



**VB7002**

**User's Manual**

Version 1.04  
June 10, 2009

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## FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B 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 his personal expense.

### Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.



Tested To Comply  
With FCC Standards  
FOR HOME OR OFFICE USE

## SAFETY INSTRUCTIONS

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- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- Keep this equipment away from humidity.
- Lay this equipment on a reliable flat surface before setting it up.
- The openings on the enclosure are for air convection hence protects the equipment from overheating. Do not cover the openings.
- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- Place the power cord in such a way that people cannot step on it. Do not place anything over the power cord.
- Always unplug the power cord before inserting any add-on card or module.
- All cautions and warnings on the equipment should be noted.
- Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- If any of the following situations arises, get the equipment checked by a service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - If the equipment has obvious sign of breakage.
- Do not leave this equipment in an environment unconditioned or in a storage temperature above 60°C (140°F). The equipment may be damaged.

**Caution:**

Only use the appropriate battery specified for this product.  
Do not reuse, recharge, or reheat an old battery.  
Do not attempt to force open the battery.  
Do not discard used batteries with regular trash.  
Discard used batteries according to local regulations.



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# CHAPTER 1

## SPECIFICATIONS

The ultra-compact and highly integrated VIA VB7002 uses the Mini-ITX mainboard form-factor developed by VIA Technologies, Inc. as part of the company's open industry-wide total connectivity initiative. The mainboard enables the creation of an exciting new generation of small, ergonomic, innovative and affordable embedded systems. Through a high level of integration, the Mini-ITX occupy 66% of the size of FlexATX mainboard form factor. The mainboard comes with a VIA C7-D NanoBGA2 Processor, boasting of ultra-low power consumption, cool and quiet operation.

## Mainboard Specifications

---

### CPU

- VIA C7-D 1.5 GHz NanoBGA2 processor

### Chipset

- VIA CN896 North Bridge
- VIA VT8237S South Bridge

### Graphics

- Integrated VIA Chrome9™ HC Integrated Graphics with 2D/3D and Video Acceleration

### Audio

- VIA VT1708A High Definition Audio codec

### Memory

- 2 x DDR2 667/533 DIMM slot (up to 4 GB)

### Expansion Slot

- 1 x 16-Lane PCI Express slot (Gen 1)
- 1 x 32-bit Mini-PCI slot

### IDE

- 1 x UltraDMA 133/100/66 IDE connector

### SATA

- 2 x SATA II connectors

### LAN

- One VIA VT6103L 10/100 Mbps Fast Ethernet PHY

### Super I/O

- VIA VT1211 LPC Super I/O

**Note:**

System resources (such as BIOS, PCI, etc.) require physical memory address locations that reduce available memory addresses above 3 GB. This may result in less than 4 GB of memory being available to the operating system and applications.

### **Back Panel I/O Ports**

- 1 x PS2 Mouse port
- 1 x PS2 Keyboard port
- 1 x Serial port
- 1 x RJ45 LAN port
- 1 x VGA port
- 2 x USB 2.0 ports
- 3 x Audio jacks: Line-out, Line-in and MIC-in (Horizontal, Smart 5.1 supported)

### **Onboard I/O Connectors**

- 3 x USB pin connector for 6 additional USB 2.0 ports (1 supports VIA WLAN module)
- 1 x LPC header
- 1 x SMBus pin connector
- 1 x Serial port pin connector (COM 2 5V/12V selectable)
- 1 x CIR pin connector (switchable for KB/MS)
- 1 x FIR pin connector (IRDA 1.0)
- 1 x Front Panel pin connector
- 1 x Front –panel Audio pin connector for Line-out and MIC-in
- 1 x SPDIF out pin connector
- 1 x Buzzer
- 2 x Fan connectors for CPU and System fans
- 1 x ATX power connector

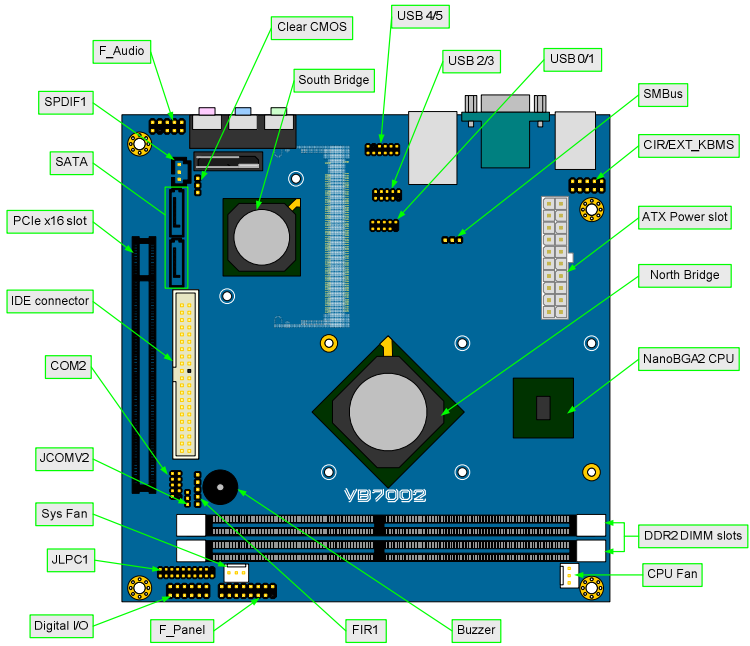
### **BIOS**

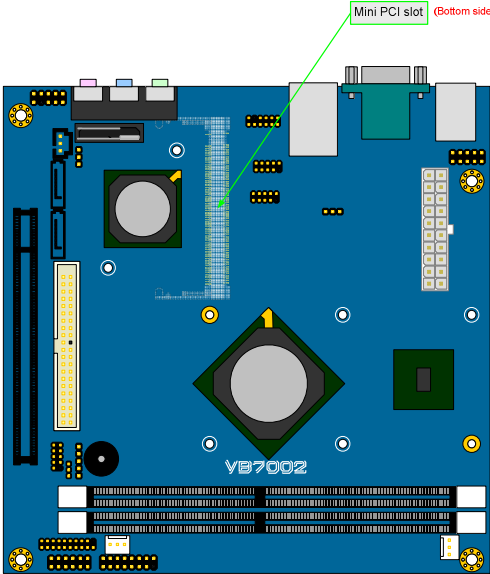
- Award BIOS with SPI 4/8Mbit flash memory capacity

### **Form Factor**

- Mini-ITX (6-layer)
- 17cm X 17cm

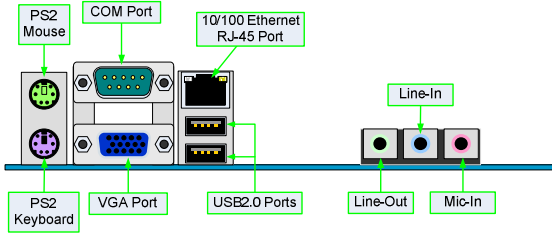
# Mainboard Layout





## Back Panel Layout

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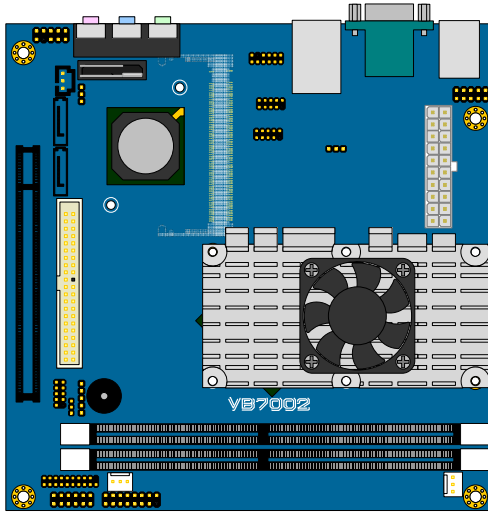
# CHAPTER 2

## INSTALLATION

This chapter provides you with information about hardware installation procedures. It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

## CPU

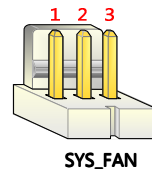
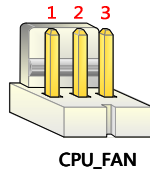
The VIA VB7002 mainboard is packaged with a standard VIA C7-D 1.5 GHz NanoBGA2 Processor. This processor requires a heatsink with fan to provide sufficient cooling.



### CPU Fan and System Fan: CPUFAN and SYSFAN

The CPU\_FAN (CPU fan) and SYS\_FAN (system fan) run on +12V and maintain system cooling. When connecting the wire to the connectors, always be aware that the red wire (positive wire) should be connected to the +12V. The black wire is Ground and should always be connected to GND.

Pin	Signal
1	FANIO
2	+12V
3	GND



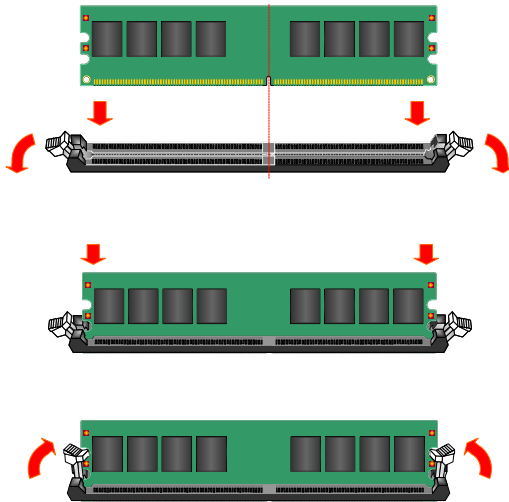
## Memory Module Installation

### Memory Slot: DDR2 DIMM

The VIA VB7002 mainboard provide two 240-DIMM slots for DDR2 667/533 SDRAM memory modules and supports memory sizes up to 4GB.

### DDR2 SDRAM Module Installation Procedures

- Locate the DIMM slot in the motherboard.
- Unlock a DIMM slot by pressing the retaining clips outward.
- Align a DIMM on the socket such that the notch on the DIMM matches the break on the slot.
- Firmly insert the DIMM into the slot until the retaining clips snap back in place and the DIMM is properly seated.



### Available DDR2 SDRAM Configurations

Refer to the table below for available DDR2 SDRAM configurations on the mainboard.

Slot	Module Size	Total
DIMM1	64MB, 128MB, 256MB, 512MB, 1GB, 2GB	64MB-2GB
DIMM2	64MB, 128MB, 256MB, 512MB, 1GB, 2GB	64MB-2GB
Maximum supported system memory		64MB-4GB

## Connecting the Power Supply

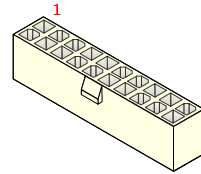
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The VIA VB7002 mainboard supports a conventional ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed correctly to ensure that no damage will be caused.

### ATX 20-Pin Power Connector

To connect the power supply, make sure the power plug is inserted in the proper orientation and the pins are aligned. Then push down the plug firmly into the connector.

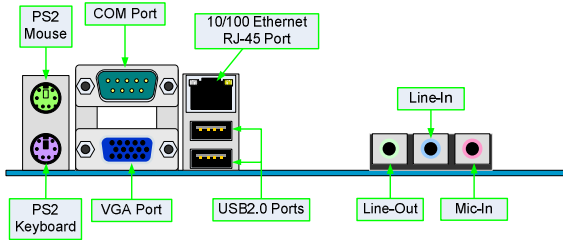
Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	Power Supply On
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power Good	18	-5V
9	+5V Standby	19	+5V
10	+12V	20	+5V



## Back Panel Ports

---

The back panel has the following ports:



### Mouse and Keyboard

The connector above is for a PS/2 mouse, and the one below is for a PS/2 keyboard.

### Serial Port: COM

The 9-pin COM port is for pointing devices or other serial devices.

### VGA Port

The 15-pin female VGA connector can be used to connect to any analog VGA monitor.

### USB Ports

Two standard USB 2.0 ports are provided on the back panel. These ports used to connect the USB2.0 devices.

### RJ-45 LAN Port

The mainboard provides a standard RJ-45 (10/100 Ethernet). This port allows the connection to a Local Area Network (LAN) through a network hub.

### Audio Port

The Line-Out jack is for connecting to external speakers or headphones. The Line-In jack is for connecting to an external audio device such as a CD player, tape player, etc. The Mic jack is for connecting to a microphone.

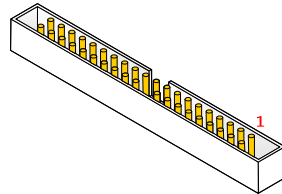
## Connectors

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### IDE Connector: IDE

The mainboard has an Ultra DMA 133/100/66 controller. You can connect up to two IDE devices in any combination.

Pin	Signal	Pin	Signal
1	#IDE_RST	2	GND
3	PD_7	4	PD_8
5	PD_6	6	PD_9
7	PD_5	8	PD_10
9	PD_4	10	PD_11
11	PD_3	12	PD_12
13	PD_2	14	PD_13
15	PD_1	16	PD_14
17	PD_0	18	PD_15
19	GND	20	NC
21	#PD_REQ	22	GND
23	#PD_IOW	24	GND
25	#PD_IOR	26	GND
27	#PD_RDY	28	Primary
29	#PD_ACK	30	GND
31	PD_IRQ15	32	NC
33	PD_A1	34	IDE_DMADET
35	PD_A0	36	PD_A2
37	#PD_CS1	38	#PD_CS3
39	#HD_LED1	40	GND



If two drives are connected to a single cable, the jumper on the second drive must be set to slave mode. Refer to the drive documentation supplied by the vendor for the jumper settings.

## SATA II Connectors: SATA1 and SATA2

These next generation connectors support the thin SATA cables for primary internal storage devices. The current SATA interface allows up to 300MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra DMA).

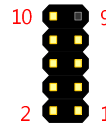


## USB Pin Connector: USB\_0/1, USB\_2/3 and USB\_4/5

The mainboard provide two 10-pin and one 12-pin USB pin header, allowing up to six additional USB 2.0 ports. Therefore mainboard can support up to eight USB 2.0 ports. These ports can be used to connect high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modem and the like.

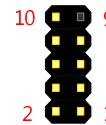
### 10-Pin USB Pin connector (USB\_0/1)

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5VDUAL
3	USBD_T0-	4	USBD_T1-
5	USBD_T0+	6	USBD_T1+
7	GND	8	GND
9	KEY	10	GND



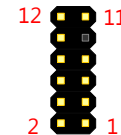
### 10-Pin USB Pin connector (USB\_2/3)

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5VDUAL
3	USBD_T2-	4	USBD_T3-
5	USBD_T2+	6	USBD_T3+
7	GND	8	GND
9	KEY	10	GND



### 12-Pin USB Pin connector (USB\_4/5 for VIA WLAN)

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5VDUAL
3	USBD_T4-	4	USBD_T5-
5	USBD_T4+	6	USBD_T5+
7	GND	8	GND
9	KEY	10	W_LESS_LED
11	NC	12	GPO_4_RF-ON



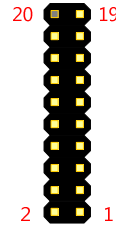
**Note:**

USB pin header connectors use the "2.0 pitch Dupont connector".

## LPC Connector: JLPC1

This pin connector is for LPC devices.

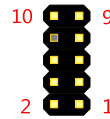
Pin	Signal	Pin	Signal
1	LAD1	2	LPCIF_33_CLK
3	-PCIRSTX	4	GND
5	LAD0	6	LPCIF_48_CLK
7	LAD2	8	-LFRAME
9	SERIRQ	10	LAD3
11	-LDRQ0	12	-EXTSMI
13	+5V	14	+3.3V
15	+5V	16	+3.3V
17	GND	18	GND
19	GND	20	NC



## Front Panel Audio Connector: F\_Audio

This is an interface for the VIA front panel audio cable that allow convenient connection and control of audio devices.

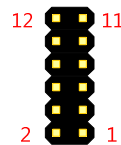
Pin	Signal	Pin	Signal
1	AUD_MIC1	2	AUD_GND
3	AUD_MIC2	4	AUD_FNT_DET
5	AUD_FPOUT_R	6	MIC2_JD
7	FRONT_IO_SENSE	8	NC
9	AUD_FPOUT_L	10	LINE2_JD



## Digital I/O Connector: DIO




General purpose digital input and output.

Pin	Signal	Pin	Signal
1	5V_DIO	2	12V_DIO
3	GPO_1	4	GPI_4
5	GPO_7	6	GPI_12
7	GPO_26	8	GPI_13
9	GPO_27	10	GPI_14
11	GND	12	GND








## System Management Bus Connector: SMBus1

This pin header allows you to connect SMBus (System Management Bus) devices. Devices communicate with a SMBus host and/or other SMBus devices using the SMBus interface.

Pin	Signal	
1	SMBCK	1 
2	SMBDT	2 
3	GND	3 

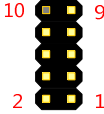
## Fast IrDA Infrared Module Connector: FIR1

This pin header is used to connect to an IrDA module. The BIOS settings must be configured to activate the IR function.

Pin	Signal	
1	+5V	1 
2	IRRX1	2 
3	IRRX	3 
4	GND	4 
5	IRTX	5 

## Serial Port Connector: COM2

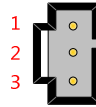
COM2 pin header can be used to attach an additional port for serial devices.

Pin	Signal	Pin	Signal	
1	SIO_COM_DCD	2	SIO_COM_RXD	
3	SIO_COM_TXD	4	SIO_COM_DTR	
5	GND	6	SIO_COM_DSR	
7	SIO_COM_RTS	8	SIO_COM_CTS	
9	SIO_COM_RI	10	KEY	

## Digital Audio Connector: SPDIF1

This connector is for connecting the Sony Philips Digital Interface (S/PDIF) bracket. The S/PDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The feature is available only with stereo system that has digital output function.

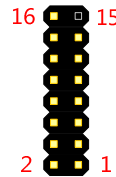
Pin	Signal
1	+5V
2	SPDIF_OUT
3	GND



## Case Connector: F\_PANEL

The F\_PANEL pin header allows you to connect the power switch, reset switch, power LED, sleep LED, HDD LED and the case speaker.

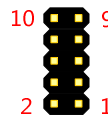
Pin	Signal	Pin	Signal
1	+PWR_LED	2	+HD_LED
3	+PWR_LED	4	-HD_LED
5	-PWR_LED	6	PW_BN
7	SPEAK+	8	GND
9	NC	10	RST_SW
11	NC	12	GND
13	SPEAK-	14	+SLEEP_LED
15	KEY	16	-SLEEP_LED



## Consumer Infrared Module/PS2 Header: CIR/EXT\_KBMS1

The mainboard provides a CIR pin header. It is also convertible to a KBMS pin header which is to attach a PS2 keyboard and mouse.

Pin	Signal	Pin	Signal
1	+5VDUAL	2	GND
3	KB_CLK	4	KB_DATA
5	EXT_KBCLK	6	EXT_KBDATA
7	MS_CLK	8	MS_DATA
9	EXT_MSCLK	10	EXT_MSDATA



**Note:**

When the pin header is not in use. Please short pin 3&5, pin 4&6, pin 7&9 and pin 8&10.

## Jumpers

The mainboard provides jumpers for setting some mainboard functions. This section will explain how to change the settings of the mainboard functions using the jumpers.

### Clear CMOS Connector: CLEAR\_CMOS1

The onboard CMOS RAM stores system configuration data and has an onboard battery power supply. To reset the CMOS settings, set the jumper on pins 1 and 2 while the system is off. Return the jumper to pins 2 and 3 afterwards. Setting the jumper while the system is on will damage the mainboard.

Setting	1	2	3
Normal Operation	ON	ON	OFF
Clear CMOS setting	OFF	ON	ON



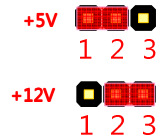
**Caution:**

Except when clearing the RTC RAM, never remove the cap on CLEAR\_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

### Voltage Selector for COM Connectors: JCOMV2

This VCC selector is to determine the input voltage of each COM connector.

Setting	1	2	3
+5V	ON	ON	OFF
+12V	OFF	ON	ON



## Slots

---

### Mini Peripheral Component Interconnect: MiniPCI

The MiniPCI slot allows you to insert a MiniPCI expansion card. First unplug the power supply before adding or removing expansion cards. Read the documentation for the expansion card to see if any changes to the system are necessary.



### PCI Interrupt Request Routing

The IRQ (interrupt request line) are hardware lines over which devices can send interrupt signals to the microprocessor. The "PCI & LAN" IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
MiniPCI Slot	INT B#	INT C#	INT D#	INT A#

### PCI Express: PCIe x16

The PCI Express slot allows you to insert a PCI Express x16 graphics expansion card. First unplug the power supply before adding or removing expansion cards. Read the documentation for the expansion card to see if any changes to the system are necessary.



# CHAPTER 3

## BIOS SETUP





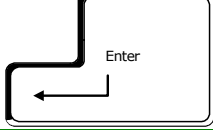



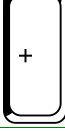






This chapter gives a detailed explanation of the BIOS setup functions.

## Entering the BIOS Setup Menu

---

Power on the computer and press <**Delete**> during the beginning of the boot sequence to enter the BIOS setup menu. If you missed the BIOS setup entry point, restart the system and try again.

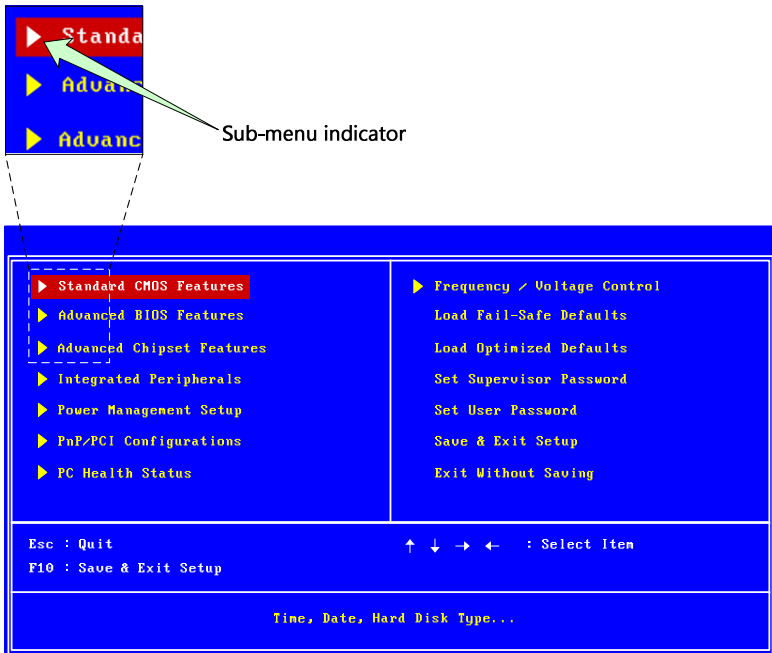
## Control Keys

Keys	Description
	Move to the previous item
	Move to the next item
	Move to the item in the left side
	Move to the item in the right side
	Select the item
	Jumps to the Exit menu or returns to the main menu from a submenu
	Increase the numeric value or make changes
	Decrease the numeric value or make changes
	Increase the numeric value or make changes
	Decrease the numeric value or make changes
	General help, only for Status Page Setup Menu and Option Page Setup Menu
	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
	Load Optimized defaults
	Save all the CMOS changes and exit

## Navigating the BIOS Menu

The main menu displays all the BIOS setup categories. Use the <Left>/<Right> and <Up>/<Down> arrow keys to select any item or sub-menu. Descriptions of the selected/highlighted category are displayed at the bottom of the screen.

An arrow symbol next to a field indicates that a sub-menu is available (see figure below). Press <Enter> to display the sub-menu. To exit the sub-menu, press <Esc>.



## Getting Help

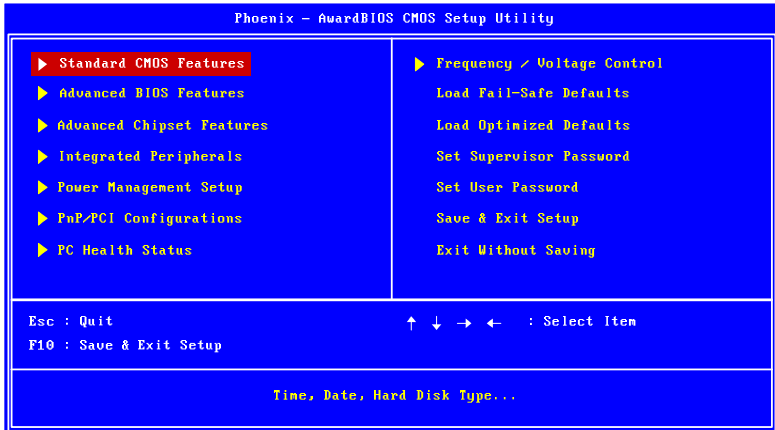
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The BIOS setup program provides a "**General Help**" screen. You can display this screen from any menu/sub-menu by pressing <**F1**>. The help screen displays the keys for using and navigating the BIOS setup. Press <**Esc**> to exit the help screen.

## Main Menu

---

The Main Menu contains twelve setup functions and two exit choices. Use arrow keys to select the items and press <Enter> to accept or enter Sub-menu.



### Standard CMOS Features

Use this menu to set basic system configurations.

### Advanced BIOS Features

Use this menu to set the advanced features available on your system.

### Advanced Chipset Features

Use this menu to set chipset specific features and optimize system performance.

### Integrated Peripherals

Use this menu to set onboard peripherals features.

### Power Management Setup

Use this menu to set onboard power management functions.

### PnP/PCI Configurations

Use this menu to set the PnP and PCI configurations.

## PC Health Status

This menu shows the PC health status.

## Frequency/Voltage Control

Use this menu to set the system frequency and voltage control.

## Load Fail-Safe Defaults

Use this menu option to load the BIOS default settings for minimal and stable system operations.

## Load Optimized Defaults

Use this menu option to load BIOS default settings for optimal and high performance system operations.

## Set Supervisor Password

Use this menu option to set the BIOS supervisor password.

## Set User Password

Use this menu option to set the BIOS user password.

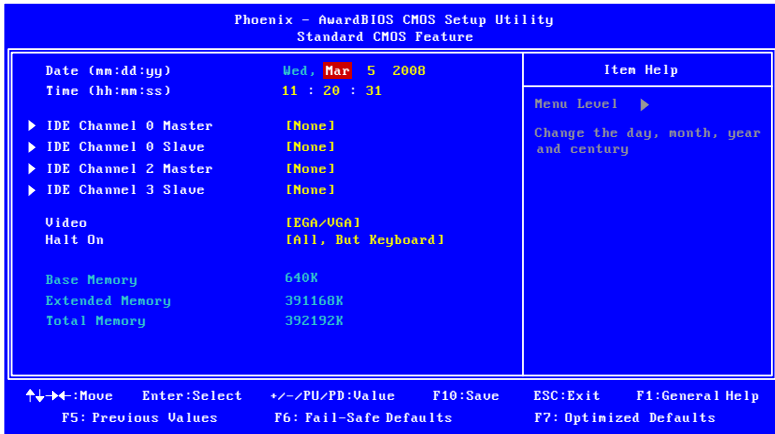
## Save & Exit Setup

Save BIOS setting changes and exit setup.

## Exit Without Saving

Discard all BIOS setting changes and exit setup.

## Standard CMOS Features



### Date

The date format is [Day, Month Date, Year]

### Time

The time format is [Hour : Minute : Second]

### Video

Settings: [EGA/VGA, CGA 40, CGA 80, MONO]

### Halt On

Set the system's response to specific boot errors. Below is a table that details the possible settings.

Settings	Description
All Errors	System halts when any error is detected
No Errors	System does not halt for any error
All, But Keyboard	System halts for all non-key errors

## IDE Drives

### IDE Channel 0 Master

Phoenix - AwardBIOS CMOS Setup Utility  
IDE Channel 0 Master

IDE HDD Auto-Detection <b>(Press Enter)</b> IDE Channel 0 Master <b>[Auto]</b> Access Mode <b>[Auto]</b> Capacity                        0 MB Cylinder                        0 Head                             0 Precomp                         0 Landing Zone                  0 Sector                          0 Primary Master PIO <b>[Auto]</b> Primary Master UDMA <b>[Auto]</b>	<p style="text-align: center;"><b>Item Help</b></p> <hr/> Menu Level ▶ To auto-detect the HDD's size, head... on this channel
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------

↑↓←→:Move    Enter:Select    +/-/PU/PD:Value    F10:Save    ESC:Exit    F1:General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

### IDE Channel 0 Slave

Phoenix - AwardBIOS CMOS Setup Utility  
IDE Channel 0 Slave

IDE HDD Auto-Detection <b>(Press Enter)</b> IDE Channel 0 Slave <b>[Auto]</b> Access Mode <b>[Auto]</b> Capacity                        0 MB Cylinder                        0 Head                             0 Precomp                         0 Landing Zone                  0 Sector                          0 Primary Slave PIO <b>[Auto]</b> Primary Slave UDMA <b>[Auto]</b>	<p style="text-align: center;"><b>Item Help</b></p> <hr/> Menu Level ▶ To auto-detect the HDD's HDD's size head... on this channel
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------

↑↓←→:Move    Enter:Select    +/-/PU/PD:Value    F10:Save    ESC:Exit    F1:General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

## IDE Channel 2 Master

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
IDE Channel 2 Master		
IDE HDD Auto-Detection	<b>[Press Enter]</b>	Menu Level ▶
Extended IDE Drive Access Mode	<b>[Auto]</b>	To auto-detect the HDD's size, head... on this channel!
Capacity	0 MB	
Cylinder	0	
Head	0	
Precomp	0	
Landing Zone	0	
Sector	0	

↑↓→←:Move    Enter:Select    +~/~PU/PD:Value    F10:Save    ESC:Exit    F1:General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

## IDE Channel 3 Slave

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
IDE Channel 3 Master		
IDE HDD Auto-Detection	<b>[Press Enter]</b>	Menu Level ▶
Extended IDE Drive Access Mode	<b>[Auto]</b>	To auto-detect the HDD's size, head... on this channel!
Capacity	0 MB	
Cylinder	0	
Head	0	
Precomp	0	
Landing Zone	0	
Sector	0	

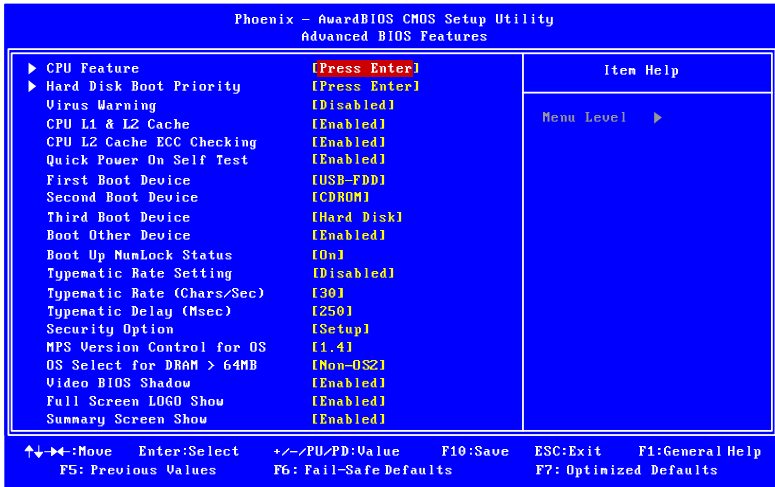
↑↓→←:Move    Enter:Select    +~/~PU/PD:Value    F10:Save    ESC:Exit    F1:General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in this category. Select **“Auto”** whenever possible. If you select **“Manual”**, make sure the information is from your hard disk vendor or system manufacturer.

Below is a table that details required hard drive information when using the **“Manual”** mode.

<b>Settings</b>	<b>Description</b>
IDE Channel	The name of this match the name of the menu. Settings: [None, Auto, Manual]
Extended IDE Drive	Settings: [None, Auto]
Access Mode	Settings: [CHS, LBA, Large, Auto]
Capacity	Formatted size of the storage device
Cylinder	Number of cylinders
Head	Number of heads
Precomp	Write precompensation
Landing Zone	Cylinder location of the landing zone
Sector	Number of sectors
Primary Master PIO	Settings: [Auto, Mode 0, Mode 1, Mode 1, Mode 2, Mode 3, Mode 4]
Primary Master UDMA	Settings: [Disabled, Auto]
Primary Slave PIO	Settings: [Auto, Mode 0, Mode 1, Mode 1, Mode 2, Mode 3, Mode 4]
Primary Slave UDMA	Settings: [Disabled, Auto]

## Advanced BIOS Features



### Virus Warning

Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection.

Settings	Description
Enabled	Turns on hard disk boot sector virus protection
Disabled	Turns off hard disk boot sector virus protection



**Note:**  
If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on the screen and alarm beep.

### CPU L1 & L2 Cache

Settings	Description
Disabled	Turns off CPU L1 & L2 cache
Enabled	Turns on CPU L1 & L2 cache

## CPU L2 Cache ECC Checking

Settings: [Enabled, Disabled]

## Quick Power On Self-Test

Shortens Power On Self-Test (POST) cycle to enable shorter boot up time.

Settings	Description
Disabled	Standard Power On Self Test (POST)
Enabled	Shorten Power On Self Test (POST) cycle and boot up time

## First/Second/Third Boot Device

Set the boot device sequence as BIOS attempts to load the disk operating system.

Settings	Description
LS120	Boot from LS-120 drive
Hard Disk	Boot from the HDD
CDROM	Boot from CDROM
ZIP100	Boot from ATAPI ZIP drive
USB-FDD	Boot from USB Floppy drive
USB-ZIP	Boot from USB ZIP drive
USB-CDROM	Boot from USB CDROM
Legacy LAN	Boot from network drive
Disabled	Disable the boot device sequence

## Boot Other Device

Enables the system to boot from alternate devices if the system fails to boot from the "First/Second/Third Boot Device" lists.

Settings	Description
Disabled	No alternate boot device allowed
Enabled	Enable alternate boot device

## Boot Up NumLock Status

Set the NumLock status when the system is powered on.

Settings	Description
Off	Forces keypad to behave as arrow keys
On	Forces keypad to behave as 10-key

## Typematic Rate Setting

Enables "Typematic Rate" and "Typematic Delay" functions.

Settings: [Disabled, Enabled]

## Typematic Rate (Chars/Sec)

This item sets the rate (characters/second) at which the system retrieves a signal from a depressed key.

Settings: [6, 8, 10, 12, 15, 20, 24, 30]

## Typematic Delay (Msec)

This item sets the delay between, when the key was first pressed and when the system begins to repeat the signal from the depressed key.

Settings: [250, 500, 750, 1000]

## Security Option

Selects whether the password is required every time the System boots, or only when you enter Setup.

Settings	Description
Setup	Password prompt appears only when end users try to run BIOS Setup
System	Password prompt appears every time when the computer is powered on and when end users try to run BIOS Setup

## MPS Version Control for OS

Settings: [1.1, 1.4]

## OS Select for DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

Settings: [Non-OS2, OS2]

## Video BIOS Shadow

Enabled copies Video BIOS to shadow RAM Improves performance.

Settings: [Disabled, Enabled]

## Full Screen Logo Show

Show full screen logo during BIOS boot up process.

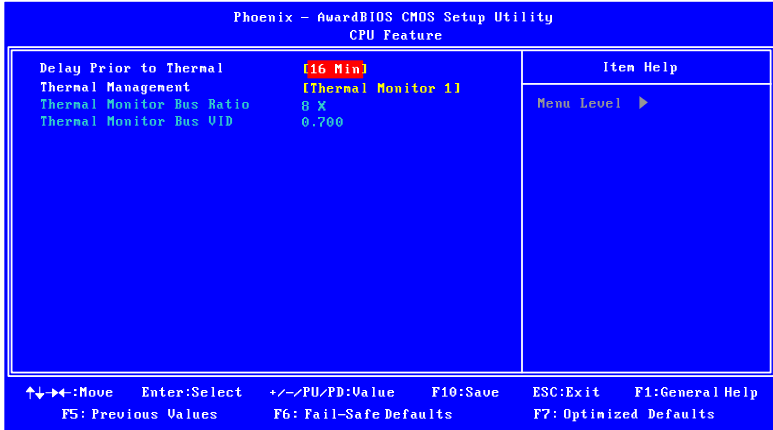
Settings: [Disabled, Enabled]

## Summary Screen Show

Show summary screen.

Settings: [Disabled, Enabled]

## CPU Features



### Delay Prior to Thermal

Settings: [4 Min, 8 Min, 16 Min, 32 Min]

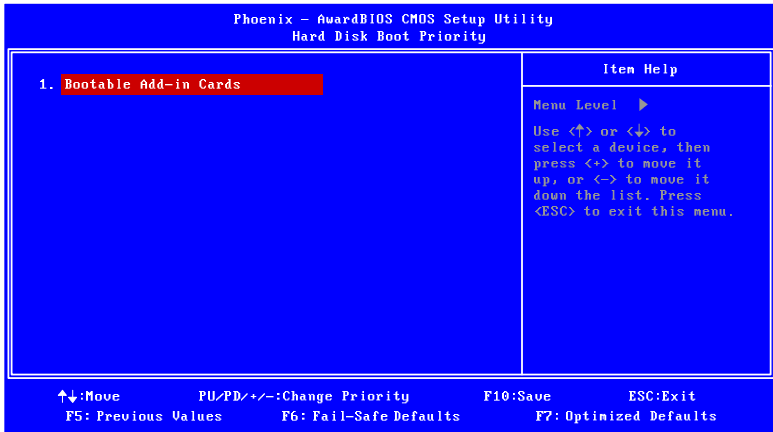
### Thermal Management

This item sets CPU's thermal control rule to protect CPU from overheat.

Settings	Description
Thermal Monitor 1	On-die throttling
Thermal Monitor 2	Ratio & VID transition

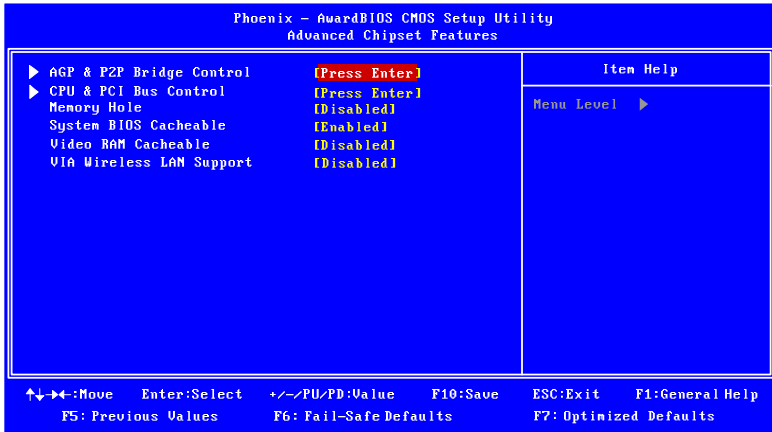
## Hard Disk Boot Priority

---



This is for setting the priority of the hard disk boot order when the "Hard Disk" option is selected in the "[First/Second/Third] Boot Device" menu item.

## Advanced Chipset Features



**Caution:**

The Advanced Chipset Features menu is used for optimizing the chipset functions. Do not change these settings unless you are familiar with the chipset.

### Memory Hole

Settings: [Disabled, 15M – 16M]

### System BIOS Cacheable

Settings: [Disabled, Enabled]

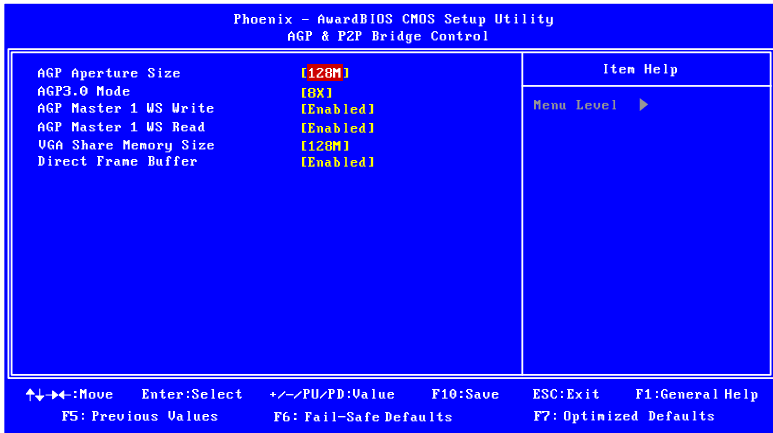
### Video RAM Cacheable

Settings: [Disabled, Enabled]

### VIA Wireless LAN Support

Settings: [Enabled, Disabled]

## AGP & P2P Bridge Control



### AGP Aperture Size

This setting controls how much memory space can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

Settings: [32MB, 64MB, 128MB, 256MB, 512MB, 1GB]

### AGP3.0 Mode

This mainboard supports the AGP 8x interface. When the AGP 8x video card is used, it can transfer video data at 2133MB/s. AGP 8x is backward compatible, leave the default 4x mode on. AGP 4x mode can be detected automatically once you plug in the AGP 4x card.

Settings: [8x, 4x]

### AGP Master 1 WS Write

Settings: [Disabled, Enabled]

### AGP Master 1 WS Read

Settings: [Disabled, Enabled]

## VGA Share Memory Size

This setting allows you to select the amount of system memory that is allocated to the integrated graphics processor.

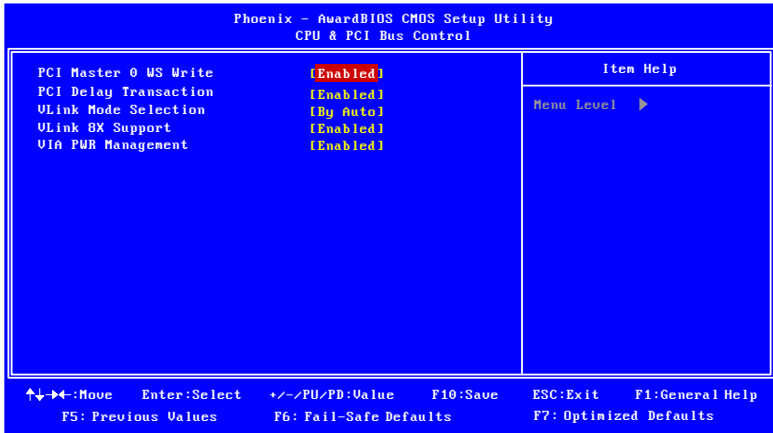
Settings: [Disabled, 64M, 128M, 256M]

## Direct Frame Buffer

Settings: [Disabled, Enabled]

## CPU & PCI Bus Control

---



### PCI Master 0 WS Write

Settings: [Enabled, Disabled]

### PCI Delay Transaction

Settings: [Disabled, Enabled]

### VLink Mode Selection

Settings: [By Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4]

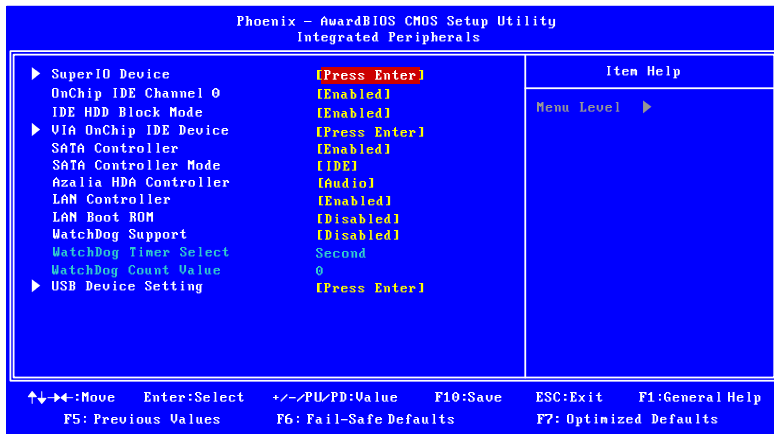
### VLink 8X Support

Settings: [Disabled, Enabled]

### VIA PWR Management

Settings: [Disabled, Enabled]

## Integrated Peripherals



### OnChip IDE Channel 0

Settings: [Disabled, Enabled]

### IDE HDD Block Mode

This allows the hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read / write.

Settings	Description
Disabled	Standard Mode
Enabled	Block Mode

### SATA Controller

Settings: [Disabled, Enabled]

### SATA Controller Mode

Controls the features of the Serial ATA controller within the South Bridge. Serial ATA is the latest generation of the ATA interface. Serial ATA hard drives deliver transfer speeds of up to 300MB/sec.

Settings	Description
IDE	Supports two PATA hard disk drives. Disables RAID and AHCI function.
RAID	Only SATA supports RAID and AHCI function

## Azalia HDA Controller

Settings: [Auto, Disabled]

## LAN Controller

Settings: [Enabled, Disabled]

## LAN Boot ROM

Settings: [Enabled, Disabled]

## WatchDog Support

Settings: [Enabled, Disabled]

## WatchDog Timer Select

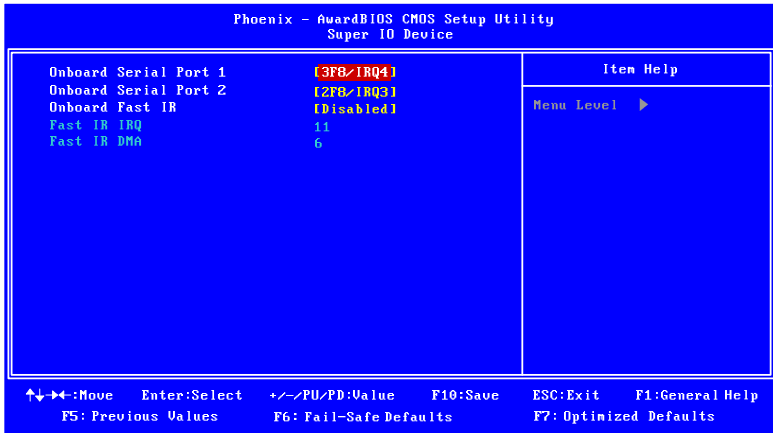
Settings: [Minute, Second]

## WatchDog Count Value

Key in a DEC number.

Settings: [Min = 0, Max = 255]

## SuperIO Device



### Onboard Serial Port 1

Settings: [Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto]

### Onboard Serial Port 2

Settings: [Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto]

### Onboard Fast IR

Enable Onboard Fast IR function.

Settings: [Disabled, Enabled]

### Fast IR IRQ

Set this field to reserve an IRQ for the Fast IR port. This field is only available if Onboard Fast IR is enabled.

Settings: [3, 4, 11]

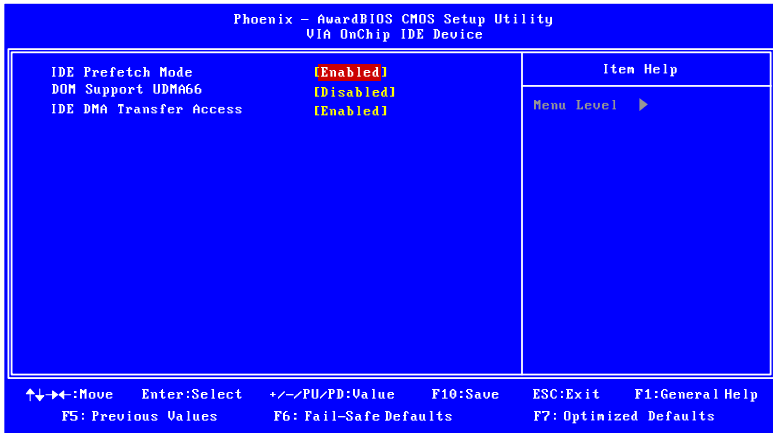
### Fast IR DMA

Set this field to choose the DMA channel. This field is only available if Onboard Fast IR is enabled.

Settings: [5, 6]

## VIA OnChip IDE Device

---



### IDE Prefetch Mode

Settings: [Disabled, Enabled]

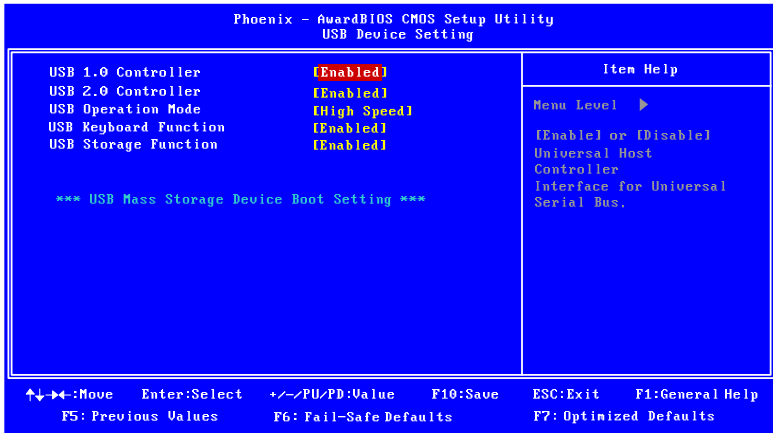
### DOM Support UDMA66

Settings: [Disabled, Enabled]

### IDE DMA Transfer Access

Settings: [Disabled, Enabled]

# USB Device Setting



## USB 1.0 Controller

Enable or disable Universal Host Controller Interface for Universal Serial Bus.  
 Settings: [Disabled, Enabled]

## USB 2.0 Controller

Enable or disable Enhanced Host Controller Interface for Universal Serial Bus.  
 Settings: [Disabled, Enabled]

## USB Operation Mode

Auto decide USB device operation mode.

Settings	Description
Full/Low Speed	All of USB Device operated on full/low speed mode
High Speed	If USB device was high speed device, then it operated on high speed mode.

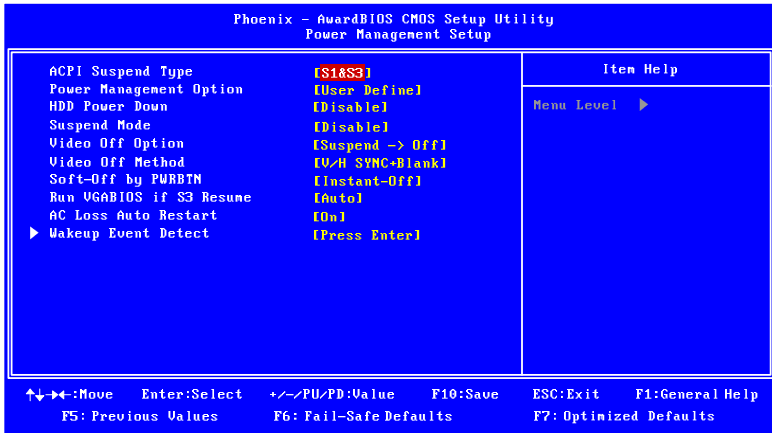
## USB Keyboard Function

Enable or disable Legacy support of USB Keyboard.  
 Settings: [Disabled, Enabled]

## USB Storage Function

Enable or disable Legacy support of USB Mass Storage.  
 Settings: [Disabled, Enabled]

# Power Management Setup



## ACPI Suspend Type

Settings	Description
S1(POS)	S1/Power On Suspend (POS) is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system contexts.
S3(STR)	S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only to essential components such as main memory and wakeup-capable devices. The system context is saved to main memory, and context is restored from the memory when a "wakeup" event occurs.
S1 & S3	Depends on the OS to select S1 or S3.

## Power Management Option

Settings: [User Define, Min Saving, Max Saving]

## HDD Power Down

Set the length of time for a period of inactivity before powering down the hard disk.

Settings: [Disable, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min]

## Suspend Mode

Sets the length of time for a period of inactivity before entering suspend mode.

Settings: [Disable, 1 Min, 2 Min, 4 Min, 6 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 1 Hour]

## Video Off Option

Select whether or not to turn off the screen when system enters power saving mode, ACPI OS such as Windows XP will override this option.

Settings	Description
Always On	Screen is always on even when system enters power saving mode
Suspend -> Off	Screen is turned off when system enters power saving mode

## Video Off Method

Settings: [Blank Screen, V/H SYNC+Blank, DPMS Support]

## Soft-Off by PWRBTN

This field configures the power button on the chassis.

Settings	Description
Delay 4 Sec	System is turned off if power button is pressed for more than four seconds.
Instant-Off	Power button functions as a normal power-on/-off button.

## Run VGABIOS if S3 Resume

Select whether to run VGA BIOS if resuming from S3 state. This is only necessary for older VGA drivers.

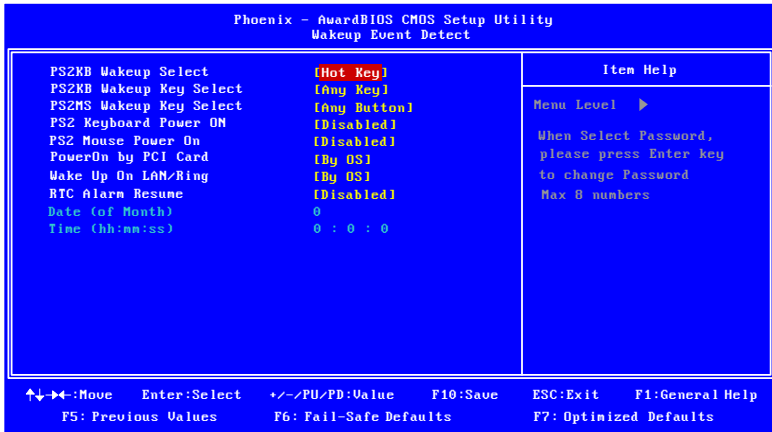
Settings: [Auto, Yes, No]

## AC Loss Auto Restart

The field defines how the system will respond after an AC power loss during system operation.

Settings	Description
Off	Keeps the system in an off state until the power button is pressed
On	Restarts the system when the power is back
Former-Sts	Former-Sts

## Wakeup Event Detect



### PS2KB Wakeup Select

When selecting "Password", press <Page Up> or <Page Down> to change password. The maximum number of characters is eight. "PS2MS Wakeup from S3/S4/S5" and "PS2KB Wakeup from S3/S4/S5" will be disabled while changing the password.

Settings: [Hot Key, Password]

### PS2KB Wakeup Key Select

Sets a Hot Key to restore the system from the power saving mode to an active state.

Settings: [Ctrl+F1, Ctrl+F2, Ctrl+F3, Ctrl+F4, Ctrl+F5, Ctrl+F6, Ctrl+F7, Ctrl+F8, Ctrl+F9, Ctrl+F10, Ctrl+F11, Ctrl+F12, Power, Wake, Any Key]

### PS2MS Wakeup Key Select

Enables any mouse activity to restore the system from the power saving mode to an active state.

Settings: [Any Button, Left Button, Right Button]

### PS2 Keyboard Power On

Settings: [Disabled, Enabled]

## PS2 Mouse Power On

Settings: [Disabled, Enabled]

## PowerOn by PCI Card

Enables activity detected from any PCI card to power up the system or resume from a suspended state. Such PCI cards include LAN, onboard USB ports, etc.

Settings: [By OS, Enabled]

## Wake Up On LAN/Ring

Enables any Wake-on LAN or Ring-In signals from the Ethernet or modem to restore the system from a suspended state to an active state.

Settings: [By OS, Enabled]

## RTC Alarm Resume

Set a scheduled time and/or date to automatically power on the system.

Settings: [Disabled, Enabled]

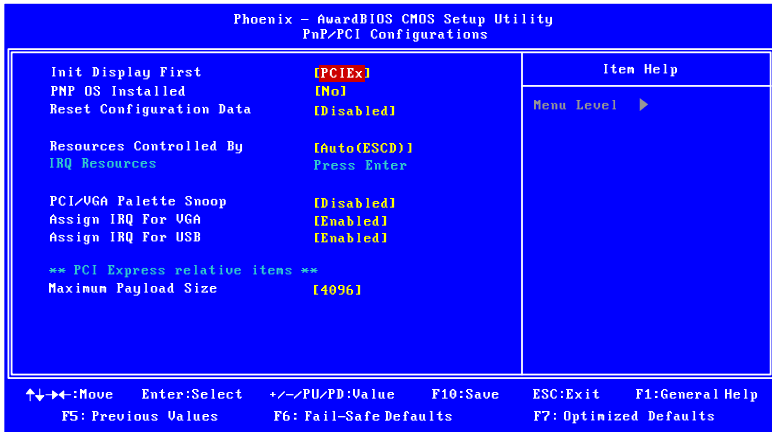
## Date (of Month)

The field specifies the date for "RTC Alarm Resume".

## Resume Time (hh : mm : ss)

The field specifies the time for "RTC Alarm Resume".

## PnP/PCI Configurations



**Note:**

This section covers some very technical items and it is strongly recommended to leave the default settings as is unless you are an experienced user.

### Init Display First

Settings: [PCI Slot, Onboard, PCIEx]

### PNP OS Installed

Settings	Description
No	BIOS will initialize all the PnP cards
Yes	BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system

### Reset Configuration Data

Settings	Description
Disabled	Default setting
Enabled	Resets the ESCD (Extended System Configuration Data) after exiting BIOS Setup if a newly installed PCI card or the system configuration prevents the operating system from loading

## Resources Controlled By

Enable the BIOS to automatically configure all the Plug-and-Play compatible devices.

Settings	Description
Auto(ESCD)	BIOS will automatically assign IRQ, DMA and memory base address fields
Manual	Unlocks "IRQ Resources" for manual configuration

## PCI/VGA Palette Snoop

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

Settings: [Disabled, Enabled]

## Assign IRQ for VGA

Assign IRQ for VGA devices.

Settings: [Disabled, Enabled]

## Assign IRQ for USB

Assign IRQ for USB devices.

Settings: [Disabled, Enabled]

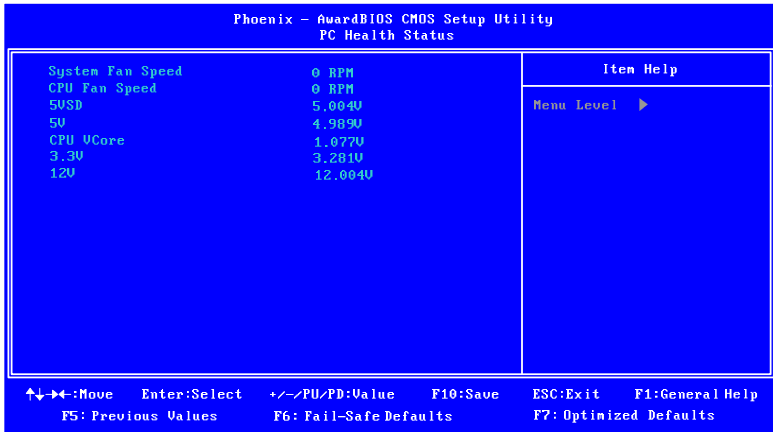
## Maximum Payload Size

Set maximum TLP payload size for the PCI Express devices. The unit is byte.

Settings: [128, 256, 512, 1024, 2048, 4096]

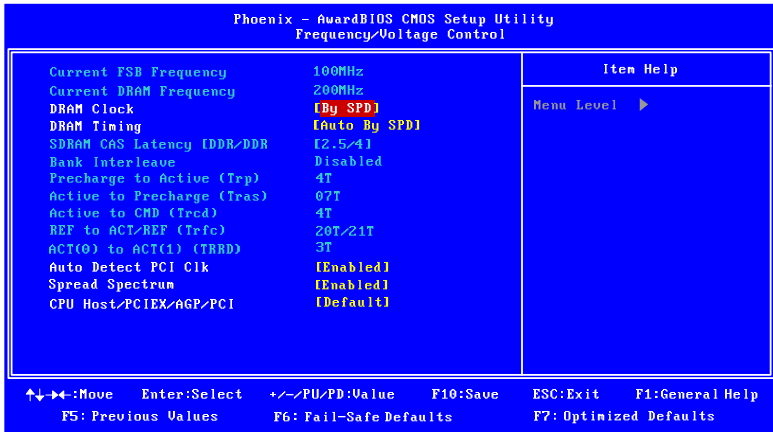
## PC Health Status

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The PC Health Status displays the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and fan speeds.

## Frequency/Voltage Control



### DRAM Clock

The chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency.

Settings: [By SPD, 200MHz, 266MHz, 333MHz]

### DRAM Timing

The value in this field depends on the memory modules installed in your system. Changing the value from the factory setting is not recommended unless you install new memory that has a different performance rating than the original modules.

Settings: [Manual, Auto By SPD]

### SDRAM CAS Latency [DDR/DDR2]

This item is for setting the speed it takes for the memory module to complete a command. Generally, a lower setting will improve the performance of your system. However, if your system becomes less stable, you should change it to a higher setting. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [1.5/2, 2/3, 2.5/4, 3/5]

## Bank Interleave

This item is for setting the interleave mode of the SDRAM interface. Interleaving allows banks of SDRAM to alternate their refresh and access cycles. One bank will undergo its refresh cycle while another is being accessed. This improves performance of the SDRAM by masking the refresh time of each bank. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [Disabled, 2 Bank, 4 Bank, 8 Bank]

## Precharge to Active (Trp)

This field is for setting the length of time it takes to precharge a row in the memory module before the row becomes active. Longer values are safer but may not offer the best performance. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T, 4T, 5T]

## Active to Precharge (Tras)

This field is for setting the length of time it a row stays active before precharging. Longer values are safer but may not offer the best performance. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [05T, 06~20T]

## Active to CMD (Trcd)

This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T, 4T, 5T]

## REF to ACT / REF (Trfc)

This field is only available when "DRAM Timing" is set to "Manual".

Settings: [08T, 09~71T]

## ACT(0) to ACT(1) (TRRD)

This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T, 4T, 5T]

## Auto Detect PCI Clk

Settings: [Enabled, Disabled]

## Spread Spectrum

When the mainboard's clock generator pulses, the extreme values (spikes) of the pulses create EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves.

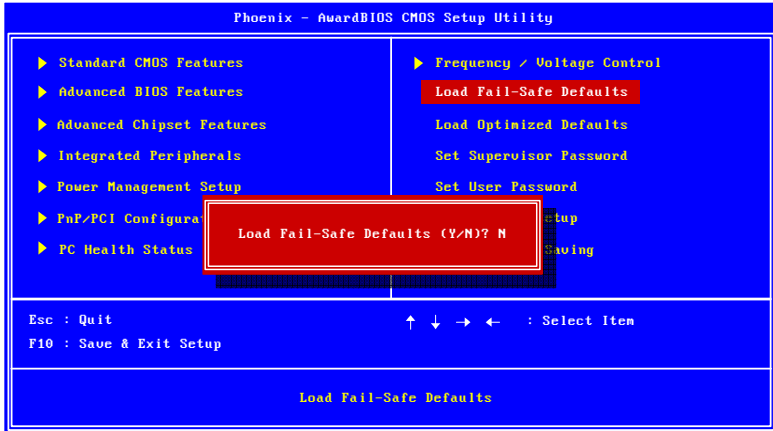
Settings: [Disabled, Enabled]

## CPU Host/PCIEX/AGP/PCI

Settings: [Default, 133/100/66/33MHz, 137/100/68/34MHz, 200/100/66/33MHz, 202/100/67/33MHz, 206/100/68/34MHz, 210/100/70/35MHz]

## Load Fail-Safe Defaults

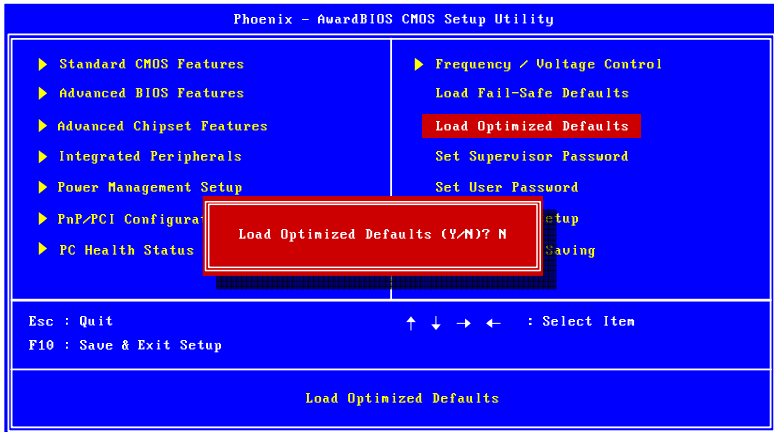
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This option is for restoring all the default fail-safe BIOS settings. These values are set by the mainboard manufacturer to provide a stable system with basic performance.

Entering "Y" and press <Enter> to load the default fail-safe BIOS values. Entering "N" and press <Enter> will cancel the load fail-safe defaults request.

## Load Optimized Defaults

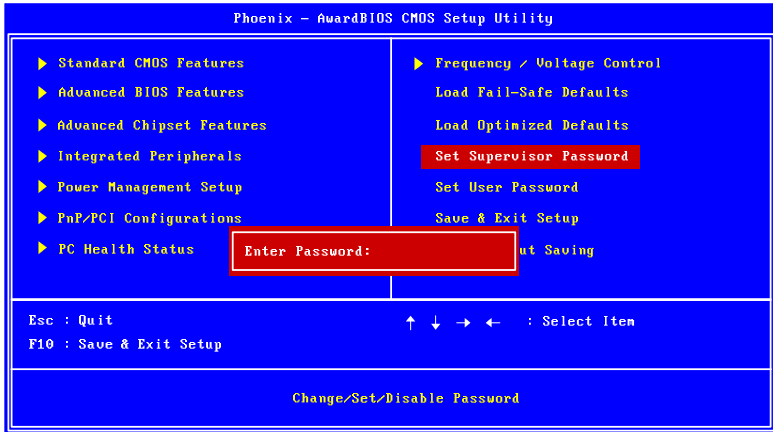


This option is for restoring all the default optimized BIOS settings. The default optimized values are set by the mainboard manufacturer to provide a stable system with optimized performance.

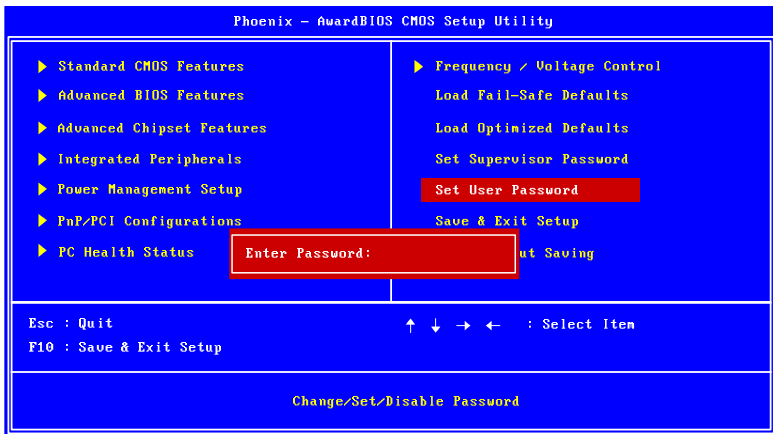
Entering "Y" and press <Enter> to load the default optimized BIOS values. Entering "N" will cancel the load optimized defaults request.

# Set Supervisor/User Password

## Set Supervisor



## User Password



This option is for setting a password for entering BIOS Setup. When a password has been set, a password prompt will be displayed whenever BIOS Setup is run. This prevents an unauthorized person from changing any part of your system configuration.

There are two types of passwords you can set. A supervisor password and a user password. When a supervisor password is used, the BIOS Setup program can be accessed and the BIOS settings can be changed. When a user password is used, the BIOS Setup program can be accessed but the BIOS settings cannot be changed.

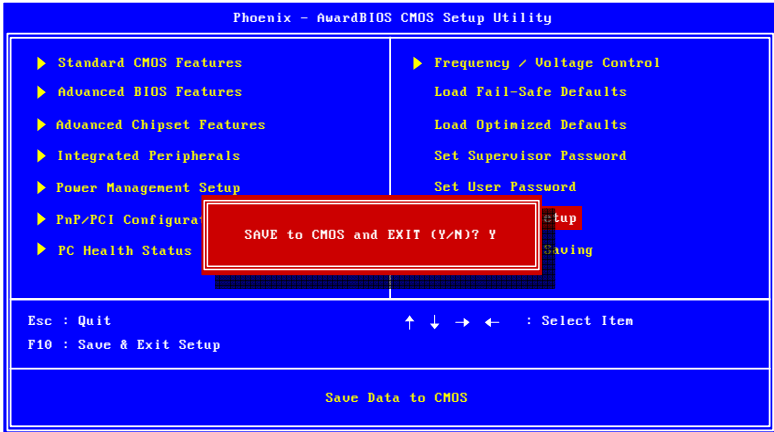
To set the password, type the password (up to eight characters in length) and press <Enter>. The password typed now will clear any previously set password from CMOS memory. The new password will need to be reentered to be confirmed. To cancel the process press <Esc>.

To disable the password, press <Enter> when prompted to enter a new password. A message will show up to confirm disabling the password. To cancel the process press <Esc>.

Additionally, when a password is enabled, the BIOS can be set to request the password each time the system is booted. This would prevent unauthorized use of the system. See "Security Option" in the "Advanced BIOS Features" section for more details.

## Save & Exit Setup

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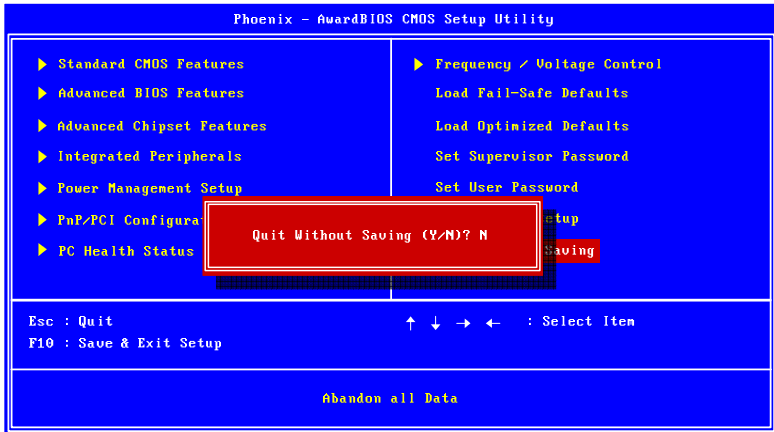


Entering "Y" saves any changes made, and exits the program.

Entering "N" will cancel the exit request.

## Exit Without Saving

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Entering "Y" discards any changes made and exits the program.

Entering "N" will cancel the exit request.

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# CHAPTER 4

## DRIVER INSTALLATION

This chapter gives you brief descriptions of each mainboard driver and application. You must install the VIA chipset drivers first before installing other drivers such as VGA drivers. The applications will only function correctly if the necessary drivers are already installed.

## Driver Utilities

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### Getting Started

The mainboard includes a Driver Utilities CD that contains the drivers and software for enhancing the performance of the mainboard. If the CD is missing from the retail box, please contact the local dealer for the CD.



**Note:**

The driver utilities and software are updated from time to time. The latest updated versions are available at <http://www.viaembedded.com/>

## Running the Driver Utilities CD

To start using the CD, insert the CD into the CD-ROM or DVD-ROM drive. The CD should run automatically after closing the CD-ROM or DVD-ROM drive. The driver utilities and software menu screen should then appear on the screen. If the CD does not run automatically, click on the "Start" button and select "Run..." Then type: "D:\Setup.exe".

For Linux drivers, click the right button on mouse and click open. Linux drivers are located in the "Driver" folder.



**Note:**

D: might not be the drive letter of the CD-ROM/DVD-ROM in your system.

## CD Content

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- VIA 4in1 Drivers:**
  - Contains VIA ATAPI Vendor Support Driver (enables the performance enhancing bus mastering functions on ATA-capable Hard Disk Drives and ensures IDE device compatibility), AGP VxD Driver (provides service routines to your VGA driver and interface directly to hardware, providing fast graphical access), IRQ Routing Miniport Driver (sets the system's PCI IRQ routing sequence) and VIA INF Driver (enables the VIA Power Management function).
  - Includes V-RAID and RAID tools.
- VIA Graphics Driver:**
  - Enhances the onboard VIA graphic chip.
- VIA Audio Driver:**
  - Enhances the onboard VIA audio chip.
- VIA USB 2.0 Driver:**
  - Enhances VIA USB 2.0 ports.
- VIA LAN Driver:**
  - Enhances the onboard VIA VT6103L 10/100Mbps LAN chip.
- VIA RAID Driver:**
  - Support for RAID devices.
- VIA FIR Driver:**
  - Support for FIR.