HS-3000

Half 386SX Single Board

User Manual edition 1.5, Aug.24 2001

CONTENTS

Chapter-1

General Information

The HS-3000 features an ALI M6117 chipset, and two 72 pin SIMM modules. It allows up to 64 MB RAM and can run at 40 MHz with a single-sided memory module. The HS-3000/4M provides 4MB system RAM on board.

The HS-3000 can support either a LCD flat panel or VGA equipped monitor, with a Intel® 65545 chipset carrying 1 MB memory support dual driver as well as support STN, TFT, or many others with a VGA resolution up to 1024 by 768, at 256 colors.

The two super I/O chips support three RS-232 serial ports and one selectable RS-232/422/485 port.

The parallel port includes the support for SPP/EPP/ECP and a bi-directional floppy driver controller.

The HS-3000 can option a DiskOnChip? device with socket supporting memory up to 144MB. That means you can issue the commands directly from DOS without any other drivers or applications.

Thanks to the HS-3000 Watchdog, a hardware device operating on an independent system, the system will reset again whenever the operations are halted.

1.1 Specifications

The HS-3000 Industrial Single Board provides the following specification:

- **CPU** : 386SX-40 (Embedded in M6117 chipset).
- **Bus interface** : ISA bus.
- **Chipset** : ALI M6117
- **Data bus** : 16-bit
- **Processing ability** : 32-bit
- **Flat panel / CRT SVGA controller** : Intel® 65545 Chipset with 1MB memory. Various support interface to color and monochrome Single Drive (SS) and Dual Drive (DD) STN, TFT panels. Supports CRT resolutions up to 1024x768 256 colors.
- **Enhanced IDE interface** : Supports up to two enhanced IDE hard disk, or LBA mode hard disks.
- **RAM memory** : Uses one 72-pin SIMM sockets (Single-sided memory module) and 4 MB RAM on board (HS-3000/4M only).
- **PC/104** : 104 pin connector for a 16 bit bus.
- **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** : Three RS-232 ports. One RS-232/422/485 Serial port. (compatible 16C550 UART with 16-byte FIFO).
- **BIOS** : AMI flash BIOS or AWARD flash BIOS (HS-3000/4M ver 2.3).
- **Watchdog timer** : The hardware circuit can be set to 1, 2, 10, 20, 110 or 220 seconds period. A reset or NMI will be generated when the CPU does 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 connector. Supports PS/2 standard mouse.
- **Flash memory disk** : Reserved socket for the "DiskOnChip? ". Supports up to 144MB Flash memory disk.
- **External power** : Supports a 4-PIN external power connector.
- **CMOS** : Real-time clock/calendar and battery backup by DS12887 or equivalent devices.
- **Power supply voltage** : +5V (4.75 to 5.25V) power supply.
- **Max. power requirement** : +5V @1.8A.
- **Operating temperature** : 0~55?C
- **Dimension** : 7.3" (L) x 4.8" (W) (185mm x 122mm)

1.2 Delivery Package

The HS-3000 package includes the following items:

- HS-3000 Single Board Computer
- Printer port Flat Cable
- IDE port Flat Cable
- FDD port Flat Cable
- COM port Cable
- 6-pin Mini-Din to 5-pin Din Keyboard Adapter Cable
- VGA Utility Diskette
- User' s Manual

If any of these items are missing or damaged please contact your dealer. Keep all the shipping materials and the packing box in case of you want to ship or store the product in feature.

Chapter-2

Hardware Installation

This chapter describes how to install the HS-3000. At first, please follow the unpacking information. The jumpers and switches setting, watchdog timer setting, and the DiskOnChip? address selection, are also included.

2.1 Caution of Static Electricity

Your HS-3000 Industrial Single Board contains very sensitive electronic components that can be easily damaged by the static electricity.

In this section, we describe the precautions that you should pay attention to while unpacking as well as during the installation. It is very important that the instructions to be followed correctly to avoid static damages and to successfully install the board.

The system board can be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

All inspecting the cardboard carton, extracting the system board and handling may cause damages to your board. Be sure that there are no shipping and handling damages on the board before processing.

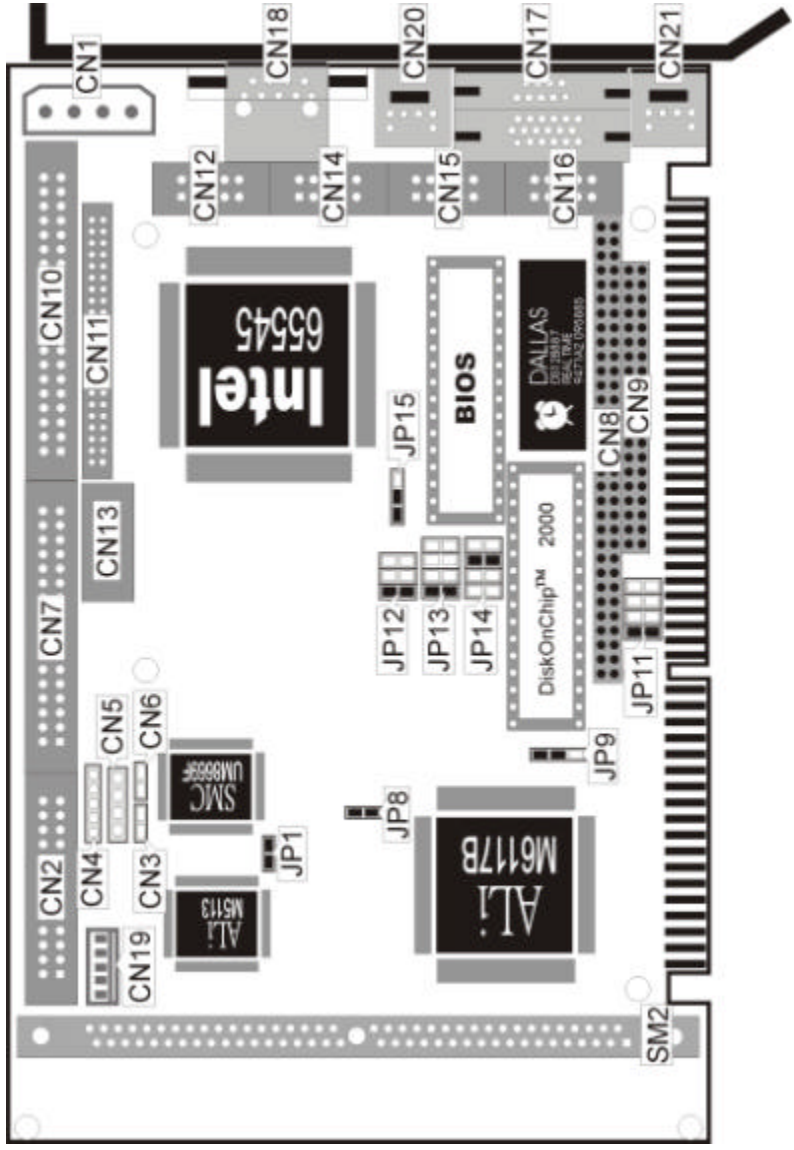
After opening the cardboard carton, extract the system board and place it only on a grounded anti-static surface component with the side up.

Again, inspect the board for damages. Press down on all the socketed IC' s to make sure they are properly seated. Do this only when the board is placed on a firm flat surface.

Note : DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your HS-3000 Industrial Single Board.

2.2 HS-3000's Layout



2.3 Quick Listing of Jumpers

CN1: EXTERNAL POWER CONNECTOR (big 4-pin)

CN2: PARALLEL PORT CONNECTOR

CN3: RESET SWITCH CONNECTOR

CN4: KEY LOCK

CN5: SPEAKER CONNECTOR

CN6: IDE LED CONNECTOR

CN7: FDD CONNECTOR

CN8: PC104-64 CONNECTOR

CN9: PC104-40 CONNECTOR

CN10: IDE CONNECTOR

CN11: LCD PANEL CONNECTOR

CN12: SERIAL 4 (RS422/485) CONNECTOR

CN14: SERIAL2 (RS232) CONNECTOR

CN15: SERIAL3 (RS232) CONNECTOR

CN16: SERIAL4 (RS232) CONNECTOR

CN17: COM1 (RS232) CONNECTOR

CN18: VGA CRT (HS-3000' s Layout

CN19: 5 PIN KEYBOARD CONNECTOR

CN20: PS/2 6-PIM MINI DIN MOUSE CONNECTOR

CN21: KEYBOARD CONNECTOR

2.4 Jumper Description

This board' s default jumpers are present at the factory. If you want to change the HS-3000' s configuration, please follow the instructions.

A jumper switch is **closed** (sometimes referred to as shorted with a plastic cap inserted over two pins of the jumper). A jumper is **open** with a plastic cap inserted over one or no pin(s) of the jumper. Figure 2.2 below shows different jumper settings which will be used in this chapter.

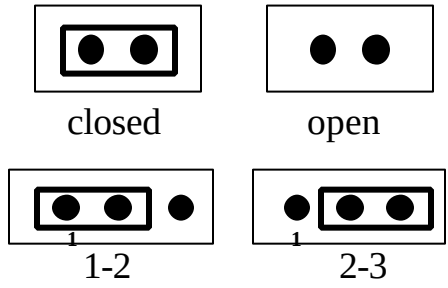


Figure 2.2

2.5 System Memory DRAM

TheHS-3000 are sold without any system memory or DiskOnChip? memory (except BIOS). The memory must be installed prior to using the HS-3000.

The HS-3000 has 2 SIMM (Single In-line Memory Module) DRAM module sockets. Each socket will accommodate a 72-pin DRAM module - 256K x 36 bit (1MB), 1M x 36 bit (4MB) or 4M x 36 bit (16MB). The memory access time should be 70ns or less. Install memory as appropriate at the locations SIMM1 - SIMM2. The HS-3000/4M hav 1 SIMM socket and 4 Mbytes on board.

✍ **Memory Type Configuration**

SM1	SM2	Total Memory
256K x 2	256K x 2	1 M Bytes
512K x 2		1 M Bytes
512K x 2	512K x 2	2 M Bytes
512K x 2	1M x 2	3 M Bytes
512K x 2	4M x 2	9 M Bytes
1M x 2		2 M Bytes
1M x 2	1M x 2	4 M Bytes
1M x 2	4M x 2	10 M Bytes
2M x 2		4 M Bytes
2M x 2	2M x 2	8 M Bytes
2M x 2	4M x 2	12 M Bytes
4M x 2		8 M Bytes
4M x 2	4M x 2	16 M Bytes
16M x 2	16M x 2	64 M Bytes

2.6 Watch-Dog Timer

The Watch-Dog Timer is enabled by reading the port 443H. It should be triggered before the time-out period ends; otherwise, it will assume that the program operation is abnormal and will either issue a reset signal to start again or activate a NMI to the CPU. The Watch-Dog Timer is disabled by reading the port 043H.

JP9 determines the watch-dog timer function. If can disable the watch-dog timer or connect the watch-dog timer to the reset trigger or NMI trigger.

JP9 : Watch-Dog Active Type Setting

JP9	DESCRIPTION
***1-2**	**System Reset**
2-3	Active NMI
OPEN	disable Watch-dog timer

*) : default setting

JP14 : WDT Time - Out Period

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

*) : default setting

When the power of the HS-3000 is turned on, the Watch-dog timer is disabled. The watch-dog timer can be enabled by reading the Watch-dog timer enable/refresh control port (443H) and disabled by reading the Watch-dog timer disable control port (43H). After the Watch-dog timer is enabled, the user must constantly refresh the Watch-dog timer by reading the Watch-dog timer enable/refresh port (443H) every 1, 2, 10, 20, 110 or 120 seconds. If the user fails to do so or the system hangs, the watch-dog timer will automatically reset the system or issue a NMI(Non-maskable interrupt).

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

443H	I/O Read	Enable/refresh the Watch -Dog Timer.
043H	I/O Read	Disable the Watch-Dog Timer.

The following programs are the examples of how to enable, disable and refresh the Watch-dog timer:

```
WDT_EN_RF       EQU     0443H
WDT_DIS         EQU     0043H

WT_Enable       PUSH    AX              ;save AX, DX
                PUSH    DX
                MOV     DX,WDT_EN_RF    ;enable the watch-dog timer
                IN      AL,DX
                POP     DX              ;reco AX, DX
                POP     AX
                RET

WT_Rresh        PUSH    AX              ;save AX, DX
                PUSH    DX
                MOV     DX,WDT_ET_RF    ;refresh the watch-dog timer
                IN      AL,DX
                POP     DX              ;reco 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              ;reco AX, DX
                POP     AX
                RET
```

2.7 VGA Controller

The HS-3000 is equipped with a VGA controller. It uses a Intel® 65545 ISA-bus VGA controller which supports up to 1280x1024 resolution. It also provide the flat panel I/F to support panels.

- Highly integrated design (Flat Panel/CRT VGA)
- Bus : ISA bus 16-bit
- Chipset: Intel® 65545
- Video Memory : two 256K x 16 DRAMs (1MB) and one 256K x 16 DRAM (512KB) used for improving the performance with color DSTN panels
- Supports panel resolutions up to 1280x1024 resolution
- True-color and Hi-color display capability with a flat panel and CRT monitors up to 640x480 resolution
- Direct interface to the Color and Monochrome Dual Drive and Single Drive Panels
- Fully Compatible with IBM VGA
- 40-pin flat panel connector

2.8 DiskOnChip? Address Setting

Install the DiskOnChip? in U9 socket.

JP11 determines the memory address of the DiskOnChip? .If you have another add-on card in the system with the same memory, neither the HS-3000 nor the add-on card will function normally. Please change the memory address.

✍ **JP11 : DiskOnChip? Address**

PIN NO.	Address
***1-2**	**D000**
3-4	D800
5-6	E000
7-8	E800

*) : default setting

2.9 FLASH ROM Type Selection

The JP15 provide in selection the type of Flash ROM type.

✍ **JP15 : Flash ROM type selection**

PIN NO.	Type
***1-2**	**29C010**
2-3	28F010

*) : default setting

2.10 Jumper Setting and Selection of RS-232/422/485

The HS-3000 provide you to select the board with CN16 RS-232 workable or CN12 RS/422/485. Please refer to the following jumpers setting for detail.

JP1	Selection
OPEN	RS-232
*CLOSE	RS-422/485

*) : default setting

JP12	RS-422/485 Receiver
*1-2	Always Enable
3-4	ON for Wring the REG.2EFh Bit1 = 1.
5-6	Always Disable

*) : default setting

JP13	RS-422/485 Transmitter
*1-2	Always Enable
3-4	Enable by -RTS4
5-6	ON for Wring the REG.2EFh Bit0 = 1.
7-8	Always Disable

*) : default setting

* JP13 7-8 is HS-3000/4M v2.4 above only.

Chapter-3

Connection

This chapter describes how to connect the peripherals, switches and indicators to the HS-3000 board.

3.1 Floppy Disk Drive Connector

HS-3000 board is equipped with a 34-pin daisy-chain driver connector cable.

CN7 : FDC 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

The HS-3000 has on-board IDE interface. It can be connected up to four IDE(Integrated Device Electronics) hard disk drives.

CN10(IDE 1) : Primary IDE Connector

CN10 : 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

The HS-3000 includes an on- board parallel port which accesses through a 26-pin flat-cable connector CN2.

CN2 : 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		

3.4 Serial Ports

The HS-3000 offers four high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports.

✍ **CN17 : 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)

✍ **CN14, 15, 16 : Serial Port 10-pin Header (COM2~COM4)**

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

✍ **CN12 : Serial 4 Connector (RS422/485)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTS-
7	RTS+	8	CTS+
9	CTS-	10	NC

3.5 Keyboard Connector

The HS-3000 provides two keyboard connectors.

CN19 : 5-pin Header Keyboard Connector

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

CN21 : 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 External Switches and Indicators

There are many external switches and indicators to monitor and control your CPU board.

✍ **CN4 : POWER LED & KEYLOCK**

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

✍ **CN3 : RESET BUTTON**

PIN NO.	DESCRIPTION
1	EXTERNAL RESET
2	GROUND

✍ **CN6 : IDE LED connector**

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

3.7 External Speaker

The HS-3000 has its own buzzer, and CN5 allows user to connect to the external speaker.

CN5 : Speaker Connector

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

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

The HS-3000 has a PS/2 mouse on board which uses IRQ12. If you do not use the PS/2 mouse and wish to assign IRQ12 for other purposes, you may change JP8 to disconnect PS/2 interrupt from IRQ12.

JP8	Display Type
OPEN	No interrupt for PS/2
*CLOSE	IRQ12

*) : default setting

CN20 : PS/2 Mouse Connector

PIN NO.	DESCRIPTION
1	MS DATA
2	NC
3	GROUND
4	+5V
5	KBT1
6	NC

3.9 VGA Connector

The HS-3000 has on-board 15-pin external VGA connector.

CN18 : 15-pin 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		

3.10 PC/104 Connection Bus

The HS-3000' s PC/104 expansion bus can let you connect any kinds of the PC/104 modules. The PC/104 bus has already become the industrial embedded PC standard bus, so you can easily install over thousands of PC/104 modules from hundreds of venders in the world. The detailed pin assignment of the PC/104 expansion bus connectors CN8 and CN9 are specified as following tables:

Note : The PC/104 connector allows to directly plug-in Stack-thru PC/104 modules without the PC/104 mounting kit.

CN8&CN9 : PC/104 Expansion Bus

(CN8 = 64-pin female connector; CN9 = 40-pin female connector.)

Pin No.	CN4 Row A	Pin No.	CN4 Row B
1	IOCHECK*	33	0V
2	SD7	34	RESETDRV
3	SD6	35	+5V
4	SD5	36	IRQ9
5	SD4	37	-5V
6	SD3	38	DRQ2
7	SD2	39	-12V
8	SD1	40	NOW*
9	SD0	41	+12V
10	IOCHRDY	42	(KEY)
11	AEN	43	SMEMW*
12	SA19	44	SMEMR*
13	SA18	45	IOW*
14	SA17	46	IOR*
15	SA16	47	DACK3*
16	SA15	48	DRQ3
17	SA14	49	DACK1*
18	SA13	50	DRQ1
19	SA12	51	REFRESH*
20	SA11	52	SYSCLK
21	SA10	53	IRQ7
22	SA9	54	IRQ6
23	SA8	55	IRQ5
24	SA7	56	IRQ4
25	SA6	57	IRQ3
26	SA5	58	DACK2*
27	SA4	59	TC
28	SA3	60	BALE
29	SA2	61	+5V
30	SA1	62	OSC
31	SA0	63	0V
32	0V	64	0V

Pin No.	CN5 Row D	Pin No.	CN5 Row C
1	0V	21	0V
2	MEMCS16*	22	SBHE*
3	IOSC16*	23	LA23
4	IRQ10	24	LA22
5	IRQ11	25	LA21
6	IRQ12	26	LA20
7	IRQ15	27	LA19
8	IRQ14	28	LA18
9	DACK0*	29	LA17
10	DRQ0	30	MEMR*
11	DACK5*	31	MEMW*
12	DRQ5	32	SD8
13	DACK6*	33	SD9
14	DRQ6	34	SD10
15	DACK7*	35	SD11
16	DRQ7	36	SD12
17	+5V	37	SD13
18	MASTER*	38	SD14
19	0V	39	SD15
20	0V	40	(KEY)

3.11 Flat-Panel Connector

The HS-3000 provides a 44-pin DIL box header connector (CN11) for the Flat panel.

+12V	1	2	+12V
GND	3	4	GND
PV_{CC}	5	6	PV_{CC}
FPVee	7	8	GND
P_0	9	10	P_1
P_2	11	12	P_3
P_4	13	14	P_5
P_6	15	16	P_7
P_8	17	18	P_9
P_{10}	19	20	P_{11}
P_{12}	21	22	P_{13}
P_{14}	23	24	P_{15}
P_{16}	25	26	P_{17}
P_{18}	27	28	P_{19}
P_{20}	29	30	P_{21}
P_{22}	31	32	P_{23}
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	ASHFCLK
V_{CC}		43	44 V_{CC}

Connections for four standard LCDs

Connections to Sharp LM64183P
(640 x 480 DSTN MONO LCD)

Sharp LM64P83		HS-3000 CN11	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	S	36	FLM
CN1-2	CP1	38	LP
CN1-3	CP2	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	VDD	6	+5V
CN1-6	VSS	3	GND
CN1-7	VEE	-	-17 V (external power)
CN1-8	DU0	12	P3
CN1-9	DU1	11	P2
CN1-10	DU2	10	P1
CN1-11	DU3	9	P0
CN1-12	DL0	16	P7
CN1-13	DL1	15	P6
CN1-14	DL2	14	P5
CN1-15	DL3	13	P4

Connections to Sharp LM64C35P

(640 x 480 DSTN Stn Color)

Sharp LM64C35P		HS-3000 CN11	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	DL4	16	P7
CN1-2	Vss	3	GND
CN1-3	DL5	15	P6
CN1-4	YD	36	FLM
CN1-5	DL6	14	P5
CN1-6	LP	38	LP
CN1-7	DL7	13	P4
CN1-8	Vss	4	GND
CN1-9	Vss	8	GND
CN1-10	XCK	35	SLFCHK
CN1-11	DL0	24	P15
CN1-12	Vcon	-	Contrast Adjust
CN1-13	DL1	23	P14
CN1-14	Vdd	5	+5V
CN1-15	Vss	33	GND
CN1-16	Vdd	6	+5V
CN1-17	DL2	22	P13
CN1-18	DISP	6	+5V
CN1-19	DL3	21	P12
CN1-20	NC	-	-
CN1-21	Vss	34	GND
CN1-22	DU3	17	P8
CN1-23	DU4	12	P3
CN1-24	DU2	18	P9
CN1-25	DU5	11	P2
CN1-26	DU1	19	P10
CN1-27	Vss	39	GND
CN1-28	DU0	20	P11
CN1-29	DU6	10	P1
CN1-30	Vss	39	GND
CN1-31	DU7	9	P0

Connections to NEC NL8060AC26

(800 x 600 TFT Color)

NEC NL8060AC26		HS-3000 CN11	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	GND	3	GND
CN1-2	Dot Clock	35	SHFCLK
CN1-3	GND	4	GND
CN1-4	Hsync	38	LP
CN1-5	Hsync	38	FLM
CN1-6	GND	8	GND
CN1-7	GND	8	GND
CN1-8	GND	8	GND
CN1-9	R0	27	P18
CN1-10	R1	28	P19
CN1-11	R2	29	P20
CN1-12	GND	8	GND
CN1-13	R3	30	P21
CN1-14	R4	31	P22
CN1-15	R5	32	P23
CN1-16	GND	39	GND
CN1-17	GND	39	GND
CN1-18	GND	39	GND
CN1-19	G0	19	P10
CN1-20	G1	20	P11
CN1-21	G2	21	P12
CN1-22	GND	39	GND
CN1-23	G3	22	P13
CN1-24	G4	23	P14
CN1-25	G5	24	P15
CN1-26	GND	41	GND
CN1-27	GND	41	GND
CN1-28	GND	41	GND
CN1-29	B0	11	P2
CN1-30	B1	12	P3
CN1-31	B2	13	P4
CN1-32	GND	41	GND
CN1-33	B3	14	P5

CN1-34	B4	15	P6
CN1-35	B5	16	P7
CN1-36	GND	41	GND
CN1-37	DE	37	M
CN1-38	PVcc	43	PVcc
CN1-39	PVcc	44	PVcc
CN1-40	PVcc	5	PVcc
CN1-41	MODE	-	---

Connections to Sharp LM64C142

(640 x 480 DSTN Stn Color)

Sharp LM64C142		HS-3000 CN11	
Pin	**Pin name**	**Pin**	**Pin name**
CN1-1	YD	36	FLM
CN1-2	LP	38	LP
CN1-3	XCX	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	PVdd	6	+5V
CN1-6	PVss	3	GND
CN1-7	PVee	-	+27 V (external power)
CN1-8	DU0	20	P11
CN1-9	DU1	19	P10
CN1-10	DU2	18	P9
CN1-11	DU3	17	P8
CN1-12	DU4	12	P3
CN1-13	DU5	11	P2
CN1-14	DU6	10	P1
CN1-15	DU7	9	P0
CN2-1	Vss	4	GND
CN2-2	DL0	24	P15
CN2-3	DL1	23	P14
CN2-4	DL2	22	P13
CN2-5	DL3	21	P12
CN2-6	DL4	16	P7
CN2-7	DL5	15	P6

CN2-8	DL6	14	P5
CN2-9	DL7	13	P4
CN2-10	Vss	8	GND

Chapter-4

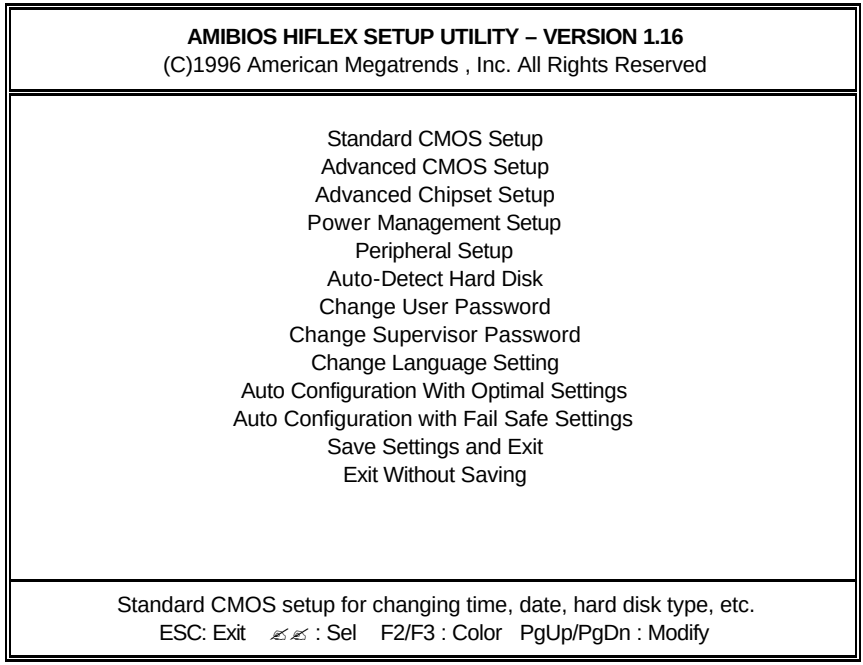
AMI BIOS Setup

The HS-3000 uses the AMI BIOS for the system configuration. The AMI 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 AMI BIOS Setup program, press <Del> key. The Main Menu will be displayed at this time.

4.1 Main Menu

Once you enter the AMI 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 accept and enter the sub-menu.



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 this 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.

AMIBIOS SETUP – STANDARD CMOS SETUP
(C)1996 American Megatrends , Inc. All Rights Reserved

Date (mm/dd/yyyy) : Wed Nov 10,1999 640 KB
Time (hh/mm/ss) : 08:41:50 3MB

Floppy Drive A : 1.44 MB 3 1/2
Floppy Drive B : Not installed

	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	BlK Mode	PIO Mode	32Bit Mode
Pri Master :	Auto									Off
Pri Slave :	Auto									

Boot Sector Virus Protection Disabled

Mouth : Jan -Dcc
Day : 01 -31
Year : 1902 -2099

ESC: Exit ✍✍ : Sel
PgUp/PgDn : Modify
F2/F3 : Color

4.3 Advanced CMOS Setup

This advanced setup is designed for the customers to achieve the highest performance of the HS-3000 board. As for normal operations, customers don t have to change any default settings. The default setting is pre-set for most reliable operations. Please refer to the following screen for the Advanced Setup.

This setup is mostly working for the Multi-I/O Chip (ALI M5113 or UM8669). These options are used to change the ChipSet' s registers. Please carefully change any default settings to meet your application requirements.

AMIBIOS SETUP – ADVANCED CMOS SETUP
(C)1996 American Megatrends , Inc. All Rights Reserved

1st Boot Device	IDE-0	Available Options :
2nd Boot Device	Floppy	Disabled
3rd Boot Device	ARMD-HDD	IDE-0
4th Boot Device	Disabled	IDE-1
Boot From Card BIOS	Yes	IDE-2
Try Other Boot Device	Yes	IDE-3
S.H.A.R.T. for Hard Disks	Disabled	Floppy
Quick Boot	Disabled	ARMD-FDD
BootUp Num-Lock	On	ARMD-HDD
Floppy Drive Swap	Disabled	RDROM
Floppy Drive Seek	Disabled	SCSI
Floppy Access Control	Normal	NETWORK
HDD Access Control	Normal	
PS/2 Mouse Support	Enabled	
System Keyboard	Present	
Primary Display	VGA/EGA	
Password Check	Setup	
System BIOS Cacheable	Disabled	
C000, 32K,Shadow	Enabled	
C800, 32K,Shadow	Disabled	
D000, 32K,Shadow	Disabled	
D800, 32K,Shadow	Disabled	ESC: Exit ↑↓ : Sel
E000, 32K,Shadow	Disabled	PgUp/PgDn : Modify
E800, 32K,Shadow	Disabled	F2/F3 : Color

Note: The default Flat Panel Display types currently are:

Default BIOS Panel Types

No	Resolution	Data	Panel Type
1	640x480	12bit Color TFT	NL6448AC30-10 (NEC)
2	640x480	18bit Color TFT	NL6448AC33-18 (NEC)
3	640x480	18bit Color TFT	LQ10D41(SHARP)
4	800x600	18bit Color TFT	NL8060AC26-11(NEC)
5	640x480	16 bit Dual-Scan Color STN	LM64C08P(SHARP)
6	640x480	8 bit Dual-Scan Monochrome STN	LM64P11(SHARP)
7	640x480	4 bit Plasma	PG640480RM16-3(OKI)
8	640x480	8 bit Dual-Scan EL	LJ64H052(SHARP)

Note: The DISPLAY MODE selects the type of display used for the primary system monitor.

LCD: Display Flat-Panel only

CRT: Display CRT monitor only

Both: Both display monitor and Flat-Panel.

Auto : Auto detect LCD or CRT

4.4 Advanced Chipset Setup

This setup functions are mostly working for the Chipset (ALI M6117B). These options are used to change the Chipset' s registers. Please carefully change any default settings, otherwise the system could be unstable.

AMIBIOS SETUP – ADVANCED CHIPSET SETUP
(C)1996 American Megatrends , Inc. All Rights Reserved

At Bus Clock	14.318/2
Slow Refresh	15 us
Memory Holo At 15-16 M	Disabled
RAS Precharge time	3.5T
RAS Active Time Insert Wait	Enabled
CAS Precharge Time Insert Wait	Enabled
Memory Write Insert Wait	Enabled
Memory Miss Read Insert Wait	Enabled
ISA Write cycle and Insert Wait	Enabled
I/O Recovery	Enabled
I/O Recovery Period	3.75 us
On-Chip I/O Recovery	Disabled
16Bit ISA Insert Wait	Enabled
******* Watch DOG Timer*********	
WatchDog Timer	Disabled
WDT Timeout Period Select	42 Sec
WatchDog Timeout Issue Signal	Reset

Available Options :
- 14.318/2
- PCLK2/3
- PCLK2/4
- PCLK2/5
- PCLK2/6
- PCLK2/8
- PCLK2/10
- PCLK2/12

ESC: Exit ↑↓ : Sel
PgUp/PgDn : Modify
F2/F3 : Color