IMBA-910

Intel® Core™ 2 Duo/ Pentium® 4 Processor

4 DDRII 533/667/800

2 10/100/1000Base-TX Ethernet

1 PCI-E〔x16〕/1 PCI-E〔x4〕/ 3 PCI Slots

8 USB 2.0 / 2 COMs

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Packing List

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

- 1   Flat Cable for FDD

- 1   Flat Cable w/Nose, w/Fold for IDE

- 1   USB Cable w/ Bracket

- 1   Flat Cable w/ Bracket for COM Port

- 1   CPU Cooler Fan for LGA 775 Pentium® 4 3.6G

- 4   SATA Cable

- 1   IMBA-910 Industrial Motherboard

- 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 IMBA-910 is AAEON's Industrial Motherboard which adopts Intel$^®$ Core^{TM} 2 Duo/ Pentium$^®$ 4 600 Sequence Processor, and supports Front Side Bus 533/800/1066MHz. The IMBA-910 is designed for Industrial Motherboard with ATX Motherboard form factor.

IMBA-910 adopts an Intel$^®$ Q965 which integrated VGA through PCI-Express〔x16〕slot.   Moreover, the shared memory is up to 256M and the resolutions are up to 2048 x 1536 at 85Hz for CRT.

IMBA-910 deploys 8 USB2.0 ports, 2 COM ports, 1 Floppy Disk Drive port which supports up to two floppy devices for a flexible expansion.   In addition, you may add up the audio function by the optional PER-U01H audio board to extend your onboard features.   Moreover, IMBA-910 also supports two PCI-Express 10/100/1000Base-TX Ethernet for network connection.

The IMBA-910 is designed to focus on the robust Industrial Motherboard market with long-term support services. It no doubt is your first choice.

1.2 Features

- Intel® Pentium® 4 Processor 600 Sequence, Core   2 Duo Processor Up to 2.66GHz, FSB 533/800/1066 MHz
- Intel® Q965 Chipset
- DDR II 533/667/800MHz Memory Support up to 8GB
- PCI-Express [x1] 10/100Base-TX & Gigabit Ethernet x 2 (Optional)
- Provides an Integrated Graphics Device (IGD) Delivering 3D/2D/Video Capabilities VGA Support
- CompactFlash^{TM} Type II x 1, SATA II x 4 (RAID Optional)
- USB2.0 x 8, COM x 2, Parallel x 1, IrDA x 1
- PCI-Express[x16] x 1, PCI-Express[x4] x 1, PCI x 3 Expansions
- ATX 2.1
- Intel® AMT with Circuit Breaker (Optional)

1.3 Specifications

System

- CPU   Intel® Pentium 4 processor 600
                        sequence, Core™ 2 Duo family up to
                        2.66GHz LGA775 package, FSB
                        533/800/1066MHz
- System Memory   240-pin 1.8V DDRII DIMM socket x 4,
                        up to 8GB; DDRII 533/667/800MHz
                        Dual-channel support
- Chipset   Intel® Q965 + ICH8/ICH8 DO optional
- Ethernet   PCI-E[x1] 10/100Base-TX &
                        10/100/1000Base-TX, RJ-45 x 2
                        (Optional);
                        LAN1: Intel® 82566/ 82562
                        LAN2: Intel® LAN controller (PCI-E) -
                        82573L
- BIOS   Award Plug & Play SPI Flash BIOS –
                        16Mb ROM
- H/W Status Monitoring   CPU Fan speed, temperature,
                        PSU Voltage
- PCI Interface   PCI-Express[x16] x 1, PCI-Express[x4]
                        x 1, 32-bit/33MHz PCI x 3
- Expansion Interface PCI, PCI-Express
- Watchdog Timer   1~255 steps, can be set with software

on super I/O

- RTC　　　　　　　　Internal RTC
- Battery　　　　　　Lithium battery
- Power Requirement　ATX 2.1
- Operating Temp.　　$32^oF \sim 140^oF$ ($0^oC \sim 60^oC$)
- Board Size　　　　 12"(L) x9.6" (W) (304.8mm x 243.8mm)
- Gross Weight　　　0.66lb (0.3kg)
- MTBF (Hours)　　　55,000
- EMC　　　　　　　 CE/FCC Class A

Display

- VGA Controller　　Integrated VGA on Intel® Q965,

　　　　　　　　　　PCI-Express[x16]

- Memory　　　　　　Shared memory up to 256M
- Resolutions　　　　2048 x 1536 @ 85Hz for CRT

I/O: Winbond 83627

- Storage　　　　　　SATA II x 4 (RAID optional)/ IDE x 1

　　　　　　　　　　(SATA to IDE);

　　　　　　　　　　CompactFlash™ Type II Connector

　　　　　　　　　　(SATA to CompactFlash™) x 1;

　　　　　　　　　　Standard FDD x 1, supports up to two

　　　　　　　　　　floppy devices

- Serial Port　　　　COM x 2 (Internal pin header x 1,

　　　　　　　　　　external D-sub x 1)

COM1: RS-232

COM2: RS-232/422/485

- Parallel Port   Supports SPP/EPP/ECP mode
- USB   USB 2.0 x 8

  5x2 pin header for internal x 2,

  Type-A connector onboard x 4

- PS/2 Port   Keyboard x 1, Mouse x 1
- Audio   Audio pin header (PER-U01H

  (Daughter Board)   audio board optional)

- Digital I/O   4 in and 4 out
- IrDA   IrDA Tx/Rx header x 1

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
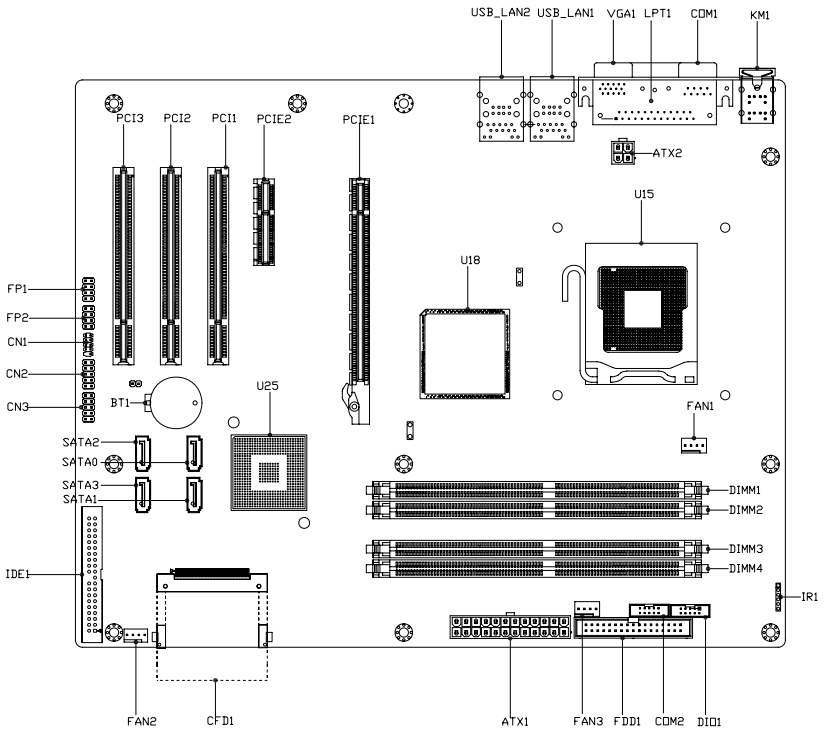
2.3 Mechanical Drawing

1.60

31.50
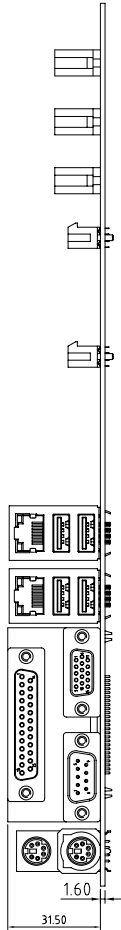
2.4 List of Jumpers

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
CMOS1	Clear CMOS
FP2 (5-7)	Internal BUZZER
MFG_MODE	MFG 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:
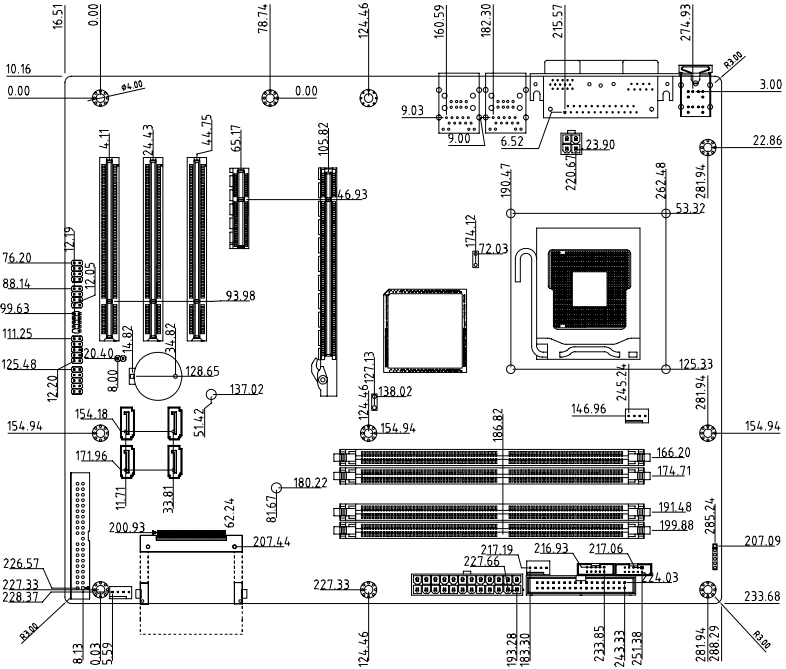
Label	Function
ATX1**	24-Pin ATX Power Connector
ATX2**	4-Pin ATX Power_12V Connector
FDD1**	Floppy Disk Connector
SATA0~3**	Serial ATA Connector
IDE1**	IDE Connector
USB_LAN1**	USB Connector and LAN1 Connector
USB_LAN2**	USB Connector and LAN2 Connector
VGA1**	VGA Connector
COM1**	RS-232 Serial Port Connector
LPT1	Printer Port

DIMM1~4**	DDRII DIMM Slot
KM1**	PS/2 Keyboard/Mouse Connector
CFD1**	Compact Flash Slot
PCIE_1**	PCI-Express〔x16〕Slot
PCIE_2**	PCI-Express〔x4〕Slot
PCI Slot 1~3**	PCI Slot
CN2、3	USB PIN HEADER
COM2	RS-232/422/485 Serial Port PIN HEADER
FAN1~3	Fan Connector
IR1	IrDA Connector
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
DIO1	Digital I/O Connector
CN1	HD Audio Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip.

To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

Open　　　**Closed**　　　**Closed 2-3**
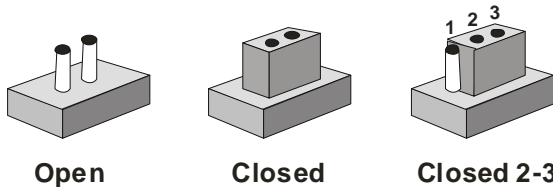
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 Clear CMOS (CMOS1)

CMOS1	Function
1-2 (Short)	Clear
Open	Protected (default)

2.8 BUZZER (FP2)

FP2	Function
5-7	Enable Internal SPK (default)
Open	Disable Internal SPK

2.9 MFG Selection (MFG_Mode)

MFG_Mode	Function
CLOSE(1-2)	Un-update BIOS/MAC
OPEN	Normal (default)

2.10 Front Panel Connector (FP1)

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

2.11 Front Panel Connector (FP2)

Note: **Internal Buzzer enable: Close Pin 5,7**

Pin	Signal	Pin	Signal
1	External Speaker(+)	2	KeyBoard Lock (+)

3	NC	4	GND
5	Internal Buzzer(-)	6	I2C Bus SMB Clock
7	External Speaker(-)	8	I2C Bus SMB Data

2.12 USB Pin Header (CN2, CN3)

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

2.13 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		

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	10	NC

2.15 FAN Connector (FAN1~3)

Pin	Signal
1	GND
2	+12V
3	SENCE
4	CTRL

2.16 PS/2 Keyboard/ Mouse Connector (KM1)

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

2.17 IrDA Connector (IR1)

Pin	Signal
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

2.18 Digital I/O Connector (DIO1)

Please refer to the appendix D for the DIO sample code.

Pin	Signal	Pin	Signal
1	DIO1-1	2	DIO1-2
3	DIO1-3	4	DIO1-4
5	DIO1-5	6	DIO1-6
7	DIO1-7	8	DIO1-8
9	+5V	10	GND

2.19 HD Audio Connector (CN1)

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	NC	10	+3.3V

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

CPU, Heatsink and Fan Installation

3.1 CPU installation and motherboard handling

Note: When integrating a Pentium 4 processor-based system, be sure to take the proper electrostatic discharge (ESD) precautions.

Caution: Please follow the steps below to ensure proper installation of your processor.   Failure to follow these instructions may result in damage to your CPU and/or your motherboard.
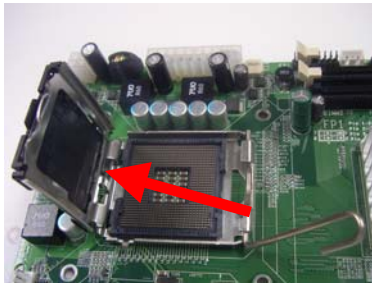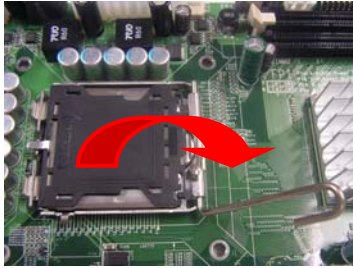

Protective Cover

Retention tab
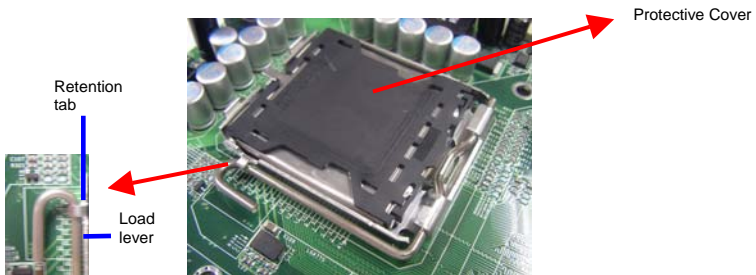
Load lever

Step 1: (Socket Preparation)

Note: Visually inspect to ensure that the socket protective cover is present and securely fastened.

1.   Opening the Socket:

   Note: Hold corner of the load plate while opening and closing the load lever. This will prevent the bounce back of the load plate which can cause bent contacts.

   a.   Disengage the Load Lever by pressing down and out on the hook allowing the lever to clear the Retention Tab and rotate to the fully open position.

    b.   Rotate Load Plate to fully open position.

    c.   Remove the Protective Cover

**Caution:** Do not touch the Socket Contacts. This may result in damage to the

contacts.

Note: Visually inspect the contact area for bent contacts and foreign material.

Step 2: (Processor Handling)

<u>**Note**</u>: Handle Processor by substrate edges only.

<u>**Caution**</u>: Do not touch processor contacts at any time

a.   Remove processor from shipping media by grasping substrate edges only

b.   Visually inspect the processor gold pad array for presence of foreign material. If foreign material is present the pads may be wiped clean with a lint-free cloth and isopropyl alcohol.

c.   Locate the connector 1 indicator and the two orientation notches. (See photo)
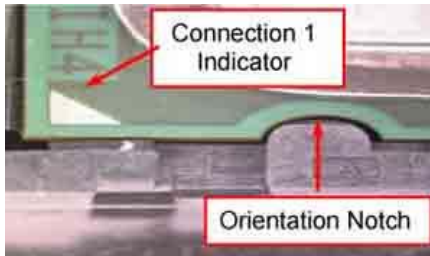
Step 3: (Positioning the CPU into socket)

> a. Grasp the processor with your thumb and forefinger on the edges with the orientation notches. The socket has cut-outs for your fingers when handled in this orientation.
>
> b. Carefully place the CPU into the socket with a purely vertical motion.
>
> c. Verify that the CPU is in the socket body and properly mated to the orientation keys.

The **Alignment Key** is for you to check if the CPU is aligned with the CPU notch properly.
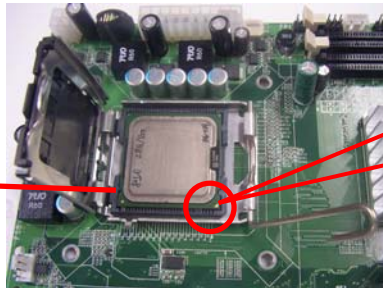
Yellow Triangle Mark

d. Close the upper plate (A), place the load lever back to the original position and tightly wedge the lever into the fastening tab. (B)
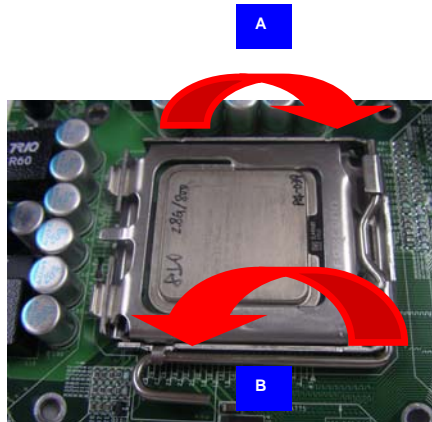
Step 4: (Heatsink/ Fan Installation).

a. Place bottom bracket underneath the socket making sure that threaded socket is aligned with the holes in the motherboard.

b. Viewing the board again from the topside make sure the bracket on the solder side has not shifted from its position. Daub thermal compound on the CPU.

c. Place the Heatsink on the top of CPU. Please make sure that the four screws are aligned with the holes on the board.
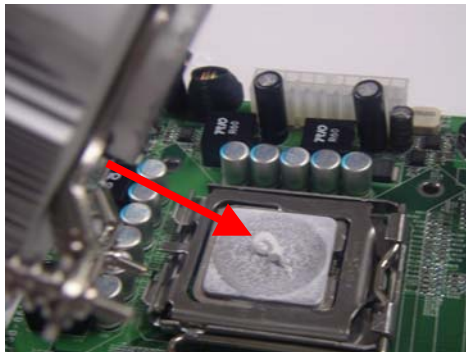
d. Fasten the four screws. First fasten the two screws (yellow) and then fasten the two screws (red) in sequence to secure the heatsink in place.

e. Connect the CPU fan cable to the power connector labeled FAN1 on the board.

Chapter

4

Award
BIOS Setup

4.1　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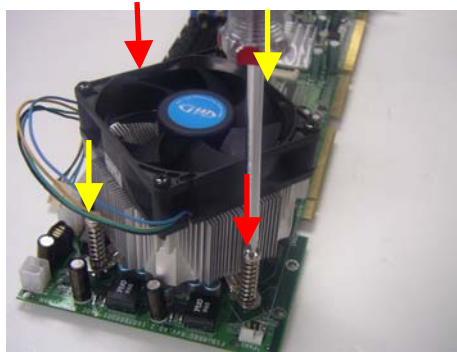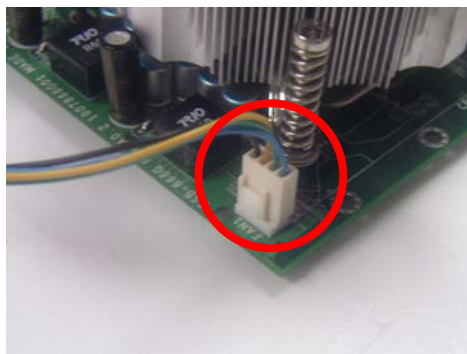 message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

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 IMBA-910 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.

4.2   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.

```
          Phoenix - AwardBIOS CMOS Setup Utility

 ▶ Standard CMOS Features          ▶ Frequency/Voltage Control

 ▶ Advanced BIOS Features            Load Fail-Safe Defaults

 ▶ Advanced Chipset Features         Load Optimized Defaults

 ▶ Integrated Peripherals            Set Supervisor Password

 ▶ Power Management Setup            Set User Password

 ▶ PnP/PCI Configurations            Save & Exit Setup

 ▶ PC Health Status                  Exit Without Saving

 Esc : Quit      F9 : Menu in BIOS    ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup

              Time, Date, Hard Disk Type...
```

Standard CMOS Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

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

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

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

Frequency/Voltage Control

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

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

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

Chapter

5

Driver Installation

The IMBA-910 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Intel INF Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install RAID Driver

USB 2.0 Drivers are available for download using Windows® Update for both Windows® XP and Windows® 2000. For additional information regarding USB 2.0 support in Windows® XP and Windows® 2000, please visit www.microsoft.com/hwdev/usb/

Please read instructions below for further detailed installations.

5.1   Installation

Insert the IMBA-910 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Intel INF Driver

1.   Click on the *Step 1-INF* folder and double click on the *Setup.exe*

2.   Follow the instructions that the window shows

3.   The system will help you install the driver automatically

Step 2 – Install VGA Driver

1.   Click on the *Step 2-VGA* folder and choose the OS your system is

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

3.   Follow the instructions that the window shows

4.   The system will help you install the driver automatically

Step 3 –Install LAN Driver

1.   Click on the *Step 3-LAN* folder and choose the OS your system is

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

3.   Follow the instructions that the window shows

4.   The system will help you install the driver automatically

Step 4 – Install RAID Driver

1.　　Click on the *Step 4-RAID* folder and select the *WinOS*
　　　folder

2.　　Double click on *iata78_cd.exe*

3.　　Follow the instructions that the windows shows

4.　　The system will help you install the driver automatically

Note: when you activate the RAID function, please use USB-CDROM to
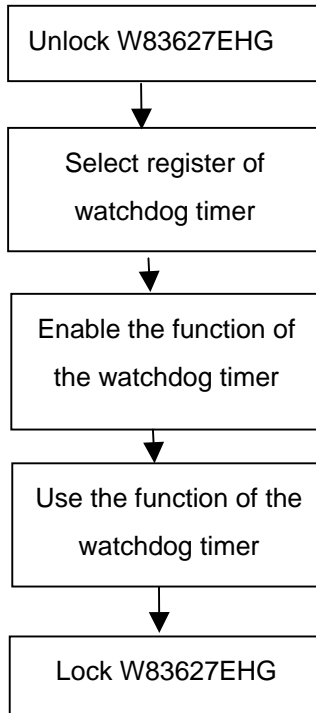　　install the OS.

Appendix

A

Programming the Watchdog Timer

A.1 Programming

IMBA-910 utilizes W83627EHG chipset as its watchdog timer controller.

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

Configuring Sequence Description

```
┌─────────────────────────┐
│   Unlock W83627EHG      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│    Select register of    │
│      watchdog timer      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   Enable the function of │
│    the watchdog timer    │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   Use the function of the│
│      watchdog timer      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│     Lock W83627EHG      │
└─────────────────────────┘
```

There are three steps to complete the configuration setup:

(1) Enter the W83627EHG config Mode

(2) Modify the data of configuration registers

(3) Exit the W83627EHG config Mode. Undesired result may occur if the config Mode is not exited normally.

(1) Enter the W83627EHG config Mode

To enter the W83627EHG config Mode, two 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 two write operations to the Special Address port (2EH). The different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

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

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the config 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 W83627EHG config Mode

The exit key is provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
0aah:	2Eh	2Fh

WatchDog Timer Register I (Index=F5h, Default=00h)

CRF5 (PLED mode register. Default 0 x 00)

Bit 7-6   : select PLED mode

= 00   Power LED pin is tri-stated.

= 01   Power LED pin is drived low.

= 10   Power LED pin is a 1Hz toggle pulse with 50 duty cycle.

= 11   Power LED pin is a 1/4Hz toggle pulse with 50 duty cycle.

Bit 5-4   : Reserved

Bit 3   : select WDTO count mode.

= 0   second

= 1   minute

Bit 2   : Enable the rising edge of keyboard Reset (P20) to force Time-out event.

= 0 Disable

= 1 Enable

Bit 1-0   : Reserved

WatchDog Timer Register II (Index=F6h, Default=00h)

Bit 7-0   = 0 x 00 Time-out Disable

= 0 x 01 Time-out occurs after 1

second/minute

= 0 x 02 Time-out occurs after 2

second/minutes

= 0 x 03 Time-out occurs after 3

second/minutes

………………………………..

= 0 x FF Time-out occurs after 255

second/minutes

WatchDog Timer Register III (Index=F7h, Default=00h)

Bit 7   : Mouse interrupt reset Enable or Disable

    = 1   Watchdog Timer is reset upon a Mouse interrupt

    = 0   Watchdog Timer is not affected by Mouse interrupt

Bit 6   : Keyboard interrupt reset Enable or Disable

    = 1   Watchdog Timer is reset upon a

            Keyboard interrupt

    = 0   Watchdog Timer is not affected by

            Keyboard interrupt

Bit 5   : Force Watchdog Timer Time-out. Write

        Only

    = 1   Force Watchdog Timer time-out

            event: this bit is self-clearing

Bit 4   : Watchdog Timer Status. R/W

    = 1   Watchdog Timer time-out occurred

    = 0   Watchdog Timer counting

Bit 3-0   : These bits select IRQ resource for

        Watchdog. Setting of 2 selects SMI.

A.2 W83627EHG Watchdog Timer Initial Program

Example: Setting 10 sec. as Watchdog timeout interval

;//

Mov dx,2eh   ;Enter W83627EHG config mode

Mov al,87h   (out 87h to 2eh twice)

Out dx,al

Out dx,al

;//

Mov al,07h

Out dx,al

Inc dx

Mov al,08h   ;Select Logical Device 8 (GPIO Port 2)

Out dx,al

;//

Dec dx

Mov al,30h   ;CR30 (GP20~GP27)

Out dx,al

Inc dx

Mov al,01h   ;Activate GPIO2

Out dx,al

```
;//////////////////////////////////////////////////////////////////////////////////////////
Dec dx
Mov al,0f5h              ;CRF5 (PLED mode register)
Out dx,al
Inc dx
In al,dx
And al,not 08h           ;Set second as counting unit
Out dx,al
;//////////////////////////////////////////////////////////////////////////////////////////
Dec dx
Mov al,0f6h              ; CRF6
Out dx,al
Inc dx
Mov al,10               ;Set timeout interval as 10 sec.
Out dx,al
;//////////////////////////////////////////////////////////////////////////////////////////
Dec dx                  ;Exit W83627EHG config mode
Mov al,0aah              (out 0aah to 2eh once)
Out dx,al
;//////////////////////////////////////////////////////////////////////////////////////////
```

Appendix

B

I/O Information

B.1 I/O Address Map

```
CP-13E3649AED9E
  Direct memory access (DMA)
  Input/output (IO)
    [00000000 - 00000CF7] PCI bus
      [00000000 - 0000000F] Direct memory access controller
      [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
      [00000274 - 00000277] ISAPNP Read Data Port
      [00000279 - 00000279] ISAPNP Read Data Port
      [000002F8 - 000002FF] Communications Port (COM2)
      [00000378 - 0000037F] Printer Port (LPT1)
      [000003B0 - 000003BB] Intel(R) Q965/Q963 Express Chipset Family
      [000003C0 - 000003DF] Intel(R) Q965/Q963 Express Chipset Family
      [000003F0 - 000003F5] Standard floppy disk controller
      [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
[00000778 - 0000077B] Printer Port (LPT1)
[00000800 - 0000087F] Motherboard resources
[00000880 - 0000088F] Motherboard resources
[00000A78 - 00000A7B] Motherboard resources
[00000B78 - 00000B7B] Motherboard resources
[00000BBC - 00000BBF] Motherboard resources
[00000D00 - 0000FFFF] PCI bus
[00000E78 - 00000E7B] Motherboard resources
[00000F78 - 00000F7B] Motherboard resources
[00000FBC - 00000FBF] Motherboard resources
[00007000 - 00007FFF] Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[00008000 - 00008FFF] Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[00009000 - 00009FFF] Intel(R) Q963/Q965 PCI Express Root Port - 2991
[0000A000 - 0000AFFF] Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
[0000B000 - 0000BFFF] Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
[0000C000 - 0000CFFF] Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
[0000EC00 - 0000EC0F] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000ED00 - 0000ED0F] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000EE00 - 0000EE03] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000EF00 - 0000EF07] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000F000 - 0000F003] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000F100 - 0000F107] Intel(R) ICH8 2 port Serial ATA Storage Controller - 2825
[0000F300 - 0000F30F] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[0000F400 - 0000F40F] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[0000F500 - 0000F503] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[0000F600 - 0000F607] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[0000F700 - 0000F703] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[0000F800 - 0000F807] Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
[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) 82562V 10/100 Network Connection
[0000FF00 - 0000FF07] Intel(R) Q965/Q963 Express Chipset Family

B.2 1st MB Memory Address Map

```
Interrupt request (IRQ)
Memory
    [00000000 - 0009FFFF] System board
    [000A0000 - 000BFFFF] PCI bus
        [000A0000 - 000BFFFF] Intel(R) Q965/Q963 Express Chipset Family
    [000C0000 - 000DFFFF] PCI bus
    [000E0000 - 000EFFFF] System board
    [000F0000 - 000FFFFF] System board
    [00100000 - 1F68FFFF] System board
    [1F690000 - 1F6FFFFF] System board
    [1F700000 - FEBFFFFF] PCI bus
        [1F700000 - 1F7FFFFF] System board
        [D0000000 - DFFFFFFF] Intel(R) Q965/Q963 Express Chipset Family
        [E0000000 - EFFFFFFF] Motherboard resources
        [FD000000 - FD0FFFFF] Intel(R) Q965/Q963 Express Chipset Family
        [FD100000 - FD1FFFFF] Intel(R) Q963/Q965 PCI Express Root Port - 2991
        [FD400000 - FD4FFFFF] Intel(R) Q963/Q965 PCI Express Root Port - 2991
        [FD500000 - FD5FFFFF] Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
        [FD600000 - FD6FFFFF] Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
        [FD700000 - FD7FFFFF] Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
        [FD800000 - FD8FFFFF] Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
        [FD900000 - FD9FFFFF] Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
        [FDA00000 - FDAFFFFF] Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
        [FDB00000 - 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
        [FDFC0000 - FDFDFFFF] Intel(R) 82562V 10/100 Network Connection
        [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) 82562V 10/100 Network Connection
    [FEC00000 - FEC00FFF] System board
    [FED13000 - FED1FFFF] System board
    [FED20000 - FED9FFFF] System board
    [FEE00000 - FEE00FFF] System board
    [FFB00000 - FFB7FFFF] System board
    [FFB80000 - FFBFFFFF] Intel(R) 82802 Firmware Hub Device
    [FFF00000 - FFFFFFFF] System board
```

B.3 IRQ Mapping Chart

```
□ 🖥 CP-13E3649AED9E
  ⊞ 🔲 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) 12   PS/2 Compatible Mouse
      📓 (ISA) 13   Numeric data processor
      📓 (PCI) 11   Intel(R) ICH8 Family SMBus Controller - 283E
      📓 (PCI) 16   Intel(R) Q965/Q963 Express Chipset Family
      📓 (PCI) 16   Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
      📓 (PCI) 16   Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
      🖧 (PCI) 16   Intel(R) ICH8 Family USB Universal Host Controller - 2834
      📓 (PCI) 16   Intel(R) Q963/Q965 PCI Express Root Port - 2991
      📓 (PCI) 17   Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
      📓 (PCI) 18   Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
      🖧 (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 2 port Serial ATA Storage Controller - 2825
      🖴 (PCI) 19   Intel(R) ICH8 4 port Serial ATA Storage Controller - 2820
      📓 (PCI) 19   Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
      🖧 (PCI) 19   Intel(R) ICH8 Family USB Universal Host Controller - 2831
      🖧 (PCI) 20   Intel(R) 82562V 10/100 Network Connection
      🖧 (PCI) 21   Intel(R) ICH8 Family USB Universal Host Controller - 2835
      🖧 (PCI) 23   Intel(R) ICH8 Family USB Universal Host Controller - 2830
      🖧 (PCI) 23   Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
  ⊞ 🔲 Memory
```

Note: Six devices have occupied the IRQ 19.   Therefore, it could occur the insufficient of the IRQ resource when you install a different PCI card.

B.4 DMA Channel Assignments

```
□ 🖥 CP-13E3649AED9E
  □ 🔲 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	1137-020-40 SA	IDE Cable	1701400453
SATA0	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
SATA1	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
SATA2(-G2)	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
SATA3(-G2)	SATA Connector	TECHBEST	161S01-025 A	SATA Cable	1709070780
FDD1	Floppy Connector	Catch Electronics	1137-000-34 SA	Floppy Disk Drive Cable	1701340704
LPT1	Parallel Port Connector	FOXCONN	DM11351-H 5W3-4F		N/A
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
CN2	USB Pin Header	JIH VEI Electronics	21B22564-X XS10B-01G -6/3-VXX	USB Cable	1709100204
CN3	USB Pin Header	JIH VEI Electronics	21B22564-X XS10B-01G -6/3-VXX	USB Cable	1709100204
DIO1	Digital I/O Box Header	Catch Electronics	1147-000-10 S		N/A
CN1	Audio Pin Header	JIH VEI Electronics	21N22050-1 0S10B-01G- 4/2.8-V1-G		N/A

ATX1	ATX External 5VSB Connector	Catch Electronics	1121-700-24S		N/A
ATX2	4P Power Connnector	Catch Electronics	1121-700-04S		N/A
FAN1	FAN Connector	Catch Electronics	1190-700-042		N/A
FAN2	FAN Connector	Catch Electronics	1190-700-042		N/A
FAN3	FAN Connector	Catch Electronics	1190-700-042		N/A
USB_LAN 1(-G2)	Ethernet & USB Connector	FOXCONN	JFM38U1B-21U5-4F		N/A
USB_LAN 2 (-G2)	Ethernet & USB Connector	FOXCONN	JFM38U1B-21U5-4F		N/A
USB_LAN 1 (-VE)	Ethernet & USB Connector	FOXCONN	JFM24U1B-21U6-4F		N/A
USB_LAN 2 (-VE)	USB Connector	FOXCONN	UFL2443-F1-01		N/A
IR1	IrDA Connector	JIH VEI Electronics	21B12050-XXS10B-01G-4/2.8		N/A
KM1	Mini-Din PS/2 Connector	FOXCONN	MH11061-P36-4F		N/A
COM1	Serial Port 1 Connector	Astron	DB6A-09-AMGN1-R		N/A
COM2	Serial Port 2 Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
VGA1	CRT Display Connector	Catch Electronics	3125-000-15SB		N/A

Appendix

D

DIO
Sample Code

D.1 DIO Sample Code

[Winbow 83627 DIO Simple code]

```
      Superio_Config_Port    EQU  2Eh


          call     Superio_Enter_Config
         mov      cl, 7              ;
          call     Set_Logic_Device


         ;
         mov   cl, 2Ah                 ;Determined by bit0~bit5 of
GPIO set
        call    Superio_Get_Reg
          mov   al, 0FCh              ; GPIO1(gpio10~17)
        call    Superio_Set_Reg


          ;
         mov   cl, 30h                ; Address 30h
enable/disable DIO function
        call    Superio_Get_Reg
         mov   al, 01h                ; bit 0 is 0 → disable, bit 0 is 1
→ enable
        call    Superio_Set_Reg
```

```
4In_4Out:
            mov   cl, 0F0h            ; Address F0h   set GPI/GPO
      call     Superio_Get_Reg
            mov   al, 0F0h            ; bit 0~3 set 0 is GP0, bit 4~7
set 1 is GPI
      call     Superio_Set_Reg


            mov   cl, 0F1h               ; Address F1h   set
GPO high/low
      call     Superio_Get_Reg
            mov   al, 0Fh                ; bit 0~3 set 1 is high
      call     Superio_Set_Reg
      jmp   Digital_IO1_Exit
Digital_IO1_Exit:
call    X_Superio_Exit_Config
Ret




--------------------------------------------------------------------
      public Superio_Enter_Config
Superio_Enter_Config   Proc   Near
      mov   dx, Superio_Config_Port
      mov   al, 087h
      out    dx, al
      out    dx, al
```

```
        ret
Superio_Enter_Config   Endp


        PUBLIC      X_Superio_Exit_Config
X_Superio_Exit_Config  Proc   Near
        mov   dx, Superio_Config_Port
        mov   al, 0AAh
        out   dx, al
        ret
X_Superio_Exit_Config  Endp


        public Set_Logic_Device
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


        public Superio_Get_Reg
Superio_Get_Reg proc   Near
```

```
        mov   al, cl
        mov   dx, Superio_Config_Port
        out   dx, al
        NEWIODELAY
        inc   dx
        in    al, dx
        NEWIODELAY


        ret
Superio_Get_Reg endp



        public Superio_Set_Reg
Superio_Set_Reg proc   near
        push  ax
        mov   dx, Superio_Config_Port
        mov   al,cl
        out   dx,al
        NEWIODELAY
        pop   ax
        inc   dx
        out   dx,al
        NEWIODELAY
        ret
Superio_Set_Reg endp
```