

**HSB-945P**

Intel® Atom™ N270 Processor

One 200-pin DDRII 400/533 SODIMM

2 SATA II/ 1 ATA100/ 1 CompactFlash

5 USB2.0/ 4 COM/ 1 Parallel/ Digital I/O

PCI Expansion

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## Packing List

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

- 1 Floppy Cable
- 1 ATA-100 Cable
- 1 PS/2 Keyboard and Mouse Cable
- 1 USB Cable
- 1 SATA Cable
- 1 ATX Cable
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 HSB-945P CPU Card

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

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The HSB-945P supports Intel® Atom™ N270 1.6GHz processor by utilizing the Intel® 945GSE + ICH7-M chipset. Moreover it equips one DDRII SODIMM and supports DDRII 400/533 up to 1GB. This model accommodates two RJ-45 connectors (one 10/100 Base-TX and one 10/100/1000Base-TX Ethernet) that are controlled by one Intel® 82562GZ/82573L and Intel® 82574L. This configuration allows for fast network connections and multi-task data transmission on the network.

The LCD controller is integrated on Intel® 945GME+Chrontel 7307 and the VGA integrated in Intel Graphic Engine GMA950. In addition, HSB-945P deploys 5 USB2.0, 4 COM (3 RS-232 and 1 RS-232/422/485), one parallel port, and digital I/O for a flexible I/O selection. The storage of HSB-945P supports two SATA II, one IDE and one Type II CompactFlash™.

The HSB-945P provides an ideal combination of high performance, widely expandable interfaces and compact size for applications that have space limitations. It will be an ideal solution for versatile applications.

## 1.2 Features

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- Intel® Atom™ N270 Processor
- Intel® 945GSE + ICH7M Chipset
- 200-Pin Non-ECC DDRII 400/533 SODIMM x 1, Up to 1GB
- 10/100Base-TX Ethernet x 1 & Gigabit Ethernet x1
- Integrated Graphics Media Accelerator GMA950
- AC97 Codes Audio Daughter Board Optional
- ATA100 x1, SATA II x 2, Compact Flash Type II x 1
- USB 2.0 x 5, RS-232/422/485 x 1, RS-232 x 3, Parallel x 1, Digital I/O
- PCI Expansion
- ATX 2.1

### 1.3 Specifications

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#### System

- CPU Onboard Intel® Atom™ N270  
1.6GHz Processor
- System Memory One 200-pin DDRII SODIMM,  
supports DDRII 400/533 up to 1GB
- Chipset Intel® 945GSE + Intel® ICH7-M
- Ethernet LAN1: Intel® 82562GZ/82573L  
LAN2: Intel® 82574L  
10/100Base-TX RJ-45 x 1,  
PCI-Express 10/100/1000Base-TX  
RJ-45 x 1
- BIOS Award Plug & Play SPI BIOS –  
8Mb ROM
- Watchdog Timer 1~255 steps, can be set with  
software on Super I/O
- H/W Status Monitor Monitoring system temperature,  
voltage, and cooling fan status
- Expansion Interface PICMG/ PCI Interface
- Battery Lithium battery
- Power Requirement ATX +12V, 4-pin power connector
- Board Size 7.3”(L) x 4.8” (W)  
(185mm x 122mm)
- Gross Weight 0.66lb (0.3kg)

## Half-size SBC

## HSB-945P

- Operating Temperature 32°F~140°F(0°C~60°C)
- Storage Temperature -4°F~158°F(-20°C~70°C)
- Operating Humidity 10~80%, non-condensing
- EMC CE/FCC Class A

### ***Display***

- Chipset Intel® 945GSE +Chrontel 7307
- Graphic Engine VGA Integrated in Intel® Graphic Engine GMA-950
- Resolution Analog up to 1600x1200@75Hz
- Output Interface VGA x 1, DVI-D x 1

### ***I/O***

- Storage SATA II x 2 (onboard), 40-pini IDE slot x 1, CompactFlash™ Type II x 1
- Serial Port COM x 4: (Internal Pin Header x 4) RS-232 x 3, RS-232/422/485 x 1
- Keyboard/Mouse Mini-DIN PS/2 K/B and Mouse x 1, Internal keyboard pin header x 1
- USB USB 2.0 Port on CPU card x 5, Internal 5x2 pin header x 2, Onboard TYPE-A Connector x 1
- Digital I/O Onboard Programmable 8-bit Digital I/O interface (4 input/4

- Audio output)  
AC97 codec audio daughter board  
optional

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.*



## 2.1 Safety Precautions

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**Warning!**

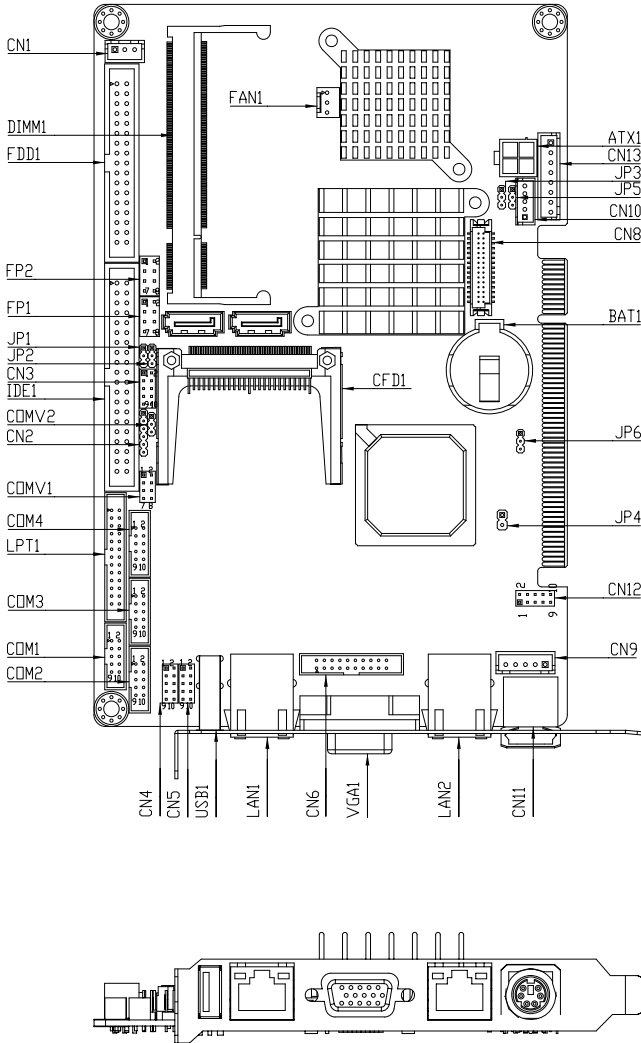
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**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*

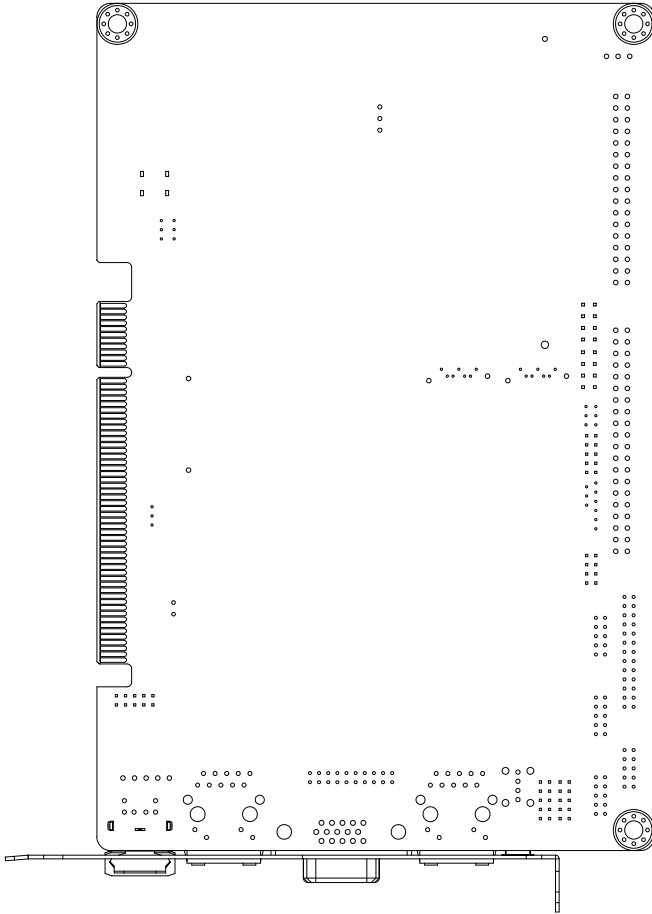
## 2.2 Location of Connectors and Jumpers

### Component Side



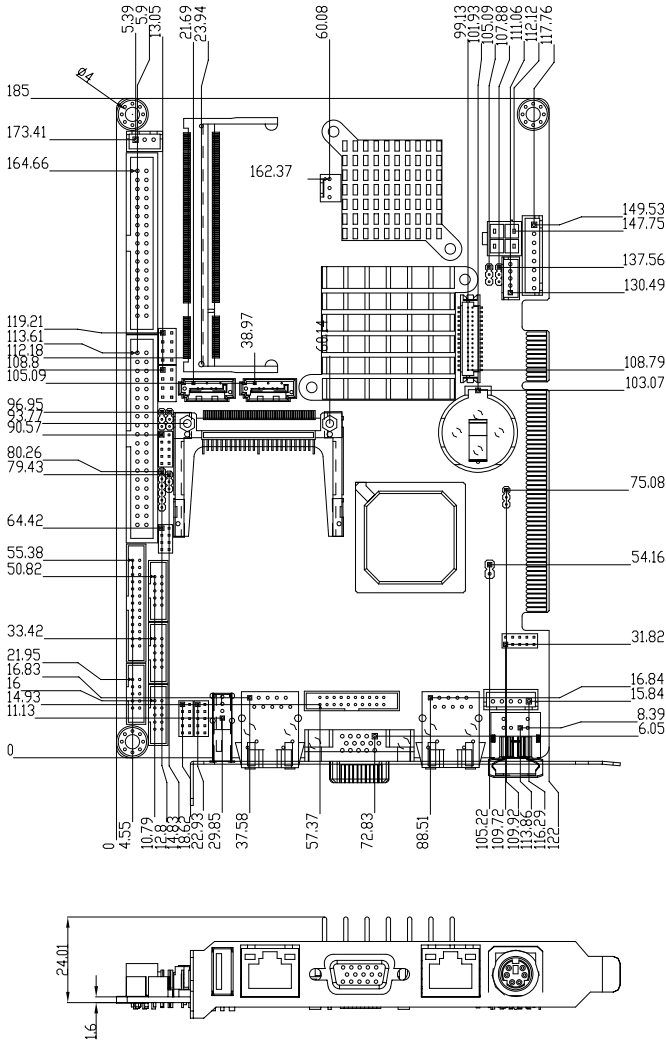


Solder Side

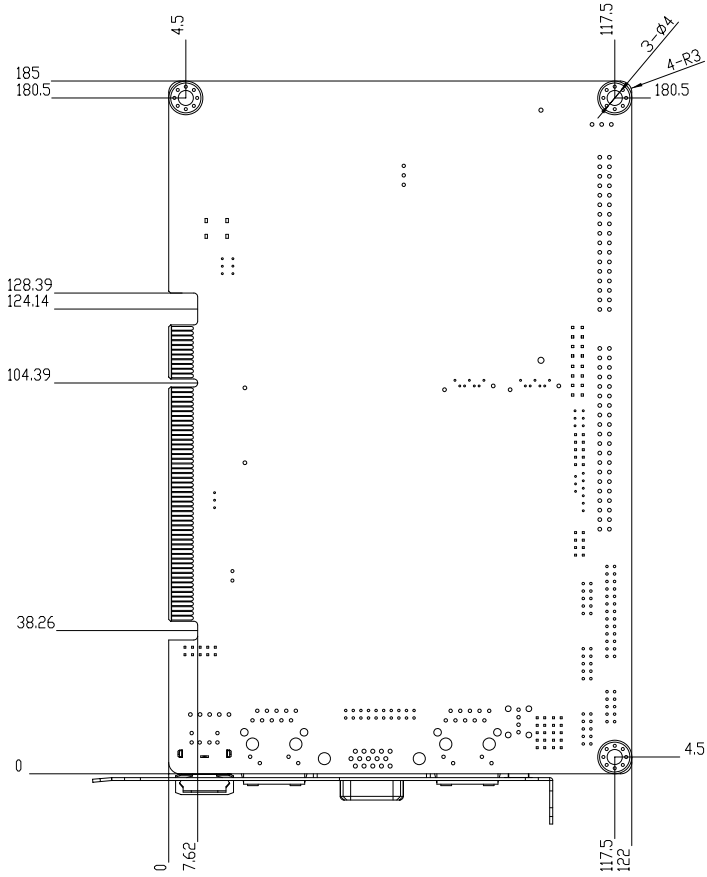


### 2.3 Mechanical Drawing

#### 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:

<b>Label</b>	<b>Function</b>
JP1	Auto Power on Selection
JP2	CFD Voltage 3.3V/5V Selection
JP3	LVDS Power Selection
JP5	LVDS Inverter Power Selection
JP6	Clear CMOS
COMV1	COM3,4 Port Function Selection
COMV2	COM3,4 Port Power 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:

<b>Label</b>	<b>Function</b>
CN1	ATX Power Control Connector
CN2	IrDA Connector
CN3	Digital I/O Connector
CN4~5	USB Pin Header
CN6	DVI Connector
CN8	LVDS Connector
CN9	Internal Keyboard Connector
CN10	LVDS Inverter Power Connector
CN11	PS/2 Keyboard/ Mouse Connector
CN12	Audio Pin Header
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1	IDE Connector (Slave)
CFD1	CompactFlash Slot (Master)
COM1, COM3, COM4	RS-232 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
LPT1	LPT Port Connector
USB1	USB Connector
LAN1~2	10/100 or 100/1000Base-TX Ethernet Connector
DIMM1	DDRII SODIMM Slot

**Half-size SBC**

**HSB-945P**

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FAN1

Fan Connector

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ATX1

+12V Power Connector

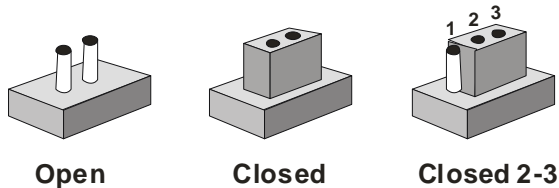
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## 2.6 Setting Jumpers

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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.



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 Auto Power Selection (JP1)

---

JP1	Function
Close 1-2	Enable
Close 2-3	Disable (Default)

## 2.8 CFD Voltage 3.3V/5V Selection (JP2)

---

JP2	Function
1-2	3.3V
2-3	5V (Default)

## 2.9 LVDS Power Selection (JP3)

---

JP3	Function
1-2	+5V
2-3	+3.3V (Default)

## 2.10 LVDS Inverter Voltage Selection (JP5)

---

JP5	Function
1-2	+5V
2-3	+12V (Default)

## 2.11 Clear CMOS (JP6)

---

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

## 2.12 COM3, COM4 Port Function Selection (COMV1)

---

COMV1	Function
Close 1-2	RI3 (Default)



---

Close 3-4	+5V/+12V
-----------	----------

---

Close 5-6	RI4 (Default)
-----------	---------------

---

Close 7-8	+5V/+12V
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### 2.13 COM3, COM4 Port Power Selection (COMV2)

---

COMV2	Function
Close 1-2	+12V
Close 2-3	+5V (Default)

---

### 2.14 ATX Power Control Connector with BP (CN1)

---

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

---

### 2.15 IrDA Connector (CN2)

---

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

---

### 2.16 Digital I/O (CN3)

---

Pin	Signal	Pin	Signal
1	In1/Out1	2	In2/Out2

---

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3	In3/Out3	4	In4/Out4
5	In5/Out5	6	In6/Out6
7	In7/Out7	8	In8/Out8
9	+5V	10	GND

**2.17 USB Connector (CN4, CN5)**

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

**2.18 DVI (CN6)**

Pin	Signal	Pin	Signal
1	DVI_TD1	2	DVI_TD1#
3	GND	4	GND
5	DVI_TDC	6	DVI_TDC#
7	GND	8	VCC5
9	HPDET_C#	10	VCC5
11	DVI_TD2	12	DVI_TD2#
13	GND	14	GND
15	DVI_TD0	16	DVI_TD0#
17	N.C	18	N.C
19	DVI_DATA	20	DVI_CLK

**2.19 LVDS (CN8)**

Pin	Signal	Pin	Signal
1	BKLTEN	2	BKLTCL

Half-size SBC		HSB-945P	
3	VLCD	4	GND
5	LA_CLK#	6	LA_CLK
7	VLCD	8	GND
9	LA_TX0#	10	LA_TX0
11	LA_TX1#	12	LA_TX1
13	LA_TX2#	14	LA_TX2
15	N.C	16	N.C
17	N.C	18	N.C
19	LB_TX0#	20	LB_TX0
21	LB_TX1#	22	LB_TX1
23	LB_TX2#	24	LB_TX2
25	N.C	26	N.C
27	VLCD	28	GND
29	LB_CLK#	30	LB_CLK

## 2.20 Internal Keyboard Connector (CN9)

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

## 2.21 LVDS Inverter (CN10)

Pin	Signal
1	12V / 5V
2	VCON
3	GND
4	GND

---

5	BKL_EN
---	--------

---

## 2.22 PS/2 Keyboard/Mouse Connector (CN11)

---

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

---

## 2.23 Audio Pin Header (CN12)

---

Pin	Signal	Pin	Signal
1	ACZ_RST#	2	ACZ_SYNC
3	ACZ_SDIN	4	ACZ_SDOUT
5	GND	6	ACZ_BITCLK
7	GND	8	+5V
9	N.C	10	+3.3V

---

## 2.24 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 (-)

---

## 2.25 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

## 2.26 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

## 2.27 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	10	N.C

## 2.28 RS-232 Serial Port Connector (COM3, COM4)

Pin	Signal	Pin	Signal
1	DCD	2	RXD

**Half-size SBC****HSB-945P**

3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI or 5V/12V	10	N.C

**2.29 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

**2.30 Fan Connector (FAN1)**

Pin	Signal
1	GND
2	+12V
3	Speed Sense

## 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	×	○	○	○	○	○
<p><b>O:</b> 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。</p> <p><b>X:</b> 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。</p> <p>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。</p>						

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-945P 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.

## **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-945P comes with a CD-ROM that contains all drivers you need.

***Follow the sequence below to install the drivers:***

- Step 1 – Install INF Driver
- Step 2 – Install VGA Driver
- Step 3 – Install Audio Driver
- Step 4 – Install LAN Driver

Please read following instructions for detailed installations.

## 4.1 Installation:

---

Insert the HSB-945P CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

### Step 1 – Install INF Driver

1. Click on the **Step 1-INF** folder and then double click on the **Setup.exe**
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

### Step 2 – Install VGA Driver

1. Click on the **Step 2-VGA** folder and select the OS your system is
2. Double click on **Setup.exe** file 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 – Install Audio Driver

1. Click on the **Step 3 - Audio** folder and then double click on the **wdm\_a371.exe**
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

### Step 4 – Install LAN Driver

1. Click on the **Step 4-LAN** folder and select the OS your system is
2. Double click on **.exe** file located in each OS folder

3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Appendix

**A**

# Programming the Watchdog Timer



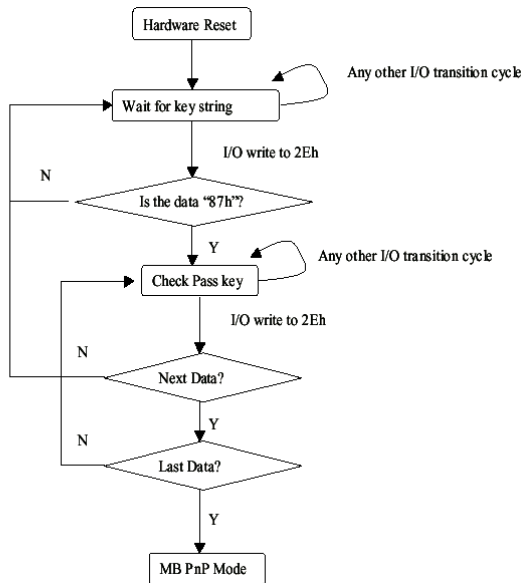
## A.1 Programming

HSB-945P utilizes ITE 8712 chipset as its watchdog timer controller. ( K version )

Below are the procedures to complete its configuration and the AAeon initial 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 operations 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 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 <sup>note</sup> 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

QASD-174D101477	
Direct memory access (DMA)	
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
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[00000280 - 00000287]	Communications Port (COM3)
[00000288 - 0000028F]	Communications Port (COM4)
[00000290 - 0000029F]	Motherboard resources
[000002F8 - 000002FF]	Communications Port (COM2)
[00000378 - 0000037F]	Printer Port (LPT1)
[000003B0 - 000003BF]	Mobile Intel(R) 945 Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 945 Express Chipset Family
[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) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000880 - 0000088F]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000C000 - 0000CFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000CF00 - 0000CF1F]	Intel(R) PRO/1000 PL Network Connection
[0000E000 - 0000EFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[0000EF00 - 0000EF1F]	Intel(R) Gigabit CT Desktop Adapter
[0000F500 - 0000F50F]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F600 - 0000F603]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F700 - 0000F707]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F800 - 0000F803]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F900 - 0000F907]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000FA00 - 0000FA0F]	Intel(R) 82801G (ICH7 Family) Ultra ATA Storage Controllers - 27DF
[0000FB00 - 0000FB1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000FC00 - 0000FC1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000FD00 - 0000FD1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000FE00 - 0000FE1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
[0000FF00 - 0000FF07]	Mobile Intel(R) 945 Express Chipset Family

## B.2 Memory Address Map

[-]	 QASD-174D101477
[+]	 Direct memory access (DMA)
[+]	 Input/output (IO)
[+]	 Interrupt request (IRQ)
[+]	 Memory
	 [00000000 - 0009FFFF] System board
	 [000A0000 - 000BFFFF] Mobile Intel(R) 945 Express Chipset Family
	 [000A0000 - 000BFFFF] PCI bus
	 [000C0000 - 000DFFFF] PCI bus
	 [000E0000 - 000EFFFF] System board
	 [000F0000 - 000FFFFF] System board
	 [00100000 - 3F6DFFFF] System board
	 [3F6E0000 - 3F6FFFFF] System board
	 [3F700000 - FEBFFFFF] PCI bus
	 [D0000000 - DFFFFFFF] Mobile Intel(R) 945 Express Chipset Family
	 [E0000000 - EFFFFFFF] Motherboard resources
	 [FD800000 - FD8FFFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
	 [FDB00000 - FDBFFFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
	 [FDBE0000 - FDBFFFFF] Intel(R) PRO/1000 PL Network Connection
	 [FDC00000 - FDCFFFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
	 [FDD00000 - FDDFFFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
	 [FDDC0000 - FDDDFFFF] Intel(R) Gigabit CT Desktop Adapter
	 [FDDFC000 - FDDFFFFF] Intel(R) Gigabit CT Desktop Adapter
	 [FDF00000 - FDF7FFFF] Mobile Intel(R) 945 Express Chipset Family
	 [FDF80000 - FDFBFFFF] Mobile Intel(R) 945 Express Chipset Family
	 [FDFF0000 - FDFF03FF] Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
	 [FDFF0000 - FDFF03FF] Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
	 [FEB80000 - FEBFFFFF] Mobile Intel(R) 945 Express Chipset Family
	 [FEC00000 - FEC0FFFF] System board
	 [FED13000 - FED1DFFF] System board
	 [FED20000 - FED8FFFF] System board
	 [FEE00000 - FEE0FFFF] System board
	 [FFB00000 - FFB7FFFF] System board
	 [FFB80000 - FFBFFFFF] Intel(R) 82802 Firmware Hub Device
	 [FFF00000 - FFFFFFFF] System board

### B.3 IRQ Mapping Chart

QASD-174D101477

- + Direct memory access (DMA)
- + Input/output (IO)
- 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) 10 Communications Port (COM3)
  - (ISA) 11 Communications Port (COM4)
  - (ISA) 13 Numeric data processor
  - (ISA) 14 Primary IDE Channel
  - (PCI) 15 Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
  - (PCI) 16 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
  - (PCI) 16 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
  - (PCI) 16 Intel(R) PRO/1000 PL Network Connection
  - (PCI) 16 Mobile Intel(R) 945 Express Chipset Family
  - (PCI) 17 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
  - (PCI) 17 Intel(R) Gigabit CT Desktop Adapter
  - (PCI) 18 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
  - (PCI) 19 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
  - (PCI) 19 Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
  - (PCI) 23 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
  - (PCI) 23 Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
- + Memory

### B.4 DMA Channel Assignments

QASD-174D101477

- 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
SATA0	SATA Connector	WING-SPAN	7CATT0710 00001A-G	SATA Cable	1709070800
SATA1	SATA Connector	WING-SPAN	7CATT0710 00001A-G	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
CN4	USB Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8	USB Cable	1709100201
CN5	USB Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8	USB Cable	1709100201
CN3	Digital I/O Pin Header	JIH VEI Electronics	21B22050-X XS10B-01G -4/2.8		N/A
CN12	Audio Pin Header	JIH VEI Electronics	21N22050-1 0S10B-01G-4/2.8-V1-G		N/A
CN1	ATX External 5VSB	Catch Electronics	1191-700-03 S		N/A

**Half-Size Board**

**HSB-945P**

	Connector				
ATX1	4P Power Connector	Catch Electronics	1121-700-04S		N/A
FAN1	FAN Connector	Catch Electronics	1190-700-03S		N/A
USB1	USB Connector	WING-SPAN	7CUSTA40920009A-G		N/A
LAN1(-VE)	Ethernet Connector	WING-SPAN	7CRJR081020002A-G		N/A
LAN1(-G2)	Ethernet Connector	WING-SPAN	7CRJR081020003A-G		N/A
LAN2	Ethernet Connector	WING-SPAN	7CRJR081020003A-G		N/A
CN2	IrDA Connector	JIH VEI Electronics	21B12050-XS10B-01G-4/2.8		N/A
CN11	Mini-Din PS/2 Connector	CONTEK	MAN3061F1G401	KB/MS Cable	1700060192
CN9	KB Pin Header	HO-BASE	2503-WS-5		N/A
COM1	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701260307
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	170110030A
COM4	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	170110030A
VGA1	CRT Display Connector	WING-SPAN	7CHDR150620006A-G		N/A
CN8	LVDS Connector	E-call	0110-01-553-300		N/A
CN10	LVDS Inverter Connector	Catch Electronics	1192-700-05S		N/A



**Half-Size Board**

**HSB-945P**

CN6	DVI Connector	Catch Electronics	1147-000-20 MP		N/A
-----	---------------	-------------------	----------------	--	-----