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PCA-6194

LGA 775 Intel® Core™ 2 Duo / Pentium® D / Pentium® 4 / Celeron® D Processor Card with PCI-ISA Bus / IPMI / VGA / DVI / 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

Table 1.1: PCA-6194 Memory Tested for Compatibility

Brand	Size	Speed	Type	Memory
Apacer	1GB	DDR2 533	DDR2	SAMSUNG K4T51083QB-ZKD5 (128x4)
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)	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 HYB18T512160AF3.7 3VV21710 (32x16)
	512MB	DDR2 533	DDR2	SEC K4T51083QC ZCD5 (64X8)
	1GB	DDR2 533	DDR2	SEC K4T51083QC ZCD5 (64X8)
	512MB	DDR2 667	DDR2	SEC K4T51083QC ZCE6 (64x8)
	512MB	DDR2 667	DDR2	Micron 5XB32D9DCL (64x8)
	1GB	DDR2 667	DDR2	SEC K4T51083QE ZCE6 (64x8)
	2GB	DDR2 667	DDR2	Micron 7HE12 D9HNL (128x8)
Transcend (RoHS)	1GB	DDR2 800	DDR2	ProMOS V59C1512804QBF25 (64x8)
	2GB	DDR2 667	DDR2	SAMSUNG K4T1G084QA-ZCE6 (128x8)
DSL	1GB	DDR2 667	DDR2	ELPIDA E5108AGBG-6E-E (64x8)
	1GB	DDR2 800	DDR2	ELPIDA E5108AHSE-8E-E (64x8)

Network Feature Comparison

Table 1.2: PCA-6194 comparison table

LAN/Model	PCA-6194F	PCA-6194G2	PCA-6194VG
LAN1: Intel® 82566DM	Yes	Yes	Yes
LAN2: Intel® 82573V	Yes	Yes	No
IPMI	Yes	No	No
DVI	Yes	No	No

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:

• PCA-6194 Intel® Core™ 2 Duo/Pentium® D/Pentium® 4/Celeron® D processor-based single board computer	
• 1 PCA-6194 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 (Dual LAN Port version only)	P/N: 1701092300
• 1 Y cable for PS/2 keyboard and PS/2 mouse	P/N: 1700060202
• 1 ATX 12V power converter cable	P/N: 170304015K
• 1 DVI cable (PCA-6194F & PCA-6194G2-D0 only)	P/N: 1700000821
• 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 PCA-6194 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the PCA-6194, 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.

Contents

Chapter 1 Hardware Configuration 2

1.1 Introduction 2
1.2 Features 3
1.3 Specifications 3
1.3.1 System 3
1.3.2 Memory 4
1.3.3 VGA interface 4
1.3.4 Input/Output 4
1.3.5 Ethernet LAN 4
1.3.6 Industrial features 4
1.3.7 Mechanical and environmental specifications 5
1.4 Jumpers and Connectors 6
Table 1.1: Jumpers 6
Table 1.2: Connectors 6
1.5 Board Layout: Jumper and Connector Locations 8
Figure 1.1: Jumper and Connector locations 8
1.6 PCA-6194 Block Diagram 9
Figure 1.2: PCA-6194 Block Diagram 9
1.7 Safety Precautions 10
1.8 Jumper Settings 11
1.8.1 How to set jumpers 11
1.8.2 CMOS clear (CMOS1) 11
Table 1.3: CMOS (CMOS1) 11
1.8.3 Watchdog timer output (JWDT1) 12
Table 1.4: Watchdog timer output (JWDT1) 12
1.8.4 COM2 RS 232/422/485 mode selector (JSETCOM2) . 13
Table 1.5: COM2 RS 232/422/485 mode selector (JSETCOM2) 13
1.9 System Memory 13
1.9.1 CPU FSB and memory speed 13
1.10 Memory Installation Procedures 13
1.11 Cache Memory 14
1.12 Processor Installation 15

Chapter 2 Connecting Peripherals 18

2.1 Introduction 18
2.2 IDE Connectors (IDE1) 18
2.3 Floppy Drive Connector (FDD1) 19
2.4 Parallel Port (LPT1) 20
2.5 VGA Connector (VGA1) 21
2.6 DVI connector (VCN1, PCA-6194F, PCA-6194G2-D0

only) 21
2.7 Serial Ports (COM1, COM2) 22
2.8 PS/2 Keyboard and Mouse Connector (KBMS1) 22
2.9 External Keyboard & Mouse (KBMS2)..... 23
2.10 CPU Fan Connector (CPFAN1)..... 23
2.11 Front Panel Connectors (JFP1, JFP2, JFP3) 24
2.11.1 ATX soft power switch (JFP1 / PWR_SW) 24
2.11.2 Reset (JFP1 / RESET)..... 24
2.11.3 HDD LED (JFP2 / HDDLED)..... 24
2.11.4 SM Bus Connector (JFP2 / SNMP) 24
2.11.5 External speaker (JFP2 / SPEAKER) 25
2.11.6 Power LED and keyboard lock connector (JFP3 / PWR_LED&KEY LOCK) 25
Table 2.1: ATX power supply LED status (No support for AT power) 25
2.12 H/W Monitor Alarm (JOBS1)..... 26
Table 2.2: Hardware Monitor Alarm setting..... 26
2.13 Gigabit LAN RJ45 connector (LAN1, LAN2)..... 26
2.14 Hi-definition Audio Link Connector (HDAUD1)..... 27
2.15 Serial ATA2 Interface 27
2.16 LAN1 and LAN2 LED connector (LANLED1) 28
2.17 BMC connector (BMC1)..... 28
2.18 IPMB connector (IPMB1)..... 29
2.19 USB (USB1~3) 29
2.20 Auxiliary 4-pin power connector (ATX1) 30
2.21 ATX feature connector (ATXF1)..... 30
2.22 GPIO header (GPIO1)..... 31
2.23 Case open (JCASE1)..... 31
Chapter 3 Award BIOS Setup.....34
3.1 Introduction 34
3.1.1 CMOS RAM Auto-backup and Restore 34
3.2 Entering Setup 35
Figure 3.1: Award BIOS Setup initial screen 35
3.3 Standard CMOS Setup 35
3.3.1 Date..... 35
3.3.2 Time..... 35
3.3.3 IDE channel 0~4 Master/Slave 35
3.3.4 Drive A / Drive B..... 36
3.3.5 Halt On..... 36
3.3.6 Memory..... 36
Figure 3.2: Standard CMOS Features Screen..... 36
3.4 Advanced BIOS Features..... 37
Figure 3.3: Advanced BIOS features screen..... 37

3.4.1 CPU Features 37
3.4.2 Hard Disk Boot Priority 38
3.4.3 Virus Warning 38
3.4.4 CPU L1, L2 & L3 Cache 38
3.4.5 Quick Power On Self Test 38
3.4.6 First/Second/Third Boot Device 38
3.4.7 Boot Other Device 38
3.4.8 Swap Floppy Drive 38
3.4.9 Boot Up Floppy Seek 38
3.4.10 Boot Up NumLock Status 38
3.4.11 Gate A20 Option 38
3.4.12 Typematic Rate Setting 38
3.4.13 Typematic Rate (Chars/Sec) 39
3.4.14 Typematic Delay (msec) 39
3.4.15 Security Option 39
3.4.16 APIC Mode 39
3.5 Advanced Chipset Features 40
Figure 3.4: Advanced chipset features screen 40
3.5.1 System BIOS Cacheable 40
3.5.2 Memory Hole At 15M-16M 40
3.5.3 PEG / Onchip VGA Control 40
3.5.4 On-Chip Frame Buffer Size 40
3.5.5 DVMT Mode 40
3.5.6 DVMT / FIXED Memory Size 41
3.5.7 Init Display First 41
3.6 Integrated Peripherals 41
Figure 3.5: Integrated peripherals 41
Figure 3.6: On-Chip IDE Device 42
3.6.1 IDE HDD Block Mode 42
3.6.2 IDE DMA Transfer Access 42
3.6.3 On-Chip Primary / Secondary IDE Device 42
3.6.4 SATA Mode 43
3.6.5 Legacy mode support 43
Figure 3.7: USB device setting 43
3.6.6 USB 1.0 Controller 43
3.6.7 USB 2.0 Controller 44
3.6.8 USB Operation mode 44
3.6.9 USB Keyboard / Mouse Function 44
3.6.10 USB storage function 44
Figure 3.8: Onboard LAN devices 44
3.6.11 Onboard LAN1 ROM 44
3.6.12 Onboard LAN2 Control 44
3.6.13 On board LAN2 ROM 45
Figure 3.9: Super I/O Device 45
3.6.14 Onboard FDC Controller 45

3.6.15 Onboard Serial Port 1 45
3.6.16 Onboard Serial Port 2 45
3.6.17 UART Mode Select 45
3.6.18 RxD, TxD Active 45
3.6.19 IR Transmission Delay 46
3.6.20 UR2 Duplex Mode 46
3.6.21 Use IR Pins 46
3.6.22 Onboard Parallel Port 46
3.6.23 Parallel Port Mode 46
3.6.24 EPP Mode Select 46
3.6.25 ECP Mode Use DMA 46
3.7 Power Management Setup 47
Figure 3.10:Power management setup screen (1) 47
3.7.1 PCI express PM Function 47
3.7.2 Power Supply Type 47
3.7.3 ACPI Function 47
3.7.4 Power Management 48
Table 3.1: Power Saving 48
3.7.5 Video Off Method 48
3.7.6 Video Off In Suspend 48
3.7.7 Suspend Type 48
3.7.8 Suspend Mode 48
3.7.9 HDD Power Down 48
3.7.10 Soft-Off by PWR-BTTN 48
3.7.11 PowerOn by LAN 49
3.7.12 PowerOn by Modem 49
3.7.13 PowerOn by Alarm 49
3.7.14 Primary IDE 0 (1) and Secondary IDE 0 (1) 49
3.7.15 FDD, COM, LPT PORT 49
3.7.16 PCI PIRQ [A-D]# 49
3.8 PnP/PCI Configurations 50
Figure 3.11:PnP/PCI configurations screen 50
3.8.1 Reset Configuration Data 50
3.8.2 Resources Controlled By 50
3.8.3 PCI / VGA Palette Snoop 50
3.8.4 Maximum Payload Size 50
3.9 PC Health Status 51
Figure 3.12:PC Health Status Screen 51
3.9.1 Case Open Warning 51
3.9.2 CPU Warning Temperature 51
3.9.3 System Temperature 51
3.9.4 CPU Temperature 51
3.9.5 CPU FAN Speed 51
3.9.6 VCORE and Other Voltages 51
3.9.7 Shutdown Temperature 51

3.10 Frequency / Voltage Control 52
Figure 3.13:Spread Spectrum Control screen 52
3.10.1 Spread Spectrum 52
3.11 Load Setup Defaults 53
Figure 3.14: Load Setup Defaults screen 53
3.12 Password Setting 53
3.13 Save & Exit Setup 54
Figure 3.15:Save & exit setup 54
3.14 Exit Without Saving 55
Figure 3.16:Exit without saving 55
Chapter 4 Chipset Software Install Utility 58
4.1 Before you begin 58
4.2 Introduction 58
4.3 Windows XP Driver Setup 59
Chapter 5 VGA Setup 64
5.1 Introduction 64
5.2 Windows XP Driver Setup 64
Chapter 6 Onboard Security Setup 70
6.1 Introduction 70
6.2 Windows XP Driver Setup 70
6.3 Using the OBS Hardware Doctor Utility 73
Chapter 7 LAN Configuration 76
7.1 Introduction 76
7.2 Features 76
7.3 Installation 76
7.4 Win XP Driver Setup (LAN) 77
Chapter 8 SATA RAID Setup 82
8.1 Introduction 82
8.2 SATA RAID Driver and Utility Setup 82
Chapter 9 IPMI 84
9.1 IPMI introduction 84
9.2 Definitions 84
9.3 IPMI function list 84
Table 9.1: Supported IPMI commands 84
9.4 IPMI OEM command lists 88
Table 9.2: OEM Commands list 88
Appendix A Watchdog Timer 90
A.1 Programming the Watchdog Timer 90
A.1.1 Watchdog timer overview 90
A.1.2 Jumper selection 90

A.1.3 Programming the Watchdog Timer 90
Table A.1: Watchdog timer registers 92
A.1.4 Example Program 93
Appendix B I/O Pin Assignments.....100
B.1 IDE Hard Drive Connector (IDE1) 100
Table B.1: IDE hard drive connector (IDE1)..... 100
B.2 Floppy Drive Connector (FDD1) 101
Table B.2: Floppy drive connector (FDD1)..... 101
B.3 Parallel Port Connector (LPT1)..... 102
Table B.3: Parallel port connector (LPT1)..... 102
B.4 VGA Connector (VGA1) 103
Table B.4: VGA connector (VGA1)..... 103
B.5 DVI Connector (VCN1)..... 103
Table B.5: DVI Connector (VCN1)..... 103
B.6 RS-232 Serial Port (COM1, COM2)..... 104
Table B.6: RS-232 serial port (COM1, COM2) 104
B.7 PS/2 Keyboard/Mouse Connector (KBMS1)..... 105
Table B.7: PS/2 keyboard/mouse connector (KBMS1)..... 105
B.8 External Keyboard Connector (KBMS2)..... 105
Table B.8: External keyboard connector (KBMS2).. 105
B.9 CPU Fan Power Connector (CPUFAN1)..... 106
Table B.9: CPU Fan Power Connector (CPUFAN1) 106
B.10 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)..... 106
Table B.10: Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK) 106
B.11 External Speaker Connector (JFP2 / SPEAKER) 107
Table B.11: External Speaker Connector (JFP2 / SPEAKER) 107
B.12 Reset Connector (JFP1 / RESET) 107
Table B.12: Reset connector (JFP1 / RESET)..... 107
B.13 HDD LED (JFP2 / HDDLED) 108
Table B.13: HDD LED (JFP2 / HDDLED)..... 108
B.14 ATX Soft Power Switch (JFP1 / PWR_SW) 108
Table B.14: ATX soft power switch (JFP1 / PWR_SW)..... 108
B.15 Hi-definition Audio Link Connector (HDAUD1) 109
Table B.15: Hi-definition audio link connector (HDAUD1)..... 109
B.16 SM Bus Connector (JFP2 / SNMP)..... 109
Table B.16: SM bus connector (JFP2 / SNMP)..... 109

B.17 LAN1 and LAN2 LED connector (LANLED1) 110
Table B.17: LAN1 and LAN2 LED connector (LANLED1) 110
B.18 ATX Feature Connector (ATXF1) 110
Table B.18: ATX feature connector (ATXF1) 110
B.19 GPIO header (GPIO1) 111
Table B.19: GPIO header (GPIO1) 111
B.20 System I/O Ports 112
Table B.20: System I/O ports 112
B.21 DMA Channel Assignments 113
Table B.21: DMA channel assignments 113
B.22 Interrupt Assignments 114
Table B.22: Interrupt assignments 114
B.23 1st MB Memory Map 114
Table B.23: 1st MB memory map 114
B.24 PCI Bus Map 115
Table B.24: PCI bus map 115
Appendix C Programming GPIO 118
C.1 Supported GPIO Register 118
C.1.1 GPIO Registers 118
C.1.2 GPIO Example program-1 119

CHAPTER 1

Hardware Configuration

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6194 is designed with the Intel® Q965 chipset and ICH8DO (I/O controller) to support Core™ 2 Duo, Dual-Core Pentium® D / Pentium® 4 / Celeron® D processors with a 533/800/1066 MHz front side bus and DDR2 533/667/800 MHz memory up to 8 GB. It follows the PICMG 1.0 specification and is the best solution for high-performance computing and applications in which a wide I/O bandwidth is demanded.

The PCA-6194 supports IPMI 2.0 for enhanced system management. With this feature users may manage and monitor the system health status remotely. Another remote management port allows users to monitor the system health status and control the system remotely through standard SNMP/HTTP protocols when used with Advantech's ACMM-1000 and SNMP-1000 Intelligent System Manager modules.

The PCA-6194 offers a high-performance cost-saving integrated graphics unit, built into the Intel® Q965 chipset, and features the unique Intel® Extreme Graphics architecture to maximize VGA performance and share up to 256 MB of system memory. In addition, the PCA-6194 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 PCA-6194 the ideal platform for industrial networking applications.

By using the Intel® ICH8DO chipset, the PCA-6194 offers six on-board SATA2 interfaces (bandwidth = 300 MB/sec) with software RAID 0, 1, 5, 10 functions; and six USB 2.0 connections. These powerful I/O capabilities ensure even more reliable data storage capabilities and suitable for work with high-speed I/O peripherals.

The ICH8DO provides a new high definition audio interface. Combined with Advantech's PCA-AUDIO-HDA1E module, the PCA-6194 offers excellent audio functions for the industrial environment.

The PCA-6194 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.

The PCA-6194 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 PCA-6194 is definitely the ideal platform for today's industrial applications.

1.2 Features

- Supports LGA 775 Intel® Core 2 Duo / Pentium D / Pentium 4 / Celeron D FSB 1066/800/533 MHz processors
- Supports Dual-channel DDR II 800/667/533 SDRAM up to 8 GB
- Dual Gigabit Ethernet via two PCI Express x1 port
- Supports IPMI 2.0 with on board BMC module
- 6 SATA II HDDs
- Supports software SATA Raid 0, 1, 5 & 10
- 6 USB 2.0 ports
- 2 COM ports. 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 2.66/3.6/3.8/3.33 GHz, FSB 533/8001066 MHz.
- **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 (16 Mb Flash via SPI bus)
- **System Chipset:** Intel Q965 with ICH8DO
- **SATA/EIDE hard disk drive interface:** Six 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.)

- **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 8 GB in four 240-pin DIMM sockets. Supports dual-channel DDRII 533/667/800 SDRAM.

1.3.3 VGA interface

- **Controller**: Intel Q965 chipset integrated
- **Display memory**: Share system memory up to 256 MB
- **Resolution**: up to 2048x1536 @ 75Hz

1.3.4 Input/Output

- **Bus interface:** PICMG 1.0 compliant PCI/ISA bus interface.
- **PCI Bus**: 32-bit / 33 MHz
- **ISA bus**: Supports ISA high drive (ITE IT8888 PCI-to-ISA bridge)
- **Enhanced parallel port:** Configured to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two 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 six USB 2.0 ports with transmission rate up to 480Mbps.
- **Audio**: PCA-6194 can provide audio with the optional PCA-AUDIO-HDA1E audio extension module

1.3.5 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® 82566DM (G2 version or VG version)

  LAN 2: Intel® 82573V (G2 Version)

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3V, +5V, +12V, +5VSBY
- **Power consumption:**
  Configuration 1: Intel Pentium D 960 (3.60 GHz,130 W) & 4 GB of DDRII 800
  Configuration 2: Intel Core 2 Duo E6700 (2.66 GHz, 65W) & 4 GB of DDRII 800
- **Test program**: Intel Max power 100% + BurnIn Test 4.0

+12 V	Config1: 13 A / Config2: 6.6 A
+5 V	10 A
+3.3 V	0 A
+5 VSB	0.7 A
-12 V	0 A
-5 V	0 A

- **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 PCA-6194 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	VGA1 VGA connector
VCN1	DVI connector
COM1	Serial port: COM1 (9-pin connector)
COM2	Serial port: COM2 (9-pin connector)
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard/mouse connector
ATX1	ATX 12V Auxiliary power connector (for CPU)
CPUFAN1	CPU1 fan connector
ATXF1	ATX feature connector
JFP1	Power and Reset Button connector
JFP2	HDD LED/SNMP SMbus/Speaker connector
JFP3	Power LED and keyboard lock connector
JIR	Reserved

Table 1.2: Connectors	
Label	**Function**
JOBS1	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
LAN1~2	Giga LAN RJ45 connectors
IPMB1	IPMB connector
HDAUD1	Hi-definition audio link connector
SATA1~6	Serial ATA1~6
LANLED1	LAN1 and LAN2 LED connector
BMC1	BMC connector
USB1~3	USB port pin headers
SPI	BIOS SPI Interface
GPIO1	GPIO pin header (SMD pitch-2.0 mm)
JCASE1	Case open

1.5 Board Layout: Jumper and Connector Locations

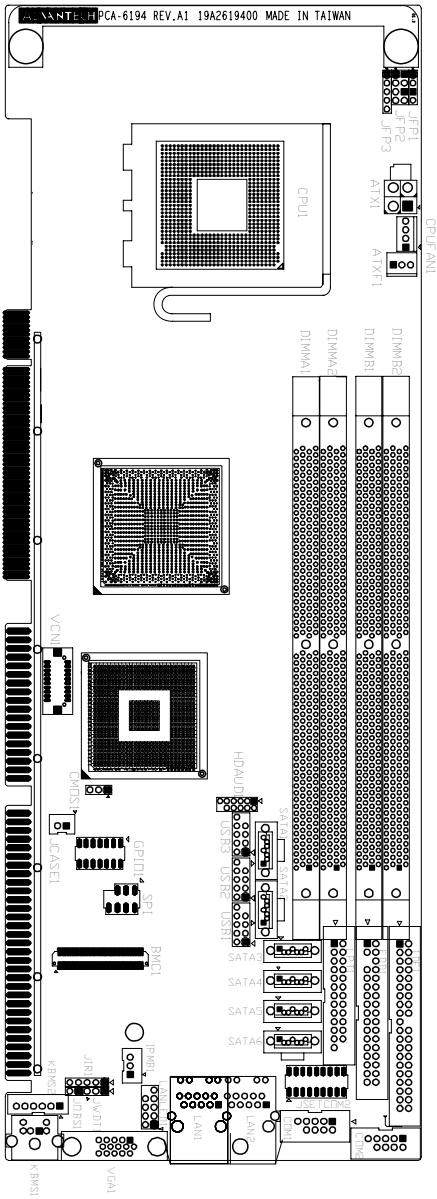


Figure 1.1: Jumper and Connector locations

1.6 PCA-6194 Block Diagram

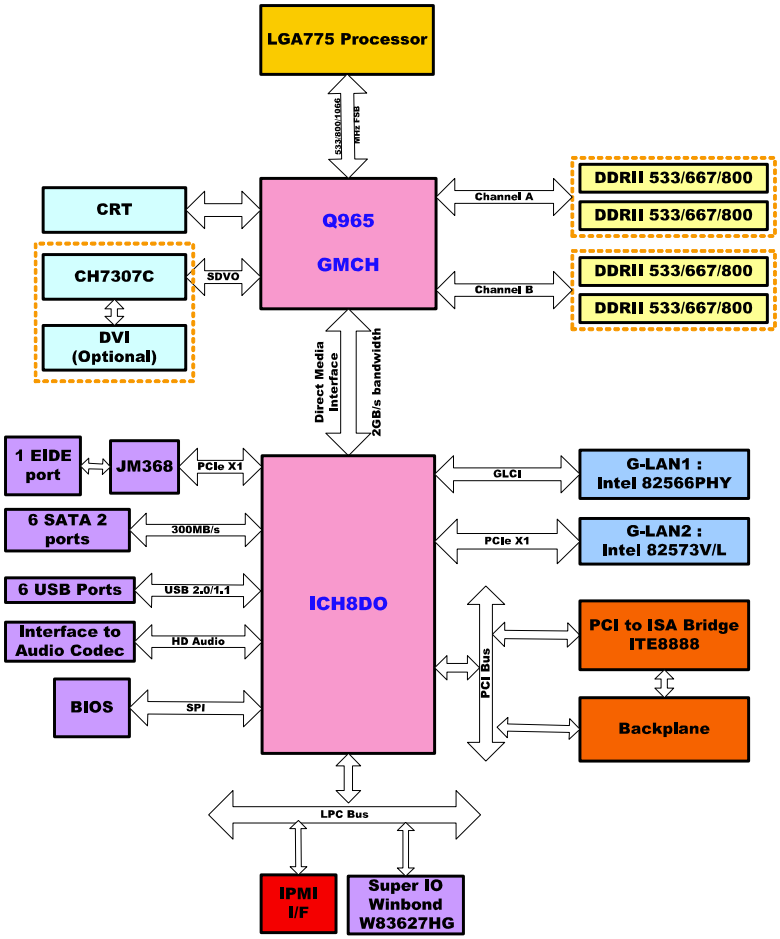


Figure 1.2: PCA-6194 Block Diagram

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 PCA-6194 by setting the jumpers. It also includes the PCA-6194's default settings and your options for each jumper.

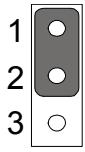
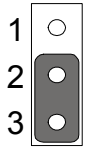
1.8.1 How to set jumpers

You can configure your PCA-6194 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 PCA-6194 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)

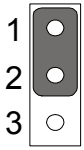
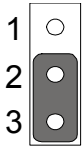
Function	Jumper Setting
* Keep CMOS data	 1-2 closed
Clear CMOS data	 2-3 closed

* default setting

1.8.3 Watchdog timer output (JWDT1)

The PCA-6194 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means the PCA-6194 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.4: Watchdog timer output (JWDT1)

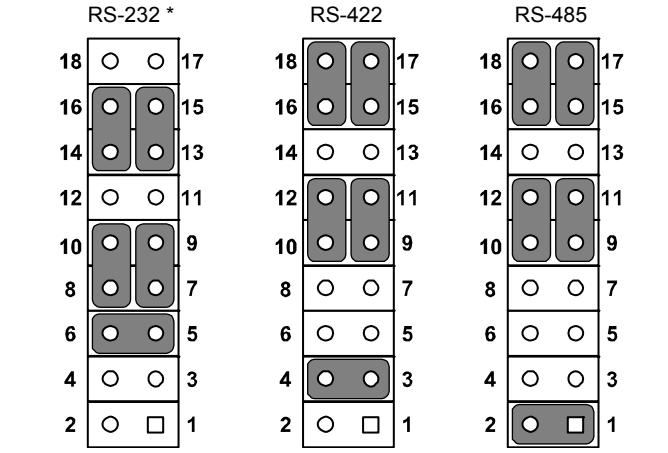
Function	Jumper Setting
Reserved	 1-2 closed
* Reset	 2-3 closed

*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)



*default setting

1.9 System Memory

The PCA-6194 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, 1024 and 2048 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 256 MB and 8 GB.

1.9.1 CPU FSB and memory speed

The PCA-6194 can accept DDR2 SDRAM memory chips without parity. Also note: The PCA-6194 accepts DDR2 533/667/800 MHz SDRAM. The PCA-6194 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.

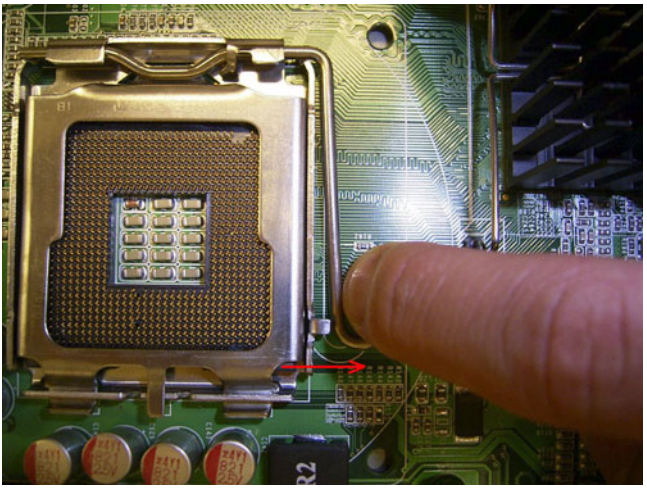
1.11 Cache Memory

The CPU that PCA-6194 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.

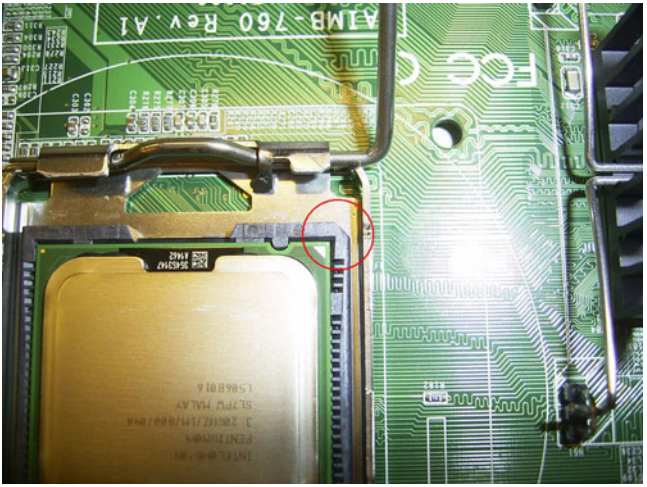
1.12 Processor Installation

The PCA-6194 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.



CHAPTER 2

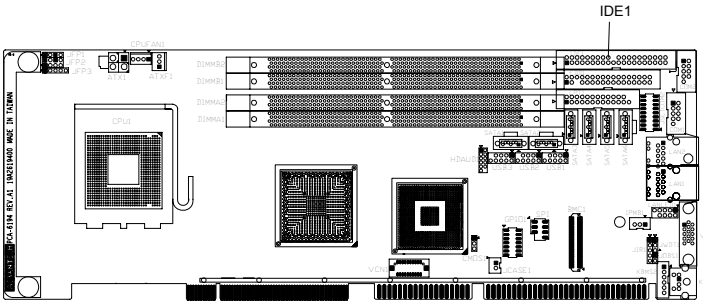
Connecting Peripherals

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)



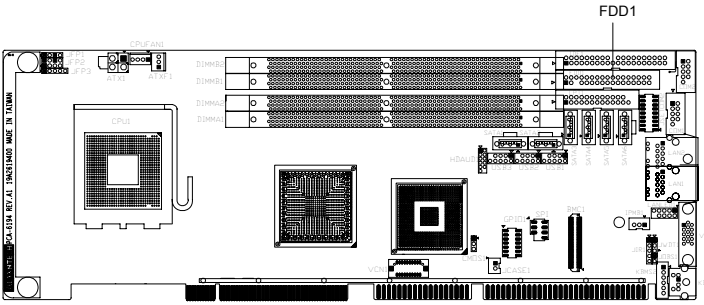
You can attach up to two IDE (Integrated Drive Electronics) drives to the PCA-6194's built-in controller.

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.

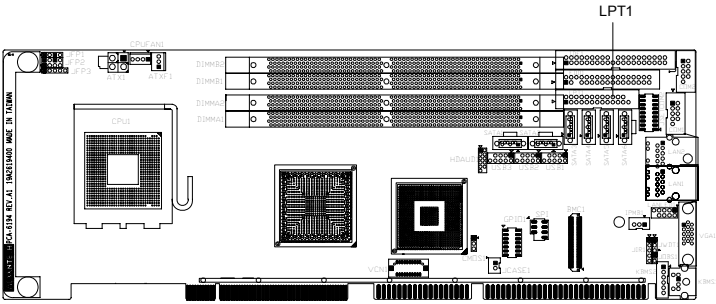
2.3 Floppy Drive Connector (FDD1)



You can attach up to two floppy disk drives to the PCA-6194'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)



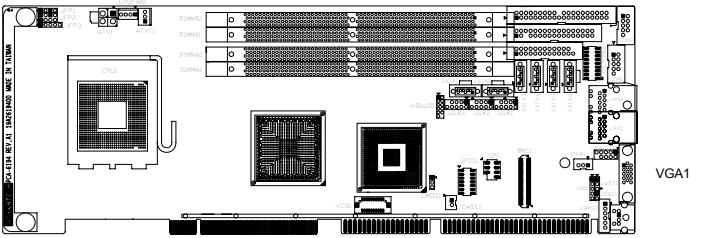
The parallel port is normally used to connect the single board computer to a printer. The PCA-6194 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector 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.

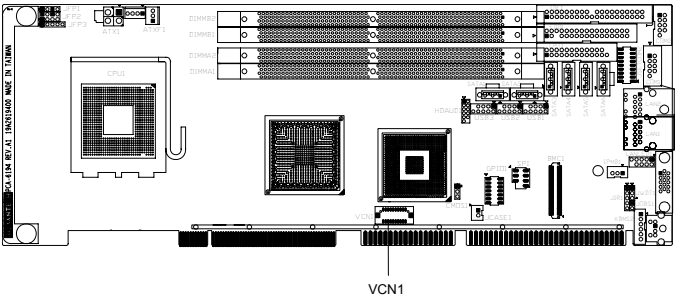
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire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

2.5 VGA Connector (VGA1)

The PCA-6194 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.

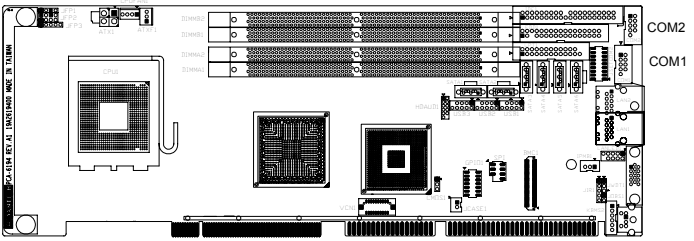


2.6 DVI connector (VCN1, PCA-6194F, PCA-6194G2-D0 only)



The PCA-6194 provides a DVI interface that supports DVI display (PCA-6194F, PCA-6194G2-D0 only). The user can choose 26-pin to 20-pin DVI cable (p/n: 1700000821) for providing DVI connector. Pin assignments for DVI connector VCN1 are detailed in Appendix B.

2.7 Serial Ports (COM1, COM2)

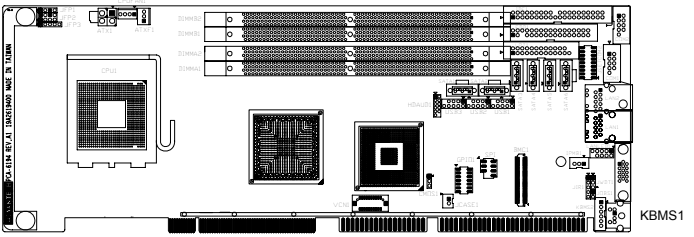


The PCA-6194 offers two serial ports. These ports can connect to serial devices, such as a mouse or to a communications network. The COM2 port can be configured to support RS-232/422/485 by pin header (JSETCOM2) setting, please refer to 1.8.4 for the information.

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.

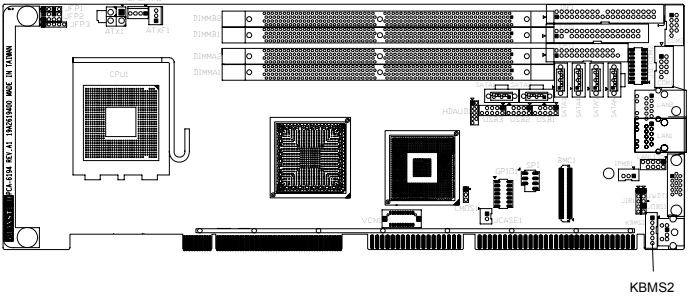
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse Connector (KBMS1)



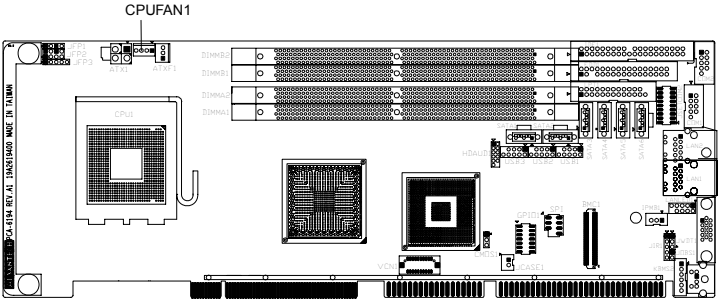
One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard or a PS/2 mouse, respectively. KBMS1 can also be connected to an adapter cable (P/N: 1700060202) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.9 External Keyboard & Mouse (KBMS2)



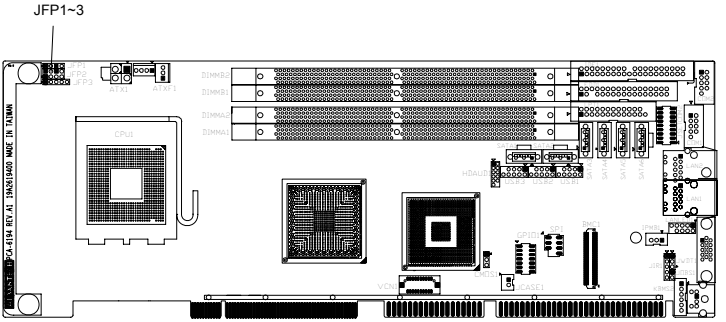
In addition to the PS/2 mouse/keyboard connector on the PCA-6194's rear plate, there is also an extra onboard external keyboard and mouse connector. This gives system integrators greater flexibility in designing their systems.

2.10 CPU Fan Connector (CPFAN1)

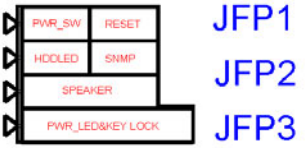


If a fan is used, this connector supports cooling fans of 12V/1A (12W) or less.

2.11 Front Panel Connectors (JFP1, JFP2, JFP3)



There are several external switches to monitor and control the PCA-6194.



2.11.1 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.

2.11.2 Reset (JFP1 / RESET)

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

2.11.3 HDD LED (JFP2 / HDDLED)

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

2.11.4 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.

2.11.5 External speaker (JFP2 / SPEAKER)

(JFP2 / SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6194 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.11.6 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.

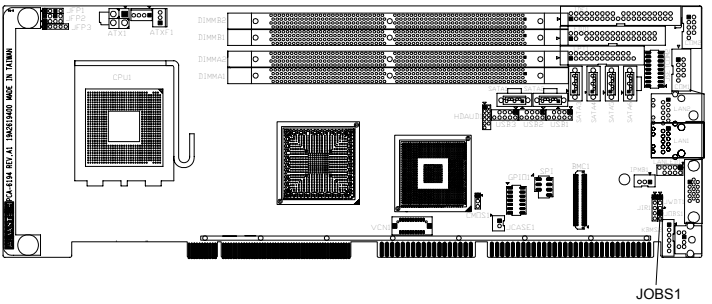
There are 3 modes for the power supply connection. The first is “ATX power mode”, system is on/off by a tentative power button. The second is “AT Power Mode”, system is on/off by the switch of the Power supply. The third is another “AT Power Mode” which is using the front panel power switch. The power 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

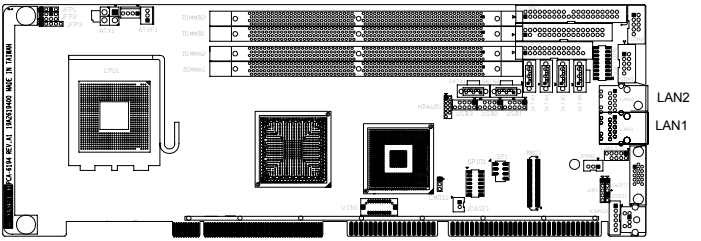
2.12 H/W Monitor Alarm (JOBS1)



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

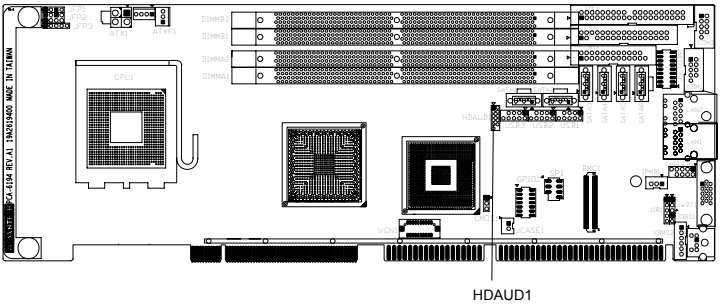
Table 2.2: Hardware Monitor Alarm setting	
Pin setting	**Function**
Close	Enable OBS alarm
open	Disable OBS alarm

2.13 Gigabit LAN RJ45 connector (LAN1, LAN2)



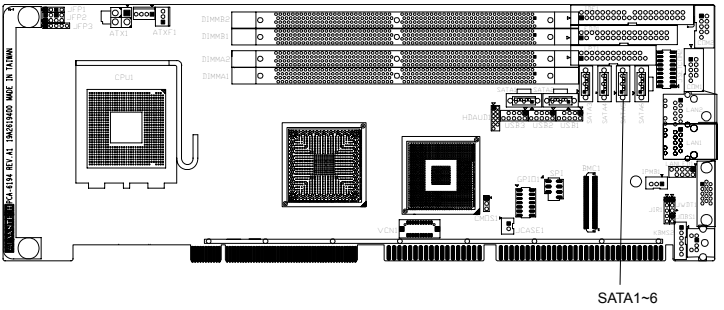
PCA-6194 uses the Intel 82566DM and 82573V Gigabit LAN chips which are interfaced with PCIe x1 links. With this chip PCA-6194 may provide high throughputs for heavy loading networking environment. It provides two or one RJ-45 connectors in the rear side and is convenient for most industrial applications.

2.14 Hi-definition Audio Link Connector (HDAUD1)



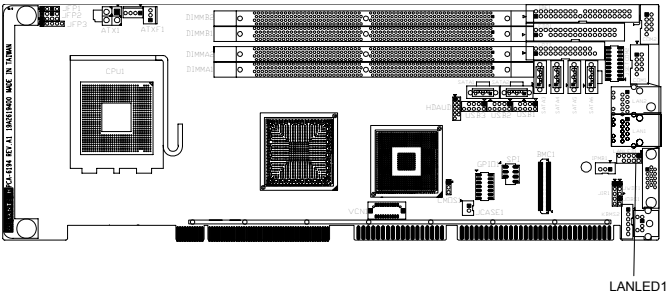
The PCA-6194 provides Hi-definition audio through PCA-AUDIO-HDA1E module from Advantech.

2.15 Serial ATA2 Interface



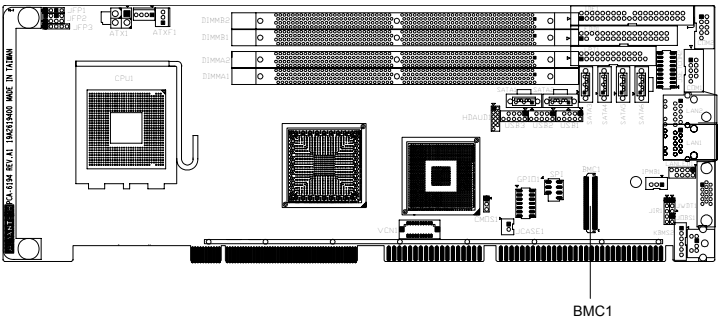
In addition to the EIDE interfaces (up to two devices), the PCA-6194 features a high performance serial ATA2 interface (up to 300MB/s) which eases cabling to hard drives with thin and long cables. These six ports can be configured for RAID 0, 1, 5 and 10 applications.

2.16 LAN1 and LAN2 LED connector (LANLED1)



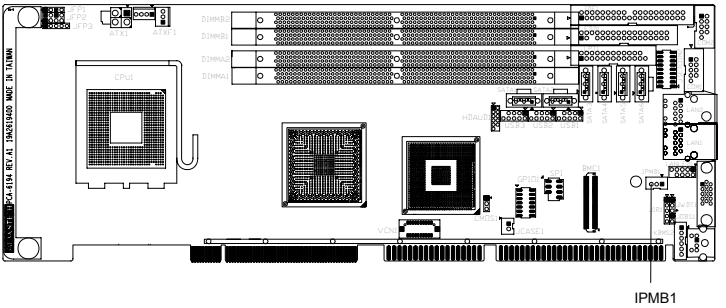
PCA-6194 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users may know whether the LAN port is acting or not easily. Refer to Appendix B for detailed information on the pin assignments.

2.17 BMC connector (BMC1)



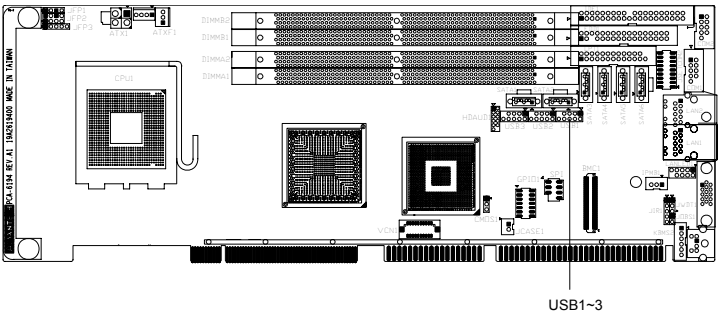
PCA-6194 is designed for supporting IPMI 2.0. The BMC module is mounted on board through this connector. For more detail operating information, please refer to Chapter 9.

2.18 IPMB connector (IPMB1)



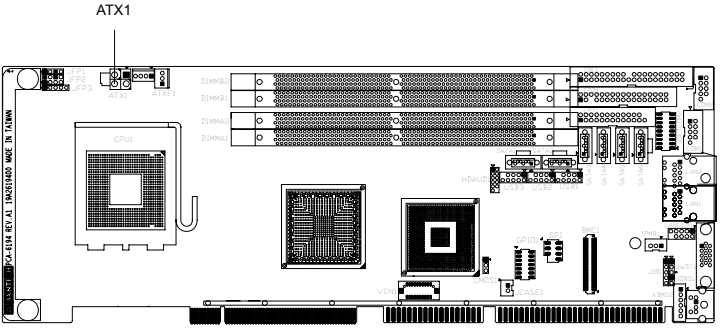
PCA-6194 provides an IPMB connector which is followed the IPMI 2.0 specification. It could be linked to Advantech's ACMM-1000 remote control module. With the ACMM-1000 module, users can monitoring and control the PCA-6194 easily.

2.19 USB (USB1~3)



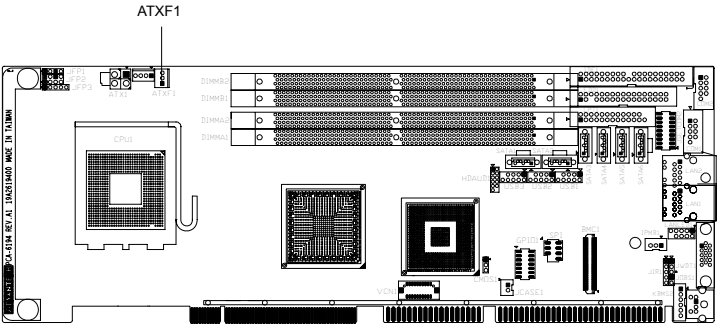
The PCA-6194 provides four on board USB 2.0 ports which support transmission rate up to 480 Mbps and is fuse-protected. To install the USB cable (p/n: 1700002314) bracket, find an empty slot in your chassis and unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the USB connector to USB12 and USB34 on the CPU card.

2.20 Auxiliary 4-pin power connector (ATX1)



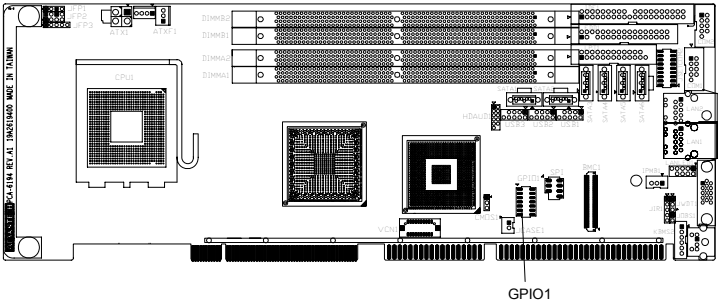
To ensure the sufficiency of power supply for single board computer, one auxiliary 4 pin power connector is available on PCA-6194. This connector must be connected to the power supply, otherwise the system may become unstable.

2.21 ATX feature connector (ATXF1)



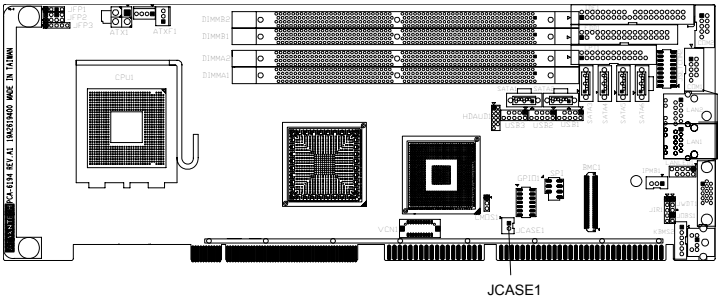
Connect to the CN1 on the Advantech backplane to enable the ATX function, 5V stand-by.

2.22 GPIO header (GPIO1)



PCA-6194 provides 14-Pins pin header for Digital I/O usage. Refer to Appendix B for detailed information on the pin assignments and programming guide in Appendix C..

2.23 Case open (JCASE1)



PCA-6194 provides 2-Pins pin header for case open detection. This function could be enabled or disabled in BIOS setting. When the PIN is shorted, it will cause the on board buzzer alarm.

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.

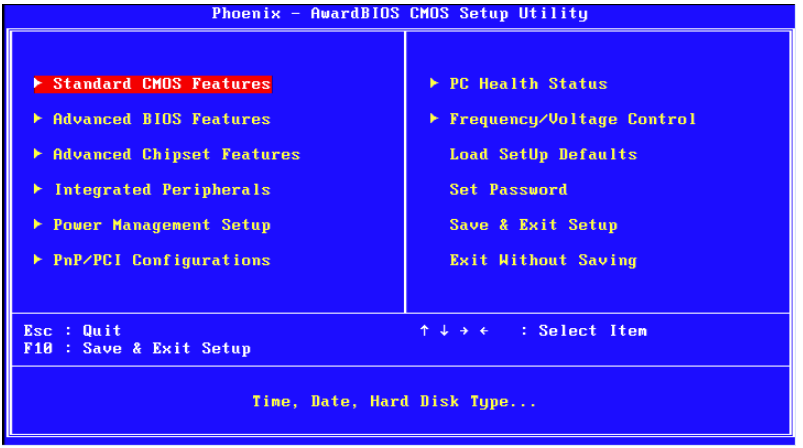


Figure 3.1: Award BIOS Setup initial screen

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 0~4 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).

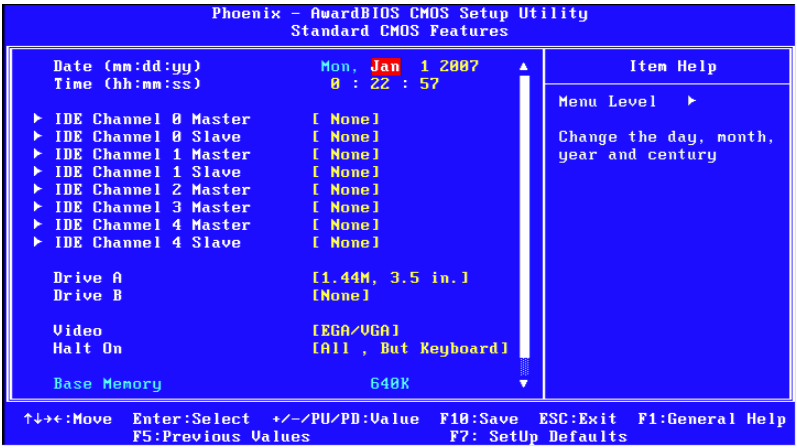


Figure 3.2: Standard CMOS Features Screen

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 PCA-6194 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.

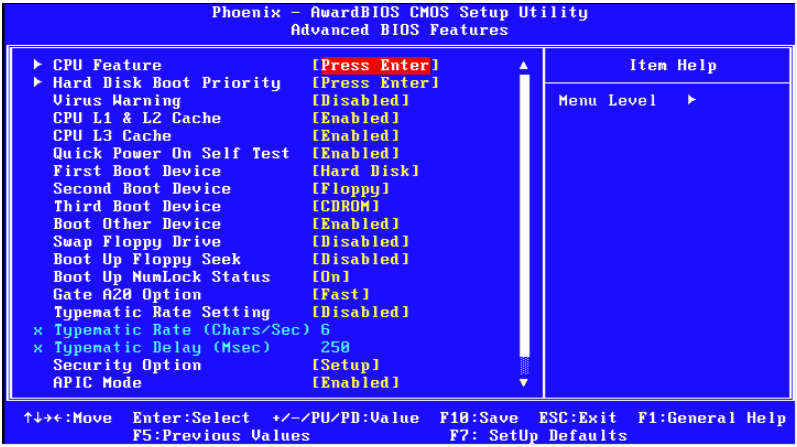


Figure 3.3: Advanced BIOS features screen

3.4.1 CPU Features

Limit CPUID MaxVal

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

C1E Function

To enable the C1 Enhance Mode function, the process will reduce the core clock frequency to system bus ratio and VID while it entered the C1 status.

Execute Disable Bit

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

Virtualization Technology

This selection item only shows up when the CPU supports the Virtualization Technology Function.

Core Multi-Processing

This selection item only shows up when using the multi-core processors.

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 Quick Power On Self Test

This allows the system to skip certain tests to speed up the boot-up procedure.

3.4.6 First/Second/Third Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: "Floppy", "LS120", "Hard Disk", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "Legacy LAN" and "Disabled".

3.4.7 Boot Other Device

Use this to boot another device. The options are "Enabled" and "Disabled".

3.4.8 Swap Floppy Drive

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

3.4.9 Boot Up Floppy Seek

Selection of the command "Disabled" will speed the boot up. Selection of "Enabled" searches disk drives during boot up.

3.4.10 Boot Up NumLock Status

Sets the boot up status Num Lock. The options are "On" and "Off".

3.4.11 Gate A20 Option

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

3.4.12 Typematic Rate Setting

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

3.4.13 Typematic Rate (Chars/Sec)

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

3.4.14 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).

3.4.15 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.

3.4.16 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 PCA-6194, as shown in Figure 3-4:

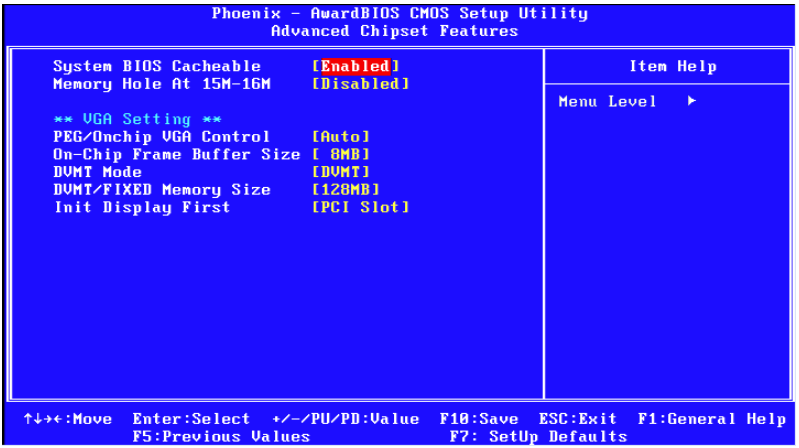


Figure 3.4: Advanced chipset features screen

3.5.1 System BIOS Cacheable

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

3.5.2 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”.

3.5.3 PEG / Onchip VGA Control

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

3.5.4 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.

3.5.5 DVMT Mode

Displays the active system memory mode.

3.5.6 DVMT / FIXED Memory Size

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

3.5.7 Init Display First

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

3.6 Integrated Peripherals

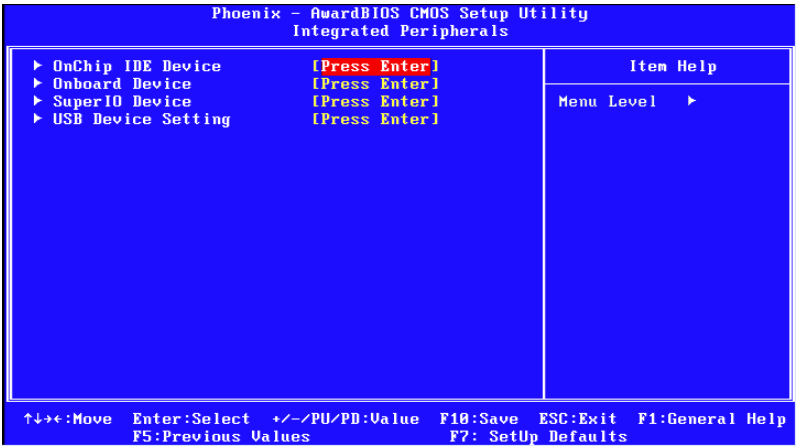


Figure 3.5: Integrated peripherals

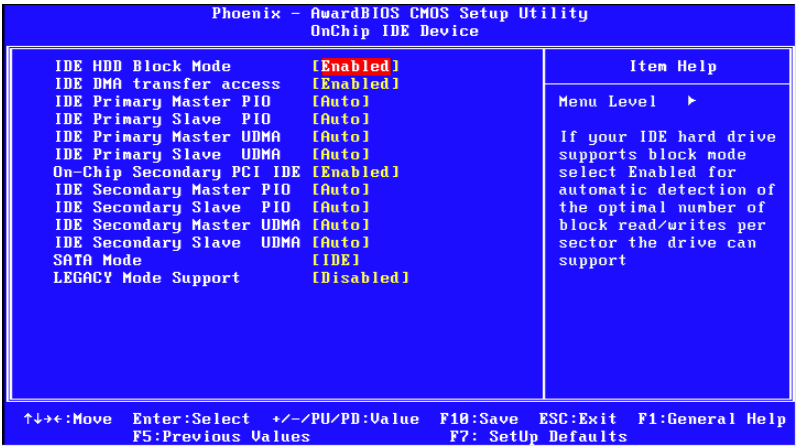


Figure 3.6: On-Chip IDE Device

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 Legacy mode support

This allows SATA system to support PATA mode. The choices are “Disabled” and “Enabled”.

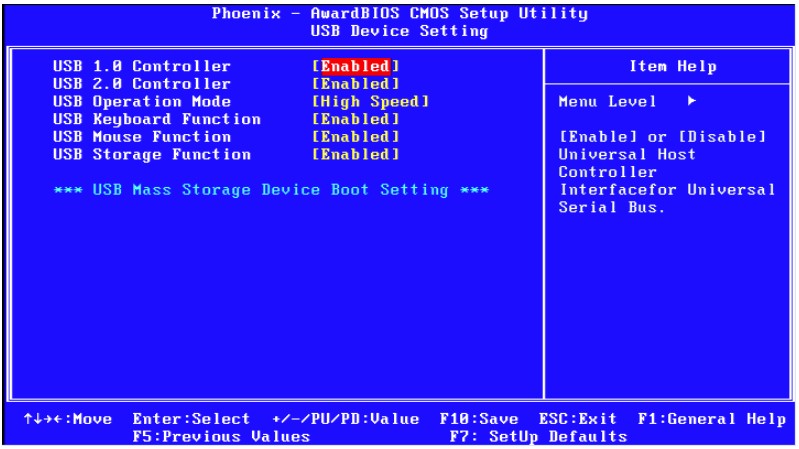


Figure 3.7: USB device setting

3.6.6 USB 1.0 Controller

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

3.6.7 USB 2.0 Controller

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

3.6.8 USB Operation mode

Set the USB 2.0 controller to Hi Speed (480 Mbps) or Full Speed (12 Mbps).

3.6.9 USB Keyboard / Mouse Function

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

3.6.10 USB storage function

Select Enabled if you plan to use an external USB storage device to boot the system under DOS mode. The choices are “Enabled” and “Disabled”.

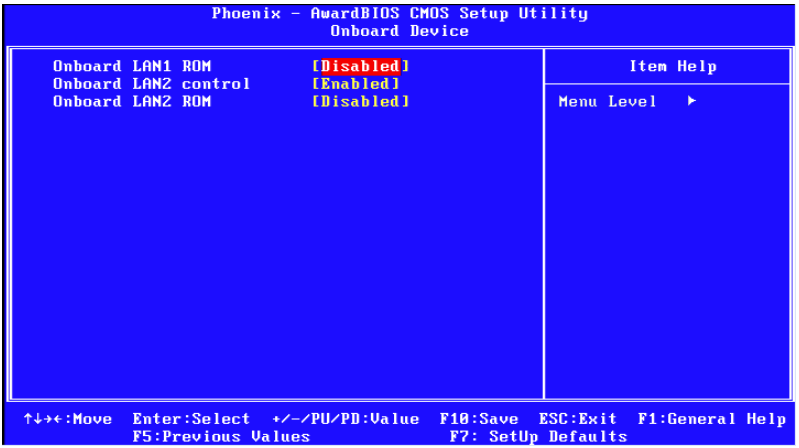


Figure 3.8: Onboard LAN devices

3.6.11 Onboard LAN1 ROM

Options are “Enabled” and “Disabled”. Select “Disabled” if you don’t want to use onboard LAN1 option ROM.

3.6.12 Onboard LAN2 Control

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

3.6.13 On board LAN2 ROM

Options are “Enabled” and “Disabled”. Select “Disabled” if you don’t want to use onboard LAN2 option ROM.

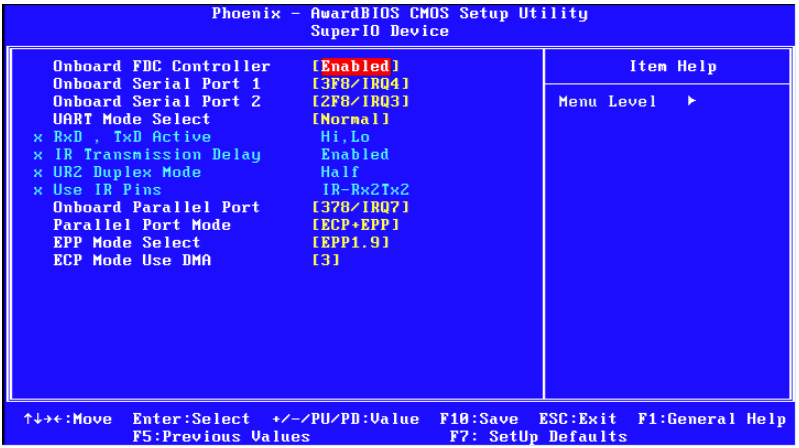


Figure 3.9: Super I/O Device

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.

3.7 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.

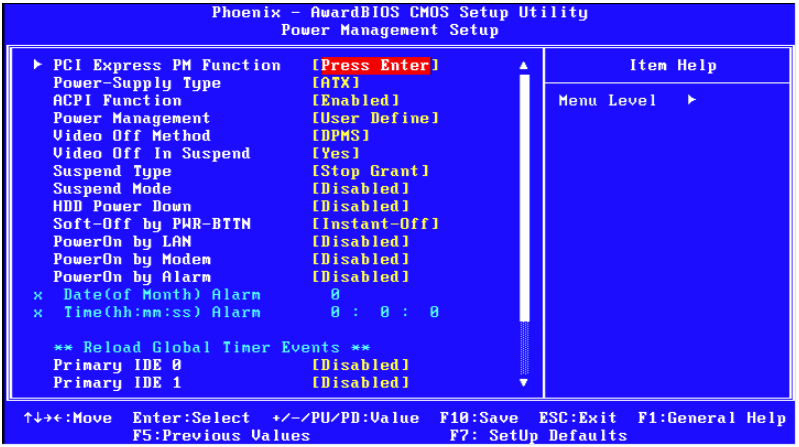


Figure 3.10: Power management setup screen (1)

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

PCA-6194 can support both "ATX" and "AT" power supplies. Customers can choose the PSU type through this selection. The choices are "ATX" and "AT".

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 Suspend Mode

Please refer to 3.7.3

3.7.9 HDD Power Down

Please refer to 3.7.3

3.7.10 Soft-Off by PWR-BTTN

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

3.7.11 PowerOn by LAN

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

3.7.12 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".

3.7.13 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.

3.7.14 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".

3.7.15 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".

3.7.16 PCI PIRQ [A-D]#

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

3.8 PnP/PCI Configurations

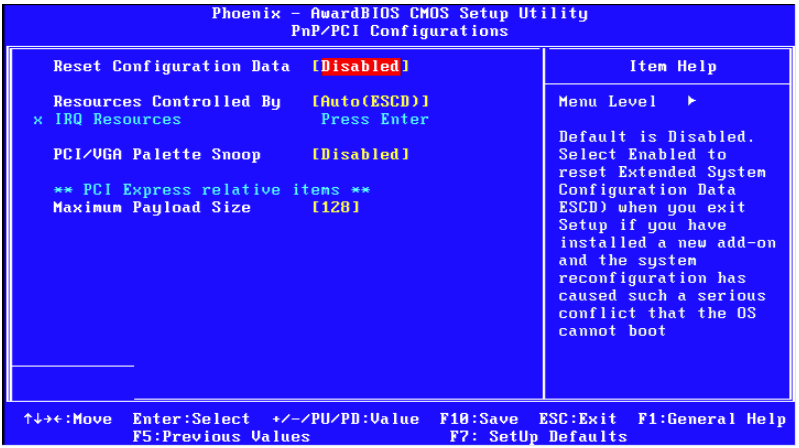


Figure 3.11: PnP/PCI configurations screen

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 option is [128 bytes].

3.9 PC Health Status

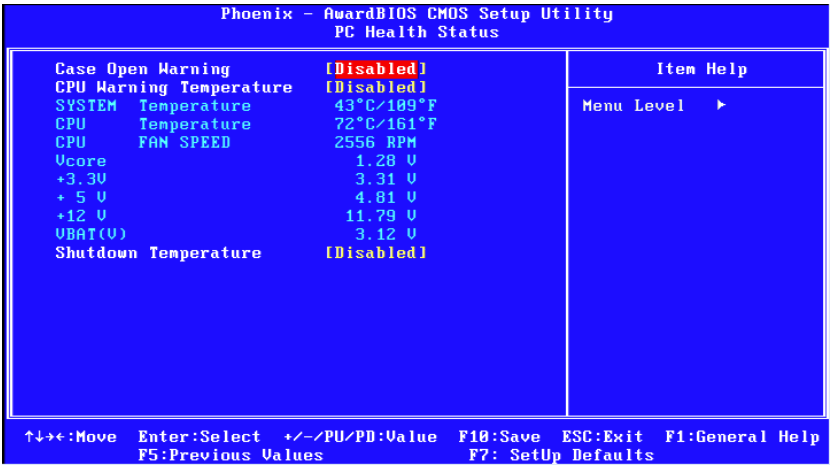


Figure 3.12: PC Health Status Screen

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 System Temperature

This shows you the current temperature of system.

3.9.4 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 VCORE and Other Voltages

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

3.9.7 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

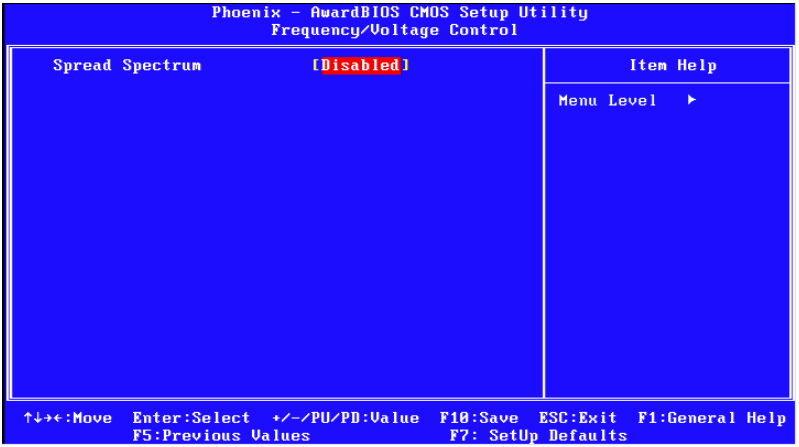


Figure 3.13: Spread Spectrum Control screen

3.10.1 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

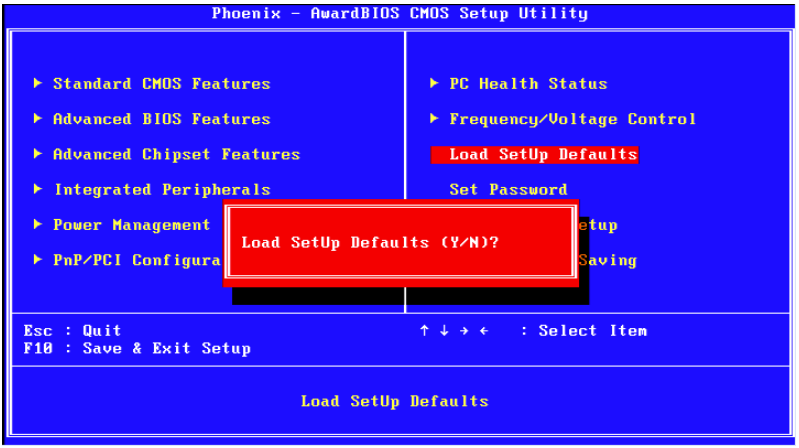


Figure 3.14: Load Setup Defaults screen

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 Password Setting

Follow these steps to change the password.

1. Choose the “Set Password” option from the “Initial Setup Screen” menu and press <Enter>. The screen displays the following message:

Please Enter Your Password

2. Press <Enter>.
3. If the CMOS is good and this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen displays the following message:

Please Confirm Your Password

4. Type the current password and press <Enter>.

5. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

3.13 Save & Exit Setup

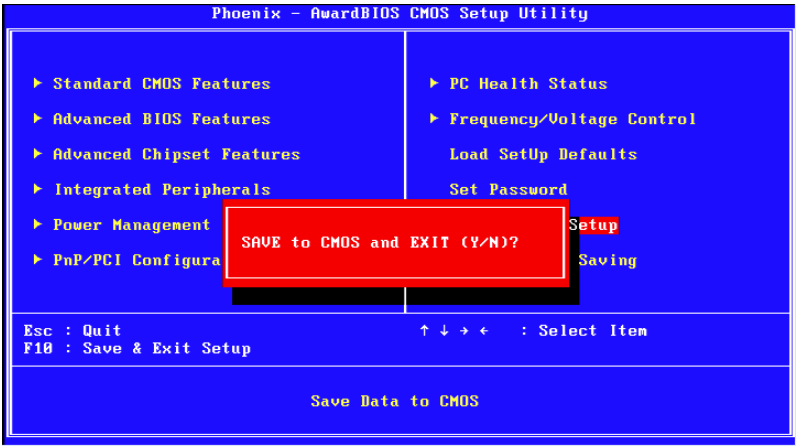


Figure 3.15: Save & exit setup

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.

3.14 Exit Without Saving

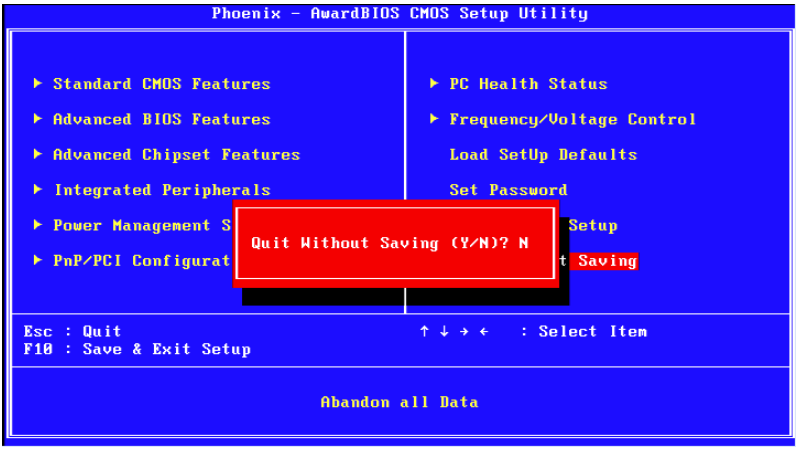


Figure 3.16: Exit without saving

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 PCA-6194 are located on the software installation CD. 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.*

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, 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

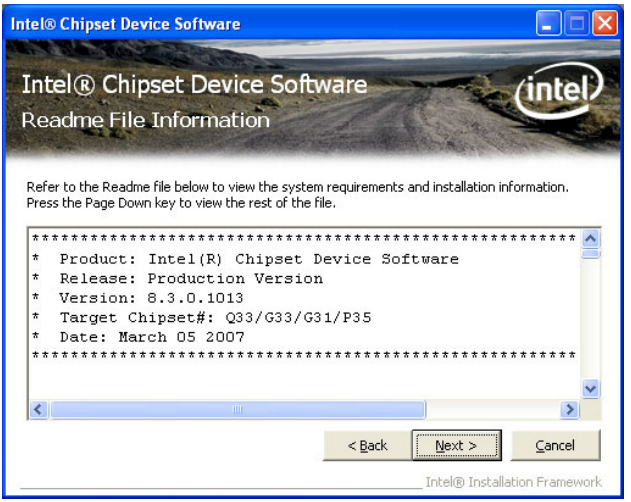
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "Intel INF" then click "infinst_autol.exe". A message pops up telling you to install the CSI utility before other device drivers. Windows XP is used as an example in the following steps.
2. Click "Next" when you see the following message.

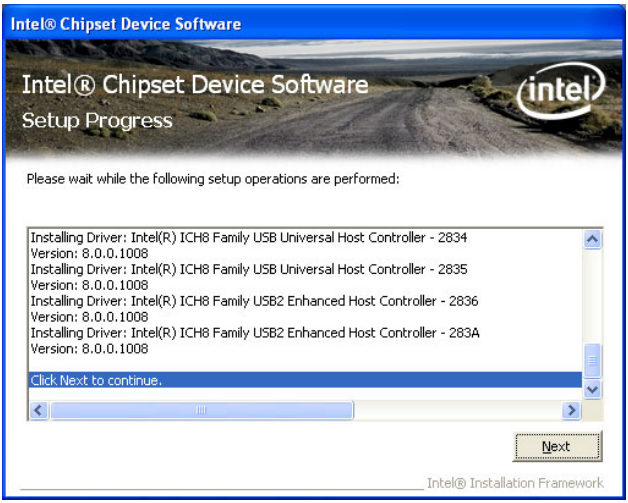


3. Click “Yes” when you see the following message.



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





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


Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
intel
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

CHAPTER 5

VGA Setup

Chapter 5 VGA Setup

5.1 Introduction

The Intel Q965 integrated graphics controller provides an analog display port and DVI interface through SDVO ports. You need to install the VGA driver to enable the function.

The Intel Q965 integrated graphics controller includes the following features.

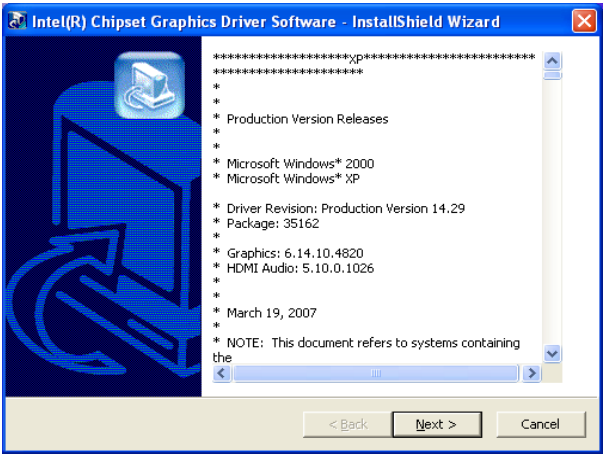
- **Intel GMA 3000 GPU Integrated:** Incorporating the latest Microsoft DirectX 10 support capabilities, the Intel GMA 3000 GPU allows software developers to create lifelike environments and characters. Dual independent display, enhanced display modes for widescreen flat panels, and optimized 3D support deliver an intense and realistic visual experience without requiring a separate graphics card.
- **Intel Serial Digital Video Output (SDVO)**: The PCA-6194 provides DVI interface through SDVO ports. It supports CRTs via a VGA connector with a maximum pixel lock of 400 MHz (up to 2048 x 1536 resolution @ 75 Hz refresh rate)

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.*

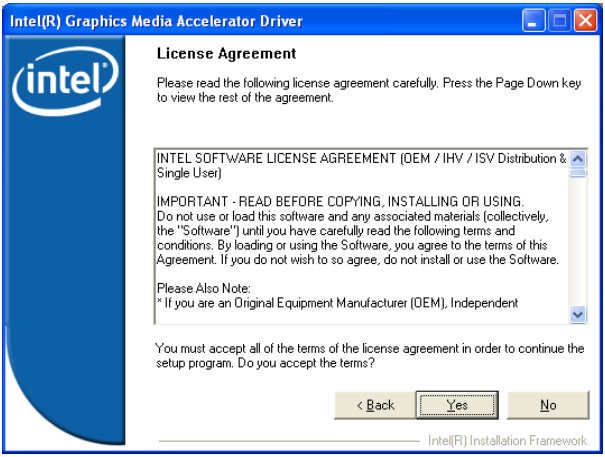
Insert the driver CD into your system's CD-ROM drive. Select the folder "VGA" then click the proper VGA driver for the OS. Windows XP is used as an example in the following steps.

1. Click “Next” to continue the installation.

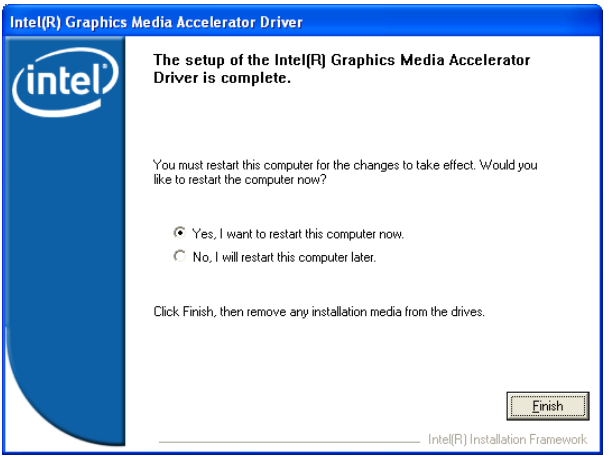


2. You will see a welcome window. Please click “Yes” to continue the installation.

.



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



CHAPTER 6

Onboard Security Setup

Chapter 6 Onboard Security Setup

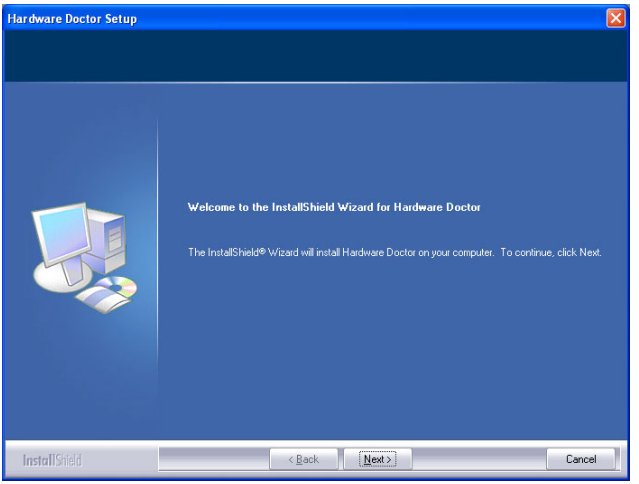
6.1 Introduction

The PCA-6194's hardware monitor is based on the Winbond W83627HG chip. Onboard security (OBS) functions monitor key hardware to help you maintain system stability and durability. The PCA-6194 can monitor five sets of positive system voltages, two sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltages that can be monitored include:

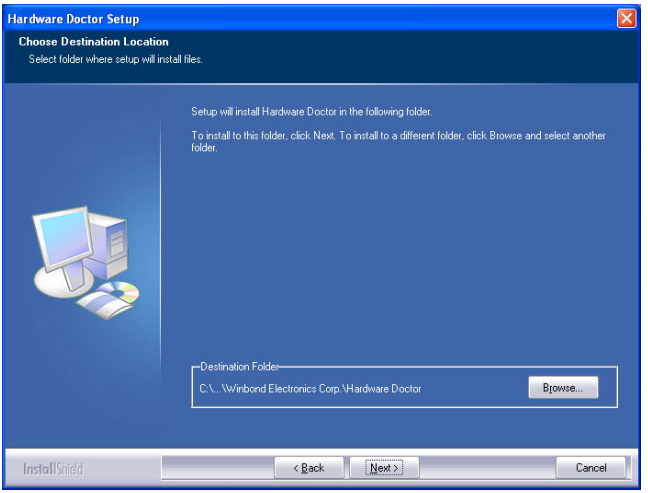
- CPU core voltage: 1.3 ~ 3.3 V, according to Intel specifications.
- Transmission voltage from CPU to chipset: typically 1.8 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.

6.2 Windows XP Driver Setup

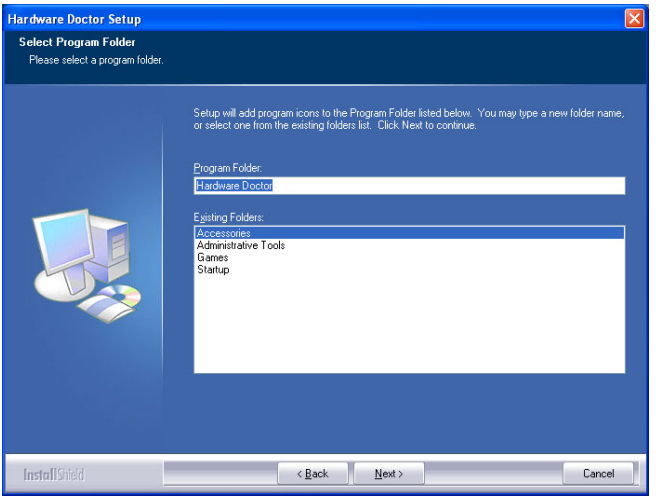
1. Insert the driver CD into your system's CD-ROM drive. Selecting the folder "OBS" then click the "setup.exe". Windows XP is used as an example in the following steps.
2. Click "Next" when you see the following message.



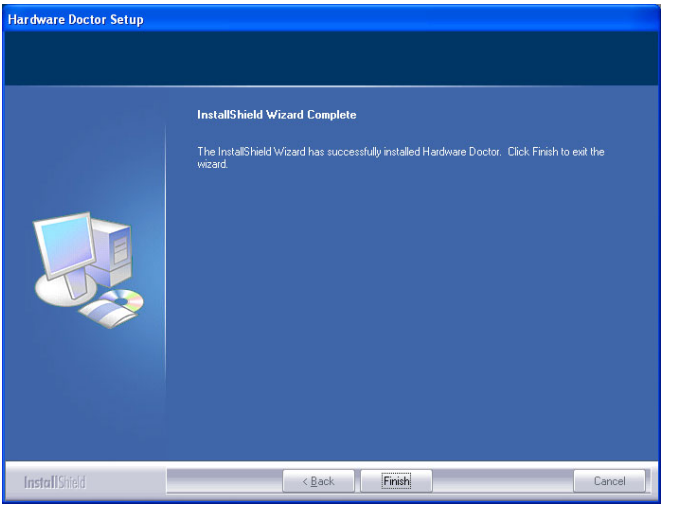
3. Click “Next” when you see the following message.



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



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



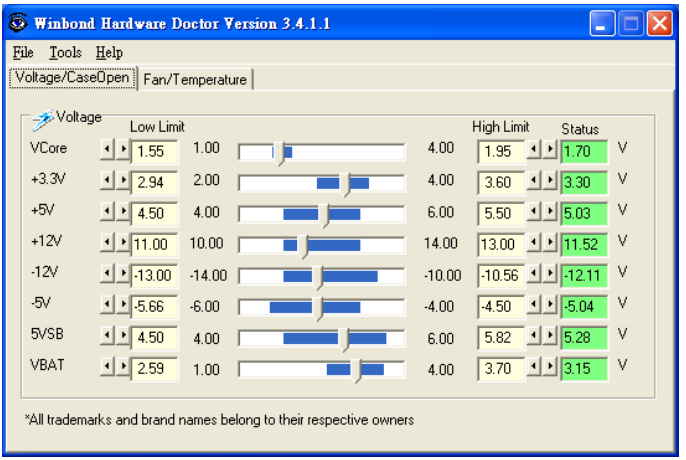
6.3 Using the OBS Hardware Doctor Utility

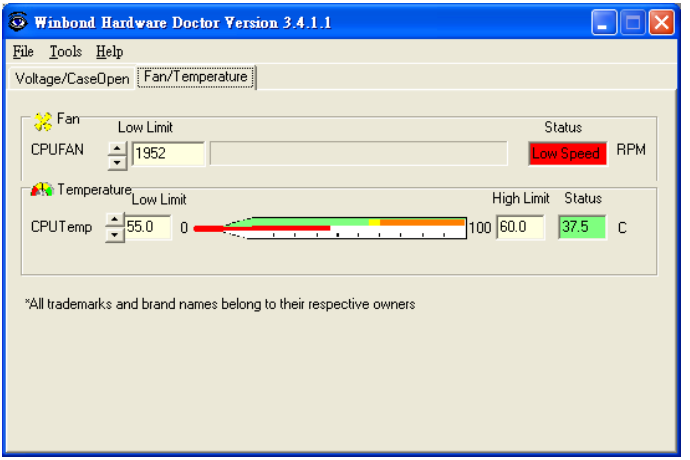
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep will sound to attract your attention.

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 Windows desktop, click on “Start” and select “Programs”, select “Win bond 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
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 PCA-6194 has a single/dual Gigabit Ethernet LAN interface (Intel 82566DM and 82573V) that is connected to a dedicated PCIe x1 link to eliminating network bottlenecks by offering a bandwidth of up to 500 MB/s.

7.2 Features

- Integrated 10/100/1000Base-T transceiver
- 10/100/1000Base-T triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

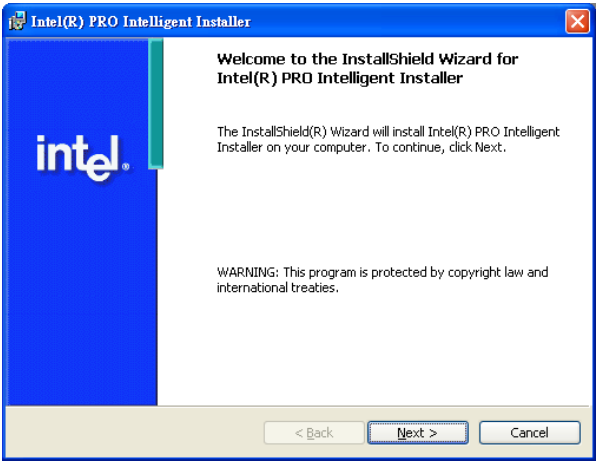
7.3 Installation

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.*

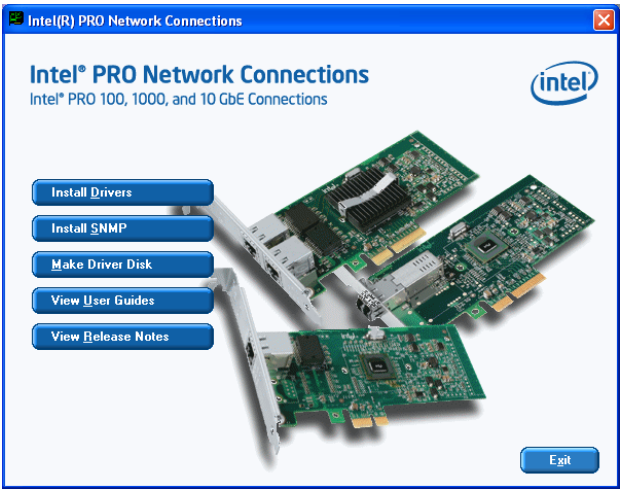
The integrated PCA-6194 Intel gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

7.4 Win XP Driver Setup (LAN)

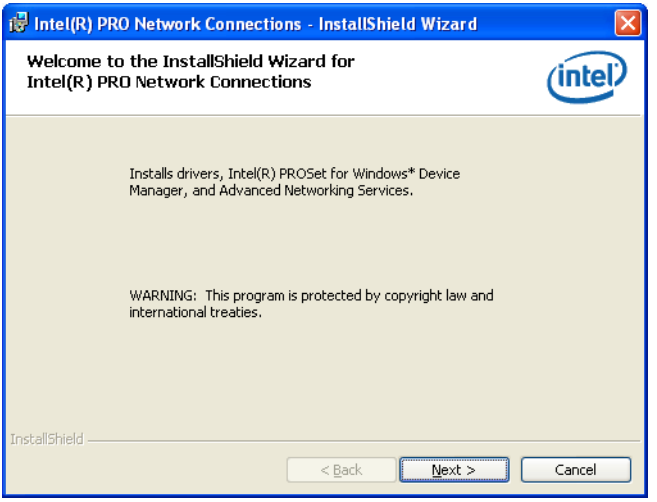
1. Insert the driver CD into your system's CD-ROM drive. Selecting the folder "LAN" then click the proper LAN driver for the OS. Windows XP is used as an example in the following steps.
2. You will see a welcome window. Click "Next" to continue the installation.



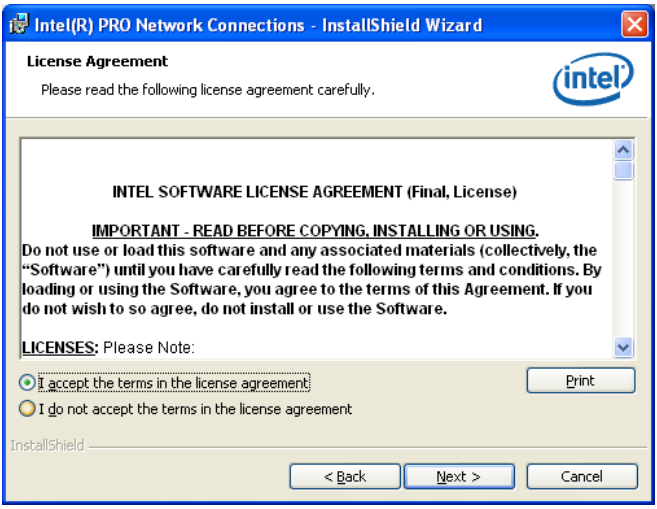
3. Click "Install Driver" to start the installation procedure.



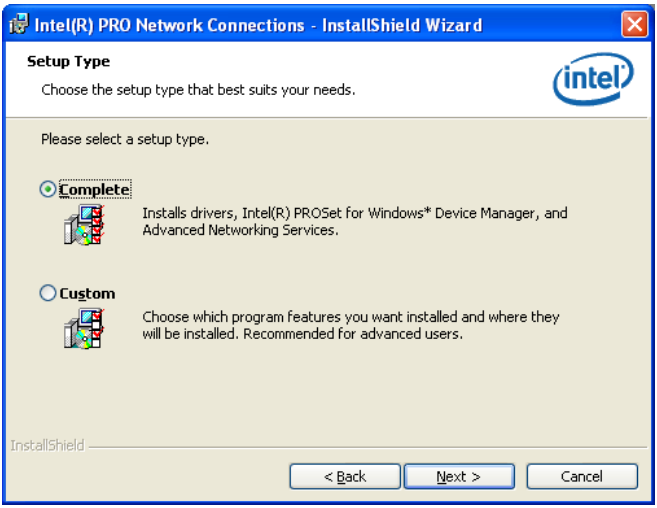
4. Click “Yes” to continue the installation.



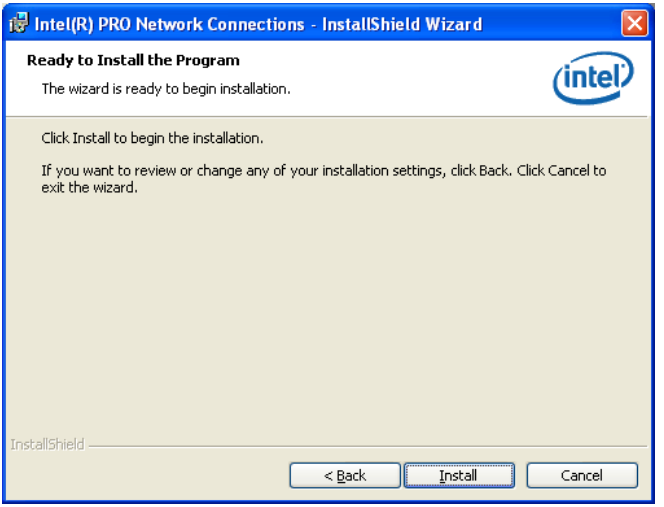
5. Select “I accept the terms in the license agreement” and click “Next” to continue.



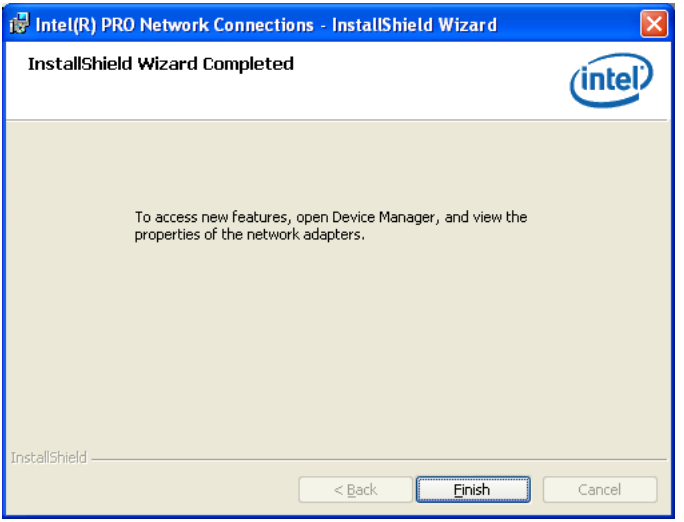
6. Select “Complete” and click “Next” to continue.



7. Click “Install” to begin the installation.



8. Click “Finish” to complete the installation.



CHAPTER 8

SATA RAID Setup

Chapter 8 SATA RAID Setup

8.1 Introduction

To support demanding disk I/O, Intel ICH8DO chipset integrates six 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: \RAID\Manual*

Note: *Before you install the Intel(R) Matrix Storage Manager Please read the "readme.txt" which is in the folder “RAID”.*

The driver is in the CD’s “RAID” folder.You may go to the directory of the CD and follow Intel's installation guide to 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 PCA-6194'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 W83627HG. 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).

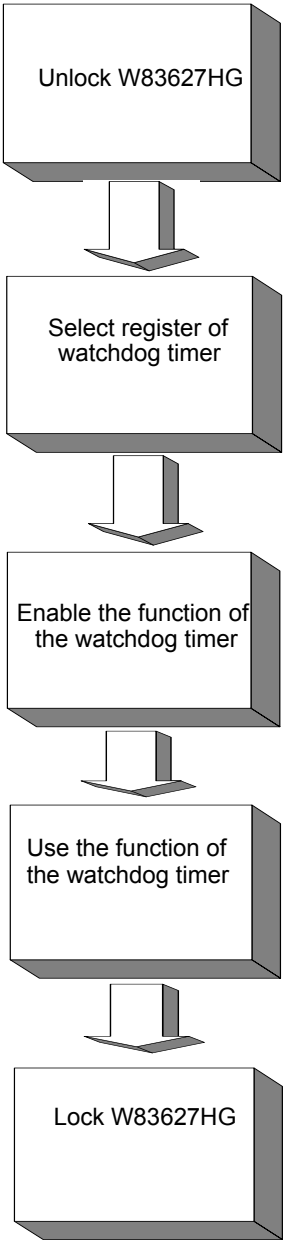

Unlock W83627HG
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627HG

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 W83627HG
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 W83627HG
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 W83627HG
Mov  al,0aah
Out    dx,al
```

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

```
;--------------------------------------------------------
Mov dx,2eh            ; unlock W83627HG
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 W83627HG
Mov  al,0aah
Out    dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627HG
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 W83627HG
Mov  al,0aah
Out   dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;-------------------------------------------------------------
Mov dx,2eh          ; unlock W83627HG
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 W83627HG
Mov  al,0aah
Out   dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627HG
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 W83627HG
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)

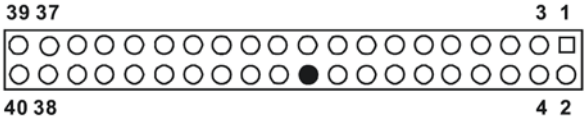


Table B.1: IDE hard drive connector (IDE1)

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)

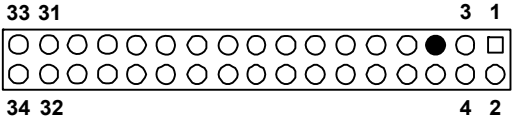


Table B.2: Floppy drive connector (FDD1)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE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

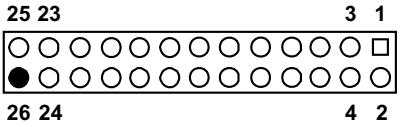


Table B.3: Parallel port connector (LPT1)			
Pin	**Signal**	**Pin**	**Signal**
1	STROBE*	2	AUTOFD*
3	D0	4	ERR
5	D1	6	INIT*
7	D2	8	SLCTINI*
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK*	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N/C
* low active			

B.4 VGA Connector (VGA1)

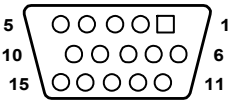


Table B.4: VGA connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.5 DVI Connector (VCN1)

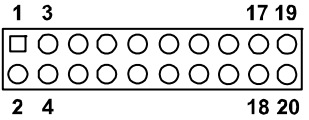


Table B.5: DVI Connector (VCN1)			
Pin	**Signal**	**Pin**	**Signal**
1	#TMDS1_0	11	GND
2	5V_TMDS1	12	DDC3_SDAOUT
3	TMDS1_0	13	#TMDS1_2
4	#TMDS1_CK	14	HP1_DETECT
5	GND	15	TMDS1_2
6	TMDS1_CK	16	NC
7	#TMDS1_1	17	5V_TMDS1

Table B.5: DVI Connector (VCN1)			
8	GND	18	NC
9	#TMDS1_1	19	NC
10	DDC3_SCLOUT	20	NC

B.6 RS-232 Serial Port (COM1, COM2)

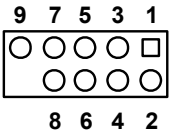


Table B.6: RS-232 serial port (COM1, COM2)	
Pin	**Signal**
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	N/A

B.7 PS/2 Keyboard/Mouse Connector (KBMS1)

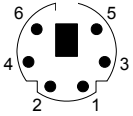


Table B.7: PS/2 keyboard/mouse connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.8 External Keyboard Connector (KBMS2)

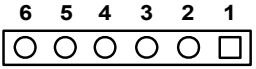


Table B.8: External keyboard connector (KBMS2)	
Pin	**Signal**
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

B.9 CPU Fan Power Connector (CPUFAN1)

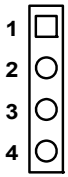


Table B.9: CPU Fan Power Connector (CPUFAN1)

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

B.10 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

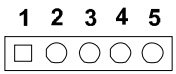


Table B.10:Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

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

B.11 External Speaker Connector (JFP2 / SPEAKER)

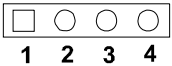


Table B.11:External Speaker Connector (JFP2 / SPEAKER)

Pin	Signal
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.12 Reset Connector (JFP1 / RESET)

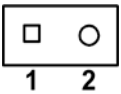


Table B.12:Reset connector (JFP1 / RESET)

Pin	Signal
1	RESET #
2	GND

B.13 HDD LED (JFP2 / HDDLED)

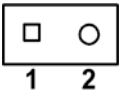


Table B.13:HDD LED (JFP2 / HDDLED)	
Pin	**Signal**
1	IDE LED+
2	IDE LED-

B.14 ATX Soft Power Switch (JFP1 / PWR_SW)

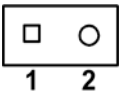


Table B.14:ATX soft power switch (JFP1 / PWR_SW)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.15 Hi-definition Audio Link Connector (HDAUD1)

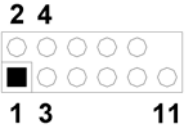


Table B.15:Hi-definition audio link connector (HDAUD1)			
Pin	**Signal**	**Pin**	**Signal**
1	ACZ_VCC	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	-ACZ_RST
9	ACZ_12V	10	GND
11	GND	12	N/C

B.16 SM Bus Connector (JFP2 / SNMP)

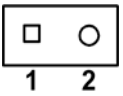


Table B.16:SM bus connector (JFP2 / SNMP)	
Pin	**Signal**
1	SMB_DATA
2	SMB_CLK

B.17 LAN1 and LAN2 LED connector (LANLED1)

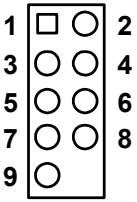


Table B.17:LAN1 and LAN2 LED connector (LANLED1)

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

B.18 ATX Feature Connector (ATXF1)



Table B.18: ATX feature connector (ATXF1)

Pin	Signal

Table B.18: ATX feature connector (ATXF1)	
1	PS_ON#
2	VCC
3	5V standby

B.19 GPIO header (GPIO1)

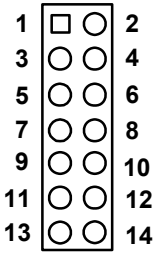


Table B.19: GPIO header (GPIO1)	
Pin	**Signal**
1	GPIO_1
2	GPIO_5
3	VCC_GPIO
4	GND
5	GPIO_2
6	GPIO_6
7	GND
8	GND
9	GPIO_3
10	GPIO_7
11	GND
12	GND
13	GPIO_4
14	GPIO_8

B.20 System I/O Ports

Table B.20:System I/O ports

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

B.21 DMA Channel Assignments

Table B.21: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.22 Interrupt Assignments

Table B.22:Interrupt assignments

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

B.23 1st MB Memory Map

Table B.23:1st MB memory map

Addr. range (Hex)	Device
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.24 PCI Bus Map

Table B.24:PCI bus map

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

Appendix C

Programming the GPIO

Appendix C Programming GPIO

C.1 Supported GPIO Register

Below are the detailed descriptions of the GPIO addresses and programming sample.

C.1.1 GPIO Registers

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

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

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

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

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

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

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

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

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

Extended Function Index Registers (EFIRs)

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

Extended Function Data Registers (EFDRs)

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

C.1.2 GPIO Example program-1

```
------------------------------------------------
 Enter the extended function mode, interruptible double-write
------------------------------------------------
MOV DX,4EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
-----------------------------------------------------------------
Configurate logical device 7(GP10~GP17), configuration register
CRF0,CRF1,CRF2
-----------------------------------------------------------------
MOV DX,4EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,4FH
MOV AL,07H ; select logical device 7
OUT DX,AL ;
MOV DX,4EH
MOV AL,F0
OUT DX,AL
MOV DX,4FH
MOV AL,00H  ; 01:Input  00:output  for  GP10~GP17
OUT DX,AL
MOV DX,4EH
MOV AL,F2H ;
OUT DX,AL
MOV DX,4FH
MOV AL,00H    ;Set GPIO is normal not inverter
OUT DX,AL;
MOV DX,4EH
MOV AL,F1H
```

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

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

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