IB886

Intel ® Core™ 2 Duo/
GME965
3.5-inch Embedded Board

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The IB886 3.5-inch SBC incorporates the Mobile Intel® GME965 Express Chipset for Embedded Computing, consisting of the Intel® GME965 Graphic Memory Controller Hub (GMCH) and Intel® I/O Controller Hub (ICH8-M), an optimized integrated graphics solution with a 533MHz/667MHz/800MHz front-side bus.

The integrated powerful 3D graphics engine, based on Intel® Graphics Media Accelerator X3100 (Intel® GMA X3100) architecture, operates at core speeds of up to 400 MHz. It features a low-power design, is validated with the Intel® Core 2 Duo and Intel® Celeron processors on 65nm process. With a DDR2 533/667MHz SODIMM socket, the board supports up to 2GB of DDR2 system memory.

Intel® Graphics supports a unique intelligent memory management scheme called Dynamic Video Memory Technology (DVMT). DVMT handles diverse applications by providing the maximum (384MB) availability of system memory for general computer usage, while supplying additional graphics memory when a 3D-intensive application requests it. The Intel® GMA X3100 graphics architecture also takes advantage of the high-performance Intel processor. Intel® GMA X3100 graphics supports Dual Independent Display technology.

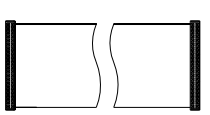
Main Features

- Supports Intel® Core™ 2 Duo processors
  Up to 2.4GHz, 533/667/800MHz FSB
- DDR2 SODIMM x1, Max. 2GB memory
- Intel GMA X3100 VGA for CRT/LVDS
- Dual Intel Gigabit Ethernet
- Intel® GME965 Express VGA for CRT / LVDS
- Watchdog timer, Digital I/O
- 1x SATA, 4x USB 2.0, 2x COM, CF Socket

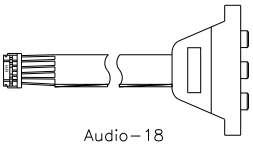
Checklist

Your IB886 package should include the items listed below.

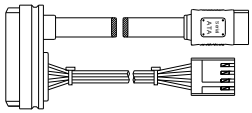
- The IB886 embedded board
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Cable kit (IDE, audio, SATA, serial port, USB, KB/mouse, DC-12V power), as shown below



IDE28



Audio–18



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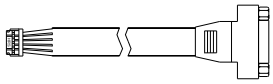
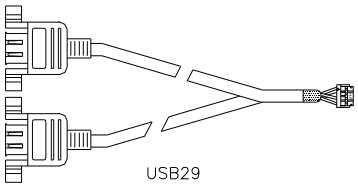
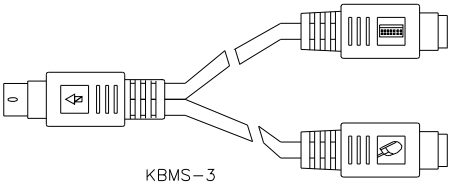


PK1H



USB29



KBMS–3

PW87

IB886 Specifications

Socket P 3.5-inch Disk Size SBC with Intel GME965 Chipset
Features

- Supports Intel® Core™ 2 Duo processors
  Up to 2.4GHz, 533/667/800MHz FSB
- DDR2 SODIMM x1, Max. 2GB memory
- Intel GMA X3100 VGA for CRT/LVDS
- Dual Intel Gigabit Ethernet
- Intel® GME965 Express VGA for CRT / LVDS
- Watchdog timer, Digital I/O
- 1x SATA, 4x USB 2.0, 2x COM, CF Socket

System

CPU	Socket P for Intel Core 2 Duo, up to 2.4GHz
System Memory	DDR SODIMM x1, Max. 2GB
System Chipset	Intel GME965 (667/800MHz FSB) + ICH8M
BIOS	Award
Watchdog Timer	256 levels
SSD	Type II CF Socket
H/W Monitor	Yes
Expansion Slot	NA

Graphics

VGA Controller	Intel GME965 built-in GMA X3100
VGA Memory	Intel Dynamic Video Memory Technology (DVMT 4.0) Maximum shared memory: 384MB
Interface	CRT and single/dual channel LVDS

Ethernet

Controller	Two Intel 82574L Gigabit Ethernet Controllers
Connector	RJ-45

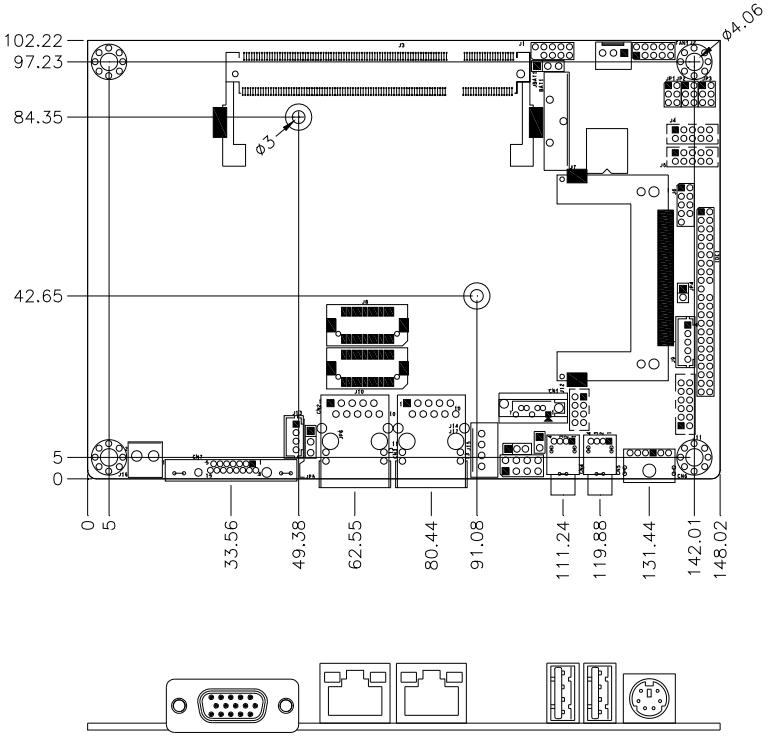
Multi I/O

Chipset	Winbond W83627EHG 1x IDE, 1x KB, 1x Mouse 1x RS232, 1x RS-232/422/485, 1x SATAII
USB	2 ports on board Pin header for 2 ports (USB 2.0)
Audio	Built-in Intel HD audio + ALC662 codec for 6 channels
Others	Digital I/O, 12V DC-in, Smart battery interface

Mechanical and Environmental

Dimensions	102mm x 147mm (4” x 5.8”)

Board Dimensions



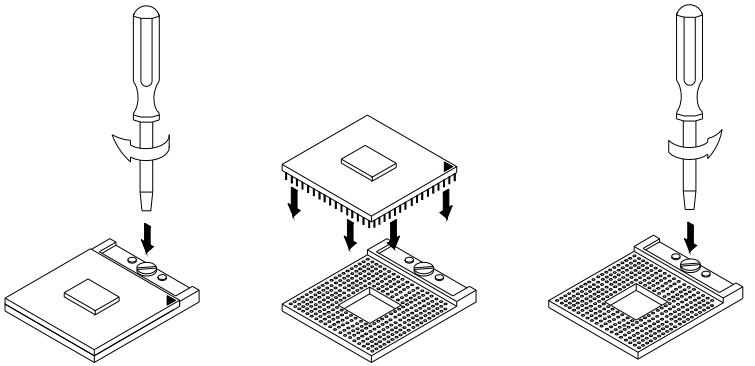
Installations

This section provides information on how to use the jumpers and connectors on the IB886 in order to set up a workable system. The topics covered are:

Installing the CPU

The IB886 SBC supports a Socket P processor socket for Intel® Core™ 2 Duo and Intel® Celeron mobile processors.

The processor socket comes with a screw to secure the processor. As shown in the picture below, loosen the screw first before inserting the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, fasten the screw.



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

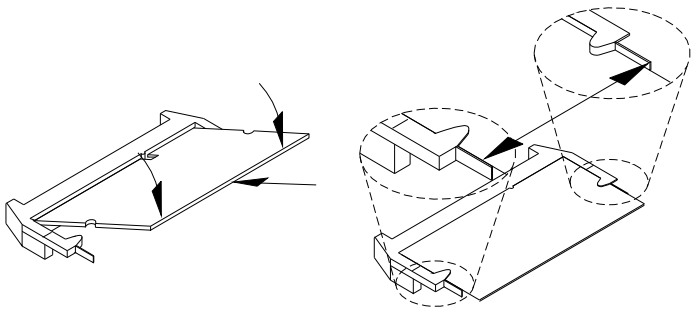
Installing the Memory

The IB886 board supports one DDR2 memory socket that can support up to 2GB memory, DDR2 533/667 (w/o ECC function).

Installing and Removing Memory Modules

To install the DDR2 modules, locate the memory slot on the board and perform the following steps:

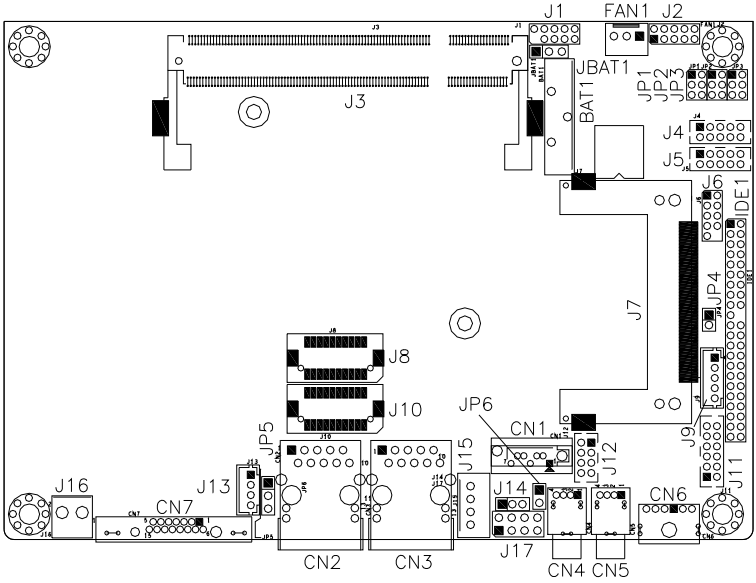
1. Hold the DDR2 module so that the key of the DDR2 module aligns with that on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
2. To seat the memory module into the socket, apply firm and even pressure to each end of the module until you feel it slip down into the socket.
3. With the module properly seated in the socket, rotate the module downward. Continue pressing downward until the clips at each end lock into position.
4. To remove the DDR2 module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on IB886 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB886 and their respective functions.

Jumper Locations on IB886

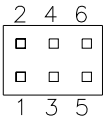


JBAT1: Clear CMOS Setting

JBAT1	Setting
	Normal
	Clear CMOS

JP1, JP2, JP3: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.



COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP1: 1-2 JP2: 3-5 & 4-6 JP3: 3-5 & 4-6	JP1: 3-4 JP2: 1-3 & 2-4 JP3: 1-3 & 2-4	JP1: 5-6 JP2: 1-3 & 2-4 JP3: 1-3 & 2-4

JP4: CompactFlash Slave/Master Selection

JP4	CF Setting
	Master
	Slave

JP5: LCD Panel Power Selection

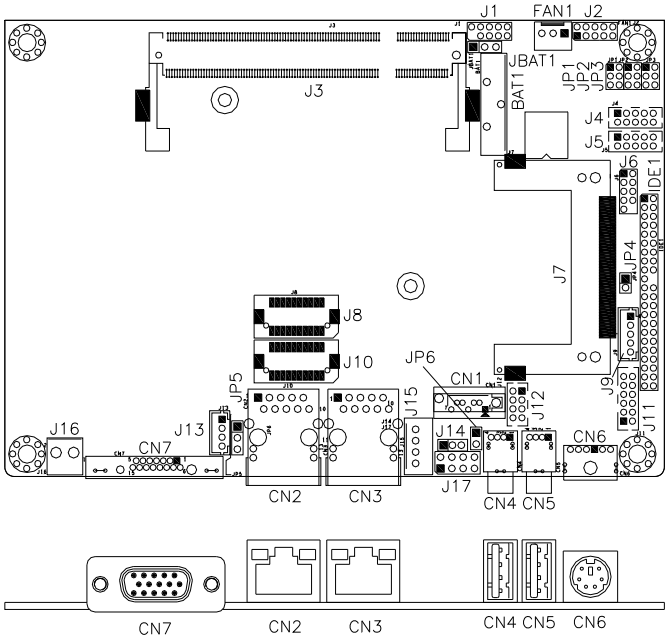
JP5	LCD Panel Power
	3.3V
	5V

J14: ATX or AT Power Selection

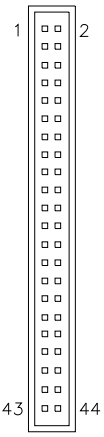
J14	ATX Power
	ATX
	AT

Connectors on IB886

Connector Locations on IB886



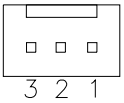
IDE1: IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

FAN1: System Fan Power Connector

FAN1 are 3-pin headers for system fans. The fan must be a 12V fan.



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

JP6: Speaker

Pin #	Signal Name
1	+5V
2	Speaker

CN1: Serial ATA Connectors

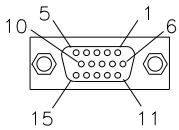
CN2, CN3: GbE RJ45 Ports

CN4, CN5: USB1/2 Ports

CN6: PS/2 Keyboard/Mouse Connector

Pin #	Signal Name
1	Keyboard data
2	Mouse data
3	GND
4	5V
5	Keyboard clock
6	Mouse clock

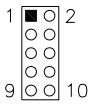
CN7: VGA Connector



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

J1: SPI Flash Connector (factory use only)

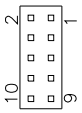
J2: Digital I/O



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

J4: COM2: Serial Port

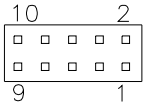
J4 COM2 serial port connector is jumper selectable for RS-232, RS-422 and RS-485.



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

J5: COM1 Serial Port

J5 (COM1) is a COM port pin-header connector.



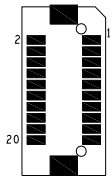
Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used

J6: For factory use only

J7: CF Socket

J8/J10: LVDS Connector (2nd channel, 1st channel)

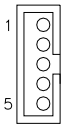
The LVDS connectors, DF13 20-pin mating connectors, are composed of the first channel (J10) and second channel (J8) to support 24-bit or 48-bit.



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
*5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
*5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

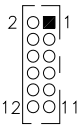
**JP5 can be used to set 3.3V or 5V.*

J9: Smart Battery Interface Connector



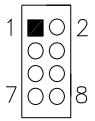
Pin #	Signal Name
1	RST
2	EXTSMI
3	Ground
4	DATA
5	CLK

J11: Audio Connector (DF11 Connector)



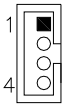
Signal Name	Pin #	Pin #	Signal Name
LINEOUT R	2	1	LINEOUT L
Ground	4	3	JD FRONT
LINEIN R	6	5	LINEIN L
Ground	8	7	JD LINEIN
MIC R	10	9	MIC L
Ground	12	11	JD MIC1

J12: USB2/USB3 Connector



Signal Name	Pin	Pin	Signal Name
Vcc	1	2	Ground
D0-	3	4	D1+
D0+	5	6	D1-
Ground	7	8	Vcc

J13: LCD Backlight Connector (DC type)



Pin #	Signal Name
1	+12V
2	Backlight Enable
3	*Backlight Adj (DC type)
4	Ground

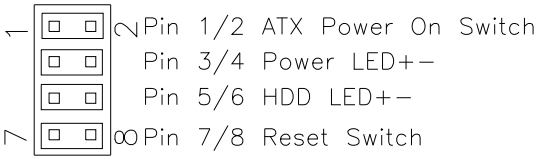
J15: HDD Power Connector

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

J16: DC-IN 12V Power Connector

Pin #	Signal Name
1	DC in (12V only)
2	Ground

J17: System Function Connector



ATX Power ON Switch: Pins 1 and 2
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

Power LED: Pins 3 and 4

Pin #	Signal Name
3	Vcc
4	Ground

Hard Disk Drive LED Connector: Pins 5 and 6

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
6	HDD Active
5	Vcc

Reset Switch: Pins 7 and 8

The reset switch allows the user to reset the system without turning the main power switch off and then on again.

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

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

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

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

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the board is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Apr 28, 2007	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level >
IDE Channel 0 Master	None	Change the day, month,
IDE Channel 0 Slave	None	Year and century
IDE Channel 1 Master	None	
IDE Channel 1 Slave	None	
Video	EGA/VGA	
Halt On	No Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1999 to 2099**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Channel Master/Slave

The onboard PCI IDE connector provides Primary and Secondary channels for connecting up to two IDE hard disks or other IDE devices.

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDING ZONE :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Remarks: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 0.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (Default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

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

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CPU Feature	Press Enter	ITEM HELP
Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level >
CPU L3 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Hard Disk	
Second Boot Device	CDROM	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	No	
Full Screen Logo Show	Disabled	
Small Logo (EPA) Show	Disabled	
Summary System Show	Disabled	

CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

Hard Disk Boot Priority

With the field, there is the option to choose, aside from the hard disks connected, "Bootable add-in Cards" which refers to other external devices.

Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU L3 Cache

Cache memory is additional memory that is faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These allow you to enable (speed up memory access) or disable the cache function.

Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*, *Hard Disk*, *CDROM*, *ZIP100*, *USB-Floppy*, *USB-ZIP*, *USB-CDROM*, *LAN* and *Disabled*.

Boot Other Device
These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Disabled***.

Full Screen Logo Show / Summary Screen Show

The default setting of these fields is ***Disabled***.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
System BIOS Cacheable	Enabled	
Memory Hole at 15M-16M	Disabled	
PCI-Express Root Port Function	Press Enter	
** VGA Setting **		
PEG/On Chip VGA Control	Onchip VGA	
PEG Force X1	Disabled	
On-Chip Frame Buffer Size	8MB	
DVMT Mode	DVMT	
DVMT/FIXED memory Size	128MB	
Active LVDS	None	
Integrated LVDS	18bit	
Boot Display	Auto	
Panel Scaling	Auto	
Panel Number	640*480 SC/DC	

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

PCI-Express Root Port Function

This portion allows you to set the PCI Express Ports (1~6) as ***Auto***, ***Enabled*** and ***Disabled***. The PCI-E Compliancy Mode field, by default, is set to ***v1.0a***.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

On-Chip VGA Setting

The fields under the On-Chip VGA Setting and their default settings are:

PEG/On Chip VGA Control	Onchip VGA
PEG Force X1	Disabled
On-Chip Frame Buffer Size	8MB
DVMT Mode	DVMT
DVMT/FIXED memory Size	128MB
Active LVDS	None
(The other option is "Integrated LVDS". Select this to activate the LVDS function.)	
Integrated LVDS	18bit
Boot Display	Auto
Panel Scaling	Auto
Panel Number	640*480 SC/DC

Panel Scaling

The default setting is ***Auto***. The options available include *On* and *Off*.

Panel Number

These fields allow you to select the LCD Panel type. The default values for these ports are:

640x480	SC/DC
800x480	SC/DC
800x600	SC/DC
1024x768	SC/DC
1280x600	SC/DC
1280x760	SC/DC
1280x800	SC/DC
1280x1024	SC/DC
1366x768	SC/DC
1440x900	SC/DC
1400x1050	SC/DC
1600x1200	SC/DC
1920x1200	SC/DC
1920x1080	SC/DC

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

OnChip IDE Device	Press Enter	ITEM HELP
SuperIO Device	Press Enter	Menu Level >
USB Device Setting	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device

IDE HDD Block Mode	Enabled	ITEM HELP
IDE DMA transfer access	Enabled	
		Menu Level >
On-Chip Serial ATA Setting		
SATA Mode	IDE	
On-Chip Serial AT	Combined Mode	
On-Chip PATA Setting		
On-chip Primary PCI IDE	Enabled	
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device

POWER ON Function	BUTTON ONLY	ITEM HELP
KB Power ON Password	Enter	
Hot Key Power ON	Ctrl-F1	Menu Level >
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
Onboard Parallel Port :	378/IRQ7	
Parallel Port Mode :	SPP	
EPP Mode Select:	EPP1.7	
ECP Mode Use DMA:	3	
PWRON After PWR-Fail	Off	

Phoenix - AwardBIOS CMOS Setup Utility
USB Device Setting

USB 1.0 Controller	Enabled	ITEM HELP
USB 2.0 Controller	Enabled	
USB Operation Mode	High Speed	
USB Keyboard Function	Enabled	Menu Level >
USB Mouse Function	Enabled	
USB Storage Function	Enabled	
*** USB Mass Storage Device Boot Setting ***		

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE DMA transfer access
This field, by default, is enabled

On-chip Primary PCI IDE Enabled
This field, by default, is enabled

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.

IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

On-Chip Serial ATA Setting
The fields under the SATA setting include Serial ATA Mode (IDE) and ON-Chip Serial AT (Combined Mode).

Power ON Function
This field is related to how the system is powered on – such as with the use of conventional power button, keyboard or hot keys. The default is ***BUTTON ONLY***.

KB Power ON Password
This field allows users to set the password when keyboard power on is the mode of the Power ON function.

Hot Key Power ON
This field sets certain keys, also known as hot keys, on the keyboard that can be used as a 'switch' to power on the system.

Onboard FDC Controller
This field, by default, is enabled.

Onboard Serial Port
These fields allow you to select the onboard serial ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3

PWRON After PWR-Fail
This field sets the system power status whether *on or off* when power returns to the system from a power failure situation.

USB 1.0 Controller
By default, this field is set to ***Enabled***.

USB 2.0 Controller
The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***. In order to use USB 2.0, necessary OS drivers must be installed first. ***Please update your system to Windows 2000 SP4 or Windows XP SP2.***

USB Keyboard/Mouse/Storage Function
The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

Power Management Setup

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	Enabled	ITEM HELP
ACPI Suspend	S3(STR)	
RUN VGABIOS if S3 Resume	Auto	Menu Level >
Power Management	User Define	
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50.0%	
Wake-Up by PCI Card	Enabled	
Power On by Ring	Disabled	
USB KB Wake-Up From S3	Disabled	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D] #	Disabled	

ACPI Function

Enable this function to support ACPI (Advanced Configuration and Power Interface).

ACPI Suspend

The default setting of the ACPI Suspend mode is ***S3(STR)***.

RUN VGABIOS if S3 Resume

The default setting of this field is ***Auto***.

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default setting is ***Yes***.

Suspend Type

The default setting for the Suspend Type field is ***Stop Grant***.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

CPU THRM-Throttling

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

Wake up by PCI Card

By default, this field is enabled.

Power On by Ring
This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

USB KB Wake-Up From S3
This field, by default, is disabled.

Resume by Alarm
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events
The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Init Display First	PCI Slot	ITEM HELP
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Auto (ESCD)	Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
PCI Express relative items		
Maximum Payload Size	128	

Init Display First

The default setting is ***PCI Card***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

Maximum Payload Size

The default setting of the PCI Express Maximum Payload Size is 128.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
Shutdown Temperature	Disabled	
CPU Warning Temperature	Disabled	
System1 Temp	45°C/113°F	Menu Level >
CPU Temp	45°C/113°F	
System2 Temp	45°C/113°F	
System Fan Speed	5400 RPM	
Vcore	1.16 V	
+12 V	11.87 V	
Vmem	1.90 V	
+5V	5.17 V	
3.3V	3.31 V	
VBAT (V)	3.26 V	
3VSB(V)	3.29 V	

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Voltages

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

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Auto Detect PCI Clk	Disabled	ITEM HELP
Spread Spectrum	Disabled	Menu Level >

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

Spread Spectrum Modulated

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

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

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. 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:

IMPORTANT NOTE:
After installing your Windows operating system (Windows 2000/ XP), 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 under Windows 2000/XP.

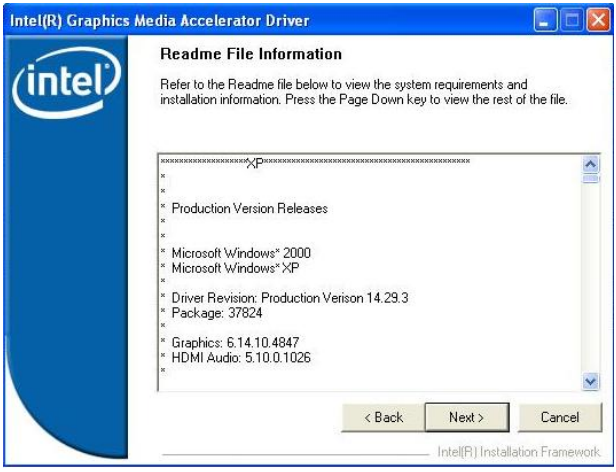
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R)GM/GM 965 Chipset Drivers***.

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

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

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On Readme 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.

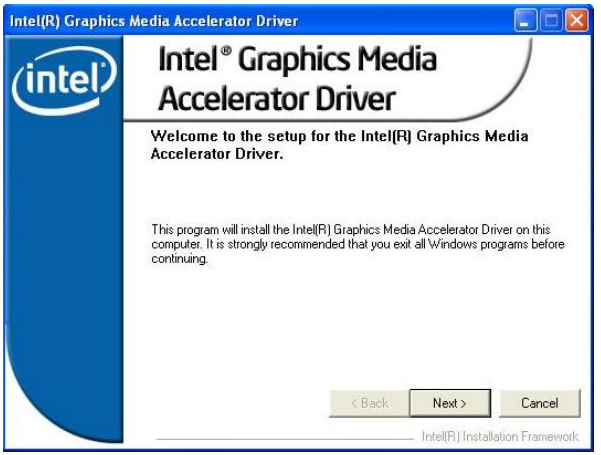
VGA Drivers Installation

To install the VGA drivers, follow the steps below to proceed with the installation.

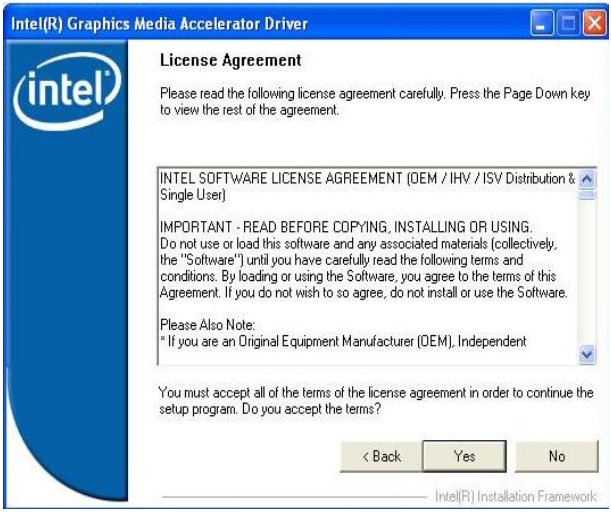
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) GM/GME965 Chipset Drivers***.

2. Click ***Intel(R) GM/GME965 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. Proceed as instructed and restart the computer as prompted and for changes to take effect.

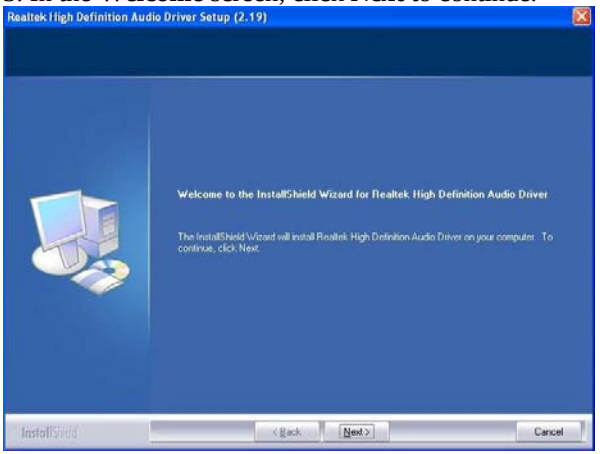
Realtek High Definition Codec Audio Driver Installation

Follow the steps below to install the Realtek AC97 Codec Audio Drivers.

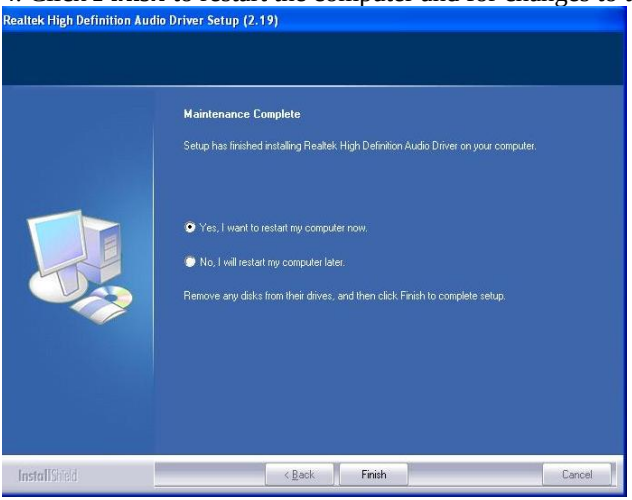
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R)GM/GME 965Chipset Drivers***.

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

3. In the **Welcome** screen, click **Next** to continue.



4. Click ***Finish*** to restart the computer and for changes to take effect.

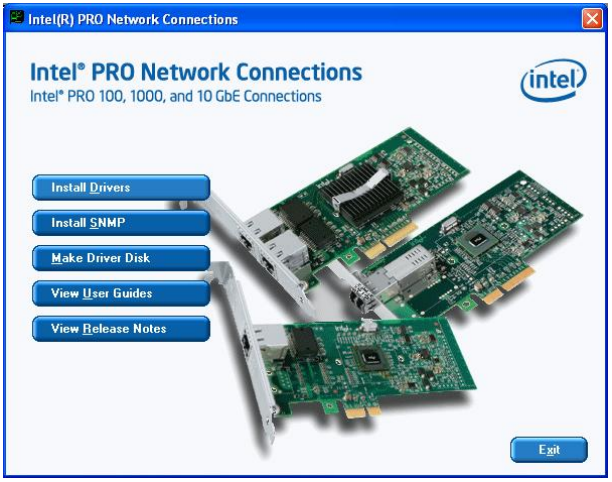


LAN Drivers Installation

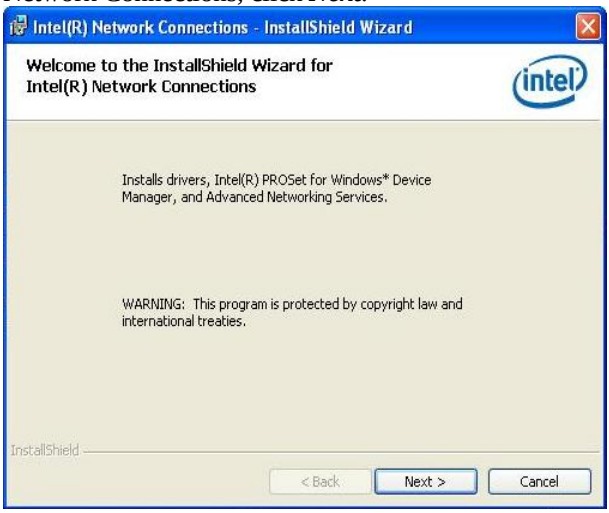
Follow the steps below to install the **Intel 82574L LAN Drivers**.

1. Insert the CD that comes with the board. Click ***LAN Card*** and then ***Intel(R) PRO 82574L LAN Drivers***.

2. In the next screen, click ***Install Drivers***.

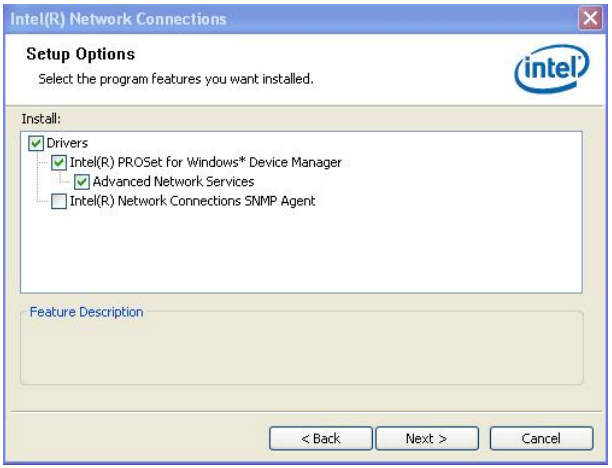


3. In the Welcome screen to the InstallShield Wizard for Intel(R) Network Connections, click ***Next***.

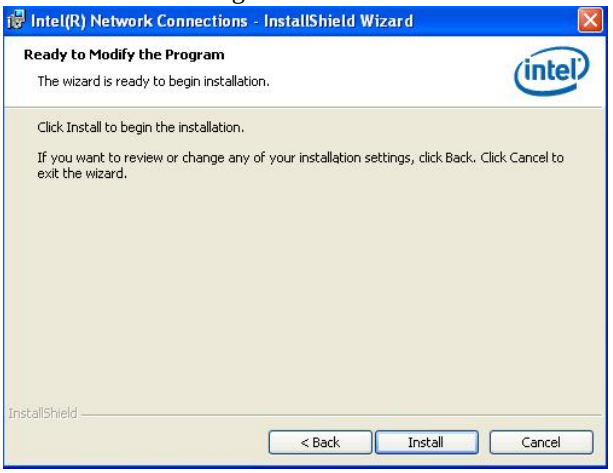


4. In the License Agreement screen, click ***Next*** to accept the terms in the license agreement.

5. In the Setup Options screen, click the checkbox of Drivers to select it and then click ***Next***.



6. Click ***Install*** to begin installation of the drivers.



7. When the InstallShield Wizard is completed, click ***Finish***.

Appendix

A. I/O Port Address Map

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

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

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

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//==========================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//==========================================================================
#include <stdio.h>
#include <stdlib.h>
#include "W627EHG.H"
//==========================================================================
int main (int argc, char *argv[]);
void copyright(void);
void EnableWDT(int);
void DisableWDT(void);
//==========================================================================
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        copyright();

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return 1;
        }

        if (Init_W627EHG() == 0)
        {
                printf(" Winbond 83627HF is not detected, program abort.\n");
                return 1;
        }
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        EnableWDT(bTime);

        return 0;
}
//==========================================================================
```

```
void copyright(void)
{
        printf("\n======== Winbond 83627EHF Watch Timer Tester (AUTO DETECT) ========\n"\
                        "       Usage : W627E_WD reset_time\n"\
                        "       Ex : W627E_WD 3  => reset system after 3 second\n"\
                        "            W627E_WD 0  => disable watch dog timer\n");
}
//===========================================================================
void EnableWDT(int interval)
{
        unsigned char bBuf;

        bBuf = Get_W627EHG_Reg( 0x2D);
        bBuf &= (!0x01);
        Set_W627EHG_Reg( 0x2D, bBuf);                   //Enable WDTO

        Set_W627EHG_LD( 0x08);                          //switch to logic device 8
        Set_W627EHG_Reg( 0x30, 0x01);                   //enable timer

        bBuf = Get_W627EHG_Reg( 0xF5);
        bBuf &= (!0x08);
        Set_W627EHG_Reg( 0xF5, bBuf);                   //count mode is second

        Set_W627EHG_Reg( 0xF6, interval);               //set timer
}
//===========================================================================
void DisableWDT(void)
{
        Set_W627EHG_LD(0x08);                           //switch to logic device 8
        Set_W627EHG_Reg(0xF6, 0x00);                    //clear watchdog timer
        Set_W627EHG_Reg(0x30, 0x00);                    //watchdog disabled
}
//===========================================================================
```

```
//=============================================================================
//
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// PURPOSE.
//
//=============================================================================
#include "W627EHG.H"
#include <dos.h>
//=============================================================================
unsigned int W627EHG_BASE;
void Unlock_W627EHG (void);
void Lock_W627EHG (void);
//=============================================================================
unsigned int Init_W627EHG(void)
{
	unsigned int result;
	unsigned char ucDid;

	W627EHG_BASE = 0x2E;
	result = W627EHG_BASE;

	ucDid = Get_W627EHG_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHG_BASE = 0x4E;
	result = W627EHG_BASE;
	ucDid = Get_W627EHG_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHG_BASE = 0x00;
	result = W627EHG_BASE;

Init_Finish:
	return (result);
}
//=============================================================================
void Unlock_W627EHG (void)
{
	outportb(W627EHG_INDEX_PORT, W627EHG_UNLOCK);
	outportb(W627EHG_INDEX_PORT, W627EHG_UNLOCK);
}
//=============================================================================
void Lock_W627EHG (void)
{
	outportb(W627EHG_INDEX_PORT, W627EHG_LOCK);
}
//=============================================================================
void Set_W627EHG_LD( unsigned char LD)
{
	Unlock_W627EHG();
	outportb(W627EHG_INDEX_PORT, W627EHG_REG_LD);
	outportb(W627EHG_DATA_PORT, LD);
	Lock_W627EHG();
}
```

```
//===========================================================================
void Set_W627EHG_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627EHG();
        outportb(W627EHG_INDEX_PORT, REG);
        outportb(W627EHG_DATA_PORT, DATA);
        Lock_W627EHG();
}
//===========================================================================
unsigned char Get_W627EHG_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627EHG();
        outportb(W627EHG_INDEX_PORT, REG);
        Result = inportb(W627EHG_DATA_PORT);
        Lock_W627EHG();
        return Result;
}
//===========================================================================
```

```
//===========================================================================
//
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// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//===========================================================================
#ifndef __W627EHG_H
#define __W627EHG_H                     1
//===========================================================================
#define         W627EHG_INDEX_PORT          (W627EHG_BASE)
#define         W627EHG_DATA_PORT           (W627EHG_BASE+1)
//===========================================================================
#define         W627EHG_REG_LD              0x07
//===========================================================================
#define W627EHG_UNLOCK                      0x87
#define         W627EHG_LOCK                0xAA
//===========================================================================
unsigned int Init_W627EHG(void);
void Set_W627EHG_LD( unsigned char);
void Set_W627EHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627EHG_Reg( unsigned char);
//===========================================================================
#endif  //__W627EHG_H
```