SHB210 Series
Intel® Core™ 2 Duo/ Core™ Duo
Core™ Solo/ Celeron® M
PICMG 1.3 Half-Size
Single Board Computer
User's Manual

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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MEMO

Chapter 1
Introduction

The **SHB210** PICMG 1.3 half-size Single Board Computer supports Intel® Core™ 2 Duo/Core™ Duo/Core™ Solo/Celeron® M processors, at FSB 533/667 MHz. The board integrates chipsets Intel® 945GM and ICH7M-DH that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There are two 200-pin DDR2 SO-DIMM sockets for dual channel DDR2 400/533/667, maximum memory capacity up to 4GB.The board also features Ethernet 10/100/1000Mb, Dual PCI-Express LAN, two serial ATA channels for a total of two serial ATA hard drives at maximum transfer rate up to 300MB/sec, six USB 2.0 high speed compliant, These feature can achieve the best stability and reliability for industrial applications.

1.1 Specifications

- **CPU: Intel® Core™ 2 Duo/Core™ Duo/Core™ Solo / Celeron® M processors**
- **System Chipset: Intel® 945GM/ICH7M-DH**
- **CPU Socket: Socket M**
- **Front-Side Bus: 533/667 MHz**
- **BIOS**
  - Award PnP Flash BIOS
- **System Memory**
  - Two x 200-pin DDR2 SO-DIMM sockets
  - Maximum up to 4GB DDR2 memory
  - Support DDR2 400/533/667 memory
- **L2 Cache:** integrated in CPU
- **IDE Interface**
  - One IDE connector and up to two IDE devices, Ultra DMA ATA33/66/100 supported
- **FDD Interface**
  - Supports up to one drives
- **Compact Flash Socket**
  - One Compact Flash® Type II Socket
- **Onboard Multi-I/O**
  - Parallel Port: one bi-directional with ECP/EPP/SPP support
  - Serial Port: one port for RS-232/422/485 (COM1) and one port for RS-232 (COM2)
  - Floppy controller: supports one drives (1.44MB for each)
- **USB Interface**
  - Six USB ports compliant with USB Spec. Rev. 2.0
- **VGA Controller**
  - Intel® Graphic Media Accelerator 950 integrated on Intel® 945GM

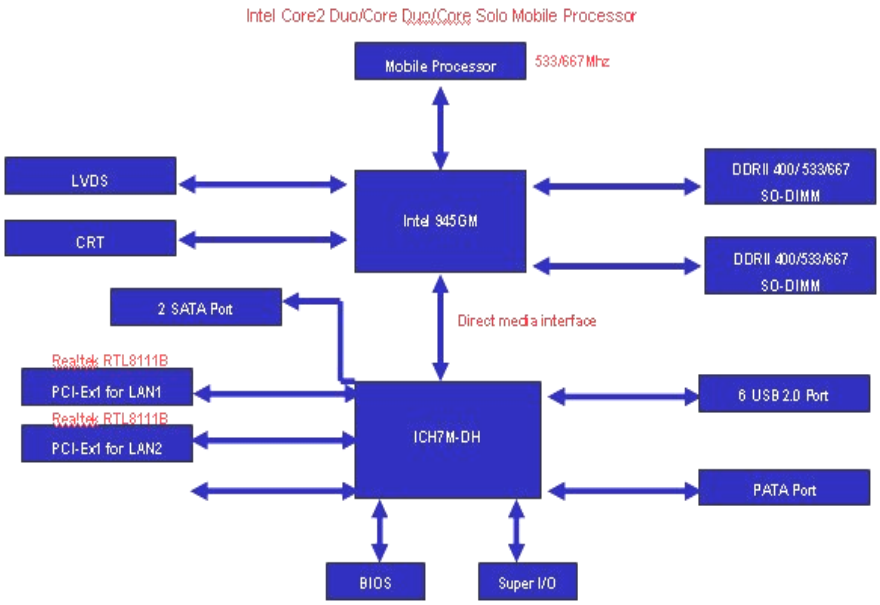
- **Ethernet**
  - The LAN1/LAN2 is 8111B Ethernet controller support 10/100/1000 Mb
  - Dual PCI-Express LAN
- **Serial ATA**
  - Support Serial ATA/Serial ATA II
  - Two Serial ATA channels for a total of two Serial ATA hard drives
  - Maximum transfer rate could up to 300MB/sec
- **Hardware Monitoring**
  - Controller: Winbond W83627HG-AW
  - Detection of CPU temperature, System temperature, Power failure and Fan speed
- **Watchdog Timer**
  - System reset and Software programmable (1-255 levels)
- **Dimensions:** 185 x 126 mm (8 layer)

***NOTE**: All specifications and images are subject to change without notice.*

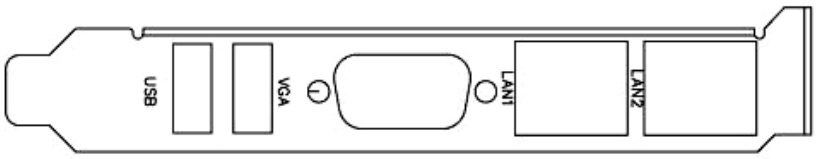
1.2 Utilities Supported

- Intel® 945GM Utility and Drivers
- VGA Drivers
- Ethernet Utility and Drivers

1.3 Block Diagram

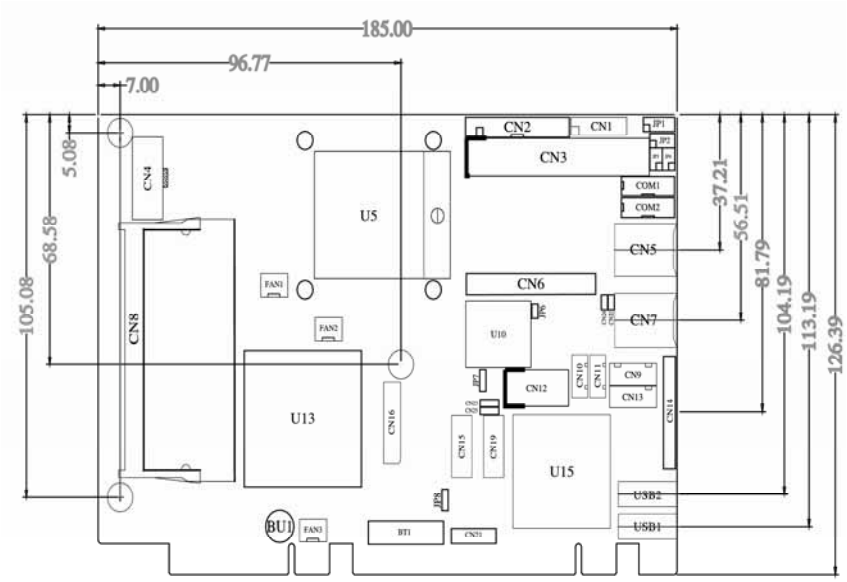


1.4 I/O Bracket

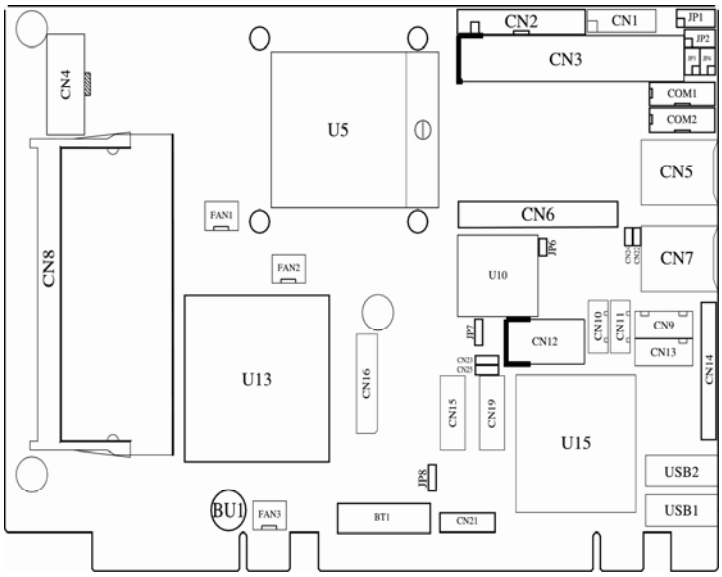


Chapter 2
Jumpers and Connectors

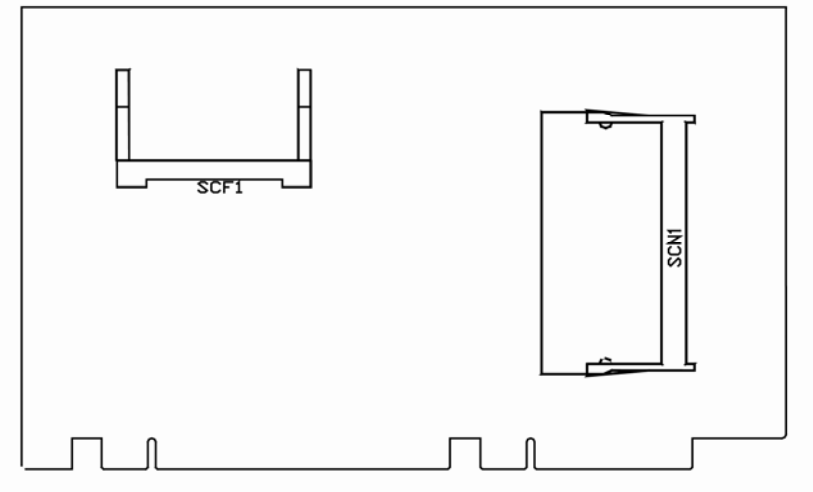
2.1 Board Dimensions



2.2 Board Layout



Top Side



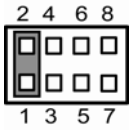
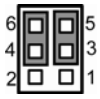
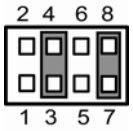
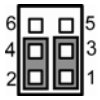
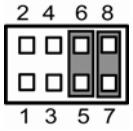
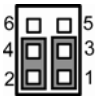
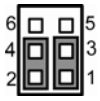
Bottom Side

2.3 Jumper Settings

Proper jumer settings configure the **SHB210** to meet your application purpose.

2.3.1 COM2 Mode Select Jumpers: JP2, JP3, JP4

These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485.

Description	Function	Jumper Setting		
COM1	RS-232 (Default)	JP2 	JP3 	JP4 
	RS-422	JP2 	JP3 	JP4 
	RS-485	JP2 	JP3 	JP4 

2.3.2 Compact Flash Setting Jumper: JP6

Use this jumper to set Master/Slave Compact Flash interface.

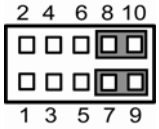
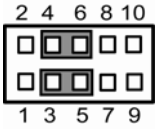
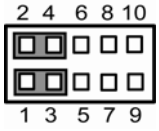
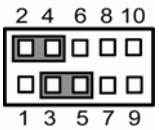
Description	Function	Jumper Setting	Function	Jumper Setting
CF Master/Slave	Master (Default)	JP6 	Slave	JP6 

2.3.3 Compact Flash Voltage Selection Jumper: JP8

This jumper is to select the voltage for Compact Flash interface.

Description	Function	Jumper Setting	Function	Jumper Setting
LCD Voltage	3.3V (Default)	JP8 	5V	JP8 

2.3.4 COM1 DCD and Voltage Selection Jumper: JP1

Jumper	Description	Jumper Setting	Description	Jumper Setting
COM1 DCD & RI Voltage Selection	Normal (Default)	JP1 	5V	JP1 
	12V	JP1 	DCD/5V RI/12V	JP1 

2.3.5 CMOS Clear Jumper: JP7

You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting	Function	Jumper Setting
CMOS	Normal (Default)	JP7 	Clear CMOS	JP7 

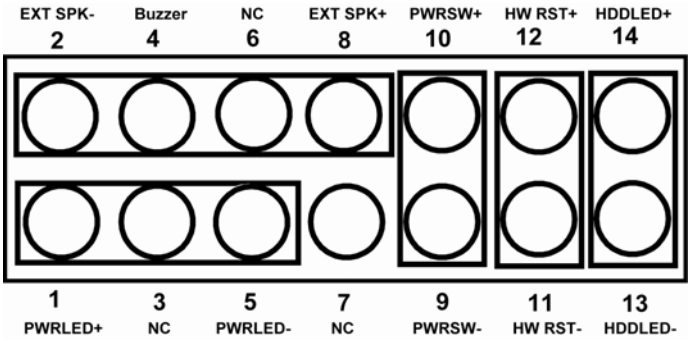
2.4 Connectors

Connectors connect this board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected.

Here is a summary table shows you all connectors on the board.

Connectors	Label	Connectors	Label
General Output Connector	CN1	IDE Connector	CN3
Printer Port Connector	CN2	CompactFlash Connector	SCF1
COM1	COM1	S-ATA Port 1 Connector	CN15
COM2	COM2	S-ATA Port 2 Connector	CN19
USB Port 1 Connector	USB1	FDD Connector	CN6
USB Port 2 Connector	USB2	System FAN2 Connector	FAN2
USB Port 3, 4 Connector	CN11	System FAN1 Connector	FAN1
USB Port 5, 6 Connector	CN10	System FAN3 Connector	FAN3
System BIOS	U10	Internal Buzzer	BU1
CRT Connector	CN14	Internal Battery	BT1
External Mouse Connector	CN9	Socket-M CPU Socket	U5
External Keyboard Connector	CN13	200-Pin DDR2 Memory Channel-A	SCN1
Ethernet Connector 1	CN7	200-Pin DDR2 Memory Channel-B	CN8
Ethernet Connector 2	CN5	Audio Connector	CN12
Ethernet Connector 1 External Speed LED	CN23	EPIC Power Connector	CN4
Ethernet Connector 1 External Link/ACT LED	CN22	AXIOMTEK LVDS LCD Interface	CN16
Ethernet Connector 2 External Speed LED	CN25	LCD Power Connector	CN21
Ethernet Connector 2 External Link/ACT LED	CN24		

2.4.1 Front Panel Output Connector: CN1



2.4.2 Printer Port Connector: CN2

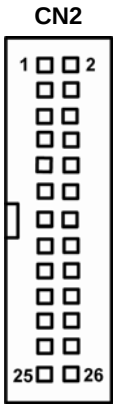
Print Port Connector
This board has a multi-mode parallel port to support the following modes:

1. **Standard Mode:**
   IBM PC/XT, PC/AT and PS/2™ are compatible with bi-directional parallel port.
2. **Enhanced Mode:**
   Enhanced parallel port (EPP) is compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant).
3. **High Speed Mode:**
   Microsoft and Hewlett Packard extended capabilities port (ECP) is IEEE 1284 compliant.

Please refer to next page for detailed pin assignment table of connector CN2.

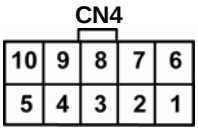
CN2: Pin Assignment Table

Pin	Signal	Pin	Signal
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error #
5	Data 1	6	Initialize #
7	Data 2	8	Printer Select In #
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge #	20	GND
21	Busy	22	GND
23	Paper Empty #	24	GND
25	Print Select	26	GND



2.4.3 EPIC Power Connector: CN4

Pin	Signal	Pin	Signal
1	PSON#	2	GND
3	GND	4	+12V
5	+3.3V	6	5V SB
7	+5V	8	+5V
9	-12V	10	GND

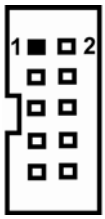


2.4.5 Serial Port Interface Connectors: COM1, COM2

The serial interface for the board consists of COM1 port support RS232/422/485(COM1) and COM2 (COM2) supports RS-232.

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	NC

COM1, COM2

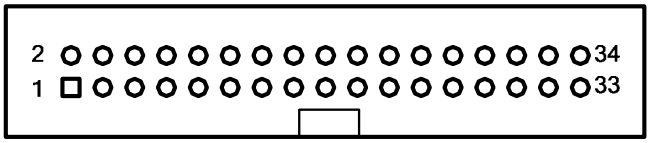


2.4.6 Floppy Disk Port Connector: CN6

The board provides a 34-pin header type connector, CN6, supporting up to two floppy drives.

Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	Reduce write current	3	GND
4	N/C	5	GND	6	N/C
7	GND	8	Index #	9	GND
10	Motor enable A #	11	GND	12	Drive select B #
13	GND	14	Drive select A #	15	GND
16	Motor enable B #	17	GND	18	Direction #
19	GND	20	STEP #	21	GND
22	Write data #	23	GND	24	Write gate #
25	GND	26	Track #	27	GND
28	Write protect #	29	GND	30	Read data #
31	GND	32	Side 1 select #	33	GND
34	Disk change #				

CN6

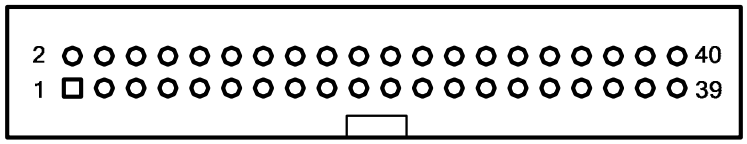


2.4.7 IDE Interface Connector: CN3

The board provided one IDE Port to support maximum up to two IDE devices.

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 16
19	GND	20	N/C	21	N/C
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	N/C	29	N/C	30	GND-Default
31	Interrupt	32	N/C	33	SA1
34	N/C	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND				

CN3



2.4.8 LVDS/LCD Connectors: CN14, CN16, CN21

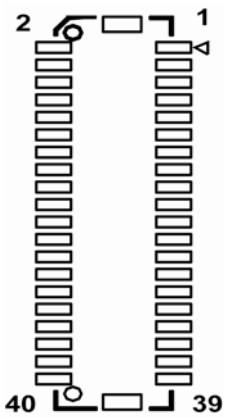
There are several connectors to support CRT VGA and flat panel displays. CN14 is a standard 15-pin connector commonly used for the CRT VGA display, CN16 a Hirose DF20-40pin connector for the LVDS flat panel connection, and CN21 a Hirose DF13-7pin connector for inverter.

Hirose DF20-40pin connector for the LVDS Flat Panel: CN16

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	NC	8	NC
9	GND	10	GND
11	NC	12	LVDSB_D0-
13	NC	14	LVDSB_D0+
15	GND	16	GND
17	LVDSB_CLK-	18	LVDSB_D1-
19	LVDSB_CLK+	20	LVDSB_D1+
21	GND	22	GND
23	LVDSA_D0-	24	LVDSB_D2-
25	LVDSA_D0+	26	LVDSB_D2+
27	GND	28	GND
29	LVDSA_D1-	30	NC
31	LVDSA_D1+	32	NC
33	GND	34	GND

Pin	Signal	Pin	Signal
35	LVDSA_D2-	36	LVDSA_CLK-
37	LVDSA_D2+	38	LVDSA_CLK+
39	GND	40	GND

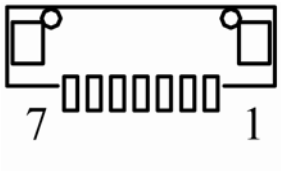
CN16



Hirose DF13-7pin LCD Power Connector for Inverter: CN21

Pin	Signal
1	12V
2	12V
3	5V
4	ENAB
5	GND
6	GND
7	GND

CN21

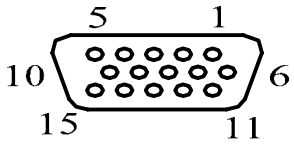


CRT Connector: CN14

CN14 is a standard 15-pin pin DB15 connector commonly used for the CRT VGA display.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	AGND
7	AGND	8	AGND	9	N/A
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

CN14

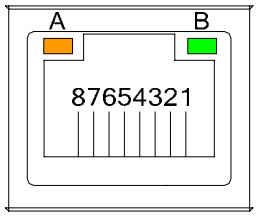


2.4.9 Ethernet Connectors: CN5, CN7

The RJ-45 connectors CN5 and CN7 are for Ethernet.

Pin	Signal
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ-1(For 100 base T-Only)
5	RJ-1(For 100 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 100 base T-Only)
8	RJ-1(For 100 base T-Only)
A	Active LED
B	100/1000 LAN LED

CN5, CN7

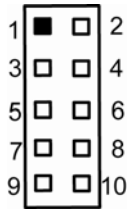


2.4.10 USB Connectors: CN10, CN11

These Universal Serial Bus (USB) connectors on this board are for installing versatile USB interface peripherals. These are 10-pin standard USB connectors.

Pin	Signal	Pin	Signal
1	USB POWER	2	USB POWER
3	USB P0-	4	USB P1-
5	USB P0+	6	USB P1+
7	USB GND	8	USB GND
9	GND	10	GND

CN10, CN11

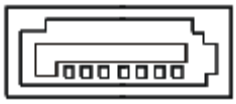


2.4.11 SATA Connectors: CN15, CN19

These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

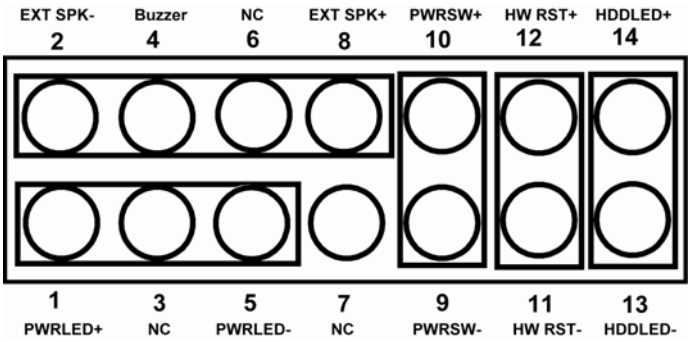
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

CN15, CN19



7 **1**

2.4.12 Front Panel Connector



- **Power LED**

  Pins 1, 3, 5 connect the system power LED indicator to its respective switch on the case. Pin 1 is +, and pin 5 assigned to -. Pin 3 is defined as NC.

- **External Speaker and Internal Buzzer Connector**

  Pins 2, 4, 6, 8 can be connected to the case-mounted speaker unit or internal buzzer.

- **Hareware Reset**
  Pins 11 and 12 are designed for Hardware Reset.

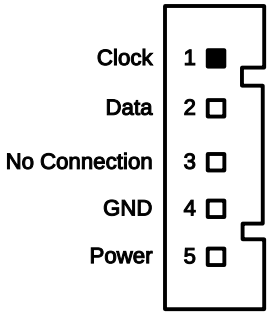
- **HDD Activity LED**
  This connector extends to the hard drive activity LED on the control panel. This LED will flash when the HDD is being accessed. Pins 13 and 14 can be connected to the hard disk drive and front panel HDD LED.

- **Power Button**

  Pins 9 and 10 connect the front panel's ATX power button to the card, which allows users to control ATX power supply on or off.

2.4.13 External Mouse/Keyboard Connectors: CN9/CN13

The board provides a keyboard (CN13) and Mouse (CN9) interface with two 5-pin connectors.

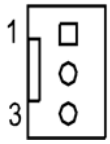


2.4.14 SYSTEM FAN1/FAN2/FAN3 Connectors:

You can connect the system cooling fan cable to FAN1/FAN2/FAN3 for system cooling fan power.

Pin	Signal
1	Ground
2	+12V
3	Rotation Detection

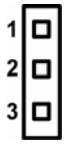
FAN1/FAN2/FAN3



2.4.15 Ethernet Connector 2 External Speed LED: CN25

Pin	Signal
1	100, Low Active
2	3.3V
3	Gigibit, Low Active

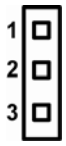
CN25



2.4.16 Ethernet Connector 1 External Speed LED: CN23

Pin	Signal
1	100, Low Active
2	3.3V
3	Gigibit, Low Active

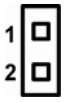
CN23



2.4.17 Ethernet Connector 2 External Act/Link LED: CN24

Pin	Signal
1	3.3V
2	Link active

CN24



2.4.18 Ethernet Connector 1 External Act/Link LED: CN22

Pin	Signal
1	3.3V
2	Link active

CN22

Chapter 3
Hardware Installation

Before installing the processor, please access Intel® website for more detailed information http://www.intel.com .

3.1 Installing the Processor

The Intel® Pentium® M Processor is available as a boxed processor for laptop computers in the micro-FCPGA form factor. Intel recommends the processor should be installed by a computer professional since this electronic device may cause serious damage to the installer, system and processor if installed improperly.

Important: Before attempting to install a new processor, carefully review the documentation that came with your system and make sure that you will not be voiding your warranty by opening the computer or replacing your processor.

Instructions

1. Make sure that your system can accommodate the Intel Pentium M Processor that you want to install. Check for motherboard, BIOS, and thermal compatibility by using the manufacturer's documentation for the laptop computer, or by contacting the vendor if necessary. This processor should only be installed in systems supporting the Intel Pentium M Processor.

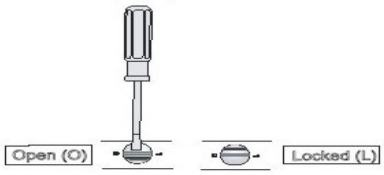
   Important Notes: Do not use a Intel Pentium M Processor in a desktop system and do not use a desktop processor in a Intel Pentium M Processor notebook. Since these processors have different electrical specifications, damage to the processor and system can occur.

2. Obtain access to your processor socket as described in the documentation for your system.

3. If the cooling solution prevents you from accessing the processor socket, you may need to remove it. Instructions on how to remove your cooling solution should be provided in the documentation that came with the system.

4. To un-install the current processor, use a screwdriver to disengage (open) the socket actuator, as shown in Figure 1 below. (The most commonly used sockets are Molex* or FoxConn* sockets, so they are used in the illustrations below.) The socket actuator should open after only a half turn or so, and you should then be able to remove the processor with your fingers.

Figure 1: Disengaging the Socket Actuator



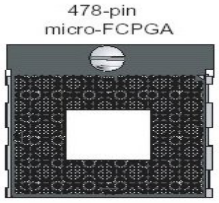
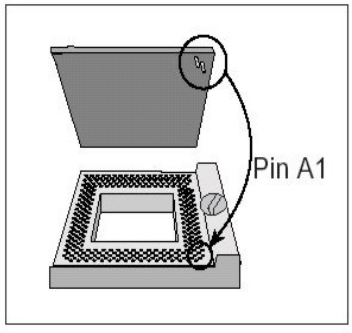
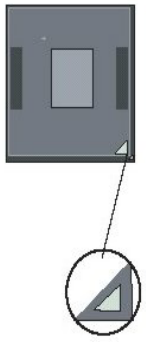


Figure 2: Aligning the Processor in the Socket



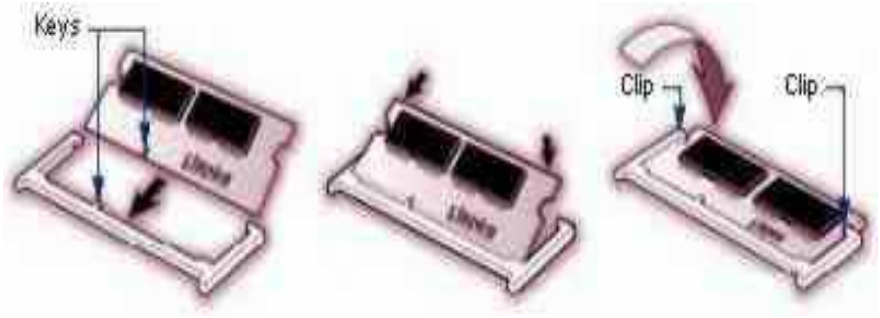


3.2 Installing the Memory

The board supports two 200-pin DDR2 SO-DIMM memory sockets with maximum memory capacity up to 4GB.

Please follow steps below to install the memory modules:

1 Push down latches on each side of the SO-DIMM socket.
2 Align the memory module with the socket that notches of memory module must match the socket keys for a correct intallation.
3 Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the SO-DIMM.
4 Install any remaining SO-DIMM modules.



MEMO

Chapter 4
Hardware Description

4.1 Microprocessors

The SHB210 Series supports Intel® Core™ 2 Duo/ Core™ Duo/Core™ solo, Celeron® M processors, which make your system operated under Windows® 2000/XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

4.2 BIOS

The SHB210 Series uses Award Plug and Play BIOS with a single 4Mbit Flash EPROM.

4.3 System Memory

The SHB210 Series supports two 200-pin DDR2 SO-DIMM sockets for a maximum memory of 4GB. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB, 1GB and 2GB.

4.4 I/O Port Address Map

The Intel® Core™ 2 Duo/ Core™ Duo/Core™ Solo, Celeron® M CPUs can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-05F	Timer
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0F0	Clear math coprocessor busy signal
0C0-0DF	DMA controller #2
0F1	Reset math coprocessor
0F8-0FF	Math processor
1F0-1F8	Fixed disk controller
200-207	Game port
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel port #1
3B0-3BF	MDA video card (including LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

Chapter 5
Award BIOS Utility

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the Setup information whenever the power is turned off.

5.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

5.2 Control Keys

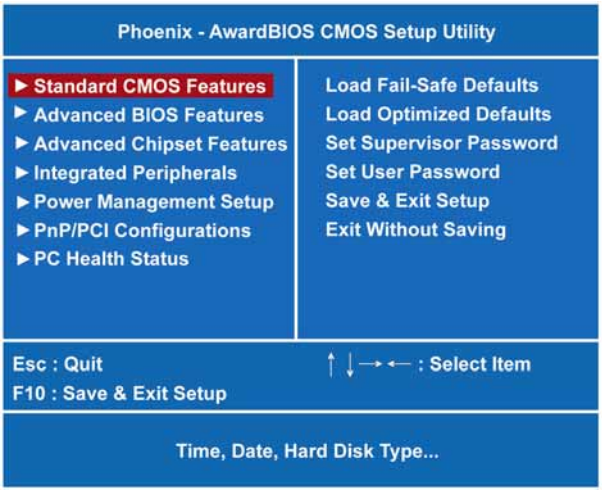
Up arrow	Move cursor to the previous item
Down arrow	Move cursor to the next item
Left arrow	Move cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+" key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

5.3 Getting Help

- **Main Menu**
  The online description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop out a small Help window that provides the description of using appropriate keys and possible selections for highlighted items. Press <F1> or <Esc> to exit the Help Window.

5.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.



NOTE: *If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

5.5 Standard CMOS Setup Menu

The Standard CMOS Setup Menu displays basic information about your system. Use arrow keys to highlight each item, and use <PgUp> or <PgDn> key to select the value you want in each item.

- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	It is determined by the BIOS and read only, from Sunday to Saturday.
month	It can be keyed with the numerical/ function key, from 1 to 31.
Date	It is from January to December.
year	It shows the current year of BIOS.

- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **IDE Channel 0 Master/IDE Channel 0 Slave/IDE Channel 1 Master/IDE Channel 1 Slave**
  These items identify the types of each IDE channel installed in the computer. There are 45 predefined types (Type 1 to Type 45) and 2 user's definable types (Type User) for Enhanced IDE BIOS. Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type, or directly type the number and press <Enter>. Please be noted your drive's specifications must match the drive table. The hard disk will not work properly if you enter improper information. If your hard disk drive type does not match or is not listed, you can use Type User to manually define your own drive type.
  If selecting Type User, you will be asked to enter related information in the following items. Directly key in the information and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the HDD interface controller supports ESDI, select "Type 1".
  If the HDD interface controller supports SCSI, select "None".
  If the HDD interface controller supports CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

- **Dive A type/Drive B type**
  The item identifies the types of floppy disk installed in the computer, as drive A or drive B.

None	No floppy drive installed
360K, 3.5 in	3.5 inch PC-type standard drive; 360Kb Mini ITXcity
1.2M, 3.5 in	3.5 inch AT-type high-density drive; 1.2MB Mini ITXcity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb Mini ITXcity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB Mini ITXcity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB Mini ITXcity

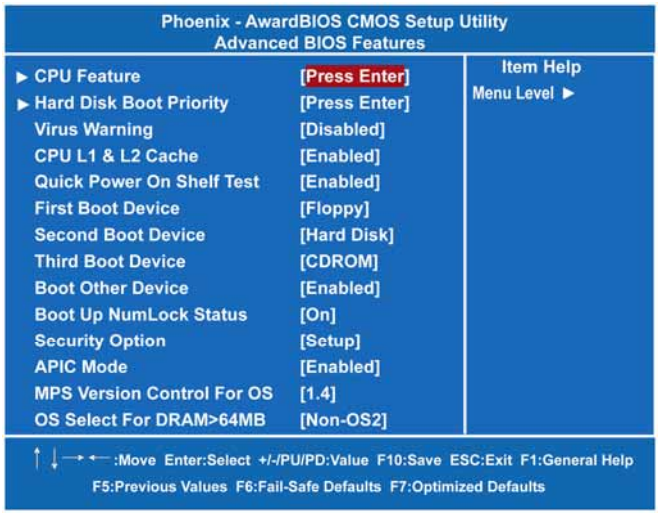
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.
All, But Diskette	The system booting will not stop for a disk error; it will stop for other errors.
All, But Disk/Key	The system booting will not stop for a keyboard or disk error; it will stop for other errors.

Press <Esc> to return to the Main Menu page.

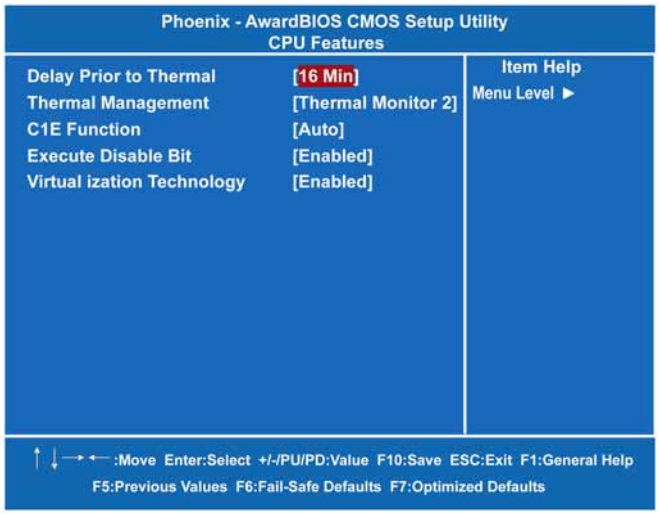
5.6 Advanced BIOS Features

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



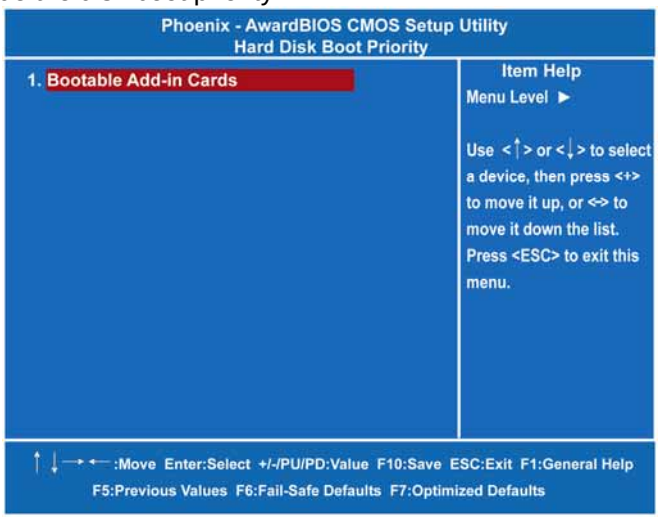
- **CPU Feature**

Scroll to this item and press <Enter> to view the CPU Feature sub menu.



- **Hard Disk Boot Priority**

  Scroll to this item and press <Enter> to view the sub menu to decide the disk boot priority.



Press <Esc> to return to the Advanced BIOS Features page.

- **Virus Warning**

  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is "*Disabled*".

! WARNING !
Disk boot sector is to be modified *Type "Y" to accept write or "N" to abort write* *Award Software, Inc.*

Enabled	It automatically activates while the system boots up and a warning message appears for an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear for attempts to access the boot sector or hard disk partition table.

***NOTE**: This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU L1 & L2 Cache**
  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is *"Enabled"*. CPUs without built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.
- **Boot Other Device**
  This item allows users to enable or disable the boot device not listed in the First/Second/Third boot devices option above. The default setting is "*Enabled"*.
- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks. The 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is "*Enabled*".

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Please be noted BIOS can not differentiate 720K, 1.2M or 1.44M drive type as they all are 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the installed drive is 360K.

- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is *"On"*.

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	If a wrong password is entered at the prompt, the system will not boot, the access to Setup will be denied, either.
Setup	If a wrong password is entered at the prompt, the system will boot, but the access to Setup will be denied.

NOTE: *To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **APIC Mode**
  Use this item to enable or disable APIC (Advanced Programmable Interrupt Controller) mode that provides symmetric multi-processing (SMP) for systems.

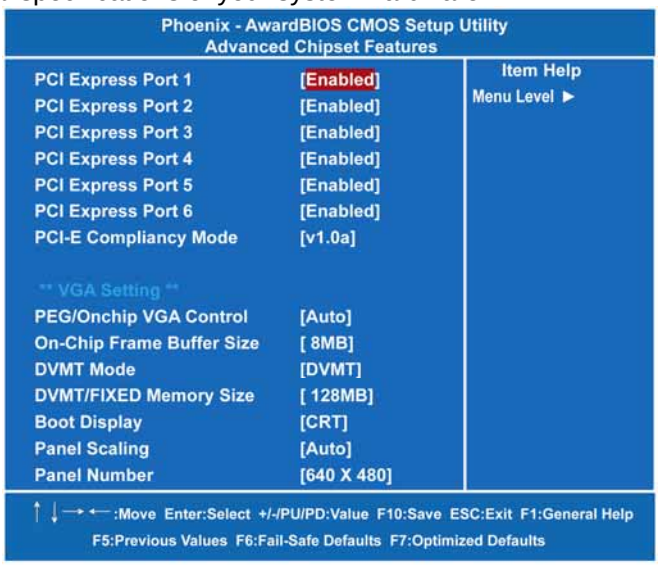
- **MPS Version Control For OS**
  This item specifies the version of the Multiprocessor Specification (MPS). Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability.

- **OS Select for DRAM >64MB**
  This item allows you to access the memory over 64MB in OS/2.

Press <Esc> to return to the Main Menu page.

5.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.



- **PCI Express Port 1 ~ 6**

  There are several PCI Express Ports for your selection.

- **PCI-E Compliancy Mode**

  This item allows you to set the version of the PCI Express base specifications.

**** VGA Setting ****

- **PEG/Onchip VGA Control**

  Use this item to choose the primary display card.

- **On-Chip Frame Buffer Size**

  Use this item to set the VGA frame buffer size.

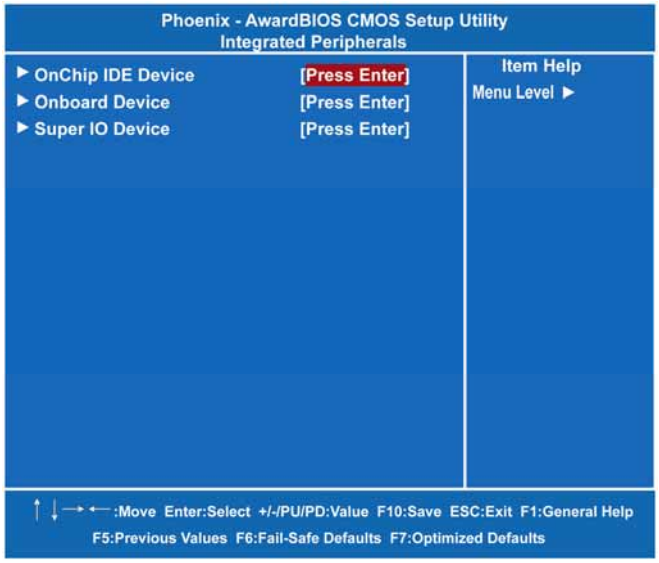
- **DVMT Mode**
  DVMT (Dynamic Video Memory Technology) helps you select the video mode.
- **DVMT/Fixed Memory Size**
  DVMT (Dynamic Video Memory Technology) allows you to select a maximum size of dynamic amount usage of the video memory. The system would configure the video memory dependent on your application.
- **Boot Display**

  This item is for Intel define ADD card only.

Press <Esc> to return to the Main Menu page.

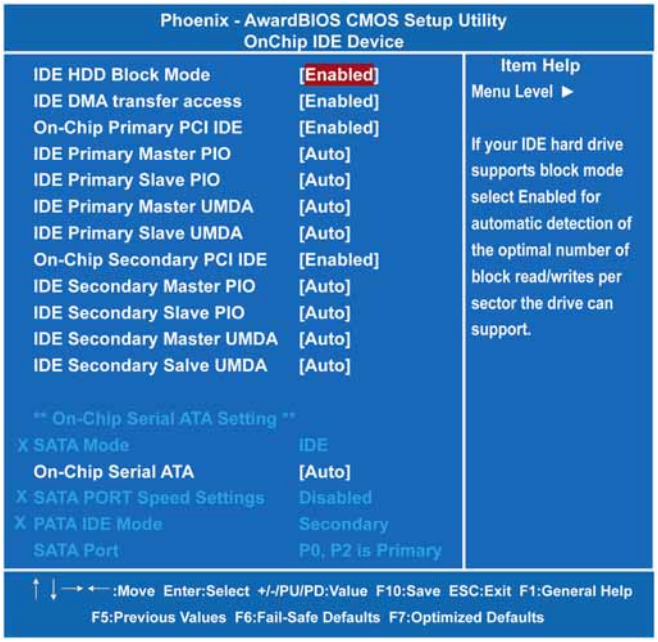
5.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.



- **OnChip IDE Device**

  Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.



  - **IDE HDD Block Mode**
    Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
  - **IDE DMA transfer access**
    Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.
  - **On-Chip Primary/Secondary PCI IDE**
    The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately. The default value is *"Enabled"*.

    ***NOTE**: Choosing Disabled for these options will*

automatically remove the IDE Primary Master/ Slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.

- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
- **IDE Primary/Secondary Master/Slave UDMA**
  Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.

**** On-Chip Serial ATA Setting ****

- **SATA Mode**
  There are these options for you to set up SATA mode: IDE, RAID or AHCI.
- **On-Chip Serial ATA**

  Use this item to enable or disable the built-in on-chip serial ATA.
- **SATA PORT Speed Settings**

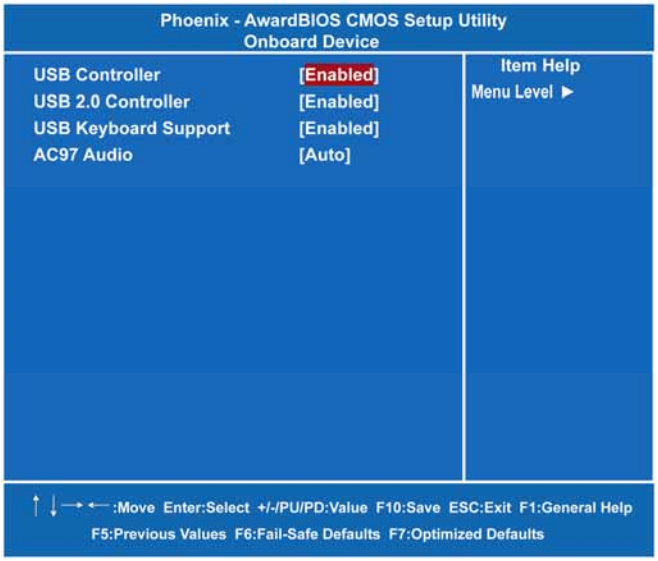
  Use this item to select SATA I or SATA II device support forcedly.
- **PATA IDE Mode**

  Use this item to set the PATA IDE mode. When set to Primary, P1 and P3 are Secondary; on the other hand, when set to Secondary, P0 and P2 are Primary.
- **SATA Port**
  If the "PATA IDE Mode" is Primary, it will show " P1, P3 is Secondary" which means SATA 2 and SATA 4 are Secondary. If the "PATA IDE Mode " is Secondary, it will show " P0, P2 is Primary " which means SATA 1 and SATA 3 are Primary.

Press <Esc> to return to the Integrated Peripherals page.

- **Onboard Device**

  Scroll to this item and press <Enter> to view the sub menu Onboard Device.

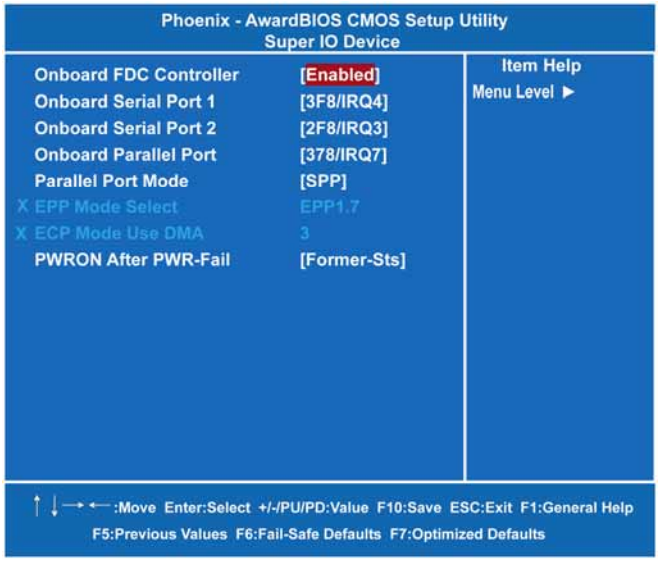


  - **USB Controller**
    Enable this item if you are using the USB in the system. You should disable this item if a higher-level controller is added.
  - **USB 2.0 Controller**
    Enable this item if you are using the EHCI (USB2.0) controller in the system.
  - **USB Keyboard Support**
    Enable this item if the system has a Universal Serial Bus (USB) controller, and you have a USB keyboard.
  - **AC'97 Audio**
    Use this item to enable or disable the onboard AC'97 Audio function.

Press <Esc> to return to the Integrated Peripherals page.

- **Super IO Device**

  Scroll to this item and press <Enter> to view the sub menu Super IO Device.



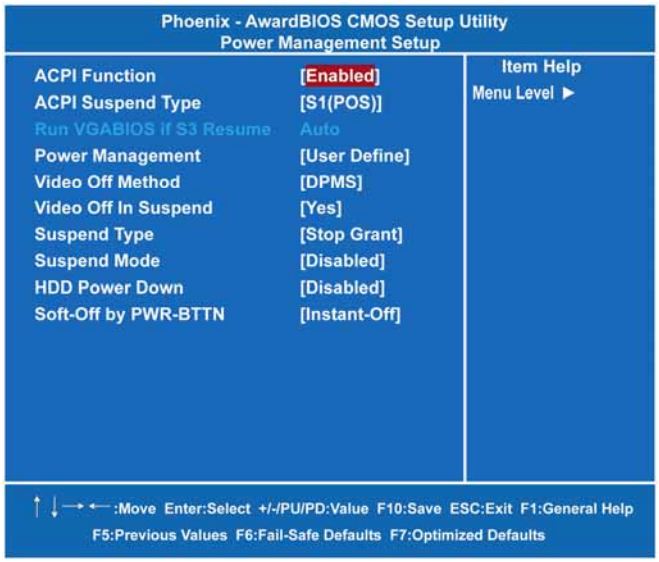
  - **Onboard FDC Controller**
    Select Enabled, if your system has a floppy disk controller (FDC) installed on the system board and you want to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Options: Enabled and Disabled.
  - **Onboard Serial Port 1 / 2**
    Select an address and corresponding interrupt for the serial port. Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.
  - **Onboard Paralellel Port**
    This item allows you to determine the I/O address for onboard parallel port. Options: 378H/IRQ7, 278H/IRQ5, 3BC/IRQ7 and Disabled.
  - **Parallel Port Mode**
    Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field. Options: EPP1.9, ECP, SPP, ECPEPP1.7, EPP1.7.
  - **EPP Mode Select**
    Select EPP port type 1.7 or 1.9.

- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port while using the ECP mode.
- **PWRON After PWR-Fail**
  This item enables your computer to automatically restart or return to its operating status.

Press <Esc> to return to the Integrated Peripherals page, and press it again to the Main Menu page.

5.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.



- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always "*Enabled*".
- **ACPI Suspend Type**
  This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE,

Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

[S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

- **Power Management**
  This option allows you to select the type of power Management. Options: APM, ACPI.

- **Video Off Method**
  This setting determines the manner in which the monitor is blanked.

V/H SYNC+Blank	It turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the supplied software for your video subsystem to select video power management values.
Blank Screen	The System only writes blanks to the video buffer.

- **Video Off In Suspend**

  This item defines if the video is powered down when the system is put into suspend mode.

- **Suspend Type**

  If this item is set to the default Stop Grant, the CPU will go into Idle Mode during power saving mode.

- **Suspend Mode**
  After a selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	The System will never enter the SUSPEND mode.
1/2/4/6/8/10/20/30/40 Min/1 Hr	It defines continuous idle time before the system entering the SUSPEND mode. If any item defined in (J) is enabled and active, the SUSPEND timer will be reloaded.

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.

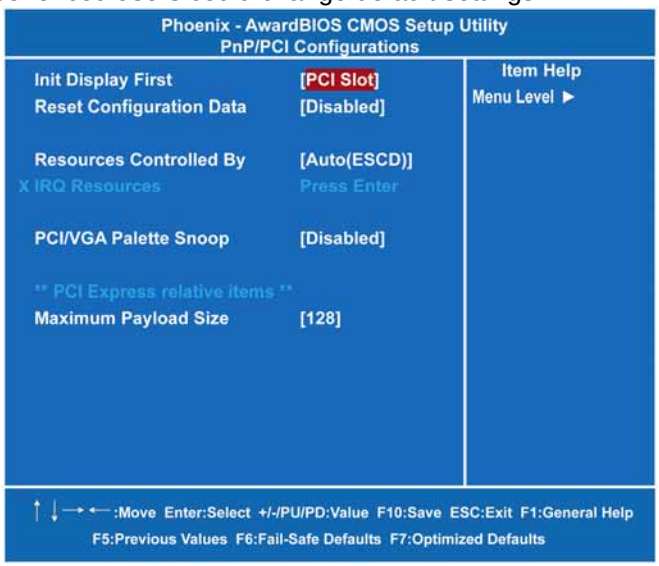
- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows users to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

Instant-Off	This option follows the conventional manner of system performance when turning the power to OFF. Instant-Off is a software power OFF sequence requiring the power supply button is switched to OFF.
Delay 4 Sec.	Upon the system's turning OFF through the power switch, this option will delay the complete system power OFF sequence approximately 4 seconds. Within this delay period, the system will temporarily enter into the Suspend Mode enabling you to restart the system at once.

Press <Esc> to return to the Main Menu page.

5.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.



- **Init Display First**
  This item allows you to decide whether PCI Slot or AGP to be the first primary display card.
- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options: Enabled, Disabled.
- **Resources Controlled By**
  The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is *"Manual"*.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:
  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default value is *"PCI/ISA PnP"*.

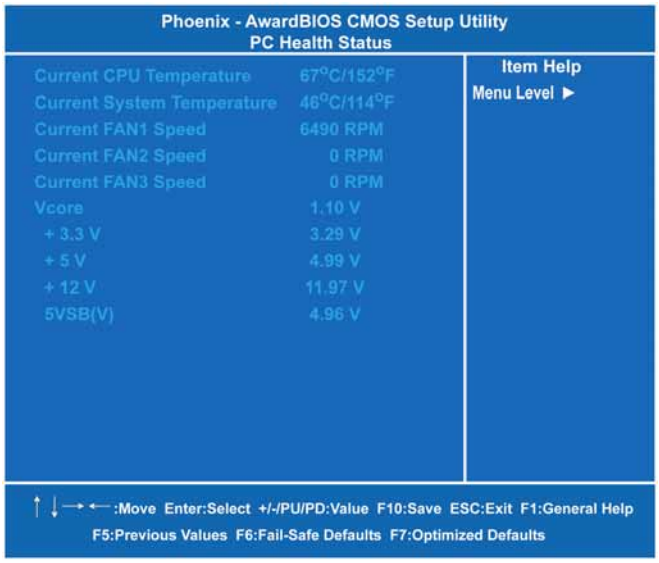
- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

**** PCI Express relative items ****

- **Maximum Payload Size**
  When using DDR SDRAM and Buffer size selection, another consideration in designing a payload memory is the size of the buffer for data storage. Maximum Payload Size defines the maximum TLP (Transaction Layer Packet) data payload size for the device.

5.11 PC Health Status

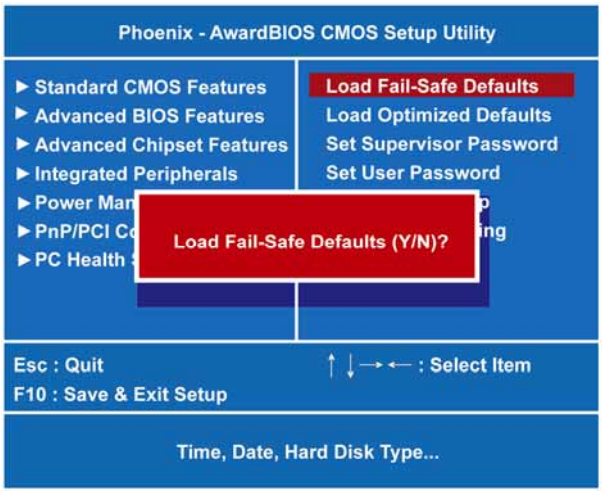
This section supports hardware monitering that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.



- **Current CPU Temperature**
  The current system CPU temperature will be automatically detected by the system.
- **Current SYSTEM Temperature**
  Show you the current system1 temperature.
- **Current FAN1 Speed**
  Show you the current system fan1 temperature.
- **Current FAN2 Speed**
  Show you the current system fan2 temperature.
- **Current FAN3 Speed**
  Show you the current system fan3 temperature.
- **Vcore +3.3V/+5V/+12V/VBAT(V)/5VSB**
  Show you the voltage of +3.3V/+5V/+12V.

5.12 Load Fail-Safe Defaults

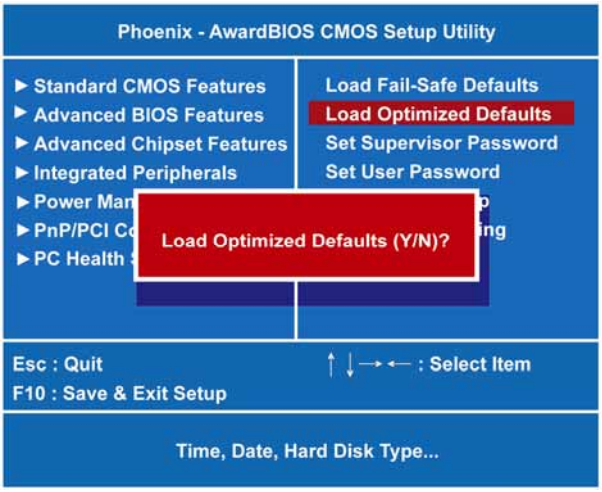
When you press <Enter> on this item, a confirmation dialog box pops out to show you such a message:



Please press "Y" to load default values that will be factory settings for accomplishing the optimal performance of system operations.

5.13 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

5.14 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1. **Supervisor password:** You can enter and change the options on the setup menu.
2. **User password:** You can just enter, but have no right to change the options on the setup menu.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

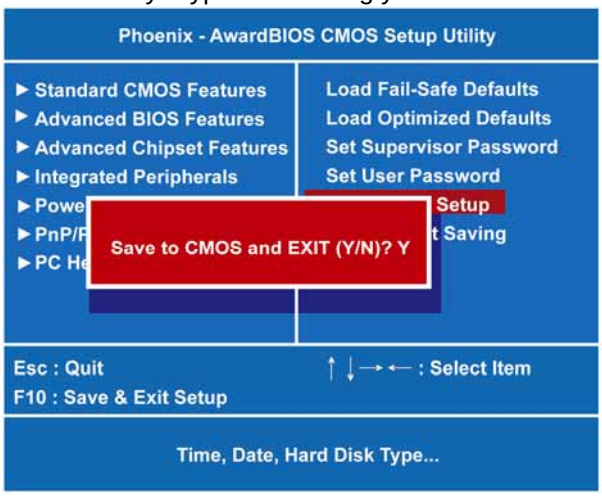
When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

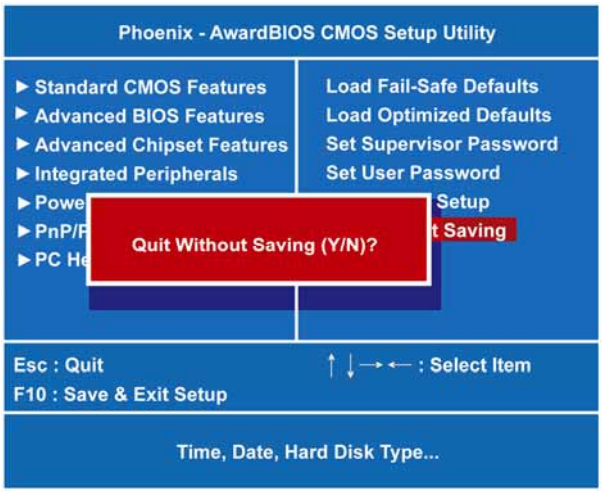
5.15 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Setup utility.



5.16 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications. Type "N" to return to the Setup utility.



Chapter 6
Installation of Drivers

The device drivers are located on the Product Information CD-ROM that comes with the SHB210 Series package. The auto-run function of drivers will guide you to install the utilities and device drivers under a Windows system. You can follow the onscreen instructions to install these devices:

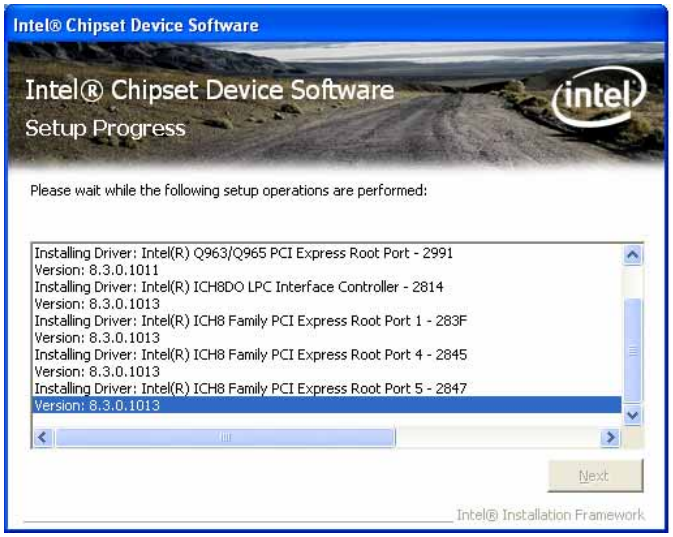
- Chipset
- VGA
- LAN

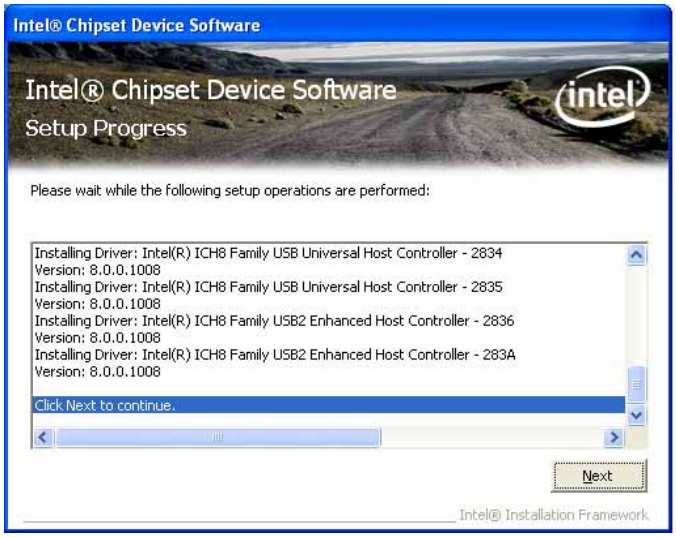
6.1 Installing Chipset Driver

1. Run the SETUP.EXE program from the driver directory in your driver CD. Click "Next" to next step.

2. An Intel® License Agreement appears to show you the important information. Click "Yes" to next step.

3. Please wait while running the following setup operations.



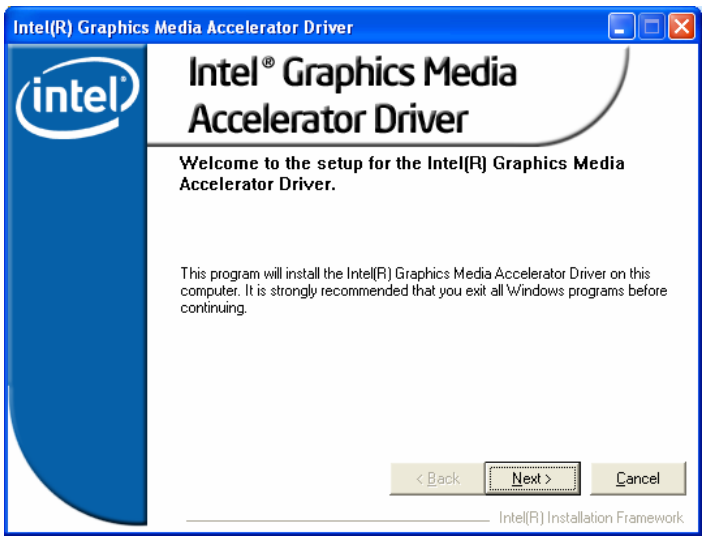


4. Click "Finish" to complete the setup process.

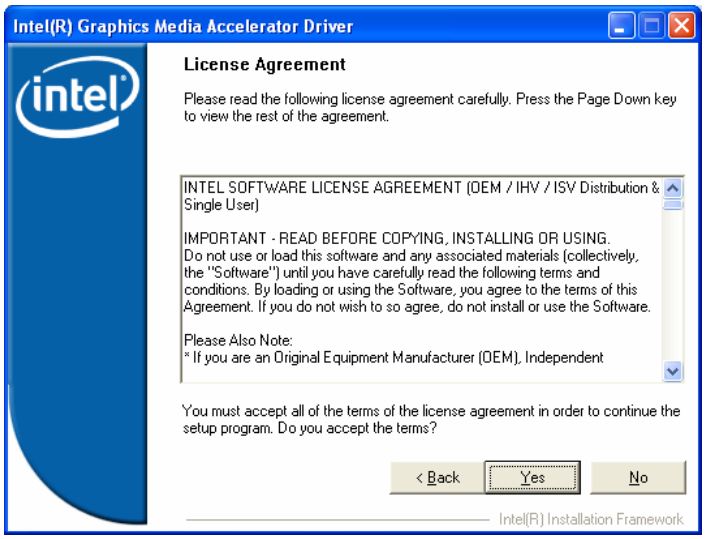
5. You will be asked to reboot your computer when the installation is completed. Please click "Yes, I want to restart my computer now" if you don't need to install any other drivers. Otherwise, please click "No, I will restart my computer later", and go on next step.

6.2 Installing VGA Driver

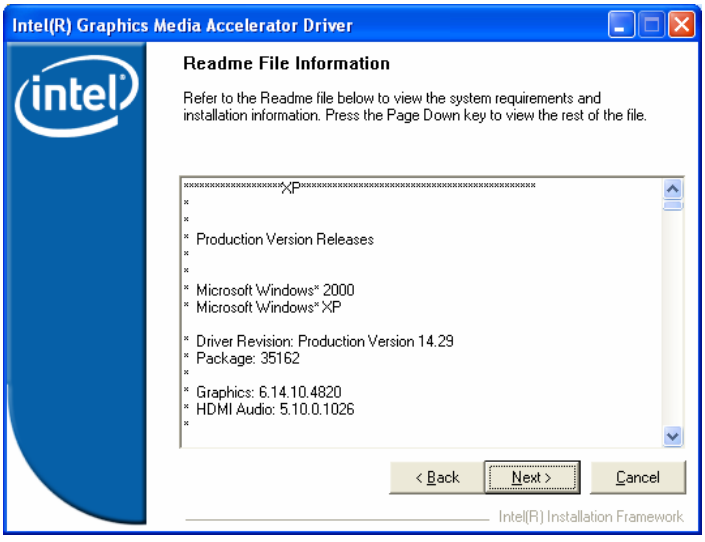
1. Run the SETUP.EXE program from the driver directory in your driver CD. Click "Next" to next step.



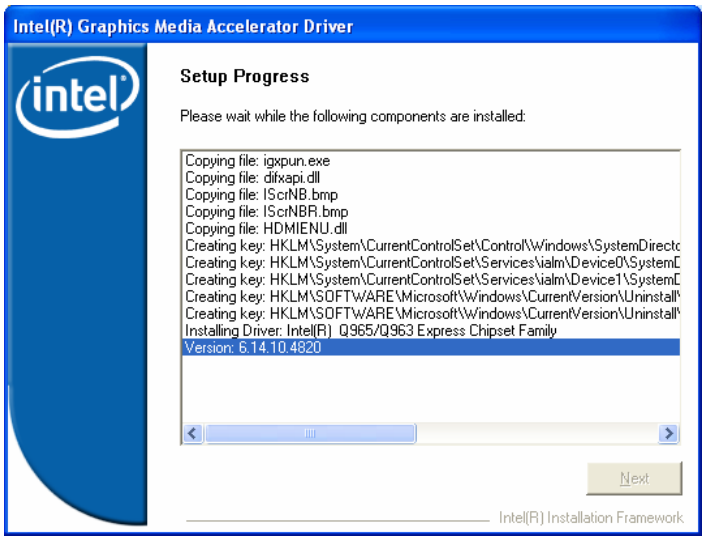
2. An Intel® License Agreement appears to show you the important information. Click "Yes" to next step.



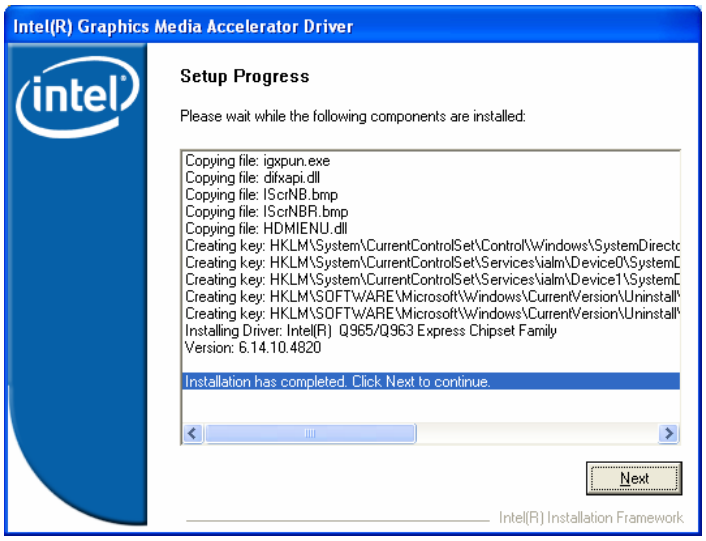
3. The message of Readme File Information appears to show you the system requirements and installation information. Please click "Next".



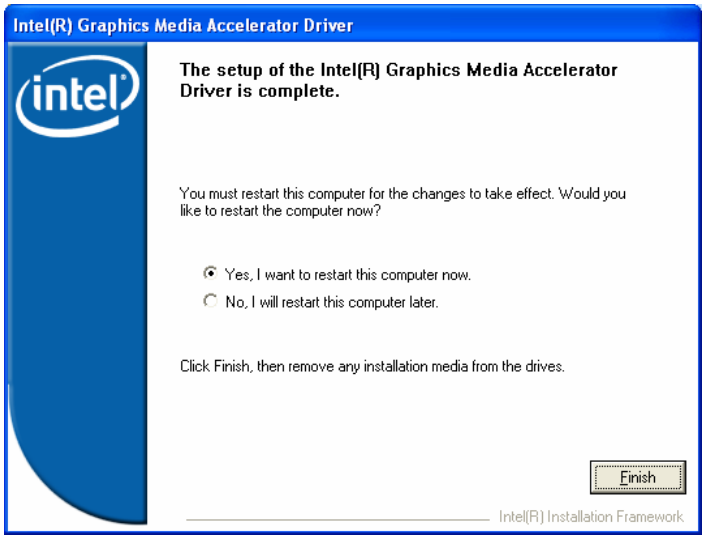
4. Please wait while running the following setup operations.



5. When this message appears, please click "Next".

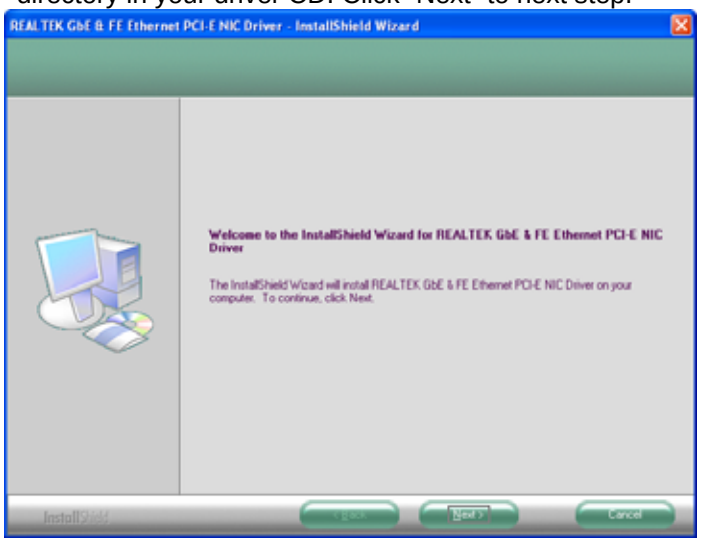


6. You will be asked to reboot your computer when the installation is completed. Please click "Yes, I want to restart my computer now" if you don't need to install any other drivers. Otherwise, please click "No, I will restart my computer later", and click "Finish" to complete the installation.

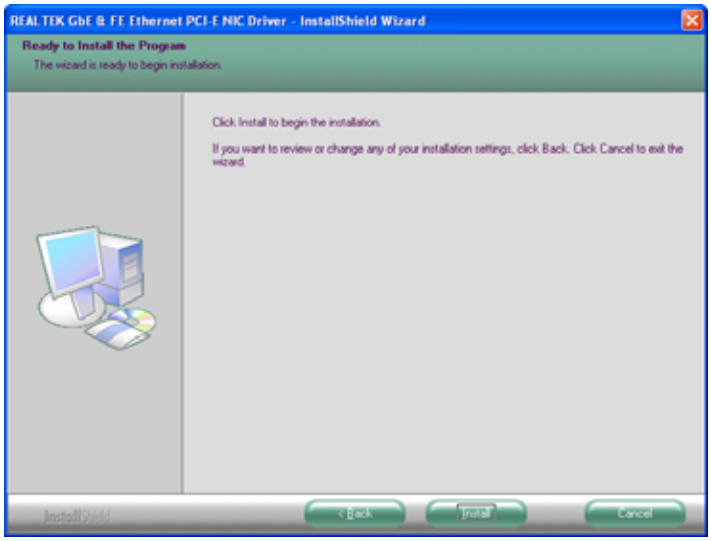


6.3 Installing LAN Driver

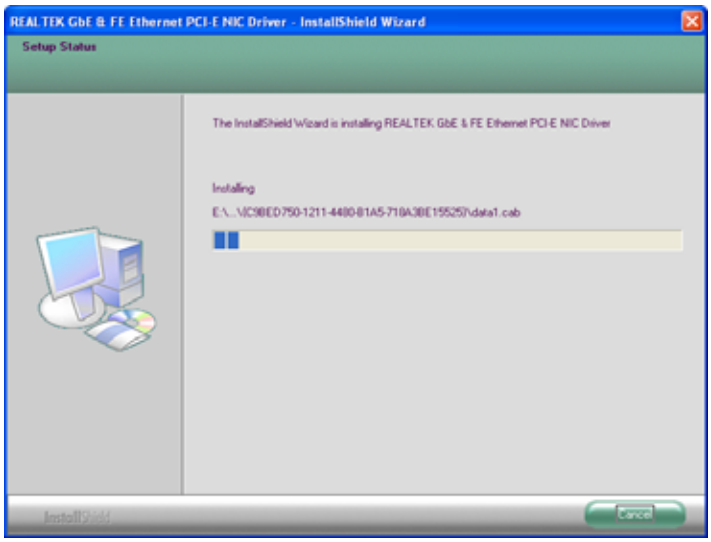
1. Run the InstallShield Wizard for Ethernet from the driver directory in your driver CD. Click "Next" to next step.



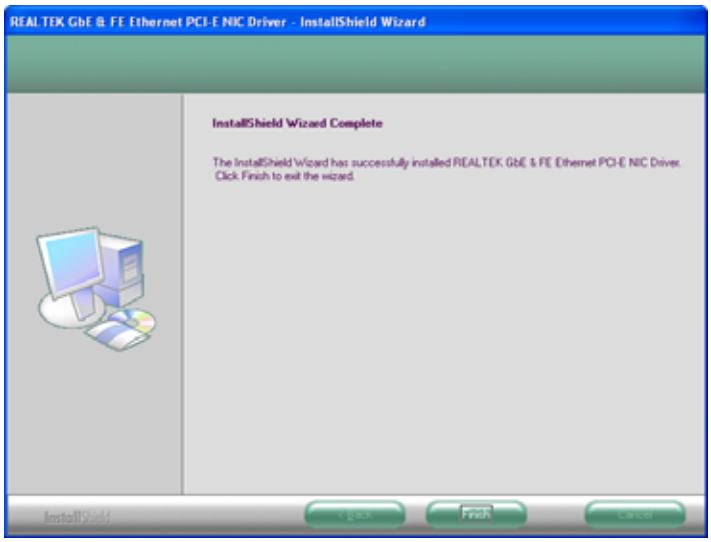
2. Click "Install" to start the installation.



3. Please wait while running the following installation operation.



4. Click "Finish" to complete the installation.

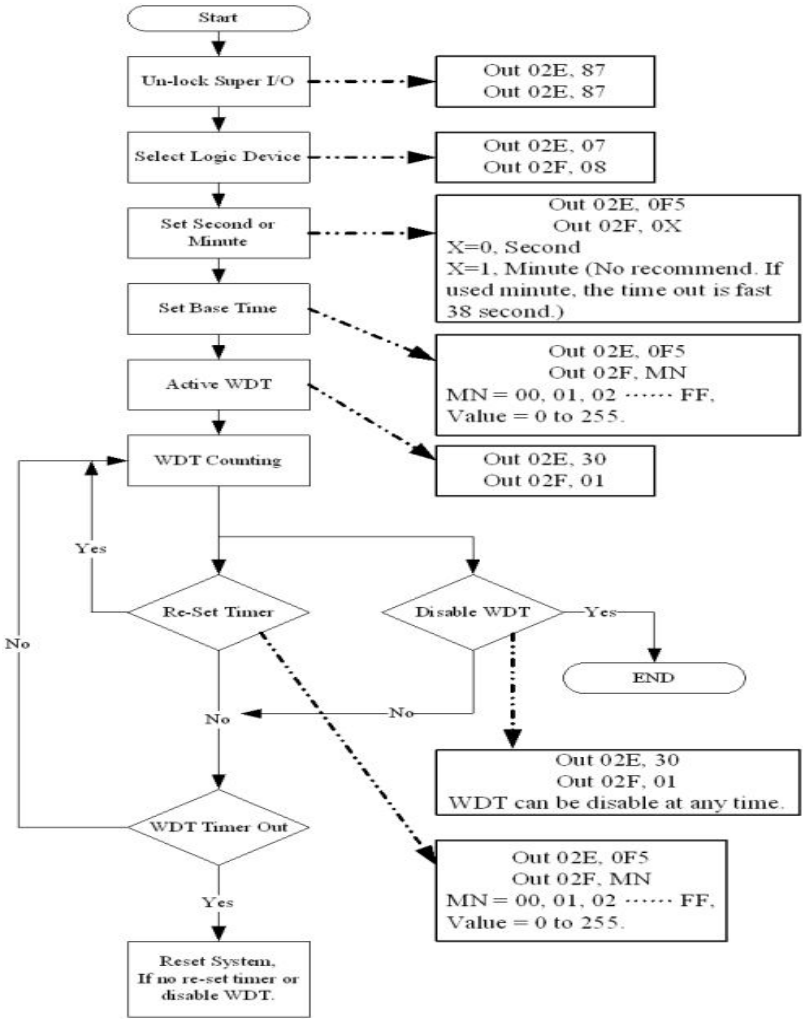


2. When this message appears, please click "Next".

MEMO

A p p e n d i x
Watch Dog Timer

Please follow the below WDT process for setup the WDT function.



MEMO