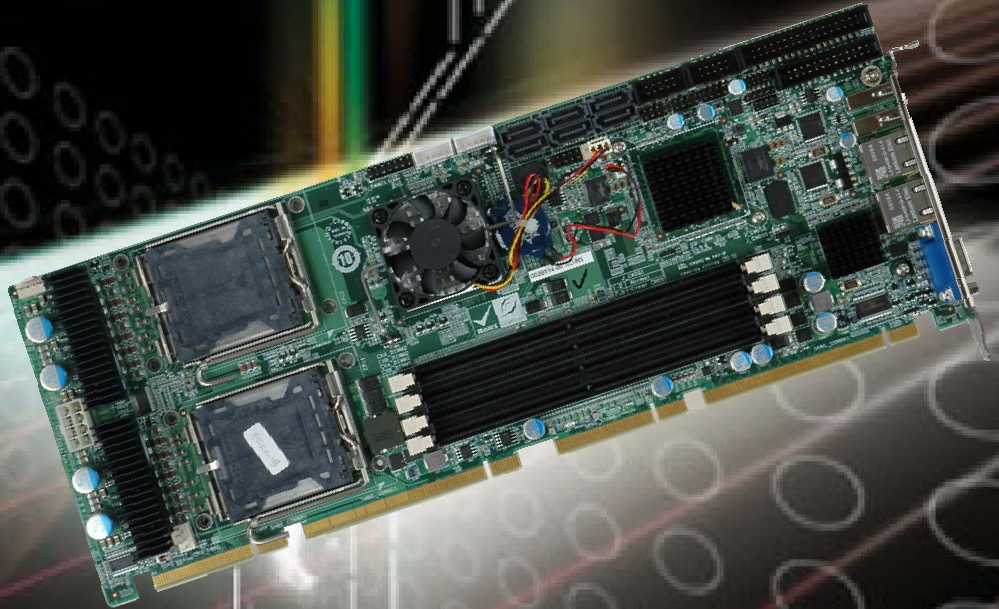




IEI Technology Corp.



**MODEL:
SPCIE-5100DX**

Full-size PICMG 1.3 CPU Card supports Dual LGA771 Intel® Xeon® Processor and comes with VGA, USB, Dual PCIe GbE, Audio and SATA II with RAID Function

User Manual

Rev. 1.02 – 24 June, 2010



Revision

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24 June, 2010	1.02	Added ATX 12 V power cable in the packing list
20 October, 2009	1.01	Added CPU support list (Section 4.4.1) and modified 4.4.3 Cooling Kit Installation
13 July, 2009	1.00	Initial release

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Chapter

1

Introduction

1.1 Overview

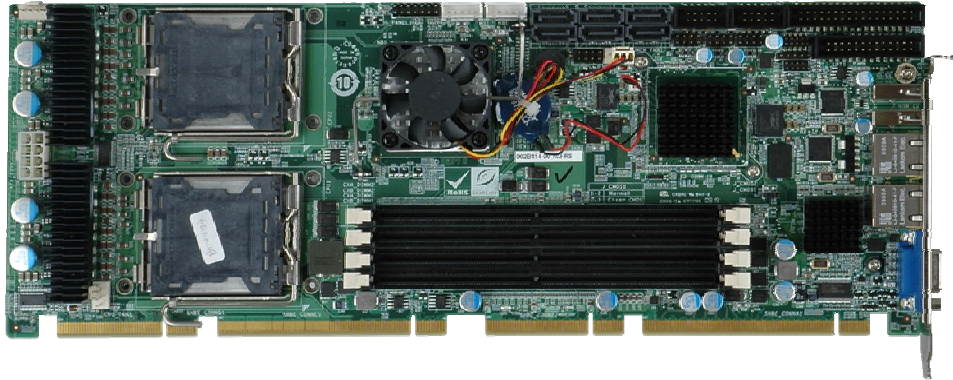


Figure 1-1: SPCIE-5100DX PICMG 1.3 CPU Card

The SPCIE-5100DX PICMG 1.3 form factor CPU card is an Intel® Xeon® CPU processor platform with an integrated Intel® 5100 and ICH9R chipset. The SPCIE-5100DX is coupled with the specially designed backplanes to provide access to up to 20 PCI Express (PCIe) lanes.

Four 8.0 GB DDR2 SDRAM Registered ECC DIMMs support a maximum of 32.0 GB DDR2 system memory. Six SATA II drives with 3.0 Gbps data transmission rates provide flexible storage options. Twelve USB 2.0 interfaces and four PCI expansion lanes (interfaced to the backplane) provide further expansion options. Dual PCIe gigabit Ethernet (GbE) controllers facilitate external Internet connectivity. An XGI Volari™ PCI graphics controller supports analog CRT display output and connectivity to standard CRT monitors through an external VGA connector.

1.1.1 SPCIE-5100DX Expansion Options

There are 20 PCIe x1 lanes on the SPCIE-5100DX. All of these, 20 PCIe x1 lanes are interfaced to the IEI SPXE backplane through the PICMG 1.3 form factor edge connectors (one PCIe x16 and one PCIe x4) on the bottom of the CPU card.

SPCIE-5100DX PICMG 1.3 CPU Card

1.1.1.1 PCI Expansion

An additional four PCI lanes are interfaced to the backplane through the standard PCI edge connectors on the bottom of the SPCIE-5100DX CPU card.

1.1.1.2 USB 2.0 Expansion

Twelve USB 2.0 interfaces are also available. Eight of the USB 2.0 interfaces are implemented directly on the SBC (six internal and two external) and the remaining four USB 2.0 interfaces are connected to the backplane through the edge connectors.

1.2 SPCIE-5100DX Features

Some of the SPCIE-5100DX features are listed below.

- Supports dual LGA771 Intel® Xeon® processors with a 1066 MHz or 1333 MHz FSB
- Supports four 240-pin 8.0 GB (max.) 533 MHz or 667 MHz DDR2 ECC Registered DIMM (system max. 32.0 GB)
- Supports up to 1600 x 1200 resolution VGA output
- Six SATA II drives with data transfer rates of 3.0 Gbps supported
- Twelve USB 2.0 devices supported (eight on-board and four on the backplane)
- Dual PCIe GbE Ethernet connectors
- PICMG 1.3 form factor
- RoHS compliant
- Supports ATX power supplies

1.3 SPCIE-5100DX Connector

The SPCIE-5100DX has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the SPCIE-5100DX.

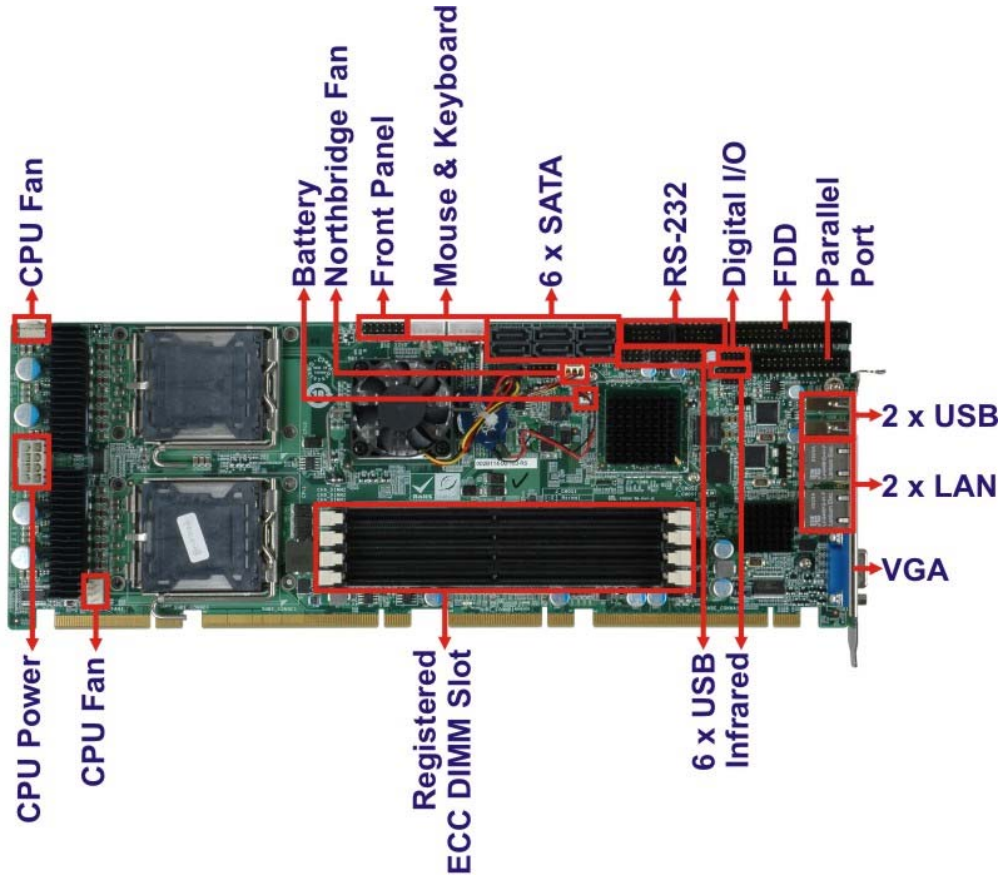


Figure 1-2: SPCIE-5100DX Overview [Front View]

SPCIE-5100DX PICMG 1.3 CPU Card

1.4 Dimensions

The dimensions of the board are listed below:

- Length: 338.58 mm
- Width: 126.39 mm

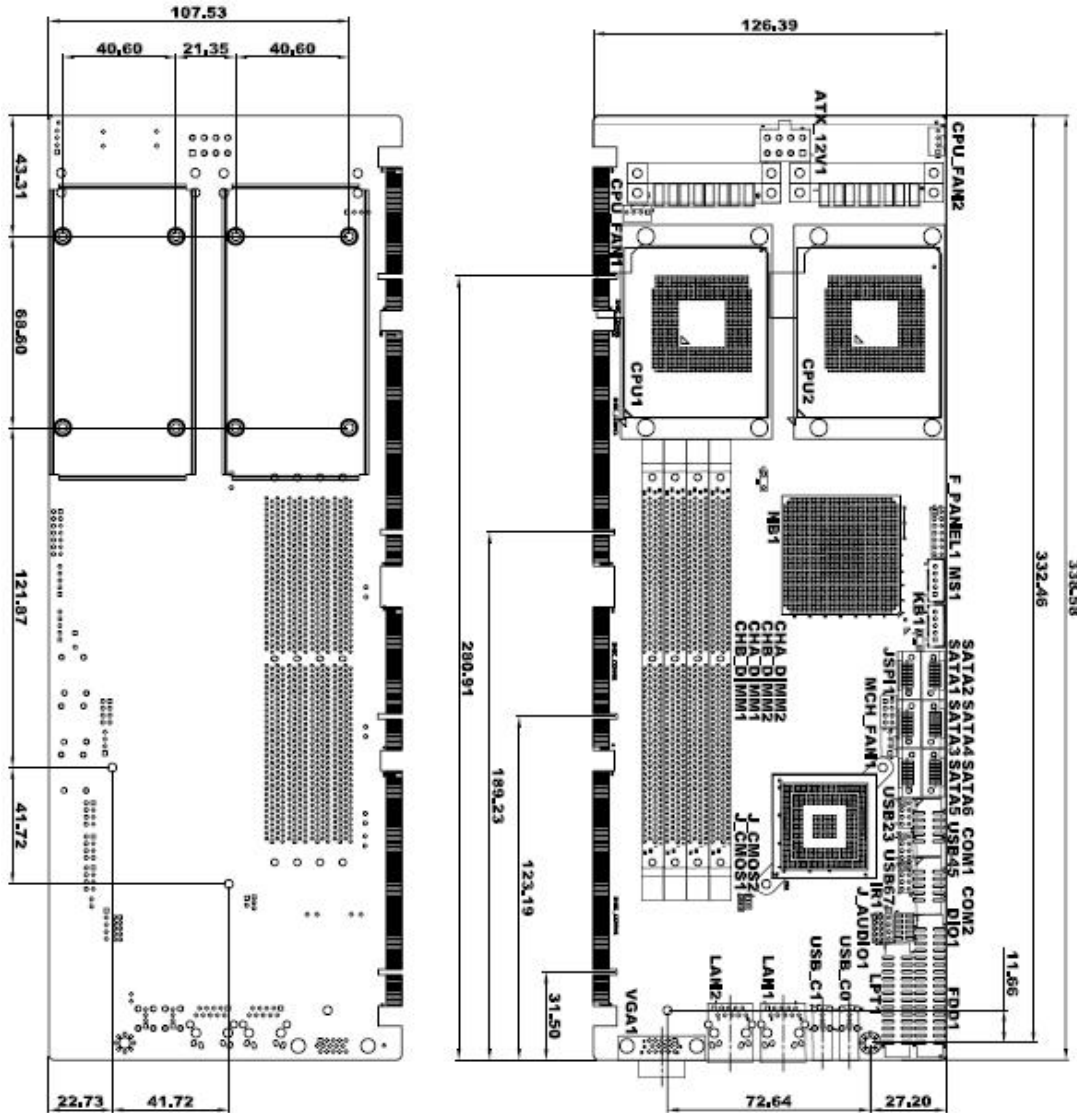


Figure 1-3: SPCIE-5100DX Dimensions (mm)

1.4.1 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 1-4**.

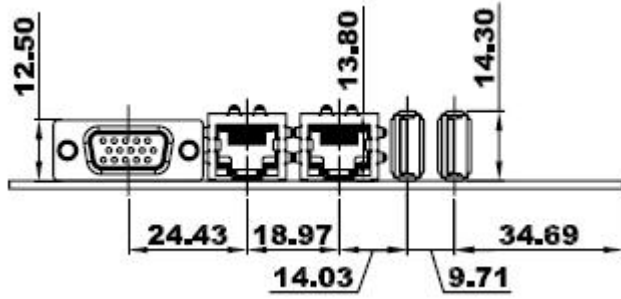


Figure 1-4: External Interface Panel Dimensions (mm)

SPCIE-5100DX PICMG 1.3 CPU Card

1.5 Data Flow

Figure 1-5 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

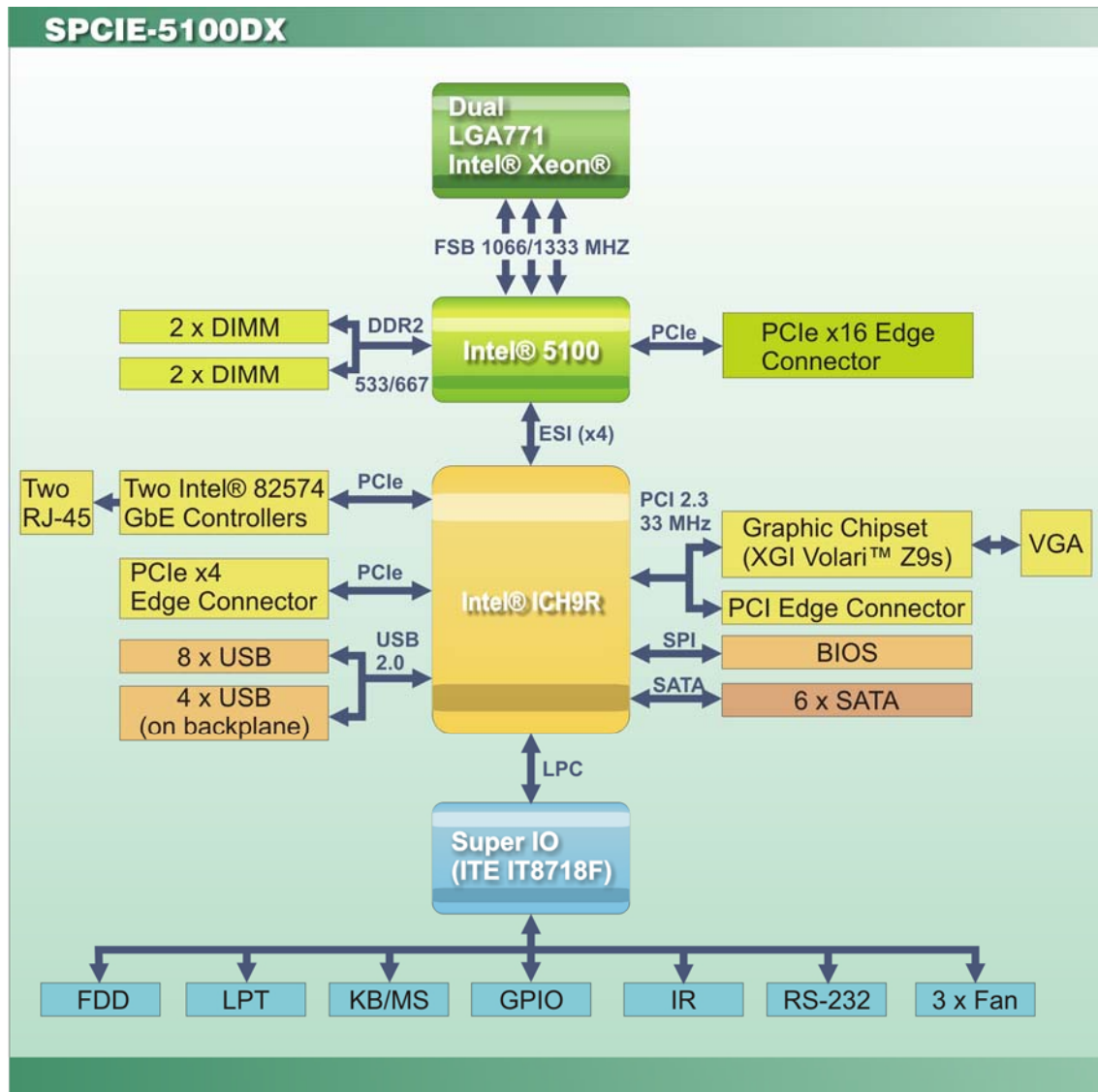


Figure 1-5: Data Flow Block Diagram

1.6 Technical Specifications

SPCIE-5100DX technical specifications are listed below.

Specification	SPCIE-5100DX
Form Factor	PICMG 1.3
Socket	LGA771 (Socket J)
CPU Supported	Intel® dual-core Xeon® 5100 series CPU Intel® dual-core Xeon® 5200 series CPU Intel® quad-core Xeon® 5300 series CPU Intel® quad-core Xeon® 5400 series CPU
Front Side Bus (FSB)	1066 MHz or 1333 MHz
Northbridge Chipset	Intel® 5100 MCH
Southbridge Chipset	Intel® ICH9R
Memory	Four 240-pin 8.0 GB (max.) 667 MHz or 533 MHz dual-channel DDR2 SDRAM ECC Registered DIMM supported (system max. 32.0 GB)
Audio	Optional 7.1 channel HD Audio kit with Realtek ALC883 audio codec
LAN	Two Intel® 82574L PCIe GbE controllers
Super I/O Controller	ITE IT8718F
BIOS	AMI SPI BIOS
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Digital I/O	8-bit digital I/O, 4-bit input and 4-bit output
Expansion	
PCI	Four PCI slots
PCIe	PCIe x16 signal to backplane PCIe x4 signal to backplane

SPCIE-5100DX PICMG 1.3 CPU Card

Specification	SPCIE-5100DX
I/O Interface Connectors	
Display port	One VGA via XGI Volari™ Z9s PCI graphics controller <ul style="list-style-type: none"> ■ GPU integrated with 64-bit 64MB GDDR2 memory ■ Supports resolution up to UXGA(1600x1200) and CRT hot plug
Ethernet	Two RJ-45 ports
Keyboard/Mouse	One 5-pin keyboard/mouse pin-header connector
LPT	One IEEE 1284 parallel port supporting normal, EPP and ECP modes
Serial Ports	Two RS-232 serial ports
USB 2.0/1.1 ports	Twelve USB 2.0 devices supported, eight on-board and four on the backplane
Infrared	One infrared connector
Storage	
Floppy Disk Drives	One 5.25" 360 KB or 1.2 MB floppy disk drives (FDD) or 3.5" 720 KB, 1.44 MB, 2.88 MB FDD.
Serial ATA	Six independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates support RAID 0, 1, 5 and 10
Environmental and Power Specifications	
Power Supply	ATX supported
Power Consumption	3.3 V @ 1.07 A 5 V @ 5.55 A 12 V @ 12.3 A Dual 1.60 GHz 5110 Intel® Xeon® CPUs with 1066 MHz FSB and four 2.0 GB of 667 MHz DDR2 memory running with 3D Mark 2001SE
Operating temperature	0°C ~ 60°C
Humidity	0% ~ 95% (non-condensing)

Specification	SPCIE-5100DX
Physical Specifications	
Dimensions	338 mm x 126 mm
Weight GW/NW	1200g/950g

Table 1-1: Technical Specifications

1.7 Expansion Options

1.7.1 Expansion Options Overview

A number of compatible IEI Technology Corp. PICMG 1.3 backplanes and chassis can be used to develop and expanded system. These backplanes and chassis are listed below.

1.7.2 IEI Expansion PICMG 1.3 Backplanes

The backplanes listed in **Table 1-2** are compatible with the SPCIE-5100DX and can be used to develop highly integrated industrial applications. All of the backplanes listed below have 24-pin ATX connector and a 4-pin ATX connector. For more information about these backplanes please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.



NOTE:

All the PCIe x16 slots in the **Table 1-2** only have PCIe x8 signals transmitted to them and **NOT** PCIe x16 signals.

SPCIE-5100DX PICMG 1.3 CPU Card

Model	Total Slots	System	Expansion Slots					System Type
			PCIe			PCI-X	PCI	
			x8	x4	x1			
SPE-4S	4	One	2*	1	-	-	-	Single
SPE-6S	6	One	-	5*	-	-	-	Single
SPE-9S	9	One	2*	3	-	-	3	Single
SPXE-9S	9	One	2*	2	-	2	2	Single
SPXE-14S	14	One	1*	-	12*	-	-	Single

*There are some limitations for certain expansion slots when the SPCIE-5100DX is installed on the backplane. Please see the section below (Section 1.7.2.1) for more details.

Table 1-2: Compatible IEI PICMG 1.3 Backplanes

1.7.2.1 Limitations

The limitations for certain expansions slots on the backplanes when installed with SPCIE-5100DX are listed below.

Backplanes	Slot Label	Limitation
SPE-4S	PCIEX8_1	The length of the expansion card installed in this PCIe x8 slot should be less than 21cm.
SPE-6S	PCIEX4_1 PCIEX4_2	The length of the expansion card installed in these two PCIe x4 slots should be less than 21cm.
SPE-9S	PCIEX8_1	This PCIe x8 slot is not supported by the SPCIE-5100DX
SPXE-9S	PCIEX8_1	This PCIe x8 slot is not supported by the SPCIE-5100DX
SPXE-14S	PCIEX1_A1	This PCIe x1 slot is not supported by the SPCIE-5100DX
	PCIEX8_1	The length of the expansion card installed in this PCIe x8 slot should be less than 21cm.

Table 1-3: Backplane Limitations

1.7.3 IEI Chassis

IEI chassis available for SPCIE-5100DX system development are listed in **Table 1-4**. For more information about these chassis please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.

Model	Slot SBC	Mounting	Max Slots	Backplanes
PAC-106G-R20	Full-size	Wall	6	SPE-4S SPE-6S
PAC-107G-R20	Full-size	Wall	6	SPE-4S SPE-6S
RACK-305G-R20	Full-size (4U)	Rack	14	SPXE-14S
RACK-360G-R20	Full-size (4U)	Rack	14	SPXE-14S
RACK-814G-R20	Full-size (4U)	Rack	14	SPXE-14S
RACK-3000G-R20	Full-size (4U)	Rack	14	SPXE-14S
PAC-125G-R20	Full-size	Wall	10	SPE-9S SPXE-9S
PAC-1000G-R20	Full-size	Wall	6	SPE-4S SPE-6S
PACO-506F	Full-size	Wall	6	SPE-4S SPE-6S

Table 1-4: Compatible IEI Chassis

Chapter

2

Unpacking

2.1 Anti-static Precautions



WARNING:

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** - Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:***- Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:***- Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the SPCIE-5100DX is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

SPCIE-5100DX PICMG 1.3 CPU Card






2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the SPCIE-5100DX was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The SPCIE-5100DX is shipped with the following components:

Quantity	Item and Part Number	Image
1	SPCIE-5100DX	
1	Dual RS-232 cable (P/N: 19800-000051-RS)	
6	SATA cables (P/N: 32000-062800-RS)	
1	Dual USB cable (w bracket) (P/N: CB-USB02-RS)	
1	ATX 12V power cable (P/N: 32102-008000-100-RS)	





2	LGA771 CPU coolers (P/N: 19100-000110-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 2-1: Package List Contents
2.3.1 Optional Items






Audio kit (P/N: AC-KIT-833HD-R10)	
FDD cable (P/N: 32200-000017-RS)	
Parallel port cable (P/N: 19800-000049-RS)	
KB/MS cable (P/N: 19800-000066-RS)	
SATA power cables (P/N: 32100-088600-RS)	

Table 2-2: Package List Contents



Chapter

3

Connector Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 SPCIE-5100DX Layout

The figures below show all the connectors and jumpers.

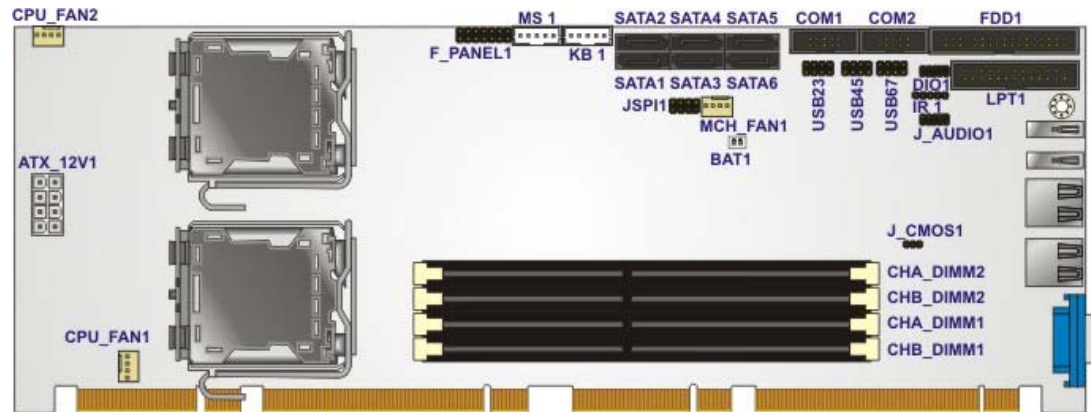


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin header	J_AUDIO1
Battery connector	2-pin wafer	BAT1
Cooling fan connector, CPU	4-pin wafer	CPU_FAN1
Cooling fan connector, CPU	4-pin wafer	CPU_FAN2
Cooling fan connector, Northbridge	4-pin wafer	MCH_FAN1
CPU 12 V power connector	8-pin connector	ATX_12V1
Digital input/output connector	10-pin header	DIO1
DIMM slot (Registered ECC)	240-pin socket	CHA_DIMM1
DIMM slot (Registered ECC)	240-pin socket	CHA_DIMM2
DIMM slot (Registered ECC)	240-pin socket	CHB_DIMM1
DIMM slot (Registered ECC)	240-pin socket	CHB_DIMM2

Floppy disk connector	34-pin box header	FDD1
Front panel connector	14-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
Keyboard connector	5-pin wafer	KB1
Mouse connector	5-pin wafer	MS1
Parallel port connector	26-pin box header	LPT1
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial ATA drive connector	7-pin SATA	SATA5
Serial ATA drive connector	7-pin SATA	SATA6
Serial port connector (COM1)	10-pin box header	COM1
Serial port connector (COM2)	10-pin box header	COM2
SPI Flash connector	8-pin header	JSPI1
USB connector	8-pin header	USB23
USB connector	8-pin header	USB45
USB connector	8-pin header	USB67

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port connector	USB port	USB_C0
USB port connector	USB port	USB_C1
VGA connector	DB-15 (female)	VGA1

Table 3-2: Rear Panel Connectors

SPCIE-5100DX PICMG 1.3 CPU Card

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the SPCIE-5100DX.

3.2.1 Audio Connector

CN Label:	J_AUDIO1
CN Type:	10-pin header (2x5)
CN Location:	See Figure 3-2
CN Pinouts:	See Table 3-3

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

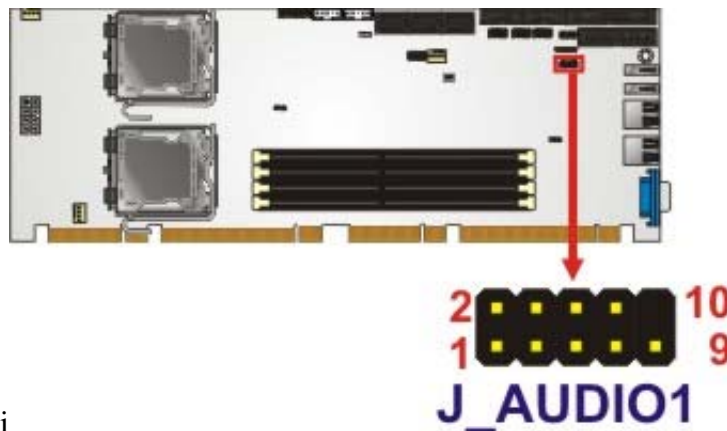


Figure 3-2: Audio Connector Location (9-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ACZ_SYNC	2	ACZ_BITCLK
3	ACZ_SDOOUT	4	ACZ_PCBEEP
5	ACZ_SDIIN	6	ACZ_RST#
7	ACZ_VCC (+5V)	8	ACZ_GND
9	ACZ_12V	10	ACZ_GND

Table 3-3: Audio Connector Pinouts

3.2.2 Cooling Fan Connectors (CPU)

- CN Label:** CPU_FAN1 and CPU_FAN2
- CN Type:** 4-pin header (1x4)
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-4**

The CPU cooling fan connector provides a 12V, 500mA current to a CPU cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

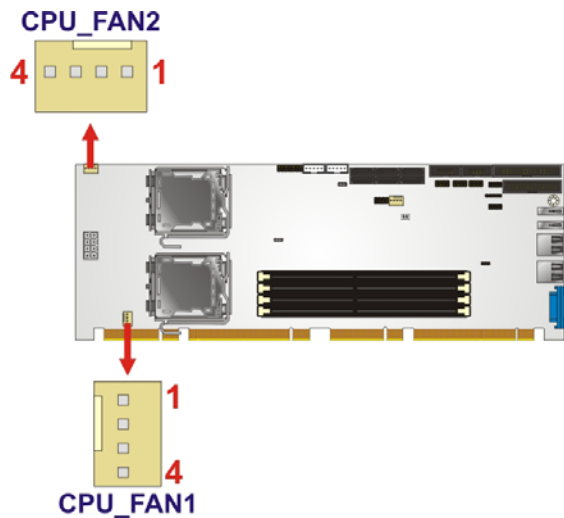


Figure 3-3: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Rotation Signal
4	Control

Table 3-4: CPU Fan Connector Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

3.2.3 Cooling Fan Connector (Northbridge)

CN Label:	MCH_FAN1
CN Type:	4-pin header (1x4)
CN Location:	See Figure 3-4
CN Pinouts:	See Table 3-5

The cooling fan connector provides a 12V, 500mA current to a northbridge cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

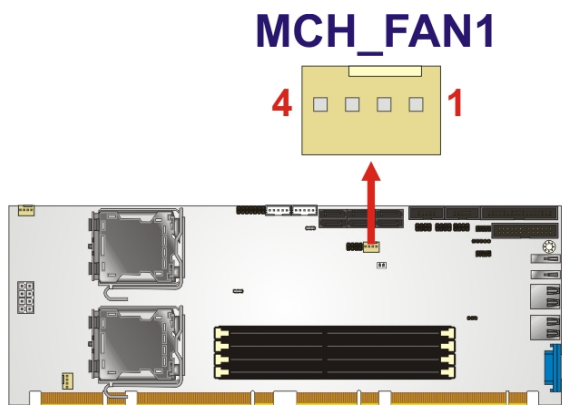


Figure 3-4: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	Ground
2	+ 12V
3	Rotation Signal
4	NC

Table 3-5: Northbridge Fan Connector Pinouts

3.2.4 CPU 12V Power Connector

- CN Label:** ATX_12V1
- CN Type:** 8-pin headers (2x4)
- CN Location:** See Figure 3-5
- CN Pinouts:** See Table 3-6

The connector supports the 12V power supply. **To be able to turn on the system, the ATX_12V1 connector must connect to a power supply.**

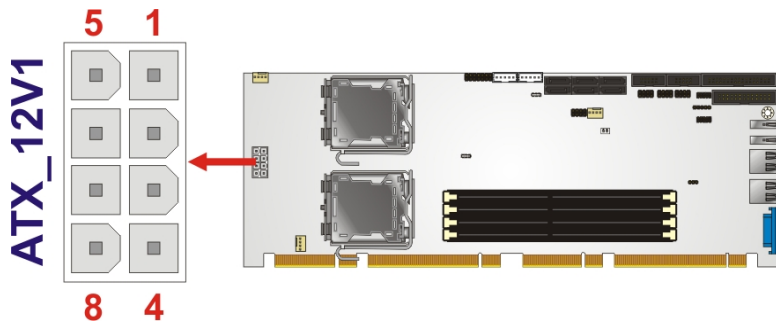


Figure 3-5: CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

Table 3-6: CPU 12V Power Connector Pinouts

3.2.5 Digital Input/Output (DIO) Connector

- CN Label:** DIO1
- CN Type:** 10-pin header (2x5)
- CN Location:** See Figure 3-6

SPCIE-5100DX PICMG 1.3 CPU Card

CN Pinouts: See Table 3-7

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

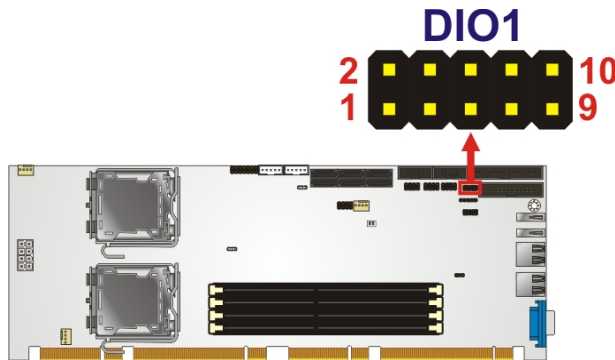


Figure 3-6: DIO Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC (+5V)
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-7: DIO Connector Pinouts

3.2.6 Floppy Disk Connector (34-pin)

CN Label: FDD1
CN Type: 34-pin header (2x17)
CN Location: See Figure 3-7
CN Pinouts: See Table 3-8

The floppy disk connector is connected to a floppy disk drive.

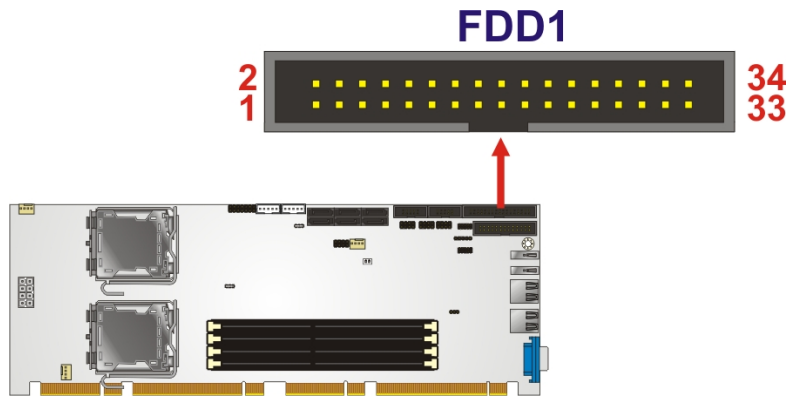


Figure 3-7: 34-pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 3-8: 34-pin FDD Connector Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

3.2.7 Front Panel Connector (14-pin)

CN Label:	F_PANEL1
CN Type:	14-pin header (2x7)
CN Location:	See Figure 3-8
CN Pinouts:	See Table 3-9

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power LED
- Speaker
- Power button
- Reset
- HDD LED

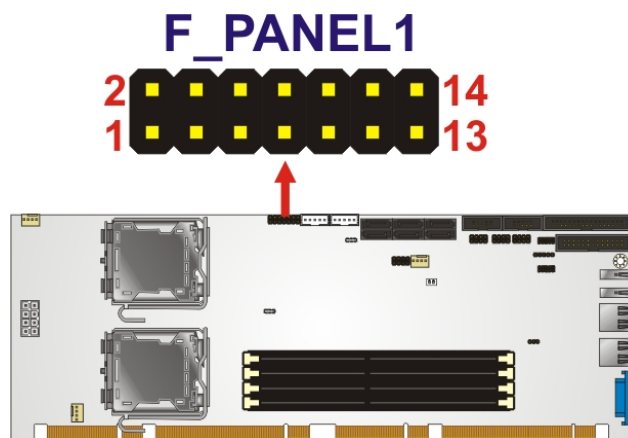


Figure 3-8: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	PWRLED+	Speaker	2	SPEAKER+
	3	N/C		4	N/C
	5	PWRLED-		6	N/C

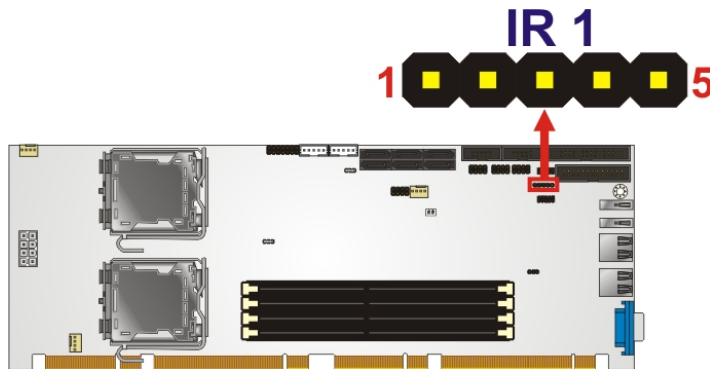
Power	7	PWRBTN+	Reset	8	SPEAKER-
Button	9	PWRBTN-		10	N/C
HDD LED	11	HDDLED+		12	RESET+
	13	HDDLED-		14	RESET-

Table 3-9: Front Panel Connector Pinouts (14-pin)

3.2.8 Infrared Interface Connector (5-pin)

- CN Label:** IR1
- CN Type:** 5-pin header (1x5)
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-10**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces. To use the infrared port, configure COM2 as SIR or ASKIR model in BIOS (see **Section 5.3.4**). By doing this, the normal RS-232 COM 2 will be disabled.


Figure 3-9: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC (+5V)
2	N/C
3	IR-RX

SPCIE-5100DX PICMG 1.3 CPU Card

PIN NO.	DESCRIPTION
4	GND
5	IR-TX

Table 3-10: Infrared Connector Pinouts

3.2.9 Keyboard Connector

CN Label:	KB1
CN Type:	5-pin header (1x5)
CN Location:	See Figure 3-10
CN Pinouts:	See Table 3-11

The keyboard connector can be connected to a standard PS/2 cable or PS/2 cable to add keyboard functionality to the system.

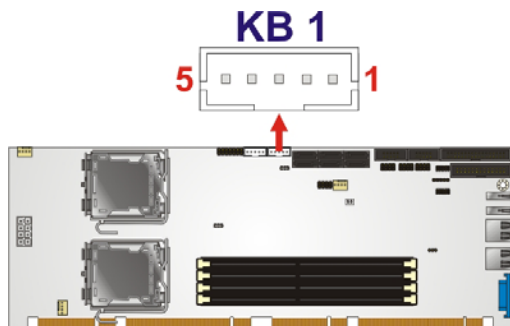


Figure 3-10: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	VCC

Table 3-11: Keyboard Connector Pinouts

3.2.10 Mouse Connector

- CN Label:** MS1
- CN Type:** 5-pin header (1x5)
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-11**

The mouse connector can be connected to a standard PS/2 cable or PS/2 cable to add mouse functionality to the system.

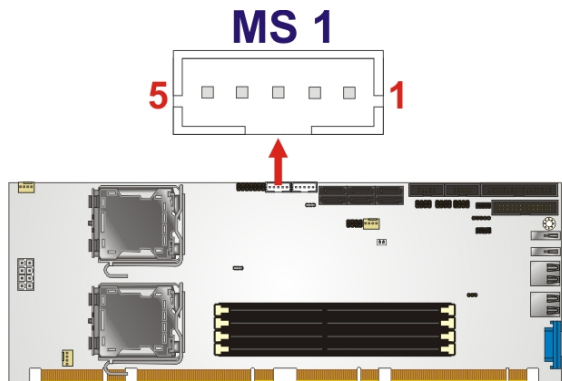


Figure 3-11: Mouse Connector Location

PIN NO.	DESCRIPTION
1	Mouse CLOCK
2	Mouse DATA
3	N/C
4	GROUND
5	VCC

Table 3-12: Mouse Connector Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

3.2.11 Parallel Port Connector

CN Label:	LPT1
CN Type:	26-pin box header
CN Location:	See Figure 3-12
CN Pinouts:	See Table 3-13

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

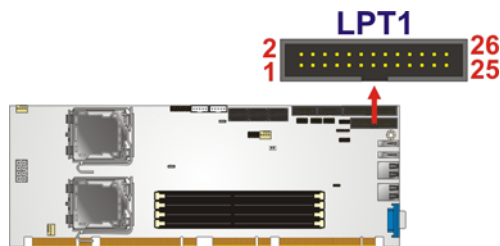


Figure 3-12: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT		

Table 3-13: Parallel Port Connector Pinouts

3.2.12 SATA Drive Connectors

- CN Label:** SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-14

The SATA drive connectors are each connected to a second generation SATA drive. Second generation SATA drives transfer data at speeds as high as 3.0 Gb/s. The SATA drives can be configured in a RAID configuration and support RAID 0, 1, 5 and 10.

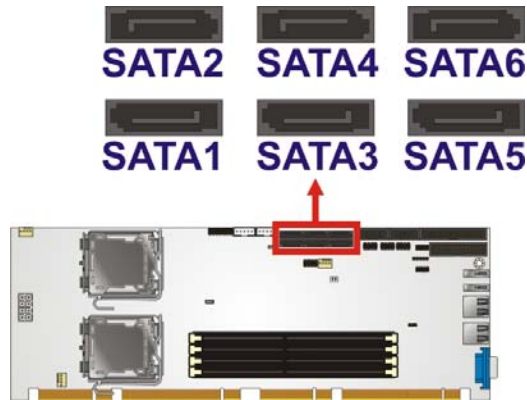


Figure 3-13: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-14: SATA Drive Connector Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

3.2.13 Serial Port Connector (COM1, COM 2)

- CN Label:** COM1 and COM2
- CN Type:** 10-pin box header (2x5)
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-15

The 10-pin serial port connector provides a RS-232 serial communications channel. The serial port connector can be connected to external RS-232 serial port devices.

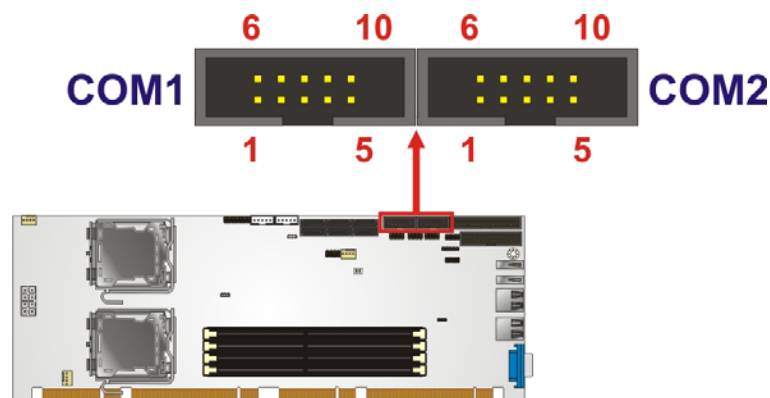


Figure 3-14: Serial Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND	10	NC

Table 3-15: Serial Connector Pinouts

3.2.14 SPI Flash Connector

- CN Label:** JSPI1
- CN Type:** 8-pin header (2x4)
- CN Location:** See Figure 3-15
- CN Pinouts:** See Table 3-16

The 8-pin SPI Flash connector is used for the BIOS.

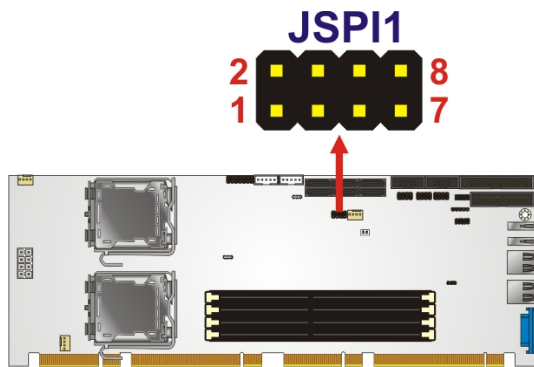


Figure 3-15: SPI Flash Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	3.3V	2	GND
3	CS0	4	CLOCK
5	SO0	6	SI
7	N/C	8	N/C

Table 3-16: SPI Flash Connector

3.2.15 USB Connectors (Internal)

- CN Label:** USB23, USB45 and USB67
- CN Type:** 8-pin header (2x4)
- CN Location:** See Figure 3-16

SPCIE-5100DX PICMG 1.3 CPU Card

CN Pinouts: See Table 3-17

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

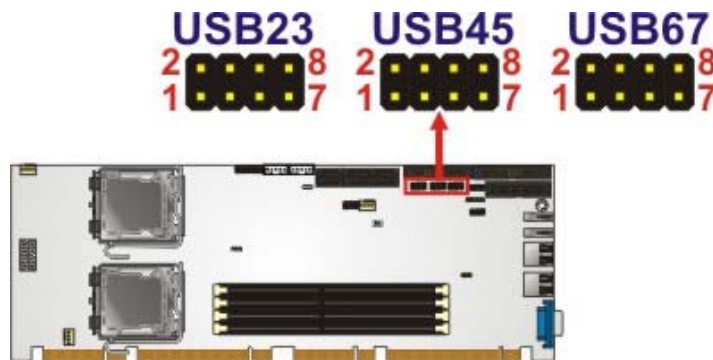


Figure 3-16: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC (+5V)	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC (+5V)

Table 3-17: USB Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The SPCIE-5100DX EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 2 x USB connectors
- 1 x VGA connector

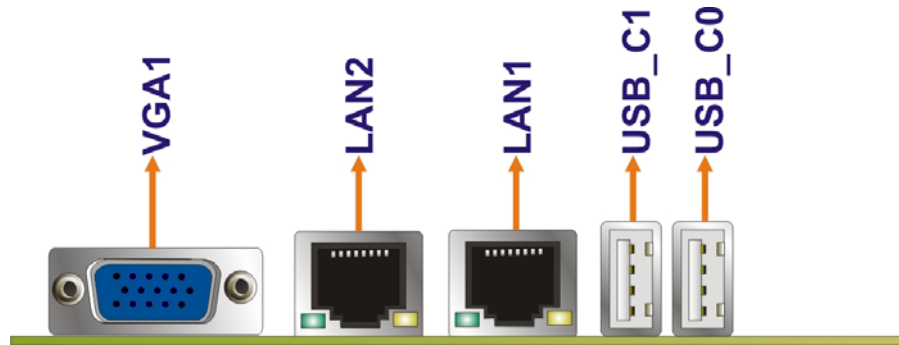


Figure 3-17: SPCIE-5100DX External Peripheral Interface Connector

3.3.1 LAN Connectors

- CN Label:** LAN1 and LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 3-17
- CN Pinouts:** See Table 3-18

The SPCIE-5100DX is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+-
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

Table 3-18: LAN Pinouts

SPCIE-5100DX PICMG 1.3 CPU Card

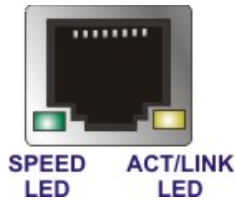


Figure 3-18: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-19**.

SPEED LED		ACT/LINK LED	
STATUS	DESCRIPTION	STATUS	STATUS
OFF	10 Mbps LAN	OFF	OFF
Green	100 Mbps LAN	YELLOW	Linked
ORANGE	1000 Mbps LAN	BLINKING	Data Activity

Table 3-19: RJ-45 Ethernet Connector LEDs

3.3.2 USB Connector

- CN Label:** USB_C0 and USB_C1
- CN Type:** USB port
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-20**

The SPCIE-5100DX has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION
1	VCC
2	DATA-
3	DATA+

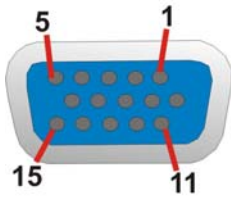
PIN NO.	DESCRIPTION
4	GROUND

Table 3-20: USB Port Pinouts

3.3.3 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Figure 3-19** and **Table 3-21**

The SPCIE-5100DX has a single 15-pin female connector for connectivity to standard display devices.


Figure 3-19: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-21: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the SPCIE-5100DX may result in permanent damage to the SPCIE-5100DX and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the SPCIE-5100DX. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the SPCIE-5100DX, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the SPCIE-5100DX, place it on an anti-static pad. This reduces the possibility of ESD damaging the SPCIE-5100DX.
- **Only handle the edges of the PCB:-:** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

Failure to take ESD precautions during the installation of the SPCIE-5100DX may result in permanent damage to the SPCIE-5100DX and severe injury to the user.

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- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:***- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the SPCIE-5100DX, place it on an anti-static pad. This reduces the possibility of ESD damaging the SPCIE-5100DX.
- ***Only handle the edges of the PCB:-:*** When handling the PCB, hold the PCB by the edges.

4.3 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual:**
 - The user manual provides a complete description of the SPCIE-5100DX installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD):**
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the SPCIE-5100DX on an antistatic pad:**
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the SPCIE-5100DX off:**
 - When working with the SPCIE-5100DX, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the SPCIE-5100DX **DO NOT:**

SPCIE-5100DX PICMG 1.3 CPU Card

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.4 CPU, CPU Cooling Kit and DIMM Installation



WARNING:

Do not run the CPU without a heatsink and fan. Without the heatsink and fan, the high temperatures can destroy the CPU and other components. CPUs marked as fanless don't need the fan, but still need adequate ventilation.

The CPU, CPU cooling kit and DIMM are the most critical components of the SPCIE-5100DX. If one of these components is not installed the SPCIE-5100DX cannot run.

4.4.1 CPU Support List

The Intel® Xeon® processors listed below are supported by the SPCIE-5100DX.

Processor Number	Process	Clock Speed (GHz)	FSB (MHz)	L2 Cache	TDP	Cores
L5430	45nm	2.66GHz	1333MHz	12MB	50W	4
L5420	45nm	2.5GHz	1333MHz	12MB	50W	4
L5410	45nm	2.33GHz	1333MHz	12MB	50W	4
L5408	45nm	2.13GHz	1066MHz	12MB	40W	4
L5320	65nm	1.86GHz	1066MHz	8MB	50W	4
L5318	65nm	1.6GHz	1066MHz	8MB	45W	4
L5310	65nm	1.6GHz	1066MHz	8MB	50W	4
L5248	45nm	3.0GHz	1333MHz	6MB	55W	2

L5240	45nm	3.0GHz	1333MHz	6MB	40W	2
L5238	45nm	2.66GHz	1333MHz	6MB	35W	2
L5215	45nm	1.86GHz	1066MHz	6MB	20W	2
E5450	45nm	3.0GHz	1333MHz	12MB	80W	4
E5440	45nm	2.83GHz	1333MHz	12MB	80W	4
E5410	45nm	2.33GHz	1333MHz	12MB	80W	4
E5405	45nm	2.0GHz	1333MHz	12MB	80W	4
E5345	65nm	2.33GHz	1333MHz	8MB	80W	4
E5335	65nm	2.0GHz	1333MHz	8MB	80W	4
E5320	65nm	1.86GHz	1066MHz	8MB	80W	4
E5310	65nm	1.6GHz	1066MHz	8MB	80W	4
E5240	45nm	3.0GHz	1333MHz	6MB	40W	2
E5220	45nm	2.33GHz	1333MHz	6MB	65W	2
E5205	65nm	1.86GHz	1066MHz	6MB	65W	2
E5160	65nm	3.0GHz	1333MHz	4MB	80W	2
E5150	65nm	2.66GHz	1333MHz	4MB	65W	2
5148	65nm	2.33GHz	1333MHz	4MB	40W	2
5140	65nm	2.33GHz	1333MHz	4MB	65W	2
5138	65nm	2.13GHz	1066MHz	4MB	35W	2
5130	65nm	2.0GHz	1333MHz	4MB	65W	2
5128	65nm	1.86GHz	1066MHz	4MB	40W	2
5120	65nm	1.86GHz	1066MHz	4MB	40W	2
5110	65nm	1.8GHz	1066MHz	4MB	65W	2

*The shaded processors are long-term support processors.

Table 4-1: Intel® Xeon® Processor Support List

SPCIE-5100DX PICMG 1.3 CPU Card

4.4.2 Socket LGA771 CPU Installation



WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA771 socket is shown in **Figure 4-1**.

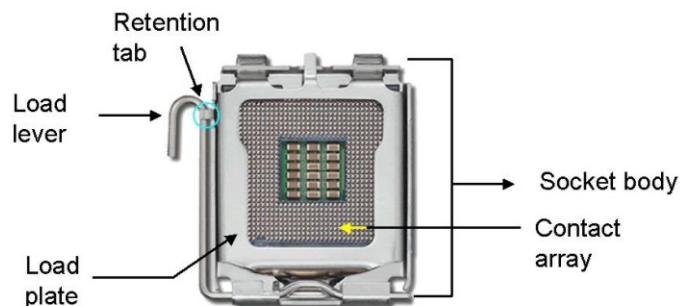


Figure 4-1: Intel LGA771 Socket

To install the CPU, follow the steps below.



WARNING:

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

Step 1: Remove the protective cover. The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.

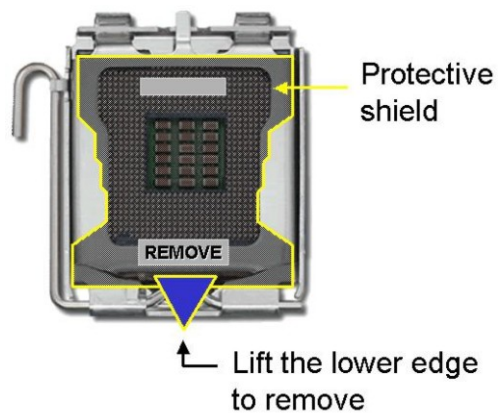


Figure 4-2: Remove Protective Cover

Step 2: **Open the socket.** Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever, then open the load plate. See **Figure 4-3**.

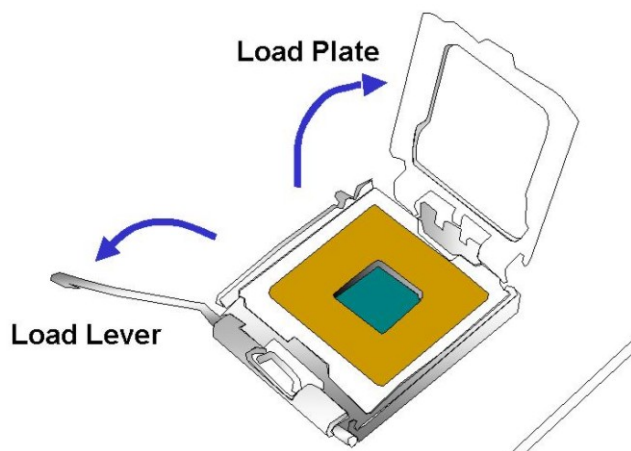


Figure 4-3: CPU Socket Load Plate

Step 3: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly.** The contact array should be facing the CPU socket.

SPCIE-5100DX PICMG 1.3 CPU Card

- Step 5:** Correctly position the CPU. Match the Pin 1 mark with the cut edge on the CPU socket.
- Step 6:** Align the CPU pins. Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.
- Step 7:** Insert the CPU. Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-4**.

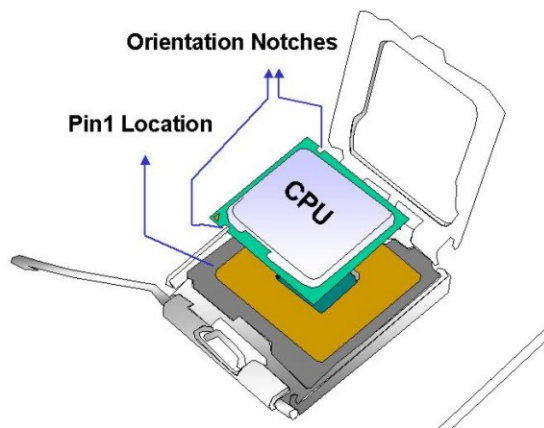


Figure 4-4: Insert the Socket LGA771 CPU

- Step 8:** Close the CPU socket. Close the load plate and engage the load lever by pushing it back to its original position. There will be some resistance, but will not require extreme pressure.
- Step 9:** Connect the 12 V power to the board. Connect the 12 V power from the power supply to the CPU power connector (**Figure 4-5**).

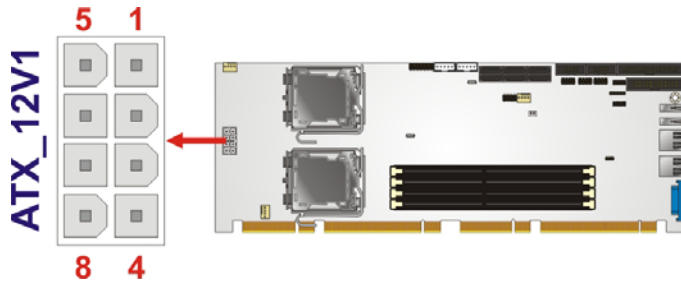


Figure 4-5: CPU 12V Power Connector

4.4.3 Cooling Kit Installation



Figure 4-6: IEI LGA771 Cooling Kit

Two IEI LGA771 CPU cooling kits (**Figure 4-6**) are shipped with the SPCIE-5100DX. The cooling kit comprises a CPU heat sink and a cooling fan. To install the cooling kit, please follow the steps below.

Step 1: Remove the four retention screws located near the LGA771 CPU sockets.



NOTE:

The SPCIE-5100DX has a SBC support bracket on the bottom and the bracket is secured to the board with few retention screws. The SBC support bracket is to support the CPU cooling fan and the SPCIE-5100DX. To install the CPU cooling fan, the four retention screws near the CPU sockets need to be removed.

SPCIE-5100DX PICMG 1.3 CPU Card

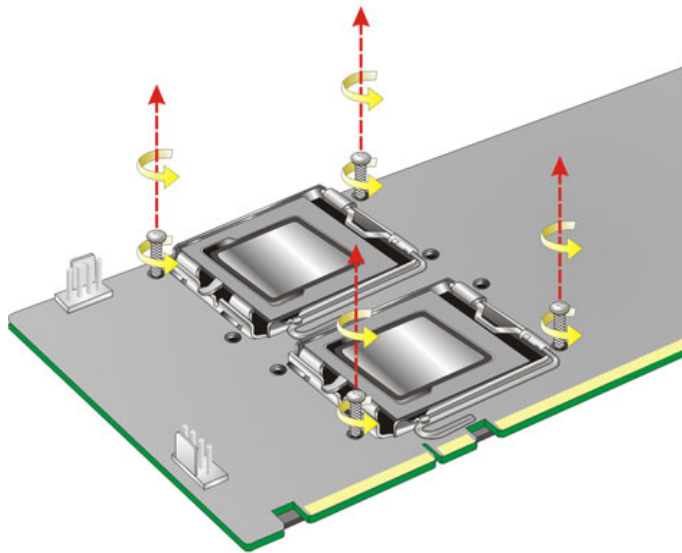


Figure 4-7: CPU Fan Installation – Retention Screws Removal

- Step 2:** Spread a proper amount of thermal paste onto the bottom of the cooling fan heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.
- Step 3:** Place the cooling kit onto the CPU and properly align the cooling kit. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed and its four spring screw fasteners can pass through the pre-drilled holes on the PCB and the SBC support bracket.
- Step 4:** Secure the cooling kit to the board and the SBC support bracket. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws. (See **Figure 4-8**)
- Step 5:** Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades.

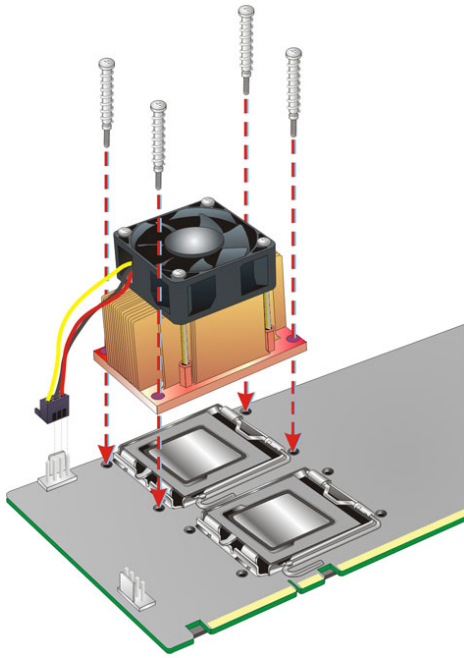


Figure 4-8: CPU Fan Installation – First

Step 6: Repeat **Step 3 ~ Step 6** to install the other CPU cooling fan. See **Figure 4-9**.

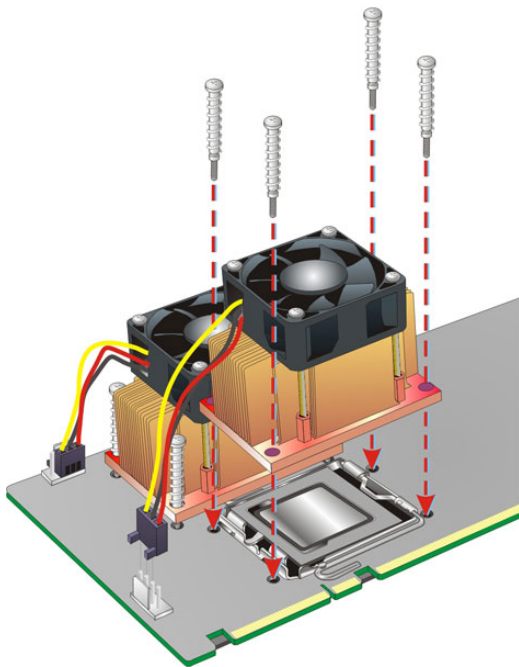


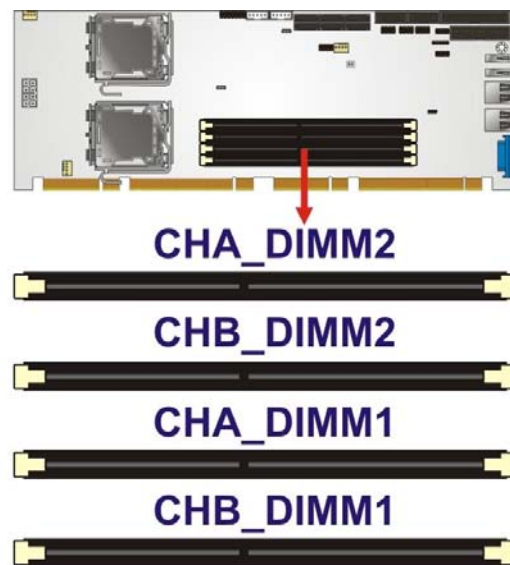
Figure 4-9: CPU Fan Installation – Second

SPCIE-5100DX PICMG 1.3 CPU Card

4.4.4 DIMM Installation

**WARNING:**

To be able to turn on the SPCIE-5100DX, either the **CHA_DIMM1** or the **CHB_DIMM1** socket must install with an ECC Registered DDR2 DIMM. To install a second DIMM, install in the socket that is at the same channel with the first DIMM. For example, the first DIMM is installed in CHA_DIMM1 then the second DIMM should be installed in the CHA_DIMM2. The DIMM socket locations are shown below.



To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 4-10**.

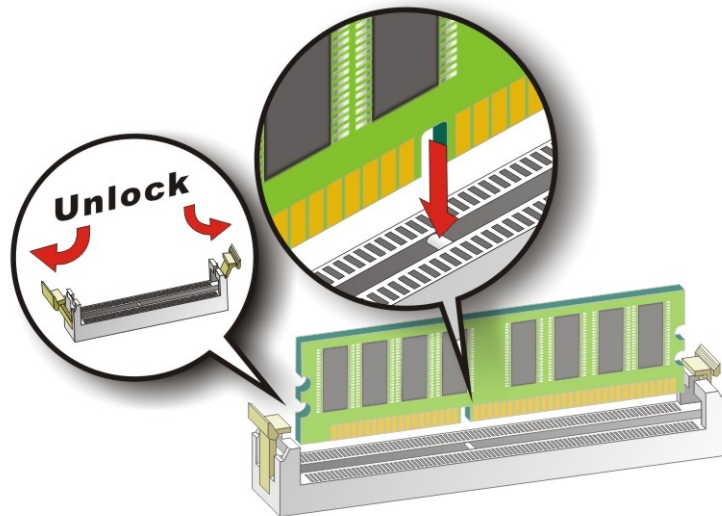


Figure 4-10: Installing a DIMM

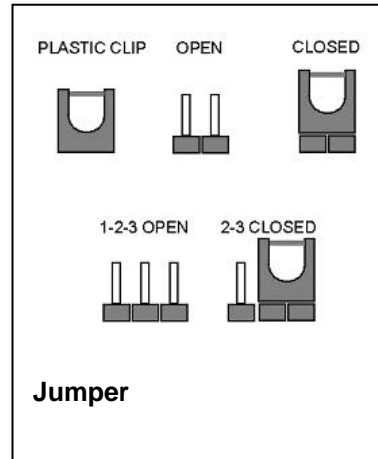
- Step 1:** Open the DIMM socket handles. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 4-10**.
- Step 2:** Align the DIMM with the socket. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 4-10**.
- Step 3:** Insert the DIMM. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 4-10**.
- Step 4:** Removing a DIMM. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.5 Jumper Settings



NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Before the SPCIE-5100DX is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the SPCIE-5100DX are listed in **Table 4-2**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header

Table 4-2: Jumpers

4.5.1 Clear CMOS Jumper

- Jumper Label:** J_CMOS1
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 4-3**
- Jumper Location:** See **Figure 4-11**

If the SPCIE-5100DX fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper

cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-3**.

Jumper Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 4-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-11** below.

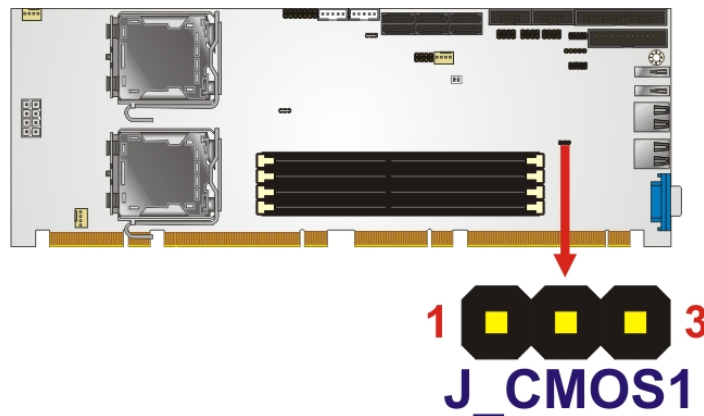


Figure 4-11: Clear CMOS Jumper

4.6 Chassis Installation

4.6.1 Airflow

**WARNING:**

Airflow is critical to the cooling of the CPU and other on-board components. The chassis in which the SPCIE-5100DX must have air vents to allow cool air to move into the system and hot air to move out.

The SPCIE-5100DX must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

**NOTE:**

IEI has a wide range of backplanes available. Please contact your SPCIE-5100DX vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieiworld.com.tw>) to find out more about the available chassis.

4.6.2 Backplane Installation

Before the SPCIE-5100DX can be installed into the chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis to see how to install the backplane into the chassis.

**NOTE:**

IEI has a wide range of backplanes available (Refer to **Section 1.7.2**). Please contact your SPCIE-5100DX vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieiworld.com.tw>) to find out more about the available chassis.

4.6.3 CPU Card Installation

To install the SPCIE-5100DX CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

4.7.1 Audio Kit Installation (Optional)

An optional audio kit that is separately ordered connects to the 9-pin audio connector on the SPCIE-5100DX. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Front-In, Front-Out, Rear-Out and subwoofer connect to four speakers including a subwoofer. To install the audio kit, please refer to the steps below:

Step 1: Locate the audio connector. The location of the 10-pin audio connector is shown in Chapter 3.

Step 2: Align pin 1. Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See

Figure 4-12.

SPCIE-5100DX PICMG 1.3 CPU Card

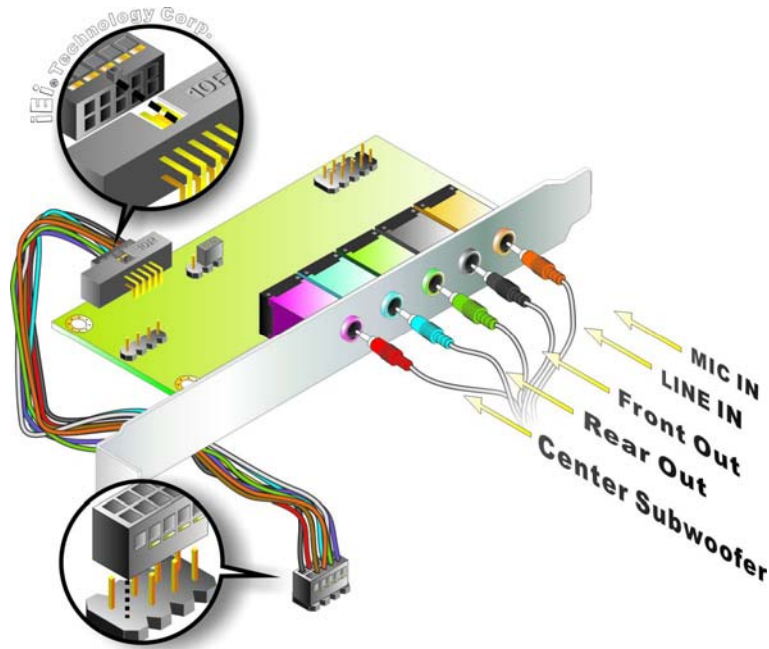


Figure 4-12: Audio Kit Connection

Step 3: Connect the audio devices. Connect the speakers and the subwoofer to the appropriate audio jack shown in **Figure 4-12**.

4.7.2 FDD Cable Connection (Optional)

The FDD flat cable connects to the SPCIE-5100DX to one FDD device. To connect an FDD to the SPCIE-5100DX please follow the instructions below.

Step 1: **Locate the FDD connector.** The location of the FDD device connector is shown in **Chapter 3**.

Step 2: **Insert the connector.** Connect the FDD cable connector to the on-board connector. See **Figure 4-13**. A key on the front of the cable connector ensures it can only be inserted in one direction.

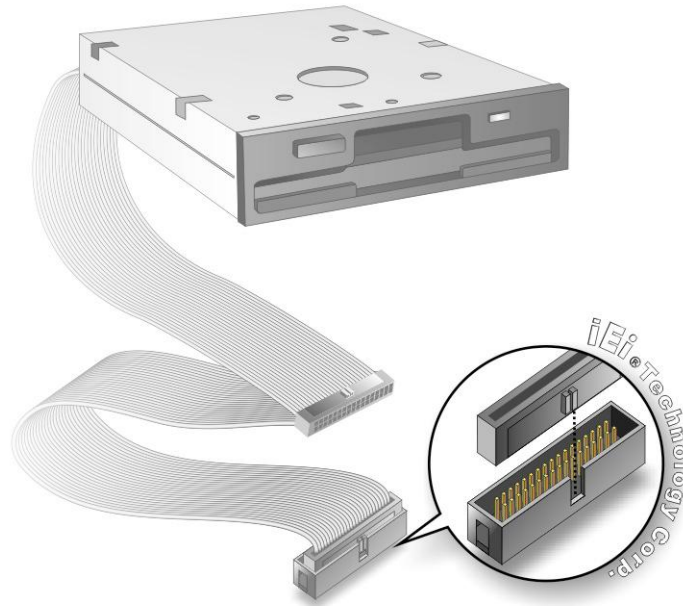


Figure 4-13: FDD Cable Connection

Step 3: **Connect the cable to an FDD device.** Connect the connector at the other end of the cable to an FDD device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

4.7.3 Keyboard and Mouse PS/2 Cable with Bracket (Optional)

The SPCIE-5100DX can be shipped with an optional keyboard and mouse PS/2 cable with bracket. The keyboard and mouse PS/2 cable with bracket comprises of two PS/2 connectors installed on a bracket. Each PS/2 connector is connected via a cable to two separate female 5-pin wafer connectors. The female 5-pin wafer connectors are connected to the corresponding on-board keyboard and mouse connector. To connect the optional keyboard and mouse PS/2 cable with bracket please follow the steps below.

Step 1: Locate the connectors. The locations of the keyboard connector and the mouse connector are shown in Chapter 3.

Step 2: Align the connectors. Correctly align pin 1 on the PS/2 keyboard (mouse) cable connector with pin 1 on the SPCIE keyboard (mouse) connector. See Figure

SPCIE-5100DX PICMG 1.3 CPU Card

4-14.

Step 3: Insert the cable connectors. Once the keyboard (mouse) cable connector is properly aligned with the keyboard (mouse) connector on the SPCIE-5100DX, connect the cable connector to the on-board connector. See Figure 4-14.

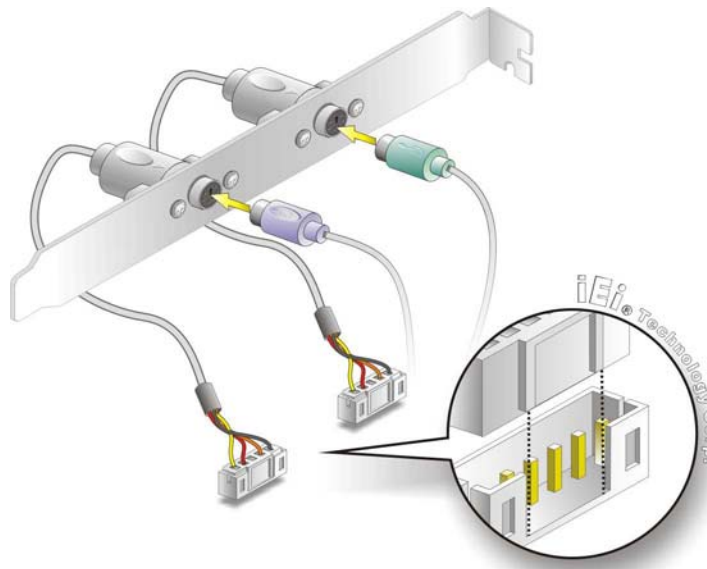


Figure 4-14: Keyboard and Mouse PS/2 Cable with Bracket

Step 4: Connect the bracket to the chassis. The bracket has a retention screw hole at the top. Properly insert the bracket into the chassis and secure the bracket to the chassis with a retention screw passing through the retention screw hole. Please see the chassis installation instructions for more details.

Step 5: Connect the keyboard and mouse. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. See Figure 4-14. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

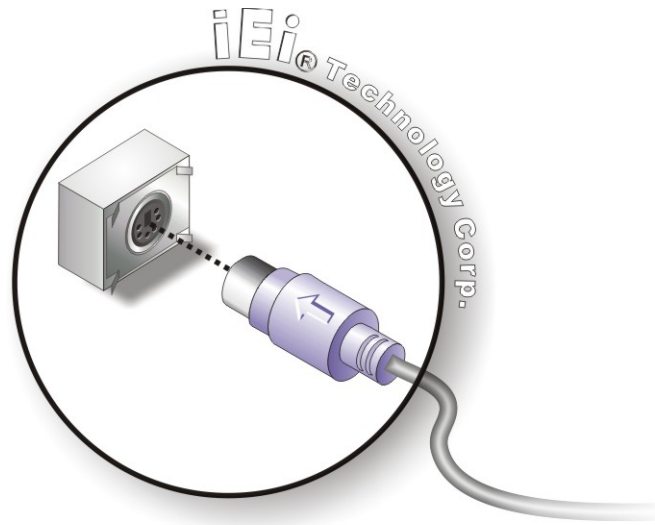


Figure 4-15: PS/2 Connector

4.7.4 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: Locate the connectors. The locations of the RS-232 connectors are shown in Chapter 3.

Step 2: Insert the cable connectors. Insert one connector into each serial port box headers. See **Figure 4-16**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

SPCIE-5100DX PICMG 1.3 CPU Card

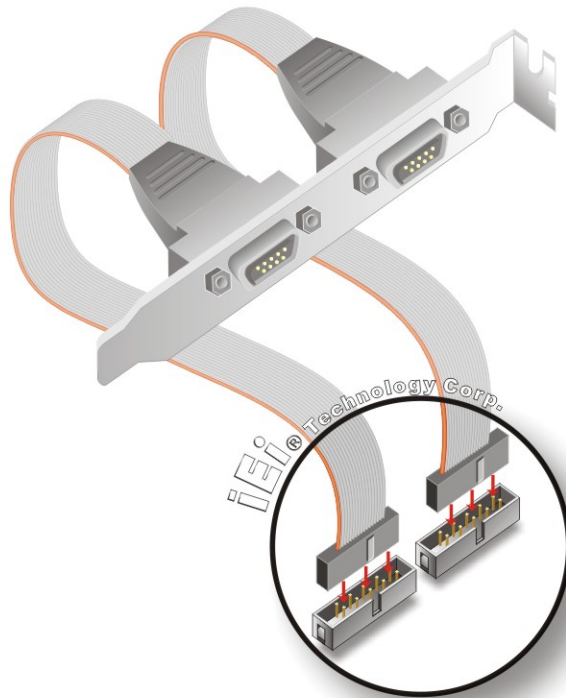


Figure 4-16: Dual RS-232 Cable Installation

Step 3: Secure the bracket. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

4.7.5 Parallel Port Cable with Slot Bracket (Optional)

The optional parallel port (LPT) cable respectively connects the on-board LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the on-board LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: Locate the connector. The LPT connector location is shown in **Chapter 4**.

Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the SPCIE-5100DX LPT box-header connector. See **Figure 4-17**.

Step 3: Insert the cable connectors Once the cable connector is properly aligned with the 26-pin box-header connector on the SPCIE-5100DX, connect the cable connector to the on-board connector. See **Figure 4-17**.

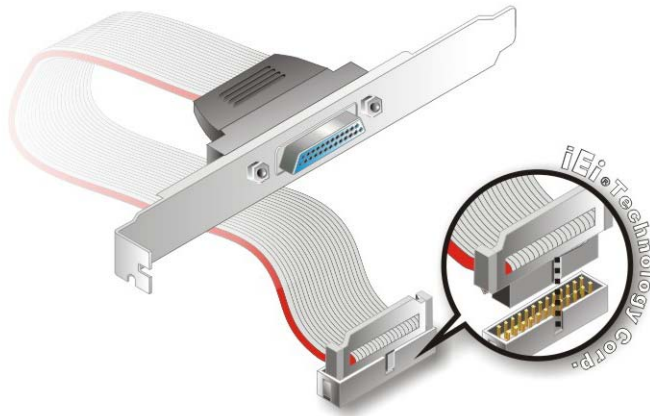


Figure 4-17: LPT Cable Connection

Step 4: Attach the LPT connector bracket to the chassis. The LPT cable connector is connected to a standard external LPT interface connector. To secure the LPT interface connector to the chassis please refer to the installation instructions that came with the chassis.

Step 5: Connect LPT device. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 4-18**

SPCIE-5100DX PICMG 1.3 CPU Card

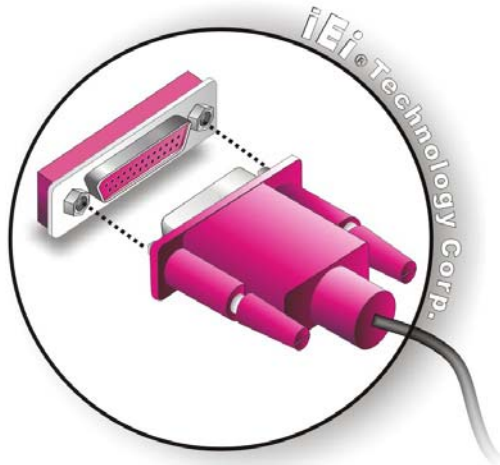


Figure 4-18: Connect the LPT Device

4.7.6 SATA Drive Connection

The SPCIE-5100DX is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

- Step 1:** Locate the connectors. The locations of the SATA drive connectors are shown in Chapter 3.
- Step 2:** Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the on-board SATA drive connector. See **Figure 4-19**.

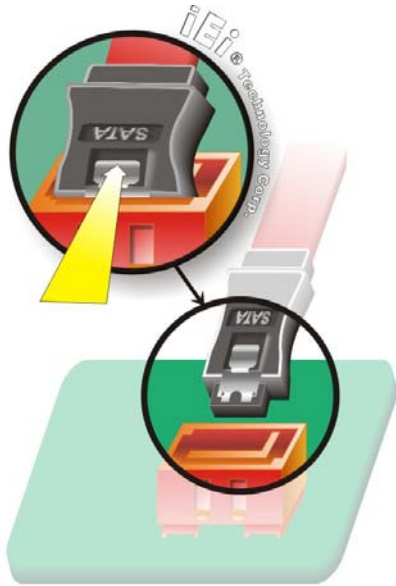


Figure 4-19: SATA Drive Cable Connection

- Step 3:** Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-20**.
- Step 4:** Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-20**.



Figure 4-20: SATA Power Drive Connection

SPCIE-5100DX PICMG 1.3 CPU Card

4.7.7 USB Cable (Dual Port)

The SPCIE-5100DX is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 3.



WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: Align the connectors. The cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the SPCIE-5100DX USB connector.

Step 3: Insert the cable connectors. Once the cable connectors are properly aligned with the USB connectors on the SPCIE-5100DX, connect the cable connectors to the on-board connectors. See **Figure 4-21**.

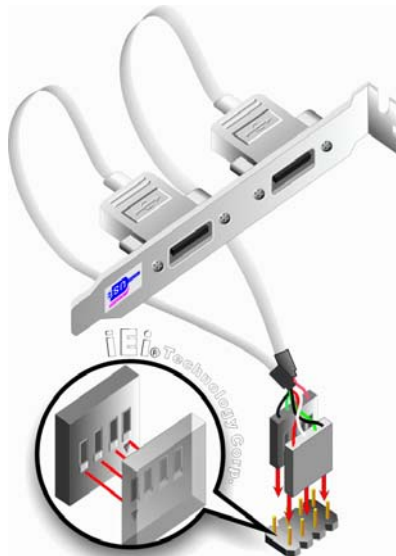


Figure 4-21: Dual USB Cable Connection

Step 4: Attach the bracket to the chassis. The USB 2.0 connectors are attached to a

bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- RJ-45 Ethernet cable connectors
- USB devices
- VGA connector

To install these devices, connect the corresponding cable connector from the actual device to the corresponding SPCIE-5100DX external peripheral interface connector making sure the pins are properly aligned.

4.8.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connectors. The locations of the USB connectors are shown in Chapter 4.

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the SPCIE-5100DX. See **Figure 4-22**.

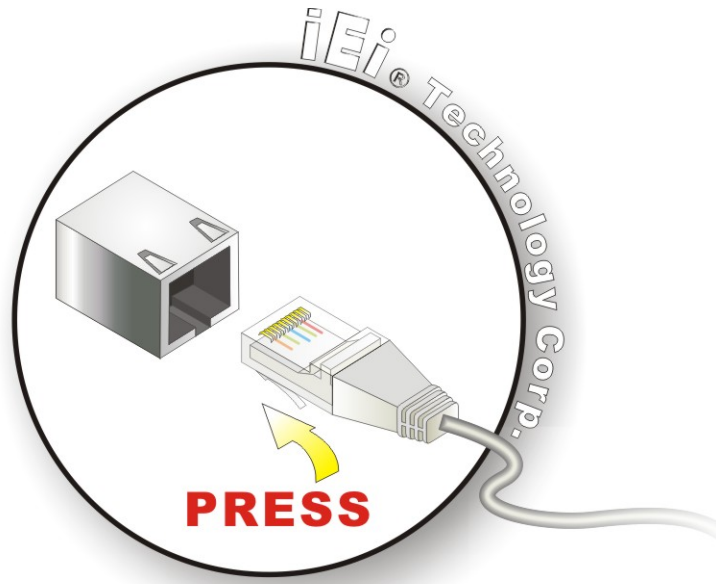


Figure 4-22: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.8.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the SPCIE-5100DX. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: Located the USB connectors. The locations of the USB connectors are shown in Chapter 4.

Step 2: Align the connectors. Align the USB device connector with one of the connectors on the SPCIE-5100DX. See Figure 4-23.

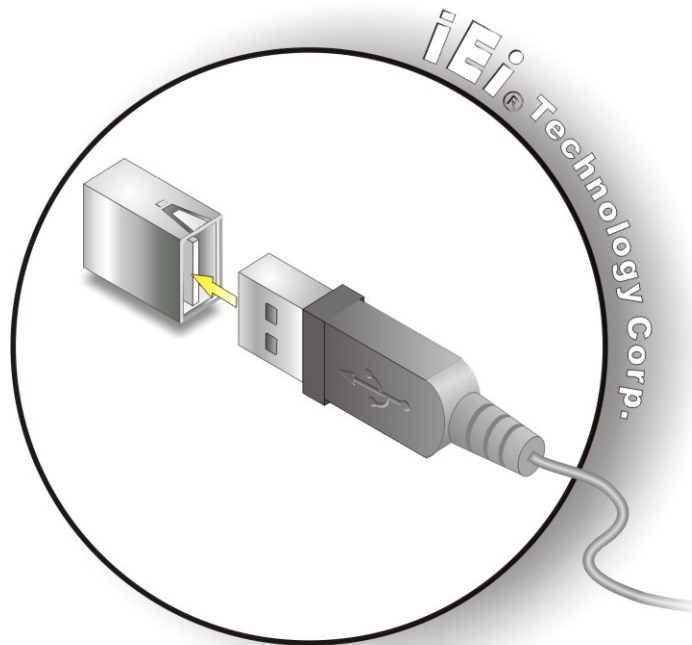


Figure 4-23: USB Device Connection

Step 3: Insert the device connector. Once aligned, gently insert the USB device connector into the on-board connector.

4.8.3 VGA Monitor Connection

The SPCIE-5100DX has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the SPCIE-5100DX, please follow the instructions below.

Step 1: Locate the female DB-15 connector. The location of the female DB-15 connector is shown in Chapter 3.

Step 2: Align the VGA connector. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: Insert the VGA connector. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the SPCIE-5100DX. See **Figure 4-24**.

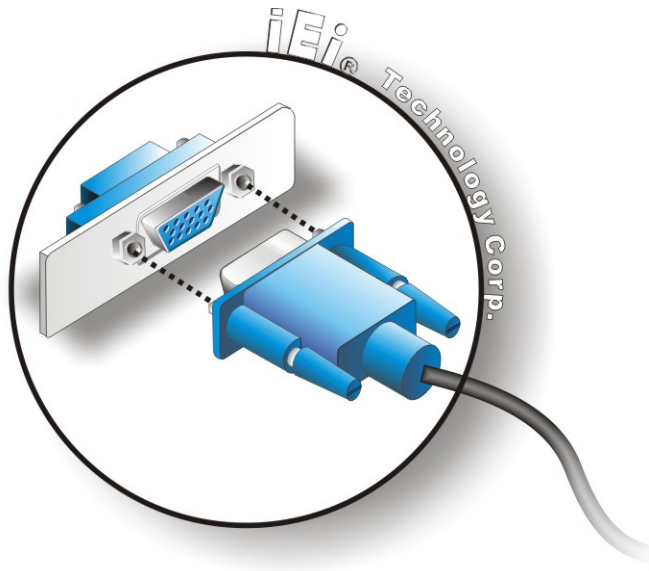


Figure 4-24: VGA Connector

Step 4: Secure the connector. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.9 Connecting the SPCIE-5100DX to the Backplane

The SPCIE-5100DX is a PICMG 1.3 form factor CPU card. To install the SPCIE-5100DX onto the backplane, please follow the instructions below.

Step 1: Align the edge connectors. Align the four edge connectors (labeled A, B, C and D in **Figure 4-25**) on the SPCIE-5100DX with the corresponding connectors on the PICMG 1.3 backplane. See **Figure 4-25**.

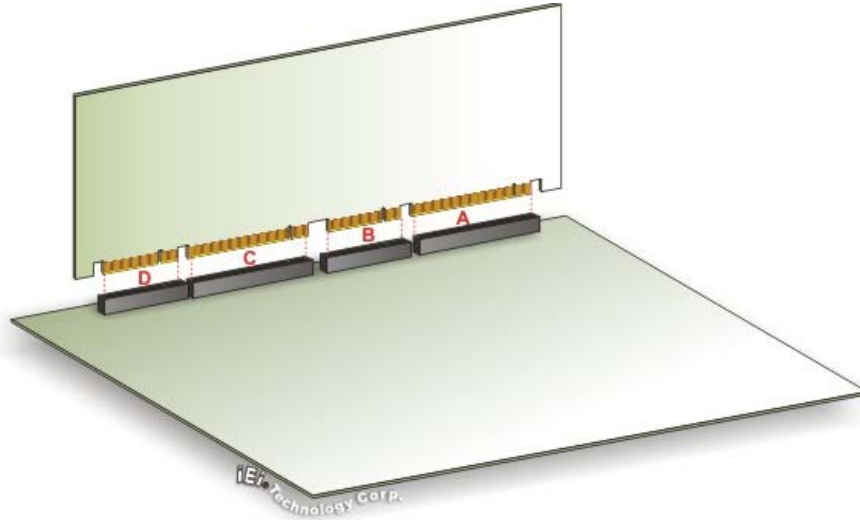


Figure 4-25: SPCIE-5100DX Installation

Step 2: Insert the connectors. Gently push the CPU card onto the connectors making sure the CPU card edge connectors are securely inserted into the corresponding backplane connectors.

Chapter

5

BIOS Screens

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the “**Press Del to enter SETUP**” message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

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F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

5.1.5 BIOS Menu Bar

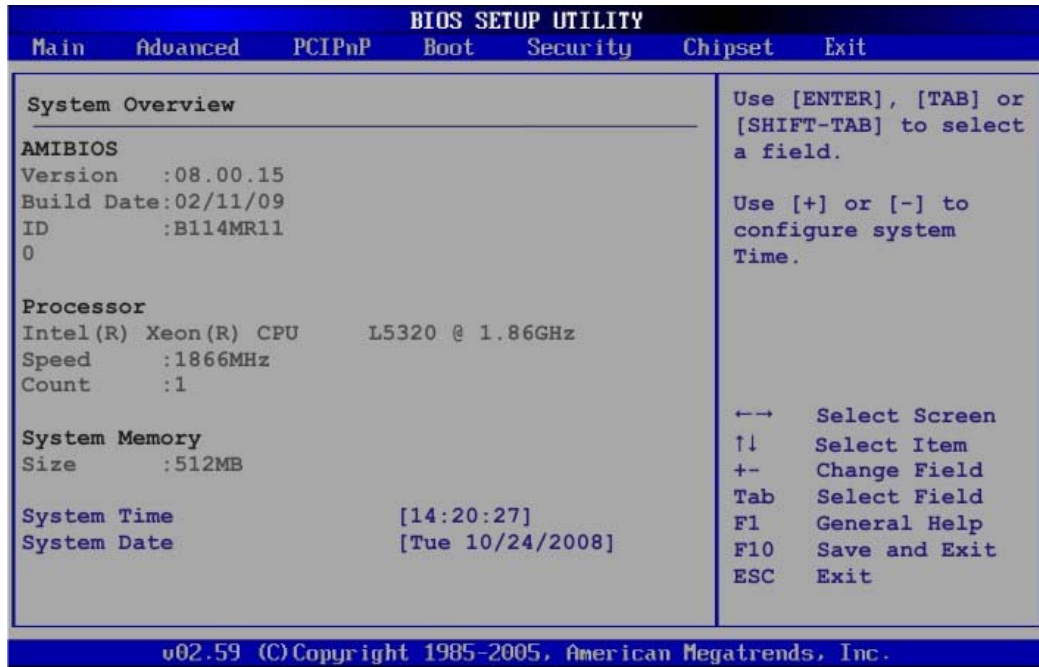
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The Main BIOS menu (**BIOS Menu 1**) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS Menu 1: Main

→ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS:** Displays auto-detected BIOS information
 - **Version:** Current BIOS version
 - **Build Date:** Date the current BIOS version was made
 - **ID:** Installed BIOS ID
- **Processor:** Displays auto-detected CPU specifications
 - **Type:** Names the currently installed processor
 - **Speed:** Lists the processor speed
 - **Count:** The number of CPUs on the motherboard
- **System Memory:** Displays the auto-detected system memory.

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- **Size:** Lists memory size

The **System Overview** field also has two user configurable fields:

→ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

→ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

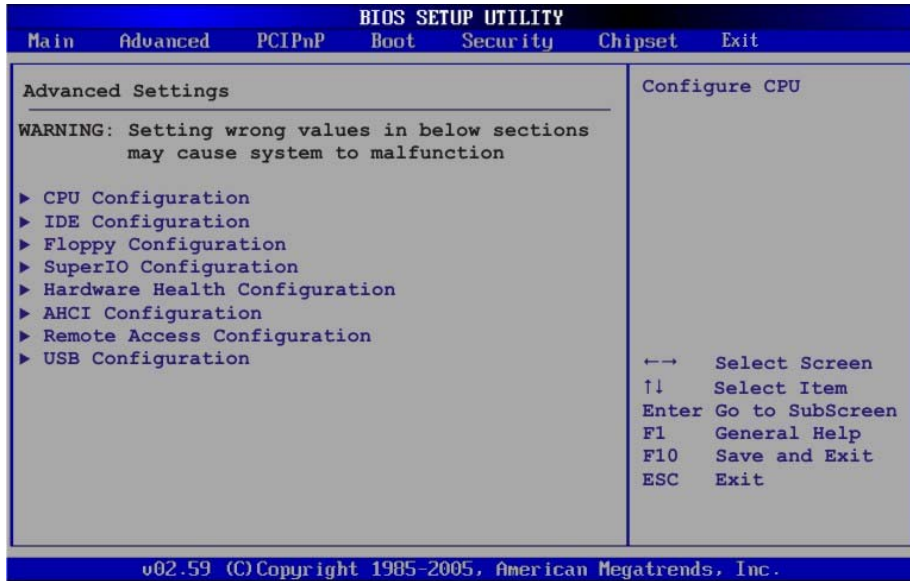
Use the **Advanced** menu to configure the CPU and peripheral devices through the following sub-menus:



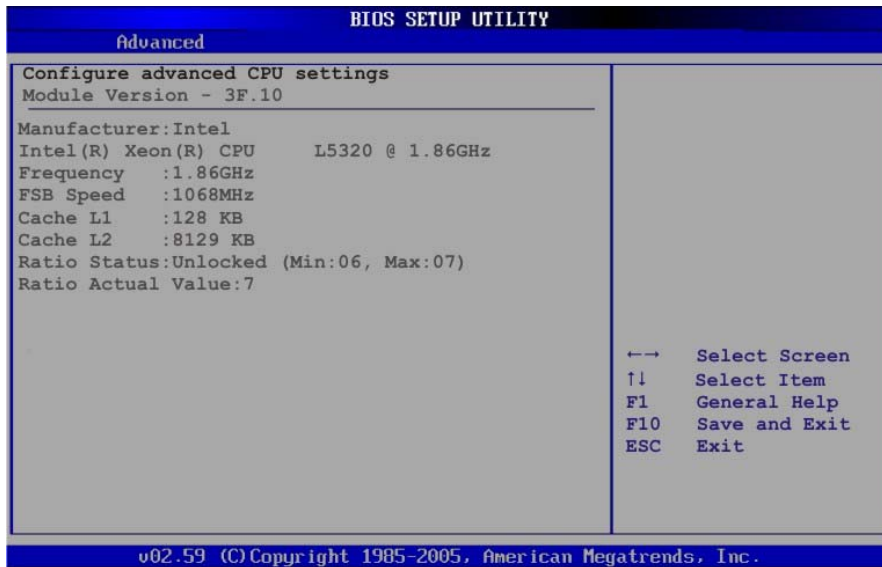
WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see **Section 5.3.1**)
- **IDE Configuration** (see **Section 5.3.2**)
- **Floppy Configuration** (see **Section 5.3.3**)
- **SuperIO Configuration** (see **Section 5.3.4**)
- **Hardware Health Configuration** (see **Section 5.3.5**)
- **AHCI Configuration** (see **Section 5.3.6**)
- **Remote Access Configuration** (see **Section 5.3.7**)
- **USB Configuration** (see **Section 5.3.8**)


BIOS Menu 2: Advanced
5.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.


BIOS Menu 3: CPU Configuration

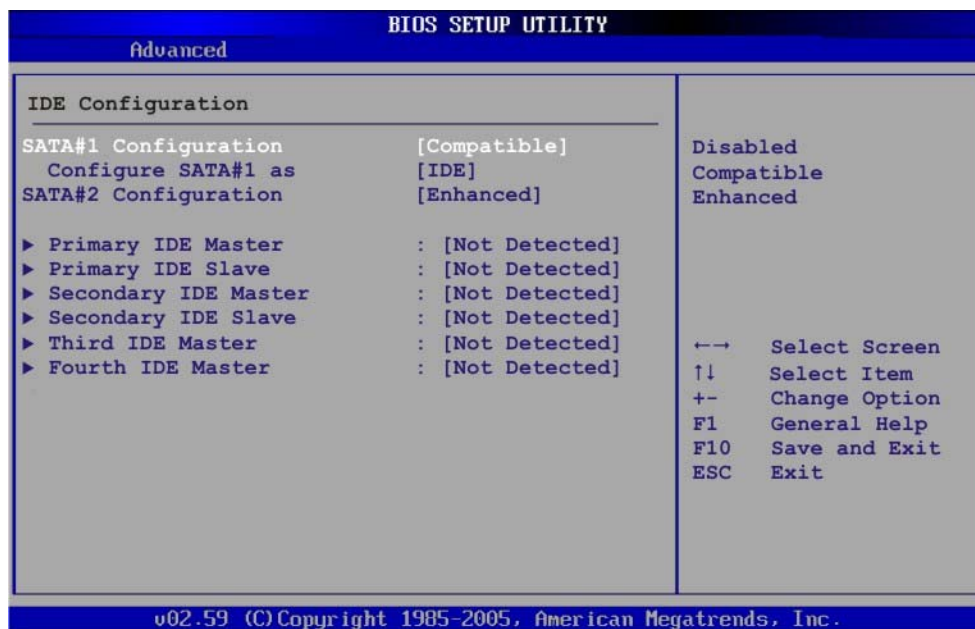
SPCIE-5100DX PICMG 1.3 CPU Card

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

→ SATA#1 Configurations [Compatible]

Use the **SATA Configurations** option to configure the SATA controller.

- **Disabled** Disables the on-board ATA/IDE controller.

- **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

- **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

→ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

- **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

- **RAID** Configures SATA devices as RAID device

- **AHCI** Configures SATA devices as AHCI

→ **SATA#2 Configurations [Enhanced]**

Use the **SATA Configurations** option to configure the SATA controller.

- **Disabled** Disables the on-board ATA/IDE controller.

- **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

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→ IDE Master and IDE Slave

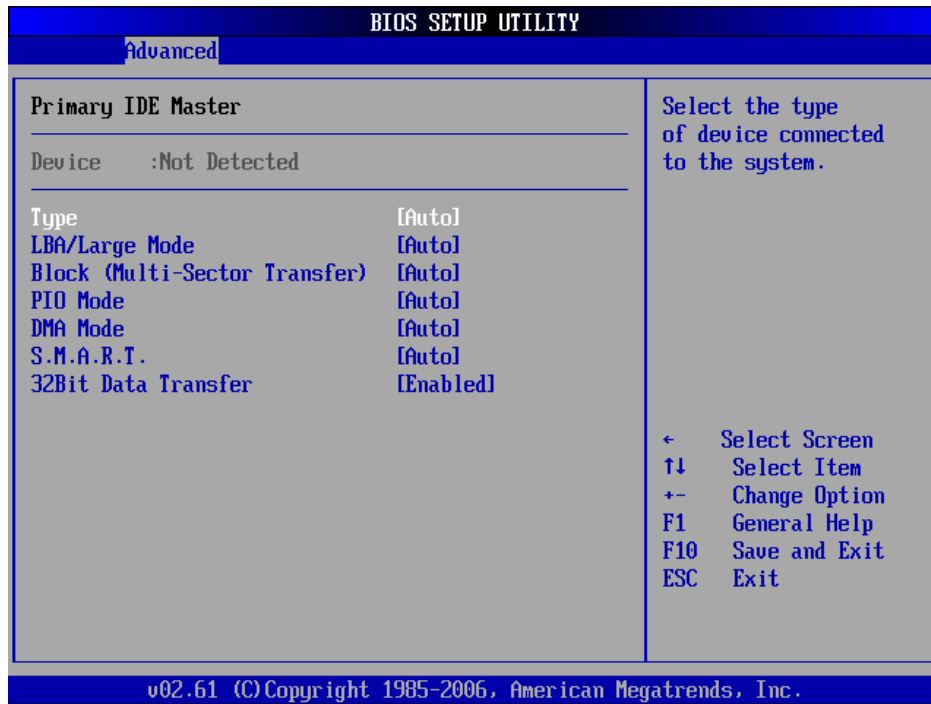
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master
- Fourth IDE Master

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave and Serial-ATA Primary/Secondary Channel

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

→ Auto-Detected Drive Parameters

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device:** Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type:** Indicates the type of devices a user can manually select
- **Vendor:** Lists the device manufacturer
- **Size:** List the storage capacity of the device.
- **LBA Mode:** Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode:** Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode:** Indicates the PIO mode of the installed device.
- **Async DMA:** Indicates the highest Asynchronous DMA Mode that is

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supported.

- **Ultra DMA:** Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.:** Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer:** Enables 32-bit data transfer.

→ Type [Auto]

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

- **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.
- **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
- **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
- **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- **ZIP**

- **LS-120**

→ LBA/Large Mode [Auto]

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

- **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.
- **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

→ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

- **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
- **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

→ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

- **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
- **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps

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- 4 PIO mode 4 selected with a maximum transfer rate of 16.6MBps
(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

→ DMA Mode [Auto]

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps

- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

→ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- **Disabled** Prevents BIOS from using the HDD SMART feature.
- **Enabled** Allows BIOS to use the HDD SMART feature

→ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

- **Disabled** Prevents the BIOS from using 32-bit data transfers.
- **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

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5.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.



BIOS Menu 6: Floppy Configuration

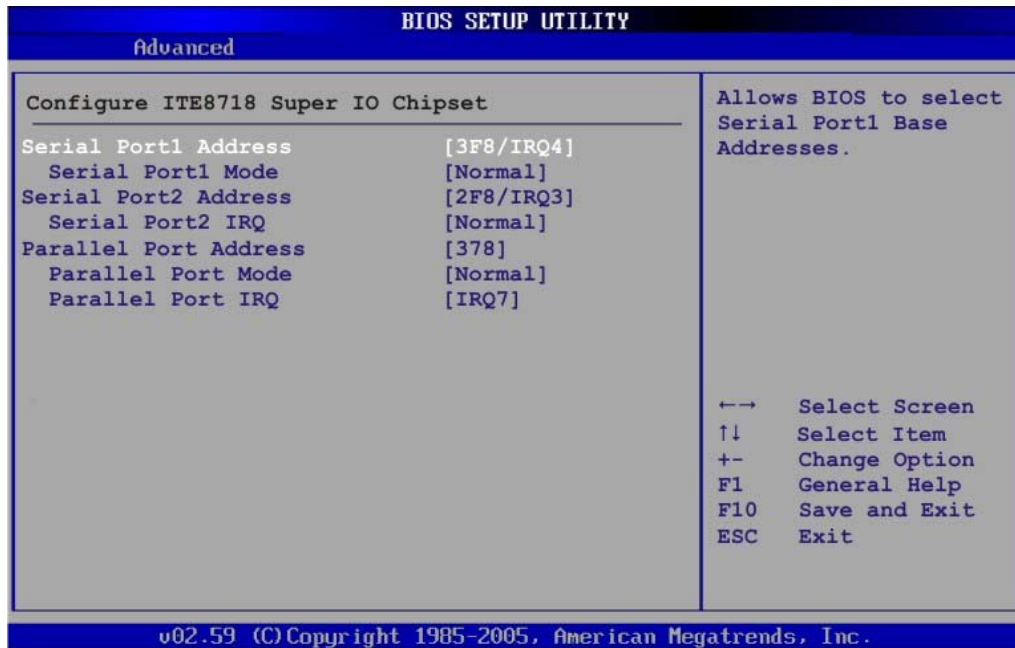
→ Floppy A

Use the **Floppy A** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 1.44 MB 3 1/2"

5.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

→ Serial Port1 Address [3F8/IRQ4]

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

- **Disabled** No base address is assigned to Serial Port 1
- **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
- **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

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→ Serial Port1 Mode [Normal]

Use the **Serial Port1 Mode** option to select the transmitting and receiving mode for the first serial port.

- **Normal** **DEFAULT** Serial Port 1 mode is normal
- **IrDA** Serial Port 1 mode is IrDA
- **ASK IR** Serial Port 1 mode is ASK IR

→ Serial Port2 Address [2F8/IRQ3]

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

→ Serial Port2 Mode [Normal]

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

- **Normal** **DEFAULT** Serial Port 2 mode is normal
- **IrDA** Serial Port 2 mode is IrDA
- **ASK IR** Serial Port 2 mode is ASK IR

→ **Parallel Port Address [378]**

Use the **Parallel Port Address** option to select the parallel port base address.

- **Disabled** No base address is assigned to the Parallel Port
- **378** **DEFAULT** Parallel Port I/O port address is 378
- **278** Parallel Port I/O port address is 278
- **3BC** Parallel Port I/O port address is 3BC

→ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

- **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- **ECP+EPP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the

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system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

→ Parallel Port IRQ [IRQ7]

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

→ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

→ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

5.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.

BIOS SETUP UTILITY	
Advanced	
Hardware Health Configuration	
CPU 1 FAN Mode Setting	[Full On mode]
CPU 2 FAN Mode Setting	[Full On mode]
CPU 1 Temperature	:23°C/73°F
System Temperature	:37°C/98°F
CPU FAN 1 Speed	:8231 RPM
CPU FAN 2 Speed	:8035 RPM
MCH FAN Speed	:5443 RPM
CPU Core 1	:1.072 V
FSB_VTT	:1.200 V
+12.0V	:12.160 V
+1.5V	:1.504 V
+1.8V	:1.840 V
+5V Dual	:4.919 V
Fan configuration mode setting	
←→	Select Screen
↑↓	Select Item
F1	General Help
F10	Save and Exit
ESC	Exit
v02.59 (C) Copyright 1985-2005, American Megatrends, Inc.	

BIOS Menu 8: Hardware Health Configuration

→ **CPU FAN Mode Setting [Full On Mode]**

Use the **CPU FAN Mode Setting** option to configure the second fan.

- **Full On Mode** **DEFAULT** Fan is on all the time
- **Automatic mode** Fan is off when the temperature is low enough. Parameters must be set by the user.
- **PWM Manual mode** Pulse width modulation set manually

When the **CPU FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Fan Start PWM
- Slope PWM 1

When the **CPU FAN Mode Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- CPU Fan PWM control

→ **CPU Temp. Limit of OFF [000]**



WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value,

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select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Temp. Limit of Start [020]



WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan 3 Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Fan Start PWM [070]

The **Fan 3 Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Fan 3 Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature 3 Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan 3 Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0

- PWM Maximum Mode: 127

→ **Slope PWM 1 [0.5 PWM]**

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

- 0.125 PWM
- 0.25 PWM
- 0.5 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 15 PWM

→ **CPU Fan PWM Control [070]**

The **CPU Fan PWM Control** option can only be set if the **CPU FAN Mode Setting** option is set to **PWM Manual Mode**. Use the **CPU Fan PWM Control** option to select PWM duty cycle control. The PWM duty cycle specifies the width of the modulated pulse. A high value ensures a wide pulse and a low value ensures a narrow pulse. To select a value, select the **CPU Fan PWM Control** option and enter a decimal number between 000 and 127. The PWM Duty Cycle control range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

→ **Monitored Parameters**

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures:** The following system temperatures are monitored
 - CPU Temperature

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- System Temperature
- Fan Speeds: The CPU cooling fan speed is monitored.
 - CPU Fan Speed
 - MCH Fan Speed
- **Voltages:** The following system voltages are monitored
 - CPU Core 1
 - FSB_VTT
 - +12V
 - +1.5V
 - +1.8V
 - +5V Dual

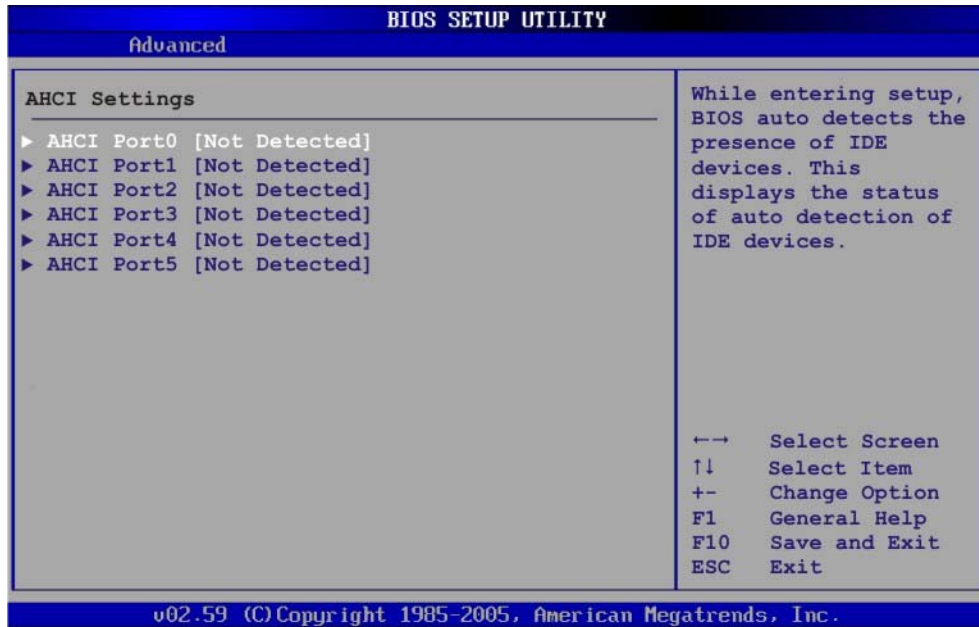
5.3.6 AHCI Configuration



NOTE:

Advanced Host Controller Interface (AHCI) is a new programming interface for SATA host controllers. AHCI systems do not have master/slave designation for SATA devices, each device is treated as a master, and hardware-assisted native command queuing.

Use the **AHCI Settings** menu (**BIOS Menu 9**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.



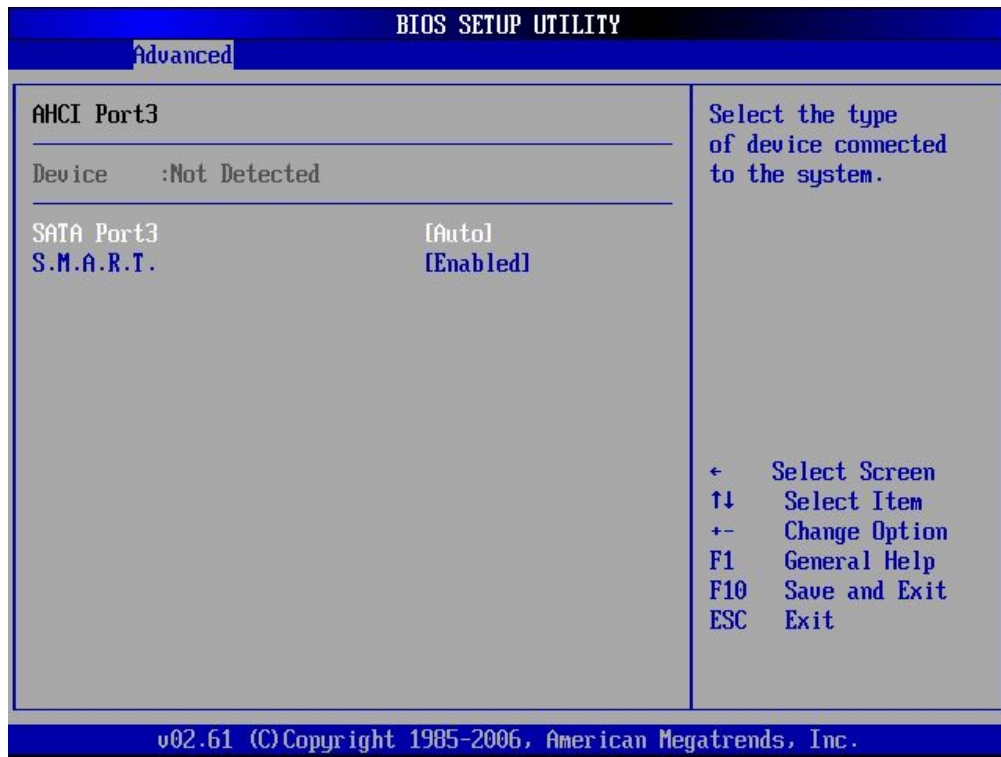
BIOS Menu 9: AHCI Configuration

→ AHCI Port n [Not Detected]

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected to a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. “**AHCI Port 3**” opens a new window.

5.3.6.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 10**) to configure the drive connected to SATA connector n.



BIOS Menu 10: AHCI Port n Configuration Menu

➔ **SATA Port n [Auto]**

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

➔ **S.M.A.R.T [Enabled]**

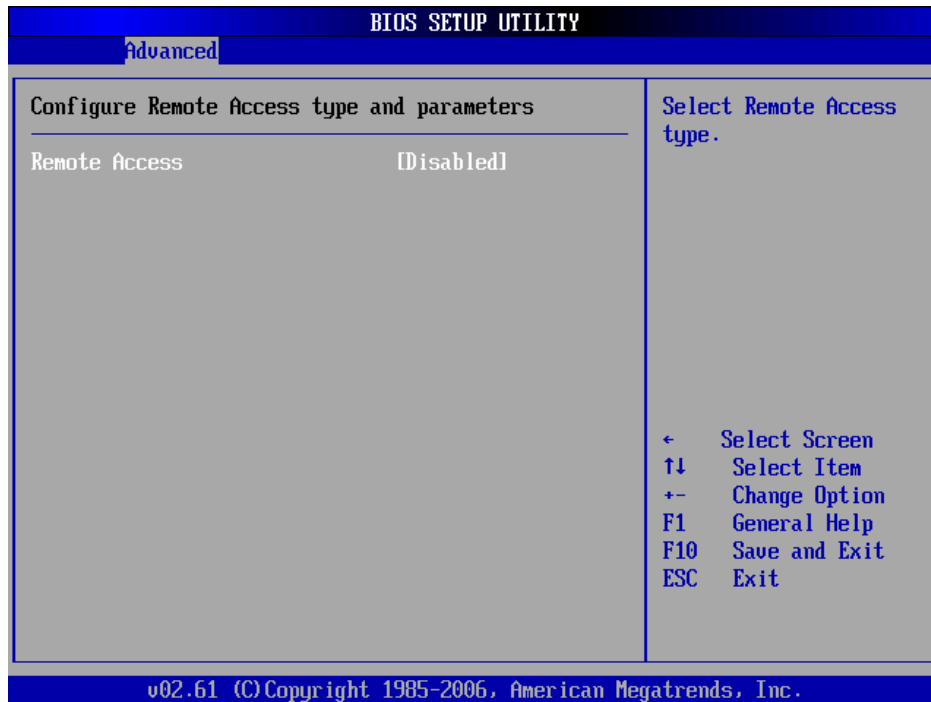
Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

➔ **Disabled** S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

➔ **Enabled** **DEFAULT** S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

5.3.7 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration [Advanced]

→ Remote Access [Disabled]

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

- **Disabled** **DEFAULT** Remote access is disabled.
- **Enabled** Remote access configuration options shown below appear:

→ Serial Port Number

→ **Serial Port Mode**

→ **Redirection after BIOS POST**

→ **Terminal Type**

These configuration options are discussed below.

→ **Serial Port Number [COM1]**

Use the **Serial Port Number** option to select the serial port used for remote access.

→ **COM1** **DEFAULT** System is remotely accessed through COM1

→ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

→ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

→ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

**NOTE:**

Identical baud rate setting must be set on the host (a management computer running a terminal software) and the slave

→ Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- | | | |
|----------------------|----------------|--|
| → Disabled | | The console is not redirected after POST |
| → Boot Loader | | Redirection is active during POST and during Boot Loader |
| → Always | DEFAULT | Redirection is always active (Some Oses may not work if set to Always) |

→ Terminal Type [ANSI]

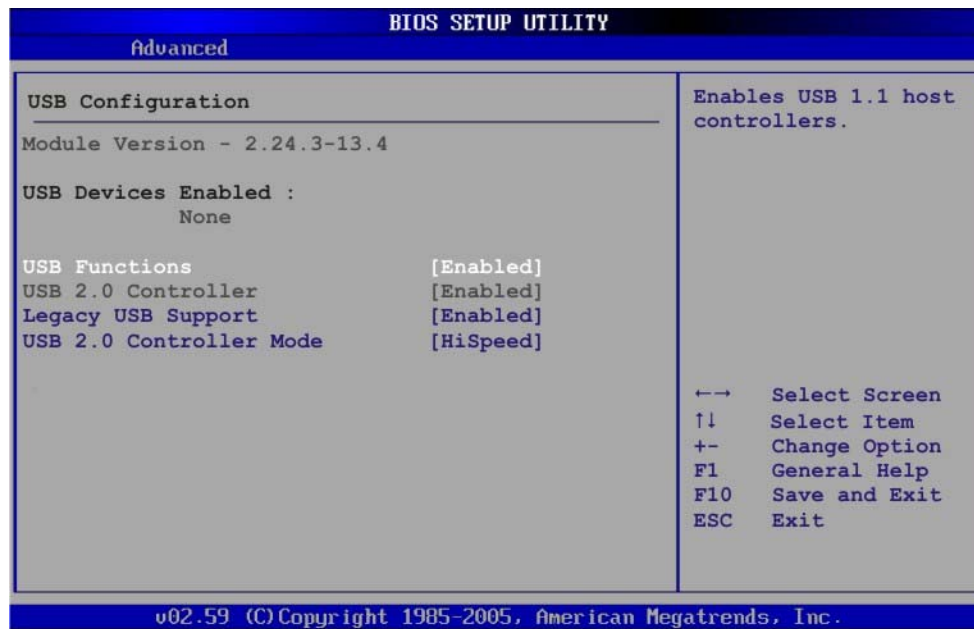
Use the **Terminal Type** BIOS option to specify the remote terminal type.

- | | | |
|------------------|----------------|-------------------------------------|
| → ANSI | DEFAULT | The target terminal type is ANSI |
| → VT100 | | The target terminal type is VT100 |
| → VT-UTF8 | | The target terminal type is VT-UTF8 |

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5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

→ USB Function [Enabled]

Use the **USB Function** BIOS option to enable or disable USB function support.

- **Disabled** USB function support disabled
- **Enabled** **DEFAULT** USB function support enabled

→ USB 2.0 Controller [Enabled]

The **USB 2.0 Controller** BIOS option is enabled and can not be configured

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does 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 control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

- ➔ **FullSpeed** The controller is capable of operating at 12Mb/s
- ➔ **HiSpeed** **DEFAULT** The controller is capable of operating at 480Mb/s

5.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 13**) to configure advanced PCI and PnP settings.



WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

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BIOS Menu 13: PCI/PnP Configuration

→ IRQ# [Available]

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

- **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices
- **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7

- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

→ DMA Channel# [Available]

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

- **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices
- **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

→ Reserved Memory Size [Disabled]

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

- **Disabled** **DEFAULT** No memory block reserved for legacy ISA devices
- **16K** 16KB reserved for legacy ISA devices
- **32K** 32KB reserved for legacy ISA devices

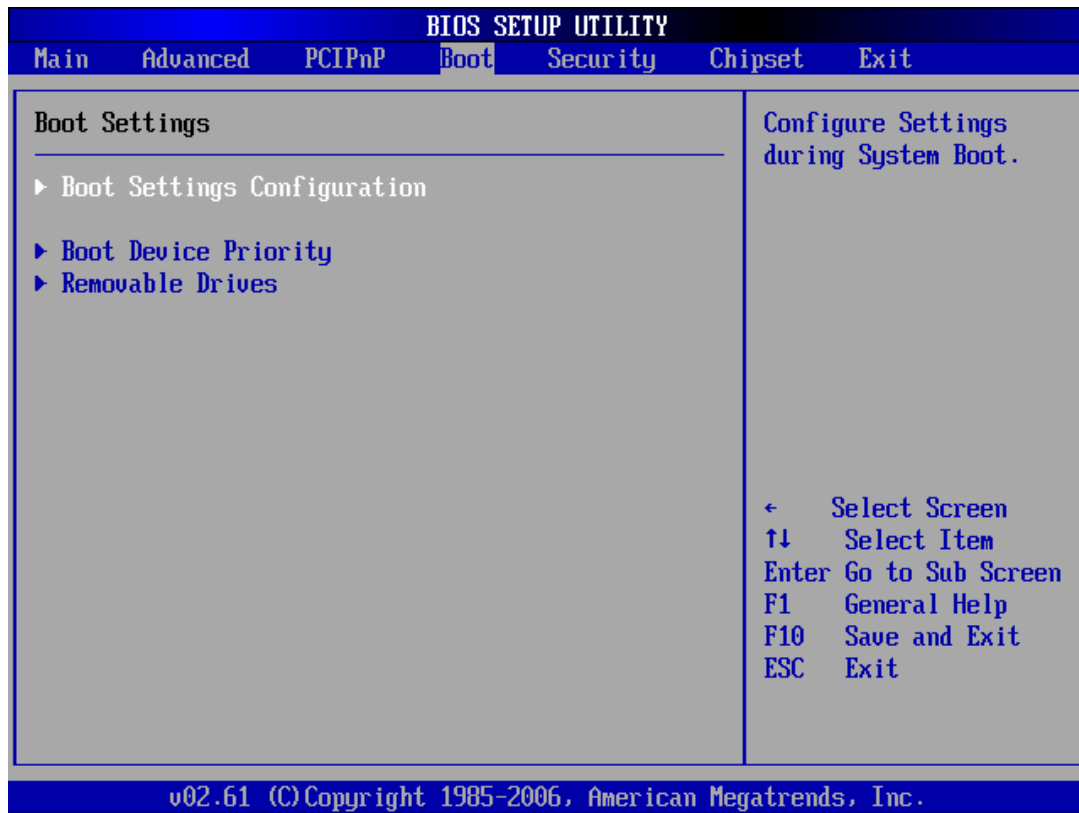
SPCIE-5100DX PICMG 1.3 CPU Card

→ 64K

54KB reserved for legacy ISA devices

5.5 Boot

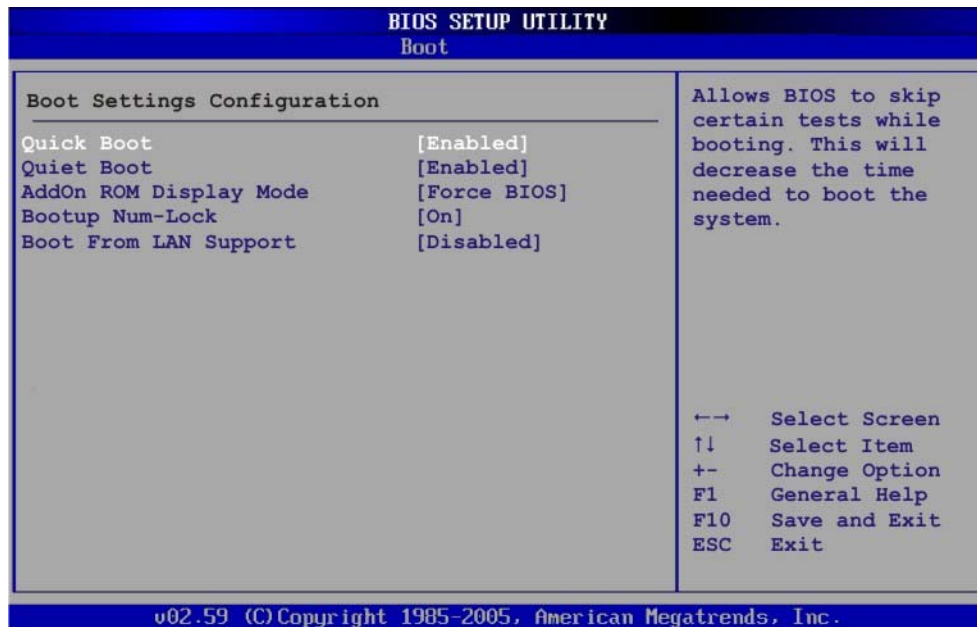
Use the Boot menu (**BIOS Menu 14**) to configure system boot options.



BIOS Menu 14: Boot

5.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 15**) to configure advanced system boot options.



BIOS Menu 15: Boot Settings Configuration

→ Quick Boot [Enabled]

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

- **Disabled** No POST procedures are skipped
- **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

→ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- **Disabled** Normal POST messages displayed
- **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

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→ AddOn ROM Display Mode [Force BIOS]

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

- **Force BIOS** **DEFAULT** Allows the computer system to force a third party BIOS to display during system boot.
- **Keep Current** Allows the computer system to display the information during system boot.

→ Bootup Num-Lock [On]

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

- **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
- **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

→ Boot From LAN Support [Disabled]

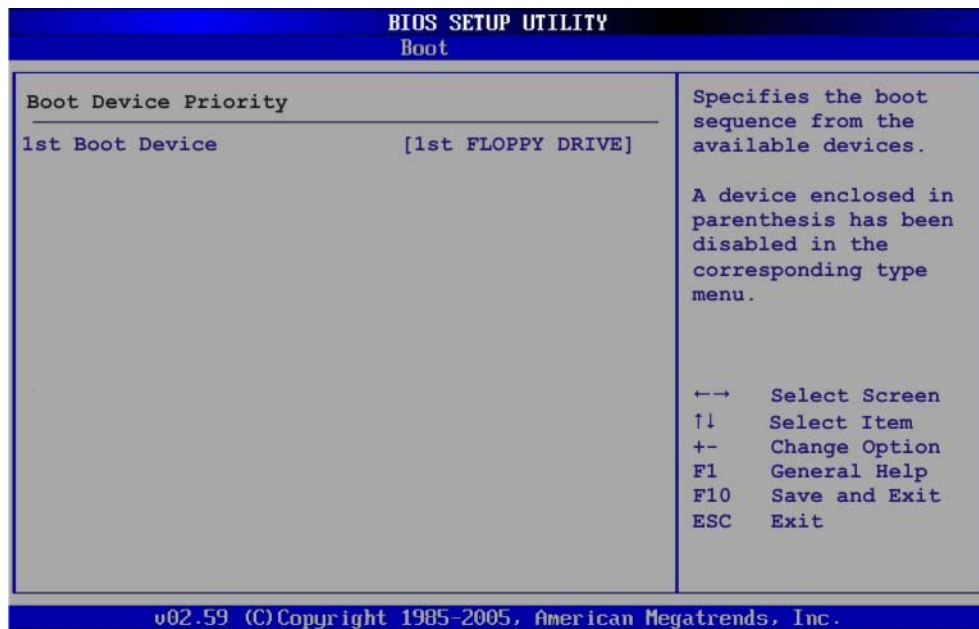
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

- ➔ **Enabled** Can be booted from a remote system through the LAN
- ➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 16**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD



BIOS Menu 16: Boot Device Priority Settings

5.5.3 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 17**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

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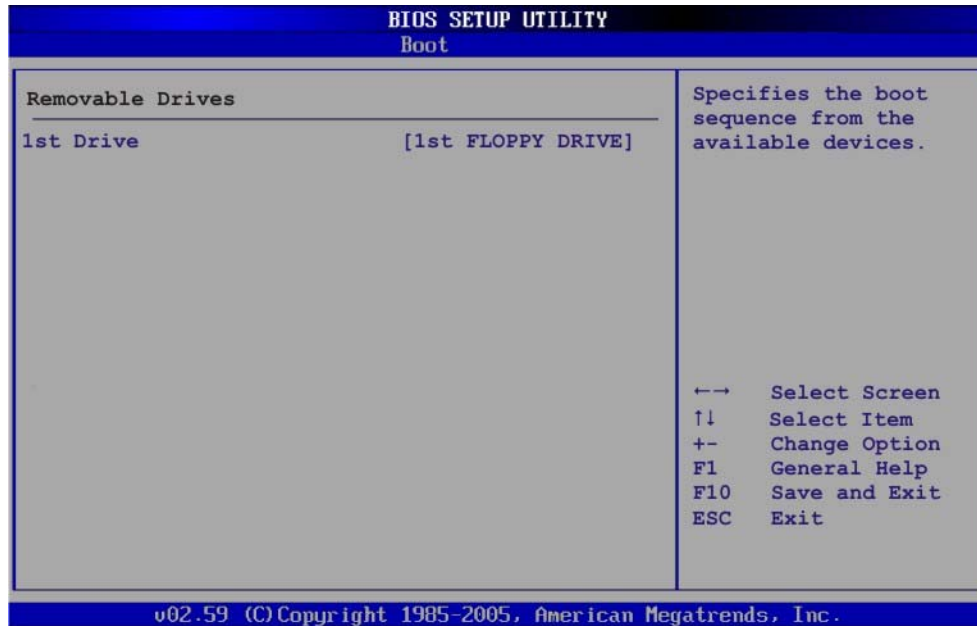
- 1st Drive [1st FLOPPY DRIVE]



NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only “**1st Drive**” is listed.

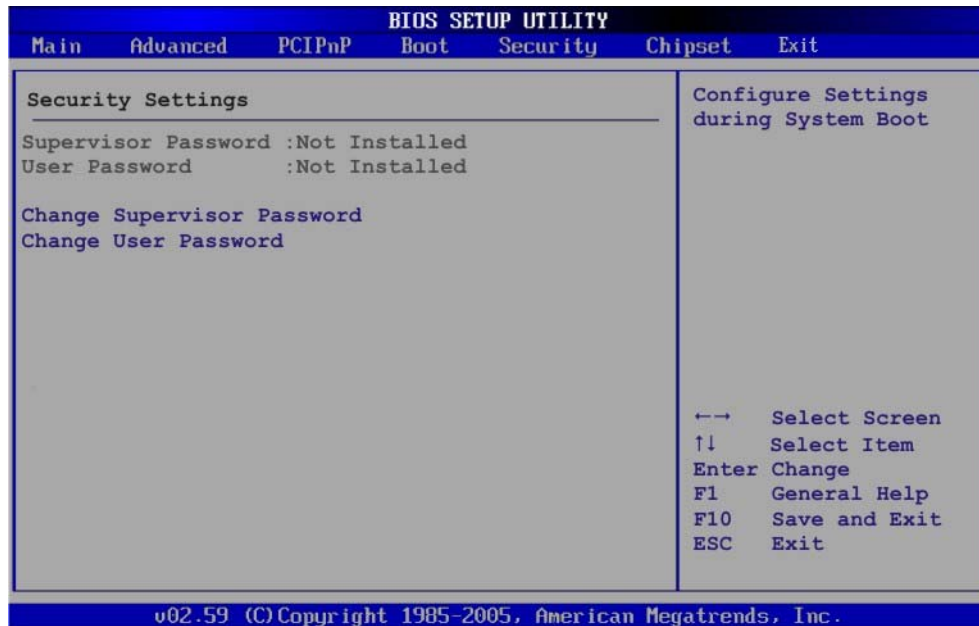
The boot sequence from the available devices is selected. If the “**1st Drive**” option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the “**1st Drive**” is not used for booting this option may be disabled.



BIOS Menu 17: Removable Drives

5.6 Security

Use the Security menu (**BIOS Menu 18**) to set system and user passwords.



BIOS Menu 18: Security

→ Change Supervisor Password

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

→ Change User Password

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

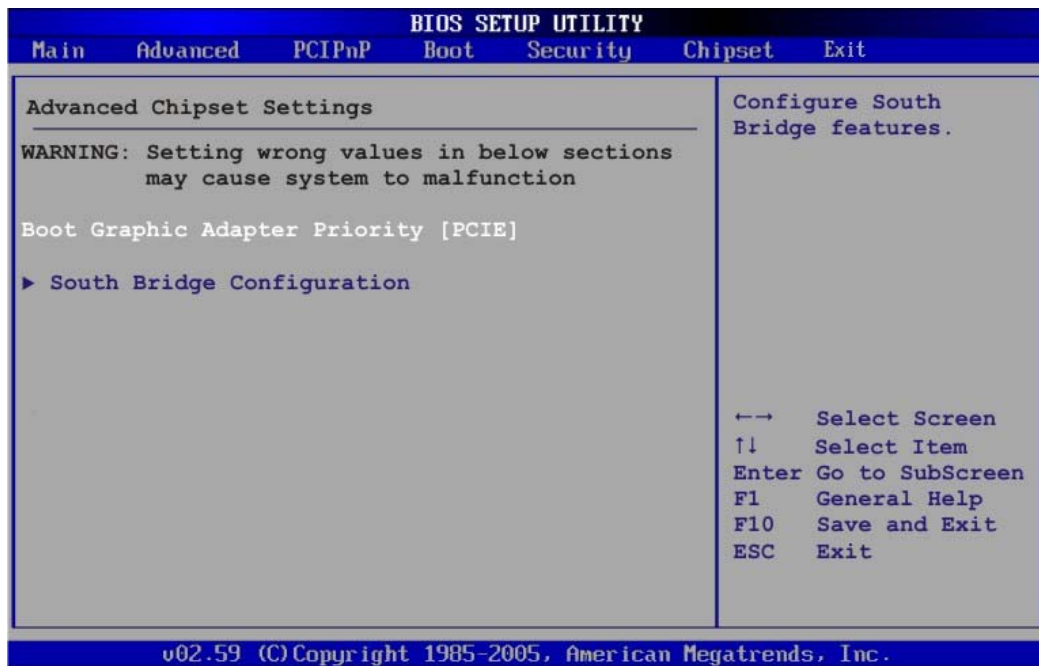
5.7 Chipset

Use the **Chipset** menu to access the SouthBridge configuration menu.



WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 19: Chipset

→ Boots Graphics Adapter Priority [PCIE]

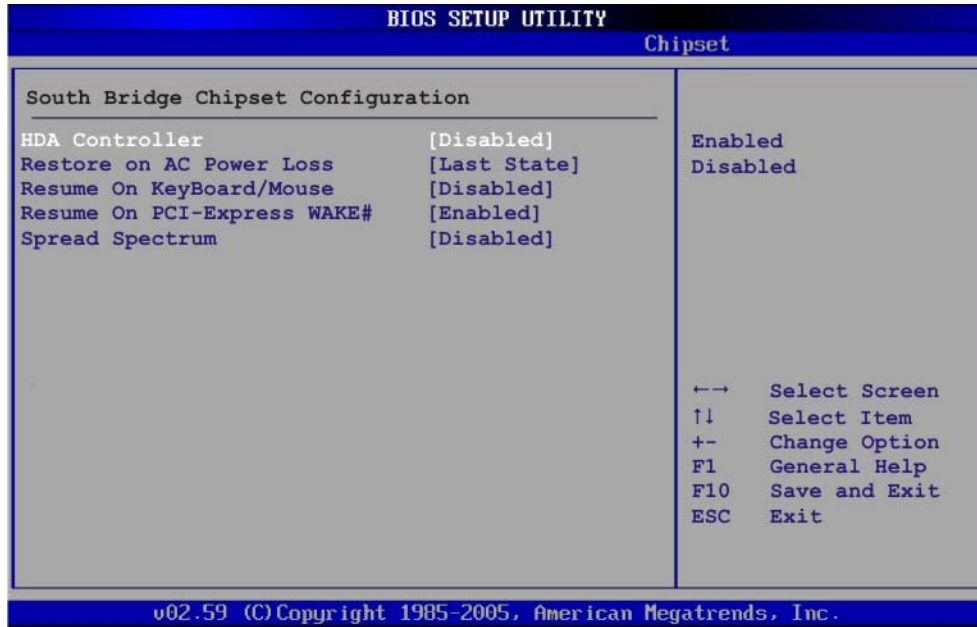
Use the **Boots Graphics Adapter Priority** option to select the graphics controller used as the primary boot device. Select either a PCI express (PCIE) controller or a PCI.

Configuration options are listed below:

- PCIE **DEFAULT**
- PCI

5.7.1 South Bridge Configuration

The South Bridge Configuration menu (**BIOS Menu 20**) enables the Southbridge chipset to be configured.



BIOS Menu 20:SouthBridge Chipset Configuration

→ HDA Controller [Disabled]

Use the **HDA Controller** BIOS option to enable or disable the HD Audio controller.

- **Enabled** HD Audio controller is enabled
- **Disabled** **DEFAULT** HD Audio controller is disabled

→ Restore on AC Power Loss [Last State]

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

- **Power Off** The system remains turned off

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- **Power On** The system turns on
- **Last State DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

→ **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

- **Disabled DEFAULT** Wake event not generated by activity on the keyboard or mouse
- **Resume On**
KeyBoard Wake event not generated by activity on the keyboard
- **Resume On**
Mouse Wake event not generated by activity on the mouse
- **Enabled** Wake event generated by activity on the keyboard or mouse

→ **Resume on PCI-Express WAKE# [Enabled]**

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.

- **Enabled DEFAULT** Wake event generated by PCI-Express activity
- **Disabled** Wake event not generated by PCI-Express activity

→ **Spread Spectrum [Disabled]**

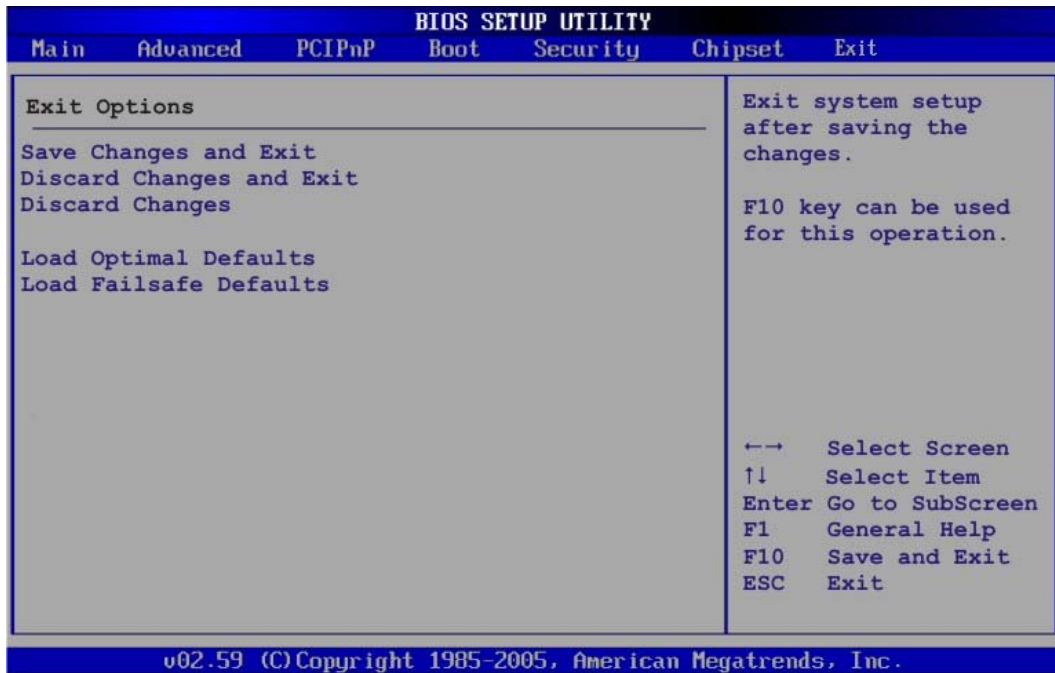
Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum

modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

- **Disabled** **DEFAULT** EMI not reduced
- **Enabled** EMI reduced

5.8 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21:Exit

→ Save Changes and Exit

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

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→ Discard Changes and Exit

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

→ Discard Changes

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

→ Load Optimal Defaults

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

→ Load Failsafe Defaults

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**



Chapter

6

RAID Setup

6.1 Introduction

The SPCIE-5100DX can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.



CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

6.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.



WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

**CAUTION!**

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

6.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

6.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: Connect SATA drives to the system. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

**NOTE:**

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: Enable SATA drives in BIOS. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

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- Step 3: Save and Exit BIOS.** After the **SATA** support option is enabled, save and exit the **BIOS**.
- Step 4: Reboot the system.** Reboot the system after saving and exiting the **BIOS**.
- Step 5: Press Ctrl+I.** During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.
- Step 6: Configure the RAID settings.** Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

6.4 Installing the Operating System to the RAID Array

To install the operating system to the RAID array some extra steps are necessary during the installation process.

- Step 1: Prepare a RAID driver floppy disk on another computer.** If installing on the RAID array a RAID driver floppy disk must be made. The RAID driver floppy disk utility is on the CD in the “5-SATA/Floppy Configuration Utility” folder. The floppy disk will be formatted and the drivers installed.
- Step 2: Restart the system with a floppy drive attached.** Attach a normal floppy drive or USB floppy drive to the system.
- Step 3: Press F6 when prompted.** During the installation process, Windows XP prompts the user to press F6 to install the RAID drivers. Press F6 and choose from the drivers on the floppy disk.
- Step 4: Install the OS.** Continue with OS installation as usual.

6.5 RAID Configuration

6.5.1 Creating a RAID Volume



WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: Select “Create RAID Volume.” Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See **Figure A-1**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]
RAID Volumes:
None defined.

Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-MCAL92193433 149.0GB Non-RAID Disk

[↑] Select [ESC] Exit [ENTER] Select Menu
  
```

Figure A-1: Matrix Storage Manager Main Menu

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Step 2: Name the RAID volume. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See

Figure A-2.

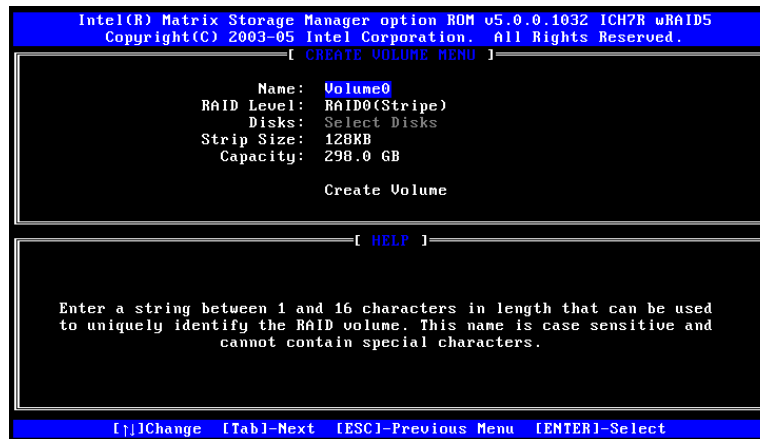


Figure A-2: Create RAID Volume Name

Step 3: Choose the RAID level. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See **Figure A-3.**



NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID 5 level requires a minimum of three hard drives.

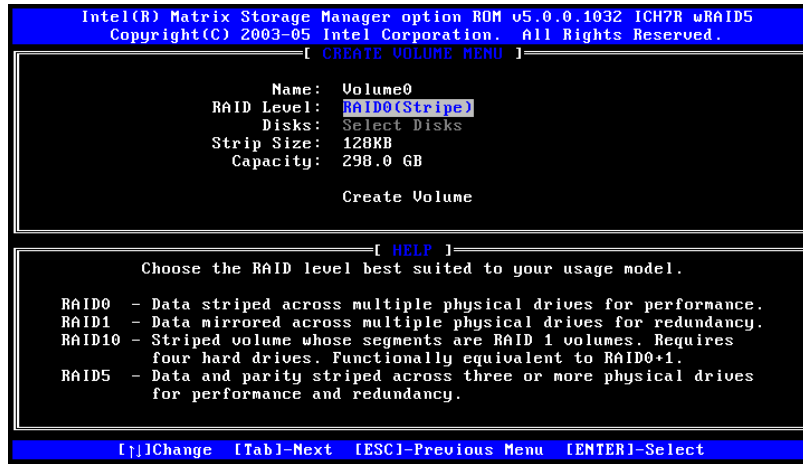


Figure A-3: Choose the Raid Level

Step 4: Select the Stripe Size. Select a stripe size from the list. See Figure A-4.

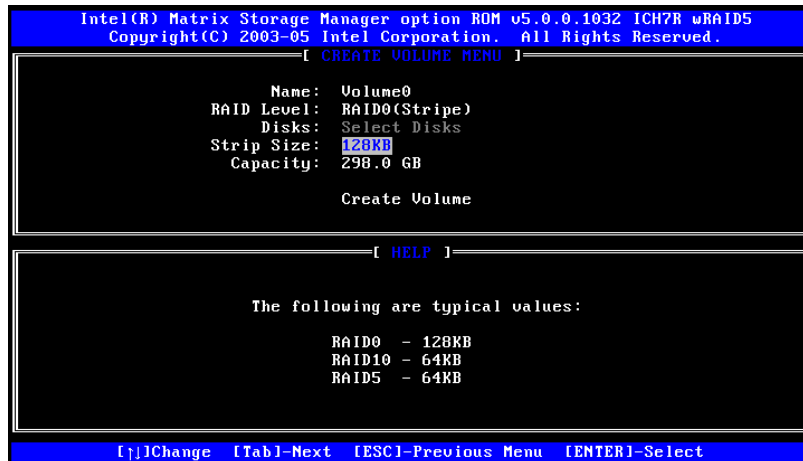


Figure A-4: Select the Stripe Size

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Step 5: Enter the Volume Capacity. Enter the volume capacity, or press **ENTER** to accept the default capacity. See **Figure A-5**.

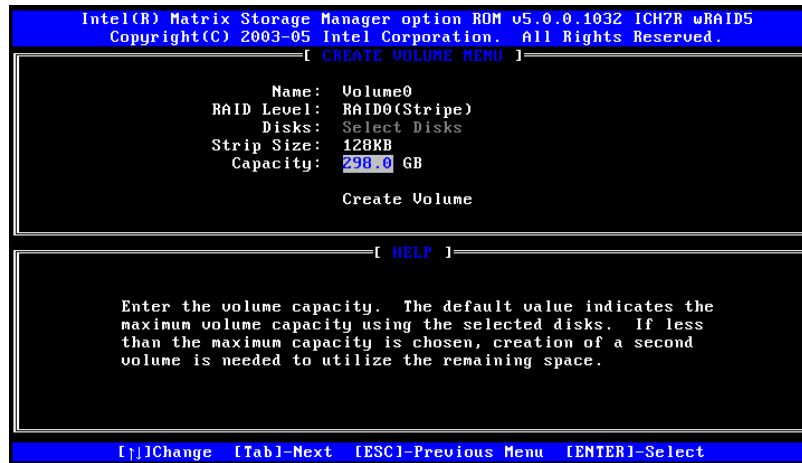


Figure A-5: Enter the Volume Capacity

Step 6: Create the RAID Volume. Press **ENTER** to create the RAID volume as specified. See **Figure A-6**.



Figure A-6: Create the RAID Volume

Step 7: Create RAID Volume Verification. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu.

See **Figure A-7**.

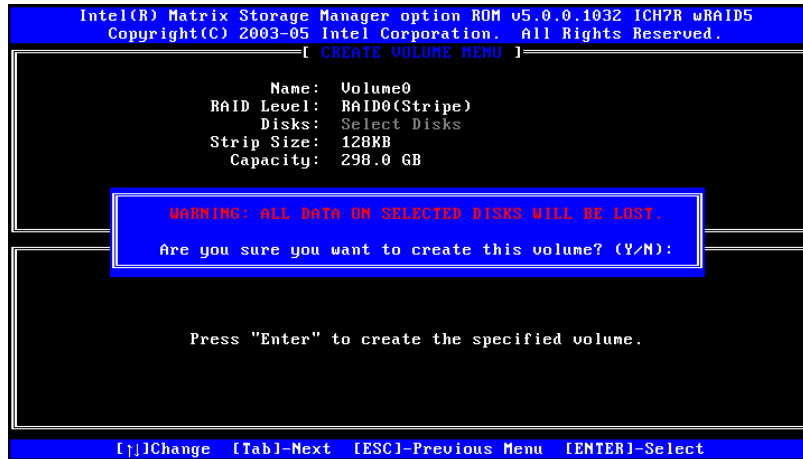


Figure A-7: Create RAID Volume Verification

6.5.2 Deleting a RAID Volume



WARNING!

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

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Step 1: Select “Delete RAID Volume.” Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See **Figure A-1**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R uRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes

Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)

[↑] Select [ESC] Exit [ENTER] Select Menu
  
```

Figure A-1: Delete RAID Volume Menu

Step 2: Select RAID Volume to be Deleted. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See **Figure A-2**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R uRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ DELETE VOLUME MENU ]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes

[ HELP ]

Deleting a volume will destroy the volume data on the drive(s) and
cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.

[↑] Select [ESC] Previous Menu [DEL] Delete Volume
  
```

Figure A-2: Select RAID Volume to be Deleted

Step 3: Delete Volume Verification. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu.

See **Figure A-3**.

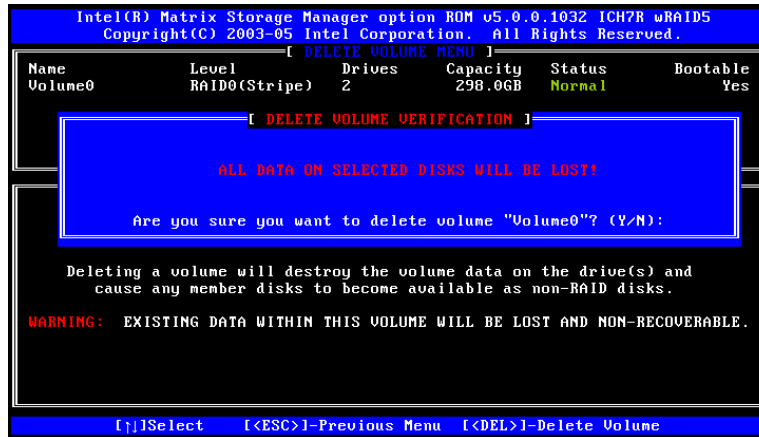


Figure A-3: Delete Volume Verification

Step 4: Non-RAID Disks. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See **Figure A-4**.

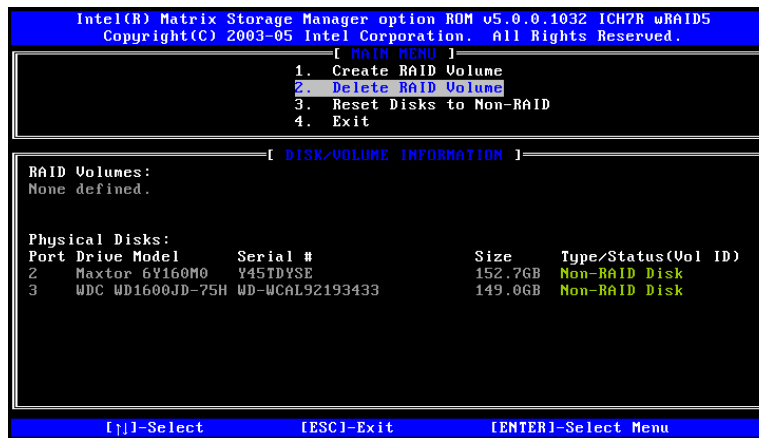


Figure A-4: Non-RAID Disks

6.5.3 Resetting a Disk to Non-RAID



WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: Select “Reset Disk to Non-RAID.” Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See **Figure A-1**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes

Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)

[ ]-Select [ESC]-Exit [ENTER]-Select Menu
    
```

Figure A-1: Reset Disk to Non-RAID Menu

Step 2: Select Disks to Reset. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See **Figure A-2**.

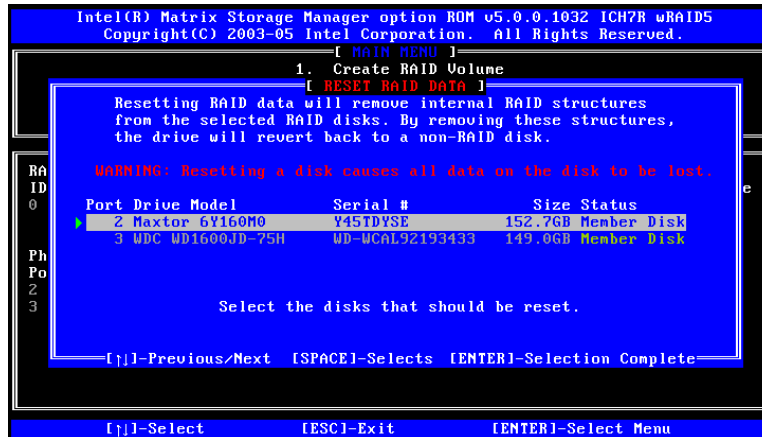


Figure A-2: Select Disk to Reset

Step 3: Reset Disk Verification. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu.

See **Figure A-3**.

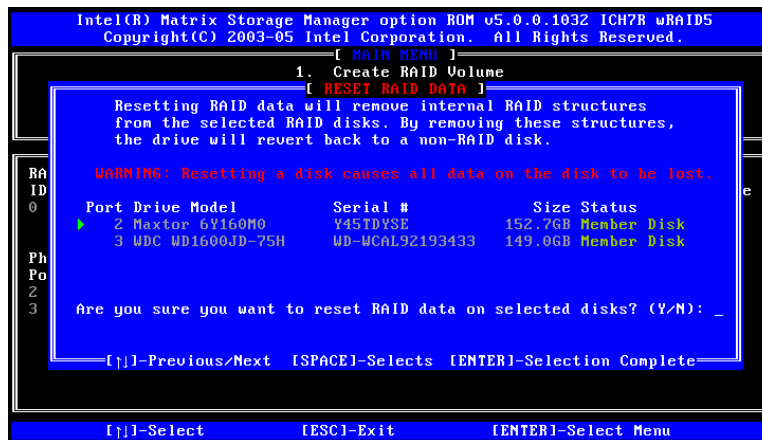


Figure A-3: Reset Disk Verification

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Step 4: Disk Drive and RAID Volume Status. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See **Figure A-4**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0 (Stripe) 128KB 298.0GB Failed Yes

Physical Disks:
Port Drive Model Serial # Size Type/Status (Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)

[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu
  
```

Figure A-4: Disk Drive and RAID Volume Status

6.5.4 Exiting the Matrix Storage Manager

Step 1: Select “Exit.” Use the arrow keys to highlight **Exit** and press **ENTER**.

See **Figure A-1**.

```

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0 (Stripe) 128KB 298.0GB Failed Yes

Physical Disks:
Port Drive Model Serial # Size Type/Status (Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)

[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu
  
```

Figure A-1: Exit Menu

Step 2: Exit Verification. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See **Figure A-2**.

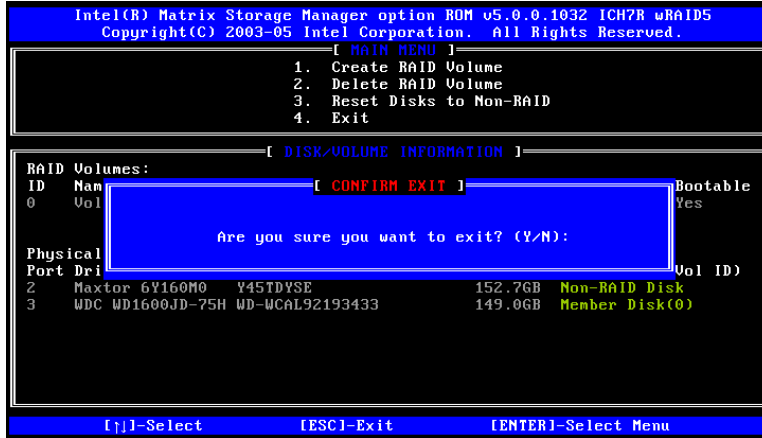


Figure A-2: Exit Verification

Chapter

7

Software Drivers

7.1 Available Software Drivers



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset driver
- VGA driver
- LAN driver
- Audio driver
- Intel® Matrix Storage Manager Driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the SPCIE-5100DX are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.



NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

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Figure 7-1: Introduction Screen

Step 3: Click SPCIE-5100DX.

Step 4: The OS selection window appears (**Figure 7-2**). Choose an OS option.

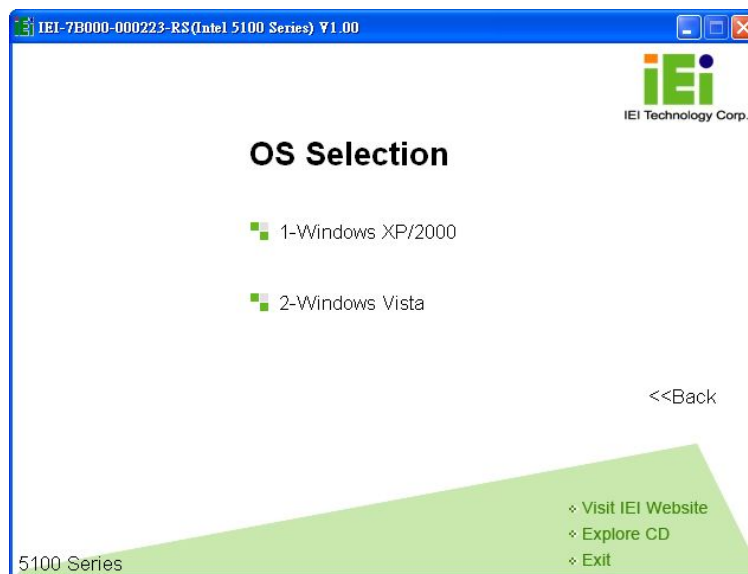


Figure 7-2: OS Selection Screen

Step 5: A new screen with a list of available drivers appears (**Figure 7-3**).

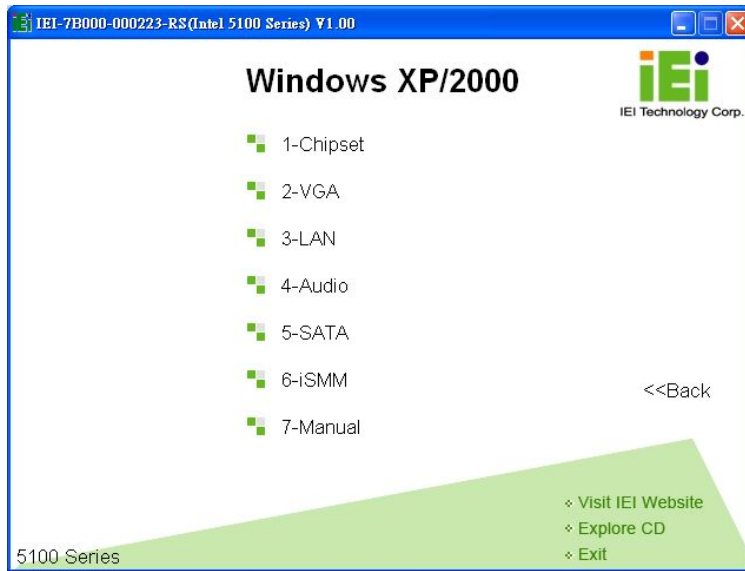


Figure 7-3: Available Drivers

Step 6: Select the driver to install from the list in **Figure 7-3**. Detailed driver installation instructions follow below.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

Step 1: Select Chipset from the list in **Figure 7-3**.

Step 2: When the setup files are completely extracted the **Welcome Screen** in **Figure 7-4** appears.

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Figure 7-4: Chipset Driver Welcome Screen

Step 3: Click **Next** to continue.

Step 4: The license agreement in **Figure 7-5** appears.



Figure 7-5: Chipset Driver License Agreement

Step 5: Read the **License Agreement**.

Step 6: Click the **YES** button to accept the license agreement and continue.

Step 7: The Read Me file in **Figure 7-6** appears.



Figure 7-6: Chipset Driver Read Me File

Step 8: Click **NEXT** to continue.

Step 9: **Setup Operations** are performed as shown in **Figure 7-7**.

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Figure 7-7: Chipset Driver Setup Operations

Step 10: Once the **Setup Operations** are complete, click the **NEXT** icon to continue.

Step 11: The **Finish** screen appears.



Figure 7-8: Chipset Driver Installation Finish Screen

Step 12: Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See **Figure 7-8**.

7.4 XGI VGA Driver Installation

To install the XGI VGA driver, please follow the steps below.

Step 1: Select VGA from the list in **Figure 7-3**.

Step 2: The setup program is prepared as shown in **Figure 7-9**.

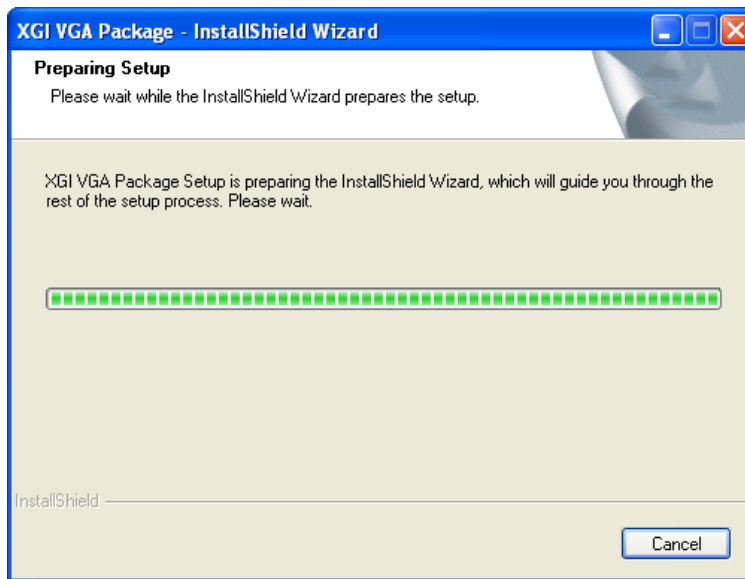


Figure 7-9: Preparing VGA Driver Setup

Step 3: The welcome screen in **Figure 7-11** next appears.

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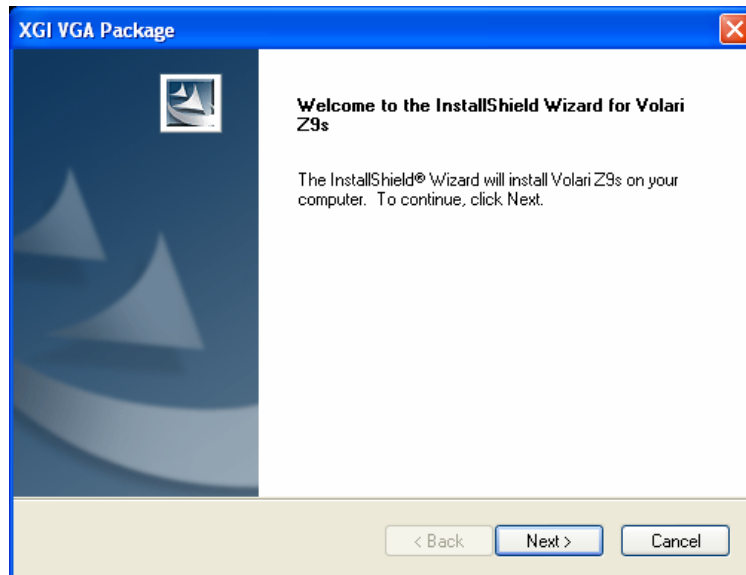


Figure 7-10: VGA Driver Welcome Screen

Step 4: Click **NEXT** to continue.

Step 5: The screen in Figure 7-11 may appear. Click **Continue Anyway**



Figure 7-11: Windows Logo Testing

Step 6: The driver is installed.

Step 7: When the driver installation is complete, the window in Figure 7-12 appears.

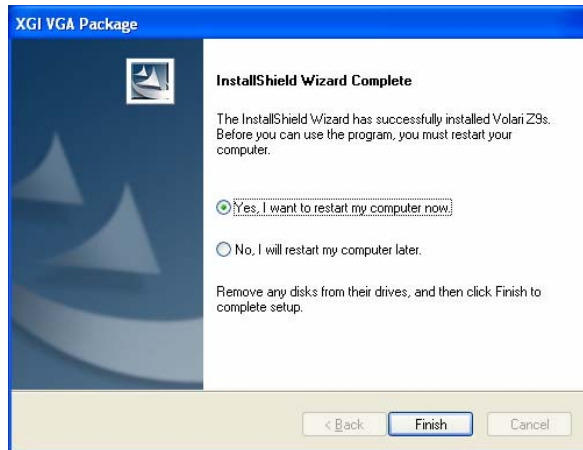


Figure 7-12: VGA Driver Installation Complete Screen

Step 8: Click **FINISH** to reboot the computer.

7.5 Intel® GbE LAN Driver

To install the Gigabit LAN connect device driver, please follow the steps below.

Step 1: Select LAN from the list in **Figure 7-3**.

Step 2: The driver begins to extract the installation files.

Step 3: The Welcome screen in **Figure 7-13** appears next.

Step 4: Click **NEXT** to continue.

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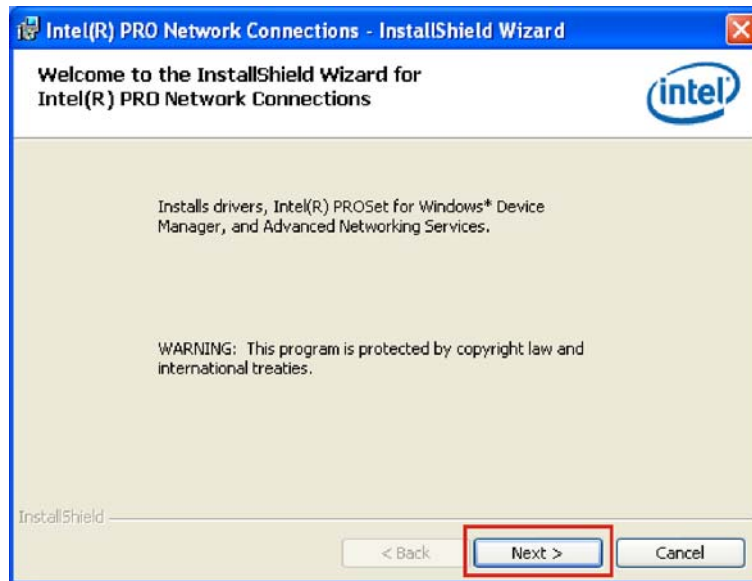


Figure 7-13: LAN Driver Welcome Screen

Step 5: The license agreement in **Figure 7-14** appears.

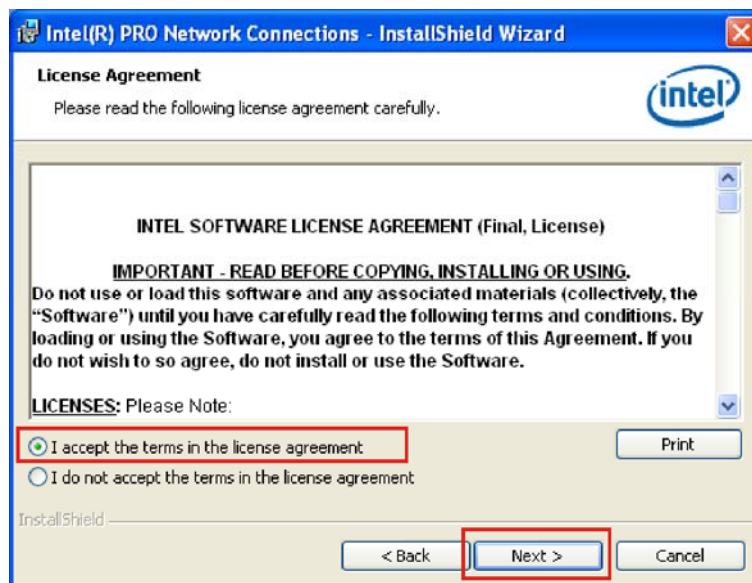


Figure 7-14: LAN Driver License Agreement

Step 6: Accept the conditions of the license agreement and click **NEXT** to continue.

Step 7: The Setup Options screen in **Figure 7-15** appears next.

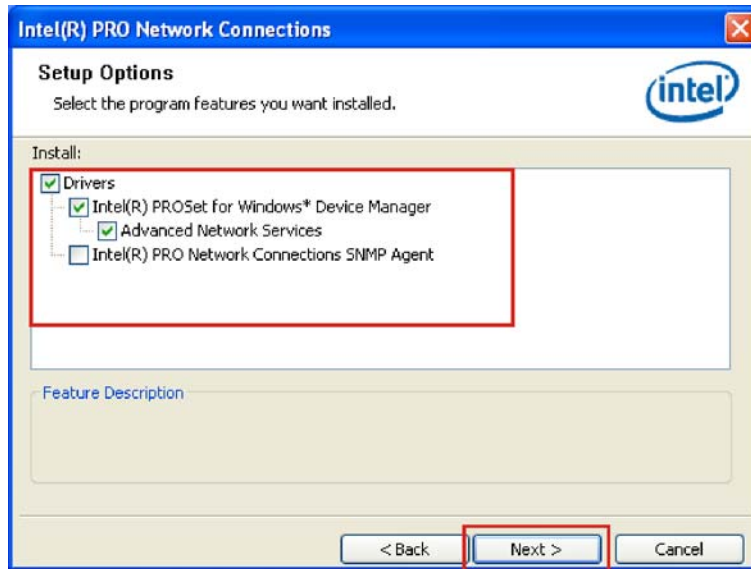


Figure 7-15: LAN Driver Setup Options

Step 8: Select the required installation configuration in **Figure 7-15** and click **NEXT** to continue.

Step 9: The Ready to Install the Program window in **Figure 7-16** appears.

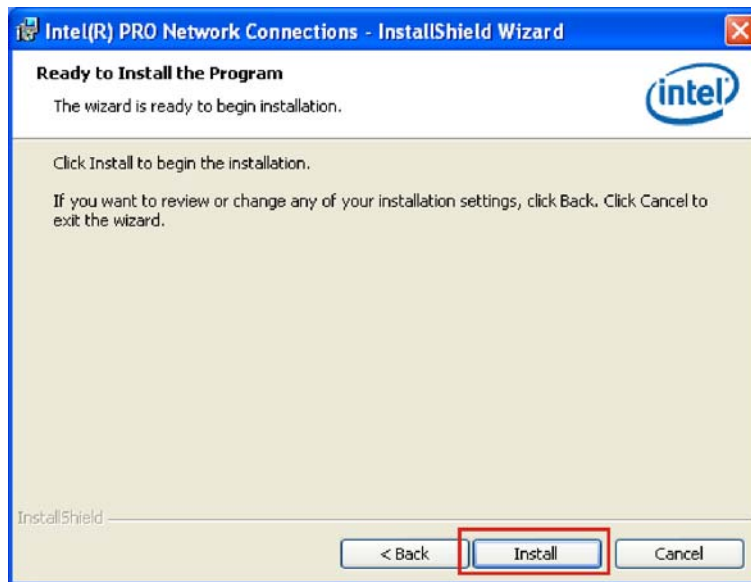


Figure 7-16: LAN Driver Installation Ready Window

Step 10: Click **INSTALL** in **Figure 7-16**.

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Step 11: The program starts to install the driver. The window in appears.

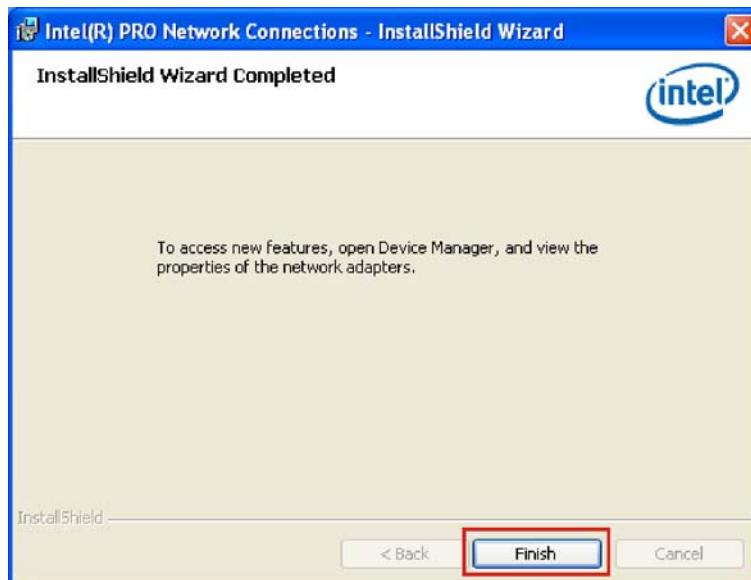


Figure 7-17: LAN Driver Installation Progress

Step 12: When the installation is finished. Click **FINISH** in the termination screen.

7.6 HD Audio Kit Driver Installation

To install the HD Audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Enable the HDA Controller option (See **Section 5.7.1**).

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select Audio from the list in **Figure 7-3**.

Step 2: The InstallShield Wizard is prepared to guide the user through the rest of the process (**Figure 7-18**).

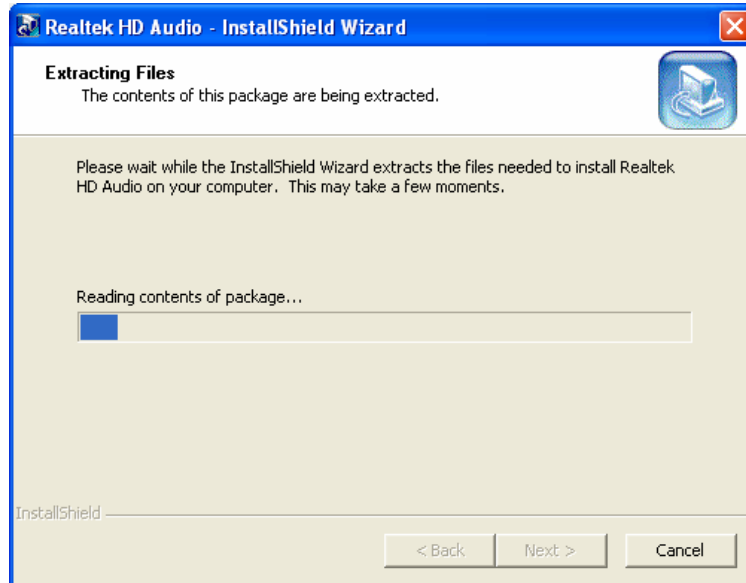


Figure 7-18: Preparing Setup Screen

Step 3: Once initialized, the InstallShield Wizard welcome screen appears (**Figure 7-19**).

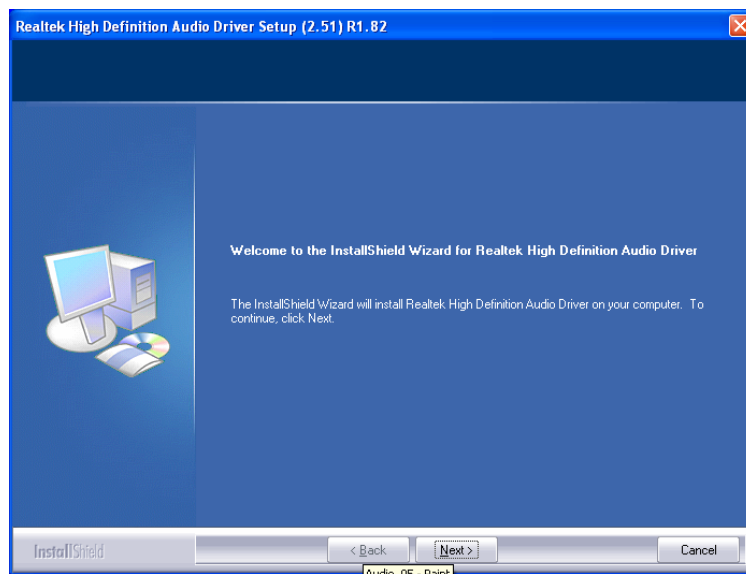


Figure 7-19: InstallShield Wizard Welcome Screen

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Step 4: Click **NEXT** to continue the installation.

Step 5: InstallShield starts to install the new software as shown in **Figure 7-20**.

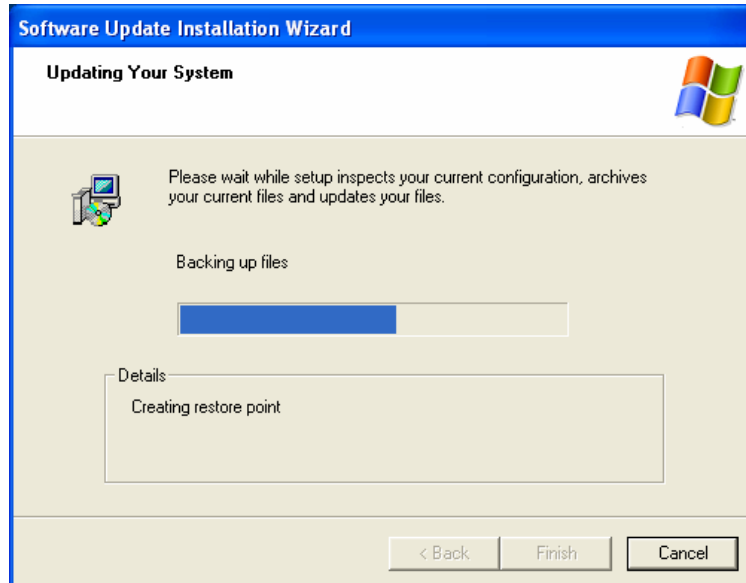


Figure 7-20: Audio Driver Software Configuration

Step 6: After the driver installation process is complete, a confirmation screen appears (**Figure 7-21**).

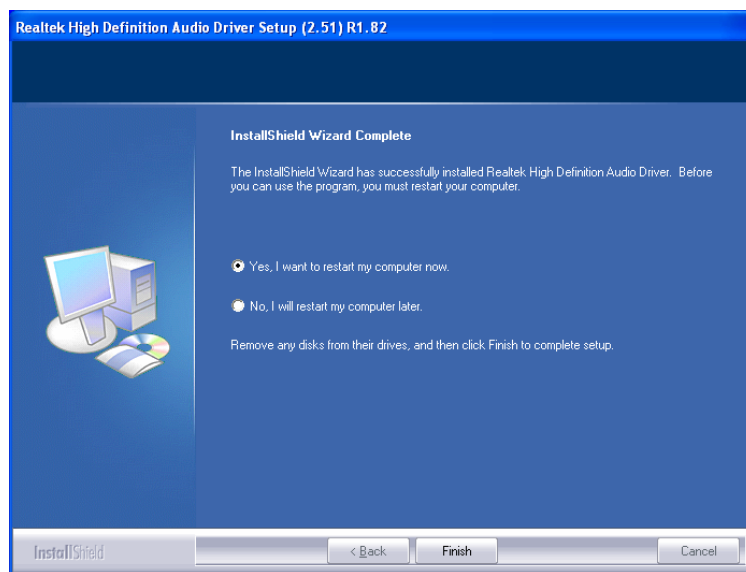


Figure 7-21: Restart the Computer

Step 7: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click FINISH to restart the computer.

7.7 Intel® Matrix Storage Manager Driver Installation

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select **SATA** from the list in **Figure 7-3**.

Step 2: A new window opens (**Figure 7-22**).



Figure 7-22: SATA RAID Driver Installation Program

Step 3: Double-click the **Intel Matrix Storage Manager** folder.

Step 4: Double-click the **iata86cd.exe** program icon.

Step 5: **Figure 7-23** shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

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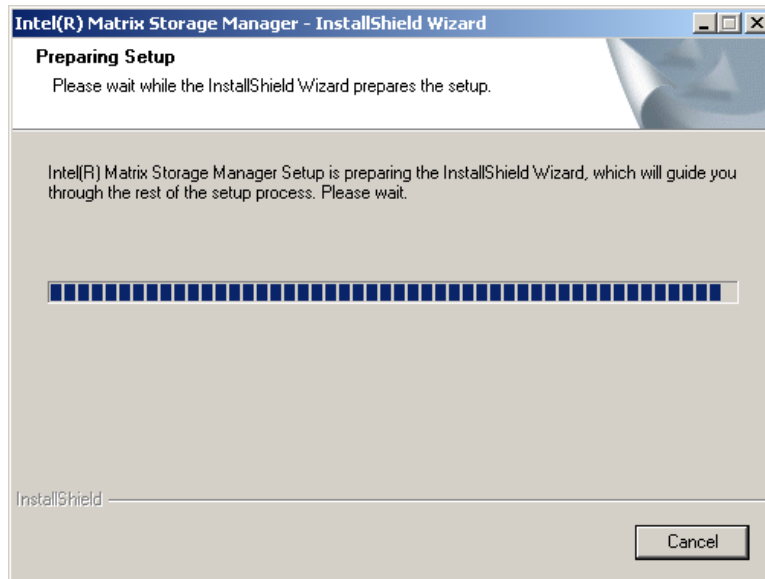


Figure 7-23: InstallShield Wizard Setup Screen

Step 6: Figure 7-24 shows the **Matrix Storage Manager** software configuring the installation process.

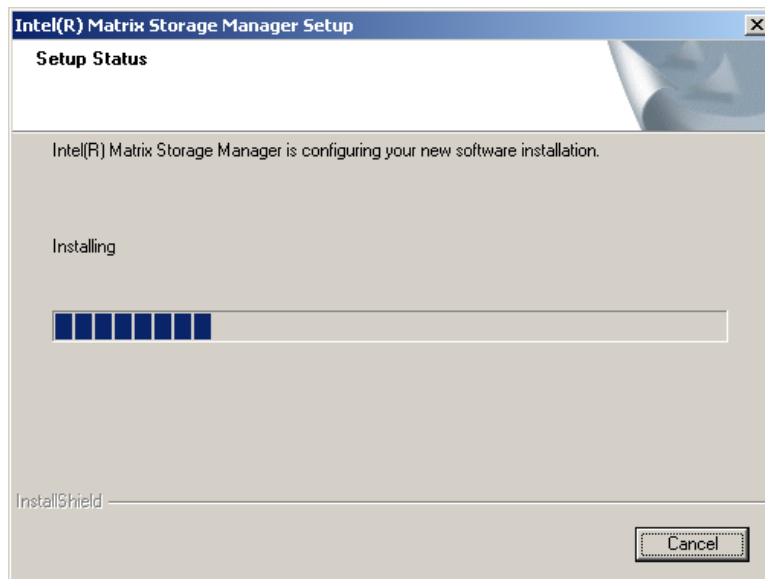


Figure 7-24: Matrix Storage Manager Setup Screen

Step 7: Figure 7-25 shows the **Matrix Storage Manager** welcome screen.

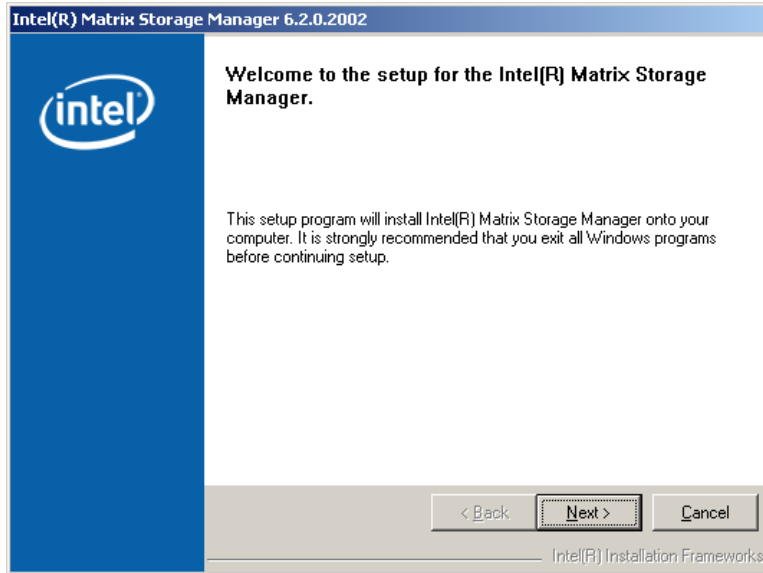


Figure 7-25: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-26**). Read the warning carefully and decide whether or not to continue the installation process.

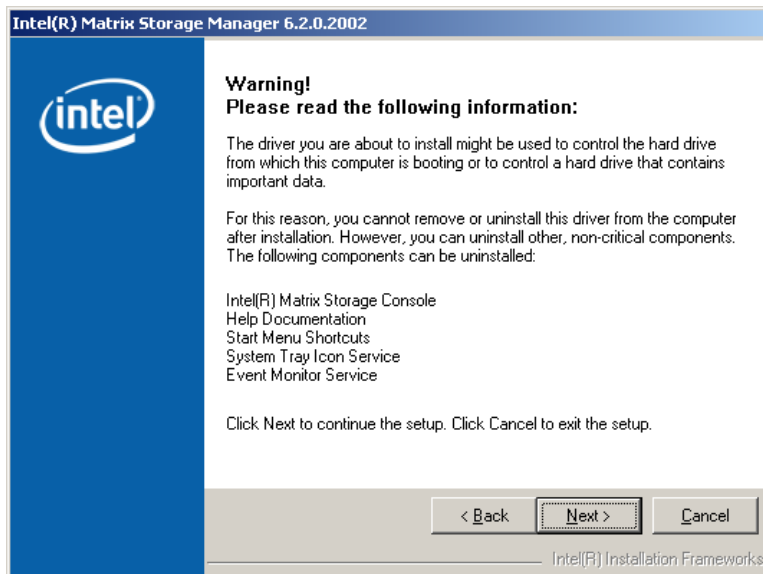


Figure 7-26: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-27**).

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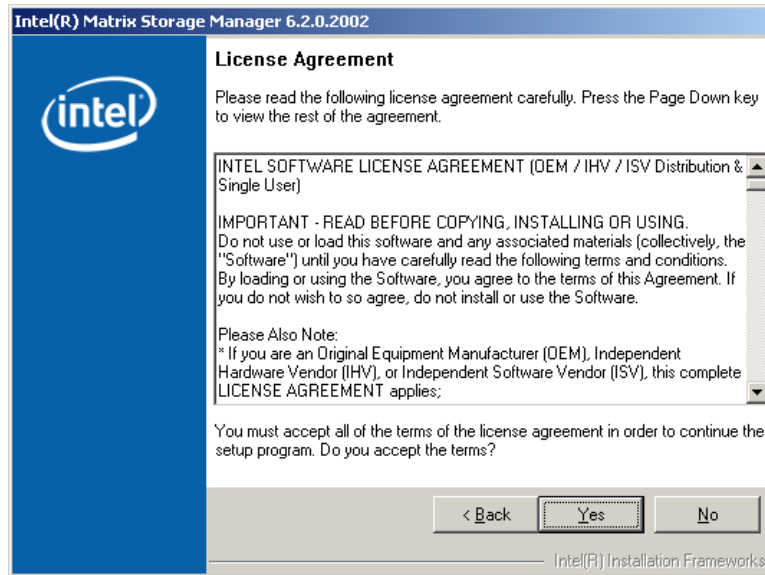


Figure 7-27: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-28** appears.

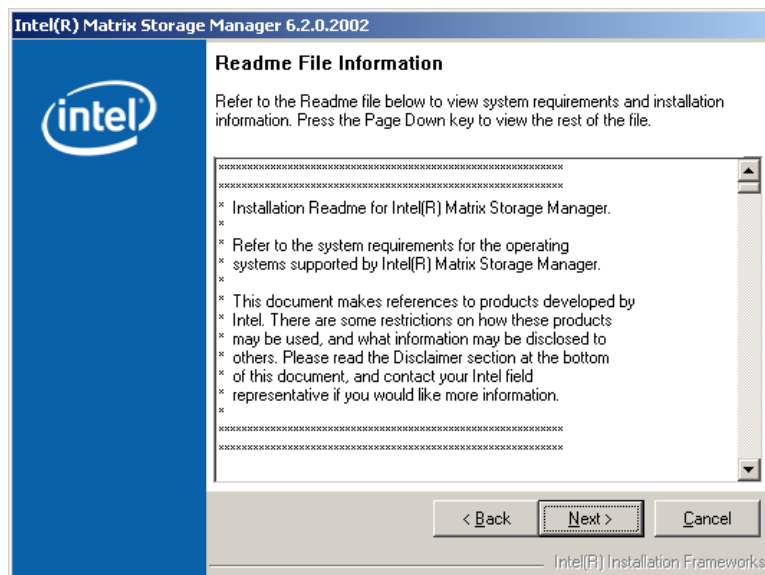


Figure 7-28: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (Figure 7-29).

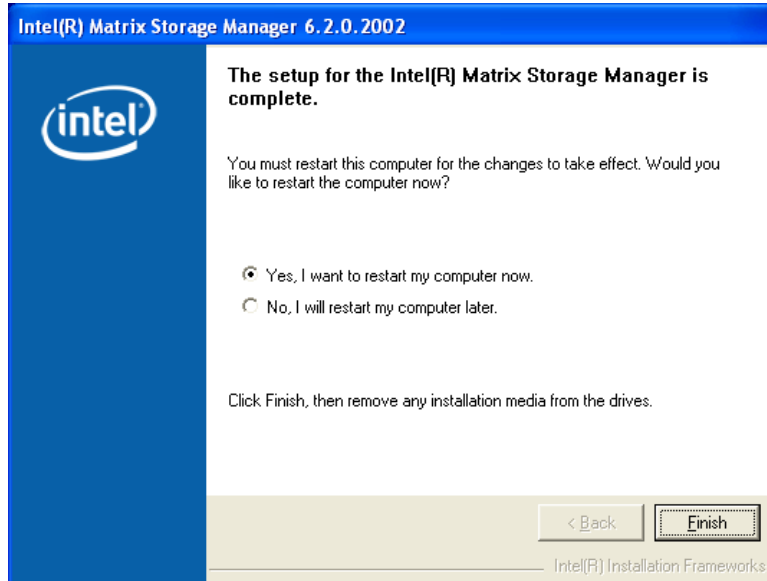


Figure 7-29: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Options

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Appendix

B

Terminology

AC'97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.

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FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
HyperTransport™ Bus	The HyperTransport™ bus, which uses HyperTransport™ technology, interfaces an AMD CPU with the Northbridge. HyperTransport™ technology provides a high-speed, low latency, point-to-point link between the CPU and the Northbridge.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAID	Redundant Array of Inexpensive Disks (RAID) refers to redundantly backing up data on multiple disks to ensure that if one disk fails, the data is not lost and can be restored from the remaining disks in the array.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.

S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates, while USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Watchdog Timer


NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
```

```
;
```

```
W_LOOP:
```

```
    MOV    AX, 6F02H    ;setting the time-out value
    MOV    BL, 30       ;time-out value is 48 seconds
    INT    15H
```

```
;
```

```
; ADD THE APPLICATION PROGRAM HERE
```

```
;
```

```
    CMP    EXIT_AP, 1    ;is the application over?
    JNE    W_LOOP        ;No, restart the application
```

```
    MOV    AX, 6F02H    ;disable Watchdog Timer
    MOV    BL, 0        ;
    INT    15H
```

```
;
```

```
; EXIT ;
```



Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

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此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。



Appendix

E

RAID Levels

E.1 Introduction

The SATA disks can be configured in a RAID array. RAID array setup is described in **Chapter 7**. The RAID array can be in one of the following configurations or levels:

- RAID 0
- RAID 1
- RAID 10
- RAID 5

These levels are described below:

E.1.1 RAID 0 or Disk Striping

RAID 0 is a disk striping method. Data is striped across two or more disks. RAID 0 does not provide any redundant storage. When one of the drives fails, the data cannot be restored. Disk striping enables faster access to the disk sectors and faster reads and writers to and from the system.

E.1.2 RAID 1 or Disk Mirroring

RAID 1 is a disk mirroring method. Data on a first drive is copied exactly as is to a second drive. If one of the drives fails then data is backed up on the second drive and no information is lost. Although read and write speeds do increase, overall storage capacity is halved. That is, if two 50 GB drives are mirrored together, the total storage capacity is 100 GB. However, since one 50 GB drive is a mirror of the other 50 GB drive, only 50 GB of data can be stored on the system.

For disk mirroring two, four or six disks are required.

E.1.3 RAID 10 or Disk Mirroring and Striping

RAID 10 combines disk mirroring and striping. First data is mirrored on two drives (drive 1 and drive 2) and then the mirrored data is striped across two other drives (drive 3 and drive 4). Although the read-write speeds are improved, the system still only has half of the actual storage capacity.

E.1.4 RAID 5

RAID 5 uses distributed parity blocks on different drives to enable the system to rebuild lost data if one of the disks crashes. The parity block is a binary representation of that data stored on the equivalent sectors of the other disks in the array. If one of the disks crashes then the disk can be rebuilt using binary techniques.