HSB-460I

NS Geode™ GX1 300MHz CPU

Half-Size CPU Card

Ethernet, Audio, LCD,

CompactFlash™, PC/104

HSB-460I Rev. A Manual

August 2003

Copyright Notice

Acknowledgments

Packing List

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

- 1 HSB-460I Half-Size CPU Card
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 Short copper and support
- 1 Jumper Cap
- 1 Cable Accessory (IDE, FDD, Parallel, Serial)
- 1 Y-Cable (Keyboard and Mouse)
- 1 USB Cable
- 1 Dual serial port
- 1 Audio cable

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

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Chapter

1

General Information

1.1 Introduction

Half-size CPU card, HSB-460I, is sized by 7.3" x 4.8" and a great solution for space-constrained applications. Equipped with National Semiconductor® Geode™ GX1 microprocessor, it is featured with low power consumption, reliable and cost-effective benefits.

To hold the overall outstanding performance, up to 256MB SDRAM memory is supported and the optional onboard 64MB SDRAM memory is offered; in total, giving a maximum of 320MB system memory capacity. The display performance is powered by Geode™ CS5530A. Both CRT and LCD monitors are supported.

The LAN work function offers a maximum of 100Mbps data transfer rate via one RJ-45 connector onboard. The Enhanced IDE connector comes with up to 33Mbps transfer protocol. DiskOnChip® supporting up to 1GB and CompactFlash™ memory are both featured and giving the best memory expansion. Also, one PC/104 socket is onboard providing further function extension.

1.2 Features

- Supports NS Geode™ 300MHz CPU
- Supports 18-bit TFT and (optional) DSTN panel
- 10/100Mbps Fast Ethernet
- AC-97 Audio
- Supports DiskOnChip® and Type II CompactFlash™ Memory
- PC/104 expansion interface
- 5V only operation
- ISA interface

1.3 Specifications

System

- CPU: NS Geode™ GX1 processor 300MHz
- Memory: 168 pin SDRAM slot x 1, Max. 256MB; (optional) onboard 64MB SDRAM memory
- Chipset: Geode GX1 + CS5530A
- BIOS: Award 256KB FLASH ROM
- SSD: DiskOnChip, Max. 1GB
  One Type II CompactFlash Card
- Watchdog timer: Generate a system reset
- Ethernet: RTL 8139DL, 10/100Base-T Fast Ethernet RJ-45 connector x 1
- Expansion Interface: ISA Interface, PC/104 socket
- Battery: Lithium battery
- Power supply voltage: +5V; AT power supply
- Operating temperature: 32 ℉ to 140 ℉ (0 to 60 ℃)
- Board size: 7.3" (L) x 4.8" (W)
  (185 mm x 122mm)
- Gross Weight: 0.88lb (0.4Kg)

Display

- Chipset: NS CS5530A
- Memory size: Shared memory up to 4MB
- Resolution: up to 1024 x 768@ 16bpp colors
- LCD Interface: Up to 18-bit TFT LCD, (optional) DSTN LCD

I/O

- MIO: EIDE (Ultra DMA33) x 1, FDD x 1, RS-232/422/485 x 1, RS-232 x 3, Parallel Port x 1,
- IR interface: One IrDA Tx/Rx header
- Audio: AD1819B AC-97 CODEC MIC-in / Line-in / Line-out / CD-in
- USB: One 5x2 pin header supports 2 USB ports

Chapter

2

Quick Installation Guide

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.

Part No. 2007460I10 Printed in Taiwan August 2003

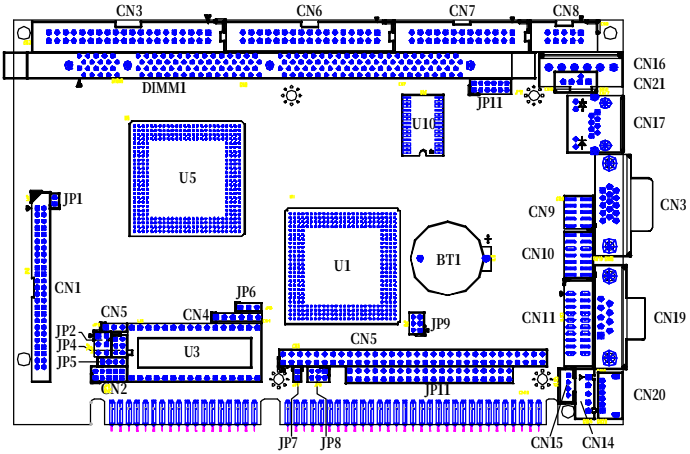
2.1 Safety Precautions

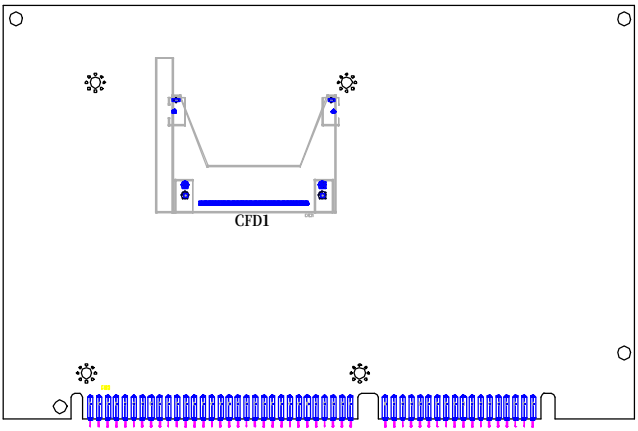
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. 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

2.2 Location of Connectors and Jumpers

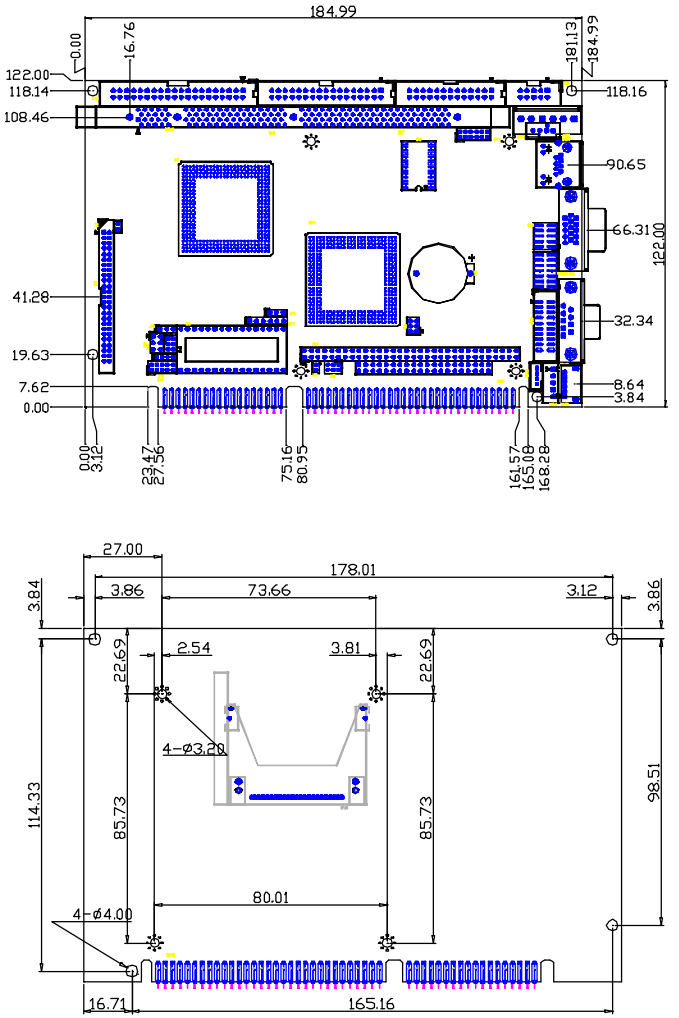
Locating connectors and jumpers





2.3 Mechanical Drawing

Mechanical drawing



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP2	LCD Panel Voltage Select and Backlight Voltage Select
JP3	LCD Panel Clock select
JP5	Speaker and Buzzer Controller
JP6	Clear CMOS
JP8 / JP11	RS-232/422/485 Selection
JP9	DiskOnChip® Address select

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each of the board's connectors:

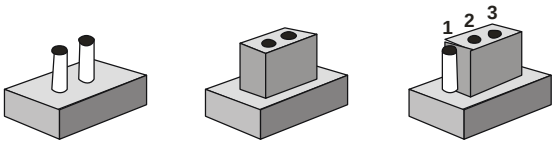
Connectors

Label	Function
CN1	LCD Panel Connector
CN2	Digital I/O
CN3	IDE(ATA33) Connector
CN4	IR Connector
CN5	PC/104 Connector
CN6	Floppy Connector
CN7	Parallel Port Connector
CN8	COM2 RS-232/422/485 Serial Port Connector
CN9	USB Connector
CN10	Audio Connector
CN11	COM3 and COM4 RS-232 Serial Port Connector
CN14	Internal Keyboard Connector
CN15	Internal Mouse Connector
CN16	AT Power Connector
CN17	10/100Base-T Ethernet Connector
CN18	CRT Connector
CN19	COM1 RS-232 Serial Port Connector
CN20	PS/2 Keyboard/Mouse Connector
CN21	4Pin wafer power connector
DIMM1	DIMM Socket
JP1	Backlight power
JP7	Reset Switch
CFD1	CompactFlash™ Slot
U3	DiskOnChip® Socket

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. 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" a jumper you connect the pins with the clip.

To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 LCD Panel Voltage Select and Backlight Voltage Select (JP2)

You can select the LCD voltage situation by setting JP2. The following chart shows the available options.

JP2	Function
1-3	LCD Panel Voltage Select 5V
3-5	LCD Panel Voltage Select 3.3V (Default)
2-4	Backlight Voltage Select (BLKVCC) 5V (Default)
4-6	-

2.8 LCD Panel Clock Select (JP3)

You can select the LCD clock situation by setting JP3. The following chart shows the available options.

JP3	Function
1-2	LCD Panel Clock normal (Default)
2-3	LCD Panel Clock invert

2.9 Speaker and Buzzer Controller (JP5)

You can close pin 3-4 to enable onboard buzzer or connect a speaker cable on pin-1, 2, 3, 4 to use external speaker instead.

JP5	Function
3-4	Onboard Buzzer (Default)
Speaker Cable on 1234	External Speaker

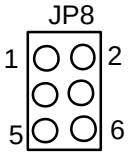
2.10 Clear CMOS (JP6)

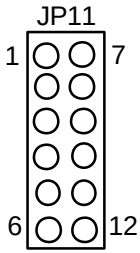
Warning:
To avoid damaging the computer, always turn off the power supply before setting " Clear CMOS." Before turning on the power supply, set the jumper back to "Normal."

JP6	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.11 RS-232/422/485 Selection (JP8 & JP11)

The COM2 port can be selected as RS-232, RS-422 or RS-485 by setting both JP8 and JP11. The following chart shows the jumper setting.





JP11	JP8	Function
1-2, 4-5, 7-8, 10-11	1-2	RS-232 (Default)
2-3, 5-6, 8-9, 11-12	3-4	RS422
2-3, 8-9	5-6	RS-485

2.12 DiskOnChipÒ Address Select (JP9)

1-2	3-4	5-6	DOC Address
-	Off	Off	D400
-	On	Off	D800
-	Off	On	DC00
-	On	On	Disable (Default)

2.13 LCD Panel Connector (CN1)

CN10 is a 20pin dual in-line header used for flat panel displays. Configuration of the VGA interface is done completely via BIOS. You do not have to set any jumpers. The following tables contain different pin definitions for various product versions.

Single TFT 18bit (with CS5330 or CS9211 onboard)

Pin	Signal	Pin	Signal
1	BLKVCC	2	BLKVCC
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9		10	
11	B0	12	B1
13	B2	14	B3
15	B4	16	B5
17		18	
19	G0	20	G1
21	G2	22	G3
23	G4	24	G5
25		26	
27	R0	28	R1

29	R2	30	R3
31	R4	32	R5
33		34	
35	FPCLK	36	VSYNC
37	DE	38	HSYNC
39	GND	40	ENABKL
41		42	
43		44	
45		46	
47		48	
49		50	

Single DSTN 24bit (with CS9211 onboard)

Pin	Signal	Pin	Signal
1	BLKVCC	2	BLKVCC
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9		10	
11	UD11	12	UD6
13	UD7	14	UD8
15	UD3	16	UD4
17	UD9	18	UD10
19	UD1	20	UD2
21	LD9	22	LD10
23	LD11	24	LD6
25	UD5	26	UD0
27	LD3	28	LD4
29	LD5	30	LD0
31	LD1	32	LD2
33	LD7	34	LD8

35	FPCLK/CL2	36	FLM
37		38	LP/CL1
39	GND	40	DISPOFF
41		42	
43		44	
45		46	
47		48	
49		50	

Single DSTN 16bit (with CS9211 onboard)

Pin	Signal	Pin	Signal
1	BLKVCC	2	BLKVCC
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9		10	
11		12	
13	UD0	14	UD1
15	UD2	16	UD3
17		18	
19	UD4	20	UD5
21	UD6	22	UD7
23	LD0	24	LD1
25		26	
27	LD2	28	LD3
29	LD4	30	LD5
31	LD6	32	LD7
33		34	
35	FPCLK/CL2	36	FLM
37		38	LP/CL1
39	GND	40	DISPOFF

41		42	
43		44	
45		46	
47		48	
49		50	

Single STN 8bit (with CS9211 onboard)

Pin	Signal	Pin	Signal
1	BLKVCC	2	BLKVCC
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9		10	
11		12	
13	D0	14	D1
15	D2	16	D3
17		18	
19	D4	20	D5
21	D6	22	D7
23		24	
25		26	
27		28	
29		30	
31		32	
33		34	
35	FPCLK/CP	36	FLM/FRM
37		38	LP/LOAD
39	GND	40	DISPON
41		42	
43		44	
45		46	

47		48	
49		50	

Single DSTN 8bit NOMO (with CS9211 onboard)

Pin	Signal	Pin	Signal
1	BLKVCC	2	BLKVCC
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9		10	
11	UD2	12	UD3
13		14	
15		16	
17	UD0	18	UD1
19	LD2	20	LD3
21		22	
23		24	
25	LD0	26	LD1
27		28	
29		30	
31		32	
33		34	
35	FPCLK/CP	36	FLM/FRM
37		38	LP/LOAD
39	GND	40	
41		42	
43		44	
45		46	
47		48	
49		50	

2.14 Digital I/O (CN2)

HSB-460I offers 4 digital inputs and 4 digital outputs. The high and low signals are received by the input connector to the computer. Then the computer sends out the signals via the output connector.

Pin	Signal	Pin	Signal
1	IN1	2	IN2
3	IN3	4	IN4
5	OUT1	6	OUT2
7	OUT3	8	OUT4
9	+5V	10	GND

2.15 IDE (ATA33) Connector (CN3)

You can attach one or two Integrated Device Electronics hard disk drives to the HSB-460I internal controller. The HSB-460I IDE controller uses a PCI local-bus interface. This advanced interface supports faster data transfer.

Connecting the hard drive

Connecting drives is done in a daisy-chain fashion requires one of two cables, depending on the drive size.

Wire number 1 on the cable is normally red or blue, and the other wires are usually gray.

1. Connect one end of the cable to CN3, and make sure the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).

2. Plug the other end of the cable to the IDE hard drive, with pin 1 on the hard drives. (Please see your hard drive's documentation for the documentation for the location of the connector.)

Connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the

master and the other as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N.C
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	GND
29	DACK	30	GND
31	INTR	32	N.C
33	ADDR1	34	N.C
35	ADDR0	36	ADDR2
37	CS#0	38	CS#1
39	N.C	40	GND

2.16 IR Connector (CN4)

The IR connector can be configured to support wireless infrared module. Install infrared module onto IR connector and enable infrared function from BIOS setup. Make sure to have correct orientation when you plug onto IR connector.

Pin	Signal
1	+5V
2	IRRXH
3	IRRX
4	GND
5	IRTX
6	CIRRX

2.17 PC/104 Connector (CN5)

JD/P2		
Pin	D	C
1	GND	GND
2	MEMCS16*	SBHE*
3	IOCS16*	LA23
4	IRQ10	LA22
5	IRQ11	LA21
6	IRQ12	LA20
7	IRQ15	LA19
8	IRQ14	LA18
9	DACK0*	LA17
10	DRQ0	MEMR*
11	DACK5*	MEMW*
12	DRQ5	SD8
13	DACK6*	SD9
14	DRQ6	SD10
15	DACK7*	SD11
16	DRQ7	SD12
17	+5V	SD13
18	MASTER*	SD14
19	GND	SD15
20	GND	ONDKEY

JU/P1		
Pin	A	B
1	IOCHCK*	GND
2	D7	RSTDRV
3	D6	+5V
4	D5	IRQ9
5	D4	-5V
6	D3	DRQ2
7	D2	-12V
8	D1	ENDXFR*
9	D0	+12V
10	IOCHRDY	GND/KEY
11	AEN	SMEMW*
12	A19	SMEMR*
13	A18	IOW*
14	A17	IOR*
15	A16	DACK3*
16	A15	DRQ3
17	A14	DACK1*
18	A13	DRQ1
19	A12	REFRESH*
20	A11	SYSCLK
21	A10	IRQ7
22	A9	IRQ6
23	A8	IRQ5
24	A7	IRQ4
25	A6	IRQ3
26	A5	DACK2*
27	A4	TC
28	A3	BALE
29	A2	+5V
30	A1	OSC
31	A0	GND
32	GND	GND

2.18 Floppy Connector (CN6)

With support of different types of floppy, you can simply adopt any of the combinations of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB, and 2.88 MB) drives onto the mainboard.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives). Wire number 1 on the cable is normally red or blue, and the other wires are usually gray.

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN6. Make sure that the red or blue wire corresponds to pin 1 on the connector.

2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to A: drive. The set in the middle connects to B: drive.

3. If you are connecting a 5.25" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

When connecting a 3.5" floppy drive, you may have trouble determining which pin is pin number 1. Look for a number printed on the circuit board indicating pin number 1. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number 1 should be on the right.
Check the documentation that came with the drive for more information.

Pin	Signal	Pin	Signal
1	GND	2	REDWC
3	GND	4	N.C.
5	GND	6	DS1
7	GND	8	INDEX
9	GND	10	MOTOR A
11	GND	12	DRIVE SELECT B
13	GND	14	DRIVE SELECT A
15	GND	16	MOTOR B
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK0
27	GND	28	WRITE PROTECT
29	GND	30	READ DATA
31	GND	32	SIDE1
33	GND	34	DISK CHANGE

2.19 Parallel Port Connector (CN7)

Normally, the parallel port is used to connect the board to a printer. The mainboard includes a 26-pin flat-cable connector. You need an adapter cable if 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.

Pin	Signal	Pin	Signal
1	STROBE	2	AFD
3	PTD0	4	ERROR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	NC

2.20 COM2 RS-232/422/485 Serial Port Connector (CN8)

Different devices implement the RS-232/422/485 standard in different ways. If you have problems with a serial device, be sure to check the pin assignments below for the connector.

Pin	Signal	Pin	Signal
1	DCD / 485TX-	2	DSR
3	RXD / 422RX+	4	RTS
5	TXD / 485TX+	6	CTS
7	DTR / 422RX-	8	RI
9	GND	10	N.C.

2.21 USB Connector (CN9)

The USB interfaces are accessed through one 10-pin flat-cable connector, CN9. The adapter cable has a 10-pin connector on one end and two USB connectors on the bracket on the other end. The USB interfaces can be disabled in the system BIOS setup.

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD0-	4	GND
5	USBD0+	6	USBD1+
7	GND	8	USBD1-
9	GND	10	+5V

2.22 Audio Connector (CN10)

The HSB-460I provides all major audio signals on a 50-pin flat-cable connector, CN10. Attach the Mic In, Line In, CD In, and Line Out to the corresponding pins as shown in the following table.

Pin	Signal	Pin	Signal
1	MIC_IN	2	MIC_VCC
3	GND	4	CD_GND
5	LIN_L	6	CD_LEFT
7	LIN_R	8	CD_GND
9	GND	10	CD_RIGHT
11	LOUT_L	12	LOUT_R
13	GND	14	GND

2.23 COM3 and COM4 RS-232 Serial Port Connector (CN11)

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 below for the connector.

Pin	Signal	Pin	Signal
1	DCDD	2	RXDD
3	TXD	4	DTRD
5	GND	6	DSRD
7	RTSD	8	CTSD
9	RID	10	N.C.
11	DCDC	12	RXC
13	TXC	14	DTRC
15	GND	16	DSRC
17	RTSC	18	CTSC
19	RIC	20	N.C.

2.24 Internal Keyboard Connector (CN14)

Pin	Signal
1	KB_CLK
2	KB_DATA
3	N.C.
4	GND
5	+5V

2.25 Internal Mouse Connector (CN15)

Pin	Signal
1	MS_CLK
2	MS-DATA
3	GND
4	+5V

2.26 AT Power Connector (CN16) / 4Pin wafer power connector (CN21)

CN16 and CN21 are located on the same position. HSB-460I is able to work under +5V operation, hence +12V power supply is not essentially needed.

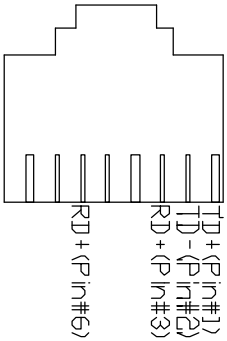
CN16	
Pin	**Signal**
1	N.C.
2	+5V
3	+12V
4	-12V
5	GND
6	GND

CN21	
Pin	**Signal**
1	+5V
2	GND
3	GND
4	+12V

2.27 10/100Base-T Ethernet Connector (CN17)

This 10/100Base-T Ethernet connector is a standard RJ-45 connector. The onboard Realtek RTL8139DL Fast Ethernet controller supports 10Mb/s and 100 Mb/s N-way auto-negotiation operations.

Pin	Signal	Pin	Signal
1	TX+	2	TX-
3	RX+	4	Temp GND
5	Temp GND	6	RX-
7	Temp GND	8	Temp GND
9	N.C	10	N.C
11	Chassis GND	12	Chassis GND
13	ACT LED+	14	ACT LED-
15	LINK LED+	16	LINK LED-



2.28 CRT Connector (CN18)

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	N.C.
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N.C.	12	DDCSDA
13	HSYNC	14	VSYNC
15	DDCSCL	16	GND

2.29 COM1 RS-232 Serial Port Connector (CN19)

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 below for the connector.

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C.

2.30 PS/2 Keyboard/Mouse Connector (CN20)

Pin	Signal
1	MS_CLK
2	KB_CLK
3	+5V
4	GND
5	KB_DATA
6	MS-DATA

2.31 Backlight Power (JP1)

This 2-pin jumper is an external +5V power. It is used for panel backlight power supply.

Pin	Signal
1	BLKVCC
2	GND

2.32 Reset Switch (JP7)

You can connect an external switch to easily reset your computer.

Pin	Signal	Pin	Signal
1	GND	2	RESET

2.33 CompactFlash ä Slot (CFD1)

The HSB-460I is equipped with a CompactFlash™ slot on the solder side, which supports the IDE interface type II CompactFlash™ card. The slot itself is specially designed to prevent any incorrect installation of the CompactFlash™ card. When installing or removing the CompactFlash™ card, please make sure that the system power is off.

Pin	Signal	Pin	Signal
1	GND	26	GND
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#0	32	SDCS#1
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	+5 V
12	GND	37	INTR
13	+5 V	38	+5 V
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	SEC_IDERST#
17	GND	42	SIORDY

18	SDA2	43	N/C
19	SDA1	44	+5 V
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/C	49	SDD10
25	GND	50	GND

Chapter

3

Award BIOS Setup

3.1 System test and initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

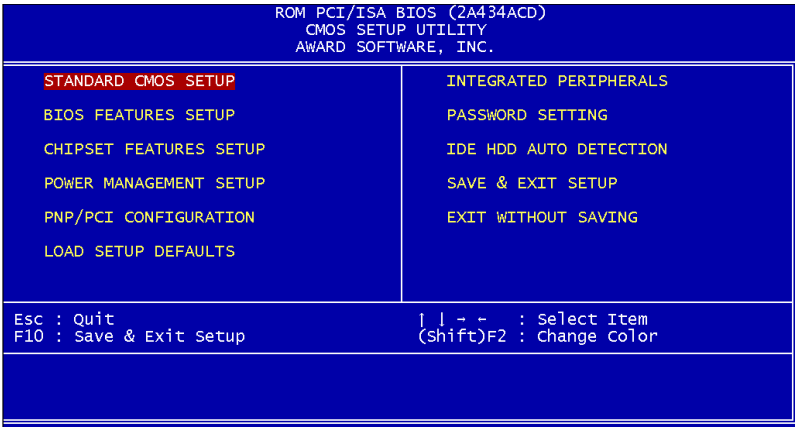
The HSB-460I CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS setup

Awards 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 CMOS RAM so that it retains the Setup information when the power is turned off.

Entering setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.



Standard CMOS Setup

Use this menu for basic system configuration. (Date, time, IDE, etc.)

BIOS Features Setup

Use this menu to set the BIOS features available on your system.

Chipset Features Setup

Use this menu to change the values in the chipset registers and optimize your system performance.

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

Load Setup Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave etc.)

Password Setting

Use this menu to set Passwords.

IDE HDD Auto Detection

Automatically detect and configure IDE hard disk parameters.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

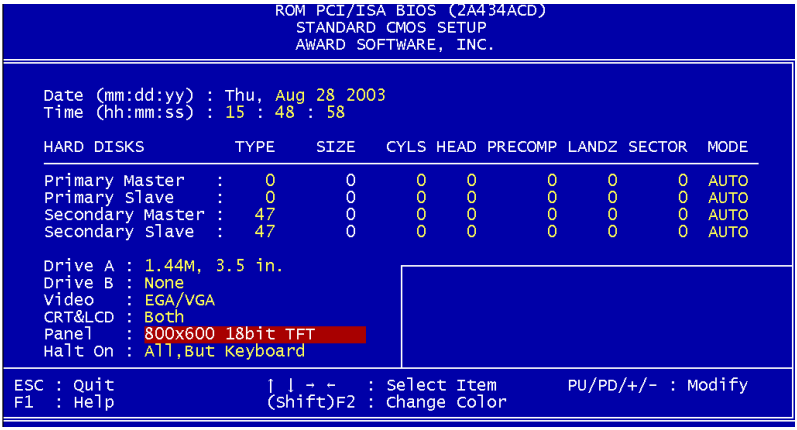
3.3 Standard CMOS Setup

When you choose the Standard CMOS Setup option from the INITIAL SETUP SCREEN menu**,** the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display.

➢ Please note:

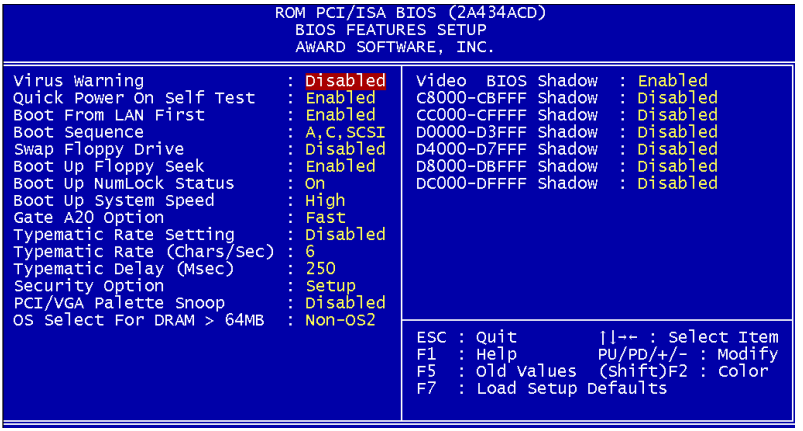
With CS9211 onboard, the **Panel** options include:
800x600 18bit TFT
640x480 8bit STN
1024x768 18bit TFT
640x480 16bit DSTN
640x480 18bit TFT
1024x768 24bit DSTN
640x480 8bit mono DSTN
800x600 16bit DSTN

Without CS9211 onboard, the **Panel** options include:
640x480 TFT
800x600 TFT
1024x768 TFT



3.4 BIOS Features Setup

By choosing the BIOS Features Setup option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



3.5 Chipset Features Setup

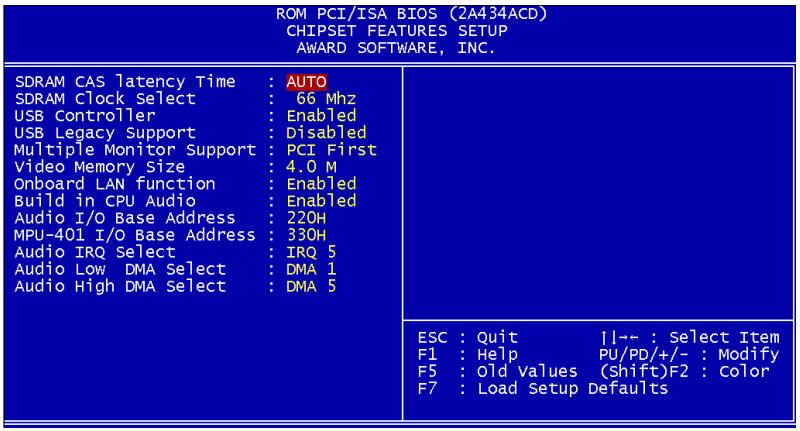
By choosing the Chipset Features Setup option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

➢ SDRAM Clock Select:

Please note when 100MHz working frequency is selected, the DIMM slot supports only the module composition of 4 chips single in-line (1 Chip Select) or 8 chips dual in-line (2 Chip Select).

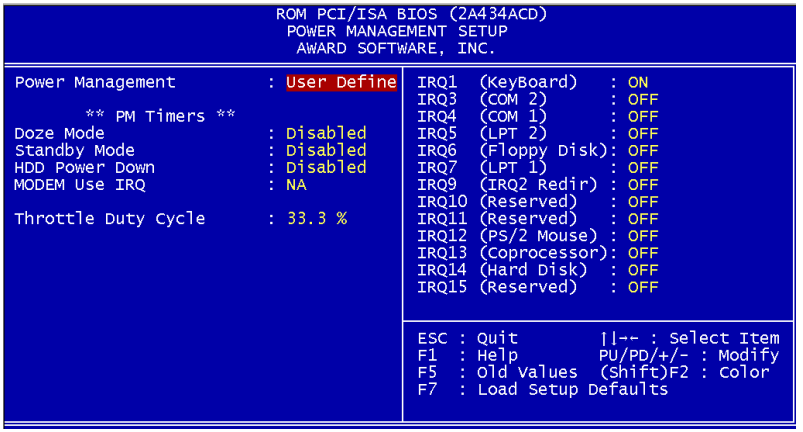
➢ Please note without AD1819B onboard, the following options will be hidden at the left bottom of screen:

Build in CPU Audio
Audio I/O Base Address
MPU-401 I/O Base Address
Audio IRQ Select
Audio Low DMA Select
Audio High DMA Select



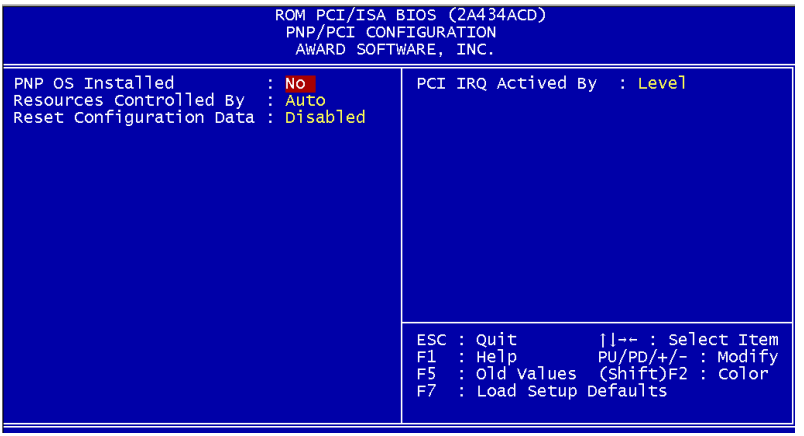
3.6 Power Management Setup

By choosing the Power Management Setup from the INITIAL SETUP SCREEN menu, the screen below is displayed.



3.7 PnP/PCI Configurations

By choosing the PnP/PCI Configurations from the INITIAL SETUP SCREEN menu, the screen below is displayed.



3.8 Load Setup Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Setup Defaults (Y/N)?

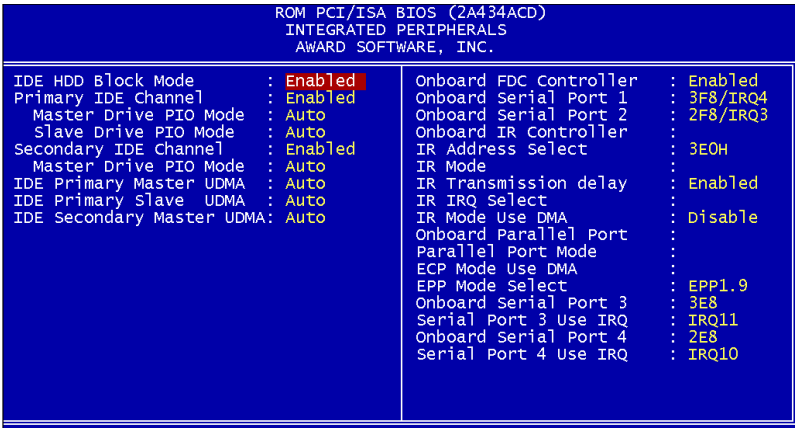
Pressing "Y" loads the default values that are manufacturer's settings for optimal performance system operations.

3.9 Integrated Peripherals

By choosing the Integrated Peripherals from the INITIAL SETUP SCREEN menu, the screen below is displayed.

➢ Please note without SMC667 onboard, the following options will be hidden at the right bottom of screen:

Onboard Serial Port 3
Serial Port 3 Use IRQ
Onboard Serial Port 4
Serial Port 4 Use IRQ



3.10 Password Setting

By choosing the Password Setting from the INITIAL SETUP SCREEN menu, you will be asked to key in the password. Next time, you will be asked for password to enter.

To clear the password protection, choosing the Password Setting and when asked to key in the password, click Enter. Then, the password function will be disabled.

To abort the process at any time, press Esc.

3.11 IDE HDD Auto Detection

The IDE HDD Auto Detection automatically detects the IDE hard disks installed in your computer. You can use this function to self-detect and/or correct the hard disk type configuration. You will have to repeat the setup for each combination.

3.12 Save & Exit Setup

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

3.13 Exit Without Saving

Selecting this option and pressing <Enter> allows you to exit the Setup program without recording any new value or changing old one.

Chapter

4

Driver Installation

4.1 Installation:

Applicable for Windows 98SE / ME

1. Insert the HSB-460I CD-ROM into the CD-ROM Drive.
2. From the CD-ROM, select the **System Driver** folder, and then select the desired Operation System folder to double click on the **National Geode Win9x Drivers 1.2.exe** icon. A driver installation screen will appear.
3. A driver installation screen will appear, please follow the onscreen instructions to install the driver in sequence and click on the Next button.
4. Click on the **Finish** button to finish installation process. And allow the system to reboot.
5. To install the LAN Driver, click on **Start** button, select the **Settings**, and then click on the **Control Panel** icon.
6. Double click on the **Add/Remove Hardware** icon and **Add New Hardware Wizard** will appear. Click on the **Next** button.
7. Select **Search for the best driver for your device (Recommended)** and click on the **Next** button.
8. Select **Specify a location,** click on **Have Disk** button then key in the CD-ROM path and specify component drivers and OS folders. Then click on the **Next** button.
9. The Wizard shows that Windows driver file search for the device. Click on the **Next** button.
10. The system will ask you to insert Windows 98 CD ROM. Click on the **OK** button to insert CD-ROM and key in path.
11. Click on the **OK** button.
12. Click on the **Finish** button to finish installation process. And allow the system to reboot.

Appendix

A

Programming the Watchdog Timer

A.1 Watchdog timer of HSB-460I

The watchdog timer of HSB-460I is located on the chipset –Winbond W83977F. It uses an 8-bit counter. The time range is from 15 second / minute to 7635 seconds / minutes with 255 level. When timer times out, a system reset will happen.

A.2 Configuration register

To utilize watchdog timer function, you have to know how to read/write the configuration register of W83977F. The basic procedure is as follows.

Enter the extended function mode.

Configure the configuration registers.

Exit the extended function mode.

To Enter/Exit the configuration mode is to write a specific value to configuration port – 370h.

Enter configuration mode: write value 87h to configuration port twice.

Exit configuration mode: write value aah to configuration port.

Example

```
;--------------------------------------------------------------------------
;enter the extended function mode, interruptible double-write
;--------------------------------------------------------------------------
        mov     dx, 370h
        mov     al, 87h
        out     dx, al
```

```
        out     dx, al
;-------------------------------------------------------------------------
;configurate logical device 1, configuration register CRF0
;-------------------------------------------------------------------------
        mov     dx, 370h
        mov     al, 07h
        out     dx, al          ;point to logical device number register
        mov     dx, 371h
        mov     al, 1
        out     dx, al          ;select logical device 1
        mov     dx, 370h
        mov     al, 0F0h
        out     dx, al          ;select CRF0
        mov     dx, 371h
        mov     al, 3ch
        out     dx, al          ;update CRF0 with value 3Ch
;-------------------------------------------------------------------------
;exit extended function mode
;-------------------------------------------------------------------------
        mov     dx, 370h
        mov     al, 0aah
        out     dx, al
```

A.3 How to set the watchdog timer

1. Set register 30h of logical device 7 to 1 to activate the timer.

2.Write the desired counter value to register F2h of logical device 8.

Logical Device 8 : Register number F2h (CRF2)

00h : Time-out Disable

01h : Time-out occurs after 15 seconds (1 level)

02h : Time-out occurs after 45 seconds (2 level)

03h : Time-out occurs after 75 seconds (3 level)

04h : Time-out occurs after 105 seconds (4 level)

.....

FFh : Time-out occurs after 7635 seconds (255 level)

Example

Following is an example of programming 15 sec period for watchdog timer in assembly language. When timer times out, it will generate signal of system reset.

```
mov     cl, 7           ;set index 7 for logic device register
mov     al, 7           ;set logic device 7
call    set_977
mov     cl, 0f2h        ;write to watch dog timer
mov     al, 1           ;set time out value 1 (1 level)
call    set_977
```

```
;-----------------------------------
;Input   : CL - register index
;Output : AL - value read
;-----------------------------------
```

```
get_977:
        mov     dx, 370h
        mov     al, cl
        out     dx, al
        delay
        inc     dx
        in      al, dx
        delay
        ret
;-----------------------------------
;Input   : CL - register index
;Output : AL - value to write
;-----------------------------------
set_977:
        push    ax
        mov     dx, 370h
        mov     al, cl
        out     dx, al
        delay
        pop     ax
        inc     dx
        out     dx, al
        delay
        ret
```