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PCE-5120

PICMG 1.3 Full-sized Intel® LGA775 processor Card with PCI Express / IPMI / VGA /Dual Gigabit LAN

User Manual

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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.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Certifications

FCC

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

- This device may not cause harmful interference
- 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.*

Memory Compatibility

Brand	Size	Speed	Type	Memory
Apacer	1GB	DDR2 533	DDR2	SAMSUNG K4T51083QB-ZKD5 (128x4)
UG	512MB	DDR2 400	DDR2	
	1GB	DDR2 400	DDR2	ELPIDA E5108AB-5C-E (64x8)
Transcend	256MB	DDR2 533	DDR2	SAMSUNG 443 K4T56083QF-GCD5 (32x8)
	512MB	DDR2 533	DDR2	ELPIDA E5108AB-5C-E (64x8)
	1GB	DDR2 533	DDR2	ELPIDA E5108AB-5C-E (64x8)
DSL	512MB	DDR2 533	DDR2	Infineon HYB18T512 800AF37 FSS43331 (64x8)
	1GB	DDR2 533	DDR2	ELPIDA E5108AE-5C-E (64x8)
Apacer (RoHS)	512MB	DDR2 533	DDR2	ELPIDA E5108AG-5C-E (64x8)
	1GB	DDR2 533	DDR2	ELPIDA E5108AG-5C-E (64x8)
	512MB	DDR2 667	DDR2	ELPIDA E5108AG-6E-E (64x8)
	1GB	DDR2 667	DDR2	ELPIDA E5108AG-6E-E (64x8)
Transcend (RoHS)	256MB	DDR2 533	DDR2	Infineon HYB18T512 160AF3.7 3VV21710 (32x16)
	512MB	DDR2 533	DDR2	SEC K4T51083QC (64X8)
	1GB	DDR2 533	DDR2	SEC K4T51083QC (64X8)
	512MB	DDR2 667	DDR2	SEC K4T51083QC ES (64x8)
	512MB	DDR2 667	DDR2	SEC K4T51083QC
	512MB	DDR2 667	DDR2	5*32 D9DCL
	1GB	DDR2 667	DDR2	SEC K4T51083QC ES

Network Feature Comparison

LAN/Model	PCE-5120F	PCE-5120G2	PCE-5120VG
LAN1: Intel® 82573V	Yes	Yes	Yes
LAN2: Intel® 82573V	Yes	Yes	No
IPMI	Yes	No	No

Processor Support

PCE-5120-00A2E (Conroe/Conroe-L)	
Intel Core™ 2 Duo Desktop Processor (E6000/E4000) Intel Pentium® Dual-Core Desktop Processor (E2000) Intel Celeron® Processor 400	Long-term supported P/N: E6400, E4300, E2160, Celeron 440
PCE-5120-00A1E (Prescott / Cedar Mill)	
Intel Pentium D Processor Intel Pentium 4 Processor Intel Celeron D Processor	Long-term supported P/N: Pentium 4 3.4 GHz Pentium 4 3.0 GHz Celeron D 352/341

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.

If you think you have a defective product, follow these steps:

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.

Initial Inspection

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

- PCE-5120 Intel® LGA775 processor-based single board computer
- 1 PCE-5120 startup manual
- 1 CD with driver utility and manual (in PDF format)
- 1 FDD cable P/N: 1700340640
- 1 Ultra ATA 66/100 HDD cable P/N: 1701400452
- 2 Serial ATA HDD data cable P/N: 1700003194
- 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
- 1 CPU cooler P/N: 1750000400
- 1 USB cable with 4 ports P/N: 1700002314
- 1 warranty card P/N: 2190000902

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the PCE-5120 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-5120, 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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CHAPTER 1

Hardware Configuration

Chapter 1 Hardware Configuration

1.1 Introduction

The PCE-5120 is designed with the Intel® 945G chipset and ICH7R (I/O controller) to support Core™ 2 Duo, Dual-Core Pentium® D / Pentium® 4 / Celeron® D processors (refer to "Processor Support" on page vi) with a 533/800/1066 MHz front side bus and DDR2 533/667 MHz memory up to 4 GB. It follows the PICMG 1.3 specification and is the best solution for high-performance computing and applications in which a wide I/O bandwidth is demanded.

The PCE-5120 offers a high-performance cost-saving integrated graphics unit, built into the Intel® 945G chipset, and features the unique Intel® Extreme Graphics architecture to maximize VGA performance and share system memory up to 224MB. Whenever higher graphics computing ability is required, the PCE-5120 also provides a mainstream PCI Express x 16 Link to the PICMG 1.3 backplane to interface add-on graphic cards. In addition, the PCE-5120 has a single/dual Gigabit Ethernet LAN via dedicated PCI Express x 1 bus, which offers bandwidths up to 500 MB/sec., eliminating the network data flow bottlenecks, and incorporating Gigabit Ethernet to operate at 1000 Mbps. High reliability and outstanding performance make the PCE-5120 the ideal platform for industrial networking applications.

By using the Intel® ICH7R chipset, the PCE-5120 offers another four PCI-Express x 1 Link to backplane which can be configured for supporting variety expansion slots. With four on-board SATA2 interfaces (bandwidth = 300MB/sec), the PCE-5120 may support software RAID 0, 1, 5, 10 functions; eight USB 2.0 connections (four on board and four to backplane). These powerful I/O capabilities ensure even more reliable data storage capabilities and suitable for work with high-speed I/O peripherals.

In addition, the PCE-5120 also provides most of the popular I/O interfaces such as one ATA-100 EIDE ports, AC'97 audio interface, four RS-232 ports (COM2 port may be configured for supporting RS-232/422/485 through a pin header), one enhanced parallel port and floppy disk interface.

The PCE-5120 retains a legacy PCI 32-bit /33 MHz bus from the CPU board to the Backplane. It does not require a PCI-Express to PCI bridge chip to lower the system cost. It is good for the application and only needs a few legacy PCI Buses.

The PCE-5120 is designed with considerations for extended reliability, and is built especially to suit demanding industrial environments. 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.

The PCE-5120 also adopts Advantech's unique patented “Sleep Mode Control Circuit” for AT Power Mode. With this thoughtful design, users need NOT clear the CMOS after the system enters S3 mode. With all these excellent features and outstanding performance, the PCE-5120 is definitely the ideal platform for today's industrial applications.

1.2 Features

- Compliance with PICMG 1.3
- Support LGA 775 Intel® Core™ 2 Duo / Dual Core Pentium® D / Pentium® 4 / Celeron® D FSB 533/800/1066 MHz processors (refer to “Processor Support” on page vi)
- Support Dual Channel DDR2 533/667 SDRAM up to 4GB
- One PCI Express x 16 Link and Four x1 Link to backplane
- Dual Gigabit Ethernet via PCI Express x1 port
- Support Intel IAMT Technology (optional)
- On board IPMI BMC module (optional)
- 4 SATA2 HDDs (only on SHB)
- Support S/W RAID 0, 1, 5, 10

- 8 USB 2.0 ports (4 on SHB; 4 to Backplane)
- 4 COM port, COM2 port can be configured to support RS-232/422/485 through a pin header
- CMOS automatic backup and restore to prevent accidental data loss of BIOS setup

1.3 Specifications

1.3.1 System

- **CPU:** Intel® LGA 775 Core™ 2 Duo, Pentium D, Pentium 4, Celeron D up to 2.66/3.2/3.8/3.06 GHz, (refer to "Processor Support" on page vi), FSB 533/800/1066 MHz. PCE-5120 also attaches a verified CPU cooler(1750000400) for customers who use high-speed CPUs in 2U chassis or in a high-temperature environment.
- **L2 Cache:** CPU has built-in 4 MB (for Core™ 2 Duo), 2 x 1024KB/2 x 2048KB (for Pentium D CPU), 1024KB/2048KB (for Pentium 4 CPU), 256KB/512 KB (For Celeron D CPU) full-speed L2 cache.
- **BIOS:** Award Flash BIOS (4Mb Flash Memory)
- **System Chipset:** Intel 945G with ICH7R
- **SATA/EIDE hard disk drive interface:** Four on-board SATA2 connectors with data transmission rate up to 300 MB/s and supporting Advanced Host controller interface (AHCI) technology. One on-board IDE connector supporting up to two enhanced IDE devices. Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.) BIOS enabled/disabled.
- **CF Socket**: PCE-5120 offer a alternative type II CF socket of IDE port. Note: CF socket and IDE port can't work at the same time
- **Floppy disk drive interface:** Supports one floppy disk drive, 5¼" (360 KB and 1.2 MB) or 3½" (720 KB, 1.44 MB). BIOS enable/disable

1.3.2 Memory

- **RAM:** Up to 4 GB in four 240-pin DIMM sockets. Supports dual-channel DDRII 400/533/667 SDRAM.

Note: *Due to limitations of the PC architecture, the system may NOT fully detect 4 GB of RAM when 4 GB of RAM is installed.*

1.3.3 Input/Output

- **PCI Express links:** 1 PCI-E x 16 Link and 4 PCIe x1 Link to the PICMG 1.3 backplane.
- **PCI Bus:** 32bit / 33MHz to the backplane
- **Enhanced parallel port:** Configured to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Four serial ports on-board pin header, COM2 port can be configured for support RS 232/422/485.
- **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
- **USB port:** Supports up to eight USB 2.0 ports (four on board and four to backplane) with transmission rate up to 480Mbps.

1.3.4 Ethernet LAN

- Supporting single/dual 10/100/1000Base-T Ethernet port(s) via PCI Express x1 bus which provides 500 MB/s data transmission rate.
- **Controller:**

  LAN 1: Intel® 82573V (G2 version or VG version)

  LAN 2: Intel® 82573V (G2 Version)

1.3.5 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)

1.3.6 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 55° C (32 ~ 131° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3V, +5V, +12V, +5VSBY
- **Power consumption:** Maximum: +5 V at 2A, +3.3V at 20A, +12V at 15A, +5VSBY at 0.7A (Intel Pentium D 3.2GHz (800 MHz FSB), 4 x 1GB DDR2 667 SDRAM)

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

1.4 Jumpers and Connectors

Connectors on the PCE-5120 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.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumpers

Label	Function
CMOS1	CMOS Clear
JWDT1	Watchdog timer output selection
JSETCOM2	COM2 RS 232/422/485 mode selector

Table 1.2: Connectors

Label	Function
IDE1	Primary IDE connector
FDD1	Floppy Drive Connector
LPT1	Parallel port
VGA1	VGA connector
COM1	Serial port: COM1 (9-pin connector)
COM2	Serial port: COM2 (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	CPU FAN connector
JFP1	Power and Reset Button connector
JFP2	HDD LED/SNMP SMbus/Speaker connector
JFP3	Power LED and keyboard lock connector

Table 1.2: Connectors	
Label	**Function**
JOBS1	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
LAN1	Giga LAN RJ45 connector
LAN2	Giga LAN RJ45 connector
AC97	AC'97 Link connector
SATA1	Serial ATA1
SATA2	Serial ATA2
SATA3	Serial ATA3
SATA4	Serial ATA4
LANLED1	LAN1 and LAN2 LED connector
BMC1	BMC connector
USB12	Two USB port pin headers
USB34	Two USB port pin headers
EXPCI1	HIROSA Extended PCI connector (Optional)

1.5 Board Layout: Jumper and Connector Locations

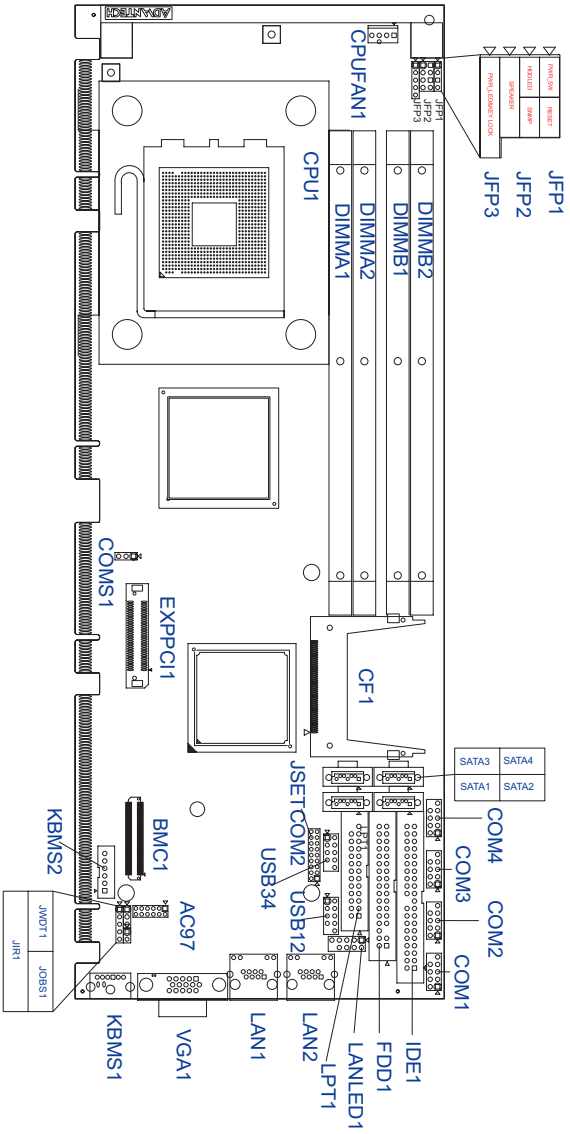


Figure 1.1: Jumper and Connector locations

1.6 PCE-5120 Block Diagram

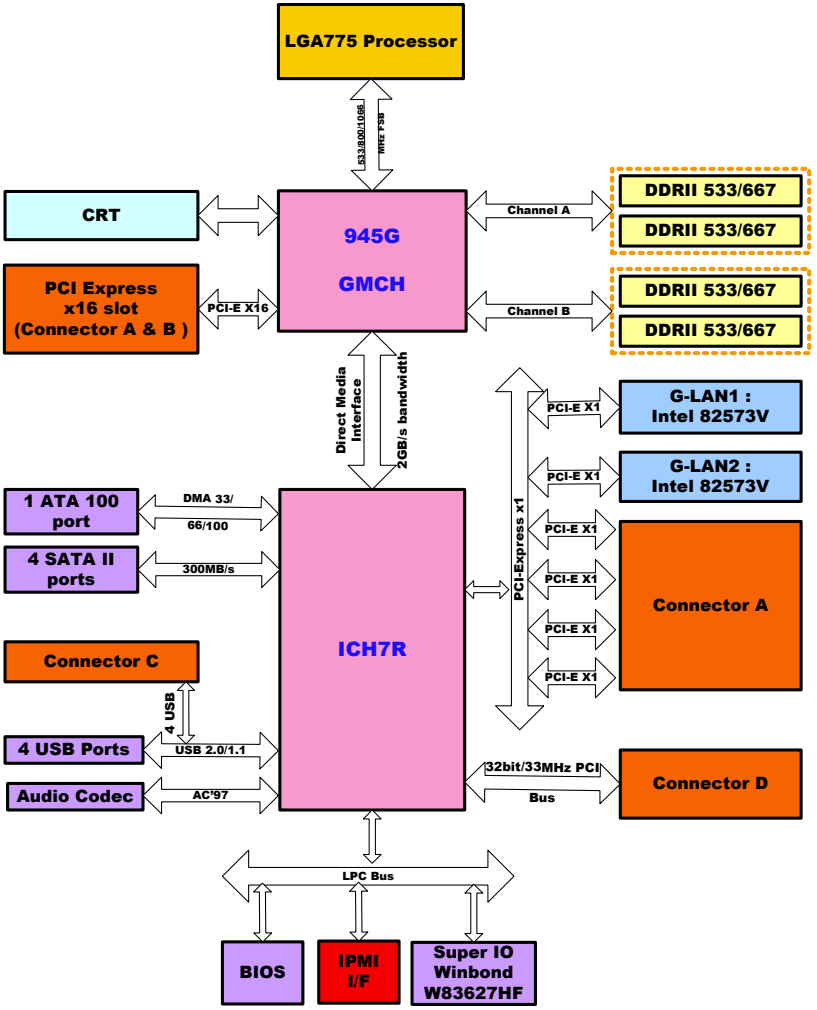


Figure 1.2: PCE-5120 Block Diagram

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 boards. 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.*

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.*

1.8 Jumper Settings

This section provides instructions on how to configure your PCE-5120 by setting the jumpers. It also includes the PCE-5120's default settings and your options for each jumper.

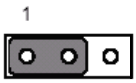
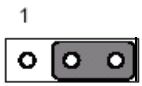
1.8.1 How to set jumpers

You can configure your PCE-5120 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-5120 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.

Table 1.3: CMOS (CMOS1)

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

* default setting

1.8.3 Watchdog timer output (JWDT1)

The PCE-5120 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means the PCE-5120 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)

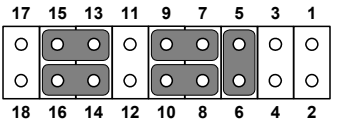
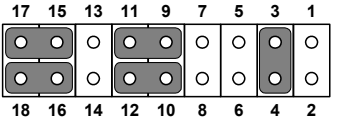
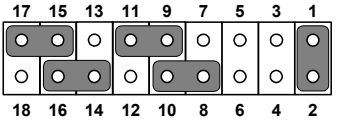
Function	Jumper Setting
Reserved	1  1-2 closed
* Reset	1  2-3 closed

*default setting

1.8.4 COM2 RS 232/422/485 mode selector (JSETCOM2)

Users can use JSETCOM2 to select among RS 232/422/485 modes for COM2. The default setting is RS 232.

Table 1.5: COM2 RS 232/422/485 mode selector (JSETCOM2)

COM 2 Port Function	Jumper Configuration
RS-232 *	
RS-422	
RS-485	

*default setting

1.9 System Memory

The PCE-5120 has four sockets for 240-pin dual inline memory modules (DIMMs) in two memory channels.

All these sockets use 1.8 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 256, 512 and 1024 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 256 MB and 4 GB.

1.9.1 CPU FSB and memory speed

The PCE-5120 can accept DDR2 SDRAM memory chips without parity. Also note: The PCE-5120 accepts DDR2 400/533/667MHz SDRAM. The PCE-5120 does NOT support ECC (error checking and correction).

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.

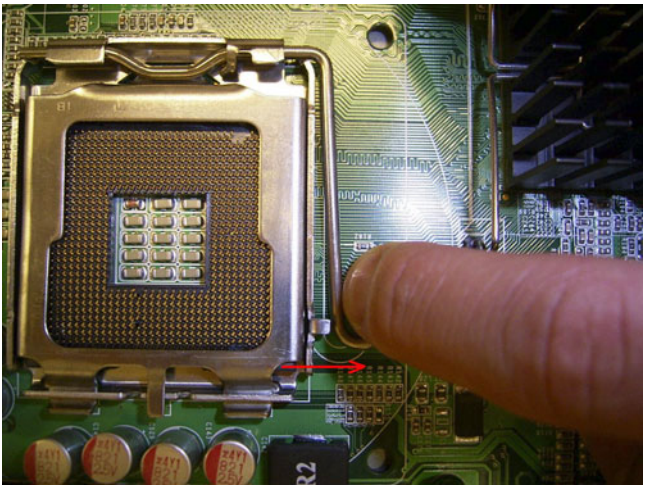
1.11 Cache Memory

The CPU that PCE-5120 supports built-in 4 MB (for Core™ 2 Duo), 2 x 1024KB/2 x 2048KB cache memory (for Pentium D CPU), and 1024KB/2048KB (for Pentium 4 CPU), and 256KB/512 KB (For Celeron D CPU) full-speed L2 cache. The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

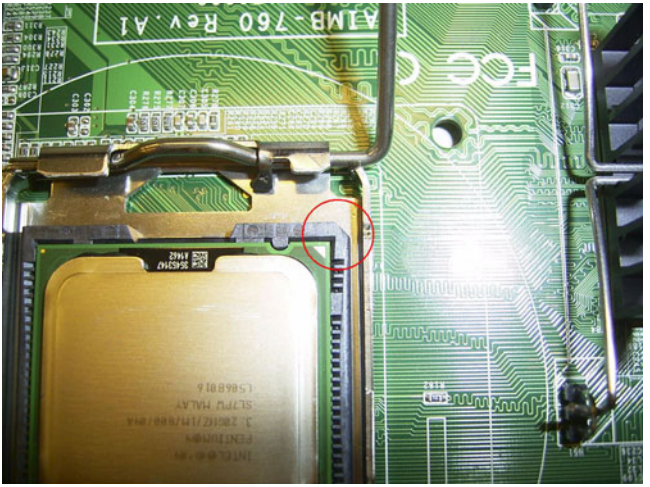
1.12 Processor Installation

The PCE-5120 is designed for Intel® LGA 775 socket CPUs.

Step 1: Pull the bar besides the CPU socket outward and lift it.



Step 2: Align the triangular marking on the processor with the cut edge of the socket.

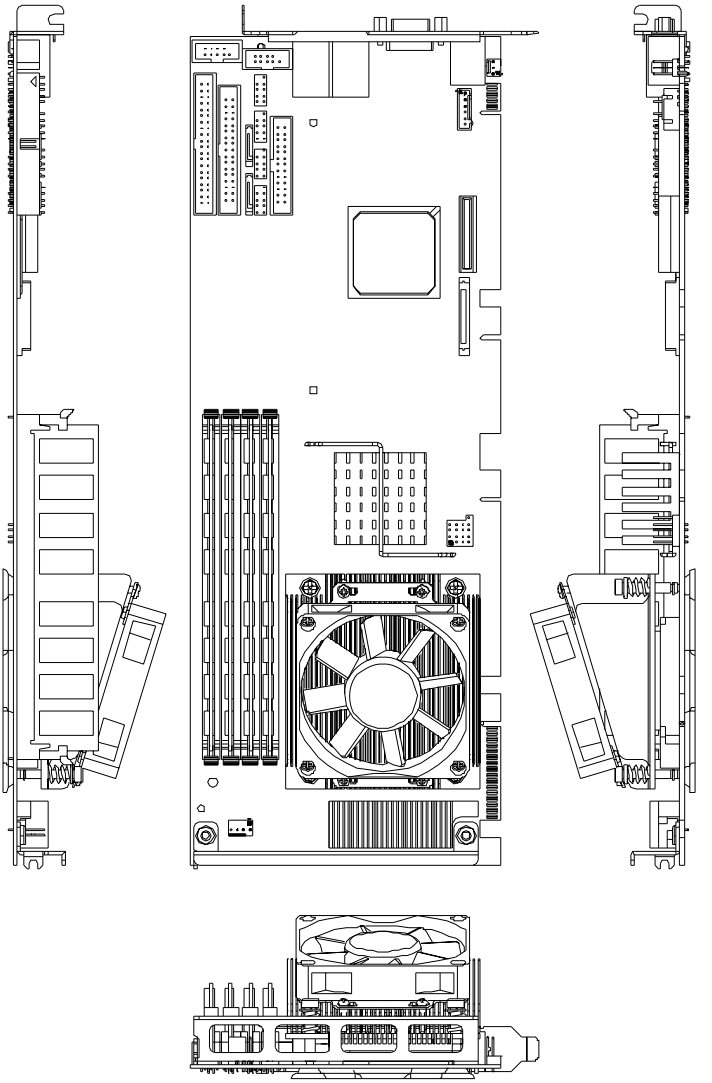


Step 3: Put back the socket cap and press down the bar to fix it.



1.13 CPU Cooler Installation

Please ensure that the CPU cooler included with the PCE-5120 is installed as follows:



CHAPTER 2

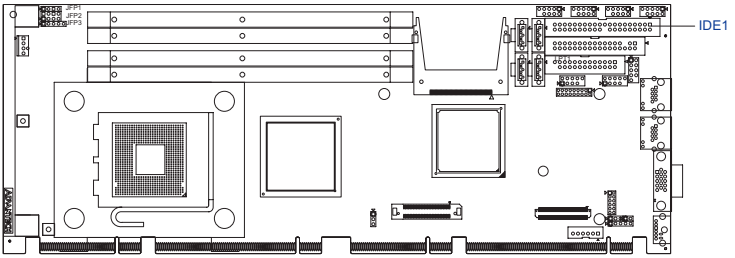
Connecting Peripherals

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 IDE Connectors (IDE1)



You can attach up to two IDE (Integrated Drive Electronics) drives to the PCE-5120's built-in controller.

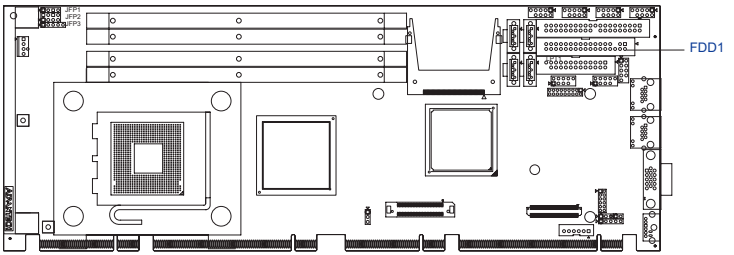
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector IDE1 on the single board computer. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

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.

PCE-5120 offers an alternative type II CF socket of IDE port. The CF socket and IDE port can't work at the same time. It will cause the data conflict.

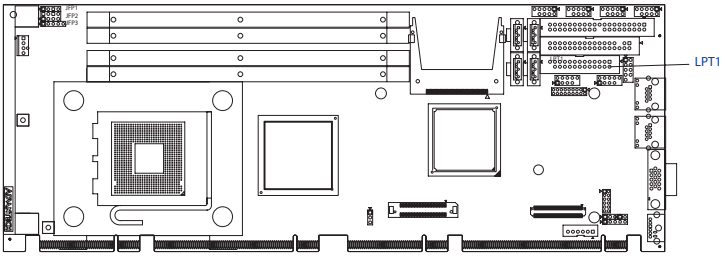
2.3 Floppy Drive Connector (FDD1)



You can attach up to two floppy disk drives to the PCE-5120'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)



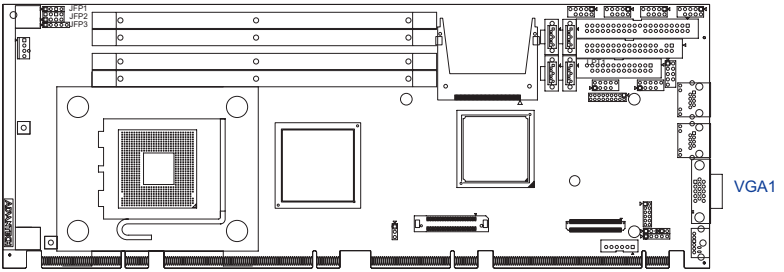
The parallel port is normally used to connect the single board computer to a printer. The PCE-5120 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector 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.

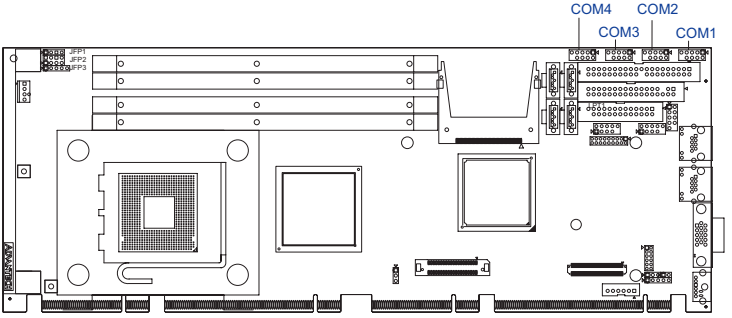
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire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

2.5 VGA Connector (VGA1)

The PCE-5120 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.



2.6 Serial Ports (COM1, COM2, COM3, COM4)

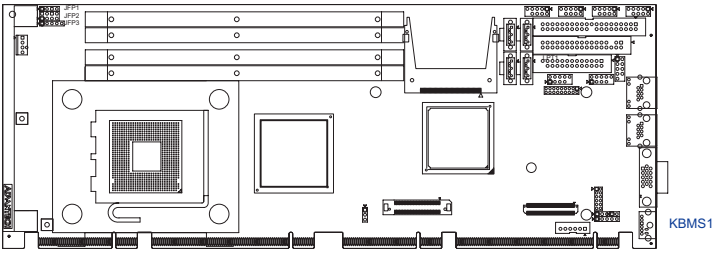


The PCE-5120 offers four serial ports COM1, COM2, COM3 and COM4. These ports can connect to serial devices, such as a mouse or to a communications network. The COM2 port can be configured to support RS-232/422/485 by pin header (JSETCOM2) setting, please refer to 1.8.4 for the information.

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.

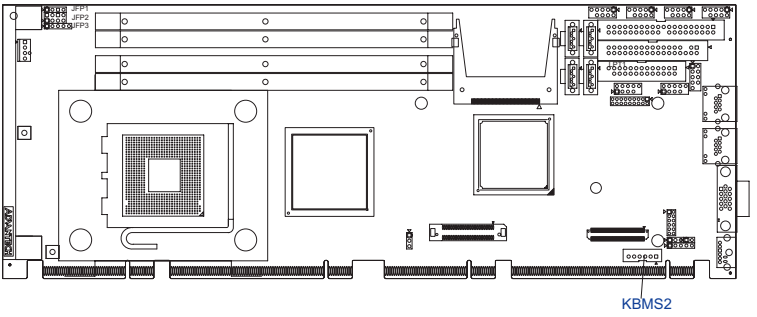
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.7 PS/2 Keyboard and Mouse Connector (KBMS1)



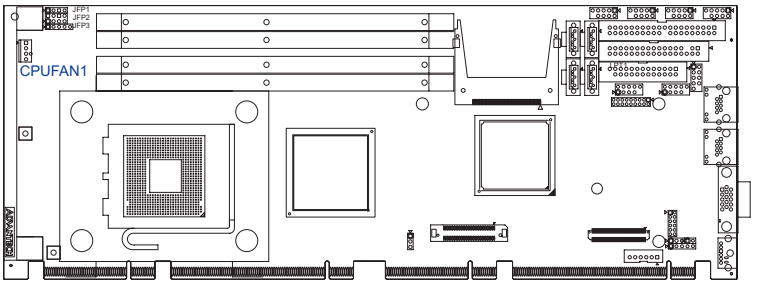
One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard or a PS/2 mouse, respectively. KBMS1 can also be connected to an adapter cable (P/N: 1700060202) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.8 External Keyboard & Mouse (KBMS2)



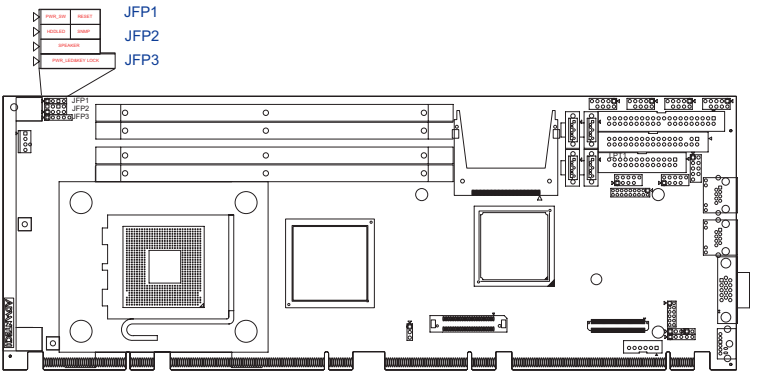
In addition to the PS/2 mouse/keyboard connector on the PCE-5120's rear plate, there is also an extra onboard external keyboard and mouse connector. This gives system integrators greater flexibility in designing their systems.

2.9 CPU Fan Connector (CPFAN1)

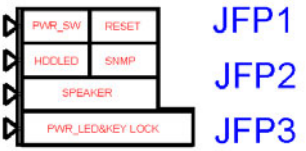


If a fan is used, this connector supports cooling fans of 12V/1A (12W) or less.

2.10 Front Panel Connectors (JFP1, JFP2, JFP3)



There are several external switches to monitor and control the PCE-5120.



2.10.1 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.

2.10.2 Reset (JFP1 / RESET)

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

2.10.3 HDD LED (JFP2 / HDDLED)

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

2.10.4 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.

2.10.5 External speaker (JFP2 / SPEAKER)

(JFP2 / SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the PCE-5120 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

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

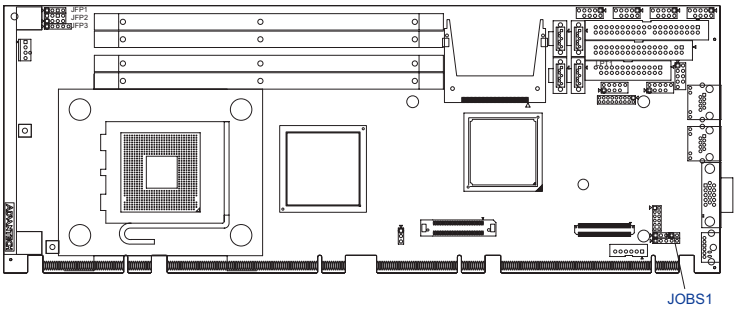
(JFP3 / PWR_LED&KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5.

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 switching 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

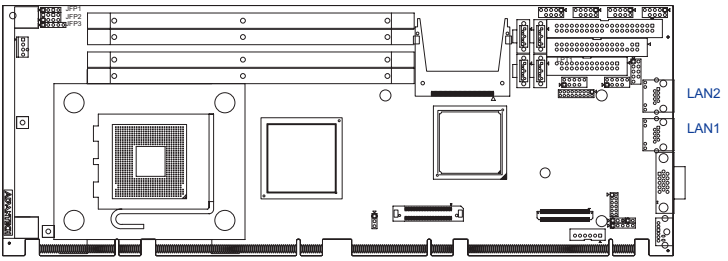
2.11 H/W Monitor Alarm (JOBS1)



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

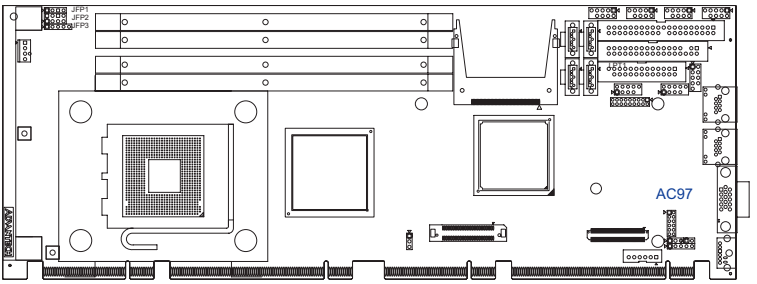
Table 2.2: Hardware Monitor Alarm setting	
Pin setting	**Function**
Close	Enable OBS alarm
open	Disable OBS alarm

2.12 Gigabit LAN RJ45 connector (LAN1, LAN2)



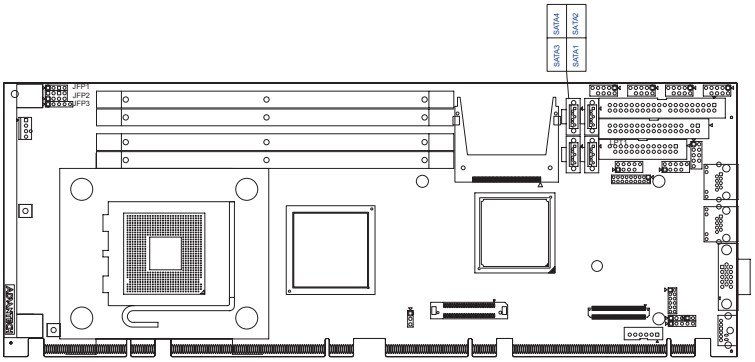
PCE-5120 uses the Intel 82573V Gigabit LAN chip which is linked to PCIe x1 Link. With this chip PCE-5120 may provide high throughputs for heavy loading networking environment. It provides two or one RJ-45 connectors in the rear side and is convenient for most industrial applications.

2.13 AC'97 Link connector (AC97)



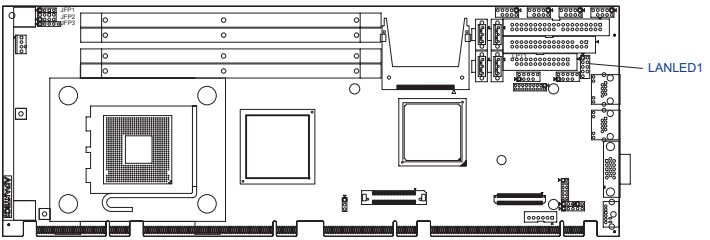
The PCE-5120 provides AC'97 audio through PCA-AUDIO-00A1 module from Advantech.

2.14 Serial ATA2 Interface



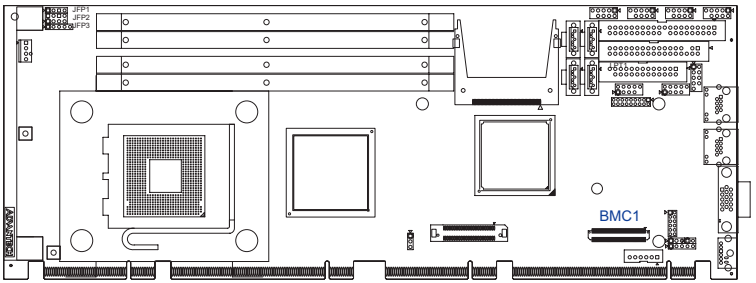
In addition to the EIDE interfaces (up to two devices), the PCE-5120 features a high performance serial ATA2 interface (up to 300MB/s) which eases cabling to hard drives with thin and long cables. These four port can be configured as RAID 0, 1, 5, 10 applications.

2.15 LAN1 and LAN2 LED connector (LANLED1)



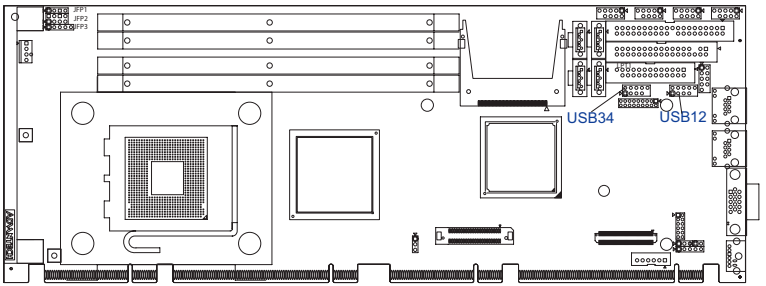
PCE-5120 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users may know whether the LAN port is acting or not easily. Refer to Appendix B for detailed information on the pin assignments.

2.16 BMC connector (BMC1)



PCE-5120 is designed for supporting IPMI 2.0. The BMC module is mounted on board through this connector. For more detail operating information, please refer to Chapter 9.

2.17 USB (USB12, USB34)



The PCE-5120 provides four on board USB 2.0 ports which support transmission rate up to 480 Mbps and is fuse-protected. To install the USB cable (p/n: 1700002314) bracket, find an empty slot in your chassis and unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the USB connector to USB12 and USB34 on the CPU card.

CHAPTER 3

Award BIOS Setup

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.

3.2 Entering Setup

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

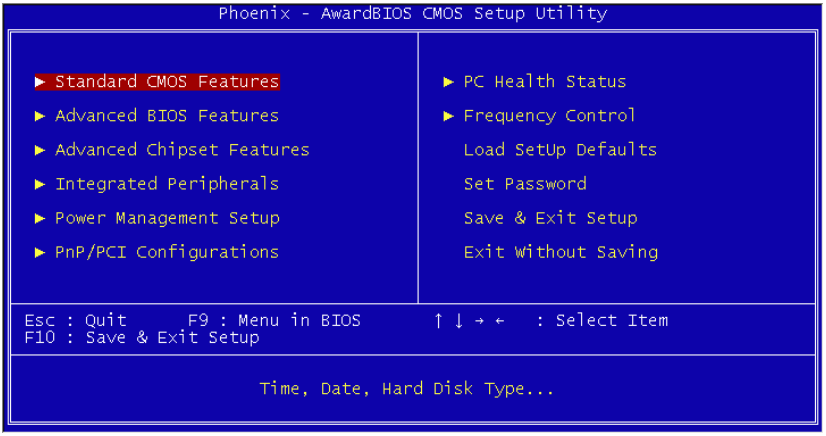


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

3.3.1 Date

The date format is <week>, <month>, <day>, <year>.

3.3.2 Time

The time format is <hour> <minute> <second>, based on the 24-hour clock.

3.3.3 IDE channel 0/1 Master/Slave

- **IDE HDD Auto-Detection**: Press “Enter” to select this option for automatic device detection.
- **IDE Device Setup**:
  Auto: Automatically detects IDE devices during POST
  None: Select this when no IDE device is used. The system will skip the auto-detection step to make system start up faster.
  Manual: User can manually input the correct settings.
- **Access Mode**: The options are CHS/LBA/Large/Auto
- **Capacity**: Capacity of currently installed hard disk.
- **Cylinder**: Number of cylinders

- **Head**: Number of heads
- **Precomp**: Write precomp
- **Landing Zone**: Landing zone
- **Sector**: Number of sectors

3.3.4 Drive A / Drive B

This category identifies the types of floppy disk drives installed in the system. The options are: None/360K, 5.25"/1.2M, 5.25"/720K, 3.5"/1.44M, 3.5"/2.88M, 3.5".

3.3.5 Halt On

This category determines whether system start-up will halt or not when an error is detected during power up.

The options are: No Errors/All Errors/All, But Keyboard/All, But Diskette/All, But Disk/Key

3.3.6 Memory

This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

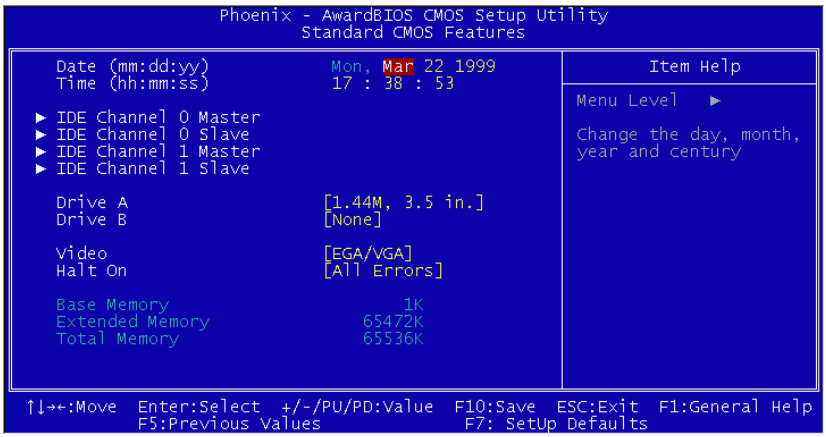


Figure 3.2: Standard CMOS Features Screen

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-5120 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.

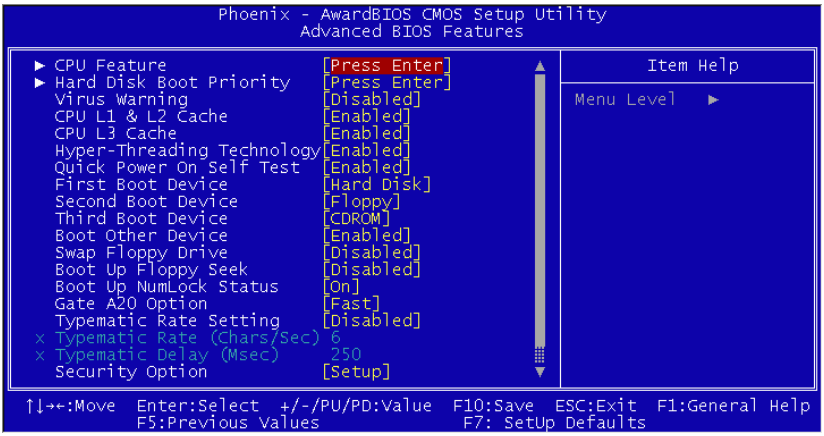


Figure 3.3: Advanced BIOS features screen

3.4.1 CPU Features

Delay Prior to thermal

This feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up. The choices are 4 Min, 8 Min, 16 Min, and 32 Min.

Limit CPUID MaxVal

Set Limit CPUID MaxVa1 to 3. This should be disabled for WinXP.

Execute Disable Bit

When disabled, forces the XD feature flag to always return 0.

3.4.2 Hard Disk Boot Priority
Set hard disk boot device priority.

3.4.3 Virus Warning
Enables or disables the virus warning.

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

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

3.4.6 Quick Power On Self Test
This allows the system to skip certain tests to speed up the boot-up procedure.

3.4.7 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".

3.4.8 Boot Other Device
Use this to boot another device. The options are "Enabled" and "Disabled".

3.4.9 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".

3.4.10 Boot Up Floppy Seek
Selection of the command "Disabled" will speed the boot up. Selection of "Enabled" searches disk drives during boot up.

3.4.11 Boot Up NumLock Status
Sets the boot up status Num Lock. The options are "On" and "Off".

3.4.12 Gate A20 Option
"Normal": A pin in the keyboard controller controls GateA20. Fast (Default) lets chipset control GateA20.

3.4.13 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.

3.4.14 Typematic Rate (Chars/Sec)

The BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, and 30.

3.4.15 Typematic Delay (msec)

Typematic delay is the time interval between the appearances of two consecutive characters, when the key is continuously depressed. The input values for this category are: 250, 500, 750, and 1000 (ms).

3.4.16 Security Option

This category determines whether the password is required when the system boots up or only when entering setup. The options are:

- **System**: The system will not boot, and access to Setup will be also denied unless the correct password is entered at the prompt.
- **Setup**: The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

Note: To disable security, select PASSWORD SETTING in the main menu. Then, 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.

3.4.17 APIC Mode

This setting allows you to enable the APIC mode. The choices are “Disabled” or “Enabled.”

3.5 Advanced Chipset Features

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-5120, as shown in Figure 3-4:

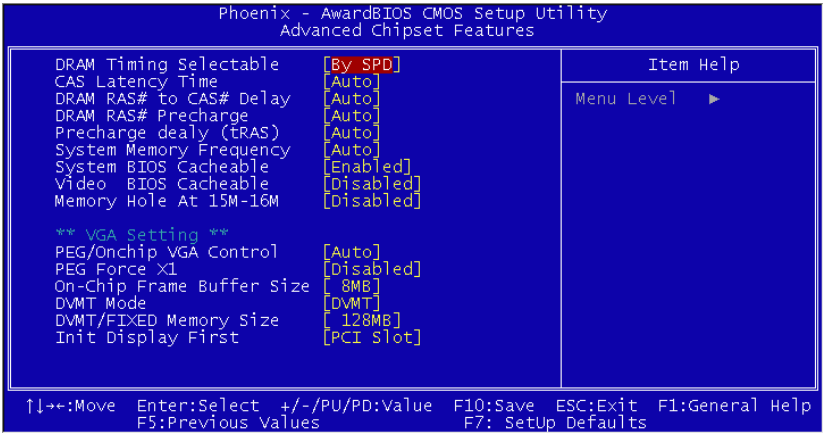


Figure 3.4: Advanced chipset features screen

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

3.5.1 DRAM Timing Selectable

This item allows you to control the DRAM speed. The selections are “Manual” or “By SPD”.

3.5.2 CAS Latency Time

When DRAM Timing Selectable is set to [Manual], this field is adjustable. This controls the CAS latency, which determines the time interval between SDRAM starting a read command and receiving it. The options are [3T], [4T], [5T], and [Auto].

3.5.3 DRAM RAS# to CAS# Delay

When DRAM Timing selectable is set to [Manual], this field is adjustable. When DRAM is refreshed, the rows and columns are addressed separately. This setup item allows user to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles are, the faster the DRAM speed is. Setting options are [2T] to [5T], and [Auto].

3.5.4 DRAM RAS# Precharge

When the DRAM Timing Selectable is set to [Manual], this field is adjustable. This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If no sufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options are [2T] to [5T], and [Auto].

3.5.5 Precharge Delay (t RAS)

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The choices are: “4” to “15” and “Auto”.

3.5.6 System Memory Frequency

To adjust the frequency of memory. The choices are: “333MHz”, “400MHz”, “533MHz” and “Auto”.

3.5.7 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 data to this memory area, a system error may occur. The Choices are “Enabled”, and “Disabled”.

3.5.8 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 are “Enabled”, and “Disabled”.

3.5.9 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”.

3.5.10 PCI-Express Root Port Func

PCI Express Port 1/2/3/4

The default setting is “Auto.” The choices are “Enabled,” “Disabled,” and “Auto.”

PCI-E Compliancy Mode

This allows the user to select the PCI-E compliant mode. The options are [v1.0], and [v1.0a].

3.5.11 PEG / Onchip VGA Control

Use this field to select PEG or Onchip VGA. The default is AUTO.

3.5.12 PEG Force X1

Use this field to select the PEG Force X1. The default is disabled.

3.5.13 On-Chip Video Memory Size

Use this field to select the On-Chip Frame Buffer Size, Fixed Memory Size and DVMT Memory Size. The total graphics memory can be up to 128 MB.

3.5.14 On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set to 1 MB or 8 MB. This memory is shared with the system memory.

3.5.15 DVMT Mode

Displays the active system memory mode.

3.5.16 DVMT / FIXED Memory Size

Specify the size of DVMT / FIXED system memory to allocate for video memory.

3.5.17 Init Display First

Choose the first display interface to initiate while booting. The choice is “PCI Slot” or “Onboard”.

3.6 Integrated Peripherals

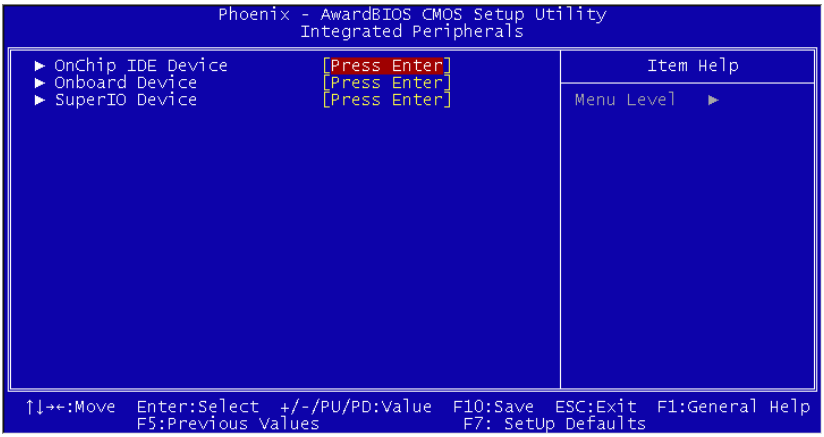


Figure 3.5: Integrated peripherals

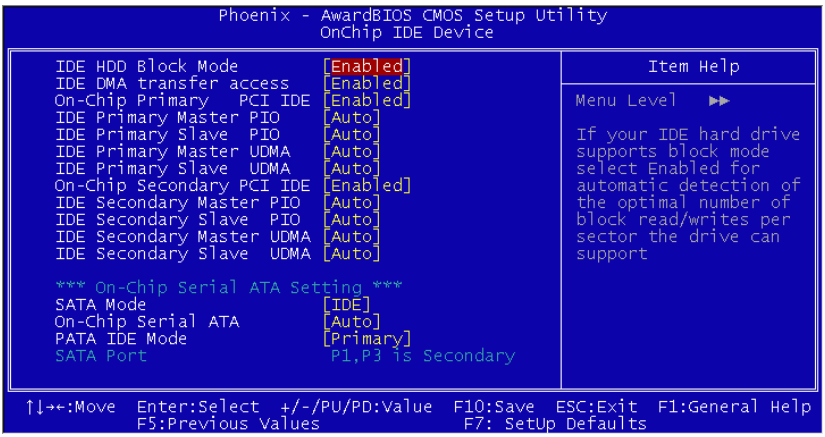


Figure 3.6: On-Chip IDE Device

3.6.1 IDE HDD Block Mode

If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

3.6.2 IDE DMA Transfer Access

Use this field to enable or disable IDE DMA transfer access.

3.6.3 On-Chip Primary / Secondary IDE Device

IDE Primary Master/Slave PIO/UDMA Mode (Auto). The channel has both a master and a slave, making four IDE devices possible. Because two IDE devices 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.

3.6.4 SATA Mode

The setting choices for the SATA Mode are IDE, RAID and AHCI Mode. Select [IDE] if you want to have SATA function as IDE. Select [AHCI] for Advanced Host Controller Interface (AHCI) feature, with improved SATA performance and native command queuing. Select [RAID] to use SATA for RAID.

Note: *Please refer to the PDF-format Intel (R) Matrix Storage Technology Quick Start Guide and Intel (R) Matrix Storage Manager User's Manual in this CD (in the MANUAL folder) to know the necessary steps to build and configure your RAID 0, 1, 10, 5 system using Intel (R) Matrix Storage Technology and Matrix Storage Manager.*

3.6.5 Note: On-Chip Serial ATA

Choose the status of serial ATA. The default setting is "Auto" which lets the system arrange all parallel and serial ATA resources automatically. The "Disabled" setting disables the SATA controller. The "Combined Mode" combines PATA and SATA, and maximum of 2 IDE drives in each channel. The "Enhanced Mode" enables both SATA and PATA, and a maximum of 6 IDE drives are supported. The "SATA Only" setting means SATA is operating in legacy mode.

3.6.6 PATA IDE Mode

This item allows you to select the parallel ATA channel. Setting options are Primary and Secondary.

3.6.7 SATA Port

This feature allows users to view the SATA port as primary or secondary channel. If PATA IDE Mode is set to "Primary", it will display "P1, P3 Secondary" which means that SATA1 and SATA3 are secondary. If PATA IDE Mode is set to "Secondary," it will display "P0, P2 Secondary" which means that SATA0 and SATA2 are secondary.

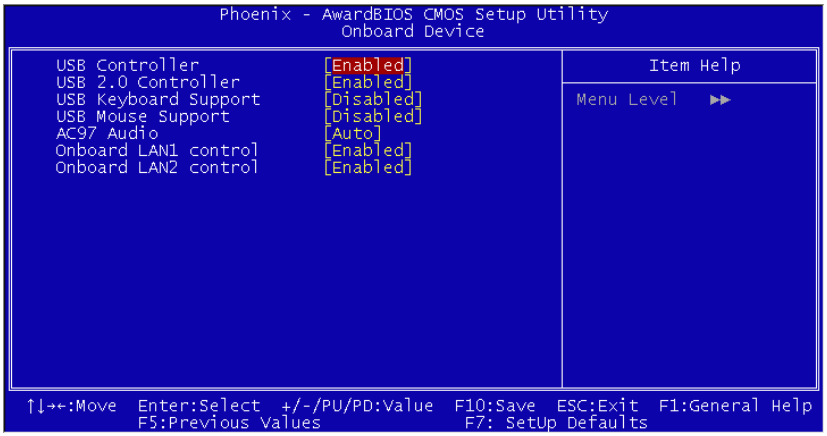


Figure 3.7: Onboard Device

3.6.8 USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices are “Enabled” and “Disabled”.

3.6.9 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”.

3.6.10 USB Keyboard / Mouse Support

Select Enabled if you plan to use an USB keyboard. The choices are “Enabled” and “Disabled”.

3.6.11 AC97 Audio

Select “Disable” if you do not want to use AC’97 audio. Options are “Auto”, and “Disabled”.

3.6.12 Onboard LAN1 Control

Options are “Enabled” and “Disabled”. Select “Disabled” if you don’t want to use onboard LAN controller1.

3.6.13 Onboard LAN2 Control

Options are “Enabled” and “Disabled”. Select Disabled if you don’t want to use the onboard LAN controller2.

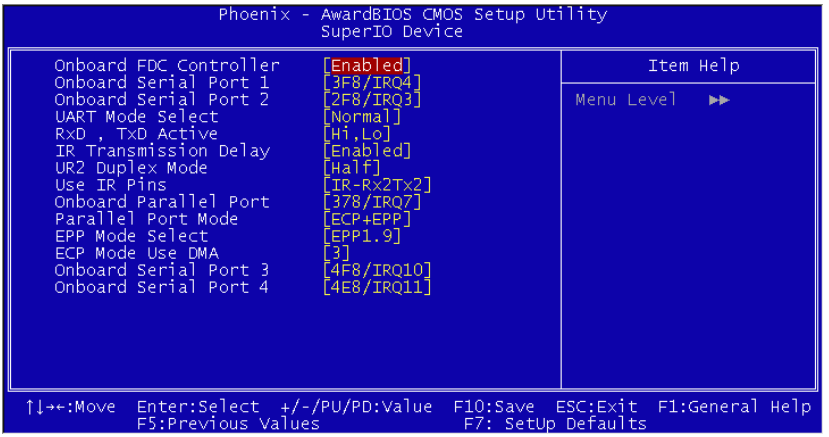


Figure 3.8: Super I/O Device

3.6.14 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.

3.6.15 Onboard Serial Port 1

The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

3.6.16 Onboard Serial Port 2

The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

3.6.17 UART Mode Select

This item allows you to select UART mode. The choices: “IrDA”, “ASKIR”, and “Normal”.

3.6.18 RxD, TxD Active

This item allows you to determine the active level of the RxD and TxD serial lines. The Choices: “Hi, Hi”, “Lo, Lo”, “Lo, Hi”, and “Hi, Lo”.

3.6.19 IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices are “Enabled” and “Disabled”.

3.6.20 UR2 Duplex Mode
This item allows you to select the IR half/full duplex function. The choices are “Half” and “Full”.

3.6.21 Use IR Pins
The choices are “RxD2, TxD2” and “IR-Rx2Tx2”.

3.6.22 Onboard Parallel Port
This field sets the address of the on-board parallel port connector. You can select “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.

3.6.23 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 bidirectional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.

3.6.24 EPP Mode Select
This field allows you to select EPP port type 1.7 or 1.9. The choices are “EPP1.9” and “EPP1.7”.

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

3.6.26 Onboard Serial Port 3
The settings are “4F8h/IRQ10”, “4E8h/IRQ10” and “Disabled” for the on-board serial connector 3.

3.6.27 Onboard Serial Port 4
The settings are “4F8h/IRQ11”, “4E8h/IRQ11” and “Disabled” for the on-board serial connector 4.

3.7 Power Management Setup

The power management setup controls the single board computer's "green" features to save power. The following screen shows the manufacturer's defaults.

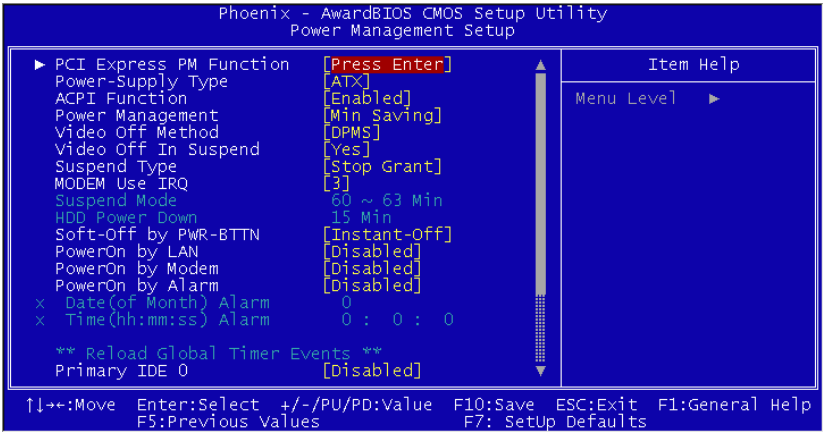


Figure 3.9: Power management setup screen (1)

3.7.1 PCI express PM Function

This is to setup PCI Express's PME function "Enable" or "Disable".

3.7.2 Power Supply Type

PCE-5120 can support both "ATX" and "AT" power supplies. Customers can choose the PSU type through this selection. The choices are "ATX" and "AT". Selecting "AT" disables the ACPI function automatically.

3.7.3 ACPI Function

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

3.7.4 Power Management

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

- HDD Power Down
- Suspend Mode

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

Table 3.1: Power Saving

Saving Mode	Function
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.

3.7.5 Video Off Method

Use this to select the method to turn off the video. The choices are “Blank Screen”, “V/H SYNC+ Blank”, and “DPMS”.

3.7.6 Video Off In Suspend

When the system is in suspend mode, the video will turn off. The choices are “No” and “Yes”.

3.7.7 Suspend Type

The choices are “Stop Grant” and “PwrOn Suspend”.

3.7.8 Modem Use IRQ

This determines the IRQ that the MODEM can use.The choices are “3”, “4”, “5”, “7”, “9”, “10”, “11”, and “NA”.

3.7.9 Suspend Mode

Please refer to 3.7.3

3.7.10 HDD Power Down

Please refer to 3.7.3

3.7.11 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.

3.7.12 PowerOn by LAN

This item allows you to power on the system by LAN. The choices are “Enabled” and “Disabled”.

3.7.13 PowerOn by Modem

To enabled or disable the function to power on the system via a Modem connection from a remote host. The choice “Enabled” and “Disabled”.

3.7.14 PowerOn by Alarm

The choices are “Enabled” and “Disabled”. Fields that follow below indicate date of current month and time of alarm settings, if enabled.

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

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) becomes active. The choices are “Enabled” and “Disabled”.

3.7.16 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if the FDD, interface, COM port, or LPT port is active. The choices are “Enabled” and “Disabled”.

3.7.17 PCI PIRQ [A-D]#

When Enabled, the system resumes from suspend mode if an interrupt occurs. The choices are “Enabled” and “Disabled”.

3.7.18 PWRON After PWR-Fail

Use this to set up the system after power failure. The “Off” setting keeps the system powered off after power failure, the “On” setting boots up the system after failure, and the “Former-Sts” returns the system to the status before power failure.

3.8 PnP/PCI Configurations

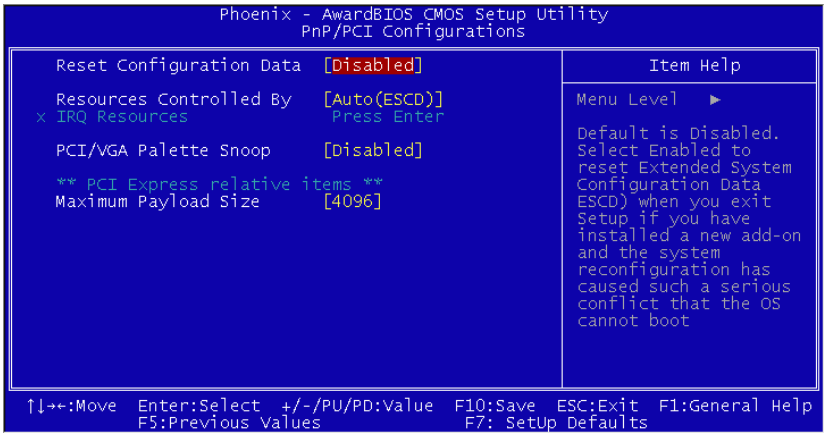


Figure 3.10: PnP/PCI configurations screen

3.8.1 Reset Configuration Data

The default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

3.8.2 Resources Controlled By

The commands here are “Auto (ESCD)” or “Manual”. Choosing “Manual” requires you to choose resources from the following sub-menu. “Auto (ESCD)” automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.

3.8.3 PCI / VGA Palette Snoop

This is set to “Disabled” by default.

3.8.4 Maximum Payload Size

This allows you to set the maximum TLP payload size for PCI Express devices. The options are [128 bytes], [256 bytes], [512 bytes], [1024 bytes], [2048 bytes], and [4096 bytes].

3.9 PC Health Status

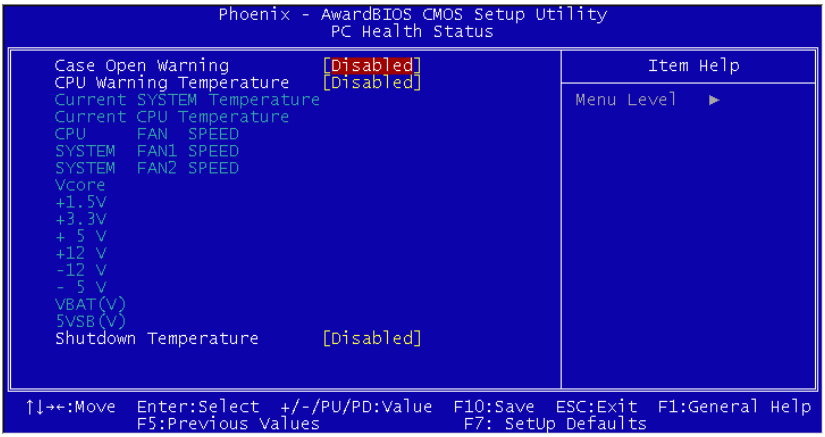


Figure 3.11: PC Health Status Screen

3.9.1 Case Open Warning

Enable this to detect if the case is open or closed.

3.9.2 CPU Warning Temperature

This item will prevent the CPU from overheating. The choices are “Disabled”, “60C/140F”, “63C/145F”, “66C/151F”, “70C/158F”, “75C/167F”, “80C/176F”, “85C/185F”, “90C/194F”, and “95C/205F”.

3.9.3 Current System Temperature

This shows you the current temperature of system.

3.9.4 Current CPU Temperature

This shows the current CPU temperature.

3.9.5 CPU FAN Speed

This shows the current CPU FAN operating speed.

3.9.6 System FAN 1 / 2 Speed

This shows the current System FAN operating speed.

3.9.7 VCORE and Other Voltages

This shows the voltage of VCORE, +1.5V, +3.3, +5V, +12V, -12V, -5V, VBAT(V), and 5VSB(V).

3.9.8 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.

3.10 Frequency / Voltage Control

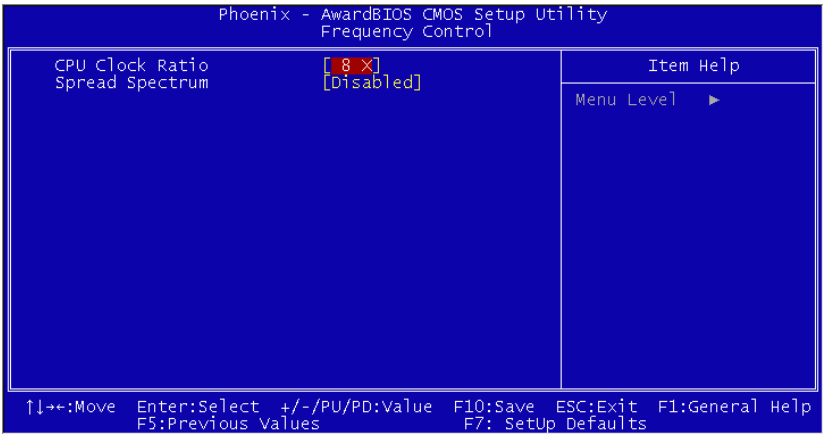


Figure 3.12: Spread Spectrum Control screen

3.10.1 CPU Clock Ratio

Type a DEC number to set up the CPU Clock Ratio (Min=14; Max=17). This item only shows up in special situations.

3.10.2 Spread Spectrum

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The choices are “Disabled” and “Enabled”.

3.11 Load Setup Defaults

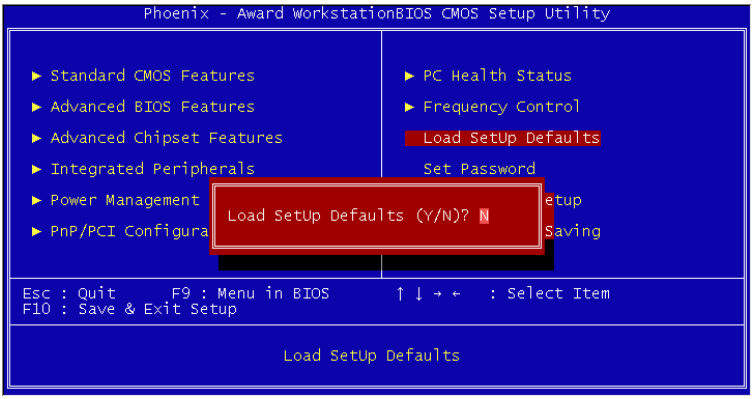


Figure 3.13: Load Setup Defaults screen

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.

3.12 Save & Exit Setup

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 processor 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.

3.13 Exit Without Saving

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

CHAPTER 4

Chipset Software Installation Utility

Chapter 4 Chipset Software Install Utility

4.1 Before you begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the PCE-5120 are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and drivers under a Windows system. The Intel® Chipset Software Installation Utility is not required on any systems running Windows NT 4.0. Updates are provided via Service Packs from Microsoft*.

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.*

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 manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI and ISAPNP Services
- PCIe Support

- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel (R) Chipset Components in the Device Manager

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

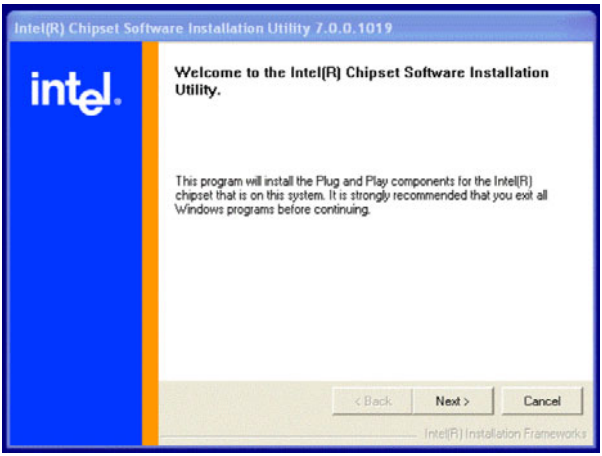
- Microsoft Windows* Server 2003 with Service Pack 1
- Microsoft Windows Server 2003 x64 Edition*
- Microsoft Windows XP Professional x64 Edition
- Microsoft Windows XP with Service Pack 2
- Microsoft Windows 2000 with Service Pack

4.3 Windows XP Driver Setup

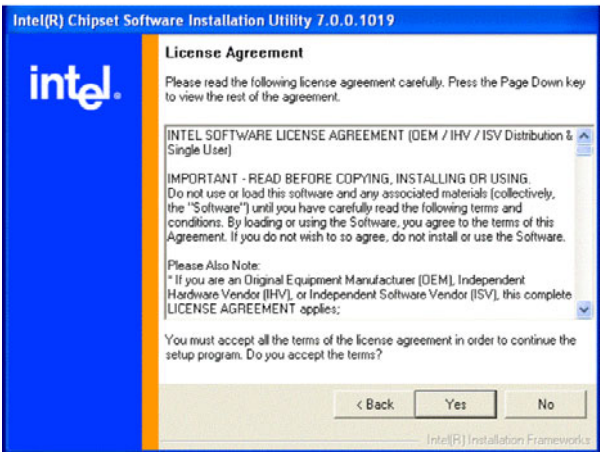
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Move the mouse cursor over the “Install” button under the “CSI UTILITY” heading. A message pops up telling you to install the CSI utility before other device drivers, as shown in the following figure. Click on this button. To take Windows XP as example.



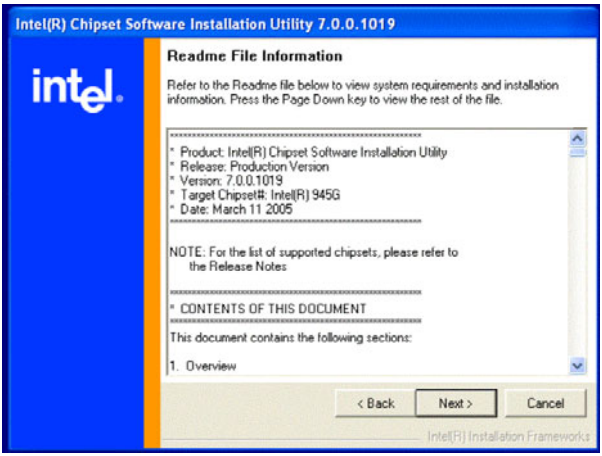
2. Click “Next” when you see the following message.



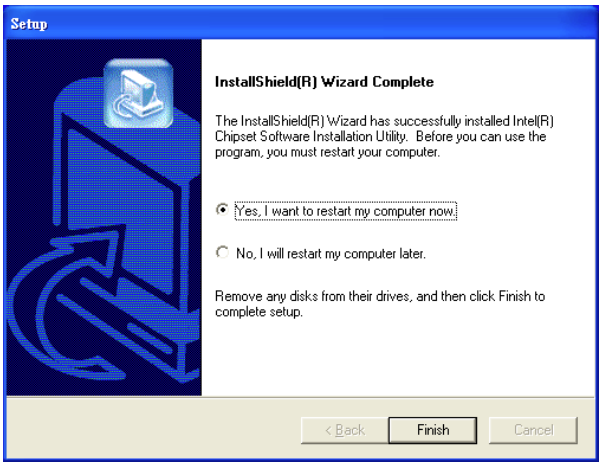
3. Click “Yes” when you see the following message.



4. Click “Next” when you see the following message.



5. When the following message appears, click “Finish” to complete the installation and restart Windows.



CHAPTER 5

VGA Setup

Chapter 5 VGA Setup

5.1 Introduction

The Intel 945G integrated graphics controller provides an analog display port. You need to install the VGA driver to enable the function. The Intel 945G integrated graphics controller incorporates the latest Microsoft* DirectX*9 support capabilities. It allows software developers to create life like environments and characters. Enhanced display modes for wide-screen flat panels, and optimized 3D support deliver an intense and realistic visual experience without requiring a separate graphics card.

5.2 Windows XP Driver Setup

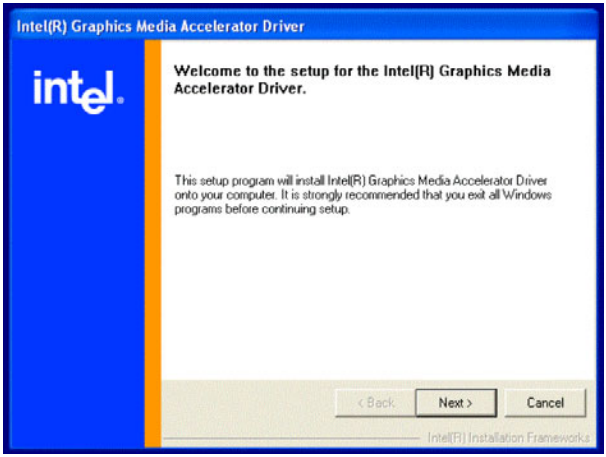
Note: *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.*

Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure.



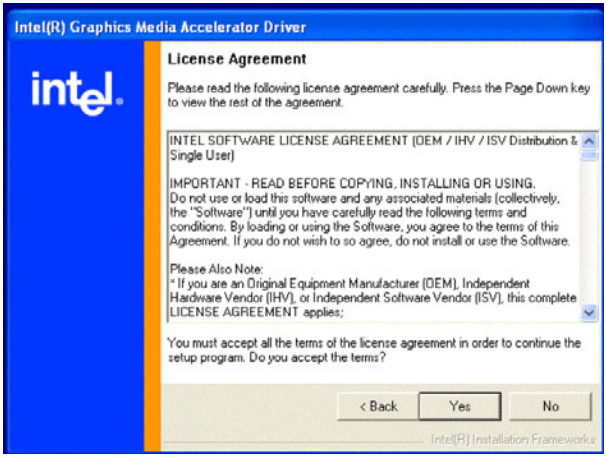
The following installation procedure is for Windows XP. For other operating systems, please do a manual installation.

1. Click “Next” to continue the installation.

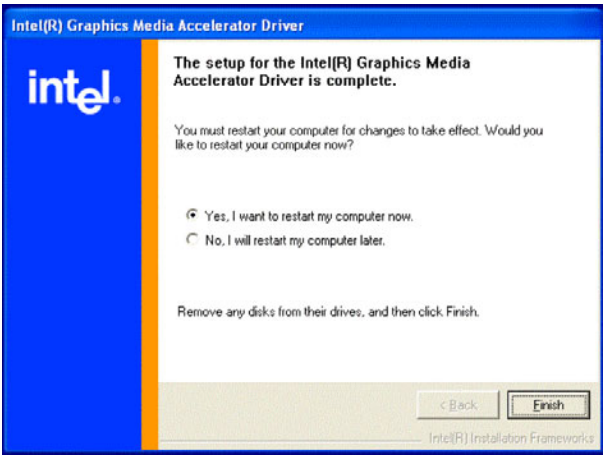


2. You will see a welcome window. Please click “Yes” to continue the installation.

.



3. Click “Finish” to complete the installation and restart the computer now or later.



CHAPTER 6

Onboard Security Setup

Chapter 6 Onboard Security Setup

6.1 Introduction

The PCE-5120's hardware monitor is based on the Winbond W83627HF chip. Onboard security (OBS) functions monitor key hardware to help you maintain system stability and durability. The PCE-5120 can monitor five sets of positive system voltages, two sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets that can be monitored include:

- CPU core voltage: 1.3 ~ 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:

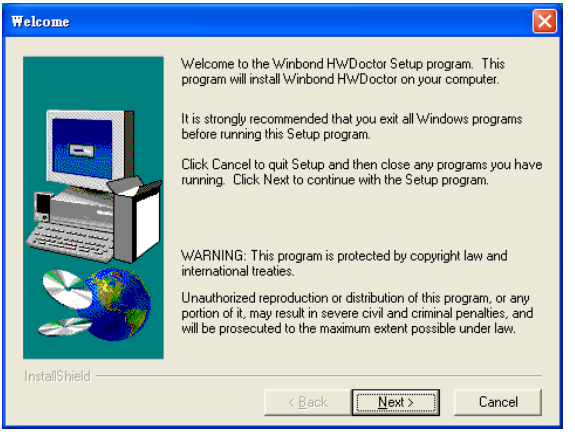
- Main voltage: -5 V, -12 V.

6.2 Windows XP Driver Setup

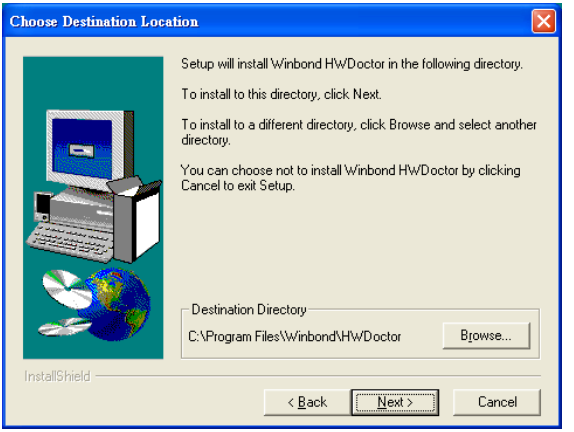
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the “Install” button under the “OB DRIVERS” heading.



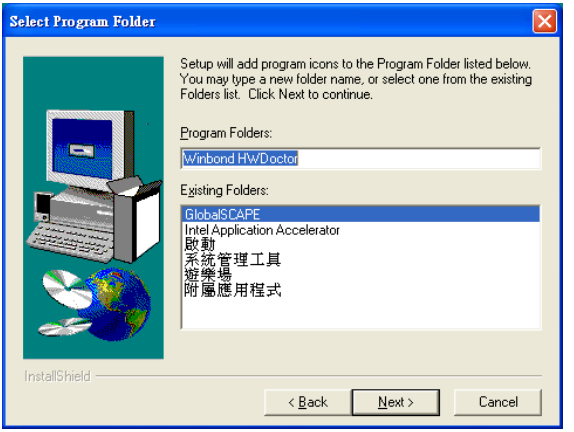
2. Click “Next” when you see the following message.



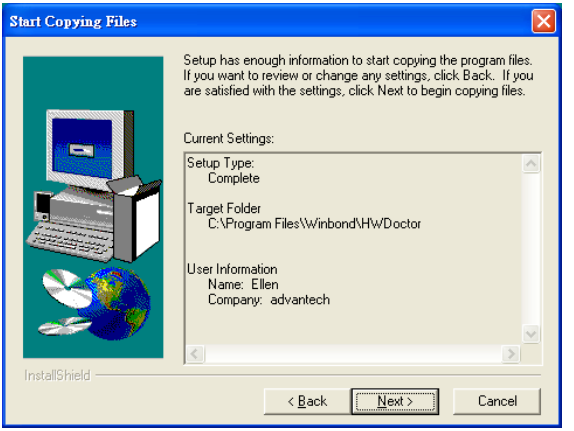
3. Click “Next” when you see the following message.



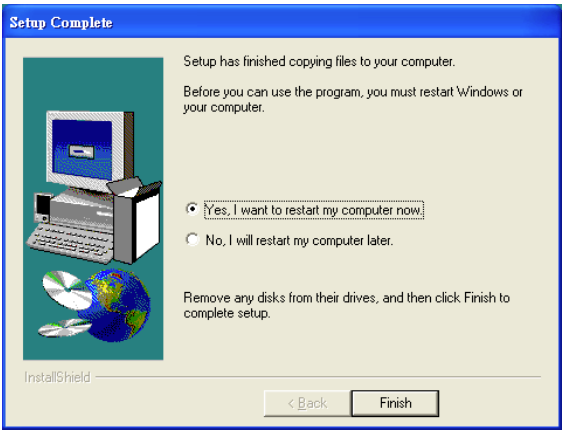
4. Click “Next” when you see the following message.



5. Click “Next” to continue.



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



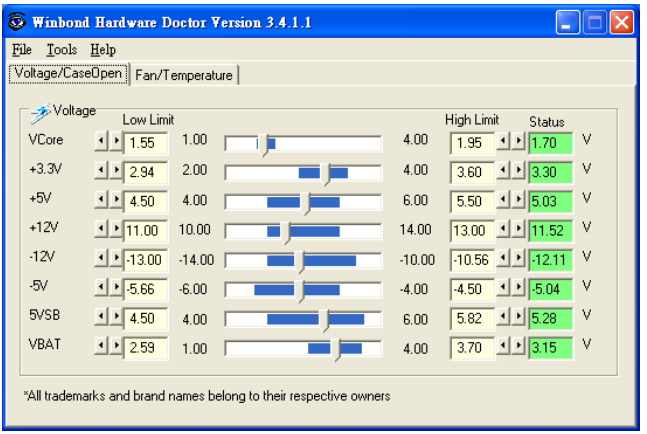
6.3 Using the OBS Hardware Doctor Utility

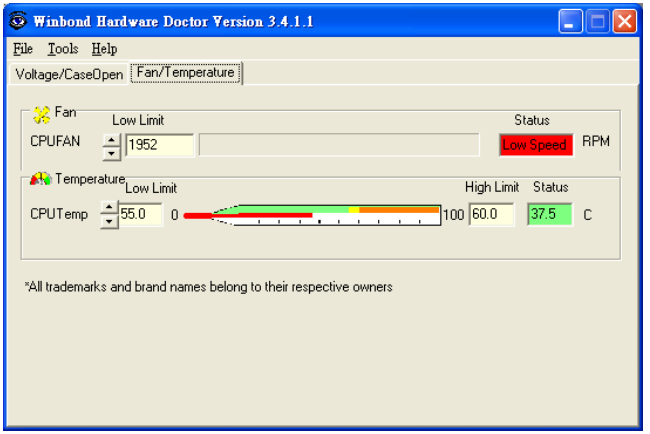
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep will sound to attract your attention.

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 following these steps.

From the desktop of Windows, click on “Start” and select “Programs”, select “Winbond HWDoctor” and click “HWDOCTOR”. 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.


Winbond Hardware Doctor Version 3.4.1.1
File Tools Help
Voltage/CaseOpen
Fan/Temperature
Voltage
Low Limit
High Limit
Status
VCore 1.55 1.00 4.00 1.95 1.70 V
+3.3V 2.94 2.00 4.00 3.60 3.30 V
+5V 4.50 4.00 6.00 5.50 5.03 V
+12V 11.00 10.00 14.00 13.00 11.52 V
-12V -13.00 -14.00 -10.00 -10.56 -12.11 V
-5V -5.66 -6.00 -4.00 -4.50 -5.04 V
5VSB 4.50 4.00 6.00 5.82 5.28 V
VBAT 2.59 1.00 4.00 3.70 3.15 V
*All trademarks and brand names belong to their respective owners


Winbond Hardware Doctor Version 3.4.1.1
File Tools Help
Voltage/CaseOpen
Fan/Temperature
Fan
Low Limit
Status
CPUFAN 1952 Low Speed RPM
Temperature
Low Limit
High Limit
Status
CPUTemp 55.0 0 100 60.0 37.5 C
*All trademarks and brand names belong to their respective owners

CHAPTER 7

LAN Configuration

Chapter 7 LAN Configuration

7.1 Introduction

The PCE-5120 has a single/dual Gigabit Ethernet LAN via dedicated PCI Express x 1 bus (Intel® 82573), which offers bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet to operate at 1000 Mbps.

7.2 Features

- Integrated 10/100/100 BASE-T transceiver
- 10/100/1000 BASE-T triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

7.3 Installation

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

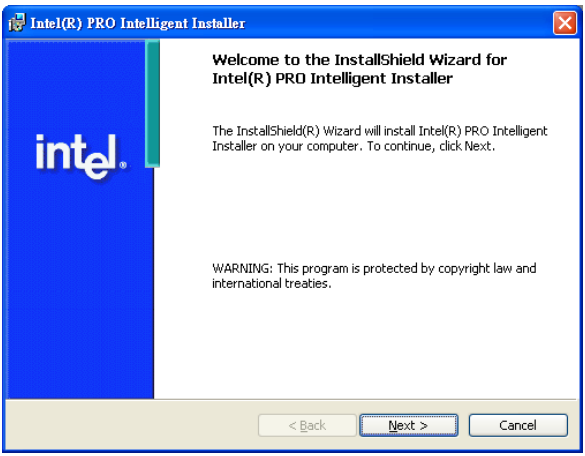
The PCE-5120 Intel 82573 Gigabit integrated controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

7.4 Win XP Driver Setup (Intel 82573)

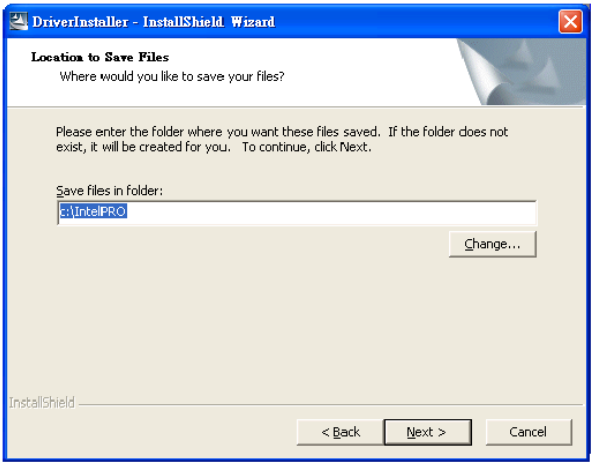
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the “LAN Drivers” heading, click on the “Manual” to open file manager, then click “SETUP.EXE” to run the installation procedure.



2. Select “I accept the terms in the license agreement” and click “Next” to continue.



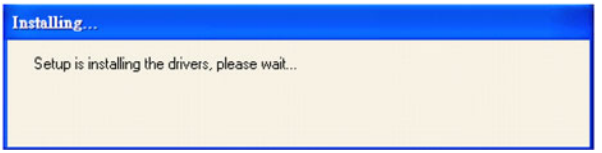
3. Click “Next” to continue.



4. Click “Install Software” to start the installation procedure.



5. The driver will be installed automatically and the LAN function will be enabled after the installation.



CHAPTER 8

SATA RAID Setup

Chapter 8 SATA RAID Setup

8.1 Introduction

To support demanding disk I/O, Intel ICH7R chipset integrates four Serial ATA controllers with software RAID 0, 1, 5, 10 capabilities.

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.

RAID 5 array contains three or more hard drives where the data is divided into manageable blocks called strips. Parity is a mathematical method for recreating data that was lost from a single drive, which increases fault-tolerance. The data and parity are striped across all the hard drives in the array. The parity is striped in a rotating sequence to reduce bottlenecks associated with the parity calculations.

RAID 10 array uses four hard drives to create a combination of RAID levels 0 and 1. The data is striped across a two-drive array forming the RAID 0 component. Each of the drives in the RAID 0 array is then mirrored by a RAID 1 component.

8.2 SATA RAID Driver and Utility Setup

Note: *For the detail installation guide of SATA RAID driver & utility please check the User Guide in the driver CD. Path: \\MANUAL\SATA_RAID*

Note: *Operating system support list: Windows* XP, Windows 2000, Windows Server 2003, Windows XP x64 Edition, and Windows Server 2003 x64 Edition.*

The driver is put in the CD's path: \\Drv_RAID\ICH7R\Driver\32bit for 32bits Windows OS and path: \\ Drv_RAID\ICH7R\Driver\64bitXP for 64bits Windows OS.

You may go to the directory of the CD and follow Intel's installation guide for install the driver and Utility.

CHAPTER 9

IPMI

Chapter 9 IPMI

9.1 IPMI introduction

This product fully supports Intelligent Platform Management Interface 2.0 (IPMI 2.0) 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, HP, NEC and Dell).

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
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
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.*

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.

Appendix A

Programming the Watchdog Timer

Appendix A Watchdog Timer

A.1 Programming the Watchdog Timer

The PCE-5120's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within 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 in to 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 before time-out

A.1.2 Jumper selection

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

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 an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

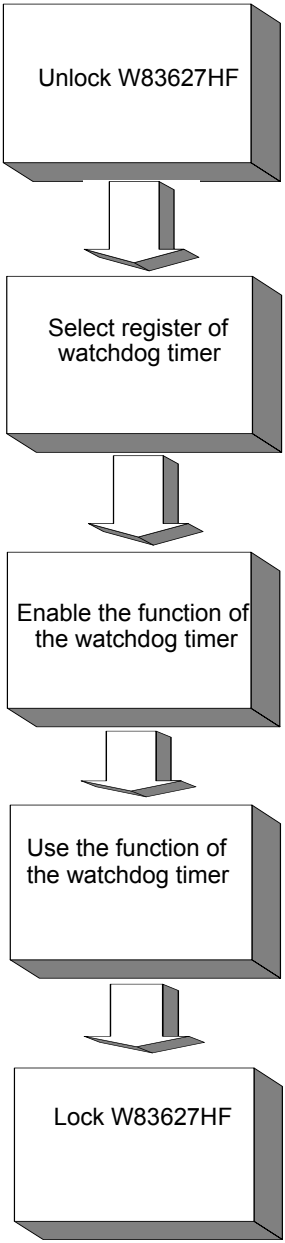

Unlock W83627HF
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627HF

Table A.1: Watchdog timer registers		
Address of register (2E)	**Attribute**	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627HF
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 minutes 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.
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 “timeout”.
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

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 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 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 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                ; 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 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                  ; 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 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                ; 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
```

Appendix B

I/O Pin Assignments

Appendix B I/O Pin Assignments

B.1 IDE Hard Drive Connector (IDE1)

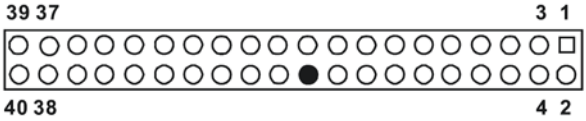


Table B.1: IDE hard drive connector (IDE1)

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			

B.2 Floppy Drive Connector (FDD1)

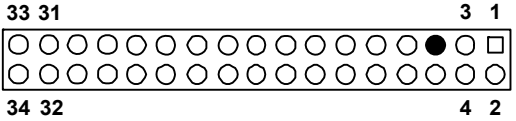


Table B.2: Floppy drive connector (FDD1)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE 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			

B.3 Parallel Port Connector (LPT1)

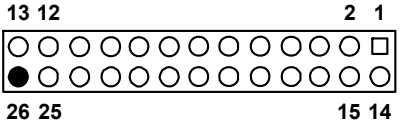


Table B.3: Parallel port connector (LPT1)			
Pin	**Signal**	**Pin**	**Signal**
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C
* low active			

B.4 VGA Connector (VGA1)

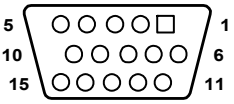


Table B.4: VGA connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.5 RS-232 Serial Port (COM1, COM2, COM3, COM4)

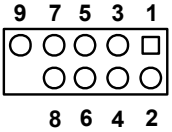


Table B.5: RS-232 serial port (COM1, COM2, COM3, COM4)

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

B.6 PS/2 Keyboard/Mouse Connector (KBMS1)

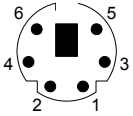


Table B.6: PS/2 keyboard/mouse connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.7 External Keyboard Connector (KBMS2)

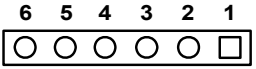


Table B.7: External keyboard connector (KBMS2)	
Pin	**Signal**
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

B.8 CPU Fan Power Connector (CPUFAN1)



Table B.8: CPU Fan Power Connector (CPUFAN1)

Pin	Signal
1	GND
2	+12V
3	Detect
4	FANPWM

B.9 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

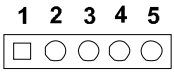


Table B.9: Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

Pin	Signal
1	LED power (+5 V)
2	NC
3	GND
4	KEYLOCK#
5	GND

B.10 External Speaker Connector (JFP2 / SPEAKER)

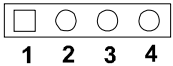


Table B.10:External Speaker Connector (JFP2 / SPEAKER)	
Pin	**Signal**
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.11 Reset Connector (JFP1 / RESET)

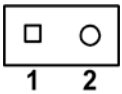


Table B.11:Reset connector (JFP1 / RESET)	
Pin	**Signal**
1	RESET #
2	GND

B.12 HDD LED (JFP2 / HDDLED)

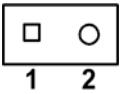


Table B.12:HDD LED (JFP2 / HDDLED)	
Pin	**Signal**
1	IDE LED+
2	IDE LED-

B.13 ATX Soft Power Switch (JFP1 / PWR_SW)

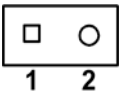


Table B.13:ATX soft power switch (JFP1 / PWR_SW)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.14 AC'97 Link connector (AC97)

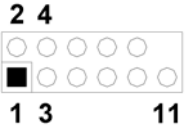


Table B.14:AC'97 Link connector (AC97)			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	GND
3	Sync	4	BITCLK
5	SDOUT	6	SDIN0
7	SDIN1	8	AC-RST
9	+12V	10	GND
11	GND	12	N/C

B.15 SM Bus Connector (JFP2 / SNMP)

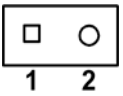


Table B.15:SM bus connector (JFP2 / SNMP)	
Pin	**Signal**
1	SMB_DATA
2	SMB_CLK

B.16 LAN1 and LAN2 LED connector (LANLED1)

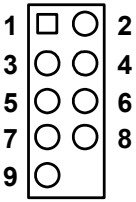


Table B.16:LAN1 and LAN2 LED connector (LANLED1)

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

B.17 System I/O Ports

Table B.17: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

B.18 DMA Channel Assignments

Table B.18:DMA channel assignments

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

B.19 Interrupt Assignments

Table B.19: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)

B.20 1st MB Memory Map

Table B.20:1st 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.21 PCI Bus Map

Table B.21:PCI bus map

Signal	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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