

AP-5200IF
PENTIUM CPU CARD



USER'S MANUAL

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INTRODUCTION

The AP-5200IF CPU card is a high performance single board computer that takes maximum advantage of PCI bus technology. It is a full-sized all-in-one plug-in CPU card using Intel Pentium-75/90/100, P54C-120 or P54CT processor selectable by jumper setting. Designed to the latest PICMG industrial PCI specification, the AP-5200IF combines leading edge technology and industry-wide compatibility. The AP-5200IF comes complete with a full array of I/O including two RS232, one multi mode parallel, one PS/2 mouse, one FDD, two PCI IDE port, one SRAM socket, and two bank of DRAM sockets. It's 6-layer printed circuit board that combines with noise tolerant and low power consumption CMOS technology applied makes AP-5200IF to withstand and adapt harsh industrial environments very well.

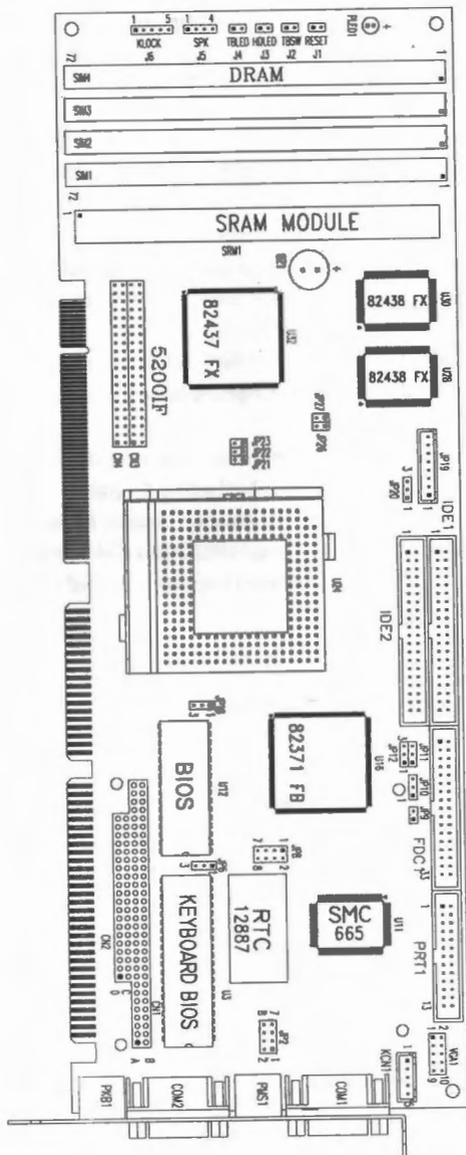
The AP-5200IF provides the primary elements for building an IBM PC/AT compatible computer for a wide variety of embedded system applications. It is fully compatible with the IBM PC/AT which means virtually all the software written for the IBM PC/AT will run on the AP-5200IF PCI - ISA CPU card. The AP-5200IF delivers the power and flexibility that you need for your high performance applications.

1.1 SPECIFICATION

- * Microprocessor : Intel Pentium 75/90/100/120 MHz, and future Pentium processor
- * Chipset : Intel 82C430FX PCI Chipset, SMC 37C665/666/669
- * System Memory : 8 - 128MB, 4 socket for 72-pin SIMM
- * Cache Size : Pipelined Burst Sync/Async Cache module slot, up to 512 KB
- * BIOS : 128KB Award licensed BIOS
- * Serial Port : Two RS232 serial ports (16550 compatible includes FIFO)
- * COM 3/4 IRQ# : Selectable IRQ 10,11
- * Parallel Port : One multi-mode high performance parallel port (SPP/EPP/ECP)
- * Keyboard Connector : 5-pin header and 6-pin Mini-Din
- * PS/2 Mouse Connector : On board 6-pin Mini-Din
- * IDE Drive Interface : Two PCI IDE port, up to 4 IDE drives
- * Floppy Drive Interface : Up to two 2.88 MB drives

- * Watch-Dog Timer : 0.5/1/2/4 sec time-out period selectable
- * RTC Battery : 12B887A RTC/Battery or compatible
- * Built-in PC-104 expansion bus connector
- * PCI bus piggyback connector for VGA /SCSI module
- * Board Size : 336 mm x 122 mm

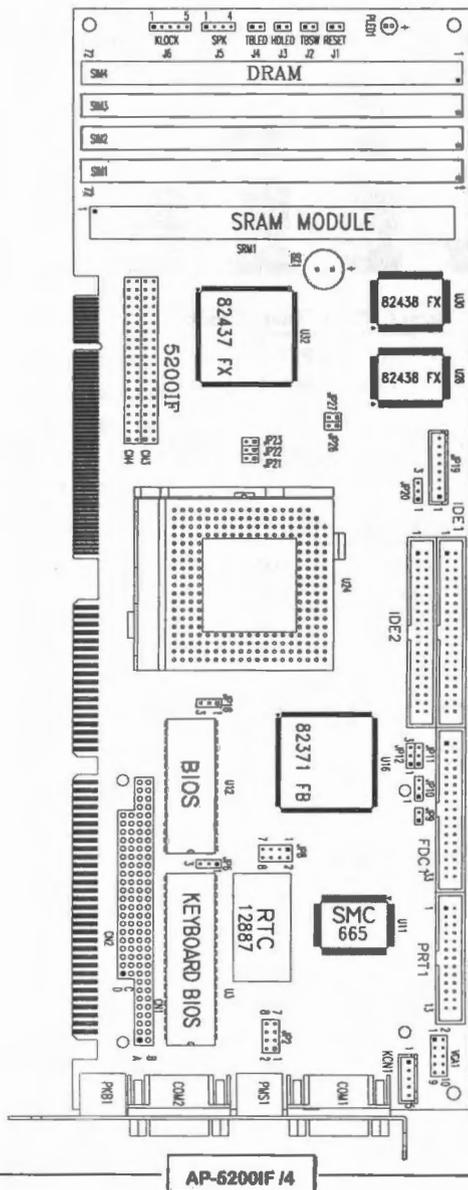
1.2 BOARD OUTLINE



CHAPTER 2.

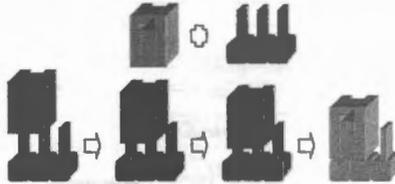
JUMPER SETTINGS AND CONNECTORS

Figure below shows the jumpers and connectors location on the AP-5200IF.



2.1 JUMPER SETTINGS

Jumpers are used to select the operation modes for your system. To set a jumper, a black cap containing metal contacts is placed over the jumper pin(s) according to the required configuration. A jumper is said to be "on" or "1-2" when the black cap has been placed on one or two of its pins, as show in the figure below :



● **JP12, JP26, JP27 : Select CPU Bus Clock**

CPU Bus Clock	JP12	JP26	JP27
50MHz	1-2	OFF	OFF
60MHz	2-3	OFF	ON
* 66MHz	2-3	ON	ON

(*) :Default

● **JP21,JP23 : Select CPU Core to Bus Clock Multiply**

Core / Bus Ratio	JP21	JP23
*1.5:1	OFF	OFF
2:1	ON	OFF
2.5:1	ON	ON
3:1	OFF	ON

(*) :Default

Note 1: The CPU core frequency can be found by multiplying the CPU bus clock frequency by the core/bus multiplier. For example , if the CPU bus clock frequency is 66.6Mhz and the core/bus multiplier is 3, the actual CPU core frequency will be $66.6 \times 3 = 200\text{MHz}$.

JP2 : WATCH DOG TIMER TIMEOUT PERIOD SELECT JUMPER

JP2	FUNCTION
1-2	0.5 sec TIME OUT
3-4	1 sec TIME OUT
5-6	2 sec TIME OUT
* 7-8	4 sec TIME OUT

JP16 : WATCH DOG FUNCTION SELECT JUMPER

JP16	FUNCTION
*1-2	ACTIVE BY RESET SYSTEM
2-3	ACTIVE BY NMI SYSTEM
OFF	DISABLE WATCH DOG

JP6 : ROM TYPE SELECT JUMPER

- * 1-2 : EPROM/5V FLASH MEMORY
- 2-3 : 12V FLASH MEMORY

JP8 : COM3/4 IRQ# SELECT JUMPER

IRQ #	COM3	COM4
IRQ 10	5-7	5-6
IRQ 11	7-8	6-8

Note : Default 1-2, 3-4 on (COM 1/2)

JP9 : SLEEP MODE EXTERNAL SWITCH JUMPER

- ON : Sleep mode
- * OFF : Normal

JP10 : IDE2 SECONDARY IDE INTERRUPT SELECT JUMPER

- * 1-2 : IRQ15
- 2-3 : MIRQ0 (Motherboard Interrupt)

JP20 : POWERGOOD SOURCE SELECT JUMPER

- * 1-2 : INTERNAL POWERGOOD
- 2-3 : EXTERNAL POWERGOOD (From POWER SUPPLY)

JP13, 14, 15, 18, 24, 25: Factory Setting

- *Note :**
1. (*) : Default
 2. Above jumpers are reserved for future function enhancement, the AP-5200IF using the default setting set at the factory . Please do not change them .

2.2 CONNECTORS DESCRIPTION

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered with your system may be caused by loose or improper connections. Ensure that all connectors are in place and firmly attached.

2.2.1 SYSTEM STATUS INDICATE AND CONTROL CONNECTORS

CONNECTOR	PIN OUT	SIGNAL NAME
J 1 : Reset Switch Connector	1	GND
	2	Reset Signal Input
J 2 : Turbo Switch Connector	1	GND
	2	Turbo Control Signal Input
J 3 : Hard Disk LED Connector	1	HD Active Signal Output
	2	VCC
J 4 : Turbo LED Connector	1	VCC
	2	Turbo Out
J 5 : Speaker Connector	1	Speaker Output
	2	NC
	3	GND
	4	VCC
J 6 : Power LED & Keylock Connector 1 & 3 : Power LED 4 - 5 : Keylock	1	VCC --- LED +
	2	NC
	3	GND --- LED -
	4	Keylock Out
	5	GND

2.2.2 I/O CONNECTOR DESCRIPTION

CONNECTOR	DESCRIPTION
KCN1	5 Pin Keyboard Cable Connector
PKB1	6 Pin Mini-Din Keyboard Connector
PMS1	6 Pin Mini-Din PS/2 MOUSE Connector
COM1	RS-232 Serial Port #1 or #3 Connector
COM2	RS-232 Serial Port #2 or #4 Connector
IDE1	Primary IDE Cable Connector
IDE2	Secondary IDE Cable Connector
FDC1	Floppy Cable Connector
PRT1	Printer Cable Connector
CN1	PC/104 8 Bits Connector
CN2	PC/104 16 Bits Connector
CN3 & CN4	PCI Piggyback Connector

JP19 : EXTERNAL POWER CONNECTOR

PIN NO.	DESCRIPTION
1	+ 5V
2	+12V
3	-12V
4	GROUND
5	GROUND
6	- 5V
7	+12V
8	+ 5V

3.1 AWARD BIOS SETUP UTILITY

Once you enter Award BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS (2A59CL7B)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PCI CONFIGURATION SETUP LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	PASSWORD SETTING IDE HDD AUTO DEFECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑↓→← : Select Item (Shift) F2 : Change color
Time, Date , Hard Disk Type	

Standard CMOS setup

This setup page includes all the items in a standard compatible BIOS.

BIOS features setup

This setup page includes all the items of Award special enhanced features.

Chipset features

This setup page includes all the items of chipset special features.

Load Setup defaults

Setup defaults include the most appropriate value of the system parameter which the system would be in maximum performance. However, you may change the parameter value through the Option Page Setup Menu.

Load BIOS defaults

BIOS defaults indicate the values required by the system for the minimum performance. However, you may change the parameter through the Option Page Setup Menu.

Power Management Setup

This setup page includes all the power management timers & events for all green functions.

PCI Configuration Setup

This setup page includes PCI interrupts (INT#A ~ INT#D) & IRQs for PCI add-ons.

HDD low level format

This setup page includes hard disk low level format utilities.

Password setting

Change set or disable password. It allows you to limit access to the system and setup, or just to setup.

IDE HDD auto detection

Automatically configure hard disk parameters.

Save & exit setup

Save CMOS value changes to CMOS and exit setup.

EXIT without save

Abandon all CMOS value changes and exit setup.

3.2 STANDARD CMOS SETUP

This item in standard CMOS Setup Menu is divided into 10 categories. Each category includes one or more than one setup item. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

ROM PCI/ISA BIOS (2A59CL7B)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Thu , Sep 7 1995																			
Time (hh:mm:ss) : 10 : 9 : 14																			
HARDS DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDS	SECTOR	MODE											
Primary Master	: Auto	0	0	0	0	0	0	AUTO											
Primary Slave	: Auto	0	0	0	0	0	0	AUTO											
Secondary Master	: Auto	0	0	0	0	0	0	AUTO											
Secondary Slave	: Auto	0	0	0	0	0	0	AUTO											
Drive A : 1.2 M, 5.25 in.					<table border="1"> <tr> <td>Base Memory</td> <td>: 640K</td> </tr> <tr> <td>Extended Memory</td> <td>: 15360K</td> </tr> <tr> <td>Other Memory</td> <td>: 384K</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Total Memory</td> <td>: 16384 K</td> </tr> </table>					Base Memory	: 640K	Extended Memory	: 15360K	Other Memory	: 384K	<hr/>		Total Memory	: 16384 K
Base Memory	: 640K																		
Extended Memory	: 15360K																		
Other Memory	: 384K																		
<hr/>																			
Total Memory	: 16384 K																		
Drive B : None																			
Video : EGA / VGA																			
Halt On : All Errors																			
ESC : Quit			↑ ↓ → : Select Item			PU / PD / + / - : Modify													
F1 : Help			(Shift) F2 : Change Color																

Date

The date format is <month> <day> <year>

Time

The time format is <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

Primary Master/Slave & Secondary Master/Slave HDD Type

The category identifies the types of hard disk that has been installed in the computer. There are 46 predefined types and a user definable type. Types 1 to Type 46 are predefined. Type User is user-definable.

Drive A type/Drive B type

The category identifies the types of floppy disk drive A or B that has been installed in the computer. The options are 360KB 5.25", 1.2MB 5.25", 720KB 3.5", 1.44MB 3.5", 2.88MB 3.5" and none.

Video

The category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. The options are EGA/VGA, CGA 40, CGA 80, MONO.

Error halt

The category determines whether the computer will stop if an error is detected during power up.

3.3 BIOS FEATURES SETUP

Virus Warning

This category flashes on the screen. During and after the system boots up any attempt to write to the boot sector or partition table of the hard disk drive will halt the system, in the mean time, you can run anti-virus program to locate the problem.

ROM PCI/ISA BIOS (2A59CL7B)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000 - CBFFF Shadow	: Disabled
External Cache	: Disabled	CC000 - CFFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D0000 - D3FFF Shadow	: Disabled
*Boot Sequence	: A,C,SCSI	D4000 - D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000 - DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	DC000 - DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Disabled	ESC : Quit	↑↓→← : Select Item
Typematic Rate Setting	: Disabled	F1 : Help	PU/PD/+/- : Modify
Typematic Rate (Chars / Sec)	: 6	F5 : Old Values (Shift)	F2 : Color
Typematic Delay (M sec)	: 250	F6 : Load BIOS Defaults	
Security Option	: Setup	F7 : Load Setup Defaults	
PS/2 mouse function control	: Enabled		
PCI/VGA Palette Snoop	: Disabled		
OS Select For Dram > 64MB	: Non-OS2		

* A, C parameters are for BIOS with date codes 11/01/96 and 02/14/96 only .

CPU Internal Cache/External Cache

These two categories speed up memory access.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during Power On Self Test.

Boot Sequence

This category determines which drive computer searches first for the disk operating system (i.e...DOS). Default value is A , C .or SCSI .

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks.

Boot Up Numlock Status

The default value is On. When "On" the keypad is number keys, otherwise the keypad is arrow keys.

Security Option

This category allows you to limit access to the system and setup, or just Setup.

Video BIOS Shadow

It determines whether video BIOS will be copied to RAM. Video BIOS Shadow will increase the video speed.

C8000-CBFFF Shadow/DC000-DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte.

3.4 CHIPSET FEATURES SETUP

This option is used to change the register values for the chipset registers. These registers control most of the system options in the computer.

ROM PCI/ISA BIOS (2A59CL7B)
 CHIPSET FEATURES SETUP
 AWARD SOFTWARE, INC.

DRAM RAS# Precharge Time : 4	PCI Concurrency : Enabled
DRAM R/W Leadoff Timing : 8/6	PCI Streaming : Enabled
DRAM RAS TO Cas Delay : 3	PCI Bursting : Enabled
DRAM Read Burst Timing : x2222	Onboard FDC Controller : Enabled
DRAM Write Burst Timing : x3333	Onboard Serial Port 1 : Auto
System BIOS Cacheable : Disabled	Onboard Serial Port 2 : Auto
Video BIOS Cacheable : Disabled	Onboard Parallel Port : 378/IRQ7
8 Bit I/O Recovery Time : 1	Parallel Port Mode : Normal
16 Bit I/O Recovery Time : 1	
Memory Hole At 15M-16M : Disabled	
IDE HDD Block Mode : Enabled	
IDE Primary Master PIO : Auto	
IDE Primary Slave PIO : Auto	
IDE Secondary Master PIO : Auto	
IDE Secondary Slave PIO : Auto	
On-Chip Primary PCI IDE : Enabled	
On-Chip Secondary PCI IDE : Enabled	
PCI Slot IDE 2nd Channel : Enabled	
	ESC : Quit ↑↓→← : Select Item
	F1 : Help PU/PD/+/- : Modify
	F5 : Old Values (Shift) F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

DRAM Timing has been set at optimal value. It is recommended that dealer will be consulted before changing any values that you do not understand.

The options for: System BIOS Cacheable

- Video BIOS Cacheable
- IDE HDD Block Mode
- IDE 32-bit Transfer Mode
- On-Chip Primary PCI IDE
- On-Chip Secondary PCI IDE
- PCI Slot IDE 2nd channel
- Onboard FDC controller
- PCI streaming

are Enable or Disable.

The options for IDE PIO Mode are Auto, Mode 0 - Mode 4, according to the IDE drive. Set "Auto", BIOS will Auto detect IDE PIO mode automatically.

The options for "Onboard Serial Port 1 & 2" are Disabled, COM1 - COM4.

The options for "Onboard Parallel Port" are 378:LPT1, 278:LPT2, 3BC and Disabled.

The options for "Parallel Port Mode" are Normal, EPP, ECP and EPP+ECP.

3.5 POWER MANAGEMENT SETUP

The options for Power Management are Disable, Enable, Minimum, Maximum and user define. When disabled, the Power Management will be inactive. Otherwise the HDD Power Down, System Doze, System Standby will be active according to the PM (Power Management) timers.

ROM PCI/ISA BIOS (2A59CL7B)
 POWER MANAGEMENT SETUP
 AWARD SOFTWARE, INC.

Power Management	: User Define	IRQ3 (COM 2)	: OFF
PM Control by APM	: Yes	IRQ4 (COM 1)	: OFF
Video Off Method	: V/H SYNC +Blank	IRQ5 (LPT 2)	: OFF
Modem Use IRQ	: 3	IRQ6 (Floppy Disk2)	: OFF
Doze Mode	: Disabled	IRQ7 (LPT 1)	: OFF
Standby Mode	: Disabled	IRQ8 (RTC Alarm)	: OFF
Suspend Mode	: Disabled	IRQ9 (IRQ 2 Redir)	: OFF
HDD Power Down	: Disabled	IRQ10 (Reserved)	: OFF
IRQ3 (Wake-Up Event)	: ON	IRQ11 (Reserved)	: OFF
IRQ4 (Wake-Up Event)	: ON	IRQ12 (PS/2 Mouse)	: OFF
IRQ8 (Wake-Up Event)	: ON	IRQ13 (Coprocessor)	: OFF
IRQ12 (Wake-Up Event)	: ON	IRQ14 (Hard Disk)	: OFF
		IRQ15 (Reserved)	: OFF
Power Down Activities	: ON	ESC : Quit ↑↓→← : Select Item	
COM Ports Accessed	: ON	F1 : Help PU/PD/+/- : Modify	
LPT Ports Accessed	: ON	F5 : Old Values (Shift) F2 : Color	
Drive Ports Accessed	: ON	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

PM Timers

The System Doze, Standby and Suspend modes will be active setup by step according to PM Times.

PM Events

The System will be resumed immediately by PM Events through COM Port, LPT, Drive Port, IRQ 1 to IRQ 15.

*Note : Some options in Power Management Setup will be inactive according to the CPU.

3.6 PCI CONFIGURATION SETUP

Since PCI is burned to plug & play , ideally no setup needed . However, there are many "DIRTY " PCI devices in the market . The Award Setup Utility is mainly for manual override of IRQs of these dirty devices.

ROM PCI/ISA BIOS (2A59CL7B)
 PCI CONFIGURATION SETUP
 AWARD SOFTWARE ,INC.

PnP BIOS Auto-Configure	: Disabled	
Slot 1 Using INT #	: Auto	
Slot 2 Using INT #	: Auto	
Slot 3 Using INT #	: Auto	
Slot 4 Using INT #	: Auto	
1st Available IRQ	: 10	
2nd Available IRQ	: 11	
3rd Available IRQ	: 9	
4th Available IRQ	: 12	
PCI IRQ Active By	: Level	ESC : Quit ↑↓→← : Select Item
PCI IDE IRQ Map to	: PCI-Auto	F1 : Help PU/PD/+/- : Modify
Primary IDE INT#	: A	F5 : Old Values (Shift) F2 : Color
Secondary IDE INT#	: B	F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

The options for :Slot 1~ 4 Using INT# are AUTO , A,B,C, and D.

AUTO : BIOS will do the following automatically.

1. Ask the PCI device on which INT (A - D) which does it want to use for interrupt.
2. Check out which IRQ is available from the above.
3. Tell the device which IRQ has been assigned to it .

The A,B,C, and D : These options are reserved for "Dirty " cards from which the system BIOS cannot tell which INT does it use.

Note :

1. Choose "AUTO "for all devices unless you know exactly which card is a dirty device & which INTs the card uses .
2. Choose Only : AUTO " for Multi-Func PCI devices because options A , B, C , D will force the BIOS to assign IRQs for function only .

The options for "1st ~ 4th Available IRQ " is 10, 11, 9, and 12
The system BIOS will assign these 4 available IRQs to find PCI device.

The option for " PCI IRQ Activated By " is Edge or Level .

The option for " PCI IDE IRQ Map To" is

PCI-AUTO : The BIOS will

1. Scan for PCI devices & determine the Location of PCI IDE device.
2. Assign IRQ 14 for primary IDE INT# for the special slot.

ISA : The BIOS will not assign any IRQs even if PCI IDE card is found , because some IDE cards connect the IRQ 14 &15 directly from ISA slot through a cord . (This cord is called Legacy Header)

The "Primary IDE INT #A" and " Secondary IDE INT # B" to tell which INT # does the PCI IDE card is using for its interrupts.

3.7 PASSWORD SETTING

When you select this function , the following message will appear at the center of the screen to assist you in creating password.

PASSWORD : ENTER

Type the password , up to eight characters , and press < Enter >. The typed password will now clear any previously entered password from CMOS memory . You will be asked to confirm the password. Type the password again and press <Enter >. You may also press < Esc > to abort the selection and not enter a password.

To disable the password , just press <Enter > when you are prompted to enter password. A message will confirm the password begin disabled . Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

If you selected System at Security Option of BIOS Features Setup Menu , you will be prompted for the password every time the system is rebooted or any time you try to enter Setup . If you select at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

INSTALLATION

This chapter describes the procedures for installing the AP-5200IF all-in-one CPU card into your system.

The following is a list of typical peripherals required to build a minimum system :

- * Passive Backplane (ISA or PICMG) and Power Supply
- * IBM PC/AT Keyboard
- * Display Card
- * Display Monitor
- * Floppy or Hard Disk with OS or Flash/ROM Disk Emulator

4.1 INSTALLING THE SIMMS

1. Insert the first SIMM edge connector at a slight angle into the socket of SIMM 1 close to the center of the board. Note that the SIMMs are keyed and will only go in one way.
2. Push the SIMM back into the connector carefully until it snaps into place.
3. Check to make sure the SIMM is inserted securely.
4. Repeat Steps 1-3 for remaining SIMM in SIMM 2 ~ SIMM 4.

4.2 INSTALLING THE CPU

1. Match pin one (white dot) on the CPU with pin one of the ZIF socket. Note pin one is marked on the board. In addition, the ZIF socket has a diagonal corner or may have an arrow marked on the base of the socket denoting the side containing pin one.
2. To complete the installation , gently press the CPU into place.
3. Double check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.

4.3 COMPLETING THE INSTALLATION

To complete the installation, the following steps should be followed:

1. Set the configuration jumpers in accordance with Chapter 2.
2. Make sure the power is off.
3. If use PC/104 display module, install the PC/104 display module into PC/104 socket CN1 and CN2 of AP-5200IF.
4. Install the AP-5200IF CPU card into one of the slots in a ISA passive backplane or PCI - ISA slot of PICMG backplane.
5. If use PC/104 display card, please omit this step. Install a display adapter into one of the slots in the passive backplane.
6. Connect the applicable I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply, etc.

Note : the color of pin one is usually red or blue, while others are gray.

7. Turn on the power.

4.4 INSTALLING THE PC/104 INTERFACE CARD

1. Insert pin headers (2 x 32 and 2 x 20) to CN1, CN2 of AP-5200IF.
2. Attach the PC/104 interface card with four 25mm (0.6") brass spacer.
3. Insert the PC/104 interface card to CN1, CN2 of AP-5200IF (component side of PC/104 card to component side of AP-5200IF).

NOTE: The specification is herein referred to as "PC/104", base on the 104 signal contacts on the two bus connectors. (64 pins on CN1 and 40 pins on CN2) It can be optimized for the unique requirements of embedded system applications. PC/104 modules can be of two bus types, 8 bits (CN1) and 16 bits (CN2).

Figure below show the PC/104 module dimensions and a typical module stack.

- Figure 1 : PC/104 module dimensions.
- Figure 2 : Illustrates a typical module stack of 8 bits or 16 bits modules (The 8 bits module on J2 connector)

Figure 2. Typical Module Stack

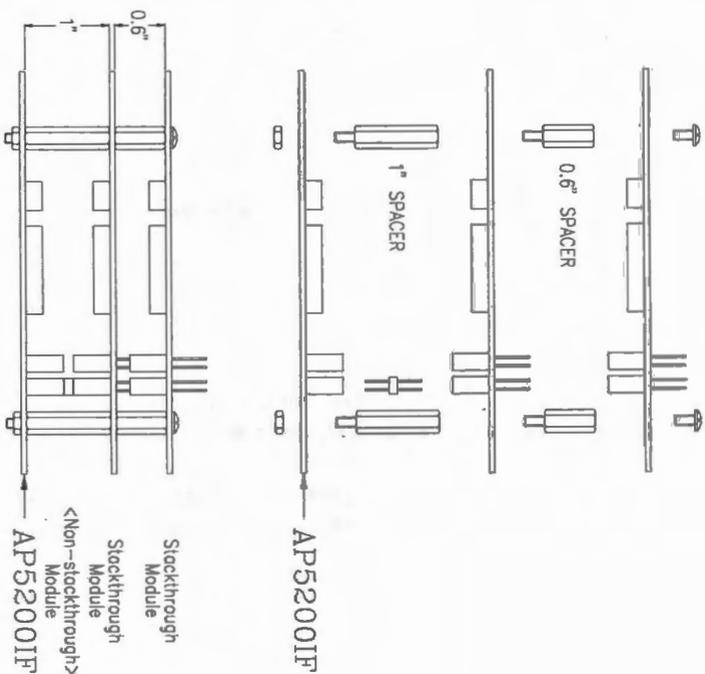
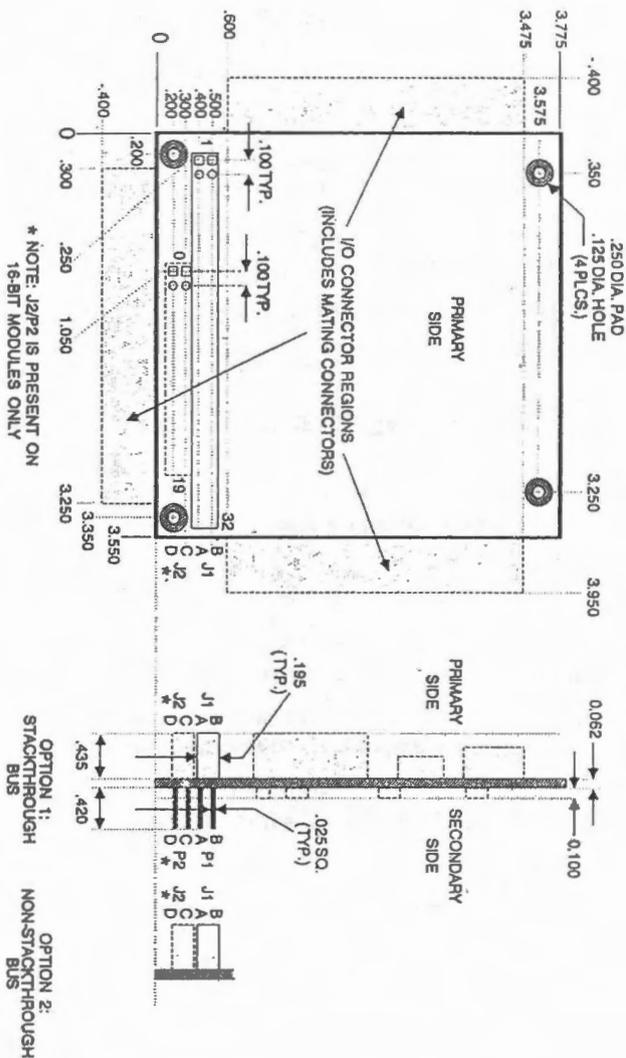


Figure 2. Typical Module Stack

Figure 1. PC/104 Module Dimensions
(Dimensions are in inches, $\pm .005$)



HOW TO USE WATCHDOG

Enable and Retrigger the Watch-Dog timer : 443 H

Disable : 43 H

EX.1 : For DOS

Execute the **DEBUG.EXE** file under **DOS**, Then key-in **i443**. The system will reboot automatically according to the time-out of you set.

For example, if you want to Set **4 seconds** for the time-out, you should set **JP2 :7-8 ON** and **JP16 :1-2 ON** to enable watch-dog timer.

```
C:\DOS> DEBUG
```

```
    - 443
```

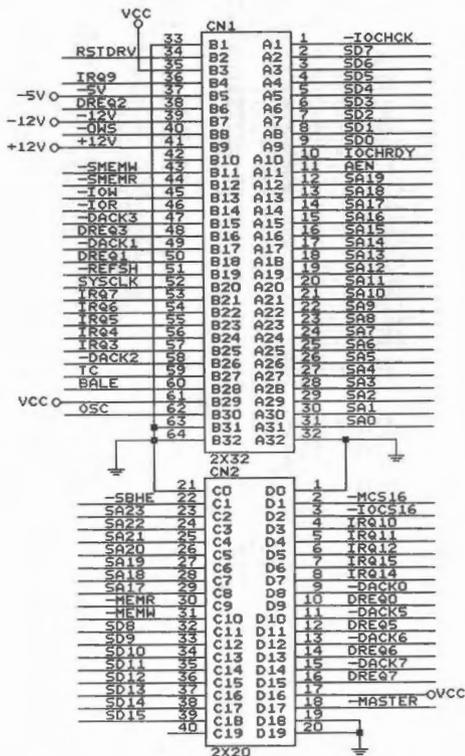
EX.2 : For assemble Language

```
Enable :  
:  
:  
MOV DX,443H  
IN AL,DX
```

```
Disable :  
:  
:  
IN AL,43H
```

EXPANSION BUS PIN ASSIGNMENTS

6.1 PC/104 EXPANSION BUS



TECHNICAL REFERENCE**7.1 I/O PORT ADDRESS MAP**

Address	Function
000 - 01F	DMA Controller #1
020 - 03F	Interrupt Controller #2
040 - 05F	Timer Chip
043	Disable Watch-Dog Times Operation (Read)
060 - 06F	Keyboard Controller
070 - 07F	Read Time Clock/NMI Mask
080 - 09F	DMA Page Register
0A0 - 0BF	Interrupt Controller #2
0C0 - 0DF	DMA Controller #2
0F0 - 0F1	Clear/Reset Math Coprocessor
1F0 - 1F7	Fix Disk Controller
200 - 210	Game Port
278 - 27F	Parallel Port #2
2E8 - 2EF	Serial Port #4 (COM 4)
2F8 - 2FF	Serial Port #2 (COM 2)
300 - 31F	prototype Card/Streaming Tape Adapter
360 - 36F	PC Network
378 - 3FF	Parallel Port #1
380 - 38F	SDLC #2
3A0 - 3AF	SDLC#1
3B0 - 3BF	MDA Video Card (Including LPT0)
3C0 - 3CF	EGA Card
3D0 - 3DF	CGA Card
3E8 - 3EF	Serial Port #3 (COM 3)
3F0 - 3F7	Floppy Disk Controller
3F8 - 3FF	Serial Port #1 (COM 1)
443	Enable Watch-dog Timer Operation (read)

7.2 MEMORY ADDRESS MAP

Address Range (Hex)	Description
000000H - 09FFFFH	640 KByte Conventional RAM
0A0000H - 0BFFFFH	128 KByte of Video RAM
0C0000H - 0DFFFFH	128 KByte of I/O Expansion ROM
0E0000H - 0FFFFFFH	128 KByte System BIOS ROM
100000H - 7FFFFFFH	1 MB - 128 MB of User RAM
FF0000H - FFFFFFFH	Duplicated 64 KB system BIOS ROM at 0F0000H

7.3 DMA CHANNELS

CHANNE L	Function
DMA 0	Reserved
DMA 1	Reserved
DMA 2	Floppy Disk Controller
DMA 3	ECP Parallel Port
DMA 4	Cascade for DMA #1
DMA 5	Reserved
DMA 6	Reserved
DMA 7	Reserved

7.4 INTERRUPT CONTROLLER

IRQ #	Function
IRQ 0	System timer output
IRQ 1	Keyboard
IRQ 2	Cascade for INTC #2
IRQ 3	Serial port #2
IRQ 4	Serial port #1
IRQ 5	Parallel port #2
IRQ 6	Floppy disk controller
IRQ 7	Parallel port #1
IRQ 8	Real time clock
IRQ 9	Software redirected to INT 0AH (IRQ 2)
IRQ 10	Reserved
IRQ 11	Reserved
IRQ 12	PS/2 Mouse
IRQ 13	Math Coprocessor 80387DX
IRQ 14	Hard disk controller
IRQ 15	Reserved
NMI	Parity Check Error

Terms and Conditions

Date:1997.10.20

Warranty Policy

1. All products are warranted against defects in materials and workmanship for a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service " , RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty :
 - A. Improper or inadequate maintenance by the customer.
 - B. Unauthorized modification or misuse.
 - C. Operation outside of the environmental specifications for the product.

RMA Service

1. Request a RMA# :

Complete and fax to Supplier the "RMA Request Form" at this manual to obtain a RMA number.

2. Shipping:

- A. The customer is requested to fill up the problem code as listed .If none of the code is selected, please write the symptom description on the remark.
- B Ship the defective units with freight prepaid.
- C. Mark the RMA # clearly on the box .
- D. Shipping damage as a result of inadequate packing is the customer's responsibility.
- E. Use the original packing materials whenever possible .

3. All RMA# are valid for 30 days only:

When RMA goods are received after valid RMA# period , the goods will be rejected.