AEC-6930

Fanless Embedded Controller
Intel® Core™ 2 Duo Processor
With 2 PCI slots, 2 PCMCIA,
4 COMs, Audio, CompactFlash™

4 Gigabit Ethernet

AEC-6930 Manual 2nd Ed.
May 2009

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Acknowledgments

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- Award is a trademark of Award Software International, Inc.

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- PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

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Packing List

Before you begin operating your PC, please make sure that the following materials are enclosed:

- 1   AEC-6930 Embedded Controller
- 1   Phoenix Power Connector
- 2   Wallmount Brackets
- 1   Audio Cable
- 1   Screw Package
- 1   PS/2 Expansion Cable for Keyboard and Mouse
- 1   IDE 44-pin Flat Cable
- 1   SATA Cable
- 1   SATA Power Cable
- 1   DVI-I to CRT & DVI-D Y Cable
- 1   Mounting Bracket
- 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.

Application Note

1. MXM Card Installation Notice:

MXM slot (for MXM video card expansion, the DVI output adapter was installed already.   If you want to install other MXM video cards, the DVI output adapter has to be removed first.)

Safety & Warranty

1. Read these safety instructions carefully.

2. Keep this user's manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.

4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.

7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.

12. Never pour any liquid into an opening. This could cause fire or electrical shock.

13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

14. If any of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

> d.   The equipment does not work well, or you cannot get it to work according to the user's manual.

> e.   The equipment has been dropped and damaged.

> f.   The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 60°C (140°F). IT MAY DAMAGE THE EQUIPMENT.

FCC

Warning!

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Boxer/ Industrial System

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	×	○	○	○	○	○
外壳	×	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
电源	×	○	○	○	○	○

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：
一、 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。
二、 上述部件物质中央处理器、内存、硬盘、电源为选购品。

Contents

Appendix A   Programming The Watchdog Timer

Appendix B   I/O Information

Chapter

1

General Information

1.1 Introduction

The AEC-6930 BOXER 2 Advanced Embedded Control system continues the BOXER design concept but focuses on the fast expanding Machine Automation market. The AEC-6930 can provide two PCI slot for expansion. Therefore AEC-6930's expandable function, compact size combined with fanless design and highly efficient heat conduction mechanism can fulfill any rugged technical application in industrial automation, factory control, test instrumentation and safety surveillance.

Outstanding Over-spec Design

Intel's® Core™ 2 Duo processor with 1.60 GHz combined with fanless design and high performance is widely acceptable and dependable in this market. USB 2.0, Quad ports GbE Ethernet and 4 Serial ports allow communication with diverse devices with a high transfer rate. Furthermore, the AEC-6930 can concurrently support three tiers of expansion interfaces - PCI, PCMCIA and mini-PCI. These interfaces are fully integrated within the BOXER series and allow an upgrade to their usefulness. It is a leading-edge thermal and vibration design (up to 55 degree operation and 5G RMS vibration) and also an innovation for Machine Automation in the IPC industry. AEC-6930 plays a role in connecting all subsystems in common applications. AAEON

not only enhances your competitive value but also gives you an excellent solution for the future.

Strict Quality Control Process

AAEON retains the perfect product design and management team. Our Quality Control through multiple level experience and test has earned a good reputation in IPC field. AAEON's whole product series are subjected to high-level standards which make them our best guarantee and assurance to customers. Excellent product quality will always be AAEON's best advertisement.

24-hour FAE System

AAEON's e-RMA and e-FAE 24-hour a day systems for all customers' prompt request was formally launched in 2005. No matter if it is a holiday or weekend; we can handle all kinds of requests and give you a satisfactory response in 10 days. AAEON is proud of our quick service and professional teamwork to provide our customers with continual support.

Great design, great value and great service are hallmarks of the AAEON BOXER embedded control PCs. There really is no other choice for your application than AAEON if you want the best performance and best value!

1.2 Features

- Fanless Design with Intel® Core™ 2 Duo 1.60 GHz (L7500) Processors

- Supports 2 PCI Slots for Expansion

- 2 PCMCIA

- 4 COM / 4 USB 2.0 / 4 10/100/1000Base-TX RJ-45 ports

- Operating Temperature: -15°C~50°C

- Anti-vibration up to 5grms / Anti-shock up to 50 g

1.3 Specifications

System

- CPU: Intel$^®$ Core^{TM} 2 Duo 1.60 GHz(L7500) Processor
- System Memory: DDR II SDRAM SODIMM x 2, Max. 2GB x 2
- Expansion: PCI slot x 2; PCMCIA x 2
- Video Interface: DVI-I; The VGA output can apply to the Y cable.
- Keyboard/Mouse: PS/2 Keyboard & Mouse
- Ethernet: 10/100/1000Base-TX RJ-45 Connector x 4
- SSD: CompactFlash$^{™}$ slot x 1
- Device Bay: Internal 2.5" Slim HDD Bay
- Serial Port: RS-232 x 2, RS-232/422/485 x 2 (COM1, COM2)
- Audio: Line-in / Line-out / MIC-in by external cable
- USB: 4 USB 2.0 ports
- Watchdog Timer: Generates a time-out system reset, setting via software
- Power Supply: 1. DC Input -- Internal DC-DC Converter (Default)

Input voltage:

DC 9V/4.3A~ DC 30V/1.29A

2. AC Input -- External Power

Adapter (Optional)

Input voltage: 100V AC ~

240V AC @ 50 ~ 60Hz

- System Control:　　　Power on / off switch x 1;

  Reset button x 1

- Indicators:　　　　Power LED x 1; HDD active

  LED x 1

Mechanical and Environmental

- Construction:　　　　Rugged Aluminum Alloy

  chassis

- Color:　　　　Mustard

- Mounting:　　　　Wallmount

- Dimension:　　　　8.4"(W) x 3.7"(H) x 9.4"(D)

  (214mm x 94.8mm x

  237.8mm)

- Net Weight:　　　12.4 lb (5.63 kg)

- Operating Temperature: 5°F ~ 131°F (-15°C~55°C)

  (L7500, 1.60GHz, CFD);

  5°F ~ 122°F (-15°C ~ 50°C)

  (L7500, 1.60GHz,

  Automotive HDD)

- Storage Humidity: 5~90%@40°C,
  non-condensing
- Vibration: 5g rms / 5~500Hz / random
  operation (CFD); 0.5g rms /
  5~500Hz / random operation
  (Internal HDD bracket)
- Shock: 50g peak acceleration
  (11msec. duration)(CFD)
  20g peak acceleration (11
  msec. duration) (HDD)
- EMC: CE/FCC class A

Front Side
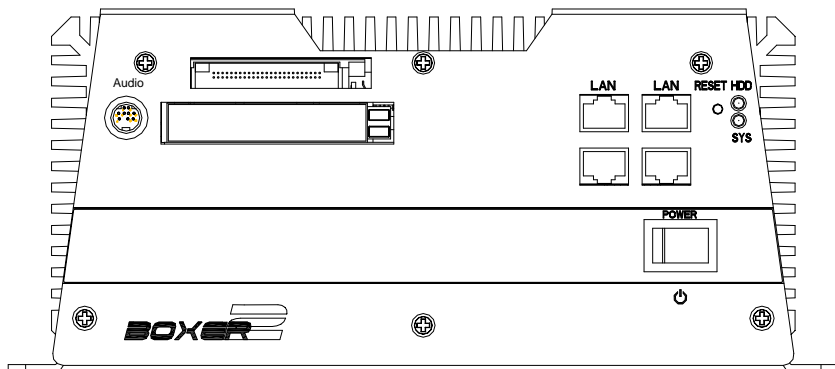
Rear Side
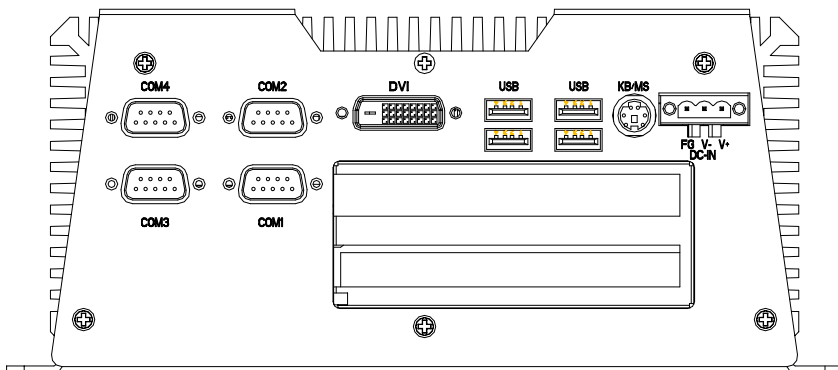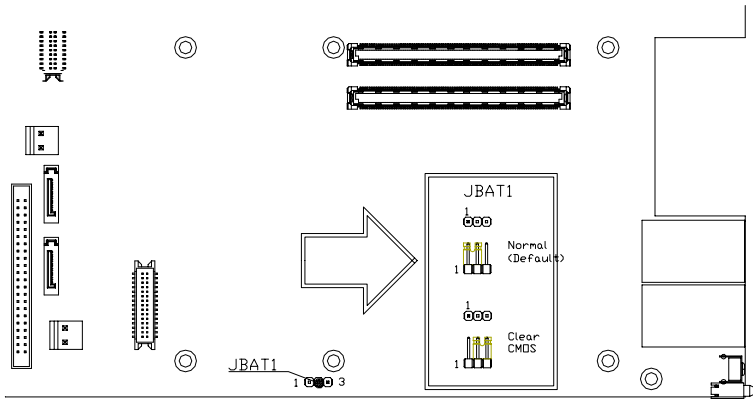
Chapter

2

Hardware Installation
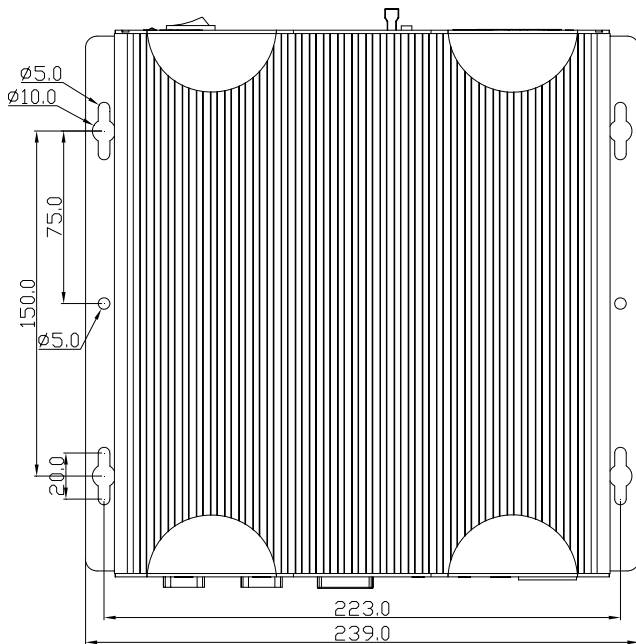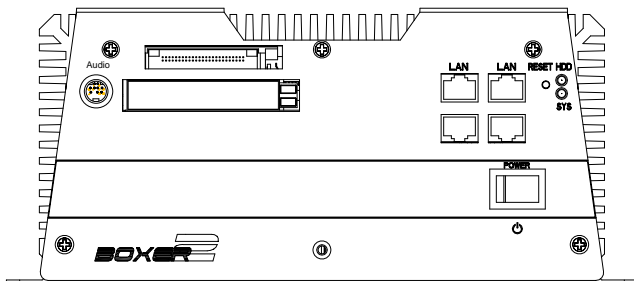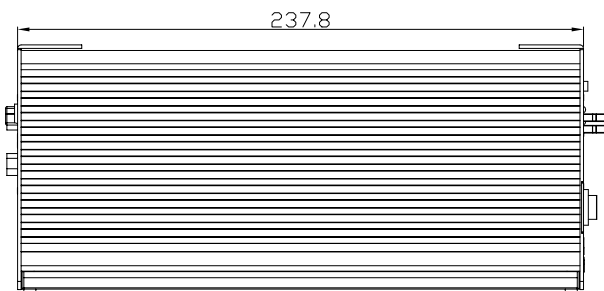
2.1 Jumpers and Connectors
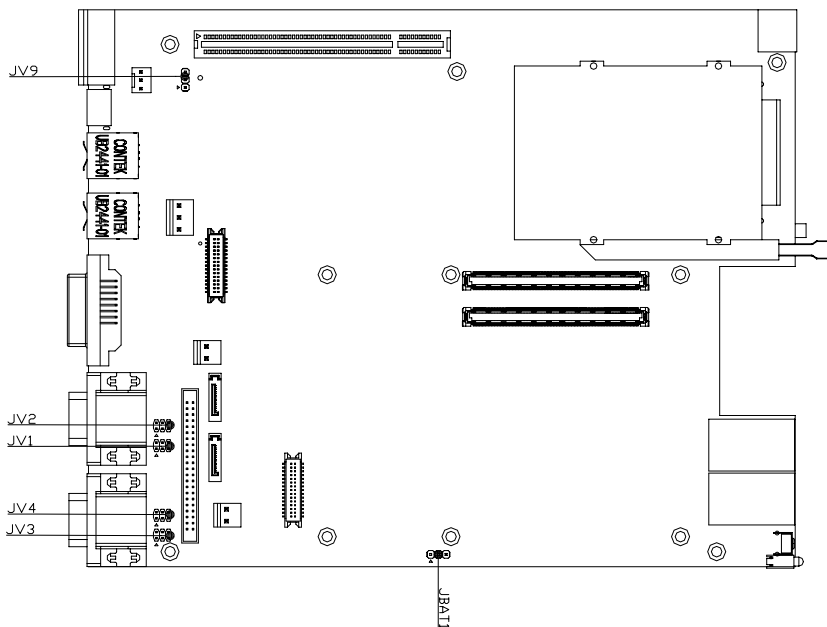
JV1/ JV2/ JV3/ JV4

JV9

JBAT1

2.2 Dimension

214.0

237.8

LAN   LAN   RESET HDD
SYS

POWER

BOXER 2
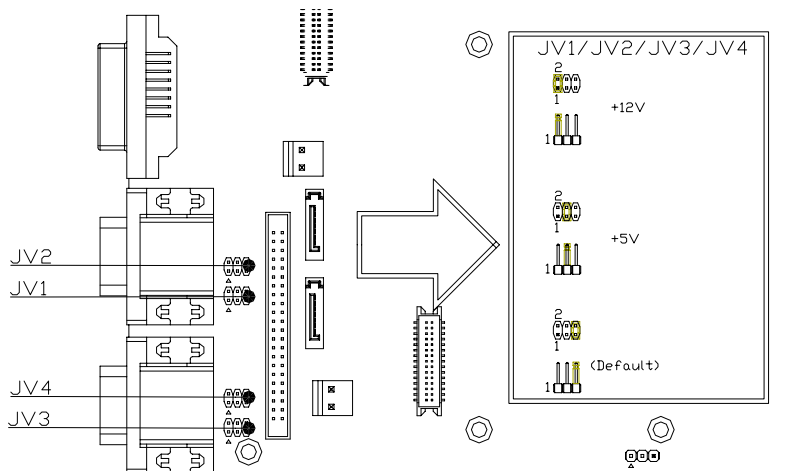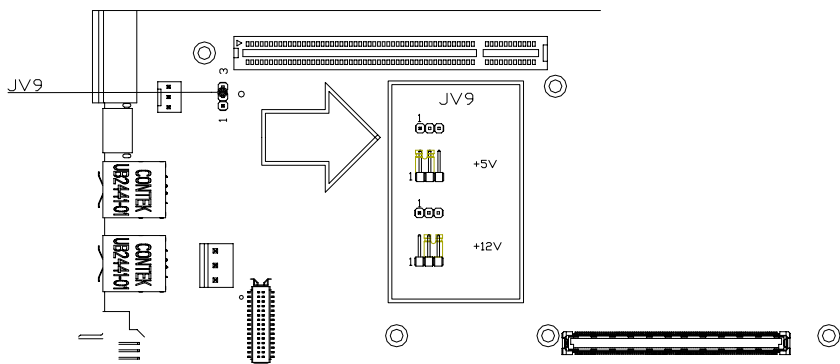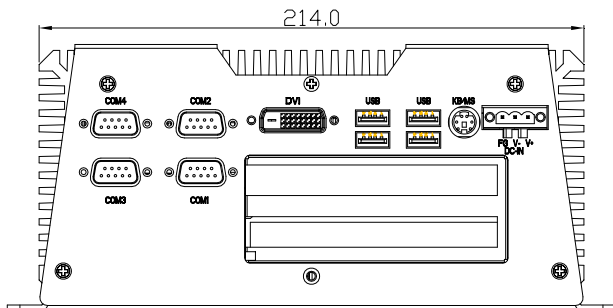
2.3 COM1, COM2 Pin 9 Selection (JV1, JV2)

JV1/JV2	Function
1-2	+12V
3-4	+5V
5-6	RI (Default)

Note: COM1 and COM2 have RS-232/422/485 function.

2.4 COM3, COM4 Pin 9 Selection (JV3, JV4)

JV3/JV4	Function
1-2	+12V
3-4	+5V
5-6	RI (Default)

2.5 FAN Port Voltage Selection (JV9)

JV9	Function
1-2	+5V (Default)
2-3	+12V

2.6 Clear CMOS Selection (JBAT1)

JBAT1	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.7 COM1/2 Connector
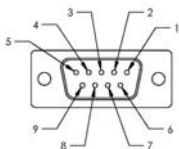
Pin	Signal	Pin	Signal
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1		

COM2/ RS-422 Mode

Pin	Signal	Pin	Signal
1	TXD-	2	RXD+
3	TXD+	4	RXD-
5	Ground	6	N/C
7	N/C	8	N/C
9	N/C	10	N/C

COM2/ RS-485 Mode

Pin	Signal	Pin	Signal
1	TXD-	2	N/C
3	TXD+	4	N/C
5	Ground	6	N/C
7	N/C	8	N/C
9	N/C	10	N/C

2.8 Hard Disk Drive Installation

Disassemble the AEC-6930

For Hard Disk Drive (HDD) installation, you have to disassemble the bottom lid of AEC-6930 and some components and covers in the AEC-6930.

Step 1: Unfasten the screw on the rear panel.
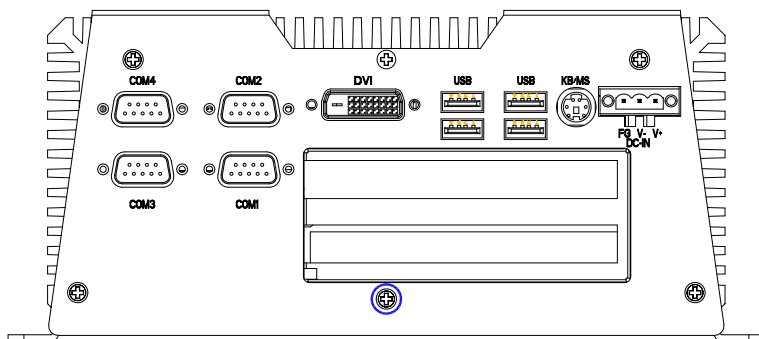
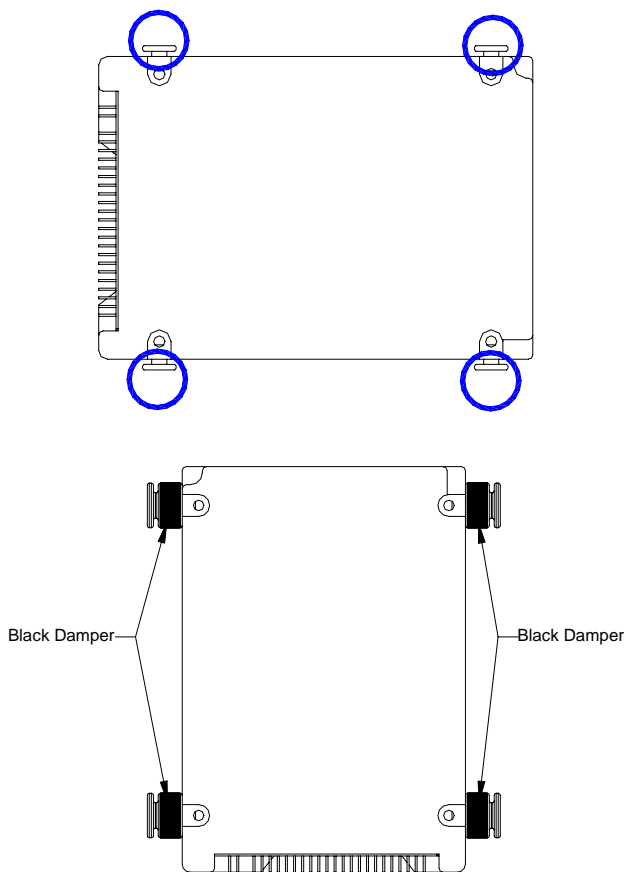Step 2: Unfasten the screw in blue circle on the front panel.
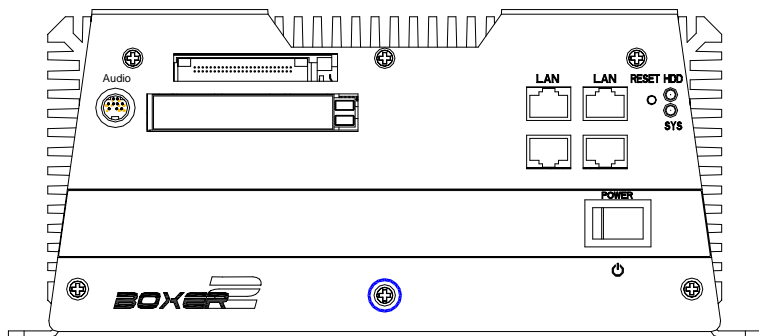
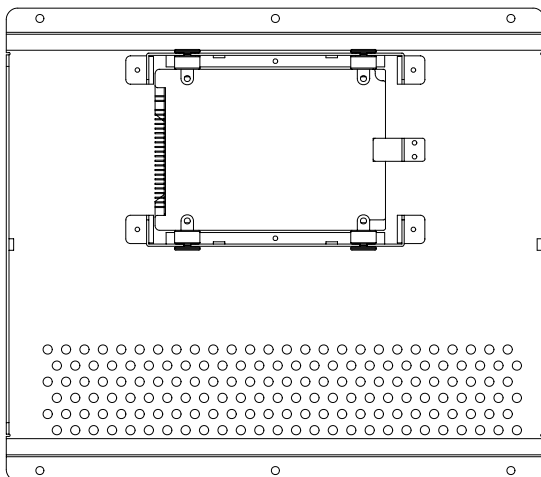Step 3: Unfasten the six screws on the bottom lid.
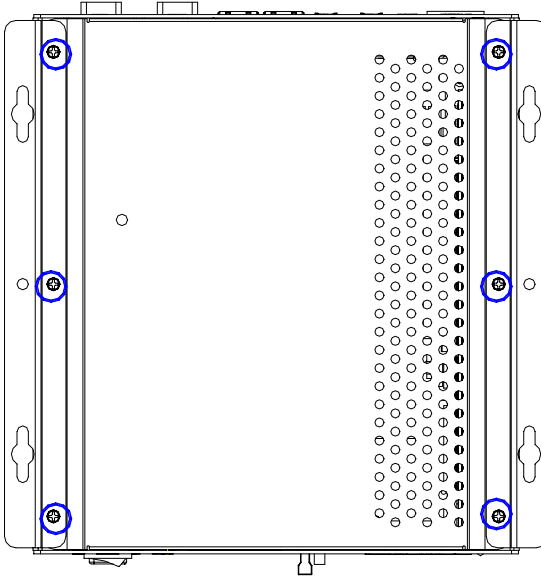
Assemble the HDD Module

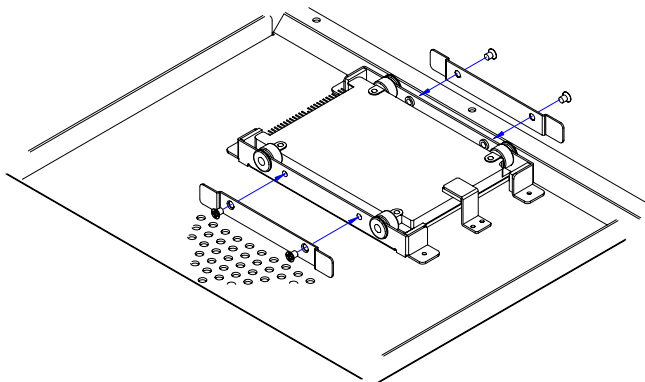After disassembling the AEC-6930, you have to get the HDD module ready for the proceeding installation.

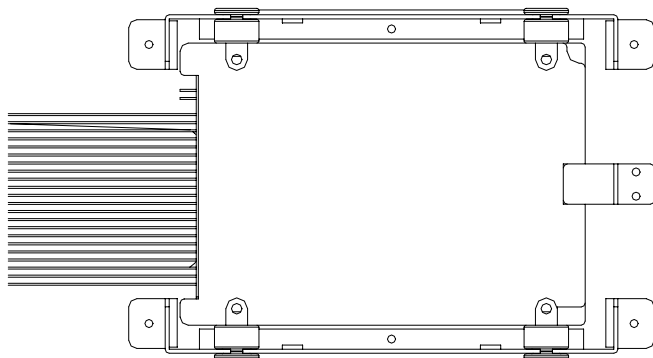Step 1: Fasten the four HDD screws and cover with the four black damper

Black Damper

Black Damper

Step 2:   Assembly the HDD chassis
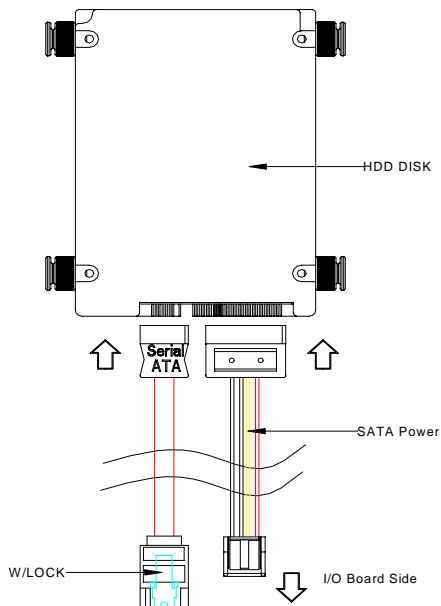

Step 3:   Assembly the damper bracket

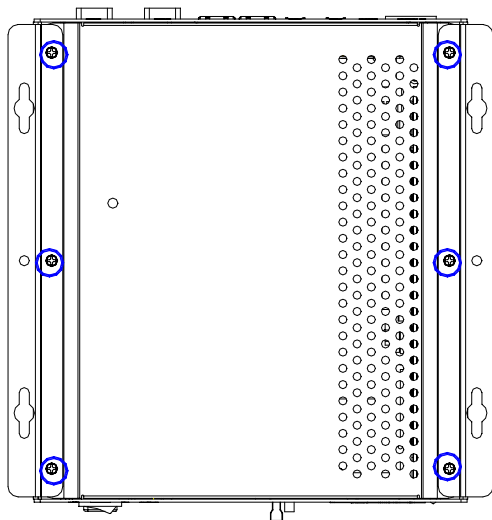<u>Step 4:</u> Connect the HDD cable (for IDE Type HDD)

Note: Because the default setting of IDE Drive is Slave (The master was apply to CFD), when users install the IDE HDD driver in the system, the HDD will apply to drive Slave.
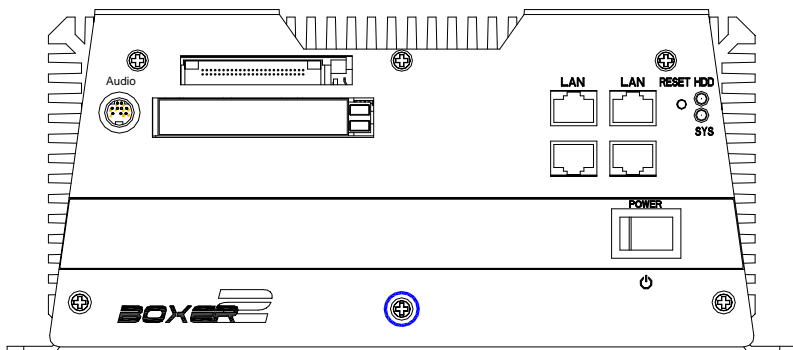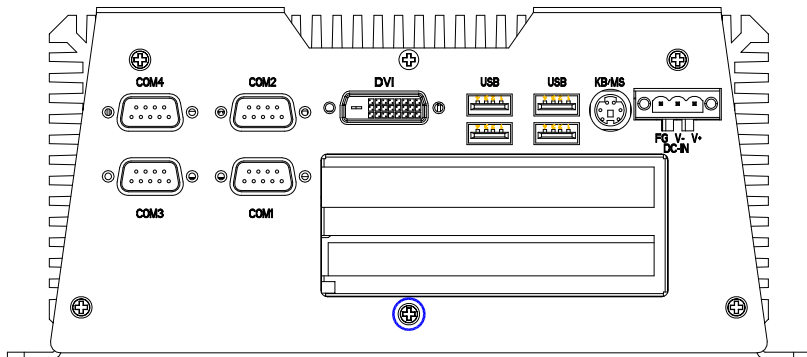
Connect the HDD cable (for SATA Type HDD)

HDD DISK

Serial ATA

SATA Power

W/LOCK

I/O Board Side

Step 5: Fasten the six screws on the back of the AEC-6930
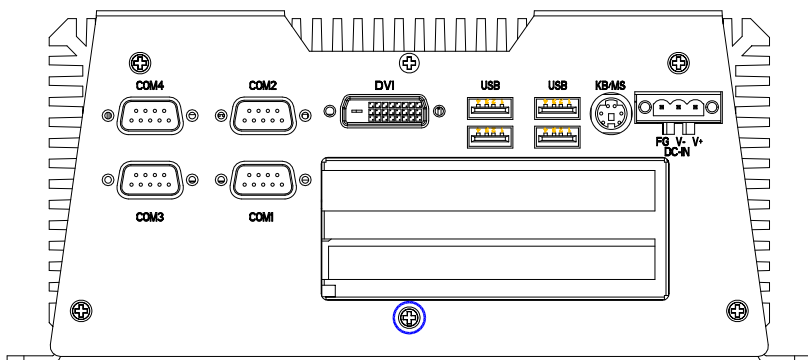

Step 6: Fasten the screw of front panel

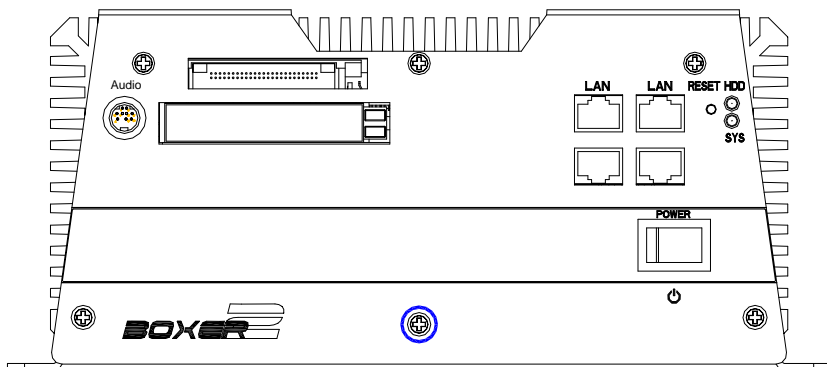Step 7: Fasten the screw of rear panel
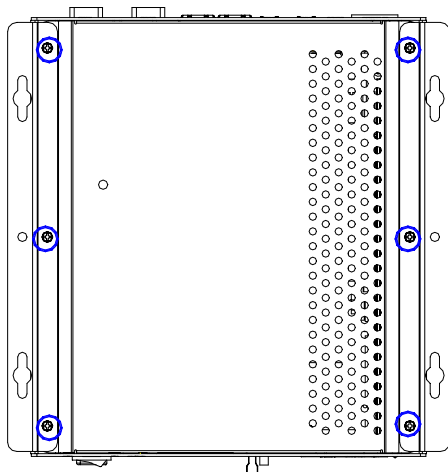
2.9 PCI Card Installation

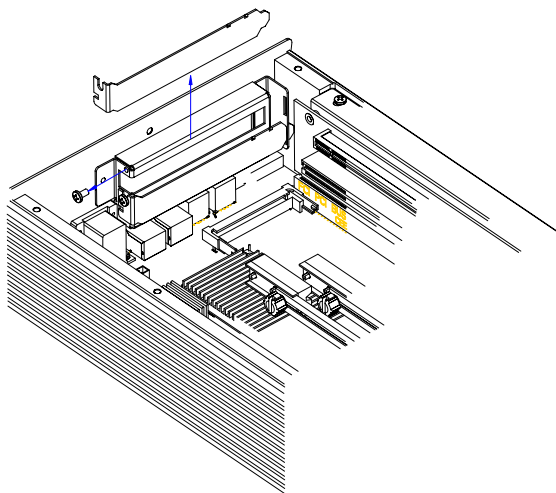Step 1: Unfasten the screw on the rear panel.

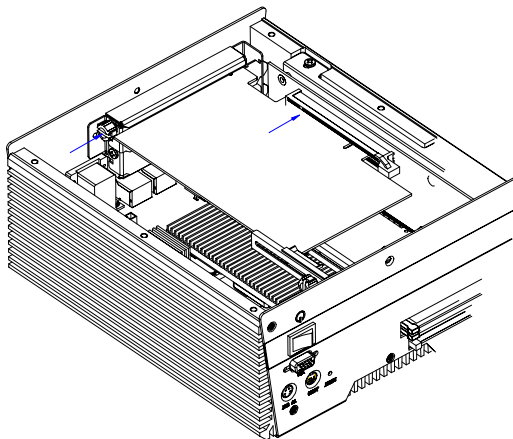

Step 2: Unfasten the screw on the front panel.

Step 3: Unfasten the six screws on the bottom lid.

Step 4: Remove the screw with your finger and get the PCI card ready to

install.   You should keep the shield and screw for use later.

Step 5: Insert the PCI card into the PCI slot and reattach the screw.

Step 6: Unfasten the screws and push the tenon to lock the PCI card in position.
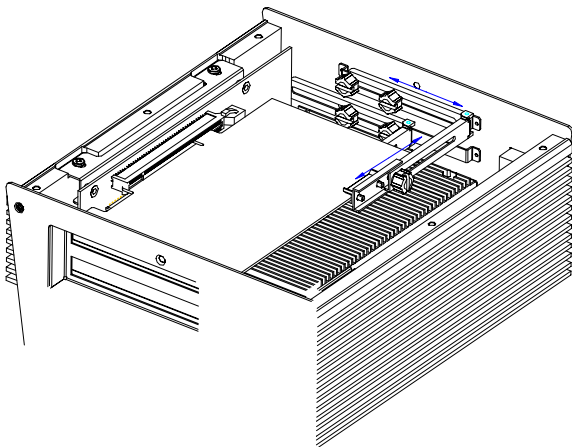
Step 7: Close the bottom lid of the AEC-6930 and fasten six screws on bottom lid.
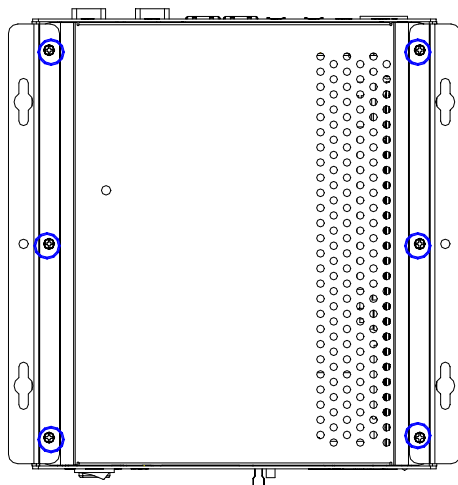
Step 8: Fasten the one screw on the front panel and one screw on the rear panel
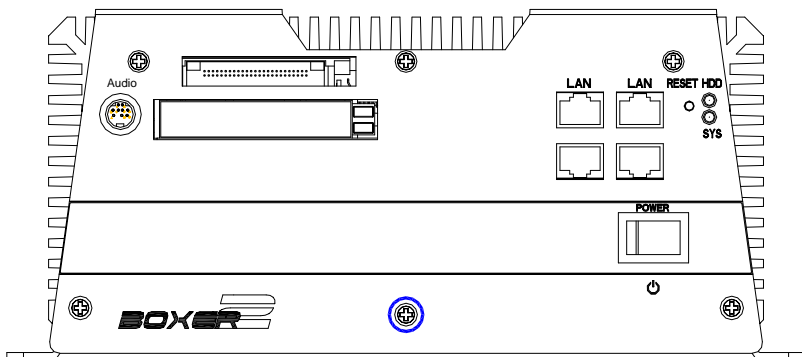
2.10 Wallmount kit Installation

Step 1: Get the brackets ready and fasten appropriate three screws on

each bracket. After fastening the two brackets on the bottom lid of

AEC-6930, the wallmount kit installation is finished

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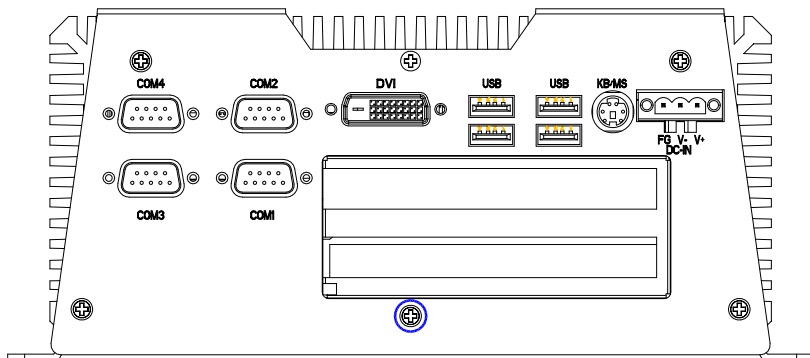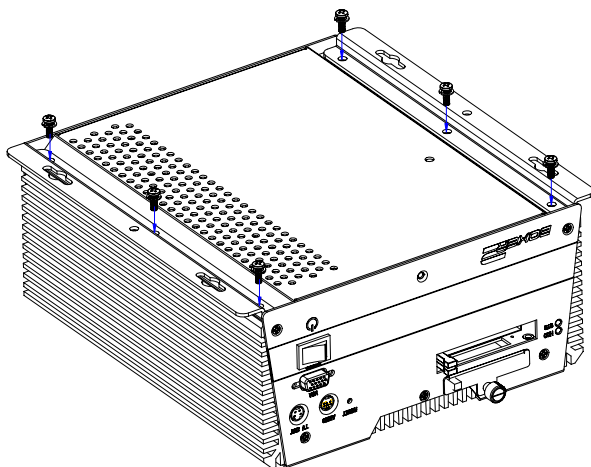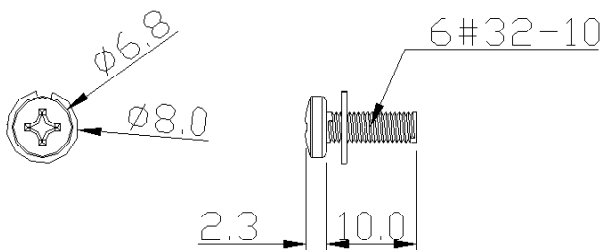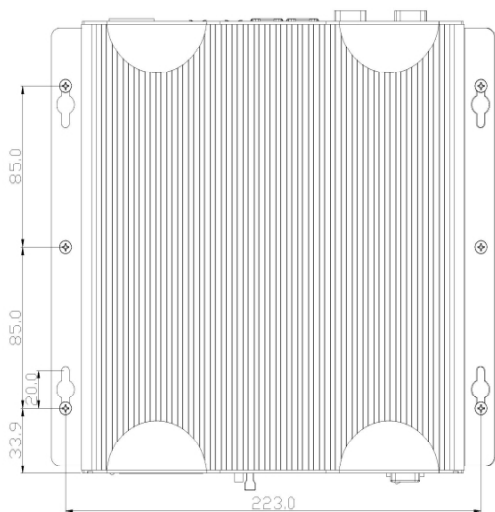en. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

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 AEC-6930 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.

Standard CMOS Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

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

Power Management Setup

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

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

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

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

4

Driver Installation

The AEC-6930 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

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

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.

4.1 Installation

Insert the AEC-6930 CD-ROM into the CD-ROM Drive.   The Autorun program will run automatically. You also can choose the drivers to install from step 1 to step 4 in order as following instructions.

Step 1 – Install INF Driver

1. Click on the *Step 1-chip* folder and then double click on the *infinst_autol.exe*

2. Follow the instructions that the window will show you

3. The system will help you 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 the *.exe* file located in each OS folder

3. Follow the instructions that the window shows you

4. The system will help you install the driver automatically

Caution:

In AAEON products with Intel embedded graphics chipset, when system booting before CRT / LCD monitor has disconnected to VGA, it will cause Intel graphics chipset automatically detected without CRT / LCD connection and set CRT output to disable. Therefore, CRT / LCD screen will go black and never recovered on Windows.

Because it's a limitation on application for Intel embedded graphics driver under Windows XP. Therefore, there is a simply way to recover CRT / LCD

output through Hot-Key function by Intel suggestion as follows:

You need to press <CTRL><ALT><F1> key simultaneously to recover VGA output again. This hot-key function is only in the Windows driver version 6.14.10.4497 or later.

Step 3 – Install LAN Driver

1. Click on the *Step 3-LAN driver* folder and select the OS your system is
2. Double click on the *.exe* file located in each OS folder
3. Follow the instructions that the window shows you
4. The system will help you install the driver automatically

Step 4 – Install Audio Driver

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

Note:

Under the Window OS environment, if the CRT connector is connected to display monitor by the data switch device, the user need to set the color and resolution from Intel Graphic utility (VGA driver) instead of setting from the control panel in case of the wrong display appearance.

Appendix

A

Programming the Watchdog Timer

A.1 General Information

The AEC-6930 utilizes Fintek F75111 chipset as its watchdog timer
Controller.

The other Watchdog timer is set to second or minute and the range is 0
to 256 seconds or minutes.

When the timeout has occurred, that will generate a status bit to indicate
it and write one will be clear.

A.2 Access Interface

The F75111 provides one serial access interface, I2C Bus, to read/write
internal registers. The address of Serial Bus is
configurable by using power-on trapping of standby power VBS3V. The
pin 3 (GPIO13/I2C _ADDR) is multi-function pin. During the
VSB3V power-on, this pin serves as input detection of logic high or logic
low. This pin is default pull-down resistor with 100K ohms
mapping the Serial Bus address 0x9C (1001_1100). Another Serial Bus
address 0x6E (0110_1110) is set when external pull-up resistor with
10K ohms is connected in this pin.

A.3 Registers Description

Configuration and Control Register – Index 01h

Power-on default [7:0] =0000_1000b

Bit	Name	Description
7	INIT	Software reset for all registers including Test Mode registers. Users use only.
6	Reserved	
5	EN_WDT10	Enable Reset Out. If set to 1, enable WDTOUT10# output. Default is disable.
4	Reserved	
3	Reserved	
2	Reserved	
1	SMART_POWR _MANAGEMENT	Set this bit to 1 will enable auto power down mode, when all function are idle then 20ms the chip will auto power down, it will wakeup when GPIO state change or read write register
0	SOFT_POWR_ DOWN	Set this bit to 1 will power down all of the analog block and stop internalclock, write 0 to clear this bit or when GPIO state change will auto clear this bit to 0.

WDTOUT Control Register – Index 34h

Power-on default [7:0] =0000_0000b

Bit	Name	Description
7-3	Reserved	
2	SEL_RST_2S	When set this bit to 1, the WDTOUT10 low pulse width is 2 Sec, if set to 0 the low pulse width is 100ms.

1	WDTOUT10_OINV	WDTOUT10# output level inverting. When write 1, the output pin will be inverted. Default is low active when time is out
0	STS_WDTOUT10	Indicate WDTOUT10 is occurred. Write 1 to clear this bit. Writing 0 is invalid.

WDTOUT Control Register – Index 35h

Power-on default [7:0] =0000_0000b

Bit	Name	Description
7	WDT10_ENABLE	Enable WDTOUT10 Output Timer. If set to 1, the WDTOUT10 timer will be started. When WDTOUT10# is asserted, low pulse is occurred.
6-0	WD1_PTIME	WDTOUT10 Pre-counter time in second. 000_0000b – 0 second (Default) 000_0001b – 1 second 000_0010b – 2 seconds : 111_1111b – 127 seconds

A.4 F75111 Watchdog Timer Initial Program

. .MODEL SMALL

.CODE

Main:

```
        push  cx
        mov   al, 20h          ;Enable WDT(Value to write)
        mov   cl, 01h          ;F75111 register index
        mov   ch, 6eh              ;(Serial Bus address 0x6E)
        call  Ct_I2CWriteByte
        mov   al, 01h          ;Indicate WDTOUT10 is occurred
        mov   cl, 34h          ;F75111 register index
        mov   ch, 6eh             ;6eh  (Serial Bus address 0x6E)
        call  Ct_I2CWriteByte


        mov   al, 83h          ;Enable WDTOUT10 Output Timer:3 seconds
        mov   cl, 35h            ;F75111 register index
        mov   ch, 6eh            ;6eh  (Serial Bus address 0x6E)
        call  Ct_I2CWriteByte
        pop   cx
              ret


Ct_I2CWriteByte    Proc  Near
```

```
push   ax
push   cx


mov    dx,SMBus_Port +04h        ;SMBus_Port(500h)
mov    al,ch                     ;ID cmd(Write)
out    dx,al
call   Delay5ms
call   Delay5ms


pop    ax
mov    dl,03h
out    dx,al                     ;Index
call   Delay5ms
call   Delay5ms


pop    ax
mov    dl,05
out    dx,al                     ;Data0
call   Delay5ms
call   Delay5ms


mov    dl,02h
mov    al,48h
out    dx,al                     ;write data
call   Delay5ms
```

```
        call    Delay5ms


        mov     cx, 100h
@@:
        newiodelay
        loop    short @B


        ret
Ct_I2CWriteByte    Endp CALL Check_Chip
```

Appendix

B

I/O Information

B.1 I/O Address Map

Input/output (IO)
- [00000000 - 0000000F] Direct memory access controller
- [00000000 - 00000CF7] PCI bus
- [00000010 - 0000001F] Motherboard resources
- [00000020 - 00000021] Programmable interrupt controller
- [00000022 - 0000003F] Motherboard resources
- [00000040 - 00000043] System timer
- [00000044 - 0000004D] Motherboard resources
- [00000050 - 0000005E] 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
- [00000290 - 0000029F] Motherboard resources
- [000002E8 - 000002EF] Communications Port (COM6)
- [000002F8 - 000002FF] Communications Port (COM2)
- [000003B0 - 000003BB] Mobile Intel(R) 965 Express Chipset Family
- [000003C0 - 000003DF] Mobile Intel(R) 965 Express Chipset Family
- [000003E8 - 000003EF] Communications Port (COM5)
- [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
- [00009000 - 00009FFF] Intel(R) ICH8 Family PCI Express Root Port 6 - 2849
- [0000A000 - 0000AFFF] Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
- [0000BF00 - 0000BFFF] Texas Instruments PCI-1520 CardBus Controller
- [0000C000 - 0000CFFF] Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
- [0000CF00 - 0000CF1F] Intel(R) PRO/1000 PL Network Connection
- [0000D000 - 0000DFFF] Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
- [0000DF00 - 0000DF1F] Intel(R) PRO/1000 PL Network Connection #2
- [0000E000 - 0000EFFF] Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
- [0000EF00 - 0000EF1F] Intel(R) PRO/1000 PL Network Connection #3
- [0000F000 - 0000F0FF] Texas Instruments PCI-1520 CardBus Controller
- [0000F100 - 0000F1FF] Texas Instruments PCI-1520 CardBus Controller
- [0000F200 - 0000F2FF] Texas Instruments PCI-1520 CardBus Controller
- [0000F300 - 0000F30F] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F400 - 0000F40F] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F500 - 0000F503] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F600 - 0000F607] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F700 - 0000F703] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F800 - 0000F807] Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
- [0000F900 - 0000F90F] Intel(R) ICH8M Ultra ATA Storage Controllers - 2850
- [0000FA00 - 0000FA1F] Intel(R) ICH8 Family USB Universal Host Controller - 2832
- [0000FB00 - 0000FB1F] Intel(R) ICH8 Family USB Universal Host Controller - 2831
- [0000FC00 - 0000FC1F] Intel(R) ICH8 Family USB Universal Host Controller - 2830
- [0000FD00 - 0000FD1F] Intel(R) ICH8 Family USB Universal Host Controller - 2835
- [0000FE00 - 0000FE1F] Intel(R) ICH8 Family USB Universal Host Controller - 2834
- [0000FF00 - 0000FF07] Mobile Intel(R) 965 Express Chipset Family

B.2 Memory Address Map

```
AAEON-F1EA220F9
├── Direct memory access (DMA)
├── Input/output (IO)
├── Interrupt request (IRQ)
└── Memory
      [00000000 - 0009FFFF] System board
      [000A0000 - 000BFFFF] Mobile Intel(R) 965 Express Chipset Family
      [000A0000 - 000BFFFF] PCI bus
      [000C0000 - 000DFFFF] PCI bus
      [000DE000 - 000DEFFF] Texas Instruments PCI-1520 CardBus Controller
      [000DF000 - 000DFFFF] Texas Instruments PCI-1520 CardBus Controller
      [000E0000 - 000EFFFF] System board
      [000F0000 - 000FFFFF] System board
      [00100000 - 7F6DFFFF] System board
      [7F6E0000 - 7F6FFFFF] System board
      [7F700000 - 7F7FFFFF] System board
      [7F750000 - FEBFFFFF] PCI bus
      [B0000000 - BFFFFFFF] Mobile Intel(R) 965 Express Chipset Family
      [D7FFD000 - D7FFDFFF] Texas Instruments PCI-1520 CardBus Controller
      [D7FFF000 - D7FFFFFF] Texas Instruments PCI-1520 CardBus Controller
      [E0000000 - EFFFFFFF] Motherboard resources
      [F5200000 - F91FFFFF] Texas Instruments PCI-1520 CardBus Controller
      [F9200000 - FD1FFFFF] Texas Instruments PCI-1520 CardBus Controller
      [FD200000 - FD2FFFFF] Mobile Intel(R) 965 Express Chipset Family
      [FD500000 - FD5FFFFF] Intel(R) ICH8 Family PCI Express Root Port 6 - 2849
      [FD600000 - FD6FFFFF] Intel(R) ICH8 Family PCI Express Root Port 6 - 2849
      [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
      [FDAE0000 - FDAFFFFF] Intel(R) PRO/1000 PL Network Connection
      [FDB00000 - FDBFFFFF] Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
      [FDC00000 - FDCFFFFF] Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
      [FDCE0000 - FDCFFFFF] Intel(R) PRO/1000 PL Network Connection #2
      [FDD00000 - FDDFFFFF] Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
      [FDE00000 - FDEFFFFF] Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
      [FDEE0000 - FDEFFFFF] Intel(R) PRO/1000 PL Network Connection #3
      [FDFF4000 - FDFF7FFF] Microsoft UAA Bus Driver for High Definition Audio
      [FDFFD000 - FDFFD0FF] Intel(R) ICH8 Family SMBus Controller - 283E
      [FDFFE000 - FDFFE3FF] Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
      [FDFFF000 - FDFFF3FF] Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
      [FEB00000 - FEBFFFFF] Mobile Intel(R) 965 Express Chipset Family
      [FEC00000 - FEC00FFF] System board
      [FED13000 - FED1FFFF] System board
      [FED20000 - FED3FFFF] System board
      [FED40000 - FED44FFF] PCI bus
      [FED43000 - FED43FFF] Texas Instruments PCI-1520 CardBus Controller
      [FED44000 - FED44FFF] Texas Instruments PCI-1520 CardBus Controller
      [FED45000 - 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

```
+ Direct memory access (DMA)
+ Input/output (IO)
- Interrupt request (IRQ)
    (ISA) 0    System timer
    (ISA) 1    Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
    (ISA) 3    Communications Port (COM2)
    (ISA) 4    Communications Port (COM1)
    (ISA) 6    Standard floppy disk controller
    (ISA) 8    System CMOS/real time clock
    (ISA) 9    Microsoft ACPI-Compliant System
    (ISA) 10   Communications Port (COM5)
    (ISA) 11   Communications Port (COM6)
    (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) ICH8 Family PCI Express Root Port 1 - 283F
    (PCI) 16   Intel(R) ICH8 Family USB Universal Host Controller - 2834
    (PCI) 16   Intel(R) PRO/1000 PL Network Connection #3
    (PCI) 16   Mobile Intel(R) 965 Express Chipset Family
    (PCI) 16   Texas Instruments PCI-1520 CardBus Controller
    (PCI) 17   Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
    (PCI) 17   Intel(R) ICH8 Family PCI Express Root Port 6 - 2849
    (PCI) 17   Intel(R) PRO/1000 PL Network Connection #2
    (PCI) 17   Texas Instruments PCI-1520 CardBus Controller
    (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) 18   Intel(R) PRO/1000 PL Network Connection
    (PCI) 19   Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
    (PCI) 19   Intel(R) ICH8 Family USB Universal Host Controller - 2831
    (PCI) 19   Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
    (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
```

B.4 DMA Channel Assignments

```
- AAEON-F1EA220F9
    - Direct memory access (DMA)
        2   Standard floppy disk controller
        4   Direct memory access controller
    + Input/output (IO)
    + Interrupt request (IRQ)
    + Memory
```