

**ROCKY-3701 Ver1.0**  
**Celeron™ & Pentium III Processor**  
**With four RS-232C Ports & Compact Flash Disk SBC**

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# 1

## Introduction

Welcome to the ROCKY-3701 Socket 370 Celeron® and Pentium III ( FC-PGA ) with four RS-232C ports & CompactFlash disk Single Board Computer. The ROCKY-3701 is a PICMG bus form factor board. It is equipped with high performance Intel® Celeron up to 500MHz and Pentium III ( FC-PGA ) 800MHz ( 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. User can use any DOS command without any extra software utility. The DOC currently is available from 2MB to 144MB.

Besides the DOC, this board also support CompactFlash disk, We use IDE2 for CompactFlash disk , which is 100% compatible with IDE interface

An advanced high performance super AT I/O chip – Winbond W83977TF & W83877TF are used in the ROCKY-3701 board. The on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

ROCKY-3701 uses the advanced INTEL 440BX Chipset which is 100% ISA/PCI compatible chipset with PCI 2.1 standard. In addition, this board provides four 168-pin sockets for its on-board DRAM. The DIMM module is 3.3 V SDRAM and max. 256MB for each module.

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## 1.1 Specifications :

- **CPU** : support Intel Celeron<sup>®</sup> up to 500 MHz , Pentium III ( FC-PGA ) 800 MHz ( or Above ) 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.
- **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. The best of all is that this new technology is compatible with existing ATA-2 IDE specifications. So, there is no need to do any change for customer's current accessory.
- **Multi-I/O Chip** : W83977TF & W83877TF, all I/O setup by BIOS  
Four 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.
- **Four 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<sup>™</sup>** : designed to enhance the ISA bus drive capability
- **Watch-dog timer** : can be set by PROGRAM 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 generate 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 let customer to use the Flash Disk with DOS command, no need 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
- **CompactFlash disk** : The CompactFlash Storage Card also runs in True IDE Mode that is electrically compatible with an IDE disk drive. It can be used with a passive adapter in a Type I socket.

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## 1.2 What You Have

In addition to this *User's Manual*, the ROCKY-3701 package includes the following items:

- ROCKY-3701 Socket 370 Celeron® & Pentium III SBC.
- Printer Cable/RS232 Cable.
- FDD/HDD Cable.
- 6-pin Mini-Din to 6-pin PS/2 MOUSE/KEYBOARD Y 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.

# 2

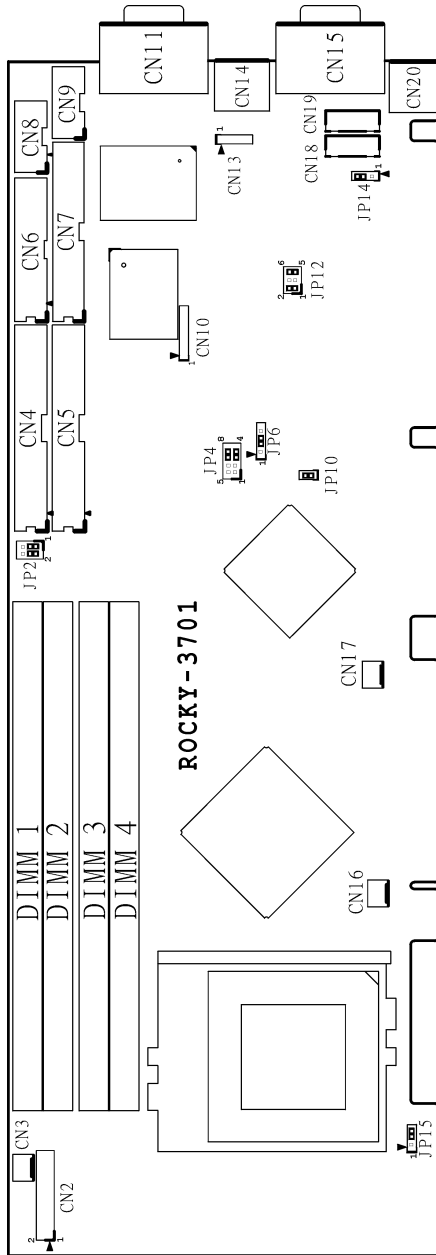
## Installation

This chapter describes how to install the ROCKY-3701. The layout of ROCKY-3701 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.

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### 2.1 ROCKY-3701 's Layout

< please, refer to the next page >



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## 2.2 Unpacking Precautions

Some components on ROCKY-3701 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-3701 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-3701 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.
- ✓ Do not put your ROCKY-3701 SBC unprotected on a flat surface because it has components on both sides.

---

## 2.3 Setting the CPU of ROCKY-3701

### • JP2 : CPU FREQUENCY SETTING

FREQUENCY	JP2	
	1-3	2-4
66MHz/100MHz	ON	ON

Note: Intel Celeron CPU will auto-detect 66MHz

### • JP15 : CPU TYPE SETTING

CPU TYPE.	JP15
CYRIX	1-2
INTEL	2-3

### • JP4 : 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
7.0x	ON	OFF	ON	OFF
7.5x	ON	OFF	OFF	OFF
8.0x	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 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.

### • JP14 : Watch-Dog Timer Type Setting

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

---

## 2.5 DiskOnChip™ Flash Disk

The DiskOnChip™ (DOC) Flash Disk Chip is produced by M-Systems. Customers don't need any extra software utility because the DOC is 100% compatible to hard disk. It is just "plug and play", easy and reliable. Right now, the DOC is available from 2MB to 144MB.

- **JP12 : DiskOnChip™ Memory Address Setting**

PIN NO.			ADDRESS
1-2	3-4	5-6	
OFF	ON	ON	CE00 – CFFF
<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>D600 – D7FF</b>
OFF	OFF	ON	DE00 – DFFF

---

## 2.6 Clear CMOS Setup

If you forget the CMOS password, you can clear or reset it by closing the **JP6**. After JP6 is closed, turn on the power for about 3 seconds then turn it off and open the JP6. Now, the password has been cleared from your CMOS.

- **JP6 : Clear CMOS Setup**

PIN NO.	DESCRIPTION
<b>2-3</b>	<b>Normal Operation</b>
3-4	Clear CMOS Setup

*Note: 1-4 is for connection with external battery (4=GND)*

---

## 2.7 PS/2 Mouse

- **JP10 : PS/2 Mouse Setting**

The PS/2 mouse uses IRQ12 while in operation.

<b>JP10</b>	<b>DESCRIPTION</b>
<b>ON</b>	<b>Enable the PS/2 Mouse, IRQ12</b>
OFF	Disable the PS/2 Mouse

# 3

## Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY-3701 board.

### 3.1 Floppy Disk Drive Connector

ROCKY-3701 board equipped with a 34-pin daisy-chain driver connector cable.

#### • CN7 : 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-3701 IDE controller.

**CN4 (IDE 1) : Primary IDE Connector**

**CN5 (IDE 2) : Secondary IDE Connector**

**• CN4/CN5 : 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-3701 includes an on-board parallel port, accessed through a 26-pin flat-cable connector CN6.

#### • CN6 : 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-3701 offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports (COMA/COMB).

#### • CN15 : Serial Port 9-pin D-sub Connector (COMA)

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

• **CN11 : Serial Port 9-pin D-sub 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

• **CN9 : Serial Port 2x5 pin header Connector (COMC)**

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	GND

• **CN8 : Serial Port 2x5 pin header Connector (COMD)**

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	GND

---

### 3.5 Keyboard/Mouse Connector

The ROCKY-3701 provides one external keyboard ,one external mouse and one PS/2 keyboard & mouse connectors.

• **CN18 : 5-pin Header External Keyboard Connector**

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

• **CN20 : 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 CLOCK

• **CN19 : 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 CN2 connector.

• **CN2 : Multi Panel**

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

---

### 3.7 USB Port Connector

The ROCKY-3701 has two built-in USB ports for the future new I/O bus expansion.

- **CN14: USB0 Connector.**

#### **CN13: USB1 by 4-Pin header**

<b>PIN NO.</b>	<b>Description</b>
1	GND
2	SBD1+
3	SBD1-
4	VCC

---

### 3.8 IrDA Infrared Interface Port

ROCKY-3701 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.

- **CN10 : IrDA Connector**

<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX
6	NC

---

### 3.9 Fan Connector

The ROCKY-3701 provides one CPU cooling fan connector and two CHASSIS 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 specified fan offers the rotation signal .

- **CN16 : CPU Fan Connector**
- **CN3 : CHASSIS1 Fan Connector**
- **CN17 : CHASSIS2 Fan Connector**

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

---

### 3.10 CompactFlash Connector

#### CN21 : CompactFlash Connector (Secondary IDE)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	DATA 3
3	DATA 4	4	DATA 5
5	DATA 6	6	DATA 7
7	HDC CS0#	8	N/C
9	GND	10	N/C
11	N/C	12	N/C
13	VCC_COM	14	N/C
15	N/C	16	N/C
17	N/C	18	SA2
19	SA1	20	SA0
21	DATA 0	22	DATA 1
23	DATA 2	24	N/C
25	VCC-IN CHECK2	26	VCC-IN CHECK1
27	DATA 11	28	DATA 12
29	DATA 13	30	DATA 14
31	DATA 15	32	HDC CS1#
33	N/C	34	IOR#
35	IOW#	36	N/C
37	INTERRUPT	38	VCC
39	CSEL	40	N/C
41	RESET#	42	IORDY
43	N/C	44	VCC_COM
45	HDD ACTIVE#	46	N/C
47	DATA 8	48	DATA 9
49	DATA 10	50	GND

# 4

## AMI BIOS Setup

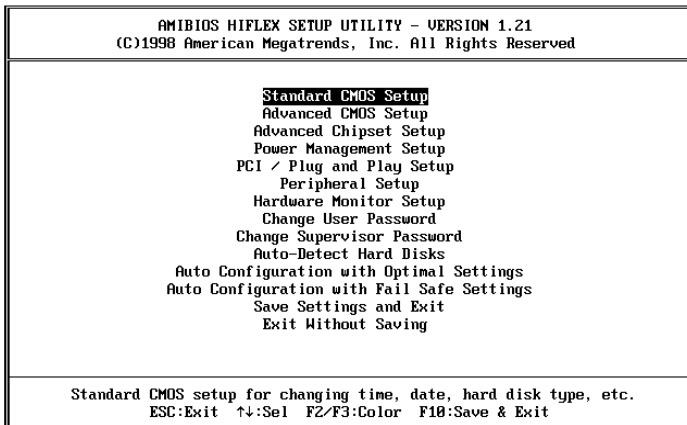
The ROCKY-3701 uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

### 4.1 Getting Start

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 and initialization and system configuration verification.

**" Hit DEL if you want to run SETUP"**

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



---

## 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 for this setup

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				Ext'd 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	P10 Mode	32Bit Mode	
Pri Master :		Auto								0n	
Pri Slave :		Auto								0n	
Sec Master :		Auto								0n	
Sec Slave :		Auto								0n	
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 set 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 the Auto setting for detection during boot-up.
2. Use the 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

This Advanced CMOS Setup is designed for tuning the best performance of the ROCKY-3701 board. As for normal operation customers don't have to change any default setting. The default setting is pre-set for 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		
<b>Quick Boot</b>	<b>Enabled</b>	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 F1: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 <Del> key or not.

**1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> Boot Device >** to define the sequence of boot drives after the routines check up completes. If the 1<sup>st</sup> Boot Device fails, the BIOS will attempt to boot from the 2<sup>nd</sup> or the 3<sup>rd</sup> 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 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> 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 turned Enabled, BIOS will perform a Seek command on floppy drive A: before boot-up.

**PS/2 Mouse Support** > to testify whether or not a PS/2 mouse is supported.

**System Keyboard** > to configure the keyboard. If you set it 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 the BIOS setup.

**Boot to OS/2** > if you run 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 Enabled will give faster execution in your system.

**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 carefully change any default setting ,otherwise the system will run unstably.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP		(C)1998 American Megatrends, Inc. All Rights Reserved	
***** SDRAM Timing *****		Available Options:	
<b>Configure SDRAM Timing by SPD</b>	Disabled	▶ 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	58-62.5%	
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 9 (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
Ring Resume From Soft Off	Disabled	Fg/Dp/Fg/Dn:Modify F1:Help F2/F3:Color

**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-3701 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		
<b>Plug and Play Aware O/S</b>	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	ESC:Exit ↑↓:Sel
DMA Channel 7	PnP	PgUp/PgDn:Modify
IRQ3	PCI/PnP	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, answer 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 carefully change any default setting to meet your application need perfectly. 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		
<b>OnBoard FDC</b>	<b>Auto</b>	Available Options:
OnBoard Serial PortA	3F8h/COM1	▶ Auto
OnBoard Serial PortB	2F8h/COM2	Disabled
Serial PortB Mode	Normal	Enabled
IR Duplex Mode	N/A	
IrDA Protocol	N/A	
OnBoard Parallel Port	378h	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	7	
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 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 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 are 7.

**Parallel Port DMA Channel >** available only if the parallel port mode is ECP. The optimal and fail-safe settings are 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

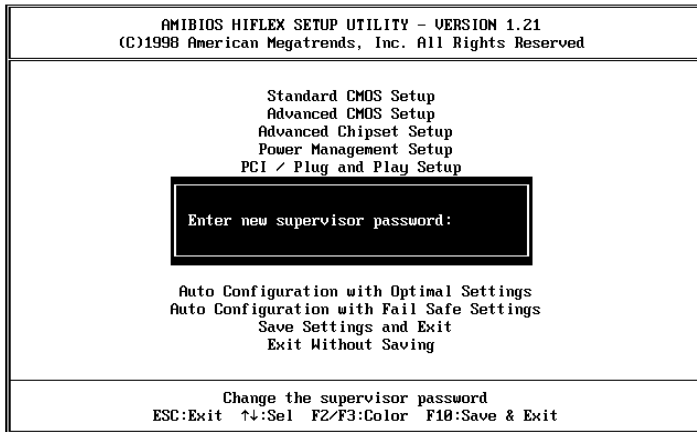
There is a LM78 chip on your board which can monitor on board system voltage and fan speed. The voltage monitoring will cover +5V,+12V,-12V,and -5V.

AMIBIOS SETUP - HARDWARE MONITOR SETUP (C)1999 American Megatrends, Inc. All Rights Reserved	
<pre>--= System Hardware Monitor =-- Current System Temperature 48°C/118°F CPU Fan Speed              5443 RPM Current chassis1 FAN speed 0 RPM Current chassis2 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</pre>	<p>Available Options:</p> <p>▶</p> <p>ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color</p>

*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 CN3/CN16/CN17 is correct.*

---

## 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.

---

## Auto-Detect Hard Disk

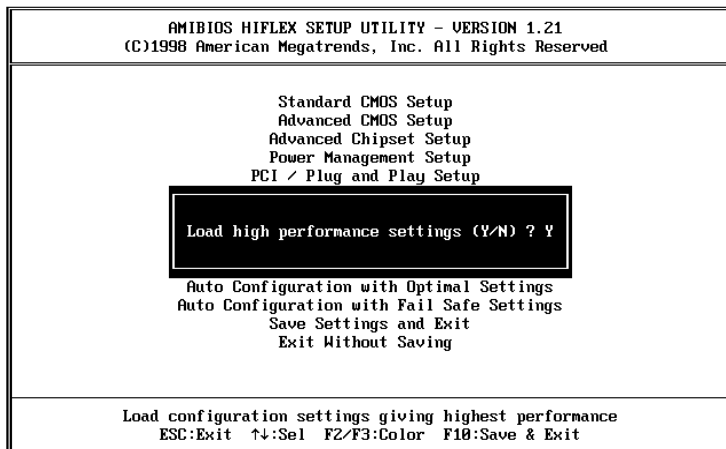
This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 4 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press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

---

## 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.



---

## Auto Configuration with Fail Save Settings

This option lets you load the *Fail Safe* default settings when something happens to your computer so that it cannot boot normally. These settings are not the most optimal settings but are the most stable settings.



---

## Save Settings and Exit

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

---

## Exit Without Saving

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

## 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, . 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 JP14.

**A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.**

---

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

---

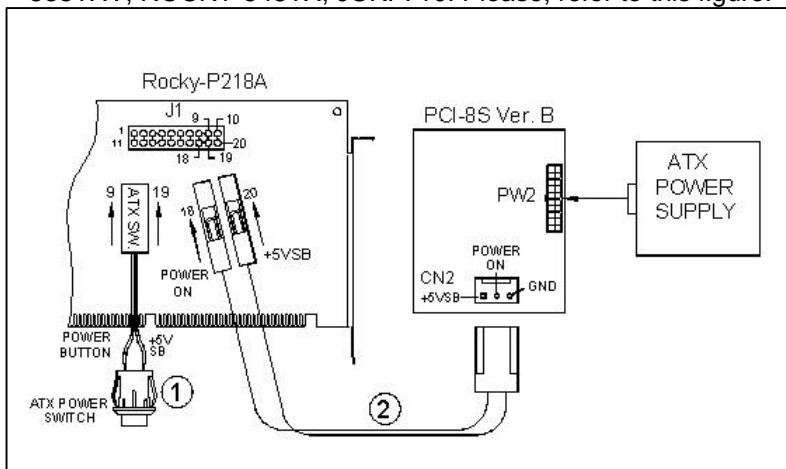
## Appendix B. ATX Power Supply

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

### A. For backplanes with ATX Connector

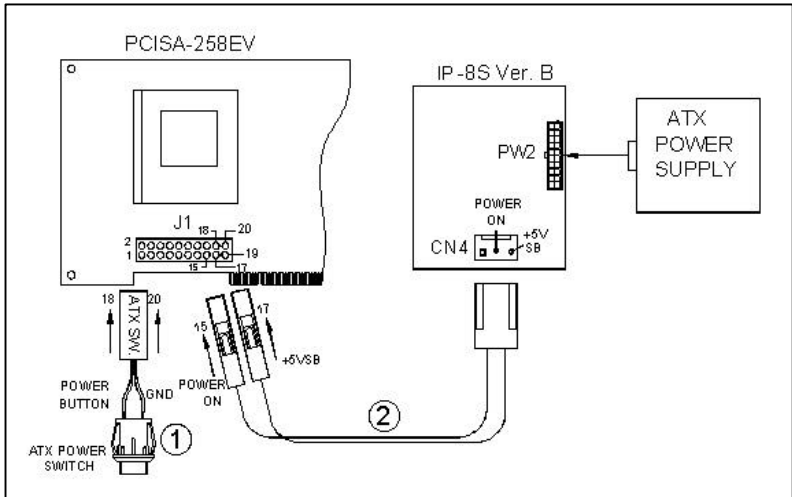
1. Please, disconnect the AC cord of the Power Supply from the AC source to prevent sudden electric surge to the board.
2. Please, check the type of your CPU board. All CPU board listed on the next page support ATX power supply but has two types of power switch connection:

**2.1.Type A (through Power Button & +5VSB) :** ROCKY-P228BX, ROCKY-P218A, ROCKY-P228, ROCKY-P238V, ROCKY-538TXV, ROCKY-548TX, JUKI-710. Please, refer to this figure:



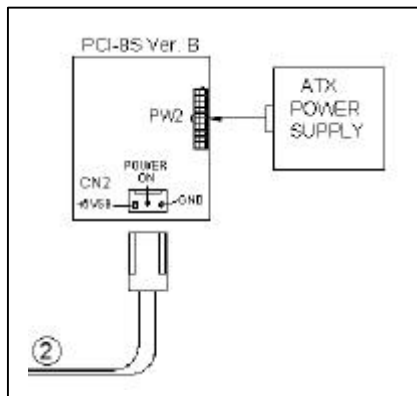
The example shown on this figure is the connection with Rocky-P218A. Connect the ATX power switch to the pin 9 (power button) and pin 19 (+5VSB) of J1 on the board.

**2.2.Type B (through Power Button & GND) :** PCISA-258EV, PCISA-358SV (*ROCKY-528AGP, ROCKY-528AGP-100*). Please refer to this figure:



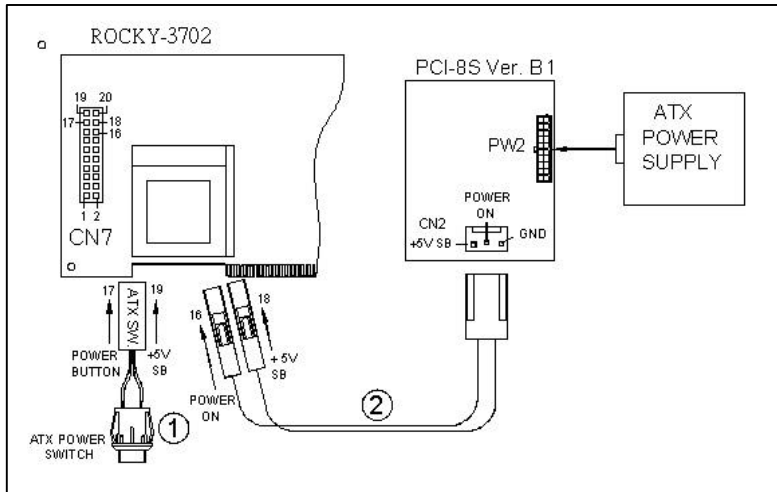
The example shown on this figure is the connection with PCISA-258EV. Connect the ATX power supply switch to the pin 18 (power button) and pin 20 (GND) of J1 on the board.

*Note: for ROCKY-528AGP and ROCKY-528AGP-100, the connection is almost the same with the above figure. The only difference thing is the backplane. See the figure below:*





## 2.4.ROCKY-3702 (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 push the ATX power switch button for about 4 sec. And to turn ON the system, simply push the button once.

## ***B. For the backplanes without ATX connector.***

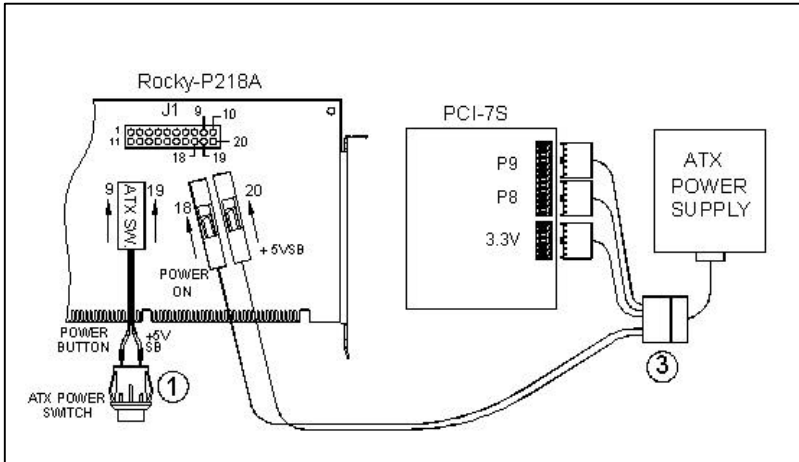
Refer to the following figure, please follow the steps below:

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)

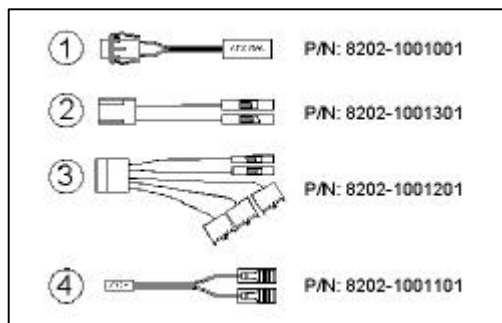
*Note : Some boards are Type B connection (through Power Button and GND).*

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, the unit is ready to switch ON now.
  7. To turn OFF the power supply, please push the ATX power switch button for about 5 sec. And to turn ON the system, simply push the button once



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 the backplanes with ATX power supply connector**

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

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

