

ROCKY-3702EV
Celeron™ & Pentium III
Processor
With VGA & Ethernet SBC
User Manual

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Chapter 1. Introduction

Thank you for choosing ROCKY-3702EV Socket 370 Celeron® and Pentium III (FC-PGA) with AGP VGA & 10/100Mbps Ethernet Single Board Computer. The ROCKY-3702EV is a PICMG bus form factor board. It is equipped with high performance Intel® Celeron up to 950MHz and Pentium III (FC-PGA) 1GHz (or above) 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.

This board has a built-in DiskOnChip™(DOC) Flash Disk for embedded application. The DOC Flash Disk is 100% compatible to hard disk which enable users to use DOS command without having to install any extra software utility.

An advanced high performance super AT I/O chip – Winbond W83977EF is used in the ROCKY-3702EV board. The on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

ROCKY-3702EV uses the advanced INTEL 440BX Chipset which is 100% ISA/PCI compatible chipset with PCI 2.1 standard. In addition to all of the above, this board provides four 168-pin sockets for its on-board DRAM. The DIMM module is 3.3 V SDRAM and support up to a maximum of 256MB for each module.

1.1 Specifications

- **CPU** : Support Intel Celeron® up to 950 MHz , Pentium III (FC-PGA) 1GHz Processor.
- **Bus** : PICMG bus, meets PCI 2.1 standard
- **DMA channels** : 7
- **Interrupt levels** : 15
- **Chipset** : Intel 82440BX 66/100MHz CPU Clock
- **RAM** : Four 168-pin DIMM sockets support SDRAM and EDO RAM module, up to 1GB.
- **AGP VGA Controller** :
 - ✓ ATI Rage Mobility-M VGA Controller
 - ✓ AGP bus speed : 1X/2X 33/66MHz
 - ✓ Screen Resolution up to 1024 x 768 32bit colors
- **10/100Mbps Ethernet Controller** :
 - ✓ Realtek RTL8100B IEEE802.u 100BASE-TX standard
 - ✓ Dual Auto-sensing interface to 10Mbps, 100Mbps Network
 - ✓ RJ45 connector for 10BASE-TX and 100BASE-TX
 - ✓ Full Duplex capability
 - ✓ Full Software driver support
- **Ultra DMA/33 (Enhanced PCI IDE Interface)** : up to four PCI Enhance IDE hard drives. The Ultra DMA/33 IDE can handle data transfer up to 33MB/s. Best of all is that this new technology is compatible with existing ATA-2 IDE specifications so there is no need to change any of customer's current accessories.

- **Multi-I/O Chip :**
 - ✓ W83977, all I/O setup by BIOS
 - ✓ Two 16C550 RS-232C Ports
 - ✓ One EPP/ECP Parallel Port, Floppy Port
- **Floppy disk drive interface :** Two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives.
- **Two high speed Serial ports :** NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **Built-in LM78 Hardware Monitoring System** to monitor power supply voltage and fan speed status.
- **IrDA port :** Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- **USB port :** Support two USB ports for future expansion.
- **ISAPLUS™ :** Designed to enhance the ISA bus drive capability
- **E²Key :** A special designed 1Kbit EEPROM (non volatile memory) provided to accept read/write data by customer's program. It is useful for storing system ID, Password and other crucial data on the board.
- **Watch-dog timer :** Can be set by 1, 2, 10, 20, 110 or 220 seconds per period. Reset or NMI is generated when CPU does not periodically trigger the timer. Your program uses hex 043 and 443 to control the watch-dog and generates a system reset.

- **Flash Disk - DiskOnChip™:** The Flash Disk provides 100% compatibility with hard disk, supports M-Systems. The built-in True FFS Transparent Flash Block Management and Space Reclamation will allow customers to use the Flash Disk with DOS command so there is no need to install any extra software utility. The DOC currently is available from 2MB to 144MB.
- **ATX Power Supply function**
- **Mouse & Keyboard Connector :** PS/2 Mouse Port on-board + Ext. Keyboard.
- **Power Consumption :** +5V/6.8A (Celeron 333MHz, 512MB SDRAM) +12V:170mA , -12V:60mA
- **Operating Humidity :** 5 ~ 95 % , non-condensing
- **Operating Temperature :** 0° ~ 60° C (CPU needs Cooler)

1.2 Package Contents

In addition to this *User Manual*, the ROCKY-3702EV package includes the following items:

- ROCKY-3702EV Socket 370 Celeron® & Pentium III with AGP VGA & 10/100Mbps Ethernet SBC
- Printer Cable/RS232 Cable
- FDD/HDD Cable
- 6-pin Mini-Din to 5-pin Din Keyboard Adapter Cable

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

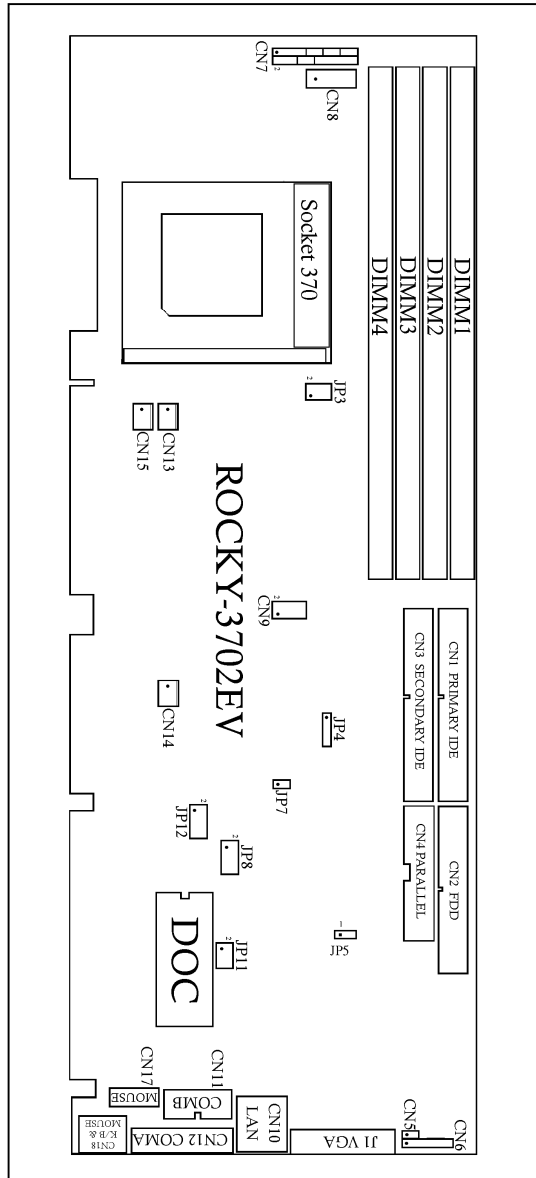
Chapter 2. Installation

This chapter describes how to install the ROCKY-3702EV. The layout of ROCKY-3702EV is shown on the next page and the unpacking precautions that you should be careful with are described on the following page. Also included is the jumpers and switches setting for this board's configuration, such as: CPU type selection, system clock setting and Watchdog timer.

2.1 ROCKY-3702EV 's Layout

< Please turn to the next page. >

2.1 ROCKY-3702EV 's Layout



2.2 Unpacking Precautions

Some components on ROCKY-3702EV 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 following precautions:

- ✓ Ground yourself to remove any static charge before touching your ROCKY-3702EV 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-3702EV SBC by its edges. Do not touch IC chips, leads or circuitry if not necessary.
- ✓ Do not plug any connector or jumper while the power is on.
- ✓ Do not put your ROCKY-3702EV SBC unprotected on a flat surface because it has components on both sides.

2.3 Setting the CPU of ROCKY-3702EV

• JP3 : CPU FREQUENCY SETTING

FREQUENCY	JP3	
	1-3	2-4
66MHz/100MHz	ON	ON

Note: Intel Celeron CPU will auto-detect 66MHz/100MHz
Intel Pentium III (FC-PGA) CPU will auto-detect 100MHz

• JP8 : CPU MULTIPLIER SETTING

Ratio	1-2	3-4	5-6	7-8
3.0 x	ON	OFF	ON	ON
3.5 x	ON	OFF	OFF	ON
4.0 x	OFF	ON	ON	ON
4.5 x	OFF	ON	OFF	ON
5.0 x	OFF	OFF	ON	ON
5.5x	OFF	OFF	OFF	ON
6.0x	ON	ON	ON	OFF
6.5x	ON	ON	OFF	OFF
7x	ON	OFF	ON	OFF
7.5x	ON	OFF	OFF	OFF
8x	OFF	ON	ON	OFF

2.4 Watch-Dog Timer

The Watch-Dog Timer is enabled by reading port 443H. It should be triggered before the time-out period ends, otherwise it will assume that the program operation is abnormal and will issue a reset signal to reboot or activate NMI to CPU. The Watch-Dog Timer is disable by reading port 043H.

• JP5 : Watch-Dog Timer Type Setting

PIN NO.	DESCRIPTION
1-2	NMI
2-3	ESET

• **JP12 : WDT Time-out Period**

PERIOD	1-2	3-4	5-6	7-8
1 sec.	OFF	OFF	ON	OFF
2 sec.	OFF	OFF	ON	ON
10 sec.	OFF	ON	OFF	OFF
20 sec.	OFF	ON	OFF	ON
110 sec.	ON	OFF	OFF	OFF
220 sec.	ON	OFF	OFF	ON

2.5 DiskOnChip™ Flash Disk

The DiskOnChip™ (DOC) Flash Disk Chip is produced by M-Systems. Customers don't need to install any extra software utility because DOC is 100% compatible to hard disk. "Plug and Play" is not only easy to use but also reliable. Right now, the DOC is available from 2MB to 144MB.

• **JP11 : DiskOnChip™ Memory Address Setting**

PIN NO.	ADDRESS
1-2	CE00 - CFFF
3-4	D600 - D7FF
5-6	DE00 - DFFF

2.6 PS/2 Mouse

• **JP7 : PS/2 Mouse Setting**

The PS/2 mouse uses IRQ12 while in operation.

JP7	DESCRIPTION
ON	Enable the PS/2 Mouse, IRQ12
OFF	Disable the PS/2 Mouse

Chapter 3. Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY-3702EV board.

3.1 Floppy Disk Drive Connector

ROCKY-3702EV board equipped with a 34-pin daisy-chain driver connector cable.

- **CN2 : FDD CONNECTOR**

PIN NO.	DESCRIPTION	PIN NO.	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	D4IRECTION#
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 to the ROCKY-3702EV IDE controller.

CN1 (IDE 1) : Primary IDE Connector

CN3 (IDE 2) : Secondary IDE Connector

• **CN1/CN3 : IDE Interface Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
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	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	GND
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA 1	34	N/C
35	SA 0	36	SA 2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

3.3 Parallel Port

This port is usually connected to a printer. The ROCKY-3702EV includes an on-board parallel port accessed through a 26-pin flat-cable connector CN4.

• CN4 : Parallel Port Connector

PIN NO.	DESCRIPTION	PIN NO.	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	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	N/C

3.4 Serial Ports

The ROCKY-3702EV offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports (COMA/COMB).

• CN12 : Serial Port 9-pin D-sub Connector (COMA)

PIN NO.	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)

- **CN11 : Serial Port 2x5 pin header Connector (COMB)**

Pin No.	Description	Pin No.	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

3.5 Keyboard/Mouse Connector

The ROCKY-3702EV provides one external keyboard, one external mouse and one PS/2 keyboard & mouse connectors.

- **CN8 : 5-pin Header External Keyboard Connector**

PIN NO.	DESCRIPTION
1	KB CLOCK
2	KB DATA
3	N/C
4	GND
5	+5V

- **CN18 : 6-pin Mini-DIN PS/2 Keyboard & Mouse Connector**

PIN NO.	DESCRIPTION
1	KB DATA
2	MS DATA
3	GND
4	+5V
5	KB CLOCK
6	MS CLK

- **CN17 : PS/2 Mouse 5-pin Header Connector**

PIN NO.	DESCRIPTION
1	MS DATA
2	N/C
3	GND
4	+5V
5	MS CLOCK

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 CN7 connector.

• **CN7 : Multi Panel**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1.	SPEAKER	2	POWER LED +
3.	N/C	4	N/C
5.	N/C	6	POWER LED -
7.	+5V	8	KEYLOCK
9.	RESET SW	10	GND
11.	GND	12	GND
13.	IDE LED -	14	N/C
15.	IDE LED+	16	ATX POWER ON
17.	ATX POWER BUTTON	18	ATX 5VSB
19.	ATX 5VSB	20	ATX 5VSB

3.7 USB Port Connector

The ROCKY-3702EV has two built-in USB ports for the future I/O bus expansion.

- **CN9: 2 USB Connectors**
Pin 1,3,5,7 for USB 0
Pin 2,4,6,8 for USB 1

PIN NO.	Description	PIN NO.	Description
1	VCC	2	GND
3	SBD0-	4	SBD1+
5	SBD0+	6	SBD1-
7	GND	8	VCC

3.8 IrDA Infrared Interface Port

ROCKY-3702EV built-in IrDA port supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. If you want to use the IrDA port, you have to configure the SIR or ASKIR model in the BIOS's Peripheral Setup's COM2. Then the normal RS-232 COM2 will be disabled.

- **CN6 : IrDA Connector**

PIN NO.	DESCRIPTION
1	VCC
2	FIR-RX
3	IR-RX
4	GND
5	IR-TX
6	CIR-RX

3.9 VGA Connector

The built-in 15-pin VGA connector can be connected directly to your monochrome CRT monitor as well as high resolution color CRT monitor.

- **J1 : 15-pin Female Connector**

1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	DDC DATA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDC CLK
8	GND		

3.10 LAN RJ45 Connector

ROCKY-3702EV is equipped with a built-in 10/100Mbps Ethernet Controller. You can connect it to your LAN through RJ45 LAN connector. The pin assignments are as following:

- **CN10 : LAN RJ45 Connector**

1.	TX+	7.	N/C
2.	TX-	8.	N/C
3.	RX+	9.	3VSB
4.	N/C	10.	SPEEDLED
5.	N/C	11.	3VSB
6.	RX-	12.	ACTLED

- **CN5 : LED Connector for LAN**

1	VCC
2	LAN ACT.

3.11 Fan Connector

The ROCKY-3702EV provides one CPU cooling fan connector and two system fan connectors. These connectors can supply 12V/500mA to the cooling fan. The connector has a "rotation" pin which supplies the fan's rotation signal to the system, so the system BIOS knows the fan speed. Please note that only specific fan offers the rotation signal .

- **CN13 : CPU Fan Connector**

- **CN14 : System1 Fan Connector**

- **CN15 : System2 Fan Connector**

PIN NO.	DESCRIPTION
1	Fan Sensor
2	+12V
3	GND

Chapter 4. AMI BIOS Setup

The ROCKY-3702EV uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected to meet end-users' needs. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Started

When you turn on the power button, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test, initialization and system configuration verification.

" Hit DEL if you want to run SETUP"

To access AMI PCI/ISA BIOS Setup program, press key. The following screen will be displayed at this time.

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.21
(C)1998 American Megatrends, Inc. All Rights Reserved

Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Change User Password
Change Supervisor Password
Auto-Detect Hard Disks
Auto Configuration with Optimal Settings
Auto Configuration with Fail Safe Settings
Save Settings and Exit
Exit Without Saving

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit  ↑:Sel  F2/F3:Color  F10:Save & Exit
```

4.2 Standard CMOS Setup

The standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk setting. Please refer to the following screen.

AMIBIOS SETUP - STANDARD CMOS SETUP										
(C)1998 American Megatrends, Inc. All Rights Reserved										
Date (mm/dd/yyyy): Thu Apr 15, 1999					Base Memory: 0 KB					
Time (hh/mm/ss) : 14:50:39					Extd Memory: 0 MB					
Floppy Drive A:		1.44 MB 3½								
Floppy Drive B:		Not Installed								
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit Mode
Pri Master :	Auto									On
Pri Slave :	Auto									On
Sec Master :	Auto									On
Sec Slave :	Auto									On
Boot Sector Virus Protection					Disabled					
Month:	Jan - Dec					ESC:Exit F1:Sel				
Day:	01 - 31					PgUp/PgDn:Modify				
Year:	1901 - 9999					F1:Help F2/F3:Color				

To set the Date, for example, press either the arrow or <Enter> button on your keyboard to select one of the fields (Months, Date or Year) then press either <PgUp> or <PgDn> to adjust it to the current Months, Date and Year. Do the same steps for Time setting.

For IDE hard disk drive setup, please check the following possible setup procedure:

1. Use Auto setting for detection during boot-up.
2. Use Auto-Detect Hard Disk option in the main menu; the computer will automatically detect the HDD specifications.
3. Manually enter the specifications by yourself from the "User" option.

4.3 Advanced CMOS Setup

Advanced CMOS Setup is designed the purpose of tuning the ROCKY-3702EV board to operate in its best performance. For common operation use, customers don't have to change any of the default settings for the default setting is pre-set to run the most reliable operation.

The following screen will be displayed if you select Advanced CMOS Setup:

AMIBIOS SETUP - ADVANCED CMOS SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	Available Options: Disabled ▶ Enabled
1st Boot Device	Floppy	
2nd Boot Device	IDE-0	
3rd Boot Device	CDROM	
Try Other Boot Devices	Yes	
Floppy Access Control	Read-Write	
Hard Disk Access Control	Read-Write	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Absent	
Primary Display	Absent	
Password Check	Setup	
Boot To OS/2 > 64MB	No	
CPU Serial Number	Enabled	
Cache Bus ECC	Disabled	ESC:Exit ↑↓:Sel
System BIOS Cacheable	Enabled	PgUp/PgDn:Modify
C000,16k Shadow	Cached	F1:Help F2/F3:Color

You can change the value of each options by using <PgUp> and <PgDn> key. The available values are shown on the right screen.

- **Quick Boot** > *Enabled*: this will enable the BIOS to boot quickly when you turn on your computer. The BIOS will only check the first 1MB of the system memory.
- **Quick Boot** > *Disabled*: the BIOS will test all system memory when it boots up. It will spend about 40 seconds until it receives a Ready signal from the HDD. It will also wait for you to press the key or not.

- **1st, 2nd, 3rd Boot Device** > to define the sequence of boot drives after routine check up completes. If the 1st Boot Device fails, the BIOS will attempt to boot from the 2nd or the 3rd device. The Optimal and Fail-Safe default settings are C:,A:,CDROM.
- **Try Other Boot Devices** > the BIOS will try to boot from any other available device in the system if the 1st, 2nd and 3rd device fails to boot.
- **Floppy Access Control** > to define the read/write access which is set when booting from a floppy drive.
- **Hard Disk Access Control** > to define the read/write access which is set when booting from a HDD.
- **S.M.A.R.T. for Hard Disks** > to allow BIOS to use the **S**ystem **M**anagement and **R**eporting **T**echnologies protocol for reporting server system information on a network
- **BootUp Num-Lock** > to turn on/off the Num-Lock option on a enhanced keyboard when you boot. If you turn it off, the arrow keys on the numeric keypad can be used just as the other set of arrow keys on the keyboard and vice versa.
- **Floppy Drive Swap** > this function enables you to swap the floppy disk drives via software or without moving the hardware.
- **Floppy Drive Seek** > when this option is set to *Enabled*, BIOS will perform a Seek command on floppy drive A: before boot-up.
- **PS/2 Mouse Support** > to test whether or not a PS/2 mouse is supported.
- **System Keyboard** > to configure the keyboard. If you set it to *Absent*, BIOS will not report keyboard errors.

- **Primary Display** > to define the type of display monitor of the system. The Absent option is for network file servers.
- **Password Check** > to define if a password is necessary or not for access to BIOS setup.
- **Boot to OS/2** > if you are running the OS/2 operating system, this option must be set to yes. It means you permit BIOS to run properly if OS/2 or any other OS that does not support Plug and Play is found in your computer.
- **CPU Serial Number** > this option is available only if you use Pentium® III processor.
- **Cache Bus ECC** > this option is available only if you use Pentium® III processor.
- **System BIOS Cacheable** > to define whether or not the memory segment F000H can be read from or written to cache memory. Setting it to Enabled will accelerate your system operation.
- **XXXX, 16k Shadow** > ROM Shadow is a technique in which BIOS code is copied from slower ROM to faster RAM. If you enable it then the BIOS will be executed from the RAM. Each option allows 16KB segment to be shadowed to the RAM.

4.4 Advanced Chipset Setup

This setup functions are working mostly for Chipset (Intel 440BX). These options are used to change the Chipset's registers. Please be careful while making changes to any default setting, otherwise the system will run unstably.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
***** SDRAM Timing *****		
Configure SDRAM Timing by SPD	Disabled	Available Options: ▶ Disabled Enabled
SDRAM RAS# to CAS# delay	3 SCLks	
SDRAM RAS# Precharge	3 SCLks	
SDRAM CAS# Latency	3 SCLks	
SDRAM Leadoff Cmd Timing	Auto	
DRAM Integrity Mode	Non-ECC	
DRAM Refresh Rate	15.6 us	
Memory Hole	Disabled	
UGA Frame Buffer USWC	Disabled	
PCI Frame Buffer USWC	Disabled	
USWC Write Post	Enabled	
Graphics Aperture Size	64MB	
Search for MDA Resources	Yes	
8bit I/O Recovery Time	1 Sysclk	
16bit I/O Recovery Time	1 Sysclk	
USB Passive Release	Enabled	
PIIX4 Passive Release	Enabled	ESC:Exit ↑:Sel
PIIX4 Delayed Transaction	Disabled	PgUp/PgDn:Modify
USB Function	Disabled	F1:Help F2/F3:Color

- **Configure SDRAM Timing by SPD** > *Enabled* will select predetermined optimal values of chipset parameters. When Disabled, chipset parameters return to setup information stored in CMOS.
- **SDRAM RAS# to CAS delay** > to specify the relative delay between row and column address strobe form SDRAM.
- **SDRAM RAS# Precharge** > this option specifies the length of time for Row Address Strobe form SDRAM to precharge.
- **SDRAM CAS# Latency** > to specify the CAS latency timing form SDRAM DRAM.

- **DRAM Integrity Mode >** to choose DRAM Integrity Mode; *ECC/EC* will enable the **Error Checking and Correction** DRAM integrity mode.
- **DRAM Refresh Rate >** to specify the timing for DRAM Refresh.
- **Memory Hole :** to specify the location of a memory hole in the CMOS RAM. This setting reserve 15MB to 16MB memory address space for ISA expansion cards that specifically require this setting. Memory from 15MB and up will be unavailable to the system because expansion cards can only access memory up to 16MB.
- **VGA Frame Buffer USWC >** to specify whether or not a caching of the video A000-BFFF RAM is allowed. *Enabled* will give you better system performance.
- **PCI Frame Buffer USWC >** to specify whether or not a caching of the PCI VGA frame buffer is allowed.
- **USWC Write Post >** to Enable or Disable the use of Uncacheable, Speculatable, Write-Combined memory.
- **Graphics Aperture Size >** to define the size of Graphics Aperture.
- **Search for MDA Resources >** to allow the BIOS to search for MDA resources or not.
- **8bit I/O Recovery Time >** to define the length of time for 8 bit I/O recovery.
- **16bit I/O Recovery Time >** to define the length of time for 16 bit I/O recovery.

- **USB Passive Release** > to specify whether or not PIIX4 is allowed to use Passive Release while transferring control data for USB transactions.
- **PIIX4 Passive Release** > *Enabled* will let the Passive Release mechanism encoded when CPU to PCI bus accesses.
- **PIIX4 Delayed Transaction** > to enable or disable the embedded 32-bit posted write buffer which supports delay transaction.
- **USB Function** > to enable or disable the USB (Universal Serial Bus) functions.

4.5 Power Management Setup

AMIBIOS SETUP - POWER MANAGEMENT SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
Power Management/APM	Disabled	Available Options: ▶ Disabled Enabled
Green PC Monitor Power State	Off	
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	50-62.5%	
Modem Use IO Port	N/A	
Modem Use IRQ	N/A	
Display Activity	Ignore	
Device 6 (Serial port 1)	Monitor	
Device 7 (Serial port 2)	Monitor	
Device 8 (Parallel port)	Ignore	
Device 5 (Floppy disk)	Monitor	
Device 0 (Primary master IDE)	Monitor	
Device 1 (Primary slave IDE)	Ignore	
Device 2 (Secondary master IDE)	Monitor	
Device 3 (Secondary slave IDE)	Ignore	
Power Button Function	Suspend	ESC:Exit ↵:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color
Ring Resume From Soft Off	Disabled	

- **Power Management/APM** > to enable or disable the Advanced Power Management feature.
- **Green PC Monitor Power State** > to specify the power state of the monitor after the specified period of display-idle has ended.
- **Video Power Down Mode** > to specify the power state of the VESA VGA video subsystem after the specified period of display-idle has ended.
- **Hard Disk Power Down Mode** > to specify the power state of the hard disk after the specified period of hard drive-idle has ended.
- **Standby Time Out (Minute)** > to specify the length of the system-idle period while the system is in full power on state. After this period of time has ended, the system will go into Standby state.

- **Suspend Time Out (Minute) >** to specify the length of the system-idle period while the system is in Standby state. After this period of time has ended, the system will go into Suspend state.
- **Throttle Slow Clock Ratio >** to specify the speed of system clock under power saving state. The figure is a ratio between power conserving and normal state CPU clock.
- **Modem Use IO Port >** to assign a port for modem.
- **Modem Use IRQ >** to assign an IRQ for modem
- **Display Activity >** to specify if BIOS has to monitor display activity or not.
- **Device X >** to monitor specified device IRQ or Ignore.

4.6 PCI / PLUG AND PLAY Setup

The setup help user handles the ROCKY-3702EV board's PCI function. All PCI bus slots on the system use INTA#, thus all installed PCI slots must be set.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options: ▶ No Yes
Clear NVRAM	No	
PCI Latency Timer (PCI Clocks)	64	
PCI VGA Palette Snoop	Disabled	
Allocate IRQ to PCI VGA	Yes	
PCI IDE BusMaster	Disabled	
OffBoard PCI IDE Card	Auto	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	
PCI Slot1 IRQ Priority	Auto	
PCI Slot2 IRQ Priority	Auto	
PCI Slot3 IRQ Priority	Auto	
PCI Slot4 IRQ Priority	Auto	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

- **Plug and Play Aware O/S > Yes or No**
When PNP OS is installed, interrupts will be reassigned by the OS when the setting is Yes. When a non-PNP OS is installed or to prevent reassigning of interrupt settings, select setting to No.
- **Clear NVRAM >** to specify whether BIOS has to clear NVRAM on every boot or not.
- **PCI Latency Timer (PCI Clocks) >** to define the latency timing (PCI clock) for all PCI devices on the PCI bus.
- **PCI VGA Palette Snoop >** this option is useful only for system with more than one VGA devices connected to it through different bus (one PCI and one ISA). To enable those various VGA devices to handle signal from the CPU

on each set of palette registers of every video devices, it must be set *Enabled*.

- **Allocate IRQ to PCI VGA >** to allocate IRQ to PCI VGA, choose Yes and vice versa.
- **PCI IDE BusMaster >** to include the BusMastering capability into the IDE Controller on the PCI.
- **Offboard PCI IDE Card >** to specify if an offboard PCI IDE card is installed in your computer or not. You must specify the slot number on the board which will be used for the card.
- **Offboard PCI IDE Primary (/Secondary) IRQ >** to specify the PCI interrupt that is assigned to the Primary (/Secondary) IDE channel on the offboard PCI IDE controller.
- **PCI Slot (1,2,3,4) IRQ Priority >** to specify the IRQ priority to be used by the PCI devices on slot 1 to 4.
- **DMA Channel (0,1,3,5,6,7) >** to indicate whether or not the DMA channel is assigned for a PnP or ISA card.
- **IRQ (3,4,5,7,9,10,11,14,15) >** to assign the displayed IRQ to be used by a legacy ISA adapter card. The settings are ISA/EISA or PCI/PnP.

4.7 Peripheral Setup

This setup is working mostly on Multi-I/O Chip (W83977F). The options are used to change the Chipset's registers. Please be careful while making any changes to default setting as to meet your application need properly. The only special concern is Onboard Serial Port 2. If you want to use the IrDA port, you have to configure the SIR or ASKIR model in the BIOS's Peripheral Setup's COM2; the RS-232 COM2 will be disabled.

AMIBIOS SETUP - PERIPHERAL SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Auto	Available Options: ▶ Auto Disabled Enabled
OnBoard Serial PortA	3F8h/COM1	
OnBoard Serial PortB	2F8h/COM2	
Serial PortB Mode	Normal	
IR Duplex Mode	N/A	
IrDA Protocol	N/A	
OnBoard Parallel Port	378h	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	?	
Parallel Port DMA Channel	N/A	
OnBoard IDE	Both	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

- **Onboard FDC >** to enable the FDC on your board. If you set it to Auto, the BIOS will decide if the FDC should be enabled, automatically.
- **Onboard Serial Port A (/B) >** to specify the I/O port address of the serial port 1(/2). If you set it to Auto, the BIOS will decide the correct I/O port address, automatically.
- **Serial Port B Mode >** to specify the mode of serial port 2.

- **IR Duplex Mode >** to specify the mode of IR device that is connected to the IR port.
- **IrDA Protocol >** to specify the function mode if an IrDA mode is selected.
- **Onboard Parallel Port >** to specify the I/O port address of the parallel port.
- **Parallel Port Mode >** to specify the mode of parallel port. The options are:
 - ✓ **Normal** (normal parallel port mode),
 - ✓ **Bi-Dir** (supports bidirectional transfer),
 - ✓ **EPP** (supports devices that comply with the Enhanced Parallel Port specification),
 - ✓ **ECP** (supports devices that comply with the Extended Capabilities Port).
- **Parallel Port IRQ >** to assign certain IRQ to the parallel port. The optimal and fail-safe settings is 7.
- **Parallel Port DMA Channel >** available only if the parallel port mode is ECP. The optimal and fail-safe settings is 3.
- **Onboard IDE >** to define which on-board IDE controller channel(s) to be used. Available options are: Primary, Secondary, Both and Disabled.

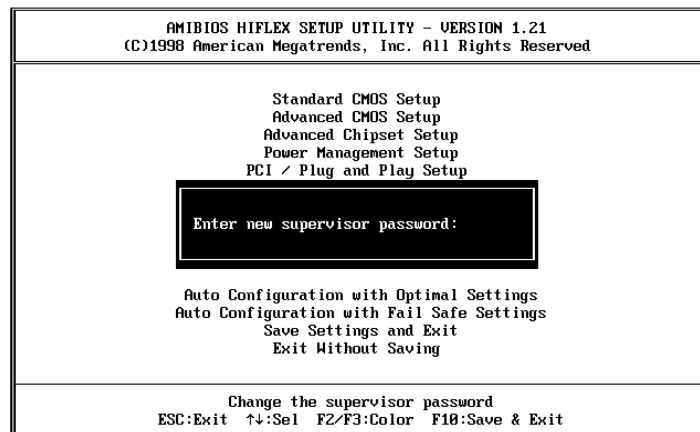
4.8 Hardware Monitor Setup

There is a LM78 chip on your board which can monitor on board system voltage and fan speed. The voltage monitoring will cover +5V,+12V,-12V,and -5V.

AMIBIOS SETUP - HARDWARE MONITOR SETUP (C)1998 American Megatrends, Inc. All Rights Reserved		
CPU Plug & Play	Auto	Available Options: Manual ▶ Auto
CPU Frequency Selection	100 Mhz	
-- System Hardware Monitor --		
Current System Temperature	48°C/118°F	
CPU1 Fan Speed	5443 RPM	
CPU2 Fan Speed	0 RPM	
Vtt	1.520 V	
Vcore	1.984 V	
Vio	3.392 V	
+ 5.000V	5.113 V	
+12.000V	12.728 V	
-12.000V	-12.209 V	
- 5.000V	-5.124 V	
ESC:Exit ↑:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color		

Note: Normal CPU Fan RPM is over than 5000 RPM. If your CPU Fan RPM is less than that figure, something is wrong and the CPU will be in overheat condition. Make sure that the connection at CN12/CN13 is correct.

4.9 Change Supervisor / User Password



This option sets a password that is used to protect your system and Setup Utility. Supervisor Password has higher priority than User Password. Once you setup the password, the system will always ask you to key-in password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with Supervisor Password, you can access every setup option on the main menu but with User Password you can only choose three setup options (USER PASSWORD, SAVE SETTING AND EXIT and EXIT WITHOUT SAVING). To disable these passwords, enter the BIOS SETUP menu with Supervisor Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pop-up.

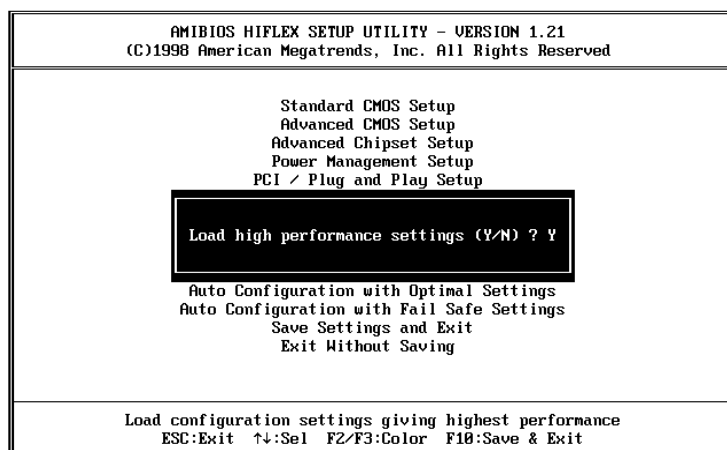
4.10 Auto-Detect Hard Disk

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 4 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press <N> to skip the next IDE drives.

Note: If your IDE HDD was formatted in previous older system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk.

4.11 Auto Configuration with Optimal Settings

This option lets you load the *Optimal* default settings. These settings are *best-case values* which will provide the best performance. Whenever your CMOS RAM is damaged, this Optimal settings will be loaded automatically.



4.12 Auto Configuration with Fail Save Settings

This option allows you to load the *Fail Safe* default settings when something happens to your computer results in the situation that it can no longer boot normally. These settings are not the most optimal settings but are the most stable settings.



4.13 Save Settings and Exit

Select this option when you finish setting all the parameters and want to save them into the CMOS. Simply press <Enter> key and all the configuration changes will be saved.

4.14 Exit Without Saving

Select this option if you want to exit the Setup without saving the changes that you made. Simply press <Enter> key and you will exit the BIOS SETUP without saving the changes.

Chapter 5. E² Key™ Function

The ROCKY-3702EV provides an outstanding E²KEY™ function for system integrator. Based on the E²KEY™, you are free to store the ID Code, Password or crucial data in the 1Kbit EEPROM. Because the EEPROM is nonvolatile memory, you don't have to worry about losing these very important data.

Basically, the E²KEY™ is based on a 1Kbit EEPROM which is configured to 64 words(from 0 to 63). You could access (read or write) each word anytime.

When you start to use the E²KEY™ you should have the utility in the package. The software utility will include four files as follows,

README.DOC
E2KEY.OBJ
EKEYDEMO.C
EKEYDEMO.EXE.

The E2KEY.OBJ provides two library functions for user to integrate their application with E²KEY™ function. These library (**read_e2key and write_e2key**) are written and compiled in C language. Please check the following statement, then you will know how to use it. It is pretty easy.

unsigned int read_e2key(unsigned int address)

/* This function will return the E²KEY™'s data at address. The address range is from 0 to 63. Return data is one word,16 bits

***/void write_e2key(unsigned int address,unsigned data)**

/* This function will write the given data to E²KEY™ at certain address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

To start to use the function in a quick way, please refer to the included EKEYDEMO.C code before you start to operate.

Please note that the E²KEY™ function is based on the working of parallel port so you should enable ROCKY-3702EV's parallel port, otherwise it will not work at all.

Appendix A. Watch-Dog Timer

The WatchDog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

Two I/O ports control the WatchDog Timer :

443 (hex)	Read	Enable to refresh the WatchDog Timer.
043 (hex)	Read	Disable the WatchDog Timer.

To enable the WatchDog Timer, a read from I/O port 443H must be performed. This will enable and activate the countdown timer which will eventually time-out and either reset the CPU or cause a NMI, depending on the setting of JP7. To ensure that this reset condition does not 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 selected by jumper group JP8.

A tolerance of at least 30% must be maintained to avoid unknown routines within 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.

Note: when exiting a program it is necessary to disable the WatchDog Timer, otherwise the system will reset.

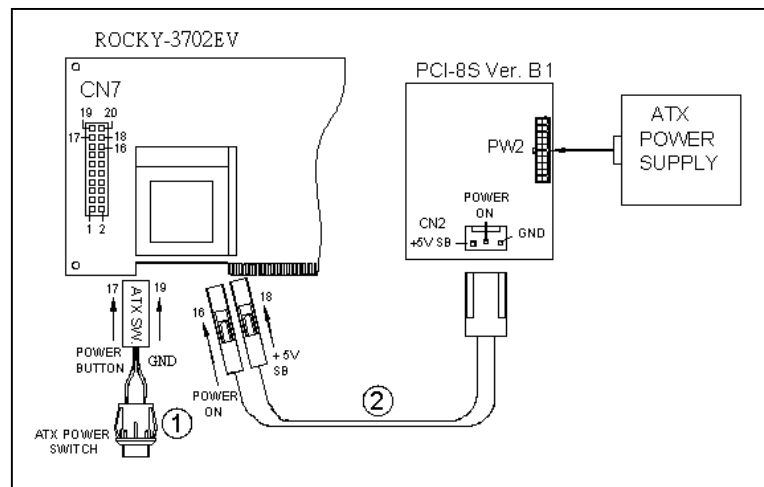
Appendix B. ATX Power Supply

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

A. For backplanes with ATX Connector

1. Please disconnect AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.
2. Please check the type of your CPU board. All CPU board listed on the next page supports ATX power supply but also has two types of power switch connection:

2.1.ROCKY-3702EV (through Power Button & +5VSB):



Connect the ATX power supply switch to the pin 17 (power button) and pin 19 (+5VSB) of CN7 (multi panel) on the board.

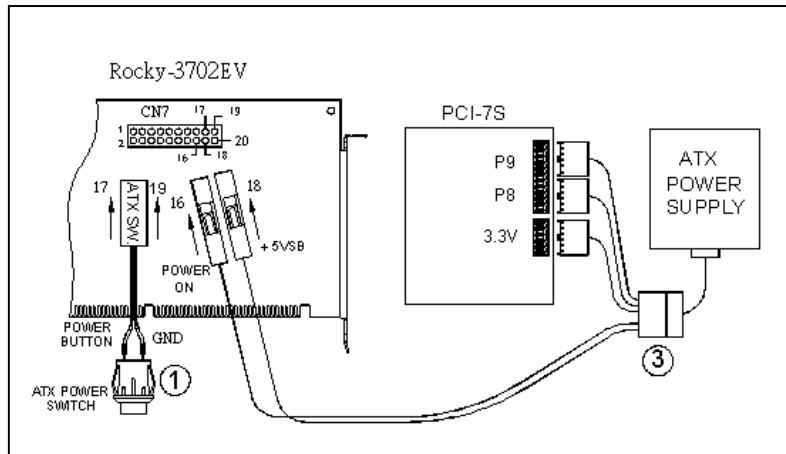
If you wish to turn off the power supply, please press the ATX power switch button down for about 4 sec. To turn ON system, simply push the button once.

B. For the backplanes without ATX connector.

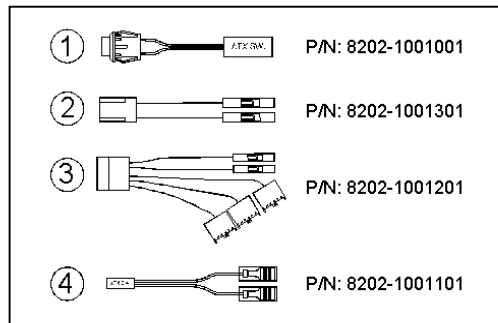
Refer to the following figures and follow the steps listed below:

1. Please disconnect the AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.
2. Connect the ATX Power Switch to the pin 9 (power button) and 19 (+5VSB) of J1 in the Rocky-P218A ISBC.
3. Connect the ATX Power Switch to the pin 9 (power button) and 19 (+5VSB) of J1 in the Rocky-P218A ISBC(Type A connection)
Note : Some boards has Type B connection (through Power Button and GND).
4. Connect the green cable from the cable kit to the pin 18 (power ON) of J1 in the Rocky-P218A ISBC and connect the purple cable to the pin 20 (+5VSB) of J1.
5. Connect the other port of the cable kit to the ATX power supply.
6. Plug in the AC jack to the AC source and the unit is now ready to be switched ON.
7. To turn OFF the power supply, please press the ATX power switch button down for about 5 sec. To turn ON the system, simply push the button once.

(Please turn to the following page for graphic illustrations.)



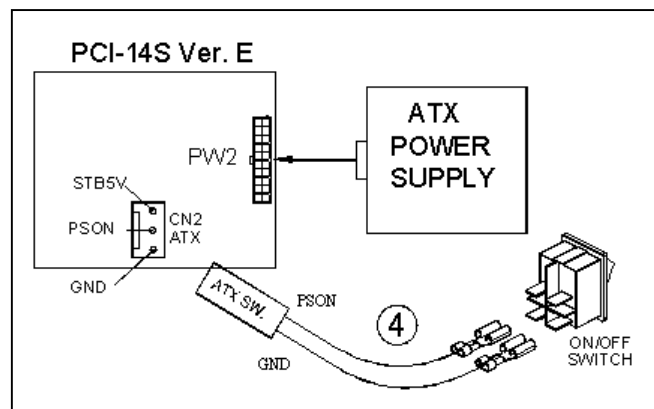
The following ISBC have the ATX power control function:
 Rocky-P218A, Rocky-P228, Rocky-P238V, **Rocky-P258BX**,
 Rocky-548TX, Rocky-538TXV, Juki-710, PCISA-258EV,
 PCISA-358SV, Rocky-528AGP, Rocky-528AGP-100



C. For backplanes with ATX power supply connector working as AT Mode

Some SBC doesn't come with ATX power ON/OFF function. In this case, you can control the ATX power supply through backplane's PS ON connector. Refer to the figure below for the backplanes with ATX connector. Connection can be made simply by following the steps listed below:

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 using the power switch



Appendix C. DMA, IRQ and 1st MB Memory I/O Address Map

DMA Channel Assignments:

DMA Channel #	Description
0	Available
1	Available
2	Floppy Disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC Clock
IRQ1	Keyboard	IRQ9	LAN
IRQ2	Cascade to IRQ Controller	IRQ10	USB
IRQ3	(COM2)	IRQ11	RAGE MOBILITY AGP
IRQ4	(COM1)	IRQ12	PS/2 Mouse
IRQ5	Available	IRQ13	Numeric data processor
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	LPT1	IRQ15	Secondary IDE

Note: All IRQs have been assigned to the listed devices, so if you want to add any additional device interface, you must free the unused IRQ first. For example, if you don't use USB K/B or Mouse, then IRQ11 may be set free.

1st MB Memory Address Map

Memory Address	Description
00000-9FFFF	System Board extension for ACPI BIOS
A0000-C7FFF	RAGE MOBILITY AGP
F0000-FFFFF	System Board extension for ACPI BIOS

I/O Address Map

I/O Address Range	Description
000-00F	DMA Controller #1
020-021	Interrupt Controller #1, Master
040-043	System Timer
060-064	8042 (Keyboard Controller)
070-071	Real Time Clock, NMI Mask
080-09F	DMA Page Register
0A0-0A1	Interrupt Controller #2
0C0-0DE	DMA Controller #2
0FF	Numeric data processor
0F8-0FF	Math Coprocessor
170-177	Fixed Disk
1F0-1F7	
2F8-2FF	Serial Port 2 (COM2)
378-37F	Printer Port 1 (LPT1)
3B0-3BB	RAGE MOBILITY AGP
3C0-3DF	RAGE MOBILITY AGP
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1 (COM1)