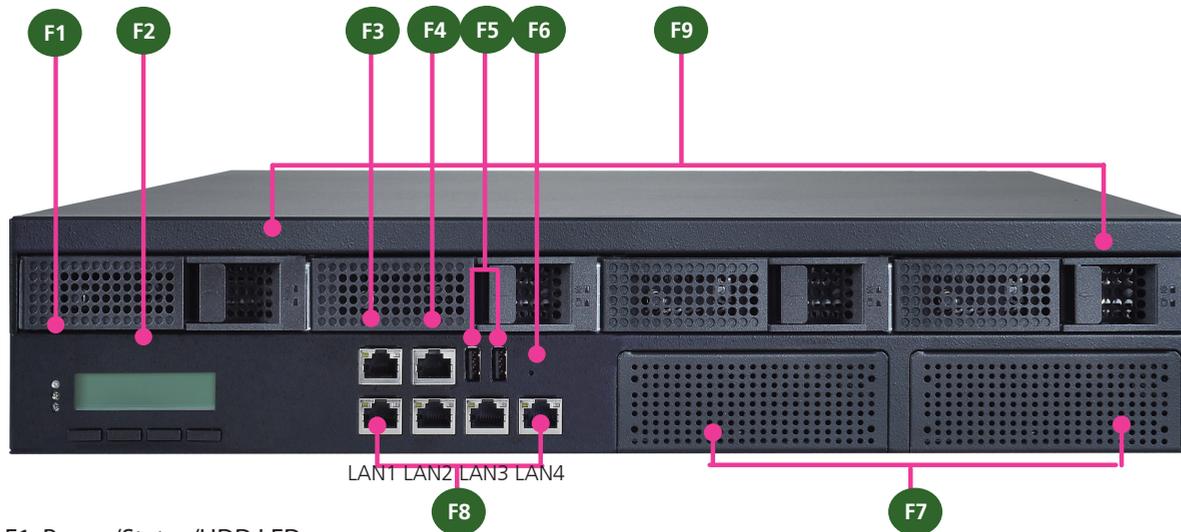
### Package Contents

Your package contains the following items:

- FX-3210 Network Security Platform
- 2 passive CPU heatsink
- 2 power cables
- 1 crossover Ethernet cable (1.8 meters)
- 1 straight-through Ethernet cable (1.8 meters)
- 1 RJ-45 to DB-9 female console cable
- Drivers and user's manual CD.



### Front Panel Features



#### F1 Power/Status/HDD LED

Power: If the LED is on it indicates that the system is powered on. If it is off, it indicates that the system is powered off.

Status: This LED is programmable. You could program it to display the operating status with the behavior like:

If the LED is green, it indicates that the system's operational state is normal. If it is red, it indicates that the system is malfunctioning.

HDD: If the LED blinks, it indicates data access activities; otherwise, it remains off.

#### F2 System Panel: LCD System Panel

The LCD System Panel can be programmed to display operating status and configuration information. For more details or sample programming code, please refer to the Drivers and user's manual CD.

#### F3 Management Port (provided by Realtek RTL8110SC)

This FastEthernet port can be connected for configuration or troubleshooting purpose. A conformity with IPMI (Intelligent Platform Management Interface) can be implemented through OPMA on this interface. It is also capable of Preboot eXecution Environment (PXE) to boot computers using a network interface. (This feature can be enabled or disabled in the BIOS; the default is disabled).

#### F4 Console Port

By using suitable rollover cable or RJ-45 to DB-9 Female (Cisco console cable), you can connect to a computer terminal for diagnostic or configuration purpose. Terminal Configuration Parameters: 115200 baud, 8 data bits, no parity, 1 stop bit, no flow control.

#### F5 Two USB 2.0 Ports

It connects to any USB devices, for example, a flash drive.

#### F6 Reset Switch

The reset switch can be used to reboot the system without turning off the power.

#### F7 Swappable Ethernet Modules (with LAN bypass options)

#### F8 Ethernet Ports (LAN1-LAN2: bypass pair; LAN3-LAN4: bypass pair)

LINK/ACT (Yellow)

- On/Flashing: The port is linking and active in data transmission.
- Off: The port is not linking.

SPEED (Green/Amber)



- Amber: The connection speed is 1000Mbps.
- Green: The connection speed is 100Mbps
- Off: .The connection speed is 10Mbps.

4 on-board Ethernet ports with 2 pairs of LAN bypass. The 4 port lan module is provided by Intel i350. With Intel i350, it equips with Intel Virtualization for Connectivity (VT-c) as part of the Intel Virtualization Technology to improve networking and I/O throughput on a virtualized system (The Intel VT is a hardware-assisted virtualization. This processor of the system supports Intel Virtualization. You need to enable or disable this feature in the BIOS menu). Moreover, 2 pairs (LAN1-LAN2, LAN3-LAN4) can be configured as LAN Bypass when failure events occur. This feature can be enabled dynamically with a watch dog timer. Refer to your User's Manual CD for a sample implementation of this feature.



**Note:**

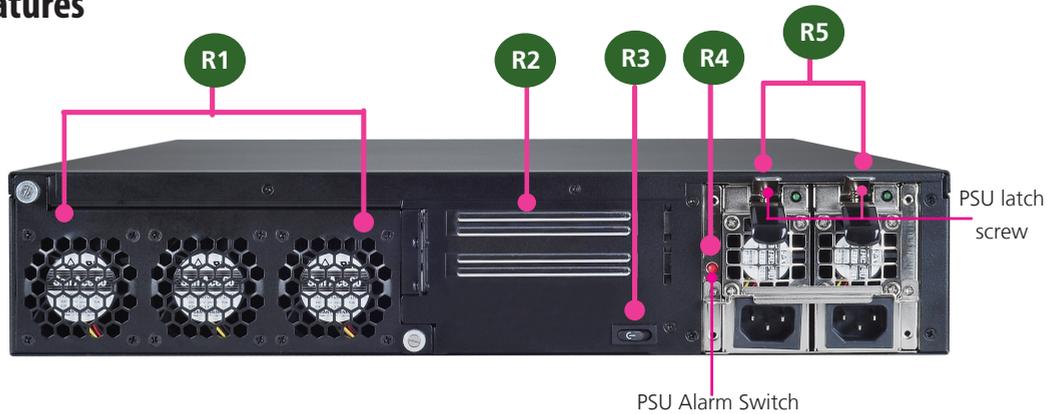
1. The availability of LAN Bypass varies depending on the model of Ethernet LAN module. For more information, visit the Lanner product website at [www.lannerinc.com/x86\\_Network\\_Appliances/Network\\_Modules](http://www.lannerinc.com/x86_Network_Appliances/Network_Modules)
2. The number of LAN ports varies depending on the module. For more information on customization of Lanner network modules, visit the Lanner product website at [www.lannerinc.com/x86\\_Network\\_Appliances/Network\\_Modules](http://www.lannerinc.com/x86_Network_Appliances/Network_Modules):
3. The management port is optional depending on the model.

### F8 Hot-swappable Hard Disk Modules

Two of them support SATA 3.0 (SATA 1 and SATA2) and the other two support SATA 2.0 (SATA3 and SATA4). Refer to *Chapter 3 Motherboard Information* for SATA connectors.



### Rear Panel Features



#### R1 Hot-swappable Modular Fans

These fans have smart fan feature which can be turned on automatically when the temperature exceed the set threshold.

#### R2 PCIe Expansion Slot

#### R3 Power-on Switch

It is a switch to turn on or off the power.

#### R4 Power Supply Alarm Switch

When the alarm sounds (it indicates a power supply failure), switch off this button to turn off the alarm. Replace the failed power supply as soon as possible.

#### R5 Redundant Power Supply

The 350W redundant power supply is hot-swappable and can be withdrawn and replaced when the alarm sounds. The LED of the failed power supply will be turned off. To replace the failed power supply unit, unscrew the screw and press the latch to release the unit and pull it out.



### Chapter 2: 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, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

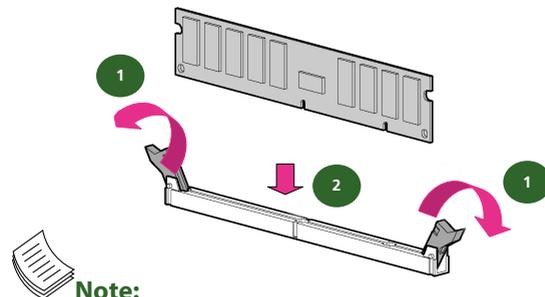
1. Unpower the FX-3210 and remove the power cord.
2. Unscrew two screws on the back of top cover .
3. Slide the cover backwards and open the cover upwards.



#### Installing the System Memory

The motherboard supports DDR3 memory that features data transfer rates of 1066, 1333 or 1600 MHz to meet the higher bandwidth requirements of the latest operating system and Internet applications. To install the memory:

1. Open the DIMM slot latches.
2. Install the DIMM.



**Note:**

1. All DIMMs installed must be the same speed (DDR3 1066, 1333 or 1600, unbuffered ECC or non-ECC). Do not install DIMMs supporting different speeds. The DDR3 1600 is supported on the Ivy Bridge platform only.
2. The system can support up to 32 GB in maximum.
3. Since the system is capable of Dual Channel Architecture, some installation guidelines have to be met to enable Dual Channel mode as directed. To insert two DIMMs on the system, insert DIMMS on slot J2 (blue) and J4 (blue). And use slot J3 (black) and J5 (black) if more slots are required. (Use slot J3 and then slot J5 in sequence for the additional DIMMS.)

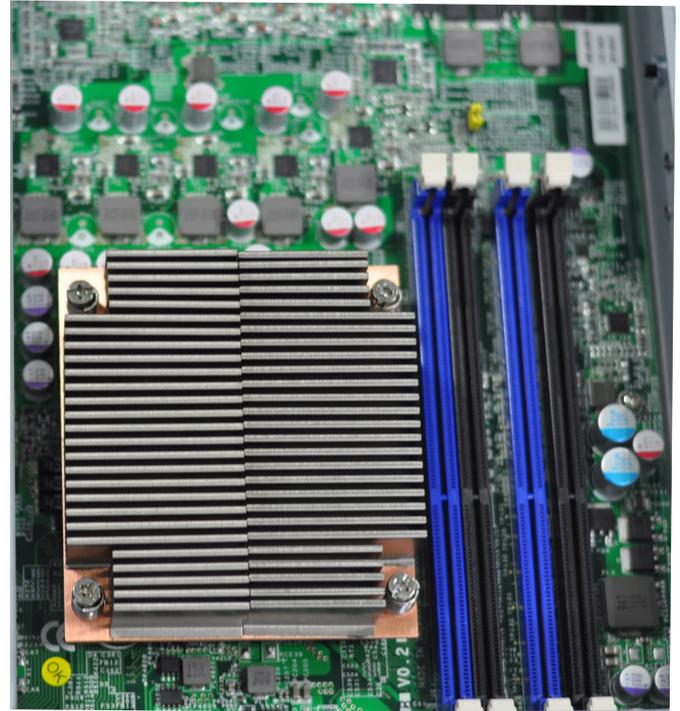
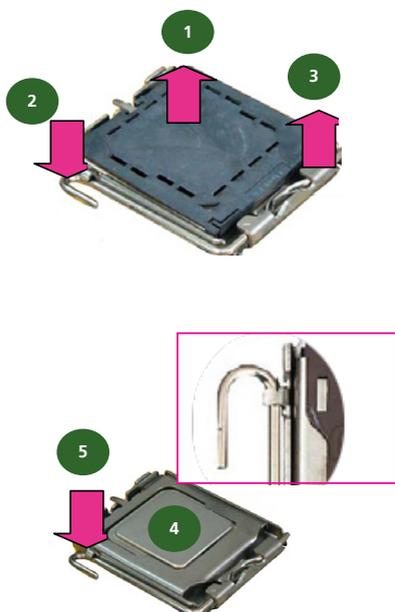


### CPU and the Heat Sink Installation

The FX-3210 sever system is powered by the MB-8865 sever board, which comes with one ZIF type LGA1155 CPU socket.

Follow the procedures bellow for installing a CPU

1. Remove the CPU socket cap.
2. Press the load lever and release it from the retention tab.
3. Lift the load lever and then the plate.
4. Align the cut-out of the CPU and the notch on the socket. The CPU should fit perfectly into the socket. Note that the CPU fits in the socket in only one direction.
5. Close the plate and push the load lever to lock it back to the retention tab.
6. Peel off the sticker on the CPU to expose the thermal compound.
7. Put the heat sink on top of the installed CPU, and match the screws with the screw holes on the board. Fasten two screws which are opposite to each other at a time and then the other two. It is easier this way because of the force of the spring.
8. Place the heat sink cover on top of the installed heat sink and screw the three screws to fasten it on the case.

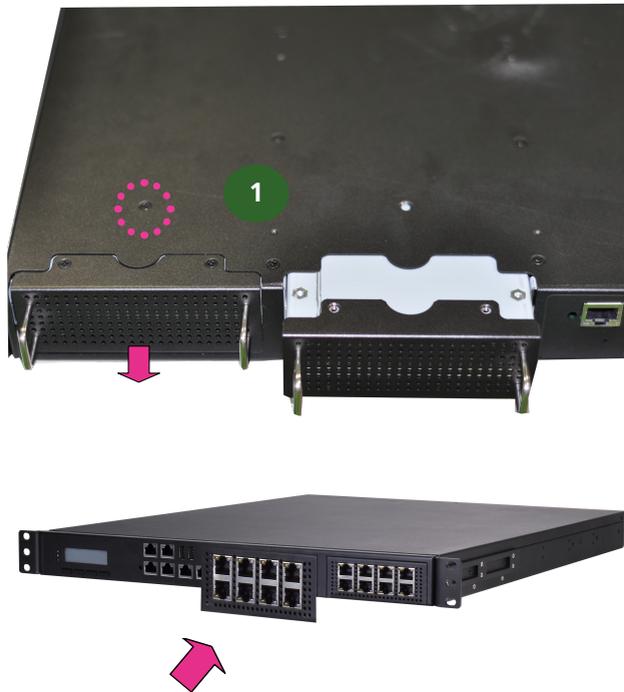


#### Note:

1. The CPU heat sink can only be installed in only one orientation as shown in the picture.
2. To protect the CPU socket pins, retain the CPU cap when the CPU is not installed.

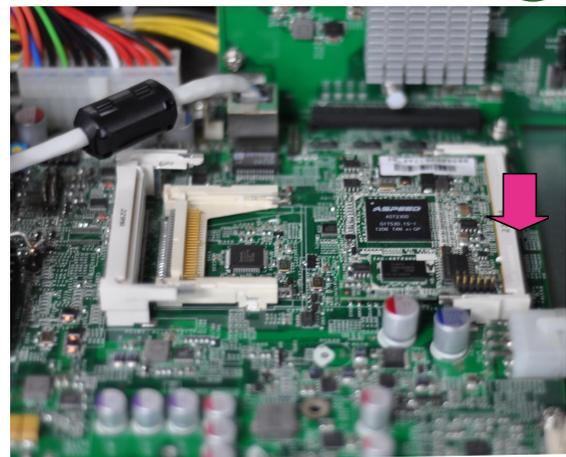
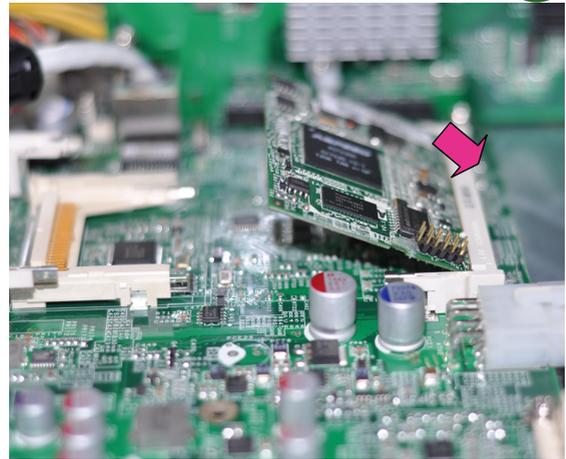


### Front Ethernet Module Installation



1. To install the front Ethernet module, take off the front bezel first by unfastening the threaded screws on the bottom of the case.
2. Insert the Ethernet module into the front expansion slot. You should hear a click when the module connects to the system's mainboard.
3. Fasten the screw back on the bottom of the case to secure the module on the system.

### IPMI Card Installation



1. To install the IPMI card, align the notch of DIMM with the slot key on the socket.
2. Press the card to insert the card into the socket until it snaps with the retaining clips.

### Mini PCI Expansion Card Installation

1



2



1. To install the PCI expansion module, align the PCI notch on the card with the slot key on the socket.
2. Insert the PCI card into the slot. Press the card firmly until the card is installed securely.

### Installing a CompactFlash Card

FX-3210 provides one CompactFlash slot. Follow the procedures below for installing a CompactFlash card.

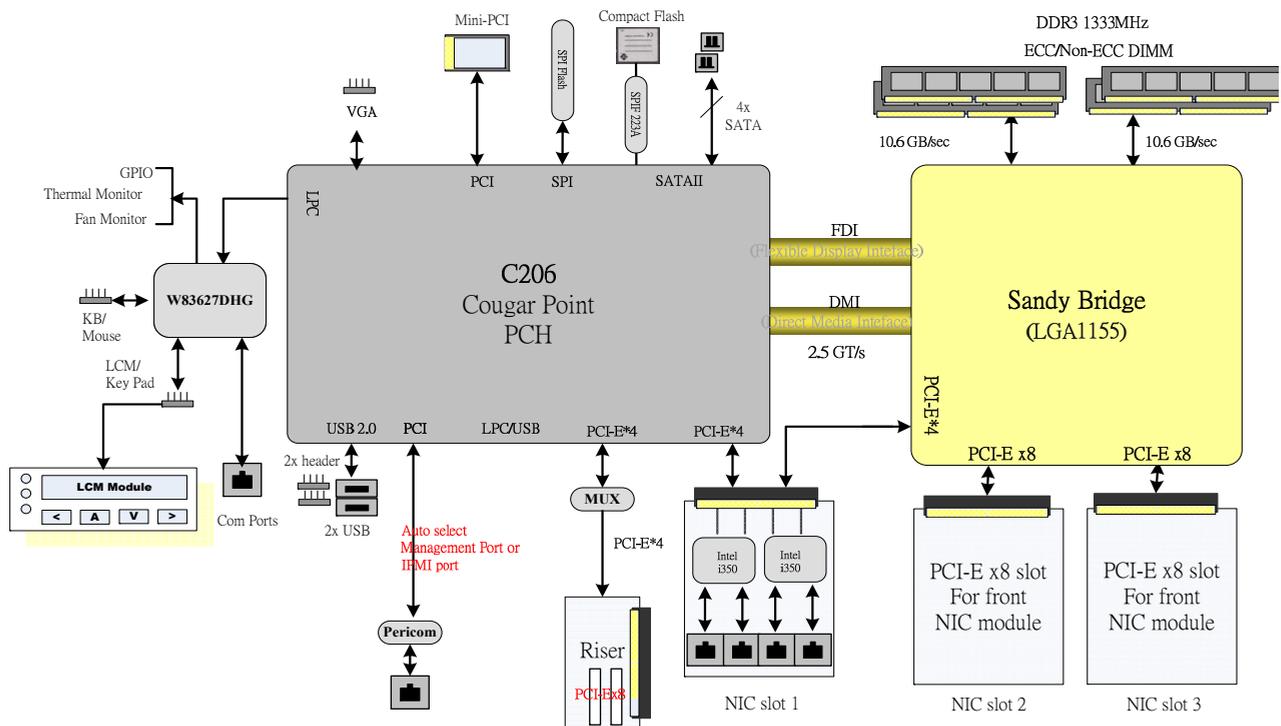
1. Align CompactFlash card and the card slot with the arrow pointing toward the connector.
2. Push the card to insert into the connector.



### Chapter 3: Motherboard Information

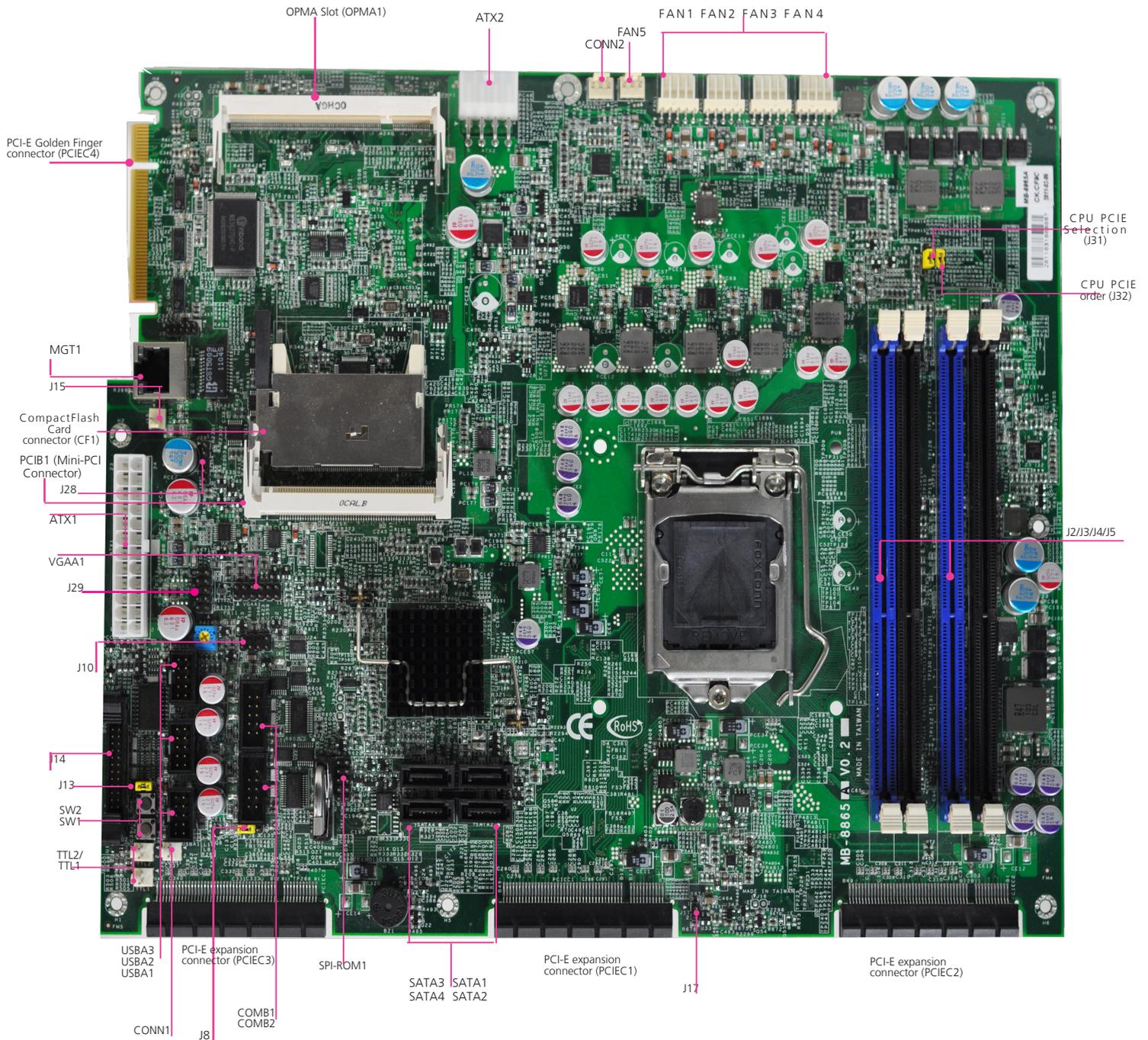
#### Block Diagram

The block diagram depicts the relationships among the interfaces or modules on the motherboard. Please refer to the following figure for your motherboard's layout design.



### Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



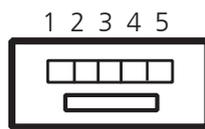
# Chapter 3

## Motherboard Information

### Jumper Settings

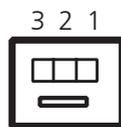
Fan Connectors(FAN1/FAN2/FAN3/FAN4): The 5-pin connector is for connecting the CPU fans. It comes with the smart fan feature by which the fans could be monitored and turned on when the temperature exceed the set threshold. Connect CPU fans to FAN1 and FAN3, and connect auxiliary fans to FAN2 and FAN4.

Pin No.	1	2	3	4	5
Function	PWM	NC	FANIN	VFAN	GROUND



Fan Connectors(FAN5): The 3-pin connector is for connecting the chassis fan.

Function	Ground	+12V	AUXFANIN1
PIN NO.	1	2	3



PCIe Connectors(PCIEC4/PCIEC3/PCIEC1/PCIEC2): It is for connecting the expansion cards which might be an Ethernet card or a RAID card. These PCIe sockets offers a variation of PCIe lanes as listed below.

Jumper	Function
PCIEC1/2	PCI Express x8 SLOT having PCIe x8 mode
PCIEC3	PCI Express x8 SLOT having 2 PCIe x4 or 4 PCIe x1 mode
PCIEC4	PCI Express x8 golden finger having 1 PCIe x4 mode

PCIEx8 Connector running at PCIe8 mode (PCIEC1,PCIEC2):to be connected to the front Ethernet module. The jumper **J31** can be used to select the PCIe mode of these two connectors and jumper **J32** can be used to select the order of the signal. **Note that with Ivy Bridge CPU, the PCIe also upgrades to PCIe 3.0 standard (currently PCIe 2.0).**

PIN NO.	FUNCTION	PIN NO.	FUNCTION
B1	+12V	A1	PRSTNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	BYPASS0 Mode	A12	GND
B13	GND	A13	REFCLKA+
B14	CPUPETP7/CPUPETP15	A14	REFCLKA-
B15	CPUPETN7/CPUPETN15	A15	GND
B16	GND	A16	CPUPERP7/CPUPERP15
B17	LANM0_LATCH_H	A17	CPUPERN7/CPUPERN15
B18	GND	A18	GND
B19	CPUPETP6/CPUPETP14	A19	BYPASS1 Mode
B20	CPUPETN6/CPUPETN14	A20	GND
B21	GND	A21	CPUPERP6/CPUPERP14
B22	GND	A22	CPUPERN6/CPUPERN14
B23	CPUPETP5/CPUPETP13	A23	GND
B24	CPUPETN5/CPUPETN13	A24	GND
B25	GND	A25	CPUPERP5/CPUPERP13
B26	GND	A26	CPUPERN5/CPUPERN13
B27	CPUPETP4/CPUPETP12	A27	GND
B28	CPUPETN4/CPUPETN12	A28	GND
B29	GND	A29	CPUPERP4/CPUPERP12
B30	REFCLK1A+	A30	CPUPERN4/CPUPERN12
B31	REFCLK1A-	A31	GND
B32	GND	A32	LANM1_LATCH_H
B33	CPUPETP3/CPUPETP11	A33	LANM1_LATCH_L
B34	CPUPETH3/CPUPETH11	A34	GND
B35	GND	A35	CPUPERP3/CPUPERP11
B36	GND	A36	CPUPERN3/CPUPERN11
B37	CPUPETP2/CPUPETP10	A37	GND
B38	CPUPETN2/CPUPETN10	A38	GND
B39	GND	A39	CPUPERP2/CPUPERP10
B40	GND	A40	CPUPERN2/CPUPERN10
B41	CPUPETP1/CPUPETP9	A41	GND
B42	CPUPETN1/CPUPETN9	A42	GND
B43	GND	A43	CPUPERP1/CPUPERP9
B44	GND	A44	CPUPERN1/CPUPERN9
B45	CPUPETP0/CPUPETP8	A45	GND
B46	CPUPETN0/CPUPETN8	A46	GND
B47	GND	A47	CPUPERP0/CPUPERP8
B48	LANM0_LATCH_L	A48	CPUPERN0/CPUPERN8
B49	GND	A49	GND



# Chapter 3

## Motherboard Information

PCIEx8 connector running at 2 PCIEx4 or 4 PCIEx1 mode (PCIEC3): to be connected to the front Ethernet module. It complies with PCIe 2.0 standard.

PCIEx8 Golden Finger running at 1 PCIEx4 mode (PCIEC4):to be connected to the PCIe expansion slot on the back panel via a riser card. **Note that if this port is connected, some applications of IPMI that requires VGA function such as remote desktop will be disabled.**

PIN NO.	FUNCTION	PIN NO.	FUNCTION
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	BYPASS0 Mode	A12	GND
B13	GND	A13	REFCLKA+
B14	EX_CPUPETP3	A14	REFCLKA-
B15	EX_CPUPETN3	A15	GND
B16	GND	A16	EX_CPUPERP3
B17	LANMO_LATCH_H	A17	EX_CPUPERN3
B18	GND	A18	GND
B19	EX_CPUPETP2	A19	BYPASS1 Mode
B20	EX_CPUPETN2	A20	GND
B21	GND	A21	EX_CPUPERP2
B22	GND	A22	EX_CPUPERN2
B23	EX_CPUPETP1	A23	GND
B24	EX_CPUPETN1	A24	GND
B25	GND	A25	EX_CPUPERP1
B26	GND	A26	EX_CPUPERN1
B27	EX_CPUPETP0	A27	GND
B28	EX_CPUPETN0	A28	GND
B29	GND	A29	EX_CPUPERP0
B30	REFCLK1A+	A30	EX_CPUPERN0
B31	REFCLK1A-	A31	GND
B32	GND	A32	LANM1_LATCH_H
B33	SBPETP3	A33	LANM1_LATCH_L
B34	SBPETH3	A34	GND
B35	GND	A35	SBPERP3
B36	GND	A36	SBPERN3
B37	SBPETP2	A37	GND
B38	SBPETN2	A38	GND
B39	GND	A39	SBPERP2
B40	GND	A40	SBPERN2
B41	SBPETP1	A41	GND
B42	SBPETN1	A42	GND
B43	GND	A43	SBPERP1
B44	GND	A44	SBPERN1
B45	SBPETP0	A45	GND
B46	SBPETN0	A46	GND
B47	GND	A47	SBPERP0
B48	LANMO_LATCH_L	A48	SBPERN0
B49	GND	A49	GND

PIN NO.	FUNCTION	PIN NO.	FUNCTION
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	RESV	A12	GND
B13	GND	A13	REFCLKA+
B14	RESV	A14	REFCLKA-
B15	RESV	A15	GND
B16	GND	A16	RESV
B17	RESV	A17	RESV
B18	GND	A18	GND
B19	RESV	A19	RESV
B20	RESV	A20	GND
B21	GND	A21	RESV
B22	GND	A22	RESV
B23	RESV	A23	GND
B24	RESV	A24	GND
B25	GND	A25	RESV
B26	GND	A26	RESV
B27	RESV	A27	GND
B28	RESV	A28	GND
B29	GND	A29	RESV
B30	RESV	A30	RESV
B31	RESV	A31	GND
B32	GND	A32	RESV
B33	SBPETP4	A33	RESV
B34	SBPETH4	A34	GND
B35	GND	A35	SBPERP4
B36	GND	A36	SBPERN4
B37	SBPETP5	A37	GND
B38	BPETN5	A38	GND
B39	GND	A39	SBPERP5
B40	GND	A40	SBPERN5
B41	SBPETP6	A41	GND
B42	SBPETN6	A42	GND
B43	GND	A43	SBPERP6
B44	GND	A44	SBPERN6
B45	SBPETP7	A45	GND
B46	SBPETN7	A46	GND
B47	GND	A47	SBPERP7
B48	RESV	A48	SBPERN7
B49	GND	A49	GND



# Chapter 3

## Motherboard Information

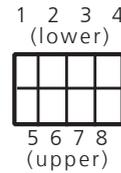
Mini-PCI Connector (PCIB1): The Mini-PCI slot enables a Mini-PCI expansion module to be connected to the board.



PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	TIP	2	RING
3	8PMJ-3	4	8PMJ-1
5	8PMJ-6	6	8PMJ-2
7	8PMJ-7	8	8PMJ-4
9	8PMJ-8	10	8PMJ-5
11	LED1_GRNP	12	LED2_YELP
13	LED1_GRNN	14	LED2_YELP
15	CHSGND	16	RESERVED
17	INT-B	18	+5V
19	+3.3V	20	INT-A
21	RESERVED	22	RESERVED
23	GROUND	24	3.3VAUX
25	CLK	26	RST
27	GROUND	28	+3.3V
29	REO	30	GNT
31	+3.3V	32	GROUND
33	AD31	34	PME
35	AD29	36	RESERVED
37	GROUND	38	AD30
39	AD27	40	+3.3V
41	AD25	42	AD28
43	RESERVED	44	AD26
45	C_BE-3	46	AD24
47	AD23	48	IDSEL
49	GROUND	50	GROUND
51	AD21	52	AD22
53	AD19	54	AD20
55	GROUND	56	PAR
57	AD17	58	AD18
59	C_BE-2	60	AD16
61	IRDY	62	GROUND
63	+3.3V	64	FRAME
65	CLKRUN	66	TRDY
67	SERR	68	STOP
69	GROUND	70	+3.3V
71	PERR	72	DEVSEL
73	C_BE-1	74	GROUND
75	AD14	76	AD15
77	GROUND	78	AD13
79	AD12	80	AD11
81	AD10	82	GROUND
83	GROUND	84	AD9
85	AD8	86	C_BE-0
87	AD7	88	+3.3V
89	+3.3V	90	AD6
91	AD5	92	AD4
93	RESERVED	94	AD2
95	AD3	96	AD0
97	+5V	98	RESERVED-WIP
99	AD1	100	RESERVED-WIP

111	MOD_AUDIO_MON	112	RESERVED
113	AUDIO_GND	114	GROUND
115	SYS_AUDIO_OUT	116	SYS_AUDIO_IN
117	SYS_AUDIO_OUT_GND118	118	SYS_AUDIO_IN_GND
119	AUDIO_GND	120	AUDIO_GND
121	RESERVED	122	MPCIACT
123	+5V	124	+3.3 STBY

ATX Power Connector(ATX1, ATX2): These 24-pin and 8-pin connectors are for connecting ATX power supply plugs. Find the proper orientation when inserting the plugs, for the supply plugs are designed to fit these connectors in only one orientation.



Pin No.	Function
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V

Pin No.	Function	Pin NO.	Function
23		24	
21		22	1 +3.3V 2 +3.3V
19		20	3 +3.3V 4 -12V
17		18	5 GROUND 6 GOUND
15		16	7 +5V 8 PSON-
13		14	9 GROUND 10 GROUND
11		12	11 +5V 12 GROUND
9		10	13 GROUND 14 GROUND
7		8	15 POWER GOOD 16 NC
5		6	17 STAND-BY 5V 18 +5V
3		4	19 +12V 20 +5V
1		2	21 +12V 22 +5V
			23 +3.3V 24 GROUND

AT Mode Power Button Connector (J15): It is for connecting the power switch in AT mode



Pin No.	Function
1	PS_ON#
2	GND

AT Mode Jumper(J17): It is for adjusting the jumper setting for the system power to be in ATX mode if AT Mode Power Button Connector (J15) is used.



Pin No.	Function
--	Normal (Default ATX Mode)
1-2	AT mode



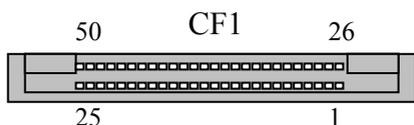
# Chapter 3

## Motherboard Information

Clear CMOS jumper (J8): It is for clearing the CMOS memory and system setup parameters by erasing the data stored in the CMOS RAM such as the system passwords.



CompactFlash Connector (CF1): It is for connecting a Compact Flash card to be served as your system's storage. The connector is a CF Type II slot which could fit both CF Type I or CF Type II cards.



Pin No.	Function	Pin No.	Function
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	CE1#	8	N.C.
9	Ground	10	N.C.
11	N.C.	12	N.C.
13	+3.3V	14	N.C.
15	N.C.	16	N.C.
17	N.C.	18	Addr 2
19	Addr 1	20	Addr 0
21	Data 0	22	Data 1
23	Data 2	24	WP
25	CD2-	26	CD1-
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	CE2#
33	N.C.	34	IOR#
35	IOW#	36	WE#
37	READY#	38	+3.3V
39	CSEL.	40	N.C.
41	RESET	42	WAIT#
43	INPACK#	44	REG#
45	DASP#	46	DIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

DIMM Socket (J2/J3/J4/J5): The 240-pin DDR3 DIMM is for connecting the DDR3 1066/1333/1600 (unbuffered ECC or non-ECC) memory. The system can support up to 32 GB in maximum. A DDR3 module has the same physical dimensions as a DDR2 DIMM but the notch on the pins is positioned differently. Channel information lists below:

- J2 Channel A DIMM0 (blue)
- J3 Channel A DIMM1 (black)
- J4 Channel B DIMM0 (blue)
- J5 Channel B DIMM1 (black)



**Note:** Since the system is capable of Dual Channel Architecture, some installation guidelines have to be met to enable Dual Channel mode as directed. To insert two DIMMs on the system, insert DIMMS on slot J2 (blue) and J4 (blue). And use slot J3 (black) and J5 (black) if more slots are required. (Use slot J3 and then slot J5 in sequence for the additional DIMMS.)

SATA 1, 2 and 3, 4 Connectors (SATA1/SATA2/SATA3/SATA4): It is for connecting a 2.5" SATA harddisk to be served as your system's storage. The system can accommodate up to 2 disks (2.5" or 1disk for 3.5") in maximum. **SATA1** and **SATA2** comply fully with *SATA Revision 3.0* standard with data transfer rates of up to 6.0 Gb/s. **SATA3** and **SATA4** support *SATA revision 2.0*. The controller contains two modes of operation—a legacy mode using I/O space, and an AHCI mode using memory space. Software that uses legacy mode will not have AHCI capabilities.

The AHCI (Advanced Host Controller Interface) is a programming interface which defines transactions between the SATA controller and software and enables advanced performance and usability with SATA. Platforms supporting AHCI may take advantage of performance features such as no master/slave designation for SATA devices—each device is treated as a master—and hardware assisted native command queuing. AHCI also provides usability enhancements such as Hot-Plug. Note you will need to configure your SATA as AHCI or RAID in the BIOS.



- Note:**
1. To configure your Hard disk using the integrated RAID feature, the Intel®Rapid Storage Technology Utility has to be installed on your Operating System.
  2. You will need to select the RAID mode in the BIOS for your SATA drives first. There is also a



# Chapter 3

## Motherboard Information

Intel® RSTe OpROM utility for creating RAID volume; to enter the RSTe OpROM, press Ctrl-I during POST.

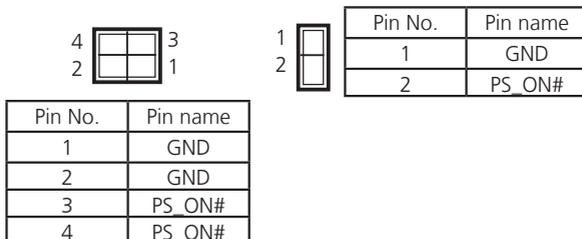
- For operating systems other than Microsoft® Windows Vista and Windows® 7, it is required to pre-install the Intel Rapid Storage Technology driver during the F6 installation of Windows setup ("press F6 if you need to install a third party SCSI or RAID driver...").

Visit the Intel support page at [http://www.intel.com/p/en\\_US/support/highlights/chpsts/ims](http://www.intel.com/p/en_US/support/highlights/chpsts/ims) for more information and download links.

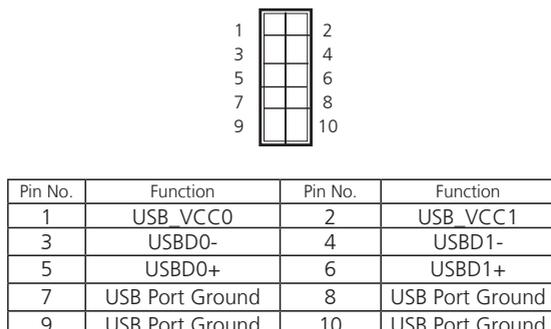
- The Intel controller hubs are also supported by Linux. Beginning with Linux kernel version 2.6.27, the *mdadm* utility 3.0 supports RAID 0, RAID 1, RAID 5, and RAID 10.

To use the RAID features in *dmraid* and *mdadm*, you will need to set up the RAID volume using the Intel® Matrix Storage Manager option ROM (click CTRL + I when prompted during boot to enter the option ROM user interface).

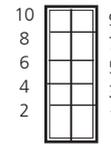
Power-switch Connector (SW1, CONN1): A tact as well as the connector for switch button used for turning on or off the power once the power supply is applied to the board.



USB Connector(USBA1&USBA2) : It is for connecting the USB module cable. It complies with USB2.0 and support up to 480 Mbps connection speed.

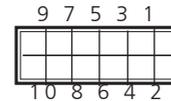


LED Signals on RJ45 port of the PCI-e Expansion Card : A LED connector showing the LEDs of the RJ45 ports



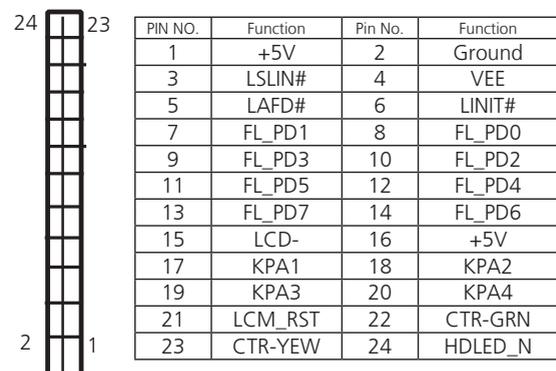
Pin No.	Function	Pin No.	Function
1	LED_SPEED_100	2	NC
3	LED_SPEED_1G	4	NC
5	LINK/ACT	6	NC
7	P3V3_DUAL	8	P3V3_DUAL
9	Ground	10	Ground

LPC I/O bus (It can also be called Port 80) (LPC1): It is a proprietary connector for connecting a checkpoint device to output checkpoints throughout booting and Power-On Self Test (POST) to indicate the task the system is currently executing.

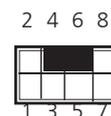


Pin No.	Function	Pin No.	Function
1	CLK_33M_P80	2	LPC_LAD1
3	RST_80DGPT_N	4	LPC_LAD0
5	LPC_FRAME_N	6	+3.3V
7	LPC_LAD3	8	Ground
9	LPC_LAD2	10	Ground

Front LCD Module Connector(J14): The 24-pin connector is for connecting the front system panel.



Keyboard and Mouse Interface Cable Connectors (J10): It is for connecting the PS/2 keyboard and mouse interface cable.



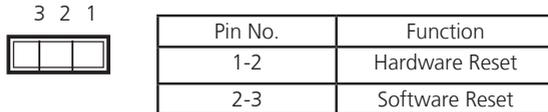
Pin No.	Function	Pin No.	Function
1	P5V	2	MSCLK
3	MSDATA	4	KEY
5	KBDATA	6	KEY
7	GND	8	KBCLK



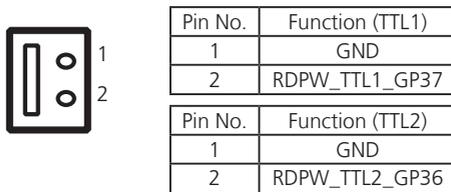
# Chapter 3

## Motherboard Information

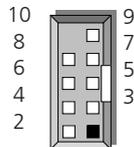
Hardware or Software Reset Jumper(J13): The jumper can be adjusted to be in either hardware or software reset mode when the reset switch is pressed. The hardware reset will reboot the system without turning off the power. The software reset can be programmed to reset a software to its default setting.



Power Failure Detection Jumper (TTL1/TTL2): This two-pin jumper can be used for power failure detection. Connect the redundant power 1 and redundant power 2 to TTL1 and TTL2 respectively in order to monitor the availability of them.



Serial Interface Connectors(COMB1/COMB2): It is for connecting the RS-232 serial port interface cable.



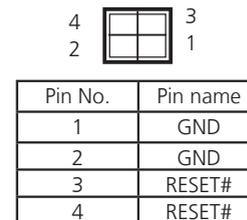
Pin NO.	Function	PIN NO.	Function
1	Data Carrier Detect (DCDB#)	2	Data Set Ready (DSRB#)
3	Receive Data (RXDB)	4	Request To Send (RTSB#)
5	Transmit Data (TXDB)	6	Clear To Send (CTSB#)
7	Data Terminal Ready (DTRB #)r	8	Ring Indicator (RIB #)
9	Ground	10	Key

OPMA Slot (OPMA1): This is an optional OPMA (Open Platform Management Architecture ) slot on the board. Through this card, the IPMI (Intelligent Platform Management Interface) implementation can be realized. **Note that if the PCIe expansion golden finger-PCIEC4 is connected, some applications of IPMI that requires VGA function such as remote desktop will be disabled.**

ManagementPort (MGT1, provided by Realtek RTL8110SC): The management port provides connects to the front management port. It can be an IPMI compliant management with the OPMA card; otherwise, it is just a normal management port.

Pin No.	Function (10/100)	PIN NO.(10/100/1000)
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	LINK_1000_N	
10	LINK_100_N	
11	LINK/ACT_N	
12	PULLHIGH	

Power-switch Connector (SW2): A tact for rebooting the system.



# Chapter 3

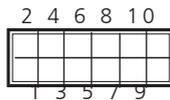
## Motherboard Information

SPI-ROM Update Connector (SPI-ROM1): Using the appropriate cable to connect this 10-pin ISP in header connector, the user can update the SPI Flash soldered on board.

1		2	
3		4	
5		6	
7		8	
9		10	

Pin No.	Function	Pin NO.	Function
1	SPI HD1_N	2	PCH_SPI_CS1_N
3	SPI_CS0	4	V_3P3_SPI
5	SPI_ICH_MISO_R	6	SPI_HOLD0_L
7	NC	8	SPI_ICH_CLK_R
9	Ground	10	SPI_ICH_MOSI_R

VGA Interface (VGAA1): It is for connecting the VGA interface cable (2X6 pin to female DB15 connector)



Pin No.	Function	PIN NO.	Function
1	R	2	Ground
3	G	4	Ground
5	B	6	Ground
7	H-SYNC	8	NC
9	V-SYNC	10	Ground
11	Detect-display Data	12	Detect-display CLOCK

USB and COM Interface signal for LCM card (J29)

10		9	
8		7	
6		5	
4		3	
2		1	

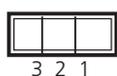
Pin No.	Function	PIN NO.	Function
1	P5V_DUAL	2	P5V
3	USB-	4	NC
5	USB+	6	HDD_LED-
7	GND	8	GND
9	NXP_TXD	10	NXP_RXD

Pin Header for Power Management Port (J28)

1	
2	
3	
4	
5	

Pin No.	Function
1	PSUMAN_SMBCLK
2	NC
3	GND
4	PSUMAN_SMBDATA
5	P5V

Case Open Signal (CONN2)



Pin No.	Function
1	GND
2	CASE OPEN
3	GND

PCIe mode selection for PCIe expansion integrated directly into the CPU (PCIEC1 and PCIEC2):J31

1	
2	
3	

Pin No.	Function
1-2	CPU PCIe divide to X8,X4,X4
2-3	CPU PCIe divide to 2 PCIeX8 (default)

PCIe signal order selection (J32): PCIe signal order selection for PCIe expansion integrated directly into the CPU: PCIEC1, PCIEC2, and PCIEC3

PCIEC1/PCIEC2

1	
2	
3	

Pin No.	Function
1-2	The PCIe signal in reverse order (default)
2-3	The PCIe signal in positive order

PIN NO.	FUNCTION	PIN NO.	FUNCTION
B1	+12V	A1	PRSN1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	BYPASS0 Mode	A12	GND
B13	GND	A13	REFCLKA+
B14	CPUPETP0/CPUPETP8	A14	REFCLKA-
B15	CPUPETN0/CPUPETN8	A15	GND
B16	GND	A16	CPUPERP0/CPUPERP8
B17	LANM0_LATCH_H	A17	CPUPERN0/CPUPERN8
B18	GND	A18	GND
B19	CPUPETP1/CPUPETP9	A19	BYPASS1 Mode
B20	CPUPETN1/CPUPETN9	A20	GND
B21	GND	A21	CPUPERP1/CPUPERP9
B22	GND	A22	CPUPERN1/CPUPERN9
B23	CPUPETP2/CPUPETP10	A23	GND
B24	CPUPETN2/CPUPETN10	A24	GND
B25	GND	A25	CPUPERP2/CPUPERP10
B26	GND	A26	CPUPERN2/CPUPERN10
B27	CPUPETP3/CPUPETP11	A27	GND
B28	CPUPETN3/CPUPETN11	A28	GND
B29	GND	A29	CPUPERP3/CPUPERP11
B30	REFCLK1A+	A30	CPUPERN3/CPUPERN11
B31	REFCLK1A-	A31	GND
B32	GND	A32	LANM1_LATCH_H
B33	CPUPETP4/CPUPETP12	A33	LANM1_LATCH_L
B34	CPUPETH4/CPUPETH12	A34	GND
B35	GND	A35	CPUPERP4/CPUPERP12
B36	GND	A36	CPUPERN4/CPUPERN12
B37	CPUPETP5/CPUPETP13	A37	GND
B38	CPUPETN5/CPUPETN13	A38	GND
B39	GND	A39	CPUPERP5/CPUPERP13
B40	GND	A40	CPUPERN5/CPUPERN13
B41	CPUPETP6/CPUPETP14	A41	GND
B42	CPUPETN6/CPUPETN14	A42	GND
B43	GND	A43	CPUPERP6/CPUPERP14
B44	GND	A44	CPUPERN6/CPUPERN14
B45	CPUPETP7/CPUPETP15	A45	GND
B46	CPUPETN7/CPUPETN15	A46	GND
B47	GND	A47	CPUPERP7/CPUPERP15
B48	LANM0_LATCH_L	A48	CPUPERN7/CPUPERN15
B49	GND	A49	GND



# Chapter 3

## Motherboard Information

### PCIEC3

PIN NO.	FUNCTION	PIN NO.	FUNCTION
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	BYPASS0 Mode	A12	GND
B13	GND	A13	REFCLKA+
B14	EX_CPUPETP0	A14	REFCLKA-
B15	EX_CPUPETN0	A15	GND
B16	GND	A16	EX_CPUPERP0
B17	LANM0_LATCH_H	A17	EX_CPUPERNO
B18	GND	A18	GND
B19	EX_CPUPETP1	A19	BYPASS1 Mode
B20	EX_CPUPETN1	A20	GND
B21	GND	A21	EX_CPUPERP1
B22	GND	A22	EX_CPUPERN1
B23	EX_CPUPETP2	A23	GND
B24	EX_CPUPETN2	A24	GND
B25	GND	A25	EX_CPUPERP2
B26	GND	A26	EX_CPUPERN2
B27	EX_CPUPETP3	A27	GND
B28	EX_CPUPETN3	A28	GND
B29	GND	A29	EX_CPUPERP3
B30	REFCLK1A+	A30	EX_CPUPERN3
B31	REFCLK1A-	A31	GND
B32	GND	A32	LANM1_LATCH_H
B33	SBPETP3	A33	LANM1_LATCH_L
B34	SBPETH3	A34	GND
B35	GND	A35	SBPERP3
B36	GND	A36	SBPERN3
B37	SBPETP2	A37	GND
B38	SBPETN2	A38	GND
B39	GND	A39	SBPERP2
B40	GND	A40	SBPERN2
B41	SBPETP1	A41	GND
B42	SBPETN1	A42	GND
B43	GND	A43	SBPERP1
B44	GND	A44	SBPERN1
B45	SBPETP0	A45	GND
B46	SBPETN0	A46	GND
B47	GND	A47	SBPERP0
B48	LANM0_LATCH_L	A48	SBPERNO
B49	GND	A49	GND



## Chapter 4: BIOS Settings

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### Updating the BIOS

The Basic Input/Output System (BIOS) can be updated using the designated Flash Utility. To obtain the utility, please contact us either through the sales rep or technical support.



**Note:**

For the update version of the BIOS image, please visit Lanner's support page at <http://assist.lannerinc.com>. Then select *support center* from the Main Menu and look under the folder for the desired product category. The resources for each product including the BIOS image will be contained within a folder named by the product model.



### Accessing the BIOS menu

When you are installing a motherboard or when the system prompts “Run Setup” during start-up, you will use the BIOS Setup program to configure the system, . This section explains how to configure your system using this program.

Even if you are not prompted to enter the BIOS Setup program when you are installing a motherboard, you can still change the configuration of your computer later on with this program. For example, you may want to enable the security password feature or change the power management settings. This requires you to reconfigure your system by using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM .

When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On-Self-Test (POST) to enter the Setup utility (There are a few cases that other keys may be used, such as <F1>, <F2>, and so forth.); otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

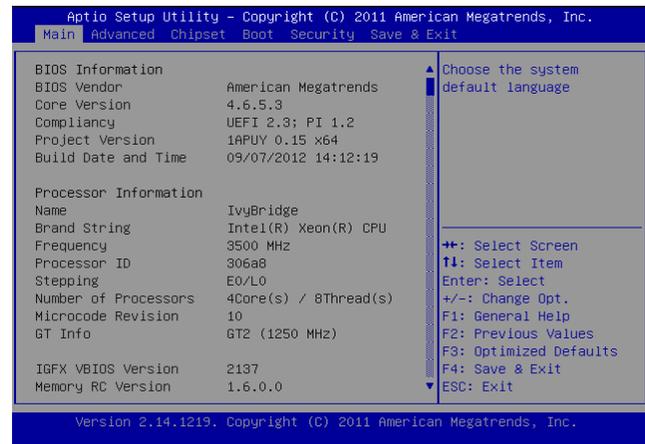


Note: This manual describes the standard look of the setup screen. There may be some instances in which the motherboard features can vary from one to another due to customization. This means that some of the options described in this manual may not match that of your motherboard’s AMIBIOS.

### Navigating the BIOS menu

The BIOS setup utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.



Keys	Description
-><- Left/Right ↑ ↓	The Left and Right <Arrow> keys allow you to select an setup screen. For example: Main screen, Advanced screen, Boot screen, and so on.
Up/Down	The Up and Down <Arrow> keys allow you to select an setup item or sub-screen.
+/- Plus/Minuss	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item. For example: Date and Time.
Tab	The <Tab> key allows you to select setup fields.



Note: The <F8> key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the <F8> key on your keyboard. The Fail-Safe settings allow the motherboard to boot up with the least amount of options set. This can lessen the probability of conflicting settings.



# Chapter 4

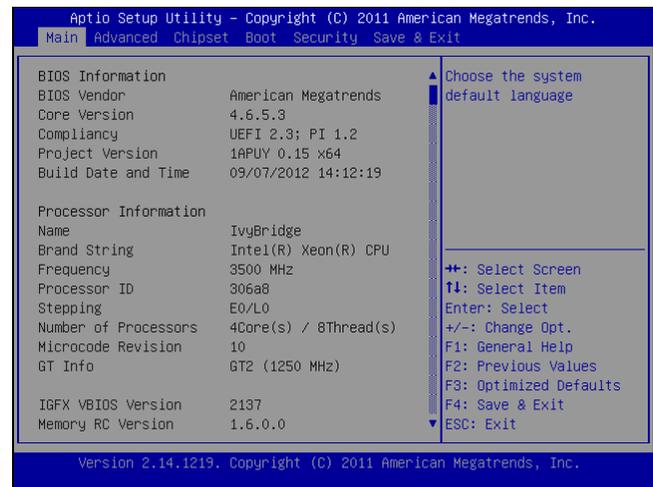
## Bios Settings

### The Main Menu

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this chapter.

The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options are configured parameters and cannot be modified. On the other hand, Options in blue can be modified.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.



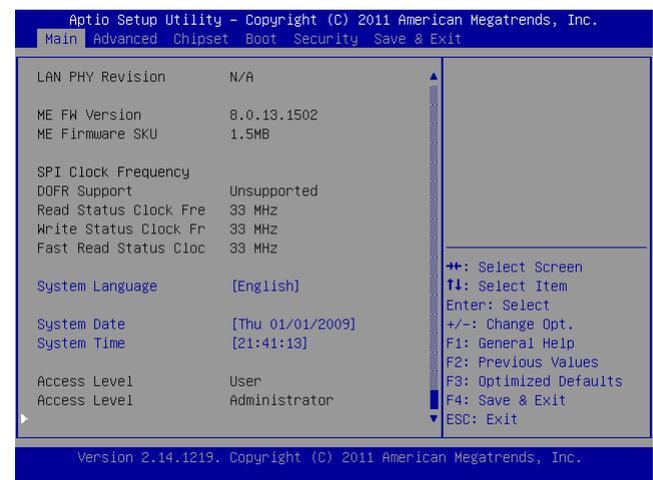
### System Language

Use this item to choose the BIOS language.



### System Time/System Date

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



### Advanced Settings

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS

Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown at the right. The sub menus are described on the following pages.



### PXE Function

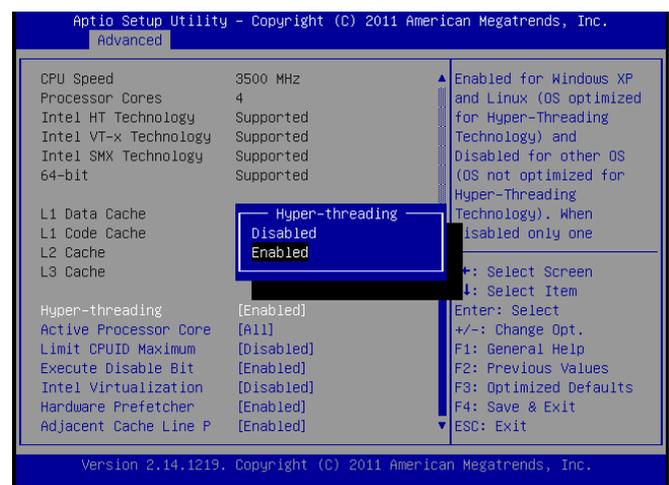
The Preboot eXecution Environment (PXE) allows you to boot computers using a network interface independently of data storage devices (like hard disks) or installed operating systems. Enable or disable this function with this option here.



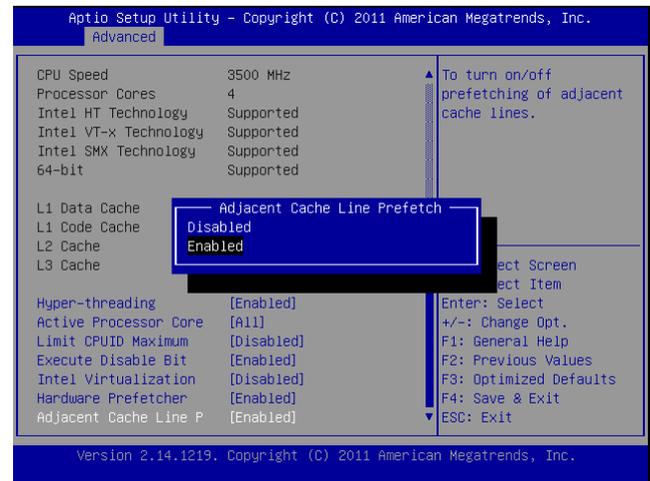
### CPU Configuration Settings

You can use this screen to view the capabilities and of your CPU. You can also use this menu to enable/disable certain functions of your CPU. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described below.

Item	Selection
Intel Hyper-Threading	The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously. Select to enable or disable this feature.
Active Processor Core	Select the number of processor cores to be active in each processor package.



Item	Selection
Limit CPUID Maximum	Allows legacy operating systems to boot even without support CPUs with extended CPUID functions. Select to enable or disable this function
Execute Disable Bit	Select to enable or disable the No-Execution Page Protection Technology.
Intel Virtualization	The Intel VT is a hardware-assisted virtualization. This processor supports Intel Virtualization. Enable or disable this feature.
Hardware Prefetcher	The processor has a hardware prefetcher that automatically prefetches data and instructions from the memory into the Level 2 cache that are likely to be required in the near future. This reduces the latency associated with memory reads. When enabled, the processor's hardware prefetcher will be enabled and allowed to automatically prefetch data and code for the processor. When disabled, the processor's hardware prefetcher will be disabled.
Adjacent Cache Line P	Select to enable or disable prefetching of adjacent line

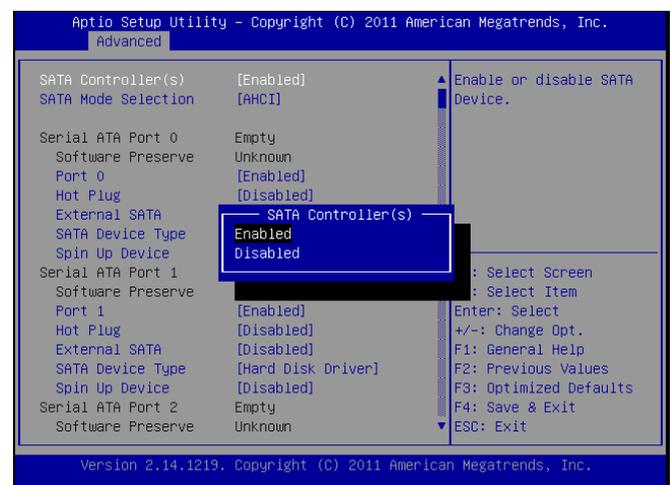


### SATA Controllers Configuration Settings

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show "Empty" if no SATA device is installed to the corresponding SATA port.

### SATA Controllers

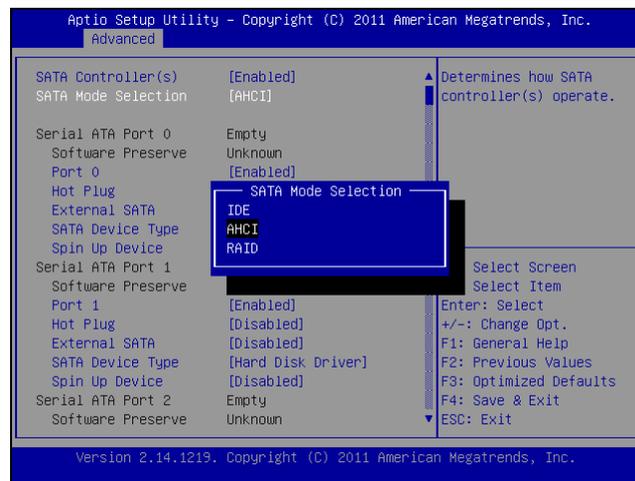
Item	Selection
Enable or Disable SATA Controller(s)	Set this value to enable or disable SATA controllers



### SATA Mode Selection

The system supports advanced SATA features such as software RAID.

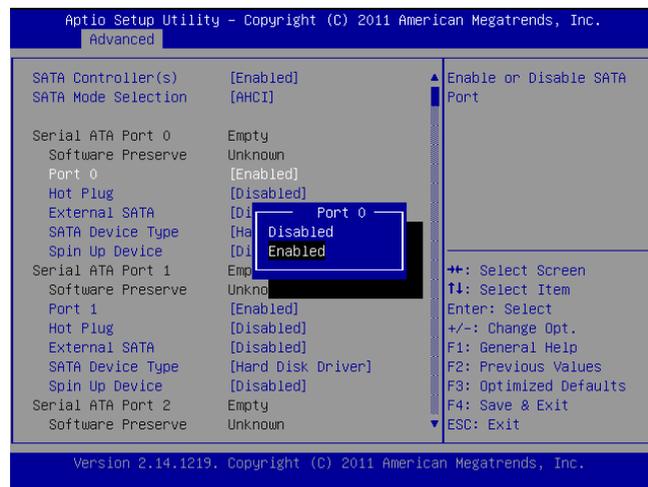
Item	Selection
IDE Mode	Set to IDE mode when you want to use the Serial-ATA hard disk drives as Parallel ATA physical storage devices.
AHCI Mode	Set to AHCI mode when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced SATA features that increases storage performance or workloads where multiple simultaneous read/write requests are outstanding, most often occurring in server-type applications (native command queuing). It also facilitates hot swapping.
RAID	Set to the RAID mode when you want to create a RAID configuration from the SATA Hard disk drives. This chipset supports software RAID by using the Intel® Matrix Storage Manager software. For more information, visit <a href="http://www.intel.com/design/chipsets/matrixstorage_sb.htm#benefit">http://www.intel.com/design/chipsets/matrixstorage_sb.htm#benefit</a>



### Serial ATA Port 0/1/2/3

Use this menu to configure specific SATA Port for all ports on the system.

Option	Description
Software Preserve	In order to avoid losing important software settings without legacy driver knowledge, the software settings preservation ensures that the value of important software settings is maintained across a COMRESET
Port 0	Enable or disable the specific port
Hot Plug	The AHCI of SATA provides hot plug capability to allow drives to be added or removed with the PC running.
External SATA	Called external SATA or eSATA, you can now utilize shielded cable lengths up to 2 meters outside the PC to transform SATA to be an external storage. enable or disable this feature.
SATA Device type	Select the SATA type from either Hard Disk Drive or Solid State Drive
Spin Up Device	Spin-up is a simple mechanism by which the storage subsystem controller can sequence hard disk drive initialization and spin-up.set to control whether each specific drive will spin up.



### USB Configuration Setting

You can use this screen to select options for the USB Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.

### Legacy USB Support

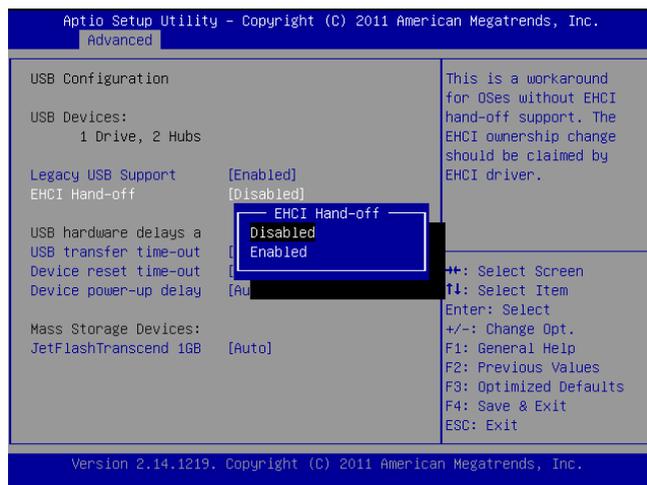
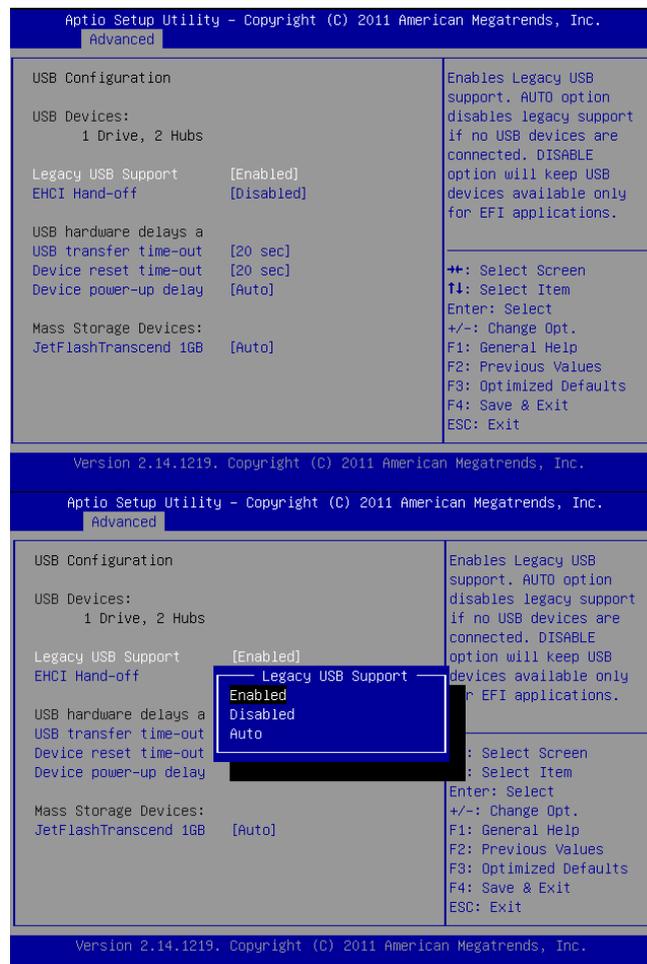
This option enable or disable the support for USB devices on legacy operating systems (OS), e.g., Windows ME/98/NT, and MS-DOS. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can be used on the system even when there is no USB drivers loaded on it.

Option	Description
Auto	Allow the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If it is not detected, the USB controller legacy mode is disabled.
Enabled	Enable the support for USB devices on legacy operating system
Disabled	Disable this function.

### EHCI Hand-Off

It allows you to enable support for operating systems which do not have the Enhanced Host Controller Interface hand-off (EHCI hand-off) feature for USB devices.

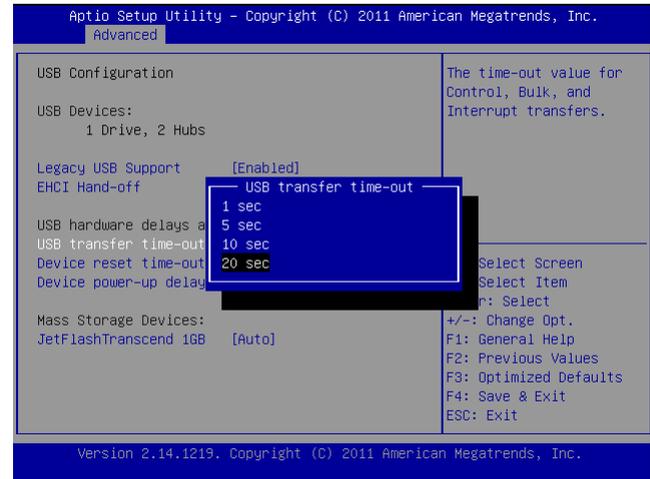
Option	Description
Enabled	Enable this feature
Disabled	Disable this feature



### USB Hardware Delays a

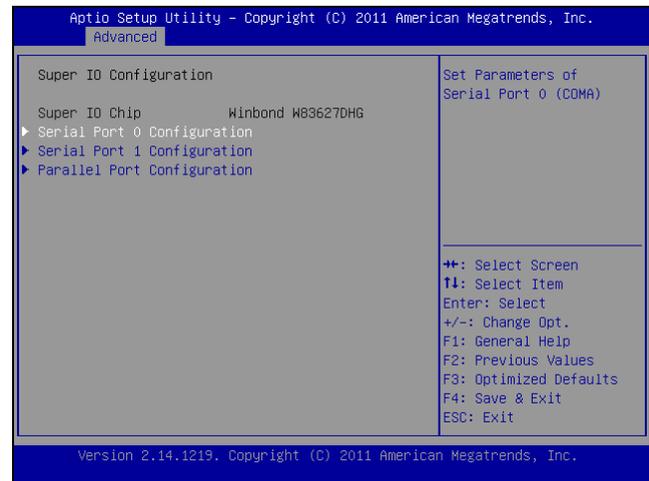
The menu sets delay time for USB operations.

Item	Description
USB transfer time-out	<p>set transfers to an endpoint to complete within a specific time.</p> <ul style="list-style-type: none"> <li>If set to zero, transfers will not time out because the host controller will not cancel the transfer. In this case, the transfer waits indefinitely until it is manually canceled or the transfer completes normally.</li> <li>If set to a nonzero value (time-out interval), the host controller starts a timer when it receives the transfer request. When the timer exceeds the set time-out interval, the request is canceled.</li> </ul>
Device reset time-out	<p>This option sets the reset timing for the USB Mass Storage to be initialized. When set to 10 Sec, the BIOS will wait for up to 30 seconds for the USB flash drive to initialize.</p>
Device power-up delay	<p>This option sets the power-up timing for the USB Mass Storage to be initialized.</p>



### SuperIO Configuration

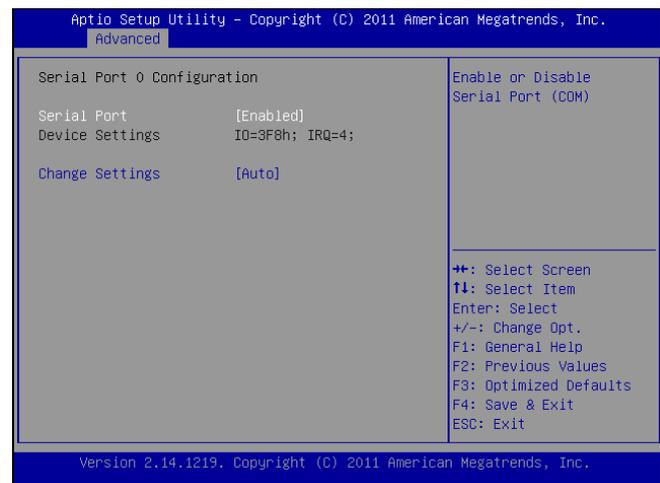
In this screen, you will be able to modify the IRQ address of the serial and parallel ports which are provided by the Winbond W83627DHG chip.



### Serial Port 0/1 Configuration

This option specifies the base I/O port address and Interrupt Request address of serial port 0 and 1.

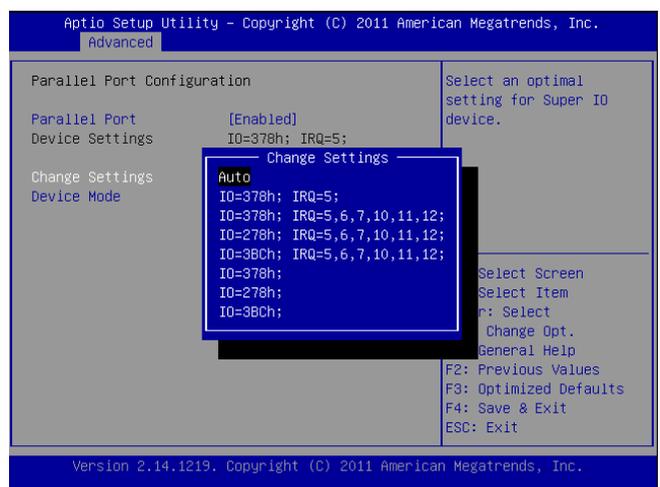
item	Selection
Enabled/Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable.
Change Settings	Selects the serial port base address and IRQ for the interrupt address.



### Parallel Port Configuration

This option specifies the I/O address used by the parallel port.

Item	Selection
Parallel Port	Enable or disable this parallel port
Device Settings	Selects the serial port base address
Device Mode	Selects the modes from the following possibilities: STD Printer, Standard Parallel Port (SPP), Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP). Currently, new products have support of a mixture of these protocols. Consult your device's specification for exact protocols supported by your product.  SPP: denotes normal or standard mode.  EPP: used specifically for non-printer devices that would attach to the parallel port, particularly storage devices that needed the highest possible transfer rate.  ECP: used specifically to provide improved speed and functionality for printers



### PC Health Status

This menu shows the hardware monitor configuration settings. Select an item then press <Enter> to display the configuration options.

#### SYSIN/CPUIN/AUXIN Temperature

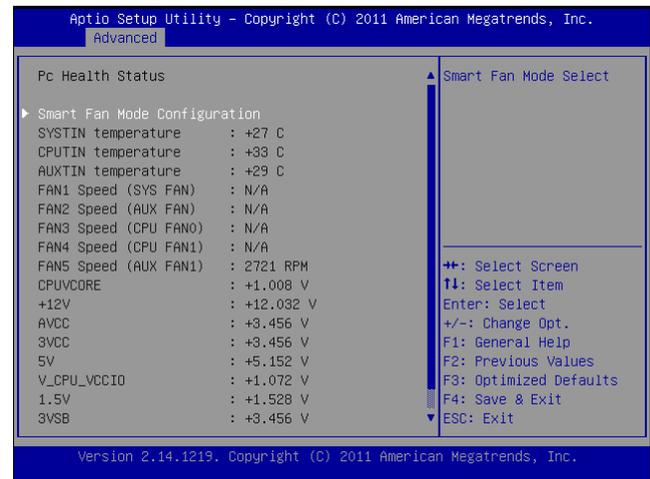
The onboard hardware monitor automatically detects and displays the CPU and motherboard temperatures.

#### FAN1/FAN2/FAN3/FAN4 Speed

The onboard hardware monitor automatically detects and displays the CPU, chassis and system fan speeds in rotations per minute (RPM). If the fan is not connected to the motherboard, it displays N/A.

#### CPU Voltage, 3.3V voltage, 5V voltage, 12V voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.



### Smart Fan Mode Configuration

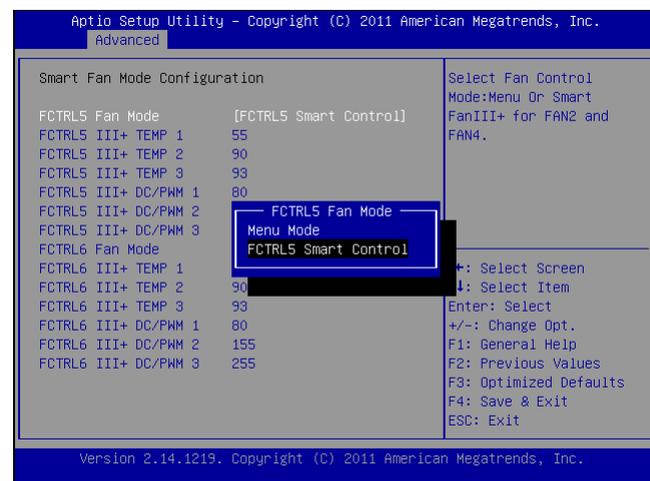
It allows you to configure the smart fan feature. You can manually turn on the CPU fan or set the target CPU temperature at which the CPU fan will start running if the fan is not yet turned on. And the CPU fan can also be turned off automatically if the temperature for the CPU is at or below the specified value. Refer to *Motherboard Layout* on Chapter 3 *Block Diagram* for CPU fan connectors.

Item	Selection
Manual Mode	Manually set the fan speed
Smart Fan Control	set the target system temperature at which the system fan will start running if the fan is not yet turned on with this mode. And the system fan can also be turned off automatically if the temperature for the system is at or below the specified value.

#### FCTRL5/FCTRL6 FAN Mode

The FCTRL5 is for setting the parameters for FAN2 and FAN4 for CPU fans.

The FCTRL6 is for setting the parameter for FAN1 and FAN3 for Auxiliary fans.



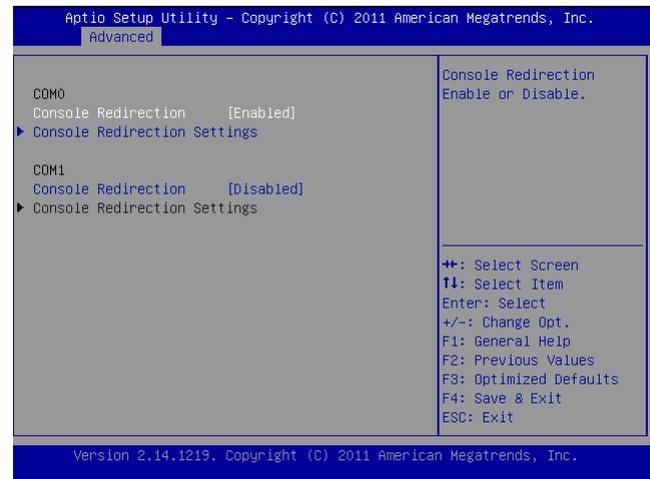
### Console Redirection

Use this menu to set the settings for BIOS remote access feature.

Item	Selection
Console Redirection	Enable or disable BIOS through remote access
Console Redirection Settings	Enter to view more options

### COM0/COM1 Console Redirection Settings

Item	Selection
Terminal Type	Sets the connection terminal type
Bits per second, Data bits, Parity, Stop Bits, Flow Control	Sets the terminal connection parameters such as the baud rate, parity check mechanism, etc.



### Lan Bypass Control

In this screen, you can configure the Lan Bypass functionality. The system has 3 LAN modules: Left module and two expansion models: M1 and M2 on the right (when facing the front panel).

#### LAN Bypass for M1/M2/Left Modu1

You can activate or deactivate the Lan Bypass ports. For the description of the physical ports that are capable of the LAN Bypass function, refer to the *Front Panel Feature* in *Chapter 1 Introduction*.

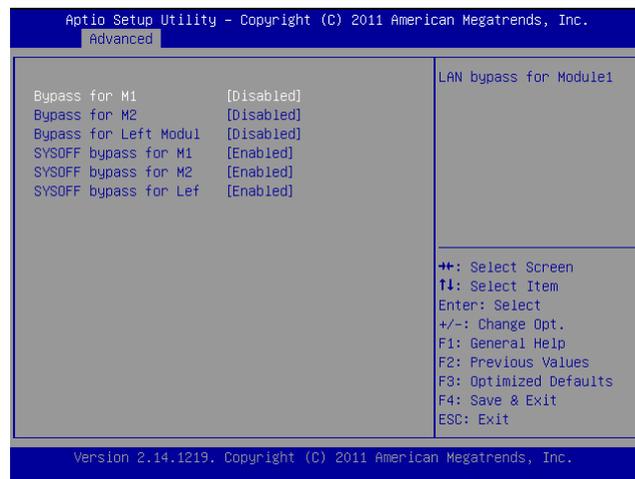
M1 denotes Ethernet expansion module No.1 and M2 denotes Ethernet module No.2.

Left Modu1 denotes the module on the far left when facing the front panel. **Note that Left Modu1 also supports Lanner Generation 3 Bypass. See appendix D Programming Generation 2 and 3 LAN Bypass for more information**

#### SYSOFF bypass for M1/M2/Left Modu1

You can enable or disable the automatic activation of hardware Lan Bypass function in the event of a power failure. Hardware Bypass can automatically activate to allow network traffic to continue.

The Lan bypass can be turned on or off in two system states, i.e., power on and power off. The following are the BIOS menu and illustration of the possibilities of LAN bypass configuration in each state.



Bypass settings System Status	LAN Bypass for Port1 and Port 2		LAN Bypass 1&2 when power off
	Power on	Enabled    Disabled	Enabled
		Bypass    Non-Bypass	
Power off	Bypass	Bypass	

Bypass settings System Status	LAN Bypass for Port1 and Port 2		LAN Bypass 1&2 when power off
	Power on	Enabled    Disabled	Disabled
		Non-Bypass    Non-Bypass	
Power off	Non-Bypass	Non-Bypass	



### CPU PPM Configuration

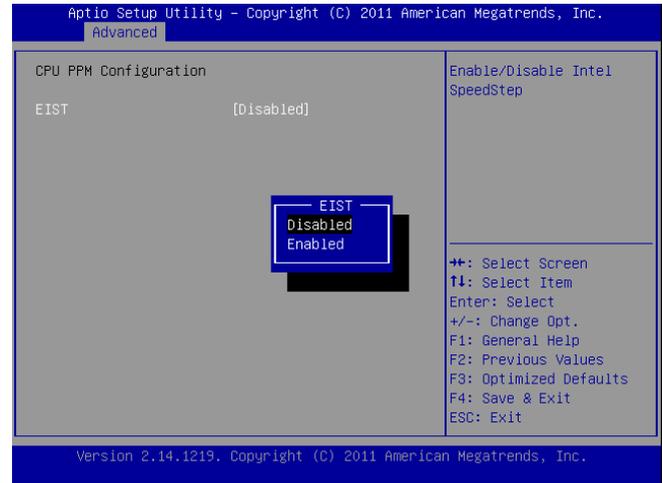
In this section, you can configure the CPU Processor Power Management.

### EIST (Enhanced Intel SpeedStep Technology)

It allows you to enable or disable the EIST.

Option	Description
Enable	The operating system controls the CPU speed
Disabled	The CPU runs at its default speed.

Enhanced Intel SpeedStep® technology (EIST) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production. There are some system requirements must be met, including CPU, chipset, motherboard, BIOS and operation system. Please refer to Intel website for more information



### Chipset

The chipset menu will let you further configure your Intel CPU and PCH capabilities:

### PCH I/O Configuration

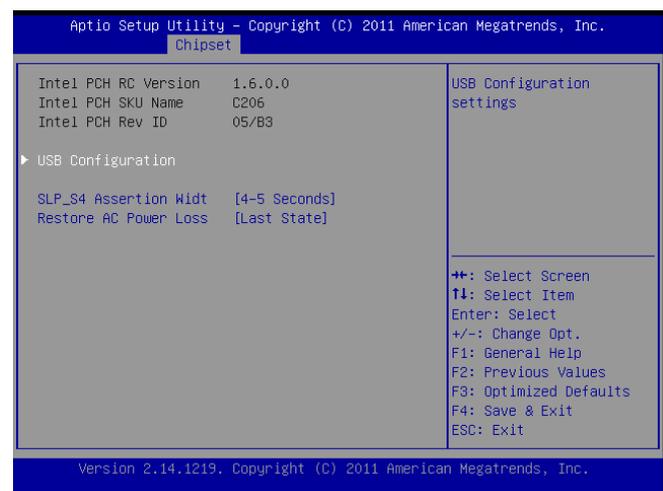
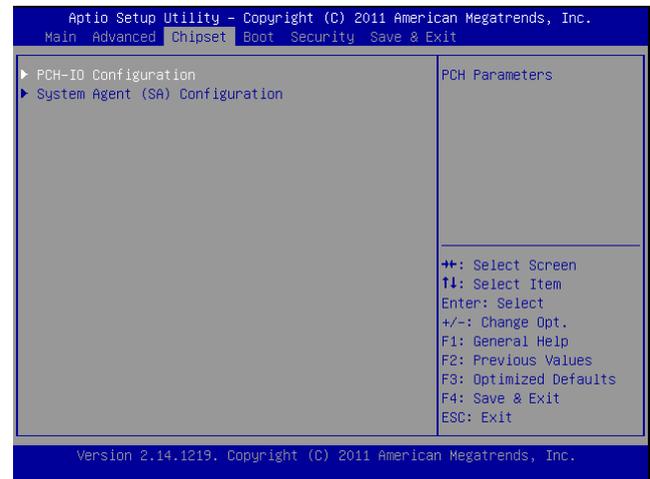
It shows the model name and version of the Intel Platform Controller Hub on the system.

### USB Configuration

Item	Selection
EHCI1/EHCI2	The EHCI specification describes a host controller that correctly supports all compliant USB 2.0 low-, full-, and high-speed devices. Select to either enable or disable the controller.

### SLP\_S4 Assertion Width

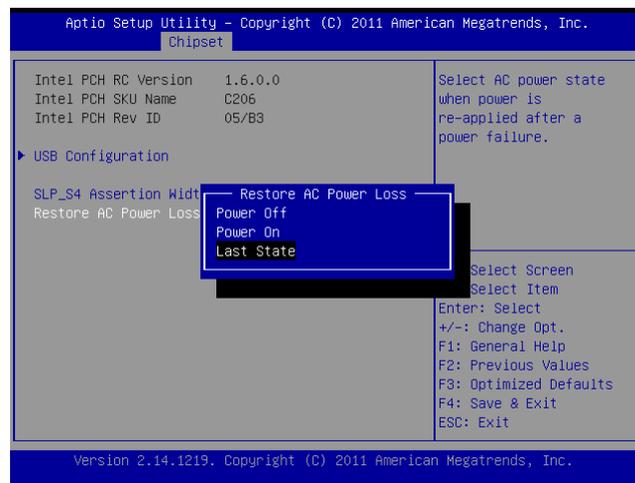
Select the minimum assertion width of the SLP\_S4# signal. This field indicates the minimum assertion width of the SLP\_S4# signal to ensure that the DRAM modules have been safely power-cycled. SLP\_S4# is a signal for power plane control. This signal shuts off power to all non-critical systems when in the S4 (Suspend to Disk) or S5 (Soft Off) state.



### Restore on AC Power Loss

This option lets you set the state of the system when it has just recovered from a power outage.

Option	Description
Power Off	When setting to Power Off, the system goes into "off state" after an AC power interruption.
Power On	When setting to Power on, the system turns on automatically after a power interruption
Last State	When setting to Last State, the system goes into whatever the state was before the power interruption.



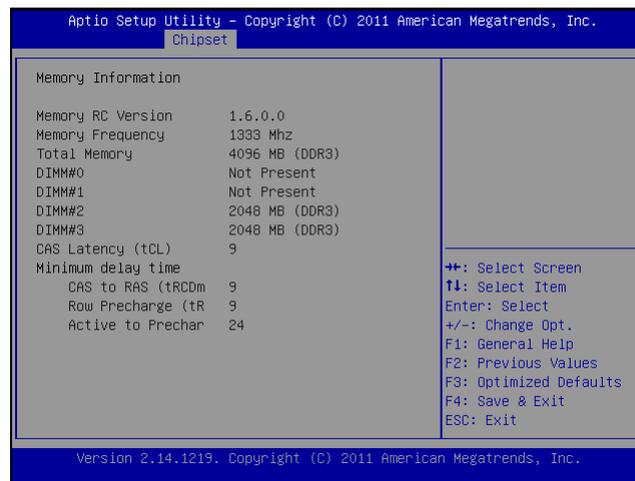
### Intel VT-d

Select to enable or disable the Intel Virtualization Technology for Directed I/O" (VT-d). The Memory and I/O virtualization are supported by the chipset as part of Intel Virtualization Technology for hardware-assisted virtualization.



### Memory Configuration

It shows the memory capacity of the system and the installed memory on the system.



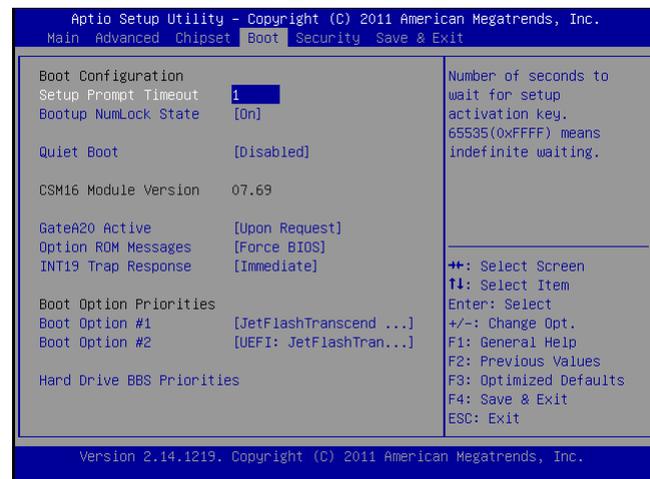
### Boot Setup

Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display an Boot BIOS Setup option by highlighting it using the <Arrow> keys. Select an item on the Boot Setup screen to access the sub menus for the following described functions.

### Boot Settings Configuration

In this screen, you will be able to configure the boot procedures and the related elements.

Items	Options
Setup Prompt Timeout	Specify the number of seconds for the boot setup prompt to wait for user's intervention during the POST.
Bootup Num-Lock State	This option lets you to enable or disable the function of the NumLock key.
Quiet Boot	Enabling this item allows the BIOS to suppress the message displayed during the POST.
GateA20 Active	This option sets the A20 address line controlling method for handling above 1MB memory access. By enabling the A20 gate, we have access to all 32 lines on the address bus, and hence, can reference 32 bit addresses, or up to 0xFFFFFFFF - 4 GB of memory. The controlling mode includes:  Upon Request: when it is enabled by user programs.  ALWAYS: never disables the A20 line



Items	Options
<b>Option ROM Messages</b>	<p>This option controls the display of ROM messages from the BIOS of add-on devices such as the graphics card or the SATA controller during the start-up sequence.</p> <p>Force BIOS: When setting to Force BIOS, third-party ROM messages will be forced to display during the start-up sequence.</p> <p>Keep Current: When setting to Keep Current, third-party ROM messages will only be displayed if the device's manufacturer has set the add-on device to do so.</p>
<b>Interrupt 19 Trap Response</b>	<p>Set this value to configure how option ROMs such as network controllers trap BIOS interrupt 19.</p>
<b>Boot Option Priorities</b>	<p>Use this screen to specify the order in which the system checks for the device to boot from.</p>
<b>Hard Drive BBS Priorities</b>	<p>You will enter a submenu that presents all the drives connected to the system. Here you can define the boot order for the Hard disks.</p>



### Security Settings

Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

#### Administrator Password

If you have set an administrator password, you should enter the administrator password for accessing the system. Otherwise, you will only be able to see or change selected fields in the BIOS setup program.

#### User Password

If you have set a user password, you must enter the user password for accessing the system.

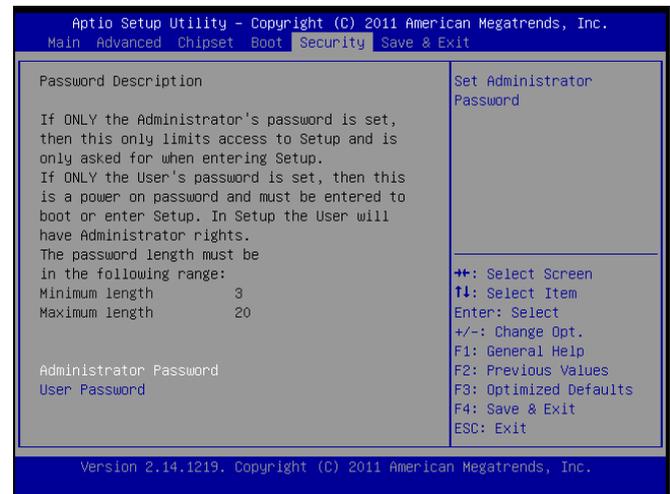
To set an Administrator/User password:

1. Select the option item and press Enter.
2. From the Create New Password box, key in a password, then press enter.
3. Confirm the password when prompted.

To change an administrator password:

1. Select the option item and press Enter.
2. From the Enter Current Password box, key in the current password, then press enter.
3. From the Create New Password box, key in a new password, then press Enter.
4. Confirm the password when prompted.

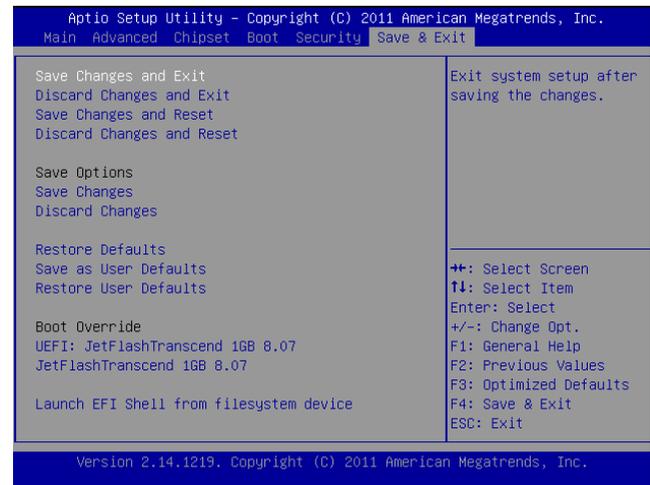
To clear the administrator password, follow the same steps as in changing an administrator password, then press Enter when prompted to create/confirm the password.



### Save & Exit

Select the Exit tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the <Arrow> keys. The following table lists the options in this menu.

Item	Options
Saving Changes and Exit	Select this option to save changes and exit the BIOS menu. It will automatically resets if the changes made require rebooting the system to take effect.
Discard Changes and Exit	Select this option to discard changes and exit and BIOS menu to continue the booting process.
Save Changes and Reset	When you have completed the system configuration changes, select this option to leave setup and reboot the computer so the new system configuration parameters can take effect.
Discard Changes and Reset	This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select Yes to discard any changes and load the previously saved values.
Save Changes	Save your changes
Discard Changes	Discard changes
Restore Defaults	Restore to factory defaults
Save as User Defaults	Save all of your changes as an user default setting.
Restore User Defaults	Loads your saved user default setting.
Boot Override	This section of the Boot Menu allows booting from a specific device immediately. Therefore you should see an entry for all bootable devices.
Launch EFI Shell from filesystem device	This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.



### Appendix A: Driver Installation

#### Chipset Driver Installation

This section provides the instructions on how to install Intel® Chipset Software Installation Utility. This utility installs specific Windows INF files for proper configuration of specific functionality such as AGP, USB, Core PCI, and ISA PnP services.

To install the Intel® Chipset driver on a Windows Operating System:

1. Restart the computer, and then log on with Administrator privileges.
2. Insert the Drivers and User's Manual CD to the USB-optical drive.
3. Browse the contents of the support CD to locate the file `infinst_autol.exe` from the `\Driver` folder. Double-click the Executable file.
4. The program starts by extracting the file. Click Next to continue the installation process.
5. Click **Next** when the Intel® Chipset InstallShield Wizard window appears.



6. Click Next when the Readme File Information screen appears.



7. Click Yes when the Software License Agreement screen appears.



8. Click Finish when the Setup Complete screen appears.



### LAN Adapters Driver Installation

This section provides the instructions on how to install Intel® Gigabit LAN adapter drivers.

#### On the Windows OS

To install the Intel® Gigabit LAN controller driver on a Windows Operating System:

To install the Intel® Gigabit LAN controller driver on a Windows Operating System:

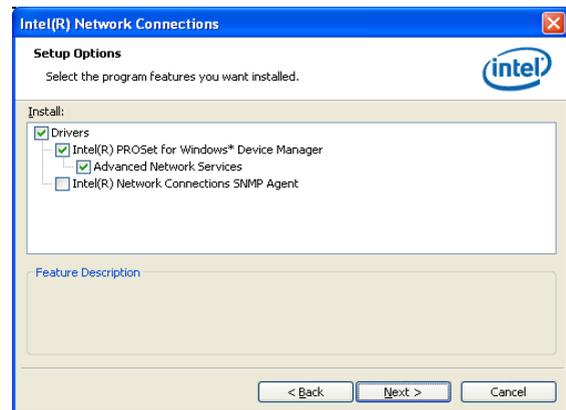
1. Restart the computer, and then log on with Administrator privileges.
2. Insert the Drivers and User's Manual CD to the USB-optical drive.
3. Browse the contents of the support CD to locate the file PRO2KXPEXE from the \Driver\LAN folder. Double-click the Executable file.
4. The program starts by extracting the file. Click Next to continue the installation process.
5. Click **Next** when the Intel® PRO Network Connections –InstallShield Wizard window appears.



6. Select the "I accept the terms in the license agreement" and then click Next.



7. Select the programs that you wish to install. Make sure that you have selected the drivers.



8. Click Next and then **Install** to proceed the installation.
9. Click **Finish** to close the installation program.

To verify the LAN controller driver installation, do the following steps:

1. Right-click on the My Computer icon, and then select Properties from the menu.

Click the Hardware tab, then click the Device Manager button.

Click the + sign next to the Network adapters, then the Intel Pro/1000 [.....] adapter should be listed.



Note: The system uses Intel I350 Ethernet controllers, you could obtain the latest drivers at the Intel download center: <http://downloadcenter.intel.com/>  
You could also use the web based utility to detect the needed drivers automatically by visiting the following website: <http://www.intel.com/support/network/detect.htm>



### On Linux

Follow these instructions when installing the Intel® LAN controller base driver for the in Red Hat® and Linux operating system.

1. Insert the motherboard/system support CD to the optical drive and mount the optional drive in the Linux platform.

2. Copy the base driver tar file from the motherboard/system support CD to the directory of your local hard disk. The Intel® LAN driver for Linux OS is located in the following directory:

`\Driver\LAN_Driver\PRO1000\LINUX`. The name format of driver file is "e1000-<Version>.tar.gz". For example: the file name of driver version 7.0.38 is "e1000-7.0.38.tar.gz".

3. Untar/unzip the archive, where <x.x.x> is the version number for the driver tar file:

```
tar xzf e1000-<x.x.x>.tar.gz
```

4. Change to the driver src directory on your system, where <x.x.x> is the version number for the driver tar:

```
cd e1000-<x.x.x>/src/
```

5. Compile the driver module by typing the following command:

```
make install
```

6. The binary will be installed as:

```
/lib/modules/<kernel_version>/kernel/drivers/net/e1000.o
```

The install locations listed above are the default locations. They might not be correct for certain Linux distributions.

7. Load the module using either the `insmod` or `modprobe` command:

```
modprobe igb
```

```
insmod igb
```

Note that for 2.6 kernels the `insmod` command can be used if the full path to the driver module is specified. For example:

```
insmod /lib/modules/<KERNEL_VERSION>/kernel/drivers/net/igb/igb.ko
```

With 2.6 based kernels also make sure that older `igb` drivers are removed from the kernel, before loading the new module:

```
rmmod igb; modprobe igb
```

8. Assign an IP address to the interface by entering the following, where <x> is the interface number:

```
ifconfig eth<x> <IP_address>
```

9. Verify that the interface works. Enter the following, where <IP\_address> is the IP address for another machine on the same subnet as the interface that is being tested:

```
ping <IP_address>
```



Note: The system uses Intel I350 Ethernet controllers, you could obtain the latest drivers at the Intel download center: <http://downloadcenter.intel.com/>

### Realtek LAN Adapters Driver nstallation

The system also uses Realtek LAN adapter RTL8110SC. This section provides the instructions on how to install Realtek® Gigabit LAN adapter drivers.

1. Insert the Drivers and User's Manual CD to the USB-Optical drive and mount the optional drive in the Linux platform.

2. Copy the archive driver in BZ2 file from the Drivers and User's Manual CD to the directory of your local hard disk. The Realtek® LAN driver for Linux OS is located in the following directory:

`\Driver\RTL8110_Driver\LINUX`. The name format of driver file is "r8169-<Version>.tar.bz2".

3. Untar/unzip the archive file:

```
tar xvfj <driver-file-in>.tar.bz2
```

4. Compile the driver module by typing the following command:

```
make install
```

5. The binary will be installed as:

```
/lib/modules/<kernel_version>/kernel/drivers/net/
```

The install locations listed above are the default locations. They might not be correct for certain Linux distributions.

6. Assign an IP address to the interface by entering the following, where <x> is the interface number:

```
ifconfig eth<x> <IP_address>
```

7. Verify that the interface works. Enter the following, where <IP\_address> is the IP address for another machine on the same subnet as the interface that is being tested:



ping <IP\_address>



**Note:** For LAN drivers installing on other operating systems, visit Realtek's download page at: <http://www.realtek.com.tw/Downloads/downloadsView.aspx?Langid=1&PNid=13&PFid=4&Level=5&Conn=4&DownTypeID=3&GetDown=false&Downloads=true>

### VGA Driver Installation

This section provides the instructions on how to install VGA adapter drivers on your windows.

1. Restart the computer, and then log on with Administrator privileges.
2. Insert the Drivers and User's Manual CD to the optical drive.
3. Browse the contents of the support CD under the directory: \Driver\VGA.
4. You may need to install the drivers manually if there is no available executable program for installing the drivers automatically.
5. To install the drivers manually, use the Found New Hardware wizard of the Windows.
6. During the steps make sure that you choose to install the hardware by manually selecting the drivers that you wish to install. When this option appears, you should select the directory containing the drivers for the VGA adapter.

This platform supports processors with an integrated Intel® HD Graphics is included. You could visit the Intel support website for the generic VGA driver on Intel support site. It is a unified drivers for all platforms using integrated video controllers on processors. So, you can install the driver posted on this site:

<http://downloadcenter.intel.com/SearchResult.aspx?lang=eng&ProductFamily=Graphics&ProductLine=Processor+graphics&ProductProduct=2nd+Generation+Intel%C2%AE+Core%E2%84%A2+Processors+with+Intel%C2%AE+HD+Graphics+3000%2f2000&ProdId=3319&LineId=3310&FamilyId=39>

You could also use the web based utility to detect the needed drivers automatically by visiting the following website:

<http://www.intel.com/support/graphics/detect.htm>

On this web, it features the Intel® Driver Update Utility to keep your Intel graphics driver up-to-date. It detects which graphics updates are relevant to your computer, and then helps you install them quickly and easily.



### Intel Rapid Storage Technology Utility Installation

1. Insert the Drivers and User's Manual CD to the optical drive. Or you can download this software from Intel website too.
2. Browse the contents of the support CD under the directory: \Driver\ for RAID software.
3. Follow the on-screen instructions to install the software.



4. Restart the computer. You will find the "Intel Rapid Storage Technology" icon on the Windows task bar.



### Appendix B: Setting up Console Redirections

---

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. This following steps illustrate how to use this feature.

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 for the device: Please refer to the *Remote Access Settings* on Chapter 4 *BIOS Settings*.

BIOS > Advanced > Serial Port Console Redirection  
> select enabled first and then go to >Console  
Redirection Settings > [115200, 8 , n ,1 ]

3. Configure Console Redirection on the client system. The following illustration 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 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 type of LCM:

- **Parallel Text-based LCM:** The LCM connects to the motherboard's parallel port. The LCD screen can display 2 lines, 20 characters per line.

#### Parallel Text-based LCM

##### Build

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

1. Copy the proper makefile from the Driver and Manual CD to your system: `Makefile.linux`
2. Type `make` to build source code:  
`make Makefile` (Note: omit the file extensions)

After compiled, the executable programs (`plcm_test`, `plcm_cursor_char`, `Test`) and the driver (`plcm_drv.ko` or `plcm_drv.o`) will appear in the program's folder.



**Note:** The OS supported by Lanner Bypass function include platforms based on Linux Kernel series 2.4.x and Linux Kernel series 2.6.x.

##### Install

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

```
#insmod plcm_drv.ko
#mknod /dev/plcm_drv c 241 0
```



**Note:** If you cannot install the driver, check whether you have enabled the parallel port in the BIOS setting.

##### Execution

This section contains sample executable programs that you could test on your platform. It demonstrates some useful functionality that the LCM provides.

To execute, type:

```
#!/plcm_test
```

**Plcm\_cursor\_char.** This program provides a menu to demonstrate the following functions:

**Insert line** (set the starting line to either line 1 or line 2)

**Move Cursor right** (select to move the cursor to the right)

**Move Cursor Left** (select to move the cursor to the left)

**Add a char** (select to display a character on the LCM screen)

**Clear** (select to clear the LCM display)

**Leave** (select to leave the program)

To execute, type:

```
#!/ plcm_cursor_char
```



**Note:** For descriptions of the command, refer to the `Readme` file contained within the program's folder.



### Appendix D: Programming Generation 2 and 3 LAN Bypass

#### Lanner Generation 3 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 states:

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

And the 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.

Please refer to

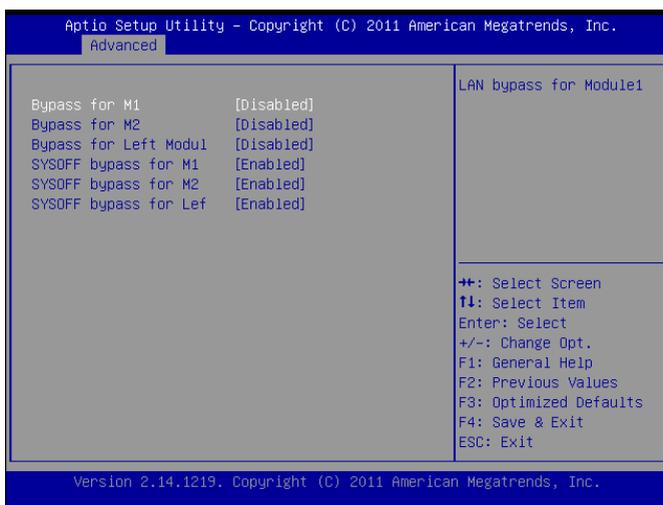
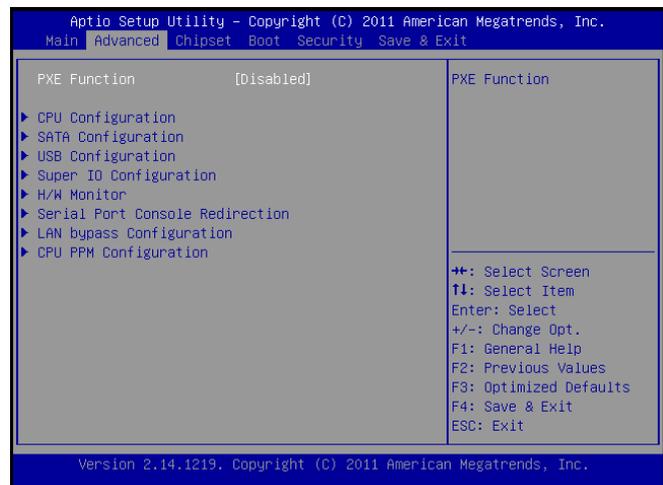
Please refer to the LAN\_Bypass\_Watchdog folder on the Driver and Manual CD.

For sample LAN bypass code and the Bypass Manual, see the LAN\_Bypass folder on the Driver and Manual CD or the Lanner Assist Website at <http://assist.lannerinc.com>. And browse the support center and look for Lanner LAN Bypass Module Manual under Software Utility Manuals folder (<http://assist.lannerinc.com/modules/wfdownloads/viewcat.php?cid=90>).

Fro a description of the physical LAN ports equipped with this function, refer to Front Panel Features in Chapter 1 Introduction.

#### Lanner Generation 2 Bypass

Unlike Lanner Generation 3 bypass, Generation 2 bypass is configured through the BIOS menu as shown below:



There are two ways to enable the bypass on the system:

1. The LAN bypass can be turned on or off in two system states, i.e., power on and power off. The following are the illustration of the possibilities of LAN bypass configuration with respect to both power-on and power-off states.

System Status \ Bypass settings	LAN Bypass for Port1 and Port 2		LAN Bypass 1&2 when power off
	Enabled	Disabled	
PWR ON	Bypass	Non-Bypass	Enabled
PWR OFF	Bypass	Bypass	

System Status \ Bypass settings	LAN Bypass for Port1 and Port 2		LAN Bypass 1&2 when power off
	Enabled	Disabled	
PWR ON	Non-Bypass	Non-Bypass	Disabled
PWR OFF	Non-Bypass	Non-Bypass	

2. A watchdog timer can be used to control the LAN Bypass function dynamically by programming. Lanner also provides sample code for bypass control with WDT via programming. For sample code, look in the LAN\_Bypass\_Watchdog directory under Driver and Manual CD.

To compile:

```
#gcc wdbp.c -o wdbp
```

then switch to a root account to run ./wdbp for execution:

```
#./wdbp
```

Commands:

Enable the bypass

```
#wdbp.exe -f
```

Set Watchdog Timer. This command will set the time interval at which the counter will start count down.

```
#wdbp.exe -wl xxx (xxx: 1-255 sec for timer count down)
```

Reset Watchdog Timer. This command will reset the watchdog timer's counter and the bypass status to non-bypass.

```
#wdbp.exe -wr xxx (xxx: 1-255 sec for timer count down)
```



### Note:

In the BIOS:

1. M1 denotes expansion Ethernet module No.1 and M2 denotes expansion Ethernet module No.2. For customization opportunity with these modules, visit Lanner website: [http://www.lannerinc.com/x86\\_Network\\_Appliances/Network\\_Modules](http://www.lannerinc.com/x86_Network_Appliances/Network_Modules)
2. Left Modu1 denotes the module on the far left when facing the front panel. This module supports both Lanner Generation 2 and Generation 3 bypass.

For a description of the physical LAN ports equipped with this functionality, refer to *Front Panel Features* in Chapter 1 Introduction.



### Appendix E: Terms and Conditions

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#### 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.

#### RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. 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.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.



**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.



# Appendix E

## Terms and Conditions

### RMA Service Request Form

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

<b>RMA No:</b>		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

