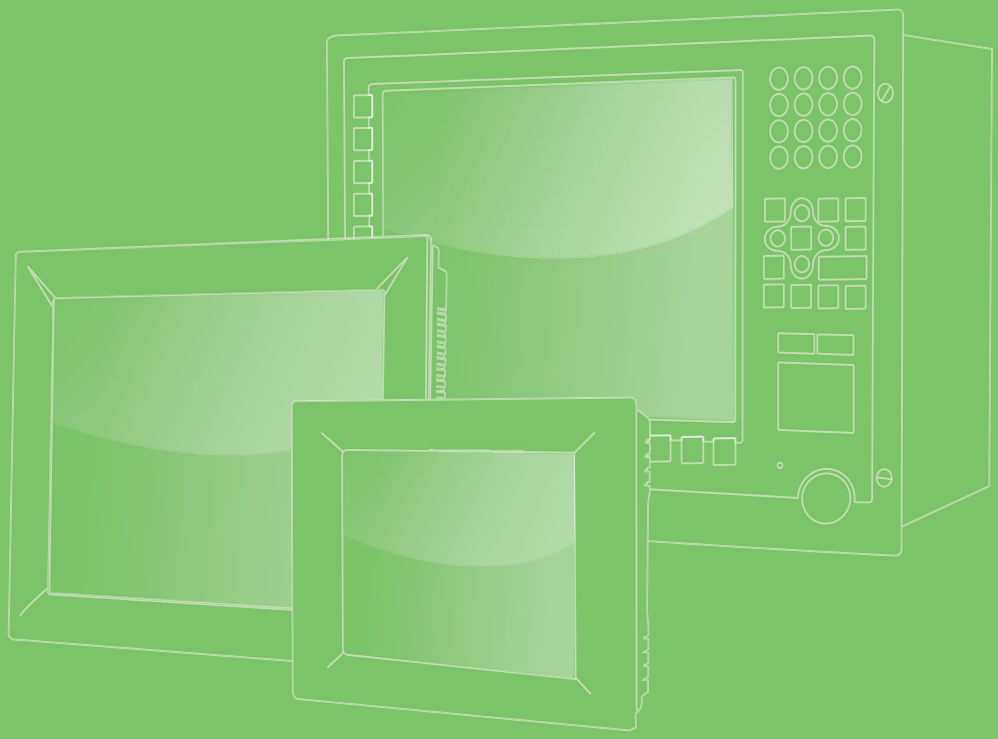

User Manual

PPC-6120

Intel® Core™ i / Celeron® based Panel PC with a 12.1" Color TFT LCD

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No.200KC61220 Edition 1

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located 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 may 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 overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
    - If one 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 user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
14. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
15. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
16. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Battery Information

Batteries, battery packs and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

Contents

Chapter 1 Overview 1

1.1 Introduction 2
1.2 Specifications 2
1.2.1 General Specifications 2
1.2.2 Power Specifications 3
1.2.3 Touchscreen Specifications 3
1.2.4 Environment Specifications 3
1.2.5 Certification 4
1.2.6 IP Grade 4
1.3 Dimensions 5
Figure 1.1 Dimensions 5

Chapter 2 System Setup 7

2.1 A Quick Tour 8
Figure 2.1 Front Panel of Panel PC 8
Figure 2.2 Side View of Panel PC 9
Figure 2.3 IO Connectors of Panel PC 10
2.2 Installation Procedures 11
2.2.1 Connecting Power Cord 11
Figure 2.4 Connecting Power Cord 11
2.2.2 Connecting Keyboard and Mouse 11
2.2.3 Switching on Power 11
2.3 Installing CPU 12
Figure 2.5 Unfastening Screws on Rear Cover 12
Figure 2.6 Unplugging Switch Wire 12
Figure 2.7 Remove rear cover 13
Figure 2.8 CPU fasten in socket 13
Figure 2.9 CPU cooler 14
Figure 2.10 Assemble cooler 14
2.4 Installing Memory 15
Figure 2.11 Install Memory 15
2.5 Installing HDD 15
Figure 2.12 Loosen HDD bracket screws 15
Figure 2.13 Fix HDD in HDD brackets 16
Figure 2.14 Assemble HDD 16
2.6 Installing mSATA 17
Figure 2.15 Assemble MSATA 17
2.7 Installing Wireless LAN Card 17
Figure 2.16 Assemble wireless card and antenna 17
Figure 2.17 Replace the HDD module 18
Figure 2.18 View of assemble antenna 18
2.8 Installing PPC-6120-EXPE 19
Figure 2.19 PPC-6120-EXPE module 19
Figure 2.20 Remove riser card door 19
Figure 2.21 Assemble riser card 20
Figure 2.22 Complete assemble expansion kits 20
2.9 Installing Hook 21
Figure 2.23 Installing Hook 21
2.10 Quick Installation of PPC 22
Figure 2.24 Put Panel PC into Cabinet 22
Figure 2.25 Installing PC with Clamp 22
Figure 2.26 Installing Hook 23

Chapter 3 Jumpers and Connectors 25

3.1 Jumpers and Connectors 26
Figure 3.1 Front View of PCM-8210 26
Table 3.1: Connectors 26
3.2 External COM Ports Pin Definition 28
Figure 3.2 COM Port 28

Chapter 4 Software Setup 31

4.1 Driver Installation 32
4.2 BIOS Setup Program 32
4.2.1 Entering BIOS Setup 32
4.2.2 Adjustment of LCD Brightness 33
4.2.3 COM5 Mode Selection (RS422/RS485) 35
4.2.4 COM5 RS485 Terminate Selection 36
4.2.5 Wake on LAN 37
4.2.6 AT & ATX Setting 39

Chapter 1

Overview

This chapter gives basic information about the PPC-6120.

Sections include:

- Introduction
- Specifications
- Dimensions

1.1 Introduction

Advantech's PPC-6120 is a 4th Generation Intel Core™ i / Celeron based Panel PC with a 12" color TFT LCD. It features extremely high computing power, various connectors, and can be installed in virtually any application. In addition, its user-friendly interface makes it a great host for information appliances. Four RS232, one isolated RS422/485 and Dual Gb Ethernet connectors support Intel AMT, one expansion slot make PPC-6120 highly reliable, and provides a great solution for versatile applications.

1.2 Specifications

1.2.1 General Specifications

Product	PPC-6120
LCD Specfication	12.1"LCD
Display type	12.1"TFT LCD (LED backlight)
Max. Resolution	1024 x 768
Supported Color	262K/16.2M
Dot Pitch	0.240(H) x 0.240(V)
View Angle	80 (left), 80 (right), 70 (up), 70 (down)
Luminance	600
Contrast Ratio	700
Backlight Life	50,000 hrs
Weight	3.8kg (8.38lb)
Dimension	325.00 x 253.80 x 73.80 mm (12.80" x 9.99" x 2.91")
CPU	4th Generation Intel® Core™ i / Celeron® Processor (Thermal Design Power: 35W/45W)

Type	**Frequence**	**Cache**	**TDP**
I7-4770TE	2.3GHz	8M	45W
I5-4570TE	2.7GHz	4M	35W
I3-4330TE	2.4GHz	4M	35W
PENTIUM-G3320TE	2.3GHz	3M	35W
Celeron-1820TE	2.2GHz	2M	35W
I5-4590T	2.0GHz	6M	35W
I3-4350T	3.1GHz	4M	35W
I3-4340TE	2.6GHz	4M	35W

Chipset	Intel Q87
Memory	Support dual channel DDR3/DDR3L up to 16 GB
Storage	1 x standard SATA connector for HDD, 1 x mSATA socket
Network (LAN)	2 x Gigabit Ethernet ports, support Intel AMT9.0
I/O	5 x COM port: 1 x RS422/485(isolation), 4 x RS232 4 x external USB 3.0 ports 1 x Display Port 1.2 1 x DB15 VGA out 1 x Line out port; 1 x MIC in 1 x Power Button
Speaker	1W Stereo Speaker x 2
Bus Expansion	1 x MiniPCIe (Standard)
	1 x PCIe x 4 / 1 x PCI through riser (Optional)
OS Support	Win 7, Win 8, Win 8.1, Linux

1.2.2 Power Specifications

Power Consumption	I7-4770TE: 84W (Test system: Windows7 64bit), 83W (Test system: Windows8 64bit) I5-4590TE: 65W (Test system: Windows7 64bit), 61W (Test system: Windows8 64bit) I3-4330TE: 56W (Test system: Windows7 64bit), 54W (Test system: Windows8 64bit) Petium-G3320TE: 47W (Test system: Windows7 64bit), 46W (Test system: Windows8 64bit)
Input Voltage	12 - 30 Vdc, 9.5A

Note! *For details about the above test conditions for power consumption, please see Remark 1.*

1.2.3 Touchscreen Specifications

Type	Five wire resistive
Resolution	2048 x 2048
Light Transmission	80%+/-3%
Controller	COM interface
Durability	36 million

1.2.4 Environment Specifications

Operating Temperature	0 ~ 50°C (32 ~ 122°F)
Storage Temperature	-20 ~ 60°C (-4 ~ 140°F)
Relative Humidity	10 ~ 95% @ 40°C (Non-condensing)
Shock	10 G peak acceleration (11 ms duration)
Vibration	5 ~ 500 Hz 1 G RMS

1.2.5 Certification

EMC	BSMI, CE, FCC Class A
Safety	CB, CCC, BSMI, UL

1.2.6 IP Grade

Front Panel Dust-Proof & Water-Proof	IP65 compliant

Remark 1:

Power consumption (PPC-6120):

Test	Test Configuration	Test System
Burn-in 7.0	Memory: Transcend 8G DDR3 1600 * 1 HDD: Seageat 500G 2.5”* 1 IO: COM Port RS232 loopback x4, USB3.0 device *4	Win 7 (64bit) Win 8 (64bit)

1.3 Dimensions

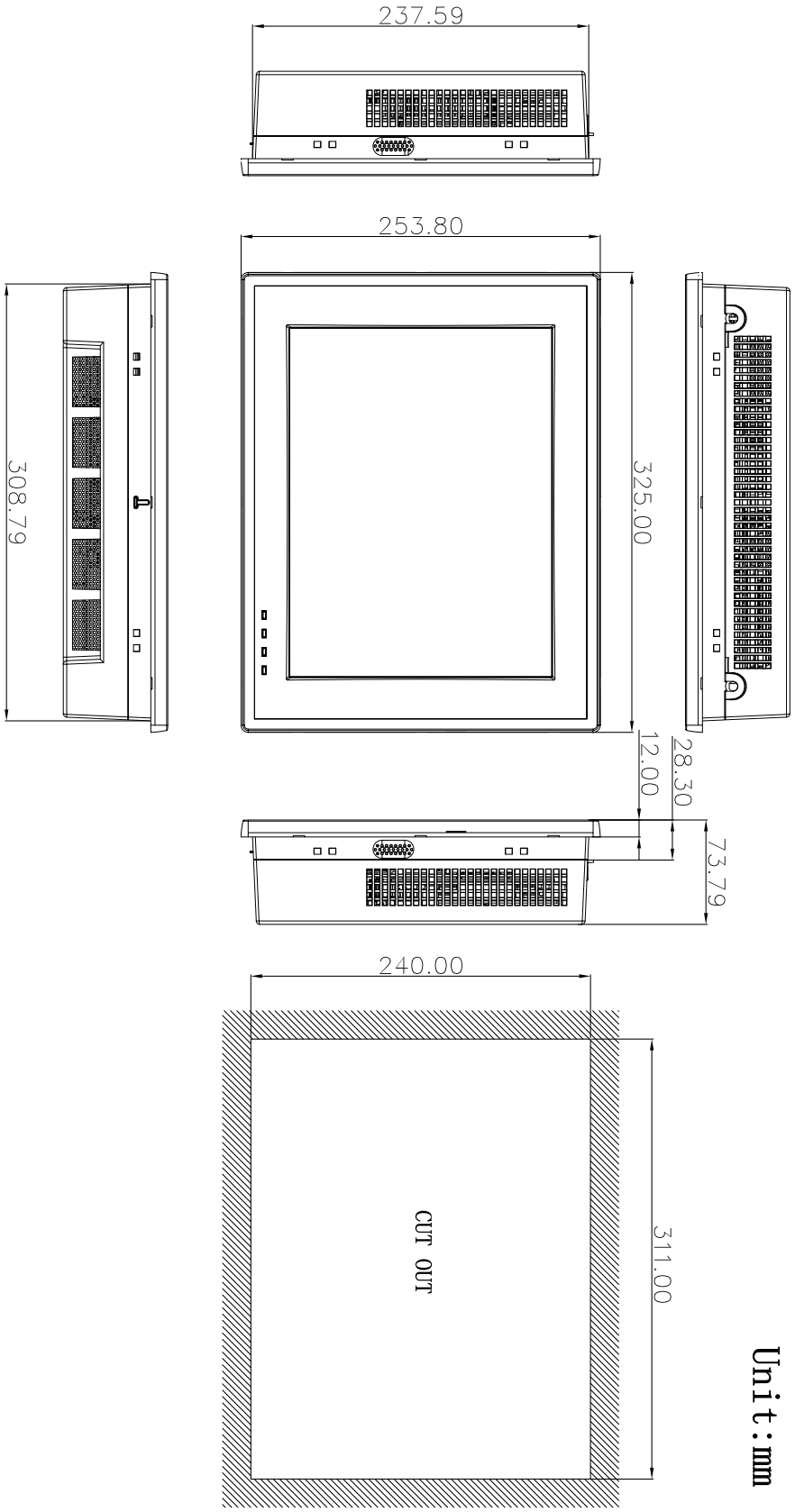


Figure 1.1 Dimensions

Note! *Specification of mounting VESA screw: M4. Depth of screw hole: 6 mm (Max.).*

Warning! *Use suitable mounting apparatus to avoid risk of injury.*

Chapter 2

System Setup

Sections include:

- A Quick Tour
- Installation Procedures
- Installing Memory
- Installing HDD
- Installing Mini SATA
- Installing Wireless LAN
- Installing Expansion Card
- Installing Hook
- Quick Installation of PPC-6120

2.1 A Quick Tour

Before starting to set up the panel PC, take a moment to become familiar with the locations and purposes of controls, drivers, connectors and ports, which are illustrated in the figures below.

When placed upright on the desktop, the front panel of the panel PC appears as shown in Figure 2.1.

Figure 2.1 Front Panel of Panel PC

1. Light sense indicator (Light sense)
2. Network status indicator (LAN LED)
3. HDD status indicator (HDD LED)
4. Power status indicator (Power LED)

Status	LAN LED		HDD LED	POWER LED
	LAN1	LAN2		
Power On (S0)	Green (Operating, flashing)	Yellow (Operating, flashing)	Yellow (Operating, flashing)	Green

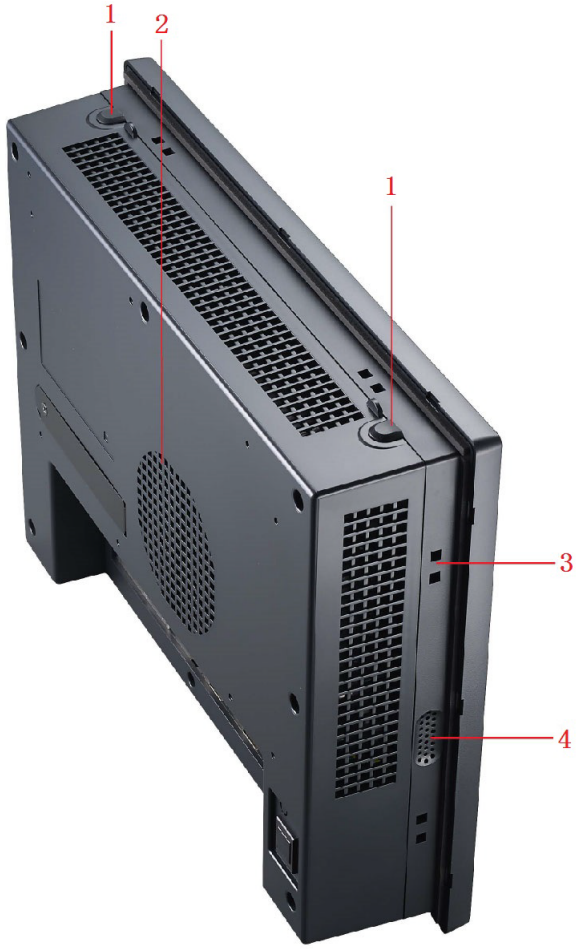


Figure 2.2 Side View of Panel PC

1. Antenna hole
2. CPU cooler holes
3. Hook hole for panel mount (8 holes)
4. Speaker (left & right)

I/O connectors:

Figure 2.3 IO Connectors of Panel PC

A: MIC In
B: Line Out
C: USB 3.0 * 4
D: Gigabit Ethernet x 2 (supports iAMT 9.0)
E: VGA Port
F: Display Port 1.2
G: COM RS-232 x 4
H: DC inlet and AT/ATX switch
I: RS422/485 (Isolation)

2.2 Installation Procedures

2.2.1 Connecting Power Cord

The panel PC can only be powered through a DC electrical outlet (12 ~ 30 V). Be sure to hold the plug end only. Follow these procedures to connect the power cord:

1. Connect the female end of the power cord to the DC inlet of the panel PC.
2. Connect the 3-pin male plug of the power cord to an electrical outlet.

Figure 2.4 Connecting Power Cord

2.2.2 Connecting Keyboard and Mouse

Connect the mouse and keyboard to the I/O connector of the panel PC.

2.2.3 Switching on Power

The power switch is located on the lower right corner on the rear cover of the panel PC.

2.3 Installing CPU

1. Unfasten the screws on the rear cover (8 screws).

Figure 2.5 Unfastening Screws on Rear Cover

2. Unplug the switch wire from the main board and remove the rear cover.

Figure 2.6 Unplugging Switch Wire

3. Remove rear cover.

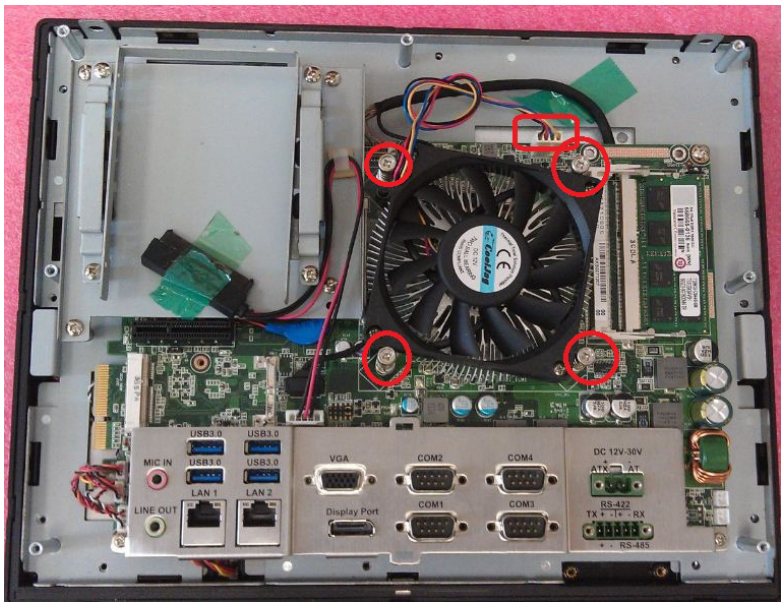


Figure 2.7 Remove rear cover

4. Put the CPU in the CPU socket and fasten the securing bracket.

Figure 2.8 CPU fasten in socket

5. Take the cooler from the carton, note that thermal pad is assembled on the cooler.

Figure 2.9 CPU cooler

6. Place the cooler on the M/B frame and insert the cooler power cable.

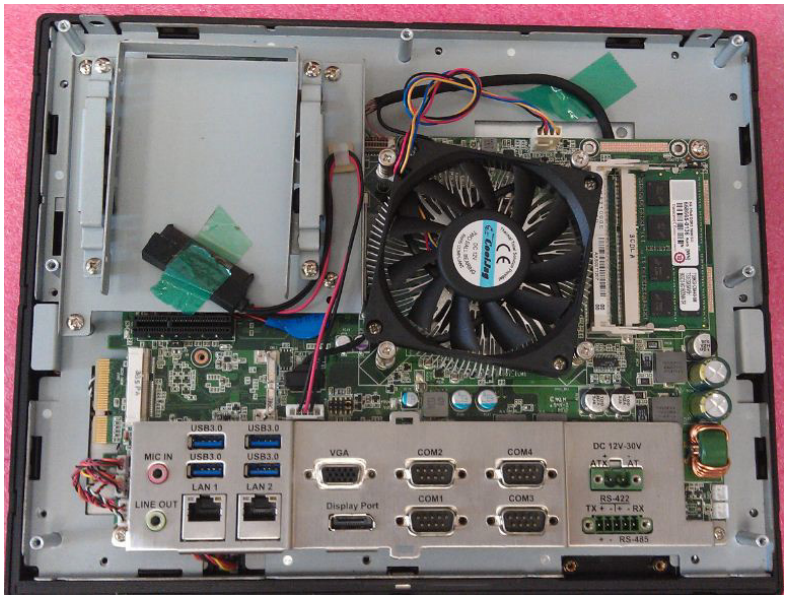


Figure 2.10 Assemble cooler

2.4 Installing Memory

1. Follow section 2.3 to remove rear cover, assemble memory in the location below, and place in the lowest socket first.

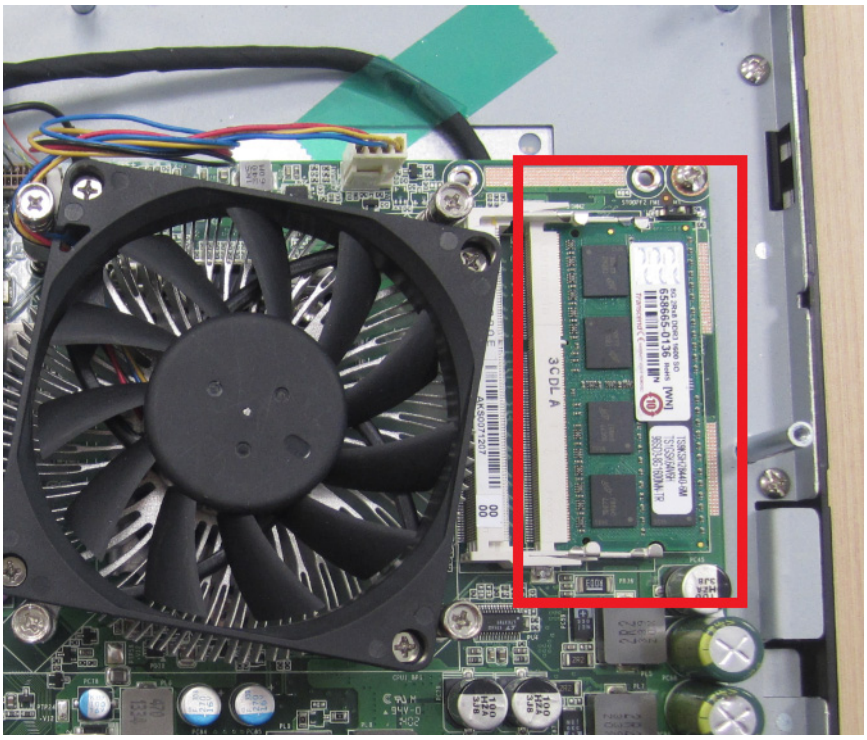


Figure 2.11 Install Memory

2.5 Installing HDD

1. Follow section 2.3 step to remove rear cover.
2. Remove the green tape and unfasten the four screws to take off HDD bracket.

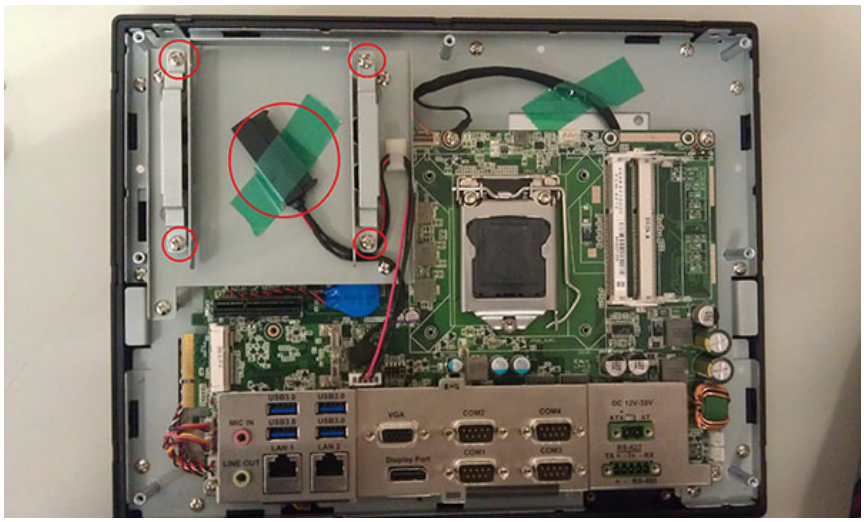


Figure 2.12 Loosen HDD bracket screws

3. Take four M3x5 screws out of the accessory box. Use the screws to secure the HDD into the bracket.

Figure 2.13 Fix HDD in HDD brackets

4. Replace the HDD bracket and plug in the power cable.

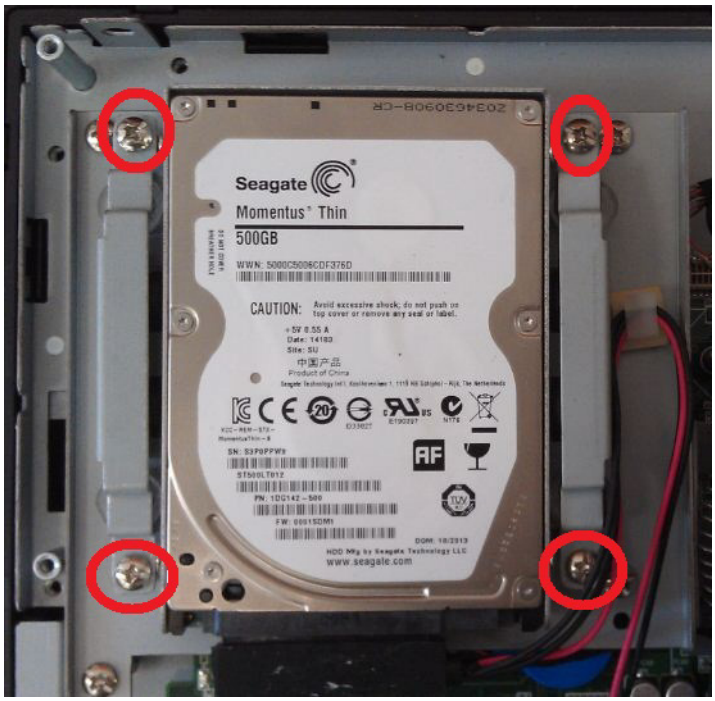


Figure 2.14 Assemble HDD

5. Attach the power cable to the main board. Replace the rear cover and secure it to finish the installation.

2.6 Installing mSATA

1. Follow the above procedure to remove the HDD bracket.
2. Insert the mSATA into the slot on the main board and use 2 M2.5x4 screws from the accessory box to fix it.

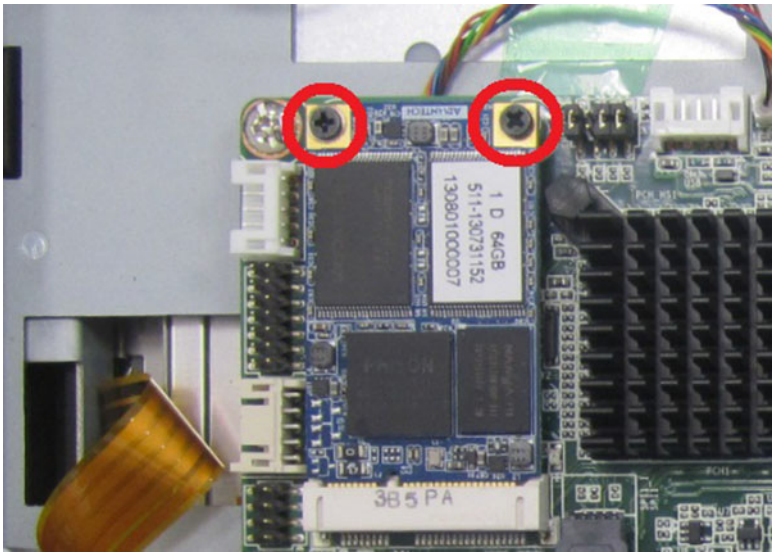


Figure 2.15 Assemble MSATA

3. Then replace the rear cover.

2.7 Installing Wireless LAN Card

1. Follow the above procedures to take off the HDD bracket. The long wireless LAN card can be directly installed to the position shown in the below figure, while the short one needs the support of a hex bolt (in accessory box) to be fixed into the position.
2. Fix the antenna into the position as shown below (left & right).

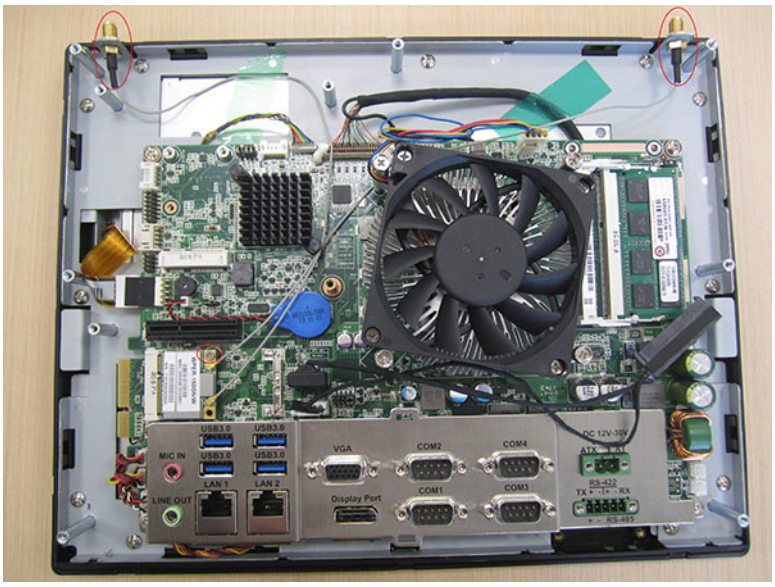


Figure 2.16 Assemble wireless card and antenna

3. Replace the HDD bracket.

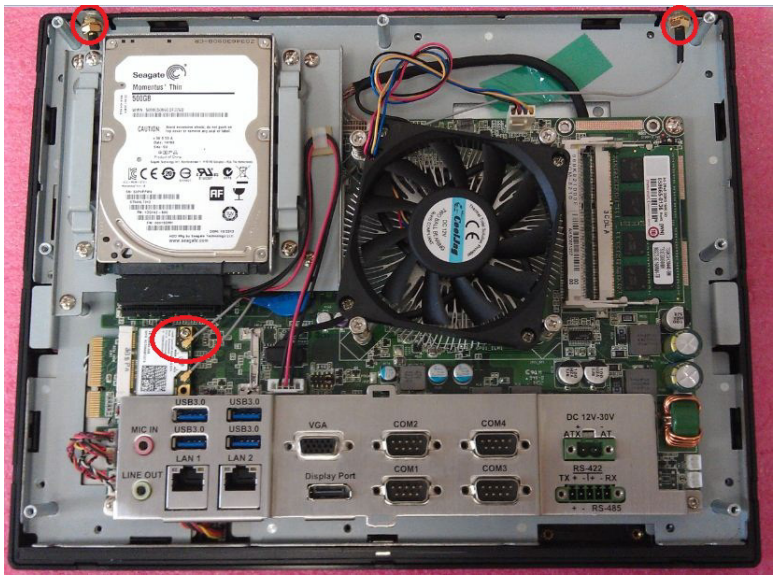


Figure 2.17 Replace the HDD module

4. Connect the antenna to the wireless LAN card and attach the external antenna terminals. Then replace the rear cover to finish the installation.

Figure 2.18 View of assemble antenna

2.8 Installing PPC-6120-EXPE

1. Take PPC-6120-EXPE module out of the box. Make sure you have correct riser card to be used. Take the PIC riser card as an example.

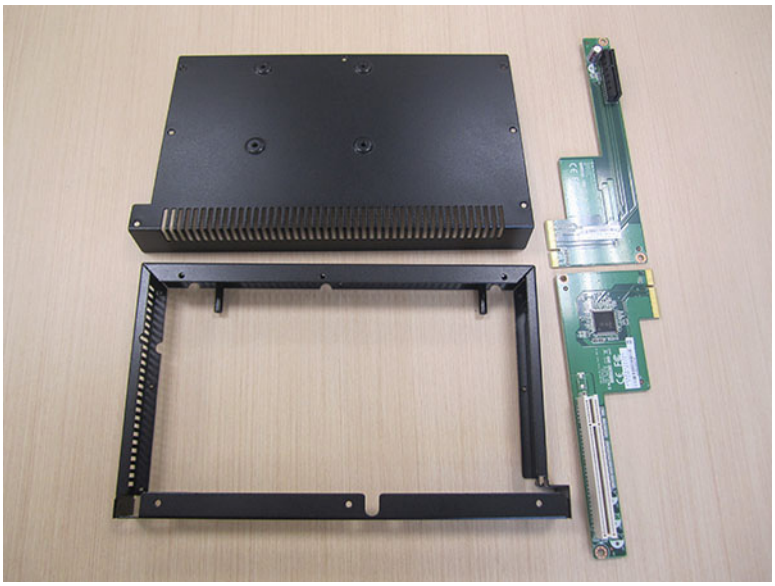


Figure 2.19 PPC-6120-EXPE module

2. Remove the screw that fixes the metal cover onto the back of PPC-6120, and then remove the cover.

Figure 2.20 Remove riser card door

3. Secure the PPC-6120-EXPE onto the rear cover with screws (4 screws). Insert the golden fingers of the riser card into the slot and use the screws to fix it (2 screws).

Figure 2.21 Assemble riser card

4. Insert the desired card into the slot and use the screw to fix it.
5. Replace the rear cover of PPC-6120-EXPE and use the screws (7 screws) to fix it.

Figure 2.22 Complete assemble expansion kits

Note! The size of PCI and PCIE card can not exceed 248mm long and 115mm wide.

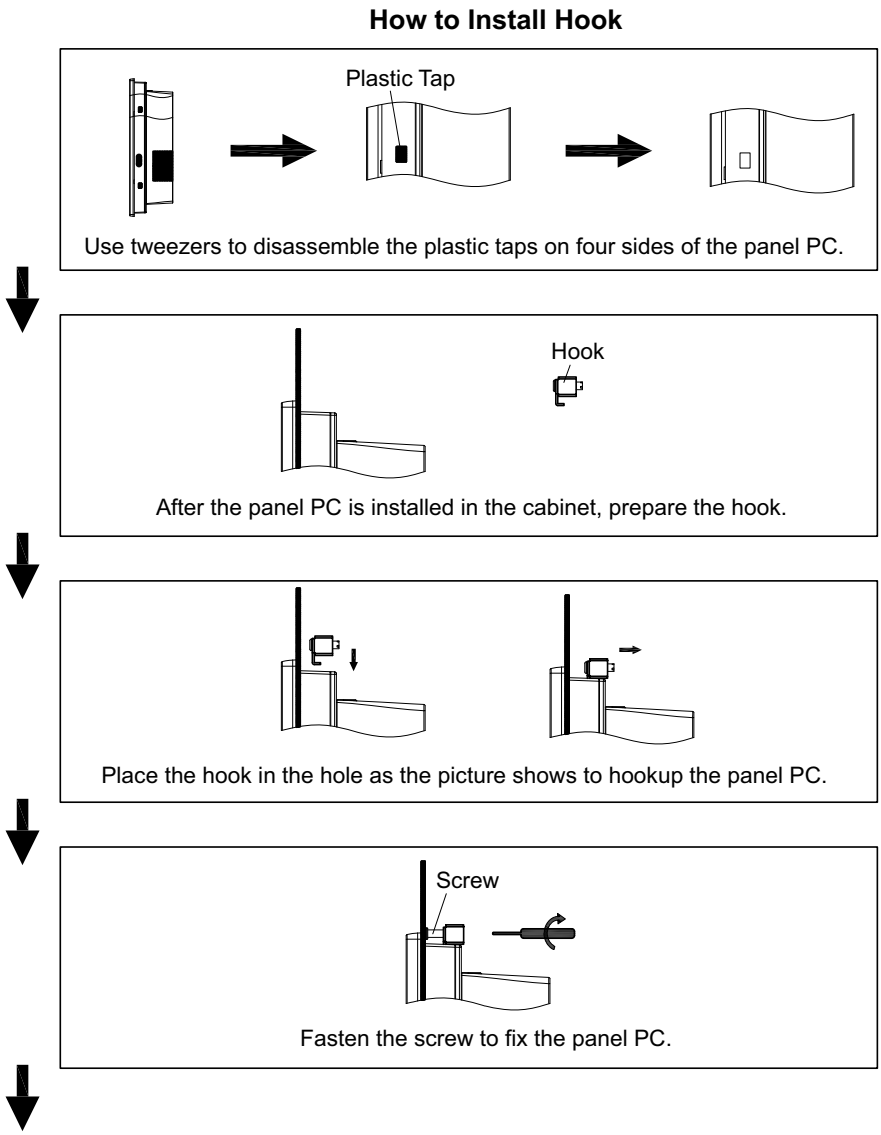
The total current load provided by the expansion slot is as follows:

12 V	2 A
5 V	2 A
3.3 V	3 A
-12 V	100 mA

Total output power of 12 V, 5 V and 3.3 V can not exceed 25 W.

2.9 Installing Hook

Refer to the figure below to install the hook:



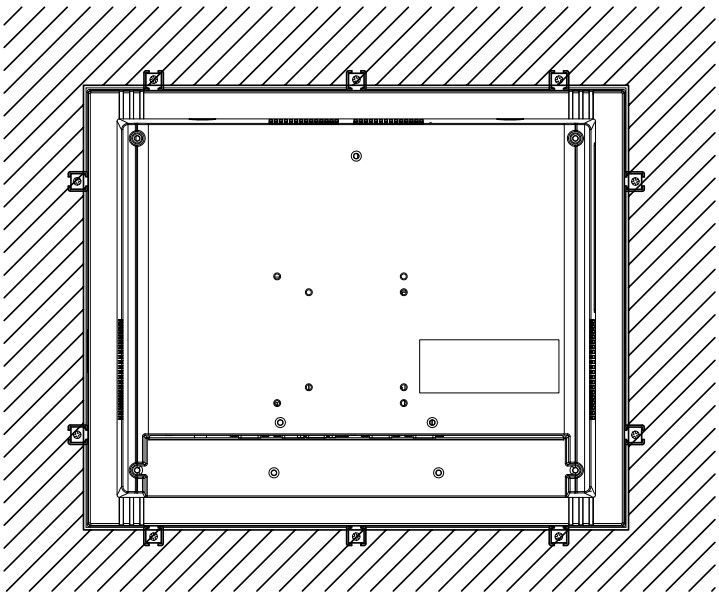


Figure 2.23 Installing Hook

2.10 Quick Installation of PPC

1. Put the panel PC into the rack hole at an angle and attach it to the inside of the cabinet wall as shown in the figure below.

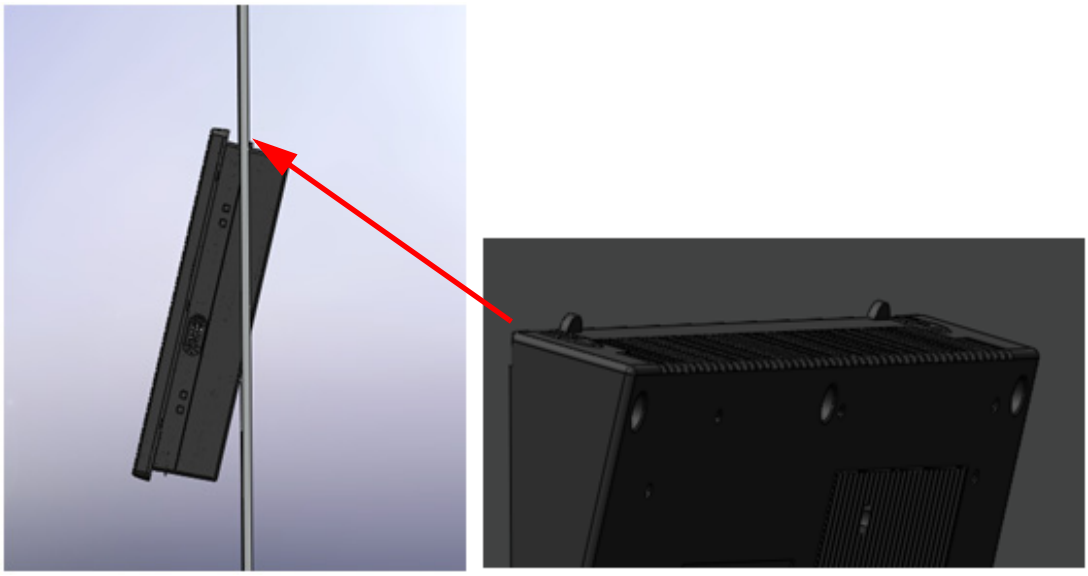


Figure 2.24 Put Panel PC into Cabinet

2. Use one hand to support the PC, while using the other to push the PC into the cabinet by pushing up the clamp with a screwdriver.

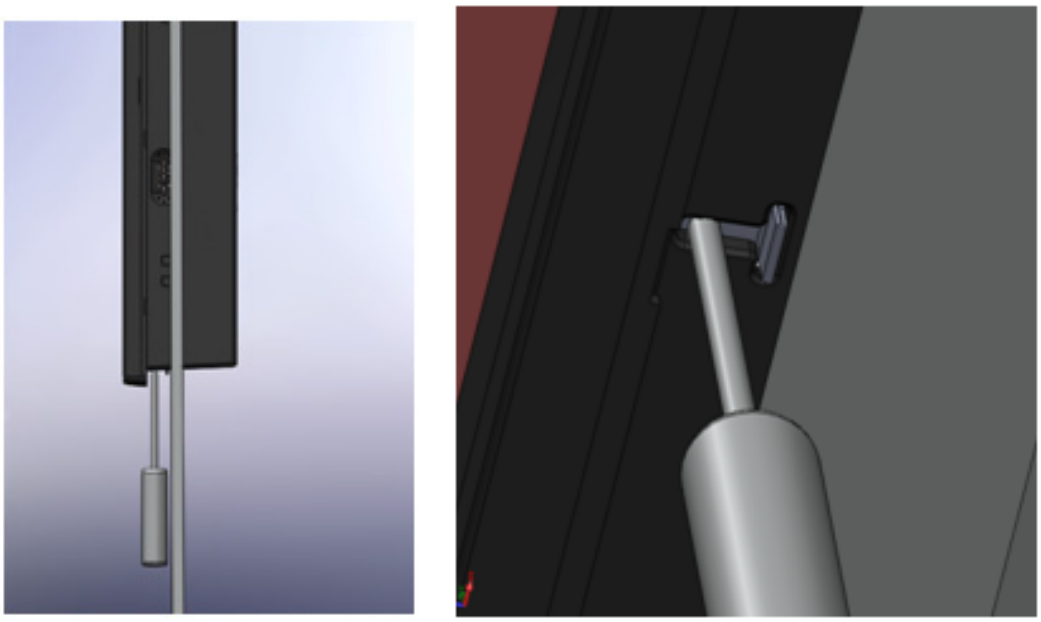


Figure 2.25 Installing PC with Clamp

3. Once the panel PC is attached into the cabinet, use the hook to secure it.

Figure 2.26 Installing Hook

4. If you want to remove the panel PC, reverse the above steps.

Chapter 3

Jumpers and Connectors

Sections include:

- Jumpers and Connectors
- External COM Ports Pin Definition

3.1 Jumpers and Connectors

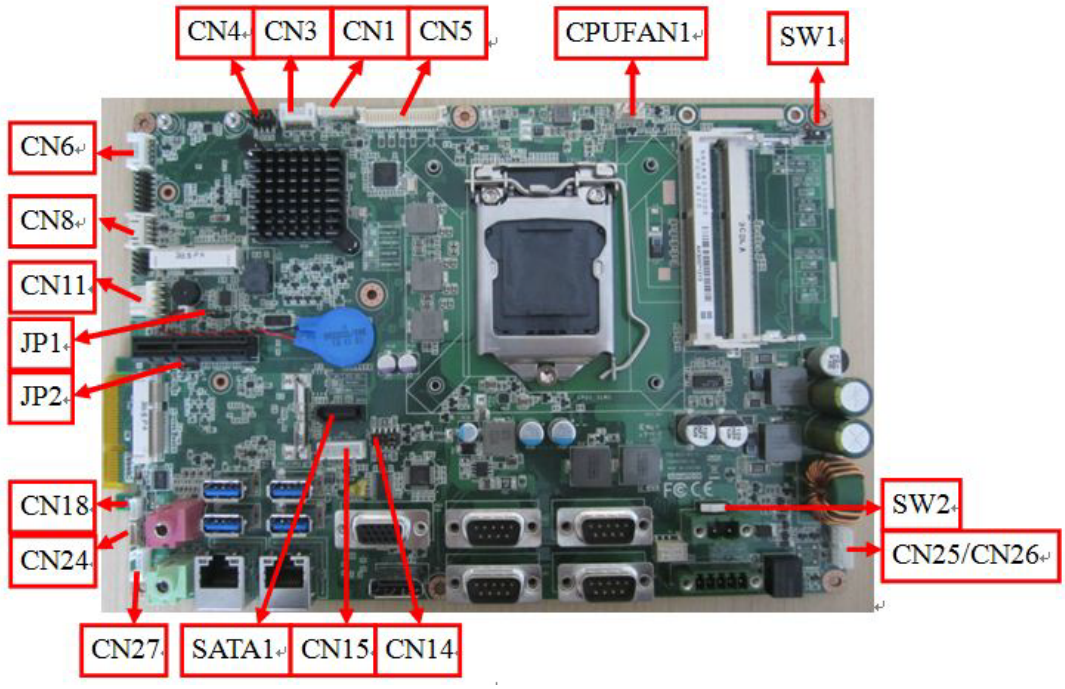


Figure 3.1 Front View of PCM-8210

Table 3.1: Connectors

Connectors	Functions
CN1	LCD Driver Board
CN3	Internal USB 2.0
CN4	Panel ID control
CN5	LVDS
CN6	Internal USB 2.0
CN8	GPIO
CN11	Touch
JP1	RTC Select
JP2	Touch Disable Select
CN18	Light sense
CN24	LED Board
CN27	Speaker
CN15	SATA Power
CN14	COM Pin9 Power Select (COM1&COM2)
CN25/CN26	Power Button
SW2	AT/ATX Select
SW1	DDR3 or DDR3L Select

JP1	Graphic	RTC Select	
(1-2)	P1	Normal*	Default*
(2-3)	P2	CMOS Clear	

P1

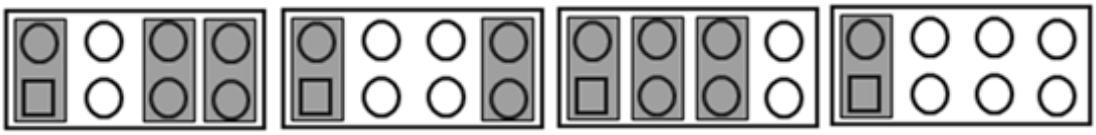
P2

JP2	Graphic	Touch Function	
(1-2)	P3	Touch Enable	Default*
(2-3)	P4	Touch Disable	

P3

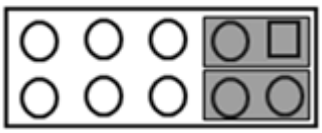
P4

CN4	Graphic	Panel Resolution	
(1-2)(5-6)(7-8)	P5	1024*768 24bit	Default*
(1-2)(7-8)	P6	1280*1024 24bit	
(1-2)(3-4)(5-6)	P7	1366*768 18bit	
(1-2)	P8	1920*1080 24bit	

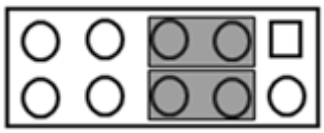


P5 P6 P7 P8

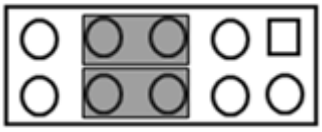
CN14	Graphic	COM1/2 RI Type Select	
(1-3)/(2-4)	P9	COM1/COM2 RI	Default*
(3-5)/(5-7)	P10	COM1/COM2 5V	
(4-6)/(6-8)	P11	COM1/COM2 5V	
(7-9)/(8-10)	P12	COM1/COM2 12V	



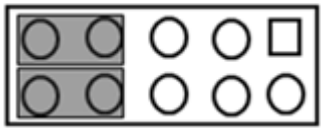
P9



P10

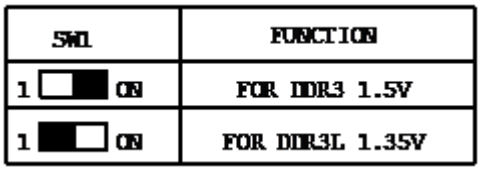


P11



P12

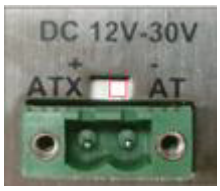
SW1	Function	
OFF	For DDR3 1.5V	Default*
ON	For DDR3L 1.35V	



P13

SW2		AT/ATX Select	
1-3	P14	ATX Power	Default*
2-3	P15	AT Power	

P14



P15

3.2 External COM Ports Pin Definition

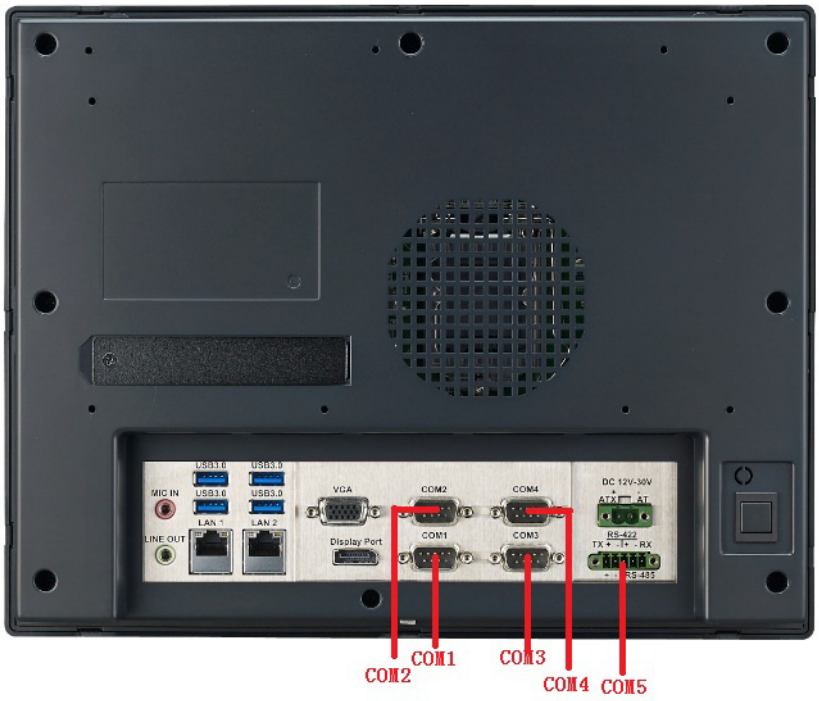


Figure 3.2 COM Port

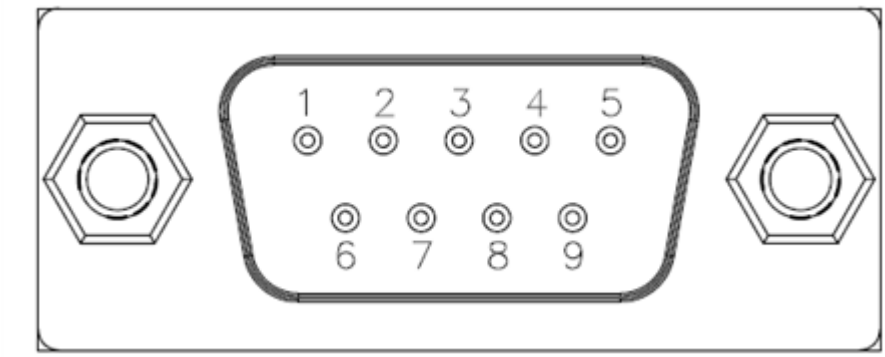
COM 1 and COM 2 (RS232, pin9 supports 5 V/12 V output)
COM 3 and COM 4 (RS232)
COM 5 RS422/485

COM1-2:
Pin9 is set as RI signal in COM port by default, and could be set as 5V/12V output by Jumper

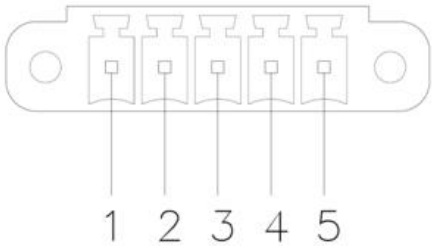
Note! *COM4 doesn't support RING function.*

Pin	COM1/COM2	COM3/COM4
1	DCD	DCD
2	RXD	RXD
3	TXD	TXD
4	DTR	DTR
5	GND	GND
6	DSR	DSR
7	RTS	RTS
8	CTS	CTS
9	RING or 5V/12V output	RING(Only COM3)

Pin9 is set as RI signal in COM port by default, and could be set as 5V/12V output by Jumper



COM5: RS422/485 with Isolation 1000 VDC, BIOS selectable



Pin	1	2	3	4	5
RS422	TX+	TX-	RX+	RX-	GND
RS485	D+	D-			GND

UART RS485 Auto Flow Control

COM5 supports RS485 auto flow control function for all UART.

When enabling the RS485 auto control function, it will automatically drive RTS# pin to logic high or low for flow control.

To make this RS485 auto flow control function work, please be noted that the parity and stop-bit setting has to be one of the following three settings:

(1) 8 data bits + 1 parity bit + 1stop bit

(2) 8 data bits + 1 parity bit + 2 stop bits

(3) 8 data bits + 2 stop bits

Chapter 4

Software Setup

Sections include:

- Driver Installation
- BIOS Setup Program

4.1 Driver Installation

When you install the OS to panel PC for the first time, you should install the corresponding drivers to make sure all the functions will work properly. Take CD-ROM out of the accessory box and insert it into the system.

Please complete the installation based on the operating system you use. The drivers on the CD-ROM may not be the latest version, please get the latest ones from the below websites:

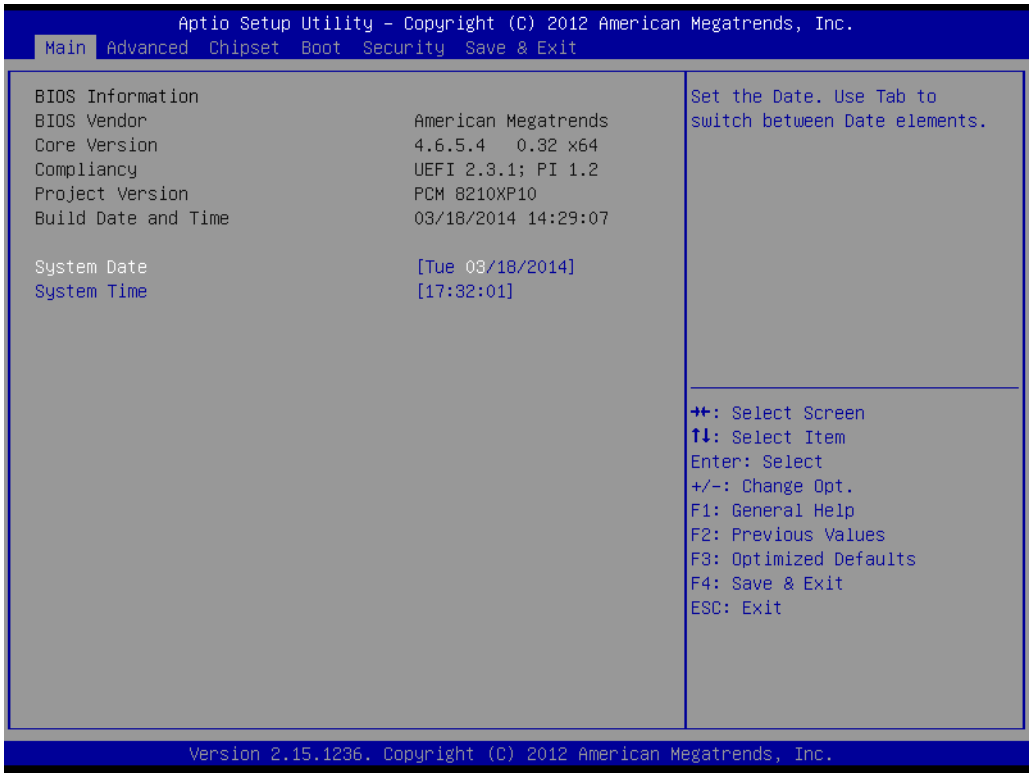
http://www.advantech.com

4.2 BIOS Setup Program

4.2.1 Entering BIOS Setup

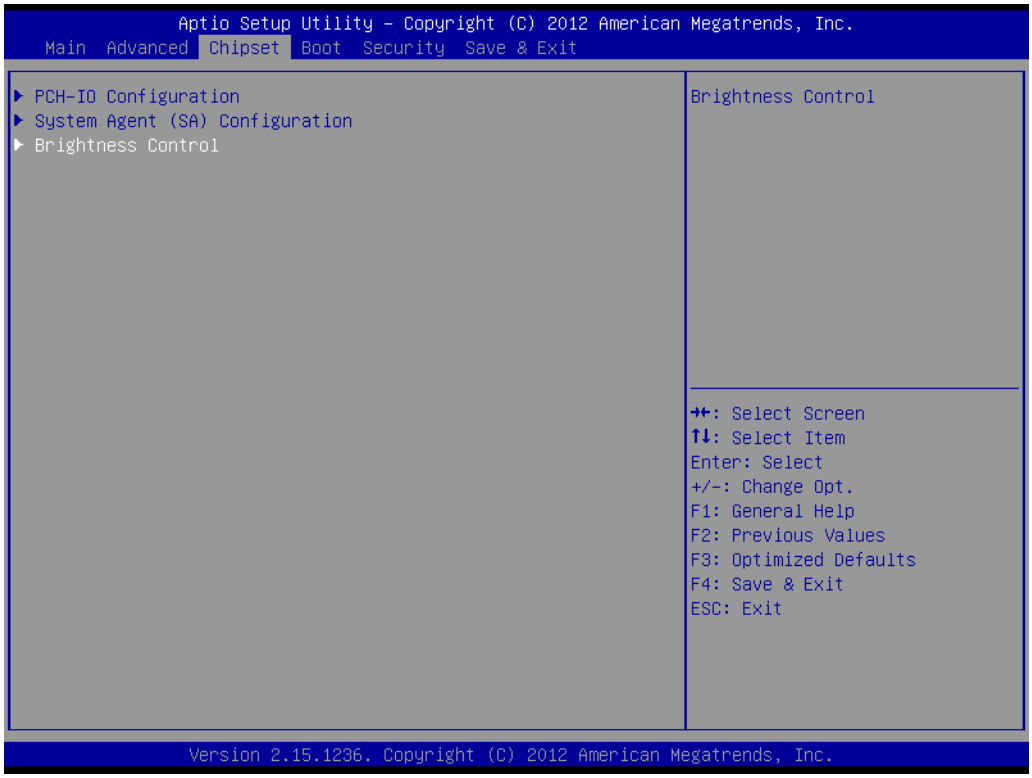
When the power is turned on, press the **<Del>** key to enter BIOS setup screen.

Whenever a change is made, press **<F4>** to save and exit; otherwise the settings will not be saved in the BIOS.



4.2.2 Adjustment of LCD Brightness

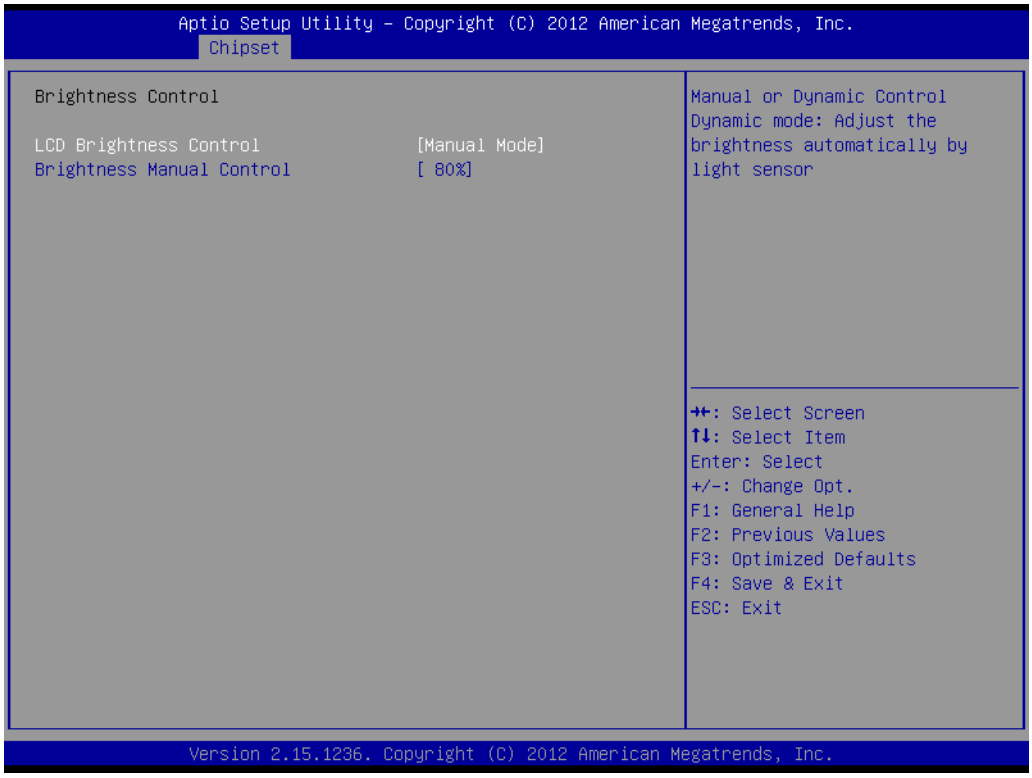
1. Select “**Brightness Control**” in “**Chipset**” tab.

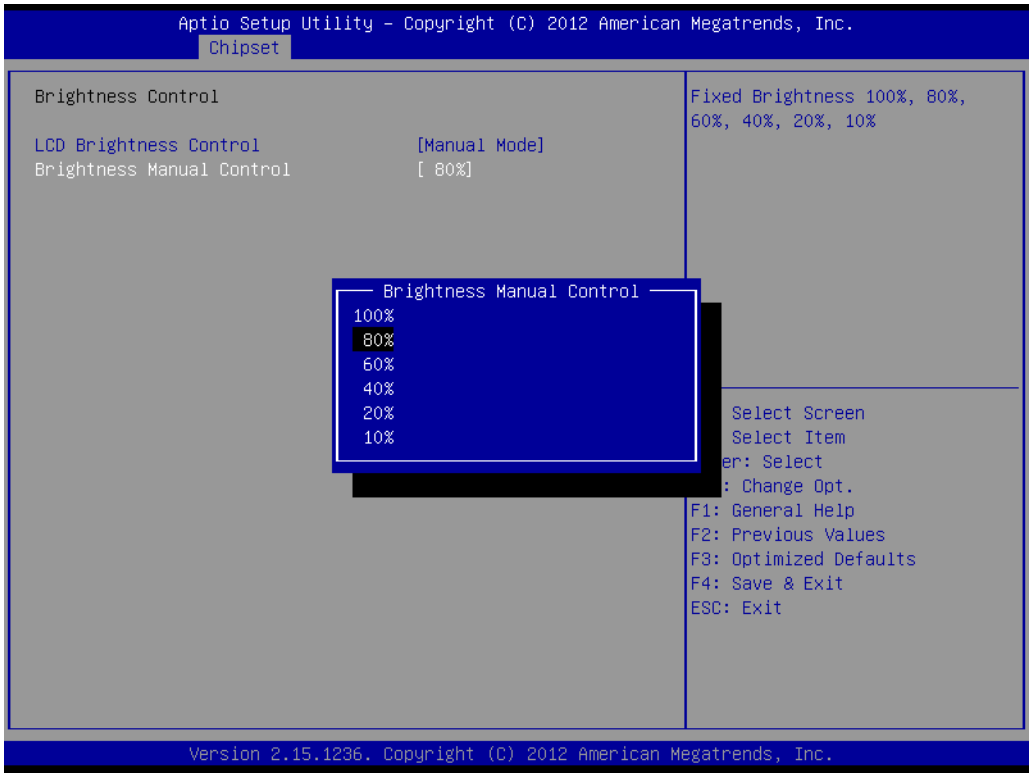


A. Manual Mode

“**LCD Brightness Control**” is set to “**Manual Mode**” by default, which means you should adjust the brightness by yourself.

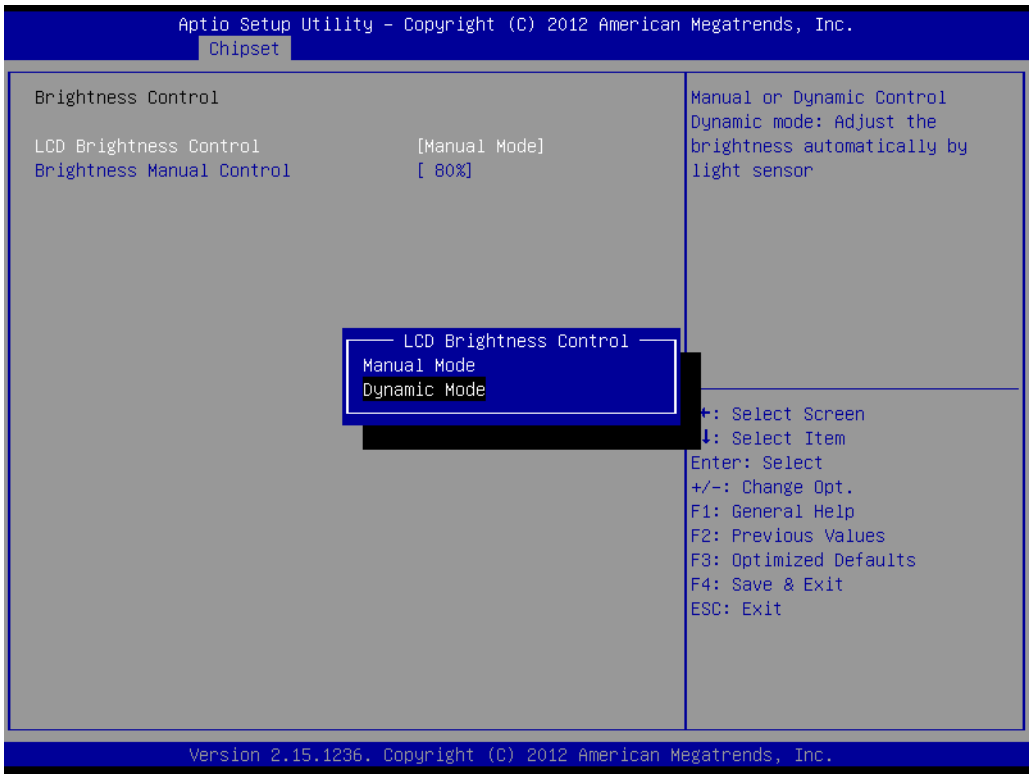
Select “**Brightness Manual Control**” under “**Brightness Control**”. There are in all six brightness levels to choose.





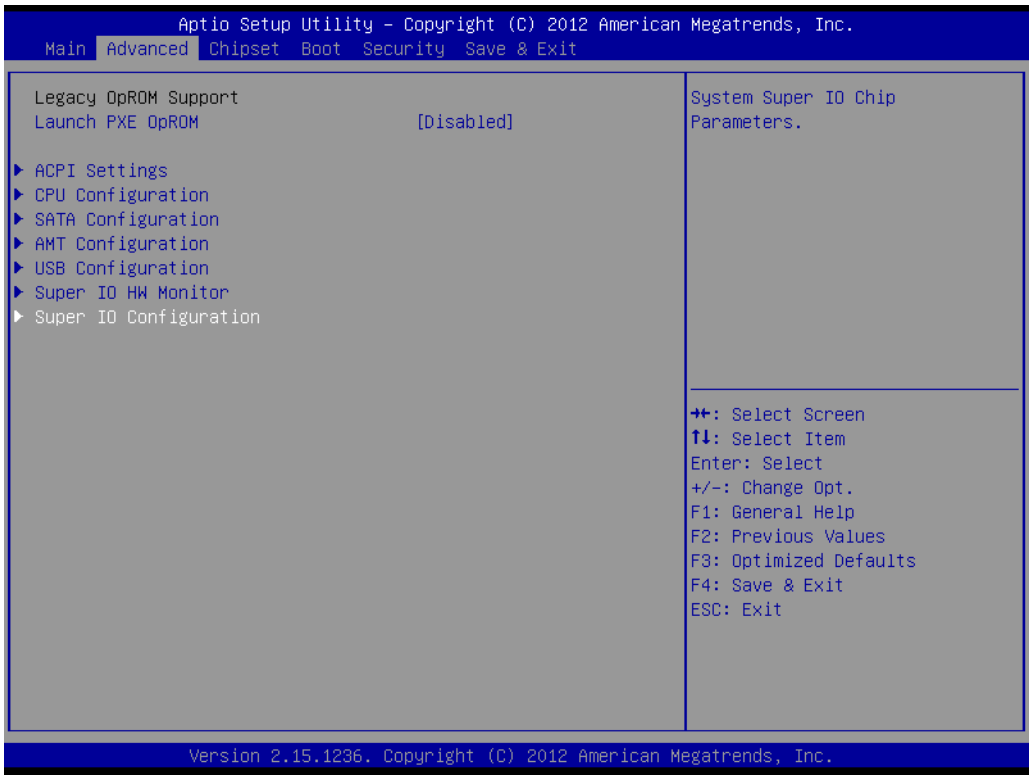
B. Dynamic Mode

"**LCD Brightness Control**" is set to "**Dynamic Mode**", which means LCD will automatically sense the light and adjust the brightness accordingly.

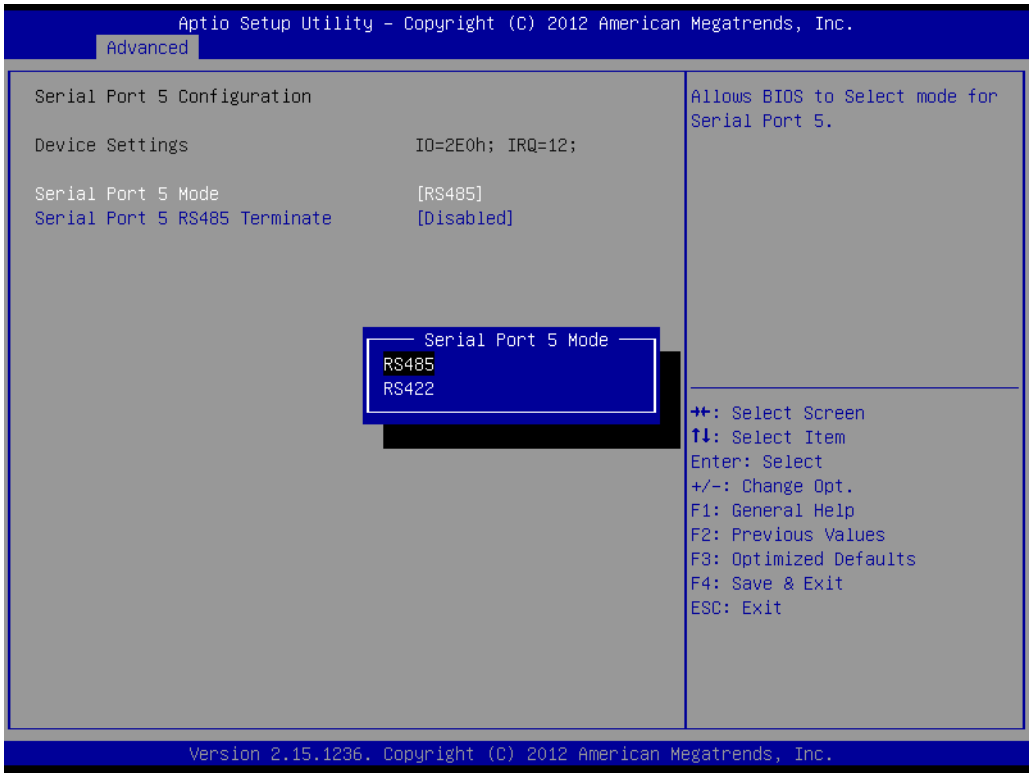


4.2.3 COM5 Mode Selection (RS422/RS485)

1. Select “**Super IO Configuration**” in “**Advanced**” tab.

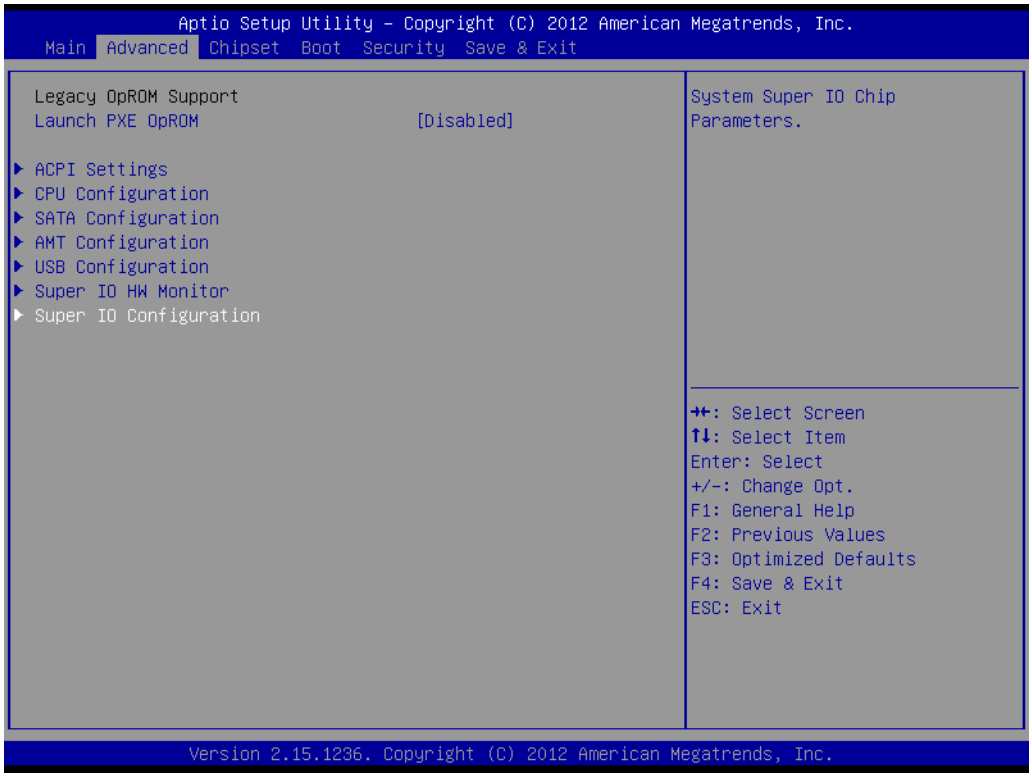


2. Select “**Serial Port 5 Configuration**”. You can select the mode of COM5 through “**Serial Port5 Mode**”.

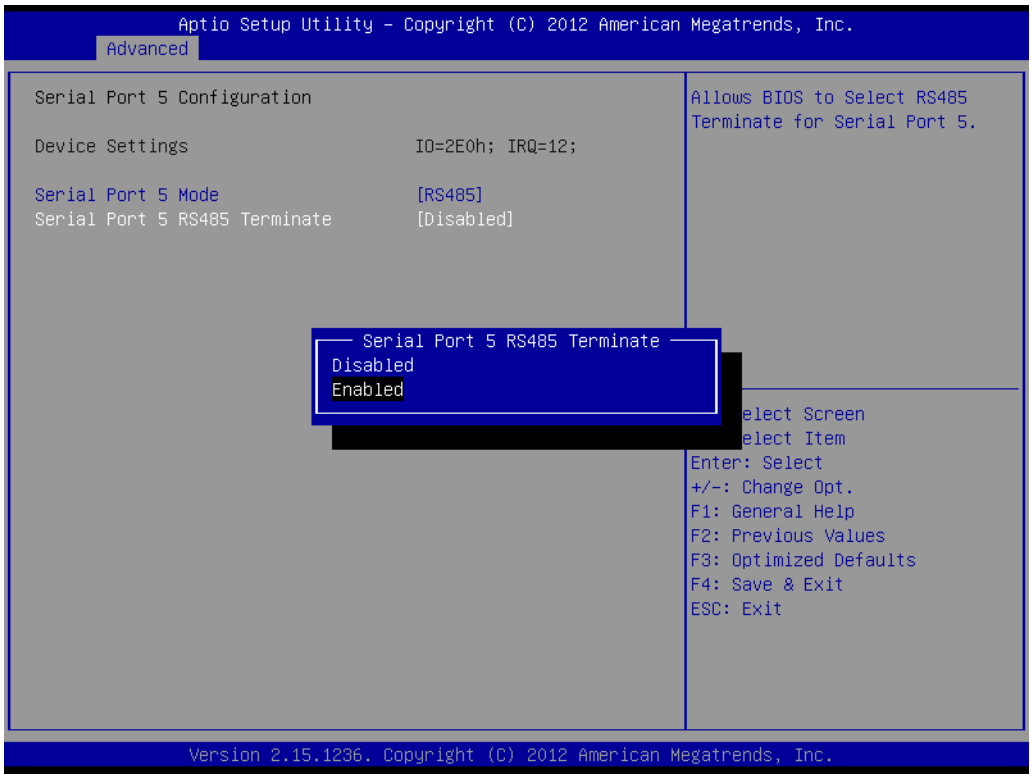


4.2.4 COM5 RS485 Terminate Selection

1. Select “**Super IO Configuration**” in “**Advanced**” tab.



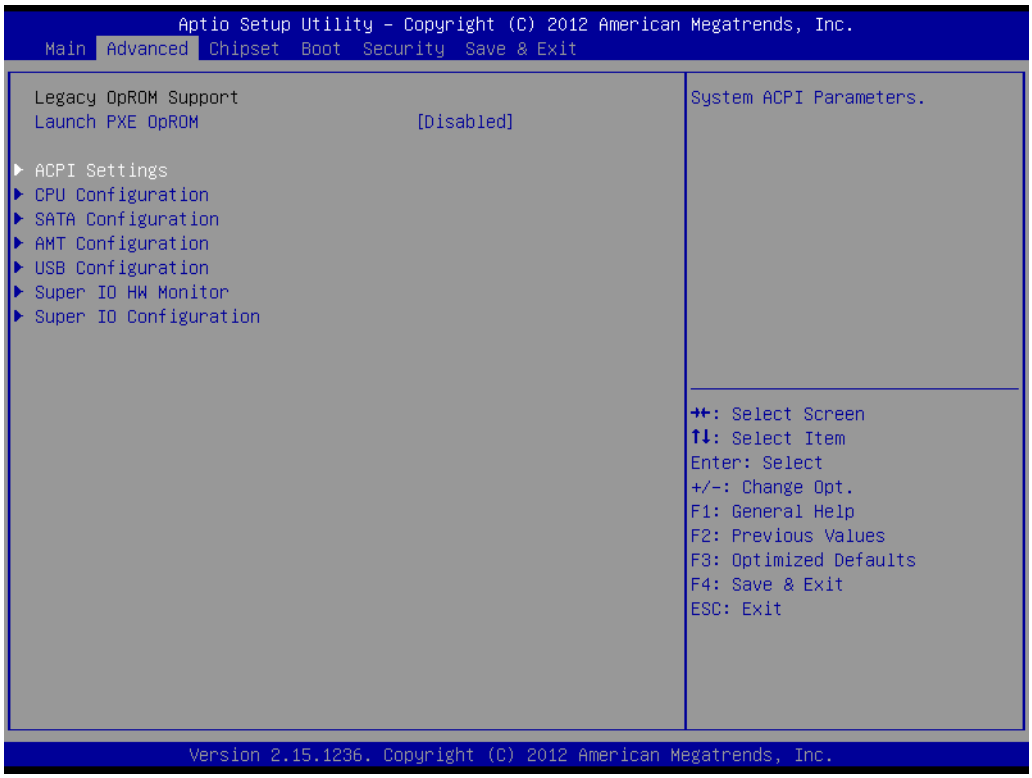
2. Select Serial Port 5 Configuration and select Serial Port5 RS485 Terminate.



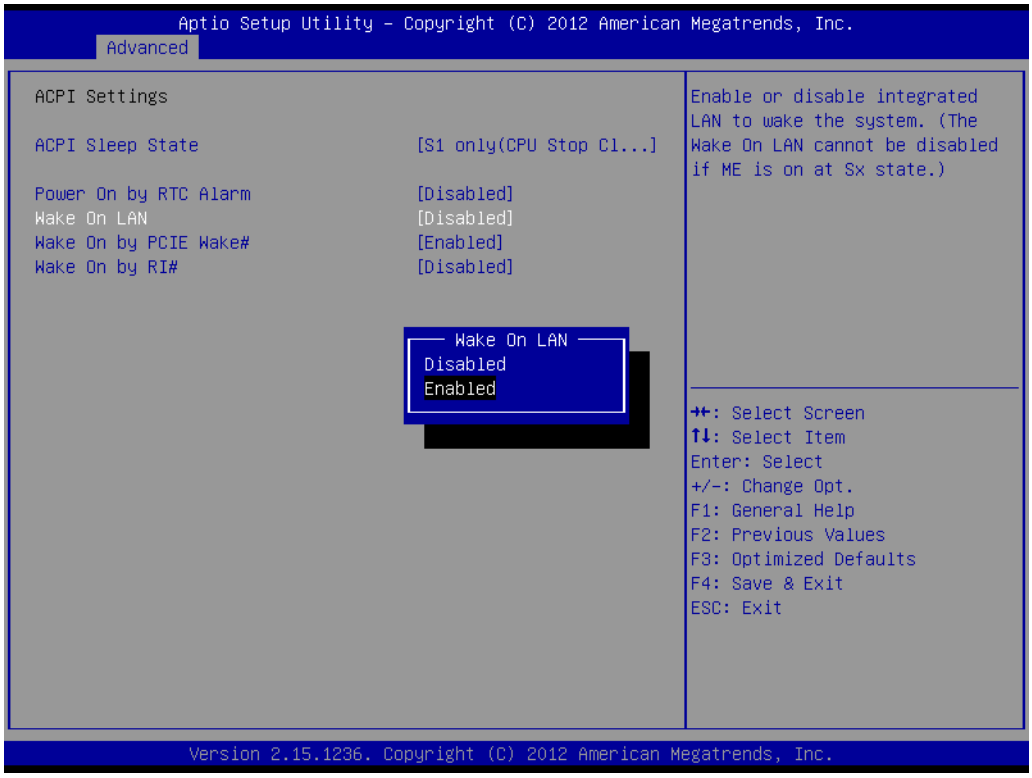
4.2.5 Wake on LAN

A. Open wake on LAN function in windows 7.

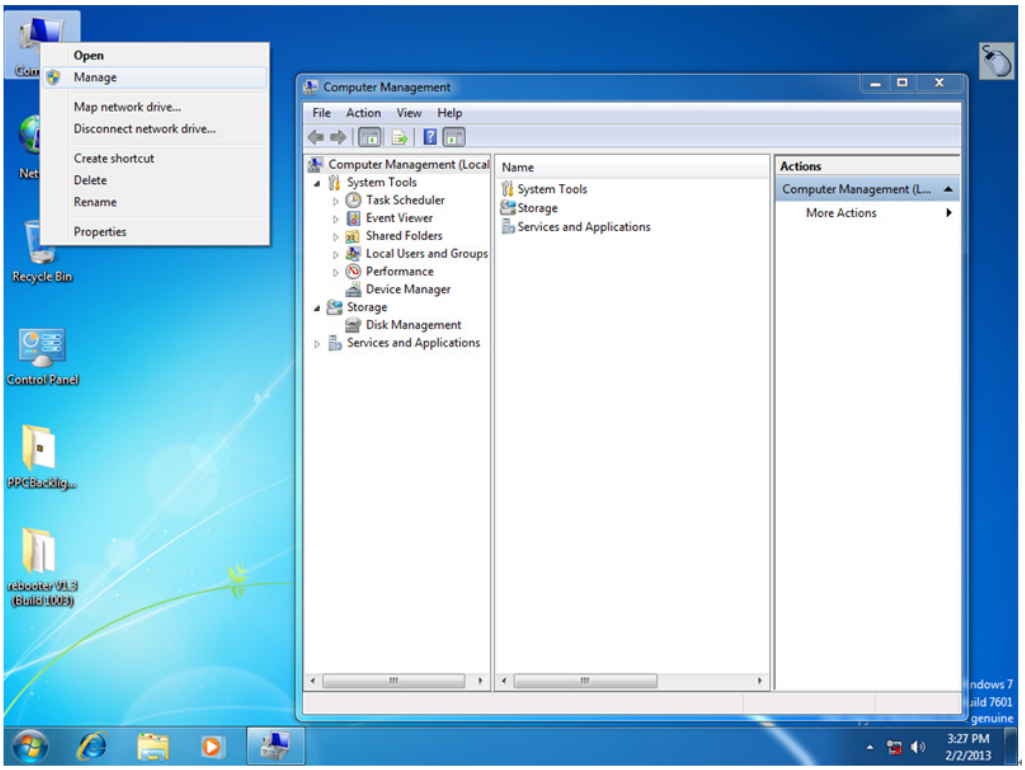
1. Select "**ACPI Settings**" in "**Advanced**" tab.



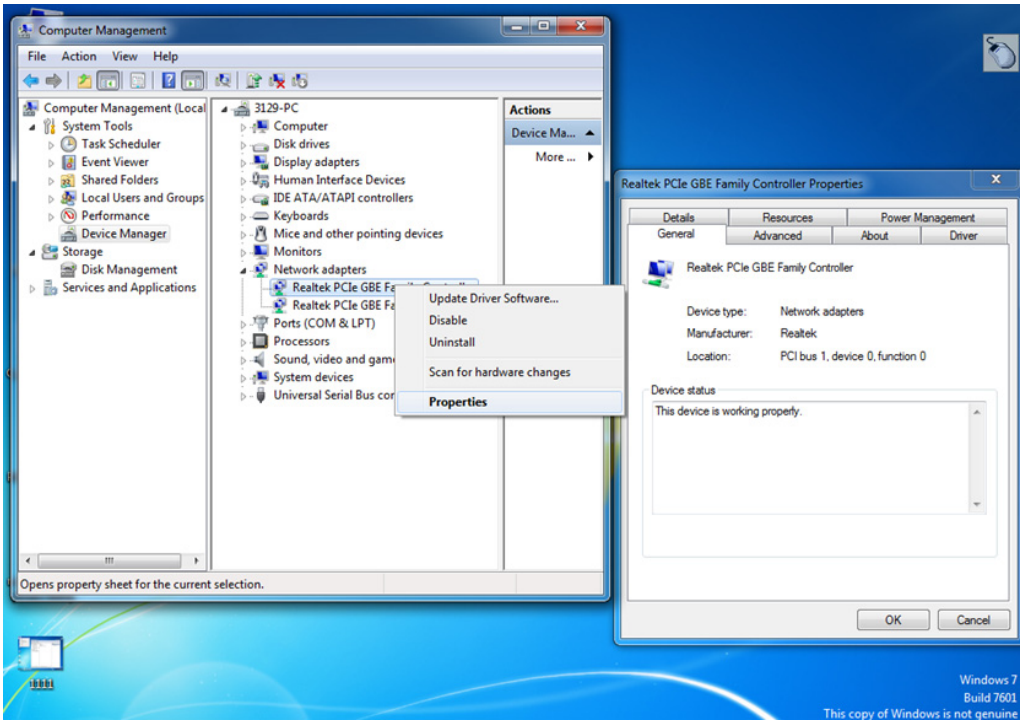
2. Set "**Wake on by PCIE Wake#"** and "**Wake on LAN"** to "**Enabled**".



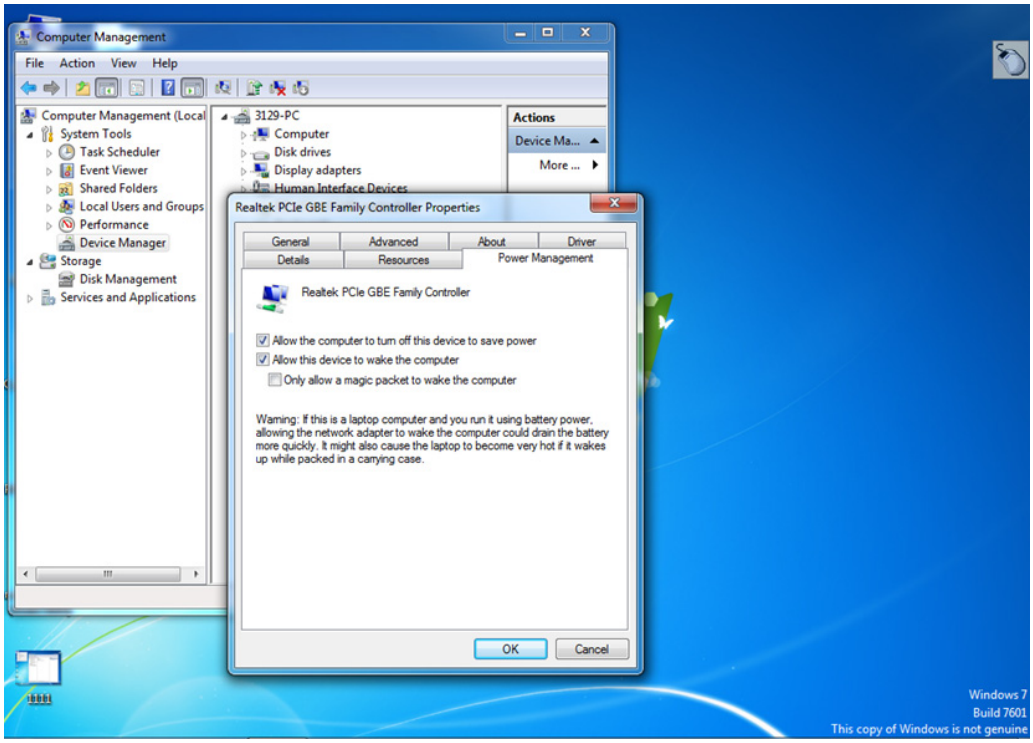
3. Save the settings and exit OS.
4. Right-click “**Computer**” to select “**Manage**” to open “**Computer Management**” window.



5. Click “**Device Manager**” and select “**Network adapters**”. Right-click the desired LAN port and select “**Properties**” to open “**Realtek PCIe GBE Family Controller Properties**” window.

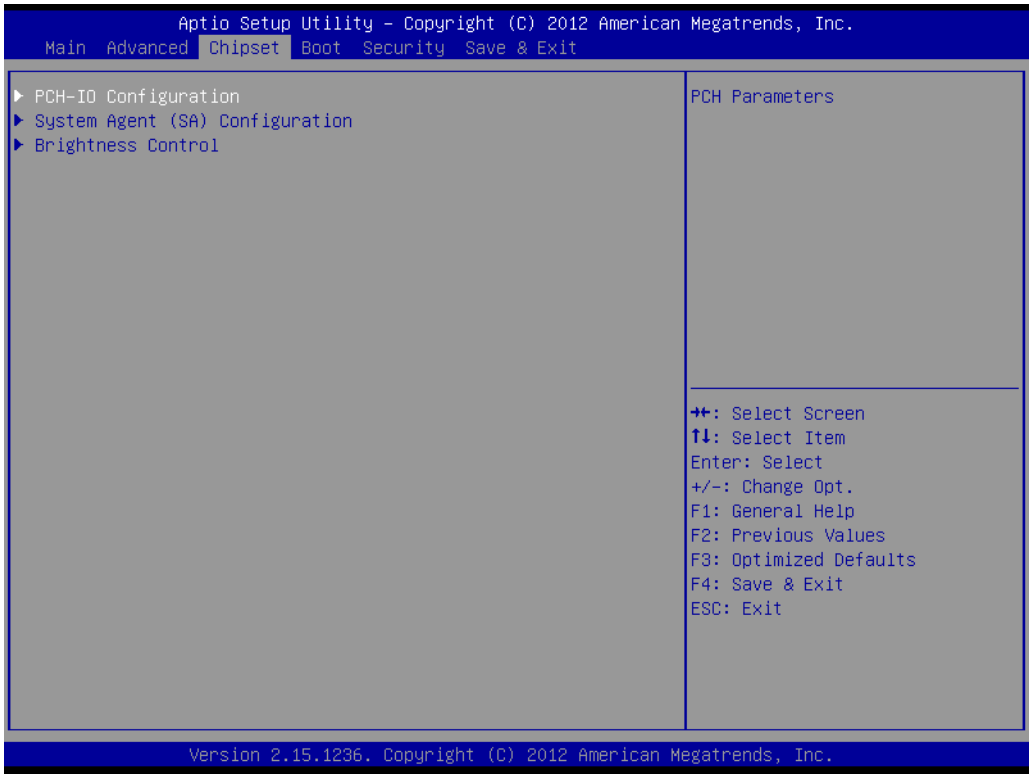


6. Select “**Power Management**” tab in “**Realtek PCIe GBE Family Controller Properties**" window, then check “**Allow this device to wake the computer**”.

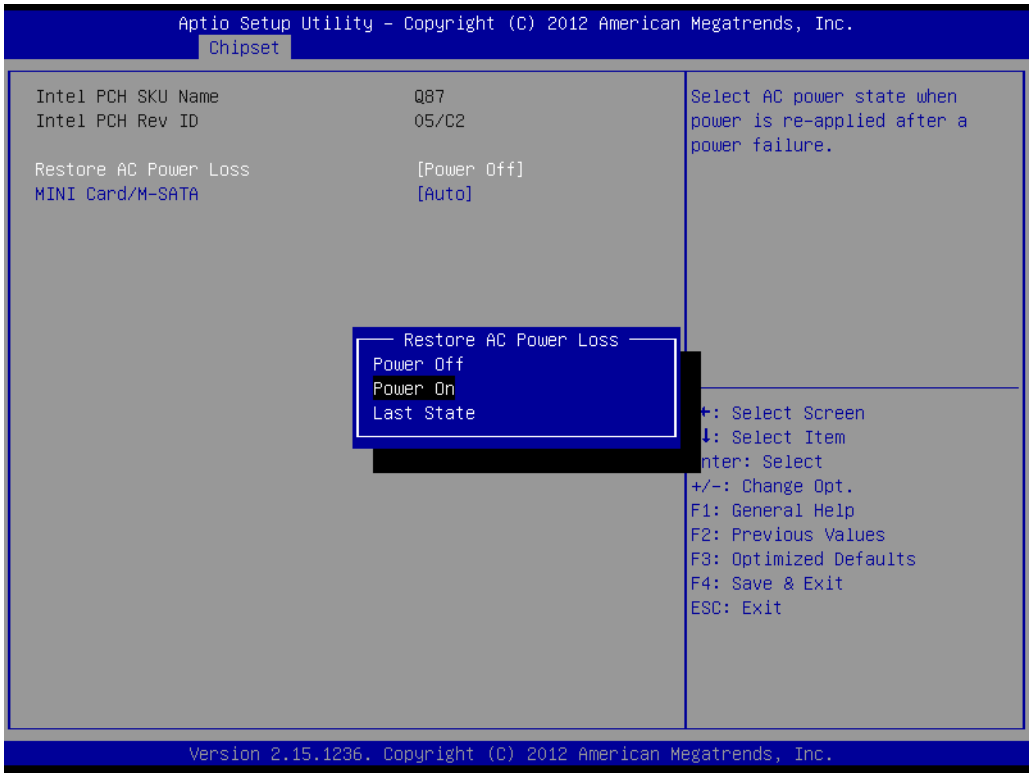


4.2.6 AT & ATX Setting

1. Select "**Chipset**", then select "**PCH-IO Configuration**"



2. Select below “**Restore AC Power Loss**”.



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