NuPRO-796

ETX PICMG 1.0
Half-Size SBC
User's Manual

Manual Rev.	2.00
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Company/Organization	
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Product Information	
Product Model	
Environment	OS: M/B: CPU: Chipset: Bios:

Please give a detailed description of the problem(s):

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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

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

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

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")

1.4 NuPRO-796 Functional Diagram
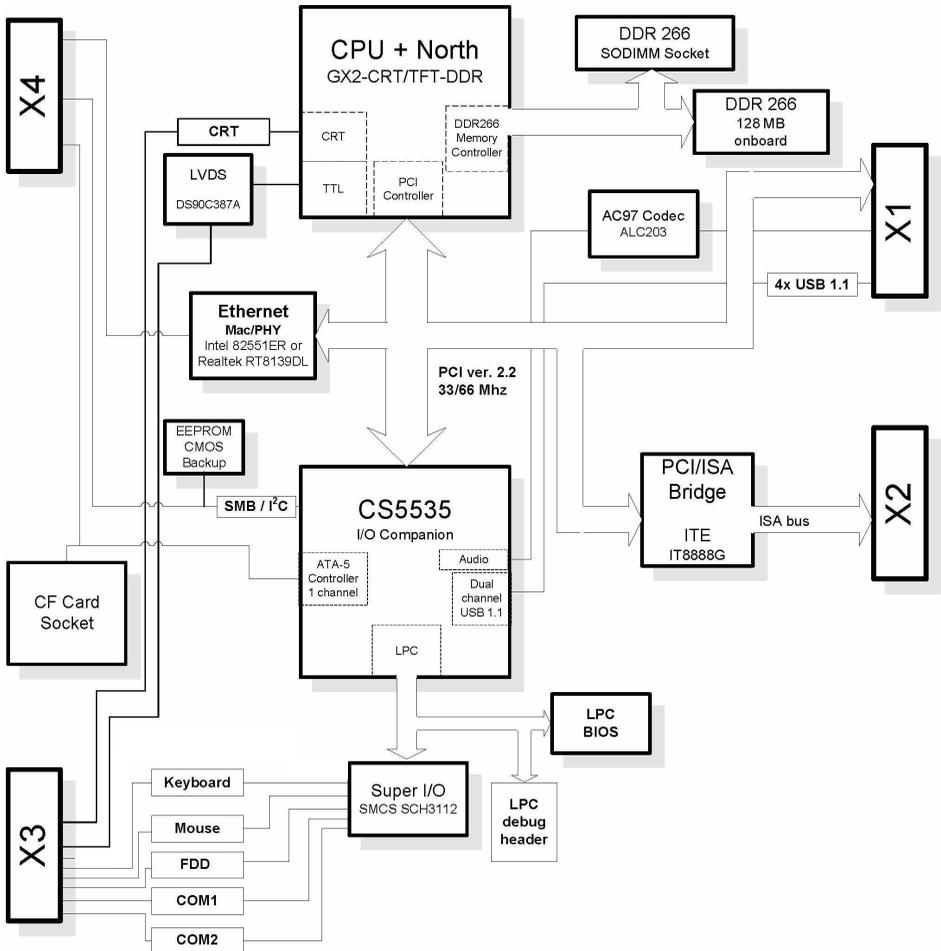
Figure 1-1: NuPRO-796 Block Diagram

1.5 NuPRO-796 Mechanical Diagram
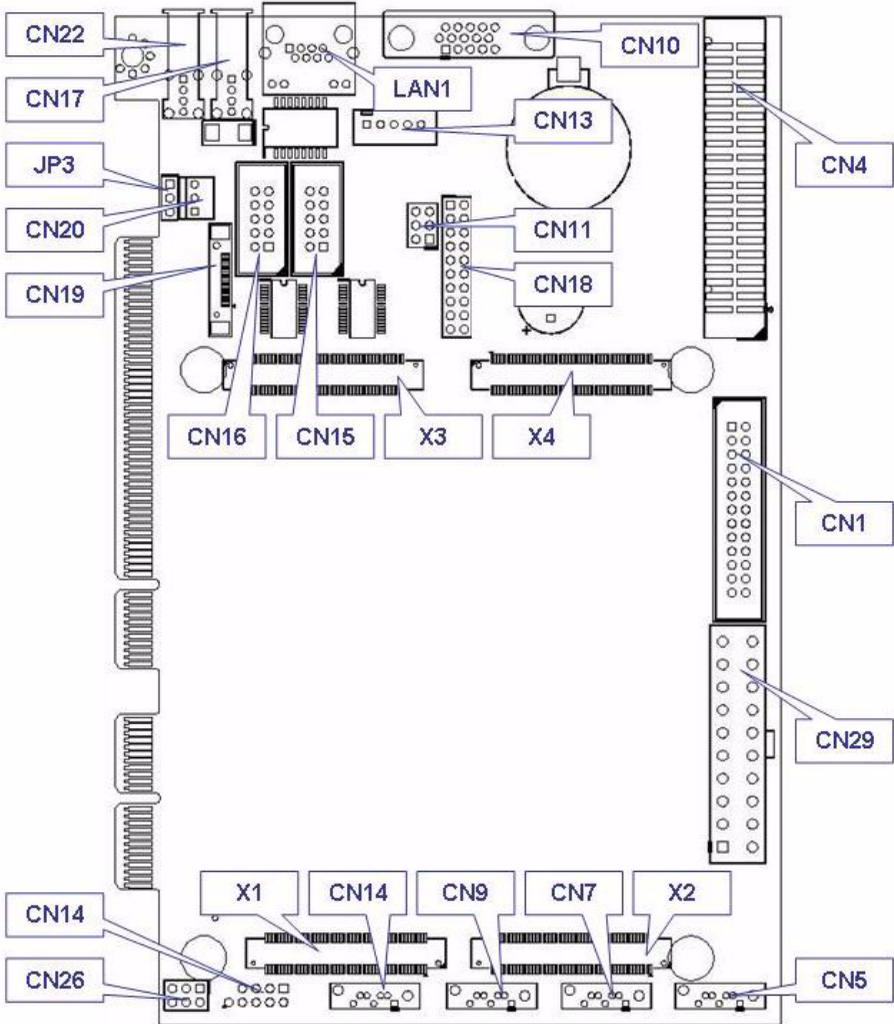
Figure 1-2: NuPRO-796 Carrier Board Layout

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.

2.1.1 VGA Connector (CN10)
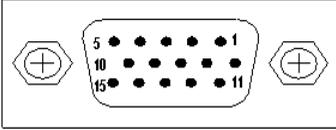
Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
+5V	9	10	GND
N.C.	11	12	DDCDAT
HSYNC	13	14	VSYNC
DDCCLK	15		

2.1.2 USB Connector (CN17, CN22)
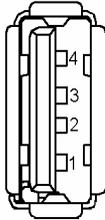
PIN	SIGNAL
1	VCC
2	USB-
3	USB+
4	Ground

2.1.3 Keyboard and Mouse (CN11)
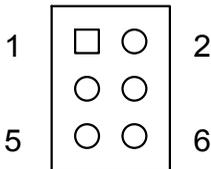
Pin	Signal Name
1	Keyboard Data
2	Keyboard Clock
3	Mouse Data
4	Mouse Clock
5	Power
6	Ground

2.1.4 COM Pin Header (CN15, CN16)
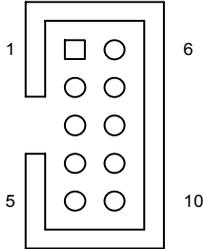
Pin	RS-232
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator

2.1.5 Parallel Port (CN1)
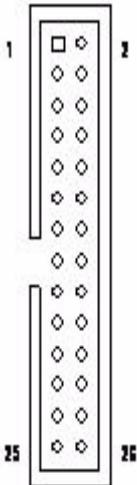
Signal Name	Pin	Pin	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, 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

2.1.6   IDE (CN4)
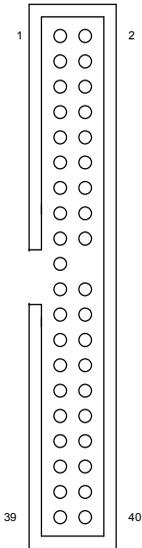
Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	GND
IDE Data 7	3	4	IDE Data 8
IDE Data 6	5	6	IDE Data 9
IDE Data 5	7	8	IDE Data 10
IDE Data 4	9	10	IDE Data 11
IDE Data 3	11	12	IDE Data 12
IDE Data 2	13	14	IDE Data 13
IDE Data 1	15	16	IDE Data 14
IDE Data 0	17	18	IDE Data 15
Ground	19	20	KEY
DREQ0	21	22	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

2.1.7 USB Pin Header (CN24)
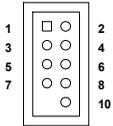
Signal Name	Pin	Pin	Signal Name
USB1_VCC	1	2	USB2_VCC
USB1-	3	4	USB2-
USB1+	5	6	USB2+
GND	7	8	GND
	10	KEY	

2.1.8 Serial ATA Connector (CN5, CN7, CN9, CN14)
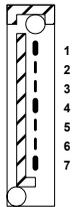
Pin	Signal Name
1	GND
2	Tx+
3	Tx-
4	GND
5	Rx-
6	Rx+
7	GND

2.1.9 LDVS Connector (CN19)
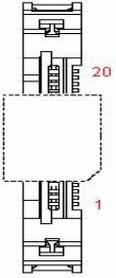
Pin	Signal Name	Pin	Signal Name
1	+3V	11	Txout2#
2	+3V	12	Txout2
3	GND	13	GND
4	GND	14	Txclk#
5	Txout0#	15	Txclk
6	Txout0	16	GND
7	GND	17	Txout3#
8	Txout1#	18	Txout3
9	Txout1	19	GND
10	GND	20	Panel Detect

2.1.10 Miscellaneous Connector (CN18)
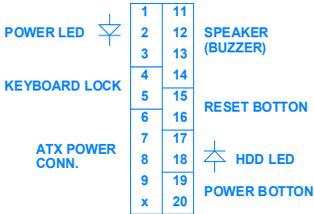
Signal Name	Pin	Pin	Signal Name
PW_LED+	1	11	BUZZER
NC	2	12	NC
PW_LED-	3	13	NC
KB_LOCK	4	14	+5V
GND	5	15	PW_GD
GND	6	16	GND
NC	7	17	HDD_LED-
PS_ON	8	18	HDD_LED+
5VSB	9	19	PW_BTN
PME#	10	20	GND

2.1.11 Fan Connector (CN20)

Pin	Signal Name
1	NC
2	+12V
3	GND

2.1.12 Audio-Out Pin Header (CN26)
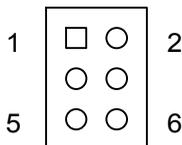
Pin	Signal Name
1	MIC In
2	ASGND
3	Line In Left
4	Line In Right
5	Line Out Left
6	Line Out Right

2.1.13 ATX Power Connector (CN29)
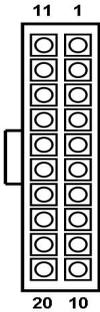
Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWRGOOD	18	-5V
9	STB5V	19	+5V
10	+12V	20	+5V

2.1.14 ETX Connector

X4
- Ethernet
- IDE1 / IDE2
- Power Signals
- Speaker, Battery
- I^{2}C & SMB bus

X2
- ISA bus

ETX Core Module (top view)
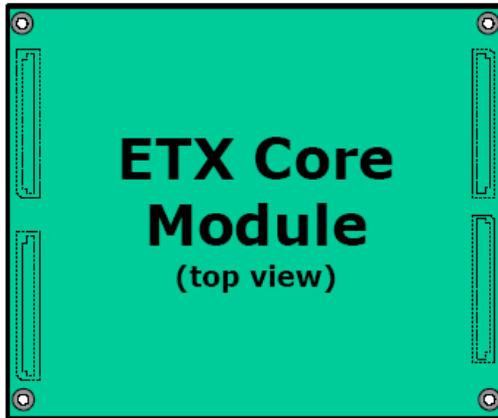
X3
- VGA / LCD/ Video
- COM1 / COM2
- LPT1
- IrDA
- Mouse
- Keyboard

X1
- 32-bit PCI bus
- USB
- Audio

2.1.15 ETX X1 Connector (PCI Bus, USB, Audio)
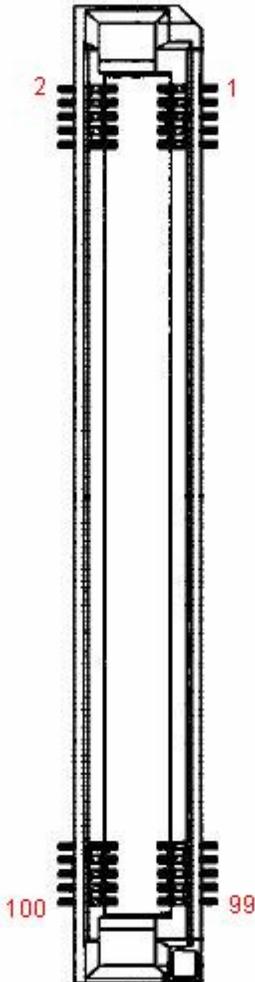
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	REQ3#	10	GNT3#
11	GNT2#	12	3V3
13	REQ2#	14	GNT1#
15	REQ1#	16	3V3
17	GNT0#	18	RESERVED
19	VCC	20	VCC
21	SERIRQ	22	REQ0#
23	AD0	24	3V3
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	C/BE0#	32	AD7
33	AD8	34	AD9
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

2.1.16 ETX X2 Connector (ISA Bus)
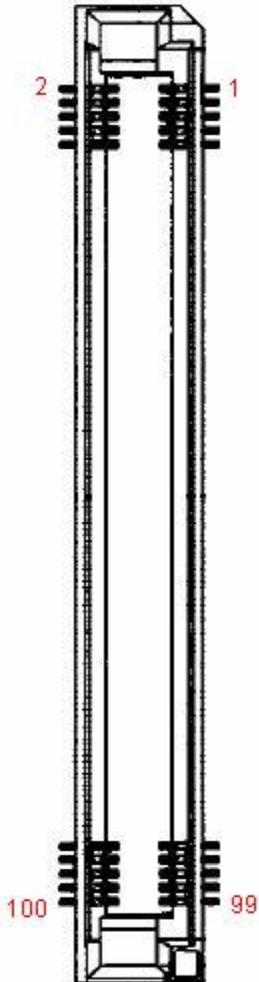
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	MASTER#
7	SD12	8	DREQ7
9	SD11	10	DACK7#
11	SD10	12	DREQ6
13	SD9	14	DACK6#
15	SD8	16	DREQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DREQ0
21	LA17	22	DACK0#
23	LA18	24	IRQ14
25	LA19	26	IRQ15
27	LA20	28	IRQ12(1)
29	LA21	30	IRQ11
31	LA22	32	IRQ10
33	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

2.1.17 ETX X3 Connector (Video, COM, misc. I/O)
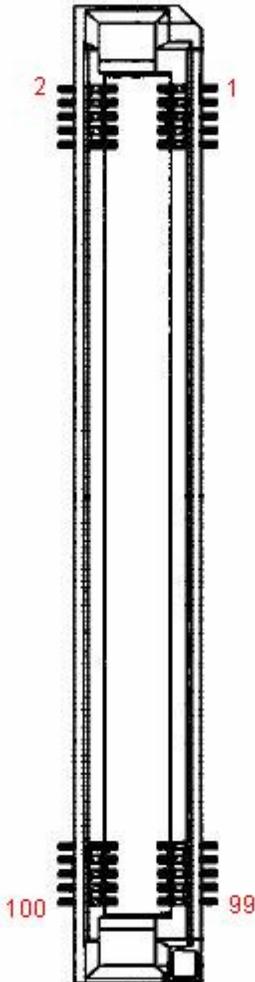
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	RED	4	BLUE
5	HSYNC	6	GREEN
7	VSYNC	8	DDC2B_CLK
9	PAL_DETECT#	10	DDC2B_DAT
11	LCDDO16	12	LCDDO18
13	LCDDO17	14	LCDDO19
15	GND	16	GND
17	LCDDO13	18	LCDDO15
19	LCDDO12	20	LCDDO14
21	GND	22	GND
23	LCDDO8	24	LCDDO11
25	LCDDO9	26	LCDDO10
27	GND	28	GND
29	LCDDO4	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

2.1.18 ETX X4 Connector (Ethernet, IDE, Power, I^{2}C & SMB)
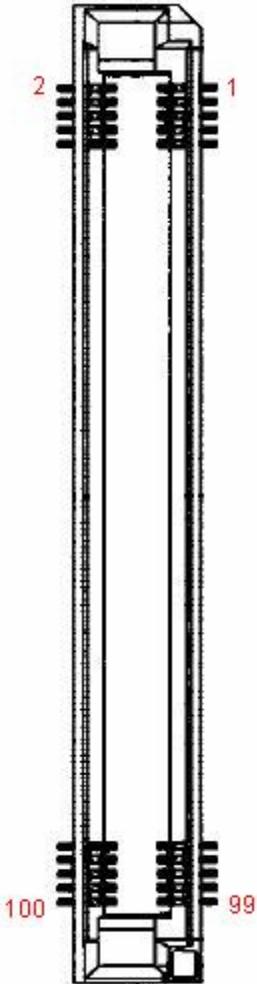
Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	5V_SB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	BATT
9	KBINH	10	LILED
11	RSMRST#	12	ACTLED
13	ROMKBCS#(1)	14	SPDLED
15	EXT_PRG(1)	16	I2CLK
17	VCC	18	VCC
19	OVCR#	20	GPCS#(1)
21	EXTSMI#	22	I2DAT
23	SMBCLK	24	SMBDATA
25	SIDE_CS3#	26	SMBALRT#
27	SIDE_CS1#	28	DASP_S(1)
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

2.2 Jumper Settings

2.2.1 Panel Power Selection (JP3)

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

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).

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

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.

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

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.

```
         CMOS SETUP UTILITY - Copyright (C) 1984-2001 Award Software
     ┌──────────────────────────────────────────────────────────────────┐
     │ ▶ Standard CMOS Features        Load Fail-Safe Defaults           │
     │                                                                    │
     │ ▶ Advanced BIOS Features        Load Optimized Defaults            │
     │                                                                    │
     │ ▶ Advanced Chipset Features     Set Supervisor Password            │
     │                                                                    │
     │ ▶ Integrated Peripherals        Set User Password                  │
     │                                                                    │
     │ ▶ Power Management Setup         Save & Exit Setup                 │
     │                                                                    │
     │ ▶ PnP/PCI Configurations        Exit Without Saving                │
     │                                                                    │
     │ ▶ PC Health Status                                                 │
     ├──────────────────────────────────────────────────────────────────┤
     │ Esc: Quit                               ↑↓→← : Select Item         │
     │ F10: Save and Exit                                                 │
     ├──────────────────────────────────────────────────────────────────┤
     │                  Time, Date, Hard Disk Type                        │
     └──────────────────────────────────────────────────────────────────┘
```

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.

4.3 Standard CMOS Features

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

```
                Phoenix - AwardBIOS CMOS SETUP UTILITY
                         Standard CMOS Features

    Date: (mm:dd:yy)          Fri, Jun 09 2006            Item Help
    Time: (hh:mm:ss)          18:20:31

  ▶ IDE Primary Master       [None]            Change the day,  month,
  ▶ IDE Primary Slave        [None]            year and century



    Drive A                  [1.44, 3.5 in.]



    Video                    [EGA/VGA]
    Halt On         [All , but Keyboard]

    Base Memory              640K
    Extended Memory          383744K
    Total Memory             384512K


  ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
  F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

▶ *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

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.

IDE Primary Master/Slave Items

```
         CMOS SETUP UTILITY - Copyright (C) 1984-2001 Award Software
                          IDE Primary Master

    IDE HDD Auto-Detection     Press Enter              Item Help

    IDE Primary Master         [Auto]               Menu Level ▶▶
    Access Mode                [Auto]

    Capacity                   0 MB

    Cylinder                   0
    Head                       0
    Precomp                    0
    Landing Zone               0


   ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
    F5:Previous Values  F6:Fail-SAfe Defaults  F7:Optimized Defaults
```
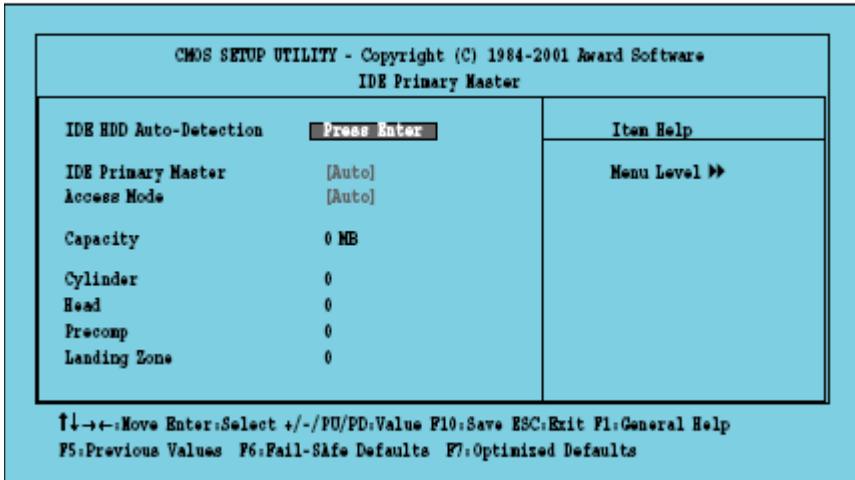
IDE HDD Auto-detection Press Enter

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

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

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.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                   Advanced BIOS Features

  CPU Internal Cache          [Enabled]        Item Help
  Quick Power On Self Test    [Disabled]
  First Boot device           [USB-FDD]     Menu Level   ▶
  Second Boot device          [HDD-0]
  Third Boot device           [CDROM]       Allows you to choose the
  Boot Other device           [Disabled]    VIRUS warning feature for
  Boot Up NumLock Status      [Off]         IDE Hard Disk boot sector
  Gate A20 Option             [Normal]      protection.  If this
  Typematic Rate Settings     [Disabled]    function is enabled and
  x Typematic Rate (Chars/Sec) 6            someone attempt to write
  x Typematic Delay (Msec)    6             data into this area, BIOS
  Security Option             [Setup]       will show a warning message
  OS Select for DRAM > 64MB   [Non-OS2]     on screen and alarm beep
  Console Redirection         [Disabled]
  x Baud Rate                 [19200]
  Agent Connect via           [NULL]
  Agent aftr boot             [Disabled]
  Summary Screen Show         [Disabled]


  ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
  F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

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

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

```
┌─────────────────────────────────────────┐
│  ┌───────────────────────────────────┐  │
│  │ First Boot Device                 │  │
│  │ ───────────────────────────────── │  │
│  │ LS120        ....   [ ]           │  │
│  │ HDD-0        ....   [ ]           │  │
│  │ SCSI         ....   [ ]           │  │
│  │ CDROM        ....   [█]           │  │
│  │ HDD-1        ....   [ ]           │  │
│  │ HDD-2        ....   [ ]           │  │
│  │ HDD-3        ....   [ ]           │  │
│  │ ZIP100       ....   [ ]           │  │
│  │ USB-FDD      ....   [ ]           │  │
│  │ USB-ZIP      ....   [ ]           │  │
│  │ USB-CDROM    ....   [ ]           │  │
│  │ USB-HDD      ....   [ ]           │  │
│  │ LAN          ....   [ ]           │  │
│  │ Disabled     ....   [ ]           │  │
│  │                                   │  │
│  │ ───────────────────────────────── │  │
│  │ ↑↓→←:Move Enter:Accept ESC:Abort  │  │
│  └───────────────────────────────────┘  │
└─────────────────────────────────────────┘
```
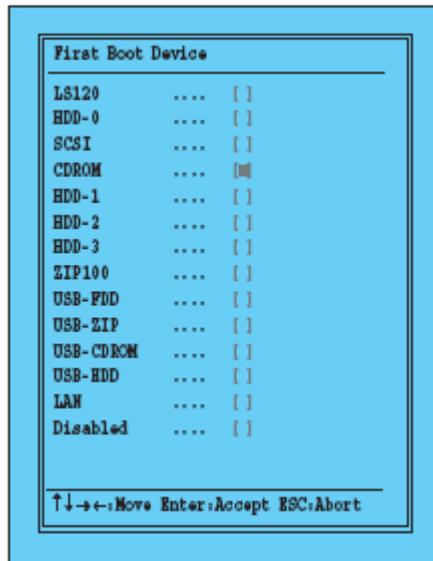
4.4.5 Boot Up NumLock Status

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

4.4.6 Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

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.

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.

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, DisableAdvanced Chipset Features

4.5 Advanced Chipset Features

```
                Phoenix - AwardBIOS CMOS Setup Utility
                      Advanced Chipset Features

  Video Memory Size              8M              Item Help

▶ Flat Panel Configuration    [Press Enter]    Menu Level  ▶
  Onboard Audio               [Enabled]




↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```
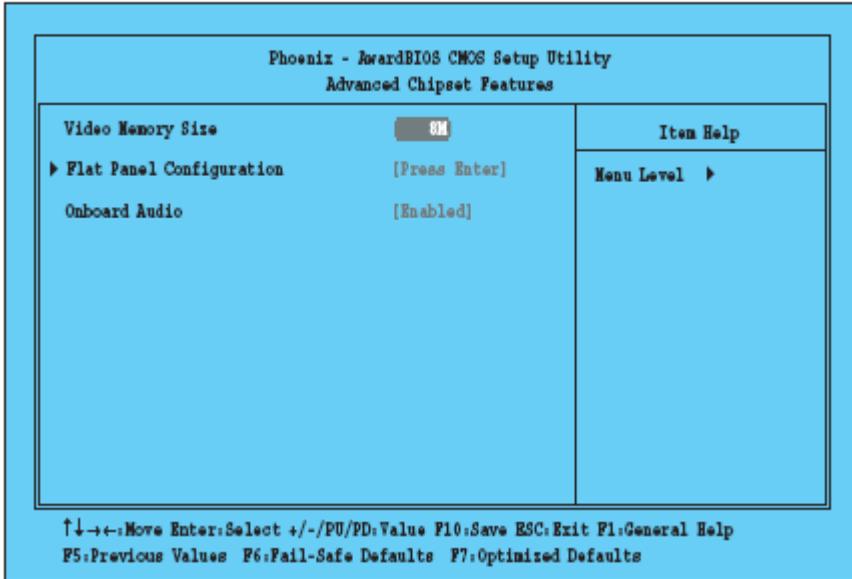
4.5.1 Video Memory Size

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.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                         Advanced Chipset Features
  Resolution                    1280x1024              Item Help

  ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
   F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```
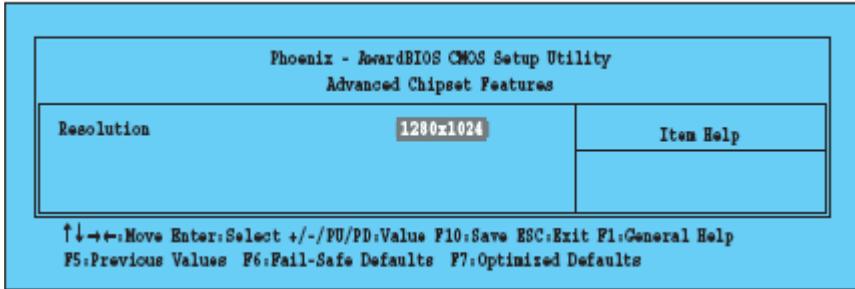
4.5.3   Onboard Audio

Enable or Disable

4.6 Integrated Peripherals

```
         Phoenix - AwardBIOS CMOS Setup Utility
                  Integrated Peripherals

 OnChip IDE Channel 1        [Enabled]          Item Help
 Master Drive PIO Mode       [Auto]
 Slave  Drive PIO Mode       [Auto]      Menu Level   ▶
 IDE Primary Master UDMA     [Auto]
 IDE Primary Slave UDMA      [Auto]      Allows you to choose the
 IDE HDD Block Mode          [Enabled]   VIRUS warning feature for
 Onboard Serial Port 1       [Auto]      IDE Hard Disk boot sector
 Onboard Serial Port 2       [Auto]      protection.  If this
 UART 2 Mode Select          [Normal]    function is enabled and
 LPT1 Setting / FDD          [378/ IRQ7] someone attempt to write
 Parallel Port Mode          [Normal]    data into this area, BIOS
 ECP Mode Use DMA            3           will show a warning message
                                         on screen and alarm beep



 ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
 F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

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

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..

4.7 PnP/PCI Configurations

```
             Phoenix - AwardBIOS CMOS Setup Utility
                    PnP/PCI Configurations
┌─────────────────────────────────────────┬──────────────────────┐
│  Init Display First          [Onboard]   │      Item Help       │
│  Reset Configuration Data    [Disabled]  │                      │
│                                          │   Menu Level   ▶     │
│  Resources Controlled By   [Auto (ESCD)] │                      │
│  x IRQ Resources           Press Enter   │                      │
│  x DMA Resources           Press Enter   │                      │
│  x Memory Resources        Press Enter   │                      │
│                                          │                      │
│  PCI/VGA Palette Snoop      [Disabled]   │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
└─────────────────────────────────────────┴──────────────────────┘
 ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
 F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

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 con-
troller or the integrated onboard VGA controller
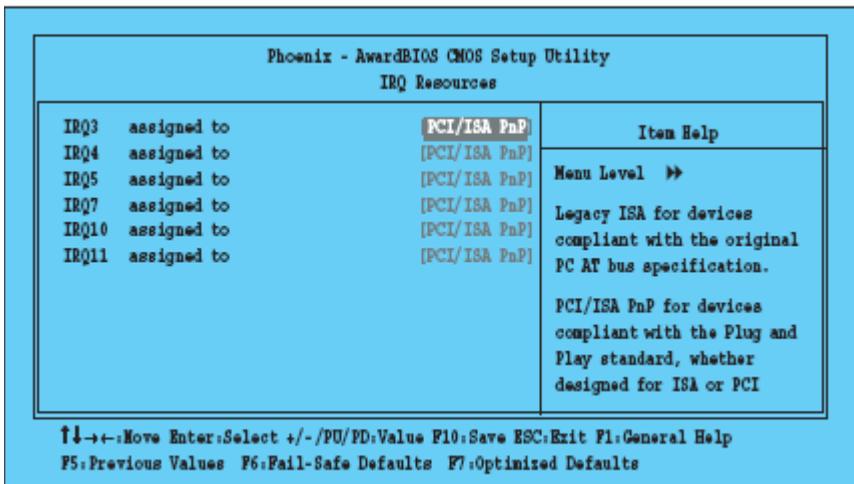
4.7.2 Reset Configuration Data

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

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


```
                    Phoenix - AwardBIOS CMOS Setup Utility
                                 IRQ Resources

    IRQ3    assigned to          [PCI/ISA PnP]         Item Help
    IRQ4    assigned to          [PCI/ISA PnP]
    IRQ5    assigned to          [PCI/ISA PnP]    Menu Level    ▶▶
    IRQ7    assigned to          [PCI/ISA PnP]
    IRQ10   assigned to          [PCI/ISA PnP]    Legacy ISA for devices
    IRQ11   assigned to          [PCI/ISA PnP]    compliant with the original
                                                  PC AT bus specification.

                                                  PCI/ISA PnP for devices
                                                  compliant with the Plug and
                                                  Play standard, whether
                                                  designed for ISA or PCI

    ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
    F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

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.

4.7.5 DMA Resources

```
          Phoenix - AwardBIOS CMOS Setup Utility
                       DMA Resources

  DMA-0  assigned to      PCI/ISA PnP           Item Help
  DMA-1  assigned to     [PCI/ISA PnP]
  DMA-3  assigned to     [PCI/ISA PnP]    Menu Level  ▶▶
  DMA-5  assigned to     [PCI/ISA PnP]
  DMA-6  assigned to     [PCI/ISA PnP]    Legacy ISA for devices
  DMA-7  assigned to     [PCI/ISA PnP]    compliant with the original
                                          PC AT bus specification.

                                          PCI/ISA PnP for devices
                                          compliant with the Plug and
                                          Play standard, whether
                                          designed for ISA or PCI

 ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
 F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```

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.

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.

```
                Phoenix - AwardBIOS CMOS Setup Utility
                          Memory Resources

    Reserved Memory Base              C800             Item Help

    Reserved Memory Base              [8K]
                                                  Menu Level  ▶▶










    ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
    F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults
```
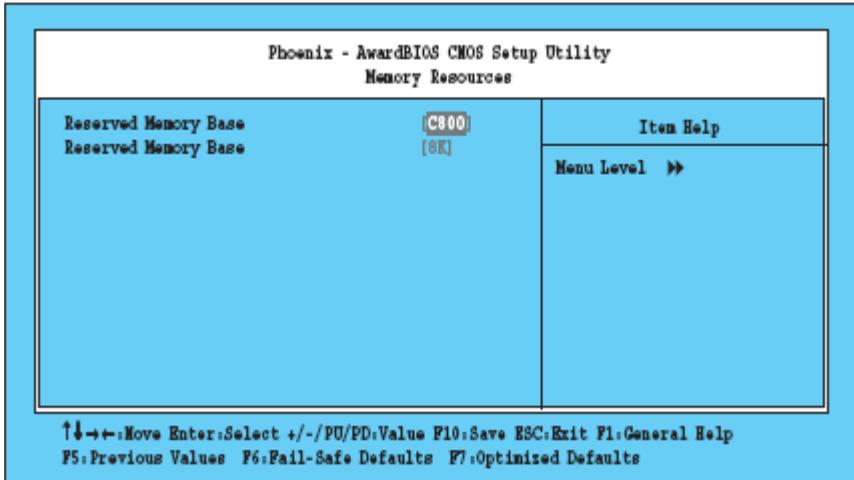
Select a base address for the memory area used by any peripheral that requires high memory.

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".

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


```
                    Phoenix - AwardBIOS CMOS Setup Utility
                              PC Health Status

   Current System Temp.        31°C/88°F          Menu Level  ▶
   Current CPU1 Temp.          36°C/98°F
   VCore                       ??? V
   VCC                         ??? V
   VBAT                        ??? V
   3.3 VSB                     3.38 V
   2.5 V                       2.52 V
   5 V                         5.01 V




   ↑↓→←:Move  Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
   F5:Previous Values  F6:Fail-SAfe Defaults  F7:Optimized Defaults
```

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.

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.

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 mono-chrome 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 key-board, 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.

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.

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 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. 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 Cyrix CPU Initialization Cache initialization

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	

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

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.

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	

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. 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

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 Enable NMI, Enable cache before boot.
85	Initialize Option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, 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	

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	

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

```
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
```

```
{

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
```

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)
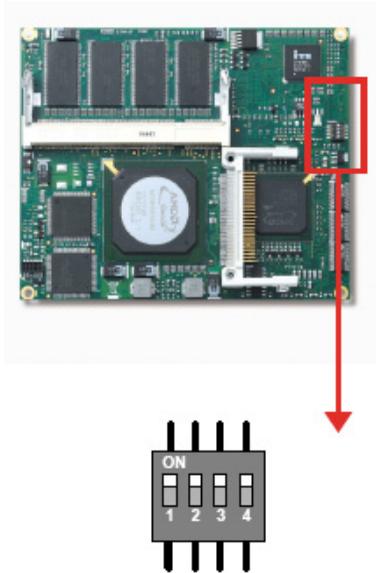
6.1.3 Flat Panel / CRT settings

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!

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.

► 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.

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.

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.