AEC-6710

IP-67 Waterproof

Embedded Communication Controller

VIA Mark 533MHz CPU

With 4 RS-232/ 1 USB/ 1 LAN

Audio, VGA

.

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Packing List

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

- 1   AEC-6710 Embedded Communication Controller
- 1   COM1 + COM2 Cable (C1)
- 1   LAN port + Audio out/in (C2)
- 2   Wallmount Bracket
- 1   VGA cable (C3)
- 1   COM3 + COM4 cable (C4)
- 1   power inlet + power switch + USB 1.1 port + keyboard/Mouse port(C5)
- 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 reliable 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:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it to work according to the users manual.
- The equipment has been dropped and damaged.
- 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 Safety

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:
It may cause danger of explosion if 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.

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Chapter

1

General Information

1.1 Introduction

AAEON is pleased to introduce the world's first IP-67 certified embedded communication controller — AEC-6710 of BOXER G series. AEC-6710 obtained five international patents (Germany, Japan, America, Taiwan and China) for its finned, fanless chassis design. Exceptional heat conduction without any moving components allows AEC-6710 to withstand temperatures up to $60^{\mathrm{o}}C$. The curved shape creates the biggest area of heat release. As an X86 computer based system with an all- aluminum body and seamless joints, AEC-6710 presents the ultimate in mechanical design.

AEC-6710 adopts a VIA Mark 533MHz processor and supports SDRAM DIMM system memory up to 512MB. For network connection, AEC-6710 also features one 10/100Base-TX RJ-45 connector. In addition, one customized Mini PCI for expansion, four serial ports, one USB port, line-in/line-out audio port serve as optimal I/O interfaces. Moreover, its industrial grade communication controller offers industrial-level anti-vibration and anti-shock approvals. AEC-6710 has passed Mil-Std-810F, Method 514.5, procedure 1, Cat.20, Table 514.5C-VII, Figure 514.5C (US highway trunk) vibration testing. It also provides isolation and surge protection. In addition, the AEC-6710 can be operated under wide temperature ranges from -15 $^{\mathrm{o}}C$ to 60 $^{\mathrm{o}}C$ ($5^{\mathrm{o}}F$ to 140 $^{\mathrm{o}}F$) including

storage temperature from -40 ^{O}C to 85 ^{O}C (-40°F to 185 ^{O}F).

IP-67 is a rating of total protection from dust ingress and immersion in water up to 1m, whereby the controller can be located in extremely harsh environments such as outdoor, heavy industrial and military applications.   A powerful communication gateway, BOXER G, AEC-6710 can be used as a front-end device, connected to multiple back-end devices for 24/7 operational requirements.

1.2 Features

- Worldwide No.1 Water Proof Controller: IP-67 Certified
- Isolation and Surge Protection
- Wide Temperature Operating
- Anti-vibration and Shock
- Compact, Easy Mounting, Rich I/O Support
- High Speed Computing and Open Application Development Environment

1.3 Specifications

System

- CPU   VIA Mark, 533MHz CPU
- Memory   SDRAM SODIMM x 1, Max.
                       512MB
- VGA   DB 15 VGA Connector x 1
- Keyboard/Mouse   PS/2 Keyboard & Mouse x 1
- Ethernet   10/100Base-TX Ethernet RJ-45
                       Connector x 1
- Solid Storage Disk   CompactFlash socket x1
- Serial port   RS-232 x 3, RS-232/422/485 x 1
- Audio   Line-in/ Line-out
- USB   USB 1.1 port x 1
- Watchdog Timer   Generates a time-out system reset
- Power supply   DC Input: 12V DC~48V DC
                       AC Input: External power adapter
                       (Optional)
- System control   Power on/off switch x 1, reset
                       button x 1
- Indicator   Power LEDx1, HDD active LEDx 1

Mechanical and Environmental

- Construction   Aluminum Alloy Chassis
- Color   Military Green
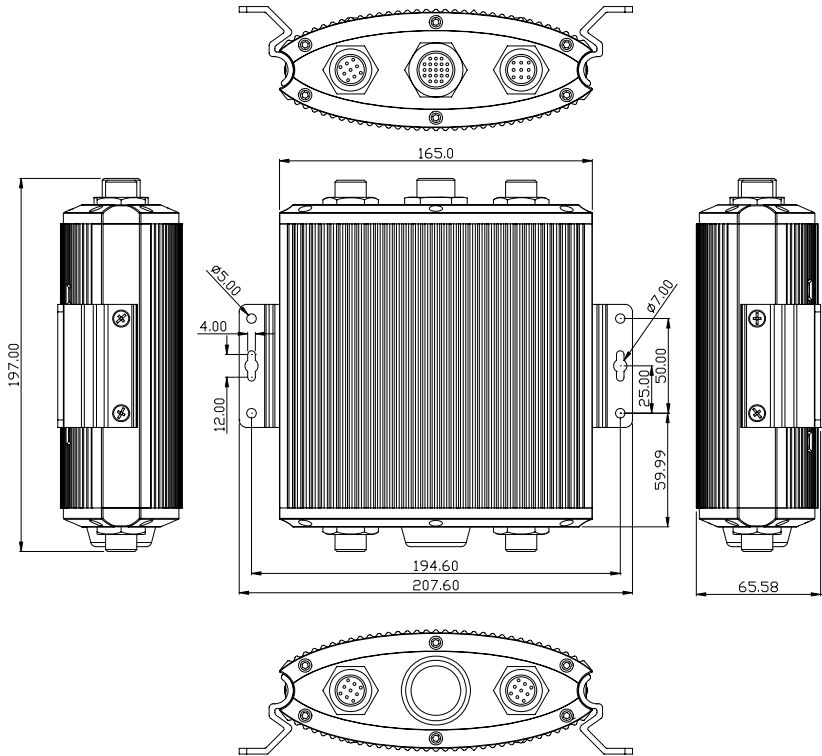
- Mounting　　　　　　　Wallmount (Default)
- Dimension　　　　　　　6.5"(W) x 2.6"(H) x 7.8"(D)

　　　　　　　　　　　　　(165mm x 65.6mm x 197mm)

- Net weight　　　　　　　4.4 lb (2 kg)
- Gross weight　　　　　　8.36 lb (3.8 kg)
- Operating Temperature　5°F~140°F (-15℃~60℃)
- Storage Temperature　　-40$^\circ\text{F}$~185$^\circ\text{F}$ (-40℃~85℃)
- Storage Humidity　　　　5~90%＠40℃, non-condensing

　　　　　　　　　　　　　Mil-Std-810F, Method 507.4,

　　　　　　　　　　　　　Storage Humidity: 5 to 95%

　　　　　　　　　　　　　relative humidity,

　　　　　　　　　　　　　non-condensing

- Vibration　　　　　　　5g rms/ 5~500Hz/ random

　　　　　　　　　　　　　operation

　　　　　　　　　　　　　Mil-Std-810F, Method 514.5,

　　　　　　　　　　　　　procedure 1, Cat.20, Table

　　　　　　　　　　　　　514.5C-VII, Figure 514.5C (US

　　　　　　　　　　　　　highway truck)

- Shock　　　　　　　　100g peak acceleration (11

　　　　　　　　　　　　　msec. duration)

- EMC　　　　　　　　　CE/FCC Class A

Chapter

2

Quick Installation Guide

2.1 Dimension

2.2 Connector alignments of AEC-6710

Front

C2 Port for:
- LAN Port
- Audio Line-in
- Audio Line-out

C1 Port for:
- COM1
- COM2

Rear

C5 Port for:
- Power Inlet
- Power Switch
- USB 1.1
- Keyboard/Mouse Port

C3 Port for:
- VGA Port

C4 Port for:
- COM3
- COM4
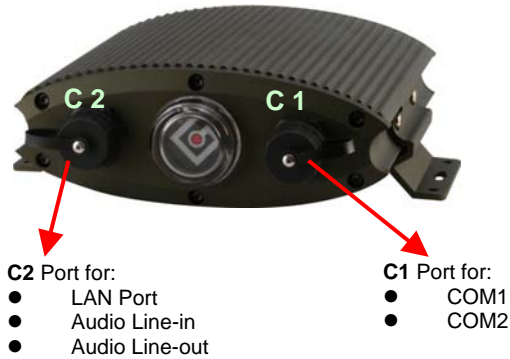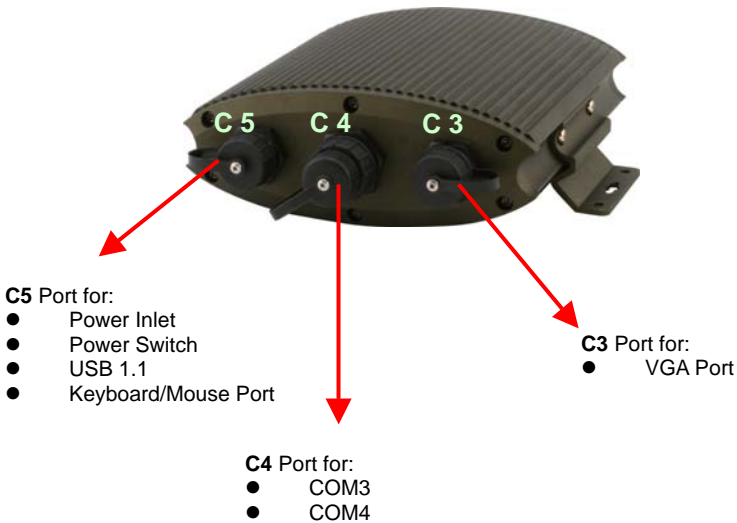
Note 1: To insert cables you must first unscrew the connector's protective caps.

Note 2: Please pay attention on the key of the cable connector when you connect the cable connector to AEC-6710. The notch of the cable connector should be in the upper position. Another way to connect properly is to identify the characters of "**LTW**" on the cable connectors. (See Photo below) The "LTW" should be on the top of the connector.
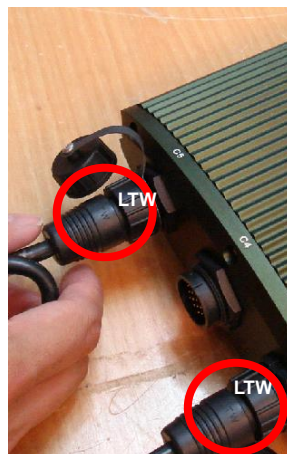
2.3 Connecting Audio Cable to AEC-6710 (C2 port)

Step 1: Take the C2 Cable from the accessory kit and twist the cap

of C2 port onto AEC-6710

Step 2: Insert the cable connector of C2 Cable (Audio cable) to C2

port of AEC-6710 and twist it to lock

2.4 Connecting VGA Cable to AEC-6710 (C3 port)

Step 1: Remove the C3 cable from the accessory kit

Step 2: Insert the C3 cable connector to C3 port of AEC-6710 and

twist it to lock

Step 3: Connect the VGA cable connector to the monitor and turn

on the monitor power button

2.5 Connecting COM Port Cable to AEC-6710 (C4 port)

Step 1: Remove the C4 cable from the accessory kit

Step 2: Insert the C4 cable connector to C4 port of AEC-6710 and

twist it to lock
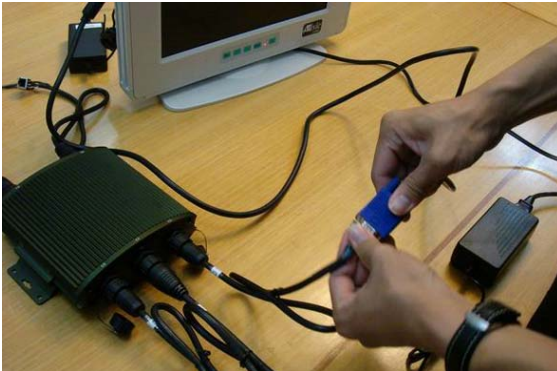
2.6 Connecting Power Cable to AEC-6710 (C5 port)

Step 1: Remove the C5 cable from the accessory kit

Step 2: Insert the C5 cable connector to C5 port of AEC-6710 and twist it to lock

Step 3: Connect the power cable to C5 Cable
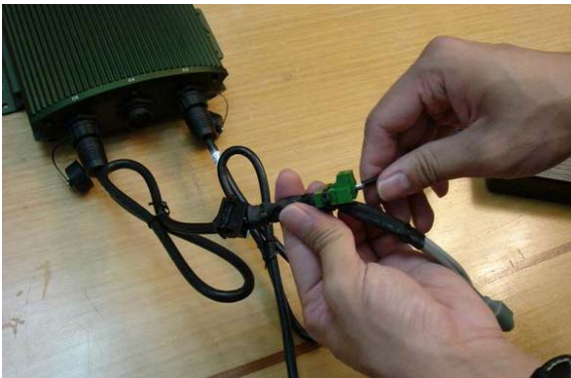
2.7 Connecting Keyboard & Mouse Cable to AEC-6710 (C5 port)

Step 1: Connect keyboard & Mouse cables with the C5 cable of AEC-6710

Step 2: After connecting all cables, please turn on the power switch along with C5 Cable

Please follow the procedures of computer setup to operate

AEC-6710

Chapter

3

Award BIOS Setup

3.1   System Test and Initialization

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

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1.   You are starting your system for the first time

2.   You have changed the hardware attached to your system

3.   The CMOS memory has lost power and the configuration information has been erased.

The AEC-6710 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-6710 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 4-in-1 Driver

Step 2 – Install Ethernet Driver

Step 3 – Install Mini PCI Module Driver

Step 4 – Install VGA Driver

Step 5 – Install AC97 Audio Driver

4.1 Installation

Insert the AEC-6710 CD-ROM into the CD-ROM drive and

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

Step 1 – Install 4-in-1 Driver

1. Click on the ***Step 1 –4-in-1 Driver*** folder
2. Double click on ***VIA Hyperion4in1455v*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 2 – Install Ethernet Driver

1. Click on the ***Step 2 –Ethernet Driver*** folder
2. Click on ***Windows*** file and double click on ***Setup*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install Mini PCI Module Driver

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Other PCI Bridge Device**

7. Click on **Update Driver…**

8. Click on **Next**

9. Select **Search for a suitable driver…**, then click on **Next**

10. Select **Specify a location**, then click on **Next**

11. Click on **Browse**

12. Select "**Ite**" file from CD-ROM **(Drivers/Step 3 –**

   PER-C40C Mini PCI RS-232 Module driver v1.0 for

   Windows) then click on **open**

13. Click on **OK**

14. Click on **Next**

15. Click on **Finish**

Step 4 –Install VGA Driver

1. Click on the *Step 4 –VGA driver* folder

2. Choose the OS your system is

3. Double click on *Setup* file

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Step 5 –Install AC97 Audio Driver

1. Click on the *Step 5 –AC97 Audio driver* folder

2. Choose the OS your system is

3. Double click on *Setup* file

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Appendix

A

Programming the

Watchdog Timer

A.1 Programming

An onboard watchdog timer reduces the chance of disruptions which CPLD (Compact Programmable Logical Device) interface can cause. This is an invaluable protective device for standalone or punmanned applications. When the watchdog timer activates (CPU processing has come to a halt), it can reset the system, or generate an interrupt on IRQ10, IRQ11, IRQ15, and NM1. This can be set via I/O Port 444, the function as following:

0: RESET
1: NM1
2: IRQ10
3: IRQ11
4: IRQ15

If you decide to program the watchdog timer, you must write data to I/O port 443 (hex). The output data is a value timer. You can write form 01 (hex) to FF (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read a Hex value from I/O port 80 (hex).

The following procesude is a sample program for the watchdog timer:

- Type C:\DOS\Debug <ENTER>

- To start watchdog timer and set function "Reset" type;

    o 444 0<Enter>; out 444h data 0

- To input Watchdog timers time-out interval of 5 seconds type; o 443 05<Enter>; out 443h data 05

- To disable the watch timer type; i80 <Enter>

The time interval data of the watchdog timer is shown in binary code (8 bits). Sample 2: 5 seconds

0	0	0	0	0	1	0	1

Appendix

B

I/O Information

B.1 I/O Address Map

Address	Description	User Address
000-01F	DMA Controller #1	000-000F
020-03F	Interrupt Controller #1, Master	020-021
040-05F	System Time	040-043
060-06F	8042 (Keyboard Controller)	060-064
070-07F	Real time Clock, NMI (non-maskable Interrupt) Mask	070-073
080-09F	DMA Page Register	080-08F
0A0-0BF	Interrupt Controller #2	0A0-0A1
0C0-0DF	DMA Controller #2	0C0-0DF
0F0-0FF	Math Coprpcessor	0F0-0FF
170-177	Secondary IDE Channel	170-177
1F0-1F7	Primary IDE Channel	1F0-1F7
2F8-2FF	Serial Port 2	2F8-2FF
378-37F	Parallel Printer Port 1	378-37F
3B0-3DF	EGA / VGA card	3B0-3DF
3F8-3FF	Serial Port 1	3F8-3FF

B.2 1st MB Memory Address Map

Memory Address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-CBFFF	VGA BIOS
E0000-FFFFF	System BIOS

B.3 IRQ Mapping Chart

IRQ0	System Timer	IRQ8	System CMOS / Real time clock
IRQ1	Keyboard	IRQ9	Unused
IRQ2	Cascade to IRQ Controller	IRQ10	Unused
IRQ3	COM2	IRQ11	Unused
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Unused	IRQ13	FPU
IRQ6	Unused	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

B.4 DMA Channel Assignments

DMA Channel	Function
0	Available
1	Available
2	Unused
3	Available
4	Direct Memory Access Controller
5	Available
6	Available
7	Available