

AEC-6612

Compact Embedded Controller

Intel® Atom™ D510 1.66GHz Processor

Dual LAN, 2/6 USB2.0, 2/6 COM, 1 VGA

2 PCI-Express Mini Card

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Packing List

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

- 1 AEC-6612 Embedded Controller
- 2 Wallmount Brackets
- 1 Screw Package
- 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.

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 55°C (131°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.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

ENERGY STAR



This Product has been certified by ENERGY STAR®

The Regulation of ENERGY STAR®: ENERGY STAR® Requirements for Computer Version 5.2.

The Test Standard of ENERGY STAR®: IEC/EN 62301, ENERGY STAR® Program Requirements for Computer Version

ENERGY STAR® Compliance: Power Management features (Basic)

Using power-saving states

The system provides the two power-saving states: Sleep and Hibernation.

When Sleep is initiated, the power lights blink and the screen clears. Your working task is saved to memory. Exiting Sleep is faster than exiting Hibernation. If the system is in the Sleep state for an extra period or if the battery reaches a critical battery level while in the Sleep state, the system initiates Hibernation.

When Hibernation is initiated, your work is saved to a hibernation file on the hard drive and the system turns off.

Initiating and exiting Sleep

The system set the Sleep mode after 30 minutes of inactivity when running on external power. You can change to none Sleep mode if the system needs to be active at all time. The default power management settings have been selected for compliance with ENERGY STAR[®], and are recommended by the ENERGY STAR[®] program for optimal energy savings.

Using power plans

You can choose your own power plan which is a collection of system settings that manages how the system uses power. Power plans can help you conserve power or maximize performance.

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。

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Chapter

1

**General
Information**

1.1 Introduction

The newest Boxer series AEC-6612 has been introduced by AAEON and it utilizes Intel® Atom™ processor. In this era of information explosion, the advertising of consumer products will not be confined to the family television, but will also spread to high-traffic public areas, like department stores, the bus, transportation station, the supermarket etc. The advertising marketing industry will resort to every conceivable means to transmit product information to consumers. System integrators will need a multifunction device to satisfy commercial needs for such public advertising.

The AEC-6612 is designed for indoor environments due to the following reasons; first, the AEC-6612 offers low power consumption system that while operating in ambient temperatures ranging from -20° to 60°C. The MTBF (Mean Time Before Failure) rating states that the AEC-6612 can operate up to 50,000 hours at 40°C ambient temperature, which indicates its careful and long-life design.

The AEC-6612 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

- Intel® Atom™ D510 1.66 GHz Processor
- COM x 2 (Optional x 6), USB x 2 (Optional x 6)
- RS-232 x 1 (Optional x 5)
- Fanless Cooling System
- Gigabit Ethernet x 2
- PCI-Express Mini Card x 2
- ATX/ACPI Power Mode

1.3 Specifications

System

- CPU Intel® Atom™ D510 1.66 GHz Processor
- Memory DDR2 400/533 SODIMM x 1, Max. 2 GB
- VGA VGA x 1
- Keyboard/Mouse Keyboard & Mouse by USB
- Ethernet 10/100/1000Base-TX Ethernet, RJ-45 connector x 2
- Hard Disk Storage 2.5" SATA HDD Bay x 1
- Expansion Mini Card Slot x 2
- LCD/CRT Controller Integrated in Processor, shared system memory up to 384MB
- Solid Storage Type 2 CompactFlash™ slot x 1 Disk
- Serial Port RS-232/422/485 x 1, RS-232 x 1 (optional x 5)
- USB USB 2.0 x 4
- System Control Power ON/OFF
- LED Indicator Power LED x 1, Hard disk active LED x 1
- Watchdog Timer Generates a time-out system reset, setting via software
- Power Supply DC power input 12V/ 9-30V (optional)
- OS Support WinCE 6.0, Windows® XP Embedded, Windows® XP, Windows® 7, Linux Fedora

Mechanical and Environmental

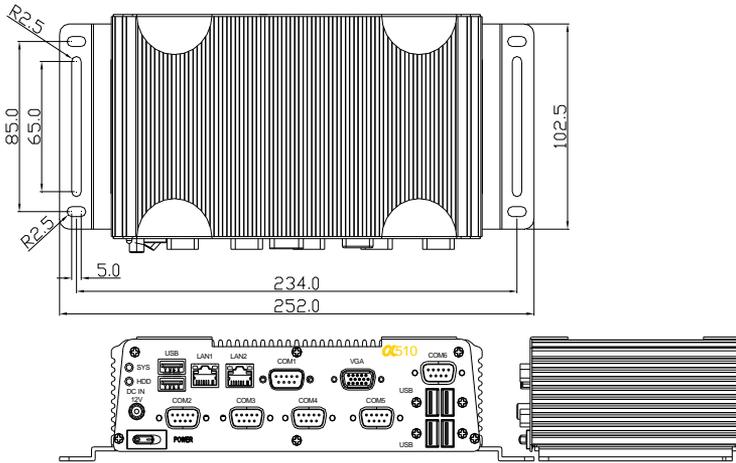
- Construction Aluminum Alloy Chassis
- Color Dark Gray
- Mounting Wallmount
- Dimension 7.8”(W) x 2.3”(H) x 4.3”(D)
(197 mm x 57.2 mm x 110 mm)
- Net Weight 2.73 lb (1.24 kg)
- Gross Weight 4.31 lb (1.96 kg)
- Operating
Temperature No Airflow:
-4°F ~ 113°F (-20°C ~ 45°C) (CFD)
-4°F ~ 122°F (-20°C ~ 50°C) (HDD)
Ambient with Airflow:
-4°F ~ 122°F (-20°C ~ 50°C) (CFD)
-4°F ~ 140°F (-20°C ~ 60°C) (HDD)
- Storage
Temperature -4°F ~ 140°F (-20°C ~ 60°C)
- Operating
Humidity 10 ~ 95% @ 40°C, non-condensing
- Vibration 5 g rms/ 5~500Hz/ random
operation –CFD
1 g rms/ 5~500Hz/ random
operation –HDD
- Shock 50 G peak acceleration (11msec.
duration) –CFD
20 G peak acceleration (11msec.
duration) –HDD
- EMC CE/FCC Class A

Chapter

2

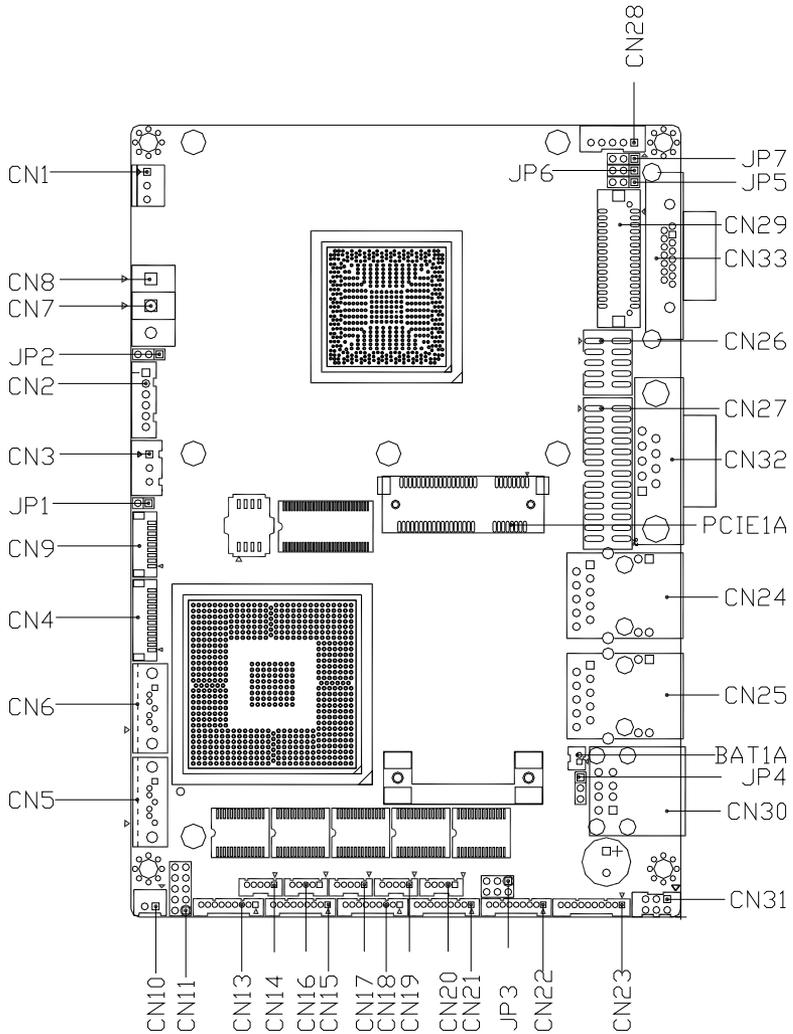
Hardware Installation

2.1 Dimension and I/O of AEC-6612

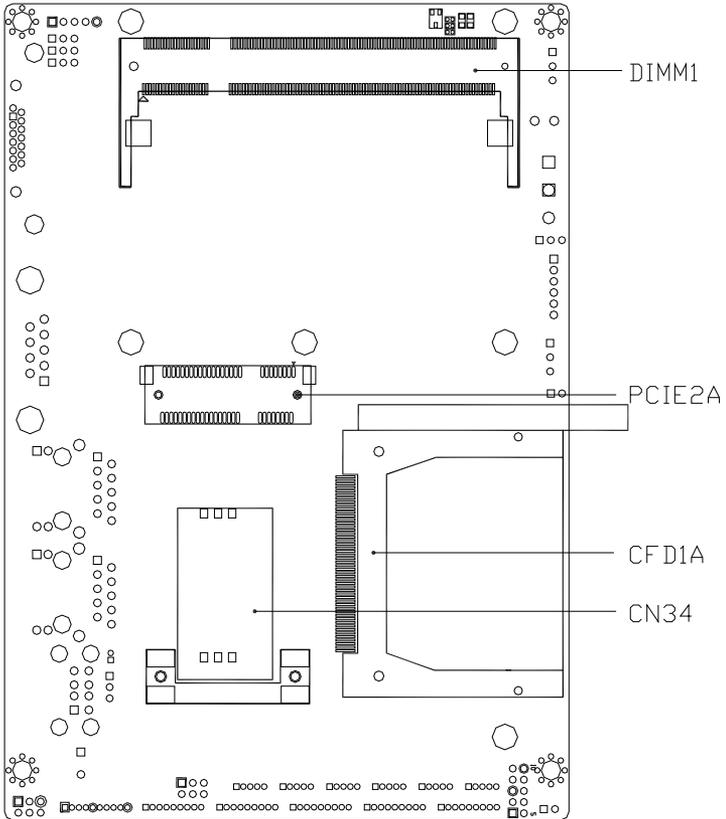


2.2 Connectors and Jumpers of The Main Board

Component Side



Solder Side



2.3 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	Touch Screen 4/5/8-wire Mode Selection
JP2	AT/ATX Power Mode Selection
JP3	COM2 RI/+5/+12V Selection
JP4	Clear CMOS
JP5	LVDS Inverter/ Backlight Bias/PWM Mode Selection
JP6	LVDS Operating Voltage Selection
JP7	LVDS Inverter/ Backlight Voltage Selection

2.4 List of Connectors

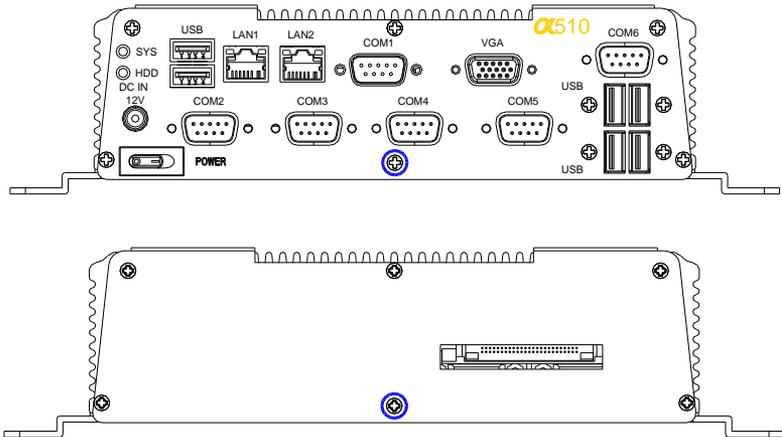
The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	CPU FAN
CN2	+5VSB Output w/ SMBus
CN3	External +5VSB Input
CN4	LPC Expansion I/F
CN5	SATA Port #1
CN6	SATA Port #2
CN7	External 5V Input (depend on power input configuration)
CN8	External 12V Input (depend on power input configuration)
CN9	Touch Screen Connector
CN10	+5V Output for SATA HDD using
CN11	Front Panel
CN13	COM Port #6
CN14	USB Port #7
CN15	COM Port #5
CN16	USB Port #6
CN17	USB Port #5
CN18	COM Port #4
CN19	USB Port #4

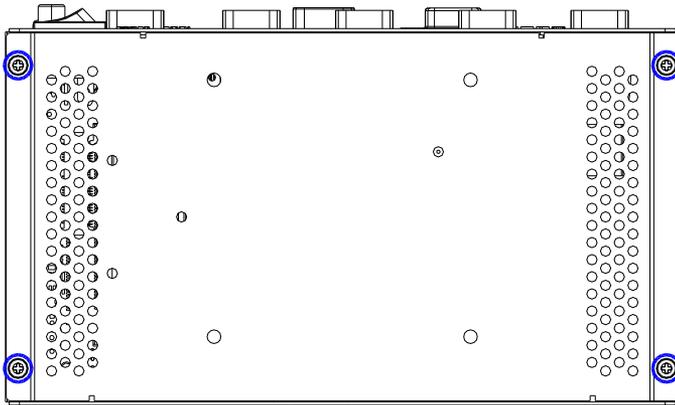
CN20	USB Port #3
CN21	COM Port #3
CN22	COM Port #2
CN23	Audio Line In/Out and MIC Connector
CN24	RJ-45 Ethernet #2
CN25	RJ-45 Ethernet #1
CN26	Digital I/O
CN27	Parallel Port
CN28	LVDS Inverter/ Backlight Connector
CN29	18-bit LVDS Output
CN30	USB Port #1 and #2
CN31	PS/2 Keyboard & Mouse
CN32	COM Port #1
CN33	Analog CRT Display
CN34	SIM Card Socket
CFD1	Compact Flash Disk
PCIE1	Mini-Card Slot #1
PCIE2	Mini-Card Slot #2
DIMM1	DDR2 SODIMM Slot

2.5 Hard Disk Drive Installation

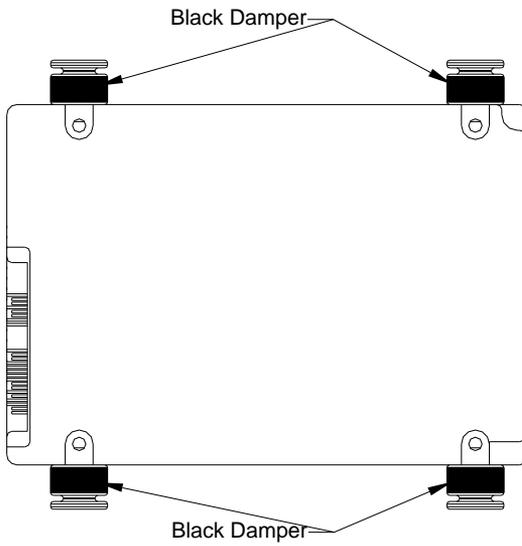
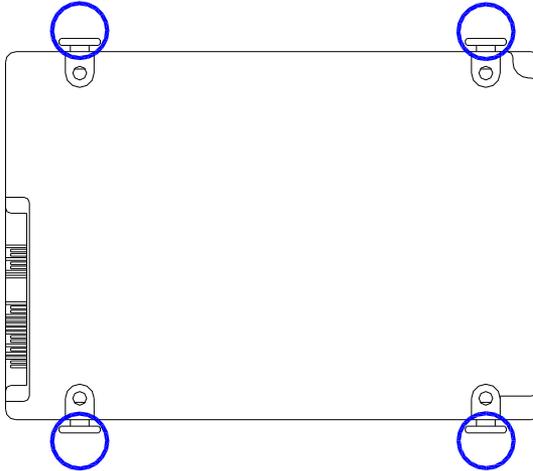
Step 1: Unfasten the screws on the front and rear panel



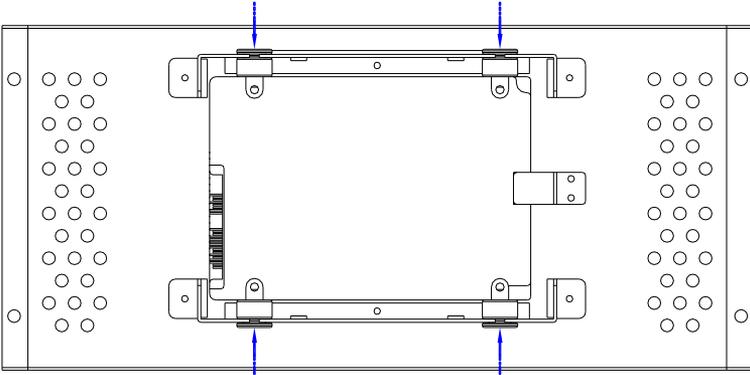
Step 2: Unfasten the four screws on the bottom lid



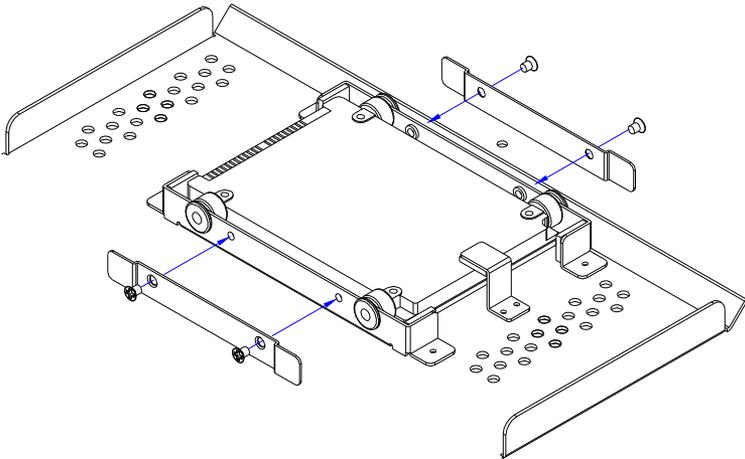
Step 3: Fasten the four HDD screws and cover with the four black damper



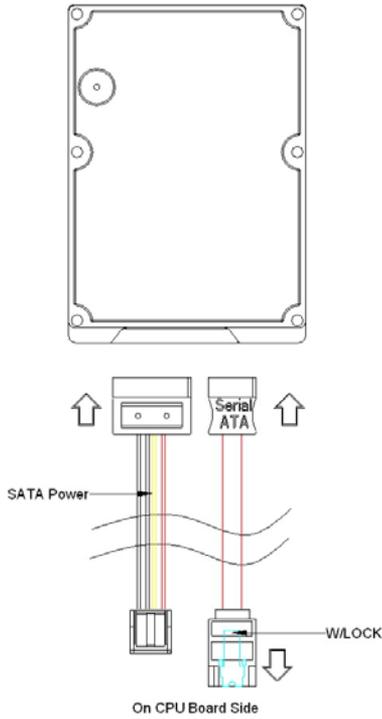
Step 4: Assembly the HDD chassis



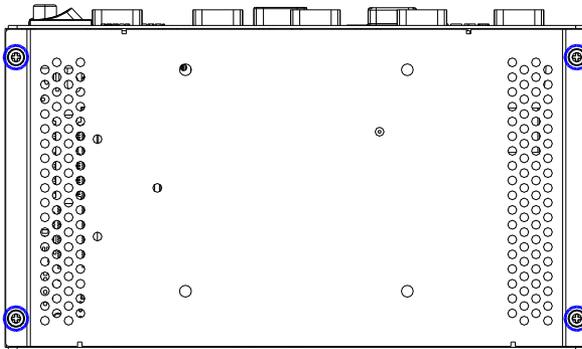
Step 5: Assembly the damper bracket



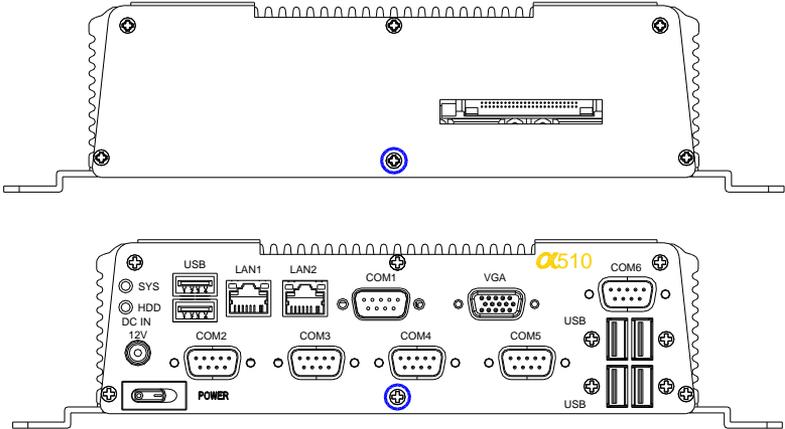
Step 6: Connect the HDD cable



Step 7: Fasten the four screws on the bottom lid of AEC-6612

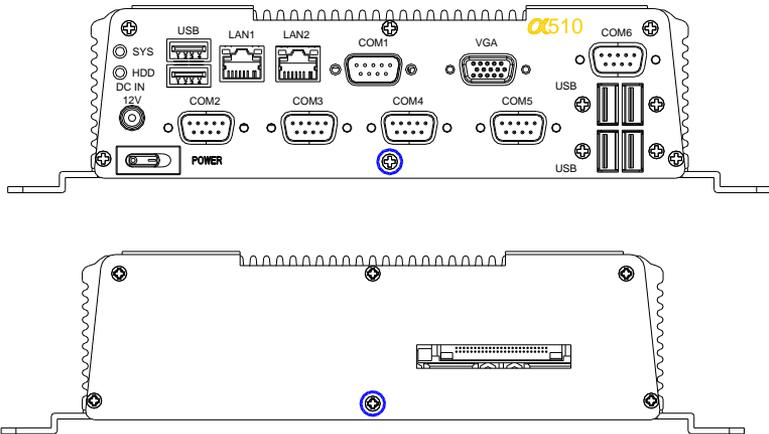


Step 8: Fasten the two screws on the front and rear panel

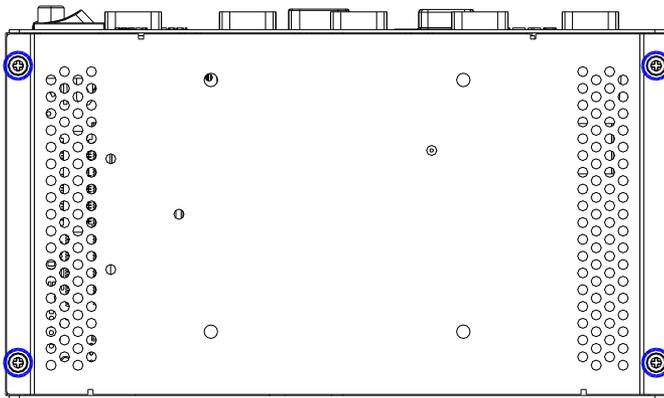


2.6 Memory Card Installation

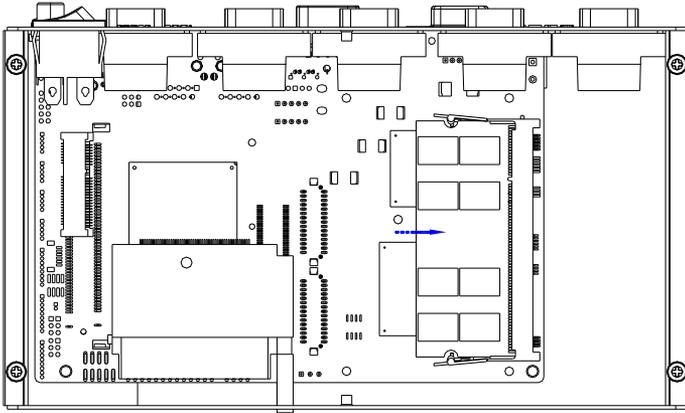
Step 1: Unfasten the screws on the front and rear panel



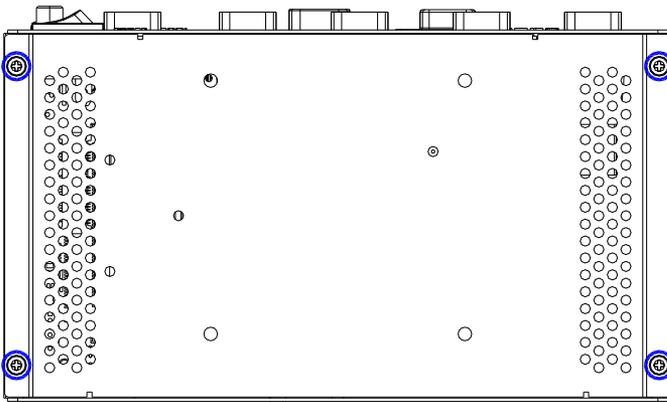
Step 2: Unfasten the four screws on the bottom lid



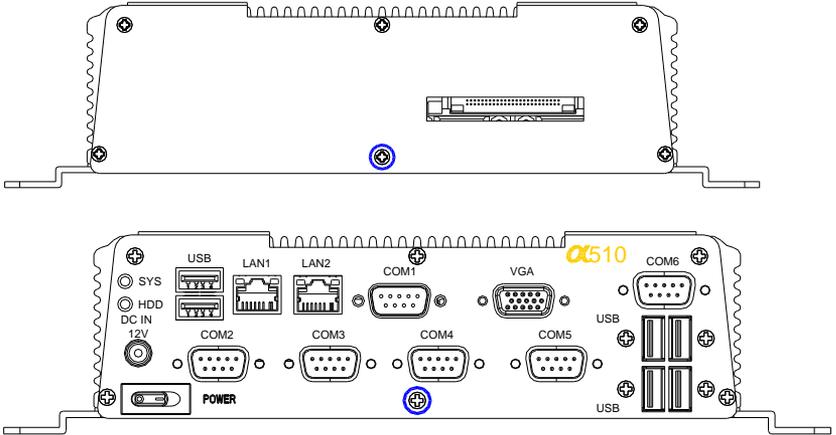
Step 3: Insert the RAM at 30-degree angle to the memory slot and press



Step 4: Close the bottom case of AEC-6612 and fasten the four screws of the bottom lid

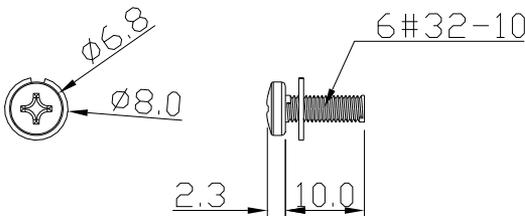
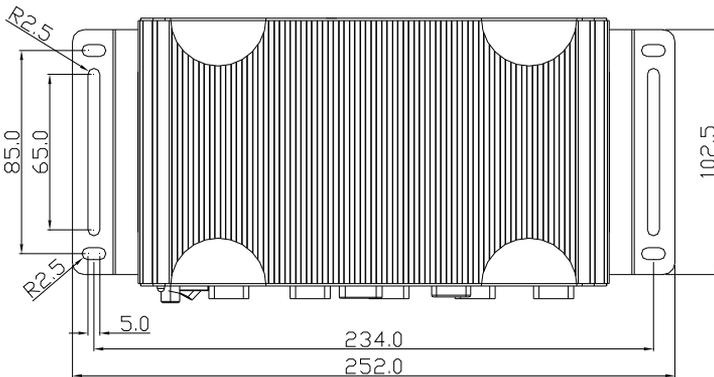
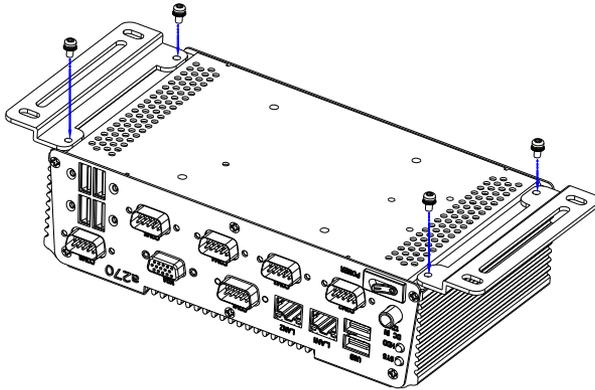


Step 5: Fasten the screws on the front and rear panel



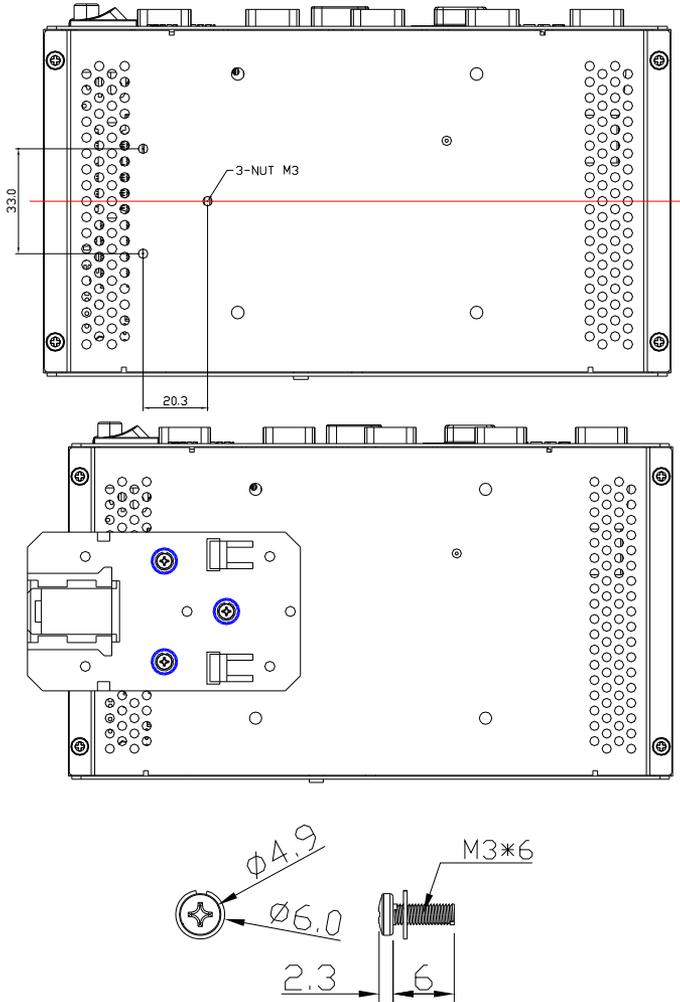
2.7 Wallmount Kit Installation

Get the brackets ready and fasten appropriate four screws on each bracket. After fastening the two brackets on the bottom lid of AEC-6612, the wallmount kit installation has been finished.



2.8 DIN Rail Kit Installation

Get the DIN Rail kit ready and fasten the three screws to mount the DIN Rail kit to the bottom lid of AEC-6612



Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

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-6612 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 AMI BIOS Setup

AMI 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 or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Chapter

4

**Driver
Installation**

The AEC-6612 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 Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install Audio Driver

Step 4 – Install LAN Driver

4.1 Installation:

Insert the AEC-6612 CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Chipset Driver

1. Click on the **STEP1-CHIPSET** folder and select the OS folder your system is
2. Double click on the **infinst_autol.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 2 – Install VGA Driver

1. Click on the **STEP2-VGA** folder and select the OS folder your system is
2. Double click on the **Setup.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 Audio Driver

1. Click on the **STEP3-AUDIO** folder and select the OS folder your system is
2. Double click on the **Setup.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 LAN Driver

1. Click on the **STEP4-LAN** folder and select the OS folder your system is
2. Double click on the **PROWin32.exe** located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Appendix

A

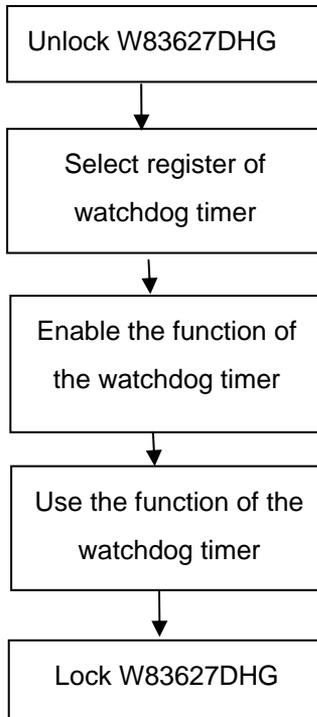
Programming the Watchdog Timer

A.1 Programming

AEC-6612 utilizes W83627DHG-P chipset as its watchdog timer controller.

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

Configuring Sequence Description



There are three steps to complete the configuration setup:

- (1) Enter the W83627DHG config Mode
- (2) Modify the data of configuration registers

- (3) Exit the W83627DHG config Mode. Undesired result may occur if the config Mode is not exited normally.

(1) Enter the W83627DHG config Mode

To enter the W83627DHG 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 W83627DHG 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 and KBC P20 Control Mode Register)

Bit 7-5 : select PLED mode

= 000 Power LED pin is driven high.

= 001 Power LED pin outputs 0.5Hz pulse with 50% duty cycle.

= 010 Power LED pin is driven low.

= 011 Power LED pin outputs 2Hz pulse with 50% duty cycle.

= 100 Power LED pin outputs 1Hz pulse with 50% duty cycle.

= 101 Power LED pin outputs 4Hz pulse with 50% duty cycle.

= 110 Power LED pin outputs 0.25Hz pulse with 50% duty cycle.

=111 Power LED pin outputs 0.25Hz pulse with 50% duty cycle..

Bit 4 : WDTO# count mode is 1000 times faster.

= 0 Disable.

= 1 Enable.

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 : Disable / Enable the WDTO# output low pulse to the KBRST# pin (PIN60)

= 0 Disable

= 1 Enable

Bit 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 W83627DHG Watchdog Timer Initial Program

Example: Setting 10 sec. as Watchdog timeout interval

;/;;

Mov dx,2eh ;Enter W83627DHG 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 W83627DHG config mode
Mov al,0aah           (out 0aah to 2eh once)
Out dx,al
;/////////////////////////////////////////////////////////////////

```