IEI Technology Corp.

MODEL:

PM-LX2-800/800W

PC/104 SBC with AMD® Geode™ LX800 500 MHz CPU, Ethernet, 2 USB 2.0, CF Card Type 2, RS-232, RS-422/485, RoHS Compliant

User Manual

Rev. 1.01 – 16 July, 2010

RoHS Lead Free

Revision

Date	Version	Changes
16 July, 2010	1.01	Minor update
9 June, 2009	1.00	Initial release

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Chapter

1

Introduction

1.1 PM-LX2-800 Introduction

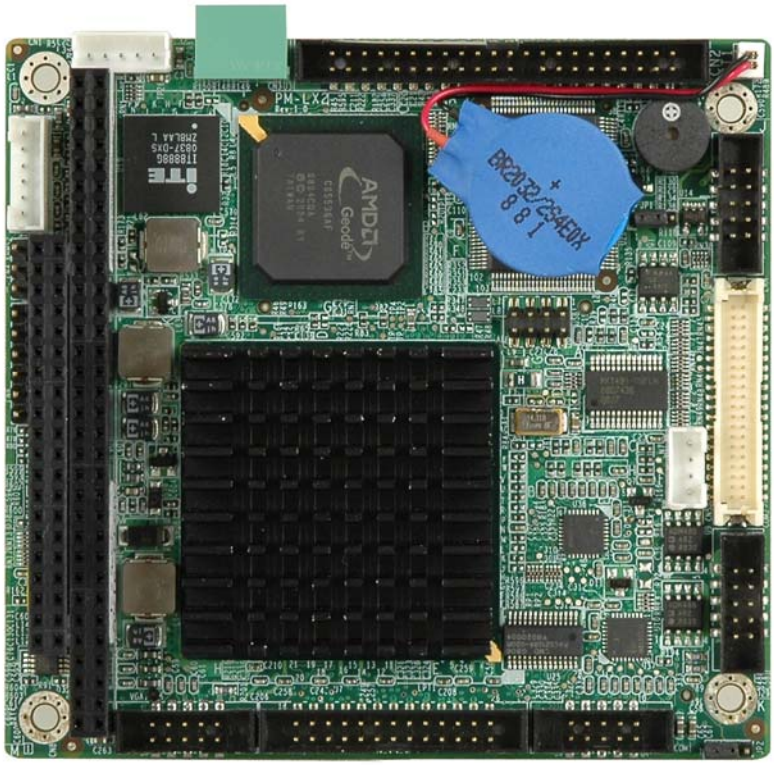


Figure 1–1: PM-LX2-800

The PC/104 form factor PM-LX2-800 is a highly integrated embedded computer specifically optimized for multi-media applications requiring minimum installation space. The PM-LX2-800 is particularly suitable for low power and fan-less applications. The PM-LX2-800 supports a full range of functions for an AT compatible industrial computer in a space-saving 96mm x 90mm profile. The PM-LX2-800 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. The PM-LX2-800**W** adds wide temperature support for applications in harsh environments.

1.1.1 PM-L2X-800 Motherboard Applications

The PM-LX2-800 motherboard has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

1.1.2 PM-LX2-800 Motherboard Benefits

Some of the PM-LX2-800 motherboard benefits include,

- Operating reliably in harsh industrial environments with ambient temperatures as ranging from 0°C to 60°C for the PM-LX2-800 or -40°C to 70°C for the wide temperature supporting PM-LX2-800W
- Rebooting automatically if the BIOS watchdog timer detects that the system is no longer operating

1.1.3 PM-LX2-800 Motherboard Features

Some of the PM-LX2-800 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, CF Type II, PC/104, LAN, and 2 x USB2.0 and 2 x RS-232
- Supports 24-bit TTL LCD

1.2 PM-LX2-800 Motherboard Overview

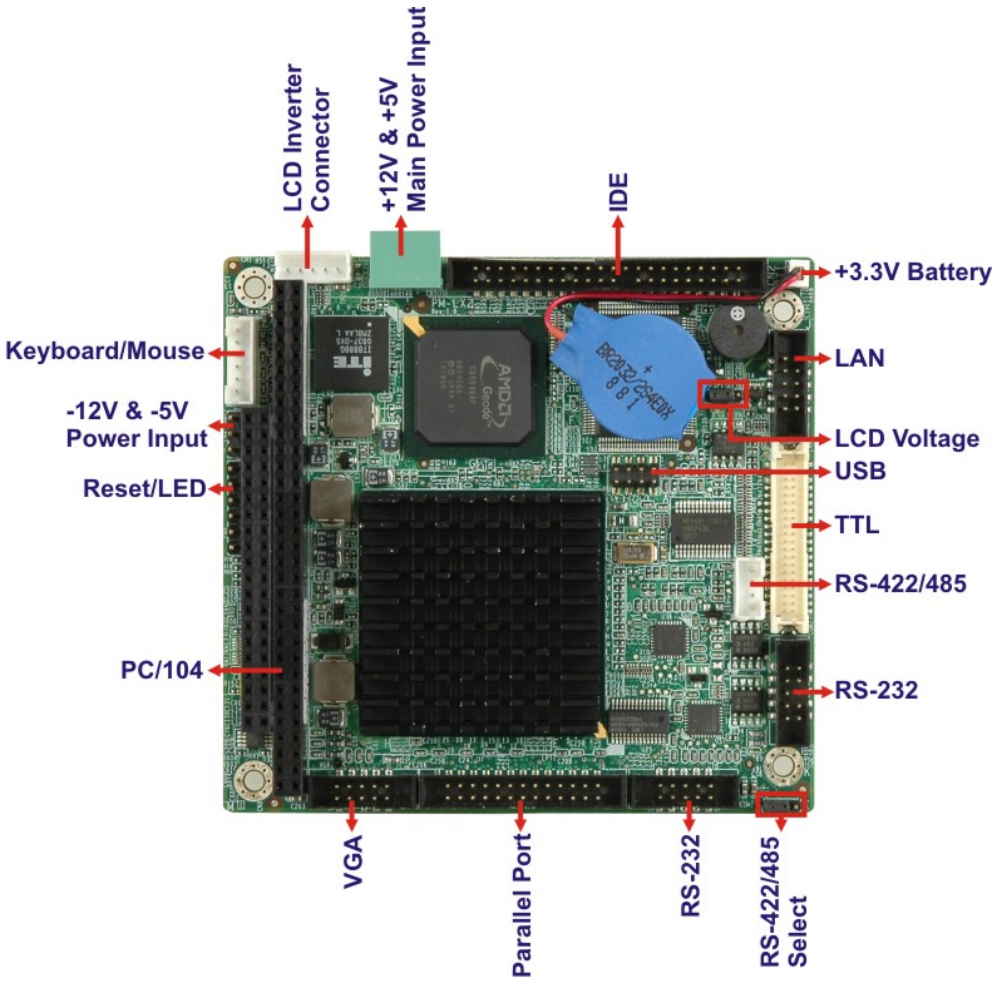


Figure 1-2: PM-LX2-800 Motherboard Overview

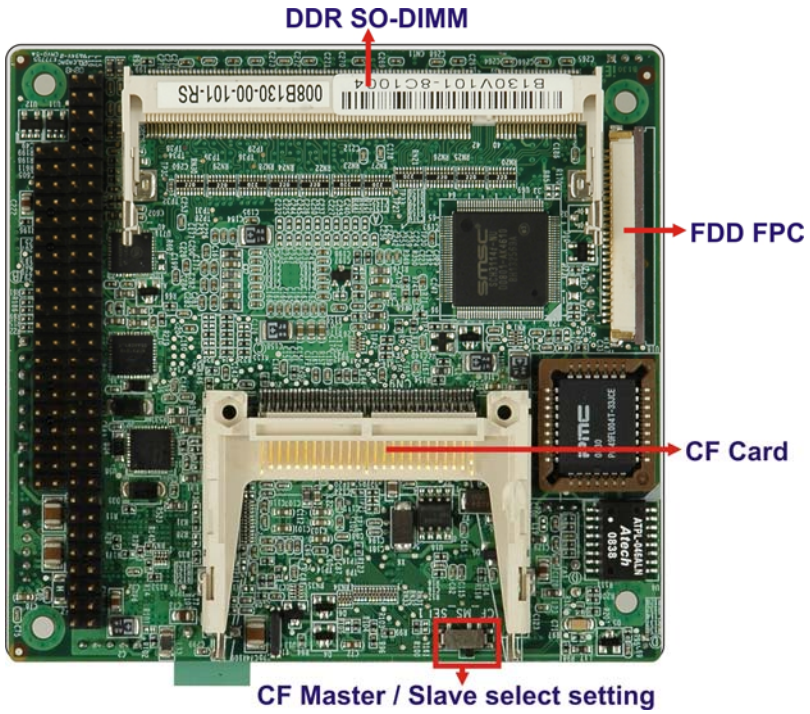


Figure 1-3: PM-LX2-800 Motherboard Solder Side Overview

1.2.1 PM-LX2-800 Motherboard Connectors

The PM-LX2-800 motherboard has the following connectors on-board:

- 1 x -12V/5V input connector
- 1 x AT 12V/5V connector
- 1 x CompactFlash® connector (solder side)
- 1 x DDR SO-DIMM connector (solder side)
- 1 x FDD connector (solder side)
- 1 x IDE device connector
- 1 x LAN connector
- 1 x LCD Inverter connector
- 1 x LED connector
- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 1 x PC/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

These connectors are fully described in **Chapter 3**.

1.3 Dimensions

The dimensions of the board are listed below:

- **Length**: 95.89mm
- **Width**: 90.17mm

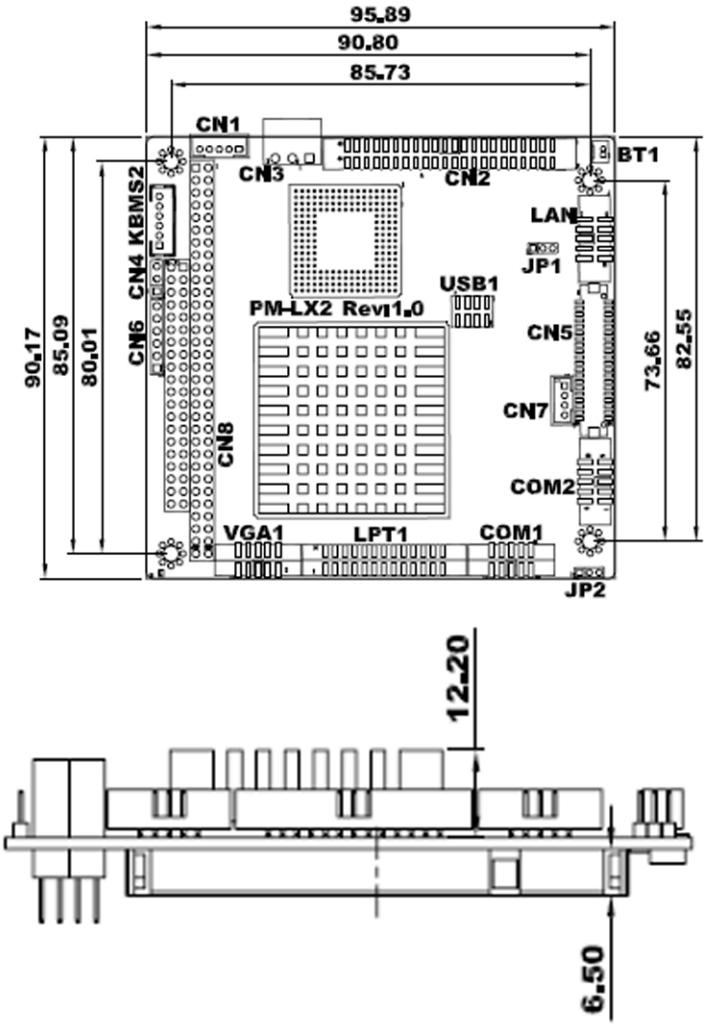


Figure 1-4: PM-LX2-800 Dimensions (mm)

1.4 Data Flow

The PM-LX2-800 motherboard comes with an AMD® Geode™ LX800 500MHz processor and an AMD Geode™ CS5536 linked together by the GeodeLink™ Interface Unit. **Figure 1-5** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

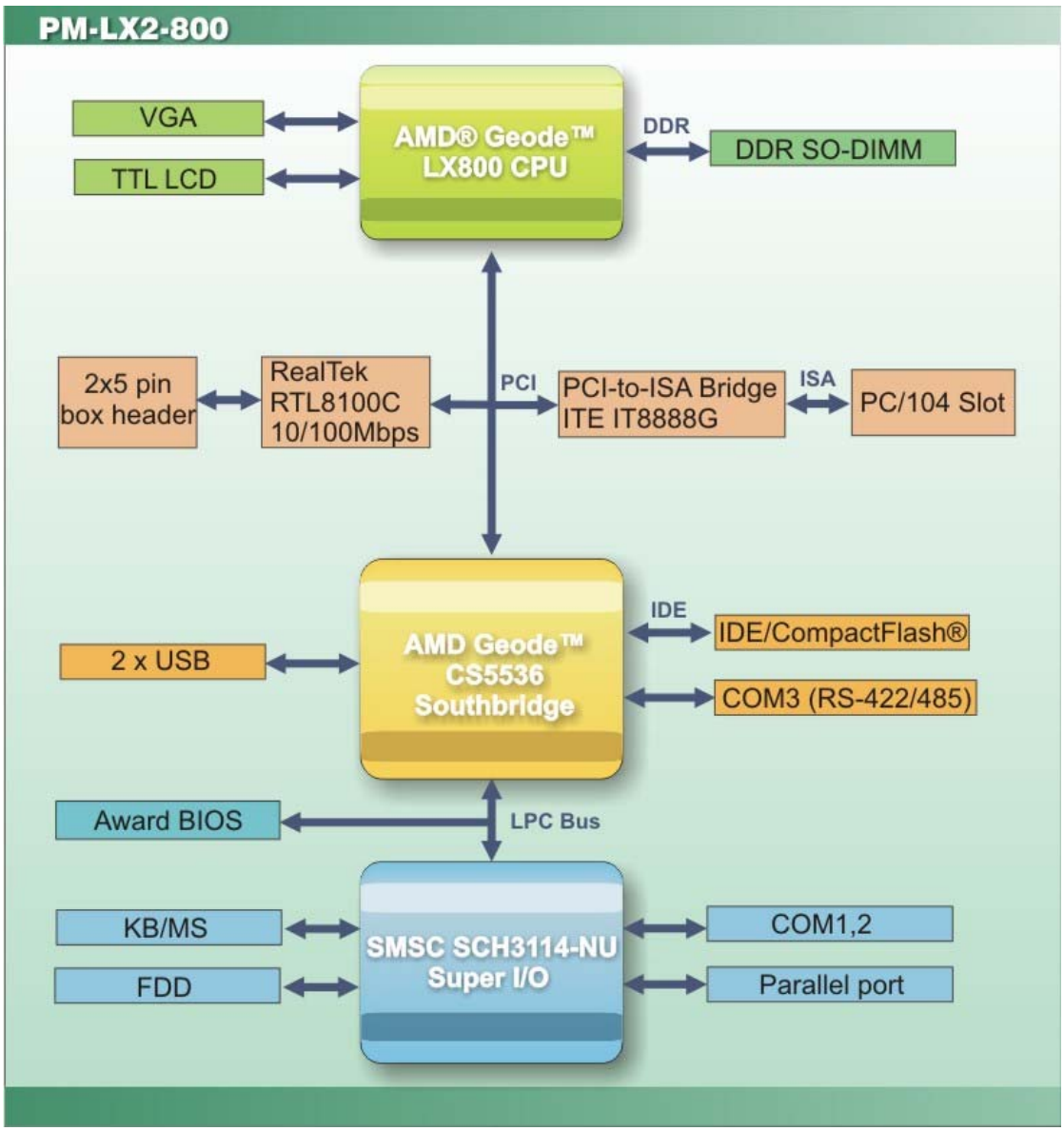


Figure 1-5: Data Flow Block Diagram

1.4.1 Technical Specifications:

PM-LX2-800 motherboard technical specifications are listed in the table below.

Specification/Model	PM-LX2-800
Form Factor	PC/104 Module
CPU	AMD® Geode™ LX800 500MHz processor
Integrated Graphics	AMD® Geode™ LX800 500MHz processor
Memory	One 200-pin 266/333/400MHz SO-DIMM DDR slot (up to 1GB)
Southbridge Chipset	AMD Geode™ CS5536 Chipset
BIOS	AMI BIOS
Compatible OS	Microsoft Windows XP Microsoft Windows 2000 Fedora 10
Ethernet Controller	RTL8100C
Super I/O Controller	PM-LX2-800-R10: SMSC SCH3114-NU PM-LX2-800W-R10: SMSC SCH3114I-NU (Wide Temperature)
Real Time Clock	256 bytes of battery-backed RAM, 32.768 KHz crystal, 3 V battery
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCI	One PC/104 via ITE IT8888G PCI-to-ISA bridge
I/O Interface Connectors	
Display	One VGA One TTL LCD
Ethernet	One LAN connector
Keyboard/Mouse	One KB/MS connector

Specification/Model	PM-LX2-800
LPT	One IEEE 1284 parallel (supports normal, EPP and ECP modes)
Serial	Two RS-232 One RS-422/485
USB 2.0/1.1	Two port USB 2.0 connector
Storage	
Floppy Disk Drive Connector	One Slim-type FDD
IDE Connector	One IDE
CF	One CF card slot
Environmental and Power Specifications	
Power Supply	5V only, AT support
Power Consumption	5 V @ 1.09A (AMD® Geode™ LX800 with 512MB DDR400)
Operating temperature	PM-LX2-800-R10: 0ºC ~ 60ºC PM-LX2-800W-R10：-40ºC ~ 70ºC
Humidity	0% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	96 mm x 90 mm
Weight GW/NW	500g/110g

Table 1-1: PM-LX2-800 Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PM-LX2-800 may result in permanent damage to the PM-LX2-800 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PM-LX2-800. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PM-LX2-800 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PM-LX2-800, place it on an antic-static pad. This reduces the possibility of ESD damaging the PM-LX2-800.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

2.2 Unpacking Precautions

When the PM-LX2-800 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the PM-LX2-800 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PM-LX2-800 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

2.3.1 Package Contents

The PM-LX2-800 is shipped with the following components:

Quantity	Item and Part Number	Image
1	PM-LX2-800-R10 (or) PM-LX2-800W-R10	
1	ATA/33 flat cable (**P/N**: 32200-000009-RS)	
2	Single COM (without bracket) (**P/N**: 32200-000049-RS)	
1	KB/MS PS/2 Y-cable (**P/N**: 32000-023800-RS)	
1	Dual USB cable (without bracket) (**P/N**: 32000-070301-RS)	
1	LAN cable (**P/N**: 32000-055702-RS)	

1	Mini jumper Pack	
1	Power cable (**P/N**:32100-130300-RS)	
1	VGA cable (**P/N**: 32000-033804-RS)	
1	Quick Installation Guide	
1	Utility CD	

Table 2-1: Package List Contents

2.4 Optional Items

FDD Cable (**P/N**: 32400-001100-RS)	
LPT cable (without bracket) (**P/N**: 32200-015100-RS)	
RS-422/485 cable (**P/N**:32200-0748)	

Table 2-2: Package List Contents (Optional Items)

Chapter

3

Connectors

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-LX2-800 Motherboard Layout

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

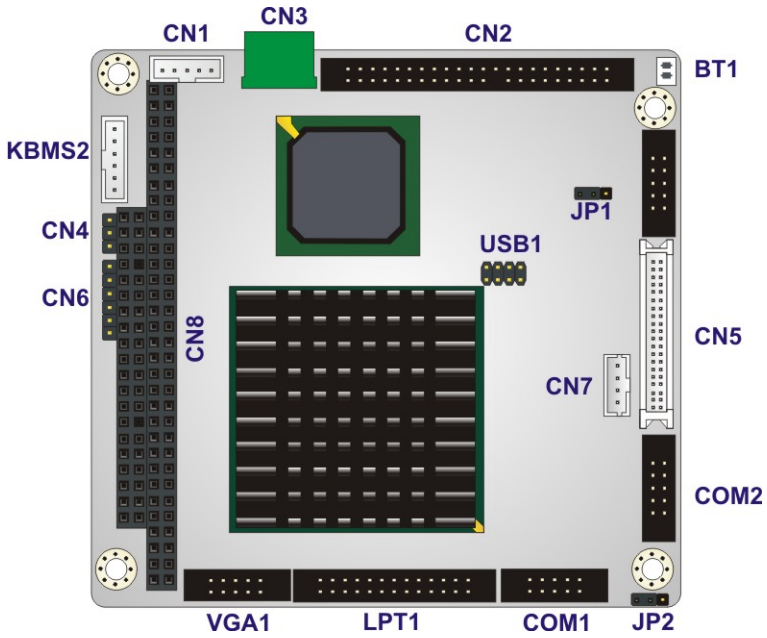


Figure 3-1: Connector and Jumper Locations (Front Side)

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

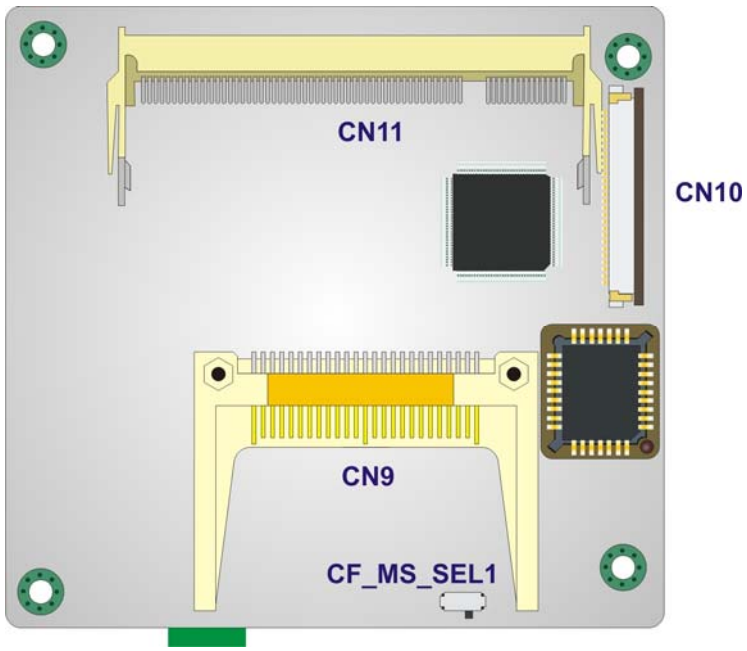


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the PM-LX2-800 motherboard. Detailed descriptions of these connectors can be found in the following section.

Connector	Type	Label
12V / 5V Power connector	3-pin terminal block	CN3
-12V Input connector	3-pin box header	CN4
200-pin DDR SO-DIMM socket	200-pin socket	CN11
Battery Connector	2-pin wafer connector	BT1
CompactFlash® Type II connector	50-pin header	CN9
FDD connector	26-pin header	CN10
IDE Interface connector	44-pin box header	CN2
LCD Inverter connector	5-pin wafer connector	CN1
Keyboard/Mouse connector	6-pin wafer connector	KBMS2

Connector	Type	Label
LAN connector	10-pin box header	LAN
LED/Reset button connector	6-pin header	CN6
Parallel Port connector	26-pin box header	LPT1
PC/104 connector	PC/104 connector	CN8
RS-232 Serial port1 connector	10-pin box header	COM1
RS-232 Serial port2 connector	10-pin box header	COM2
RS-422/485 Serial port3 connector	4-pin wafer connector	CN7
TTL LCD connector	40-pin crimp connector	CN5
USB connector	8-pin header	USB1
VGA connector	10-pin box header	VGA1

Table 3-1: Peripheral Interface Connectors

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-LX2-800 motherboard.

3.2.1 12V / 5V Power Connector

CN Label: CN3

CN Type: 3-pin terminal block

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-2**

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

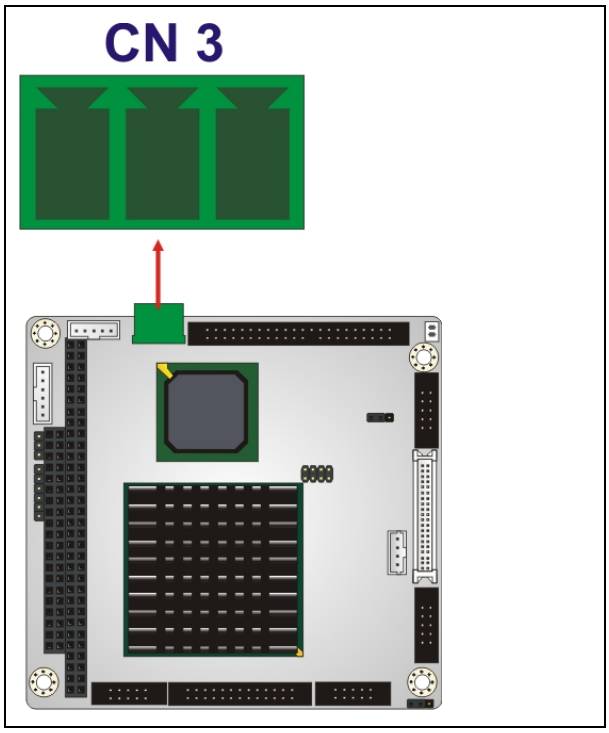


Figure 3-3: 12V / 5V Power Connector Location

PIN NO.	DESCRIPTION
1	VCC12
2	GND
3	VCC5

Table 3-2: 12V / 5V Power Connector Pinouts

3.2.2 -12V / -5V Input Connector

CN Label: CN4

CN Type: 3-pin box header

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-3**

The -12V power supply provides an additional power output connector for other applications.

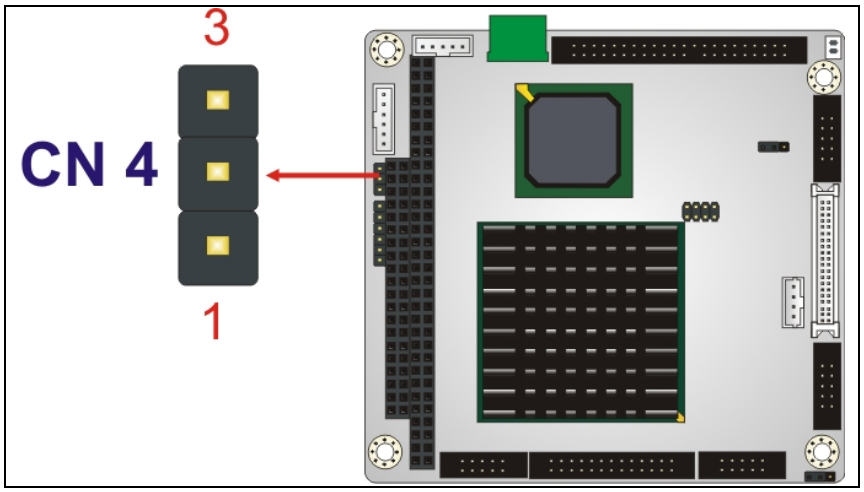


Figure 3-4: -12V Power Connector Location

PIN NO.	DESCRIPTION
1	-5V
2	GND
3	-12V

Table 3-3: –12V Power Connector Pinouts

3.2.3 200-pin DDR SO-DIMM Socket

CN Label: **CN11** (solder side)

CN Type: 200-pin socket

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-4**

The 200-pin DDR SO-DIMM socket receives a DDR 266MHz SO-DIMM module.

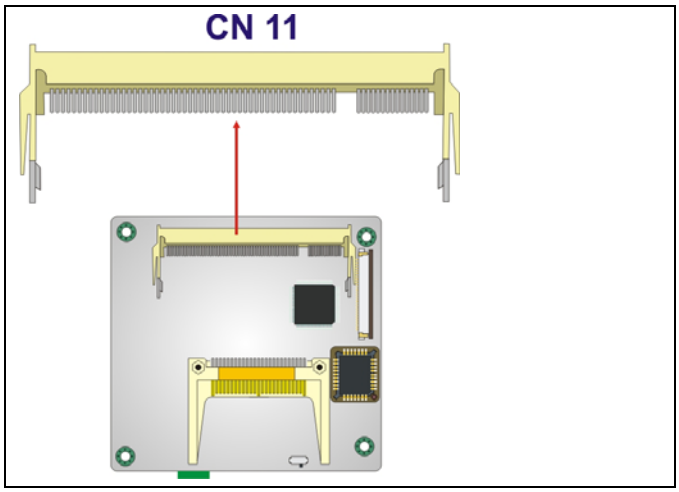


Figure 3-5: 200-pin DDR SO-DIMM Socket Location

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

PIN	FRONT	PIN	BACK	PIN	FRONT	PIN	BACK
41	DQ16	42	DQ20	141	DQ40	142	DQ44
43	DQ17	44	DQ21	143	VDD	144	VDD
45	VDD	46	VDD	145	DQ41	146	DQ45
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 3-4: 200-pin DDR SO-DIMM Socket Pinouts

3.2.4 Battery Connector

CN Label:	BT1
CN Type:	2-pin wafer connector
CN Location:	See **Figure 3-6**
CN Pinouts:	See **Table 3-5**

This battery connector connects to an externally mounted 3V, Lithium, cell coin battery (VARTA CR2032). The life expectancy of the battery is approximately seven 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.

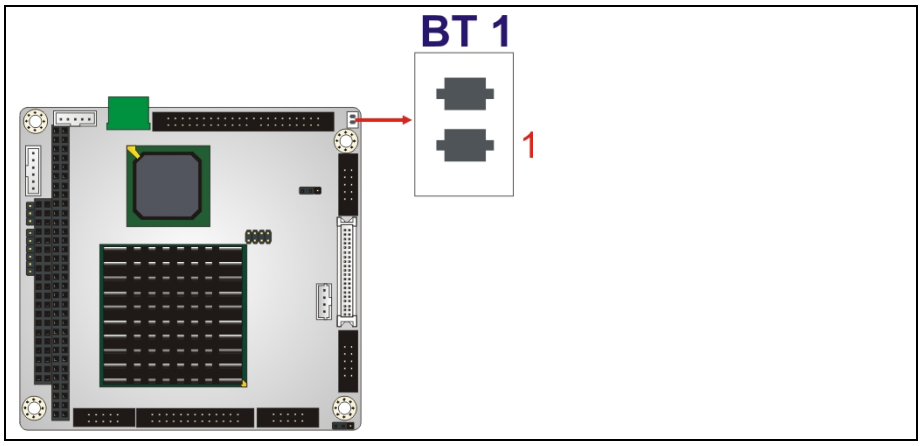


Figure 3-6: Battery Connector Location

PIN NO.	DESCRIPTION
1	BAT+
2	GND

Table 3-5: Battery Connector Pinouts

3.2.5 CompactFlash® Connector

CN Label: **CN9** (solder side)

CN Type: 50-pin header (2x25)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-6**

A CompactFlash® memory module is inserted to the CompactFlash® connector.

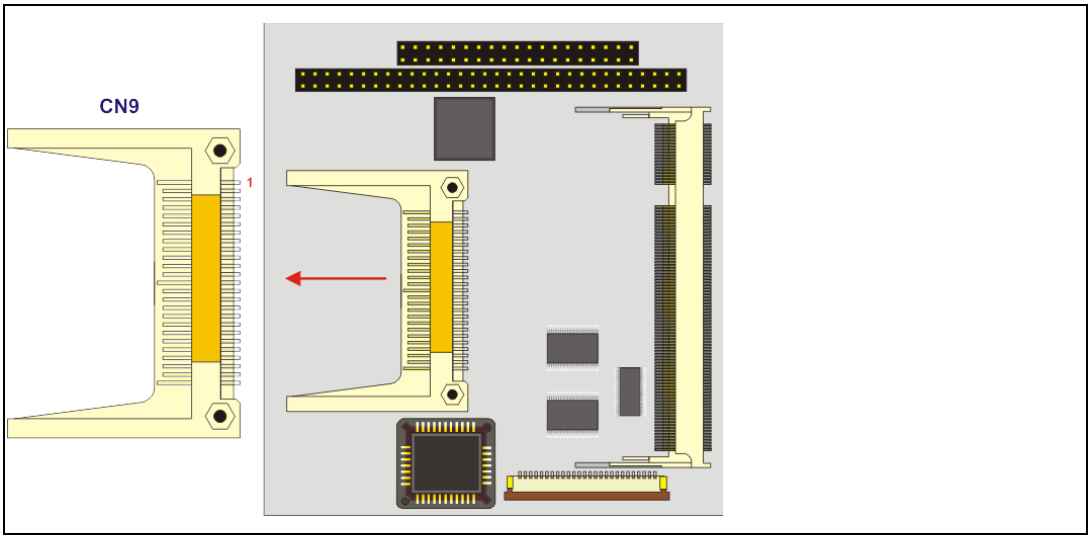


Figure 3-7: CompactFlash® Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14

6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	VCC_COM
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	N/C
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-6: CompactFlash® Connector Pinouts

3.2.6 Floppy Disk Connector

CN Label: **CN10** (solder side)

CN Type: 26-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-7**

The floppy disk connector (CN10) is connected to a floppy disk drive.

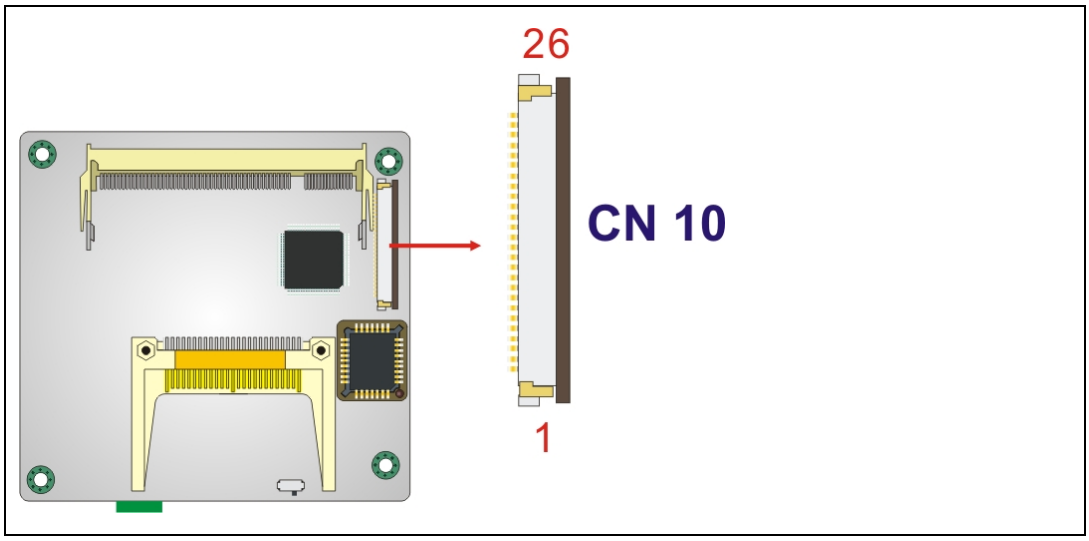


Figure 3-8: 26-Pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	14	STEP#
2	INDEX#	15	GND
3	+5V	16	WDATA#
4	DSA#	17	GND
5	+5V	18	WGATE#
6	DSKCHG#	19	GND
7	NC	20	TRACK0#
8	NC	21	GND
9	NC	22	WP#
10	MOTO0#	23	GND
11	NC	24	RDATA#
12	DIR#	25	GND
13	NC	26	HEAD#

Table 3-7: 26-pin FDD Connector Pinouts

3.2.7 IDE Connector (Primary, 44-pin)

CN Label:	CN2
CN Type:	44-pin box header
CN Location:	See **Figure 3-9**
CN Pinouts:	See **Table 3-8**

One primary 44-pin IDE device connector on the PM-LX2-800 CPU board supports connectivity to Ultra ATA/33/66/100/133 IDE devices with data transfer rates up to 133MB/s.

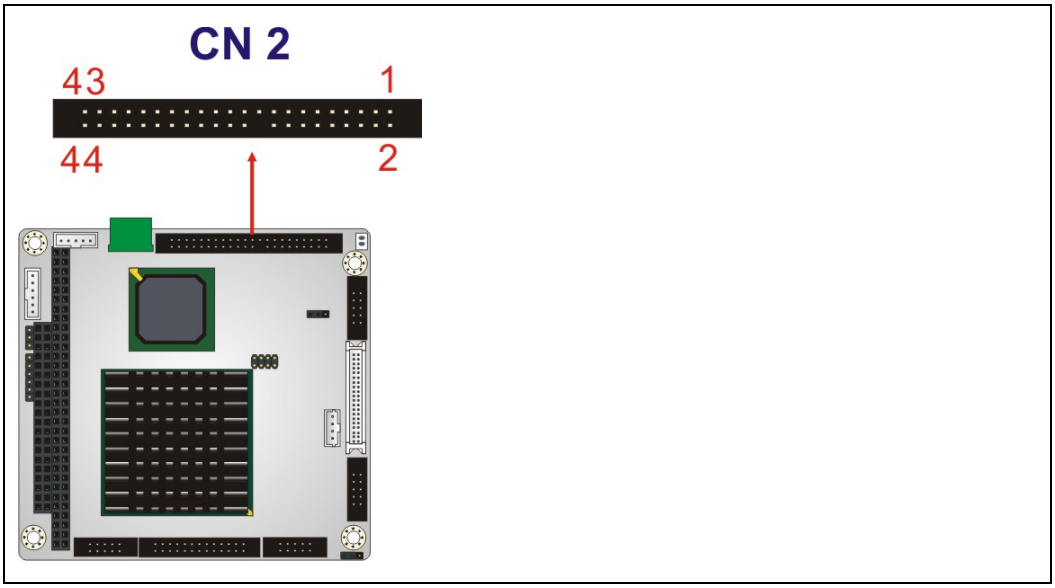


Figure 3-9: Primary IDE Device Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14

17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-8: Primary IDE Connector Pinouts

3.2.8 Keyboard/Mouse Connector

CN Label: KBMS2

CN Type: 6-pin wafer connector

CN Pinouts: See **Figure 3-10**

CN Location: See **Table 3-9**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.

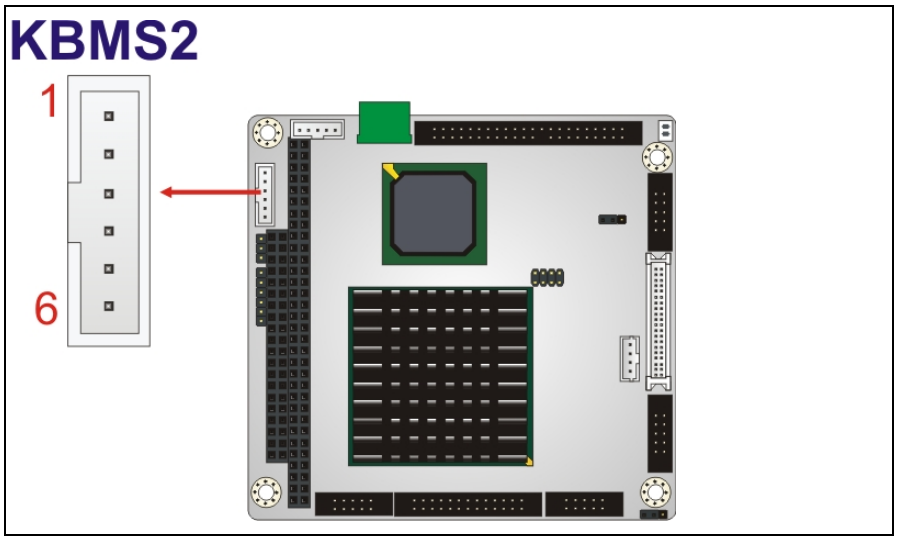


Figure 3-10: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	VCC5
2	MOUSE DATA
3	MOUSE CLOCK
4	KEYBOARD DATA
5	KEYBOARD CLOCK
6	GND

Table 3-9: Keyboard/Mouse Connector Pinouts

3.2.9 LAN Connector

CN Label: LAN

CN Type: 10-pin box header

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-10**

The PM-LX2-800 is equipped with an Ethernet controller. The Ethernet controller is interfaced to the external LAN by direct connection to the LAN connection or by connecting the LAN connector to an RJ-45 interface connector.

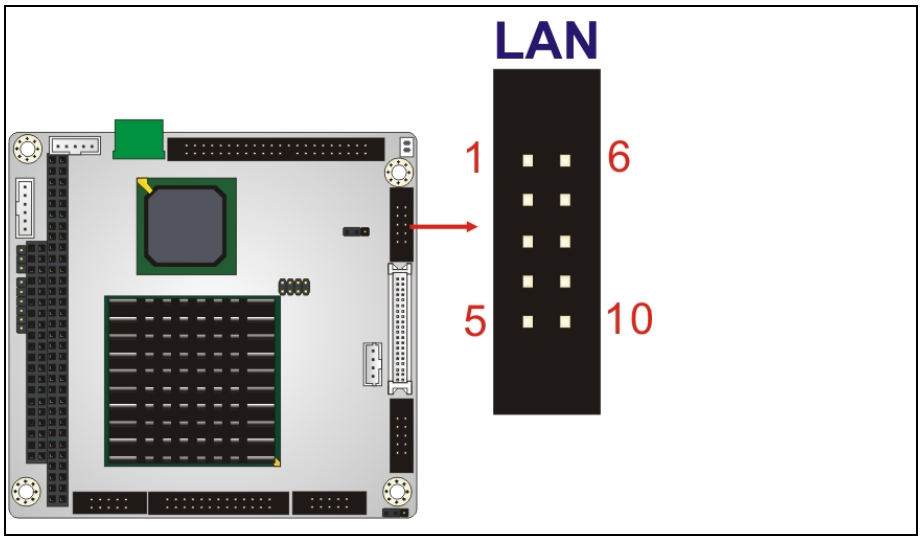


Figure 3-11: LAN Connector Location

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 3-10: LAN Connector Pinouts

3.2.10 LCD Inverter Connector

CN Label: CN1

CN Type: 5-pin wafer connector

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-11**

The Inverter connector connects to the LCD backlight.

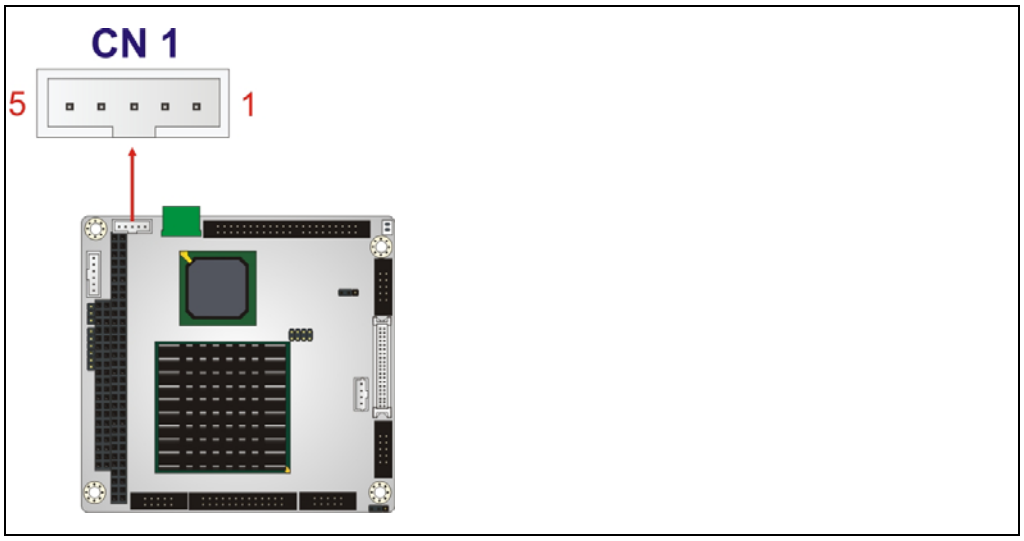


Figure 3-12: LCD Inverter Connector Location

PIN NO.	DESCRIPTION
1	LCD_BKLTCTL
2	GROUND
3	VCC12
4	GROUND
5	LCD_BKLEN

Table 3-11: LCD Inverter Connector Pinouts

3.2.11 LED/Reset Button Connector

CN Label: CN6

CN Type: 6-pin header

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 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.

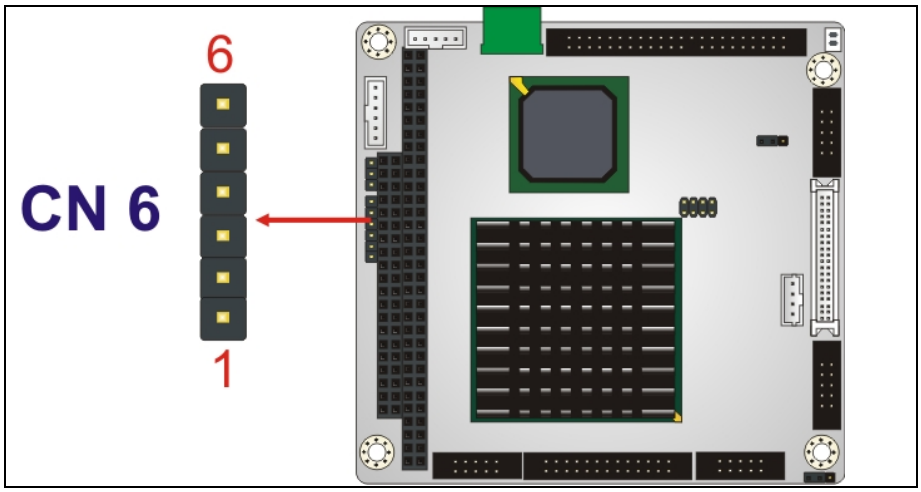


Figure 3-13: LED Connector Location

PIN NO.	DESCRIPTION
1	RESET1
2	RESET2
3	VCC5 LED+
4	GND
5	HDD LED+
6	HDD LED-

Table 3-12: LED Connector Pinouts

3.2.12 Parallel Port Connector

CN Label: LPT1

CN Type: 26-pin box header

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-13**

The 26-pin box header can be connected to a parallel port connector interface or some other parallel port device such as a printer.

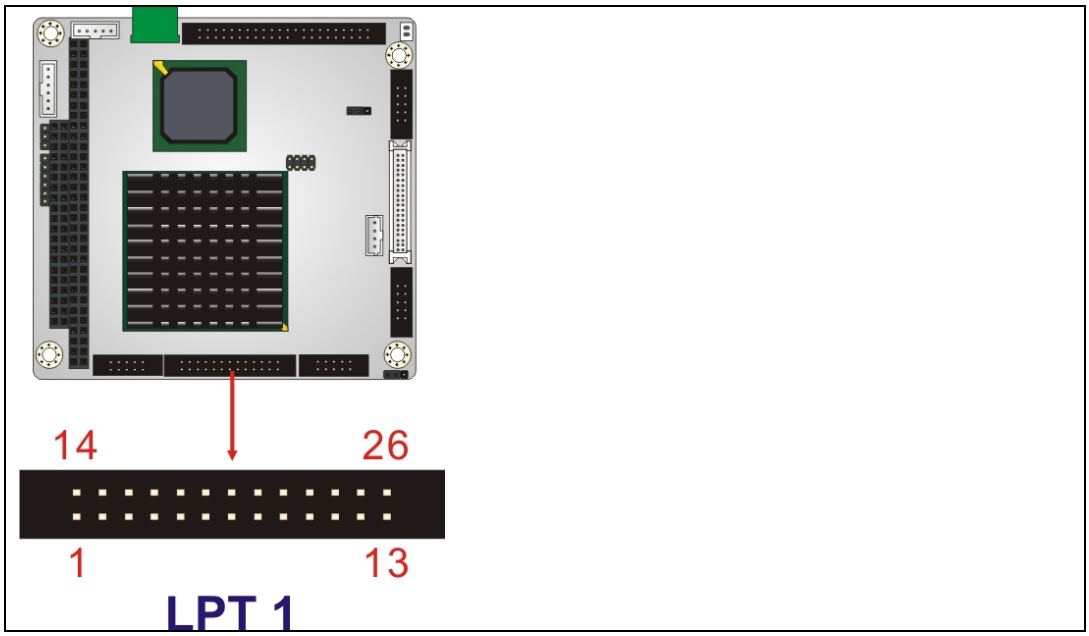


Figure 3-14: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	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

3.2.13 PC/104 Slot

CN Label: CN8

CN Type: 104-pin PC/104 slot

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-14**

The PC/104 slot enables a PC/104 compatible expansion module to be connected to the board.

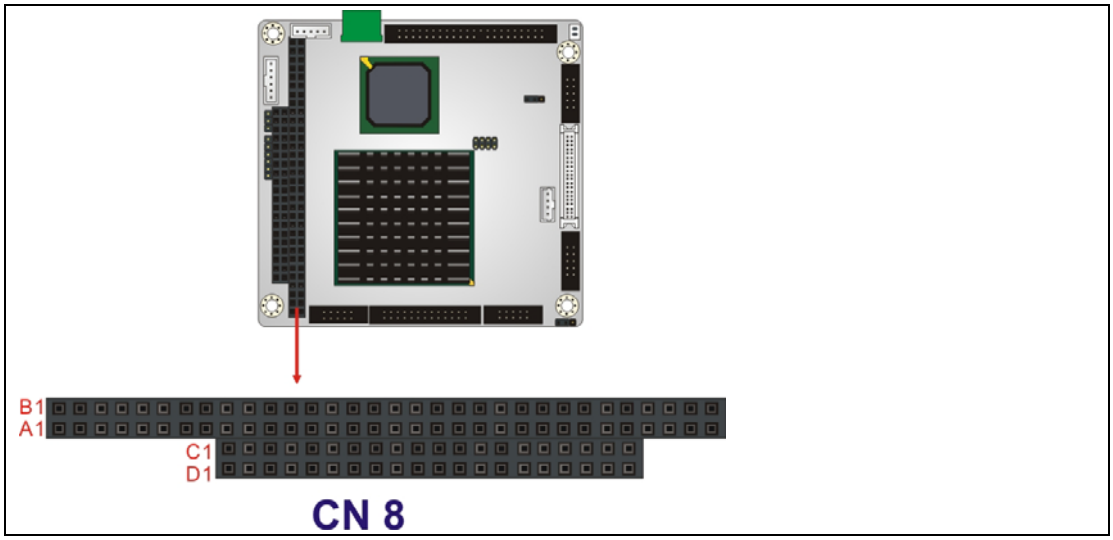


Figure 3-15: PC/104 Slot Location

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
A1	IOCHCK#	B1	GND	C1	GND	D1	GND
A2	SD7	B2	IRSTDRV	C2	SBHE#	D2	MEMCS16#
A3	SD6	B3	VCC	C3	LA23	D3	IOCS16#
A4	SD5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	SD4	B5	-5V	C5	LA21	D5	IRQ11
A6	SD3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	SD2	B7	-12V	C7	LA19	D7	IRQ15
A8	SD1	B8	ZWS	C8	LA18	D8	IRQ14
A9	SD0	B9	+12V	C9	LA17	D9	DACK0#
A10	IOCHRDY	B10	GND	C10	MEMR#	D10	DRQ0

A11	AEN	B11	SMEMW#	C11	MEMW#	D11	DACK5#
A12	LA19	B12	SMEMR#	C12	SD8	D12	DRQ5
A13	LA18	B13	IOW#	C13	SD9	D13	DACK6#
A14	LA17	B14	IOR#	C14	SD10	D14	DRQ6
A15	SA16	B15	DACK3#	C15	SD11	D15	DACK7#
A16	SA15	B16	DRQ3	C16	SD12	D16	DRQ7
A17	SA14	B17	DACK1#	C17	SD13	D17	VCC
A18	SA13	B18	DRQ1	C18	SD14	D18	MASTER#
A19	SA12	B19	REFRESH#	C19	SD15	D19	GND
A20	SA11	B20	SYSCLK	C20	GND	D20	GND
A21	SA10	B21	IRQ7				
A22	SA9	B22	IRQ6				
A23	SA8	B23	IRQ5				
A24	SA7	B24	IRQ4				
A25	SA6	B25	IRQ3				
A26	SA5	B26	DACK2				
A27	SA4	B27	TC				
A28	SA3	B28	BALE				
A29	SA2	B29	VCC				
A30	SA1	B30	OSC				
A31	SA0	B31	GND				
A32	GND	B32	GND				

Table 3-14: PC/104 Slot Connector Pinouts

3.2.14 RS-232 Serial Port Connectors

CN Label: COM1 and COM2

CN Type: 10-pin box header

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-15**

The COM1 and COM2 serial ports connectors connect to RS-232 serial port devices.

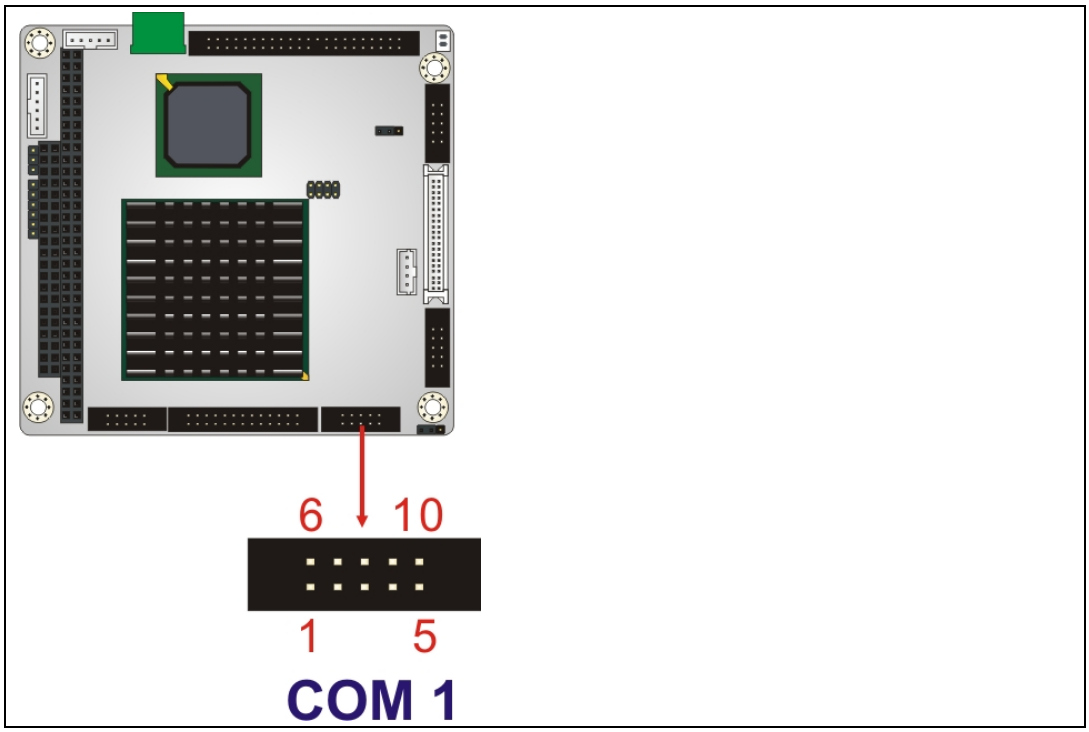


Figure 3-16: RS-232 Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	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-232 Serial Port Connector Pinouts

3.2.15 RS-422/485 Serial Port Connector

CN Label: CN7

CN Type: 4-pin wafer connector

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-16**

The serial port connector connects to an RS-422 or RS-485 serial port device.

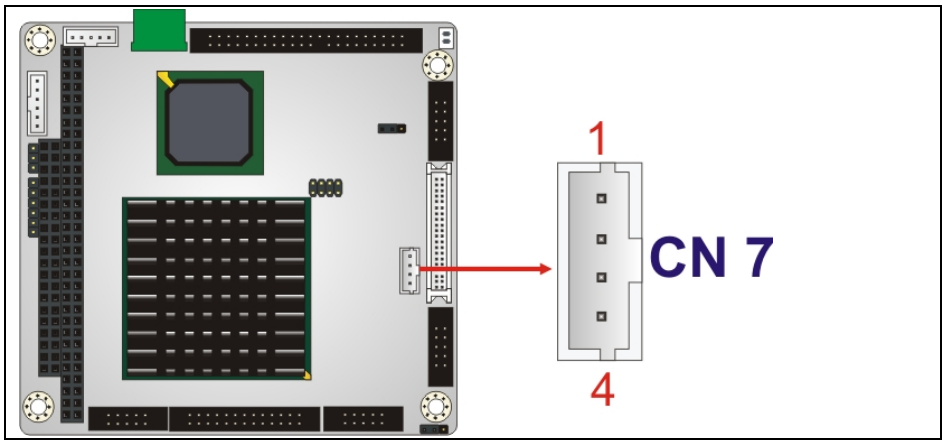


Figure 3-17: RS-422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION
1	RXD485#
2	RXD485+
3	TXD485+
4	TXD485#

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

3.2.16 TTL LCD Connector

CN Label: CN5

CN Type: 40-pin crimp connector

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-17**

The TTL connector is connected to a TTL display device.

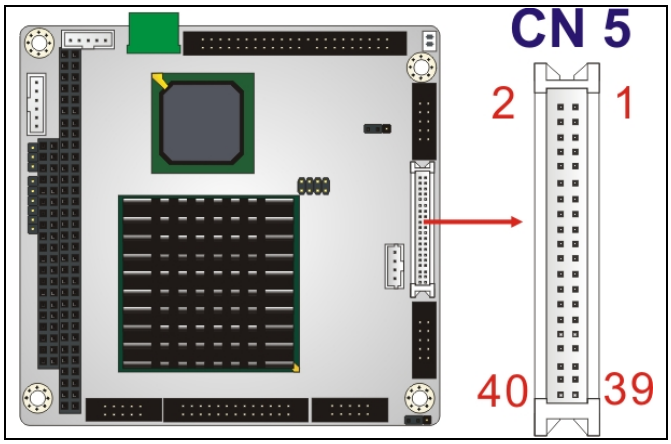


Figure 3-18: TTL Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	LCDVCC	1	LCDVCC
4	GND	3	GND
6	LCDVCC	5	LCDVCC
8	GND	7	SDA
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	SCL

Table 3-17: TTL Connector Pinouts

3.2.17 USB Connector

CN Label: USB1

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-18**

The 2x4 USB pin connector provides connectivity to USB 2.0 ports. Each USB connector can support two USB devices. The USB port is used for I/O bus expansion.

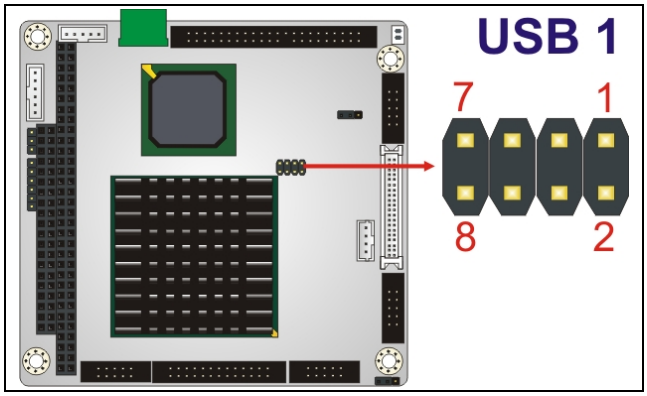


Figure 3-19: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC1	2	GND
3	D1F-	4	D2F+
5	D1F+	6	D2F-
7	GND	8	USBVCC1

Table 3-18: USB Port Connector Pinouts

3.2.18 VGA Connector

CN Label: VGA1

CN Type: 10-pin box header (2x5)

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-19**

The internal VGA connector connects to an external VGA display for system monitoring.

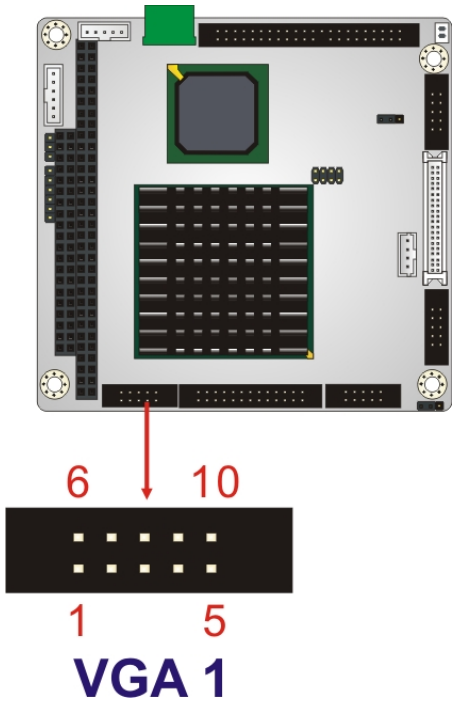


Figure 3-20: VGA Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	6	DDCCLK
2	GREEN	7	DDCDAT
3	BLUE	8	GND
4	HSYNC	9	GND
5	VSYNC	10	GND

Table 3-19: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PM-LX2-800 may result in permanent damage to the PM-LX2-800 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PM-LX2-800. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PM-LX2-800 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PM-LX2-800, place it on an antic-static pad. This reduces the possibility of ESD damaging the PM-LX2-800.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the PM-LX2-800 is installed. All installation notices should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PM-LX2-800 and injury to the person installing the motherboard.

4.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PM-LX2-800, PM-LX2-800 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the PM-LX2-800 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PM-LX2-800 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the PM-LX2-800 off:
  - When working with the PM-LX2-800, 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-LX2-800 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the PM-LX2-800 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The PM-LX2-800 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - IDE drives
  - RS-232 devices
  - RS-422/485 devices
  - Keyboard and mouse
  - LAN
  - LCD backlight
  - LPT device
  - Power
  - TTL screen
  - USB port
  - VGA port

WARNING:

A CPU should never be turned on without its heat sink being installed. If the heat sink is removed and the system turned on, permanent damage to the CPU, PM-LX2-800 and other electronic components attached to the system may be incurred. Running a CPU without a heat sink may also result in injury to the user.

4.3 Unpacking

When the PM-LX2-800 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 4.1**.
- Make sure the packing box is facing upwards so the PM-LX2-800 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 2.3.1** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 2.3.1** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PM-LX2-800 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

4.4 SO-DIMM and CompactFlash® Installation

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

- The maximum SO-DIMM capacity supported is 1.0 GB
- The maximum SO-DIMM frequency supported is 400 MHz
- The SO-DIMM chip must be a 200-pin memory chip

4.4.1 SO-DIMM Module Installation

The PM-LX2-800 motherboard has one 200-pin DDR SO-DIMM socket. To install the DDR SO-DIMM module, follow the instructions below.

Step 1: Turn the PM-LX2-800 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.

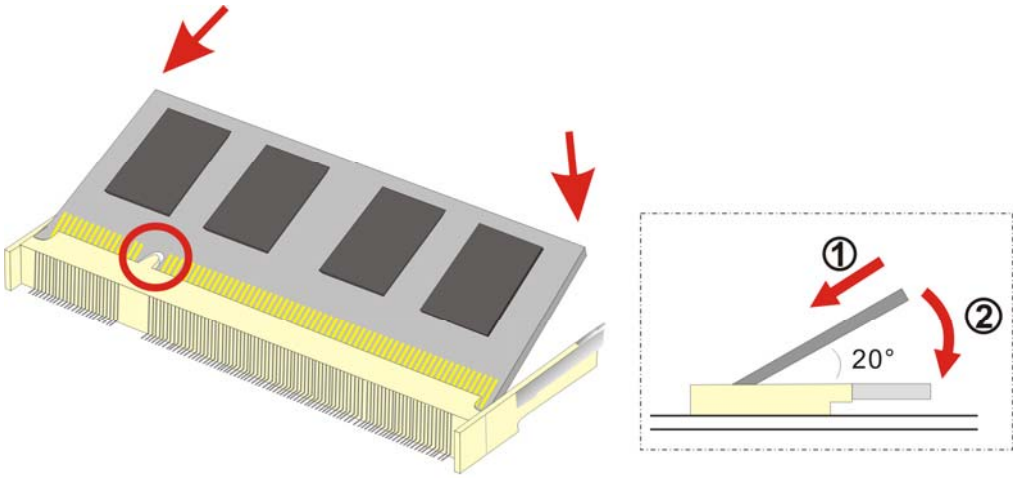


Figure 4-1: SO-DIMM Module Installation

The SO-DIMM is a critical component of the PM-LX2-800 and cannot be run if it is not installed.

4.5 CompactFlash® Card Installation

A CompactFlash® Type 2 (CF Type II) card slot is located on the solder side of the CPU board. When appropriately formatted, a CF Type II card can serve as a bootable hard drive in applications where installation space is limited. The CF Type II card occupies a secondary IDE channel. Configuration options can be found through the BIOS configuration utility.

To install a CF Type II card, follow the instructions below.

Step 1: Turn the CPU board over so that the CF Type II card socket is facing up.

Step 2: Gently push the CF Type II card into the socket until it clicks into place. (See **Figure 4-2**)

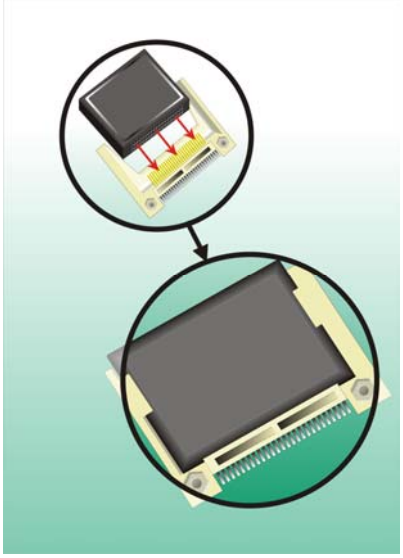
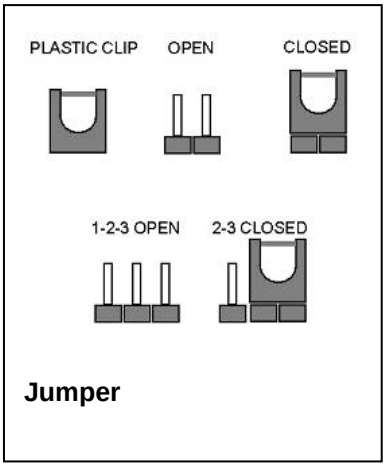


Figure 4-2: CompactFlash® Card Installation

4.6 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (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.



Jumper

Before the PM-LX2-800 is installed in the system, the jumpers must be set in accordance with the desired configuration. There are two jumpers on the PM-LX2-800. These two jumpers are listed in the table below.

Description	Label	Type
COM3 RS422/RS485 select	JP2	3-pin header
LCD voltage select	JP1	3-pin header

The PM-LX2-800 CPU board has two onboard jumpers (**Figure 4-3**).

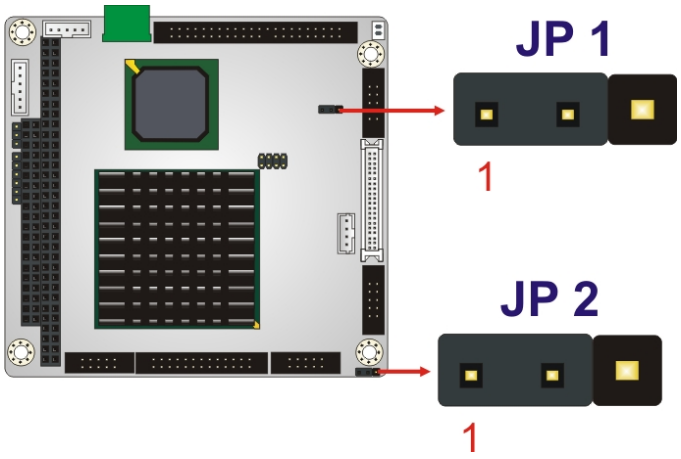


Figure 4-3: Jumper Locations

NOTE:

The PM-LX2-800 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.

4.6.1 COM3 RS422/RS485 Select Jumper

Jumper Label: JP2

Jumper Type: 3-pin header

Jumper Location: See **Figure 4-3**

Jumper Settings: See **Table 4-1**

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

JP2	DESCRIPTION
1-2	RS-422 (Default)
2-3	RS-485

Table 4-1: COM3 RS422/RS485 Select Jumper Settings

4.6.2 LCD Voltage Select Jumper

Jumper Label: JP1

Jumper Type: 3-pin header

Jumper Location: See **Figure 4-3**

Jumper Settings: See **Table 4-2**

The **LCD Voltage Select** jumper sets the LCD voltage to +3.3V or +5V.

JP1	DESCRIPTION
1-2	LCD/VCC +3.3V (Default)
2-3	LCD/VCC +5V

Table 4-2: LCD Voltage Select Jumper Settings

4.7 Chassis Installation

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PM-LX2-800 must have air vents to allow cool air to move into the system and hot air to move out.

The PM-LX2-800 must be installed in a chassis with ventilation holes on the sides allowing air to flow through the heat sink surface. In a system with an individual power supply unit, the power supply cooling fan can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

4.8 Internal Peripheral Device Connections

The cables listed in **Table 4-3** are shipped with the PM-LX2-800.

Quantity	Type
1	ATA/33 flat cable
1	Single RS-232 cable w/o bracket
1	KB/MS PS/2 Y-cable
1	Dual USB cable w/o bracket
1	LAN cable
1	Power cable
1	VGA cable

Table 4-3: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- FDD cable
- LPT cable
- RS-422/485 cable

For more details about the items listed above, please refer to **Chapter 2.4**. Installation of the accessories listed above is described in detail below.

4.8.1 ATA Flat Cable Connection

The ATA/33 flat cable connects to the PM-LX2-800 to one or two IDE devices. To connect an IDE HDD to the PM-LX2-800, please follow the instructions below:

Step 3: **Locate the IDE connector**. The location of the IDE device connector is shown in **Section 3.1.1**.

Step 4: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 4-4**. A key on the front of the cable connector ensures it can only be inserted in one direction.

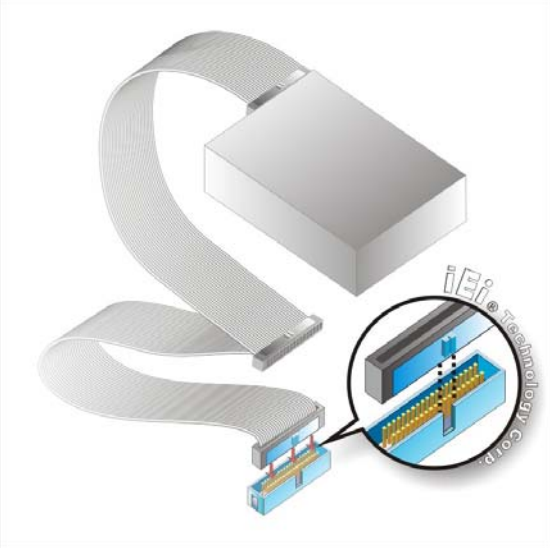


Figure 4-4: IDE Cable Connection

Step 5: **Connect the cable to an IDE device**. Connect the two connectors on the other

side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

4.8.2 Keyboard/Mouse Y-cable Connector

The PM-LX2-800-R11 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the PM-LX2-800-R11 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Section 3.1.1**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the PM-LX2-800-R11 keyboard/mouse connector. See **Figure 4-5**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the PM-LX2-800-R11, connect the cable connector to the onboard connectors. See **Figure 4-5**.

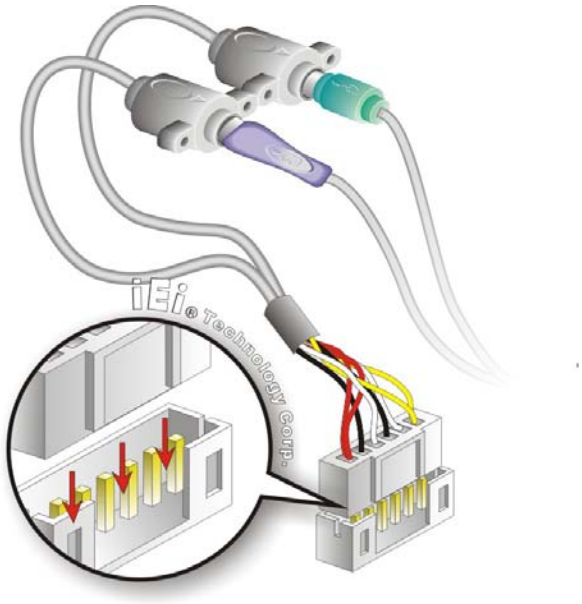


Figure 4-5: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.8.3 Parallel Port Cable without Bracket

The optional parallel port (LPT) cable respectively connects the onboard LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the onboard LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: **Locate the connector**. The LPT connector location is shown in **Section 3.1.1**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the PCIE-9452 LPT box-header connector. See **Figure 4-6**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the 26-pin box-header connector on the PCIE-9452, connect the cable connector to the onboard connector. See **Figure 4-6.**

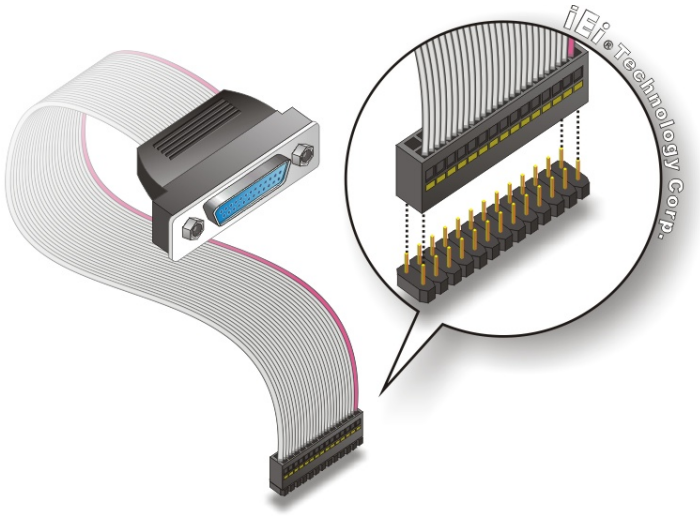


Figure 4-6: LPT Cable Connection

Step 4: **Attach the LPT connector to the chassis**. To secure the LPT interface connector to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect LPT device**. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 4-7**

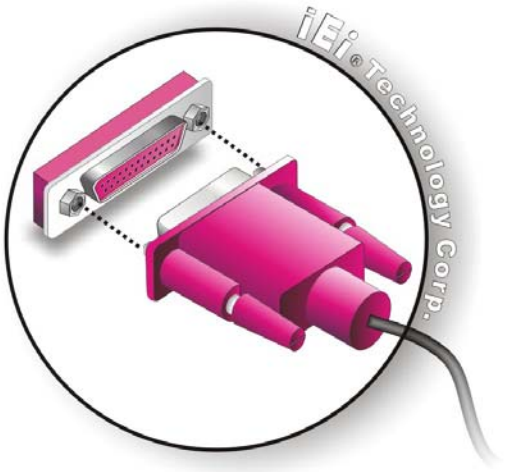


Figure 4-7: Connect the LPT Device

4.8.4 Single RS-232 Cable (without Bracket)

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Section 3.1.1**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 4-8.** A key on the front of the cable connectors ensures the connector can only be installed in one direction.

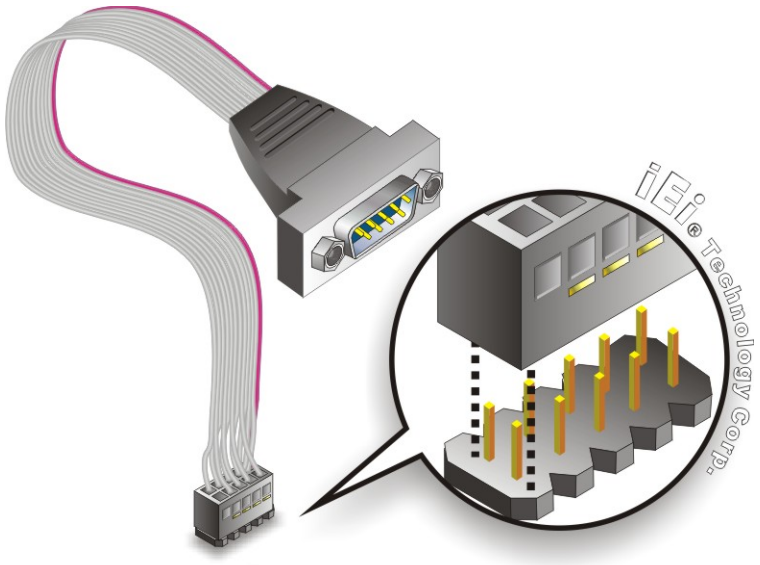


Figure 4-8: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 4: **Connect the serial device**. Once the single RS-232 connector is connected to a chassis or bracket, connect a serial communications device to the chassis or bracket.

4.8.5 TFT LCD Installation

The PM-LX2-800-R11 can be connected to a TFT LCD screen through the 40-pin TTL screen on the board. To connect a TFT LCD to the PM-LX2-800, please follow the steps below.

Step 5: **Locate the connector**. The location of the TTL connector is shown in **Section 3.1.1**.

Step 6: **Insert the cable connector**. Insert the connector from the TTL PCB driving board to the TTL connector as shown in **Figure 4-9**. When connecting the connectors, make sure the pins are properly aligned.

WARNING:

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

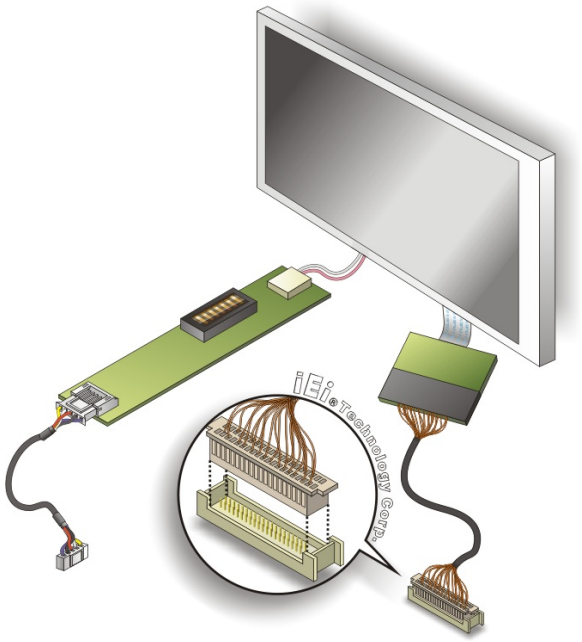


Figure 4-9: TTL Connector

Step 7: **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Section 3.1.1**.

Step 8: **Connect backlight connector**. Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-10**. When inserting the cable connector, make sure the pins are properly aligned.

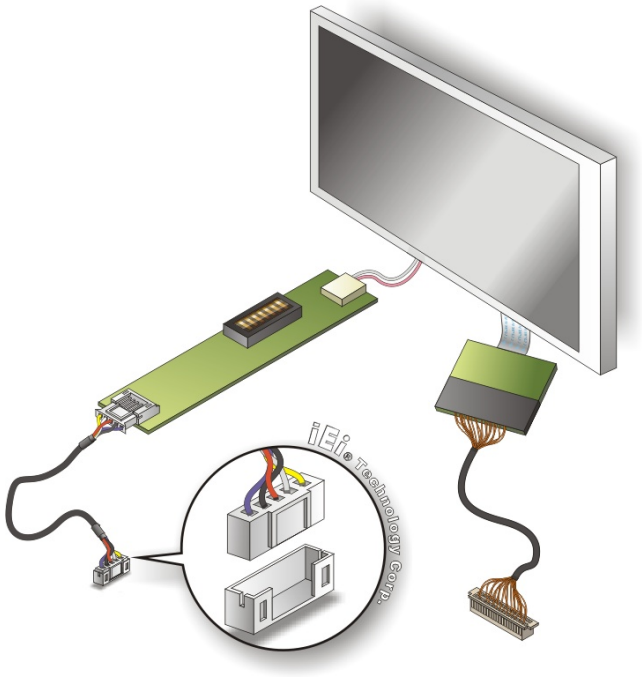


Figure 4-10: Backlight Inverter Connection

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI 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 before the **DELETE** key is pressed, 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 in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

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 computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **5**.

5.1.5 BIOS Menu Bar

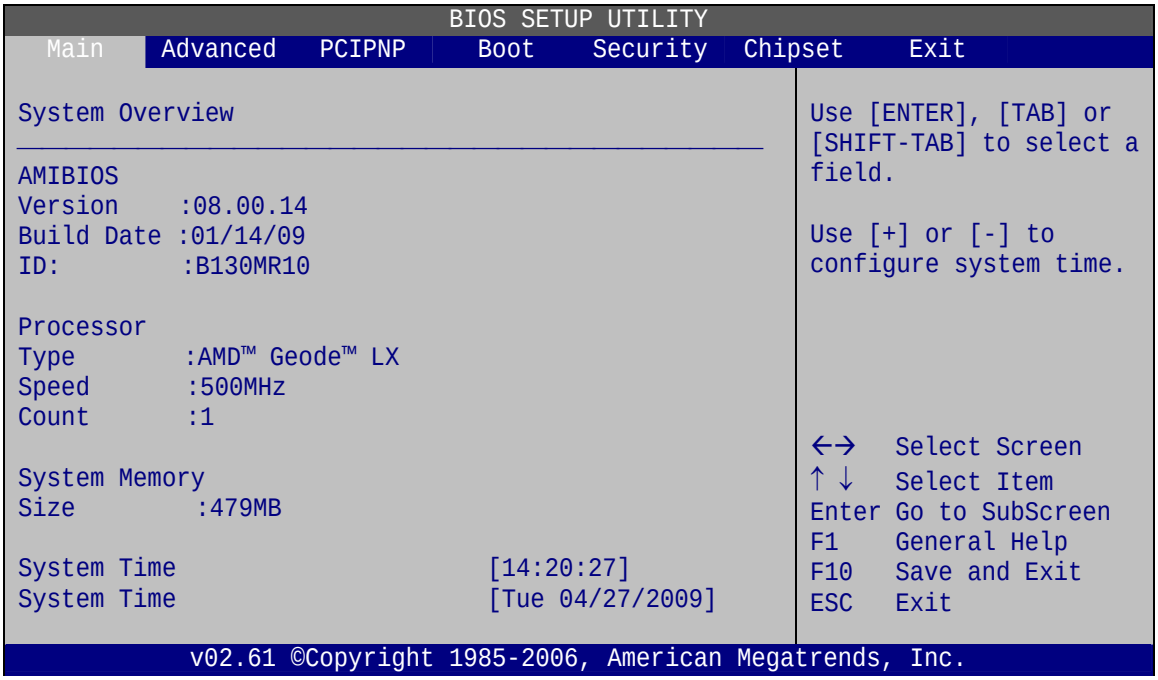
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
  - **Version:** Current BIOS version
  - **Build Date:** Date the current BIOS version was made
  - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
  - **Type:** Names the currently installed processor
  - **Speed:** Lists the processor speed
  - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
  - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

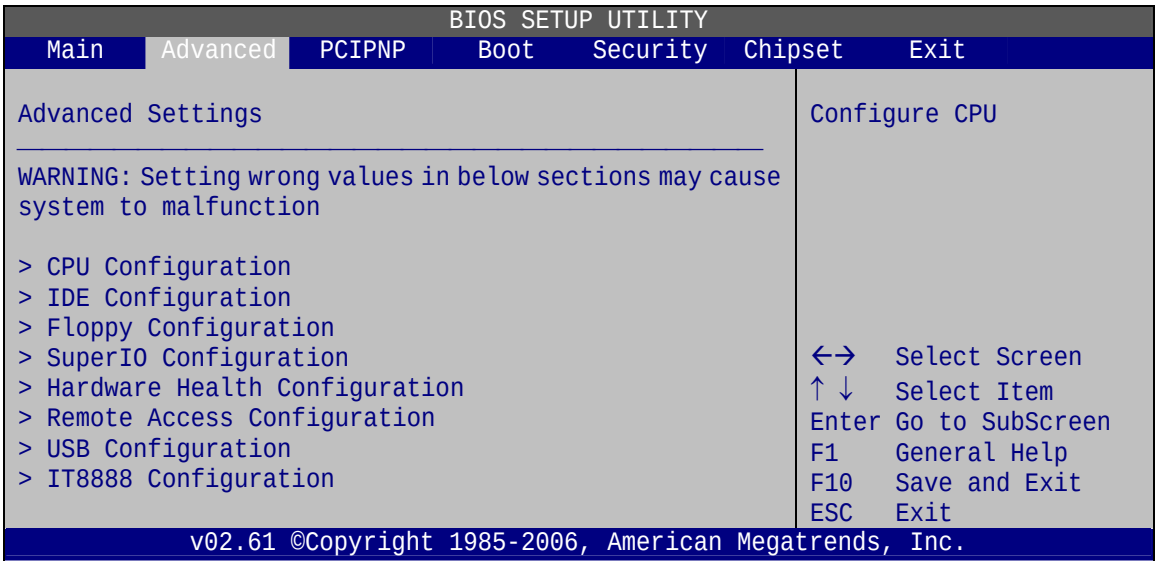
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

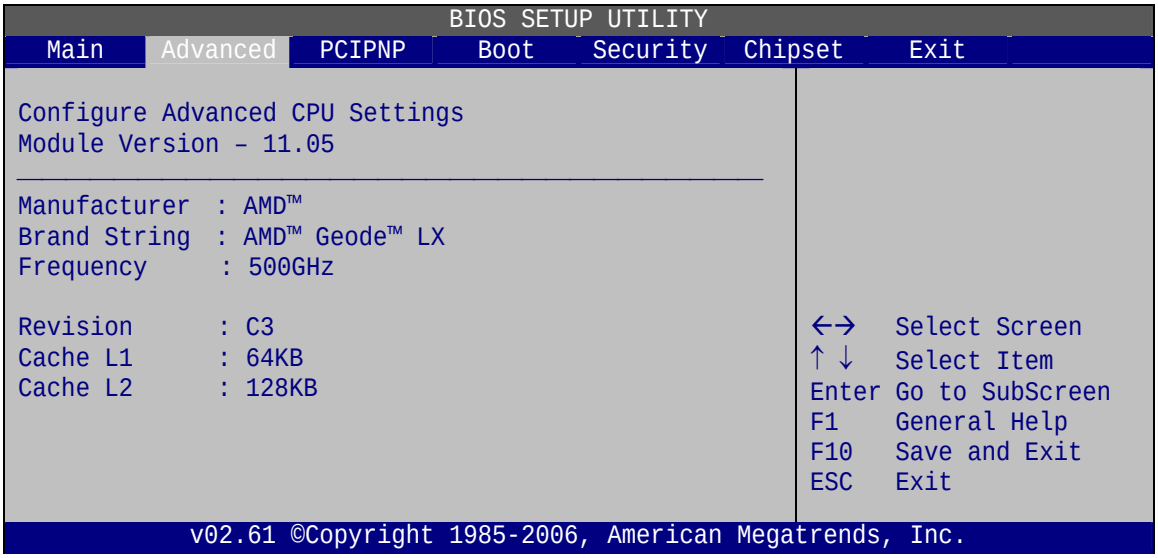
- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- Floppy Configuration (see **Section 5.3.3**)
- Super I/O Configuration (see **Section 5.3.4**)
- Hardware Health Configuration (see **Section 5.3.5**)
- Remote Access Configuration (see **Section 5.3.6**)
- USB Configuration (see **Section 5.3.7**)
- IT8888 Configuration (see **Section 5.3.8**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

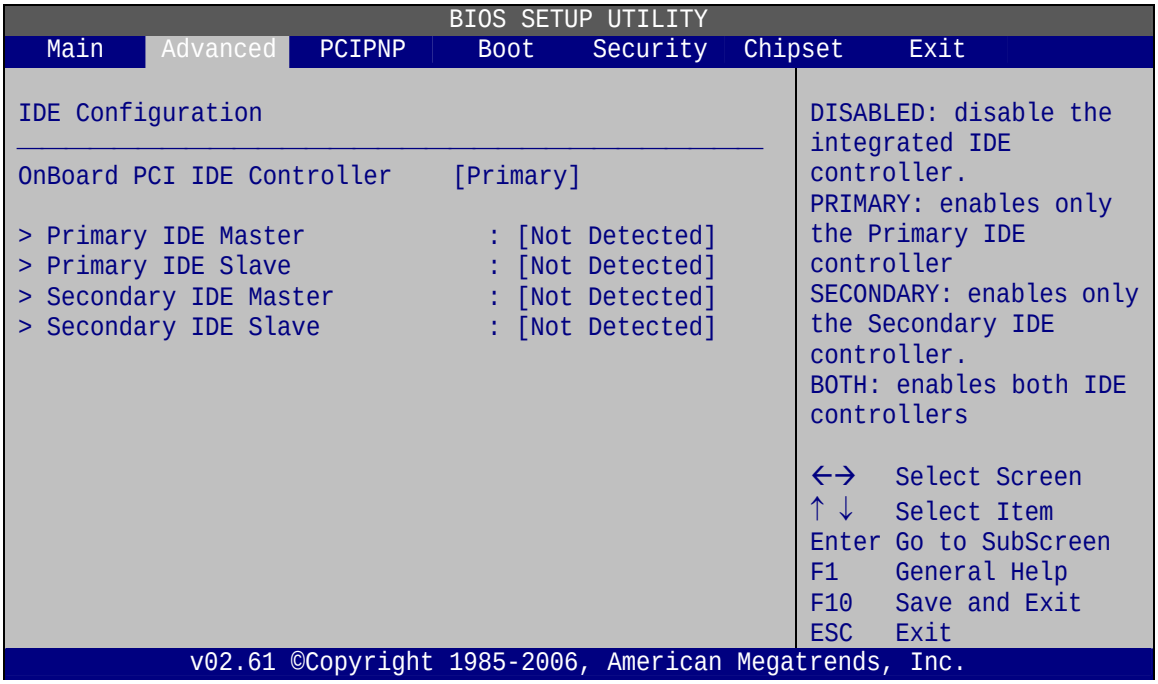
The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer

- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled**	Disables the on-board ATA/IDE controller.
➔ **Compatible**	Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **Configure SATA Channels [Behind PATA]**

Use the **Configure SATA Channels** option to determine how SATA channels and PATA channels are ordered.

➔ **Before PATA** Puts SATA channels before PATA channels.

➔ **Behind PATA** **DEFAULT** Puts SATA channels behind PATA channels.

➔ **Legacy IDE Channels [PATA Pri, SATA Sec]**

➔ **SATA Only** Only the SATA drives are enabled.

➔ **PATA Pri, SATA Sec** **DEFAULT** The IDE drives are enabled on the Primary IDE channel. The SATA drives are enabled on the Secondary IDE channel.

➔ **PATA Pri., PATA Sec** The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

➔ **OnBoard PCI IDE Controller [Both]**

Use the **OnBoard PCI IDE Controller** BIOS option to specify the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled**		Prevents the system from using the onboard IDE controller
➔ **Primary**		Only allows the system to detect the Primary IDE channel, including both the Primary Master and the Primary Slave
➔ **Secondary**		Only allows the system to detect the Secondary IDE channel, including both the Secondary Master and Secondary Slave
➔ **Both**	**DEFAULT**	Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary Slave.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

➔ **Hard Disk Write Protect [Disabled]**

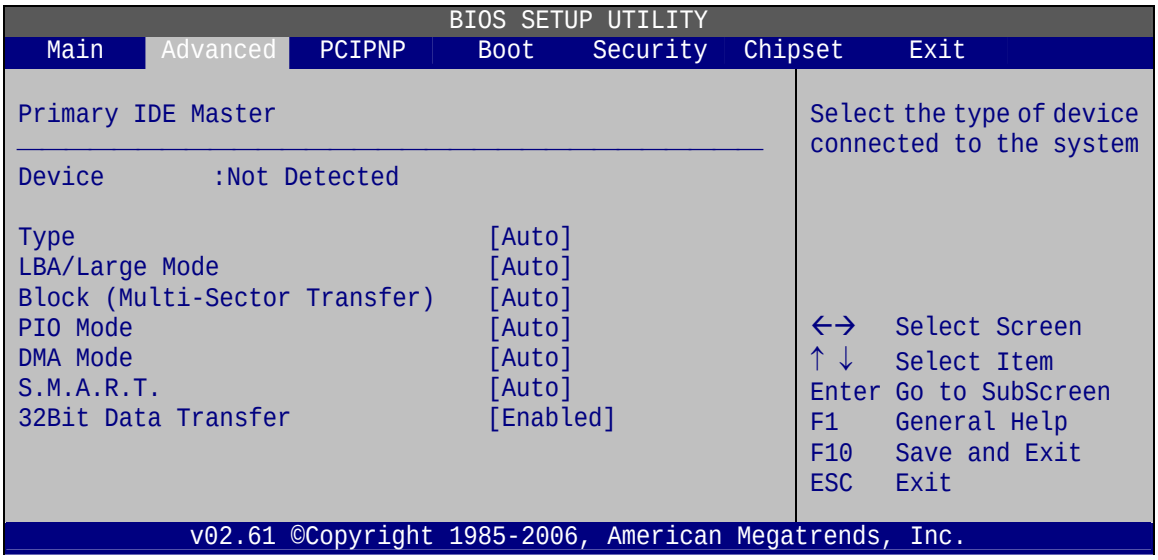
Use the **Hard Disk Write Protect** BIOS option to protect the hard disks from being overwritten. This menu item is only effective if the device is accessed through the BIOS.

➔ **Disabled**	**DEFAULT**	Allows hard disks to be overwritten

➔ **Enabled** Prevents hard disks from being overwritten

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per

interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- 32Bit Data Transfer: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s

➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA0**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**		Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA5**		Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

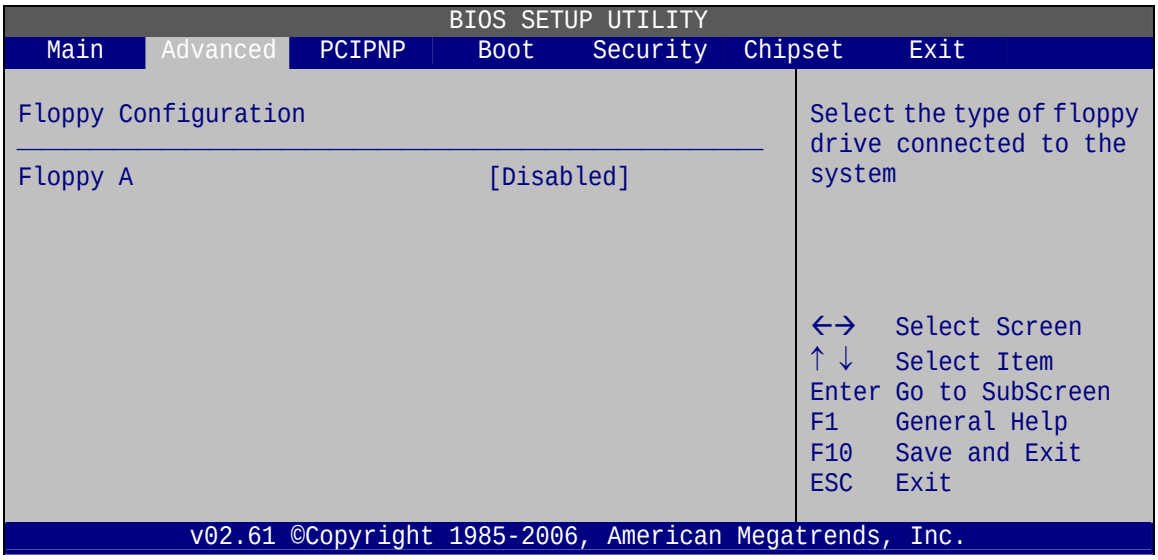
➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**		Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**	**DEFAULT**	Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.



BIOS Menu 6: IDE Master and IDE Slave Configuration

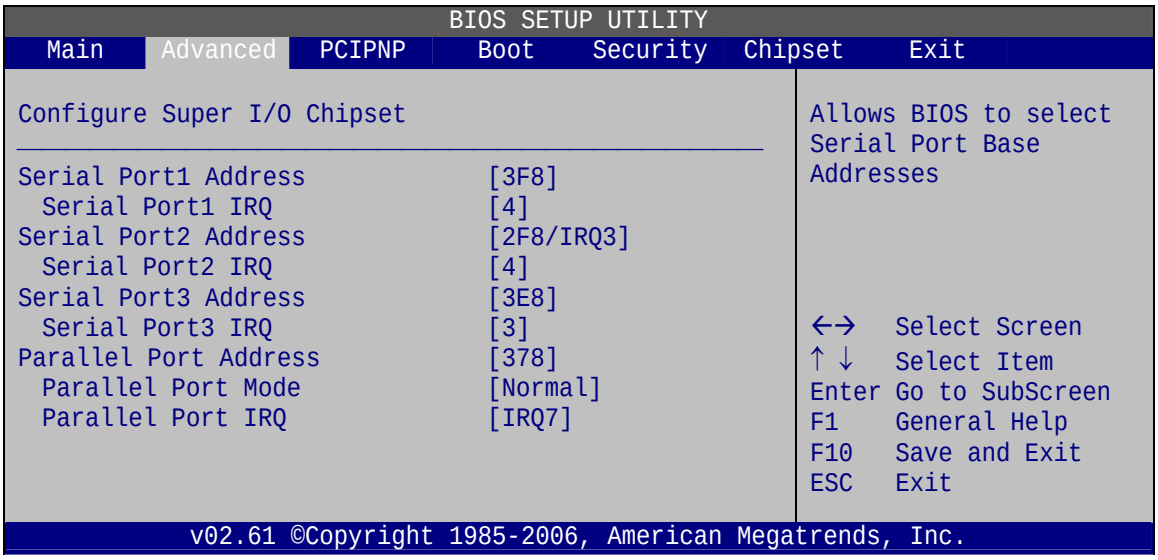
➔ **Floppy A/B**

Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2’
- 2.88 MB 31/2”

5.3.4 Super I/O Configuration

Use the **Super I/O Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

➔ **Serial Port1 Address [3F8]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port1 IRQ [4]**

Use the **Serial Port1 IRQ** option to select the interrupt address for serial port 1.

➔ **3**		Serial port 1 IRQ address is 3
➔ **4**	**DEFAULT**	Serial port 1 IRQ address is 4
➔ **10**		Serial port 1 IRQ address is 10
➔ **11**		Serial port 1 IRQ address is 11

➔ **Serial Port2 Address [2F8]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 IRQ [4]**

Use the **Serial Port2 IRQ** option to select the interrupt address for serial port 2.

➔ **3**		Serial port 2 IRQ address is 3
➔ **4**	**DEFAULT**	Serial port 2 IRQ address is 4
➔ **10**		Serial port 2 IRQ address is 10
➔ **11**		Serial port 2 IRQ address is 11

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3E8**	**DEFAULT**	Serial port 3 I/O port address is 3E8
➔ **2E8**		Serial port 3 I/O port address is 2E8
➔ **2E0**		Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [3]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- ➔ **3** Serial port 3 IRQ address is 3
- ➔ **4** Serial port 3 IRQ address is 4
- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Parallel Port Address [Disabled]**

Use the **Parallel Port Address** option to select the parallel port base address.

- ➔ **Disabled** **DEFAULT** No base address is assigned to the Parallel Port
- ➔ **378** Parallel Port I/O port address is 378
- ➔ **278** Parallel Port I/O port address is 278
- ➔ **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

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

- ➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- ➔ **SPP (Bi-directional)** Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
- ➔ **EPP + SPP** 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 Normal mode.

  The parallel port is also be compatible with SPP devices described above

➔ **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 Normal mode

➔ **ECP + EPP** 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 Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

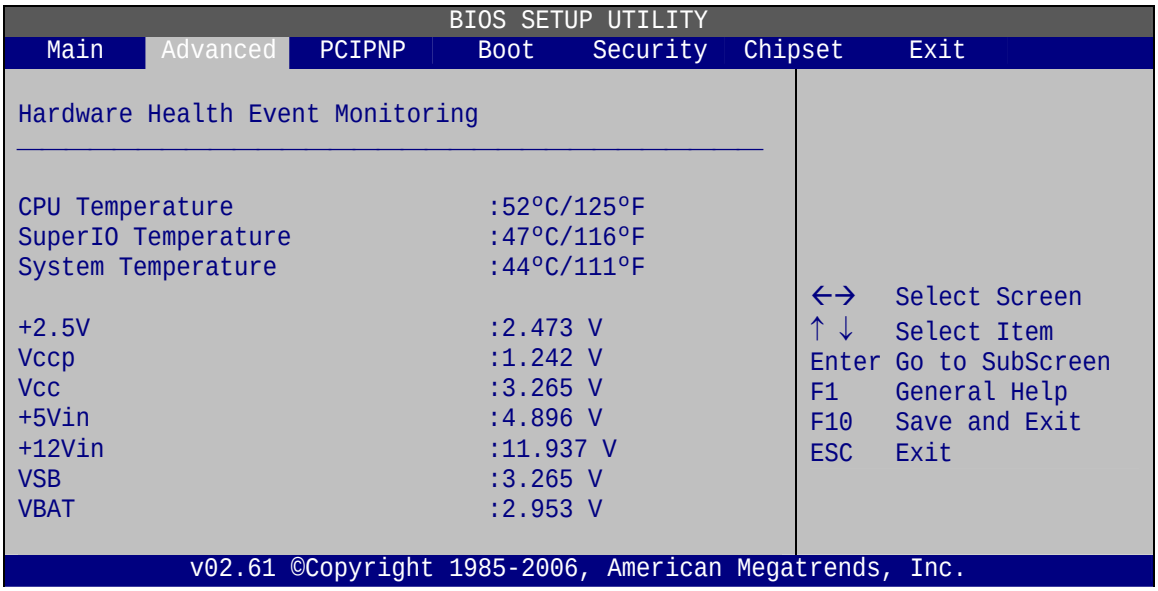
Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

5.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 8: Hardware Health Configuration

➔ **Hardware Health Monitoring**

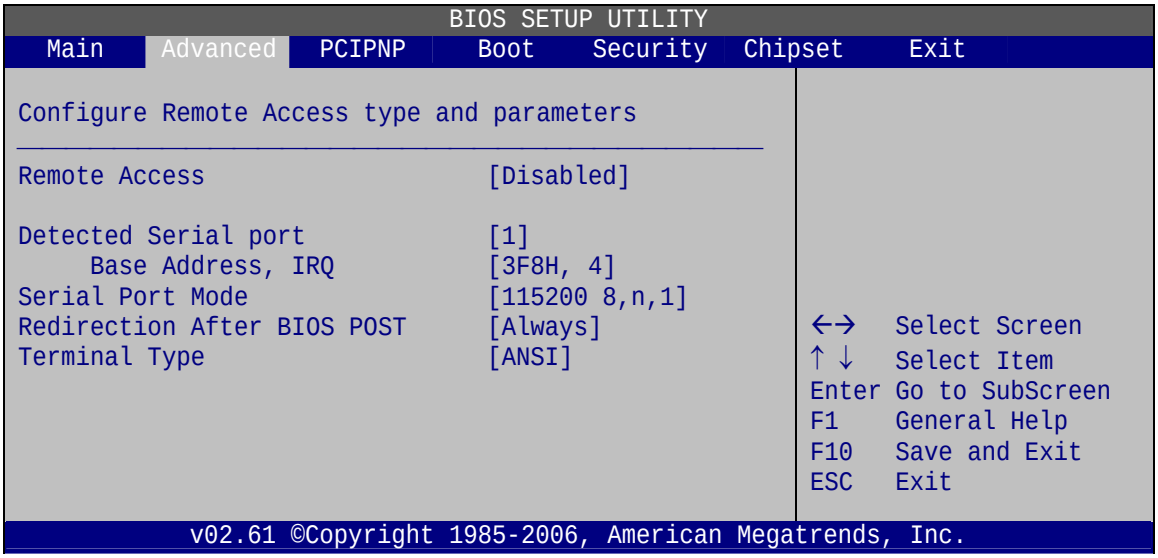
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - Super I/O Temperature
  - System Temperature
- Voltages:
  - +2.5V
  - Vccp
  - Vcc
  - +5Vin
  - +12Vin
  - VSB
  - VBAT

5.3.6 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 9**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and

allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 9: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- Serial Port Number
- Serial Port Mode
- Flow Control
- Redirection after BIOS POST
- Terminal Type
- VT-UTF8 Combo Key Support

These configuration options are discussed below.

➔ **Detected Serial Port r [1]**

Use the **Detected Serial Port** option to select the serial port used for remote access.

➔	**1**	**DEFAULT**	System is remotely accessed through COM1
➔	**2**		System is remotely accessed through COM2
➔	**3**		System is remotely accessed through COM3

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- → **Disabled** — The console is not redirected after POST
- → **Boot Loader** — Redirection is active during POST and during Boot Loader
- → **Always** **DEFAULT** — Redirection is always active (Some OSes may not work if set to Always)

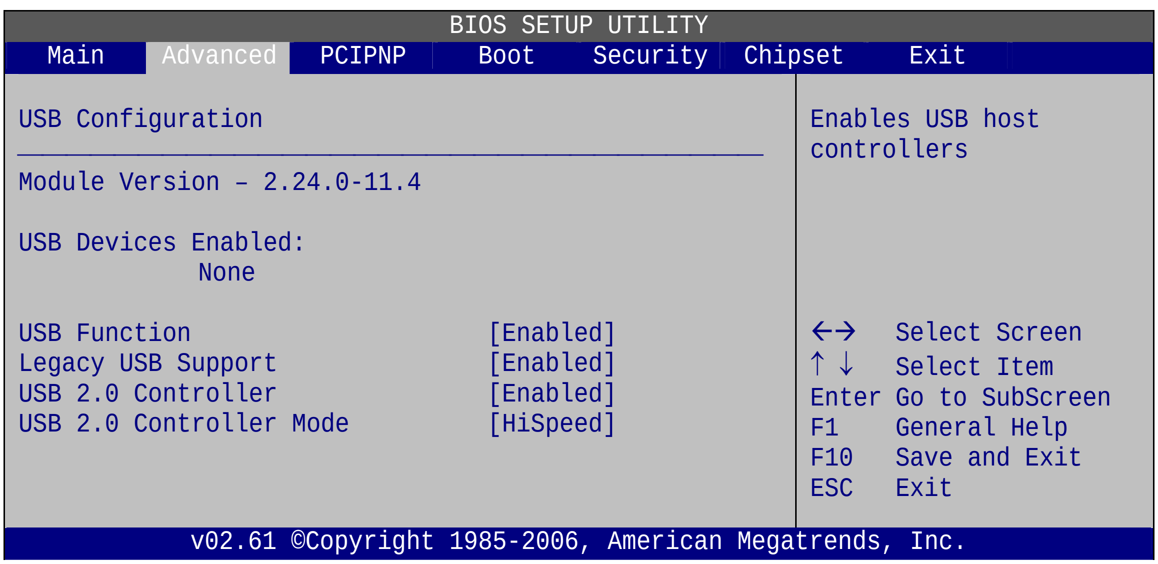
→ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

- → **ANSI** **DEFAULT** — The target terminal type is ANSI
- → **VT100** — The target terminal type is VT100
- → **VT-UTF8** — The target terminal type is VT-UTF8

5.3.7 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 10**) to read USB configuration information and configure the USB settings.



BIOS Menu 10: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB 1.1 Controller [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB 1.1 controller disabled
➔ **Enabled**	**DEFAULT**	USB 1.1 controller enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

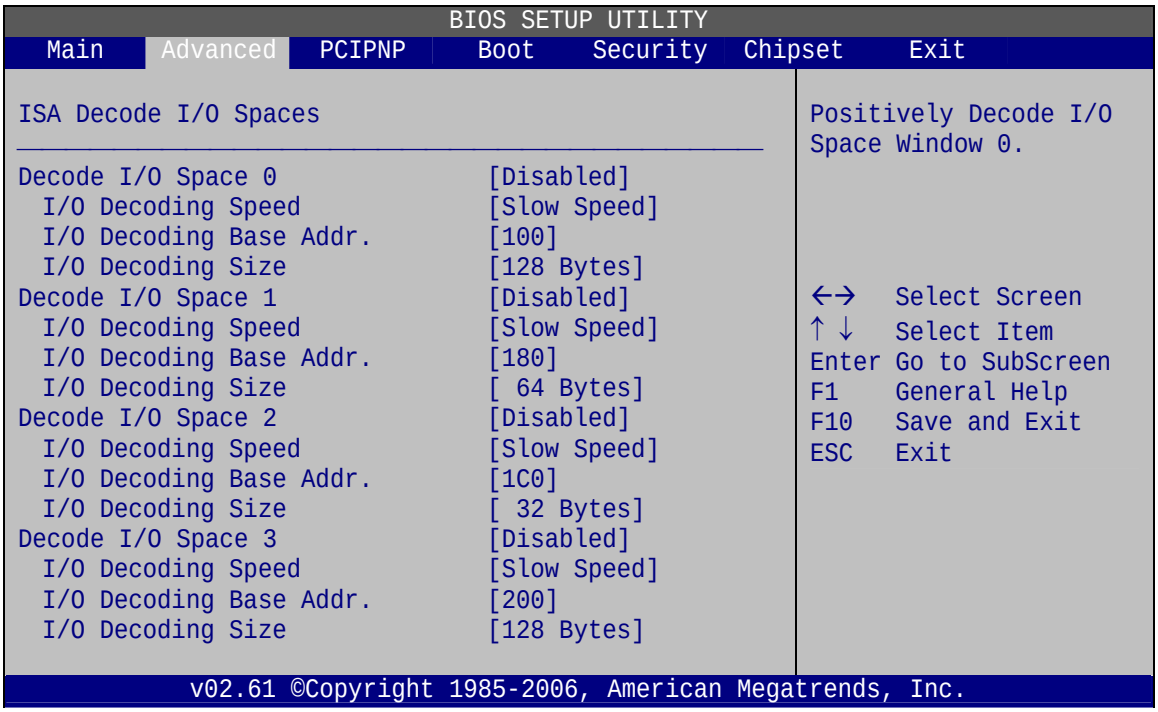
Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled

➔ **Auto** Legacy USB support disabled if no USB devices are connected

5.3.8 IT8888 ISA Decode IO Spaces

Access the **IT8888 ISA Decode Spaces** configuration settings (**BIOS Menu 11**) in the Integrated Peripherals menu and make the appropriate I/O space settings.



BIOS Menu 11: IT8888 ISA Decode IO

➔ **Decode IO Space x [Disabled]**

Use the **Decode IO Space x** option to enable or disable the decoding of a particular IO space.

➔ **Disabled** (Default) IO space decoding is disabled

➔ **Enabled** IO space decoding is enabled and the options below are accessible

➔ **Decode IO Speed x [Slow Speed]**

Use the **Decode IO Space x** option to enable or disable the decoding of a particular IO space.

➔ **Fast Speed**		Set the I/O speed to Fast
➔ **Medium Speed**		Set the I/O speed to Medium
➔ **Slow Speed**	(Default)	Set the I/O speed to Slow
➔ **Subtractive Speed**		Set the I/O speed to Subtractive

➔ **Decode IO Address x [15:0] [Varying defaults]**

Use the **Decode IO Address** option to manually enter the IO address that should be used by this IO space. The defaults for the different IO spaces are shown below

- IO Space 0: 0100
- IO Space 1: 0180
- IO Space 2: 01C0
- IO Space 3: 0200

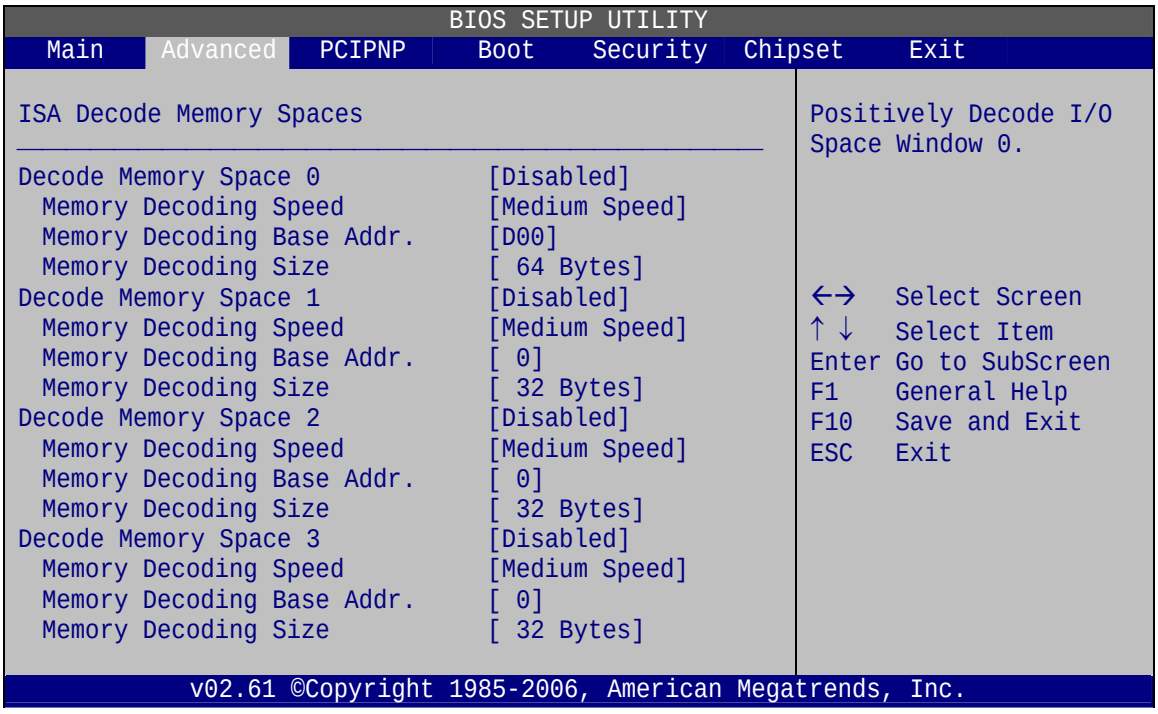
➔ **Decode IO Size x [Varying defaults]**

Use the **Decode IO Size** option to manually enter the size of the IO space. The defaults for the different IO spaces are shown below.

- IO Space 0: 128 Bytes
- IO Space 1: 64 Bytes
- IO Space 2: 32 Bytes
- IO Space 3: 128 Bytes

5.3.9 IT8888 ISA Decode Memory

Access the **IT8888 ISA Decode Memory** configuration settings (**BIOS Menu 12**) in the Integrated Peripherals menu and make the appropriate I/O space settings.



BIOS Menu 12: IT8888 ISA Decode Memory

➔ **Decode Memory Space x [Disabled]**

Use the **Decode Memory Space x** option to enable or disable the decoding of a particular IO space.

➔ **Disabled**	(Default)	Memory space decoding is disabled
➔ **Enabled**		Memory space decoding is enabled and the options below are accessible

➔ **Decode Memory Speed x [Medium Speed]**

Use the **Decode Memory Space x** option to enable or disable the decoding of a particular IO space.

➔ **Fast Speed**		Set the Memory Speed to Fast Speed
➔ **Medium Speed**	(Default)	Set the Memory Speed to Medium Speed
➔ **Slow Speed**		Set the Memory Speed to Slow Speed

➔ **Subtractive Speed** Set the Memory Speed to Subtractive Speed

➔ **Decode Memory Address x [Varying defaults]**

Use the **Decode Memory Address** option to manually enter the memory address that should be used by this memory space. The defaults for the different memory spaces are shown below

- Memory Space 0: D00
- Memory Space 1: 000
- Memory Space 2: 000
- Memory Space 3: 000

➔ **Decode Memory Size x [Varying defaults]**

Use the **Decode Memory Size** option to manually enter the size of the memory space. The defaults for the different memory spaces are shown below

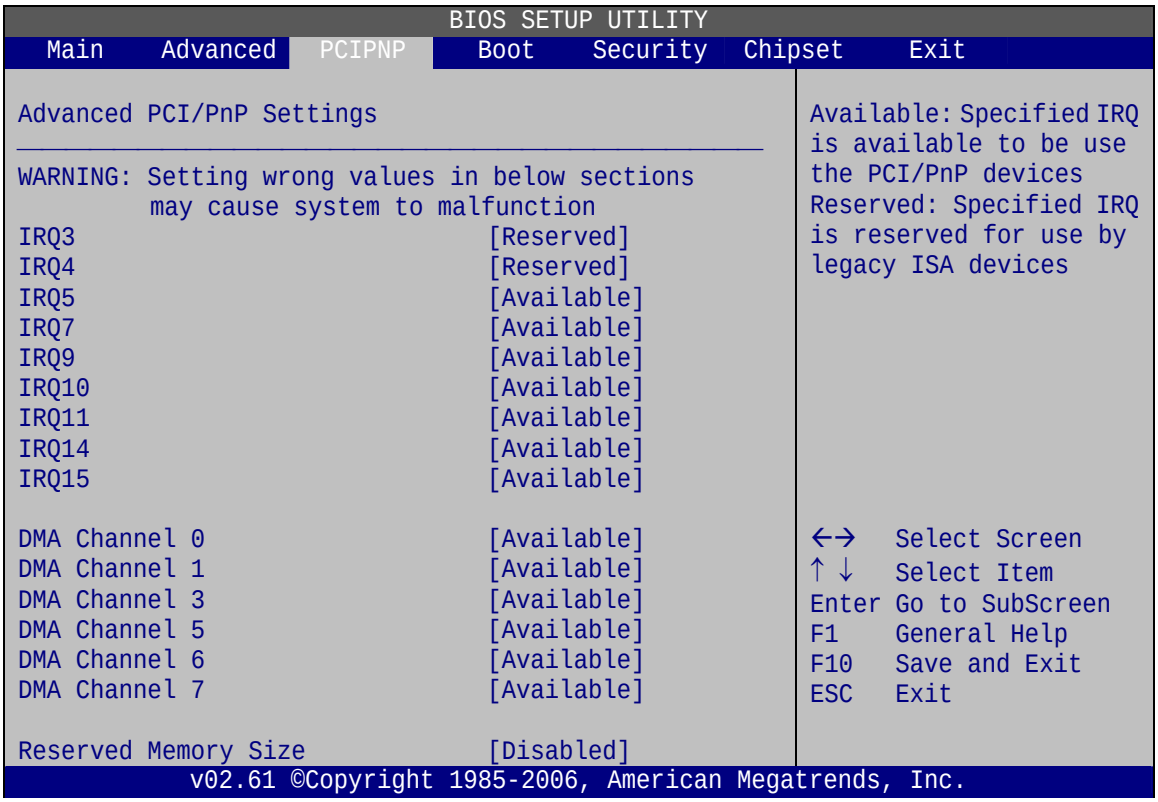
- Memory Space 0: 64 Bytes
- Memory Space 1: 32 Bytes
- Memory Space 2: 32 Bytes
- Memory Space 3: 32 Bytes

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 13**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 13: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9

- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

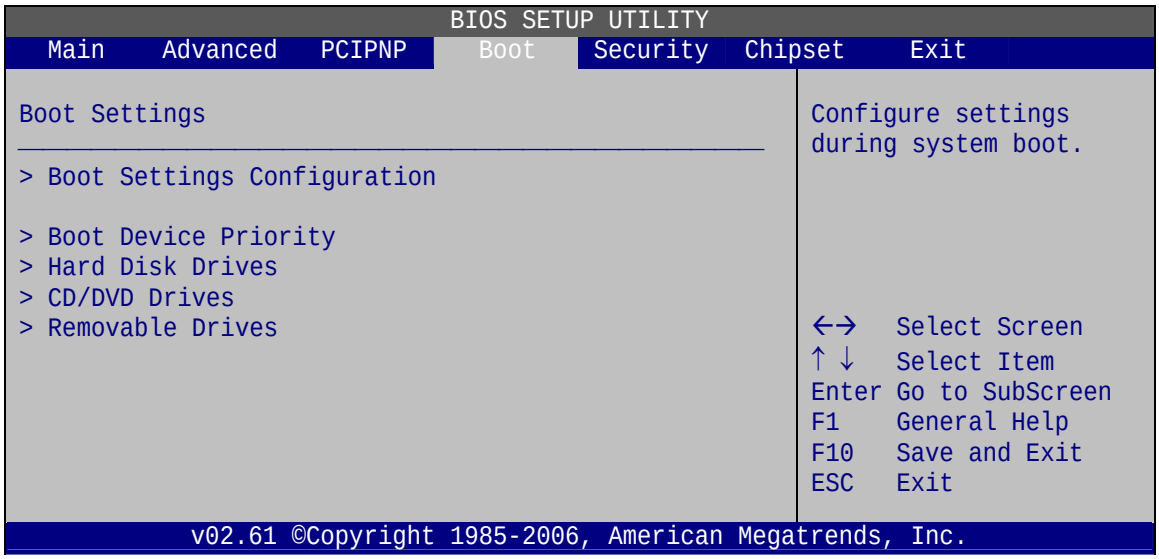
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16 KB reserved for legacy ISA devices
➔ **32K**		32 KB reserved for legacy ISA devices
➔ **64K**		54 KB reserved for legacy ISA devices

5.5 Boot

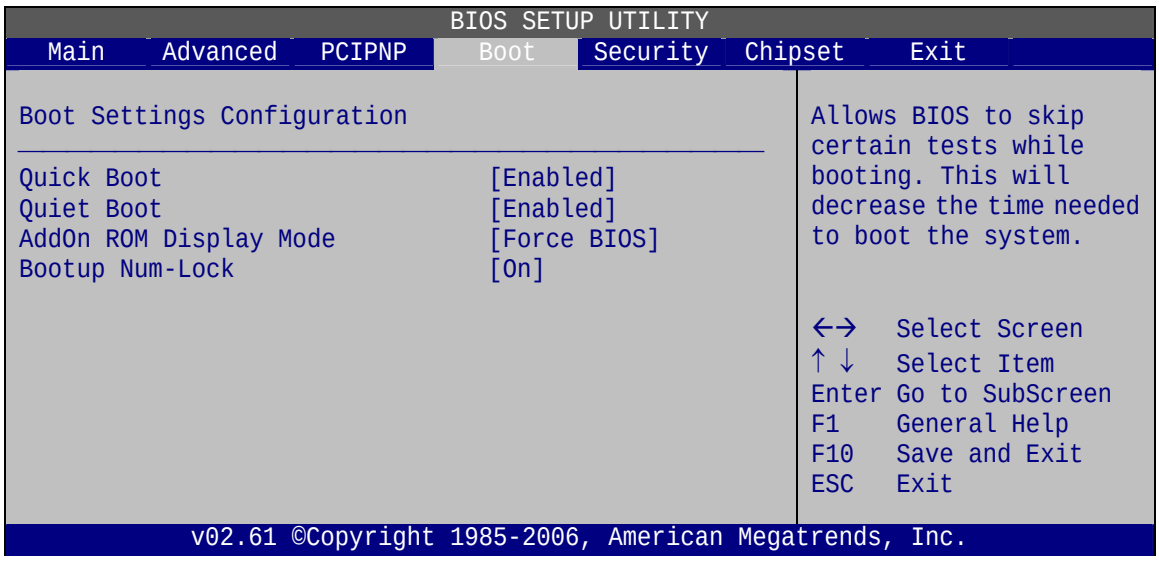
Use the **Boot** menu (**BIOS Menu 14**) to configure system boot options.



BIOS Menu 14: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 15**) to configure advanced system boot options.



BIOS Menu 15: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**	Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Spread Spectrum Mode [Disabled]**

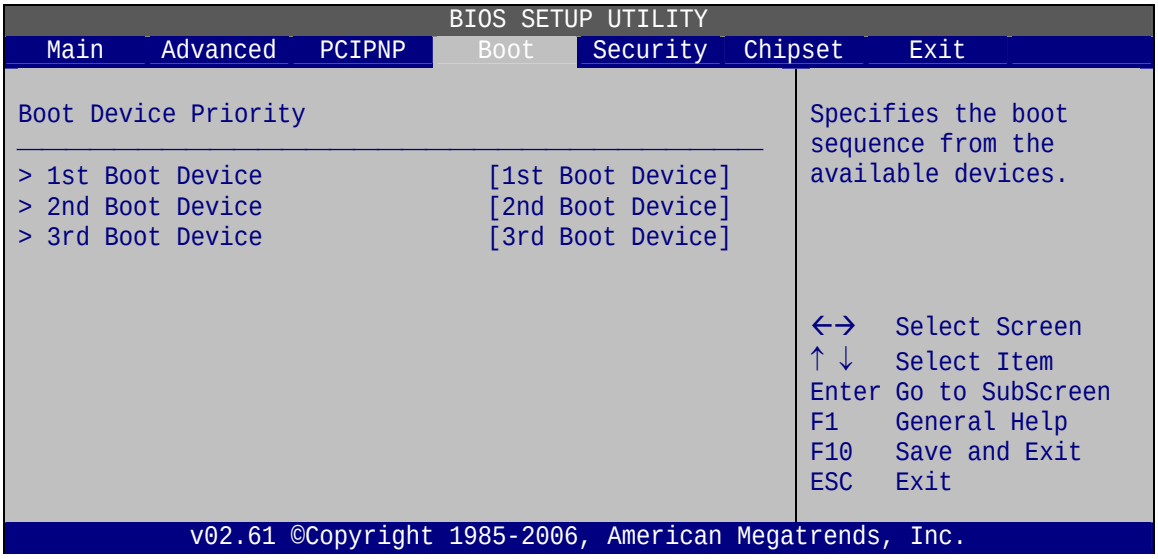
The **Spread Spectrum Mode** option can help to improve CPU EMI issues.

➔ **Disabled** **DEFAULT** The spread spectrum mode is disabled

➔ **Enabled** The spread spectrum mode is enabled

5.5.2 Boot Device Priority

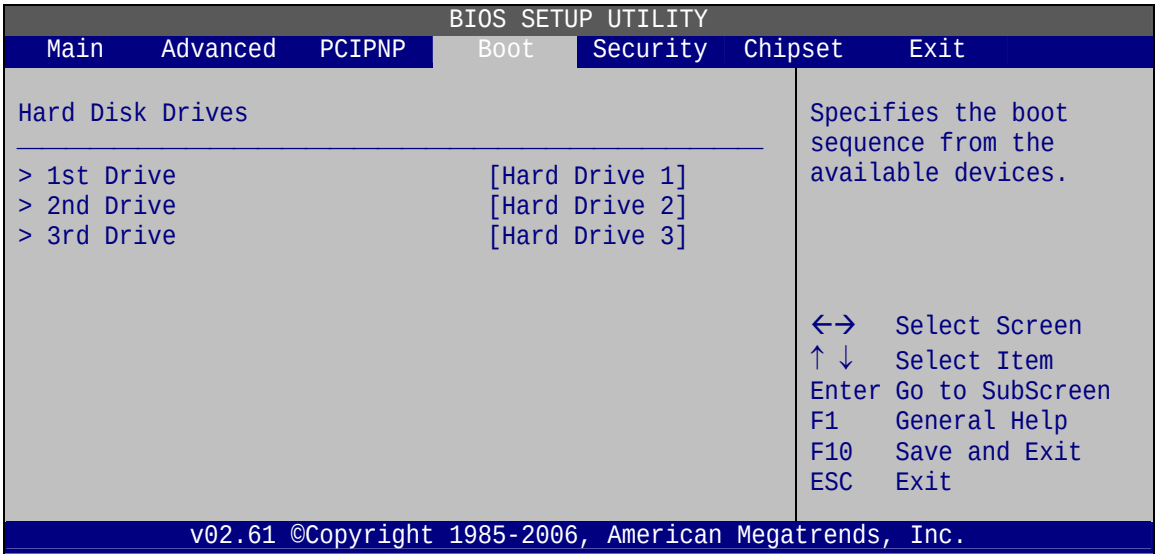
Use the **Boot Device Priority** menu (**BIOS Menu 16**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.



BIOS Menu 16: Boot Device Priority Settings

5.5.3 Hard Disk Drives

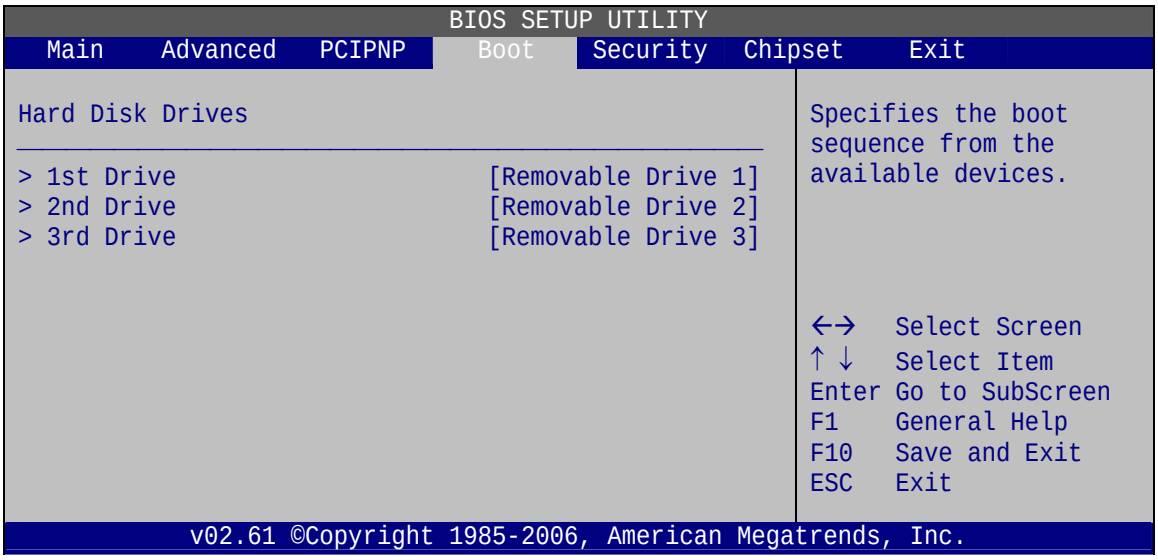
Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.



BIOS Menu 17: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 18**) to specify the boot sequence of the removable drives. Only connected drives are shown.



BIOS Menu 18: Removable Drives

5.5.5 CD/DVD Drives

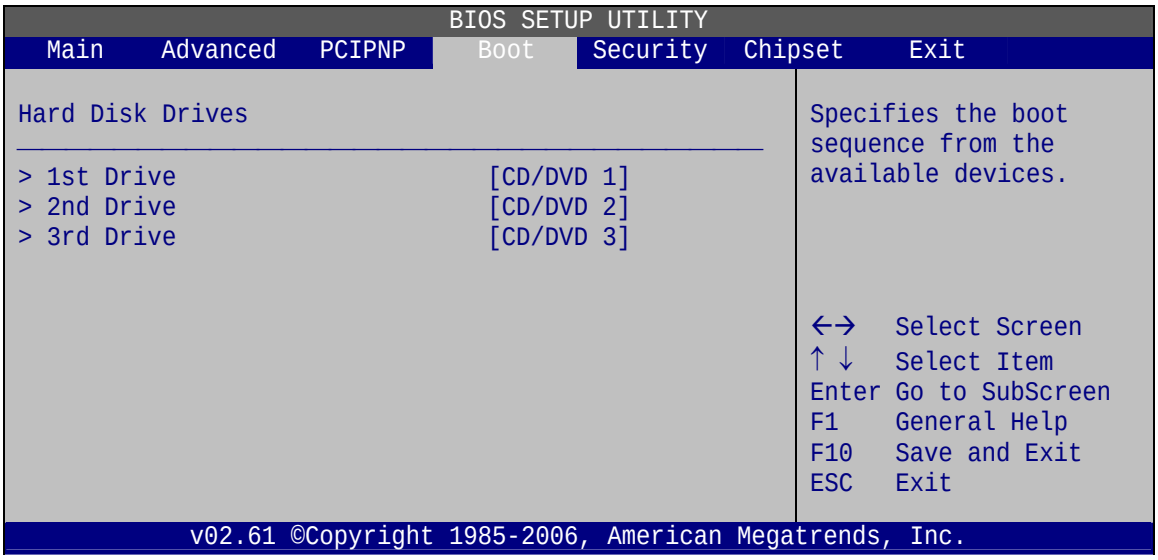
Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]

NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

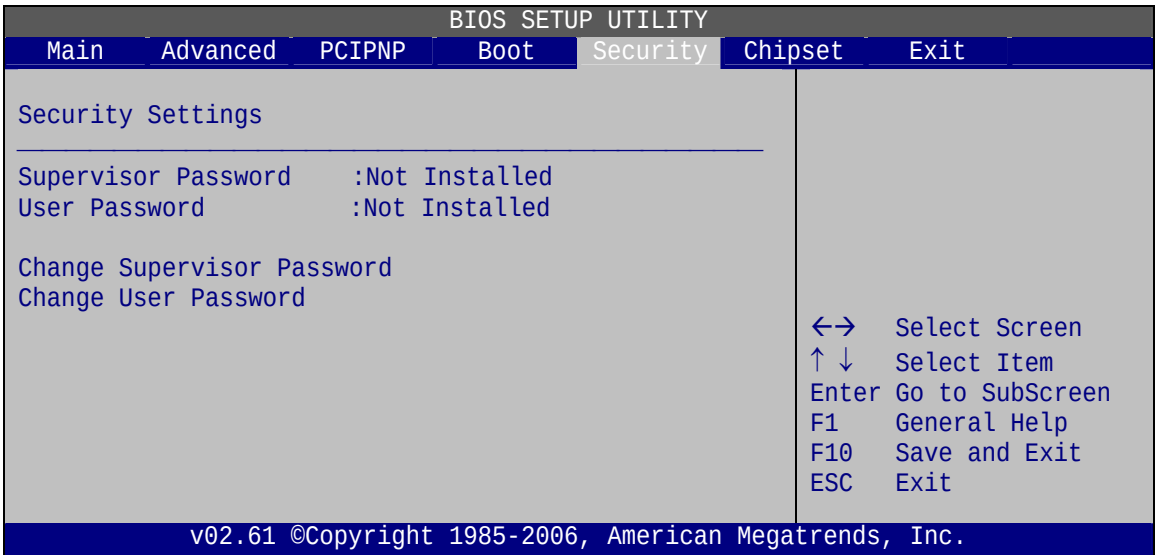
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 19: CD/DVD Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select

this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

➔ **Clear User Password**

Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

➔ **Boot Sector Virus Protection [Disabled]**

Use the **Boot Sector Virus Protection** to enable or disable boot sector protection.

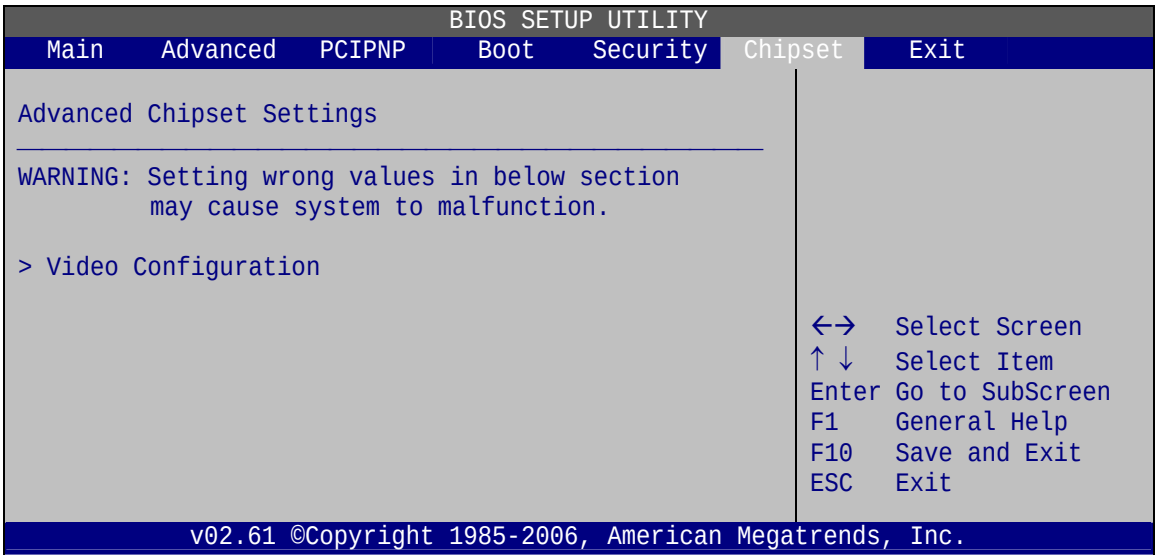
➔ **Disabled**	**DEFAULT**	Disables the boot sector virus protection
➔ **Enabled**		Enables the boot sector virus protection

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 21**) to access the Video configuration menu.

WARNING!

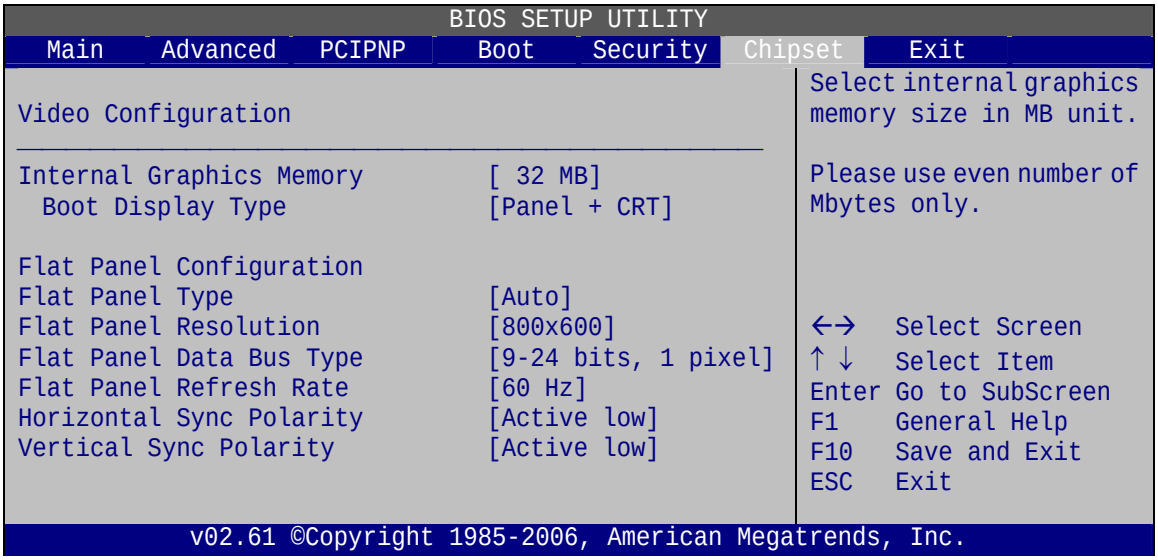
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 21: Chipset

5.7.1 Video Configuration

Use the **Video Configuration** menu (**BIOS Menu 22**) to set the configuration settings for the flat panel screen connected to the system.



BIOS Menu 22: Video Configuration

➔ **Internal Graphics Memory [32 MB]**

Use the **Share Memory Size** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 16 MB
- 32 MB **Default**
- 64 MB
- 128 MB
- Disabled

➔ **Boot Display Device [Panel + CRT]**

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- CRT
- Flat Panel
- Panel + CRT **Default**

➔ **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.

➔ **Flat Panel Resolution [800 x 600]**

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

➔ **Flat Panel Data Bus Type [9 – 24 bits, 1 ppc]**

The **Flat Panel Data Bus Type** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Flat Panel 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 **Flat Panel Data Bus Type** options are:

- 9-24 bits, 1 pixel/clock (Default)
- 18, 24 bits, 2 pixels/clock

➔ **Refresh Rate [60Hz]**

The **Flat Panel Refresh Rate** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Flat Panel 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 **Flat Panel Refresh Rate** options are:

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

➔ **Horizontal Sync Polarity [Low]**

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

- Active High
- Active Low (Default)

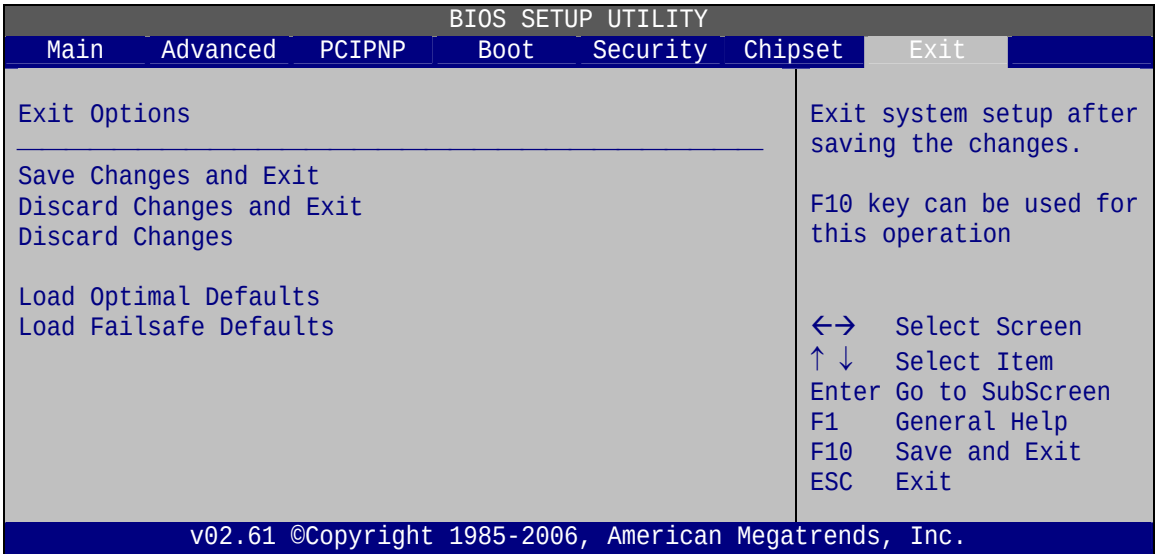
➔ **Vertical Sync Polarity [Low]**

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

- Active High
- Active Low (Default)

5.8 Exit

Use the **Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 23:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

Appendix

B

Terminology

ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Southbridge chipset.
GPIO	General purpose input

HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited 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 EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs 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 C-1: AH-6FH Sub-function

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 starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to 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 resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

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

;
; EXIT ;
```

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						