FWA8308 Series

Networking Appliance

User's Manual

Version: 1.1

Table of Contents

Foreword

To prevent damage to the system board, please handle it with care and follow the measures below, which are generally sufficient to protect your equipment from static electricity discharge:

When handling the board, use a grounded wrist strap designed for static discharge elimination grounded to a metal object before removing the board from the antistatic bag. Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

When handling processor chips or memory modules, avoid touching their pins or gold edge fingers. Return the Network Appliance system board and peripherals back into the antistatic bag when not in use or not installed in the chassis.

Some circuitry on the system board can continue to operate even though the power is switched off. Under no circumstances should the Lithium battery cell used to power the real-time clock be allowed to be shorted. The battery cell may heat up under these conditions and present a burn hazard.

WARNING!

1. "CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED.

   REPLACE ONLY WITH SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS"
2. This guide is for technically qualified personnel who have experience installing and configuring system boards. Disconnect the system board power supply from its power source before you connect/disconnect cables or install/remove any system board components. Failure to do this can result in personnel injury or equipment damage.
3. Avoid short-circuiting the lithium battery; this can cause it to superheat and cause burns if touched.
4. Do not operate the processor without a thermal solution. Damage to the processor can occur in seconds.
5. Do not block air vents at least minimum 1/2-inch clearance required.

Chapter 1 Introduction

FWA8308 series was specifically designed for the network security & management market.

Network Security Applications:

- Firewall
- Unified Threat Management (UTM)
- Virtual Private Network (VPN)
- Proxy Server
- Caching Server

Network Management Applications:

- Load balancing
- Quality of Service
- Remote Access Service

The FWA networking appliance product line covers the spectrum from offering platforms designed for:

- SOHO
- SMB
- Enterprise

Each product is designed to address the distinctive requirements of its respective market segment from cost effective entry-level solutions to high throughput and performance-bound systems for the Enterprise level.

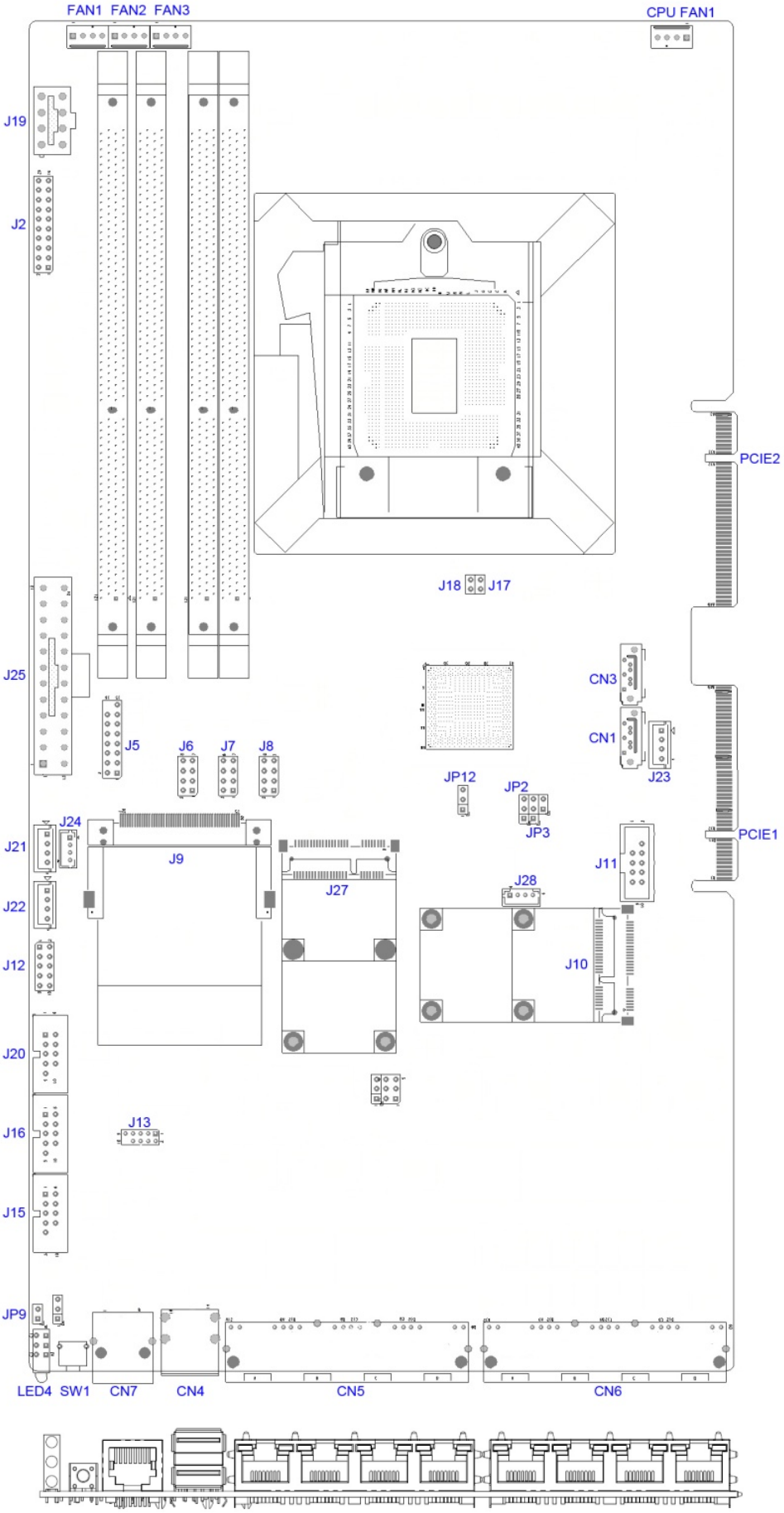
Chapter 2 System Specification

Product Name	FWA8308
Form Factor	19” 1U Mainstream Networking Product
Motherboard	MB968
Processor	• Support for Intel® Shark Bay DT LGA1150 Haswell processors • TDP = 35W ~ 84W (DC / QC)
Chipset	Intel® Lynx Point C226 PCH Package =23 mm x 22 mm , 0.65 mm ball pitch
Supported CPUs	● E3-1275 v3 ● E3-1225 v3 ● E3-1268L v3 ● i7-4770TE ● i7-4770S ● i5-4570S ● i5-4570TE ● i3-4330 ● i3-4330TE ● Celeron G1820TE ● Celeron G1820 ● Pentium G3320TE ● Pentium G3420
Memory	● Four DDR3 UDIMM total for 32GB max memory (4Gb chip support) ● Support DDR3 / DDR3L at 1.5V ● Dual channel DDR3 up to 1600 MHz ● Unbuffered ● ECC or non-ECC
Network	● Eth1: Intel® Clarkville I217LM GbE PHY , 6mm x 6mm, QFN48 with iAMT 9.0 supporting. No Bypass ● Eth2~4: Intel® Pearsonville I210-AT. No Bypass. ● Eth5~6: Intel® Pearsonville I210-AT. Support Bypass. ● Eth7~8: Intel® Pearsonville I210-AT. Support Bypass.
Expansion Slot	● Two PCI-e x8 Golden Finger ● CF Card Socket ● Mini PCI-e Socket (m-SATA compatible)
Storage	One internal 2.5” HDD (FWA8308 & FWA8308-RPSU) One internal 3.5” HDD (FWA8308-2SLOT)
Front Panel	● Two RJ-45 1x4 connectors for Eth1~4 & 5~6 ● USB 3.0 x2 ● RJ-45 (for console, COM1) ● Three LEDs for Power, Bypass & Status ● Factory Mode Restore Reset Switch
Rear Panel	● PSU inlet ● 1x or 2x Slot (Depend on product SKU)
USB Port	● Two USB 3.0 + 2.0 ports at front panel ● One USB 2.0 for Mini PCI-e ● Six USB 2.0 pin headers (pitch 2.54)

Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	Ground
USB1-	3	4	USB2+
USB1+	5	6	USB2-
Ground	7	8	VCC

ATM	ATM 9.0
TPM	Nuvoton WPCT210AA0WX TPM1.2
VGA	Pin header on board
LCM	2x16 characters LCM
Watchdog Timer	256 segments, 0, 1, 2...255 sec/min
Power Supply	● 300W Single PSU (FWA8308 & FWA8308-2SLOT) ● 275W 1+1 redundant PSU (FWA8308-RPSU)
Dimensions	44 (H) x 440 (W) x 406.5 (D) mm
Operation Temperature	0 ~ 45 ˚C
Storage Temperature	-20 ~ 70 ˚C
Operation Humidity	5% ~ 95%
Certifications	CE, FCC, LVD
Compatible Front Expansion Cards	● IBP161: 4-port RJ-45 10/100/1000 Copper LAN Module Card ● IBP162: 2-port 10 GbE SFP+ LAN Module Card ● IBP163: 2+2 ports GbE Copper or SFP LAN Module Card ● IBP164: Crypto Acceleration Card ● IBP165: 4-port RJ-45 10/100/1000 Copper LAN Module Card ● IBP167: 8-port RJ-45 10/100/1000 Copper LAN Module Card ● IP331: PCI-e 1-to-1 Riser Card ● IP332: PCI-e Adapter Card (with 2.5” HDD Interface) ● IP333: PCI-e 2-to-2 Riser Card ● IP335: PCI-e 1-to-2 Riser Card

Jumper Locations on MB968



Jumper Settings on MB968

JP2: Clear CMOS Setting

JP2	Setting
	Normal
	Clear CMOS

JP3: Clear ME Setting

JP3	Setting
	Normal
	Clear ME

JP9: AT / ATX Mode Setting

JP9	Setting
	ATX
	AT

JP12: BIOS Flash Security Setting

JP12	Setting
	Normal
	For BIOS Update

JP15: LED Function Selection

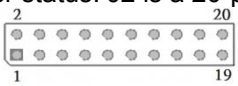
JP15	Setting
	HDD Activate
	Bypass Activate

J17, J18: PCIE Config Setting

J18	J17	Setting
		2 x 8 for Golden Finger PCIE1 & PCIE2
		1x16 for Golden Finger PCIE2

J2: System Function Connector

J2 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J2 is a 20-pin header that provides interfaces for the following functions



Pin 2, 4, 6, 8: Speaker

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.

Pin #	Signal Name
2	SPEAKER
4	NC
6	GND
8	+5V

Pin 1, 3, 5: Power LED

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

Pin #	Signal Name
1	+5V
3	NC
5	GND

Pin 13, 14: ATX Power ON Switch

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

Pin #	Signal Name
13	GND
14	Power_ON

Pin 17, 18: Reset Switch

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

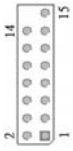
Pin #	Signal Name
17	GND
18	PM_SYSRST#

Pins 19, 20: HDD LED

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

Pin #	Signal Name
19	+3.3V
20	-HDD_LED

J5: VGA Connectors

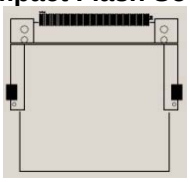


SIGNAL NAME	Pin #	Pin #	Signal Name
VGA_R	1	2	VGA_PWR
VGA_G	3	4	GND
VGA_B	5	6	NC
NC	7	8	VGADDCDATA
GND	9	10	HSYNC
GND	11	12	VSYNC
GND	13	14	VGADDCCLK
GND	15		

J6, J7, J8: USB6~USB11 Ports

SIGNAL NAME	Pin #	Pin #	Signal Name
+5V	1	2	GND
D-	3	4	D+
D+	5	6	D-
GND	7	8	+5V

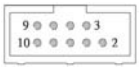
J9: Compact Flash Socket



Note: CF card supports IDE mode only.
If CF card applied, please set the SATA configuration to "IDE mode" in BIOS.

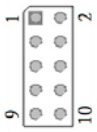
J10: Mini PCI- E / mSATA Socket

J11: SPI Debug Port



SIGNAL NAME	Pin #	Pin #	Signal Name
		2	NC
SPI_CS# 0	3	4	+3.3V
SPI_SO	5	6	SPI0_HOLD#
SPI0_WP#	7	8	SPI_CLK
GND	9	10	SPI_SI

J12: Digital IO 4-IN / 4-OUT Connector

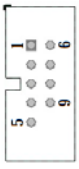


SIGNAL NAME	Pin #	Pin #	Signal Name
GND	1	2	+5V
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J13: LPC Debug Port

Signal Name	Pin #	Pin #	Signal Name
LPC_AD0	1	2	SIO_PLTRST#
LPC_AD1	3	4	LPC_FRAME#
LPC_AD2	5	6	+3.3V
LPC_AD3	7	8	Ground
LPC_CLK	9		

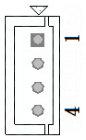
J15, J16, J20: Serial Port (COM1~COM3)



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

J19, J25: ATX Power Connector

J21, J22, J23: Power Connector, Pitch 2.54mm



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

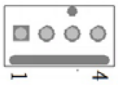
J24: Power Connector, Pitch 2.0mm

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

J27: mSATA Socket

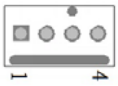
CN1, CN3: HDD Serial ATA Connector

CPU_FAN1: CPU Fan Connector
CPU_FAN1 is a 4-pin header for the CPU fan.
The fan must be 12V (Max. 1A).



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

FAN1, FAN2, FAN3: System Fan Connectors
FAN1, FAN2, FAN3 is a 4-pin header for system fans.
The fan must be 12V (Max. 1A).



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

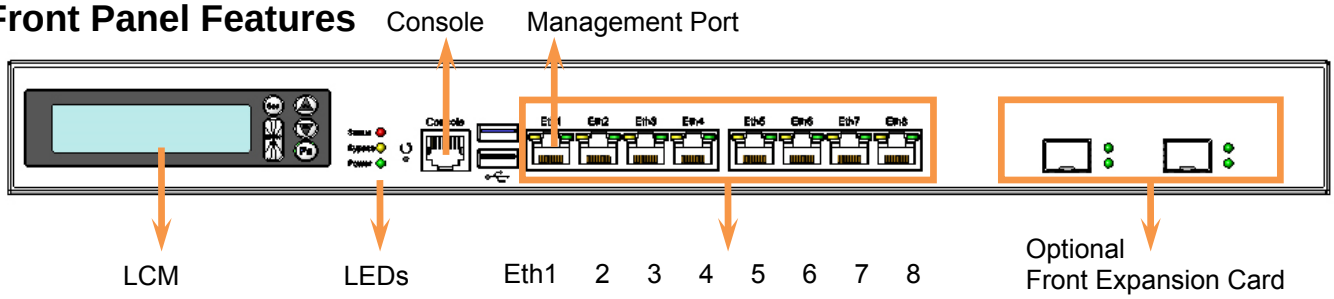
LED4: Status LED
A1 & C1 : Status LED
A2 & C2 : Bypass or HDD status LED
A3 & C3 : Power LED

SIGNAL NAME	Pin #	Pin #	Signal Name
SIO_GPIO33	A1	C1	SIO_GPIO32
+5 V	A2	C2	JP15 Selection
+3.3 V	A3	C3	GND

SW1: Software reset button
I/O base :
Read IO 0x1C00 and set bit 7 to “1” (Enable GPIO function)
Read IO 0x1C04 and set bit 7 to “1” (GPIO act as GPI)
Read IO 0x1C0C and set check bit 7 (Control Pin)

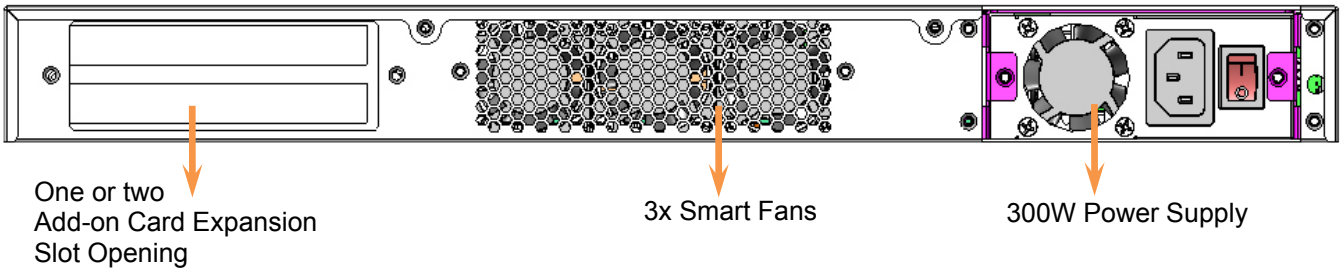
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	PCH GPIO7

Front Panel Features

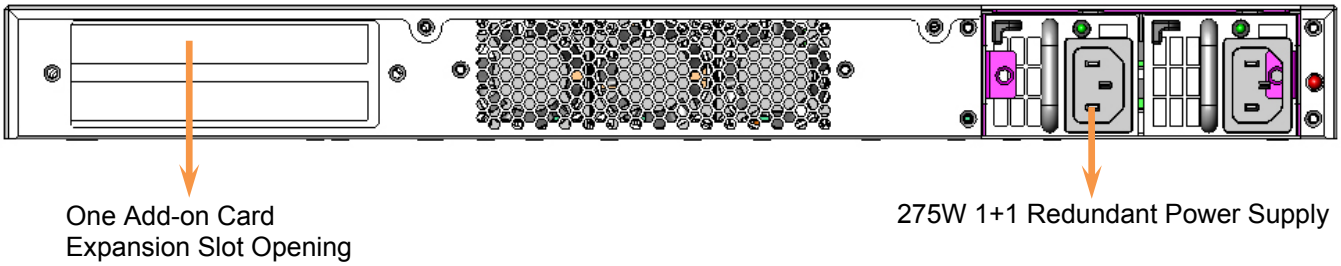


Rear Panel Features

FWA8308 & FWA8308-2SLOT



FWA8308-RPSU



Chapter 4 Console Mode Information

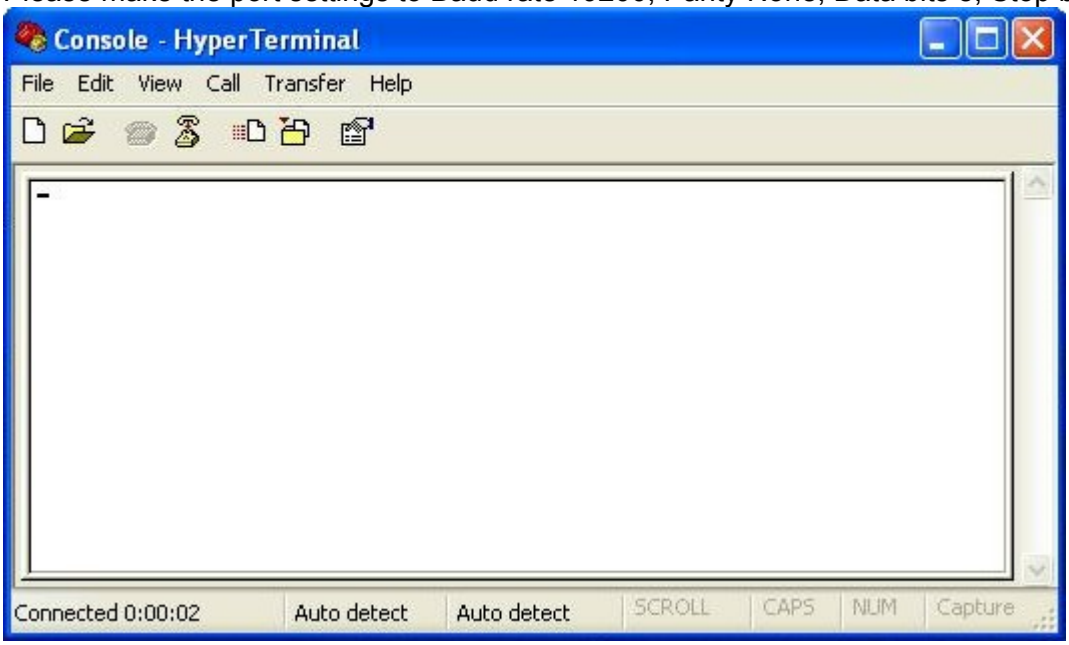
FWA8308 supports output information via Console in BIOS level.

Prepare a computer as client loaded with an existing OS such as Windows XP and Windows 7.
Connect client computer and FWA8308 with NULL Modem cable.
Follow the steps below to configure the Windows Hyper Terminal application setting:

1. Execute Hyper Terminal. Issue command “hypertrm”.
2. Customize your name for the new connection.

3. Choose COM port on the client computer for the connection.

4. Please make the port settings to Baud rate 19200, Parity None, Data bits 8, Stop bits 1



5. Power on FWA8308.
   Press <**Tab**> key to enter BIOS setup screen in **Console mode**.
   Press <**Del**> key to enter BIOS setup screen in **VGA mode**.

Chapter 5 Open the Chassis

Fig. 5-2 Take off six screws and open the top lead

Fig. 5-3 The base stand

Chapter 6 Installing DDR3 Memory

Install system memory by pulling the socket's arm and pressing it into the slot gently.

Fig. 6-1 Open both arms on DIMM socket

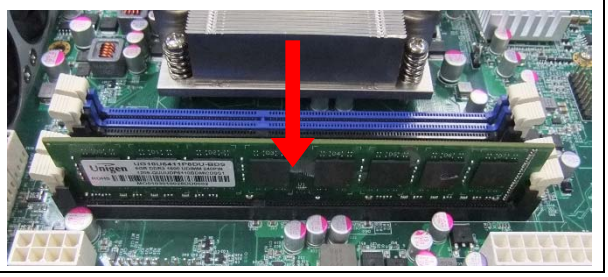


Fig. 6-2 Install DIMM

Notice:

1. **MB968 supports two groups of dual channels memory.**
   One group is on the black DIMM sockets, and the other one is blue DIMM sockets.
2. **The recommended height of memory module doesn't exceed 30 mm.**

Chapter 7 Installing CompactFlash Card

Insert CompactFlash card into the socket.

Fig. 7-1 *Insert CompactFlash Card into the CF interface*

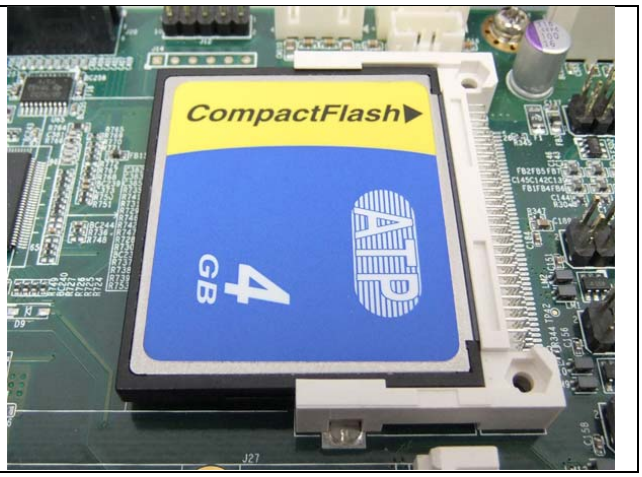


Fig. 7-2 *Completion of CompactFlash Card connection*

Chapter 8 Removing and Installing the Battery

1. Press the metal clip back to eject the button battery.
2. Replace it with a new one by pressing the battery with fingertip to restore the battery

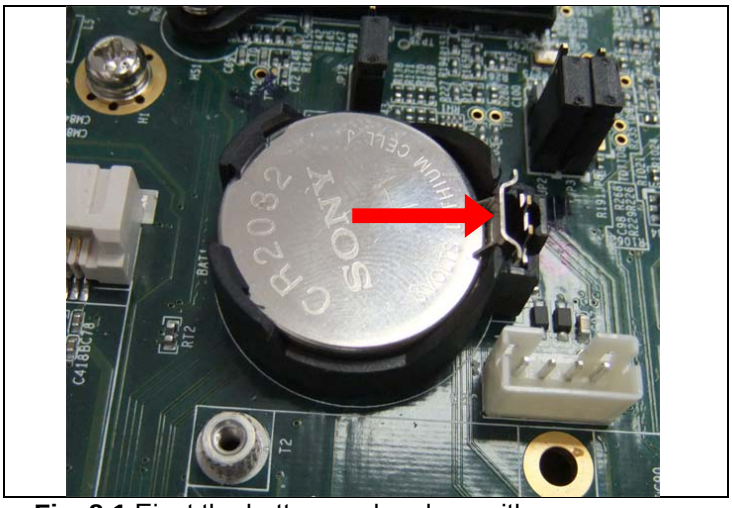


Fig. 8-1 Eject the battery and replace with new one

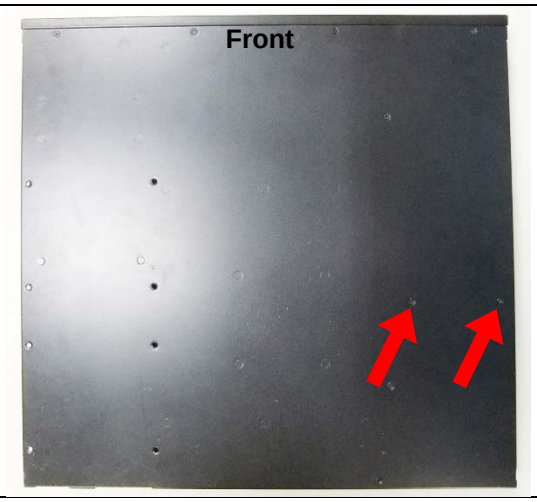


Fig. 9- *Take off two screws on bottom to remove 2.5" HDD bracket.*

Fig. 9-2 *Fasten the four screws to lock HDD and bracket together.*

Fig. 9-3 *Push HDD into connector*

Fig. 9-4 *Completion of HDD connection*

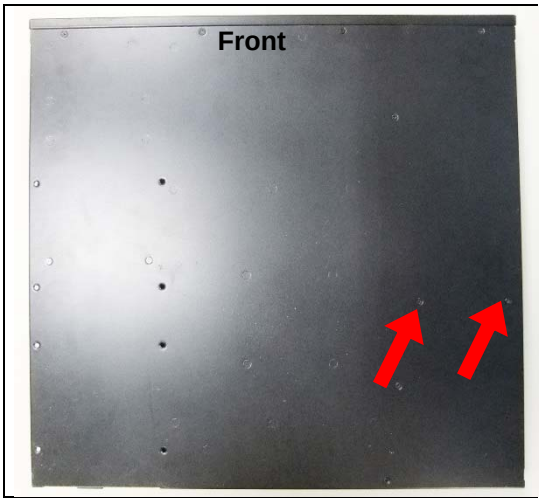


Fig. 9-5 *Fix HDD bracket with two screws*

Chapter 10 Installing Optional Dual 2.5” HDD Kit

The following is for optional Dual 2.5” HDD kit:

Fig. 10-1 Push eight shock-absorbent pads to fasten HDD bracket.

Fig. 10-2 Fasten the screws to lock 2.5” HDD bracket and bracket together.

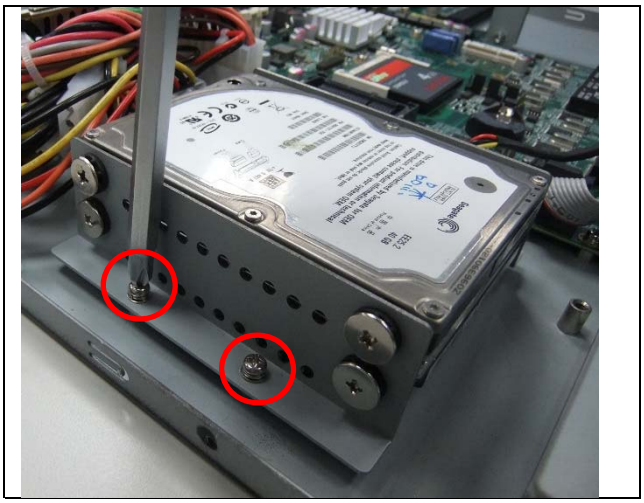


Fig. 10-3 *Fix HDD bracket on chassis with four screws*

Chapter 11 Installing Add-on Card

Fig. 11-1 Loosen screw on slot bracket.

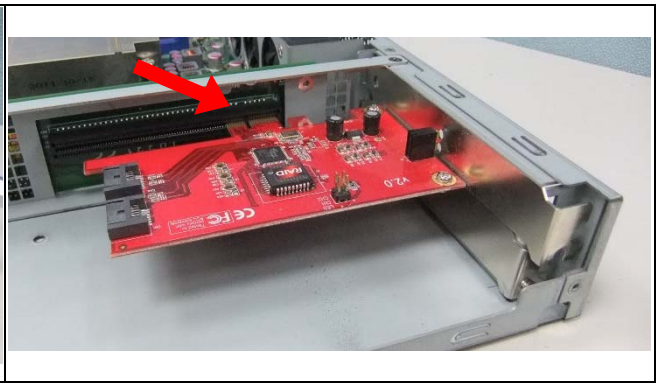


Fig. 11-2 Slide in PCI-e add-on card.

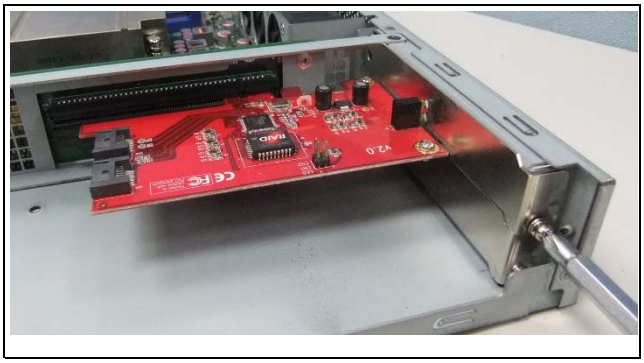


Fig. 11-3 *Fix the add-on card*

Chapter 12 Installing Mini PCI-e Card

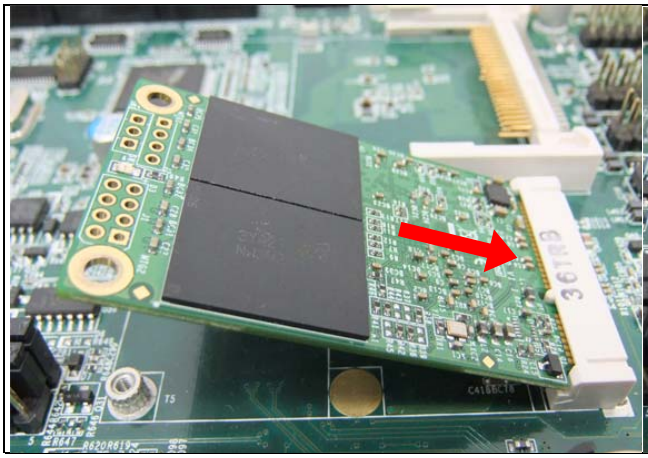


Fig. 12-1 Insert Mini PCI-e card.

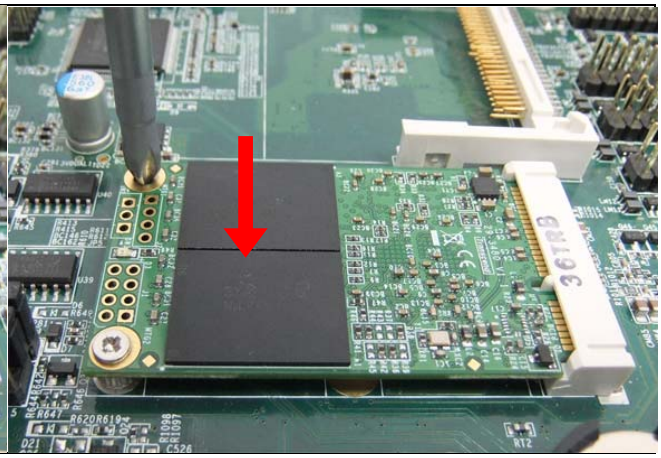
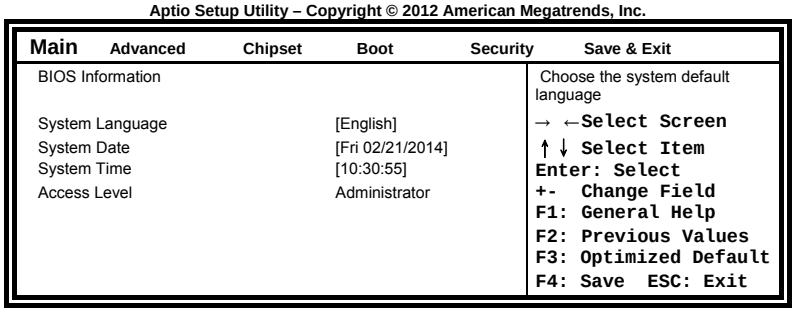


Fig. 12-2 Push down Mini PCI-e card & fix it with two M2 screws

Chapter 13 BIOS Information

This setup allows you to view processor configuration used in your computer system and set the system time and date.

Main Settings

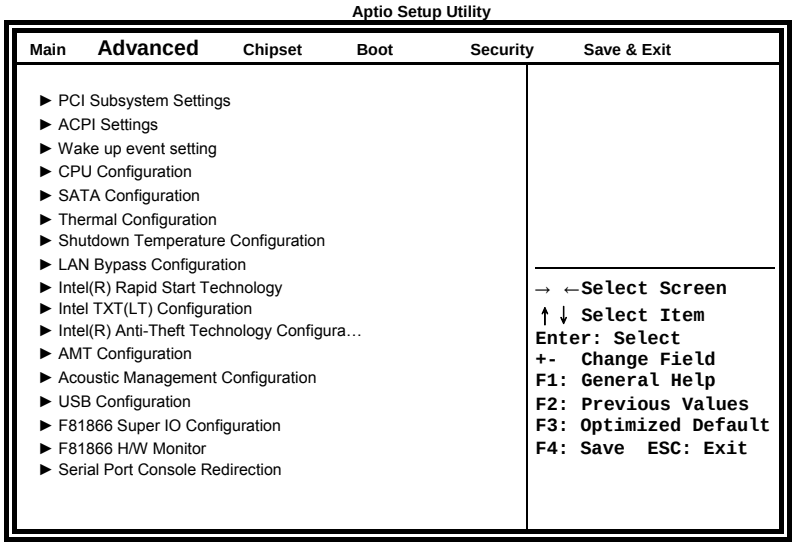


System Language
Choose the system default language.

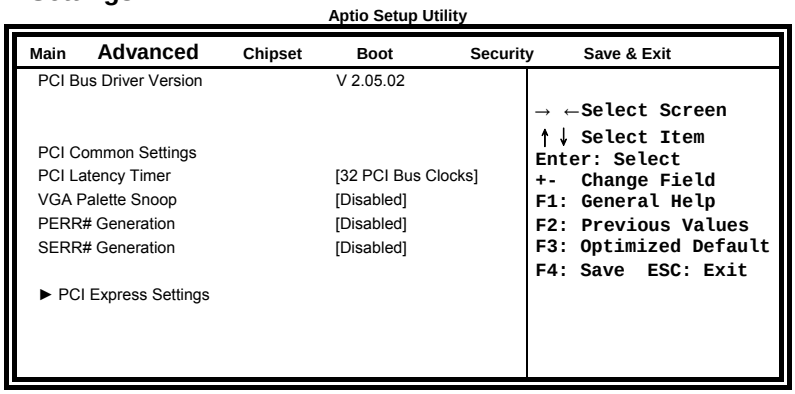
System Date
Set the Date. Use Tab to switch between Data elements.

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.



PCI Subsystem Settings



PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

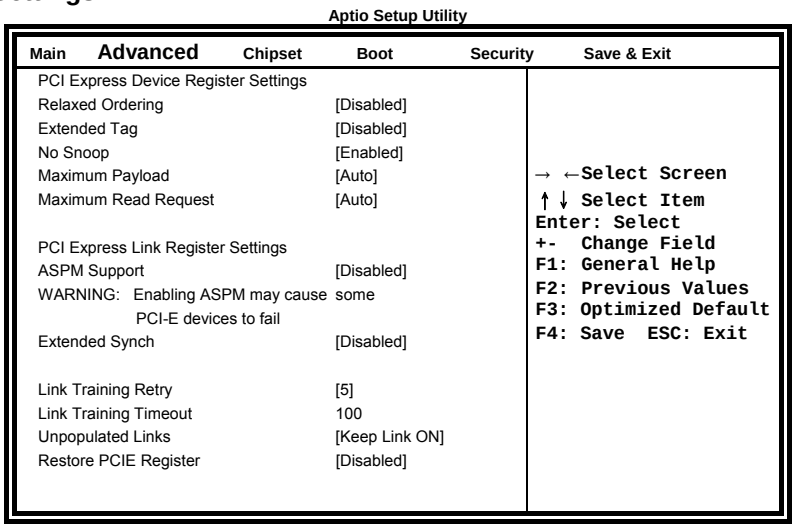
VGA Palette Snoop
Enables or disables VGA Palette Registers Snooping.

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.

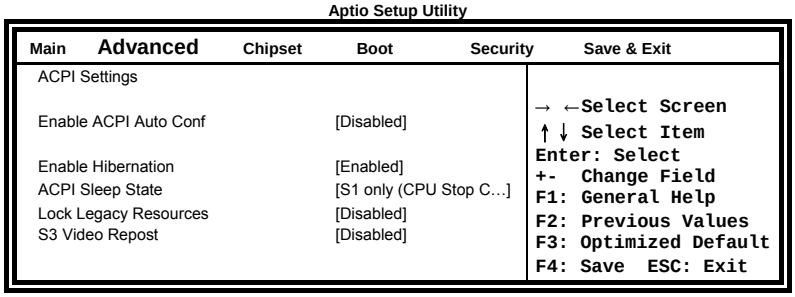
Extended Synch
If ENABLED allows generation of Extended Synchronization patterns.

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

Link Training Timeout
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



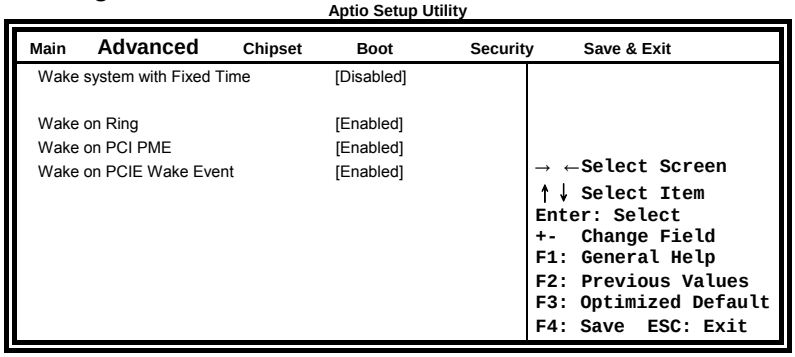
Enable Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

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.

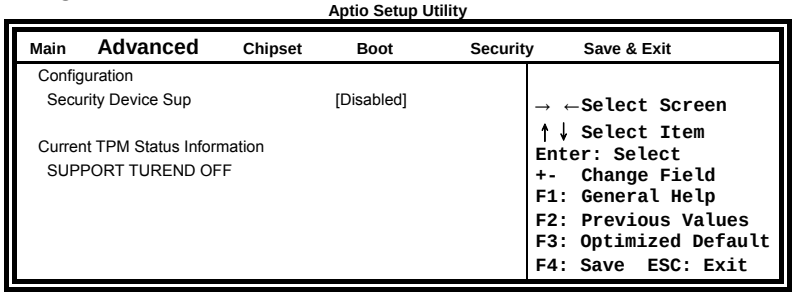
Wake up event settings



Wake system with Fixed Time
Enables or Disables System wake on alarm event. When enabled, System will wake on the hr::min:: sec specified.

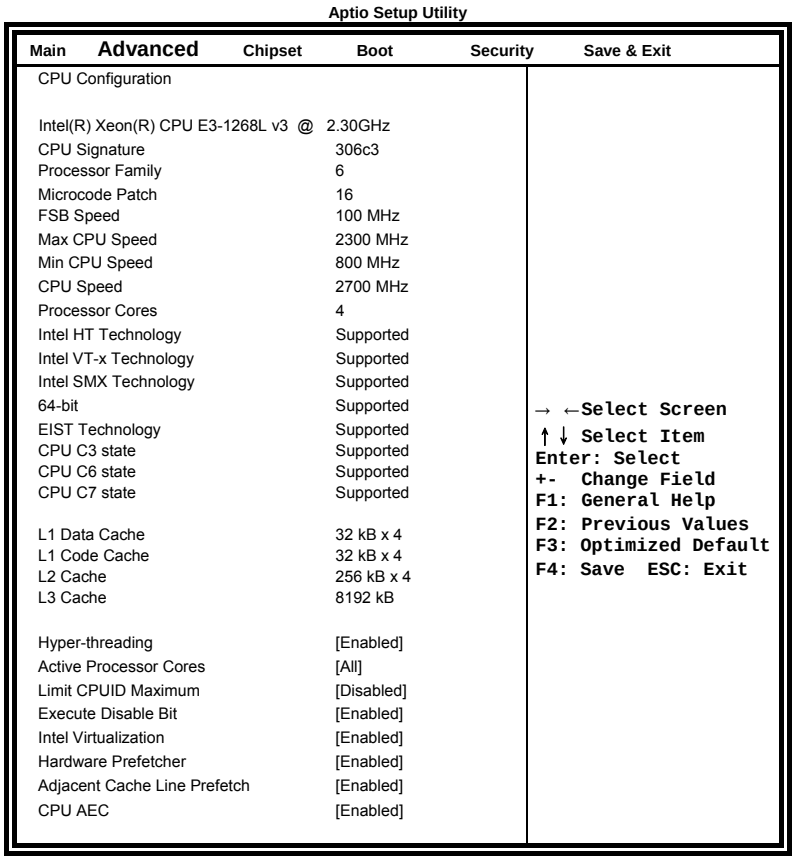
Wake on PCIE PME Wake Event
The options are Disabled and Enabled.

Trusted Computing



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.)

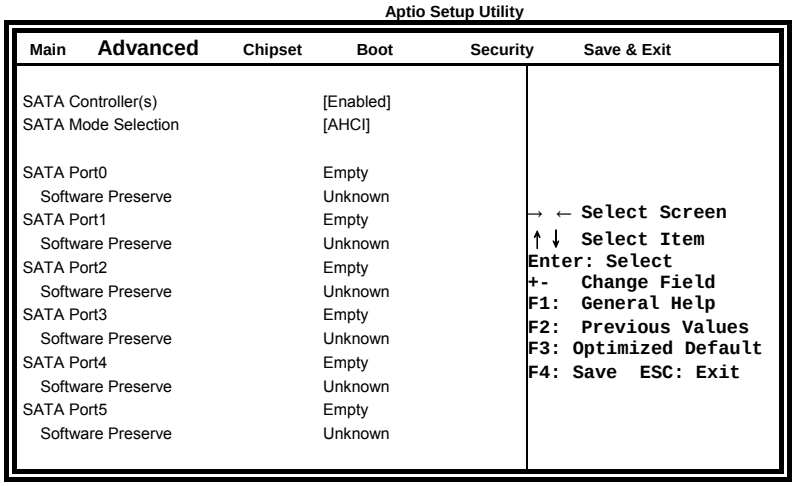
Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

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

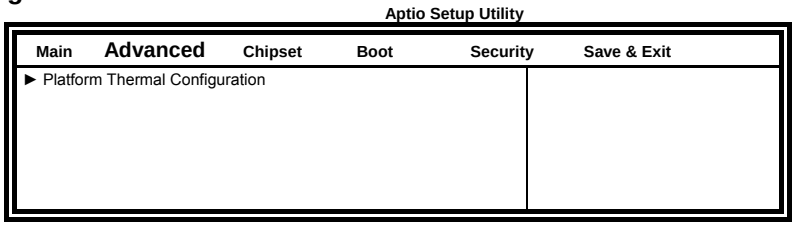
SATA Devices Configuration.



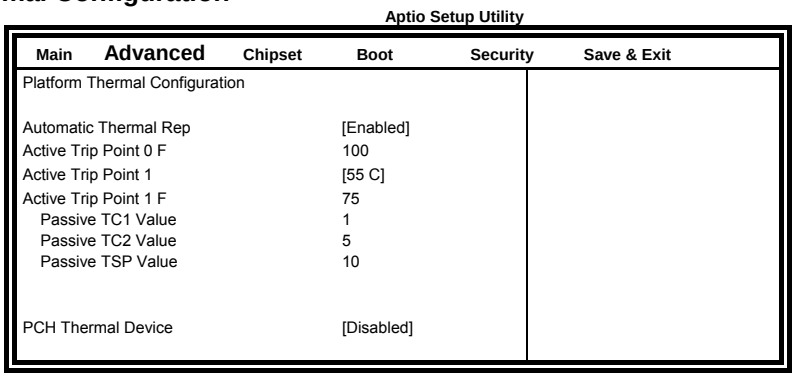
SATA Controller(s)
Enable / Disable Serial ATA Controller.

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

Thermal Configuration

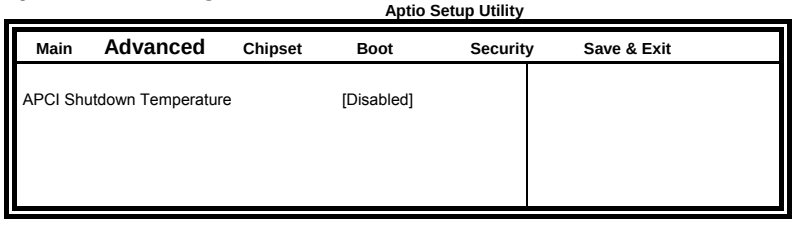


Platform Thermal Configuration



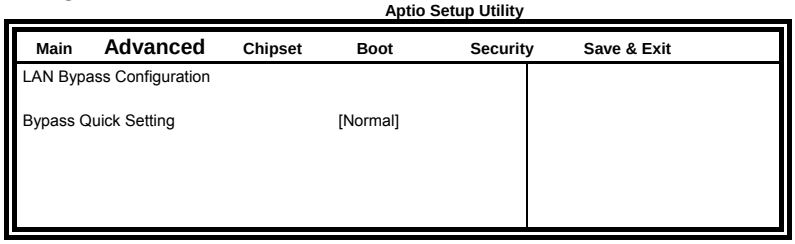
Automatic Thermal Reporting
Configure CRT, PSV and ACO automatically based on values recommended in BWG's thermal reporting for thermal management settings. Set to Disable for manual configuration.

Shutdown Temperature Configuration



ACPI Shutdown Temperature
Set function Disabled or 70/75/80/85/90/95/100 ℃

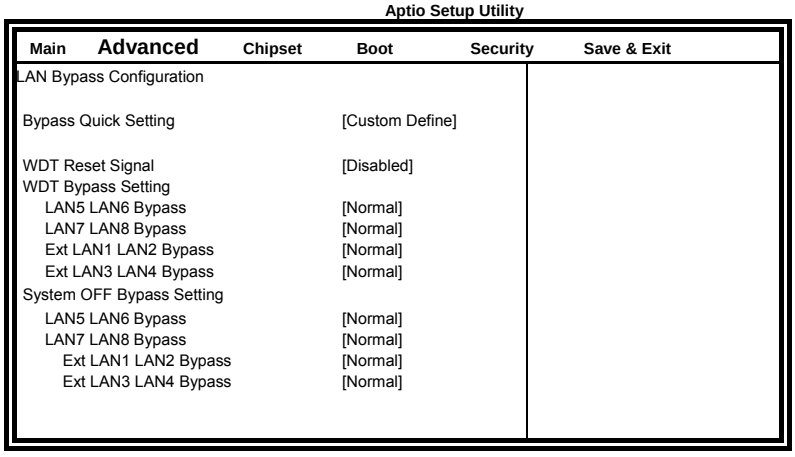
LAN Bypass Configuration



Bypass Quick Setting

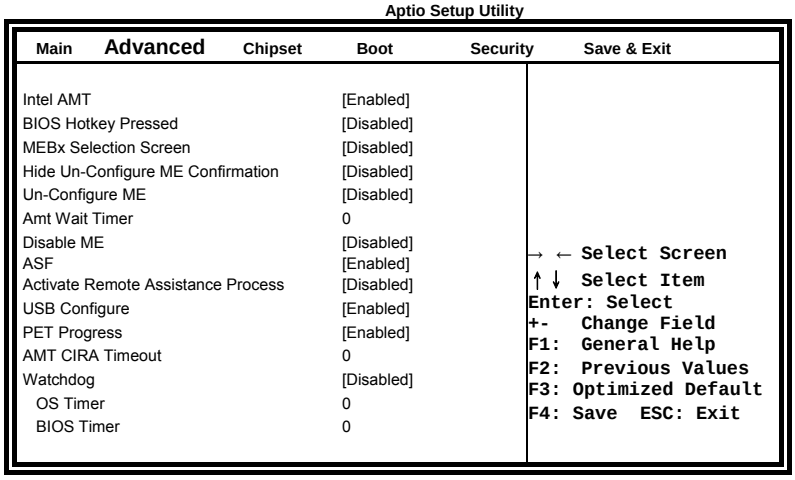
Set LAN Bypass to Normal, Bypass, Firewall or Custom Define Mode

Normal mode: All LAN ports in NORMAL. When Watchdog monitor system hangs, software will initiates a system reboot.
Bypass mode: All LAN ports in BYPASS during power-off or watchdog initiates Bypass. System will not reboot.
Firewall mode: All LAN ports in BYPASS until software change it to NORMAL under OS. When watchdog monitors system hang, software will initiates a system reboot.
Custom Define mode: Customer defines watchdog reset, watchdog Bypass and power-off Bypass settings.



Note: "Ext LAN Bypass" items only appear when extended IBASE LAN module card installed.

AMT Configuration



AMT Configuration

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

Unconfigure ME

Perform AMT/ME unconfigure without password operation.

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Activate Remote Assistance Process

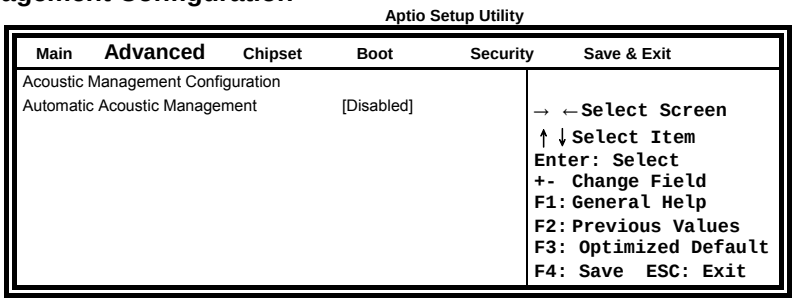
Trigger CIRA boot.

PET Progress

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

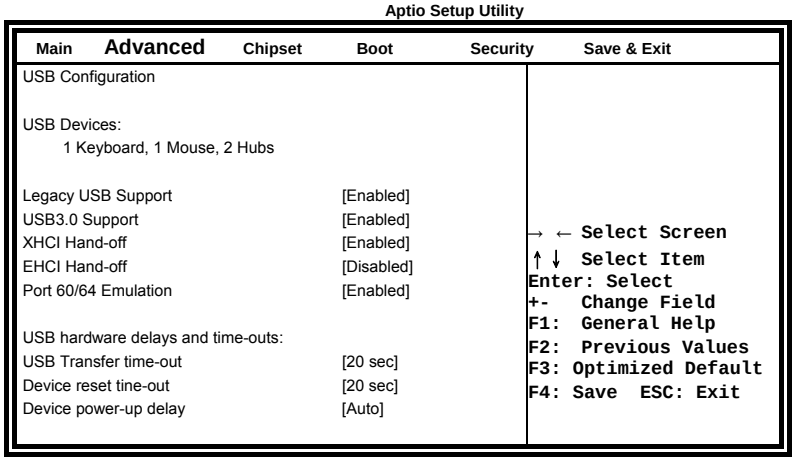
Watchdog Timer
Enable/Disable Watchdog Timer.

Acoustic Management Configuration



Smart fan function Enable or Disable.

USB Configuration



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.

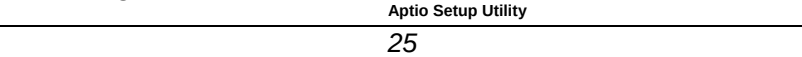
Port 64/60 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

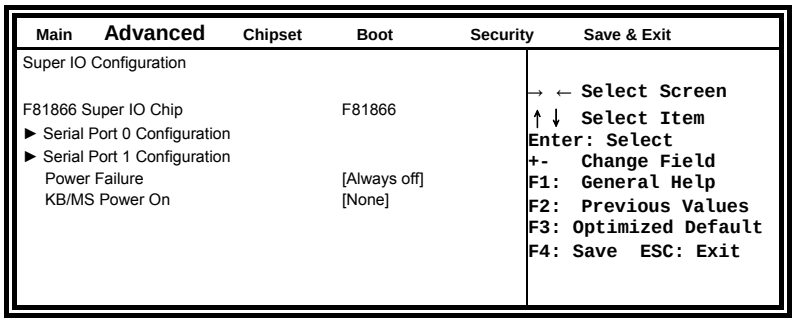
USB Transfer time-out
The time-out value for Control, Bulk, and Interrupt transfers.

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

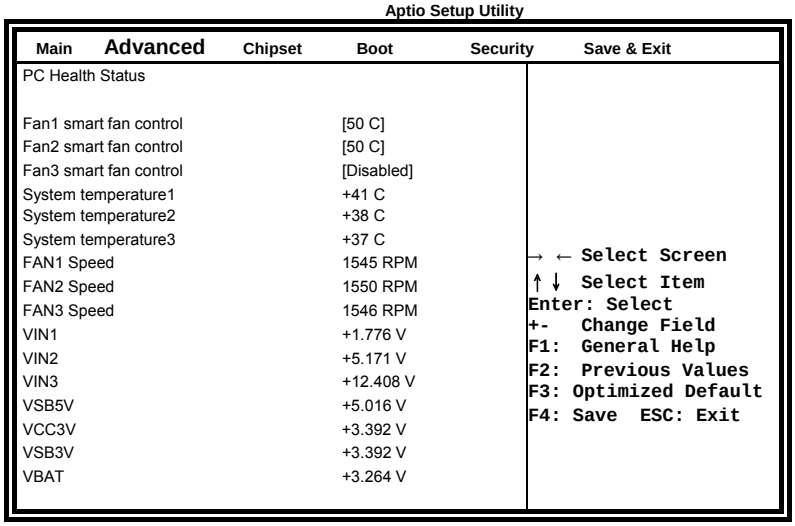




Serial Port Configuration

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

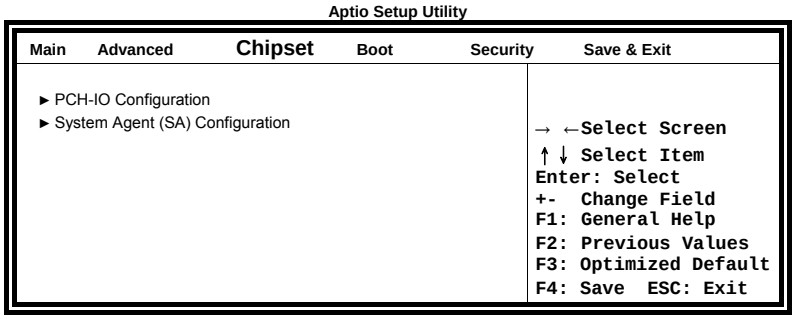
These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Fan1/Fan2/Fan3 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.

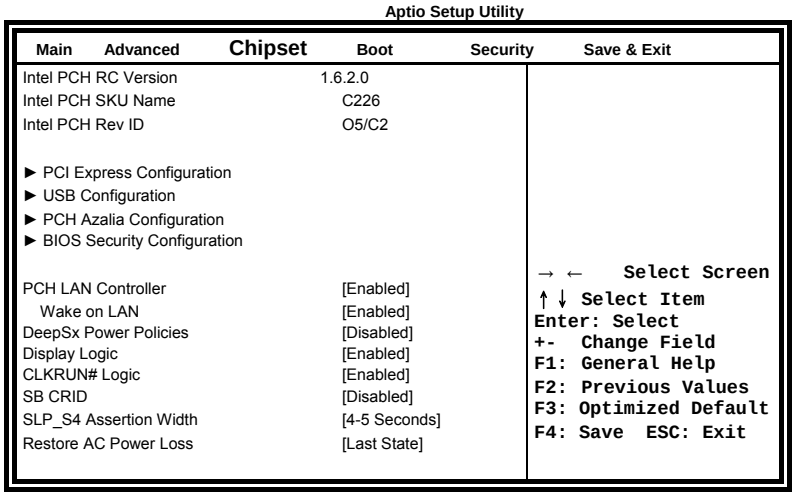
Chipset Settings

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.)

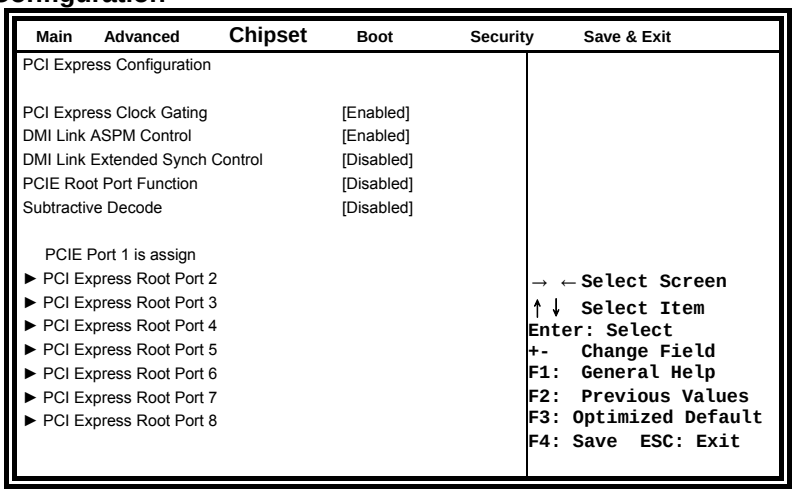
SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

PCI Express Configuration



PCI Express Clock Gating

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

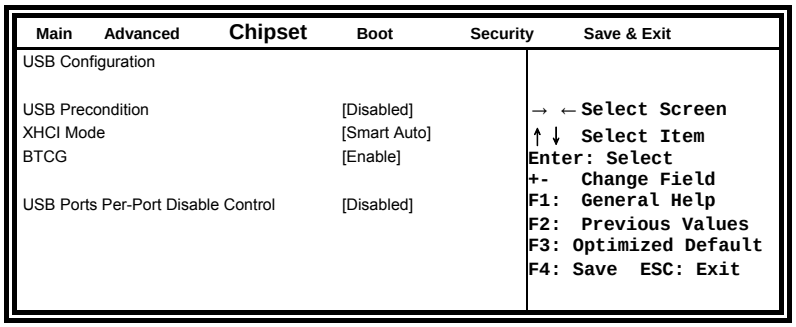
DMI Link ASPM Control

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

PCIE Root Port Function

Enable or disable PCI express Root Port function swapping.

USB Configuration



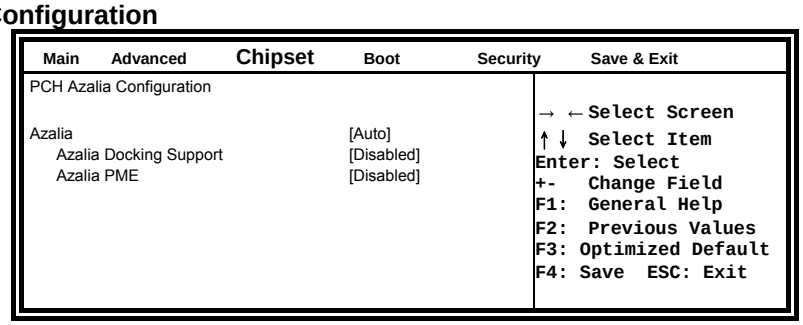
USB Precondition
Precondition work on USB host controller and root ports for faster enumeration.

xHCI Mode
Mode of operation of xHCI controller

BTCG
Enable or disable trunk clock gating.

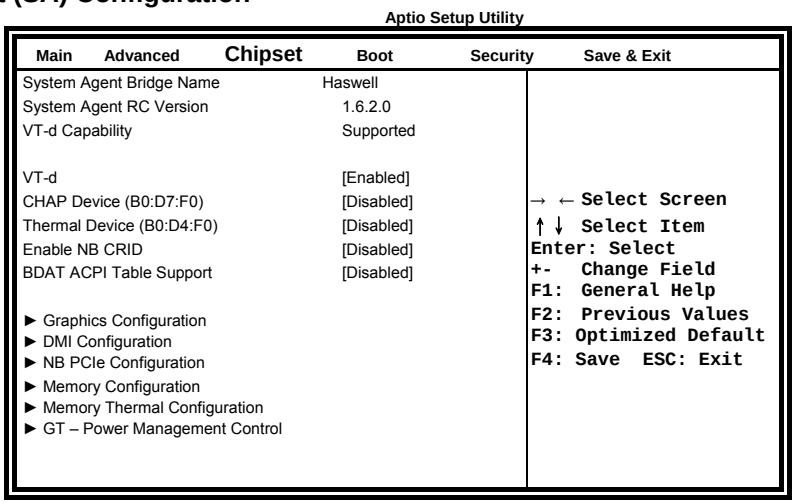
USB Ports Per-Port Disable Control
Control each of the USB ports (0~13) disabling.

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.

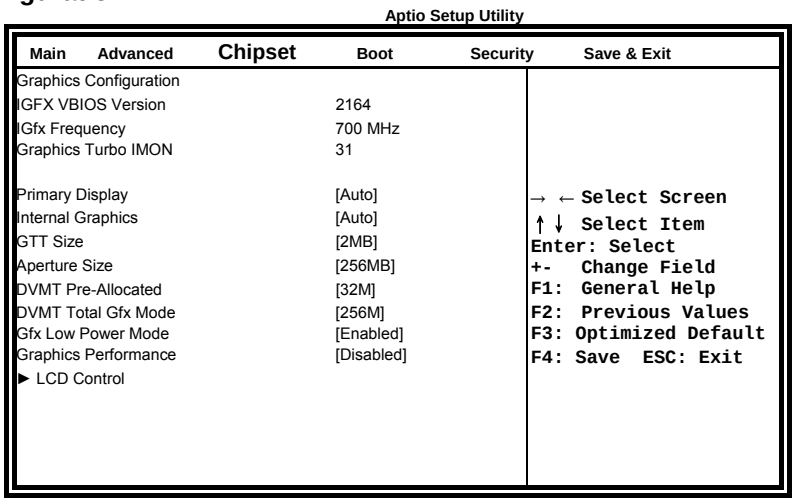
System Agent (SA) Configuration



VT-d
Check to enable VT-d function on MCH.

Enable NB CRID
Enable or disable NB CRID WorkAround.

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.

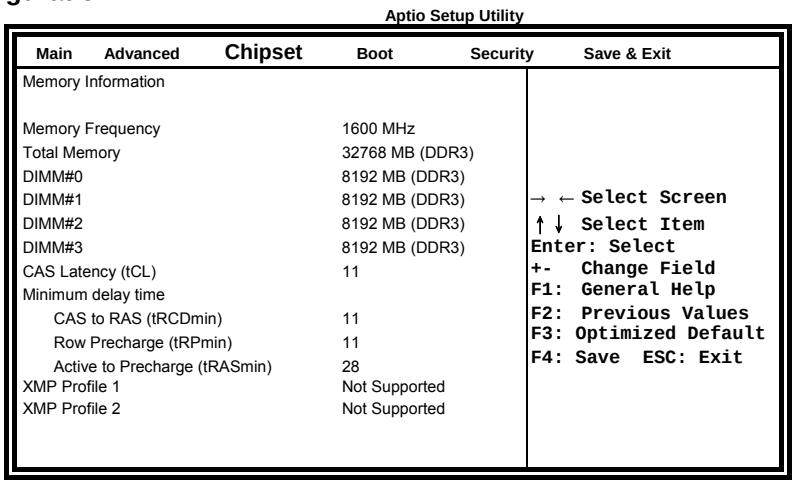
DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

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

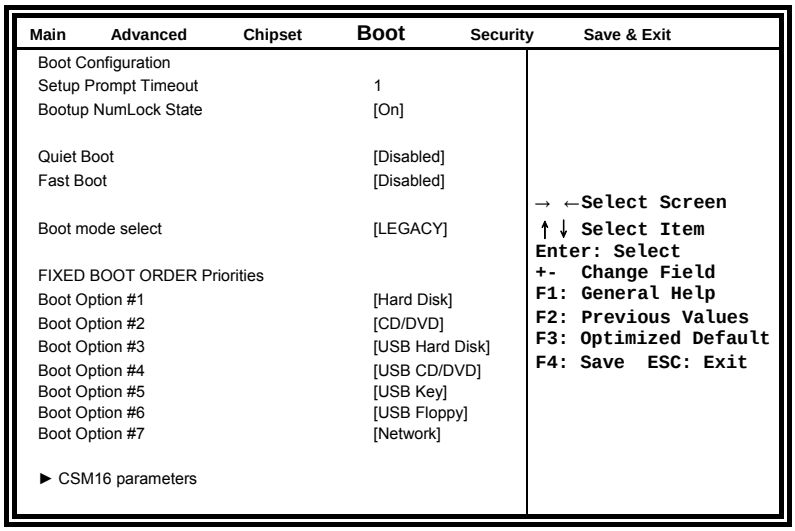
Gfx Low Power Mode
This option is applicable for SFF only.

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



Boot Settings



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

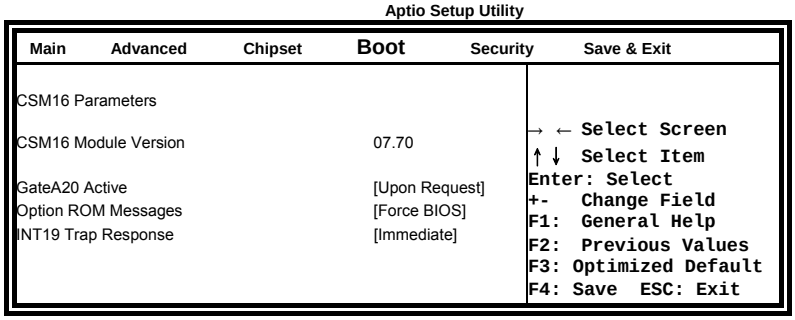
Bootup NumLock State
Select the keyboard NumLock state.

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.

Boot Option Priorities
Sets the system boot order.

CSM16 parameters
This section allows you to configure the boot settings.

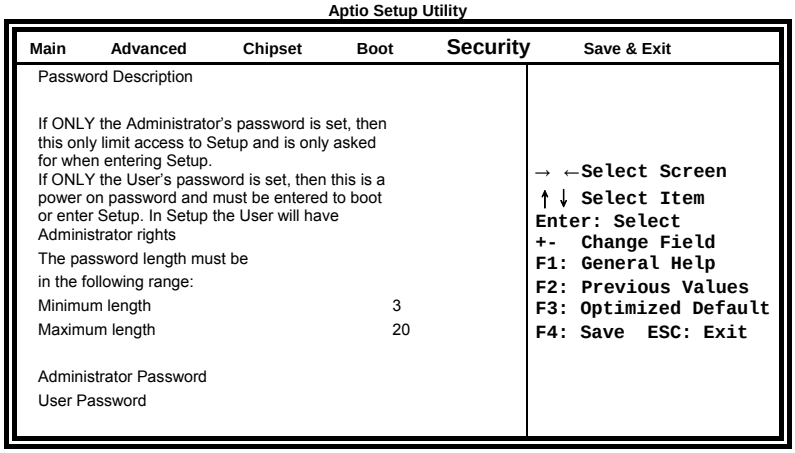


GateA20 Active
UPON REQUEST: GA20 can be disabled using BIOS services
ALWAYS: do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages
Set display mode for Option ROM

INT19 Trap Response
BIOS reaction on INT19 trapping by option ROM:
IMMEDIATE: execute the trap right away.
POSTPONED: execute the trap during legacy boot.

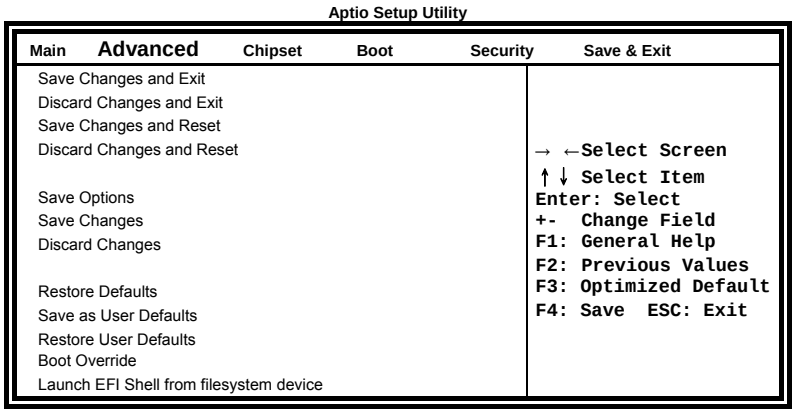
Security Settings
This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



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.

Chapter 14 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.

```
//---------------------------------------------------------------------------
//
// 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
```

Chapter 15 Digital I/O Sample Configuration

Filename：Main.cpp

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81865.H"

#define BIT0 0x01
#define BIT1 0x02
#define BIT2 0x04
#define BIT3 0x08
#define BIT4 0x10
#define BIT5 0x20
#define BIT6 0x40
#define BIT7 0x80

//---------------------------------------------------------------------------
int main (void);

void Dio5Initial(void);
void Dio5SetOutput(unsigned char);
unsigned char Dio5GetInput(void);
void Dio5SetDirection(unsigned char);
unsigned char Dio5GetDirection(void);
//---------------------------------------------------------------------------
int main (void)
{
        char SIO;
        unsigned char DIO;

        printf("Fintek 81865/81866 digital I/O test program\n");

        SIO = Init_F81865();
        if (SIO == 0)
        {
                printf("Can not detect Fintek 81865/81866, program abort.\n");
                return(1);
        }//if (SIO == 0)

        Dio5Initial();
/*
        //for GPIO50..57
        Dio5SetDirection(0xF0);     //GP50..53 = input, GP54..57=output
        printf("Current DIO direction = 0x%X\n", Dio5GetDirection());

        printf("Current DIO status = 0x%X\n", Dio5GetInput());

        printf("Set DIO output to high\n");
        Dio5SetOutput(0x0F);

        printf("Set DIO output to low\n");
        Dio5SetOutput(0x00);
*/

        //for GPIO50..57
        Dio5SetDirection(0xF0);     //GP50..53 = input, GP54..57=output

        Dio5SetOutput(0x00);                                    //clear
//      DIO = Dio5GetInput() & 0x0F;
```

```
		Dio5SetOutput(0x00);					//clear
		DIO = Dio5GetInput() & 0x0F;
		if (DIO != 0x0A)
		{
			printf("The Fintek 81865 digital IO abnormal, abort.\n");
			return(1);
		}//if (DIO != 0x0A)

		Dio5SetOutput(0xA0);					//clr# is high
		Dio5SetOutput(0xF0);					//clk and clr# is high
		Dio5SetOutput(0xA0);					//clr# is high

		DIO = Dio5GetInput() & 0x0F;
		if (DIO != 0x05)
		{
			printf("The Fintek 81865 digital IO abnormal, abort.\n");
			return(1);
		}
		printf("!!! Pass !!!\n");
		return 0;
}
//-----------------------------------------------------------------------------
void Dio5Initial(void)
{
		unsigned char ucBuf;

		//switch GPIO multi-function pin for	gpio 50~57

//gpio53~57 UR5_FULL_EN(bit1), clear UR6_FULL_EN(bit3)
		//set UR5_FULL_EN,should set UR_GP_PROG_EN = 1 (reg26,bit0) first

		ucBuf = Get_F81865_Reg(0x26);
		ucBuf |= BIT0;
		Set_F81865_Reg(0x26, ucBuf);
		//set UR5_FULL_EN(bit1), clear UR6_FULL_EN(bit3)
		ucBuf = Get_F81865_Reg(0x2A);
		ucBuf &= ~BIT3;//clear bit 3,
		ucBuf |= BIT1;//set bit 1,
		Set_F81865_Reg(0x2a, ucBuf);

//GPIO51 ~ GPIO52
		//clear UR6_ALT_EN(bit5), IR_ALT_EN(bit4),set FDC_GP_EN(bit3)

//GPIO50
//set FDC_GP_EN(bit3), clear  RTS6_ALT_EN(RTS6_2_ALT_EN)(bit6)

		ucBuf = Get_F81865_Reg(0x2A);
		ucBuf &= ~(BIT4+BIT5+BIT6);		//clear UR6_ALT_EN(bit5), IR_ALT_EN(bit4),  RTS6_ALT_EN(RTS6_2_ALT_EN)(bit6)
		Set_F81865_Reg(0x2a, ucBuf);
		//set FDC_GP_EN(bit3), should clear UR_GP_PROG_EN (reg26,bit0) first
		ucBuf = Get_F81865_Reg(0x26);
		ucBuf &= ~BIT0;
		Set_F81865_Reg(0x26, ucBuf);//clear UR_GP_PROG_EN = 0 (reg26,bit0)

		ucBuf = Get_F81865_Reg(0x2A);
		ucBuf |= BIT3;			//set FDC_GP_EN(bit3),
		Set_F81865_Reg(0x2a, ucBuf);


		Set_F81865_LD(0x06);					//switch to logic device 6

		//enable the GP5 group
		ucBuf = Get_F81865_Reg(0x30);
		ucBuf |= 0x01;
		Set_F81865_Reg(0x30, ucBuf);

		Set_F81865_Reg(0xA0, 0x00);				//define as input mode
		Set_F81865_Reg(0xA3, 0xFF);				//push pull mode
}
//-----------------------------------------------------------------------------
```

```
void Dio5SetOutput(unsigned char NewData)
{
        Set_F81865_LD(0x06);                                    //switch to logic device 6
        Set_F81865_Reg(0xA1, NewData);
}
//----------------------------------------------------------------------------
unsigned char Dio5GetInput(void)
{
        unsigned char result;

        Set_F81865_LD(0x06);                                    //switch to logic device 6
        result = Get_F81865_Reg(0xA2);
        return (result);
}
//----------------------------------------------------------------------------
void Dio5SetDirection(unsigned char NewData)
{
        //NewData : 1 for input, 0 for output
        Set_F81865_LD(0x06);                                    //switch to logic device 6
        Set_F81865_Reg(0xA0, NewData);
}
//----------------------------------------------------------------------------
unsigned char Dio5GetDirection(void)
{
        unsigned char result;

        Set_F81865_LD(0x06);                                    //switch to logic device 6
        result = Get_F81865_Reg(0xA0);
        return (result);
}
//----------------------------------------------------------------------------
```

Filename：81865.cpp

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

        F81865_BASE = 0x4E;
        result = F81865_BASE;

        ucDid = Get_F81865_Reg(0x20);
        if (ucDid == 0x07||ucDid == 0x10)                       //Fintek 81865/66
        {       goto Init_Finish;       }

        F81865_BASE = 0x2E;
        result = F81865_BASE;

        ucDid = Get_F81865_Reg(0x20);
        if (ucDid == 0x07||ucDid == 0x10)                       //Fintek 81865/66
        {       goto Init_Finish;       }

        F81865_BASE = 0x00;
        result = F81865_BASE;

Init_Finish:
        return (result);
}
//----------------------------------------------------------------------------
void Unlock_F81865 (void)
{
        outportb(F81865_INDEX_PORT, F81865_UNLOCK);
        outportb(F81865_INDEX_PORT, F81865_UNLOCK);
}
//----------------------------------------------------------------------------
void Lock_F81865 (void)
{
        outportb(F81865_INDEX_PORT, F81865_LOCK);
}
//----------------------------------------------------------------------------
void Set_F81865_LD( unsigned char LD)
{
        Unlock_F81865();
        outportb(F81865_INDEX_PORT, F81865_REG_LD);
        outportb(F81865_DATA_PORT, LD);
        Lock_F81865();
}
//----------------------------------------------------------------------------
void Set_F81865_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_F81865();
        outportb(F81865_INDEX_PORT, REG);
        outportb(F81865_DATA_PORT, DATA);
        Lock_F81865();
}
//----------------------------------------------------------------------------
unsigned char Get_F81865_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_F81865();
```

```
	outportb(F81865_INDEX_PORT, REG);
	Result = inportb(F81865_DATA_PORT);
	Lock_F81865();
	return Result;
}
//-----------------------------------------------------------------------------
```

Filename：81865.h

```
//-----------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----------------------------------------------------------------------------
#ifndef __F81865_H
#define __F81865_H                                  1
//-----------------------------------------------------------------------------
#define	F81865_INDEX_PORT		(F81865_BASE)
#define	F81865_DATA_PORT		(F81865_BASE+1)
//-----------------------------------------------------------------------------
#define	F81865_REG_LD                               0x07
//-----------------------------------------------------------------------------
#define F81865_UNLOCK                               0x87
#define	F81865_LOCK                                                 0xAA
//-----------------------------------------------------------------------------
unsigned int Init_F81865(void);
void Set_F81865_LD( unsigned char);
void Set_F81865_Reg( unsigned char, unsigned char);
unsigned char Get_F81865_Reg( unsigned char);
//-----------------------------------------------------------------------------
#endif	//__F81865_H
```

Chapter 16 Drivers Installation

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

Intel® Chipset Software Installation Utility
Intel® Graphics Driver Installation
LAN Drivers Installation
Intel® Management Engine Interface

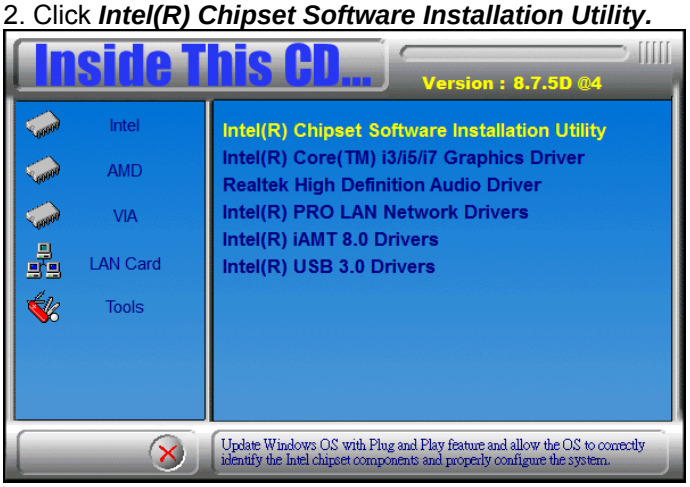
IMPORTANT NOTE:
After installing your Windows operating system, you must install first the Intel® Chipset Software Installation Utility before proceeding with the drivers installation.

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.

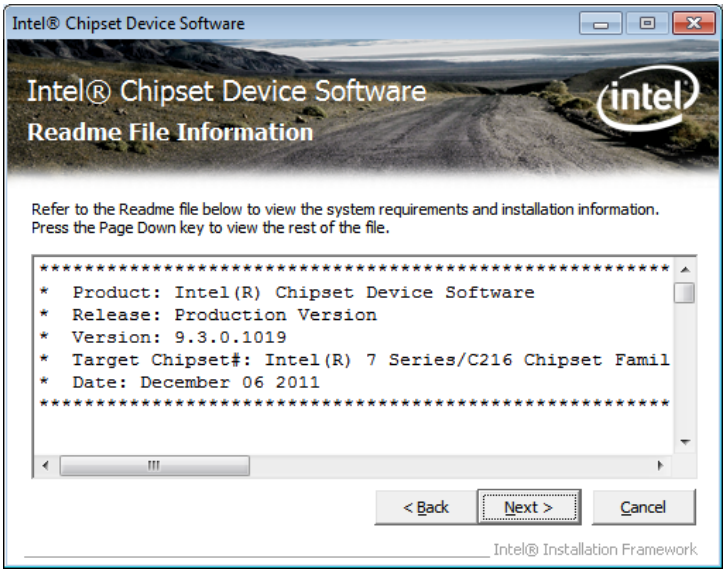
2. Click ***Intel(R) Chipset Software Installation Utility.***



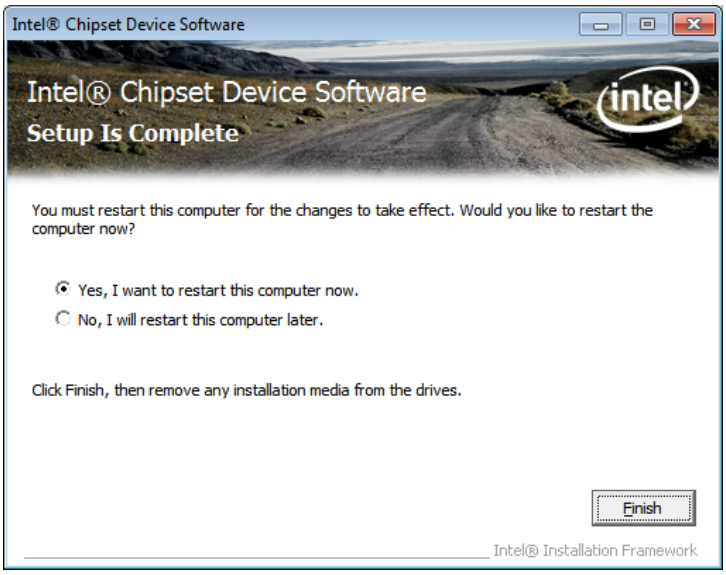
3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.

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

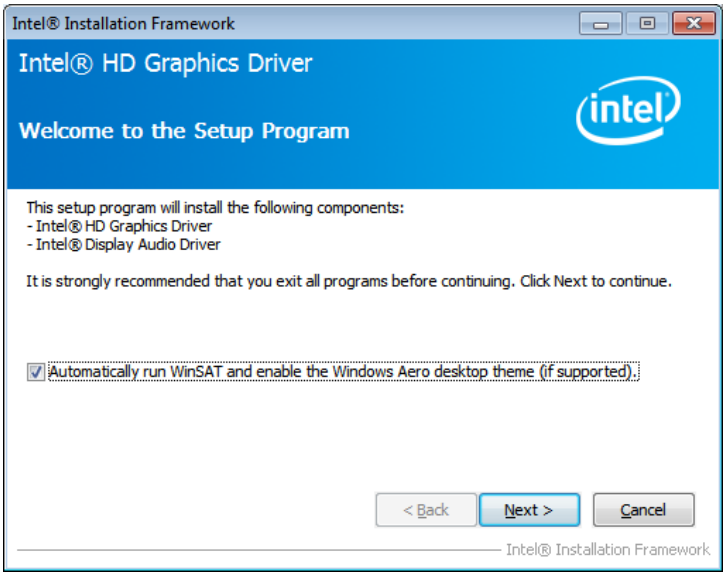
NOTE: Before installing the *Intel(R) C216 Chipset Family Graphics Driver,* the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

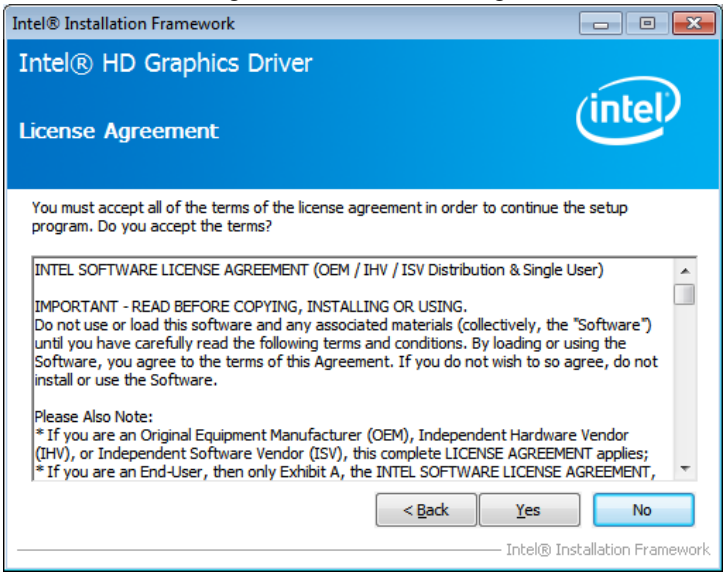
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) C216 Chipset Family Graphics Driver.***

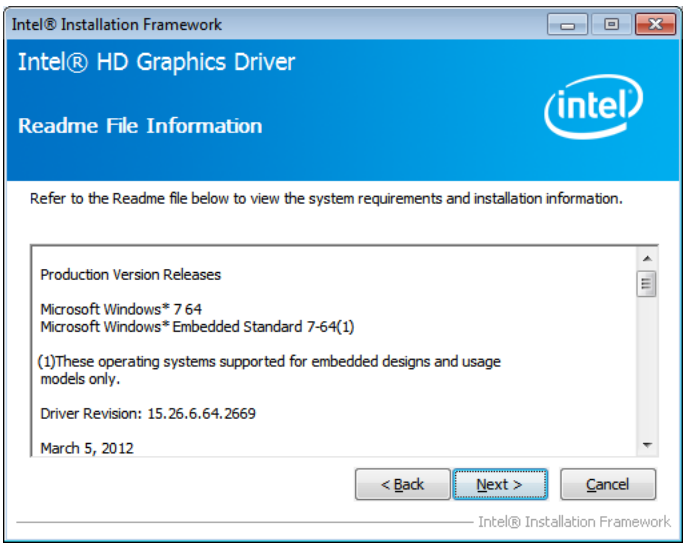
3. When the Welcome screen appears, click ***Next*** to continue.



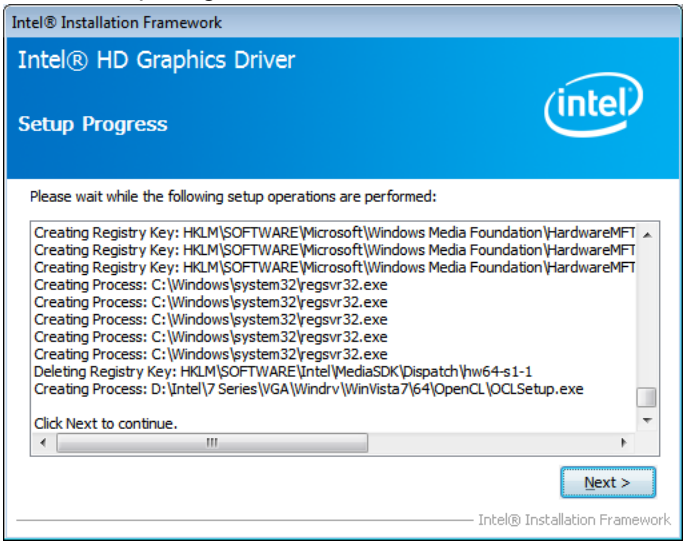
4. Click ***Yes*** to to agree with the license agreement and continue the installation.



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.



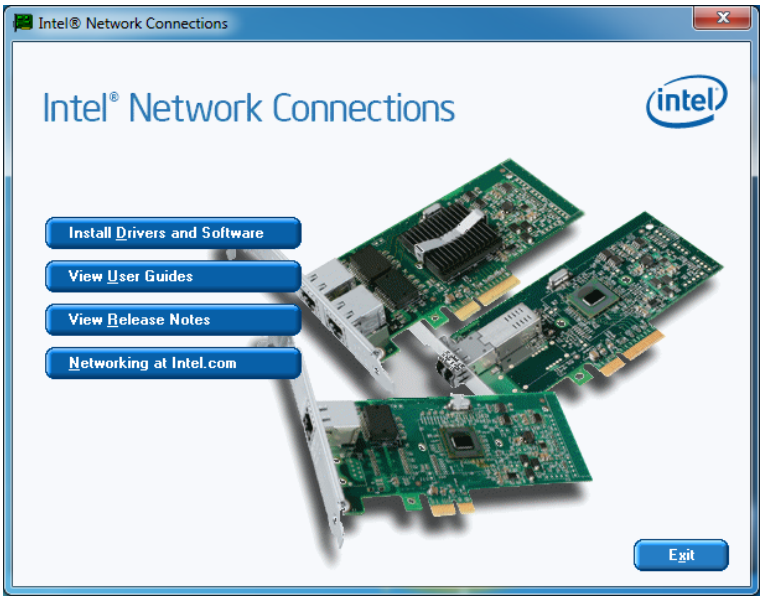
7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

LAN Drivers Installation

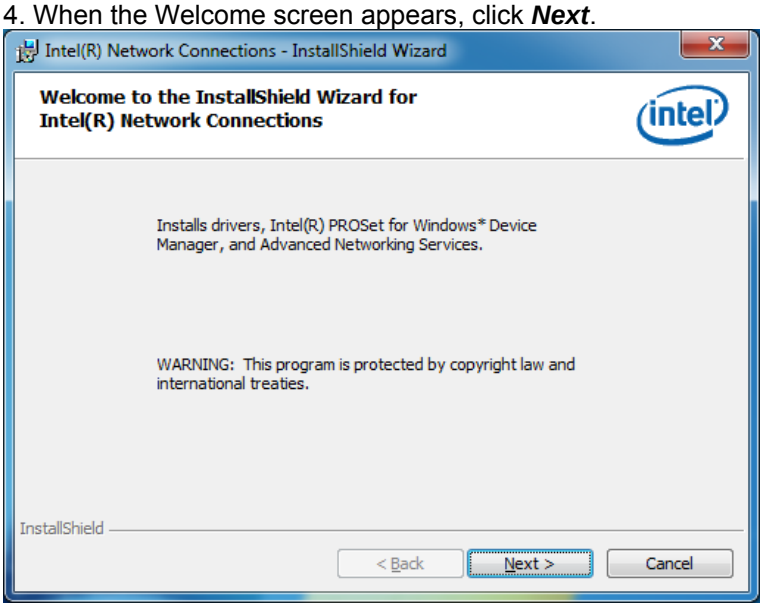
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

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

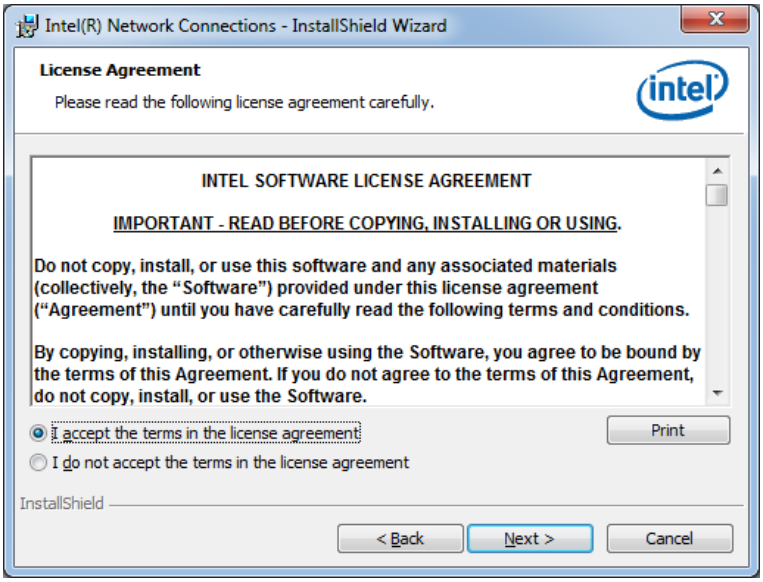
3. Click ***Install Drivers and Software.***



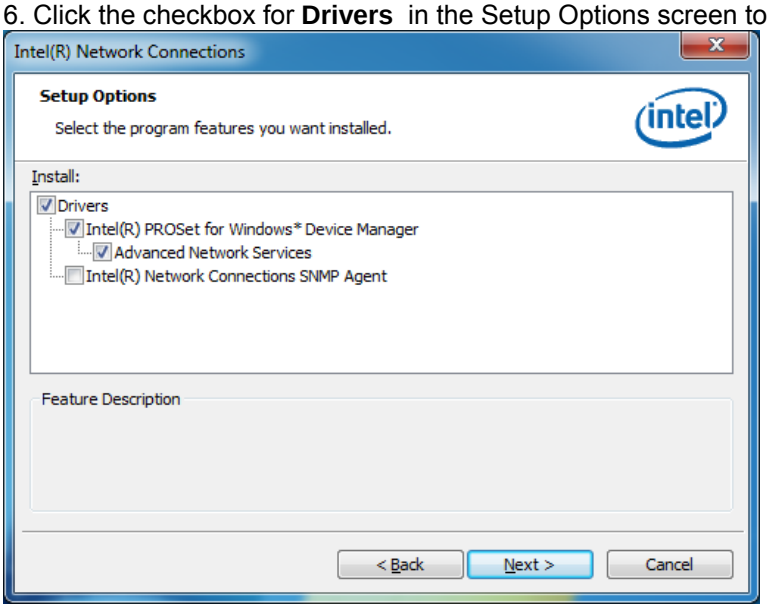
4. When the Welcome screen appears, click ***Next***.



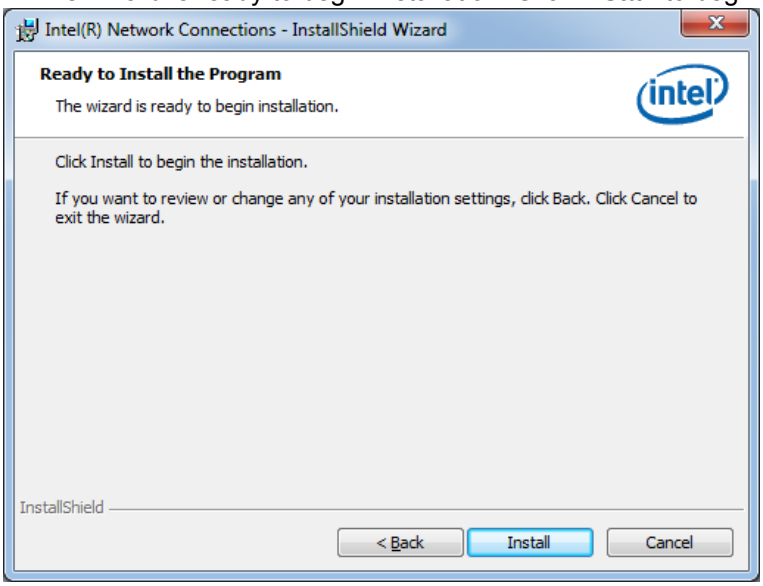
5. Click ***Next*** to to agree with the license agreement.



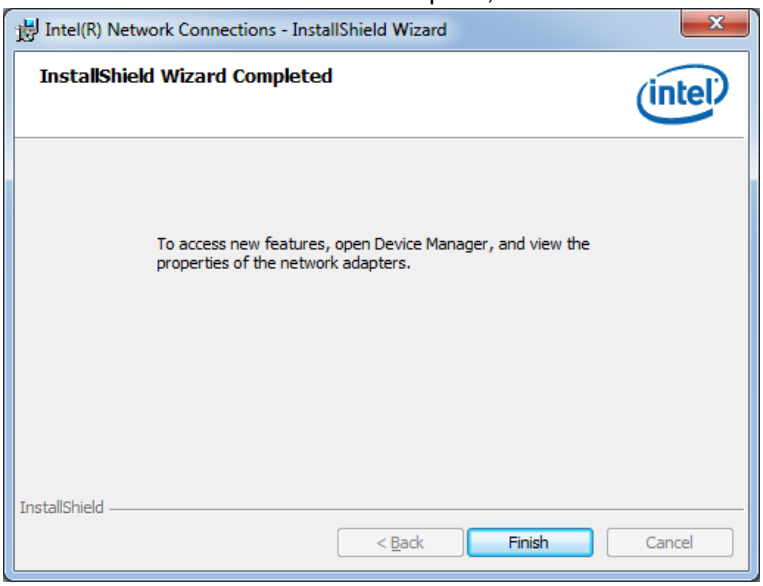
6. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



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



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

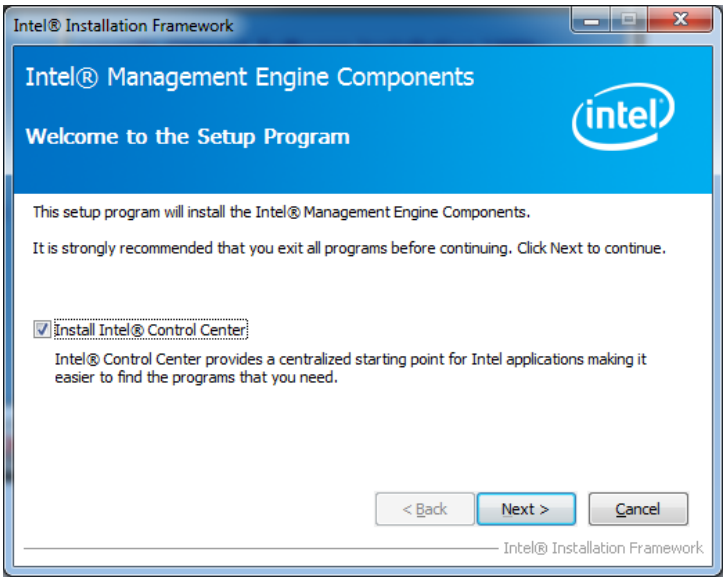


Intel® Management Engine Interface

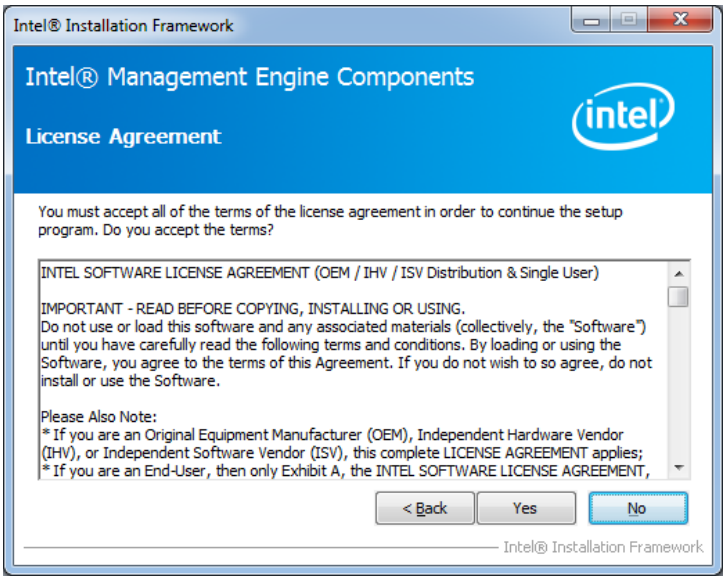
Follow the steps below to install the Intel Management Engine.

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

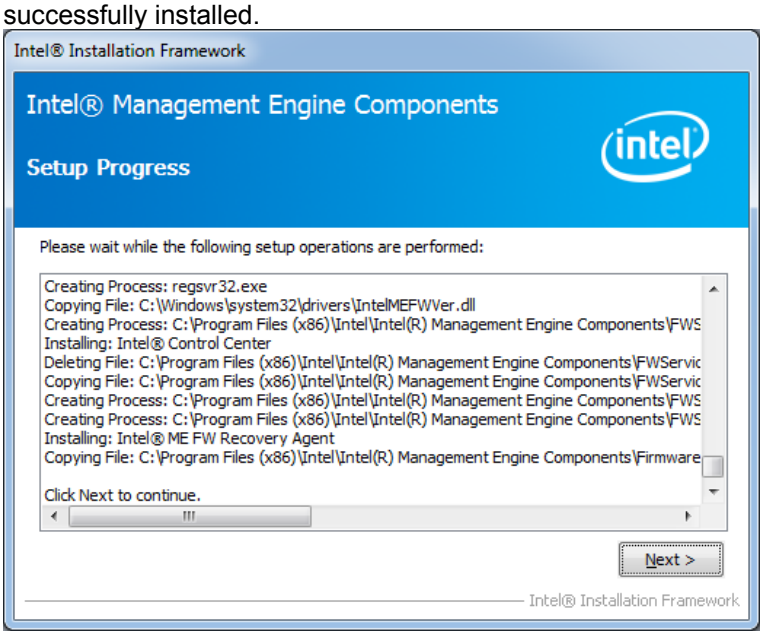
2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.

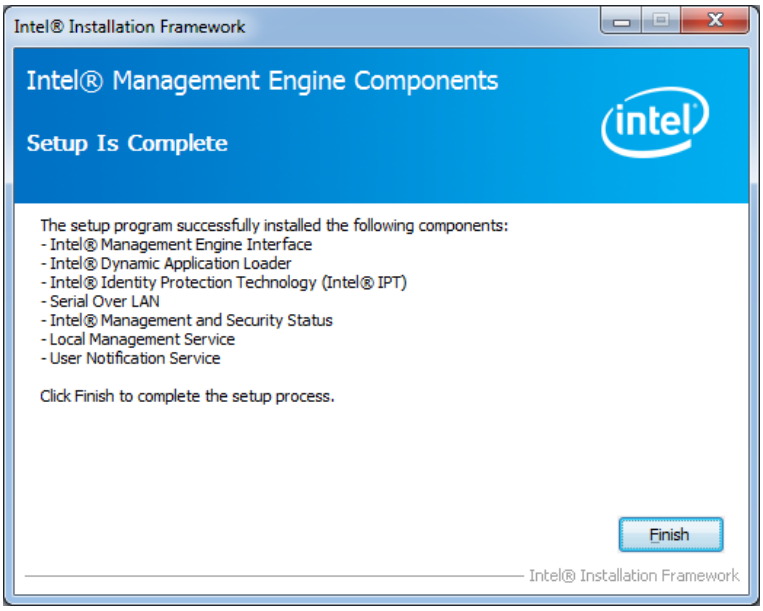


3. Click ***Yes*** to to agree with the license agreement.



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



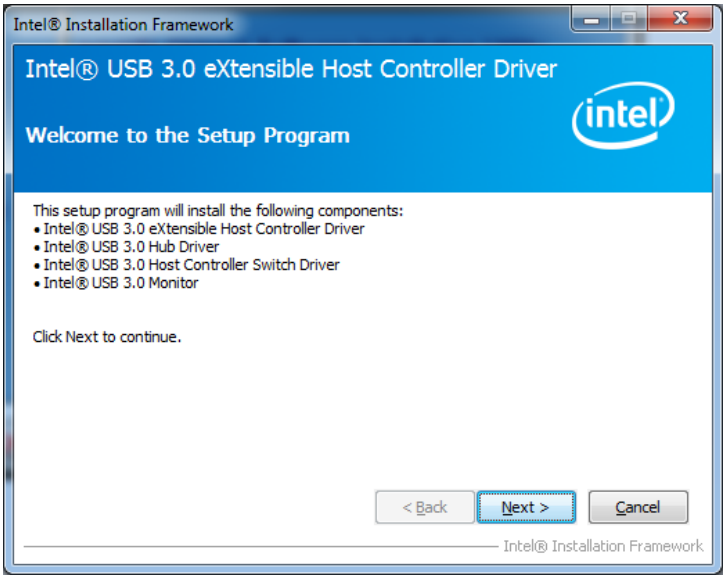


Intel® USB 3.0 Drivers

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) C216 Series Chipset Drivers***.

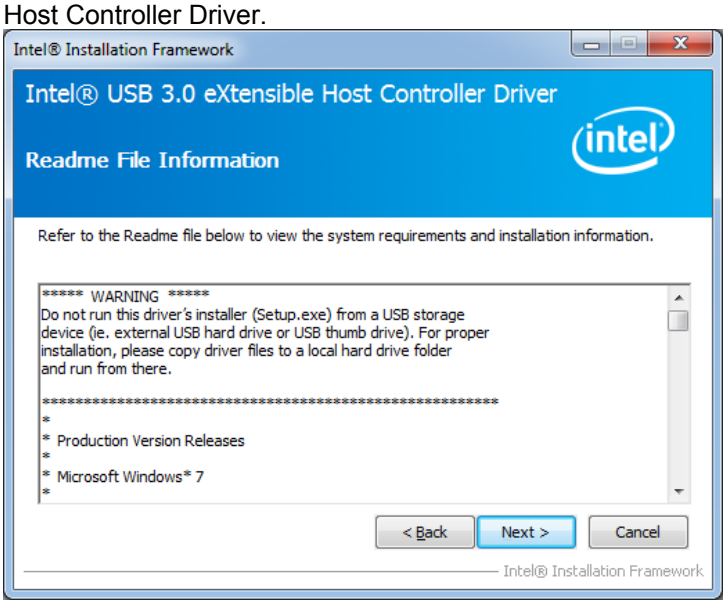
2. Click ***Intel(R) USB 3.0 Drivers.***

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

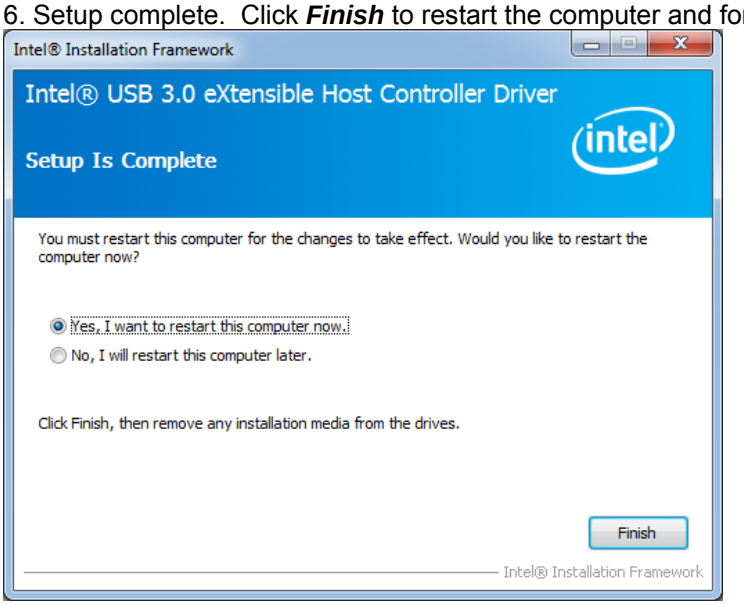


4. Click ***Yes*** to to agree with the license agreement and continue the installation.

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.



Appendix-A I/O Port Address Map

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

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

Appendix-B Interrupt Request Lines (IRQ)

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

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

Appendix-C FWA8308 Series Configurations

The following lists the available SKUs of FWA8308 for different system requirement.

FWA8308

2.5” HDD x1, PCI-e add-on card rear expansion x1, front panel expansion card x1, 300W PSU

- MB968 x1
- IP331 x1: 1-to-1 Riser Card
- IP332 x1: PCI-e Adapter
- Single 2.5” HDD Bracket x1
- 4-pin Smart Fan x3
- 300W Single Power Supply

FWA8308 Optional Items

- IBP161, IBP162…: Expansion LAN Card
- Dual 2.5” HDD Bracket Kit SC2FWA8308-0A1100P
- VGA cable: C501VGA0415272000P
- Console Cable: C501PK15108A12000P
- Rear Rackmount Kit: 600 or 800mm

FWA8308-2SLOT

3.5” HDD x1, PCI-e add-on card rear expansion x2, 300W PSU

- MB968 x1
- IP333 x1: 2-to-2 Riser Card
- Single 3.5” HDD Bracket x1
- 4-pin Smart Fan x3
- 300W Single Power Supply

FWA8308-2SLOT Optional Items

- Dual 2.5” HDD Bracket Kit SC2FWA8308-0A1100P
- VGA cable: C501VGA0415272000P
- Console Cable: C501PK15108A12000P
- Rear Rackmount Kit: 600 or 800mm

FWA8308-RPSU

2.5” HDD x1, PCI-e add-on card rear expansion x1, front panel expansion card x1, 275W 1+1 Redundant PSU

- MB968 x1
- IP331 x1: 1-to-1 Riser Card
- IP332 x1: PCI-e Adapter
- Single 2.5” HDD Bracket x1
- 4-pin Smart Fan x3
- 275W 1+1 Redundant Power Supply

FWA8308-RPSU Optional Items

- IBP161, IBP162…: Expansion LAN Card
- VGA cable: C501VGA0415272000P
- Console Cable: C501PK15108A12000P
- Rear Rackmount Kit: 600 or 800mm