P6IC-A+ Mainboard

Ver. 1.0

Brief Manual

SEPTEMBER 1999

Overview

The P6IC-A+ is a full-sized ATX mainboard that uses 4-layer printed circuit board and measures 304mm by 220mm. The mainboard features the new high-performance I820 chipset from Intel. The 820 chipset supports new PC features including RAMBUS memory technology and an AGP4x graphics adapter slot for better graphics performance. The mainboard has a slot-1 processor slot. The board has a full set of I/O ports, 5 PCI expansion slots, and an AMR slot for the optional installation of an Audio Modem Riser card. The P6IC-A+ is high-performance mainboard. It provides an excellent platform for a professional-class PC.

Features

Slot-1 Processors
A variety of slot-processors are available for installation in this mainboard. However, since the 820 chipset is designed to maximize performance, the mainboard provides the best value if it is used with a powerful processor such as the Pentium-III

For higher-performance business-class computing, the slot-1 can be installed with a Pentium-II or Pentium-III processor cartridge. The Pentium-II and –III have 32K of internal cache memory and 512K of external cache memory. They operate over a 100 MHz system bus (except for older versions). The Pentium-III includes new instructions that are designed to enhance multimedia/internet computing by providing rapid encoding and decoding of the compressed audio and video files which are pervasive in the internet environment. The Pentium-II ships with clock speeds running from 233 MHz through to 450 MHz. The Pentium-III ships with clock speeds of 450 MHz, 500 MHz and 550 MHz.

Intel's 820 Chipset
This board features the 820 chipset from Intel. The 820 chipset is designed for use on high-performance maiboards using the latest technology. The principal features of the 820 chipset are the support for RAMBUS memory and a high-bandwidth AGP4x graphics adapter slot. The 820 chipset includes a Memory Controller Hub (MCH), an I/O Controller Hub (ICH) and a FirmWare Hub (FWH). The 82820 Memory Controller Hub includes the controller for the new 4xspeed Accelerated Graphics Slot and the memory controller for the new RAMBUS memory slots. It also provides a direct link between the MCH and the ICH.

The 82801AA I/O Controller Hub is responsible for the system I/O including the PCI Ver. 2.2 bus, the integrated PCI IDE channels, the USB controller, and the Interrupt controller. The ICH supports power management compliant with ACPI Ver. 1.0 and supports the AC'97 specification for audio codecs. The 82802 Firmware Hub integrates the system BIOS and the non-volatile memory for faster execution. It also includes a random number generator for advanced system encryption operations to enhance system security. By supporting new technologies such as RAMBUS, AGP4x and advanced encryption, the 820 chipset raises the PC platform to new levels of performance and security.

RAMBUS (DRDRAM) Memory
The mainboard is installed with three RIMM (Rambus In-line Memory Modules) slots for the installation of DRDRAM (Direct Rambus Dynamic Random Access Memory) memory modules. Rambus memory is a new memory technology that is designed to increase system performance by operating over a narrow, but very fast, memory bus and using CMOS technology memory chips. This mainboard supports Rambus memory modules that operate at 300 MHz or 400 MHz, and since the rising and falling edge of the signal is used, the effective rates are 600 MHz and 800 MHz. The Rambus technology includes a Serial Presence Detect (SPD) chip that lets the system detect and configure the memory at boot-up time. Maximum memory size is 256 MB using 64Mb/72Mb DRDRAM chips, 512 MB using 128Mb/144Mb chips, 1 GB using 256Mb/288Mb chips.

Highly Integrated Design

As well as the Intel 820 chipset, the P6IC-A+ features other highly integrated silicon chips. The ITE 8870-F provides support for a floppy disk drive interface, serial, parallel, and infrared ports, a game/MIDI port and a keyboard controller. The CMI 8738/PCI C3DX is a two-chip solution that provides an integrated audio and fax/modem system.

AGP4x Graphics Adapter Slot

The mainboard includes an AGP slot (Accelerated Graphics Port) that provides four times the bandwidth of the original AGP specification. AGP technology provides a direct connection between the graphics sub-system and the processor so that the graphics do not have to compete for processor time with other devices on the PCI bus. In addition the AGP design allows the graphics controller to use part of the main memory when it needs it, for example, in handling the very large texture maps required by virtual reality and 3D video games and applications.

Built-in PCI 3D Sound

The Elite PCI Audio CMI 8738 is a single chip solution for PCI-bus 3D audio. The chip provides Sound Blaster 16-bit-compatible audio, plus support for Microsoft's DirectSound 3D specification and Aureal A3D interface. The sound ports include jacks for speakers, microphone and stereo in, and a game/MIDI port. The audio system supports full duplex operation and drivers are available for WIN 95/98 and WIN NT 4.0. The audio system can output sound to 4 loudspeakers and also supports SPDIF 24-bit digital sound input and output.

Built-in V.90 Fax/modem

The PCI C3DX chip is a single chip solution for value PC communications. The chip supports 56 Kbps transmission using the V.90 protocol. The chip is integrated with the built-in audio system to support voice as well as data transmissions. The modem is facilitated by plugging an optional card (installed with RJ11 line and telephone sockets) onto the mainboard.

Up-to-date Expansion Options

This is a full-sized ATX board with a full set of current technology expansion slots. The mainboard no longer supports the legacy ISA (Industry Standard Architecture) 8/16-bit slots. Instead, the board provides five 32-bit PCI (Peripheral Components Interconnect) slots, with each slot supporting Ultra DMA 66/33 and bus mastering. In addition, the board has an AMR slot. The AMR slot lets you install an AMR (Audio Modem Riser) card. An AMR card is a neat solution to the problem of integrating a modem on the mainboard. Because the regulations regarding the use of modems is different from country to country, mainboard manufacturers can simply install a standard AMR slot which can be used by third-party Audio Modem Riser cards that have been certified for use in the local territory.

Integrated I/O

Using the ITE LPC I/O chip and the Intel 820 chipset, the board has a comprehensive set of integrated I/O ports. The I/O port array features PS/2 keyboard and mouse ports, a parallel port, two USB ports, two serial ports, a game/MIDI port, and three audio jacks. The mainboard has connectors for the installation of an infrared port and a fax/modem card. Two more USB ports can be installed on an auxiliary connector on the mainboard. The board includes connections for floppy diskette drives and two PCI IDE channels.

Keyboard Power On Feature

Using the system BIOS setup program, you can configure the system to turn on using a keyboard typed password. A green keyboard is not required.

Programmable Firmware

The mainboard includes Award BIOS which allows BIOS setting of CPU parameters. The fully programmable firmware enhances the system features and allows users to set power management, CPU and memory timing, LAN and modem wake-up alarms, and so on. The firmware can also be used to set parameters for different processor clock speeds so that you don't need to change mainboard jumpers and switches.

Mainboard Illustration
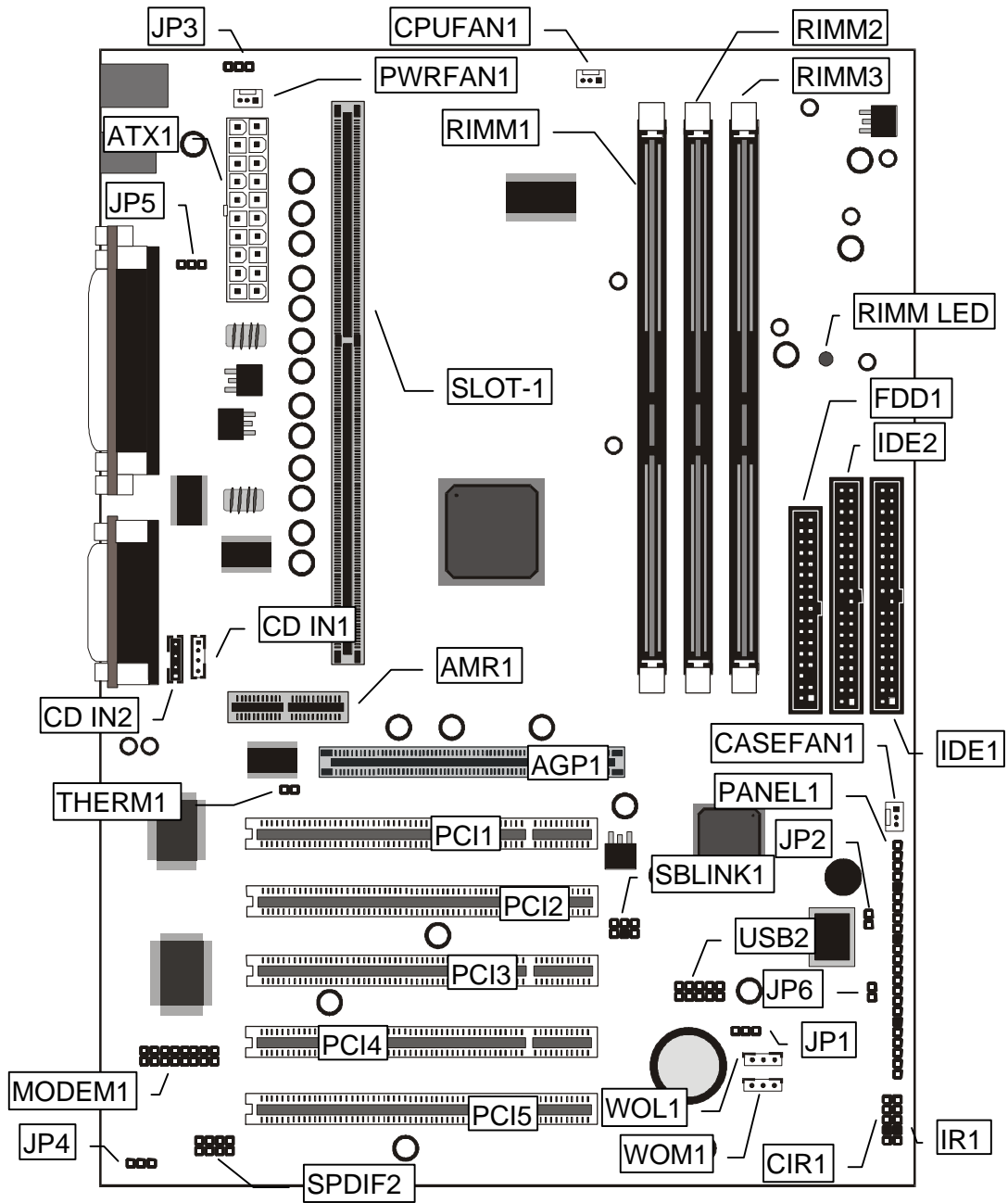
Key to Mainboard Components

| Component	Description
Slot-1	Slot for Slot-1 processor cartridge
AMR1	Slot for an Audio Modem Riser card
AGP1	Slot for AGP4x graphics adapter
PCI 1,2,3,4,5	Five 32-bit PCI Slots
RIMM 1, 2, 3	Three slots for RAMBUS memory modules
FDD1	Connector for floppy disk drives
IDE1, IDE2	Primary and secondary IDE channels
ATX1	Connector for ATX power supply
THERM1	Connector for thermal resistor cable to detect AGP temp.
IR1	Connector for optional infrared port
CIR1	Connector for optional consumer infrared port
PANEL1	Panel connector for switches and indicators
WOM1	Connector for modem wake up
WOL1	Connector for LAN wake up
SBLINK1	SBLINK connector for optional PCI Sound Blaster card
SPDIF1	SPDIF In/out connector (24-bit digital audio interface)
USB2	USB connector for optional auxiliary USB ports
MODEM1	Onboard Modem Connector
CD IN1	Audio connector for CD-ROM/DVD drive
CD IN2	Auxiliary audio connector for CD-ROM/DVD drive
CASEFAN1	Power connector for case cooling fan
CPUFAN1	Power connector for CPU cooling fan
PWRFAN1	Power connector for power supply cooling fan
RIMM LED	RIMM Power Indicator
JP1	Clear CMOS memory jumper
JP2	BIOS Boot Block Lock jumper
JP3	Keyboard power on jumper
JP4	Audio/modem enable/disable jumper
JP5	USB wake up enable/disable jumper
JP6	CPU Safe Mode enable/disable jumper

I/O Port Array
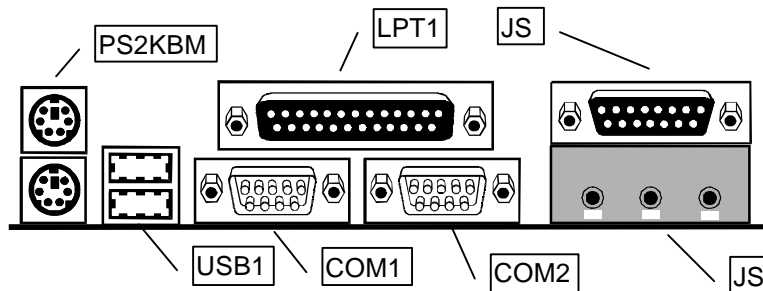
Key to I/O Ports

PS2KBM	PS/2 port for pointing device (upper port)
	PS/2 port for keyboard (lower port)
LPT1	External parallel port
JS (Upper)	External game/MIDI port
JS (Lower)	Audio jacks for (from left to right) line out, line in, microphone
COM2	External serial port 2/4
COM1	External serial port 1/3
USB1	Two stacked Universal Serial Bus ports

Jumper Setting Reference

JP1: Clear CMOS memory jumper
Use this 3-pin jumper top clear all the current data stored in the CMOS memory.

Function	Jumper Cap
Normal operation	Short pins 1-2
Clear CMOS	Short pins 2-3

JP1

1 2 3
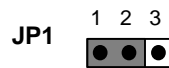
JP2: BIOS Boot Block Lock jumper
If you lock the BIOS Boot Block, it protects the BIOS from virus attacks. You need to unlock this jumper when you flash a new BIOS.
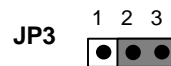
| Function	Jumper Cap
Unlocked	Short pins 1-2
Locked	Open pins 1-2

JP2

JP3: Keyboard Power On Jumper
Use this jumper to enable or disable the audio system and modem integrated on the mainboard.

Function	Jumper Cap
Disable keyboard power on	Short Pins 1-2
Enable keyboard power on	Short pins 2-3

JP3

1 2 3

JP4: Audio/modem enable/disable jumper

Function	Jumper Cap
	Short Pins 1-2
Disable audio/modem	

JP4 1 2 3
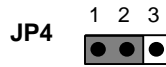
JP5: USB wake up enable/disable jumper

Use this jumper to enable or disable the wake up feature for USB devices.

	Jumper Cap
Disable USB wake up	
Enable USB wake up	Short pins 2-3

JP5 1 2 3
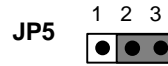
Use this 2-pin jumper to enable or disable CPU safe mode. When you enable CPU safe mode, the CPU runs at twice the system bus frequency. You can use this jumper to recover the system if stops the system booting.

Function	
Disable safe mode	Short pins 1-2
	Open pins 1-2

JP6
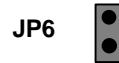
PANEL1: Panel connectors for switches and indicators

Function	Pins
	1+, 2+, 3
Suspend Switch	
Green Indicator	7+, 8+, 9
	10, 11
Reset Switch	
Speaker	15+, 16, 17, 18
	20+, 21
Power Switch	

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PANEL1

Reset SW

KeyLock

Green LED

Suspend SW

Power LED

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