

HS-5200/5000

Half Pentium[®]MMX[™] L/VGA I.S.B.

- Half Size All-in-one with VGA CRT-LCD Interface •
- WDT • DOC • CTA • USB • IrDA • COM-1/2 • PPI •
- PISA/ISA Bus Industrial Single Board Computer •

HS-5200P/5000P

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Chapter-1

General Information

This is a common manual of HS-5200, HS-5200P, HS-5000 and HS-5000P series Industrial Single Board CPU Card. The descriptions herein are subject to HS-5200. The HS-5200P, which is based on HS-5200 but without VGA CRT-LCD, supports. The HS-5000 is based on HS-5200 but supports with ISA bus which without PCI interface at slot. The HS-5000P, which is based on HS-5000 but without VGA CRT-LCD supports.

The HS-5200/5000 is a PISA/ISA bus Industrial Single Board (I.S.B.) CPU card with features combine together to make it an ideal all-in-one industrial single board computer, enhanced I/O effects, VGA and support panel functions and make it an excellent choice for display-intensive applications. Various panel of LCD types support including TFT, monochrome STN, EL and many others. The HS-5200/5000 also provides a 10-pin header internal VGA connector for monitor built-in system. The HS-5200 supports BEDO, EDO and FPM DRAM sockets. This gives you the flexibility of configuring your system from 1 to 128 MB DRAM by using the most economical SIMMs. It also provides two 72-pin SIMM sockets for its on-board system DRAM.

The advanced PISA bus add-on connection of HS-5200/5000 allows user could easily obtain both ISA's 16-bit and PCI's 32-bit full set signals from a small 16-bit PISA slot for suitable plug into a small size system with 8/16/32-bit operating. A single Flash chip holds the system BIOS, and you can change the Flash BIOS by the Utility Update. Advanced USB and IR ports also provide a faster data transmission.

The HS-5200/5000 features include a temperature-warning sensor installed under the CPU socket. The sensor monitors the CPU temperature and generates a warning buzzer in response to the temperature increases that may cause a system malfunctions. You can also use the DOS version of the "DiskOnChip™" socket by issuing commands from the DOS prompt without the necessity of other software supports. The "DiskOnChip™" supports up to 72 MB. If a un-expect program cause halts, the watchdog timer will automatically reset the CPU or generate an interrupt. The watchdog is designed for pure hardware and doesn't need any arithmetical functions of a real-time clock chip. This ensures the reliability in an unmanned or standalone system.

1.1 Major Features

- ✓ HS-5200/5000, HS-5200/5000P PISA bus supported. HS-5000, HS-5000P ISA bus supported.
- ✓ Intel MMX™/Pentium® CPU 75~233 MHz, AMD k5, k6, k6-2 333MHz, 350MHz, Cyrix 6x86, M2 300MHz.
- ✓ SiS 5571 chipset supports EDO or FastPage DRAM up to 128 MB.
- ✓ Fast PCI enhanced IDE controller supports four IDE drives (large hard disks, CD-ROM, tape backup ... etc.)
- ✓ PnP I/O address & IRQ selection.
- ✓ Two high-speed serial RS-232 Ports supports 16C550 UART with 16-byte FIFO.
- ✓ One enhanced bi-directional parallel port. Supports SPP/EPP/ECP.
- ✓ On board keyboard and PS/2 Mouse connector.
- ✓ On board SMC 37C669 super I/O.
- ✓ On board 32 bit PCI-BUS SVGA/ Panel controller. (HS-5200/5000, HS-5000 only)
- ✓ "DiskOnChip™" Socket Supported Memory Size up to 72 MB.
- ✓ Switch Power Regulator
- ✓ CPU Temperature Alarm supported.

1.2 Specifications

- CPU:** Intel MMX™/Pentium® 75~233MHz, AMD k5, k6, k6-2 350MHz, Cyrix 6x86,M2 300MHz.
- Bus interface:** PISA bus (HS-5200, HS-5200P) ISA bus (HS-5000, HS-5000P)
- Chipset:** SiS 5571
- Data bus:** 64-bit
- Processing ability:** 64-bit
- Flat panel / CRT SVGA Controller:** CHIP 65550 (HIQV32) Chipset with 1 MB memory support to color and monochrome Single Drive (SS) and Dual Drive (DD) STN, TFT & EL panels. Support CRT resolutions up to 1024x768 256 colors. (HS-5200 and HS-5000 only)
- PCI Enhanced IDE interfaces:** Supports up to four IDE devices support mode 3, 4 hard Disk, and data transfer rate up to 16.6 MB/sec minimum.
- RAM memory:** Up to 128MB uses two 72-pin SIMM sockets; supports BEDO, EDO and FastPage DRAM.
- Cache memory:** 512KB Pipeline burst cache memory.
- Floppy disk drive interface:** Supports up to two floppy disk drives.
- Parallel port:** One bi-directional parallel port. Supports SPP/ECP/EPP mode.
- Serial port:** Two RS-232 ports. Both provide 16C550 UART with 16-byte FIFO.
- BIOS:** AWARD Y2K flash BIOS.
- Watchdog timer:** Hardware circuit can be set by 1, 2, 10, 20, 110, or 220 seconds period Reset or NMI were generated when CPU did not periodically trigger the timer.
- DMA channels:** 7
- Interrupt levels:** 15
- Keyboard:** 6-pin mini DIN connector or 5-pin header supports standard PC/AT keyboard.
- Mouse:** 6-pin mini DIN support PS/2 mouse.
- USB:** Supports 2 USB header.
- IR interface:** Supports one IrDA TX/RX header.
- Flash memory Disk:** Reserved socket for "DiskOnChip™", support up to 72MB Flash memory disk.

-
- Extra Power:** Supports 8-PIN extra DC power input connector.
 - CMOS:** Real-time clock/calendar and battery backup by DS12B887 or equivalent device.
 - CPU Temperature Alarm:** Hardware circuit design via beeping alarm when CPU's temperature is over heating 55°C±5°C limited.
 - Power supply voltage:** +5V (4.75 to 5.25V), +12V / -12V power supply.
 - Max. Power requirement:** +5V @6A, +12V/-12V @20mA.
 - Operating temperature:** 0-55°C (CPU need cooler).
 - Board size:** HS-5200, HS-5200P 7.3"(L) x 5" (W) (185mm x 127mm).
HS-5000, HS-5000P 7.3"(L) x 4.8" (W) (185mm x 122mm).

1.3 Delivery Package

The delivery package includes all following items:

- * One Industrial Single Board CPU Card
- * One Printer & COM2 Bracketed Flat Cable
- * Two IDE port Flat Cables
- * FDD port Flat Cable
- * COM port Cable
- * One PS/2 Mouse to Standard Keyboard Cable
- * VGA Utility Diskette (HS-5200, HS-5000 only)
- * User's Manual

Please contact with your dealer if any of these items are missing or damaged when purchasing. And please keep all parts of the delivery package with packing materials in case of you want to ship or store the product in feature.

Chapter-2

Hardware Installation

This chapter provides the information on how to install the hardware. At first, please follow up sections 1.3, 2.1 and 2.2 in check the delivery package and carefully unpacking. Following after, the jumpers setting of switch, watchdog timer, and the DiskOnChip™ address selection.

2.1 Caution of Static Electricity

The CPU Card has been well package with an anti-static bag in protect its sensitive computer components and circuitry from the damage of static electric discharge.

Note: DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.

You should follow the steps as following to protect the board in against the static electric discharge whenever you handle the board:

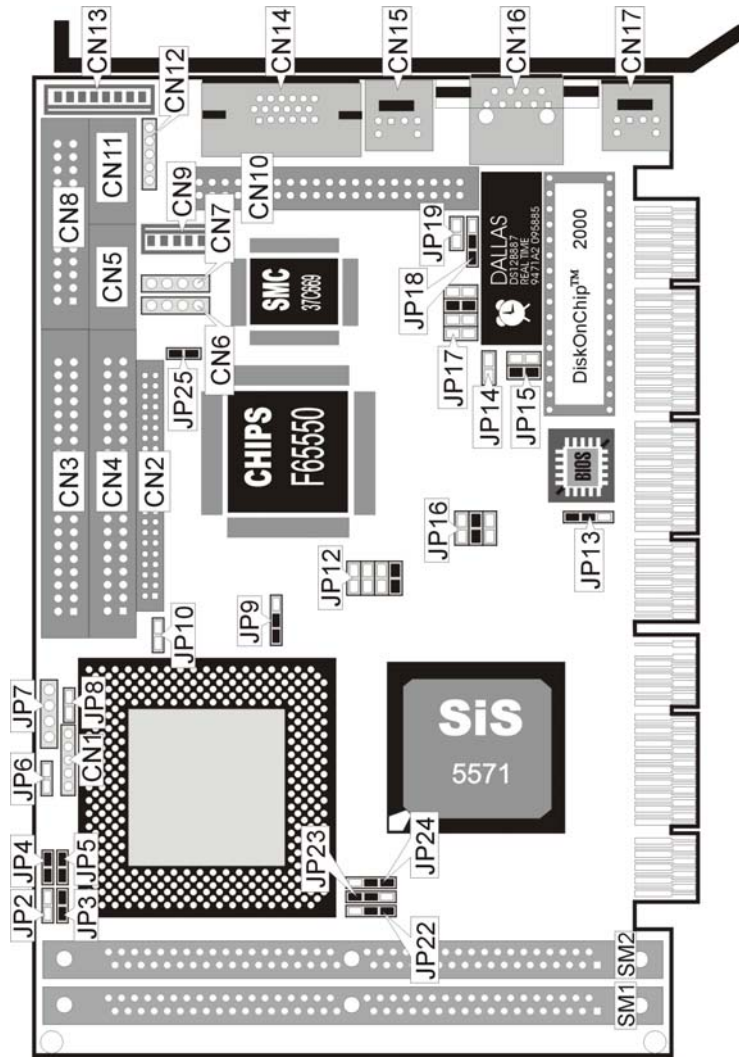
1. Please use a grounding wrist strap on whoever needs to handle the CPU Card. Well clip the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handles the CPU Card for harmlessly discharge any static electricity through the strap.
2. Please use anti-static pad for put any components or parts or tools on the pad whenever you work on them outside the computer. You may also in use the anti-static bag instead the pad. Please ask from your local supplier in help up your necessary parts on anti-static requirement.

2.2 Caution on Unpacking and Before Installation

First of all, please follow with all necessary steps of section 2.1 in protection the CPU Card from electricity discharge. With refer to section 1.3, please check the delivery package again with following steps:

1. Unpacking the CPU Card, keep well storage of all packing material, manual and diskette etc. if has.
2. Is there any components lose or drop from the board? DO NOT INSTALL IF HAPPENED.
3. Is there any visual damaged of the board? DO NOT INSTALL IF HAPPENED.
4. Well check from your optional parts (i.e. CPU, SRAM, DRAM, ROM-Disk etc.) for completed setting all necessary jumpers setting to jumper pin-set and CMOS setup correctly. Please also reference to all information of jumpers setting in this manual.
5. Well check from your external devices (i.e. Add-On-Card, Driver Type etc.) for completed add-in or connection and CMOS setup correctly. Please also reference to all information of connector connection in this manual.
6. Please keep all necessary manual and diskette in a good condition for your necessary re-installation if you change your Operating System or whatever needs.

2.3 HS-5200/5000's Layout



Default Setting : JP12 1-2 ON for HS-5000
 JP12 1-2, 7-8 ON for HS-5200

2.4 Quick Listing of Jumpers

JP 3, 4, 5	—	for CPU type setting
JP 10	—	for Cache RAM mode setting
JP 13	—	Type setting of Flash BIOS
JP 14	—	CMOS Data Clear
JP 15	—	for DiskOnChip™ address setting
JP 12	—	CPU's Vcore voltage level selection setting
JP 9	—	CPU's operating voltage selection setting
JP 22, 23, 24	—	System PLL clock setting
JP 16	—	System Clock selection
JP 17	—	WATCH-DOG Time-out period selection
JP 18	—	WATCH-DOG Active selection
JP 19	—	On-Board I/O Enable & Disable control
JP 25	—	CPU Temperature Alarm control

2.5 Quick Listing of Connectors

CN1:	KEYLOCK
CN2:	FLAT-PANEL CONNECTOR (HS-5200, HS-5000 only)
CN3:	1st HDD (IDE) CONNECTOR
CN4:	2nd HDD (IDE) CONNECTOR
CN5:	COM2 (HEADER 5x2)
CN6:	USB0 CONNECTOR
CN7:	USB1 CONNECTOR
CN8:	PARALLEL PORT
CN9:	5P KEYBOARD CONNECTOR
CN10:	FDD CONNECTOR
CN11:	INTERNAL VGA 10-PIN CONNECTOR (HS-5200, HS-5000 only)
CN12:	IR CONNECTOR
CN13:	8P POWER CONNECTOR
CN14:	EXTERNAL VGA CONNECTOR (DB15) (HS-5200, HS-5000 only)
CN15:	MINI-DIN 6-PINS MOUSE CONNECTOR (PS/2)
CN16:	COM1 (DB9)
CN17:	MINI-DIN 6-PINS KEYBOARD CONNECTOR (PS/2)
JP6:	RESET BUTTON CONNECTOR
JP7:	SPEAKER CONNECTOR
JP8:	IDE LED CONNECTOR

2.6 Jumper Setting Description

A jumper pin-set is **ON** as a shorted circuit with a plastic cap inserted over two pins. A jumper pin-set is **OFF** as an open circuit with a plastic cap inserted over one or no pin(s) between pins. The below figure 2.2 shows the examples of different jumper pin-set setting as **ON** or **OFF** in this manual.

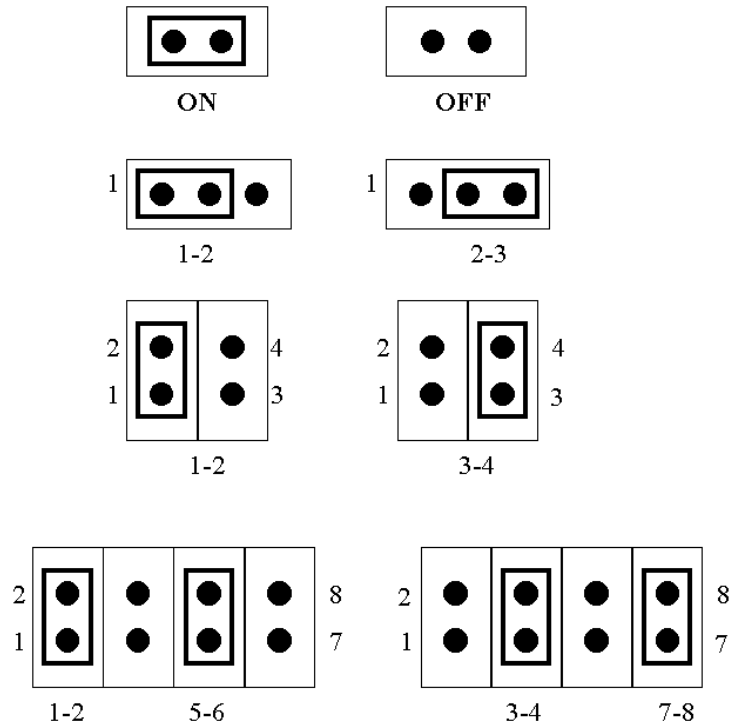


Figure 2.2

All jumper pin-set already has its default setting with the plastic cap inserted as ON, or without the plastic cap inserted as OFF. The default setting may reference in this manual with a "*" symbol in front of the selected item.

2.7 Setting the CPU

All CPU Card provides all possibility in jumper setting for wide using all types of CPU with JP3, JP4, JP5, JP16, JP22, JP23 and JP24 setting in following.

The JP1 sets the multi-times ratio of the CPU's specification. Please reference to the following table for all type CPU in used.

- **CPU's Clock Ratio select**

Clock Ratio			BF2	BF1	BF0
Intel		AMD	JP4	JP5	JP3
P54C	P55C	K6	1-2	1-2	1-2
2.5	2.5	*2.5	OFF	ON	ON
3.0	3.0	3.0	OFF	ON	OFF
2.0	2.0	2.0	OFF	OFF	ON
1.5	3.5	3.5	OFF	OFF	OFF
2.5	2.5	4.5	ON	ON	ON
3.0	3.0	5.0	ON	ON	OFF
1.5	2.0	4.0	ON	OFF	ON
2.5	3.5	5.5	ON	OFF	OFF

*) : default setting

JP16 used to setting the System clock base rate. The System clock setting will preset the system operating clocking base rate.

- **System Clock select**

JP16 (System Clock)	1-2	3-4	5-6
50 MHz	ON	ON	OFF
55 MHz	OFF	OFF	ON
60 MHz	ON	OFF	OFF
*66 MHz	OFF	ON	OFF
75 MHz	ON	OFF	ON

*) : default setting

- **CPU Vcore Voltage Selection**

Correspond to different type CPU, it is request to set JP12 for match the CPU's Vcore operating voltage. Here shows at below of the proper jumper settings for their respective Vcore at range 2.0V to 3.5V.

Voltage	HS-5200	HS-5000
2.0V	ALL OFF	
2.1V	7-8	
2.2V	5-6	5-6, 7-8
2.3V	5-6, 7-8	
2.4V	3-4	
2.5V	3-4, 7-8	7-8
2.6V	3-4, 5-6	
2.7V	3-4, 5-6, 7-8	
2.8V	1-2	
*2.9V	* 1-2, 7-8	* 5-6
3.0V	1-2, 5-6	
3.1V	1-2, 5-6, 7-8	
3.2V	1-2, 3-4	
3.3V	1-2, 3-4, 7-8	ALL OFF
3.4V	1-2, 3-4, 5-6	1-2
3.5V	1-2, 3-4, 5-6, 7-8	3-4

*) : default setting

For single or dual power type CPU, please set a correct to jumper JP9 as following table.

- **CPU Operating Voltage Selection**

CPU Type	JP9
P54,P55	2-3
*P55C Dual Voltage	1-2

*) : default setting

The JP22, 23, 24 used to setting the system PLL clock rate for meet with the best feature of I/O interface performance. Please set the clock rate at a necessary operating condition. An over specification setting will cause the system malfunction or un-stateable.

- **PLL Clock setting**

PLL Clock	JP22	JP23	JP24
50 MHz	1-2	2-3	1-2
60 MHz	1-2	1-2	2-3
*66 MHz	2-3	1-2	2-3
75 MHz	1-2	2-3	2-3

*) : default setting

The above default setting of JP3, JP4, JP5, JP9, JP12, JP16, JP22, JP23 and JP24 show a AMDK6-166(2.9V) CPU in used. (i.e. 66.6 x 2.5 ≈ 166 MHz). Please contact with your CPU supplier for detail specification in correcting selected setting of all.

2.8 CMOS Data Clear

The JP14 provides a hardware CMOS data clear function with an **ON** to it. *Never clear CMOS data during power on in case of damage the sensitive electronic components or the board.*

- **CMOS Data Clear (Only for DS12B887)**

JP14	DESCRIPTION
ON	Clear Data
*OFF	Normal

2.9 System Memory DRAM

All CPU Card provides a wide range on-board DRAM memory by two pieces SIMM sockets (Bank0 & Bank1) to accept 1 MB, 2MB, 4MB, 8MB, 16MB, 32MB or 64MB. The SIMMs (Single In-Line Memory Modules) RAM request the access time should be 70 n-second or faster. The total capacity of the on board memory are between 2MB to 128MB.

See the figure on section 2.3 for get the identifying the banks. Please take notes that the memory capacity of both SIMMs should be the same.

The Card requires **at least 2pcs of the RAM modules on SIMM** socket.

2.10 Watch-Dog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable. The Enable cycle should proceed by READ PORT 443H. The Disable cycle should proceed by READ PORT 043H. A continue Enable cycle after a first Enable cycle means Refresh.

Once if the Enable cycle activity, a Refresh cycle is request before the time-out period for restart counting the WDT Timer's period. Otherwise, it will assume that the program operation is abnormal when the time counting over the period preset of WDT Timer. A System Reset signal to start again or a NMI cycle to the CPU comes if over.

The JP18 is using for select the active function of watch-dog timer in disable the watch-dog timer, or presetting the watch-dog timer activity at the reset trigger, or presetting the watch-dog timer activity at the NMI trigger.

- **JP18 : Watch-Dog Active Type Setting**

JP18	DESCRIPTION
*1-2	System Reset
2-3	Active NMI
OFF	disable Watch-dog timer

• **JP17 : WDT Time - Out Period**

PERIOD	1-2	3-4	5-6	7-8
*1 sec	OFF	OFF	ON	OFF
2 sec	OFF	OFF	ON	ON
10 sec	OFF	ON	OFF	OFF
20 sec	OFF	ON	OFF	ON
110 sec	ON	OFF	OFF	OFF
220 sec	ON	OFF	OFF	ON

The Watch-dog timer is disabled after the system Power-On. The watch-dog timer can be enabled by a Enable cycle with reading the control port (443H), a Refresh cycle with reading the control port (443H) and a Disable cycle by reading the Watch-dog timer disable control port (043H). After a Enable cycle of WDT, user must constantly proceed a Refresh cycle to WDT before its period setting comes ending of every 1, 2, 10, 20, 110 or 120 seconds. If the Refresh cycle does not active before WDT period cycle, the on board WDT architecture will issue a Reset or NMI cycle to the system.

The Watch-Dog Timer is controlled by two I/O ports.

443H	I/O Read	The Enable cycle.
443H	I/O Read	The Refresh cycle.
043H	I/O Read	The Disable cycle.

The following sample programs showing how to Enable, Disable and Refresh the Watch-dog timer:

```

WDT_EN_RF      EQU    0443H
WDT_DIS        EQU    0043H

WT_Enable      PUSH    AX                ; keep AX DX
                PUSH    DX
                MOV     DX,WDT_EN_RF    ; enable the watch-dog timer
                IN     AL,DX
                POP     DX                ; get back AX, DX
                POP     AX
                RET

```

```

WT_Refresh      PUSH  AX          ; keep AX, DX
                PUSH  DX
                MOV   DX,WDT_ET_RF ; refresh the watch-dog timer
                IN    AL,DX
                POP   DX          ; get back AX, DX
                POP   AX
                RET

WT_DISABLE      PUSH  AX
                PUSH  DX
                MOV   DX,WDT_DIS   ; disable the watch-dog timer
                IN    AL,DX
                POP   DX          ; get back AX, DX
                POP   AX
                RET

```

2.11 VGA Controller (HS-5200, HS-5000 only)

The C&T 655xx family supports a wide variety of monochrome and color Single-Panel, Single-Drive (SS) and Dual-Panel, Dual Drive (DD) standard and high-res passive STN and active matrix TFT/MIN LCD, and EL panels. For monochrome panels, up to 64 gray scales are supported. Up to 4096 different colors can be displayed on passive STN LCDs and up to 16M colors on 24-bit active matrix LCDs.

The CPU Card uses C&T 65550 chipset. Provides 2.0 mm pitch 44-pin on-board internal connector for flat panel connection; and a external DB15 analogy R.G.B. output connector for CRT monitor. By BIOS setup, user may use one of the display devices or both. Please use at the same resolution when both display. Please contact with your dealer if connection to a new specification flat panel.

The CPU Card offers a variety of programmable features to optimize display quality. Vertical centering and stretching are provided for handling modes with less than 480 lines on 480 - line panels. Horizontal and vertical stretching capabilities are also available for both text and graphics modes for optimal display of VGA text and graphics modes on 800x600 and 1024x768 panels.

2.12 DiskOnChip™ Address Setting

All CPU Card provides a U10 socket for install the DiskOnChip™ module.

A JP15 may select the starting memory address of the DiskOnChip™ (D.O.C.) to avoid the mapping area with any other memory devices. If you have another extra memory devices in the system with the same memory, neither the CPU Card nor the extra memory devices will function normally. Please setting both at different memory address mapping.

- **JP15 : DiskOnChip™ Address**

JP15	Address
*1-2	D000
3-4	D800

*) : default setting

The D.O.C. function allows the system in using without FDD nor HDD. The D.O.C. may formatting as driver C: or driver A:. User may also easily uses the DOS's commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc. This is means that the D.O.C. may uses as driver-A if the system without FDD-A for ambient application. Please contact with your supplier for different size D.O.C. module.

2.13 CPU Temperature Alarm

All CPU Card provides the feature of CPU temperature alarm. The warning buzzer will alarm when the CPU's temperatures rise over to $55\pm 5^{\circ}\text{C}$.

The warning buzzer will shout off automatically until the temperatures goes under $55\pm 5^{\circ}\text{C}$.

The JP25 provides for disable or enable the alarm function.

- **JP25 : CPU Temperature Alarm Control**

JP25	DESCRIPTION
*ON	Enable
OFF	Disable

*) : default setting

2.14 On Board Multi-I/O Setting

All CPU Card provides a JP19 for enable or disable the on-board multi-I/O chipset when application of CPU temperature alarm.

An Enable means that the CPU Card using the on-board multi-I/O chipset. A Disable means that the CPU Card doesn't using the on-board multi-I/O chipset. User may use their I/O interface card when JP19 selects Disable.

- **JP19 : On Board Multi-I/O Chipset Enable/Disable Selection**

JP19	Address
*OFF	Enable
ON	Disable

*) : default setting

2.15 BIOS Type Selection

All CPU Card provides a JP13 for selects the type of flash chip in using as the BIOS. The manufacturer provides 29C010 on the board.

- **JP13 : BIOS Type Selection**

JP13	Address
*1-2	29C010
2-3	28F010

*) : default setting

2.16 Cache RAM Mode Selection

All CPU Card provides a JP10 for selects the type of cache RAM mode in using. The manufacturer provides WB on the board.

- **JP10 : Cache RAM Mode Selection**

JP10	Address
*OFF	WB
ON	WT

Chapter-3

Connection

This chapter gives all necessary information of the peripheral's connections, switches and indicators.

3.1 The Floppy Disk Drive Connector

A standard 34-pin header daisy-chain driver connector provides as CN10 with following pin assignment. Total two FDD drivers may connect.

- **CN10 : FDD CONNECTOR**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Drive Connector

Two standard 40-pin header daisy-chain driver connectors provide as CN3 & CN4 with following pin assignment. Total four IDE (Integrated Device Electronics) drivers may connect.

CN3(IDE 1) : Primary IDE Connector

CN4(IDE 2) : Secondary IDE Connector

• **CN3/CN4 : IDE Interface Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET	2	GROUND
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	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND# -DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0	38	HDC CS1#
39	HDD ACTIVE	40	GROUND

3.3 Parallel Port Connector

A standard 26-pin flat cable driver connector provides as CN8 with following pin assignment for connection to parallel printer.

- **CN8 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	GROUND

3.4 Serial Ports Connectors

All CPU Card offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports with one DB-9 external connector, and one internal 10-pin header connector.

- **CN16 : Serial Port DB-9 Connector (ACE0)**

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- **CN5 : Serial Port 10-pin Header (ACE1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTX
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

3.5 Keyboard Connectors

All CPU Card offers two possibilities for keyboard connections to external PS/2 type keyboard at CN17, or an internal 5-pin header at CN9.

- **CN9 : 5-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

- **CN17 : 6-pin Mini-DIN Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	N/C
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	N/C

3.6 Power's LED, Key-Lock and Reset Button

The following provides the pin information for Power's LED indicator, Key-Lock and Reset Button connections from CN1, JP6 and JP8.

- **CN1 : POWER LED & KEYLOCK**

PIN NO.	DESCRIPTION
1	POWER LED ANODE
2	NC
3	GROUND
4	KEYLOCK
5	GROUND

- **JP6 : RESET BUTTON**

PIN NO.	DESCRIPTION
1	EXTERNAL RESET
2	GROUND

- **JP8 : IDE LED connector**

PIN NO.	DESCRIPTION
1	+5V
2	HDD ACTIVE#

3.7 External Speaker

All CPU Card has an on-board buzzer. And it also provides the JP7 in allows user to connecting to the external speaker.

- **JP7 : Speaker Connector**

PIN NO.	DESCRIPTION
1	SPEAKER SIGNAL
2	NC
3	GROUND
4	+5V

3.8 PS/2 Mouse 6-pin Mini-DIN Connector

All CPU Card provides an external PS/2 mouse connector at CN15 with following pin information.

- **CN15 : PS/2 Mouse Connector**

PIN NO.	DESCRIPTION
1	DATA
2	NC
3	GROUND
4	+5V
5	CLK
6	NC

3.9 VGA Connectors (HS-5200, HS-5000 only)

The CPU Card provides two possible VGA connections. One standard DB-15 external VGA connector as following CN14 pin information. Another internal 10-pin header as following CN11 pin information.

- **CN14 : 15-pin DB-15 Female VGA connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	NC	10	GROUND
11	NC	12	NC
13	HSYNC	14	VSYNC
15	NC		

- **CN11 : 10-pin internal VGA Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	HSYNC	8	GROUND
9	VSYNC	10	GROUND

3.10 IR Connector

All CPU Card provides a 5-pin internal IR communication connector as following CN12 pin information. The CN12 provides for IrDA 1.0 specification application.

- **CN12 : 5-PIN IR CONNECTOR**

PIN NO.	DESCRIPTION
1	Vcc
2	NC
3	IRRX
4	GROUND
5	IRTX

3.11 Extra Power Connector

All CPU Card provides an 8-pin extra DC power connector CN13 for internal power connection at a single board application. Please refer to the following table for detail pin information.

- **CN13 : 8P Extra Power Connector**

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

3.12 USB Ports Connector

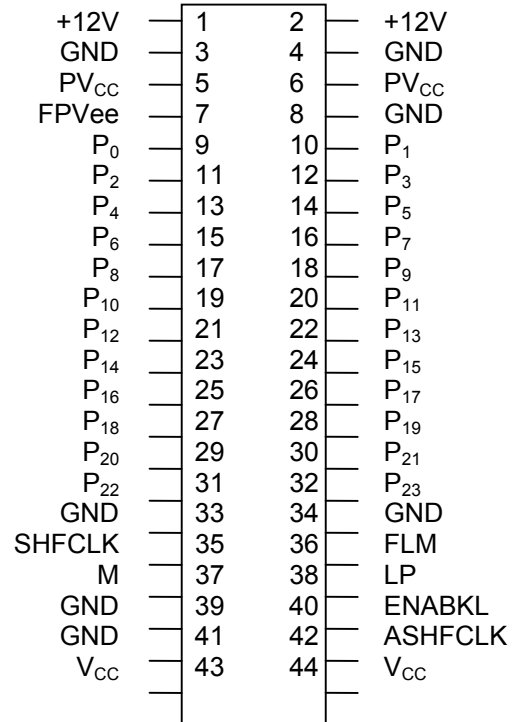
All CPU Card provides two internal 4-pin USB ports connectors. Please refer to the following detail pin information.

- **CN6, CN7 : 4-pin Header USB connector**

PIN NO.	CN6(USB0)	PIN NO.	CN7(USB1)
1	Vcc	1	Vcc
2	BD0-	2	BD1-
3	BD0+	3	BD1+
4	GROUND	4	GROUND

3.13 Flat-Panel Connector (HS-5200, HS-5000 only)

The CPU Card provides a 44-pin 2.0 mm pitch header connector (CN2) for Flat-Panel connection. Please reference to the following pin-assignment for correct connection to flate panel module.



Chapter-4

AWARD BIOS Setup

The board uses Award PCI/ISA BIOS for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AWARD PCI/ISA BIOS Setup program, press key during memory testing when first power on. The Main Menu will be displayed at this time.

Be notes that only HS-5200 and HS-5200P provides with slot extension PCI bus and ISA bus functions. And the HS-5000 and HS-5000P provides with ISA bus function only. The relative setup on PCI in the BIOS may not cause any activity to HS-5000 and HS-5000P.

4.1 Main Menu

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

```
ROM PCI/ISA BIOS (2AS1HD2A)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	
F10 : Save & Exit Setup	
↑ ↓ → ← : Select Item	
(Shift)F2 : Change Color	

Note that a brief description of each highlighted selection appears at the bottom of the screen.

4.2 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for the setup. When the IDE hard disk drive you are using is larger than 528MB, please set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

ROM PCI/ISA BIOS (2A5IHD2A)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Tue, Nov 3 1998							
Time (hh:mm:ss) : 14 : 17 : 13							
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR MODE
Primary Master	: 0	0	0	0	0	0	0 NORMAL
Primary Slave	: 0	0	0	0	0	0	0 NORMAL
Secondary Master	: 0	0	0	0	0	0	0 NORMAL
Secondary Slave	: 0	0	0	0	0	0	0 NORMAL
Drive A : None							
Drive B : None							
LCD&CRT : Both							
Halt On : All Errors							
ESC : Quit		↑ ↓ → ← : Select Item		PU/PD/+/- : Modify			
F1 : Help		(Shift)F2 : Change Color					

4.3 BIOS Features Setup

This section allows you to configure your system for the basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

ROM PCI/ISA BIOS (2AS1HD2A)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

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

4.4 Chipset Features Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

ROM PCI/ISA BIOS (2A5IHD2A)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Disabled	DRAM loading > 32 Pieces: No
L2 (WB) Tag Bit Length	: 7bits	System BIOS Cacheable : Disabled
SRAM Back-to-Back	: Enabled	Video BIOS Cacheable : Disabled
NA# Enable	: Disabled	Memory Hole at 15M-16M : Disabled
DRAM RD Leadoff Time	: 5T	Linear Mode SRAM Support: Disabled
Refresh Cycle Time (us)	: 15.6	
RAS Pulse Width Refresh	: 3T	
RAS Precharge Time	: 2T	
RAS to CAS Delay	: 2T	
CAS# Pulse Width (FP)	: 2T	
CAS# Pulse Width (EDO)	: 2T	
RAMW# Assertion Timing	: Normal	
EDO Back-to-Back Timing	: 3T	
SDRAM CAS Latency	: 2T	
SDRAM WR Retire Rate	: X-2-2-2	ESC : Quit ↑↓←→ : Select Item
Read Prefetch Memory RD	: Enabled	F1 : Help PU/PD/+/- : Modify
CPU to PCI Post Write	: 4T	F5 : Old Values (Shift)F2 : Color
CPU to PCI Burst Mem. WR	: Disabled	F6 : Load BIOS Defaults
ISA Bus Clock Frequency	: 7.159MHz	F7 : Load Setup Defaults

4.5 Integrated Peripherals

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

PIO means Programmed Input /Output. Rather than having the BIOS issue a series of commands to affect the transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is much simpler and more efficient (also faster).

ROM PCI/ISA BIOS (2A5IHD2A)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

Internal PCI/IDE : Disabled	PS/2 mouse function : Disabled
	USB Controller : Disabled
IDE Data Port Post Write: Disabled	
IDE HDD Block Mode : Disabled	
Onboard FDC Controller : Disabled	
Onboard UART 1 : Disabled	
Onboard UART 2 : Disabled	
Onboard Parallel Port : Disabled	ESC : Quit ↑↓←→ : Select Item
	F1 : Help PU/PD/+/- : Modify
	F5 : Old Values (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

4.6 Power Management Setup

The Power Management Setup allows user to configure the system for saving energy in a most effective way while operating in a manner consistent with his own style of computer use.

ROM PCI/ISA BIOS (2A5IHD2A)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management : User Define	IRQ3 (COM 2) : Enabled
PM Control by APM : No	IRQ4 (COM 1) : Enabled
Video Off Option : Always On	IRQ5 (LPT 2) : Enabled
Video Off Method : Blank Screen	IRQ6 (Floppy Disk): Enabled
Switch Function : Disabled	IRQ7 (LPT 1) : Enabled
Doze Speed (div by): 1	IRQ8 (RTC Alarm) : Enabled
Stodby Speed(div by): 1	IRQ9 (IRQ2 Redir) : Enabled
MODEM Use IRQ : NA	IRQ10 (Reserved) : Enabled
	IRQ11 (Reserved) : Enabled
** PM Timers **	IRQ12 (PS/2 Mouse) : Enabled
HDD Off After : Disable	IRQ13 (Coprocessor): Enabled
Doze Mode : Disable	IRQ14 (Hard Disk) : Enabled
Standby Mode : Disable	IRQ15 (Reserved) : Enabled
Suspend Mode : Disable	
** PM Events **	ESC : Quit ↑↓←→ : Select Item
COM Ports Activity : Disabled	F1 : Help PU/PD/+/- : Modify
LPT Ports Activity : Disabled	F5 : Old Values (Shift)F2 : Color
HDD Ports Activity : Disabled	F6 : Load BIOS Defaults
VGA Activity : Disabled	F7 : Load Setup Defaults