IB965F

3rd Gen. Intel® Core™ i7/i5/i3
+ PCH
PICMG 1.3 SHB Express Full-Size CPU Card

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The IB965F PICMG 1.3 SHB Express full size CPU Card is based on the latest Intel® BD82B75 chipset. The platform supports 3rd Generation Intel® Core i7/i5/i3 with LGA1155 packing and features an integrated dual-channel DDR3 memory controller as well as a graphics core (4000).

Display interfaces of the CPU card include VGA CRT, DVI-D and *24-bit dual channel LVDS*. The edge connectors are for VGA CRT, USB 2.0, USB 3.0 and dual Gigabit LAN RJ45 connectors. One SATA III port and three SATA II ports are available. Expansion slot is provided with a Mini PCIe socket on the component side. Four serial ports and a parallel port are supported.

Dimensions of the board are 338mm x 126mm.

IB965F FEATURES:

- Supports Intel® 3rd Generation Core i7/i5/i3 DT processors
- Two DDR3 DIMM, 1066/1333/1600MHz, Max. 16GB
- Dual Intel® PCI-Express Gigabit LAN
- Integrated Graphics for CRT, DVI-D, LVDS displays
- 3x SATA 2.0, 1x SATA III, 3x USB 2.0, 3x USB 3.0
  4x COM, 1x parallel port
- Mini PCIe socket, iSMART, Watchdog timer, Digital I/O
- 2x SATA 2.0, 4x USB 2.0 for PICMG 1.3 backplane
- 1x PCI-E (x16), 1x PCI-E (x4), 4x PCI for PICMG 1.3 backplane

Checklist

Your IB965F package should include the items listed below.

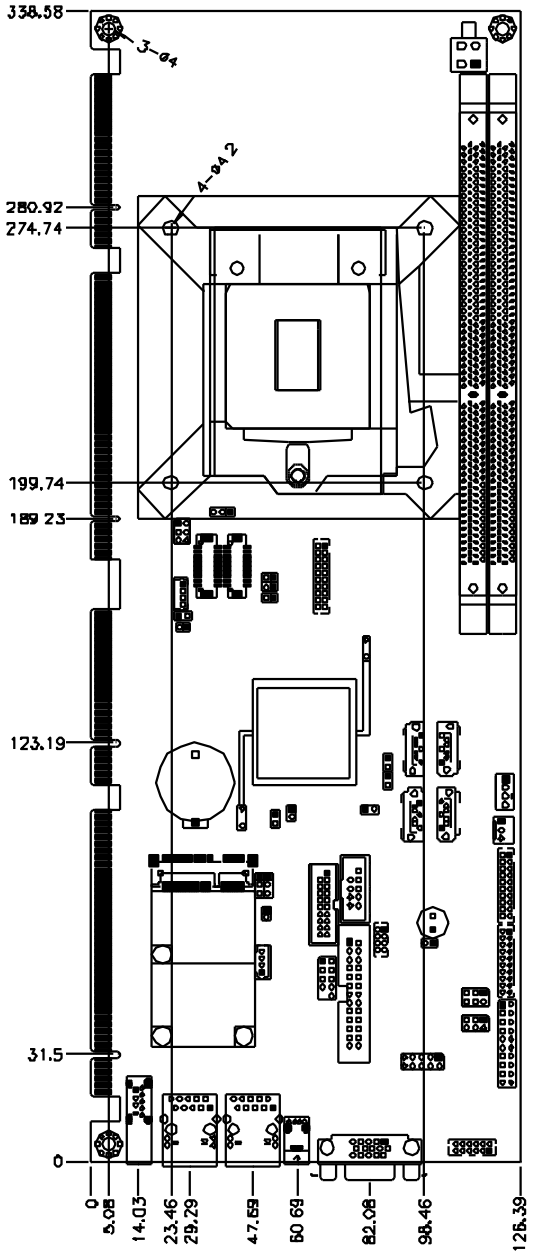
- The IB965F PICMG 1.3 SHB Express Full-Size CPU Card
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility

IB965F Specifications

Product Name	**IB965F (B75)** **IB965RF(Q77)**
Form Factor	PICMG 1.3 SHB Express Full size CPU card
CPU Type	- 3rd Generation Intel® Core™ i7/i5/i3 DT processor - FCLGA1155 package [37.5 mm x 37.5mm] - TDP: QC= 77W/65W ; DC=45W/35W
CPU Speed	2.3GHz ~ 3.4GHz (TDP=35W~77W)
BIOS	AMI BIOS, support ACPI Function
CPU Socket	LGA1155
Chipset	Intel® BD82B75 PCH [IB965F] Intel® BD82Q77 PCH [IB965RF] 27mm x 27mm, FCBGA942 (TDP=6.7W)
Memory	3rd Generation Intel® Core™ i7/i5/i3 DT processor integrated memory controller, support DDR3-1333/1600 MHz (Non-ECC) - DIMM x 2, Max. **16GB**
VGA / LVDS	3rd Generation Intel® Core™ i7/i5/i3 DT processor integrated graphics device - VGA - LVDS (Chrontel CH7511 via DP, support 24-bit dual channel) - DVI-**D**: via level-shifter ASM1442
LAN	1. Intel® 82579V GbE PHY x1 2. Intel® 82583V PCI-e Gigabit LAN controller x1 **** There is no LAN signal to the backplane****
USB	Intel® BD82B75/Q77 PCH integrated USB **2.0** host controller - **2** ports thru onboard pin-header - **1** port @ rear panel I/O - **1** port via MiniPCIe @ component side Intel® BD82B75/Q77 PCH integrated USB **3.0** host controller - **1** port @ rear panel I/O **2** ports via onboard box header [2*10 pins box header, **Blue** color] **6 ports on SHB, 4 ports to the backplane [Connector C]**
Serial ATA Ports	Intel® BD82B75/Q77 PCH built-in SATA controller, supports total 6 ports **1** x SATAIII + 3 x SATAII (one SATA II shared with mSATA)[IB965F] **2** x SATAIII + 2 x SATAII (one SATA II shared with mSATA)[IB965RF] **[2 x SATA 2.0 ports to the backplane Connector C]**
Audio	Intel® BD82B75/Q77 PCH built-in high definition audio w/ Realtek ALC662 Codec support 5.1 channel
LPC I/O	Fintek **F81866AD-I** (128-pin LQFP [14mm x 14 mm]) - COM1 (RS232/422/485), jumper-less design (SP339) - COM2/COM3/COM4 (RS232), - Hardware monitoring (2 thermal inputs,4 voltage monitor inputs & 2 Fan headers, one PWM fan type = 4-pin for CPU FAN; one DC fan type = 3-pin for SYS FAN) - Support Parallel port
Digital IO	4 in & 4 out
Keyboard/Mouse Connector	Supports PS/2 Keyboard/Mouse thru onboard pin-header
Expansion Slots	Mini PCIe socket x1@ component side [Full-sized] Support USB client & mSATA[share with onboard SATA]

Edge Connector (The same as IB970)	DB15 x1 for VGA RJ45 x 2 for LAN 1 & 2 USB 2.0 x 1 USB 3.0 x 1
Onboard Header/Connector	DF11-20 pins pin-header x1 for DVI-D DF13-20 pins pin-header x 2 for 24-bit dual channel LVDS(** brightness control not supported**) 2x13 pins box-header x1 for Printer port DF11-20 pins box-header x1 for COM1/2 DF11-20 pins box-header x1 for COM3/4 2x5 pins pin-header x**1** for USB 2.0 x2 2x6 pins pin-header x1 for Audio (Line-Out, Line-In & Mic) 2 x 5 pins pin-header x 1 for Digital I/O 2 x 4 pins pin-header x 1 for PS/2 KB/MS 4 pins pin-header x1 for CPU fan (PWM smart fan) 3 pins pin-header x1 for system fan SATA x 4 (Black connectors for SATA2; Blue connectors for SATA 3) 2X10 pins pin-header x 1 for front panel indicators 2 x 2 pin ATX power connector x 1
Interface	1x PCIe(16x) [Connector A & B] 4x PCIe(1x) **or** 1x PCIe(4x) [Connector A] 4x PCI masters [Connector D]
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
Others	- RAID function (0, 1, 5, 10) [IB965RF only] - iSMART{Thru MCU for supporting auto scheduler & Power resume} - LAN wake up - TPM 1.2 supported - Reserved extra mounting hole as IB970
System Voltage	+5V, +3.3V, +12V, -12V & 5VSB
RoHS	Yes
Board Size	338mm x 126mm

Board Dimensions



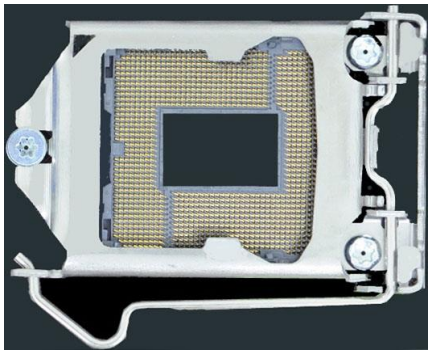
Installations

This section provides information on how to use the jumpers and connectors on the IB965F in order to set up a workable system. The topics covered are:

Installing the CPU

The IB965F board supports an LGA1155 Socket (shown below) for Intel Sandy Bridge processors.

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



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

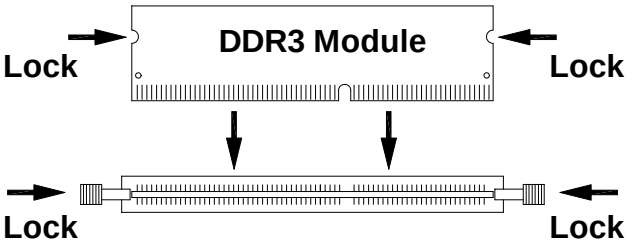
Installing the Memory

The IB965F board supports two 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:

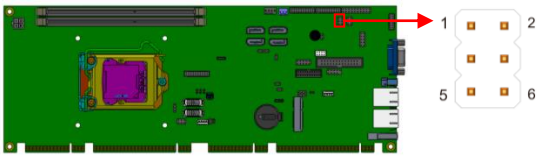
1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module,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

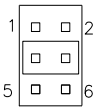


Setting the Jumpers

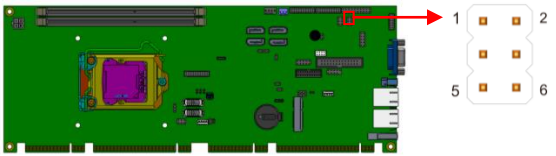
Jumpers are used on IB965F to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB965F and their respective functions.

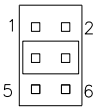
JP1: COM1 RS232 RI/+5V/+12V Power Setting



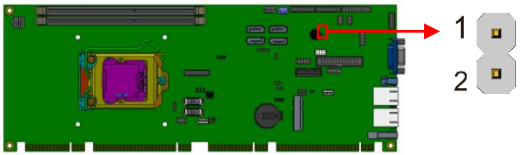
JP1	Setting	Function
	Pin 1-3 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 3-5 Short/Closed	+5V

JP2: COM2 RS232 RI/+5V/+12V Power Setting



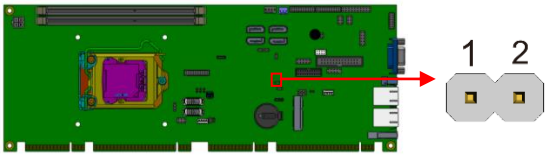
JP2	Setting	Function
	Pin 1-3 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 3-5 Short/Closed	+5V

JP3: Power On Type



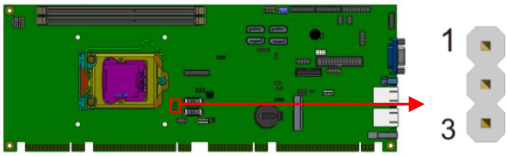
JP3	Function
Open	ATX Mode (Default)
Close	AT Mode

JP7: Flash Descriptor Security Override (Factory use only)



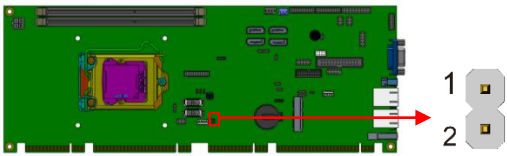
JP7	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

JP10: LVDS Panel Power Selection

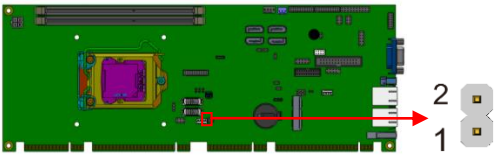


JP10	Setting	Panel Voltage
	Pin 1-2 Short/Closed	3.3V (default)
	Pin 2-3 Short/Closed	5V

JP11: LVDS EEPROM Flash Connector (factory use only)

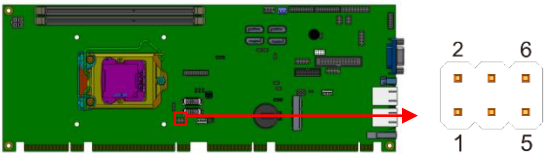


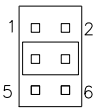
JP12: BL_ADJ_LEVEL Setting



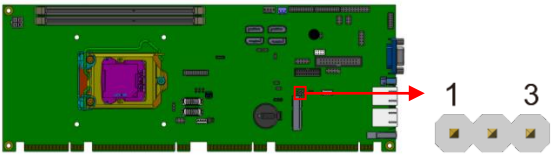
JP12	Function
Open	3.3V
Close	5V (default)

JP13: BL Voltage Setting



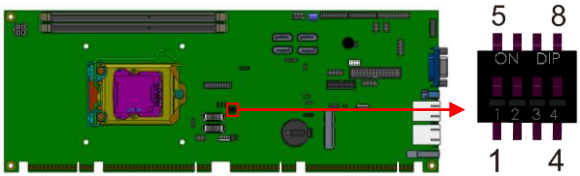
JP13	Setting	Function
	Pin 1-2 Short/Closed	+3.3V
	Pin 3-4 Short/Closed	+5V
	Pin 5-6 Short/Closed	+12V(Default)

JBAT1: Clear CMOS Contents



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

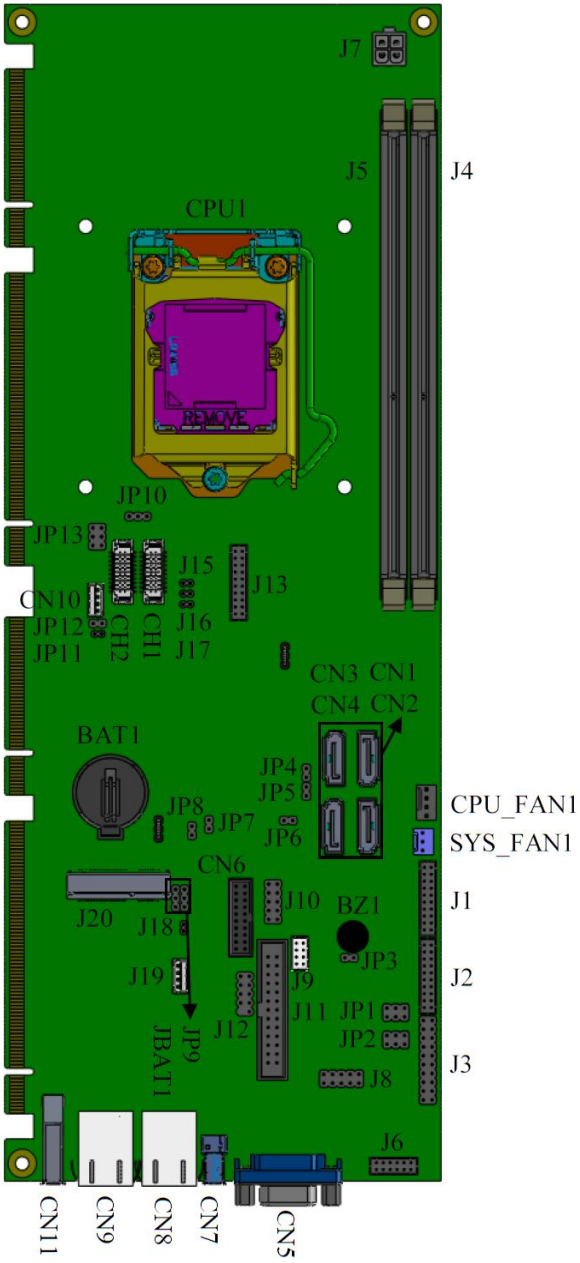
SW1: LVDS Panel Type Setting



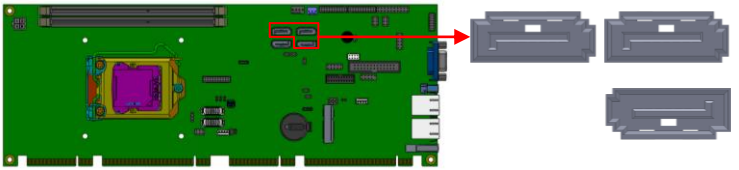
SW1-4	SW1-3	SW1-2	SW1-1	Panel Type
ON	ON	ON	ON	800*600 18bit 1ch
ON	ON	ON	OFF	1024*768 18bit 1ch
ON	ON	OFF	ON	1024*768 24bit 1ch
ON	ON	OFF	OFF	1280*768 18bit 1ch
ON	OFF	ON	ON	1280*800 18bit 1ch
ON	OFF	ON	OFF	1280*960 18bit 1ch
ON	OFF	OFF	ON	1280*1024 24bit 2ch
ON	OFF	OFF	OFF	1366*768 18bit 1ch
OFF	ON	ON	ON	1366*768 24bit 1ch
OFF	ON	ON	OFF	1440*900 24bit 2ch
OFF	ON	OFF	ON	1440*1050 24bit 2ch
OFF	ON	OFF	OFF	1600*900 24bit 2ch
OFF	OFF	ON	ON	1680*1050 24bit 2ch
OFF	OFF	ON	OFF	1600*1200 24bit 2ch
OFF	OFF	OFF	ON	1920*1080 24bit 2ch
OFF	OFF	OFF	OFF	1920*1200 24bit 2ch

Connectors on IB965F

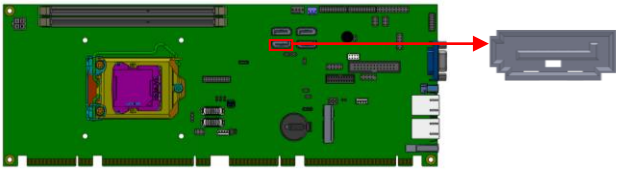
Connector Locations on IB965F



CN1, CN2, CN4: SATA2 Connectors

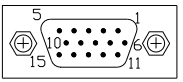


CN3: SATA3 Connectors



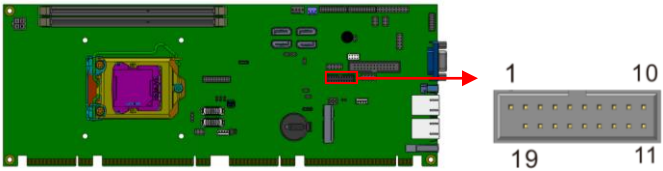
CN1: SATA3 Connectors (IB965RF only)

CN5: DB-15 VGA Connector



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

CN6: USB3.0/2.0 Connector



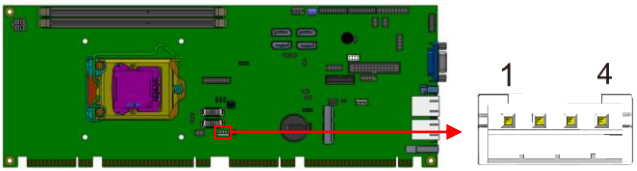
Signal Name	Pin #	Pin #	Signal Name
Vcc	1	X	
P1_SSRX-	2	19	Vcc
P1_SSRX+	3	18	P2_SSRX-
GND	4	17	P2_SSRX+
P1_SSTX-	5	16	GND
P1_SSTX+	6	15	P2_SSTX-
GND	7	14	P2_SSTX+
P1_U2_D-	8	13	GND
P1_U2_D+	9	12	P2_U2_D-
NC	10	11	P2_U2_D+

CN7: USB2.0 Connector

CN8: Gigabit LAN (Intel 82579V) Connector

CN9: Gigabit LAN (Intel 82583V) Connector

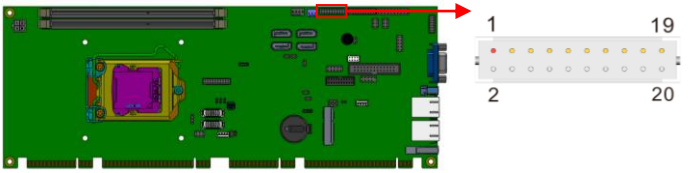
CN10: LCD Backlight Connector



Pin #	Signal Name
1	Backlight Power
2	Backlight Enable
3	NC
4	Ground

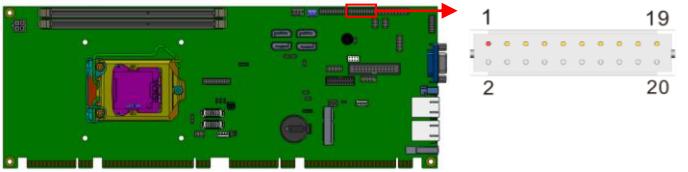
CN11: USB3.0 Connector

J1: COM3, COM4 Serial Port (DF11 Connector)



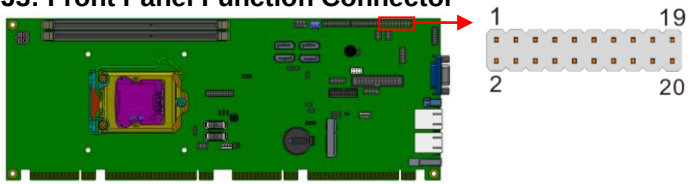
Signal Name	Pin #	Pin #	Signal Name
DSR3	2	1	DCD3
RTS3	4	3	RXD3
CTS3	6	5	TXD3
RI3	8	7	DTR3
NC	10	9	Ground
DSR4	12	11	DCD4
RTS4	14	13	RXD4
CTS4	16	15	TXD4
RI4	18	17	DTR4
NC	20	19	Ground

J2: COM1, COM2 Serial Port (DF11 Connector)



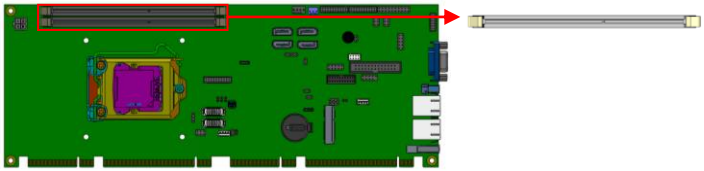
Signal Name	Pin #	Pin #	Signal Name
DSR1	2	1	DCD1
RTS1	4	3	RXD1
CTS1	6	5	TXD1
RI1	8	7	DTR1
NC	10	9	Ground
DSR2	12	11	DCD2
RTS2	14	13	RXD2
CTS2	16	15	TXD2
RI2	18	17	DTR2
NC	20	19	Ground

J3: Front Panel Function Connector



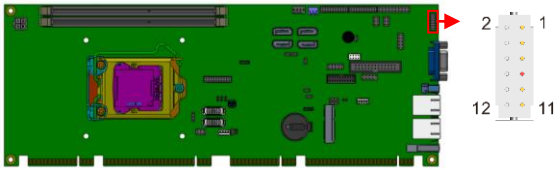
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	Speaker Out
NC	3	4	NC
Ground	5	6	Ground
NC	7	8	VCC
Ground	9	10	NC
Ground	11	12	NC
Ground	13	14	PWR_SW
NC	15	16	NC
Ground	17	18	RST
HDD LED +	19	20	HDD LED -

J4, J5: DDR3 DIMM Socket



J6: External Audio Connector (DF11 Connector)

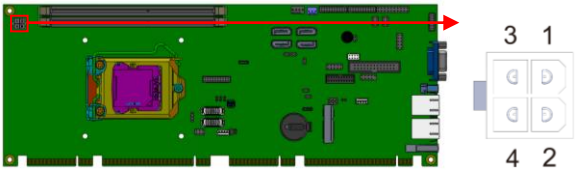
J6 is a 12-pin header that is used to connect to the optional audio cable.



Signal Name	Pin #	Pin #	Signal Name
LINE OUT_R	2	1	LINE OUT_L
Ground	4	3	JD_FRONT
LINE IN_R	6	5	LINE IN_L
Ground	8	7	JD_LINE IN
MIC-R	10	9	MIC-L
Ground	12	11	JD_MIC1

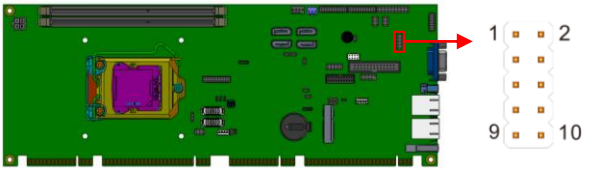
J7: ATX 12V Power Connector

This connector supplies the CPU operating voltage.



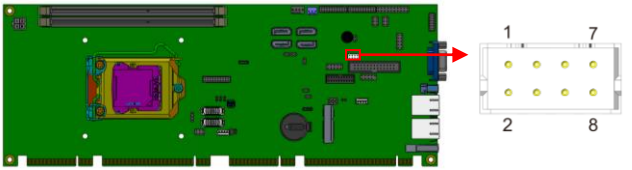
Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

J8: Digital I/O 4 In/4 Out



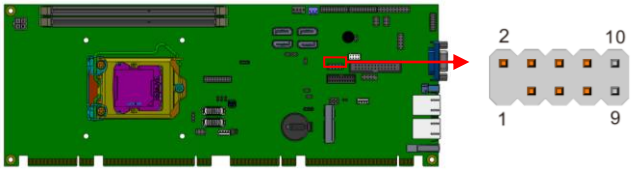
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	VCC
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J9: PS/2 Keyboard and Mouse Connectors (DF11 Connector)

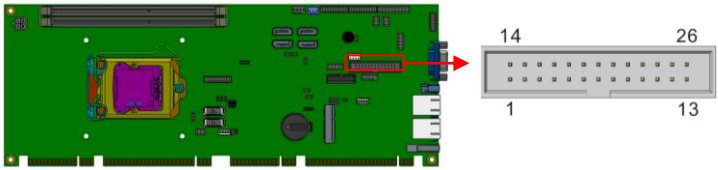


Signal Name	Pin #	Pin #	Signal Name
Vcc	2	1	VCC
KB_DATA	4	3	MS_DATA
KB_CLK	6	5	MS_CLK
Ground	8	7	Ground

J10: SPI Flash Connector (Factory use only)

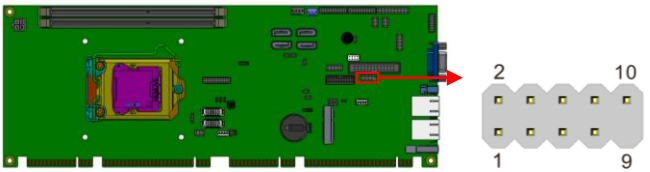


J11: Parallel Port



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	26	Ground

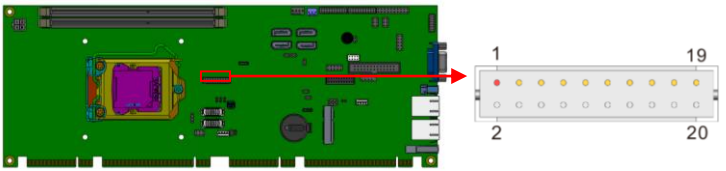
J12: USB2.0 Connectors



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

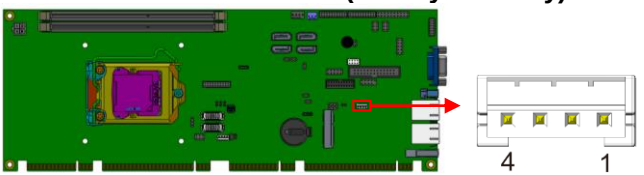
J13: DVI-D Port (DF11 Connector)

J13 is a 20-pin header that is used to connect to the optional DVI-D cable.



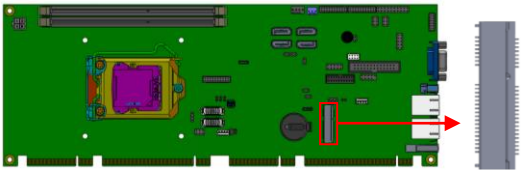
Signal Name	Pin #	Pin #	Signal Name
TDC1#_B	2	1	TDC1_B
Ground	4	3	Ground
TLC#_B	6	5	TLC_B
5V	8	7	Ground
N.C.	10	9	HPDET_B
TDC2#_B	12	11	TDC2_B
Ground	14	13	Ground
TDC0#_B	16	15	TDC0_B
N.C.	18	17	N.C.
SC_DDC_B	20	19	SD_DDC_B

J19: MCU Flash Connector (factory use only)

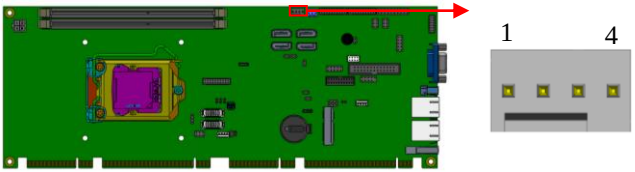


J20: Mini PCIE Connector (Support M-SATA with CN4)

J20 also supports mSATA. However, when J20 is used for mSATA, then CN4 SATA port cannot be used. Only one of them can be used at one time to support SATA.

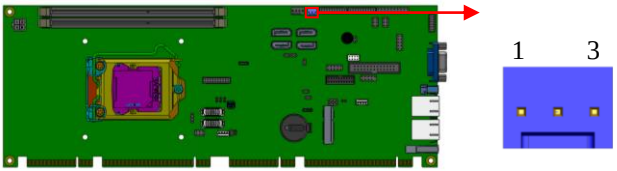


CPU_FAN1: CPU Fan Power Connector



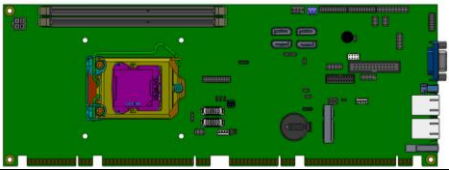
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

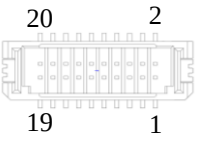
SYS_FAN1: System Fan1 Power Connector



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

CH1, CH2: LVDS Connectors





Signal Name	Pin #	Pin #	Signal Name
N.C	19	20	N.C
ENABLE	17	18	LCD_PWR
CLK+	15	16	CLK-
GND	13	14	GND
LD2+	11	12	LD2-
LD3+	9	10	LD3-
GND	7	8	LCD_PWR
LD1+	5	6	LD1-
GND	3	4	GND
LD0+	1	2	LD0-

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:

BIOS Introduction

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

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <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:

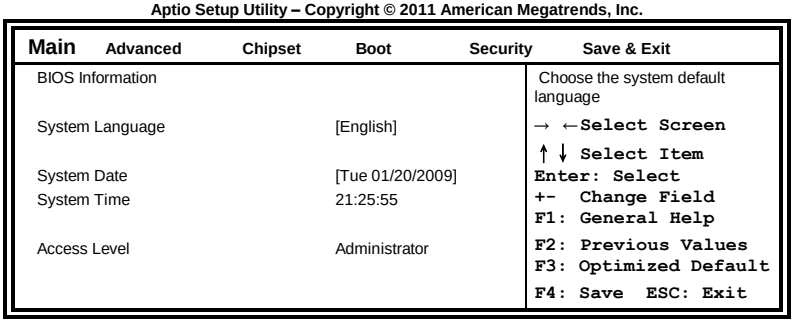
```
Press  <DEL>  to  Enter  Setup
```

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.*

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
► Trusted Computing
► 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 2.0502

PCI 64bit Resources Handing
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		→ ←Select Screen
Maximum Read Request			Auto		↑ ↓ Select Item
					Enter: Select
PCI Express Link Register Settings					+- Change Field
ASPM Support			Disabled		F1: General Help
WARNING: Enabling ASPM may cause some PCI-E devices to fail					F2: Previous Values
Extended Synch			Disabled		F3: Optimized Default
					F4: Save ESC: Exit
Link Training Retry			5		
Link Training Timeout (uS)			100		
Unpopulated Links			Keep Link ON		

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.

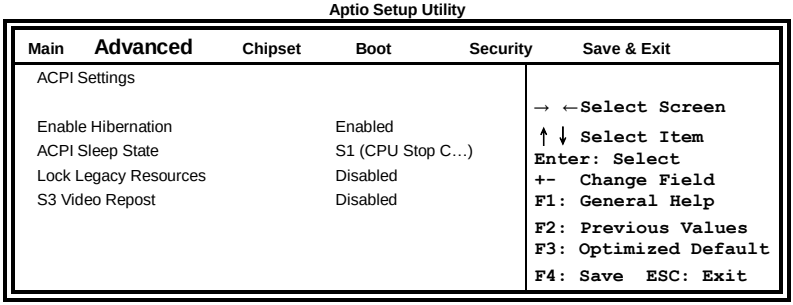
Extended Synch
If ENABLED allows generation of Extended Synchronization patterns.

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.

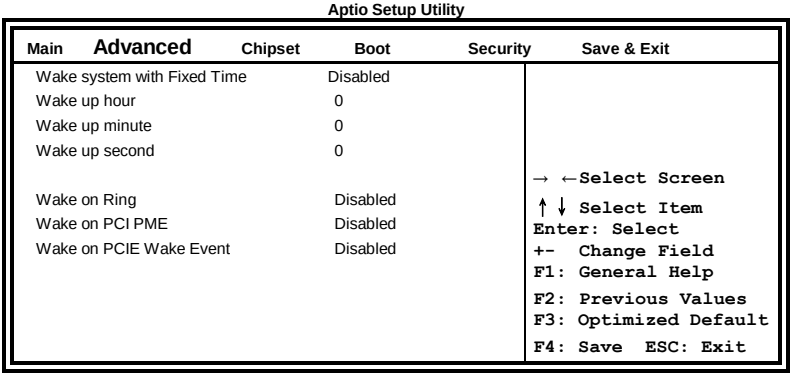
Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

Wake up event settings



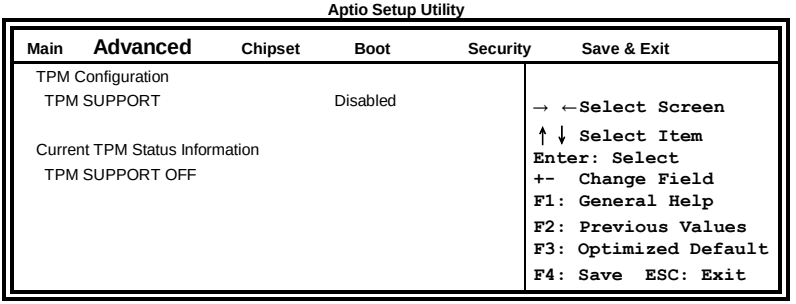
Wake system with Fixed Time

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

Wake on PCIE PME Wake Event

The options are Disabled and Enabled.

Trusted Computing



TPM Support

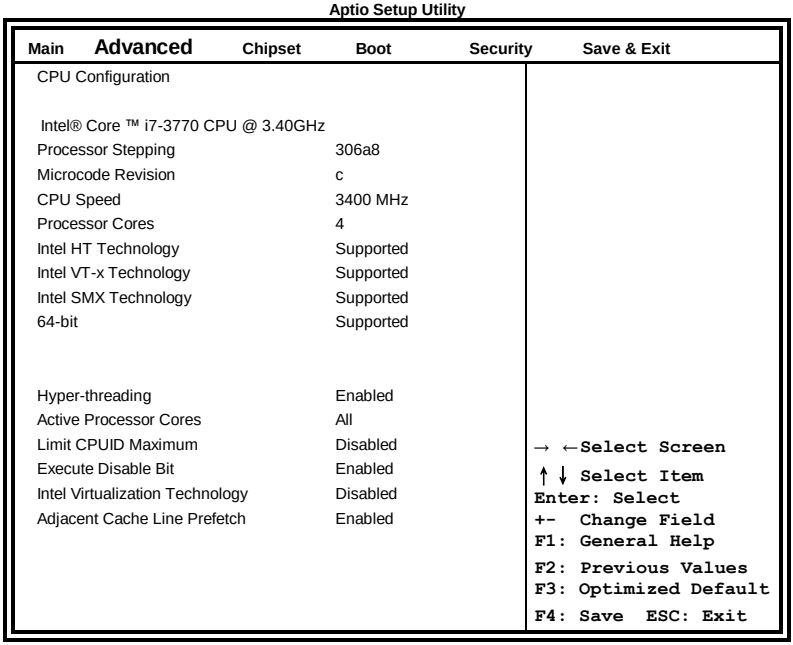
This configuration is supported only with MB970VF. Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.

Security Device Support

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

This section shows the CPU configuration parameters.



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.

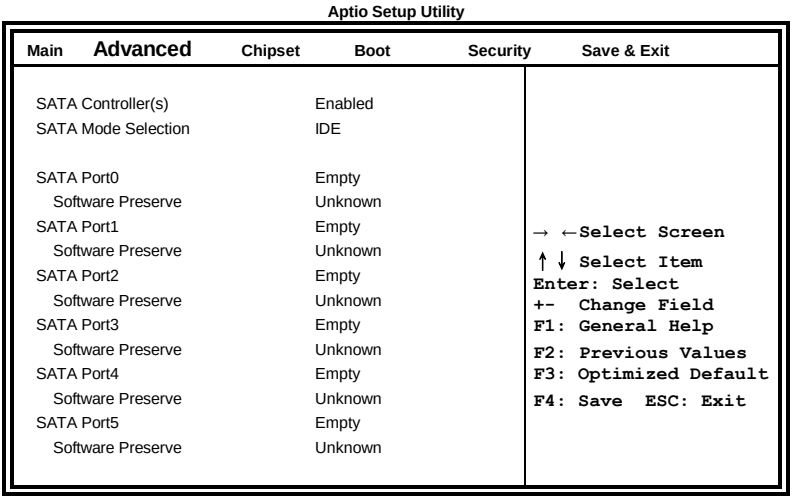
Execute Disable Bit

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.

Adjacent Cache Line Prefetch
To turn on/off prefetching of adjacent cache lines.

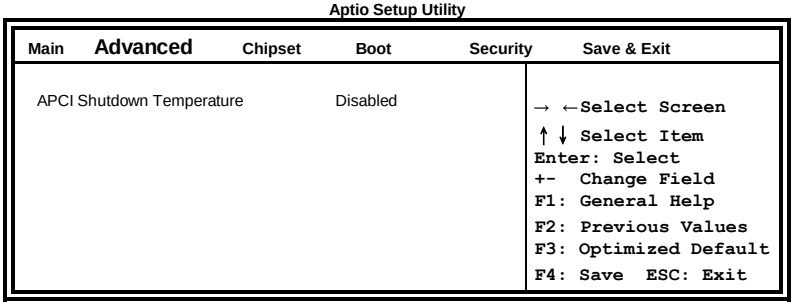
SATA Configuration
SATA Devices Configuration.



SATA Controller(s)
Enable / Disable Serial ATA Controller.

SATA Mode Selection
(1) IDE Mode.
(2) AHCI Mode.
(3) RAID Mode.

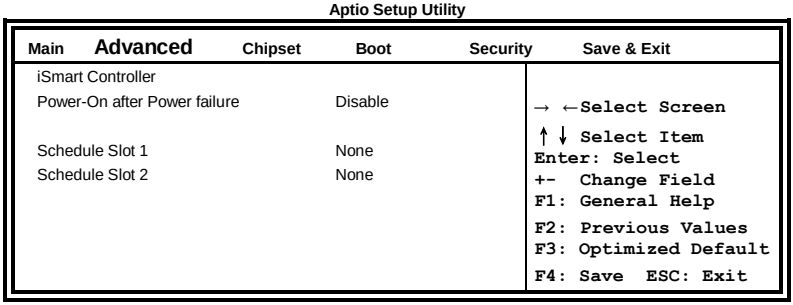
Shutdown Temperature Configuration



ACPI Shutdown Temperature

The default setting is Disabled.

iSmart Controller



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		
Port 60/64 Emulation			Disabled		
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.

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

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

Device reset 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

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

Super IO Configuration

F81866 Super IO Chip F81866

► Serial Port 0 Configuration
► Serial Port 1 Configuration
► Serial Port 2 Configuration
► Serial Port 3 Configuration
► Parallel Port Configuration

KB/MS Power On None

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

Serial Port Configuration

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

Parallel Port Configuration

Set Parameters of Parallel Ports. User can Enable/Disable the Parallel port and Select an optimal settings for the Super IO Device.

KB/MS Power On

None (default)
Mouse Move
Any Key
Any Key / Mouse Move

F81866 H/W Monitor

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Health Status					
CPU smart fan control			Disabled		
System smart fan control			Disabled		
CPU temperature			+41 C		
System temperature			+35 C		
CPU FAN Speed			2115 RPM		
System FAN Speed			N/A		
Vcore			+1.000 V		
+5V			+5.213 V		
+12V			+12.408 V		
+1.5V			+1.544 V		

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

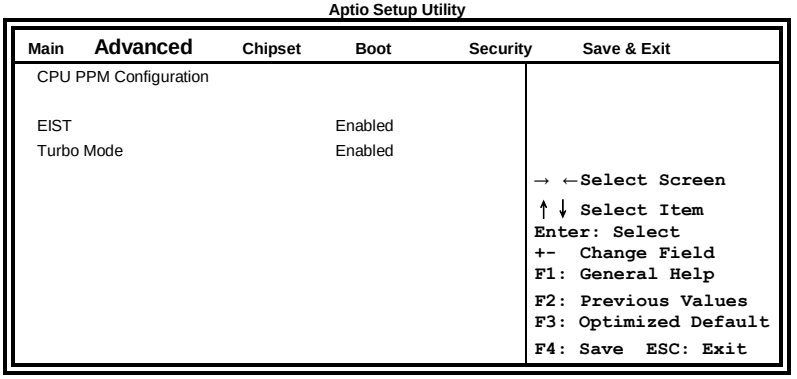
Temperatures/Voltages

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.

CPU/System 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

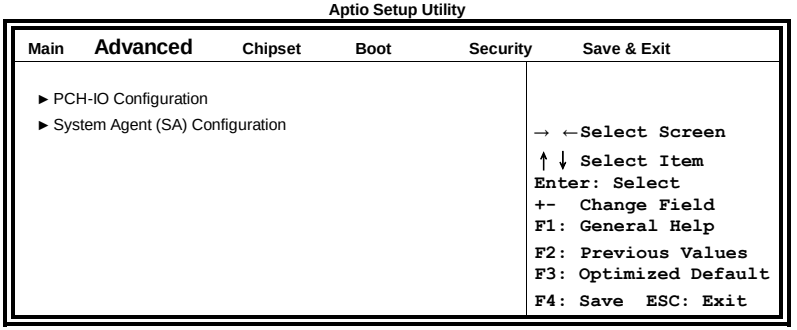


EIST

Enable/Disable Intel SpeedStep.

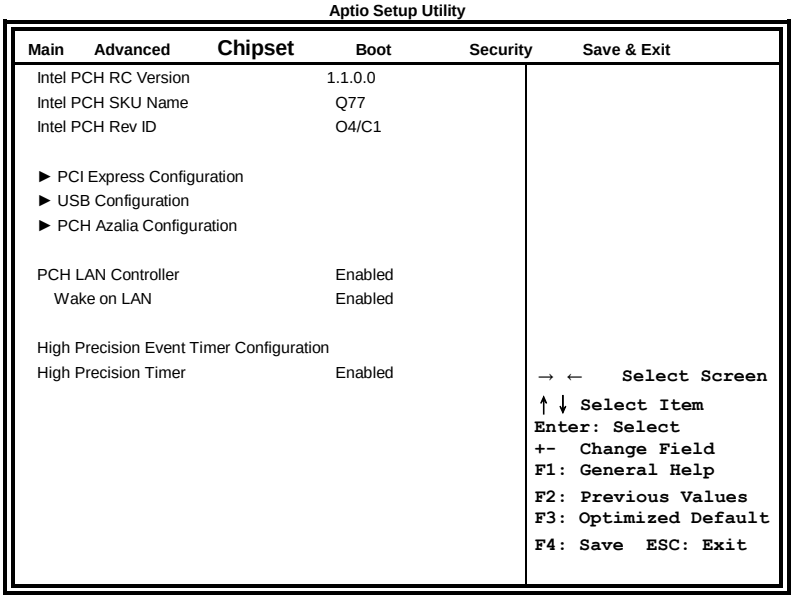
Chipset Settings

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



PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.



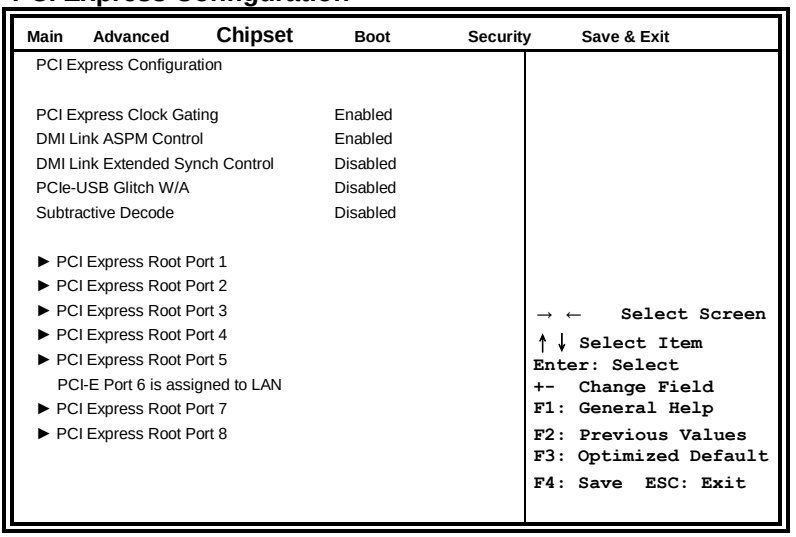
PCH LAN Controller

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.)

PCI Express Configuration



PCI Express Clock Gating

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

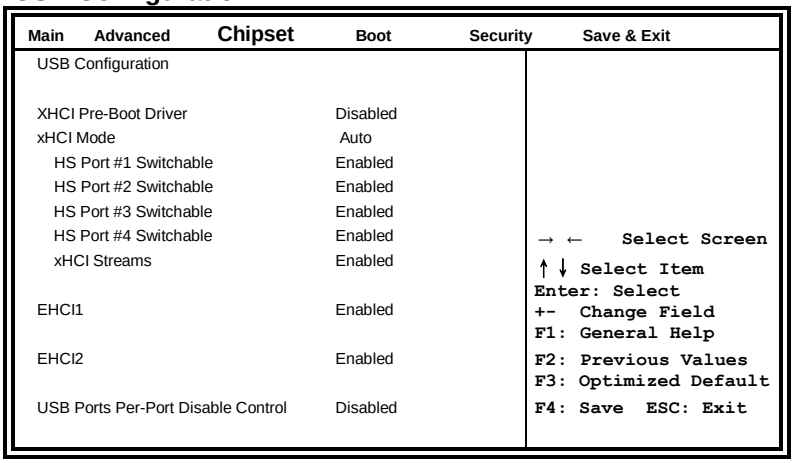
DMI Link ASPM Control

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



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

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCH Azalia Configuration					
Azalia			Auto		

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

Azalia

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

System Agent (SA) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
System Agent Bridge Name			IvyBridge		
System Agent RC Version			1.1.0.0		
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					

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

VT-d

Check to enable VT-d function on MCH.

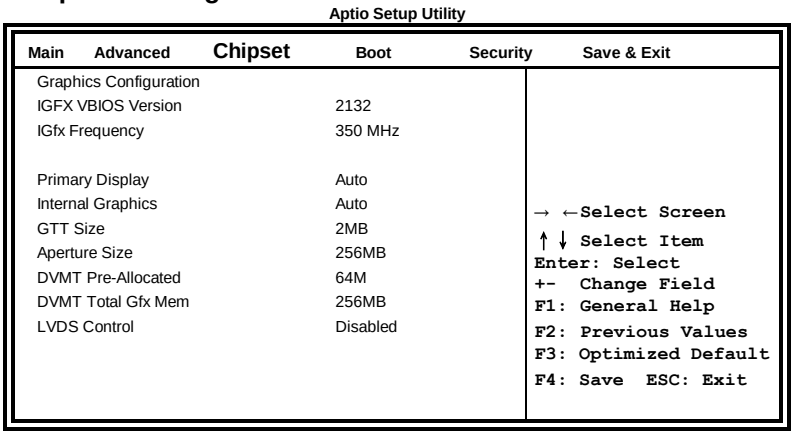
Enable NB CRID

Enable or disable NB CRID WorkAround.

C-State Pre-Wake

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

Graphics Configuration



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.

LVDS Control

Enabled or Disabled LVDS.

Memory Configuration

Aptio Setup Utility

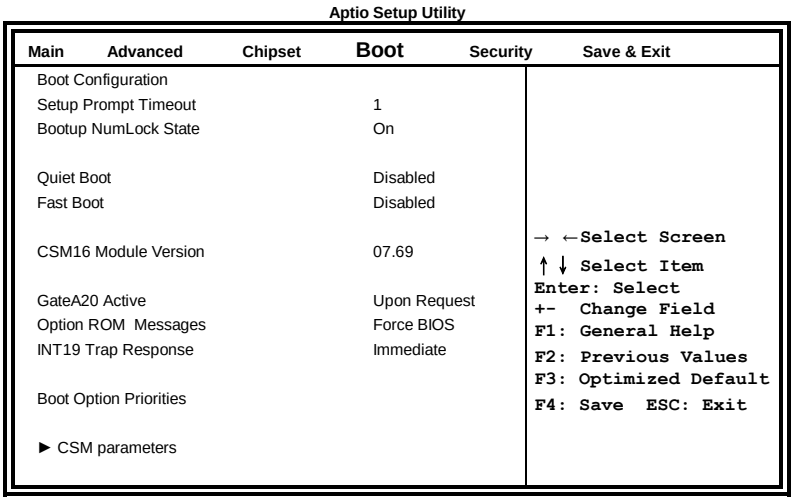
Main	Advanced	Chipset	Boot	Security	Save & Exit

Memory Information	
Memory Frequency	1333 MHz
Total Memory	4096 MB (DDR3)
DIMM#0	2048 MB (DDR3)
DIMM#1	Not Present
DIMM#2	2048 MB (DDR3)
DIMM#3	Not Present
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.

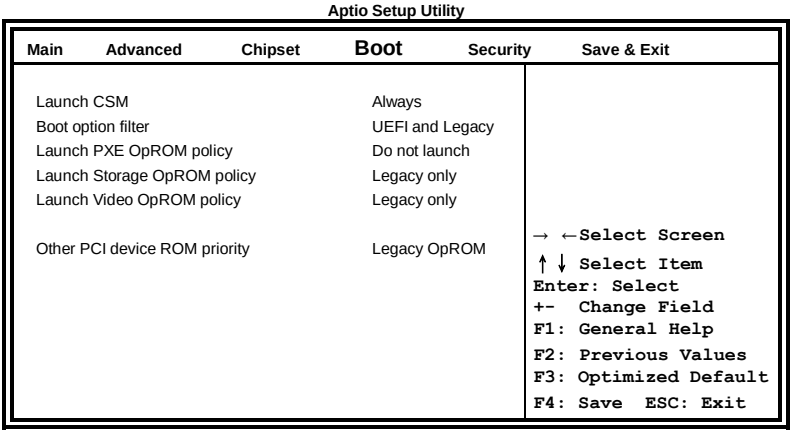
Option ROM Messages

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.

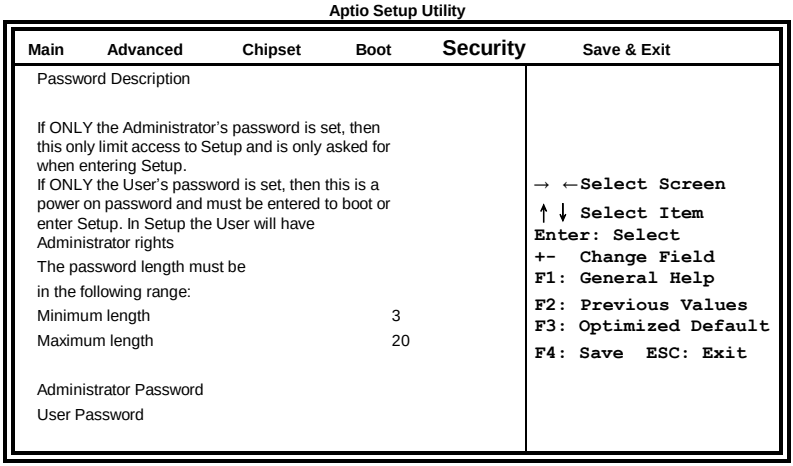
Launch Storatge OpROM policy
Controls the execution of UEFI and Legacy Storage OpROM.

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.



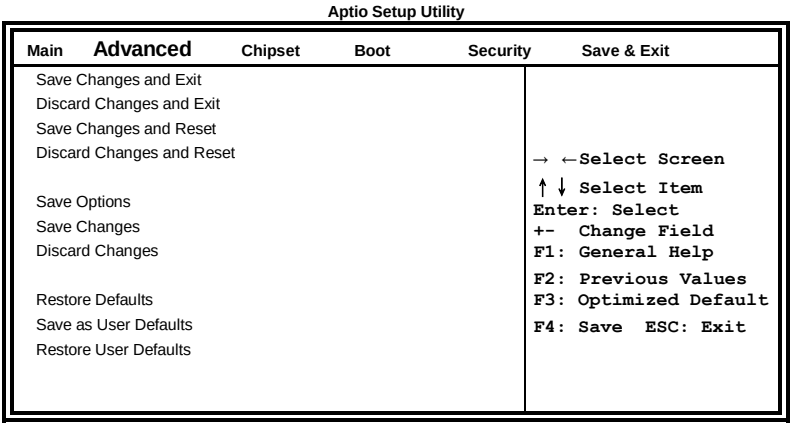
Administrator Password

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.

Drivers Installation

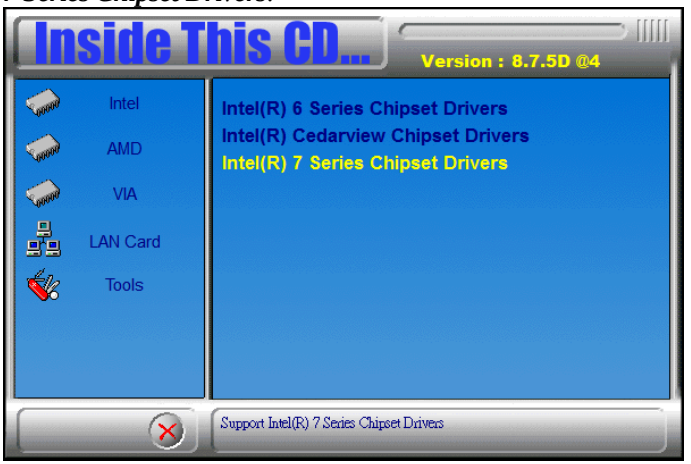
This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

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) 7 Series Chipset Drivers***.

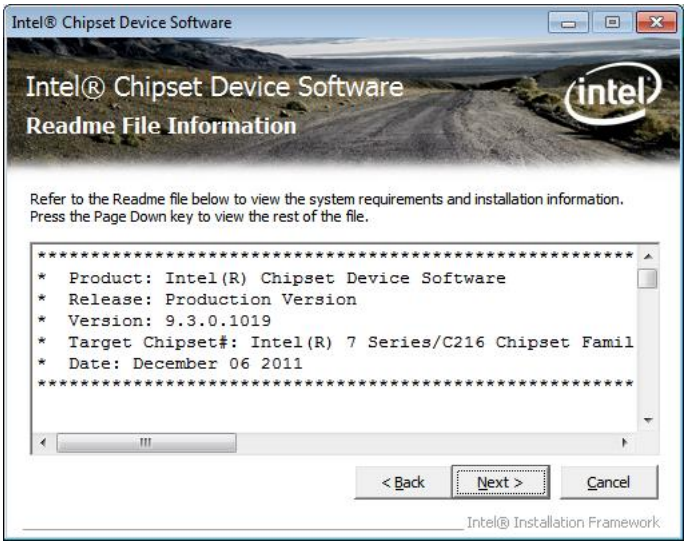


2. Click ***Intel(R) Chipset Software Installation Utility.***

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.



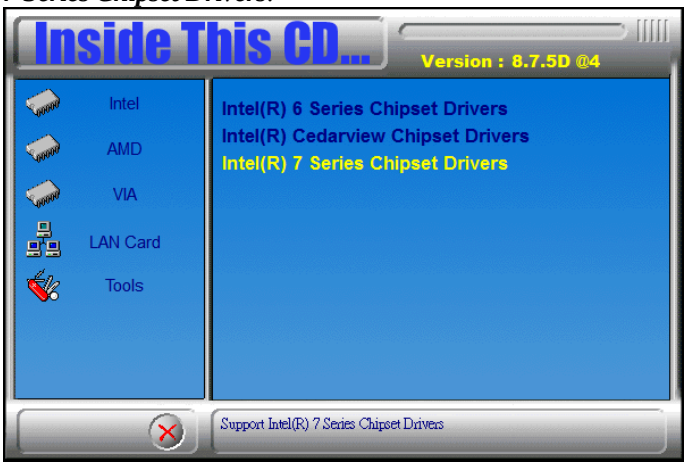
6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

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.

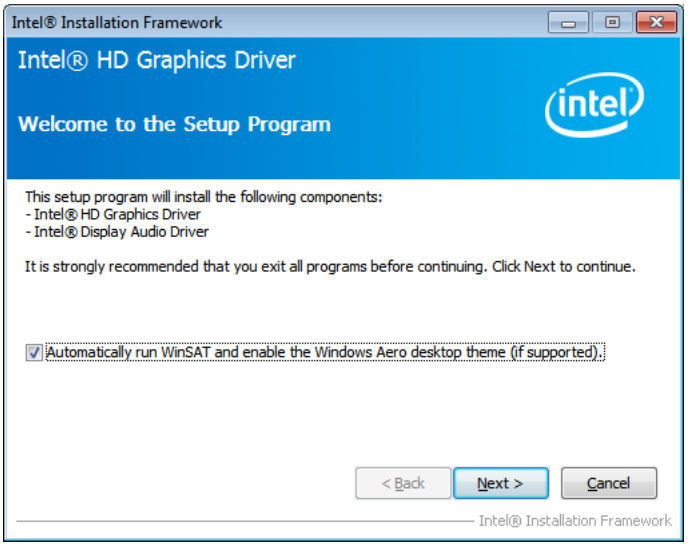
To install the VGA drivers, follow the steps below.

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

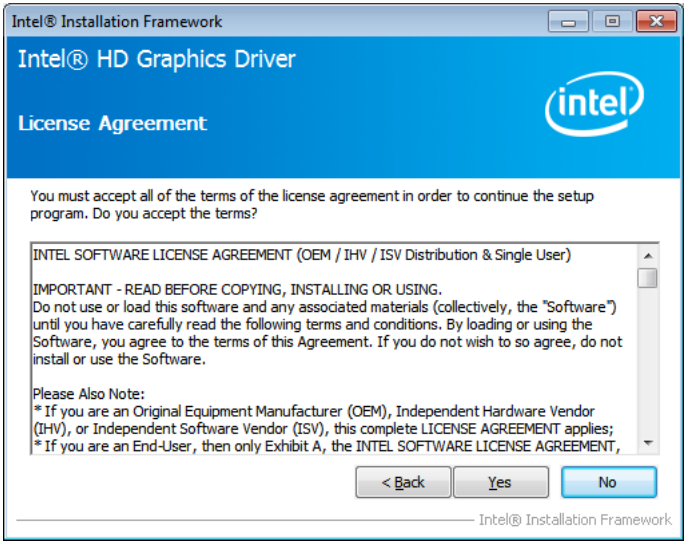


2. Click ***Intel(R) Core™ i3/i5/i7 Graphics Driver.***

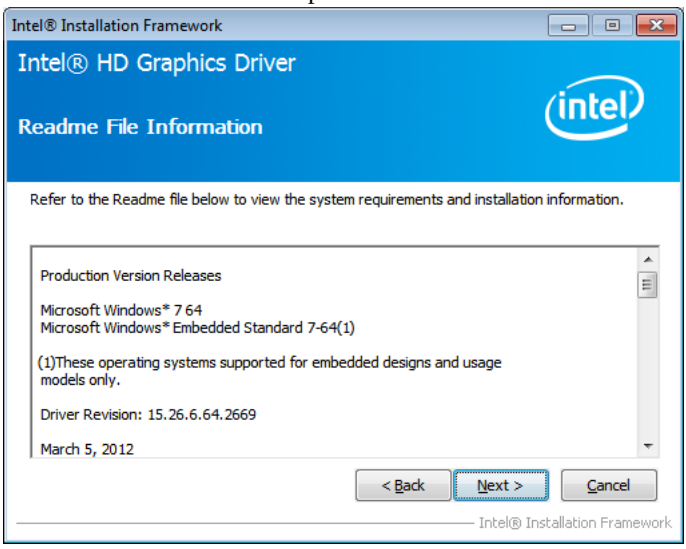
3. When the Welcome screen appears, click ***Next*** to continue.



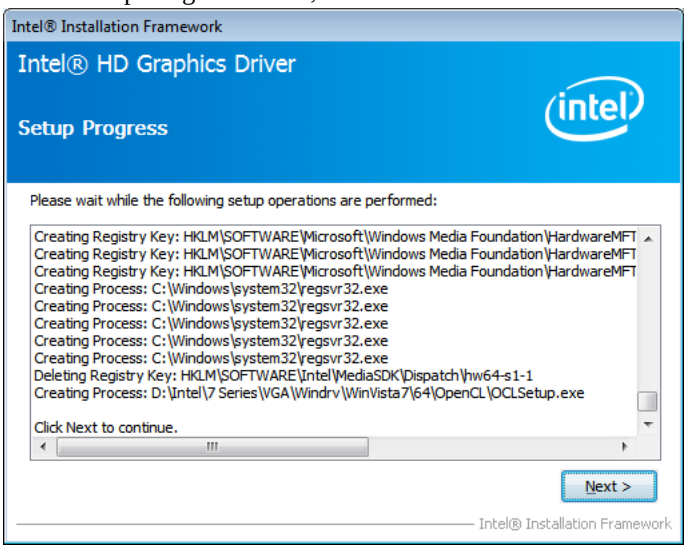
4. Click ***Yes*** to to agree with the license agreement and continue the installation.



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.



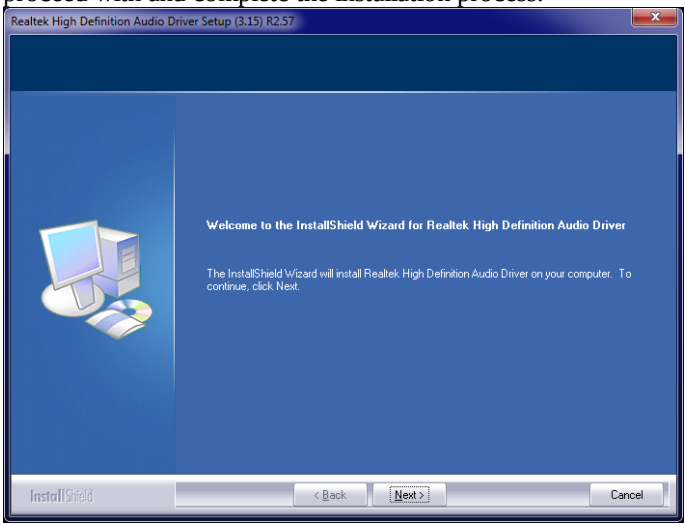
7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

Realtek HD Audio Driver Installation

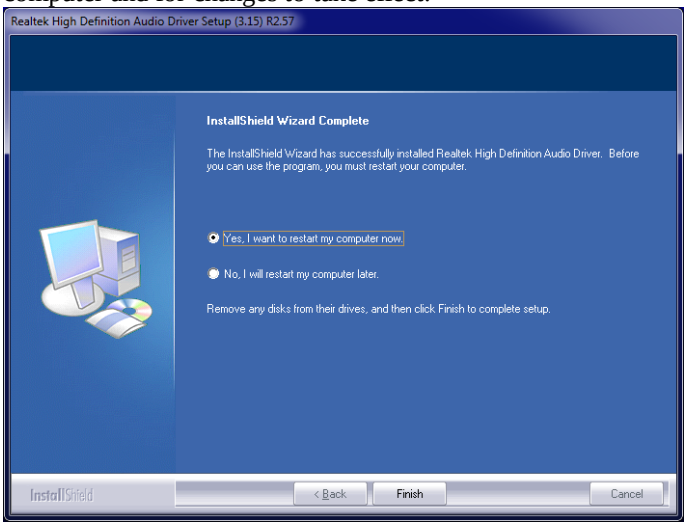
Follow the steps below to install the Realtek HD Audio Drivers.
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers***.

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.

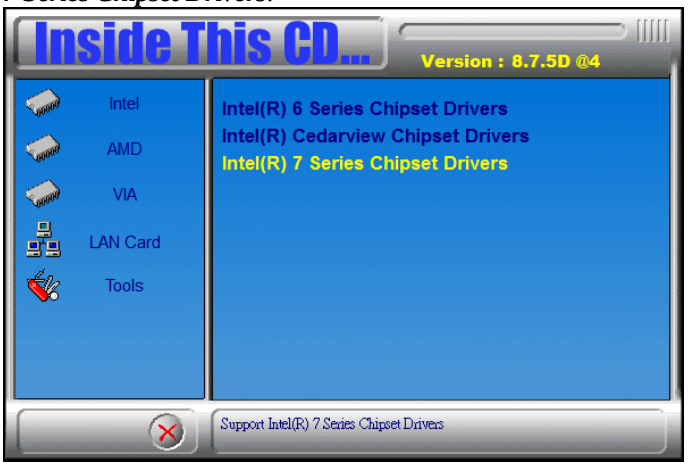


4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.



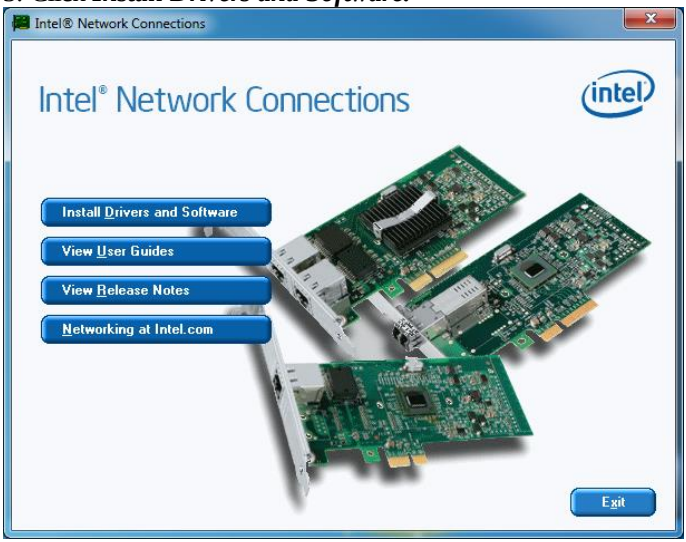
LAN Drivers Installation

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

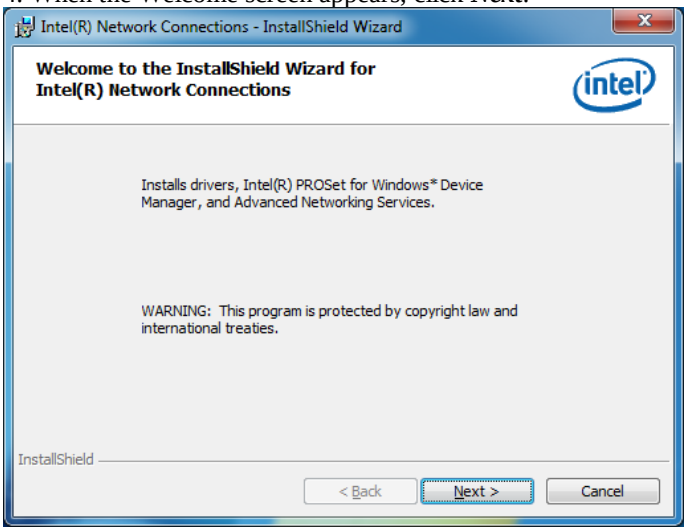


2. Click ***Intel(R) PRO LAN Network Driver.***

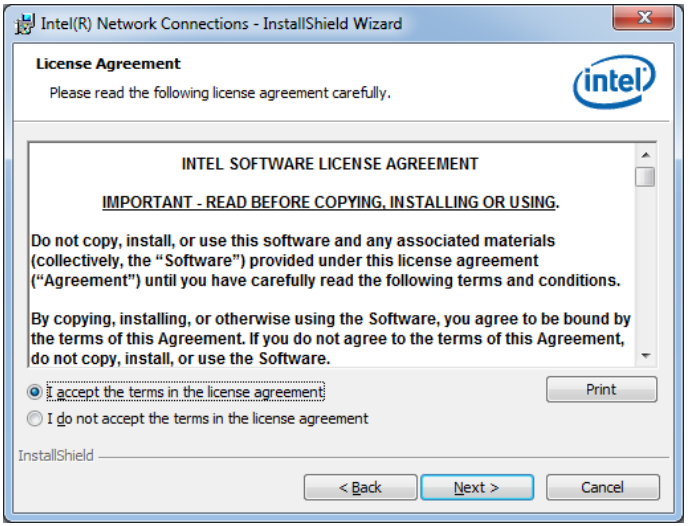
3. Click ***Install Drivers and Software.***



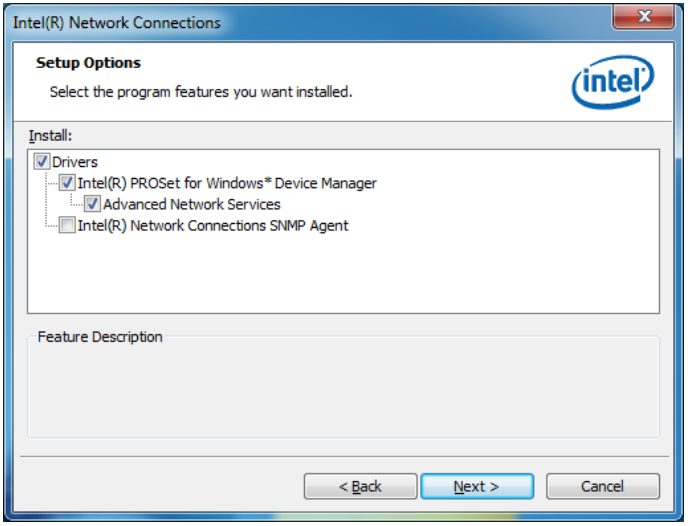
4. When the Welcome screen appears, click ***Next***.



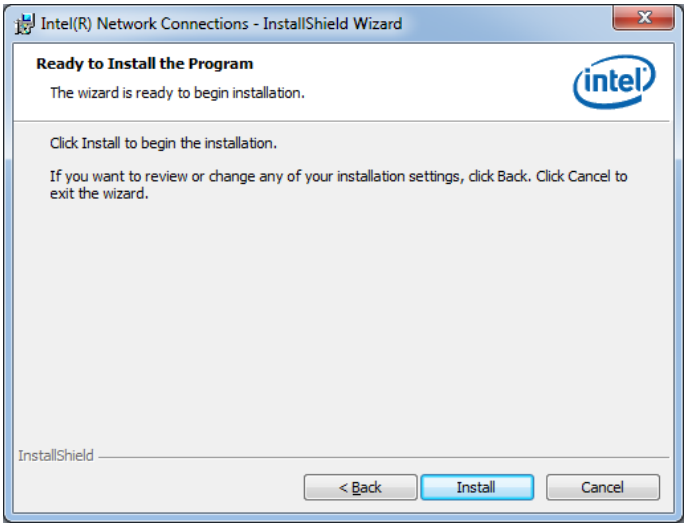
5. Click ***Next*** to to agree with the license agreement.



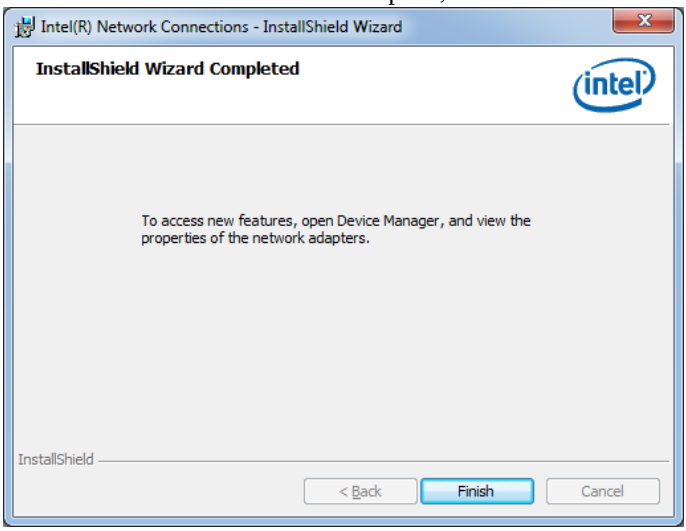
6. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



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



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



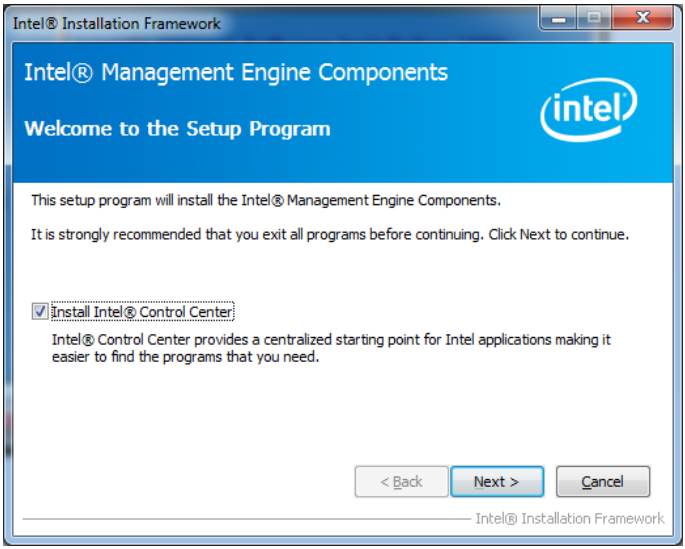
Intel® Management Engine Interface

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.

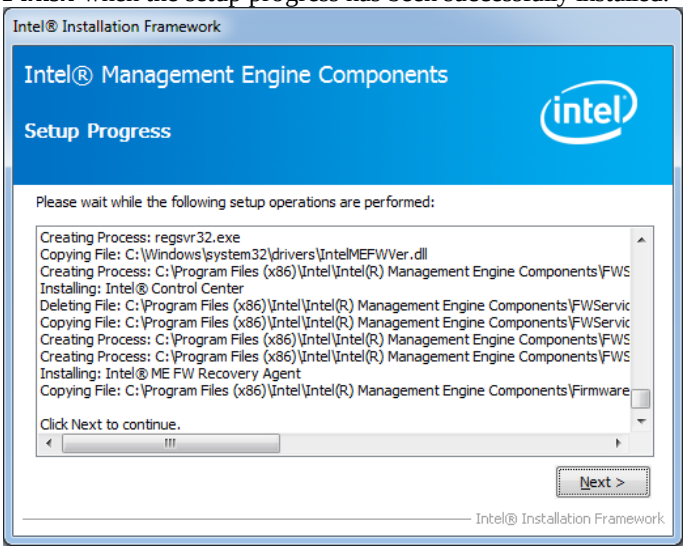
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) iAMT 8.0 Drivers***.

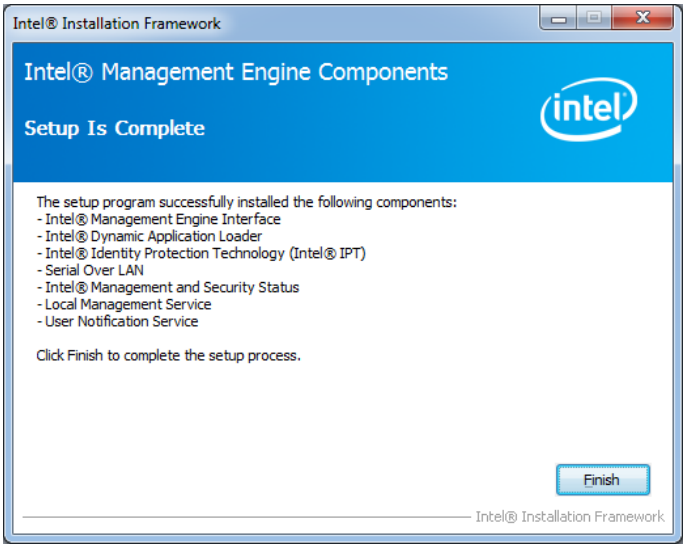
2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.



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.



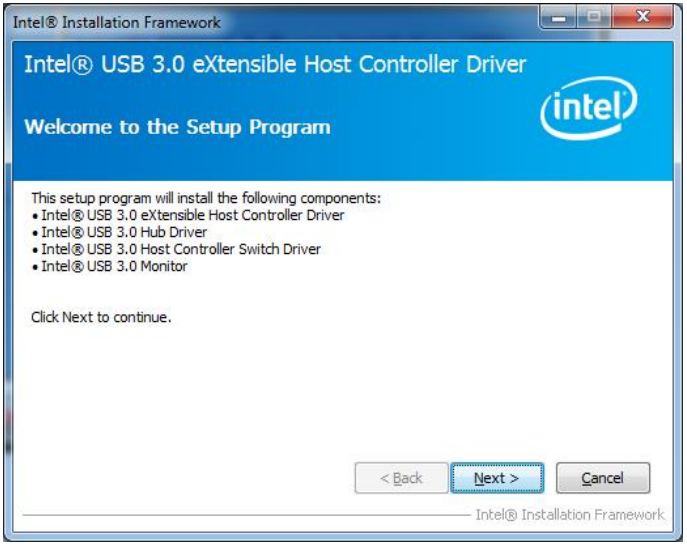


Intel® USB 3.0 Drivers

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

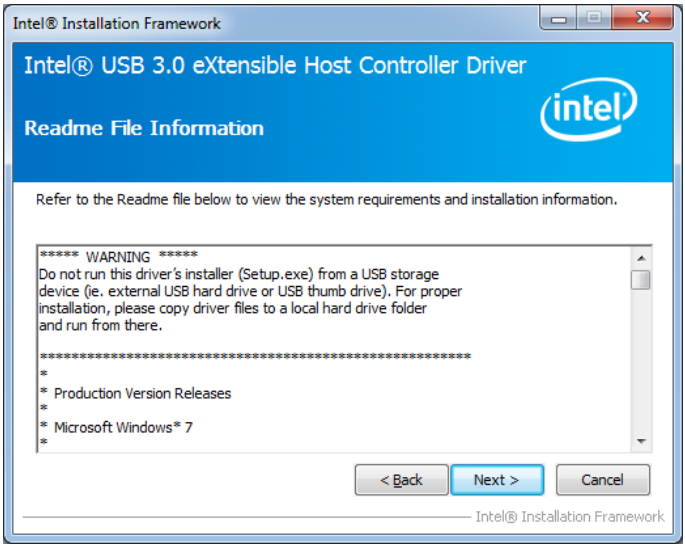
2. Click ***Intel(R) USB 3.0 Drivers.***

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

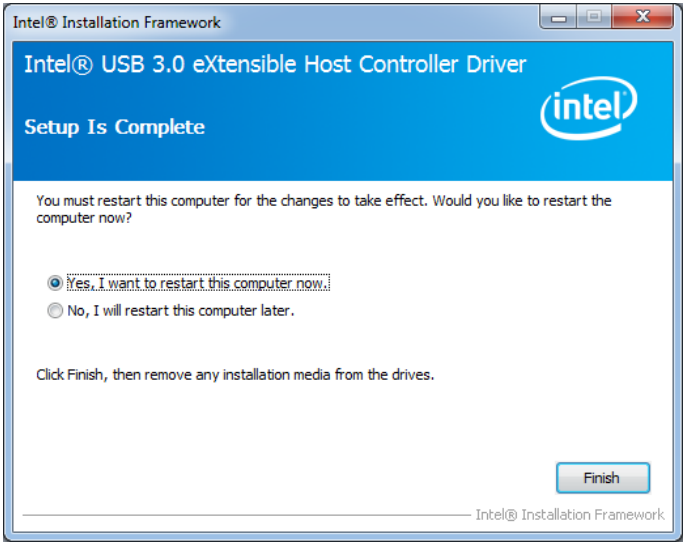


4. Click ***Yes*** to to agree with the license agreement and continue the installation.

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.



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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
0000h - 001Fh	DMA Controller #1
0020h - 003Fh	Interrupt Controller #1
0040h - 0043h	Timer
0050h - 0053h	Timer
0060h	Keyboard Controller
0064h	Keyboard Controller
0070h - 0077h	Real Time Clock
00A0h - 00BFh	Interrupt Controller #2
00C0h - 00DFh	DMA Controller #2
02E8h - 02EFh	Serial Port #4(COM4)
02F8h - 02FFh	Serial Port #2(COM2)
0378h - 037Fh	Parallel Port #1(LPT1)
03E8h - 03EFFh	Serial Port #3(COM3)
03F8h - 03FFh	Serial Port #1(COM1)
E000h - E01Fh	82583V Gigabit Network
F000h - F03Fh	Graphics adapter Controller
F060h - F07Fh	82579V Gigabit Network

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	PS/2 Keyboard
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ7	Serial Port #3
IRQ8	Real Time Clock
IRQ11	Serial Port #4
IRQ12	PS/2 Mouse
IRQ18	82583V Gigabit Network
IRQ20	82579V Gigabit Network

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

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

```
//-----------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----------------------------------------------------------------------------
#ifndef __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
```