

EC-3000

Intel® Core™ i7/i5 Fanless Embedded Controller

**USER
Manual**

Worldwide Technical Support and Product Information

www.vecow.com

Vecow Corporate Headquarters

4F No52 Aly3 Lane182 Section 2 WenHua Rd Panchiao Dist New Taipei City Taiwan

Tel: 886 2 2258 5665

For further support information, refer to the Technical Support and Professional Services appendix. To comment on Vecow Co., Ltd. documentation, refer to the Vecow Co., Ltd. web site at www.vecow.com.

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Record of Revision

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- FCC** 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.
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Packing List

Item	Description	Qty
1	EC-3000 Series fanless controller (According to the configuration you order, the EC-3000 series may contain HDD and DDR3 SO-DIMM. Please verify these items if necessary.)	1
2	Accessory box, which contains <ul style="list-style-type: none"> ● Vecow Drivers & Utilities DVD ● Wall-mounting bracket ● M4 screws for wall-mounting bracket ● Foot pad ● 4-pin pluggable terminal block ● HDD thermal pad 	1 2 4 4 1 1
3	Quick Installation Guide	1

Order Information

Part Number	Description
EC-3000-3G	Intel® Core™ i7/i5 Fanless Embedded Controller with 3x GbE, 2x eSATA, 4x COM
EC-3000-5G	Intel® Core™ i7/i5 Fanless Embedded Controller with 5x GbE, 2x eSATA, 4x COM

Optional Accessories

Part Number	Description
VMX-200-4	4-CH, D1, Real-time, Mini-PCI Express, 120 fps, Video Capture Card, include cables and SDK
VMX-200-8	8-CH, D1, Real-time, Mini-PCI Express, 240 fps, Video Capture Card, include cables and SDK
PWA-60W	60W AC/DC power adapter

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1

General Introduction

1.1 Overview

Incorporating Intel® Core™ i7/i5 processor, Vecow EC-3000 controller offers extraordinary performance for arithmetic-intensive applications, while its fanless design provides superb reliability and durability.

Especially design for harsh environment, the Vecow EC-3000 can process various advanced measurement and control applications ranging in ambient temperatures between -20 and 60 degrees Celsius.

The fanless design of EC-3000 gives it exceptional long-term durability and tolerance to vibration because all heat-producing components are placed close with the aluminum housing.

The all-in-one embedded box PC features rich I/O interfaces, including maximum 5 Gigabit Ethernet ports and 2 eSATA ports particularly for surveillance and security applications.

The VGA+DVI/HDMI dual display accomplishes an easy way of high-resolution content output for image or media applications. In addition, EC-3000 also provides mini-PCIe, to fit a broader range of applications.

1.2 Product Specification

1.2.1 Specification of Vecow EC-3000-3G

System	
Processor	Intel® Core™ i7/i5 Mobile Processors: i7-620M (2.66 GHz) , i5-520M (2.4 GHz), P4500 (1.86 GHz)
Chipset	Intel® HM55
Memory	1x SO-DIMM socket, support up to 4GB DDR3 1066MHz SDRAM
BAck Panel I/O	
LAN 1, 2, 3, 4, 5	Gigabit Ethernet controller
Display	VGA, up to 2560 x 1600 resolution DVI-D, up to 1920 x 1080 resolution
Serial Port	COM1: RS-232/422/485 (Programmable by software) COM2, COM3, COM4: RS-232
USB	6x USB 2.0 ports
KB/MS	1x PS/2 keyboard and 1x PS/2 mouse
Audio	1x Mic-in and 1x speaker-out
eSATA	2x eSATA ports
CompactFlash	1x Type-I CF socket
Internal I/O	
SATA	1x SATA Port with power pins for 2.5" HDD/SSD installation
Mini PCI-E	1x Mini-PCIe socket
PCI-104	1x internal PCI-104 socket (Optional with reserved footprint)
Power Input	
DC-In	DC input by two selections: Selection 1: 8-26 Volts 4-pin pluggable terminal block with remote on/off control Selection 2: 12 Volts DC jack (Ø2.5) for AC/DC adapter input
Mechanical	
Size (W x D x H)	240mm x 195mm x 76mm
Weight	2.7 Kg
Mounting	Wall-mount by mounting bracket
Environmental	
Operating Temperature	-20°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	10% to 90% humidity, non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/SSD, according to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms duration (w/SSD, according to IEC60068-2-27)
EMC	CE/FCC Class A

1.2.2 Specification of Vecow EC-3000-5G

System	
Processor	Intel® Core™ i7/i5 Mobile Processors: i7-620M (2.66 GHz) , i5-520M (2.4 GHz), P4500 (1.86 GHz)
Chipset	Intel® HM55
Memory	1x SO-DIMM socket, support up to 4GB DDR3 1066MHz SDRAM
Back Panel I/O	
LAN 1, 2, 3, 4, 5	Gigabit Ethernet controller
Display	VGA, up to 2560 x 1600 resolution DVI-D, up to 1920 x 1080 resolution
Serial Port	COM1: RS-232/422/485 (Programmable by software) COM2, COM3, COM4: RS-232
USB	6x USB 2.0 ports
KB/MS	1x PS/2 keyboard and 1x PS/2 mouse
Audio	1x Mic-in and 1x speaker-out
eSATA	2x eSATA ports
CompactFlash	1x Type-I CF socket
Internal I/O	
SATA	1x SATA Port with power pins for 2.5" HDD/SSD installation
Mini PCI-E	1x Mini-PCIe socket
PCI-104	1x internal PCI-104 socket (Optional with reserved footprint)
Power Input	
DC-In	DC input by two selections: Selection 1: 8-26 Volts 4-pin pluggable terminal block with remote on/off control Selection 2: 12 Volts DC jack (Ø2.5) for AC/DC adapter input
Mechanical	
Size (W x D x H)	240mm x 195mm x 76mm
Weight	2.7 Kg
Mounting	Wall-mount by mounting bracket
Environmental	
Operating Temperature	-20°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	10% to 90% humidity, non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/SSD, according to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms duration (w/SSD, according to IEC60068-2-27)
EMC	CE/FCC Class A

1.2.3 Specification of Optional Video Capture Card-VMX-200-4

General	
Bus Type / Form Factor	Mini PCI Express
Dimensions (L x H)	51mm x 30mm
I/O connector	1x 16 pin headers to D-Sub 15 cables 1x D-Sub 15 to BNC cable
Environment Certification	FCC, CE, RoHS Compliance
Storage Temperature	-40°C to 85°C
Operate Temperature	0°C to 60°C
Video	
Maximum Channel Number	4
Input Connector	4 input BNC to D-Sub 15
Resolution	D1 (NTSC: 720 x 480 / PAL: 720 x 576) CIF (NTSC: 360 x 240 / PAL: 360 x 288) 4CIF (NTSC: 704 x 480 / PAL: 704 x 576) DCIF (NTSC: 528 x 320 / PAL: 528 x 384) QCIF (NTSC: 180 x 120 / PAL: 180 x 144)
Recording Rate	4CH with full D1 resolution 120 fps on NTSC system, 100 fps on PAL system
Video Compression Format	H.264 / MJPEG
Audio	
Maximum Channel Number	4 mono or 2 stereo
Audio Input Connector	4 input RCA to D-Sub 15
Software	
OS Support	WindowsXP/VISTA/Windows7 (32 Bits or 64 Bits) Standard Linux kernel 2.6.32 and all above
SDK	VC++ / .NET
Recommend System	
CPU	Intel Core 2 Duo E4500 2.2GHz
Memory	1GB
Graphics Unit	DirectX 9.0c compatible display card
Storage Size	500GB

1.2.4 Specification of Optional Video Capture Card-VMX-200-8

General	
Bus Type / Form Factor	Mini PCI Express
Dimensions (L x H)	51mm x 30mm
I/O connector	2x 16 pin headers to D-Sub 15 cables 2x D-Sub 15 to BNC cable
Environment Certification	FCC, CE, RoHS Compliance
Storage Temperature	-40°C to 85°C
Operate Temperature	0°C to 60°C
Video	
Maximum Channel Number	8
Input Connector	2x 4 input BNC to D-Sub 15
Resolution	D1 (NTSC: 720 x 480 / PAL: 720 x 576) CIF (NTSC: 360 x 240 / PAL: 360 x 288) 4CIF (NTSC: 704 x 480 / PAL: 704 x 576) DCIF (NTSC: 528 x 320 / PAL: 528 x 384) QCIF (NTSC: 180 x 120 / PAL: 180 x 144)
Recording Rate	8CH with full D1 resolution 240 fps on NTSC system, 100 fps on PAL system
Video Compression Format	H.264 / MJPEG
Audio	
Maximum Channel Number	8 mono or 2 stereo
Audio Input Connector	2x 4 input RCA to D-Sub 15
Software	
OS Support	WindowsXP/VISTA/Windows7 (32 Bits or 64 Bits) Standard Linux kernel 2.6.32 and all above
SDK	VC++ / .NET
Recommend System	
CPU	Intel Core 2 Quad Q8400 2.66GHz
Memory	1GB
Graphics Unit	DirectX 9.0c compatible display card
Storage Size	750GB

1.3 Supported CPU List

Vecow EC-3000 accepts a PGA-type Intel® i7/i5 processors via a rPGA988 CPU socket. The following processors have been tested by Vecow Co., Ltd. for the compatibility with Vecow EC-3000. Instead of i7-620M, i5-520M and Celeron P4500, You may also select other processor according to your consideration of cost and performance.

i7-640M 2.8 GHz	i7-620M 2.66 GHz *
i5-580M 2.66 GHz	i5-480M 2.66 GHz
i5-560M 2.66 GHz	i5-460M 2.53 GHz
i5-540M 2.53 GHz	i5-450M 2.4 GHz
i5-520M 2.4 GHz *	i5-430M 2.26 GHz
i3-380M 2.53 GHz	i3-350M 2.26 GHz
i3-370M 2.40 GHz	i3-330M 2.13 GHz
Celeron P4500 1.86 GHz *	
Pentium P6000 1.86 GHz	

The processors with * are listed in Intel® Embedded Roadmap and with a 7-year life cycle support (from 2010 to 2016).

1.4 Mechanical Dimension

Figure 1.1 Top view

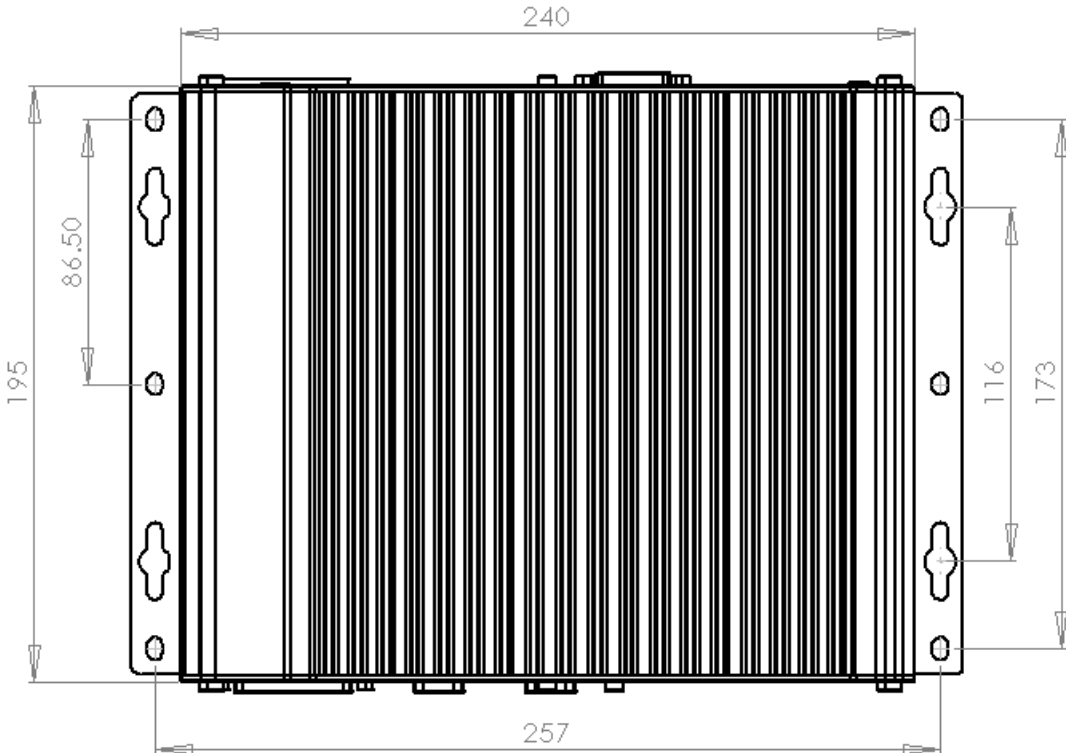


Figure 1.2 Front view

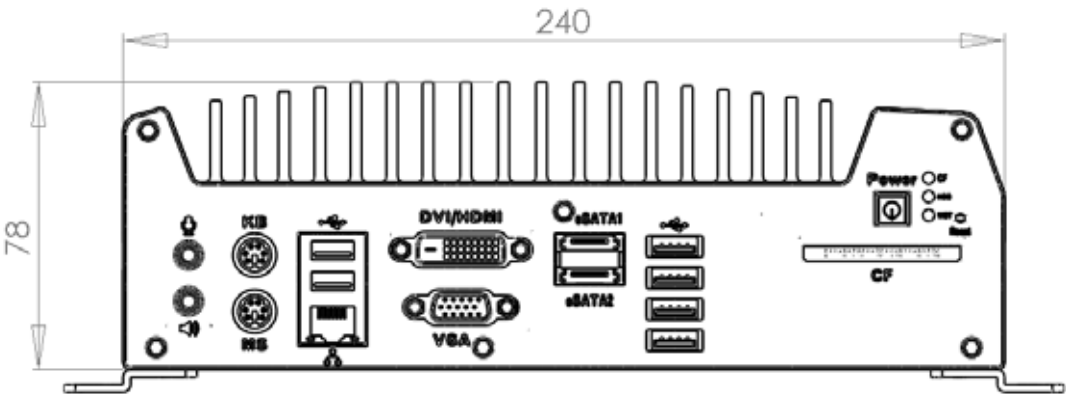


Figure 1.3 Side view

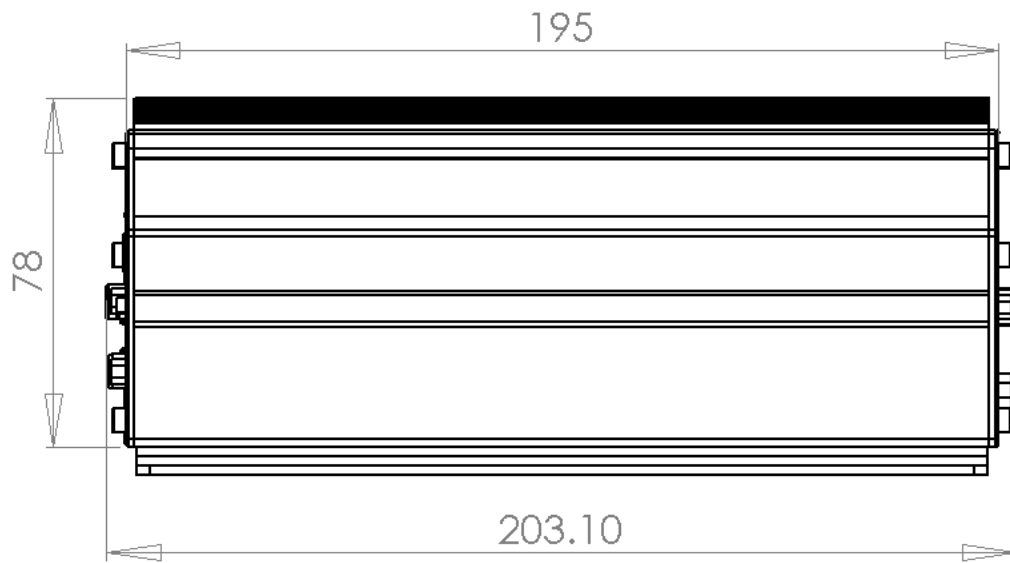
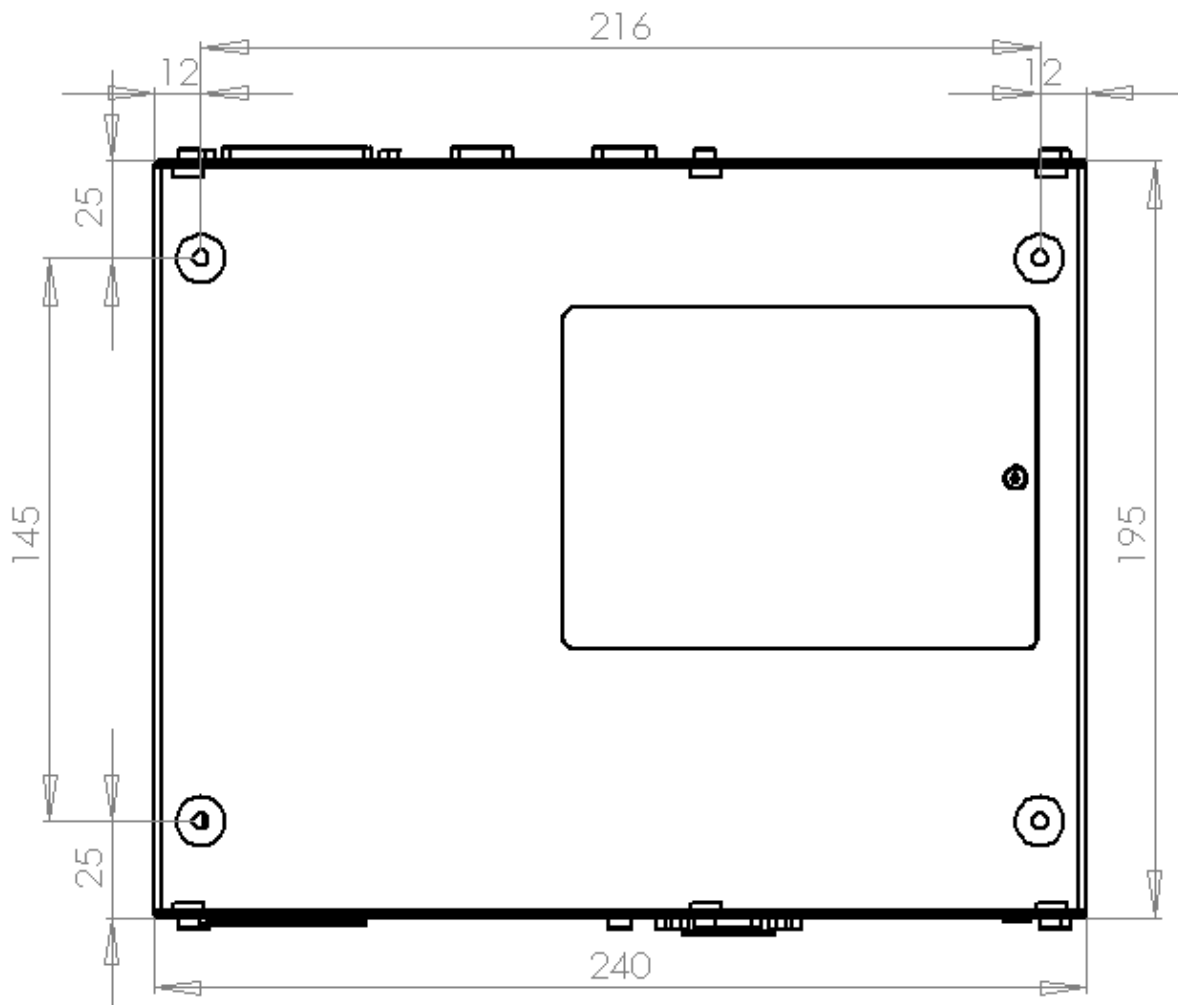


Figure 1.4 Bottom view



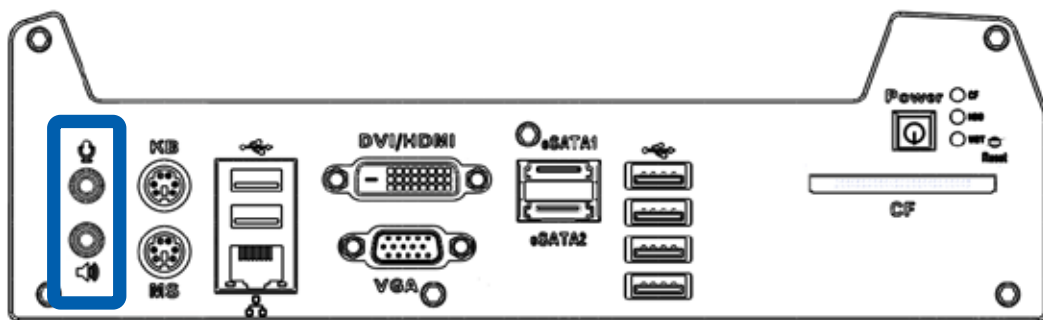
2

Hardware Installation

2.1 Front Side External I/O Connectors

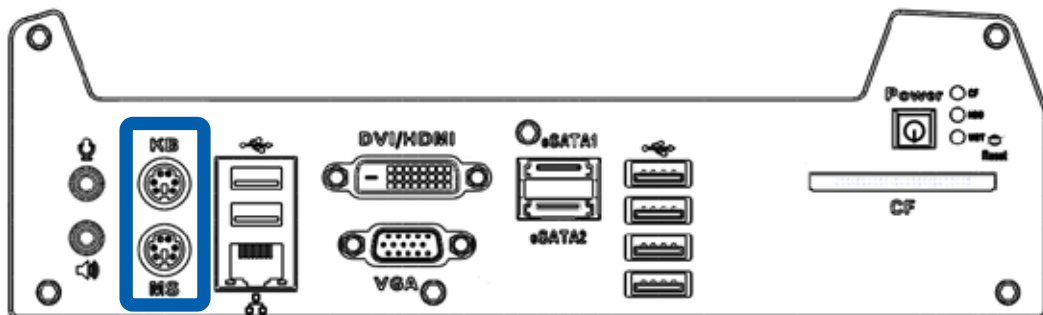
On EC-3000 series, all I/O connectors are located on front panel and rear panel. Most general computer connectors (i.e. audio, USB, keyboard/mouse, VGA and etc.) are placed on the front panel.

2.1.1 Audio Jacks



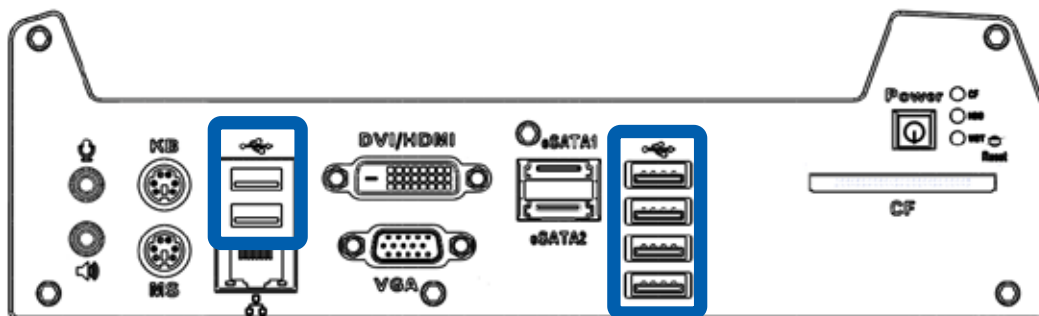
On EC-3000 series, all I/O connectors are located on front panel and rear panel. Most general computer connectors (i.e. audio, USB, keyboard/mouse, VGA and etc.) are placed on the front panel. To utilize the audio function in Windows, you need to install corresponding drivers for both Intel® HM55 PCH chipset and Realtek ALC262 codec. Please refer to section 4 for information of driver installation.

2.1.2 PS/2 Keyboard and Mouse Connectors



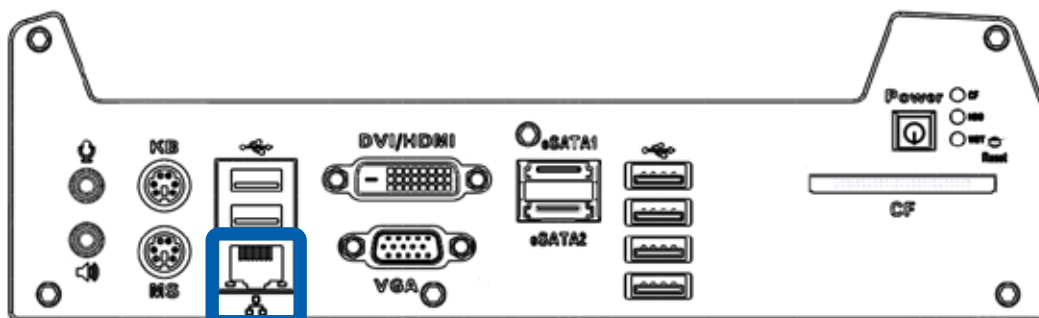
Support of legacy PS/2 keyboard and mouse on EC-3000 series is implemented using industrial-grade ITE8783 Super IO chip (-40 to 85°C). There are two 6-pin Mini-DIN connectors on the panel. The purple one is for PS/2 keyboard, and the green one is for PS/2 mouse.

2.1.3 USB Connectors



There are totally 6 USB ports on the front panel. By BIOS default, these USB ports are operated in EHCI (Enhanced Host Control Interface) mode and are compatible to USB 2.0, USB 1.1 and USB 1.0 devices. Legacy USB support is provided so you can use USB keyboard/mouse in DOS environment.

2.1.4 Gigabit Ethernet Port



EC-3000 series controller offers 5 GbE ports (EC-3000-5G) or 3 GbE ports (EC-3000-3G) using Intel® 82574L Gigabit Ethernet controllers. Each port has one dedicated GbE controller and one dedicated PCI Express link to present maximal network performance. One of these GbE ports is located on the front panel. When plugging in the Ethernet cable, you can tell the Ethernet status and speed from the LED indicators on the RJ45 connector as following:

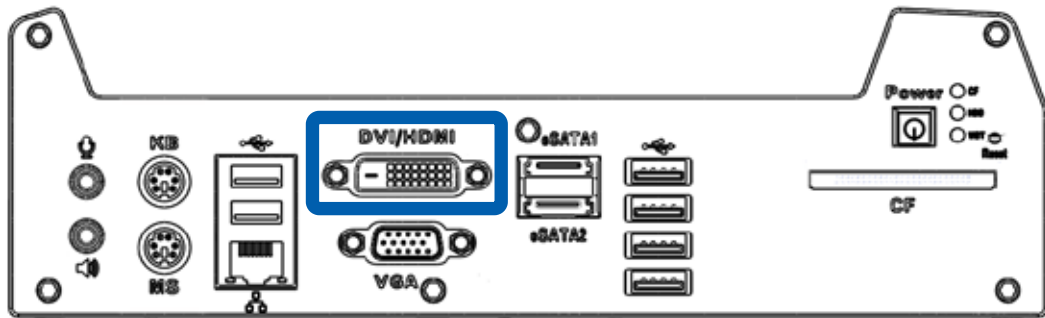
Active/Link LED

LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

LED Color	Status	Description
Green / Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

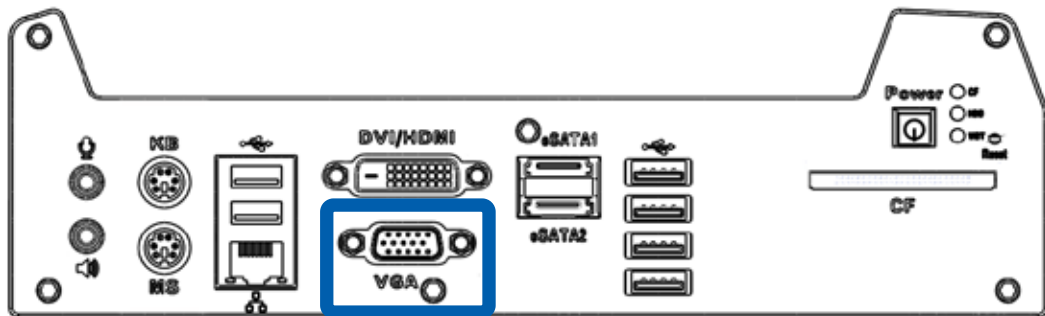
2.1.5 DVI/HDMI Connector



The DVI-D connector on the front panel supports both DVI and HDMI operation mode. This connector can either output DVI signals or HDMI signal. The DVI output mode supports up to 1600x1200 resolution and HDMI output mode supports up to 1920x1080 resolution. The DVI or HDMI mode is automatically selected according to the display device connected. **You shall need a DVI-D to HDMI cable when connecting to a HDMI display device.**

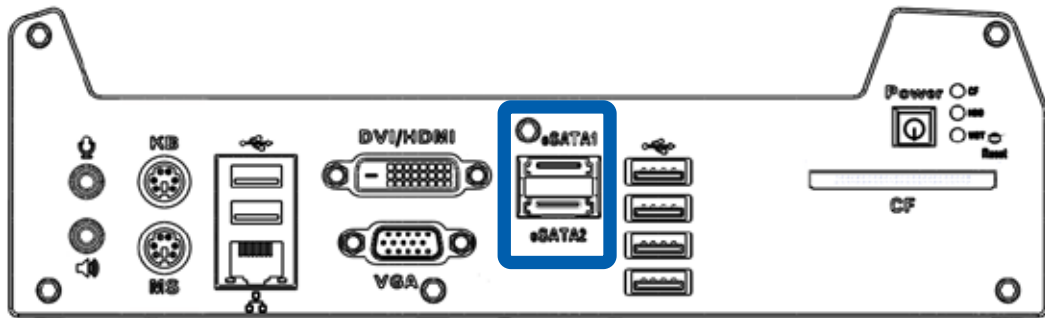
To utilize the VGA or DVI/HDMI output in Windows, you need to install corresponding graphics driver. Please refer to section 4 for information of driver installation.

2.1.6 VGA Connector



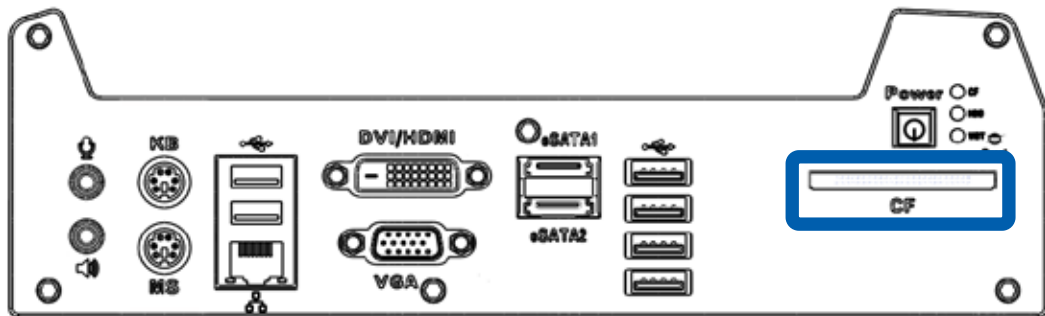
VGA connector is the most popular way to connect a display. The VGA output of EC-3000 series supports up to 2560 x 1600 resolution. By BIOS default, **both VGA and DVI/HDMI output are enabled.** To utilize the VGA or DVI/HDMI output in Windows, you need to install corresponding graphics driver. Please refer to section 4 for information of driver installation.

2.1.7 eSATA Ports



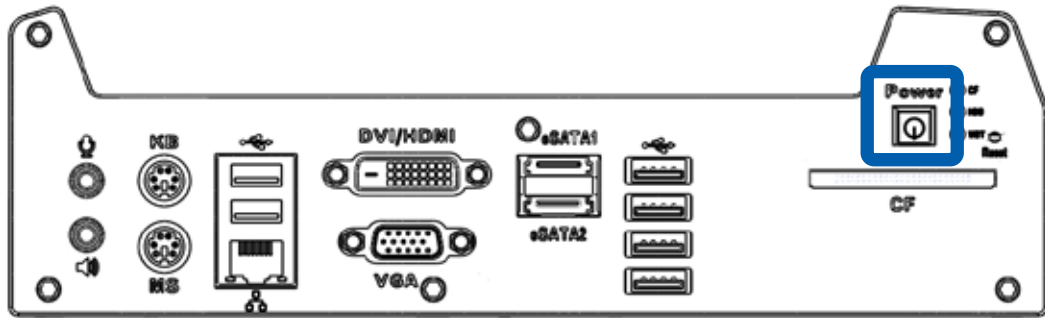
eSATA is a convenient way to extend storage devices. Devices with SATA interface, such as hard drive and CD/DVD drive, can be attached to the EC-3000 series controller via eSATA ports. In addition, eSATA interface supports **hot-plug** if SATA controller is configured as AHCI (Advanced Host Controller Interface) mode. Please refer to section 3.2 for setting SATA controller mode in BIOS.

2.1.8 CF Socket



EC-3000 series provides a CF socket on the front panel for Type I CompactFlash card. It is implemented by a SATA-to-IDE bridge chip. For best compatibility, **configuring SATA controller as IDE mode is highly recommended** if you want to use CF card in your system. Please refer to section 3.2 for setting SATA controller mode in BIOS.

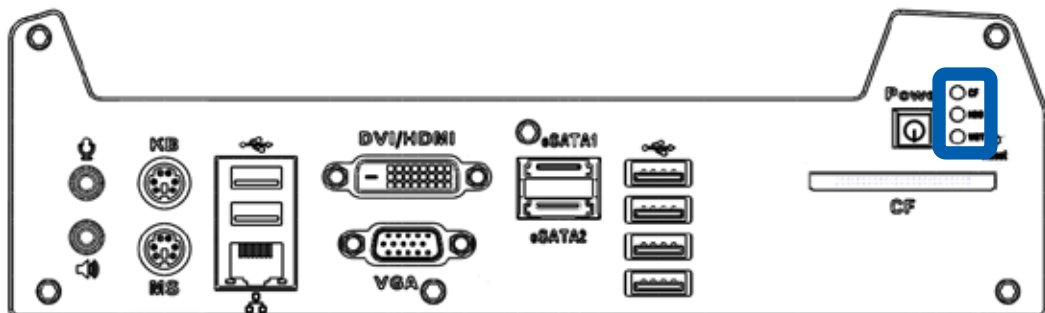
2.1.9 Power Button



The power button is a non-latched switch with LED for ATX mode on/off operation.

- **To turn on** the EC-3000, press the power button and the blue LED is lighted up.
- **To turn off** the EC-3000 series, you can either issue a shutdown command in OS, or just simply press the power button.
- In case of **system halts**, you can press and hold the power button for 5 seconds to compulsorily shut down the system.
- Please note that a 5 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you **shall wait for 5 seconds to initiate another power-on operation**).

2.1.10 LED Indicators



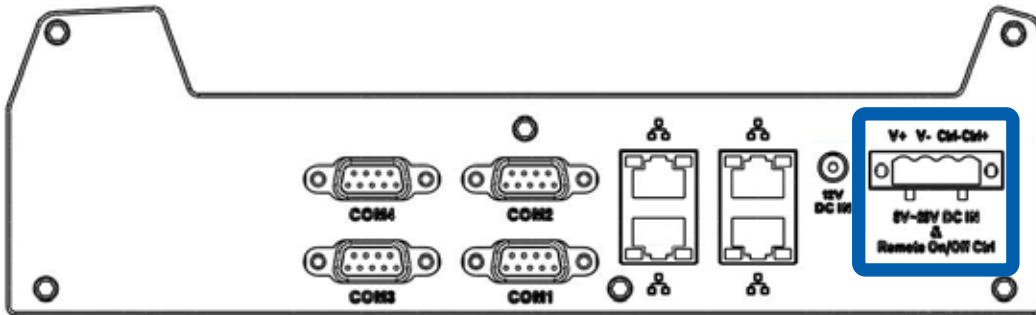
There are three LED indicators on the front panel: CF, HDD and WDT. The descriptions of these three LED are listed in the following table.

Indicator	Color	Description
CF	Green	CF indicator, flashing when CompactFlash card is active.
HDD	Red	Hard drive indicator, flashing when SATA hard drive is active.
WDT	Yellow	Watchdog timer indicator, flashing when watchdog timer is started.

2.2 Rear Side External I/O Connectors

Power input, GbE ports, COM ports and optional isolated DIO are located on the rear panel. In this section, we'll illustrate connectors on the rear panel.

2.2.1 DC Input Terminal Block



EC-3000 series allows a wide range of DC power input from 8 to 26V. It provides two ways for connecting DC power: a 4-pin pluggable terminal block or a DC jack. The 4-pin pluggable terminal block is fit for field usage where DC power is usually provided. And the screw clamping connection of terminal block gives a very reliable way of wiring the DC power. In addition to 2 pins for DC power input (V+, V-), the terminal block offers another 2 pins for remote on/off control (Ctrl+, Ctrl-). You can wire these two pins to an external switch to control system on/off in AT mode. The following table describes the pin definition of the pluggable terminal block. For detail information of connecting DC power and remote on/off control, please refer to section 2.6.

Pin	Description
V+	Positive polarity of DC power input.
V-	Negative polarity of DC power input (usually power ground).
Ctrl+	Control pin to connect a latched on/off switch (polarity is negligible).
Ctrl-	Control pin to connect a latched on/off switch (polarity is negligible).

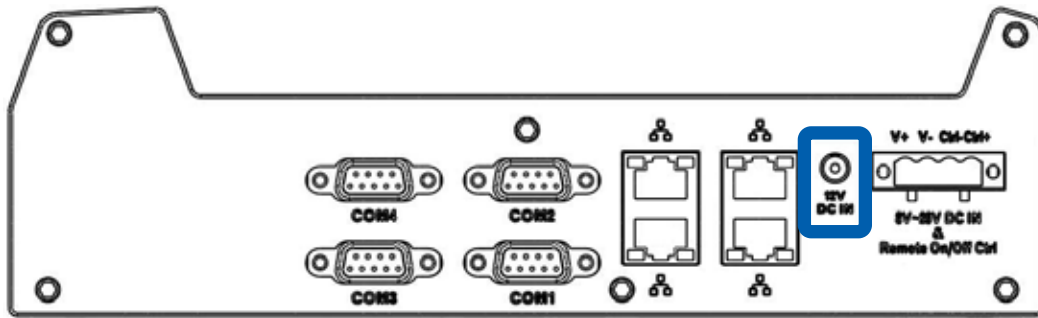


CAUTION!

1. Please make sure the voltage of DC power is correct before you connect it to EC-3000 series. Supplying a voltage over 26V will damage the system.
2. You should use either 4-pin pluggable terminal block or DC jack for DC power input. **DO NOT** supply power to both connectors at the same time.

CAUTION!

2.2.2 DC Jack

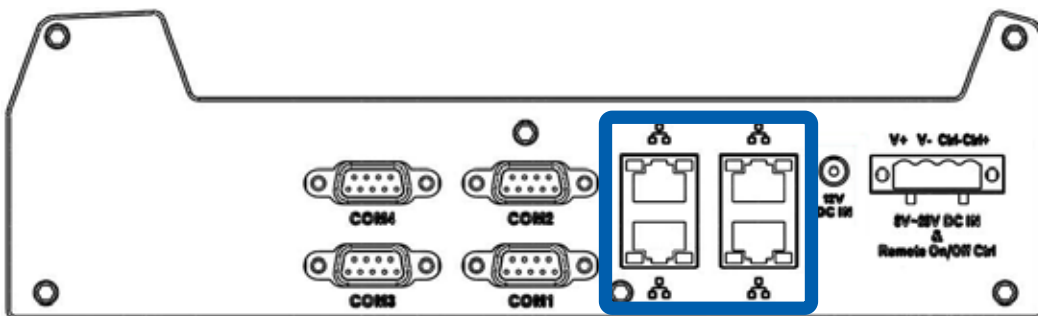


The DC jack on the rear panel provides another way for supplying DC power. It's convenient for indoor usage where AC power is usually available. The DC jack is designed to use with a 12V AC/DC adapter with a $\varnothing 2.5/5.5$ plug.



1. The rated voltage of DC jack is 16V. Supplying a voltage over 16V may cause safety issue.
2. You should use either 4-pin pluggable terminal block or DC jack for DC power input. **DO NOT supply power to both connectors at the same time.**

2.2.3 Gigabit Ethernet Ports



There are another 4 GbE ports (EC-3000-5G) or 2 GbE ports (EC-3000-3G) on the rear panel. These GbE ports are implemented using Intel® 82574L Gigabit Ethernet controllers. Each port has one dedicated GbE controller and one dedicated PCI Express link to present maximal network performance. When plugging in the Ethernet cable, you can tell the Ethernet status and speed from the LED indicators on the RJ45 connector as following:

Active/Link LED

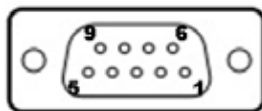
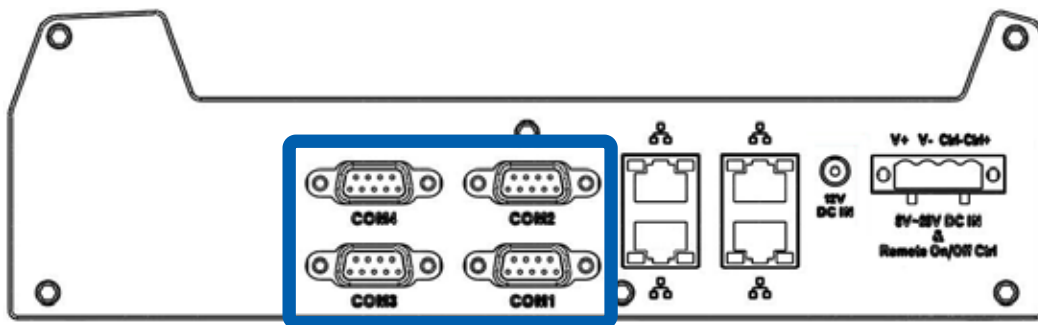
LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

LED Color	Status	Description
Green / Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

To utilize the GbE port in Windows, you need to install corresponding driver for Intel® 82574L GbE controller. Please refer to section 5 for information of driver installation.

2.2.4 COM Ports



EC-3000 series provides 4 COM ports via 9-pin D-Sub male connectors for communicating with external devices. These COM ports are implemented using industrial-grade ITE8783F Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate. COM1 is a software-selectable RS-232/422/485 port and COM2/COM3/COM4 is RS-232 only. The operation mode of COM1 can be set in BIOS setup utility (refer to section 3 for detail).

Pin#	COM1			COM2/COM3/COM4
	RS-232 Mode	RS-422 Mode	RS-485 Mode (Two-wire 485)	RS-232 Mode
1	DCD	422 RXD-		DCD
2	RX	422 RXD+		RX
3	TX	422 TXD+	485 TXD+/RXD+	TX
4	DTR			DTR
5	GND			GND
6	DSR			DSR
7	RTS	422 TXD-	485 TXD-/RXD-	RTS
8	CTS			CTS
9	GND			RI

2.3 Install HDD and DDR3 SO-DIMM

When you put the EC-3000 series upside down, you can see the “pet-door” on the bottom of the chassis. The “pet-door” design allows users to install or replace the memory module and hard drive quickly and easily.



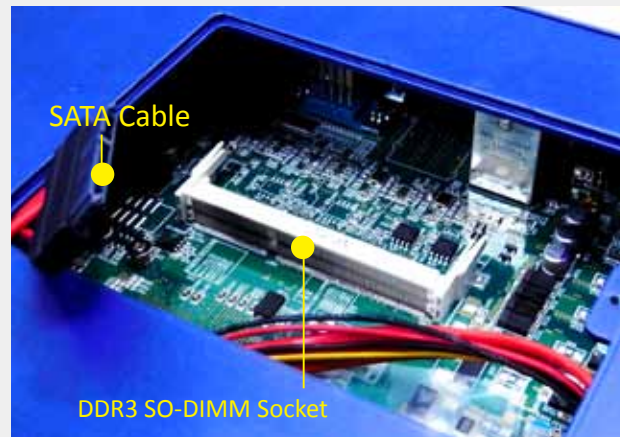
2.3.1 To install a DDR3 SO-DIMM module

Step1.



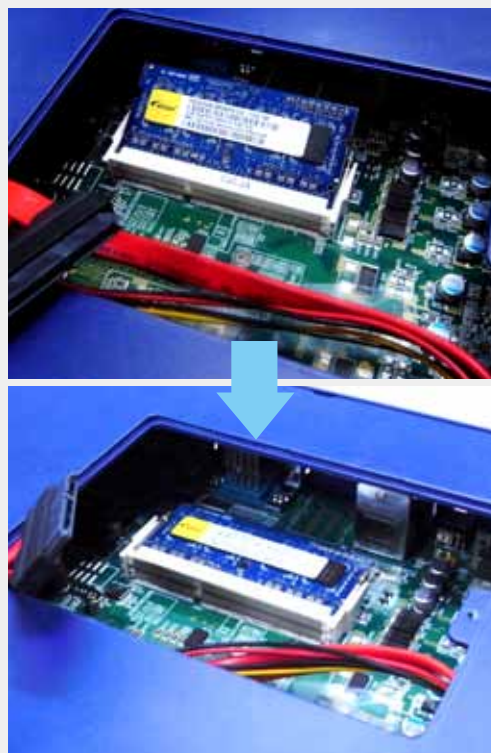
Put the EC-3000 series upside down on a flat surface. You can see the “Pet-Door” exposed. Use a Philips screwdriver to loose the M3 flat-head screw on the “Pet-Door”.

Step2.



Remove the “Pet-Door” and you can see a SATA cable and DDR3 SODIMM socket exposed.

Step3.



Tile the SODIMM module and insert it to the SODIMM socket.

As it's firmly contacted with socket connectors, press it down until the clamps of the socket snap into the latching position of SODIMM module.

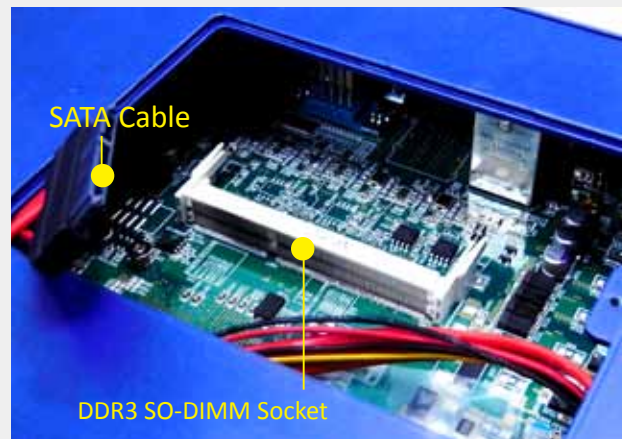
2.3.2 To install a HDD

Step1.



Put the EC-3000 series upside down on a flat surface. You can see the “Pet-Door” exposed. Use a Philips screwdriver to loose the M3 flat-head screw on the “Pet-Door”.

Step2.



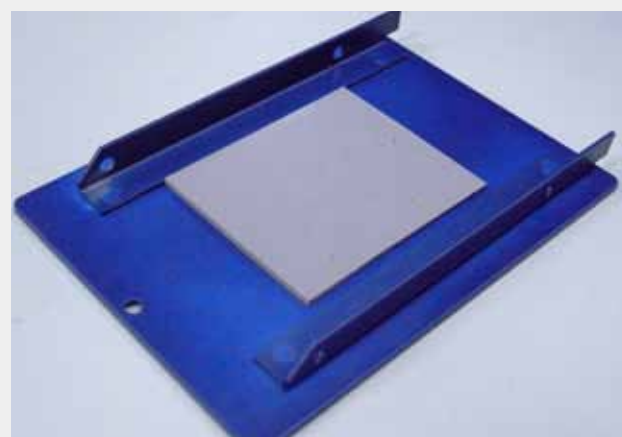
Remove the “Pet-Door” and you can see a SATA cable and DDR3 SODIMM socket exposed.

Step3.



Find the HDD bracket come with “Pet-Door”, M3 screws (4 pieces), and HDD thermal pad (1 piece) in the accessory box.

Step4.



Put the HDD thermal pad on the center of HDD bracket.

Step5.



Place the HDD into the bracket and gently push it down to make it contact with thermal pad. Use a Philips screwdriver to fix the HDD with M3 screws. Please note that the HDD must be placed in the right direction as below.

Step6.



Pull out the SATA cable inside the chassis and connect it to HDD.

Step7.



Tilt the HDD assembly and insert the wedge of HDD bracket to the bottom cover.

Once it's firmly wedged, push it down and fix it using a M3 flat-head screw.

2.4 Wall-Mount EC-3000 series

EC-3000 is shipped with wall-mount brackets. You can mount your EC-3000 series on the wall by following the steps listed below.

Step1.



Find your wall-mounts brackets (2 pieces) and M4 screws (4 pieces) in the accessory box.

Step2.

Put the EC-3000 series upside down on a flat surface. 4 screw holes for M4 screws exposed on the bottom cover.

Step3.

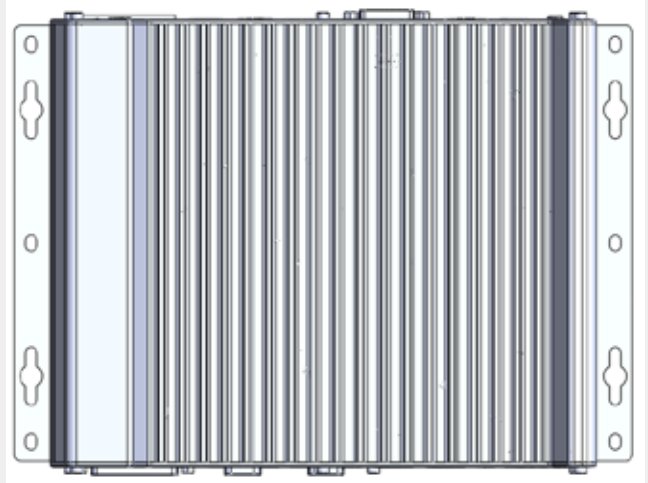


Fix two wall-mount brackets to the chassis with four M4 screws using a Philips screwdriver.

Step3.

Now you can mount your EC-3000 series on the wall. For best efficiency of heat dissipation, please mount EC-3000 series in a right direction.

O



X



2.5 Power Supply

There are two connectors on the rear panel you can use for DC power input: a 4-pin pluggable terminal block and a DC jack. The 4-pin pluggable terminal block accepts 8~26V DC input and the DC jack accepts 12V DC input.

CAUTION!

1. Please make sure the voltage of DC power is correct before you connect it to EC-3000 series. Supplying a voltage over 26V will damage the system.
2. You should use either 4-pin pluggable terminal block or DC jack for DC power input. DO NOT supply power to both connectors at the same time.

CAUTION!

2.5.1 To connect DC power via the 4-pin pluggable terminal block

Step1.

Make sure the external DC power supply is power off or disconnected before wiring.

Step2.

Locate the 4-pin pluggable terminal block in the accessory box. Note that the terminal block fits the wires with a gauge of 12~24 AWG.

Step3.

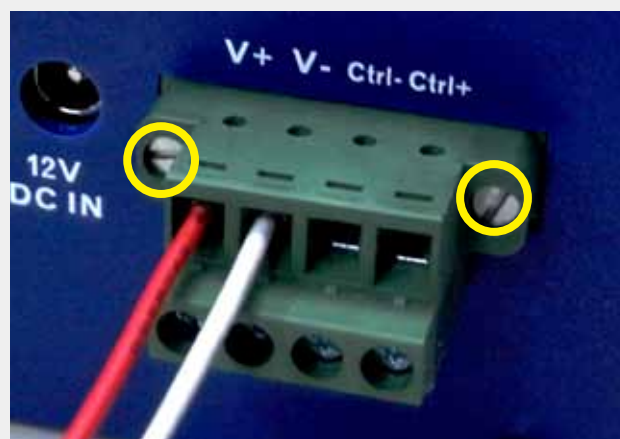


Carefully identify the positive and negative contacts of your DC power supply and pluggable terminal block. The polarities between DC power supply and terminal block must be positive (+) to positive (+) and negative (-) to negative (-).

Step4.

Insert the wires to correct contacts of pluggable terminal block and tighten clamping screws using a Philips screwdriver.

Step5.



Firmly plug the terminal block into a receptacle on the rear panel, and tighten the captive screws using a Slotted screwdriver.

2.6 Power Management

For better operation flexibility, EC-3000 series supports three alternatives power-on methods. You can turn your EC-3000 series on by pressing the **power button**, using an external **latched on/off switch**, or by sending a special **LAN packet**.

2.6.1 Using the power button on the front panel

This is the simplest way to start EC-3000 series. The power button on the front panel is a non-latched switch and behaves an ATX-mode on/off control.

As DC power is connected, push the power button and then system is on as well as the blue LED of power button is on. The button is also can turn-off the system while the system is under operation.

If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), push the power button causes a pre-defined system behavior, such as shutdown or hibernation.

2.6.2 Using remote on/off control on the rear panel

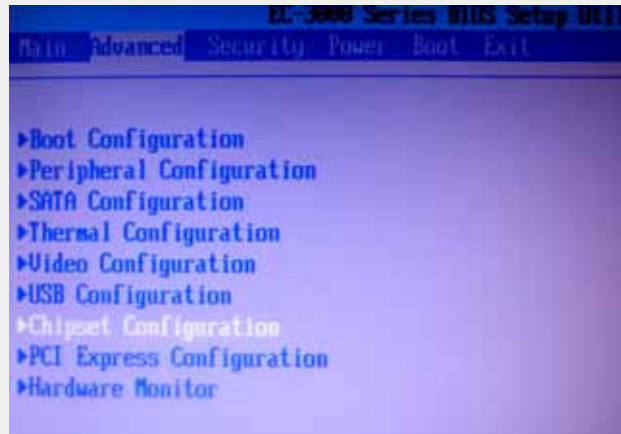
In addition to accept DC power (V+, V-), the 4-pin pluggable terminal block provides two pins (Ctrl+, Ctrl-) for behaving AT-mode remote on/off control. Please follow the steps listed below to use the remote on/off control function.

Step1.



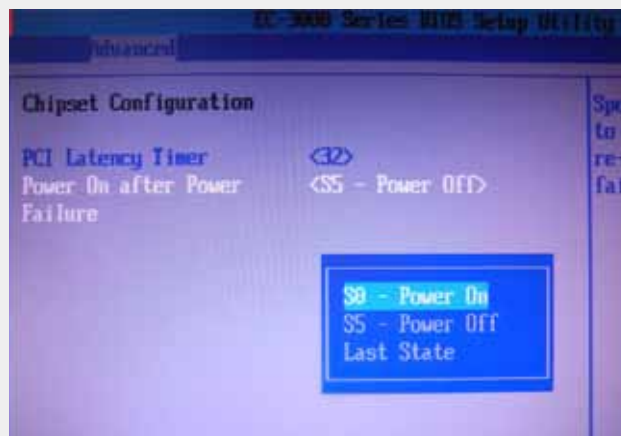
When EC-3000 series boots up, press F2 to enter BIOS setup page.

Step2.



Go to the [Advanced] [Chipset Configuration]

Step3.



Configure the [Power On after Power Failure] BIOS option as [S0 - Power On].

This setting allows the system to turn on after external DC power is connected. Please refer to section 2.6 for the instruction of configuring this option.

Step3.



Connect a latched switch to Ctrl+ and Ctrl-. Polarity is negligible.*

*When the latched switch is closed, the DC power is break off and system is turn off. When the latched switch is open, the DC power is feed-in, and, with the correct setting of "Power On after Power Failure" BIOS option, the system is turn on.

2.6.3 Using Wake-on-LAN function

Wake-on-LAN (WOL) is a feature to wake up a computer system from a S3 (standby), S4 (Hibernate) or S5 (system off with standby power) state via issuing Subnet Directed Broadcasts (SDB) or a magic packet. EC-3000 series implements the Wake-on-LAN function on the GbE port on the front panel. The rest GbE ports on the rear panel do not support WOL function.

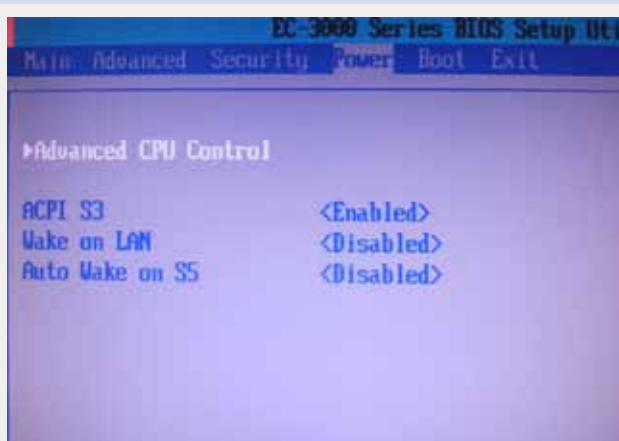
To enable WOL function and power on EC-3000 series, please follow the steps listed below.

Step1.



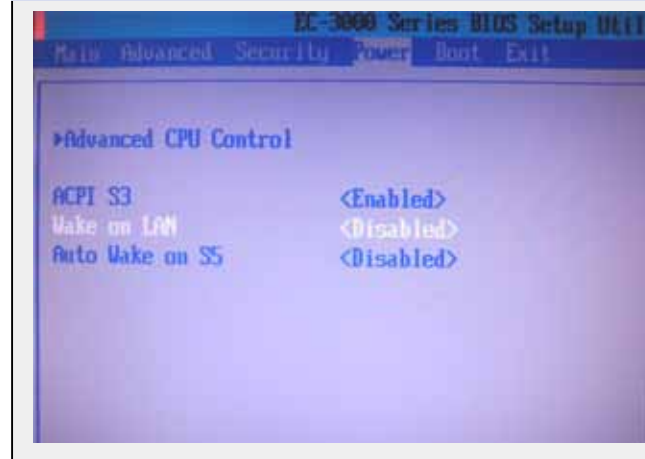
When EC-3000 series boots up, press F2 to enter BIOS setup page.

Step2.



Go to the [Power] BIOS setting menu.

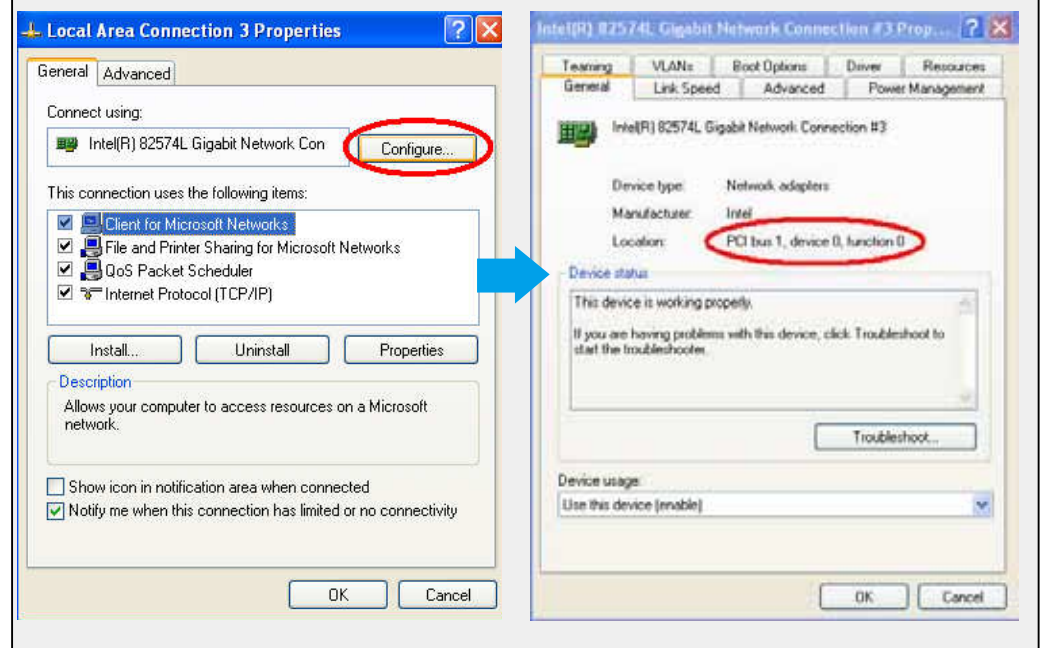
Step3.



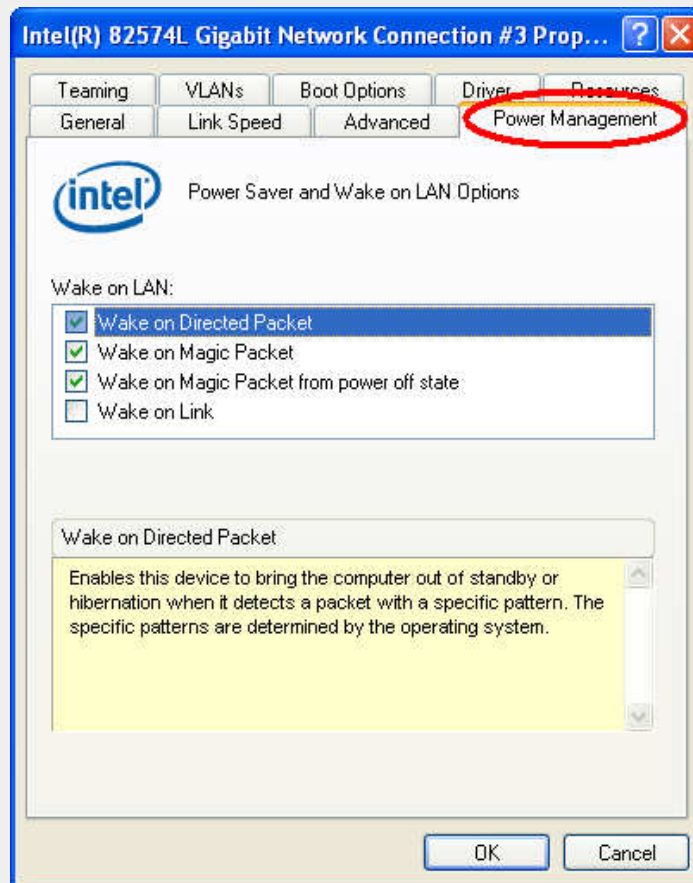
Configure the [Wake On LAN] BIOS option as [Enabled]. This setting enables the Wake-on-LAN function for EC-3000 series. Please refer to section 3 for the instruction of this configuring option.

Step4.

In Windows system, identify the Intel® 82574L Gigabit Connection on PCI bus 1, device 0, function 0. This is the GbE port on the front panel.



Step5.



Click the Power Management tag, there are several options for Wake-on-LAN.

- **Wake on Direct Packet**

EC-3000 series can wake from S3 or S4 state when receiving a direct packet, such as a ping command from another computer. Please note that the “Wake on Direct Packet” option does not support waking from S5 state.

- **Wake on Magic Packet***

The EC-3000 series can wake from S3 or S4 state when receiving a magic packet. The magic packet is a broadcast frame containing anywhere within its payload 6 bytes of all 255 (FF FF FF FF FF FF in hexadecimal), followed by sixteen repetitions of the target computer's 48-bit MAC address. For example, NIC's 48-bit MAC Address is 78h D0h 04h 0Ah 0Bh 0Ch

```
DESTINATION SOURCE MISC
FF FF FF FF FF FF
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
MISC CRC
```

*There are some free tools available on Internet that can be used to send a magic packet. Please refer to the following link to understand more about Magic Packet.
<http://en.wikipedia.org/wiki/Wake-on-LAN>

- **Wake on Magic Packet from power off state**

When checking this option, EC-3000 series can wake from S5 (system off with standby power) state when receiving a magic packet.

3

BIOS Settings

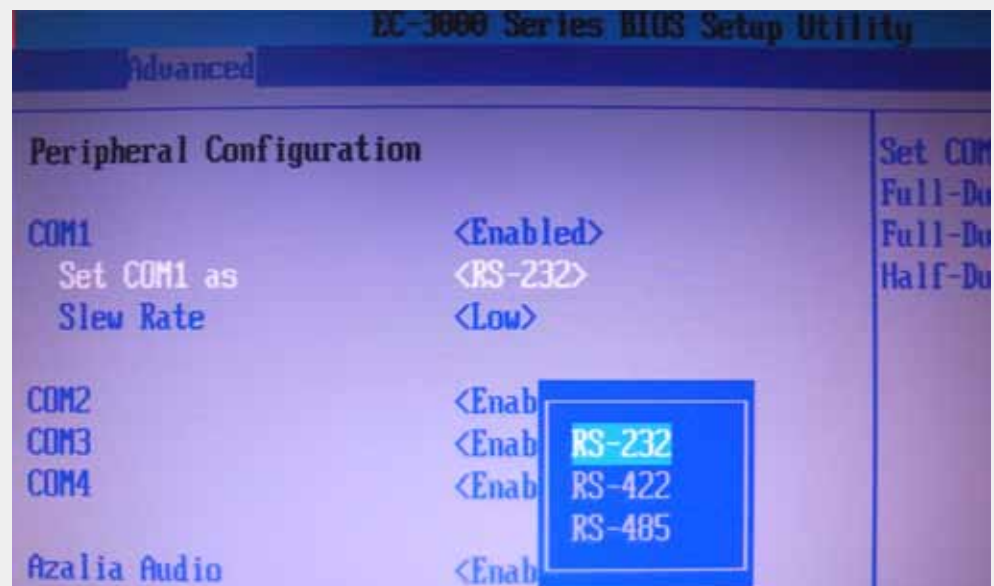
EC-3000 series is shipped with factory-default BIOS settings cautiously programmed for best performance and compatibility. In this section, we'll introduce some of BIOS settings you may need to modify. Please always make sure you understand the effect of change before you proceed with any modification.

3.1 COM1 Operating Mode

COM1 of EC-3000 series supports RS-232 (full-duplex), RS-422 (full-duplex) and RS-485 (half-duplex) mode. You can set the COM1 operating mode via BIOS settings. Another option in BIOS called "Slew Rate" defines how sharp the rasing/falling edge is for the output signal of COM1. For long-distance RS-422/485 transmission, you may set the "Slew Rate" option as "High" to improve signal quality.

To set COM1 operating mode:

1. When EC-3000 series boots up, press F2 to enter BIOS setup page.
2. Go to [Advanced] [Peripheral Configuration].
3. Set the [Set COM1 as] to a proper mode for COM1.



3.2 SATA Controller Mode

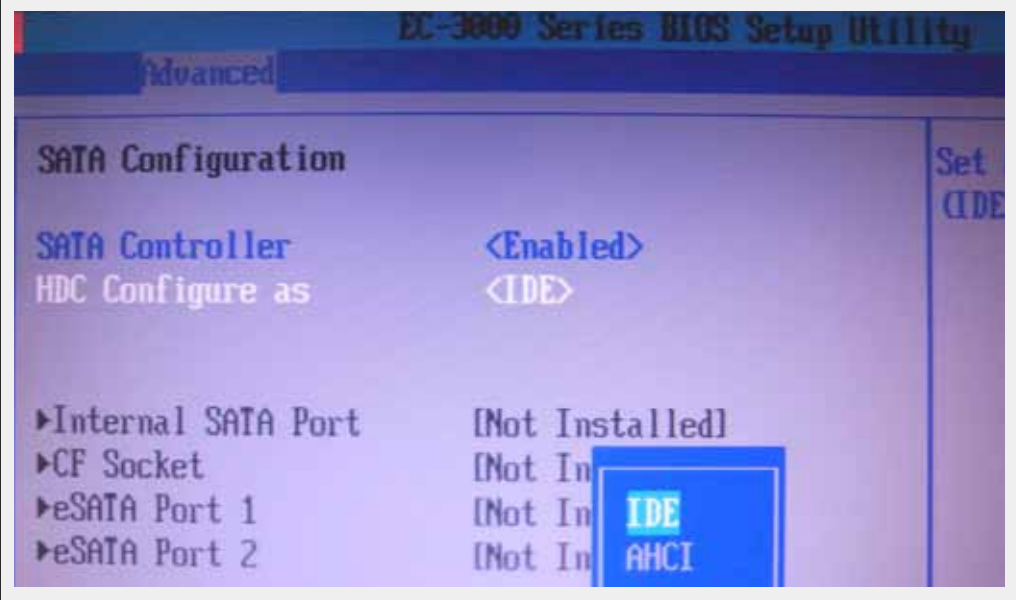
The SATA controller of EC-3000 series supports IDE and AHCI mode. IDE mode is a legacy interface and is compatible with most storage devices. AHCI mode, which exposes SATA's advanced capabilities such as hot swapping and native command queuing, are supported in several later version of operating systems.

Our suggestion of how to set SATA controller mode is

- If you're using Windows XP, Linux kernel earlier than 2.6.19, or you want to use a CF card, you should select IDE mode.
- If you're using Windows Vista, Windows 7, or Linux kernel from 2.6.19 onward, you should select AHCI mode for better performance.

To set SATA controller mode:

1. When EC-3000 series boots up, press F2 to enter BIOS setup page.
2. Go to [Advanced] [SATA Configuration].
3. Set the [HDC Configure as] to a proper mode.



3.3 CPU Shutdown Temperature & Thermal Throttling

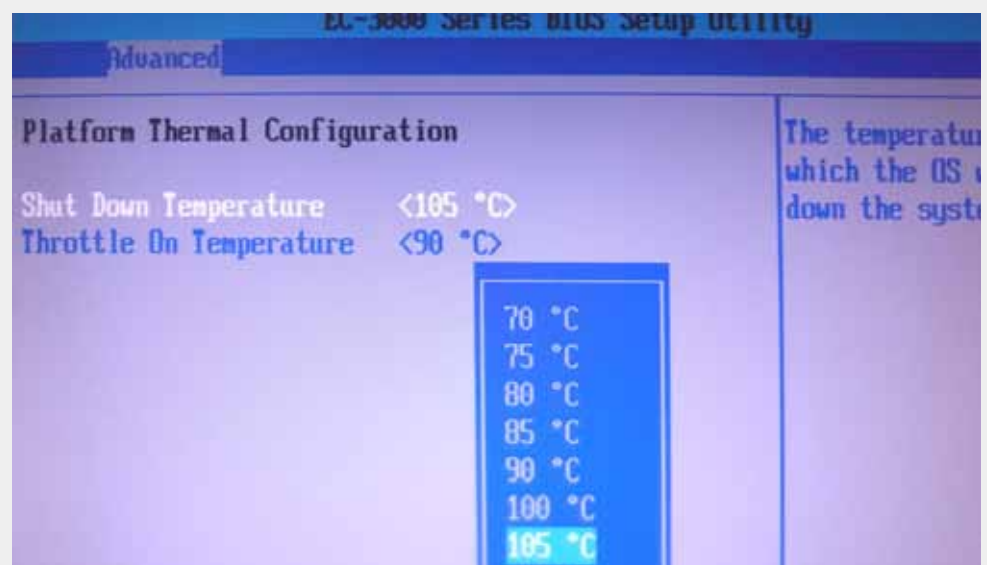
To avoid CPU from overheating in some circumstances, Intel® provides several measures to protect CPU. When CPU core temperature reaches the throttling-on temperature, CPU start to insert idle clock cycle to reduce heat generated. As if the core temperature is still raising and shutdown temperature is reached, CPU shuts down itself to prevent further damage.

Since Intel® i7/i5 processor has a Tjmax (core temperature limite) of 105°C and Intel® i3/P4500 processor has a Tjmax (core temperature limite) of 90°C, we suggest you set these two value according to the following principles:

- For Intel® i7/i5 processor, you should set the shutdown temperature as 105°C and throttling-on temperature as 90°C.
- - For Intel® i3/P4500 processor, you should set the shutdown temperature as 90°C and throttling-on temperature as 75°C.

To set CPU shutdown and thermal throttling temperature:

1. When EC-3000 series boots up, press F2 to enter BIOS setup page.
2. Go to [Advanced] [Thermal Configuration] [Platform Thermal Configuration].
3. Set the [Shut Down Temperature] to a proper value according to the processor you're using.
4. Set the [Throttle On Temperature] to a proper value according to the processor you're using.



3.4 Power-on after Power Failure Option

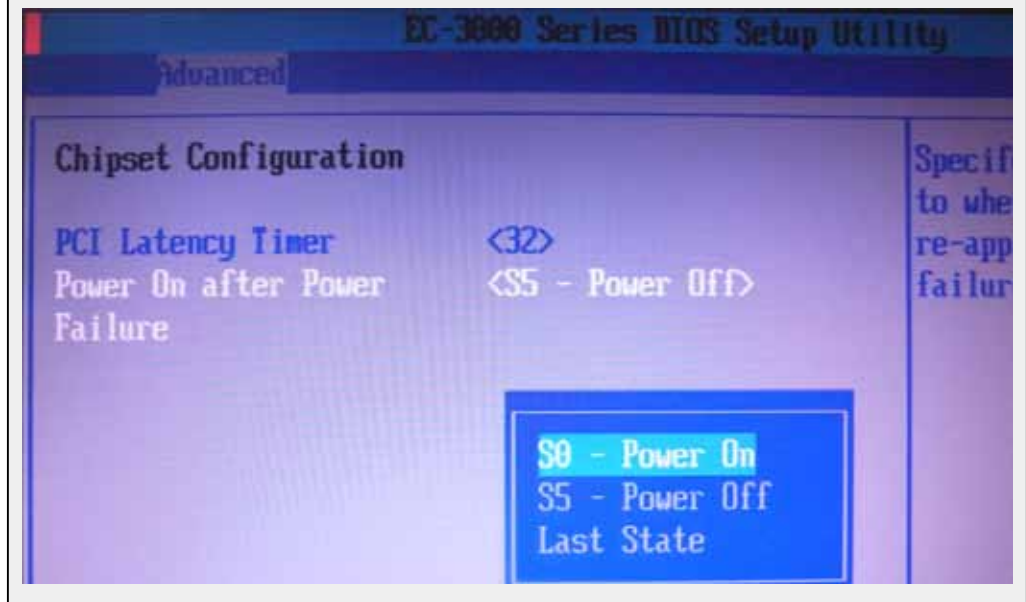
This option defines the behavior of EC-3000 series when DC power is supplied.

S0 - Power On	System is powered on when DC power is supplied.
S5 - Power Off	System is kept in off state when DC power is supplied.
Last State	The on/off state of the system is determined according to the last state when DC power is disconnected. For example, if system is still on but DC power is unplugged, the system is powered on next time when DC power is supplied.

When you want to use the remote on/off control function, you have to set this option to “S0 – Power On”. Please refer to section 2.6 for instructions of using remote on/off control function.

To set “Power On after Power Failure” option:

1. When EC-3000 series boots up, press F2 to enter BIOS setup page.
2. Go to [Advanced] [Chipset Configuration].
3. Set the [Power On after Power Failure] to a proper.



3.5 Wake-on-LAN Option

Wake-on-LAN (WOL) is a mechanism which allows you to turn on your EC-3000 series via Ethernet connection.

Before utilizing Wake-on-LAN function, you have to enable this option first in BIOS settings.

Please refer to section 2.6.3 for instructions of using WOL function.

To enable/disable “Wake on LAN” option:

1. When EC-3000 boots up, press F2 to enter BIOS setup page.
2. Go to [Power].
3. Enable/disable the [Wake on LAN] option according to your application.



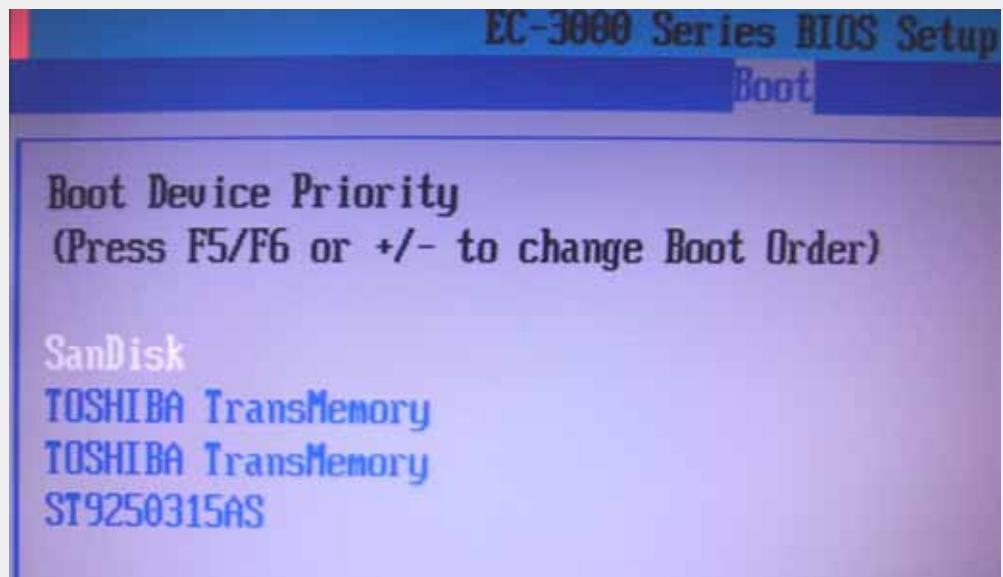
3.6 Select a Boot Device

When you have multiple bootable devices connected to your EC-3000 series (i.e. HDD, USB flash disk, USB DVD-drive), you may need to select one of them as the boot device. There are two ways to select the device.

You can either, press F12 when system boots up to go to Boot Manager and then select one of the devices, or select the boot device in BIOS settings.

To select a boot device in BIOS:

1. When EC-3000 series boots up, press F2 to enter BIOS setup page.
2. Go to [Boot] [Select Boot Device].
3. It appears a list which contains all bootable devices connected to EC-3000. You can use F5/F6 or +/- to change the boot order.



3.7 Operating System Support

When you have multiple bootable devices connected to your EC-3000 series supports most operating system developed for Intel® x86 architecture. The following list contains the operating systems which have been tested by Vecow Co., Ltd technical professionals.

OS	Vesion
Microsoft Windows	XP
	7, 32 bit
	7, 64 bit
Linux	Ubuntu 10.04 LTS 32/64 bit
	Fedora 13, 32/64 bit

Vecow will keep this list updated as we continuously test other operating systems with EC-3000. Please contact us or go to <http://www.vecow.com> for the latest OS support list.

4

Software Installation

You can find the drivers in “WindowsXP” folder
For WindowsXP system , you must upgrade to SP2 or SP3.
The Recommend driver install sequence is :

4.1 Windows XP

You can find the drivers in “WindowsXP” folder
For WindowsXP system , you must upgrade to SP2 or SP3.
The Recommend driver install sequence is :

1. Chipset driver
Chipset driver EC3000v10_Chipset_Win_9.2.0.1021
2. Microsoft NET Framework 3.5
Microsoft NET Framework 3.5 \DotNET\dotnetfx35.exe
3. Graphics driver
Graphics driver EC3000v10_Graphics_XP_6.14.10.5337
4. Audio driver
Audio driver EC3000v10_Audio_Win_R2.57_20110620
5. LAN driver
LAN driver EC3000v10_LAN_XP_20110620
6. ME driver
ME driver EC3000v10_ME_Win_6.1.0.1042_PV

CAUTION!

1. XP SP2 please refer as below information for audio problem
<http://support.microsoft.com/kb/888111>
2. If you need "AHCI mode" to install Windows XP , please use "AHCI" driver.

CAUTION!

4.2 Windows 7 or Windows Vista 32-bit

In order to avoid unknown problem, please do check your Windows 7 is 32-bit or 64-bit version before installation. You can find the drivers in “Windows7\32bit” folder

The driver installation sequence is:

1. Chipset driver
[Chipset driver EC3000v10_Chipset_Win_9.2.0.1021](#)
2. Graphics driver
[Graphics driver EC3000v10_Graphics_Win7_32b_15.21.10.2291](#)
3. Audio driver
[Audio driver EC3000v10_Audio_Win_R2.57_20110620](#)
4. LAN driver
[LAN driver EC3000v10_LAN_Win7_32b_20110620](#)
5. ME driver
[ME driver EC3000v10_ME_Win_6.1.0.1042_PV](#)

4.3 Windows 7 or Windows Vista 64-bit

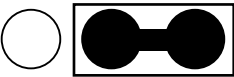
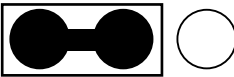
In order to avoid unknown problem, please do check your Windows 7 is 32-bit or 64-bit version before installation. You can find the drivers in “Windows7\32bit” folder

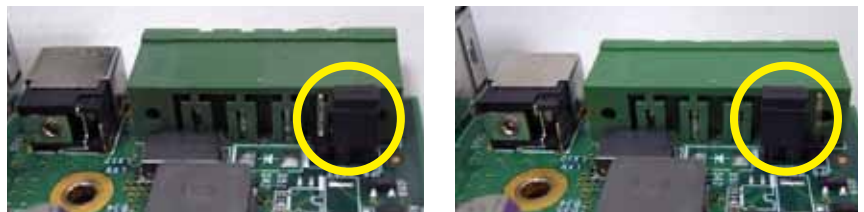
1. Chipset driver
[Chipset driver EC3000v10_Chipset_Win_9.2.0.1021](#)
2. Graphics driver
[Graphics driver EC3000v10_Graphics_Win7_32b_15.21.10.2291](#)
3. Audio driver
[Audio driver EC3000v10_Audio_Win_R2.57_20110620](#)
4. LAN driver
[LAN driver EC3000v10_LAN_Win7_32b_20110620](#)
5. ME driver
[ME driver EC3000v10_ME_Win_6.1.0.1042_PV](#)

A ppendix I

AT/ATX Power Mode Select

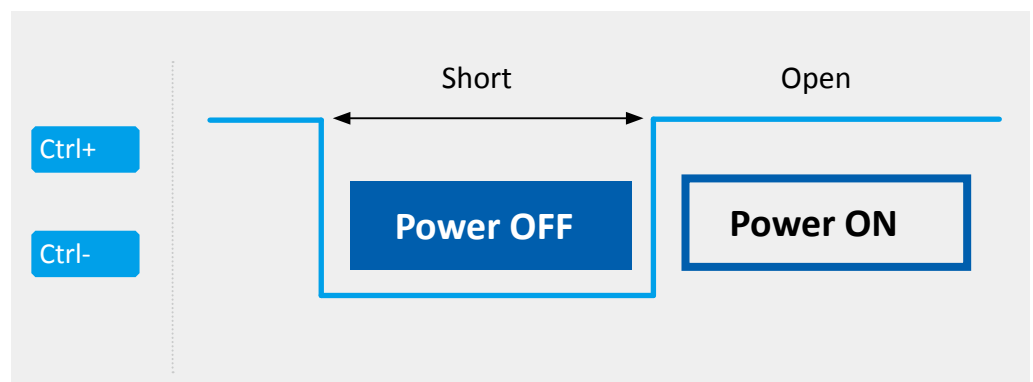
The EC-3000 support AT/ATX power modes when use in 4p Terminal block. Please note this function "DOES NOT" support DC-Jack. You can configure AT/ATX modes by JP6, "**Ctrl+ / Ctrl-**" is for remote power control.

AT/ATX Power Select		
	AT Mode	ATX Mode
JP6		



AT Mode Behavior

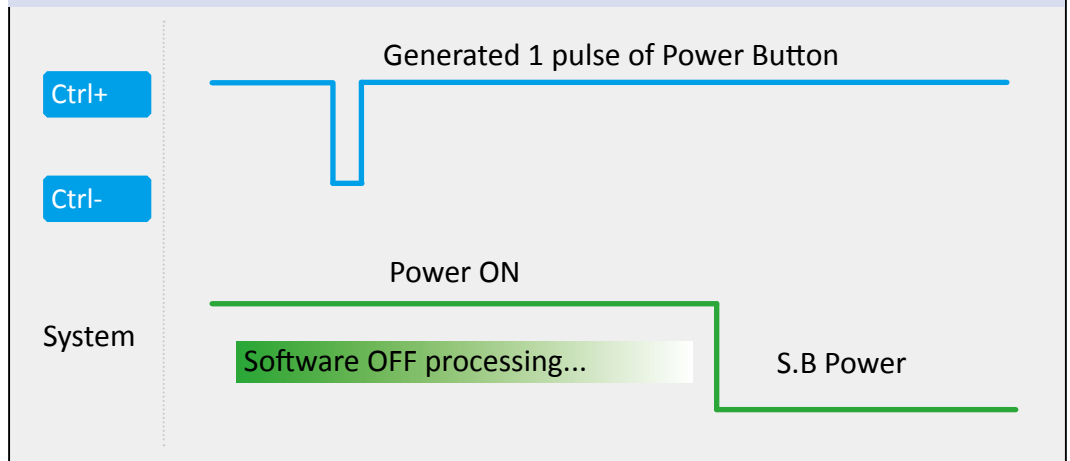
When short the "ctrl+" and "ctrl-" pins, the system will be set into S.B mode immediately. To Open the "ctrl+" and "ctrl-" pins, system would be boot up, as the following graphic:



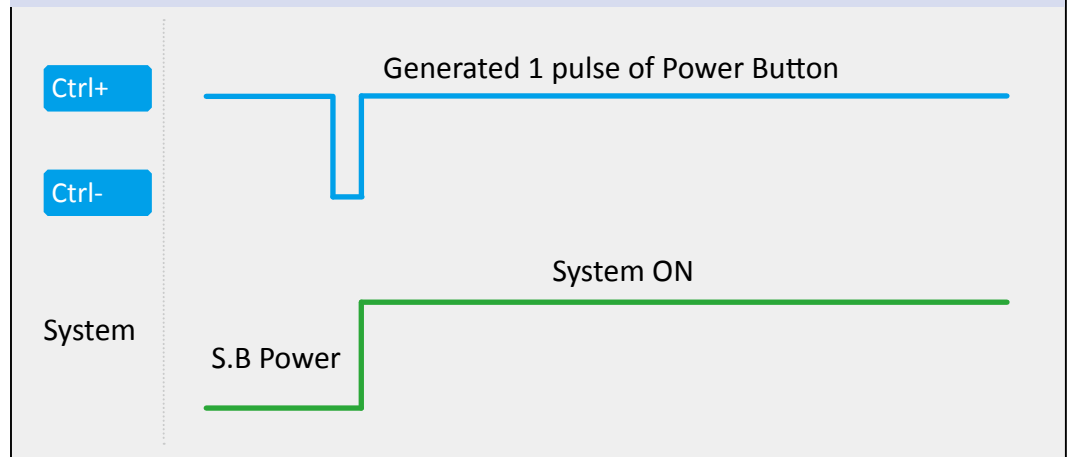
ATX Mode Behavior

When short the "ctrl+" and "ctrl-" pins, system hardware will generate one pulse of power button. While Windows is running, you can active this signal to turn off the system as the graphic 1 shows. And short the "ctrl+" and "ctrl-" pins again to turn on system as the graphic 2 shows.

1. Define "OFF" Action: When System Already Boot Up.



2. Define "ON" Action: When System Keeps on Standby Power.



Other Action: Short for 4 Second, Power OFF your System

