IPPCxxA9-RE Series

User Manual

2013 Nov V1

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Safety Information

Your IPPCxxA9-RE is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the system for ventilation. ***Never insert objects of any kind into the ventilation openings***.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between 0˚C and 45˚C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THESTORAGE TEMPERATURE MAY GO BELOW -10° C OR ABOVE 60° C. THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not function properly even if you follow the operating instructions.
  - The system was dropped or the cabinet is damaged.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users.

WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

Acknowledgments

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CHAPTER 1 INTRODUCTION

1.1 General Description

IPPCxxA9-RE series is a fanless-design panel pc, powered by 2nd Generation Intel® Core i3-2340UE 1.3GHz and supports 2x SO-DIMM to fit up to 16GB DDRIII 1333MHz FSB, 4x USB connectors, 3x COM ports, support 1x SATA HDD space, 1x CFast slot, 2x PCI expansion slots and DC power 12~24V input. It is ideal for industrial and factory automation applications.

1.2 System Specification

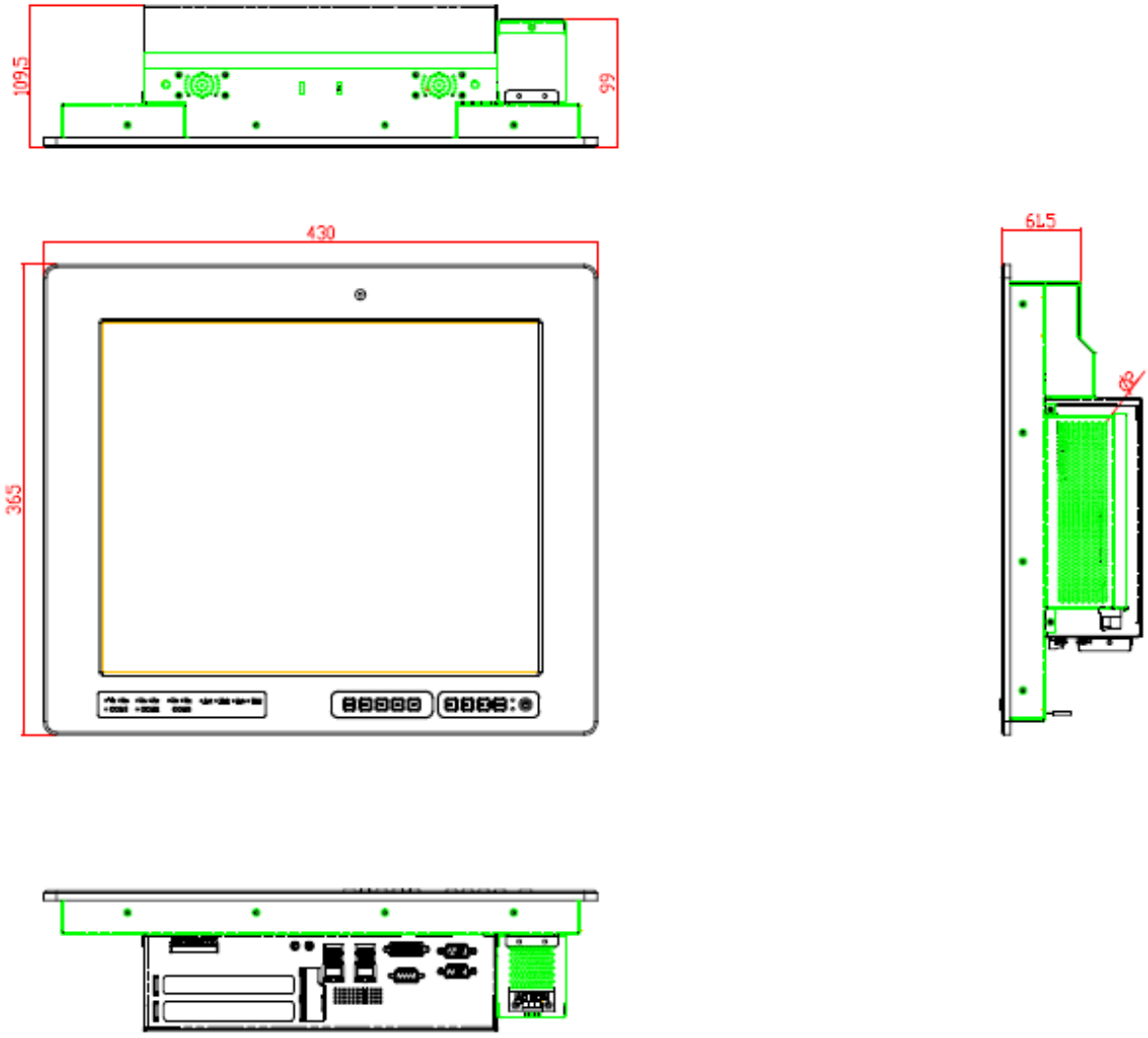
1.2.1 Hardware Specifications

Model Name	IPPC17A9-RE	IPPC19A9-RE
System Mainboard	IB907	
CPU	2nd Generation Intel® Core ™ i3-2340UE	
Chipset	Intel® HM76 PCH	
Memory	2x DDR3 1333 SO-DIMM up to 16GB	
I/O Interface	1x DVI-I connector 3x DB9 for COM1/2(RS-232/422/485), COM 3 (RS-232 only) 1x 10-pin terminal block for Digital I/O 2x RJ45 for GbE LAN 4x USB connector; USB1/2 USB2.0 only, USB3/4 USB3.0 1x Line-out micro jack 1x Mic-in micro jack 1x CFast slot	
Storage	CFast / HDD	
Expansion Slots	2x PCI slots	
Power Supply	12~24V Wide Range DC input	
LCD Size	17” TFT LCD	19” TFT LCD
LCD Color	16.7M colors	
LCD Resolution	1280 x 1024	
LCD Brightness	350 cd/m2	
LCD Viewing Angle	170(H)/170(V)	170(H)/160(V)
Backlight MTBF	50,000 hrs	
Touch Screen	Resistive Touch Screen	
Construction	Aluminum & SPCC	
Mounting	VESA Mount 75x75 and 100x100 mm	
Dimensions (W)x(D)x(H) mm	430 x 365 x 109.5	465 x 390 x 109.5
Operating Temperature	0°C ~ 45°C	
Storage Temperature	-20°C ~ 80°C	
Relative Humidity	5~90% @45°C (non-condensing)	
Protection Class	IP65 (Front panel with wall mount)	

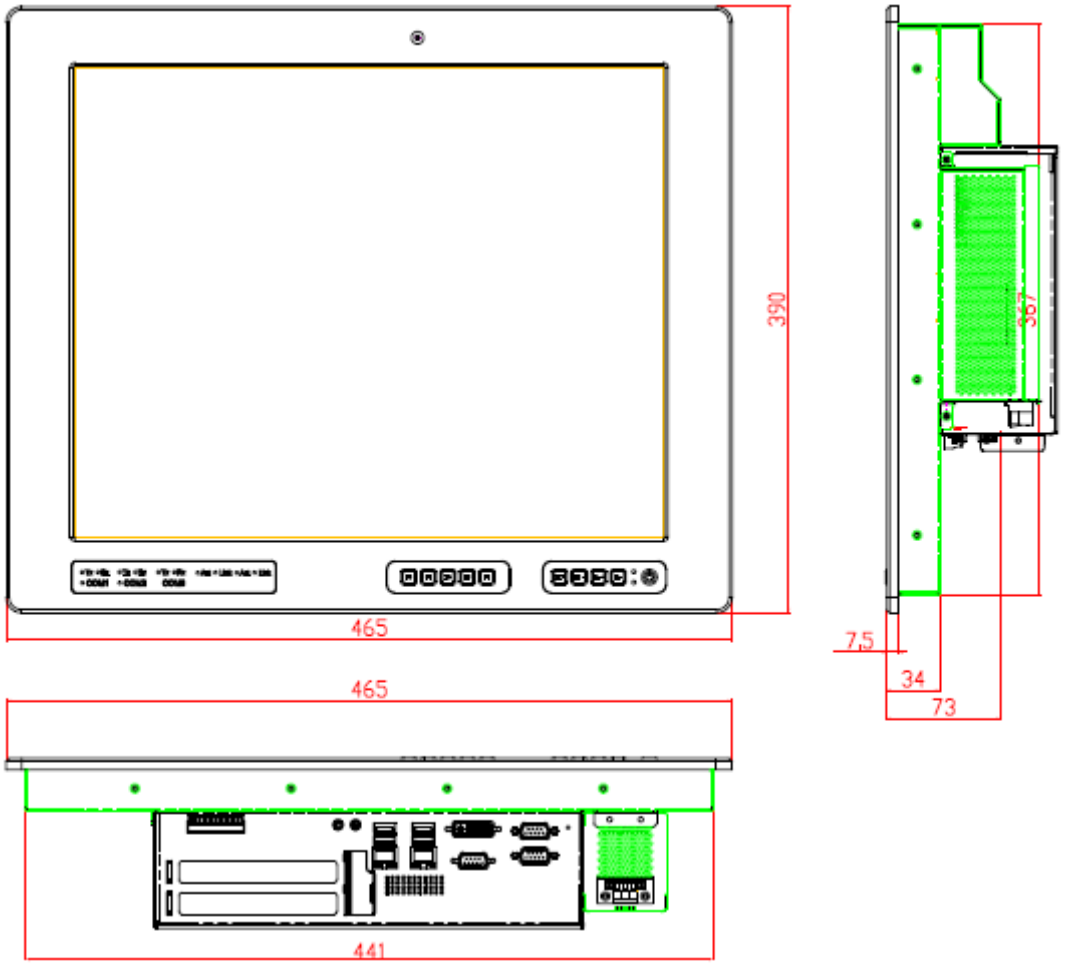
·This specification is subject to change without prior notice.

1.2.2 Dimensions

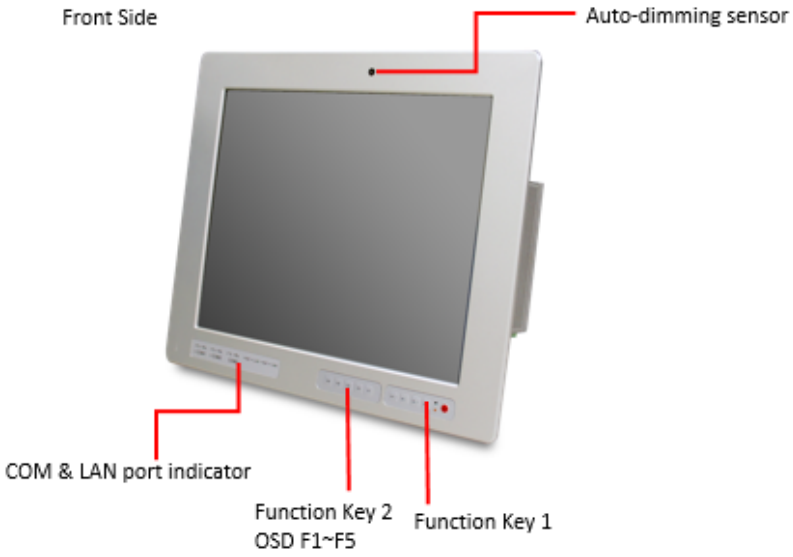
IPPC17A9-RE



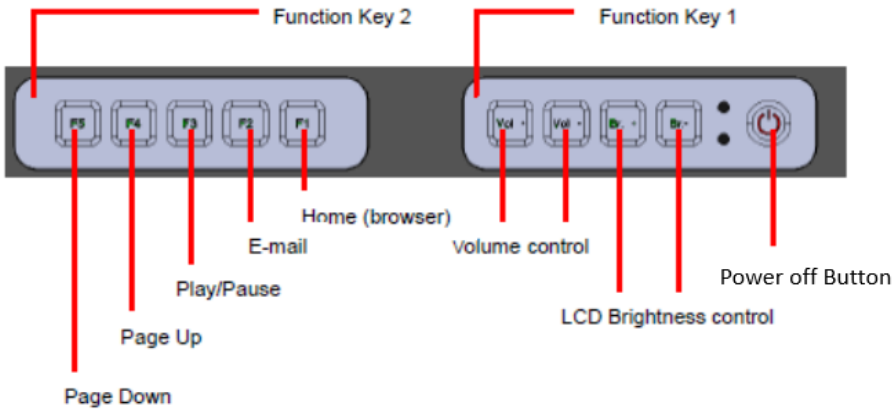
IPPC19A9-RE

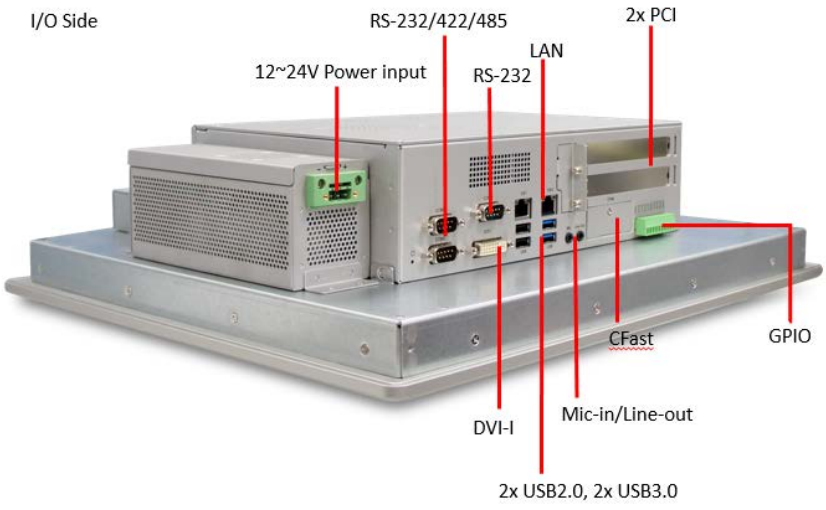


1.2.3 I/O View



Function key





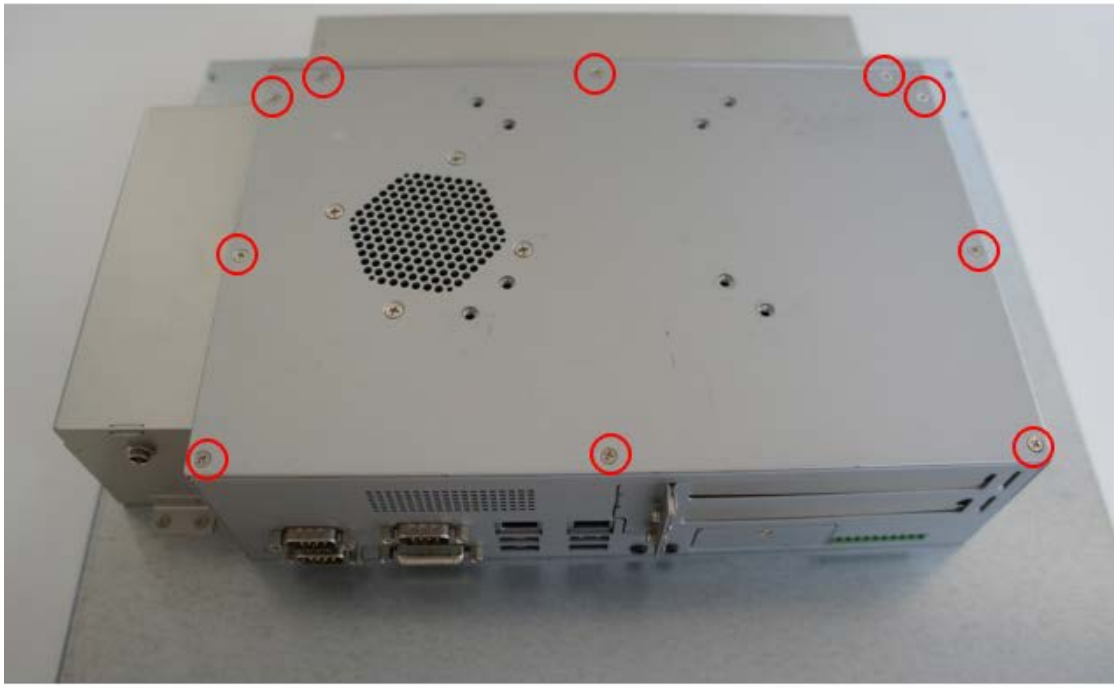
1.3 Packing List

Part No.	Description	Quantity
1	Driver CD	1 pc
2	Mounting Kits	1 set
3	Power Cord	1 pc

1.4 Installation

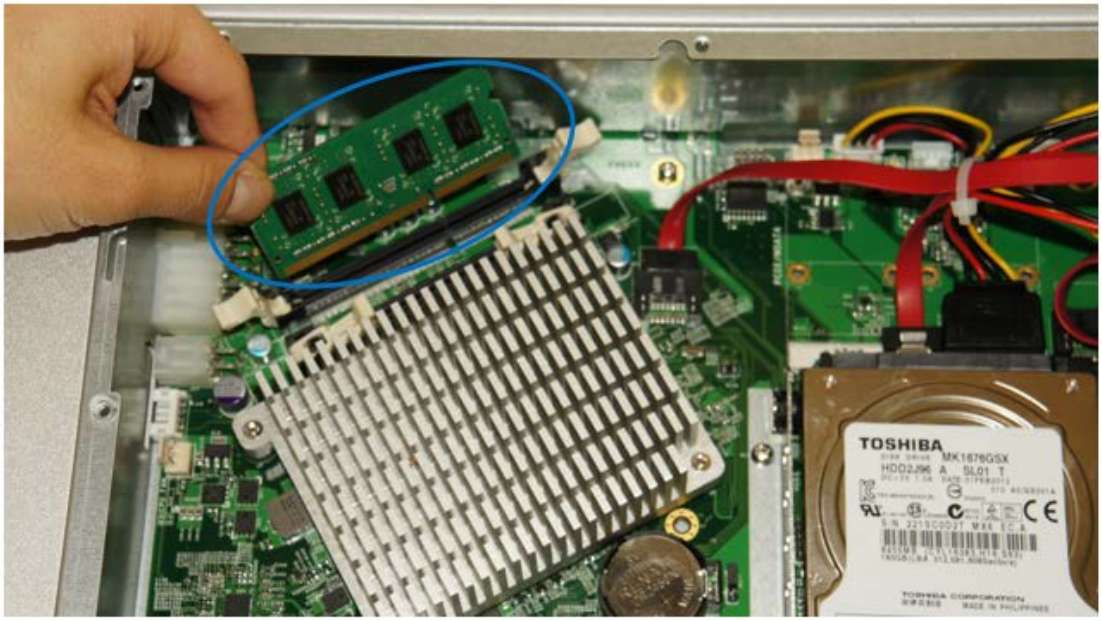
1.4.1 Installing Memory

1. Unlock and remove 10 screws as in the picture below.

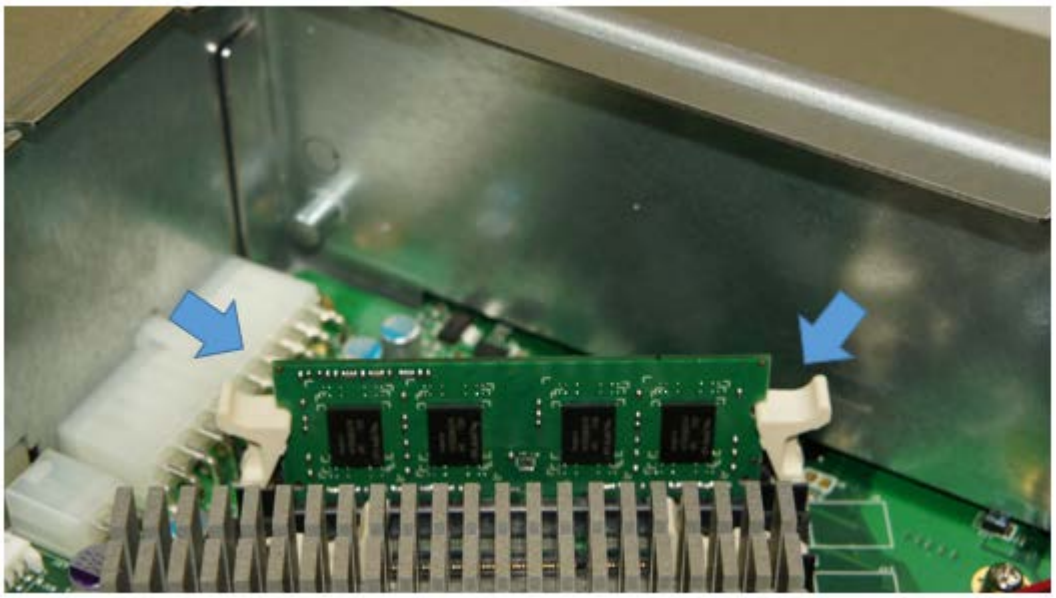


2. After opening the back cover, please note the mating fan cable as shown.

3. Put the memory module into the socket.

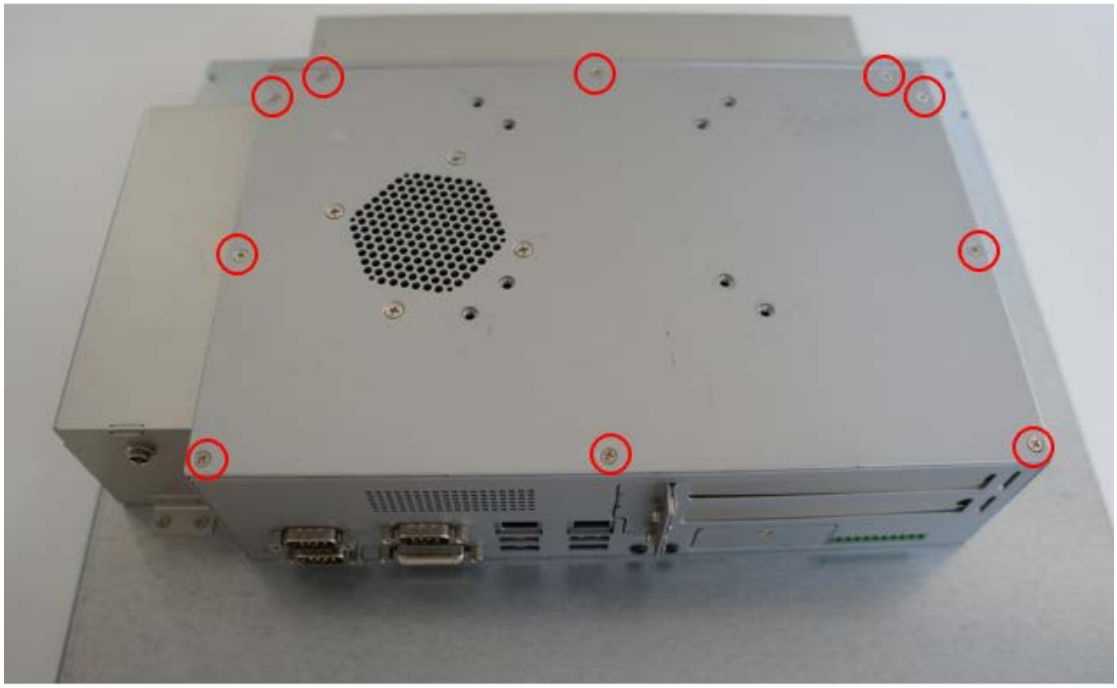


4. Place the memory module into the socket and press it firmly.



1.4.2 Installing Storage

1. Unlock and remove 10 screws as shown.

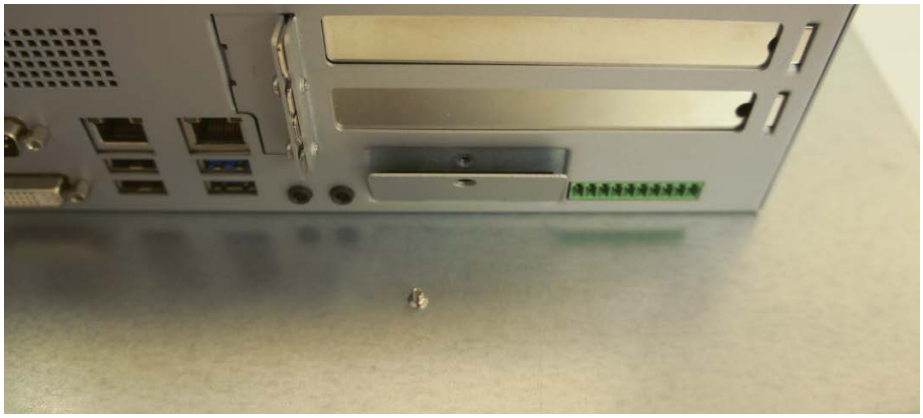


2. Unlock and remove 4 screws and SATA connector as shown.

3. Remove the four screws if you want to remove and change the HDD with a different storage capacity.

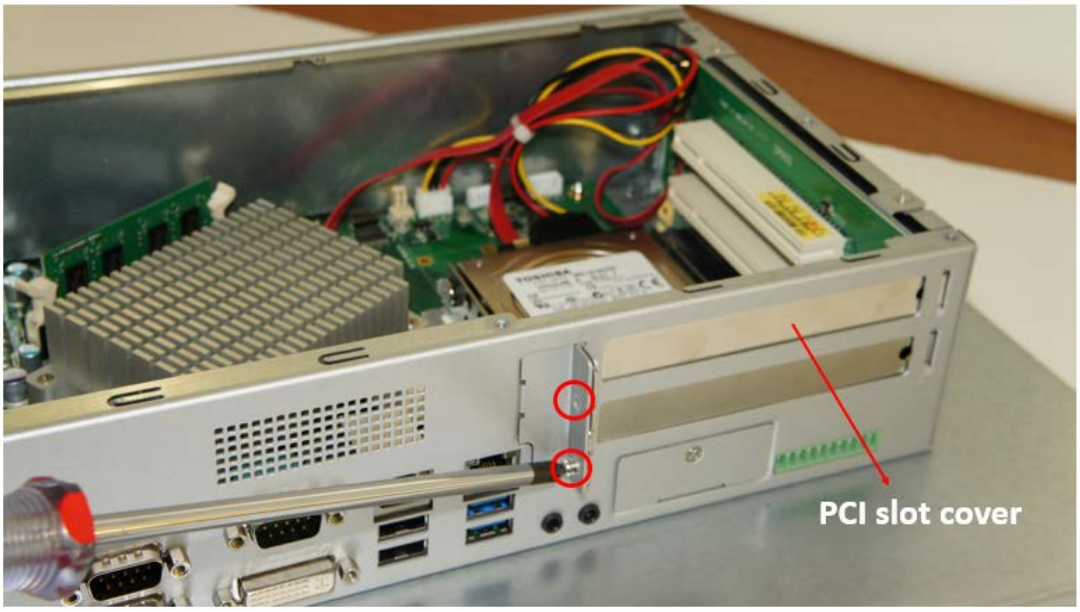
1.4.3 Installing CFast

1. Unlock and remove the screw as shown.

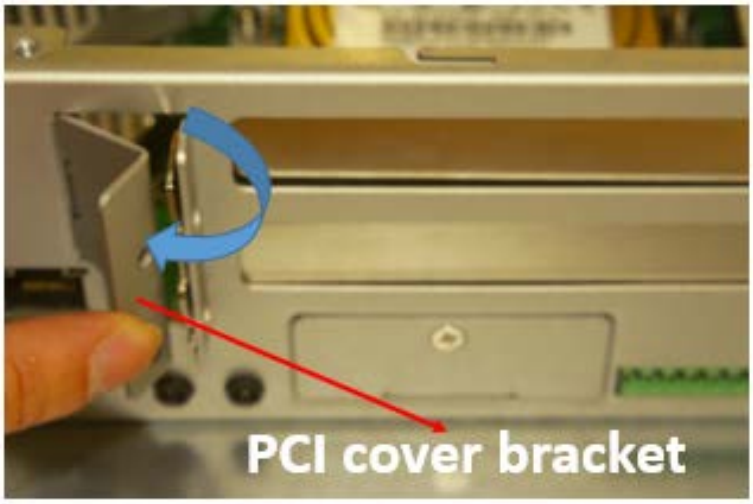


1.4.4 Installing PCI slot

1. Unlock and remove the 2 screws from PCI slot cover.



2. Remove the PCI slot cover and PCI cover bracket from inside.

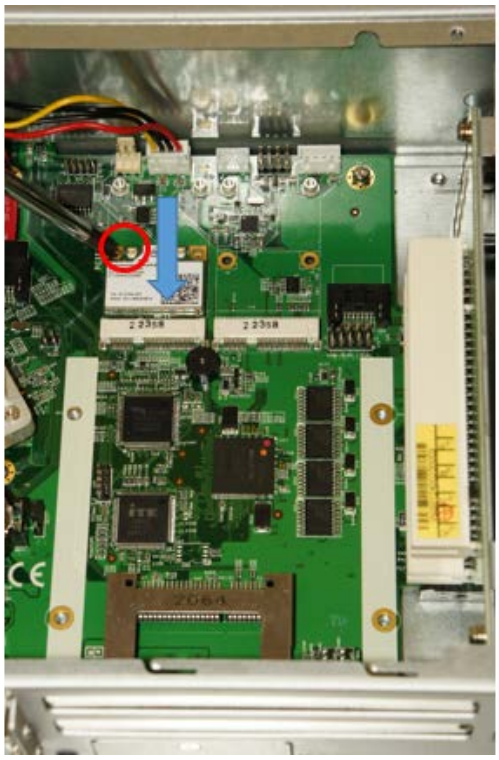


3. Install the PCI card.

4. Put on the PCI cover bracket and lock the screw.

1.4.5 Installing WIFI module

1. Push the WIFI module into the slot and use a screwdriver to turn the screw to its unlocked position.



CHAPTER 2 MOTHERBOARD INTRODUCTION

2.1 Introduction

The IB907 motherboard is based on the latest Intel® HM76 chipset. The platform supports 3rd generation Intel® Core processor family with BGA1023 packing and feature an integrated dual-channel DDR3 memory controller as well as a graphics core.

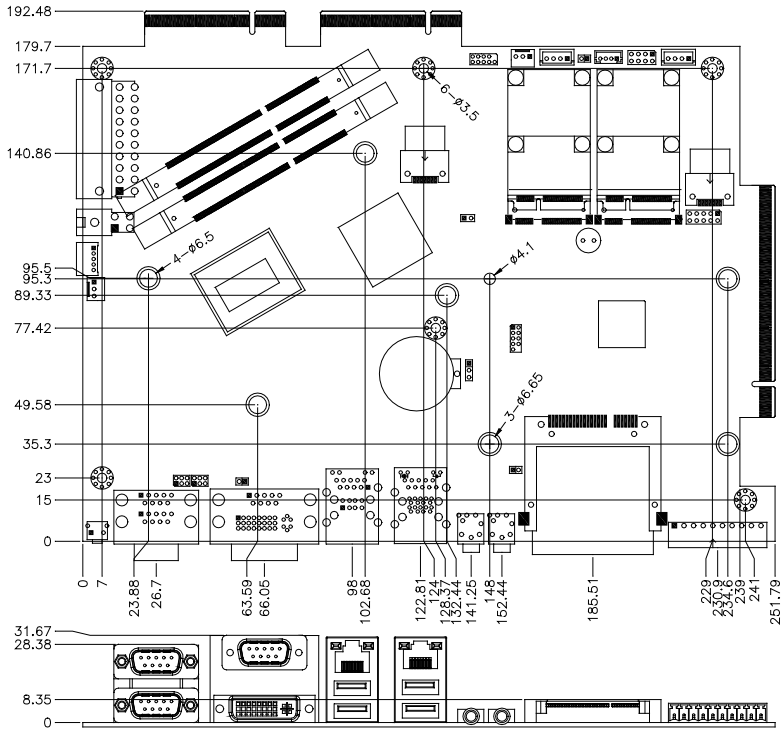
The HM76 platform is made with 22 nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The IB907 Embedded Flex Motherboard is utilizes the dramatic increase in performance provided this Intel's latest cutting-edge technology. Measuring 190mm x 110mm, IB907 offers fast 6Gbps SATA support (2 ports), USB3.0 (4 ports) and interfaces for, DVI-I and LVDS. It features Intel Active Management Technology 8.0

Specifications – Mainboard	
Model	IB907
Form Factor	Customized
CPU Type	Supports Intel® Sandy-Bridge and Ivy-Bridge mobile processors. Intel i3-2340UE 1.3G 17W BGA type default L3 cache 3MB (default)
Last Level Cache	CPU integrated
CPU Socket	FCBGA1023 31mmx24mm
Chipset	Intel® HM76 PCH (TDP=3.9W) , 25mm x25mm, 989-pin FCBGA
BIOS	AMI BIOS, supports ACPI Function
Memory	DRAM: Ivy Bridge supports DDR3-1600 SO-DIMM, Max. 16GB (None-ECC) Sandy Bridge supports DDR3-1333 SO-DIMM, Max.16GB (None-ECC) Default CPU supports DDR3-1333. Two DDR3-1600/1333 SO-DIMM sockets [horizontal type], Unbuffered, 1.5V
	SRAM: CPLD EPM1270 + ST M40SZ100W x 4 SRAM 2Mb (via ITE IT8892) Battery: CR2450
LVDS	24-bit dual channels LVDS interface from HM76
DVI	DVI-I x1
LAN	Intel® 82579V GbE LAN as 1st LAN Realtek® 8111E (GbE) as 2nd LAN
Audio	Intel® HM76 PCH built-in HD Audio controller + Realtek ALC662 Codec

USB 2.0	Intel® HM76 integrated USB 2.0 host controller: 1. 4ports in the rear panel (2x USB2.0; 2x USB3.0) 2. 2 ports (USB3.0) via edge golden-finger for connector ID912 3. 2 ports via onboard Mini-PCIE 4. 2 ports via edge golden-finger for connecting with ID912 5. 1 port (with open collector) via edge golden-finger for connecting with IP931 **Total 11 x USB 2.0 ports**
USB 3.0	Intel® HM76 integrated USB 3.0 host controller: 1. 2 ports in the rear panel 2. 2 ports **Total 4 x USB 3.0 ports**
Serial ATA Ports	Intel® HM76 built-in SATA controller Supports 2x SATAIII for HDD Supports 1x SATAII for mini PCIE and mSATA Supports 1x SATAII for CFast slot SATA power on mainboard
LPC I / O	Fintek F81866AD-I - COM #1 (RS232/422/485 jumper-less) support ring-in with power @500 mA (selectable for 5V or 12V) - COM #2 (RS232/422/485 jumper-less) support ring-in with power @500 mA (selectable for 5V or 12V) - COM #3 (RS232 only) - COM #4 (TTL for daughter board usage) thru golden finger to expansion module - COM #5(TTL for MCU usage) thru golden finger to expansion module [Hardware Monitor] 2x Thermal inputs 2x Voltage monitoring
Expansion Slot	- Mini PCI-e socket x 1, Full-sized type, reserved one mounting hole for half-sized type, [USB device and mSATA support] - Mini PCI-e socket x 1,Full-sized type [USB device support]
Digital IO	4 in (TTL)& 4 out (open collector) 5Vcc 1A and Ground [@ terminal block 1x10 180D.] ECH350R-10P/EC350V-10P
Edge Connector	DIV-I connector x1 DB9 x 3 for COM1/2(RS-232/422/485) COM 3 (RS-232 only) 10pin terminal block for Digital I/O x1 RJ45 x2 for GbE LAN USB connector x 4; USB1/2 USB2.0 only; USB3/4 USB3.0 Line-out microjack x 1 Mic-in microjack x 1 CFast slot x 1
Onboard Header/Connector	2 ports x SATA III 4 pins power connector x 2 for SATA HDD 2x5 pins pitch 2.0mm header x 1 for LPC (Debug purpose only) Mini PCI-e(1x) connector x 1 [Full-sized] Mini PCI-e(1x) connector x 1 [Full-sized] Box header 5pins for smart battery interface x 1 2x10-pin for 12V 5V 3.3V ATX power connector right angel type x 1 1x3 box header for CPU fan 1x3 box header for system fan

Onboard Button/Switch	1x power button
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
Power management	MSP430G2433
Power Connector	Standard ATX connector for AT (default)/ATX mode
RoHS	Yes
Golden Finger	A. PCIE(x16) golden finger x 1 for connecting to IP931 which has the following signals: - PCIe(1x) x1, PCI x3 (via ITE IT8892) - COM(TTL) x 1, USB 2.0 x 1 - 12V 2A power, 5V 2A, 3.3V 2A **Each pin for PCI-express is 1A** PCIE (8x) x2 For ID912 Golden finger A: - COM(TTL) x 1, USB 2.0 x 2 - Dual channel 24-bit LVDS, PWR button x1 (front panel) - Reset button x1 (pin header), LED signal HDD x1 - Audio x1, Audio detect pin for AMP x1 - 12V 4A power, 5V 4A power, 3.3V 4A power - SCI x1, SMbus x1 Golden finger B: - PCIE(8x) x2 For ID912 board - 14 pins LED light pin header for COM(Tx and Rx) and LAN(Link and active) - GPIO x5pins (4 pins for panel selection 1pin for backlight) - 2x10 pins for front panel USB3.0 x2

Board Dimensions



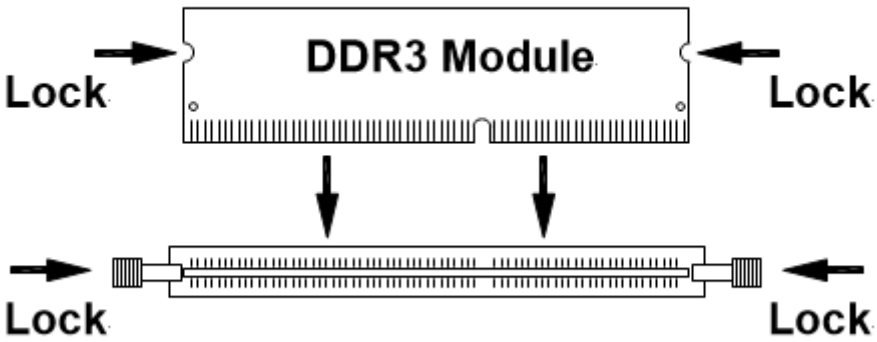
2.2 Installing the Memory

The IB907 board supports two DDR3 memory sockets for a maximum total memory of 16GB in DDR3 SO-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:

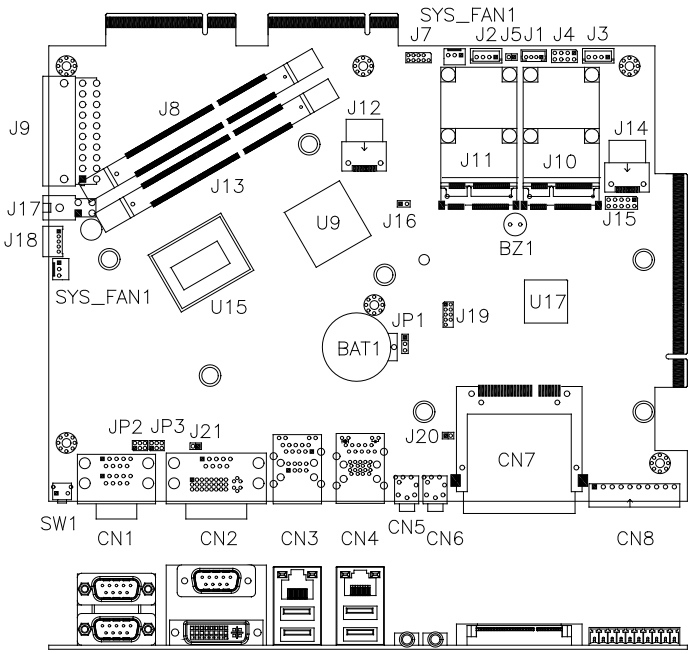
1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module,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



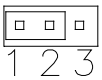
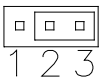
2.3 Setting Jumpers

Jumpers are used on IB907 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 IB970 and their respective functions.

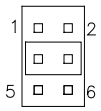
Jumper Locations on IB907



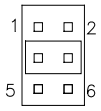
JP1: Clear CMOS Contents

JP1	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP2: COM1 RS232 RI/+5V/+12V Power Setting

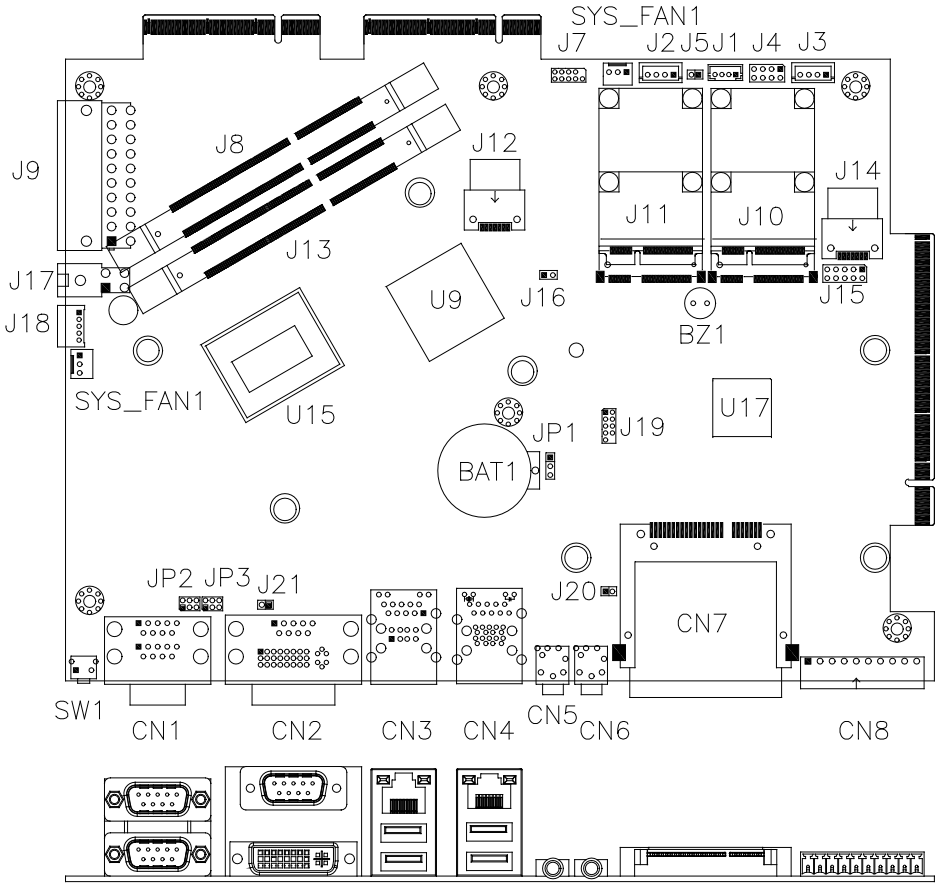
JP2	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP3: COM2 RS232 RI/+5V/+12V Power Setting

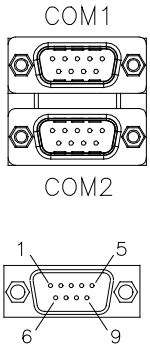
JP3	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

2.4 Connectors

Connector Locations on IB907

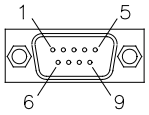


CN1: COM1 and COM2 Serial Ports



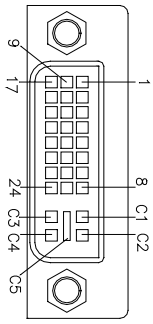
Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

CN2: COM3 and DVI-I Connector



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

DVI-I



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
CRT_VSYNC	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	CRT_R
SHIELD 1/3	11	C2	CRT_G
DATA 3-	12	C3	CRT_B
DATA 3+	13	C4	CRT_HSYNC
DDC POWER	14	C5	A GROUND2
A GROUND 1	15	C6	A GROUND3

CN3: Gigabit LAN (RTL8111E) +USB2 4/5

CN4: Gigabit LAN (82579V) + USB3 0/1, USB2 0/1

CN5: Mic Phone-Jack Connector

CN6: Line-out Phone-Jack Connector

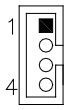
CN7: CFAST (SATA2)

CN8: Digital I/O Connector (4 in, 4 out)

Pin #	Digital I/O
1	VCC5 (1A)
2	IN0
3	IN1
4	IN2
5	IN3
6	OUT0
7	OUT1
8	OUT2
9	OUT3
10	GND

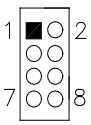
J1: MCU Flash Connector (factory use only)

J2, J3: SATA HDD Power Connector



Pin #	Signal Name
1	+5V
2	Ground
3	Ground
4	+12V

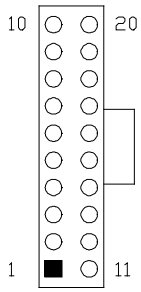
J4: Front Panel Function Connector



Signal Name	Pin #	Pin #	Signal Name
Power BTN	1	2	Power BTN
HDD LED+	3	4	HDD LED-
Reset BTN	5	6	Reset BTN
Power LED+	7	8	Power LED-

J7: SPI Flash Connector (Factory use only)

J9: 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

J8: DDR SO-DIMM Channel A

J13: DDR SO-DIMM Channel B

J10: Mini-PCIE Connector

J11: Mini-PCIE Connector and mSATA/share

J12, J14: SATA3 Connector

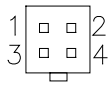
J15: SRAM CPLD Flash Connector (factory use only)

J16: Flash Descriptor Security Override (Factory use only)

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

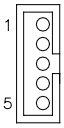
J17: ATX 12V Power Connector

This connector supplies the CPU operating voltage.



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

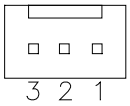
J18: Smart Battery Interface Connector



Pin #	Signal Name
1	RST
2	EXTSMI
3	Ground
4	DATA
5	CLK

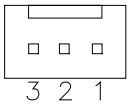
J19: LPC Debug Connector (factory use only)

SYS_FAN1: CPU Fan Power Connector



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

SYS_FAN2: System Fan Power Connector



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

PCIE1: PCIEx8 Golden Finger

(Include, USB2.0x2, COMx1, LVDS dual Channel 24bit Signal)

PCIE2: PCIEx8 Golden Finger

(Include DVI, USB2.0x2, USB3.0x2, LED,)

PCIE3: PCIEx16 Golden Finger

(Include PCI 32bit master x2, USBx1, COMx1, PCIEx1 Signal)

CHAPTER 3 BIOS SETUP

3.1 BIOS Introduction

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

3.2 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:

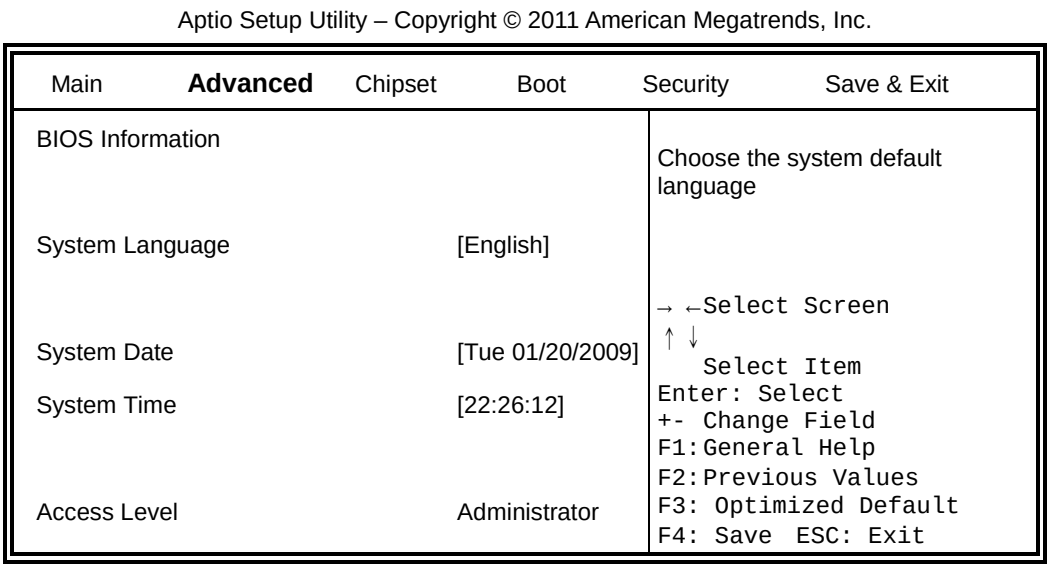
```
Press <DEL> to Enter Setup
```

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.*

3.3 Main Settings



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.

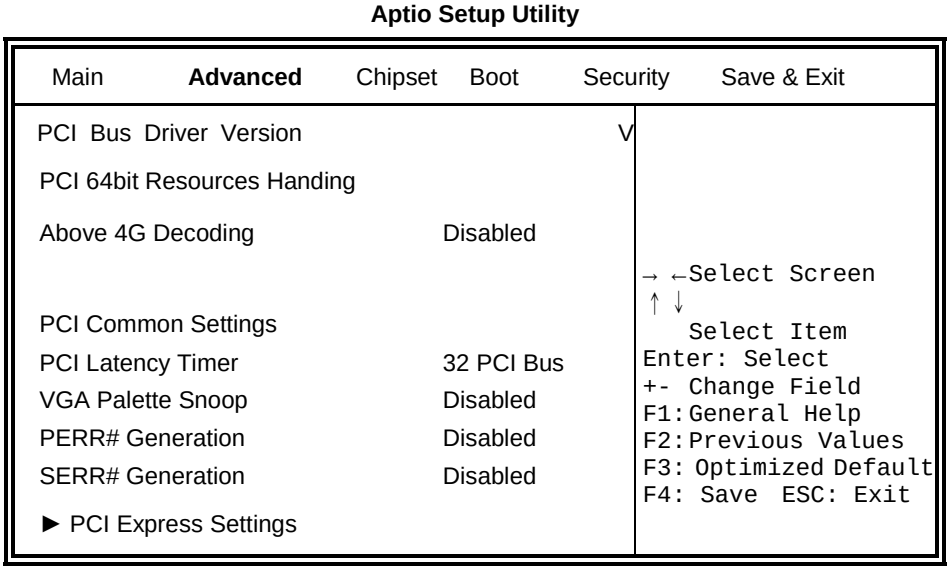
Aptio Setup Utility

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



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#.

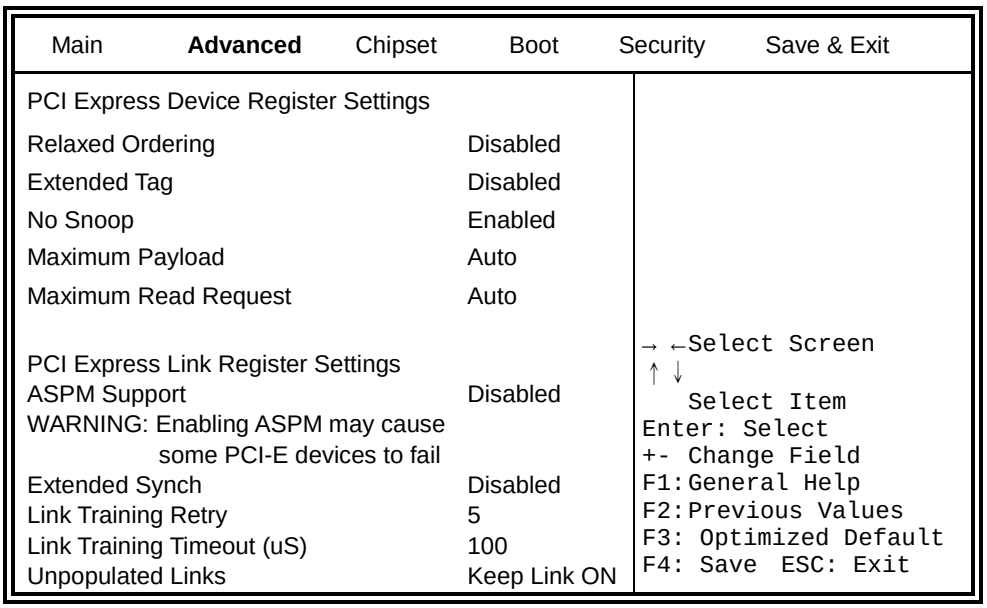
SERR# Generation

Enables or disables PCI device to generate SERR#.

PCI Express Settings

Change PCI Express devices settings.

PCI Express Settings



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.

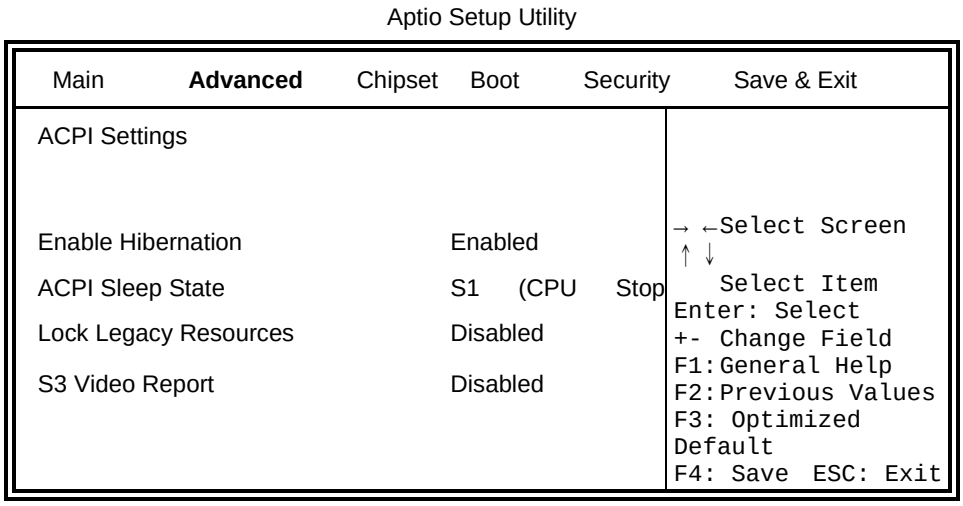
Link Training Timeout (uS)

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



Enable Hibernation

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

ACPI Sleep State

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

Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

Wake up event settings

Aptio Setup Utility

Main	**Advanced**	Chipset	Boot	Security	Save & Exit
Wake on Ring	Disabled				
Wake on PCI PME	Disabled				
Wake on PCIE Wake Event	Disabled				

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

Wake 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® Celeron® CPU B810E@ 1.60GHz					
Processor Signature	206a7				
Microcode Patch	25				
CPU Speed	1600 MHz				
Processor Cores	4				
Intel HT Technology	Not Supported				
Intel VT-x Technology	Supported				
Intel SMX Technology	Not 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				

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

Hyper-threading

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

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

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

Intel Virtualization Technology

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

Hardware Prefetcher

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

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

SATA Configuration

SATA Devices Configuration.

Aptio Setup Utility

Main	**Advanced**	Chipset	Boot	Security	Save & Exit

SATA Controller(s)	Enabled
SATA Mode Selection	IDE
SATA Port0	Empty
Software Preserve	Unknown
SATA Port1	Empty
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

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

SATA Controller(s)

Enable / Disable Serial ATA Controller.

SATA Mode Selection

(1) IDE Mode.

(2) AHCI Mode.

(3) RAID Mode.

Shutdown Temperature Configuration

Aptio Setup Utility

Main	**Advanced**	Chipset	Boot	Security	Save & Exit
APCI 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					
Power-On after Power failure	Disabled				
Schedule Slot 1	None				
Schedule Slot 2	None				

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

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 tine-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.

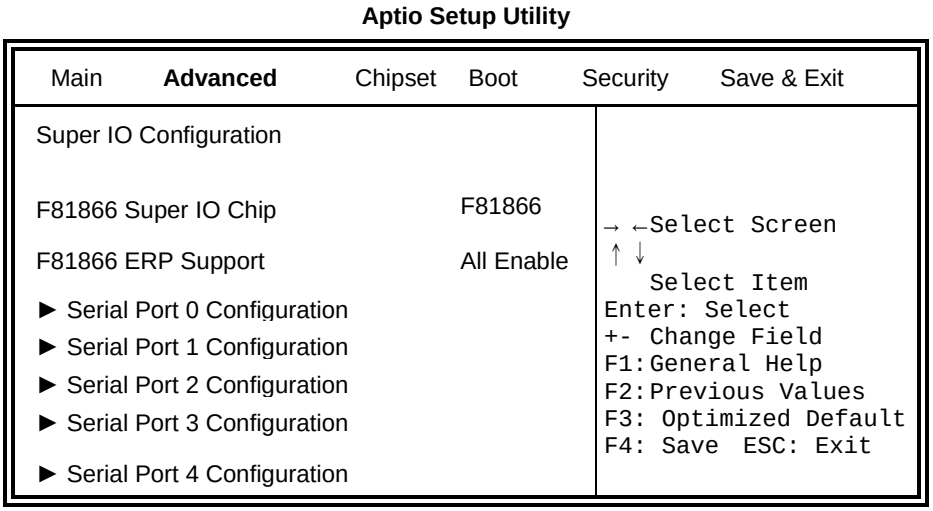
Device reset tine-out

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.

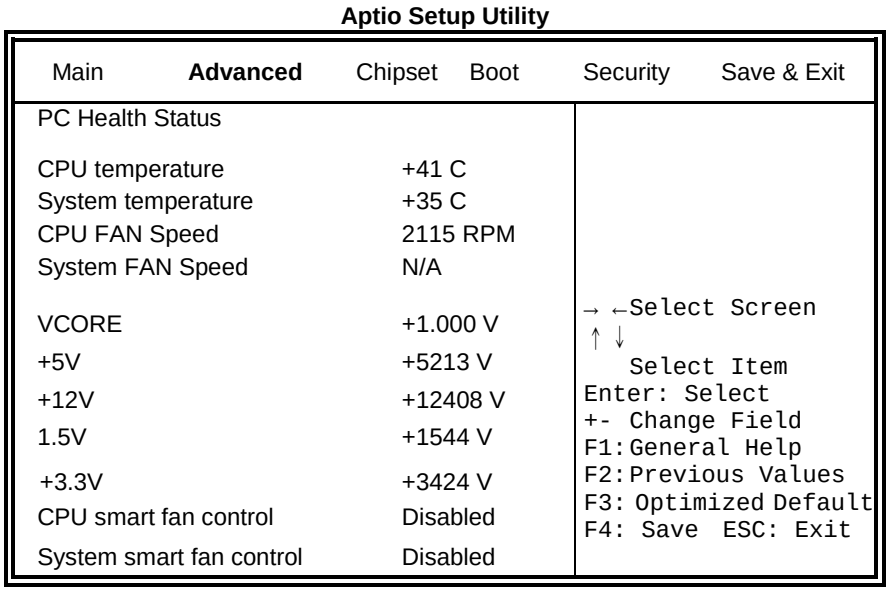
F81866 Super IO Configuration



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



Temperatures/Voltages

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

Fan1/Fan2 Smart Fan Control

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

CPU PPM Configuration

Aptio Setup Utility

Main	**Advanced**	Chipset	Boot	Security	Save & Exit

CPU PPM Configuration	
EIST	Enabled

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

EIST

Enable/Disable Intel SpeedStep.

3.4 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

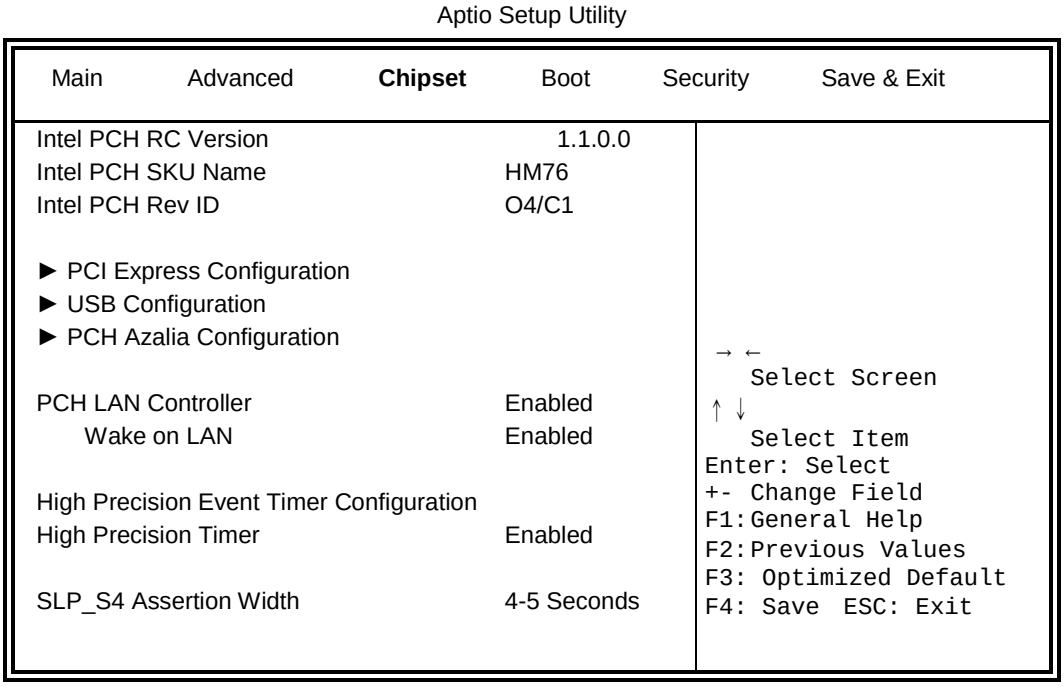
► PCH-IO Configuration

► 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.



PCH LAN Controller

Enable or disable onboard NIC.

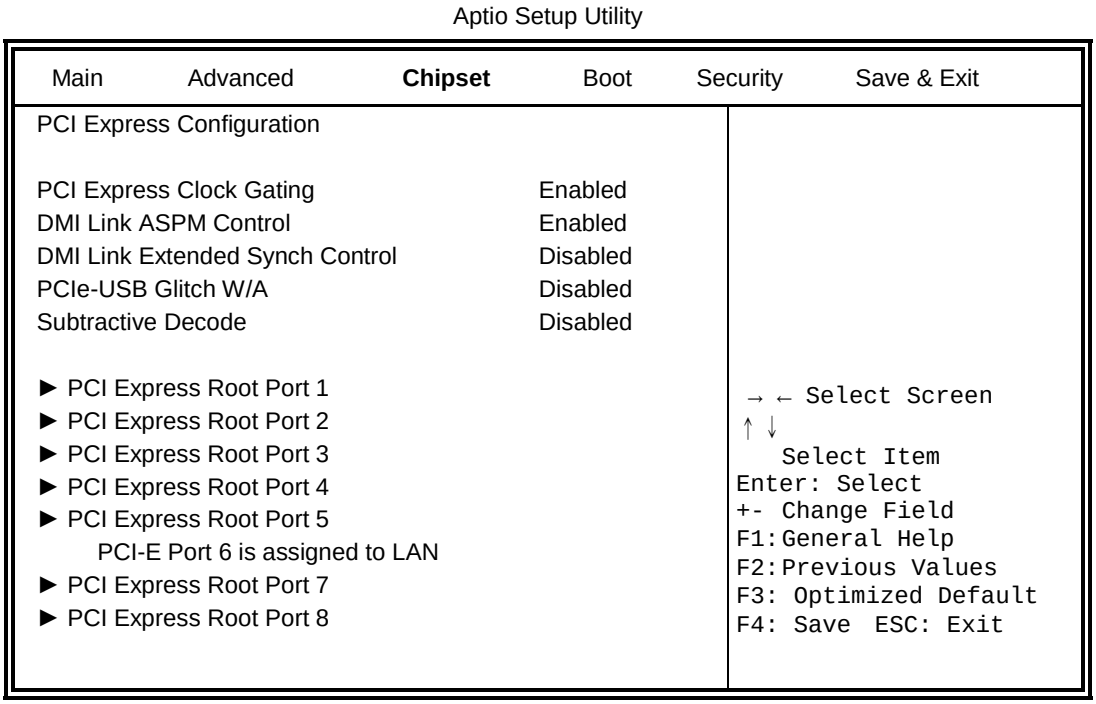
Wake on LAN

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

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

PCI Express Configuration



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

Aptio Setup Utility

Main	Advanced	**Chipset**	Boot	Security	Save & Exit

USB Configuration		
XHCI Pre-Boot Driver	Disabled	
xHCI Mode	Auto	
HS Port #1 Switchable	Enabled	
HS Port #2 Switchable	Enabled	
HS Port #3 Switchable	Enabled	
HS Port #4 Switchable	Enabled	
xHCI Streams	Enabled	→ ← 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

HS Port #1/2/3/4 Switchable

Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams

Enable or disable xHCI Maximum Primary Stream Array Size.

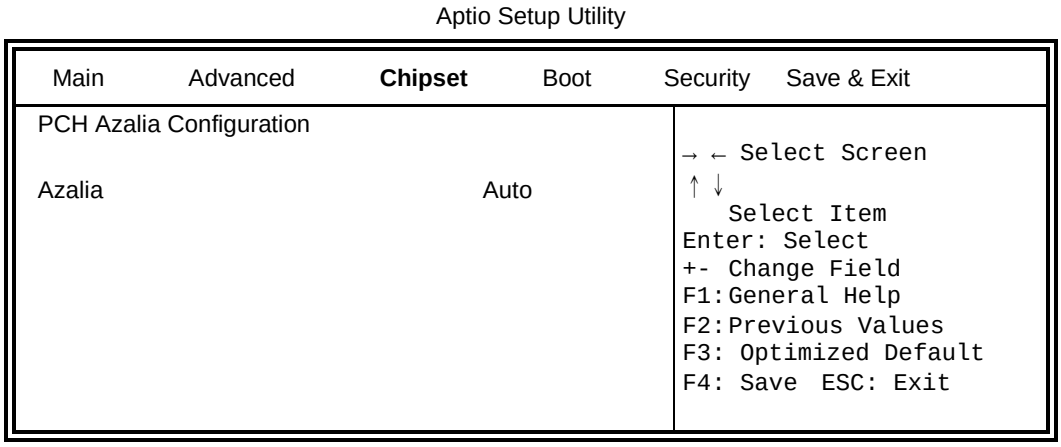
EHCI1/2

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



Azalia

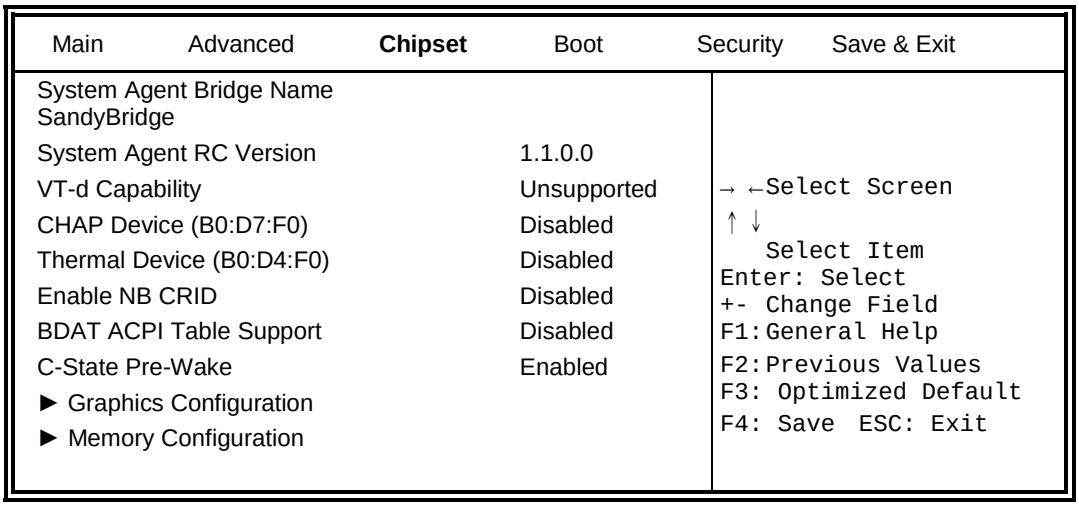
Control Detection of the Azalia device.

Disabled = Azalia will unconditionally disabled.

Enabled Azalia will be unconditionally enabled.

Auto = Azalia will enabled if present, disabled otherwise.

System Agent (SA) Configuration



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		2137			
IGfx Frequency		650 MHz			
Primary Display		Auto			
Internal Graphics		Auto			
GTT Size		2MB			
Aperture Size		256MB			
DVMT Pre-Allocated		64M			
► LCD Control					

→ ←Select Screen
↑ ↓
Select Item
Enter: Select
+- 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.

Primary IGFX Boot Display (LCD Control)

Select the Video Device that will be activated during POST. This has no effect if external graphics present. Secondary booty display selection will appear based on your selection. VGA modes will be supported only on primary display.

Memory Configuration

Aptio Setup Utility

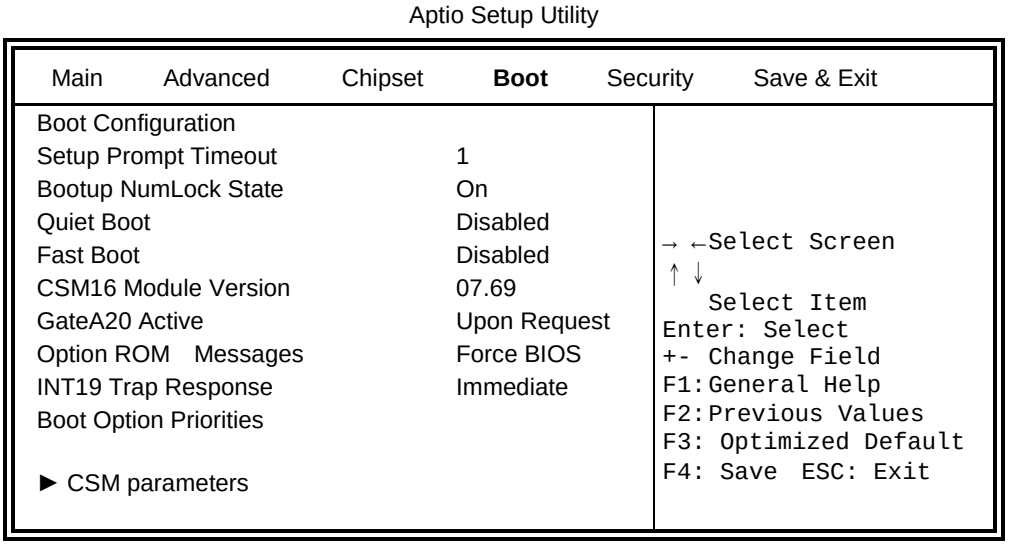
Main	Advanced	**Chipset**	Boot	Security	Save & Exit

Memory Information		
Memory Frequency	1333 MHz	
Total Memory	2048 MB (DDR3)	
DIMM#0	2048 MB (DDR3)	
DIMM#1		
DIMM#2		
DIMM#3		
CAS Latency (tCL)	9	
Minimum delay time		
CAS to RAS (tRCDmin)	9	
Row Precharge (tRPmin)	9	
Active to Precharge (tRASmin)	24	

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

Boot Settings

This section allows you to configure the boot settings.



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

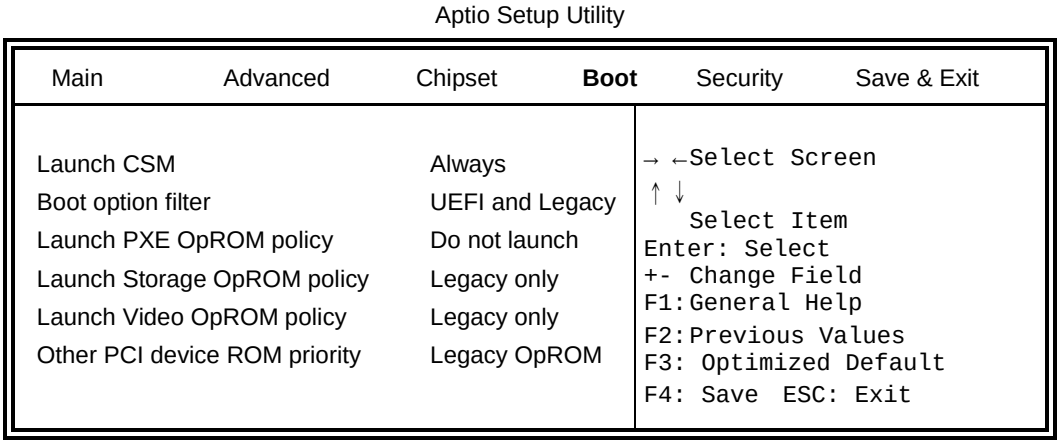
Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities

Sets the system boot order.

CSM parameters

This section allows you to configure the boot settings.



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 Storatge OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority

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

Security Settings

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

Aptio Setup Utility

Main	Advanced	Chipset	Boot	**Security**	Save & Exit

Password Description

If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights
The password length must be
in the following range:
Minimum length 3
Maximum length 20

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

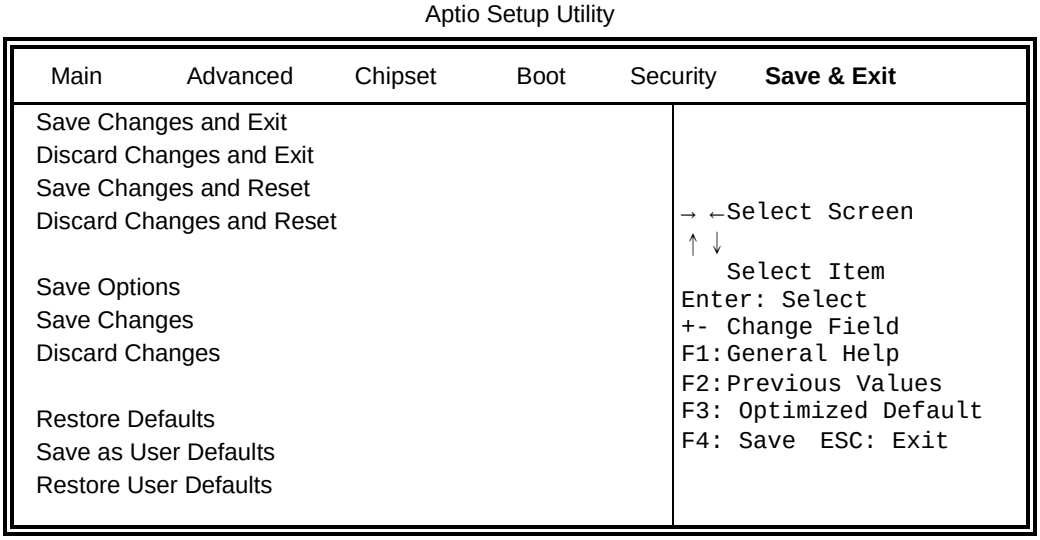
Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings



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.

CHAPTER 4 DRIVERS INSTALLATION

This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard.

IMPORTANT NOTE:

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

4.1 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.

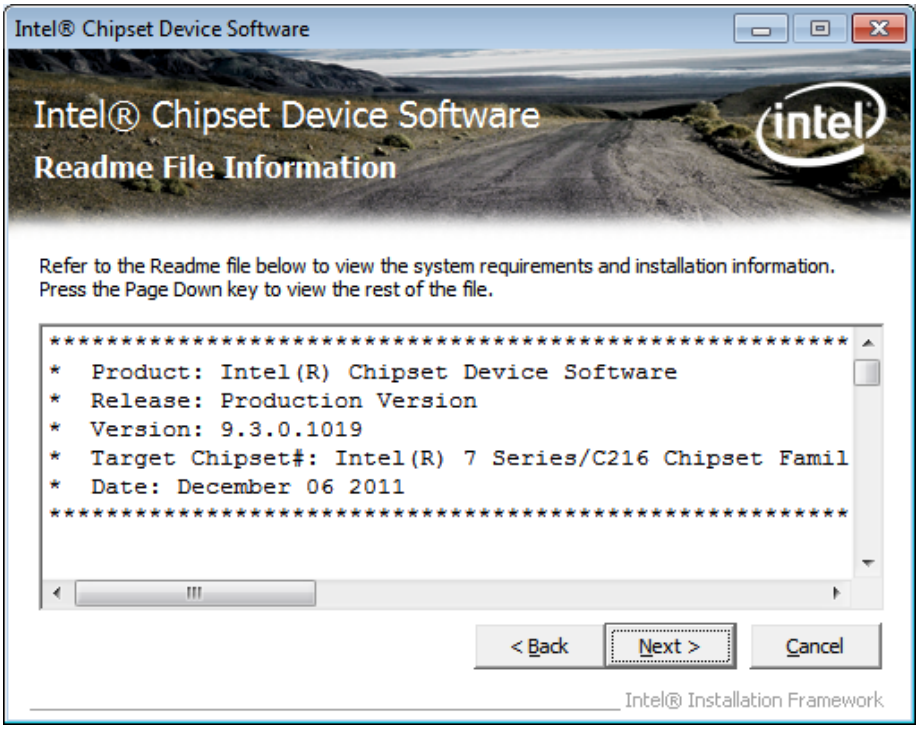
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers***.

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.

4.2 VGA Drivers Installation

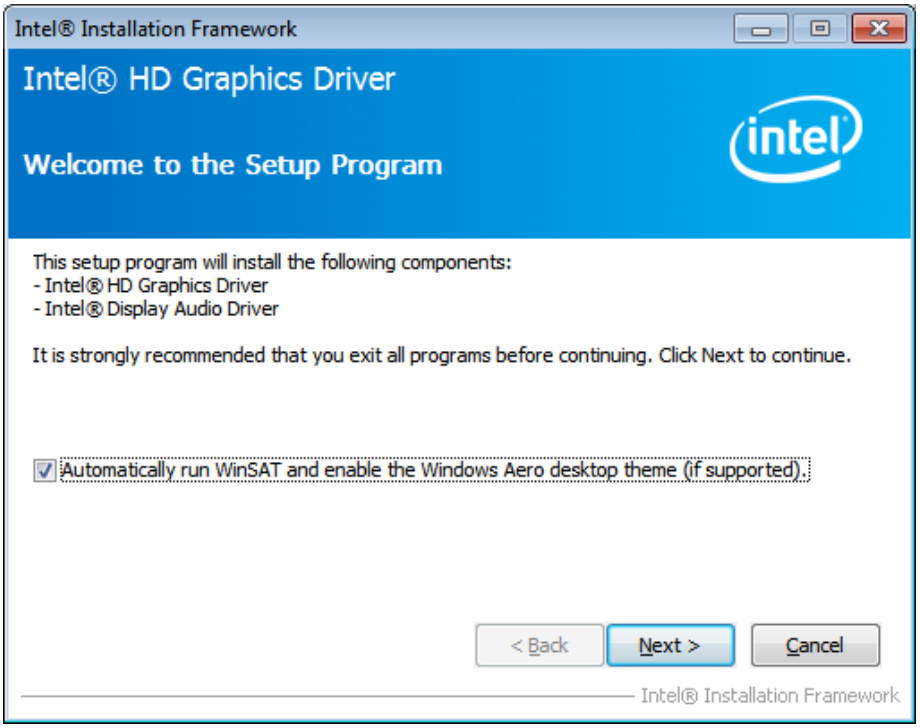
NOTE: Before installing the Intel(R) 7 Series Chipset Family Graphics Driver, the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

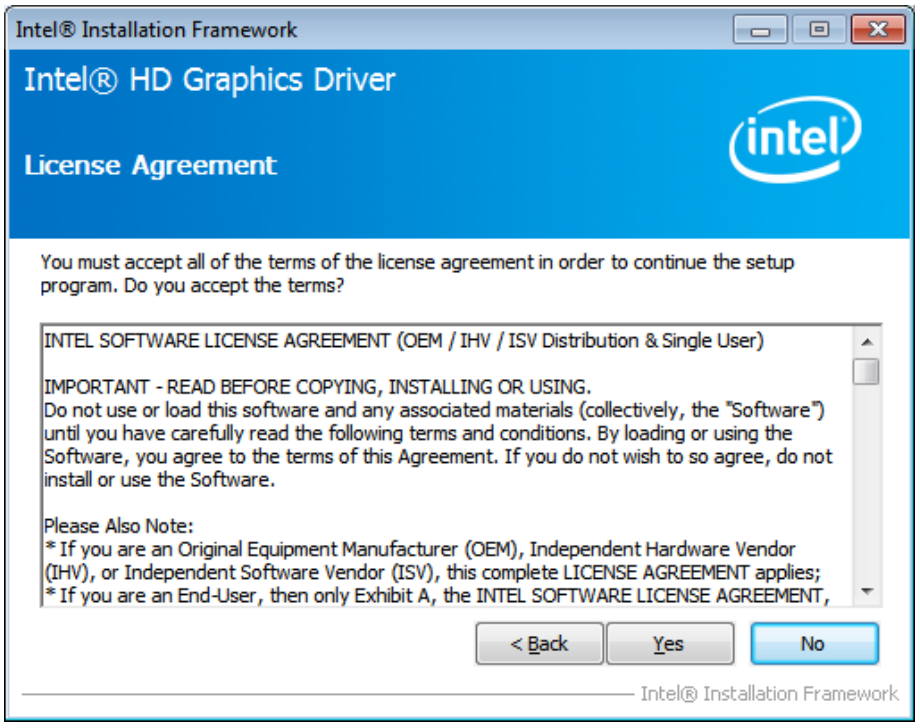
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers.***

2. Click ***Intel(R) 7 Series Chipset Family Graphics Driver.***

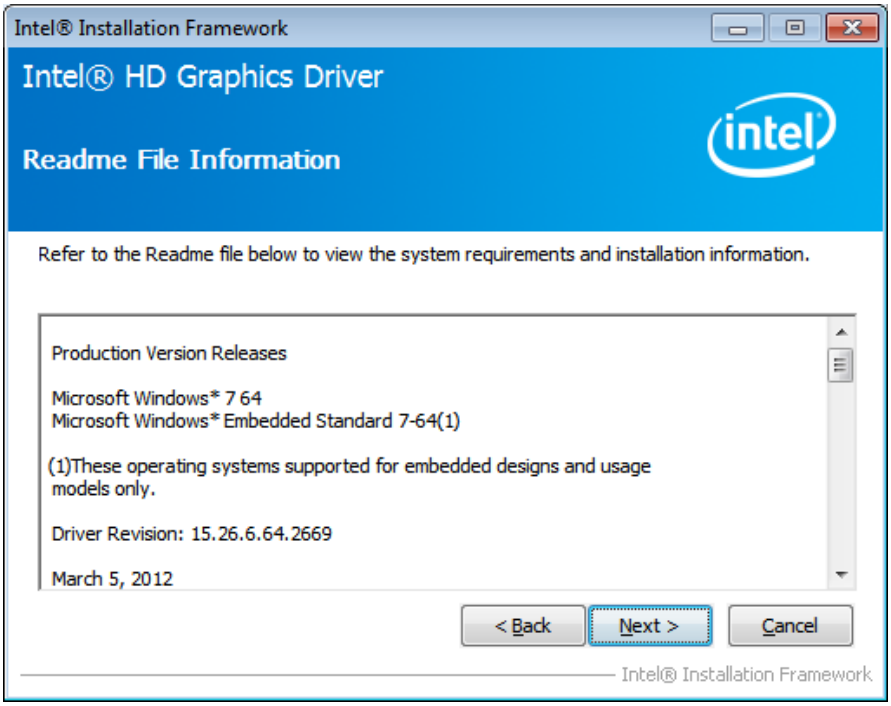
3. When the Welcome screen appears, click ***Next*** to continue.



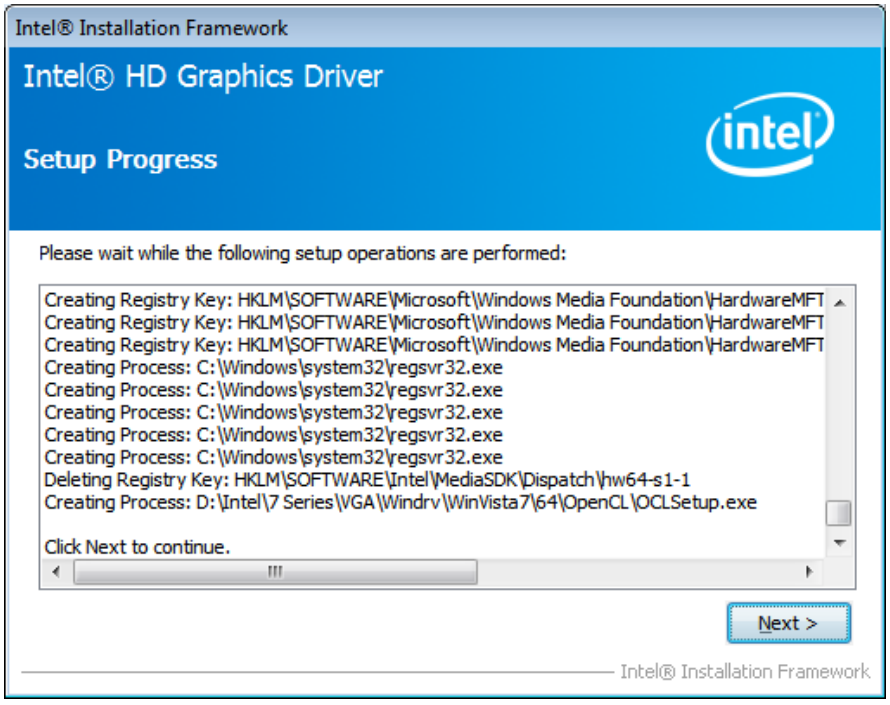
4. Click ***Yes*** to to agree with the license agreement and continue the installation.



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.

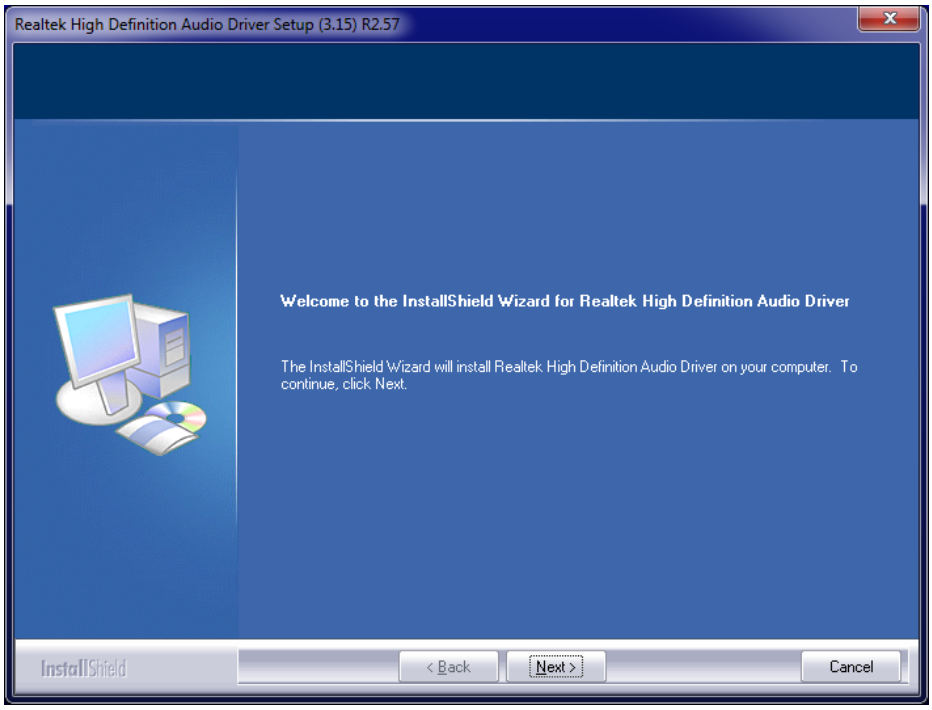
4.3 Realtek HD Audio Driver Installation

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

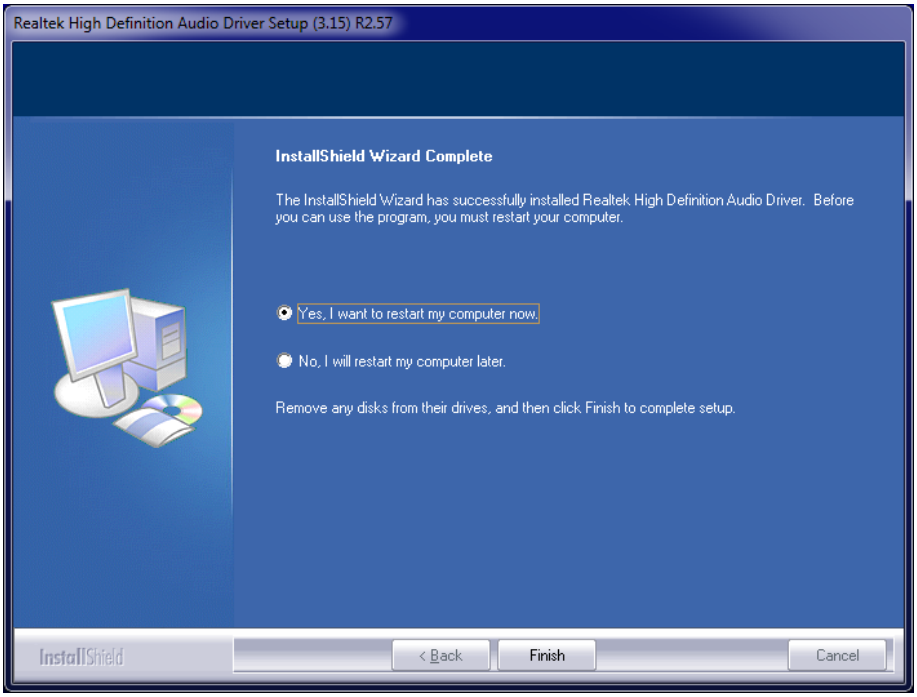
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers.***

2. Click ***Realtek High Definition Audio Driver.***

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



4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.

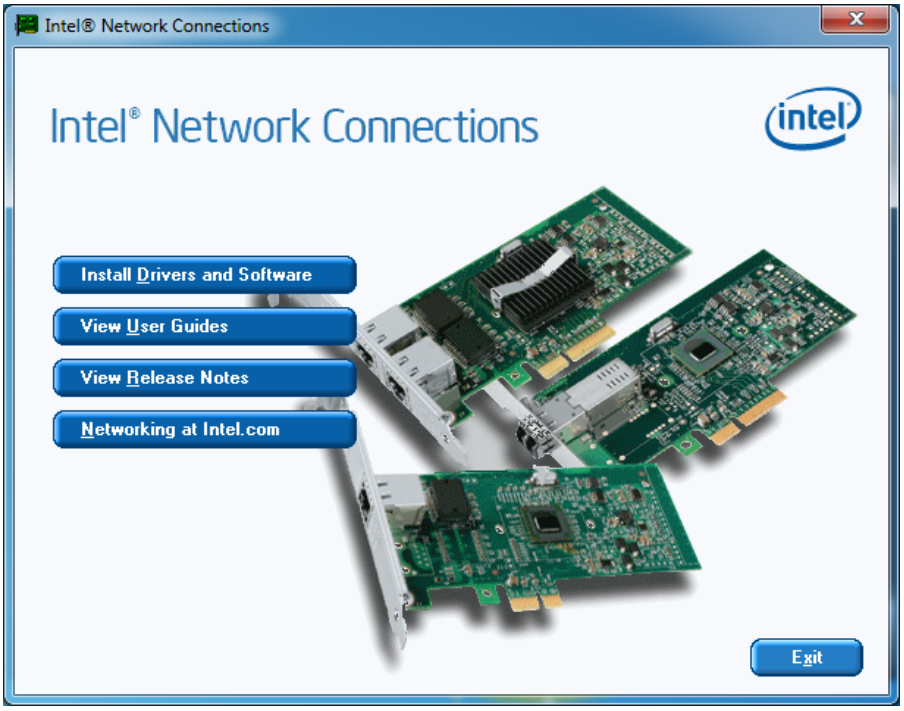


4.4 LAN Drivers Installation

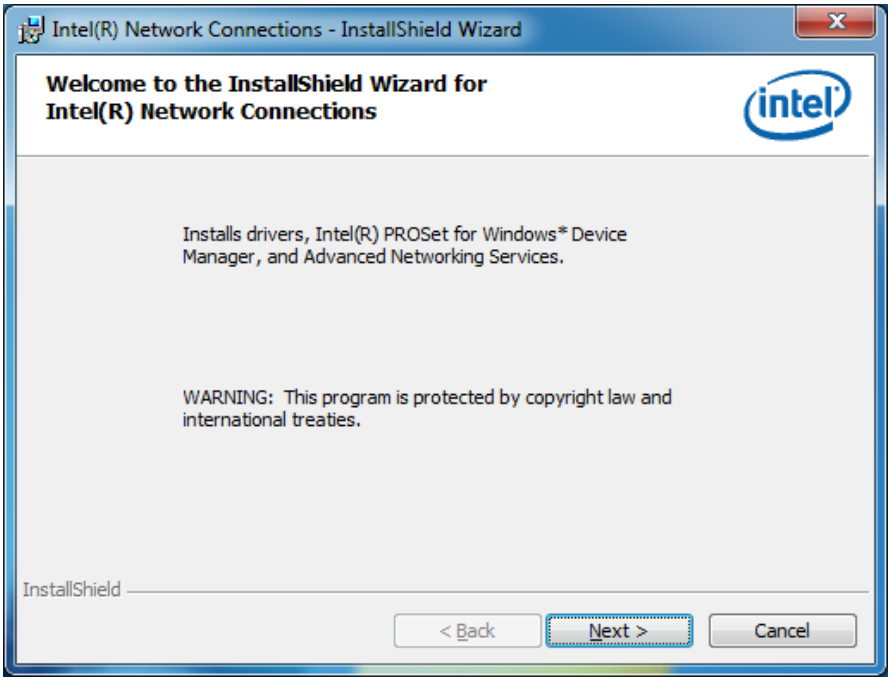
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers.***

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

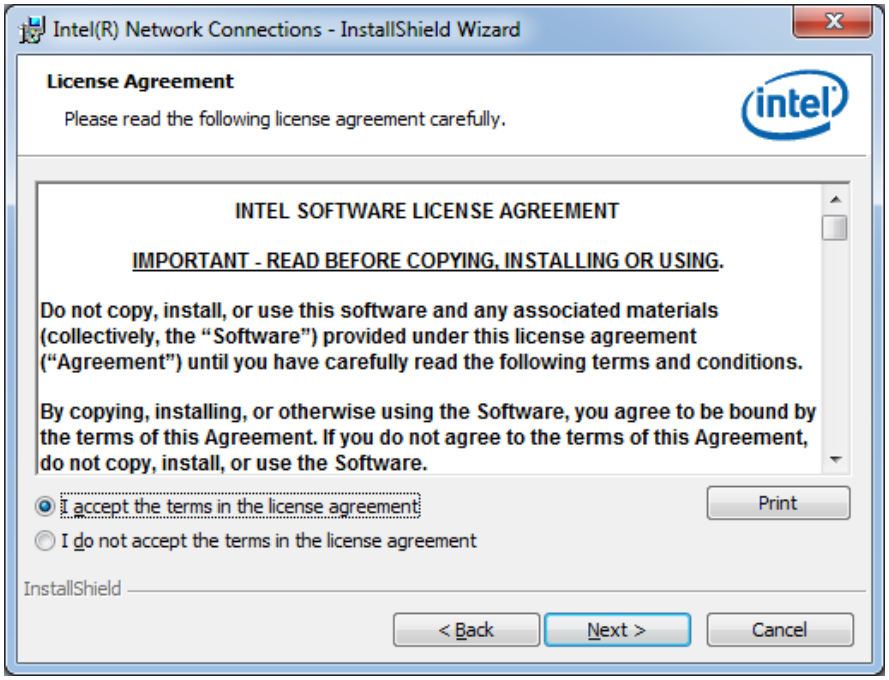
3. Click ***Install Drivers and Software.***



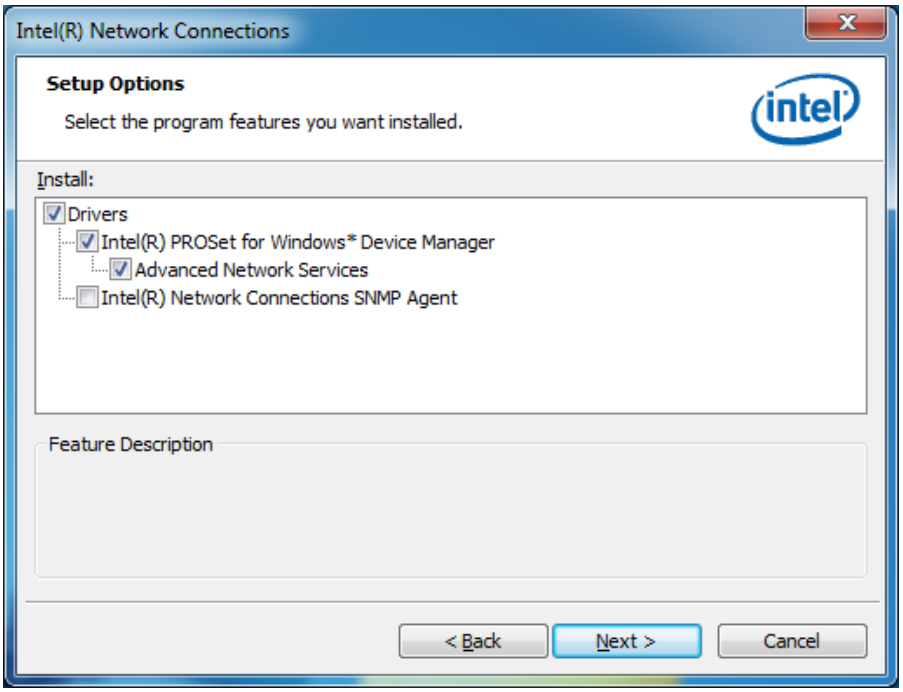
4. When the Welcome screen appears, click ***Next***.



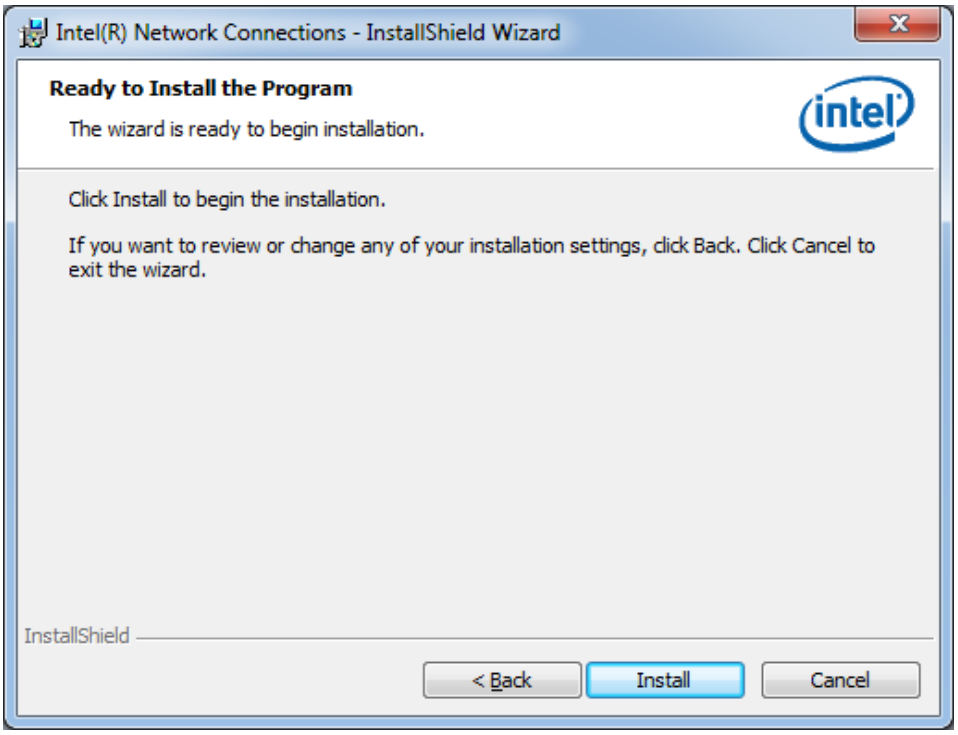
5. Click ***Next*** to to agree with the license agreement.



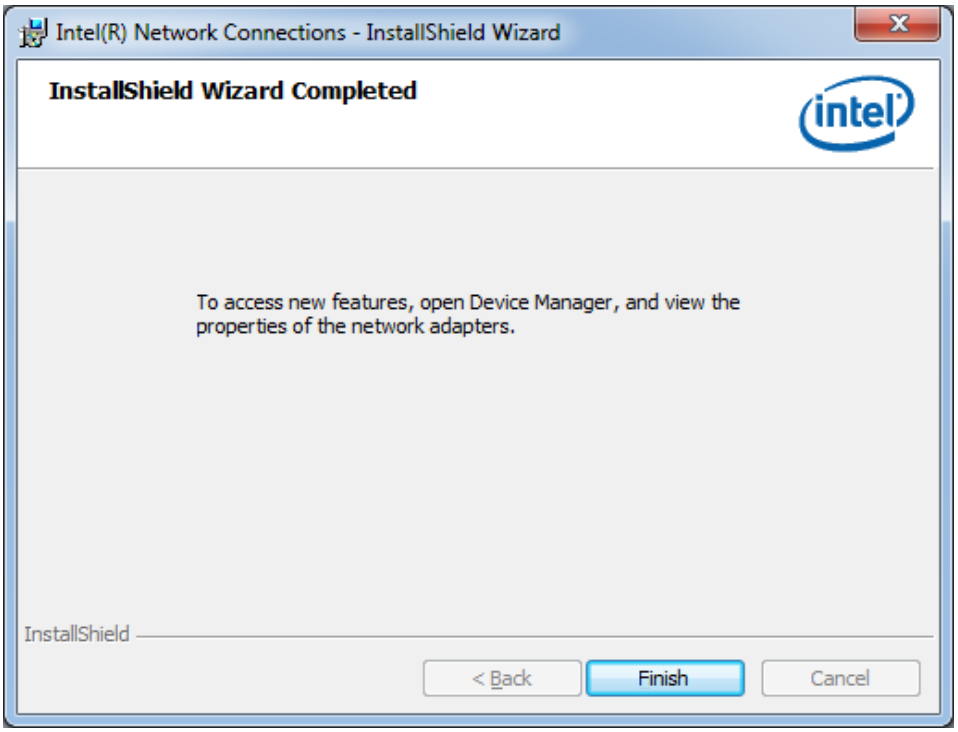
6. Click the checkbox for ***Drivers*** in the Setup Options screen to select it and click ***Next*** to continue.



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



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



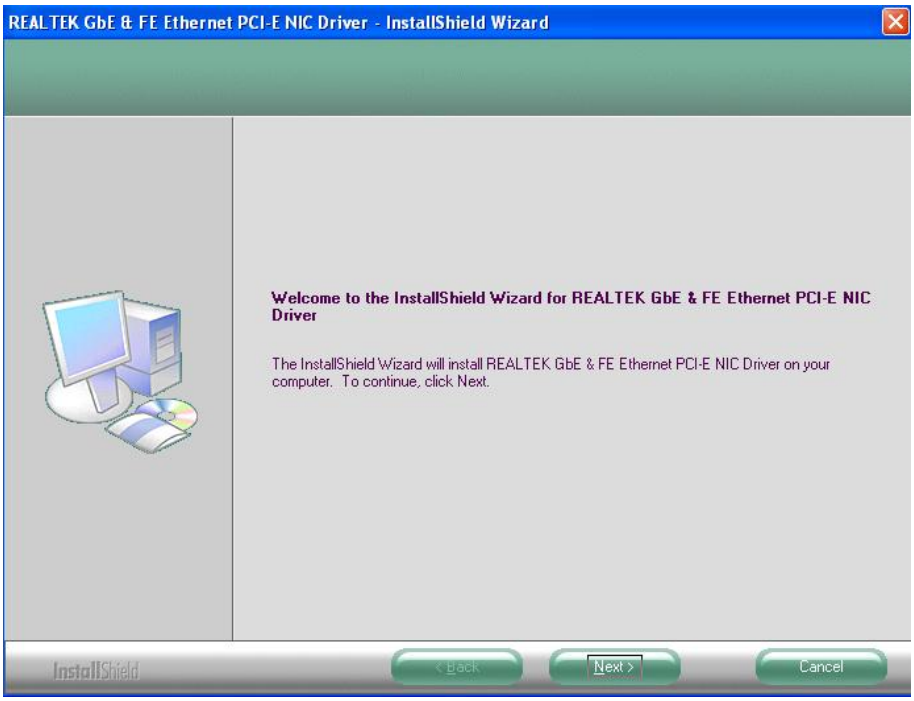
4.5 Realtek LAN Controller Drivers Installation

Follow the steps below to install the Realtek LAN Drivers.

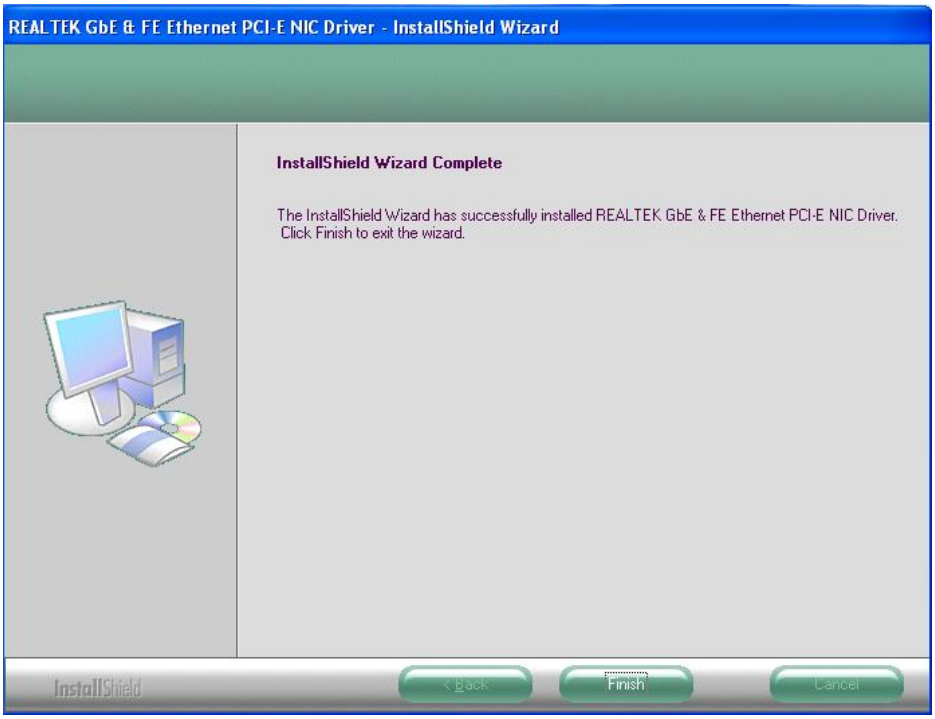
1. Insert the CD that comes with the board. Click ***Intel***, then ***LAN Card***, and then ***Realtek LAN Controller Drivers***.

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

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



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

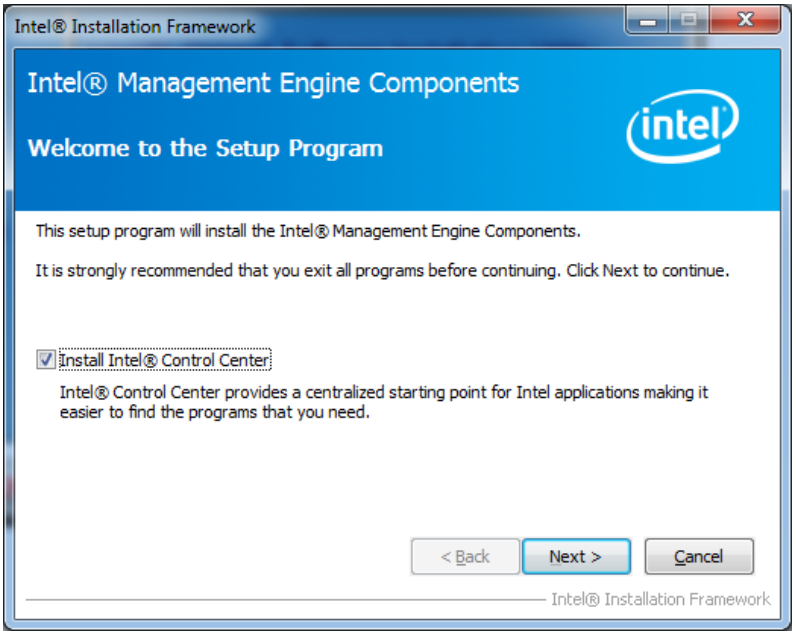


4.6 Intel® Management Engine Interface

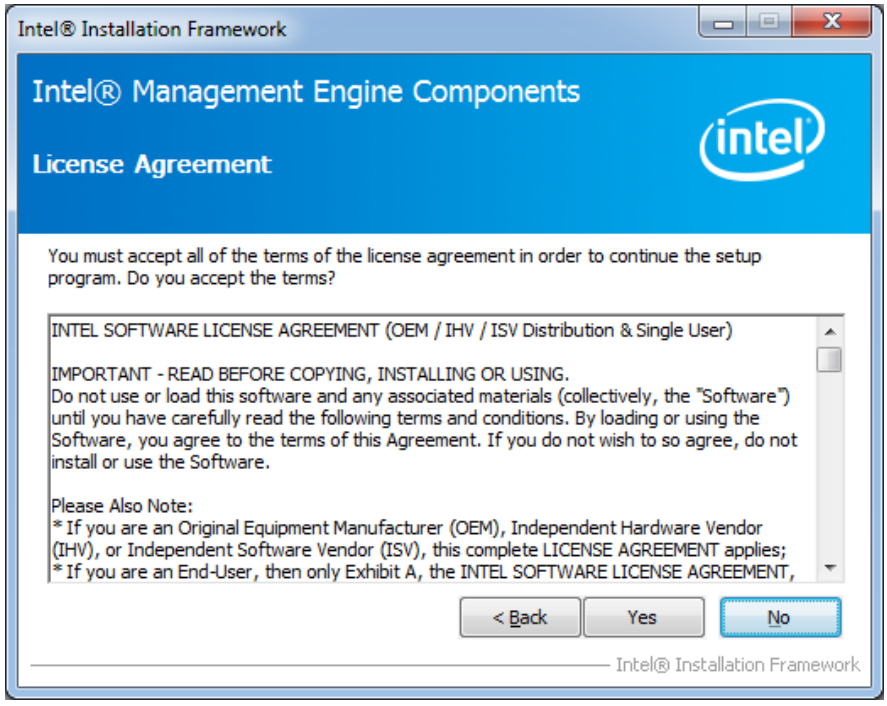
Follow the steps below to install the Intel Management Engine.

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) AMT 8.0 Drivers.***

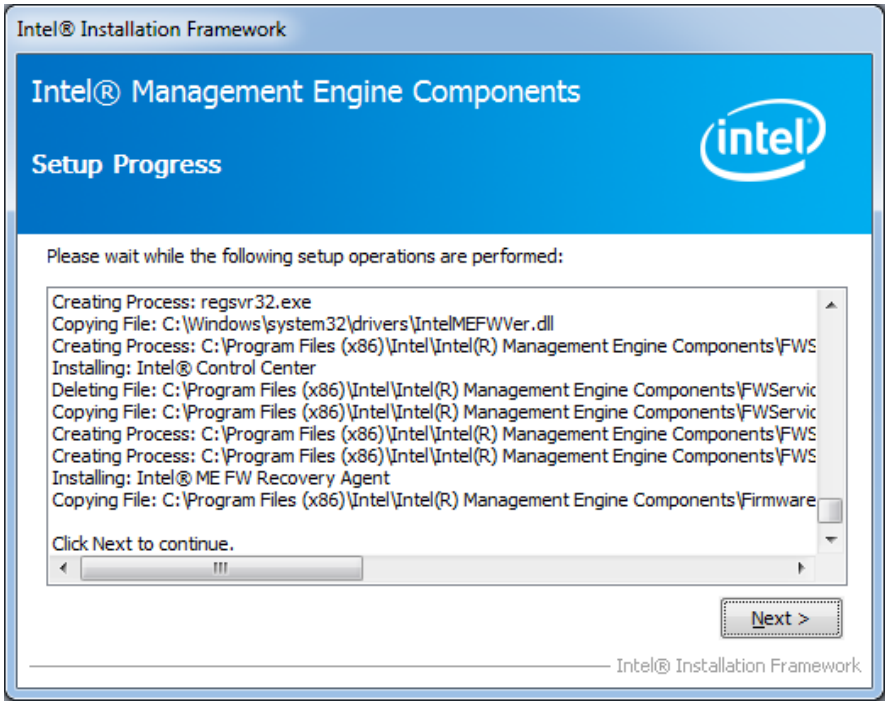
2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.



3. Click ***Yes*** to to agree with the license agreement.



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

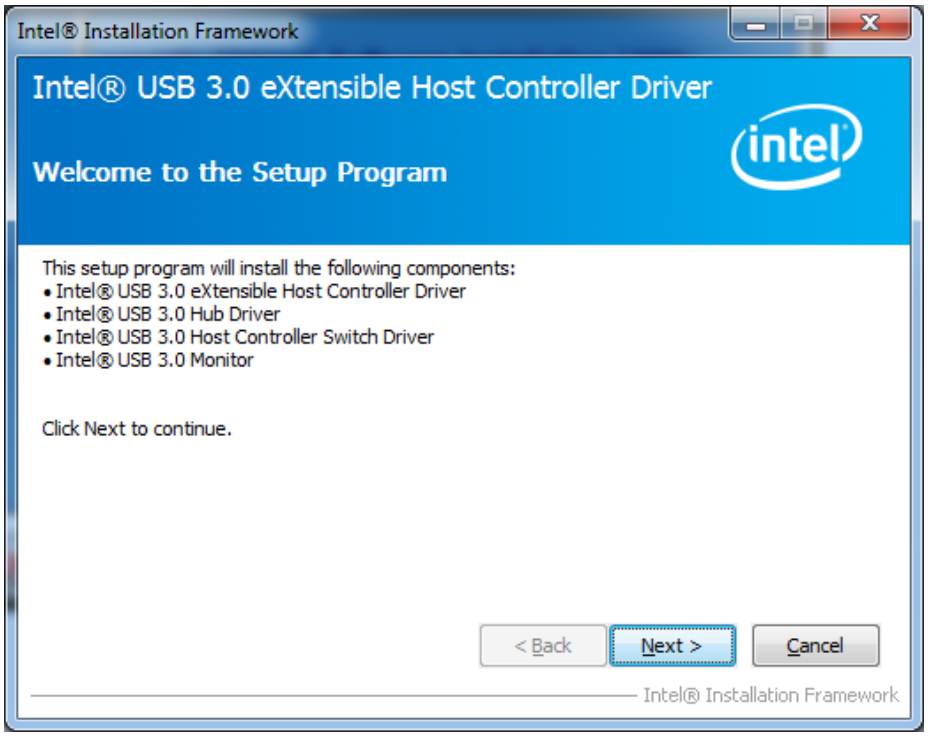


4.7 Intel® USB 3.0 Drivers

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers***.

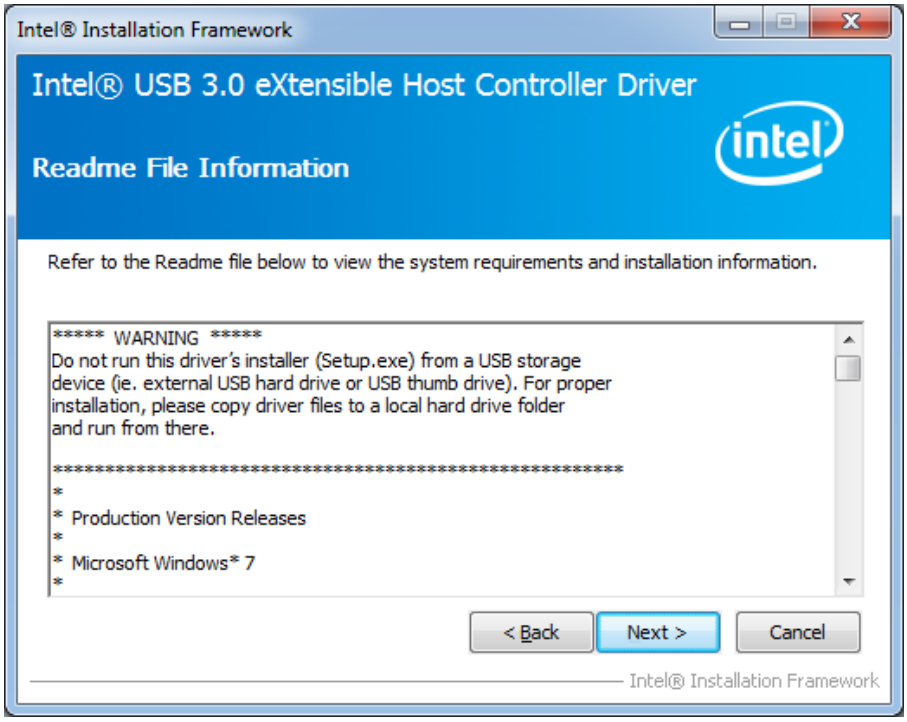
2. Click ***Intel(R) USB 3.0 Drivers.***

3. When the Welcome screen to the InstallShield Wizard for Intel® USB 3.0 eXtensible Host Controller Driver, click ***Next***.

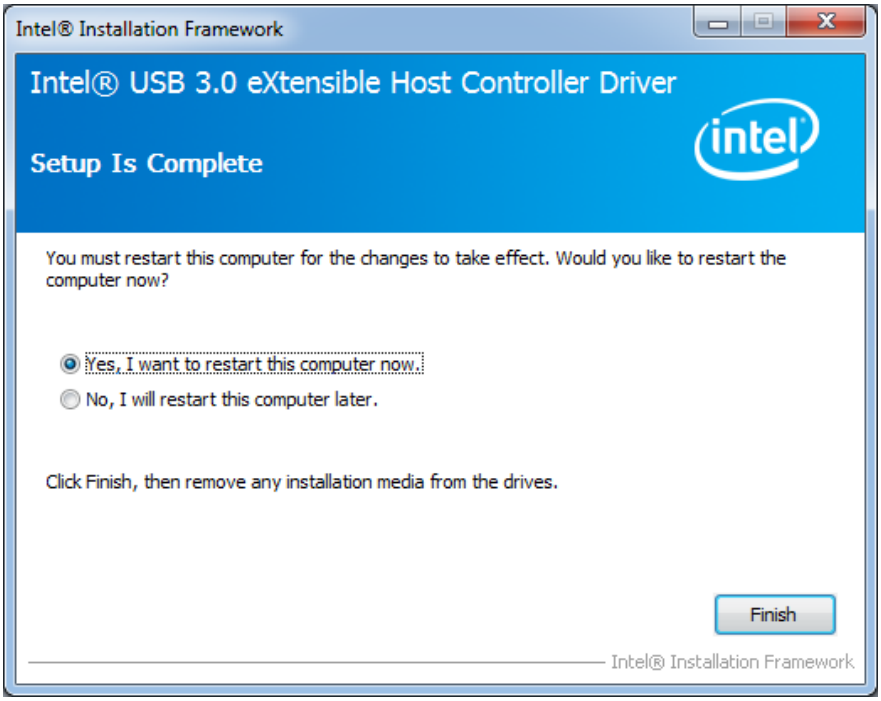


4. Click ***Yes*** to to agree with the license agreement and continue the installation.

5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® USB 3.0 eXtensible Host Controller Driver.



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



4.8 ALTERA FPGA Driver Installation

1. Insert the drivers DVD into the DVD drive. Click ***AMD*** and then ***ALTERA FPGA Driver.***

2. When the Welcome to IBASE Peripheral Controller Driver 2.0 for Windows XP/Vista Setup Wizard screen appears, click ***Next*** to continue.

3. When the Ready to Install screen appears, click ***Install*** to continue.

4. The Setup process is now complete, Click ***Finish*** to restart the computer.