

NOVA-7820
VIA[®] C3 Processor CPU Embedded
Board
with 10/100Mbps Ethernet, VGA,
Audio, Version 1.0

User Manual

Version 1.2

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Table of Contents

| | |
|---|-----------|
| 1. INTRODUCTION | 4 |
| 1.1 SPECIFICATIONS | 4 |
| 1.2 PACKAGE CONTENTS | 5 |
| 2. INSTALLATION | 6 |
| 2.1 NOVA-7820 LAYOUT | 6 |
| 2.2 CLEAR CMOS SETUP | 8 |
| 2.3 COMPACT FLASH SETTING | 8 |
| 2.4 AUDIO AMPLIFIER SELECT | 8 |
| 2.5 LCD PANEL SHIFT CLOCK/PANEL VCC SELECT | 9 |
| 2.6 COM PORT RI AND VOLTAGE SELECTION | 9 |
| 2.7 COM4 RS232/RS422(485) SELECTION | 10 |
| 3. CONNECTION | 11 |
| 3.1 FLOPPY DISK DRIVE CONNECTOR | 12 |
| 3.2 VIDEO-IN CONNECTOR | 12 |
| 3.3 ULTRA ATA33/66/100 IDE DISK DRIVE CONNECTOR | 13 |
| 3.4 PARALLEL PORT | 13 |
| 3.5 USB PORT CONNECTOR | 14 |
| 3.6 SERIAL PORTS | 14 |
| 3.7 POWER CONNECTOR | 15 |
| 3.8 KEYBOARD CONNECTOR | 16 |
| 3.9 IRDA INFRARED INTERFACE PORT | 16 |
| 3.10 FAN CONNECTOR | 16 |
| 3.11 AUDIO CONNECTORS | 17 |
| 3.12 VGA CONNECTOR | 17 |
| 3.13 LAN RJ45 CONNECTOR | 18 |
| 3.14 COMPACT FLASH CONNECTOR-TYPE II | 18 |
| 3.15 EXTERNAL SWITCHES AND INDICATORS | 19 |
| 3.16 IEEE-1394 CONNECTOR | 19 |
| 3.17 CARDBUS/PCMCIA CONNECTOR | 20 |
| 3.18 DIGITAL I/O | 21 |
| 3.19 LCD PANEL CONNECTOR | 22 |
| 4. AMI BIOS SETUP | 23 |
| 4.1 INTRODUCTION | 23 |
| 4.2 STARTING SETUP | 23 |
| 4.3 SETUP SUMMARY | 23 |
| 4.4 STANDARD CMOS SETUP SELECTIONS | 25 |
| 4.5 ADVANCED CMOS SETUP SELECTIONS | 26 |
| 4.6 ADVANCED CHIPSET SETUP SELECTIONS | 31 |
| 4.7 POWER MANAGEMENT SETUP SELECTIONS | 33 |
| 4.8 PCI / PLUG AND PLAY SETUP SELECTIONS | 35 |
| 4.9 PERIPHERAL SETUP SELECTIONS | 37 |
| 4.10 HARDWARE MONITOR SETUP SELECTIONS | 39 |
| APPENDIX A WATCHDOG TIMER | 40 |
| APPENDIX B DIGITAL I/O | 41 |
| APPENDIX C. ADDRESS MAPPING | 42 |
| APPENDIX D. HOW TO USE WAKE-UP FUNCTION | 44 |
| APPENDIX E. HOW TO USE VIDEO-IN FUNCTION | 45 |

1. Introduction

Thank you for choosing NOVA-7820 VIA® C3 Processor CPU with Multimedia & LAN Ethernet Embedded Little Board, which comes equipped with Low power VIA® C3 Processor CPU 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.

NOVA-7820 provides on-chip VGA which provides up to 1600 x 1200 resolution. LCD which provides up to 1024 x 768 resolution.

An advanced high performance super I/O chip – W83627 and NS87366 is used in the NOVA-7820 board. Which provide four UARTs are compatible with the NS16C550. The parallel port and FDD interface are compatible with IBM PC/AT architecture's.

The NOVA-7820 has one Fast Ethernet Multifunction PCI Controller as a LAN controller, Which are fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

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

For multimedia application, NOVA-7820 provides many function, such as 1394 ,5.1 channel Audio and video in.

1.1 Specifications

- CPU: VIA® C3 Processor CPU
- 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 115 Kbps in speed. And 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 when time out.
- VGA Controller: Embedded VGA controller. Screen Resolution: up to 1600 x 1200 in 256 Colors at 85 Hz Refresh.

- LCD Controller: Onboard SP1015 LCD controller. Screen Resolution: up to 1024 x 768 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/3.0A and 12V/0.22A, as running by VIA Eden ESP 4000(400MHz) and 256MB SDRAM.
- Operating Temperature: 0 °C ~ 60 °C (CPU needs heatsink)

1.2 Package Contents

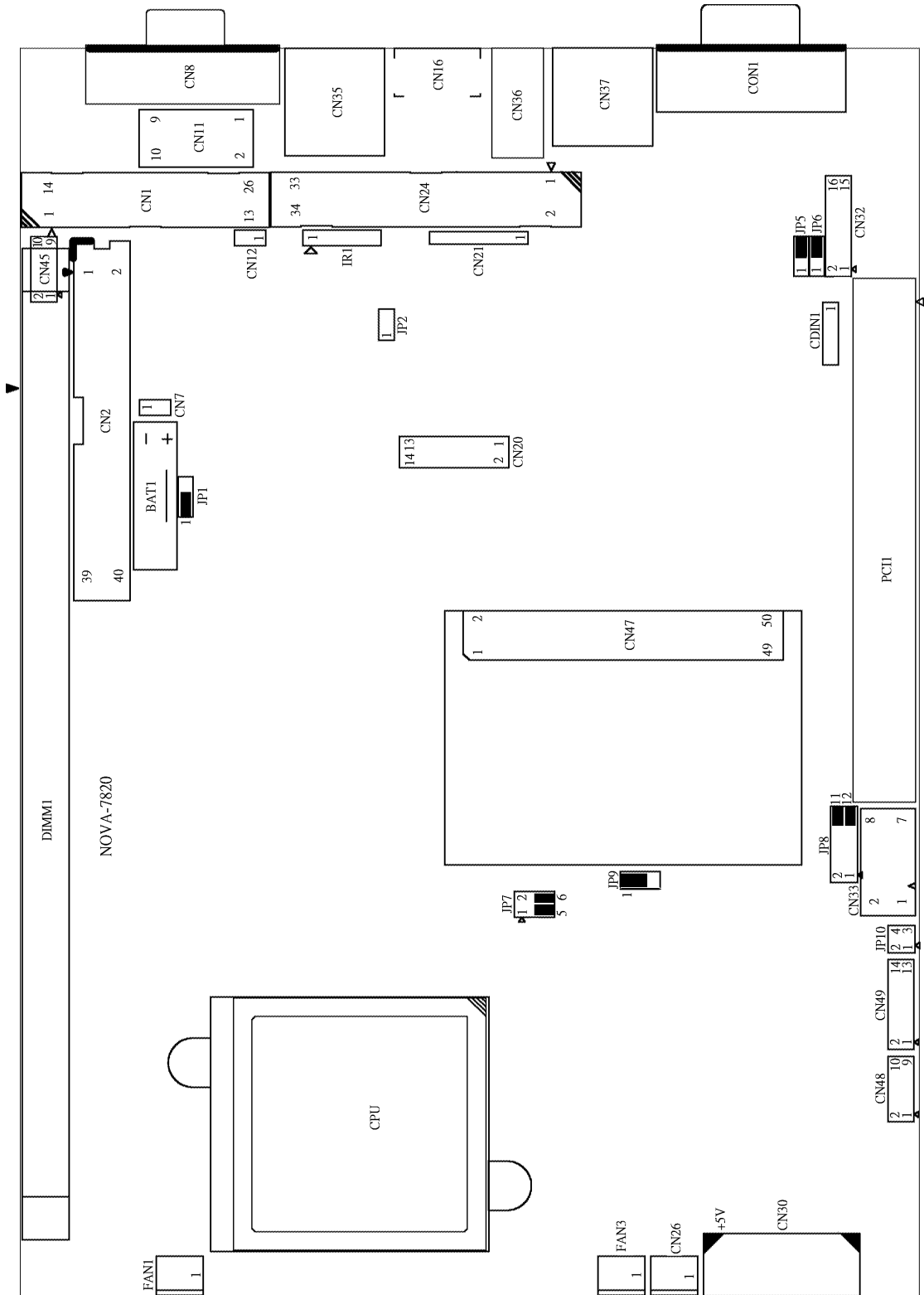
In addition to this User Manual, NOVA-7820 package includes the following items:

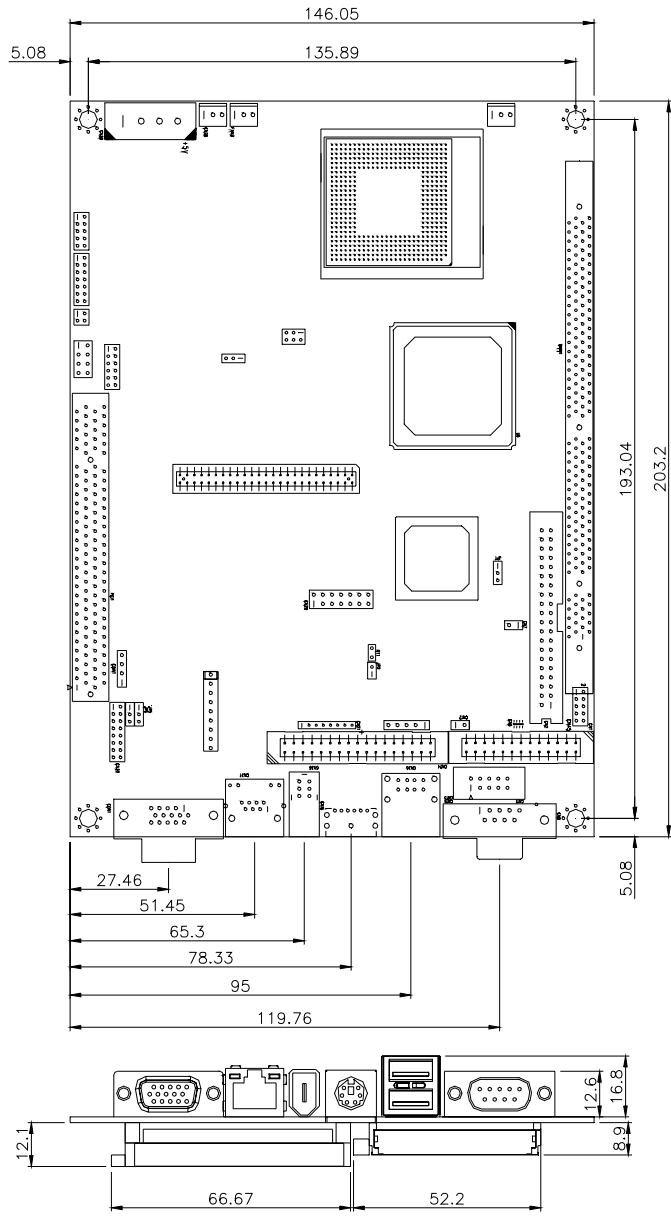
- NOVA-7820 Mobile CPU bases Single board computer x 1
- FDD cable x 1
- HDD cable x 1
- Keyboard / Mouse adapter Y cable
- Two RS-232 serial ports and RS-232/422/485 serial port cable x 1
- Printer port cable x 1
- AUDIO ports cable x 1
- 4-channel composite video cable x 2
- IEEE-1394 cable x 1

2. Installation

Follow the instructions of installing NOVA-7820. Read the unpacking information carefully before installation.

2.1 NOVA-7820 Layout





2.2 Clear CMOS Setup

CMOS RAM holds the configuration data of NOVA-7820, 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 to normal mode.

- **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 | +5V |
| 4-6 | +3.3V |

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**

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

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the NOVA-7820 board. The following table lists the connectors on NOVA-7820.

| 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 |

3.1 Floppy Disk Drive Connector

NOVA-7820 board is 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# |

3.2 Video-in Connector

NOVA-7820 is equipped with 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 |

3.3 Ultra ATA33/66/100 IDE Disk Drive Connector

You can attach one IDE (Integrated Device Electronics) hard disk drives to the NOVA-7820 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 |

3.4 Parallel Port

This port is usually connected to a printer. NOVA-7820 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 |

3.5 USB Port Connector

NOVA-7820 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 |

3.6 Serial Ports

NOVA-7820 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) |

3.7 Power Connector

NOVA-7820 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 |

3.8 Keyboard Connector

NOVA-7820 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 |

3.9 IrDA Infrared Interface Port

NOVA-7820 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. To use the IrDA port, set SIR or ASKIR model in COM 2 of BIOS Peripheral Setup. Then the normal RS-232 COM 2 will be disabled.

- **IR1: IrDA Connector**

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

3.10 Fan Connector

NOVA-7820 provides CPU cooling fan connector and system fan connector. CPU connectors can supply 12V/500mA. The Fan's rotation is in full speed.

- **FAN1, FAN3: Fan Connector**

| PIN | Description |
|------------|--------------------|
| 1 | SENSOR |
| 2 | 12V |
| 3 | GROUND |

3.11 Audio Connectors

NOVA-7820 has a built-in AUDIO chipset (CMEDIA CMI8738LX); connector directly connects to the pin-header (CN32). The audio chipset can support 5.1 channel sounds that include LINE-OUT, 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 |

3.12 VGA Connector

NOVA-7820 has a 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 | | |

3.13 LAN RJ45 Connector

NOVA-7820 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 following:

- **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 |

3.14 Compact Flash Connector-TYPE II

NOVA-7820 supports one Compact Flash socket that be provided from IDE2. You must set the jumper to avoid the conflict.

- **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 |

3.15 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 connectors.

- **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 - |

3.16 IEEE-1394 Connector

NOVA-7820 is equipped with IEEE1394 controller (TI TSB43AA22). You can connect it to your 1394 device through CN21, 36 connectors. 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+ |

3.17 CardBus/PCMCIA Connector

NOVA-7820 built-in a 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 |

3.18 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 NOVA-7820.

Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. We provide "BIOS Call" for DIO 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 |

3.19 LCD Panel Connector

NOVA-7820 provides a 2 x 25-pin connector for the LCD flat panel interface. NOVA-7820 supports TFT LCD panels at following display options:

| Video Display Type | Resolution | Example |
|--------------------|---------------------|--------------------|
| TFT VGA | 640 x 480, 18 bits | Toshiba LTM10C209H |
| TFT SVGA | 800 x 600, 18 bits | Toshiba LTM12C275C |
| TFT XVGA | 1024 x 768, 18 bits | L.G LM151X2 |

Note that the table is for reference only. The LCD panel connector of NOVA-7820 may support more panel types.

- **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 |

4. AMI BIOS Setup

4.1 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.

4.2 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: By pressing immediately after switching the system on, or by pressing the 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.

4.3 Setup Summary

- **Standard CMOS Setup:**
Standard CMOS Setup to change time, date, hard disk type, etc.
- **Advanced CMOS Setup:**
Advanced CMOS Setup to configure system options.
- **Advanced Chipset Setup:**
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 will appear 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 fails-safe configuration settings.
- **Save Settings and Exit:**
Write the current settings to CMOS and exit.
- **Exit Without Saving:**
Exit without saving the current settings.

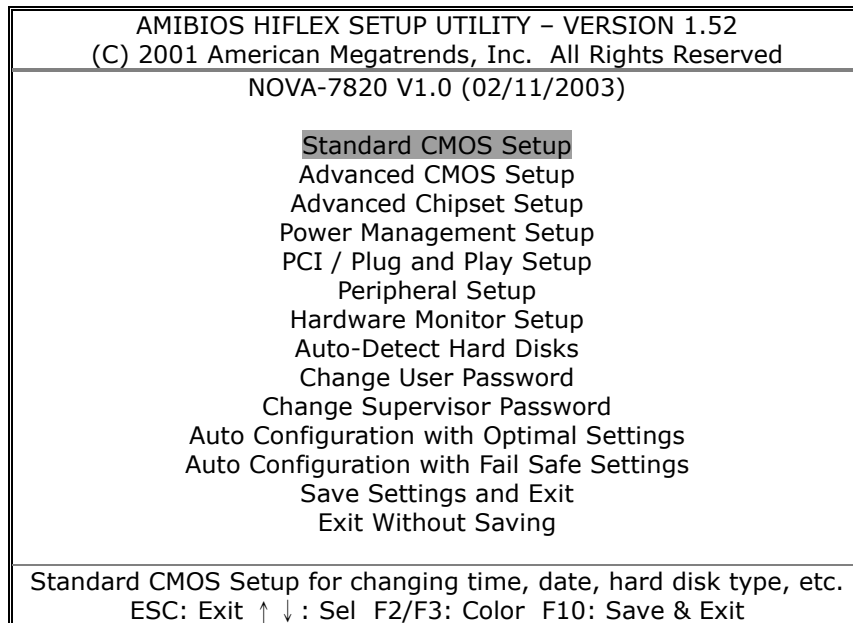


Figure 1: Main Menu

4.4 Standard CMOS Setup Selections

| AMIBIOS SETUP – STANDARD CMOS SETUP | |
|--|--|
| (C) 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, or Enabled.
- **Base/Extd Memory**
Displays the amount of conventional/extended memory detected during boot up.

4.5 Advanced CMOS Setup Selections

| AMIBIOS SETUP - ADVANCED CMOS SETUP (C) 2001 American Megatrends, Inc. All Rights Reserved | | |
|---|------------|---|
| Quick Boot | Enabled | Available Options: Disabled > Enabled |
| 1st Boot Device | Disabled | |
| 2nd Boot Device | Disabled | |
| 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 Cacheable | Disable | |
| C000 16K Shadow | Enabled | |
| C400 16K Shadow | Enabled | |
| C800 16K Shadow | Enabled | |
| CC00 16K Shadow | Disabled | ESC: Exit ↑ ↓ : Sel PgUp/PgDn: Modify F1: Help F2/F3: Color |
| D000 16K Shadow | Disabled | |
| 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 if you want to run Setup" from appearing when the system boots. The settings are Disabled or Enabled.
- **L1 Cache**
The options include Disable/WriteThru/WriteBack the internal cache memory in the processor.
- **L2 Cache**
The options include 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 Enabled, Disabled, and 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 Enabled, Disabled, and 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 Enabled, Disabled, and 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.

4.6 Advanced Chipset Setup Selections

| AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C) 2001 American Megatrends, Inc. All Rights Reserved | | |
|--|--------------|---|
| Memory Hole | Disabled | Available Options: > Disabled Enabled |
| SDRAM Timing by SPD | Disabled | |
| DRAM Refresh | 15.6uS | |
| 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 | |
| | | |

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] [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.

4.7 Power Management Setup Selections

| AMIBIOS SETUP – POWER MANAGEMENT SETUP (C) 2001 American Megatrends, Inc. All Rights Reserved | | |
|--|------------|-----------------------------------|
| ACPI Aware O/S | No | Available Options: > No Yes |
| Sleep State | S1/POS | |
| USB KB/MS wakeup From S3 | Disable | |
| Power Management/APM | Enabled | |
| Suspend Time Out | Disabled | |
| Throttle Slow Clock Temperature | 65°C/149°F | |
| 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 entry to 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 allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal mode.

- **FDC/LPT/COM Ports**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **SB & MSS Audio Ports**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **MIDI Ports**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **ADLIB Ports**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **Primary Master IDE**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **Primary Slave IDE**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **Secondary Master IDE**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.
- **Secondary Slave IDE**
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating 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.

4.8 PCI / Plug and Play Setup Selections

| AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C)2001 American Megatrends, Inc. All Rights Reserved | | |
|--|--------------|---|
| Plug and Play Aware O/S | No | Available Options: No > Yes |
| Clear NVRAM on Every Boot | No | |
| On Board Audio Controller | Enabled | |
| On Board IEEE1394 Controller | Enabled | |
| On Board PCMCIA Controller | Enabled | |
| PCI Latency Timer (PCI Clocks) | 64 | |
| Primary Graphics Adapter | External PCI | |
| PCI VGA Palette Snoop er | 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 | ESC: Exit ↑ ↓ : Sel PgUp/PgDn: Modify F1: Help F2/F3: Color |
| DMA Channel 1 | PnP | |
| DMA Channel 3 | PnP | |
| DMA Channel 5 | PnP | |
| 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. If 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.

4.9 Peripheral Setup Selections

| AMIBIOS SETUP – PERIPHERAL SETUP | | |
|--|-------------|--|
| (C) 2001 American Megatrends, Inc. All Rights Reserved | | |
| OnBoard Serial PortC | 3E8/COM3 | Available Options: Disabled 3F8/COM1 2F8/COM2 > 3E8/COM3 2E8/COM4 |
| Serial Port C IRQ | 11 | |
| OnBoard Serial PortD | 2E8/COM4 | |
| Serial Port D IRQ | 10 | |
| OnBoard FDC | Enabled | |
| OnBoard Serial PortA | 3F8/COM1 | |
| 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 | |
| | | |

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 PortA/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, or 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.

4.10 Hardware Monitor Setup Selections

| AMIBIOS SETUP – HARDWARE MONITOR SETUP | |
|--|-----------|
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| 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 NOVA-7820 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

Watchdog Timer is a device to ensure that standalone systems can always recover from catastrophic conditions that cause CPU crash which may be caused by external EMI or a software bug. When the CPU stops working normally, hardware on the board will issue a time-out signal.

A BIOS function call (INT 15H) is used to control 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, Watchdog Timer will start counting down. When the timer value reaches zero, the system will reset. To ensure reset condition does not occur, 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 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 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-7820.

Digital Input and Output, generally, are control signals. 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 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-FFFFFF | 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-7820 provides two kind of Wake up Function. This page describes how to use 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.

The format of ID is xxxxxxxxxxxx

Example ID: 009027388320

Appendix E. How to Use Video-in Function

NOVA-7820 provides users to capture live video from video source such as the CCTV camera. NOVA-7820 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".

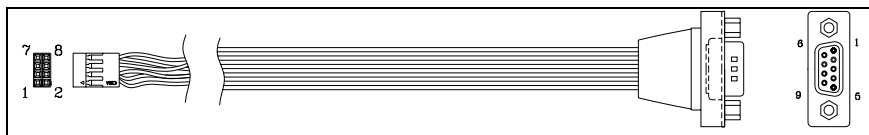
Microsoft Direct X 8.1 or above is need. The setup program (ieisetup.exe) will prompt you to install Direct X 8.1 after the driver installation has been completed. Therefore, IEI strongly recommends you to use ieisetup.exe for driver installation.

Demo Programs:

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

Connection:

Connect cable 1: Dupont Head 8-pin, to CPU board.



Dupont Head 8-pin

D-SUB 9-pin

Pin Definition:

Dupont Head 8-pin

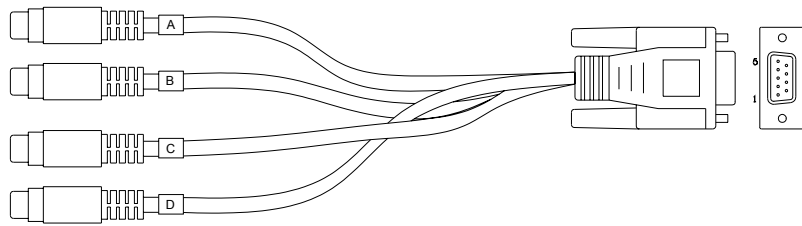
| PIN | Description | PIN | Description |
|-----|-------------|-----|-------------|
| 1 | AVIN0 | 2 | GROUND |
| 3 | AVIN1 | 4 | GROUND |
| 5 | AVIN2 | 6 | GROUND |
| 7 | AVIN3 | 8 | GROUND |

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