

PCA-6007

**Full-sized PCI/ISA-bus socket
478 Pentium® 4 / Celeron®D /
Celeron® processor-based
CPU card**

User Manual

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Part No. 2002600700
Printed in Taiwan

1st Edition
October 2006

1.0.1 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.

Table 1.1: PCA-6007 comparison table

Model	PCA-6007VE-00A1E	PCA-6007LV-00A1E
VGA: Intel 865GV integrated	Yes	Yes
USB 2.0 port	Max.6; 2 ports by internal USB, 4 ports by PCA-USB4-00A1E module.	Max.6; 2 ports by internal USB, 4 ports by PCA-USB4-00A1E module.
LAN 1: Intel 82562EZ 10/100Base-T	Yes	No

Table 1.2: PCA-6007 DDR memory compatibility table

Brand	Size	Speed	Type	Part Number	Memory	Full Load*
Apacer	256MB	DDR266	DDR	7710603.112	Infineon HYB25D25680B1-F(32*8)	N/A
	512MB	DDR333	DDR	N/A	Samsung K4H560838C-TCB3(32*8)	N/A
Samsung (DSL)	256MB	DDR333	DDR	N/A	Samsung K4H560838F-TCB3(32*8)	V
	512MB	DDR333	DDR	N/A	Kingston D328DM-60(32*8)	N/A
Kingston	512MB	DDR333	DDR	KVR333X64C26/512	Nanya NT5DS32MBAT-6	N/A
	512MB	DDR400	DDR	7710639.535	PSC AZS56D30A1P-5(32*8)	V
Transcend	512MB	DDR400	DDR	7710736.19G	Infineon HYB25D256807B1-5(32*8)	V
	256MB	DDR400	DDR	TS32MLD64V4F3	MOSEL V68C2256804SA15(32*8)	V
Samsung (DSL)	512MB	DDR400	DDR	TS64MLD64V4F3	Samsung K4H560838F-TCOC(32*8)	V
	256MB	DDR400	DDR	N/A	SAMSUNG K4H560838F-TCOC(32*8)	V
Kingston	512MB	DDR400	DDR	KVR400X64C3/256	Hynix HY6DU6822B1-D43(32*8)	V
	512MB	DDR400	DDR	7710736.33G	Infineon HYB25D256800CE-5	V
Apacer	256MB	DDR400	DDR	7710636.33G	Infineon HYB25D256800CE-5	V
	512MB	DDR333	DDR	7710628.33G	Infineon HYB25D256800CE-5	N/A
Transcend	512MB	DDR333	DDR	7710728.33G	Infineon HYB25D256800CE-5	V
	512MB	DDR333	DDR	7710728.56G	Mosel V58C2256804SA15B	V
Samsung (DSL)	256MB	DDR400	DDR	7710636.465	Samsung K4H560838E-TCOC	V
	512MB	DDR400	DDR	7710736.464	Samsung K4H560838E-TCOC	V
Kingston	1GB	DDR400	DDR	7711136.464	Samsung K4H510838B-TCOC	V
	256MB	DDR400	DDR	7710736.114	Infineon HYB25D256800B1-5	V
Apacer	512MB	DDR400	DDR	7710736.56G	Infineon HYB25D256800B1-5	V
	1GB	DDR333	DDR	N/A	Mosel V58C2256804SA15B	V
Transcend	1GB	DDR400	DDR	N/A	Samsung K4H510838B-TCOC	V
	1GB	DDR400	DDR	UG764D6688KN-GJ	Samsung K4H510838B-TCOC	V
UG	512MB	DDR400	DDR	UG764D6688KN-DH	ELPIDA 0407A9K32-5B	V
	1GB	DDR400	DDR	UG7728D6688LP-GJ	ELPIDA 0419A9K1K-6B	V
Samsung (DSL)	512MB	DDR400	DDR	UG7728D6688LP-GJ	SAMSUNG K4H510838B-TCOC	V
	512MB	DDR400	DDR	UG764D6688KN-GJ	ELPIDA 041TA9K4D-5B	V
Kingston	512MB	DDR400	DDR	UG764D6688KP-GJ	ELPIDA 0407A9K1P-5B	V
	1GB	DDR333	DDR	UG7728D6688LP-DH	SAMSUNG K4H510838B-TCB3	V
Apacer	1GB	DDR333	DDR	UG7728D6688LP-DH	ELPIDA DD5108ADTA-6B (04140E12P000)	V
	512MB	DDR333	DDR	N/A	ELPIDA DD2508AMTA	V
DSL	1GB	DDR333	DDR	N/A	Samsung K4H510838B-TCB3	V
	512MB	DDR333	DDR	N/A	Samsung K4H560838F-TCB3	V
Kingston	256MB	DDR333	DDR	N/A	Samsung K4H510838B-TCB3	V
	256MB	DDR400	DDR	N/A	Samsung K4H560838E-TCOC	V
Kingston	256MB	DDR400	DDR	N/A	Hynix HY6DU6822B1-D43	V
	256MB	DDR400	DDR	N/A	Hynix HY6DU6822C1-D43	V

Full Load* : Supports 4 modules inserted in four slots as two pairs of Dual-channel memory configuration

1.0.2 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:

- Step 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.
- Step 2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
- Step 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.
- Step 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.
- Step 5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

1.0.3 Initial Inspection

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

- 1 PCA-6007 Pentium®4/Celeron®D/Celeron® processor-based single board computer
- 1 PCA-6007 Startup Manual
- 1 CD with driver utility and manual (in PDF format)
- 1 FDD cable P/N: 1700340640
- 2 Ultra ATA 100 HDD cables P/N: 1701400452
- 2 Serial ATA HDD data cable P/N: 1700071000
- 2 Serial ATA HDD power cable P/N: 1703150102
- 1 ATX 12V power converter cable P/N: 170304015K
- 1 Printer (parallel) port & COM port cable kit P/N: 1700060305
- 1 Y cable for PS/2 keyboard and PS/2 mouse P/N: 1700060202
- 1 Two USB ports cable (optional) P/N 1700100170

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

We have carefully inspected the PCA-6007 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-6007, 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.

1.0.4 Release Note

Date	Revision	Description
October 2006	1st Edition	Initial Release

Important Safety Information

SAFETY INSTRUCTIONS

FCC

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

- 1. This device may not cause harmful interference, and*
- 2. This device must accept any interference received, including interference that may cause undesired operation*

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

CAUTION!!

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

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	Input/Output.....	4
1.3.4	VGA interface.....	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-6007 Block Diagram	9
	Figure 1.2:PCA-6007 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 (J1).....	11
	Table 1.3:CMOS (J1).....	11
1.8.3	Watchdog timer output (J2)	11
	Table 1.4:Watchdog timer output (J2).....	12
1.9	System Memory	12
1.9.1	CPU FSB and memory speed	13
	Table 1.5:CPU FSB and memory speed	13
1.9.2	Dual channel configuration.....	13
1.10	Memory Installation Procedures	14
1.11	Processor Installation	14
Chapter 2	Connecting Peripherals	16
2.1	Introduction	16
2.2	1st & 2nd (CN1, CN2) IDE Connectors	16
2.3	Floppy Drive Connector (CN3).....	17
2.4	Parallel Port (CN4).....	17
2.5	USB Ports (CN6).....	18
2.6	VGA Connector CN7	18

2.7	Ethernet Connector (CN8)	19
2.8	Serial Ports (COM1 : CN9; COM2 : CN10)	19
2.9	PS/2 Keyboard/Mouse Connector (CN11/CN33)	20
2.10	External Keyboard Connector (CN12).....	20
2.11	CPU Fan Connector (CN14)	21
2.12	Front Panel Connectors (CN16, 17, 18, 19, 21).....	21
	2.12.1 Power LED (CN16)	21
	2.12.2 External speaker (CN17)	22
	2.12.3 Reset (CN18)	22
	2.12.4 HDD LED (CN19).....	22
	2.12.5 ATX soft power switch (CN21).....	22
2.13	ATX feature connector (CN20).....	23
2.14	AC-97 Audio interface (CN43).....	23
2.15	Serial ATA interface (SA0 and SA1).....	24
2.16	Auxiliary 4-pin power connector (ATX1)	24

Chapter 3 Award BIOS Setup.....26

3.1	Introduction	26
	3.1.1 CMOS RAM Auto-backup and Restore	26
3.2	Entering Setup	27
	Figure 3.1: Award BIOS Setup initial screen	27
3.3	Standard CMOS Setup	27
	Figure 3.2: Standard CMOS features screen	27
3.4	Advanced BIOS Features	28
	Figure 3.3: Advanced BIOS features screen.....	28
	3.4.1 CPU Features	28
	3.4.2 Hard Disk Boot Priority.....	28
	3.4.3 Virus Warning.....	28
	3.4.4 CPU L1 & L2 Cache.....	28
	3.4.5 Hyper-Threading Technology.....	29
	3.4.6 Quick Power On Self Test	29
	3.4.7 First/Second/Third Boot Device	29
	3.4.8 Boot Other Device	29
	3.4.9 Swap Floppy Drive	29
	3.4.10 Boot UP Floppy Seek	29
	3.4.11 Boot Up NumLock Status	29
	3.4.12 Gate A20 Option	29
	3.4.13 Typematic Rate Setting	29
	3.4.14 Typematic Rate (Chars/Sec).....	29
	3.4.15 Typematic Delay (msec).....	30
	3.4.16 Security Option	30
	3.4.17 APIC Mode.....	30
	3.4.18 MPS Version Control For OS.....	30

3.4.19	OS Select For DRAM > 64MB	30
3.5	Advanced Chipset Features	31
	Figure 3.4:Advanced chipset features screen	31
3.5.1	DRAM Timing Selectable	31
3.5.2	CAS Latency Time	31
3.5.3	Active to Precharge Delay	32
3.5.4	DRAM RAS# to CAS# Delay	32
3.5.5	DRAM RAS# Precharge.....	32
3.5.6	Memory Frequency.....	32
3.5.7	System BIOS Cacheable.....	32
3.5.8	Video Bios Cacheable.....	32
3.5.9	Memory Hole At 15M-16M	32
3.5.10	AGP Aperture Size (MB)	32
3.5.11	Init Display First	32
3.5.12	On-Chip VGA.....	33
3.5.13	On-Chip Frame Buffer Size.....	33
3.6	Integrated Peripherals.....	34
	Figure 3.5:Integrated peripherals.....	34
	Figure 3.6:On-Chip IDE Device.....	34
3.6.1	IDE HDD Block Mode	35
3.6.2	On-Chip IDE Device	35
3.6.3	On-Chip Serial ATA	35
3.6.4	Serial ATA Port0/Port1 Mode	35
	Figure 3.7:Onboard Device.....	35
3.6.5	USB Controller	36
3.6.6	USB 2.0 Controller	36
3.6.7	USB Keyboard/Mouse Support	36
3.6.8	AC97 Audio.....	36
3.6.9	Onboard LAN1 Control.....	36
3.6.10	Onboard LAN1 Boot ROM	36
3.7	SuperIO Device	37
	Figure 3.8:SuperIO Device.....	37
3.7.1	Onboard FDC Controller	37
3.7.2	Onboard Serial Port 1	37
3.7.3	Onboard Serial Port 2	37
3.7.4	UART Mode Select	37
3.7.5	RxD, TxD Active.....	37
3.7.6	IR Transmission Delay	37
3.7.7	UR2 Duplex Mode.....	38
3.7.8	Use IR Pins	38
3.7.9	Onboard Parallel Port.....	38
3.7.10	Parallel Port Mode	38
3.7.11	EPP Mode Select	38
3.7.12	ECP Mode Use DMA	38
3.7.13	PWRON After PWR-Fail	38

3.8	Power Management Setup.....	39
	Figure 3.9:Power management setup screen (1).....	39
3.8.1	Power-Supply Type	39
3.8.2	ACPI function	39
3.8.3	Video Off Method.....	39
3.8.4	Video Off In Suspend	39
3.8.5	Suspend Type.....	39
3.8.6	Modem Use IRQ.....	39
3.8.7	Soft-Off by PWR-BTTN	40
3.8.8	CPU THRM-Throttling.....	40
3.8.9	Resume on LAN/PCI PME#.....	40
3.8.10	Resume on Ring.....	40
3.8.11	Resume on Alarm	40
3.8.12	Primary IDE 0 (1) and Secondary IDE 0 (1)	40
3.8.13	FDD, COM, LPT PORT	40
3.8.14	PCI PIRQ [A-D]#	40
3.9	PnP/PCI Configurations	41
	Figure 3.10:PnP/PCI configurations screen.....	41
3.9.1	Reset Configuration Data.....	41
3.9.2	Resources Controlled By	41
3.9.3	PCI/VGA Palette Snoop	41
3.10	PC Health Status.....	42
3.10.1	CPU Warning Temperature	42
	Figure 3.11:PC health status screen.....	42
3.10.2	Current System Temp	42
3.10.3	Current CPU Temperature	42
3.10.4	Current CPUFAN Speed.....	42
3.10.5	VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V).....	42
3.11	Spread Spectrum Control	43
	Figure 3.12:Spread Spectrum Control screen.....	43
3.11.1	CPU Clock Ratio	43
3.11.2	Spread Spectrum	43
3.12	Password Setting	43
3.13	Save & Exit Setup	44
3.14	Exit Without Saving.....	44

Chapter 4 Chipset Software Install Utility.....46

4.1	Before you begin	46
4.2	Introduction	46
4.3	Windows XP Driver Setup.....	47

Chapter	5	VGA Setup	52
	5.1	Introduction	52
	5.2	Dynamic Video Memory Technology.....	52
	5.3	Windows XP Driver Setup.....	53
Chapter	6	LAN Configuration	58
	6.1	Introduction	58
	6.2	Features	58
	6.3	Installation	59
	6.4	Win XP Driver Setup (Intel 82562)	59
Chapter	7	USB 2.0 Configuration	64
	7.1	Introduction	64
	7.2	Features	64
	7.3	Installation	64
Chapter	8	Onboard Security Setup	66
	8.1	Introduction	66
	8.2	Windows XP Driver Setup.....	67
	8.3	Using the OBS Hardware Doctor Utility	70
Appendix A		Programming the watchdog	74
	A.1	Programming the Watchdog Timer.....	74
	A.1.1	Watchdog timer overview.....	74
	A.1.2	Reset/ Interrupt selection	74
	A.1.3	Programming the Watchdog Timer	74
	A.1.4	Example Program	77
Appendix B		Pin Assignments	84
	B.1	IDE Hard Drive Connector (CN1, CN2).....	84
	B.2	Floppy Drive Connector (CN3).....	85
	B.3	Parallel Port Connector (CN4)	86
	B.4	USB Connector (CN6)	87
	B.5	VGA Connector (CN7)	87
	B.6	COM1/COM2 RS-232 Serial Port (CN9, CN10).....	88
	B.7	Keyboard and Mouse Connector (CN11).....	89
	B.8	External Keyboard Connector (CN12).....	89
	B.9	CPU Fan Power Connector (CN14).....	90
	B.10	Power LED (CN16).....	90

B.11	External Speaker Connector (CN17).....	91
B.12	Reset Connector (CN18).....	91
B.13	HDD LED Connector (CN19).....	92
B.14	ATX Feature Connector (CN20).....	92
B.15	ATX Soft Power Switch (CN21)).....	93
B.16	H/W Monitor Alarm (CN22).....	93
B.17	AC-97 Audio Interface (CN43).....	94
B.18	System I/O Ports.....	95
B.19	DMA Channel Assignments.....	96
B.20	Interrupt Assignments.....	96
B.21	1st MB Memory Map.....	97
B.22	PCI Bus Map.....	97

CHAPTER

1

General Information

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6007 Series all-in-one industrial grade single board computer is a high performance and full-featured computing engine. It follows the PICMG 1.0 specification and meets most requirements for industrial applications.

The PCA-6007 uses Intel's 865GV chipset to support Intel's Socket 478 Pentium®4, Celeron®D, and Celeron® processors with 800/533/400 MHz front side bus. The dual channel DDR 400 SDRAM interface provides bottle neck free memory bandwidth up to 6.4GB/s. In addition to the two EIDE interfaces (up to four devices), it features a high performance serial ATA interface (up to 150MB/s) which eases cabling to hard drives in industrial chassis with thin and long cables. Other features include chipset built-in high performance VGA interface, six USB 2.0 ports (up to 480 Mbps), and other standard PC functions like two RS-232 serial ports, one enhanced parallel port and floppy disk interface.

The PCA-6007 Series offers several impressive industrial features such as: CMOS data backup, which is stored in the Flash memory, which protects data even after battery failure. Also included is a 256-level watchdog timer, which resets the CPU if a program cannot be executed normally.

Note: *Some of the features mentioned above are not available with all models. For more information about the specifications of a particular model, see Table 1.1 : Comparison table and Section 1.3: Specifications.*

1.2 Features

1. **High performance:** The PCA-6007 uses Intel 865GV chipset which offers high-bandwidth interfaces such as dual-channel DDR400 main memory, 800 MHz system bus, integrated graphics controller with Intel® Extreme Graphics 2 Technology, Hi-Speed USB 2.0 connectivity to ensure the flexibility and performance you expect.
2. **BIOS CMOS backup and restore:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, BIOS will check the data, and automatically restore the original data for booting.
3. **Supports Hyper-Threading :** This allows a single HT-enabled Pentium 4 processor to process two threads simultaneously. By building two logical processors into a single physical processor, the performance and utilization of the processor resource will both increase. Users can obtain a higher CPU performance while Hyper-Threading is enabled.

1.3 Specifications

1.3.1 System

- **CPU:** CPU: Intel® socket 478 Pentium® 4 up to 3.4GHz FSB 533/800MHz, Celeron®D up to 3.06GHz FSB 533MHz, Celeron® up to 2.8GHz FSB 400MHz; supports Intel Hyper Threading technology. CPUs with 1.75V core voltage (Willamete) are not supported.
- **L2 Cache:** CPU built-in 128/256/512/1024 KB full-speed L2 cache
- **BIOS:** Award Flash BIOS (4Mb Flash Memory)
- **System Chipset:** Intel 865GV with ICH5
- **SATA/EIDE hard disk drive interface:** Supports up to two independent Serial ATA hard drives (up to 150MB/s) and two IDE hard disk drives or four enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.) BIOS enabled/disabled.
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB). BIOS enabled/disabled

1.3.2 Memory

- **RAM:** Up to 4GB in four 184-pin DIMM sockets. Supports dual channel DDR266/333/400 SDRAM

1.3.3 Input/Output

- **Bus interface:** PICMG 1.0 compliant PCI/ISA bus interface
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two RS-232 ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM2 or disabled
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **ISA bus:** Support ISA high drive. PCI-to-ISA bridge: ITE 8888
- **AC-97 Audio:** PCA-6007 can provide audio function with the optional audio extension module PCA-AUDIO-00A1E
- **USB port:** Supports up to six USB 2.0 and transmission rate up to 480Mbps; available on PCA-USB4 or through an optional two-USB-port cable kit, P/N : 1700100170

1.3.4 VGA interface

- **Controller:** Intel 865GV chipset integrated
- **Display memory:** Share system memory up to 64 MB, BIOS selectable
- **Resolution:** up to 2048 × 1536 @ 85Hz

1.3.5 Ethernet LAN

- Supports single/dual 10/100Base-T networking or single/dual 10/100/1000Base-T Ethernet networking
- **Controller:**
- Single 10/100Base-T: Intel 82562EZ

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels). You can find programming detail in Appendix A

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0°~60° C (32° ~ 140° F, Depending on CPU)
- **Storage temperature:** -20°~ 70° C (-4° ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:** Typical : +5V:6.53A, +12V:4.57A (Intel Pentium 4 3.0GHz with 800MHz FSB, 512MB DDR 400 SDRAM)
- **Board size:** 338 x 122 mm (13.3" x 4.8")
- **Board weight:** 0.5 kg (1.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6007 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 single board computer.

Table 1.1: Jumpers

Label	Function
J1	CMOS Clear
J2	Watchdog timer output selection

Table 1.2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN6	USB port 4, 5
CN7	VGA connector
CN8	Ethernet connector 1
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN13	Reserved
CN14	CPU FAN connector
CN16	Power LED
CN17	External speaker

Table 1.2: Connectors	
CN18	Reset connector
CN19	HDD LED connector
CN20	ATX feature connector
CN21	ATX soft power switch (PS_ON)
CN22	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
CN43	AC97 Link connector
SA0	Serial ATA0
SA1	Serial ATA1
ATX1	ATX 12v Auxillary power connector

Notice: The 4-pin ATX 12V power connector "ATX1" must be connected to the power supply to provide adequate power to the CPU card. Otherwise system might be unstable.

1.5 Board Layout: Jumper and Connector Locations

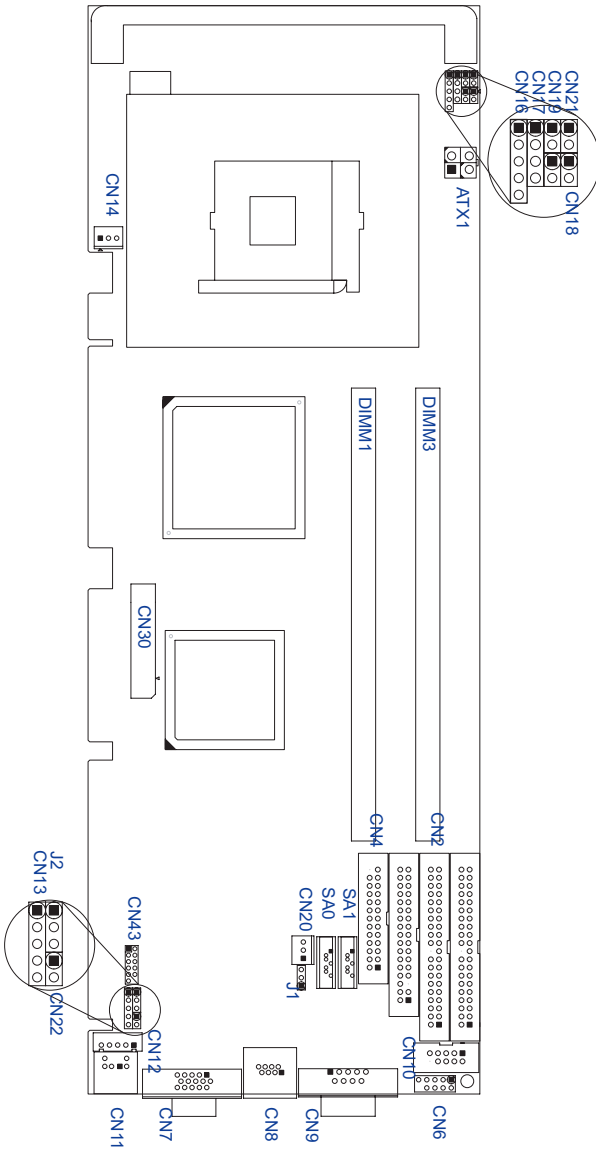


Figure 1.1: Jumper and Connector locations

1.6 PCA-6007 Block Diagram

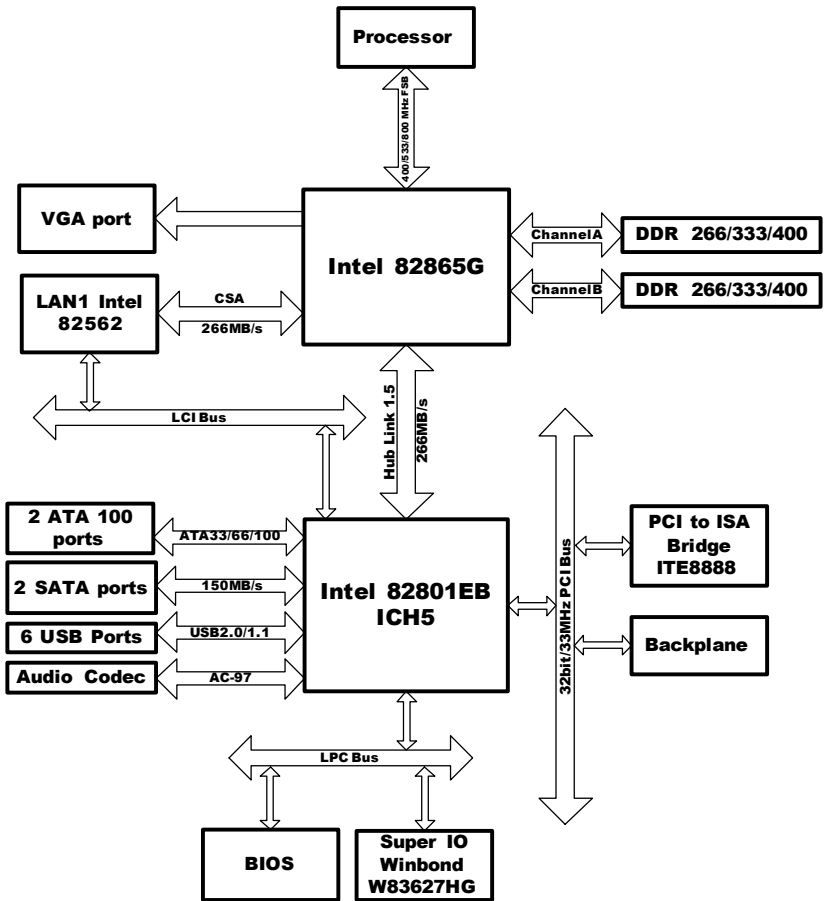


Figure 1.2: PCA-6007 Block Diagram

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 single board computer. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

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

Notice: Before install your PCA-6007 into a chassis, make sure that all components on both sides of the CPU card do not touch any metal parts, especially the chassis wall and add-on card at the adjacent slot.

1.8 Jumper Settings

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



1.8.1 How to set jumpers

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

1.8.2 CMOS clear (J1)

The PCA-6007 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 J1 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 (J1)



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

* default setting

1.8.3 Watchdog timer output (J2)

The PCA-6007 contains a watchdog timer that will reset the CPU or send a signal to IRQ11 in the event the CPU stops processing. This feature means the PCA-6007 will recover from a software failure or an EMI problem. The J2 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 (J2)

Function	Jumper Setting
IRQ11	1  1-2 closed
* Reset	1  2-3 closed
* default setting	

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

1.9 System Memory

The PCA-6007 has two sockets for 184-pin dual inline memory modules (DIMMs) in two separated memory channels. It can operate with single channel or dual channel modules. We recommend to use dual channel mode to provide optimized performance.

All these sockets use 2.5 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 128, 256, 512 and 1024 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 128 MB and 4 GB.

1.9.1 CPU FSB and memory speed

The PCA-6007 can accept DDR SDRAM memory chips without parity. Also note: The PCA-6007 accepts PC2100 (DDR266), PC2700 (DDR 333) and PC3200 (DDR 400) DDR SDRAM, depending on the CPU front side bus frequency (FSB). Please refer below table for the relationship between the CPU FSB and memory speed.

Table 1.5: CPU FSB and memory speed

Memory Speed	Processor	FSB frequency	Memory speed Outcome
DDR400	Pentium 4	800 MHz	400 MHz
DDR333	Pentium 4	800 MHz	320 MHz
	Pentium 4	533MHz	333 MHz
	Pentium 4 or Celeron	400 MHz	266 MHz
DDR266	Pentium 4	533 or 400 MHz	266 MHz
	Celeron	400 MHz	266 MHz

The PCA-6007 does not support ECC (error checking and correction). Memory modules with 9 SDRAM chips/side support ECC; modules with 8 chips/side do not support ECC.

1.9.2 Dual channel configuration

The two DIMM sockets are arranged in two channels: DIMM1 in channel A; DIMM3 in channel B. To enable dual channel operation, please install a matched pair of DIMMs in DIMM1 & DIMM3.

"Matched pair of DIMMs" means: same in speed (DDR266, DDR333, DDR400), same in size (128MB, 256MB, 512MB or 1GB), same in chip density (128 Mb, 256Mb or 512Mb and same in CSA latency). Any other memory configuration will result in single channel memory operation.

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 Processor Installation

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

Warning: Without a fan or heat sink, the CPU will over-heat and cause damage to both the CPU and the single board computer. To install a CPU, first turn off your system and remove its cover. Locate the processor socket 478.

1. Make sure the socket 478 lever is in the upright position. To raise the lever, pull it out to the side a little and raise it as far as it will go.
2. Place the CPU in the empty socket. Follow the instructions that came with the CPU. If you have no instructions, complete the following procedure. Carefully align the CPU so it is parallel to the socket and the notches on the corners of the CPU correspond with the notches on the inside of the socket. Gently slide the CPU in. It should insert easily. If it does not insert easily, pull the lever up a little bit more.
3. Press the lever down. The plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and will not damage the CPU. When the CPU is installed, the lever should snap into place at the side of the socket.

Note : The CPUs made with 0.18 micro-meter process technology ("Willamette") cannot be supported by PCA-6007.

CHAPTER

2

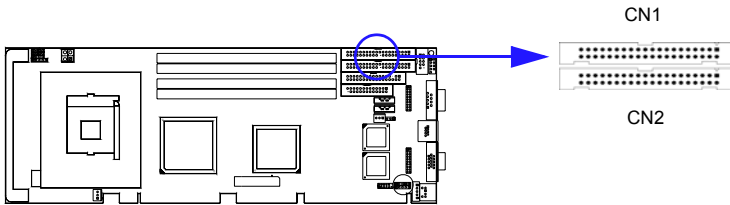
Connecting Peripherals

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 1st & 2nd (CN1, CN2) IDE Connectors



You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6007's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

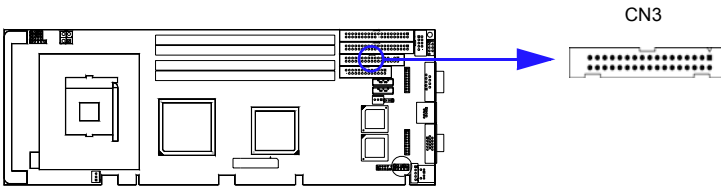
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the single board computer. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

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

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

Connect the second hard drive to the remaining connector (CN2 or CN1), in the same way as described above.

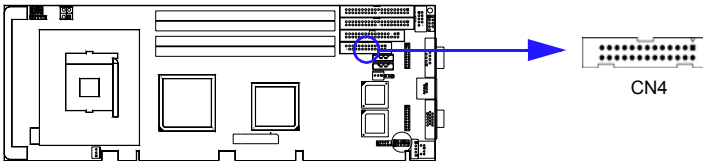
2.3 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6007'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 (CN4)

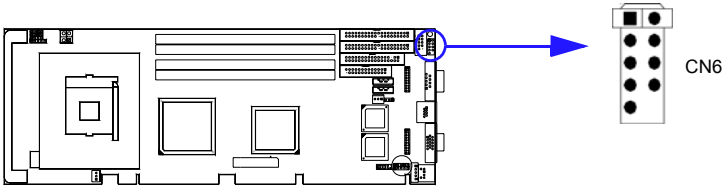


The parallel port is normally used to connect the single board computer to a printer. The PCA-6007 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector 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.

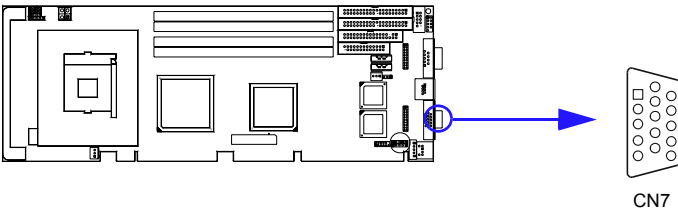
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN4 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN4. Pin 1 is on the upper right side of CN4.

2.5 USB Ports (CN6)



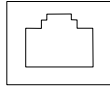
The PCA-6007 provides up to six ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps and is fuse-protected. The USB interface can be disabled in the system BIOS setup.

2.6 VGA Connector CN7



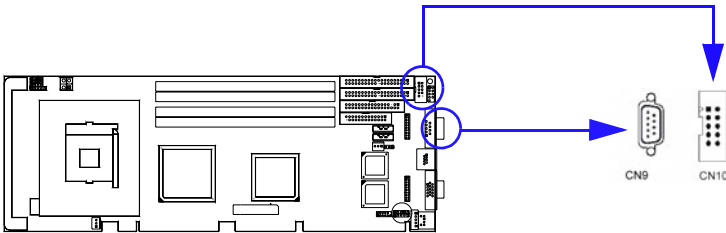
The PCA-6007 includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.7 Ethernet Connector (CN8)



The PCA-6007 is equipped with single high-performance 32-bit PCI-bus Ethernet interface, which is fully compliant with IEEE 802.3/u 10/100Mbps CSMA/CD and IEEE 802.3ab 1000Base-T standards. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible. An onboard RJ-45 jack provides convenient 10/100Base-T operation.

2.8 Serial Ports (COM1 : CN9; COM2 : CN10)

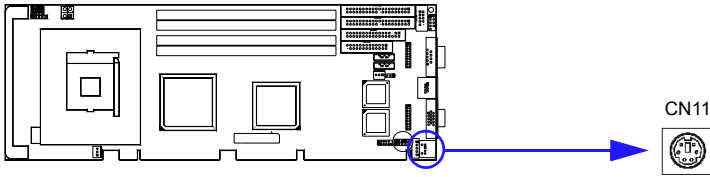


The PCA-6007 offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

The IRQ and address ranges for both 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.

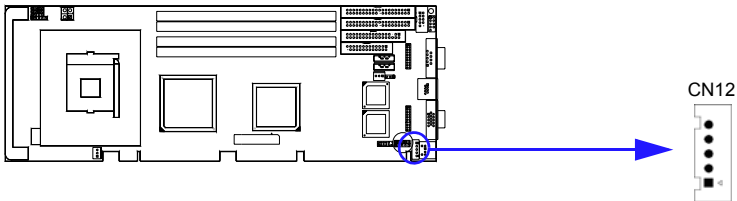
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.9 PS/2 Keyboard/Mouse Connector (CN11/CN33)



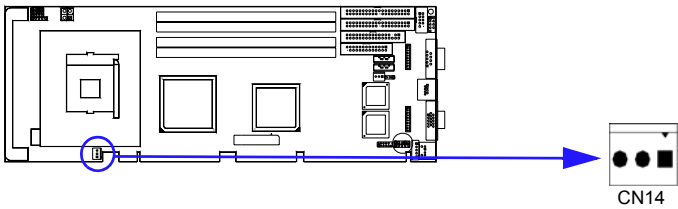
Two 6-pin mini-DIN connectors (CN11 and CN33) on the card mounting bracket provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. CN11 can also be connected to an adapter cable (P/N: 1700060202, available from Advantech) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.10 External Keyboard Connector (CN12)



In addition to the PS/2 mouse/keyboard connector on the PCA-6007's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

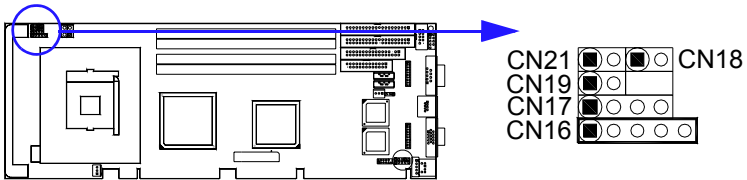
2.11 CPU Fan Connector (CN14)



If fan is used, this connector supports cooling fans of 500mA (6W) or less.

2.12 Front Panel Connectors (CN16, 17, 18, 19, 21)

There are several external switches to monitor and control the PCA-6007



2.12.1 Power LED (CN16)

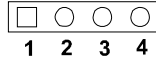
CN16 is a 5-pin connector for the power on LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.1: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	On	On
System Suspend	Fast flashes	Fast flashes
System Off	Off	Slow flashes

2.12.2 External speaker (CN17)

CN17 is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6007 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed



2.12.3 Reset (CN18)

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



2.12.4 HDD LED (CN19)

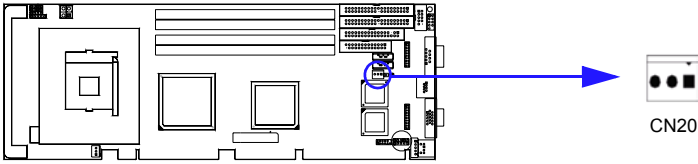
You can connect an LED to connector CN19 to indicate when the HDD is active.



2.12.5 ATX soft power switch (CN21)

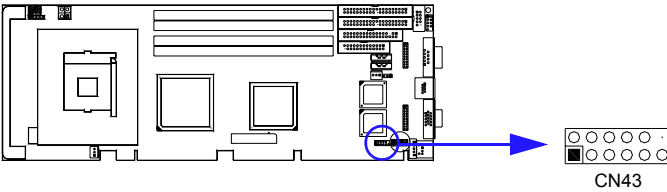
If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to CN21. This connection enables you to turn your computer on and off.

2.13 ATX feature connector (CN20)



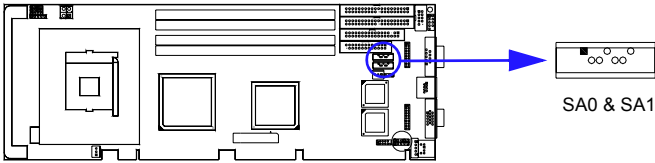
Connect to the CN1 on the Advantech backplane to enable the ATX function, 5V stand-by.

2.14 AC-97 Audio interface (CN43)



The PCA-6007 provides AC-97 audio through PCA-AUDIO-00A1 module from Advantech.

2.15 Serial ATA interface (SA0 and SA1)



In addition to the two EIDE interfaces (up to four devices), the PCA-6007 features high performance serial ATA interface (up to 150MB/s) which eases cabling to hard drives with thin and long cables.

2.16 Auxiliary 4-pin power connector (ATX1)

To ensure the sufficiency of power supply for Pentium® 4 single board computer, one auxiliary 4 pin power connector is available on PCA-6007. This connector must be connected to the power supply, otherwise system might be unstable.

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 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 environment cause 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 to allow you to enter the BIOS setup.

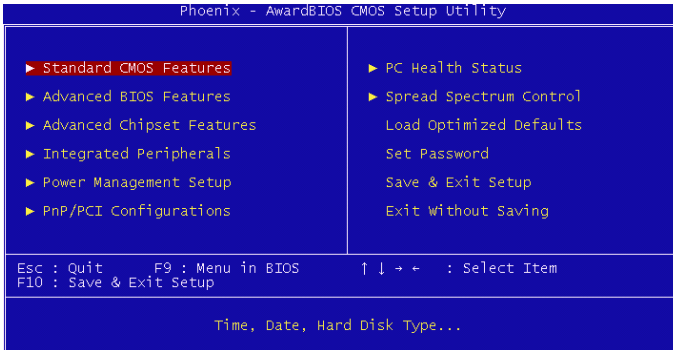


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

Choose the “Standard CMOS Features” option from the “Initial Setup Screen” menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

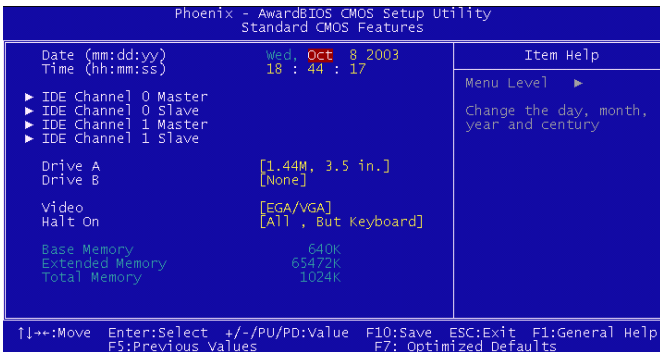


Figure 3.2: Standard CMOS features screen

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-6007 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

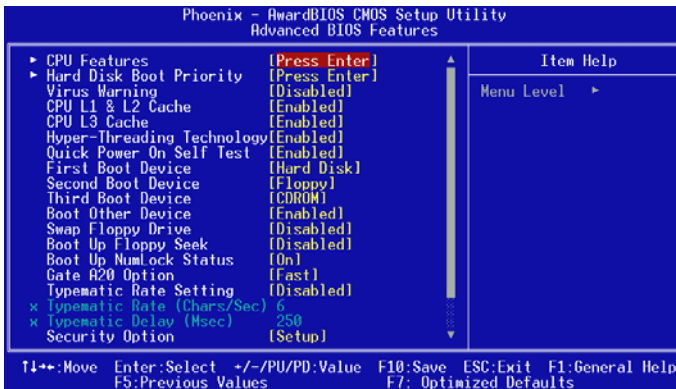


Figure 3.3: Advanced BIOS features screen

3.4.1 CPU Features

While using Prescott core CPU, the "CPU Features" will show up for user to adjust the value of "Delay Prior to Thermal" and "Limit CPUID MaxVal". The "Delay Prior to Thermal" can select the period if user wants to lower the CPU speed when CPU temperature is too high. The choices are: "4 Min", "8 Min", "16 Min" and "32 Min". The suitable selections of "Limit CPUID MaxVal" are "Disabled" in WinXP, and "Enabled" in NT 4.0.

3.4.2 Hard Disk Boot Priority

Select hard disk boot device priority.

3.4.3 Virus Warning

Enable virus warning, the commands are "Enabled" or "Disabled".

3.4.4 CPU L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”

3.4.5 Hyper-Threading Technology

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

3.4.6 Quick Power On Self Test

Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.

3.4.7 First/Second/Third Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: "Floppy", "LS120", "HDD-0", "SCSI", "CDROM", "HDD-1", "HDD-2", "HDD-3", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN", "Disabled".

3.4.8 Boot Other Device

Choose other device to boot, the choice is "Enabled" or "Disabled".

3.4.9 Swap Floppy Drive

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

3.4.10 Boot UP Floppy Seek

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

3.4.11 Boot Up NumLock Status

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

3.4.12 Gate A20 Option

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

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

3.4.13 Typematic Rate Setting

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

3.4.14 Typematic Rate (Chars/Sec)

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

3.4.15 Typematic Delay (msec)

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

3.4.16 Security Option

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

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

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

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

3.4.17 APIC Mode

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

3.4.18 MPS Version Control For OS

This reports if an FDD is available for Windows 95. The selections are "1.1" or "1.4."

3.4.19 OS Select For DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system. Commands are "Non-OS2" or "OS2."

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-6007, as shown in Figure 3-4:

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

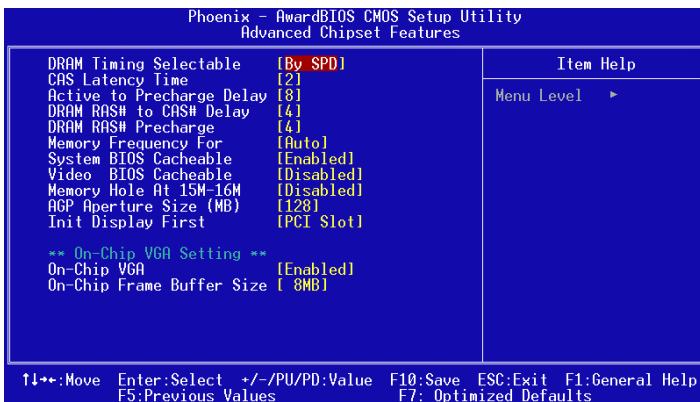


Figure 3.4: Advanced chipset features screen

3.5.1 DRAM Timing Selectable

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

3.5.2 CAS Latency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available. Leave this on the default setting. The options are "2", "2.5" or "3".

3.5.3 Active to Precharge Delay

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The Choice: "8", "7", "6" and "5".

3.5.4 DRAM RAS# to CAS# Delay

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB. The Choice: "4", "3" and "2".

3.5.5 DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to DRAM. Leave this on the default setting. The choice : "4", "3" and "2".

3.5.6 Memory Frequency

To adjust the frequency of memory. The choice : "DDR266", "DDR333", "DDR400" and "Auto".

3.5.7 System BIOS Cacheable

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

3.5.8 Video Bios Cacheable

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

3.5.9 Memory Hole At 15M-16M

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

3.5.10 AGP Aperture Size (MB)

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The Choice : "4", "8", "16", "32", "64", "128", and "256".

3.5.11 Init Display First

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

3.5.12 On-Chip VGA

User can disable onboard VGA controller by selecting "Disabled"

3.5.13 On-Chip Frame Buffer Size

User can select frame buffer size. Option is : "1MB", "8MB" and "16MB".

3.6 Integrated Peripherals

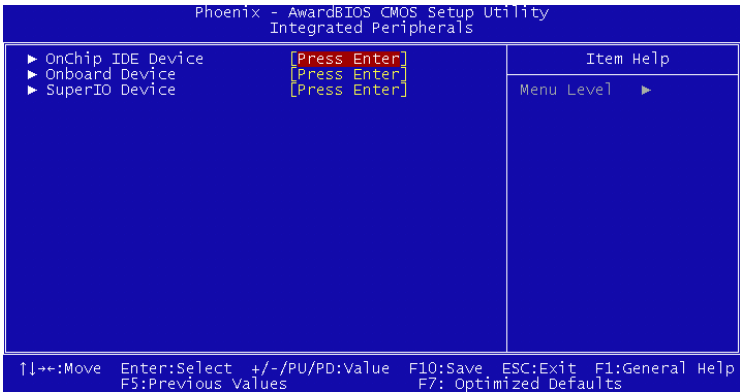


Figure 3.5: Integrated peripherals

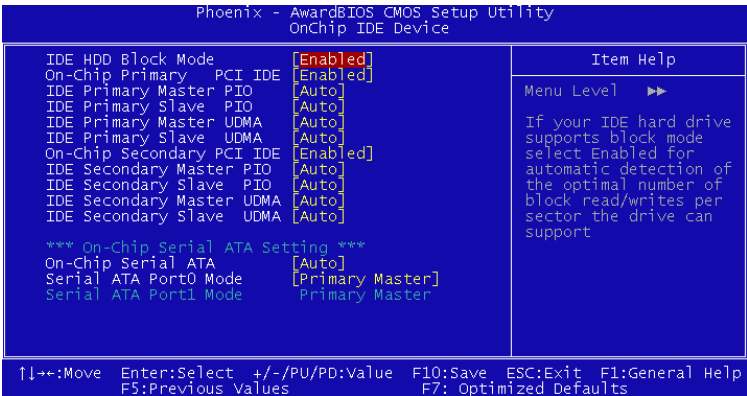


Figure 3.6: On-Chip IDE Device

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 On-Chip IDE Device

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

3.6.3 On-Chip Serial ATA

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

3.6.4 Serial ATA Port0/Port1 Mode

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

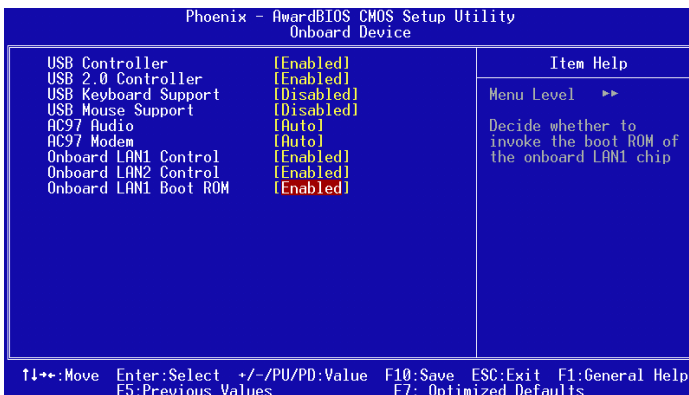


Figure 3.7: Onboard Device

3.6.5 USB Controller

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

3.6.6 USB 2.0 Controller

This entry is for disable/enable USB2.0 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 be automatically turn on when high speed device were attached. The Choice : "Enabled" and "Disabled".

3.6.7 USB Keyboard/Mouse Support

Select Enabled if user plan to use an USB keyboard. The choice: "Enabled", "Disabled".

3.6.8 AC97 Audio

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

3.6.9 Onboard LAN1 Control

Options are "Enabled" and "Disabled" Select Disable if user does not want to use onboard LAN controller1

3.6.10 Onboard LAN1 Boot ROM

Decide whether to invoke the boot ROM of the onboard LAN chip. The Choice : "Disabled", "Enabled".

3.7 SuperIO Device

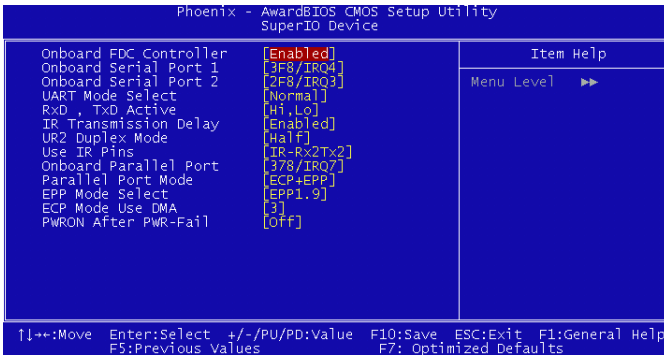


Figure 3.8: SuperIO Device

3.7.1 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.

3.7.2 Onboard Serial Port 1

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

3.7.3 Onboard Serial Port 2

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

3.7.4 UART Mode Select

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

3.7.5 RxD, TxD Active

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

3.7.6 IR Transmission Delay

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

3.7.7 UR2 Duplex Mode

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

3.7.8 Use IR Pins

The Choice : "RxD2, TxD2", "IR-Rx2Tx2".

3.7.9 Onboard Parallel Port

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

3.7.10 Parallel Port Mode

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

3.7.11 EPP Mode Select

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

3.7.12 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 Use DMA, you can select DMA channel 1, or DMA channel 3. Leave this field on the default setting.

3.7.13 PWRON After PWR-Fail

To setup the status of system after power fail. The "Off" will keep system power off after power fail, the "On" will boot up the system after fail, and the "Former-Sts" will return to the status before power fail.

3.8 Power Management Setup

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

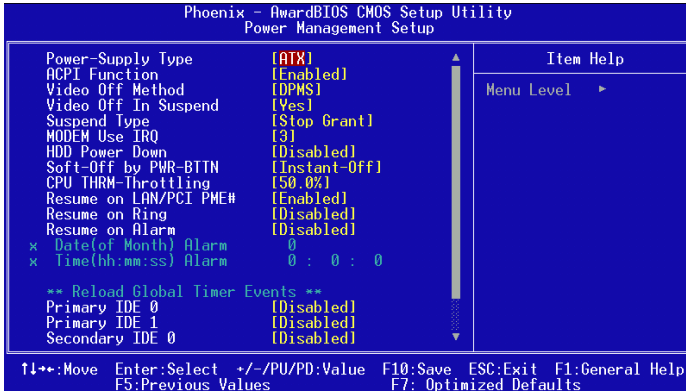


Figure 3.9: Power management setup screen (1)

3.8.1 Power-Supply Type

Choose the power-supply type, the choices are "AT" and "ATX".

3.8.2 ACPI function

The choice: "Enabled", "Disabled".

3.8.3 Video Off Method

To select the method to off the video. The Choice : "Blank Screen", "V/H SYNC+ Blank", "DPMS".

3.8.4 Video Off In Suspend

When system is in suspend, video will turn off. The choices are "No" and "Yes".

3.8.5 Suspend Type

The Choice : "Stop Grant", "PwrOn Suspend".

3.8.6 Modem Use IRQ

This determines the IRQ in which the MODEM can use. The choices: "3", "4", "5", "7", "9", "10", "11", "NA".

3.8.7 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.

3.8.8 CPU THRM-Throttling

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

3.8.9 Resume on LAN/PCI PME#

To enabled or disable the function to resume the system by PCI card or LAN. The Choice : "Enabled", "Disabled".

3.8.10 Resume on Ring

This item allows you to wake up the system via COM port from the remotehost. The choices: "Enabled", "Disabled".

3.8.11 Resume on Alarm

The Choice : "Enabled", "Disabled".

3.8.12 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) is active. The choice: "Enabled", "Disabled".

3.8.13 FDD, COM, LPT PORT

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

3.8.14 PCI PIRQ [A-D]#

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

3.9 PnP/PCI Configurations

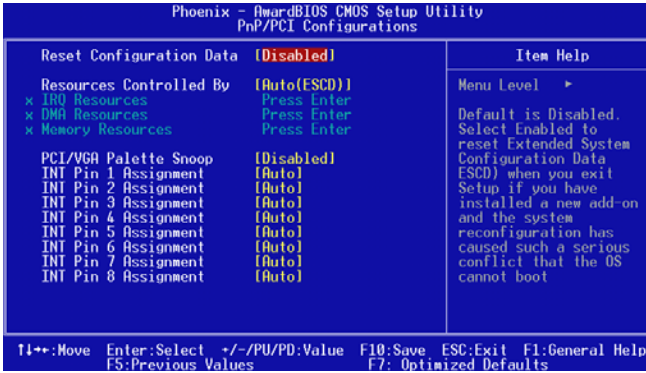


Figure 3.10: PnP/PCI configurations screen

3.9.1 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused such a conflict that OS cannot boot.

3.9.2 Resources Controlled By

The commands here are "Auto(ESCD)" or "Manual." Choosing "manual" requires you to choose resources from each 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.

3.9.3 PCI/VGA Palette Snoop

This is left at "Disabled."

3.10 PC Health Status

3.10.1 CPU Warning Temperature

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

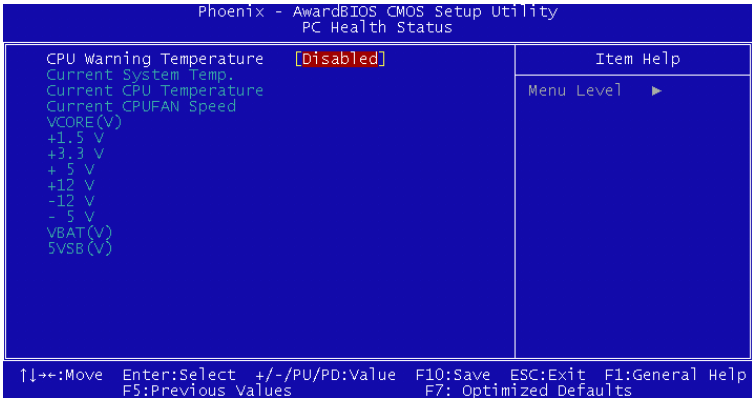


Figure 3.11: PC health status screen

3.10.2 Current System Temp

This shows you the current temperature of system.

3.10.3 Current CPU Temperature

This shows you the current CPU temperature.

3.10.4 Current CPUFAN Speed

This shows you the current CPUFAN operating speed.

3.10.5 VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

This shows you the voltage of VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), and 5VSB(V).

3.11 Spread Spectrum Control



Figure 3.12: Spread Spectrum Control screen

3.11.1 CPU Clock Ratio

Key in a DEC number to setup the CPU Clodk Ratio. (Min=8; Max=50). This item only shows up under some special situations.

3.11.2 Spread Spectrum

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

3.12 Password Setting

To change the password:

1. Choose the “Set Password” option from the “Initial Setup Screen” menu and press <Enter>.

The screen will display the following message:

Please Enter Your Password

Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Please Confirm Your Password

Enter the current password and press <Enter>.

3. 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

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

3.14 Exit Without Saving

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 device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the PCA-6007 board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system. 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's manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs to the target system 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 ISA PnP services.
- AGP support.
- IDE Ultra ATA 100/66/33 and Serial ATA interface support.
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)

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

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

Windows 98SE

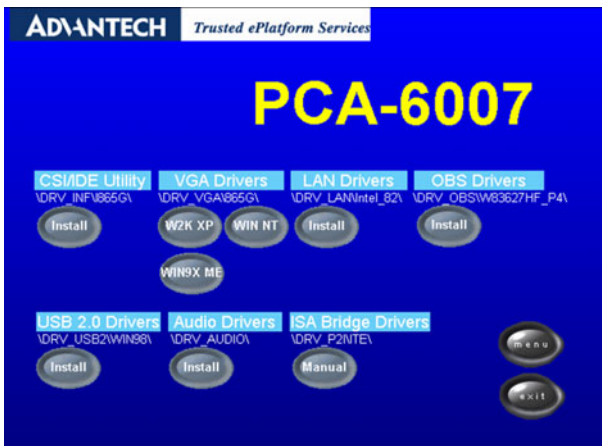
Windows 2000

Windows Me

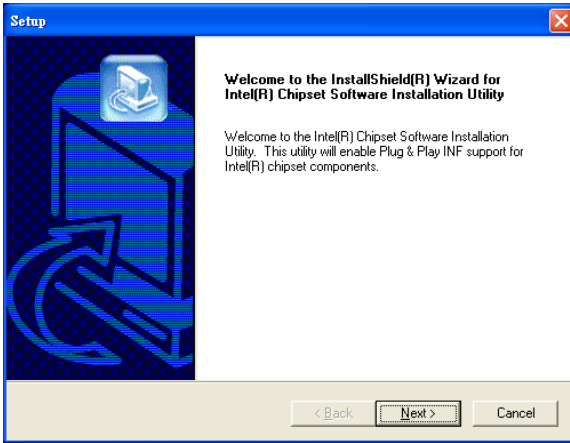
Windows XP

4.3 Windows XP Driver Setup

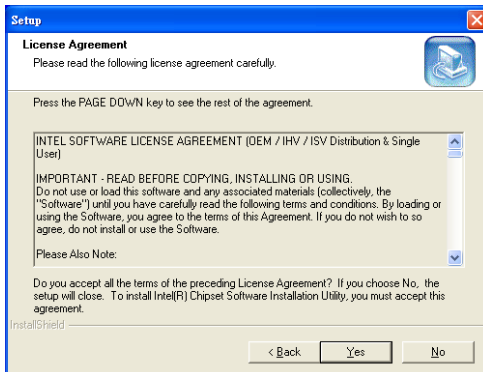
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Move the mouse cursor over the "Auto" button under the "CSI UTILITY" heading, a message pops up telling you to install the CSI utility before other device drivers, as shown in the following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



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



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



CHAPTER
5

VGA Setup

Chapter 5 VGA Setup

5.1 Introduction

The PCA-6007 has VGA onboard, you need to install the VGA driver to enable the function.

The Intel® 865GV Graphics Memory Controller Hub (the 865GV GMCH) provides an integrated graphics accelerator delivering cost competitive 3D, 2D, and video capabilities. The GMCH contains an extensive set of instructions for 3D operations, BLT and Stretch BLT operations, motion compensation, overlay, and display control. The 865GV GMCH's video engines support video conferencing and other video applications. The GMCH does not support a dedicated local graphics memory interface; it may only be used in a UMA configuration. The features include:

- Built-in 2D/3D VGA controller.
- Use Intel® Extreme Graphics Architecture
- Integrated 350MHz RAMDAC that can directly drive a progressive scan analog monitor up to a resolution of 2048x1536 at 75Hz
- Maximum 3D resolution supported : 1600 x 1200 x 32 @ 85Hz.
- H/W motion compensation assistance for s/w MPEG 2 decoding.
- Software DVD at 30 fps Full Screen.

5.2 Dynamic Video Memory Technology

The following is quoted from "Intel® 865GV Chipset Dynamic Video Memory Technology", document number : 253144-001 :

The method of memory allocation where the Operating System, Application and Graphics Memory come from a unified System Memory pool known as Unified Memory Architecture (UMA).

Dynamic Video Memory Technology (DVMT) is an enhancement of the UMA concept, wherein the optimum amount of memory is allocated for balanced graphics and system performance, through Direct AGP (known as Non-Local Video Memory, or NLVM), and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available memory – regardless of frame buffer or main memory sizing – for maximum 2D/3D graphics performance.

DVMT dynamically responds to system requirements, and application demands, by allocating the proper amount of display, texturing and buffer memory after the operating system has booted. For example, a 3D application when launched may require more vertex buffer memory to enhance the complexity of objects, or more texture memory to enhance the richness of the 3D environment. The operating system views the integrated graphics driver as an application, which uses Direct AGP to request allocation of additional memory for 3D applications, and returns the memory to the operating system (OS) when no longer required.

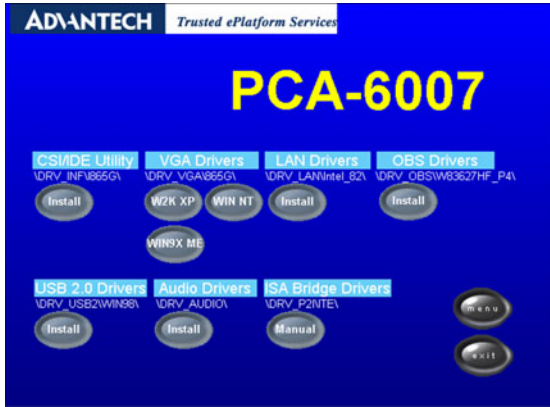
The Intel Extreme Graphics Driver determines the size of the pre-allocated memory needed and will make additional Non-Local Video Memory requests to achieve the amount needed for the display and application requirement. The video memory size in the Intel® 865GV chipset varies and is determined using several factors. The key factors are system resources and system activity. The maximum video memory is up to 64MB SDRAM

5.3 Windows XP Driver Setup

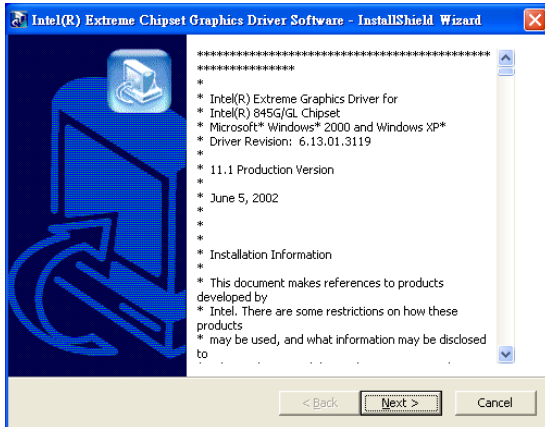
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "VGA DRIVERS" heading, click on one of the buttons (labeled "W2K XP", "WIN9X ME", and "WIN NT" respectively) according to the operating system you are using. The following

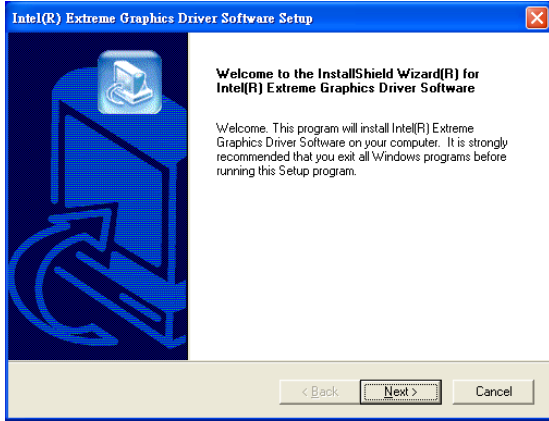
installation procedure is for Windows XP. For other operating systems, please follow the on-screen installation guide



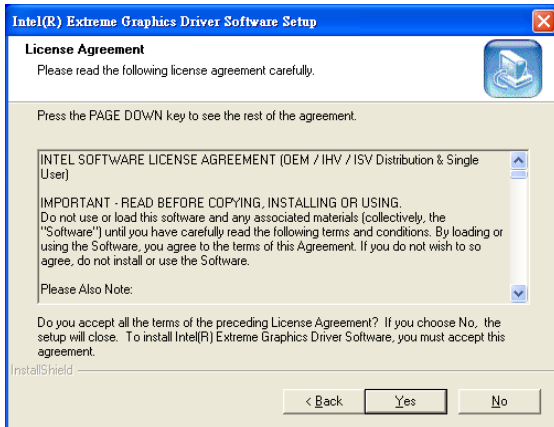
1. Please click on "Next" to continue the installation



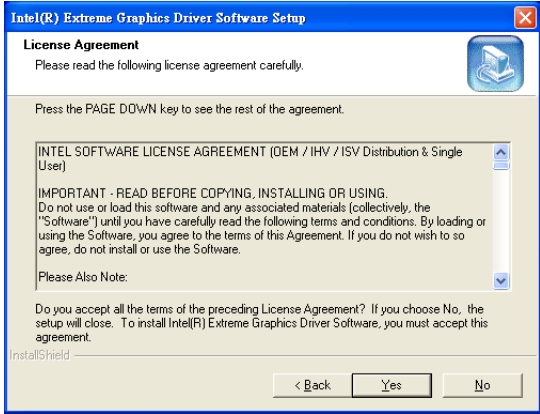
2. You will see a welcome window. Please click on "Next" to continue the installation.



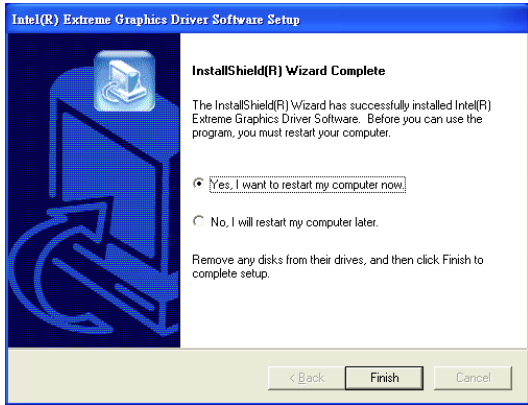
3. Click "Yes" when you see the following message.



4. Click on "Yes" to continue the installation



5. Click "Finish" to complete the installation and restart the computer now or later.



CHAPTER
6

LAN Configuration

Chapter 6 LAN Configuration

6.1 Introduction

The PCA-6007 features the 32-bit 10/100 Mbps Ethernet network interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling with RJ-45 connectors for 10 Mbps, 100 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

6.2 Features

- Optional single/dual Intel 82562 10/100Base-T Ethernet LAN controller
- Supports Wake-on-LAN remote control function.
- PCI Bus Master complies with PCI Rev. 2.2
- MAC & PHY (10/100/1000 Mbps) interfaces.
- Complies with 100Base-TX, and 10Base-T applications.
- Fully supports 100Base-TX, and 10Base-T operation.
- Single RJ-45 connector gives auto-detection of 10 Mbps or 100 Mbps network data transfer rates and connected cable types.
- Plug and Play.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.1,
- ACPI Rev. 2.0, and Device Class Power Management Rev. 1.0.

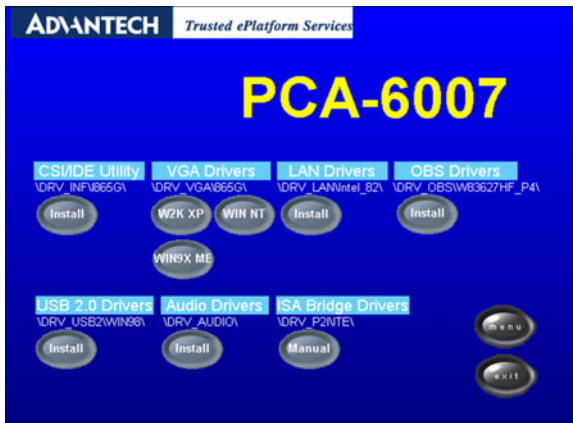
6.3 Installation

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

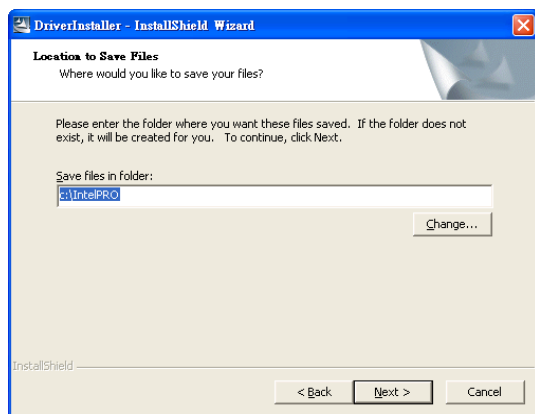
The PCA-6007's onboard Ethernet interface supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

6.4 Win XP Driver Setup (Intel 82562)

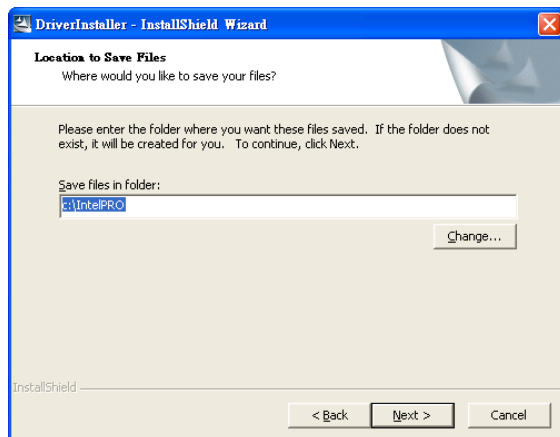
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "LAN Drivers" heading, click on the "Manual" to open file manager, then click "SETUP.EXE" to run the installation procedure.



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



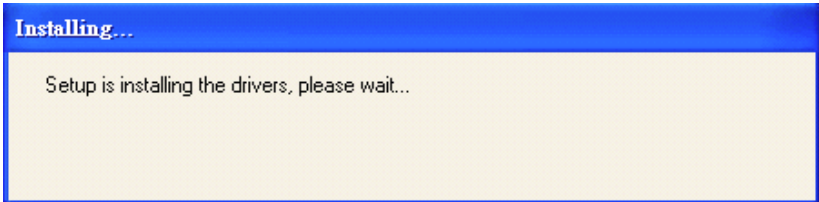
3. Click "Next" to continue.



4. Click "Install Software" to start the installation procedure.



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



CHAPTER
7

USB 2.0 Configuration

Chapter 7 USB 2.0 Configuration

7.1 Introduction

The PCA-6007 is designed with Intel ICH5 which supports both USB1.1 and USB 2.0 high-speed transmission. It still remains the compatibility with today's USB device. High-speed USB 2.0 provides data transfer up to 480Mb/s which is 40 times faster than USB 1.1. It is ideal for today's speed-demanding I/O peripherals.

7.2 Features

- Provides data transmission rate up to 480Mb/s
- Offer 40 greater bandwidth than USB 1.1
- Offers complete compatibility with current USB device

7.3 Installation

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

Note: USB 2.0 driver is not available for Windows 98SE/ME from PCA-6007 driver CD. Under these operating systems, the USB device will operate at USB 1.1 speeds.

Note: Install service pack 4 under Windows 2000 to enable USB 2.0.

Note: Install service pack 1 under Windows XP to enable USB 2.0.

CHAPTER

8

Onboard Security Setup

Chapter 8 Onboard Security Setup

8.1 Introduction

The PCA-6007's hardware monitor is designed with Winbond W83627HF. Onboard security (OBS) functions monitor key hardware. They help you maintain your system's stability and durability. The PCA-6007 can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets which can be monitored include:

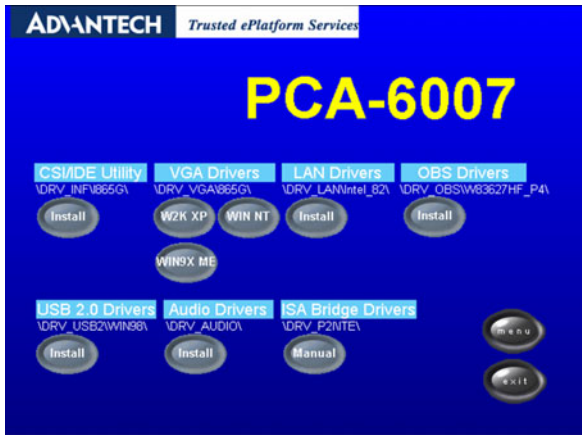
- CPU core voltage: 1.3 V ~ 3.3 V, according to Intel specifications.
- Transmission voltage from CPU to chipset: typically 1.8 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.

The negative system voltage sets which can be monitored include:

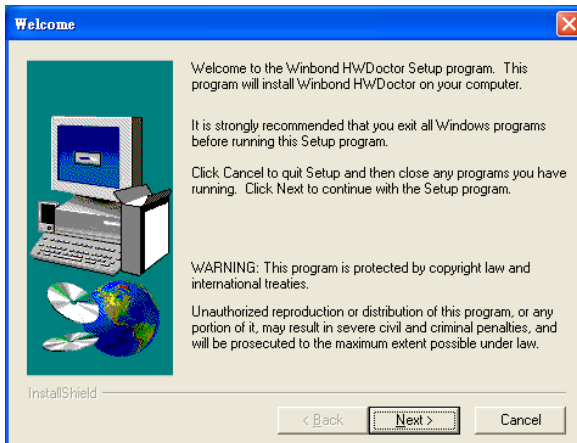
- Main voltage: -5 V, -12 V.

8.2 Windows XP Driver Setup

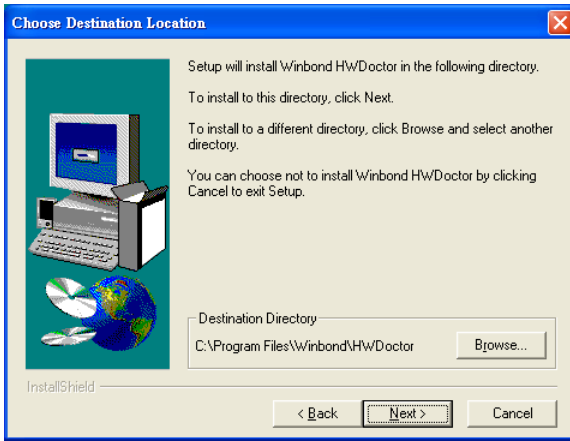
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "Install" button under the "OBS DRIVERS" heading.



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



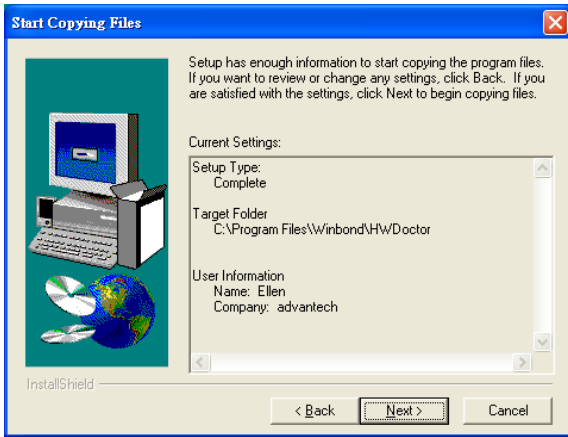
3. Click "Next" when you see the following message.



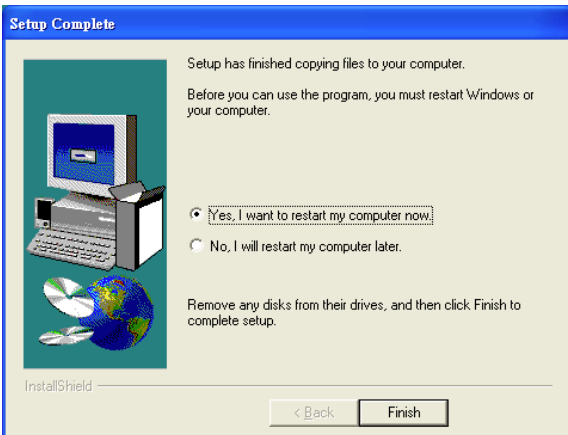
4. Click "Next" when you see the following message.



5. Click "Next" to continue.



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



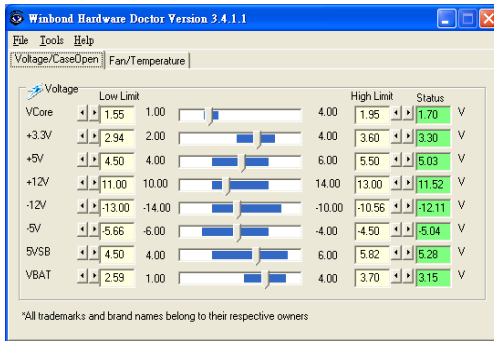
8.3 Using the OBS Hardware Doctor Utility

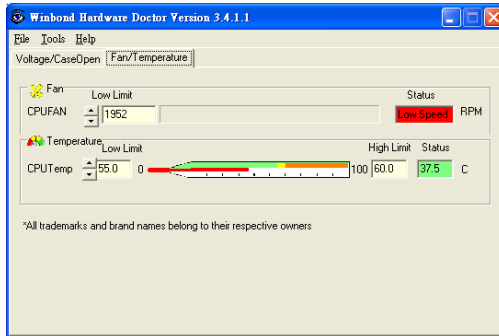
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

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

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

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





Appendix

A

Programming the Watchdog Timer

Appendix A Programming the watchdog

A.1 Programming the Watchdog Timer

The PCA-6007's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

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

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

A.1.2 Reset/ Interrupt selection

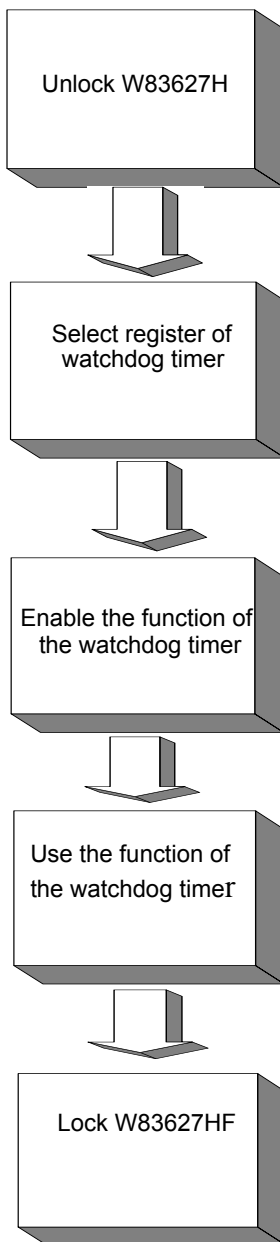
The J2 jumper is used to select reset or interrupt (IRQ 11) in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

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

A.1.3 Programming the Watchdog Timer

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

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



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

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

Table A.1: Watchdog timer registers

A.1.4 Example Program

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

```

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

```

```

;-----
Dec dx          ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al

```

```

;-----
Dec dx          ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al

```

```

;-----
Dec dx          ; lock W83627HF
Mov al,0aah
Out dx,al

```

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

```

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

```

```

;-----
Mov al,07h      ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al

```

```
;-----  
Dec dx          ; Enable the function of watchdog timer  
Mov al,30h  
Out dx,al  
Inc dx  
Mov al,01h  
Out dx,al
```

```
;-----  
Dec dx          ; Set minute as counting unit  
Mov al,0f5h  
Out dx,al  
Inc dx  
In al,dx  
Or al,08h  
Out dx,al
```

```
;-----  
Dec dx          ; Set timeout interval as 5 minutes and start counting  
Mov al,0f6h  
Out dx,al  
Inc dx  
Mov al,5  
Out dx,al
```

```
;-----  
Dec dx          ; lock W83627HF  
Mov al,0aah  
Out dx,al
```

3. Enable watchdog timer to be reset by mouse

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

```

Out dx,al
;-----
Mov al,07h      ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx          ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;-----
Dec dx          ; lock W83627HF
Mov al,0aah
Out dx,al
4. Enable watchdog timer to be reset by keyboard
;-----
Mov dx,2eh     ; unlock W83627H
Mov al,87h
Out dx,al

```

```

Out dx,al
;-----
Mov al,07h      ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx          ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
;-----
Dec dx          ; lock W83627HF
Mov al,0aah
Out dx,al
5.   Generate a time-out signal without timer counting
;-----
Mov dx,2eh      ; unlock W83627H
Mov al,87h
Out dx,al

```

```

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

```


Appendix

B

I/O Pin Assignments

Appendix B Pin Assignments

B.1 IDE Hard Drive Connector (CN1, CN2)

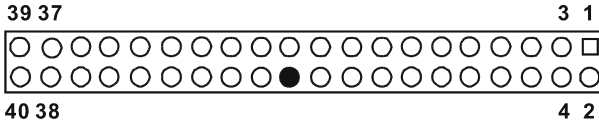


Table B.1: IDE hard drive connector (CN1, CN2)

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 (CN3)

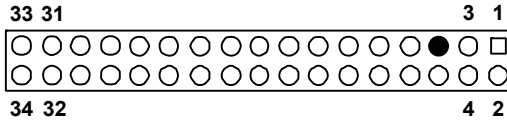


Table B.2: Floppy drive connector (CN3)

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 (CN4)

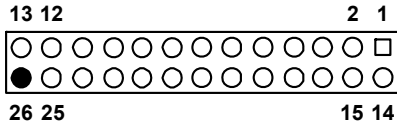


Table B.3: Parallel port connector (CN4)

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

* low active

B.4 USB Connector (CN6)

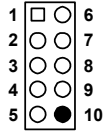


Table B.4: USB1/USB2 connector (CN6)

Pin	USB1 Signal	Pin	USB2 Signal
1	+5 V	6	+5 V
2	UV-	7	UV-
3	UV+	8	UV+
4	GND	9	GND
5	Chassis GND	10	N/CA

B.5 VGA Connector (CN7)

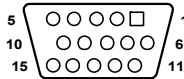


Table B.5: VGA connector (CN7)

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.6 COM1/COM2 RS-232 Serial Port (CN9, CN10)

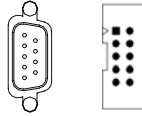


Table B.6: COM1/2 RS-232 serial port (CN9/10)

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

B.7 Keyboard and Mouse Connector (CN11)

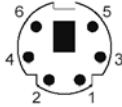


Table B.7: Keyboard and mouse connector (CN11)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.8 External Keyboard Connector (CN12)

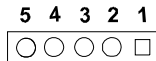


Table B.8: External keyboard connector (CN12)

Pin	Signal
1	CLK
2	DATA
3	NC
4	GND
5	VCC

B.9 CPU Fan Power Connector (CN14)



Table B.9: CPU Fan Power Connector (CN14)

Pin	Signal
1	GND
2	+12V
3	Detect

B.10 Power LED (CN16)

You can use an LED to indicate when the single board computer is on. Pin 1 of CN16 supplies the LED's power, and Pin 3 is the ground.

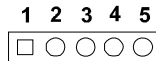


Table B.10: Power LED and keylock conn (CN16)

Pin	Function
1	LED power (+5 V)
2	NC
3	GND
4	NC
5	GND

B.11 External Speaker Connector (CN17)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.

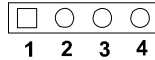


Table B.11: External Speaker Connector (CN17)

Pin	Function
1	Internal buzzer
2	NC
3	Internal buzzer
4	Speaker out

B.12 Reset Connector (CN18)



Table B.12: Reset connector (CN18)

Pin	Signal
1	RESET
2	GND

B.13 HDD LED Connector (CN19)



Table B.13: HDD LED connector (CN19)

Pin	Signal
1	VCC (LED+)
2	IDE LED (LED-)

B.14 ATX Feature Connector (CN20)



Table B.14: ATX feature connector (CN20)

Pin	Signal
1	PS-ON
2	VCC
3	VCCSB

B.15 ATX Soft Power Switch (CN21)



Table B.15: ATX soft power switch (CN21)

Pin	Signal
1	5VSB
2	PWR-BTN

B.16 H/W Monitor Alarm (CN22)



Table B.16: H/W monitor alarm (CN22)

Pin	Signal
1	Enable OBS alarm
2	Disable OBS alarm

B.17 AC-97 Audio Interface (CN43)

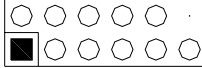


Table B.17: AC-97 Audio Interface (CN43)

1 VCC	2 GND
3 SYNC	4 BITCLK
5 SDOUT	6 SDIN0
7 SDIN1	8 AC-RST
9 +12V	10 GND
11 GND	12 N/C

B.18 System I/O Ports

Table B.18: 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.19 DMA Channel Assignments

Table B.19: DMA channel assignments

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

B.20 Interrupt Assignments

Table B.20: 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.21 1st MB Memory Map

Table B.21: 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.22 PCI Bus Map

Table B.22: PCI bus map

Function Signals	Device ID	INT# pin	GNT	REQ
Onboard LAN1		INT E		
OnboardLAN2	AD21	INT H	GNT F	REQ F
SCSI	AD19	INT F, G	GNT A	REQ A
Bridge	AD22		GNT E	REQ E
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

