PCE-7210

Dual Socket 604 Intel® Xeon® / LV Xeon® Processor Card with PCI Express / IPMI / VGA/ Dual Gigabit LAN / FSB 800MHz

User Manual

深圳市研伟科技有限公司

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- CE
- FCC Class A

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A Message to the Customer

Advantech customer services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

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Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

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1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Before you begin installing your single board computer, please make sure that the following materials have been shipped:

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

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We have carefully inspected the PCE-7210 mechanically and

electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the PCE-7210, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Initial Inspection

Before you begin installing your single board computer, please make sure that the following materials have been shipped:

1 PCE-7210 Dual Intel® Xeon® / LV Xeon® processor-based single board computer	
1 PCE-7210 Startup Manual	
1 CD with driver utility and manual (in PDF format)	
1 FDD cable	P/N: 1700340640
2 Ultra ATA 66/100 HDD cables	P/N: 1701400452
2 Serial ATA HDD data cable	P/N: 1700071000
2 Serial ATA HDD power cable	P/N: 1703150102
1 Printer (parallel) port & COM port cable kit	P/N: 1701260305
1 Dual COM port cable kit	P/N: 1701092300
1 Y cable for PS/2 keyboard and PS/2 mouse	P/N: 1700060202
2 CPU cooler	P/N: 1750000282
1 VGA cable	P/N: 1700000259
1 Video Cable (S / Composite terminal)	P/N: 1700000784
Warranty card	

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

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As you unpack the PCE-7210, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Verified CPU List

Table 1.1: Verified CPU List

CPU Freq.	Spec.	Core Step-ping	Thermal	Vcore	FSB	Mfg. Tech	HT	L2 cache	L3 cache	Pack-age Type
XEON 3.6 G	SL7ZC	N0	110W	1.4V max	800	90nm	Y	2MB	NA	604 pin
XEON 3.2 G	SL7ZE	N0	110W	1.4V max	800	90nm	Y	2MB	NA	604 pin
XEON 3.0 G	SL7ZF	N0	110W	1.4V max	800	90nm	Y	2MB	NA	604 pin
XEON 2.8 G	SL7ZG	N0	110W	1.4V max	800	90nm	Y	2MB	NA	604 pin
XEON 3.6 G	SL7PH	E0	103W	1.4V max	800	90nm	Y	1MB	NA	604 pin
XEON 3.0 G	SL7TC	E0	103W	1.4V max	800	90nm	Y	1MB	NA	604 pin

Verified Memory List

Table 1.2: Verified Memory List

Brand	Size	Speed	Type	ECC	Part Number	Memory
Apacer (RoHS)	512MB	DDR2 400	Register DDR2	Y	78.91G57.421	ELPIDA E5108AE-5C-E (64x8)
	1GB	DDR2 400	Register DDR2	Y	78.01G57.420	ELPIDA E5108AE-5C-E (64x8)
Unigen (RoHS)	1GB	DDR2 400	Register DDR2	Y	UG12T7200L8DR-5AC	ELPIDA E5108AG-5C-E (64x8)
	2GB	DDR2 400	Register DDR2	Y	UG25T7200L4DR-5AW	ELPIDA E5104AE-5C-E (128x4)
Trancend	512MB	DDR2 400	Register DDR2	Y	NA	SEC K4T51043QC
	2GB	DDR2 400	Register DDR2	Y	NA	SEC K4T51043QC

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FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

CAUTION!!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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Contents

Chapter 1 Hardware Configuration 2

1.1 Introduction 2
1.2 Features 4
1.3 Specifications 5
1.3.1 System 5
1.3.2 Memory 5
1.3.3 Input/Output 5
1.3.4 VGA interface 6
1.3.5 Ethernet LAN 6
1.3.6 Industrial features 6
1.3.7 Mechanical and environmental specifications 6
1.4 Jumpers and Connectors 7
Table 1.1:Jumper descriptions 7
Table 1.2:Connector descriptions 7
1.5 Board Layout: Jumper and Connector Locations 9
Figure 1.1:Jumper and Connector locations 9
1.6 PCE-7210 Block Diagram 10
Figure 1.2:Block Diagram 10
1.7 Safety Precautions 11
1.8 Jumper Settings 12
1.8.1 How to set jumpers 12
1.8.2 CMOS clear (CMOS1) 12
Table 1.3:CMOS (CMOS1) 12
1.8.3 Watchdog timer output (JWDT1) 13
Table 1.4:Watchdog timer output (JWDT1) 13
1.9 System Memory 14
Figure 1.3:PCE-7210 DIMM location 14
Table 1.5:Memory Configuration 15
1.10 Memory Installation Procedures 15
1.11 Processor Installation 16
1.12 CPU Cooler Installation 17
Figure 1.4:CPU Cooler Installation 17

Chapter 2 Connecting Peripherals 20

2.1 Introduction 20
2.2 1st & 2nd IDE Connectors (IDE1, IDE2) 20
Figure 2.1: PCE-7210 IDE1 and IDE2 location 20
2.3 Floppy Drive Connector (FDD1) 21
Figure 2.2: PCE-7210 FDD1 location 21
2.4 Parallel Port (LPT1) 22

深圳市研华科技有限公司

Figure 2.3: PCE-7210 LPT1 location 22
2.5 VGA Connector (VGA1) 23
Figure 2.4:VGA Connector (VGA1) 23
2.6 VGA-2 Connector (VGA2) 23
Figure 2.5:VGA Connector (VGA2) 23
2.7 DVI connector (DVI1) 24
Figure 2.6:DVI connector (DVI1) 24
2.8 Serial Ports (COM1, COM3, COM4) 25
Figure 2.7:Serial Ports (COM1, COM3, COM4) 25
2.9 PS/2 Keyboard/Mouse Connector (KBMS1) 26
Figure 2.8:PS/2 Keyboard/Mouse Connector (KBMS1) 26
2.10 External Keyboard Connector (KBMS2) 26
Figure 2.9: External Keyboard Connector (KBMS2) ... 26
2.11 CPU Fan Connectors (CPUFAN1, CPUFAN2) 27
Figure 2.10:CPU Fan Connectors (CPUFAN1, CPUFAN2) 27
2.12 Front Panel Connectors (JFP1, JFP2, JFP3) 27
Figure 2.11:Front Panel Connectors (JFP1, JFP2, JFP3) 27
Figure 2.12:Detail (JFP1, JFP2, JFP3) 28
2.12.1 ATX soft power switch (JFP1 / PWR_SW) 28
2.12.2 2.12.2 Reset (JFP1 / RESET) 28
2.12.3 HDD LED (JFP2 / HDDLED) 28
2.12.4 SM Bus Connector (JFP2 / SNMP) 28
2.12.5 External speaker (JFP2 / SPEAKER) 28
2.12.6 Power LED and keyboard lock connector (JFP3 / PWR_LED&KEY LOCK) 29
Table 2.1:ATX power supply LED status (No support for AT power) 29
2.13 HW Monitor Alarm (JOBS1) 30
Figure 2.13:HW Monitor Alarm (JOBS1) 30
Table 2.2:Hardware Monitor Alarm setting 30
2.14 Dual Giga LAN RJ45 connector (LAN12) 31
Figure 2.14:Dual Giga LAN RJ45 connector (LAN12) 31
2.15 AC'97 Link connector (AC97) 31
Figure 2.15:AC'97 Link connector (AC97) 31
2.16 Serial ATA interface (SATA1, SATA2) 32
Figure 2.16:Serial ATA interface (SATA1, SATA2) ... 32
2.17 LAN1 and LAN2 LED connector (LANLED1) 32
Figure 2.17:LAN1 and LAN2 LED connector (LANLED1) 32
2.18 BMC connector (BMC1) 33
Figure 2.18: BMC connector (BMC133
2.19 GPIO header (GPIO1) 33
Figure 2.19:GPIO header (GPIO1) 33

深圳市研华科技有限公司

Chapter 3 Award BIOS Setup.....36
3.1 Introduction 36
3.1.1 CMOS RAM Auto-backup and Restore 36
3.2 Entering Setup 37
Figure 3.1:Award BIOS Setup initial screen 37
3.3 Standard CMOS Setup 37
Figure 3.2:Standard CMOS features screen 37
Figure 3.3:Standard CMOS features IDE Channel screen... 38
3.4 Advanced BIOS Features 39
Figure 3.4:Advanced BIOS features screen - 1 39
Figure 3.5:Advanced BIOS features screen - 2 39
3.4.1 Hard Disk Boot Priority 40
3.4.2 Virus Warning 40
3.4.3 CPU L1 & L2, L3 Cache 40
3.4.4 Hyper-Threading Technology 40
3.4.5 Quick Power On Self Test 40
3.4.6 First/Second/Third Boot Device 40
3.4.7 Boot Other Device 40
3.4.8 Swap Floppy Drive 40
3.4.9 Boot Up Floppy Seek 40
3.4.10 Boot Up NumLock Status 41
3.4.11 Gate A20 Option 41
3.4.12 Typematic Rate Setting 41
3.4.13 Typematic Rate (Chars/Sec) 41
3.4.14 Typematic Delay (msec) 41
3.4.15 Security Option 41
3.4.16 APIC Mode (Advanced Programmable Interrupt Controller) 41
3.4.17 MPS Version Control For OS 42
3.4.18 Console Redirection 42
3.4.19 Baud Rate 42
3.4.20 Agent Connect via 42
3.4.21 Agent wait time (sec) 42
3.4.22 Agent after boot 42
3.5 Advanced Chipset Features 43
Figure 3.6: Advanced Chipset features screen 43
3.5.1 System BIOS Cacheable 43
3.5.2 Video Bios Cacheable 43
3.5.3 Memory Hole At 15M-16M 44
3.5.4 Delay Prior to Thermal 44
3.5.5 MCH Compliance Mode 44
3.5.6 Memory RAS Feature 44
3.5.7 Init Display first 44
3.6 Integrated Peripherals 45
Figure 3.7:Integrated peripherals 45
Figure 3.8:On-Chip IDE Device 45

深圳市研扬科技有限公司

3.6.1 IDE HDD Block Mode 46
3.6.2 On-Chip IDE Device 46
3.6.3 SATA Mode 46
3.6.4 On-Chip Serial ATA 46
3.6.5 Serial ATA Port0/Port1 Mode 46
Figure 3.9:Onbaord Device 46
3.6.6 USB Controller 47
3.6.7 USB 2.0 Controller 47
3.6.8 USB Keyboard Support 47
3.6.9 AC97 Audio 47
3.6.10 GPIO Control 47
Figure 3.10:Super IO Device 47
3.6.11 Onboard FDC Controller 47
3.6.12 Onboard Serial Port 1 48
3.6.13 Onboard Serial Port 2 48
3.6.14 UART Mode Select 48
3.6.15 RxD, TxD Active 48
3.6.16 IR Transmission Delay 48
3.6.17 UR2 Duplex Mode 48
3.6.18 Use IR Pins 48
3.6.19 Onboard Parallel Port 48
3.6.20 Parallel Port Mode 48
3.6.21 EPP Mode Select 48
3.6.22 ECP Mode Use DMA 48
3.6.23 Onboard Serial Port 3 49
3.6.24 Onboard Serial Port 3 use 49
3.6.25 Onboard Serial Port 4 49
3.6.26 Onboard Serial Port 4 use 49
3.7 Power Management Setup 49
Figure 3.11:Power management setup screen-1 49
Figure 3.12:Power management setup screen-2 50
3.7.1 Power Supply Type 50
3.7.2 ACPI function 50
3.7.3 Power Management 50
3.7.4 Video Off Method 51
3.7.5 Video Off In Suspend 51
3.7.6 Suspend Type 51
3.7.7 Modem Use IRQ 51
3.7.8 Suspend Mode 51
3.7.9 HDD Power Down 51
3.7.10 Soft-Off by PWR-BTTN 51
3.7.11 CPU THRM-Throttling 51
3.7.12 PowerOn by LAN 51
3.7.13 PowerOn by Modem 51
3.7.14 PowerOn by Alarm 51

深圳市研华科技有限公司

3.7.15 Primary IDE 0 (1) and Secondary IDE 0 (1). 51
3.7.16 FDD, COM, LPT PORT 52
3.7.17 PCI PIRQ [A-D]# 52
3.7.18 PWRON After PWR-FAIL 52
3.8 PnP/PCI Configuration Setup 52
Figure 3.13:PnP/PCI configurations screen 52
3.8.1 Reset Configuration Data 52
3.8.2 Resource Controlled By 53
3.8.3 IRQ Resources 53
3.8.4 PCI/VGA Palette Snoop 53
3.8.5 Maximum Payload Size 53
3.9 PC Health Status 54
Figure 3.14:PC Health Status Screen 54
3.9.1 CPU Warning Temperature 54
3.9.2 Current System Temperature 54
3.9.3 Current CPU1/CPU2 Temperature 54
3.9.4 CPU1/CPU2 FAN Speed 54
3.9.5 Vcore1/ Vcore2, +3.3V, +5V, +12V, VBAT(V), 5VSB(V)54
3.9.6 Shutdown Temperature 54
3.10 Frequency Control 55
Figure 3.15:Frequency Control screen 55
3.10.1 Spread Spectrum 55
3.11 Load Setup Defaults 56
Figure 3.16: Load Setup Defaults screen 56
3.12 Set Password 57
Figure 3.17: Set Password screen 57
3.13 Save & Exit Setup 58
Figure 3.18:Save & Exit Setup screen 58
3.14 Exit Without Saving 58
Figure 3.19: Exit Without Saving screen 58

Chapter 4 Chipset Software Install Utility 60
4.1 Before you begin 60
4.2 Introduction 60
4.3 Windows XP Driver Setup 61

Chapter 5 VGA Setup 66
5.1 Introduction 66
5.2 Windows XP Driver Setup 66
5.3 Microsoft® Windows Server™ 2003 & Windows Server 2003 x64 Driver Setup 70

深圳市研扬科技有限公司

Chapter 6 LAN Configuration 74
6.1 Introduction 74
6.2 Win XP Driver Setup 74

Chapter 7 Onboard Security Setup 78
7.1 Introduction 78
7.2 Windows XP Driver Setup 78
7.3 Using the OBS Hardware Doctor Utility 81

Chapter 8 SATA RAID Setup 84
8.1 Introduction 84
8.2 Windows XP Driver Setup 85
8.3 Utility for SATA RAID 88
Table 9.1:Supported IPMI commands 90
Table 9.2:OEM Commands list 94

Appendix A Programming the Watchdog Timer 96
A.1 Watchdog Timer 96
A.1.1 Watchdog timer overview 96
A.1.2 Reset/ Interrupt selection 96
A.1.3 Programming the Watchdog Timer 96
Table A.1: Watchdog Timer Registers 98
A.1.4 Example Program 99

Appendix B I/O Pin Assignments.....106
B.1 IDE Hard Drive Connector (IDE1, IDE2) 106
Table B.1:IDE hard drive connector (IDE1, IDE2).... 106
B.2 Floppy Drive Connector (FDD1) 107
Table B.2:Floppy drive connector (FDD1)..... 107
B.3 Parallel Port Connector (LPT1)..... 108
Table B.3:Parallel port connector (LPT1) 108
B.4 VGA Connector (VGA1) 109
Table B.4:VGA connector (VGA1)..... 109
B.5 VGA-2 Connector (VGA2)..... 109
Table B.5:VGA-2 Connector (VGA2)..... 109
B.6 DVI Connector (DVI1) 110
Table B.6:DVI Connector (DVI1) 110
B.7 RS-232 Serial Port (COM1,COM3,COM4)..... 111
Table B.7:RS-232 serial port (COM1,COM3,COM4) 111
B.8 PS/2 Keyboard/Mouse Connector (KBMS1)..... 112
Table B.8:PS/2 keyboard/mouse connector (KBMS1)..... 112
B.9 External Keyboard Connector (KBMS2)..... 112

深圳市研华科技有限公司

Table B.9:External keyboard connector (KBMS2) 112
B.10 CPU Fan Power Connector (CPUFAN1,CPUFAN2) ... 113
Table B.10:CPU Fan Power Connector (CPUFAN1,CPUFAN2) 113
B.11 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK) 113
Table B.11:Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)..... 113
B.12 External Speaker Connector (JFP2 / SPEAKER) 114
Table B.12:External Speaker Connector (JFP2 / SPEAKER) 114
B.13 Reset Connector (JFP1 / RESET) 114
Table B.13:Reset connector (JFP1 / RESET)..... 114
B.14 HDD LED (JFP2 / HDDLED) 115
Table B.14:HDD LED (JFP2 / HDDLED)..... 115
B.15 ATX Soft Power Switch (JFP1 / PWR_SW) 115
Table B.15:ATX soft power switch (JFP1 / PWR_SW) ... 115
B.16 AC'97 Link connector (AC97) 116
Table B.16:AC'97 Link connector (AC97)..... 116
B.17 SM Bus Connector (JFP2 / SNMP)..... 116
Table B.17:SM bus connector (JFP2 / SNMP)..... 116
B.18 LAN1 and LAN2 LED connector (LANLED1) 117
Table B.18:LAN1 and LAN2 LED connector (LANLED1)..... 117
B.19 GPIO header (GPIO1)..... 118
Table B.19:GPIO header (GPIO1)..... 118
B.20 System I/O Ports..... 119
Table B.20:System I/O ports 119
B.21 DMA Channel Assignments..... 120
Table B.21:DMA channel assignments 120
B.22 Interrupt Assignments 121
Table B.22:Interrupt assignments..... 121
B.23 1st MB Memory Map..... 121
Table B.23:1st MB memory map 121
B.24 PCI Bus Map 122
Table B.24:PCI bus map..... 122

Appendix C Programming GPIO & Watchdog Timer ..124
C.1 Supported GPIO Register..... 124
C.1.1 GPIO Registers 124
C.1.2 GPIO Example program-1 125

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CHAPTER 1

Hardware Configuration

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Chapter 1 Hardware Configuration

1.1 Introduction

The PCE-7210 is designed with the Intel® E7520 chipset and 6300ESB (I/O controller) to support sever grade Intel® Dual Xeon® / LV Xeon® (FSB 800) Processor. It follows the PICMG 1.3 specification and is the best solution for high computing performance and wide I/O bandwidth demand applications.

Besides supports Dual Intel® Xeon® / LV Xeon® CPUs Intel® E7520 also provides three PCIe x8 Links which I/O bandwidth is up to 12 GB/s. With this feature PCE-7210 provide two x8 Links and one x4 Link to the PICMG 1.3 backplane, it offers up to 10 GB/s bandwidth for the backplane. It allows the backplane configure to variant expansion I/O slot such as PCI-express slots thru the PCIe to PCIe Switch Chips or PCI-X slots by PCIe to PCI-X Bridge chips which eliminates the I/O traffic bottleneck between I/O boards and CPU board. The other one PCIe x4 Link is linked to Broadcom BCM5715C dual ports Gigabit LAN chip. With this chip, PCE-7210 may provide high throughputs for heavy loading networking environment.

PCE-7210 provides 4 DIMMs which may support dual channel DDR2-400 ECC Registered RAM up to 8GB. DDR2 is double bandwidth than the DDR RAM between memory and North Bridge. It provides same bandwidth between CPU, North Bridge and memory which optimize the performance for memory demanding applications. ECC Registered RAM is for memory error detection and correction of any number of bit failures which may provide reliable environment for industrial applications.

An optional small form factor mezzanine card provides a fully fledged IPMI 2.0 interface with LAN and serial port support for out-of-band management (including serial console redirection over LAN).

PCE-7210 uses the ATI-7000M Graphic chip. It integrates 16M on chip graphic memory and 2D/3D Accelerator, supports dual VGA display and one DVI interfaces. It is enough for most graphic demand in the server grade applications.

PCE-7210 provides two Serial ATA ports (up to 150MB/s) which support Software RAID 0 or 1 functions. Customer may set a higher reliability storage application without extra cost.

In addition, the PCE-7210 also provides most of the popular I/O interfaces such as four USB2.0 ports, two ATA-100 EIDE ports, AC'97 audio

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interface, three RS-232 ports, one enhanced parallel port and floppy disk interface.

PCE-7210 retains a legacy PCI-X 32-bit /66 MHz bus from the CPU board to the Backplane. Don't need PCI-Express to PCI-X bridge chip for lower the system cost. Good for the application only needs few legacy PCI Bus.

PCE-7210 is designed with reliability considerations to suit industrial environments. A specially designed heat-sink is attached to the main chips to keep them cool and to extend the operating temperature to 60 degree Celsius. The CMOS data backup and restore function protects the BIOS setup data from loss due to battery failure. A 256-level watchdog timer prevents the system from hanging up if a program cannot be executed normally. A remote management port allows users to monitor the system health status and control the system remotely through standard SNMP/HTTP protocol when used with Advantech's ACMM-1000 and SNMP-1000 Intelligent System Manager.

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1.2 Features

1. Compliance with PICMG 1.3
2. Support single/dual socket 604 Intel® Xeon® / LV Xeon® FSB 800Mhz processors
3. Support Dual Channel DDR2 400 ECC Registered SDRAM up to 8GB
4. Two PCI Express X 8 and One X4 to backplane
5. PCI-X 32bits / 66 MHz bus to backplane
6. Broadcom® BCM 5715C Dual Gigabit Ethernet Chip via PCI Express X4 port
7. Onboard ATI® Radeon® 7000-M with 16MB frame buffer memory
8. Onboard IPMI module(Optional)
9. 2 SATA HDDs Support S/W SATA RAID 0,1
10. 4 USB 2.0 ports to Back plane
11. Remote management with SNMP-1000-B1 modules
12. CMOS automatic back and prevent accidental data loss of BIOS setup

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1.3 Specifications

1.3.1 System

- **CPU**: Dual Intel® 800 Mhz Xeon® / LV Xeon® processors
- **L2 Cache**: CPU built-in 1MB / 2MB L2 cache
- **BIOS**: Award Flash BIOS (4Mb Flash Memory)
- **System Chipset**: Intel® E7520 + 6300ESB
- **SATA/EIDE hard disk drive interface**: Supports up to two independent Serial ATA hard drives (up to 150MB/s) with software RAID 0 or 1 functions as well as two IDE hard disk drives, or four enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.)
- **Floppy disk drive interface**: Supports up to two floppy disk drives, 5¼ (360 KB and 1.2 MB) and/or 3½ (720 KB, 1.44 MB). BIOS enabled/disabled.

1.3.2 Memory

- **RAM:** Up to 8 GB in four 240-pin DIMM sockets. Supports Dual-channel DDR2 400 MHz (ECC Registered DIMM).

1.3.3 Input/Output

- **Bus interface**: PICMG 1.3 SHB Express compliant bus interface
- **PCI Express Bus**: Two x8 & One x4 to backplane
- **PCI Bus**: 32bit / 66MHz PCI-X to backplane
- **Enhanced parallel port**: Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports**: Three RS-232 ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM3, COM4 or disabled
- **Keyboard and PS/2 mouse connector**: One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **AC'97 Audio**: PCE-7210 can provide audio function with the optional audio extension module PCA-AUDIO-00A1
- **USB ports**: PCE-7210 supports up to four USB 2.0 ports with transmission rates up to 480Mbps; these ports are linked to the backplane base on PICMG 1.3 specification. Only the Backplane supports USB port link can offer this function

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1.3.4 VGA interface

- **Controller**: ATI RADEON 7000-M
- **Display memory**: 16MB frame buffer memory on chip
- Resolution:

  VGA 1: 2048x1536 at 60Hz; 15 pin CRT connector x1

  VGA 2: 2048x1536 at 60Hz; Alternative with TV-out, S-video signal by pin header

  DVI connector: 1600 x 1200 at 60Hz; connect to a special DVI cable via pin header

1.3.5 Ethernet LAN

- Supports dual10/100/1000Base-T Ethernet networking
- Controller: Broadcom BCM5715C

1.3.6 Industrial features

- Watchdog timer: Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels). You can find programming detail in Appendix A

1.3.7 Mechanical and environmental specifications

- Operating temperature: 0° ~ 60° C (32° ~ 140° F, depending on CPU)
- Storage temperature: -20° ~ 70° C (-4° ~ 158° F)
- Humidity: 20 ~ 95% non-condensing
- Power supply voltage: +5 V, + 12V, 3.3V, +5VSBY
- Power consumption:
- CPU Intel® Xeon® 3.2GHz/2M/800/110W *2

  MEMORY DDR2 2GB *4

  Test program, Intel Max power 100% + BurnIn test 4.0

+12V	20.5 A
+5V	3.28 A
+3.3V	11.51 A
+5VSB	0.42 A
-12V	0.01 A
-5V	0.01 A

- Board size: 338 x 122 mm (13.3 x 4.8 inch)
- Board weight: 0.5 kg (1.2 lb)

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1.4 Jumpers and Connectors

Connectors on the PCE-7210 single board computer link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

Below, Table 1.1 and Table 1.2 list the jumper and connector functions. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your single board computer.

Table 1.1: Jumper descriptions

Label	Function
CMOS1	CMOS Clear
JWDT1	Watchdog timer output option

Table 1.2: Connector descriptions

Label	Function
IDE1	Primary IDE connector
IDE2	Secondary IDE connector
FDD1	Floppy drive connector
LPT1	Parallel port
VGA1	VGA connector
VGA2	VGA-2 connector
DVI1	DVI connector
COM1	Serial port:COM1 (9-pin connector)
COM3	Serial port:COM3 (9-pin connector)
COM4	Serial port:COM4 (9-pin connector)
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard/mouse connector
JIR1	Reserved
CPUFAN1	CPU1 FAN connector
CPUFAN2	CPU2 FAN connector
JFP1	Power and Reset Button connector

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Table 1.2: Connector descriptions	
Label	**Function**
JFP2	HDD LED / SNMP(SM bus) / Speaker connector
JFP3	Power LED and keyboard lock connector
JOBS1	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
LAN12	Dual Giga LAN RJ45 connector with Transformer
AC97	AC'97 Link connector
SATA1	Serial ATA1
SATA2	Serial ATA2
LANLED1	LAN1 and LAN2 LED connector
BMC1	BMC connector
GPIO1	GPIO header
EXPCI1	HIROSA Extended PCI connector (Optional)

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1.5 Board Layout: Jumper and Connector Locations

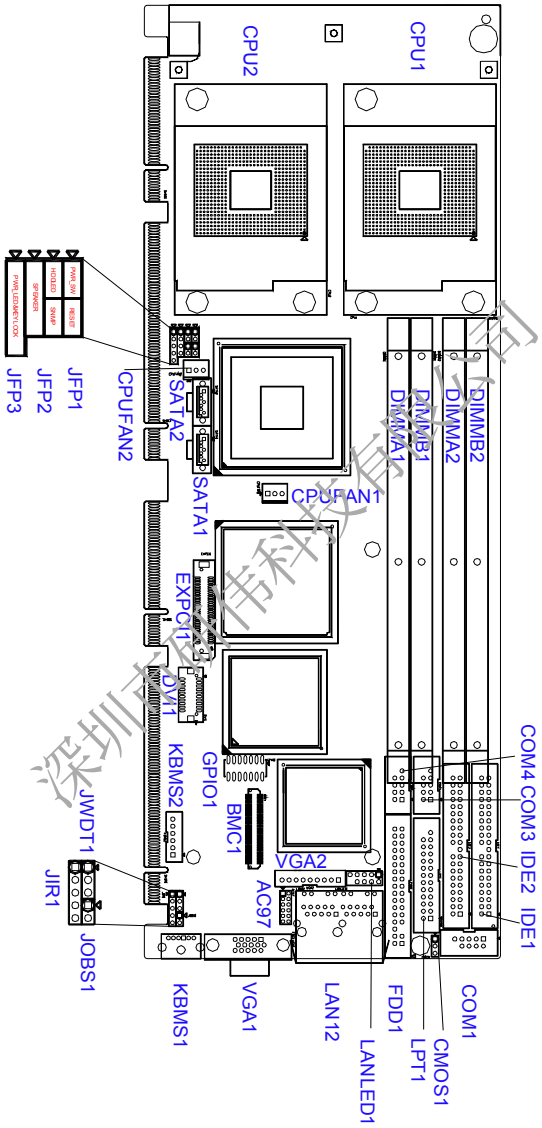

Figure 1.1:Jumper and Connector locations

1.6 PCE-7210 Block Diagram

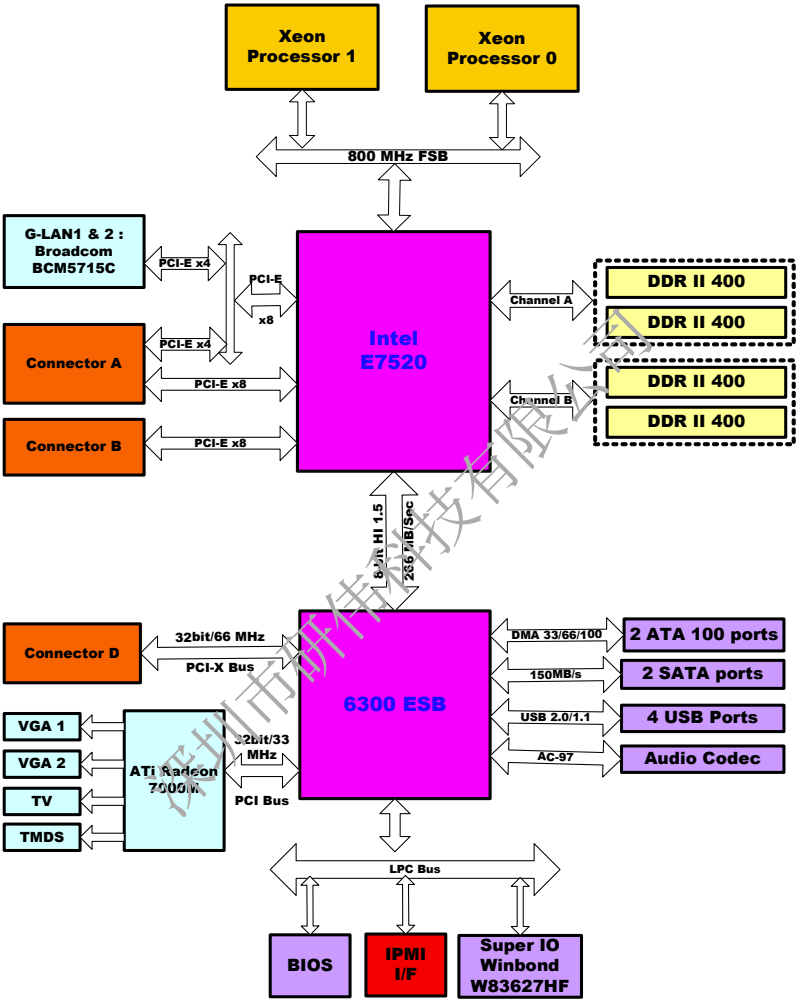

Figure 1.2: Block Diagram

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1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the single board computer. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered Real-time Clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Notice: *Before install your PCE-7210 into a chassis, make sure that all components on both sides of the CPU card do not touch any metal parts, especially the chassis wall and add-on card at the adjacent slot.*

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1.8 Jumper Settings

This section provides instructions on how to configure your single board computer by setting the jumpers. It also includes the single board computer's default settings and your options for each jumper.

1.8.1 How to set jumpers

You can configure your single board computer to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes 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” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (CMOS1)

The PCE-7210 single board computer contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

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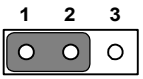
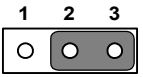
Table 1.3: CMOS (CMOS1)

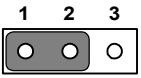
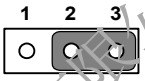
Function	Jumper Setting	
* Keep CMOS data		1 - 2 closed
Clear CMOS data		2 - 3 short

* default setting

1.8.3 Watchdog timer output (JWDT1)

The PCE-7210 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means the PCE-7210 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.4: Watchdog timer output (JWDT1)

Function	Jumper Setting
Reserved	 1 - 2 closed
* Reset	 2 - 3 short

* default setting

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1.9 System Memory

The PCE-7210 has four sockets for 240-pin dual inline memory modules (DIMMs) in two separated memory channels. It can operate with single channel or dual channel modules. We recommend using dual channel mode to provide optimized performance. All these sockets use ECC registered DDR2-400 SDRAM. They are available in capacities of 256, 512, 1024 and 2048 MB. The maximum memory size is up to 8GB.

Notice: *Owing to limitation of the Intel® E7520 chipset, the RAM module must be configured as the Table 1-5.*

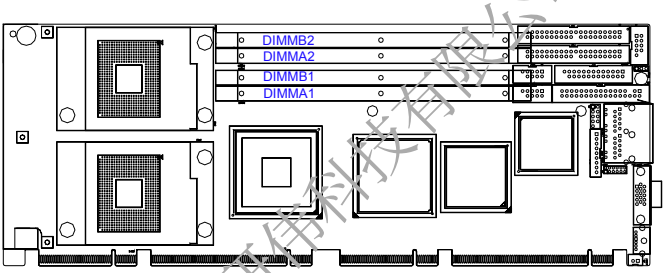

Figure 1.3: PCE-7210 DIMM location

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Table 1.5: Memory Configuration

Quantity of Memory modules	Location (DIMM No.)	Memory Type	Channel Type
One module	Either A2 or B2	Non-Limited	Single
Two modules	(A1+A2) or (B1+B2)	Non-Limited	Single
Two modules	Only A2 + B2	Same Type	Dual
Three modules	Not Recommend	--	--
Four modules	(A2+B2) and (A1+B1)	A2=B2 and A1=B1	Dual

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

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1.11 Processor Installation

The CPU on the board must have a fan and heat sink attached, to prevent overheating.

Notice: *Owing to limitation of the Intel® E7520 chipset when you only use single CPU on the PCE-7210, the CPU have to be located on the CPU1 socket. Otherwise the system can not boot up normally.*

Warning: *Without a fan or heat sink, the CPU will over-heat and cause damage to both the CPU and the single board computer. To install a CPU, first turn off your system and remove its cover.*

1. Make sure the socket 604 lever is in the upright position. To raise the lever, pull it out to the side a little and raise it as far as it will go.
2. Place the CPU in the empty socket. Follow the instructions that came with the CPU. If you have no instructions, complete the following procedure. Carefully align the CPU so it is parallel to the socket and the notches on the corners of the CPU correspond with the notches on the inside of the socket. Gently slide the CPU in. It should insert easily. If it does not insert easily, pull the lever up a little bit more.
3. Press the lever down. The plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and will not damage the CPU. When the CPU is installed, the lever should snap into place at the side of the socket.
4. PCE-7210 accessory includes two CPU heat sink, please follow the installation guide in the heat sink Box to install it properly.CP

Notice: *The PCE-7210 only supports the Intel® Xeon® processor with 800 MHz system made with 0.09 micrometer process technology.*

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1.12 CPU Cooler Installation

Please ensure that the CPU cooler included with the PCE-7210 is installed as follows:

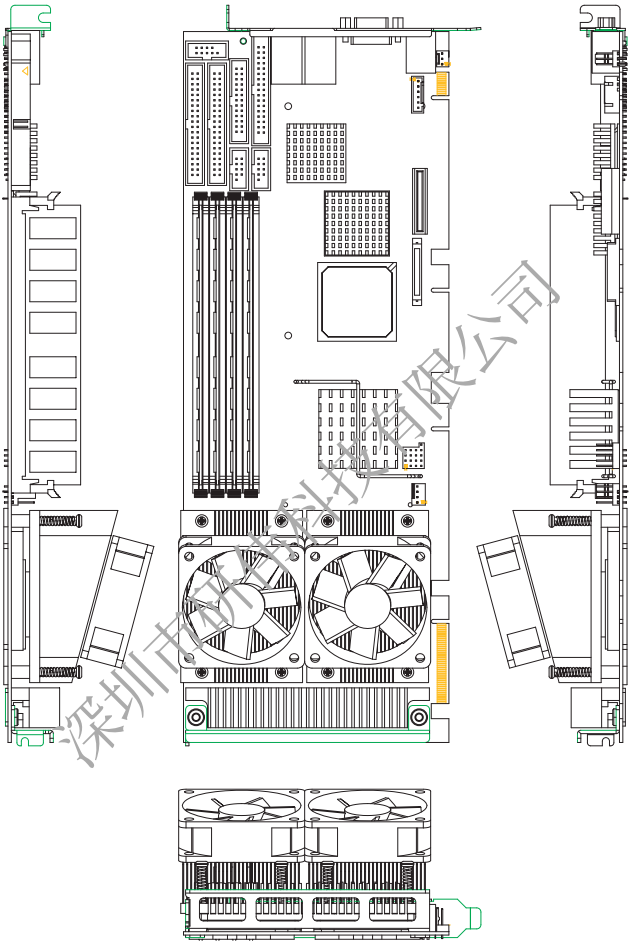

Figure 1.4: CPU Cooler Installation

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CHAPTER 2

Connecting Peripherals

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Chapter 2 Connecting Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 1st & 2nd IDE Connectors (IDE1, IDE2)

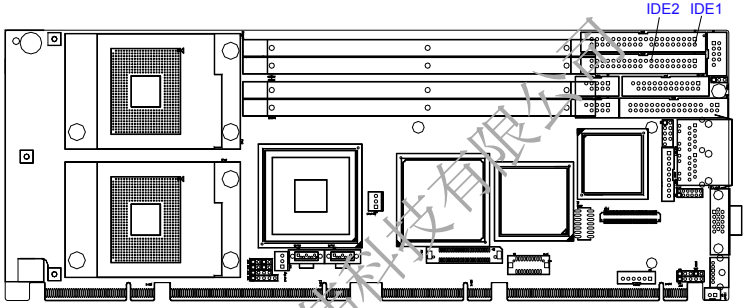

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Figure 2.1: PCE-7210 IDE1 and IDE2 location

You can attach up to four IDE (Integrated Drive Electronics) drives to the PCE-7210's built-in controller. The primary (IDE1) and secondary (IDE2) connectors can each accommodate two drives.

Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector IDE1 or IDE2 on the single board computer. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See *Chapter 1* for help finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second hard drive to the remaining connector (IDE1 or IDE2), in the same way as described above.

2.3 Floppy Drive Connector (FDD1)

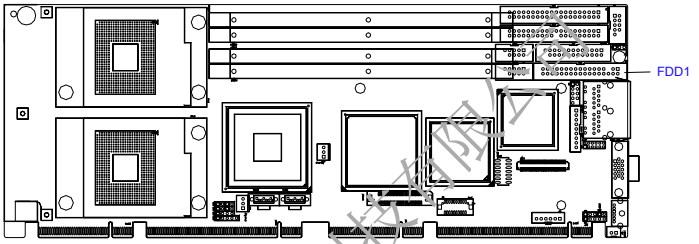

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Figure 2.2: PCE-7210 FDD1 location

You can attach up to two floppy disk drives to the PCE-7210's on board controller. You can use 3.5" (720 KB, 1.44 MB) drives.

The single board computer comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of 34-pin flat-cable connector (usually used for 3.5" drives). The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

2.4 Parallel Port (LPT1)

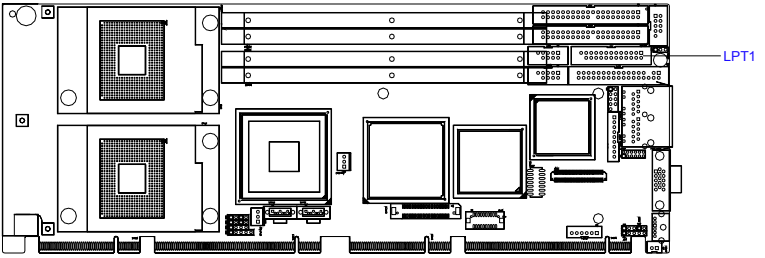

Figure 2.3: PCE-7210 LPT1 location

The parallel port is normally used to connect the single board computer to a printer. The PCE-7210 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

The parallel port is designated as LPT1, and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of LPT1. Pin 1 is on the upper right side of LPT1.

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2.5 VGA Connector (VGA1)

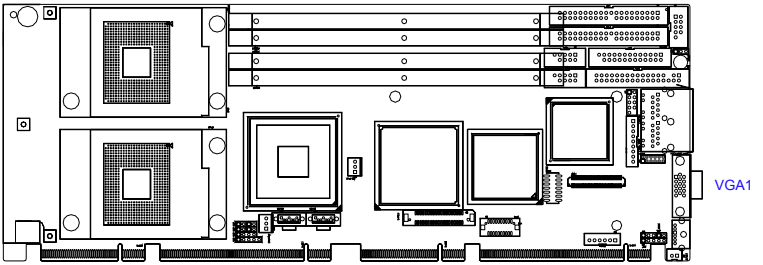

Figure 2.4: VGA Connector (VGA1)

The PCE-7210 includes a VGA interface that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector VGA1 are detailed in Appendix B.

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2.6 VGA-2 Connector (VGA2)

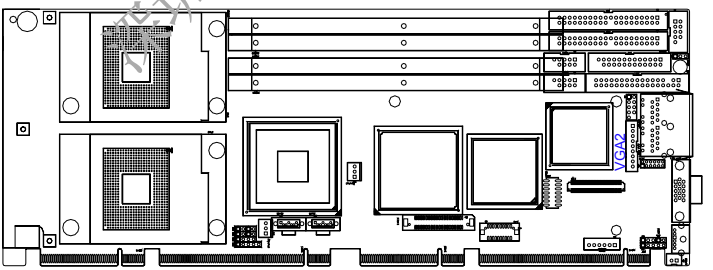

Figure 2.5: VGA Connector (VGA2)

The PCE-7210 provides an additional VGA interface supports dual VGA display, VGA2 is an 9 pin connector. There are two type cables for user's

different application. User can choose 15-pin to 9-pin D-Sub VGA cable (p/n: 1700000259) for providing VGA connector or choose Video Cable (p/n: 1700000784) for providing S or AV terminal. Please be aware of S and AV terminal can not use at the same time, it will cause unstable situation.

2.7 DVI connector (DVI1)

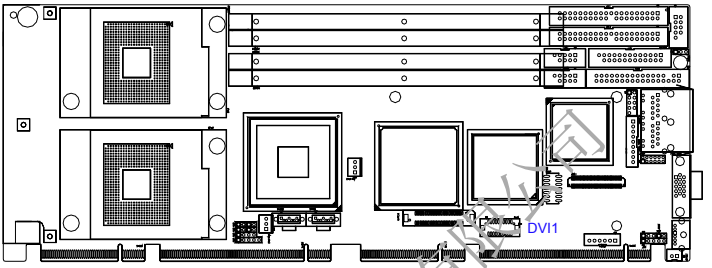

Figure 2.6: DVI connector (DVI1)

The PCE-7210 provides a DVI interface that supports DVI display. The user can choose 26-pin to 20-pin DVI cable (p/n: 1700000821) for providing DVI connector. Pin assignments for DVI connector DVI1 are detailed in Appendix B.

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2.8 Serial Ports (COM1, COM3, COM4)

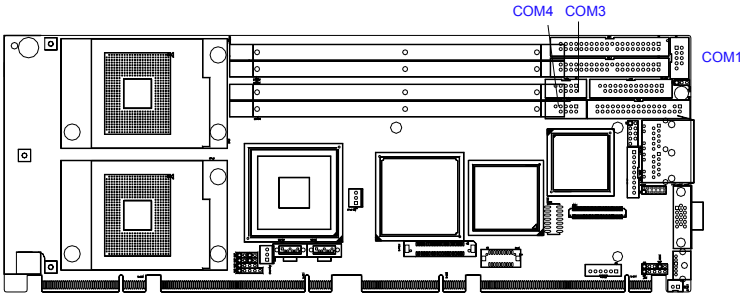

Figure 2.7:Serial Ports (COM1, COM3, COM4)

The PCE-7210 offers three serial ports COM1, COM3 and COM4. These ports can connect to serial devices, such as a mouse or to a communications network.

The IRQ and address ranges for all ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

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2.9 PS/2 Keyboard/Mouse Connector (KBMS1)

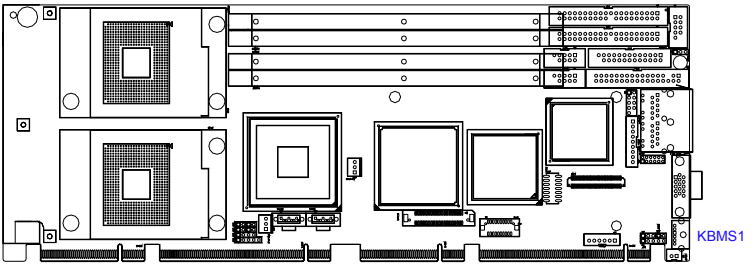

Figure 2.8: PS/2 Keyboard/Mouse Connector (KBMS1)

One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard or a PS/2 mouse, respectively. KBMS1 can also be connected to an adapter cable (P/N: 1700060202) for connecting to both a PS/2 keyboard and a PS/2 mouse.

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2.10 External Keyboard Connector (KBMS2)

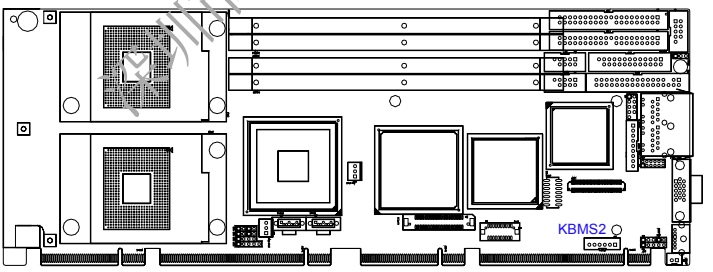

Figure 2.9: External Keyboard Connector (KBMS2)

In addition to the PS/2 mouse/keyboard connector on the PCE-7210's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater design flexibility.

2.11 CPU Fan Connectors (CPUFAN1, CPUFAN2)

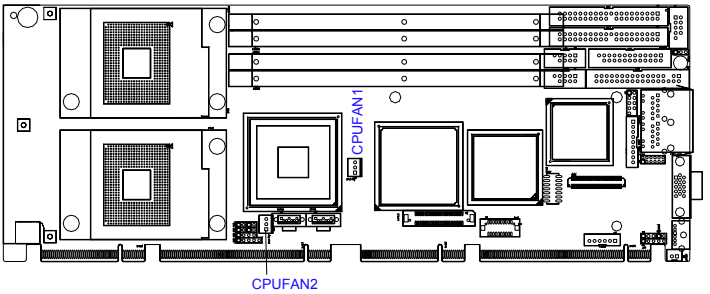

Figure 2.10: CPU Fan Connectors (CPUFAN1, CPUFAN2)

If a fan is used, this connector supports cooling fans of 12V/1A (12W) or less.

2.12 Front Panel Connectors (JFP1, JFP2, JFP3)

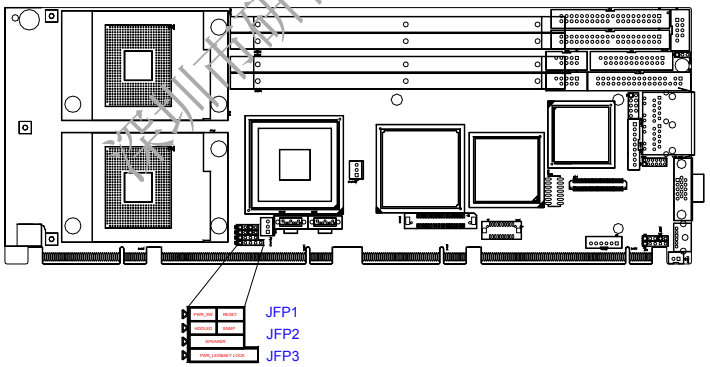

Figure 2.11: Front Panel Connectors (JFP1, JFP2, JFP3)

There are several external switches to monitor and control the PCE-7210.

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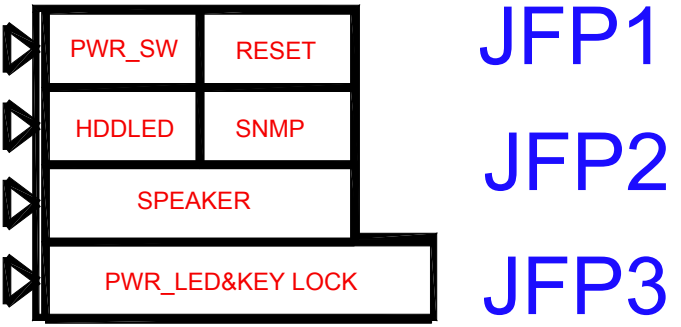

Figure 2.12: Detail (JFP1, JFP2, JFP3)

2.12.1 ATX soft power switch (JFP1 / PWR_SW)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1 / PWR_SW). This connection enables you to turn your computer on and off.

2.12.2 2.12.2 Reset (JFP1 / RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.12.3 HDD LED (JFP2 / HDDLED)

You can connect an LED to connector (JFP2 / HDDLED) to indicate when the HDD is active.

2.12.4 SM Bus Connector (JFP2 / SNMP)

This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

(JFP2 / SNMP) can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin 2 to pin 2 on both ends of cable.

2.12.5 External speaker (JFP2 / SPEAKER)

(JFP2 / SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the PCE-7210 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

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2.12.6 Power LED and keyboard lock connector (JFP3 / PWR_LED&KEY LOCK)

(JFP3 / PWR_LED&KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. The first is "ATX power mode", system is on/off by a tentative power button. The second is "AT Power Mode", system is on/off by the switch of the Power supply. The third is another "AT Power Mode" which is using the front panel power switch. The power LED status is indicated as following table:

Table 2.1: ATX power supply LED status (No support for AT power)

Power mode	LED (ATX Power mode) (On/off by tentative button)	LED (AT Power mode) (On/off by switch of Power supply)	LED (AT Power mode) (On/off by front panel Switch)
PSON1 (On Back-plane Jumper setting)	2-3 pin closed	1-2 pin closed	Connect 1-2 pin cable with switch
System On	On	On	On
System Suspend	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off

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2.13 HW Monitor Alarm (JOBS1)

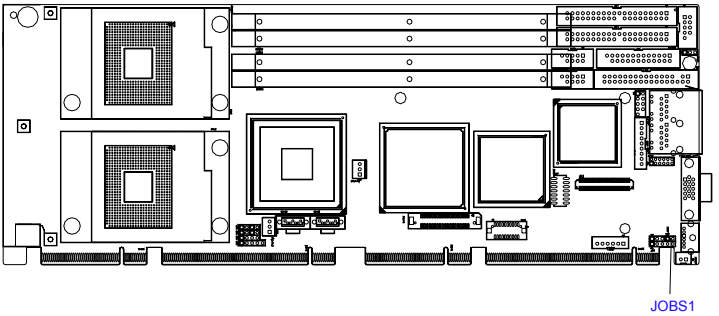

Figure 2.13: HW Monitor Alarm (JOBS1)

(JOBS1) is a 2-pin connector for setting enable/disable alarm while the On Board security event acts.

Table 2.2: Hardware Monitor Alarm setting

Pin setting	Function
Close	Enable OBS alarm
open	Disable OBS alarm

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2.14 Dual Giga LAN RJ45 connector (LAN12)

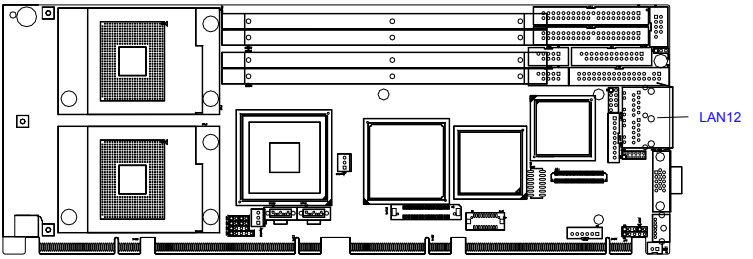

Figure 2.14: Dual Giga LAN RJ45 connector (LAN12)

PCE-7210 uses the Broadcom BCM5715C dual ports Gigabit LAN chip is linked to PCIe x4 Link. With this chip PCE-7210 may provide high throughputs for heavy loading networking environment. It provides two RJ-45 connectors in the rear side and is convenient for most industrial applications.

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2.15 AC'97 Link connector (AC97)

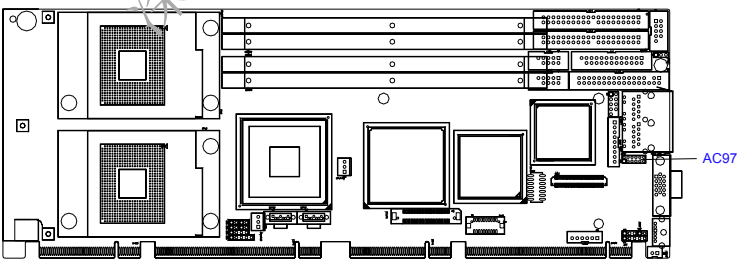

Figure 2.15: AC'97 Link connector (AC97)

The PCE-7210 provides AC'97 audio through PCA-AUDIO-00A1 module from Advantech.

2.16 Serial ATA interface (SATA1, SATA2)

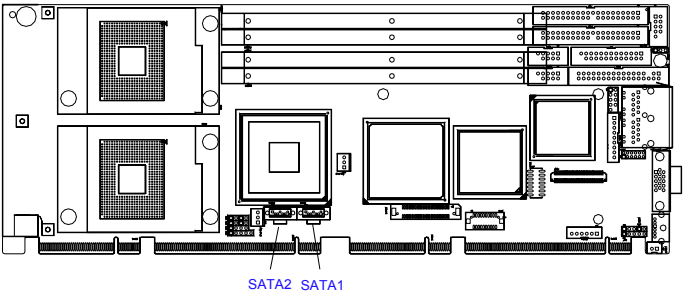

Figure 2.16: Serial ATA interface (SATA1, SATA2)

In addition to the two EIDE interfaces (up to four devices), the PCE-7210 features a high performance serial ATA interface (up to 150MB/s) which eases cabling to hard drives with thin and long cables. These two port can be configured as RAID 0 and RAID 1 applications.

2.17 LAN1 and LAN2 LED connector (LANLED1)

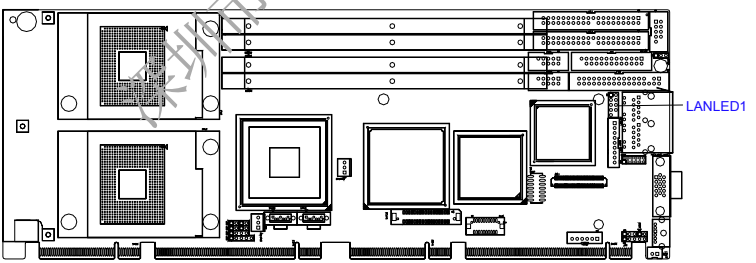

Figure 2.17: LAN1 and LAN2 LED connector (LANLED1)

PCE-7210 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users may know whether the LAN port is acting or not easily. Refer to Appendix B for detailed information on the pin assignments.

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2.18 BMC connector (BMC1)

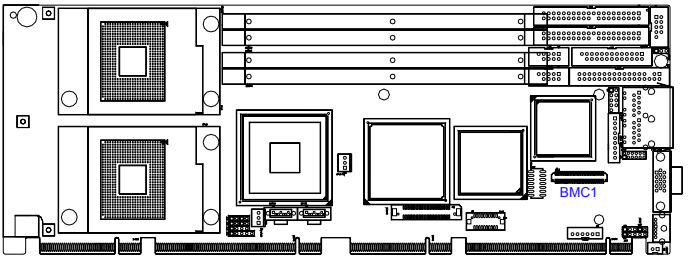

Figure 2.18: BMC connector (BMC1)

PCE-7210 is designed for supporting IPMI 2.0. The BMC module is mounted on board thru this connector. For more detail operating information, please refer to Chapter 9.

2.19 GPIO header (GPIO1)

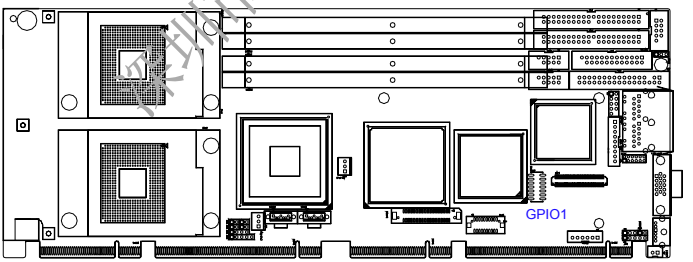

Figure 2.19: GPIO header (GPIO1)

PCE-7210 provides 14-Pins pin header for Digital I/O usage. Refer to Appendix B for detailed information on the pin assignments and programming guide in Appendix C.

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CHAPTER 3

Award BIOS Setup

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Chapter 3 Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery backed-up memory (CMOS RAM) so that it retains the setup information when the power is turned off.

3.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environments causes a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: *If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..."message appears again and again, please check to see if you need to replace the battery in your system.*

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3.2 Entering Setup

Turn on the computer and press <Del> to enter the BIOS setup.

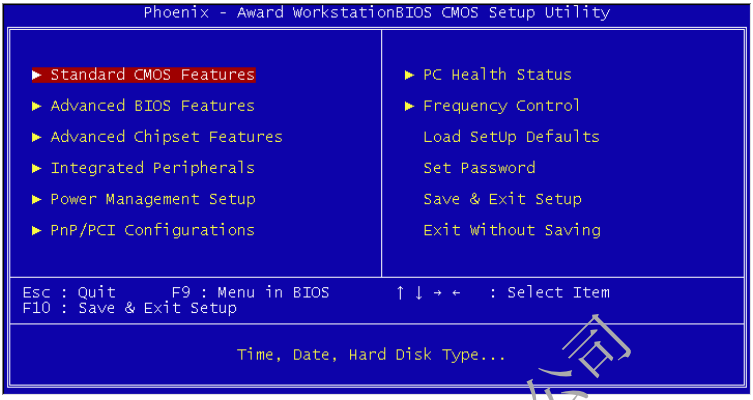

Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

Choose the "Standard CMOS Features" option from the "Initial Setup Screen" menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want for each item.

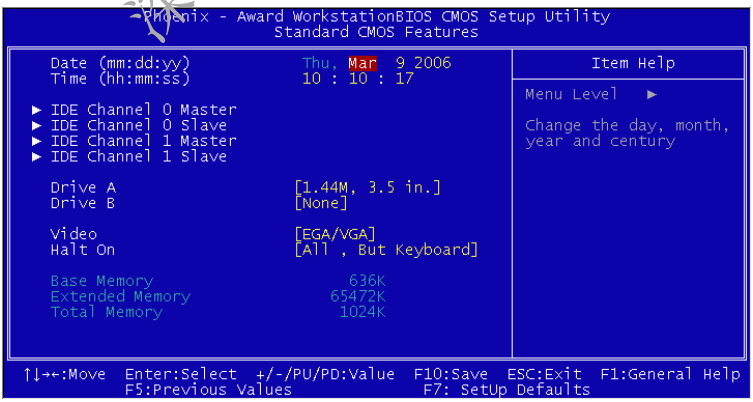

Figure 3.2: Standard CMOS features screen

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IDE Channel 0 Master/Slave IDE Channel 1 Master/Slave: Press PgUp/<+> or PgDn/<-> to select Manual, None, Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually. If you select Manual, the system will prompt for related information for the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

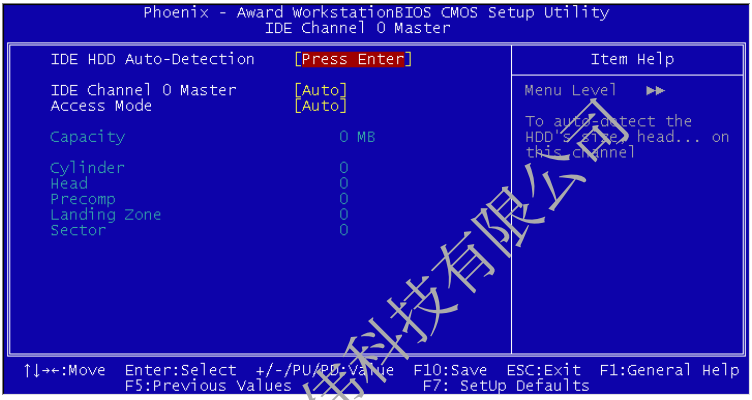

Figure 3.3: Standard CMOS features IDE Channel screen

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3.4 Advanced BIOS Features

The "Advanced BIOS Features" screen appears when choosing the "Advanced BIOS Features" item from the "Initial Setup Screen" menu. It allows the user to configure the PCE-7210 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

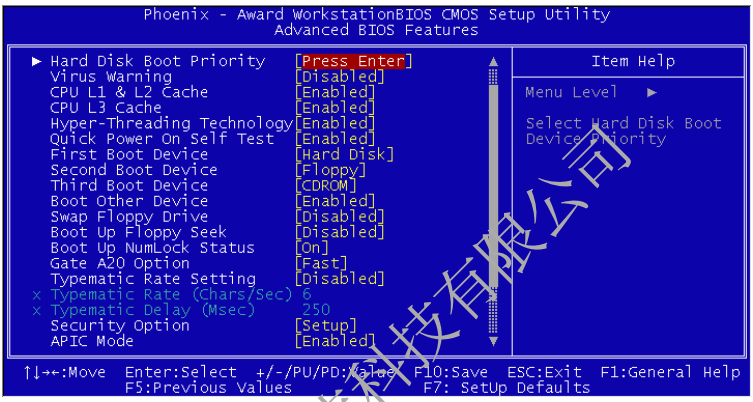

Figure 3.4: Advanced BIOS features screen - 1

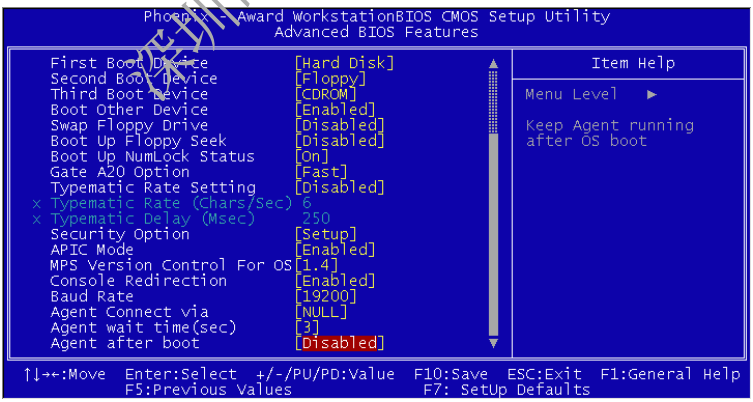

Figure 3.5: Advanced BIOS features screen - 2

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3.4.1 Hard Disk Boot Priority
Select hard disk boot device priority.

3.4.2 Virus Warning
During and after the system boot, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. If this happens, a warning message will be displayed. You can run the anti-virus program to locate the problem. If Virus Warning is disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition. The commands are "Enabled" or "Disabled".

3.4.3 CPU L1 & L2, L3 Cache
Enabling this feature speeds up memory access. The commands are "Enabled" or "Disabled".

3.4.4 Hyper-Threading Technology
While using CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper Threading Technology in OS which supports Hyper-Threading Technology or select "Disabled" for other OS which do not support HT technology.

3.4.5 Quick Power On Self Test
Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.

3.4.6 First/Second/Third Boot Device
The BIOS tries to load the OS with the devices in the sequence selected. Choices are: "Floppy", "LS120", "Hard Disk", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "LAN1", "LAN2" and "Disabled".

3.4.7 Boot Other Device
Selectable items is "Enabled" or "Disabled". When choose "Enabled"; while the upper (3.4.6) selected items can not boot up normally. The system will try to boot from other devices which list in the selection table in the upper items.

3.4.8 Swap Floppy Drive
If the system has two floppy drives, choose "Enabled" to assign physical drive B to logical drive A and vice-versa. The commands are "Enabled" or "Disabled".

3.4.9 Boot Up Floppy Seek
Selection of the command "Disabled" will pass the Floppy disk driver during the boot up procedure and it will speed the boot up. Selection of "Enabled" searches disk drives during boot up.

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3.4.10 Boot Up NumLock Status

This feature selects the "power on" state for NumLock. The commands are "Off" or "On".

3.4.11 Gate A20 Option

"Normal": A pin in the keyboard controller controls GateA20.

"Fast" (Default): Lets chipset control GateA20.

3.4.12 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled". Enabling allows the typematic rate and delay to be selected.

3.4.13 Typematic Rate (Chars/Sec)

While Typematic Rate Setting is "Enabled", BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

3.4.14 Typematic Delay (msec)

Typematic delay is the time interval between the appearances of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

3.4.15 Security Option

Select whether the password is required every time the system boots or only when you enter setup.

"System" The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.

"Setup" The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: *To disable security, select "PASSWORD SETTING" in the main menu. At this point, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot, and you can enter Setup freely.*

3.4.16 APIC Mode (Advanced Programmable Interrupt Controller)

This setting allows you to enable the APIC mode; the choice is "Disabled" or "Enabled".

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3.4.17 MPS Version Control For OS

This feature is only applicable to multiprocessor motherboard as it specifies the version of the Multi-Processor Specification (MPS) that the motherboard will use. MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future.. The selections are "1.1" or "1.4."

3.4.18 Console Redirection

When choose "Enable" users may configure BIOS SETUP and monitor POST via COM1 while during system power on, the host system must connect to the system with serial line before power on system.

The default is "Disable".

3.4.19 Baud Rate

This is to set the COM1 baud rate when using the Console Redirection function.

3.4.20 Agent Connect via

Please keep the default setting.

3.4.21 Agent wait time(sec)

This is for setting the waiting time that local system waits for Host system response. The selection is "3", "6", "12", "18" second.

3.4.22 Agent after boot

When choose "enable" the host system still can monitor local system after local system entering "DOS" environment.

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3.5 Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values in the chipset registers. These registers control most of the system options in the computer.

By choosing the "Advanced Chipset Features" option from the "Initial Setup Screen" menu, the screen below will be displayed. This sample screen contains the manufacturer's default values for the PCE-7210, as shown in Figure 3-6:

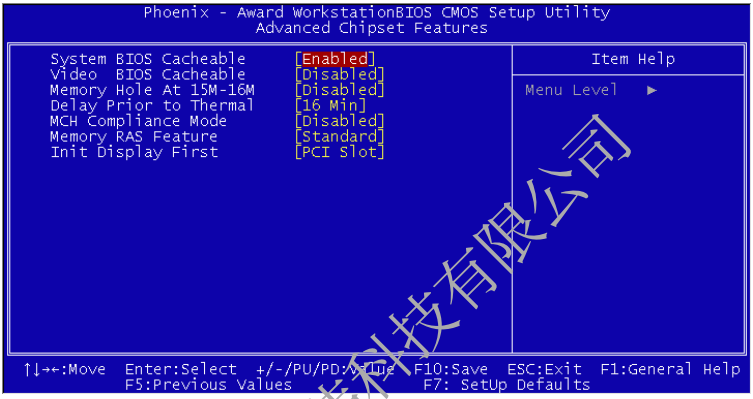

Figure 3.6: Advanced Chipset features screen

Note: DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support.

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3.5.1 System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The Choices: "Enabled", "Disabled".

3.5.2 Video Bios Cacheable

Selecting Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The Choices: "Enabled", "Disabled".

3.5.3 Memory Hole At 15M-16M

Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is "Disabled".

3.5.4 Delay Prior to Thermal

Select the period if user wants to lower the CPU speed when CPU temperature is too high. The choice: "4 Min", "8 Min", "16 Min" and "32Min".

3.5.5 MCH Compliance Mode

This feature allows you to enable the PCI-Express Compliance mode.

3.5.6 Memory RAS Feature

This feature allow enable the special feature of DIMM sparing or memory mirroring. "Memory mirroring" allows for two copies of all data in memory subsystem to be maintained. "DIMM sparing" allow for one DIMM per channel to be held in reserve and brought on-line if another DIMM in the channel becomes defective.

3.5.7 Init Display first

Choose the first display interface to initiate while booting. The choices are "PCI Slot and Onboard/AGP".

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3.6 Integrated Peripherals

The "Integrated Peripherals" screen appears when choosing the "Integrated Peripherals" item from the "Initial Setup Screen" menu. It allows the user to configure the PCE-7210 on board device according to his particular requirements.

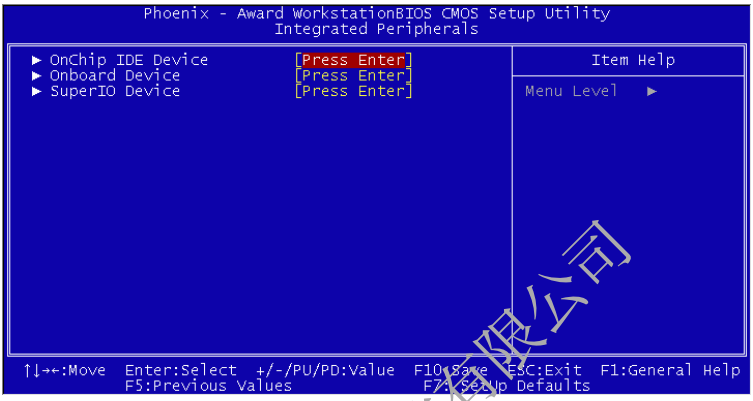

Figure 3.7: Integrated peripherals

There are three sub screen of the "Integrated Peripherals" screen, users may choose each one for setting the relevant device.

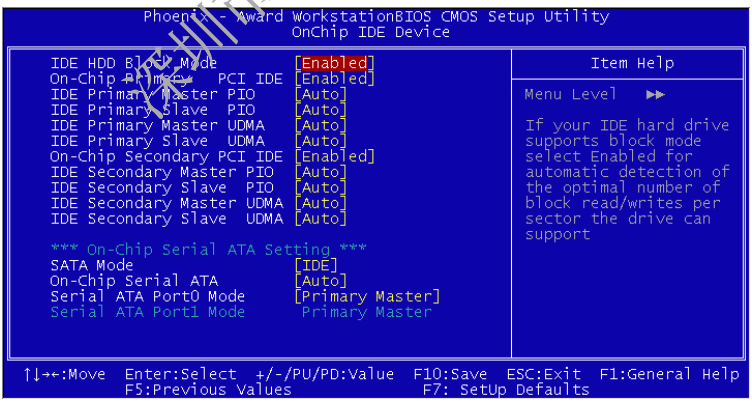

Figure 3.8: On-Chip IDE Device

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3.6.1 IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The settings are: Enabled (Default), Disabled.

3.6.2 On-Chip IDE Device

IDE Primary (Secondary) Master/Slave PIO/UDMA Mode (Auto) Each channel (Primary and Secondary) has both a master and a slave, making four IDE devices possible. Because each IDE device may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting "Auto" will allow auto detection to ensure optimal performance.

3.6.3 SATA Mode

There are two options (IDE and RAID). The default is IDE.

3.6.4 On-Chip Serial ATA

Choose the status of serial ATA, the default setting is "Auto" which let system to arrange all parallel and serial ATA resource automatically. The "Disabled" will disable SATA controller. The "Combined Mode" will combine PATA and SATA, and max of 2 IDE drives in each channel. The "Enhanced Mode" will enable both SATA and PATA, and max of 6 IDE drives is supported. The "SATA Only" means SATA is operating in legacy mode.

3.6.5 Serial ATA Port0/Port1 Mode

Select the mode for SATA port0 and SATA port1. The choices are "Primary Master", "Primary Slave", "Secondary Master", "Secondary Slave", "SATA0 Master" and "SATA1 Master".

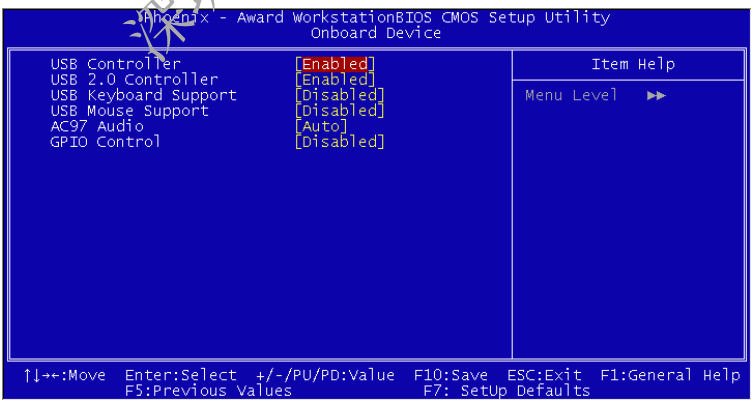

Figure 3.9: Onbaord Device

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3.6.6 USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices: "Enabled", "Disabled".

3.6.7 USB 2.0 Controller

This entry is to disable/enable the USB 2.0 controller only. The BIOS itself may/may not have high speed USB support. If the BIOS has high speed USB support built in, the support will automatically turn on when a high speed device is attached. The choices are "Enabled" or "Disabled."

3.6.8 USB Keyboard Support

Select Enabled if you use USB KB/Mouse in DOS mode. Default is "Disabled".

3.6.9 AC97 Audio

Select Disable if you do not want to use AC'97 audio. Option is "Auto"," Disabled."

3.6.10 GPIO Control

The selection is "Enable" or "Disable". When users want to use the GPIO function, it should set as "Enable"

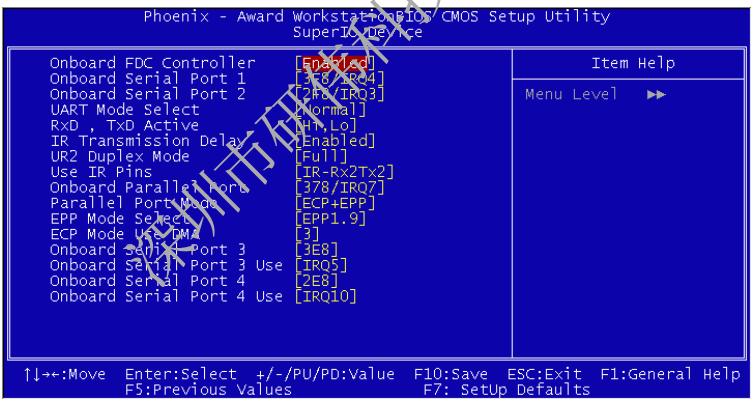

Figure 3.10: Super IO Device

3.6.11 Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

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3.6.12 Onboard Serial Port 1
The settings are "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/ IRQ3" and "Disabled" for the on-board serial connector.

3.6.13 Onboard Serial Port 2
The settings are "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/ IRQ3" and "Disabled" for the on-board serial connector.

3.6.14 UART Mode Select
This item allows you to select UART mode. The choices: "IrDA", "ASKIR", "Normal".

3.6.15 RxD, TxD Active
This item allows you to determine the active of RxD, TxD. The Choices: "Hi, Hi," "Lo, Lo," "Lo, Hi," "Hi, Lo".

3.6.16 IR Transmission Delay
This item allows you to enable/disable IR transmission delay. The choices: "Enabled", "Disabled".

3.6.17 UR2 Duplex Mode
This item allows you to select the IR half/full duplex function. The choices: "Half", "Full".

3.6.18 Use IR Pins
The Choice: "RxD2, TxD2", "IR-Rx2Tx2".

3.6.19 Onboard Parallel Port
This field sets the address of the on-board parallel port connector. You can select either "378/IRQ7", "278/IRQ5", "3BC/IRQ7", or "Disabled". If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The single board computer can support up to three parallel ports, as long as there are no conflicts for each port.

3.6.20 Parallel Port Mode
This field allows you to set the operation mode of the parallel port. The setting "Normal" allows normal speed operation, but in one direction only. "EPP" allows bidirectional parallel port operation at maximum speed. "ECP" allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode.

3.6.21 EPP Mode Select
This field allows you to select EPP port type 1.7 or 1.9. The choices: "EPP1.9", "EPP1.7".

3.6.22 ECP Mode Use DMA

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This selection is available only if you select .ECP. or .ECP + EPP. In the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, or DMA channel 3. Leave this field on the default setting.

3.6.23 Onboard Serial Port 3

The settings are "3F8", "2F8 ", "3E8 ", "2E8 "and "Disabled" for the on-board serial port3.

3.6.24 Onboard Serial Port 3 use

The settings are "IRQ5", "IRQ10" for the on-board serial port3.

3.6.25 Onboard Serial Port 4

The settings are "3F8", "2F8 ", "3E8 ", "2E8 "and "Disabled" for the on-board serial port4.

3.6.26 Onboard Serial Port 4 use

The settings are "IRQ5", "IRQ10" for the on-board serial port4.

3.7 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

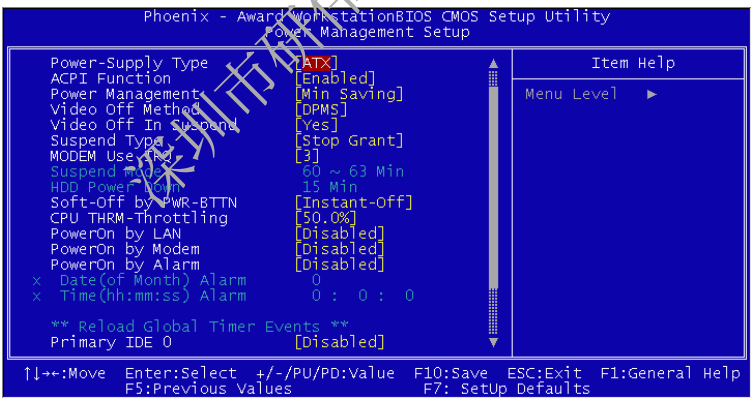

Figure 3.11: Power management setup screen-1

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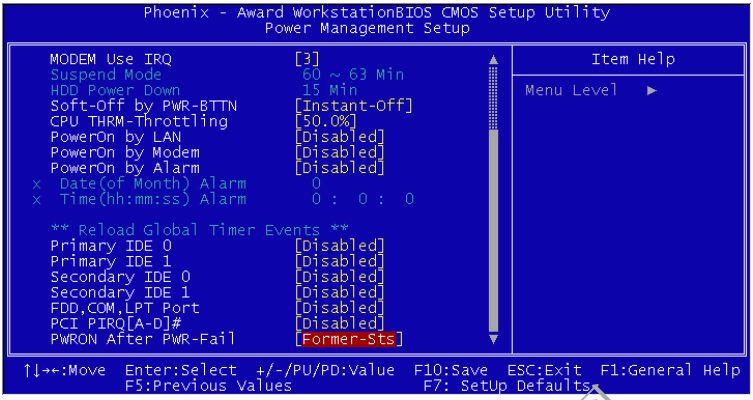

Figure 3.12: Power management setup screen-2

3.7.1 Power Supply Type

PCE-7210 can support both "ATX" and "AT" power supply. Customers can choose the PSU type through this selection. The choices are: "ATX","AT". While selecting "AT", the ACPI function will disable automatically.

3.7.2 ACPI function

The choices are: "Enabled", "Disabled".

3.7.3 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Suspend Mode

There are three selections for Power Management, and they have fixed mode settings.

Min Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min, and disabled.

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3.7.4 Video Off Method
Use this to select the method to turn off the video. The choices are : "Blank Screen", "V/H SYNC+ Blank", "DPMS".

3.7.5 Video Off In Suspend
When the system is in suspend mode, the video will turn off. The choices are "No" and "Yes".

3.7.6 Suspend Type
The choices are : "Stop Grant", "PwrOn Suspend".

3.7.7 Modem Use IRQ
This determines the IRQ that the MODEM can use.The choices are: "3", "4", "5", "7", "9", "10", "11", "NA".

3.7.8 Suspend Mode
Please refer to 3.7.3

3.7.9 HDD Power Down
Please refer to 3.7.3

3.7.10 Soft-Off by PWR-BTTN
If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode. You can choose "Delay 4 sec". If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to "suspend" mode.

3.7.11 CPU THRM-Throttling
This field allows you to select the CPU THRM-Throttling rate. The choices: "75.0%", "50.0%", and "25.0%".

3.7.12 PowerOn by LAN
This item allows you to power on the system by LAN. The choices: "Enabled", "Disabled".

3.7.13 PowerOn by Modem
To enabled or disable the function to power on the system via Modem from the remote host. The Choice: "Enabled", "Disabled".

3.7.14 PowerOn by Alarm
When choose "Enabled" system will auto power on as below time.

Date (of month) Alarm: date of every month.

Time (hh:mm:ss) Alarm: time of the date

3.7.15 Primary IDE 0 (1) and Secondary IDE 0 (1).

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When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active. The choice: "Enabled", "Disabled".

3.7.16 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: "Enabled", "Disabled".

3.7.17 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs. The choice: "Enabled", "Disabled".

3.7.18 PWRON After PWR-FAIL

This option allows you to set the system so that it reboots after a power failure. Select Former-Sts to reboot the system with its former settings.

3.8 PnP/PCI Configuration Setup

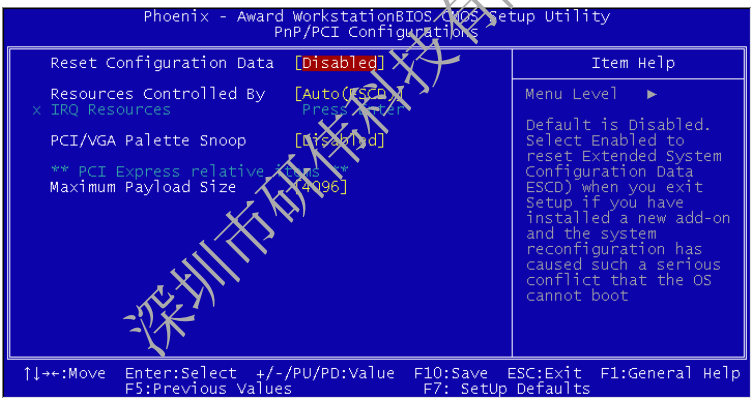

Figure 3.13: PnP/PCI configurations screen

3.8.1 Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The settings are: Enabled and Disabled (Default).

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3.8.2 Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98. If you set this field to "manual," choose specific resources by going into each of the sub menus that follow this field (a sub menu is preceded by a "Y"). The settings are: Auto (ESCD) (Default), Manual.

3.8.3 IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

3.8.4 PCI/VGA Palette Snoop

The VGA "palette" is the set of colors that are in use by the video card when it is in 256-color mode. Since there are thousands of colors and only 256 can be used in that mode, a palette containing the current colors is used. Some special VGA cards, high-end hardware MPEG decoders etc. need to be able to look at the video card's VGA palette to determine what colors are currently in use. Enabling this feature turns on this palette "snoop". Leave this field at Disabled. The settings are Enabled, Disabled (Default).

3.8.5 Maximum Payload Size

This feature allows setting maximum TLP (Transaction Layer Packet) payload size for the device. The default is 4096.

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3.9 PC Health Status

This section shows the Status of the CPU, Fan, and gives a warning for overall system status. This is only available if there is a hardware monitor on board.

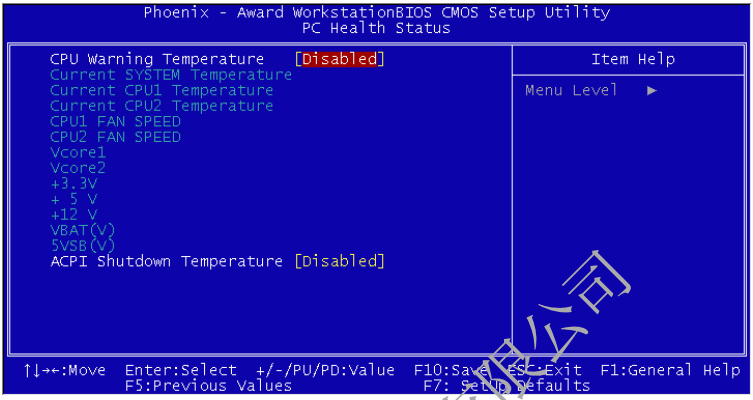

Figure 3.14: PC Health Status Screen

3.9.1 CPU Warning Temperature

This item will prevent the CPU from overheating. The choices are: "Disabled," "50C/122F," "53C/127F," "56C/133F," "60C/140F," "63C/145F," "66C/151F," and "70C/158F".

3.9.2 Current System Temperature

This shows you the current temperature of system.

3.9.3 Current CPU1/CPU2 Temperature

This shows you the current CPU temperature.

3.9.4 CPU1/CPU2 FAN Speed

This shows you the current CPU FAN operating speed.

3.9.5 Vcore1/ Vcore2, +3.3V, +5V, +12V, VBAT(V), 5VSB(V)

This shows you the voltage of Vcore1/ Vcore2, +3.3V, +5V, +12V, VBAT(V) and 5VSB(V).

3.9.6 Shutdown Temperature

The system will shut down automatically when the CPU temperature is over the selected setting. This function can prevent CPU damage caused by overheating. It only works under the ACPI power mode.

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3.10 Frequency Control

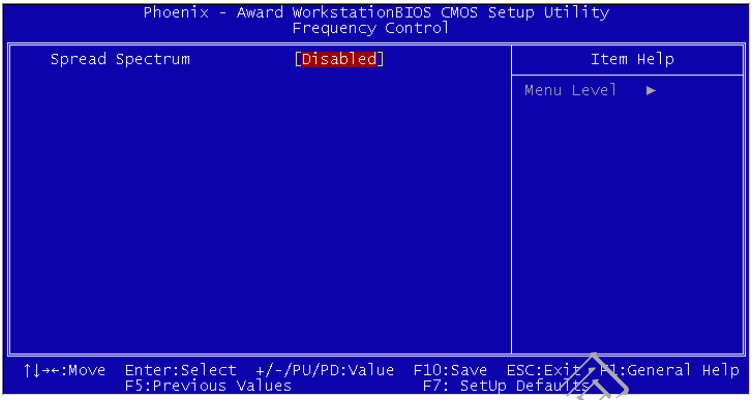

Figure 3.15: Frequency Control screen

3.10.1 Spread Spectrum

Use this function to tune the PCI clock frequency. Setting this option to Disabled will limit the clock signal spread, increase the consistency of the frequency, but increase the EMI. Setting this option to Enabled will decrease the EMI.

To enable/disable the spread spectrum. The choices are: "Disabled," "-0.40%," "- 0.50%," "- 0.60%," and "- 1.00%".

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3.11 Load Setup Defaults

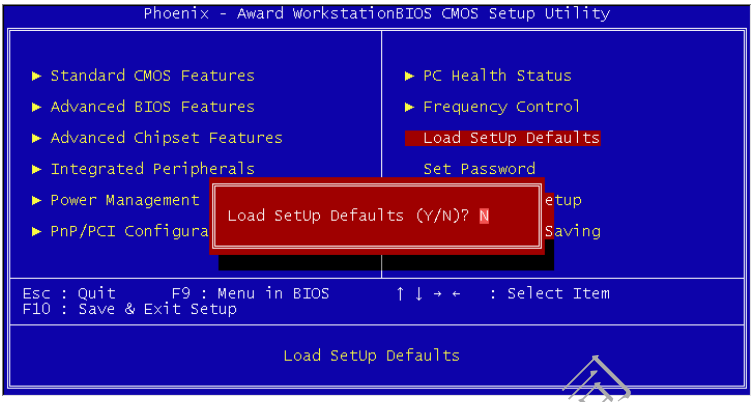

Figure 3.16: Load Setup Defaults screen

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:

- Load setup Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

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3.12 Set Password

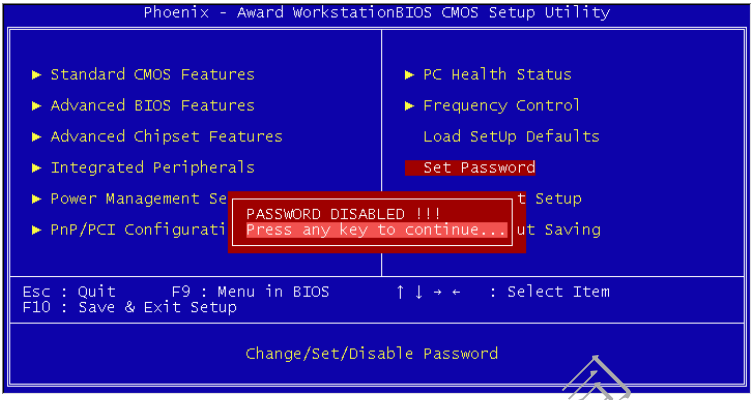

Figure 3.17: Set Password screen

To change, confirm, or disable the password, choose the "Set Password" option from the Setup main menu and press Enter. The password can be at most 8 characters long. Remember, to enable this feature. You must first select the Security Option in the Advance BIOS FEATURES SETUP to be either "Setup" or "System." Pressing Enter again without typing any characters can disable the password setting function.

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3.13 Save & Exit Setup

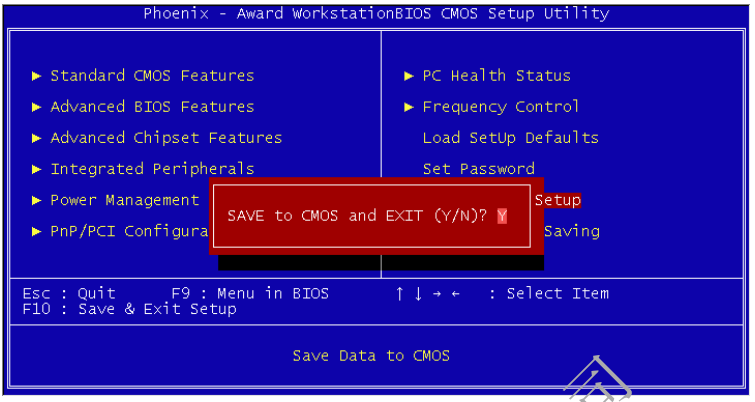

Figure 3.18: Save & Exit Setup screen

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.14 Exit Without Saving

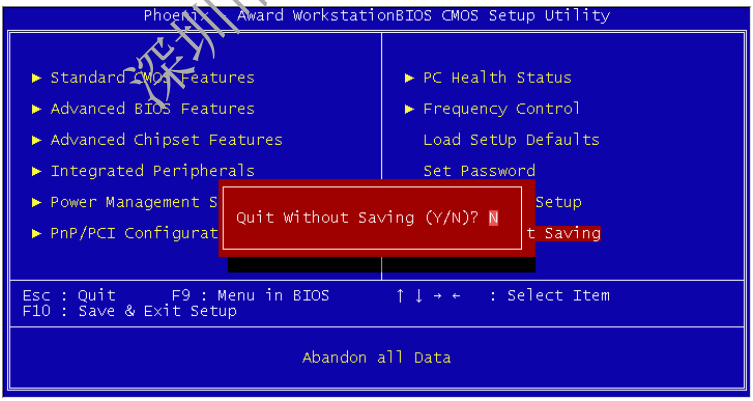

Figure 3.19: Exit Without Saving screen

Selecting this option and pressing the Enter key lets you exit the Setup program without recording any new values or changing old ones.

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CHAPTER 4

Chipset Software Installation Utility

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Chapter 4 Chipset Software Install Utility

4.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the PCE-7210 board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system. .

Note: *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Note: *The Auto-Run function only can run under the 32-bit Microsoft Windows OS. If it can't run under your system, please set up the driver manually.*

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Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) installs Windows* INF files to the target system. These files outline to the operating system how to configure the Intel® chipset components in order to ensure that the following features function properly:

- Core PCI and ISA PnP services.
- PCIe support.
- IDE Ultra ATA 100/66/33 and Serial ATA interface support.

- USB 1.1/2.0 support
- Identification of Intel® chipset components in the Device Manager.
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

Note: This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:

Microsoft Windows* Server 2003 with Service Pack 1

Microsoft Windows Server 2003 x64 Edition*

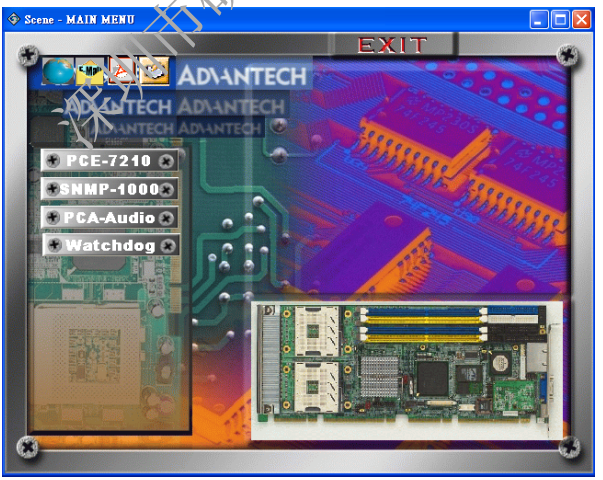
Microsoft Windows XP Professional x64 Edition

Microsoft Windows XP with Service Pack 2

Microsoft Windows 2000 with Service Pack 4

4.3 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears.



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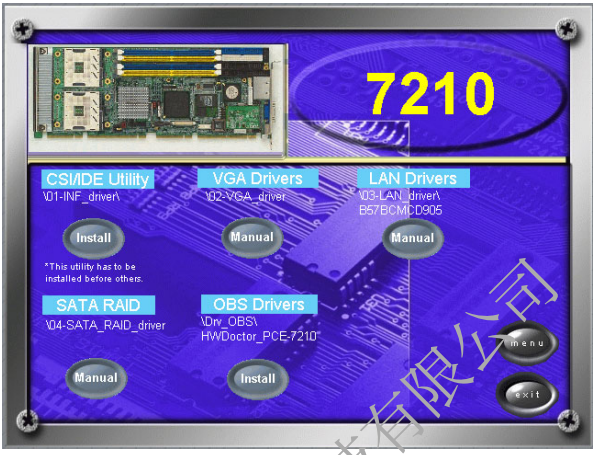
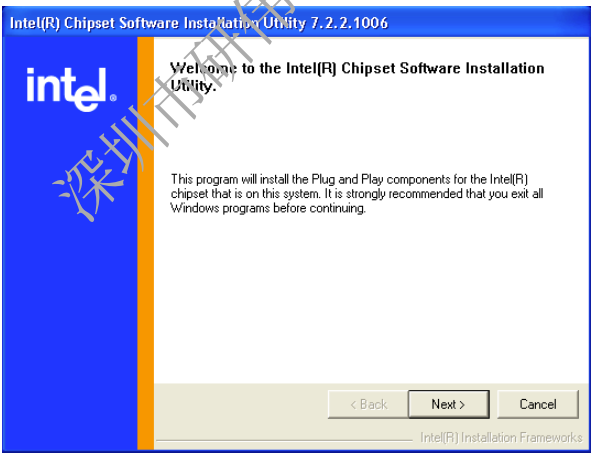
2. Select the PCE-7210 for entering the following screen. Move the mouse cursor over the "Install" button under the "CSI UTILITY" heading, a message pops up telling you to install the CSI utility before other device drivers, as shown in the following figure. Click on this button. Taking Windows XP as example.



3. Click "Next" when you see the following message.



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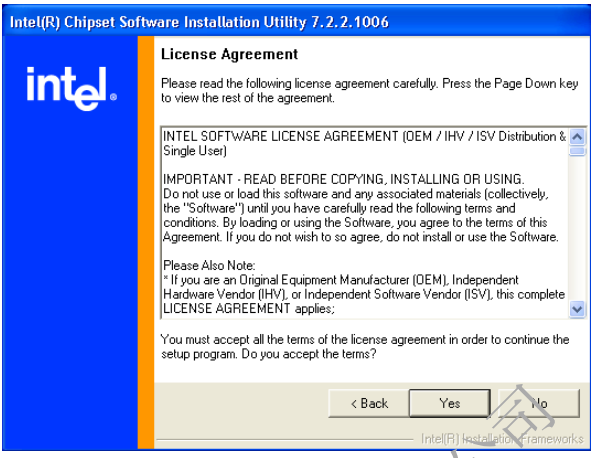
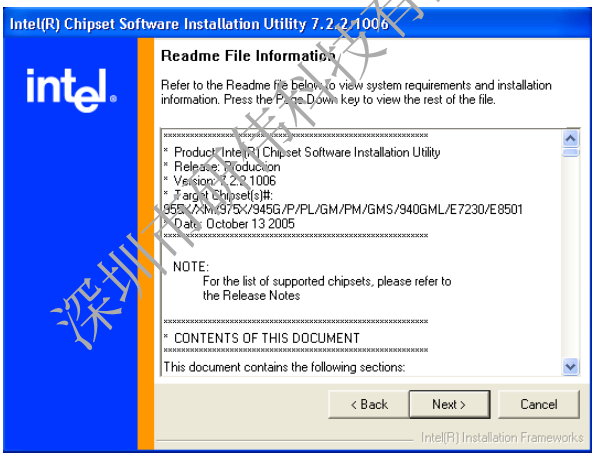
4. Click "Yes" when you see the following message.



5. Click "Next" when you see the following message.



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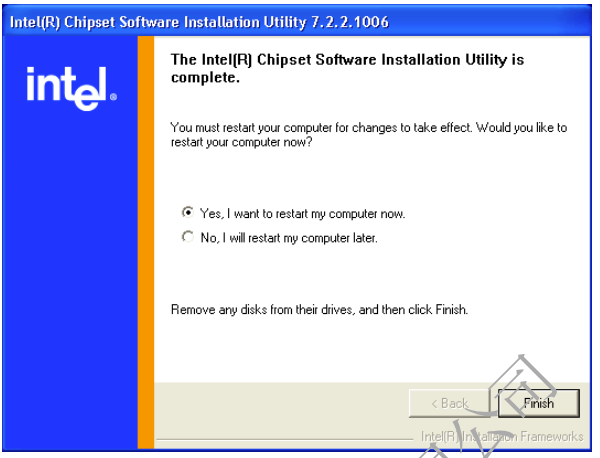
6. When the following message appears, click "Finish" to complete the installation and restart Windows.



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CHAPTER 5

VGA Setup

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Chapter 5 VGA Setup

5.1 Introduction

- The PCE-7210 has VGA onboard; you need to install the VGA driver to enable the function.
- The on-board ATI RADEON 7000-M graphic accelerator including 16MB frames buffer memory on chip. It provides dual VGA display and supports DVI interface for panel display.

5.2 Windows XP Driver Setup

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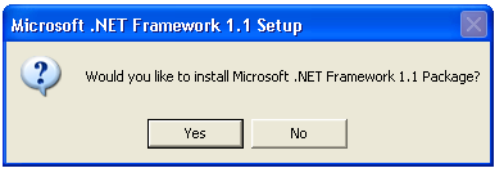
Note: *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility*

Note: *While install the VGA driver, please select the proper version for the OS that you are using manually.* The Driver path is: \\02-VGA_driver.

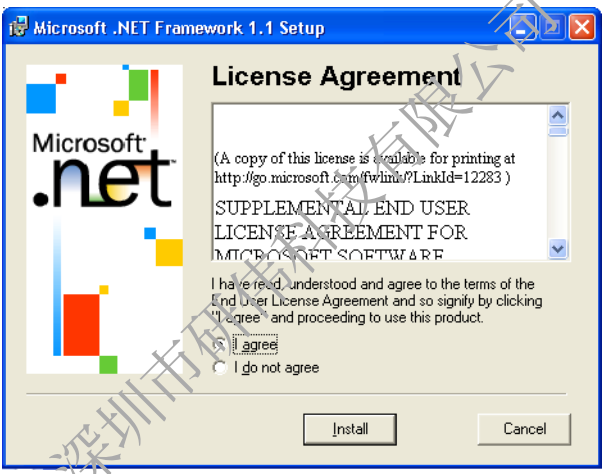
Note: *ATI recommends Windows XP Service Pack 2 or higher to be installed.*

Note: *You must have Microsoft .NET Framework installed prior to downloading and installing the Catalyst Control Center:*
The Driver Path is: \\02-VGA_driver\Framework.

1. Insert the driver CD into your system's CD-ROM drive and choose the directory \\02-VGA_driver\Framework. Double click the "dotnetfx.exe" for installing the Microsoft .NET Framework. Click "Yes" when you see the following message.



2. Choose "I agree" and Click "Install" when you see the following message.



3. Click "OK" when you see the following message.

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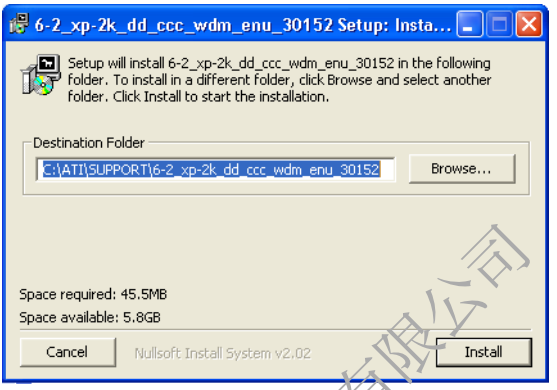
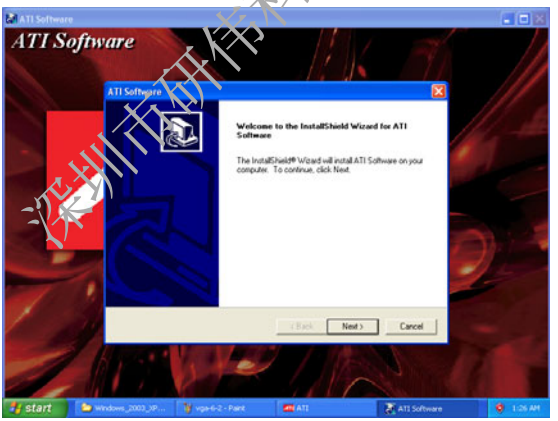
4. Choose the directory \\02-VGA_driver. Then select the proper version for the OS that you are using. The following installation procedure is for Windows XP. For other operating systems, please follow the on-screen installation guide. Double click the "6-2_xp-2k_dd_ccc_wdm_enu_30152.exe". Click the"Install" button when you see the following message.



5. Click "Next" when you see the following message.



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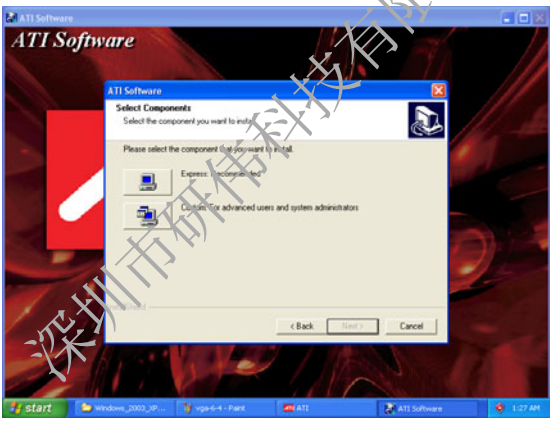
6. Click "Yes" when you see the following message.

7. Click "Express Recommend" when you see the following message.



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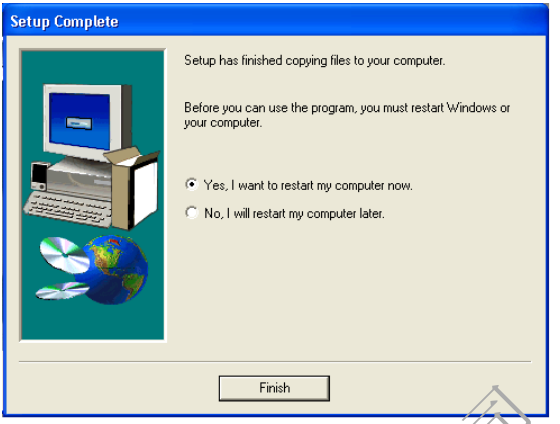
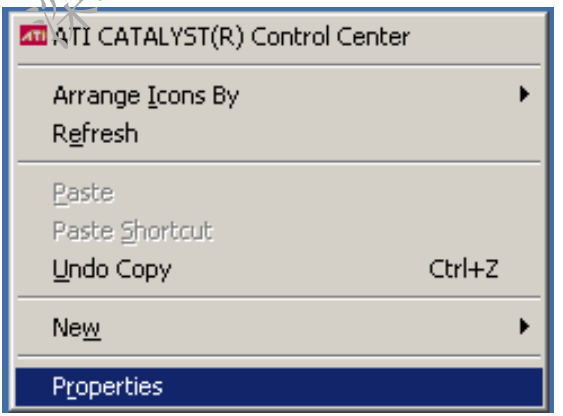
8. Click "Finish" when you see the following message.



5.3 Microsoft® Windows Server™ 2003 & Windows Server 2003 x64 Driver Setup

Note: *Before you install the driver for Microsoft® Windows Server™ 2003 & Windows Server 2003 x64, you need to set the display property by following these steps.*

1. Right click the desk top screen and choose the “Properties”.



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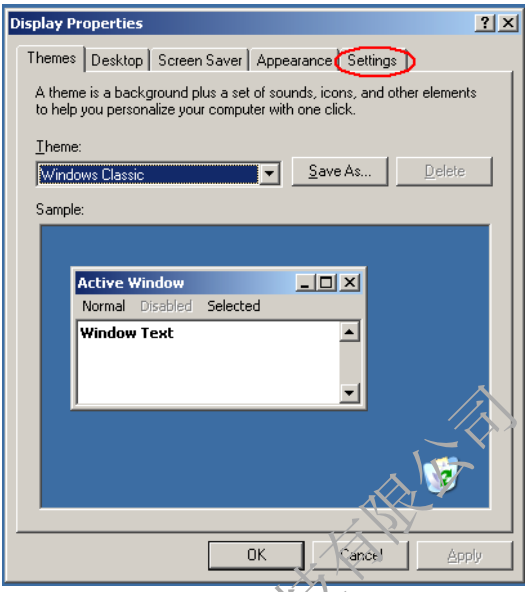
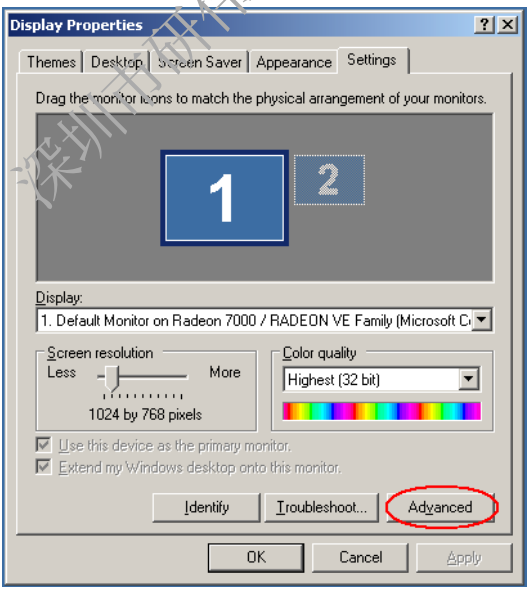
2. Choose the “Setting” tag.



3. Choose the “Advanced” icon.



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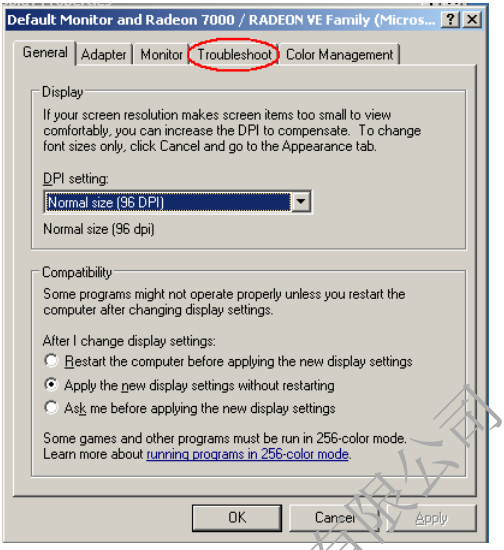
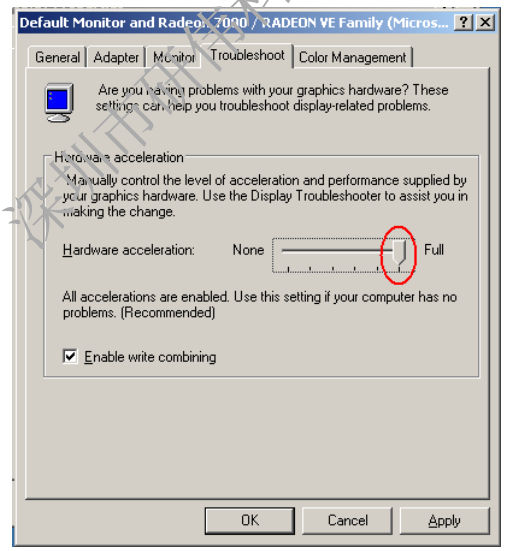
4. Choose the “Troubleshoot” tag.



5. Move the “Hardware Acceleration” to full.



6. Go to the directory: \\02-VGA_driver\Windows_2003_XP_x64 and run ***setup.exe***; then, follow the setting procedure to ensure the driver can be installed successfully.

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CHAPTER 6

LAN Configuration

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Chapter 6 LAN Configuration

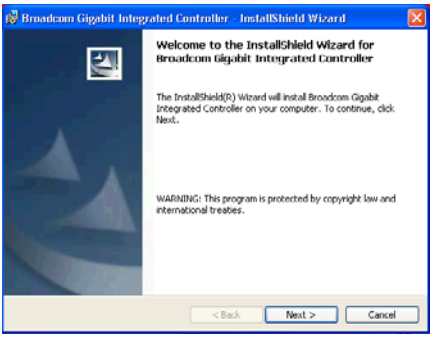
6.1 Introduction

The PCE-7210 designed with Broadcom BCM5715C which is a 10/100/1000BASE-T dual-port LAN controller for high performance server application. It provides a single x4 PCI express host interface and two integrated Gigabit Ethernet Controllers which may provide higher Thru-put than the chips interface with PCI bus.

6.2 Win XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive and choose the directory \\03-LAN_driver\B57BCMCD905. Double click the "Launch.exe" and the following screen will show up.

2. Click "DRIVER INSTALLER" then you will see following message. And click "Next".



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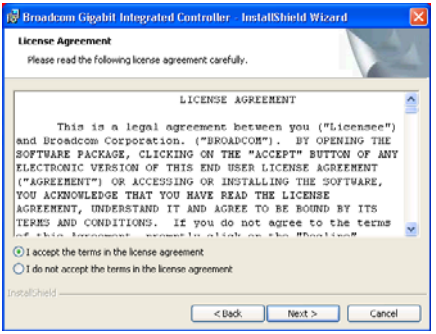
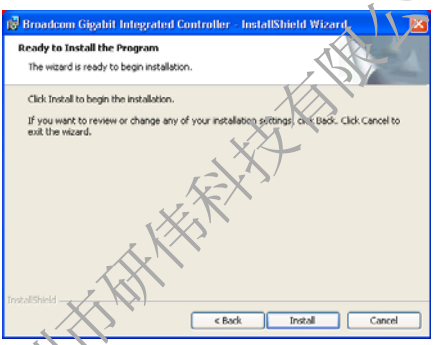
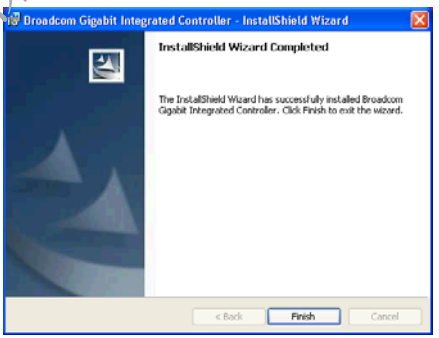
3. Choose "I accept the terms in the license agreement" and then click "Next" when you see the following message.



4. Click "Install" when you see the following message. Then the driver installation procedure will be run automatically.



5. Click "Finish" when you see the following message.



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After installing the driver, you may choose to install the S/W utility for this LAN chip. You may choose the "Users Guide" for more detail information about the LAN function.

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CHAPTER 7

Onboard Security Setup

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Chapter 7 Onboard Security Setup

7.1 Introduction

The PCE-7210's hardware monitor is designed with Winbond W83627HF. Onboard security (OBS) functions monitor key hardware. They help you maintain your system's stability and durability. The PCE-7210 can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets which can be monitored include:

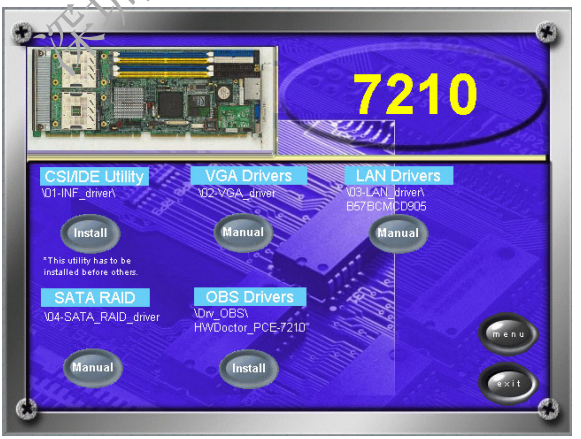
- CPU core voltage: 1.3 V ~ 3.3 V, according to Intel specifications.
- Transmission voltage from CPU to chipset: typically 1.8 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.

The negative system voltage sets which can be monitored include:

- Main voltage: -5 V, -12 V.

7.2 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive and choose the PCE-7210 for seeing the following screen. Then click the install button of the OBS driver.:



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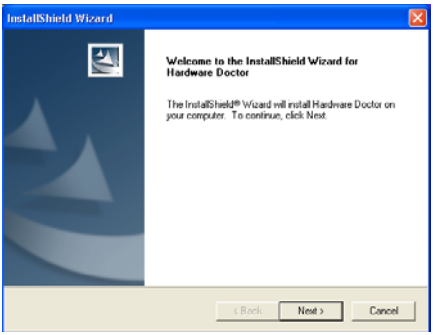
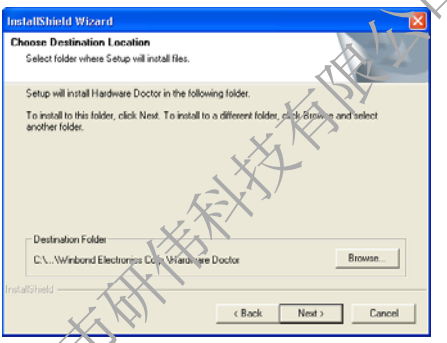
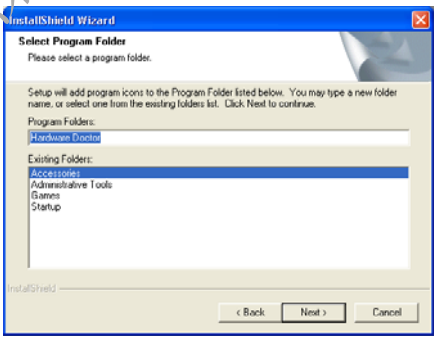
2. Click "Next" when you see the following message.



3. Click "Next" when you see the following message.



4. Click "Next" when you see the following message.



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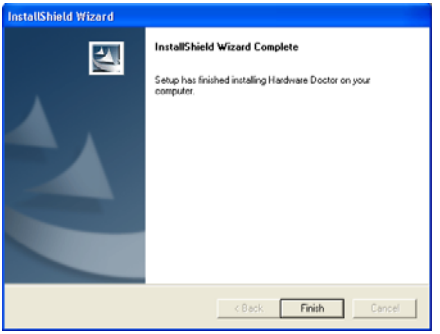
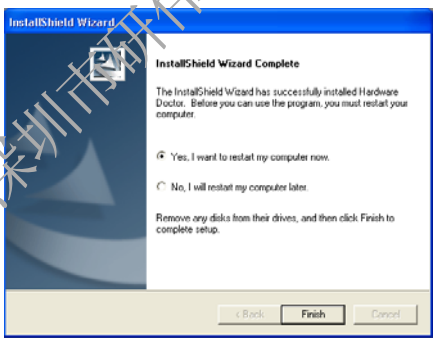
5. Click "Finish" when you see the following message.



6. Click "Yes" if you want to create a short cut for the hardware doctor.

7. Click "Yes" to restart your system after the OBS utility installed finish.



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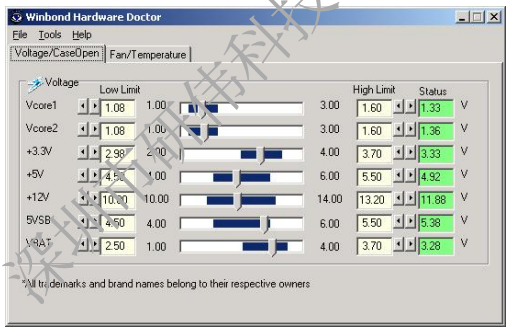
7.3 Using the OBS Hardware Doctor Utility

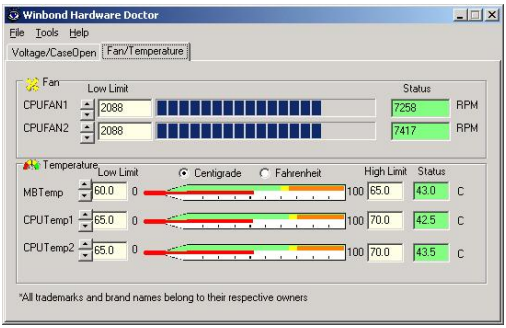
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security system.

You can view or change values for various OBS settings by running this utility:

1. From the desktop of Windows, click on "Start" and select "Programs", select "Winbond HWDoctor" and click "HWDOCTOR".
2. It is recommended that you load the default values for all the OBS settings. However, if desired, you can establish new conditions for voltage, fan speed, and temperature.





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CHAPTER 8

SATA RAID Setup

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Chapter 8 SATA RAID Setup

8.1 Introduction

To support demanding disk I/O, Intel 6300ESB chipset integrates two Serial ATA controllers with software RAID 0 and 1 capability. RAID 0 stripping increases the storage performance and is designed to speed up data transfer rates for disk-intensive applications. RAID 1 mirroring protects valuable data that might be lost in the event of a hard drive failure.

Note: *Operating system support list: Microsoft Windows 2000, Windows Server 2003, Windows XP; Linux: Red Hat Advanced Server 2.1 and 3.0, SuSE SLES 8.0 and 8.2, SuSE 9.0, United Linux 1.0, Miracle Linux 2.1*

Note: *Device drivers and utility software require around 20 MB disk space*

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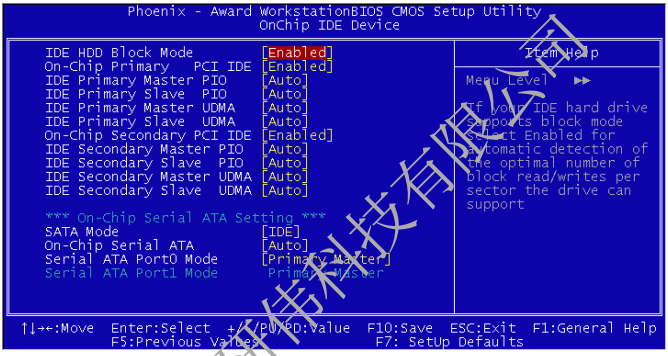
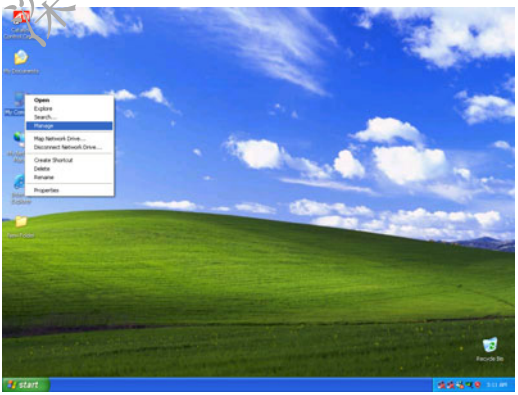
8.2 Windows XP Driver Setup

Note: *The following installation guide is only the basic procedure for S/W SATA RAID driver, if you want to know more detail information, please check the User Guide in the driver CD. Path: \\04SATA_RAID_driver\user's guide*

1. Before you install the SATA RAID driver under, the BIOS has to be set accordantly. Integrated peripherals =>OnChip IDE Device=>SATA Mode=> RAID



2. After booting up to Windows XP, Go to the Desk Top screen and right click "My Computer". Choose "manage".



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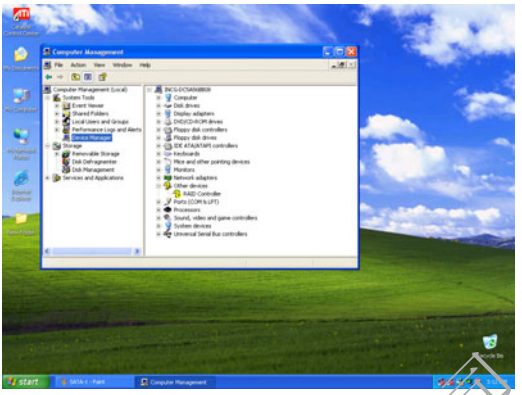
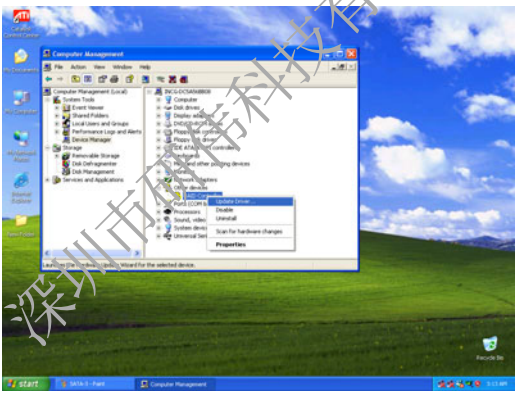
3. Double Click “Device manager” and you will see the device with question mark.



4. Right Click “RAID Controller” which with question mark. And choose update driver.



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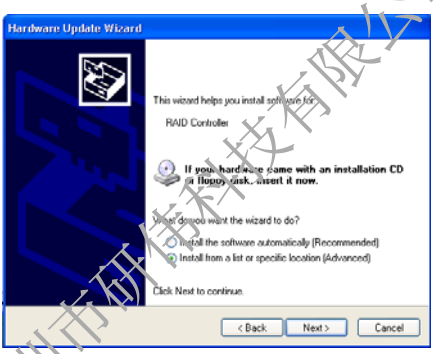
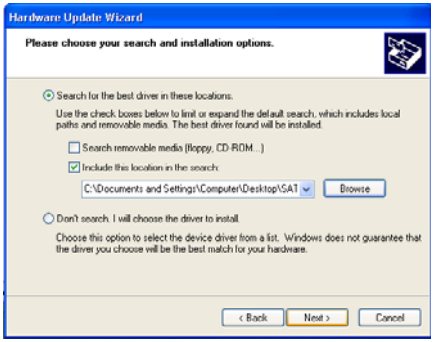
5. Choose “No, not this time” and click “Next”.

6. Choose “Install from a list or specific location (advanced)” and click “Next”.



7. Choose “Include this location in the search” and click “Browse”.



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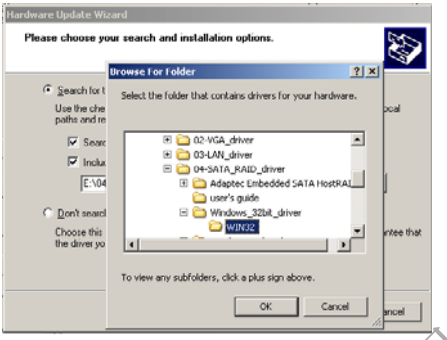
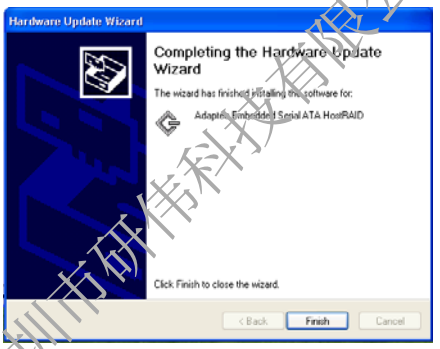
8. Find the right path for the Driver “ex: \\04-SATA_RAID_driver\Windows_32bit_driver\WIN32” and click “OK”. The driver will install automatically.



9. Click “Finish” when you see the following message.



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8.3 Utility for SATA RAID

There is a basic storage management utility attached in this driver CD. Path: \\04-SATA_RAID_driver\Adaptec Embedded SATA HostRAID\utility-ASM_BE\ASM 4494\ASM 4494\books. If you want to use this utility, please read the user guide in folder "books".

CHAPTER 9

IPMI

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Chapter 9 IPMI

9.1 IPMI introduction

This product fully supports Intelligent Platform Management Interface 2.0 (IPMI 2.0) and PICMG1.3R1.0 specifications. It uses a micro-controller (Hitachi H8/2167) to run an IPMI firmware.

9.2 Definitions

- BMC - (Baseboard Management Controller) This is the common abbreviation for an IPMI Baseboard Management Controller
- IPMB – (Intelligent Platform Management Bus) Protocol defined for passing IPMI messages over a public I2C bus.
- IPMI - (Intelligent Platform Management Interface) A standardized system management interface. Please refer to the IPMI Specification for more detail.
- IPMIv2.0 – Specifically version 2.0 of IPMI

9.3 IPMI function list

The following standard IPMI commands will be supported. The 5th column (Mandatory / Optional) is the record to distinguish the command is mandatory or optional based on the definitions of Intel IPMI specification (Intelligent Platform Management Interface Specification v2.0, revision 1.0, Intel Hewlett-Packard NEC Dell).

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Table 9.1: Supported IPMI commands

IPMI Device Global Commands	NetFn	Cmd	Mandatory / Optional
Get Device Id	App	0x01	M
Cold Reset	App	0x02	O
Get Self Test Results	App	0x04	M
Manufacturing Test On	App	0x05	O
Set ACPI Power State	App	0x06	O
Get ACPI Power State	App	0x07	O
Get Device GUID	App	0x08	O

BMC Device and Messaging Commands	NetFn	Cmd	Mandatory / Optional
Set BMC Global Enables	App	0x2e	M
Get BMC Global Enables	App	0x2f	M
Clear Message Flags	App	0x30	M
Get Message Flags	App	0x31	M
Enable Message Channel Receive	App	0x32	O
Get Message	App	0x33	M
Send Message	App	0x34	M
Read Event Message Buffer	App	0x35	O
Get System GUID	App	0x37	O
Get Channel Authentication Capabilities	App	0x38	O
Get Session Challenge	App	0x39	O
Activate Session	App	0x3a	O
Set Session Privilege Level	App	0x3b	O
Close Session	App	0x3c	O
Get Session Information	App	0x3d	O
Get AuthCode	App	0x3f	O
Set Channel Access	App	0x40	O
Get Channel Access	App	0x41	O
Get Channel Info	App	0x42	O
Set User Access	App	0x43	O
Get User Access	App	0x44	O
Set User Name	App	0x45	O
Get User Name	App	0x46	O
Set User Password	App	0x47	O
Master Write-Read	App	0x52	M
BMC Watchdog Timer Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Reset Watchdog Timer	App	0x22	M
Set Watchdog Timer	App	0x24	M
Get Watchdog Timer	App	0x25	M
Chassis Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Get Chassis Capabilities	Chassis	0x00	M
Get Chassis Status	Chassis	0x01	M
Chassis Control	Chassis	0x02	M
Chassis Identify	Chassis	0x04	O
Set Chassis Capabilities	Chassis	0x05	O

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Get System Restart Cause	Chassis	0x07	O
Set System Boot Options	Chassis	0x08	O
Get System Boot Options	Chassis	0x09	O
Set Front Panel Button Enables	Chassis	0x0a	O
Set Power Cycle Interval	Chassis	0x0b	O
Event Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Set Event Receiver	S/E	0x00	M
Get Event Receiver	S/E	0x01	M
Platform Event	S/E	0x02	M
PEF and Alerting Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Get PEF Capabilities	S/E	0x10	M
Arm PEF Postpone Timer	S/E	0x11	M
Set PEF Configuration Parameters	S/E	0x12	M
Get PEF Configuration Parameters	S/E	0x13	M
Set Last Processed Event ID	S/E	0x14	M
Get Last Processed Event ID	S/E	0x15	M
Alert Immediate	S/E	0x16	O
PET acknowledge	S/E	0x17	O
SEL Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Get SEL Info	Storage	0x40	M
Reserve SEL	Storage	0x42	O
Get SEL Entry	Storage	0x43	M
Add SEL Entry	Storage	0x44	M
Clear SEL	Storage	0x47	M
Get SEL Time	Storage	0x48	M
Set SEL Time	Storage	0x49	M
SDR Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Get SDR Repository Info	Storage	0x20	M
Reserve SDR Repository	Storage	0x22	M
Get SDR	Storage	0x23	M
Get SDR Repository Time	Storage	0x28	M
Set SDR Repository Time	Storage	0x29	M
Run Initialization Agent	Storage	0x2c	O

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FRU Device Commands	NetFn	Cmd	Mandatory / Optional
Get FRU Inventory Area Info	Storage	0x10	M
Read FRU Inventory Data	Storage	0x11	M
Write FRU Inventory Data	Storage	0x12	M
Sensor Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Set Sensor Hysteresis	S/E	0x24	O
Get Sensor Hysteresis	S/E	0x25	O
Set Sensor Threshold	S/E	0x26	O
Get Sensor Threshold	S/E	0x27	O
Set Sensor Event Enable	S/E	0x28	O
Get Sensor Event Enable	S/E	0x29	O
Re-arm Sensor Events	S/E	0x2a	O
Get Sensor Event Status	S/E	0x2b	O
Get Sensor Reading	S/E	0x2d	M
LAN Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Set LAN Configuration Parameters	Transport	0x01	M
Get LAN Configuration Parameters	Transport	0x02	M
Serial/Modem Device Commands	**NetFn**	**Cmd**	**Mandatory / Optional**
Set Serial/Modem Configuration Parameters	Transport	0x10	M
Get Serial/Modem Configuration Parameters	Transport	0x11	M
Set Serial/Modem Mux	Transport	0x12	M

Note: Network function (NetFn) is a field that identifies the functional class of the message. The Network Function clusters IPMI commands into different sets. You can refer the IPMI spec of network function codes for more information.

Note: These command codes follow the IPMI spec.

Note: Mandatory and Optional command are define in IPMI spec. If you want to know more detail, please refer to IPMI spec.

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9.4 IPMI OEM command lists

In addition to the above list of IPMI commands, the following OEM commands will be supported.

Table 9.2: OEM Commands list

Net Function = 0x2E, LUN = 0

Code	Command	Request, Response Data	Description
05h	Set System GUID	Request: Byte 1:16 – System GUID Response: Byte 1 — Completion code.	This command is used to set the system GUID. The GUID can be retrieved using a standard IPMI command.
0Dh	Reset to Defaults	Request: Reset module ID Byte 1[7:0] 1 = OEM module 2 = LAN module 3 = User Info module 4 = Serial module 5 = SOL module 6 = PEF module 7 = Firewall module 8 = System Information 0xFF = all modules Byte 2:4 Reserved. Response: Byte 1 Status of Reset to Default. If fail, this value indicate the last fail module and the reset process stops. [7:0] 0 = success 1 = fail in OEM module 2 = fail in LAN module 3 = fail in User Info module 4 = fail in Serial module 5 = fail in SOL module 6 = fail in PEF module 7 = fail in Firewall module 8 = fail in System Information	This command resets the BMC configuration to default values.

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Appendix A

Programming the Watchdog Timer

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Appendix A Programming the Watch-dog Timer

A.1 Watchdog Timer

The PCE-7210's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

The watchdog timer is built into the super I/O controller W83627HF. It provides the following functions for user programming:

- Can be enabled and disabled by user's program.
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes.
- Generates an interrupt or resets signal if the software fails to reset the timer after time-out.

A.1.2 Reset/ Interrupt selection

The JWDT1 jumper is used to select reset in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

A.1.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E(hex) and 2F(hex).

2E (hex) is the address port. 2F(hex) is the data port.

You must first assign the address of register by writing address value into address port 2E(hex), then write/read data to/from the assigned register through data port 2F (hex).

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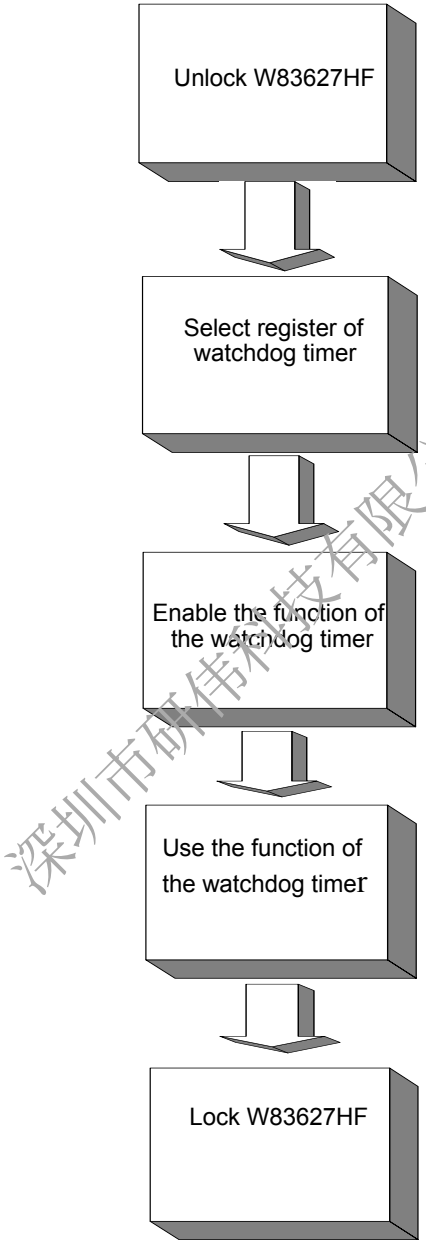

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Table A.1: Watchdog Timer Registers		
Address of register (2E)	**Attribute**	
Read/Write	Value (2F) and description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock theW83627HF
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer.
Write 0 to bit 3: set second as counting unit. [default]		
Write 1 to bit 3: set minute as counting unit		
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.

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F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is ""time out""."
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer.2

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A.1.4 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh                    ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h                    ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx                ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc   dx
Mov  al,01h
```

```
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; Set second as counting unit
Mov  al,0f5h
Out    dx,al
Inc    dx
In     al,dx
And al,not 08h
Out    dx,al
;--------------------------------------------------------
Dec dx              ; Set timeout interval as 10 seconds and start counting
Mov  al,0f6h
Out    dx,al
Inc    dx
Mov  al,10
Out    dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out    dx,al
Inc    dx
Mov  al,08h
```

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```
Out    dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out    dx,al
Inc     dx
Mov  al,01h
Out    dx,al
;--------------------------------------------------------
Dec dx              ; Set minute as counting unit
Mov  al,0f5h
Out    dx,al
Inc     dx
In      al,dx
Or  al,08h
Out    dx,al
;--------------------------------------------------------
Dec dx              ; Set timeout interval as 5 minutes and start counting
Mov  al,0f6h
Out    dx,al
Inc     dx
Mov  al,5
Out    dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
```

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```
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Enable watchdog timer to be reset by mouse
Mov  al,0f7h
Out   dx,al
Inc    dx
In     al,dx
Or   al,80h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
```

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```
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Enable watchdog timer to be strobed reset by keyboard
Mov  al,0f7h
Out   dx,al
Inc    dx
In     al,dx
Or   al,40h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
```

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```
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; Generate a time-out signal
Mov  al,0f7h
Out   dx,al                 ;Write 1 to bit 5 of F7 register
Inc    dx
In     al,dx
Or   al,20h
Out   dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

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Appendix **B**

I/O Pin Assignments

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Appendix B I/O Pin Assignments

B.1 IDE Hard Drive Connector (IDE1, IDE2)

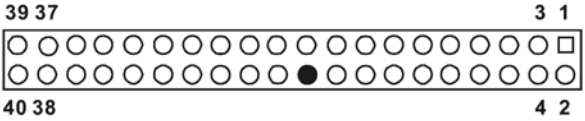

Table B.1: IDE hard drive connector (IDE1, IDE2)

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	IDSC16-
33	ADDR 1	34	PDIAG
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND
* low active			

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B.2 Floppy Drive Connector (FDD1)

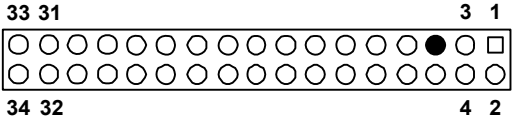

Table B.2: Floppy drive connector (FDD1)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*
* low active			

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B.3 Parallel Port Connector (LPT1)

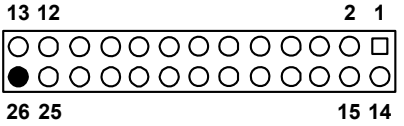

Table B.3: Parallel port connector (LPT1)			
Pin	**Signal**	**Pin**	**Signal**
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C
* low active			

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B.4 VGA Connector (VGA1)

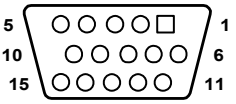

Table B.4: VGA connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.5 VGA-2 Connector (VGA2)

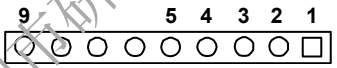

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Table B.5: VGA-2 Connector (VGA2)	
Pin	**Signal**
1	CRT2_R1
2	CRT2_G1
3	CRT2_B1
4	GND
5	D2_HS1OUT
6	D2_VS1OUT
7	DDC3_SDAOUT
8	DDC3_SCLOUT
9	VCC_VGA03

B.6 DVI Connector (DVI1)

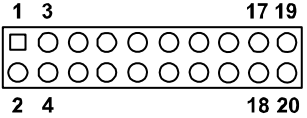

Table B.6: DVI Connector (DVI1)

Pin	Signal	Pin	Signal
1	#TMDS1_0	11	GND
2	AGP_5V_TMDS2	12	DDC3_SDAOUT
3	TMDS1_0	13	#TMDS1_2
4	GND	14	#TMDS1_2
5	GND	15	TMDS1_2
6	TMDS1_CK	16	ATI_12C_DAT
7	#TMDS1_1	17	AGP_5V_TMDS2
8	GND	18	ATI_12C_CLK
9	#TMDS1_1	19	CPIS_ENA_BL
10	DDC3_SCLOUT	20	CPIS_VDD_VCL

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B.7 RS-232 Serial Port (COM1,COM3,COM4)

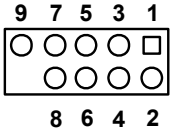

Table B.7: RS-232 serial port (COM1,COM3,COM4)

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	N/A

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B.8 PS/2 Keyboard/Mouse Connector (KBMS1)

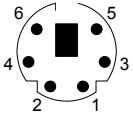

Table B.8: PS/2 keyboard/mouse connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.9 External Keyboard Connector (KBMS2)

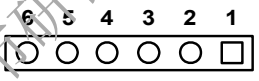

Table B.9: External keyboard connector (KBMS2)	
Pin	**Signal**
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

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B.10 CPU Fan Power Connector (CPUFAN1,CPUFAN2)

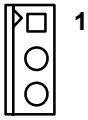

Table B.10: CPU Fan Power Connector (CPUFAN1,CPUFAN2)	
Pin	**Signal**
1	GND
2	+12V
3	Detect

B.11 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

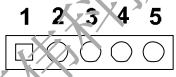

Table B.11: Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)	
Pin	**Function**
1	LED power (+5 V)
2	NC
3	GND
4	KEYLOCK#
5	GND

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B.12 External Speaker Connector (JFP2 / SPEAKER)

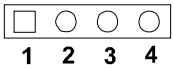

Table B.12: External Speaker Connector (JFP2 / SPEAKER)	
Pin	**Function**
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.13 Reset Connector (JFP1 / RESET)

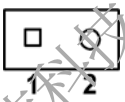

Table B.13: Reset connector (JFP1 / RESET)	
Pin	Signal
1	RESET #
2	GND

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B.14 HDD LED (JFP2 / HDDLED)

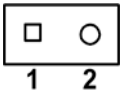

Table B.14: HDD LED (JFP2 / HDDLED)	
Pin	Signal
1	IDE LED+
2	IDE LED-

B.15 ATX Soft Power Switch (JFP1 / PWR_SW)

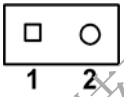

Table B.15: ATX soft power switch (JFP1 / PWR_SW)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

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B.16 AC'97 Link connector (AC97)

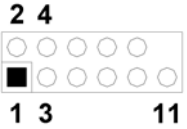

Table B.16: AC'97 Link connector (AC97)	
1 VCC	**2 GND**
3 Sync	4 BITCLK
5 SDOUT	6 SDIN0
7 SDIN1	8 AC-RST
9 +12V	10 GND
11 GND	12 N/C

B.17 SM Bus Connector (JFP2 / SNMP)

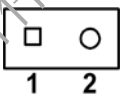

Table B.17: SM bus onnector (JFP2 / SNMP)	
Pin	**Signal**
1	SMB_DATA
2	SMB_CLK

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B.18 LAN1 and LAN2 LED connector (LANLED1)

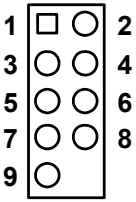

Table B.18: LAN1 and LAN2 LED connector (LANLED1)

Pin	Signal
1	#LAN1_ACT
2	V33_AUX
3	#LAN1_LINK1000
4	#LAN1_LINK100
5	V33_AUX
6	#LAN2_ACT
7	V33_AUX
8	#LAN2_LINK1000
9	#LAN2_LINK100

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B.19 GPIO header (GPIO1)

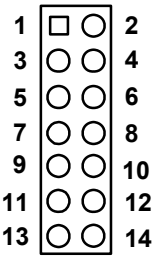

Table B.19: GPIO header (GPIO1)	
Pin	**Signal**
1	GPIO_1
2	GPIO_5
3	VCC_GPIO
4	GND
5	GPIO_2
6	GPIO_6
7	GND
8	GND
9	GPIO_3
10	GPIO_7
11	GND
12	GND
13	GPIO_4
14	GPIO_8

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B.20 System I/O Ports

Table B.20: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT3)
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

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B.21 DMA Channel Assignments

Table B.21: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

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B.22 Interrupt Assignments

Table B.22: Interrupt assignments		
Priority	**Interrupt#**	**Interrupt source**
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Available
7	IRQ11	Available
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Parallel port 2
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)

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B.23 1st MB Memory Map

Table B.23: 1st MB memory map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.24 PCI Bus Map

Table B.24: PCI bus map

Function Signals	IDSEL	INT# pin	GNT	REQ
SCSI	AD19	INT B,C	GNT B	REQ B
PCI slot 1	AD31	INT D, A, B, C	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT B,C,D,A	GNT C	REQ C
PCI slot 4	AD28	INT A, B, C, D	GNT D	REQ D

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Appendix C

Programming the GPIO and Watchdog Timer

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Appendix C Programming GPIO & Watchdog Timer

C.1 Supported GPIO Register

Bellow are detailed description of the GPIO addresses and programming sample.

C.1.1 GPIO Registers

CRF0 (GP10-GP17 I/O selection register. Default 0xFF)

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

CRF1 (GP10-GP17 data register. Default 0x00)

If a port is programmed to be an output port, then its respective bit can be read/written.

If a port is programmed to be an input port, then its respective bit can only be read.

CRF2 (GP10-GP17 inversion register. Default 0x00)

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in data register.

Extended Function Index Registers (EFIRs)

The EFIRs are write-only registers with port address 2Eh or 4Eh on PC/AT systems.

Extended Function Data Registers(EFDRs)

the EFDRs are read/write registers with port address 2Fh or 4Fh on PC/AT systems.

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C.1.2 GPIO Example program-1

Enter the extended function mode, interruptible double-write

```
MOV DX,4EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
```

Configurate logical device 7(GP10~GP17), configuration register CRF0,CRF1,CRF2

```
MOV DX,4EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,4FH
MOV AL,07H ; select logical device 7
OUT DX,AL ;
MOV DX,4EH
MOV AL,F0
OUT DX,AL
MOV DX,4FH
MOV AL,00H  ; 01:Input  00:output  for  GP10~GP17
OUT DX,AL
MOV DX,4EH
MOV AL,F2H ;
OUT DX,AL
MOV DX,4FH
MOV AL,00H    ;Set GPIO is normal not inverter
OUT DX,AL;
MOV DX,4EH
MOV AL,F1H
```

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```
OUT DX,AL
MOV DX,4FH
MOV AL,??H ;  Put the output value into AL
OUT DX,AL

-----------------------------------------
 Exit extended function mode |
-----------------------------------------
MOV DX,4EH
MOV AL,AAH
OUT DX,AL
```

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