HSB-800P

AMD LX800 Processor

PCI Half-size CPU Card

With DDR, Ethernet,

CompactFlash™ & 4 COM Ports & 4 USB

HSB-800P Manual Rev. A 3rd Ed.

March 2010

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Packing List

Before you begin installing HSB-800P, please make sure that the following items have been shipped:

- 1701340704   Flat Cable.34P.70cm.GRAY for FDD

- 1701400453   Cable.40P 2.54mm IDC W/Nose W/Fold.40P 2.54mm IDC W/Nose W/Fold.45cm.Blue ATA-100

- 1700060192   Cable.6P-6P-6P.19cm.IVORY PS2/KB&Mouse

- 1703030501   Wire.3P 2.5mm Housing.3P 2.5mm Housing.50cm

- 1701260307   Flat Cable.9P/DB9P MALE&25P DB25P FEMALE.10P 2mm&26P 2mm/IDC NO FOLD.30cm.W/BKT.A002-015

- 1701100305   Flat Cable.9P/DB9P MALE.10P/2.0mm Pitch/IDC NO FOLD.30cm.W/BRACKET

- 1709100201   USB Cable.20cm2.0mm.W/Bracket

- 1709070800   SATA CABLE.7P Pitch 1.27mm.80cm.W/Lock

- HSB-800P

- Quick Installation Guide

- CD-ROM for manual (in PDF format) and drivers

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

Contents

Chapter 1 General Information

Chapter 2 Quick Installation Guide

Appendix C   Mating Connector

Chapter

1

General Information

1.1 Introduction

AAEON releases the economic half-size Single Board Computer (SBC) – HSB-800P, which is designed to target the industrial control and automation market. HSB-800P is based on AMD LX800 processor, which features the low power consumption and faster heat spreading to ensure the performance of the product.

HSB-800P supports onboard DDR400 system memory up to 256MB and the chipset of HSB-800P is AMDLX800 +CS5536. For the display function, the VGA controller is integrated to the AMD LX 800 processor that supports CRT and LCD simultaneous display. Moreover, 2D graphics accelerator has been integrated to provide higher performance to graphic processing. The LCD interface is up to 24-bit and support LVDS/ LCD.

HSB-800P targets the common industrial applications include factory automation systems and production process control devices. If you are looking for a cost-effective and reliable solution for your essential application, HSB-800P definitely is your first choice. For more detailed product information and instruction, please read the manual before the installation.

1.2 Features

- Ultra Low Voltage CPU Power Consumption
- CPU Clock 500 MHz
- Onboard 256MB DDR400 Memory
- Integrated 2D Graphics Accelerator, VGA Support
- Supports CRT/LVDS
- 10/100 Base-TX Ethernet x 1
- Ultra ATA100 x 1; SATA I x 2
- USB2.0 x 4 / RS-232 x 3 ; RS232/422/485 x 1/ Parallel x 1/Digital I/O
- Watchdog Function 1~255 Sec
- AC97 Audio Codec (optional)

1.3 Specification

System

- Form Factor   PCI Half-Size Card
- Processor   AMD LX800
- System Memory   On board 256MB DDR400 Memory
- Chipset   CS5536
- Ethernet   PCI 10/100Mb LAN x 1, RJ-45 x 1; Realtek 8100C controller
- Audio   AC 97 codec daughter board (optional)
- BIOS   Award Plug & Play FWH BIOS-8Mb ROM
- RTC   Internal RTC
- Watchdog Timer   1~255 step, can be set with software on Super I/O
- Expansion Interface   PCI Interface
- Power Requirement   ATX 5V, 12V, 4-pin power connector
- Certification   CE/FCC Class A
- Board Size (L x W)   7.3" (L) x 4.8" (W)(185 mm x 121 mm)
- Gross Weight   0.61lb (0.3kg)
- Operating Temperature   32°F~140°F (0°C~60°C)

Display: Supports CRT and LCD Simultaneous Display

- Chipset   LX800
- LCD Interface   Up to 24-bit, LVDS LCD
                           Support
- Memory   Shared memory up to 16M
- Resolution   1600 x 1200@32bpp at
                           100MHz for CRT
                           1024 x 768@24bpp for LVDS

I/O: CS5536

- Serial Port   COM Port x 4 (Internal Pin
                           Header x 3; Rear I/O x 1);
                           COM 1(Rear I/O), COM 3,
                           COM 4: RS-232; COM 2:
                           RS-232/422/485
- KB & Mouse   Mini-Din PS/2, KB & Mouse
                           Connector x 1 (Rear I/O);
                           Internal keyboard Box header x
                           1
- Universal Serial Bus   USB x 4 (pin header x 4)
- Storage   ATA100 x 1(Slave), Standard
                           FDD port x 1, supports up to
                           one floppy device; CFD Type II
                           connector (Master) x 1;
                           Onboard SATA I x 1

Half-size SBC	HSB-800P

- Digital I/O   8 bit digital I/O, 4 input/ 4 output by super I/O
- Parallel   SPP/EPP/ECP mode
- Audio   AC 97 codec daughter board (optional)
- LAN   PCI 10/100Mb LAN x 1, RJ-45 x 1; Realtek 8100C controller (Rear I/O)

Chapter

2

Quick Installation Guide

Notice:
The Quick Installation Guide is derived from Chapter 2 of the 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

FP2
FP1
IDE1
CN1
FDD1
JP1
CN2
LPT1
COM2
COM3
COM4

IR1
USB1
USB2
VGA1
LAN1
COM1
CN10

U21
CN5

CN8
JP5
CN7
JP2
CN6
JP3
U23
CN3
BT1
SATA2
SATA1
CN9

JP4

Solder Side

CFD1
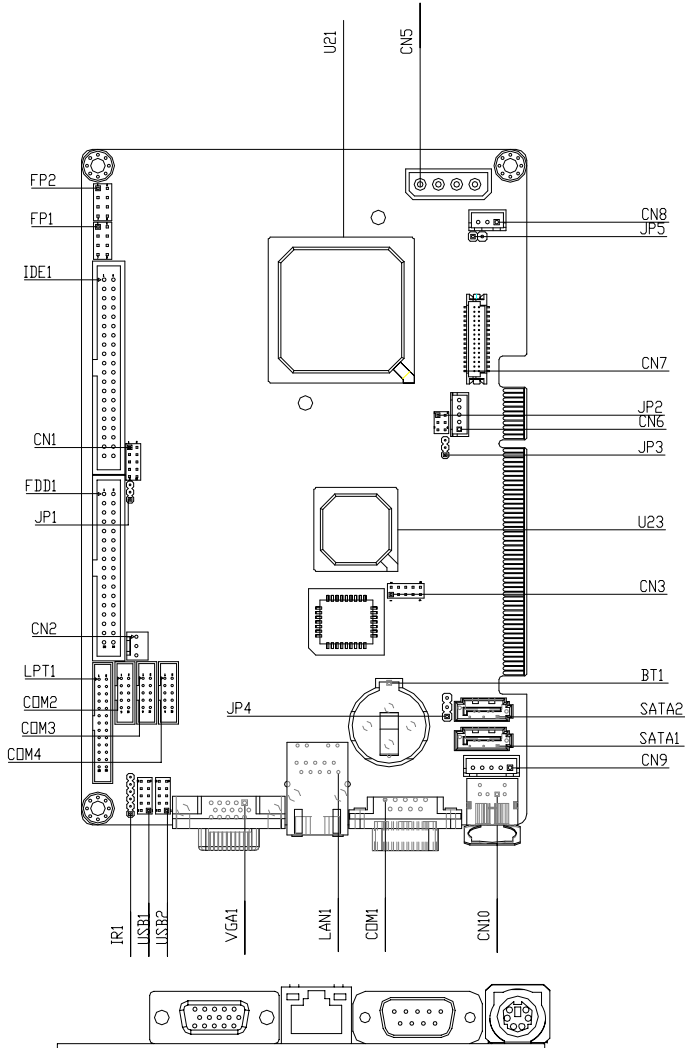
2.3 Mechanical Drawing

Component Side
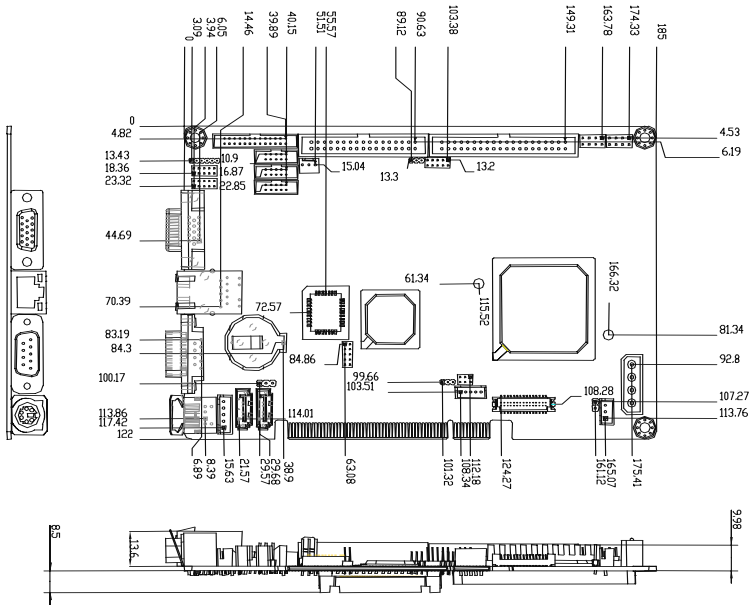
Solder Side
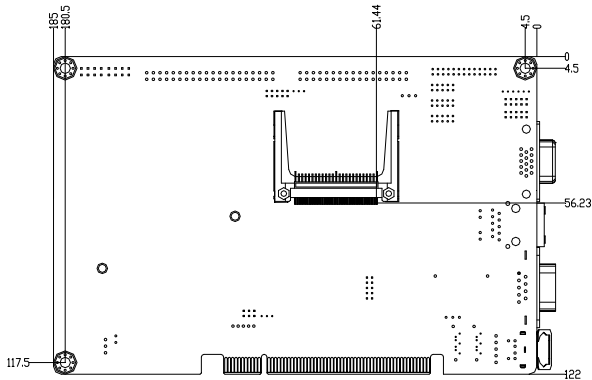
2.4 List of Jumpers

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:

Label	Function
JP1	CFD Voltage 3.3V/5V Selection
JP2	LCD Clock and Power Selection
JP3	Inverter Voltage Selection
JP4	Clear CMOS
JP5	AT/ATX Power Type 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:

Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1	EIDE Connector
CFD1	Compact Flash Slot
COM1, COM3, COM4	RS-232 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
IR1	IrDA Connector
LPT1	LPT Port Connector
USB1~2	USB Connector
LAN1	10/100 or 100/1000 Base-TX Ethernet Connector
CN1	Digital I/O
CN2	Fan Connector
CN3	Audio Input/Output
CN5	AT Power_5V, 12V Connector
CN6	LCD Inverter Power Connector
CN7	LVDS1 Connector
CN8	+5VSB Power Connector
CN9	Internal Keyboard Connector
CN10	PS/2 Keyboard/Mouse 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**
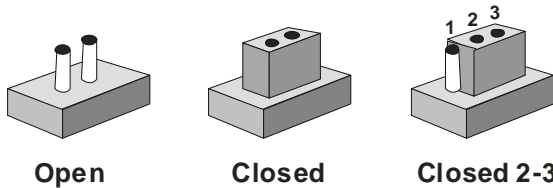
A pair of needle-nose pliers may be helpful when working with jumpers.

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 CFD Voltage 3.3V/5V Selection (JP1)

JP1	Function
1-2	3.3V
2-3	5V (default)

2.8 LCD Clock and Power Selection (JP2)

JP2	Function
1-3	Normal (default)
3-5	Inverse
2-4	+5Vlcd
4-6	+3Vlcd (default)

2.9 Inverter Voltage Selection (JP3)

JP3	Function
1-2	+12V (default)
2-3	+5V

2.10 Clear CMOS (JP4)

JP4	Function
1-2	Normal (default)
2-3	Clear CMOS

2.11 AT/ATX Power Type Selection (JP5)

JP5	Function
1-2	ATX Power Supply (default)
	AT Power Supply

Note: Only AT function w/o backplane.

2.12 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 (-)

2.13 Front Panel Connector (FP2)

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

Note: Internal Buzzer Enable: Close Pin 5,7

2.14 RS-232 Serial Port Connector (COM1, COM3, COM4)
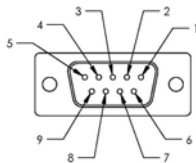
Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

Chapter 2 Quick Installation Guide 2-10

2.15 RS-232/422/485 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/+12V	10	N.C

2.16 IrDA Connector (IR1)

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

2.17 Digital I/O (CN1)

Pin	Signal	Pin	Signal
1	IN0	2	IN1
3	IN2	4	IN3
5	OUT0	6	OUT1
7	OUT2	8	OUT3
9	+5V	10	GND

BIOS Setting	Connector Definition	Address	IT8781 GPIO Setting
DIO-1	CN1 Pin1	Bit 7	U7 Pin20

DIO-2	CN1 Pin2	Bit6	U7 Pin21
DIO-3	CN1 Pin3	Bit5	U7 Pin22
DIO-4	CN1 Pin4	Bit4	U7 Pin23
DIO-5	CN1 Pin5	Bit3	U7 Pin24
DIO-6	CN1 Pin6	Bit2	U7 Pin25
DIO-7	CN1 Pin7	Bit1	U7 Pin26
DIO-8	CN1 Pin7	Bit0	U7 Pin27

2.18 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	GND

2.19 USB Connector (USB1~2)

Pin	Signal		
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD1+

7	GND	8	USBD1-
9	GND	10	+5V

2.20 Fan Connector (CN2)

Pin	Signal
1	GND
2	+5V
3	Speed Sense

2.21 Audio Input/ Output (CN3)

Pin	Signal	Pin	Signal
1	AC_RST#	2	AC_SYNC
3	AC_SDIN0	4	AC_SDOUT
5	GND	6	AC_BITCLK
7	GND	8	+5V
9	N.C	10	+3.3V

2.22 AT Power_5V, 12V Connector (CN5)

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

2.23 LCD Inverter (CN6)

Pin	Signal
1	12V / 5V
2	GND

3	VCON
4	GND
5	BKL_EN

2.24 LVDS1 (CN7)

Pin	Signal	Pin	Signal
1	BKL_EN	2	N.C
3	VLCD	4	GND
5	LVDS_CLK#	6	LVDS_CLK
7	VLCD	8	GND
9	TX0#	10	TX0
11	TX1#	12	TX1
13	TX2#	14	TX2
15	TX3#	16	TX3
17	N.C	18	N.C
19	N.C	20	N.C
21	N.C	22	N.C
23	N.C	24	N.C
25	N.C	26	N.C
27	VLCD	28	GND
29	N.C	30	N.C

2.25 +5VSB Power Connector (CN8)

Pin	Signal
1	PS_ON#
2	+5V
3	+5VSB

2.26 Internal Keyboard Connector (CN9)

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

2.27 PS2 Keyboard/Mouse Connector (CN10)

Pin	Signal
1	KB_DATA
2	MS-DATA
3	GND
4	+5V
5	KB_CLK
6	MS_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-800P 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 etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu shows you the status of PC.

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.

For more detailed information, 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-800P comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

    Step 1 – Install VGA Driver

    Step 2 – Install AES Driver

    Step 3 – Install LAN Driver

    Step 4 – Install Audio Driver

    Step 5 – Install SATA Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the HSB-800P CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 –Install VGA Driver

Place the Driver CD-ROM into your CD-ROM drive and follow

the steps below to install.

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 **Video Controller (VGA Compatible)**

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 **"lx_win"** file from CD-ROM **(Driver/Step 1 –**

   Display) then click on **Open**

13. Click on **OK**

14. Click on **Next**

15. Click on **Yes**

16. Click on **Finish**

Step 2 –Install AES Driver

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

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 **Entertainment Encryption/Decryption 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 **"Ixaes"** file from CD-ROM **(Drivers/Step 2 – AES)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Yes**
16. Click on **Finish**

Step 3 – Install LAN Driver

1. Click on the *Step 3 –LAN* folder and select the folder of *Windows*

2. Double click on *Setup.exe*

3. Follow the instructions that the window shows

4. The system will help you install the driver automatically

Step 4– Install Audio Driver

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

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 **Multimedia Audio 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 **"LXWDMAu"** file from CD-ROM **(Driver/Step 4– Audio)** then click on **Open**

13. Click on **OK**

14. Click on **Next**

15. Click on **Yes**

16. Click on **Finish**

Step 5 – Install SATA 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 Sil3112 SATALink Controller"** file
    from CD-ROM **(Driver/Step 5- SATA 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-800P utilizes ITE 8712 chipset as its watchdog timer controller. (K version)

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.
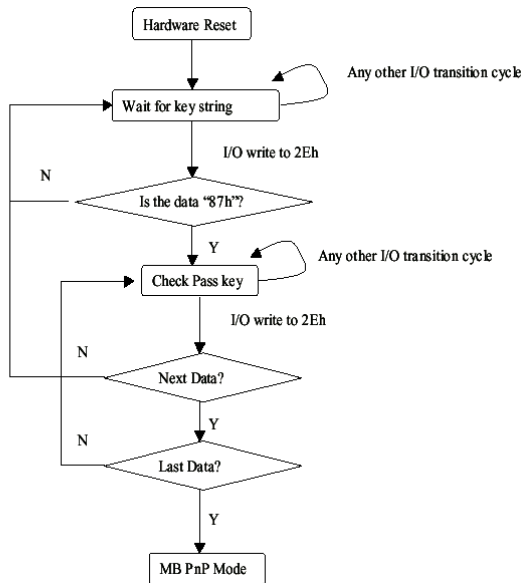
There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3)

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	Configuration 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 (LSB) Register
07H	74H	R/W	00H	WatchDog Timer Time-out Value (MSB) 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

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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	WDT Time-out value Extra select
	1: 4s.
	0: Determine by WDT Time-out value select (bit7 of this register)
4	WDT output through PWROK1/PWROK2 (pulse) enable
3	Select the interrupt level[note] for WDT

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

Default=00h)

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

WatchDog Timer Time-out Value (MSB) Register (Index=74h,

Default=00h)

Bit	Description
7-0	WDT Time-out value 15-8

A.2 ITE8712 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

.

.

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
    [00000020 - 00000021] Programmable interrupt controller
    [00000022 - 0000003F] PCI bus
    [00000040 - 00000043] System timer
    [00000044 - 00000047] PCI bus
    [0000004C - 0000006F] PCI bus
    [00000060 - 00000060] PC/AT Enhanced PS/2 Keyboard (101/102-Key)
    [00000061 - 00000061] System speaker
    [00000064 - 00000064] PC/AT Enhanced PS/2 Keyboard (101/102-Key)
    [00000070 - 00000071] System CMOS/real time clock
    [00000072 - 0000007F] PCI bus
    [00000081 - 00000083] Direct memory access controller
    [00000087 - 00000087] Direct memory access controller
    [00000089 - 0000008B] Direct memory access controller
    [0000008F - 00000091] Direct memory access controller
    [00000090 - 00000091] PCI bus
    [00000093 - 0000009F] PCI bus
    [000000A0 - 000000A1] Programmable interrupt controller
    [000000A2 - 000000BF] PCI bus
    [000000C0 - 000000DF] Direct memory access controller
    [000000E0 - 000000EF] PCI bus
    [000000F0 - 000000FF] Numeric data processor
    [00000100 - 00000CF7] PCI bus
    [00000170 - 00000177] Secondary IDE Channel
    [000001F0 - 000001F7] Primary IDE Channel
    [00000274 - 00000277] ISAPNP Read Data Port
    [00000279 - 00000279] ISAPNP Read Data Port
    [000002E8 - 000002EF] Communications Port (COM3)
    [000002F8 - 000002FF] Communications Port (COM2)
    [00000376 - 00000376] Secondary IDE Channel
    [00000378 - 0000037F] Printer Port (LPT1)
    [000003B0 - 000003BA] Advanced Micro Devices Win 2K/XP Graphics Driv
    [000003C0 - 000003DF] Advanced Micro Devices Win 2K/XP Graphics Driv
    [000003E8 - 000003EF] Communications Port (COM4)
    [000003F0 - 000003F5] Standard floppy disk controller
    [000003F6 - 000003F6] Primary IDE Channel
    [000003F7 - 000003F7] Standard floppy disk controller
    [000003F8 - 000003FF] Communications Port (COM1)
    [00000778 - 0000077F] Printer Port (LPT1)
    [00000A79 - 00000A79] ISAPNP Read Data Port
    [00000D00 - 0000FFFF] PCI bus
    [0000F800 - 0000F8FF] Realtek RTL8139 Family PCI Fast Ethernet NIC
    [0000FA00 - 0000FA0F] Standard Dual Channel PCI IDE Controller
    [0000FB00 - 0000FB0F] Silicon Image SiI 3512 SATALink Controller
    [0000FC00 - 0000FC03] Silicon Image SiI 3512 SATALink Controller
    [0000FD00 - 0000FD07] Silicon Image SiI 3512 SATALink Controller
    [0000FE00 - 0000FE03] Silicon Image SiI 3512 SATALink Controller
    [0000FF00 - 0000FF07] Silicon Image SiI 3512 SATALink Controller
```

B.2 Memory Address Map

```
Memory
    [00000000 - 0009FFFF] System board
    [0009E000 - 0009EFFF] PCI bus
    [000A0000 - 000BFFFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [000A0000 - 000BFFFF] PCI bus
    [000C8000 - 000EEFFF] PCI bus
    [000E0000 - 000EFFFF] Motherboard resources
    [000F0000 - 000F3FFF] Motherboard resources
    [000F4000 - 000F7FFF] Motherboard resources
    [000F8000 - 000FBFFF] Motherboard resources
    [000FC000 - 000FFFFF] Motherboard resources
    [00100000 - 00FFFFFF] System board
    [0F7C0000 - FFFEFFFF] PCI bus
    [EE000000 - EEFFFFFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [EFFE8000 - EFFEBFFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [EFFEC000 - EFFEFFFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [EFFF0000 - EFFF3FFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [EFFF4000 - EFFF7FFF] Advanced Micro Devices Win 2K/XP Graphics Driver
    [EFFF8000 - EFFFBFFF] Geode LX AES Crypto Driver
    [EFFFC000 - EFFFCFFF] Standard Enhanced PCI to USB Host Controller
    [EFFFD000 - EFFFDFFF] Standard OpenHCD USB Host Controller
    [EFFFE000 - EFFFE1FF] Silicon Image SiI 3512 SATALink Controller
    [EFFFF000 - EFFFF0FF] Realtek RTL8139 Family PCI Fast Ethernet NIC
    [FEE00000 - FEE0FFFF] System board
    [FFFC0000 - FFFFFFFF] System board
```

B.3 IRQ Mapping Chart

```
Interrupt request (IRQ)
    (ISA)  0    System timer
    (ISA)  1    PC/AT Enhanced PS/2 Keyboard (101/102-Key)
    (ISA)  3    Communications Port (COM2)
    (ISA)  4    Communications Port (COM1)
    (ISA)  6    Standard floppy disk controller
    (ISA)  8    System CMOS/real time clock
    (ISA) 10    Communications Port (COM4)
    (ISA) 11    Communications Port (COM3)
    (ISA) 12    Microsoft PS/2 Mouse
    (ISA) 13    Numeric data processor
    (ISA) 14    Primary IDE Channel
    (PCI)  5    Advanced Micro Devices Win 2K/XP Graphics Driver
    (PCI)  5    Geode LX AES Crypto Driver
    (PCI)  5    Realtek RTL8139 Family PCI Fast Ethernet NIC
    (PCI)  5    Silicon Image SiI 3512 SATALink Controller
    (PCI)  5    Standard Enhanced PCI to USB Host Controller
    (PCI)  5    Standard OpenHCD USB Host Controller
```

B.4 DMA Channel Assignments

```
Direct memory access (DMA)
    2    Standard floppy disk controller
    4    Direct memory access controller
```

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		
IDE1	IDE Connector	Catch Electronics	1137-020-40 SA	IDE Cable	1701400453
SATA1	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070800
SATA2	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070800
FDD1	Floppy Connector	Catch Electronics	1137-000-34 SA	Floppy Disk Drive Cable	1701340704
LPT1	Parallel Port Connector	Catch Electronics	1147-000-26 S	LPT Cable	1701260307
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
USB1	USB Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8	USB Cable	1709100201
USB2	USB Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8	USB Cable	1709100201
CN1	Digital I/O Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8		N/A
CN3	Audio Pin Header	JIH VEI Electronics	21N22050-1 0S10B-01G- 4/2.8-V1-G		N/A
CN2	FAN Connector	Catch Electronics	1190-700-03 S		N/A

LAN1	Ethernet Connector	UDE	RT1-165ABB1A		N/A
IR1	IrDA Connector	JIH VEI Electronics	21B12050-XXS10B-01G-4/2.8		N/A
CN10	Mini-Din PS/2 Connector	CONTEK	MAN3061F1G401	KB/MS Cable	1700060192
CN9	KB Pin Header	HO-BASE	2503-WS-5		N/A
COM1	COM Port Connector	Astron	DB6A-09-AMGN1-R		N/A
COM2	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
COM3	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
COM4	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
VGA1	CRT Display Connector	Catch Electronics	3125-000-15SB		N/A
CN7	LVDS Connector	E-call	0110-01-553-300		N/A
CN6	Inverter Connector	Catch Electronics	1192-700-05S		N/A
CN8	ATX Power Connector with BP	Catch Electronics	1191-700-03S		1703030501
CN5	Big 4P Power Connector	HO-BASE	5082A-WS-4		N/A