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MXC-6300

High Performance 3rd Generation Intel® Core™
i7/i5/i3 Fanless Computer

User's Manual



Manual Rev.: 2.00

Revision Date: Mar. 28, 2013

Part No: 50-1Z141-2000

Recycled Paper

Advance Technologies; Automate the World.

Revision History

Revision	Release Date	Description of Change(s)
2.00	Mar. 28, 2013	Initial Release

Preface

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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 MXC-6300 provides powerful, fanless, expandable embedded computing using the new Intel® Core™ i7-620LE Processor 2.0 GHz with improved computing performance. The MXC-6300 continues the exceptional fanless and cable-free design from the existing Matrix C series.

The MXC-6300 offers 2x displayports and 1xDVI-I port supporting three independent displays, 4xUSB3.0 and 2xUSB2.0 ports, and 2 GbE LAN ports with teaming function. The two 2.5" onboard SATA III ports with High speed SATA 6 Gb/s and RAID 0, 1 maximise disk read/write performance and data protection in RAID array. Built-in 16 channel isolated DI/O enables general industrial control. PCI & PCI express (Gen2) expansion slots receive avariety of PCI, PCIex8, and PCIex16 add-on cards for specific application platform development operations.

Compared to other industrial PCs, the MXC-6300 is more compact and reliable with a fanless and cable-free design, with superior dependability in harsh environments where severe tempe8rature variation and vibration may occur. The MXC-6300 provides an optional hot-pluggable fan module to dissipate heat from the system when high power consumption PCI/PCIe cards are installed. Innovative mechanical design retains a cable-free structure which dramatically improves thermal stability when PCI/PCIe cards are installed.

1.2 Features

- 3rd generation Intel® Core™ i7/i5/i3 Ivy Bridge rPGA processor + QM77 chipset
- 2 x DDR3 SO-DIMM socket, supporting up to 16GB DDR3 1333/1600 SO-DIMM Module
- 2PCIex8 + 1PCI slots or 1PCIex16 + 1PCI expansion slots available, supporting PCIe Gen2 cards
- 3 independent display support with on-board 2xDisplayPort + 1x DVI-I port
- 6 External USB ports (USB 3.0 portsx4 + USB 2.0x2) + 1 Internal USB 2.0 port
- 2 Intel GbE LAN ports with teaming function, featuring Intel iAMT 8.0
- Build-in 16-CH isolation DI and DO, 2 software-programmable RS-232/422/485 + 2 RS-232 ports
- 2 CFast socket, onboard SATA III port for 2x2.5" HDD/SSD installation, SATA 6Gb/s and RAID 0,1 support
- Built-in 9 VDC to 32 VDC wide-range DC power input
- Fanless & cable-free design, operating temperature range from -20°C to 60°C (w/ industrial SSD)



This option guarantees cold boot of the system at -20°c and operation with 100% loading at 60° without add-on cards. The industrial solid-state drive storage option is required.

1.3 Specifications

	MXC-6301D	MXC-6302D	MXC-6303D
System Core			
Processor	Intel® Core™ i7-3610QE Quad Core, 2.3GHz, 6M cache (Max Turbo Frequency 3.3GHz)	Intel® Core™ i5-3610ME Dual Core, 2.7GHz, 3M cache (Max Turbo Frequency 3.3GHz)	Intel® Core™ i3-3120ME Dual Core, 2.4GHz, 3M cache
Chipset	Intel® Mobile Platform Controller hub (QM77)		
Video	Three Independent Display support (only on 3rd Generation Processor) 2x DisplayPort support VGA/DVI/HDMI interfaces by convertor cable with latch VGA+DVI dual display output by DVI-I connector Support up to 2560x1600 for 1st displayport Support up to 1920x1600 for 2nd displayport Support up to 1920x1200 for DVI-I port		
Memory	4GB DDR3 1600MHz SODIMM module (Max. capacity 16GB with 2x SODIMM socket option)		
I/O Interface			
Expansion slots	1 PCI + 2PCIex8 slots or 1PCI + 1PCIex16 slots by auto switching Supports PCIe Gen2 cards Add-on card length: 174mm Power consumption: 25W		
Ethernet	2 Intel GbE ports (1 Intel® Springville WGI210IT + 1 82579 PHY) Supports teaming function, Intel iAMT 8.0, Wake On LAN		
Serial Ports	2 software-programmable RS-232/422/485 (COM1 & COM2) with auto flow control 2 RS-232 (COM3 & COM4)		
USB	4 USB 3.0 ports & 2 USB 2.0 ports (external), 1 USB 2.0 port (internal)		
DIO	16-CH DI and 16-CH DO with 1.5KV isolation		

	MXC-6301D	MXC-6302D	MXC-6303D
Audio	1 Mic-in and 1 Line-out		
KB/MS	1 PS/2 keyboard and 1 PS/2 mouse		
Power Supply			
DC Input	Built-in 9-32 VDC wide-range DC input 3P pluggable connectors with latch (GND, V-, V+) Optional 2-pin remote power on/off switch		
AC Input	Optional 160 W external AC-DC adapter for AC input		
Storage			
SATA HDD	2 onboard SATA-III port for 2.5" HDD/SSD installation SATA RAID 0,1 & high speed SATA 6 Gb/s support		
CFast	2 CFast socket (external + internal), supporting PIO and DMA modes		
Mechanical			
Fan Module	Optional fan module for dissipating heat from PCI/PCIe card, Smart Fan Control		
Dimensions	172.5 (W) x 213 (H) x 225 (D) mm (6.79 x 8.39 x 8.86 inches)		
Weight	4.3 kg (9.48 lb)		
Mounting	Wall-mount kit		
Environmental			
Operating Temperature (Ambient without air flow)	Standard: 0°C to 50°C (w/HDD) MXC-6301 Extended Temperature: -20°C to 55°C (-4 to 131°F) w/industrial SSD or CFast MXC-6302/6303 Extended Temperature: -20°C to 60°C (-4 to 140°F) w/industrial SSD or CFast		
Storage Temperature	-40°C to 85°C (-40 to 185°F) excl. HDD/SDD/CFast		
Humidity	~95% @ 40°C (non-condensing)		
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		

NOTE:

Extending operating temperature to the -20°C to +60°C range is optional and requires an industrial solid-state storage drive.

Power Supply (24VDC)	Power Off*	System Idle**	System Full Load***	Recommended Power Supply****
Integrated Embedded Computer				
MXC-6300 i7	2.16 W	18.48 W	91.2 W	160W
MXC-6300 i5	2.16 W	16.8 W	67.2 W	160W
MXC-6300 i3	2.16 W	16.08 W	53.76 W	160W

*In shutdown status with DC input and only PS2 keyboard/mouse connected

**Under Windows 7 desktop with no application programs executed

***Under Windows 7 with 100% CPU utilization and simultaneous access to all I/O devices

****Additional power supply is necessary if add-on cards are installed and in use

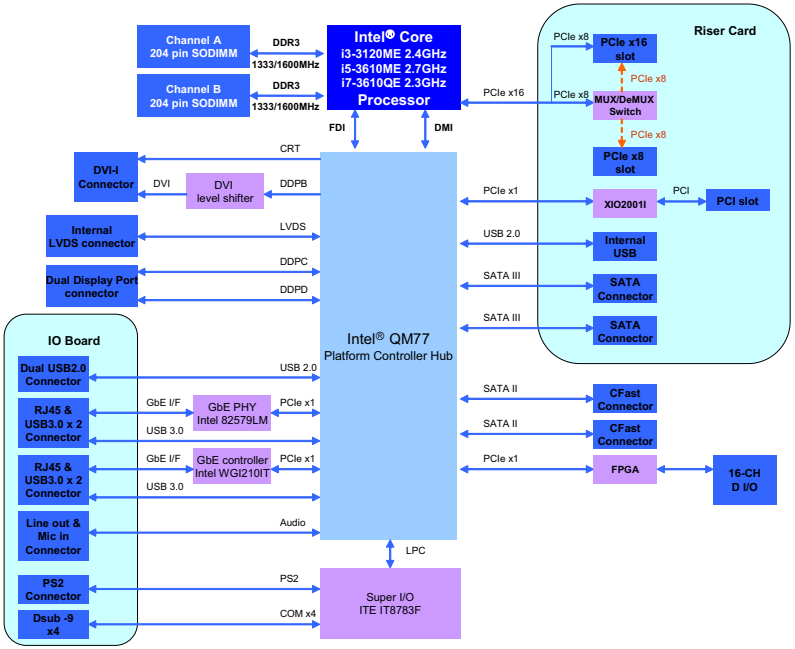


Figure 1-1: MXC-6300 Functional Block Diagram

1.4 Schematics and Dimensions

NOTE:

All dimensions shown are in mm (millimeters).

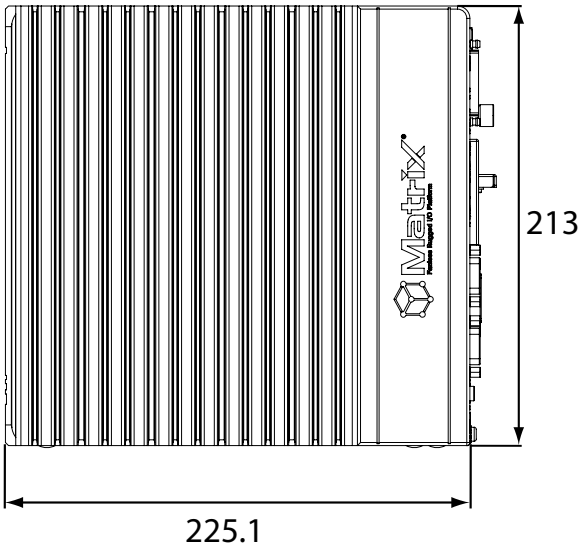


Figure 1-2: MXC-6300 Left Side View

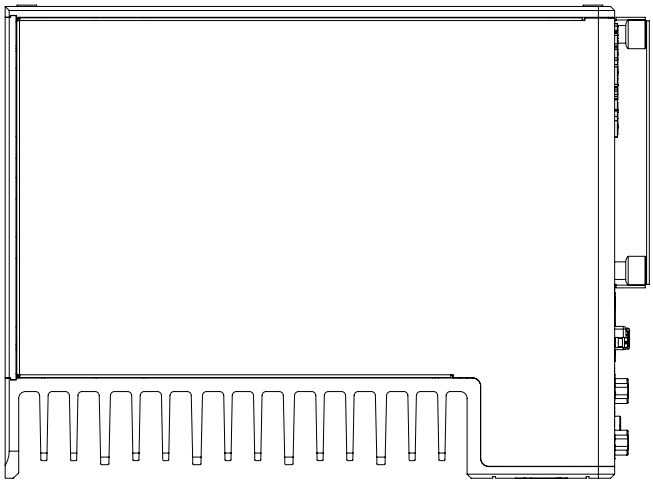


Figure 1-3: MXC-6300 Top View

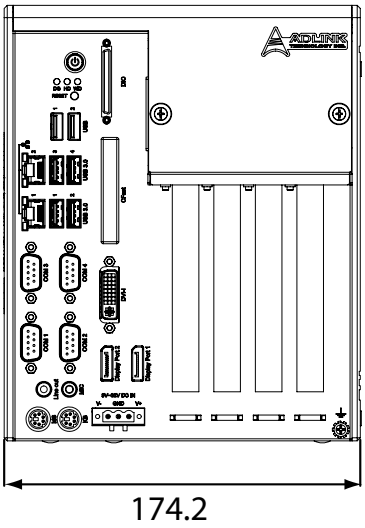


Figure 1-4: MXC-6300 Front View

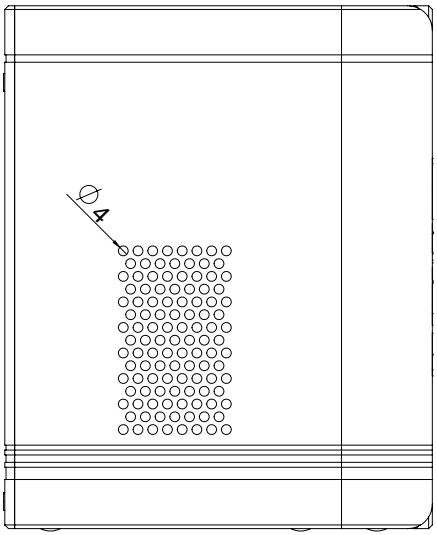


Figure 1-5: MXC-6300 Rear View

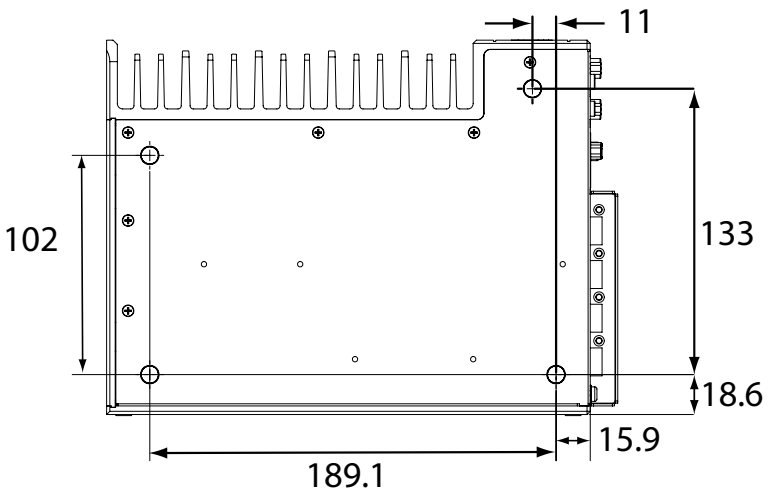


Figure 1-6: MXC-6300 Underside View

1.5 Front Panel I/O Connectors

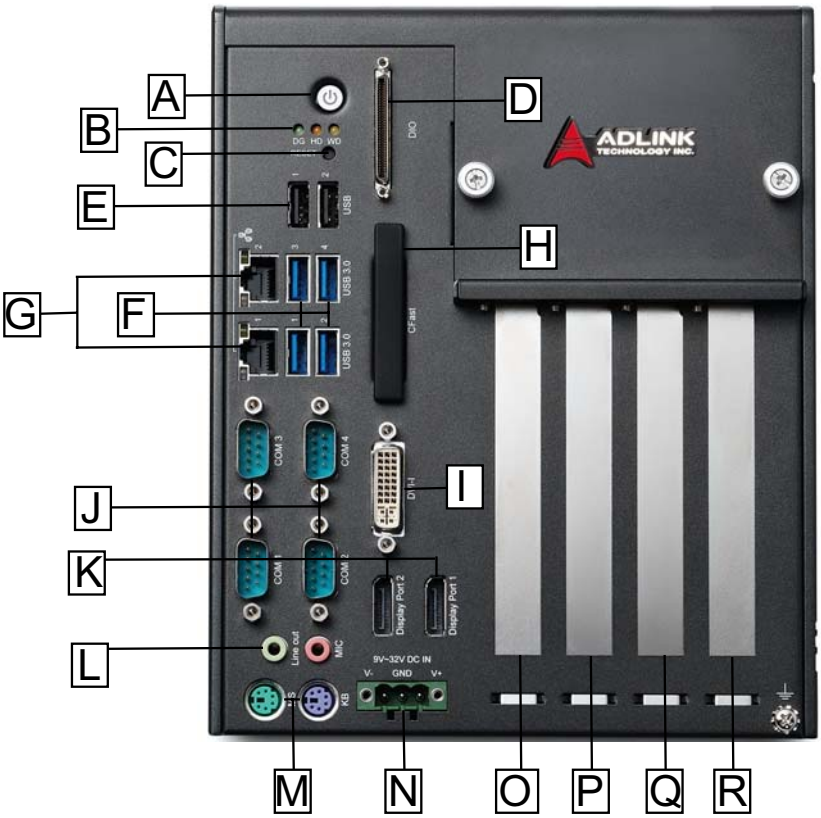


Figure 1-7: Front Panel I/O Connectors

A	Power Button	J	COM port x4
B	LED Indicators	K	DisplayPorts
C	Reset Button	L	Audio Jacks
D	Digital I/O connector	M	PS/2 Keyboard & Mouse
E	USB 2.0 x2 (Type A)	N	DC power supply
F	USB3.0 x4 (Type A)	O	5V 32-Bit PCI Slot

G	Gigabit Ethernet	P	PCI express x8 Slot
H	CFast (Push-Push, Type II)	Q	PCI express x16 Slot
I	DVI-I connector	R	Reserved space for dual-slot width PCIex16 graphic card

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



1 PCIe x16 + 1 PCI expansion slot, with PCIe x16 signal converts to PCIe x8 if two PCI x8 cards are installed in P+Q slots

1.5.1 Power Button

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

1.5.2 LED Indicators

In addition to the LED of the power button, three LEDs on the front panel indicate the following.

LED indicator	Color	Description
Watchdog (WD)	Yellow	Indicates watchdog timer status. When watchdog timer starts, the LED flashes. When the timer is expired, the LED remains lit..
Hard disk drive (HD)	Orange	Indicates the HDD operating state. When the SATA hard drive or CFast card is active, the LED indicator flashes.
Diagnostic (DG)	Green	When lit continuously, indicates no physical storage is connected, and if blinking, indicates no memory is installed on either SODIMM socket.

Table 1-2: LED Indicators

1.5.3 Reset Button

The reset button executes a hard reset for the MXC-6300.

1.6 Digital I/O Connector

The MXC-6300 controller features an onboard isolated digital I/O circuit with a 68-pin VHDCI (Very High Density Cable Interconnect) connector on the front panel. The onboard digital I/O card supports the following features:

16-CH Isolated DI

- Logic high: 5 to 24 V
- Logic low: 0 to 1.5 V
- Input resistance: 8.2K @ 0.75W
- Isolation type: photocoupler
- Isolation voltage: 1500 V DC

16-CH Isolated DO

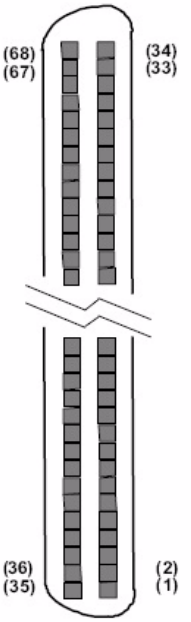
- Output Type: MOSFET transistor
- Sink current up to 100 mA (sustained loading) or 250 mA (peak loading) on each isolated output channel
- Supply voltage: 5 to 35 V DC
- Isolation type: Digital Isolator
- Isolation voltage: 1500 V DC
- Flywheel diode for VDD on all DO channels

Isolated 5V DC Power Source for DO

- Supply voltage: 5 ± 0.5V DC
- Supply current: 180 mA (maximum)
- Isolation type: DC-to-DC transformer
- Isolation voltage: 1500 VRMS (channel to system)

General Specification

- 68-pin VHDCI(Very High Density Cable Interconnect) connector (mating with AMP 787082-7) on the front panel
- Optional accessories: DIN-68S-01 and ACL-10568-1
- Data transfer: programmed IO
- Software Driver support for Win7 32bit: PCMe-1432_x86_v0.0.0.6Software Driver support for Win7 64bit: PCMe-1432_x64_v0.0.0.7



Pin	Signal	Pin	Signal	Pin	Signal
1	+VDD	24	DI1_L	47	EOGND
2	EOGND	25	DI0_H	48	DO10
3	DO7	26	DI0_L	49	EOGND
4	EOGND	27	DI11	50	DO9
5	DO6	28	ISO_COM	51	EOGND
6	EOGND	29	DI10	52	DO8
7	DO5	30	ISO_COM	53	DI7_H
8	EOGND	31	DI9	54	DI7_L
9	DO4	32	ISO_COM	55	DI6_H
10	EOGND	33	DI8	56	DI6_L
11	DO3	34	ISO_COM	57	DI5_H
12	EOGND	35	+VDD	58	DI5_L
13	DO2	36	+V5DIO_CN_ISO	59	DI4_H
14	EOGND	37	EOGND	60	DI4_L
15	DO1	38	DO15	61	DI15
16	EOGND	39	EOGND	62	ISO_COM
17	DO0	40	DO14	63	DI14
18	EOGND	41	EOGND	64	ISO_COM
19	DI3_H	42	DO13	65	DI13
20	DI3_L	43	EOGND	66	ISO_COM
21	DI2_H	44	DO12	67	DI12
22	DI2_L	45	EOGND	68	ISO_COM
23	DI1_H	46	DO11		

Table 1-3: Digital I/O Connector Pin Signals

DI	DIn_H	High input of isolated differential DI channel (n=0 to 7)
	DIn_L	Low input of isolated differential DI channel (n=0 to 7)
	DIn	Input of isolated DI channel (n=8 to 15)
	ISO_COM	Common ground of isolated DI channel 8 to 15
DO	DOn	Output of isolated DO channel (n=0 to 15)
	EOGND	Ground return path of isolated DO channel 0 to 15 and +V5DIO_CN_ISO
	+VDD	Power input signal for flywheel diode of isolated DO channel 0 to 15
	+V5DIO_CN_ISO	Isolated 5V DC power, maximum output 180mA

Table 1-4: Digital I/O Connector Pin Legend

1.6.1 Isolated Digital Input Circuits

Input accepts voltages up to 24V, with input resistors of 8.2 kΩ, with connections between outside signals as shown.

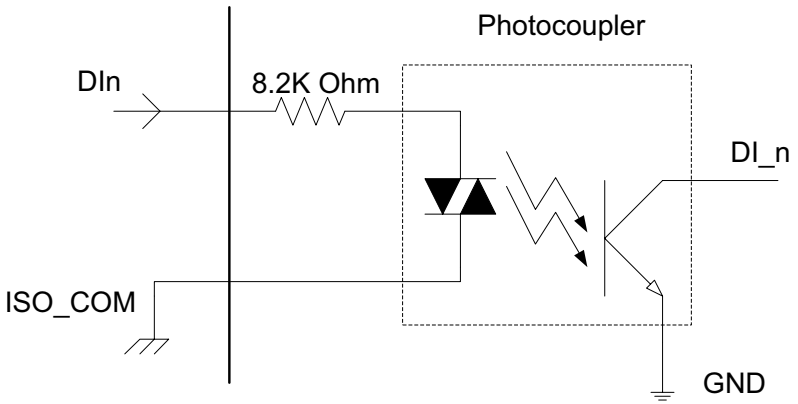


Figure 1-8: Isolated Digital Input Circuit

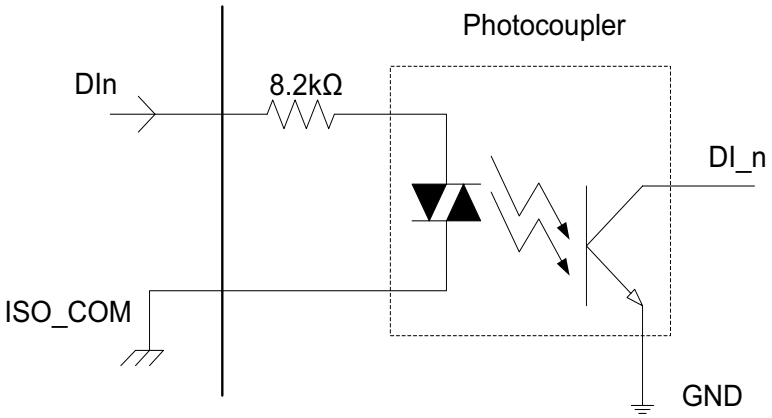


Figure 1-9: Isolated Digital Input Differential Input Circuit

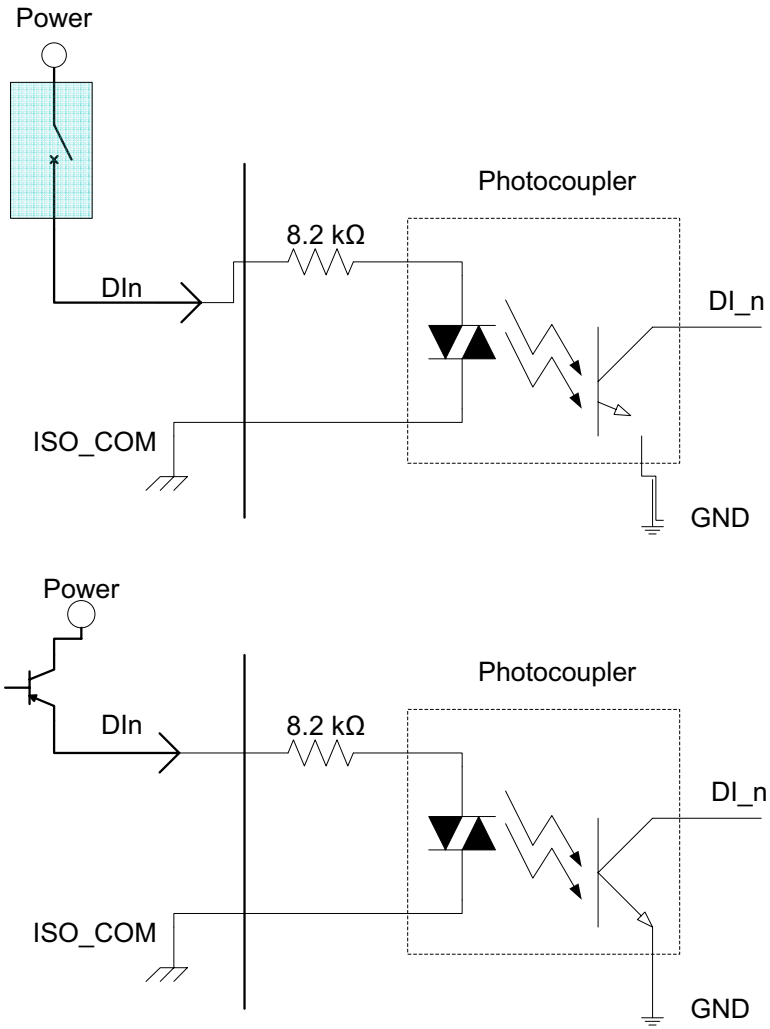


Figure 1-10: Isolated Digital Input Sample Application Circuit

1.6.2 Isolated Digital Output Circuits

Each isolation digital output channel adopts a MOSFET transistor, capable of driving peak current up to 250mA (sustained current up to 100 mA) with voltage ranges from 5V to 35V.

The VDD pin is connected in serial with a flywheel diode protecting the driver during inductance loading, such as relay, motor, or solenoid, wherein the VDD must connect to external power to form a flywheel current loop.

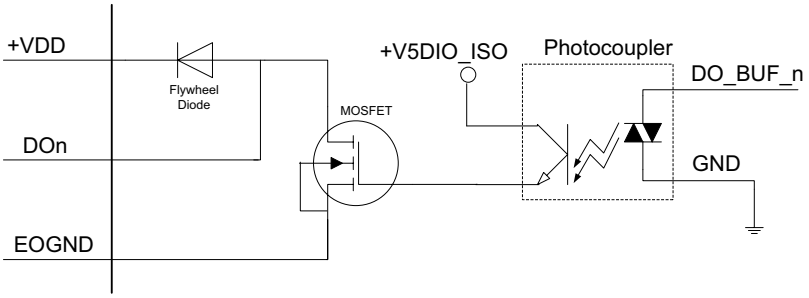


Figure 1-11: Isolated Digital Output Circuits

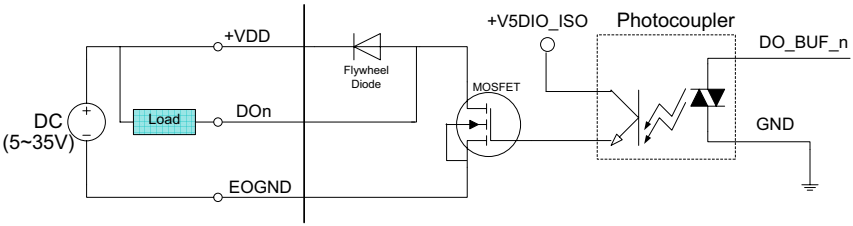


Figure 1-12: Isolated Digital Output Sample Application Circuit

1.6.3 Digital I/O Windows Driver and API

The MXC-6300 DI/O incorporates ADLINK's PCMe-1432 Windows driver, on the bundled driver CD or downloadable from Adlink's MXC-6300 web support page (driver for MXC-6300 DI/O).

1.6.4 USB 2.0 Ports

The MXC-6300 provides two USB 2.0 ports supporting Type A USB connection on the front panel. All USB ports are compatible with high-speed, full-speed and low-speed USB devices. The MXC-6300 supports multiple boot devices, including USB flash drive, USB external hard drive, USB floppy, USB CD-ROM and others. The boot priority and boot device can be configured in BIOS. Please refer to Section B.4: Boot on page 74 for details.

1.6.5 USB 3.0 Ports

The MXC-6300 provides four USB 3.0 ports supporting Type A USB3.0 connection on the front panel. All USB3.0 ports are compatible with super-speed, high-speed, full-speed and low-speed USB devices.

1.6.6 Gigabit Ethernet Ports

The MXC-6300 has two Gigabit Ethernet ports on the front panel, supporting Intel WGI210IT GbE and WG82579LM Gigabit Ethernet PHY controllers.

WG210IT provides:

- IEEE 802.3az Energy Efficient Ethernet
- IEEE 1588/802.1AS precision time synchronization
- IEEE 802.3Qav traffic shaper
- Interrupt moderation, VLAN support, IP checksum offload
- PCIe OBFF (Optimized Buffer Flush/Fill) for improved system power management
- Four transmit and four receive queues
- RSS and MSI-X to lower CPU utilization in multi-core systems
- ECC - error correcting memory in packet buffers
- Wake-On-LAN
- NC-SI for increased bandwidth passthrough
- Preboot eXecution Environment (PXE) flash interface
- Jumbo frame support

- LAN Teaming

The WG82579LM provides:

- 802.3x flow control
- IEEE 802.1p and 802.1q
- Energy Efficient Ethernet(EEE)802.3az
- 10/100/1000 IEEE 802.3
- Automatic MDI/MDIX crossover at all speeds
- Wake-On-LAN
- Intel® AMT 8.0
- Reduced power consumption during normal operation and power down
- Preboot eXecution Environment (PXE) flash interface
- 9 KB jumbo frame support
- LAN Teaming



Active/Link Yellow	Speed LED Green/Orange

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

Table 1-5: Active/Link LED

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

Table 1-6: Speed LED

1.6.7 CFast Socket

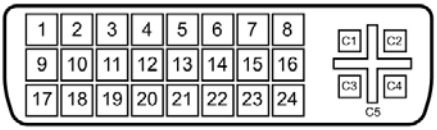
The Matrix MXC-6300 is equipped with a Type II Push Push CFlash host connector on the front panel, by SATA interface. Data transfer rates up to 3.0Gb/s(300MB/s)/1.5Gb/s(150MB/s) are supported. The host SATA controller provides a legacy operating mode using I/O space, and an AHCI operating mode using memory space. The CFast card can function as a storage device for system installation.

1.6.8 DVI-I Connector

The MXC-6300 provides one DVI-I connector providing connection to an external monitor.

CAUTION:

Since VGA signals are analog based, VGA display quality is greatly affected by quality and length of cable used. We strongly recommended VGA cable less than 2 meters in length with effective shielding, such as UL style 2919 AWM.

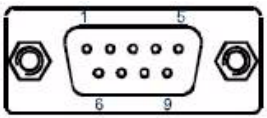


Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	DVIdata 2-	9	DVIdata 1-	17	DVIdata 0-	C1	Analog Red
2	DVIdata 2+	10	DVIdata 1+	18	DVIdata 0+	C2	Analog Green
3	GND	11	GND	19	GND	C3	Analog Blue
4	CRT DDC clock	12	N/C	20	N/C	C4	Analog horiz. sync
5	CRT DDC data	13	N/C	21	N/C	C5	Analog GND
6	DVIDC clock	14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

Table 1-7: DVI-I Connector Signals

1.6.9 COM Port Connectors

The MXC-6300 provides four COM ports through D-sub 9 pin connectors. The COM1 & COM2 ports support RS-232/422/485 modes by BIOS setting, while COM3 and COM4 support only RS-232. Please refer to Section :COM 1~4, SOL(Serial Over LAN) COM for details of BIOS COM port mode settings.



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

Table 1-8: D-Sub 9p Signal Function of Com Ports

1.6.10 DisplayPort Connectors

Two displayport connectors on the front panel can connect to VGA, DVI, HDMI and DisplayPort monitors via DisplayPort to VGA adapter cable, DisplayPort to DVI adapter cable, or DisplayPort to HDMI adapter cable and DisplayPort cable.

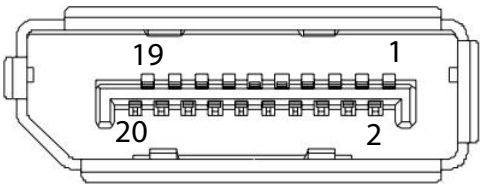


Figure 1-13: DisplayPort Connector

Pin	Signal	Pin	Signal
1	CN_DDPx0+	11	GND
2	GND	12	CN_DDPx3-
3	CN_DDPx0-	13	CN_DDPx_AUX_SEL
4	CN_DDPx1+	14	CN_DDPx_CONFIG2
5	GND	15	CN_DDPx_AUX+
6	CN_DDPx1-	16	GND
7	CN_DDPx2+	17	CN_DDPx_AUX-
8	GND	18	CN_DDPx_HPD
9	CN_DDPx2-	19	GND
10	CN_DDPx3+	20	+V3.3_DDPx_PWR_CN

Table 1-9: DisplayPort Pin Assignments

P/N	Description
30-01119-0000	Passive DisplayPort to HDMI adapter cable
30-01120-0000	Passive DisplayPort to DVI adapter cable
30-01121-0000	Passive DisplayPort to VGA adapter cable
30-01157-0000	Active DisplayPort to DVI adapter cable

Table 1-10: Applicable Cable Types

Display Options

With computing and graphic performance enhancement by its 3rd generation Intel processor, the MXC-6300 controller can support three independent displays, with configuration as follows.

DisplayPort1	DisplayPort2	Other Ports
DisplayPort 2560x1600, 60Hz	DisplayPort 1920x1200, 60Hz	DVI 1920x1200, 60Hz
DisplayPort 2560x1600, 60Hz	DisplayPort 1920x1200, 60Hz	VGA 1920x1200, 60Hz
DisplayPort 2560x1600, 60Hz	DisplayPort 1920x1200, 60Hz	LVDS 1920x1200, 60Hz

Table 1-11: Maximum Available Resolutions with 3-Display Configuration

1.6.11 Audio Jacks

The MXC-6300 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/lineout and microphone input. Audio jack access is on the front panel. The pink jack provides microphone input, and the green jack lineout.



Color	Signal
Green	lineout
Pink	Mic In

Table 1-12: Audio Jack Signals

1.6.12 Keyboard & Mouse PS/2 Connectors

The MXC-6300 provides PS/2 connectors for keyboard and mouse. The green connector provides PS/ 2 mouse connection and the purple connector PS/2 keyboard



Color	Signal
Green	Mouse
Purple	Keyboard

Table 1-13: PS/2 Connector Signals

NOTE:

Keyboard & mouse PS/2 connectors do not support hot-plug capability.

1.6.13 DC Power Connector

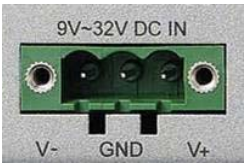
The DC power supply connector of the MXC-6300 is on the front panel. The power supply connector consists of three pins, V+, chassis ground, and V- from right to left respectively. V+ and V- pins provide DC power input and the chassis ground pin allows connection of the chassis to ground for better EMC compatibility. The DC power input for the MXC-6300 allows a voltage input range from 9 V DC to 32 V DC.

WARNING:

Ensure that the DC power supply:

- is within the input voltage range defined in the specification
- is stable and low-noise DC
- provides sufficient operating current

DC power supply over or under voltage, unstable, or of insufficient power may cause system instability and physical damage



Pin	Signal
1	V+ (DC_IN)
2	GND (CHGND)
3	V- (DGND)

Table 1-14: DC Power Supply Connector Signals

1.6.14 PCI Slot

The MXC-6300 provides one PCI slot for expansion on the ABX-6310-BP board. Based on the TI XIO2001I PCIe to PCI bridge, connection to the host system is achieved through a PCIe x1 Gen2 interface, supporting universal or 5V PCI 32-bit cards operating at 33/66MHz clocks.

1.6.15 PCI Express x8 Slot

The MXC-6300 provides one PCI express x8 slot for expansion. The PCI express slot can support support standard PCIe Gen 2 short cards.

1.6.16 PCI Express x16 Slot

One PCI express x16 slot supports expansion with standard PCIe Gen2 cards and full PCI express x16 signals if no card is present in the PCI express x8 slot. otherwise, the PCIex16 slot is limited to PCIex8 speeds.

1.6.17 Reserved Space for Wide PCI Express x16 Card

PCI express x16 cards equipped with cooling fans can require supplemental reserved space, this slot accommodates the fan.

1.7 Internal I/O connectors

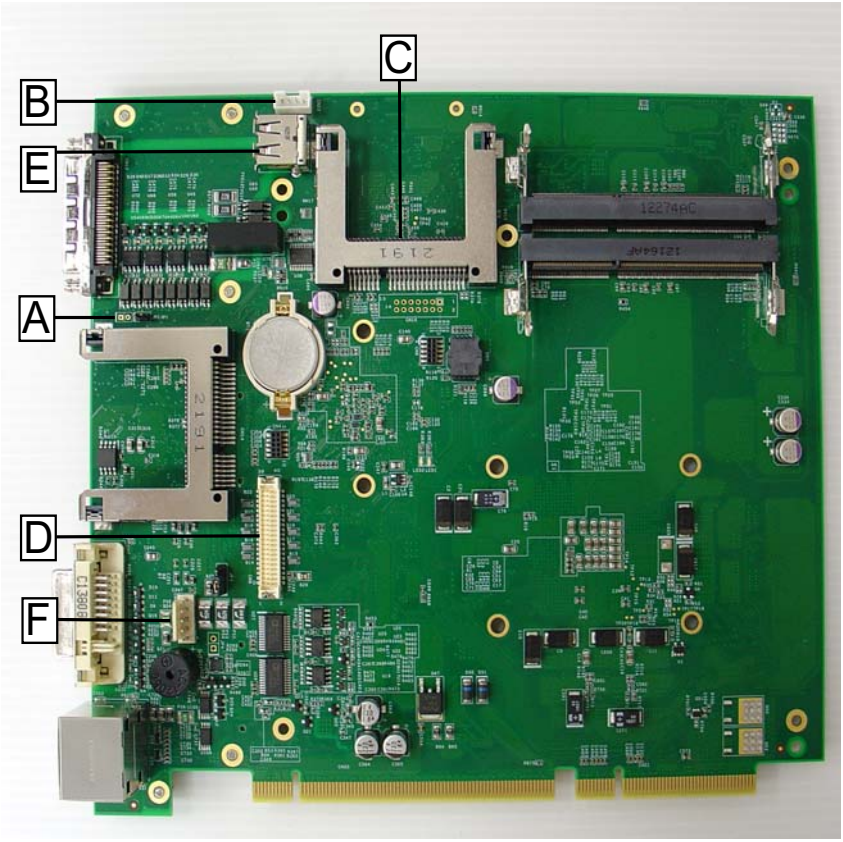


Figure 1-14: Mainboard PCB

A	Clear CMOS jumper
B	Internal reserved +5V and +12V connector
C	Internal CFast Card connector
D	LVDS interface connector
E	12V DC fan connector
F	LVDS panel backlight control connector

Table 1-15: Mainboard Connector Legend

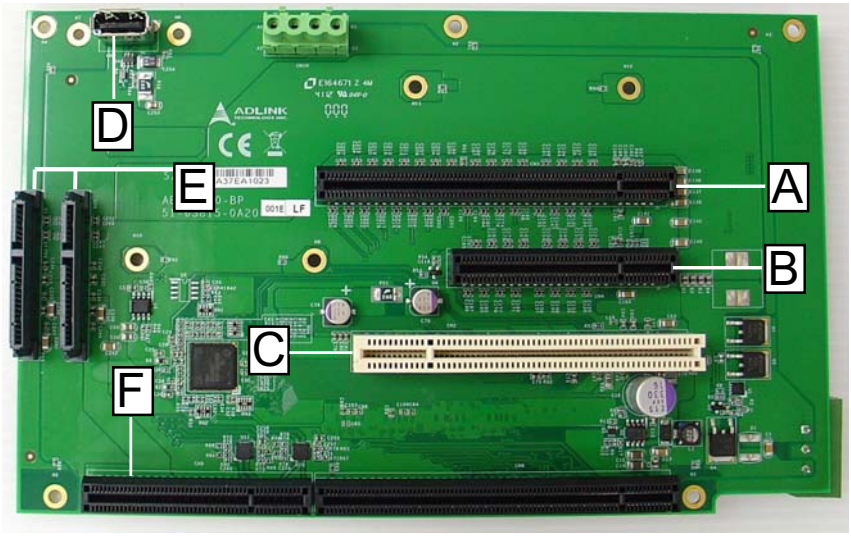


Figure 1-15: Backplane Board PCB

A	PCI express x16 slot
B	PCI express x8 slot
C	32bit 5V PCI slot
D	Internal USB connector
E	SATA connector x2
F	Backplane board to mainboard PCB connector

Table 1-16: Backplane Board Connector Legend

NOTE:

Recommended expansion slot configuration options for MXC-6300 (not applicable for MXC-6310):

- 1 x PCI card + 1 x PCIe x16, with PCIe x8 slot empty

OR

- 1 x PCI card + 1 x PCIe x8 (in PCIe x8 slot)+ 1 x PCIe x8 (in PCIe x16 slot)

For best results, other configurations are not recommended

1.7.1 Clear CMOS Jumper

Upon encountering an abnormal condition preventing the MXC-6300 from booting, the jumper can clear the BIOS content stored in CMOS and restore default settings. To clear CMOS, short pin #1 to pin #2 of JP1 and then remove the jumper to return to normal mode.

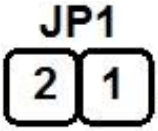
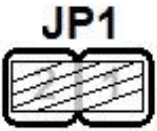
Normal	Clear
	

Table 1-17: Clear CMOS Jumper Settings

1.7.2 Internal Reserved +5V and +12V Connector

The MXC-6300 provides one power pin header with +5V and +12V DC power, providing access for PCI and PCI express card external power supplies.

Please refer to Section A.2:Power Supply Reference for +5V and +12V connector power supply specifications

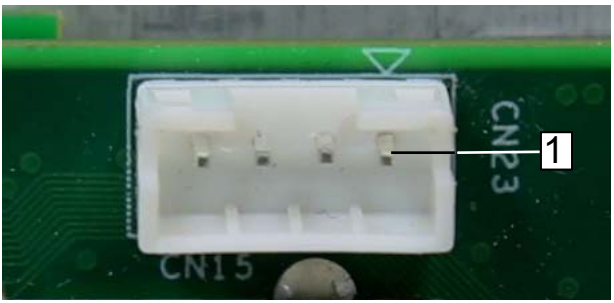


Figure 1-16: +5V and +12V Connector

Pin	Signal
1	+12V

Pin	Signal
2	GND
3	GND
4	+5V

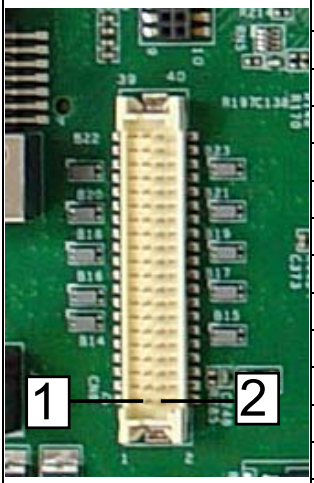
Table 1-18: +5V and +12V Connector Pin Functions

1.7.3 Internal CFast Card Connector

An internal Type II push-push CFast socket connects 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. Installation of a CFast card is described in Section 2.4:Installing CFast Cards.

1.7.4 LVDS Interface Connector

The MXC-6300 provides an internal LVDS interface connector. The LVDS interface can support dual channel LVDS signals.



Pin	Signal	Pin	Signal
1	LVDS_VCC	2	LVDS_VCC
3	LVDS_VCC	4	LVDS_VCC
5	GND	6	GND
7	GND	8	GND
9	LVDS_A_CLK+	10	LVDS_B_CLK+
11	LVDS_A_CLK-	12	LVDS_B_CLK-
13	GND	14	GND
15	LVDS_A_DATA0+	16	LVDS_B_DATA0+
17	LVDS_A_DATA0-	18	LVDS_B_DATA0-
19	GND	20	GND
21	LVDS_A_DATA1+	22	LVDS_B_DATA1+
23	LVDS_A_DATA1-	24	LVDS_B_DATA1-
25	GND	26	GND
27	LVDS_A_DATA2+	28	LVDS_B_DATA2+
29	LVDS_A_DATA2-	30	LVDS_B_DATA2-
31	GND	32	GND
33	LVDS_A_DATA3+	34	LVDS_B_DATA3+
35	LVDS_A_DATA3-	36	LVDS_B_DATA3-
37	GND	38	GND
39	LDDC_CLK	40	LDDC_DATA

Table 1-19: LVDS Connector Pin Functions

1.7.5 12V DC Fan Connector

The MXC-6300 provides a DC 12V to USB connector for fan module power. The optional fan module connects to the connector when assembled to the chassis.

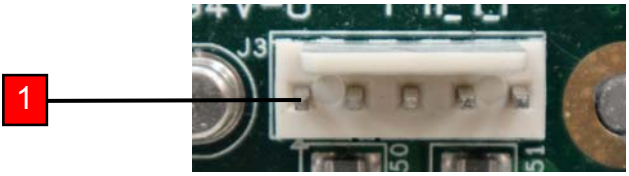
Fan speed changes with CPU temperature according to thermal sensor, initiating at 40°C(104°F), and reaching maximum speed at

80°C (176°F). The fan rotates at maximum speed when Power On Self Test begins.

WARNING:	The USB connector does not support standard USB connections, which may be damaged by the DC 12V power supply.

1.7.6 LVDS Panel Backlight Control Connector

The MXC-6300 provides backlight control to the LVDS panel by the pin header connector, controlling LVDS panel backlight on/off and brightness functions.



Pin	LED	CCFL
1	Backlight Enable	Backlight Enable
2	Backlight Ctrl	N/C
3	N/C	Backlight Ctrl
4	GND	GND
5	+12V	+12V

Table 1-20: Backlight Connector Pin Functions

1.7.7 Internal USB Connector

The MXC-6300 provides an internal USB connector on the back board PCB.

1.7.8 SATA Connectors

The MXC-6300 provides 2 SATA ports, supporting up to 6.0Gb/s (600MB/s) transfer rate. The SATA host controller can be set to

operate in IDE or AHCI mode in BIOS.This SATA connector is designed to support a 2.5 inch hard disk drive (HDD) or solid state disk (SSD). The HDD or SSD must be installed into the SATA connector with a HDD bracket. Please refer to Section 3.1 for installation of a 2.5 inch HDD or SSD.

1.7.9 Backboard to System PCB Connector

This connector connects the backboard to a golden finger-equipped mainboard PCB.

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2 Getting Started

This chapter discusses installation of a hard disk drive, a PCI/PCIe card, and two CFast cards in the system. In addition to connection and use of eSATA-to-SATA interface external storage device, MXC-6300 wall-mounting is also described.

2.1 Unpacking Checklist

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

- MXC-6300 controller
- Accessory Box
- Screw pack for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD

2.2 Installing Hard Disk Drives

Before installing hard disk drives, remove the top cover of the chassis first as follows.

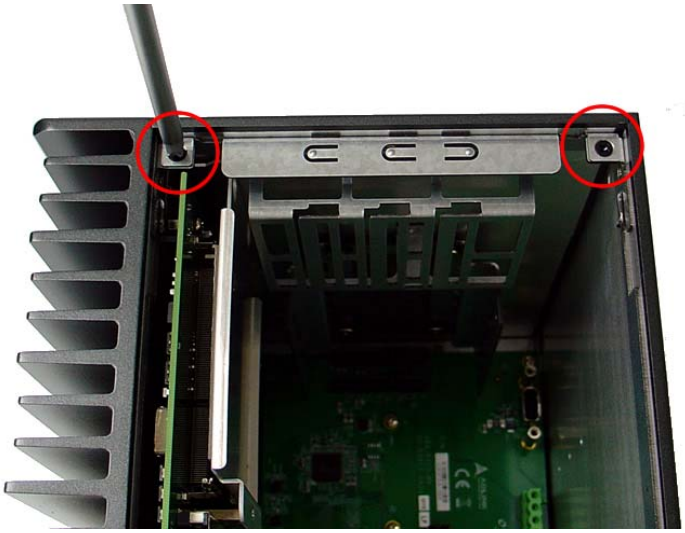
1. Loosen the thumbscrews on the front panel by hand or screwdriver.



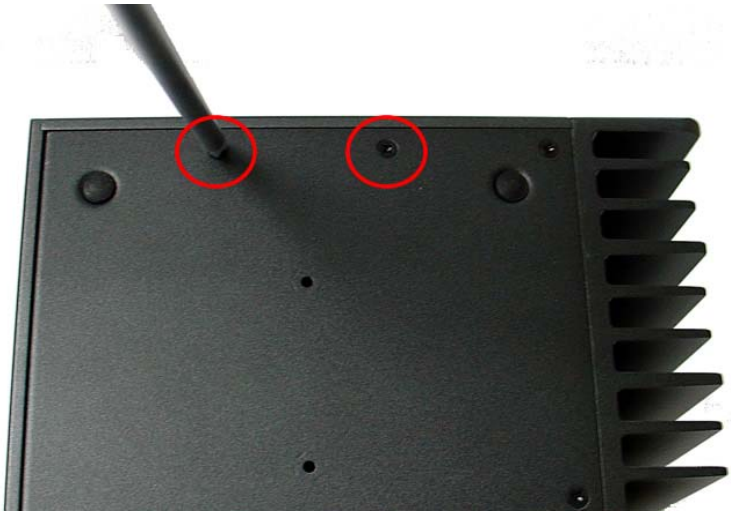
2. Withdraw the thumbscrew and remove the top cover by lifting.



3. Remove 2 screws from the top of the HDD bracket.



4. Place the chassis upside down and remove the other 2 screws from the bottom of the HDD bracket.



5. Lift the HDD bracket.



6. Use the 8 included M3 screws to fix one or two 2.5” HDD or SSD units to the bracket. Upper 2.5’’ HDD or SSD is SATA 2, and the lower SATA 1.



7. Gently push the HDD/SSD bracket down to the SATA connector on the PCB.

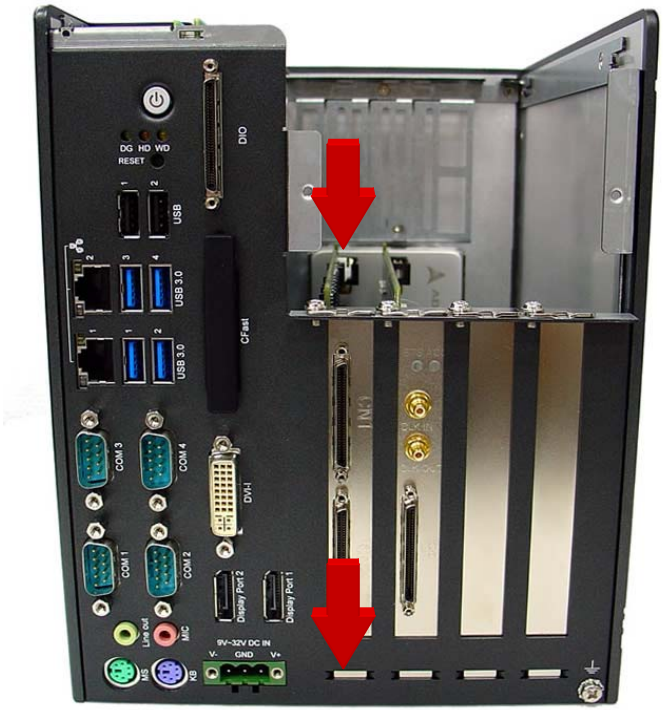


8. Reverse Steps 3 and 4 to fasten the 4 screws.
9. Replace the top cover and fasten the thumbscrew.

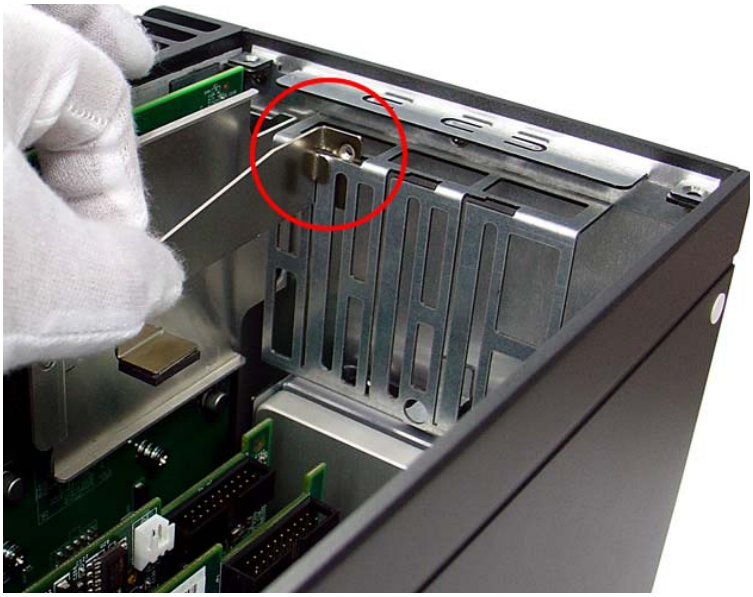
2.3 Installing a PCI/PCIe Card

Follow steps 1-2 in Section 2.2:Installing Hard Disk Drives to remove the top cover before installing a PCI/PCIe card.

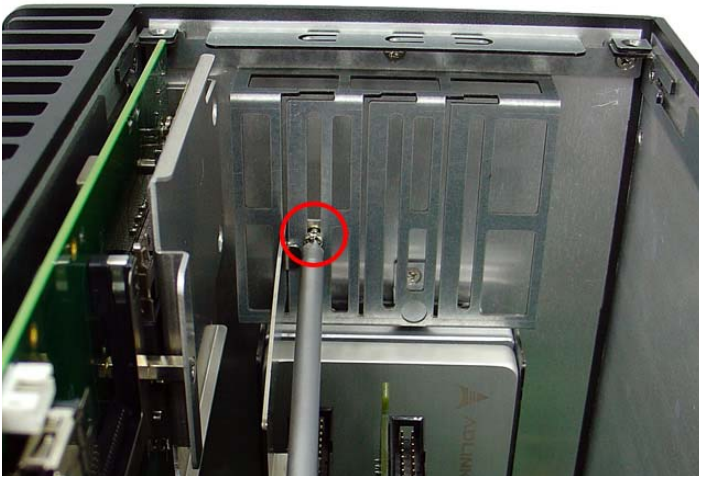
1. Insert thePCI/PCIe card into the PCI/PCIe slot. Ensure that the lower edge of the PCI/PCIe card aligns with the alignment guide.



2. Adjust the position of the included card brace to firmly fix the card.



Tighten the screw to fix the brace.

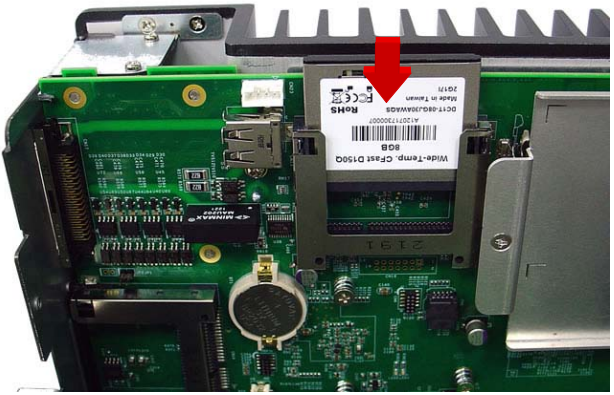


3. Replace the top cover and fasten the thumbscrew.

2.4 Installing CFast Cards

The MXC-6300 provides internal and external CFast sockets to accommodate a total of two CFast cards. According to steps 1-2 in Section 2.2, remove the top cover.

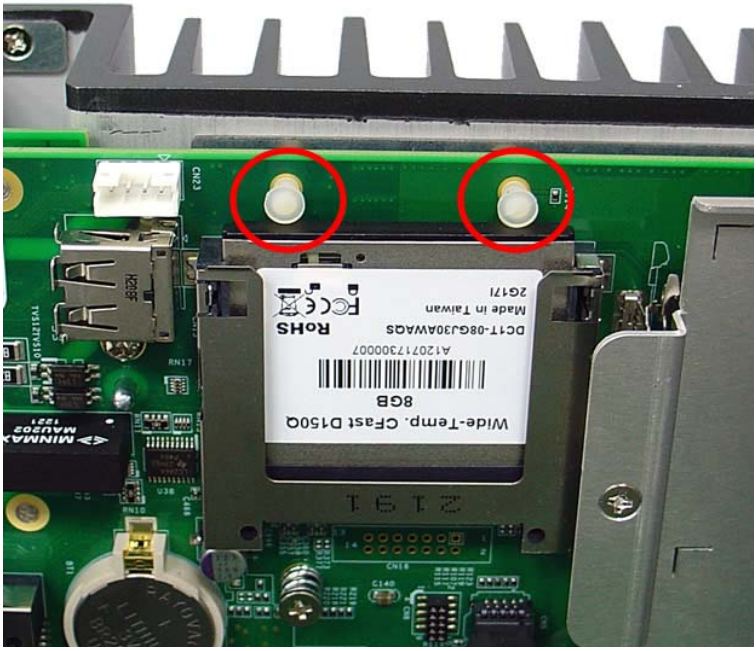
1. Align the internally mounted CFast card with the guide of the internal CFast socket.



2. Gently depress the CFast card until it is firmly seated in the internal CFast socket.



3. Place the two included spacer supports to prevent the CFast card from dislodging.



4. Replace the top cover and refasten the thumbscrews.

5. Remove the external CFast socket cover

.



6. Align the externally mounted CFast card with the guide of the external CFast socket.

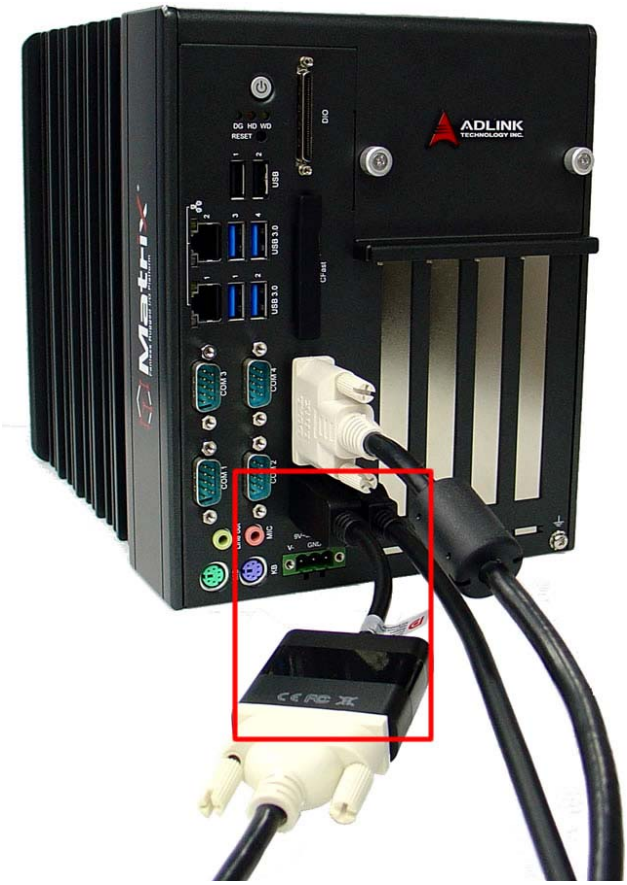


7. Gently insert the CFast card until it is firmly seated in the external CFast socket, as shown.



2.5 Connecting and Using DisplayPort Extension Devices

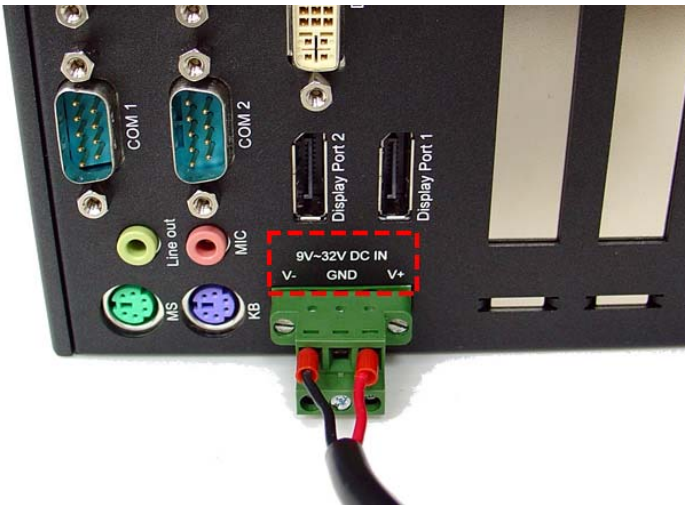
1. Connect a DisplayPort-to-DVI active adapter cable to the MXC-6300 DisplayPort jack.
2. Connect a DVI monitor to a single-mode DisplayPort output from the computer via a DisplayPort-to-DVI active adapter cable (P/N# 30-01157-0000)



2.6 Connecting DC Power

WARNING:

Before connecting DC power to the MXC-6300, ensure voltage and polarity are compliant with the DC input. Improper input voltage or polarity can cause system damage.



The DC power input connector of the MXC-6300 has V+, V- , and chassis ground pins, and accepts input voltage as shown previously. Connect DC power as shown. Two screws fasten to secure the plug.

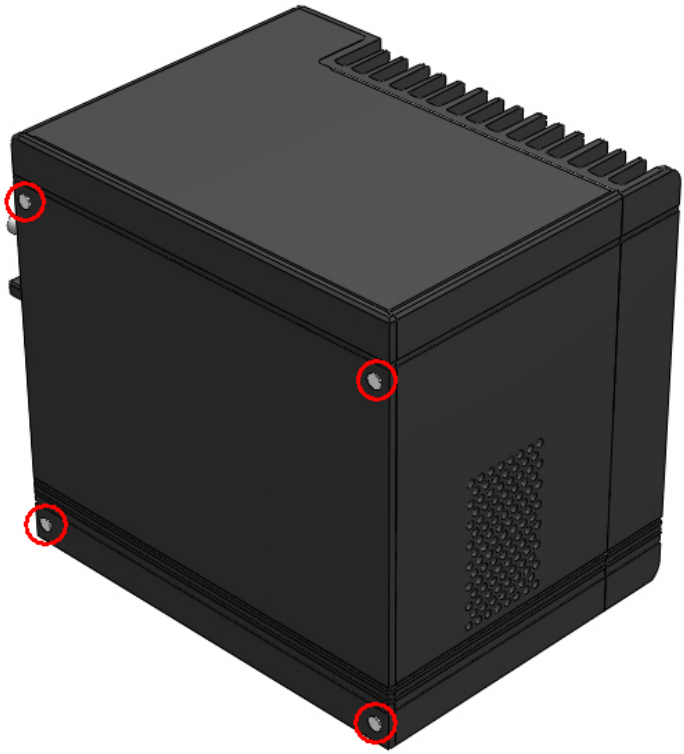
2.7 Wall-mounting the MXC-6300

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

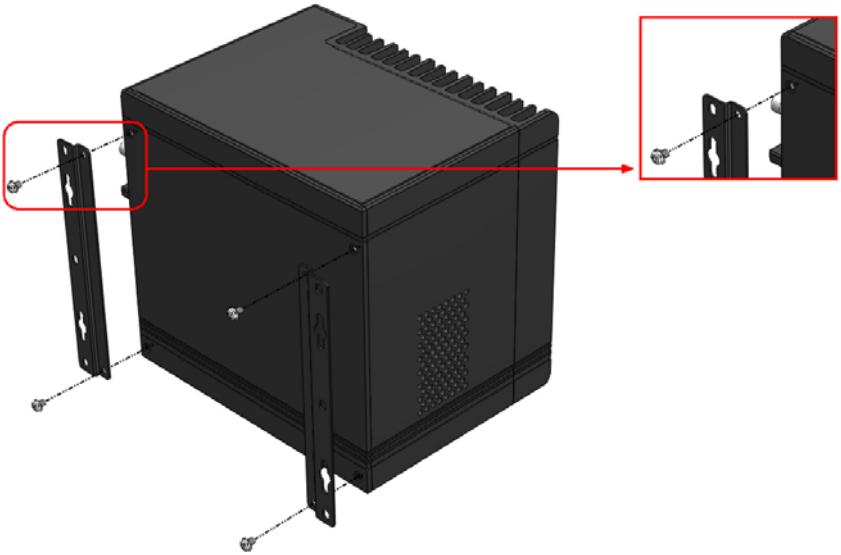
The MXC-6300 is shipped with wall-mount brackets and accessory screws.

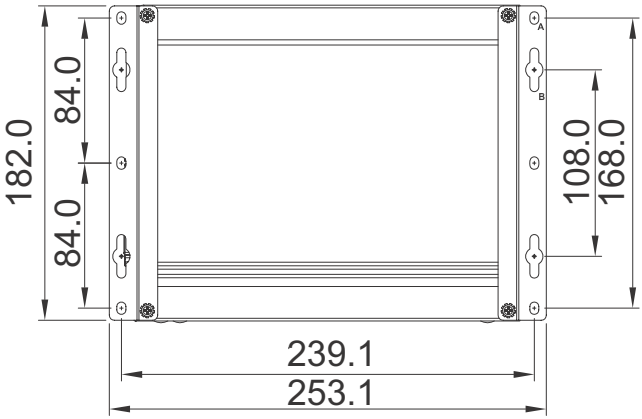
Wall–mounting procedures follow.

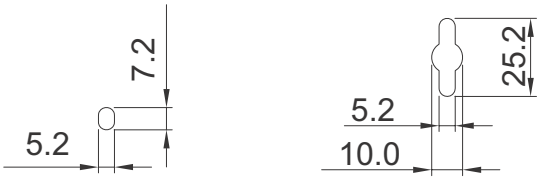
1. Remove the 4 plastic pads from the corners.



2. Use the 4 M4 screws shipped with the controller to fix the 2 wall-mount brackets, also included, to the chassis, according to the spacing dimensions of the screw holes and brackets, as shown.







3. Once final assembly as shown is complete, mount the MXC-6300 on the wall via screw holes.



2.8 Optional Fan Module

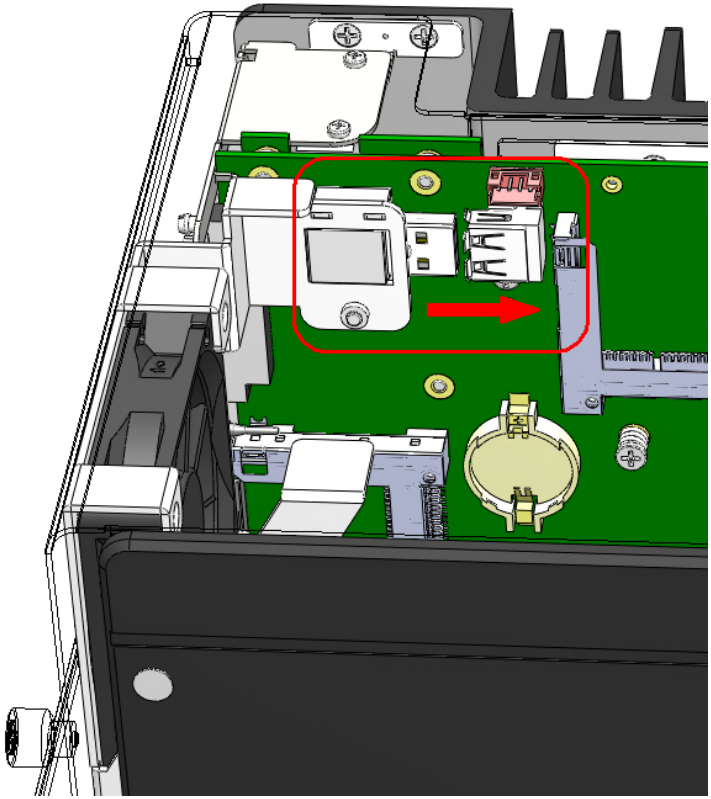
The MXC-6300 can be optionally equipped with an easily installed fan module providing heat dissipation.

To install the fan module:

1. Follow steps 1-2 in Section 2.2 to remove the top cover. Seat the fan module in the chassis.



2. Slide the fan module back until USB connection is secured, as shown.



3. Replace the thumbscrews.

2.9 Cooling Considerations

Heat-generating components of the MXC-6300 (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 MXC-6300 controller.

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.

The MXC-6300 enables full driver support for systems running Windows 7 32 or 64bit.



Ensure the Microsoft Windows OS is fully installed before installing any drivers, since most standard I/O device drivers are included therein

It is recommended that drivers be installed as follows.

1. Chipset driver
2. Graphics driver
3. Ethernet driver
4. Audio driver
5. USB 3.0 driver
6. Intel Management Engine driver
7. WDT (watchdog timer) driver
8. Digital Input/Output driver

3.1 Installing the Chipset Driver

The chipset driver directs the operating system to configure the Intel® NM10chipset 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

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\Chipset\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\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

The MXC-6300 is equipped with the Intel® HD Graphics 4000 integrated in the Intel® Core i7.

To install the graphics driver:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The graphics drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\Graphics\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\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

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\LAN-Intel\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\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

The MXC-6300 supports Intel High Definition audio using the Realtek ALC269 audio codec.

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\Audio\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\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 USB 3.0 Driver

The MXC-6300 supports USB 3.0 using Intel QM77 chipset.

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\

USB3.0\
x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\USB3.0\
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.

3.6 Installing the Intel Management Engine Driver

The MXC-6300 supports the Intel Management Engine on the Intel QM77 chipset.

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\ManageEngine\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\ManageEngine\
   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.

3.7 Installing the WDT Driver/API

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.

To install the WDT driver/API for the MXC-6300:

1. Close any running applications.
2. Ensure that you have Administrator privileges.
3. Download Microsoft® Visual C++ 2005 Redistributable Package x86 or x64 version at: http://www.micro-

soft.com/en-us/download/details.aspx?id=3387
This is necessary for WDT operation.

4. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\WDT\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\WDT\
   where x: denotes the DVD-ROM drive.
5. Execute Setup.exe and follow onscreen instructions to complete the setup.
6. After installation is complete, reboot the system.

3.8 Installing the DI/O Driver/API

The MXC-6300 also provides 12 channels for DI and 12 for channels DO based on the PCMe-1432.

To install the DI/O driver/API:

1. Close any running applications.
2. Ensure that you have Administrator privileges.
3. Insert the ADLINK All-in-One DVD. The drivers are located in:
   x:\Driver Installation\Matrix\MXC-6300\Win7_32bit\DIO\
   x:\Driver Installation\Matrix\MXC-6300\Win7_64bit\DIO\
   where x: denotes the DVD-ROM drive.
4. Execute Setup.exe and follow onscreen instructions to complete the setup.
5. After installation is complete, reboot the system.
6. The PCMe-1432 DIO API library and sample programs are in the MXC6300_DIO folder, with default location C:\Program Files\ADLINK\MXC6300_DI

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Appendix A: Power Consumption



Information in this Appendix is for power budget planning and design purposes only. Actual power consumption may differ based on final application.

A.1 Power Consumption Reference

Power consumption as follows is based on lab data in which 24V DC is applied and current is measured by the DC power supply. The power consumption (W) is calculated as the product of applied voltage (V) and the current (A).

Platforms tested for this data have available external I/O interfaces, and are attached to supported devices such as VGA and DVI monitors, CFast card, PS2 keyboard/mouse, USB dummy load (5VDC 500mA), external SATA , COM loopback, and audio loopback, and an internal hard disk driver is installed.

No internal PCI/PCIe/mini PCIe slots are occupied.

Information is presented for reference only. Actual power consumption will vary with different attached devices and platform operations.

Power Supply: 24VDC	Power Off	System Idle	System Full Load	Recommended Power Supply
Integrated Embedded Computer				
MXC-6300 i7	2.16 W	18.48 W	91.2 W	160W
MXC-6300 i5	2.16 W	16.8 W	67.2 W	160W
MXC-6300 i3	2.16 W	16.08 W	53.76 W	160W

Table A-1: Power Consumption

NOTE:

- Sufficient power supply for the entire system is required to meet these specifications. At least 100W at 24V input is recommended.
- Heat generated by add-on PCI/PCIe adapters affects thermal stability. Additional heat dissipation is required when the system operates at high temperatures or in harsh environments with add-on adapters.
- Power supply specifications shown are for total power consumption of all PCI/PCIe slots at once, not for single slot use.

A.2 Power Supply Reference

+3.3V Power Rail	Maximum 7A	Total Power Supply Max. 25W
+5V Power Rail	Maximum 5A	
+12V Power Rail	Maximum 2A	
-12V Power Rail	Maximum 0.2A	
CN23 +12V	Maximum 1A	
CN23 +5V	Maximum 1A	

Table A-2: Power Supply

A.3 Accessory Cabling

Power supply to add-on cards is provided by the auxiliary power cable (from CN23 to Molex 8981), Part Number 30-20724-0000.



Yellow	12V	Black	GND
Black	GND	Red	5V

Appendix B: BIOS Setup

The Basic Input/Output System (BIOS) is a program that provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the MXC-6300. The BIOS setup program includes menus for configuring settings and enabling features of the MXC-6300. Most users do not need to use the BIOS setup program, as the MXC-6300 ships with default settings that work well for most configurations.

Enter BIOS setup by selecting DEL when the system is powered on the POST (Power On Self Test) message is displayed.The MXC-6300 controller supports one-time Boot Menu allowing selection of boot device. Enter the Boot Menu by selectiong F7 at POST.


NOTE:

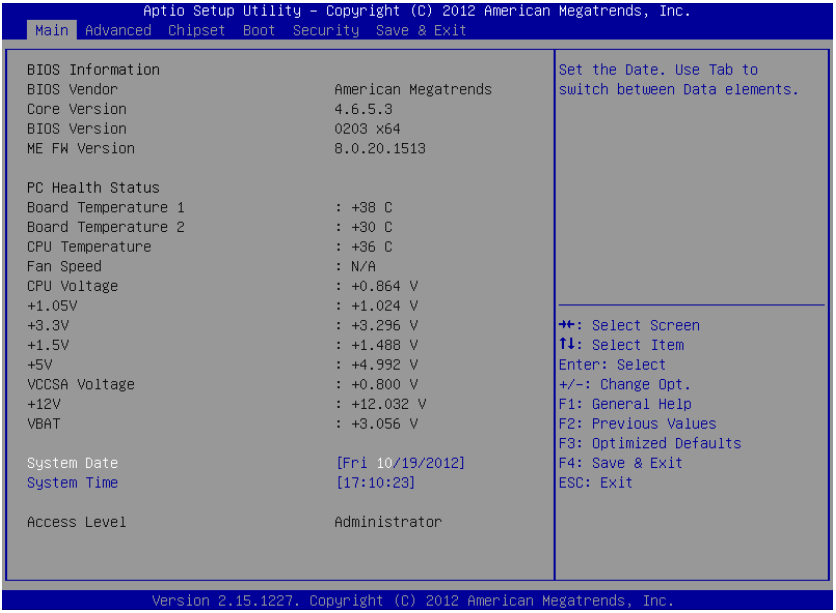
- BIOS options listed are for reference only.
- Different configurations can afffect BIOS behavior.
- Displayed material may reflect only the BIOS version corresponding to initial release and may differ from that of the purchased motherboard.
- Users are welcome to download the latest BIOS version from our official website.

B.1 Main

Contains basic system information for the MXC-6300.


WARNING:

Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot. In such a case, Section 2.4.4 provides instruction on clearing the CMOS and restoring default settings



BIOS Information

Shows current system BIOS code version and BIOS version.

PC Health Status

Hardware health on Super I/O supports Board Temperature, Fan Speed, CPU Voltage, +1.05V, +3.3V, +1.5V, +5V, +12.0V, and VBAT.

System Time/System Date

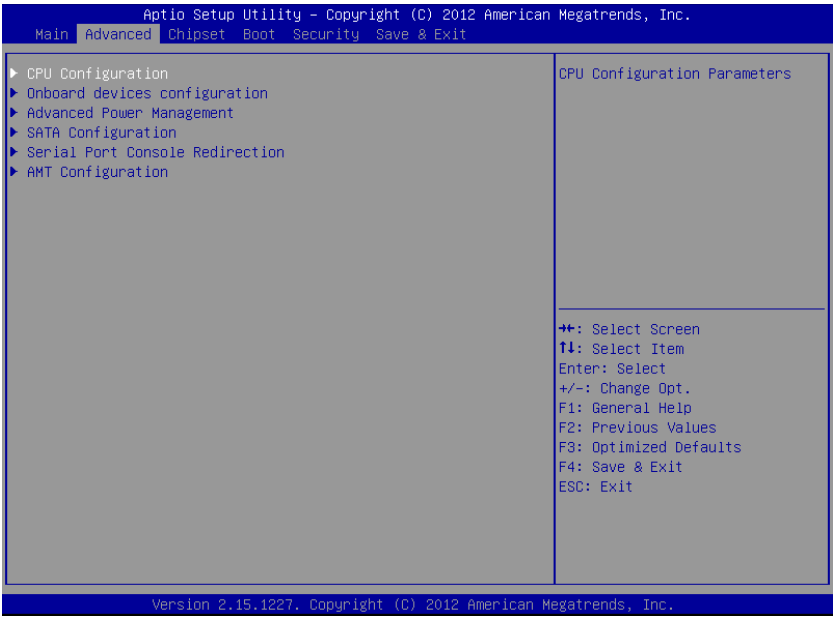
Allows adjustment of system time and date, as follows.

1. Highlight System Time or System Date using the up and down <Arrow> keys
2. Enter new values using the keyboard and select <Enter>
3. Select < Tab > to move between fields.

NOTE:

- The date must be entered in MM/DD/YY format, and the time in HH:MM:SS.
- 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

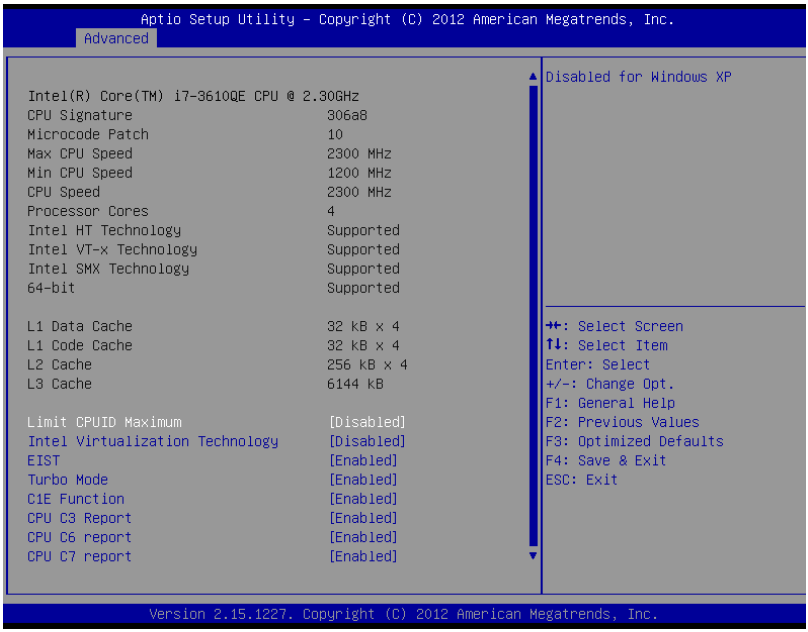


CAUTION:

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

Accesses advanced options of the MXC-6300.

B.2.1CPU Configuration



Limit CPUID Maximum

Disabled for Windows XP.

Intel Virtualization Technology

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

EIST

Enables/Disables Intel SpeedStep Technology.

Turbo Mode

Enables/Disables Intel TurboBoost Technology.

C1E Function

When enabled, let CPU enter enhanced C1 sleep state to save more power than C1.

CPU C3 Support

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

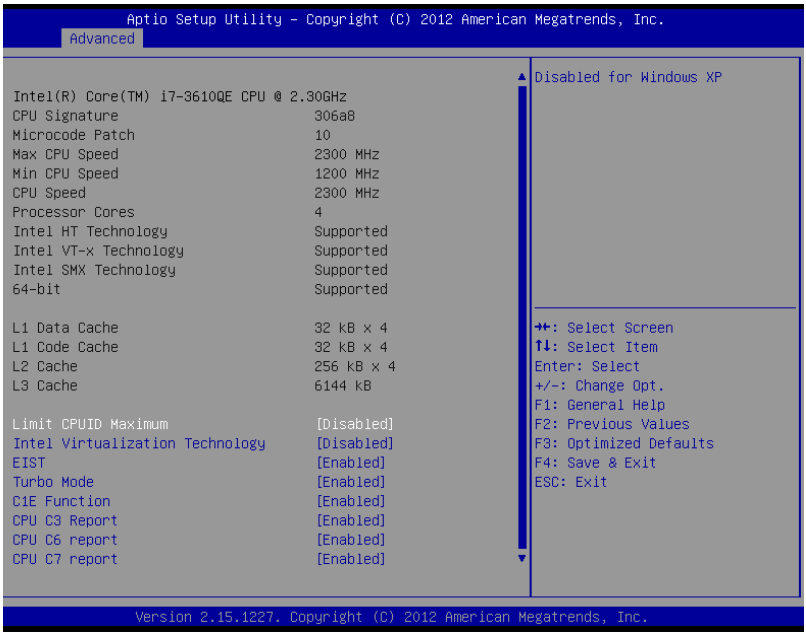
CPU C6 Support

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

CPU C7 Support

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

B.2.2 Onboard Device Configuration



Serial Port 1~4 Configuration

Allows election of port type (RS-232/422/485) for Serial Ports 1 and 2 only

Intel LAN 82579LM

Enables/Disables onboard Intel 82579LM 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 LAN WGI210IT

Enables/Disables onboard Intel WGI210IT LAN controller

Launch Intel WGI210IT 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 either (1) IDE Mode (2) AHCI Mode or (3) RAID Mode

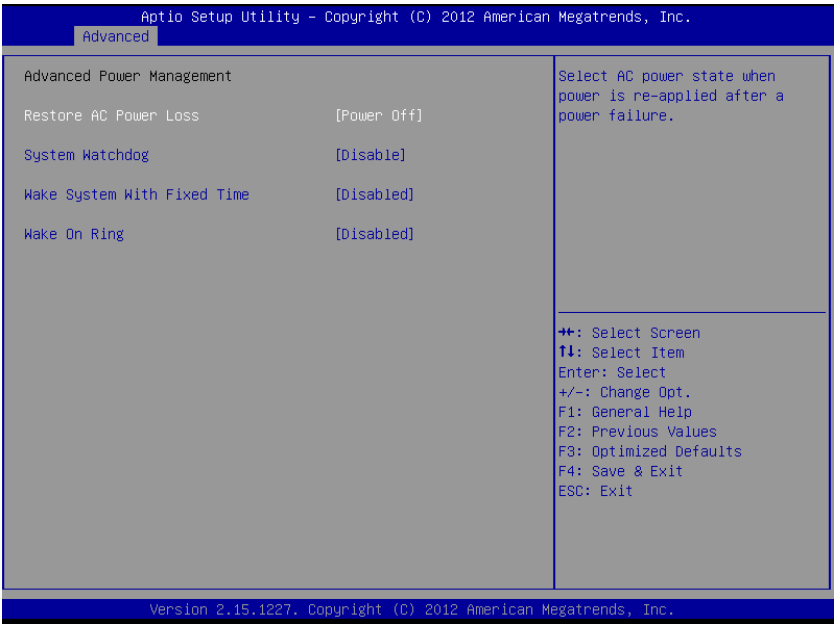
Legacy USB Support

Enables Legacy USB Support, with AUTO option disabling legacy support if no USB devices are connected, and DISABLE keeping USB devices available only for EFI applications

USB 3.0 Support

Enables/Disables USB3.0 (XHCI) controller support, by which USB 3.0 devices can be used in DOS environments

B.2.3 Advanced Power Management



Restore AC Power Loss

Determines the state the computer enters when power is restored after power loss, from among Last State, Power On, and Power Off

Option	Description
Power Off	Retains system power off after power is restored
Power On	Powers the system up when power is restored
Last State	When power is restored, returns the system to the state in which power was interrupted

System Watchdog

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

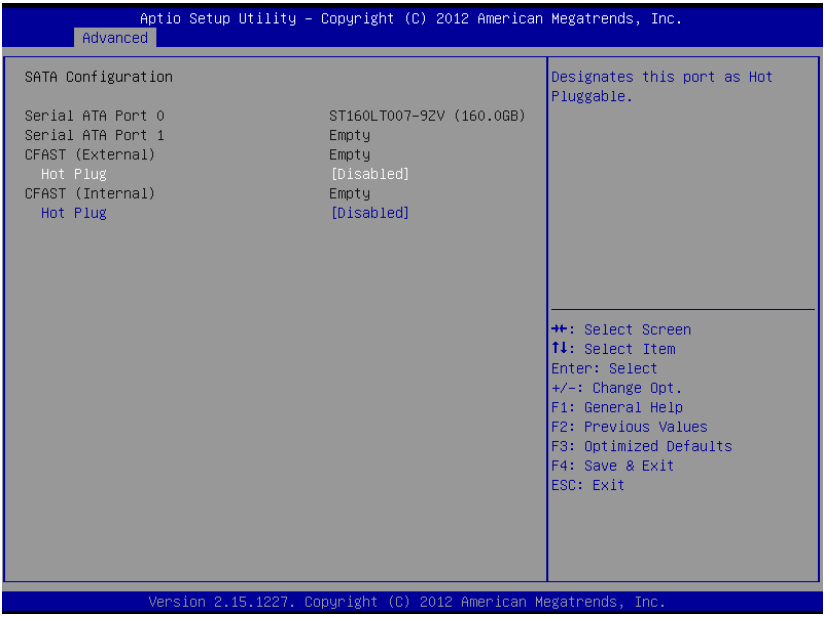
Wake System With Fixed Time

Enables/disables System Wake on Alarm event

Wake on Ring

Enables/disables System Wake on RI event

B.2.4 SATA Configuration



CFast (External)

Hot Plug

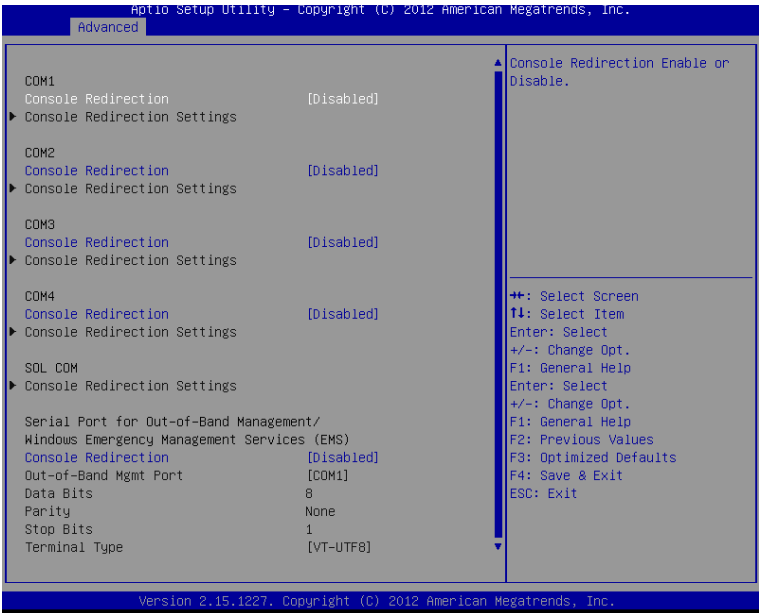
Sets this port as hot pluggable

CFast (Internal)

Hot Plug

Sets this port as hot pluggable

B.2.5 Serial Port Console Redirection



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

Console Redirection

Enables Console Redirection on COM 1~4, SOL COM

Console Redirection Settings

Miscellaneous parameters for COM Ports 1~4, 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

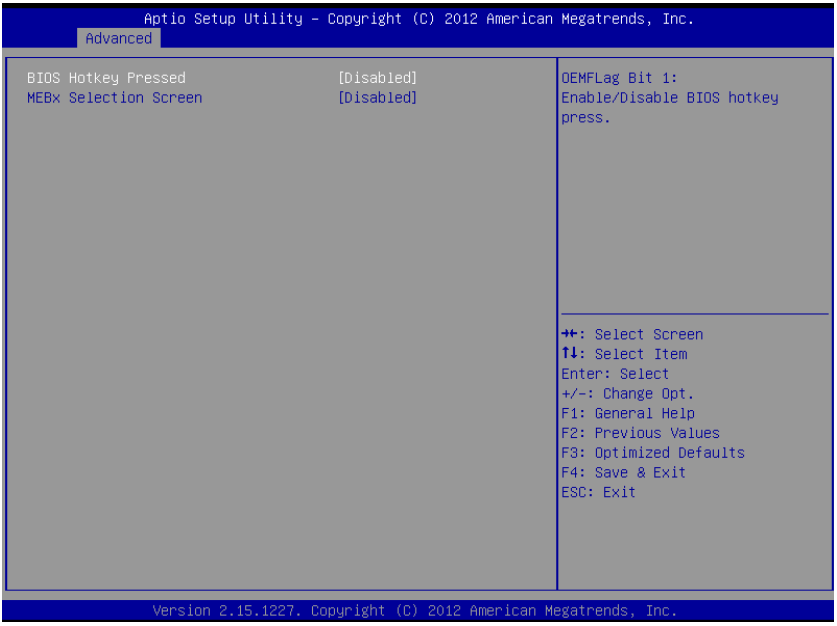
Out-of-Band Mgmt Port

Selects the COM Port for remote management of a Windows OS

Terminal Type

Selects the transmission protocol for remote terminal console

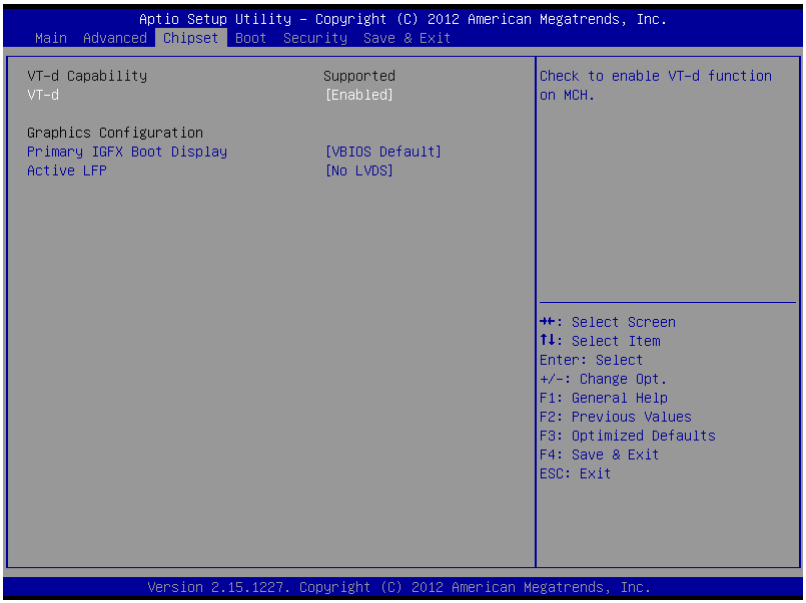
B.2.6 AMT Configuration



BIOS Hotkey Selected/MEBx Selection

Miscellaneous settings for iAMT function

B.3 Chipset



VT-d

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

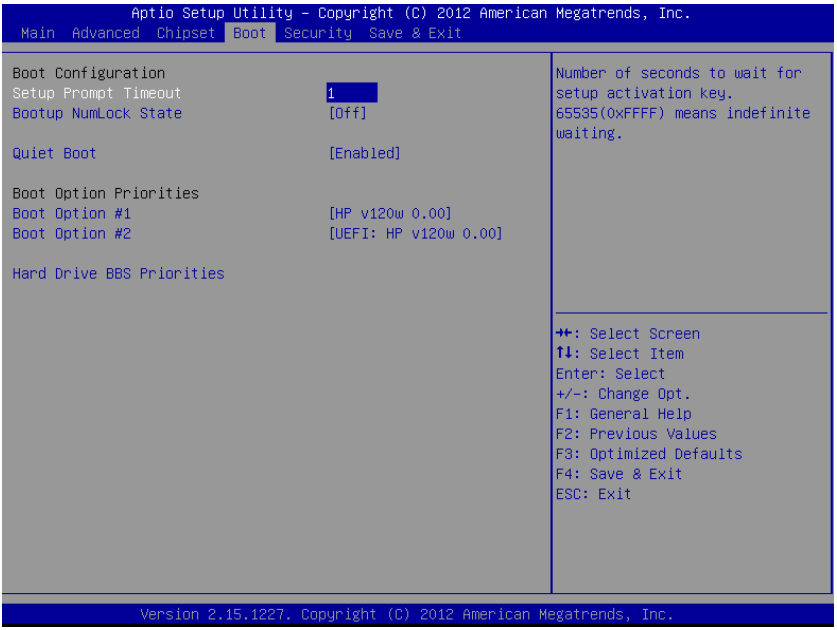
Primary IGFX Boot Display

Selects the video device to be activated during POST

Active LFP

Selects the Active LFP configuration

B.4 Boot



Setup Prompt Timeout

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

Bootup Num-Lock State

Set to allow the Number Lock setting to be modified during boot

Quiet Boot

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

Fast Boot

Option	Description
Disabled	Directs BIOS to perform all POST tests.
Enabled	Directs BIOS to skip certain POST tests to boot faster.

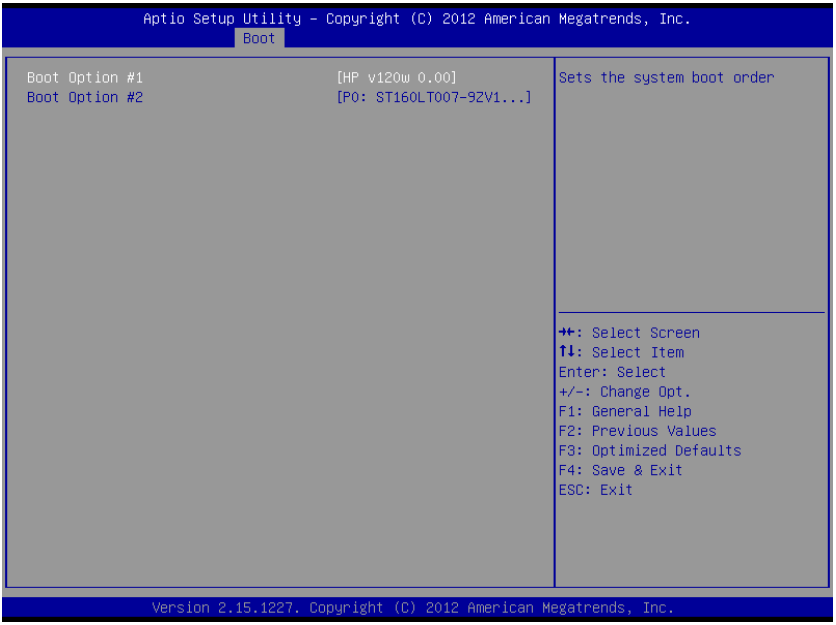
Enabling Fast Boot may reduce system ready time, but some prerequisites can reduce the effectiveness

Boot Option Priorities

Specifies the priority of boot devices, all of which are detected during POST and displayed.

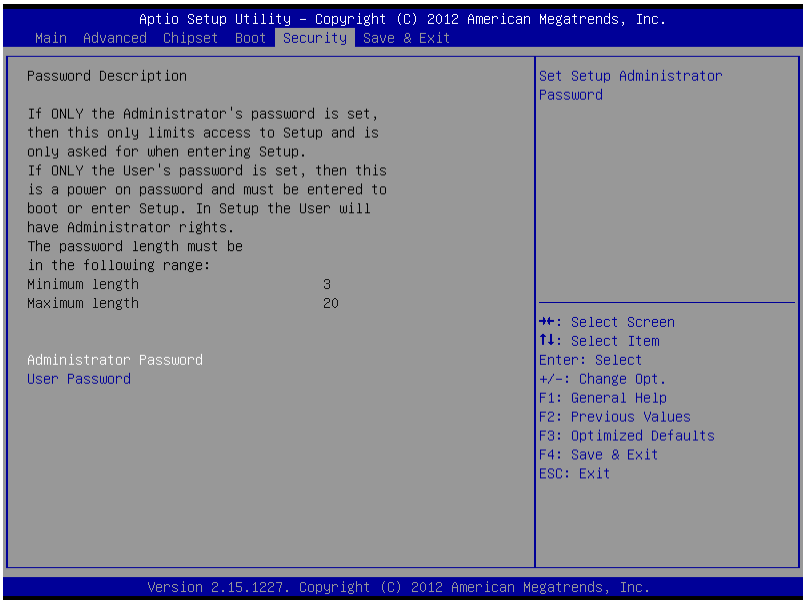
Move the cursor to target Boot Option # and click to select the desired device

Hard Drive BBS Priorities



Specifies the priority of boot devices. All installed boot devices are detected during POST and displayed. Move the cursor to target Boot Option # and select.

B.5 Security



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

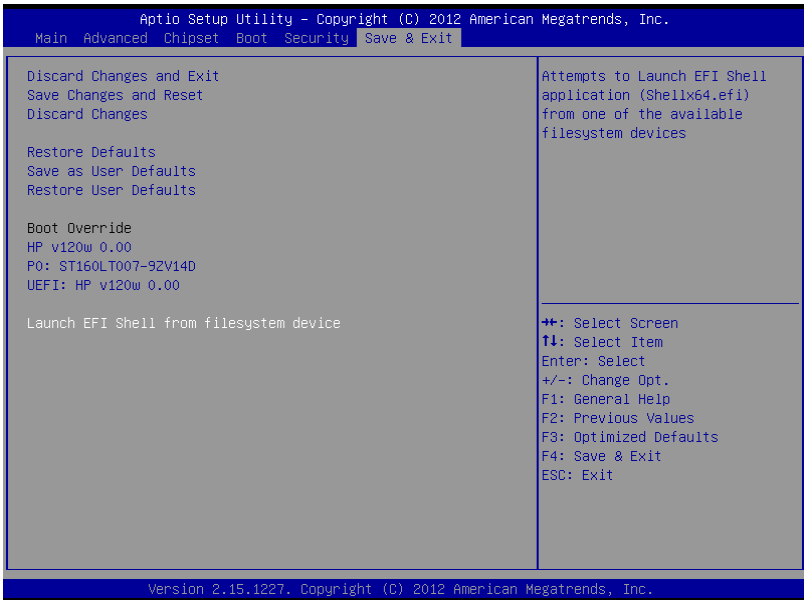
Administrator Password

Sets Administrator password

User Password

Sets boot/setup User password

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, with new settings taking effect

Discard Changes

Resets system setup without saving any changes

Restore Defaults

Sets all BIOS options to default settings, designed for maximum system stability but less than maximum performance. Select Restore Defaults if the computer encounters system configuration problems.

Save as User Defaults

Saves all changes to this point as user defaults

Restore User Defaults

Restores user defaults to all setup options

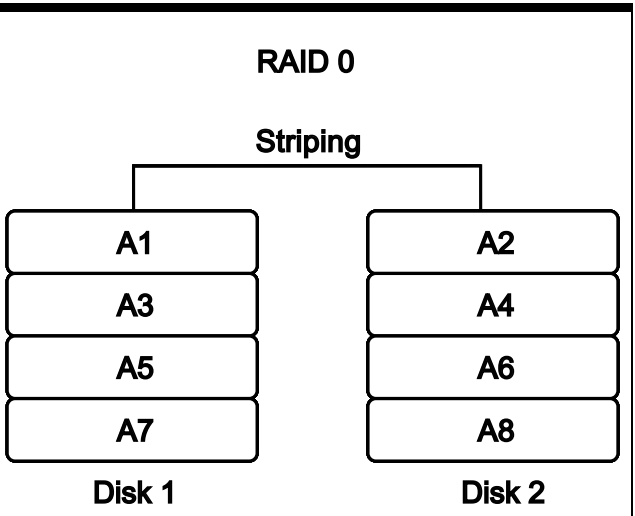
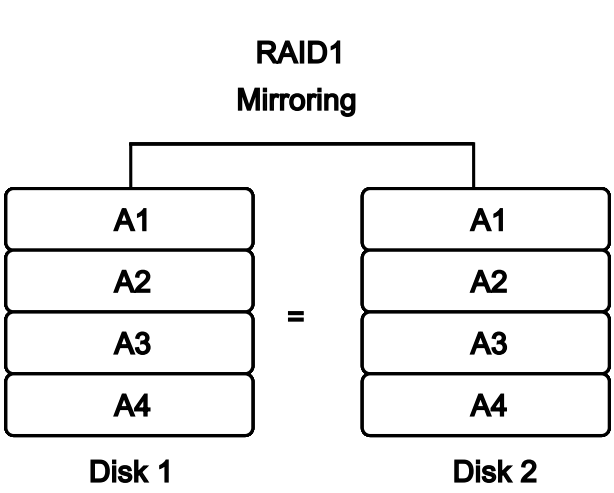
Launch EFI Shell from filesystem device

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

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Appendix C: Activating RAID Function

The Matrix MXC-6300 utilizes Intel® Rapid Storage Technology provided by the Intel QM77 chipset, and supports RAID 0 and RAID 1 levels, differentiated as follows.

RAID 0 (Striping): Maximum Disk I/O performance, but no disk error tolerance	
RAID 1 (Mirrored): Data is strongly secured, but total disk size is halved.	

RAID function is disabled by default. Activation procedures are as follows.

Ensure all data on the disks to be used in the RAID array is fully backed up.

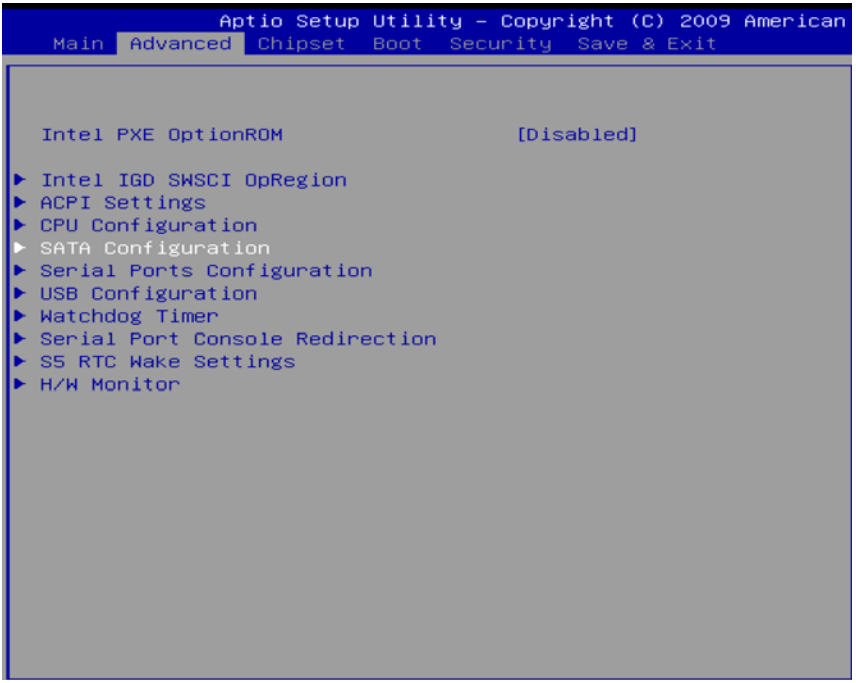
Refer to section 2.2 to install the two hard disks in the chassis.

CAUTION:

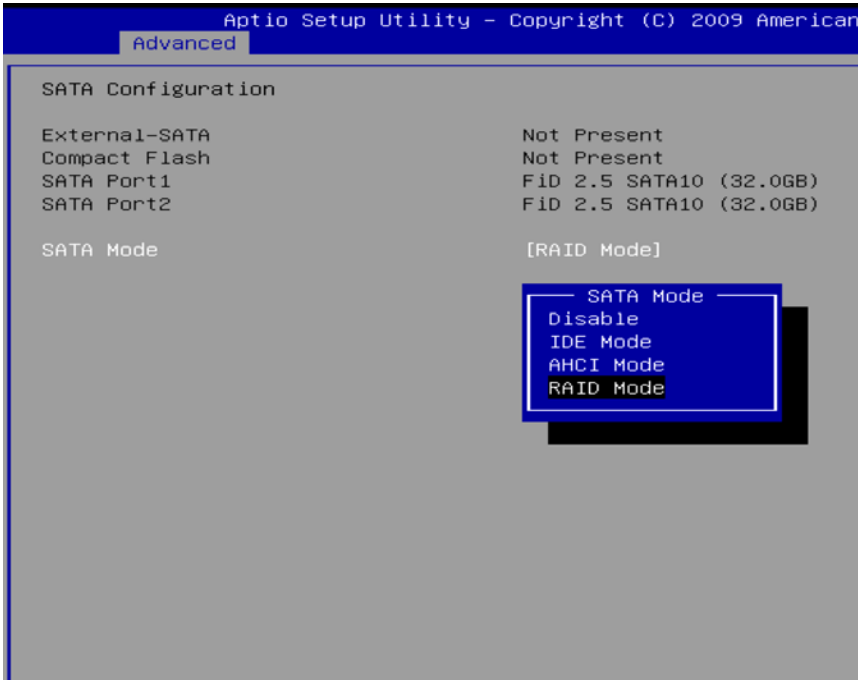
It is strongly recommended that both HDDs are the same model and size for maximal compatibility.

C.1 RAID Activation in System Manangement

1. In the BIOS menu, enter “SATA Configuration” under “Advanced” tab



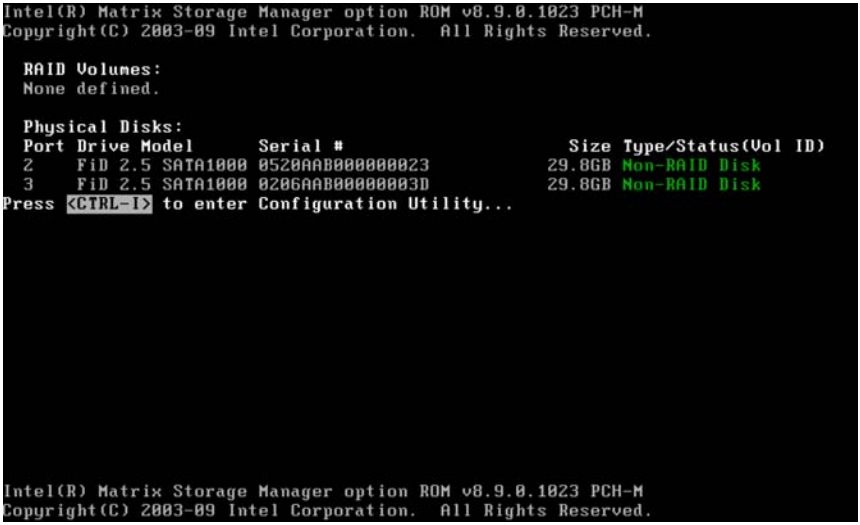
2. Set SATA Mode to “RAID Mode”, and save and exit BIOS.


Aptio Setup Utility – Copyright (C) 2009 American
Advanced
SATA Configuration
External-SATA
Not Present
Compact Flash
Not Present
SATA Port1
FiD 2.5 SATA10 (32.0GB)
SATA Port2
FiD 2.5 SATA10 (32.0GB)
SATA Mode
[RAID Mode]
SATA Mode
Disable
IDE Mode
AHCI Mode
RAID Mode

C.1.1 Intel Matrix Storage Manager

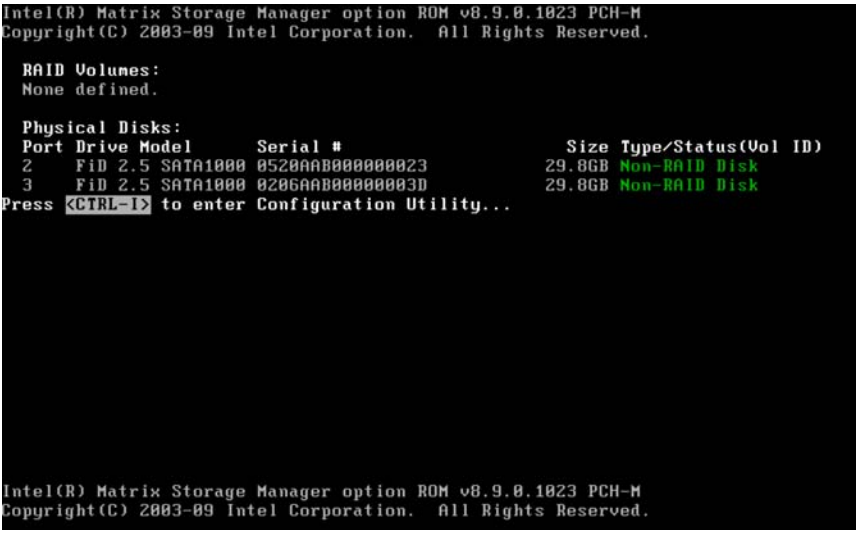
After the SATA is set to RAID mode, the Intel Matrix Storage Manager appears in POST.

1. Select “Ctrl + I” to enter the utility when prompted.

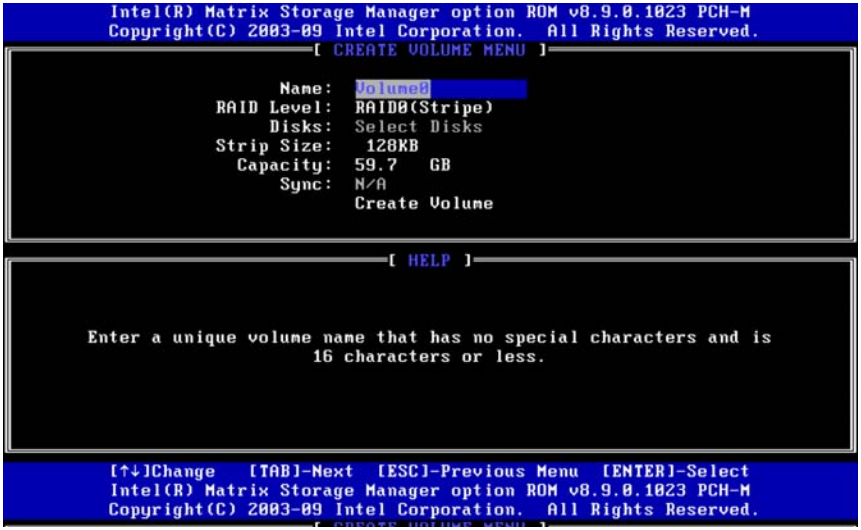


The menu lists the 2 installed HDDs as “Non-RAID Disk” since the RAID volume has not yet been created.

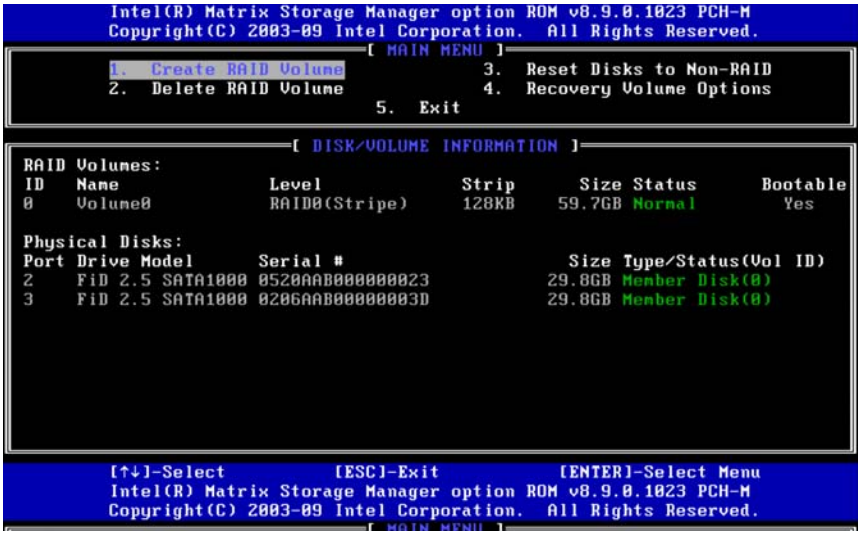
2. Select “Create RAID Volume” to continue.



3. In the menu, set the Volume name, choose the RAID level (from RAID0 (Stripe) and RAID1 (Mirror)) and configure other parameters. Select “Create Volume”. All data will be erased from the HDD.



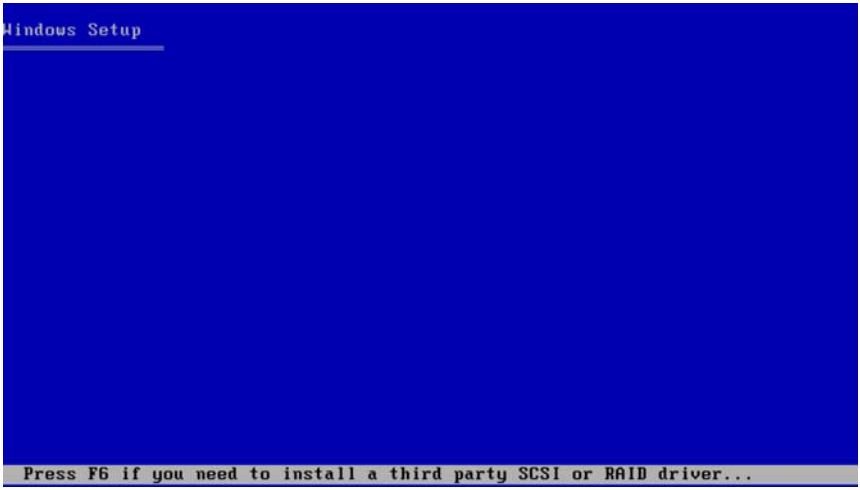
4. After the RAID Volume is created, it should appear in the RAID volume list.



C.2 OS Activation

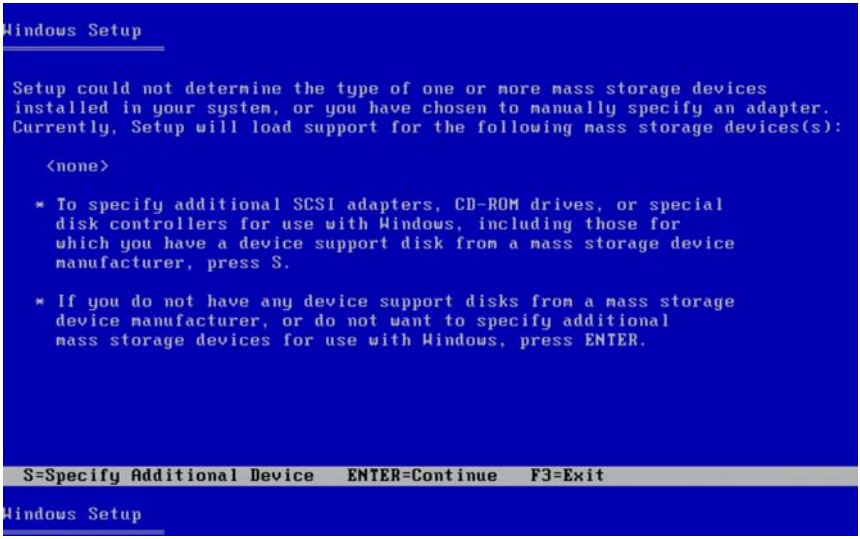
Download the MXC-6300 RAID drivers from the ADLINK website, unzip, and copy the files to a floppy disk, and connect to the MXC-6300 via a USB floppy disk drive.

1. Begin Windows XP installation. When the disk is requested, press F6.



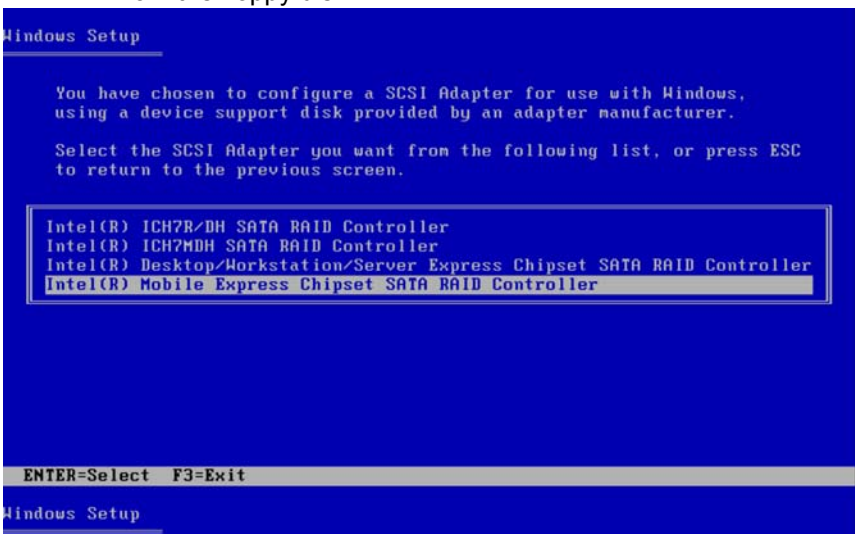
The Installer will show no storage devices before installing the RAID drivers.

2. When an additional device driver is requested, press S.



An Intel controller list is displayed.

3. From the list, select “Intel® Mobile Express Chipset SATA RAID Controller”. Required drivers are copied from the floppy disk.



4. The Intel® Mobile Express Chipset SATA RAID Controller is displayed in the mass storage device list. OS Installation can continue.



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Appendix D: Watchdog Timer (WDT) Function Library

This appendix describes use of the watchdog timer (WDT) function library for the MXC-6300 controller. 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.

D.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 MXC-6300, include the header file WDT.h and linkage library WDT.lib in the C++ project.

InitWDT

Initializes the watchdog timer function. Must be called before the invocation of any other WDT function.

Syntax

C/C++

```
BOOL InitWDT()
```

Parameters

None

Return codes

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer fails to initialize.

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`

Specifies 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

Start the 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()
```

Parameters

None

Return codes

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer is failed to start.

ResetWDT

Reset 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.

D.2 WDT with DOS/Linux

Under Linux, please program WDT function using the same LPC IO registers according to the sample program as follows.

```
#include <dos.h>
#include <stddef.h>
#include <stdio.h>

/* Config LPC IO ITE8783 to enter config mode */
EnterConfig(void)
{
outp(0x2E, 0x87);
outp(0x2E, 0x01);
outp(0x2E, 0x55);
outp(0x2E, 0x55);}

/* Config LPC IO to exit config mode */
ExitConfig(void)
{
outp(0x2E, 0x02);
outp(0x2F, 0x02);
}

/* Read byte from LPC IO register */
unsigned char r_reg(unsigned char regoffset)
{
outp(0x2E, regoffset);
return inp(0x2F);
}

/* Write byte to LPC IO register */
```

```
void w_reg(unsigned char regoffset, unsigned char
data)
{
outp(0x2E, regoffset);
outp(0x2F, data);
}

main(void)
{
unsigned int    count;
/* print program title  */
printf("-----------------MXC-6300 WDT Demo------------
-----\n");
printf("Init          and          config          GPIO
ports<<<<<<<<<<<<<<<<<<<<<<<<\n");
printf("-----------------------------------------------
-----\n");

EnterConfig();

/* config WDT registers */
w_reg(0x07,0x07);

/* enable keyboard interrupt to reset WDT timeout
value */
w_reg(0x71,r_reg(0x71)|0x20);

/* set unit as second */
w_reg(0x72,r_reg(0x72)|0x80);

/* enable reset when timeout  */
w_reg(0x72,r_reg(0x72)|0x40);
```

```
/* set timeout value as 10 seconds */
/* WDT start automatically while timeout value is set
*/
w_reg(0x73,0x0A);


printf("-----------------------------------------------
-----\n");
printf("WDT    is    set    and    counting    down
now.<<<<<<<<<<<<<<<<<\n");
printf("-----------------------------------------------
-----\n");


for(count=10;count!=0;count--)
{
printf("Countdown %2d : 0xF6=%2x Press any key to
invoke keyboard interrupt.\n",count,r_reg(0xF6));
/* reset WDT timeout value to 10 seconds */
/* w_reg(0x73,0x0A); */
            sleep(1);
}


printf("At least one keyboard interrupt must occur
during countdown.\n");
printf("Otherwise WDT has already reset system.\n\n");
printf("Try again and leave keyboard.\n\n");


/* disable WDT */
/* WDT stop while timeout value is set to zero */
        w_reg(0x73,0x00);
printf("WDT is disable. Program is terminating.");


ExitConfig();


return 0;
}
```

Appendix E: Digital Input/Output Function Library

ADMX_DIO_Init

Reserves system resources for digital input/output API service.

Must be called before using other MXC-6300 matrix_dio functions.

Syntax

C/C++, Linux C/C++, and Borland C++

```
I16 ADMX_DIO_Init(void)
```

Visual Basic

```
ADMX_DIO_Init () As Integer
```

Parameter(s)

None

Return codes

```
NoError
ErrorOpenDriverFailed
ErrorDeviceIoctl
```

ADMX_DIO_Close

Instructs the MXC-6300 matrix_dio library that DI/O is currently idle and may be released. Required at the end of a program to release all system resources.

Syntax

C/C++, Linux C/C++, and Borland C++

```
I16 ADMX_DIO_Close(void)
```

Visual Basic

```
ADMX_DIO_Close () As Integer
```

Parameter(s)

None

Return codes

```
NoError
```

DI_ReadPort

Reads digital data from the specified digital input port.

Syntax

C/C++ and Borland C++

```
I16 DI_ReadPort (U32 *Value)
```

Visual Basic

```
DI_ReadPort (Value As Long) As Integer
```

Parameter(s)

Value

Returns the digital data read from the specified port

Valid values include MXC-6300 16-bit data

Return codes

```
NoError
CardNotRegistered
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

DO_WritePort

Writes digital data to the specified digital output port.

Syntax

C/C++ and Borland C++

```
I16 DO_WritePort (U32 Value)
```

Visual Basic

```
DO_WritePort (ByVal Value As Long) As Integer
```

Parameter(s)

Value

Digital datawritten to the specified port

Valid values include: MXC-6300 16-bit data

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

DO_ReadPort

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

Syntax

C/C++ and Borland C++

```
I16 DO_ReadPort (U32 *Value)
```

Visual Basic

```
DO_ReadPort (Value As Long) As Integer
```

Parameter(s)

Value

Returns the digital data read from the specified output port.

Valid values include: MXC-6300 16-bit data

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

DI_ReadLine

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

Syntax

C/C++ and Borland C++

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

Visual Basic

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

Parameter(s)

Line

Digital line to be read.

Valid values include: MXC-6300 0 to 15

State

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

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

DO_WriteLine

Sets the specified digital output line in the specified digital port to the specified state. Only available for cards supporting DO readback.

Syntax

C/C++ and Borland C++

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

Visual Basic

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

Parameter(s)

Line

Digital line to be read.

Valid values include: MXC-6300 0 to 15

State

New digital logic state 0 or 1.

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

DO_ReadLine

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

Syntax

C/C++ and Borland C++

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

Visual Basic

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

Parameter(s)

Line

Digital line to be read.

Valid values include: MXC-6300 0 to 15

State

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

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
ErrorInvalidIoChannel
```

DIO_INT_Event_Message

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

Syntax

C/C++ and Borland C++

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

Visual Basic

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

Parameter(s)

mode

Operation mode of adding or removing message, with
0 Removes an existing message interrupt event defined argument event
1 Adds a new message for an interrupt event defined

evt

Handle of the INT event to be handled.

windowHandle

Handle to the destination window for a Windows message when the specified INT event occurs. If windowHandle is 0, no Windows messages will be sent.

message

User-defined message. When the specified INT event occurs, MXC-6300 matrix_dio remits this message. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. However, to define a designated message, any value ranging from WM_USER (0x400) to 0x7fff can be used. This range is reserved by Windows for user-defined messages.

callbackAddr

Address of the user callback function. The MXC-6300 matrix_dio calls this function when the specified INT event occurs. If no callback function is desired, set callbackAddr to 0.

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

DIO_INT1_EventMessage

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

Syntax

C/C++ and Borland C++

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

Visual Basic

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

Parameter(s)

Int1Mode

Interrupt mode of INT1.

Valid values include: MXC-6300, INT1_DISABLE, INT1_EXT_SIGNAL INT1 by COS of Ch0 of Port 0

windowHandle

Handle to the destination window for a Windows message when the specified INT event occurs. If windowHandle is 0, no Windows messages will be sent.

message

User-defined message. When the specified INT event occurs, MXC-6300 matrix_dio remits this message. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. However, to define a designated message, any value ranging from WM_USER (0x400) to 0x7fff can be used. This range is reserved by Windows for user-defined messages.

callbackAddr

Address of the user callback function. The MXC-6300 matrix_dio calls this function when the specified INT event occurs. If no callback function is desired, set callbackAddr to 0.

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

DIO_INT2_EventMessage

Controls INT2 interrupt sources for a dual-interrupt system and notifies the application when an interrupt event occurs. The

notification is performed through a user-specified callback function or the Windows PostMessage API.

Syntax

C/C++ and Borland C++

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

Visual Basic

```
DIO_INT2_EventMessage (ByVal Int2Mode As Integer,
     ByVal windowHandle As Long, ByVal message As
     Long, ByVal callbackAddr As Long) As Integer
```

Parameter(s)

Int2Mode

INT2 interrupt mode. Valid values include: MXC-6300, INT2_DISABLE, and INT2_EXT_SIGNAL INT2 by COS of Ch1 of Port 0

windowHandle

Handle to the destination window for a Windows message when the specified INT event occurs. If windowHandle is 0, no Windows messages will be sent.

message

User-defined message. When the specified INT event occurs, MXC-6300 matrix_dio remits this message. The message can be of any value. In Windows, the message can be set to a value including any Windows predefined messages, such as WM_PAINT. However, to define a designated message, any value ranging from WM_USER (0x400) to 0x7fff can be used. This range is reserved by Windows for user-defined messages.

callbackAddr

Address of the user callback function. The MXC-6300 matrix_dio calls this function when the specified INT event occurs. If no callback function is desired, set callbackAddr to 0.

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

DIO_ SetDualInterrupt

Informs the MXC-6300 matrix_dio library of the two interrupt source modes of a dual-interrupt system and returns dual interrupt events. If an interrupt is generated, the corresponding interrupt event is signaled. The application uses Win32 wait functions, such as WaitForSingleObject or WaitForMultipleObjects to determine interrupt event status.

Syntax

C/C++ and Borland C++

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

Visual Basic

```
DIO_SetDualInterrupt (ByVal Int1Mode As Integer,
     ByVal Int2Mode As Integer, hEvent As Long)
     As Integer
```

Parameter(s)

CardNumber

ID of the card performing the operation.

Int1Mode

Interrupt mode of INT1.

Valid values include: MXC-6300, and INT1_DISABLE, INT1_EXT_SIGNAL INT1 by COS of Ch0 of Port 0

Int2Mode

Interrupt mode of INT2.

Valid values include: MXC-6300, and INT2_DISABLE, INT2_EXT_SIGNAL INT2 by COS of Ch1 of Port 0

hEvent

Returned dual-interrupt event handles, where status of a dual-interrupt event indicates whether an interrupt is generated for cards comprising dual-interrupt systems

Return codes

```
NoError
ErrorInvalidCardNumber
ErrorCardNotRegistered
ErrorFuncNotSupport
```

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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.

- 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.

Getting Service

Contact us should you require any service or assistance.

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