MXE-5300 Series

5301/5302/5303

Fanless Embedded Computer

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	Dec. 23, 2011	Initial release

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Preface

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Conventions

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



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



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



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

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1 Introduction

1.1 Overview



The Matrix MXE-5300 series is the latest addition to ADLINK's Matrix E line, based on the Intel® Core™ i7-2710QE quad-core processor, providing a performance boost of almost 150% with minimal increase in power consumption, and outstanding computing power tailored to a variety of specific application needs.

Featuring new simplified system component replacement and maintenance, the MXE-5300 allows effortless access to storage, memory, and wireless modules. Leveraging proprietary mechanical engineering, the MXE-5300 series also retains all the popular features of the Matrix E series, including rugged -20 to 70°C (w/ SSD) fanless operation, 5 Grms vibration resistance, and 9-32V wide range DC input.

In addition, the MXE-5300 provides dual mini-PCIe sockets and a USIM socket supporting wireless protocols such as 3G, GPS, WIFI, and Bluetooth. ADLINK's proprietary wireless enhancement technology empowers the MXE-5300 to deliver industrial-grade wireless performance.

The MXE-5300 accommodates Intel® Active Management Technology 7.0, for remote system management, enabling easy maintenance, diagnosis, update, and even BIOS configuration tasks on the MXE-5300 via Ethernet connection.

Combing superior processor performance, innovative mechanical design, flexible wireless capability, and rich IO, all in a compact

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package, the ADLINK MXE-5300 is an ideal choice for a wide range of applications.

1.2 Features

- Intel® Core™ i7-2710QE/i5-2510E/i3-2330E processor + Intel® QM67 chipset
- Rugged, up to -20°C to 70°C fanless operation (w/SSD)*
- Intel® Active Management Technology 7.0 support
- ADLINK proprietary wireless enhancement technology
- One onboard SATA-III port
- 2 software-programmable RS-232/422/485 (COM1 & COM2), 2 RS-232
- 4 USB 2.0 ports & 2 USB 3.0 ports
- Four 1000/100/10 Mbps Ethernet ports (2 Realtek® 8111C + 1 Intel® 82574IT + 1 Intel® 82579 PHY)
- One external CFAST socket


NOTE:

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

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1.3 Specifications

	MXE-5301	MXE-5302	MXE-5303
System Core			
Processor	Intel® Core™ i7-2710QE	Intel® Core™ i5-2510E	Intel® Core™ i3-2330E
Chipset	Intel® Mobile Platform Controller Hub (QM67)		
Video	VGA+DVI dual display output by DVI-I connector Analog CRT, supports QXGA (2048 x 1536) res. DVI output, supports up to 1920 x 1080 res.		
Memory	4 GB DDR3 1066 MHz SODIMM module (Up to 8 GB support)		
I/O Interface			
Ethernet	4 GbE ports (2 Realtek® 8111C + 1 Intel® 82574IT + 1 82579 PHY)		
Serial Ports	2 software-programmable RS-232/422/485 (COM1 & COM2) 2 RS-232 (COM3 & COM4)		
USB	4 USB 2.0 ports & 2 USB 3.0 ports		
DIO	4 DIO w/ 1.5KV isolation		
Audio	1 mic-in and 1 speaker-out		
KB/MS	1 PS/2 keyboard and 1 PS/2 mouse (combo)		
Mini PCIe	2 internal PCIe mini card sockets		
USIM	1 USIM socket for 3G communication (used for a 3G-mini module)		
WDT	Supports watchdog timer		
Power Supply			
DC Input	Built-in 9-32 VDC wide-range DC input 3P pluggable connectors with latch (GND, V-, V+)		

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	MXE-5301	MXE-5302	MXE-5303
AC Input	Optional 160 W external AC-DC adapter for AC input		
Storage			
SATA HDD	1 onboard SATA-III port for 2.5" HDD/SSD installation		
CompactFlash	1 CFAST slot, supporting PIO and DMA modes		
eSATA	1 eSATA interface connectors on rear panel for storage expansion		
Mechanical			
Dimensions	230 mm (W) x 205 mm (D) x 75 mm (H) (9” x 8” x 2.5”)		
Weight	3.8 kg (8.39 lbs)		
Mounting	Wall-mount kit		
Environmental			
Operating Temperature	Standard: 0°C to 50°C (w/HDD) Extended Temperature: -20°C to 70°C (w/ industrial SSD or CFAST)		
Storage Temperature	-40°C to 85°C (excl. HDD/SDD/CFAST)		
Humidity	~95% @ 40°C (non-condensing)		
Vibration	Operating, 5 Grms, 5-500 Hz, 3 axes (w/ CFAST or SSD)		
	Operating, 0.5 Grms, 5-500 Hz, 3 axes (w/ HDD)		
ESD	Contact +/-4 KV and Air +/-8 KV		
Shock	Operating, 50 G, half sine 11 ms duration (w/ CFAST or SSD)		
EMC	CE and FCC Class A		

1.4 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform the dealer immediately. Retain the shipping carton and packing mate-

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rials for inspection. Obtain authorization from the dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- MXE-5300 controller
- Wall-mount bracket (located in the Accessory Box)
- Screw pack for wall-mounting and HDD fixing (located in the Accessory Box)
- User's manual
- Com port cable for DB62 to DB9

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2 System Description

This section describes the appearance and connectors of the MXE-5300 series, including chassis dimensions, front panel connectors, rear panel connectors, and internal IO connectors.

2.1 Mechanical Views

NOTE:

(All dimensions are in mm)

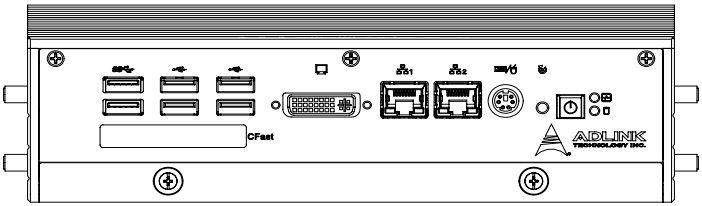


Figure 2-1: Front View

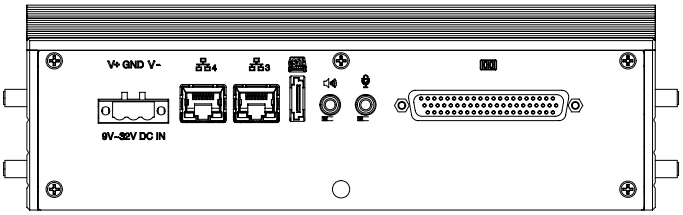


Figure 2-2: Rear View

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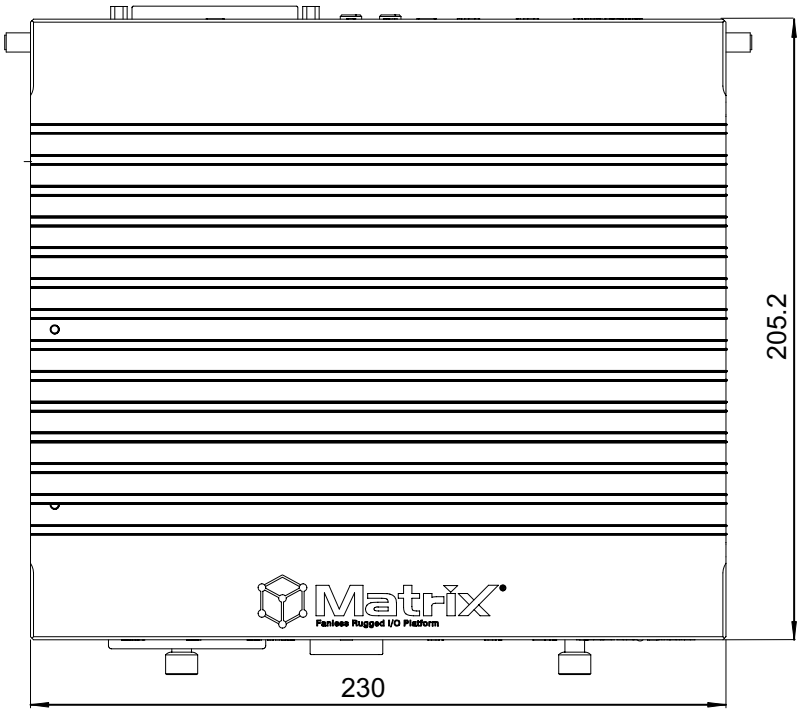


Figure 2-3: Top View

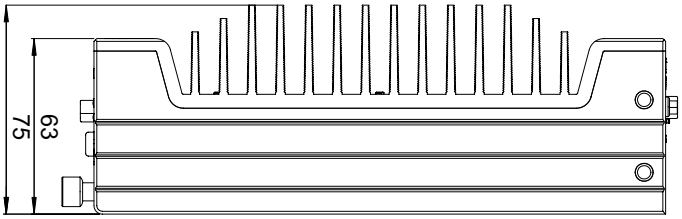
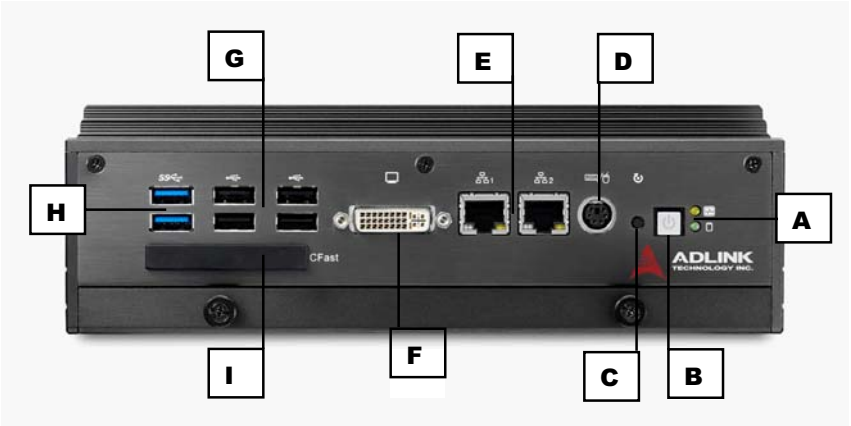


Figure 2-4: Side View

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2.2 Front Panel I/O Connectors

This section describes the functions of the MXE-5300 I/O connectors



A	LED Indicators
B	Power Button
C	Reset Button
D	PS/2 keyboard & mouse
E	Dual Gigabit Ethernet ports
F	DVI-I connector
G	USB 2.0 connector x4 (Type A)
H	USB 3.0 connector x2 (Type A)
I	CFast connector(Push-Push,Type II)

Table 2-1: MXE-5300 Front Panel Connectors

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2.2.1 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 2-2: LED Indicators

2.2.2 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.

2.2.3 Reset Button

The reset button executes a hard reset.

2.2.4 PS/2 Connector

The MXE-5300 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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2.2.5 Dual Gigabit Ethernet Ports

The MXE-5300 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 2-3: Gigabit Ethernet Port Features

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

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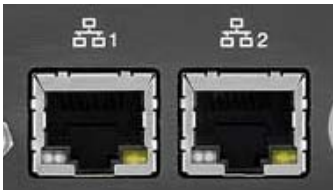


Figure 2-5: Gigabit Ethernet Ports

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 2-4: Active/Link LED

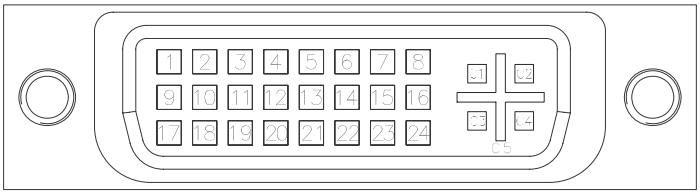
LED Color	Status	Description
Green/ Orange	OFF	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

Table 2-5: Speed LED

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2.2.6 DVI-I Connector

The MXE-5300 provides one DVI-I connector for external monitor, which can separate to VGA and DVI-D (single link) interfaces.



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

Table 2-6: DVI-I Connector Pin Assignment

2.2.7 USB 2.0 Connectors

The MXE-5300 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 MXE-5300 supports multiple boot devices, including USB flash, USB external HD, USB floppy, and USB CD-ROM drives.

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Boot priority and device can be configured in BIOS. Please refer to Section 6.2.8 USB Configuration for details.

2.2.8 USB 3.0 Connectors

The MXE-5300 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 interface, supporting SuperSpeed, Hi-Speed, full-speed, and low-speed transmission for the downstream USB 3.0 ports.

The MXE-5300 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:

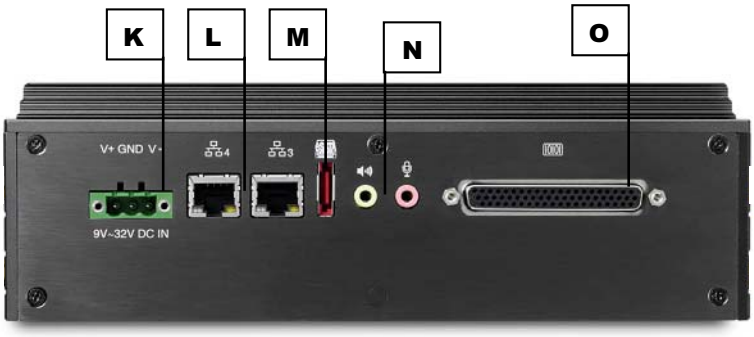
While the USB 3.0 ports allow boot from CD-ROM, OS installation via CD-ROM is not supported.

2.2.9 CFast Slot

The MXE-5300 is equipped with a type II push-push CFast host connector on the front panel, connecting to the host controller by SATA interface. Data transfer rates up to 3.0Gb/s(300MB/s)/ 1.5Gb/s(150MB/s) are supported. The host SATA controller provides a legacy operating mode using I/O space, and an AHCI operating mode using memory space. The CFast card can function as a storage device for system installation.

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2.3 Rear Panel I/O Connectors



K	DC Power Supply Connector
L	Dual Gigabit Ethernet ports
M	eSATA Connector
N	Audio Jacks
O	DB-62P COM Ports and Digital I/O Connector

2.3.1 DC Power Supply Connector

The DC power supply connector of the MXE-5300, 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 MXE-5300 allows a voltage input range from 9 VDC to 32 VDC.

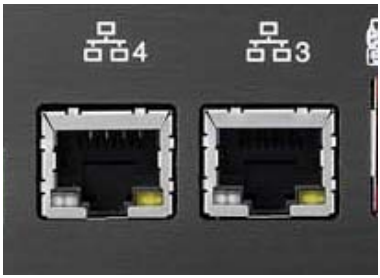
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2.3.2 Dual Gigabit Ethernet Ports

The back panel provides two Gigabit Ethernet ports, both on RealTek RTL8111C-VC-GR Gigabit Ethernet Controllers.

The RTL8111C-VC-GR supports:

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports pair swap/polarity/skew correction
- Crossover detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5, NDIS6 checksum offload and segmentation task-offload support
- 802.3x flow control-compliant
- Fully compliant with IEEE802.3, IEEE 802.3u, IEEE802.3ab
- IEEE 802.1p and 802.1q support
- Supports power down/link down power saving
- Supports PCI MSI (message signal interrupt) and MSI-X
- Supports receive-side scaling (RSS)
- Preboot eXecution environment (PXE) flash interface support



LEDs on each rear panel LAN port provide the following operational information:

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

Table 2-7: Active/Link LED

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

Table 2-8: Speed LED

2.3.3 eSATA Connector

One eSATA port connector is located on the back panel, supporting external SATA storage expansion at data transfer rates up to 3.0Gb/s(300MB/s) / 1.5Gb/s(150MB/s).

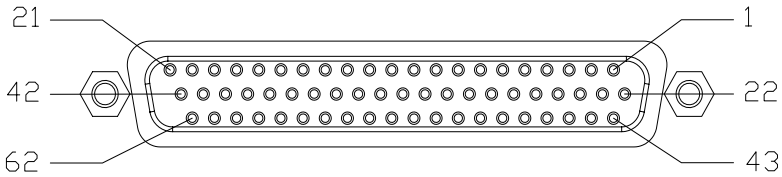
The host SATA controller provides two modes of operation: a legacy mode using I/O space, and an AHCI mode using memory space. This connector supports only SATA singaling, and SATA HDD or SSD requires connection to an external power supply for operation.

2.3.4 Audio Jacks

The MXE-5300 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. Access is provided by the pink jack for microphone input and the green jack for output.

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2.3.5 DB-62P COM Port and Digital I/O Connector



The MXE-5300 features 4 COM ports and 4-CH isolated digital input and 4channel isolated digital output through a DB-62P connector on the back panel. Also provided is a cable connect to DB-62P connector to extend four D-SUB 9-pin connectors and one 25-pin digital I/O connector. The COM1 and COM2 ports selectively support RS-232/ RS-422/ RS-485 mode by BIOS setting, and RS-422/RS-485 mode also provides an optional choice of isolated 1.4 kV capability.

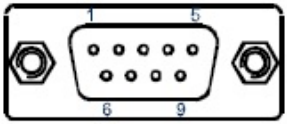
The residual COM3 and COM4 ports support RS-232 function only.

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	EOGND	34	GND	55	EOGND

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Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
14	EOGND	35	IDO_3	56	EOGND
15	EOGND	36	IDO_2	57	EOGND
16	EOGND	37	IDO_1	58	EOGND
17	EOGND	38	IDO_0	59	EOGND
18	IDI_3L	39	IDI_3H	60	+V5DIO_CN_ISO
19	IDI_2L	40	IDI_2H	61	+VDD
20	IDI_1L	41	IDI_1H	62	+VDD
21	IDI_0L	42	IDI_0H		

Table 2-9: DB-62P Connector Pin Assignment



Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD#	TXD422-	485DATA-
2	RXD	TXD422+	485DATA+
3	TXD	RXD422+	N/C
4	DTR#	RXD422-	N/C
5	GND	N/C	N/C
6	DSR#	N/C	N/C
7	RTS#	N/C	N/C
8	CTS#	N/C	N/C
9	RI#	N/C	N/C

Table 2-10: D-SUB 9P COM Port Signal Names

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The onboard digital I/O card supports the following specs:

4-CH Isolated DI	4-CH Isolated DO
Logic high: 5 to 24 V	Output Type: Open Drain N-Channel Power MOSFET driver
Logic low: 0 to 1.5 V	250 mA for all channels @60℃, 100% duty
Input resistance: 2.4 k @ 0.5 W	Supply voltage: 5 to 35 VDC
Interrupt source: DI	Isolation voltage: 1.5KV DC
Isolation voltage: 1.5KV DC channel 0 ~3	

Table 2-11: Digital I/O Specifications

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	EOGND	10	IDO_1	19	IDI_3L
2	+V5DIO_CN_ISO	11	EOGND	20	IDI_2H
3	+VDD	12	IDO_0	21	IDI_2L
4	+VDD	13	EOGND	22	IDI_1H
5	EOGND	14	EOGND	23	IDI_1L
6	IDO_3	15	EOGND	24	IDI_0H
7	EOGND	16	EOGND	25	IDI_0L
8	IDO_2	17	EOGND		
9	EOGND	18	IDI_3H		

Table 2-12: D-SUB 25P Pin Assignment on Digital I/O port

Legend:

- IDO_n: Isolated digital output channel #n.
- IDI_nH: High input of isolated differential DI channel #n.
- IDI_nL: Low input of isolated differential DI channel #n.
- EOGND: Ground return path of isolated output channels.
- VDD: Power input signal for fly-wheel diode of DO channels.

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2.4 Internal I/O Connectors

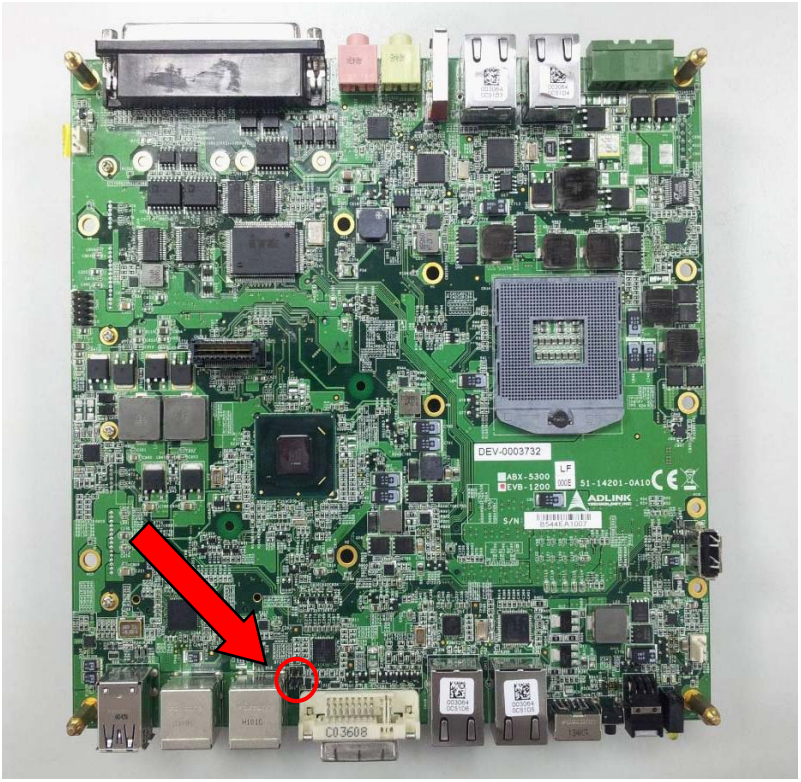


Figure 2-6: Mainboard Top View
(showing Clear CMOS and ME RTC Register Jumpers)

2.4.1 Clear CMOS and ME RTC Register Jumpers

Under abnormal conditions in which the MXE-5300 controller fails to boot, clearing the BIOS content stored in CMOS and restoring the default settings may be effective. To clear CMOS, shorten

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Pin#1 and Pin#2 of JP1 and remove the jumper, after which the CMOS will be restored to factory default settings.

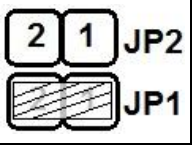
Normal	Clear
	

Table 2-13: Clear CMOS Jumper

CAUTION:

As with JP1, shorting Pin#1 and #2 of JP2 will clear the ME RTC register, however, since this jumper is used by RMA, user clearance of the ME RTC register may cause unexpected errors in system behavior.

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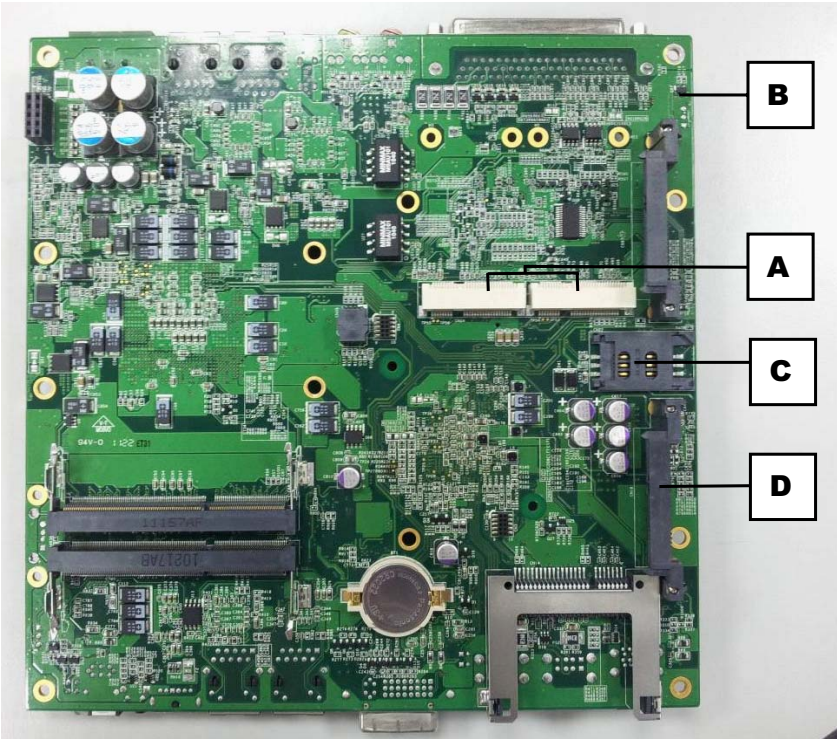


Figure 2-7: Mainboard Underside View

A	Mini-PCIe Connectors (Default: Rev.1.2, Option: Rev.1.1)
B	DC 5V and 3.3V Connectors for GPS Module
C	USIM Port
D	SATA Connectors

2.4.2 Mini-PCIe Connector

Mini-PCIe connectors provide function expansion by enabling installation of a third party Mini-PCIe module such as a WiFi module, 3.5G module, or other.

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2.4.3 DC 5V and 3.3V Connectors for GPS Module

Two power connectors are provided for GPS module use, one 5V and the other 3.3V, with maximum current rating of each 1A.

2.4.4 USIM Port

Use of a 3.5G mini-PCIe module normally requires a SIM card to support communication with a telecom operator. The MXE-5300 provides a USIM port connected to mini-PCIe connector. The SIM card and 3.5G mini-PCIe module can be installed to facilitate 3.5G communication.

2.4.5 SATA Connector

Two SATA connectors support data transfer up to 6.0Gb/s(600MB/s). The SATA host controller supports a legacy mode using I/O space and AHCI mode using memory space. The SATA connector is compatible with a 2.5 in hard disk drive (HDD) or solid state disk (SSD). The HDD or SSD must be installed into the SATA connector with a HDD bracket.

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3 Getting Started

This chapter discusses installation of hard disk drive, memory, and CFast card. In addition to connection and use of DIO and COM ports, wall-mount installation is also described.

3.1 Installing a Hard Disk Drive

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

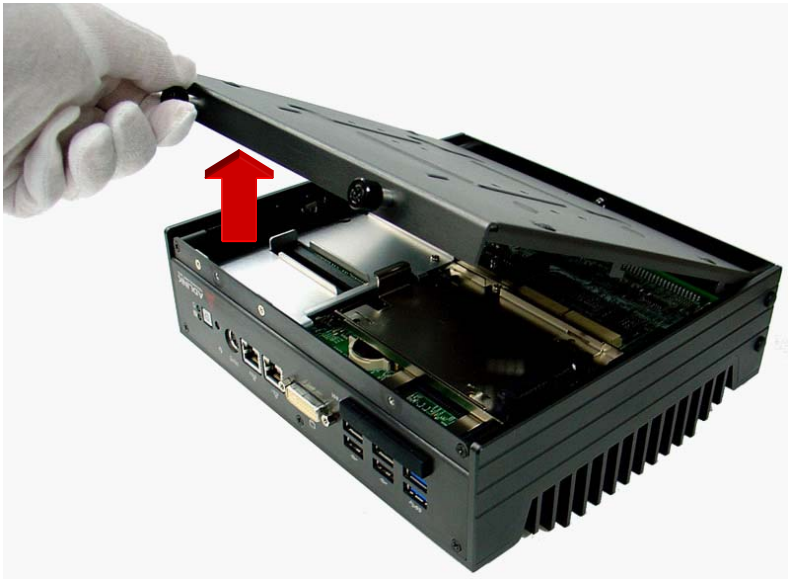
1. Remove the thumbscrews on the front panel by hand or a screwdriver.



2. Withdraw the thumbscrews and remove the bottom cover by pulling and lifting.



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3. Remove the mounting screw from the top of the HDD bracket.

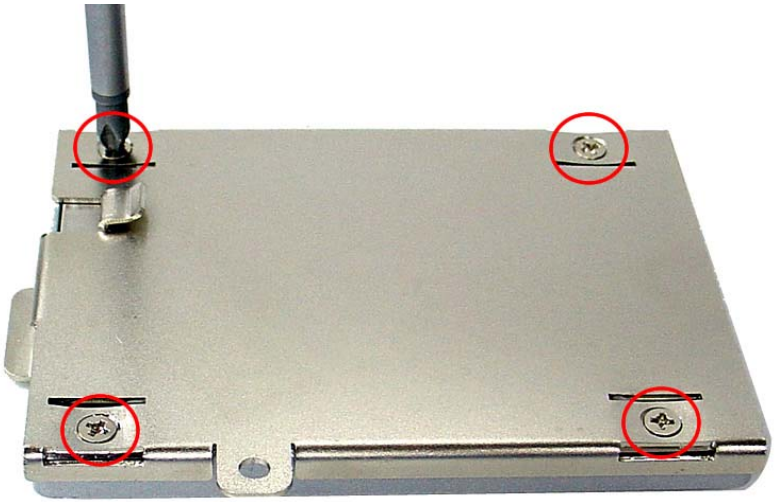


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4. Pull and lift the HDD bracket.



5. Use the 4 included M3-F head screws to fix one 2.5” HDD or SSD to the bracket.



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6. Install the 2.5’’ HDD or SSD to the SATA connector.



7. Reassemble the chassis.

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3.2 Installing Memory

Before installing RAM, the bottom cover must be removed, as described in steps 1 and 2 of Section 3.1.

1. Remove 3 M3-P head screws from the top of the RAM bracket.



2. Remove 2 M3-F head screws from the front panel.

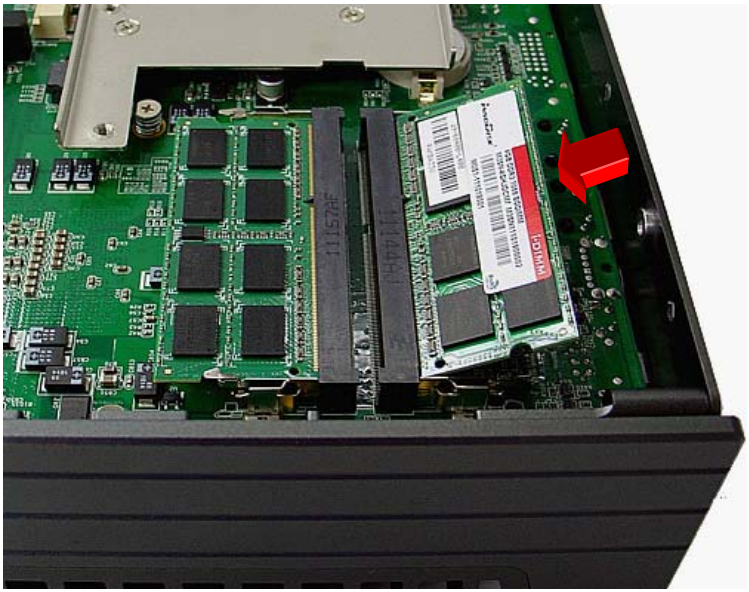


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3. Pull and lift the RAM bracket.

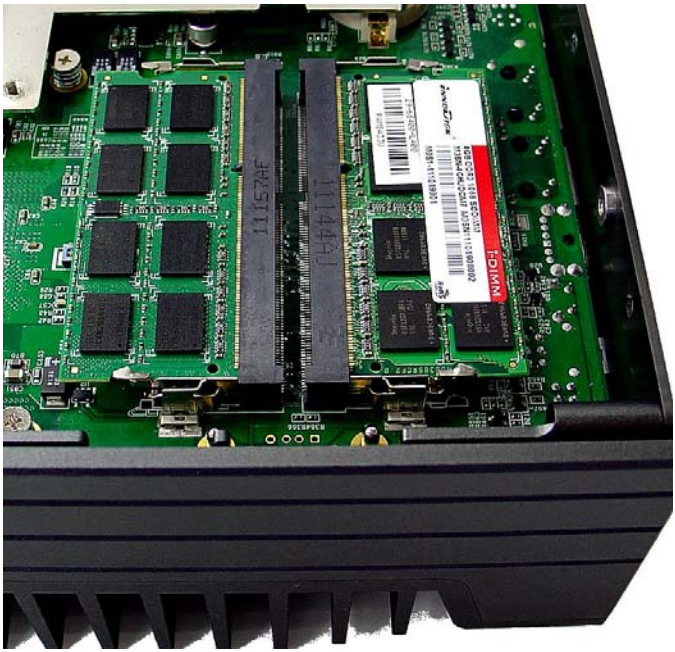


4. Insert DDRIII SODIMM RAM into the slot at an angle.



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5. Depress RAM until the latch catches and RAM is securely fixed.



3.3 Installing CFast Cards

The MXE-5300 series provides an external CFast socket to accommodate one CFast card, acting as a replacement of the hard disk drive.

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

.



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



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3. Rotate the CFast cover to its orginal position and replace.



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3.4 COM Ports and DIO Device

The MXE-5300 series controller integrates 4 COM ports and 4 digital input and 4 digital output ports into a connector, The included breakout cable can connect COM ports and the DIO device.

1. Connect the cable to the connector on the rear panel

.



2. The 4 COM ports cables are numbered 1 to 4, with 1 and 2 connecting to RS-232 interface devices and 3 and 4 to RS-422 or RS-485 interface devices.



3. The DIO cable connects to a terminal board for digital input and output.



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3.5 Connecting to DC power



Before introducing DC power to the MXE-5300 controller, ensure the voltage and polarity provided are compatible with the DC input. Improper input voltage and/or polarity can be responsible for system damage

The DC power input connector of the MXE-5300 utilizes V+, V-, and chassis ground pins, and accepts input voltage as shown previously.

1. Connect the DC power as shown
2. Fix the DC connector using the 2 screws.



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3.6 Wall-mounting the MXE-5300

The MXE-5300 controller is shipped with wall-mount brackets and accessory screws, with mounting procedures as follows.

1. Prepare the two wall-mount brackets and 4 M4-P head screws included in the package.



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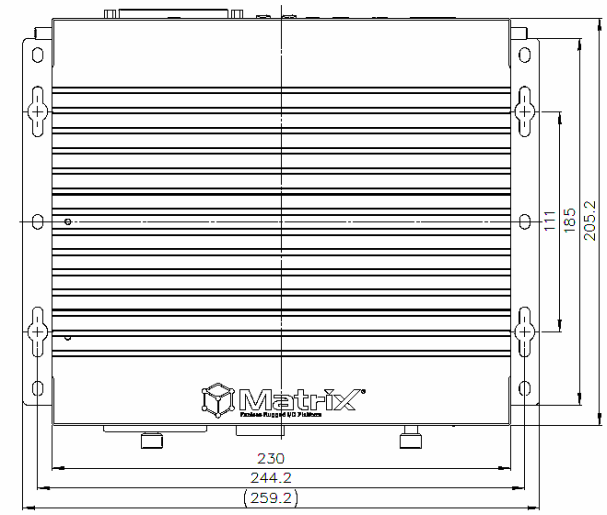
2. Remove the 4 plastic pads from the corners of the chassis underside.

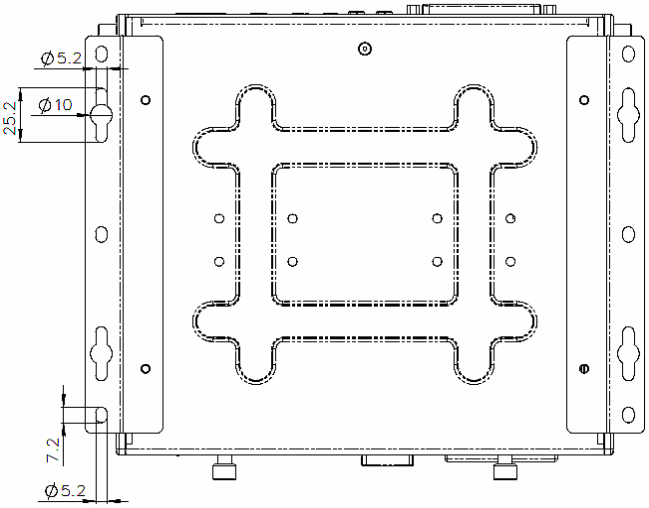


3. With the 4 included M4-P head screws, fix the 2 wall-mount brackets, also included, to the chassis, according to the spacing dimensions of the screw holes and brackets, as shown.



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111
185
205.2
230
244.2
(259.2)


Ø5.2
Ø10
25.2
7.2
Ø5.2

4. Once final assembly as shown is complete, mount the MXE-5300 series controller on the wall via the screw holes.

3.7 Thermal Considerations

Heat-generating components of the MXE-5300 (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, a minimum of 2 inches (5 cm) clearance should be maintained on the top of the chassis.

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4 Driver Installation

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.

Properly install Windows before installing any drivers. Most standard I/O device drivers have been included in Windows. The following drivers must be installed:

- Chipset
- Graphics
- Ethernet
- WDT (watchdog timer)

4.1 Installing the Chipset Driver

The chipset driver directs the operating system in configuration of the Intel® QM67 chipset components to guarantee performance of:

- Core PCI and ISAPNP Services
- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

One of the following operating systems must be fully installed and running on the system before installing this software:

- Microsoft Windows XP
- Microsoft windows 7

To install the chipset driver for the MXE-5300 :

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD; the chipset driver is located in the directory: x:\Driver Installa-

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tion\Matrix\MXE-5300\Chipset\ (where x: denotes the DVD-ROM drive)

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

4.2 Installing the Graphics Driver

The MXE-5300 is equipped with the Intel® HD Graphic 3000 graphics media accelerator integrated in Intel Mobile Intel® ATOM.

The Intel® Graphics Media Accelerator Driver package supports Windows 7 and Windows XP.

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-5300\Graphics\ (where x: denotes the DVD-ROM drive).
3. Execute Setup.exe and follow the onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

4.3 Installing the Ethernet Driver

To install the driver for Realtek 8111C Gigabit Ethernet controller, for Windows 7 and XP users:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD; the Ethernet driver is located in the directory: x:\Driver Installation\Matrix\MXE-5300\LAN-Realtek\ (where x: denotes the DVD-ROM drive).
3. Execute Setup.exe and follow the onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

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To install the driver for Intel 82547 Gigabit Ethernet controller, for Windows 7 and XP users:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD; the Ethernet driver is located in the directory: x:\Driver Installation\Matrix\MXE-5300\LAN-Intel\ (where x: denotes the DVD-ROM drive).
3. Execute Setup.exe and follow the onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

4.4 Installing the Audio Driver

The MXE-5300 supports Intel High Definition audio using Realtek ALC269 audio codec. To install the audio driver for MXE-5300, for Windows 7, XP, and Vista users:

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-5300\Audio\ (where x: denotes the DVD-ROM drive).
3. Execute Setup.exe and follow the onscreen instructions to complete the setup.
4. After installation is complete, reboot the system.

4.5 Installing the WDT Driver

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 and periodically reset timers, and when a timer is expired, the system resets.

To install the WDT driver for the MXE-5300:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD; the WDT driver is located in the directory: x:\Driver Installa-

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tion\Matrix\MXE-5300\WDT\ (where x: denotes the DVD-ROM drive).

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

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5 BIOS Settings

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-5300. The BIOS setup program includes menus for configuring settings and enabling features of MXE-5300. Most users do not need to use the BIOS setup program, as the MXE-5300 controller ships with default settings that work well for most configurations.



BIOS options in the manual are for reference only. Different configurations may lead to actual BIOS displayed differing from that shown here. Users are welcome to download the latest BIOS version from our website.



Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot. In such a case, see Section 2.4.1: Clear CMOS and ME RTC Register Jumpers for instruction on clearing the CMOS and restoring default settings.

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5.1 Main



5.1.1 BIOS Information

Shows current system BIOS code version and BIOS version.

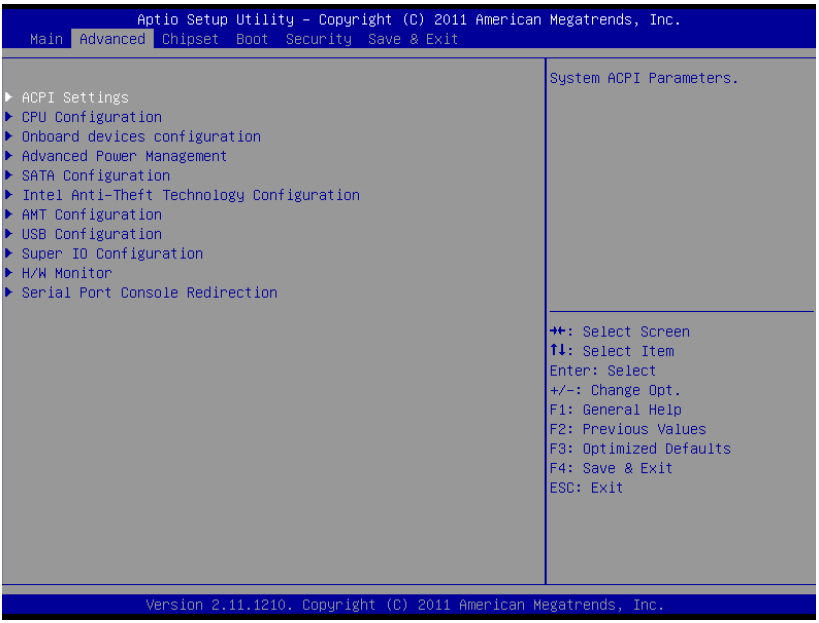
5.1.2 System Time/System Date

Use this option to change 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 <Enter>. Enter < Tab > 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.

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5.2 Advanced

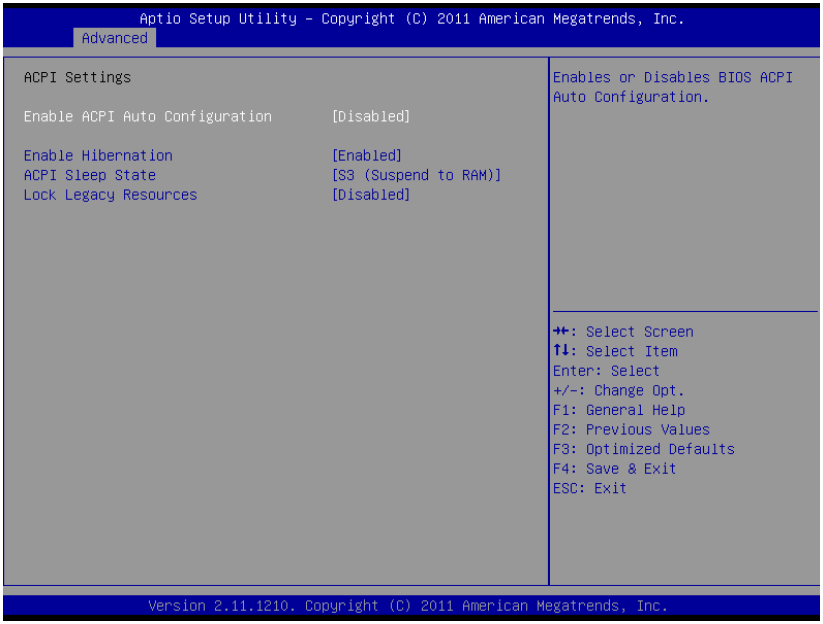


CAUTION:

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

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5.2.1 ACPI Settings



Enable ACPI Auto Configuration

Enables or disables BIOS ACPI Auto Configuration.

Enable Hibernation

Enables or disables system's ability to hibernate. This option may be not effective with some OS.

ACPI Sleep State

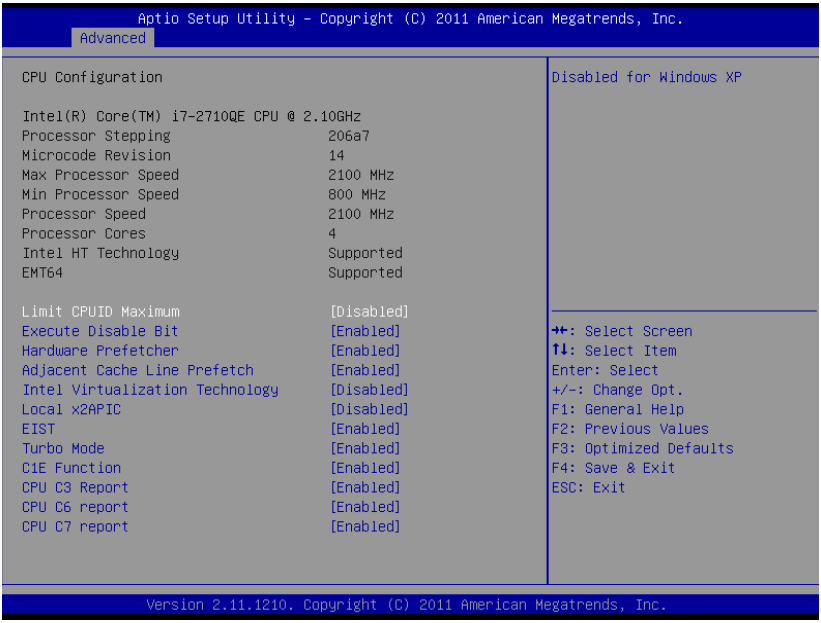
Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Lock Legacy Resource

Enables or disables lock of legacy resource to prevent changes in IO resource for legacy devices like serial ports.

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5.2.2 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 the 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, lets CPU 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

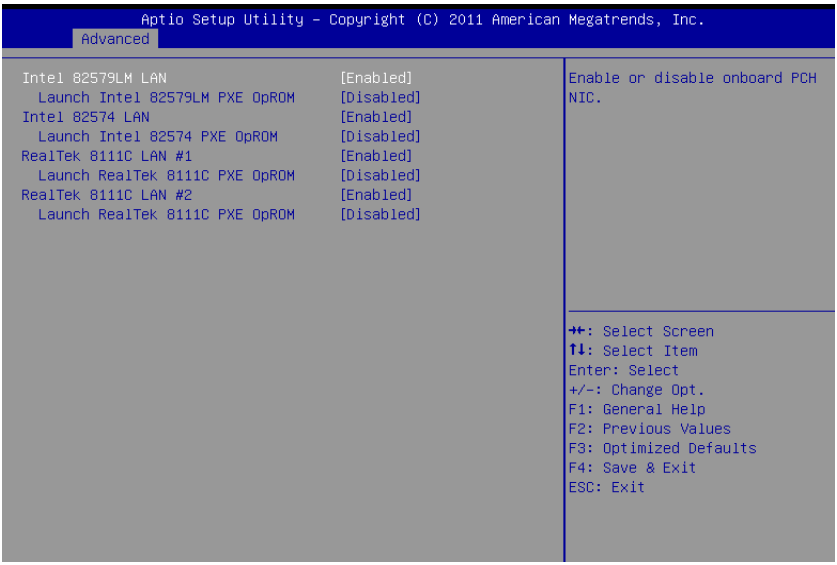
Enables/disables CPU C6(ACPI C3) report to OS.

CPU C7 Support

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

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5.2.3 Onboard Device Configuration



Intel 82579LM LAN

Enables/disables onboard Intel 82579LM (built-in PCH) LAN controller.

Launch Intel 82579LM LAN PXE OpROM

Enables or 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 or disables execution of LAN boot-rom to add boot option for legacy network devices.

RealTek 8111C LAN #1 (Appear on MXE5300 only)

Enables/disables onboard RealTek 8111C LAN controller.

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Launch RealTek 8111C PXE OpROM

Enables or disables execution of LAN boot-rom to add boot option for legacy network devices.

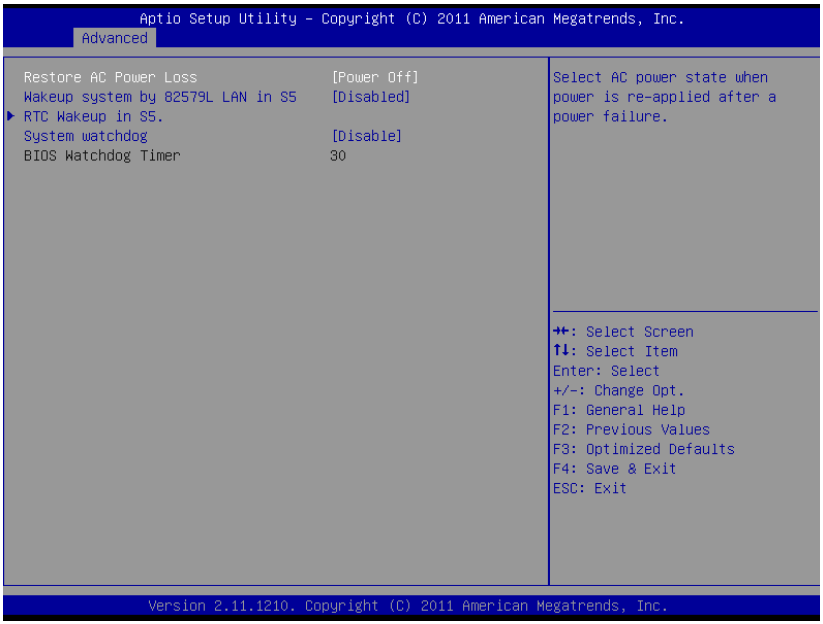
RealTek 8111C LAN #2 (Appear on MXE5300 only)

Enables/disables onboard RealTek 8111C LAN controller.

Launch RealTek 8111C PXE OpROM

Enables or disables execution of LAN boot-rom to add boot option for legacy network devices.

5.2.4 Advanced Power Management



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Restore On AC Power Loss

Determines the state the computer enters when power is restored after a power loss. Options for this value 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 on when power is restored.
Last State	When set, powers the system down or on depending on the last system power state when power is restored.

Table 5-1: Restore On Power Loss

Wake up system by 82579L LAN in S5

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

RTC Wakeup in S5

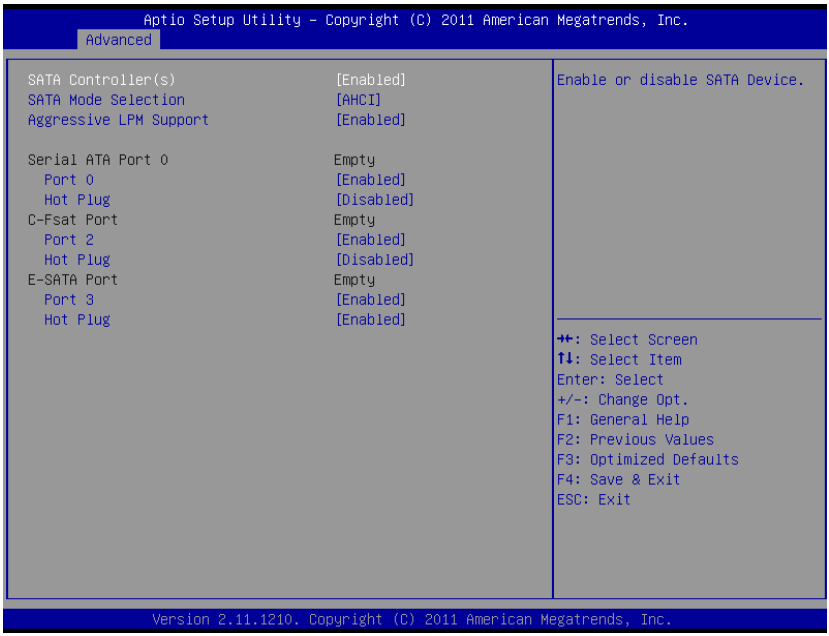
Enables or disables system wake on alarm event.

System watchdog

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

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5.2.5 SATA Configuration



SATA Controller(s)

Enables/disables internal serial ATA controller

SATA Mode Selection

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

Serial ATA Port 0 / C-Fast Port / E-SATA Port

Port X

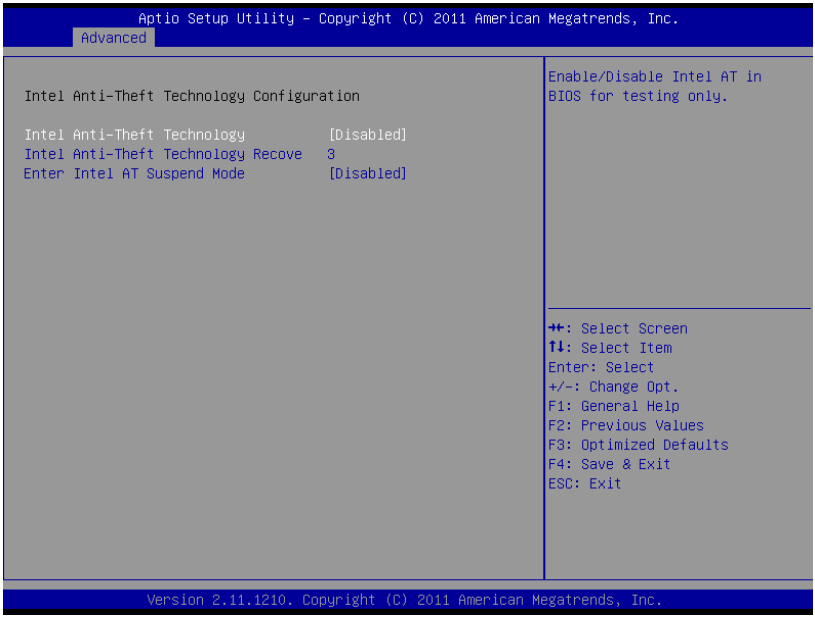
Enables or disables SATA Port X

Hot Plug

Sets this port as hot pluggable.

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5.2.6 Intel Anti-Theft Technology Configuration



5.2.7 Intel Anti-Theft Technology

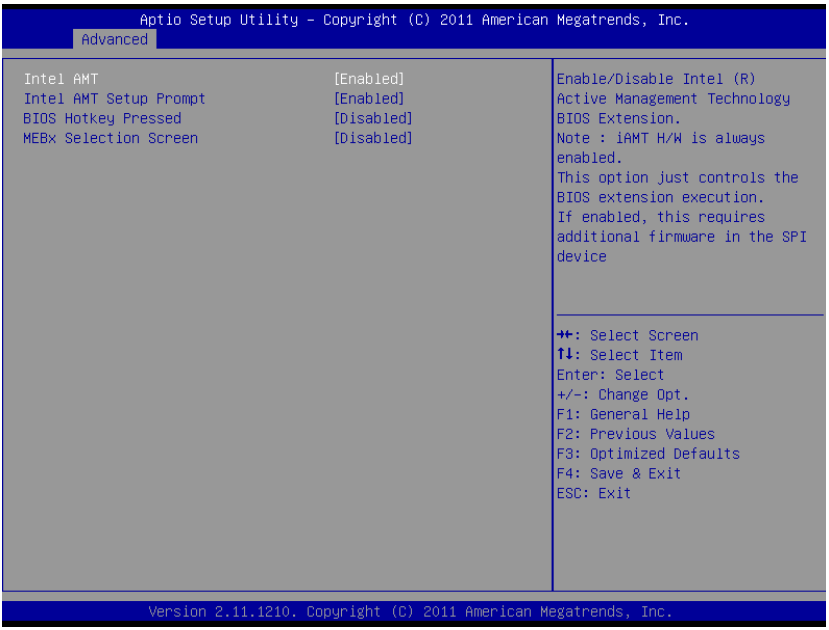
Enables or disables Intel AT function. Intel® Anti-Theft Technology helps stop theft by making computers non-functional with immediate shutdown.

Intel Anti-Theft Technology Recovery/Enter Intel AT suspend mode

Miscellaneous settings for Intel AT function.

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5.2.8 AMT Configuration



Intel AMT

Enables/disables Intel AMT function.

Intel AMT Setup Prompt

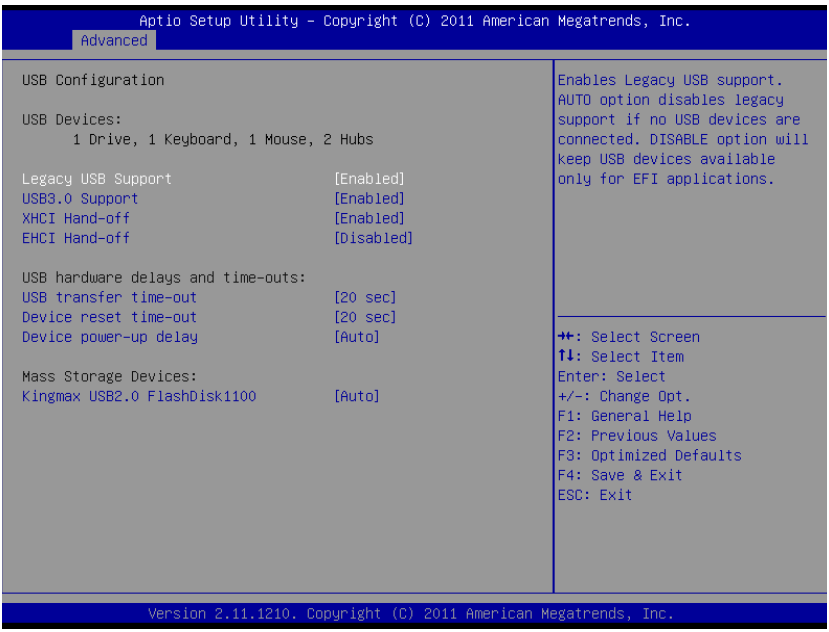
Enables/disables launching of MEBx during system post for configuring AMT features.

BIOS Hotkey Pressed/MEBx Selection Screen

Miscellaneous settings for iAMT function.

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5.2.9 USB Configuration



Legacy USB Support

AUTO option disables legacy support if no USB devices are connected, DISABLE option keeps 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

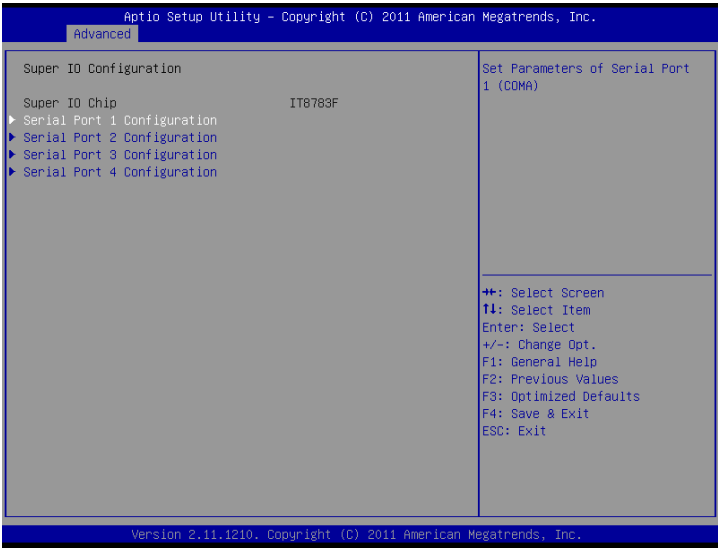
Enables BIOS support of XHCI Hand-Off feature. Default option is Enabled.

EHCI Hand-Off

Enables BIOS support of EHCI Hand-Off feature. Default option is Enabled.

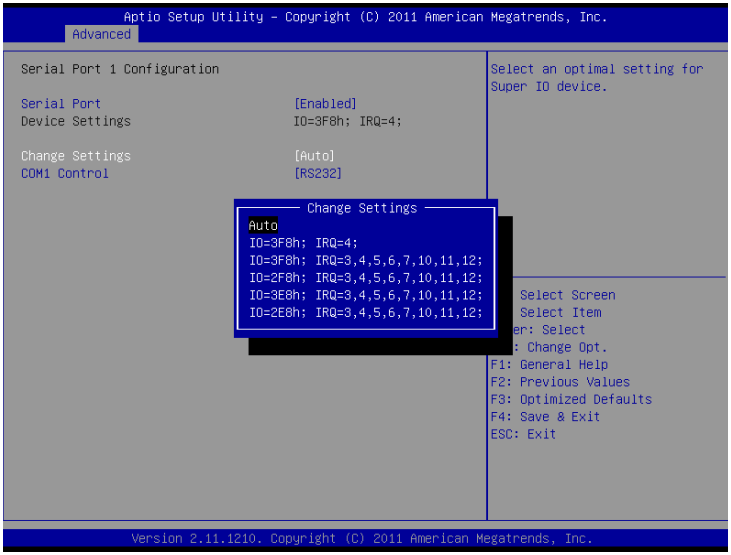
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5.2.10 Super IO Configuration



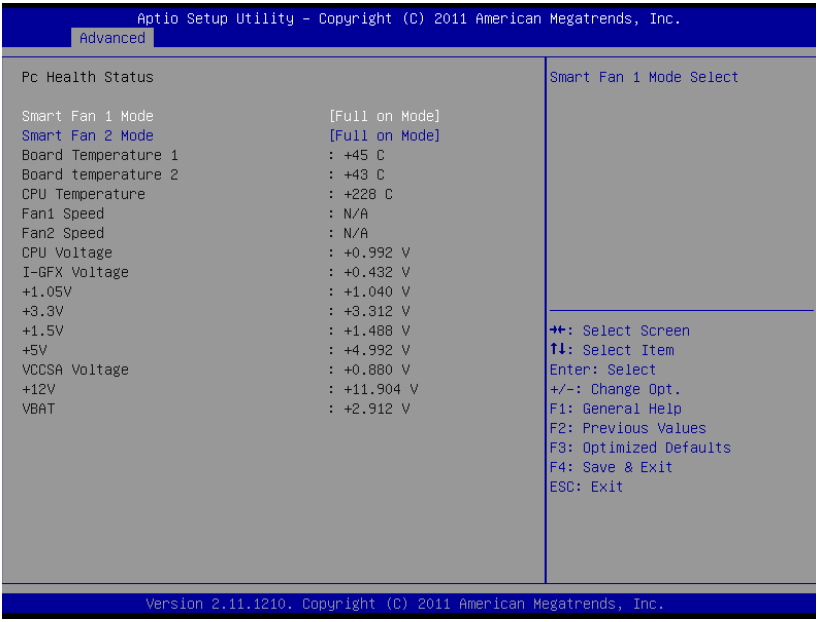
Serial Port 1 to 4 Configuration

Can enable/disable the port, select port type (RS-232/422/485) for Serial Port 1 and 2 only, or change the port settings (address).



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5.2.11 H/W Monitor

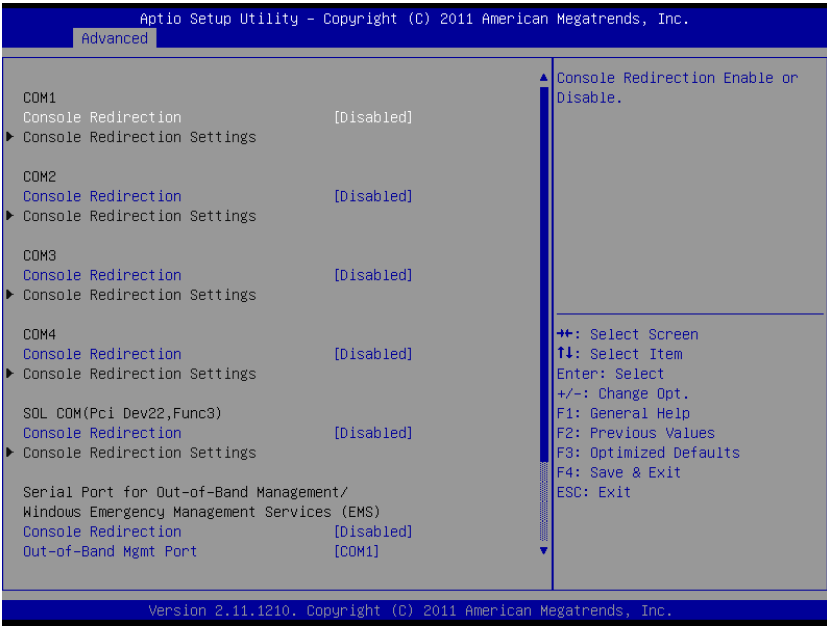


PC Health Status

The hardware health on Super I/O supports Board Temperature 1/2, CPU Temperature, CPU Voltage, I-GFX Voltage, VCCSA Voltage, +1.05V, +3.3V, +1.5V, +5V, +12.0V, and VBAT.

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5.2.12 Serial Port Console Redirection



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

Console Redirection

Enables console redirection of COM 1 to 4, SOL COM.

Console Redirection Settings

Miscellaneous parameters for COM Port 1 to 4, SOL COM.

Serial Port for Out-of-Band Management/EMS

Console Redirection

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

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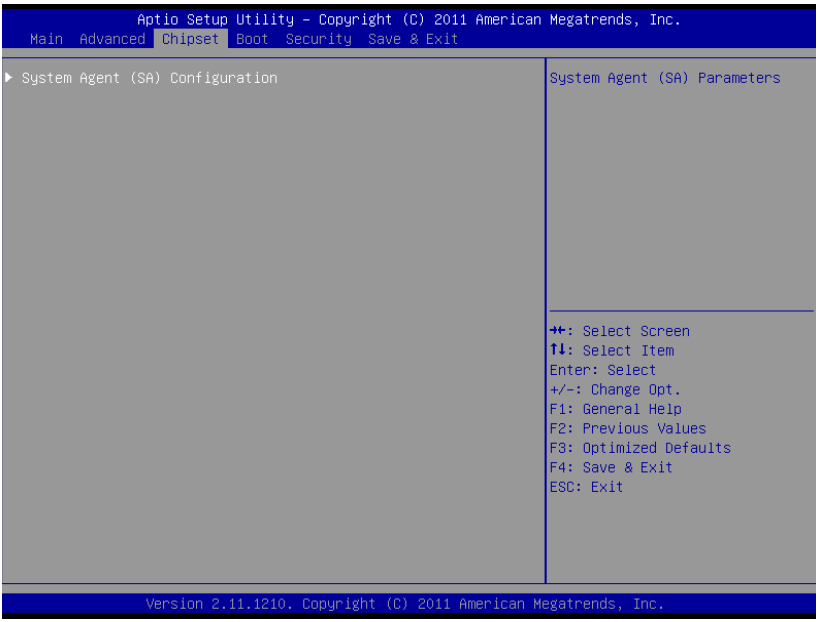
Out-of-Band Mgmt Port

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

Terminal Type

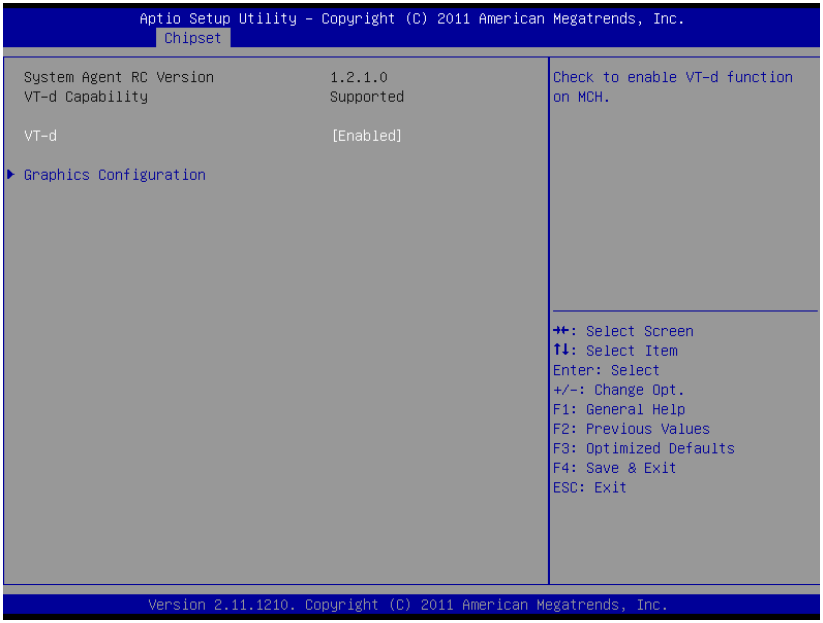
Selects the transmission protocol for remote terminal console.

5.3 Chipset



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5.3.1 System Agent (SA) Configuration



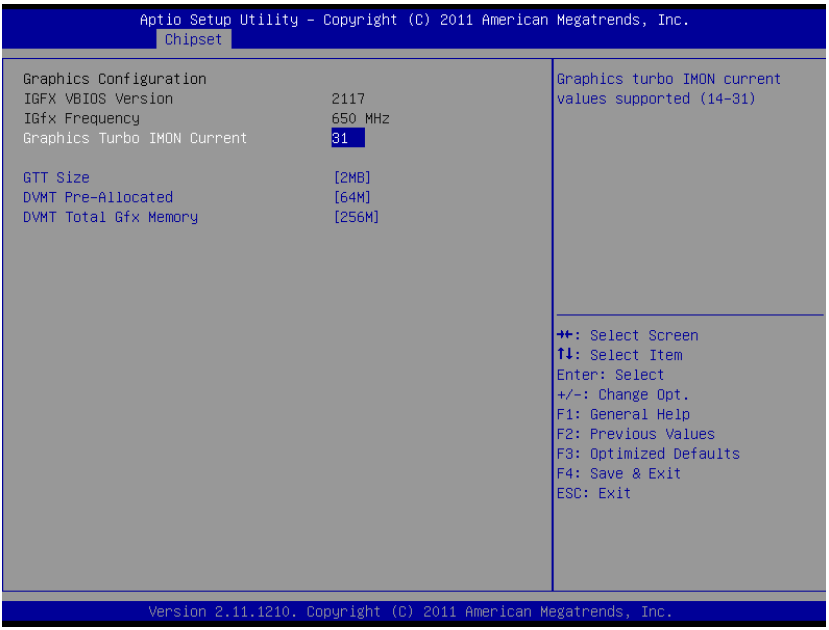
VT-d

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

Graphics Configuration

Selects 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 GTT size for internal graphics.

DVMT Pre-Allocated

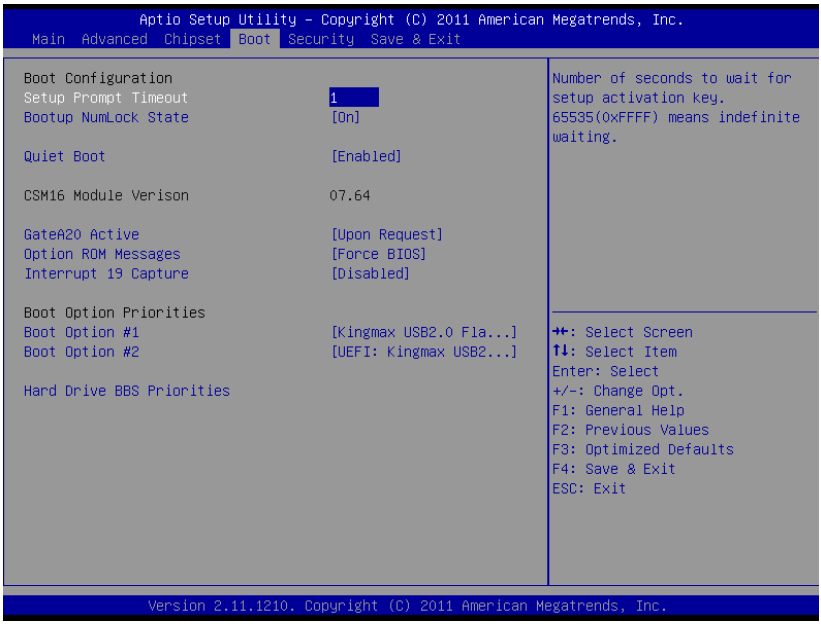
Selects DVMT 5.0 pre-allocated graphics memory size used by the internal graphics device.

DVMT Total Gfx Memory

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

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5.4 Boot



5.4.1 Boot Configuration

Setup Prompt Timeout

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

Bootup Num-Lock State

Allows Number Lock setting to be modified during boot.

Quiet Boot

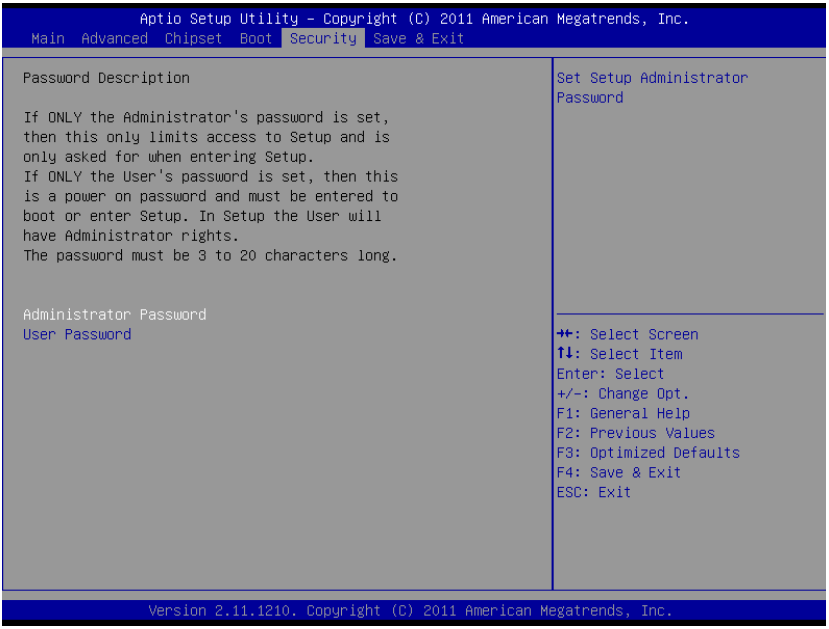
When Disabled, directs BIOS to display POST messages; when Enabled, directs BIOS to display the OEM logo.

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5.4.2 Boot Option Priorities

Specifies the priority of boot devices, with all installed boot devices detected during POST and displayed, selecting Boot Option # specifies the desired boot device.

5.5 Security



If only the Administrator's password is set, only access to Setup is limited and is only requested when entering Setup. If only the user's password is set, power on requires a password which must be entered to boot or enter setup. In Setup the user has Administrator rights.

Administrator Password

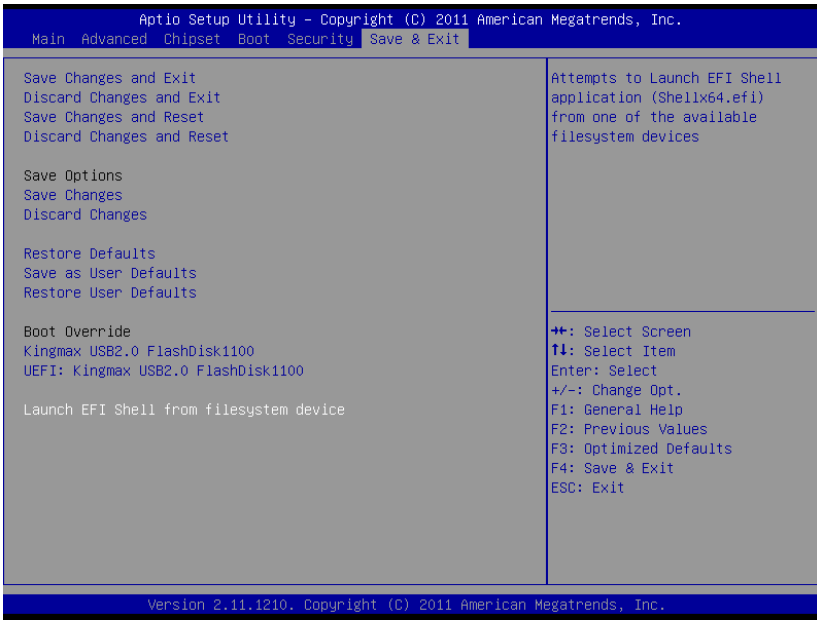
Sets Administrator password

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User Password

Sets boot/setup User password

5.6 Exit



Save Changes and Exit

When BIOS settings are complete, selecting this option saves all changes and reboots the system, and new settings take effect.

Discard Changes and Exit

Discards all changes and exits BIOS setup.

Discard Changes and Reset

Resets system setup without saving any changes.

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Restore Defaults

Returns all BIOS options to Default settings, designed for maximum system stability, but not performance. Applicable in the event of 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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Appendix A WDT Function Reference

A.1 Watchdog Timer (WDT) Function Reference

This appendix describes the usage of the watchdog timer (WDT) function library for the MXE-5300 controller. Watchdog timer is a hardware mechanism to reset the system in case the operating system or an application halts. After starting watchdog timer, you need to periodically reset the watchdog timer in the application before the timer expires. Once watchdog timer expires, a hardware-generated signal is sent to reset the system.

To use the WDT function library for MXE-5300, you need to include the header file WDT.h and linkage library WDT.lib in your C++ project.

InitWDT

Description

Initializes the watchdog timer function of MXE-5300 controller. InitWDT must be called before the invocation of any other WDT function.

Supported controllers

MXE-5300

Syntax

C/C++

```
BOOL InitWDT()
```

Parameters

None

Return code

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer is failed to initialize.

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SetWDT

Description

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

Supported controllers

MXE-5300

Syntax

C/C++

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

Parameters

`tick`

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

`unit`

Specify the timeout ticks of the watchdog timer.

Value	Description
0	The unit of tick is second. For example, when you specify tick as 100 and unit as 0, the timeout value is 100 seconds.
1	The unit of tick is minute. For example, when you specify tick as 100 and 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.

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StartWDT

Description

Start the watchdog timer function. Once the StartWDT is invoked, the countdown of watchdog timer starts. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

Supported controllers

MXE-5300

Syntax

C/C++

```
BOOL StartWDT()
```

Parameters

None

Return codes

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer is failed to start.

ResetWDT

Description

Reset the watchdog timer. The invocation of ResetWDT allows users to restore the watchdog timer to the initial timeout value specified in SetWDT function. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

Supported controllers

MXE-5300

Syntax

C/C++

```
BOOL ResetWDT()
```

Parameters

None

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Return codes

TRUE if watchdog timer is successfully reset.

FALSE if watchdog timer is failed to reset.

StopWDT

Description

Stop the watchdog timer.

Supported controllers

MXE-5300

Syntax

C/C++

```
BOOL StopWDT()
```

Parameters

None

Return codes

TRUE if watchdog timer is successfully stopped.

FALSE if watchdog timer is failed to stop.

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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 an incorrect type; please 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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