IA30 Motherboard

3.5” Fanless SBC w/Intel Atom N270 1.6GHz Processor,, VGA, LVDS, Dual Giga Ethernet, and Mini-PCI Interface.

USER MANUAL Version 1.0

FCC Statement

This device complies with part 15 FCC rules. Operation is subject to the following two conditions：

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at him own expense.

Copyright Notice

Trademark Acknowledgement

Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Winmate Communication Inc. makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, We will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W07Axxxxxxxx means October of year 2007.

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package：

- IA30 Motherboard
- User Manual
- HDD IDE Cable
- User's Manual & Driver CD
- RS232 Cable

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Customer Service

We provide service guide for any problem as follow steps： The first, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You may have the following information ready before you call：

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Description of complete problem
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

7 *Safety Precautions*

- **Warning!**

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.

- **Caution!**

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user's manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
    A. The power cord or plug is damaged.
    B. Liquid has penetrated into the equipment.
    C. The equipment has been exposed to moisture.
    D. The equipment does not work well, or you cannot get it to work according to the user's manual.
    E. The equipment has been dropped and damaged.
    F. The equipment has obvious signs of breakage.
15. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20° C (-4°F) or above 60° C (140° F). It may damage the equipment.

Revision History

Version	Date	Note	Author
1.0	2009.01.15	Initial Draft	Randy Chang

Contents

CHAPTER 1

General Information

This chapter includes the IA30 Motherboard background information.

Sections include:

- Introduction
- Feature
- Motherboard Specification
- Function Block
- Board Dimensions

Chapter 1 General Information

1.1 Introduction

The IA30 SBC is integrated with Intel 945GSE North Bridge and Intel ICH7M South Bridge. IA30 is designed for use with Intel's mobile Intel® Atom Processor. Comparing to previous 855GME chipset, Intel Atom Processor with 45nm low power design enables down to 50% less average power consumption and the chipset delivers up to 4x improvement in graphics performance and enables up to 50% higher data transfer bus speed rate.

In peripheral connectivity, IA30 SBC features with Mini-PCI I/O ports, two Serial ATA connectors, and Four Hi-Speed USB 2.0 connectors. Additionally, IA30 SBC build-in a 12V DC-IN power adapter.

Thus, the IA30 SBC is designed to satisfy most of the applications in the industrial computer market, such as Gaming, POS, KIOSK, Industrial Automation, and Programmable Control System. It is a compact design to meet the demanding performance requirements of today's business and industrial applications.

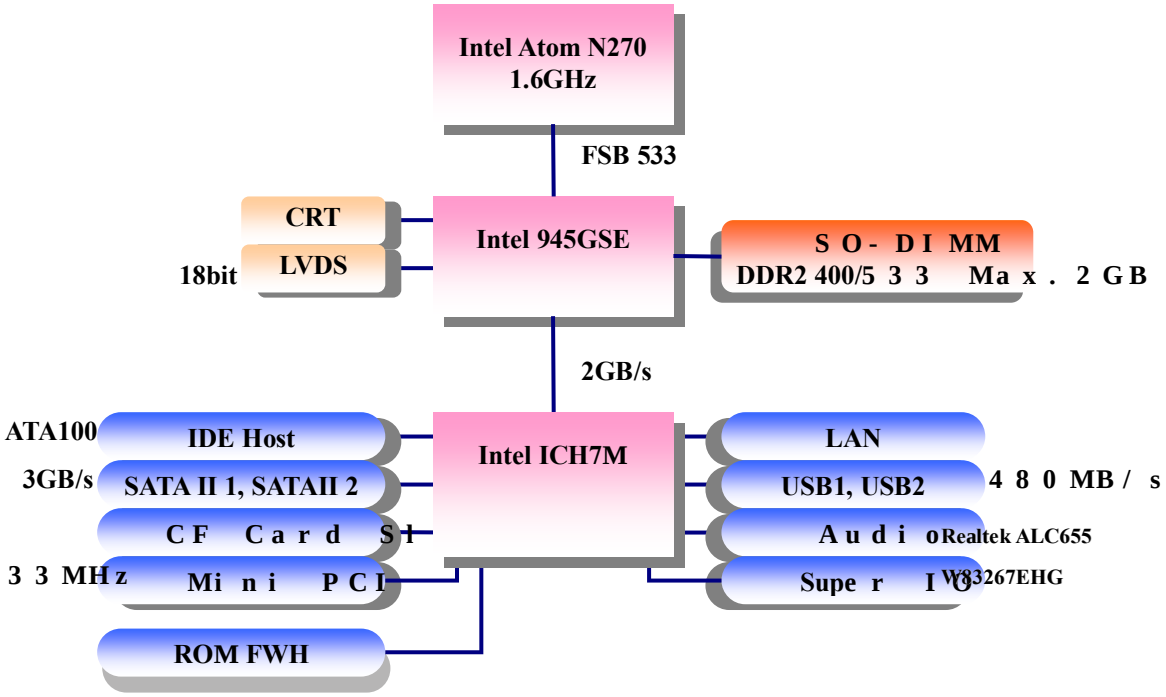
1.2 Feature

- 3.5-inch Form Factor (146mm x 101mm)
- Supports Intel® Atom N270 1.6GHz processors
- System memory up to 2GB SO-DIMM 400/533, 1 x SO-DIMM
- Integrated Intel 945GSE + ICH7M Chipset
- Intel® GMA950 Integrated Graphics Engine.
- Dual Gigabit Ethernet
- 1 x Mini PCI, 2 X COM, 4 x USB2.0, 2 x SATA, 8 x GPIO ports, 1 x PATA and CF Card Type I/II

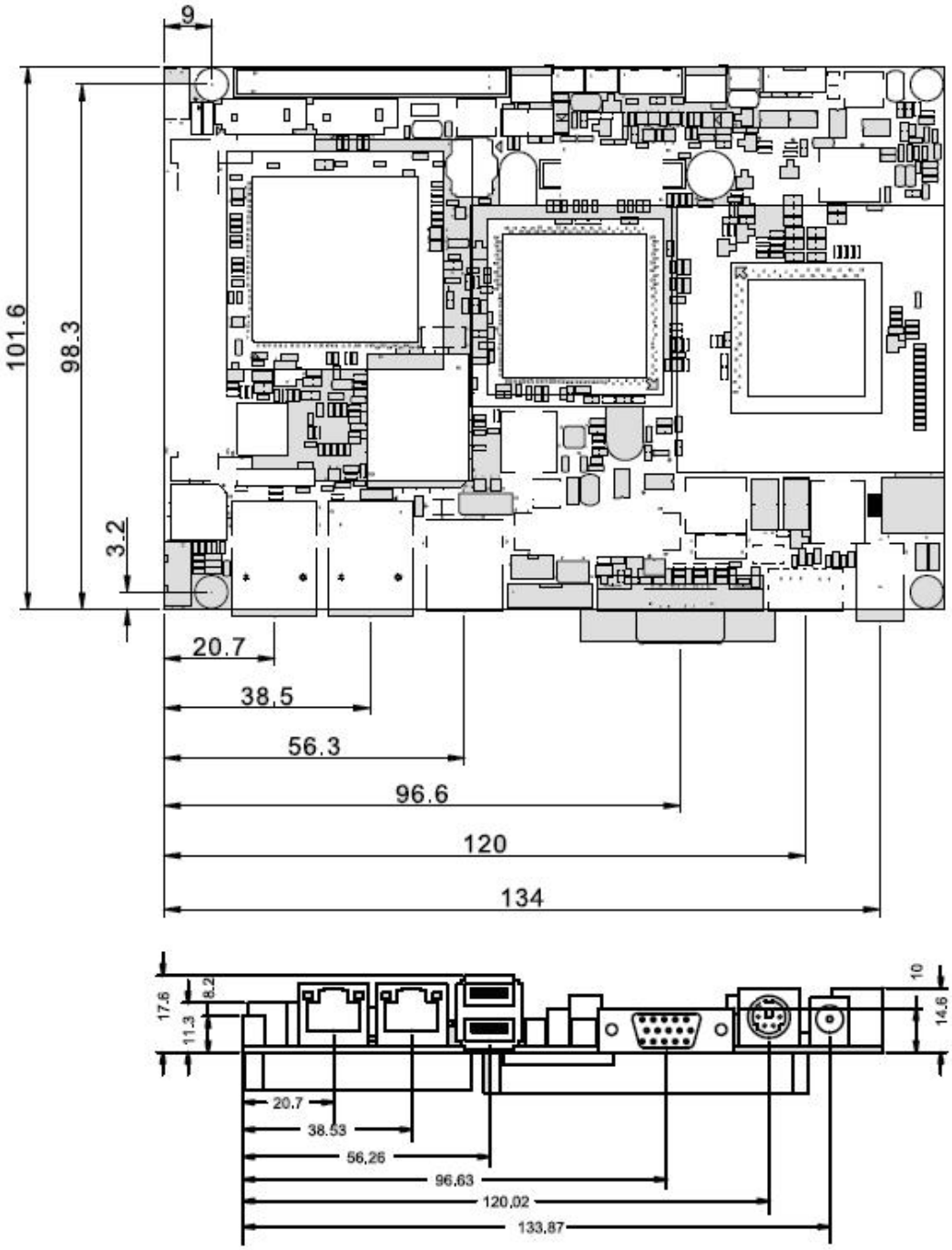
1.3 Motherboard Specifications

CPU Type	Intel Atom N270 1.6GHz Processor
CPU Speed	1.6GHz
CPU FSB	533MHz
Chipset	Intel 945GSE / ICH7M
BIOS	AMI 4M Flash
VGA	Intel® GMA950 Integrated Graphics Engine Up to 224MB shared with system memory
LVDS	Intel® GMA950 Integrated Graphics Engine built-in, single- or dual-channel panel support up to UXGA panel resolution.
LAN	2 x Giga LAN (Realtek RTL8111B + Realtek RTL8111B Giga LAN Controller)
Memory Type	1 x SO-DIMM socket, supports up to 2GB SO-DIMM 400/533 SDRAM
LPC I/O	Winbond W83627EHG integrated hardware monitoring
Keyboard/Mouse	1 x PS/2 Keyboard/Mouse connectors
IDE Interface	One channels; supports Ultra DMA 33/66/100
Sound	Realtek ALC655 5.1 channel (Line-out, Line-in & Mic in)
USB	4 ports, USB 2.0 (2 x USB Connector, 2 x USB pin-header)
Edge Connectors	1 x DC-IN Jack 1 x PS/2 connector for keyboard/mouse 1 x VGA out connector 2 x Gigabit LAN RJ-45 1 x Dual USB stack connector
On Board Pin-Header Connectors	1 x 44 pins box-header 2 x SATA connector for SATAI/II 3.0 Gb/s 1 x 10pins pin-header for Front Panel(2x5) 1 x 8pins pin-header for 5V/12V external power 1 x 3pins pin-header for CPU Fan 1 x 3pins pin-header for NB Fan 1 x 2pins pin-header for 5V external power 1 x 2pins pin-header for 12V external power 1 x 10pins pin-header for Front Audio(2x5) 1 x 8pins pin-header for USB 3/4(2X4) 1 x 10pins Digital I/O(2x5) 2 x 10pins pin-header for COM 1(RS232) (2X5) 1 x 5pins pin-header for COM1 (RS422/485) 1 x 4pins ATX 12V connector 1 x 40pins DF13 Connector for LVDS 1 x 3pins digital panel backlight brightness controller 1 x 7pins digital panel inverter
Power Connector	Input: 4-pin ATX 12V Power input
Expansion Slots	1 x Mini-PCI, 1 x CF Card Type I/II
Form Factor	3.5 inch
Dimensions	146mm x 101mm
Mechanical & environmental	Operating temperature: 0 deg. C to 60 deg. C Operating Humidity: 10 ~ 90% Relative humidity, non-condensing Shock: Operating 15G, 11ms duration Vibration: Operating 5 Hz~500Hz / 1Grms / 3 Axis Certification: CE, FCC, RoHS

1.4 Function Block



1.5 Board dimensions



CHAPTER 2

Installations

This chapter provides information on how to use the jumps and connectors on the IA30 Motherboard.
The Sections include:

- Memory Module Installation
- I / O Equipment Installation
- Setting the Jumpers
- Connectors on IA30 Motherboard

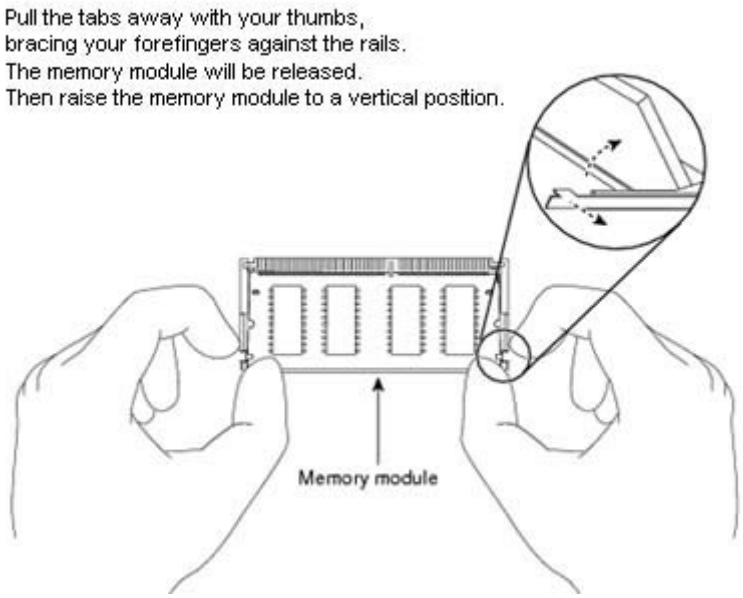
Chapter 2 Installations

2.1 Memory Module（SO-DIMM）Installation

The IA30 Motherboard provides one 200-pin SODIMM slot. The socket supports up to 2GB DDR2 400/533 SDRAM. When installing the Memory device, please follow the steps below：

Step.1. Firmly insert the SO-DIMM at an angle into its slot. Align the SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.

Step.2. Press downwards on SO-DIMM until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.



- Caution!

The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if the SO-DIMM is forced into the slot at the incorrect orientation.

2.2 I/O Equipment Installation

2.2.1 12V DC-IN

The Motherboard allows plugging 12V DC-IN jack on the board without another power module converter under power consumption by Intel Atom N270 1.6GHz Processor in 945GSE with ICH7M chipset.

2.2.2 PS/2 Keyboard or PS/2 Mouse

The Motherboard provides One Mini-DIN connector supports PS/2 interface. Mini-DIN connector supports Keyboard or Mouse. In other cases, especially in embedded applications, a mouse is not used. Therefore, the BIOS standard setup menu allows you to select* “All, But Keyboard” under the “Halt On”. This allows no-keyboard operation in embedded system applications without the system halting under POST.

2.2.3 Serial COM ports

Two RS-232 connectors build in the rear I/O. One optional COM ports support RS-422/485. When an optional touch-screen is ordered with PPC, serial com port can connect to a serial or an optional touch-screen.

2.2.4 External VGA

The Motherboard has one VGA port that can be connected to an external CRT/ LCD monitor. Use VGA cable to connect to an external CRT / LCD monitor, and connect the power cable to the outlet. The VGA connector is a standard 15-pin D-SUB connector.

2.2.5 Ethernet interface

The Motherboard is equipped with Realtek RTL8111B + Realtek RTL8111B chipset which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol compatible. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.2.6 USB ports

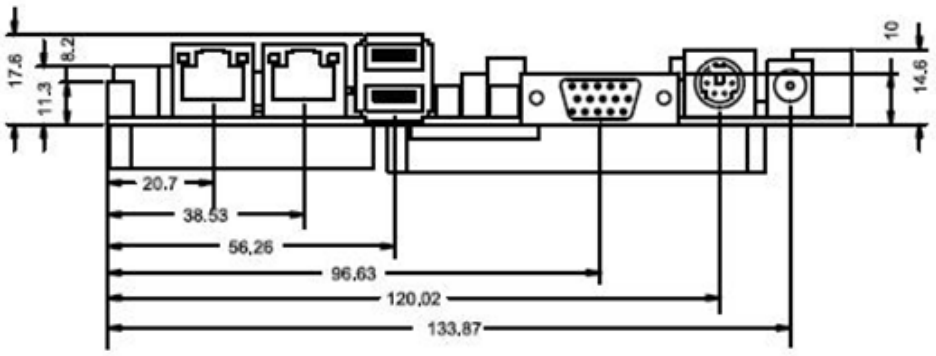
Four USB devices (Two with pin headers) may be connected to the system though an adapter cable. Various adapters may come with USB ports. USB usually connect the external system to the system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

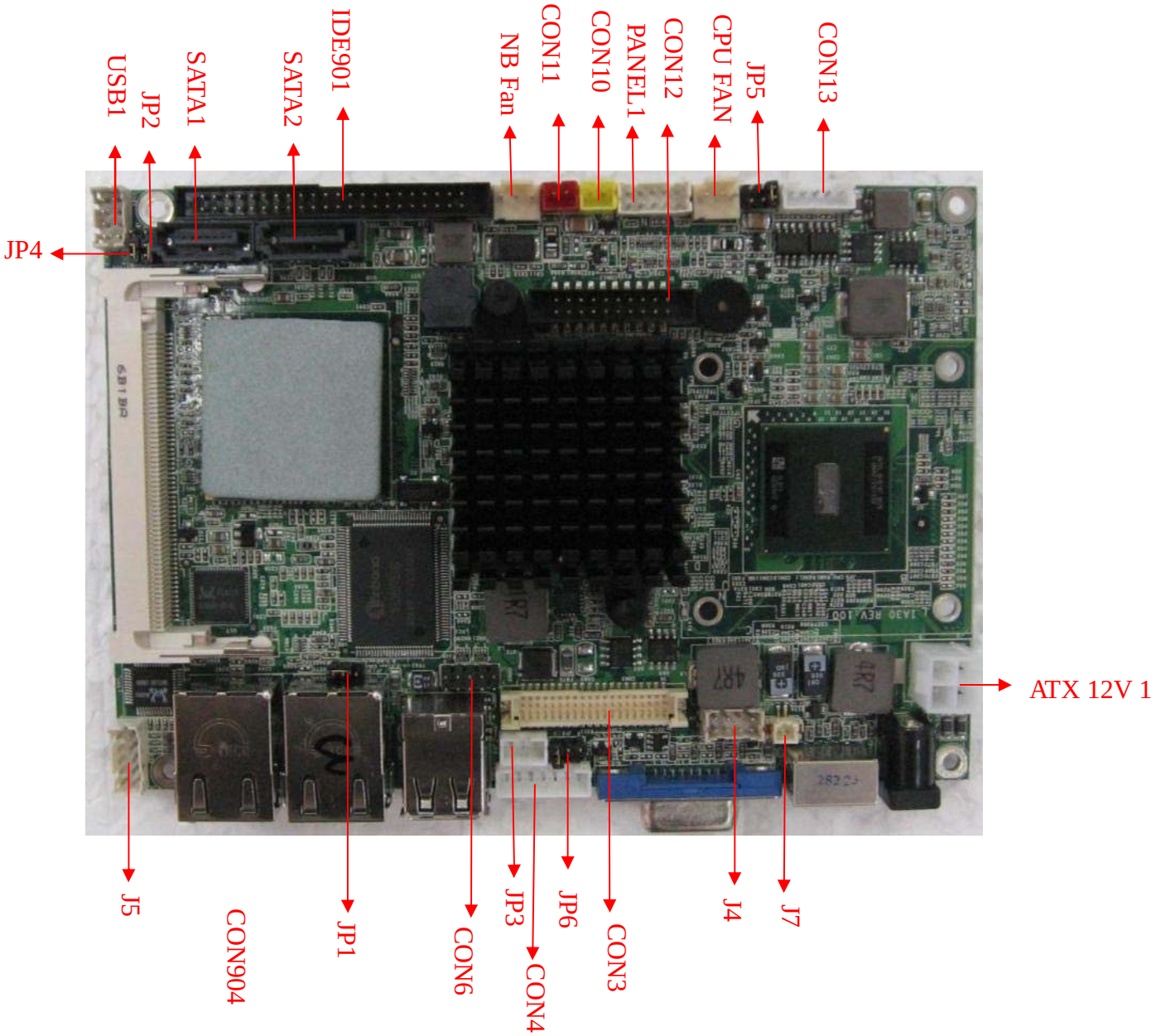
2.2.7 Audio function

The Audio 5.1 channel capabilities are provided by a Realtek ALC655 chipset supporting digital audio outputs. The audio interface includes two jacks: line-in and line-out.

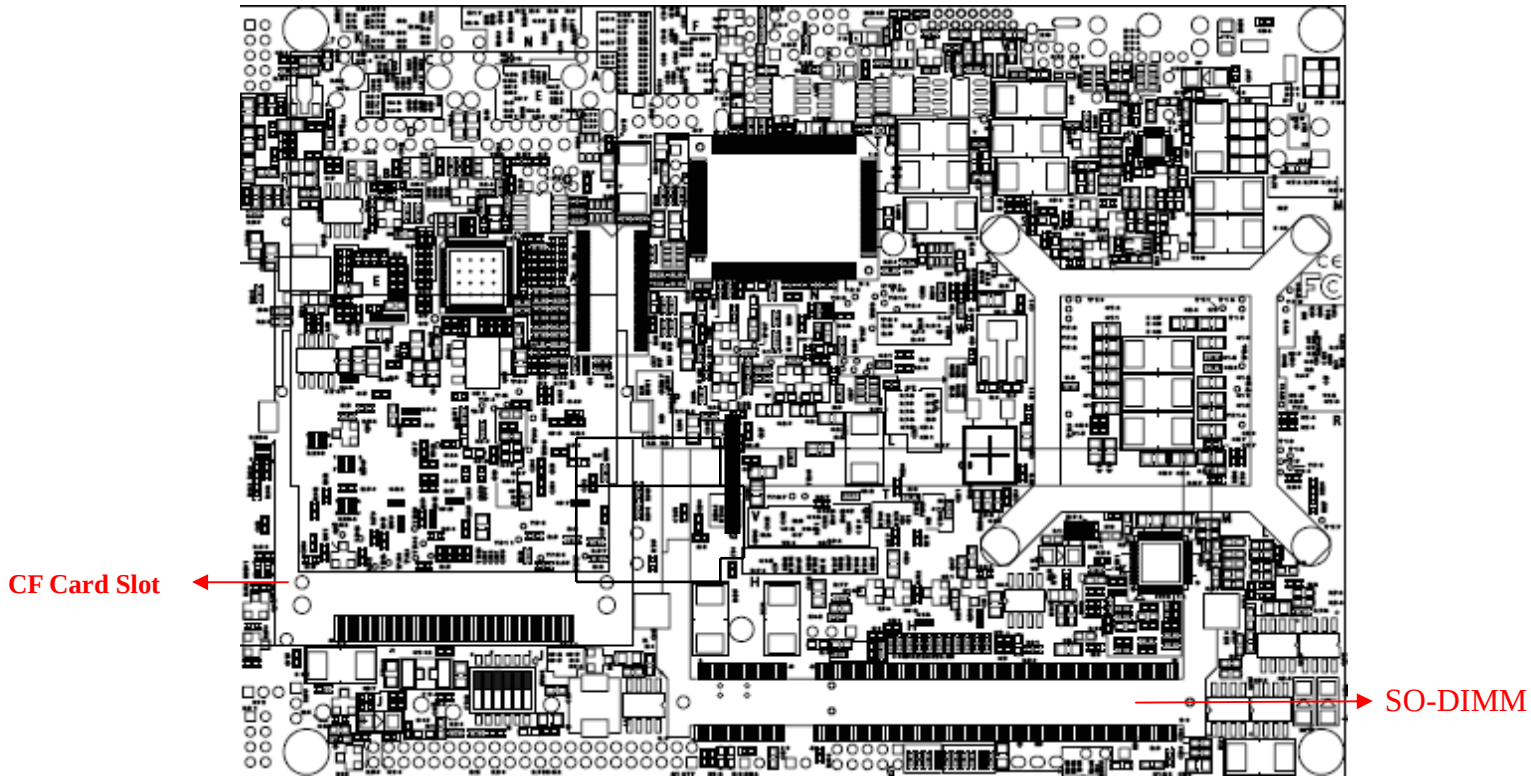
2.3 Jumpers and Connectors

TOP





BOTTOM

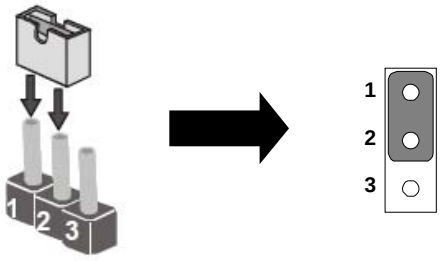


Locating Jumpers and Connectors (rear side)

2.4 Jumper Setting

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is as below. If a jumper shorts pin 1 and pin 2, the setting diagram is shown as the right one.

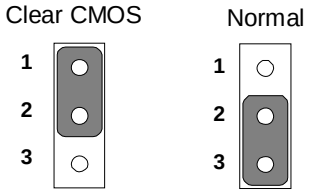


The following tables list the function of each of the board's jumpers.

Label	Function	Note
JP1	Clear CMOS	3x1 header , pitch 2.0mm
JP5	RS232 / RS422 / RS485 Selector	2x3 header , pitch 2.0mm
JP2	CF CARD PRIORITY	3x1 header , pitch 2.0mm
JP6	LVDS VOLTAGE	2x3 header , pitch 2.0mm

2.4.1 JP1: Clear CMOS

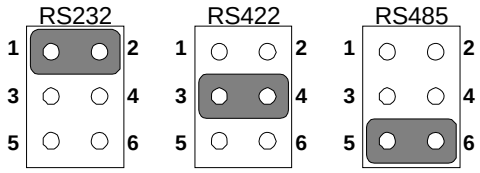
User must make sure the power supply to turn off the power supply before setting Clear CMOS. Users remember to setting jumper back to Normal before turning on the power supply. Default: 2short3.



Pin No.	Functions
1 Short 2	Clear CMOS
2 Short 3	Normal

2.4.2 JP5: RS232 / RS422 / RS485 Selector

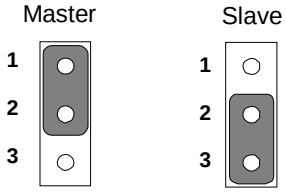
The jumper can be configured to operate COM1 in RS-232/422/485 mode. And the setting must be cooperated with the 2.4.3 settings.



Pin No.	Functions
1 Short 2	RS232
3 Short 4	RS422
5 Short 6	RS485

2.4.3 JP2: CF Card Priority

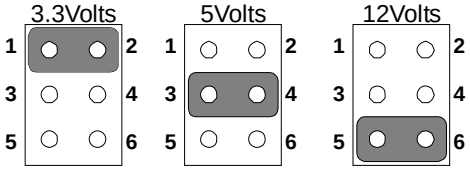
JP901 can be configured to operate CF Card Priority in Master/Slave mode.



Pin No.	Functions
1 Short 2	Master
2 Short 3	Slave

2.4.4 JP6: LCD Panel Voltage Select

JP6 can be configured to operate in 3.3Volts / 5Volts / 12Volts mode.



Pin No.	Functions
1 Short 2	3.3Volts Selected
3 Short 4	5Volts Selected
5 Short 6	12Volts Selected

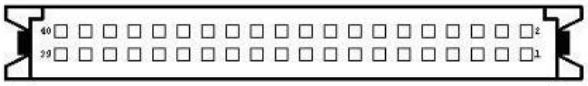
2.5 Connectors and Pin Assignment

The table below lists the function of each of the board's connectors.

Label	Function	Note
CON3	LVDS LCD Output Connector	DF13-40DP-1.25V
JP3	Digital Panel Backlight Brightness Control	3x1 header, pitch 2.54mm
CON4	Digital Panel Backlight Inverter Power	7x1 header, pitch 2.54mm
PSKBM1	PS2 Keyboard/Mouse Connector	Mini-DIN
VGA	VGA Output	15pin VGA
CON12(Left)	COM1 for RS232	2x5 header
CON12(Right)	COM2 for RS232	2x5 header
CON13	COM1 for RS422/485	1x5 header
J5	Audio connector	1x5 header
IDE1	IDE Connector	44Pin IDE Conn.
USB1	USB PIN HEADER	4x2 Pin Header
NB_FAN	FAN CONNECTOR	3x1 Pin Header
CPU_FAN	FAN CONNECTOR	3x1 Pin Header
PANEL1	System Function Connector	5x2 header ,pitch 2.0mm
CON10	12V External Power	2x1 header, pitch 2.0mm
CON11	5V External Power	2x1 header, pitch 2.0mm
J4	12V/5V External Power	4x2 header ,pitch 2.54mm
ATX12V1	12V DC Jack	4 Pin Jack
CON6	Digital I/O	2x5 Pin header

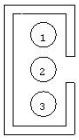
* Not Default Connector

2.5.1 CON3: LVDS Connector



Pin No.	SYMBOL	Pin No.	SYMBOL
1	LCDVDD	2	LVDS_LTX0-
3	LCDVDD	4	LVDS_LTX0+
5	LCDVDD	6	LVDS_LTX1-
7	GND	8	LVDS_LTX1+
9	GND	10	LVDS_LTX2-
11	GND	12	LVDS_LTX2+
13	GND	14	LVDS_LCLK-
15	GND	16	LCDS_LCLK
17	GND	18	NC
19	GND	20	NC
21	GND	22	LVDS_UTX0-
23	GND	24	LVDS_UTX0+
25	GND	26	LVDS_UTX1-
27	GND	28	LVDS_UTX1+
29	GND	30	LVDS_UTX2-
31	GND	32	LVDS_UTX2+
33	GND	34	LVDS_UCLK-
35	GND	36	LVDS_UCLK
37	GND	38	NC
39	GND	40	NC

2.5.2 JP3: Digital Panel Backlight Brightness Control



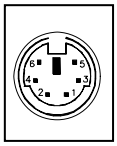
Pin No.	SYMBOL
1	VCC
2	Black Light Control
3	GND

2.5.3 CON4: Digital Panel Backlight Inverter Power

Pin No.	SYMBOL
1	+12V
2	+12V
3	+12V
4	GND
5	Black Light Control
6	GND
7	Black Light EN 5V

2.5.4 PSKBM1: PS2 K/B Mouse Connector

6-pin Mini Din

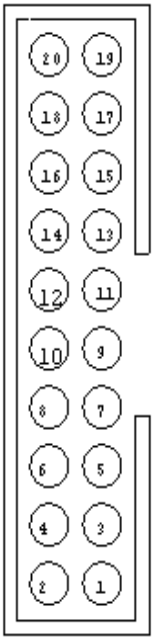


Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
N.C.	2	2	N.C.
GND	3	3	GND
5V	4	4	5V
Keyboard clock	5	5	Mouse clock
N.C.	6	6	N.C.

2.5.5 CON12: D-SUB Dual Output

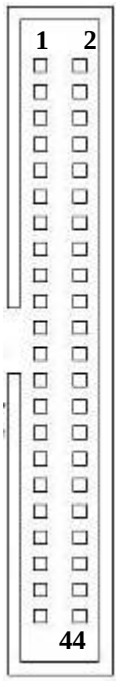
The serial port CON2, which is option 1 for RS232 (from 11 pin to 20 pin) , is the Winbond I/O serial port.

10x2 header, pitch 2.0mm



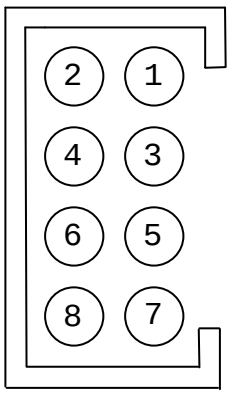
Pin No.	SYMBOL	Pin No.	SYMBOL
20	GND	19	GND
18	FK NRI2	17	FK NDTR2
16	FK NCTS2	15	FK NSOUT2
14	FK NRTS2	13	FK NSIN2
12	FK NDSR2	11	FK NDCD2
10	GND	9	GND
8	FK NRI1	7	FK NDTR1
6	FK NCTS1	5	FK NSOUT1
4	FK NRTS1	3	FK NSIN1
2	FK NDSR1	1	FK NDCD1

2.5.6 IDE1: IDE Connector



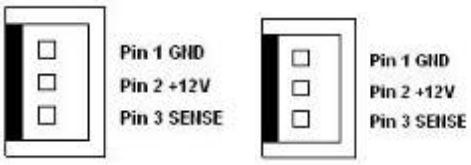
Pin No.	SYMBOL	Pin No.	SYMBOL
1	RESET	2	GND3
3	DD7	4	DD8
5	DD6	6	DD9
7	DD5	8	DD10
9	DD4	10	DD11
11	DD3	12	DD12
13	DD2	14	DD13
15	DD1	16	DD14
17	DD0	18	DD15
19	GND1	20	NC
21	DREQ	22	GND4
23	DIOW#	24	GND5
25	DIOR#	26	GND6
27	IO_RDYD	28	CSEL
29	DACK#	30	GND7
31	IRQ	32	IOCS16#
33	DA1	34	CBL_ID#
35	DA0	36	DA2
37	DCS#1	38	DCS#3
39	DASP#	40	GND8
41	+5V1	42	+5V2
43	GND	44	NC

2.5.7 USB1: USB PIN HEADER



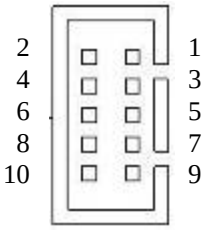
USB1			
Pin	SYMBOL	Pin	SYMBOL
2	USBVCC	1	USBVCC
4	USB_P6-	3	USB_P7-
6	USB_P6+	5	USB_P7+
8	GND	7	GND

2.5.8 NB_FAN/CPU_FAN: FAN CONNECTOR



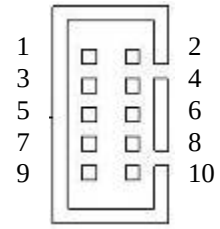
NB_FAN **CPU_FAN**

2.5.9 PANEL1: Front Panel System Function Connector



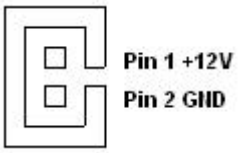
Pin	SYMBOL	Pin	SYMBOL
2	HD_LED+	1	PW_LED+
4	HD_LED-	3	PW_LED-
6	RT_BT1	5	PW_BT1
8	RT_BT2	7	PW_BT2
10	5VSB	9	RSEV

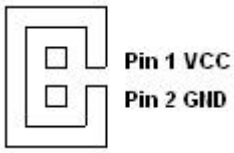
2.5.10 J5: Audio Connector

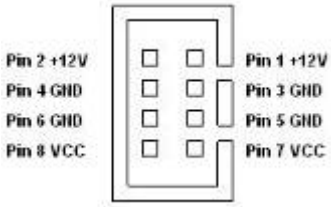


Pin	SYMBOL	Pin	SYMBOL
2	LINE OUT L	1	LINE_OUT R
4	GND	3	GND
6	LINE IN L	5	LINE IN R
8	MICVREF	7	MIC1
10	VOL OUT	9	GND

2.5.11 CON10/CON11/J4: External Power

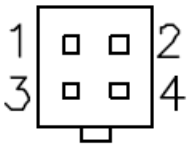






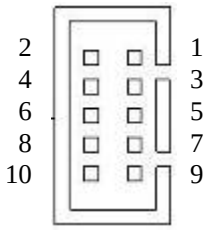
CON10 **CON11** **J4**

2.5.12 ATX12V1: 12V DC Connector



Pin	SYMBOL
1	Ground
2	Ground
3	+12V
4	+12V

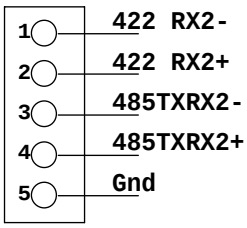
2.5.13 Digital: Digital I/O Connector



Pin	SYMBOL	Pin	SYMBOL
2	Vcc	1	GND
4	Out1	3	Out3
6	Out0	5	Out2
8	IN1	7	IN3
10	IN0	9	IN2

2.5.13 CON13: RS-422 / RS-485 Header

Pls note that our IA30 the COM1: RS232 transfer RS422/RS485 are using different socket and different cable



Pin No.	SYMBOL
1	422 RX2-
2	422 RX2+
3	485 TXRX2-
4	485TXRX2+
5	Gnd

CHAPTER 3

Graphic Driver Installation

This chapter offers information on the chipset software Installation utility

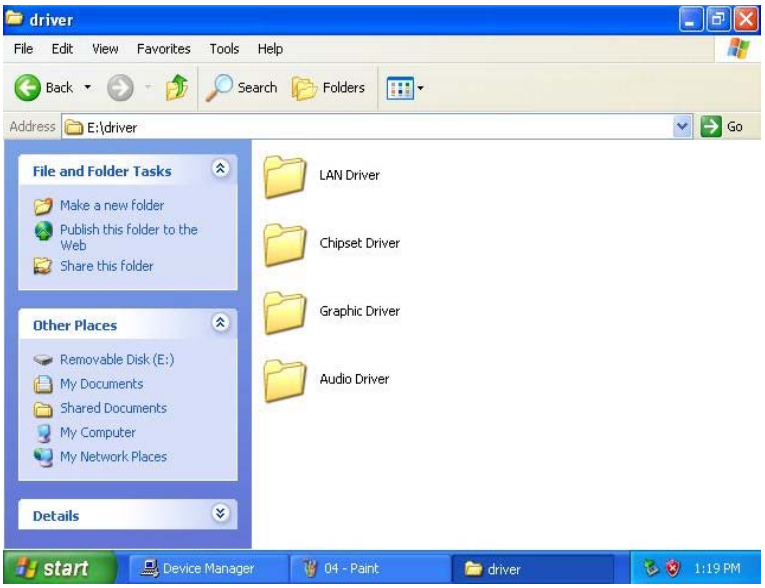
- Installation of Graphic Driver
- Panel Resolution Setting

Chapter 3 Graphic Driver Installation

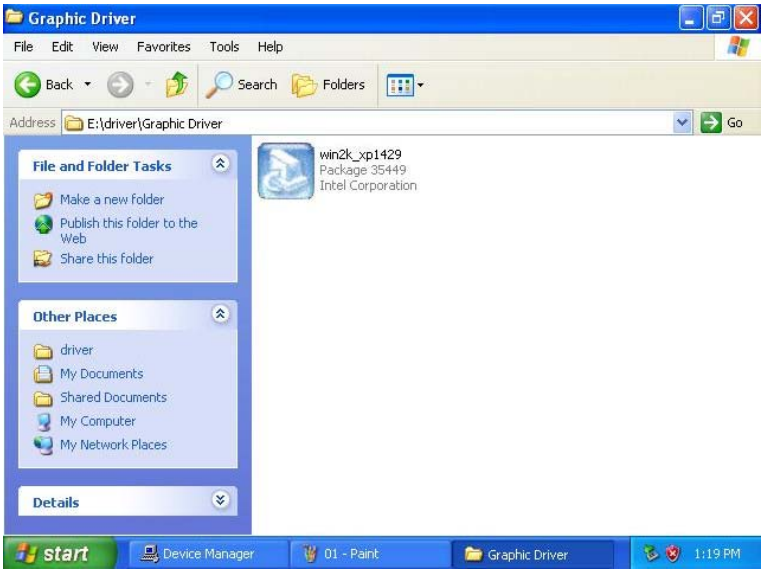
3.1 Standard CMOS Feature

IA30 Motherboard is equipped with Intel 945GSE / ICH7M Companion Device. The Intel Graphic Drivers should be installed first, and it will enable “Video Controller (VGA compatible). Follow the instructions below to complete the installation. You will quickly complete the installation.

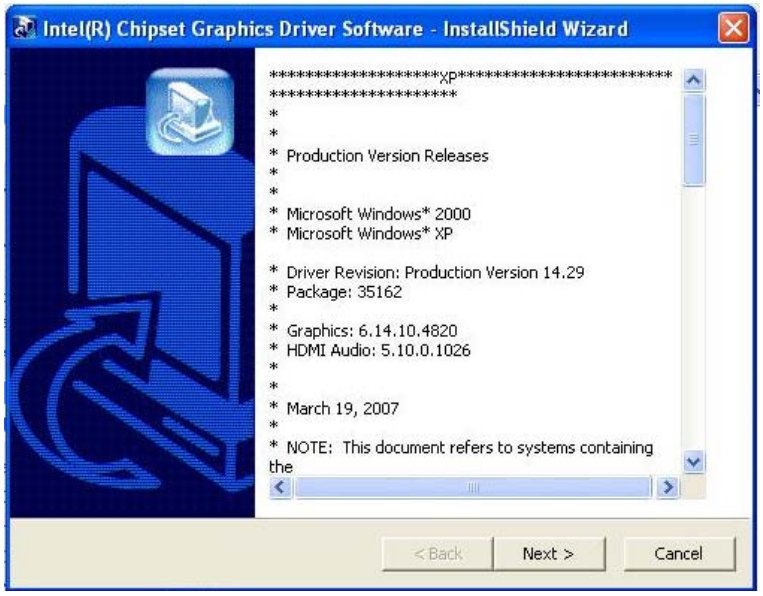
Step.1. Insert the CD that comes with the Motherboard. Open the file document “Graphic Driver “.



Step.2. Click on “win2K_xp1429” to execute the setup.

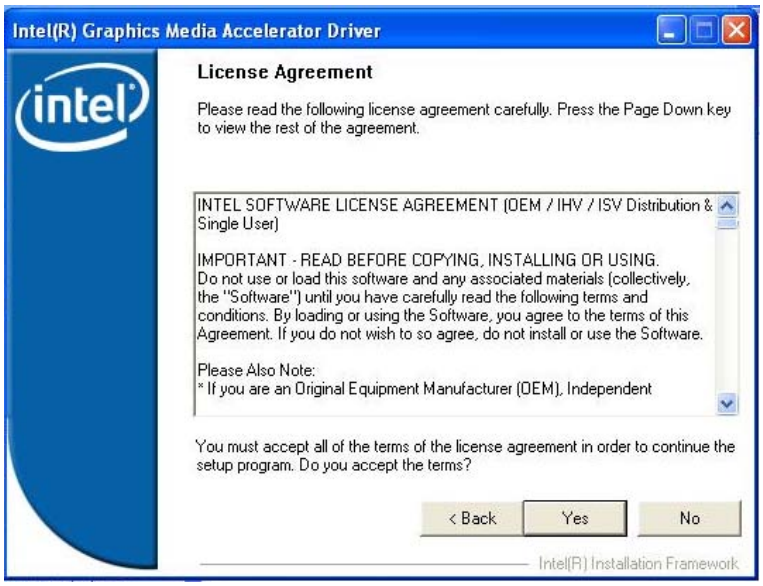


Step.3. Click on “Next “ to install Driver.

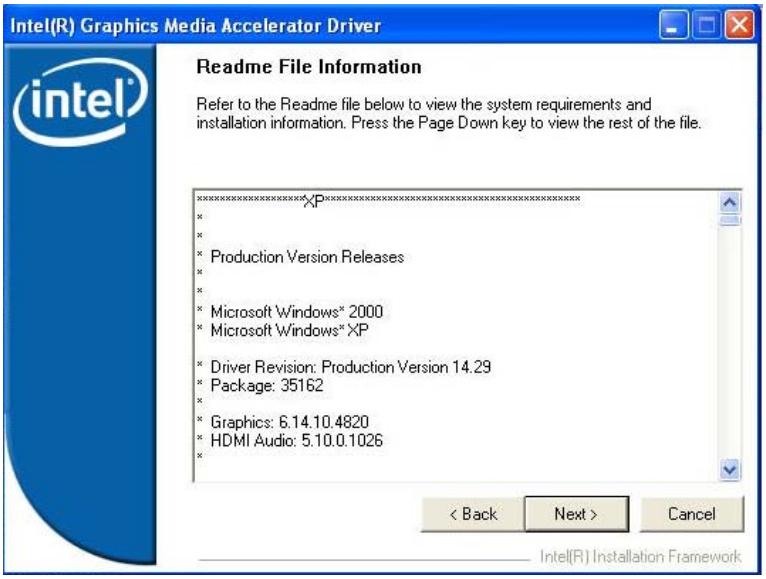


Step.4. Click on “Next “ to install Driver.

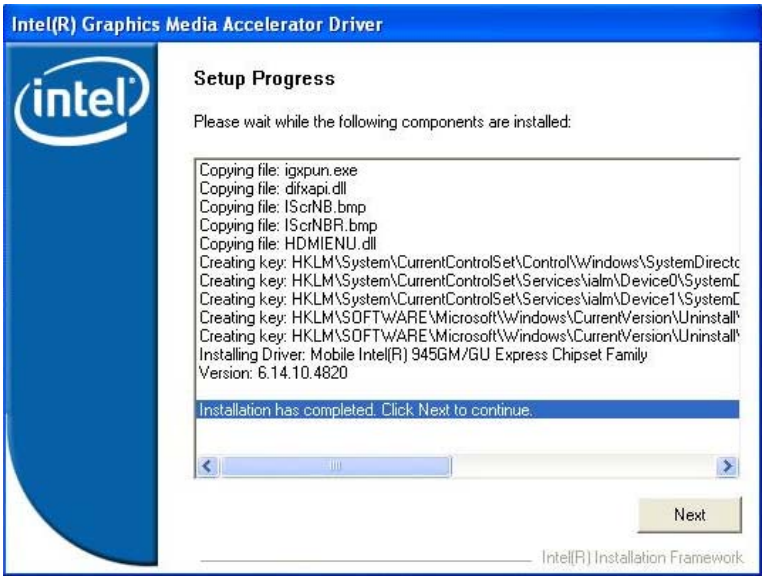
Step.5. Click on “Yes “ to agree License.



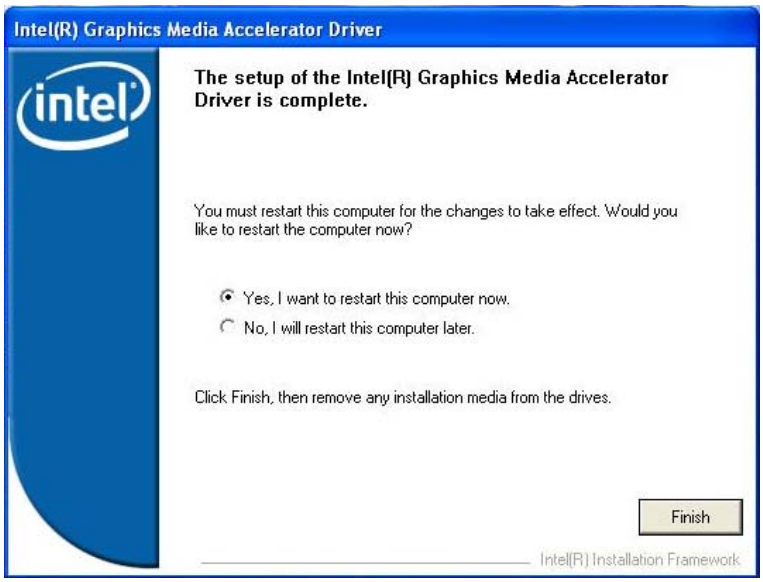
Step.6. Click on “Next “ to install Driver.



Step.7. Click on “Next “ to install Driver.



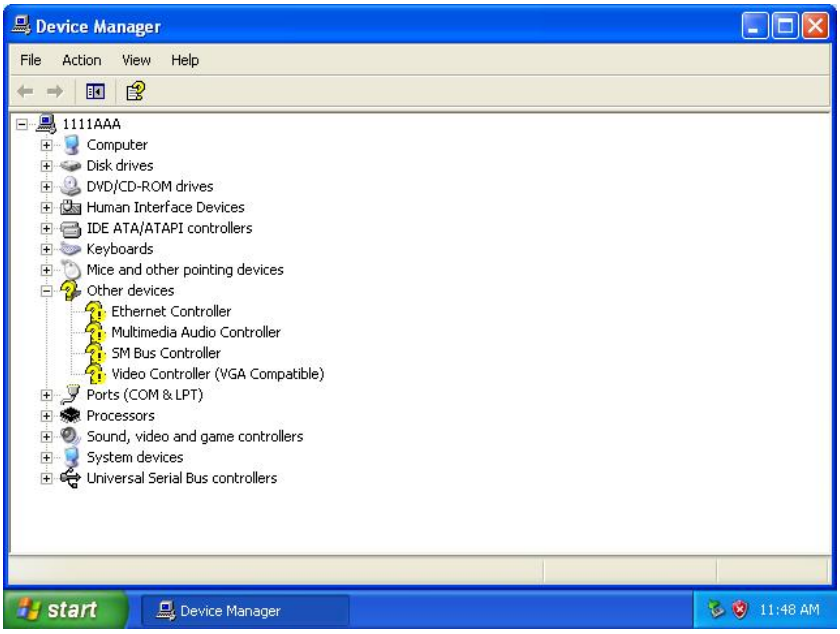
Step.8. Click on “Yes, I want to restart this computer now“ to go on.



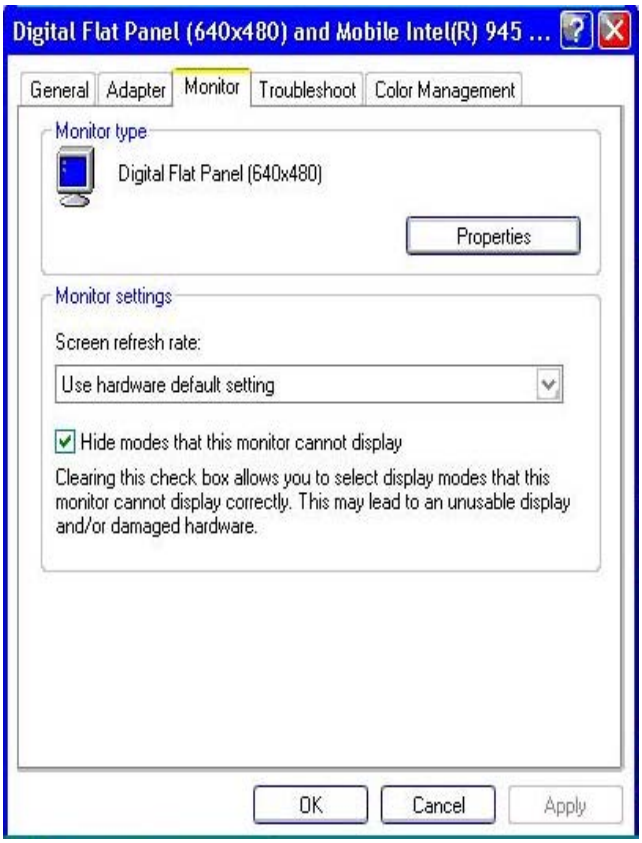
3.2 Panel Resolution Setting

Step.1. Right-click the desktop, and then click Properties.

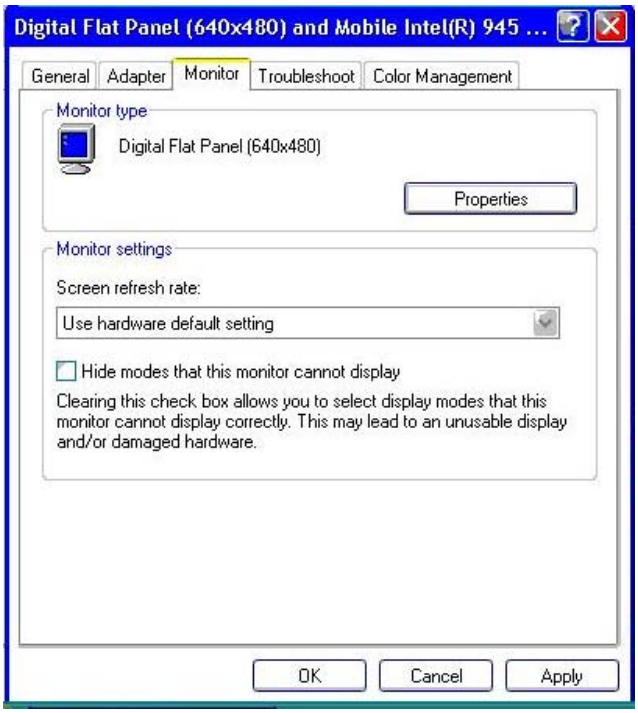
Step.2. In the Display Properties dialog box, click the Settings tab.



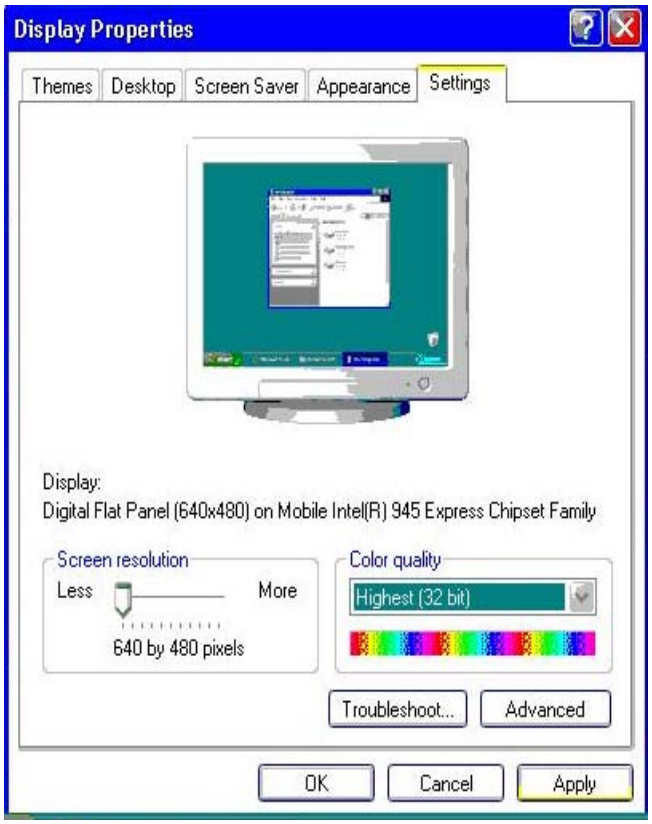
Step.3. Click on “Monitor”.



Step.4. Click on “Hide modes that this monitor cannot display” to remove this option.



Step.5. Click on “Setting”, then could choose 32bit color qualify.



CHAPTER 4

Chipset Driver Installation

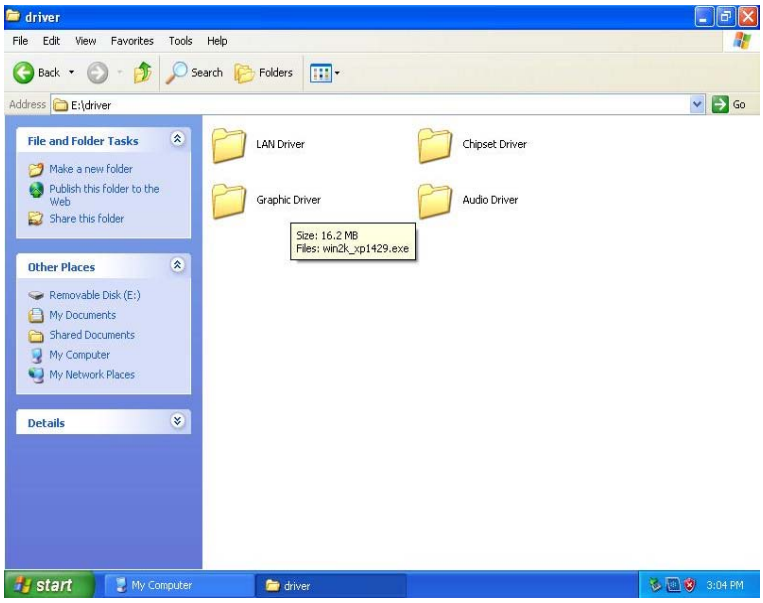
This chapter offers information on the chipset software Installation utility

- Installation of Chipset Driver
- Further information

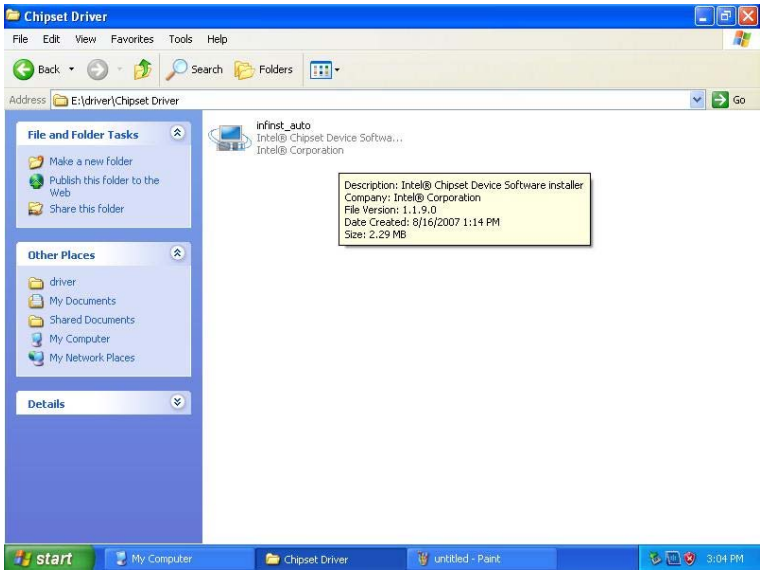
Chapter 4 Chipset Driver Installation

4.1 Standard CMOS Features

Setp.1. Insert the CD that comes with the motherboard. Open the file document "Chipset Driver".



Setp.2. Click on "infinst_auto.exe" to install driver.



Setp.3. Click on “Next“ to install driver.

Setp.4. Click on “Yes “ to agree License

Setp.5. Click on “Next“ to install driver.

Setp.6. Click on “Next“ to install driver.

Step.7. Click on “Yes, I want to restart this computer now“ to go on.

CHAPTER 5

Ethernet Driver Installation

This chapter offers information on the Ethernet software installation utility.

Sections include:

- Introduction
- Installation of Ethernet Driver

Chapter 5 Ethernet Driver Installation

5.1 Introduction

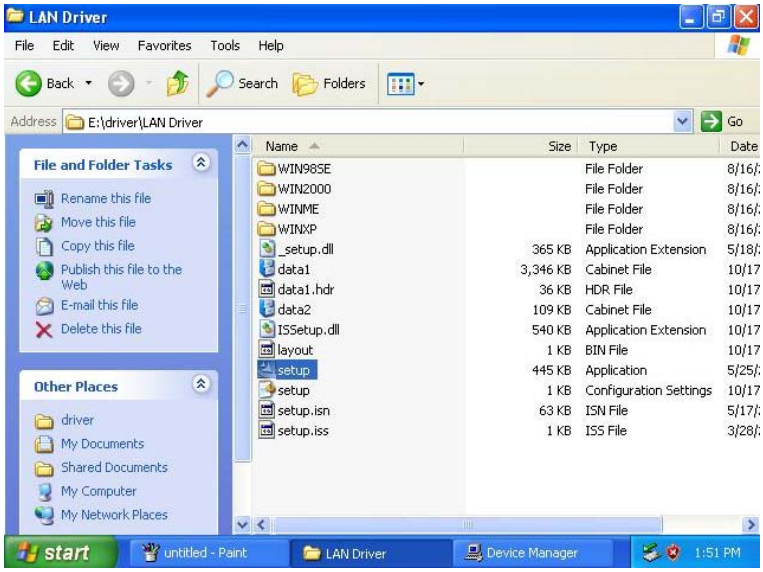
IA30 Motherboard is equipped with the Realtek RTL8111B Gigabit Ethernet controller combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, PCI Express bus controller, and embedded memory. With state-of-the-art DSP technology and mixed-mode signal technology, it offers high-speed transmission over CAT 5 UTP cable or CAT 3 UTP (10Mbps only) cable. Functions such as Crossover Detection & Auto-Correction, polarity correction, adaptive equalization, cross-talk cancellation, echo cancellation, timing recovery, and error correction are implemented to provide robust transmission and reception capability at high speeds.

The device supports the PCI Express 1.0a bus interface for host communications with power management and is compliant with the IEEE 802.3u specification for 10/100Mbps Ethernet and the IEEE 802.3ab specification for 1000Mbps Ethernet. It also supports an auxiliary power auto-detect function, and will auto-configure related bits of the PCI power management registers in PCI configuration space.

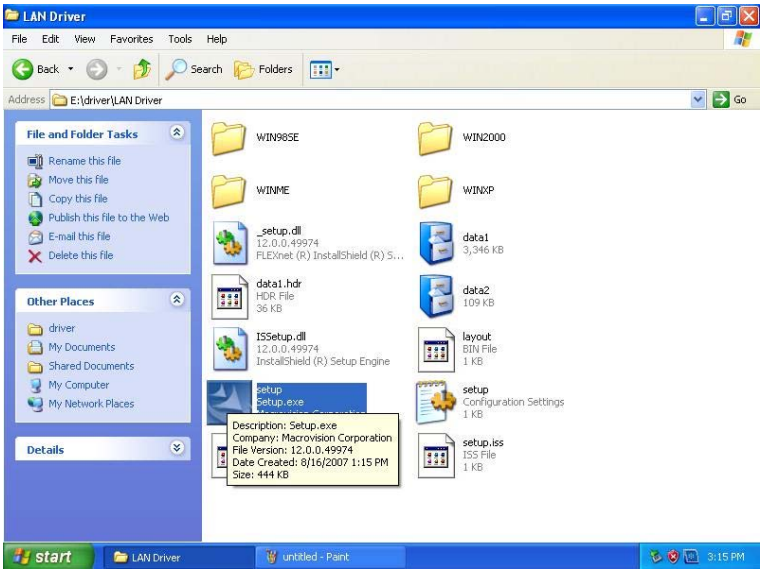
5.2 Installation of Ethernet Driver

The Users must make sure which operating system you are using in the IA30 Motherboard before installing the Ethernet drivers. Follow the steps below to complete the installation of the Realtek RTL8111B LAN drivers. You will quickly complete the installation.

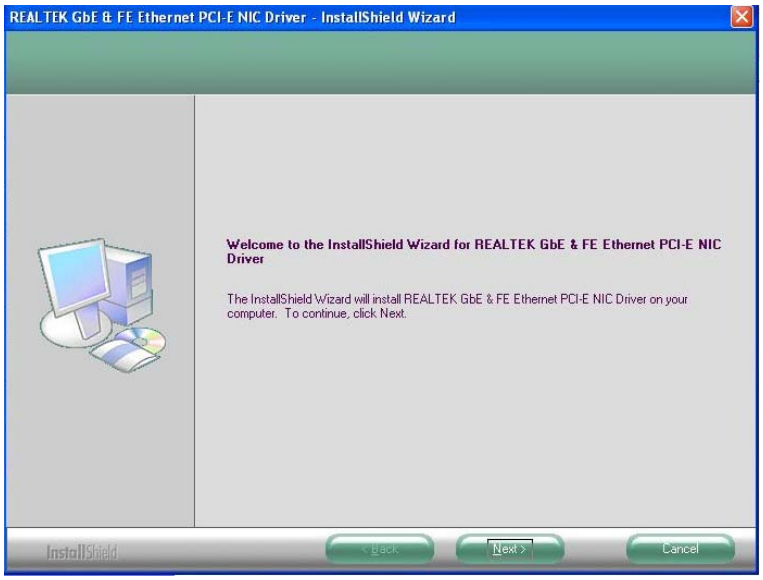
Step.1. Insert the CD that comes with the motherboard. Open the file document “LAN Driver”.



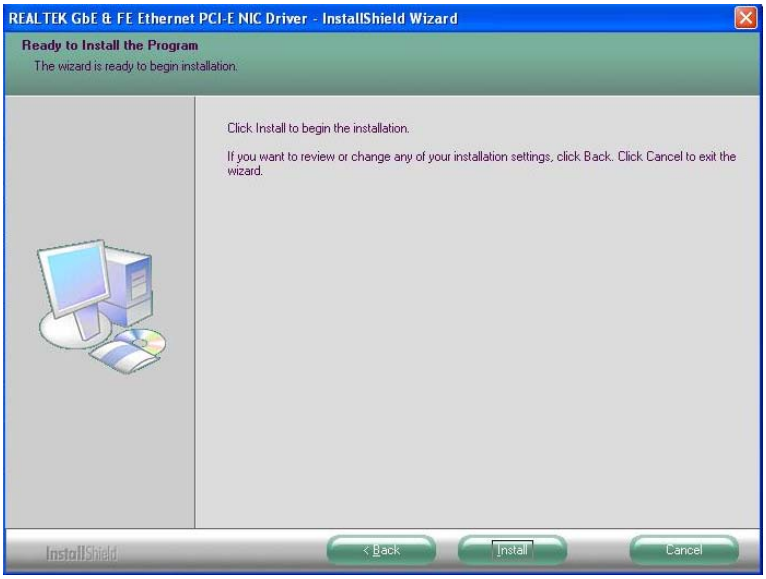
Step.2 Click on “Setup” to execute the setup.



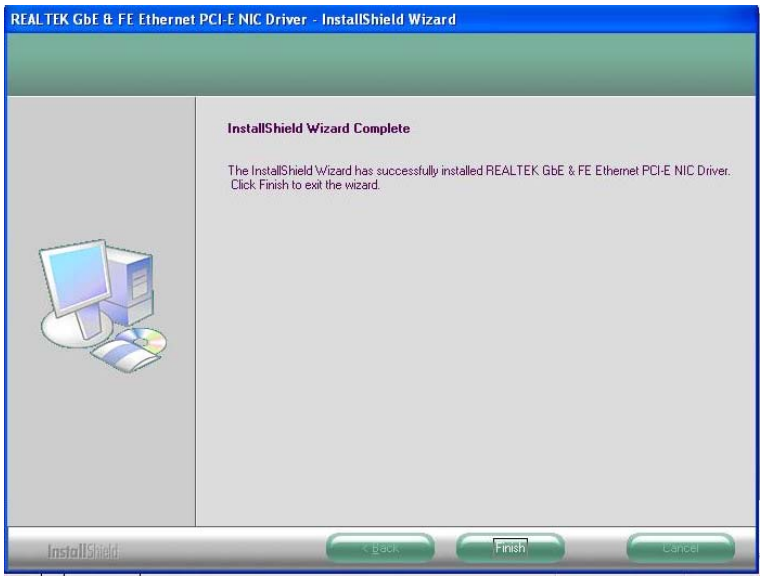
Step.4. Click on “Next“ to install driver.



Step.5. Click on “Install“ to install driver.



Setp.6. Click on “Finish“ and go on.



CHAPTER 6

Audio Driver Installation

This chapter offers information on the Audio software installation utility.

Sections include:

- Introduction
- Installation of Audio Driver

Chapter 6 Audio Driver Installation

6.1 Introduction

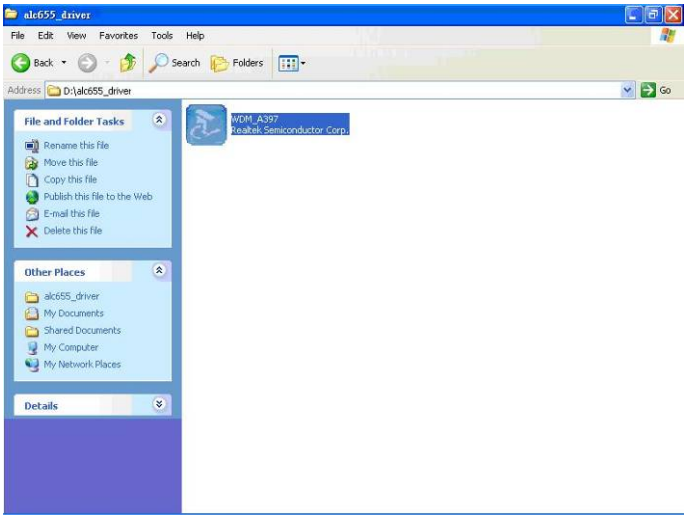
The IA30 Motherboard is equipped with the ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs..

The ALC655 CODEC provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions to provide a complete integrated audio solution for PCs.

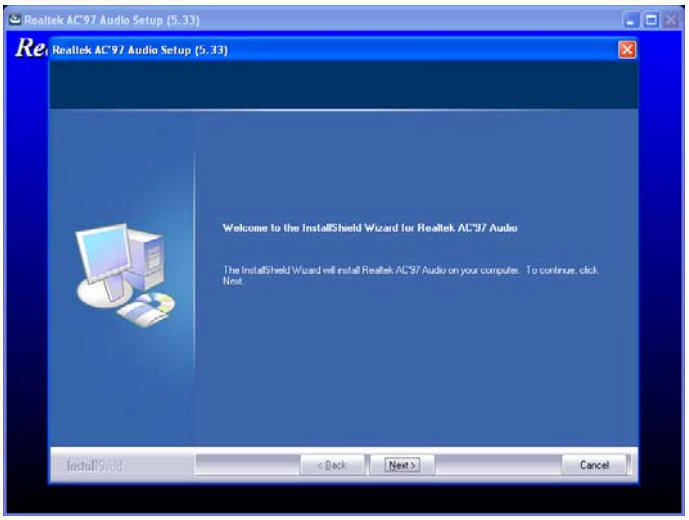
6.2 Installation of Audio Driver

The users must make sure which operating system you are using in the IA30 Motherboard before installing the Audio drivers. Follow the steps below to complete the installation of the Realtek ALC655 Audio drivers. You will quickly complete the installation.

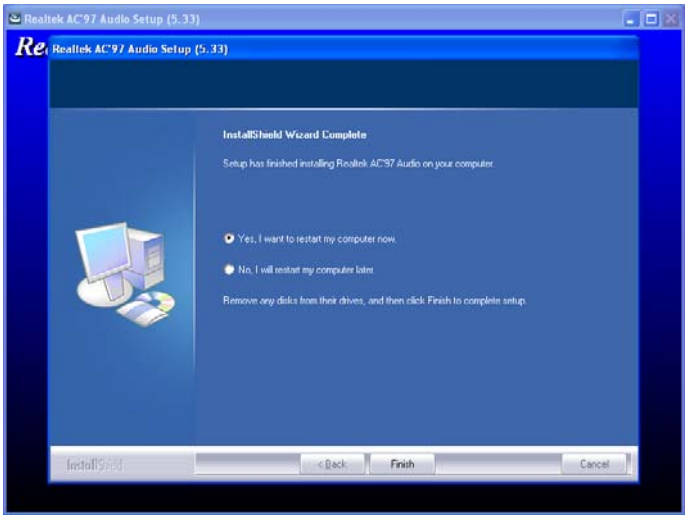
Step.1. Insert the CD that comes with the motherboard. Open the file document "alc655_driver" and click on "Setup.exe" to execute the setup.



Step.2. Click on “Next“ to install driver.



Step.3. Click on “Yes, I want to restart my computer now” to finish installation.



CHAPTER 7

AMI BIOS Setup

This chapter describes how to set BIOS configuration

Chapter 7 AMI BIOS SETUP

7.1 Starting Setup

Your computer comes with a hardware configuration program called BIOS Setup that allows you to view and set system parameters.

The BIOS (Basic Input / Output System) is a layer of software, called 'firmware', that translates instructions from software (such as the operating system) into instructions that the computer hardware can understand. The BIOS settings also identify installed devices and establish special features.

- **ENTERING BIOS SETUP**

You can access the BIOS program just after you turn on your computer. Just press the DEL key when the following prompt appears:

Press <DEL> to enter Setup.

When you press <DEL> to enter BIOS Setup, the system interrupts the Power-On Self-Test (POST).

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

The Main BIOS setup screen has two main frames. The left frame dis- plays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key leg- end.

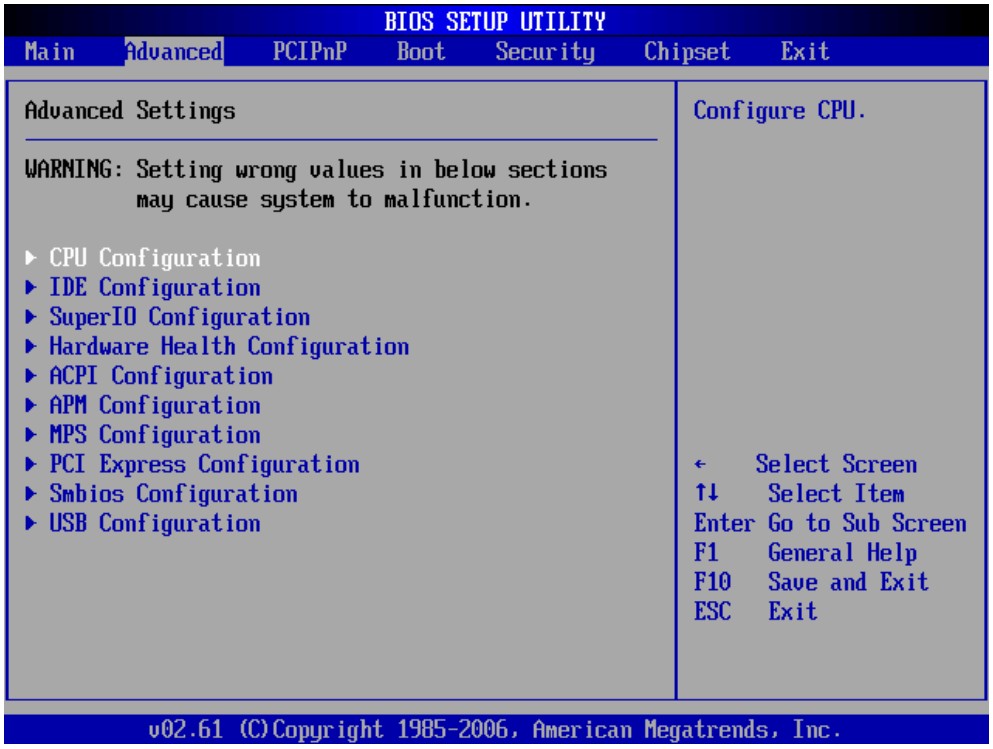
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

7.2 System Overview

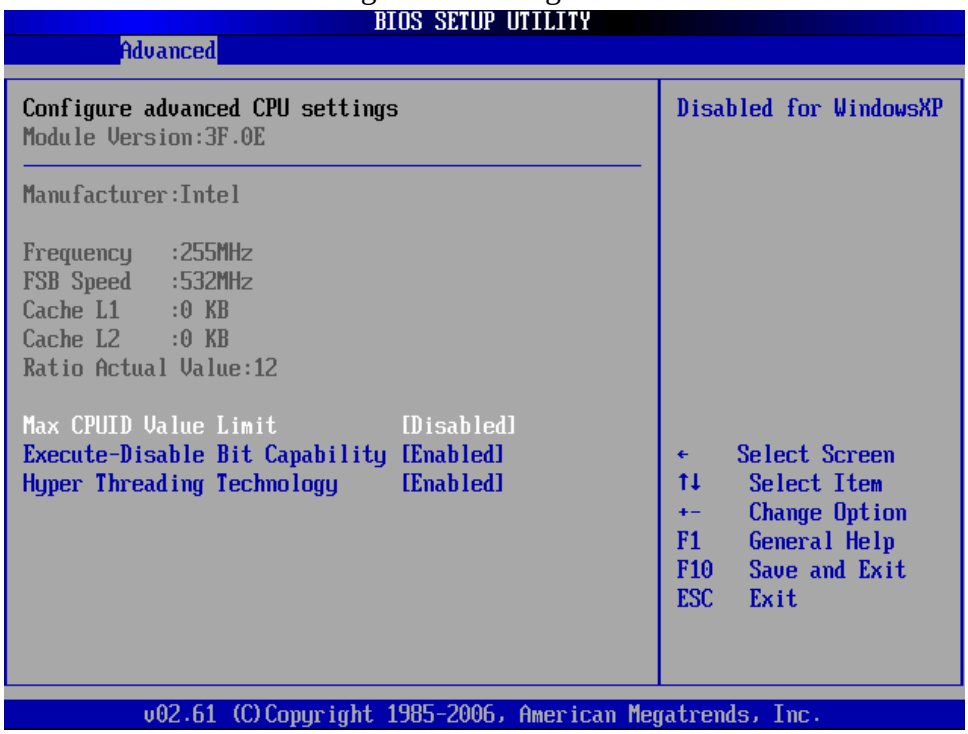
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format

7.3 Advanced Setting

CPU Configuration



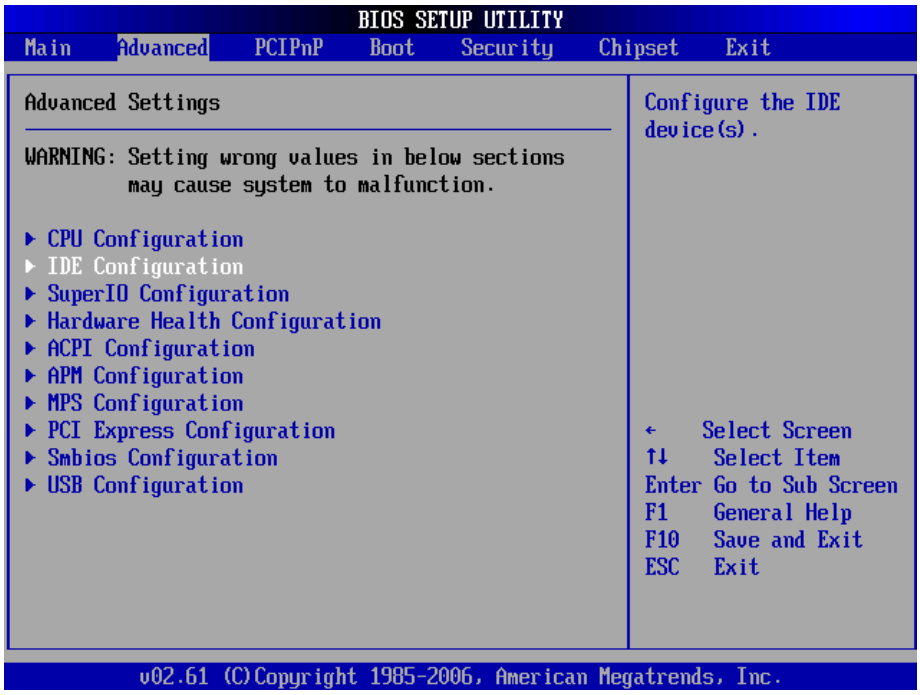
Press “Enter” to CPU Configuration setting.

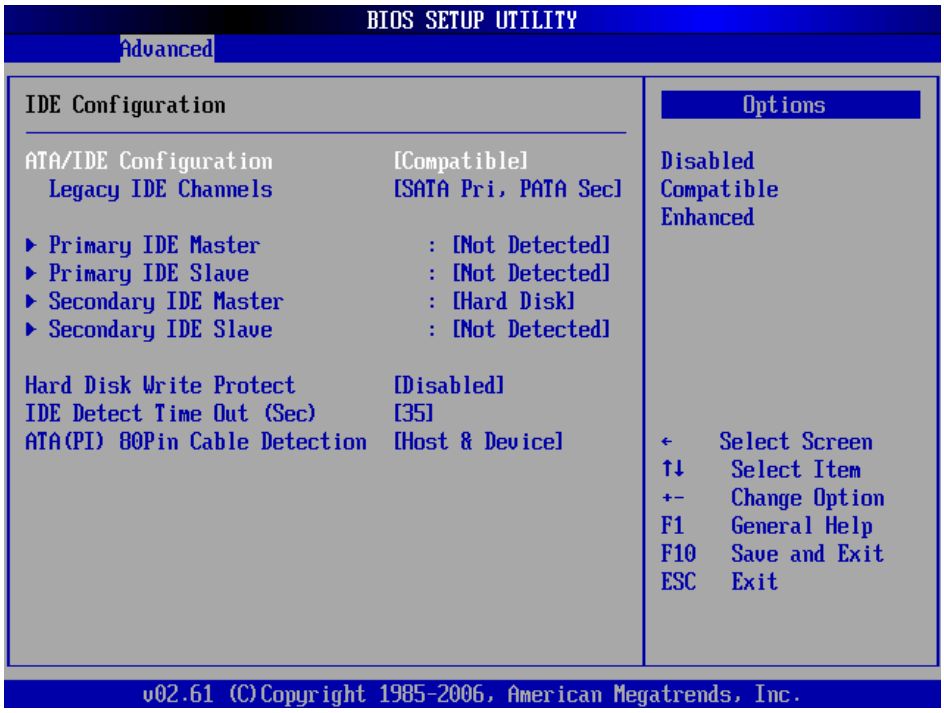


CPU configuration differs from writing an executable program. It is equivalent to setting dip switches or jumpers on a circuit board. The executing program has no way

to change this configuration.

IDE/SATA Configuration





IDE Channel IO Master

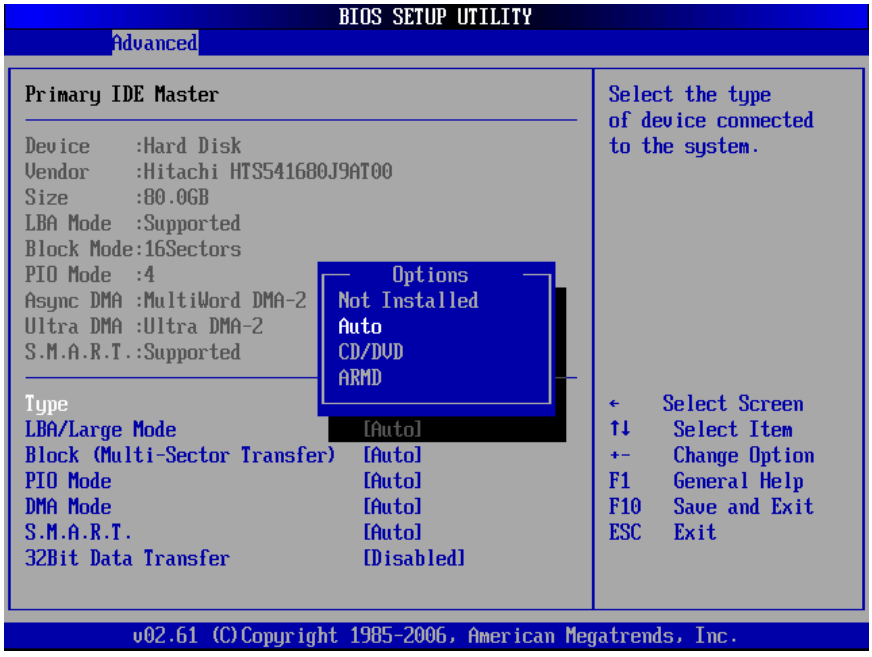
While entering setup, the BIOS automatically detects the presence of IDE devices. This displays the status of IDE device auto-detection.

IDE Channel IO Slave

While entering setup, the BIOS automatically detects the presence of IDE devices. This displays the status of IDE device auto-detection.

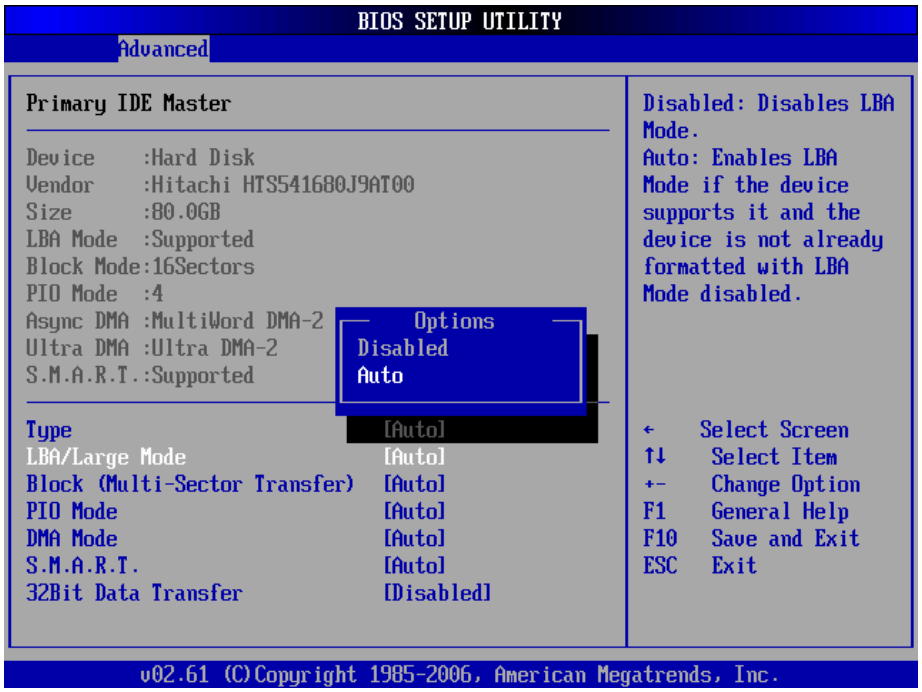
Type

Select the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device either is ZIP, LS-120, or MO drive. The options: [Not Installed], [Auto], [CD/DVD], [ARMD].



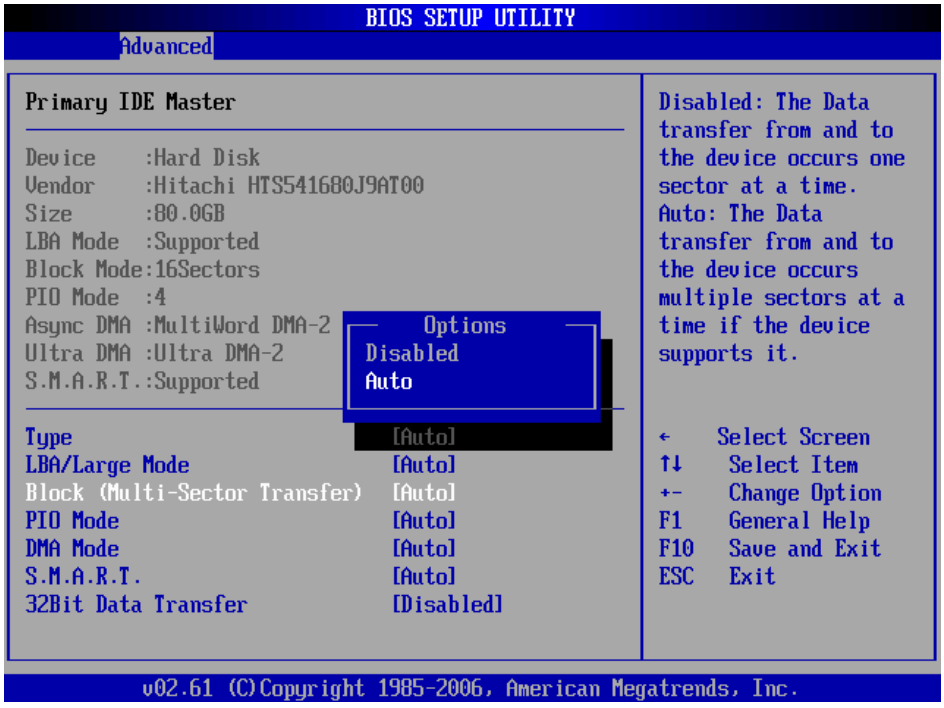
LBA/Large Mode

Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors. The options: [Disabled], [Auto].



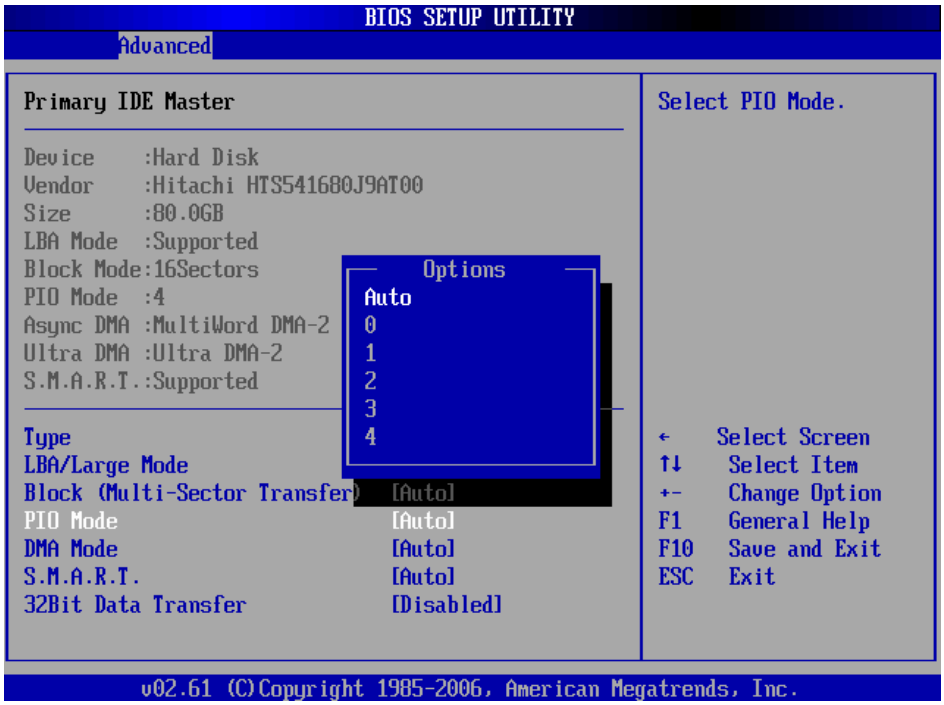
Block (Multi-Sector Transfer)

Controls enabling of multi-sector transfer, if supported. The options: [Disabled],[Auto].



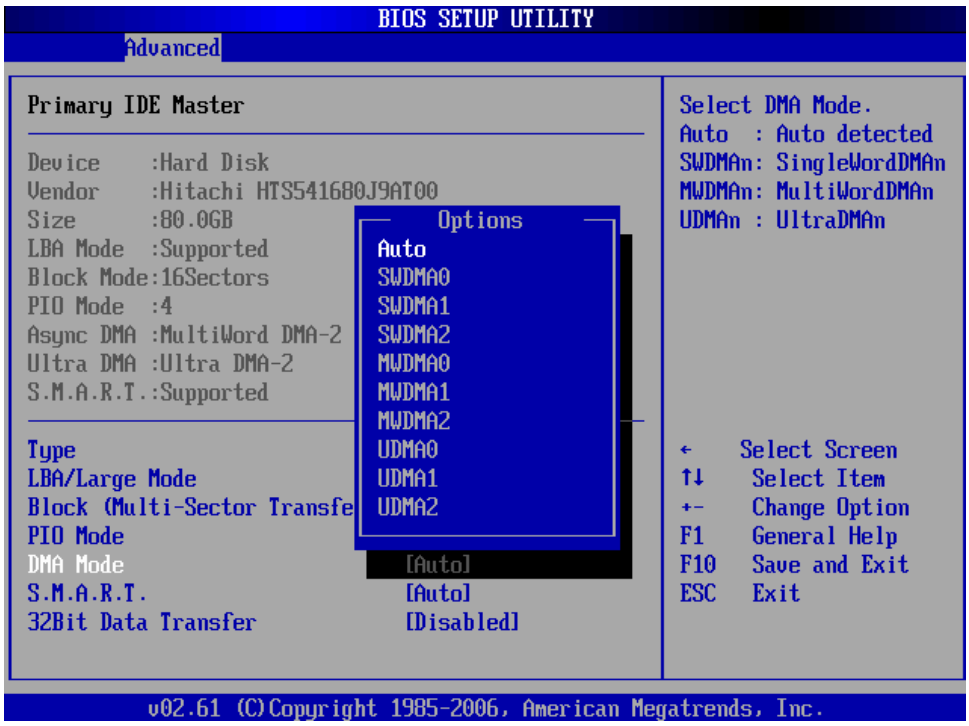
PIO Mode

Indicates the type of PIO (Programmed Input/Output).



DMA Mode

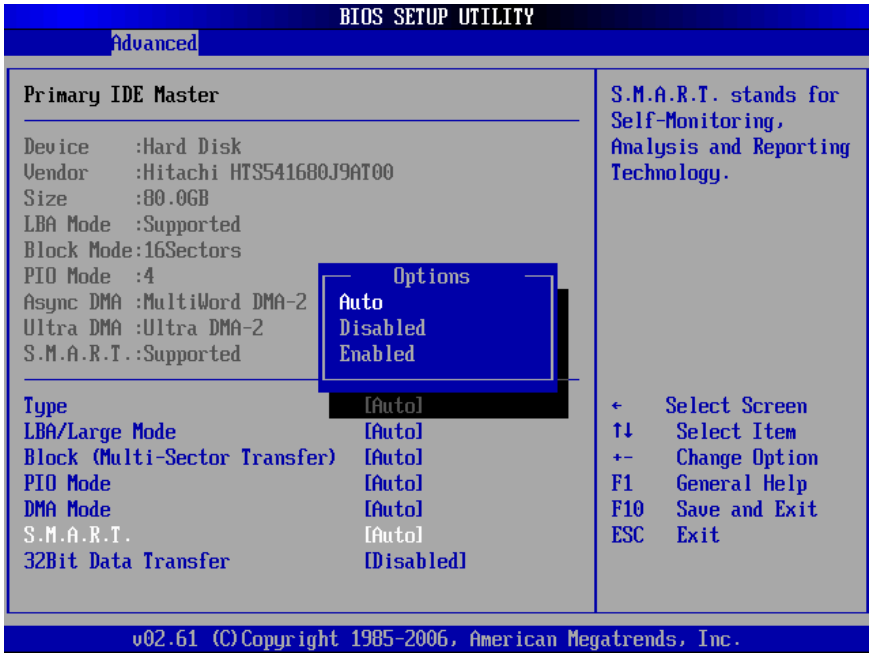
Indicate the type of Ultra DMA. The options: [Auto], [SWDMan], [MWDMAn], [UDMAn].



S.M.A.R.T

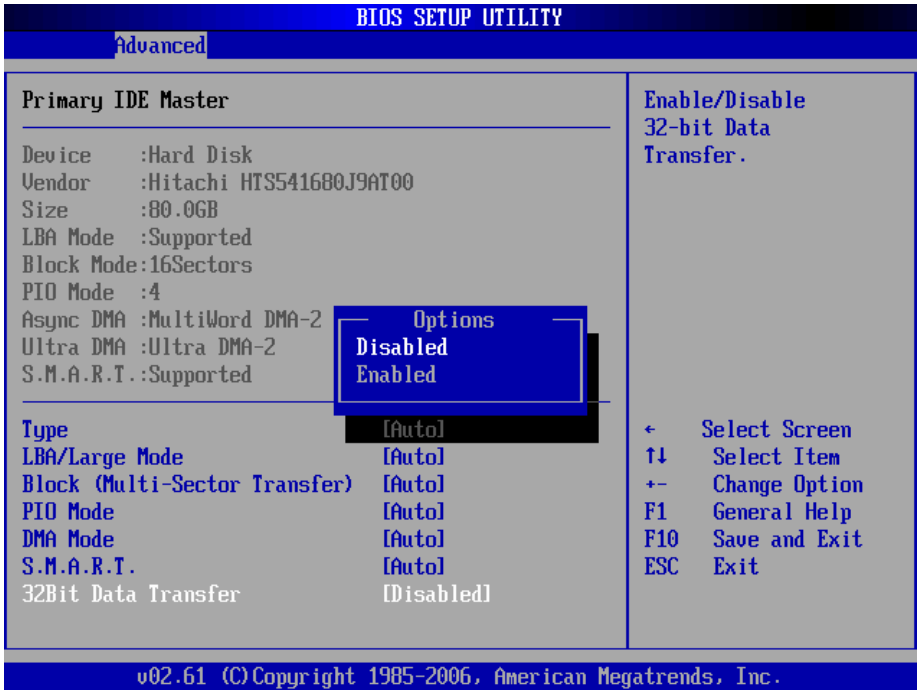
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting

Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

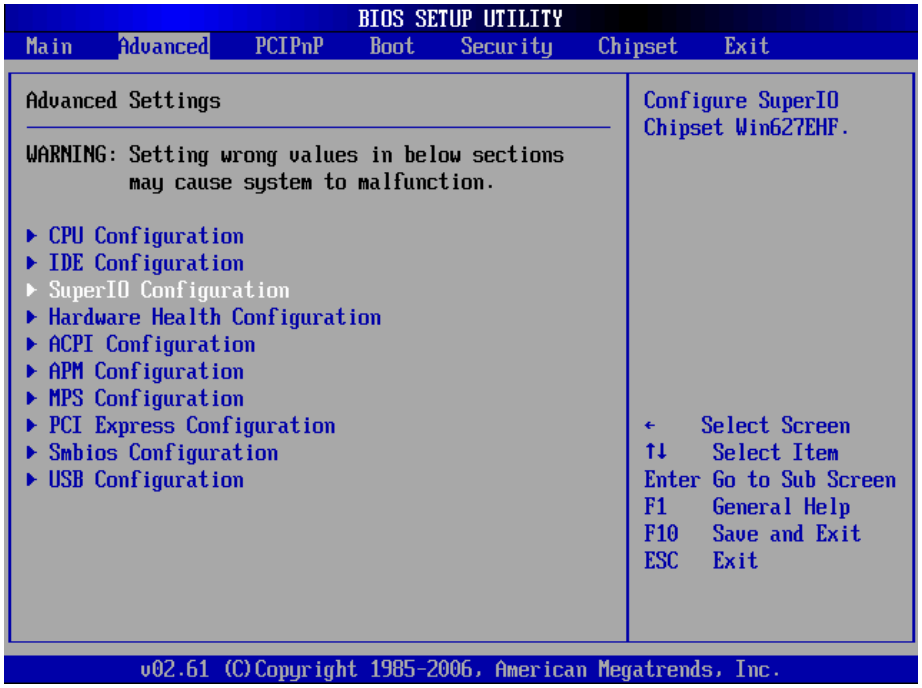


32Bit Data Transfer

Enable 32-bit communication between CPU and IDE card. The options: [Enabled], [Disabled].

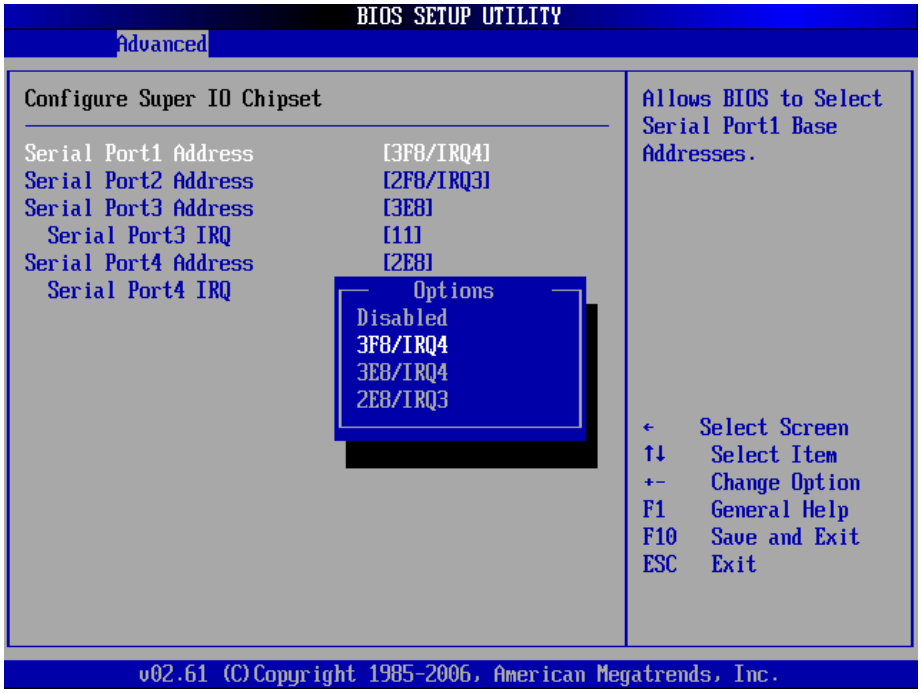


Super IO Configuration



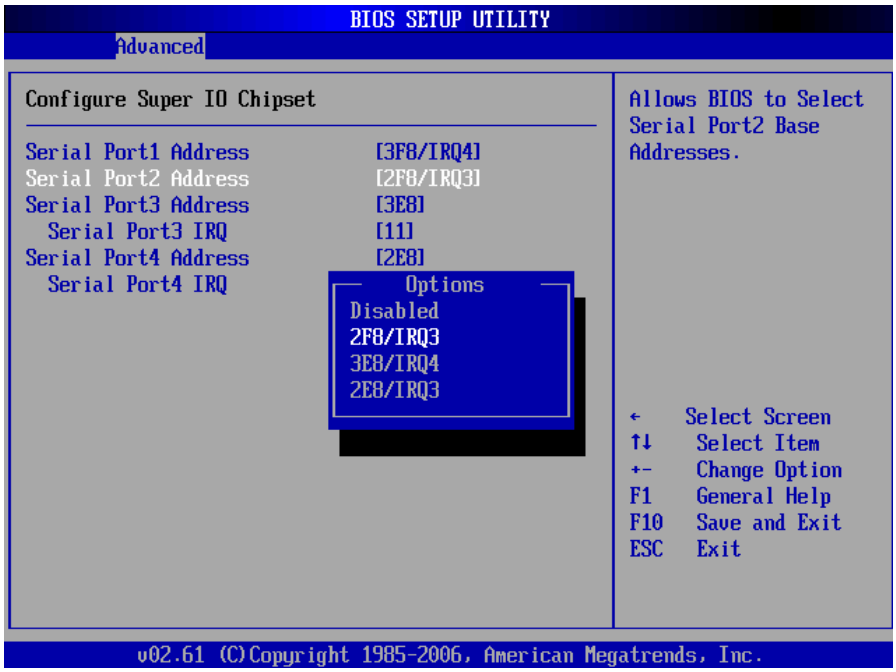
Serial Port 1 Address

Allows you to select the Serial Port1 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/
IRQ3].



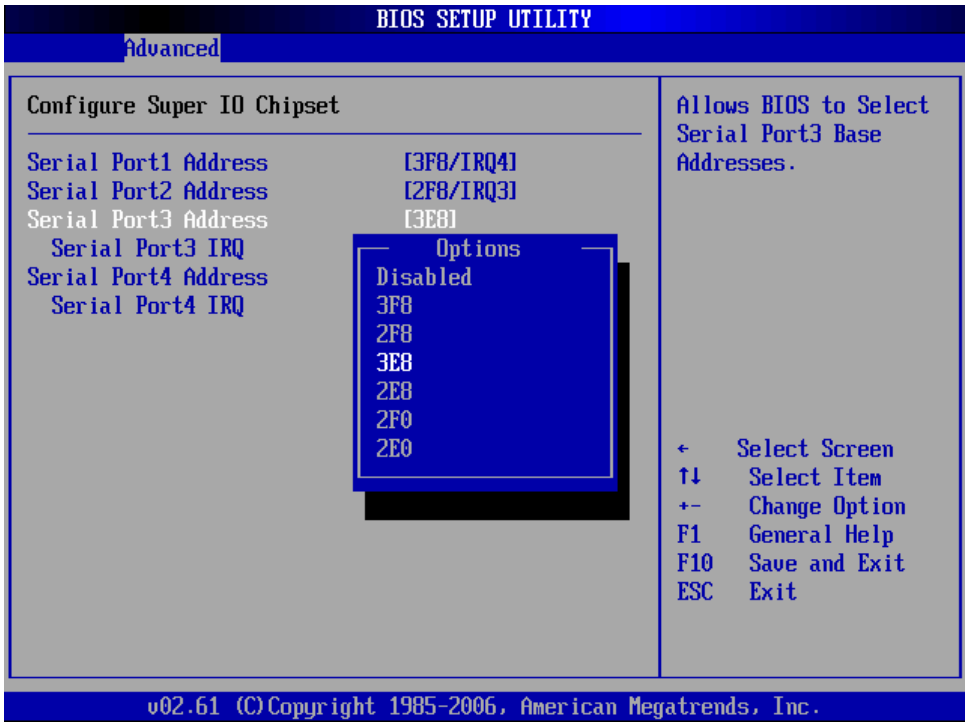
Serial Port 2 Address

Allows you to select the Serial Port2 base address. The options: [Disabled], [3F8/IRQ4], [2F8/IRQ3], [3E8/IRQ4], [2E8/IRQ3].



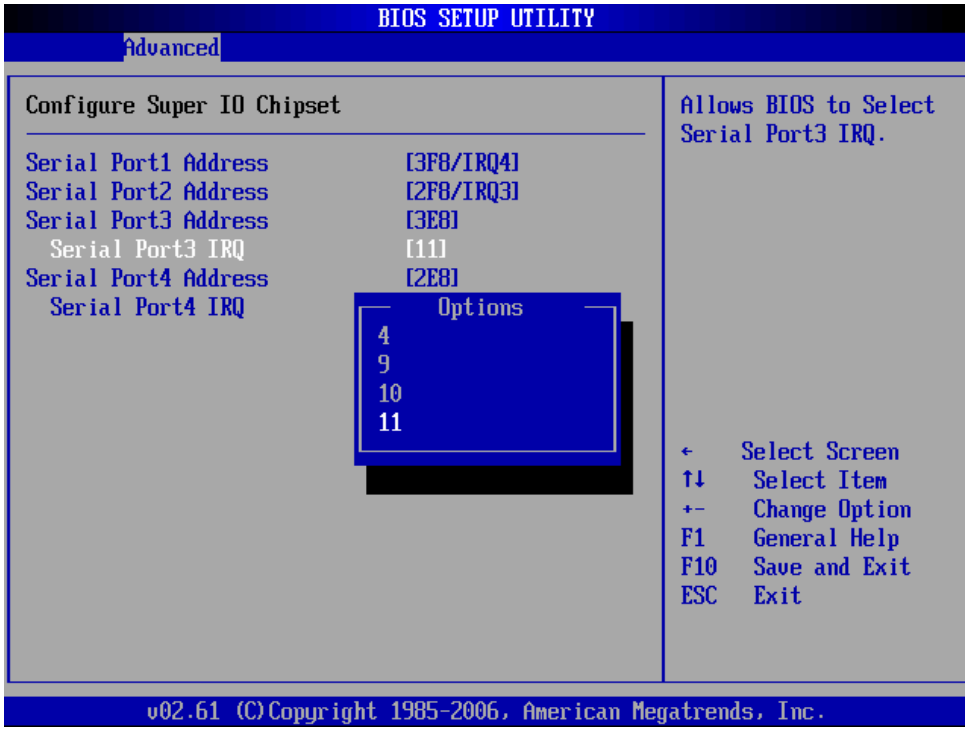
Serial Port 3 Address (Optional)

Allows you to select the Serial Port3 base address. The options: [Disabled], [3E8], [2E8].



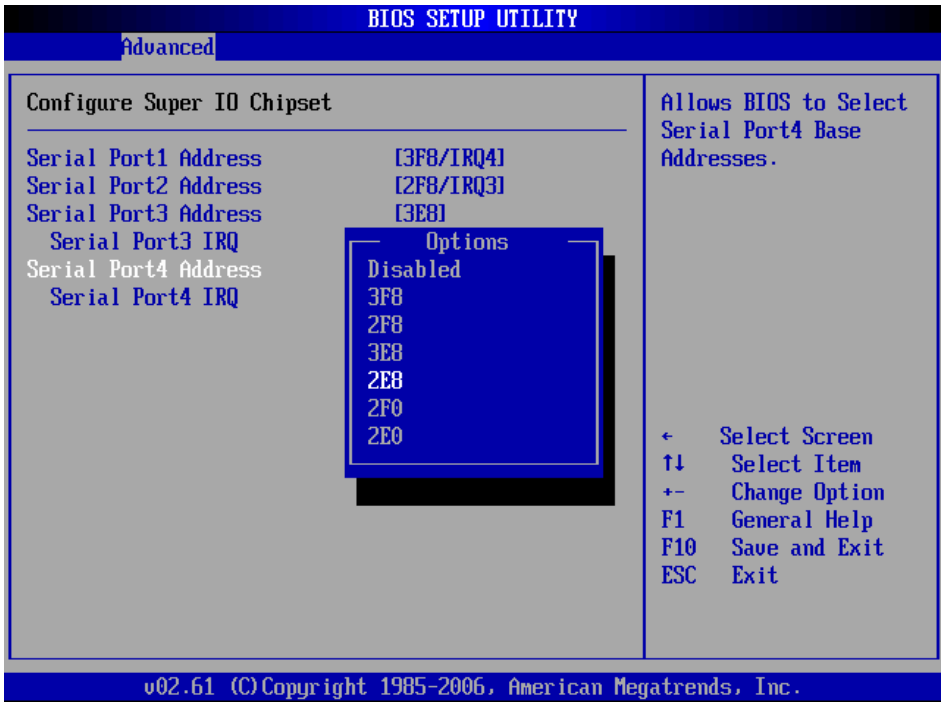
Serial Port 3 IRQ(Optional)

Allow BIOS to select Serial Port 3 IRQ. The options: [4], [9], [10], [11]



Serial Port 4 Address(Optional)

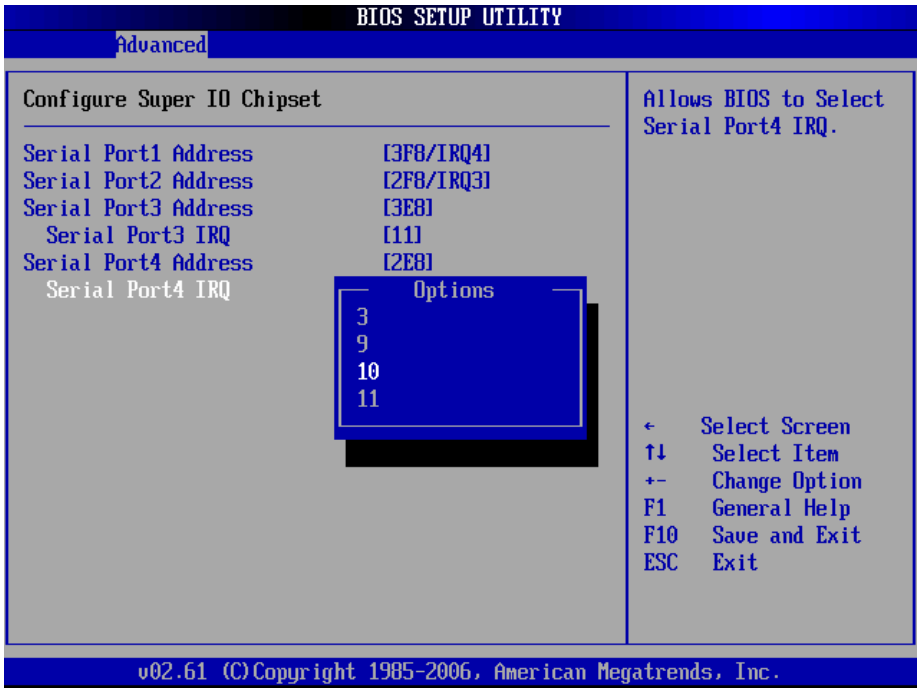
Allows you to select the Serial Port4 base address. The options: [Disabled], [3E8], [2E8].



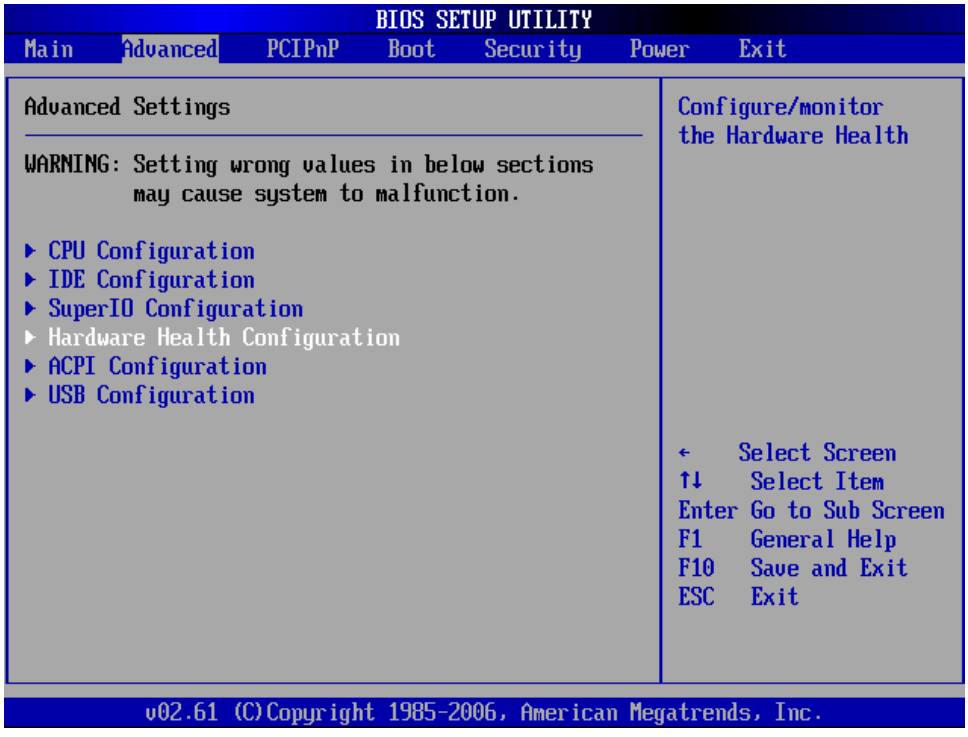
Serial Port 4 IRQ (Optional)

Allow BIOS to select Serial Port 4 IRQ.

The options: [3], [9], [10], [11].

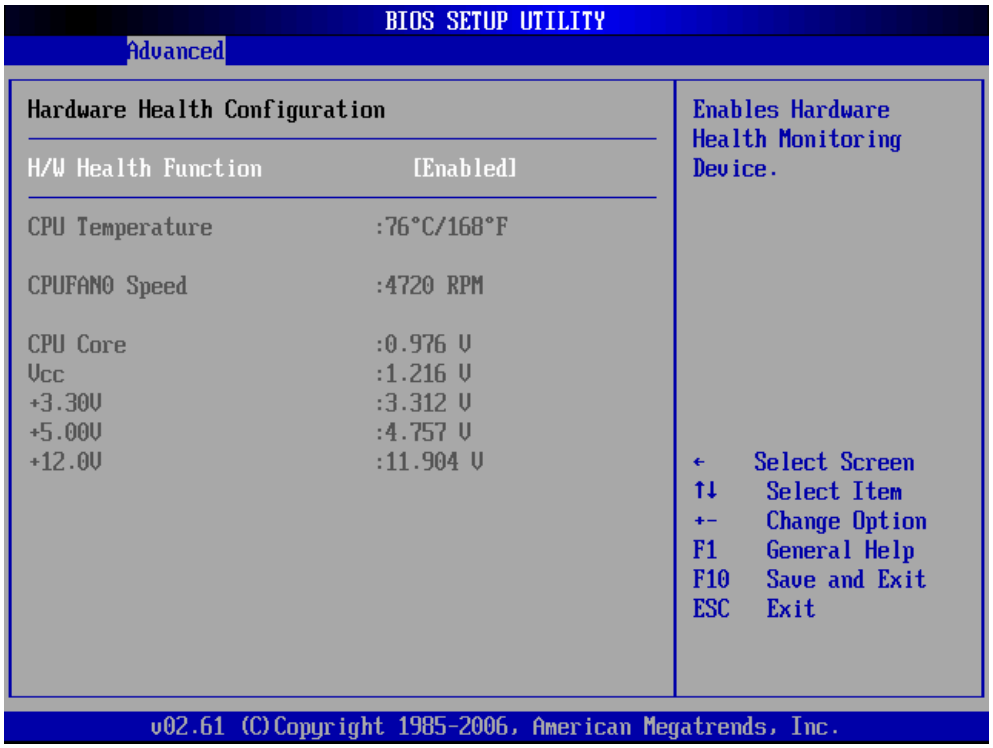


Hardware Health Configuration

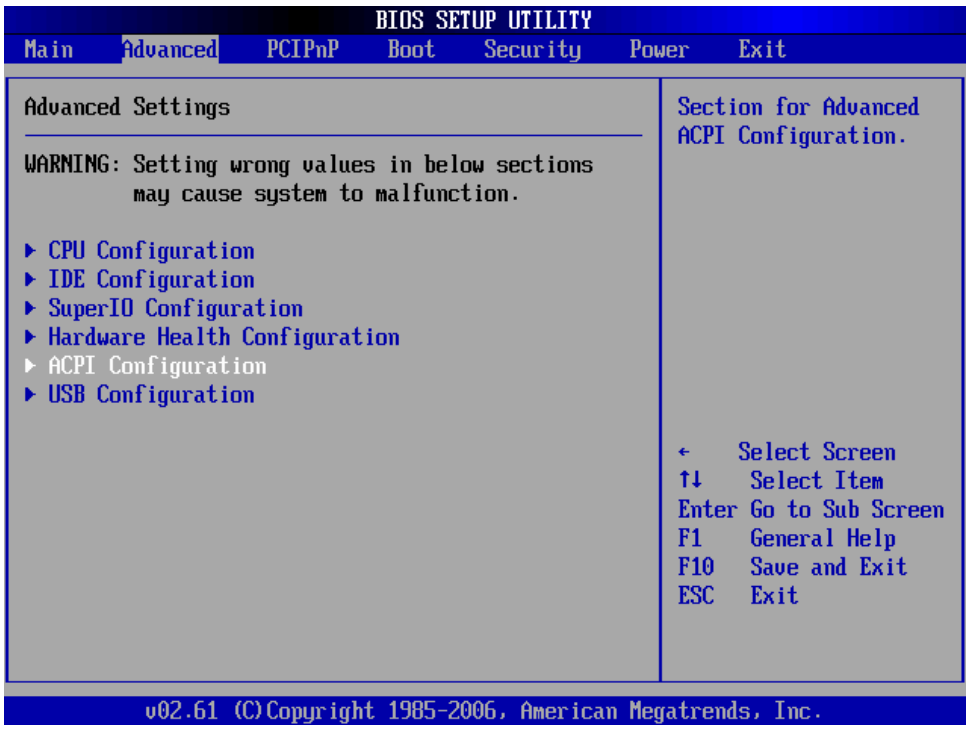


CPU Temperature

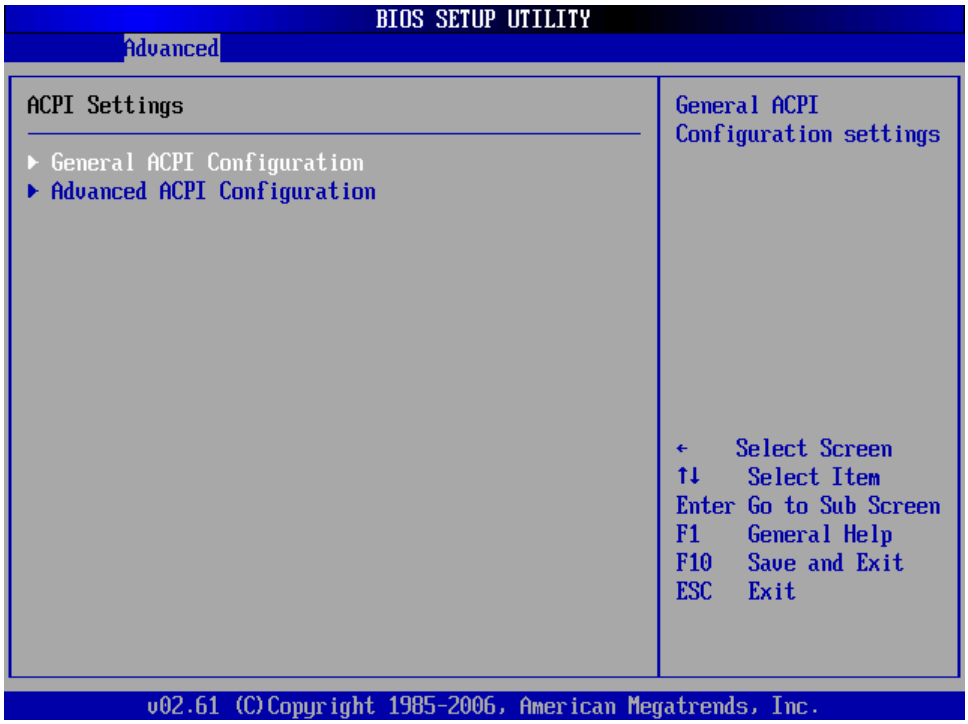
The onboard hardware monitor automatically detects and displays the CPU temperatures. Select [Disable] if you do not wish to display the detected temperatures.



ACPI Configuration

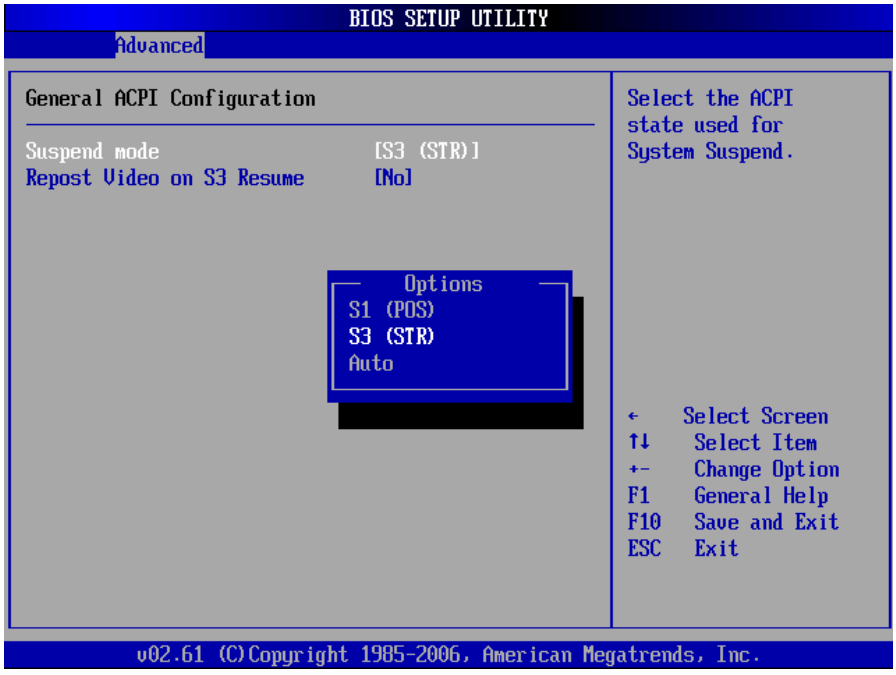


General ACPI Configuration



Suspend Mode

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

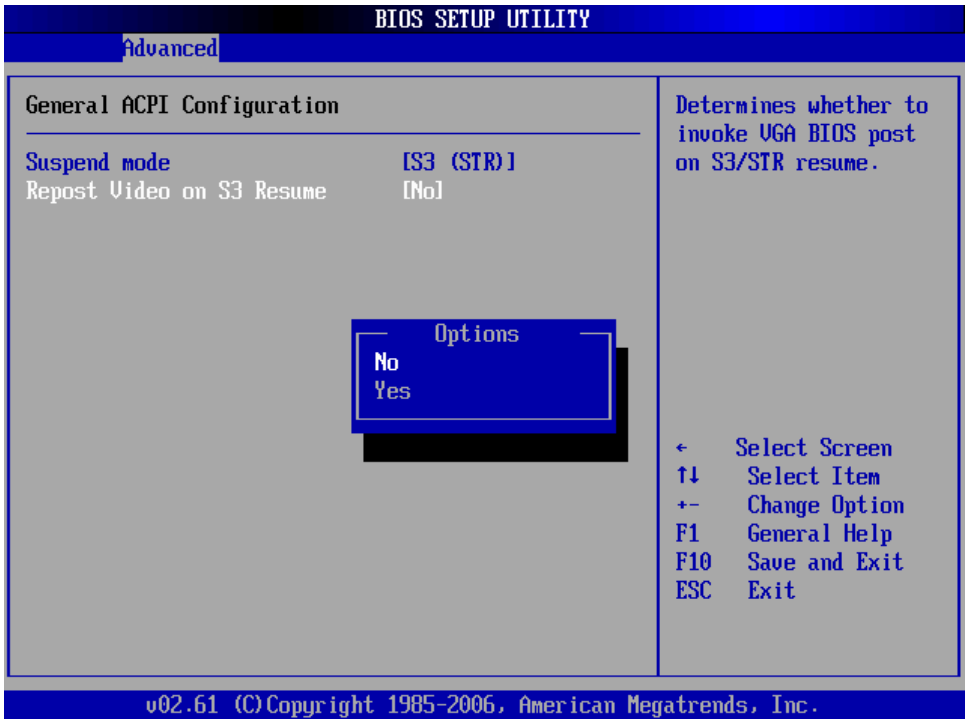


These options:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts. [S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and

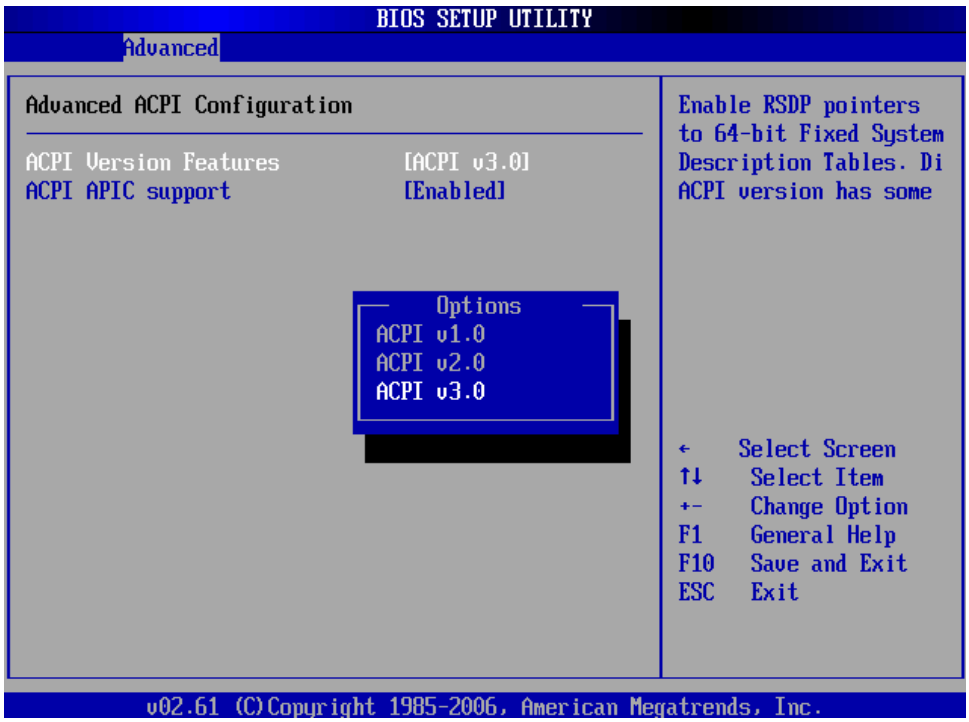
open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Repost Video on S3 Resume Determine whether to invoke VGA BIOS post on S3/STR resume. The options: [No], [Yes].



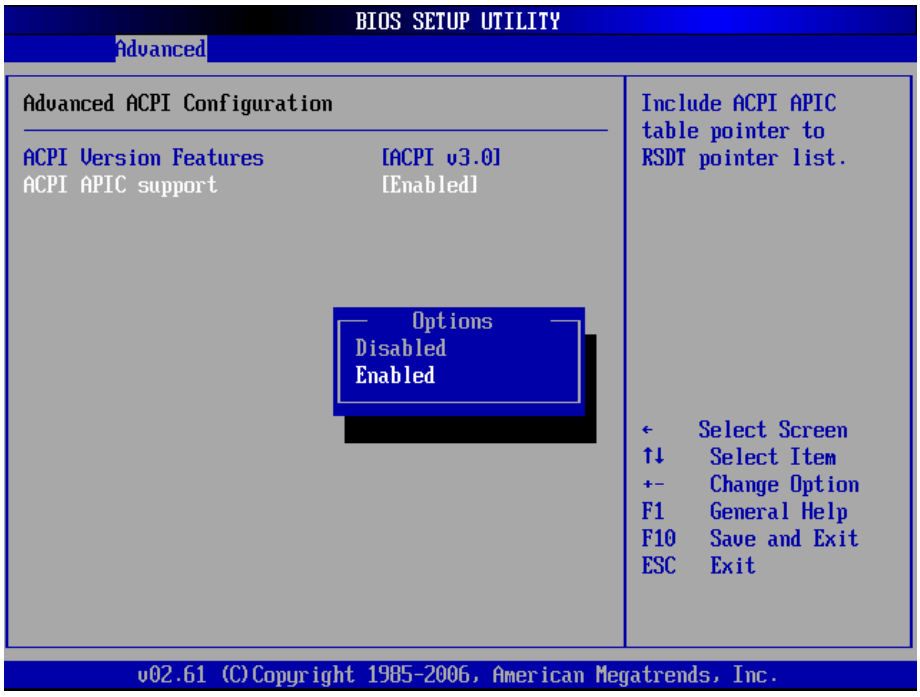
ACPI Version Features

Allows adding more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. The options: [ACPI V1.0], [ACPI V2.0], [ACPI V3.0].

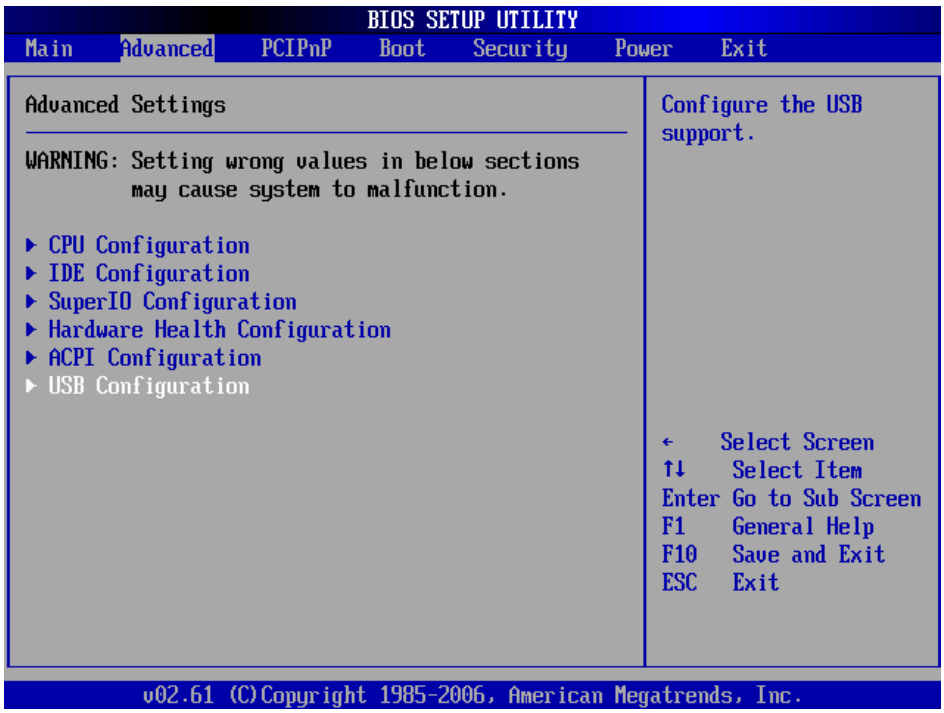


ACPI APIC Support

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APCI table pointer is included in the RSDT pointer list. The options: [Disabled], [Enabled].

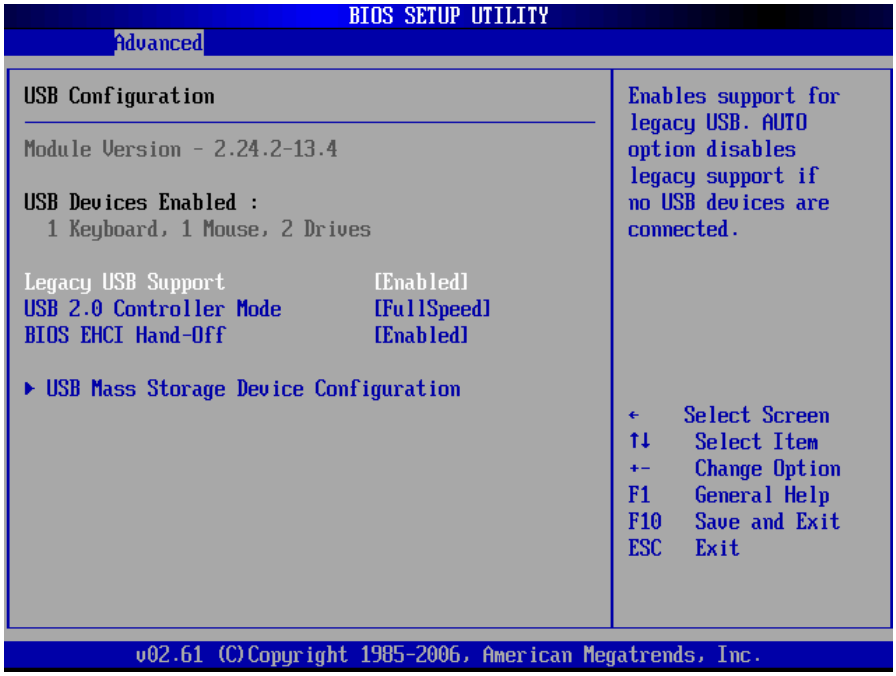


USB Configuration



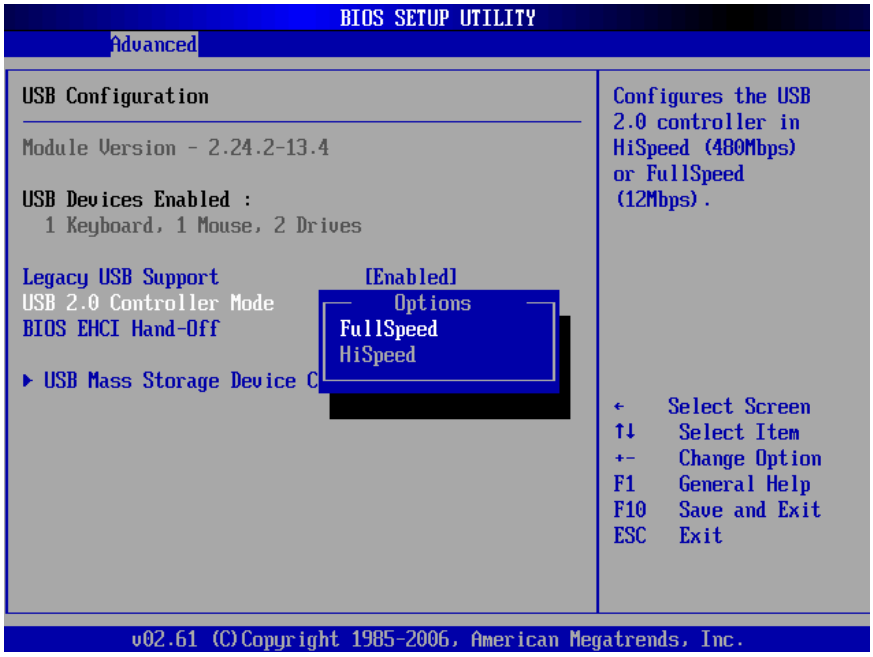
Legacy USB Support

Allows you to enable or disable support for USB devices on legacy operating system (OS). Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. The options: [Disabled], [Enabled], [Auto].USB 2.0 Controller Allows you to enable or disable the USB 2.0 controller. The options: [Disabled] [Enabled].



USB 2.0 Controller Mode

Allows you to configure the USB 2.0 controller in [HiSpeed (480 Mbps)] or [Full Speed (12 Mbps)]. The options: [FullSpeed], [HiSpeed].

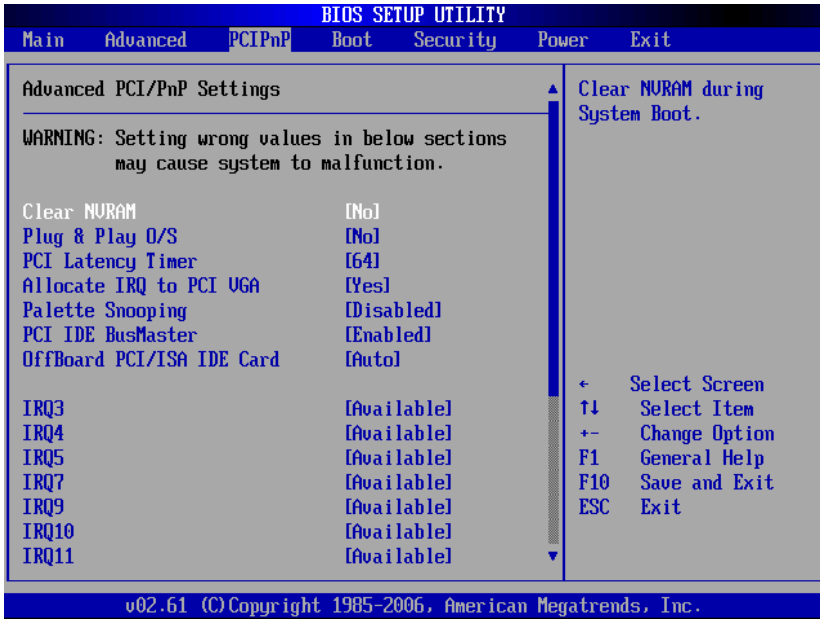


BIOS EHCI Hand-Off

Allows you enable support for operating systems without an EHCI hand-off feature. The options: [Disabled], [Enabled].

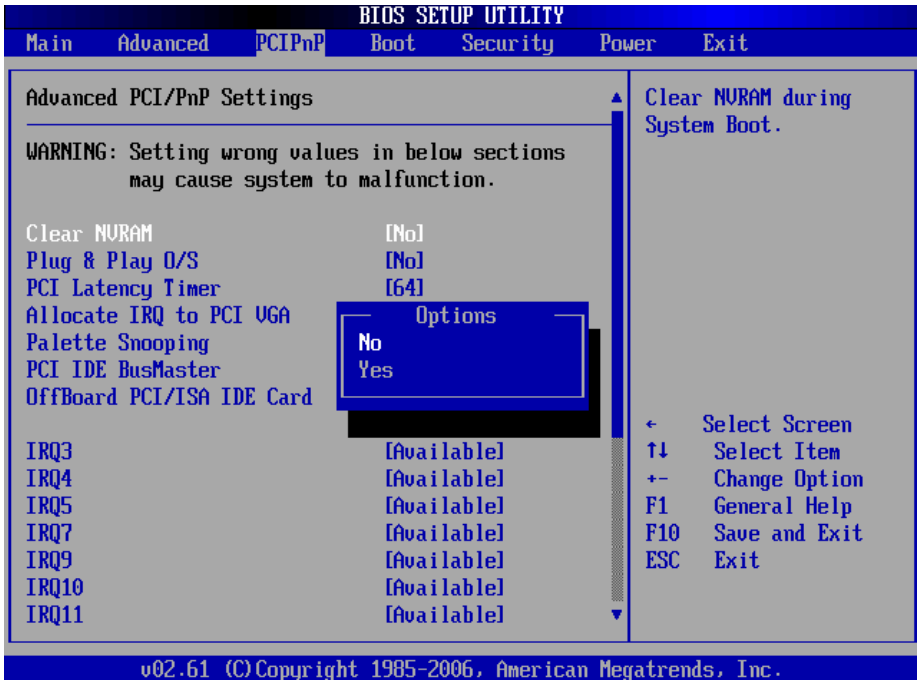
7.4 PCI/PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/ PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices



Clear NVRAM

Clear NVRAM during system boot. The options: [No], [Yes].

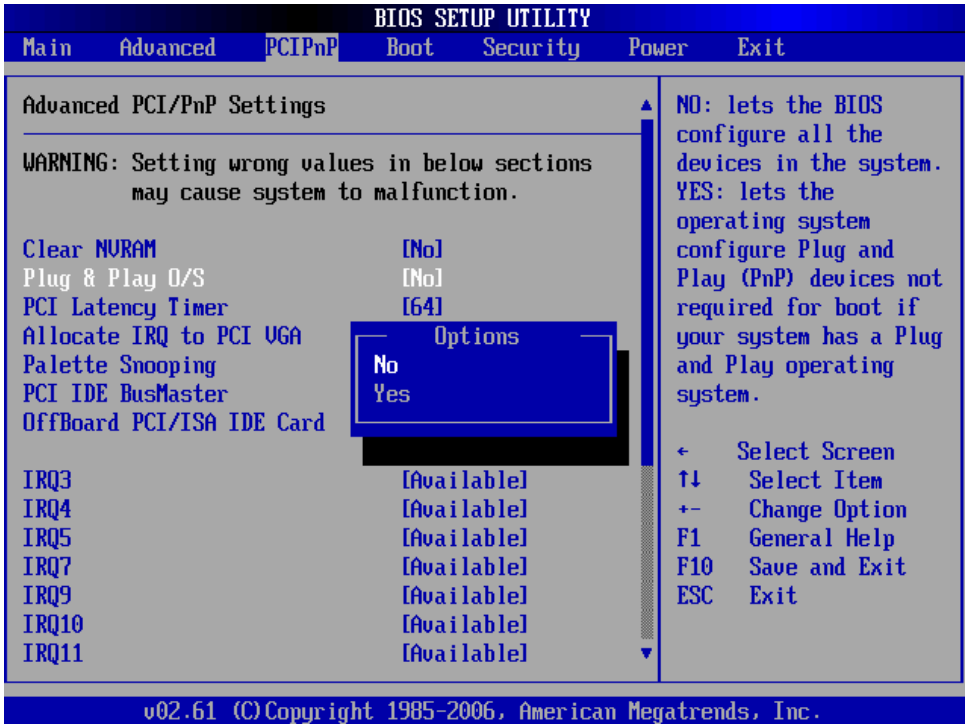


Plug & Play O/S

When set to [No], BIOS configures all the devices in the system. When set to

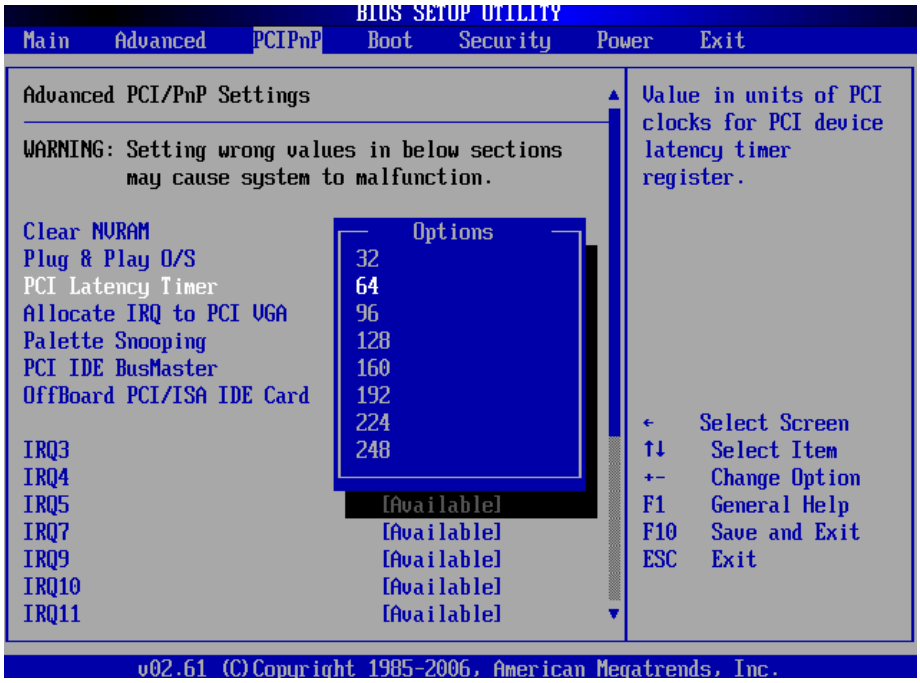
[Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

The options: [No] [Yes].



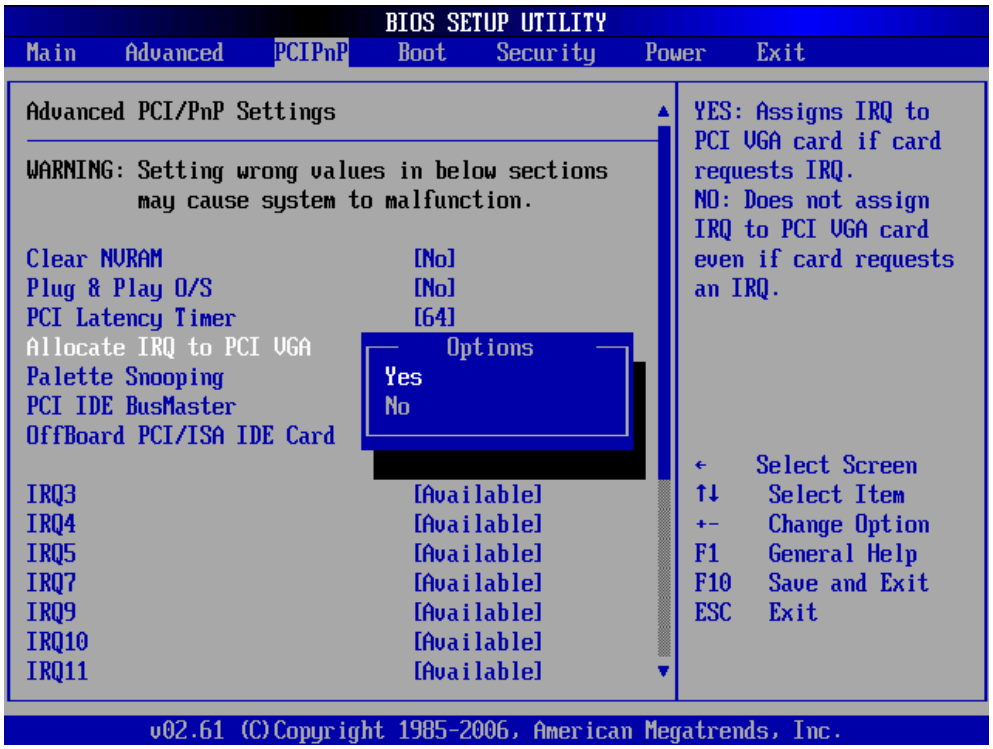
PCI Latency Timer

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. The options: [32] [64] [96] [128] [160] [192] [224] [248].



Allocate IRQ to PCI VGA

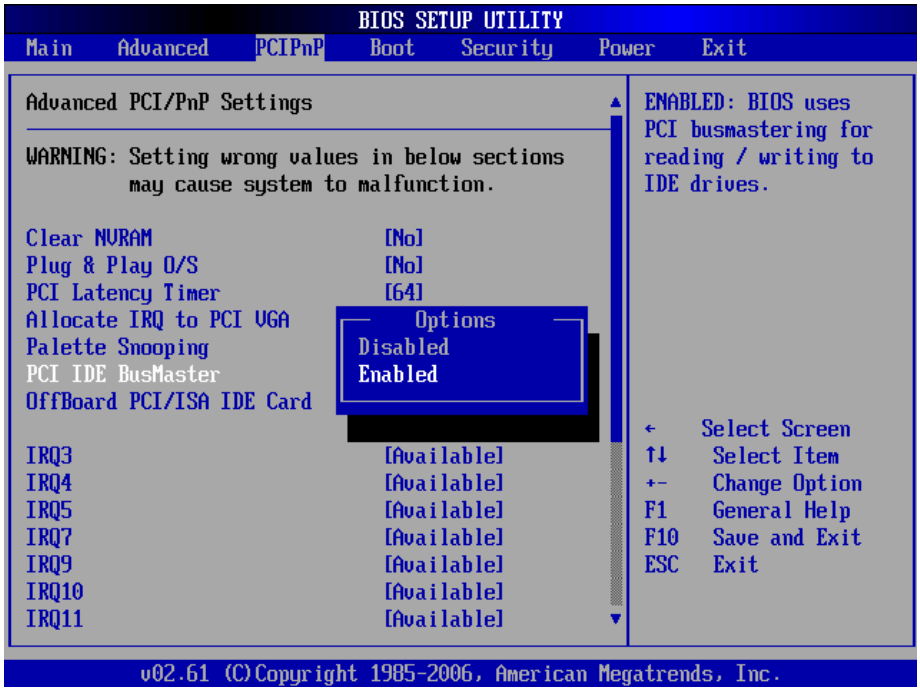
When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. The options: [No] [Yes].



Palette Snooping

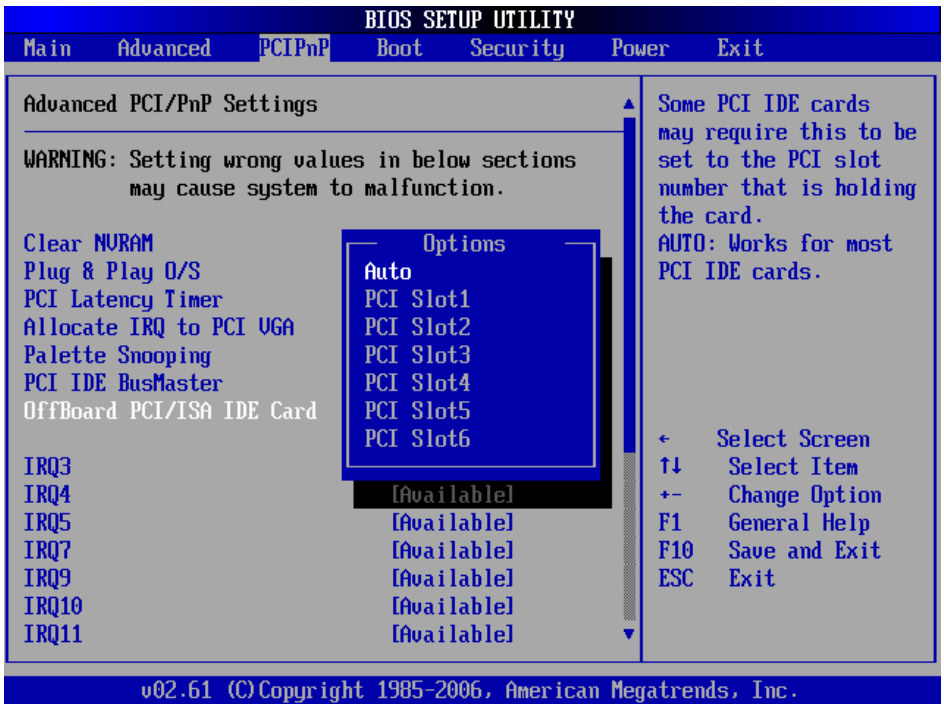
When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. The options: [Disabled] [Enabled].

PCI IDE BusMaster the BIOS use PCI bus mastering for reading/writing to IDE device. The options: [Disabled], [Enabled].



OffBoard PCI/ISA IDE Card

Allows you to set the PCI slot number. The options: [Auto], [PCI Slot1], [PCI Slot2], [PCI Slot 3], [PCI Slot4], [PCI Slot5], [PCI Slot6].



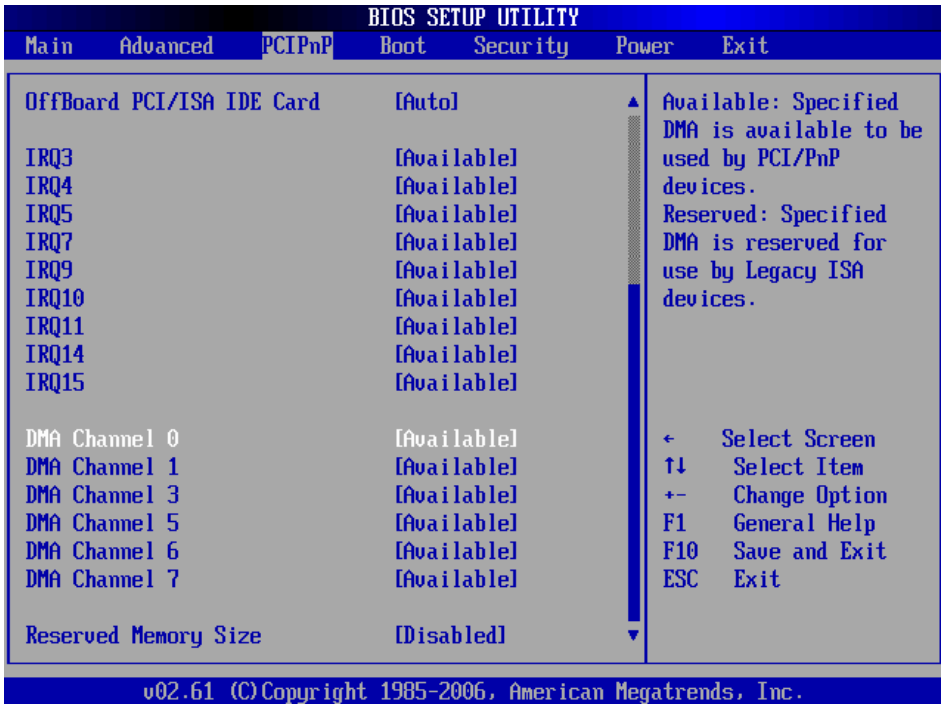
IRQ3,4,5,7,9,10,11,14,15

Allows you to specify IRQ that is available to be used by PCI/PnP or Legacy ISA

device. The options: [Available], [Reserved].

DMA Channel 0,1,3,5,6,7

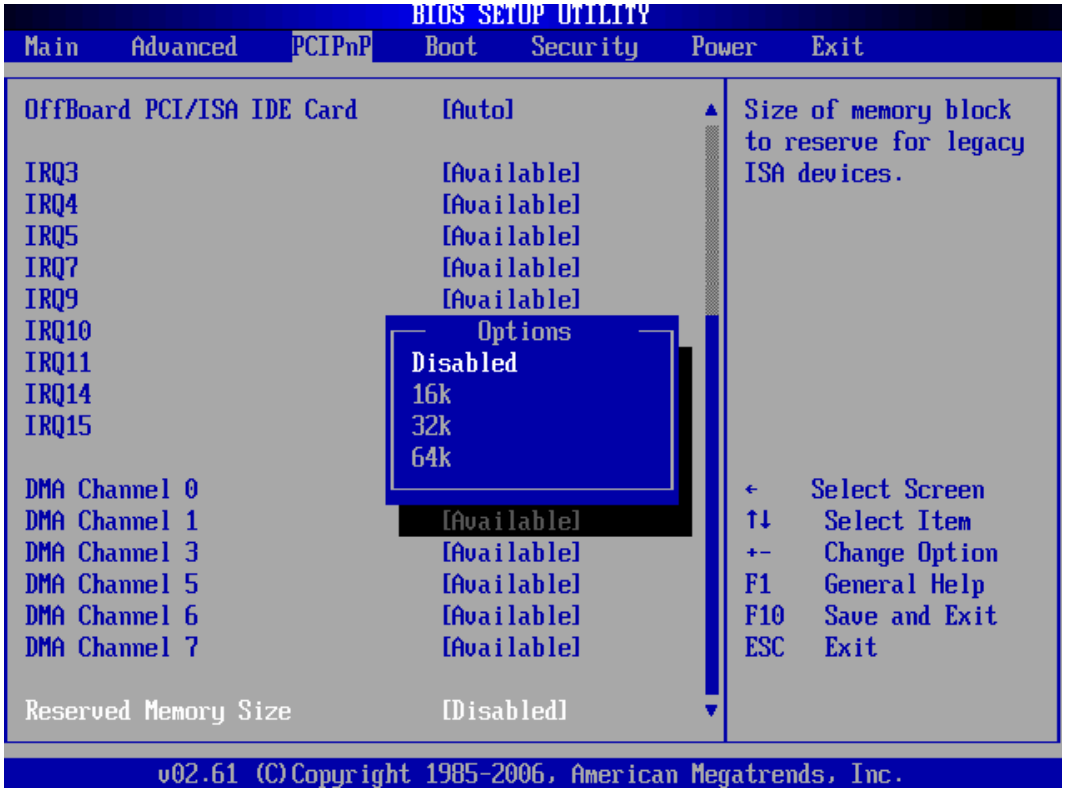
DMA Channel PCI/PMP functions. The options: [Available], [Reserved].



Reserved Memory Size

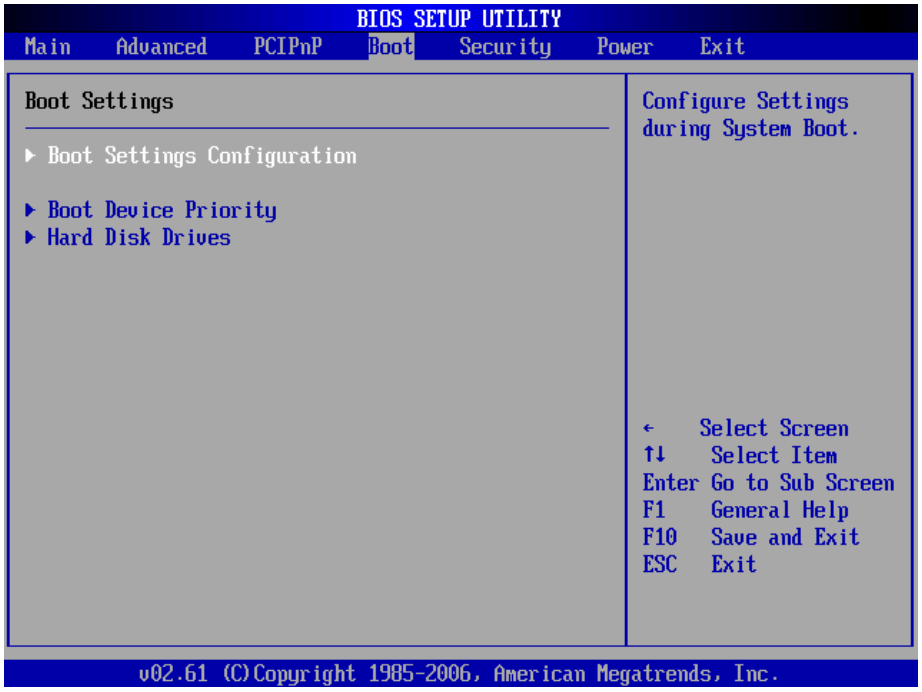
Set the size of memory block to reserve for legacy ISA devices.

The options: [Disabled], [16 K], [32 K], [64 K].


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Power Exit
OffBoard PCI/ISA IDE Card [Auto]
IRQ3 [Available]
IRQ4 [Available]
IRQ5 [Available]
IRQ7 [Available]
IRQ9 [Available]
IRQ10
IRQ11
IRQ14
IRQ15
DMA Channel 0
DMA Channel 1 [Available]
DMA Channel 3 [Available]
DMA Channel 5 [Available]
DMA Channel 6 [Available]
DMA Channel 7 [Available]
Reserved Memory Size [Disabled]
Options
Disabled
16k
32k
64k
Size of memory block to reserve for legacy ISA devices.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

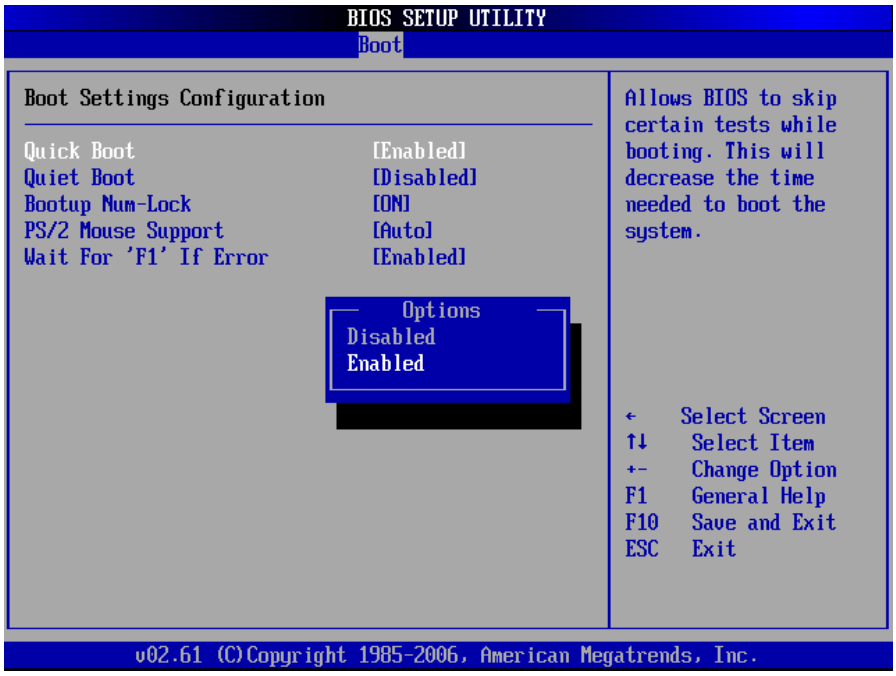
7.5 Boot

Boot Setting Configuration



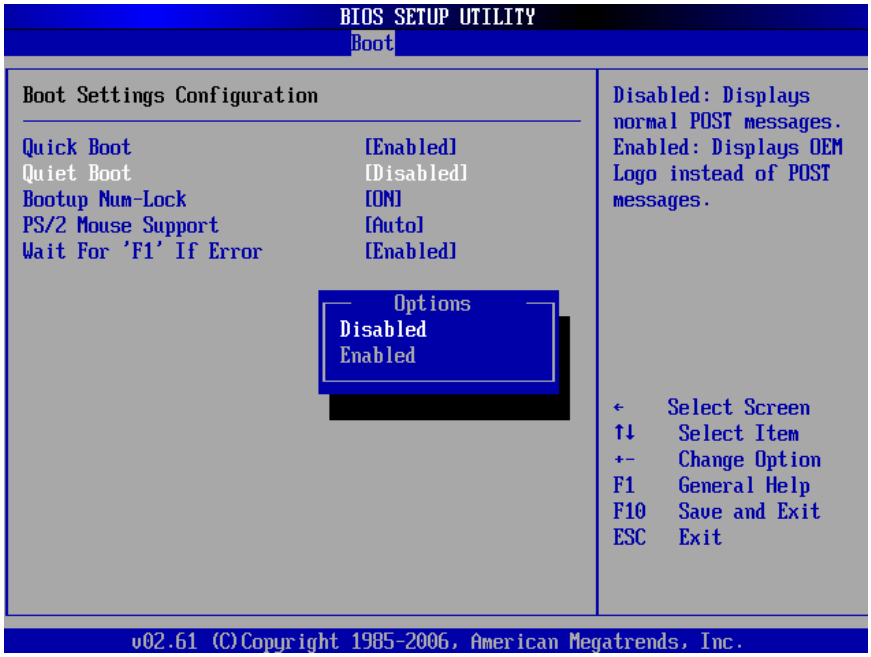
Quick Boot

Enable this item allows the BIOS to skip some power on self test (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items. The options: [Disabled], [Enabled].



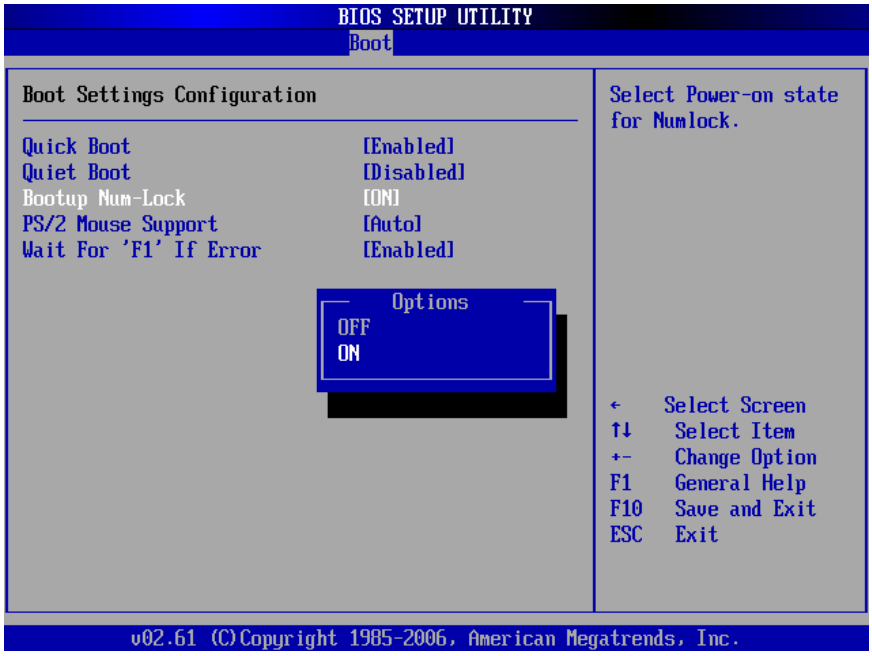
Quiet Boot

Allows you to display Normal POST message or OEM logo. The options: [Disabled], [Enabled].



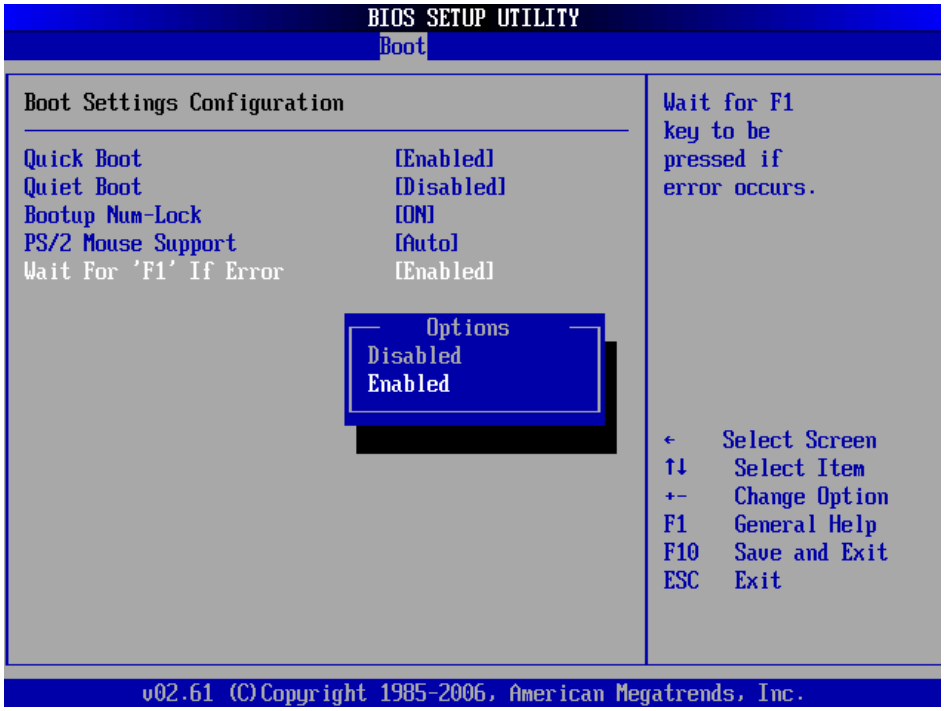
Boot up Num-Lock

Allows you to select the power-on state for the NumLock. The options: [Off], [On].

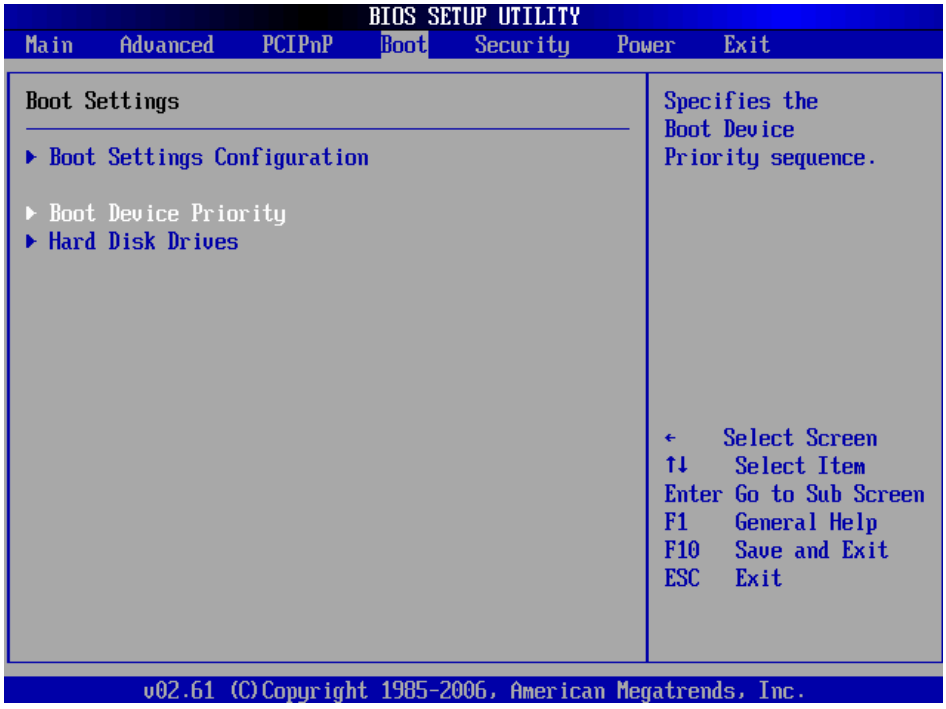


Wait for 'F1' If Error

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. The options: [Disabled], [Enabled].

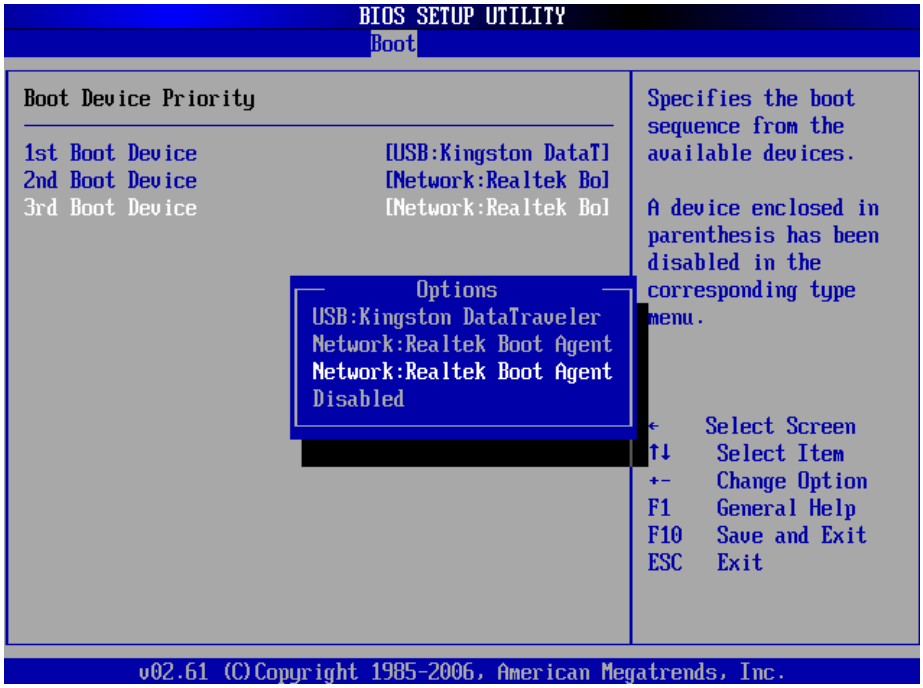


Boot Device Priority

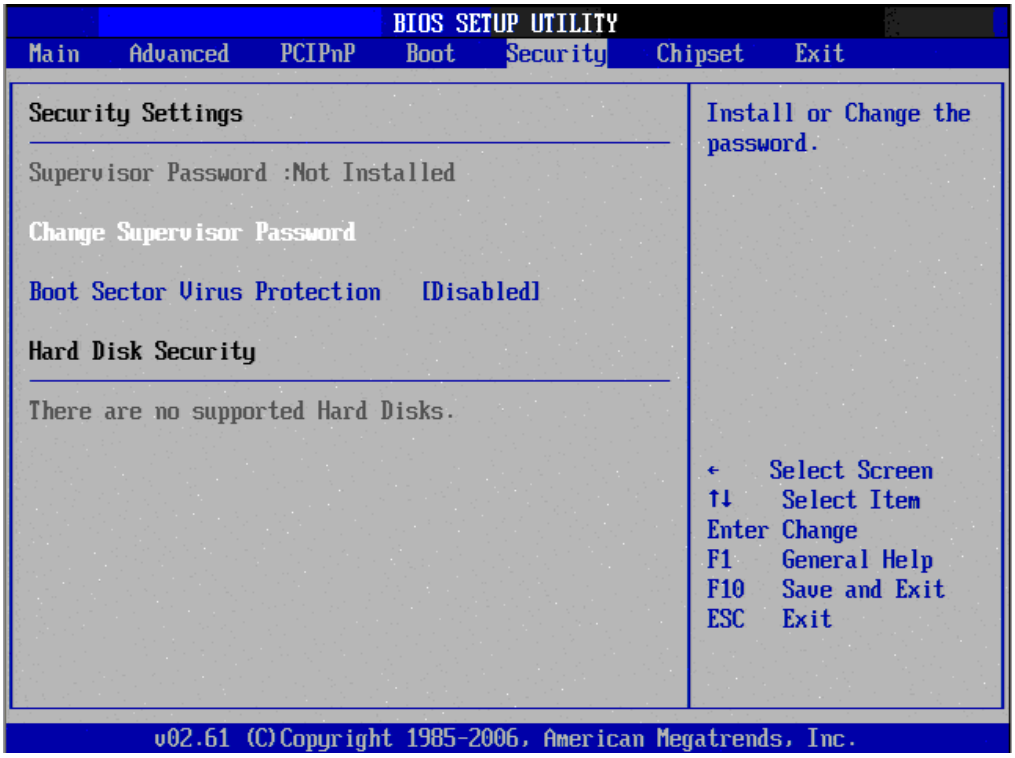


Boot Device Priority

Select the priority of Boot devices.


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [USB:Kingston DataT]
2nd Boot Device [Network:Realtek Bo]
3rd Boot Device [Network:Realtek Bo]
Options
USB:Kingston DataTraveler
Network:Realtek Boot Agent
Network:Realtek Boot Agent
Disabled
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

7.6 Security

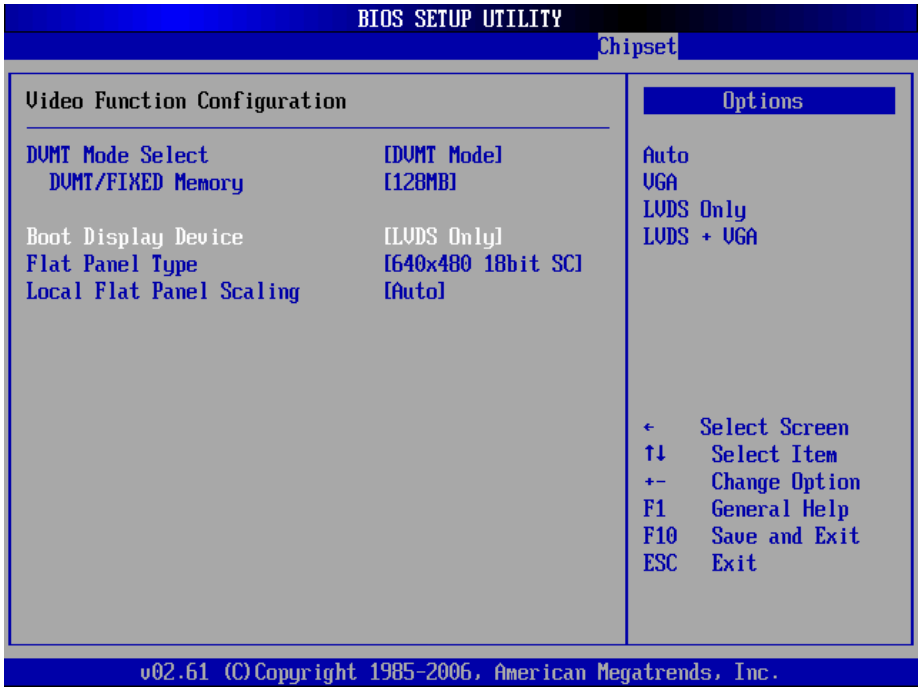


Select Security Setup from the IA70 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protec- tion are described in this section. To access the sub menu for the follow- ing items, select the item and press <Enter>:

ï Change Supervisor Password

ï Boot sector Virus protection: The boot sector virus protection will warn if any program tries to write to the boot sector.

7.7 Chipset

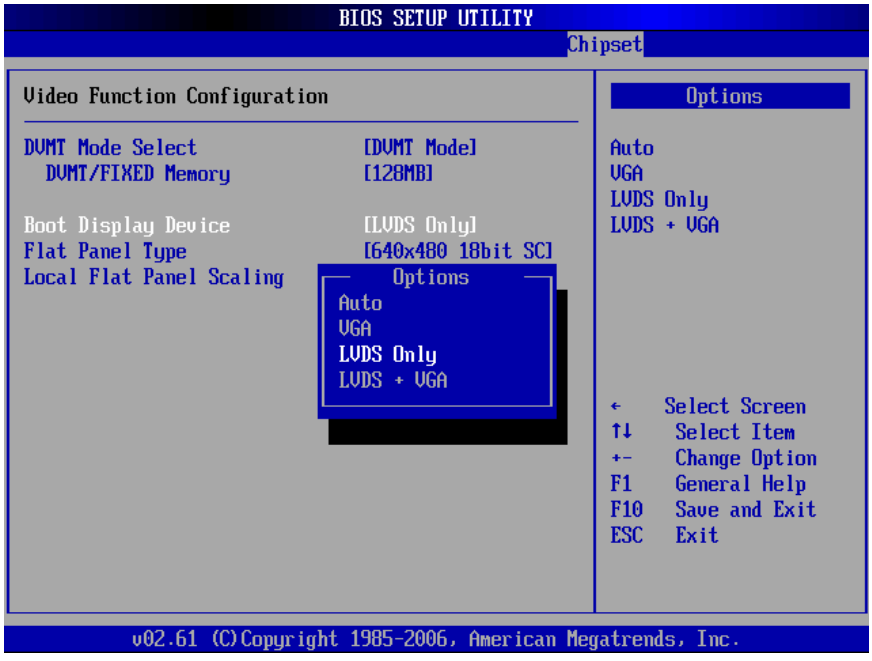


DVMT model select

This function displays the active system memory mode.

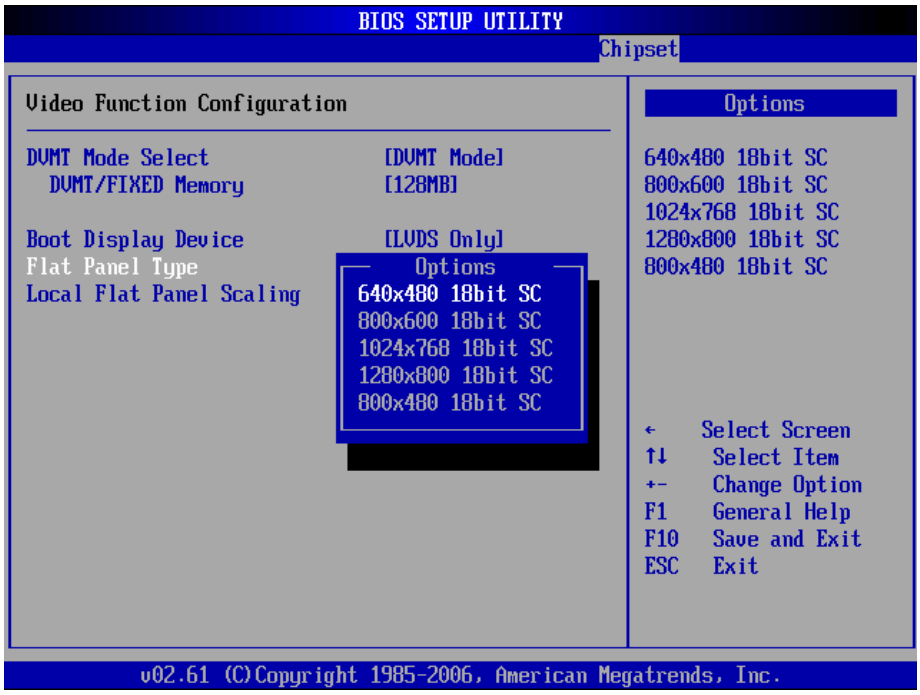
DVMT / FIXED Memory

Specify the amount of DVMT / FIXED system memory to allocate for video memory.



Boot display device

Select boot display device at post stage. You could select Auto/VGA/LVDS only/LVDS+VGA.

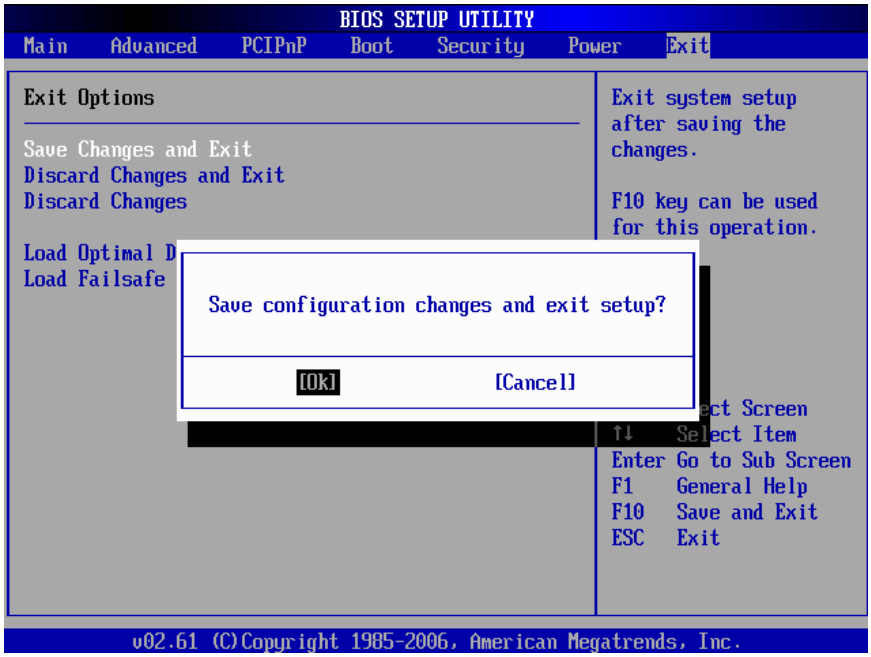


Flat panel type

Select panel resolution

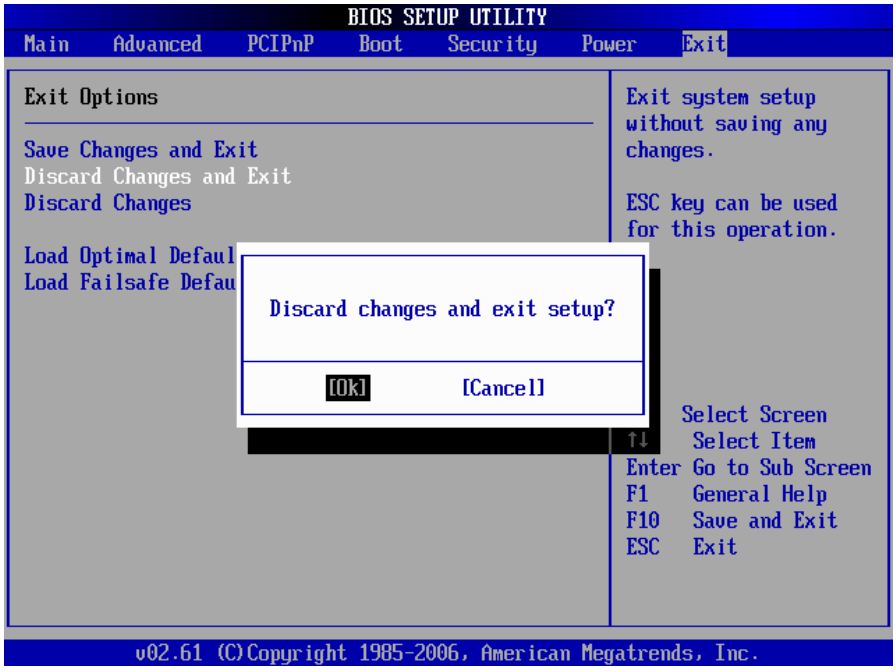
7.8 Exit

This Exit menu items allow you to load the optimal or failsafe default value for the BIOS items, and save or discard your changes to the BIOS items.



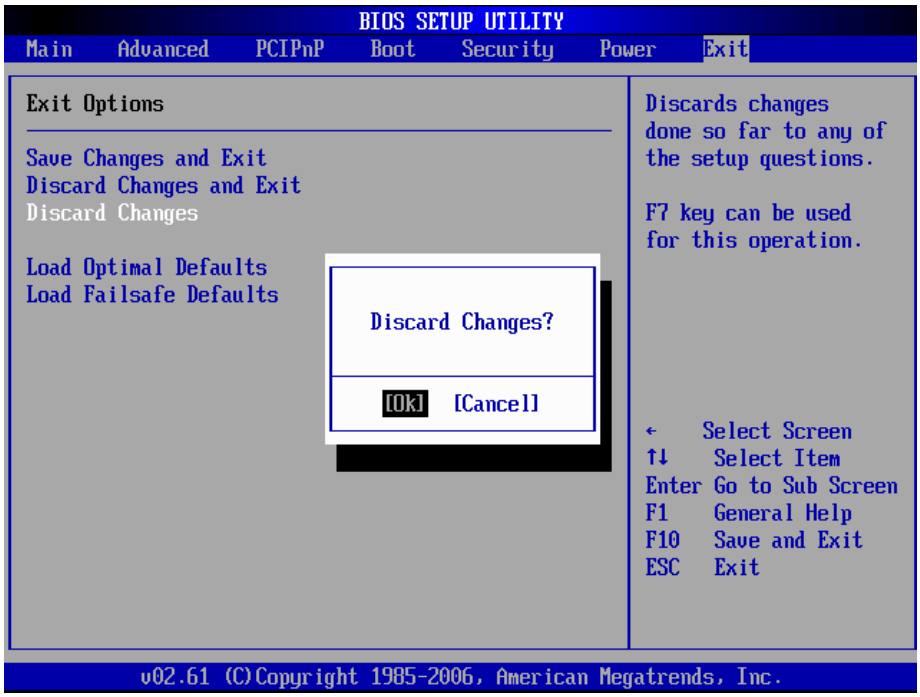
Discard Changes and Exit

Select this option only if you do not want to save the changes that you made to the setup program. If you made changes to fields other than System Date, System time, and Password, the BIOS asks for a confirmation before exiting.



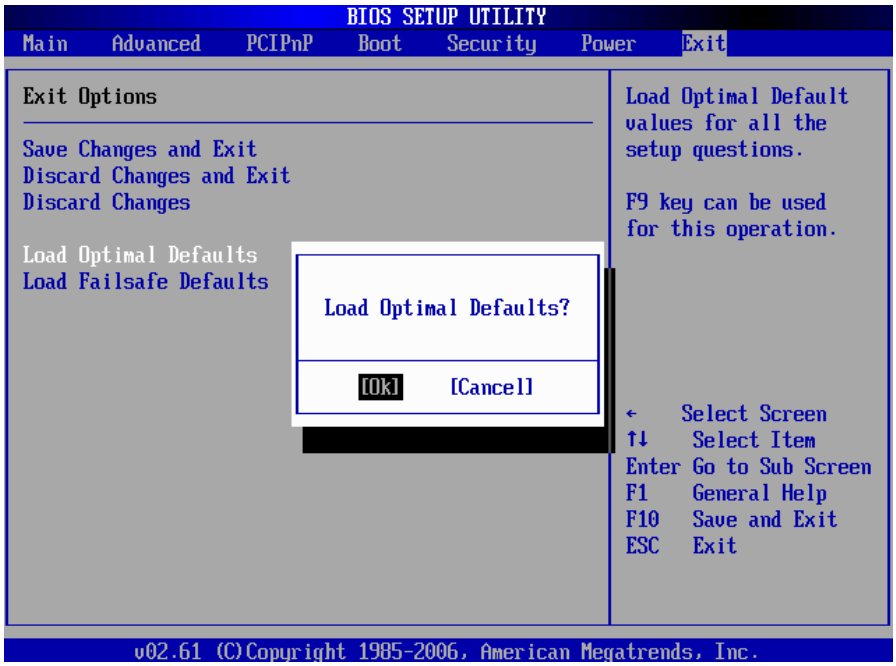
Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [OK] to discard any changes and load the previously saved values.



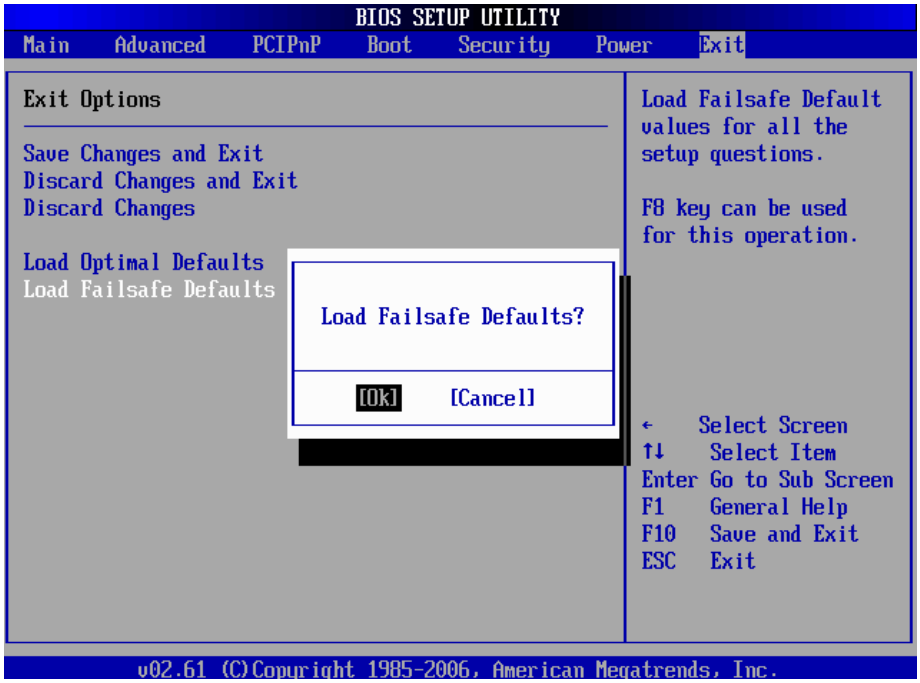
Load Optimal Defaults

This option allows you to load the optimal default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select [OK] to load optimal default values. Select [Save Change and Exit] or make other changes before saving the values to the non-volatile RAM.



Load Failsafe Defaults

This option allows you to load the failsafe default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select [OK] to load failsafe default values.



Note1: Digital I/O Sample Code

```
//File of the Main.cpp
//============================================================
//This code is for test IA30 Super I/O.
//============================================================
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>

//============================================================
#define W83627EHG_INDEX_PORT 0x2E
#define W83627EHG_DATA_PORT 0x2F
//============================================================
#define W83627EHG_REG_LD 0x07
//============================================================
#define W83627EHG_UNLOCK 0x87
#define W83627EHG_LOCK 0xAA

//============================================================
void ClrKbBuf(void);
void Unlock_W83627EHG(void);
void Lock_W83627EHG(void);
void Set_W83627EHG_Reg(unsigned char,unsigned char);
unsigned char Get_W83627EHG_Reg(unsigned char);
int main ();
//============================================================
int main ()
{
      unsigned char ucDO = 0; //data for digital output
      unsigned char ucDI; //data for digital input
      unsigned char ucBuf;
      Set_W83627EHG_Reg(0x07,0x07);//switch to logic device 7

//    PIN 121~128 function select
//    Bit0 = 0 -> Game Port.
```

```
//            = 1 -> GPIO1.
        ucBuf = Get_W83627EHG_Reg(0x29);
        Set_W83627EHG_Reg(0x29,ucBuf|0x01);

//    Bit0 = 0 -> GPIO1 is inactive.
//     Bit1 = 1 -> Activate GPIO1.
        ucBuf = Get_W83627EHG_Reg(0x30);
        Set_W83627EHG_Reg(0x30,ucBuf|0x01);//Activate GPIO1

        Set_W83627EHG_Reg(0xF0,0x0F);//switch GPIO Input(1)/Output(0) port

        Set_W83627EHG_Reg(0xF1, 0x00); //clear
        ucDI = Get_W83627EHG_Reg(0xF1) & 0x0F;
        ClrKbBuf();
        while(1)
        {
                ucDO++;
                Set_W83627EHG_Reg(0xF1, ((ucDO & 0x0F) << 4));
                ucBuf = Get_W83627EHG_Reg(0xF1) & 0x0F;
                if (ucBuf != ucDI)
                {
                        ucDI = ucBuf;
                        printf("Digital I/O Input Changed. Current Data is 0x%X\n",ucDI);
                }
                if (kbhit())
                {
                        getch();
                        break;
                }
                delay(500);
        }
        return 0;
}
//============================================================
void ClrKbBuf(void)
{
        while(kbhit())
        { getch(); }
```

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

void Unlock_W83627EHG (void)
{
	outportb(W83627EHG_INDEX_PORT, W83627EHG_UNLOCK);
	outportb(W83627EHG_INDEX_PORT, W83627EHG_UNLOCK);
}
//=====================================================
void Lock_W83627EHG (void)
{
	outportb(W83627EHG_INDEX_PORT, W83627EHG_LOCK);
}
//=====================================================
void Set_W83627EHG_Reg( unsigned char REG, unsigned char DATA)
{
	Unlock_W83627EHG();
	outportb(W83627EHG_INDEX_PORT, REG);
	outportb(W83627EHG_DATA_PORT, DATA);
	Lock_W83627EHG();
}
//=====================================================
unsigned char Get_W83627EHG_Reg( unsigned char REG)
{
	unsigned char Result;
	Unlock_W83627EHG();
	outportb(W83627EHG_INDEX_PORT, REG);
	Result = inportb(W83627EHG_DATA_PORT);
	Lock_W83627EHG();
	return Result;
}
//=====================================================
```

Note2: Watchdog Sample Code

```
//File of the Watchdog.cpp
//============================================================
//This Sample code is for Watchdog timer configuration
//============================================================
//============================================================
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>

//============================================================
#define W83627_INDEX_PORT 0x2E
#define W83627_DATA_PORT 0x2F
#define W83627_UNLOCK 0x87
#define W83627_LOCK 0xAA
//#define Watchdog_timeout 10

//============================================================
void Unlock_W83627(void);
void Lock_W83627(void);
void Set_W83627_Reg(unsigned char,unsigned char);
unsigned char Get_W83627_Reg(unsigned char);
//============================================================

int main ()
{

    int Watchdog_timeout = 10;
    printf("Input Watchdog Timer time-out value [0-255] : ");
    scanf("%d",&Watchdog_timeout);
    if(Watchdog_timeout <= 0 || Watchdog_timeout > 255)
    {
        printf("Time-out value out of range!!\n\n");
        printf("Input Watchdog Timer time-out value [0-255] : ");
        scanf("%d",&Watchdog_timeout);
```

```
    }
    Set_W83627_Reg(0x07,0x08);//switch to logic device 8

    Set_W83627_Reg(0x30,0x01);//Activate watchdog

    Set_W83627_Reg(0xF5,0x06);//Select WDTO# count mode.Second Mode.

    Set_W83627_Reg(0xF6,Watchdog_timeout); //Set Watch Dog Timer Time-out
value

    //Set_W83627_Reg(0xF7,0xC0); //Clear Watchdog timer event

    int i = Watchdog_timeout;
    while(1)
    {
        if (kbhit())
        {
            if(getch()==0x1B)   //Esc
                break;
            else{
                i=Watchdog_timeout;     //Reset Watchdog timer
                Set_W83627_Reg(0xF6,Watchdog_timeout); //Set Watch Dog
Timer Time-out value
            }
        }
        clrscr();
        if(i>0){
            i--;
            printf("After %2d sec reset computer!\n",i);
            printf("Press any key to reset watchdog timer!\n");
            printf("Press [Esc] to exit!\n");

        }
        else
            printf("Watchdog timer fail!");
        delay(1000);
    }
```

```
	Set_W83627_Reg(0xF6,0);    //Disable Watchdog timer

	return 0;
}


//---------------------------------------------------------------------

void Unlock_W83627 (void)
{
	outportb(W83627_INDEX_PORT, W83627_UNLOCK);
	outportb(W83627_INDEX_PORT, W83627_UNLOCK);
}
//=============================================================
void Lock_W83627 (void)
{
	outportb(W83627_INDEX_PORT, W83627_LOCK);
}
//=============================================================
void Set_W83627_Reg( unsigned char REG, unsigned char DATA)
{
	Unlock_W83627();
	outportb(W83627_INDEX_PORT, REG);
	outportb(W83627_DATA_PORT, DATA);
	Lock_W83627();
}
//=============================================================
unsigned char Get_W83627_Reg( unsigned char REG)
{
	unsigned char Result;
	Unlock_W83627();
	outportb(W83627_INDEX_PORT, REG);
	Result = inportb(W83627_DATA_PORT);
	Lock_W83627();
	return Result;
}
//=============================================================
```

Note3:

There is some problem when install software in CF Card as following condition:

1. Master: IDE CD-ROM (PIONEER DVD-227A)
   Slave: CF Card (Transcend 120X-standard)
   CF Card is not founded.

2. Master: CF Card (InnoDisk)
   Slave: IDE CD-ROM (Plextor PX-760A)
   CD-ROM is not founded.

3. Master: CF Card (InnoDisk)
   Slave: IDE CD-ROM (PIONEER)
   CF Card is not founded.

4. Master: CF Card (Transcend 120X-standard)
   Slave: IDE CD-ROM (Plextor PX-760A)
   CD-ROM is not founded.

5. Master: IDE CD-ROM (Plextor PX-760A)
   Slave: CF Card (Transend 120X-standard)
   CF Card is not founded.