ROCKY–538TXV

User Manual

Version 7.5

Pentium® with VGA
Single Board Computer

October 4, 2004

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Chapter 1. Introduction

Thank you for choosing ROCKY-538TXV Pentium® with VGA Single Board Computer. The ROCKY-538TXV board is an ISA/PCI form factor board, which comes equipped with high performance Pentium® CPU 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 suitable for embedded applications. The DOC Flash Disk is 100% compatible to hard disk, which allows users to use DOS command without having to install any extra software utility. DOC currently is available from 2MB to 72MB. An alternative solution namely, PROMDISK-Chip™ , can be used in the same DOC socket.

An advanced high performance super AT I/O chip – Winbond W83977TF is used in the ROCKY-538TXV board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT and XT architectures.

In addition, the ROCKY-538TXV Ver. 6.x provides two 168-pin DIMM sockets for on-board DRAM. The RAM module accepts 8, 16, 32,64 or 128MB memory. Total on-board memory can be configured from 16MB to 256MB.

ROCKY-538TXV uses the advanced INTEL Chipset, 430TX which is 100% ISA/PCI compatible chipset with PCI 2.1 standard.

1.1 Specifications

The ROCKY-538TXV Pentium® with VGA Single Board Computer provides the following specification:

- **CPU** : Pentium® MMX up to 233Mhz, AMD K6 processor up to 300MHz (or above), Cyrix 6x86MX processor & Intel Low-Power Embedded Processor.
- **Bus** : ISA bus and PCI 32-bit local bus, PCI 2.1 standard
- **DMA channels** : 7
- **Interrupt levels** : 15
- **Chipset** : Intel 430TX
- **PCI VGA :** PCI VGA ATI RAGE Mobility-M Chipset with 4MB or 8MB(optional) RAM
  - ✓ Resolution :1280x1024, 24bit color
  - ✓ 1024x768, 32bit color
  - ✓ 800x600, 32bit color
- **Real-time clock/calendar** : Available in 430TX chipset, backup by industrial Li-battery, 3V/850mAH
- **RAM memory** : Support up to 256MB, SDRAM
- **Second Cache memory** : 512KB Pipelined Burst SRAM on board
- **Ultra DMA/33 IDE Interface** : Support 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 change any of customer's current accessory.
- **Floppy disk drive interface** : Two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives.
- **Two high speed Series ports** : NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **IrDA port :** Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- **USB port :** Support two USB ports for future expansion.
- **Watch-dog timer** : Can be set by 1,2,10,20,110 or 220 seconds per interval. Reset or NMI was generated when CPU did not periodically trigger the timer. Your program use hex 043 and 443 to control the watch-dog and generate a system reset.
- **Flash Disk - DiskOnChip™ :** The Flash Disk provided is 100% compatible with hard disk. The built-in TrueFFS Transparent Flash Block Management and Space Reclamation will allow customers to use the Flash Disk with DOS command, no need to install any extra software utility.
- **Keyboard connector**
- **Mouse** : PS/2 Mouse Port on-board.
- **Power Consumption** :
  - ✓ +5V @ 4.8A
  - ✓ (Pentium/MMX-200,32MB SDRAM)
  - ✓ +12V @ 170mA , -12V@20mA
- **Operating Temperature** : 0° ~ 55° C (CPU needs Cooler)

1.2 Package Contents

In addition to this *User Manual*, the ROCKY-538TXV package includes the following items:

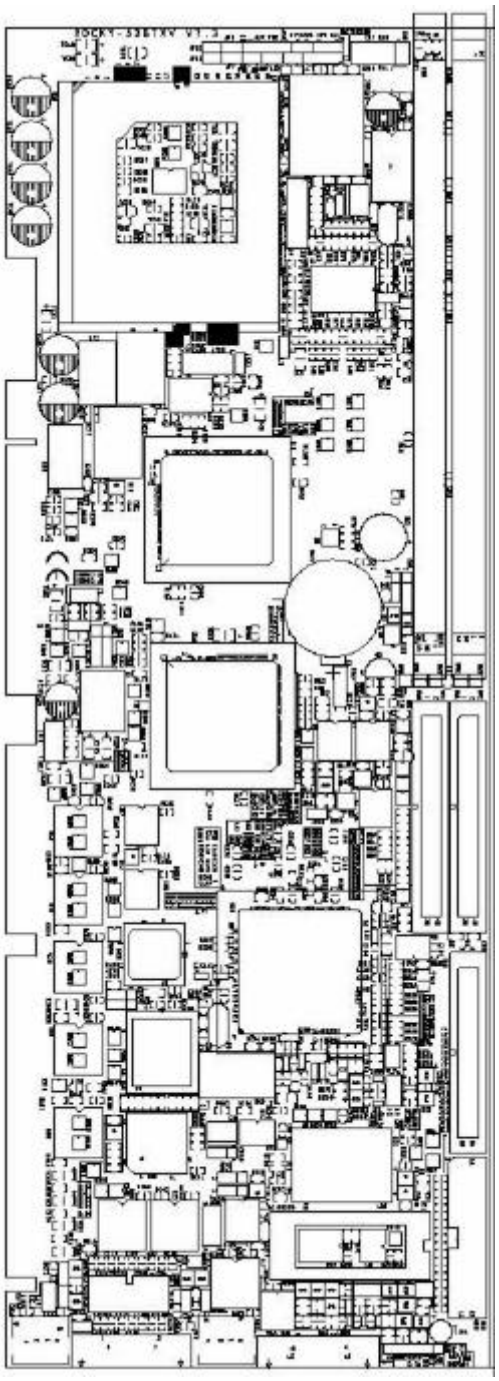
- ROCKY-538TXV Pentium® with VGA Single Board Computer
- RS-232/Printer Cable
- FDD/HDD Cable

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-538TXV. First, the layout of ROCKY-538TXV is shown, then the unpacking information that you should be careful is described. Reference information on how to set the jumpers and switches for ROCKY-538TXV's configuration, such as CPU type selection, system clock setting, and watch dog timer, are also included.

2.1 ROCKY-538TXV Layout



2.2 Unpacking

The ROCKY-538TXV Single Board Computer contains sensitive electronic components that can be easily damaged by static electricity.

In this section, we describe the precautions that you should take while unpacking, as well as during installation. It is very important that the instructions be followed correctly, to avoid static damage, not to mention successfully install the board for operation.

- The system board should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

- Inspect the cardboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handing damages on the board before you continue.

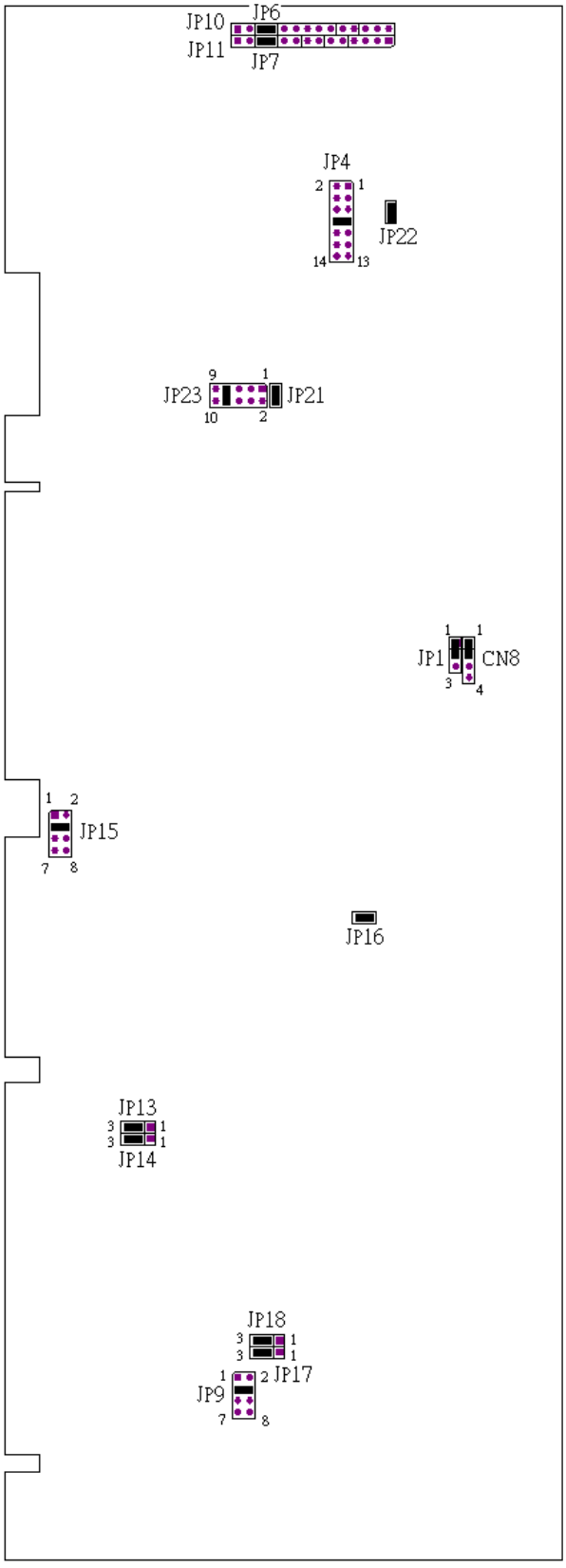
- After opening the cardboard carton, exact the system board and place it only on a grounded anti-static surface component side up.

- Again inspect the board for damage. Press down on all the socketed IC's to make sure that they are properly seated. Do this only with the board place on a firm flat surface.

Note : DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your ROCKY-538TXV Single Board Computer.

2.3 CPU Settings for ROCKY-538TXV



- **CPU Clock Setting :**

Cpu Speed/Clock	JP4 1-2	JP4 3-4	JP4 11-12	JP4 13-14
55MHz	OPEN	SHORT	SHORT	OPEN
60MHz	OPEN	SHORT	OPEN	OPEN
66MHz	**OPEN**	**OPEN**	**OPEN**	**OPEN**

- **CPU to Bus Multiple :**

Multiplier	JP4 5-6	JP4 7-8	JP4 9-10
1.5 x	OPEN	OPEN	OPEN
2x	SHORT	OPEN	OPEN
2.5x	SHORT	SHORT	OPEN
3 x	**OPEN**	**SHORT**	**OPEN**
3.5 x	OPEN	OPEN	OPEN
4 x	SHORT	OPEN	SHORT
4.5x	SHORT	SHORT	SHORT
Low-Power Embedded Pentium	JP4 5-6	JP4 7-8	JP4 7-8
2.5 x (166)	SHORT	SHORT	SHORT
4x (266)	SHORT	SHORT	OPEN

- **CPU Frequency = CPU Clock x Multiplier for example Pentium® 200MHz = 66MHz CPU Clock x 3**

JP22	DESCRIPTION
SHORT	**If use Intel Low-Power Embedded 266MHz Processor.**
OPEN	**Other Processor.**

- **CPU Core Voltage Selection :**

Please check CPU Core Voltage before going on to CPU installation procedure. Currently, the new Intel MMX CPU utilizes dual voltages for core and I/O, that is, I/O is 3.3V and core is 2.8V. This kind of CPU design will enhance low power consumption capability. Common Pentium CPU's uses one voltage for both I/O and core, namely, 3.3V,3.4V,or 3.5V.

- **JP23 CPU Core Voltage Setting :**

CPU Core Voltage	JP23 1-2	JP23 3-4	JP23 5-6	JP23 7-8	JP23 9-10
3.5V(P54C/CS) VRE	SHORT	SHORT	SHORT	SHORT	OPEN
3.4V(P54C/CS) STD	OPEN	SHORT	SHORT	SHORT	OPEN
3.3V	SHORT	OPEN	SHORT	SHORT	OPEN
3.2V	OPEN	OPEN	SHORT	SHORT	OPEN
3.1V	SHORT	SHORT	OPEN	SHORT	OPEN
3.0V	OPEN	SHORT	OPEN	SHORT	OPEN
2.9V	SHORT	OPEN	OPEN	SHORT	OPEN
2.8V	**OPEN**	**OPEN**	**OPEN**	**SHORT**	OPEN
2.7V	SHORT	SHORT	SHORT	OPEN	OPEN
2.6V	OPEN	SHORT	SHORT	OPEN	OPEN
2.5V	SHORT	OPEN	SHORT	OPEN	OPEN
2.4V	OPEN	OPEN	SHORT	OPEN	OPEN
2.3V	SHORT	SHORT	OPEN	OPEN	OPEN

2.2V	OPEN	SHORT	OPEN	OPEN	OPEN
2.1V	SHORT	OPEN	OPEN	OPEN	OPEN
2.0V	OPEN	SHORT	SHORT	SHORT	SHORT
1.9V	OPEN	OPEN	SHORT	SHORT	SHORT
1.8V	OPEN	SHORT	OPEN	SHORT	SHORT

- **Dual / Single CPU Voltage setting:**

Vcore & VIO	JP10	JP11	JP6	JP7
Pentium® (P54C)	SHORT	SHORT	OPEN	OPEN
Pentium® MMX AMD K6 Cyrix 6x86MX Dual Voltage	**OPEN**	**OPEN**	**SHORT**	**SHORT**
Intel Low-Power Embedded Processor	OPEN	OPEN	OPEN	OPEN

- **Cyrix 6x86MX PR Rating Table**
  (Vcore : 2.9V,dual voltage)

PR Rating	Bus MHz	CPU Core MHz	Clock Multiplier
6x86MX-PR133	**50**	**100**	**2x**
6x86MX-PR133*	**55**	**110**	**2x**
6x86MX-PR150	**60**	**120**	**2x**
6x86MX-PR150	**50**	**125**	**2.5x**
6x86MX-PR166	**66**	**133**	**2x**
6x86MX-PR166	**55**	**138**	**2.5x**
6x86MX-PR166	**50**	**150**	**3x**
6x86MX-PR166	**60**	**150**	**2.5x**
6x86MX-PR200	**55**	**165**	**3x**
6x86MX-PR200	**66**	**166**	**2.5x**
6x86MX-PR200	**60**	**180**	**3x**
6x86MX-PR233	**66**	**200**	**3x**
6x86MX-PR266	**66**	**233**	**3.5x**

- **AMD K6 MMX Rating Table, dual voltage**

Product Name	Core Freq	Vcore	Bus MHz	Multiplier
K6-233 model 6	**233MHz**	**3.2V**	**66**	**3.5x**
K6-200 model 6	**200MHz**	**2.9V**	**66**	**3x**
K6-166 model 6	**166MHz**	**2.9V**	**66**	**2.5x**
K6-300 model 7	**300MHz**	**2.2V**	**66**	**4.5x**
K6-266 model 7	**266MHz**	**2.2V**	**66**	**4x**
K6-233 model 7	**233MHz**	**2.2V**	**66**	**3.5x**

2.4 PS/2 Mouse IRQ12 Setting

The on board PS/2 mouse will use IRQ12 in operation..

- **JP16 : IRQ12 Enable/Disable Setting**

JP16	DESCRIPTION
SHORT	**IRQ12 Enable for PS/2 Mouse Operating**
OPEN	PS/2 Mouse Disable. IRQ12 to bus

2.5 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 program operation is abnormal and will issue a reset signal to start again, or activate NMI to CPU. The Watch-Dog Timer is disable by reading port 043H.

- **JP13 : Watch-Dog Active Type Setting**

JP13	DESCRIPTION
2-3	**RESET WHEN WDT TIME-OUT**
1-2	ACTIVATE NMI TO CPU WHEN WDT TIME-OUT
OPEN	DISABLE WDT

- **JP15: WDT Time-Out Period**

PERIOD	1-2	3-4	5-6	7-8
1 sec.	OPEN	OPEN	SHORT	OPEN
2 sec.	OPEN	OPEN	SHORT	SHORT
10 sec.	**OPEN**	**SHORT**	**OPEN**	**OPEN**
20 sec.	OPEN	SHORT	OPEN	SHORT
110 sec.	SHORT	OPEN	OPEN	OPEN
220 sec.	SHORT	OPEN	OPEN	SHORT

2.6 DiskOnChip™ Flash Disk

The DiskOnChip™ Flash Disk Chip(DOC) is produced by M-Systems. Because DOC is 100% compatible to hard disk and DOS system, customers don't need to install any extra software utility. Its "plug and play" function is not only easy to use but also reliable. Right now, DOC is available from 2MB to 72MB. There is also an alternative solution, PROMDISK-Chip™ , can be used with the same socket.

- **JP9 : DiskOnChip Memory Address Setting**

ADDRESS	JP9
D000	**3-4**
D800	5-6

2.7 Clear CMOS Setup

If you want to clear the CMOS Setup (for example you have forgotten the password, what you should do is first clear original setup then reset the password.), you should short JP1 pin 2-3 about 3 seconds, then open it again. To set system back to normal operation mode, please short pin 1-2.

- **JP1 : Clear CMOS Setup (Reserve Function)**

JP1	DESCRIPTION
1-2	**Normal Operation**
2-3	Clear CMOS Setup

2.8 Battery Backup for CMOS Setup

There is one 4-pin header CN8 used for battery backup function. When set to short, pin 1-2 will be using on board battery. When using external battery, you should take off the jumper and use the connector as an external battery connector.

- **CN8 : Battery Backup Function**

CN8	DESCRIPTION
1-2 SHORT **3-4 OPEN**	**Using Internal Battery**
1-2 OPEN **3-4 OPEN**	Use as External Battery Connector

2.9 BIOS Flash Chip Write Voltage Setting

There might be two types of BIOS Flash Chip, one is 12V write voltage and the other is 5V.

- **JP14 : 5V/12V Flash Chip Write Voltage Setting**

(This jumper is a fixed factory setting so customers are not allowed to make changes to it)

JP14	DESCRIPTION
2-3	**5V Flash Write Voltage**
1-2	12V Flash Write Voltage

*****Note : JP17 & JP18 is Manufactory Default Setting**

JP17	JP18
2-3	**2-3**

Chapter 3. Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY-538TXV board.

3.1 Floppy Disk Drive Connector

ROCKY-538TXV board is equipped with a 34-pin daisy-chain driver connector cable.

- **CN2 : FDC CONNECTOR**

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

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE (Integrated Device Electronics) hard disk drives to the ROCKY-538TXV IDE controller. The IDE support Ultra DMA/33 interface.

CN1(IDE 1) : Primary IDE Connector
CN4(IDE 2) : Secondary IDE Connector

- **CN1/CN4: IDE Interface Connector**

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

3.3 Parallel Port

This port is usually connected to a printer. The ROCKY-538TXV includes an on-board parallel port accessed through a 26-pin flat-cable connector CN3.

- **CN3 : Parallel Port Connector**

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

3.4 Serial Ports

The ROCKY-538TXV offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports.

- **CN12 : Serial Port DB-9 Connector(COM1)**

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)

- **CN13 : Serial Port 10-pin Header(COM2)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTX
4	DTR	9	RI
5	GND	10	NC

3.5 Keyboard Connector

The ROCKY-538TXV provides two keyboard connectors.

- **CN6 : 5-pin Header Keyboard Connector**

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

- **CN16 : 6-pin Mini-DIN Keyboard Connector**

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

3.6 External Switches and Indicators

There are many external switches and indicators for monitoring and controlling your CPU board.

- **JP3 : External Switches and Indicators**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	SPEAKER SIGNAL	2	+5V (POWER LED)
3	N/C	4	N/C
5	N/C	6	GROUND
7	+5V	8	KEYLOCK SIGNAL
9	RESET	10.	GROUND
11	GROUND	12	GROUND
13	HDD ACTIVE#	14	N/C
15	+5V	16	PS_ON
17	ATX power button	18	ATX power button
19	GROUND	20	5V STANDBY

3.7 PS/2 Mouse 6-pin Mini-DIN Connector

- **CN11 : PS/2 Mouse Connector**

PIN	DESCRIPTION
1	MS DATA
2	NC
3	GROUND
4	+5V
5	MS CLOCK
6	NC

3.8 External Battery Connector

The ROCKY-538TXV has a built-in 3V/850mAH industrial Li-battery for CMOS and RTC backup. In normal operation, this factor board doesn't need any external battery to backup data. If you want to connect an external battery, you could take off CN8 's pin on 1-2 jumper. Then connect the external battery to pin 1-4.

- **CN8 : External Battery Connector**

PIN	DESCRIPTION
1	External Battery +
2	NC
3	N/C
4	Ground

3.9 USB Port Connector

The ROCKY-538TXV built-in two USB ports for the future new I/O bus expansion.

- **CN14 USB Connector:**

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

- **CN14 diagram:**

3.10 IrDA Infrared Interface Port

The ROCKY-538TXV has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. When in use, the IrDA port must be set to SIR or ASKIR model through BIOS's Peripheral Setup's COM 2. Then the normal RS-232 COM 2 will be disabled.

- **CN5 : IrDA connector**

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

3.11 VGA Connector

The ROCKY-538TXV has a built-in 15-pin VGA connector that allows direct connection to your CRT monitor. And additional 10-pin header will help you do the internal connection to CRT screen in your embedded applications.

- **CN17 : 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	NC
13	HSYNC	14	VSYNC
15	NC		

- **CN18 : 10-pin Header Connector**

1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	HSYNC	8	GROUND
9	VSYNC	10	GROUND

3.12 Fan Connector

The ROCKY-538TXV provides a CPU cooling fan connector and a chassis fan connector. These connectors can supply 12V/500mA to the cooling fan. There is a "rotation" pin in this connector. The rotation pin is used to retrieve fan's rotation signal back to the system enabling system BIOS to recognize fan speed. Please note that only specified fan offers rotation signal.

- **CN7 : CPU Fan Connector**

PIN	DESCRIPTION
1	Rotation Signal
2	12V
3	Ground

- **CN9 : Chassis Fan Connector**

PIN	DESCRIPTION
1	Rotation Signal
2	12V
3	Ground

3.13 5V Standby Connector for ATX power supply

- **ATX Power Supply 20-pin power connector**

1	12V	2	5V
3	**5V standby**	4	5V
5	PW-0K	6	-5V
7	Ground	8	Ground
9	5V	10	Ground
11	Ground	12	Ground
13	5V	**14**	**Suspend Control**
15	Ground	**16**	**Ground**
17	3.3V	18	-12V
19	3.3V	20	3.3V

Chapter 4. AWARD BIOS Setup

The ROCKY-538TXV uses the AWARD PCI/ISA BIOS for system configuration. The AWARD BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected to meet end-user demands. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Start

When powering on the system, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test, initialization and system configuration verification. After the POST routines are completed, the following message appears :

" Hit DEL if you want to run SETUP"

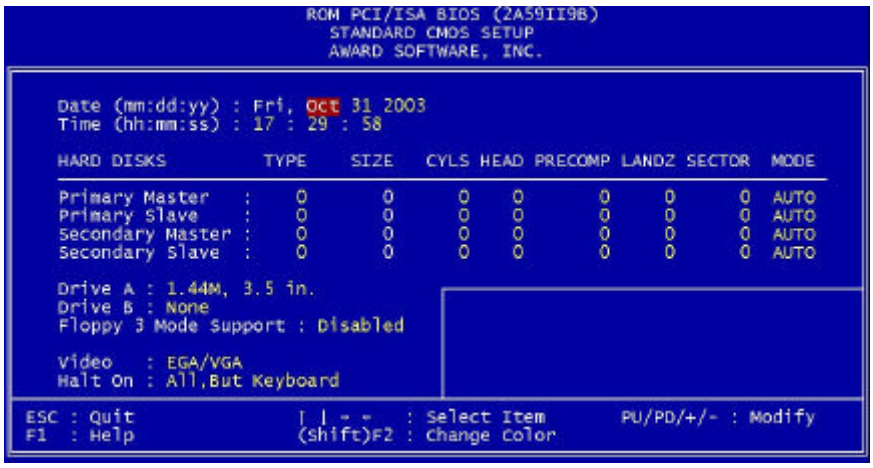
To access AWARD PCI/ISA BIOS Setup program, press <Del> key. The following screen will be displayed at this time.

When you choose **Load BIOS Defaults** , the system will load minimized settings for Troubleshooting. The performance should be very poor when you use this setting.

When you select **Load Setup Defaults** , the system will load optimized defaults for regular use. Choosing this setting, will modify all applicable settings.

4.2 Standard CMOS Setup

The Standard CMOS Setup is used for basic hardware system configuration. Main function is to modify Date/Time settings and Floppy/Hard Disk Drive settings. Please refer the following screen for this setup.



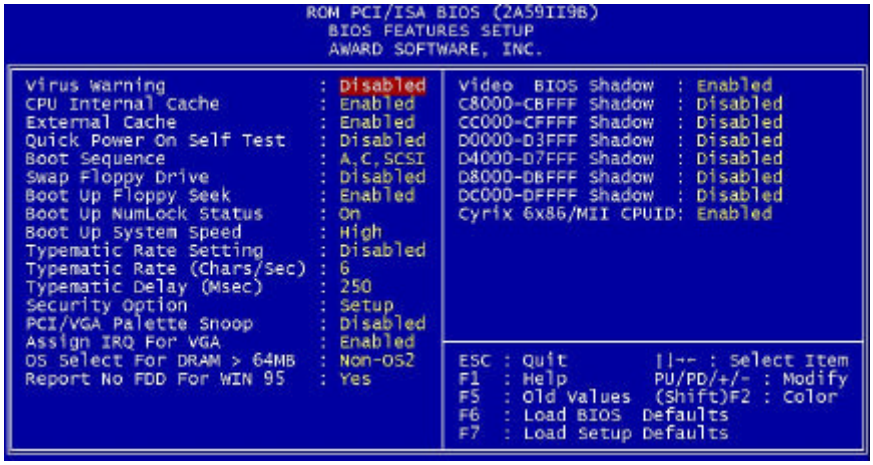
For IDE hard disk drive setup, please check the following possible setup procedure:

1. Use Auto setting for detection during bootup.
2. Use IDE HDD AUTO DETECTION in the main menu to automatically enter drive specifications.
3. Manually enter the specifications by yourself from the “User” option.

- **Halt On (All Errors) :** You could choose **All Errors**, **No Errors All, but Keyboard** , **All, but Diskette**, and **All, but Disk/Key** Some embedded systems don’t need keyboard and monitor in application, in this case, you could select No Errors.

4.3 BIOS Features Setup

BIOS Features Setup is designed for customer's to tune ROCKY-538TXV board to its best performance possible. As for normal operations, customers don't have to change any default setting as the default setting is pre-set for most reliable operation.



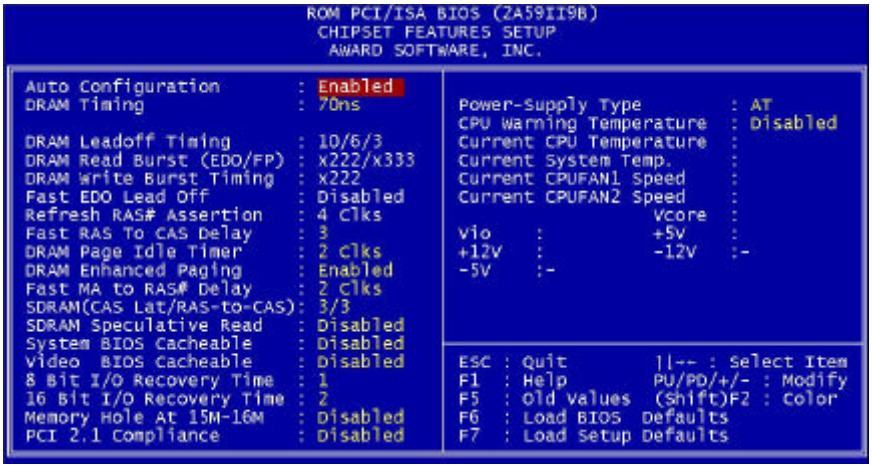
- **BootUp Sequence:**
  Allow users to set the sequence of A:,C:,and CDROM.

- **Video BIOS Shadow C000,32K:**
  Enable - Will increase the video speed.

- **Shadow C8000-CFFFF,D0000-D7FFF,& D8000-DFFFF :**
  When the installed add-on card's ROM address is as above address, you could enable shadow for higher operation performance. When you enable shadow function, it will also reduce the memory available by between 640KB and 1024KB.

4.4 Chipset Features Setup

Most of these setup functions are working for ChipSet (Intel 430TX). These options are used to change the ChipSet's registers. Please be careful while making changes to any default setting, otherwise the system could become unstable.



- **Auto Configuration : Enable or Disable**
  When you are using 60nS general type DRAM, please enable this setting so as to get optimal timings.

- **SDRAM Speculative Read : Enable or Disable**
  When you enable this option, the CPU will send predict commands to the SDRAM, if a miss happens, the CPU will cancel this command. As some OS under certain situations have problem enabling this feature, it is normally set to disable.

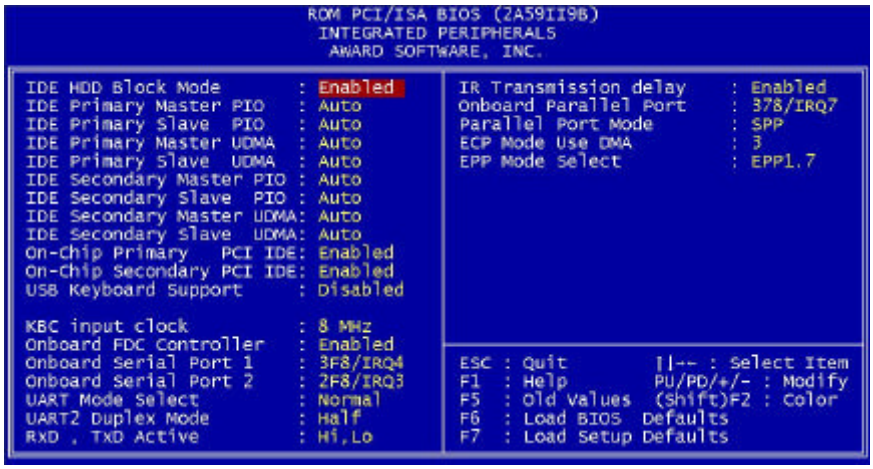
- **Memory Hole at 15M-16M : Enable or Disable**
  This setting reserve 15MB to 16MB memory address space for ISA expansion cards that specifically needs this setting. Memory from 15MB and up will be unavailable to the system because expansion cards can only access memory up to 16MB.

- **CPU Warning Temperature : Disable,50** ..
  There is a LM75 temperature sensor under the bottom of CPU. Setting CPU Warning Temperature to a certain limit which will help customer in securing the system as not to burn out resulted from a fan failed or other related accidents.

- **Hardware Monitoring :**
  In this option, customer could see the working status of this board for **Current CPU Temperature**, **Current System Temperature**, **Current CPUFAN1 Speed**, **Current CPUFAN2 Speed**, **Vcore voltage**, **Vio voltage**, **+5V,-5V,+12V,and –12V status.**

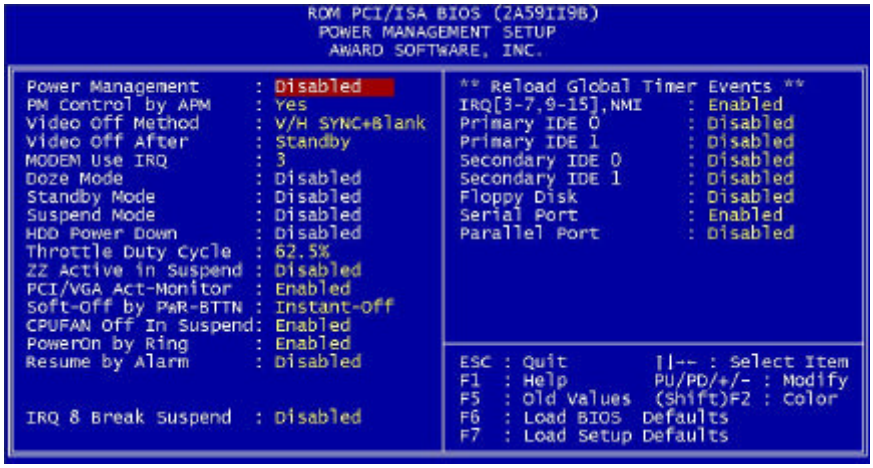
4.5 Integrated Peripherals

This part of setup for Multi-I/O Chip (W83977F). These options are used to change the ChipSet's registers. Please be careful while making any changes to default setting so as to meet your application needs. The only special point that you must pay attention to in this menu page is the Onboard Serial Port2. If you are using the IrDA port, you will have to set this port accordingly.



4.6 Power Management Setup

Power Management Setup help users in modifying ROCKY-538TXV board's "green" function. These features could shut down video display and hard disk in order to save energy. Please refer to the sample caption below for power management setup screen:

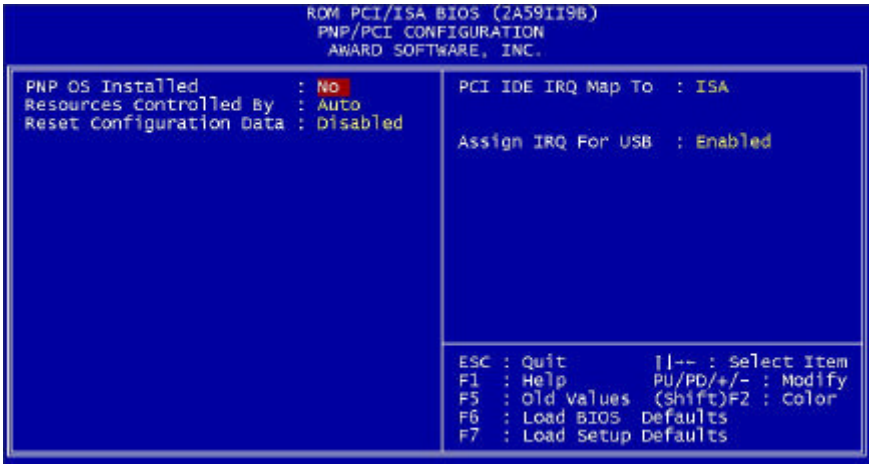


- **Power Management : Disable, Max Saving, Min Saving, or User Defined**
  Max Saving puts the system into power saving mode after a brief period of inactivity. Min Saving is almost the same as Max Saving except that the inactivity period is longer. User Defined allows you to set power saving options according to your needs.

Note : Advanced Power Management(APM) have to be installed to keep the system time updated when the computer enters suspend mode activated by the Power Management. Under DOS environment, you need to add DEVICE=C:\DOS\POWER.EXE in your CONFIG.SYS on the other hand under Windows 3.x and Windows 95,you have to install Windows with APM feature. A battery and power cord icon labeled "Power" Will appear in the "Control Panel"

4.7 PNP/PCI Configuration

The PNP/PCI Configuration help users to set ROCKY-538TXV board's "PCI" function. All PCI bus slots on the system use INTA#, thus all installed PCI slots must be set to this value.



- **PNP OS Installed : Yes or No**
  When PNP OS is installed, interrupts may be reassigned by the OS when the setting is Yes. When a non-PNP OS is installed or to prevent reassigning of interrupt settings, please set setting to No.

Appendix A. E^2 Key™ Function

The ROCKY-538TXV provides an outstanding E^{2}KEY™ function for system integrator. Based on the E^{2}KEY™ you are free to store ID Code, Pass Word, or Critical Data in the 1Kbit EEPROM. As the EEPROM is nonvolatile memory, you don't have to worry about losing important data.

Basically the E^{2}KEY™ is based on a 1Kbit EEPROM which is configured to 64 words(from 0 to 63). You could access (read or write) each word at any time.

When you need to use E^{2}KEY™ you should find the utility inside of the package. The software utility will include the following four files,

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

The E2KEY.OBJ provides two library function for user to integrate their application with E^{2}KEY™ function. These library **(read_e2key and write_e2key)** are written and compiled in C format. Please refer to the following statement and you will know how to implement it.

- **unsigned int read_e2key(unsigned int address)**
  /* This function will return the E^{2}KEY™ '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 E^{2}KEY™ at address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

A quick and easy way to learn to use the function is to first review EKEYDEMO.C code included.

Please note the E^{2}KEY™ function is only available if the parallel port is working. In other words, you should enable ROCKY-538TXV's parallel port, otherwise will this function will be not working.

Appendix B. Watch-Dog Timer

The Watch-Dog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that caused 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.

The Watch-Dog Timer is controlled by two I/O ports.

443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
043 (hex)	Read	Disable the Watch-Dog Timer.

To enable the Watch-Dog 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 an NMI depending on the setting of JP13. To ensure that this reset condition does not occur, the Watch-Dog Timer must be periodically refreshed by reading the same I/O port 433H. This must be done within the time out period that is selected by jumper group JP15.

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: While exiting a program, it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.