HSB-813S

Intel® Pentium® / Celeron® M Processors

LVDS Output, Dual Display Support

Two DDR 266/333 SoDIMM Memory

Realtek ALC655 AC97 Codec

5 USB 2.0 / 2 COMs / 1 IrDA

HSB-813S Manual Rev.A 2nd Ed.

June 2008

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Packing List

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

- 1   HSB-813S CPU Card
- 1   Floppy Cable
- 1   ATA-100 Cable
- 1   USB Cable
- 1   Keyboard Cable
- 1   Serial + Parallel Cable
- 1   ATX Cable
- 1   Serial Cable
- 1   Two Serial Ports Cable
- 1   CPU Cooler Fan
- 1   Quick Installation Guide
- 1   CD-ROM for manual (in PDF format) and drivers

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

HSB-813S, powered by Intel Pentium M socket 479, PCISA half-size form factor SBC with an onboard VGA, 10/100/1000Mb LAN (optional), 5 USB 2.0 ports and supports LVDS.

The HSB-813S is a high performance, low power half size card with the Intel 82855GME chipset. This chipset supports CPU frequencies up to 1.8GHz with a front side bus running at 400MHz. In addition, HSB-813S supports dual display and AC97 Codec Audio for optional Audio daughterboard. The low height and low power consumption of the HSB-813S satisfies most industrial customer needs.

The HSB-813S also provides a high memory capacity up to 2GB DDR DRAM (DDR 333) and supports Ultra ATA100 & CompactFlash Type II storage. In addition to its powerful computing engine, one Mini PCI socket Type III provides flexible applications such as wireless LAN, Bluetooth…,etc.

5 USB 2.0 ports provide an expandable Plug and Play serial interface that ensure a standard low-cost connection for peripheral devices. Industrial applications will benefit the 5 USB 2.0 ports by 3 pin-headers on Type A connector, offering 480 Mbps high-speed efficiency and value without compromising performance.

Moreover, HSB-813S is also equipped with Intel Ethernet controllers. One of these provides superior 1Gb Mbps networking access capability for high-speed networking applications such as gateway, VPN and Mini server.

The target market of HSB-813S is embedded applications where full features and performance are major concerns. The release of the HSB-813S will complete AAEON's product line in Penitum 4 level half-size card series, providing customers with higher performance in a high quality product. HSB-813S is a versatile half-size CPU card and most cost-effective for CTI, networking and mini-server markets.

1.2 Features

- Supports Intel® Pentium M Socket 479 Processor
- Supports DDR333 Memory Up To 2GB
- Integrates AGP 4X 2D/3D Graphics Accelerator, LVDS Support
- Integrates AC97 Codec Audio (Daughter Board Optional)
- Supports Two 10/100/1000Base-TX Ethernet (10/100 & GbE Optional)
- Supports Ultra ATA100 & CompactFlash Type II Storage
- Supports Mini PCI Type III Socket
- 5 USB 2.0/ 1 RS-232 , 1 RS-232/422/485/ 1 Parallel/ 1 IrDA ports
- Watchdog Function 1~255 Steps (Sec./Min.)

1.3 Specifications

System

- CPU   Intel® Pentium® M/ Celeron® M (400/533MHz FSB) Socket 479 Processors
- System Memory   2 x 200-pin 2.5V DDR SODIMM Socket, support DDR memory (DDR 266/333) up to 2GB
- Chipset   Intel® 82855GME + Intel®82801DB (ICH4)
- Ethernet   Intel® 82562ET/ 82541PI Controllers, 10/100Mb or 10/100/1000Mb LAN optional, RJ-45 x 2
- BIOS   Award Plug & Play BIOS – 8Mb ROM
- Watchdog Timer   1~255 steps, can be set with software on Super I/O
- CompactFlash   Supports CFD Type II Connector
- Expansion Interface   PCISA Interface, Mini-PCI socket Type III Socket
- Battery   Lithium battery
- Power Requirement   Standard ATX Power Connector, ATX 12V, 5V/ 12V used only

Half-size SBC	HSB-813S

- Board Size 7.28"(L) x6.85" (W)
  (185mm x 174mm)
- Gross Weight 0.88lb (0.4kg)
- Operating Temperature 32°F~140°F(0°C~60°C)

Display

- VGA Controller Integrated on Intel$^®$ 82855GME,
  AGP 4X, dual display support
- LCD Controller Integrated on Intel$^®$ 82855GME,
  LVDS output, dual display
  support

I/O

- MIO ATA –100 x 2 channel (support
  four ATAPI devices);
  Two COM ports (Internal pin
  header),
  COM1: RS-232
  COM2: RS-232/422/485
  (Jumpless selection);
  One Mini-DIN PS/2 Keyboard +
  Mouse Connector, One internal
  keyboard pin header
- IrDA One IrDA Tx/Rx header
- Audio Realtek ALC655 AC97 Codec,

	(Daughter Board)	MIC-in/ Line-in/ Line-out/ CD-in
●	IDE interface	ATA-100 X 2 Channel (Support four ATAPI devices)
●	Floppy Driver Interface	One standard FDD port, supports one floppy device
●	Parallel Port	Supports SPP/EPP/ECP mode
●	USB	Five USB 2.0 Ports, Two 5x2 pin headers for internal, One Type-A connector onboard
●	RTC	Internal RTC
●	ISA	ISA Bridge ITE8888G
●	EMC	CE/FCC Class A

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.

OZONE SAFE

RECYCLABLE

2.1 Safety Precautions

Warning! *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.*

Caution! *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

Component Side

Solder Side

DIMM2

DIMM1

CFD1

USB3

LAN1

VGA1

LAN2

CN7
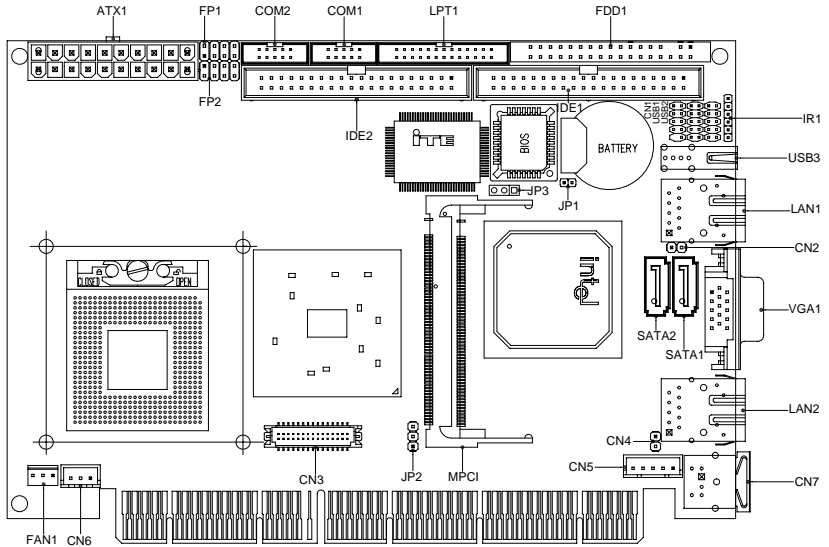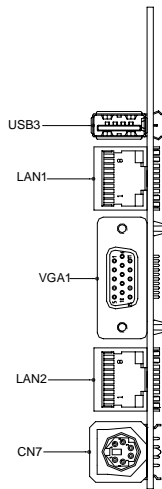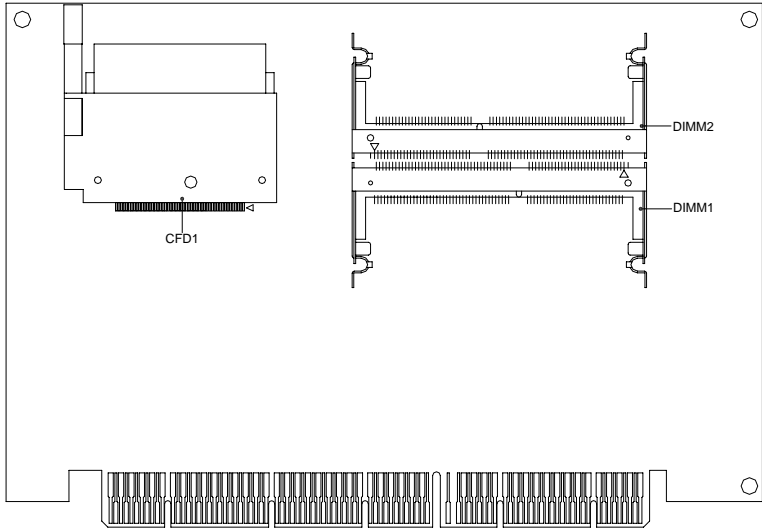
2.3 Mechanical Drawing

Component Side
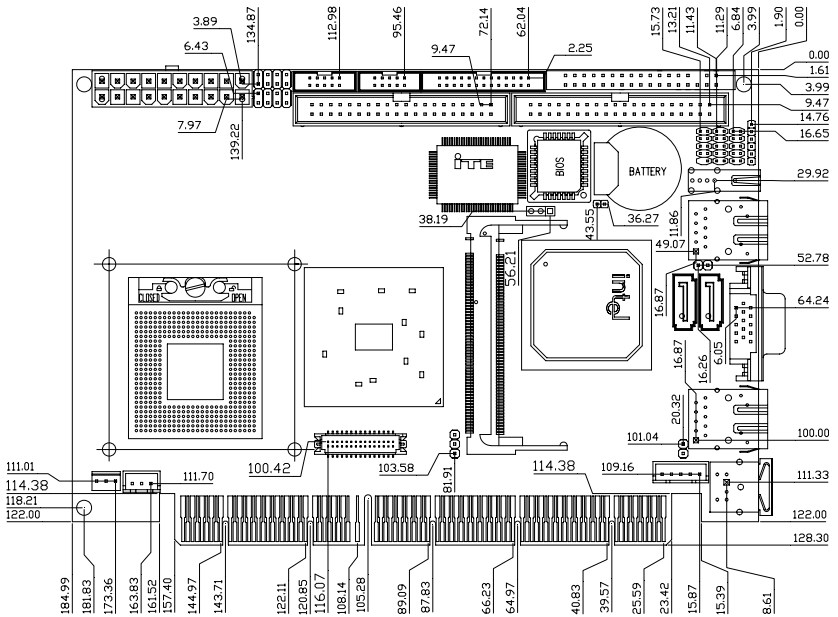
Solder Side
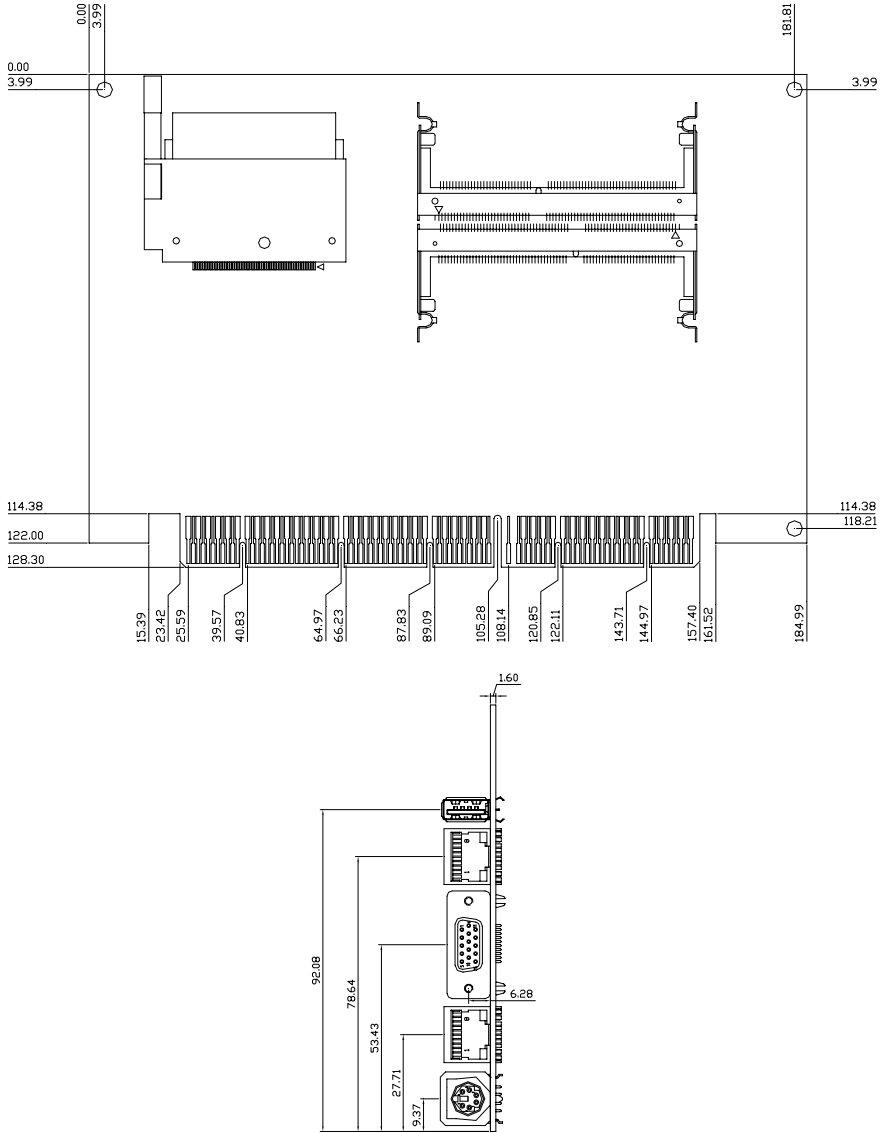
2.4 List of Jumpers

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
JP1	Clear CMOS
JP2	LCD Voltage Selection
JP3	CF Voltage Selection

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 board's connectors:

Connectors

Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
ATX1	ATX Power Connector
SATA1~2	Serial ATA Connector
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1~2	EIDE Connector
CFD1	Compact Flash Slot
COM1	RS-232 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
IR1	IrDA Connector
LPT1	LPT Port Connector
USB3	USB Connector
USB1~2	USB Connector
LAN1	10/100 Base-TX Ethernet Connector
LAN2	10/100 or 100/1000 Base-TX Ethernet Connector
MPCI1	Mini PCI Slot
DIMM1~2	DIMM Slot
FAN1	Fan Connector

CN6	ATX Power Control Connector
CN1	AC97 Connector
CN7	PS2 Keyboard/Mouse Connector
CN5	Internal Keyboard Connector
CN3	LVDS Channel Connector
CN2	LAN 1 Active LED Connector
CN4	LAN 2 Active LED Connector

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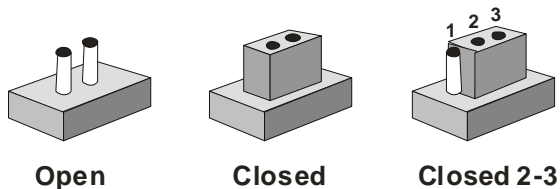
A pair of needle-nose pliers may be helpful when working with jumpers.

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 Clear CMOS (JP1)

JP1	Function
1-2	Clear
Open	Protected (Default)

2.8 LCD Voltage Selection (JP2)

LVDS-LCD	Function
1-2	+5V
2-3	+3.3V (Default)

2.9 CF Voltage Selection (JP3)

LVDS-LCD	Function
1-2	+3.3V
2-3	+5V (Default)

2.10 Front Panel Connector (FP1)

Pin	Signal	Pin	Signal
1	Power On Button(+)	2	Reset Switch(+)
3	Power On Button(-)	4	Reset Switch(-)
5	IDE LED(+)	6	Power LED(+)
7	IDE LED(-)	8	Power LED(-)

2.11 Front Panel Connector (FP2)

Pin	Signal	Pin	Signal
1	External Speaker(+)	2	KeyBoard Lock (+)
3	N.C.	4	GND
5	Internal Buzzer(-)	6	I2C Bus SMB Clock
7	External Speaker(-)	8	I2C Bus SMB Data

Note: Internal Buzzer enable : Close Pin 5,7

2.12 RS-232 Serial Port Connector (COM1)

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.

2.13 RS232/422/485 Serial Port Connector (COM2)

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

2.14 IrDA Connector (IR1)

Pin	Signal
1	+5V
2	N.C
3	IRRX
4	GND
5	IRTX
6	N.C

2.15 LPT Port Connector (LPT1)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR
5	DATA1	6	#INIT
7	DATA2	8	#SLIN
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	#ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	N.C

2.16 USB Connector (USB1,2)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+
7	GND	8	USBD2-
9	GND	10	+5V

2.17 FAN Connector (FAN1)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.18 ATX Power Control Connector (CN6)

Pin	Signal
1	PS-ON
2	+5V
3	5VSB

Note: AT Power Use: Close Pin 2,3

2.19 AC97 Connector (CN1)

Pin	Signal	Pin	Signal
1	AC RST-	2	AC SYNC
3	AC_DAIN2	4	AC_DAOUT
5	GND	6	AC_BCLK
7	GND	8	+5V
9	Lock	10	+3.3V

2.20 PS2 Keyboard/Mouse Connector (CN7)

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

5	KB_CLK
6	MS_CLK

2.21 Internal Keyboard Connector (CN5)

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

2.22 LAN1,LAN2 LED Connector (CN2,CN4)

Pin	Signals	Pin	Signal
1	Active (+)	2	Active (-)

2.23 LVDS Channel Connector (CN3)

Pin	Signal	Pin	Signal
1	BKLEN	2	BKLCTL
3	PPVCC	4	GND
5	CH1_CLK#	6	CH1_CLK
7	PPVCC	8	GND
9	CH1_TX0#	10	CH1_TX0
11	CH1_TX1#	12	CH1_TX1
13	CH1_TX2#	14	CH1_TX2
15	CH1_TX3#	16	CH1_TX3
17	I2C_DATA	18	I2C_CLK
19	CH2_TX0#	20	CH2_TX0
21	CH2_TX1#	22	CH2_TX1

Half-size SBC		HSB-813S	
23	CH2_TX2#	24	CH2_TX2
25	CH2_TX3#	26	CH2_TX3
27	PPVCC	28	GND
29	CH2_CLK#	30	CH2_CLK

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在
   SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出
   SJ/T 11363-2006 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

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-813S 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 Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

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

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.

PC Health Status

This menu allows you to set the shutdown temperature for your system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

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

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the "AAEON BIOS Item Description.pdf" file in the CD for the meaning of each setting in this chapter.

Chapter

4

Driver Installation

The HSB-813S comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Intel® INF Driver

Step 2 – Intel® VGA Driver

Step 3 – Intel® LAN Driver

Step 4 – S-ATA Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the HSB-813S CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 - Intel[®] INF Driver

1. Click on the *Step1.Intel[®] INF* folder and then double click on the *infinst_autol.exe*

2. Follow the instructions that the window shows

3. The system will help you to install the driver automatically

Step 2 - Intel[®] VGA Driver

1. Click on the *Step 2. Intel VGA Driver* folder and select the OS your system is

2. Double click on *Setup.exe* located in each OS folder

3. Follow the instructions that the window shows

4. The system will help you to install the driver automatically

Step 3 - Intel[®] LAN Driver

1. Click on the *Intel LAN Driver* folder and then click on the *Intel PRO Network Connections Ver 10.0* folder

2. Double click on *Autorun.exe*

3. Follow the instructions that the window shows

4. The system will help you to install the driver automatically

Step 4 - S-ATA Driver

Place the Driver CD-ROM into your CD-ROM drive and pull up

the CD-ROM file on your screen.

1. Click on **Start** button

2. Click on **Settings** button

3. Click on **Control Panel** button

4. Click on **System** button

5. Select **Hardware** and click on **Device Manager…**

6. Double click on **SCSI and RAID Controller**

7. Click on **Update Driver…**

8. Click on **Next**

9. Select **Search for a suitable driver…**, then click on **Next**

10. Select **Specify a location**, then click on **Next**

11. Click on **Browse**

12. Select "**silicon Image Sil3512 SATALink Controller"** file from CD-ROM **(Driver/Step 4.S-ATA Driver)** then click on **Open**

13. Click on **OK**

14. Click on **Next**

15. Click on **Yes**

16. Click on **Finish**

Appendix

A

Programming the Watchdog Timer

A.1 Programming

HSB-813S utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON intial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.
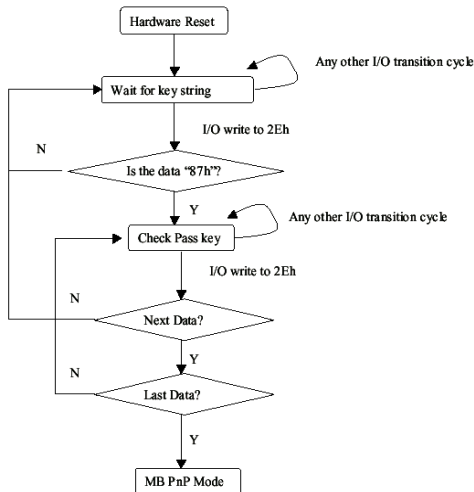
There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write opera-tions to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h,

Default=00h)

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level[Note] for WDT

WatchDog Timer Time-out Value Register (Index=73h,

Default=00h)

Bit	Description
7-0	WDT Time-out value 7-0

A.2 IT8712F/HX Watchdog Timer Initial Program

```
        .MODEL SMALL
        .CODE
Main:
        CALL Enter_Configuration_mode
        CALL Check_Chip
        mov cl, 7
        call Set_Logic_Device
        ;time setting
        mov cl, 10 ; 10 Sec
        dec al
Watch_Dog_Setting:
        ;Timer setting
        mov al, cl
        mov cl, 73h
        call Superio_Set_Reg
        ;Clear by keyboard or mouse interrupt
        mov al, 0f0h
        mov cl, 71h
        call Superio_Set_Reg
        ;unit is second.
        mov al, 0C0H
        mov cl, 72h
        call Superio_Set_Reg
```

```
; game port enable
mov cl, 9
call Set_Logic_Device


Initial_OK:
CALL Exit_Configuration_mode
MOV AH,4Ch
INT 21h


Enter_Configuration_Mode PROC NEAR
MOV SI,WORD PTR CS:[Offset Cfg_Port]


MOV DX,02Eh
MOV CX,04h
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP


Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
CALL Write_Configuration_Data
```

```
        RET
        Exit_Configuration_Mode ENDP


        Check_Chip PROC NEAR


        MOV AL,20h
        CALL Read_Configuration_Data
        CMP AL,87h
        JNE Not_Initial


        MOV AL,21h
        CALL Read_Configuration_Data
        CMP AL,12h
        JNE Not_Initial


Need_Initial:
        STC
        RET
Not_Initial:
        CLC
        RET
        Check_Chip ENDP
        Read_Configuration_Data PROC NEAR
        MOV DX,WORD PTR CS:[Cfg_Port+04h]
        OUT DX,AL
```

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP


Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP


Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
Set_Logic_Device   proc   near
```

```
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp

;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h

DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping
0Fh-Dh: not valid
0Ch: IRQ12

.

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03h: IRQ3
02h: not valid
01h: IRQ1
00h: no interrupt selected

Appendix

B

I/O Information

B.1 I/O Address Map

```
Input/output (IO)
    [00000000 - 0000000F] Direct memory access controller
    [00000000 - 00000CF7] PCI bus
    [00000010 - 0000001F] Motherboard resources
    [00000020 - 00000021] Programmable interrupt controller
    [00000022 - 0000003F] Motherboard resources
    [00000040 - 00000043] System timer
    [00000044 - 0000005F] Motherboard resources
    [00000060 - 00000060] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
    [00000061 - 00000061] System speaker
    [00000062 - 00000063] Motherboard resources
    [00000064 - 00000064] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
    [00000065 - 0000006F] Motherboard resources
    [00000070 - 00000073] System CMOS/real time clock
    [00000074 - 0000007F] Motherboard resources
    [00000080 - 00000090] Direct memory access controller
    [00000091 - 00000093] Motherboard resources
    [00000094 - 0000009F] Direct memory access controller
    [000000A0 - 000000A1] Programmable interrupt controller
    [000000A2 - 000000BF] Motherboard resources
    [000000C0 - 000000DF] Direct memory access controller
    [000000E0 - 000000EF] Motherboard resources
    [000000F0 - 000000FF] Numeric data processor
    [00000170 - 00000177] Secondary IDE Channel
    [000001F0 - 000001F7] Primary IDE Channel
    [00000274 - 00000277] ISAPNP Read Data Port
    [00000279 - 00000279] ISAPNP Read Data Port
    [00000290 - 0000029F] Motherboard resources
    [000002F8 - 000002FF] Communications Port (COM2)
    [00000376 - 00000376] Secondary IDE Channel
    [00000378 - 0000037F] Printer Port (LPT1)
    [000003B0 - 000003BB] Intel(R) 82852/82855 GM/GME Graphics Controller
    [000003C0 - 000003DF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [000003F0 - 000003F5] Standard floppy disk controller
    [000003F6 - 000003F6] Primary IDE Channel
    [000003F7 - 000003F7] Standard floppy disk controller
    [000003F8 - 000003FF] Communications Port (COM1)
    [00000400 - 000004BF] Motherboard resources
    [000004D0 - 000004D1] Motherboard resources
    [00000500 - 0000051F] Intel(R) 82801DB/DBM SMBus Controller - 24C3
    [00000800 - 00000805] Motherboard resources
    [00000A79 - 00000A79] ISAPNP Read Data Port
    [00000D00 - 0000FFFF] PCI bus
    [0000D000 - 0000D007] Silicon Image SiI 3512 SATALink Controller
    [0000D100 - 0000D103] Silicon Image SiI 3512 SATALink Controller
    [0000D200 - 0000D207] Silicon Image SiI 3512 SATALink Controller
    [0000D300 - 0000D303] Silicon Image SiI 3512 SATALink Controller
    [0000D400 - 0000D40F] Silicon Image SiI 3512 SATALink Controller
    [0000E800 - 0000E81F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C7
    [0000E900 - 0000E907] Intel(R) 82852/82855 GM/GME Graphics Controller
    [0000EB00 - 0000EB1F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C2
    [0000ED00 - 0000ED1F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C4
    [0000F000 - 0000F00F] Intel(R) 82801DB Ultra ATA Storage Controller - 24CB
```

B.2 Memory Address Map

```
Memory
    [00000000 - 0009FFFF] System board
    [000A0000 - 000BFFFF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [000A0000 - 000BFFFF] PCI bus
    [000C0000 - 000DFFFF] PCI bus
    [000CD400 - 000CFFFF] System board
    [000E0000 - 000EFFFF] System board
    [000F0000 - 000F7FFF] System board
    [000F8000 - 000FBFFF] System board
    [000FC000 - 000FFFFF] System board
    [00100000 - 1DEDFFFF] System board
    [1DEE0000 - 1DEFFFFF] System board
    [1DF00000 - FEBFFFFF] PCI bus
    [E0000000 - E7FFFFFF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [E8080000 - E80801FF] Silicon Image SiI 3512 SATALink Controller
    [E8100000 - E817FFFF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [E8180000 - E81803FF] Intel(R) 82801DB/DBM USB2 Enhanced Host Controller - 24CD
    [F0000000 - F7FFFFFF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [FEB00000 - FEB7FFFF] Intel(R) 82852/82855 GM/GME Graphics Controller
    [FEBFFC00 - FEBFFFFF] Intel(R) 82801DB Ultra ATA Storage Controller - 24CB
    [FEC00000 - FECFFFFF] System board
    [FEE00000 - FEEFFFFF] System board
    [FFB00000 - FFB7FFFF] System board
    [FFB80000 - FFBFFFFF] Intel(R) 82802 Firmware Hub Device
    [FFF00000 - FFFFFFFF] System board
```

B.3 IRQ Mapping Chart

```
Interrupt request (IRQ)
    (ISA)  0   System timer
    (ISA)  1   Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
    (ISA)  3   Communications Port (COM2)
    (ISA)  4   Communications Port (COM1)
    (ISA)  6   Standard floppy disk controller
    (ISA)  8   System CMOS/real time clock
    (ISA)  9   Microsoft ACPI-Compliant System
    (ISA) 12   PS/2 Compatible Mouse
    (ISA) 13   Numeric data processor
    (ISA) 14   Primary IDE Channel
    (ISA) 15   Secondary IDE Channel
    (PCI) 11   Intel(R) 82801DB/DBM SMBus Controller - 24C3
    (PCI) 16   Intel(R) 82801DB/DBM USB Universal Host Controller - 24C2
    (PCI) 16   Intel(R) 82852/82855 GM/GME Graphics Controller
    (PCI) 18   Intel(R) 82801DB/DBM USB Universal Host Controller - 24C7
    (PCI) 19   Intel(R) 82801DB/DBM USB Universal Host Controller - 24C4
    (PCI) 23   Intel(R) 82801DB/DBM USB2 Enhanced Host Controller - 24CD
    (PCI) 23   Silicon Image SiI 3512 SATALink Controller
```

B.4 DMA Channel Assignments

```
B
    Direct memory access (DMA)
        2   Standard floppy disk controller
        4   Direct memory access controller
    Input/output (IO)
    Interrupt request (IRQ)
    Memory
```

Appendix
C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
FP1	Front Panel Connector	JIH VEI Electronics	21B22564-X XS10B-01G-6/3-VXX		N/A
FP2	Front Panel Connector	JIH VEI Electronics	21B22564-X XS10B-01G-6/3-VXX		N/A
IDE1	IDE Connector	Catch Electronics	1137-020-40 SA	IDE Cable	1701400453
IDE2	IDE Connector	Catch Electronics	1137-020-40 SA	IDE Cable	1701400453
SATA1	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
SATA2	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
FDD1	Floppy Connector	Catch Electronics	1137-000-34 SA	Floppy Disk Drive Cable	1701340704
LPT1	Parallel Port Connector	Catch Electronics	1147-000-26 S		N/A
COM1	Serial Port 1 Connector	Catch Electronics	1147-000-10 S	Serial Port Cable	1701100305
COM2	Serial Port 2 Connector	Catch Electronics	1147-000-10 S	Serial Port Cable	1701100305
IR1	IrDA Connector	JIH VEI Electronics	21B12050-X XS10B-01G-4/2.8		N/A
USB1	USB Connector	JIH VEI Electronics	21B22050-X XS10B-01G-4/2.8	USB Cable	1709100201

USB2	USB Connector	JIH VEI Electronics	21B22050-X XS10B-01G-4/2.8	USB Cable	1709100201
USB3	USB Connector	Ho-Base Electronics	KS-001V-ANW		N/A
LAN1	Ethernet Connector	BOTHHAND	LU1T516-43 LF		N/A
VGA1	CRT Display Connector	Catch Electronics	3125-000-15 SB		N/A
LAN2 (EG)	Ethernet Connector	BOTHHAND	LA1T109D-43 LF		N/A
LAN2 (E2)	Ethernet Connector	BOTHHAND	LU1T516-43 LF		N/A
CN7	Mini-Din PS/2 Connector	CONTEK	MAN3061F1 G401		N/A
ATX1	ATX Connector	Catch Electronics	1121-700-20 SA		N/A
FAN1	CPU FAN Connector	Catch Electronics	1190-700-03 S		N/A
CN1	AC97 Connector	Ho-Base Electronics	EE-A041787		1701100305
CN2	Lan1 Active LED Connector	JIH VEI Electronics	21B12564-X XS10B-01G-6/3		N/A
CN3	LVDS Channel Connector	E-CALL Electronics	0110-01-553-300		N/A
CN4	Lan2 Active LED Connector	JIH VEI Electronics	21B12564-X XS10B-01G-6/3		N/A
CN5	Internal KeyBoard Connector	Ho-Base Electronics	2503-WS-5		N/A
CN6	ATX Power Control Connector	Catch Electronics	1191-700-03 S		1703030501
JP1	Clear CMOS Connector	JIH VEI Electronics	21B12050-X XS10B-01G-4/2.8		N/A

| JP2 | LVDS Voltage Selection Connector | Astron Electronics | 27-01031XX-1G | | N/A |
| JP3 | CF Voltage Selection Connector | Astron Electronics | 27-01031XX-1G | | N/A |