

MB960

Intel® Sandy Bridge / PCH
ATX Motherboard

USER'S MANUAL

Version 1.0A

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Introduction

Product Description

The MB960F ATX motherboard is based on the latest Intel® Q67 chipset. The platform supports 2nd generation Intel® Core processor family with LGA1155 packing and features an integrated dual-channel DDR3 memory controller as well as a graphics core.

The latest Intel® processors provide advanced performance in both computing and graphics quality. This meets the requirement of customers in the gaming, POS, digital signage and server market segment.

The Q67 platform is made with 32-nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The MB960F ATX board utilizes the dramatic increase in performance provided this Intel's latest cutting-edge technology. Measuring 305mm x 244mm, the MB960F offers fast 6Gbps SATA support (2 ports), USB3.0 (2 ports) and interfaces for DVI-D, DVI-I and HDMI displays. MB960AF features Intel Active Management Technology 7.0.

MB960F FEATURES:

- Supports Intel® 2nd Generation Core i7/i5/i3 QC/DC desktop processors
- Four DDR3 DIMM, 1066/1333MHz, Max. 16GB memory
- Dual Intel® PCI-Express Gigabit LAN
- Integrated Graphics for DVI-I, DVI-D/HDMI displays
- 4x SATA 2.0, 2x SATA 3.0, 14x USB 2.0, USB 3.0 (2 ports), 4x COM, Watchdog timer
- 1x PCI-E (x16), 1x PCI-E (x4), 4x PCI, 1x ISA
- Optional AMT (MB960AF only)

Checklist

Your MB960 package should include the items listed below.

- The MB960 ATX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Serial ATA cable

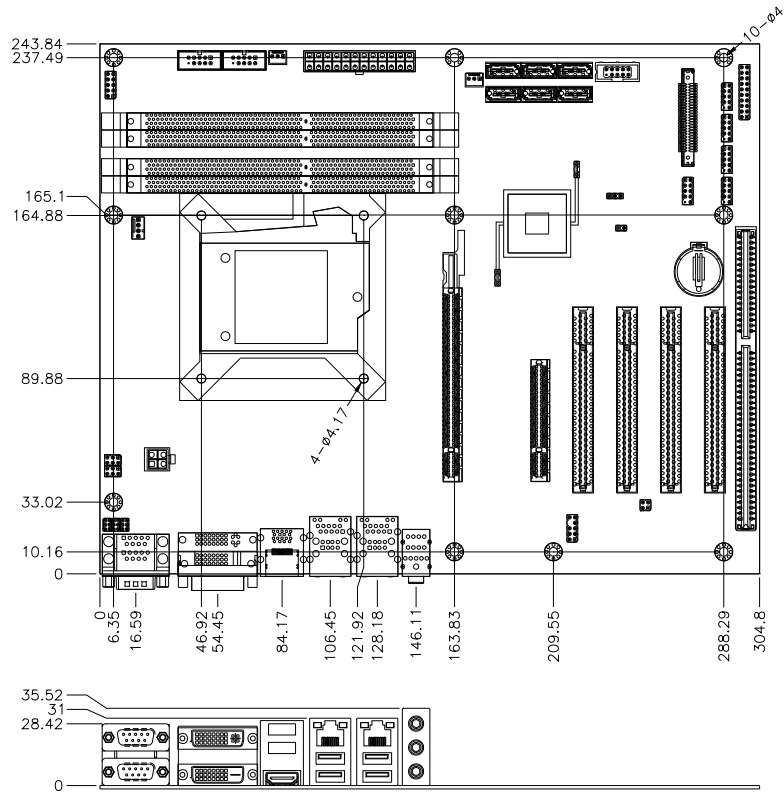
MB960 Specifications

Product Name	MB960AF/MB960F
Form Factor	ATX
CPU Type	- Intel® Sandy Bridge 32nm QC/DC DT processor w/ IMC & Gfx - LGA package[37.5 mm x 37.5mm](TDP: QC= 95W/65W ; DC = 65W) **Sandy Bridge-DT is NOT socket compatible with Clarkdale/Lynnfield
CPU Speed	Up to 3.1GHz
Cache	Up to 8MB
CPU Socket	LGA1155 (Socket H2)
Chipset	Intel® Q67 PCH 27 x 27 mm package size
BIOS	AMI BIOS, support ACPI Function
Memory	Intel® 2 nd generation Core™ i7/i5/i3 QC/DC mobile processor integrated controller DDRIII 1067/1333 MHz - DIMM x 4 (w/o ECC), Max.16GB
VGA	- Intel® 2 nd generation Core™ i7/i5/i3 mobile processor integrated Gfx • DVI-I X 1 (thru Level shifter ASM1442) • DVI-D X 1 (thru Level shifter ASM1442) • HDMI X 1 (thru Level shifter ASM1442)
LAN	1. Intel® Lewisville 82579LM GbE PHY [MI960AF only] or 82579V GbE PHY [MI960F only] 2. Intel® 82583V as 2 nd GbE
USB	USB 2.0 host controller, supports 14 ports w/ two EHCI - 4 ports in the rear panel - Others reserved for onboard pin header (10 ports, 2.54mm pitch) USB 3.0 host controller [ASMedia # ASM1042], support 2 ports - 2 ports in the rear panel
Serial ATA	Intel® Q67 PCH built-in SATA controller, supports total 6 ports 2 x SATA (3.0) 6Gbps+ 4 x SATA (2.0) 3Gbps ports (2 FIS based Port Multiplier)
Audio	Intel® Q67 PCH built-in High Definition Audio controller + ALC892 w/ 7.1 CH
LPC I/O	Fintek F81865-1 (Ver. C) COM1 (RS232/422/485), COM2/COM3/COM4 (RS232), Hardware Monitor (2 thermal inputs,4 voltage monitor inputs & 2 Fan headers) COM1/2 with pin-9 with power for 2 ports (500 mA for each port)
Digital IO	4 in & 4 out
IAMT(7.0)	Intel® Q67 PCH built-in (MI960AF only) - Intel® Active Management Technology ver. 7.0
TPM 1.2	Winbond WPCT210A (MB960AF only)
PCI to ISA	ITE IT8888G x 1 for high ISA bus
PATA	JMicron JMB368 (PCI-e to PATA) x1 for 1 PATA channel - CF x1 (Horizontal type)
Expansion Slots	- PCI-Express (16x) x1 [PEG]; PCI-Express (4x) x1; PCI x4; ISA x1
Edge Connectors	DVI-D + DVI-I stack connector; Dual DB9 stack connector for COM #1, #2 Dual USB (3.0) dual stack connector; HDMI stack connector Gigabit LAN RJ-45 + dual USB (2.0) stack connector x2 RCA Jack 3 x 1 for HD Audio
Onboard Header/ Connector	2 ports x SATA III [Blue color]; 4 ports x SATA II 2x5 pin-header x5 for 10 ports USB; 2x5 pin-header for front panel audio 2x10 pin-header for COM3 (RS232) & COM4 (RS232) 2x5 pin-header for Digital IO
Watchdog Timer	Yes (256 segments, 0, 1, 2...255 sec/min)
System Voltage	ATX
Others	LAN Wakeup, EuP feature (Fintek F75160), UL 60950-1 2 nd Edition compatible

INTRODUCTION

Board Size	305mm x 244mm
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Board Dimensions



Installations

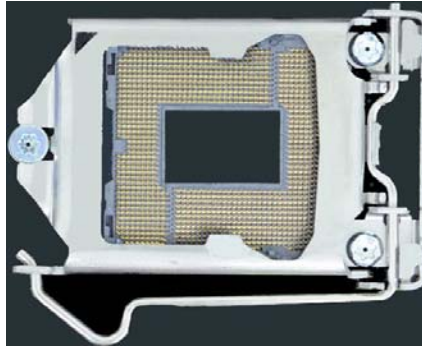
This section provides information on how to use the jumpers and connectors on the MB960 in order to set up a workable system. The topics covered are:

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Installing the CPU

The MB960 board supports an LGA1155 Socket (shown below) for Intel Sandy Bridge processors.

To install the CPU, unlock first the socket by pressing the lever sideways, then lift it up to a 90-degree. Then, position the CPU above the socket such that the CPU corner aligns with the gold triangle matching the socket corner with a small triangle. Carefully insert the CPU into the socket and push down the lever to secure the CPU. Then, install the heat sink and fan.



NOTE: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.

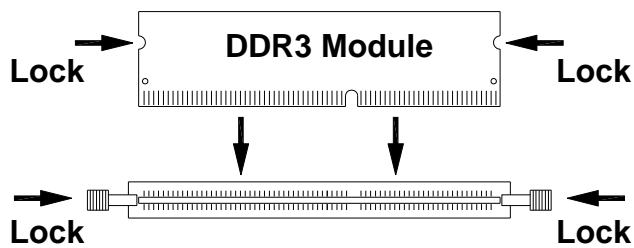
Installing the Memory

The MB960 board supports four DDR3 memory socket for a maximum total memory of 16GB in DDR3 DIMM memory type.

Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.

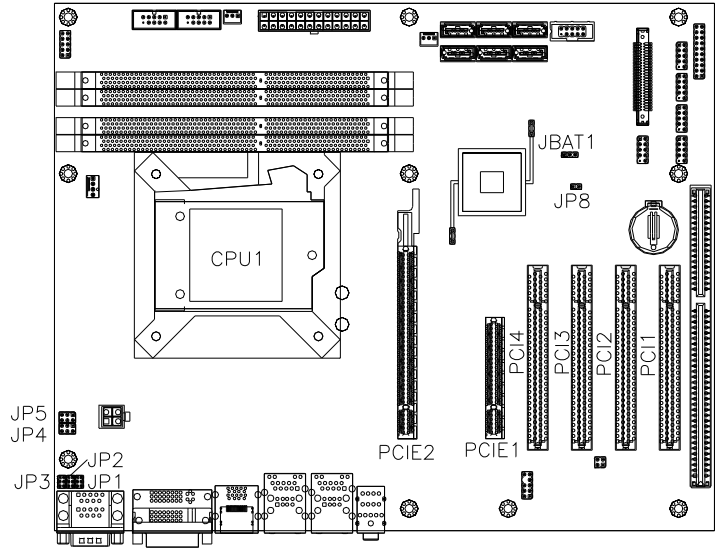


Setting the Jumpers

Jumpers are used on MB960 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB960 and their respective functions.

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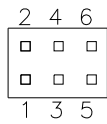
Jumper Locations on MB960



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JP1, JP2, JP3: RS232/RS422/RS485 (COM1) Selection



COM1 Function	RS-232	RS-422	RS-485
Jumper Setting (Pin closed)	JP1: 3-5&4-6	JP1: 1-3&2-4	JP1: 1-3&2-4
	JP3: 1-2	JP3: 3-4	JP3: 5-6
	JP2: 3-5 & 4-6	JP2: 1-3 & 2-4	JP2: 1-3 & 2-4

JP4: COM1 RS232 RI/+5V/+12V Power Setting

JP4	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V



JP5: COM2 RS232 RI/+5V/+12V Power Setting

JP5	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP8: Flash Descriptor Security Override (Factory use only)

JP8	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

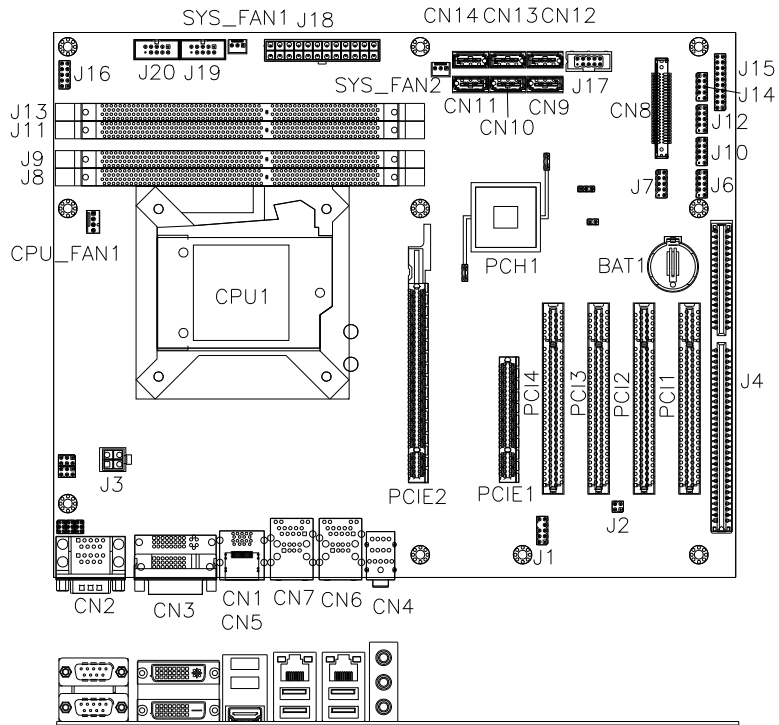
JBAT1: Clear CMOS Contents

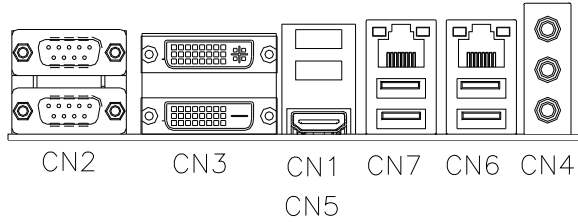
JBAT1	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	Normal
 1 2 3	Pin 2-3 Short/Closed	Clear CMOS

Connectors on MB960

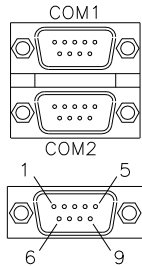
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Connector Locations on MB960



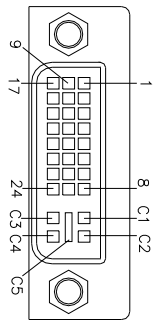


CN2: COM1 and COM2 Serial Ports

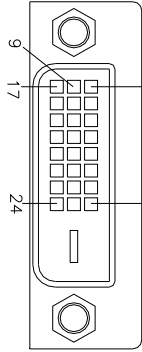
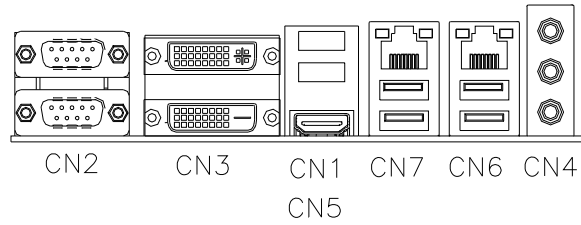


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

CN3: DVI-D and DVI-I Connector



Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
VSYNC	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	Red
SHIELD 1/3	11	C2	Green
DATA 3-	12	C3	Blue
DATA 3+	13	C4	HSYNC
DDC POWER	14	C5	A GROUND2
A GROUND 1	15	C6	A GROUND3



Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
N.C	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	N.C.
SHIELD 1/3	11	C2	N.C.
DATA 3-	12	C3	N.C.
DATA 3+	13	C4	N.C.
DDC POWER	14	C5	N.C.
A GROUND 1	15	C6	N.C.

CN5: USB3.0 Connector

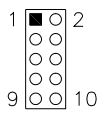
CN1: HDMI Connector

CN7: Gigabit LAN (Intel 82579LM) + USB 2/3

CN6: Gigabit LAN (Intel 82583V) + USB 0/1

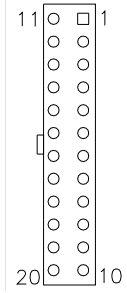
CN4: HD Audio Connector

J16: Digital I/O



Signal Name	Pin #	Pin #	Signal Name
GND	1	2	VCC
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J18: ATX Power Supply Connector



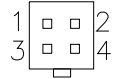
Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J19, J20: COM3, COM4 RS232 Serial Ports

Signal Name	Pin #	Pin #	Signal Name
DCD#	1	6	DSR#
SIN#	2	7	RTS#
SOUT	3	8	CTS#
DTR#	4	9	RI#
GND	5	X	KEY

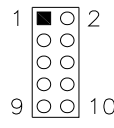
J3: ATX 12V Power Connector

This connector supplies the CPU operating voltage.



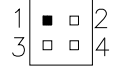
Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

J6, J7, J10, J12, J14: USB Connectors



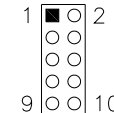
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	GND
D0-	3	4	D1-
D0+	5	6	D1+
GND	7	8	GND
KEY	9	10	NC

J2: SPDIF I/O



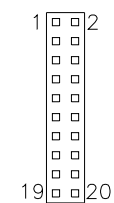
Pin #	Signal Name
1	SPDIF IN
2	Ground
3	SPDIF OUT
4	Ground

J1: Audio Pin Header for Chassis Front Panel

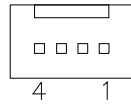


Signal Name	Pin #	Pin #	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

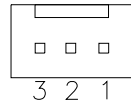
J15: Front Panel Function Connector



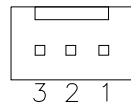
Signal Name	Pin #	Pin #	Signal Name
SPK +	1	2	PWR LED +
NC	3	4	NC
SPK - (GND)	5	6	PWR LED- (GND)
SPK - (GND)	7	8	NC
NC	9	10	NC
NC	11	12	NC
PWR_SW	13	14	PWR_SW
NC	15	16	NC
RST	17	18	GND
HDD LED -	19	20	HDD LED +

CPU_FAN1: CPU Fan Power Connector

Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

SYS_FAN1: System Fan1 Power Connector

Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

SYS_FAN2: System Fan2 Power Connector

Pin #	Signal Name
1	Ground
2	+12V
3	NC

CN9, CN10, CN11, CN12, CN13, CN14: SATA Connectors**CN8: Compact Flash Connector****J17: SPI Flash Connector (Factory use only)****J4: ISA Slot (shared with PCI1)****PCIE2: PCI-E X16 Slot****PCIE1: PCI-E X8 Slot (X4 Link)****PCI1-PCI4: PCI 32-bit Slot**

BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

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BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

Press to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Main Settings

Aptio Setup Utility – Copyright © 2011 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit
System Language		[English]			Choose the system default language → ← Select Screen
System Date		[Tue 01/20/2009]			↑ ↓ Select Item
System Time		[22:26:12]			Enter: Select
Access Level		Administrator			+ - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

System Language

Choose the system default language.

System Date

Set the Date. Use Tab to switch between Data elements.

System Time

Set the Time. Use Tab to switch between Data elements.

Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
<ul style="list-style-type: none"> ▶ PCI Subsystem Settings ▶ ACPI Settings ▶ Trusted Computing ▶ Wake up event setting ▶ CPU Configuration ▶ SATA Configuration ▶ Shutdown Temperature Configuration ▶ EuP/ErP Power Saving Controller ▶ PCI IRQ Configuration ▶ AMT Configuration ▶ Acoustic Management Configuration ▶ USB Configuration ▶ F81865 Super IO Configuration ▶ F81865 H/W Monitor ▶ CPU PPM Configuration 					<p>→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</p>

PCI Subsystem Settings

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Bus Driver Version		V 2.05.02			
PCI 64bit Resources Handling		Above 4G Decoding		Disabled	
PCI Common Settings		PCI Latency Timer		32 PCI Bus Clocks	
VGA Palette Snoop		PERR# Generation		Disabled	
SERR# Generation				Disabled	
▶ PCI Express Settings					
					<p>→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</p>

Above 4G Decoding

Enables or Disables 64bit capable devices to be decoded in above 4G address space (only if system supports 64 bit PCI decoding).

PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

VGA Palette Snoop

Enables or disables VGA Palette Registers Snooping.

PERR# Generation

Enables or disables PCI device to generate PERR#.

SERR# Generation

Enables or disables PCI device to generate SERR#.

PCI Express Settings

Change PCI Express devices settings.

PCI Express Settings

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Express Device Register Settings					
Relaxed Ordering		Disabled			
Extended Tag		Disabled			
No Snoop		Enabled			
Maximum Payload		Auto			
Maximum Read Request		Auto		→ ← Select Screen	
PCI Express Link Register Settings					
ASPM Support		Disabled		↑ ↓ Select Item	
WARNING: Enabling ASPM may cause some PCI-E devices to fail				Enter: Select	
Extended Synch		Disabled		+- Change Field	
Link Training Retry		5		F1: General Help	
Link Training Timeout (uS)		100		F2: Previous Values	
Unpopulated Links		Keep Link ON		F3: Optimized Default	
				F4: Save ESC: Exit	

Relaxed Ordering

Enables or disables PCI Express Device Relaxed Ordering.

Extended Tag

If ENABLED allows device to use 8-bit Tag field as a requester.

No Snoop

Enables or disables PCI Express Device No Snoop option.

Maximum Payload

Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

Maximum Read Request

Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value.

ASPM Support

Set the ASPM Level: Force L0s – Force all links to L0s State:
AUTO – BIOS auto configure : DISABLE – Disables ASPM.

Extended Synch

If ENABLED allows generation of Extended Synchronization patterns.

Link Training Retry

Defines number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.

Link Training Timeout (uS)

Defines number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Value range from 10 to 1000 uS.

Unpopulated Links

In order to save power, software will disable unpopulated PCI Express links, if this option set to 'Disable Link'.

ACPI Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Settings					
Enable Hibernation			Enabled		→ ← Select Screen
ACPI Sleep State			S1 (CPU stop C...)		↑ ↓ Select Item
Lock Legacy Resources			Disabled		Enter: Select
S3 Video Repost			Disabled		+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

Wake up event settings

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
	Wake system with Fixed Time		Disabled		
	Wake up hour		0		
	Wake up minute		0		
	Wake up second		0		
	Wake on Ring		Disabled		
	Wake on PCI PME		Disabled		
	Wake on PCIE Wake Event		Disabled		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Wake system with Fixed Time

Enables or Disables System wake on alarm event. When enabled, System will wake on the hr::min:: sec specified.

Wake on PCIE PME Wake Event

The options are Disabled and Enabled.

Trusted Computing

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
	TPM Configuration				
	TPM SUPPORT		Disabled		
	Current TPM Status Information				
	TPM SUPPORT OFF				
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

TPM Support

This configuration is supported only with MB960AF. Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.

CPU Configuration

This section shows the CPU configuration parameters.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Configuration					
Intel® Core™ i7-3770 CPU @ 3.40GHz					
Processor Signature		306a8			
Microcode Patch		10			
CPU Speed		3400 MHz			
Processor Cores		4			
Intel HT Technology		Supported			
Intel VT-x Technology		Supported			
Intel SMX Technology		Supported			
64-bit		Supported			
Hyper-threading		Enabled			
Active Processor Cores		All			
Limit CPUID Maximum		Disabled			
Execute Disable Bit		Enabled			
Intel Virtualization Technology		Disabled		→ ← Select Screen	
Hardware Prefetcher		Disabled		↑ ↓ Select Item	
Adjacent Cache Line Prefetch		Enabled		Enter: Select	
+ - Change Field					
F1: General Help					
F2: Previous Values					
F3: Optimized Default					
F4: Save ESC: Exit					

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, Re33dHat Enterprise 3 Update 3.)

Intel Virtualization Technology

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

Hardware Prefetcher

To turn on/off the Mid level Cache (L2) streamer Prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

SATA Configuration

SATA Devices Configuration.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
	SATA Controller(s)		Enabled		
	SATA Mode Selection		IDE		
	SATA Port0		Empty		
	Software Preserve		Unknown		
	SATA Port1		Empty		→ ← Select Screen
	Software Preserve		Unknown		↑ ↓ Select Item
	SATA Port2		Empty		Enter: Select
	Software Preserve		Unknown		+ - Change Field
	SATA Port3		Empty		F1: General Help
	Software Preserve		Unknown		F2: Previous Values
	SATA Port4		Empty		F3: Optimized Default
	Software Preserve		Unknown		F4: Save ESC: Exit
	SATA Port5		Empty		
	Software Preserve		Unknown		

SATA Controller(s)

Enable / Disable Serial ATA Controller.

SATA Mode Selection

- (1) IDE Mode.
- (2) AHCI Mode.
- (3) RAID Mode.

Shutdown Temperature Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Shutdown Temperature		Disabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

ACPI Shutdown Temperature

The default setting is Disabled.

EuP/ErP Power Saving Controller

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Standby Power on S5		All Enable		[Enable] Provide the Standby Power for devices. [Disable] Shutdown the standby power.	

Standby Power on S5

This configuration is supported only with MB960F.

PCI IRQ Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
IRQ3			PCI/ISA		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
IRQ4			PCI/ISA		
IRQ5			PCI/ISA		
IRQ6			PCI/ISA		
IRQ7			PCI/ISA		
IRQ10			PCI/ISA		
IRQ11			PCI/ISA		
IRQ12			PCI/ISA		

AMT Configuration

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
	Intel AMT		Enabled		
	BIOS Hotkey Pressed		Disabled		
	MEBx Selection Screen		Disabled		
	Hide Un-Configure ME Confirmation		Disabled		
	Un-Configure ME		Disabled		
	Amt Wait Timer		0		
	Activate Remote Assistance Process		Disabled		
	USB Configure		Enabled		→ ← Select Screen
	PET Progress		Enabled		↑ ↓ Select Item
	AMT CIRA Timeout		0		Enter: Select
	Watchdog		Disabled		+ - Change Field
	OS Timer		0		F1: General Help
	BIOS Timer		0		F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

AMT Configuration

This configuration is supported only with MB960AF (with iAMT function). Options are Enabled and Disabled.

Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

Unconfigure ME

This configuration is supported only with MB960AF (with iAMT function). Perform AMT/ME unconfigure without password operation.

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Activate Remote Assistance Process

Trigger CIRA boot.

PET Progress

User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog Timer

This configuration is supported only with MB960AF (with iAMT function). Enable/Disable Watchdog Timer.

Acoustic Management Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Acoustic Management Configuration					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Acoustic Management			Disabled		

USB Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
USB Devices:					
2 Hubs					
Legacy USB Support			Enabled		
USB3.0 Support			Enabled		
XHCI Hand-off			Enabled		
EHCI Hand-off			Enabled		
USB hardware delays and time-outs:					
USB Transfer time-out			20 sec		
Device reset time-out			20 sec		
Device power-up delay			Auto		

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSeS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSES without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

F81865 Super IO Configuration

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
F81865 Super IO Configuration					
F81865 Super IO Chip		F81865		→ ← Select Screen	
▶ Serial Port 0 Configuration				↑ ↓ Select Item	
▶ Serial Port 1 Configuration				Enter: Select	
▶ Serial Port 2 Configuration				+- Change Field	
▶ Serial Port 3 Configuration				F1: General Help	
Power Failure		Always off		F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

Serial Port Configuration

Set Parameters of serial ports. User can Enable/Disable the serial port and select an optimal settings for the Super IO Device.

Power Failure

- Options are:
- Keep last state
 - Bypass mode
 - Always on
 - Always off (default)

F81865 H/W Monitor

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Health Status					
CPU Temp.		+41 C			
System Temp.		+35 C			
CPU FAN Speed		4109 RPM			
System FAN1 Speed		N/A			
Vcore		+1.184 V		→ ← Select Screen	
+5V		+5.087 V		↑ ↓ Select Item	
+12V		+12.232 V		Enter: Select	
Vmem		+1.504 V		+- Change Field	
+3.3V		+3.39284 V		F1: General Help	
CPU Smart Fan Control		Disabled		F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Fan1/Fan2 Smart Fan Control

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

CPU PPM Configuration

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU PPM Configuration					
EIST		Enabled			
Turbo Mode		Enabled			
				→ ← Select Screen	
				↑ ↓ Select Item	
				Enter: Select	
				+- Change Field	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

EIST

Enable/Disable Intel SpeedStep.

PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
		Intel PCH RC Version	1.5.0.0		
		Intel PCH SKU Name	H61		
		Intel PCH Rev ID	05/B3		
		▶ PCI Express Configuration			
		▶ USB Configuration			
		▶ PCH Azalia Configuration			
		PCH LAN Controller	Enabled		
		Wake on LAN	Enabled		
		High Precision Event Timer Configuration			
		High Precision Timer	Enabled		→ ← Select Screen
		SLP_S4 Assertion Width	4-5 Seconds		↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

PCI Express Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Express Configuration					
PCI Express Clock Gating			Enabled		
DMI Link ASPM Control			Enabled		
DMI Link Extended Synch Control			Disabled		
PCIe-USB Glitch W/A			Disabled		
Subtractive Decode			Disabled		
▶ PCI Express Root Port 1					
▶ PCI Express Root Port 2					
▶ PCI Express Root Port 3					
▶ PCI Express Root Port 4					
▶ PCI Express Root Port 5					
▶ PCI Express Root Port 7					
▶ PCI Express Root Port 8					
			→ ← Select Screen		
			↑ ↓ Select Item		
			Enter: Select		
			+- Change Field		
			F1: General Help		
			F2: Previous Values		
			F3: Optimized Default		
			F4: Save ESC: Exit		

PCI Express Clock Gating

Enable or disable PCI Express Clock Gating for each root port.

DMI Link ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI link.

PCIe-USB Glitch W/A

PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG port.

USB Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					→ ← Select Screen
EHCI1			Enabled		↑ ↓ Select Item
EHCI2			Enabled		Enter: Select
USB Ports Per-Port Disable Control			Disabled		+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

EHCI/2

Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

PCH Azalia Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCH Azalia Configuration					
Azalia			Auto		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Azalia

Control Detection of the Azalia device.
 Disabled = Azalia will unconditionally disabled.
 Enabled Azalia will be unconditionally enabled.
 Auto = Azalia will be enabled if present, disabled otherwise.

System Agent (SA) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
System Agent Bridge Name			IvyBridge		
System Agent RC Version			1.5.0.0		
VT-d Capability			Supported		
VT-d			Enabled		
CHAP Device (B0:D7:F0)			Disabled		→ ← Select Screen
Thermal Device (B0:D4:F0)			Disabled		↑ ↓ Select Item
Enable NB CRID			Disabled		Enter: Select
BDAT ACPI Table Support			Disabled		+ - Change Field
C-State Pre-Wake			Enabled		F1: General Help
▶ Graphics Configuration					F2: Previous Values
▶ Memory Configuration					F3: Optimized Default
					F4: Save ESC: Exit

VT-d

Check to enable VT-d function on MCH.

Enable NB CRID

Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

Graphics Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Graphics Configuration					
IGFX VBIOS Version		2132			
IGfx Frequency		350 MHz			
Primary Display		Auto			
Internal Graphics		Auto		→ ← Select Screen	
GTT Size		2MB		↑ ↓ Select Item	
Aperture Size		256MB		Enter: Select	
DVMT Pre-Allocated		64M		+- Change Field	
DVMT Total Gfx Mem		256MB		F1: General Help	
				F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem

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

Memory Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Memory Information					
Memory Frequency		1067 MHz			
Total Memory		1024 MB (DDR3)			
DIMM#0		1024 MB (DDR3)			
DIMM#1					
DIMM#2					
DIMM#3					
CAS Latency (tCL)		7			
Minimum delay time					
CAS to RAS (tRCDmin)		7			
Row Precharge (tRPmin)		7			
Active to Precharge (tRASmin)		20			
				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

Boot Settings

This section allows you to configure the boot settings.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Configuration					
Setup Prompt Timeout			1		
Bootup NumLock State			On		
Quiet Boot			Disabled		
Fast Boot			Disabled		
CSM16 Module Version			07.68		→ ← Select Screen
GateA20 Active			Upon Request		↑ ↓ Select Item
Option ROM Messages			Force BIOS		Enter: Select
INT19 Trap Response			Immediate		+ - Change Field
Boot Option Priorities					F1: General Help
▶ CSM parameters					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Setup Prompt Timeout

Number of seconds to wait for setup activation key.
65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables/Disables Quiet Boot option.

Fast Boot

Enables/Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.

ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM. Options are Force BIOS and Keep Current.

INT19 Trap Response

Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities

Sets the system boot order.

CSM parameters

This section allows you to configure the boot settings.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
			Launch CSM	Always	
			Boot option filter	UEFI and Legacy	
			Launch PXE OpROM policy	Do not launch	
			Launch Storage OpROM policy	Legacy only	
			Launch Video OpROM policy	Legacy only	
			Other PCI device ROM priority	Legacy OpROM	
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Boot option filter

This option controls what devices system can boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storage OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Security Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Password Description					
If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup.					
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights				→ ← Select Screen	
The password length must be in the following range:				↑ ↓ Select Item	
Minimum length			3	Enter: Select	
Maximum length			20	+- Change Field	
Administrator Password				F1: General Help	
User Password				F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings

Aptio Setup Utility	
Main	Advanced
Save Changes and Exit	
Discard Changes and Exit	
Save Changes and Reset	
Discard Changes and Reset	
Save Options	
Save Changes	
Discard Changes	
Restore Defaults	
Save as User Defaults	
Restore User Defaults	
	→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

Drivers Installation

This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility	47
VGA Drivers Installation.....	48
Realtek HD Audio Driver Installation	49
LAN Drivers Installation	50
Intel® Management Engine Interface.....	52
ASMedia USB 3.0 Drivers	54

IMPORTANT NOTE:

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM67/Q67 Chipset Drivers**.



2. Click **Intel(R) Chipset Software Installation Utility**.



3. When the Welcome screen to the Intel® Chipset Device Software appears, click **Next** to continue.

4. Click **Yes** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click **Next** to continue the installation.

6. The Setup process is now complete. Click **Finish** to restart the computer and for changes to take effect.

VGA Drivers Installation

NOTE: Before installing the *Intel(R) Q67 Chipset Family Graphics Driver*, the Microsoft .NET Framework 3.5 SPI should be installed.

To install the VGA drivers, follow the steps below.

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.
2. Click *Intel(R) Q67 Chipset Family Graphics Driver*.



3. When the Welcome screen appears, click *Next* to continue.



4. Click *Yes* to agree with the license agreement and continue the installation.
5. On the Readme File Information screen, click *Next* to continue the installation of the Intel® Graphics Media Accelerator Driver.
6. On Setup Progress screen, click *Next* to continue.
7. Setup complete. Click *Finish* to restart the computer and for changes to take effect.

Realtek HD Audio Driver Installation

Follow the steps below to install the Realtek HD Audio Drivers.

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.

2. Click *Realtek High Definition Audio Driver*.



3. On the Welcome to the InstallShield Wizard screen, click *Yes* to proceed with and complete the installation process.



LAN Drivers Installation

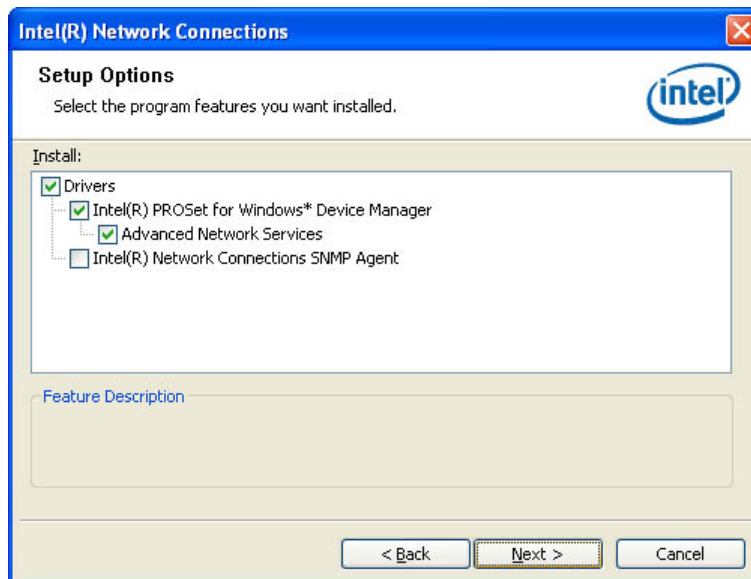
1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM67/Q67 Chipset Drivers**.

2. Click **Intel(R) PRO LAN Network Driver**.

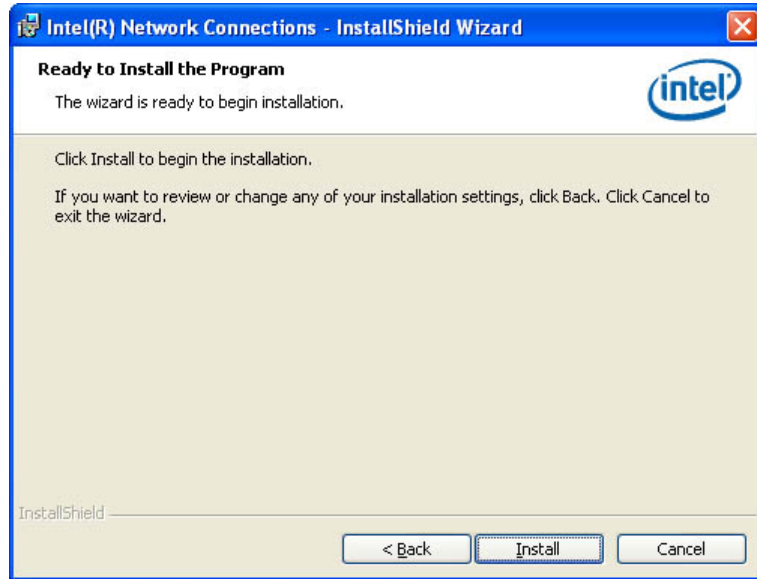


3. When the Welcome screen appears, click **Next**. On the next screen, click **Yes** to agree with the license agreement.

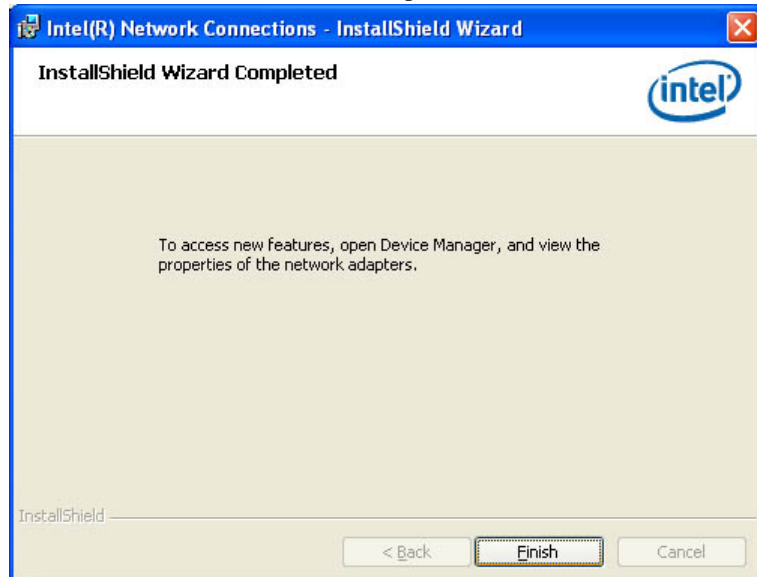
4. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



5. The wizard is ready to begin installation. Click **Install** to begin the installation.



6. When InstallShield Wizard is complete, click **Finish**.



Intel® Management Engine Interface

REMARKS: The Intel iAMT 7.0 Drivers can be installed on MB960AF, not MB960F.



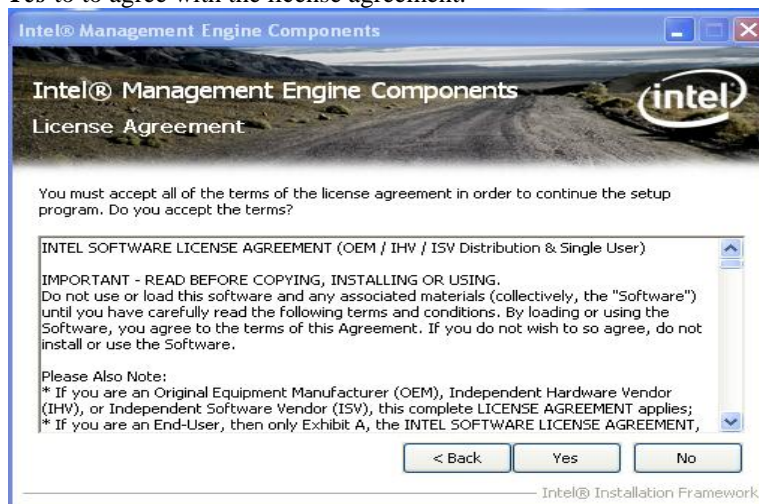
The following application requires Microsoft .NET Framework 3.5 or later: Intel® Management Engine Components. Please install the latest version of Microsoft .NET Framework from Microsoft Download Center to run this application correctly.

Follow the steps below to install the Intel Management Engine.

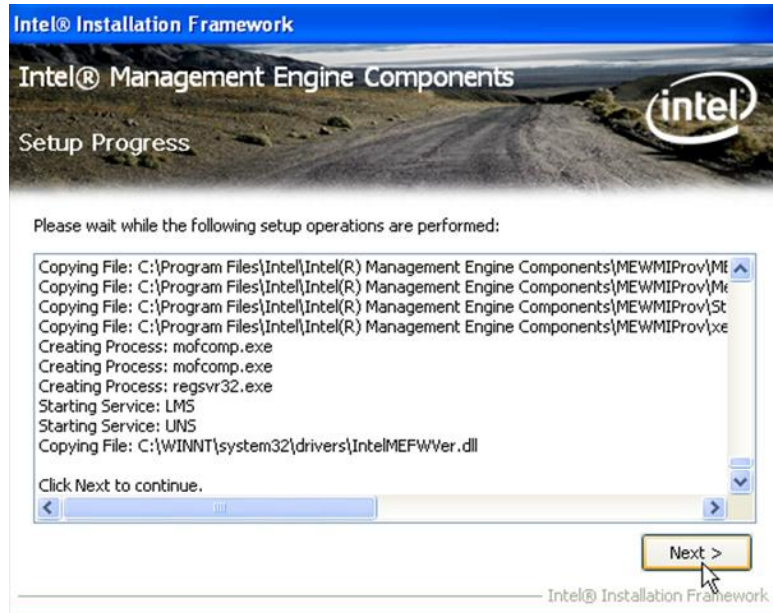
1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) AMT 7.0 Drivers*.



2. When the Welcome screen to the InstallShield® Wizard for Intel® Management Engine Components, click *Next*. On the next screen, click *Yes* to agree with the license agreement.



2. When the Setup Progress screen appears, click **Next**. Then, click **Finish** when the setup progress has been successfully installed.



ASMedia USB 3.0 Drivers

1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM67/Q67 Chipset Drivers**.

2. Click **Intel(R) PRO LAN Network Driver**.



2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click **Next**.



3. When InstallShield Wizard is complete, click **Finish**.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
2B0h- 2DFh	Graphics adapter Controller
360h - 36Fh	Network Ports
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ8	Real Time Clock
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81865.H"
//-----
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//-----
int main (int argc, char *argv[])
{
    unsigned char bBuf;
    unsigned char bTime;
    char **endptr;

    char SIO;

    printf("Fintek 81865 watch dog program\n");

    SIO = Init_F81865();
    if (SIO == 0)
    {
        printf("Can not detect Fintek 81865, program abort.\n");
        return(1);
    }/if (SIO == 0)

    if (argc != 2)
    {
        printf(" Parameter incorrect!!\n");
        return (1);
    }

    bTime = strtol (argv[1], endptr, 10);
    printf("System will reset after %d seconds\n", bTime);

    if (bTime)
    {
        EnableWDT(bTime);
    }
    else
    {
        DisableWDT();
    }

    return 0;
}
```

```

}
//-----
void EnableWDT(int interval)
{
    unsigned char bBuf;

    bBuf = Get_F81865_Reg(0x2B);
    bBuf &= (~0x20);
    Set_F81865_Reg(0x2B, bBuf);                //Enable WDTO

    Set_F81865_LD(0x07);                      //switch to logic device 7
    Set_F81865_Reg(0x30, 0x01);              //enable timer

    bBuf = Get_F81865_Reg(0xF5);
    bBuf &= (~0x0F);
    bBuf |= 0x52;
    Set_F81865_Reg(0xF5, bBuf);              //count mode is second

    Set_F81865_Reg(0xF6, interval);          //set timer

    bBuf = Get_F81865_Reg(0xFA);
    bBuf |= 0x01;
    Set_F81865_Reg(0xFA, bBuf);              //enable WDTO output

    bBuf = Get_F81865_Reg(0xF5);
    bBuf |= 0x20;
    Set_F81865_Reg(0xF5, bBuf);              //start counting
}
//-----
void DisableWDT(void)
{
    unsigned char bBuf;

    Set_F81865_LD(0x07);                    //switch to logic device 7

    bBuf = Get_F81865_Reg(0xFA);
    bBuf &= ~0x01;
    Set_F81865_Reg(0xFA, bBuf);              //disable WDTO output

    bBuf = Get_F81865_Reg(0xF5);
    bBuf &= ~0x20;
    bBuf |= 0x40;
    Set_F81865_Reg(0xF5, bBuf);              //disable WDT
}
//-----

```

```

//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include "F81865.H"
#include <dos.h>
//-----
unsigned int F81865_BASE;
void Unlock_F81865 (void);
void Lock_F81865 (void);
//-----
unsigned int Init_F81865(void)
{
    unsigned int result;
    unsigned char ucDid;

    F81865_BASE = 0x4E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x2E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x00;
    result = F81865_BASE;

Init_Finish:
    return (result);
}
//-----
void Unlock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
}
//-----
void Lock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_LOCK);
}
//-----
void Set_F81865_LD( unsigned char LD)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, F81865_REG_LD);
    outportb(F81865_DATA_PORT, LD);
    Lock_F81865();
}
//-----
void Set_F81865_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, REG);
    outportb(F81865_DATA_PORT, DATA);
    Lock_F81865();
}
//-----

```

```
unsigned char Get_F81865_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, REG);
    Result = inportb(F81865_DATA_PORT);
    Lock_F81865();
    return Result;
}
//-----

//-----
//
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// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#ifndef __F81865_H
#define __F81865_H                1
//-----
#define F81865_INDEX_PORT        (F81865_BASE)
#define F81865_DATA_PORT        (F81865_BASE+1)
//-----
#define F81865_REG_LD            0x07
//-----
#define F81865_UNLOCK            0x87
#define F81865_LOCK              0xAA
//-----
unsigned int Init_F81865(void);
void Set_F81865_LD(unsigned char);
void Set_F81865_Reg(unsigned char, unsigned char);
unsigned char Get_F81865_Reg(unsigned char);
//-----
#endif //__F81865_H
```


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