

# MB960

Intel® Sandy Bridge / PCH  
ATX Motherboard

## USER'S MANUAL

Version 1.0

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# Introduction

## Product Description

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The MB960F ATX motherboard is based on the latest Intel® Q67 chipset. The platform supports 2<sup>nd</sup> 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**

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Your MB960 package should include the items listed below.

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

## MB960 Specifications

<b>Product Name</b>	<b>MB960AF/MB960F</b>
<b>Form Factor</b>	ATX
<b>CPU Type</b>	- 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 <u>NOT</u> socket compatible with Clarkdale/Lynnfield
<b>CPU Speed</b>	Up to 3.1GHz
<b>Cache</b>	Up to 8MB
<b>CPU Socket</b>	<b>LGA1155 (Socket H2)</b>
<b>Chipset</b>	Intel® Q67 PCH 27 x 27 mm package size
<b>BIOS</b>	AMI BIOS, support ACPI Function
<b>Memory</b>	Intel® 2 <sup>nd</sup> generation Core™ i7/i5/i3 QC/DC mobile processor integrated controller DDRIII 1067/1333 MHz - DIMM x 4 (w/o ECC), Max.16GB
<b>VGA</b>	- Intel® 2 <sup>nd</sup> generation Core™ i7/i5/i3 mobile processor integrated Gfx <ul style="list-style-type: none"> <li>• DVI-I X 1 (thru Level shifter ASM1442)</li> <li>• DVI-D X 1 (thru Level shifter ASM1442)</li> <li>• HDMI X 1 (thru Level shifter ASM1442)</li> </ul>
<b>LAN</b>	1. Intel® Lewisville 82579LM GbE PHY [MI960AF only] or 82579V GbE PHY [MI960F only] 2. Intel® 82583V as 2 <sup>nd</sup> GbE
<b>USB</b>	USB 2.0 host controller, supports 14 ports w/ two EHCI <ul style="list-style-type: none"> <li>- 4 ports in the rear panel</li> <li>- Others reserved for onboard pin header ( 10 ports , 2.54mm pitch)</li> </ul> USB 3.0 host controller [ASMedia # ASM1042], support 2 ports <ul style="list-style-type: none"> <li>- 2 ports in the rear panel</li> </ul>
<b>Serial ATA</b>	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)
<b>Audio</b>	Intel® Q67 PCH built-in High Definition Audio controller+ ALC892 w/ 7.1 CH
<b>LPC I/O</b>	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)
<b>Digital IO</b>	4 in & 4 out
<b>IAMT(7.0)</b>	Intel® Q67 PCH built-in ( <b>MI960AF only</b> ) - Intel® Active Management Technology ver. 7.0
<b>TPM 1.2</b>	Winbond WPCT210A ( <b>MB960AF only</b> )
<b>PCI to ISA</b>	ITE IT8888G x 1 for high ISA bus
<b>PATA</b>	JMicron JMB368 (PCI-e to PATA) x1 for 1 PATA channel - CF x1 ( Horizontal type)
<b>Expansion Slots</b>	- PCI-Express (16x) x1 [PEG]; PCI-Express (4x) x1; PCI x4; ISA x1
<b>Edge Connectors</b>	DVI-D + DVI-I stack connector; Dual DB9 stack connector for COM #1, #2 Dual USB(3.0) dual stack connector; HDMI stack connector Gbit LAN RJ-45 + dual USB(2.0) stack connector x2 RCA Jack 3 x 1 for HD Audio
<b>Onboard Header/ Connector</b>	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
<b>Watchdog Timer</b>	Yes (256 segments, 0, 1, 2...255 sec/min)
<b>System Voltage</b>	ATX
<b>Others</b>	LAN Wakeup , EuP feature (Fintek F75160) ,UL 60950-1 2 <sup>nd</sup> Edition compatible

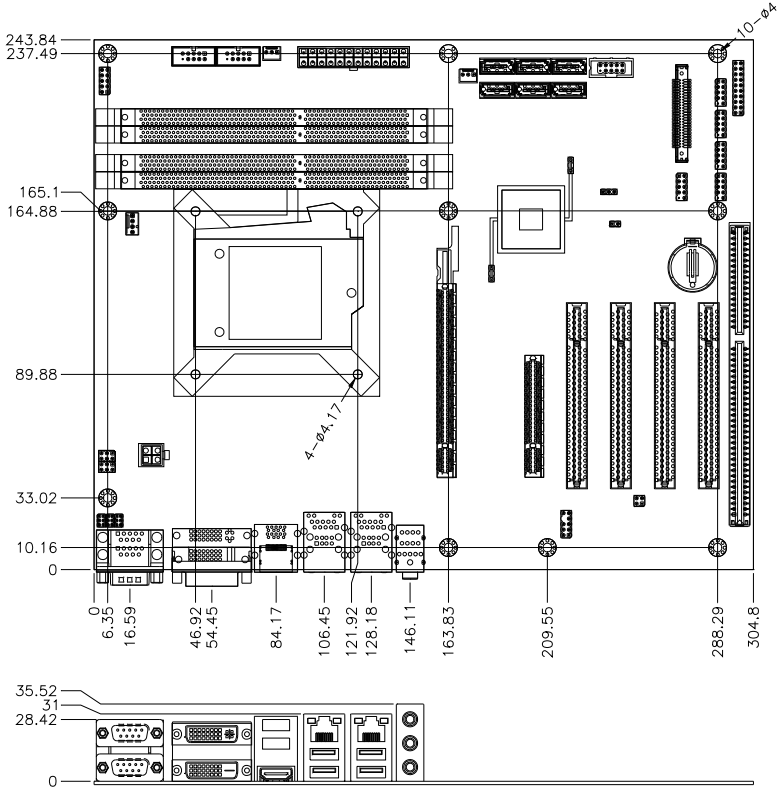
## *INTRODUCTION*

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<b>Board Size</b>	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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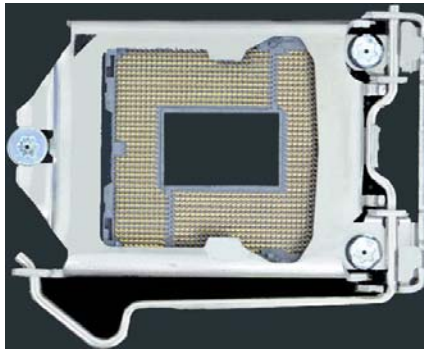
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## Installing the CPU

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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

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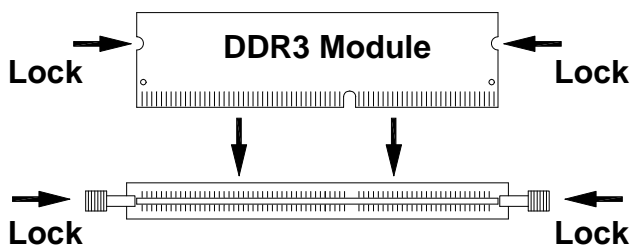
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The MB960 board supports four DDR3 memory socket for a maximum total memory of 16GB in DDR3 DIMM memory type.

### 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.



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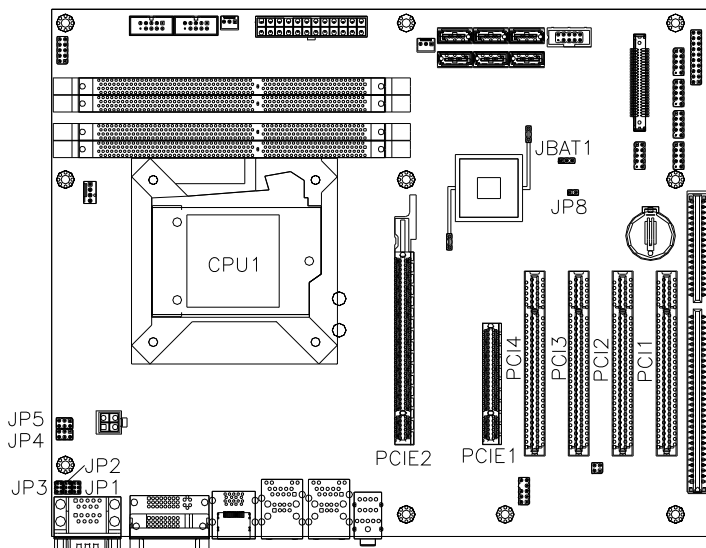
## Setting the Jumpers

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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.

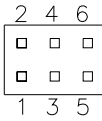
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Jumper Locations on MB960



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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	JP2: 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
<p>A diagram of a 6-pin header. The pins are arranged in two rows of three. The top row pins are labeled 1, 2, and 3 from left to right. The bottom row pins are labeled 5, 4, and 6 from left to right.</p>	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
<p>A diagram of a 6-pin header. The pins are arranged in two rows of three. The top row pins are labeled 1, 2, and 3 from left to right. The bottom row pins are labeled 5, 4, and 6 from left to right.</p>	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



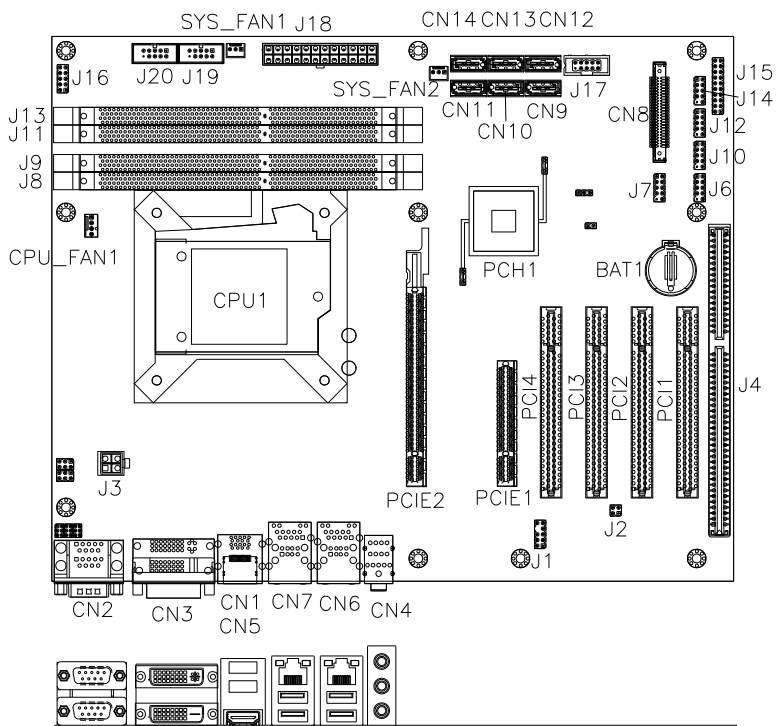
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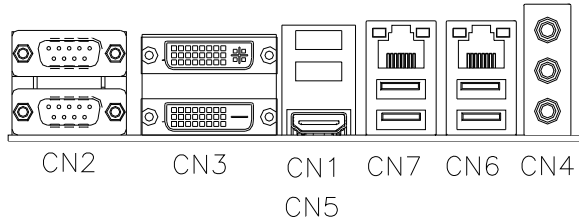
## Connectors on MB960

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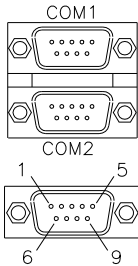
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### Connector Locations on MB960



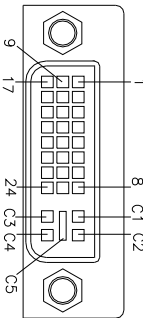


**CN2: COM1 and COM2 Serial Ports**

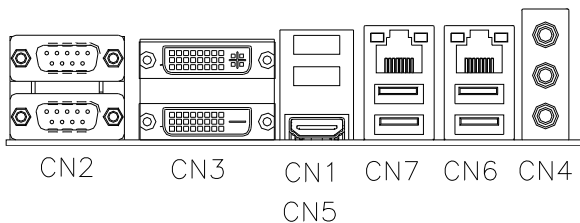


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

**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
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	A GROUND2
A GROUND 1	15	C6	A GROUND3



A detailed diagram of the USB3.0 connector (CN5) showing the pin layout. Pin numbers 9, 17, 24, and 8 are indicated on the left side of the 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
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**

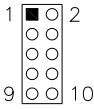
**CN1: HDMI Connector**

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

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

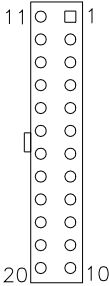
**CN4: HD Audio Connector**

**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**



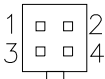
Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

**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

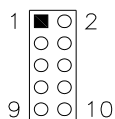
**J3: ATX 12V Power Connector**

This connector supplies the CPU operating voltage.



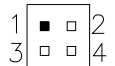
Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

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



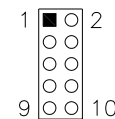
Signal Name	Pin	Pin	Signal Name
VCC	1	2	GND
D0-	3	4	D1-
D0+	5	6	D1+
GND	7	8	GND
KEY	9	10	NC

**J2 :SPDIF I/O**



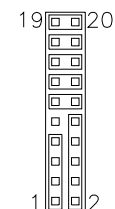
Pin #	Signal Name
1	SPDIF IN
2	Ground
3	SPDIF OUT
4	Ground

**J1 : Audio Pin Header for Chassis Front Panel**

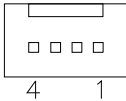


Signal Name	Pin	Pin	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

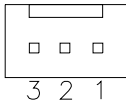
**J15: Front Panel Function Connector**



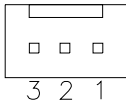
Signal Name	Pin #	Pin #	Signal Name
SPK +	1	2	PWR LED +
NC	3	4	PWR LED- (GND)
SPK - (GND)	5	6	PWR LED- (GND)
SPK - (GND)	7	8	NC
NC	9	10	NC
NC	11	12	NC
PWR_SW	13	14	PWR_SW
NC	15	16	NC
RST	17	18	GND
HDD LED -	19	20	HDD LED +

**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 provides 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 <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> 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 <DEL> 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.*

### **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
	Legacy OpROM Support				
	Launch PXE OpROM			Disabled	
	Launch Storage OpROM			Enabled	
	▶ ACPI Settings				
	▶ Trusted Computing				
	▶ Wake up event setting				
	▶ CPU Configuration				
	▶ SATA Configuration				
	▶ Shutdown Temperature Configuration				
	▶ EuP/ErP Power Saving Controller				
	▶ PCI IRQ Configuration				
	▶ Intel IGD SWSCI OpRegion				
	▶ USB Configuration				
	▶ Super IO Configuration				
	▶ H/W Monitor				
	▶ AMT Configuration				
	▶ Serial Port Consol Redirection				
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

### Launch PXE OpROM

Enable or Disable Boot Option for Legacy Network Devices.

### Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

## ACPI Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
	Enable ACPI Auto Configuration		Disabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
	Enable Hibernation		Enabled		
	ACPI Sleep State		S3 (Suspend to R...)		
	Lock Legacy Resources		Disabled		

### Enabled ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration.

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

### Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

## Trusted Computing

Aptio Setup Utility

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

### 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.

## Wake up event settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
	Wake system with Fixed Time		Disabled		
	Wake up hour		0		→ ← Select Screen
	Wake up minute		0		↑ ↓ Select Item
	Wake up second		0		Enter: Select
	Wake on Ring		Disabled		+ - Change Field
	Wake on PCI PME		Disabled		F1: General Help
	Wake on PCIE Wake Event		Disabled		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 Ring

The options are Disabled and Enabled.

### Wake on PCI PME

The options are Disabled and Enabled.

### Wake on PCIE PME Wake Event

The options are Disabled and Enabled.

## CPU Configuration

This section shows the CPU configuration parameters.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Configuration					
Intel® Core™ i5-2400 CPU @ 3.10GHz					
Processor Stepping			206a7		
Microcode Revision			d		
Processor Speed			3100 MHz		
Processor Cores			4		
Intel HT Technology			Not Supported		
EMT64			Supported		
Active Processor Cores			All		→ ← Select Screen
Limit CPUID Maximum			Disabled		↑ ↓ Select Item
Execute Disable Bit			Enabled		Enter: Select
Hardware Prefetcher			Enabled		+ - Change Field
Adjacent Cache Line Prefetch			Enabled		F1: General Help
Intel Virtualization Technology			Disabled		F2: Previous Values
Power Technology			Energy Efficient		F3: Optimized Default
Local x2APIC			Disabled		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.)

### Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

## Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

## Intel Virtualization Technology

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

## Power Technology

Enable the power management features.

## Local x2APIC

Enable Local x2APIC. Some OSES do not support this.

## SATA Configuration

SATA Devices Configuration.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
SATA Configuration					
SATA Mode		IDE Mode		→ ← Select Screen	
Serial-ATA Controller 0		Compatibled		↑ ↓ Select Item	
Serial-ATA Controller 1		Enhanced		Enter: Select	
SATA Port0		Not Present		+- Change Field	
SATA Port1		Not Present		F1: General Help	
SATA Port2		Not Present		F2: Previous Values	
SATA Port3		Not Present		F3: Optimized Default	
SATA Port4		Not Present		F4: Save ESC: Exit	
SATA Port5		Not Present			

## SATA Mode

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

## Serial-ATA Controller

Enable / Disable Serial ATA Controller.

## ME SMBus Thermal Reporting

Enable/Disable ME SMBus Thermal Reporting Configuration.

## PCH Temp Read

PCH Temperature Read Enable.

## ACPI Shutdown Temperature

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
			PCI/ISA		→ ← Select Screen
			PCI/ISA		↑ ↓ Select Item
			PCI/ISA		Enter: Select
			PCI/ISA		+ - Change Field
			PCI/ISA		F1: General Help
			PCI/ISA		F2: Previous Values
			PCI/ISA		F3: Optimized Default
			PCI/ISA		F4: Save ESC: Exit

## Intel IGD SWSCI OpRegion

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Intel IGD SWSCI OpRegion Configuration					
			DVMT Mode		
			256MB		
					→ ← Select Screen
					↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

### DVMT Mode Select

Select DVMT Mode used by Internal Graphics Device.

### DVMT/FIXED Memory

Select DVMT/FIXED Mode Memory size used by Internal Graphics Device. Options are 128MB, 256MB and Maximum.

## USB Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
USB Devices: 2 Hubs					→ ← Select Screen
Legacy USB Support					↑ ↓ Select Item
USB3.0 Support					Enter: Select
XHCI Hand-off					+ - Change Field
EHCI Hand-off					F1: General Help
Port 60/64 Emulation					F2: Previous Values
USB hardware delays and time-outs:					F3: Optimized Default
USB Transfer time-out					F4: Save ESC: Exit
Device reset time-out					
Device power-up delay					

### 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.

**Port 64/60 Emulation**

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

**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.

## Super IO Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Super IO Configuration					
Super IO Chip		Fintek 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)

**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		
+3.3V			+3.408 V		→ ← Select Screen
Vcore			+1.184 V		↑ ↓ Select Item
+5V			+5.087 V		Enter: Select
+12V			+12.232 V		+ - Change Field
Vmem			+1.504 V		F1: General Help
VSB3V			+3.39284 V		F2: Previous Values
CPU Smart Fan Control			Disabled		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.

## AMT Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
	AMT		Enabled		
	Unconfigure AMT/ME		Disabled		
	WatchDog Timer		Disabled		→ ← Select Screen
	OS WatchDog Timer		0		↑ ↓ Select Item
	BIOS WatchDog Timer		0		Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

### AMT

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

### Unconfigure AMT/ME

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

### WatchDog Timer

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

## Serial Port Console Redirection

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
COM0 (Disabled)			Console Redirection		Port is Disabled
COM4(PCI Dev0, Func0) (Disabled)			Console Redirection		Port is Disabled
Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)					→ ← Select Screen
Console Redirection					↑ ↓ Select Item
<b>Console Redirection Settings</b>					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save & Exit
					ESC: Exit

### Console Redirection

This configuration is supported only with MB960AF (with iAMT function).  
Enable/Disable Console Redirection.

### Console Redirection Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Out-of-Band Mgmt Port			COM0 (Disabled)		→ ← Select Screen
Terminal Type			VT-UTF8		↑ ↓ Select Item
Bit per second			115200		Enter: Select
Flow Control			None		+ - Change Field
Data Bits			8		F1: General Help
Parity			None		F2: Previous Values
Stop Bits			1		F3: Optimized Default
					F4: Save & Exit
					ESC: Exit

### Out-of-Band Mgmt Port

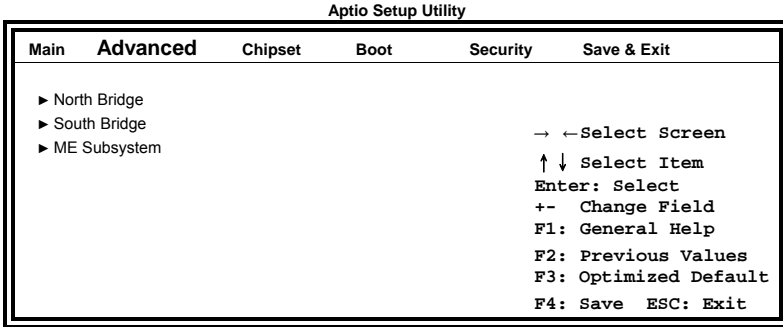
This configuration is supported only with MB960AF (with iAMT function).  
Microsoft Windows Emergency Management Services (EMS) allows  
for remote management of a Windows Server OS through a serial port.

### Terminal Type

This configuration is supported only with MB960AF (with iAMT function).  
VT-UTF8 is the preferred terminal type for out-of-band management.  
The next best choice is VT100+ and then VT100.

## Chipset Settings

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



### Enable CSID

By default, this item is disabled. Enable Compatible Revision ID.

### North Bridge

This item shows the North Bridge Parameters.

### South Bridge

This item shows the South Bridge Parameters.

### ME Subsystem

This item shows the ME Subsystem Parameters.



## North Bridge

This section allows you to configure the North Bridge Chipset.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Memory Information					
Total Memory		4096 MB (DDR3 1066)			→ ← Select Screen
Memory Slot0		2048 MB (DDR3 1066)			↑ ↓ Select Item
Memory Slot1		0			Enter: Select
Memory Slot2		2048 MB (DDR3 1066)			+ - Change Field
Memory Slot3		0			F1: General Help
Low MMIO Align		1024M			F2: Previous Values
DMI Gen2		Enabled			F3: Optimized Default
VT-d		Disabled			F4: Save ESC: Exit
Initiate Graphic Adapter		PEG/PCI			
IGD Memory		64M			
Render Standby		Enabled			
IGD Multi-Monitor		Disabled			
PCI Express Port		Auto			
PEG Force Gen1		Disabled			
Detect Non-Compliance		Disabled			

### Low MMIO Align

Low MMIO resources align at 64MB/1024MB.

### VT-d

VT-d Enable/Disable.

### Initiate Graphic Adapter

Select which graphics controller to use as the primary boot device.

Options are IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI and SG.

### IGD Memory

IGD Share Memory Size. Options are Disable, 32M, 64M and 128M.

### Render Standby

Enabled/Disabled Render standby by Internal Graphics Device.

### IGD Multi-Monitor

Enabled/Disabled IGD Multi-Monitor by Internal Graphics Device.

### PCI Express Port

Options are Disabled, Enabled and Auto.

### PEG Force Gen1

PCI Express Port Force Gen1. Options are Disabled and Enabled.

### Detect Non-Compliance

Detect Non-Compliance PCI Express Device in PEG.

## SB Chipset Configuration

This section allows you to configure the South Bridge Chipset.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
SB Chipset Configuration					
GbE Controller		Enabled			
Wake on LAN from S5		Enabled			
Audio Configuration					
Azalia HD Audio		Enabled		→ ← Select Screen	
Azalia Internal HDMI codec		Enabled		↑ ↓ Select Item	
High Precision Event Timer Configuration					
High Precision Timer		Enabled		Enter: Select	
PCI Express Ports Configuration					
USB Configuration					
				+- Change Field	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

### GbE Controller

This is constantly enabled.

### Wake on LAN from S5

Wake on LAN from S5 help.

### Audio Configuration

The Audio Configuration settings Enable/Disable the Azalia HD Audio and the Azalia internal HDMI codec.

### High Precision Event Timer Configuration

Enable/or Disable the High Precision Event Timer.

## PCI Express Ports Configuration

Enable or Disable the PCI Express Ports in the Chipset.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Express Ports Configuration					
		PCI Express Port 1	Auto		
		PCI Express Port 2	Auto		→ ← Select Screen
		PCI Express Port 3	Auto		↑ ↓ Select Item
		PCI Express Port 4	Auto		Enter: Select
		PCI Express Port 5	Auto		+ - Change Field
		PCI Express Port 6	Auto		F1: General Help
		PCI Express Port 7	Auto		F2: Previous Values
		PCI Express Port 8	Auto		F3: Optimized Default
					F4: Save ESC: Exit

## USB Configuration

Enable/Disable All USB Devices, USB 2.0 (EHCI) Support and RMH Support. The setting of AUTO on RMH Support Enable RMH support on Ibex Peak B0 Stepping.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
		All USB Devices	Enabled		
		EHCI Controller 1	Enabled		→ ← Select Screen
		EHCI Controller 2	Enabled		↑ ↓ Select Item
		USB Port 0	Enabled		Enter: Select
		USB Port 1	Enabled		+ - Change Field
		USB Port 2	Enabled		F1: General Help
		USB Port 3	Enabled		F2: Previous Values
		USB Port 4	Enabled		F3: Optimized Default
		USB Port 5	Enabled		F4: Save ESC: Exit
		USB Port 6	Enabled		
		USB Port 7	Enabled		
		USB Port 8	Enabled		
		USB Port 9	Enabled		
		USB Port 10	Enabled		
		USB Port 11	Enabled		
		USB Port 12	Enabled		
		USB Port 13	Enabled		

## Intel ME Subsystem Configuration

This section allows you to configure the PCI settings.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Intel ME Subsystem Configuration					
ME Version			7.0.4.1197		→ ← Select Screen
ME Subsystem		Enabled			↑ ↓ Select Item
ME Temporary Disabled		Disabled			Enter: Select
End of Post Message		Enabled			+ - Change Field
Execute MEBx		Enabled			F1: General Help
MEBx		Normal			F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

### ME Version

This configuration is supported only with MB960AF (with iAMT function). Launches (Enabled/Disabled) the boot option for legacy network devices.

### ME Subsystem

This configuration is supported only with MB960AF (with iAMT function). Launches (Enabled/Disabled) the boot option for legacy network devices.

### End of Post Message

This configuration is supported only with MB960AF (with iAMT function). Launches (Enabled/Disabled) the boot option for legacy network devices.

### Execute MEBx

This configuration is supported only with MB960AF (with iAMT function). Launches (Enabled/Disabled) the boot option for legacy network devices.

## 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			07.64		→ ← Select Screen
GateA20 Active			Upon Request		↑ ↓ Select Item
Option ROM Messages			Force BIOS		Enter: Select
Interrupt 19 Canture			Disabled		+ - Change Field
Boot Option Priorities					F1: General Help
Hard Drive BBS Priorities					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.

### Interrupt 19 Canture

Enable: Allows Option ROMs to trap Int 19.

### Boot Option Priorities

Sets the system boot order.

## 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 limits 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					
Administrator Password					
User Password					
					→ ← Select Screen
					↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					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	Chipset	Boot	Security	Save & Exit
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  Boot Override  Launch EFI Shell from filesystem device					→ ← 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.

### **Boot Override**

Pressing ENTER causes the system to enter the OS.

### **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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## 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 first 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.

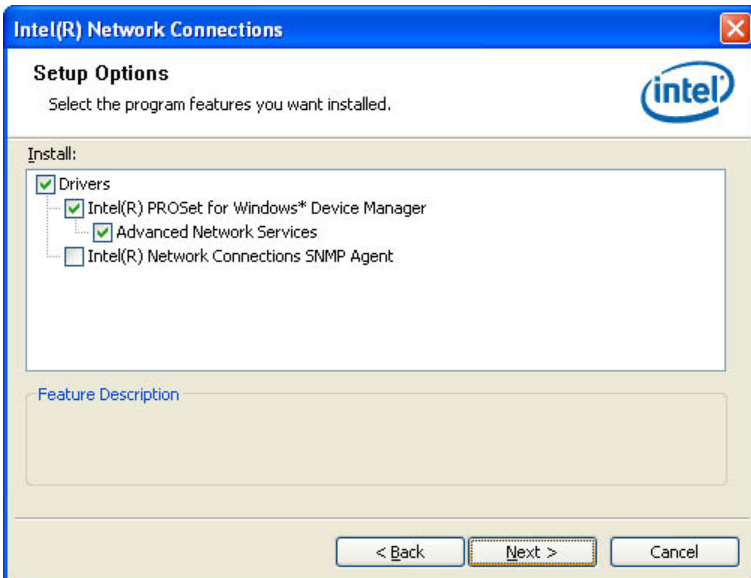


## LAN Drivers Installation

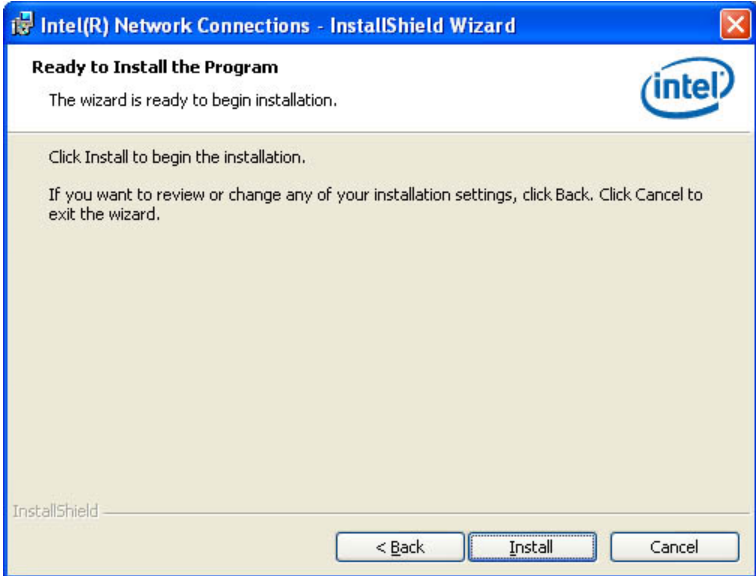
1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM67/Q67 Chipset Drivers**.
2. Click **Intel(R) PRO LAN Network Driver**.



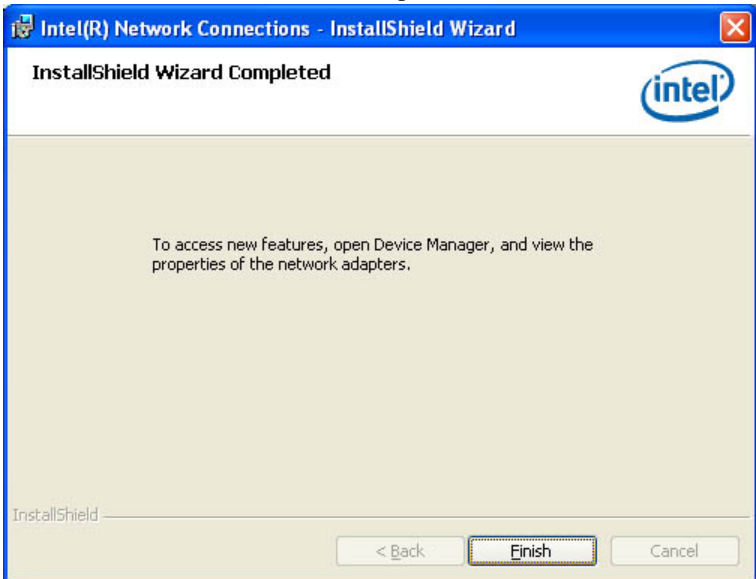
3. When the Welcome screen appears, click **Next**. On the next screen, click **Yes** to agree with the license agreement.
4. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



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.**



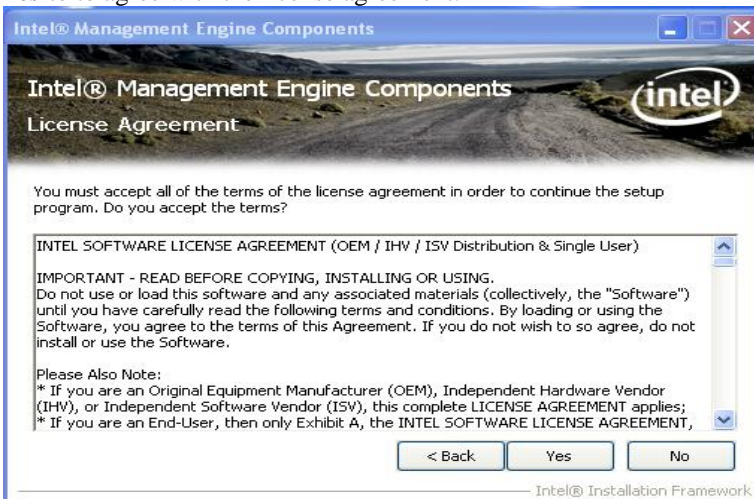
The following application requires Microsoft .NET Framework 3.5 or later: Intel® Management Engine Components. Please install the latest version of Microsoft .NET Framework from Microsoft Download Center to run this application correctly.

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*.

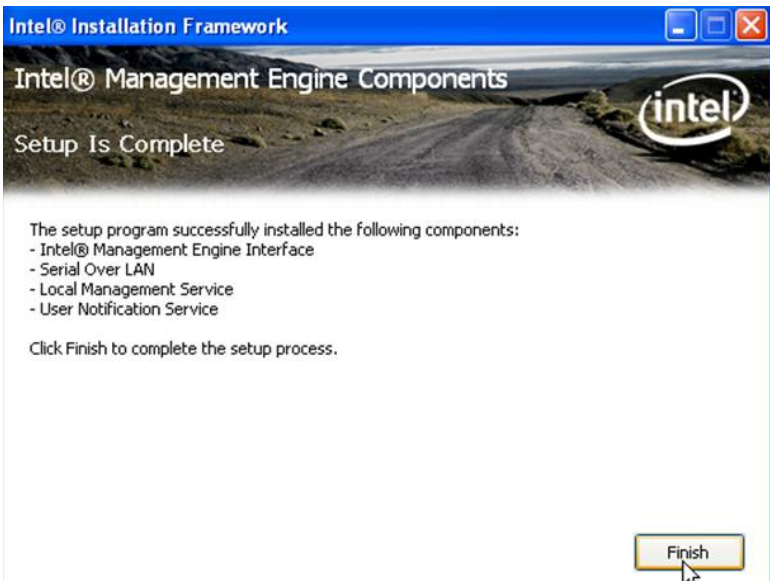
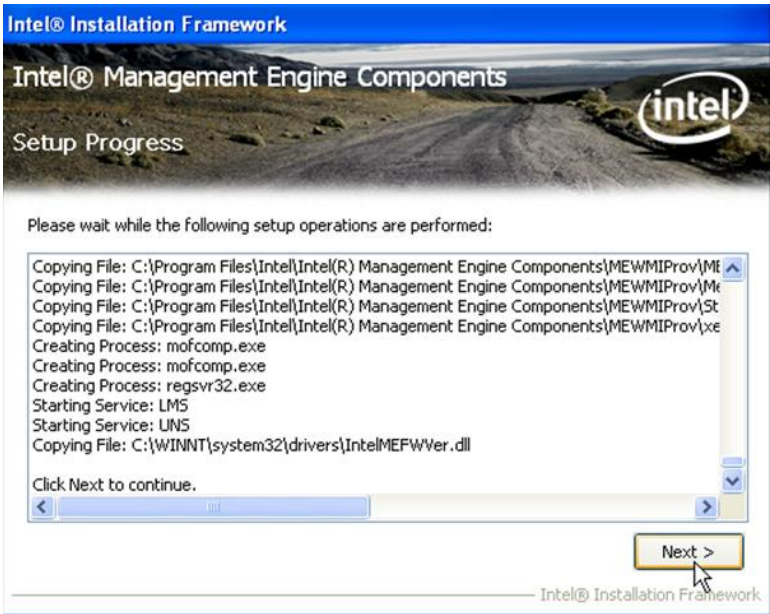


2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click *Next*. On the next screen, click *Yes* to agree with the license agreement.





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 WDT0

    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 WDT0 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 WDT0 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();
}
//-----

```

## APPENDIX

---

```
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;
}
//-----

//-----
//
// 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.
//
//-----
#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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