IB891

Intel® Pineview-M/ Pineview-D +ICH8M

Luna-Pier / Luna-Pier Refresh Platform

3.5” Disk Size SBC

USER’S MANUAL

Version 1.0A

Acknowledgments

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Introduction

Product Description

The IB891 is a 3.5-inch single board computer based on a two-chip the Intel® Atom™ single-core N450 or dual-core D510 processor. The processors come integrated with both a memory controller and an IGP graphics core with 200MHz (N450) and 400MHz (D510) of GPU frequency. The IB891 performs with low power consumption and better hardware decode on graphics intensive and multimedia applications for the digital signage, POS/kiosk, automation and other fanless and low-noise embedded applications.

Measuring 102mm x 147mm, the IB891 has a 3D-capable built-in Intel® graphics engine that support DirectX 9 and OpenGL 1.4, with an 18-bit single channel LVDS interface and a VGA CRT port edge connector. The board offers essential features and high-speed connectivity including two gigabit LAN, watchdog timer, digital I/O, eight USB 2.0 ports, four serial ports and CF socket. Expansion is provided by a Mini PCI-e connector that can be used for wireless LAN or TV-tuner modules.

Checklist

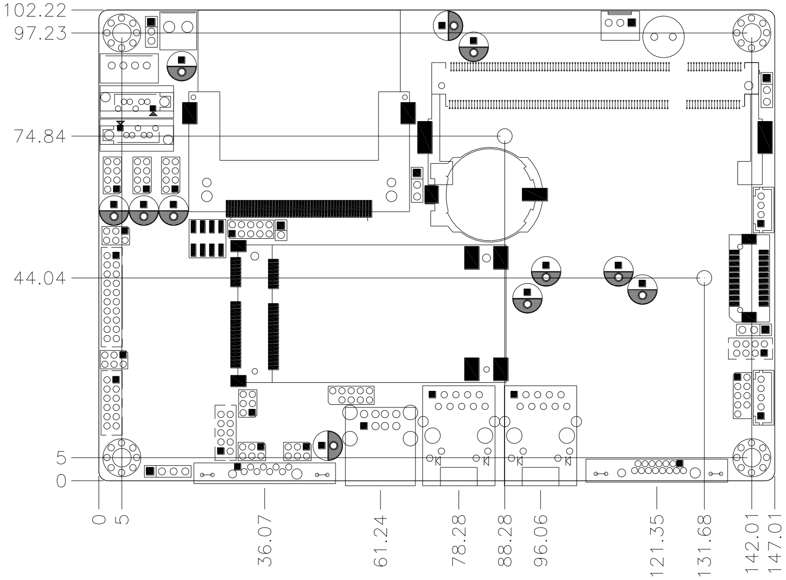
Your IB891 package should include the items listed below.

- The IB891 3.5” disk-size SBC
- This User’s Manual
- 1 CD containing chipset drivers and flash memory utility
- Cable kit (USB, Serial port, Serial ATA, Power)

IB891 Specifications

Product Name	IB891 (SC) /IB891-D5 (DC)
Form Factor	3.5" SBC
CPU Type	Intel® Pineview-M SC / Pineview-D DC Processor
CPU Speed	Intel® Atom^{TM} SC N450 / 512K cache/1.66 GHz (5.5W) Intel® Atom^{TM} DC D510 / 1MB cache/1.66GHz (14.5W) 22mm x 22mm, Micro-FCBGA8
Green /APM	APM1.2
BIOS	AMI BIOS, support ACPI Function
Chipset	ICH8M: 31mm x 31mm, 676-pin T-PBGA (2.4W)
Memory	DDR2 667MHz SO-DIMM x 1 (w/o ECC), Max. 2GB / 4GB , Single channel
VGA	Intel® Integrated Graphics Controller Supports DirectX 9 Graphic (200MHz/ 400MHz), OpenGL 1.4
LVDS	18-bit one channels LVDS interface w/DF13 socket x1
LAN	Realtek 8111DL x 2
USB	ICH8M built-in USB 2.0 host controller, support 8 ports
Serial ATA Ports	ICH8M built-in SATA controller, supports 2 ports
Parallel IDE	ICH8M built-in one channel Ultra DMA 33/66/100, for CF Type II
Audio	Intel ICH8M built-in audio controller w/ Realtek ALC662 Codec (supports 5.1 CH audio & SSM2304 2W/4ohm Amplifier
LPC I/O	Winbond W83627UHG : COM1 (RS232/422/485), COM2(RS232) COM3(RS232) & COM4(RS232) with pin-9 with power for 2 ports (500 mA for each port) Hardware monitor (2 thermal inputs, 4 voltage monitor inputs, VID0-4 & 1 x Fan Header)
Digital IO	4 in & 4 out
Keyboard/Mouse Connector	Pin header
Expansion Slots	Mini PCI-e socket x 1 for Wireless LAN or TV-tuner module
Edge Connector	DB15 x1 for VGA RJ45 x2 for LAN 1&2 USB stack connector x 1 for USB1 ~2 DB9 x 1 for COM1
On Board Header/Connector	2x5 pin header for KB/MS 2x4 pins header x 3 for 6 USB ports DF13 socket connector x 1 for 18-bit single channel LVDS 2x6 pins box header x1 for Audio 4 pins header x1 for speaker 2x5 pins box header x 1 for COM2 2x10 pins box header x 1 for COM3 ~4 2x5 pins headers x 1 for LPC(80-port card debugging purpose) Mini PCI-e(1x) connector x 1 Compact Flash socket x 1 5 pins box header x 1 for smart battery 4 pins box header x 1 for backlight/brightness control 4-pins power connector for SATA HDD
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
Power Connector	+12V DC-in
RoHS	Yes
Board Size	102mm x 147mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB891 in order to set up a workable system. The topics covered are:

Installing the Memory

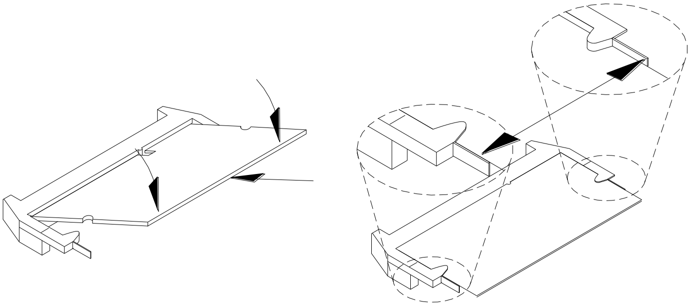
The IB891 board supports one DDR667 DDR2 memory.

Remarks:
N450 supports SO-DIMM x 1 (w/o ECC), Max. 2GB , Single channel
D510 supports SO-DIMM x 1 (w/o ECC), Max. 2GB , Single channel

Installing and Removing Memory Modules

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

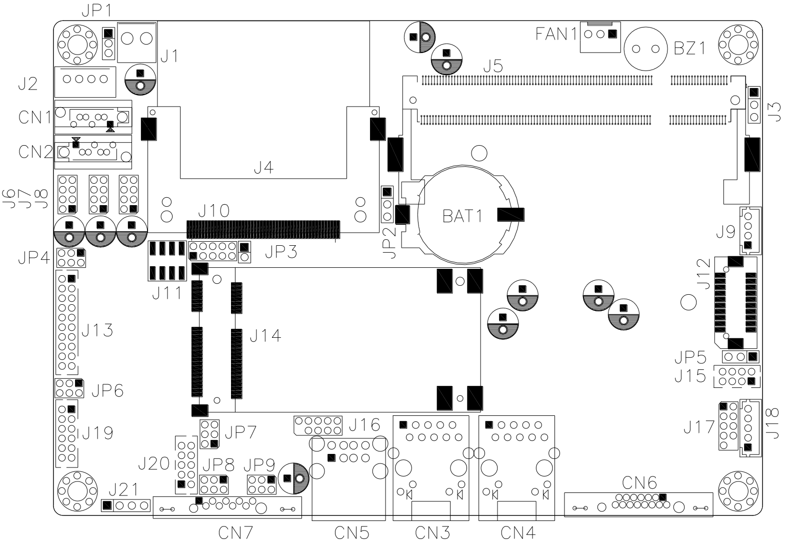
1. Hold the DDR2 module so that the key of the DDR2 module aligns with that on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
2. To seat 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.



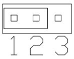
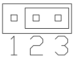
Setting the Jumpers

Jumpers are used on IB891 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 IB891 and their respective functions.

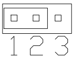
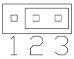
Jumper Locations on IB891



JP1: ATX/AT Mode Select

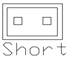
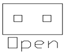
JP1	ATX / AT
	ATX mode
	AT mode

JP2: Clear CMOS Setting

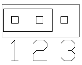
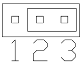
JP2	Setting
	Normal
	Clear CMOS

Note: Please remove the lithium battery before setting the jumper.

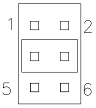
JP3: Compact Flash Slave/Master Selection

JP3	CF Setting
	Master
	Slave

JP5: LCD Panel Power Selection

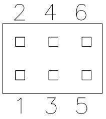
JP5	LCD Panel Power
	3.3V
	5V

JP4, JP6: COM3/4 RS232 +5V/+12V Power Setting

JP4/JP6	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	Normal
	Pin 5-6 Short/Closed	+5V

JP7, JP8, JP9: RS232/422/485 (COM1) Selection

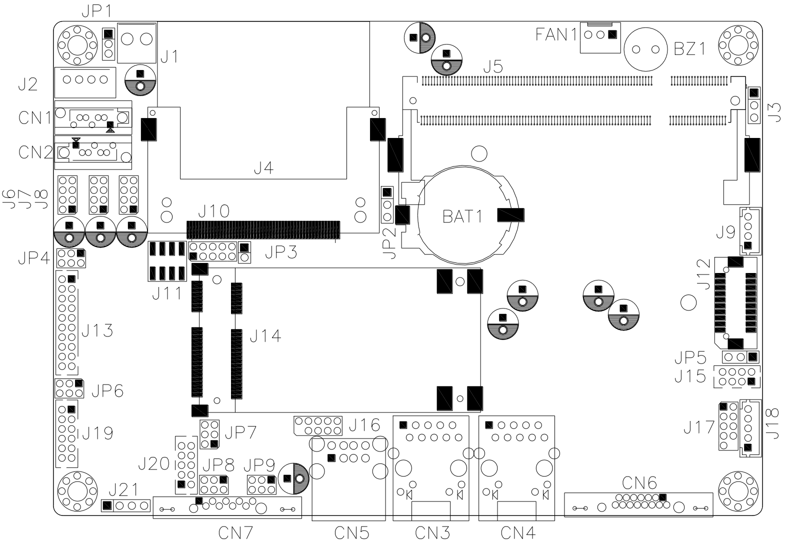
COM2, COM3, COM4 are fixed for RS-232 use only.
COM1 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM1 selection.



COM1 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP7: 1-2 JP8: 3-5 & 4-6 JP9: 3-5 & 4-6	JP7: 3-4 JP8: 1-3 & 2-4 JP9: 1-3 & 2-4	JP7: 5-6 JP8: 1-3 & 2-4 JP9: 1-3 & 2-4

Connectors on IB891

Connector Locations on IB891

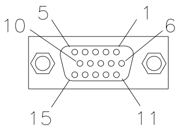


CN1, CN2: SATA Connectors

CN3, CN4: Gigabit LAN RJ45 Connector

CN5: USB 1/2 Connector

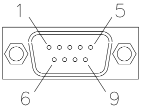
CN6: VGA Connector



VGA

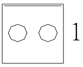
Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
N.C.	11	12	DDCDATA
HSYNC	13	14	VSYNC
DDCCLK	15		

CN7: COM1 RS232/RS422/RS485 Connector



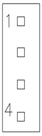
Pin #	Signal Name		
	RS-232	**R2-422**	**RS-485**
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

J1: Board Input Power Connector



Pin #	Signal Name
1	+12V
2	GND

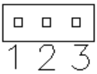
J2: HDD Power Connector (Output Only)



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

J3: Power LED

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

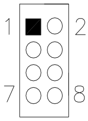


Pin #	Signal Name
1	Power LED
2	No connect
3	Ground

J4: Compact Flash Connector

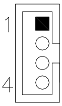
J5: DDR2 SO-DIMM

J6, J7, J8: USB3/4/5/6/7/8 Connector



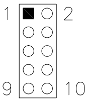
Signal Name	Pin	Pin	Signal Name
Vcc	1	2	Ground
D-	3	4	D+
D+	5	6	D-
Ground	7	8	Vcc

J9: LCD Backlight Connector



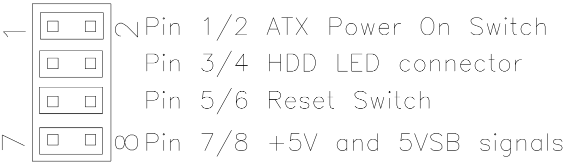
Pin #	Signal Name
1	+12V
2	Backlight Enable
3	Brightness Control
4	Ground

J10: 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

J11: System Function Connector


Pin 1/2 ATX Power On Switch
Pin 3/4 HDD LED connector
Pin 5/6 Reset Switch
Pin 7/8 +5V and 5VSB signals

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.

Hard Disk Drive LED Connector: Pins 3 and 4
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

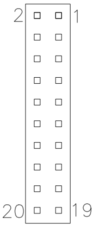
Pin #	Signal Name
4	HDD Active
3	5V

Reset Switch: Pins 5 and 6
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

+5V and 5VSB Signals: Pins 7 and 8

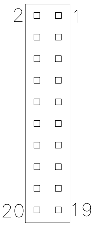
Pin #	Signal Name
7	+5V
8	+5VSB

J12 : LVDS(18bit) Connectors



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

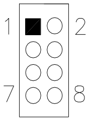
J13: COM3, COM4 Serial Port (DF11 Connector)



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

J14: Mini PCIE Connector

J15: Keyboard & Mouse Connector (DF11 Connector)

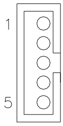


Signal Name	Pin	Pin	Signal Name
VCC	1	2	VCC
MDA	3	4	KBDA
MCL	5	6	KBCL
Ground	7	8	Ground

J16: SPI Flash Connector (factory use only)

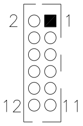
J17: LPC Connector (factory use only)

J18: Smart Battery Interface Connector



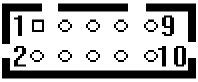
Pin #	Signal Name
1	RST
2	EXTSMI
3	Ground
4	DATA
5	CLK

J19: Audio Connector (DF11 Connector)



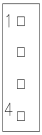
Signal Name	Pin #	Pin #	Signal Name
LINEOUT_R	2	1	LINEOUT_L
Ground	4	3	JD_FRONT
LINEIN_R	6	5	LINEIN_L
Ground	8	7	JD_LINEIN
MIC-In	10	9	MIC_L
Ground	12	11	JD_MIC1

J20: COM2/RS232 Serial Port



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

J21: Amplify Connector



Pin #	Signal Name
1	OUTL+
2	OUTL-
3	OUTR-
4	OUTR+

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BIOS SETUP

This chapter describes the different settings available in the AMI (American Megatrends, Inc.) BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

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

BIOS Setup

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

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

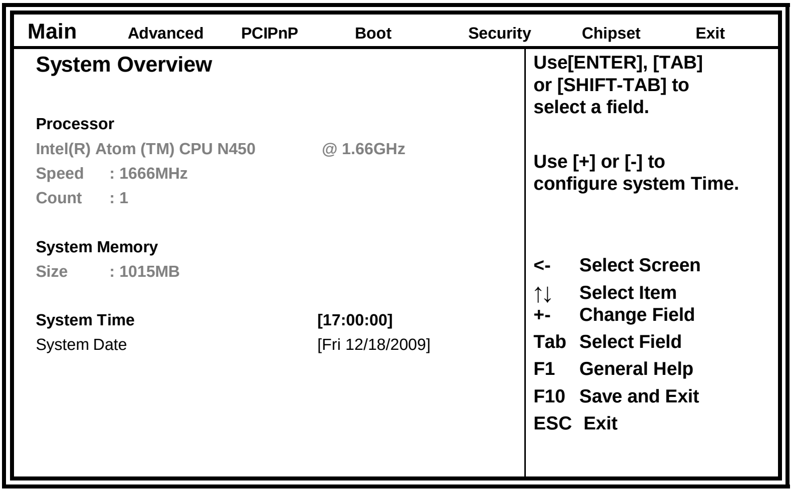
In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

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

Main BIOS Setup

This setup allows you to record some basic hardware configurations in your computer system and set the system clock.

BIOS SETUP UTILITY



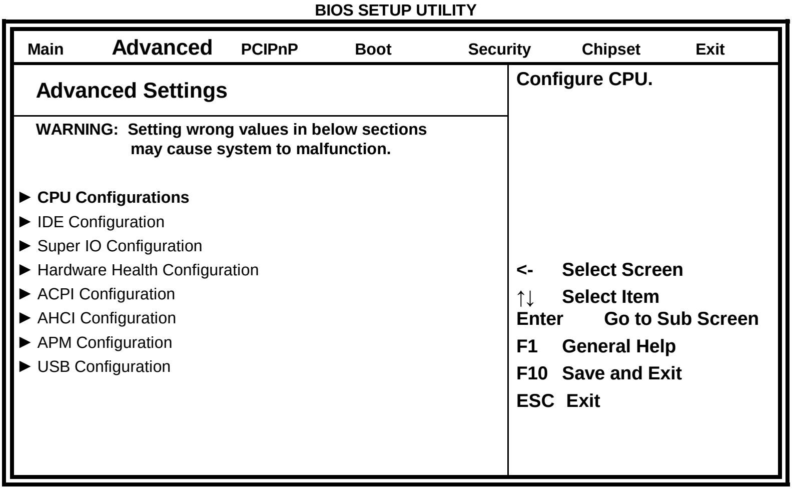
```
Main      Advanced    PCIPnP      Boot        Security     Chipset      Exit
System Overview                                   Use[ENTER], [TAB]
                                                  or [SHIFT-TAB] to
                                                  select a field.
Processor
Intel(R) Atom (TM) CPU N450       @ 1.66GHz
Speed     : 1666MHz                               Use [+] or [-] to
Count     : 1                                     configure system Time.

System Memory
Size      : 1015MB                                <-    Select Screen
                                                  ↑↓    Select Item
System Time                       [17:00:00]      +-    Change Field
System Date                       [Fri 12/18/2009] Tab  Select Field
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit
```

***Note**:* *If the system cannot boot after making and saving system changes with Setup, the AMI 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 AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Advanced Settings

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

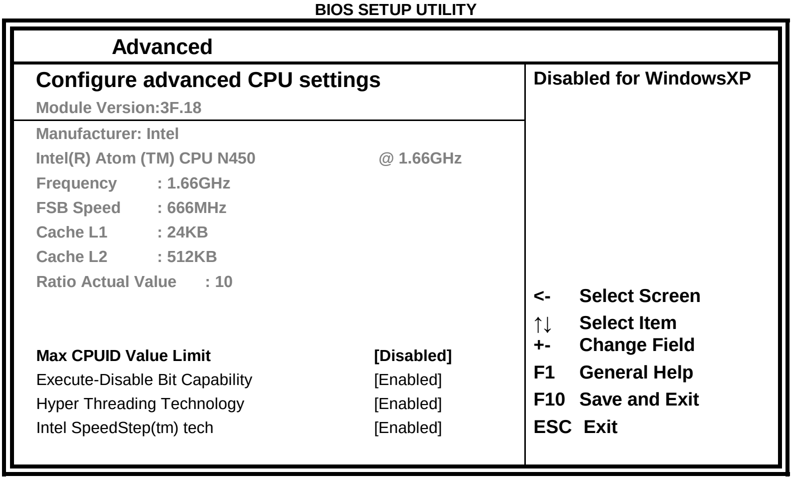


```
                              BIOS SETUP UTILITY
 Main     Advanced   PCIPnP     Boot        Security     Chipset     Exit
 Advanced Settings                                  | Configure CPU.
 ---------------------------------------------------|
 WARNING:  Setting wrong values in below sections   |
           may cause system to malfunction.         |
                                                    |
 ► CPU Configurations                               |
 ► IDE Configuration                                |
 ► Super IO Configuration                           |
 ► Hardware Health Configuration                    | <-    Select Screen
 ► ACPI Configuration                               | ↑↓    Select Item
 ► AHCI Configuration                               | Enter     Go to Sub Screen
 ► APM Configuration                                | F1    General Help
 ► USB Configuration                                | F10   Save and Exit
                                                    | ESC  Exit
```

The Advanced BIOS Settings contains the following sections:

► CPU Configurations
► IDE Configuration
► Super IO Configuration
► Hardware Health Configuration
► ACPI Configuration
► AHCI Configuration
► APM Configuration
► USB Configuration

The fields in each section are shown in the following pages, as seen in the computer screen. Please note that setting the wrong values may cause the system to malfunction. If unsure, please contact technical support of your supplier.



```
BIOS SETUP UTILITY
          Advanced
Configure advanced CPU settings                         Disabled for WindowsXP
Module Version:3F.18
Manufacturer: Intel
Intel(R) Atom (TM) CPU N450              @ 1.66GHz
Frequency       : 1.66GHz
FSB Speed       : 666MHz
Cache L1        : 24KB
Cache L2        : 512KB
Ratio Actual Value     : 10                             <-    Select Screen
                                                        ↑↓    Select Item
Max CPUID Value Limit                    [Disabled]     +-    Change Field
Execute-Disable Bit Capability           [Enabled]      F1    General Help
Hyper Threading Technology               [Enabled]      F10   Save and Exit
Intel SpeedStep(tm) tech                 [Enabled]      ESC  Exit
```

The CPU Configuration menu shows the following CPU details: Manufacturer: the name of the CPU manufacturer
Brand String: the brand name of the CPU being used
Frequency: the CPU processing speed
FSB Speed: the FSB speed
Cache L1: the CPU L1 cache size
Cache L2: the CPU L2 cache

Max CPUID Value Limit

Disabled for WindowsXP.

Execute-Disable Bit Capability

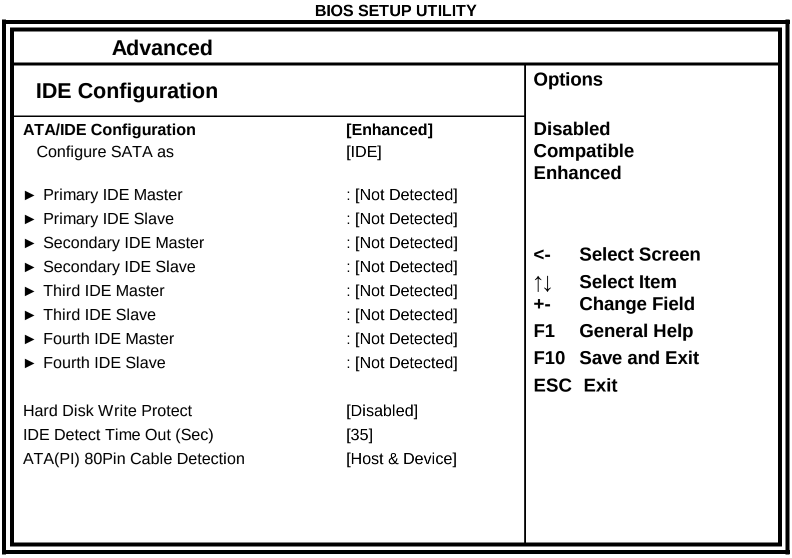
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS.

Hyper Threading Technology

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

Intel SpeedStep(tm) tech (Pineview-M)

Disabled: Disable GV3
Enabled: Enable GV3



```
                         BIOS SETUP UTILITY
        Advanced
  IDE Configuration                                  Options

ATA/IDE Configuration              [Enhanced]        Disabled
  Configure SATA as                [IDE]             Compatible
                                                     Enhanced
► Primary IDE Master               : [Not Detected]
► Primary IDE Slave                : [Not Detected]
► Secondary IDE Master             : [Not Detected]  <-    Select Screen
► Secondary IDE Slave              : [Not Detected]  ↑↓    Select Item
► Third IDE Master                 : [Not Detected]  +-    Change Field
► Third IDE Slave                  : [Not Detected]  F1    General Help
► Fourth IDE Master                : [Not Detected]  F10   Save and Exit
► Fourth IDE Slave                 : [Not Detected]  ESC  Exit

Hard Disk Write Protect            [Disabled]
IDE Detect Time Out (Sec)          [35]
ATA(PI) 80Pin Cable Detection      [Host & Device]
```

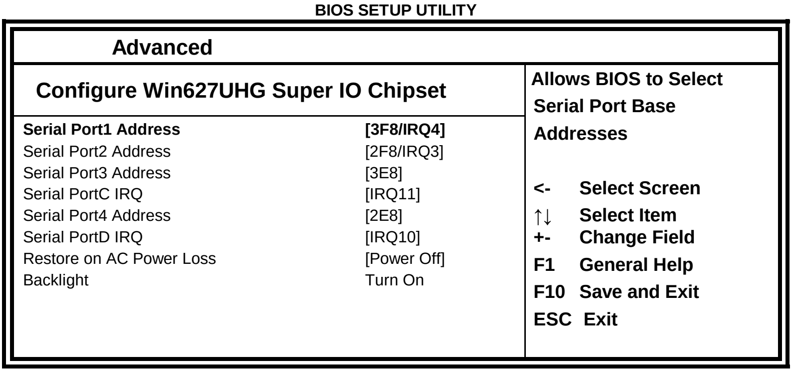
The IDE Configuration menu is used to change and/or set the configuration of the IDE devices installed in the system.

ATA/IDE Configuration

(1) Disabled.
(2) Compatible.
(3) Enhanced

Configure SATA as

(1) IDE Mode.
(2) AHCI Mode.



```
                         BIOS SETUP UTILITY
        Advanced
  Configure Win627UHG Super IO Chipset               Allows BIOS to Select
                                                     Serial Port Base
Serial Port1 Address               [3F8/IRQ4]        Addresses
Serial Port2 Address               [2F8/IRQ3]
Serial Port3 Address               [3E8]
Serial PortC IRQ                   [IRQ11]           <-    Select Screen
Serial Port4 Address               [2E8]             ↑↓    Select Item
Serial PortD IRQ                   [IRQ10]           +-    Change Field
Restore on AC Power Loss           [Power Off]       F1    General Help
Backlight                          Turn On           F10   Save and Exit
                                                     ESC  Exit
```

Onboard Serial Port

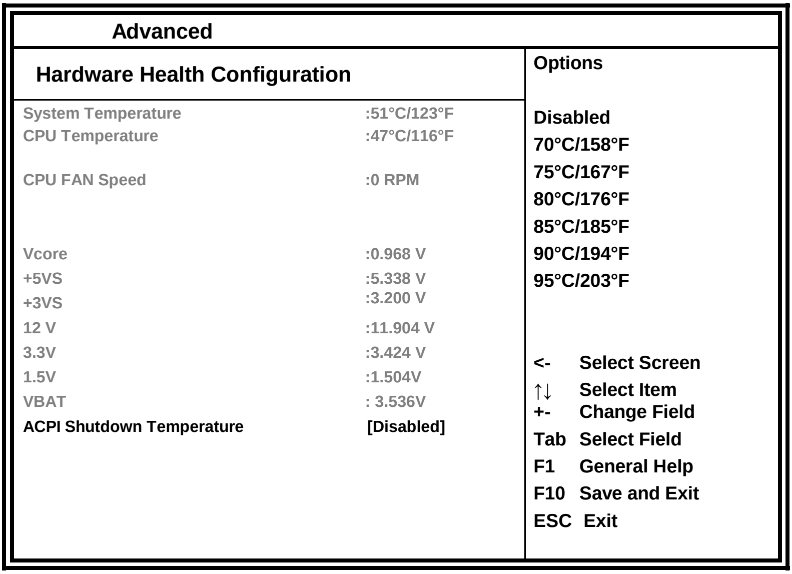
The default values are:

Serial Port 1:	3F8/IRQ4
Serial Port 2:	2F8/IRQ3
Serial Port 3:	3E8/IRQ11
Serial Port 4:	2E8/IRQ10

Restore on AC Power Loss

This field sets the system power status whether *Power On or Power Off* when power returns to the system from a power failure situation.

BIOS SETUP UTILITY

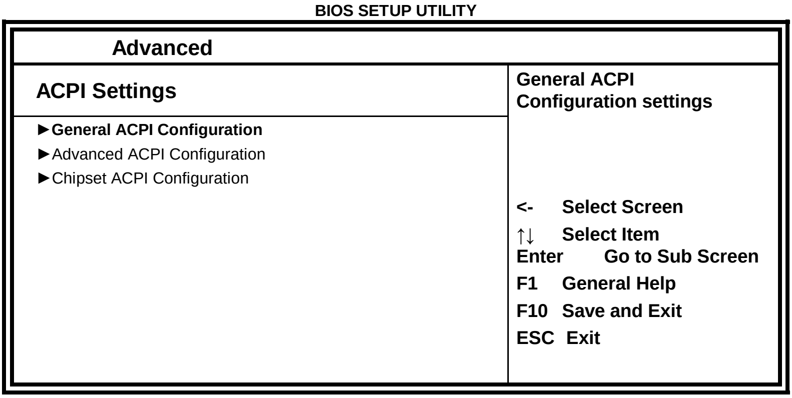


```
          Advanced
Hardware Health Configuration                                  Options

System Temperature                    :51°C/123°F              Disabled
CPU Temperature                       :47°C/116°F              70°C/158°F
                                                               75°C/167°F
CPU FAN Speed                         :0 RPM                   80°C/176°F
                                                               85°C/185°F
Vcore                                 :0.968 V                 90°C/194°F
+5VS                                  :5.338 V                 95°C/203°F
+3VS                                  :3.200 V
12 V                                  :11.904 V
3.3V                                  :3.424 V                 <-   Select Screen
1.5V                                  :1.504V                  ↑↓   Select Item
VBAT                                  : 3.536V                 +-   Change Field
ACPI Shutdown Temperature             [Disabled]               Tab  Select Field
                                                               F1   General Help
                                                               F10  Save and Exit
                                                               ESC  Exit
```

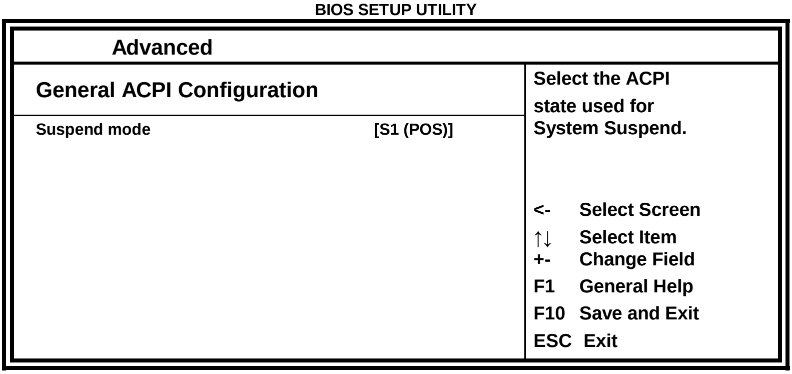
The Hardware Health Configuration menu is used to show the operating temperature, fan speeds and system voltages.

ACPI Shutdown Temperature

The system will shut down automatically under OS with ACPI mode, when the CPU temperature reaches the configured temperature.



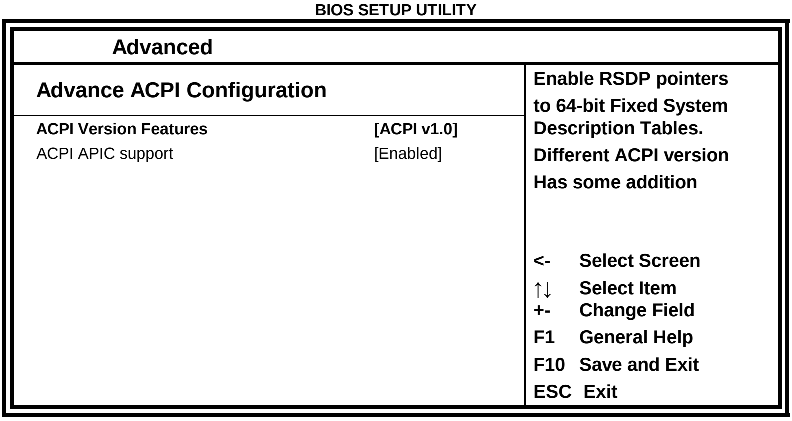
```
BIOS SETUP UTILITY
Advanced
ACPI Settings                              General ACPI
                                           Configuration settings
►General ACPI Configuration
►Advanced ACPI Configuration
►Chipset ACPI Configuration
                                           <-     Select Screen
                                           ↑↓     Select Item
                                           Enter     Go to Sub Screen
                                           F1     General Help
                                           F10    Save and Exit
                                           ESC  Exit
```



```
BIOS SETUP UTILITY
Advanced
General ACPI Configuration                  Select the ACPI
                                            state used for
Suspend mode                  [S1 (POS)]    System Suspend.

                                            <-     Select Screen
                                            ↑↓     Select Item
                                            +-     Change Field
                                            F1     General Help
                                            F10    Save and Exit
                                            ESC  Exit
```

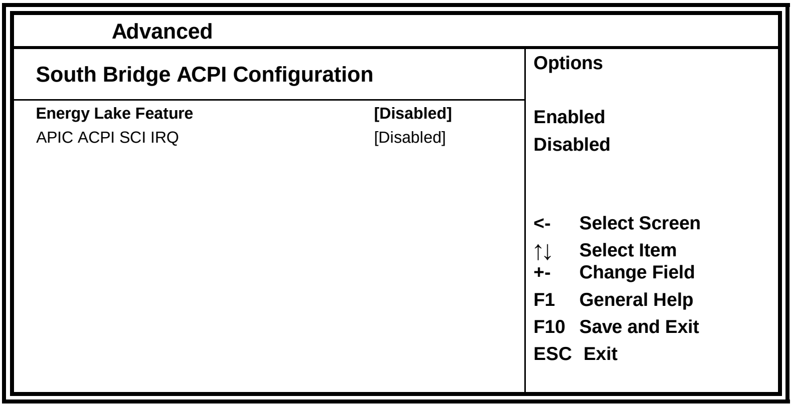
Suspend Mode

The options of this field are *S1*, *S3* and *Auto*.



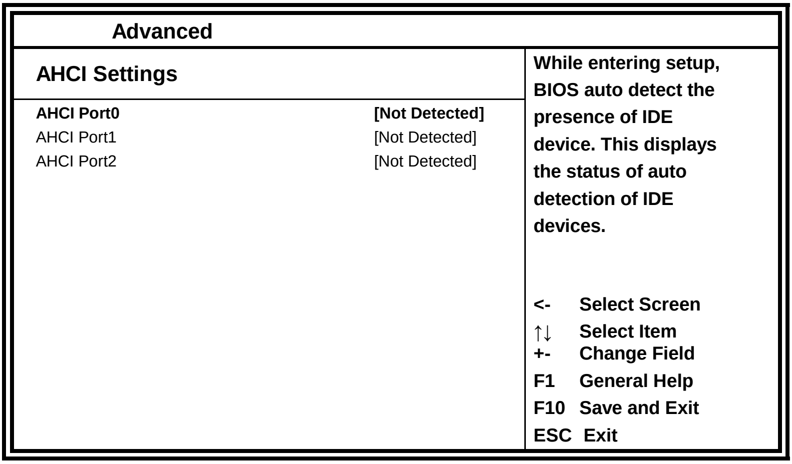
```
BIOS SETUP UTILITY
Advanced
Advance ACPI Configuration                  Enable RSDP pointers
                                            to 64-bit Fixed System
ACPI Version Features         [ACPI v1.0]   Description Tables.
ACPI APIC support             [Enabled]     Different ACPI version
                                            Has some addition

                                            <-     Select Screen
                                            ↑↓     Select Item
                                            +-     Change Field
                                            F1     General Help
                                            F10    Save and Exit
                                            ESC  Exit
```

BIOS SETUP UTILITY



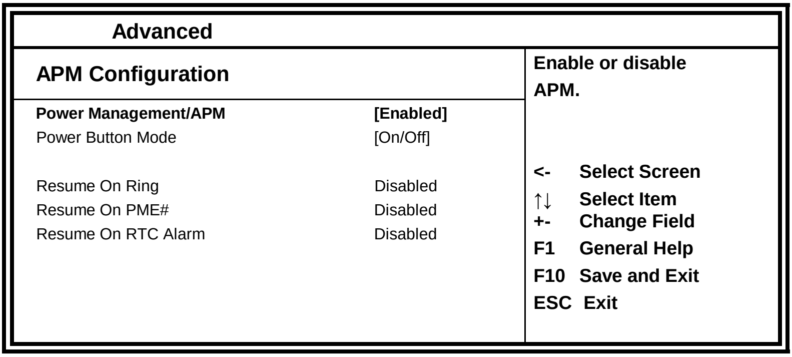
```
Advanced
South Bridge ACPI Configuration                          Options
Energy Lake Feature                    [Disabled]
APIC ACPI SCI IRQ                      [Disabled]        Enabled
                                                         Disabled

                                                         <-    Select Screen
                                                         ↑↓    Select Item
                                                         +-    Change Field
                                                         F1    General Help
                                                         F10   Save and Exit
                                                         ESC   Exit
```

BIOS SETUP UTILITY



```
Advanced
AHCI Settings                                            While entering setup,
                                                         BIOS auto detect the
AHCI Port0                             [Not Detected]    presence of IDE
AHCI Port1                             [Not Detected]    device. This displays
AHCI Port2                             [Not Detected]    the status of auto
                                                         detection of IDE
                                                         devices.

                                                         <-    Select Screen
                                                         ↑↓    Select Item
                                                         +-    Change Field
                                                         F1    General Help
                                                         F10   Save and Exit
                                                         ESC   Exit
```

BIOS SETUP UTILITY



```
Advanced
APM Configuration                                        Enable or disable
                                                         APM.
Power Management/APM                   [Enabled]
Power Button Mode                      [On/Off]

Resume On Ring                         Disabled          <-    Select Screen
Resume On PME#                         Disabled          ↑↓    Select Item
Resume On RTC Alarm                    Disabled          +-    Change Field
                                                         F1    General Help
                                                         F10   Save and Exit
                                                         ESC   Exit
```

Power Management/APM

By default, this field is set to *Enabled*.

Power Button Mode

Go into On/Off, or Suspend when power button is pressed.

Resume on Ring

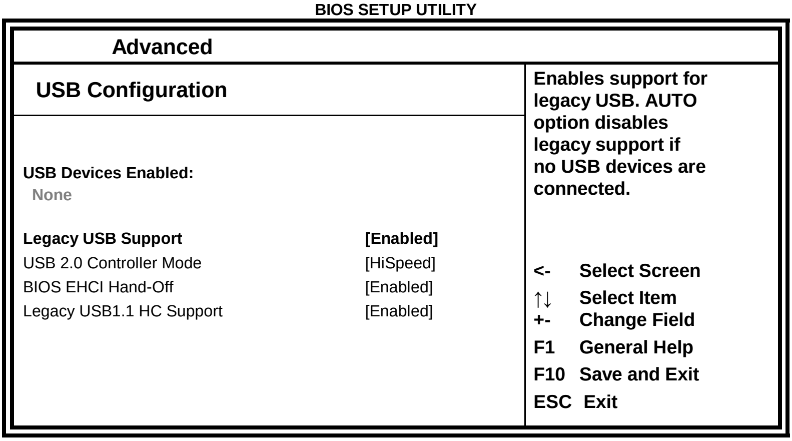
This option is used to enable activity on the RI (ring in) modem line to wake up the system from a suspend or standby state. That is, the system will be awakened by an incoming call on a modem.

Resume on PME#

This option is used enable activity on the PCI PME (power managementevent) controller to wake up the system from a suspend or standby state

Resume On RTC Alarm

This option is used to specify the time the system should be awakened from a suspended state



```
                              BIOS SETUP UTILITY
         Advanced
  USB Configuration                               Enables support for
                                                  legacy USB. AUTO
                                                  option disables
                                                  legacy support if
 USB Devices Enabled:                             no USB devices are
   None                                           connected.

 Legacy USB Support                  [Enabled]
 USB 2.0 Controller Mode             [HiSpeed]     <-    Select Screen
 BIOS EHCI Hand-Off                  [Enabled]     ↑↓    Select Item
 Legacy USB1.1 HC Support            [Enabled]     +-    Change Field
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit
```

The USB Configuration menu is used to read USB configuration information and configure the USB settings.

Legacy USB Support

Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

USB 2.0 Controller Mode

Configures the USB 2.0 controller in HiSpeed (480Mbps) or FullSpeed (12Mbps).This option is enabled by HiSpeed.

BIOS EHCI Hand-Off

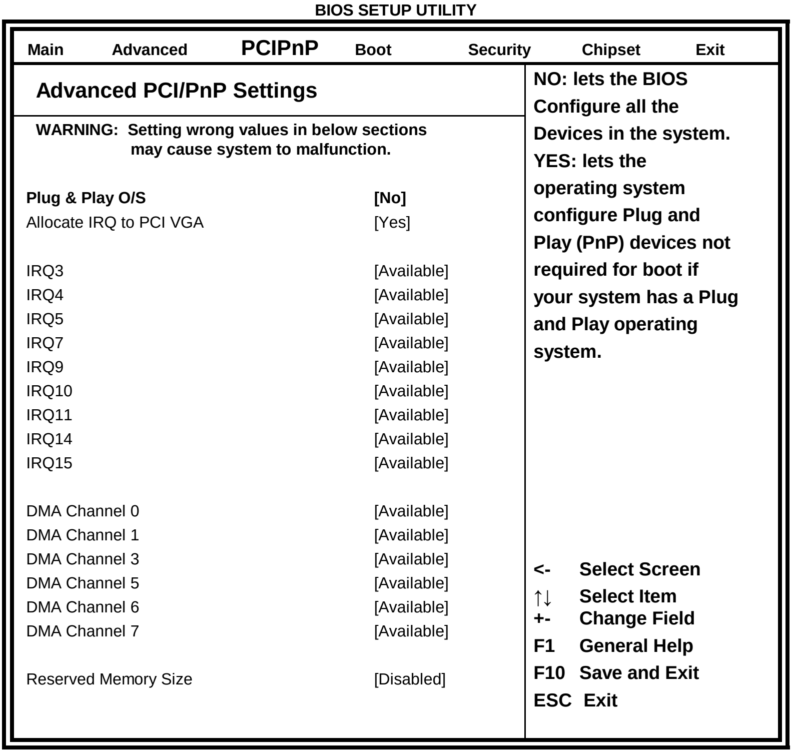
Enabled/Disabled. This is a workaround for Oses without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Legacy USB1.1 HC Support

Support USB1.1 HC.

PCIPnP Settings

This option configures the PCI/PnP settings.



```
                              BIOS SETUP UTILITY
 Main     Advanced     PCIPnP     Boot        Security      Chipset      Exit
 Advanced PCI/PnP Settings                              NO: lets the BIOS
                                                        Configure all the
 WARNING:  Setting wrong values in below sections       Devices in the system.
           may cause system to malfunction.             YES: lets the
                                                        operating system
 Plug & Play O/S                     [No]               configure Plug and
 Allocate IRQ to PCI VGA             [Yes]              Play (PnP) devices not
                                                        required for boot if
 IRQ3                                [Available]        your system has a Plug
 IRQ4                                [Available]        and Play operating
 IRQ5                                [Available]        system.
 IRQ7                                [Available]
 IRQ9                                [Available]
 IRQ10                               [Available]
 IRQ11                               [Available]
 IRQ14                               [Available]
 IRQ15                               [Available]

 DMA Channel 0                       [Available]
 DMA Channel 1                       [Available]
 DMA Channel 3                       [Available]        <-    Select Screen
 DMA Channel 5                       [Available]        ↑↓    Select Item
 DMA Channel 6                       [Available]        +-    Change Field
 DMA Channel 7                       [Available]        F1    General Help
                                                        F10   Save and Exit
 Reserved Memory Size                [Disabled]         ESC   Exit
```

Plug & Play O/S

This lets BIOS configure all devices in the system or lets the OS configure PnP devices not required for boot if your system has a Plug and Play OS.

Allocate IRQ to PCI VGA

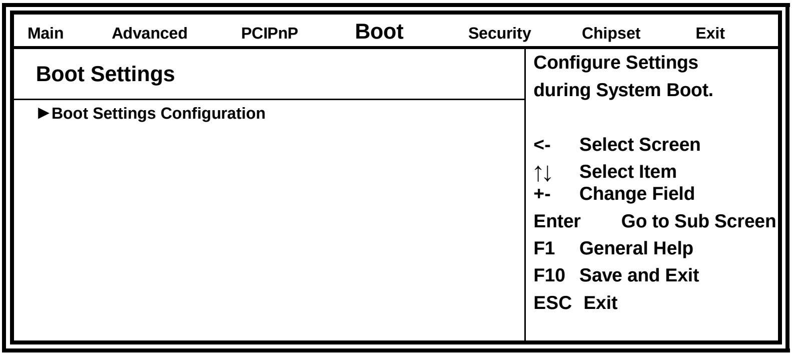
This assigns IRQ to PCI VGA card if card requests IRQ or doesn't assign IRQ to PCI VGA card even if card requests an IRQ.

IRQ#

Use the IRQ# address to specify what IRQs can be assigned to a particular peripheral device.

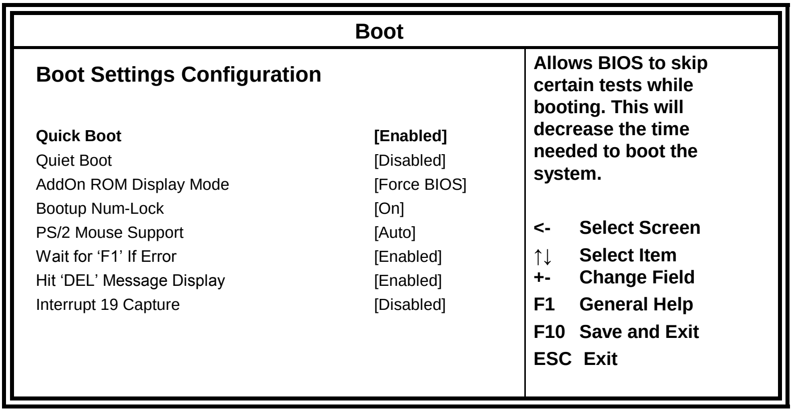
Boot Settings

BIOS SETUP UTILITY



```
Main   Advanced   PCIPnP   Boot   Security   Chipset   Exit

Boot Settings                          Configure Settings
                                       during System Boot.
►Boot Settings Configuration
                                       <-     Select Screen
                                       ↑↓     Select Item
                                       +-     Change Field
                                       Enter  Go to Sub Screen
                                       F1     General Help
                                       F10    Save and Exit
                                       ESC    Exit
```

BIOS SETUP UTILITY



```
                                Boot
Boot Settings Configuration                    Allows BIOS to skip
                                               certain tests while
                                               booting. This will
Quick Boot                  [Enabled]          decrease the time
Quiet Boot                  [Disabled]         needed to boot the
AddOn ROM Display Mode      [Force BIOS]       system.
Bootup Num-Lock             [On]
PS/2 Mouse Support          [Auto]             <-   Select Screen
Wait for 'F1' If Error      [Enabled]          ↑↓   Select Item
Hit 'DEL' Message Display   [Enabled]          +-   Change Field
Interrupt 19 Capture        [Disabled]         F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit
```

Quick Boot

This allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

Quite Boot

When disabled, this displays normal POST messages. When enabled, this displays OEM Logo instead of POST messages.

AddOn ROM Display Mode

This allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.

Bootup Num-Lock

This select the power-on state for numlock.

PS/2 Mouse Support

This select support for PS/w mouse.

Wait for ‘F1’ If Error

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. This allows option ROM to trap interrupt 19.

Hit <DEL> Message Display

This displays “Press <DEL> to run Setup” in POST.

Interrupt 19 Capture

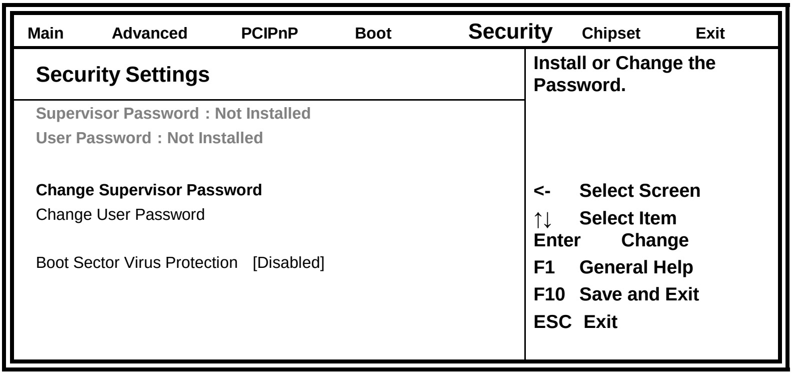
This allows option ROMs to trap interrupt 19.

Security Settings

This setting comes with 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 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.

BIOS SETUP UTILITY

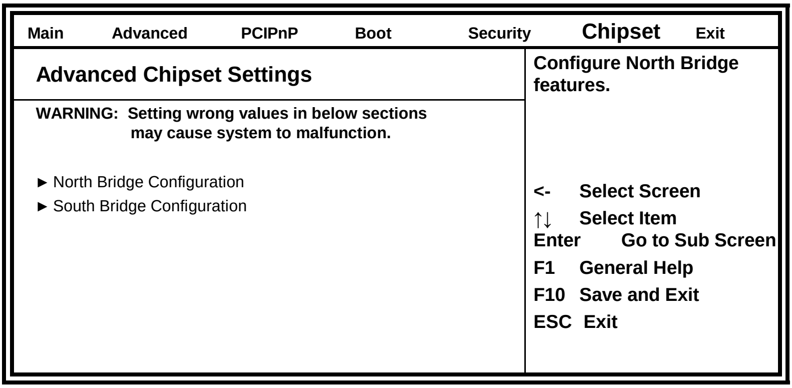


```
Main     Advanced     PCIPnP     Boot     Security   Chipset    Exit

Security Settings                            Install or Change the
                                             Password.
Supervisor Password : Not Installed
User Password : Not Installed

Change Supervisor Password                   <-     Select Screen
Change User Password                         ↑↓     Select Item
                                             Enter     Change
Boot Sector Virus Protection   [Disabled]    F1     General Help
                                             F10    Save and Exit
                                             ESC  Exit
```

Advanced Chipset Settings

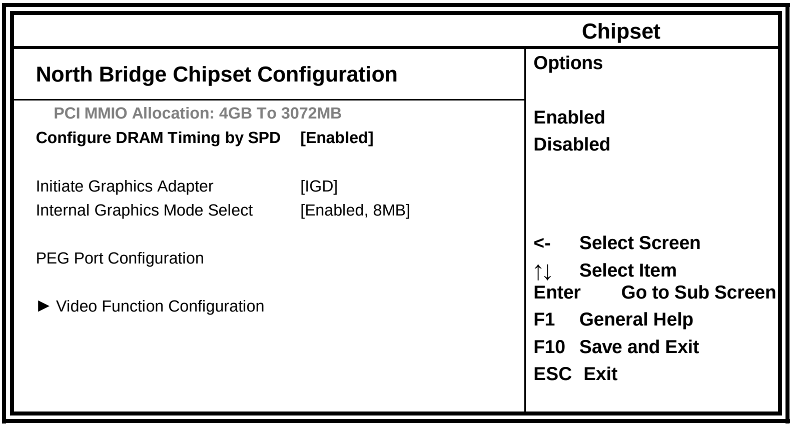
This setting configures the north bridge, south bridge and the ME subsystem. WARNING! Setting the wrong values may cause the system to malfunction.

BIOS SETUP UTILITY



```
Main     Advanced     PCIPnP     Boot     Security     Chipset     Exit

Advanced Chipset Settings                           Configure North Bridge
                                                    features.
WARNING:  Setting wrong values in below sections
          may cause system to malfunction.

► North Bridge Configuration                        <-    Select Screen
► South Bridge Configuration                        ↑↓    Select Item
                                                    Enter     Go to Sub Screen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit
```

BIOS SETUP UTILITY



```
                                                    Chipset

North Bridge Chipset Configuration                  Options

  PCI MMIO Allocation: 4GB To 3072MB                Enabled
Configure DRAM Timing by SPD    [Enabled]           Disabled

Initiate Graphics Adapter       [IGD]
Internal Graphics Mode Select   [Enabled, 8MB]
                                                    <-    Select Screen
PEG Port Configuration                              ↑↓    Select Item
                                                    Enter     Go to Sub Screen
► Video Function Configuration                      F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit
```

Configure DRAM Timing by SPD

When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.

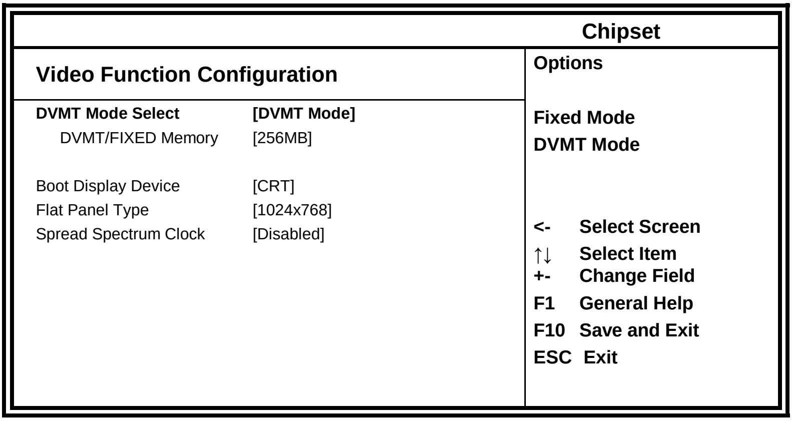
Initiate Graphic Adapter

Select which graphics controller to use as the primary boot device. This option, by default, is set to IGD.

Internal Graphics Mode Select

Use the feature to set the amount of system memory to be used by the Internal. graphics device. expansion cards that require a specified area of memory to work properly.

BIOS SETUP UTILITY



```
                                                      Chipset
 Video Function Configuration                  | Options
-----------------------------------------------|
 DVMT Mode Select            [DVMT Mode]       | Fixed Mode
    DVMT/FIXED Memory        [256MB]           | DVMT Mode
                                               |
 Boot Display Device         [CRT]             |
 Flat Panel Type             [1024x768]        | <-    Select Screen
 Spread Spectrum Clock       [Disabled]        | ↑↓    Select Item
                                               | +-    Change Field
                                               | F1    General Help
                                               | F10   Save and Exit
                                               | ESC  Exit
```

DVMT Mode Select

Select the control mode of memory built-in graphics capabilities. This option, by default, is set to DVMT Mode.

DVMT/FIXED Memory

Sets the maximum memory size assigned to the integrated graphics capabilities. This option, by default, is set to 256MB.

Boot Display Device

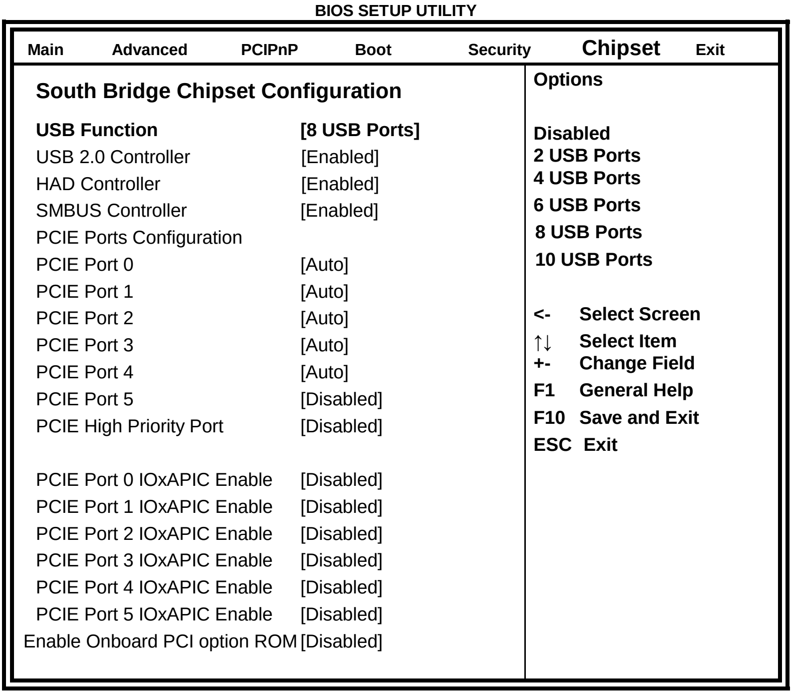
This option is used to select the display device used by the system when it boots.

Flat Panel Type

This option is used to select the type of flat panel connected to the system. Options include: 640x480 / 800x600 / 1024x768 / 1280x768 / 1280x800 / 1280x600.

Spread Spectrum Clock

By default, this field is set to *Disabled*.



```
                              BIOS SETUP UTILITY
 Main     Advanced     PCIPnP     Boot       Security     Chipset     Exit
 South Bridge Chipset Configuration                     | Options
                                                        |
 USB Function                   [8 USB Ports]           | Disabled
 USB 2.0 Controller             [Enabled]               | 2 USB Ports
 HAD Controller                 [Enabled]               | 4 USB Ports
 SMBUS Controller               [Enabled]               | 6 USB Ports
 PCIE Ports Configuration                               | 8 USB Ports
 PCIE Port 0                    [Auto]                  | 10 USB Ports
 PCIE Port 1                    [Auto]                  |
 PCIE Port 2                    [Auto]                  | <-    Select Screen
 PCIE Port 3                    [Auto]                  | ↑↓    Select Item
 PCIE Port 4                    [Auto]                  | +-    Change Field
 PCIE Port 5                    [Disabled]              | F1    General Help
 PCIE High Priority Port        [Disabled]              | F10   Save and Exit
                                                        | ESC  Exit
 PCIE Port 0 IOxAPIC Enable     [Disabled]              |
 PCIE Port 1 IOxAPIC Enable     [Disabled]              |
 PCIE Port 2 IOxAPIC Enable     [Disabled]              |
 PCIE Port 3 IOxAPIC Enable     [Disabled]              |
 PCIE Port 4 IOxAPIC Enable     [Disabled]              |
 PCIE Port 5 IOxAPIC Enable     [Disabled]              |
Enable Onboard PCI option ROM   [Disabled]              |
```

USB Function

This option enables the number of USB ports desired or disables the USB function.

USB 2.0 Controller

This option is disabled by default.

HDA Controller

This option is used to enable the Southbridge high definition audio controller.

SMBUS Controller

This option is enabled by default.

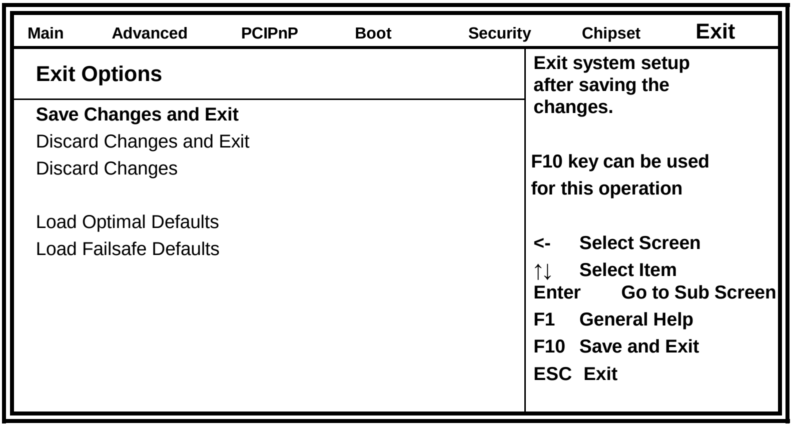
Enable Onboard PCI option ROM

This option is disabled by default.

Exit Setup

The exit setup has the following settings which are:

BIOS SETUP UTILITY



```
Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

 Exit Options                          | Exit system setup
                                       | after saving the
 Save Changes and Exit                 | changes.
 Discard Changes and Exit              |
 Discard Changes                       | F10 key can be used
                                       | for this operation
 Load Optimal Defaults                 |
 Load Failsafe Defaults                | <-     Select Screen
                                       | ↑↓     Select Item
                                       | Enter      Go to Sub Screen
                                       | F1     General Help
                                       | F10    Save and Exit
                                       | ESC  Exit
```

Save Changes and Exit

This option allows you to determine whether or not to accept the modifications and save all changes into the CMOS memory before exit.

Discard Changes and Exit

This option allows you to exit the Setup utility without saving the changes you have made in this session.

Discard Changes

This option allows you to discard all the changes that you have made in this session.

Load Optimal 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.

Load Failsafe 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.

This page is intentionally left blank.

Drivers Installation

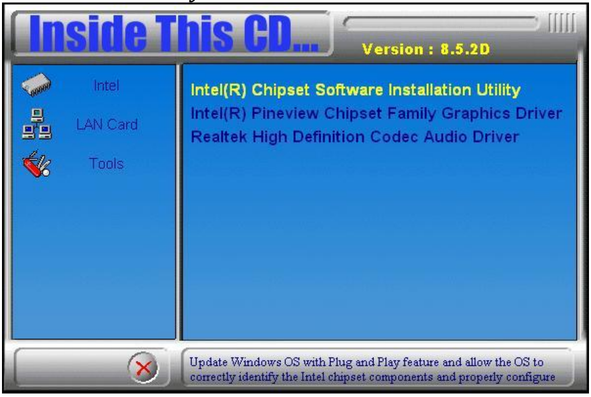
This section describes the installation procedures for software and drivers under the Windows XP, Windows Vista and Windows 7. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

IMPORTANT NOTE:
After installing your Windows operating system (Windows XP/ Vista/ 7), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Installation Utility

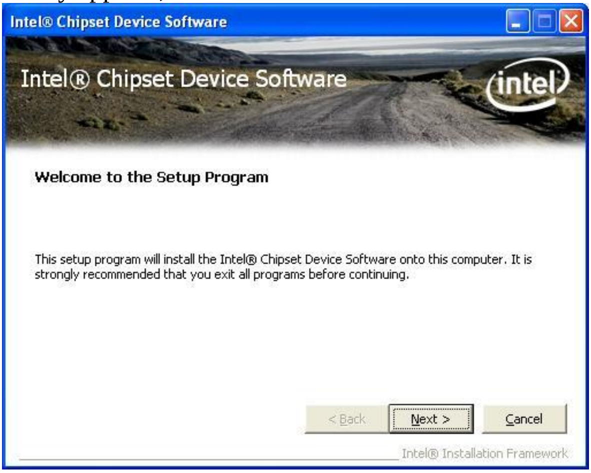
The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows XP/Vista/7.

1. Insert the drivers DVD into the DVD drive. Click ***Intel*** and then ***Intel(R) Pineview Chipset Drivers***. Click ***Intel(R) Chipset Software Installation Utility***.


Inside This CD...
Version : 8.5.2D
Intel
LAN Card
Tools
Intel(R) Chipset Software Installation Utility
Intel(R) Pineview Chipset Family Graphics Driver
Realtek High Definition Codec Audio Driver

Update Windows OS with Plug and Play feature and allow the OS to correctly identify the Intel chipset components and properly configure

2. When the welcome screen to the Intel(R) Chipset Software Installation Utility appears, click ***Next*** to continue.

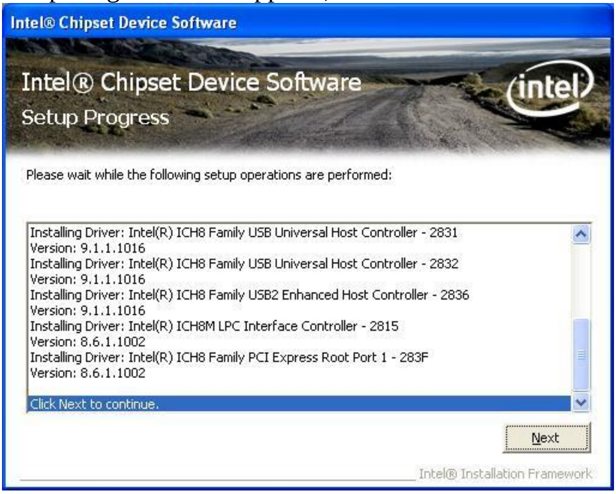

Intel® Chipset Device Software
Intel® Chipset Device Software
intel
< Back
Next >
Cancel
Intel® Installation Framework

Welcome to the Setup Program

This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.

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

4. On the Readme Information screen, click ***Next*** to continue.When the Setup Progress screen appears, click ***Next*** to continue.



Intel® Chipset Device Software

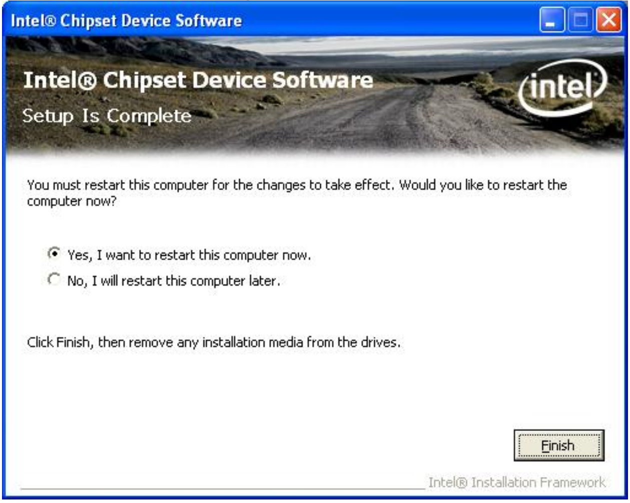
Intel® Chipset Device Software

Setup Progress

Please wait while the following setup operations are performed:

```
Installing Driver: Intel(R) ICH8 Family USB Universal Host Controller - 2831
Version: 9.1.1.1016
Installing Driver: Intel(R) ICH8 Family USB Universal Host Controller - 2832
Version: 9.1.1.1016
Installing Driver: Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
Version: 9.1.1.1016
Installing Driver: Intel(R) ICH8M LPC Interface Controller - 2815
Version: 8.6.1.1002
Installing Driver: Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
Version: 8.6.1.1002

Click Next to continue.
```

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



Intel® Chipset Device Software

Intel® Chipset Device Software

Setup Is Complete

You must restart this computer for the changes to take effect. Would you like to restart the computer now?

● Yes, I want to restart this computer now.

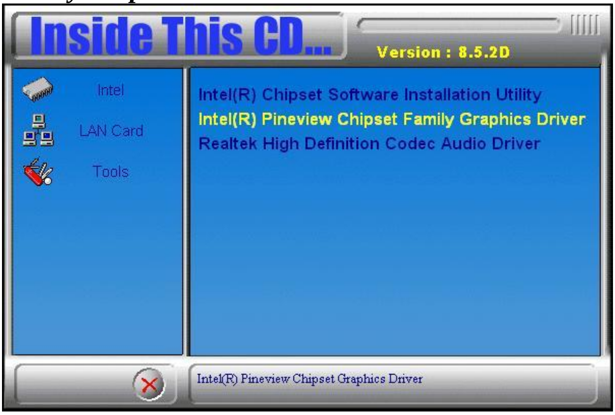
○ No, I will restart this computer later.

Click Finish, then remove any installation media from the drives.

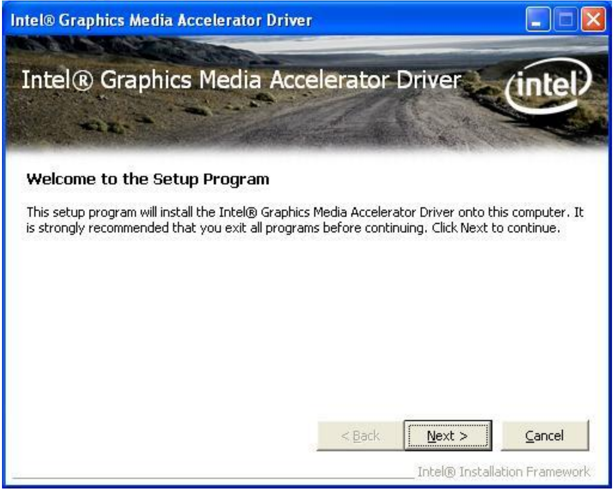
Intel Pineview Chipset Family Graphics Driver Installation

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

1. Insert the drivers DVD into the DVD drive. Click ***Intel*** and then ***Intel(R) Pineview Chipset Drivers***. Click ***Intel(R) Pineview Chipset Family Graphics Driver***.


Inside This CD...
Version : 8.5.2D
Intel
LAN Card
Tools
Intel(R) Chipset Software Installation Utility
Intel(R) Pineview Chipset Family Graphics Driver
Realtek High Definition Codec Audio Driver
Intel(R) Pineview Chipset Graphics Driver

2. When the welcome screen of the Intel(R) Graphics Media Accelerator Driver appears, click ***Next*** to continue.

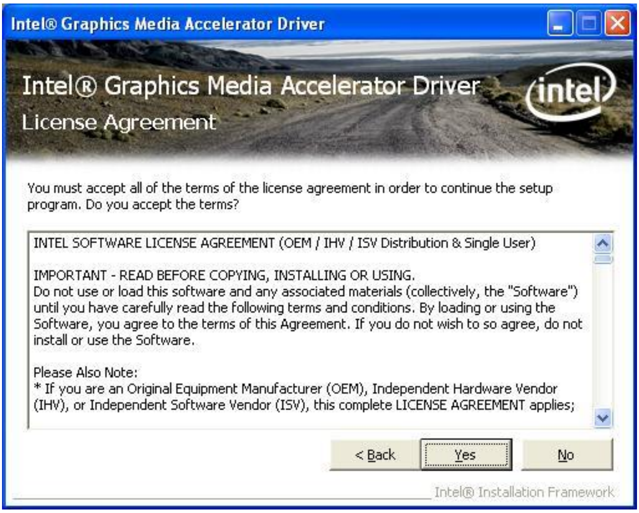

Intel® Graphics Media Accelerator Driver

Welcome to the Setup Program

This setup program will install the Intel® Graphics Media Accelerator Driver onto this computer. It is strongly recommended that you exit all programs before continuing. Click Next to continue.

Intel® Graphics Media Accelerator Driver
intel
< Back
Next >
Cancel
Intel® Installation Framework

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


Intel® Graphics Media Accelerator Driver
intel
< Back
Yes
No
Intel® Installation Framework

Intel® Graphics Media Accelerator Driver

License Agreement

You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?

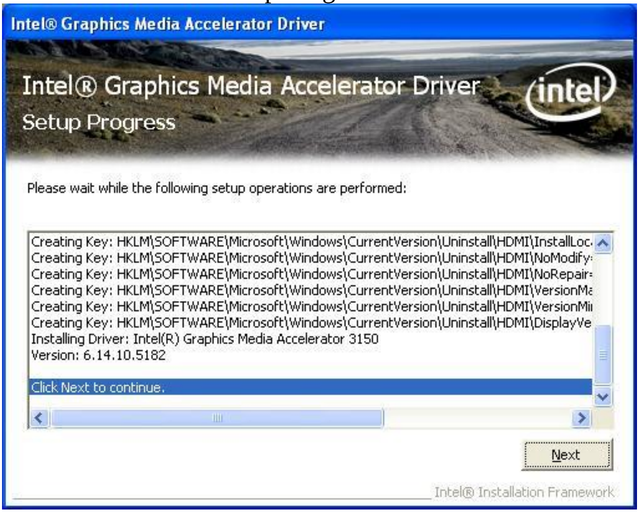
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;

4. Click ***Next*** in the Readme File Information window.

5. Click ***Next*** in the Setup Progress window.


Intel® Graphics Media Accelerator Driver
intel
Next
Intel® Installation Framework

Intel® Graphics Media Accelerator Driver

Setup Progress

Please wait while the following setup operations are performed:

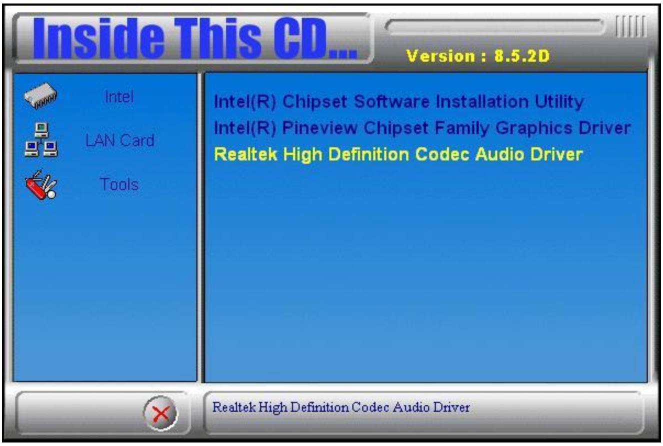
```
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\InstallLoc
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\NoModify
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\NoRepair
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\VersionMa
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\VersionMi
Creating Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI\DisplayVe
Installing Driver: Intel(R) Graphics Media Accelerator 3150
Version: 6.14.10.5182

Click Next to continue.
```

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

Realtek High Definition Codec Audio Driver Installation

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

1. Insert the drivers DVD into the DVD drive. Click ***Intel*** and then ***Intel(R) Pineview Chipset Drivers***. Click ***Realtek High Definition Codec Audio Driver.***


Inside This CD...
Version : 8.5.2D
Intel
LAN Card
Tools
Intel(R) Chipset Software Installation Utility
Intel(R) Pineview Chipset Family Graphics Driver
Realtek High Definition Codec Audio Driver
Realtek High Definition Codec Audio Driver

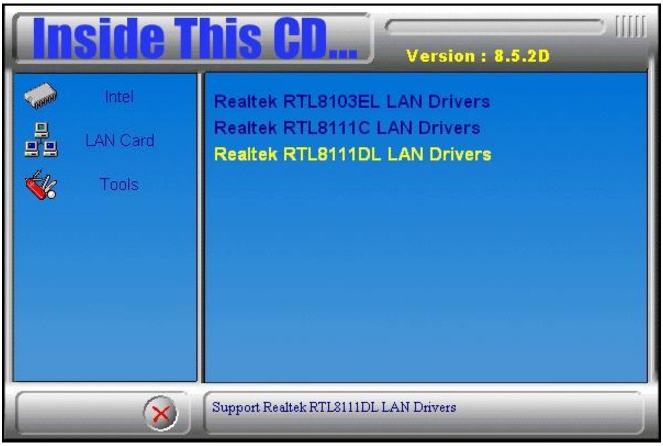
2.When the welcome screen to InstallShield Wizard for ***Realtek High Definition Audio Driver*** appears, click ***Next*** to start the installation.

3.When the InstallShieldWizard has finished performing maintenance operations on Realtek High Definition Codec Audio Audio Driver, click ***Finish*** to restart the computer.

Realtek RTL8111DL LAN Drivers Installation

Follow the steps below to install Realtek RTL8111DL LAN Drivers.

1. Insert the drivers DVD into the DVD drive. Click ***LAN Card*** and then ***Realtek LAN Controller Drivers***. Click ***Realtek RTL8111DL LAN Drivers***.


Inside This CD...
Version : 8.5.2D
Intel
LAN Card
Tools
Realtek RTL8103EL LAN Drivers
Realtek RTL8111C LAN Drivers
Realtek RTL8111DL LAN Drivers
Support Realtek RTL8111DL LAN Drivers

2. In the welcome screen of the InstallShield Wizard for REALTEK GbE & FE Ethernet PCI-E NIC Driver, click ***Next***.

3. In the InstallShield Wizard screen, click ***Install*** to begin the installation.

4. InstallShield Wizard completed. Click ***Finish*** to exit the Wizard.

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Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses that 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
2B0h - 2DFh	Graphics adapter Controller
2E8h - 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
360h - 36Fh	Network Ports
3B0h - 3BFh	Monochrome & Printer adapter
3C0h - 3CFh	EGA adapter
3D0h - 3DFh	CGA adapter
3E8h - 3EFh	Serial Port #3(COM3)
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	Reserved
IRQ7	Reserved
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Serial Port #4
IRQ11	Serial Port #3
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary 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:

```
File of the W627UHG.CPP
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include "W627UHG.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int W627UHG_BASE;
void Unlock_W627UHG (void);
void Lock_W627UHG (void);
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void)
{
        unsigned int result;
        unsigned char ucDid;

        W627UHG_BASE = 0x4E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                  //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x2E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                  //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x00;
        result = W627UHG_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_W627UHG (void)
```

```
{
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_LOCK);
}
//---------------------------------------------------------------------------
void Set_W627UHG_LD( unsigned char LD)
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, W627UHG_REG_LD);
        outportb(W627UHG_DATA_PORT, LD);
        Lock_W627UHG();
}
//---------------------------------------------------------------------------
void Set_W627UHG_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        outportb(W627UHG_DATA_PORT, DATA);
        Lock_W627UHG();
}
//---------------------------------------------------------------------------
unsigned char Get_W627UHG_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        Result = inportb(W627UHG_DATA_PORT);
        Lock_W627UHG();
        return Result;
}
//---------------------------------------------------------------------------
```

File of the W627UHG.H

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#ifndef __W627UHG_H
#define __W627UHG_H                1
//---------------------------------------------------------------------------
#define     W627UHG_INDEX_PORT          (W627UHG_BASE)
#define     W627UHG_DATA_PORT           (W627UHG_BASE+1)
//---------------------------------------------------------------------------
#define     W627UHG_REG_LD              0x07
//---------------------------------------------------------------------------
#define W627UHG_UNLOCK             0x87
#define     W627UHG_LOCK                0xAA
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void);
void Set_W627UHG_LD( unsigned char);
void Set_W627UHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627UHG_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif//__W627UHG_H
```

File of the MAIN.CPP

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627UHG.H"
//---------------------------------------------------------------------------
int main (void);

void WDTInitial(void);
void WDTEnable(unsigned char);
void WDTDisable(void);

//---------------------------------------------------------------------------
int main (void)
{
        char SIO;

        SIO = Init_W627UHG();
        if (SIO == 0)
        {
        ............................................. printf("Can not detect Winbond 83627UHG, program abort.\n");
        .......................................................................................................return(1);
        }

        WDTInitial();

        WDTEnable(10);

        WDTDisable();

        return 0;
}
//---------------------------------------------------------------------------
void WDTInitial(void)
{
        unsigned char bBuf;
        Set_W627UHG_LD(0x08); ..............................................................//switch to logic device 8
        bBuf = Get_W627UHG_Reg(0x30);
        bBuf &= (~0x01);
        Set_W627UHG_Reg(0x30, bBuf); .................................................................. //Enable WDTO
}
//---------------------------------------------------------------------------
void WDTEnable(unsigned char NewInterval)
{
        unsigned char bBuf;

        Set_W627UHG_LD(0x08); ..........................................................................................
        Set_W627UHG_Reg(0x30, 0x01); ................................................................... //enable timer
        bBuf = Get_W627UHG_Reg(0xF5);
        bBuf &= (~0x08);
        Set_W627UHG_Reg(0xF5, bBuf); ........................................................ //count mode is second

        Set_W627UHG_Reg(0xF6, NewInterval);................................................................ //set timer
}
//---------------------------------------------------------------------------
void WDTDisable(void)
{
        Set_W627UHG_LD(0x08); ..........................................................................................
        Set_W627UHG_Reg(0xF6, 0x00); ......................................................... //clear watchdog timer
        Set_W627UHG_Reg(0x30, 0x00); .............................................................................
}
//---------------------------------------------------------------------------
```

D. Digital I/O Sample Code

File of the W627UHG.H

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#ifndef __W627UHG_H
#define __W627UHG_H                 1
//---------------------------------------------------------------------------
#define       W627UHG_INDEX_PORT            (W627UHG_BASE)
#define       W627UHG_DATA_PORT             (W627UHG_BASE+1)
//---------------------------------------------------------------------------
#define       W627UHG_REG_LD                0x07
//---------------------------------------------------------------------------
#define W627UHG_UNLOCK                0x87
#define       W627UHG_LOCK                  0xAA
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void);
void Set_W627UHG_LD( unsigned char);
void Set_W627UHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627UHG_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif//__W627UHG_H
```

File of the W627UHG.CPP

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include "W627UHG.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int W627UHG_BASE;
void Unlock_W627UHG (void);
void Lock_W627UHG (void);
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void)
{
        unsigned int result;
        unsigned char ucDid;

        W627UHG_BASE = 0x4E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                        //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x2E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                        //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x00;
        result = W627UHG_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_LOCK);
}
//---------------------------------------------------------------------------
void Set_W627UHG_LD( unsigned char LD)
```

```
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, W627UHG_REG_LD);
        outportb(W627UHG_DATA_PORT, LD);
        Lock_W627UHG();
}
//---------------------------------------------------------------------------
void Set_W627UHG_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        outportb(W627UHG_DATA_PORT, DATA);
        Lock_W627UHG();
}
//---------------------------------------------------------------------------
unsigned char Get_W627UHG_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        Result = inportb(W627UHG_DATA_PORT);
        Lock_W627UHG();
        return Result;
}
//---------------------------------------------------------------------------
```

File of the MAIN.CPP

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627UHG.H"
//---------------------------------------------------------------------------
int main (void);

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

        SIO = Init_W627UHG();
        if (SIO == 0)
        {
                printf("Can not detect Winbond 83627UHG, program abort.\n");
                return(1);
        }

        Dio5Initial();

        //for GPIO50..57
        Dio5SetDirection(0x0F); //GP50..53 = input, GP54..57=output
        printf("Current DIO direction = 0x%X\n", Dio5GetDirection());

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

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

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

        return 0;
}
//---------------------------------------------------------------------------
void Dio5Initial(void)
{
        unsigned char ucBuf;

        Set_W627UHG_LD(0x08);                                           //switch to logic device 8
        //enable the GP5 group
        ucBuf = Get_W627UHG_Reg(0x30);
        ucBuf |= 0x02;
        Set_W627UHG_Reg(0x30, ucBuf);
}
//---------------------------------------------------------------------------
void Dio5SetOutput(unsigned char NewData)
{
        Set_W627UHG_LD(0x08);                                   //switch to logic device 8
        Set_W627UHG_Reg(0xE1, NewData);
}
//---------------------------------------------------------------------------
unsigned char Dio5GetInput(void)
{
        unsigned char result;

        Set_W627UHG_LD(0x08);                                   //switch to logic device 8
        result = Get_W627UHG_Reg(0xE1);
        return (result);
}
//---------------------------------------------------------------------------
void Dio5SetDirection(unsigned char NewData)
{
        //NewData : 1 for input, 0 for output
        Set_W627UHG_LD(0x08);                                   //switch to logic device 8
        Set_W627UHG_Reg(0xE0, NewData);
}
//---------------------------------------------------------------------------
unsigned char Dio5GetDirection(void)
{
        unsigned char result;

        Set_W627UHG_LD(0x08);                                   //switch to logic device 8
        result = Get_W627UHG_Reg(0xE0);
        return (result);
}
//---------------------------------------------------------------------------
```