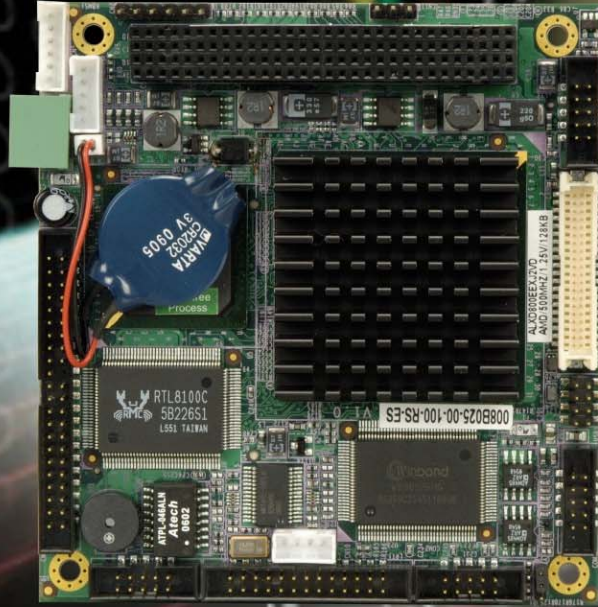




IEI Technology Corp.



MODEL: PM-LX-800

PC/104 AMD LX800 CPU Board

with on-board TTL, VGA and USB2.0

User Manual

Rev. 1.10 March 2007



REVISION HISTORY

Title	PM-LX-800 Motherboard	
Revision Number	Description	Date of Issue
1.0	Initial release	November 2006
1.10	<ul style="list-style-type: none">- Updated TTL LCD connector pinouts- Updated power consumption value	March 2007

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Glossary

AC '97	Audio Codec 97	HDD	Hard Disk Drive
ACPI	Advanced Configuration and Power Interface	IDE	Integrated Data Electronics
APM	Advanced Power Management	I/O	Input/Output
ARMD	ATAPI Removable Media Device	ICH4	I/O Controller Hub 4
ASKIR	Shift Keyed Infrared	L1 Cache	Level 1 Cache
ATA	Advanced Technology Attachments	L2 Cache	Level 2 Cache
BIOS	Basic Input/Output System	LCD	Liquid Crystal Display
CFII	Compact Flash Type 2	LPT	Parallel Port Connector
CMOS	Complementary Metal Oxide Semiconductor	LVDS	Low Voltage Differential Signaling
CPU	Central Processing Unit	MAC	Media Access Controller
Codec	Compressor/Decompressor	OS	Operating System
COM	Serial Port	PCI	Peripheral Connect Interface
DAC	Digital to Analog Converter	PIO	Programmed Input Output
DDR	Double Data Rate	PnP	Plug and Play
DIMM	Dual Inline Memory Module	POST	Power On Self Test
DIO	Digital Input/Output	RAM	Random Access Memory
DMA	Direct Memory Access	SATA	Serial ATA
EIDE	Enhanced IDE	S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
EIST	Enhanced Intel SpeedStep Technology	SPD	Serial Presence Detect
FDD	Floppy Disk Drive	S/PDI	Sony/Philips Digital Interface
FDC	Floppy Disk Connector	SDRAM	Synchronous Dynamic Random Access Memory
FFIO	Flexible File Input/Output	SIR	Serial Infrared
FIFO	First In/First Out	UART	Universal Asynchronous Receiver-transmitter
FSB	Front Side Bus	USB	Universal Serial Bus
IrDA	Infrared Data Association	VGA	Video Graphics Adapter

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Chapter

1

Introduction

1.1 PM-LX-800 Motherboard Introduction

The PC/104 form factor PM-LX-800 is a highly integrated embedded computer specifically optimized for multi-media applications requiring minimum installation space. The PM-LX-800 is particularly suitable for low power and fan-less applications. The PM-LX-800 supports a full range of functions for an AT compatible industrial computer in a space-saving 90mm x 96mm profile. The PM-LX-800 is equipped with an on-board low-power consumption and high performance AMD™ Geode™ LX 800 processor. It also contains a DDR SO-DIMM socket that supports up to 1GB memory in size.

1.1.1 PM-LX-800 Motherboard Applications

The PM-LX-800 motherboard has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

1.1.2 PM-LX-800 Motherboard Benefits

Some of the PM-LX-800 motherboard benefits include,

- operating reliably in harsh industrial environments with ambient temperatures as high as 60°C
- rebooting automatically if the BIOS watchdog timer detects that the system is no longer operating

1.1.3 PM-LX-800 Motherboard Features

Some of the PM-LX-800 motherboard features are listed below:

- Complies with RoHS
- Supports AMD™ Geode™ LX 800 CPU
- Supports a maximum front side bus (FSB) speed up to 500MHz
- DDR 333 SO-DIMM SDRAM up to 1GB
- Complete I/O support with IDE, CFII, PCI-104, LAN, and 2 x USB2.0 and 2 x RS-232
- Supports 24-bit TTL LCD

1.2 PM-LX-800 Motherboard Overview

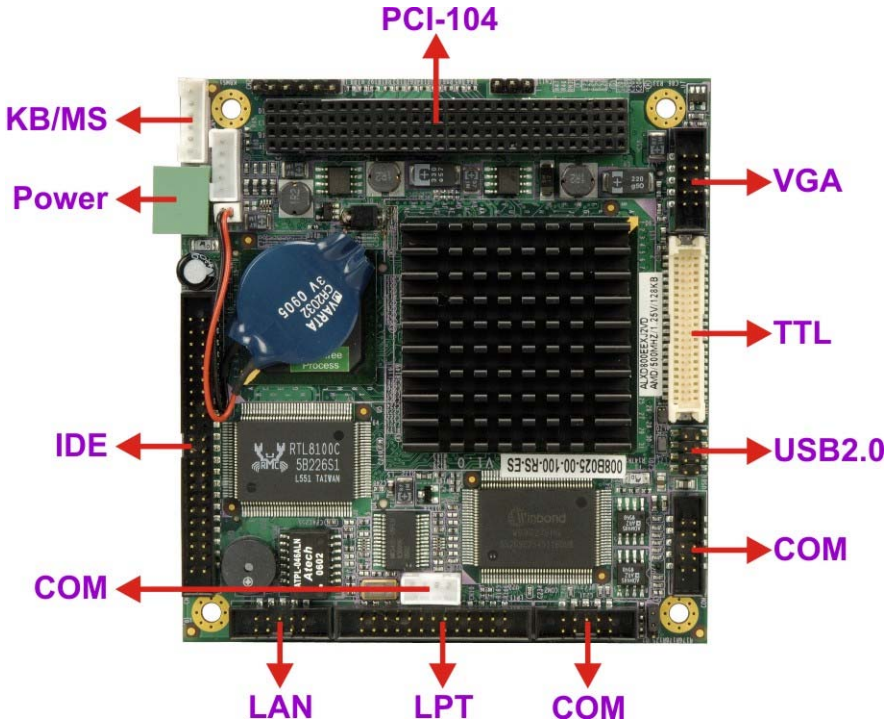


Figure 1-1: PM-LX-800 Motherboard Overview (Front Side)

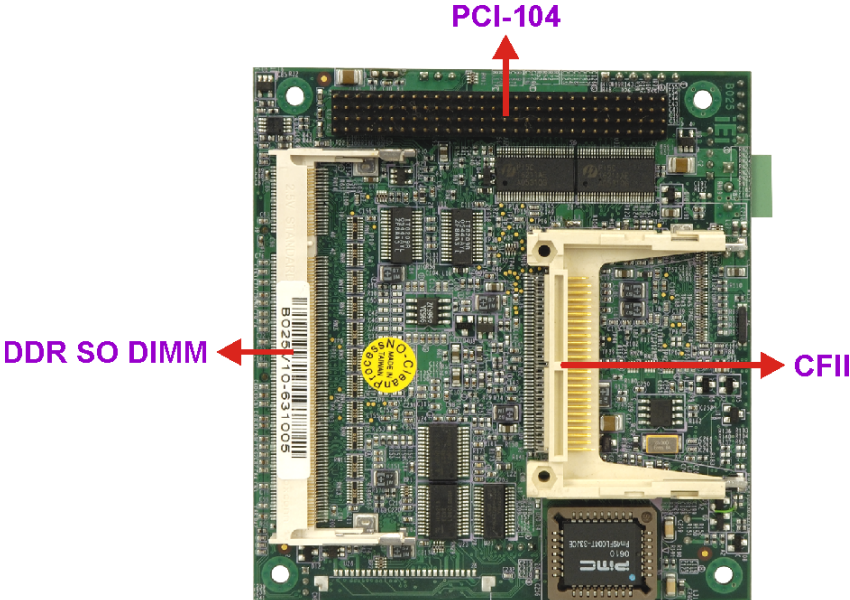


Figure 1-2: PM-LX-800 Motherboard Overview (Solder Side)

1.2.1 PM-LX-800 Motherboard Connectors

The PM-LX-800 motherboard has the following connectors on-board:

- 1 x AT 12V/5V connector
- 1 x CFII compact flash connector (solder side)
- 1 x DDR SO-DIMM connector (solder side)
- 1 x IDE device connector
- 1 x Inverter connector
- 1 x Keyboard/Mouse connector
- 1 x LAN connector
- 1 x Parallel port connector
- 1 x PCI-104 connector
- 2 x RS-232 connectors
- 1 x RS-422/485 connector
- 1 x TTL/LCD connector
- 1 x USB connector
- 1 x VGA connector

The location of these connectors on the motherboard can be seen in **Figure 1-1** and **Figure 1-2**. These connectors are fully described in **Chapter 3**.

1.2.2 Technical Specifications:

PM-LX-800 motherboard technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2**.

SPECIFICATION	DESCRIPTION
CPUs Supported	AMD™ Geode™ LX 800
Cache Memory	64K I/ 64k D L1 cache, 128K L2 cache
System Chipset	AMD™ CS5536
I/O Controller	AMD™ CS5536
Memory	One 200-pin DDR 333MHz SO-DIMM SDRAM with a maximum size of 1GB.
PCI Bus Interface	Revision 2.2
Super IO	W83627EHG

SPECIFICATION	DESCRIPTION
Display	CRT integrated in AMD™ LX 800
TTL	24 bit TTL integrated in AMD LX 800
HDD Interface	One IDE channel supports two Ultra ATA 100/66/33 devices
Power Support	AT power support
Power Consumption	+5V @ 1.3A (LX-800, 500MHz, DDR 333, 512MB RAM)
Power Management	Supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 2.0
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Interfaces	1 x LPT 1 x CFII 1 x IDE 1 x KB/MS 1 x LAN 1 x LCD Inverter 2 x RS-232 1 x RS-422/485 1 x TTL 1 x USB 1 x VGA
PC/104 Interface	PCI-104 stack through connector
Real Time Clock	256-byte battery backed CMOS RAM
Hardware Monitoring	CPU temperature and system voltages
Ethernet	10/100Base-T RTL8100C
BIOS	AWARD
Physical Dimensions	90mm x 96mm
Operating Temperature	Minimum: 0°C (32°F) Maximum: 60°C (140°F)

Table 1-1: Technical Specifications

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Chapter

2

Detailed Specifications

2.1 CPU Support

The PM-LX-800 has a preinstalled AMD LX 800 processor. Technical specifications for the AMD LX 800 processor are listed below:

- x86/x87-compatible core
- Processor frequency up to 500 MHz
- 64K I/64K D L1 cache and 128K L2 cache
- Split I/D cache/TLB (Translation Look-Aside Buffer)
- 64-bit DDR Memory interface. 333MHz DDR memory supported
- Integrated FPU that supports the Intel MMX® and AMD 3DNow!™ Technology instruction sets
- 9 GB/s internal GeodeLink™ Interface Unit (GLIU)
- Security Block
 - 128-bit AES (CBC/ECB)
 - True Random Number Generator
- High-resolution CRT and TFT outputs (simultaneous operation)
 - Support for High Definition (HD) and Standard Definition (SD) standards
 - Support 1920x1440 in CRT mode and 1600x1200 in TFT mode
- VESA 1.1 and 2.0 VIP/VDA support
- 0.13 micron process
- 481-terminal PBGA (Plastic Ball Grid Array) with internal heatspreader

Power management features for the AMD LX 800 processor are listed below:

- 1.8W Typical (3.9W TDP) @ 500MHz
- 1.3W Typical (3.1W TDP) @ 433MHz
- GeodeLink active hardware power management
- Hardware support for standard ACPI software power management
- I/O companion SUSP#/SUSPA# power controls
- Lower power I/O
- Wakeup on SMI/INTR

2.2 System Chipset

The PM-LX-800 motherboard has an AMD Geode™ CS5536 chipset installed. The AMD Geode™ CS5536 is a companion device for the AMD Geode™ LX 800 to create a high-performance, low-power x86 solution for embedded applications.

Technical specifications of the AMD Geode™ CS5536 chipset are listed below. For more information on these two chipsets please refer to the AMD website.

- **GeodeLink™ Interface Unit:**
 - 64-bit, 66MHz operation
 - PCI VSM (Virtual System Module) that makes the interface transparent to applications software and BIOS
 - Programmable routing descriptors, use and activity monitors, and SSMI (Synchronous System Management Interrupt)
- **ATA-6 Controller:**
 - 100 MB/second IDE Controller in UDMA mode per the ATA-6 specification
 - 5V interface
- **Flash Interface:**
 - Multiplexed with IDE interface Connects to an array of industry standard NAND Flash and/or NOR Flash
- **USB Controller:**
 - 4 USB ports
 - Supports both USB 1.1 and USB 2.0
 - 3 host ports
 - 1 host/device
- **Audio Codec 97 (AC97) Controller:**
 - AC97 specification v2.3 compliant interface to multiple audio codecs: Serial In, Serial Out, Sync Out, Bit Clock In
 - Legacy “PC Beep” support
- **Diverse Device:**
 - 82xx Legacy Devices
 - IR Communication Port
 - System Management Bus (SMB) Controller

- LPC (Low Pin Count) Port
- General Purpose I/Os (GPIOs)
- 8 Multi-Function General Purpose Timers (MFGPTs)
- Real-Time Clock (RTC) with CMOS RAM
- **Power Management Controller:**
 - ACPI v2.0 compliant

2.2.1 Data Flow

Figure 2-1 shows the data flow between the system chipset, the CPU and other I/O interfaces that can connect to the PM-LX-800 motherboard.

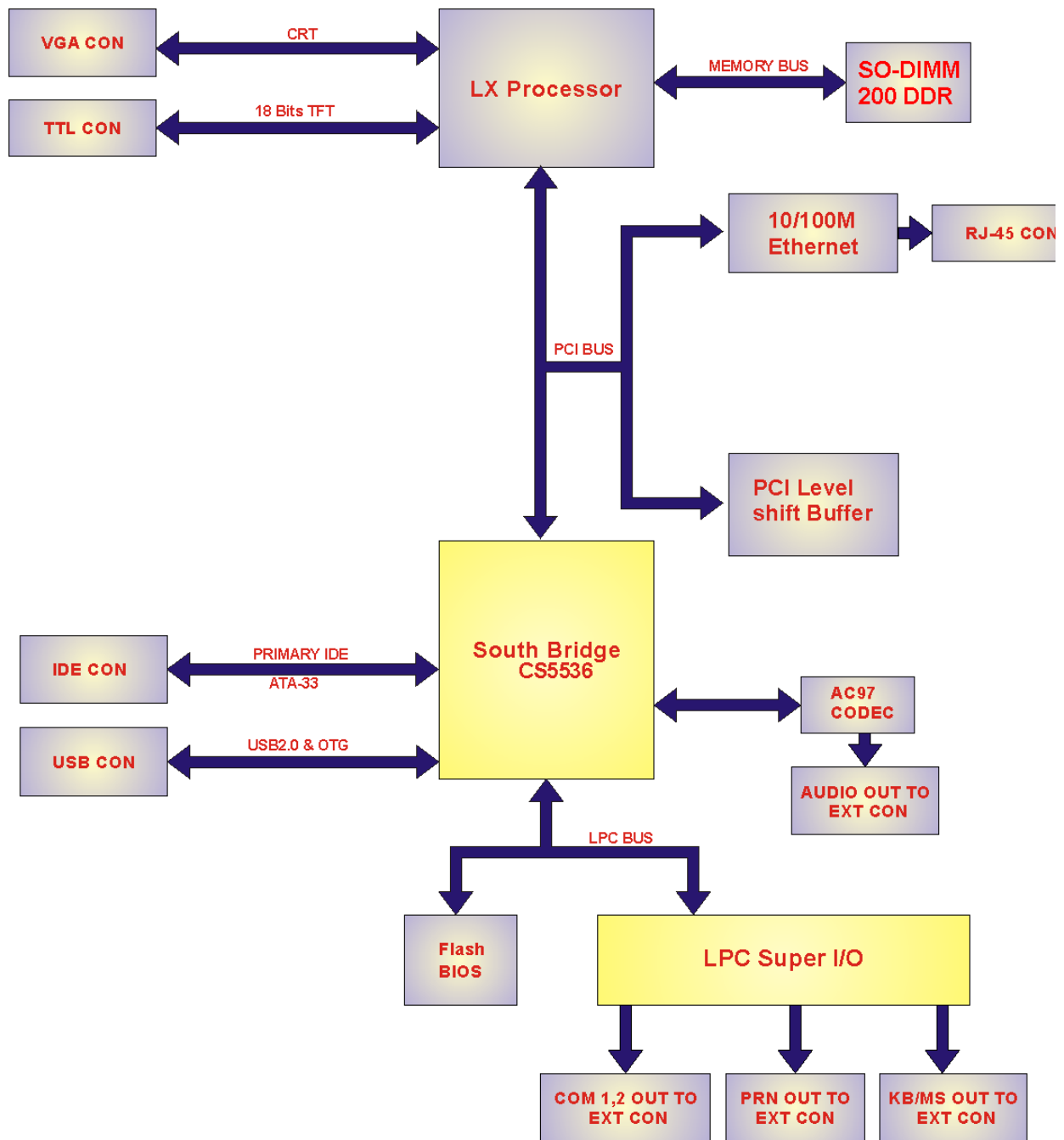


Figure 2-1: Data Flow Block Diagram

2.3 Graphics Support

Table 2-1 lists the PM-LX-800 graphics processor features.

Feature	AMD Geode™ LX Processor
Color Depth	8, 16, 32 bpp (A) RGB 4 and 8-bit indexed
ROPs	256 (2-src, dest and pattern)
BLT Buffers	FIFOs in Graphics Processor
BLT Splitting	Managed by hardware
Video Synchronized BLT/Vector	Throttle by VBLANK
Bresenham Lines	Yes
Patterned (stippled) Lines	Yes
Screen to Screen BLT	Yes
Screen to Screen BLT with mono expansion	Yes
Memory to Screen BLT	Yes (throttled rep movs writes)
Pattern Size (Mono)	8x8 pixels
Pattern Size (Color)	8x8 pixels
Monochrome Pattern	Yes (with inversion)
Dithered Pattern (4 color)	No
Color Pattern	8, 16, 32 bpp
Transparent Pattern	Monochrome
Pattern Fill	Yes
Transparent Source	Monochrome
Color Key Source Transparency	Y with mask
Variable Source Stride	Yes
Variable Destination Stride	Yes
Destination Write Bursting	Yes
Selectable BLT Direction	Vertical and Horizontal
Alpha BLT	Yes (constant α , α/pix , or sep. α channel)
VGA Support	Decodes VGA Register
Accelerated Rotation BLT	8, 16, 32 bpp
Color Depth Conversion	5:6:5, 1:5:5:5, 4:4:4:4, 8:8:8:8

Table 2-1: Geode LX Graphics Processor Features

2.4 Memory Support

Up to 1GB of DDR 333 MHz SO-DIMM SDRAM is supported.

2.5 PCI Bus Interface Support

The GeodeLink PCI South Bridge (GLPCI_SB) provides a PCI interface for the Geode CS5536 system chipset. The GLPCI_SB acts as a PCI master or PCI slave in providing PCI transactions to and from the Geode CS5536 system chipset and the PCI bus. A special serial interface to the Geode LX processor, the CPU Interface Serial (CIS) assists in the transfer of information between the Geode CS5536 companion device and the Geode LX processor.

The interface is compliant to PCI specification v2.2 and may operate at up to 66 MHz. Within a PCI burst, zero wait state operation is achieved. The PCI interface supports programmable IDSEL selection, and can handle inbound transactions immediately after system reset.

2.6 Ethernet

The Realtek RTL8100C(L) is a single-chip Fast Ethernet controller. It is enhanced with an ACPI (Advanced Configuration Power Interface) management function for PCI in order to provide efficient power management for advanced operating systems with OSPM (Operating System Directed Power Management). Realtek RTL8100C features are listed below.

- 128-pin PQFP/LQFP (PQFP package pin-to-pin compatible with Realtek RTL8110S-32 Single-Chip Gigabit Ethernet Controller)
- Supports PCI/mini-PCI interfaces
- Integrates Fast Ethernet MAC, physical chip, and transceiver onto a single chip
- 10Mbps and 100Mbps operation
- Supports 10Mbps and 100Mbps N-way auto-negotiation
- Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- Complies with PC99/PC2001 standards
- Supports ACPI power management

- Provides PCI bus master data transfer
- Provides PCI memory space or I/O space mapped data transfer
- Supports PCI clock speed of 16.75MHz-40MHz
- Advanced power saving mode
- Half/Full duplex capability
- Supports Full Duplex Flow Control (IEEE 802.3x)
- Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- Provides PCI clock run pin
- Provides LED pins for network operation status indication
- 2.5/3.3V power supply with 5V tolerant I/Os
- 0.25µm CMOS process

2.7 Drive Interfaces

The PM-LX-800 can support the following drive interfaces:

- 1 x IDE connector supports two IDE devices
- 1 x Compact flash device

The PM-LX-800 is compliant to the ATA-6 specification. The IDE interface supports one channel, that in turn supports two devices that can operate in PIO modes 0 to 4, MDMA modes 0 to 2, or UDMA modes 0 to 5 (up to 100 MB/s).

2.8 Serial Ports

The PM-LX-800 CPU Board has three high-speed UART serial ports, configured as COM1, COM2 and CN10. The serial ports have the following specifications.

- 16C550 UART with 16/32 byte selectable FIFO buffer
- 115.2Kbps transmission rate

2.9 Real Time Clock

256-byte battery backed CMOS RAM

2.10 System Monitoring

The PM-LX-800 motherboard is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +3.3V, +5V, and +12V
- CPU and board temperatures (by the corresponding embedded sensors)

2.11 BIOS

The PM-LX-800 uses a licensed copy of Phoenix Award BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-Boot Execution Environment) support
- USB booting support

2.12 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the PM-LX-800 motherboard are listed below.

- Minimum Operating Temperature: 0°C (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling heat sink is installed on the CPU. Thermal paste is smeared on the lower side of the heat sink before it is mounted on the CPU.

2.13 Power Consumption

Table 2-2 shows the power consumption parameters for the PM-LX-800 when an AMD LX-800 CPU is running with a 333 MHz, 512MB DDR RAM module.

Voltage	Current
+5V	1.3A

Table 2-2: Power Consumption

2.14 PXE: Pre-Boot Execution Environment

PXE is an open industry standard developed by a number of software and hardware vendors. IEI BIOS PXE feature allows a workstation to boot from a server on a network by receiving a pre-OS agent prior to booting the operating system on the local hard drive.

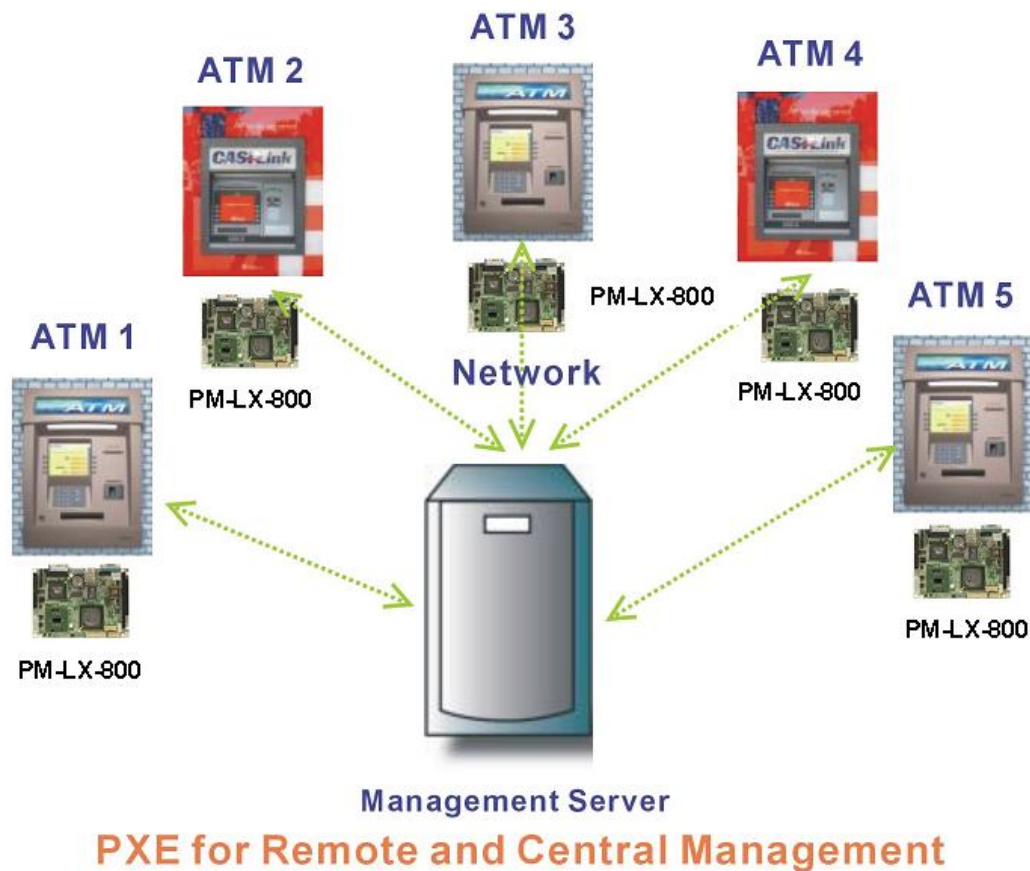


Figure 2-2: PXE: Pre-Boot Execution Environment

2.15 Packaged Contents and Optional Accessory Items

2.15.1 Package Contents

When you unpack the PM-LX-800 motherboard, you should find the following components.

- 1 x PM-LX single board computer
- 1 x Mini jumper pack
- 1 x ATA33 flat cable
- 2 x RS232 cable
- 1 x USB cable
- 1 x VGA cable
- 1 x LAN cable
- 1 x Power cable
- 1 x KB/MS cable
- 1 x Utility CD
- 1 x QIG (quick installation guide)

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Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

The locations of the peripheral interface connectors are shown in **Section 3.1.1**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.2**.

3.1.1 PM-LX-800 Motherboard Layout

Figure 3-1 shows the on-board peripheral connectors and jumpers on the front side of the motherboard.

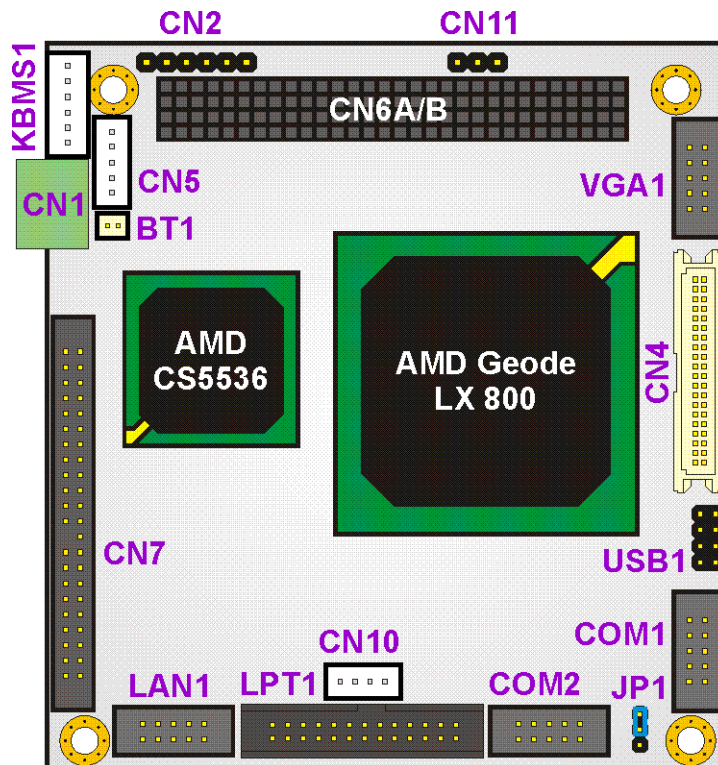


Figure 3-1: Connector and Jumper Locations (Front Side)

Figure 3-2 shows the onboard peripheral connectors on the solder side of the board.

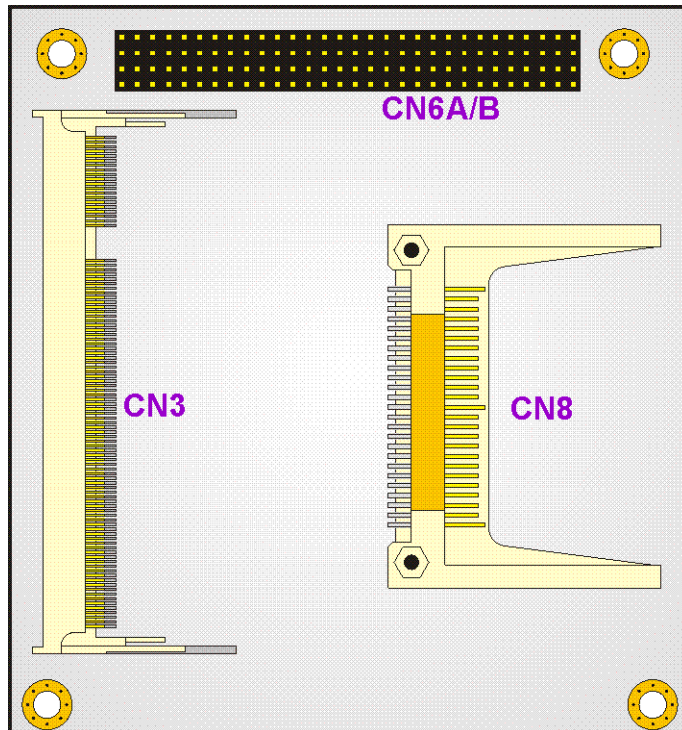


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the PM-LX-800 motherboard. Detailed descriptions of these connectors can be found in **Section 3.2**.

Connector	Type	Label
12V / 5V Power connector	3-pin terminal block	CN1
-12V Input connector for CN11	3-pin header	CN11
200-pin DDR SO-DIMM socket	200-pin socket	CN3
Battery Connector	2-pin header	BT1
Compact Flash Type II connector	50-pin header	CN8
IDE Interface connector	44-pin header	CN7
Inverter connector	5-pin header	CN5
Keyboard/Mouse connector	6-pin header	KBMS1
LAN connector	10-pin header	LAN1
LED Power connector	6-pin header	CN2
Parallel Port connector	26-pin header	LPT1

Connector	Type	Label
PCI-104 connector	PCI-104 connector	CN6A/B
RS-232 Serial Communications connector	10-pin header	COM1, COM2
RS-422/485 Serial Communications connector	4-pin header	CN10
TTL LCD connector	40-pin connector	CN4
USB connector	6-pin header	USB1
VGA connector	10-pin header	VGA1

Table 3-1: Peripheral Interface Connectors

3.1.3 Onboard Jumpers

Table 3-2 lists the onboard jumper. A detailed description of the jumper can be found in Section 3.3.

Connector	Type	Label
COM3 RS422/RS485 Select	3-pin header	JP1

Table 3-2: Onboard Jumper

3.2 Internal Peripheral Connectors

Internal peripheral connectors on the motherboard are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the PM-LX-800 motherboard.

3.2.1 12V / 5V Power Connector

- CN Label: CN1
- CN Type: 3-pin terminal block
- CN Pinouts: See **Table 3-3**
- CN Location: See **Figure 3-3**

The **12V / 5V Power Connector** supplies power to the motherboard.

PIN	DESCRIPTION
1	VCC12
2	GND
3	VCC5

Table 3-3: 12V / 5V Power Connector Pinouts

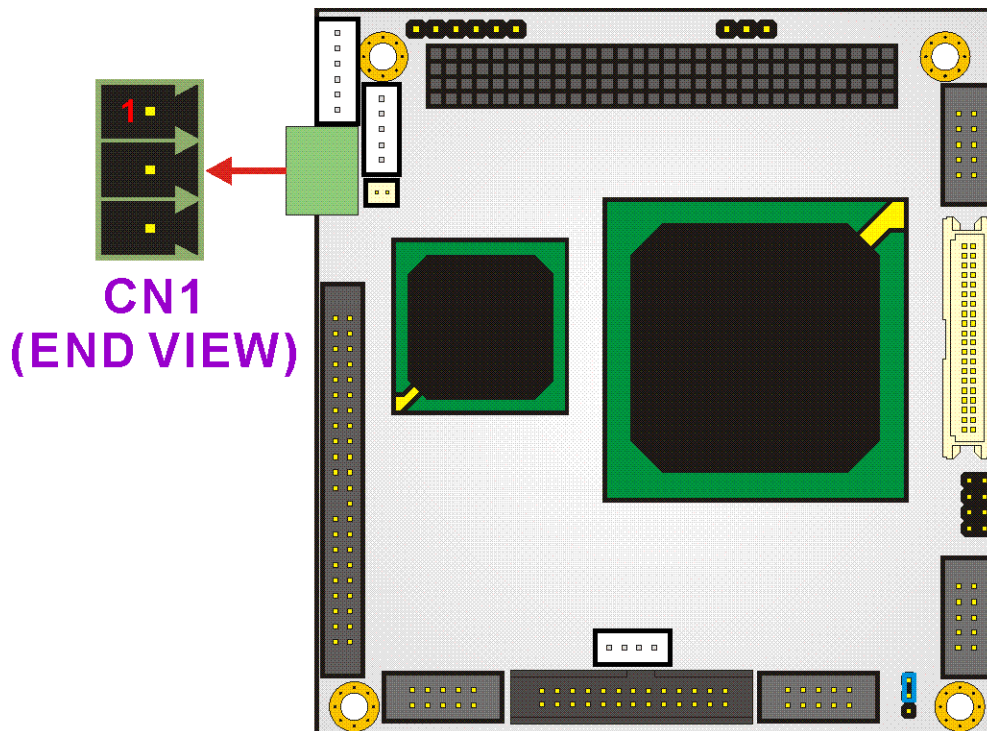


Figure 3-3: 12V / 5V Power Connector Location

3.2.2 -12V Input connector for CN11

CN Label:	CN11
CN Type:	3-pin header
CN Pinouts:	See Table 3-4
CN Location:	See Figure 3-4

The 12V input connector can be used to supply 12V power to the motherboard.

PIN	DESCRIPTION
1	N/C
2	GND
3	-12V

Table 3-4: 12V Input Connector Pinouts

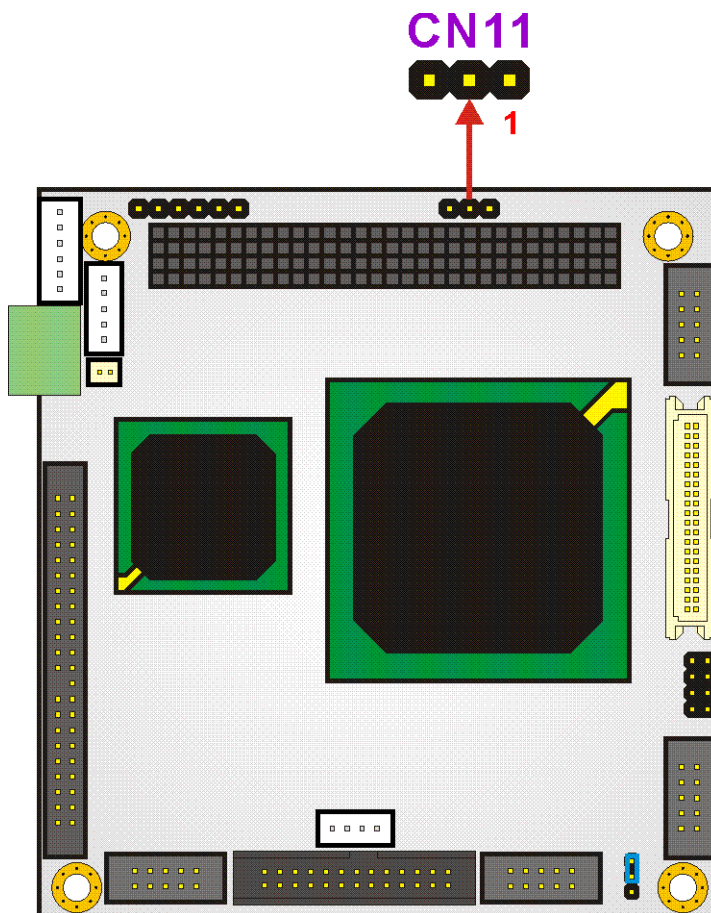


Figure 3-4: 12V Input Connector Location

3.2.3 200-pin DDR SO-DIMM Socket

CN Label:	CN3
CN Type:	200-pin header
CN Pinouts:	See Table 3-5
CN Location:	See Figure 3-5

The 200-pin DDR SO-DIMM socket receives a DDR 333 MHz SO-DIMM module.

Pin	Front	Pin	Back	Pin	Front	Pin	Back
1	VREF	2	VREF	101	A9	102	A8
3	VSS	4	VSS	103	VSS	104	VSS
5	DQ0	6	DQ4	105	A7	106	A6
7	DQ1	8	DQ5	107	A5	108	A4
9	VDD	10	VDD	109	A3	110	A2
11	DQS0	12	DM0\DQS9	111	A1	112	A0
13	DQ2	14	DQ6	113	VDD	114	VDD
15	VSS	16	VSS	115	A10\AP	116	BA1
17	DQ3	18	DQ7	117	BA0	118	/RAS
19	DQ8	20	DQ12	119	/WE	120	/CAS
21	VDD	22	VDD	121	/S0	122	/S1
23	DQ9	24	DQ13	123	DU(A13)	124	DU(BA2)
25	DQS1	26	DM1\DQS10	125	VSS	126	VSS
27	VSS	28	VSS	127	DQ32	128	DQ36
29	DQ10	30	DQ14	129	DQ33	130	DQ37
31	DQ11	32	DQ15	131	VDD	132	VDD
33	VDD	34	VDD	133	DQS4	134	DM4\DQS13
35	CK0	36	VDD	135	DQ34	136	DQ38
37	/CK0	38	VSS	137	VSS	138	VSS
39	VSS	40	VSS	139	DQ35	140	DQ39
41	DQ16	42	DQ20	141	DQ40	142	DQ44
43	DQ17	44	DQ21	143	VDD	144	VDD
45	VDD	46	VDD	145	DQ41	146	DQ45

Pin	Front	Pin	Back	Pin	Front	Pin	Back
47	DQS2	48	DM2\DQS11	147	DQS5	148	DM5\DQS14
49	DQ18	50	DQ22	149	VSS	150	VSS
51	VSS	52	VSS	151	DQ42	152	DQ46
53	DQ19	54	DQ23	153	DQ43	154	DQ47
55	DQ24	56	DQ28	155	VDD	156	VDD
57	VDD	58	VDD	157	VDD	158	/CK1
59	DQ25	60	DQ29	159	VSS	160	CK1
61	DQS3	62	DM3\DQS12	161	VSS	162	VSS
63	VSS	64	VSS	163	DQ48	164	DQ52
65	DQ26	66	DQ30	165	DQ49	166	DQ53
67	DQ27	68	DQ31	167	VDD	168	VDD
69	VDD	70	VDD	169	DQS6	170	DM6\DQS15
71	CB0*	72	CB4*	171	DQ50	172	DQ54
73	CB1*	74	CB5*	173	VSS	174	VSS
75	VSS	76	VSS	175	DQ51	176	DQ55
77	DQS8*	78	DM8\DQS17*	177	DQ56	178	DQ60
79	CB2*	80	CB6*	179	VDD	180	VDD
81	VDD	82	VDD	181	DQ57	182	DQ61
83	CB3*	84	CB7*	183	DQS7	184	DM7\DQS16
85	DU	86	DU(/RESET)	185	VSS	186	VSS
87	VSS	88	VSS	187	DQ58	188	DQ62
89	CK2*	90	VSS	189	DQ59	190	DQ63
91	/CK2*	92	VDD	191	VDD	192	VDD
93	VDD	94	VDD	193	SDA	194	SA0
95	CKE1	96	CKE0	195	SCL	196	SA1
97	DU	98	DU	197	VDDSPD	198	SA2
99	A12	100	A11	199	VDDID*	200	DU

Table 3-5: 200-pin DDR SO-DIMM Socket Pinouts

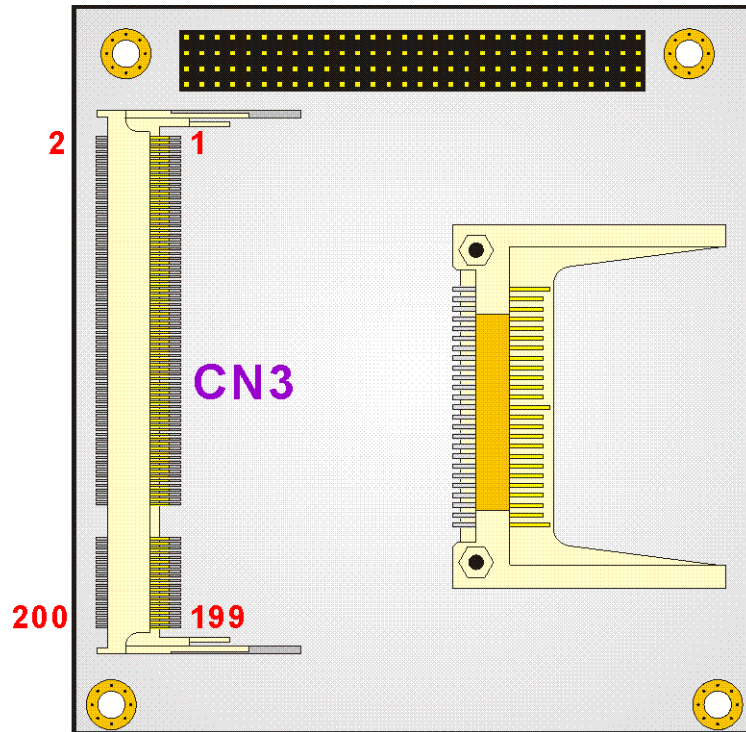


Figure 3-5: 200-pin DDR SO-DIMM Socket Location

3.2.4 Battery Connector

CN Label:	BT1
CN Type:	2-pin header
CN Pinouts:	See Table 3-6
CN Location:	See Figure 3-6

This battery connector connects to an externally mounted 3V, Lithium, cell coin battery (VARTA CR2032). The life expectancy of the battery is approximately 7 years. Depending on the working condition, the life expectancy may be shorter.

Replacing the battery is not a user operation.

If the battery starts to weaken and lose voltage, contact a vendor or IEI for a replacement module. Dispose of the used battery properly. Contact the local waste disposal agency for disposal instructions. Do not dispose of a used battery with normal household waste.



WARNING!

1. Keep batteries away from children.
2. There is a danger of explosion if the battery is incorrectly replaced.
3. Only a certified module from IEI can be used as a replacement.
4. Do not expose the battery to excessive heat or fire.
5. If the battery shows signs of leakage, contact a local vendor or IEI immediately.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	BAT+	2	GND

Table 3-6: Battery Connector Pinouts

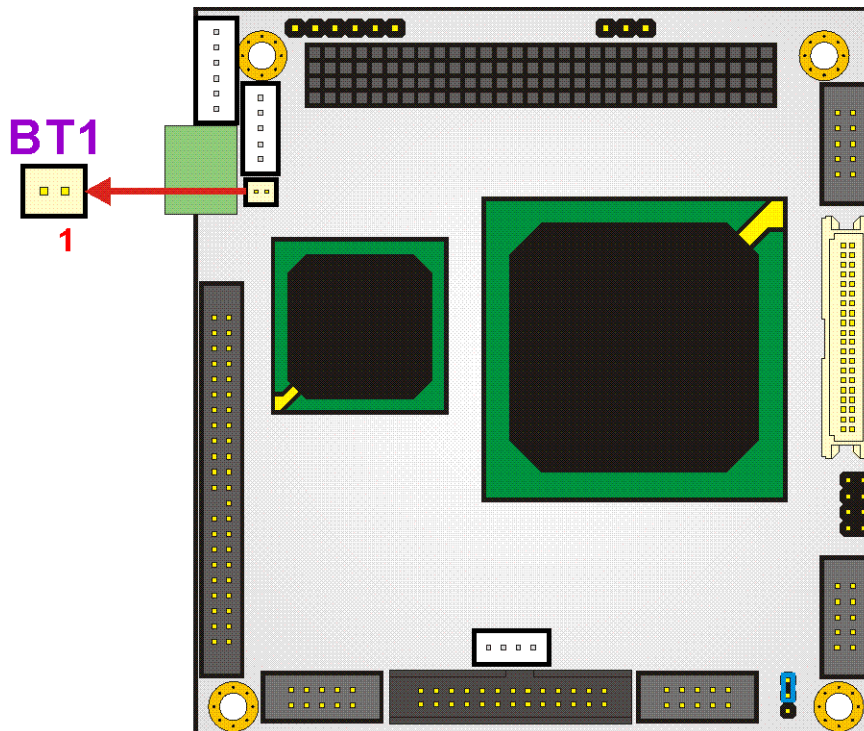


Figure 3-6: Battery Connector Location

3.2.5 CompactFlash Connector

CN Label:	CN8
CN Type:	50-pin header (2x25 pins)
CN Pinouts:	See Table 3-7
CN Location:	See Figure 3-7

The CompactFlash connector is used to adapt Type II CompactFlash and CF+ cards for use in Type II (5 mm thick) PCMCIA card slots.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	26	GROUND
2	D03	27	D11
3	D04	28	D12
4	D05	29	D13
5	D06	30	D14
6	D07	31	D15
7	-CS0	32	-CS1
8	(N/C)	33	(N/C)
9	GND	34	-IORD
10	(N/C)	35	-IOWR
11	(N/C)	36	-WE
12	(N/C)	37	INTRQ
13	VCC	38	VCC
14	(N/C)	39	-CSEL
15	(N/C)	40	(N/C)
16	(N/C)	41	RESET
17	(N/C)	42	IORDY
18	A02	43	SDRQ
19	A01	44	SDACK#
20	A00	45	-DASP
21	D00	46	-PDIAG
22	D01	47	DO8

PIN	DESCRIPTION	PIN	DESCRIPTION
23	D02	48	D09
24	(N/C)	49	D10
25	GROUND	50	GND

Table 3-7: CompactFlash Connector Pinouts

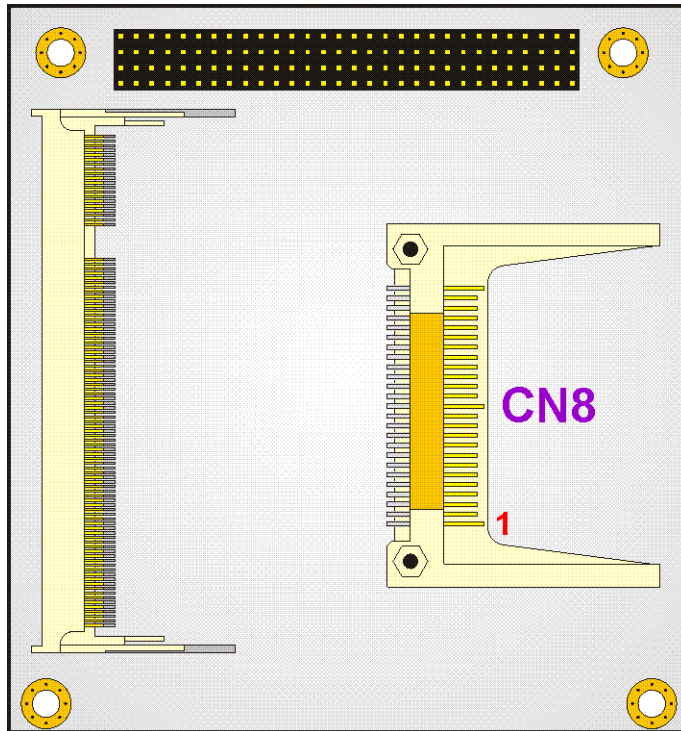


Figure 3-7: Compact Flash Connector Location

3.2.6 IDE Interface Connector

CN Label:	CN7
CN Type:	44-pin header (2x22 pins)
CN Pinouts:	See able 3-8
CN Location:	See Figure 3-8

The IDE Interface connector provides connectivity for two IDE devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	GND
29	IDE DACK#	30	GND
31	INTERRUPT	32	N/C
33	SA 1	34	IDE CABLEID
35	SA 0	36	SA 2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND
41	VCC	42	VCC
43	GND	44	N/C

able 3-8: IDE Interface Connector Pinouts

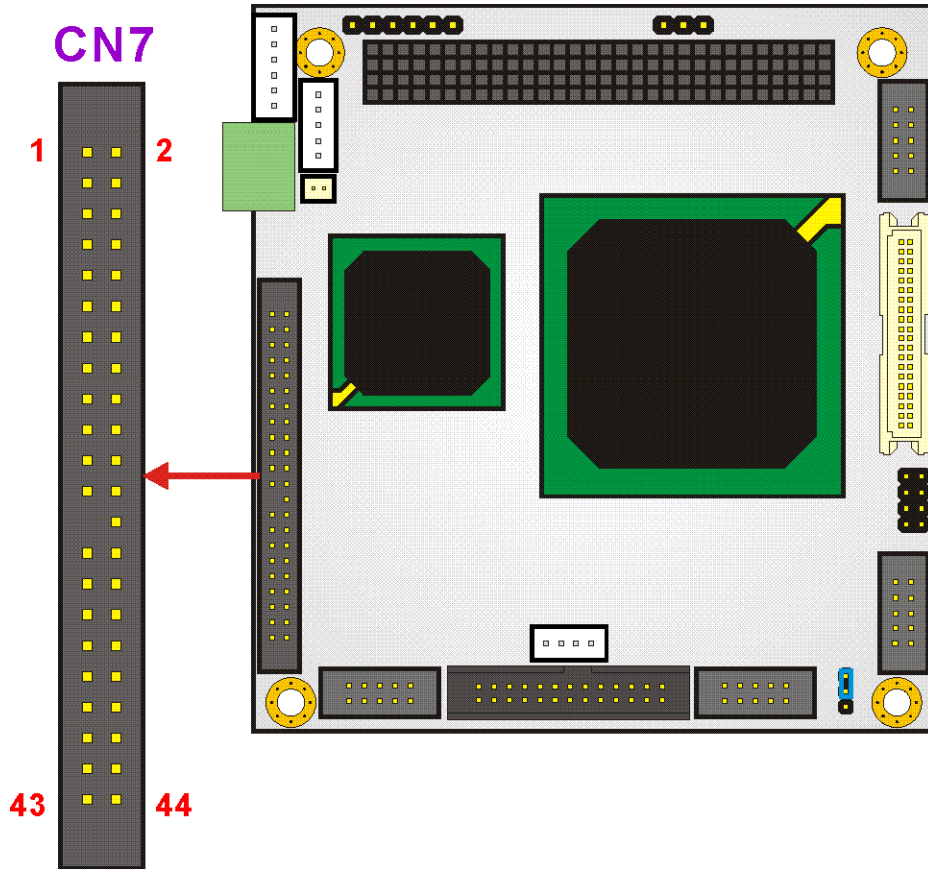


Figure 3-8: IDE Interface Connector Location

3.2.7 Inverter Connector

CN Label:	CN5
CN Type:	5-pin header
CN Pinouts:	See Table 3-9
CN Location:	See Figure 3-9

The Inverter connector connects to the LCD backlight.

PIN	DESCRIPTION
1	LCD_BKLTCTL
2	GND
3	VCC12
4	GND
5	LCD_BKLEN

Table 3-9: Inverter Connector Pinouts

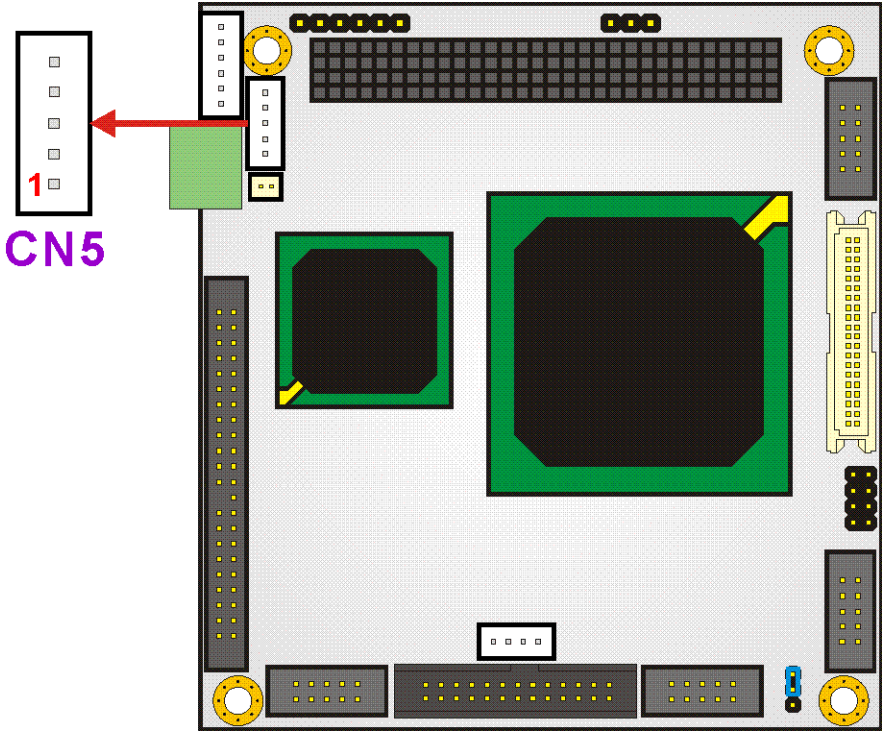


Figure 3-9: Inverter Connector Location

3.2.8 Keyboard/Mouse Connector

- CN Label: KBMS1
- CN Type: 6-pin header
- CN Pinouts: See **Table 3-10**
- CN Location: See **Figure 3-10**

For alternative applications, an on board keyboard/mouse pin header connector is also available.

PIN	DESCRIPTION
1	VCC5
2	MOUSE DATA
3	MOUSE CLOCK
4	KEYBOARD DATA
5	KEYBOARD CLOCK
6	GND

Table 3-10: Keyboard/Mouse Connector Pinouts

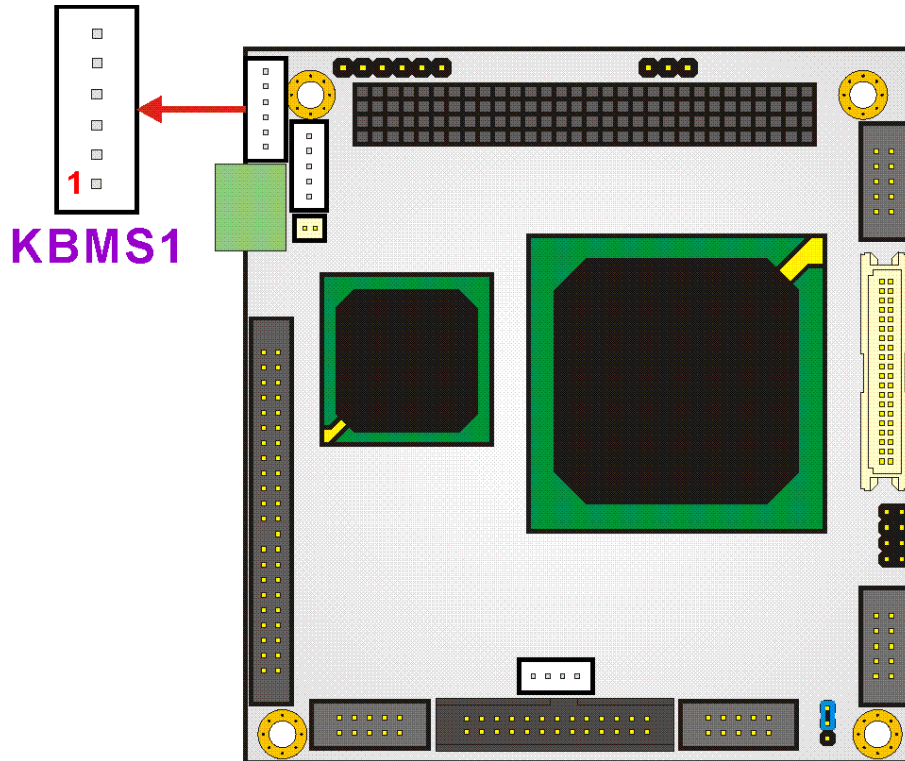


Figure 3-10: Keyboard/Mouse Connector Location

3.2.9 LAN Connector

CN Label:	LAN1
CN Type:	10-pin header (2x5 pins)
CN Pinouts:	See Table 3-11
CN Location:	See Figure 3-11

Use the LAN connector to connect to a LAN.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC3.3	6	ACTIVE
2	RX+	7	RX-
3	LINK	8	GND
4	N/C	9	GND
5	TX+	10	TX-

Table 3-11: LAN Connector Pinouts

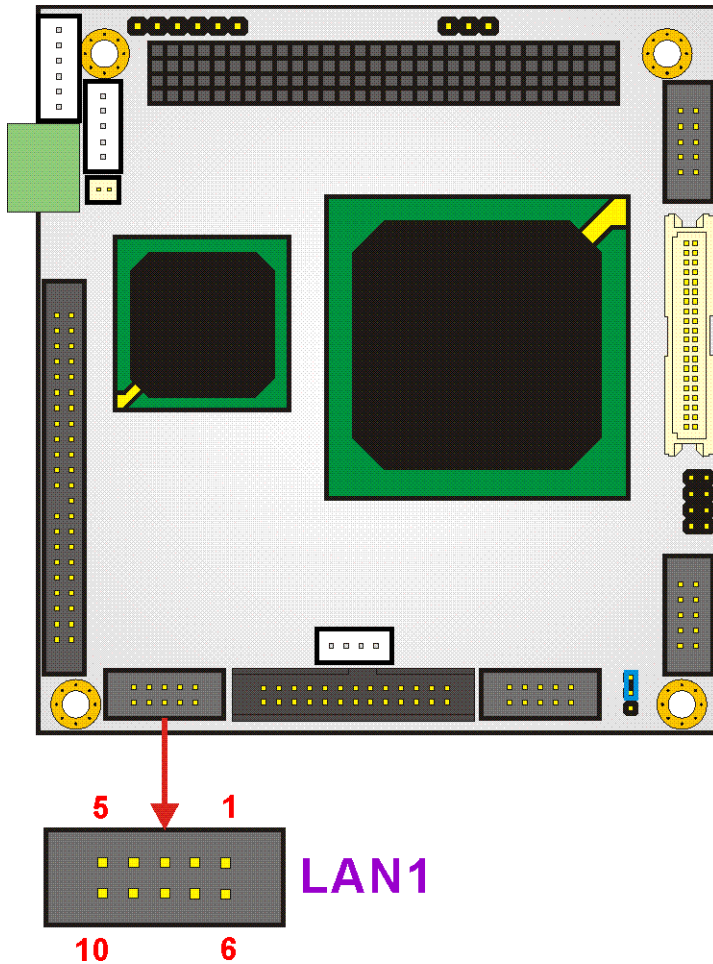


Figure 3-11: LAN Connector Location

3.2.10 LED Power Connector

CN Label:	CN2
CN Type:	6-pin header
CN Pinouts:	See Table 3-12
CN Location:	See Figure 3-12

The LED power connector provides the connectivity to the power and hard drive activity LEDs on the chassis front panel. An adapter cable is required.

PIN	DESCRIPTION
1	RESET 1
2	RESET 2
3	VCC5 LED+
4	GND
5	HDD LED+
6	HDD LED-

Table 3-12: LED Power Connector Pinouts

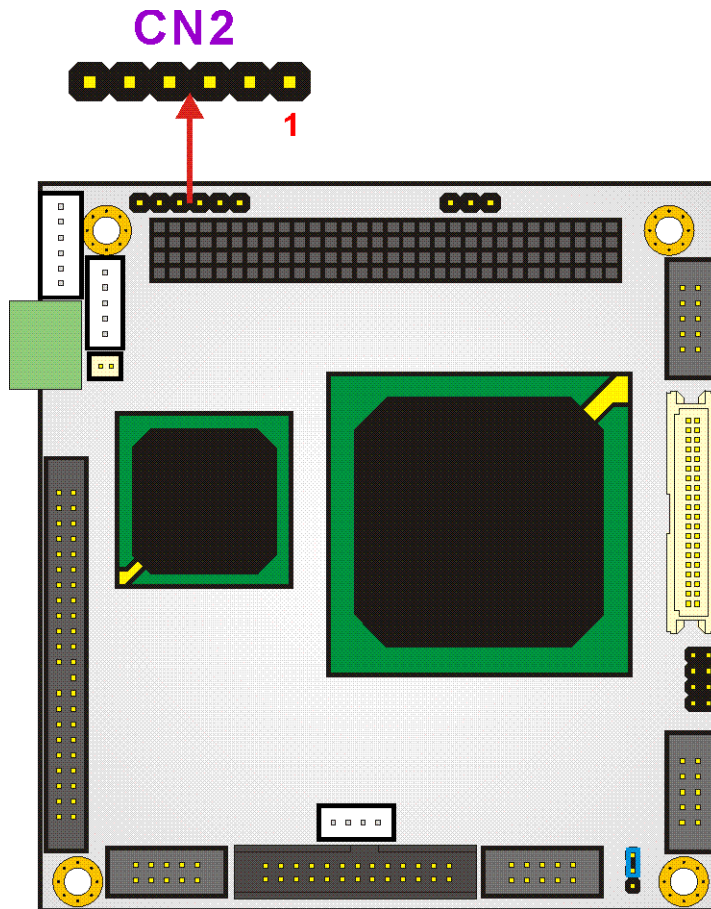


Figure 3-12: LED Power Connector Location

3.2.11 Parallel Port Connector

CN Label:	LPT1
CN Type:	26-pin header (2x13 pins)
CN Pinouts:	See Table 3-13
CN Location:	See Figure 3-13

The parallel port connector connects to a printer. The PM-LX-800 comes with a multi-mode (ECP/EPP/SPP) parallel port. The CN20 parallel port interface features a 26-pin flat-cable connector that requires an adapter cable if a traditional DB-25 connector is preferred. The parallel interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. The default interrupt channel is IRQ7. Select ECP or EPP DMA mode using the BIOS configuration utility.

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

Table 3-13: Parallel Port Connector Pinouts

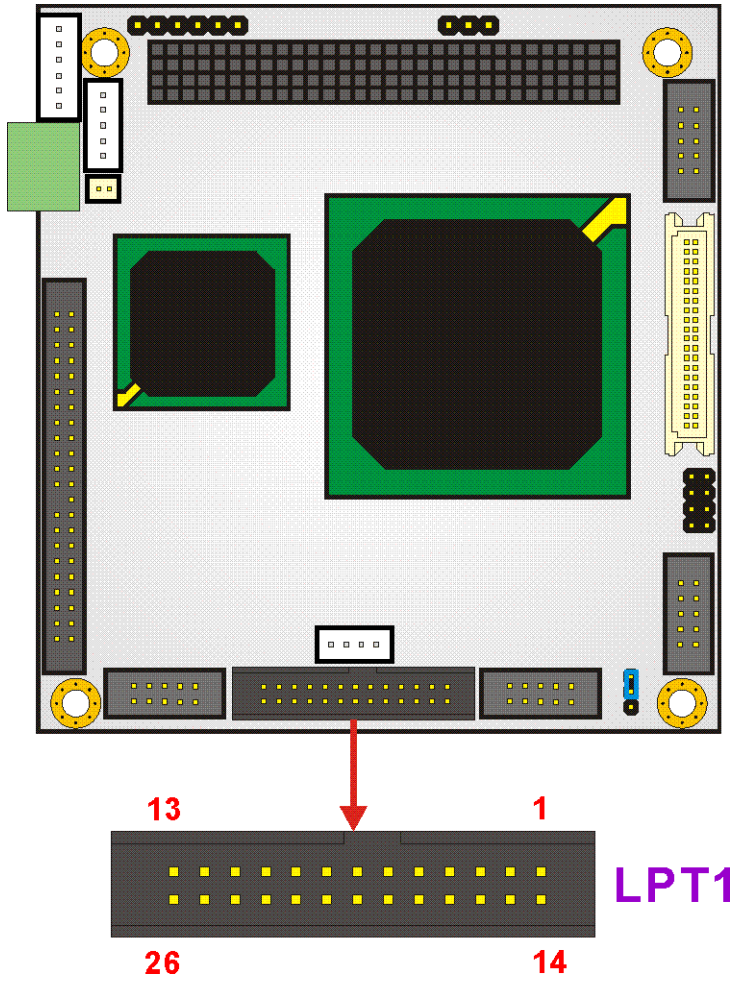


Figure 3-13: Parallel Port Connector Location

3.2.12 PCI-104 Connector

CN Label:	CN6A/B
CN Type:	PCI-104 connector
CN Pinouts:	See Table 3-14
CN Location:	See Figure 3-14

Use the PCI-104 connector to add auxiliary boards using stack-through connectors.

Pin	A	B	C	D
1	GROUND	NC/SERIRQ	+5V	AD0
2	VIO	AD2	AD1	+5V
3	AD5	GND	AD4	AD3
4	CBE0-	AD7	GND	AD6
5	GND	AD9	AD8	GND
6	AD11	VIO	AD10	N66EV
7	AD14	AD13	GND	AD12
8	+3.3V	CBE1-	AD15	+3.3V
9	SERR-	GND	SBO-	PAR
10	GND	PERR-	+3.3V	SDONE
11	STOP-	+3.3V	LOCK-	GND
12	+3.3V	TRDY-	GND	DEVSEL-
13	FRAME-	GND	IRDY-	+3.3V
14	GND	AD16	+3.3V	CBE2-
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	CBE3-	VIO	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0-	GND	REQ1-	VIO
24	GND	REQ2-	+5V	GNT0-
25	GNT1-	VIO	GNT2-	GND
26	+5V	PCICLK0	GND	PCICLK1
27	PCICLK2	+5V	PCICLK3	GND
28	GND	INTD-	+5V	PCIRST-
29	+12V	INTA-	INTB-	INTC-
30	-12v	REQ3-	GNT3-	GND/3.3V

Table 3-14: PCI-104 Connector Pinouts

CN6A/B

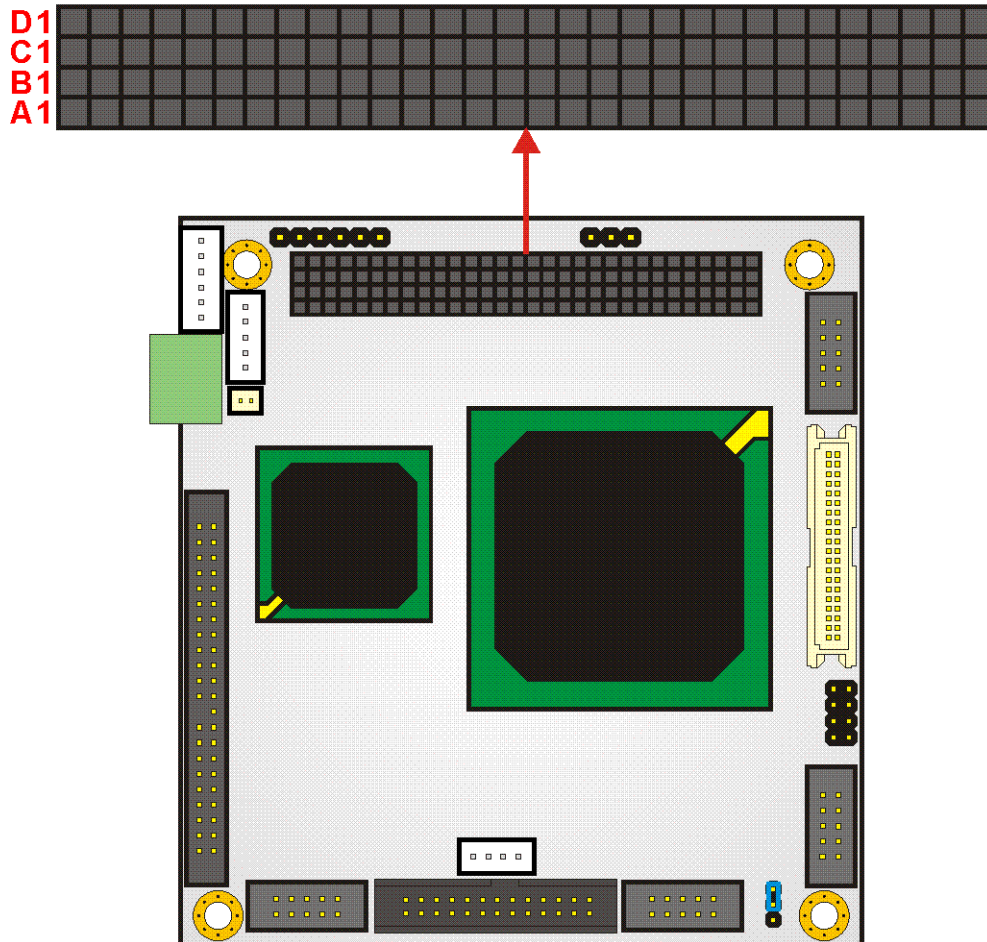


Figure 3-14: PCI-104 Connector Location

3.2.13 RS-232 Serial Communications Connector

CN Label:	COM1, COM2
CN Type:	10-pin headers (2x5 pins)
CN Pinouts:	See Table 3-15
CN Location:	See Figure 3-15

The PM-LX-800 offers two ten-pin headers for RS-232 serial connections.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD#	6	DSR#
2	RX	7	RTS#
3	TX	8	CTS#
4	DTR#	9	RI#
5	GND	10	GND

Table 3-15: RS-422 Serial Communications Connector Pinouts

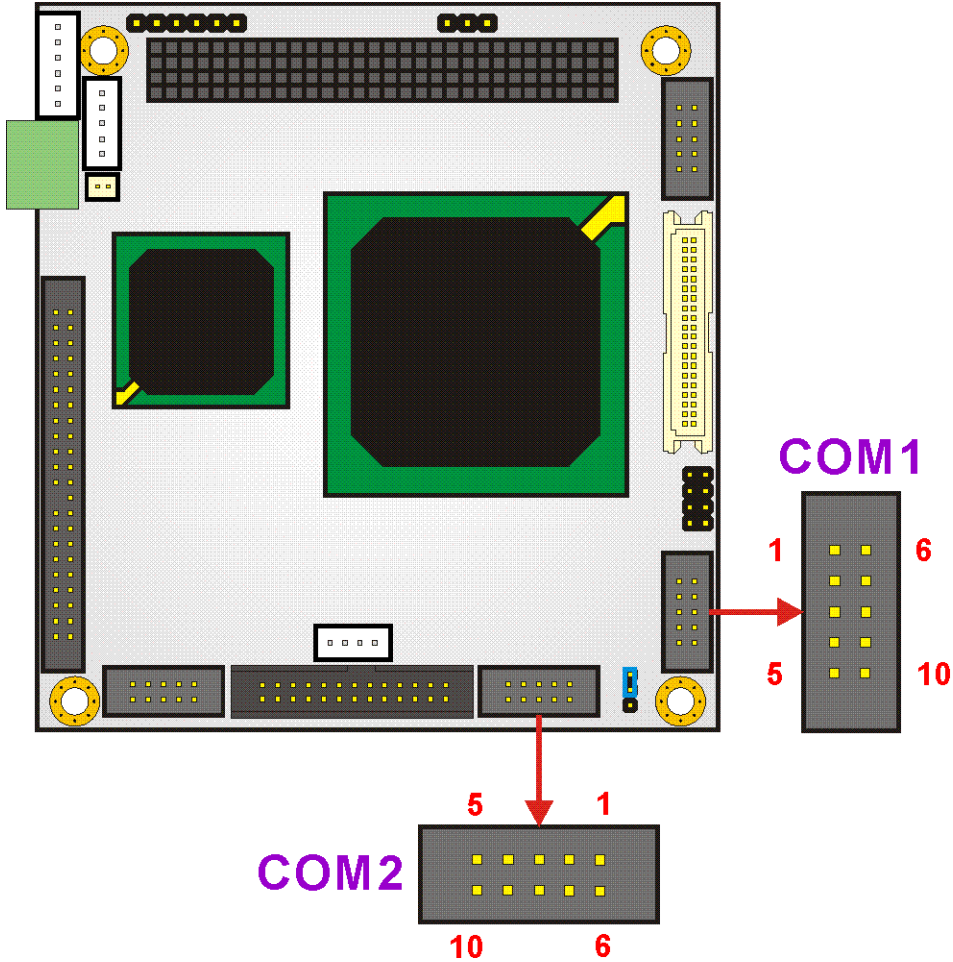


Figure 3-15 RS-232 Serial Communications Connector Locations

3.2.14 RS-422/485 Serial Communications Connector

CN Label:	CN10
CN Type:	4-pin header
CN Pinouts:	See Table 3-16
CN Location:	See Figure 3-16

The PM-LX-800 offers one four-pin header for RS-485 serial connection.

PIN	DESCRIPTION
1	RDX485-
2	RDX485+
3	TXD485+
4	TXD485-

Table 3-16: RS-422/485 Serial Communications Connector Pinouts

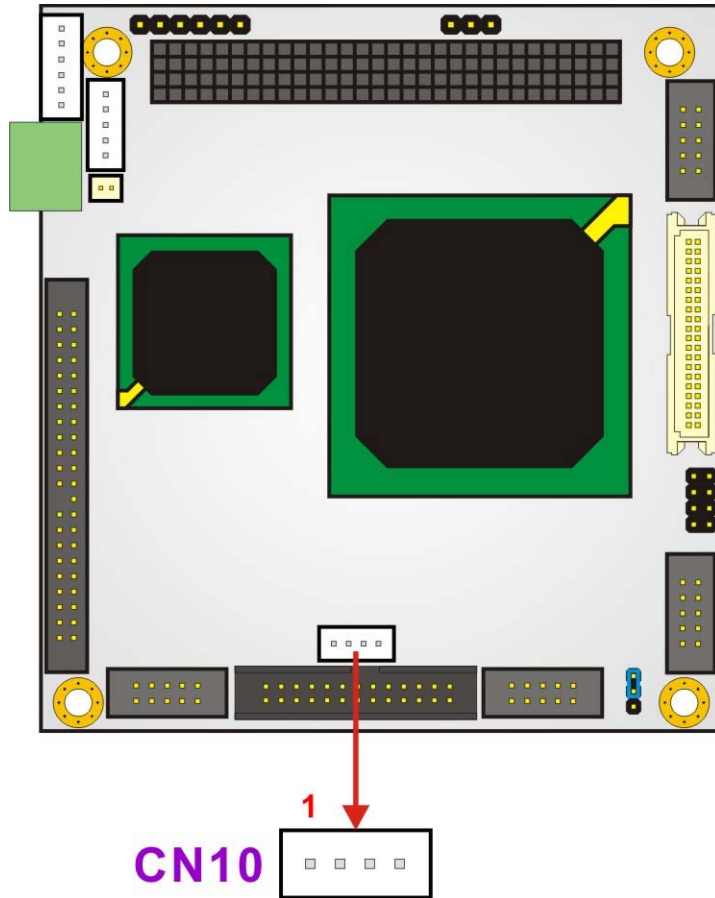


Figure 3-16 RS-422/485 Serial Communications Connector Locations

3.2.15 TTL LCD Connector

- CN Label: CN4
- CN Type: 40-pin headers (2x20 pins)
- CN Pinouts: See Table 3-17
- CN Location: See Figure 3-17

TTL LCD (24-bit one channel; DF13-40DP-1.25V)

PIN	DESCRIPTION	PIN	DESCRIPTION
2	LCDVCC5	1	LCDVCC5
4	GND	3	GND
6	LCDVCC3	5	LCDVCC3

PIN	DESCRIPTION	PIN	DESCRIPTION
8	GND	7	N/C
10	B1	9	B0
12	B3	11	B2
14	B5	13	B4
16	B7	15	B6
18	G1	17	G0
20	G3	19	G2
22	G5	21	G4
24	G7	23	G6
26	R1	25	R0
28	R3	27	R2
30	R5	29	R4
32	R7	31	R6
34	GND	33	GND
36	VSYNC	35	FPCLK
38	HSYNC	37	LCDEN
40	DISPEN	39	N/C

Table 3-17: TTL LCD Connector Pinouts

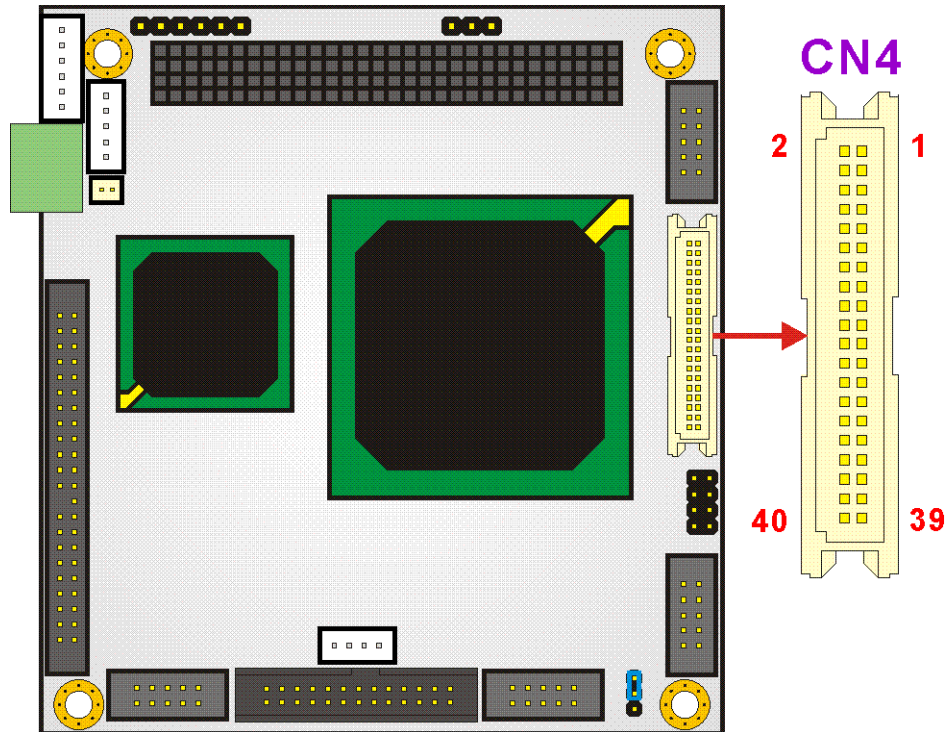


Figure 3-17 TTL LCD Connector Locations

3.2.16 USB Connector

CN Label:	USB1
CN Type:	8-pin header (2x4 pins)
CN Pinouts:	See Table 3-18
CN Location:	See Figure 3-18

An 8-pin header provide connectivity to two USB 2.0 ports. The USB ports are used for I/O bus expansion.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBVCC1	2	GND
3	D1F-	4	D2F+
5	D1F+	6	D2F-
7	GND	8	USBVCC1

Table 3-18: USB Connector Pinouts

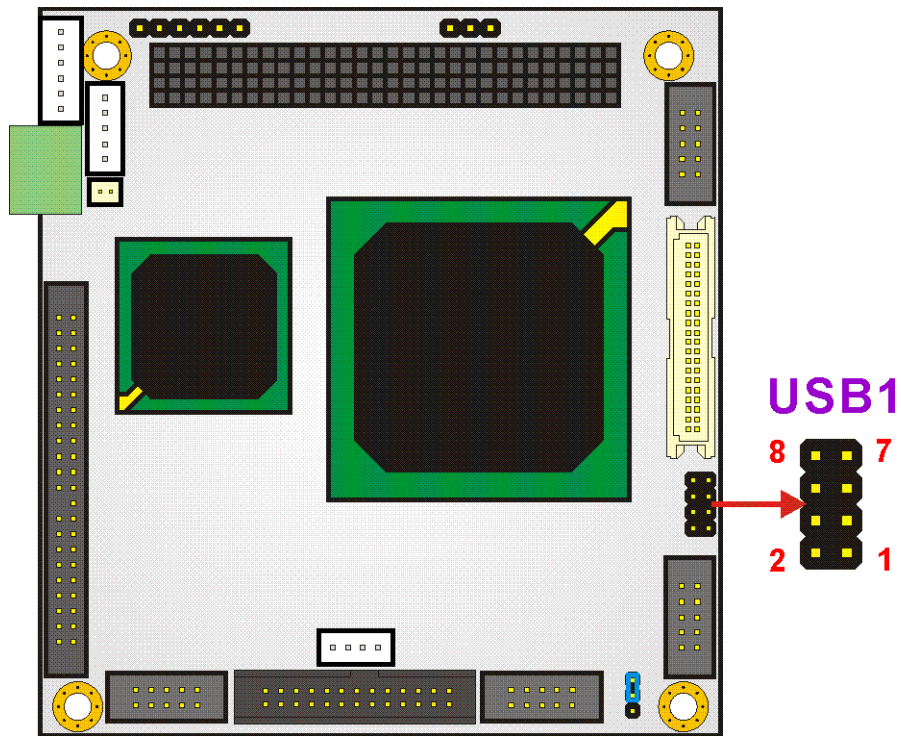


Figure 3-18 USB Connector Locations

3.2.17 VGA Connector

CN Label:	VGA1
CN Type:	10-pin headers (2x5 pins)
CN Pinouts:	See Table 3-19
CN Location:	See Figure 3-19

The VGA1 connector is an internal VGA connector.

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

Table 3-19: VGA Connector Pinouts

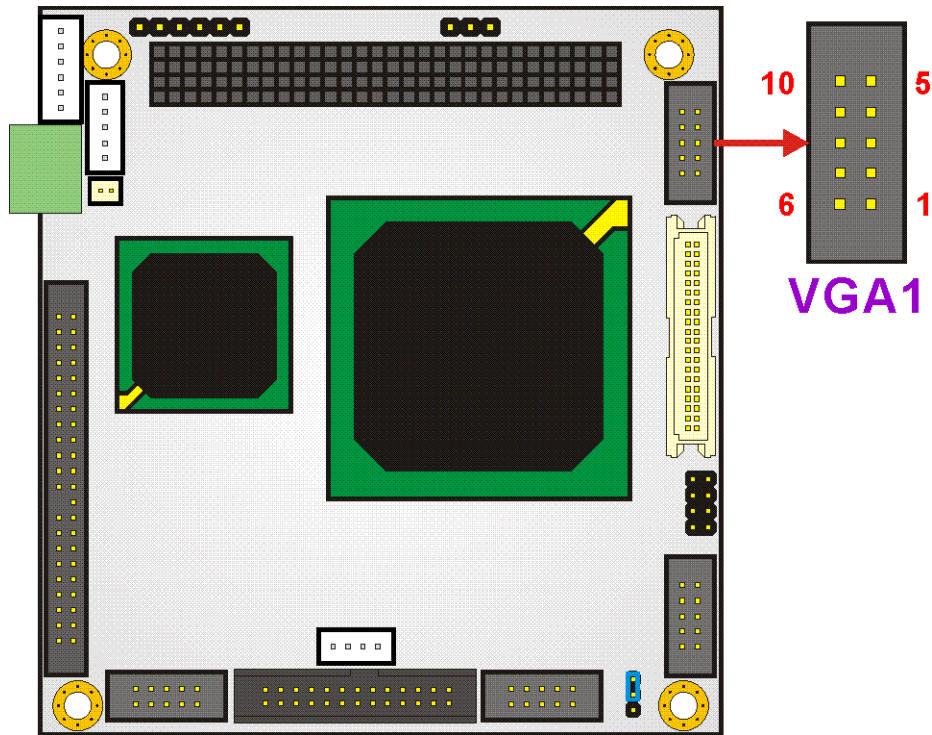


Figure 3-19 VGA Connector Location

3.3 Onboard Jumpers



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

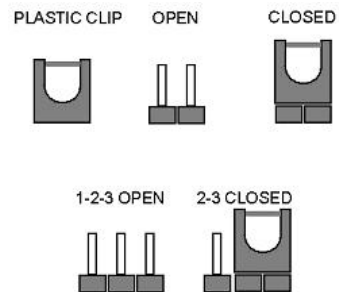


Figure 3-20: Jumper Locations

The PM-LX-800 CPU Board has one onboard jumper (Table 3-2).

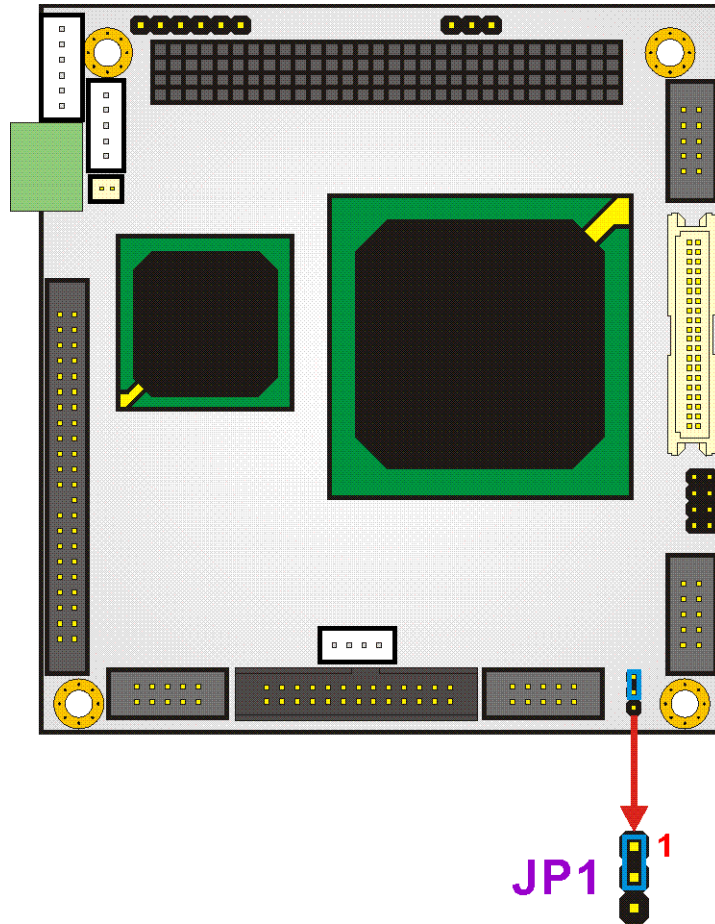


Figure 3-21: Jumper Locations



NOTE:

The PM-LX-800 does not provide a “Clear CMOS” configuration jumper. If the system fails to boot due to improper BIOS settings, reset the CMOS contents by disconnecting and reconnecting the BT1 battery connector. Use small-sized needle nose pliers to carefully disconnect and reconnect the BT1 battery connector.

3.3.1 COM3 RS422/RS485 Select Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Location:	See Figure 3-21
Jumper Settings:	See Table 3-20

The **COM3 RS422/RS485 Select** jumper sets the COM3 connector type to RS-422 or RS-485.

JP1	Description
1-2	UART-2 RxD Signal connect to RS-422 (Default)
2-3	UART-2 RxD Signal connect to RS-485

Table 3-20: COM3 RS422/RS485 Select Jumper Settings

Chapter

4

Installation and Configuration

4.1 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the motherboard is installed. All installation notices pertaining to the installation of the motherboard should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the motherboard and injury to the person installing the motherboard.

4.1.1 Installation Notices

Before and during the installation of the PM-LX-800 motherboard:

- Read the user manual
 - The user manual provides a complete description of the PM-LX-800 motherboard, installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD)
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff will remove ESD from your body and help to prevent ESD damage.
- Place the motherboard on an antistatic pad
 - When installing or configuring the motherboard, place it on an antistatic pad. This will help to prevent potential ESD damage.
- Turn off all power to the PM-LX-800 motherboard
 - When working with the motherboard, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PM-LX-800 motherboard, **DO NOT**:

- Remove any of the stickers from the PCB. These stickers are required for warranty validation.
- Use the product before you have verified that all cables and power connectors are properly connected.
- Allow screws to contact the PCB, connector pins, or its components.

4.2 Unpacking



NOTE:

If any of the items listed below are missing when the PM-LX-800 motherboard is unpacked, do not proceed with the installation and contact the reseller or vendor from whom the motherboard was purchased.

4.2.1 Unpacking Precautions

Unpack the PM-LX-800 motherboard before installing it. Some components on the PM-LX-800 are very sensitive to static electricity and can be damaged by a sudden rush of power. Follow these precautions to protect the motherboard from damage:

- Ground yourself to remove any static charge before touching the motherboard by wearing a grounded wrist strap at all times or by frequently touching any conducting material that is connected to the ground.
- Handle the motherboard by its edges. Do not touch the IC chips, leads, or circuitry if not necessary.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.2.2 Checklist

Please ensure the package contains the following items.

- 1 x PM-LX single board computer
- 1 x Mini jumper pack
- 1 x ATA33 flat cable
- 2 x RS232 cable
- 1 x USB cable
- 1 x VGA cable
- 1 x LAN cable
- 1 x Power cable
- 1 x KB/MS cable
- 1 x Utility CD
- 1 x QIG

If any of these items are missing, please contact the motherboard reseller or vendor and do not proceed any further with the installation.

4.3 PM-LX-800 CPU Board Installation



WARNING!

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the motherboard components and injury to the user.



WARNING!

When installing electronic components onto the motherboard or installing the motherboard onto the baseboard, always take anti-static precautions in order to prevent ESD damage to the motherboard and other electronic components like the CPU and DIMM modules.

The following components must be installed onto the motherboard or connected to the motherboard during the installation process.

**NOTE:**

The PM-LX-800 motherboard has a preinstalled AMD CPU.

- SO-DIMM module
- Mount the motherboard onto a baseboard

4.3.1 DIMM Module Installation

4.3.1.1 Purchasing the Memory Module

When purchasing SO-DIMM modules, the following considerations should be taken into account:

- The maximum SO-DIMM capacity supported is 1GB
- The maximum SO-DIMM frequency supported is 333 MHz.
- The SO-DIMM chip must be a 200-pin memory chip

4.3.1.2 SO-DIMM Module Installation

The PM-LX-800 motherboard has one 200-pin SO-DIMM socket. To install the SO-DIMM module, follow the instructions below.

Step 1: Turn the PM-LX-800 over so that the SO-DIMM socket is facing up.

Step 2: Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-1**)

Step 3: Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM module down. (See **Figure 4-1**)

Step 4: Release the arms of the SO-DIMM socket. They clip into place and secure the SO-DIMM module in the socket.

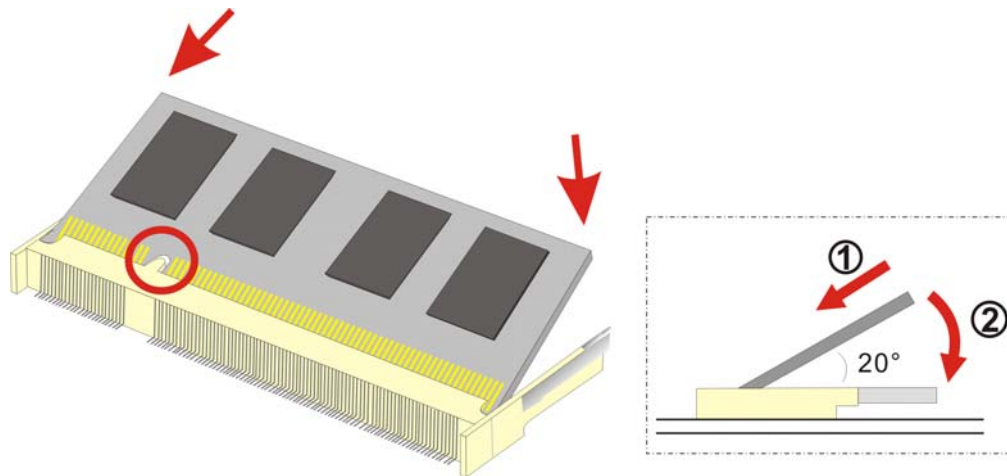


Figure 4-1: SO-DIMM Module Installation

4.3.2 Compact Flash Disk Installation

When appropriately formatted, a CompactFlash disk can serve as a bootable hard drive in applications where installation space is limited. The CompactFlash card occupies a secondary IDE channel. Configuration options can be found through the BIOS configuration utility. Follow the instructions below to connect a CompactFlash disk to the motherboard.

Step 1: Turn the PM-LX-800 over so that the CompactFlash socket is facing up.

Step 2: Gently push the CompactFlash chip into the socket until it clicks into place.

4.3.3 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the motherboard are listed in **Table 4-1**. Cables not included in the kit must be purchased separately.

Quantity	Type
1	ATA33 flat cable
1	KB/MS cable
2	RS232 cable

Quantity	Type
1	USB cable
1	VGA cable
1	LAN cable
1	Power cable

Table 4-1: IEI Provided Cables

4.3.4 IDE Disk Drive Installation

The cable used to connect the motherboard to the IDE HDD is a standard 44-pin ATA33 flat cable. To connect an IDE HDD to the motherboard, follow the instructions below.

- Step 1:** Find the ATA33 flat cable in the kit that came with the motherboard.
- Step 2:** Connect one end of the cable to the IDE1 connector on the motherboard. A keyed pin on the IDE connectors prevents it from being connected incorrectly.
- Step 3:** Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.
- Step 4:** Connect the other end of the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.

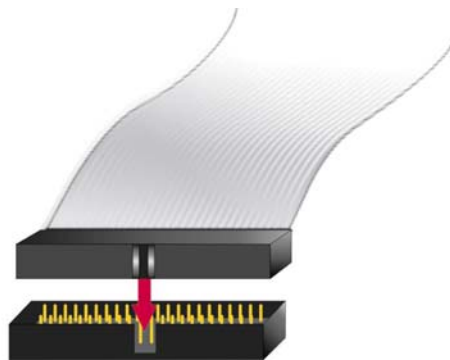


Figure 4-2: Connection of IDE Connector

4.3.5 Chassis LED Installation

To connect the chassis LED to the motherboard, follow the instructions below.

Step 1: Connect the 6-pin connector end of an LED cable to the CN2 pin header on the motherboard. Be sure to align the red wire on the connector to pin 1 on the header.

4.3.6 COM1/COM2 RS-232 Serial Port Installation

The cable used to connect the motherboard to an RS-232 serial port is a 10-pin header to male D-sub 9 connector. To connect an RS-232 serial port to the motherboard, follow the instructions below.

Step 1: Find the RS-232 cables in the kit that came with the motherboard.

Step 2: Connect the 10-pin connector end of the cables to the COM1 and COM2 box headers on the motherboard. Be sure to align the red wire on the connector to pin 1 on the box header.

Step 3: Connect the other end of the cables to standard female D-sub 9 connectors.

4.3.7 COM3 RS-422/485 Serial Port Installation

To connect an RS-422/485 serial port to the motherboard, follow the instructions below.

Step 1: Connect the 4-pin connector end of an RS-422/485 serial port cable to the CN10 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.



NOTE:

Be sure to configure the JP1 COM3 RS422/RS485 Select Jumper for either an RS-422 or RS-485 connection. Refer to **Section 0** for more information.

4.3.8 Keyboard/Mouse Installation

The cable used to connect the motherboard to a keyboard or mouse is a 6-pin header to PS/2 cable connector. To connect a keyboard or mouse to the motherboard, follow the instructions below.

Step 1: Find the KB/MS cable in the kit that came with the motherboard.

Step 2: Connect the 6-pin connector end of the cable to the KBMS1 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 3: Connect the other side of the cable to a keyboard and/or mouse using a standard PS/2 connector.

4.3.9 LAN Installation

The cable used to connect the motherboard to a LAN is a 10-pin header to RJ-45 connector. To connect a LAN to the motherboard, follow the instructions below.

Step 1: Find the LAN cable in the kit that came with the motherboard.

Step 2: Connect the 10-pin connector end of the cable to the LAN1 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 3: Connect the other end of the cable to a standard RJ-45 connector.

4.3.10 LCD Backlight Installation

To connect an LCD backlight (inverter) to the motherboard, follow the instructions below.

Step 1: Connect the 5-pin connector end of the LCD backlight cable to the CN5 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.3.11 LPT Port Installation

To connect an LPT port to the motherboard, follow the instructions below.

Step 1: Connect the 26-pin connector end of an LPT printer cable to the LPT1 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.3.12 Power Connection

To connect the motherboard to a power supply, follow the instructions below.

Step 1: Find the power cable in the kit that came with the motherboard.

Step 2: Connect the 3-pin terminal block connector end of the cable to the CN1 terminal block on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 3: Connect the other end of the cable to a power supply.

4.3.13 TTL LCD Installation

To connect a TTL LCD to the motherboard, follow the instructions below.

Step 1: Connect the 40-pin connector end of a TTL LCD cable to the CN4 miniature crimping connector on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.3.14 USB Port Installation

The cable used to connect the motherboard to a USB port is an 8-pin header to USB connector. To connect a USB port to the motherboard, follow the instructions below.

Step 1: Find the USB cable in the kit that came with the motherboard.

Step 2: Connect the 8-pin connector end of the cable to the USB1 header on the motherboard. Be sure to align the red wire on the connector to pin 1 on the header.

Step 3: Connect the other end of the cable to standard USB connectors.

4.3.15 VGA Port Installation

The cable used to connect the motherboard to a VGA port is a 10-pin header to female HD-D-sub 15 connector. To connect a VGA port to the motherboard, follow the instructions below.

Step 1: Find the VGA cable in the kit that came with the motherboard.

Step 2: Connect the 10-pin connector end of the cable to the VGA1 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 3: Connect the other end of the cable to standard male HD-D-sub 15 VGA connector.

4.3.16 Mounting the PM-LX-800 Motherboard

The PM-LX-800 motherboard has a standard PCI-104 connector on the front side. Baseboards can be designed by the end user, customized by IEI, or purchased from IEI. For more information visit the IEI website (www.ieiworld.com) or contact an IEI sales representative.

To install the module, follow the instructions below.

Step 1: Align the PCI-104 connector with the corresponding connector on a compatible module.

Step 2: Gently push the motherboard down to ensure the connectors are properly connected.

4.3.17 Airflow Consideration

Although the embedded board can operate without active cooling, it is still necessary to install the board in a chassis with ventilation holes on the sides allowing airflow to travel

through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.4 Jumper Configuration

The PM-LX-800 motherboard has one onboard jumpers:

- COM3 RS422/RS485 Select (JP1)

Make sure the jumper settings are properly configured before the PM-LX-800 motherboard is installed into a chassis. For more information about jumper settings and configurations, refer to **Section 3.3**.

4.5 Chassis Installation

The motherboard can be mounted into a chassis only after the CPU and the SO-DIMM module has been installed, the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configured.

Refer to the chassis user guide for instructions on how to mount the motherboard into a chassis.

Chapter

5

Award BIOS Setup

5.1 Introduction

A licensed copy of Phoenix Award BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The Phoenix Award BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the “**Press Del to enter SETUP**” message appears on the screen.

If the message disappears, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the **PAGEUP** and **PAGEDOWN** keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown below.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+ / Page up	Increase the numeric value or make changes
- / Page down	Decrease the numeric value or make changes
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Item help

Key	Function
F5	Previous values for the page menu items
F6	Fail-safe defaults for the current page menu items
F7	Optimized defaults for the current page menu items
F9	Menu in BIOS
F10	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

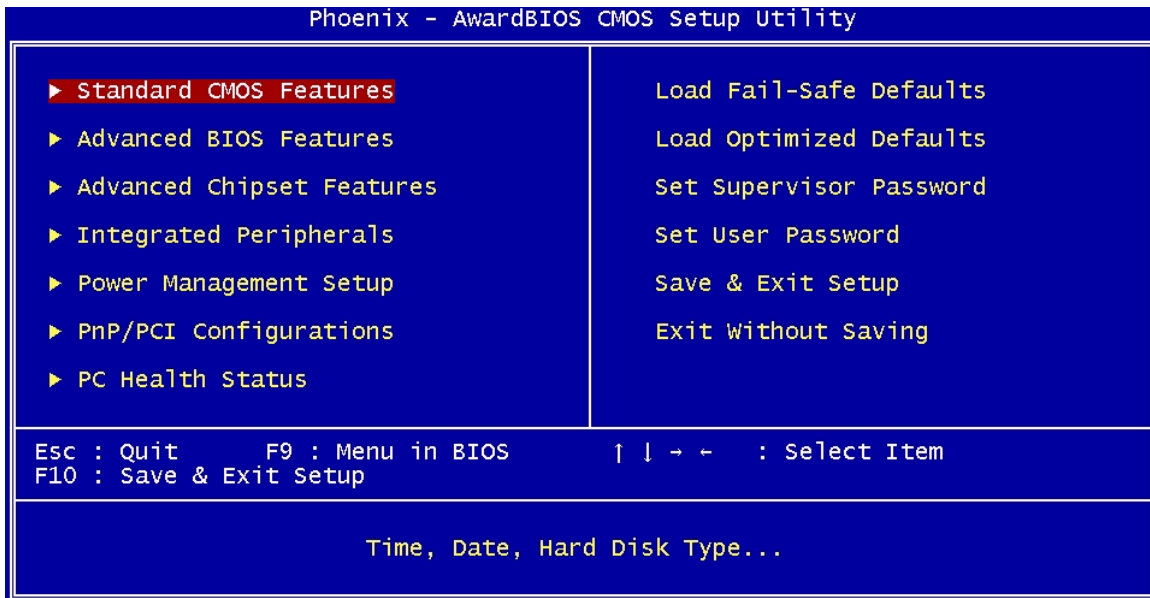
When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the system cannot be booted after changes are made, restore the CMOS defaults. The motherboard should come with a restore CMOS settings jumper. Refer to **Section 3.3** for more information.

5.1.5 Main BIOS Menu

Once the BIOS opens, the main menu (**BIOS Menu 1**) appears.



BIOS Menu 1: AwardBIOS CMOS Setup Utility



NOTE:

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS Menu 1**.

- **Standard CMOS Features:** Changes the basic system configuration.
- **Advanced BIOS Features:** Changes the advanced system settings.
- **Advanced Chipset Features:** Changes the chipset configuration features.
- **Integrated Peripherals:** Changes the settings for integrated peripherals.
- **Power Management Setup:** Configures power saving options.
- **PnP/PCI Configurations:** Changes the advanced PCI/PnP settings.
- **PC Health Status:** Monitors essential system parameters.

The following user configurable options are also available in **BIOS Menu 1**:

→ **Load Fail-Safe Defaults**

Select this option to load failsafe default values for each BIOS parameter in the setup menus. Press **F6** for this operation on any page.

→ **Load Optimized Defaults**

Select this option to load optimal default values for each BIOS parameter in the setup menus. Press **F7** for this operation on any page.

→ **Set Supervisor Password**

By default, no supervisor password is set. To install a supervisor password, select this field and enter the password. After this option is selected, a red dialogue box appears with “**Enter Password:** ”. Type the password and press **ENTER**. Retype the original password into the “**Confirm Password:** ” dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the “**Enter Password:** ” dialogue box, then press any key in the “**Password Disabled !!!**” dialogue box.

→ **Set User Password**

By default no user password is set. To install a user password, select this field and enter the password. After this option is selected, a red dialogue box appears with “**Enter Password:** ”. Type the password and press **ENTER**. Retype the original password into the “**Confirm Password:** ” dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the “**Enter Password:** ” dialogue box, then press any key in the “**Password Disabled !!!**” dialogue box.

→ **Save & Exit Setup**

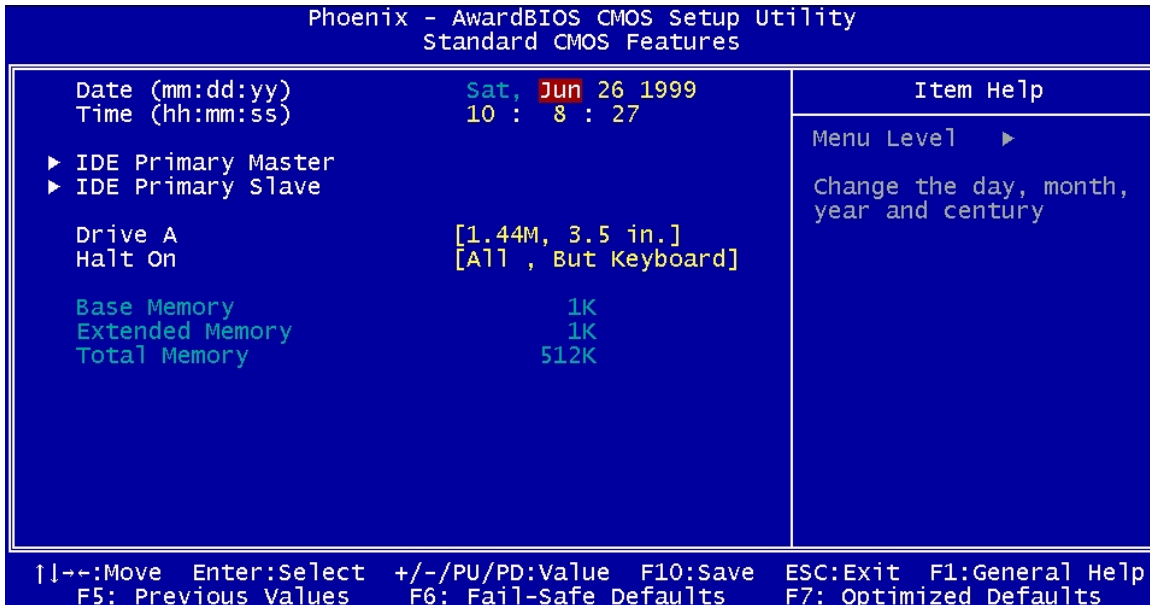
Select this option to save any configuration changes made and exit the BIOS menus.

→ **Exit Without Saving**

Select this option exit the BIOS menus without saving any configuration changes.

5.2 Standard CMOS Features

Use the Standard CMOS Features BIOS menu (**BIOS Menu 2**) to set basic BIOS configuration options.



BIOS Menu 2: Standard CMOS Features

→ Date [Day mm:dd:yyyy]

The **Date** option sets the system date.

→ Time [hh/mm/ss]

The **Time** option sets the system time.

→ IDE Master and IDE Slave

When entering setup, BIOS auto detects the presence of IDE devices. The **Standard CMOS Features** menu shows the status of the auto detected IDE devices. The following IDE devices are detected and shown in the **Standard CMOS Features** menu:

- IDE Primary Master
- IDE Primary Slave

IDE device configurations are changed or set in the IDE Configuration menu (**BIOS Menu 3**). If an IDE device is detected, and one of the above listed two BIOS configuration options is selected, the IDE configuration options shown in **Section 5.2.1** appear.

→ **Drive A [1.44M, 3.5in]**

Use the Drive A configuration to specify the floppy drive type installed in the system. The floppy drive configuration options are:

- None
- 360K, 5.25 in.
- 1.2M, 5.25 in.
- 720K, 3.5 in.
- 1.44M, 3.5in (Default)
- 2.88M, 3.5 in.

→ **Halt On [All, But Keyboard]**

Use the Halt On option to specify what errors detected during the power up process stop the system.

- | | | |
|---|------------------------------------|--|
| → | All Errors | Whenever BIOS detects a non-fatal error the system is stopped and the user prompted. |
| → | No Errors | The system boot is not stopped for any errors that may be detected. |
| → | All, But Keyboard (Default) | The system boot does not stop for a keyboard error; it stops for all other errors. |
| → | All, But Diskette | The system boot does not stop for a disk error; it stops for all other errors. |
| → | All, But Disk/Key | The system boot does not stop for a keyboard or a disk error; it stops for all other errors. |

→ **Base Memory:**

The **Base Memory** is NOT user configurable. The POST determines the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed, or 640K for systems with 640K or more memory installed.

→ **Extended Memory**

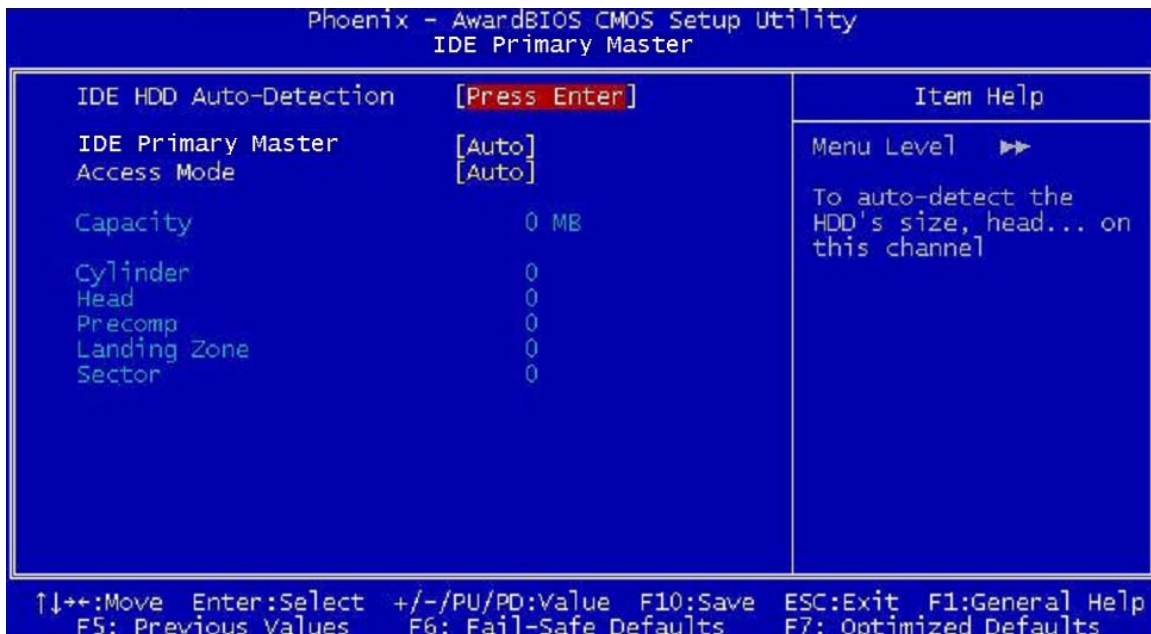
The **Extended Memory** is NOT user configurable. The BIOS determines how much extended memory is present during the POST. This is the amount of memory above 1MB located in the memory address map of the CPU.

→ **Total Memory**

The **Total Memory** is NOT user configurable.

5.2.1 IDE Primary Master/Slave

Use the IDE Primary Master/Slave menu (**BIOS Menu 3**) to set or change the master/slave IDE configurations.



BIOS Menu 3: IDE Primary Master

→ IDE HDD Auto-Detection [Press Enter]

Use the **IDE HDD Auto-Detection** option to enable BIOS to automatically detect the IDE settings. Select **IDE HDD Auto-Detection** and press **ENTER**. BIOS automatically detects the HDD type. Do not set this option manually.

→ IDE Primary Master [Auto]

Use the **IDE Primary Master** option to activate or deactivate the following drive channels:

- Channel 0 Master
- Channel 0 Slave
- Channel 1 Master
- Channel 0 Slave

- ➔ **None** If no drives are connected to the IDE channel select this option. Once set, this IDE channel becomes inaccessible and any drives attached to it are undetected.
- ➔ **Auto** (Default) Setting this option allows the device to be automatically detected by the BIOS.
- ➔ **Manual** Selecting this option allows manual configuration of the device on the IDE channel in BIOS.

➔ **Access Mode [Auto]**

The **Access Mode** option can only be configured if the **IDE Primary Master** is set to either **Manual** or **Auto**. Use the **Access Mode** option to determine the hard disk BIOS translation modes. Most systems now use hard drives with large capacities and therefore either the LBA translation mode or auto mode should be selected.

- ➔ **CHS** Select this mode if the HDD capacity is less than 504MB.
- ➔ **LBA** Select this mode if the HDD capacity is more than 8.4GB.
- ➔ **Large** This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.
- ➔ **Auto** (Default) If you are unsure of what access mode to set, select this option.

➔ **Capacity**

The **Capacity** specification indicates the storage capacity of the HDD installed in the system.

→ Cylinder

The **Cylinder** specification indicates how many cylinders (tracks) are on the HDD installed in the system.

→ Head

The **Head** specification indicates how many logical heads are on the HDD installed in the system.

→ Precomp

The **Precomp** specification indicates on what track the write precompensation begins.

→ Landing Zone

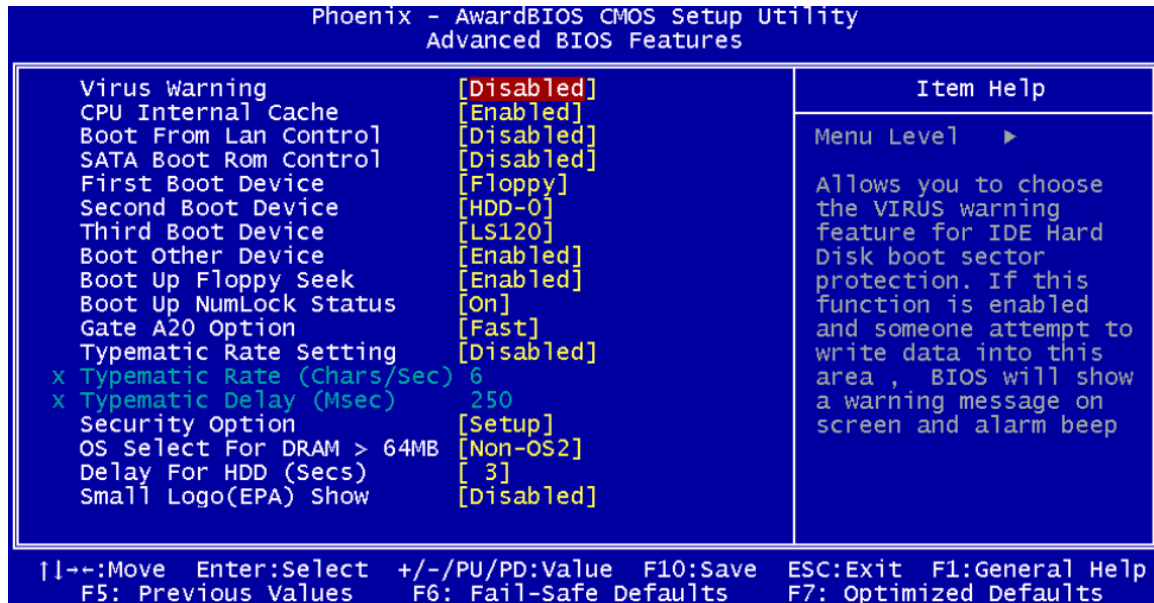
The **Landing Zone** specification indicates where the disk head will park itself after the system powers off.

→ Sector

The **Sector** specification indicates how many logical sectors the HDD has been divided into.

5.3 Advanced BIOS Features

CPU and peripheral device configuration options are accessed in the **Advanced BIOS Features** menu (**BIOS Menu 4**).



BIOS Menu 4: Advanced BIOS Features

→ Virus Warning [Disabled]



NOTE:

Many disk diagnostic programs can cause the above warning message to appear when the program attempts to access the boot sector table. If you are running such a program, it is recommended that the virus protection function be disabled beforehand.

Use the **Virus Warning** option to enable BIOS to monitor the boot sector and partition table of the HDD for any attempted modification. If a modification attempt is made, the BIOS halts the system and an error message appears. If necessary, an anti-virus program can then be run to locate and remove the virus before any damage is done.

- **Enabled** Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or HDD partition table.
- **Disabled** (Default) No warning message appears when there is an attempt to access the boot sector or HDD partition table.

→ **CPU Internal Cache [Enabled]**

Use the **CPU Internal Cache** option to enable or disable the internal CPU cache.

- **Disabled** The internal CPU cache is disabled.
- **Enabled** (Default) The internal CPU cache is enabled.

→ **Boot From LAN Control [Disabled]**

Use the **BOOT From LAN Control** option to enable the system to be booted from a remote system.

- **Disabled** (Default) The system cannot be booted from a remote system through the LAN.
- **Enabled** The system can be booted from a remote system through the LAN.

→ **SATA Boot ROM Control [Disabled]**

Use the **SATA Boot ROM Control** option to configure SATA IDE use in DOS mode.

- **Disabled** (Default) Disables SATA IDE use in DOS mode.
- **Enabled** Enables SATA IDE use in DOS mode.

→ **Boot Device**

Use the **Boot Device** options to select the order of the devices the system boots from.

There are three boot device configuration options:

- **First Boot Device** [Default: Floppy]
- **Second Boot Device** [Default: HDD-0]
- **Third Boot Device** [Default: CDROM]

Using the default values, the system first looks for a floppy disk to boot from. If it cannot find a floppy disk, it boots from an HDD. If both The floppy and the HDD are unavailable, the system boots from a CDROM drive.

Boot Device configuration options are:

- Floppy
- LS120
- HDD-0
- SCSI
- CDROM
- HDD-1
- ZIP100
- USB-FDD
- USB-ZIP
- USB-CDROM
- USB-HDD
- LAN
- Disabled

→ **Boot Other Device [Enabled]**

Use the **Boot Other Device** option to determine whether the system uses a second or third boot device if the first boot device is not found.

- **Disabled** The system does not look for second and third boot devices if the first one is not found.
- **Enabled** (Default) The system looks for second and third boot devices if the first one is not found.

→ Boot Up Floppy Seek [Disabled]

Use the **Boot Up Floppy Seek** option to enable the BIOS to determine if the floppy disk drive installed has 40 or 80 tracks during the POST. 360K FDDs have 40 tracks while 760K, 1.2M and 1.44M FDDs all have 80 tracks.

→ Disabled (Default) BIOS does not search for the type of FDD drive by track number. Note that there is no warning message if the drive installed is 360K.

→ Enabled BIOS searches for a FDD to determine if it has 40 or 80 tracks. Note that BIOS cannot tell the difference between 720K, 1.2M or 1.44M drives as they all have 80 tracks.

→ Boot Up Numlock Status [On]

Use the **Boot Up Numlock Status** option to specify the default state of the numeric keypad.

→ Off The keys on the keypad are not activated.

→ On (Default) Activates the keys on the keypad.

→ Gate A20 Option [Fast]

Use the **Gate A20 Option** option to set if the keyboard controller or the chipset controls the Gate A20 switching.

→ Normal The keyboard controller does the switching.

→ Fast (Default) The chipset does the switching.

→ Typematic Rate Setting [Disabled]

Use the **Typematic Rate Setting** configuration option to specify if only one character is allowed to appear on the screen if a key is continuously held down. When this option is enabled, the BIOS reports as before, but it then waits a moment, and, if the key is still held

down, it begins to report that the key has been pressed repeatedly. This feature accelerates cursor movement with the arrow keys.

- ➔ **Disabled** (Default) Disables the typematic rate.
- ➔ **Enabled** Enables the typematic rate.

➔ **Typematic Rate (Chars/sec) [6]**

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Rate** option to specify the rate keys are accelerated.

- ➔ **6** (Default) 6 characters per second
- ➔ **8** 8 characters per second
- ➔ **10** 10 characters per second
- ➔ **12** 12 characters per second
- ➔ **15** 15 characters per second
- ➔ **20** 20 characters per second
- ➔ **24** 24 characters per second
- ➔ **30** 30 characters per second

➔ **Typematic Delay (Msec) [250]**

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Delay** option to specify the delay time between when a key is first pressed and when the acceleration begins.

- ➔ **250** (Default) 250 milliseconds
- ➔ **500** 500 milliseconds
- ➔ **750** 750 milliseconds
- ➔ **1000** 1000 milliseconds

→ **Security Option [Setup]**

Use the **Security Option** to limit access to both the system and Setup, or just Setup.

- **Setup** (Default) The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.
- **System** The system boots, but access to Setup is denied if the correct password is not entered at the prompt.



NOTE:

To disable security, select the password setting in the Main Menu. When asked to enter a password, don't type anything, press **ENTER** and the security is disabled. Once the security is disabled, the system boots and **Setup** can be accessed.

→ **OS Select For DRAM > 64MB [Non-OS2]**

Use the **OS Select For DRAM > 64MB** option to specify the operating system.

- **Enabled** Specifies the operating system used as OS/2.
- **Disabled** (Default) Select this option when not using the OS/2 operating system.

→ **Delay for HDD (Secs) [3]**

Use the **Delay for HDD** option to specify the period of time the system should wait before the HDD is identified. If selected, the user is asked to enter a number between 0 and 15. The number specified is the number of seconds the system waits before the HDD is identified.

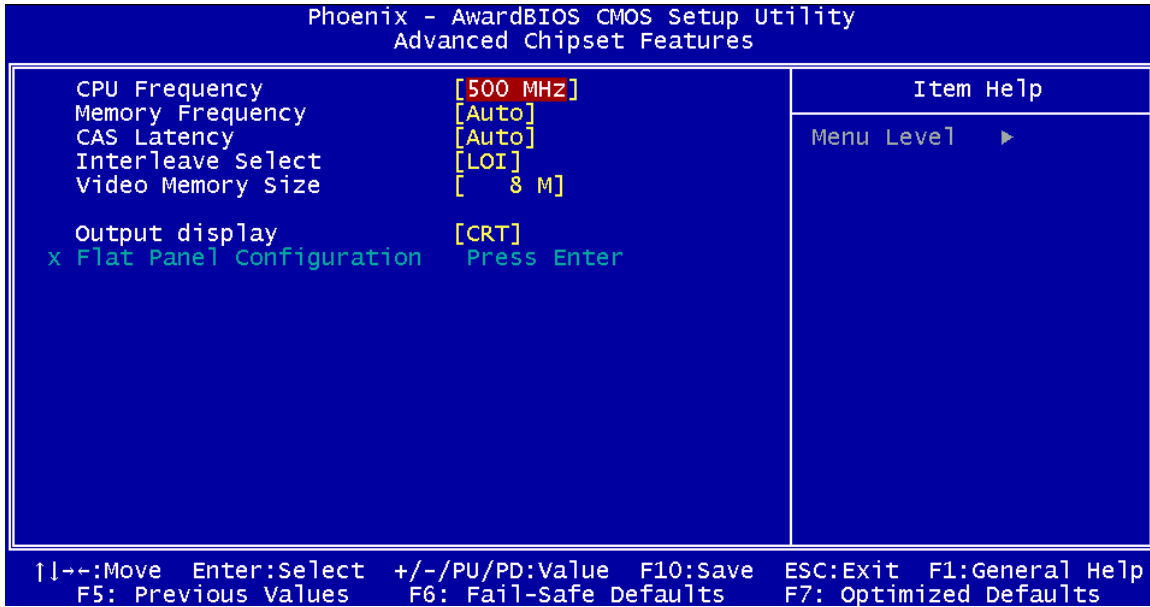
→ **Small Logo (EPA) Show [Disabled]**

Use the **Small Logo (EPA) Show** option to specify if the Environmental Protection Agency (EPA) logo appears during the system boot-up process. If enabled, the boot up process may be delayed.

- **Disabled** (Default) EPA logo does not appear during boot up.
- **Enabled** EPA logo appears during boot up.

5.4 Advanced Chipset Features

Use the Advanced Chipset Features menu (**BIOS Menu 5**) to change chipset configuration options.



BIOS Menu 5: Advanced Chipset Features

→ CPU Frequency [500MHz]

Use the **CPU Frequency** option to set the CPU frequency.

- 500MHz (Default)

→ Memory Frequency [Auto]

Use the **Memory Frequency** option to set the frequency of the installed DRAM modules.

The **Memory Frequency** options are:

- Auto (Default)
- 100 MHz
- 133 MHz
- 166 MHz
- 200 MHz

→ **CAS Latency [Auto]**

Use the **CAS Latency Time** option to set the Column Address Strobe (CAS) delay time.

The **CAS Latency Time** options are:

- Auto (Default)
- 1.5 nanoseconds
- 2.0 nanoseconds
- 2.5 nanoseconds
- 3.0 nanoseconds
- 3.5 nanoseconds

→ **Interleave Select [LOI]**

Use the **Interleave Select** option to specify how the cache memory is interleaved.

- **LOI** (Default) Low order interleaving (LOI) of memory occurs.
- **HOI** High order interleaving (HOI) of memory occurs.

→ **Video Memory Size [8M]**

Use the **Video Memory Size** option to determine how much memory is allocated to the video graphics device. The **Video Memory Size** options are:

- None
- 8M (Default)
- 16M
- 32M
- 64M
- 128M
- 254M

→ Output Display [CRT]

Use the **Output Display** configuration to specify the display devices the system is connected to. The **Output Display** options are:

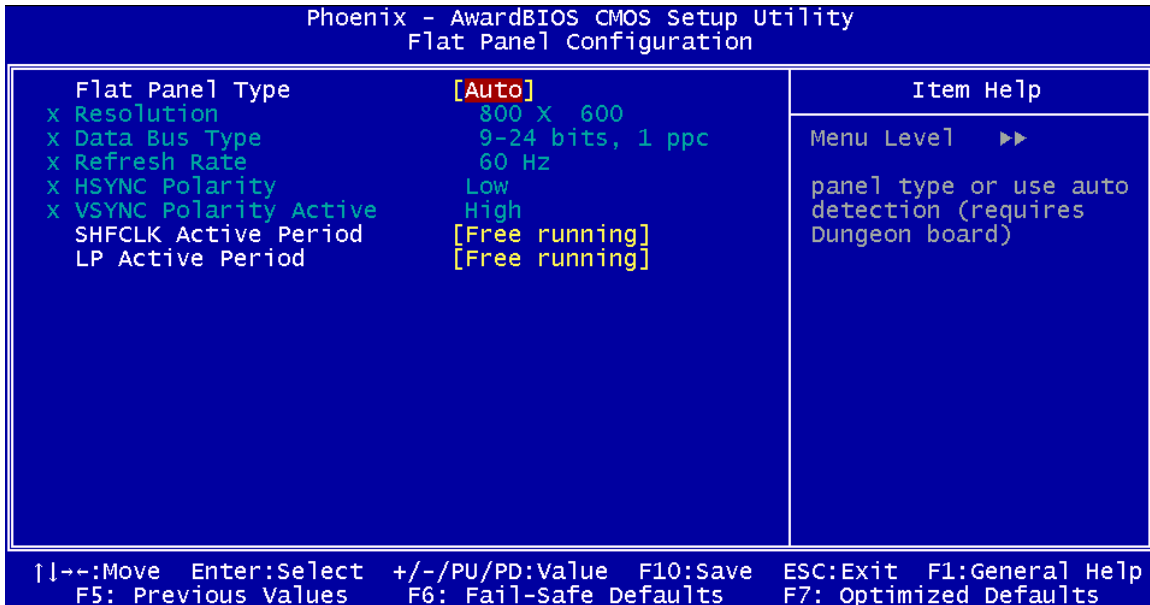
- Flat Panel
- CRT (Default)
- Panel & CRT

→ Flat Panel Configuration [Press Enter]

Use the Flat Panel Configuration option to open the Flat Panel Configuration menu. The Flat Panel Configuration options are shown in Section **5.4.1**.

5.4.1 Flat Panel Configuration

Use the **Flat Panel Configuration** menu (**BIOS Menu 6**) to set the configuration settings for the flat panel screen connected to the system.



BIOS Menu 6: Flat Panel Configuration

→ Flat Panel Type [Auto]

Use the **Flat Panel Type** option to specify the type of flat panel screen connected to the system.

- **TFT** Specifies the system is connected to a TFT display.
- **LVDS** Specifies the system is connected to an LVDS display.
- **Auto** (Default) The system detects the display type and the display settings.

→ Resolution [800 x 600]

The **Resolution** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Resolution** option to set the resolution of the flat panel screen connected to the system. The **Resolution** options are:

- 320 x 240
- 640 x 480
- 800 x 600 (Default)
- 1024 x 768
- 1152 x 864
- 1280 x 1024
- 1600 x 1200

→ **Data Bus Type [9 – 24 bits, 1 ppc]**

The **Data Bus Type** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Data Bus Type** option to set the bus type and the data bus width used to transfer data between the system and the flat panel screen connected to the system. The **Data Bus Type** options are:

- 9-24 bits, 1 ppc (Default)
- 18, 24 bits, 2 ppc

→ **Refresh Rate [60Hz]**

The **Refresh Rate** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Refresh Rate** option to set the screen refresh rate required by the panel connected to the system. Check the documentation that came with the panel before setting this option. The **Refresh Rate** options are:

- 60Hz (Default)
- 70Hz
- 72Hz
- 75Hz
- 85Hz
- 90Hz
- 100Hz

→ **HSYNC Polarity [Low]**

The **HSYNC Polarity** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **HSYNC Polarity** option to set the polarity of the HSYNC signal to the panel. The **HSYNC Polarity** options are:

- High
- Low (Default)

→ **VSYNC Polarity Active [Low]**

The **VGSYNC Polarity Active** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **VGSYNC Polarity Active** option to set the polarity of the VSYNC signal to the panel. The **VGSYNC Polarity Active** options are:

- High
- Low (Default)

→ **SHFCLK Active Period [Free Running]**

Use the **SHFCLK Active Period** option to set the SHFCLK. The **SHFCLK Active Period** options are:

- Active Only
- Free running (Default)

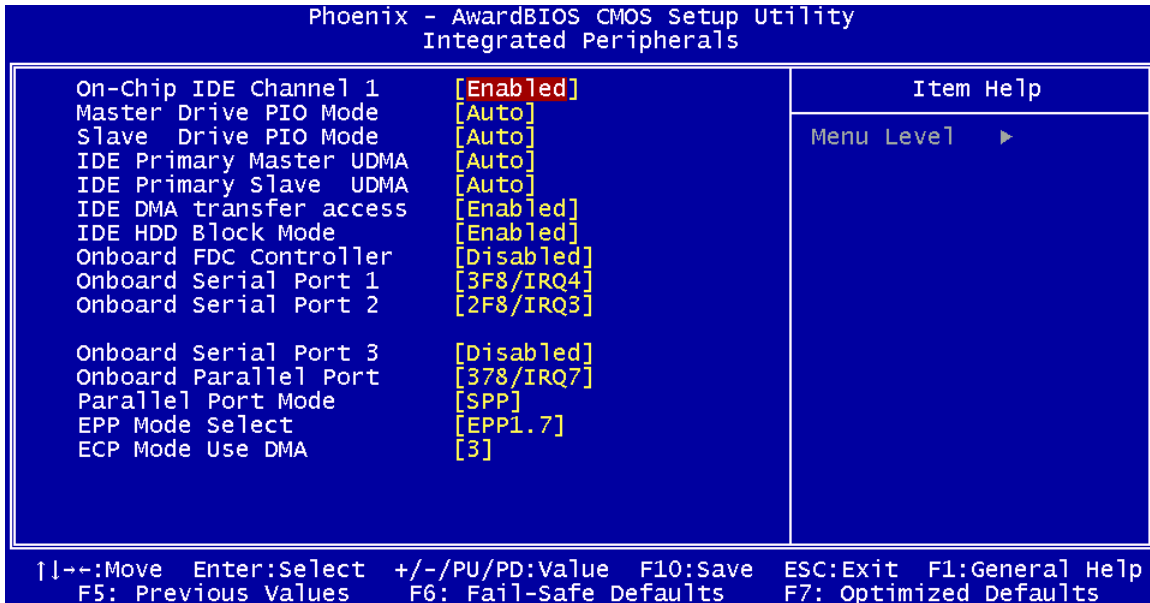
→ **LP Active Period [Free Running]**

Use the **LP Active Period** option to set the LDE/MOD signal to the panel. The **LP Active Period** options are:

- Active Only
- Free running (Default)

5.5 Integrated Peripherals

Use the Integrated Peripherals menu (**BIOS Menu 7**) to change the configuration options for the attached peripheral devices.



BIOS Menu 7: Integrated Peripherals

→ On-Chip IDE Channel 1 [Enabled]

The **On-Chip IDE Channel 1** option is enabled and is NOT user configurable.

→ Drive PIO Mode [Auto]

Use the **Drive PIO Mode** options below to select the Programmed Input/Output (PIO) mode for the following HDDs:

- Master Drive PIO Mode
- Slave Drive PIO Mode

→ **Auto** (Default) The computer selects the correct mode.

→ **Mode 0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps.

- ➔ **Mode 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps.
- ➔ **Mode 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps.
- ➔ **Mode 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps.
- ➔ **Mode 4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps.

➔ **IDE UDMA [Auto]**

Use the **IDE UDMA** option below to select the Ultra DMA (UDMA) mode for the following HDDs:

- IDE Primary Master UDMA
 - IDE Primary Slave UDMA
- ➔ **Auto** (Default) The computer selects the correct UDMA.
 - ➔ **Disabled** The UDMA for the HDD device is disabled.

➔ **IDE DMA transfer access [Enabled]**

Use the **IDE DMA transfer access** option to enable or disable DMA support for IDE devices connected to the system.

- ➔ **Disabled** All IDE drive DMA transfers are disabled. The IDE drives use PIO mode transfers.
- ➔ **Enabled** (Default) All IDE drive DMA transfers are enabled.

➔ **IDE HDD Block Mode [Enabled]**

If the drive connected to the system supports block mode, use the **IDE HDD Block Mode** option to enable the system to detect the optimal number of block read/writes per sector the system IDE drive can support. Block mode is also called block transfer, multiple commands, or multiple sector read/write.

- ➔ **Disabled** Block mode is not supported.

→ **Enabled** (Default) Block mode is supported.

→ **Onboard FDC Controller [Disabled]**

Use the **Onboard FDC Controller** option to enable or disable the onboard floppy controller. If the system is not connected to a floppy disk or uses an adapter for the FDD, this option can be disabled.

→ **Disabled** (Default) The FDD controller is disabled.

→ **Enabled** The FDD controller is enabled.

→ **Onboard Serial Port 1 [3F8/IRQ4]**

Use the **Onboard Serial Port 1** option to select the I/O address and IRQ for the onboard serial port 1. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 1** options are:

- Disabled
- 3F8/IRQ4 (Default)
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

→ **Onboard Serial Port 2 [2F8/IRQ3]**

Use the **Onboard Serial Port 2** option to select the I/O address and IRQ for the onboard serial port 2. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 2** options are:

- Disabled
- 3F8/IRQ4
- 2F8/IRQ3 (Default)
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

→ **Onboard Serial Port 3 [Disabled]**

Use the **Onboard Serial Port 3** option to select the I/O address and IRQ for the onboard serial port 2. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 3** options are:

- Disabled (Default)
- 3F8/IRQ4
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

→ **Onboard Parallel Port [378/IRQ7]**

Use the **Onboard Parallel Port** option to specify a logical LPT port address and corresponding interrupt for the physical parallel port. The **Onboard Parallel Port** options are:

- Disabled
- 378/IRQ7 (Default)
- 278/IRQ5
- 3BC/IRQ7

→ **Parallel Port Mode [SPP]**

Use the **Parallel Port Mode** option to select parallel port operation mode.

→ **SPP** (Default) The parallel port operates in the standard parallel port (SPP) mode. This parallel port mode works with most parallel port devices but is slow.

→ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

- ➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.
- ➔ **ECP+EPP** The parallel port is compatible with both ECP and EPP devices.
- ➔ **Normal**

➔ **x EPP Mode Select [EPP1.7]**

The **EPP Mode Select** option is only available if the **Parallel Port Mode** option is set to an EPP mode. Use the **EPP Mode Select** option to select the parallel port mode standard for the parallel port.

- ➔ **EPP1.9** EPP 1.9 is selected as the EPP standard.
- ➔ **EPP1.7** (Default) EPP 1.7 is selected as the EPP standard.

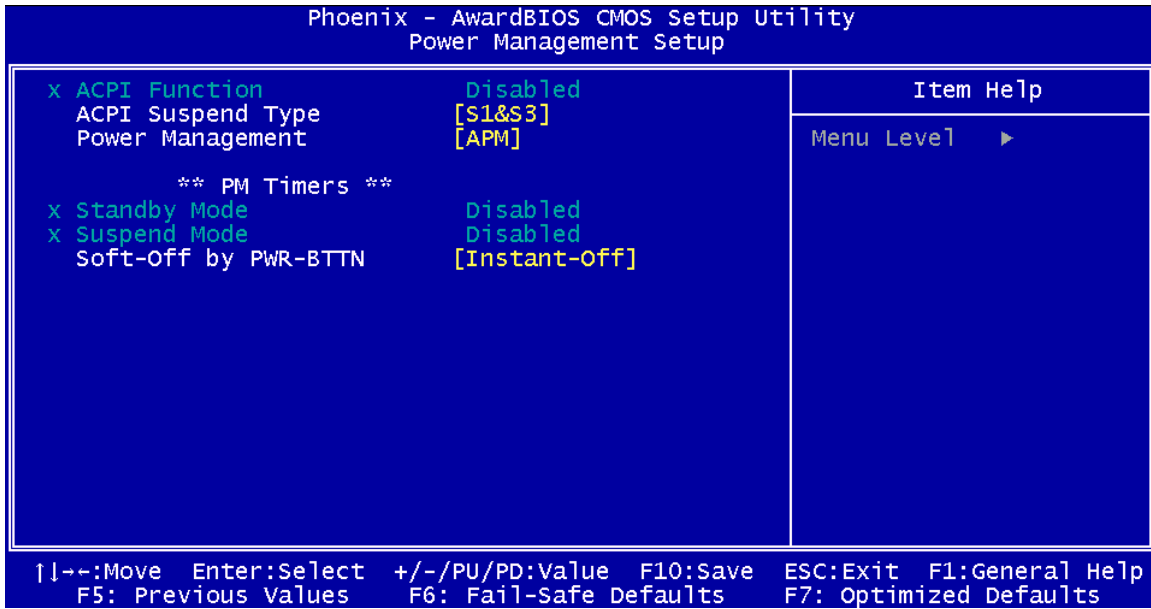
➔ **x ECP Mode Use DMA [3]**

The **ECP Mode Use DMA** option is only available if the **Parallel Port Mode** option is set to ECP mode. Use the **ECP Mode Use DMA** option to specify the DMA channel the parallel port must use in the ECP mode.

- ➔ **1** The parallel port uses DMA Channel 1 in ECP mode.
- ➔ **3** (Default) The parallel port uses DMA Channel 3 in ECP mode.

5.6 Power Management Setup

Use the **Power Management Setup** menu (**BIOS Menu 8**) to set the BIOS power management and saving features.



BIOS Menu 8: Power Management Setup

→ x ACPI Function [Disabled]

The **ACPI Function** is enabled when the **Power Management** option is set to ACPI; otherwise, it is disabled.

→ ACPI Suspend Type [S1&S3]

When the system is in the [S1&S3] suspend state, the system appears off. The CPU is stopped, RAM is refreshed and the system is runs in a low power mode.

- **S1(POS)** Sets the ACPI Suspend Type to POS (Power On Suspend).
- **S3(STR)** Sets the ACPI Suspend Type to STR (Suspend To RAM).
- **S1&S3** (Default) Sets the ACPI Suspend Type to POS and STR.

→ Power Management [APM]

Use the **Power Management** option to set the power management type used by the system.

- Disabled** All power management options are turned off. The only user configurable options are the power button and alarm settings.
- Legacy** Standby and suspend modes can be set.
- APM** (Default) Advanced power management (APM) is activated
- ACPI** Advanced Configuration and Power Interface (ACPI) is activated.

→ x Standby Mode [Disabled]

The **Standby Mode** option can only be selected if the **Power Management** option is set to **Legacy**. The **Standby Mode** specifies the amount of time the system can be inactive before the system enters standby mode. The **Standby Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min
- 45 Min
- 60 Min
- 90 Min
- 120 Min

→ **x Suspend Mode [Disabled]**

The **Suspend Mode** option can only be selected if the **Power Management** option is set to Legacy. The **Suspend Mode** specifies the amount of time the system can be inactive before the system enters suspend mode. The **Suspend Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min
- 45 Min
- 60 Min
- 90 Min
- 120 Min

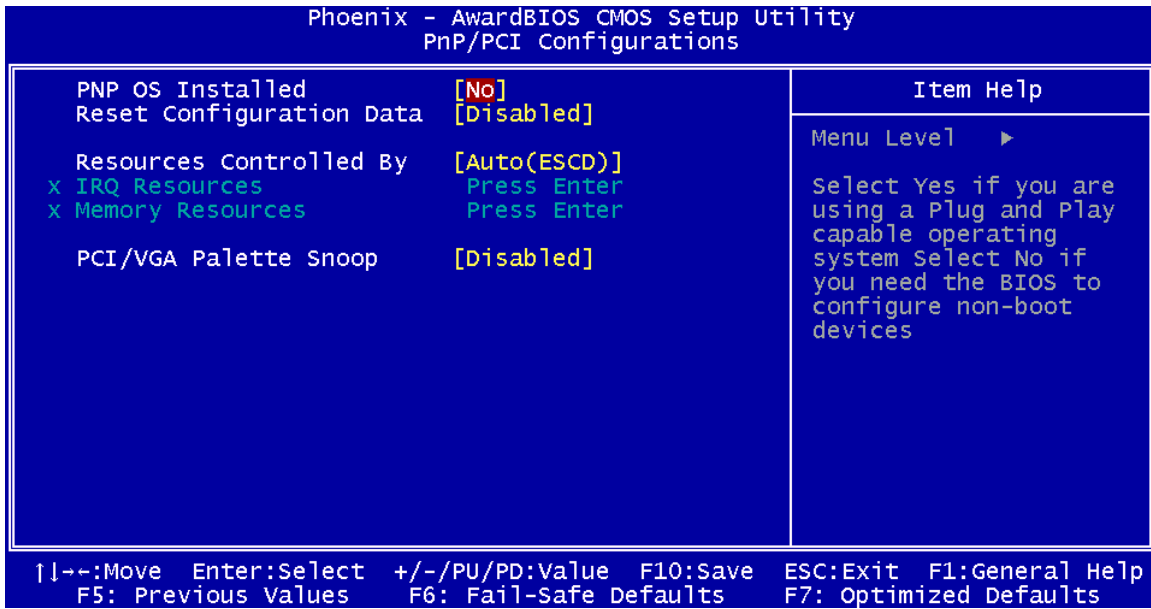
→ **Soft-Off by PWR-BTTN [Instant-Off]**

Use the **Soft-Off by PWR-BTTN** option to enabled the system to enter a very low-power-usage state when the power button is pressed.

- **Instant-Off** (Default) When the power button is pressed, the system is immediately shutdown.
- **Delay 4-sec** To shutdown the system the power button must be held down longer than four seconds otherwise, the system enters a low power usage state.

5.7 PnP/PCI Configurations

Use the PnP/PCI Configurations menu (**BIOS Menu 9**) to set the plug and play, and PCI options.



BIOS Menu 9: PnP/PCI Configurations

→ PNP OS Installed [No]

The **PNP OS Installed** option determines whether the Plug and Play devices connected to the system are configured by the operating system or the BIOS.

- No (Default) If the operating system does not meet the Plug and Play specifications, BIOS configures all the devices in the system.
- Yes Set this option if the system is running Plug and Play aware operating systems. The operating system changes the interrupt, I/O, and DMA settings.

→ Reset Configuration Data [Disabled]

Use the **Reset Configuration Data** option to reset the Extended System Configuration Data (ESCD) when exiting setup if booting problems occur after a new add-on is installed.

- ➔ **Disabled** (Default) ESCD will not be reconfigured
- ➔ **Enabled** ESCD will be reconfigured after you exit setup

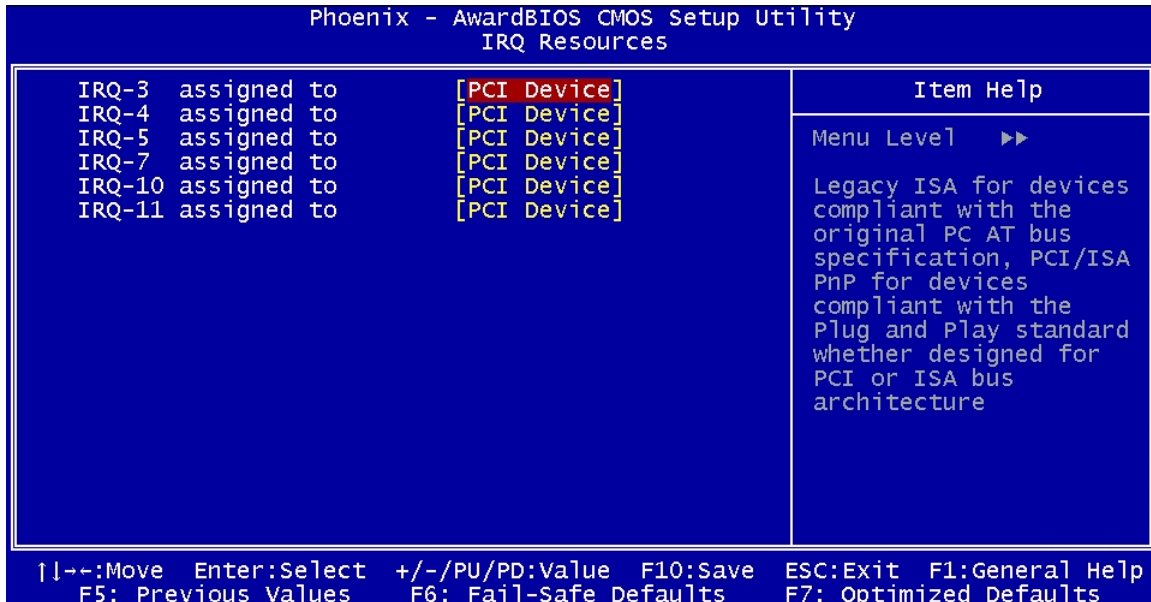
➔ **Resources Controlled By [Auto (ESCD)]**

Use the **Resources Controlled By** option to either manually configure all the boot and plug and play devices, or allow BIOS to configure these devices automatically. If BIOS is allowed to configure the devices automatically IRQs, DMA and memory base address fields cannot be set manually.

- ➔ **Auto(ESCD)** (Default) BIOS automatically configures plug and play devices as well as boot devices.
- ➔ **Manual** Manually configure the plug and play devices and any other boot devices.

→ **x IRQ Resources [Press Enter]**

The IRQ Resources option (**BIOS Menu 10**) can only be selected if the Resources Controlled By option is set to Manual.



BIOS Menu 10: IRQ Resources

The **IRQ Resources** menu has the following options:

- IRQ-3 assigned to
- IRQ-4 assigned to
- IRQ-5 assigned to
- IRQ-7 assigned to
- IRQ-10 assigned to
- IRQ-11 assigned to

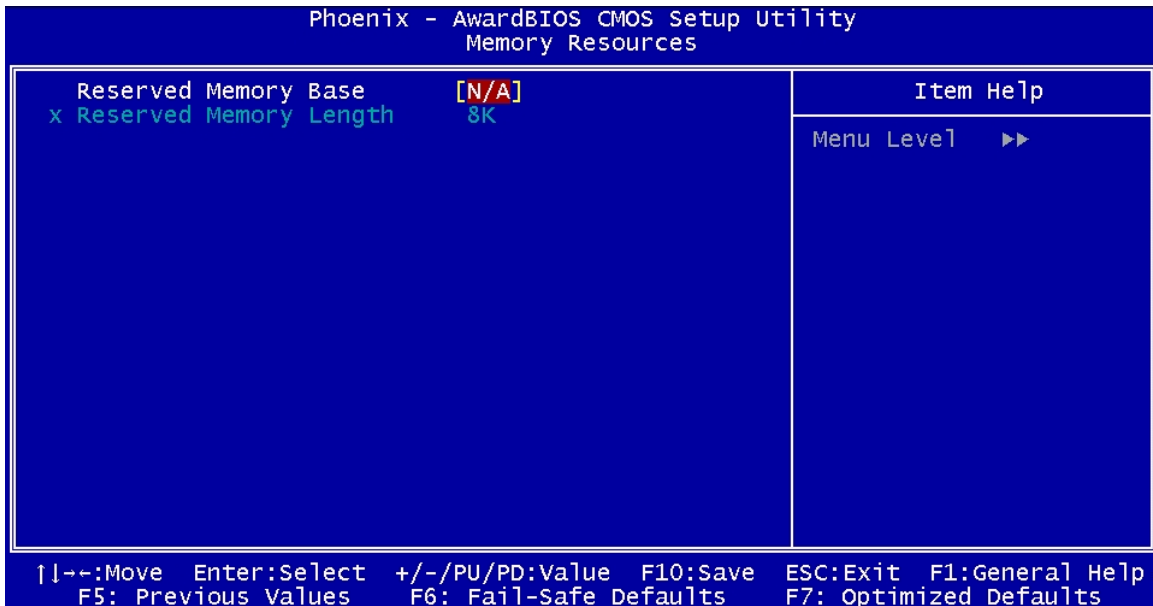
The above options all have the following default options.

- **PCI Device** (Default) The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

➔ **Reserved** The IRQ is reserved by BIOS.

➔ **x Memory Resources [Press Enter]**

The Memory Resources menu (**BIOS Menu 11**) can only be accessed if the Resources Controlled By option is set to Manual. Use Memory Resources to select a base address and the length for the memory area used by a peripheral that requires high memory.



BIOS Menu 11: Memory Resources

The menu has two configurable options:

- Reserved Memory Base
- Reserved Memory Length

→ **Reserved Memory Base [N/A]**

The **Reserved Memory Base** option specifies the base address for the peripheral device.

The **Reserved Memory Base** options are:

- N/A (Default)
- C800
- CC00
- D000
- D400
- D800
- DC00

→ **x Reserved Memory Length [8K]**

The **Reserved Memory Length** option can only be accessed if the **Reserved Memory Base** option is not set to **N/A**. The **Reserved Memory Length** specifies the amount of memory reserved for the peripheral device. The **Reserved Memory Length** options:

- 8K (Default)
- 16K
- 32K
- 64K

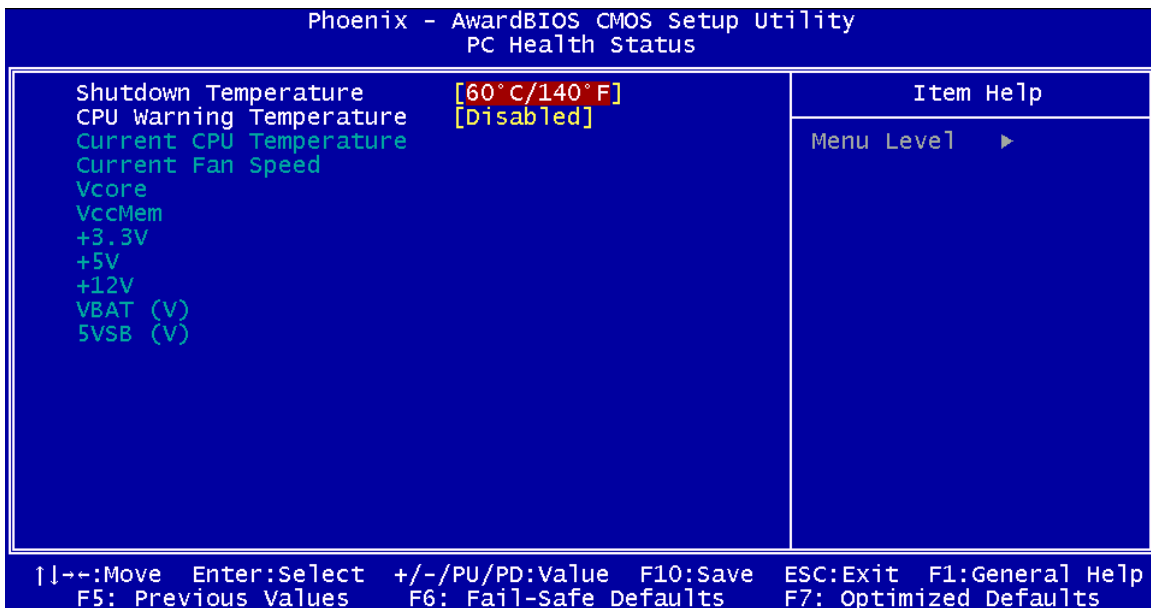
→ **PCI/VGA Palette Snoop [Disabled]**

The **PCI/VGA Palette Snoop** option enables the system to determine whether or not some special VGA cards, high-end hardware MPEG decoders and other similar devices are allowed to look at the VGA palette on the video card so these devices can determine what colors are in use. This option is needed *very rarely* and should be left "Disabled" unless a video device specifically requires the setting to be enabled upon installation.

- **Disabled** (Default) Does not allow the graphics devices to examine the VGA palette on the graphics card.
- **Enabled** Allows the graphics devices to examine the VGA palette on the graphics card.

5.8 PC Health Status

The **PC Health Status** menu (**BIOS Menu 12**) has two user configurable options and shows system operating parameters that are essential to the stable operation of the system.



BIOS Menu 12: PC Health Status

→ Shutdown Temperature

Use the **Shutdown Temperature** option to specify a CPU operating temperature threshold that, when reached, would shutdown the system.

- 60°C/140°F
- 65°C/149°F
- 70°C/158°F
- 75°C/167°F
- Disabled (Default)

→ CPU Warning Temperature

Use the **CPU Warning Temperature** option to specify a CPU operating temperature threshold that, when reached, generates a warning signal.

- Disabled (Default)
- 50°C/122°F
- 53°C/127°F
- 56°C/133°F
- 60°C/140°F
- 63°C/145°F
- 66°C/151°F
- 70°C/158°F

The following system parameters are monitored by the **PC Health Status** menu.

→ Temperatures

The following temperature is monitored:

- Current CPU Temperature

→ Fan Speeds

The following fan speed is monitored:

- Current CPU Fan Speed

→ Voltages

The following voltages are monitored:

- Vcore
- VccMem
- +3.3 V
- +5 V
- +12 V
- VBAT (V)
- 5VSB (V)

Chapter

6

Software Drivers

6.1 Available Software Drivers



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The PM-LX-800 motherboard requires two software drivers:

- VGA Driver
- LAN Driver

All drivers can be found on the CD that came with the motherboard. To install the drivers please follow the instructions in the sections below.

Insert the CD into the system that contains the PM-LX-800 motherboard.



NOTE:

If your system does not run the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (replace **X** with the actual drive letter for your CD-ROM) to access the **IEI Driver CD** main menu.

Step 1: From the AMD LX/GX Driver CD main menu (**Figure 6-1**), click **PM-LX-800**.



Figure 6-1: AMD LX/GX CD Main Menu

Step 2: A window appears listing the drivers available for installation (**Figure 6-2**).

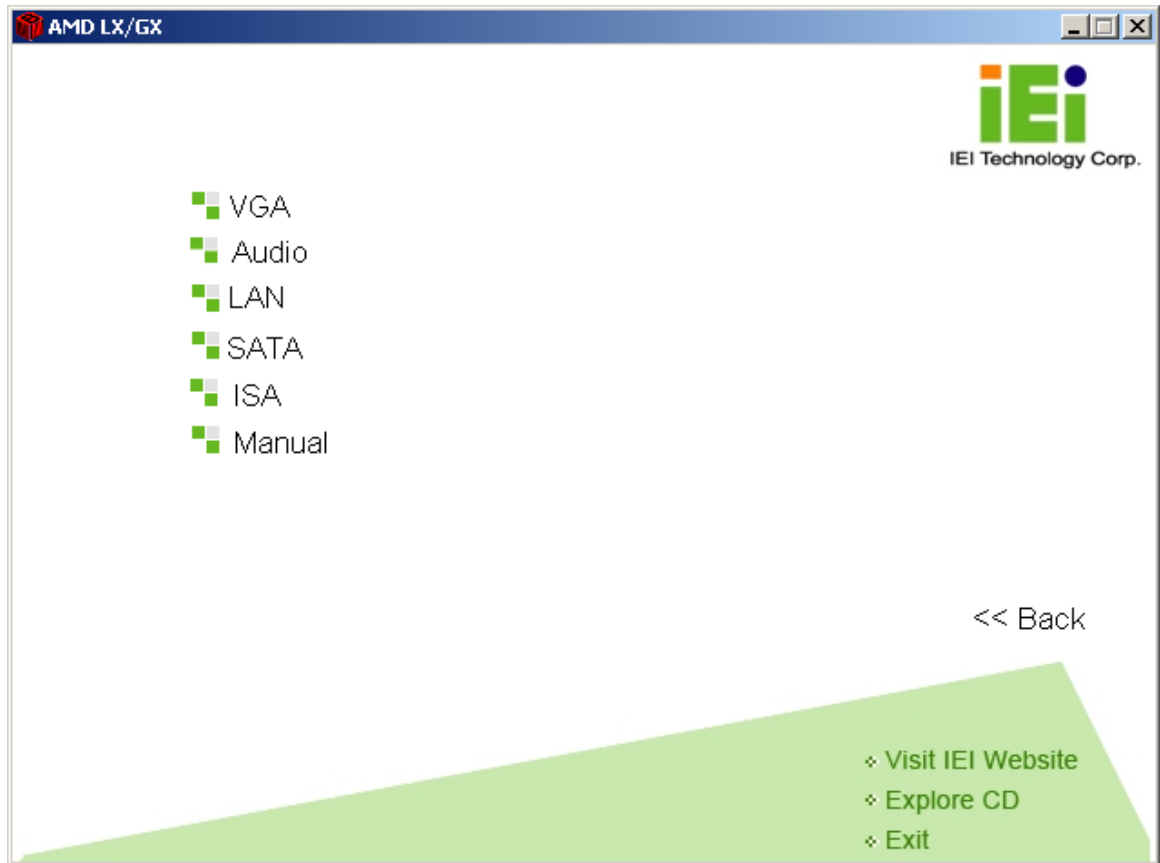


Figure 6-2: AMD LX/GX CD Driver Menu

Step 3: Select any item from the list to view more information on the driver installation, or select Manual to navigate to the PM-LX-800 user manual.

The following sections fully describe the driver installation procedures for the PM-LX-800 motherboard.

6.2 VGA Driver

To install the VGA driver please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 6-3)**.

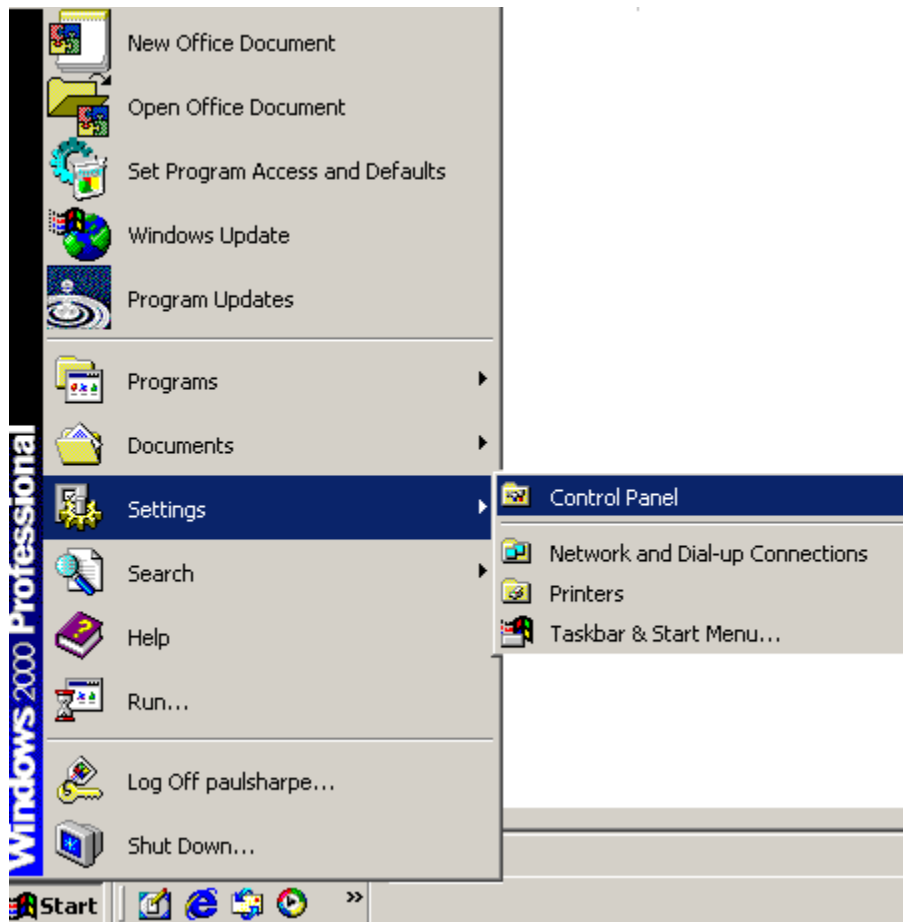


Figure 6-3: Access Windows Control Panel

Step 2: Double click the **System** icon (Figure 6-4).

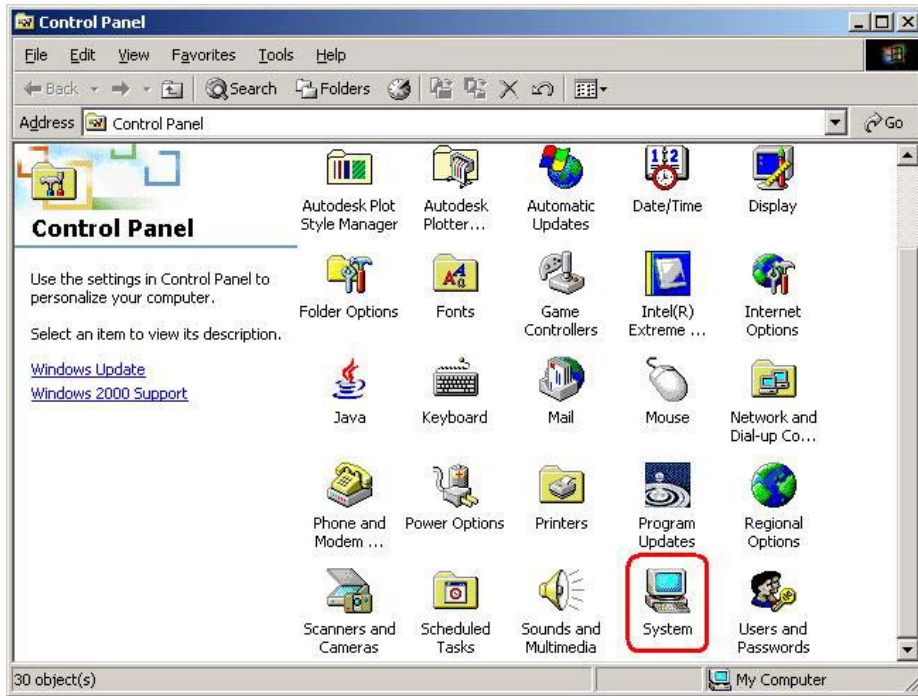


Figure 6-4: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (Figure 6-5).

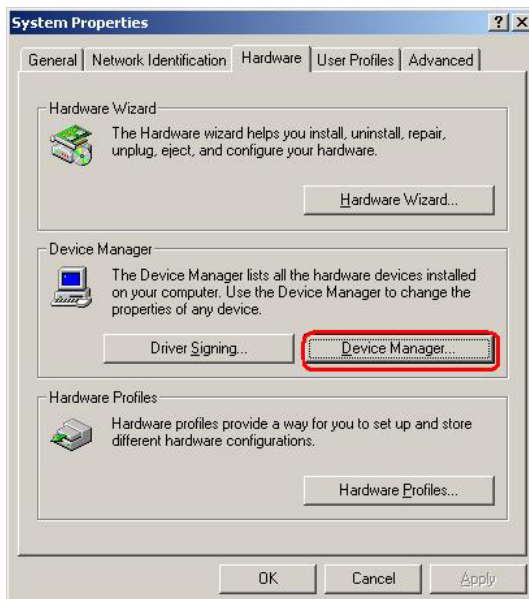


Figure 6-5: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (Figure 6-6).

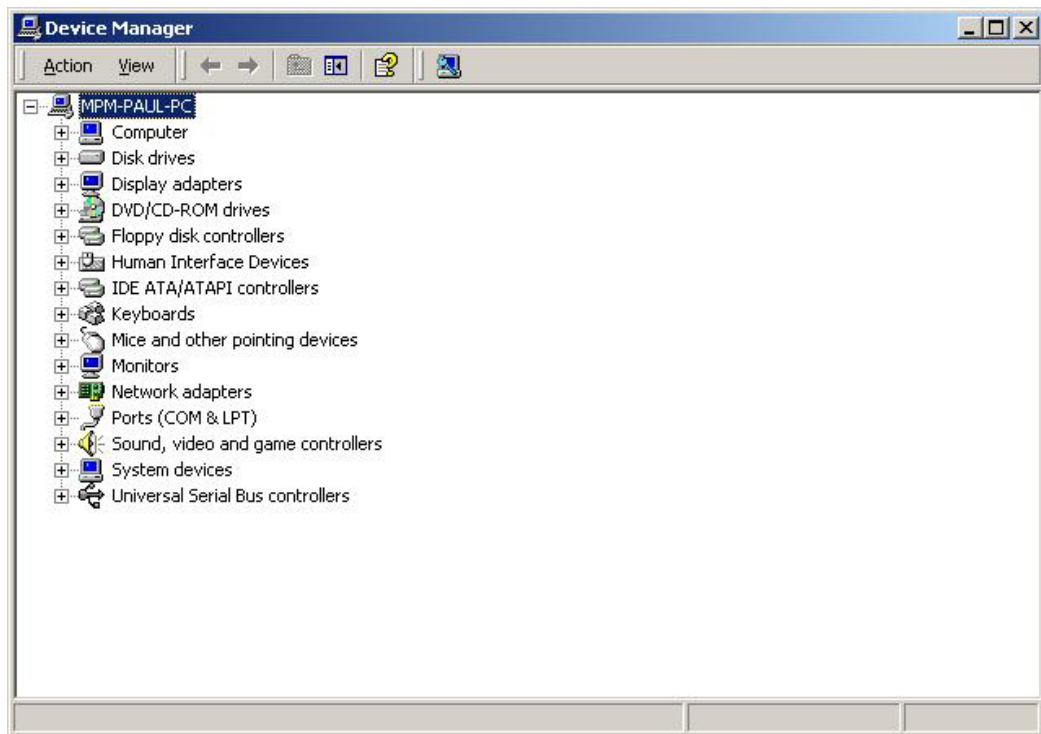


Figure 6-6: Device Manager List

Step 5: Expand the **Display Adapters** category (**Figure 6-7**). Right click the adapter and select **Properties**.



NOTE:

If the **Display Adapters** category is not available, navigate to **X:\VGAILX800\XPIVGA 2.01.05** (where **X:** is the system CD drive) and read the **ReleaseNotes.txt** file for further information on installing the VGA driver.

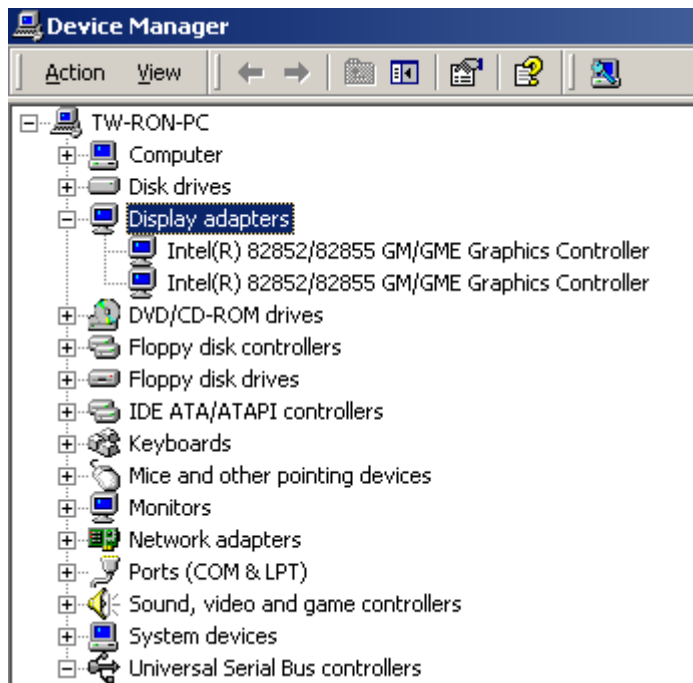


Figure 6-7: Expand the Display Adapters Category

- Step 6:** From the **Driver** tab of the **Properties** window, click **Update Driver (Figure 6-8)** or, click **Reinstall Driver** if **Update Driver** is not seen.

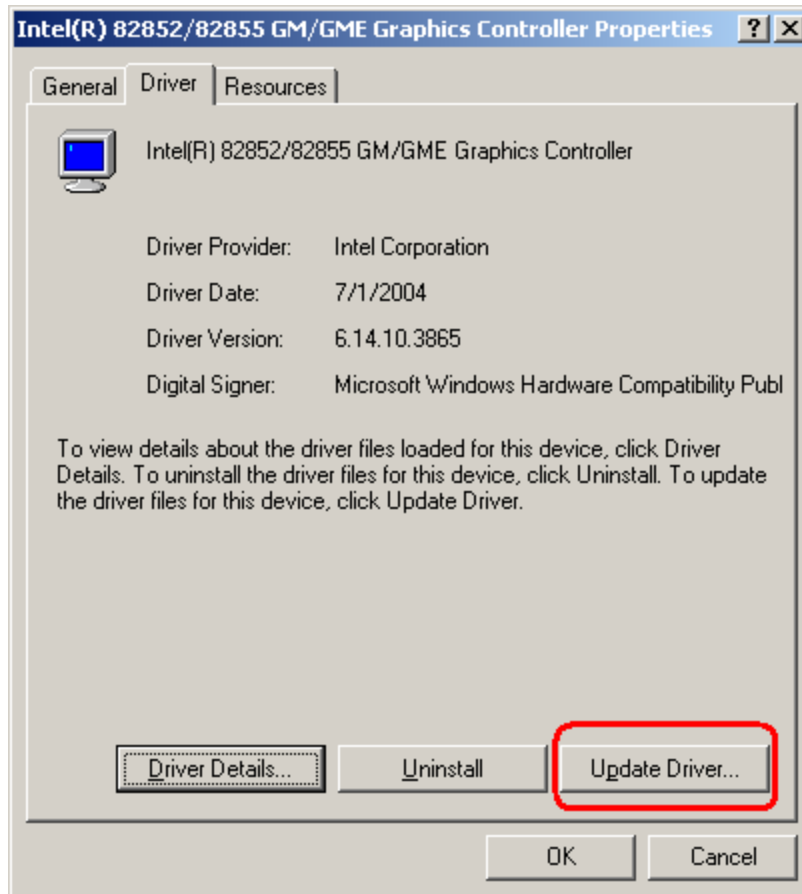


Figure 6-8: Update Driver

Step 7: The **Upgrade Device Driver Wizard** appears (**Figure 6-9**). Click **NEXT** to continue.



Figure 6-9: Upgrade Device Driver Wizard

Step 8: The **Install Hardware Device Driver** screen appears (**Figure 6-10**). Select the **Search for a suitable driver for my device** radio button and click **NEXT** to continue.



Figure 6-10: Search for Suitable Driver

- Step 9:** Select **Specify a Location** in the **Locate Driver Files** window (**Figure 6-11**).
Click **NEXT** to continue.



Figure 6-11: Locate Driver Files

Step 10: Click **Browse** and navigate to the **X:\AMD\LX800\XP\VGA 2.01.05** directory, where “X:” is the system CD drive (**Figure 6-12**).

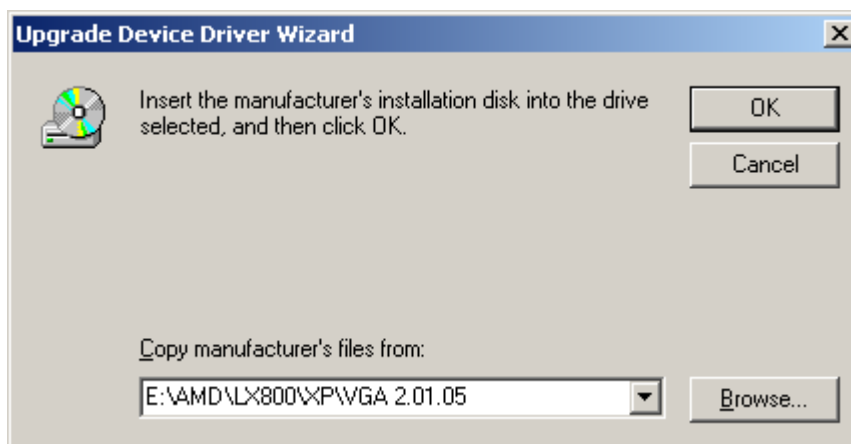


Figure 6-12: Location Browsing Window

Step 11: Click **OK** to continue.

Step 12: A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

6.3 LAN Driver

To install the LAN driver, please follow the steps below.

Step 1: Click **LAN** from the **AMD LX/GX CD Driver Menu** to open a window to the **X:\LAN\Realtek** (where **X:** is the system CD drive) folder on the driver CD.

Step 2: Open the **RTL8100C** folder.

Step 3: Locate the **Setup** program icon (**Figure 6-13**).

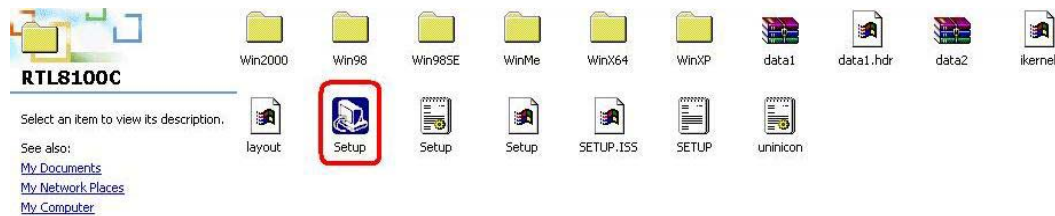


Figure 6-13: Locate the Setup Program Icon

Step 4: Double click the **Setup** program icon in **Figure 6-13**.

Step 5: The **Install Shield Wizard** is prepared to guide the user through the rest of the process (**Figure 6-14**).

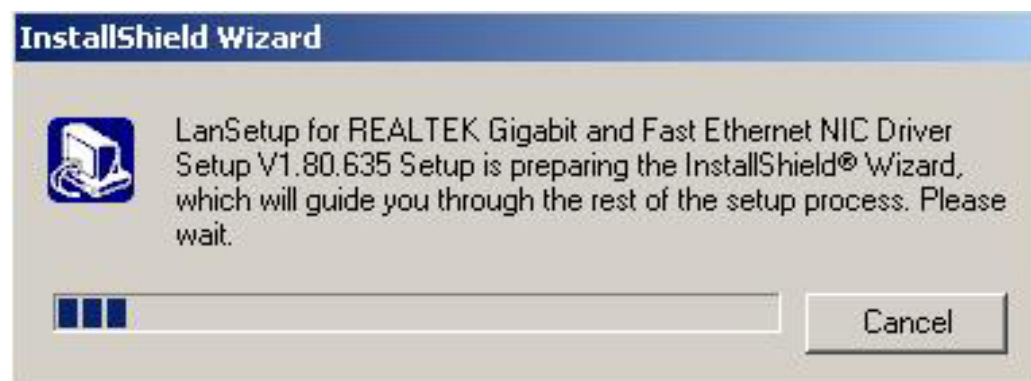


Figure 6-14: Preparing Setup Screen

Step 6: Once initialized, the **Install Wizard** welcome screen appears (**Figure 6-15**).

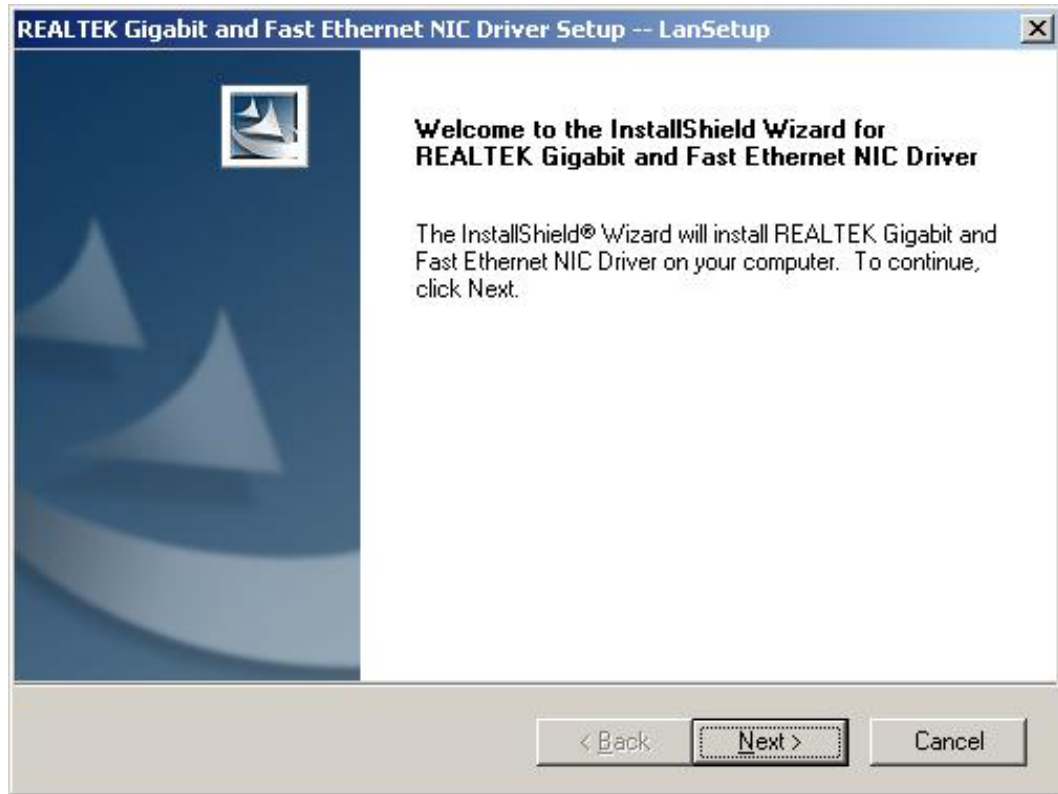


Figure 6-15: Install Wizard Welcome Screen

- Step 7:** Click **NEXT** to continue the installation or **CANCEL** to stop the installation.
- Step 8:** The **Install Wizard** starts to install the LAN driver.
- Step 9:** Once the installation is complete, the **InstallShield Wizard Complete** screen appears (**Figure 6-16**).

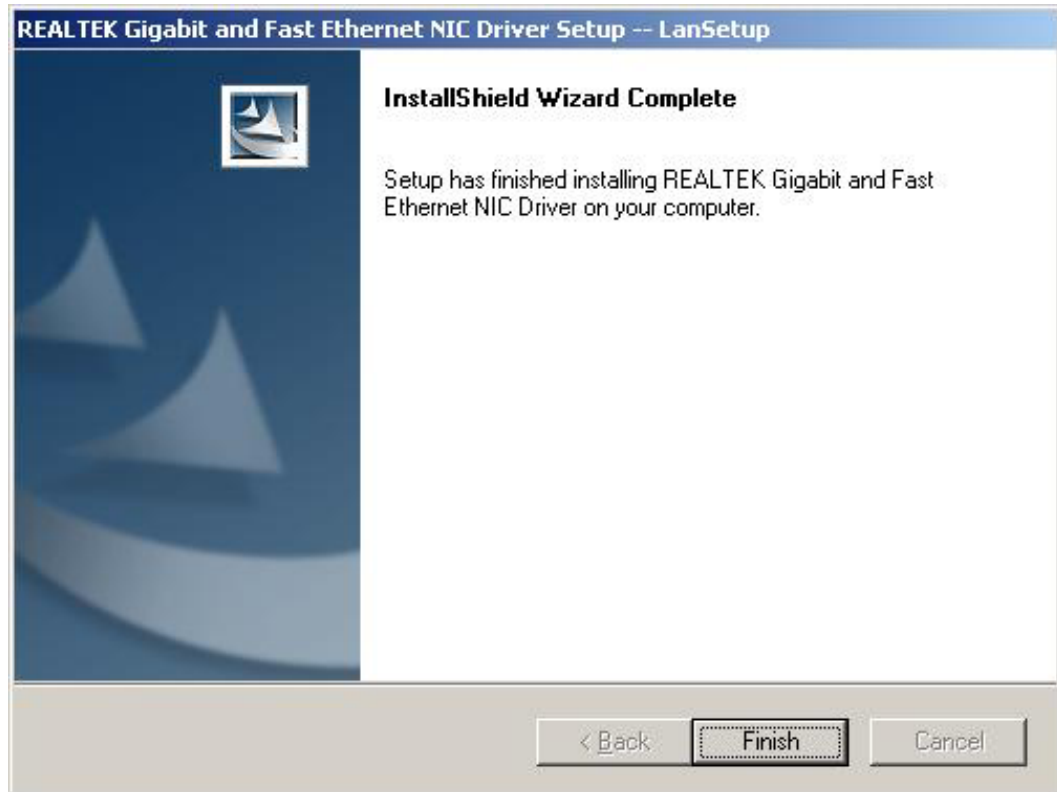


Figure 6-16: Installing Screen

Step 10: Click **FINISH** to complete the installation and exit the **Install Shield Wizard**.

Step 11: Once the installation process is complete, the computer may be restarted immediately or later. Select the preferred option and click **FINISH** to complete the installation process and exit the **Install Shield Wizard** (Figure 6-17).



Figure 6-17: Restart the Computer

Appendix

A

BIOS Configuration Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

→ Load Fail-Safe Defaults	81
→ Load Optimized Defaults.....	81
→ Set Supervisor Password	81
→ Set User Password	81
→ Save & Exit Setup	81
→ Exit Without Saving	81
→ Date [Day mm:dd:yyyy].....	82
→ Time [hh/mm/ss]	82
→ IDE Master and IDE Slave	82
→ Drive A [1.44M, 3.5in].....	83
→ Halt On [All, But Keyboard]	83
→ Base Memory:	84
→ Extended Memory.....	84
→ Total Memory	84
→ IDE HDD Auto-Detection [Press Enter].....	85
→ IDE Primary Master [Auto]	85
→ Access Mode [Auto]	86
→ Capacity	86
→ Cylinder	87
→ Head	87
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Appendix

B

Watchdog Timer



NOTE:

The following discussion applies to DOS environment. It is recommended you contact IEI support or visit our website for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

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

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer’s period.
BL:	Time-out value (Its unit-second is dependent on the item “Watchdog Timer unit select” in CMOS setup).

Table B-1: AH-6FH Sub-function

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

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset.

Example program:

```

; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:
    MOV     AX, 6F02H      ; setting the time-out value
    MOV     BL, 30        ; time-out value is 48 seconds
;
; ADD YOUR APPLICATION PROGRAM HERE
;
    CMP     EXIT_AP, 1    ; is your application over?
    JNE     W_LOOP       ; No, restart your application
    MOV     AX, 6F02H    ; disable Watchdog Timer
    MOV     BL, 0        ;
    INT     15H
;
; EXIT ;

```

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Appendix

C

Address Mapping

C.1 I/O Address Map

I/O Address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel(R) Graphics Controller
3C0-3DF	Intel(R) Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: I/O Address Map

C.2 1st MB Memory Address Map

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

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

IRQ#	Description	IRQ#	Description
IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

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

Table C-4: IRQ Mapping Table

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