MXE-1300 Series

Intel® Atom™ D2550/N2600 Fanless
Embedded Computer with Integrated I/O



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Part No: 50-1Z130-2000

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Revision History

Revision	Release Date	Description of Change(s)
2.00	Sept 28, 2012	Initital 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 Matrix MXE-1300 series is the latest addition to ADLINK's Matrix line of embedded computers. Based on the Intel® Atom™ D2550/N2600 processor, the MXE-1300 provides excellent computing performance while conserving considerable power.

The three Intel® Gigabit Ethernet ports provide abundant support for a variety of internet/ intranet applications, and four digital inputs and outputs deliver superior flexibility for inter-device communication. An internal PCI Express Mini Card socket and the USIM slot support extension of additional functions, such as wireless connection (3G/WiFi/BT/GPS), video capture, Secure Access Modules (SAM), and others.

With its ruggedized architecture and rich I/O, the MXE-1300 is the best choice for industrial automation/ intelligent transportation systems, facility management, and applications demanding reliability in harsh environments.

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1.2 Features

- Intel® Atom™ D2550/N2600 processor + NM10 chipset
- 2X Software-programmable RS-232/422/485 + 2 RS-232 ports
- 3X 1000/100/10 Mbps Ethernet ports, 6 USB 2.0 ports, 4 TTL digital input and output
- 1 external CF slot and 1 internal PCIe Mini Card socket with USIM slot
- Built-in 6 VDC to 36 VDC wide-range DC power input
- Rugged, -20°C to 70°C fanless operation (w/ industrial SSD)*

*This option guarantees cold boot of the system at -20°c and operation with 100% loading at 70°. The industrial solid-state drive storage option is required

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1.3 Specifications

	MXE-1301	MXE-1302
System Core		
Processor	D2550 1.86GHz	N2600 1.6GHz
Chipset	Intel® NM10	
Video	DVI + VGA dual display up to 1920 x 1200	
Memory	Up to 4 GB DDR3 800/1066	Up to 2 GB DDR3 800
I/O Interface		
Ethernet	3x GbE ports (3x Intel® 82574L)	
Serial Ports	2x software-programmable RS-232/422/485 (COM1 & COM2) 2x RS-232 (COM3 & COM4)	
USB	6x USB 2.0 ports	
Audio	1x mic-in and 1x line-out	
Expansion	1x mini PCIe slot	
DI/O	4DI + 4DO	
Power Supply		
DC Input	Built-in 6-36 V DC wide-range DC input , 3P pluggable connector with latch (V-, GND, V+)	
AC Input	Optional 80 W external AC-DC adapter for AC input	
Storage		
SATA HDD	1 x onboard SATA port for 2.5" HDD/SSD installation	
CF	1x external type I CompactFlash socket	
Mechanical		
Dimensions	210 (W) x 170 (D) x 53(H) mm (8.3 x 6.75 x 2.1 in.)	

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	MXE-1301	MXE-1302
Weight	1.8 kg (3.98 lb)	
Mounting	VESA 100	
Environmental		
Operating Temperature	Standard: 0°C to 50°C (32 to 122°F) (w/ HDD) Extended: -20°C to 70°C (-14 to 140°F) (w/o HDD or w/ industrial SSD/CF)	
Storage Temperature	-40°C to 85°C (-40 to 185°F)	
Humidity	approx. 95% @ 40°C (non-condensing)	
Vibration	Operating, 5 G, 5-500 Hz, 3 axes (w/ CF or SSD)	
	Operating, 0.5 G, 5-500 Hz, 3 axes (w/ HDD)	
EMC	CE, FCC	
Shock	Operating, 50 G, half sine 11ms duration (w/ CF or	
Power Consumption		
Power off	2.16 W	In shutdown status with DC input and only USB keyboard/mouse
System Idle	11.04 W	Under Windows Desktop with no application programs executed
Processor full load	14/15.8W	Under Windows with 100% CPU utilization /with 2D/3D graphic full load
System full load	49.92 W	Under Windows with 100% CPU utilization and simultaneous access to all I/O devices.
Recommended power supply	80W	With consideration of voltage de-rating under high environment temperature.

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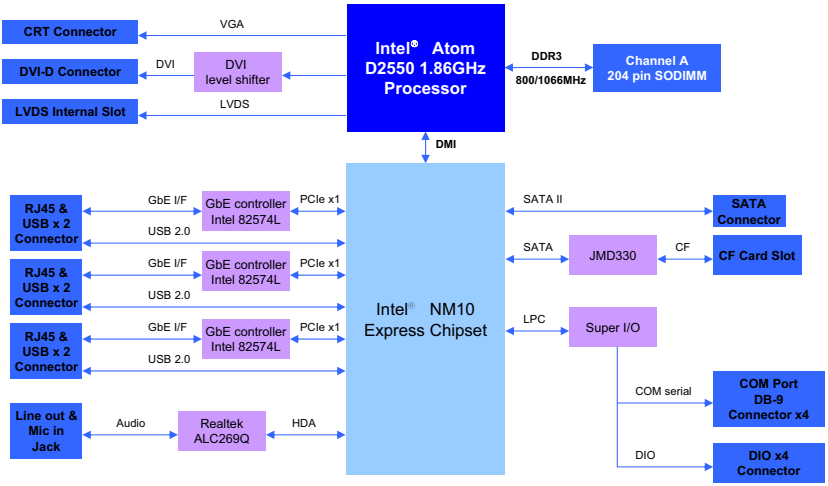


Figure 1-1: MXE-1300 Functional Block Diagram

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.

- MXE-1300
- Screw pack for wall-mounting and HDD installation
- User's Manual
- ADLINK All-in-One DVD

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1.5 Mechanical Drawings

NOTE: All dimensions shown are in millimeters (mm) unless otherwise stated.

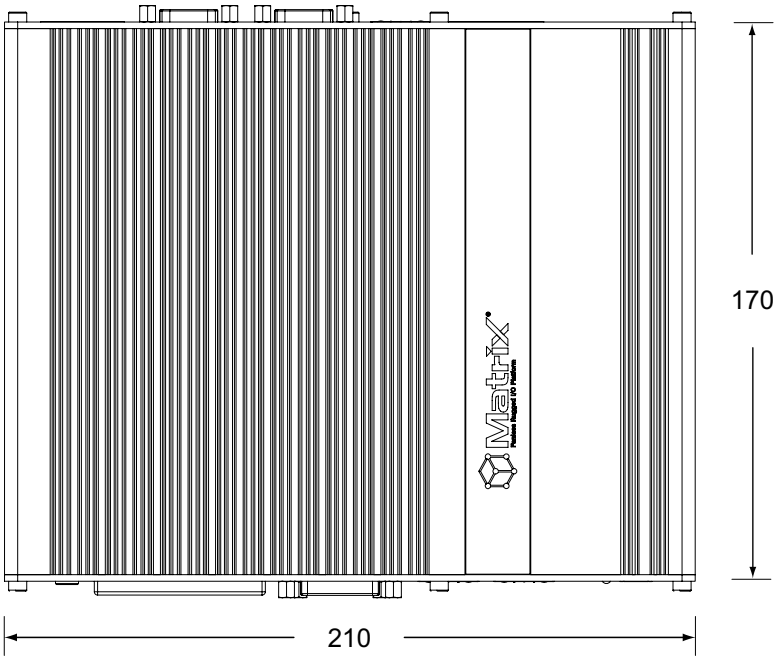


Figure 1-2: Top View

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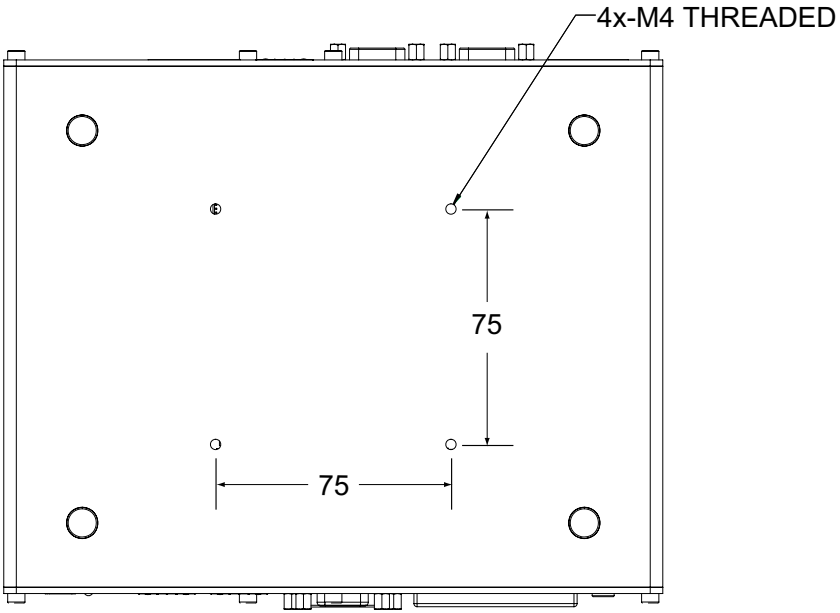


Figure 1-3: Underside View

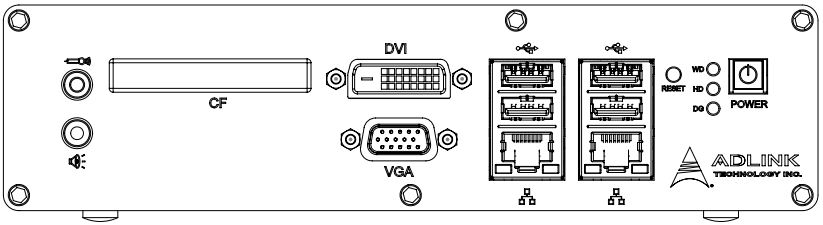


Figure 1-4: Front View

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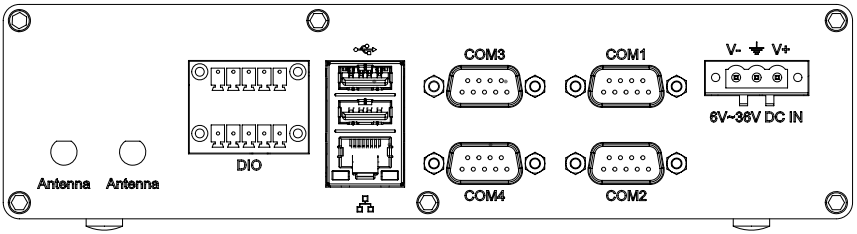


Figure 1-5: Rear View



Figure 1-6: Side View

1.6 Front Panel I/O Connectors

This section describes the I/O connectors lcoated on the front panel of the MXE-1300.

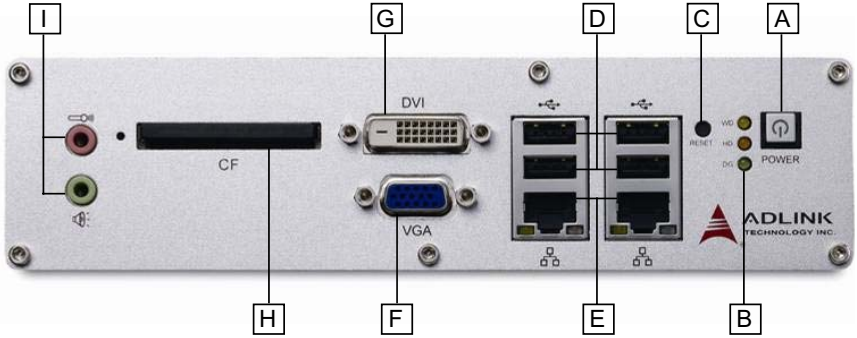


Figure 1-7: Front Panel I/O

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A	Power Button
B	LED Indicators
C	Reset Button
D	USB 2.0 connectors (Type A)
E	Gigabit Ethernet connectors
F	VGA connector
G	DVI connector
H	Compact-flash socket
I	MIC & speaker jacks

Table 1-1: MXE-1300 Front Panel I/O Connector Legend

1.6.1 Power Button

The power button is a non-latched push button with a blue LED indicator. System is turned on when button is pressed, and the power LED lit. To shut down the system, the operating system can be issued shutdown command in or just press the power button. If the system halts, press the button for 5 seconds also can turn off the system compulsorily.

1.6.2 LED indicators

Besides the LED attached in the power button, there are three LED indicators on the front panel. The following table describes the color and function of the LED indicators.

Indicator	Color	Description
Watchdog (WDT)	Yellow	When Watchdog Timer is started, flashes and lights when timer is expired.
Hard disk drive	Red	When the SATA interface device is active, blinks.
Diagnostic	Green	If no physical storage device is connected to the system, remians lit If no memory is installed in the SO-DIMM sockets, blinks.

Table 1-2: LED Indicators

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1.6.3 Reset Button

The reset button is used to perform hard reset for the MXE-1300.

1.6.4 VGA Connector

The MXE-1300 provides one VGA connector for display on external (D-sub 15P) monitor.

1.6.5 DVI-D Connector

The MXE-1300 provides one DVI-D connector for display on an external (DVI-D) monitor.


NOTE:

The high impedance of long VGA/DVI cables negatively affects video signal integrity at the receiver side.
It is recommended that VGA/DVI cables be less than 2 meters in length with effective shielding, such as UL style 2919 AWM. If video transmission distance is to exceed 10 meters, a VGA/DVI signal repeater or active KVM may provide better results..

1.6.6 USB 2.0 Connectors

The MXE-1300 provides a total of six USB 2.0 ports using Type A USB connectors, with four ports on the front and two on the rear panel. All are compatible with Hi-Speed, full-speed, and low-speed USB devices. All USB ports share one EHCI controller, and two USB ports share one UHCI controller. The MXE-1300 supports multiple boot devices, including USB flash drive, USB external hard drive, USB floppy, USB CD-ROM and etc. The boot priority and boot device can be configured in BIOS setting.

1.6.7 Compact-Flash Port

The MXE-1300 is equipped with a Type I Compact-Flash socket on the front panel. The CF interface provides +3.3V voltage to the CF card, is transferred from SATA by an ASIC, and can act as an alternative storage device for system installation. The MXE-1300 can be booted up via a CF card with OS installed. When the CF card is used as the boot device, it must be installed before system

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powerup. For installation details, see “Installing a CF Card” on page 32..

1.6.8 Gigabit Ethernet (Intel 82574L)

The MXE-1300 provides two Gigabit Ethernet ports on the front panel, and one on the rear, via the Intel 82574L controller. The Ethernet controller supports the following features:

- Advanced error reporting
- Message signaled interrupts
- TCP segmentation offload/large-send support
- 802.3x flow control-compliant
- IEEE 802.1p and 802.1q support
- 10/100/1000 IEEE 802.3-compliant
- Automatic MDI/MDIX crossover at all speeds
- ACPI 2.0 specification
- Wake-On-Link feature
- Preboot eXecution Environment (PXE) flash interface support

1.6.9 Active/Link & Speed LEDs



Figure 1-8: Active/Link & Speed LEDs

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Color	Status	Description
Yellow	OFF	Ethernet port is disconnected
	ON	Ethernet port is connected and no data transmission is underway
	Flashing	Ethernet port is connected and transmitting/receiving data.

Table 1-3: Active/Link LED

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

Table 1-4: Speed LED

1.6.10 MIC & Speaker Jacks

The MXE-1300 implements Intel High Definition audio on the REALTEK ALC269Q chip, with support up to 24-bit, 192 KHz sample rate high quality headphone output and microphone input. The pink jack is for microphone input, and the green jack for headphone output.

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1.7 Rear Panel I/O Connectors

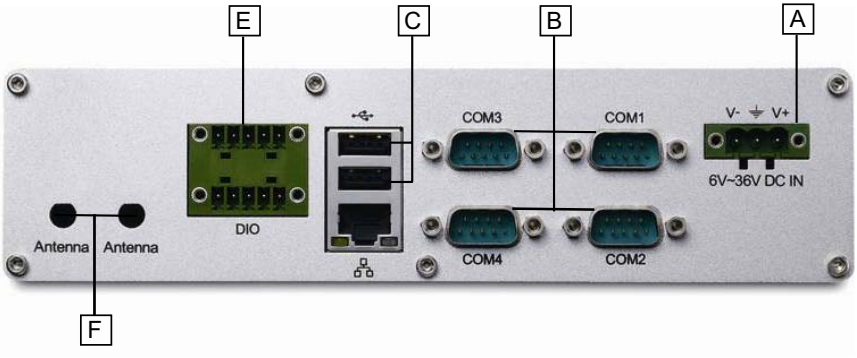


Figure 1-9: Rear Panel I/O

A	DC power supply connector
B	COM port connectors (DB9 x4)
C	USB 2.0 connectors (Type A)
D	Gigabit Ethernet connector
E	Digital I/O connector
F	Antenna connector (optional)

Table 1-5: MXE-1300 Rear Panel I/O Connector Legend

1.7.1 DC Power Supply Connector

The DC power supply connector consists of three pins, V+, chassis ground, and V- from right to left respectively. V+ and V- pins are for DC power input and chassis ground pin grounds the chassis for better EMC compatibility. DC power input of the MXE-1300 allows a voltage input range from DC 6 to 36V, with UVP (under voltage protect of 6V), OVP (over voltage protect of 36V), and reversed polarity protection.

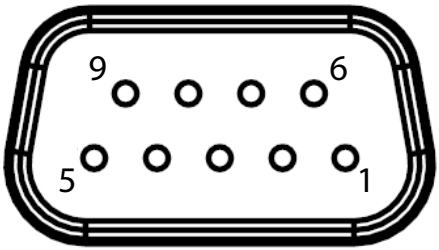
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WARNING:

Please ensure that DC power supply is within the input voltage range defined in the specification, stable and low-noise, and provides sufficient operating current.
Over- or under-voltage, unstable, or insufficiently powered DC power supply may cause system instability and physical damage.

1.7.2 COM Ports

The MXE-1300 provides 4 COM ports on the rear panel in the form of D-sub 9P connectors, configured as follows. COM1 & COM2 ports can support RS232/RS422/RS485 mode as set in BIOS, see “Serial Port 1~4 Configuration” on page 54..



- 2x Software-programmable RS-232/422/485 (COM1 & COM2) by DB9 connectors
- 2x RS-232 (COM3 & COM4) by DB9 connectors

PIN	Signal name		
	RS-232	RS-422	RS-485
1	DCD#	RXD422n	485n
2	RXD	RXD422p	485p
3	TXD	TXD422p	N/S
4	DTR#	TXD422n	N/S
5	GND	N/S	N/S
6	DSR#	N/S	N/S

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PIN	Signal name		
	RS-232	RS-422	RS-485
7	RTS#	N/S	N/S
8	CTS#	N/S	N/S
9	RI#	N/S	N/S

Table 1-6: D-sub 9P signal name of COM1 & COM2 ports

1.7.3 Digital I/O Connector

The MXE-1300 provides four channel non-isolation digital input circuits and four digital non-isolation output circuits through a terminal slot of pitch 3.81mm. Spec and connector pin numbering and definitions are as follows.

4-Channel Digital Input	4-Channel Digital Output
Logic high: 2 to 5.25 V	Output type: Open drain N-channel MOSFET driver with internal pull high of 200 Ω resistance
	Output high: 2.4 to 5 V
Logic low: 0 to 0.8 V	Output low: 0 to 0.5 V
	Source/Sink current for all channels: 24 mA

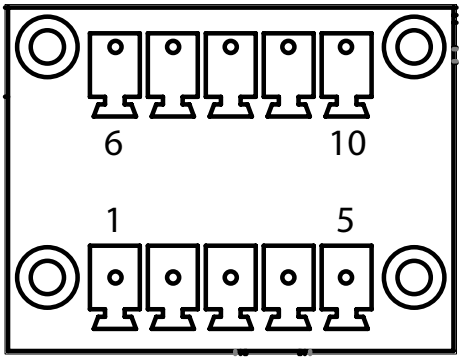
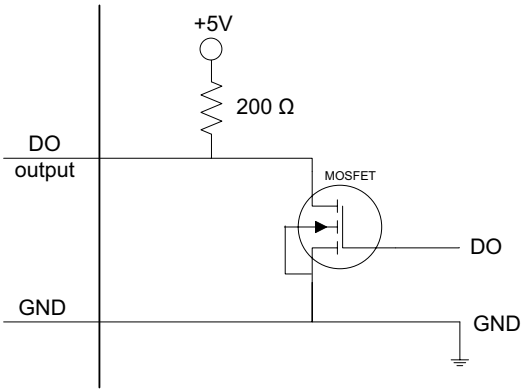


Figure 1-10: DI/O Connector Pin Numbering

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Pin	Description	Pin	Description
1	DI 0	6	DO 0
2	DI 1	7	DO 1
3	DI 2	8	DO 2
4	DI 3	9	DO 3
5	GND	10	GND

Table 1-7: DI/O Connector Pin Definition



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Figure 1-11: DO Schematic

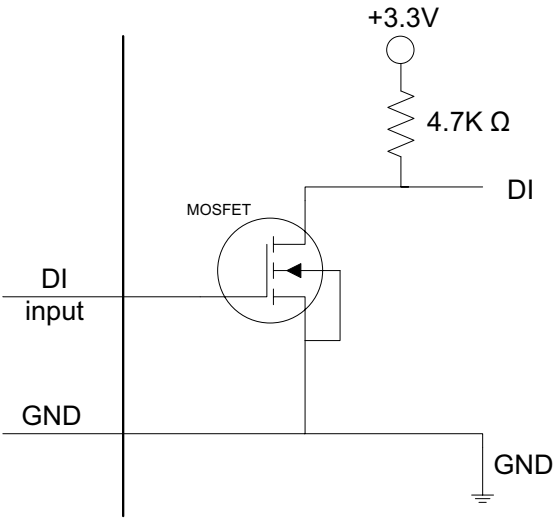


Figure 1-12: DI Schematic

1.7.4 Antenna Connector

The MXE-1300 provides two SMA type antenna connectors suitable for Wireless LAN and Wireless WAN modules of an internal Mini PCI Express card.

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1.8 Internal I/O Connectors

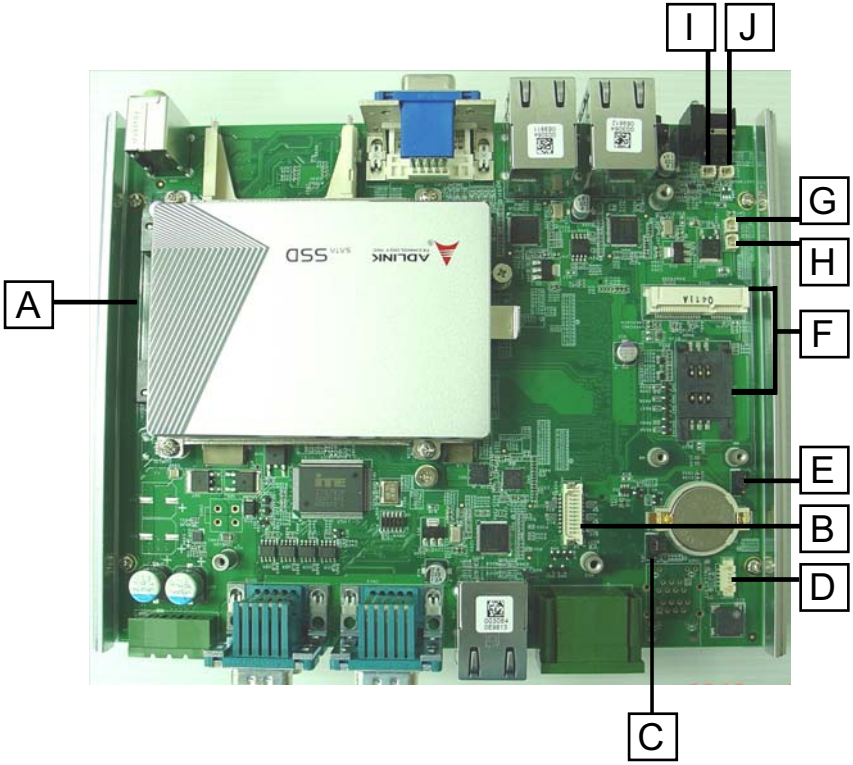


Figure 1-13: Internal I/O

A	SATA slot	F	Mini PCI Express slot & USIM Socket
B	LVDS interface connector	G	Extra +3.3V voltage internal connector
C	Clear CMOS jumper	H	Extra +5V voltage internal connector
D	LVDS backlight power connector	I	Reset button extend internal connector
E	LVDS voltage select jumper	J	Power button extend internal connector

Table 1-8: MXE-1300 Internal I/O Legend

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1.8.1 SATA Slot

The MXE-1300 provides a Gen 2 SATA port at 3.0 Gbit/s, compatible with SATA Gen 1 1.5Gbit/s. The SATA host controller supports legacy mode using I/O space and AHCI mode using memory space. This SATA connector accepts 2.5” and 3.5” (optional) HDD or solid state disk (SSD). The disk must be installed in the SATA connector with a HDD bracket. For installation information, see “Installing a Hard Disk Drive” on page 25.

1.8.2 LVDS Interface Connector (optional)

The MXE-1300 provides an internal LVDS interface connector, supporting single channel up to 1366*768 24-bit resolution, with pin numbering and definition as follows.

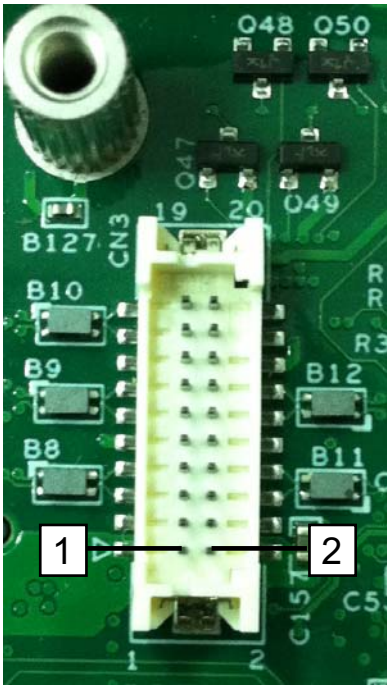


Figure 1-14: LVDS Pin Numbering

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Pin	Signal	Pin	Signal
1	+LVDS_VCC	2	+LVDS_VCC
3	GND	4	GND
5	LVDS_CLK+	6	LVDS_TXP2
7	LVDS_CLK-	8	LVDS_TXN2
9	GND	10	GND
11	LVDS_TXP0	12	LVDS_TXP3
13	LVDS_TXN0	14	LVDS_TXN3
15	GND	16	GND
17	LVDS_TXP1	18	LVDS_DCLK
19	LVDS_TXN1	20	LVDS_DDAT

Table 1-9: LVDS Interface Connector Pin Definition

1.8.3 Clear CMOS Jumper

Upon encountering an abnormal condition preventing the MXE-1300 from booting, the jumper can clear the BIOS content stored in CMOS and restore default settings. To clear CMOS, short pin #2 to pin #3 of JP1 and then return to normal mode (short pin #1 to pin #2).

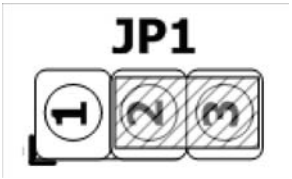
Normal	Clear
	

Table 1-10: Clear CMOS Jumper

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1.8.4 LVDS Backlight Power Connector (option)

The MXE-1300 internal LVDS backlight power connector supports +5V and +12V, with numbering and pin definitions as follows.

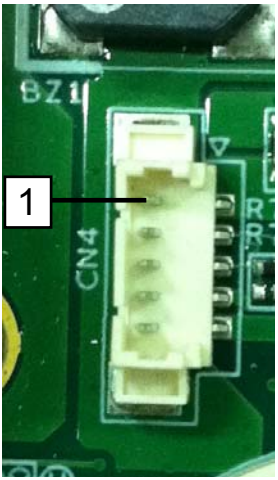


Figure 1-15: LVDS Backlight Power Connector Pin Numbering

Pin	Description
1	+5V
2	Backlight Enable
3	Backlight Control
4	GND
5	+12V

Table 1-11: LVDS Backlight Power Connector Pin Definition

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1.8.5 LVDS Voltage Selected Jumper (optional)

The MXE-1300 can support +3.3V and +5V for the LVDS power panel, with power of the LVDS interface (+LVDS_VCC) selected by internal jumper. default jumper setting is 5 V, as follows.

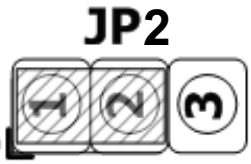
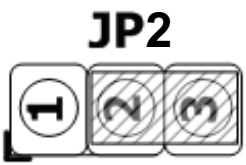
+LVDS_VCC: +5V	+LVDS_VCC: +3.3V
	

Table 1-12: LVDS Voltage Selected Jumper

1.8.6 Mini PCI Express Slot & USIM Socket

The MXE-1300 features a Mini PCI Express slot providing functional expansion with, for example, wireless LAN module, wireless WAN module, GPS module, and others. Conforms to PCI Express Mini Card Electromechanical Specification Revision 1.2.

The USIM Socket allows a wireless WAN module for wireless communication with a telecom operator, connected to a Mini PCI Express module. SIM card and Wireless WAN module can be installed to facilitate wireless wide area network communication.

1.8.7 Extra +3.3 V/ +5 V Voltage Internal Connectors

Internal +3.3V and +5V connectors support up to 1A current of +3.3V and +5V to the Mini PCI Express card if needed, such as for wireless WAN or GPS card. Pin numbering and definition are as follows.

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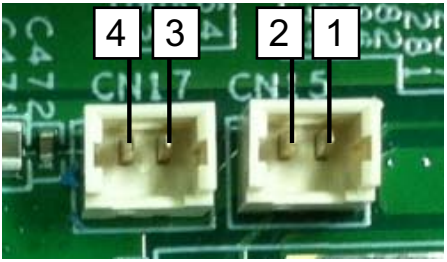


Figure 1-16: +3.3 V/ +5 V Voltage Internal Connectors Pin Numbering

Pin	Description
1	+5V
2	GND
3	+3.3V
4	GND

Table 1-13: +3.3 V/ +5 V Voltage Internal Connectors Pin Definition

1.8.8 Reset/Power Button Extension Internal Connector

Internal reset and power button extension connectors extend power and reset button function to external controllable devices, with pin numbering and definition of the two connectors as follows.

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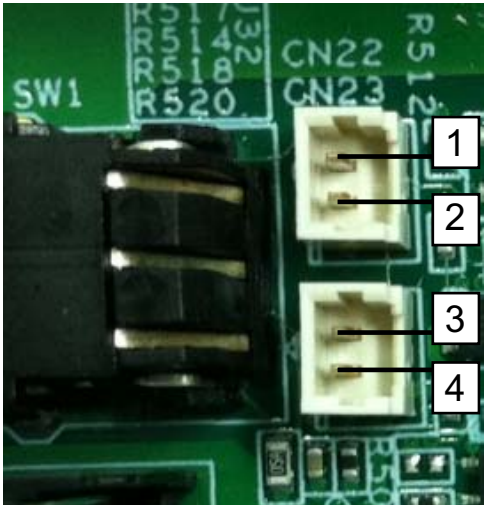


Figure 1-17: Reset/Power Button Extension Internal Connector Pin Numbering

Pin	Description
1	Power button
2	GND
3	Reset button
4	GND

Table 1-14: Reset/Power Button Extension Internal Connector Pin Definitions

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2 Getting Started

This chapter demonstrates installation of a hard disk drive and CompactFlash card. In addition to connection and use of DI/O, wall-mounting instruction is also provided.

2.1 Installing a Hard Disk Drive

Before installing a hard disk drive, remove the bottom cover of the chassis as follows.

1. Use a #3 hex wrench to unscrew all 6 screws (M3 hex bolts) from the front panel.



2. Remove the 4 fixing members from the front panel and remove the panel.

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3. Remove the 6 screws from the rear panel.

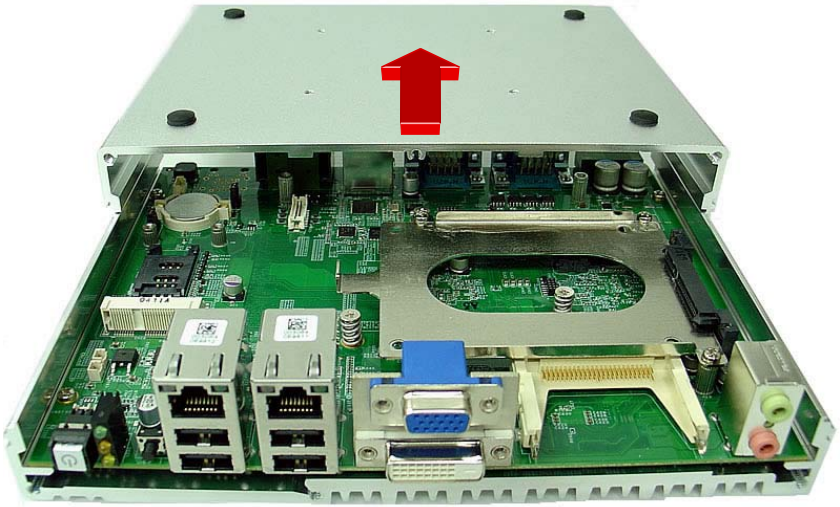


4. Remove the 8 fixing members from the rear panel and remove the panel.

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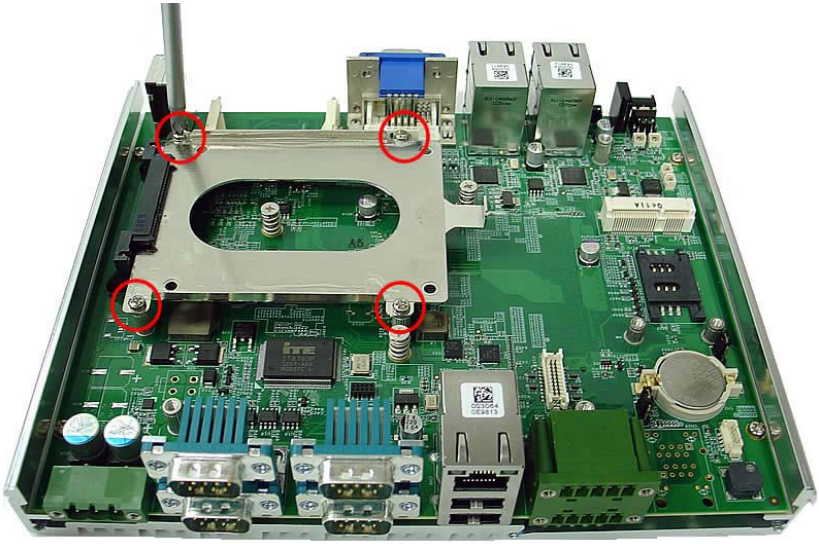


5. Remove the bottom chassis by sliding it off the top chassis.



6. The MXE-1300 ships with an attached empty HDD bracket. Unscrew the 4 screws and remove the HDD bracket.

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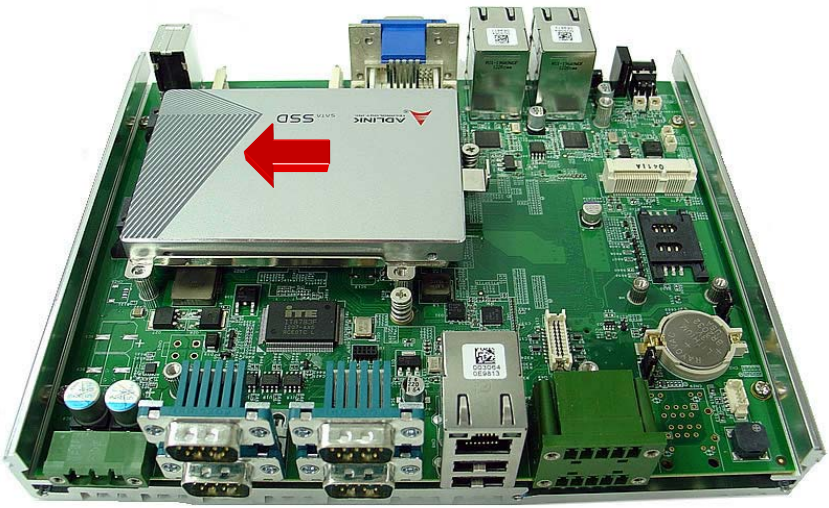


7. Use the 4 M3-F head screws provided to fix a 2.5” HDD or SSD to the bracket.



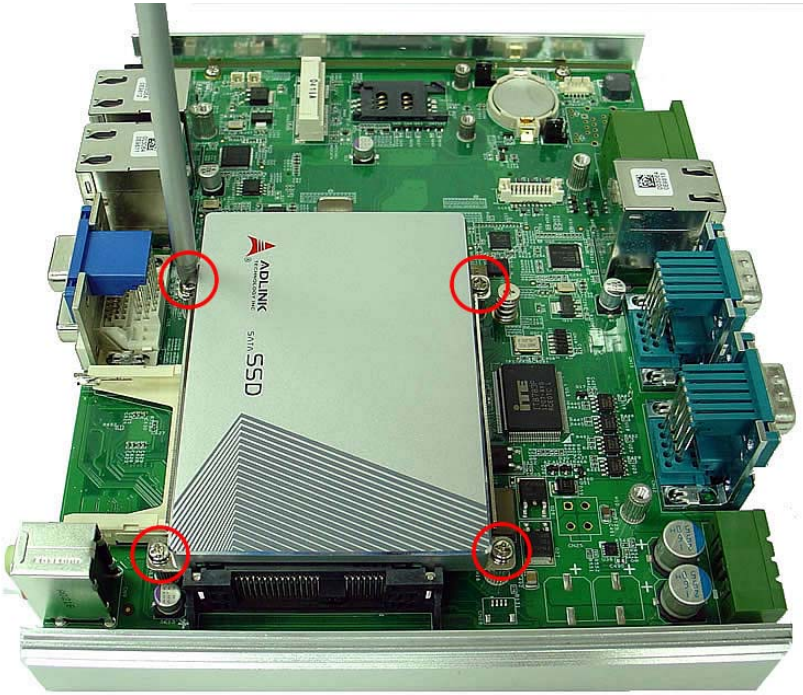
8. Connect the 2.5’’ HDD or SSD to the SATA connector.

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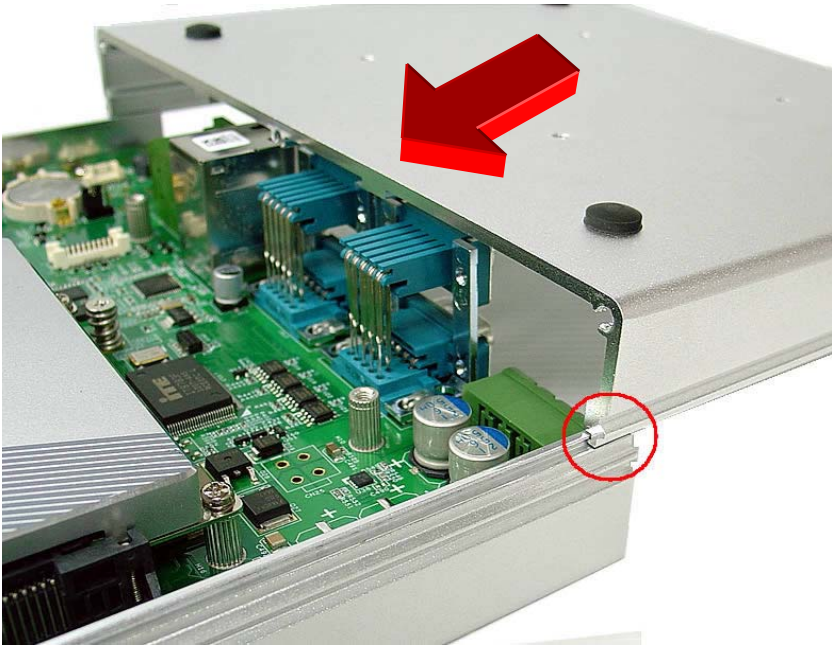
9. Fasten the 4 screws to fix the HDD bracket to the fixing members.

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10. Align the sliding parts as shown and reassemble the bottom chassis to the top chassis.

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11. Reinstall the front and rear panels and fasten 12 screws (M3 hex bolts) and 12 fixing members into the front and rear panels.

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2.2 Installing a CF Card

The MXE-1300 series provides a CompactFlash socket on the front panel to accommodate one CF card. A SATA HDD or SSD and CF card can further be simultaneously installed, and boot device preferences set in the BIOS. To install the CF card:

1. Remove and rotate the CF cover to expose the slot.



2. Gently insert the CF card into the CF socket.



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3. Rotate the CF cover to its original position and replace.



2.3 Connecting DI/O Device

The MXE-1300 series controller provides 4 digital input and 4 digital output ports. The two pluggable terminals provided enable connection to the DI/O device.

Connect the two pluggable terminals to the DI/O connector on the rear panel. Fix the pluggable terminal using the 2 screws.



For DI/O pin definitions, See “Digital I/O Connector” on page 15..

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2.4 Connecting DC power

WARNING:

Before providing DC power to the MXE-1300, ensure voltage and polarity provided are compatible with the DC input. Improper input voltage and/or polarity can be responsible for system damage.

The MXE-1300 DC power input connector utilizes V+, V- , and chassis ground pins, and accepts input voltage as discussed.

Connect the DC power connector and fix using the 2 screws.



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2.5 Wall-mounting the MXE-1300

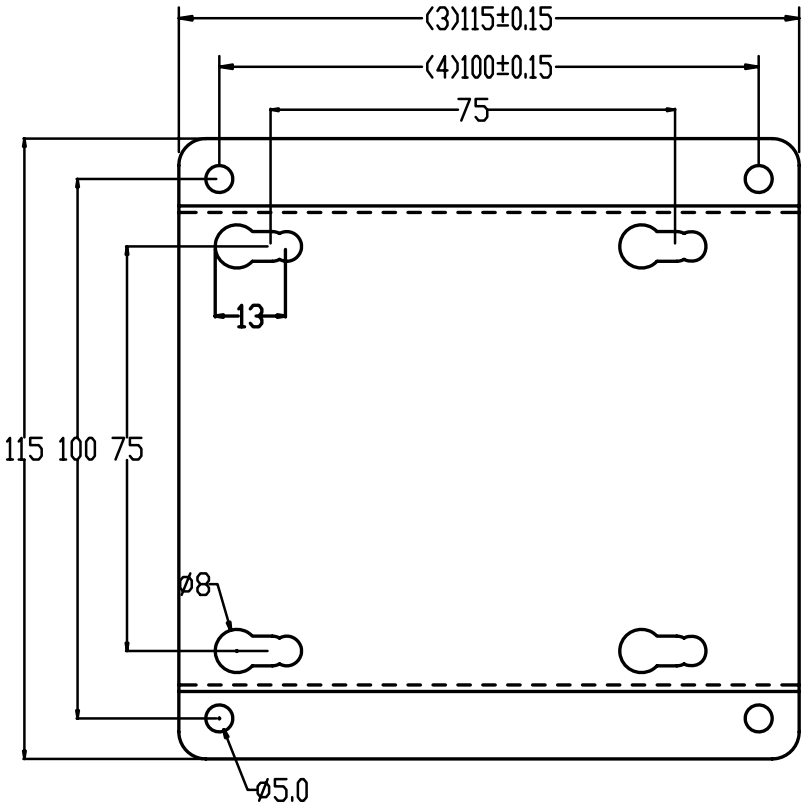
The MXE-1300 is shipped with a VESA 100 wall-mount brackets and accessory screws. The bracket has four M4 mounting holes with a pitch of 100 mm, allowing fixture to any VESA 100 compatible mounting mechanism. The mounting bracket enables the MXE-1300 series controller to be mounted on a wall or the back of a monitor. To wall-mount the MXE-1300:

1. Prepare the wall-mount brackets and 4 M4 screws provided.



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2. Fasten the 4 screws to fix the bracket to the desired mounting surface (wall or monitor) as shown.



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3. Fasten the 4 dedicated mounting screws provided into the holes on the bottom of the MXE-1300.



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4. Depress the MXE-1300 until a click is heard. The chassis is now locked to the mounting bracket

2.6 Cooling Configuration

Heat-generating components of the MXE-1300 (such as CPU and PCH) are all situated on the left side of the system. These components directly contact the heat sink via thermal pads and dissipate heat generated by the components. To maximize efficiency of heat dissipation, maintain a minimum of 2 inches (5 cm) clearance on the top of the MXE-1300.

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3 Driver Installation

After installing the operating system, all related drivers must be installed for the system to function properly. This section describes the drivers needed for Windows operating systems and the procedures to install them. For other OS support, please contact ADLINK for further information.

Install drivers as follows.

1. Fully install Microsoft Windows OS before installing any drivers. Most standard I/O device drivers have been included in Microsoft Windows OS. For Windows 7 users, please note that you need Administrator privilege to install the drivers properly.
2. Install the chipset driver.
3. Install the graphics driver.
4. Install the Ethernet driver.
5. Install the audio driver.
6. Install the WDT (watchdog timer) driver.
7. Install the DI/O driver.

3.1 Installing the chipset driver

This section describes installation of the chipset driver for the MXE-1300. The chipset driver directs the operating system to configure the Intel® NM10 chipset components in order to ensure that the following features function properly:

- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

Microsoft Windows 7 must be fully installed and running on the system before installing this software:

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The following steps install the chipset driver for the MXE-1300

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory
   x:\Driver Installation\Matrix\MXE-1300\Chipset
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

3.2 Installing the graphics driver

This section describes installation of the graphics driver for the MXE-1300. The MXE-1300 is equipped with the Intel® Graphics Media Accelerator Driver package, which supports Windows 7.

To install the graphics driver:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The graphics driver is located in the directory
   x:\Driver Installation\Matrix\MXE-1300\Graphics
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

3.3 Installing the Ethernet driver

This section describes installation of the Ethernet driver for the MXE-1300. To install the driver for the Intel 82547 Gigabit Ethernet controller:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The Ethernet driver is located in the directory

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x:\Driver Installation\Matrix\MXE-1300\LAN-Intel\
where x: denotes the DVD-ROM drive.

3. Execute setup.exe and follow onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

3.4 Installing the audio driver

This section describes installation of the audio driver for the MXE-1300. The MXE-1300 supports High Definition audio using the Realtek ALC269 audio codec. To install the audio driver:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The audio driver is located in the directory
   x:\Driver Installation\Matrix\MXE-1300\Audio\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

3.5 Installing the WDT and DI/O drivers

A WDT (watchdog timer) is a hardware mechanism resetting the system when the operating system or application is halted. A typical usage of WDT is to start the timers and periodically reset the timer, and when timer is expired, the system resets. The WDT driver must be installed to program the WDT.

The MXE-1300 also provides 4 channel DI and 4 channel DO. WDT and DI/O Driver/ API driver packages must be installed to access and use the DI/O feature.

To install the WDT and DI/O drivers for the MXE-1300:

Close any running applications.

Ensure you have Administrator privilege.

Download Microsoft® Visual C++ 2005 Redistributable Package x86 or x64 version from: http://www.microsoft.com/en-us/download/details.aspx?id=3387

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Insert the ADLINK All-in-One DVD. The WDT driver is located in the directory:
x:\Driver Installation\Matrix\MXE-1300\WDT_DI/O\
where x denotes the DVD-ROM drive.

Run Setup.exe and follow the onscreen instructions to complete setup.

After complete installation, reboot the system.

WDT, DI/O API library and sample programs are located in the MXE1300_WDT folder, default location of “C:\Program Files\ADLINK\MXE1300_WDT”


NOTE:

Administrator privilege is required to use the WDT API in Windows 7.

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Appendix A: Watchdog Timer (WDT) & DI/O Function Libraries

This appendix describes use of the watchdog timer (WDT) function library for the MXE-1300.

The watchdog timer is a hardware mechanism provided to reset the system if the operating system or an application stalls. After starting, the watchdog timer in the application must be periodically reset before the timer expires. Once the watchdog timer expires, a hardware-generated signal is sent to reset the system.

DI/O provides input/output to support inter-device communications. Simple programming guides allow easy transmission of digital signals between the system and attached peripherals.

A.1 WDT with API/Windows

Matrix WDT API library files and a demo program (incl. source code) can be found on the included driver CD or downloaded from http://www.adlinktech.com.

To use the WDT function library for MXE-1300 series, include the header file WDT.h and linkage library WDT.lib in the C++ project.

InitWDT

Initializes watchdog timer function of MXE-1300. InitWDT must be called before the invocation of any other WDT function.

@ Syntax

C/C++

```
BOOL InitWDT()
```

@ Parameters

None

@ Return code

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer fails to initialize.

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SetWDT

Sets the timeout value of the watchdog timer. There are two parameters for this function to indicate the timeout ticks and unit. ResetWDT or StopWDT should be called before the expiration of watchdog timer, or the system will reset.

@ Syntax

C/C++

```
BOOL SetWDT(BYTE tick, BYTE unit)
```

@ Parameters

`tick`

Specify the number of ticks for watchdog timer. A valid value is 1 - 255.

`unit`

Specify the timeout ticks of the watchdog timer.

Value	Description
0	The unit for one tick is one second. For example, when one tick is specified as 100 and the unit as 0, the timeout value is 100 seconds.
1	The unit for one tick is one minute. For example, whenone tick is specified as 100 and the unit as 1, the timeout value is 100 minutes.

@ Return codes

TRUE if timeout value of watchdog timer is successfully set.

FALSE if timeout value of watchdog timer is failed to set.

StartWDT

Starts watchdog timer function. Once the StartWDT is invoked, the watchdog timer starts. ResetWDT or StopWDT should be called before the expiration of watchdog timer, or the system will reset.

@ Syntax

C/C++

```
BOOL StartWDT()
```

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@ **Parameters**

None

@ **Return codes**

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer is failed to start.

ResetWDT

Resets the watchdog timer. The invocation of ResetWDT allows restoration of the watchdog timer to the initial timeout value specified in SetWDT function. ResetWDT or StopWDT should be called before the expiration of the watchdog timer, or the system will reset.

@ **Syntax**

C/C++

```
BOOL ResetWDT()
```

@ **Parameters**

None

@ **Return codes**

TRUE if watchdog timer is successfully reset.

FALSE if watchdog timer fails to reset.

StopWDT

Stops the watchdog timer.

@ **Syntax**

C/C++

```
BOOL StopWDT()
```

@ **Parameters**

None

@ **Return codes**

TRUE if watchdog timer is successfully stopped.

FALSE if watchdog timer fails to stop.

A.2 DI/O with API/Windows

Matrix DI/O API library files and a demo program (incl. source code) are located on the included driver CD or downloaded from http://www.adlinktech.com.

DI/O functions are as follows.

GPIO_Init

Reserves system resources for digital input/output API service.It is necessary to call this function before using other MXE-1300 DI/O functions.

@ **Syntax**

C/C++

```
I16 GPIO_Init(void)
```

@ **Parameters**

None

@ **Return code**

```
NoError
ErrorOpenDriverFailed
ErrorDeviceIoctl
```

GPI_Read()

Reads the digital logic state of the digital input line..

@ **Syntax**

C/C++

```
I16 GPI_Read(U16 *pwState)
```

@ **Parameters**

pwState

Returns the digital logic state of MXE-1300 digital input channels 1~4 (bit 0~3)

@ **Return code**

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```
NoError
ErrorOpenDriverFailed
ErrorDeviceIoctl
```

GPO_Write()

Sets the digital logic state of the digital output line.

@ Syntax

C/C++

```
I16 GPO_Write(U16 wState)
```

@ Parameters

State

Sets the digital logic state of MXE-1300 digital output channels 1~4 (bit 0~3) to 0 or 1.

@ Return code

```
NoError
ErrorOpenDriverFailed
ErrorDeviceIoctl
```

GPO_Read()

Reads the digital logic state of the digital output line.

@ Syntax

C/C++

```
I16 GPO_Read(U16 *pwState)
```

@ Parameters

pwState

Returns the digital logic state of MXE-1300 digital output channels 1~4 (bit 0~3).

@ Return code

```
NoError
ErrorOpenDriverFailed
ErrorDeviceIoctl
```

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Appendix B: BIOS Setup



BIOS options in the manual are for reference only, and are subject to configuration. Users can contact their hardware provider for the latest BIOS version.

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 MXE-1300. The BIOS setup program includes menus for configuring settings and enabling features of the MXE-1300 series. Most users do not need to use the BIOS setup program, as the MXE-1300 ships with default settings that work well for most configurations.

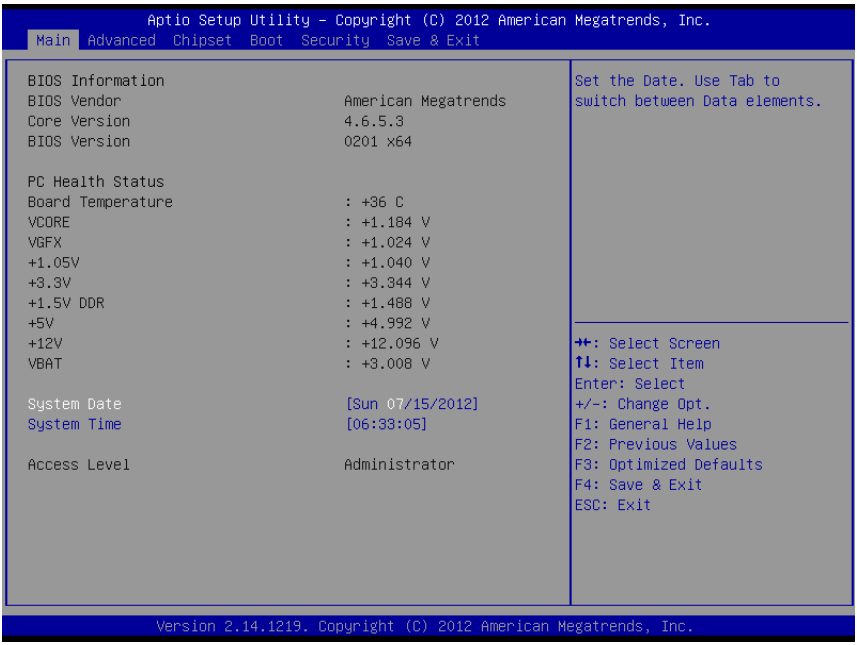


Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot. In such a case, Section 1.8.3 on page 20 provides instruction on clearing the CMOS and restoring default settings

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B.1 Main

Contains basic system information for the MXE-1300.



B.1.1 BIOS Information

BIOS Vendor: Provider of the BIOS code

Core Version

BIOS Version: Current BIOS version

B.1.2 PC Health Status

Indicates CPU Temperature and voltages for CPU, VGFX, +1.05V, +3.3V, +1.5V, +5V, +12.0V, VBAT.

B.1.3 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.

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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:

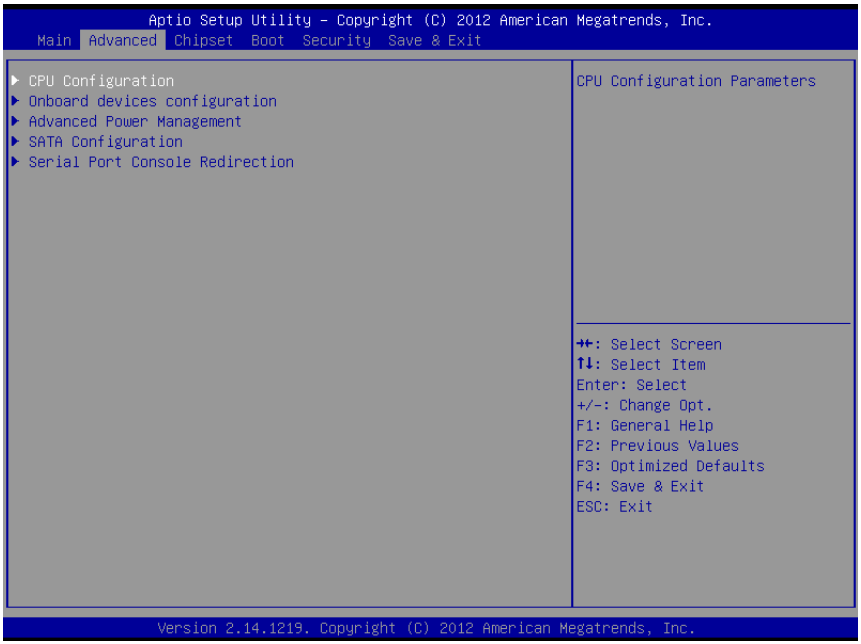
The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

B.2 Advanced

CAUTION:

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

Accesses advanced options of the MXE-1300.



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B.2.1 CPU Configuration



Displays:

- Processor Type
- EMT64 Support
- Processor Speed
- System Bus Speed
- Ratio Status
- Actual Ratio
- Processor Stepping
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- Processor Core
- Hyper-threading Support

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And settings for

Hyper-Threading

Enabled for Windows XP and Linux (OS is optimized for Hyper-Threading Technology) and disabled for other OS (OS not optimized for Hyper-Threading Technology).

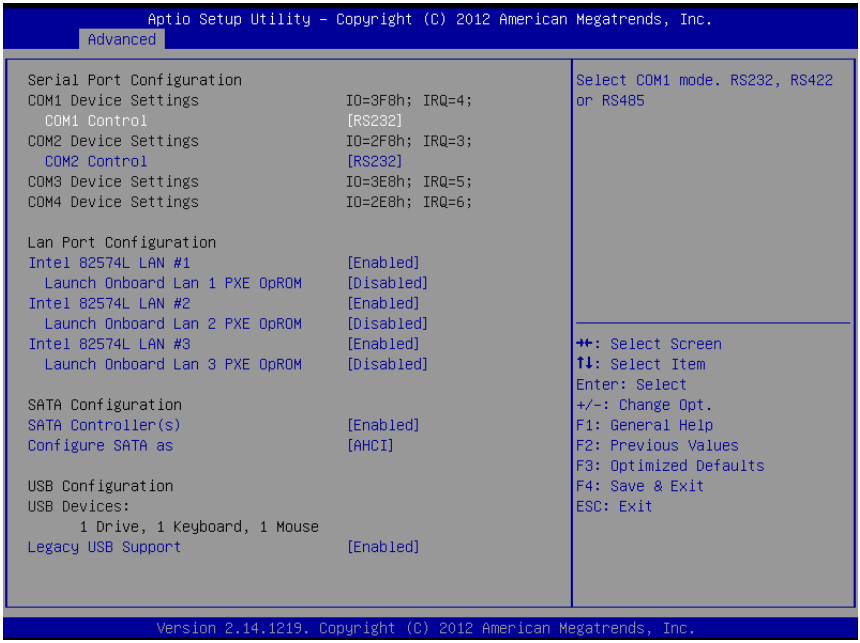
Execute Disable Bit

Enabled in XP, can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS.

Limit CPUID Maximum

Disabled for Windows XP.

B.2.2 Onboard Device Configuration



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Serial Port 1~4 Configuration

Port type (RS-232/422/485) is controllable for Serial Ports 1 and 2 only.

Intel 82574L LAN #1

Enables/Disables onboard Intel 82574L LAN controller.

Launch Intel 82574 LAN PXE OpROM

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

Intel 82574L LAN #2

Enables/Disables onboard Intel 82574L LAN controller.

Launch Intel 82574 LAN PXE OpROM

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

Intel 82574L LAN #3

Enables/Disables onboard Intel 82574L Lan controller.

Launch Intel 82574 LAN PXE OpROM

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

SATA Controller(s)

Enables/Disables internal serial ATA controller.

SATA Mode Selection

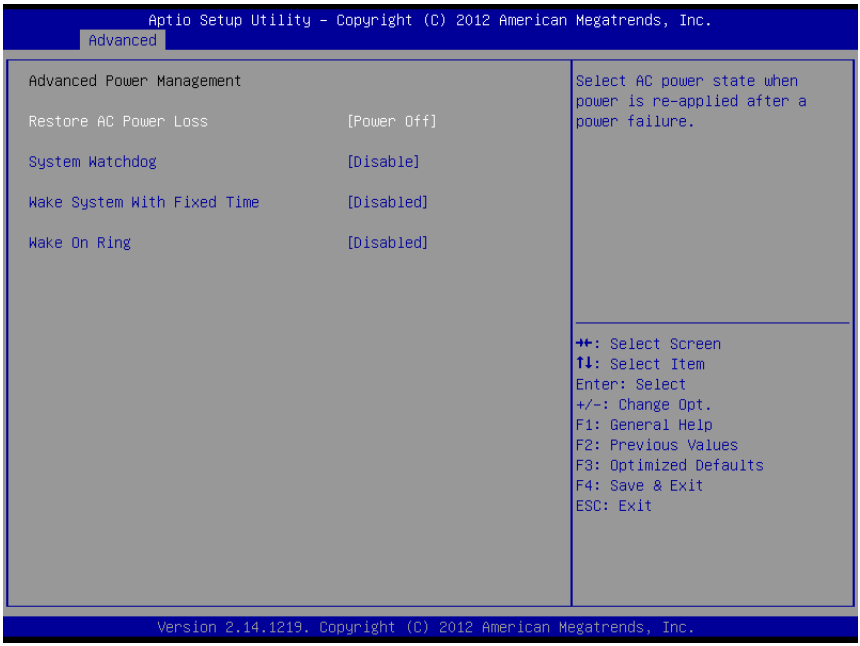
Allows selection of SATA channel configuration, from IDE Mode or AHCI Mode

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Legacy USB Support

Enables Legacy USB Support, with AUTO disabling if no USB devices are connected, and DISABLE maintaining USB devices available only for EFI applications.

B.2.3 Advanced Power Management



Restore AC Power Loss

Determines the state the computer will enter when power is restored after a power loss, from among Last State, Power On and Power Off, as follows

Option	Description
Power Off	When enabled, powers off the system when power is restored.
Power On	When enabled, powers on the system when power is restored.

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Option	Description
Last State	When enabled, powers the system off or on depending on the previous system power state while power is restored.

System Watchdog

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

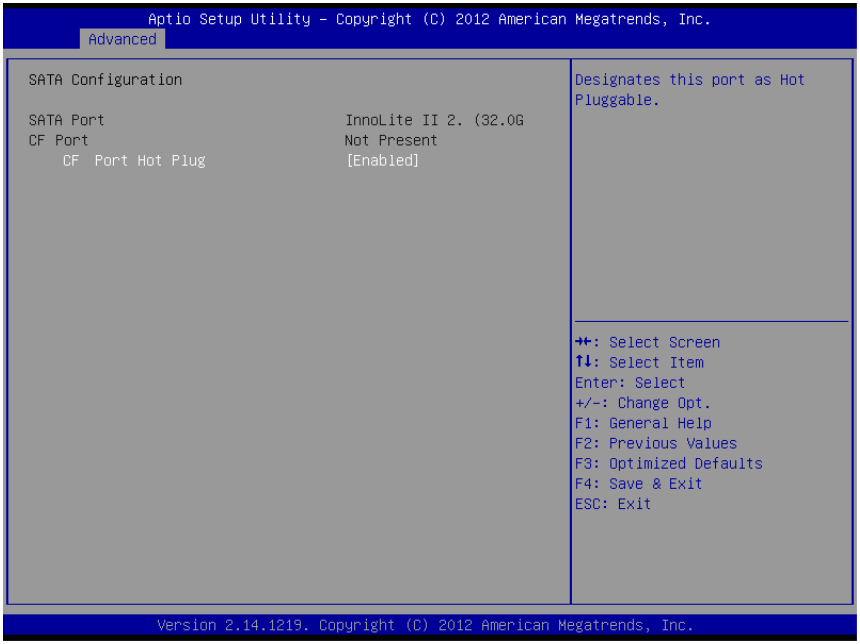
Wake System With Fixed Time

Enables/disables system wake on alarm event.

Wake On Ring

Enables/disables system wake on RI event.

B.2.4 SATA Configuration



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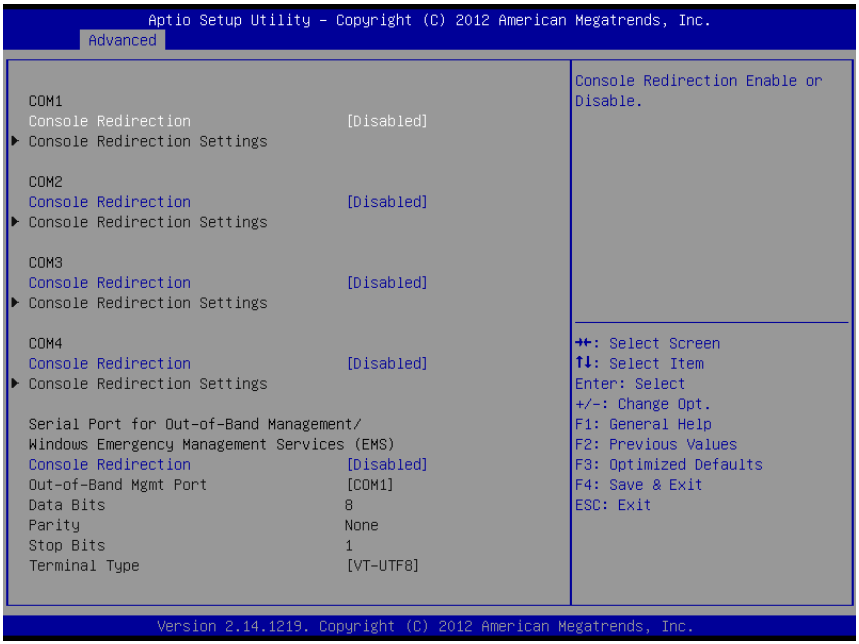
Displays status ionformation for:

SATA Port

CF Port

And allows setting of CF Port Hot Plug.

B.2.5 Serial Port Console Redirection



Provides redirection and settings for COMs 1 to 4.

Also displays current status of miscellaneous parameters for COM Ports.

As well, the following Serial Port for Out-of-Band Management/ EMS settings can be made:

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Console Redirection

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

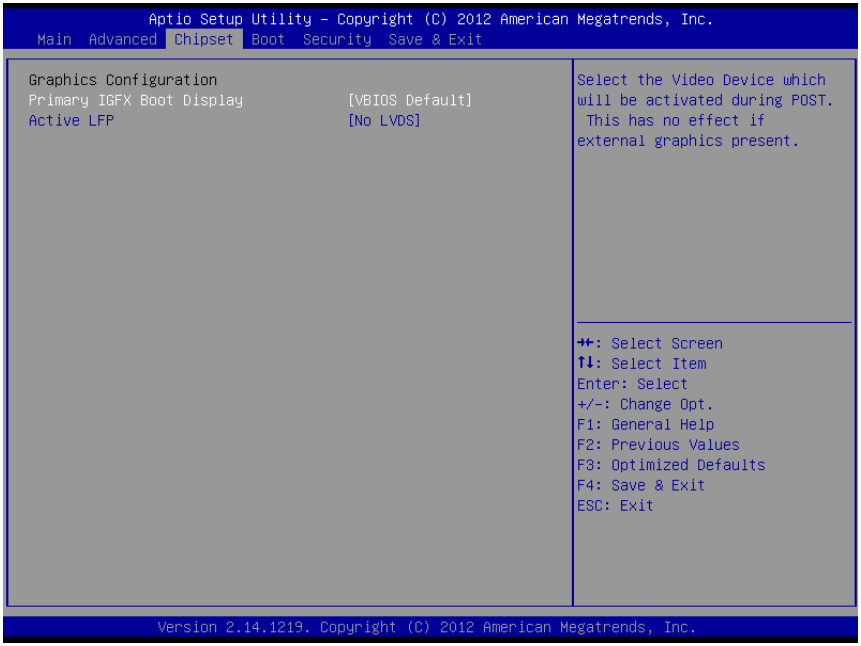
Out-of-Band Mgmt Port

Selects the COM Port for remote management of a Windows OS.

Terminal Type

Selects the transmission protocol for remote terminal console.

B.3 Chipset



Primary IGFX Boot Display

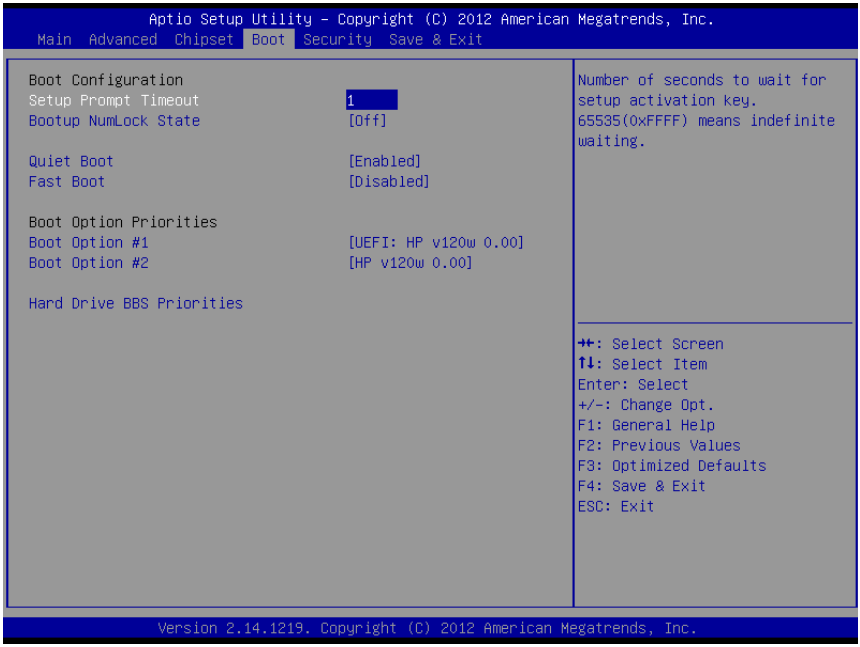
Selects the video device to be activated during POST.

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Active LFP

Selects the Active LFP configuration.

B.4 Boot



Setup Prompt Timeout

Sets the number of seconds for the setup activation key (“DEL”) to remain active.

Bootup Num-Lock State

Allows the Number Lock setting to be modified during boot.

Quiet Boot

When disabled, BIOS displays POST messages, and when enabled, BIOS displays the OEM logo.

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Fast Boot

When disabled, BIOS performs all POST tests. When enabled, BIOS to skips selected POST tests to boot faster.

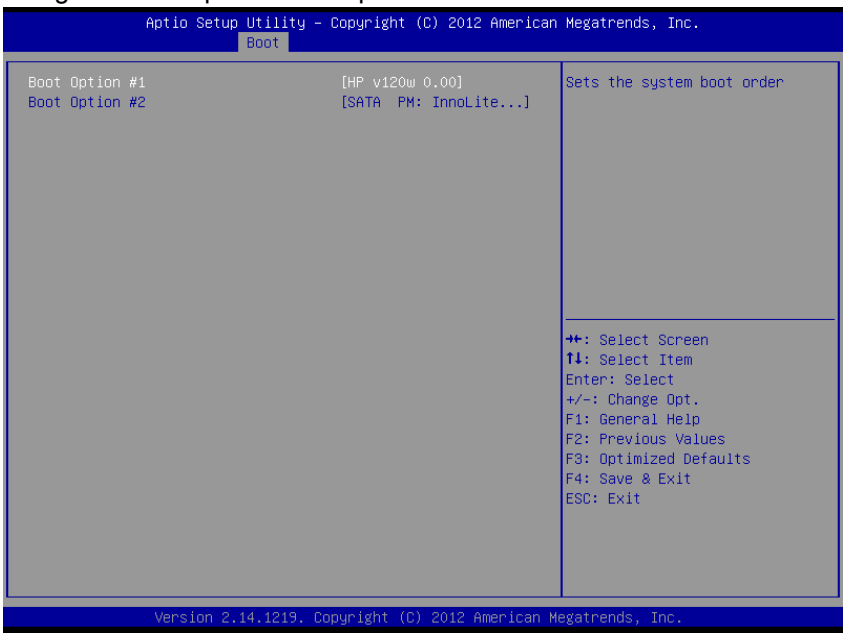
NOTE: While enabling Fast Boot can reduce the ready time of system, some startup parameters will be assumed and may not function as expected.

Boot Option Priorities

Specifies the priority of boot devices. All installed boot devices are detected during POST and displayed. Selection of the target Boot Option # selects the desired boot device.

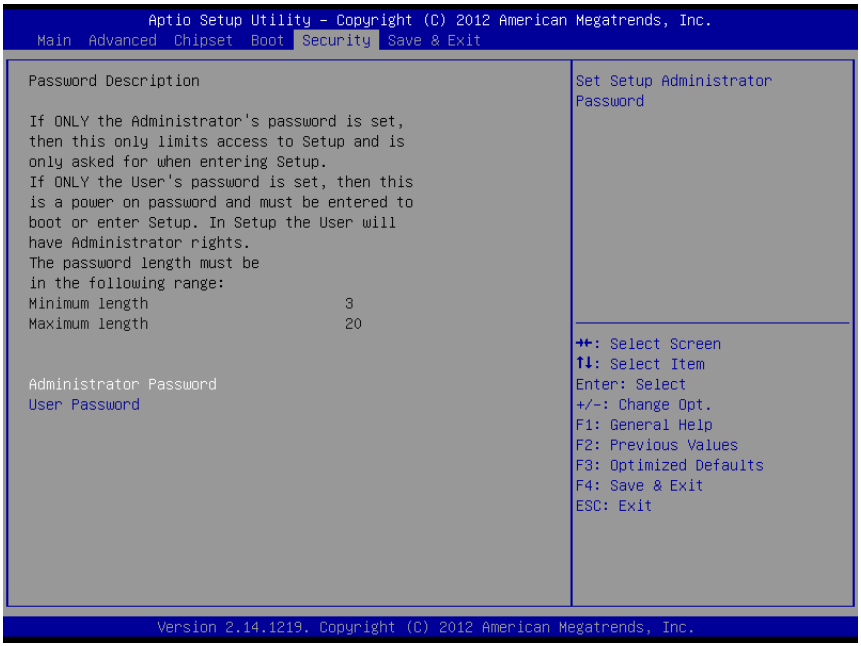
Hard Drive BBS Priorities

Selects the HDD to be displayed in the Boot Option Priorities listing when multiple HDD are present.



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B.5 Security



If only the Administrator's password is set, only access to Setup is limited and requests the password. If only User's password is set, the password is requested at power up to boot or enter Setup, in which the user is grated Administrator rights.

Administrator Password

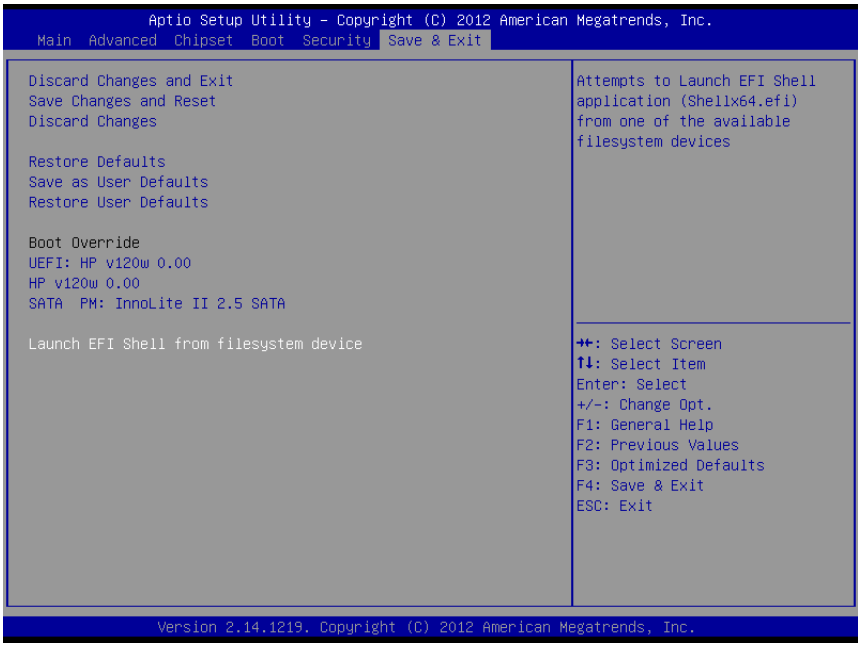
Sets Setup Administrator password

User Password

Sets Boot/Setup User password

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B.6 Save & Exit



Discard Changes and Exit

Discards all changes and exits BIOS setup.

Save Changes and Reset

Saves all changes and reboots the system to activate new settings.

Discard Changes

Resets system setup without saving any changes.

Restore Defaults

Resets all BIOS options to the complete default settings. Default settings, while designed for maximum system stability, may impact

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performance. Restore Defaults Setup is indicated if the computer encounters system configuration problems.

Save as User Defaults

Saves all changes made as user defaults.

Restore User Defaults

Restores the user defaults to all setup options.

Launch EFI Shell from filesystem device

Attempts to launch an EFI Shell application (Shellx64.efi) from one available filesystem device.

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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.



There is risk of explosion if the battery is replaced with 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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