

ROCKY - 4784EVG Series

User Manual

Version 1.3

<Product Overview>

**SOCKET 478 PENTIUM 4 with
10/100M LAN & Gigabit LAN &
SiS 315 AGP4X VGA SBC**

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Chapter 1. Introduction

Thank you for choosing ROCKY-4784EVG SOCKET 478 PENTIUM 4 Single Board Computer. The ROCKY-4784EVG board is an ISA/PCI form factor board, which equipped with high performance Processor and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

In addition, ROCKY-4784EVG provides SiS315 AGP4X VGA on board. The VGA chip is 3D graphics chipset, which provides up to 2048x1536x16-color resolution. The VGA on board has 32MB SDRAM frame buffer .

An advanced high performance Super AT I/O Chip – Winbond W83627HF is used in the ROCKY-4784EVG board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

The ROCKY-4784EVG uses dual(ICH2 & **Broadcom BCM5705**) 10/100 & 10/100/1000 Fast Ethernet LAN .They are fully integrated 10BASE-T/100BASE-TX & 10BASE-T/100BASE-TX/1000BASE-T LAN solution with high performance networking functions as well as low power consumption.

The ROCKY-4784EVG uses the advanced Intel 845E/ICH2 Chipsets which is 100% software compatible chipset with PCI 2.2 standard.

1.1 Specifications

- **CPU(PGA 478) Intel:** Pentium 4 Processor, supports 400/533 MHz FSB
- **Bus interface:** PCI/ISA bus, PICMG compliant
- **Bus speed:** ISA : 8MHz, PCI: 33MHz
- **DMA channels:** 7
- **Interrupt levels:** 15
- **Chipset:** INTEL 845E (MCH)
- **Real-time clock/calendar:** INTEL 82801BA(ICH2)
- **RAM memory:** TWO 184-pin DIMM sockets support DDR SDRAM . The max. Memory is up to 2GB.
- **ATA/100 IDE interface:** Up to four PCI Enhanced IDE hard drives. The ATA/100 IDE can handle data transfer up to 100MB/s. Compatible with existing ATA-2 IDE specifications its best advantage, so there is no need to do any changes for users' current accessories.
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)
- **Serial ports:** Two RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be individually configured to COM1, COM2 or disabled.
- **Bi-directional parallel port:** Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP
- **Hardware monitor:** Built-in to monitor power supply voltage and fan speed status
- **IrDA port:** Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface
- **USB port:** Supports 2 USB ports for future expansion
- **Watch-dog timer:** Software Programmable Reset generated when CPU does not periodically trigger the timer. You can use I/O Port hex 043(843) & 443 to control the watchdog and generate a system reset.
- **VGA controller:** On Board SiS 315 AGP4X 256-bit 3D graphics engine. 32MB SDRAM. (Driver select AG-32) Screen Resolution: up to 2048x1536x16.
- **Ethernet:** ICH2-82562E & **Broadcom-BCM5705** Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX & 10BASE-T/100BASE-TX/1000BASE-T standard. Two RJ45 connectors are located on the mounting bracket for easy connection.
- **Keyboard and PS/2 mouse connector:** A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. For alternative application, a keyboard and a PS/2 mouse pin header connector are also available on board.
- **Audio:** AC'97 Audio CODEC
- **CompactFlash:** It can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
- **Power consumption**
 - ✓ (PENTIUM 4 : 2GHz, 1GB DDR266 SDRAM)
 - ✓ +5V @ 4.46A , +12V @ 6.55A .
 - ✓ Recommended : 350-watt power supply or higher
- **Operating temperature** 0° ~ 60° C (*CPU needs Cooler & silicone heatsink paste*)

WARNING !

1. Never run the processor without the heatsink(Cooler) properly and firmly attached.
2. Please use ATX-12V Power Connector (J2) to provide power to the CPU.

1.2 Package Contents

In addition to this *User Manual*, the ROCKY-4784EVG package includes the following items:

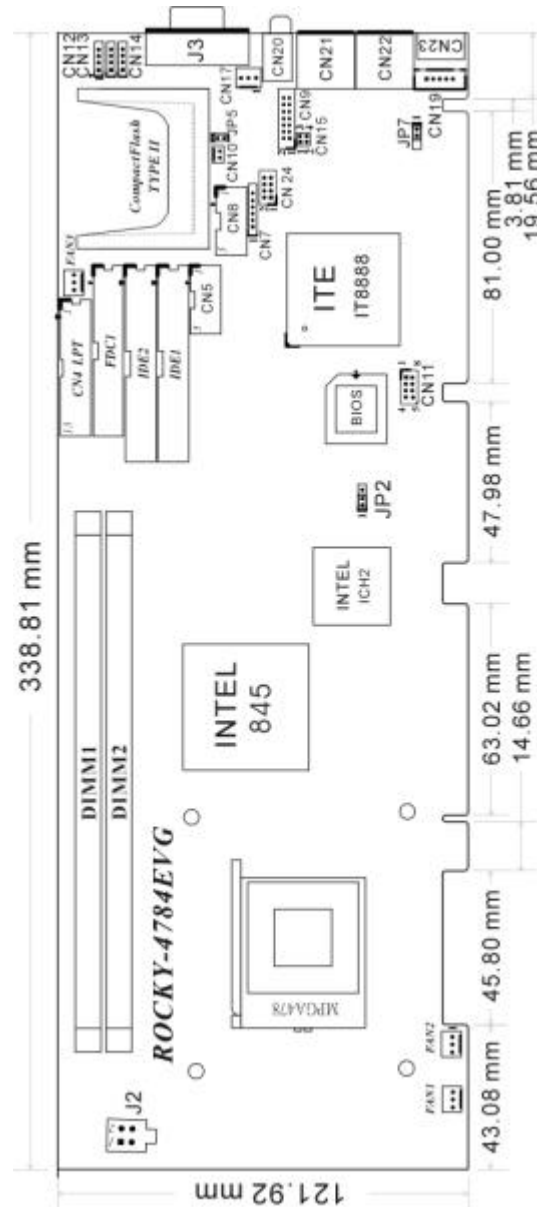
- One ROCKY-4784EVG Single Board Computer
- One RS-232 x2 and Printer Cable with bracket
- One FDD cable
- One ATA/100 IDE cables.
- One ATX-12V cables.
- One 6-pin Mini-Din converts to two 6-pin mini-Din cables for keyboard and mouse connection.

If any of these items are missing or damaged, contact the dealer from whom you purchased this product. Save the shipping materials and carton in case you want to ship or store the product in the future.

Chapter 2. Installation

This chapter describes how to install the ROCKY-4784EVG. First, the layout of ROCKY-4784EVG is shown, then comes the unpacking information that you should be careful is described. The jumpers and switches setting for the ROCKY-4784EVG's configuration, such as CPU clock setting, and watchdog timer, are also included.

2.1 ROCKY - 4784EVG's Layout



2.2 Unpacking Precautions

Some components on ROCKY-4784EVG SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- ✓ Ground yourself to remove any static charge before touching your ROCKY-4784EVG SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- ✓ Handle your ROCKY-4784EVG SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.
- ✓ Do not plug any connector or jumper while the power is on.

● Table of Jumpers

LABEL	FUNCTION
JP2	CMOS state setting
JP5	CompactFlash Master(short)/Slave(open) Setting.
JP7	Keyboard/Mouse power source Setting

Note: All shaded rows in tables of this manual are the default settings for the ROCKY-4784EVG.

2.3 Clear CMOS Setup

If user want to clear the CMOS Setup (for example you have forgotten the password then you should clear setup and then reset the password.), you should short the JP2 (2-3) about 3 seconds, then open it again. Set back to normal operation mode, open JP2.

● JP2 : Clear CMOS Setup (Reserve Function)

JP2	DESCRIPTION
1-2	Normal Operation
2-3	Clear CMOS Setup

WARNING !

When you change power between ATX to AT, be sure to clear CMOS(Power ON) first. Otherwise, the CPU Board may fail to boot.

2.4 CompactFlash Master/Slave Setting

JP5	DESCRIPTION
Short	Master
Open	Slave

2.5 Onboard Keyboard/Mouse source Setting

JP7	DESCRIPTION
1-2	VCC (+5V)
2-3	5VSB

Chapter 3. Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY- 4784EVG board.

● Table of Connectors

LABEL	FUNCTION
FAN1~FAN3	Fan Connectors
J2	ATX-12V CPU Power Source
J3	VGA 15-pin Female Connector
CN7	IrDA connector
CN10	ATX BUTTON (Power ON) Switch
CN11	USB Connectors
CN4	Parallel Port Connector
CN8,CN5	Serial Port 10-pin Connectors
CN9	External Switches and Indicators
CN12	AUDIO LINE-IN
CN13	AUDIO CD-IN
CN14	AUDIO MIC-IN
CN15,CN24	LAN State LED Connectors
CN21,CN22	LAN RJ45 Connectors
CN17	Backplane to Mainboard Connectors
CN19	External 5-pin Header Keyboard Connector
CN23	PS/2 MOUSE & KEYBOARD Connector
FDC1	FDC Connector
IDE2	Secondary IDE Connector
IDE1	Primary IDE Connector

3.1 Floppy Disk Drive Connector

The ROCKY-4784EVG board is equipped with a 34-pin daisy-chain drive connector cable.

● FDC1 : FDC Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) hard disk drives on two channels. These connectors support Ultra-DMA100 IDE devices. Non-DMA100 devices are suggested to be connecting to the secondary IDE connector.

IDE 1 : Primary IDE Connector

IDE 2 : Secondary IDE Connector

• **IDE Interface Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND - DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

3.3 Parallel Port

This port is usually connected to a printer. The ROCKY -4784EVG includes an on-board parallel port, accessed through a 26-pin flat-cable connector.

• **CN4 : Parallel Port Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND		

3.4 Serial Ports

The ROCKY-4784EVG offers two high speeds NS16C550 compatible UART.

CN8 (COM1) : 10-pin header on board

CN5 (COM2) : 10-pin header on board

CONNECTOR	PORTS	ADDRESS	INTERRUPT
CN8	COM1	3F8	IRQ4
CN5	COM2	2F8	IRQ3

• Serial Port 10-pin Connector

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	GROUND (GND)

3.5 Keyboard & PS/2 Mouse Connector

A 6-pin mini DIN connector (CN23) is located on the mounting bracket for easy connection to a keyboard or a PS/2 mouse. The card comes with a cable to convert from the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for keyboard and mouse connection.

• CN23 : 6-pin Mini-DIN Keyboard Connector

PIN	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

For alternative application, a keyboard pin header connector are also available on board, located on CN19 respectively.

• CN19 : 5-pin Header Keyboard Connector

PIN	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN9 connector.

• **CN9 : External Switches and Indicators**

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker	Speaker
	3	N/C	4	N/C	
	5	GND	6	N/C	
	7	Reserved	8	+5V	
	9	Reserved	10	Reset Switch	Reset button
	11	GND	12	GND	
HDD(+)	13	IDE LED+	14	IDE LED-	HDD(-)

• **CN10 : 2-pin Header ATX BUTTON Connector**

PIN	DESCRIPTION
1	ATX BUTTON PIN1
2	ATX BUTTON PIN2

• **CN17 : Backplane to Mainboard Connector**

PIN	DESCRIPTION
1	5VSB
2	ATX-ON
3	GND

Power source from Backplane with ATX Connector
(Through Power Button & +5VSB)

3.7 USB Port Connector

The ROCKY- 4784EVG provide 2 built-in USB ports for the future new I/O bus expansion.

CN11			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	8	GROUND
2	DATA-	7	DATA+
3	DATA+	6	DATA-
4	GROUND	5	VCC

3.8 IrDA Infrared Interface Port

The ROCKY-4784EVG has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. If you want to use the IrDA port, you have to configure SIR or ASKIR model in the BIOS under Peripheral Setup COM2. Then the normal RS-232 COM 2 will be disabled.

• **CN7: IrDA connector**

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	Ground
5	IR-TX
6	NC

3.9 Fan Connectors (FAN~FAN3)

The ROCKY-4784EVG provides two CPU cooling fan connectors, these connectors can supply 12V/500mA to the cooling fan. All connectors have the same pin assignments and provide a "rotation" pin to get rotation signals from fans and notice the system. So the system BIOS can recognize the fan speed. Please note that only specified fan can issue the rotation signals.

. Fan Connector

PIN	DESCRIPTION
1	Rotation Signal
2	+12V
3	Ground

3.10 LAN RJ45& State LED Connectors

The ROCKY-4784EVG is equipped with built-in 10/100Mbps & 10/100/1000Mbps Ethernet controllers. You can connect it to your LAN through RJ45 LAN connectors. There are two LED on the connector indicating the status of LAN. The pin assignments are as following: (CN21:ICH2 / CN22:BCM5705)

. LAN RJ45 Connector

PIN	DESCRIPTION		PIN	DESCRIPTION	
	CN21	CN22		CN21	CN22
1	TX+	TD0+	5.	N/C	TD2-
2	TX-	TD0-	6.	RX-	TD1-
3.	RX+	TD1+	7.	N/C	TD3+
4.	N/C	TD2+	8.	N/C	TD3-
LED-Green	Act/Link	ACT	LED-Yellow	100TX	LINK

. CN15(ICH2)/CN24(BCM5705): LAN State LED Connector

PIN	DESCRIPTION	
	CN15	CN24
1-2	ACT/LINK	100
3-4	100TX	1000
5-6		LINK
7-8		ACTIVE

3.11 VGA Connector

The ROCKY-4784EVG has a built-in 15-pin VGA connector directly connects to your CRT monitor.

. J3 : 15-pin Female Connector

1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	+5V	10	GROUND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

3.12 AUDIO Headphone & Connector

The ROCKY-4784EVG has a built-in AC'97 AUDIO CODEC; connector directly connects to your MIC-IN & CD-IN & LINE-IN.

- **CN20: AUDIO Headphone Jack (Output)**
- **CN12: AUDIO LINE-IN Connector (Input)**
- **CN13: AUDIO CD-IN Connector (Input)**
- **CN14: AUDIO MIC-IN Connector (Input)**

PIN	DESCRIPTION		
	CN12	CN13	CN14
1	LEFT	LEFT	MIC-IN
2	GND	GND	GND
3	GND	GND	GND
4	RIGHT	RIGHT	NC

3.13 ATX-12V Power Connector

This connector supports the ATX-12V power.

J2(CPU)			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

Notice: The power from J2 should support at least 6.5A current for the use of P4 CPU. If the power is not enough, the operation of CPU could be abnormal. Be sure the power from power supply is enough, and don't share this power with other devices, such as hard disk and etc. You can use ICP's special cable for connection if your power supply doesn't have suitable cable.

Chapter 4. AWARD BIOS SETUP

4.1 Introduction

This part of manual discusses Award's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.2 Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system. While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing immediately after switching the system on, or
2. By pressing the key when the following message appears briefly at the bottom of the screen during the POST.

Press DEL to enter SETUP.

If the message disappears before you can respond to it and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system will not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

4.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key)	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

Press **F1** to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the **F1** key again.

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the Award BIOS supports an override to the CMOS settings which resets your system to its default settings.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

- **PC Health Status**

Use this menu to monitor your hardware. See section 4.12 for the details.

- **Frequency/Voltage Control**

Use this menu to specify your settings for frequency/voltage control. See section 4.13 for the details.

- **Load Fail-Safe Defaults**

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. See section 4.14 for the details.

- **Load Optimized Defaults**

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs. See section 4.14 for the details.

- **Supervisor / User Password**

Use this menu to set User and Supervisor Passwords. See section 4.15 for the details.

- **Save & Exit Setup**

Save CMOS value changes to CMOS and exit setup. See section 4.16 for the details.

- **Exit Without Save**

Abandon all CMOS value changes and exit setup. See section 4.16 for the details.

4.6 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Phoenix – AwardBIOS CMOS Setup Utility

Standard CMOS Features

Date: Mon, Jan 1 2003 Time: 16:19:20 > IDE Primary Master [2557 MB] > IDE Primary Slave [None] > IDE Secondary Master [None] > IDE Secondary Slave [None] Drive A [1.44M, 3.5 in.] Drive B [None] Video [EGA/VGA] Halt On [All, But Keyboard] Based Memory 640K Extended Memory 64512K Total Memory 65536K	Item Help <hr/> Menu Level > Change the day, month, year and century
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help	
F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults	

Figure 1: The Main Menu

● **Main Menu Selections**

Item	Options	Description
Date	MM DD YYYY	Set the system date.
Time	HH : MM : SS	Set the system time
IDE Primary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

Table 2 Main Menu Selections

● **IDE Adapters**

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. Figure 2 shows the IDE primary master sub menu.

Phoenix – AwardBIOS CMOS Setup Utility
IDE Primary Master

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Primary Master Access Mode	[Auto] [Auto]	Menu Level >>> 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		

Figure 2 IDE Primary Master sub menu

Use the legend keys to navigate through this menu and exit to the main menu.
 Use Table 3 to configure the hard disk.

ITEM	OPTIONS	DESCRIPTION
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	Normal LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Table 3 Hard disk selections

4.7 Advanced BIOS Features

This section allows you to configure your system for basic operation. You modify select system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix – AwardBIOS CMOS Setup Utility

Advanced BIOS Features

Virus Warning [Disabled] CPU L1 & L2 Cache [Enabled] Hyper-Threading [Disabled] Technology [Enabled] Quick Power On Self Test [Disabled] LAN(CN21/UP) BootROM [Floppy] First Boot device [HDD-0] Second Boot device [LS120] Third Boot device [Disabled] Boot other device [Disabled] Swap Floppy Drive [Enabled] Boot Up Floppy Seek [On] Boot Up NumLock Status [Fast] Gate A20 Option [Disabled] Typematic Rate Setting [6] Typematic Rate (Chars/Sec) [250] Typematic Delay (Msec) [Setup] Security Option [Non-OS2] OS Select For DRAM > 64MB	Item Help <hr/> Menu Level ➤ Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults	

- **Virus Warning**

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

- **CPU L1 & L2 Cache**

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

- **Hyper-Threading Technology**

"Enabled" for Windows XP and Linux 2.4.x(OS optimized for Hyper-Threading Technology and "Disable" for other OS(OS not optimized for Hyper-Threading Technology)

PS: If Intel CPU not support Hyper-Threading, the item is no purpose.

- **Quick Power On Self Test**

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

- **LAN(CN21/UP) BootROM**

Enabled	Decompress LAN Boot ROM
Disabled	Don't use Boot ROM

- **First/Second/Third/Other Boot Device**

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Options: Floppy, LS/ZIP, HDD, SCSI, CDROM, Disabled.

- **Swap Floppy Drive**

If the system has two floppy drives, you can swap the logical drive name assignments.

Options: Enabled/Disabled.

- **Boot Up Floppy Seek**

Seeks disk drives during boot up. Disabling speeds boot up.

Options: Enabled/Disabled.

- **Boot Up NumLock Status**

Select power on state for NumLock.

Options: Enabled/Disabled.

- **Gate A20 Option**

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

- **Typematic Rate Setting**

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

Options: Enabled/Disabled.

- **Typematic Rate (Chars/Sec)**

Sets the number of times a second to repeat a key stroke when you hold the key down.

Options: 6, 8, 10, 12, 15, 20, 24, 30.

- **Typematic Delay (Msec)**

Sets the delay time after the key is held down before it begins to repeat the keystroke.

Options: 250, 500, 750, 1000.

- **Security Option**

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
--------	---

Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.
-------	--

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

- **OS Select For DRAM > 64MB**

Select the operating system that is running with greater than 64MB of RAM on the system.

Options: Non-OS2, OS2.

- **Video BIOS Shadow**

This item allows the video BIOS to be copied to system memory for faster performance.

The Choice : Enable , Disable.

4.8 Advanced Chipset Features

Phoenix – AwardBIOS CMOS Setup Utility

Advanced Chipset Features

DRAM Timing Selectable	[By SPD]	Item Help
CAS Latency Time	[1.5]	
Active to Precharge Delay	[7]	Menu Level ▶
DRAM RAS# TO CAS# Delay	[3]	
DRAM RAS# Precharge	[3]	
DRAM DATA Integrity Mode	[ECC]	
Memory Frequency For	[Auto]	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Disabled]	
Video RAM Cacheable	[Disabled]	
AGP Aperture Size	[64]	
Flash BIOS	[Disabled]	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults		

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system.

- **DRAM Timing Selectable**

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs.

Options: SPD, Manual.

- **CAS Latency Time**

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

Options: 2, 3.

- **DRAM Data Integrity Mode**

This item enabled to detect the memory parity and Error Checking & Correcting.

Options: ECC, Non-ECC.

- **Memory Frequency For**

Auto: by hardware.

DDR200/266 : 200MHz /266MHz.

- **System BIOS Cacheable**

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Options: Enabled, Disabled.

- **Vedio RAM Cacheable**

Select Enabled allows caching of the video RAM , resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Options: Enabled, Disabled.

- **AGP Aperture Size**

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

Options: 8M-32M.

- **Flash BIOS**

When Enabled, you can update BIOS by software(flash utility).

Options: Enabled, Disabled.

4.9 Integrated Peripherals

Phoenix – AwardBIOS CMOS Setup Utility

Integrated Peripherals

Onboard LAN(10/100/1000)	[Enabled]	Item Help
Onboard VGA Device	[Enabled]	
On-Chip Primary PCI IDE	[Enabled]	Menu Level ➤
IDE Primary Master PIO	[Auto]	If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support
IDE Primary Slave PIO	[Auto]	
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
USB Controller	[Disabled]	
USB Keyboard Support	[Disabled]	
USB Mouse Support	[Disabled]	
Init Display First	[PCI Slot]	
IDE HDD Block Mode	[Enabled]	
POWER ON Function	[BUTTON ONLY]	
Onboard FDC Controller	[Enabled]	
Onboard Serial Port 1	[Auto]	
Onboard Serial Port 2	[Auto]	
UART Mode Select	[Normal]	
RxD , TxD Active	[Hi,Lo]	
IR Function Duplex	[Half]	
TX,RX inverting enable	[IR-Rx2Tx2]	
Onboard Parallel Port	[378/IRO7]	
Onboard Parallel Mode	[SPP]	
EPP Mode Select	[EPP1..7]	
ECP Mode Use DMA	[3]	
PWRON After PWR-Fail	[Off]	
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

- **On-Chip Primary PCI IDE**

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

Options: Enabled, Disabled.

- **Primary/Secondary Master/Slave PIO**

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Options: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

- **Primary/Secondary Master/Slave UDMA**

Ultra DMA-33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA-33/66/100, select Auto to enable

BIOS support.

Options: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

- **Init Display First**

This item allows you to decide to active whether PCI Slot of VGA card first.

Options: PCI Slot,AGP

- **IDE HDD Block Mode**

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

Options: Enabled, Disabled

- **Onboard FDC Controller**

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.

- **OnChip USB**

This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

Options: Enabled, Disabled.

- **Onboard Serial Port 1/Port 2**

Select an address and corresponding interrupt for the first and second serial ports.

Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

- **UART Mode Select**

This item allows you to select which mode for the Onboard Serial Port 2.

Options: Normal, IrDA, ASKIR.

- **RxD , TxD Active**

This item allow you to RxD ,TxD Active high or low.

Options: [Hi,Hi] / [Hi,Lo] / [Lo,Hi] / [Lo,Lo]

- **IR Transmission Delay**

This item allow you to enabled IR transmission delay.

Options: Enabled , Disabled

- **UR2 Duplex Mode**

This item allows you to select the IR half/full duplex function.

Options: Half, Full.

- **Use IR Pins**

This item allow you to select the IR Pins.

Options: [IR-Rx2Tx2] / [RxD2 , TxD2.]

- **Onboard Parallel Port**

This item allows you to determine onboard parallel port controller I/O address setting. Options: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled,

- **Parallel Port Mode**

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.
Options: Normal, SPP, EPP, ECP,ECP/EPP

- **EPP Mode Select**

Select EPP port type 1.7 or 1.9.
Options: EPP1.7, EPP1.9

- **ECP Mode Use DMA**

Select a DMA channel for the parallel port for use during ECP mode.
Options: 3, 1.

- **PWRON After PWR-Fail**

State after power is re-applied.
Options: Off, On, Former-Sts

4.10 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

Phoenix – AwardBIOS CMOS Setup Utility

Power Management Setup

ACPI function	[Disabled]	Item Help
ACPI Suspend Type	[S1(POS)]	
Power Management	[User Define]	Menu Level ➤
Video Off Method	[DPMS]	
Video Off In Suspend	[Yes]	
Suspend Type	[Stop Grant]	
MODEM Use IRQ	[3]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Soft-Off by PWR-BTTN	[Instant-Off]	
Power On by Ring	[Enabled]	
Resume by Alarm	[Disabled]	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner to fit your personal style of use.

- **ACPI Function**

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

Options: Enabled, Disabled.

- **Power Management**

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. **HDD Power Down** : When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
2. **Doze Mode**: When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
3. **Suspend Mode**: When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- ONLY AVAILABLE FOR SL CPU's . Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

- **Video Off In suspend**

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

NO	Monitor will remain on during power saving modes.
YES	Monitor blanked when the systems enters the Suspend mode.

- **Video Off Method**

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

- **Suspend Type**

Select the suspend type.

Options: Stop Grant, PWRON Suspend.

- **MODEM Use IRQ**

This determines the IRQ in which the MODEM can use.

Options: 3, 4, 5, 7, 9, 10, 11, NA.

- **Soft-Off by PWR-BTTN**

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

Options: Delay 4 Sec, Instant-Off.

- **Power On by Ring**

Wake Up events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as On, even when the system is in a power down mode.

- **Power On by Ring**

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) and LAN WOL awakens the system from a soft off state.

- **Resume by Alarm**

When Enabled, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

The following is a list of IRQ's, **I**nterrupt **R**e**Q**uests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

4.11 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **Personal Computer Interconnect**, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix – AwardBIOS CMOS Setup Utility

PnP/PCI Configurations

PnP OS Installed	[No]	Item Help ----- Menu Level ➤
Reset Configuration Data	[Disabled]	
Resources Controlled	[Auto(ESCD)]	Default is Disabled. Select Enabled to reset Extended System Configuration Data(ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
By	[Press Enter]	
x IRQ Resources	[Press Enter]	
x DMA Resources		
PCI/VGA Palette Snoop	[Disabled]	
PCI Latency Timer(CLK)	[32]	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults		

- **Pnp OS Installed**

This item allows you to determine install PnP OS or not.

Options: Yes, No.

- **Reset Configuration Data**

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

Options: Enabled, Disabled .

- **Resource controlled by**

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➤").

Options: Auto(ESCD), Manual.

- **IRQ Resources**

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

- **IRQ3/4/5/7/9/10/11/12/14/15 assigned to**

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

Options: PCI/ISA PnP, Legacy ISA.

- **DMA Resource**

When resources are controlled manually, assign each system DMA channel a type, depending on the type of device using the DMA channel.

- **DMA 0/1/3/5/6/7 assigned to**

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

Options: Legacy ISA and PCI/ISA PnP.

- **PCI/VGA Palette Snoop**

Leave this field at Disabled.

Options: Enabled, Disabled.

- **PCI Latency Timer(CLK)**

PCI Latency Timer for PCI command cycle.

Options: 0-255(Default 32).

4.12 PC Health Status

Phoenix – AwardBIOS CMOS Setup Utility

PC Health Status

Current System1 Temp.	28	Item Help
Current CPU Temp.	32	-----
Current System2 Temp	32	Menu Level >
Current FAN3 Speed	5336RPM	
Current FAN2 Speed	5353RPM	
Current FAN1 Speed	5353RPM	
Vcore	1.75V	
+3.3V	3.32V	
+5V	5.01V	
+12V	12.05V	
-12V	-12.19V	
- 5V	- 5.04V	
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

4.13 Frequency/Voltage Control

Phoenix – AwardBIOS CMOS Setup Utility

Frequency/Voltage Control

CPU Clock Ratio	[8X]	Item Help
Auto Detect DIMM/PCI Clk	[Disabled]	-----
Spread Spectrum	[Disabled]	-----
CPU HOST/SDRAM/PCI Clock	[Default]	Menu Level >
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help		
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults		

- **CPU Clock Ratio**

This item allows you to select CPU Ratio .
PS: If Intel fixes CPU RATIO, the item is no purpose.

- **Auto Detect DIMM/PCI CLK**

This item allows you to enable/disable auto detect DIMM/PCI Clock.
Options: Enabled, Disabled.

- **Spread Spectrum**

This item allows you to enable/disable the spread spectrum modulate.
Options: Enabled, Disabled.

- **CPU Host/DRAM/PCI Clock**

This item allows you to select CPU/PCI frequency.
Options: Default, 133/33MHz, 136/34MHz... ..

4.14 Defaults Menu

Selecting "Defaults" from the main menu shows you two options which are described below

- **Load Fail-Safe Defaults**

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? **N**

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

- **Load Optimized Defaults**

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? **N**

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.15 Supervisor/User Password Setting

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

Supervisor Password :

can enter and change the options of the setup menus.

User Password :

just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.16 Exit Selecting

- **Save & Exit Setup**

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)?

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

- **Exit Without Saving**

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)?

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Appendix A. Watch-Dog Timer

The WatchDog Timer is a device to ensure that standalone systems can always recover from abnormal conditions that cause the system to crash. These conditions may result from an external EMI or a software bug. When the system stops working, hardware on the board will perform hardware reset (cold boot) to bring the system back to a known state.

Three I/O ports control the operation of WatchDog Timer.

443 (hex)	Write	Set WatchDog Time period
443 (hex)	Read	Enable the WatchDog Timer.
043/843 (hex)	Read	Disable the WatchDog Timer.

Prior to enable the WatchDog Timer, user has to set the time-out period. The resolution of the timer is 1 second and the range of the timer is from 1 sec to 255 sec. You need to send the time-out value to the I/O port – 443H, and then enable it by reading data from the same I/O port – 443H. This will activate the timer that will eventually time out and reset the CPU board. To ensure that this reset condition won't occur, the WatchDog Timer must be periodically refreshed by reading the same I/O port 443H. This must be done within the time-out period that is set by the software, please refer to the example program. Finally, we have to disable the WatchDog timer by reading the I/O port -- 843H or 043H. Otherwise the system could reset unconditionally.

A tolerance of at least 5% must be maintained to avoid unknown routines in the operating system (DOS), such as disk I/O that can be very time-consuming. Therefore if the time-out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Example Assembly Program:

```
TIMER_PORT = 443H
TIMER_START = 443H
TIMER_STOP = 843H

;;INITIAL TIMER COUNTER
MOV DX, TIMER_PORT
MOV AL, 8 ;;8 seconds
OUT DX, AL
MOV DX, TIMER_START
IN AL, DX. ;;START COUNTER

W_LOOP:
MOV DX, TIMER_STOP
IN AL, DX
MOV DX, TIMER_START
IN AL, DX ;;RESTART COUNTER
;;ADD YOUR APPLICATION HERE
CMP EXIT_AP, 0
JNE W_LOOP
MOV DX, TIMER_STOP
IN AL, DX
;;EXIT AP
```

Appendix B. I/O Address Map

• I/O Address Map

I/O ADDRESS MAP	DESCRIPTION
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor
170-1F7	BUS Master PCI IDE Controller
278-27F	Parallel Printer Port 2
290-295	Hardware Monitor Address Base
2F8-2FF	Serial Port 2
376-376	BUS Master PCI IDE Controller
378-37F	Parallel Printer Port 1
3B0-3DF	SiS 315 AGP Graphic Adapter
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
480-48F	PCI BUS
843/043	Watch dog timer disable

• 1 st MB Memory Address Map

MEMORY ADDRESS	DESCRIPTION
00000-9FFFF	SYSTEM MEMORY
A0000-BFFFF	VGA BUFFER
C0000-CFFFF	VGA BIOS
E0000-FFFFFF	SYSTEM BIOS
100000	EXTEND MEMORY

• IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	IRQ FOR PCI STEERING
IRQ2	IRQ Controller	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	AUDIO	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

• DMA Channel Assignment

CHANNEL	FUNCTION
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

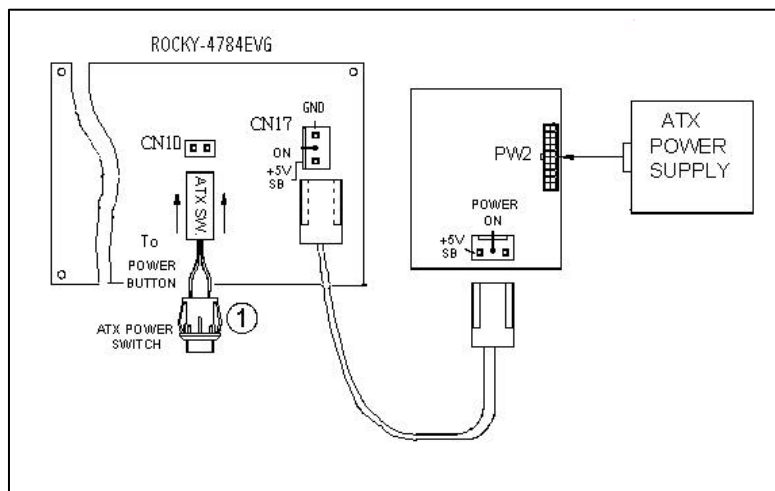
Appendix C. ATX Power Supply

The following notes show how to connect ATX Power Supply to the backplanes and / or the ISBC card.

A. For backplanes with ATX Connector

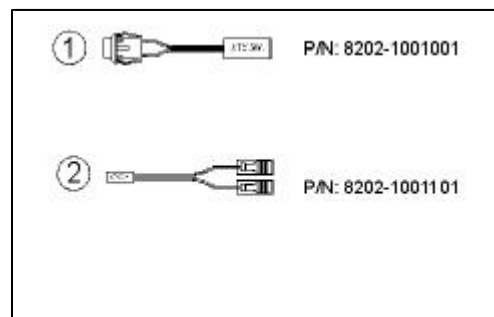
1. Please disconnect the AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.
2. Check the type of your CPU board. CPU boards may support ATX power supply but has two different types of power switch connection:

2.1. ROCKY-4784EVG (through Power Button & GND):



Connect the ATX power button switch to the CN10 (power button) and connect the power cable from Backplane to CN17 of CPU card.

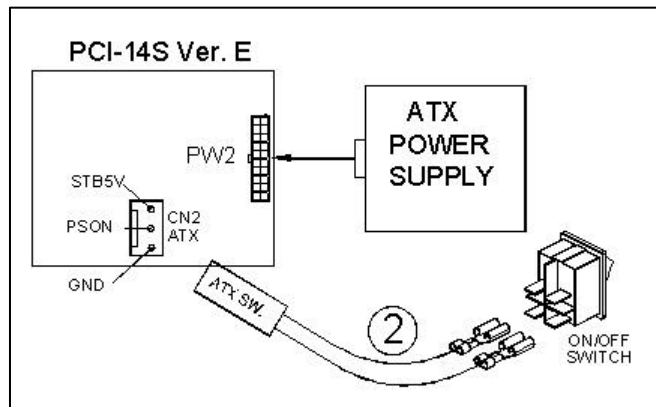
If you want to turn ON the system, just press the button once. And if you want to turn off the power supply, please press the ATX power switch button down for about 4 seconds.



B. For the backplanes with ATX power supply connector

For some SBC without ATX power ON/OFF function, then you can control the ATX power supply through backplane's PS ON connector. Please refer to the figure below; connection can be made simply as following:

1. Connect the ON/OFF (ordinary one) switch to Pin 2 (PS ON) and Pin 3 (GND) of connector CN2
2. You may now turn the power ON/OFF by the power switch



Appendix D. How to use Wake-Up Function

The ROCKY-4784EVG provides two kind of Wake up Function. This page describes how to use Modem Wake-Up and LAN Wake-Up function. Wake-Up function is working while you use ATX power supply,

- **Wake - Up On Modem(Ring) :**
You must set the option **Wake-Up On LAN/Ring** of CMOS SETUP to be enabled. The ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.
- **Wake-Up On LAN:**
When your computer is in power-down status, you can see LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and waits for Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN. Every LAN chip has a factory-set ID, which you can find it from network information in WINDOWS.

ID's format is xxxxxxxxxxxx

Example ID: 009027388320