FWB-880M

Intel® Pentium® 4 Processor

Integrated VGA on Intel® 945G

With X16 PCI-Express Slot

4 x DDRII 533/667

Dual Channel Memory

8 USB 2.0 / 2 COMs

FWB-880M Manual Rev.A 1st Ed.

Oct. 2005

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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   Serial Cable
- 4   Serial ATA Cable
- 1   CPU Cooler, Fan for LGA 775 Pentium® 4
- 1   FWB-880M 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 FWB-880M is AAEON's Industrial Motherboard which adopts Intel® Pentium® 4/ Celeron® D LGA775 CPU (Supports 1066/880/533MHz FSB).   The high-speed system chipset is one of Intel® leader accounts.   The FWB-880M is designed for Industrial Motherboard with ATX form factor.

Integrating with GMA950 2D/3D Graphics Accelerator which makes the FWB-880M with a great performance on VGA display and the core frequency up to 400MHz with X16 PCI-Express slot.

FWB-880M promises you off-the-shelf expansion possibilities with versatile expansion interfaces- PCI connectors to extend your onboard features.

The FWB-880M is designed to focus on the Industrial Motherboard market with long-term support services. The FWB-880M no doubt is your best choice.

1.2 Features

1. Supports Intel® Pentium® 4 / Celeron-D LGA775 CPU (Supports 1066/800/533MHz FSB)

2. DDR2 Memory Support up to 4GB

3. Integrated GMA950 2D/3D Graphics Accelerator with X16 PCI-Express Slot, VGA Support

4. Supports Ultra 1 ATA100 & 4 SATA 3Gb/s

5. 8 USB 2.0/ 2 RS-232/422/485/ 1 Parallel/ 1 IrDA port/ AC 97 Connector

6. 10/100Base-TX Ethernet (Optional)

7. Watchdog Function 1~255 Sec.

1.3 Specifications

System

- CPU   Intel® Pentium® 4/ Celeron® D LGA 775 CPU (Supports 1066/ 800/ 533MHz FSB)
- System Memory   4 x 240-pin 1.8V DDR II DIMM Socket, support Dual Channel DDR memory up to 4GB (DDR2 533/667)

Note: Due to chipset resource allocation, the system may detect less than 4G system memory when installing four 1G DDR II memory modules.

- Chipset   Intel® 945G + Intel® 82801GB (ICH7)
- Ethernet   Intel 82562EZ controller, 10/100Mb LAN optional, RJ-45 x 1
- BIOS   Award Plug & Play BIOS – 4Mb ROM
- IDE Interface   ATA-100 x 1 channel; SATA 3Gb/s x 4 (supports four SATA II devices)
- Watchdog Timer   1~255 steps, can be set with software on super I/O
- Expansion Interface   PCI
- RTC   Internal RTC
- Battery   Lithium battery

- Power Requirement   ATX 12V
- EMC   CE/ FCC Class A
- Operating Temp. $0^{o}C \sim 40^{o}C$ ($32^{o}F \sim 104^{o}F$)
- Board Size   11.8"(L) x9.45" (W)
                           (300mm x 240mm)
- Gross Weight   1lb (0.5kg)

Display

- VGA Controller   Integrated VGA on Intel$^{®}$ 945G,
                           Core frequency up to 400MHz with
                           X16 PCI Express slot

I/O

- Floppy Drive Interface   One Standard FDD port, supports
                           up to two floppy devices
- IrDA   One IrDA Tx/Rx header
- Audio(Daughterboard)   AC-97 pin-header (optional Audio
                           Daughterboard)
- PCI Interface   32-bit/ 33MHz PCI supports 5
                           Masters
- Serial Port   Two COM ports: (Internal Pin
                           Header x 1, External D-sub x 1);
                           COM 1,2: RS-232/422/485
- Parallel Port   Supports SPP/ EPP/ ECP Mode
- USB   Eight USB 2.0 Ports; Two 5x2 pin

		headers for internal; Four Type-A connectors onboard
●	Keyboard & Mouse	One Mini-DIN PS/2 Keyboard Connector; One Mini-DIN PS/2 Mouse Connector

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
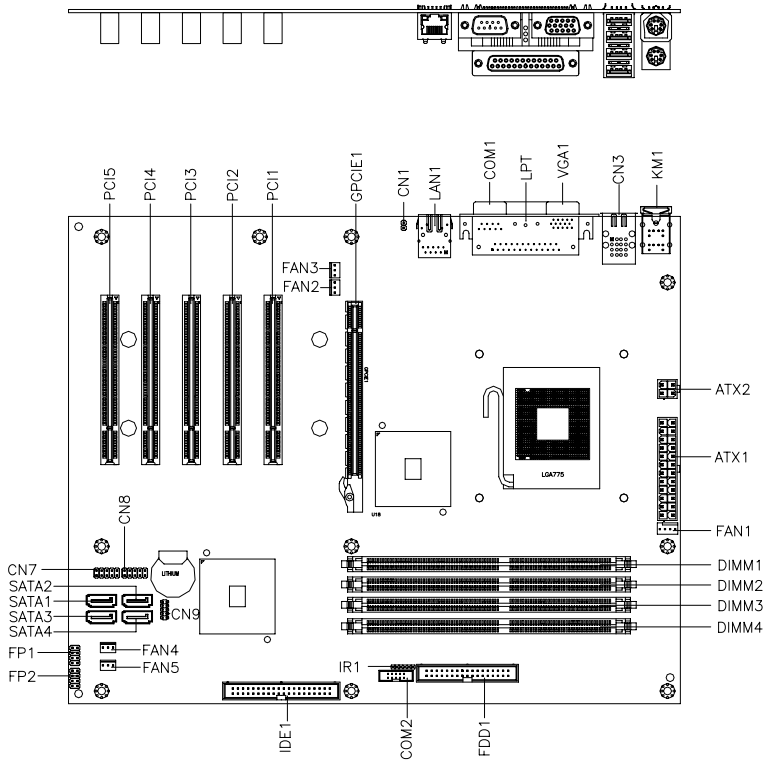
2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	Clear CMOS

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
ATX1	24 pin ATX Power
ATX2	4 pin ATX Power +12V Connector
DIMM1~4	DIMM Slot
GPCIE1	PCI express X16 Graphics Slot
VGA1	VGA Display Connector
IDE1	EIDE Connector
SATA1~4	SATA Connector
PCI1~5	PCI Slot
KM1	PS2 Keyboard/Mouse Connector
LAN1	10/100 Base-TX Ethernet Connector

CN1	LAN 1 Active LED Connector
CN3	USB Connector 90D X 4
CN7~8	USB Connector
CN9	AC97 Connector
FDD1	Floppy Connector
COM1	RS-232/422/485 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
LPT1	LPT Port Connector
IR1	IrDA Connector
FAN1	4-pin Fan Connector
FAN2~5	3-pin Fan 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**
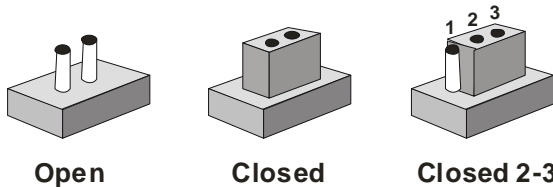
A pair of needle-nose pliers may be helpful when working with jumpers.

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 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(-)

2.8 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

2.9 LAN LED Connector (CN1)

Pin	Signal	Pin	Signal
1	Link_LED(-)	2	Active_LED(+)

2.10 USB Connector (CN7, CN8)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+

7	GND	8	USBD2-
9	GND	10	+5V

2.11 AC97 Connector (CN9)

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

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

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

2.13 IrDA Connector (IR1)

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

5	IRTX
6	N.C

2.14 Fan Connector (FAN1)

Pin	Signal
1	GND
2	+12V
3	Speed Sense
4	Speed CTRL

2.15 FAN Connector (FAN2~5)

| Pin	Signal
1	GND
2	+12V
3	Speed Sense

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.
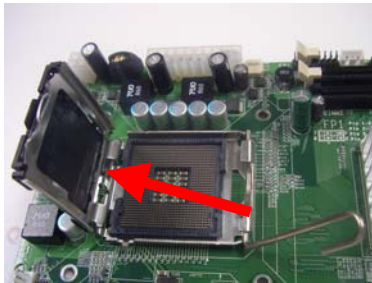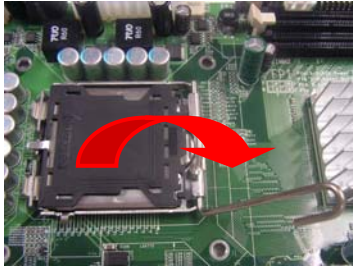

Protective Cover

Retention tab
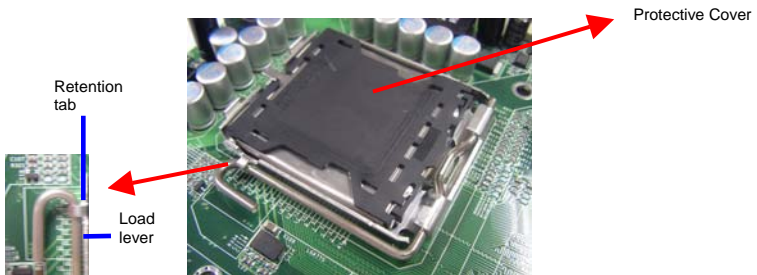
Load lever

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)

Note: Handle Processor by substrate edges only.

**Caution**: 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)
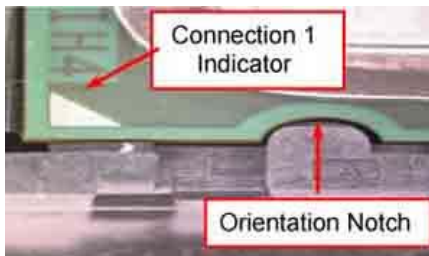
Step 3: (Positioning the CPU into socket)

> 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.
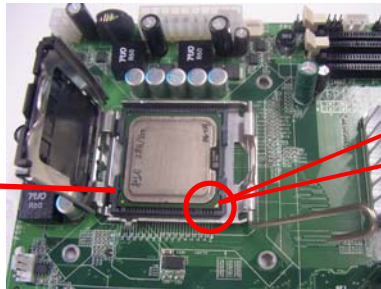
Yellow Triangle Mark

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)
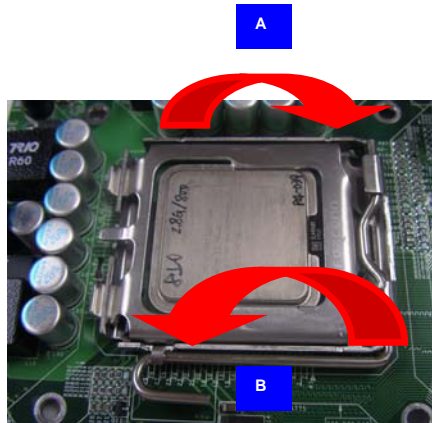

Step 4: (Heatsink/ Fan Installation).

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.
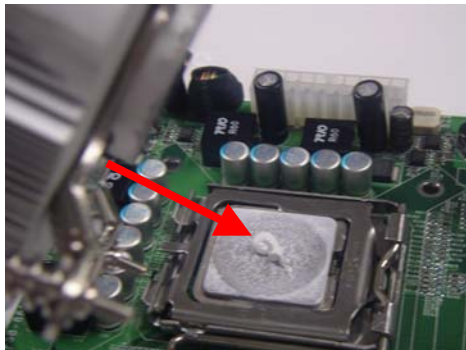
d.   Fasten the four screws. First fasten the two screws
     (yellow) and then fasten the two screws (red) in
     sequence to secure the heatsink in place.
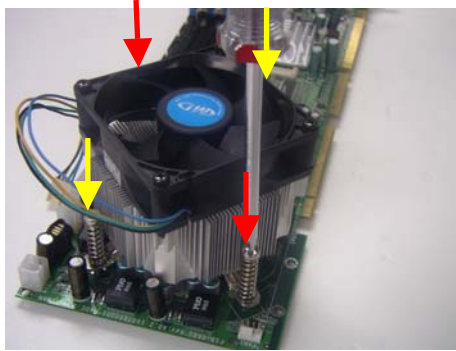
e.   Connect the CPU fan cable to the power connector
     labeled FAN1 on the board.

Chapter

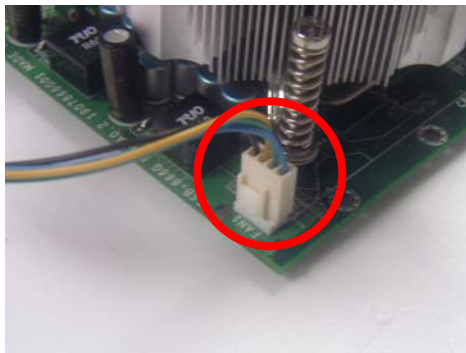4

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 FWB-880 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.
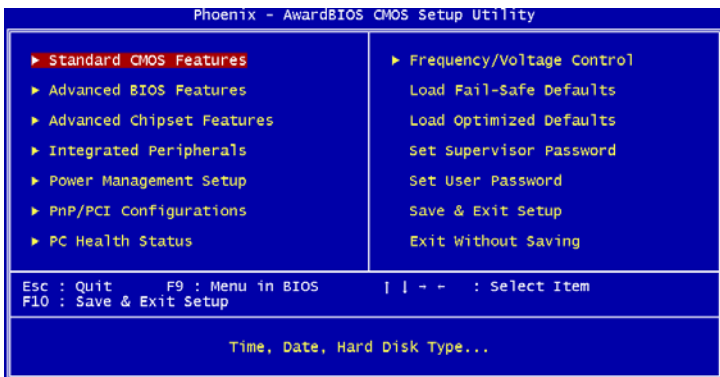
Standard CMOS Features

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 FWB-880M 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 Update

Step 2 － Install Intel Extreme Graphics Driver

Step 3 － Install Intel LAN Driver

Step 4 － Install Hardware Doctor Driver

Step 5 － Install Realtek AC97 Codec 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 FWB-880M CD-ROM into the CD-ROM drive. And

install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Intel INF Update Driver

1. Click on the *INF* folder and go to the *Public* folder

2. Choose the folder of *Ver.7.2.1.1003*

3. Double click on the ***.exe** file

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Step 2 – Install Intel Graphics Driver

1. Click on the *VGA* folder

2. Select the folder of *FWB-880*

3. Choose the OS your system is

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

5. Follow the instructions that the window shows

6. The system will help you install the driver automatically

Step 3 –Install LAN Driver

1. Click on the *LAN Driver* folder

2. Select the folder of *Intel PRO Network Connections*
   Ver.10.0

3. Double click on the *Autorun* folder

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Step 4 – Install Hardware Doctor

1. Click on the *Hardware Doctor* folder

2. Select the *FWB-880* folder

3. Double click on the ***.exe** file

4. Follow the instructions that the window shows

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

Step 5 – Install AC97 Driver

1. Click on the Audio folder

2. Choose the folder of PER-U00A

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

4. Follow the instructions that the window shows

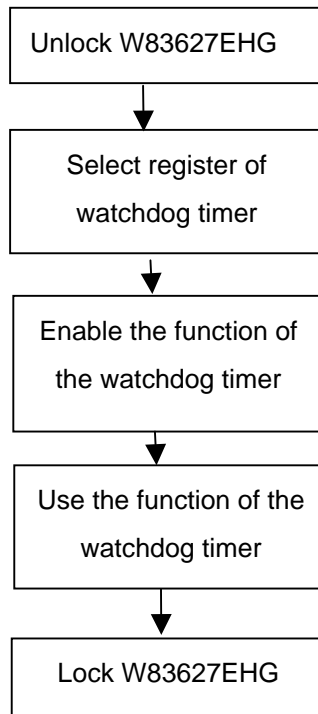5. The system will help you to install the driver automatically

Appendix

A

Programming the
Watchdog Timer

A.1 Programming

FWB-880M 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.

Appendix A Programming the Watchdog Timer   A-3

= 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

;//////////////////////////////////////////////////////////////////////////////
```