NOVA-7830

SOCKET-370 CPU Embedded Board

With 10/100 Mbps Ethernet, VGA,

Audio

User Manual
Version 1.1

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For any questions regarding the content of this manual or the product, please contact us at: support@iei.com.tw.

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Chapter 1   Introduction

Thank you for choosing NOVA-7830 SOCKET370 CPU with Multimedia & LAN Ethernet Embedded Little Board, which comes equipped with the Intel advanced chipset 815E. This product is designed for the system manufacturers, integrators, or VARs that want to build a low power consumption system.

In addition, NOVA-7830 provides on-chip VGA which provides up to 1600x1200 resolution. LCD which provides up to 1024x768 resolution.

An advanced high performance super I/O chip— W83627 and NS87366 is used in the NOVA-7830 board, which provides four UARTs are compatible with the NS16C550. The parallel port and FDD interface are compatible with IBM PC/AT architecture's.

NOVA-7830 has one Fast Ethernet Multifunction PCI Controller as a LAN controller, which is fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power consumption features.

This board has a built-in Compact Flash Disk Socket, CardBus, and FireWire for embedded applications.

For multimedia application, NOVA-7830 provides many functions, such as 1394, 5.1 channel Audio and video in.

1.1   Specifications

- **CPU**: SOCKET-370
- **DMA channels**: 7
- **Interrupt levels**: 15
- **Chipset**: Intel 815E
- **Memory**: One 168-pin DIMM sockets. The memory capability is up to 512MB/133MHz.
- **Ultra ATA/33/66/100 IDE interface**: One PCI Enhanced IDE channels (2 IDE devices). The south bridge ICH2 supports Ultra ATA/33/66/100 IDE interface. To support Ultra ATA66/100 Hard disk, a specific cable (maximum length— 45 cm) is available.
- **Floppy disk drive interface**: Single 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drive.
- **Serial ports**: Four high-speed 16C550 compatible UARTs with 16-byte FIFO buffer. Up to 115Kbps in speed. One port supports RS232/422/485 function.
- **Parallel port**: One IEEE1284 compatible bi-directional ports. Supports SPP/ECP/EPP.
- **IrDA**: Supports Serial Infrared (SIR) and Amplitude Shift Keyed IR (ASKIR) interface.
- **USB**: Supports two USB 1.1 compatible ports.

- **Audio**: Onboard CMI8738 chipset, Supports 5.1 channel sound, that include LINEOUT, REAR, and CENTER/BASS.
- **Watchdog Timer**: Software programmable— enable/disabled. Timer interval is 1~255 seconds. System Reset will be generated while time out.
- **VGA Controller**: Embedded VGA controller. Screen resolution: up to 1600x1200 in 256 Colors at 85Hz refresh.
- **LCD Controller**: Onboard SP1015 LCD controller. Screen resolution: up to 1024x768 36bits.
- **Intel 82801BA embedded LAN**: IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX. Fast back-to-back transmission support with minimum interframe spacing. Connected to your LAN through RJ45 connector.
- **Keyboard Controller**: 8042 compatible for keyboard and PS/2 mouse
- **4 digital inputs and 4 digital outputs**
- **4 channels of composite video input**
- **FireWire**: TSB43AA22 provides the digital and analog transceiver functions to implement a two-port node in a cable-based IEEE 1394. Provides two P1394a fully compliant cable ports at 100/200/400 megabits per second (Mbits/s).
- **CardBus**: Compliant with CardBus/PCMCIA PC Card 95/97 standard specification.
- **Power Consumption**: 5V/4.9A and 12V/0.22A, as running by CELERON-850, 256 SDRAM.
- **Operating Temperature**: 0 ~ 60 (CPU needs cooler).

1.2 Package Contents

NOVA-7830 package includes the following items:

- NOVA-7830 Mobile CPU based Single board computer.
- FDD cable x 1
- HDD cable x 1
- Keyboard / Mouse adapter Y cable x 1
- RS-232 serial port cable x 2
- RS-232/422/485 serial port cable x 1
- Printer port cable x 1
- AUDIO port cable x 1
- 4-channel composite video cable x 2
- User manual x 1
- IEEE 1394 cable X1

Chapter 2   Installation

This chapter describes how to install NOVA-7830. Read the unpacking information carefully. The jumpers and switches setting for NOVA-7830 configuration, such as CPU type selection, system clock setting, and watchdog timer, are also included.

2.1   NOVA-7830 Layout
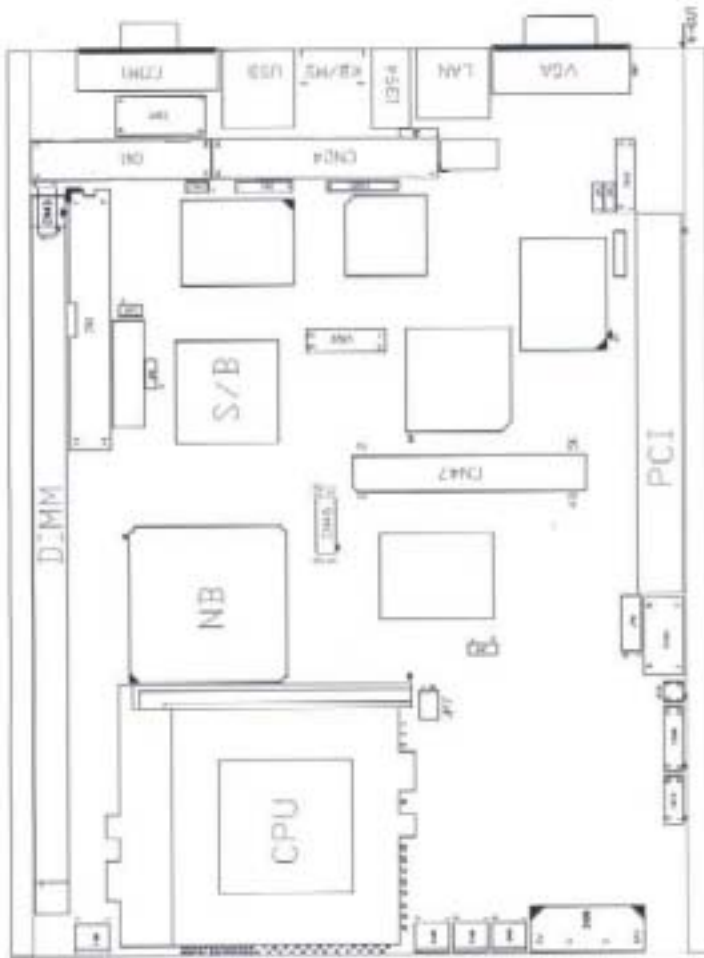
2.2   Clear CMOS Setup

CMOS RAM holds the board's configuration data, which has to be set by means of system BIOS. To clear CMOS RAM, close JP1 for about 3 seconds, and then open it again. It will then resume normal operation.

- **JP1: Clear CMOS Setup**

JP1	Description
1-2	**Keep CMOS Setup (Normal Operation)**
2-3	Clear CMOS Setup

2.3   Compact Flash Setting

Set the operating mode of Compact Flash disk. This is similar to the operation of hard disk.

- **JP2: Compact Flash Setting**

JP2	Description
OPEN	**Slave**
Close	Master

2.4   Audio Amplifier Select

This jumper is for the setting of Audio Amplifier.

- **JP5: Audio L_Line out select**

JP5	Description
1-2	OFF
2-3	**ON**

- **JP6: Audio R_Line out select**

JP6	Description
1-2	OFF
2-3	**ON**

2.5　LCD Panel Shift Clock/Panel VCC Select

This jumper is for the setting of LCD panel shift clock mode and panel power voltage.

- **JP7: LCD Panel Shift Clock**

JP7	Description
1-3	Inverted
3-5	**Normal**

- **JP7: Panel VCC**

JP7	Description
2-4	+5 V
4-6	**+3.3 V**

2.6　COM Port RI and Voltage Selection

JP8 is setting COM3, 4 RI and Voltage.

- **JP8: Set pin 9 of COM3 as signal RI or voltage source**

JP8	Description
10-12	**COM3 RI Pin Use RI**
8-10	COM3 RI Pin Use Voltage

- **JP8: Set pin 9 of COM4 as signal RI or voltage source**

JP8	Description
9-11	**COM4 RI Pin Use RI**
7-9	COM4 RI Pin Use Voltage

- **JP8: Set pin 9 of COM3 as +5V or 12V**

JP8	Description
2-4	COM3 RI Pin Use Voltage +5V
4-6	COM3 RI Pin Use Voltage +12V

- **JP8: Set pin 9 of COM4 as +5V or 12V**

JP8	Description
1-3	COM4 RI Pin Use Voltage +5V
3-5	COM4 RI Pin Use Voltage +12V

2.7 COM4 RS232/RS422 (485) Selection

- **JP9: Selection COM4 is RS232/RS422 (485)**

JP9	Description
1-2	**RS232**
2-3	RS422/485

- **JP10: Selection COM4 is RS422/RS485**

JP10	Description	
	1-3	2-4
RS422	**OFF**	**OFF**
RS485	ON	ON

Chapter 3   Connection

This chapter describes how to connect peripherals, switches and indicators to the NOVA-7830 board. The following table lists the connectors on NOVA-7830.

Label	Description
CDIN1	CD-IN Connector
CN1	Parallel Port Connector
CN2	IDE Connector
CN7	SUS LED
CN8, 11	Serial Port 1, 2
CN12	ATX Power On/Off Button Connector
CN16	DIN Connector for Keyboard/Mouse
CN20	External Switch and Indicators
CN21, 36	IEEE-1394 Connector
CN24	FDD Connector
CN26	ATX Power Connector
CN30	Power Connector
CN32	Audio Connector
CN33	4 Channels of composite video in Connector
CN35	USB Connector
CN37	LAN Connector
CN43	Compact Flash
CN44	CardBus/PCMCIA Connector
CN45	Digital I/O
CN47	LCD Connector
CN48, 49	Serial Port 3,4
CON1	VGA Connector
FAN1, 3	Fan Connectors
IR1	IrDA Connector
PCI1	Specific PCI Slot

1.3   Floppy Disk Drive Connector

NOVA-7830 board equipped with a 34-pin daisy-chain driver connector cable.

- **CN24: FDD Connector**

PIN	Description	PIN	Description
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	DS1#
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	N/C	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	N/C	34	DISK CHANGE#

1.4   Video IN Connector

NOVA-7830 is equipped witch 4 channels of composite video connector (BT878A).

- **CN33: Capture IN**

PIN	Description	PIN	Description
1	AVIN0	2	GROUND
3	AVIN1	4	GROUND
5	AVIN2	6	GROUND
7	AVIN3	8	GROUND

1.5 Ultra ATA33/66/100 IDE Disk Drive Connector

You can attach one IDE (Integrated Device Electronics) hard disk drives to the NOVA-7830 IDE controller.

- **CN2: Primary IDE 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	CHRDY	28	GROUND
29	DACK	30	GROUND
31	INTERRUPT	32	GROUND
33	SA1	34	P66DET
35	SA0	36	N/C
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

1.6 Parallel Port

This port is usually connected to a printer. NOVA-7830 includes an on-board parallel port, and accessed through a 26-pin flat-cable connector CN1. Three modes— SPP, EPP and ECP, are supported.

- **CN1: Parallel Port Connector**

PIN	Description	PIN	Description
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	25	GROUND
13	PRINTER SELECT	26	N/C

1.7 USB Port Connector

NOVA-7830 provides two USB ports (USB 1.1 compliant).

- **CN35: USB 8-Pin Header**

PIN	Description
A1	VCC
A2	DATA0-
A3	DATA0+
A4	GROUND
B1	VCC
B2	DATA0-
B3	DATA0+
B4	GROUND

1.8 Serial Ports

NOVA-7830 offers four high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO in each serial port.

- **CN8: D_SUB 9-PIN Connector**

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

- **CN11: 10-pin Connector**

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

- **CN48: 10-pin Connector**

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

- **CN49: 14-pin Connector**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	N/C
11	TX+ (RS422/485)
12	TX- (RS422/485)
13	RX+ (RS422/485)
14	RX- (RS422/485)

1.9　Power Connector

The NOVA-7830 has one power connector for power supply.

- **CN30: Power Supply Connector**

PIN	Description
1	VCC12V
2	GROUND
3	GROUND
4	VCC5V

- **CN26: ATX Power Connector**

PIN	Description
1	VCC5VSB
2	PS_ON
3	GROUND

1.10　Keyboard Connector

NOVA-7830 provides 6-PIN MIN-DIN keyboard/mouse connector.

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

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

1.11 IrDA Infrared Interface Port

NOVA-7830 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. When IrDA port is used, you have to set SIR or ASKIR model in COM 2 of Peripheral Setup in BIOS. Normal RS-232 COM 2 will then be disabled.

- **IR1: IrDA Connector**

PIN	Description
1	VCC5V
2	N/C
3	IR-RX
4	GROUND
5	IR-TX

1.12 Fan Connector

NOVA-7830 provides CPU cooling fan connector and system fan connector. CPU connectors can supply 12V/500mA. The fan rotation is in full speed.

- **FAN1, FAN3: Fan Connector**

PIN	Description
1	SENSOR
2	12V
3	GROUND

1.13 Audio Connectors

NOVA-7830 has a built-in AUDIO chipset (CMEDIA CMI8738LX); and a connector directly connected to the pin-header (CN32). The Audio chipset can support 5.1 channel sounds that include LINEOUT, REAR, and CENTER/BASS.

- **CN32: Audio Connector (2x8_2.00mm)**

PIN	Description	PIN	Description
1	LINEOUT_L	2	GROUND
3	LINEOUT_R	4	GROUND
5	CENTER	6	BASS
7	GROUND	8	GROUND
9	LININ_L	10	LINEIN_R
11	GROUND	12	GROUND
13	REAR_L	14	REAR_R
15	MIN_IN	16	GROUND

- **CDIN1: CD-IN**

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

1.14 VGA Connector

NOVA-7830 built-in 15-pin VGA connector directly to your CRT monitor.

- **CON1: 15-pin Female Connector**

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	VCC	10	GROUND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

1.15 LAN RJ45 Connector

NOVA-7830 is equipped with built-in one 10/100Mbps Ethernet Controller. You can connect it to your LAN through RJ45 LAN connector. The pin assignments are as below:

- **CN37: Intel 82562ET LAN RJ45 Connector**

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

1.16 Compact Flash Connector—TYPE II

NOVA-7830 supports one Compact Flash socket provided from IDE2. You must set the jumper to avoid the conflict (like master or slave).

- **CN43: Compact Flash Socket**

PIN	Description	PIN	Description
1	GROUND	26	VCC-IN CHECK2
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	HDC_CS0#	32	HDC_CS1#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	+5V	38	+5V
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	+5V
20	SA0	45	HDD_ACTIVE#
21	DATA0	46	N/C
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	N/C	49	DATA10
25	VCC-IN CHECK2	50	GROUND

1.17 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN7, CN12, and CN20 connector.

- **Suspend LED Connector (CN7)**

PIN	Description
1	LED+
2	LED-

- **ATX Power On/Off Button Connector (CN12)**

PIN	Description
1	PWR_BUTTON+
2	GROUND

- **CN20: Multi Panel**

PIN	Description	PIN	Description
1	POWER-LED +	2	SPEAKER -
3	N/C	4	N/C
5	POWER-LED -	6	N/C
7	KEYLOCK+	8	SPEAKER +5V
9	KEYLOCK-	10	RESET SW
11	GROUND	12	RESET SW GND
13	HDD LED+	14	HDD LED -

1.18 IEEE-1394 Connector

NOVA-7830 is equipped witch IEEE1394 controller (TI TSB43AA22). You can connect it to your 1394 device through CN21, 36 connector. The pin assignments are as follows:

- **CN21: 1394 Connector**

PIN	Description	PIN	Description
1	VCC12V	2	GROUND
3	TPB-	4	TPB+
5	TPA-	6	TPA+
7	NC/FG	8	NC/FG

- **CN36: 1394 Connector**

PIN	Description	PIN	Description
1	VCC12V	2	GROUND
3	TPB-	4	TPB+
5	TPA-	6	TPA+

1.19 CardBus/PCMCIA Connector

NOVA-7830 has a built-in CardBus/PCMCIA interface connector.

- **CN44: CardBus/PCMCIA Connector**

PIN	Description	PIN	Description
1	GROUND	2	D3
3	D4	4	D5
5	D6	6	D7
7	CE1#	8	A10
9	OE#	10	A11
11	A9	12	A8
13	A13	14	A14
15	WE#	16	READY
17	VCC	18	VCC
19	A16	20	A15
21	A12	22	A7
23	A6	24	A5
25	A4	26	A3
27	A2	28	A1
29	A0	30	D0
31	D1	32	D2
33	WP	34	GROUND
35	GROUND	36	CD1#
37	D11	38	D12
39	D13	40	D14
41	D15	42	CE2#
43	VS1#	44	IORD#
45	IOWR#	46	A17
47	A18	48	A19
49	A20	50	A21
51	VCC	52	VCC
53	A22	54	A23
55	A24	56	A25
57	VS2#	58	RESET
59	WAIT#	60	INPACK#
61	REG#	62	BVD2
63	BVD1	64	D8
65	D9	66	D10
67	CD2#	68	GROUND
69	GROUND	70	GROUND

1.20 Digital I/O

One of the characteristics of digital circuit is its fast response to high or low signal. This kind of response is highly necessary for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on NOVA-7830.

Digital Input and Output are control signals in general. You can use these signals to control external devices that needs On/Off circuit or TTL devices. We provide "BIOS Call" for DIO's reading.

READ		WRITE	
Bit0	DIN0	Bit0	DO0
Bit1	DIN1	Bit1	DO1
Bit2	DIN2	Bit2	DO2
Bit3	DIN3	Bit3	DO3

- **CN45: Digital I/O**

PIN	Description	PIN	Description
1	GROUND	2	VCC5V
3	DO3	4	DO2
5	DO1	6	DO0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

1.21 LCD Panel Connector

NOVA-7830 provides a 2 x 25-pin connector for the LCD flat panel interface. NOVA-7830 comes to support TFT LCD panels at following display options:

Video Display type	Resolution	Example
TFT VGA	640x480, 18bits	Toshiba LTM10C209H
TFT SVGA	800x600, 18bits	Toshiba LTM12C275C
TFT XVGA	1024x768, 18bits	L.G LM151X2

This is a reference table only, may support more type panels.

- **CN47: LCD Panel Connector for SP1015.**

PIN	Description	PIN	Description
1	N/C	2	RB2
3	BB2	4	RB3
5	BB3	6	RB4
7	BB4	8	RB5
9	BB5	10	RB6
11	BB6	12	RB7
13	BB7	14	RA5
15	RA7	16	RA6
17	GB2	18	RA4
19	GB3	20	RA2
21	RA3	22	GA6
23	GA5	24	GA4
25	GA7	26	GA3
27	BA7	28	GA2
29	Panel-VCC	30	Panel-VCC
31	GB4	32	GB5
33	BA4	34	BA6
35	BA3	36	BA5
37	BA2	38	GB6
39	RM	40	GB7
41	Shift Clock	42	Enable Backlight
43	FPVDD	44	FLM
45	Enable VEE	46	LP
47	GND	48	GND
49	Inverter VCC	50	Inverter VCC

Chapter 4   AMI BIOS Setup

1.1   Introduction

This chapter discusses the Setup program built into the BIOS which allows users to configure the system. This configuration is then stored in battery-backed CMOS RAM so that Setup information is retained whilst the power is off.

1.2   Starting Setup

The BIOS is immediately active when you turn on the computer. While the BIOS is activated, the Setup program can be entered in one of two ways:

i.   By pressing <Del> immediately after switching the system on, or
ii.   By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

   Press DEL to run SETUP.

1.3   Setup Summary

Field	Description
Standard CMOS Setup	To change time, date, hard disk type, etc.
Advanced CMOS Setup	To configure system options.
Advanced Chipset Setup	To configure chipset features.
Power Management Setup	Power Management Setup to configure power management features.
PCI / Plug and Play Setup	Configures PCI / Plug and Play features.
Peripheral Setup	Configures peripheral features.
Hardware Monitor Setup	Configures hardware monitor features.
Auto-Detect Hard Disks	Selecting these options allow the user to configure the drive named in the option. Select Auto-Detect Hard Disks to allow AMIBIOS to automatically configure the drive. A list of drive parameters that appears on the screen.
Change User Password	Change the user password.
Change Supervisor Password	Change the supervisor password.
Auto Configuration with Optimal Settings	Load configuration settings that ensure the highest performance.
Auto Configuration with Fail Safe Settings	Load fail-safe configuration settings.

Save Settings and Exit	Write the current settings to CMOS and exit.
Exit Without Saving	Exit without saving the current settings.

```
            AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52
            ©2001 American Megatrends, Inc. All Rights Reserved
                      NOVA-7830 V1.0 (02/11/2003)

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


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

Figure 1: The Main Menu

1.4   Standard CMOS Setup Selections

```
            AMIBIOS SETUP – STANDARD CMOS SETUP
            ©2001 American Megatrends, Inc.  All Rights Reserved


   Date (mm/dd/yyyy): Tue Mar 19, 2002          Base Memory: 639 KB
    Time (hh/mm/ss): 17:18:10                   Extd Memory: 247 MB


  Floppy Drive A: Not Installed
  Floppy Drive B: Not Installed
                                            LBA  Blk  PIO  32Bit
              Type      Size  Cyln Head WPcom Sec Mode Mode Mode Mode
  Pri Master: Auto                                          On
  Pri Slave: Auto                                           On
  Sec Master: Auto                                          On
  Sec Slave: Auto                                           On


  Boot Sector Virus Protection    Disabled


  Month:  Jan – Dec                    ESC: Exit      :Sel
  Day:   01 – 31                       PgUp/PgDn: Modify
  Year: 1980 – 2099                    F1: Help  F2/F3: Color
```

Figure 2: Standard CMOS Setup

Date (mm/dd/yyyy)
Set the system date.

Time (hh/mm/ss)
Set the system time.

Floppy A, B
Move the cursor to these fields and select the floppy type.

Primary/Secondary Master/Slave LBA Mode
LBA (Logical Block Addressing) is a new IDE HDD access method to develop to overcome the 528-megabyte capacity bottleneck. If your IDE hard disk capacity is greater than 528MB, AMIBIOS can enable this LBA mode feature. The option is only for Primary Master IDE LBA mode.

Primary/Secondary Master/Slave Block Mode
If your hard disk drive supports IDE block transfer mode, enable this option for a faster IDE hard disk drive transfer rate. The option is only for Primary Master Block mode.

Primary/Secondary Master/Slave PIO Mode
This option enables Primary Master IDE PIO mode on the IDE, which can set proper cycle timings. The cycle timing between the IDE PIO mode value and IDE cycle timing is shown below:
Mode 0 -> Timing (600ns)Mode 1 -> Timing (383ns)
Mode 2 -> Timing (240ns)Mode 3 -> Timing (180ns)
Mode 4 -> Timing (120ns)Mode 5 -> Timing (60ns)

Primary/Secondary Master/Slave 32Bit Mode
This option enables Primary Master IDE 32-bit data transfers on the IDE data port. If disabled, 16-bit data transfer is used by the BIOS.32-bit data transfers can only be enabled if IDE prefetch mode is also enabled.

Boot Sector Virus Protection
When this option is enabled, AMIBIOS issues a warning when any program or virus issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are Disabled, Enabled.

Base/Extd Memory
Displays the amount of conventional/extended memory detected during boot up.

1.5　Advanced CMOS Setup Selections

```
            AMIBIOS SETUP – ADVANCED CMOS SETUP
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 Quick Boot                 Enabled        Available Options:
 1st Boot Device            Disabled         Disabled
 2nt Boot Device            Disabled       > Enabled
 3rd Boot Device            Disabled
 Try Other Boot Devices     Yes
 LAN Boot ROM                Disabled
 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 Seek           Disabled
 PS/2 Mouse Support         Enabled
 System Keyboard            Present
 Primary Display            VGA/EGA
 Password Check             Setup
 Boot To OS/2               No
 Wait For 'F1' If Error       Enabled
 Hit 'DEL' Message Display     Enabled
 L1 Cache                   WriteBack
 L2 Cache                   WriteBack
 System BIOS Cacheabled      Disable
 C000 16K Shadow            Enabled
 C400 16K Shadow            Enabled
 C800 16K Shadow            Enabled       ESC: Exit      : Sel
 CC00 16K Shadow            Disabled      PgUp/PgDn: Modify
 D000 16K Shadow            Disabled      F1: Help F2/F3: Color
 D400 16K Shadow            Disabled
 D800 16K Shadow            Disabled
 DC00 16K Shadow            Disabled
```

Figure 3: Advanced CMOS Setup

Quick Boot
When Quick Boot is selected, DRAM testing function will be disabled.

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

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

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

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

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

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

S.M.A.R.T. for Hard Disks
Self-Monitoring, Analysis and Reporting Technology. This option can help the BIOS to warn the user of a possible device failure and give the user a chance to back up the device before the failure actually happens. The settings are Auto, Disabled, Enabled.

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

BootUp Num-Lock
When this option is selected, Num Lock is turned off when the system is powered on so the user can use the arrow keys on both the numeric keypad and the keyboard.

PS/2 Mouse Support
When this option is enabled, BIOS supports a PS/2- type mouse.

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

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

Password Check
This item allows you Setup/Always Password Check.

Boot To OS/2
Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the motherboard. The settings are Disabled or Enabled.

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

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

L1 Cache
The option includes: Disable/WriteThru/WriteBack the internal cache memory in the processor.

L2 Cache
The option includes: Disable/WriteThru/WriteBack the secondary cache memory.

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

C000, 16k Shadow
When this option is set to Enabled, the Video ROM area from C0000-C3FFF is copied (shadowed) to the RAM for faster execution.

Disabled: The contents of the video ROM are not copied to the RAM.
Cached: The contents of the video ROM area from C0000h - C3FFFh are copied from the ROM to the RAM and can be written to or read from the cache memory.
Enabled: The contents of the video ROM area from C0000h - C3FFFh are copied (shadowed) from the ROM to the RAM for faster execution.

C400, 16k Shadow
When this option is set to Enabled, the Video ROM area from C4000-C7FFF is copied (shadowed) to the RAM for faster execution.
Disabled: The contents of the video ROM are not copied to the RAM.
Cached: The contents of the video ROM area from C4000h-C7FFFh are copied from the ROM to the RAM and can be written to or read from the cache memory.
Enabled: The contents of the video ROM area from C4000h-C7FFFh are copied (shadowed) from the ROM to the 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.

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.

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.

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.

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.

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. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

1.6   Advanced Chipset Setup Selections

```
              AMIBIOS SETUP – ADVANCED CHIPSET SETUP
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Memory Hole                       Disabled        Available Options:
SDRAM Timing by SPD               Disabled        > Disabled
DRAM Refresh                      15.6uS          Enabled
DRAM Cycle time (SCLKs)           7/9
CAS# Latency (SCLKs)              3
RAS to CAS delay (SCLKs)          3
SDRAM RAS# Precharge (SCLKs)      3
Internal Graphics Mode Size       1MB
Display Cache Window Size         64MB
AGP Aperture Window               64MB
USB Function                      All USB Port
USB Device Legacy Support          Disabled
Port 64/60 Emulation               Disabled




                                                  ESC: Exit     : Sel
                                                  PgUp/PgDn: Modify
                                                  F1: Help F2/F3: Color
```

Figure 4: Advanced Chipset Setup

Memory Hold
This field allows you to reserve an address space for ISA devices that require it. Configuration options: [Disabled] and [15MB-16MB]

SDRAM Timing by SPD
This sets the optimal timings for items "DRAM Refresh", "DRAM Cycle time", "CAS# Latency", "RAS to CAS delay" and "SDRAM RAS# Precharge", depending on the memory modules that you are using.

DRAM Cycle time (SCLKs)
This feature controls the number of SDRAM clocks used for SDRAM parameters Tras and Trc. Tras specifies the minimum clocks required between active command and precharge command. Trc specifies the minimum clocks required between active command and re-active command.

CAS# Latency (SCLs)
This controls the latency between the SDRAM read command and the time that the data actually becomes available.

RAS to CAS delay (SCLKs)
This controls the latency between the SDRAM active command and the read/write command.

SDRAM RAS# Precharge (SCLKs)
This controls the idle clocks after issuing a precharge command to the SDRAM.

Display Cache Window Size
This feature allows you to select the size of mapped memory for Display Cache data.

AGP Aperture Window
This feature allows you to select the size of mapped memory for AGP graphic data.

USB Function
Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

USB Device Legacy Support
This motherboard support Universal Serial Bus (USB) devices. If detected, USB controller legacy mode will be enabled. If not detected, USB controller legacy mode will be disabled.

1.7   Power Management Setup Selections

```
                  AMIBIOS SETUP – POWER MANAGEMENT SETUP
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  ACPI Aware O/S                    No            Available Options:
  Sleep State                      S1/POS          > No
  USB KB/MS wakeup From S3         Disable           Yes
  Power Management/APM             Enabled
  Suspend Time Out                 Disabled
  Throttle Slow Clock Temperature  65  /149
  Throttle Slow Clock Ratio        50.0%
  Keyboard & PS/2 Mouse            Monitor
  FDC/LPT/COM Ports                Monitor
  SB & MSS Audio Ports             Ignore
  MIDI Ports                       Ignore
  ADLIB Ports                      Ignore
  Primary Master IDE               Monitor
  Primary Slave IDE                Ignore
  Secondary Master IDE             Monitor
  Secondary Slave IDE              Ignore
  System Thermal                   Ignore
  Power Button Function            ON/Off         ESC: Exit     : Sel
  Restore on AC/Power Loss         Last State     PgUp/PgDn: Modify
  Wake Up On Ring                  Disabled       F1: Help F2/F3: Color
  Wake Up On LAN                   Disabled
  Wake Up On PME                   Disabled
  Resume By Alarm                  Disabled
  Alarm Date                       15
  Alarm Hour                       12
  Alarm Minute                     30
  Alarm Second                     30
  Power Type Select                AT
```

Figure 5: Power Management Setup

ACPI Aware O/S
This feature is switch of ACPI function.

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

USB KB/MS Wakeup from S3
This option set to "Enabled", using USB keyboard or USB mouse can wake up system when system enters S3 mode.

Power Management/APM
Set this option to Enabled to run APM (Advanced Power Management).

Suspend Time Out
This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state.

Keyboard & PS/2 Mouse
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

FDC/LPT/COM Ports
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

SB & MSS Audio Ports
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

MIDI Ports
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

ADLIB Ports
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

Primary Master IDE
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

Primary Slave IDE
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

Secondary Master IDE
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

Secondary Slave IDE
Enabling the option allow the IRQ input to be monitored for both inactiving for entering Auot_mode/SMI_mode and activing for entering Normal_mode.

Power Button Function
This option specifies how the power button mounted externally on the computer chassis is used.

Wake Up On Ring
Ring Resume From Soft Off

Wake Up On LAN
LAN Resume From Soft Off

Wake Up On PME
PME# Resume From Soft Off

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

Alarm Date
You can set time for date.

Alarm Hour
You can set time for hour.

Alarm Minute
You can set time for minute.

Alarm Second
You can set time for second.

Power Type Select
Select you use power type.

1.8 PCI / Plug and Play Setup Selections

```
┌──────────────────────────────────────────────────────────────────────┐
│              AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP                 │
│            ©2001 American Megatrends, Inc.  All Rights Reserved        │
├──────────────────────────────────────────────────────────────────────┤
│                                                                        │
│  Plug and Play Aware O/S            No        │ Available Options:     │
│  Clear NVRAM on Every Boot          No        │   No                   │
│  On Board Audio Controller          Enabled   │ > Yes                  │
│  On Board IEEEE1394 Controller      Enabled   │                        │
│  On Board PCMCIA Controller         Enabled   │                        │
│  PCI Latency Timer (PCI Clocks)     64        │                        │
│  Primary Graphics Adapter           External PCI                       │
│  PCI VGA Palette Snooper            Disabled  │                        │
│  Allocate IRQ to PCI VGA            No        │                        │
│  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       │ ESC: Exit    : Sel      │
│  DMA Channel 3                      PnP       │ PgUp/PgDn: Modify       │
│  DMA Channel 5                      PnP       │ F1: Help F2/F3: Color   │
│  DMA Channel 6                      PnP       │                        │
│  DMA Channel 7                      PnP       │                        │
│  IRQ3                               PCI/PnP   │                        │
│  IRQ4                               PCI/PnP   │                        │
│  IRQ5                               PCI/PnP   │                        │
│  IRQ7                               PCI/PnP   │                        │
│  IRQ9                               PCI/PnP   │                        │
│  IRQ10                              PCI/PnP   │                        │
│  IRQ11                              PCI/PnP   │                        │
│  IRQ14                              PCI/PnP   │                        │
│  IRQ15                              PCI/PnP   │                        │
│                                                                        │
└──────────────────────────────────────────────────────────────────────┘
```

Figure 6: 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. When disabled, BIOS will configure all devices.

Clear NVRAM on Every Boot
When this option is set to Yes, system can auto clear NVRAM.

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

PCI VGA Palette Snoop
If enable, PCI will allow VGA palette signals to go to the ISA bus.

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 Slot1/2/3/4 IRQ Priority
The option specifies the IRQ priority for PCI device installed in the PCI expansion slot. The settings are Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

DMA Channel 0/1/3/5/6/7
The option allows you to specify the bus type used by each DMA channel. The settings are PnP or ISA/EISA.

IRQ3/4/5/7/9/10/11/14/15
The option specifies the bus that the specified IRQ line is used on. The option allows 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.

1.9 Peripheral Setup Selections

```
┌─────────────────────────────────────────────────────────────────────┐
│                  AMIBIOS SETUP – PERIPHERAL SETUP                     │
│            ©2001 American Megatrends, Inc.  All Rights Reserved       │
╞═════════════════════════════════════════════╤═══════════════════════╡
│  OnBoard Serial PortC        3E8/COM3        │  Available Options:   │
│  Serial Port C IRQ           11              │    Disabled           │
│  OnBoard Serial PortD        2E8/COM4        │    3F8/COM1           │
│  Serial Port D IRQ           10              │  2F8/COM2             │
│  OnBoard FDC                  Enabled        │   > 3E8/COM3          │
│  OnBoard Serial PortA        3F8/COM1        │  2E8/COM4             │
│  OnBoard Serial PortB        2F8/COM2        │                       │
│  Serial PortB Mode           Normal          │                       │
│  IR Duplex Mode              Half Duplex     │                       │
│  IR Pin Select               IRRX/IRIX       │                       │
│  OnBoard Parallel Port       378             │                       │
│  Paralled Port Mode          Normal          │                       │
│  EPP Version                 N/A             │                       │
│  Parallel Port IRQ            3              │                       │
│  Parallel Port DMA Channel    N/A            │                       │
│  On-Chip IDE                 Both            │                       │
│                                              │                       │
│                                              │  ESC: Exit     : Sel  │
│                                              │  PgUp/PgDn: Modify    │
│                                              │  F1: Help F2/F3: Color│
└─────────────────────────────────────────────┴───────────────────────┘
```

Figure 7: Peripheral Setup

OnBoard FDC
Set this option to Enabled to enable the floppy drive controller on the
motherboard. The settings are Auto (AMIBIOS automatically determines if the
floppy controller should be enabled), Enabled, or Disabled.

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

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

Parallel Port Mode
This option specifies the parallel port mode.
The settings are Normal, Bi-Dir, EPP, and 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 Extended
Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data
transfer rates up to 2.5 Megabits per second. ECP provides symmetric bi-
directional communication.

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

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

On-Chip IDE
This option specifies the IDE channel used by the onboard IDE controller
The settings are Disabled, Primary, and Secondary.

1.10 Hardware Monitor Setup Selections

```
┌─────────────────────────────────────────────────────────────┐
│           AMIBIOS SETUP – HARDWARE MONITOR SETUP            │
│        ©2001 American Megatrends, Inc.  All Rights Reserved │
├─────────────────────────────────┬───────────────────────────┤
│                                 │                           │
│   CPU Temperature     31°C/87°F │                           │
│   System Temperature  29°C/84°F │                           │
│   CPU Fan Speed        6300 RPM │                           │
│   Chassis Fan Speed    0 RPM    │                           │
│   Vcore               1.399 V   │                           │
│   Vtt                 1.501 V   │                           │
│   + 3.3V              3.349 V   │                           │
│   + 5.0V              5.070 V   │                           │
│   +12.0V              12.046 V  │                           │
│   +5V SB              4.978 V   │                           │
│                                 │                           │
│                                 │                           │
│                                 │                           │
│                                 │                           │
│                                 │ ESC: Exit      : Sel      │
│                                 │ PgUp/PgDn: Modify         │
│                                 │ F1: Help  F2/F3: Color    │
└─────────────────────────────────┴───────────────────────────┘
```

Figure 8: Hardware Monitor Setup

This setup helps users monitor the NOVA-7830 board on board system voltage and fan speed. The function is implemented by on board W83627HF chip. The voltage monitoring will cover Vcore, Vtt, +3.3V, SB5V, +5V and +12V. And there is one fan connector for CPU fan.

Appendix A Watchdog 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) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function: AL– 2: Set the Watchdog Timer's period BL: Time-out value (the time unit-second, is dependent on the item "Watchdog Timer unit (selected in BIOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. When the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the Watchdog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

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.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H              ;setting the time-out value
        MOV     BL, 30                  ;time-out value is 48 seconds
        INT     15H
;
; ADD YOUR APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1             ;is your application over?
        JNE     W_LOOP                 ;No, restart your application

        MOV     AX, 6F02H              ;disable Watchdog Timer
        MOV     BL, 0                   ;
        INT     15H
;
; EXIT
```

Appendix B Digital I/O

One of the characteristics 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 is why we design 4-bit digital inputs and 4-bit digital outputs on NOVA-7830.

Digital Input and Output are control signals in general. You can use these signals to control external devices that needs On/Off circuit or TTL devices. You can read or write data to the selected address to enable the function of digital IO.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function:
AL–8: Set the Digital port is 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 is 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 C Address Mapping

IO Address Map

I/O address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
02E-02F	Super I/O
040-05F	8254 timer
04E-04F	Super I/O
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F2	Core logic programming configuration
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
295-296	Hardware Monitor
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-C7FFF	VGA BIOS
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

IRQ Mapping Table

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

DMA Channel Assignments

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

Appendix D How to Use Wake-up Function

NOVA-7830 provides two kinds of wake-up function: modem wake-up and LAN wake-up function. Wake-up function is working while you use ATX power supply.

Wake-up By Ring:
You must set the option *Power On By Ring* of CMOS SETUP to be enabled. The 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 your computer by sending ID to it.

ID: ID is the 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 E How to Use VIDEO-IN Function

NOVA-7830 provides users to capture live video from video source such as the CCTV camera. NOVA-7830 has four video input channels for surveillance systems.

Driver Installation:

Taking the advantage of IEI driver installation program makes the driver installation an easy job.

Steps:
1.   Insert the IEI Driver CD (4).
2.   The window will display the menu of IEI Driver CD. Click "IVC Series".
3.   Click "IVC-100/100G/200/200G".
4.   Double click the "Windows" folder.
5.   Double click " ieisetup.exe".

Microsoft Direct X 8.1 or above is need. The setup program (ieisetup.exe) will prompt you to install Direct X8.1 after the driver installation has been completed. Therefore, IEI strongly recommend you to use ieisetup.exe for driver installation.

Demo Programs:

1.   Double click "Demo" folder.
2.   Double click "ivc-100.exe".

Connection:

Cable 1: Dupont Head 8Pin, to CPU board.
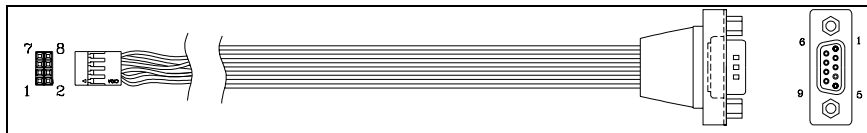
Dupont Head 8-Pin   D-SUB 9-Pin
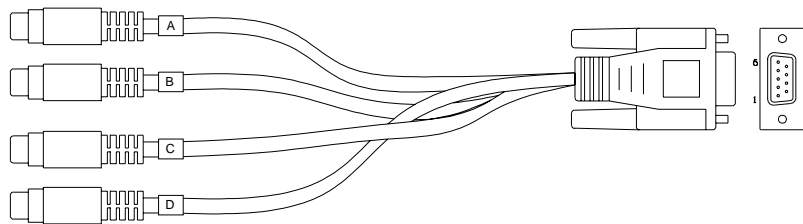
Pin Definition:

Dupont Head 8-Pin

PIN	Description	PIN	Description
1	AVIN0	2	GROUND
3	AVIN1	4	GROUND
5	AVIN2	6	GROUND
7	AVIN3	8	GROUND

D-SUB 9-Pin (for both cable 1 and cable 2)

PIN	Description	PIN	Description
1	AVIN0	2	AVIN1
3	AVIN2	4	AVIN3
5	N.C.	6	GROUND
7	GROUND	8	GROUND
9	GROUND		

Cable 2: D-SUB 9-Pin, connected to cable 1.
RCA connectors are used to connect with video-in source.

RCA connector   D-SUB 9-Pin

Appendix F How to Use LCD-TYPE Function

NOVA-7830 provides four kinds of LCD-TYPE Function. This page describes how to use LCD-TYPE function.

LCD-TYPE function Procedure:

1. Go to the DOS command prompt in MS-DOS or Windows 9x.
2. At the DOS command prompt, type "LCD_Prg".
3. Set 1, 2, 3, and 4 from LCD Type.

ICP Electronic Inc. LCD Module Flash Utility
640x480 18 bits 800x600 18 bits 1024x768 18 bits 1024x768 36 bits
[M] Menu [1-4] LCD Type [ESC] Exit

4. Reboot the system