

**ROCKY – 4783EV Series  
SOCKET 478 PENTIUM 4 with  
LAN & USB 2.0 & IEEE-1394  
AGP4X VGA SBC**

**User Manual Version 1.1**

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## 1. Introduction

Thank you for choosing ROCKY-4783EV SOCKET 478 PENTIUM 4 Single Board Computer. ROCKY-4783EV board is an ISA/PCI form factor board, which is equipped with a high performance processor and multi-mode I/O, designed for the system manufacturers, integrators, or VARs to provide quality and reliable performance at a reasonable price.

In addition, the ROCKY-4783EV has built-in SiS 315 AGP4X VGA on board. The VGA chip is a 3D graphics chipset, which provides up to 2,048 x1, 536 x 16-color resolution. The VGA on board can share 4 ~64 MB DDR-SDRAM frame buffer of system memory.

For the application that needs high-speed serial transmission, ROCKY-4783EV provides both 1394 and USB 2.0 ports for your choice. The high speed USB 2.0 host controller implements an ECHI interface that provides 480Mb/s bandwidth. The integrated 1394a controller supports bus transfer rate of 400 Mbits/s.

An advanced high performance super LPC I/O chip— W83697HF is used in ROCKY-4783EV board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

ROCKY-4783EV has a built-in 10/100 Fast Ethernet LAN. It is a fully integrated 10BASE-T/100BASE-TX LAN solution with high performance and low power consumption features.

ROCKY-4783EV uses the advanced SiS 651/962 chipsets, which are 100% software compatible chipset with PCI 2.2 standard.

## 1.1 Specifications

|                                     |   |
|-------------------------------------|---|
| <b>CPU (PGA 478)</b>                | Intel Pentium 4 Processor, supports 400/533 MHz FSB (FSB SETTING BY BIOS)   |
| <b>Bus interface</b>                | PCI/ISA bus, PICMG compliant  |
| <b>Bus speed</b>                    | ISA: 8MHz, PCI: 33MHz   |
| <b>DMA channels</b>                 | 7   |
| <b>Interrupt levels</b>             | 15  |
| <b>Chipset</b>                      | SIS 651   |
| <b>Real-time clock/calendar</b>     | SIS 962   |
| <b>RAM memory</b>                   | Two 184-pin DIMM sockets to support DDR266/333 SDRAM. The maximum memory is up to 2 GB.   |
| <b>Ultra DMA 133 IDE interface</b>  | Up to four PCI Enhanced IDE hard drives. The Ultra DMA 133 IDE can handle data transfer up to 133MB/s. Compatible with existing ATA IDE specifications, so there is no need to do any changes for users' current accessories. |
| <b>Floppy disk drive interface</b>  | Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)  |
| <b>Serial ports</b>                 | 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.  |
| <b>Bi-directional parallel port</b> | Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP  |
| <b>Hardware monitor</b>             | Built-in to monitor power supply voltage and fan speed status   |
| <b>IrDA port</b>                    | Supports Serial Infrared (SIR) and Amplitude Shift Keyed IR (ASKIR) interface   |
| <b>USB 2.0/1.1 port</b>             | Supports four USB 2.0/1.1 ports for future expansion  |
| <b>1394 port</b>                    | Supports three 1394 ports compliant with 1394 OHCI specification 1.1, IEEE 1394-1395 and 1394a-2000.  |
| <b>Watchdog timer</b>               | 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.  |

|  |  |
|--|--|
| <b>VGA controller</b>                    | Built-in SiS 315 AGP4X 256-bit 3D graphics engine. 4~64 MB share memory.<br>Screen resolution: up to 2048 x 1536 x 16.   |
| <b>Ethernet</b>                          | Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard. The RJ45 connectors are located on the mounting bracket for easy connection.   |
| <b>Keyboard and PS/2 mouse connector</b> | 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 connectors are also available on board. |
| <b>Audio</b>                             | AC'97 Audio CODEC  |
| <b>Compactflash</b>                      | It can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.   |
| <b>Power consumption</b>                 | (PENTIUM 4: 2GHz, 1GB PC133 DDR-SDRAM)<br>+5V @ 4.46A, +12V @ 6.55A.<br>Recommended: 350-watt power supply or higher   |
| <b>Operating temperature</b>             | 0 ~ 60<br>(*CPU needs Cooler & silicon heatsink paste*)  |

**WARNING:**

1. Never run the processor without the heatsink (Cooler) being properly and firmly attached.
2. Use ATX-12V Power Connector (ATX2) to provide power to the CPU.

## 1.2 Package Contents

ROCKY-4783EV package includes the following items:

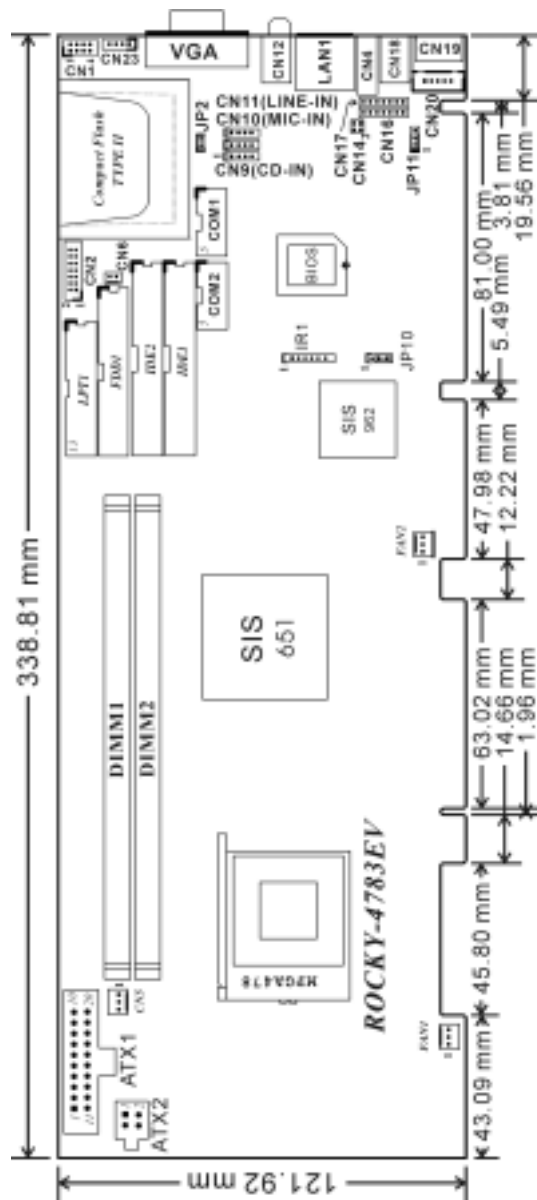
- ROCKY-4783EV Single Board Computer x 1
- RS-232 and printer cable with bracket x 1
- FDD cable x 1
- ATA IDE cable x 1
- ATX-12V cable x 1
- 6-pin Mini-Din converts to two 6-pin mini-Din cables for keyboard and mouse connection x 1
- User manual x 1

If any of these items is 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.

## 2. Installation

This chapter describes how to install ROCKY-4783EV. All shaded rows in tables of this manual are the default settings for ROCKY-4783EV.

### 2.1 ROCKY-4783EV Layout





## 2.2 Unpacking Precautions

Some components on ROCKY-4783EV 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-4783EV 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-4783EV 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

| <b>LABEL</b> | <b>FUNCTION</b>                                   |
|--------------|---|
| JP2          | CompactFlash Master (close)/Slave (open) Setting. |
| JP10         | CMOS state setting                                |
| JP11         | Keyboard/Mouse power source Setting               |

## 2.3 Clear CMOS Settings

If you want to clear the CMOS settings, close the JP10 (1-2) about 3 seconds, then open it again. This will set CMOS to normal operation mode, i.e. JP10 (2-3).

- **JP10: Clear CMOS Settings (Reserved Function)**

| JP10 | Description         |
|------|---------------------|
| 1-2  | Clear CMOS Settings |
| 2-3  | Normal Operation    |

**WARNING:**

When you change the power from ATX to AT, or change the CPU type, be sure to clear CMOS (power on) first. Otherwise, the CPU Board may fail to boot up.

## 2.4 Onboard Keyboard/Mouse source Setting

| JP11 | Description |
|------|-------------|
| 1-2  | Vcc (+5V)   |
| 2-3  | 5VSB        |

## 2.5 CompactFlash Master/Slave Setting

| JP2   | Description |
|-------|-------------|
| CLOSE | Master      |
| OPEN  | Slave       |

### 3. Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY- 4783EV board.

**Table of Connectors**

| <b>LABEL</b>     | <b>FUNCTION</b>                                    |
|------------------|--|
| FAN1 ~FAN2       | Fan Connectors                                     |
| ATX1             | ATX 20-PIN Power Connector                         |
| ATX2             | ATX-12V CPU Power Source                           |
| VGA              | VGA 15-pin Female Connector                        |
| IR1              | IrDA connector                                     |
| CN6              | ATX BUTTON (Power ON) Switch                       |
| CN1, CN4, CN23   | USB Connectors                                     |
| LPT1             | Parallel Port Connector                            |
| COM1, COM2       | Serial Port 10-pin Connectors                      |
| CN2              | External Switches and Indicators                   |
| CN11             | AUDIO LINE-IN                                      |
| CN9              | AUDIO CD-IN  |
| CN10             | AUDIO MIC-IN                                       |
| CN12             | AUDIO Headphone Jack (Output)                      |
| CN14             | LAN State LED Connectors                           |
| LAN1             | LAN RJ45 Connectors                                |
| CN16, CN17, CN18 | IEEE 1394 Connectors                               |
| CN5              | Backplane to Mainboard ATX power control Connector |
| CN20             | External 5-pin Header Keyboard Connector           |
| CN19             | PS/2 MOUSE & KEYBOARD Connector                    |
| FDD1             | FDC Connector                                      |
| IDE2             | Secondary IDE Connector                            |
| IDE1             | Primary IDE Connector                              |

### 3.1 Floppy Disk Drive Connector

The ROCKY-4783EV board is equipped with a 34-pin daisy-chain drive connector cable.

- **FDD1: FDC Connector**

| <b>PIN</b> | <b>Description</b> | <b>PIN</b> | <b>Description</b> |
|------------|--------------------|------------|--------------------|
| 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**

| <b>PIN</b> | <b>Description</b> | <b>PIN</b> | <b>Description</b> |
|------------|--------------------|------------|--------------------|
| 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-4783EV includes an on-board parallel port, accessed through a 26-pin flat-cable connector.

- **LPT1: Parallel Port Connector**

| <b>PIN</b> | <b>Description</b> | <b>PIN</b> | <b>Description</b> |
|------------|--------------------|------------|--------------------|
| 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

ROCKY-4783EV offers two high speeds NS16C550 compatible UART.

- **COM1: 10-pin header on board**
- **COM2: 10-pin header on board**

| Connector | Address | Interrupt |
|-----------|---------|-----------|
| COM1      | 3F8     | IRQ4      |
| 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 (CN19) 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.

- **CN19: 6-pin Mini-DIN Keyboard Connector**

| <b>PIN</b> | <b>Description</b> |
|------------|--------------------|
| 1          | KEYBOARD DATA      |
| 2          | MOUSE DATA         |
| 3          | GROUND             |
| 4          | +5V                |
| 5          | KEYBOARD CLOCK     |
| 6          | MOUSE CLOCK        |

- **CN20: 5-pin Header Keyboard Connector**

| <b>PIN</b> | <b>Description</b> |
|------------|--------------------|
| 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.

- **CN2: 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   | NC          | 8   | Speaker -   |              |
|           | 9   | NC          | 10  | Reset PIN1  | Reset Button |
|           | 11  | GND         | 12  | Reset PIN2  |              |
| HDD LED   | 13  | HDD LED+    | 14  | HDD LED-    | HDD LED      |

- **CN6: 2-pin Header ATX POWER BUTTON Connector**

| PIN | Description |
|-----|-------------|
| 1   | BUTTON PIN1 |
| 2   | BUTTON PIN2 |

- **CN5: Backplane to Mainboard ATX Power Control Connector\***

| PIN | Description |
|-----|-------------|
| 1   | 5VSB        |
| 2   | ATX-ON      |
| 3   | GND         |

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

### 3.7 USB Port Connector

ROCKY-4783EV provides four built-in USB ports (1.1 or 2.0). Each port can be automatically routed to support a high-speed USB 2.0 device or full-or-low speed USB 1.1 device.

| CN1 /CN4/CN23 |             |     |             |
|---------------|-------------|-----|-------------|
| PIN           | Description | PIN | Description |
| 1             | VCC         | 5   | GROUND      |
| 2             | DATA-       | 6   | DATA+       |
| 3             | DATA+       | 7   | DATA-       |
| 4             | GROUND      | 8   | VCC         |

### 3.8 IrDA Infrared Interface Port

ROCKY-4783EV 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.

- **IR1: IrDA Connector**

| <b>PIN</b> | <b>Description</b> |
|------------|--------------------|
| 1          | VCC                |
| 2          | NC                 |
| 3          | IR-RX              |
| 4          | Ground             |
| 5          | IR-TX              |
| 6          | NC                 |

### 3.9 Fan Connectors (FAN1 ~ FAN2)

ROCKY-4783EV 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 notify the system. So the system BIOS can recognize the fan speed. Note that only specified fan can issue the rotation signals.

- **Fan Connector**

| <b>PIN</b> | <b>Description</b> |
|------------|--------------------|
| 1          | Rotation Signal    |
| 2          | +12V               |
| 3          | Ground             |

### 3.10 LAN RJ45& State LED Connectors

ROCKY-4783EV is equipped with one built-in 10/100Mbps Ethernet controllers. You can connect it to your LAN through RJ45 LAN connectors. There are two LEDs on the connector (CN14) indicating the LAN status.

- **LAN1 RJ45 Connector**

| PIN | Description | PIN | Description |
|-----|-------------|-----|-------------|
| 1   | TX+         | 5   | N/C         |
| 2   | TX-         | 6   | RX-         |
| 3   | RX+         | 7   | N/C         |
| 4   | N/C         | 8   | N/C         |

- **CN14: LAN State LED Connector**

| PIN | Description        |
|-----|--------------------|
| 1-2 | ACT LED (PIN2: +)  |
| 3-4 | LINK LED (PIN4: +) |

### 3.11 VGA Connector

ROCKY-4783EV has a built-in 15-pin VGA connector directly connected to your CRT monitor.

- **VGA: 15-pin Female Connector**

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

### 3.12 AUDIO Headphone & Connector

ROCKY-4783EV has a built-in AC'97 AUDIO CODEC; connector directly connected to your MIC-IN & CD-IN & LINE-IN.

- **CN9: AUDIO CD-IN Connector (Input)**
- **CN10: AUDIO MIC-IN Connector (Input)**
- **CN11: AUDIO LINE-IN Connector (Input)**
- **CN12: AUDIO Headphone Jack (Output)**

| PIN | Description |        |       |       |
|-----|-------------|--------|-------|-------|
|     | CN9         | CN10   | CN11  | CN12  |
| 1   | LEFT        | MIC-IN | LEFT  | LEFT  |
| 2   | GND         | GND    | GND   | GND   |
| 3   | GND         | GND    | GND   | GND   |
| 4   | RIGHT       | NC     | RIGHT | RIGHT |

### 3.13 ATX1 & ATX2 Power Connector

This connector supports the ATX power and functions such as modem ring on, wake-up LAN and soft power off.

| ATX1 (SYSTEM) |             |     |             |
|---------------|-------------|-----|-------------|
| PIN           | Description | PIN | Description |
| 1             | 3.3V        | 2   | 3.3V        |
| 3             | GND         | 4   | 5V          |
| 5             | GND         | 6   | 5V          |
| 7             | GND         | 8   | PW_OK       |
| 9             | 5VSB        | 10  | +12V        |
| 11            | 3.3V        | 12  | -12V        |
| 13            | GND         | 14  | ATX-ON      |
| 15            | GND         | 16  | GND         |
| 17            | GND         | 18  | -5V         |
| 19            | 5V          | 20  | 5V          |

| ATX2 (CPU) |             |     |             |
|------------|-------------|-----|-------------|
| PIN        | Description | PIN | Description |
| 1          | GND         | 2   | GND         |
| 3          | +12V        | 4   | +12V        |

**Note:** The power from ATX2 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. You can use ICP's special cable for connection if your power supply does not have suitable cable.

### 3.14 IEEE 1394 Port Connector

ROCKY-4783EV provides three built-in IEEE 1394 ports to connect to 1394 devices.

| <b>CN16 /CN17/CN18</b> |                    |            |                    |
|------------------------|--------------------|------------|--------------------|
| <b>PIN</b>             | <b>Description</b> | <b>PIN</b> | <b>Description</b> |
| 1                      | +12V               | 5          | TPA-               |
| 2                      | GND                | 6          | TPA+               |
| 3                      | TPB-               | 7          | SHIELD             |
| 4                      | TPB+               | 8          | SHIELD             |

## 4. AMI BIOS SETUP

### 4.1 Introduction

This chapter discusses AMI'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

AMI BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the 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 <Del> immediately after switching the system on, or
2. By pressing the <Del>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 respond 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 does not boot, an error message will be displayed and you will again be asked to...

**PRESS F2 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<br>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   |
| F2 /F3 key  | Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward   |
| F4 key      | Reserved   |
| F5 key      | Reserved   |
| F6 key      | Reserved   |
| F7 key      | Reserved   |
| 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.

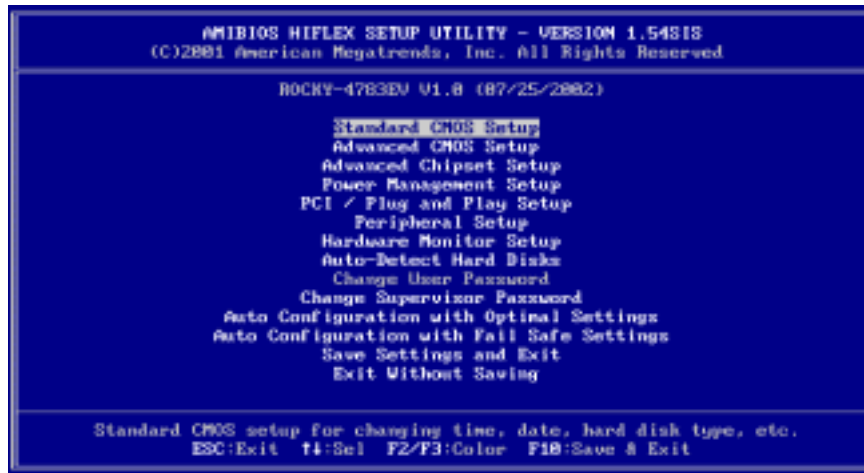
If your computer cannot boot after making system changes with Setup, AMI BIOS supports an override to the CMOS settings that resets your system to its defaults.

The best advice is to only alter settings that you thoroughly understand. Hence, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen to provide the absolute maximum performance and reliability. A minor change to the chipset setup may cause compatibility problems.



## 4.5 Main Menu

Once you enter the AMIBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



Note that a brief description of each highlighted selection appears at the bottom of the screen. The main menu includes the following main setup categories. Recall that some systems may not include all entries.

### **Standard CMOS Setup**

Use this menu for basic system configuration.

### **Advanced CMOS Setup**

Use this menu to set the Advanced Features available on your system.

### **Advanced Chipset Setup**

Use this menu to change the values in the chipset registers and optimize your system's performance.

### **Power Management Setup**

When Disabled, SMI will not be initialized, and complete power management functionality is removed until this option is set to Enabled.

### **PCI / Plug and Play Setup**

This entry appears if your system supports PnP / PCI.

### **Peripheral Setup**

Use this menu to specify your settings for integrated peripherals.

**Hardware Monitor Setup**

Use this menu to monitor your hardware.

**Auto-detect Hard Disks**

Use this menu to specify your settings for hard disks control.

**Change Supervisor Password**

Use this menu to set User and Supervisor Passwords.

**Auto Configuration with Optimal Settings**

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

**Auto Configuration with Fail-Safe Settings**

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

**Save Settings and Exit**

Save CMOS value changes to CMOS and exit setup.

**Exit Without Saving**

Abandon all CMOS value changes and exit setup.

## 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.

```
AMIBIOS SETUP - STANDARD CMOS SETUP
(C)2001 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy): Thu 01/25/2002           Base Memory: 8 KB
Time (hh/mm/ss)   : 11:32:49                 Ext'd Memory: 8 MB

Floppy Drive A:   Not Installed
Floppy Drive B:   Not Installed

Type      Size      Cyls  Head  WPcom  Sec  LBA  Sisk  PIO  32Bit
Pri Master: Not Installed
Pri Slave  : Not Installed
Sec Master: Not Installed
Sec Slave  : Not Installed

Boot Sector Virus Protection: Disabled

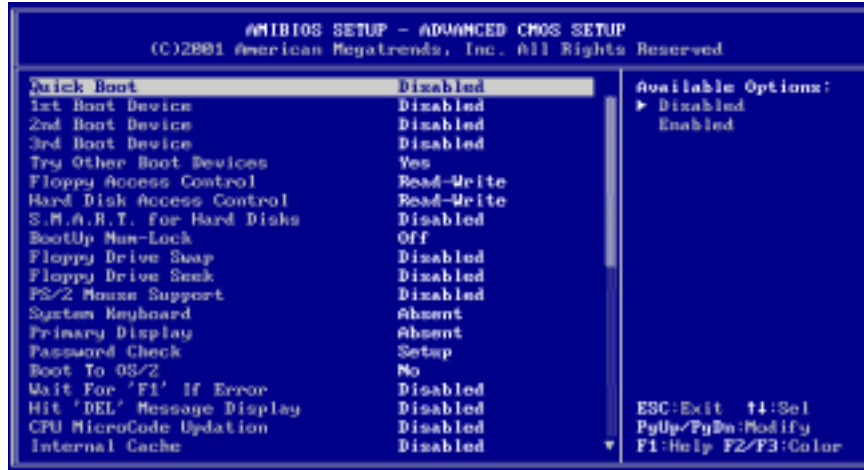
Month: Jan - Dec           ESC:Exit  F4:Set
Day: 01 - 31              PgUp/PgDn:Modify
Year: 1988 - 2899         F1:Help  F2/F3:Color
```

## Main Menu Selections

| Item                 | Options  | Description  |
|----------------------|--|--|
| Date                 | MM DD YYYY   | Set the system date.   |
| Time                 | HH : MM : SS   | Set the system time.   |
| IDE Primary Master   | 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 Master | Options are in its sub menu (described in Table 3)                                       | Press <Enter> to enter the sub menu of detailed options.                                 |
| IDE Secondary Master | Options are in its sub menu (described in Table 3)                                       | Press <Enter> to enter the sub menu of detailed options.                                 |
| Drive A<br>Drive B   | None<br>360K, 5.25 in<br>1.2M, 5.25 in<br>720K, 3.5 in<br>1.44M, 3.5 in<br>2.88M, 3.5 in | Select the type of floppy disk drive installed in your system.                           |
| Halt On              | All Errors<br>No Errors<br>All, but Keyboard<br>All, but Diskette<br>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.                          |

## 4.7 Advanced CMOS Setup

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



### Quick Boot

When set to enable, DRAM testing function will disable. Warning

### 1st /2nd /3rd Boot Device

This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.

### Try Other Boot Devices

Set this option to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the 1st Boot Device, 2nd Boot Device, 3rd Boot Device, 4th Boot Device options. The settings are Yes or No.

### Floppy Access Control

This option specifies the read/write access that is set when booting from a floppy drive. The settings are Read/Write or Read-Only.

### Hard Disk Access Control

This option specifies the read/write access that is set when booting from a hard disk drive. The settings are Read/Write or Read-Only.

**S.M.A.R.T. for Hard Disks**

Self-Monitoring, Analysis and Reporting Technology. This option can help BIOS to warn the user of the possible device failure and give user a chance to back up the device before actual failure happens. The settings are Disabled, Enabled.

**Boot Up Num-Lock**

When On, this option turns off Num Lock when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard.

**Floppy Drive Swap**

Set this option to Enabled to permit drives A: and B: to be swapped. The settings are Enabled or Disabled.

**Floppy Drive Seek**

Set this option to Enabled to specify that floppy drives A: will perform a Seek operation at system boot. The settings are Enabled or Disabled.

**PS/2 Mouse Support**

When this option is enabled, BIOS support a PS/2- type mouse.

**System Keyboard**

This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstation with no keyboard. The settings are Absent, Present.

**Primary Display**

Select this option to configure the type of monitor attached to the computer. The settings are Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA ,or Not Install.

**Password Check**

This option enables the password check option every time the system boots or the end user runs Setup. If always is chosen a user password prompt appears every time the computer is tuned on. If setup is chosen, the password prompt appears if BIOS is executed.

**Boot To OS/2**

Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the motherboard. The settings are YES or NO.

**Wait For 'F1' If Error**

If this option is enabled, AMIBIOS waits for the end user to press <F1> before continuing. If this option is disabled, AMIBIOS continues the boot process without waiting for <F1> to be pressed. The settings are Disabled or Enabled.

### **Hit 'DEL' Message Display**

Disabling this option prevents "Hit <DEL> if you want to run Setup" from appearing when the system boots. The settings are Disabled or Enabled.

### **Internal Cache**

The option enabled or disabled the internal cache memory in the processor.

### **External Cache**

The option enables secondary cache memory. If Enabled is selected, external cache memory is enabled. If disabled is select, external cache memory is disabled.

### **System BIOS Cacheable**

When this option is set to enabled, the System ROM area from F0000-FFFFF is copied (shadowed) to RAM for faster execution.

### **C000,32k Shadow**

When this option is set to enabled, the Video ROM area from C0000-C7FFF is copied (shadowed) to RAM for faster execution.

Disabled: The contents of the video ROM are not copied to RAM.

Cached: The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.

Enabled: The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

### **C800,16k Shadow**

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000,32k Shadow.

### **CC00,16k Shadow**

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.800,16k Shadow.

### **D000,16k Shadow**

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.C00,16k Shadow.

### **D400,16k Shadow**

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000,16k Shadow.

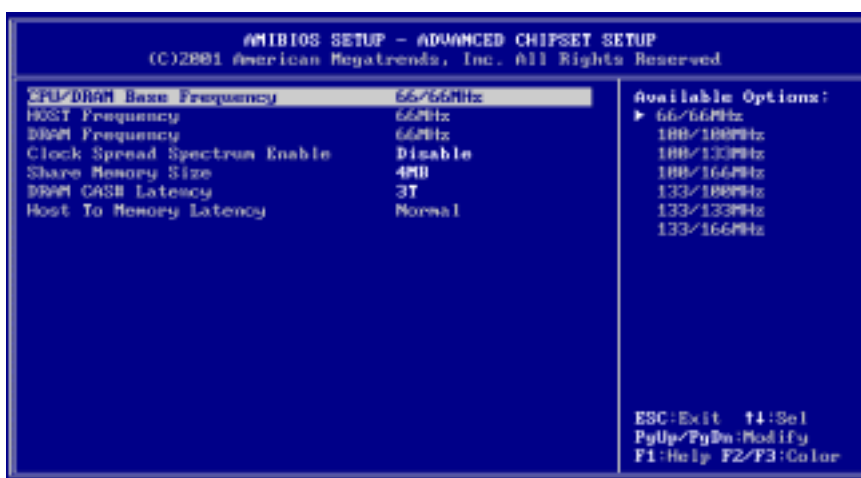
### D800,16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.400,16k Shadow.

### DC00,16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. ISA adapter cards will be allocated to PCI adapter cards.800,16k Shadow.

## 4.8 Advanced Chipset Setup



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.

### CPU/DRAM Base Frequency

This setting decided by Processor and Memory frequency.

### HOST Frequency

This field displays the capability of the CPU modules that you are using— either H/W TRAP, 66MHz, 100MHz, 133MHz.

### DRAM Frequency

This field displays the capability of the memory modules that you are using— either H/W TRAP, 66MHz, 100MHz, 133MHz, 166MHz.



### Share Memory Size

This option is setting for sharing memory size from system memory to Video memory.

### DRAM CAS# Latency

This controls the latency between the SDRAM read command and the time that the data actually becomes available.

### Host To Memory Latency

This option is setting CPU to Memory Access Latency Control.

## 4.9 Power Management Setup



### ACPI Aware O/S

This feature is switch of ACPI function. Configuration options: [No] [Yes].

### ACPI Standby State

This feature is switch of STR (S3) or POS (S1) function. Configuration options: [S3/STR] [S1/POS].

### Power Management

When Disabled, SMI will not be initialized, and complete power management functionality is removed until this option is set to Enabled.

### Suspend Time Out

If no activity occurs during this time period, the BIOS will place the system into the suspend low power state. The "Standby Time Out" period must expire first (if enabled) before this time out period begins.

### Hard Disk Time Out

If no disk activity occurs for , this time period, the BIOS will put the hard disk , device(s) into low power mode.

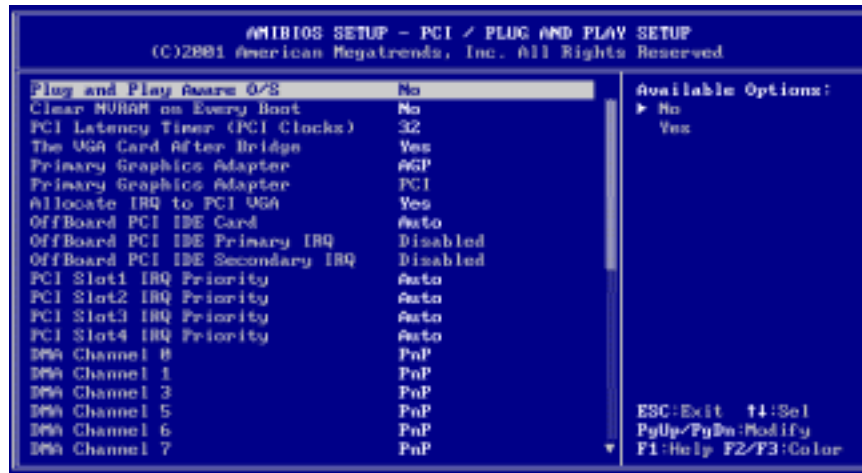
### RTC Alarm Resume From Soft Off

When this option is set enabled, system will according to you set time then wakeup from soft off mode.

### Resume on Modem Ring

Modem ring resumes from soft off.

## 4.10 PCI / Plug and Play Setup



### Plug and Play Aware O/S

If enable, BIOS will configure only PnP ISA boot devices(i.e. all PnP ISA cards which has boot flag set). And PnP aware OS will configure all other devices. If disable, BIOS will configure all devices.

### Clear NVRAM on Every Boot

When this option is set to Yes, system can auto clear NVRAM. The settings are No, Yes.

### PCI Latency Timer (PCI Clocks)

This option specifies the latency timings(in PCI clocks) for PCI devices installed in the PCI expansion slots. The settings are 32, 64, 96, 128, 160, 192, 224, or 248.

### Allocate IRQ to PCI VGA

Set this option to Yes to allocate an IRQ to the VGA device on the PCI bus. The settings are Yes or No.

### OffBoard PCI IDE Card

This question is needed for off-board non-compliant PCI IDE card. If present, BIOS needs to know which slot it is in and how the IRQ is used by the card.

### OffBoard PCI IDE Primary IRQ

This option specifies the PCI interrupt used by the primary IDE channel on the offboard PCI IDE controller. The settings are Disabled,

Hardwired, INTA, INTB, INTC, or INTD.

**OffBoard PCI IDE Secondary IRQ**

This option specifies the PCI interrupt used by the secondary IDE channel on the offboard PCI IDE controller. The settings are Disabled, Hardwired, INTA, INTB, INTC, or INTD.

**PCI Slot1 / Slot2 / Slot3 / Slot4 IRQ Priority**

The option specifies the IRQ priority for PCI device installed in the PCI expansion slot. The settings are Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

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

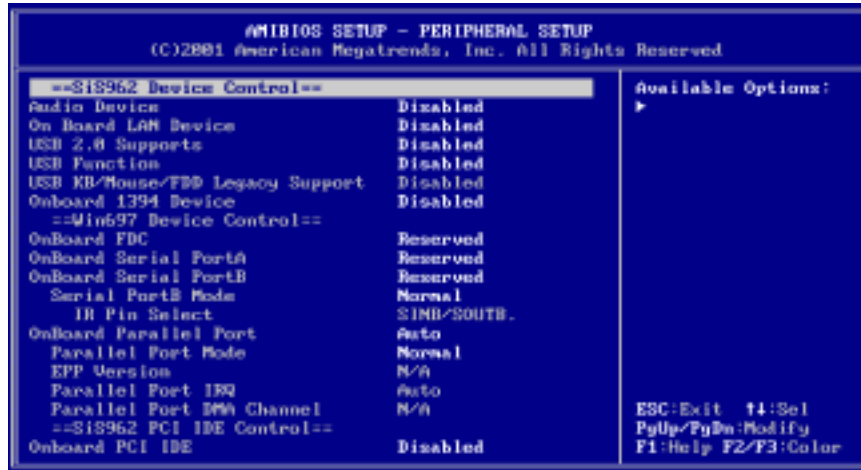
The option enables you to specify the bus type used by each DMA channel. The settings are PnP or ISA/EISA.

**IRQ 3, 4, 5, 7, 9, 10, 11, 14, 15**

The option specifies the bus that specified IRQ line is used on. It enables you to reserve IRQs for legacy ISA adapter cards and determines if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices configurable by system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, end users can use the option to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as PCI/PnP.

## 4.11 Peripheral Setup

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



### OnBoard Serial PortA /PortB

This option specifies the base I/O port address of serial port 1. The settings are Auto (AMIBIOS automatically determines the correct base I/O port address), Disabled, 3F8h, 2F8h, 2E8h, or 3E8h.

### Serial PortB Mode

This option specifies the IR active pulse or inverting clock of serial port B.

### IR Pin Select

The SINB/SOUTB pin of Serial PortB function or IRRX/IRTX pin if IR function in normal condition.

### Onboard Parallel Port

This option specifies the base I/O port address of parallel port on the motherboard. The settings are Disabled, 378h, 278h, or 3BCh.

### Parallel Port Mode

This option specifies the parallel port mode. The settings are Normal, Bi-Dir, EPP, ECP. Normal : The normal parallel port mode is used. Bi-Dir : Use this setting to support bidirectional transfers on the parallel port.

**EPP:** The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.

**ECP:** The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bidirectional communication.

### EPP Version

EPP data or address read cycle 1.9 or 1.7

### Parallel Port IRQ

This option specifies the IRQ used by the parallel port. The settings are Auto, (IRQ)5, (IRQ)7.

### Parallel Port DMA Channel

This option is only available if the setting for the Parallel Port Mode option is ECP. This option sets the DMA channel used by the parallel port. The settings are DMA Channel 0, 1, or 3.

## 4.12 Hardware Monitor Setup

This page shows the current hardware status.



## 4.13 Change Supervisor Password

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

### **Supervisor password:**

You can enter and modify the options of the setup menu.

### **User password:**

You can only enter but cannot modify the options of setup menu. 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 will 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 "Always" password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

## Appendix A: Watchdog 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              |
| 2F8-2FF         | Serial Port 2                        |
| 376-376         | BUS Master PCI IDE Controller        |
| 378-37F         | Parallel Printer Port 1              |
| 3B0-3DF         | SiS 651 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<sup>st</sup> MB Memory Address Map

| Memory address | Description   |
|----------------|---------------|
| 00000-9FFFF    | SYSTEM MEMORY |
| A0000-BFFFF    | VGA BUFFER    |
| C0000-CFFFF    | VGA BIOS      |
| E0000-FFFFF    | SYSTEM BIOS   |
| 100000         | EXTEND MEMORY |

### IRQ Mapping Chart

|      |                |       |                |
|------|----------------|-------|----------------|
| IRQ0 | System Timer   | IRQ8  | RTC CMOS clock |
| IRQ1 | Keyboard       | IRQ9  | ACPI STEERING  |
| IRQ2 | IRQ Controller | IRQ10 | AUDIO /USB     |
| IRQ3 | COM2           | IRQ11 | LAN /1394      |
| IRQ4 | COM1           | IRQ12 | PS/2 mouse     |
| IRQ5 | USB            | 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                    |

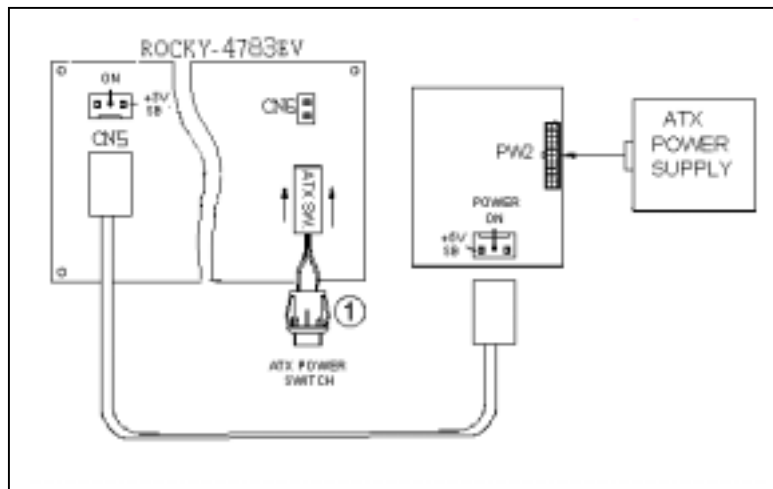
## Appendix C: ATX Power Supply

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

### 1. Using ATX Power Switch

- i. Disconnect the AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.

#### ROCKY-4783EV (through Power Button & GND):

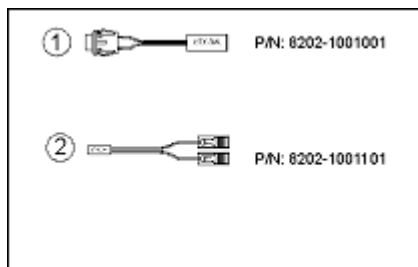
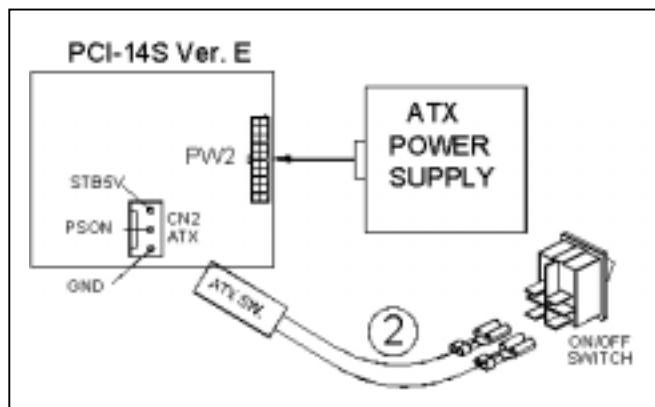


- ii. Connect the ATX power button switch to the CN6 (power button). And connect the power cable from Backplane to CN5 of CPU card.
- iii. To turn on the system, press the button once. To turn off the power supply press the ATX power switch button for about 4 seconds.

## 2. Using AT Power Switch

You can also control ATX power supply through the PS ON connector of backplane.

- i. Install Rocky-4783EV on the backplane.
- ii. Connect the ON/OFF (ordinary one) switch to Pin 2 (PS ON) and Pin 3 (GND) of connector CN2.
- iii. You may now turn the power ON/OFF by the power switch.



## Appendix D: How to Use Wake-Up Function

ROCKY-4783EV provides two kinds of Wake-up Function, which operates when you use ATX power supply.

### Wake-Up On Modem (Ring):

Enable **Wake-Up On LAN/Ring** of CMOS SETUP. The ATX power supply will be switched on when a ring signal is detected on pin "RI" of serial port.

### Wake-Up On LAN:

When your computer is in power-down status, you can see that LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and is waiting for Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the MAC address of your system LAN. Every LAN chip has a factory-set ID, which can be found from network information in Windows.

ID format is xxxxxxxxxxxx

**Example ID:** 009027388320