

MI961F

**Intel® H61 Express Chipset
Mini ITX Motherboard**

USER'S MANUAL

Version 1.0A

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Introduction

Product Description

The MI961F Mini ITX motherboard is based on the latest Intel® H61 Express 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 H61 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 MI961F board utilizes the dramatic increase in performance provided by this Intel's latest cutting-edge technology. Measuring 170mm x 170mm, the MI961F offers 3Gbps SATA support (3 ports), USB3.0 (2 ports) and interfaces for DVI-D, VGA and HDMI displays.

MI961F FEATURES:

- Supports Intel® 2nd Generation Core i7/i5/i3 QC/DC desktop processors
- Two DDR3 DIMM, 1066/1333MHz; supports up to 16GB memory
- Dual Realtek PCI-Express Gigabit LAN
- Integrated Graphics for VGA, DVI-D/HDMI displays
- 3x SATA 2.0, 9x USB 2.0, USB 3.0 (2 ports), 4x COM, Watchdog timer
- 1x PCI-E (x16), 1x Mini PCI-E Socket (supports Mini PCI-E card or MSATA)

Checklist

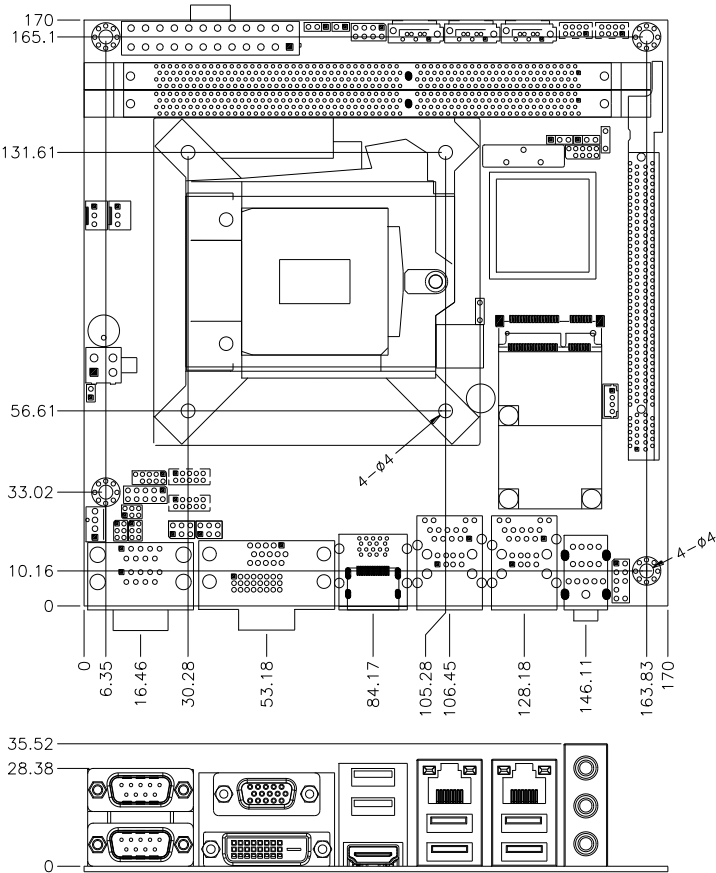
Your MI961F package should include the items listed below.

- The MI961F Mini ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Serial ATA cable

MI961F Specifications

Form Factor	Mini-ITX
CPU Type	Intel® 2 nd generation Core™ i7/i5/i3/Pentium®/Celeron® DT processor TDP for QC= 95W/65W/45W; DC= 65W/35W [Package = FC-LGA10, 37.5 mm x 37.5mm]
CPU Speed	Up to 3.40 GHz
Cache Size	Up to 8MB shared L2 Cache
CPU Socket	LGA1155 (Socket H2)
Chipset	Intel® BD82H61 PCH (TDP=6.1W) [27mm x 27mm, 942-pin FCBGA package]
BIOS	AMI BIOS, support ACPI Function
Memory	Intel® 2 nd generation Core™ i7/i5/i3/Pentium®/Celeron® DT processor integrated memory controller support DDR3-1333 (Non-ECC) UDIMM x 2, Max. =16GB
VGA	Intel® 2 nd generation Core™ i7/i5/i3/Pentium® DT processor integrated Gfx(HD2000/HD3000) ● CRT X 1, DVI-D X 1 (thru Level shifter ASM1442) ● HDMI X 1 (thru Level shifter ASM1442)
LAN	Realtek RTL8111E PCIe Gigabit LAN controller x2
USB	USB 2.0 host controller, supports 10 ports - 4 ports in the rear panel and 4 ports for onboard pin header - 1 port for Mini PCIe USB 3.0 host controller (ASM1042), support 2 ports - 2 ports in the rear panel
Serial ATA	Intel® H61 PCH build-in SATA 2.0 controller, supports 3 ports
Audio	Intel® H61 PCH build-in built-in High Definition Audio controller: ALC892 w/ 7.1 channels
LPC I/O	Fintek F81866AD-I COM1 (RS232/422/485) [Auto flow control]; COM2~4 (RS232 only) COM1/2 with pin-9 with power for 2 ports (500 mA for each port) Hardware Monitor (2 thermal inputs, 4 voltage monitor inputs & 3 Fan headers, 2 x DC FAN supporting only, AUX FAN cannot) CPU FAN = 4-pin type; others= 3-pin type
Digital IO	4 in & 4 out
Expansion Slots	PCIe(16x) x 1 Mini PCIe(1x) x1 [Full-sized type] w/ mSATA & USB
Edge Connector	Dual DB9 stack connector for COM1, COM2 DVI-D + CRT stack connector x 1 Dual USB(3.0) [BLUE color] + HDMI stack connector x1 RJ-45 GbE + dual USB (2.0) stack connector x2 RCA Jack 3 x 1 for HD Audio
Onboard Header/ Connector	3 ports x SATA II 2x4 pin-header x2 for 4 ports USB 2.0 2x5 pin-header x1 for front panel audio DF11-10 for COM3, DF11-10 for COM4 2x5 pin-header x1 for Digital I/O 2x5 male connector for LPC module [Debugging purpose only]
Watchdog Timer	Yes (256 segments, 0, 1, 2...255 sec/min)
iSmart function	TI MSP430G2433 Micro-processor (Remote On/Off Control)
System Voltage	+5V, +3.3V, +12V, -12V, 5VSB (2A) 24-pin ATX main power + 4-pin 12V
Other	- Single LAN only to support LAN Wakeup while EuP is enabled - Atmel AT24C02C EEPROM [SO8 type] for RTC back via SMBus
RoHS	Yes
Board Size	170mm x 170mm

Board Dimensions



Installations

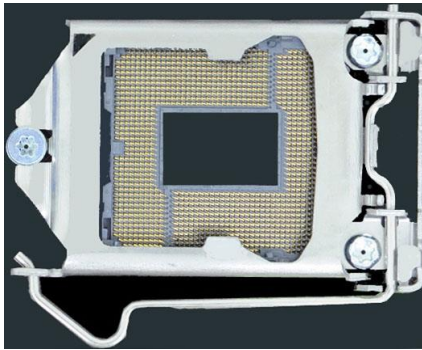
This section provides information on how to use the jumpers and connectors on the MI961F in order to set up a workable system. The topics covered are:

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Installing the CPU

The MI961F board supports an LGA1155 Socket (shown below) for 2nd generation Intel® Core™ processor family with LGA1155 packing.

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.

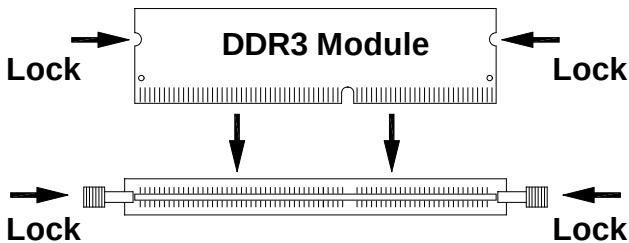
Installing the Memory

The MI961F 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.

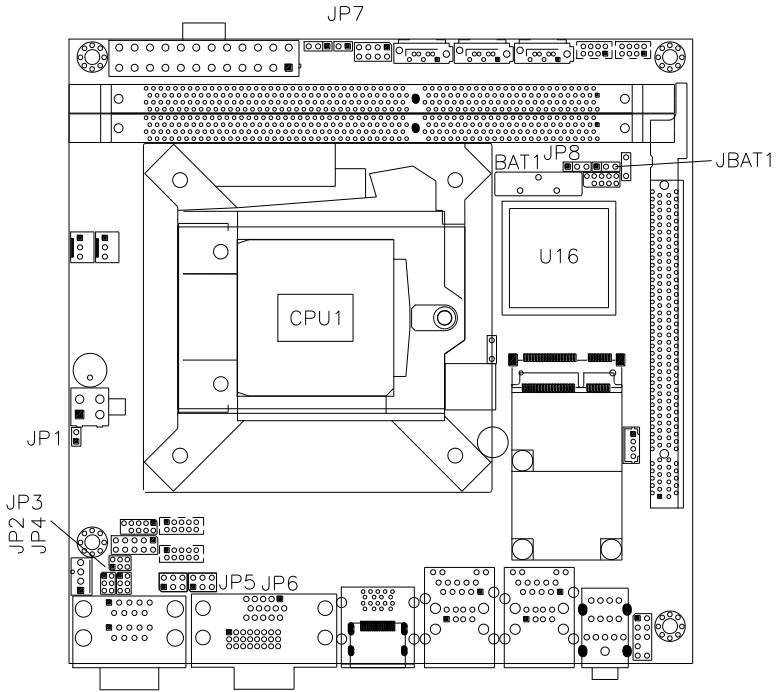


Setting the Jumpers

Jumpers are used on MI961F 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 MI961F and their respective functions.

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 JP2, JP3, JP4: RS232/RS422/RS485 (COM1) Selection 10
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 JP7: Flash Descriptor Security Override (Factory use only) 11
 JBAT1: Clear CMOS Contents 11

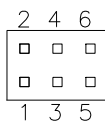
Jumper Locations on MI961F



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JP1: Factory use only (Default: open)

JP2, JP3, JP4: RS232/RS422/RS485 (COM1) Selection



COM1 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP2: 3-5&4-6	JP2: 1-3&2-4	JP2: 1-3&2-4
	JP3: 1-2	JP3: 3-4	JP3: 5-6
	JP4: 3-5 & 4-6	JP4: 1-3 & 2-4	JP4: 1-3 & 2-4

JP5: COM1 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

JP6: COM2 RS232 RI/+5V/+12V Power Setting

JP6	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP7: Flash Descriptor Security Override (Factory use only)

JP7	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

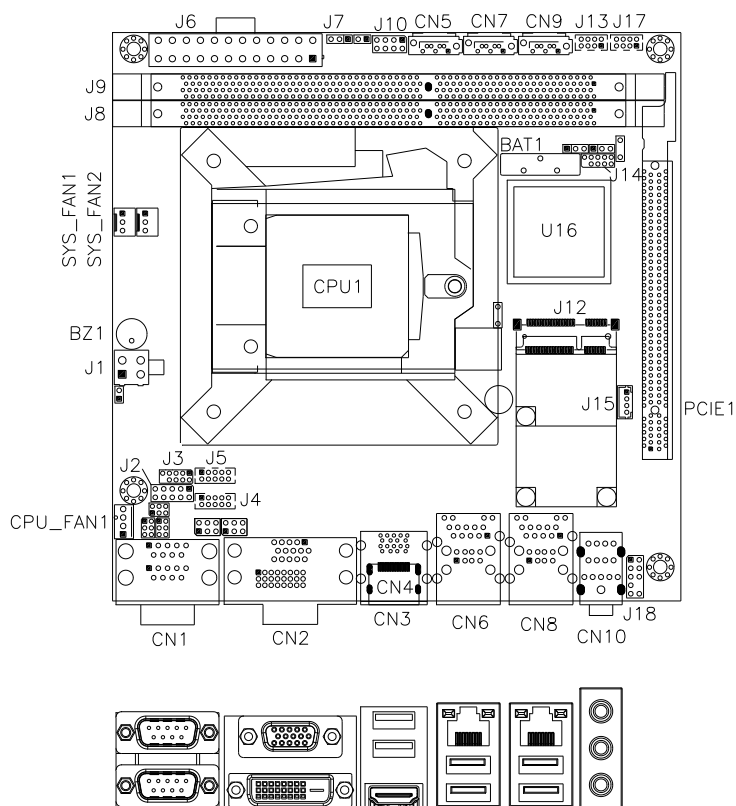
JBAT1: Clear CMOS Contents

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

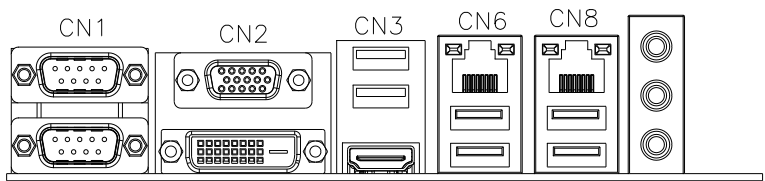
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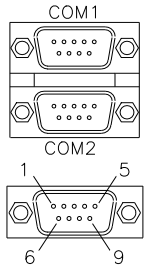
Connector Locations on MI961F



INSTALLATIONS

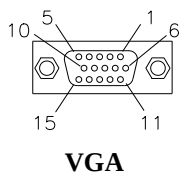


CN1: COM1 and COM2 Serial Ports

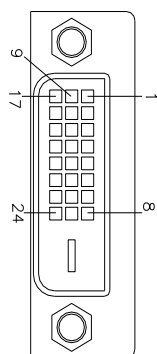
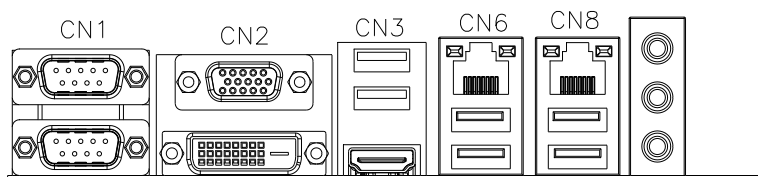


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

CN2: VGA and DVI-D Connector



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	DDCDATA
HSYNC	13	14	VSYNC
DDCCLK	15		



Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
GROUND	3	18	DATA 0+
N.C.	4	19	GROUND
N.C.	5	20	N.C.
DDC CLOCK	6	21	N.C.
DDC DATA	7	22	GROUND
N.C	8	23	CLOCK +
DATA 1-	9	24	CLOCK -
DATA 1+	10		
GROUND	11		
N.C.	12		
N.C.	13		
DDC POWER	14		
GROUND	15		

CN3: USB3.0 Connector

CN4: HDMI Connector

CN5, CN7, CN9: SATA Connectors

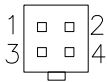
CN6: Gigabit LAN + USB 2/3

CN8: Gigabit LAN + USB 10/11

CN10: HD Audio Connector

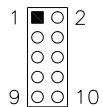
INSTALLATIONS

J1: ATX 12V Power Connector



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

J2: Digital I/O



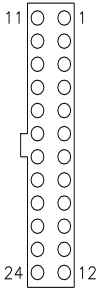
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	VCC
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J3: LPC Connector (for debug use)

J4, J5: COM3, COM4 RS232 Serial Ports



Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	2	RXD, Receive data
TXD, Transmit data	3	4	DTR, Data terminal ready
GND, ground	5	6	DSR, Data set ready
RTS, Request to send	7	8	CTS, Clear to send
RI, Ring indicator	9	10	Not Used

J6: 24-pin ATX Power Connector


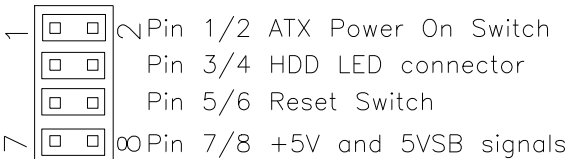
Signal Name	Pin #	Pin #	Signal Name
3.3V	13	1	3.3V
-12V	14	2	3.3V
Ground	15	3	Ground
PS-ON	16	4	+5V
Ground	17	5	Ground
Ground	18	6	+5V
Ground	19	7	Ground
-5V	20	8	Power good
+5V	21	9	5VSB
+5V	22	10	+12V
+5V	23	11	+12V
Ground	24	12	+3.3V

J7: Power LED

The power LED indicates the status of the main power switch.



Pin #	Signal Name
1	Power LED
2	No connect
3	Ground

J8, J9, DDR3 DIMM Sockets
J10: System Function connector

ATX Power ON Switch: Pins 1 and 2

This 2-pin connector is an “ATX Power Supply On/Off Switch” on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

INSTALLATIONS

Hard Disk Drive LED Connector: Pins 3 and 4

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

Pin #	Signal Name
4	HDD Active
3	+3.3V

Reset Switch: Pins 5 and 6

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

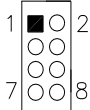
+5V and 5VSB Signals: Pins 7 and 8

Pin #	Signal Name
7	+5V
8	+5VSB

J12: Mini PCI-E Connector

Supports Mini PCI-E card or MSATA device

J13, J17: USB Connectors

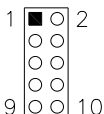


Signal Name	Pin #	Pin #	Signal Name
Vcc	1	2	Ground
D-	3	4	D+
D+	5	6	D-
Ground	7	8	Vcc

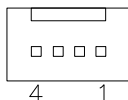
J14: SPI Connector (For debug use)

J15: MCU JTAG (for debug use)

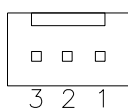
J18: Audio Pin Header for Chassis Front Panel



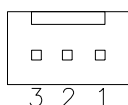
Signal Name	Pin #	Pin #	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

PCIE1: PCI-E X16 Slot**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	Rotation detection

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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 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 ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
System Date		[Tue 01/20/2009]			
System Time		[22:26:12]			
Access Level		Administrator			

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
▶ PCI Subsystem Settings ▶ ACPI Settings ▶ Wake up event setting ▶ CPU Configuration ▶ SATA Configuration ▶ Shutdown Temperature Configuration ▶ iSmart Controller ▶ Acoustic Management Configuration ▶ USB Configuration ▶ F81866 Super IO Configuration ▶ F81866 H/W Monitor ▶ CPU PPM Configuration				→ ← Select Screen ↑ ↓ Select Item Enter: Select + - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

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		Disabled			
PERR# Generation		Disabled			
SERR# Generation		Disabled			
▶ PCI Express Settings					
				→ ← Select Screen ↑ ↓ Select Item Enter: Select + - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

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		
PCI Express Link Register Settings					
	ASPM Support		Disabled		
	WARNING: Enabling ASPM may cause some PCI-E devices to fail				
	Extended Synch		Disabled		
	Link Training Retry		5		
	Link Training Timeout (uS)		100		
	Unpopulated Links		Keep Link ON		
				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values 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

Apno Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Settings				→ ← 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		S1 (CPU stop C...)			
Lock Legacy Resources		Disabled			
S3 Video Repost		Disabled			

Enable Hibernation

Enables or Disables System ability to Hibernates (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

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Wake on Ring			Disabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Wake on PCIE Wake Event			Disabled		

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					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
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		
Hardware Prefetcher			Disabled		
Adjacent Cache Line Prefetch			Enabled		

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, Red Hat 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			→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
SATA Port0		Empty			
Software Preserve		Unknown			
SATA Port1		Empty			
Software Preserve		Unknown			
SATA Port2		Empty			
Software Preserve		Unknown			
SATA Port3		Empty			
Software Preserve		Unknown			
SATA Port4		Empty			
Software Preserve		Unknown			
SATA Port5		Empty			
Software Preserve		Unknown			

SATA Controller(s)

Enable / Disable Serial ATA Controller.

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.

iSmart Controller

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
iSmart Controller					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Power-On after Power failure			Disable		
Schedule Slot 1			None		
Schedule Slot 2			None		

iSmart Controller

Setup the power on time for the system.

Schedule Slot 1 / 2

Setup the hour/minute for system power on.

Acoustic Management Configuration

Aptio Setup Utility

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

USB Configuration

Aptio Setup Utility

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

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.

F81866 Super IO Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Super IO Configuration				→ ← Select Screen ↑ ↓ Select Item Enter: Select + - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	
F81866 Super IO Chip		F81866			
F81866 ERP Support		All Enable			
▶ Serial Port 0 Configuration					
▶ Serial Port 1 Configuration					
▶ Serial Port 2 Configuration					
▶ Serial Port 3 Configuration					

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.

F81866 H/W Monitor

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Health Status					
CPU temperature			+41 C		
System temperature			+35 C		
CPU FAN Speed			2115 RPM		
System Fan1 Speed			N/A		
System Fan2 Speed			N/A		
Vcore			+1.000 V		
+5V			+5.213 V		
+12V			+12.408 V		
+1.5V			+1.544 V		
+3.3V			+3.424 V		
CPU smart fan control			Disabled		
System smart fan1 control			Disabled		
System smart fan2 control			Disabled		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help 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				→ ← Select Screen ↑ ↓ Select Item Enter: Select + - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	
EIST					
Turbo Mode					

EIST

Enable/Disable Intel SpeedStep.

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.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
▶ PCH-IO Configuration ▶ System Agent (SA) Configuration				→ ← Select Screen ↑ ↓ Select Item Enter: Select + - Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

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
		High Precision Event Timer Configuration	
		High Precision Timer	Enabled
		SLP_S4 Assertion Width	4-5 Seconds
		→ ← Select Screen ↑ ↓ 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.

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

EHCI1/2

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				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	
Azalia		Auto			
Azalia PME		Disabled			

Azalia

Control Detection of the Azalia device.

Disabled = Azalia will unconditionally disabled.

Enabled Azalia will be unconditionally enabled.

Auto = Azalia will enabled if present, disabled otherwise.

System Agent (SA) Configuration

Aptio Setup Utility

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

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		
GTT Size			2MB		→ ← Select Screen
Aperture Size			256MB		↑ ↓ Select Item
DVMT Pre-Allocated			64M		Enter: Select
DVMT Total Gfx Mem			256MB		+ - Change Field
					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				→ ← Select Screen	
DIMM#2				↑ ↓ Select Item	
DIMM#3				Enter: Select	
CAS Latency (tCL)			7	+- Change Field	
Minimum delay time				F1: General Help	
CAS to RAS (tRCDmin)			7	F2: Previous Values	
Row Precharge (tRPmin)			7	F3: Optimized Default	
Active to Precharge (tRASmin)			20	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.

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	

Set Setup Administrator 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					→ ←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	46
VGA Drivers Installation	47
Realtek HD Audio Driver Installation	48
Realtek LAN Controller Drivers Installation.....	49
Intel® Management Engine Interface	51
ASMedia USB 3.0 Drivers.....	53

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) 6 Series 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

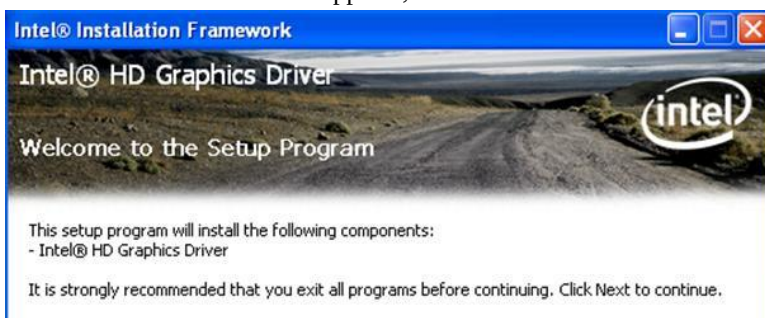
NOTE: Before installing the *Intel(R) Core™ i3/i5/i7 Graphics Driver*, the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) 6 Series Chipset Drivers**.
2. Click **Intel(R) Core™ i3/i5/i7 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) 6 Series 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.



Realtek LAN Controller Drivers Installation

Follow the steps below to install the Realtek LAN Drivers.

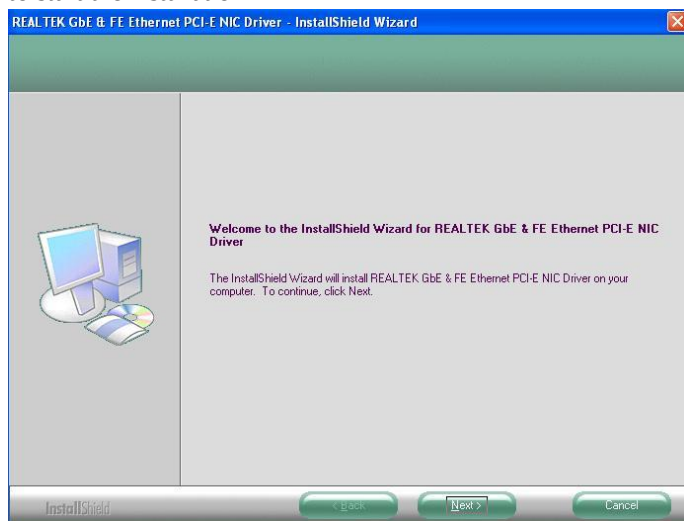
1. Insert the CD that comes with the board. Click **Intel**, then **LAN Card**, and then **Realtek LAN Controller Drivers**.



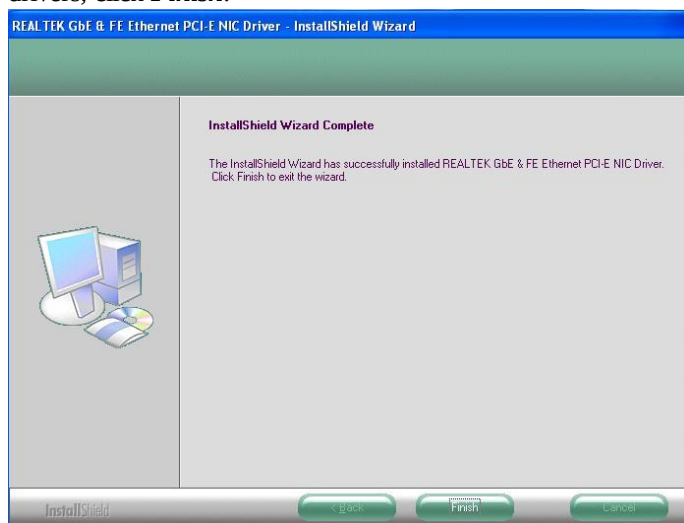
2. Click **Realtek RTL8111E LAN Drivers**.



3. When the welcome screen to InstallShield Wizard appears, click **Next** to start the installation



4. When the InstallShield Wizard has finished installing the Realtek LAN drivers, click **Finish**.



Intel® Management Engine Interface



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**.

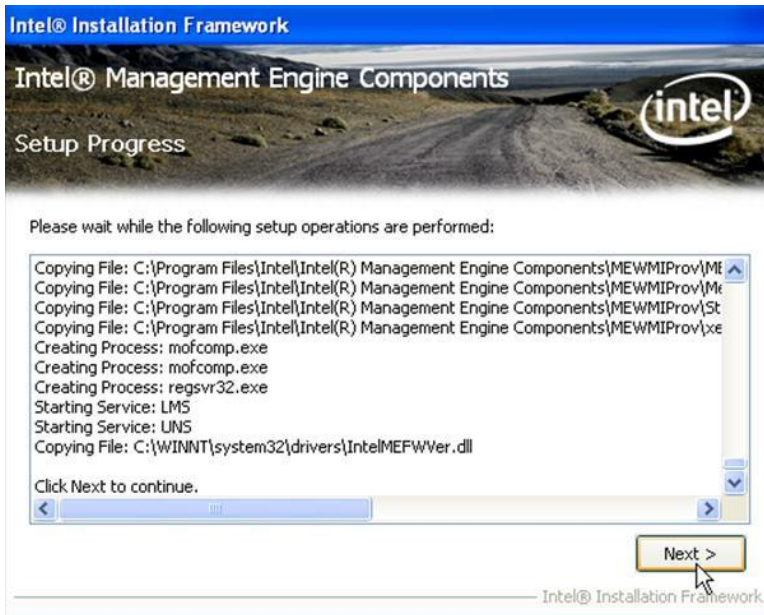


2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click **Next**. On the next screen, click **Yes** to agree with the license agreement.



DRIVER INSTALLATION

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) 6 Series Chipset Drivers**.
2. Click **ASMedia USB3.0 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
2E8h - 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
2B0h- 2DFh	Graphics adapter Controller
360h - 36Fh	Network Ports
3E8h - 3EFh	Serial Port #2(COM3)
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
IRQ5	Serial Port #3
IRQ5	Serial Port #4
IRQ8	Real Time Clock
IRQ14	Primary 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 "F81866.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 81866 watch dog program\n");  
  
    SIO = Init_F81866();  
    if (SIO == 0)  
    {  
        printf("Can not detect Fintek 81866, 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_F81866_Reg(0x2B);
    bBuf &= (~0x20);
    Set_F81866_Reg(0x2B, bBuf);                                //Enable WDTO

    Set_F81866_LD(0x07);                                       //switch to logic device 7
    Set_F81866_Reg(0x30, 0x01);                                //enable timer

    bBuf = Get_F81866_Reg(0xF5);
    bBuf &= (~0x0F);
    bBuf |= 0x52;
    Set_F81866_Reg(0xF5, bBuf);                                //count mode is second

    Set_F81866_Reg(0xF6, interval);                             //set timer

    bBuf = Get_F81866_Reg(0xFA);
    bBuf |= 0x01;
    Set_F81866_Reg(0xFA, bBuf);                                //enable WDTO output

    bBuf = Get_F81866_Reg(0xF5);
    bBuf |= 0x20;
    Set_F81866_Reg(0xF5, bBuf);                                //start counting
}
//-----
void DisableWDT(void)
{
    unsigned char bBuf;

    Set_F81866_LD(0x07);                                       //switch to logic device 7

    bBuf = Get_F81866_Reg(0xFA);
    bBuf &= ~0x01;
    Set_F81866_Reg(0xFA, bBuf);                                //disable WDTO output

    bBuf = Get_F81866_Reg(0xF5);
    bBuf &= ~0x20;
    bBuf |= 0x40;
    Set_F81866_Reg(0xF5, bBuf);                                //disable WDT
}
//-----
```

APPENDIX

```
//-----  
//  
// 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 "F81866.H"  
#include <dos.h>  
//-----  
unsigned int F81866_BASE;  
void Unlock_F81866 (void);  
void Lock_F81866 (void);  
//-----  
unsigned int Init_F81866(void)  
{  
    unsigned int result;  
    unsigned char ucDid;  
  
    F81866_BASE = 0x4E;  
    result = F81866_BASE;  
  
    ucDid = Get_F81866_Reg(0x20);  
    if (ucDid == 0x07)                                //Fintek 81866  
    {        goto Init_Finish;        }  
  
    F81866_BASE = 0x2E;  
    result = F81866_BASE;  
  
    ucDid = Get_F81866_Reg(0x20);  
    if (ucDid == 0x07)                                //Fintek 81866  
    {        goto Init_Finish;        }  
  
    F81866_BASE = 0x00;  
    result = F81866_BASE;  
  
Init_Finish:  
    return (result);  
}  
//-----  
void Unlock_F81866 (void)  
{  
    outportb(F81866_INDEX_PORT, F81866_UNLOCK);  
    outportb(F81866_INDEX_PORT, F81866_UNLOCK);  
}  
//-----  
void Lock_F81866 (void)  
{  
    outportb(F81866_INDEX_PORT, F81866_LOCK);  
}  
//-----  
void Set_F81866_LD( unsigned char LD)  
{  
    Unlock_F81866();  
    outportb(F81866_INDEX_PORT, F81866_REG_LD);  
    outportb(F81866_DATA_PORT, LD);  
    Lock_F81866();  
}  
//-----  
void Set_F81866_Reg( unsigned char REG, unsigned char DATA)  
{  
    Unlock_F81866();  
    outportb(F81866_INDEX_PORT, REG);  
    outportb(F81866_DATA_PORT, DATA);  
    Lock_F81866();  
}  
//-----
```

```

unsigned char Get_F81866_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_F81866();
    outportb(F81866_INDEX_PORT, REG);
    Result = inportb(F81866_DATA_PORT);
    Lock_F81866();
    return Result;
}
//-----

//-----
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// PURPOSE.
//
//-----
#ifndef __F81866_H
#define __F81866_H                1
//-----
#define      F81866_INDEX_PORT      (F81866_BASE)
#define      F81866_DATA_PORT      (F81866_BASE+1)
//-----
#define      F81866_REG_LD          0x07
//-----
#define F81866_UNLOCK                0x87
#define      F81866_LOCK              0xAA
//-----
unsigned int Init_F81866(void);
void Set_F81866_LD( unsigned char);
void Set_F81866_Reg( unsigned char, unsigned char);
unsigned char Get_F81866_Reg( unsigned char);
//-----
#endif __F81866_H

```

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