EOS-4000

2-CH PoCL Embedded Vision System

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	Sept. 27, 2013	Initial release

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



Additional information, aids, and tips that help users perform tasks.



Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

1.1 Overview

The EOS-4000 is a rugged compact embedded vision system equipped with the 3rd Generation IntelCore™ i5/i7 processor, providing dual independent PoCL (power over Camera Link) ports with data transfer up to 2.56 Gb/s, and pixel clock rates up to 85 MHz for high speed capture of large images, greatly enhancing computing power and connectivity with minimal footprint.

The EOS-4000 supports 2-CH PoCL Camera Link as base configuration to reduce cabling burdens and eliminate the need for external power adapters. In addition, the EOS-4000 supports 64-bit memory addressing for large address space vision applications.

The EOS-4000's rich I/O capability includes trigger and encoder input and two independent RS-232 serial communication ports, reducing host computer loading. 64 isolated digital I/Os, digital filter, dual storage, internal USB port, and 1 kbit programmable EEPROM all ideally equip the EOS-4000 to integrate, deploy, and manage copy protection or authentication of software licenses for system development, further accelerating time to market.

Combining increased computing power with multi-channel connectivity and a ready-to-deploy application platform, the EOS-4000 delivers embedded vision ideally suited for machine vision applications.

1.2 Features

- 230W X 206D X 82H mm (9.06 X 8.11 X 3.23 in), compact and rugged system design
- 3rd Generation Intel® Core™ i5/i7 processors
- Up to 2-CH PoCL, base Camera Link® configuration
- Internal USB port and 1 kbit programmable EEPROM
- 64-CH isolation DI/O with digital filter
- Supports two SATA ports and one CFast slot

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1.3 Specifications

General Specifications	
System Core	
Processor	IntelCore™ i7-3610QM, i5-3610ME
Chipset	Intel® QM6 Express
Video	VGA+DVI-D output by DVI-I connector- analog CRT, supports QXGA, 2048 x 1536 resolution
Memory	2 socket slot for DDR3 1066/1333/1600 MHz SODIMM module (Max. capacity 16GB)
Camera Interface	
Camera Link	2-CH power over Camera Link, base configuration, up to 85 MHz
I/O Interface	
DI/O	▶ 32 DI, 32 DO COS interrupt for all digital input ▶ 2.5 kV isolation protection ▶ Configurable digital filter (0.25 µs-131 ms)
Ethernet	2x GbE port (1x Intel® 82574L, 1x Intel® 82579LM(PHY)) with WOL function on each port
Serial Port	2x software-programmable RS-232/422/485 (COM1 & COM2) 2x RS-232 (COM3 & COM4)
USB	4x USB 2.0 ports 2x USB 3.0 ports
Trigger I/O	2 trigger input 1 encoder input
KB/MS	1x PS/2 for keyboard and mouse (requires S3 wakeup)
Power Supply	
DC Input	Built-in 9-32 VDC wide-range DC 3P pluggable connector with latch (GND, V-, V+)
AC Input	Optional 150 W external AC-DC adapter
Security	

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General Specifications		
USB	1x internal USB port supporting installation of a USB dongle for security function.	
ID	1kBit EEPROM	
Storage		
SATA HDD	2x SATA port for 2.5" HDD/SSD installation RAID 0/1/5/10	
CFast	1x CFast slot, SATA 3Gb/s compatible	
Mechanical		
Dimensions	230W X 206D X 82H mm (9.06 X 8.11 X 3.23 in)	
Weight	3 kg (6.61 lb)	
Mounting	Wall- and rail-mount kit	
OS		
Operating system	Windows 7/7 Embedded	
Environmental		
Operating temperature	0° to 55° C (32 to 131° F)	
Storage temperature	-40° to 85° C (-40 to 185° F) (excl. HDD/SDD/CFast)	
Humidity	Approx. 95% @ 40° C (non-condensing)	
Vibration (Operating)	CFast	5 Grms, 5-500 Hz, 3 axes
	SSD	3 Grms, 5-500 Hz, 3 axes
	HDD	0.5 Grms, 5-500 Hz, 3 axes
Shock	Operating, 30 Grms, half sine 11ms duration (CF or SSD)	
EMI	CE, FCC Class A	

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1.4 Schematics

NOTE:

All units are in millimeters (mm)

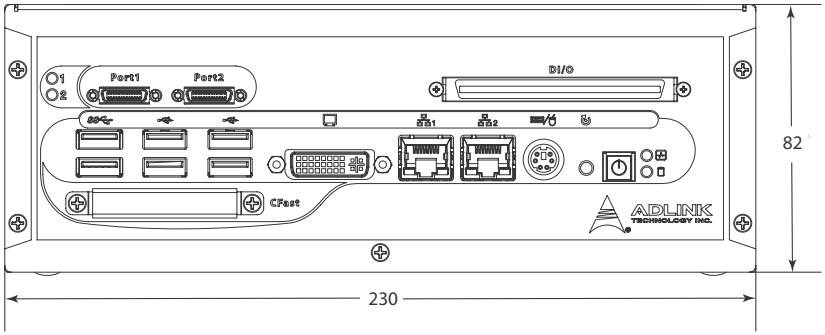


Figure 1-1: EOS-4000 Front View

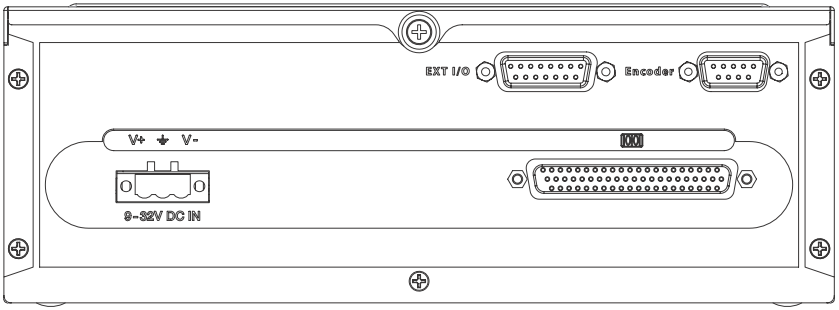


Figure 1-2: EOS-4000 Rear View

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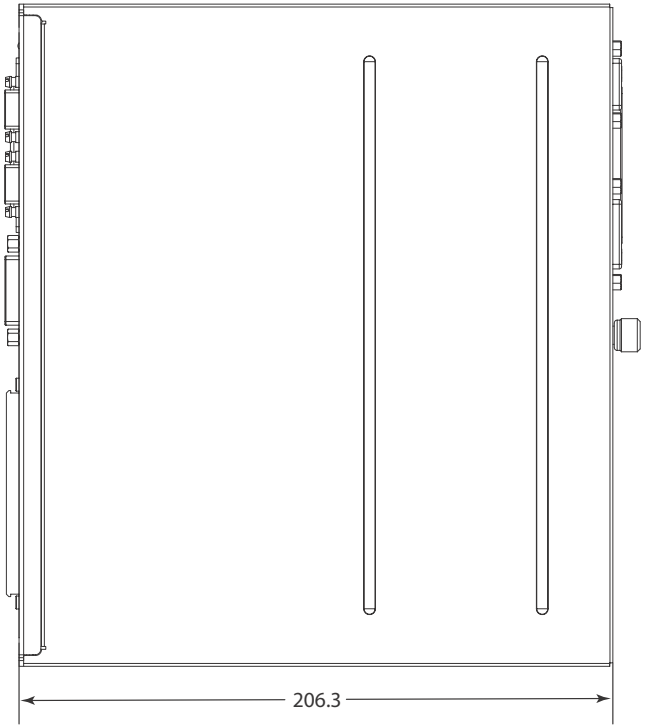


Figure 1-3: EOS-4000 Top View

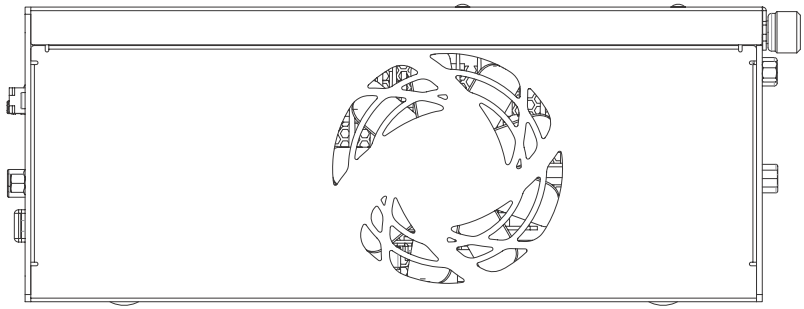


Figure 1-4: EOS-4000 Right Side View

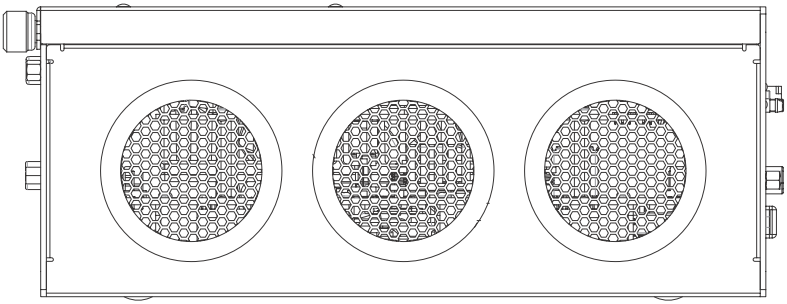


Figure 1-5: EOS-4000 Left Side View

1.5 Front Panel I/O Connectors

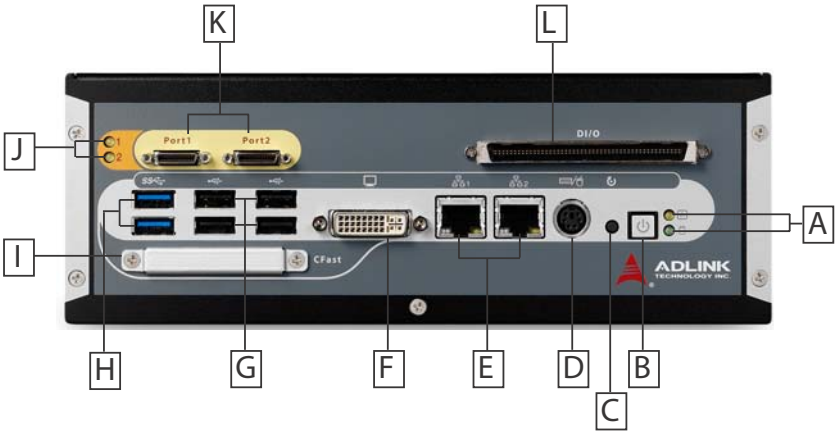


Figure 1-6: Front Panel I/O Connectors

A	LED indicators
B	Power switch
C	Reset switch
D	PS/2 keyboard & mouse
E	Dual Gigabit Ethernet ports
F	DVI-I connector

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G	USB 2.0 connectors x4 (Type A)
H	USB3.0 connector (Type A) x2
I	CFast connector (push-push,type II)
J	Camera Link port LED indicators
K	Camera Link port x2
L	32 channel isolation DIO connector

Table 1-1: Front Panel I/O Connector Legend

1.5.1 LED Indicators

In addition to an LED on the power switch, two LEDs on the front panel indicate as follows..

LED indicator	Color	Description
Diagnostic	Yellow	▶ If lit continuously, indicates no physical storage is connected ▶ If blinking, indicates no memory is installed on either SO-DIMM socket
HDD	Green	When blinking, indicates the SATA hard drive is active

Table 1-2: LED Indicators

1.5.2 Power Switch

The power switch is non-latched, with a blue LED indicator. System is turned on when the button is depressed, and the power LED lights. If the system hangs, depressing the switch for 5 seconds turns the system off completely.

1.5.3 Reset Button

The reset button executes a hard reset.

1.5.4 PS/2 Connector

The EOS-4000 provides connectors for PS/2 keyboard and mouse, either singly or with a Y-cable to connect both at the same time.

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1.5.5 Dual Gigabit Ethernet Ports

The EOS-4000 provides two Gigabit Ethernet ports on the front panel, an Intel® 82574IT Gigabit Ethernet Controller and Intel® 82579LM Gigabit Ethernet PHY, with features as follows.

Intel® 82574IT Gigabit Ethernet Controller	Intel® 82579LM Gigabit Ethernet PHY
Advanced error reporting	802.3x flow control-compliant
Message signaled interrupts	IEEE 802.1p and 802.1q support
TCP segmentation offload/large-send support	Energy efficient Ethernet(EEE)802.3az support
802.3x flow control-compliant	10/100/1000 IEEE 802.3-compliant
IEEE 802.1p and 802.1q support	Automatic MDI/MDIX crossover at all speeds
10/100/1000 IEEE 802.3-compliant	Wake-On-LAN feature
Automatic MDI/MDIX crossover at all speeds	Support Intel® AMT 7.0
ACPI 2.0 specification	Reduced power consumption during normal operation and power down modes
Wake-On-LAN	Preboot eXecution Environment (PXE) flash interface support
Fully integrated ASF 2.0 functionality with on-chip µc	9 KB jumbo frame support
SMBus 2.0 master interface for ASF functionality	Supports LAN Teaming function
Preboot eXecution environment (PXE) flash interface support	802.3x flow control-compliant
9 KB jumbo frame support	IEEE 802.1p and 802.1q support
LAN Teaming Function support	Energy Efficient Ethernet(EEE)802.3az support

Table 1-3: Gigabit Ethernet Port Features

Both Gigabit Ethernet ports provide function indication through LED display, as follows, with a yellow Activity indicator LED on the right side of the port, and a green/orange Speed indicator LED on the left. LED function is the same for both ports

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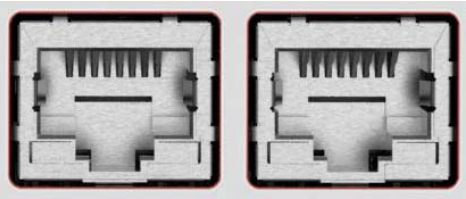


Figure 1-7: Gigabit Ethernet Ports

LED Color	Status	Description
Yellow	OFF	Ethernet port is disconnected.
	ON	Ethernet port is connected with no activity.
	Flashing	Ethernet port is connected and active.

Table 1-4: Active/Link LED

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

Table 1-5: Speed LED

1.5.6 DVI-I connector

The EOS-4000 provides one DVI-I connector for connection to an external monitor. The DVI-I connector can be separated into VGA and DVI-D (single link) interfaces.

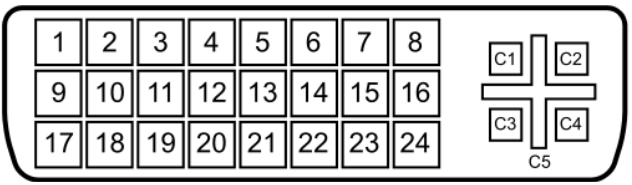


Figure 1-8: DVI-I connector

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PIN	Signal	PIN	Signal	PIN	Signal	PIN	Signal
1	DVIdata 2-	9	DVIdata 1-	17	DVIdata 0-	C1	Analog Red
2	DVIdata 2+	10	DVIdata 1+	18	DVIdata 0+	C2	Analog Green
3	GND	11	GND	19	GND	C3	Analog Blue
4	CRT DDC clock	12	N/C	20	N/C	C4	Analog horiz. sync
5	CRT DDC data	13	N/C	21	N/C	C5	Analog GND
6	DVIDC clock	14	+5V	22	GND		
7	DVIDC data	15	GND	23	DVI clock +		
8	Analog vert. sync	16	Hot plug detect	24	DVI clock -		

Table 1-6: DVI-I Connector Signals

1.5.7 USB 2.0 Connectors

The EOS-4000 provides four Type A USB 2.0 ports on the front panel. All are compatible with Hi-Speed, full-speed, and low-speed USB devices.

The EOS-4000 supports multiple boot devices, including USB flash, USB external HD, USB floppy, and USB CD-ROM drives. Boot priority and device can be configured in BIOS. Please refer to Section A.2.8 USB Configuration for details.

1.5.8 USB 3.0 Connectors

The EOS-4000 provides two Type A USB 3.0 ports on the front panel. Based on the TI TUSB7320RKM USB host controller, connection to the host system is achieved through a PCIe x1 Gen2

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interface, supporting SuperSpeed, Hi-Speed, full-speed, and low-speed transmission for the downstream USB 3.0 ports.

The EOS-4000 supports multiple boot devices, including USB flash, USB external HD, and USB CD-ROM drives. Boot priority and device can be configured in BIOS.


NOTE:

While the USB 3.0 ports allow boot from CD-ROM, OS installation via CD-ROM is not supported.

1.5.9 CFast Slot

The EOS-4000 is equipped with a type II push-push CFast host connector on the front panel, connecting to the host controller by SATA interface. Data transfer rates up to 3.0Gb/s(300MB/s)/ 1.5Gb/s(150MB/s) are supported. The host SATA controller provides a legacy operating mode using I/O space, and an AHCI operating mode using memory space. The CFast card can function as a storage device for system installation.

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1.5.10 Camera Link Ports

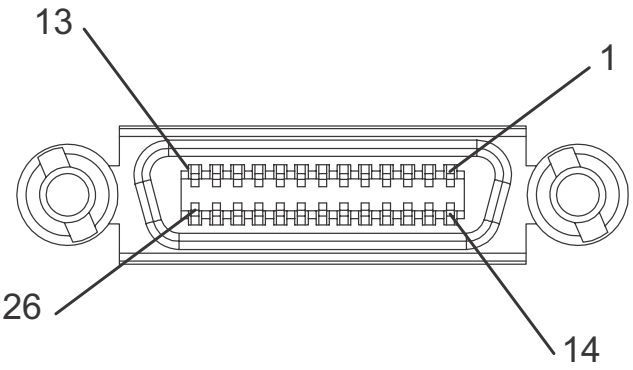


Figure 1-9: Camera Link Port Connections

Pin	Signal	Pin	Signal
1	Inner shield or Power	14	Inner shield or Power return
2	CC4-	15	CC4+
3	CC3+	16	CC3-
4	CC2-	17	CC2+
5	CC1+	18	CC1-
6	SerTFG+	19	SerTFG-
7	SerTC-	20	SerTC+
8	X3+	21	X3-
9	Xclk+	22	Xclk-
10	X2+	23	X2-
11	X1+	24	X1-
12	X0+	25	X0-
13	Inner shield or Power return	26	Inner shield or Power

Table 1-7: Camera Link Port Connections Legend

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1.5.11 Camera Link LED Indicators

Two LEDs on the front panel indicate the status of the Camera Link function, as follows.

NOTE: LED 1 indicates status of Camera Link Port 1, and LED 2 Port 2.



Figure 1-10: Camera Link LED Indicators

Status	Description
Unlit	No camera clock is detected
Lit	Camera clock is detected
Blinking	Image capture is in progress

Table 1-8: Camera Link LED Indicators Legend

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1.6 Rear Panel I/O Connectors

The EOS-4000 further provides I/O connection on the rear panel, as follows.

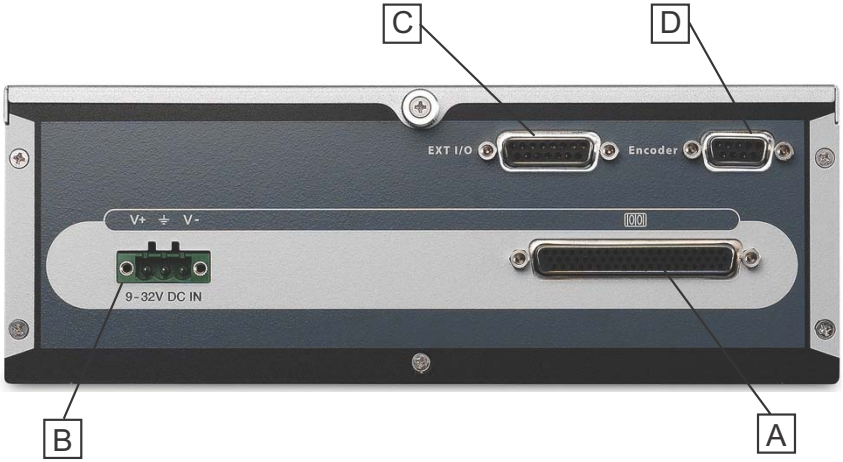


Figure 1-11: Rear Panel I/O Connectors

A	DB-62P COM port
B	DC power supply connector
C	Trigger input and strobe output port
D	Encoder input port

Table 1-9: Rear Panel I/O Connector Legend

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1.6.1 DC Power Supply Connector

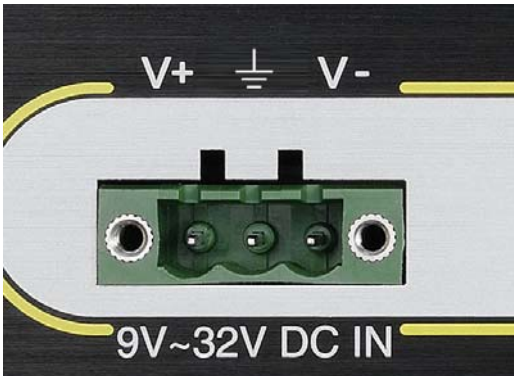


Figure 1-12: DC Power Connector

The DC power supply connector of the EOS-4000, on the back panel, consists of V-, chassis ground, and V+ pins, from right to left. V+ and V- pins accept DC power input and the chassis ground pin grounds the chassis for better EMC compatibility. The DC power input of the EOS-4000 allows a voltage input range from 9 VDC to 32 VDC.

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1.6.2 DB-62P COM Port Connector

The EOS-4000 provides four COM ports with DB-62P Connector on the back panel, with cable connect to DB-62P connector to extend four D-SUB 9-pin connectors, at COM1, COM2, COM3,and COM4. COM1 & COM2 can support RS-232/ RS-422/ RS-485 modes based on BIOS settings, and COM3 and COM4 ports support only RS-232. Pin assignments are as follows.

PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	COM3_TXD	22	COM3_RXD	43	COM3_CTS#
2	COM3_DTR#	23	COM3_DSR#	44	COM3_RTS#
3	COM3_RI#	24	COM3_DCD#	45	GND
4	COM4_TXD	25	COM4_RXD	46	COM4_CTS#
5	COM4_DTR#	26	COM4_DSR#	47	COM4_RTS#
6	COM4_RI#	27	COM4_DCD#	48	GND
7	COM1_TXD	28	COM1_RXD	49	COM1_CTS#
8	COM1_DTR#	29	COM1_DSR#	50	COM1_RTS#
9	COM1_RI#	30	COM1_DCD#	51	GND
10	COM2_TXD	31	COM2_RXD	52	COM2_CTS#
11	COM2_DTR#	32	COM2_DSR#	53	COM2_RTS#
12	COM2_RI#	33	COM2_DCD#	54	GND
13-21	N/C	34-42	N/C	55-62	N/C

Table 1-10: DB-62P Connector Pin Assignment

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1.6.3 Trigger Input/Strobe Output Connector

The EOS-4000 features a 2-CH trigger input and strobe output on the rear panel, based on an onboard digital I/O card supporting features as follows.

Line/Area Trigger Input			
Item	**Min.**	**Max.**	**Test Conditions**
Input high threshold	+2.0V	+5.5V	Ambient temperature: 25°C
Input low threshold	0V	+0.8V	
Input signal frequency	N/A	2MHz	
Strobe Output			
Item	**Min.**	**Max.**	**Test Conditions**
High output voltage	+3.8V	+5V	Typical output current: +/- 24mA
Low output voltage	0V	+0.4V	

Table 1-11: Trigger Input/Strobe Output Specifications

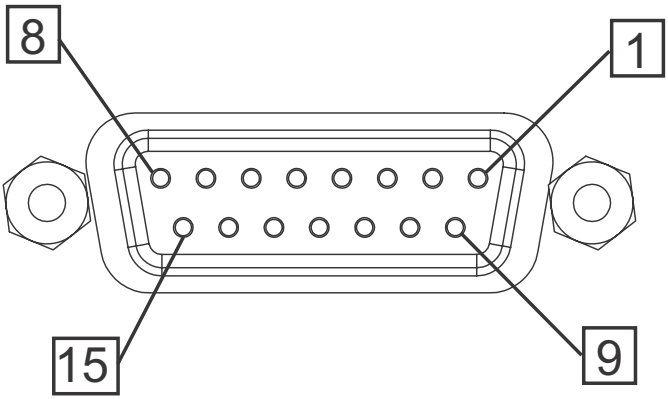


Figure 1-13: Trigger Input/Strobe Output Connector

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Pin	Name	IN/OUT	Description
1	Trigger 1	IN	Line/area trigger (TTL) for CH1
2	Trigger 2	IN	Line/area trigger (TTL) for CH2
3	N/A		
4	N/A		
5	Strobe 1	OUT	Strobe output (TTL) for CH1
6	Strobe 2	OUT	Strobe output (TTL) for CH2
7	N/A		
8	N/A		
9	+5V	OUT	+5V power source
10	GND	N/A	System digital ground
11	GND	N/A	System digital ground
12	GND	N/A	System digital ground
13	GND	N/A	System digital ground
14	GND	N/A	System digital ground
15	GND	N/A	System digital ground

Table 1-12: Trigger Input/Strobe Output Pin Definitions

1.6.4 Encoder Input Port

The EOS-4000 features a 1-CH encoder input on the rear panel, based on an onboard digital I/O card supporting features as follows.

Encoder Input			
Item	**Min.**	**Max.**	**Test Conditions**
Terminal resistor	100Ω		
Input common mode voltage		+/-7V	Terminal resistor: 100Ω
Positive input threshold		+0.2V	
Negative input low threshold		-0.2V	
Input signal frequency		10MHz	Ambient temperature=25°C

Table 1-13: Encoder Input Configurations

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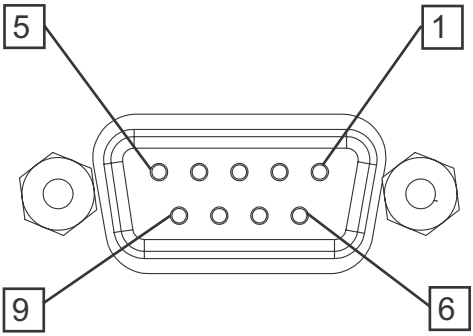


Figure 1-14: Encoder Input Port

Pin	Name	In/Out	Description
1	EA+	IN	Encoder trigger A+ (EIA-422)
2	EB+	IN	Encoder trigger B+ (EIA-422)
3	EZ+	IN	Encoder trigger Z+ (EIA-422)
4	GND	N/A	System digital ground
5	GND	N/A	System digital ground
6	EA-	IN	Encoder trigger A- (EIA-422)
7	EB-	IN	Encoder trigger B- (EIA-422)
8	EZ-	IN	Encoder trigger Z- (EIA-422)
9	GND	--	System digital ground

Table 1-14: Encoder Input Port Pin Assignment

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1.7 Internal I/O connectors

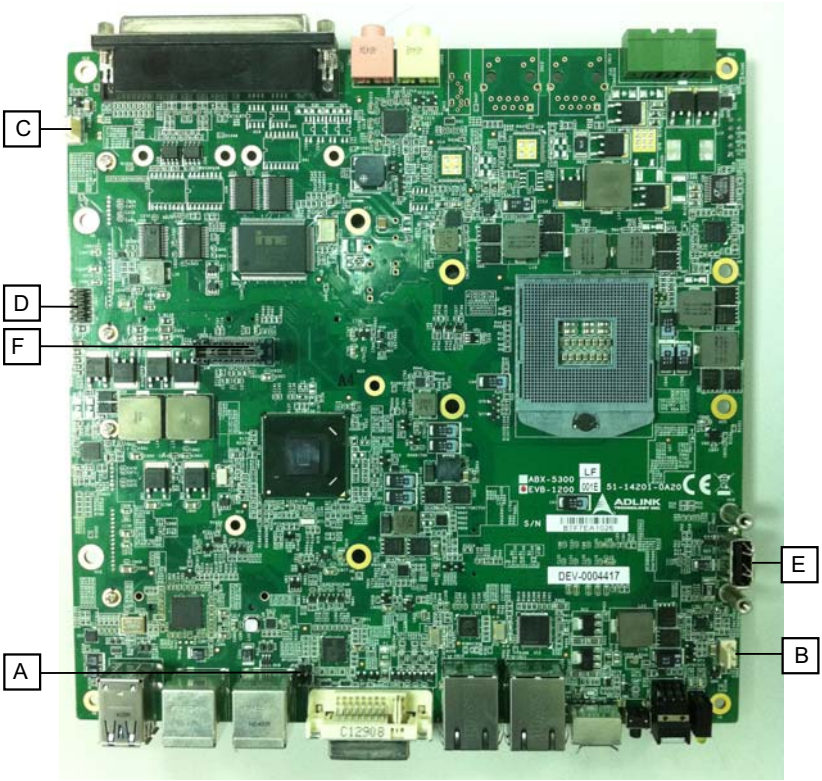


Figure 1-15: EOS-4000 Mainboard Top View

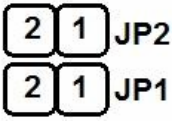
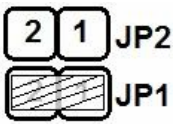
A	Clear CMOS and ME RTC register jumpers
B	DC 12 V fan connector
C	DC 12 V fan connector (reserved)
D	COM port connector (optional)
E	USB 2.0 Type A connector
F	SUMIT Connector

Table 1-15: Mainboard Connector Legend

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1.7.1 Clear CMOS and ME RTC Register Jumpers

When conditions occur under which the EOS-4000 controller fails to boot, clearing stored BIOS content from CMOS and restoring default settings may be required. To clear the CMOS, short pin#1 and pin#2 of JP1 and remove the jumper. CMOS restores to factory default settings

Normal	Clear
	

As with JP1, shorting pin#1 and #2 of JP2 will clear the ME RTC register, however, since this jumper is used by RMA, this is not recommended, and may cause unexpected errors in system behavior.

1.7.2 DC 12V Fan Connector

The EOS-4000 provides DC 12 V supply for fan module power. The FAN module, inside the chassis, uses power directly from this connector to exhaust heat, decreasing temperature of the system for more stable operation.

1.7.3 DC 12V Fan Connector (reserved)

The EOS-4000 further reserves an additional DC 12 V supply connector for a second fan module. Like the first, the second module is inside the chassis, and uses power directly from this connector to exhaust heat, decreasing temperature of the system for more stable operation.

1.7.4 USB 2.0 Type A Connector

A USB 2.0 Type A connector is provided to support expanded storage or security function through a dongle connection. The connector is deployed vertically, perpendicular to the board surface.

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1.7.5 SUMIT Connector

SUMIT is a connection protocol that integrates common high-and low-speed serial and legacy expansion buses for dedicated use. A compact, stackable, multiboard I/O expansion solution, the SUMIT connector supports one x1 PCI Express lane, one x4 PCI Express lane, and additional power, ground and control signals. Pin definitions are as follows.

Pin	Description	Pin	Description
1	GND	27	PCIex4_TX2+
2	GND	28	PCIex4_RX2+
3	PCIex1_TX+	29	PCIex4_TX2-
4	PCIex1_RX+	30	PCIex4_RX2-
5	PCIex1_TX-	31	GND
6	PCIex1_RX-	32	GND
7	GND	33	PCIex4_TX3+
8	NC	34	PCIex4_RX3+
9	PCIex4_CLK+	35	PCIex4_TX3-
10	PCIex1_CLK+	36	PCIex4_RX3-
11	PCIex4_CLK-	37	GND
12	PCIex1_CLK-	38	GND
13	NC	39	PERST#
14	GND	40	WAKE#
15	PCIex4_TX0+	41	+V12
16	PCIex4_RX0+	42	+V12
17	PCIex4_TX0-	43	+V5
18	PCIex4_RX0-	44	+V12
19	GND	45	+V5
20	GND	46	+V3.3
21	PCIex4_TX1+	47	+V5
22	PCIex4_RX1+	48	+V3.3
23	PCIex4_TX1-	49	+V5
24	PCIex4_RX1-	50	+V3.3
25	GND	51	+V5
26	GND	52	+V5SB

Table 1-16: SUMIT Pin Definitions

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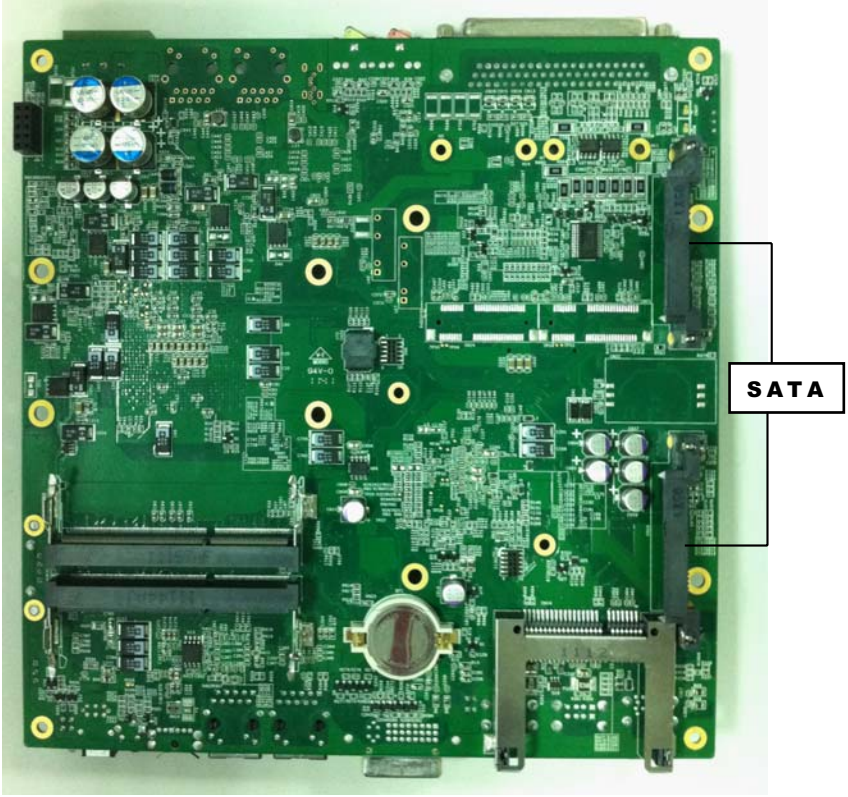


Figure 1-16: EOS-4000 Mainboard Underside View

1.7.6 SATA Connectors

The EOS-4000 provides two SATA connectors supporting data transfer up to 6.0 Gb/s(600 MB/s). The SATA host controller supports legacy mode using I/O space and AHCI mode using memory space.

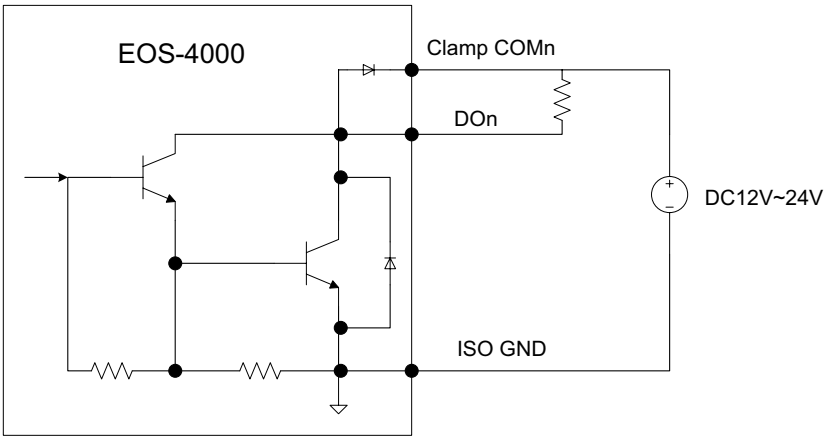
The SATA connectors are compatible with 2.5 inch hard disk (HDD) or solid state disk (SSD) drives, which must be installed to the SATA connector with a HDD bracket.

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1.8 General Purpose Digital Signals

1.8.1 General Purpose Digital Output (EDO)

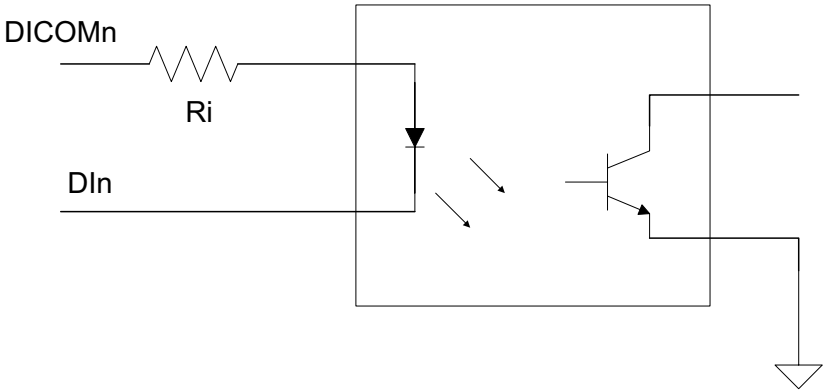
In the common ground connection of isolated digital output, as shown, when a “1” (logic high) is written by FPGA to a DO channel, the sink current passes through the transistors and the DO channel goes low. When a “0” (logic low) is written by FPGA to a DO channel, no current passes through the transistors and the DO channel goes high. When the load is of an “inductance nature” such as a relay, coil or motor, the Clamp COMn must be connected to an external power source. The extra connection is utilized for the ‘fly-wheel diode’ to form a current-release closed loop, so that the transistors are protected from any high reverse voltage generated by the inductance load when the output is switched from high to low.



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1.8.2 General Purpose Digital Input (EDI)

The EOS-4000 provides 32 opto-isolated digital input channels on the front panel. Circuitry of the isolated input channel is as follows.



As shown, signal connections for a supply and load connected to an isolated input, here in the EOS-4000, can determine when a load is powered. The load is connected to the power supply by a switch and can be any DC voltage between 12 and 24 VDC. When the switch is open, no current flows through the load and no voltage is applied to the load or to the EOS-4000 DI channels.

The digital logic of the EOS-4000 then registers a logic high for the channel. When the switch is closed, current flows through the diode and the EOS-4000 registers logic low for the channel.

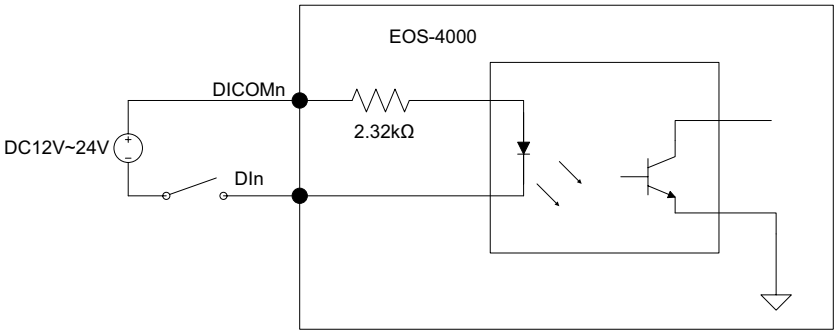
Reducing DI channel Forward Current for High Voltage

As input voltage exceeds 12 V, the input current drawn by the EOS-4000 (forward current If) rises commensurately. At 24 V, for example, current per line is determined by the formula:

```
(24V- 0.5V)/2.32kΩ = 10.129 mA
```

To reduce the current and the power drawn, on a monitored circuit, for example, another resistor can be added in series with the 2.32 kΩ current-limiting resistor, as shown.

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It is recommended a resistance value be chosen allowing at least 5 mA through the diode, assuming a maximum drop across the diode of 0.5 V.

For example, for 24 V inputs a maximum resistance for Rs can be found by the formula:

```
(24 V-0.5 V)/5 mA - 2.32kΩ = 2.38kΩ
```

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2 Getting Started

This chapter describes accessing/changing memory modules, hard disk drives, and the USB dongle in the system. Wall-mounting is also described.

2.1 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- EOS-4000 unit
- Wall mounting brackets (x2)
- Mounting M4, 8mm screws (x4)
- PS/2 Y cable
- Quick Start Guide
- ADLINK All-in-One DVD



OEM versions with non-standard configuration, functionality, or packaging may vary according to individual requirements.

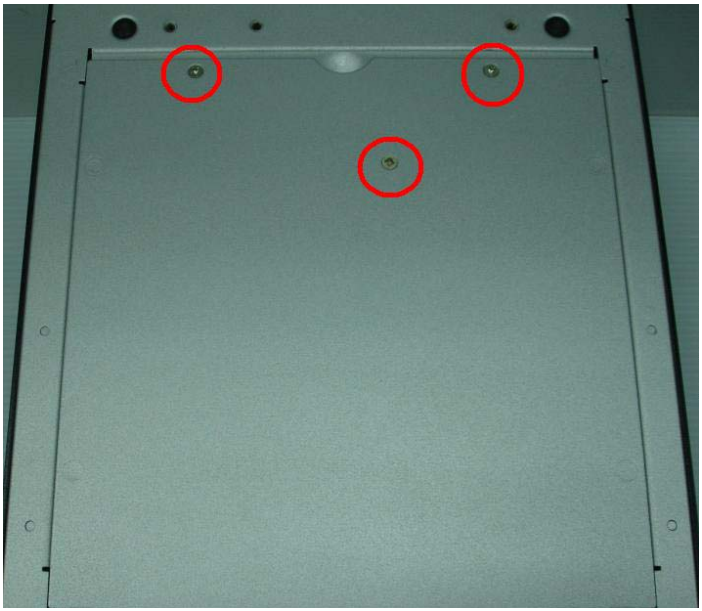


- Always disconnect the power cord from the chassis when working on the device, and do not reconnect while the power switch is on, since sudden power input can damage sensitive electronic components
- Only authorized and experienced electronics personnel should open the chassis
- Always ground yourself to remove any static electric charge before touching EOS, the device is very sensitive to static electric charges; use a grounding wrist strap at all times, and place all electronic components on a static-dissipative surface or in a static-shielded bag

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2.2 Installing Memory

1. Remove the three screws from the underside

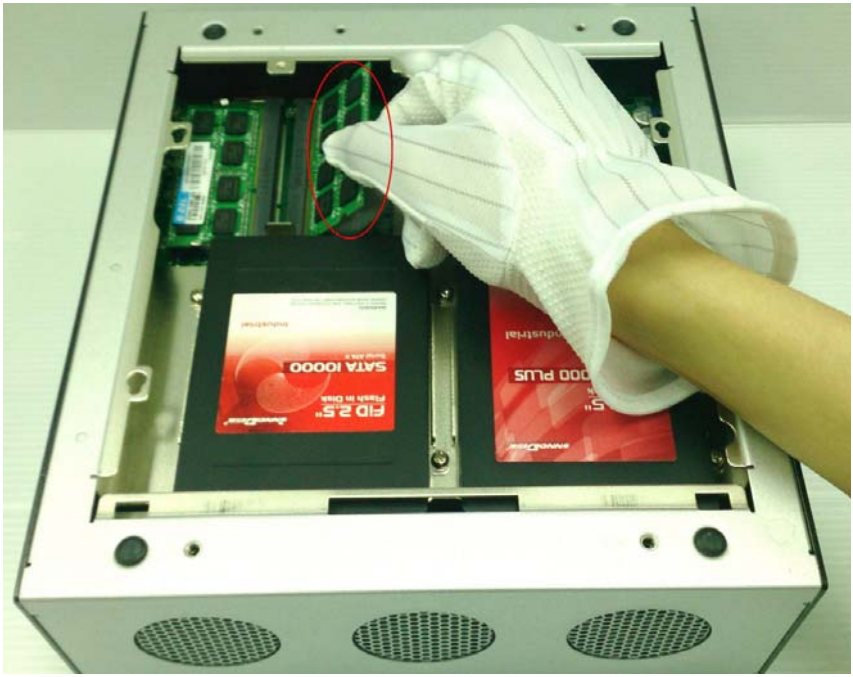


2. Remove the underside cover



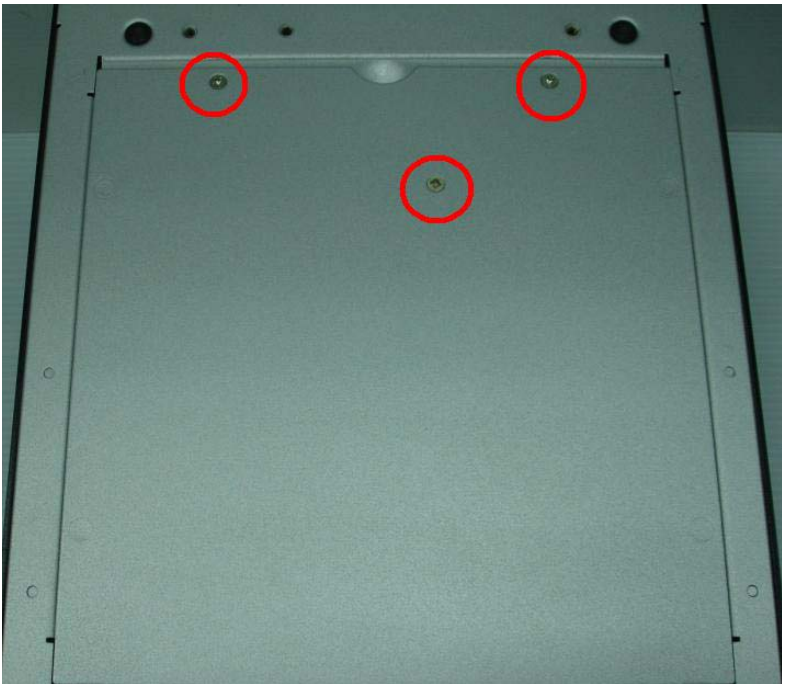
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3. Insert the memory module into the DDR3 SO-DIMM at a 45° angle and press down until the memory module snaps into place



2.3 Installing a Hard Disk Drive

1. Remove all three screws from the underside



2. Remove the underside cover



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3. Remove the two screws fixing the hard drive carriage



4. Slide the hard drive carriage out



5. Secure the new hard drive to the hard drive carriage



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6. Slide the hard drive carriage in, until connection is secured with the SATA power and data connectors



7. Secure the hard drive carriage



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8. Replace the bottom cover and secure the three screws



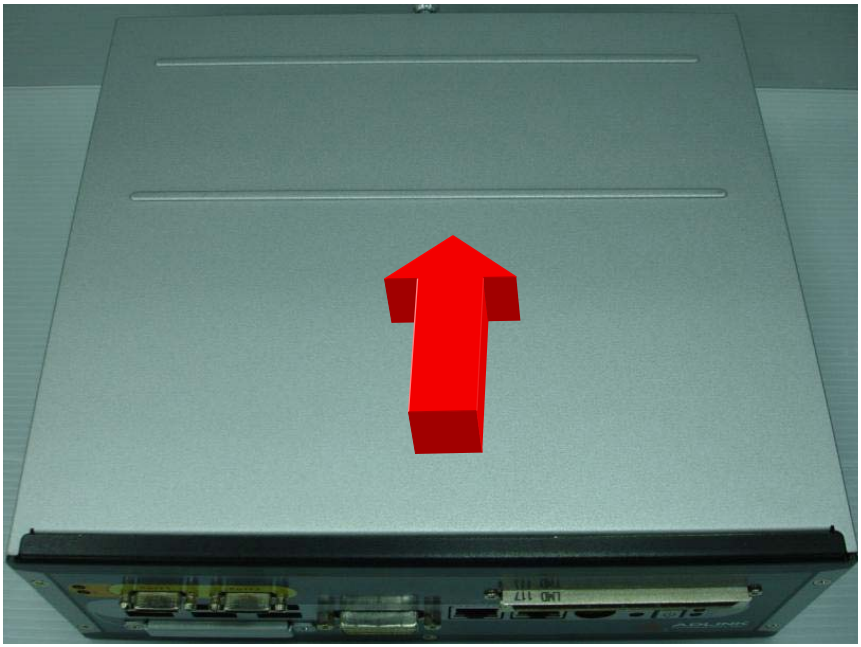
2.4 Installing the USB Dongle

1. Loosen the thumbscrew

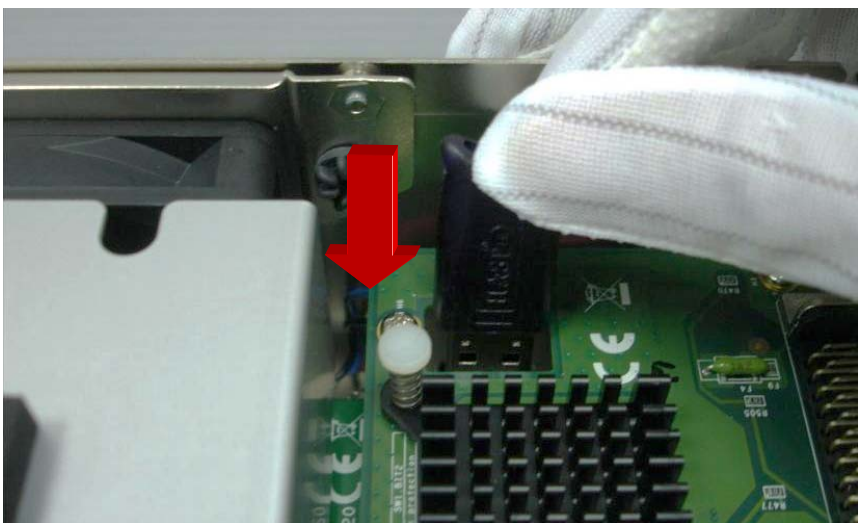


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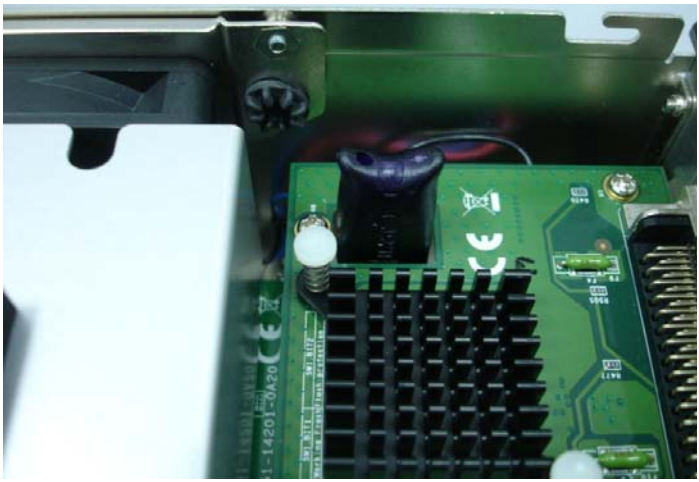
2. Remove the top cover



3. Plug the USB dongle into the USB port



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2.5 Installing Wallmount Brackets

Secure the walmount brackets in the four screwholes provided on the underside of the chassis



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2.6 Operating System Installation

The EOS-4000 is compatible with several operating systems for maximum flexibility. Installation instructions for each follow. For other OS support, please contact ADLINK for further information.

2.6.1 Windows 7

Installing AHCI on Windows 7

The AHCI driver must be enabled in the registry before SATA mode of the boot drive can be changed, as follows:

1. Exit all Windows-based programs
2. In the Start menu, enter **regedit** in the Start Search box, and select ENTER
3. If the User Account Control dialog box appears, select Continue
4. Locate and select the registry subkey **HKEY_LOCAL_MACHINESystemCurrentControlSetServicesMsahci**
5. In the Name column of the right pane, right-click Start, and select Modify
6. In the Value data box, enter 0 and select OK
7. In the File menu, select Exit to close the Registry Editor
8. Restart the computer, open the BIOS and enable AHCI. At the next Windows login, the drivers for AHCI show as intalled.
9. Restart a final time to complete the installation

Windows 7

Windows 7 supports EOS-4000 chipset drivers, allowing simple installation. ADLINK also provides pre-installation services for Windows 7 on the EOS-4000 (when the Windows XP license is pre-purchased from ADLINK). For more information, please visit the OS website

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Windows 7 Embedded Service Pack 1

Windows Embedded Standard 7 SP1 delivers the power, familiarity, and reliability of the Windows 7 operating system in a componentized form, allowing developers to create advanced commercial and consumer devices compatible with thousands of existing Windows applications and drivers.

You can download the evaluation version from: http://www.microsoft.com/download/en/details.aspx?id=11887

The download contains 3 DVD5 images (ISO's). Download the .exe and .rar files for each DVD image into its own folder and run the .exe file in that folder to reconstitute the .ISO file. Once the .ISO file is created you can then burn the ISO onto a blank DVD. The toolkit DVD is used to install the Image Configuration Editor (ICE) and associated distribution share(s) onto a PC. The 32-bit and 64-bit Standard 7 SP1 DVDs are bootable WinPE DVDs that contain the Image Builder Wizard (IBW) and the corresponding 32-bit or 64-bit distribution share. Typically these DVDs are used to boot into Windows PE on the target device and apply the runtime image created with ICE or to prototype image creation using the wizard and various templates available in IBW.

Please read the Windows Embedded Standard 7 SP1 documentation for more information on using ICE and IBW to create and deploy runtime images.

2.7 Driver Installation

After the OS is installed, all related drivers must be installed. This section describes drivers needed for Windows operating systems and installation procedures. For other OS support, please contact ADLINK directly.

Once Windows is properly installed, the following installations are required (most standard I/O device drivers have been included in the Windows install):

1. Install the chipset driver
2. Install the graphics driver
3. Install the Ethernet driver

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4. Install the USB3.0 driver
5. Install the ME (Management Engine Components) software
6. Install the Frame Grabber And Digital Input/Output Drivers

2.7.1 Chipset Driver Installation

The chipset driver directs the operating system to configure the Intel® QM67 chipset, to ensure that the following features function properly:

- ▷ Core PCI and ISAPNP services
- ▷ PCIe support
- ▷ SATA storage support
- ▷ USB support
- ▷ Identification of Intel® Chipset components in the Device Manager

To install the chipset driver:

1. Close any running applications
2. Execute Setup.exe and follow onscreen instructions
3. Reboot the system

2.7.2 Graphics Driver Installation

The EOS-4000 is equipped with the Intel® HD graphics family. To install the graphics driver:

1. Close any running applications
2. Execute Setup.exe in the Graphics folder and follow the onscreen instructions
3. Reboot the system

2.7.3 Ethernet Driver Installation

To install the driver for the Intel® 82574L/82579LM Gigabit network connection:

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1. Close any running applications
2. Execute Network.exe and follow onscreen instructions
3. Reboot the system

2.7.4 USB 3.0 Driver Installation

Please follow the following steps to install the Texas Instruments USB 3.0 driver:

1. Close any running applications
2. Execute Texas Instruments xHCI Driver v1.12.25 (WHQL - Multilanguage).exe in the USB3 folder and follow the onscreen instructions to complete the setup
3. Reboot the system

2.7.5 ME (Management Engine Components) Software Installation

The Intel® Management Engine software components requiring installation depend on the system's specific hardware and firmware features.

The installer detects system capabilities and installs the relevant drivers and applications.

To install the ME Software:

1. Close any running applications
2. Execute Setup.exe in the ME_SW folder and follow the onscreen instructions

2.7.6 Frame Grabber And Digital Input/Output Driver Installation

To install the drivers for ADLINK frame grabber and DI/O:

1. Close any running applications.

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2. Execute PCMe-4432A-xxx.exe and follow the onscreen instructions to complete the setup.

WARNING:

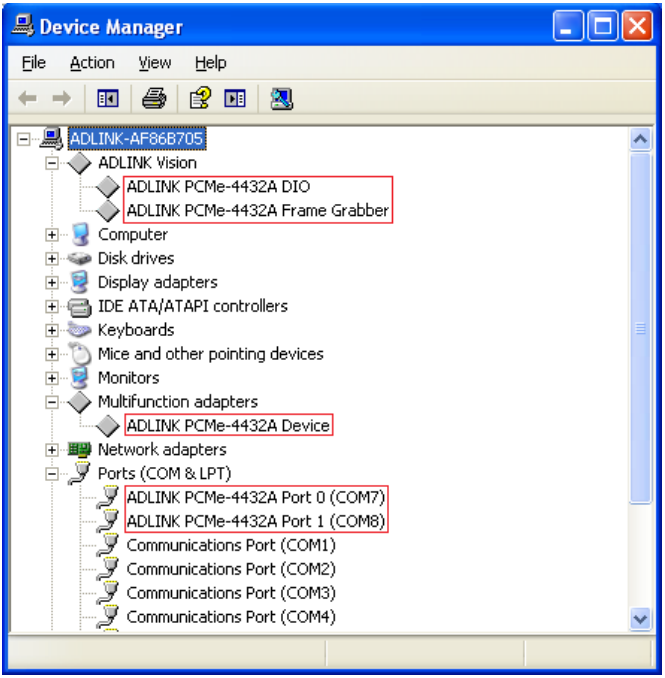
Microsoft .Net Framework 3.5 must be installed manually if the OS is Windows 8, to ensure complete installation and proper utility function.

NOTE:

The CamCreator utility automatically installs with the frame grabber and digital I/O driver. For more information, please see the CamCreator User's Manual.

Following successful installation, the devices should appear in the Device Manager, as shown

.



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Appendix A BIOS Setup

The Basic Input/Output System (BIOS) is a program that provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the EOS-4000. The BIOS setup program includes menus for configuring settings and enabling features of the EOS-4000. Most users do not need to use the BIOS setup program, as the EOS-4000 ships with default settings that work well for most configurations.

In this section, BIOS configuration is described.



Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot. See “Clear CMOS and ME RTC Register Jumpers” on page 21.

A.1 Main



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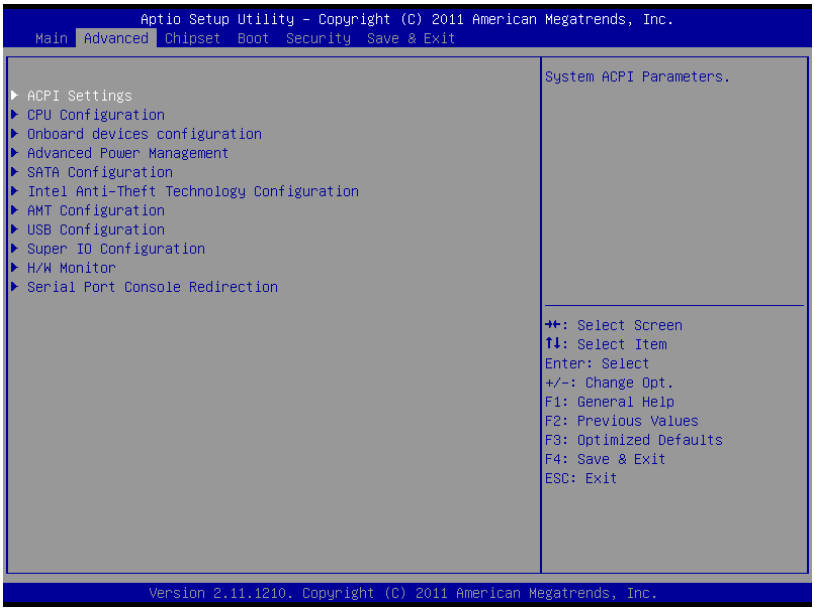
A.1.1 System Time/System Date

This option changes the system time and date. Highlight System Time or System Date using the up or down <Arrow> keys. Enter new values using the keyboard then press <Enter> key. Press the < Tab > key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

NOTE:

The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

A.2 Advanced

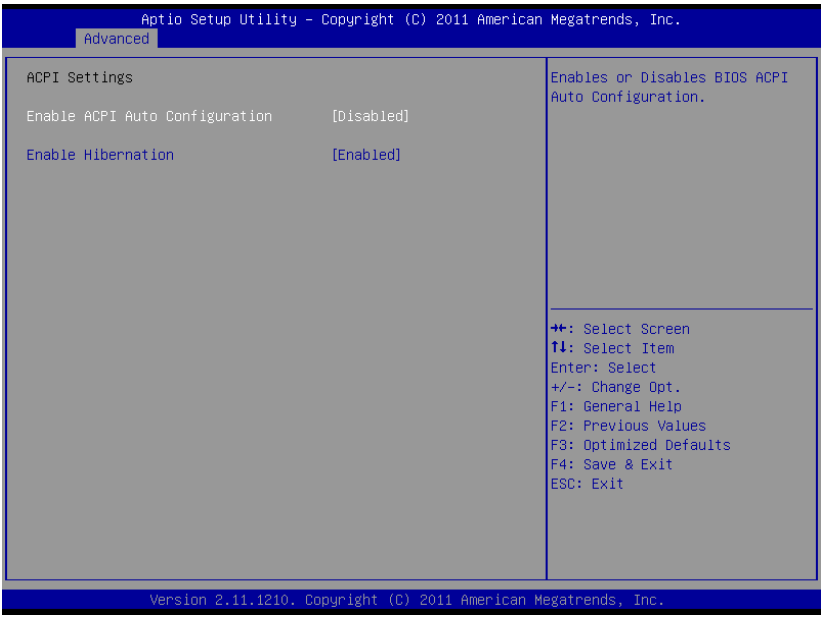


CAUTION:

Setting incorrect or conflicting values in Advanced BIOS Setup may cause system malfunction

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A.2.1 ACPI Settings



Enable ACPI Auto Configuration

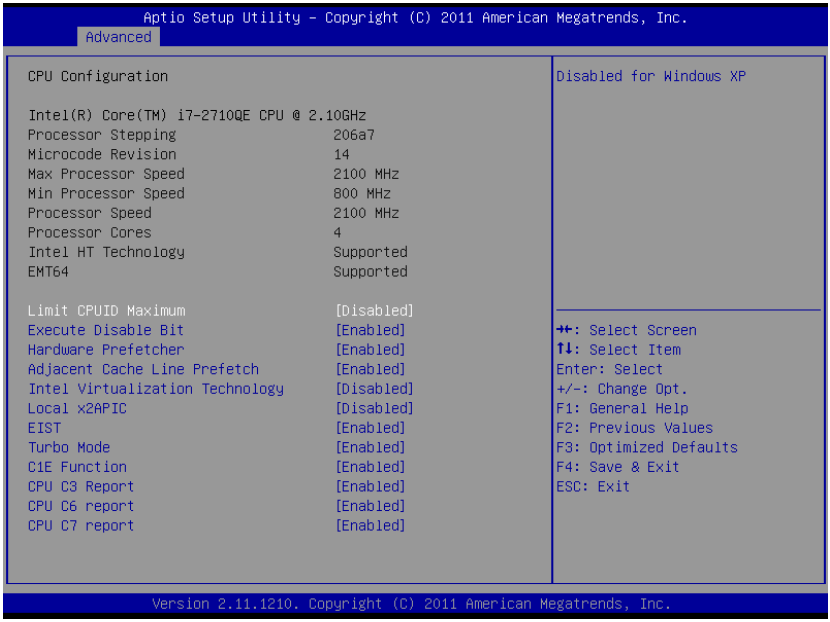
Enables or disables BIOS ACPI Auto Configuration.

Enable Hibernation

Enables or disables System ability to Hibernate. This option may be not effective with some OS.

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A.2.2 CPU Configuration



Limit CPUID Maximum

Disabled for Windows XP

Execute Disable Bit

Enables XD to prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS

Hardware Prefetcher

Enables or disables the Mid Level Cache(L2) streamer prefetcher.

Adjacent Cache Line Prefetch

Enables or disables prefetching of adjacent cache lines.

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Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

Local x2APIC

Enables Local x2APIC; some OS do not support this

EIST

Enables/Disables Intel SpeedStep Technology

Turbo Mode

Enables/Disables Intel TurboBoost Technology

C1E Function

When enabled, allows the CPU to enter enhanced C1 sleep state to save more power than C1

CPU C3 Support

Enables/Disables CPU C3(ACPI C2) report to OS

CPU C6 Support

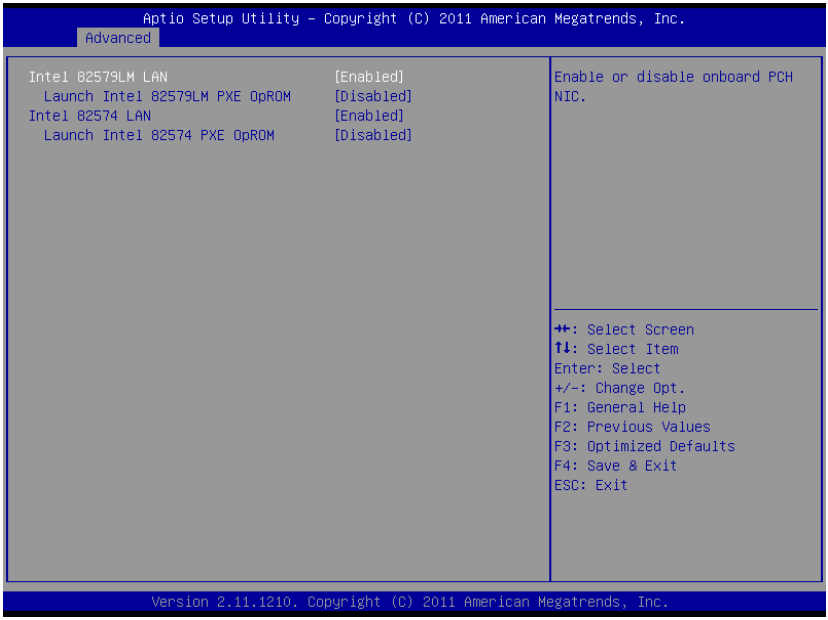
Enables/Disables CPU C6(ACPI C3) report to OS

CPU C7 Support

Enables/Disables CPU C7(ACPI C3) report to OS.

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A.2.3 Onboard Device Configuration



Intel 82579LM LAN

Enables/Disables onboard Intel 82579LM (built-in PCH) Lan controller

Launch Intel 82579LM LAN PXE OpROM

Enables/Disables execution of LAN boot-rom to add boot option for legacy network devices

Intel 82574 LAN

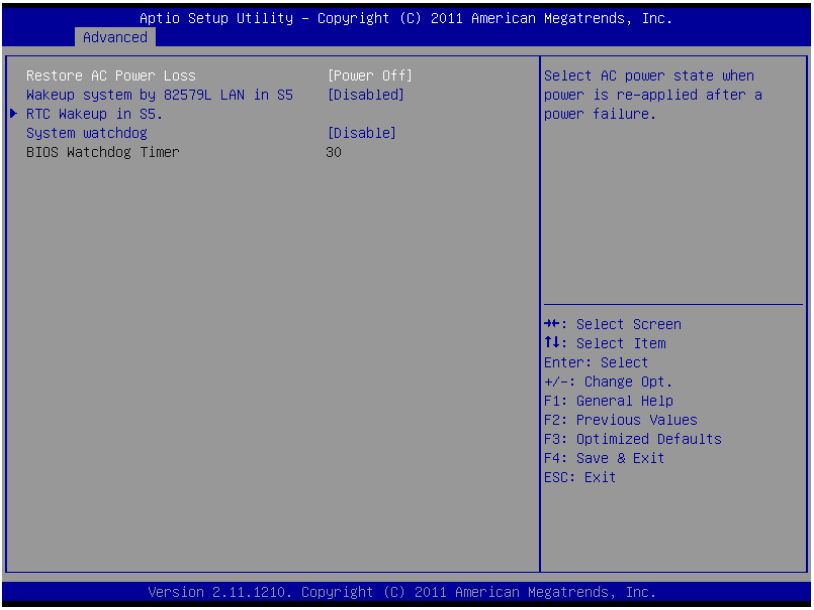
Enables/Disables onboard Intel 82574 Lan controller

Launch Intel 82574 LAN PXE OpROM

Enables/Disables execution of LAN boot-rom to add boot option for legacy network devices

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A.2.4 Advanced Power Management



Restore On AC Power Loss

Determines the state the computer enters when power is restored after a power loss. Options are Last State, Power On and Power Off.

Option	Description
Power Off	When set, powers the system down when power is restored.
Power On	When set, powers the system up when power is restored.
Last State	When set, powers the system up or down depending on the last state when power is restored.

Table A-1: Restore On Power Loss Options

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Wake up system by 82579L LAN in S5

Enables or disables integrated LAN to wake the system in S5 state.

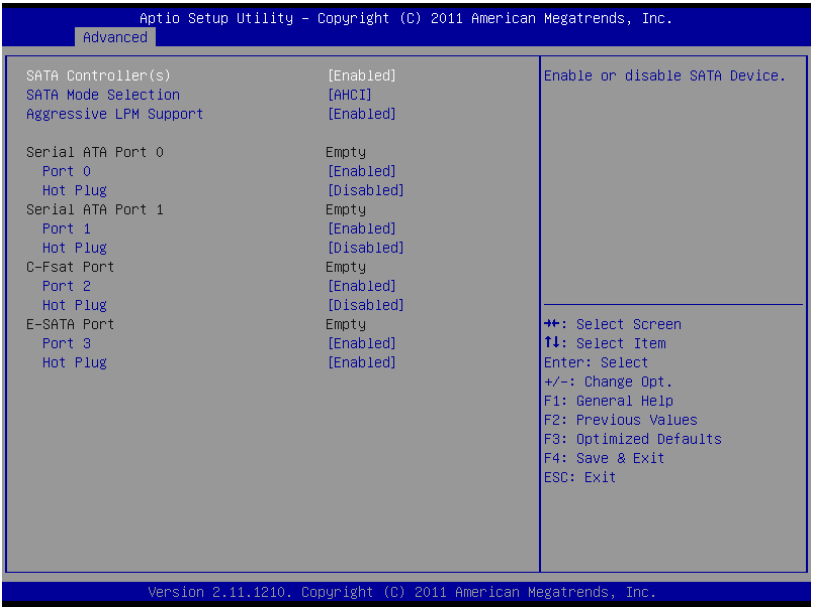
RTC Wakeup in S5

Enables or disables system wake on alarm event.

System watchdog

Enables or disables system internal watchdog to prevent boot failure at system POST stage.

A.2.5 SATA Configuration



S-ATA Controller

Enables/ Disables Internal Serial ATA Controller 0.

SATA Mode

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This option selects the SATA channel configuration from (1) IDE Mode (2) AHCI Mode or (3) RAID Mode.

Serial ATA Port 0~1, C-Fast Port, and E-SATA Port.

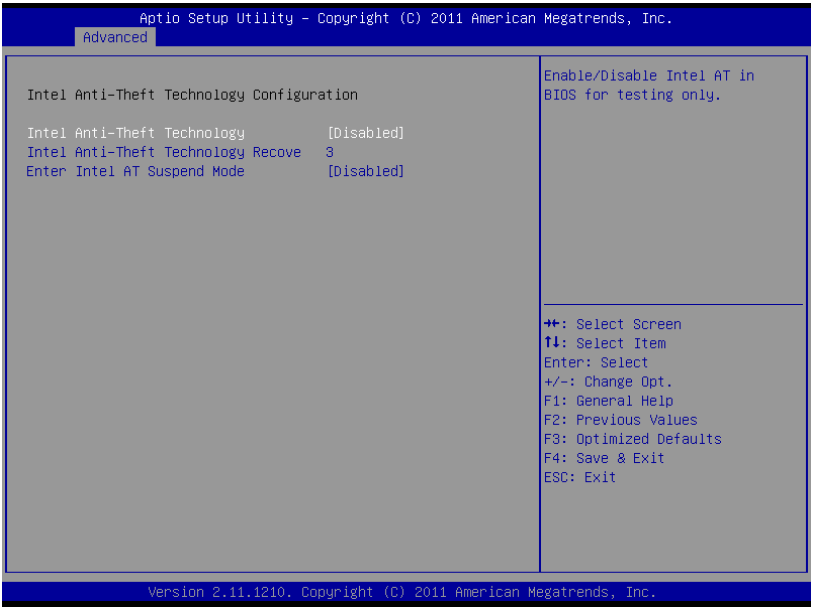
Port X

Enables or Disables SATA Port X

Hot Plug

Sets this port as hot pluggable.

A.2.6 Intel Anti-Theft Technology Configuration



Intel Anti-Theft Technology

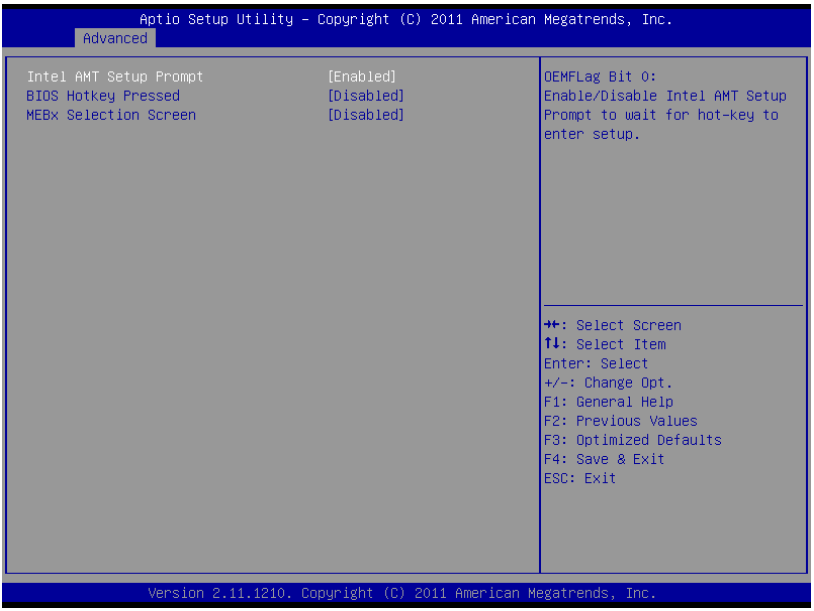
Enables or disables Intel AT function. Intel® Anti-Theft Technology helps stop theft by rendering computers useless with immediate shutdown

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Intel Anti-Theft Technology Recovery/Enter Intel AT Suspend Mode

Miscellaneous settings for Intel AT function

A.2.7 AMT Configuration



Intel AMT Setup Prompt

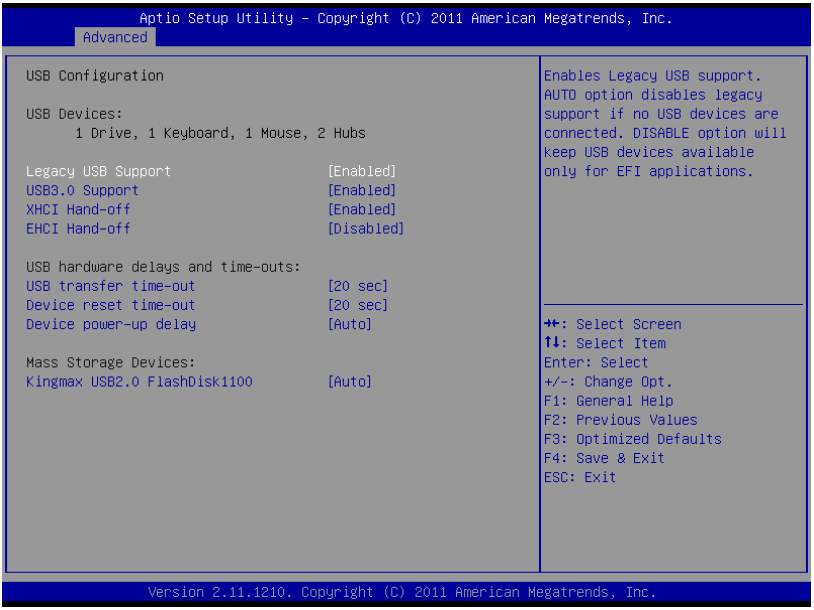
Enables or disables MEBx launch during system post for configuring AMT features

BIOS Hotkey Pressed/MEBx Selection Screen

Miscellaneous settings for iAMT function

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A.2.8 USB Configuration



Legacy USB Support

Enables Legacy USB Support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enables or disables USB3.0 (XHCI) controller support, allowing USB 3.0 devices to be used in DOS environment

XHCI Hand-Off

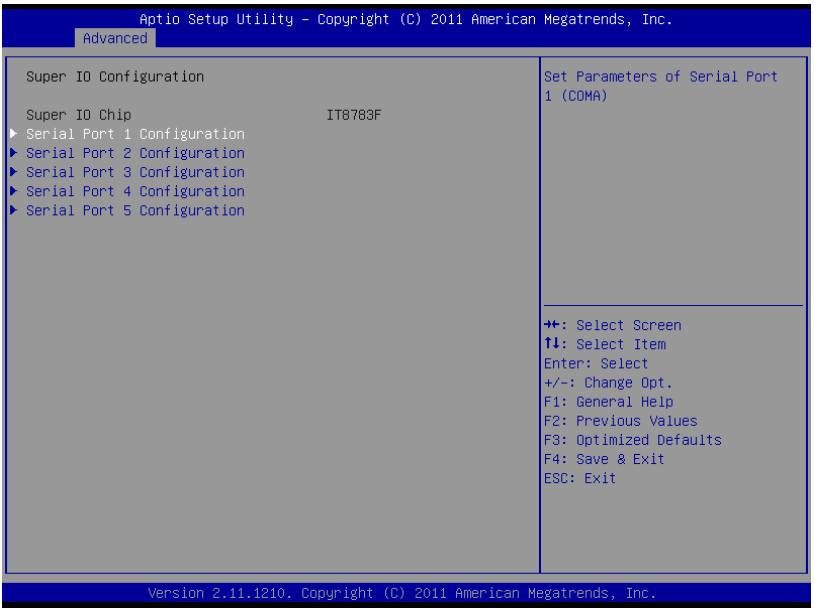
Enables BIOS support for XHCI Hands-Off feature. The default option is Enabled.

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EHCI Hand-Off

Enables BIOS support on EHCI Hands-Off feature. The default option is Enabled.

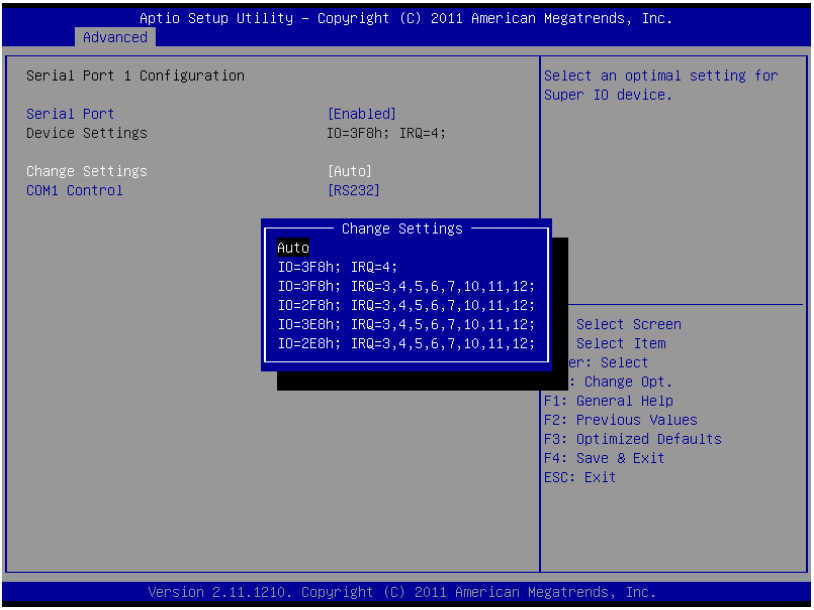
A.2.9 Super I/O Configuration



Serial Port 1 to 4 Configuration/Serial Port 5 Configuration (Valid when PCB is changed)

Options in this configuration can enable/disable the port, select a port type (RS-232/422/485) for Serial Port 1 and 2 only, or change the port settings (address)

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A.2.10 Hardware Monitor

PC Health Status

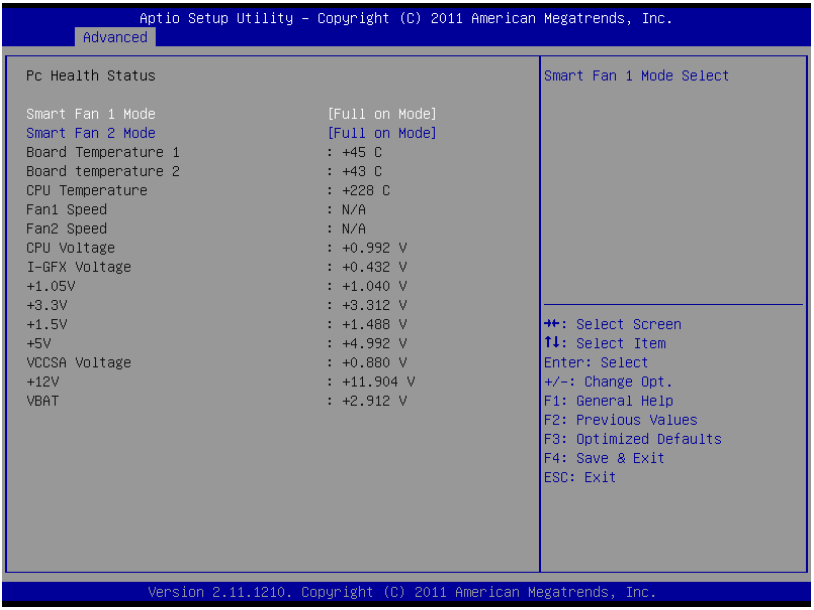
Hardware health on Super I/O monitors Board Temperature 1/2, CPU Temperature, CPU Voltage, I-GFX Voltage, VCCSA Voltage, +1.05V, +3.3V, +1.5V, +5V, +12.0V, VBAT, and Fan1/2 Speed.

Smart Fan 1/2 Mode

Sets the fan policy, supporting “Full on Mode”, in which the system fan (1/2) runs at full speed, “Manual Mode”, providing manual control of fan speed, and “Automatic Mode”, which controls the system fan (1/2) according to a given fan policy

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A.2.11 Serial Port Console Redirection



COM 1 to 4, SOL (Serial Over LAN) COM

Console Redirection

Enables Console Redirection function on COM 1 to 4, SOL COM

Console Redirection Settings

Sets miscellaneous parameters for COM Port 1 to 4, SOL COM

A.2.12 Serial Port for Out-of-Band Management/EMS

Console Redirection

Enables Console Redirection function for remote management of a Windows Server OS, via the port selected by Out-of-Band Mgmt Port

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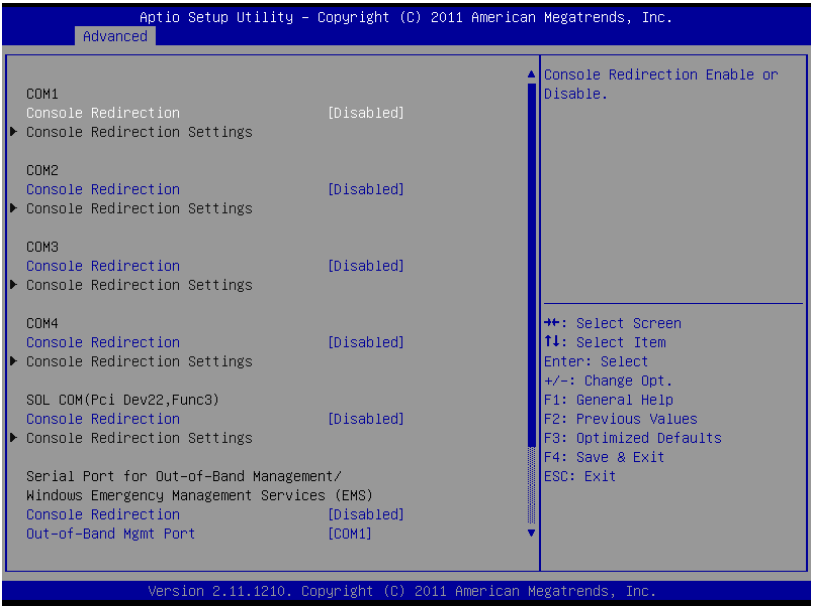
Out-of-Band Mgmt Port

Selects the COM Port for remote management of a Windows OS

Terminal Type

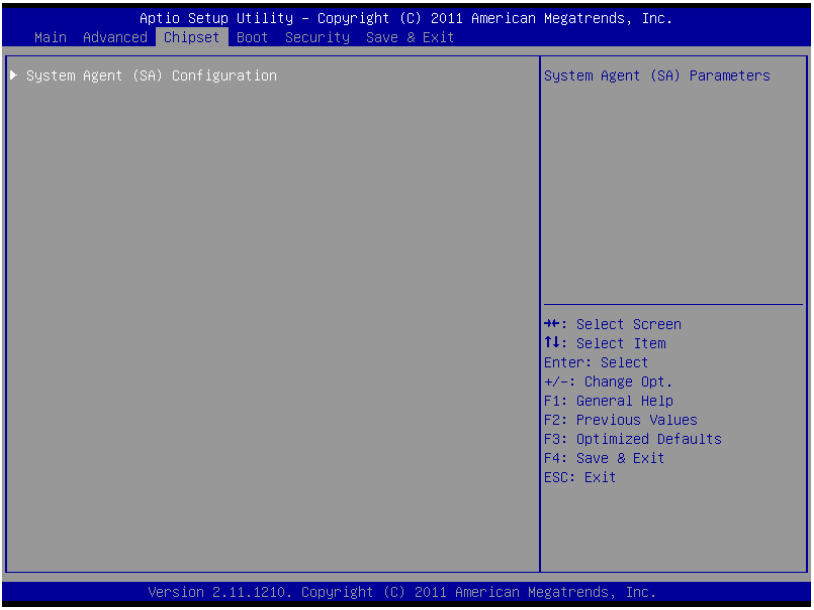
Selects the transmission protocol for remote terminal console

A.3 Chipset



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A.3.1 System Agent (SA) Configuration



VT-d

Enables VT-d function for efficient virtualization of I/O devices

Graphics Configuration

Selects the internal graphic device shared memory size and power policy

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Graphics Turbo IMON Current

Sets the maximum IMON current value for graphics turbo mode

GTT Size

Selects the GTT size for internal graphics

DVMT Pre-Allocated

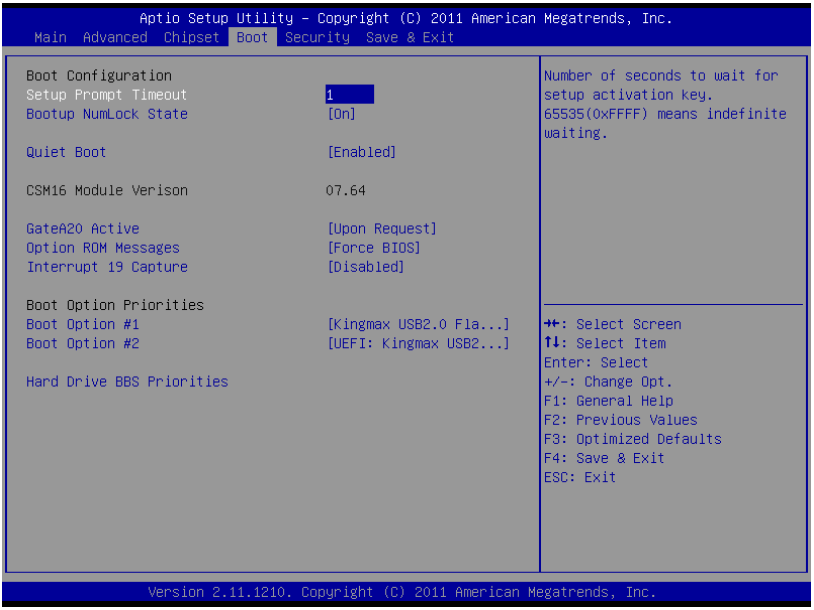
Selects DVMT 5.0 pre-allocated graphics memory size used by the internal graphics device

DVMT Total Gfx Memory

Selects DVMT 5.0 total graphics memory size used by the internal graphics device

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A.4 Boot



A.4.1 Boot Configuration

Setup Prompt Timeout

Number of seconds to wait for setup activation key (“DEL”)

Bootup NumLock State

Allows/disallows the NumLock setting to be modified during boot

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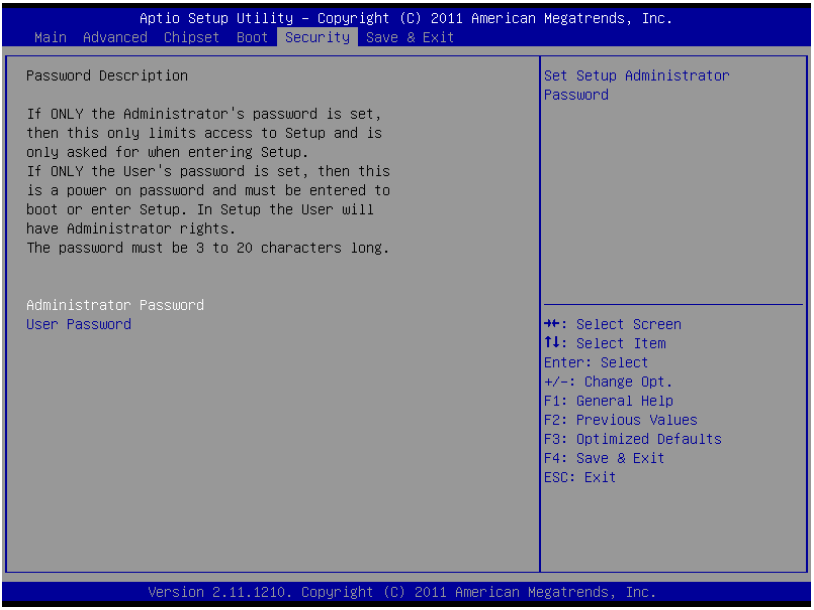
Quiet Boot

Option	Description
Disabled	Directs BIOS to display the POST messages
Enabled	Directs BIOS to display the OEM logo

A.4.2 Boot Option Priorities

Specifies the priority of boot devices. All installed boot devices are detected during POST and displayed

A.5 Security



If only the Administrator's password is set, then only access to Setup is limited and requested only when entering Setup. If only the user's password is set, then this is a power-on password and

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must be entered to boot or enter setup. In Setup the user will have Administrator rights.

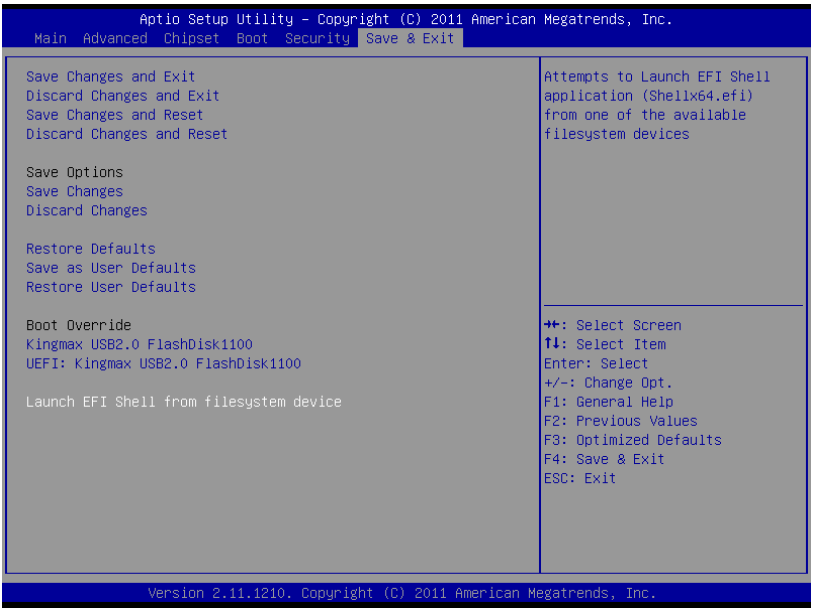
Administrator Password

Set Administrator password for setup

User Password

Set boot/setup User password

A.6 Exit



Save Changes and Exit

When BIOS settings are complete, select this option to save all changes and reboot the system for the new settings to take effect.

Discard Changes and Exit

Select this option to discard all changes and exit BIOS setup.

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Discard Changes and Reset

Resets system setup without saving any changes.

Restore Defaults

Select this option to set all BIOS options to default settings. The Default setting is designed for maximum system stability, but not maximum performance. Select the Restore Defaults Setup options if the computer encounters system configuration problems.

Launch EFI Shell from Filesystem Device

Attempts to launch EFI Shell application (Shellx64.efi) from one of the available file system devices.

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

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