

HSB-965P

Intel® Core™ 2 Duo Processor

18/24-bit Dual-channel LVDS

Two DDRII 533/667 SODIMM

3 SATA II/ 1 IDE/ 1 FDD/ 1 CompactFlash

7 USB 2.0/ 4 COM/ 1 IrDA

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Packing List

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

- 1 HSB-965P CPU Card
- 1 Floppy Cable
- 1 ATA-100 Cable
- 1 USB Cable
- 1 Keyboard Cable
- 1 Serial + Parallel Cable
- 3 Serial Cables
- 3 SATA Cables
- 1 ATX Cable
- 1 Heat Sink
- 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

The HSB-965P supports Intel® Socket 478-based Core 2 Duo processor by utilizing the Intel® GME965 + ICH8-M chipset. Moreover it equips two DDRII SODIMM and supports DDRII 533/667 up to 4GB. This model accommodates two Gigabit Ethernet RJ-45 connectors (10/100 Base-TX and Gigabit Ethernet optional) that are controlled by one Intel® 82562/82566 (co-lay, optional) 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® 82855GME that support dual displays support to meet the demands of the embedded market while still maintaining cost efficiency. In addition, HSB-965P deploys 7 USB2.0, 4 COMs (3 RS-232 and 1 RS-232/422/485), one parallel port, one IrDA, and digital I/O for a flexible I/O selection. The storage of HSB-965P supports three SATA II ports and one Type II CompactFlash.

The HSB-965P provides an ideal combination of high performance, widely expandable interfaces and compact size for applications that have space limitations. It will be an ideal tool for your vital applications.

1.2 Features

- Intel® Core™ 2 Duo Processor, FSB 533/667/800MHz
- Two SODIMM Dual-channel DDRII 533/667 Memory, up to 4GB
- Up to 18/24-bit Dual-channel LVDS
- Integrated Intel® Enhance Graphics Core, VGA Support
- Two Gigabit Ethernet (Optional 10/100Base-TX and Gigabit Ethernet)
- Three SATA II ports and one Type II CompactFlash
- Seven USB2.0/ 1 RS-232/422/485 & 3 RS-232/ 1 Parallel/ 1 IrDA/ Digital I/O

1.3 Specifications

System

- CPU Intel® Socket 478-based Core™ 2 Duo Processor, FSB 533/667/800MHz
- System Memory Two DDRII SODIMM, support DDRII 533/667 up to 4GB
- Chipset Intel® GME965 + Intel® ICH8-M
- Ethernet LAN1: Intel® 82574L
LAN2: Intel® 82566/ 82562 (co-lay, optional)
One PCI-Express, 10/100Base-TX & Gigabit Ethernet optional, RJ-45 x 2
- BIOS Award Plug & Play SPI BIOS – 8Mb ROM
- Watchdog Timer 1~255 steps, can be set with software on Super I/O
- CompactFlash Supports CFD Type II Connector, shared IDE channel (Master)
- Expansion Interface PICMG/ PCI Interface
- Battery Lithium battery
- Power Requirement ATX +12V, 4-pin power connector
- Board Size 7.28”(L) x 4.8” (W)

(185mm x 122mm)

- Gross Weight 0.88lb (0.4kg)
- Operating Temperature 32°F~140°F(0°C~60°C)
- EMC CE/FCC Class A

Display

- VGA Controller Enhanced Integrated Graphics
- LCD Controller Integrated on Intel® 82855GME, LVDS output, dual display support

I/O

- Storage SATA II x 2 (onboard), IDE slot x 1 (Shared), Standard Floppy Disk Drive x 1 (supports up to one floppy device)
- IrDA One IrDA Tx/Rx header
- Audio MIC-in/ Line-in/ Line-out/ CD-in (Optional Daughter Board)
- Parallel Port Supports SPP/EPP/ECP mode
- USB Seven USB 2.0 Ports, Three 5x2 pin headers for internal, One Type-A connector onboard
- RTC Internal RTC
- Serial Port COM port x 4 (Internal pin header)

- Keyboard & Mouse
x 4)
RS-232 x 3, RS-232/422/485 x 1
One Mini-DIN PS/2 keyboard and mouse connector, one internal Keyboard pin header

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

Warning!

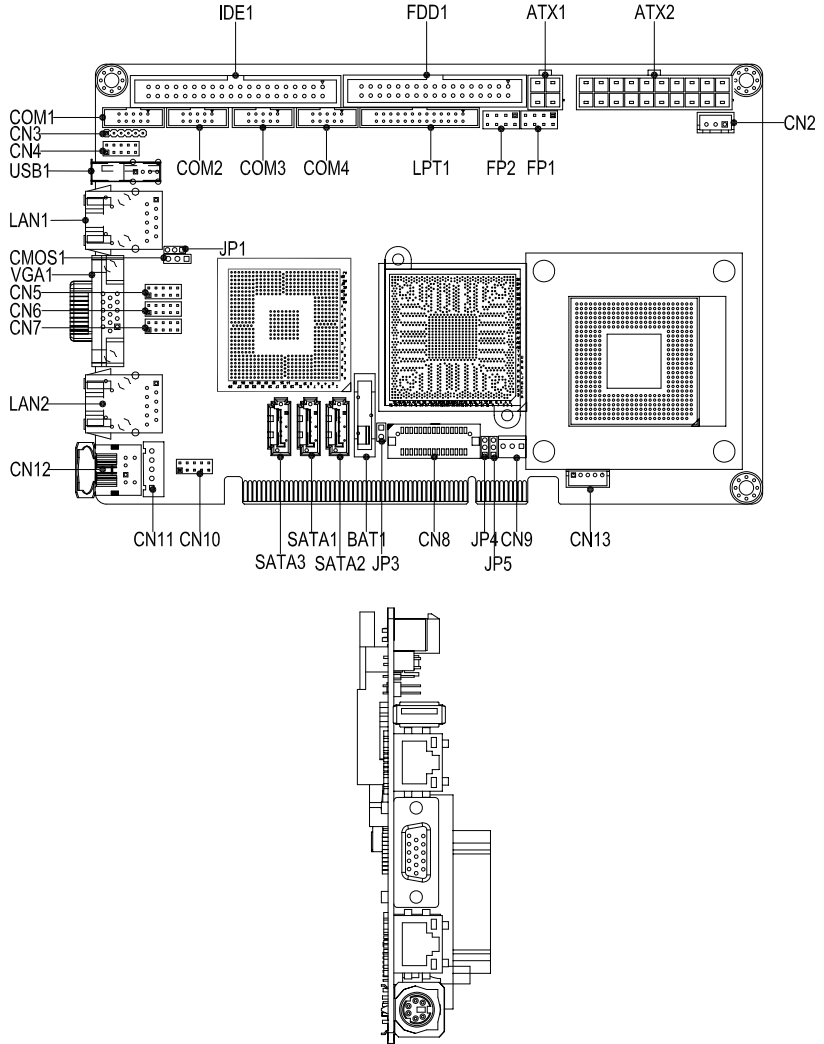
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

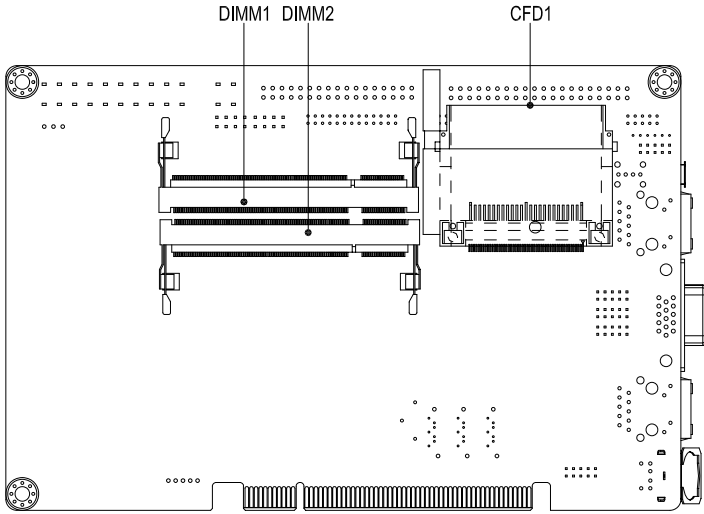
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

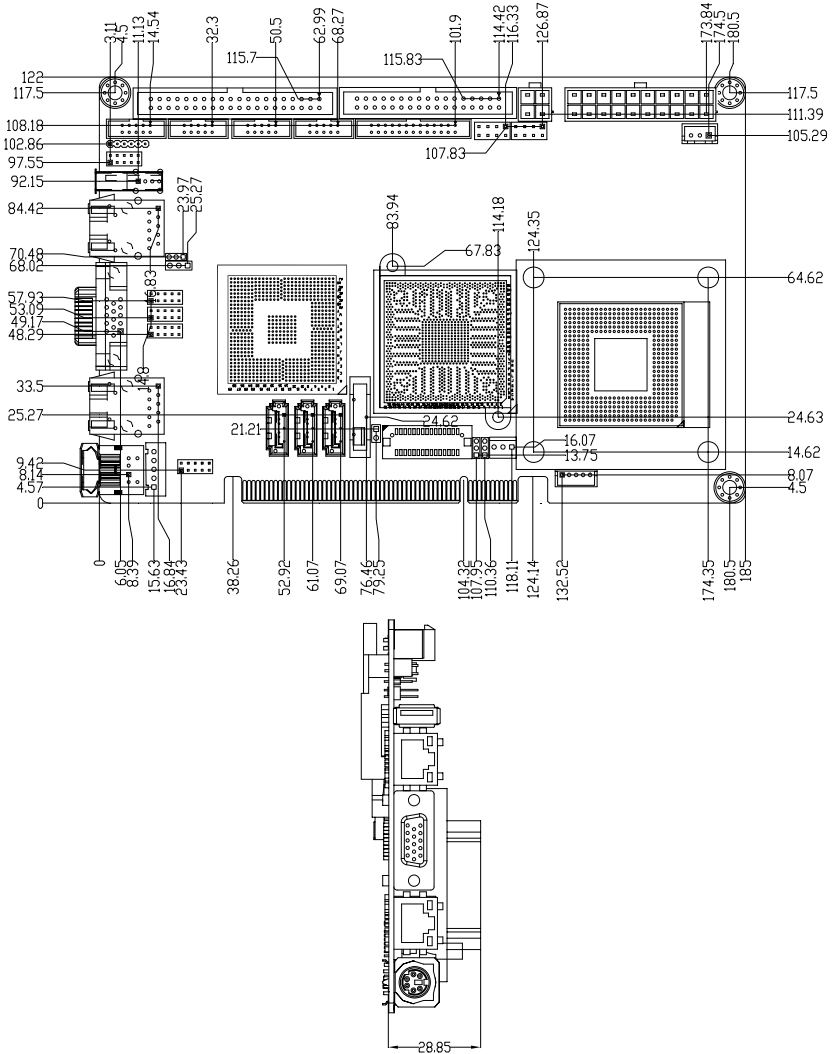


Solder Side

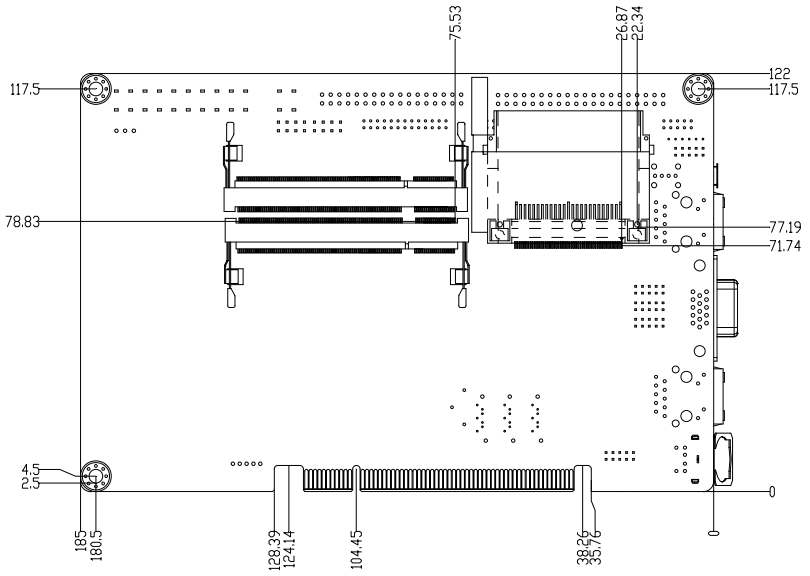


2.3 Mechanical Drawing

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:

Jumpers

Label	Function
JP1	CFD Voltage 3.3V/5V Selection
CMOS1	Clear CMOS
JP4	LVDS Power Selection
JP5	LVDS Inverter 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:

Connectors

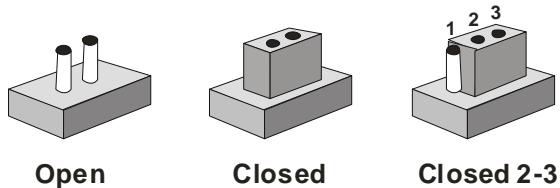
Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1	IDE Connector (Slave)
CFD1	Compact Flash Slot (Master)
COM1, COM3, COM4	RS-232 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
LPT1	LPT Port Connector
USB1	USB Connector
LAN1~2	10/100 or 100/1000 Base-TX Ethernet Connector (LAN2 optional)
DIMM1~2	DDRII SODIMM Slot
ATX1	+12V Power Connector
ATX2	ATX Power Connector
CN2	ATX Power Control Connector
CN3	IrDA Connector
CN4	Digital I/O Connector
CN5~7	USB Pin Header

CN8	LVDS Connector
CN9	Fan Connector
CN10	Audio Pin Header
CN11	Internal Keyboard Connector
CN12	PS/2 Keyboard/Mouse Connector
CN13	LVDS Inverter Power 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.



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 CF Voltage 3.3V/5V Selection (JP1)

JP1	Function
1-2	+3.3V
2-3	+5V (Default)

2.8 Clear CMOS (CMOS1)

CMOS1	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.9 LVDS Power Selection (JP4)

JP4	Function
1-2	+5V
2-3	+3.3V (Default)

2.10 LVDS Inverter Voltage Selection (JP5)

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

2.11 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 (-)

2.12 Front Panel Connector (FP2)

Pin	Signal	Pin	Signal
1	External Speaker (+)	2	Key Board Lock (+)
3	NC	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

2.13 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

2.14 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

2.15 LPT Port Connector (LPT1)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR

Half-size SBC**HSB-965P**

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

2.16 ATX Power Control Connector With BP (CN2)

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

2.17 IrDA Connector (CN3)

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

2.18 Digital I/O (CN4) Address: 801h

Pin	Signal	Pin	Signal
1	In1/Out1	2	In2/Out2
3	In3/Out3	4	In4/Out4
5	In5/Out5	6	In6/Out6
7	In7/Out7	8	In8/Out8
9	+5V	10	GND

2.19 USB Connector (CN5~7)

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

2.20 LVDS (CN8)

Pin	Signal	Pin	Signal
1	BKLTEN	2	BKLTCL
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	LA_TX3#	16	LA_TX3
17	N.C.	18	N.C.

Half-size SBC**HSB-965P**

19	LB_TX0#	20	LB_TX0
21	LB_TX1#	22	LB_TX1
23	LB_TX2#	24	LB_TX2
25	LB_TX3#	26	LB_TX3
27	VLCD	28	GND
29	LB_CLK#	30	LB_CLK

2.21 FAN Connector (CN9)

Pin	Signal
1	GND
2	+5V
3	Speed Sense

2.22 Audio Pin Header (CN10)

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

2.23 Internal Keyboard Connector (CN11)

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

2.24 PS/2 Keyboard/ Mouse Connector (CN12)

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

2.25 LVDS Inverter (CN13)

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

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>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。</p> <p>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。</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-965P 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 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-965P comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Install Chip Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the HSB-965P CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Chip Driver

1. Click on the **Step 1-chip** folder and then double click on the ***ininst_autol.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 **.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 LAN Driver

Note: If the HSB-965P equips one LAN chip (Intel 82574L), please select the folder of “**85274**”; if the HSB-965P equips two LAN chips (Intel 82566X/82562V and Intel 82574L), then you have to install the two LAN drivers in the folders of “**82562 and 82566**” and “**82574**.”

Installing Intel 82574L LAN driver

1. Go to **My Computer** and click on the right of mouse, select **Properties**
2. Select **Hardware**
3. Enter **Device Management**

4. Select your LAN card and click on the right of mouse
5. Select **Update your driver** and follow the instructions that the window show
6. Select to **install from CD-ROM**
7. Click on the **Driver\Step 3 - LAN driver\82574 (depends on the chip your card supports)** folder
8. Choose the OS your system is
9. The system will help you install the driver automatically
10. Please re-start your computer

Installing Intel 82562/82566 LAN drivers

1. Click on the **Step 3-LAN driver** 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

Step 4 – Install Audio Driver

1. Click on the **Step 4 - AUDIO** folder and then double click on the **WDM_R141.exe**
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Appendix

A

Programming the Watchdog Timer

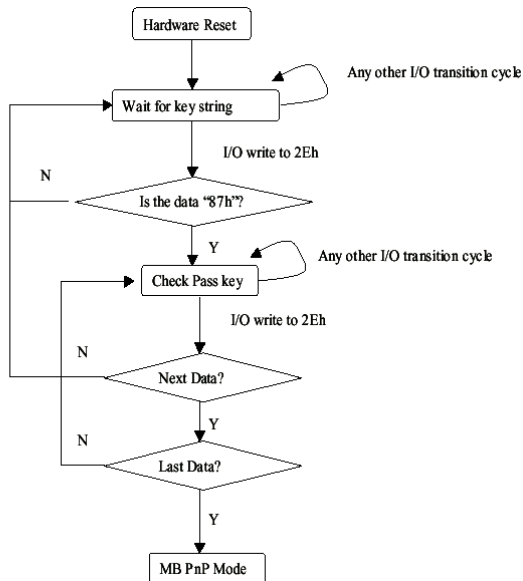
A.1 Programming

HSB-965P 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 ^{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

Address Range	Device Name
Input/output (I/O)	
[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 - 000003BB]	Mobile Intel(R) 965 Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 965 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) ICH8 Family SMBus Controller - 283E
[00000880 - 0000088F]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000C000 - 0000CFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[0000CF00 - 0000CF1F]	Intel(R) Gigabit CT Desktop Adapter
[0000D000 - 0000DFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[0000F200 - 0000F20F]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F300 - 0000F30F]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F400 - 0000F403]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F500 - 0000F507]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F600 - 0000F603]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F700 - 0000F707]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
[0000F800 - 0000F80F]	Intel(R) ICH8M Ultra ATA Storage Controllers - 2850
[0000F900 - 0000F91F]	Intel(R) ICH8 Family USB Universal Host Controller - 2832
[0000FA00 - 0000FA1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2831
[0000FB00 - 0000FB1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2830
[0000FC00 - 0000FC1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2835
[0000FD00 - 0000FD1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2834
[0000FE00 - 0000FE1F]	Intel(R) 82566MM Gigabit Network Connection
[0000FF00 - 0000FF07]	Mobile Intel(R) 965 Express Chipset Family
Interrupt request (IRQ)	
Memory	

B.2 Memory Address Map

Address Range	Device Name
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 965 Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	System board
[000F0000 - 000FFFFF]	System board
[00:000000 - 7F6DFFFF]	System board
[7F6E0000 - 7F6FFFFF]	System board
[7F700000 - 7F7FFFFF]	System board
[7F700000 - FEBFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 965 Express Chipset Family
[E0000000 - EFFFFFFF]	Motherboard resources
[FD700000 - FD7FFFFF]	Mobile Intel(R) 965 Express Chipset Family
[FDB80000 - FDBFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[FDC00000 - FDCFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[FDD00000 - FDDFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[FDE00000 - FDEFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[FDEC0000 - FDEFFFFF]	Intel(R) Gigabit CT Desktop Adapter
[FDEFC000 - FDEFFFFF]	Intel(R) Gigabit CT Desktop Adapter
[FDFC0000 - FDFDFFFF]	Intel(R) 82566MM Gigabit Network Connection
[FDFF4000 - FDFF7FFF]	Microsoft UAA Bus Driver for High Definition Audio
[FDFFC000 - FDFFC0FF]	Intel(R) ICH8 Family SMBus Controller - 283E
[FDFFD000 - FDFFD3FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
[FDFFE000 - FDFFE3FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
[FDFFF000 - FDFFFFFF]	Intel(R) 82566MM Gigabit Network Connection
[FE800000 - FEBFFFFF]	Mobile Intel(R) 965 Express Chipset Family
[FEC00000 - FEC00FFF]	System board
[FED13000 - FED1FFFF]	System board
[FED20000 - FED9FFFF]	System board
[FEE00000 - FEE00FFF]	System board
[FF800000 - FF87FFFF]	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) 5 Communications Port (COM3)
	(ISA) 6 Standard Floppy disk controller
	(ISA) 7 Communications Port (COM4)
	(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
	(PCI) 15 Intel(R) ICH8 Family SMBus Controller - 283E
	(PCI) 16 Intel(R) Gigabit CT Desktop Adapter
	(PCI) 16 Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
	(PCI) 16 Intel(R) ICH8 Family USB Universal Host Controller - 2834
	(PCI) 16 Mobile Intel(R) 965 Express Chipset Family
	(PCI) 17 Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
	(PCI) 18 Intel(R) ICH8 Family USB Universal Host Controller - 2832
	(PCI) 18 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
	(PCI) 19 Intel(R) ICH8 Family USB Universal Host Controller - 2831
	(PCI) 19 Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	(PCI) 20 Intel(R) 82566MM Gigabit Network Connection
	(PCI) 21 Intel(R) ICH8 Family USB Universal Host Controller - 2835
	(PCI) 22 Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 23 Intel(R) ICH8 Family USB Universal Host Controller - 2830
	(PCI) 23 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836

B.4 DMA Channel Assignments

	DHG-AE684A38B0
	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		
IDE1	IDE Connector	Catch Electronics	1137-020-40S A	IDE Cable	1701400453
SATA0	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
SATA1	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
SATA2	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
FDD1	Floppy Connector	Catch Electronics	1137-000-34S A	Floppy Disk Drive Cable	1701340704
LPT1	Parallel Port Connector	Catch Electronics	1147-000-26S	LPT Cable	1701260307
FP1	Front Panel Connector	JIH VEI Electronics	21B22564-XX S10B-01G-6/3 -VXX		N/A
FP2	Front Panel Connector	JIH VEI Electronics	21B22564-XX S10B-01G-6/3 -VXX		N/A
CN5	USB Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8	USB Cable	1709100201
CN6	USB Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8	USB Cable	1709100201
CN7	USB Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8	USB Cable	1709100201
CN4	Digital I/O Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8		N/A
CN10	Audio Pin Header	JIH VEI Electronics	21N22050-10 S10B-01G-4/2		N/A

			.8-V1-G		
ATX2	ATX External 5VSB Connector	Catch Electronics	1121-700-20S		N/A
ATX1	4P Power Connector	Catch Electronics	1121-700-04S		N/A
CN9	FAN Connector	Catch Electronics	1190-700-03S		N/A
USB1	USB Connector	HO-BASE	KS-001V-AN W		N/A
LAN1	Ethernet Connector	BOTHHAND	LA1T109D-A-D43 LF		N/A
LAN2(-G2)	Ethernet Connector	BOTHHAND	LA1T109D-A-D43 LF		N/A
LAN2 (-EG)	Ethernet Connector	BOTHHAND	LU1T516-43 LF		N/A
CN3	IrDA Connector	JIH VEI Electronics	21B12050-XX S10B-01G-4/2 .8		N/A
CN12	Mini-Din PS/2 Connector	CONTEK	MAN3061F1G 401	KB/MS Cable	1700060192
CN11	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	Catch Electronics	3125-000-15S B		N/A

Half-size SBC**HSB-965P**

CN8	LVDS Connector	E-call	0110-01-553-300		N/A
CN13	LVDS Inverter Connector	Catch Electronics	1192-700-05S		N/A
CN2	ATX Power Connector with BP	Catch Electronics	1191-700-03S		1703030501