NOVA-EDEN/C3 Series
VIA-EDEN/C3 Processor
With Ethernet, USB 2.0, Audio
Embedded Board

User Manual

Version 1.5

September 1, 2004

© Copyright 2003 by ICP Electronics Inc. All Rights Reserved.

Copyright Notice

The information in this document is subjected to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Trademarks

NOVA-EDEN/C3 is registered trademarks of ICP Electronics Inc.; IBM PC is a registered trademark of International Business Machines Corporation. VIA is a registered trademark of VIA Corporation. AMI is registered trademarks of American Megatrends Inc., Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Support

For any questions concerning the content of this manual or other related problems, please contact us by email at: support@iei.com.tw

Table of Contents

CHAPTER 1. INTRODUCTION 5

1.1 SPECIFICATIONS 5
1.2 PACKAGE CONTENTS 7

CHAPTER 2. INSTALLATION 8

2.1 NOVA-EDEN/C3 LAYOUT 8
2.2 NOVA-EDEN/C3 DIMENSIONS (UNIT: MM) 9
2.3 UNPACKING PRECAUTIONS 9
2.4 CLEAR CMOS SETUP 10
2.5 BUZZER FUNCTION SETTING 10
2.6 COM2 RS-232 /422/485 MODE SELECTION 10
2.7 TFT LCD SETTING 11
2.8 PCI SLOT VIO VOLTAGE SETTING 11
2.9 COM1, COM2, COM3, COM4 RI FUNCTION SETTING 11
2.10 COMPACT FLASH MASTER/SLAVE FUNCTION SETTING 12

CHAPTER 3. CONNECTION 13

3.1 AUDIO CONNECTORS 13
3.2 PCI E-IDE DISK DRIVE CONNECTOR 13
3.3 PARALLEL PORT 14
3.4 USB PORT CONNECTORS 14
3.5 SERIAL PORT 15
3.6 KEYBOARD/MOUSE CONNECTOR 15
3.7 IRDA INFRARED INTERFACE PORT 16
3.8 FAN CONNECTOR 16
3.9 VGA CONNECTOR 16
3.10 TV OUT CONNECTOR 16
3.11 DIGITAL I/O CONNECTOR 17
3.12 POWER CONNECTOR 17
3.13 EXTERNAL SWITCHES AND INDICATORS 17
3.14 PS-ON CONNECTOR 18
3.15 LAN CONNECTOR 18
3.16 RS422 / 485 CONNECTOR 19
3.17 TFT LCD CONNECTOR 19
3.18 LCD CONNECTOR 20
3.19 PCI SLOT 20
3.20 PC/104-PLUS CONNECTOR 21
3.21 FLOPPY CONNECTOR 24

CHAPTER 4. AMI BIOS SETUP 25

4.1 INTRODUCTION 25
4.2 STARTING SETUP 25
4.3 USING SETUP 25
4.4 GETTING HELP 26
4.5 MAIN MENU 26
4.6 STANDARD CMOS SETUP 28
4.7 ADVANCED CMOS SETUP 29
4.8 ADVANCED CHIPSET SETUP 32
4.9 POWER MANAGEMENT SETUP 33
4.10 PCI / PLUG AND PLAY SETUP 35
4.11 PERIPHERAL SETUP 37
4.12 HARDWARE MONITOR SETUP 38
4.13 CHANGE SUPERVISOR PASSWORD 39

APPENDIX A: WATCHDOG TIMER 40
APPENDIX B: I/O ADDRESS MAP 42
APPENDIX C: HOW TO USE WAKE-UP FUNCTION 44
APPENDIX D: DIGITAL I/O 45
APPENDIX E: SIGNAL MAPPING OF LVDS 46
APPENDIX F: ATX POWER SUPPLY 47

Chapter 1. Introduction

Thank you for choosing NOVA-EDEN/C3 embedded board. NOVA-EDEN/C3 is an 5"1/4 form factor CPU board equipped with a low power consumption and high performance VIA EDEN/C3 processor. It is designed for system manufacturers, integrators, or VARs who want to provide quality and reliable CPU board at a reasonable price.

NOVA-EDEN/C3 has a built-in the ProSavage4 AGP4X VGA controller. It is a 2D/3D graphics controller, which provides resolution up to 1920x1440, and supports both CRT and LCD. The VGA controller can share 8-32MB frame buffer of system memory.

For applications requiring a high speed serial transmission, NOVA-EDEN/C3 provides both USB 1.1 and USB 2.0. The high speed USB 2.0 host controller implements an ECHI interface that provides 480Mb/s bandwidth.

Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

NOVA-EDEN/C3 also has a built-in 10/100 Fast Ethernet LAN, which is a fully integrated 10BASE-T/100BASE-TX LAN controller with high performance and low power consumption features.

NOVA-EDEN/C3 uses the advanced VIA VT8606/VT82C686B Chipsets which is 100% software compatible chipset with PCI 2.2 standard.

1.1 Specifications

CPU	VIA EDEN/C3 processor, supports 133 MHz FSB
Bus interface	PCI/ISA bus
Bus speed	ISA: 8MHz, PCI: 33MHz
DMA channels	7
Interrupt levels	15
Chipset	VT8606
Real-time clock/calendar	VT82C686B
Main memory	✓ One 168-pin DIMM socket supports 133Mhz SDRAM. ✓ The maximum memory is up to 512MB.
Ultra DMA 100 IDE interface	✓ Up to four PCI Enhanced IDE hard drives are supported. ✓ The Ultra DMA 100 IDE can handle data transfer up to 100MB/s. ✓ Compatible with existing ATA IDE specifications is the best advantage this board has, so there is no need to do any changes to users' current accessories.

Floppy disk drive interface	Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB).
Serial ports	✓ Four RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. ✓ Support up to 115.2Kbps. ✓ The ports can be individually configured to COM1, COM2 ,COM3, COM4 or disabled.
Bi-directional parallel port	✓ Configurable to LPT1, LPT2, LPT3 or disabled. ✓ Supports EPP/ECP/SPP.
Hardware monitor	Built-in to monitor power supply voltage and fan speed status.
IrDA port	✓ Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
USB 2.0 / 1.1 port	Supports 4 USB2.0 and 2 USB1.1 ports for future expansion.
Watchdog timer	✓ Software programmable, reset generated when watchdog timer is time-out. ✓ Can use I/O Port hex 043(843) & 443 to control the watchdog.
VGA controller	✓ Built-in ProSavage4 AGP4X 256-bit 2D/3D graphics engine. ✓ 8-32MB share Memory. ✓ Screen Resolution: up to 1920x1440.
Ethernet	✓ Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation supports 10BASE-T/100BASE-TX standard. ✓ The RJ45 connectors are located on the mounting bracket for easy connection.
Keyboard and PS/2 mouse connector	✓ A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. ✓ For alternative application, a keyboard and a PS/2 mouse pin header connector are also available on board.
Audio	AC'97 Audio CODEC
Compactflash	It can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
Expansion bus	PC/104-Plus compatible
Power consumption	(VIA EDEN/C3, PC133 SDRAM) +5V @ 3.6A ,+12V @ 500mA Recommended: 350-watt power supply or higher
Operating temperature	0°-60° C

1.2 Package Contents

NOVA-EDEN/C3's package includes the following items:

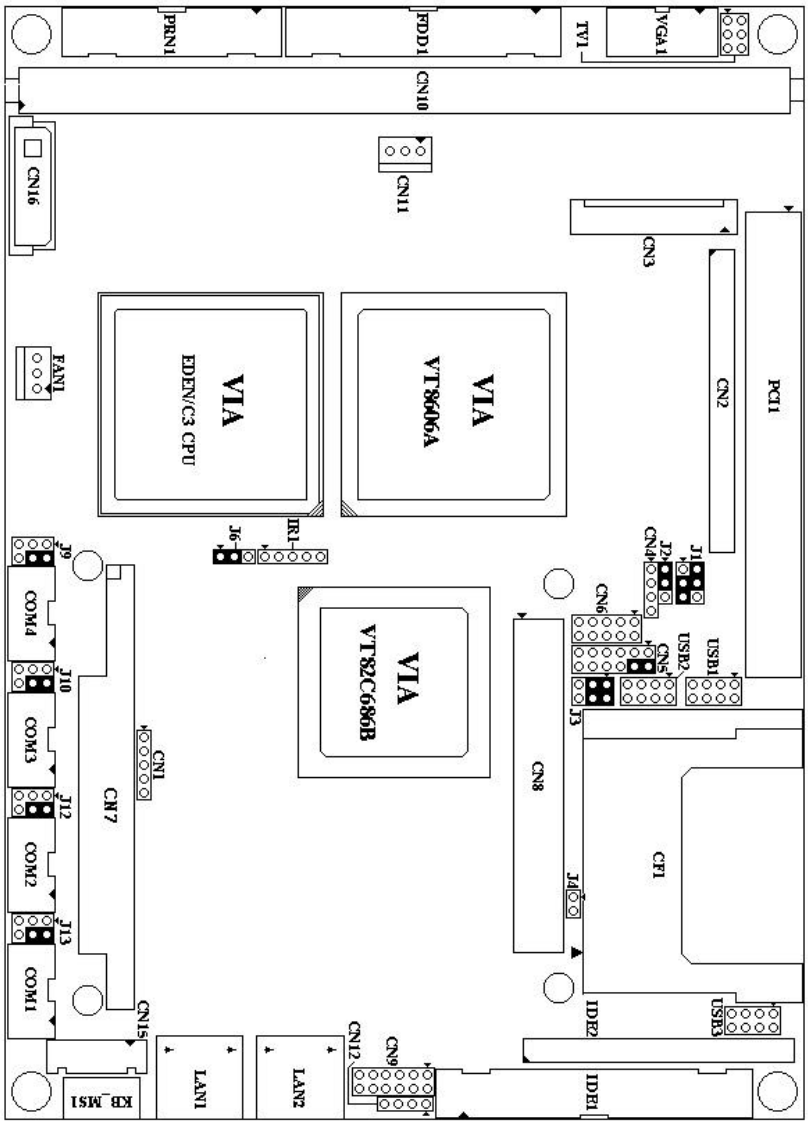
- User Manual
- NOVA-EDEN/C3 Embedded Board
- Four RS-232 cables
- One Parallel port cable
- One FDD cable
- Two ATA IDE cables
- One Audio cable
- One USB cable
- One VGA cable
- Keyboard and mouse Y-Adapter cable.
- One Driver CD

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

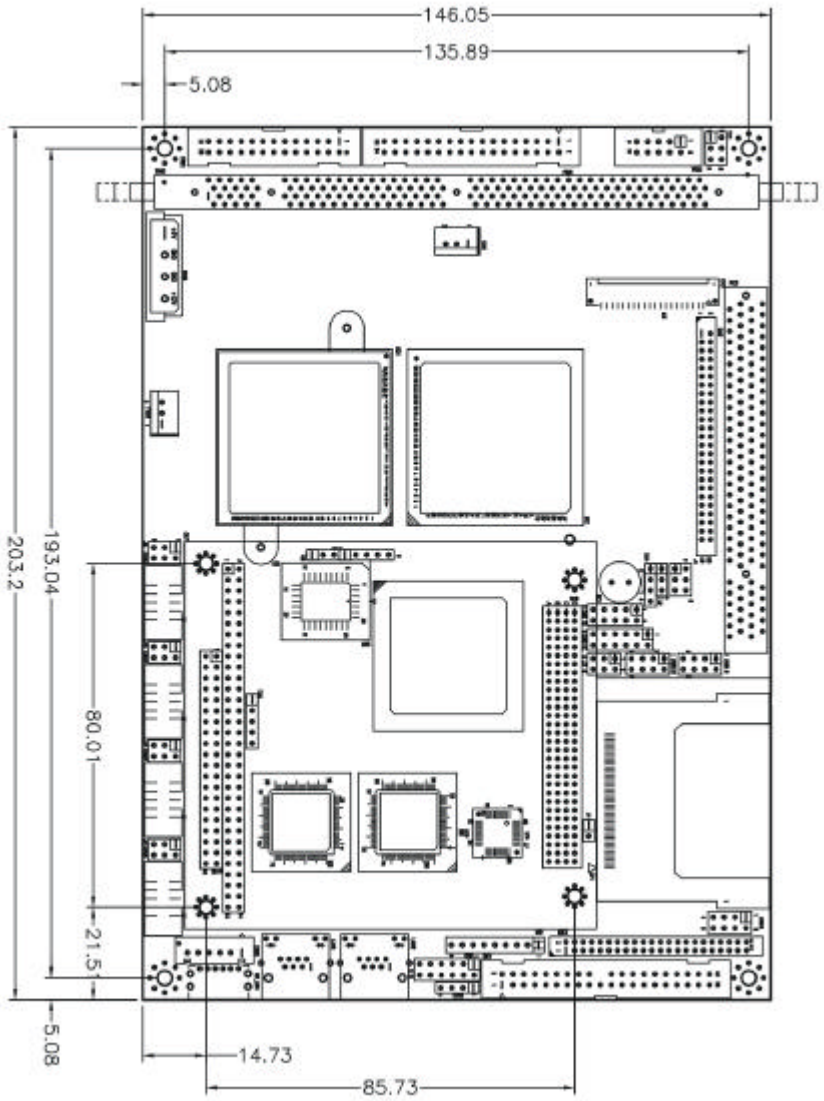
Chapter 2. Installation

This chapter describes how to install NOVA-EDEN/C3. Follow the unpacking information carefully and refer to the following diagram of NOVA-EDEN/C3 when necessary.

2.1 NOVA-EDEN/C3 Layout



2.2 NOVA-EDEN/C3 Dimensions (Unit: mm)



2.3 Unpacking Precautions

Some components of NOVA-EDEN/C3 are very sensitive to static electricity 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 NOVA-EDEN/C3 . You can do it by using a wrist strap connected to the ground or by frequently touching any conducting materials connected to the ground.
- Handle your NOVA-EDEN/C3 by its edges. Do not touch IC chips, leads or circuitry.
- Do not plug any connector or jumper when the power is on.

2.4 Clear CMOS Setup

To clear the CMOS Setup (for example, if you have forgotten the password, you should clear the CMOS and then re-set the password), you have to close the J6 (2-3) for about 3 seconds, then open it. This will put the system back to normal operation mode.

- **J6 : Clear CMOS Setup**

J6	Description
1-2 (default)*	Keep CMOS Setup (Normal Operation)
Short 2-3	Clear CMOS Setup

**Note: All shaded rows in the tables of this manual are the default settings for the NOVA-EDEN/C3.*

2.5 Buzzer Function Setting

- **CN5(2-4): Enabled/Disabled Onboard Buzzer Function**

2 – 4	Description
SHORT *	Enabled
OPEN	Disabled

2.6 COM2 RS-232 /422/485 Mode Selection

- **J2 : COM2 Mode Selection**

J2	Description
1-2 Short	RS232
2-3 Short	RS422/485

Caution: If RS422/485 is in use, the RS232 mode on the main board will be disabled.

2.7 TFT LCD Setting

- **J1: TFT LCD type (5V / 3V & FPCLK / #FPCLK) Setting**

J1	Description
2 – 4	3V TFT LCD
3 – 5	FPCLK
4 – 6	5V TFT LCD
1 – 3	#FPCLK

2.8 PCI Slot VIO Voltage Setting

- **J3: VIO Voltage (5V / 3V) Setting**

J3	Description
1 - 3	5VIO
2 - 4	5VIO
3 - 5	3VIO
4 - 6	3VIO

2.9 COM1, COM2, COM3, COM4 RI Function Setting

- **J9, J10, J12, J13 : RI Function Setting**

Short 2 – 4 pin, normal RS232 RI Function
Short 4 – 6, 1 – 3 pin, RI is 5V output
Short 4 – 6, 3 – 5 pin, RI is 12V output

J9, J10, J12, J13	Description
2 – 4	Normal RI Function
1 – 3 4 – 6	RI is 5 Voltage output
3 – 5 4 – 6	RI is 12 Voltage output

2.10 Compact Flash Master / Slave Function Setting

- **J4 : Compact Flash Master / Slave Function Setting**

Short 1 - 2 pin, Compact Flash is Master

J4	Description
Close	Master
Open	Slave

Chapter 3. Connection

This chapter describes how to connect peripherals, switches and indicators to the NOVA-EDEN/C3 board.

3.1 Audio Connectors

The onboard AC'97 CODEC supports several audio functions. The audio connectors are described below.

- **CN9 :Audio connector (Speaker out, Line out, Line in, MIC in)**

PIN	Description	PIN	Description
1	Speaker out (Left)	2	Speaker Out (Right)
3	GROUND	4	GROUND
5	Line Out (Left)	6	Line Out (Right)
7	Line In (Left)	8	Line In (Right)
9	GROUND	10	GROUND
11	MIC In	12	GROUND

- **CN12:Audio CD In connector**

PIN	Description
1	CD SIGNAL (LEFT)
2	GROUND
3	GROUND
4	CD SIGNAL (RIGHT)

3.2 PCI E-IDE Disk Drive Connector

You can attach up to four IDE (Integrated Device Electronics) devices.

IDE1 : Primary IDE Connector (40pin 2.54mm)
IDE2 : Secondary IDE Connector (44pin 2.0mm)

- **IDE1 & IDE2 : 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	DRQ	22	GROUND

23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	CHRDY	28	REV. PULL LOW
29	DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	+5V(IDE2)	42	+5V(IDE2)
43	GND(IDE2)	44	N/C(IDE2)

3.3 Parallel Port

Usually, a printer is connected to the parallel port. NOVA-EDEN/C3 includes an on-board parallel port, accessed via a 26-pin flat-cable.

- **PRN1 : 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	26	NC

3.4 USB Port Connectors

NOVA-EDEN/C3 is equipped with two USB 2.0 ports with high bandwidth (480Mbps) and is backward compatible with USB1.1.

- **USB1, USB2: USB 2.0 Connector (2 ports each)**

PIN	Description	PIN	Description
1.	VCC	8.	GROUND
2.	DATA0-	7.	DATA1+
3.	DATA0+	6.	DATA1-
4.	GROUND	5.	VCC

NOVA-EDEN/C3 is also equipped with two USB 1.1 ports.

- **USB3: USB 1.1 Connector (2 ports)**

PIN	Description	PIN	Description
1.	VCC	8.	GROUND
2.	DATA0-	7.	DATA1+
3.	DATA0+	6.	DATA1-
4.	GROUND	5.	VCC

3.5 Serial Port

NOVA-EDEN/C3 offers four high speed NS16C550 compatible UART's with 16-byte Read/Receive FIFO serial ports**.**

- **COM1, COM2, COM3, COM4: Serial Port Connector**

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

3.6 Keyboard/Mouse Connector

NOVA-EDEN/C3 has a 6-pin DIN keyboard/mouse connector and a 5-pin keyboard connector.

- **KB_MS1: Mini DIN Keyboard/Mouse Connector**

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

- **CN15: 6-pin Keyboard/Mouse Connector**

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

3.7 IrDA Infrared Interface Port

NOVA-EDEN/C3 comes with an integrated IrDA port which supports either a Serial Infrared(SIR) or an Amplitude Shift Keyed IR(ASKIR) interface.

- **IR1: IrDA connector**

PIN	Description
1	VCC
2	IR-RX2
3	IR-RX
4	Ground
5	IR-TX

3.8 Fan Connector

NOVA-EDEN/C3 also has a CPU cooling fan connector, which can supply 12V/500mA to the fan. There is a rotation pin in the fan connector, which transfers the fan's rotation signal to the system BIOS in order to recognize the fan speed. Please note that only specific fans offer a rotation signal.

- **FAN1: CPU Fan Connector**

PIN	Description
1	Rotation Signal
2	+12V
3	Ground

3.9 VGA Connector

- **VGA1: 10-pin VGA Connector**

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

3.10 TV OUT Connector

NOVA-EDEN/C3 supports both NTSC and PAL signal on the TV-out.

- **TV1: 6-pin TV-OUT Connector**

PIN	Description	PIN	Description
1	GROUND	2	TV_Y
3	GROUND	4	TV_C
5	GROUND	6	TV_CVBS

3.11 Digital I/O Connector

The digital IO port of NOVA-EDEN/C3 is 5V CMOS level. Internal pull-up are existed on the output.

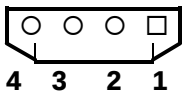
- **CN6: 10-pin Digital I/O Connector**
  (Please refer to Appendix D for used digital I/O function)

PIN	Description	PIN	Description
1	GROUND	2	+5V
3	INPUT1	4	OUTPUT1
5	INPUT2	6	OUTPUT2
7	INPUT3	8	OUTPUT3
9	INPUT4	10	OUTPUT4

3.12 Power Connector

NOVA-EDEN/C3 is equipped with one standard power connector.

- **CN16 : 4-pin Connector**



PIN	Description
1	+5V
2	GND
3	GND
4	+12V

3.13 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All functions are in the CN5 connector.

- **CN5: Pin Assignment and Functions**

FUNCTION	PIN	Description	
SPEAKER	2	SPK SIGNAL	Jump for Buzzer
	4	Buzzer-	
	6	NC	
	8	VCC	
RESET	10	RESET	
	12	GROUND	
HDD LED	9	IDE_LED+	
	11	IDE_LED-	
POWER LED	1	LED+	
	3	LED-(GROUND)	
POWER BUTTON	5	GROUND	
	7	PSON	

3.14 PS-ON Connector

This connector is used to control the ATX power supply.

- **CN11: PS-ON Connector**
  (Please refer to Appendix F for used ATX power supply)

PIN	Description
1	+5V Standby
2	PS-ON
3	Ground

3.15 LAN Connector

NOVA-EDEN/C3 is equipped with 10/100Mbps Ethernet controllers, which are connected to the LAN via an RJ45 connector. The pin assignments are as follows.

- **LAN1, LAN2: RJ45 Connectors (10/100M)**

PIN	Description	PIN	Description
1	TX+	7	N/C
2	TX-	8	N/C
3	RX+	9	Speed +
4	N/C	10	Speed -
5	N/C	11	Active/LINK +
6	RX-	12	Active/LINK -

3.16 RS422 / 485 Connector

The RS485 port of NOVA-EDEN/C3 is half-duplex with auto direction. So you do not have to switch transfer mode while sending or receiving data.

- **CN4: RS 422 / 485 Connector**

PIN	Description
1	TX+
2	TX-
3	RX+
4	RX-

3.17 TFT LCD Connector

NOVA-EDEN/C3 is equipped with TFT LCD controller, which can be connected to the LCD via CN2 connector. The pin assignments are as follows.

- **CN2: TFT LCD Connector**

PIN	Description	PIN	Description
1	N/C	2	FP33
3	FP34	4	FP31
5	FP35	6	FP32
7	FP30	8	FP28
9	FP29	10	FP27
11	FP25	12	FP26
13	FP24	14	FP21
15	FP23	16	FP22
17	FP16	18	FP20
19	FP17	20	FP18
21	FP19	22	FP14
23	FP13	24	FP12
25	FP15	26	FP11
27	FP7	28	FP10
29	+LCD	30	+LCD
31	FP9	32	FP8
33	FP4	34	FP6
35	FP3	36	FP5
37	FP2	38	FP1
39	FPDEN	40	FP0
41	FPCLK	42	VEEON
43	ENVDD	44	FPVS
45	ENVEE	46	FPHS
47	GND	48	GND
49	+12V	50	+12V

3.18 LCD Connector

NOVA-EDEN/C3 can support 1 or 2 channel (18 or 36bit) LVDS panel, which can be connected to CN3. The pin assignments are as follows.

- **CN3: LVDS LCD Connector**

PIN	Description	PIN	Description
1	2nd LVDS clock output +	2	2nd LVDS clock output -
3	2nd LVDS data2 output +	4	2nd LVDS data2 output -
5	2nd LVDS data1 output +	6	2nd LVDS data1 output -
7	2nd LVDS data0 output +	8	2nd LVDS data0 output -
9	1st LVDS clock output +	10	1st LVDS clock output -
11	1st LVDS data2 output +	12	1st LVDS data2 output -
13	1st LVDS data1 output +	14	1st LVDS data1 output -
15	1st LVDS data0 output +	16	1st LVDS data0 output -
17	GROUND	18	GROUND
19	+LCD (+3Vor +5V)	20	+LCD (+3Vor +5V)

Please refer to Appendix E for the signal mapping of LVDS.

3.19 PCI Slot

- **PCI 1: PCI Slot**

PIN	Description	PIN	Description
1	NC	2	NC
3	+12V	4	NC
5	NC	6	GND
7	NC	8	NC
9	+5V	10	+5V
11	INTD-	12	+5V
13	INTB-	14	INTA-
15	+5V	16	INTC-
17	NC	18	PRSNT
19	+5V	20	NC
21	NC	22	PRSNT
23	GND	24	GND
25	GND	26	GND
27	NC	28	NC
29	PCIRST-	30	GND
31	+5V	32	PCICLK
33	GNT-	34	GND
35	GND	36	REQ-
37	NC	38	+5V
39	AD30	40	AD31
41	+3V	42	AD29
43	AD28	44	GND
45	AD26	46	AD27
47	GND	48	AD25

49	AD24	50	+3V
51	IDSEL	52	CBE3-
53	+3V	54	AD23
55	AD22	56	GND
57	AD20	58	AD21
59	GND	60	AD19
61	AD18	62	+3V
63	AD16	64	AD17
65	+3V	66	CBE2-
67	FRAME-	68	GND
69	GND	70	IRDY-
71	TRDY-	72	+3V
73	GND	74	DEVSEL-
75	STOP-	76	GND
77	+3V	78	LOCK-
79	SDONE	80	PERR-
81	SBO-	82	+3V
83	GND	84	SERR-
85	PAR	86	+3V
87	AD15	88	CBE1-
89	+3V	90	AD14
91	AD13	92	GND
93	AD11	94	AD12
95	GND	96	AD10
97	AD9	98	GND
99	CBE0	100	AD8
101	+3V	102	AD7
103	AD6	104	+3V
105	AD4	106	AD5
107	GND	108	AD3
109	AD2	110	GND
111	AD0	112	AD1
113	+5V	114	+5V
115	REQ64-	116	ACK64-
117	+5V	118	+5V
119	+5V	120	+5V

3.20 PC/104-Plus Connector

NOVA-EDEN/C3 has a PC/104-Plus connector for both PC/104-Plus and PC/104 modules. The PCI bus of PC/104-Plus is a 32-bit bus running at 33MHz, and it is PCI2.1 compliant.

- **CN8: PC/104-Plus PCI Connector (120-pin PCI bus)**

PIN	Description	PIN	Description
A1	NC	B1	NC
A2	NC	B2	AD2
A3	AD5	B3	GND
A4	CBE0-	B4	AD7
A5	GND	B5	AD9
A6	AD11	B6	NC

A7	AD14	B7	AD13
A8	NC	B8	CBE1-
A9	SERR-	B9	GND
A10	GND	B10	PERR-
A11	STOP-	B11	NC
A12	NC	B12	TRDY-
A13	FRAME-	B13	GND
A14	GND	B14	AD16
A15	AD18	B15	NC
A16	AD21	B16	AD20
A17	NC	B17	AD23
A18	IDSEL0	B18	GND
A19	AD24	B19	CBE3-
A20	GND	B20	AD26
A21	AD29	B21	+5V
A22	+5V	B22	AD30
A23	REQ0-	B23	GND
A24	GND	B24	REQ2-
A25	GNT1-	B25	NC
A26	+5V	B26	PCICLK0
A27	PCICLK2	B27	+5V
A28	GND	B28	INTD-
A29	+12V	B29	INTA-
A30	NC	B30	REQ3-

PIN	Description	PIN	Description
C1	+5V	D1	AD0
C2	AD1	D2	+5V
C3	AD4	D3	AD3
C4	GND	D4	AD6
C5	AD8	D5	GND
C6	AD10	D6	NC
C7	GND	D7	AD12
C8	AD15	D8	NC
C9	SBO-	D9	PAR
C10	NC	D10	SDONE
C11	LOCK-	D11	GND
C12	GND	D12	DEVSEL-
C13	IRDY-	D13	NC
C14	NC	D14	CBE2-
C15	AD17	D15	GND
C16	GND	D16	AD19
C17	AD22	D17	NC
C18	IDSEL1-	D18	IDSEL2
C19	NC	D19	IDSEL3
C20	AD25	D20	GND
C21	AD28	D21	AD27
C22	GND	D22	AD31
C23	REQ1-	D23	NC
C24	+5V	D24	GNT0-
C25	GNT2-	D25	GND
C26	GND	D26	PCICLK1
C27	PCICLK3	D27	GND

C28	+5V	D28	PCIRST-
C29	INTB-	D29	INTC-
C30	GNT3-	D30	NC

- **CN7: PC/104 Connector (104-pin ISA bus)**

PIN	Description	PIN	Description
A1	IOCHK-	B1	GND
A2	SD7	B2	RSTDRV
A3	SD6	B3	+5V
A4	SD5	B4	IRQ9
A5	SD4	B5	NC
A6	SD3	B6	DREQ2
A7	SD2	B7	NC
A8	SD1	B8	ZWS-
A9	SD0	B9	+12V
A10	IOCHRDY	B10	GND
A11	AEN	B11	SMEMW-
A12	SA19	B12	SMEMR-
A13	SA18	B13	IOW-
A14	SA17	B14	IOR-
A15	SA16	B15	DACK3-
A16	SA15	B16	DREQ3
A17	SA14	B17	DACK1-
A18	SA13	B18	DREQ1
A19	SA12	B19	REFRESH-
A20	SA11	B20	ISACLK
A21	SA10	B21	IRQ7
A22	SA9	B22	IRQ6
A23	SA8	B23	IRQ5
A24	SA7	B24	IRQ4
A25	SA6	B25	IRQ3
A26	SA5	B26	DACK2-
A27	SA4	B27	TC
A28	SA3	B28	BALE
A29	SA2	B29	+5V
A30	SA1	B30	ISA_OSC
A31	SA0	B31	GND
A32	GND	B32	GND

PIN	Description	PIN	Description
C1	GND	D1	GND
C2	SBHE-	D2	MCS16-
C3	SA23	D3	IOCS16-
C4	SA22	D4	IRQ10
C5	SA21	D5	IRQ11
C6	SA20	D6	IRQ12
C7	SA19	D7	IRQ15
C8	SA18	D8	IRQ14
C9	SA17	D9	DACK0-
C10	MEMR-	D10	DREQ0
C11	MEMW-	D11	DACK5-

C12	SD8	D12	DRREQ5
C13	SD9	D13	DACK6-
C14	SD10	D14	DREQ6
C15	SD11	D15	DACK7-
C16	SD12	D16	DREQ7
C17	SD13	D17	+5V
C18	SD14	D18	MASTER-
C19	SD15	D19	GND
C20	NC	D20	GND

3.21 Floppy Connector

- **FDD1: Floppy Connector**

PIN	Description	PIN	Description
1	GROUND	2	RWC0-
3	GROUND	4	NC
5	GROUND	6	RWC1-
7	GROUND	8	INDEX-
9	GROUND	10	MO-A
11	GROUND	12	DS-B
13	GROUND	14	DS-A
15	GROUND	16	MO-B
17	GROUND	18	DIR-
19	GROUND	20	STEP-
21	GROUND	22	WD-
23	GROUND	24	WGATE-
25	GROUND	26	TRK0-
27	GROUND	28	WP-
29	GROUND	30	RDATA-
31	GROUND	32	HEAD-
33	GROUND	34	DSKCHG-

Chapter 4. AMI BIOS Setup

4.1 Introduction

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

4.2 Starting Setup

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

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

Press DEL to enter SETUP.

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

PRESS F2 TO CONTINUE, DEL TO ENTER SETUP

4.3 Using Setup

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

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand

Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F4 key	Reserved
F5 key	Reserved
F6 key	Reserved
F7 key	Reserved
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

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

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

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

4.5 Main Menu

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

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

Field	Description
Standard CMOS Setup	Use this menu for basic system configuration.
Advanced CMOS Setup	Use this menu to set the Advanced Features available on your system.
Advanced Chipset Setup	Use this menu to change the values in the chipset registers and optimize your system's performance.
Power Management Setup	When Disabled, SMI will not be initialized, and complete power management functionality is removed until this option is set to Enabled.
PCI / Plug and Play Setup	This entry appears if your system supports PnP / PCI.
Peripheral Setup	Use this menu to specify your settings for integrated peripherals.
Hardware Monitor Setup	Use this menu to monitor your hardware.
Auto-detect Hard Disks	Use this menu to specify your settings for hard disks control.
Change Supervisor Password	Use this menu to set User and Supervisor Passwords.
Auto Configuration with Optimal Settings	Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AMI has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.
Auto Configuration with Fail-Safe Settings	Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.
Save Settings and Exit	Save CMOS value changes to CMOS and exit setup.
Exit Without Saving	Abandon all CMOS value changes and exit setup.

4.6 Standard CMOS Setup

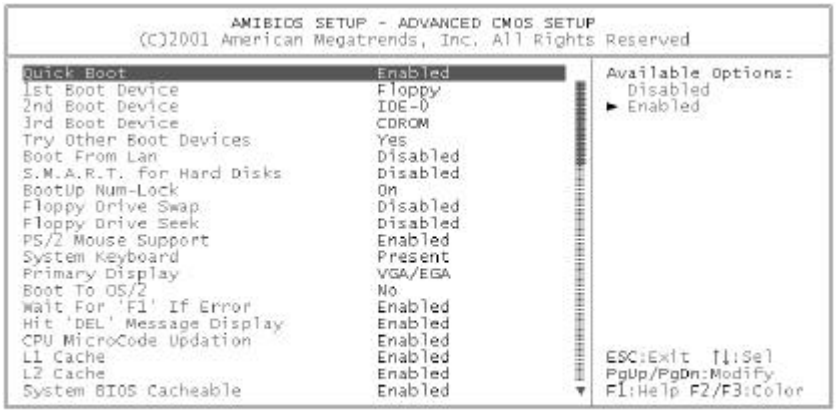
The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

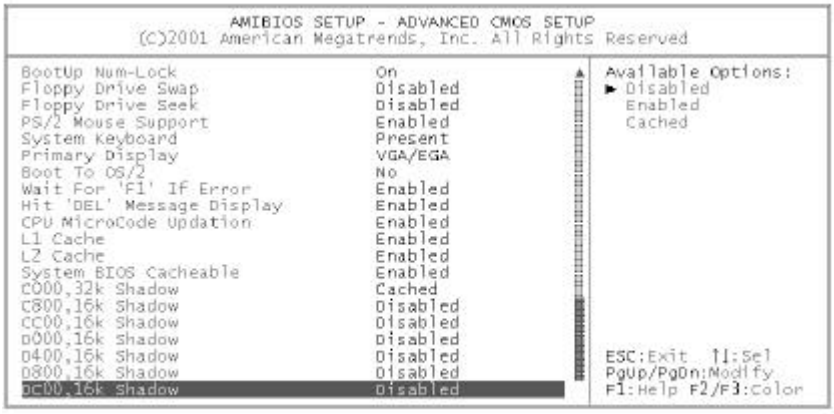
- **Main Menu Selections**

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

4.7 Advanced CMOS Setup

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





Quick Boot

When set to enabled, DRAM testing function will disable.

1st / 2nd / 3rd Boot Device

This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes.

The Choice: Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, SCSI.

Try Other Boot Devices

Set this option to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the 1st Boot Device, 2nd Boot Device, 3rd Boot Device, 4th Boot Device options.

The Choice: Yes or No.

Floppy Access Control

This option specifies the read/write access that is set when booting from a floppy drive.

The Choice: Read/Write or Read-Only.

Hard Disk Access Control

This option specifies the read/write access that is set when booting from a hard disk drive.

The Choice: Read/Write or Read-Only.

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

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

The Choice: Disabled, Enabled.

Boot Up Num-Lock

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

Floppy Drive Swap

Set this option to Enabled to permit drives A: and B: to be swapped.

The Choice: Enabled or Disabled.

Floppy Drive Seek

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

The Choice: Enabled or Disabled.

PS/2 Mouse Support

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

System Keyboard

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

The Choice: Absent, Present.

Primary Display

Select this option to configure the type of monitor attached to the computer.

The Choice: Monochrome, Color 40x25,Color 80x25,VGA/PGA/EGA ,or Not Install.

Password Check

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

Boot To OS/2

Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the motherboard.

The Choice: YES or NO.

Wait For 'F1' If Error

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

The Choice: Disabled or Enabled.

Hit 'DEL' Message Display

Disabling this option prevents "Hit <DEL> if you want to run Setup" from appearing when the system boots.

The Choice: Disabled or Enabled.

Internal Cache

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

External Cache

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

System BIOS Cacheable

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

C000, 32k Shadow

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

- Disabled: The contents of the video ROM are not copied to RAM.
- Cached: The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.
- Enabled: The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

C800, 16k Shadow

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

CC00, 16k Shadow

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

D000, 16k Shadow

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

D400,16k Shadow

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

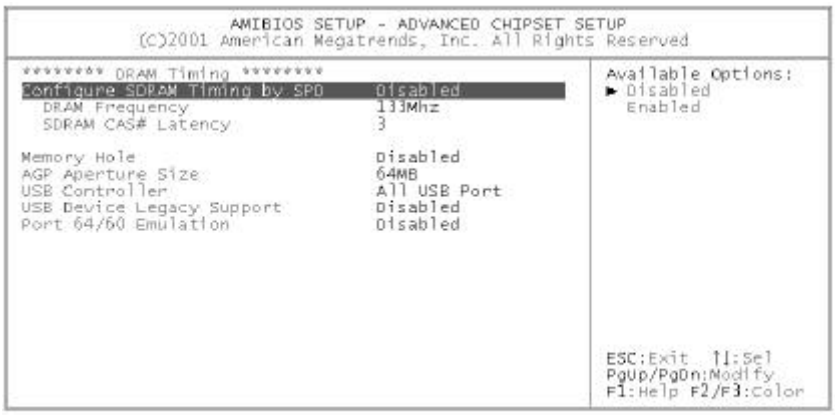
D800, 16k Shadow

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

DC00,16k Shadow

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

4.8 Advanced Chipset Setup



This section enables you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be

altered. The default settings have been chosen because they provide the best operating conditions for your system.

DRAM Frequency

This setting decided by Memory frequency.

SDRAM CAS# Latency

This setting decided by Memory CAS latency.

AGP Aperture Size

Select the size of AGP aperture. The aperture is a portion of the PCI Memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

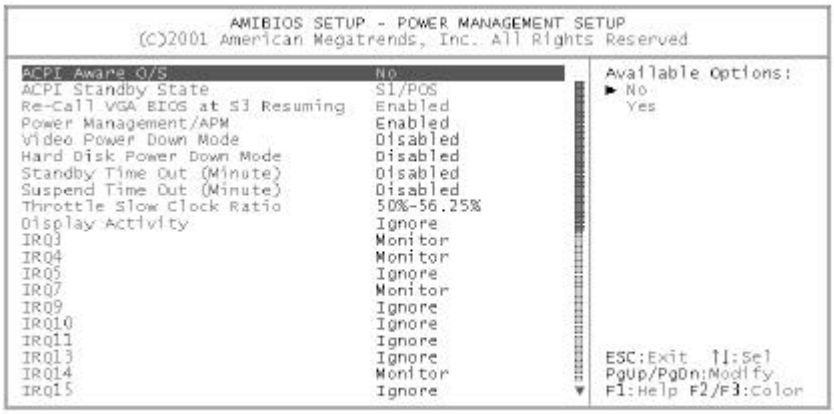
USB Controller

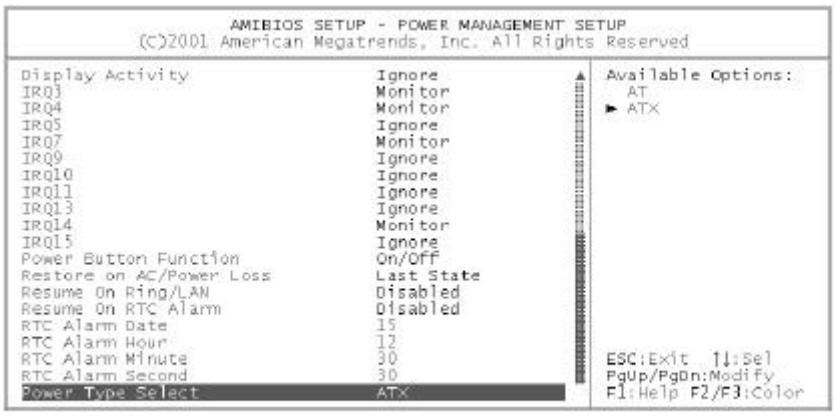
Select enable if your system contains a USB controller and you have USB Peripherals.

USB Device Legacy support

Enable or Disable USB device legacy support.

4.9 Power Management Setup





ACPI Aware O/S

This feature is switch of ACPI function.

Configuration options: [Yes]; [No].

ACPI Standby State

This feature is switch of STR (S3) or POS (S1) function.

Configuration options: [S3/STR] [S1/POS].

Power Management/APM

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

Video Power Down Mode

Video power down when system is in Suspend mode.
Video power down when system is in Standby mode.

Hard Disk Power Down Mode

Heard Disk power down when system is in Suspend mode.
Heard Disk power down when system is in Standby mode.

Suspend Time Out

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

IRQ3, 4, 5, 7, 9, 10, 11, 13, 14, 15

As Individual IRQ Wake Up Events.

Power Button Function

On/Off allows the system to switch off immediately the power button is pressed. Suspend allows the system to Suspend immediately the power button is pressed.

Resume on Ring/LAN

Allow the system to wake up in response to a Ring Indicator signal from external modem. Wake up on LAN enables remote booting of a PC via a network even if it is shut down.

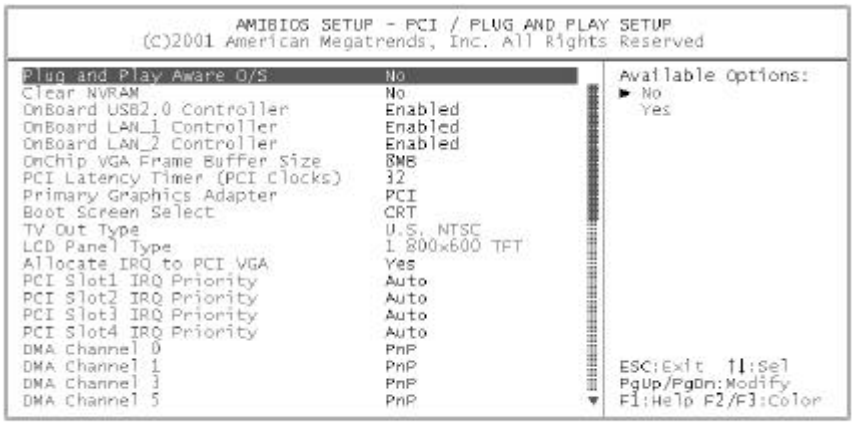
Resume On RTC Alarm

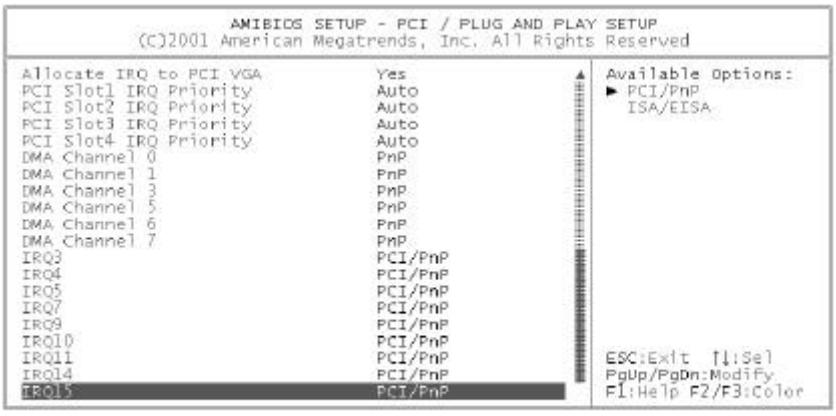
When this option is enabled, the system will turn from soft off mode according to your schedule.

Power Type Select

This option is select Power Type for AT or ATX.

4.10 PCI / Plug and Play Setup





Plug and Play Aware O/S

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

Clear NVRAM

When this option is set to Yes, system can auto clear NVRAM.

The Choice: Yes and No.

On Board USB2.0 Controller

This option is select enable USB2.0 controller or disable.

On Board LAN1 Controller

This option is select enable LAN1 controller or disable.

On Board LAN2 Controller

This option is select enable LAN2 controller or disable.

On Chip VGA Frame Buffer Size

This option is select frame buffer size (2~32MB) for VGA.

PCI Latency Timer (PCI Clocks)

This option specifies the latency timings(in PCI clocks) for PCI devices installed in the PCI expansion slots.

The Choice: 32, 64, 96, 128, 160 , 192, 224, or 248.

Boot Screen Select

This option is select Boot Screen from CRT or LCD or TV out. Select CRT+LCD or CRT+TV is Boot from CRT and LCD or CRT and TV.

TV out Type

If you select TV or CRT+TV from Boot screen select optional. You can select TV out type optional to select TV out type. You can select U.S. NTSC, Japanese NTSC or PAL.

LCD Panel Type

This option is select LCD Panel type.

Allocate IRQ to PCI VGA

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

PCI Slot1 / Slot2 / Slot3 / Slot4 IRQ Priority

The option specify the IRQ priority for PCI device installed in the PCI expansion slot.

The Choice: Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

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

The option allow you to specify the bus type used by each DMA channel.

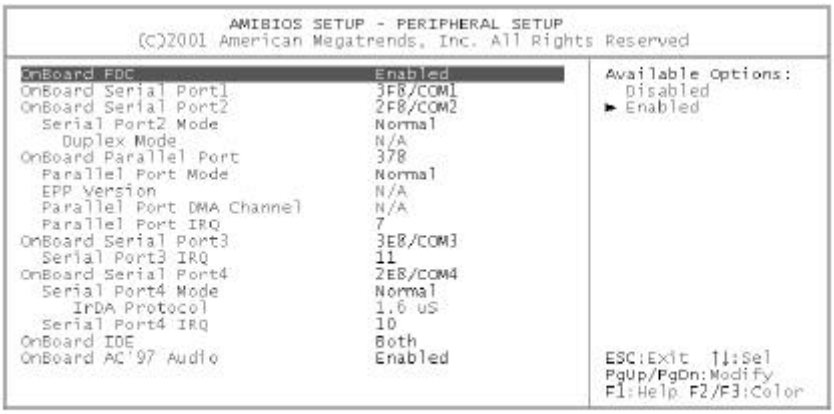
The Choice: PnP or ISA/EISA.

IRQ3 , 4 , 5 , 7 , 9, 10, 11, 14, 15

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

4.11 Peripheral Setup

The Peripheral Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with user defined system environment.



OnBoard Serial Port 1 / Port 2 / Port 3 / Port4

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

Serial Port4 Mode

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

IR Pin Select

The SIN/SOUT pin of Serial Port 3 function or IRRX/IRTX pin if IR function in normal condition.

OnBoard Parallel Port

This option specifies the base I/O port address of parallel port on the motherboard.

The Choice: Disabled, 378h, 278h, or 3BCh.

Parallel Port Mode

This option specifies the parallel port mode. The settings are Normal, Bi-Dir, EPP, ECP.

- Normal: The normal parallel port mode is used.
- Bi-Dir : Use this setting to support bi-directional transfers on the parallel port.
- EPP: The parallel port can be used with devices that adhere to the Enhanced Parallel Port(EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
- ECP: The parallel port can be used with devices that adhere to the Entended Capabilities Port(ECP) specification.

ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP providessymmetric bi-directional communication.

EPP Version

EPP data or address read cycle 1.9 or 1.7

Parallel Port IRQ

This option specifies the IRQ used by the parallel port.

The Choice: Auto , (IRQ)5, (IRQ)7.

Parallel Port DMA Channel

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

On Board LAN

This option is select LAM Function Enable or Disable.

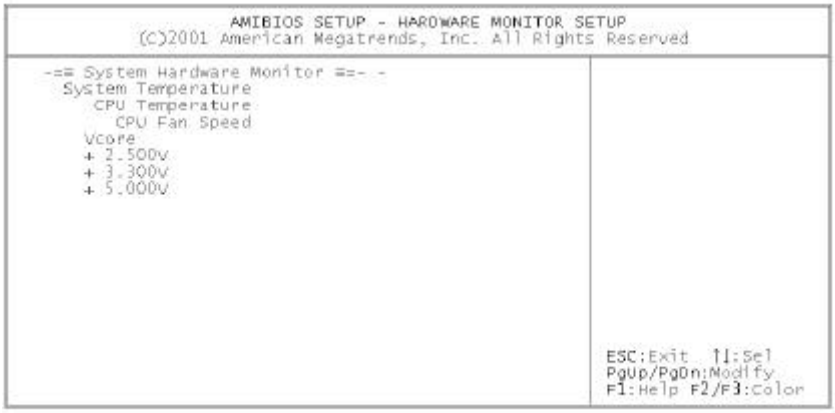
On Board LAN P.M.E

Enable or Disable P.M.E Function for LAN Wake up.

On Board AC'97 Audio

Enable or Disable AC'97 Audio Function.

4.12 Hardware Monitor Setup



4.13 Change Supervisor Password

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

Supervisor Password:
Users can change the options of the setup menu.

User Password:
Users do not have the right to change the options of the setup menu. When you select this function, the following message will appear for you to create a password.

ENTER PASSWORD:
Type a password of up to eight characters in length and press Enter. Confirm the password by entering it again and press Enter. Previous password in CMOS memory will be cleared once a new password is created. To abort, press Esc. When a password is enabled, you will be prompted to enter it every time you enter Setup. This prevents an unauthorized party from changing any part of the system configuration. You can also require BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.
You can determine when the password is required in the BIOS Features Setup Menu and its Security option.

PASSWORD ENABLED / DISABLED:
To disable a password, press Enter when you are prompted to enter the password. Then confirm the selection. Once the password is disabled, the system will restart and you can enter Setup freely.

Appendix A: Watchdog Timer

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

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

Prior to enable the Watchdog Timer, user has to set the time-out period. The resolution of the timer is 1 second and the range of the timer is from 1 sec to 255 sec. You need to send the time-out value to the I/O port–443H, and then enable it by reading data from the same I/O port–443H. This will activate the timer that will eventually time out and reset the CPU board. To ensure that this reset condition will 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 set by the software, please refer to the example program. Finally, we have to disable the Watchdog timer by reading the I/O port– 843H or 043H. Otherwise the system could reset unconditionally.

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

Example assembly program:

```
TIMER_PORT   =  443H
TIMER_START  =  443H
TIMER_STOP   =  843H
;;INITIAL TIMER COUNTER
MOV DX, TIMER_PORT
MOV AL, 8     ;;8 seconds
OUT DX, AL
MOV DX, TIMER_START
IN AL, DX.    ;;START COUNTER
W_LOOP:
MOV DX, TIMER_STOP
IN AL, DX
MOV DX, TIMER_START
IN AL, DX        ;;RESTART COUNTER
;;ADD YOUR APPLICATION HERE
CMP EXIT_AP, 0
JNE W_LOOP
MOV DX, TIMER_STOP
IN AL, DX
;;EXIT AP
```

Appendix B: I/O Address Map

- **I/O Address Map**

I/O Address Map	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-OFF	Math Coprocessor
170-1F7	BUS Master PCI IDE Controller
278-27F	Parallel Printer Port 2
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
376-376	BUS Master PCI IDE Controller
378-37F	Parallel Printer Port 1
3B0-3DF	AGP Graphic Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watchdog timer enable
480-48F	PCI BUS
843/043	Watchdog timer disable

1 st MB Memory Address Map

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

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC CMOS clock
IRQ1	Keyboard	IRQ9	ACPI STEERING
IRQ2	IRQ Controller	IRQ10	COM4
IRQ3	COM2	IRQ11	COM3
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	USB	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignment

Channel	**Function**
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix C: How to use Wake-Up Function

NOVA-EDEN/C3 provides two kinds of Wake-up function. This page describes how to use Modem Wake-Up and LAN Wake-Up functions. Wake-Up function only works with ATX power supply.

- **Wake-Up On Modem(Ring)**:
  You must set the option **Wake-Up On LAN/Ring** of CMOS SETUP to be enabled. ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.

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

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

  ID's format is xxxxxxxxxxxx
  Example ID: 009027388320

Appendix D: Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the NOVA-EDEN/C3.
There are two kinds of signals (Input and Output) used by the Digital I/O function. These signals are used to control external devices that need On/Off circuit or TTL devices. When one of the signals has been selected, user can read or write data to the system through the Digital I/O function.

A BIOS function call (INT 15H) is used to control the digital I/O:

INT 15H

AH – 6FH
Sub-function: **AL – 8** : Set the Digital port as INPUT **AL** : Digital I/O input value

Example program:

```
MOV    AX, 6F08H          ;setting the Digital port is input
INT    15H                 ;
```

AL low byte = value

AH – 6FH
Sub-function: **AL – 9** : Set the Digital port as OUTPUT **BL** : Digital I/O output value

Example program:

```
MOV    AX, 6F09H          ;setting the Digital port is output
MOV    BL, 09H            ;Digital value is 09H
INT    15H                 ;
```

Digital Output is 1001b

Appendix E: Signal mapping of LVDS

18bit LVDS mapping table

(R0)	1st LVDS (data0 output-) (data0 output +)	(B2)	1st LVDS (data2 output -) (data2 output +)
(R1)		(B3)	
(R2)		(B4)	
(R3)		(B5)	
(R4)		HSYNC	
(R5)		VSYNC	
(G0)		DE	
(G1)	1st LVDS (data1 output -) (data1 output +)	DCLK	1st LVDS (clock output -) (clock output +)
(G2)			
(G3)			
(G4)			
(G5)			
(B0)			
(B1)			

36bit LVDS mapping table

(RA0)	1st LVDS (data0 output -) (data0 output +)	(BA2)	1st LVDS (data2 output -) (data2 output +)
(RA1)		(BA3)	
(RA2)		(BA4)	
(RA3)		(BA5)	
(RA4)		HSYNC	
(RA5)		VSYNC	
(GA0)		DE	
(GA1)	1st LVDS (data1 output -) (data1 output +)	DCLKA	1st LVDS (clock output -) (clock output +)
(GA2)			
(GA3)			
(GA4)			
(GA5)			
(BA0)			
(BA1)			

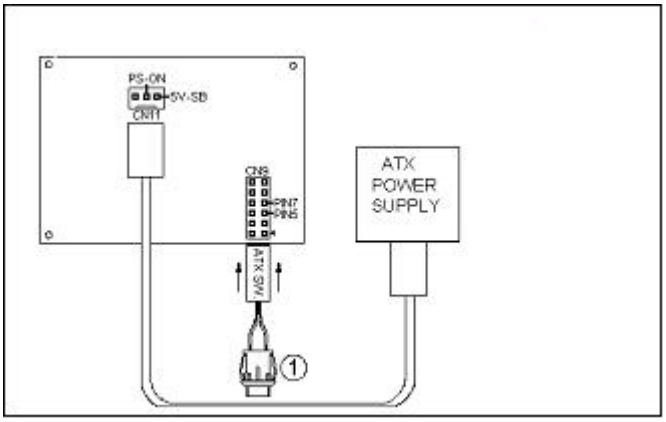
(RB0)	2nd LVDS (data0 output -) (data0 output +)	(BB2)	2nd LVDS (data2 output -) (data2 output +)
(RB1)		(BB3)	
(RB2)		(BB4)	
(RB3)		(BB5)	
(RB4)		NC	
(RB5)		NC	
(GB0)		NC	
(GB1)	2nd LVDS (data1 output -) (data1 output +)	DCLKB	2nd LVDS (clock output -) (clock output +)
(GB2)			
(GB3)			
(GB4)			
(GB5)			
(BB0)			
(BB1)			

Appendix F: ATX Power Supply

The following notes show how to connect ATX Power Supply

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

- **NOVA-EDEN/C3 (through Power Button & GND):**



Connect the ATX power button switch to the CN9 (power button). And connect the power cable from ATX Power supply to CN11 of CPU card.

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