EOS-1200

4-CH Gigabit PoE Embedded Vision System

User's Manual



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Recycled Paper

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Revision History

Revision	Release Date	Description of Change(s)
2.00	Dec. 28, 2011	Initial release
3.00	Mar. 27,2013	New device release Function Library errata rectified Organizational structure updated

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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

ADLINK's EOS-1200 is a rugged embedded vision system that features four independent Gigabit PoE (power over Ethernet) ports in a compact 220mm (W) x 80 mm (H) x 200 mm (D) small form factor chassis, with 2nd and 3rd Generation Intel® Core™ i5/i7 processors providing ample power to manage demanding multicamera high resolution machine vision applications, such as robot guidance and 3D machine vision.

The EOS-1200 supports rich I/O, including 4 RS-232/422/485, 4 USB 2.0, 2 USB 3.0, and 32 isolation digital I/O input, and dual storage support (two SATA and one CFAST slots). An internal USB port and 1 kbit Programmable EEPROM make the system friendly to integrate, deploy, and manage copy protection or software license authentication.

With long-life embedded components and incorporated system monitoring components to monitor CPU temperature, fan speed, and system responsiveness, the EOS-1200 provides a notably robust and reliable platform for mission critical applications.

1.2 Features

- 230W X 206D X 82H mm (9.06 X 8.11 X 3.23 in), compact and rugged system design
- 2nd and 3rd Generation Intel® Core™ i5/i7 processors
- Up to 4 gigabit PoE (power over Ethernet) multi-camera support
- Internal USB port and 1 Kbit Programmable EEPROM
- IEEE-1588 (Precise Time Protocol) compliant for multi-camera synchronization
- Supports two SATA ports and one CFast slot

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1.3 Specifications

General Specifications	
System Core	
Processor	Intel® Core ™ i5 2.5GHz, i7 2.1GHz, or i7 2.3GHz
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 8GB)
Camera Interface	
GigE Vision	4-CH Gigabit PoE (power over Ethernet) IEEE 802.3af compliant, total max. power output 32W
I/O Interface	
DI/O	16 DI/O in rear panel, DSUB37 female
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
Audio	1x Mic-in and 1x Speaker-out
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	

Table 1-1: EOS-1200 General Specifications

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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 XP/XP Embedded 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	

Table 1-1: EOS-1200 General Specifications

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- 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

1.4 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-1200 unit
- Wall mounting brackets (x2)
- Mounting M4, 8mm screws (x4)
- PS/2 Y cable
- Gigabit PoE covers (x4)
- USB dongle mounting bracket
- User's manual
- ADLINK All-in-One DVD


NOTE:

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

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1.5 Schematics

NOTE:

All units are in millimeters (mm)

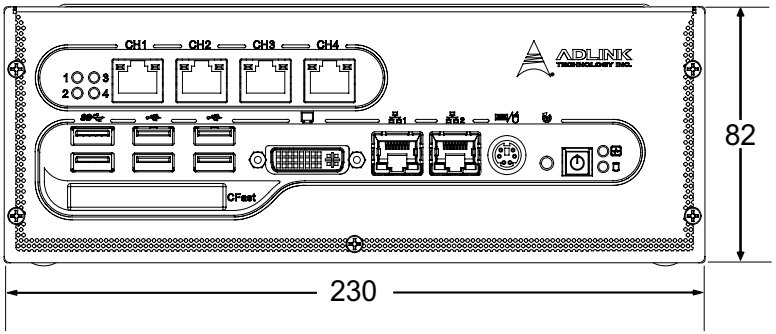


Figure 1-1: EOS-1200 Front View

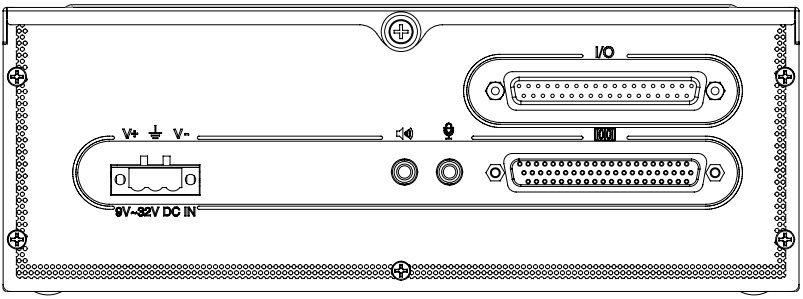


Figure 1-2: EOS-1200 Rear View

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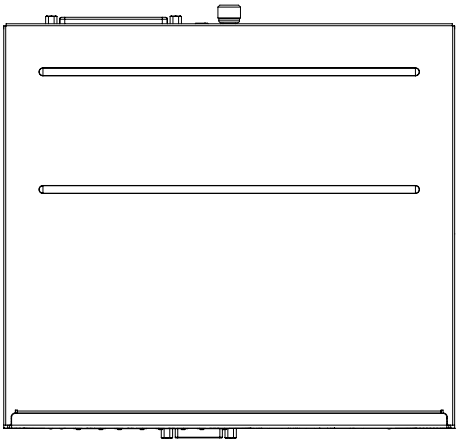


Figure 1-3: EOS-1200 Top View

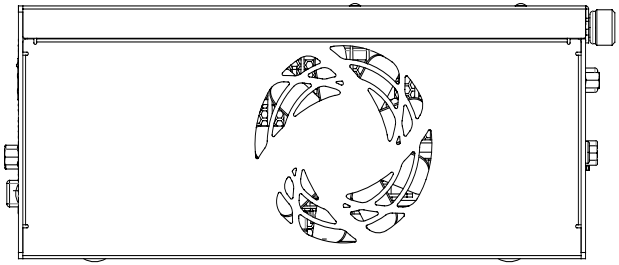
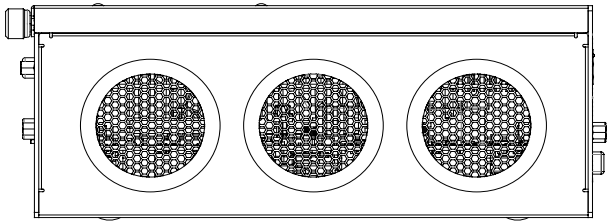


Figure 1-4: EOS-1200 Right Side View



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Figure 1-5: EOS-1200 Left Side View

1.6 Front Panel I/O Connectors

The EOS-1200 provides I/O connection on the front panel, as follows.

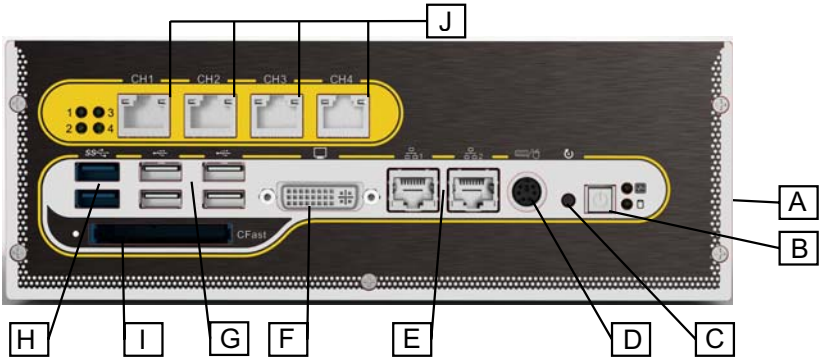


Figure 1-6: Front Panel I/O Connectors

A	LED indicators
B	Power switch
C	Reset switch
D	PS/2 keyboard & mouse
E	Dual Gigabit Ethernet ports
F	DVI-I connector
G	USB 2.0 connectors x4 (Type A)
H	USB3.0 connector (Type A) x2
I	CFast connector(Push-Push,Type II)
J	4-CH PoE Connectors

Table 1-2: Front Panel I/O Connector Legend

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1.6.1 LED Indicators

In addition to the LED of the power switch, two LEDs on the front panel indicate the following.

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 1-3: LED Indicators

1.6.2 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.

1.6.3 Reset Button

The reset button executes a hard reset.

1.6.4 PS/2 Connector

The EOS-1200 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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1.6.5 Dual Gigabit Ethernet Ports

The EOS-1200 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 1-4: 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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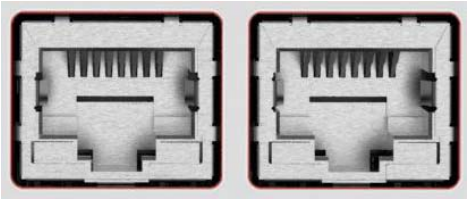


Figure 1-7: Gigabit Ethernet Ports

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 1-5: Active/Link LED

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

Table 1-6: Speed LED

1.6.6 DVI-I connector

The EOS-1200 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.

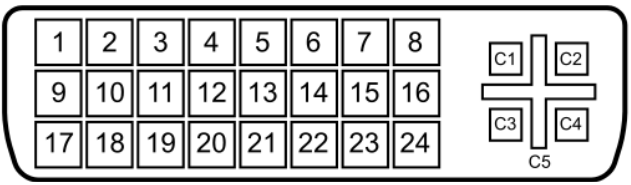


Figure 1-8: DVI-I connector

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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 1-7: DVI-I Connector Signals

1.6.7 USB 2.0 Connectors

The EOS-1200 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-1200 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 B.2.8 USB Configuration for details.

1.6.8 USB 3.0 Connectors

The EOS-1200 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-1200 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.

1.6.9 CFast Slot

The EOS-1200 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.

1.6.10 PoE (Power over Ethernet) Ports

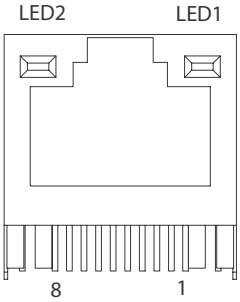


Figure 1-9: PoE Port Connections

Pin	Signal	Pin	Signal
1	MDI0+	5	MDI2-
2	MDI0-	6	MDI1-
3	MDI1+	7	MDI3+

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Pin	Signal	Pin	Signal
4	MDI2+	8	MDI3-

Table 1-8: PoE Port Connections Legend

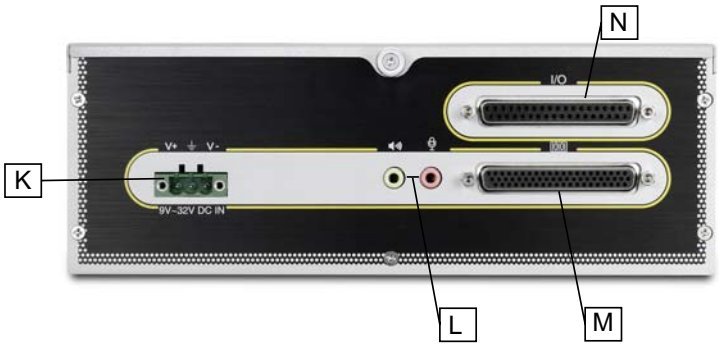
Power over Ethernet support includes:

- Four fully-integrated Gigabit Ethernet Media Access Control (MAC) and physical layer (PHY) ports
- Compliance with IEEE 802.3.af standard for a maximum of 8 W/channel with power up to 48 V over the existing CAT-5 W with power up to 48 V over the e n
- Standard IEEE 802.3 Ethernet interface for 1000BASE-T, 100BASE-TX, and 10BASE-T applications (802.3, 802.3u, and 802.3ab)
- Smart PoE function provides manual power down of PoE supply with software API
- 9 kB jumbo frame support

Four LEDs, numbered 0-4, are deployed on the front panel to indicate the status of each PoE port, lighting when the respective port is active.

1.7 Rear Panel I/O Connectors

The EOS-1200 further provides I/O connection on the rear panel, as follows.



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Figure 1-10: Rear Panel I/O Connectors

K	DC Power Supply Connector
L	Audio Jacks
M	DB-62P COM Port Connector
N	Digital I/O Connector

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

1.7.1 DC Power Supply Connector

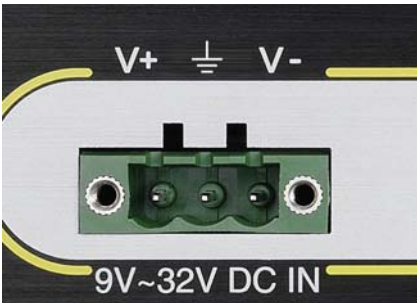


Figure 1-11: DC Power Connector

The DC power supply connector of the EOS-1200, 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-1200 allows a voltage input range from 9 VDC to 32 VDC.

1.7.2 Audio Jacks

The EOS-1200 implements Intel High Definition audio on a Realtek ALC269 chip. The HD audio supports up to 24-bit, 192 KHz sample rate high quality headphone/speaker output and microphone input, accessed on the back panel, pink for microphone input, and green for speaker output.

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1.7.3 DB-62P COM Port Connector

The EOS-1200 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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1.7.4 Rear Panel Digital I/O

The EOS-1200 features a 16-CH isolated digital I/O on its back panel, based on an onboard digital I/O card supporting features as follows.

16-CH Isolated DI	16-CH Isolated DO
Input Range : 0 – 24 V (please see Section Reducing DI channel Forward Current for High Voltage	Output type: Darlington transistors
Logic high: 5 – 24 V	Sink current: Max 500 mA for each 8 channel set (DO 0~7 and DO 8~15)
Logic low: 0 – 2 V	Isolated voltage: 2500 Vrms
Input resistance: 2.4 K Allowed input current : 50mA per channel (Max)	
Isolation voltage: 2500 Vrms	
Interrupt source: DI channel 0 to 15	

Pin	Definition	Pin	Definition
1	DI0	20	DI1
2	DI2	21	DI3
3	DI4	22	DI5
4	DI6	23	DI7
5	DI8	24	DI9
6	DI10	25	DI11
7	DI12	26	DI13
8	DI14	27	DI15
9	DI_COM1	28	DO_GND
10	DO_GND	29	DO_GND
11	DO0	30	DO1
12	DO2	31	DO3
13	DO4	32	DO5
14	DO6	33	DO7
15	DO8	34	DO9

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Pin	Definition	Pin	Definition
16	DO10	35	DO11
17	DO12	36	DO13
18	DO14	37	DO15
19	Clamp1		

Table 1-11: Rear Panel Digital I/O Pin Definitions

Din	Isolated digital input channel #n
Don	Isolated digital output channel #n
DI_COM1	Common Ground or Common power for front panel isolated input channels (DI0~DI15)
DO_GND	Ground return path for isolated output channels
Clamp1	Power input signal of clamp diode for front panel DO channels (DO0~DO15)

Table 1-12: Rear Panel Digital I/O Pin Legend

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1.8 Internal I/O connectors

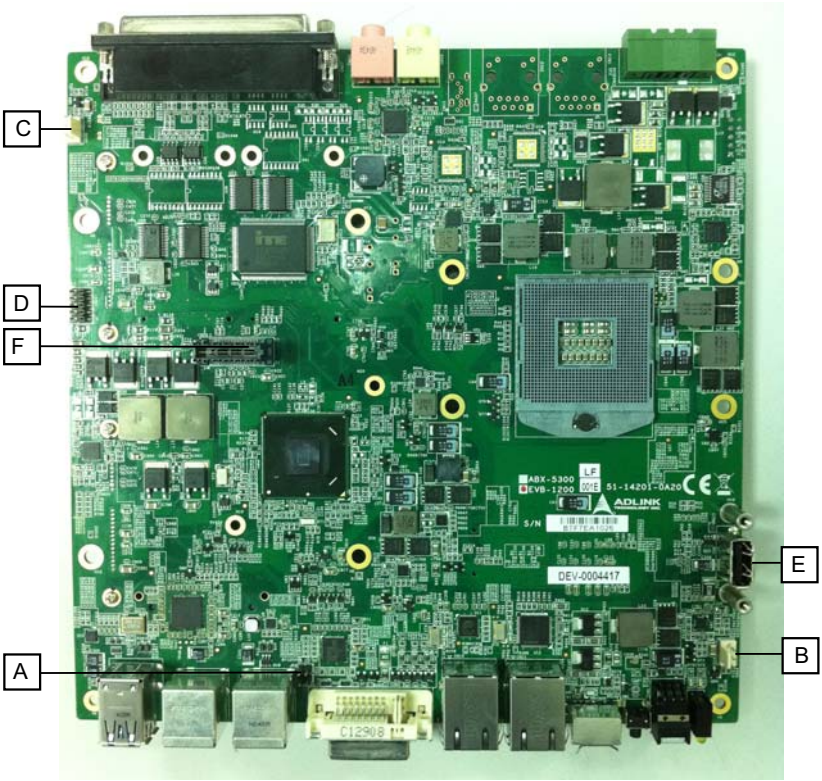


Figure 1-12: EOS-1200 Mainboard Top View

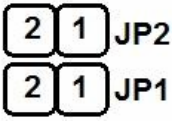
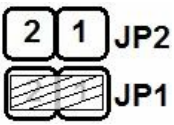
A	Clear CMOS and ME RTC register jumpers
B	DC 12 V fan connector
C	DC 12 V fan connector (reserved)
D	COM port connector (optional)
E	USB 2.0 Type A connector
F	SUMIT Connector

Table 1-13: Mainboard Connector Legend

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1.8.1 Clear CMOS and ME RTC Register Jumpers

When conditions occur under which the EOS-1200 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.

1.8.2 DC 12V Fan Connector

The EOS-1200 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.

1.8.3 DC 12V Fan Connector (reserved)

The EOS-1200 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.

1.8.4 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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1.8.5 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

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Pin	Description	Pin	Description
26	GND	52	+V5SB

Table 1-14: SUMIT Pin Definitions

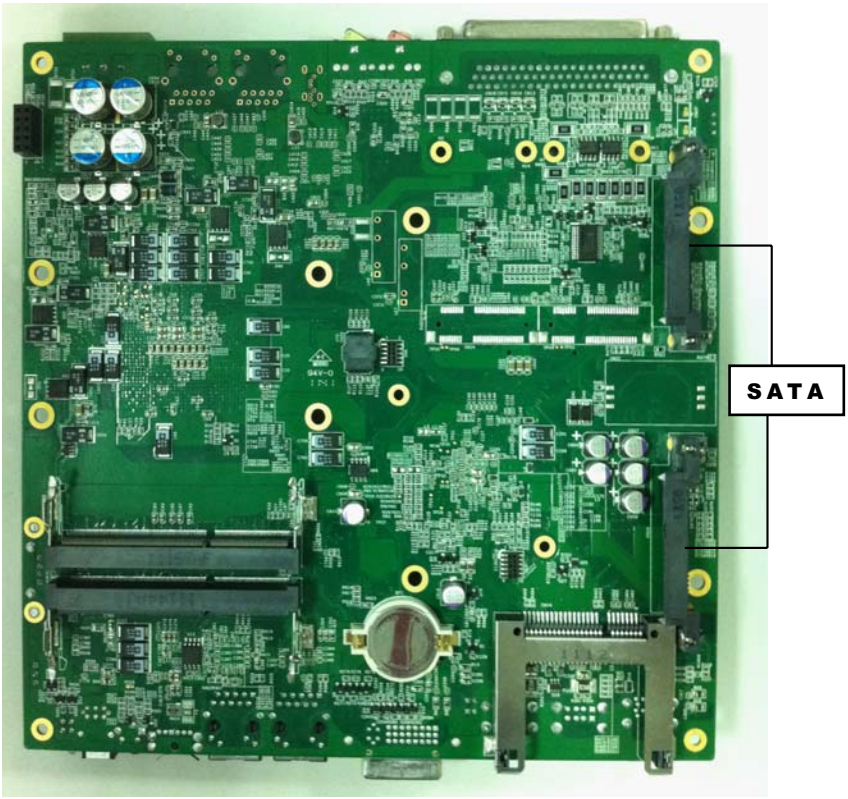


Figure 1-13: EOS-1200 Mainboard Underside View

1.8.6 SATA Connectors

The EOS-1200 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.

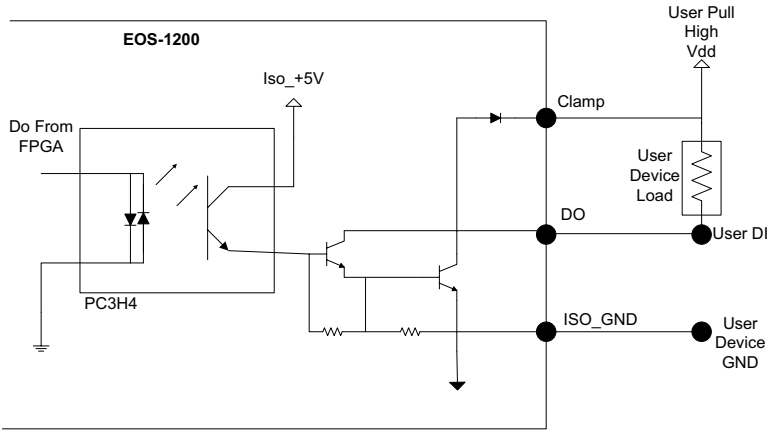
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The SATA connectors are compatible with 2.5 inch hard disk (HDD) or solid state disk (SSD) drives, which must be installed to the SATA connector with a HDD bracket.

1.9 General Purpose Digital Signals

1.9.1 General Purpose Digital Output (EDO)

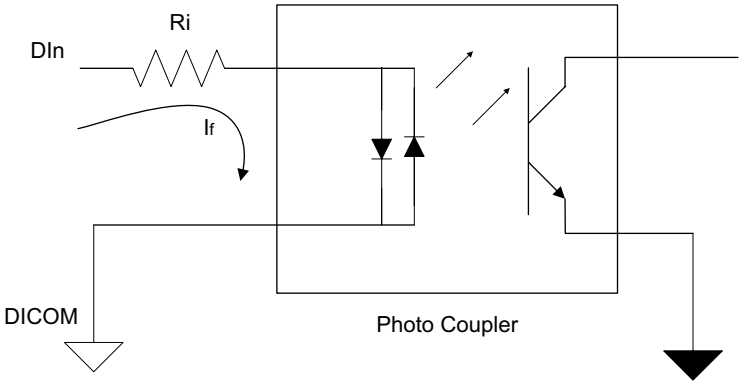
In the common ground connection of isolated digital output, as shown, when a “1” (logic high) is written by FPGA to a DO channel, the sink current passes through the transistors and the DO channel goes low. When a “0” (logic low) is written by FPGA to a DO channel, no current passes through the transistors and the DO channel goes high. When the load is of an “inductance nature” such as a relay, coil or motor, the VDD pin 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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1.9.2 General Purpose Digital Input (EDI)

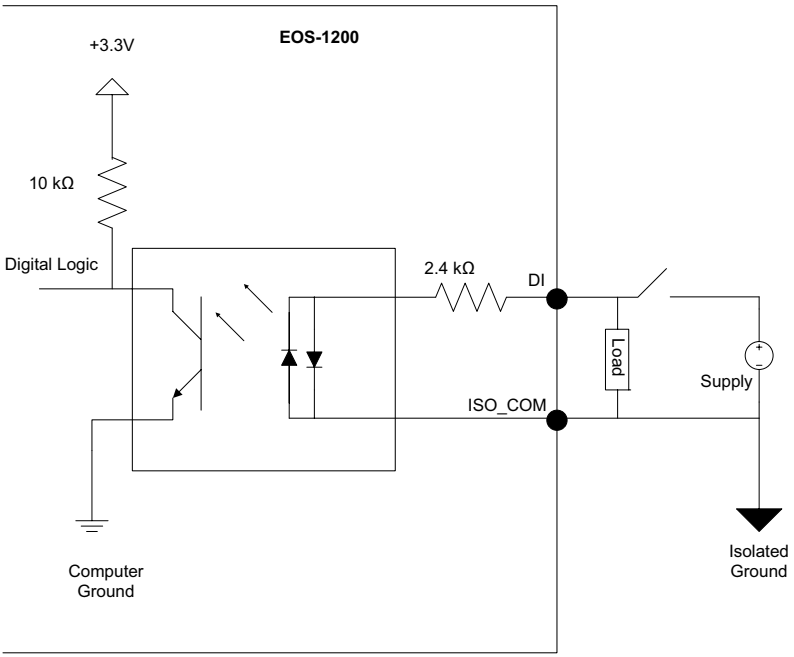
The EOS-1200 provides 16 opto-isolated digital input channels on the front panel. Circuitry of the isolated input channel is as follows.



As shown, signal connections for a supply and load connected to an isolated input, here in the EOS-1200, 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 0 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-1200 DI channels.

The digital logic of the EOS-1200 then registers a logic high for the channel. When the switch is closed, current flows through the diode and the EOS-1200 registers logic low for the channel.

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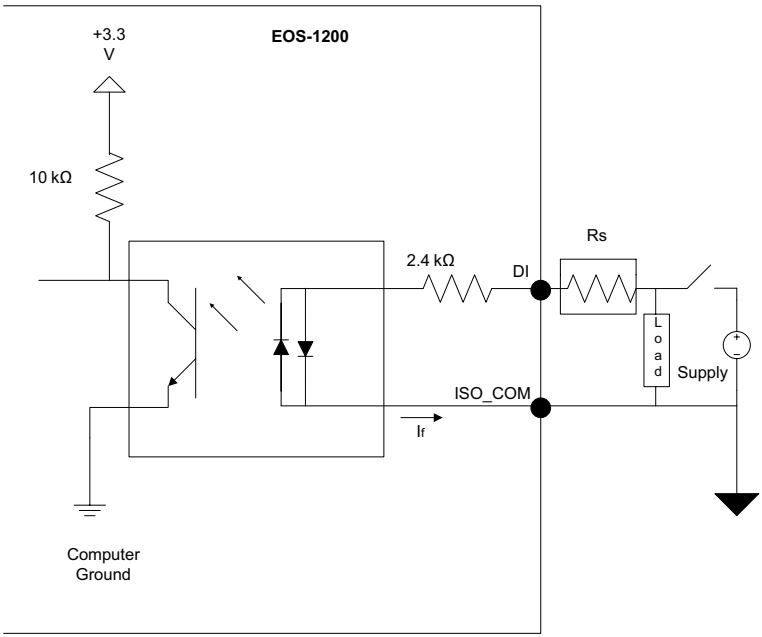
Reducing DI channel Forward Current for High Voltage

As input voltage increases above 5 V, the input current drawn by the EOS-1200 (forward current If) rises commensurately. At 24 V, for example, current per line is determined by the formula:

```
(24V- 0.5V)/2.4Kohm = 9.79 mA
```

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To reduce the current and the power drawn, on a monitored circuit, for example, another resistor can be added in series with the 2.4 kΩ current-limiting resistor, as shown.



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 - 2.4 kΩ = 2.3 kΩ
```

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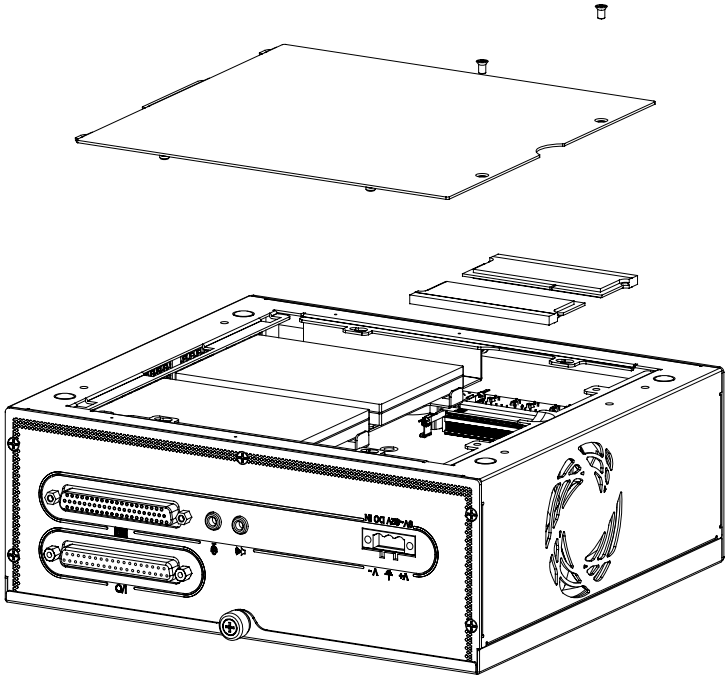
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2 Getting Started

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

2.1 Installing Memory

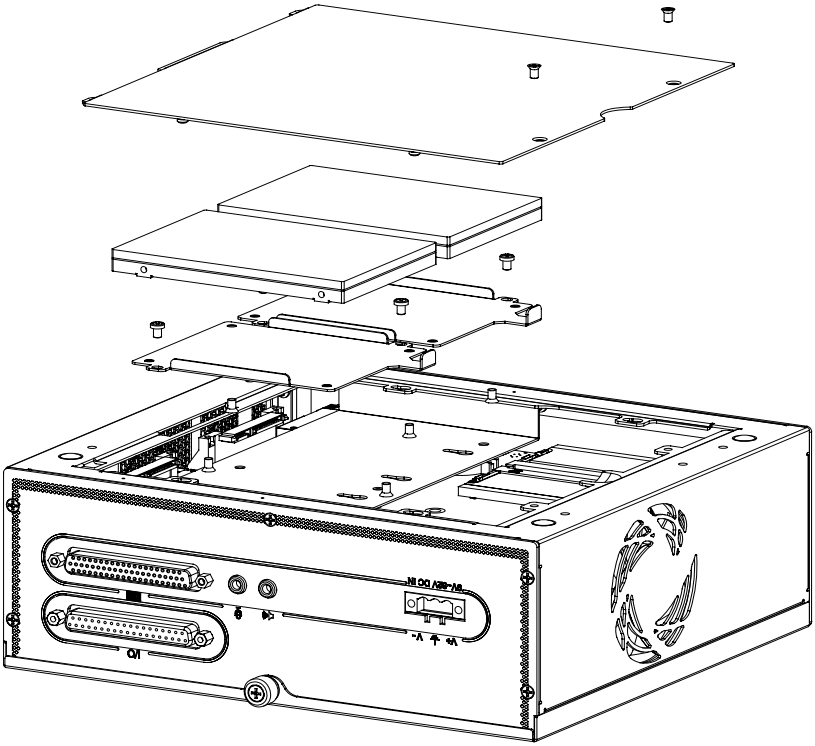
1. Remove the two screws securing the bottom cover and remove, as shown.



2. Insert the memory module into the DDR3 SO-DIMM socket at a 45° angle and press down until the module is properly seated.

2.2 Installing a Hard Disk Drive (HDD)

1. Remove the two screws securing the bottom cover and remove, as shown.

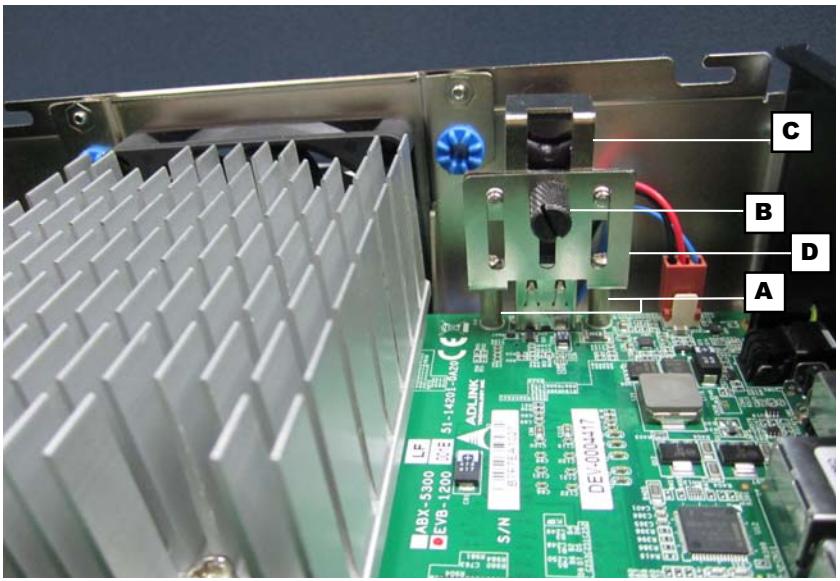


2. Remove the two screws fixing the hard drive carriage.
3. Slide the hard drive carriage out.
4. Remove the four screws from the hard drive to be removed.
5. Secure the new hard drive to the hard drive carriage.
6. Slide the hard drive carriage in, until received securely in the SATA power and data connectors.
7. Secure the hard drive carriage.
8. Replace the bottom cover.

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2.3 Installing the USB Dongle

1. Remove the top cover by loosening the thumbscrew by hand or a screwdriver.

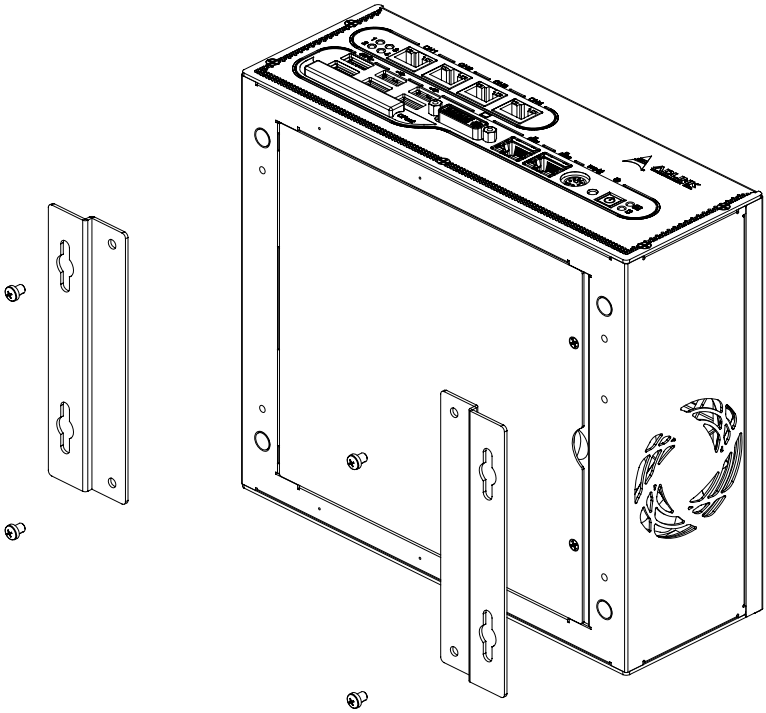


2. Once the USB dongle mounting bracket base D is fixed to the board surface via standoffs A, unscrew the thumbscrew B and loosen the USB dongle retainer C.
3. Slide the USB dongle retainer C upward to accommodate the USB dongle.
4. Plug the USB dongle into the USB port.
5. Slide the USB dongle retainer C down to secure USB dongle D to USB dongle mounting bracket base A and fasten thumbscrew B.

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2.4 Installing Wall-Mount Brackets

1. Secure the wall-mount brackets in the four screwholes provided on the underside of the chassis, as shown



2.5 Operating System Installation

The EOS-1200 is compatible with several operating systems for maximum flexibility. Installation instructions for each follow. For other OS support, please contact ADLINK for further information.

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2.5.1 Windows XP

Installing AHCI on Windows XP

Windows XP can be installed on an AHCI-enabled system by BIOS settings.

Press “Delete” to enter the BIOS, and go to “SATA Configuration→SATA mode” to select AHCI.

Install the Intel(R) Mobile Express Chipset SATA AHCI Controller driver over USB after pressing F6. If the driver is already running in IDE (ATA) emulation mode, no installation is required.

Windows XP

Windows XP supports EOS-1200 chipset drivers, allowing simple installation. ADLINK also provides pre-installation services for Windows XP on the EOS-1200 (when the Windows XP license is pre-purchased from ADLINK).

Windows XP Embedded

As a result of its overwhelming popularity, human-machine interface, and plentiful development tools, Windows XP is well suited to comparatively simple application development. Embedded XP is simply a modularized Windows XP. System developers select only the needed Windows XP components and functions and then organize them to construct an XP Embedded OS.

With this architectural modularization, system integrators can readily reduce storage space requirements of XP Embedded. The only factor determining storage space requirements is the number of function modules needed.

Because XP Embedded is wholly compatible with Windows XP, developers can compile controller software in the Windows XP environment and transfer the code to Embedded XP for immediate use. No new tools are required to use XP Embedded, lowering software development costs. Another advantage is the cost of licensing Embedded XP being much less than that of Windows XP.

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ADLINK currently provides standard XP Embedded OS images for the EOS-1200 (XP Embedded license pre-purchase from ADLINK is required). The standard XP Embedded OS image provided by ADLINK is about 1.4 GB, and key features include:

- ▷XP Embedded OS Kernel
- ▷Drivers for EOS H/W and peripheral cards
- ▷TCP/IP Networking
- ▷TCP/IP with file sharing and client for Microsoft network
- ▷Internet Explorer
- ▷File Manager
- ▷Language Support

The standard XP Embedded OS image meets most application needs. If you have any special functional requirements for XP Embedded, please contact ADLINK for more details.

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2.5.2 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-1200 chipset drivers, allowing simple installation. ADLINK also provides pre-installation services for Windows 7 on the EOS-1200 (when the Windows XP license is pre-purchased from ADLINK). For more information, please visit the OS website

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

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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.

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2.6 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
4. Install the audio driver
5. Install the USB3.0 driver
6. Install the ME (Management Engine Components) software
7. Install the Digital Input/ Output Driver

2.6.1 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 Chipset.exe and follow onscreen instructions
3. Reboot the system

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2.6.2 Graphics Driver Installation

The EOS-1200 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

2.6.3 Ethernet Driver Installation

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

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

2.6.4 Audio Driver Installation

Please follow the following steps to install the Realtek audio driver:

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

2.6.5 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 v1.12.7 (WHQL - Multilanguage).exe in the USB3 folder and follow the onscreen instructions to complete the setup
3. Reboot the system

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2.6.6 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

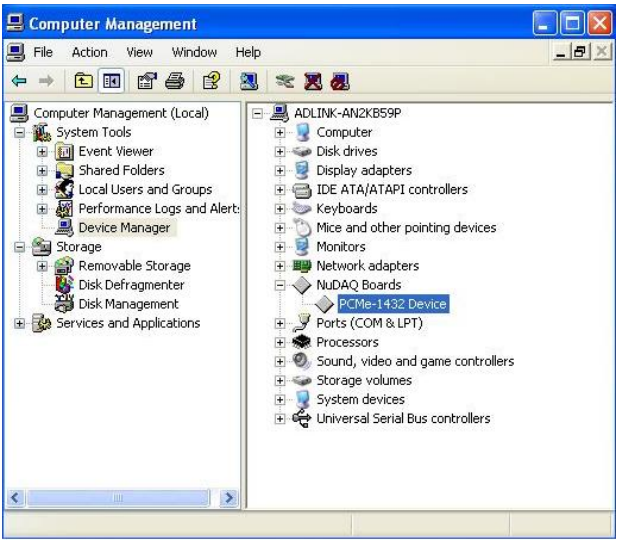
2.6.7 Digital Input/ Output Driver Installation

To install the driver for ADLINK DIO:

1. Close any running applications.
2. Execute PCMe-1432_x86/64_v0.0.0.7.exe and follow the onscreen instructions to complete the setup.
3. Reboot the system.

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Following successful installation, the PCMe-1432 should appear in the directory, as shown.



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Appendix A Function Library

This chapter provides a detailed description of the EOS-1200 function library. These functions, excluding SmartPoE and EEPROM, are compatible with the PCIS-DASK library, and can be used to develop applications under C++, C#, VB.Net, and Delphi.

A.1 List of Functions

Category	Function
System & Initialization	Register_Card
	Release_Card
	GetBaseAddr
	GetCardIndexFromID
	GetCardType
	GetLCRAddr
DI/O	DI_ReadLine
	DI_ReadPort
	DO_ReadLine
	DO_WriteLine
	DO_ReadPort
	DO_WritePort
COS Interrupt	DIO_INT_Event_Message
	DIO_INT1_EventMessage
	DIO_INT2_EventMessage
	DIO_SetDualInterrupt
	DIO_SetCOSInterrupt32
	DIO_GetCOSLatchData32
Smart PoE	SmartPoE_SetPower
EEPROM	EEPROM_ReadByte
	EEPROM_WriteByte
	EEPROM_WriteBytes

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A.2 Data Types.

Type	Description	Range
U8	8-bit ASCII character	0 to 255
I16	16-bit signed integer	-32768 to 32767
U16	16-bit unsigned integer	0 to 65535
I32	32-bit signed integer	-2147483648 to 2147483647
U32	32-bit unsigned integer	0 to 4294967295
F32	32-bit single-precision floating-point	-3.402823E38 to 3.402823E38
F64	64-bit double-precision floating-point	-1.797683134862315E308 to 1.797683134862315E308

A.3 Setting Up the Build Environment

A.1.1 Include Files

All applications using API are required to include the following files.

Include File	Description
Dask.h	Header file required for all C/C++ applications.
Dask.vb	Function definitions required for all VB.Net applications.
Dask.cs	Function definitions required for all C# applications.
PCMe1432.h	Header file required for all C/C++ applications.
PCMe1432.vb	Function definitions required for all VB.Net applications.
PCMe1432.cs	Function definitions required for all C# applications.

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A.1.2 Library Files

All C/C++ applications using API require the following library files.

Library File	Description
PCI-Dask.lib	Exports API function definitions; required for all Visual C/C++ 32 bit applications.
PCI-DASK_bcb.lib	Exports API function definitions; required for all 32 bit Borland C++ Builder applications.
PCMe1432.lib	Exports API function definitions; required for all Visual C/C++ 32 bit applications.
PCI-Dask64.lib	Exports API function definitions; required for all Visual C/C++ 64 bit applications.
PCMe1432x64.lib	Exports API function definitions; required for all Visual C/C++ 64 bit applications.

A.1.3 DLL Files

All applications using API require the following DLL files.

All files are located in [Installed directory]\ADLINK\PCMe-1432\Include, where 'Installed directory' is the destination directory specified in the setup program.

DLL File	Description
PCI-Dask.dll	Dynamic link library. Required for all applications.
PCMe1432.dll	Dynamic link library. Required for all applications.

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A.2 System & Initialization Functions

A.1.1 Register_Card

Description

Initializes the hardware and software states of a NuDAQ PCI-bus data acquisition card, and returns a numeric card ID corresponding to the initialized card. Register_Card must be called before any other PCIS-DASK library functions can be called for a particular card. The function initializes the card and variables internal to the PCIS-DASK library. Because NuDAQ PCI-bus data acquisition cards meet plug-and-play specifications, the base address (pass-through address) and IRQ level are assigned directly by the system BIOS.

Syntax

C/C++

```
I16 Register_Card (U16 CardType, U16 card_num)
```

Visual Basic

```
Register_Card (ByVal CardType As Integer,
ByVal card_num As Integer) As Integer
```

VB.Net

```
Register_Card (ByVal CardType As Short, ByVal
card_num As Short) As Short
```

C#

```
short Register_Card (ushort CardType, ushort
card_num)
```

Parameter(s)

CardType

Type of card to be initialized. ADLINK periodically upgrades PCIS-DASK to add support for new NuDAQ PCI-bus data acquisition cards and NuIPC CompactPCI cards. Refer to release notes of the card to dtermine whether PCIS-DASK

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supports that card. These are the constants defined in DASK.H that represent the NuDAQ PCI-bus data acquisition cards supported by PCIS-DASK:

PCMe_1432

card_num

Sequence number of the card with the same card type (as defined in argument CardType) or that belongs to the same card type series (except PCI- 7300A_Rev. A and PCI-7300A Rev. B) in the PCI slot. card_num is always equal to 0 for PCMe-1432.

Return Code

Returns a numeric card ID for the initialized card. The card ID range is between 0 and 31. If any error occurs, a negative error code is returned, with possible error codes as follows:

```
ErrorTooManyCardRegistered
ErrorUnknownCardType
ErrorOpenDriverFailed
ErrorOpenEventFailed
```

A.1.2 Release_Card

Description

A maximum of 32 cards can be registered simultaneously. This function informs the PCIS-DASK library that the registered card is not currently in use and can be released. Releasing a card clears space for a new card to register. This function is also applied at the end of a program to release all registered cards.

Syntax

C/C++

```
I16 Release_Card (U16 CardNumber)
```

Visual Basic

```
Release_Card (ByVal CardNumber As Integer) As
Integer
```

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VB.Net

```
Release_Card (ByVal CardNumber As Short) As Short
```

C#

```
short Release_Card (ushort CardNumber)
```

Parameter(s)

CardNumber

ID of the card for release.

Return Code(s)

```
NoError
```

A.1.3 GetBaseAddr

Description

Acquires I/O base addresses of the device with a specified card index

Syntax

C/C++

```
I16 GetBaseAddr (U16 CardNumber, U32 *BaseAddr, U32 *BaseAddr2)
```

Visual Basic

```
GetBaseAddr (ByVal CardNumber As Integer, BaseAddr As Long, BaseAddr2 As Long) As Integer
```

VB.Net

```
Release_Card (ByVal CardNumber As Short) As Short
```

C#

```
short GetBaseAddr (ushort CardNumber, uint [] BaseAddr, uint [] BaseAddr2)
```

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Parameter(s)

CardNumber

ID of the card for release.

BaseAddr

Returns the I/O base address.

BaseAddr2

Returns the second base address #2. This is only available in cards that support two I/O base addresses, such as PCI-9113 and PCI-9114. For PCI-6202, PCI-9221, PCI-9222, and PCI-9223, this parameter returns the memory address of the specified card.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.4 GetCardIndexFromID

Description

Obtains the card type and the sequence number of the device with a specified card ID. This is the reverse function of Release_Card.

Syntax

C/C++

```
I16 GetCardIndexFromID (U16 CardNumber, U16
*cardType, U16 *cardIndex)
```

Visual Basic

```
GetCardIndexFromID (ByVal CardNumber As Inte-
ger, cardType As Integer, cardIndex As Inte-
ger) As Integer
```

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VB.Net

```
GetCardIndexFromID (ByVal CardNumber As Short,
ByRef cardType As Short, ByRef cardIndex As
Short) As Short
```

C#

```
short GetCardIndexFromID (ushort CardNumber,
out ushort cardType, out ushort cardIndex)
```

Parameter(s)

CardNumber

ID of the card for release.

CardType

Returns the card type.

CardIndex

Returns the sequence number of the card of the same type

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.5 GetCardType

Description

Obtains the card type of the device with a specified card index.

Syntax

C/C++

```
I16 GetCardType (U16 CardNumber, U16 *card-
Type)
```

Visual Basic

```
GetCardType (ByVal CardNumber As Integer,
cardType As Integer) As Integer
```

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VB.Net

```
GetCardType (ByVal CardNumber As Short, ByRef
cardType As Short) As Short
```

C#

```
short GetCardType (ushort CardNumber, out ush-
ort cardType)
```

Parameter(s)

CardNumber

ID of the card for release.

CardType

Returns the card type.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.6 GetLCRAddr

Description

Obtains the LCR base address of the device with a specified card index as defined by the onboard PCI controller.

Syntax

C/C++

```
I16 GetLCRAddr(U16 CardNumber, U32 *LcrAddr)
```

Visual Basic

```
GetLCRAddr (ByVal CardNumber As Integer,
LcrAddr As Long) As Integer
```

VB.Net

```
GetLCRAddr (ByVal CardNumber As Short, ByRef
LcrAddr As Integer) As Short
```

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C#

```
short GetLCRAddr(ushort CardNumber, uint [] LcrAddr)
```

Parameter(s)

CardNumber

ID of the card for release.

LcrAddr

Returns the LCR base address.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.2 DI/O Functions

A.1.1 DI_ReadLine

Description

Reads the digital logic state of the digital line in the specified port.

Syntax

C/C++

```
I16 DI_ReadLine (U16 CardNumber, U16 Port, U16 Line, U16 *State)
```

Visual Basic

```
DI_ReadLine (ByVal CardNumber As Integer, ByVal Port As Integer, ByVal Line As Integer, State As Integer) As Integer
```

VB.Net

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```
DI_ReadLine (ByVal CardNumber As Short, ByVal
Port As Short, ByVal Line As Short, ByRef State
As Short) As Short
```

C#

```
short DI_ReadLine (ushort CardNumber, ushort
Port, ushort Line, out ushort State)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

Line

Digital line to be read. Valid values:PCMe-1432 0 to 15 (for port 0 and port 1)

State

Returns the digital logic state of the specified line to 0 or 1

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

A.1.2 DI_ReadPort

Description

Reads the digital data from the specified digital input port.

Syntax

C/C++

```
I16 DI_ReadPort (U16 CardNumber, U16 Port, U32
*Value)
```

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Visual Basic

```
DI_ReadPort (ByVal CardNumber As Integer,
ByVal Port As Integer, Value As Long) As Inte-
ger
```

VB.Net

```
DI_ReadPort (ByVal CardNumber As Short, ByVal
Port As Short, ByRef Value As Integer) As Short
```

C#

```
short DI_ReadPort (ushort CardNumber, ushort
Port, out uint Value)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

Value

Returns the digital data read from the specified port. Valid values: PCMe-1432 16-bit data (for port 0 and port 1)

Return Code(s)

```
NoError
CardNotRegistered
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.3 DO_ReadLine

Description

Reads back the digital logic state of the specified digital output line of the specified port.

Syntax

C/C++

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```
I16 DO_ReadLine (U16 CardNumber, U16 Port, U16
Line, U16 *State)
```

Visual Basic

```
DO_ReadLine (ByVal CardNumber As Integer,
ByVal Port As Integer, ByVal Line As Integer,
State As Integer) As Integer
```

VB.Net

```
DO_ReadLine (ByVal CardNumber As Short, ByVal
Port As Short, ByVal Line As Short, ByRef State
As Short) As Short
```

C#

```
short DO_ReadLine (ushort CardNumber, U16 ush-
ort, ushort Line, out ushort State)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

Line

Digital line to be read. Valid values: PCMe-1432 0 to 15 (for port 0 and port 1)

State

Returns the digital logic state, 0 or 1, of the specified line.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

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A.1.4 DO_WriteLine

Description

Sets the specified digital output line in the specified digital port to the specified state. This function is only available for cards that support digital output readback.

Syntax

C/C++

```
I16 DO_WriteLine (U16 CardNumber, U16 Port,
U16 Line, U16 State)
```

Visual Basic

```
DO_WriteLine (ByVal CardNumber As Integer,
ByVal Port As Integer, ByVal Line As Integer,
State As Integer) As Integer
```

VB.Net

```
DO_WriteLine (ByVal CardNumber As Short, ByVal
Port As Short, ByVal Line As Short, ByRef State
As Short) As Short
```

C#

```
short DO_WriteLine (ushort CardNumber, U16
ushort, ushort Line, out ushort State)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

Line

Digital line to be read. Valid values: PCMe-1432 0 to 15 (for port 0 and port 1)

State

Returns the digital logic state, 0 or 1, of the specified line.

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Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

A.1.5 DO_ReadPort

Description

Reads back the output digital data from the specified digital output port.

Syntax

C/C++

```
I16 DO_ReadPort (U16 CardNumber, U16 Port, U32
*Value)
```

Visual Basic

```
DO_ReadPort (ByVal CardNumber As Integer,
ByVal Port As Integer, Value As Long) As Inte-
ger
```

VB.Net

```
DO_ReadPort (ByVal CardNumber As Short, ByVal
Port As Short, ByRef Value As Integer) As Short
```

C#

```
short DO_ReadPort (ushort CardNumber, ushort
Port, out uint Value)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

Value

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Returns the digital data read from the specified output port.
Valid values: PCMe-1432 16-bit data (for port 0 and port 1)

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

A.1.6 DO_WritePort

Description

Writes digital data to the specified digital output port.

Syntax

C/C++

```
I16 DO_WritePort (U16 CardNumber, U16 Port,
U32 Value)
```

Visual Basic

```
DO_WritePort (ByVal CardNumber As Integer,
ByVal Port As Integer, ByVal Value As Long) As
Integer
```

VB.Net

```
DO_WritePort (ByVal CardNumber As Short, ByVal
Port As Short, ByVal Value As Integer) As Short
```

C#

```
short DO_WritePort (ushort CardNumber, ushort
Port, uint Value)
```

Parameter(s)

CardNumber

ID of the card for release.

Port

Digital input port number. Valid values: PCMe-1432 0, 1

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Value

Returns the digital data read from the specified output port. Valid values: PCMe-1432 16-bit data (for port 0 and port 1)

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

A.2 COS Interrupt Functions

A.1.1 DIO_INT_Event_Message

Description

Controls and notifies the user application when a specified interrupt event occurs. The notification is executed through a user-specified callback function or the Windows PostMessage API. When a new event message is added, it remains active until the function is called by setting the argument mode to 0, removing the specified interrupt event message. To remove a specified message, make sure to specify the event handle to be notified for the message.

Syntax

C/C++

```
I16 DIO_INT_EventMessage (U16 CardNumber, I16 mode, HANDLE evt, HANDLE windowHandle, U32 message, U32 callbackAddr)
```

Visual Basic

```
DIO_INT_EventMessage (ByVal CardNumber As Integer, ByVal mode As Integer, ByVal evt As Long, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer
```

VB.Net

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```
DIO_INT_EventMessage (ByVal CardNumber As Short, ByVal mode As Short, ByVal evt As Integer, ByVal windowHandle As Integer, ByVal message As Integer, ByVal callbackAddr As CallbackDelegate) As Short
```

C#

```
short DIO_INT_EventMessage (ushort CardNumber, short mode, long evt, long windowHandle, uint message, MulticastDelegate callbackAddr)
```

Parameter(s)

CardNumber

ID of the card for release.

Mode

Operating mode for adding or removing messages, wherein

0: Remove an existing message interrupt event defined argument evt.

1: Add a new message for an interrupt event defined

evt

Handle of the INT event to handle

windowHandle

Handle to the window in which a Windows message will be received when the specified INT event occurs; if windoHandle is 0, no Windows messages will be sent

Message

User-defined message issued when the specified INT event occurs. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. To define a custom message, any value ranging from WM_USER (0x400) to 0x7fff can be used, this range reserved by Windows for same.

callbackAddr

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Address of the user callback function. The PCIS-DASK calls this function when the specified INT event occurs. If no callback function is required, set callbackAddr to 0.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.2 DIO_INT1_EventMessage

Description

Controls the INT1 interrupt sources for a dual-interrupt system and notifies the user's application when an interrupt event occurs. The notification is performed through a user-specified callback function or the Windows PostMessage API.

Syntax

C/C++

```
I16 DIO_INT1_EventMessage (U16 CardNumber, I16 Int1Mode, HANDLE windowHandle, U32 message, void *callbackAddr())
```

Visual Basic

```
DIO_INT1_EventMessage (ByVal CardNumber As Integer, ByVal Int1Mode As Integer, ByVal windowHandle As Long, ByVal message As Long, ByVal callbackAddr As Long) As Integer
```

VB.Net

```
DIO_INT1_EventMessage (ByVal CardNumber As Short, ByVal Int1Mode As Short, ByVal windowHandle As Integer, ByVal message As Integer, ByVal callbackAddr As CallbackDelegate) As Short
```

C#

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```
short DIO_INT1_EventMessage (ushort CardNum-
ber, short Int1Mode, long windowHandle, long
message, MulticastDelegate callbackAddr)
```

Parameter(s)

CardNumber

ID of the card performing the operation

Int1Mode

Interrupt mode of INT1. Valid values:

INT1_DISABLE

INT1_EXT_SIGNALINT1 by COS of Ch0 of Port 0

windowHandle

Handle to the window in which a Windows message will be received when the specified INT event occurs; if windoHandle is 0, no Windows messages will be sent

Message

User-defined message issued when the specified INT event occurs. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. To define a custom message, any value ranging from WM_USER (0x400) to 0x7fff can be used, this range reserved by Windows for same.

callbackAddr

Address of the user callback function. The PCIS-DASK calls this function when the specified INT event occurs. If no callback function is required, set callbackAddr to 0.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

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A.1.3 DIO_INT2_EventMessage

Description

Controls the INT2 interrupt sources for a dual-interrupt system and notifies the active application when an interrupt event occurs. The notification is executed via a user-specified callback function or the Windows PostMessage API.

Syntax

C/C++

```
I16 DIO_INT2_EventMessage (U16 CardNumber, I16
Int2Mode, HANDLE windowHandle, U32 message,
void *callbackAddr())
```

Visual Basic

```
DIO_INT2_EventMessage (ByVal CardNumber As
Integer, ByVal Int2Mode As Integer, ByVal win-
dowHandle As Long, ByVal message As Long,
ByVal callbackAddr As Long) As Integer
```

VB.Net

```
DIO_INT2_EventMessage (ByVal CardNumber As
Short, ByVal Int1Mode As Short, ByVal window-
Handle As Integer, ByVal message As Integer,
ByVal callbackAddr As CallbackDelegate) As
Short
```

C#

```
short DIO_INT2_EventMessage (ushort CardNum-
ber, short Int1Mode, long windowHandle, long
message, MulticastDelegate callbackAddr)
```

Parameter(s)

CardNumber

ID of the card performing the operation

Int2Mode

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INT2 interrupt mode. Valid values:

▷INT2_DISABLE

▷INT2_EXT_SIGNAL INT2 by COS of Ch1 of Port 0

windowHandle

Handle to the window in which a Windows message will be received when the specified INT event occurs; if windoHandle is 0, no Windows messages will be sent

Message

User-defined message issued when the specified INT event occurs. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. To define a custom message, any value ranging from WM_USER (0x400) to 0x7fff can be used, this range reserved by Windows for same.

callbackAddr

Address of the user callback function. The PCIS-DASK calls this function when the specified INT event occurs. If no callback function is required, set callbackAddr to 0.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.4 DIO_SetDualInterrupt

Description

Informs the PCIS-DASK library of the interrupt mode of two interrupt sources of a dual-interrupt system and returns dual interrupt events. If an interrupt is generated, the corresponding interrupt events are signaled. The application uses Win32 wait functions, such as WaitForSingleObject or WaitForMultipleObjects to check the interrupt event status.

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Syntax

C/C++

```
I16 DIO_SetDualInterrupt (U16 CardNumber, I16
Int1Mode, I16 Int2Mode, HANDLE *hEvent)
```

Visual Basic

```
DIO_SetDualInterrupt (ByVal CardNumber As
Integer, ByVal Int1Mode As Integer, ByVal
Int2Mode As Integer, hEvent As Long) As Inte-
ger
```

VB.Net

```
DIO_SetDualInterrupt (ByVal CardNumber As
Short, ByVal Int1Mode As Short, ByVal Int2Mode
As Short, ByRef hEvent() As IntPtr) As Short
```

C#

```
short DIO_SetDualInterrupt (ushort CardNumber,
short Int1Mode, short Int2Mode, ref IntPtr[]
hEvent)
```

Parameter(s)

CardNumber

ID of the card performing the operation

Int1Mode

The interrupt mode of INT1. Valid values:

- ▷INT1_DISABLE
- ▷INT1_EXT_SIGNALINT1 by COS of Ch0 of Port 0

Int2Mode

INT2 interrupt mode. Valid values:

- ▷INT2_DISABLE
- ▷INT2_EXT_SIGNAL INT2 by COS of Ch1 of Port 0

hEvent

Returned dual-interrupt event handles. The status of a dual-interrupt event indicates that an interrupt is generated or not for cards comprising dual-interrupt system.

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Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.5 DIO_SetCOSInterrupt32

Description

Enables or disables the COS (Change Of State) interrupt detection capability of the specified ports with 32-bit data width.

Syntax

C/C++

```
I16 DIO_SetCOSInterrupt32 (U16 CardNumber, U8 Port, U32 ctl, HANDLE *hEvent, BOOLEAN Manual-Reset)
```

Visual Basic

```
DIO_SetCOSInterrupt32 (ByVal CardNumber As Integer, ByVal Port As Byte, ByVal ctl As Long, hEvent As Long, ByVal ManualReset As Byte) As Integer
```

VB.Net

```
DIO_SetCOSInterrupt32 (ByVal CardNumber As Short, ByVal Port As Byte, ByVal ctl As UInte-ger, ByRef hEvent As Integer, ByVal ManualRe-set As Byte) As Short
```

C#

```
short DIO_SetCOSInterrupt32 (ushort CardNum-ber, byte Port, uint ctl, out long hEvent, bool ManualReset)
```

Parameter(s)

CardNumber

ID of the card performing the operation

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Port

Channel number on which COS detection capability is to be enabled/disabled. Valid port numbers: PCMe-1432 0

ctl

Control value for the port defined by argument port. Each bit of the value of ctrl controls one DI channel. The '0' value of the bit value disables the COS function of the corresponding line, and the '1' value of the bit value enables the COS function of the corresponding line. The valid values for ctrl are 0 to 4294967295 (0xFFFFFFFF)

hEvent (Win32 only)

Returned COS interrupt event handle.

ManualReset (Win32 only)

Specifies whether the event is:

- ▷(1) manual-reset by *ResetEvent* function in active application, or
- ▷(0) autoreset by driver.

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

A.1.6 DIO_GetCOSLatchData32

Description

Acquires 32-bit width DI data latched in the COS Latch register when Change-of-State (COS) interrupt occurs.

Syntax

C/C++

```
I16 DIO_GetCOSLatchData32(U16 CardNumber, U8
Port, U32 *CosLData)
```

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Visual Basic

```
DIO_GetCOSLatchData32 (ByVal CardNumber As Integer, ByVal Port As Byte, CosLData As Long) As Integer
```

VB.Net

```
DIO_GetCOSLatchData32 (ByVal CardNumber As Short, ByVal Port As Byte, ByRef CosLData As UInteger) As Short
```

C#

```
short DIO_GetCOSLatchData32(ushort CardNumber, byte Port, out uint CosLData)
```

Parameter(s)

CardNumber

ID of the card performing the operation

Port

Channel number on which COS detection capability is to be enabled/disabled. Valid port numbers: 0

CosLData

Returns the DI data latched in the COS Latch register while the Change-of-State (COS) interrupt occurs.Valid port numbers: 32-bit data

Return Code(s)

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

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A.2 Smart PoE Functions

A.1.1 SmartPoE_SetPower

Description

Controls the smart PoE (Power over Ethernet) functionality, determining when to supply power to the PoE device, by detecting whether a PoE device is connected to the cable and supplying power to the cable. SmartPoE can be disabled if the device has an existing power source, or for testing purposes.

Syntax

C/C++

```
short SmartPoE_SetPower (short Port, short Mode)
```

Visual Basic

```
SmartPoE_SetPower (ByVal Port As Integer, ByVal Mode As Integer) As Integer
```

VB.Net

```
SmartPoE_SetPower (ByVal Port As Short, ByVal Mode As Short) As Short
```

C#

```
short SmartPoE_SetPower (short Port, short Mode)
```

Parameter(s)

Port

Port number of the PoE performing the operation. Valid values are 0 to 3.

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Mode

Power mode of the PoE port. Valid values:

▷0: disables power supply to the PoE port

▷1: automatically supplies power to the PoE port when the PoE device is connected to the port

Return Code(s)

```
0: No error
-1: Not a valid device
-2: Invalid parameter
```

A.2 EEPROM Functions

The EOS-1200 provides 1k bits EERPOM, to store private data.

A.1.1 EEPROM_ReadByte

Description

Reads one byte of data from the EEPROM.

Syntax

C/C++

```
short EEPROM_ReadByte (short Offset, unsigned
char *Data)
```

Visual Basic

```
EEPROM_ReadByte (ByVal Offset As Integer,
ByRef Data As Byte) As Integer
```

VB.Net

```
EEPROM_ReadByte (ByVal Offset As Short, ByRef
Data As Byte) As Short
```

C#

```
short EEPROM_ReadByte (short Offset, out byte
Data)
```

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Parameter(s)

Offset

Offset address of the EEPROM performing the operation. Valid values are 0 to 255.

Data

Data read from the address of the EEPROM.

Return Code(s)

```
0: No error
-1: Not a valid device
-2: Invalid parameter
-3: EEPROM is busy
```

A.1.2 EEPROM_WriteByte

Description

Writes one byte of data from the EEPROM. After a successful write byte command, the EEPROM enters an internally timed write cycle for about 5 ms. All subsequent read or write commands during this write cycle will return a -3 error code.

Syntax

C/C++

```
short EEPROM_WriteByte (short Offset, unsigned char Data)
```

Visual Basic

```
EEPROM_WriteByte (ByVal Offset As Integer, ByVal Data As Byte) As Integer
```

VB.Net

```
EEPROM_WriteByte (ByVal Offset As Short, ByVal Data As Byte) As Short
```

C#

```
short EEPROM_WriteByte (short Offset, byte Data)
```

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Parameter(s)

Offset

Offset address of the EEPROM performing the operation. Valid values are 0 to 255.

Data

Data written to the address of the EEPROM.

Return Code(s)

```
0: No error
-1: Not a valid device
-2: Invalid parameter
-3: EEPROM is busy
```

A.1.3 EEPROM_WriteBytes

Description

Writes 1 to 4 bytes of data to the EEPROM.

Syntax

C/C++

```
short EEPROM_WriteBytes (short Offset, short
Count, unsigned int Data)
```

Visual Basic

```
EEPROM_WriteBytes (ByVal Offset As Integer,
ByVal Count As Integer, ByVal Data As Long) As
Integer
```

VB.Net

```
EEPROM_WriteBytes (ByVal Offset As Short,
ByVal Count As Short, ByVal Data As UInteger)
As Short
```

C#

```
short EEPROM_WriteBytes (short Offset, short
Count, uint Data)
```

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Parameter(s)

Offset

Offset address of the EEPROM performing the operation. Valid values are 0 to 255.

Count

Indicates how many bytes of data will be written to the EEPROM. Valid values are 1 to 4

Data

Data written to the address of the EEPROM.

Return Code(s)

```
0: No error
-1: Not a valid device
-2: Invalid parameter
-3: EEPROM is busy
```

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Appendix B 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-1200. The BIOS setup program includes menus for configuring settings and enabling features of the EOS-1200. Most users do not need to use the BIOS setup program, as the EOS-1200 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 19.

B.1 Main



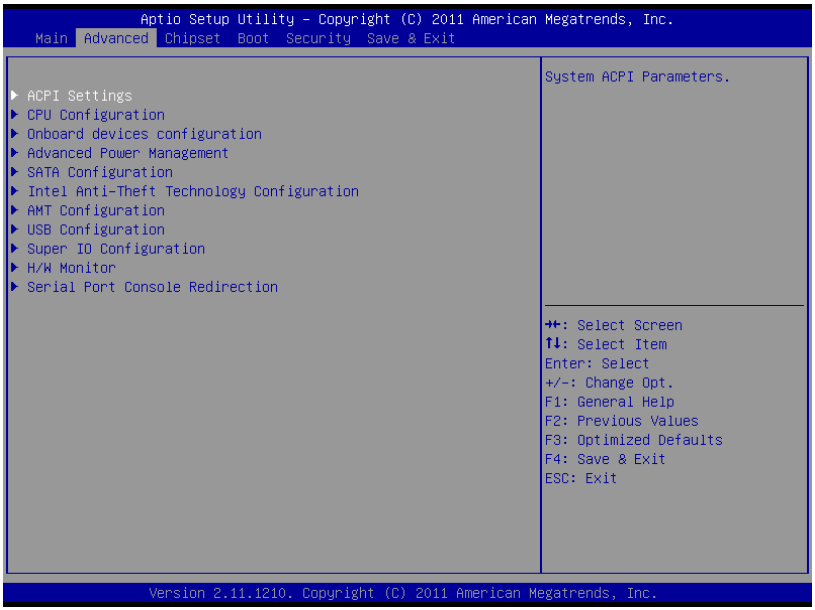
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B.1.1 System Time/System Date

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.

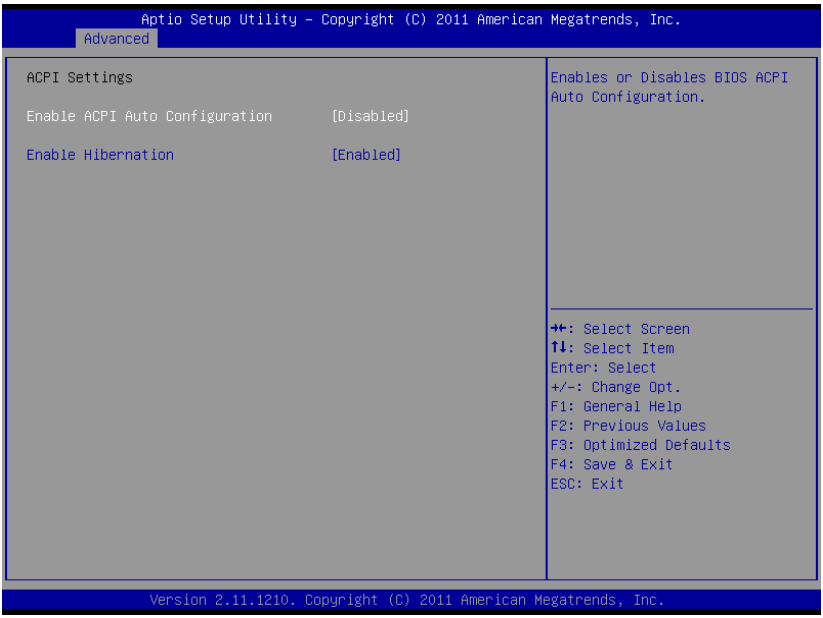
B.2 Advanced



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

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B.2.1 ACPI Settings



Enable ACPI Auto Configuration

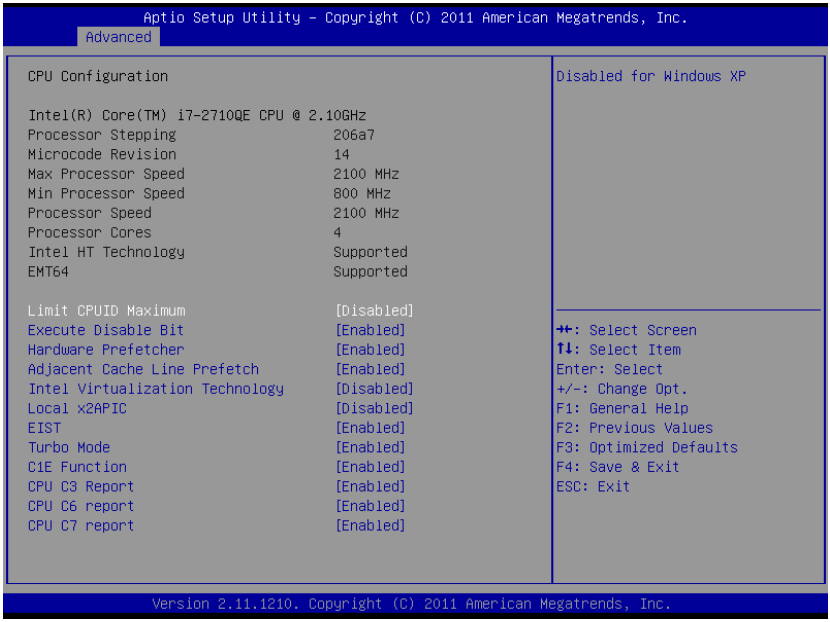
Enables or disables BIOS ACPI Auto Configuration.

Enable Hibernation

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

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B.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

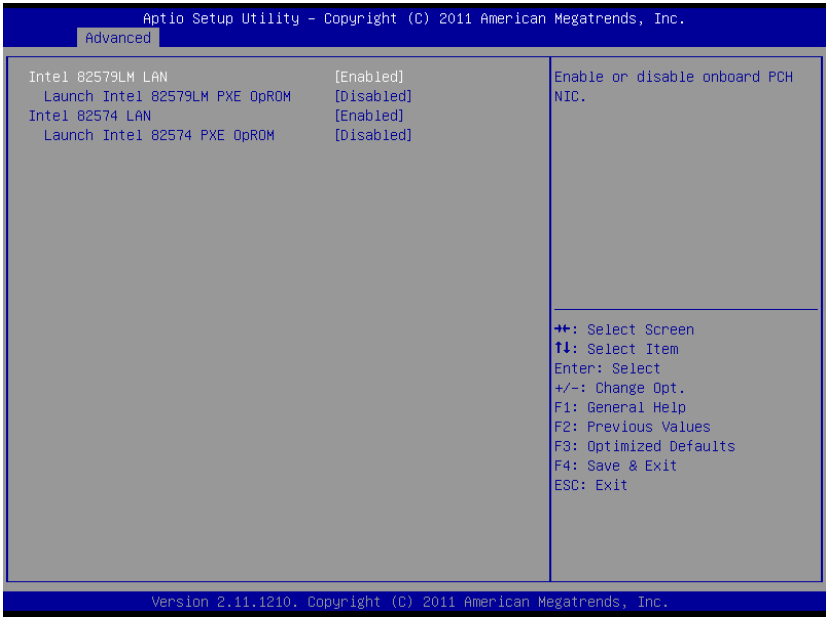
Enables/Disables CPU C6(ACPI C3) report to OS

CPU C7 Support

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

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B.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

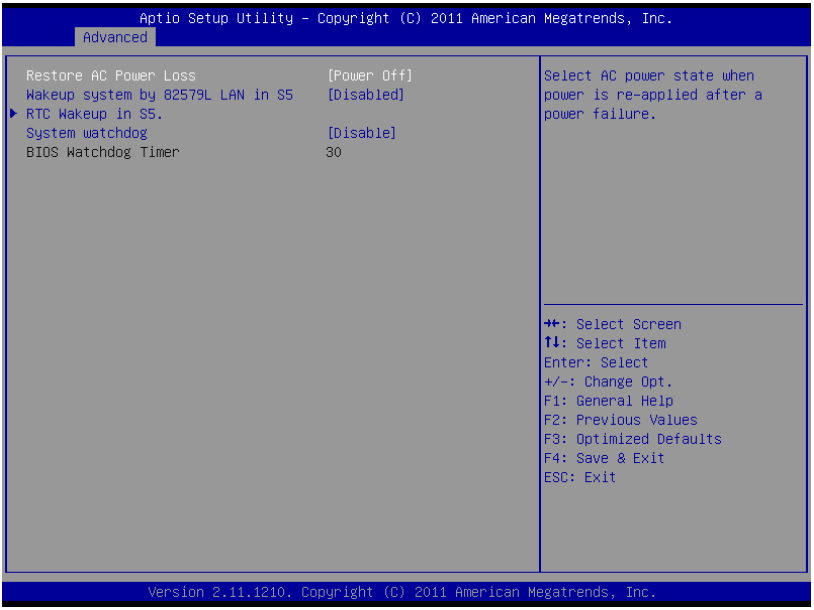
Enables/Disables onboard Intel 82574 Lan controller

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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B.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 B-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.

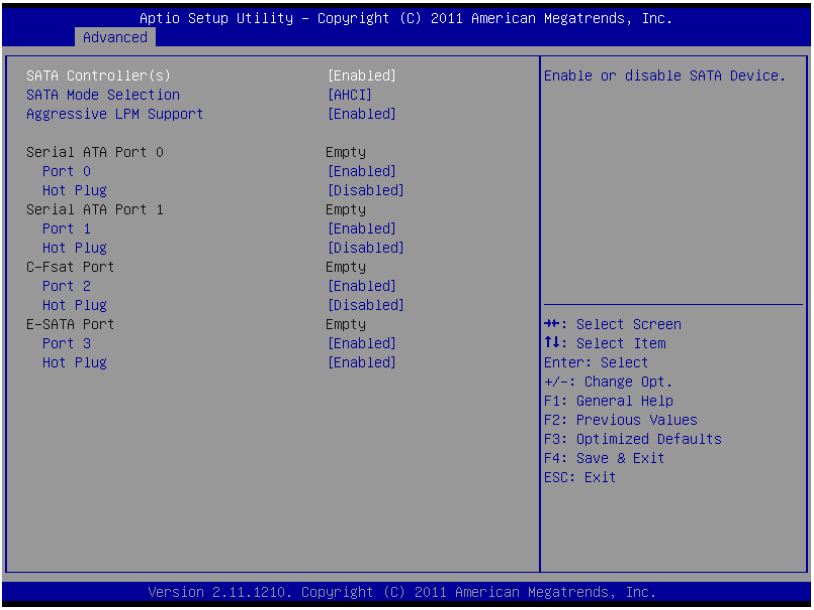
RTC Wakeup in S5

Enables or disables system wake on alarm event.

System watchdog

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

B.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.

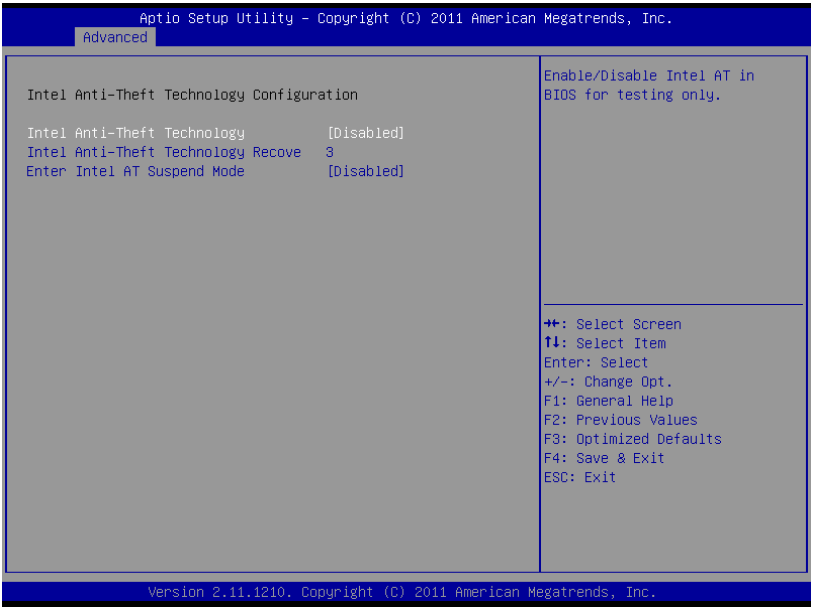
Port X

Enables or Disables SATA Port X

Hot Plug

Sets this port as hot pluggable.

B.2.6 Intel Anti-Theft Technology Configuration



Intel Anti-Theft Technology

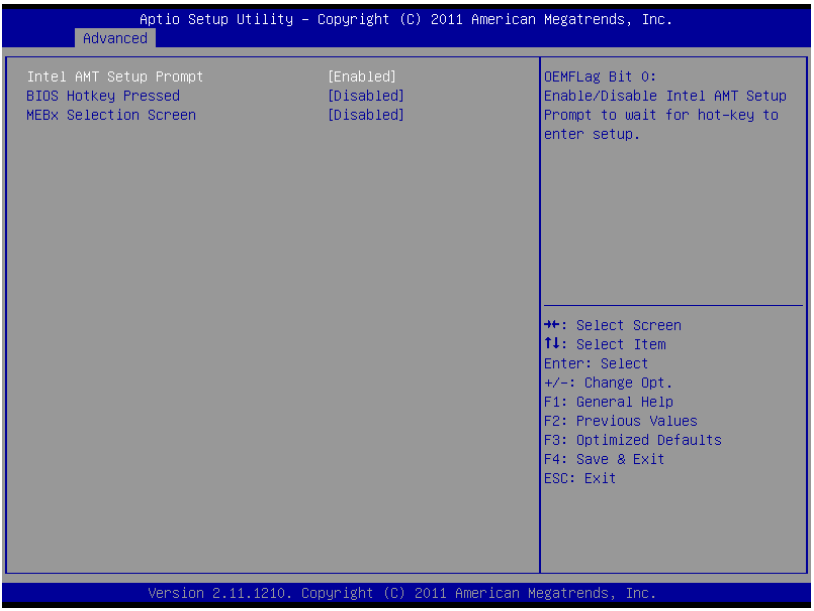
Enables or disables Intel AT function. Intel® Anti-Theft Technology helps stop theft by rendering computers useless with immediate shutdown

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

Miscellaneous settings for Intel AT function

B.2.7 AMT Configuration



Intel AMT Setup Prompt

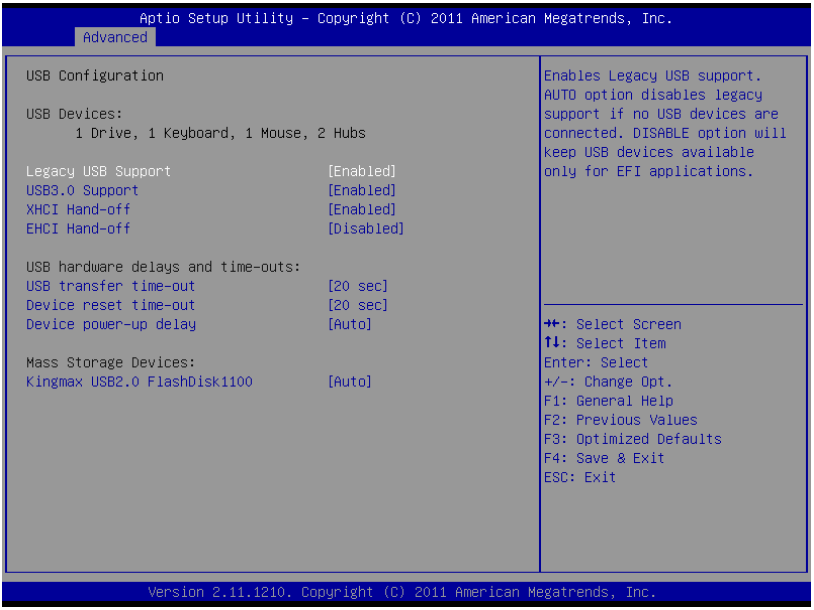
Enables or disables MEBx launch during system post for configuring AMT features

BIOS Hotkey Pressed/MEBx Selection Screen

Miscellaneous settings for iAMT function

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B.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

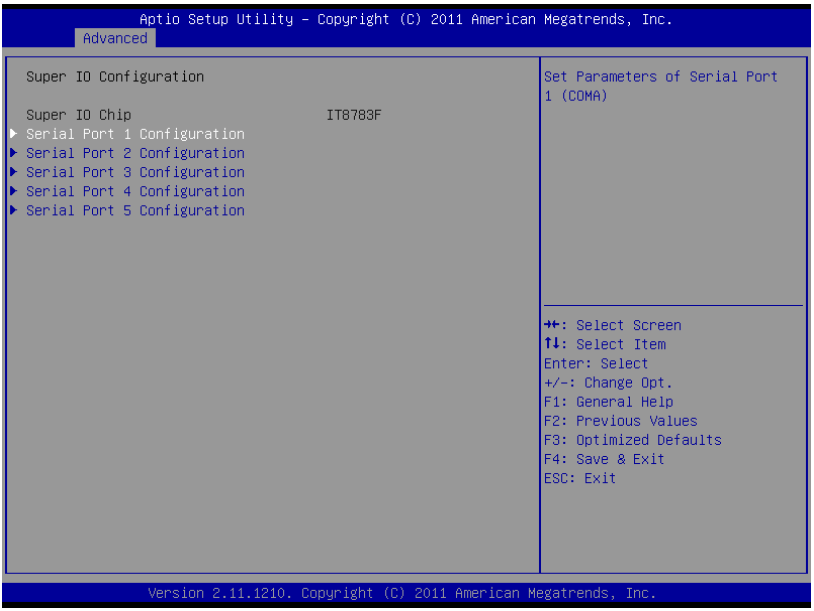
Enables BIOS support for XHCI Hands-Off feature. The default option is Enabled.

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EHCI Hand-Off

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

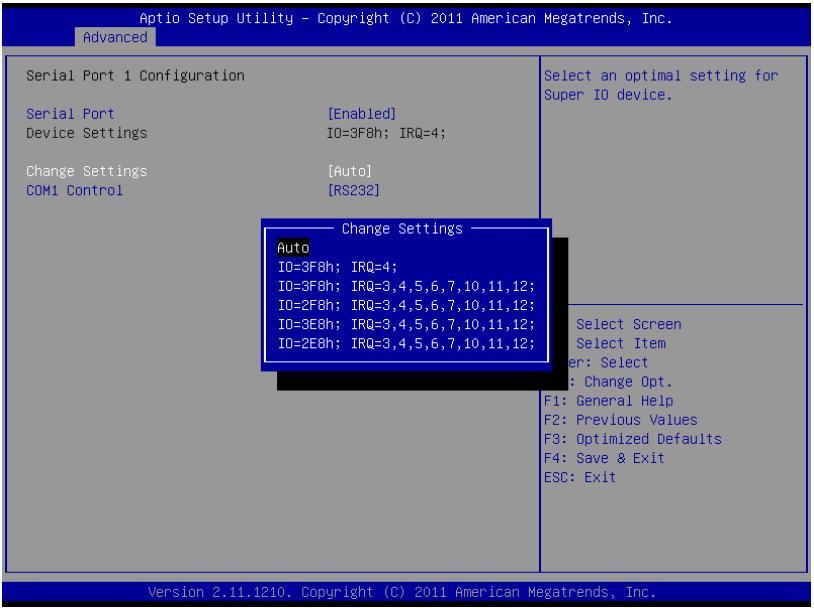
B.2.9 Super I/O Configuration



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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B.2.10 Hardware Monitor

PC Health Status

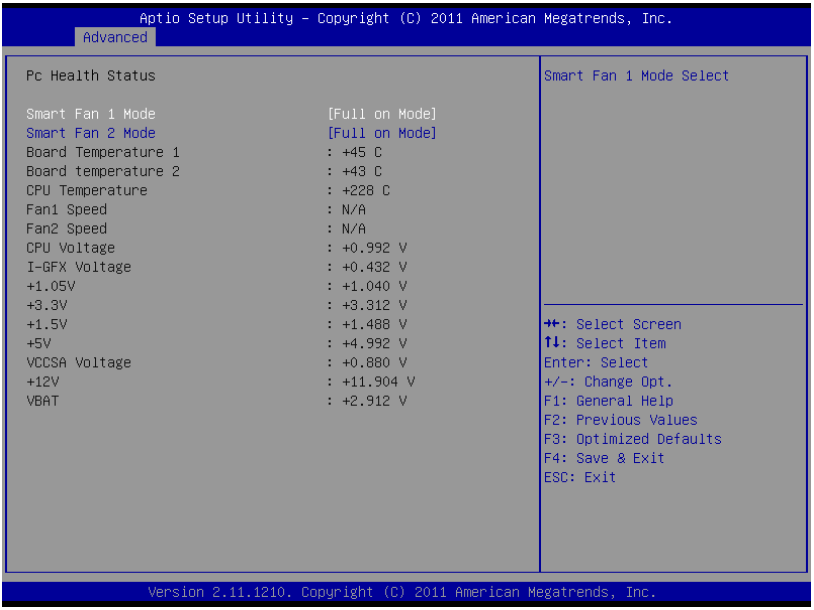
Hardware health on Super I/O monitors Board Temperature 1/2, CPU Temperature, CPU Voltage, I-GFX Voltage, VCCSA Voltage, +1.05V, +3.3V, +1.5V, +5V, +12.0V, VBAT, and Fan1/2 Speed.

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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B.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

B.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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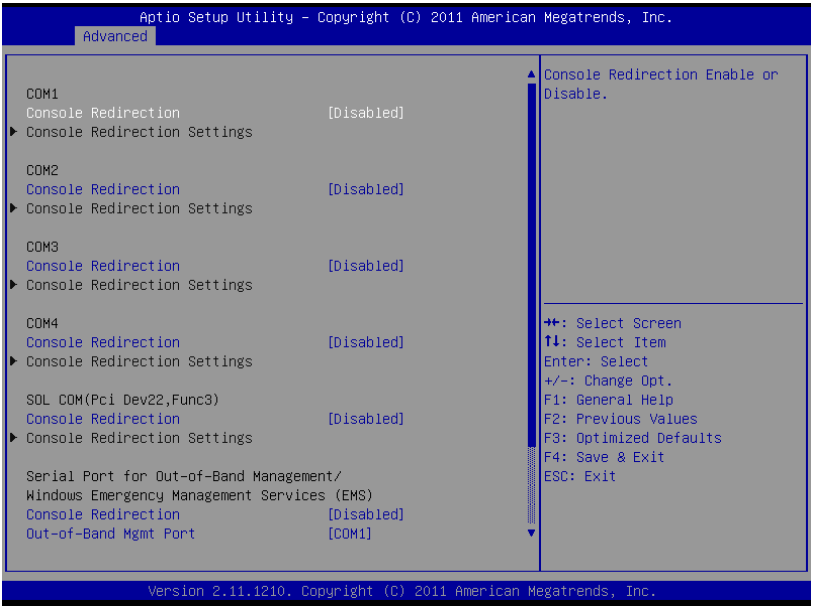
Out-of-Band Mgmt Port

Selects the COM Port for remote management of a Windows OS

Terminal Type

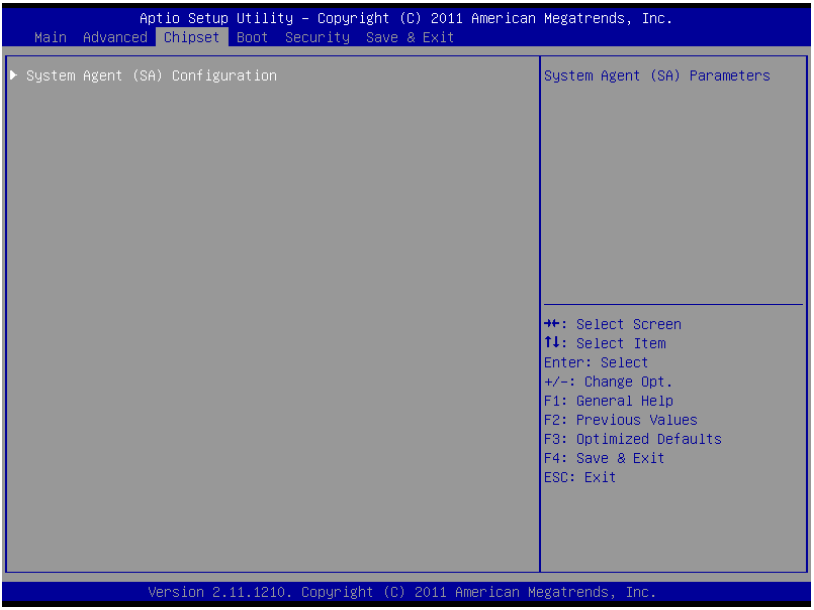
Selects the transmission protocol for remote terminal console

B.3 Chipset



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B.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

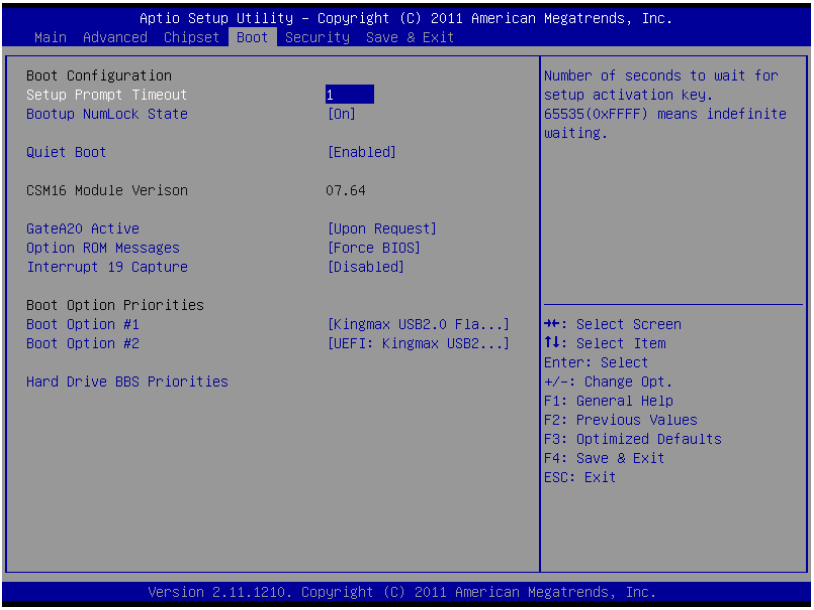
Selects DVMT 5.0 pre-allocated graphics memory size used by the internal graphics device

DVMT Total Gfx Memory

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

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B.4 Boot



B.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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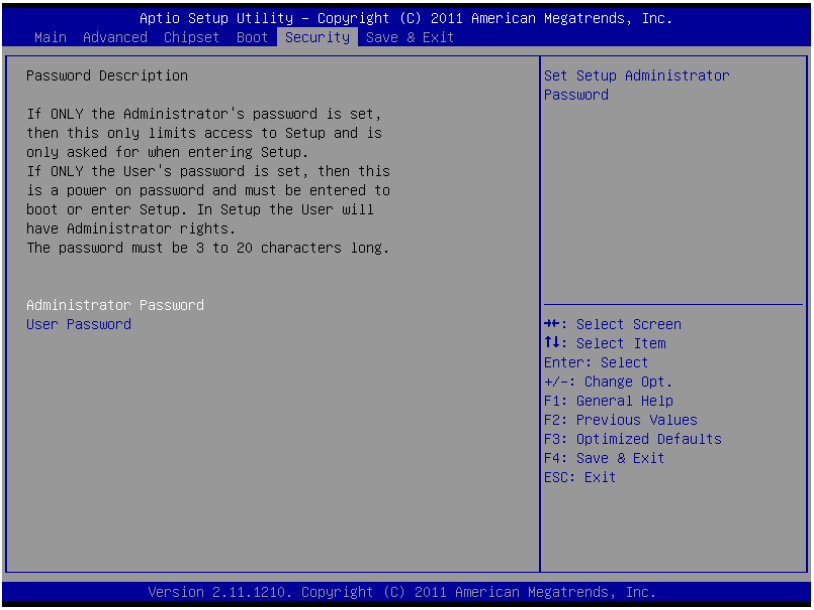
Quiet Boot

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

B.4.2 Boot Option Priorities

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

B.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.

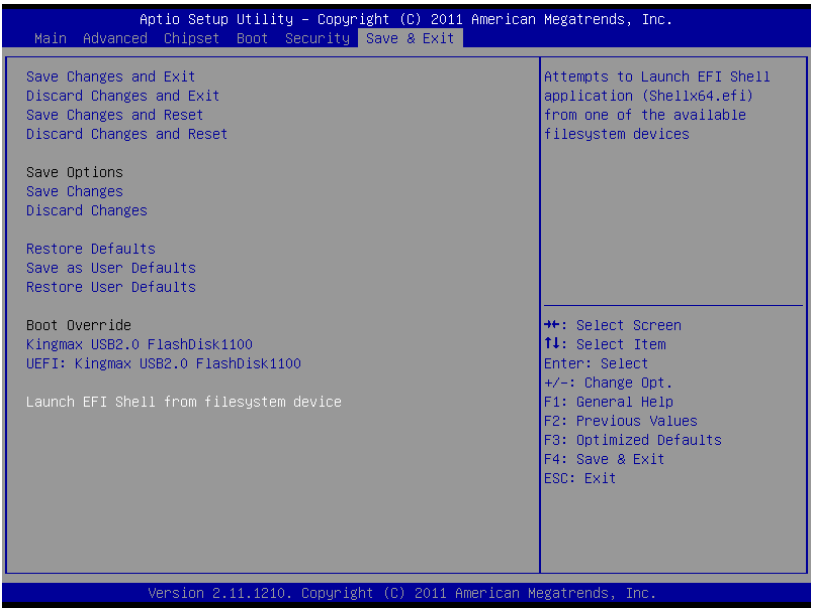
Administrator Password

Set Administrator password for setup

User Password

Set boot/setup User password

B.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 filesystem 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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