# NuPRO-796

ETX PICMG 1.0
Half-Size SBC
**User's Manual**


**Manual Rev.** 2.00

**Revision Date:** August 20, 2006

**Part No:** 50-13051-1000


Recycled Paper


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| Please give a detailed description of the problem(s): |
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# Table of Contents


**1 Introduction ..... 1**
- 1.1 Product Overview ..... 1
- 1.2 Unpacking Checklist ..... 1
- 1.3 Specifications ..... 2
  - Display (CRT + LVDS) ..... 3
  - Multi I/O ..... 3
  - Audio ..... 3
  - LAN ..... 4
  - Mechanical and Environmental ..... 4
- 1.4 NuPRO-796 Functional Diagram ..... 5
- 1.5 NuPRO-796 Mechanical Diagram ..... 6

**2 Connectors and Jumpers ..... 7**
- 2.1 Connector Pin Assignments ..... 7
  - VGA Connector (CN10) ..... 8
  - USB Connector (CN17, CN22) ..... 8
  - Keyboard and Mouse (CN11) ..... 8
  - COM Pin Header (CN15, CN16) ..... 9
  - Parallel Port (CN1) ..... 9
  - IDE (CN4) ..... 10
  - USB Pin Header (CN24) ..... 11
  - Serial ATA Connector (CN5, CN7, CN9, CN14) ..... 11
  - LDVS Connector (CN19) ..... 12
  - Miscellaneous Connector (CN18) ..... 13
  - Fan Connector (CN20) ..... 13
  - Audio-Out Pin Header (CN26) ..... 13
  - ATX Power Connector (CN29) ..... 14
  - ETX Connector ..... 14
  - ETX X1 Connector (PCI Bus, USB, Audio) ..... 15
  - ETX X2 Connector (ISA Bus) ..... 16
  - ETX X3 Connector (Video, COM, misc. I/O) ..... 17
  - ETX X4 Connector (Ethernet, IDE, Power, I2C & SMB) 18
- 2.2 Jumper Settings ..... 19
  - Panel Power Selection (JP3) ..... 19

**3 System Resources ..... 21**
- 3.1 System Memory Map ..... 21
- 3.2 Direct Memory Access Channels ..... 21


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3.3 I/O Map ..... 22
3.4 Interrupt Request (IRQ) Lines ..... 23
3.5 PCI Configuration Space Map ..... 24
3.6 PCI Interrupt Routing Map ..... 24
3.7 System Management Bus and I2C Bus ..... 24

**4 Phoenix Award BIOS ..... 25**
4.1 Description ..... 25
4.2 Main Menu ..... 26
4.3 Standard CMOS Features ..... 27
4.4 Advanced BIOS Features ..... 31
CPU Internal Cache ..... 31
Quick Power On Self Test ..... 31
First/Second/Third Boot Device ..... 32
Boot Other Device ..... 32
Boot Up NumLock Status ..... 32
Gate A20 Option ..... 32
Typematic Rate Setting ..... 33
Typematic Rate (Chars/Sec) ..... 33
Typematic Delay (Msec) ..... 33
Security Option ..... 33
OS Select For DRAM > 64MB ..... 33
Console Redirection ..... 34
Baudrate ..... 34
Agent Connect via ..... 34
Agent wait time(min) ..... 34
Agent after boot ..... 34
Summary Screen Show ..... 34
Console Redirection ..... 34
Baud Rate ..... 34
Agent Connect via ..... 35
Agent Wait Time(min) ..... 35
Agent after boot ..... 35
Summary Screen Show ..... 35
4.5 Advanced Chipset Features ..... 36
Video Memory Size ..... 36
Flat Panel Configuration ..... 36
Onboard Audio ..... 37
4.6 Integrated Peripherals ..... 38
OnChip IDE Channel 0/1 ..... 38

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Master/Slave PIO ..... 38
IDE Primary Master/Slave UDMA ..... 39
IDE HDD Block Mode ..... 39
Onboard Serial Port 1 & 2 ..... 39
UART Mode Select ..... 39
LPT1 Setting / FDD ..... 39
ECP Mode Use DMA ..... 39
4.7 PnP/PCI Configurations ..... 40
Init Display First ..... 40
Reset Configuration Data ..... 40
Resource Controlled By ..... 41
IRQ Resources ..... 41
DMA Resources ..... 42
Memory Resources ..... 43
PCI VGA Palette Snoop ..... 43
4.8 PC Health Status ..... 44
Current System Temp. ..... 44
Current CPU1 Temp. ..... 44
Vcore, VCC, VBAT, 3.3 VSB, 2.5 V and 5V ..... 44
4.9 BIOS POST Messages ..... 45
POST Beep ..... 45
Error Messages ..... 45
4.10 BIOS POST Codes ..... 48
Normal POST Codes ..... 48

**5 Watchdog Timer ..... 57**

**6 Appendix ..... 61**
6.1 Onboard DIP switch ..... 61
Location & Function ..... 61
Onboard CF Card setting ..... 61
Flat Panel / CRT settings ..... 62

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# List of Figures

Figure 1-1: NuPRO-796 Block Diagram ..... 5
Figure 1-2: NuPRO-796 Carrier Board Layout ..... 6

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# 1 Introduction

## 1.1 Product Overview

The NuPRO-796 ETX-based single board computer is comprised of the ProCB-796, a PICMG 1.0 compliant half-size carrier board, and the ETX-GX2 ETX module.

The ProCB-796 carrier board includes common PC peripheral I/O interfaces such as serial and parallel ports, keyboard/mouse, Ethernet, IDE, VGA, and audio. It also includes an integrated debug port, SATA controller with RAID, hardware monitor, GPIO, and audio power amplifier and is expandable via the PCI bus.

The ETX-GX2 core module consists of an AMD Geode™ GX533@1.1W processor and AMD Geode™ CS5535 companion device.

The NuPRO-796 supports DDR based SODIMM's, ensuring long term availability and stable pricing for SODIMM parts in projects that will have a long production life, when compared to SDRAM-based SODIMMS. Memory can be soldered on board as 128MB, and/or can be inserted in the onboard 200-pin SODIMM socket that accept up to 512MB DDR SODIMMs.

The NuPRO-796 also includes an integrated 10/100Base-T Ethernet port, a watchdog timer, and support for LVDS based flat panel displays.

## 1.2 Unpacking Checklist

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the dealer for a replacement. Retain the shipping carton and packing materials for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

Check the following items are included in the package, if there are any items missing, please contact your dealer:

| Included Items |
|---|
| All-In-One Driver CD |

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| Included Items |
|---|
| NuPRO-796 carrier board with ETX-GX2 module |
| This user manual |
| Printer and COM port cable bracket |
| ATA-100 cable (x1) |
| SATA cable kit (x2) |

Note: The packaging of the NuPRO-796 OEM version with non-standard configuration, functionality, or package may vary according to different configuration requests.

CAUTION: The NuPRO-796 SBC must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a grounded wrist strap when servicing.

## 1.3 Specifications

- **Embedded Processor**: AMD Geode™ GX 533 @ 1.1W soldered onboard.
- **Carrier Board**: ProCB-796
- **Chipset**: Geode CS5535 companion device
- **Memory**: 128MB of soldered onboard DDR266 memory and one 200-pin socket for additional, up to 512 MB DDR266 SODIMM
- **Cache**: 32Kbyte L1 cache (16K instruction and 16K data)
- **Enhanced IDE**: one port for up to 2 ATAPI devices, supports PIO Mode 4 and ATA-5 Ultra DMA66
- **BIOS**: AWARD 2 Mb Flash BIOS with ACPI and APM 1.2 power management with console redirection and CMOS backup in onboard EEPROM
- **Serial ATA**: onboard Silicon Image SiI3114 supports 4-channel SATA-150 hard drivers with RAID 0, RAID 1 & RAID 0+1

**Warning**: The SATA interface of NuPRO-796 is used for only storage application but not Boot-Up device due to the specification limitation of SATA controller SiI3114. An

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IDE hard drive is required for installation of operation system!

- **Hardware Monitor**: integrated in SMSC SCH3112 monitors supply voltages and CPU temperature
- **Watchdog Timer**: 255-level timer generates RESET
- **Expansion**: 16-bit ISA and 32-bit PCI 2.1

### 1.3.1 Display (CRT + LVDS)

- **Chipset**: Integrated AMD Geode™ GX graphics.
- **Memory**: up to 16 MB UMA Video RAM
- **CRT**: High-resolution video controller supports resolutions up to
  - -1600 x 1200 x 16 @ 85Hz
  - -1280 x 1024 x 24 @ 85Hz
- **LVDS**: 18-bit TFT supports resolutions up to
  - -1280 x 1024 x 24 @ 60Hz

### 1.3.2 Multi I/O

- **Chipset**: SMSC SCH3112
- **Serial**: 2 high speed RS-232C
  - COM1 - 16550 UART: up to 115Kbits/sec
  - COM2 - 16550 UART: up to 115Kbits/sec
- **Parallel** : SPP, EPP and ECP mode
- **USB**: supports 4 ports ver 1.1
- **Keyboard & Mouse**: one PS/2 keyboard and one PS/2 mouse

### 1.3.3 Audio

- **Chipset**: included in CS5535
- **Audio Codec**: Realtek ALC203
  - 20-bit DAC and 18-bit ADC full-duplex AC'97 v2.3

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### 1.3.4 LAN

- **Chipset**: Intel® 82551ER
- **Interface**: 10BASE-T/ 100BASE-TX with TCP/UDP/IP checksum offloading

### 1.3.5 Mechanical and Environmental

- **Power Requirement**: (+5V only) : 4 Watt typical with GX533 and 128 MB soldered DDR266
- **Operating Temperature**: 0 to 60°C (32 to 140°F)
- **Relative Humidity**: up to 90% @ 55°C
- **ETX Board Dimensions**: 95 mm x 114 mm (3.7" x 4.5")

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## 1.4 NuPRO-796 Functional Diagram

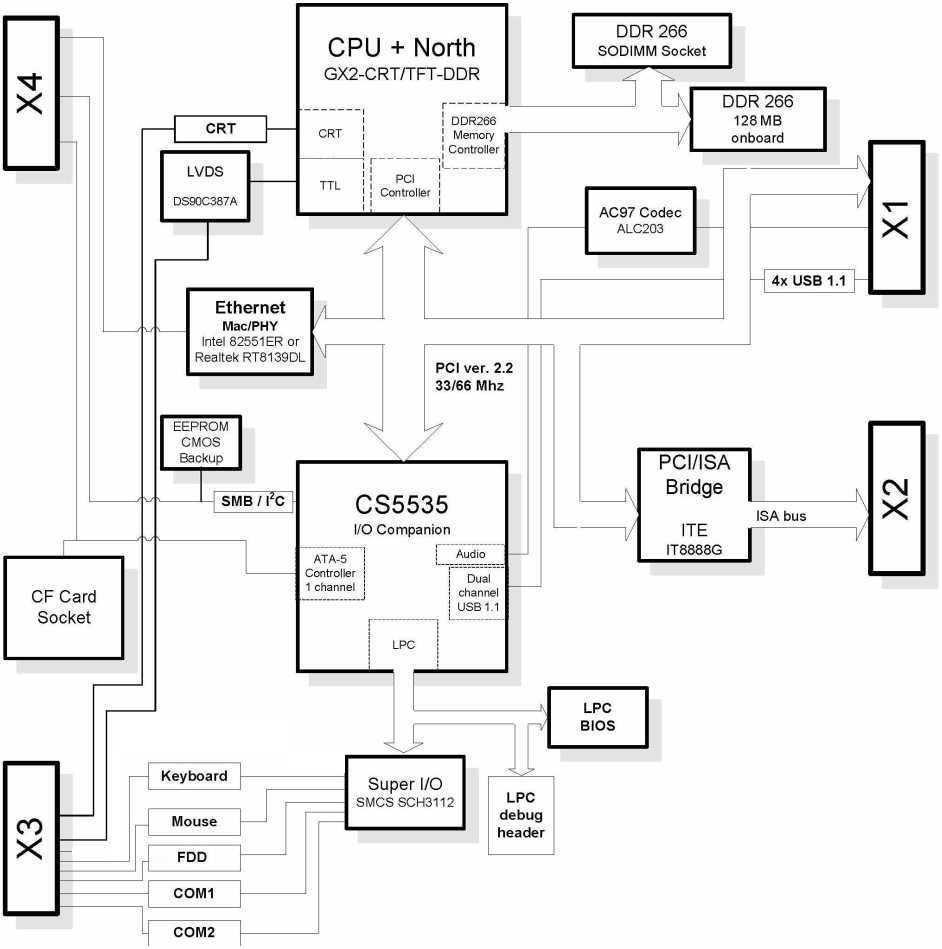



**Figure 1-1: NuPRO-796 Block Diagram**

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## 1.5 NuPRO-796 Mechanical Diagram

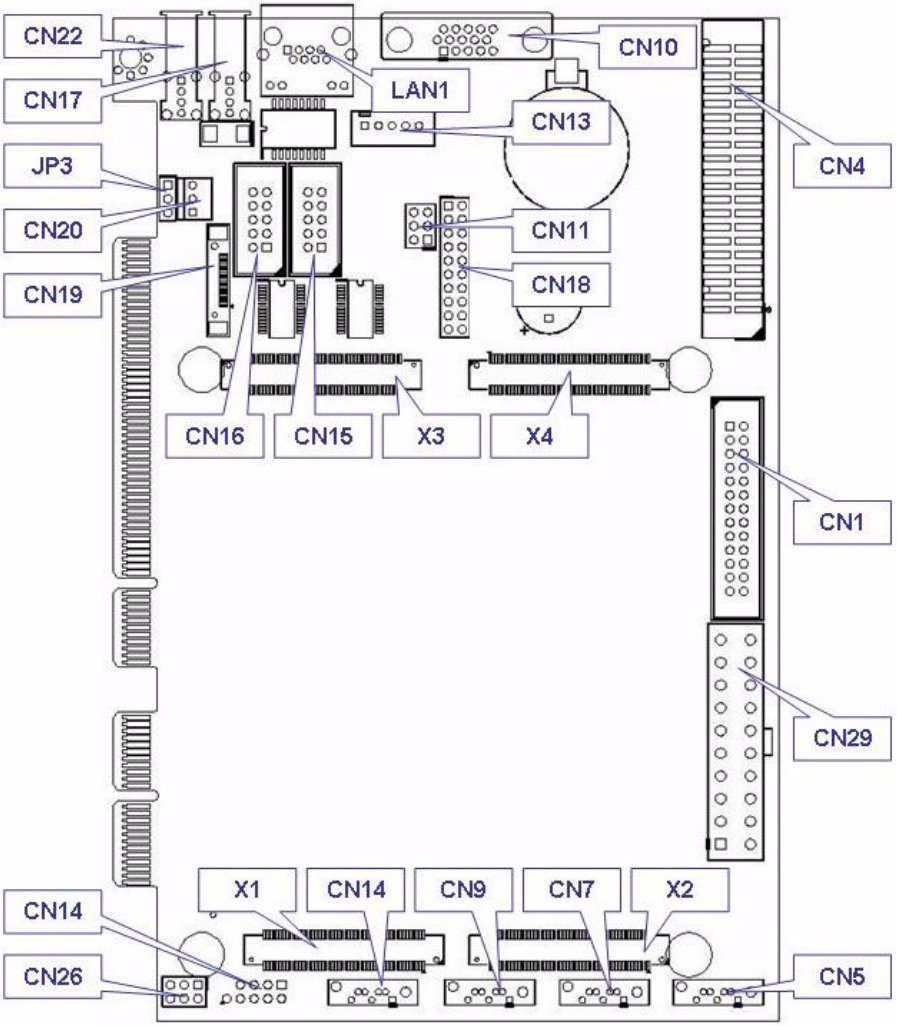



**Figure 1-2: NuPRO-796 Carrier Board Layout**

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# 2 Connectors and Jumpers

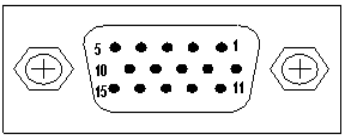
This chapter will familiarize the user with the connectors on the NuPRO-796.

## 2.1 Connector Pin Assignments

Detailed descriptions and pin-outs for each connector are given in the following section.

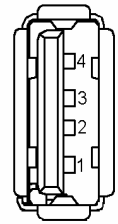
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### 2.1.1 VGA Connector (CN10)



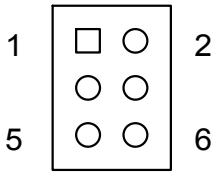

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Red | 1 | 2 | Green |
| Blue | 3 | 4 | N.C. |
| GND | 5 | 6 | GND |
| GND | 7 | 8 | GND |
| +5V | 9 | 10 | GND |
| N.C. | 11 | 12 | DDCDAT |
| HSYNC | 13 | 14 | VSYNC |
| DDCCLK | 15 | | |

### 2.1.2 USB Connector (CN17, CN22)




| PIN | SIGNAL |
|---|---|
| 1 | VCC |
| 2 | USB- |
| 3 | USB+ |
| 4 | Ground |

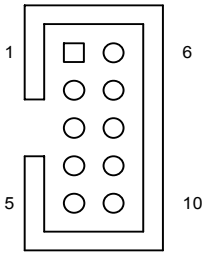
### 2.1.3 Keyboard and Mouse (CN11)




| Pin | Signal Name |
|---|---|
| 1 | Keyboard Data |
| 2 | Keyboard Clock |
| 3 | Mouse Data |
| 4 | Mouse Clock |
| 5 | Power |
| 6 | Ground |

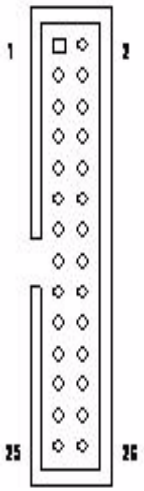
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### 2.1.4 COM Pin Header (CN15, CN16)




| Pin | RS-232 |
|---|---|
| 1 | DCD, Data carrier detect |
| 2 | RXD, Receive data |
| 3 | TXD, Transmit data |
| 4 | DTR, Data terminal ready |
| 5 | GND, ground |
| 6 | DSR, Data set ready |
| 7 | RTS, Request to send |
| 8 | CTS, Clear to send |
| 9 | RI, Ring indicator |

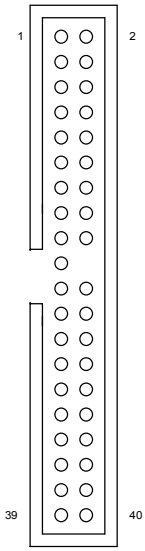
### 2.1.5 Parallel Port (CN1)




| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Line printer strobe | 1 | 14 | AutoFeed |
| PD0, parallel data 0 | 2 | 15 | Error |
| PD1, parallel data 1 | 3 | 16 | Initialize |
| PD2, parallel data 2 | 4 | 17 | Select |
| PD3, parallel data 3 | 5 | 18 | Ground |
| PD4, parallel data 4 | 6 | 19 | Ground |
| PD5, parallel data 5 | 7 | 20 | Ground |
| PD6, parallel data 6 | 8 | 21 | Ground |
| PD7, parallel data 7 | 9 | 22 | Ground |
| ACK, acknowledge | 10 | 23 | Ground |
| Busy | 11 | 24 | Ground |
| Paper empty | 12 | 25 | Ground |
| Select | 13 | N/A | N/A |

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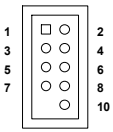
### 2.1.6 IDE (CN4)




| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Reset IDE | 1 | 2 | GND |
| IDE Data 7 | 3 | 4 | IDE Data 8 |
| IDE Data 6 | 5 | 6 | IDE Data 9 |
| IDE Data 5 | 7 | 8 | IDE Data 10 |
| IDE Data 4 | 9 | 10 | IDE Data 11 |
| IDE Data 3 | 11 | 12 | IDE Data 12 |
| IDE Data 2 | 13 | 14 | IDE Data 13 |
| IDE Data 1 | 15 | 16 | IDE Data 14 |
| IDE Data 0 | 17 | 18 | IDE Data 15 |
| Ground | 19 | 20 | KEY |
| DREQ0 | 21 | 22 | GND |
| IDEIOW# | 23 | 24 | GND |
| IDEIOR# | 25 | 26 | GND |
| IDEIORDY | 27 | 28 | CBSEL |
| DACK0# | 29 | 30 | GND |
| IDEIRQ14 | 31 | 32 | NC |
| IDE Address 1 | 33 | 34 | PDIAG# |
| IDE Address 0 | 35 | 36 | IDE Address 2 |
| IDE Chip select 1# | 37 | 38 | IDE Chip select 3# |
| IDE activity | 39 | 40 | GND |

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### 2.1.7 USB Pin Header (CN24)




| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| USB1_VCC | 1 | 2 | USB2_VCC |
| USB1- | 3 | 4 | USB2- |
| USB1+ | 5 | 6 | USB2+ |
| GND | 7 | 8 | GND |
| | 10 | KEY | |

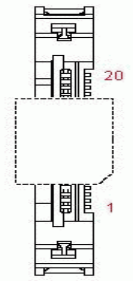
### 2.1.8 Serial ATA Connector (CN5, CN7, CN9, CN14)




| Pin | Signal Name |
|---|---|
| 1 | GND |
| 2 | Tx+ |
| 3 | Tx- |
| 4 | GND |
| 5 | Rx- |
| 6 | Rx+ |
| 7 | GND |

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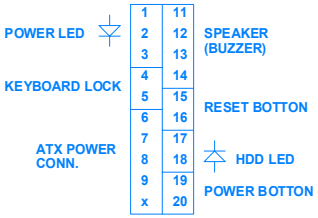
### 2.1.9 LDVS Connector (CN19)




| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | +3V | 11 | Txout2# |
| 2 | +3V | 12 | Txout2 |
| 3 | GND | 13 | GND |
| 4 | GND | 14 | Txclk# |
| 5 | Txout0# | 15 | Txclk |
| 6 | Txout0 | 16 | GND |
| 7 | GND | 17 | Txout3# |
| 8 | Txout1# | 18 | Txout3 |
| 9 | Txout1 | 19 | GND |
| 10 | GND | 20 | Panel Detect |

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### 2.1.10 Miscellaneous Connector (CN18)



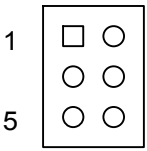

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| PW_LED+ | 1 | 11 | BUZZER |
| NC | 2 | 12 | NC |
| PW_LED- | 3 | 13 | NC |
| KB_LOCK | 4 | 14 | +5V |
| GND | 5 | 15 | PW_GD |
| GND | 6 | 16 | GND |
| NC | 7 | 17 | HDD_LED- |
| PS_ON | 8 | 18 | HDD_LED+ |
| 5VSB | 9 | 19 | PW_BTN |
| PME# | 10 | 20 | GND |

### 2.1.11 Fan Connector (CN20)




| Pin | Signal Name |
|---|---|
| 1 | NC |
| 2 | +12V |
| 3 | GND |

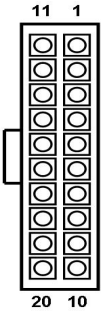
### 2.1.12 Audio-Out Pin Header (CN26)




| Pin | Signal Name |
|---|---|
| 1 | MIC In |
| 2 | ASGND |
| 3 | Line In Left |
| 4 | Line In Right |
| 5 | Line Out Left |
| 6 | Line Out Right |

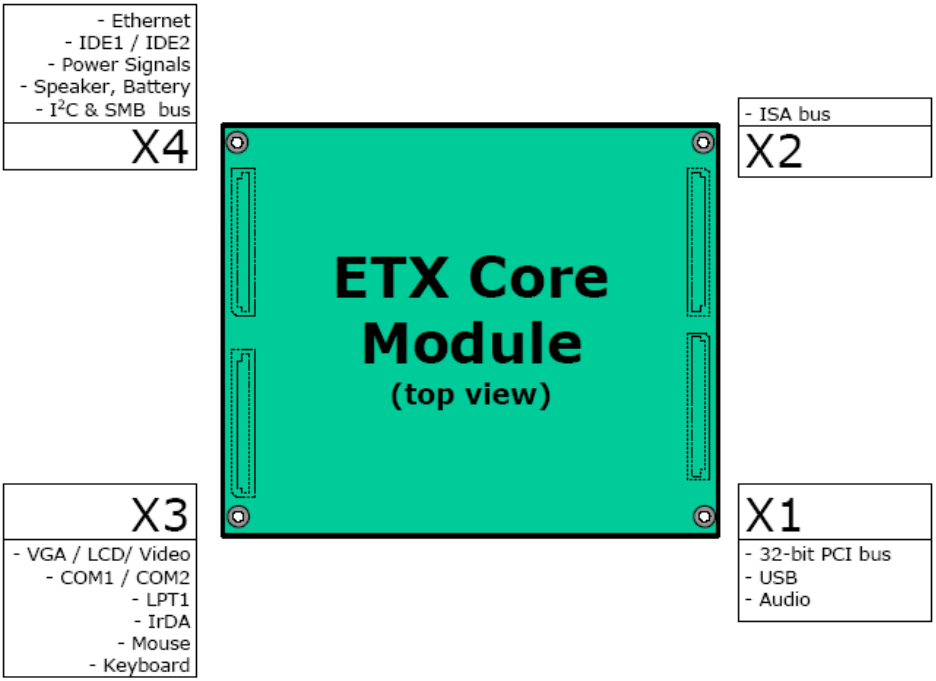
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### 2.1.13 ATX Power Connector (CN29)



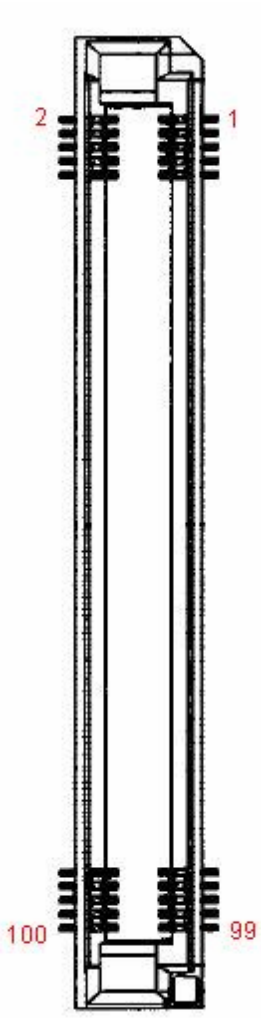

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +3.3V | 11 | +3.3V |
| 2 | +3.3V | 12 | -12V |
| 3 | GND | 13 | GND |
| 4 | +5V | 14 | PS_ON# |
| 5 | GND | 15 | GND |
| 6 | +5V | 16 | GND |
| 7 | GND | 17 | GND |
| 8 | PWRGOOD | 18 | -5V |
| 9 | STB5V | 19 | +5V |
| 10 | +12V | 20 | +5V |

### 2.1.14 ETX Connector




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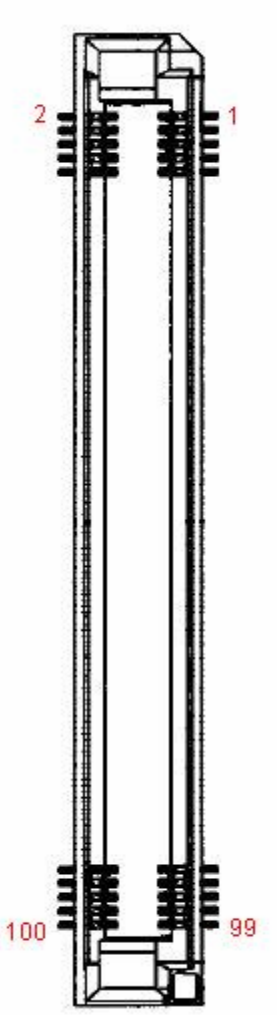
## 2.1.15 ETX X1 Connector (PCI Bus, USB, Audio)




| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | PCICLK3 | 4 | PCICLK4 |
| 5 | GND | 6 | GND |
| 7 | PCICLK1 | 8 | PCICLK2 |
| 9 | REQ3# | 10 | GNT3# |
| 11 | GNT2# | 12 | 3V3 |
| 13 | REQ2# | 14 | GNT1# |
| 15 | REQ1# | 16 | 3V3 |
| 17 | GNT0# | 18 | RESERVED |
| 19 | VCC | 20 | VCC |
| 21 | SERIRQ | 22 | REQ0# |
| 23 | AD0 | 24 | 3V3 |
| 25 | AD1 | 26 | AD2 |
| 27 | AD4 | 28 | AD3 |
| 29 | AD6 | 30 | AD5 |
| 31 | C/BE0# | 32 | AD7 |
| 33 | AD8 | 34 | AD9 |
| 35 | GND | 36 | GND |
| 37 | AD10 | 38 | LINEIN_L |
| 39 | AD11 | 40 | MICIN |
| 41 | AD12 | 42 | LINEIN_R |
| 43 | AD13 | 44 | AVCC |
| 45 | AD14 | 46 | LINEOUT_L |
| 47 | AD15 | 48 | AGND |
| 49 | C/BE1# | 50 | LINEOUT_R |
| 51 | VCC | 52 | VCC |
| 53 | PAR | 54 | SERR# |
| 55 | PERR# | 56 | RESERVED |
| 57 | PME# | 58 | USB2- |
| 59 | LOCK# | 60 | DEVSEL# |
| 61 | TRDY# | 62 | USB3- |
| 63 | IRDY# | 64 | STOP# |
| 65 | FRAME# | 66 | USB2+ |
| 67 | GND | 68 | GND |
| 69 | AD16 | 70 | C/BE2# |
| 71 | AD17 | 72 | USB3+ |
| 73 | AD19 | 74 | AD18 |
| 75 | AD20 | 76 | USB0- |
| 77 | AD22 | 78 | AD21 |
| 79 | AD23 | 80 | USB1- |
| 81 | AD24 | 82 | C/BE3# |
| 83 | VCC | 84 | VCC |
| 85 | AD25 | 86 | AD26 |
| 87 | AD28 | 88 | USB0+ |
| 89 | AD27 | 90 | AD29 |
| 91 | AD30 | 92 | USB1+ |
| 93 | PCIRST# | 94 | AD31 |
| 95 | INTC# | 96 | INTD# |
| 97 | INTA# | 98 | INTB# |
| 99 | GND | 100 | GND |

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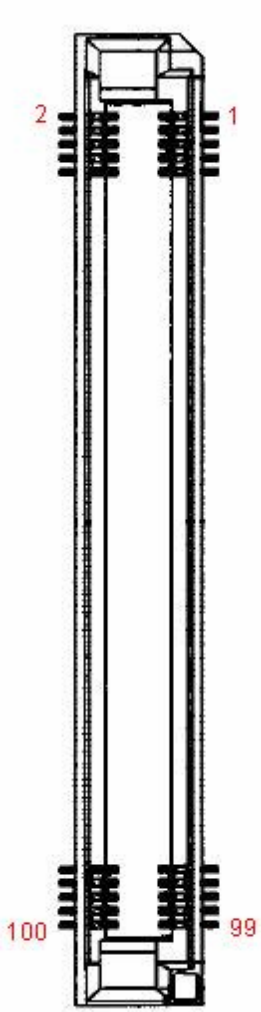
## 2.1.16 ETX X2 Connector (ISA Bus)




| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | SD14 | 4 | SD15 |
| 5 | SD13 | 6 | MASTER# |
| 7 | SD12 | 8 | DREQ7 |
| 9 | SD11 | 10 | DACK7# |
| 11 | SD10 | 12 | DREQ6 |
| 13 | SD9 | 14 | DACK6# |
| 15 | SD8 | 16 | DREQ5 |
| 17 | MEMW# | 18 | DACK5# |
| 19 | MEMR# | 20 | DREQ0 |
| 21 | LA17 | 22 | DACK0# |
| 23 | LA18 | 24 | IRQ14 |
| 25 | LA19 | 26 | IRQ15 |
| 27 | LA20 | 28 | IRQ12(1) |
| 29 | LA21 | 30 | IRQ11 |
| 31 | LA22 | 32 | IRQ10 |
| 33 | LA23 | 34 | IO16# |
| 35 | GND | 36 | GND |
| 37 | SBHE# | 38 | M16# |
| 39 | SA0 | 40 | OSC |
| 41 | SA1 | 42 | BALE |
| 43 | SA2 | 44 | TC |
| 45 | SA3 | 46 | DACK2#(2) |
| 47 | SA4 | 48 | IRQ3 |
| 49 | SA5 | 50 | IRQ4 |
| 51 | VCC | 52 | VCC |
| 53 | SA6 | 54 | IRQ5 |
| 55 | SA7 | 56 | IRQ6 |
| 57 | SA8 | 58 | IRQ7 |
| 59 | SA9 | 60 | SYSCLK |
| 61 | SA10 | 62 | REFSH# |
| 63 | SA11 | 64 | DREQ1 |
| 65 | SA12 | 66 | DACK1# |
| 67 | GND | 68 | GND |
| 69 | SA13 | 70 | DREQ3 |
| 71 | SA14 | 72 | DACK3# |
| 73 | SA15 | 74 | IOR# |
| 75 | SA16 | 76 | IOW# |
| 77 | SA18 | 78 | SA17 |
| 79 | SA19 | 80 | SMEMR# |
| 81 | IOCHRDY | 82 | AEN |
| 83 | VCC | 84 | VCC |
| 85 | SD0 | 86 | SMEMW# |
| 87 | SD2 | 88 | SD1 |
| 89 | SD3 | 90 | NOWS# |
| 91 | DREQ2(2) | 92 | SD4 |
| 93 | SD5 | 94 | IRQ9 |
| 95 | SD6 | 96 | SD7 |
| 97 | IOCHK# | 98 | RSTDRV |
| 99 | GND | 100 | GND |

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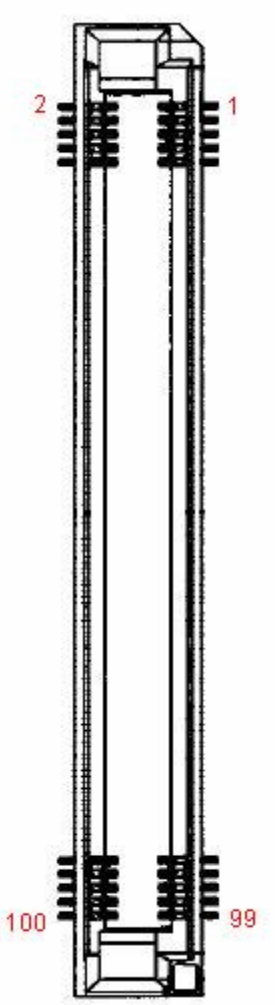
## 2.1.17 ETX X3 Connector (Video, COM, misc. I/O)




| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | RED | 4 | BLUE |
| 5 | HSYNC | 6 | GREEN |
| 7 | VSYNC | 8 | DDC2B_CLK |
| 9 | PAL_DETECT# | 10 | DDC2B_DAT |
| 11 | LCDDO16 | 12 | LCDDO18 |
| 13 | LCDDO17 | 14 | LCDDO19 |
| 15 | GND | 16 | GND |
| 17 | LCDDO13 | 18 | LCDDO15 |
| 19 | LCDDO12 | 20 | LCDDO14 |
| 21 | GND | 22 | GND |
| 23 | LCDDO8 | 24 | LCDDO11 |
| 25 | LCDDO9 | 26 | LCDDO10 |
| 27 | GND | 28 | GND |
| 29 | LCDDO4 | 30 | LCDDO7 |
| 31 | LCDDO5 | 32 | LCDDO6 |
| 33 | GND | 34 | GND |
| 35 | LCDDO1 | 36 | LCDDO3 |
| 37 | LCDDO0 | 38 | LCDDO2 |
| 39 | VCC | 40 | VCC |
| 41 | JILI_DAT | 42 | FLM |
| 43 | JILI_CLK | 44 | BLON# |
| 45 | BIASON | 46 | PLPWR_EN |
| 47 | TV_COMP | 48 | TV_Y |
| 49 | TV_SYNC | 50 | TV_C |
| 51 | LPT/FLPY# | 52 | RESERVED |
| 53 | VCC | 54 | GND |
| 55 | STB# | 56 | AFD# |
| 57 | RESERVED | 58 | PD7 |
| 59 | IRRX | 60 | ERR# |
| 61 | IRTX | 62 | PD6 |
| 63 | RXD2 | 64 | INIT# |
| 65 | GND | 66 | GND |
| 67 | RTS2# | 68 | PD5 |
| 69 | DTR2# | 70 | SLIN# |
| 71 | DCD2# | 72 | PD4 |
| 73 | DSR2# | 74 | PD3 |
| 75 | CTS2# | 76 | PD2 |
| 77 | TXD2 | 78 | PD1 |
| 79 | RI2# | 80 | PD0 |
| 81 | VCC | 82 | VCC |
| 83 | RXD1 | 84 | ACK# |
| 85 | RTS1# | 86 | BUSY# |
| 87 | DTR1# | 88 | PE |
| 89 | DCD1# | 90 | SLCT# |
| 91 | DSR1# | 92 | MSCLK |
| 93 | CTS1# | 94 | MSDAT |
| 95 | TXD1 | 96 | KBCLK |
| 97 | RI1# | 98 | KBDAT |
| 99 | GND | 100 | GND |

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## 2.1.18 ETX X4 Connector (Ethernet, IDE, Power, I²C & SMB)




| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | 5V_SB | 4 | PWGIN |
| 5 | PS_ON | 6 | SPEAKER |
| 7 | PWRBTN# | 8 | BATT |
| 9 | KBINH | 10 | LILED |
| 11 | RSMRST# | 12 | ACTLED |
| 13 | ROMKBCS#(1) | 14 | SPDLED |
| 15 | EXT_PRG(1) | 16 | I2CLK |
| 17 | VCC | 18 | VCC |
| 19 | OVCR# | 20 | GPCS#(1) |
| 21 | EXTSMI# | 22 | I2DAT |
| 23 | SMBCLK | 24 | SMBDATA |
| 25 | SIDE_CS3# | 26 | SMBALRT# |
| 27 | SIDE_CS1# | 28 | DASP_S(1) |
| 29 | SIDE_A2 | 30 | PIDE_CS3# |
| 31 | SIDE_A0 | 32 | PIDE_CS1# |
| 33 | GND | 34 | GND |
| 35 | PDIAG_S | 36 | PIDE_A2 |
| 37 | SIDE_A1 | 38 | PIDE_A0 |
| 39 | SIDE_INTRQ | 40 | PIDE_A1 |
| 41 | BATLOW# | 42 | GPE1# |
| 43 | SIDE_ACK# | 44 | PIDE_INTRQ |
| 45 | SIORDY | 46 | PIDE_ACK# |
| 47 | SIDE_IOR# | 48 | PIORDY |
| 49 | VCC | 50 | VCC |
| 51 | SIDE_IOW# | 52 | PIDE_IOR# |
| 53 | SIDE_DRQ | 54 | PIDE_IOW# |
| 55 | SIDE_D15 | 56 | PIDE_DRQ |
| 57 | SIDE_D0 | 58 | PIDE_D15 |
| 59 | SIDE_D14 | 60 | PIDE_D0 |
| 61 | SIDE_D1 | 62 | PIDE_D14 |
| 63 | SIDE_D13 | 64 | PIDE_D1 |
| 65 | GND | 66 | GND |
| 67 | SIDE_D2 | 68 | PIDE_D13 |
| 69 | SIDE_D12 | 70 | PIDE_D2 |
| 71 | SIDE_D3 | 72 | PIDE_D12 |
| 73 | SIDE_D11 | 74 | PIDE_D3 |
| 75 | SIDE_D4 | 76 | PIDE_D11 |
| 77 | SIDE_D10 | 78 | PIDE_D4 |
| 79 | SIDE_D5 | 80 | PIDE_D10 |
| 81 | VCC | 82 | VCC |
| 83 | SIDE_D9 | 84 | PIDE_D5 |
| 85 | SIDE_D6 | 86 | PIDE_D9 |
| 87 | SIDE_D8 | 88 | PIDE_D6 |
| 89 | GPE2# | 90 | CBLID_P# |
| 91 | RXD- | 92 | PIDE_D8 |
| 93 | RXD+ | 94 | SIDE_D7 |
| 95 | TXD- | 96 | PIDE_D7 |
| 97 | TXD+ | 98 | HDRST# |
| 99 | GND | 100 | GND |

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## 2.2 Jumper Settings

### 2.2.1 Panel Power Selection (JP3)




| Jumper | Status |
|---|---|
| 1-2 | +5V |
| 2-3 | +3.3V |

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# 3 System Resources

## 3.1 System Memory Map

PCI and ISA interrupts supported by the GX2/CS5355 are as follows:

| Address Range (decimal) | Address Range (hex) | Size | Description |
|---|---|---|---|
| 1024 K - TOM(1) | 100000 - TOM | N.A. | Extended memory |
| 928 K - 1024 K | E8000 - FFFFF | 96 KB | System BIOS |
| 896 K - 928 K | E0000 - E7FFF | 32 KB | System BIOS (Available as UMB) |
| 800 K - 896 K | C8000 - DFFFF | 96 KB | Available high DOS memory (open to ISA and PCI buses) |
| 640 K - 800 K | A0000 - C7FFF | 160 KB | Video memory and BIOS |
| 0 K - 640 K | 00000 - 9FFFF | 640 KB | Conventional memory |

[1]TOM = Top of Memory depends on amount of memory installed

## 3.2 Direct Memory Access Channels

| Channel Number | Data Width | System Resource | Available |
|---|---|---|---|
| 0 | 8- or 16-bits | Open | Yes |
| 1 | 8- or 16-bits | Open | Yes |
| 2 | 8- or 16-bits | Open | Note1 |
| 3 | 8- or 16-bits | Open | Note2 |
| 4 | 16 bits | AT DMA Controller (PnP) | No |
| 5 | 16-bits | Open | Yes |
| 6 | 16-bits | Open | Yes |
| 7 | 16-bits | Open | Yes |

Note 1: If the corresponding device is disabled in BIOS setup then the DMA channel can be used by customers hardware.

Note 2: Not available if Parallel Port is used in ECP mode (Enhanced Parallel Port).

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## 3.3 I/O Map

| Address (hex) | Size | Description | Available |
|---|---|---|---|
| 0000 - 000F | 16 bytes | DMA controller 1 | No |
| 0020 - 0021 | 2 bytes | Interrupt controller 1 | No |
| 0040 - 0043 | 4 bytes | Counter/Timer 1 | No |
| 0060 | 1 byte | Keyboard controller | No |
| 0061 | 1 byte | NMI, speaker control | No |
| 0064 | 1 byte | Keyboard controller | No |
| 0070 - 0073 | 4 bytes | System CMOS/Real-Time clock | No |
| 0080 - 0090 | 17 bytes | DMA controller2 | No |
| 0094 - 009F | 12 bytes | DMA controller3 | No |
| 00A0 - 00A1 | 2 bytes | Interrupt controller 2 | No |
| 00C0 - 00DF | 32 bytes | DMA controller 4 | No |
| 00F0 - 00FF | 16 bytes | Numeric processor | No |
| 0170 - 0177 | 8 bytes | Secondary IDE controller | No |
| 01F0 - 01F7 | 8 bytes | Primary IDE controller | No |
| 0274 - 0277,0279,0A79 | 6 bytes | ISA PNP Read Data Port | No |
| 02F8 - 02FF | 8 bytes | COM2 | Note1 |
| 0376 - 0376 | 1 bytes | Secondary IDE controller | No |
| 03B0 - 03BA , 03C0 - 03DF | 43 bytes | Advanced Micro Devices WinXP Graphic Drivers | No |
| 03F6 | 1 bytes | Primary IDE controller | No |
| 0378 - 03FF | 8 bytes | LPT1 | Note1 |
| 03F8 - 03FF | 8 bytes | COM1 | Note1 |
| 0CF8 - 0CFF | 8 bytes | PCI configuration registers | Note2 |
| 0010 - 001F | 16 bytes | Motherboard Resource | No |
| 0022 - 002D | 12 bytes | Motherboard Resource | No |
| 0030 - 003F | 16 bytes | Motherboard Resource | No |
| 0044 - 005F | 28 bytes | Motherboard Resource | No |
| 0062 - 0063 | 2 bytes | Motherboard Resource | No |
| 0065 - 006F | 11 bytes | Motherboard Resource | No |
| 0074 - 007F | 12 bytes | Motherboard Resource | No |
| 0091 - 0093 | 3 bytes | Motherboard Resource | No |
| 00A2 - 00BF | 30 bytes | Motherboard Resource | No |
| 00E0 - 00EF | 16 bytes | Motherboard Resource | No |
| 04D0 - 04D1 | 2 bytes | Motherboard Resource | No |
| 0800 - 087F | 128 bytes | Motherboard Resource | No |
| FD00 - FD7F | 128 bytes | Geode - GX2 WDM Audio Driver | No |
| FE00 - FE0F | 16 bytes | Standard Dual Channel PCI IDE controller | No |
| FF00 - FF3F | 64 bytes | Intel 8255xER PCI Adapter | No |

Note 1: Default, but can be changed to another address range

Note 2: DWORD access only

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## 3.4 Interrupt Request (IRQ) Lines

Note: PIC Mode only !

| IRQ# | Typical Interrupt Resource | Connected | Available |
|---|---|---|---|
| 0 | AT Timer | N.A. | No |
| 1 | Keyboard | N.A. | No |
| 2 | None | N.A. | No |
| 3 | COM2 | IRQ3 via SERIRQ | Note1 |
| 4 | COM1 | IRQ4 via SERIRQ | Note1 |
| 5 | Standard OpenHCD USB Host Controller | IRQ5 via SERIRQ | No |
| 6 | Floppy Drive Controller | IRQ6 via SERIRQ | Note1 |
| 7 | Parallel Port (LPT) | IRQ7 via SERIRQ | Note1 |
| 8 | System CMOS/Real-time clock | N.A. | No |
| 9 | Microsoft ACPI-Compliant System | IRQ9 via SERIRQ | Note2 |
| 10 | Standard OpenHCD USB Host Controller | IRQ10 via SERIRQ | No |
| 11 | Geode-Gx2 WDM Audio Driver/Intel 8255Xer PCI Adapter IRQ11 via SERIRQ | No | |
| 12 | PS/2 Mouse | IRQ12 via SERIRQ | No |
| 13 | Math Processor | N.A. | No |
| 14 | IDE Controller 0 | IRQ14 | No |
| 15 | None | N.A. | No |

Note 1: Default, but can be changed to another address range. If disabled in BIOS setup the resource can be used for another purpose.

Note 2: In ACPI mode, IRQ9 is used for the SCI (System Control Interrupt). The SCI can be shared with a PCI interrupt line.

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## 3.5 PCI Configuration Space Map

| Bus Number | Device Number | Function Number | Routing | Description |
|---|---|---|---|---|
| 00h | 01 | 01 | internal | Display Cntrlr |
| 00h | 14 | 00 | INTA-INTD | Network Cntrlr |
| 00h | 15 | 02 | Internal | IDE Cntrlr |
| 00h | 15 | 03 | Internal | Multimedia Device |
| 00h | 15 | 04 | Internal | USB 1.0/1.1 OHCI Cntrlr |
| 00h | 15 | 05 | Internal | USB 1.0/1.1 OHCI Cntrlr |
| 00h | 09 | 00 | INTA-INTD | PCI Bus Slot 1 |
| 00h | 10 | 00 | INTA-INTD | PCI Bus Slot 2 |
| 00h | 11 | 00 | INTA-INTD | PCI Bus Slot 3 |
| 00h | 12 | 00 | INTA-INTD | PCI Bus Slot 4 |

## 3.6 PCI Interrupt Routing Map

| PIRQ | INT line | VGA | Lan | IDE | Multimedia | OHCI 1 | OHCI 2 | PCI 1 Slot 1 | PCI 2 Slot 2 | PCI 3 Slot 3 | PCI4 Slot4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | INTA | INTA | INTB | INTA | INTA | INTA | INTA | INTA | INTB | INTC | INTD |
| B | INTB | INTB | INTC | INTB | INTB | INTB | INTB | INTB | INTC | INTD | INTA |
| C | INTC | INTC | INTD | INTC | INTC | INTC | INTC | INTC | INTD | INTA | INTB |
| D | INTD | INTD | INTA | INTD | INTD | INTD | INTD | INTD | INTA | INTB | INTC |

## 3.7 System Management Bus and I2C Bus

Internally, the SMB bus and I2C bus are the same, both coming from the same source the GX2 companionchip CS5535. The X4 connector has pinouts for both I2C and SMB bus. The following onboard devices are connected to the SMB/I2C bus:

| Address | Function | Device | Bus |
|---|---|---|---|
| 1010000 | Identification Info. | DDR SO-DIMM | SMB/I2C |
| 1010001 | Identification Info. | DDR Onboard Memory | SMB/I2C |
| 1010010 | None | None | |
| 1010011 | None | None | |
| 1010100 | None | None | |
| 1010101 | None | None | |
| 1010110 | None | None | |
| 1010111 | CMOS setting backup | CMOS EEPROM | SMB/I2C |

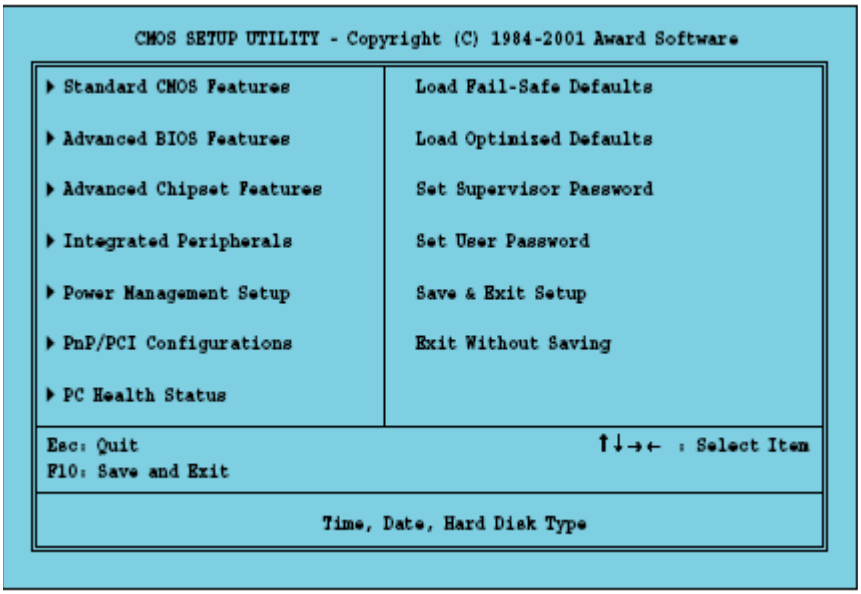
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# 4 Phoenix Award BIOS

## 4.1 Description

The module has a Phoenix Award PCI/ISA BIOS ver 6.0 for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access the Phoenix AWARD PCI/ISA BIOS Setup program, press `<Del>` key. The Main Menu will be displayed.




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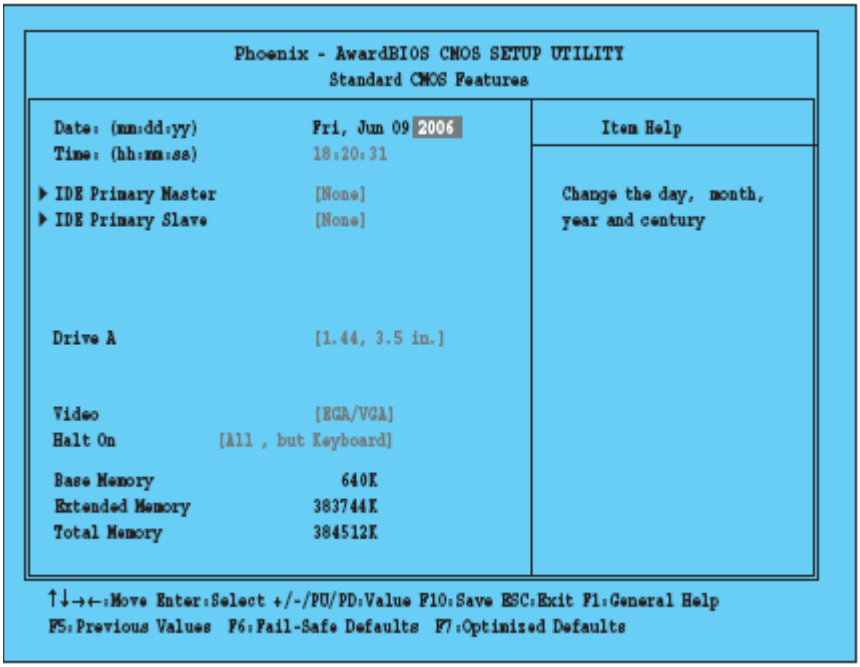
## 4.2 Main Menu

- *Standard CMOS Features.* Use this menu for basic system configuration.
- *Advanced BIOS Features.* Use this menu to set the Advanced Features available on your system.
- *Advanced Chipset Features.* Change values in the chipset registers and optimize your system's performance.
- *Integrated Peripherals.*Use this menu to specify your settings for integrated peripherals.
- *Power Management Setup.* Use this menu to specify your settings for power management.
- *PnP / PCI Configuration.* This entry appears if your system supports PnP / PCI.
- *PC Health Status.* Use this menu to specify your settings for frequency/voltage control.
- *Load Fail-Safe Defaults.* Loads the BIOS default values for the minimal/stable performance for your system to operate.
- *Load Optimized Defaults.* Loads the BIOS default values that are factory settings for optimal system performance.
- *Supervisor / User Password*. Use this menu to set User and Supervisor Passwords.
- *Save & Exit Setup.* Save CMOS value changes to CMOS and exit setup.
- *Exit Without Saving.* Abandon all CMOS value changes and exit setup.

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## 4.3 Standard CMOS Features

The main menu includes the following main setup categories. Recall that some systems may not include all entries.




- *Date*.The BIOS determines the day of the week from other date information; this field is for information only.
- *Time*. The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the ( key to move to the desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.
- *IDE Primary Master/Slave Items*. This selection brings you a configuration menu of the designated Drive.
- *Drive A*. The module can support one single FDD drive. Because FDD and LPT1 share the same pins on following

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BIOS menu:

- ▷ Integrated Peripherals > Super I/O Device > LPT1 Setting / FDD

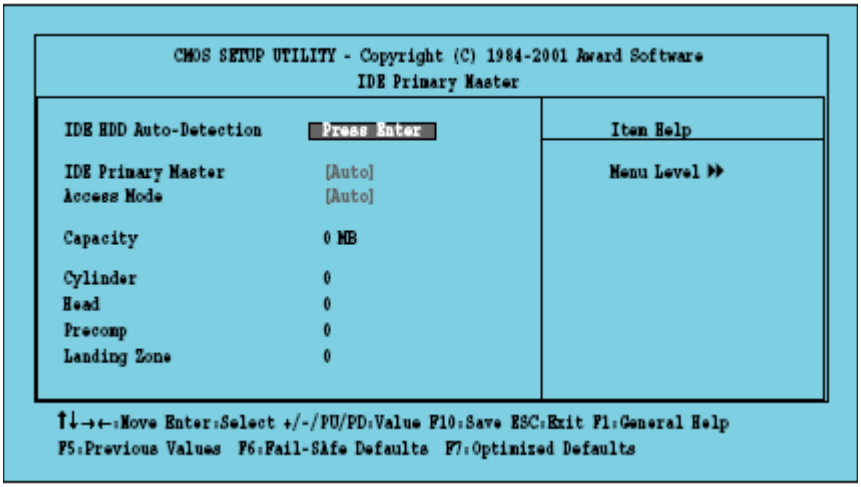
  This menu allows setup of LPT1 resources or disabling of LPT1 and setting the mode to FDD. After enabling the FDD, select the correct specifications for the diskette drive:

  - ▷ None: No diskette drive installed
  - ▷ 360K: 5-1/4 inch PC-type standard drive
  - ▷ 1.2M: 5-1/4 inch AT-type high-density drive
  - ▷ 720K: 3-1/2 inch double-sided drive
  - ▷ 1.44M: 3-1/2 inch double-sided drive
  - ▷ 2.88M: 3-1/2 inch double-sided drive

- ▶ Video. Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. Options are:
  - ▷ EGA/VGA For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
  - ▷ CGA 40 Power up in 40 columns mode.
  - ▷ CGA 80 Power up in 80 columns mode.
  - ▷ MONO For Hercules or MDA adapters.
- ▶ Halt On. During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:
  - ▷ No errors: POST does not stop for any errors.
  - ▷ All errors: If any non-fatal error, POST stops and prompts to take corrective action.
  - ▷ All, But Keyboard: POST does not stop for a keyboard error, but stops for all other errors
  - ▷ All, But Diskette: POST does not stop for diskette drive errors, but stops for all other errors
  - ▷ All, But Disk/Key: POST does not stop for keyboard / disk error, but stops for all other errors.

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### IDE Primary Master/Slave Items




**IDE HDD Auto-detection** Press Enter

Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.

**IDE Primary Master** None/Auto/Manual

Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE!

**Capacity** Auto Display disk size

Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

**Access Mode** CHS/LBA/Large/Auto

Choose the access mode for this hard disk

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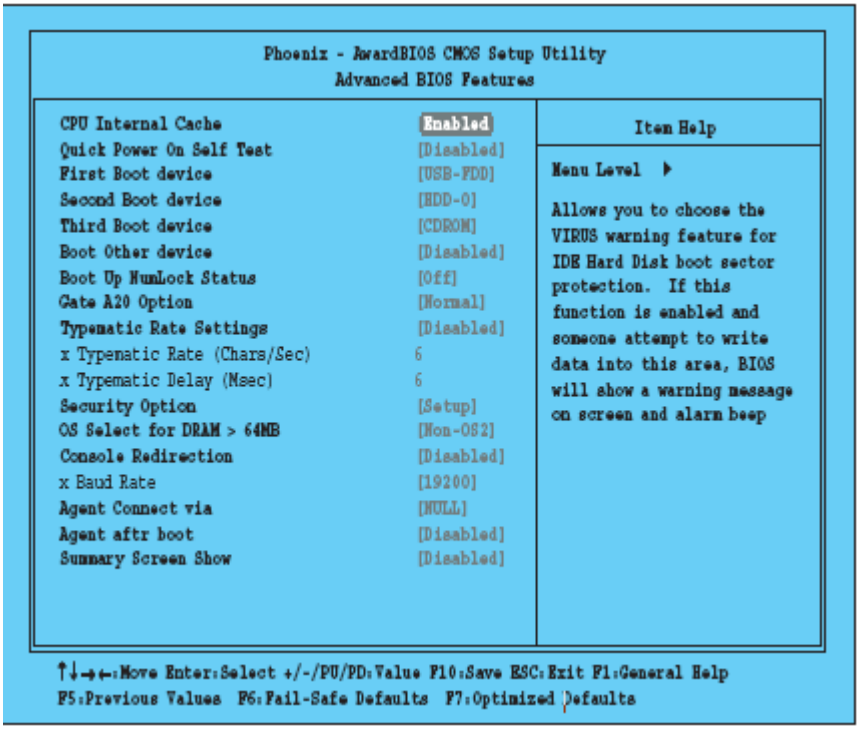
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

| | | |
|---|---|---|
| Cylinder | Min = 0 Max = 65535 | Set the number of cylinders for this hard disk. |
| Head | Min = 0 Max = 255 | Set the number of read/write heads |
| Precomp | Min = 0 Max = 65535 | **** Warning: Setting a value of 65535 means no hard disk |
| Landing zone | Min = 0 Max = 65535 | **** |
| Sector | Min = 0 Max = 255 | Number of sectors per track |

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## 4.4 Advanced BIOS Features

This section allows the user to configure the system for basic operation. The following features can be selected here: system default speed, boot-up sequence, keyboard operation, shadowing, security, and CPU Internal Cache/CPU External Cache.




### 4.4.1 CPU Internal Cache

This function enables/disables CPU Internal Cache. Options: Enabled, Disabled.

### 4.4.2 Quick Power On Self Test

This category speeds up the Power On Self Test (POST). If enabled, BIOS will shorten or skip some check items during

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POST. Options: Enabled: enables quick POST. Disabled: normal POST.

### 4.4.3 First/Second/Third Boot Device

Pressing Enter brings up the Boot Device Menu. The BIOS attempts to load the operating system from the selected device. See menu for possible options

### 4.4.4 Boot Other Device

When enabled, the BIOS will try to boot from second or third option if booting from first device fails. When dis-abled the BIOS will not use the alternative devices




### 4.4.5 Boot Up NumLock Status

Select power on state for NumLock. Options: On/Off

### 4.4.6 Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

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Normal: A pin in the keyboard controller controls GateA20

Fast: Lets chipset control GateA20

### 4.4.7 Typematic Rate Setting

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected. Options: Enabled/Disabled.

### 4.4.8 Typematic Rate (Chars/Sec)

Sets the number of times per second to repeat a key stroke when holding down the key. Options: 6, 8, 10, 12, 15, 20, 24, and 30.

### 4.4.9 Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke. Options: 250, 500, 750, and 1000.

### 4.4.10 Security Option

Select whether the password is required every time the system boots or only when you enter setup. Choices :

**System**: The system will not boot and access to Setup will be denied if an incorrect password is entered at the prompt.

**Setup**: The system will boot, but access to Setup will be denied if an incorrect password is not entered at the prompt.

To disable security, select PASSWORD SETTING in Main Menu. The user will then be prompted to enter the password. Do not type anything and press <Enter> to disable security. Once security is disabled, the system will boot and Setup can be entered freely.

### 4.4.11 OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system. Options: Non-OS2, OS2.

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### 4.4.12 Console Redirection

Award's Preboot Agent provides you with console redirection to let you control a remote PC or embedded system via modem or direct serial connection at boot time. Choices: Enable, Disable.

### 4.4.13 Baudrate

Select baud rate: 9600,19200, 38400, 57600 and 115200.

### 4.4.14 Agent Connect via

Fixed to NULL (Null modem cable), no selection possible.

### 4.4.15 Agent wait time(min)

Timeout in minutes to install agent if no serial connection can be established

### 4.4.16 Agent after boot

Enable this option to keep the Agent running after OS boot.

### 4.4.17 Summary Screen Show

Suppress the summary screen. Choices: Enable, Disable

### 4.4.18 Console Redirection

Console redirection allows you to operate a system without display and keyboard by redirecting keyboard input and text output through the serial port. Console redirection can be used for tasks such as setting up a the BIOS settings or operating in text mode under MSDOS. Remote Console is a character-based terminal application. It supports either VT100 or ANSI terminals. It does not support graphics. This field allows you to select if remote console function is Enabled or Disabled. Default value is Enabled.

### 4.4.19 Baud Rate

When Console Redirection is Enabled, This BIOS filed will let you set the serial port's operating baud rate. There are five settings for user to select, 9600,19200,38400, 57600 and 115200.

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The Baud Rate setting between module and monitoring computer must be the same. When different, a error message "Award Pre-boot Agent Installation Failed" will display when BIOS is building the connection between two computers.

### 4.4.20 Agent Connect via

This field selects connection mode. Only supported is: NULL mode. NULL mode means that user can connect a host computer using a null modem cable to establish the serial connection.

### 4.4.21 Agent Wait Time(min)

This option allows to select the amount of time(min) to wait until a successful connection is established.

### 4.4.22 Agent after boot

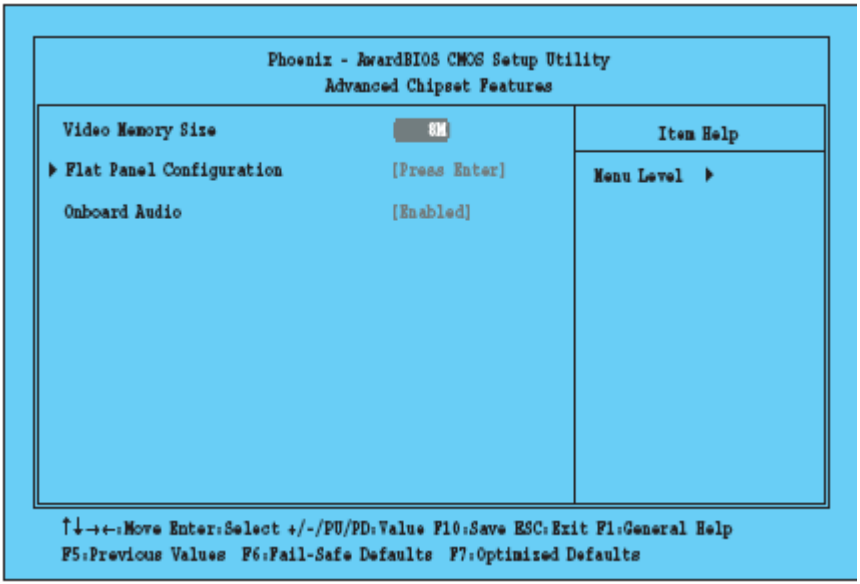
When enabled this field allows you to monitor text-based OS (such as DOS) after POST. For those OS that will establish their own text based communication over serial (Unix, Linux) select Disabled to terminate remote console after POST.

### 4.4.23 Summary Screen Show

Suppress the summary screen. Options: Enable, DisableAd-vanced Chipset Features

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## 4.5 Advanced Chipset Features




### 4.5.1 Video Memory Size

The NuPRO-796 VGA controller uses a portion of system memory as video memory. The use of main system memory for video memory is called Unified Memory Architecture (UMA).

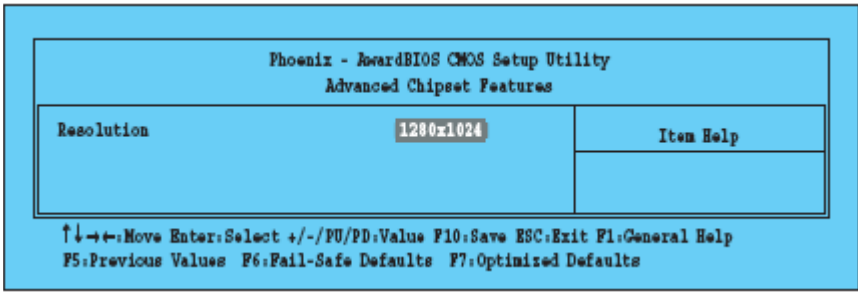
The amount of system memory that can be assigned to the video controller is: None, 4 , 6, 8, 12 or 16 MB.

### 4.5.2 Flat Panel Configuration

This selection brings up a configuration menu to setup the panel resolution :

Options: 640x480 ,800x600, 1024x768, and 1280x1024.

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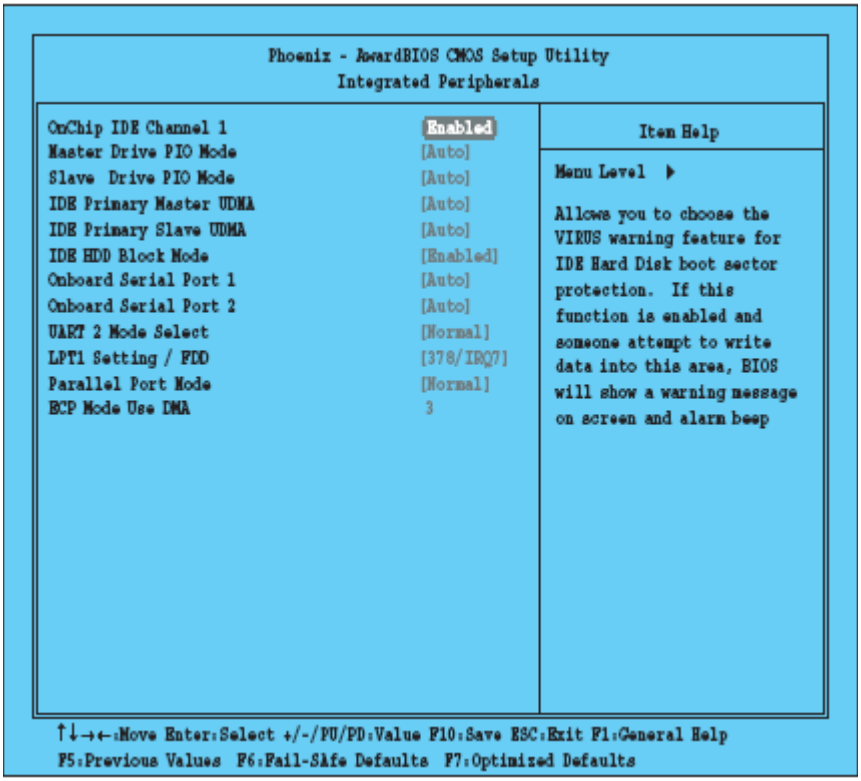



### 4.5.3 Onboard Audio

Enable or Disable

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## 4.6 Integrated Peripherals




### 4.6.1 OnChip IDE Channel 0/1

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

### 4.6.2 Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically

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determines the best mode for each device. Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

### 4.6.3 IDE Primary Master/Slave UDMA

Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support Ultra DMA, select Auto to enable BIOS support.

### 4.6.4 IDE HDD Block Mode

This feature enhances disk performance by allowing multi-sector data transfers and eliminates the interrupt handling time for each sector.

### 4.6.5 Onboard Serial Port 1 & 2

Select an address and corresponding interrupt for the serial ports.

### 4.6.6 UART Mode Select

The serial port 2 on your system offers a variety of infrared modes. There are two different IR (Infra-Red) modes - IrDA and ASK IR. Select the IR mode that is supported by your external IR device. Choosing the wrong IR mode will prevent your computer from communicating with the external IR device.

### 4.6.7 LPT1 Setting / FDD

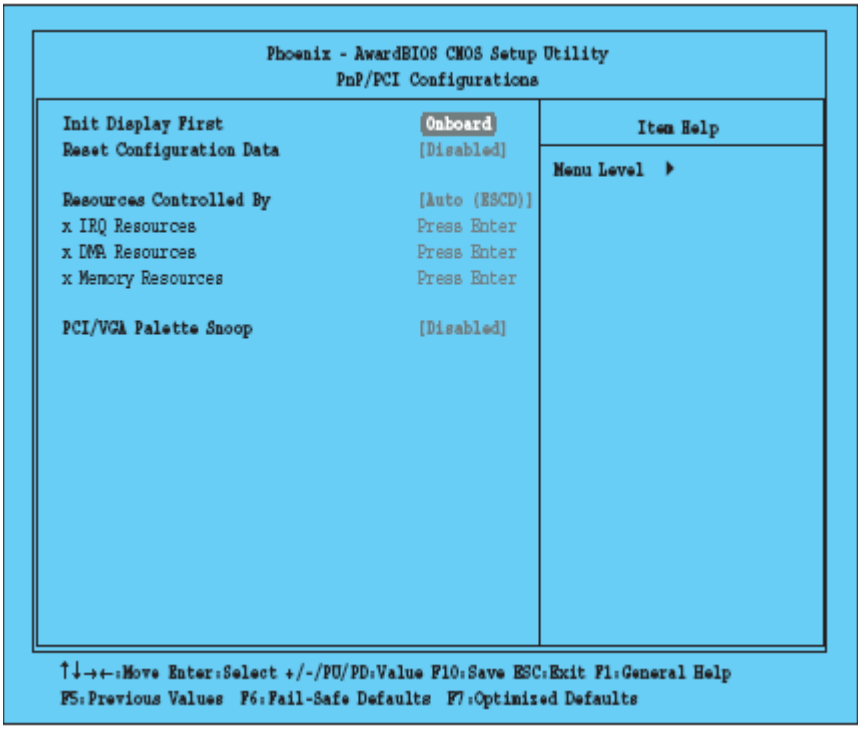
This setting allows the user to assign resources to LPT1 or disable the function and allow using an FDD drive. Since share LPT1 and FDD share the same pins on the X3 connector, only one of them can be used at a time.

### 4.6.8 ECP Mode Use DMA

You can use this feature to select the DMA channel of your preference. The default value is Channel 3. You should only select the alternative value of Channel 1 if there's a DMA channel conflict with another device..

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## 4.7 PnP/PCI Configurations




This section describes the configuring of the PCI bus system. PCI, or Personal Computer Inter¬connect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

### 4.7.1 Init Display First

This item allows you to decide to activate either PCI Slot VGA controller or the integrated onboard VGA controller

### 4.7.2 Reset Configuration Data

Normally, this field is left Disabled. Select Enabled to reset ESCD (Extended System Configura¬tion Date) upon exiting Setup if a new add-on has been installed and the system reconfiguration has

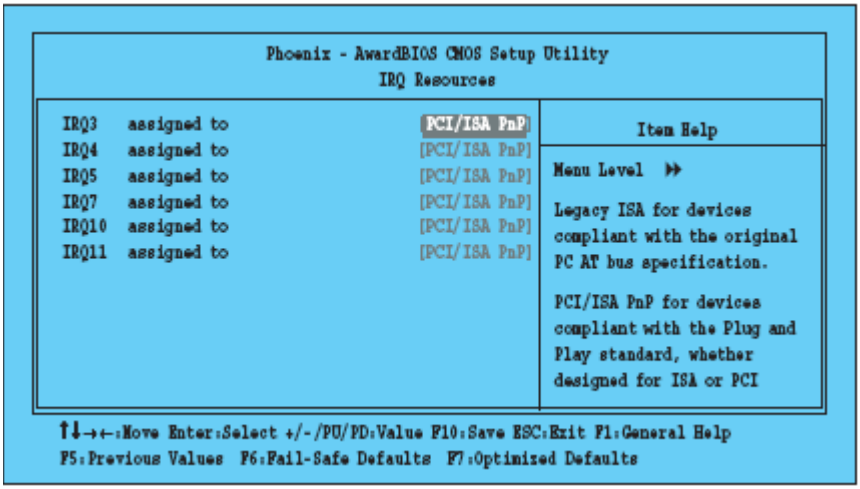
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caused such a serious conflict that the operating system cannot boot.

### 4.7.3 Resource Controlled By

The Award Plug and Play BIOS can automatically configure all the boot and Plug-and-Play compatible devices. If Auto is selected, all interrupt requests (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them. If selected manual than three configuration menus (IRQ, DMA and Memory) become available.

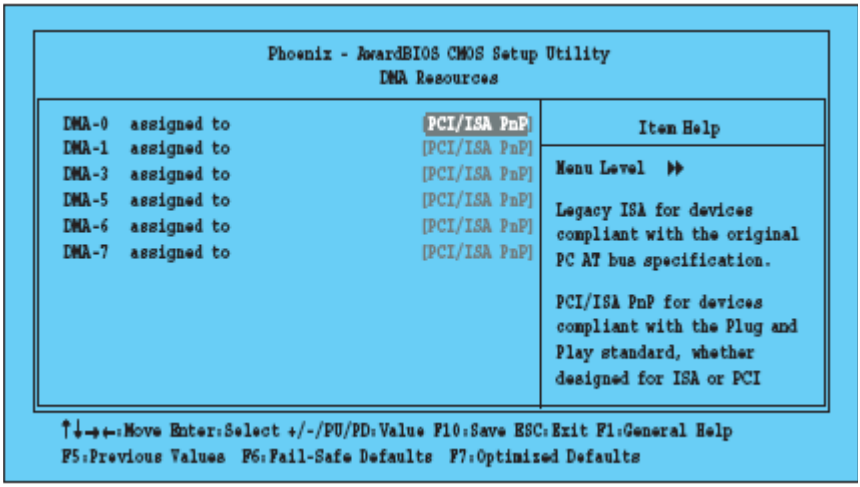
### 4.7.4 IRQ Resources




**Legacy ISA** for devices compliant with the original PC/AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP for devices that comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

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### 4.7.5 DMA Resources

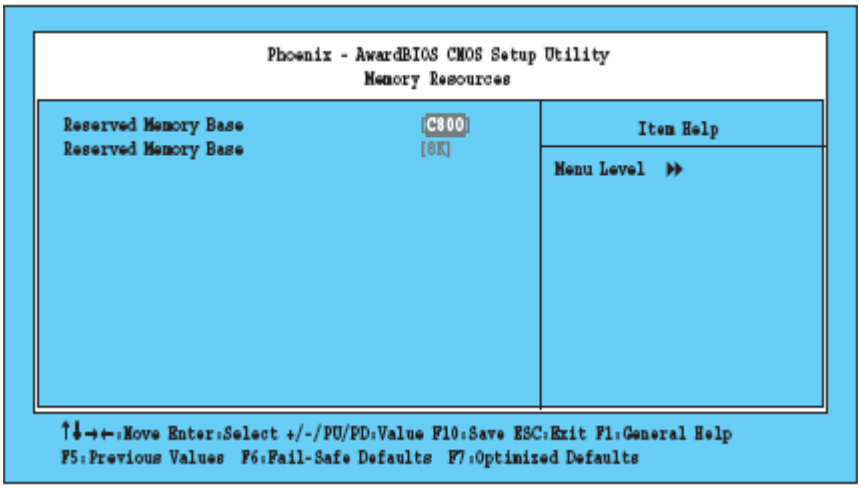



**Legacy ISA** for devices compliant with the original PC/AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP for devices that comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture. architecture.

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### 4.7.6 Memory Resources

The memory resource menu allows you to exclude memory from being used by the system. In the menu you can both set the start address as well as the memory length.




Select a base address for the memory area used by any peripheral that requires high memory.

For **Reserved Memory Base** the values are : N/A, C800, CC00, D000, D400, D800, DC00

For **Reserved Memory Length** the values are : 8K, 16K, 32K and 64K

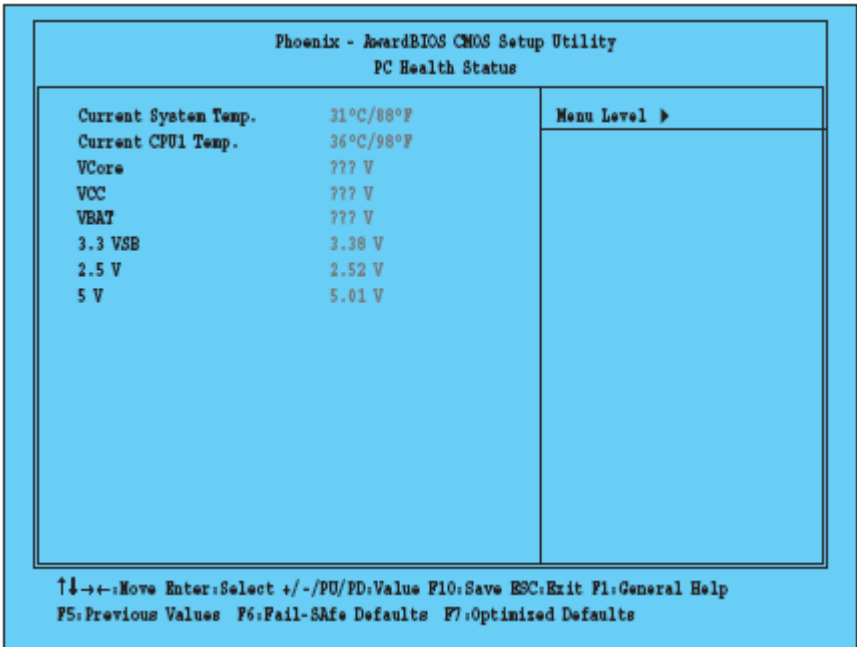
### 4.7.7 PCI VGA Palette Snoop

This is a legacy feature. The VGA "palette" is the set of colors that are in use by the video card when it is in 256-color mode. Since there are thousands of colors and only 256 can be used in that mode, a palette containing the current colors is used. Some special VGA cards, high-end hardware MPEG decoders etc. need to be able to look at the video card's VGA palette to deter¬mine what colors are currently in use. Enabling this feature turns on this palette "snoop".

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This option is only very rarely needed. It should be left at "Disabled" unless a video device specifically requires the setting enabled upon installation.

## 4.8 PC Health Status




### 4.8.1 Current System Temp.

Displays the current system temperature measured on the rear side of the module

### 4.8.2 Current CPU1 Temp.

Displays the current CPU temperature measured on the CPU.

### 4.8.3 Vcore, VCC, VBAT, 3.3 VSB, 2.5 V and 5V

Displays the actual voltage levels on the board.

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## 4.9 BIOS POST Messages

If BIOS detects an error during the Power On Self-Test (POST), it will prompt the user by either sounding a beep code or displaying a message. If a message is displayed, it will be accompanied by:

**PRESS F1 TO CONTINUE, OR DEL TO ENTER SETUP**

### 4.9.1 POST Beep

Currently there are two kinds of beep codes in BIOS :

- This first beep code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.
- The second beep code indicates that a DRAM error has occurred. This beep code consists of a repeated single long beep.

### 4.9.2 Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST.

**CMOS CHECKSUM ERROR - DEFAULTS LOADED**

Checksum of CMOS is incorrect. This may indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

**DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER**

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Reboot the system.

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### DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

### DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

### FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

### KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

### OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

### OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

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### PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

### PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-Maskable Interrupt condition during boot, you can choose to disable the NMI and continue to boot, or you can reboot the system with NMI enabled.

### RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

### SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ..

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

### Memory test fail.

BIOS reports the memory test as failed if the onboard memory test results in an error.

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## 4.10 BIOS POST Codes

### 4.10.1 Normal POST Codes

| POST (hex) | Name | Description |
|---|---|---|
| C0 | Turn Off Chipset And CPU test | OEM Specific-Cache control cache<br>Processor Status (1FLAGS) Verification. Tests the following processor status flags: Carry, zero, sign, overflow, The BIOS sets each flag, verifies They are set, then turns each flag off and verifies it is off.<br>Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00. RAM must be periodically refreshed to keep the memory from decaying. This function ensures that the memory refresh function is working properly. |
| C1 | Memory Presence | First block memory detect OEM Specific-Test to size on-board memory. Early chip set initialization Memory presence test OEM chip set routines Clear low 64K of memory Test first 64K memory. |
| C2 | Early Memory Initialization | OEM Specific- Board Initialization |
| C3 | Extend Memory DRAM select | OEM Specific- Turn on extended memory Initialization<br>Cyrix CPU Initialization<br>Cache initialization |

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| POST (hex) | Name | Description |
|---|---|---|
| C4 | Special Display Handling | OEM Specific- Display/Video Switch Handling so that Switch Handling display switch errors never occurs |
| C5 | Early Shadow | OEM specific- Early shadow enable for fast boot |
| C6 | Cache presence | External cache size detection test |
| CF | CMOS Check | CMOS checkup |
| B0 | Spurious | If interrupt occurs in protected mode |
| B1 | Unclaimed NMI | If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot |
| BF | Program Chip Set | To program chipset from defaults values |
| E1-EF | Setup Pages | E1- Page 1, E2 - Page 2, etc. |

| POST (hex) | Name | Description |
|---|---|---|
| 1 | Force load Default | Chipset defaults program to chipset |
| 2 | Reserved | |
| 3 | Early Superio Init | Early Initialized the super IO |
| 4 | Reserved | |
| 5 | Blank video | Reset Video controller |
| 6 | Reserved | |
| 7 | Init KBC | Keyboard controller init |
| 8 | KB test | Test the Keyboard |
| 9 | Reserved | |
| A | Mouse Init | Initialized the mouse |
| B | Onboard Audio init | Onboard audio controller initialize if exist |
| C | Reserved | |
| D | Reserved | |

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| POST (hex) | Name | Description |
|---|---|---|
| E | CheckSum Check | Check the intergraty of the ROM,BIOS and message |
| F | Reserved | |
| 10 | Auto detec EEPROM | Check Flash type and copy flash write/erase routines to 0F000h segments |
| 11 | Reserved | |
| 12 | Cmos Check | Check Cmos Circuitry and reset CMOS |
| 13 | Reserved | |
| 14 | Chipset Default load | Program the chipset registers with CMOS values |
| 15 | Reserved | |
| 16 | Clock Init | Init onboard clock generator |
| 17 | Reserved | |
| 18 | Identify the CPU | Check the CPU ID and init L1/L2 cache |
| 19 | Reserved | |
| 1A | Reserved | |
| 1B | Setup Interrupt | Initialize first 120 interrupt Vector Table vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL |
| 1C | Reserved | |
| 1D | Early PM Init | First step initialize if single CPU onboard |
| 1E | Reserved | |
| 1F | Re-initial KB | Re-init KB |
| 20 | Reserved | |
| 21 | HPM init If support HPM, HPM get initialized here | |
| 22 | Reserved | |
| 23 | Test CMOS Interface and Battery Status | Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS |

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| POST (hex) | Name | Description |
|---|---|---|
| 24 | Reserved | |
| 25 | Reserved | |
| 26 | Reserved | |
| 27 | KBC final Init | Final Initial KBC and setup BIOS data area |
| 28 | Reserved | |
| 29 | Initialize Video | Read CMOS location 14h to find out Interface type of video in use. Detect and Initialize Video Adapter. |
| 2A | Reserved | |
| 2B | Reserved | |
| 2C | Reserved | |
| 2D | Video memory test | Test video memory, write sign-on message to screen Setup shadow RAM - Enable shadow according to Setup. |
| 2E | Reserved | |
| 2F | Reserved | |
| 30 | Reserved | |
| 31 | Reserved | |
| 32 | Reserved | |
| 33 | PS2 Mouse setup | Setup PS2 Mouse and reset KB |
| 34 | Reserved | |
| 35 | Test DMA Controller 0 Reserved | Test DMA channel 0 |
| 36 | Reserved | |
| 37 | Test DMA Controller 1 Reserved | Test DMA channel 1 |
| 38 | Reserved | |
| 39 | Test DMA Page Registers | Test DMA Page Registers. |
| 3A | Reserved | |
| 3B | Reserved | |
| 3C | Test Timer Counter 2 | Test 8254 Timer 0 Counter 2. |

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| POST (hex) | Name | Description |
|---|---|---|
| 3D | Reserved | |
| 3E | Test 8259-1 Mask Bits | Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines. |
| 3F | Reserved | |
| 40 | Test 8259-2 Mask Bits | Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines. |
| 41 | Reserved | |
| 42 | Reserved | |
| 43 | Test Stuck 8259's Interrupt Bits | Turn off interrupts then verify no interrupt mask register is on. |
| | Test 8259 Interrupt Functionality | Force an interrupt and verify the interrupt occurred. |
| 44 | Reserved | |
| 45 | Reserved | |
| 46 | Reserved | |
| 47 | Set EISA Mode | If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag. |
| 48 | Reserved | |
| 49 | Size Base and Extended Memory | Size base memory from 256K to 640K and extended memory above 1MB. |
| 4A | Reserved | |
| 4B | Reserved | |
| 4C | Reserved | |
| 4D | Reserved | |

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| POST (hex) | Name | Description |
|---|---|---|
| 4E | Test Base and Extended Memory | Test base memory from 256K to 640K and extended memory above 1MB using various patterns.<br>NOTE: This test is skipped in EISA mode and can be skipped with ESC key in ISA mode. |
| 4F | Reserved | |
| 50 | USB init | Initialize USB controller |
| 51 | Reserved | |
| 52 | Memory Test | Test all memory of memory above 1MB using Virtual 8086 mode, page mode and clear the memory |
| 53 | Reserved | |
| 54 | Reserved | |
| 55 | CPU display | Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features |
| 56 | Reserved | |
| 57 | PnP Init | Display PnP logo and PnP early init |
| 58 | Reserved | |
| 59 | Setup Virus Protect | Setup virus protect according to Setup |
| 5A | Reserved | |
| 5B | Awdflash Load | If required, will auto load Awdflash.exe in POST |
| 5C | Reserved | |
| 5D | Onboard I/O Init | Initializing onboard superIO |
| 5E | Reserved | |
| 5F | Reserved | |
| 60 | Setup enable | Display setup message and enable setup functions |

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| POST (hex) | Name | Description |
|---|---|---|
| 61 | Reserved | |
| 62 | Reserved | |
| 63 | Initialize & | Detect if mouse is present, Install Mouse initialize mouse, install interrupt vectors. |
| 64 | Reserved | |
| 65 | PS2 Mouse special | Special treatment to PS2 Mouse port |
| 66 | Reserved | |
| 67 | ACPI init | ACPI sub-system initializing |
| 68 | Reserved | |
| 69 | Setup Cache Controller | Initialize cache controller. |
| 6A | Reserved | |
| 6B | Setup Entering | Enter setup check and auto configuration check up |
| 6C | Reserved | |
| 6D | Initialize Floppy Drive & Controller | Initialize floppy disk drive controller and any drives. |
| 6E | Reserved | |
| 6F | FDD install | Install FDD and setup BIOS data area parameters |
| 70 | Reserved | |
| 71 | Reserved | |
| 72 | Reserved | |
| 73 | Initialize Hard Drive & Controller | Initialize hard drive controller and any drives. |
| 74 | Reserved | |
| 75 | Install HDD | IDE device detection and install |
| 76 | Reserved | |
| 77 | Detect & Initialize Serial/Parallel Ports | Initialize any serial and parallel ports (also game port). |
| 78 | Reserved | |
| 79 | Reserved | |

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| POST (hex) | Name | Description |
|---|---|---|
| 7A | Detect & Initialize Math Coprocessor | Initialize math coprocessor. |
| 7B | Reserved | |
| 7C | HDD Check for Write protection | HDD check out |
| 7D | Reserved | |
| 7E | Reserved | |
| 7F | POST error check | Check POST error and display them and ask for user intervention |
| 80 | Reserved | |
| 81 | Reserved | |
| 82 | Security Check | Ask password security (optional). |
| 83 | Write CMOS | Write all CMOS values back to RAM and clear screen. |
| 84 | Pre-boot Enable | Enable parity checker<br>Enable NMI, Enable cache before boot. |
| 85 | Initialize Option ROMs | Initialize any option ROMs present from C8000h to EFFFFh.<br>NOTE: When FSCAN option is enabled,<br>ROMs initialize from C8000h to F7FFFh. |
| 86 | Reserved | |
| 87 | Reserved | |
| 88 | Reserved | |
| 89 | Reserved | |
| 8A | Reserved | |
| 8B | Reserved | |
| 8C | Reserved | |
| 8D | Reserved | |
| 8E | Reserved | |
| 8F | Reserved | |

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| POST (hex) | Name | Description |
|---|---|---|
| 90 | Reserved | |
| 91 | Reserved | |
| 92 | Reserved | |
| 93 | Boot Medium detection | Read and store boot partition head and cylinders values in RAM |
| 94 | Final Init | Final init for last micro details before boot |
| 95 | Special KBC patch | Set system speed for boot Setup NumLock status according to Setup |
| 96 | Boot Attempt | Set low stack Boot via INT 19h. |
| FF | Boot | |

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# 5 Watchdog Timer

The NuPRO-796 implements a watchdog timer embedded in the LPC based SMSC SCH3112 Super I/O controller.

The Watchdog timer contains of a one-second/minute resolution down counter. The Watchdog output is connected to "RESET".

When the system hangs up without software re-trigger, the system will be reset. So basically this is a watchdog timer that has a 1 second granularity up to 255 seconds or a 1 minute granularity up to 255 minutes. Optionally any movement of keyboard, mouse can reload the timer value and restart the countdown process. Countdown can be stopped by writing the value 0 to the value register.

To configure the registers, the following sequence should be followed :

1. Writing 0Eh to IO port 847h to setup WDT mode (standard mode on booting is WDT-off or GPIO mode 01h value in 847h)
2. Writing 06h to IO port 867h to enable reset of countdown by mosue/keyboard interrupt
3. Writing 80h (minutes) or 00h (seconds) to IO port 865h to configure the granularity
4. START Counter : write value 1~255 to IO port 866h to set timer value and start countdown
5. RESET Counter : write any 1~255 to IO port 866h to reset timer value and start countdown
6. STOP Counter : write any 0 (zero) to IO port 866h to stop countdown and disable WDT

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```
void main()
{
unsigned charTimeOut_Val=0,Mode=3;

printf("SMSC SIO3112 Watch-Dog Function test
     utility.\n\n");

while((Mode > 2)||(Mode==0))

{
 printf("Please select the unit(1:Min, 2:Sec):");
 scanf("%d",&Mode);

}

switch(Mode)
{
 case 1:
 while((TimeOut_Val==0)||(TimeOut_Val > 255))
{

 printf("Min.(1-
     255):");scanf("%d",&TimeOut_Val);
}
break;

 case 2:
while((TimeOut_Val==0)||(TimeOut_Val > 255))
{

 printf("Sec.(1-
     255):");scanf("%d",&TimeOut_Val);
}
break;

}


if(Mode==1) Mode=0;

else

_asm
```

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```
{

mov
mov
out

out

mov
mov
out

out

mov
mov
out

}

}

Mode=0x80;

dx,0x847 //WDT_EN_REG
al,0x0E //WDT enable and invert
dx,al
0xeb,al
dx,0x865 //WDT_MOD_REG
al,Mode
dx,al
0xeb,al
dx,0x866 //WDT_VAL_REG

al,TimeOut_Val
dx,al
```

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# 6 Appendix

## 6.1 Onboard DIP switch

### 6.1.1 Location & Function

A board configuration DIP switch is located on the right side of the board just over the CF card socket

The DIP switch can be used to configure Master/Slave mode for the onboard CF card or configure CRT or TFT mode for display.

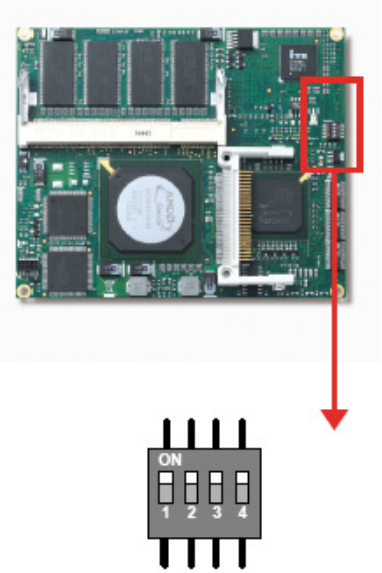
### 6.1.2 Onboard CF Card setting

The NuPRO-796 supports only one IDE channel. When setting the onboard CF card as MASTER than no other device can be connected as a SLAVE. This is due to limitations in the ETX pinout.

If a Master / Slave combination is need with CF card (Master) and Harddisk (Slave) than both devices have to be connected to the external IDE coming from the X4 connector. In this case Switch 2 has to be set to OFF!

| Switch | ON | OFF |
|---|---|---|
| 2 | Onboard CF is Master | Onboard CF is Slave (or disable onboard CF) |


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### 6.1.3 Flat Panel / CRT settings

TFT LVDS mode or CRT mode can be selected here. Note that TFT LVDS can support dual and single channel LVDS.

| Switch | ON | OFF |
|---|---|---|
| 1 | CRT Mode | TFT (LVDS) mode |
| 4 | Dual channel LVDS | Single channel LVDS |
| | | |

**Switch 3 is not used but should always bet set to ON!**


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# Important Safety Instructions

Please read and follow all instructions marked on the product and in the documentation before operating the system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User's Manual for future reference.
- The equipment should be operated in an ambient temperature between 0 to 50°C.
- The equipment should be operated only from the type of power source indicated on the rating label. Make sure the voltage of the power source is correct when connecting the equipment to the power outlet.
- If the user's equipment has a voltage selector switch, make sure that the switch is set to the proper position for the area. The voltage selector switch is set at the factory to the correct voltage.
- For pluggable equipment, ensure they are installed near a socket-outlet that is easily accessible.
- Secure the power cord to prevent unnecessary accidents. Do not place anything over the power cord.
- If the equipment will not be in use for long periods of time, disconnect the equipment from mains to avoid being damaged by transient overvoltage.
- All cautions and warnings on the equipment should be noted.
- Please keep this equipment away from humidity.
- Do not use this equipment near water or a heat source.
- Place this equipment on a reliable surface when installing. A drop or fall could cause injury.
- Never pour any liquid into the opening, this could cause fire or electrical shock.

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- Openings in the case are provided for ventilation. Do not block or cover these openings. Make sure there is adequate space around the system for ventilation when setting up the work area. Never insert objects of any kind into the ventilation openings.
- To avoid electrical shock, always unplug all power and modem cables from the wall outlets before removing covers.
- Lithium Battery provided (real time clock battery)

  **"CAUTION - Risk of explosion if battery is replaced by an incorrect type. Dispose used batteries as instructed in the instructions"**
- The equipment should be checked by service personnel if one of the following situation arises:
  - The power cord or plug is damaged.
  - Liquid has penetrated the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is not functioning or does not function according to the user's manual.
  - The equipment has been dropped and damaged.
  - If the equipment has obvious sign of breakage.
- Never open the equipment. For safety reasons, the equipment should only be opened by qualified service personnel.

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# Warranty Policy

Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ADLINK's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: http://rma.adlinktech.com/policy/.
2. All ADLINK products come with a limited two-year warranty, one year for products bought in China:
   - The warranty period starts on the day the product is shipped from ADLINK's factory.
   - Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
   - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ADLINK is not responsible for any loss of data.
   - Please ensure the use of properly licensed software with our systems. ADLINK does not condone the use of pirated software and will not service systems using such software. ADLINK will not be held legally responsible for products shipped with unlicensed software installed by the user.
   - For general repairs, please do not include peripheral accessories. If peripherals need to be included, be certain to specify which items you sent on the RMA Request & Confirmation Form. ADLINK is not responsible for items not listed on the RMA Request & Confirmation Form.

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3. Our repair service is not covered by ADLINK's guarantee in the following situations:
   - Damage caused by not following instructions in the User's Manual.
   - Damage caused by carelessness on the user's part during product transportation.
   - Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
   - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
   - Damage caused by leakage of battery fluid during or after change of batteries by customer/user.
   - Damage from improper repair by unauthorized ADLINK technicians.
   - Products with altered and/or damaged serial numbers are not entitled to our service.
   - This warranty is not transferable or extendible.
   - Other categories not protected under our warranty.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website: http://rma.adlinktech.com/policy. Damaged products with attached RMA forms receive priority.

If you have any further questions, please email our FAE staff: service@adlinktech.com.

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