IEI Integration Corp.

MODEL:

IOWA-LX-600

Half-size ISA CPU Card with on-board AMD Geode™ LX 600 VGA, LAN, USB 2.0, CF, COM, Parallel Port and Audio RoHS Compliant

User Manual

Rev. 1.01 - August 24, 2020

RoHS Lead Free

Revision

Date	Version	Changes
August 24, 2020	1.01	Added Section 4.10 RAID Configuration (S Model Only)
March 31, 2011	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Table of Contents

List of Figures

List of Tables

Table 1-1: IOWA-LX-600 Model Variations 2

Table 1-2: Technical Specifications..8

Table 3-1: Peripheral Interface Connectors 16

Table 3-2: Rear Panel Connectors 16

Table 3-3: ATX Power Supply Enable Connector Pinouts 17

Table 3-4: Audio Connector Pinouts (10-pin) 18

Table 3-5: Backlight Inverter Connector Pinouts 19

Table 3-6: Battery Connector Pinouts 21

Table 3-7: CF Card Socket Pinouts..22

Table 3-8: DIO Connector Pinouts 23

Table 3-9: Fan Connector Pinouts 24

Table 3-10: FDD Connector Pinouts 26

Table 3-11: Front Panel Connector Pinouts..27

Table 3-12: IDE Connector Pinouts..28

Table 3-13: Infrared Connector Pinouts 29

Table 3-14: Keyboard/Mouse Connector Pinouts 30

Table 3-15: Parallel Port Connector Pinouts 31

Table 3-16: Power Connector Pinouts..32

Table 3-17: SATA Drive Connector Pinouts...33

Table 3-18: Internal Serial Port Connector Pinouts 34

Table 3-19: TFT LCD Port Connector Pinouts 36

Table 3-20: USB Port Connector Pinouts..37

Table 3-21: -VCC Power Connector Pinouts..38

Table 3-22: PS/2 Connector Pinouts..40

Table 3-23: RJ-45 Ethernet Connector Pinouts 40

Table 3-24: J7 Connector LEDs..41

Table 3-25: RS-232 Serial Port (COM 1) Pinouts 41

Table 3-26: VGA Connector Pinouts..42

Table 4-1: Jumpers 49

Table 4-2: AT/ATX Power Select Jumper Settings 50

Table 4-3: CompactFlash® Setup Jumper Settings 51

List of BIOS Menus

Chapter

1

Introduction

1.1 Introduction

Figure 1-1: IOWA-LX-600

The IOWA-LX-600 is an AMD Geode™ LX based based half-size ISA CPU card. The IOWA-LX-600 has a Front Side Bus (FSB) of 366 MHz, 128 MB of RAM on-board and is upgradeable with a further 512 MB of SDRAM.

Multiple input/output options include VGA and 24-bit TTL for video output, a parallel port, two serial ports, an infrared port and 10/100BASE-T Ethernet. The IOWA-LX-600 supports up to two IDE drives and one floppy drive. Two SATA ports with RAID 0 and RAID 1 capabilities are optional.

1.2 Model Variations

The IOWA-LX-600 series has two models. The specifications for the two models are show in Table 1-1

MODEL	IOWA-LX-600	IOWA-LX-600S
CPU Speed	366 MHz	366 MHz
Onboard Memory	128 MB	128 MB
SATA	No	Yes

Table 1-1: IOWA-LX-600 Model Variations

1.3 Benefits

Some of the IOWA-LX-600 benefits:

- Power efficient, fanless CPU lowers hardware and operational overhead costs
- ISA expansion options available through compatible IEI backplanes
- Support for both legacy ISA and DMA (direct memory access)
- Multiple display output devices including VGA and TTL
- RAID options including RAID 1 for increased data safety and RAID 0 for improved drive performance for faster data access (on SATA models)

1.4 Features

Some of the IOWA-LX-600 features:

- Half-size form factor
- RoHS compliant
- AMD Geode™ LX processor installed
- VGA or TTL display
- Low power consumption
- One 10/100BASE-T Ethernet controller on-board
- Two SATA channels with transfer rates up to 1.5Gb/s on-board (SATA model)
- Four USB 2.0 devices supported
- Integrated audio

1.5 Connectors

The connectors on the IOWA-LX-600 are shown in the figure below.
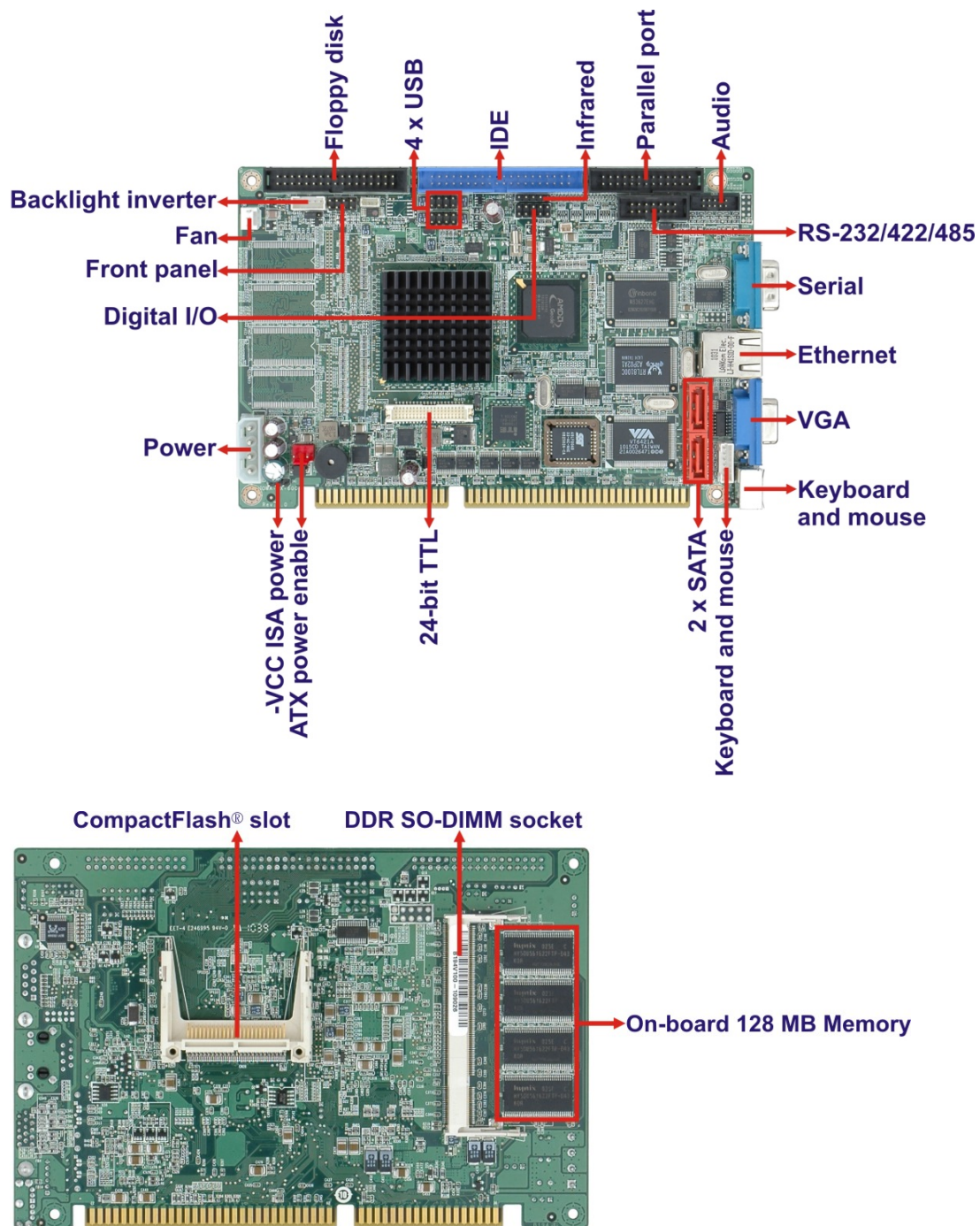
Figure 1-2: Connectors

1.6 Dimensions

The dimensions of the board are listed below:

- **Length**:   184.99 mm
- **Width**:   122.38 mm
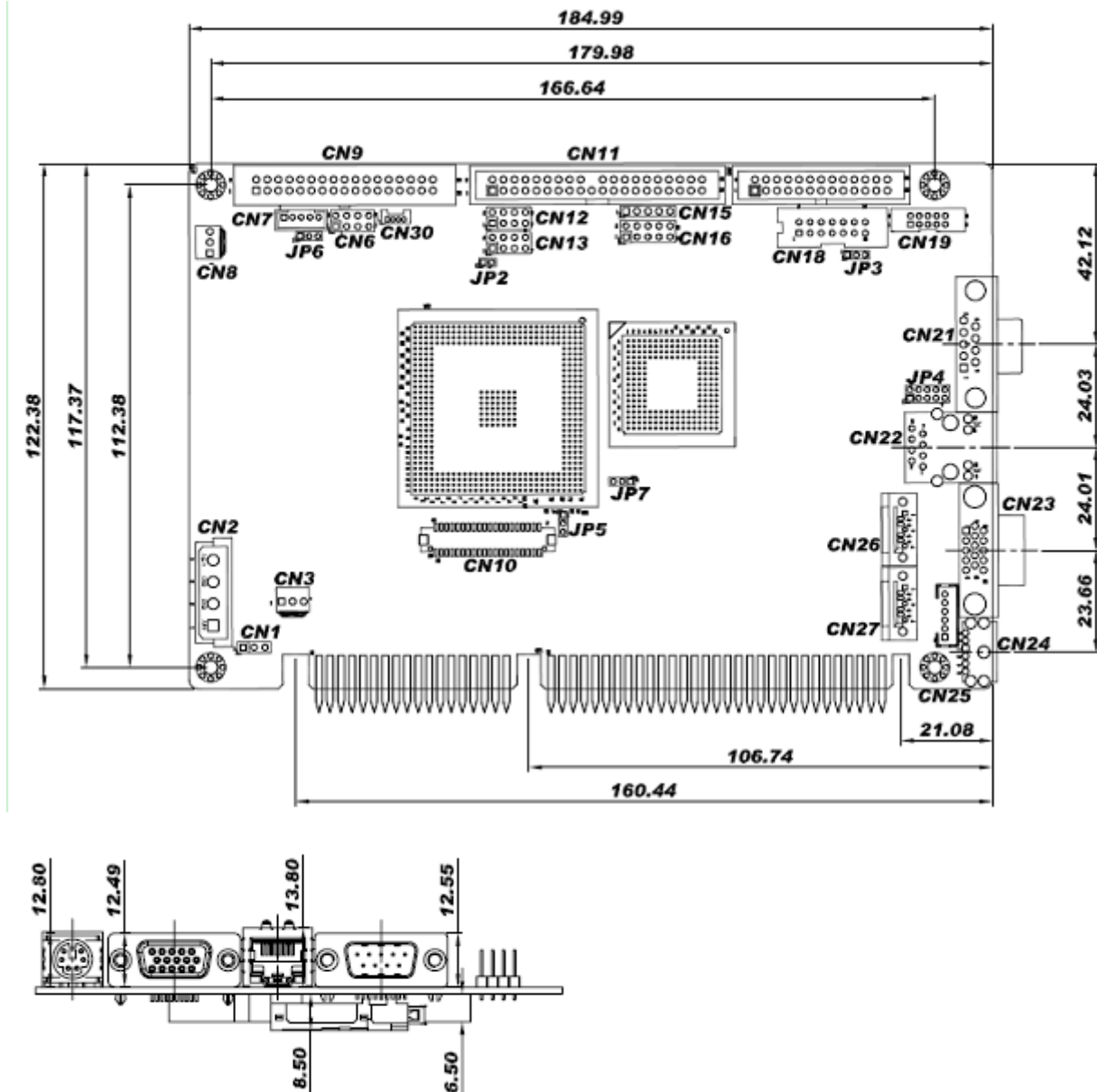
Figure 1-3: IOWA-LX-600 Dimensions (mm)

1.7 Data Flow

Figure 1-4 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.
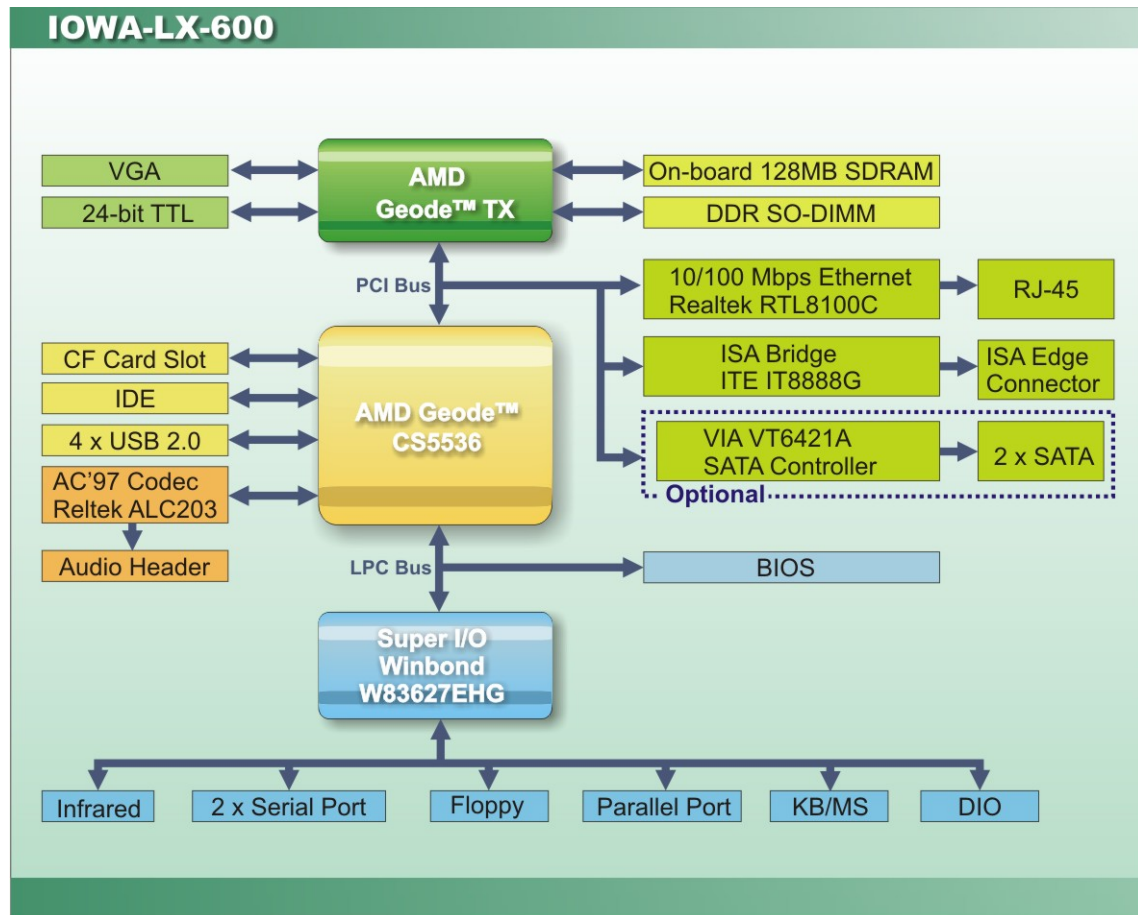
Figure 1-4: Data Flow Block Diagram

1.8 Technical Specifications

IOWA-LX-600 technical specifications are listed in table below.

Specification	IOWA-LX-600
Form Factor	Half-size
CPU Supported	AMD Geode™ LX 600 with a 366 MHz FSB and 128KB L2 cache
Express Chipset	AMD Geode™ CS5536
Memory	On-board 128 MB 200/266 MHz DDR SDRAM One 200-pin SO-DIMM sockets support 200/266 MHz DDR SDRAM SO-DIMMs (system max. 512 MB)
Graphics	VGA integrated in AMD Geode™ LX 600 AMD Geode™ LX 600 24-bit TTL
Display Output	Single HD VOP 2.0 output 1920x1440 CRT output 1600x1200 TFT output
Audio	Realtek ALC203 AC'97 audio codec
LAN	10/100 Mbps Realtek RTL8100C Ethernet Chipset
Super I/O	Winbond W83627EHG
BIOS	Award BIOS
Digital I/O	8-bit digital I/O (4-bit input/4-bit output)
Watchdog Timer	Software programmable supports 1~255 sec. system reset
I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin header)
Display Ports	One external VGA port One internal 24-bit TTL connector (40-pin)
Ethernet	One RJ-45 10/100 Mbps Ethernet port

Specification	IOWA-LX-600
Serial Ports	Two RS-232 One RS-422/485 via pin header
USB 2.0/1.1 Ports	Four internal USB ports via two 8-pin headers
Parallel Port	One internal parallel port via one 26-pin header
Keyboard/Mouse	One keyboard/mouse connector via one 6-pin wafer One PS/2 keyboard/mouse connector
Fan Connectors	One 3-pin fan connector
Infrared	One 5-pin header
Storage	
IDE	One 40-pin IDE connector
CompactFlash®	One CF Type II slot
Floppy Disk Drive	One 34-pin FDD connector
Serial ATA (Optional)	Two SATA 1.5 Gb/s connectors support RAID0, 1
Environmental and Power Specifications	
Power Supply	5 V / 12 V via ISA bus ATX and AT power supported
Power Connector	One internal 4-pin Molex power connector for power supply
Power Consumption	5V@1.51A, 5VSB@0.09A (366 MHz AMD Geode™ LX 600 CPU with on-board 128 MB memory and 512 MB 333 MHz DDR SDRAM)
Operating Temperature	-10ºC ~ 60ºC (requires cooler and silicone heat sink paste)
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	185.00 mm x 122.38 mm
Weight GW/NW	1000 g / 250 g

Table 1-2: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

⚠ **WARNING!**

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- *Wear an anti-static wristband*: Wearing an anti-static wristband can prevent electrostatic discharge.
- *Self-grounding*: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- *Use an anti-static pad*: When configuring any circuit board, place it on an anti-static mat.
- *Only handle the edges of the PCB*: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the IOWA-LX-600 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.
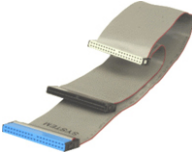
2.3 Packing List

![NOTE icon] **NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IOWA-LX-600 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.
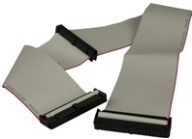
The IOWA-LX-600 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IOWA-LX-600 motherboard	
1	Audio cable	
1	IDE flat cable	
1	KB/MS PS/2 Y-cable	
1	Dual USB cable (w bracket)	
1	Mini jumper pack (2.0mm)	

| 1 | Quick Installation Guide | |

2.3.1 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
FDD cable (**P/N**: 32200-000017-RS)	
Parallel port cable (**P/N**:19800-000049-RS)	
SATA cable (**P/N**: 32801-000703-500-RS)	
Dual RS-232/422/485 cable (**P/N**: 19800-004400-200-RS)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 IOWA-LX-600 Layout

The figures below show all the connectors and jumpers.
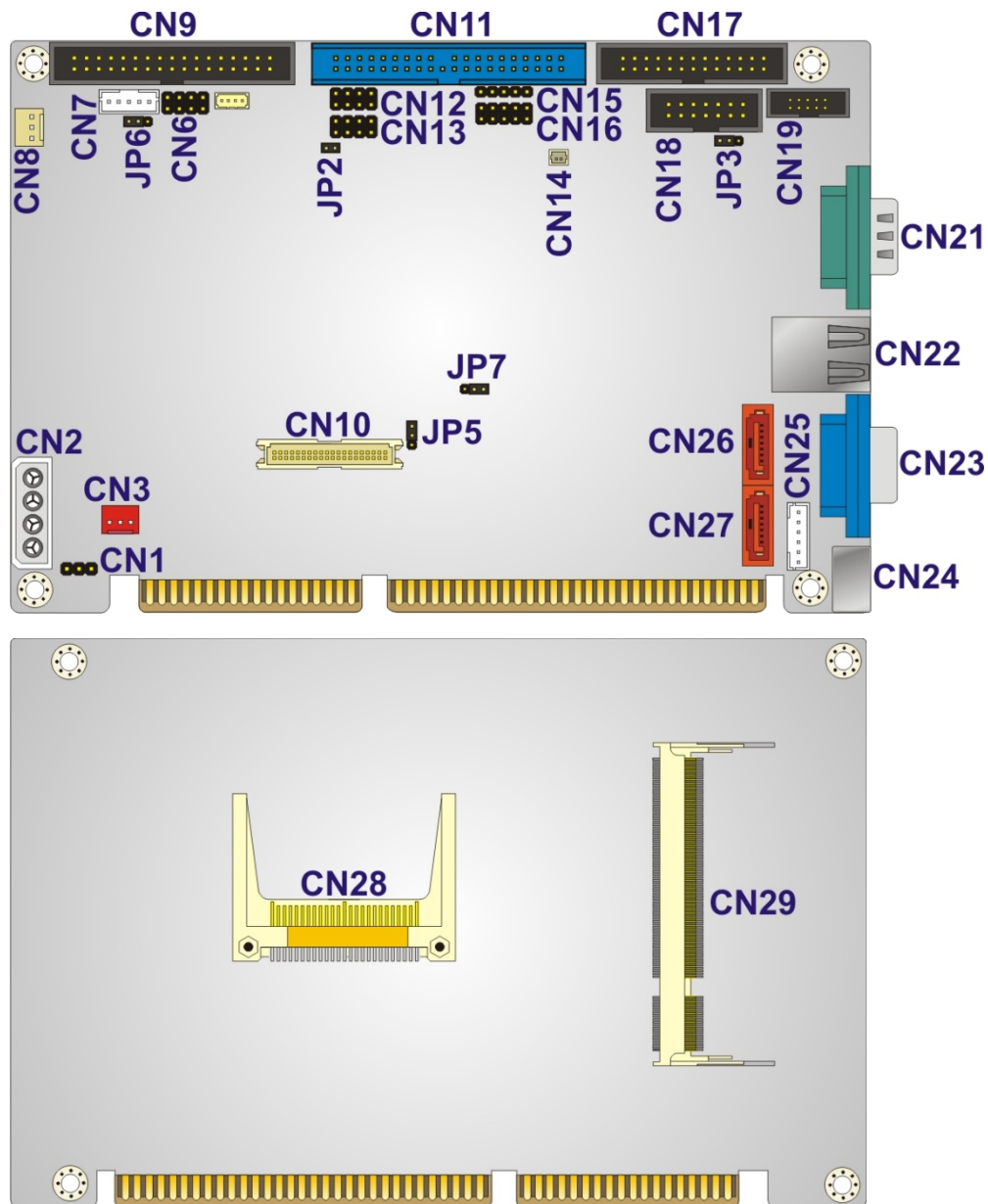
Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX power enable connector	3-pin wafer	CN3
Audio connector	10-pin box header	CN19
Backlight inverter connector	5-pin wafer	CN7
Battery connector	2-pin wafer	CN14
CompactFlash® slot	CF Type II slot	CN28
DDR SO-DIMM socket	200-pin socket	CN29
Digital I/O connector	10-pin header	CN16
Fan connector (CPU)	3-pin wafer	CN8
Floppy disk connector	34-pin box header	CN9
Front panel connector	10-pin header	CN6
IDE connector	40-pin box header	CN11
Infrared connector	5-pin header	CN15
Keyboard and mouse connector	6-pin wafer	CN25
Parallel port connector	26-pin box header	CN17
Power connector (+12V, power supply)	4-pin connector	CN2
RS-232/422/485 serial port connector	14-pin box header	CN18
Serial ATA (SATA) drive connector	7-pin SATA	CN26
Serial ATA (SATA) drive connector	7-pin SATA	CN27
TTL LCD connector	40-pin crimp	CN10
USB connector	8-pin header	CN12

| USB connector | 8-pin header | CN13 |
| VCC ISA power connector | 3-pin header | CN1 |

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	CN22
Keyboard and mouse connector	PS/2	CN24
Serial port	DB-9 male	CN21
VGA connector	DB-15 female	CN23

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IOWA-LX-600.

3.2.1 ATX Power Enable Connector

CN Label:	CN3
CN Type:	3-pin wafer, p=2.54 mm
CN Location:	See Figure 3-2
CN Pinouts:	See Table 3-3

The ATX power supply enable connector enables the IOWA-LX-600 to be connected to an ATX power supply. In default mode, the IOWA-LX-600 can only use an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured.
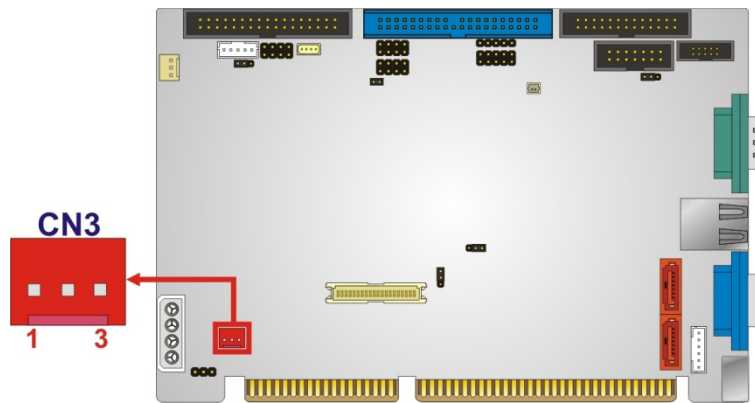
Figure 3-2: ATX Power Supply Enable Connector Location

PIN	DESCRIPTION
1	GND
2	PS-ON
3	+5V Standby

Table 3-3: ATX Power Supply Enable Connector Pinouts

3.2.2 Audio Connector (10-pin)

CN Label:	CN19
CN Type:	10-pin box header, p=2.00 mm
CN Location:	See Figure 3-3
CN Pinouts:	See Table 3-4

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.
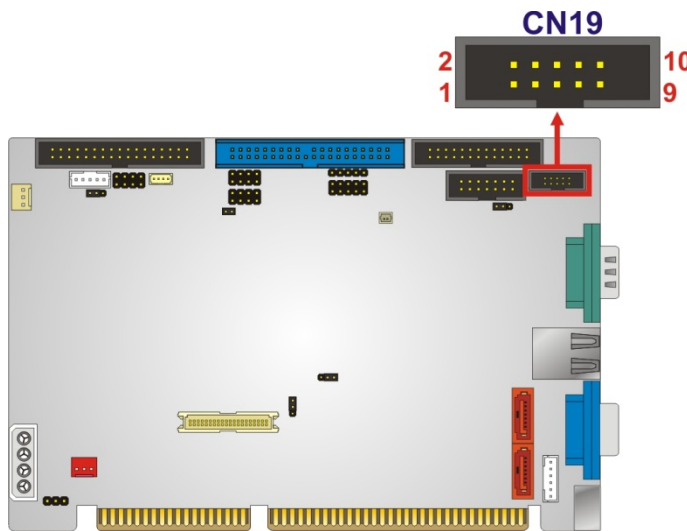
Figure 3-3: Audio Connector Pinouts (10-pin)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Line out (Right)	2	Line in (Right)
3	GND	4	GND
5	Line out (Left)	6	Line in (Left)
7	GND	8	GND
9	MIC1 in	10	MIC2 in

Table 3-4: Audio Connector Pinouts (10-pin)

3.2.3 Backlight Inverter Connector

CN Label:	CN7
CN Type:	5-pin wafer, p=2.00 mm
CN Location:	See Figure 3-4
CN Pinouts:	See Table 3-5

The backlight inverter connector provides the backlight on the LCD display connected to the IOWA-LX-600 with +12V of power.
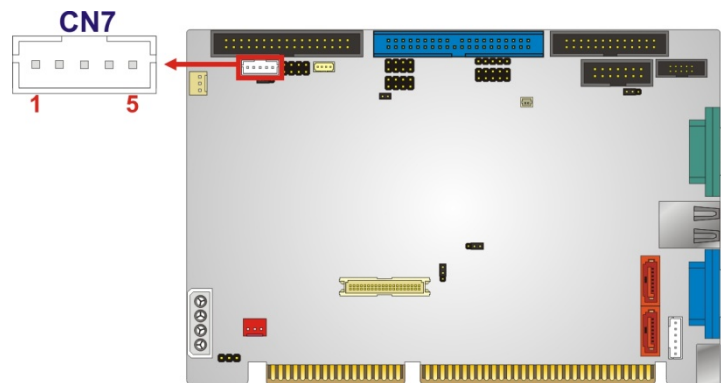
Figure 3-4: Backlight Inverter Connector Pinout Locations

PIN	DESCRIPTION
1	GND
2	GND
3	+12V
4	GND
5	LCD Enable

Table 3-5: Backlight Inverter Connector Pinouts

3.2.4 Battery Connector

⚠️ **CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

✅ **NOTE:**

It is recommended to attach the RTC battery onto the system chassis in which the IOWA-LX-600 is installed.

CN Label:	CN14
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See Figure 3-5
CN Pinouts:	See Table 3-6

The battery connector is connected to a backup battery. The battery connector is also used to reset the CMOS memory if the incorrect BIOS settings have been made and the system cannot boot up.
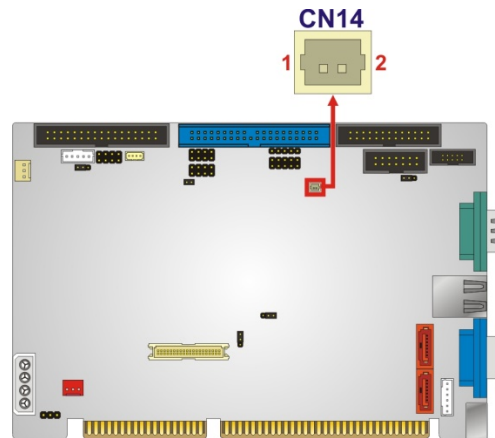
Figure 3-5: Battery Connector Location

PIN NO.	DESCRIPTION
1	Battery+
2	Ground

Table 3-6: Battery Connector Pinouts

3.2.5 CompactFlash® Socket

CN Label:	CN28 (solder side)
CN Type:	50-pin CF Type II slot
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-7

A CF Type I or Type II memory card can be inserted to the CF socket on the solder side of the IOWA-LX-600.
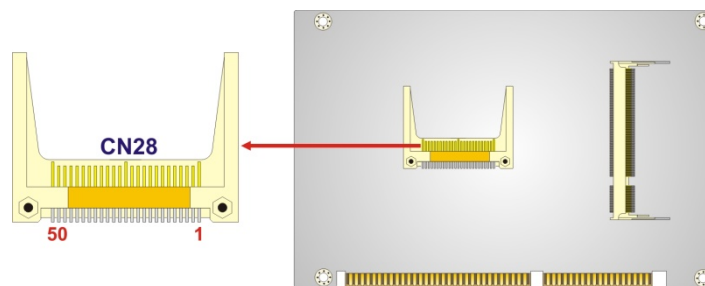
Figure 3-6: CF Card Socket Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	26	CFD2
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS1#	32	SDCS3#
8	GROUND	33	N/C
9	GROUND	34	SDIOR#
10	GROUND	35	SDIOW#
11	GROUND	36	VCC
12	GROUND	37	IRQ15
13	VCC	38	VCC
14	GROUND	39	MASTER/SLAVE
15	GROUND	40	N/C
16	GROUND	41	RESET#
17	GROUND	42	SIORDY
18	SDA2	43	SDDREQ
19	SDA1	44	SDDACK#
20	SDA0	45	HD_LED2
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/C	49	SDD10
25	CFD1	50	GROUND

Table 3-7: CF Card Socket Pinouts

3.2.6 Digital Input/Output (DIO) Connector

CN Label: CN16

CN Type: 10-pin header, p=2.54 mm

CN Location: See Figure 3-7

CN Pinouts: See Table 3-8

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.
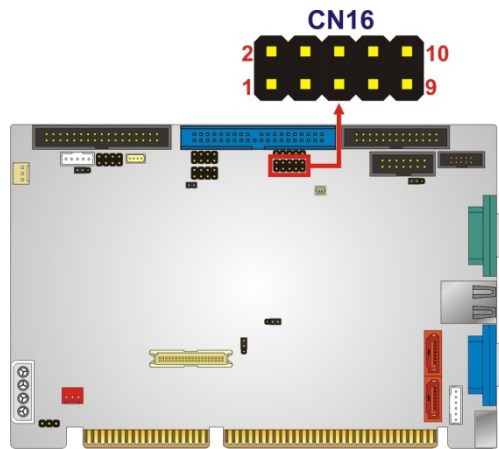
Figure 3-7: DIO Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Ground	2	+5V
3	Output 0	4	Output 1
5	Output 2	6	Output 3
7	Input 0	8	Input 1
9	Input 2	10	Input 3

Table 3-8: DIO Connector Pinouts

3.2.7 Fan Connector (+5V)

CN Label: CN8

CN Type: 3-pin wafer, p=2.54 mm

CN Location: See Figure 3-8

CN Pinouts: See Table 3-9

The cooling fan connector provides a 5V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans. Please note that only specified fans can issue the rotation signals.
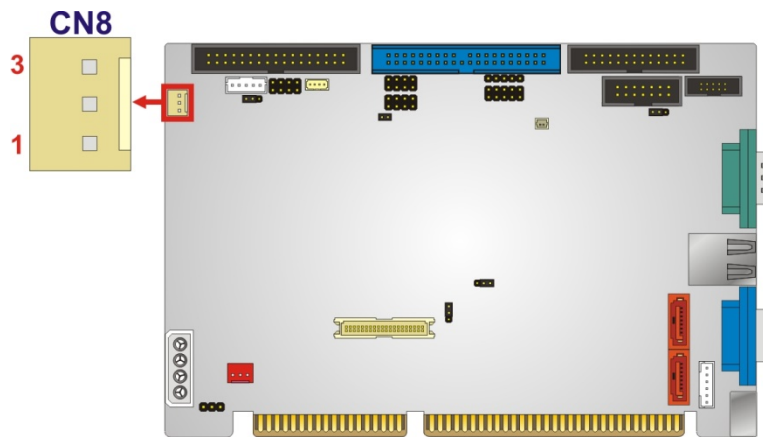
Figure 3-8: Fan Connector Location

PIN	DESCRIPTION
1	GND
2	+5V
3	Rotation Signal

Table 3-9: Fan Connector Pinouts

3.2.8 Floppy Disk Connector

CN Label:	CN9
CN Type:	34-pin header, p=2.54 mm
CN Location:	See Figure 3-9
CN Pinouts:	See Table 3-10

The floppy disk connector is connected to a floppy disk drive.
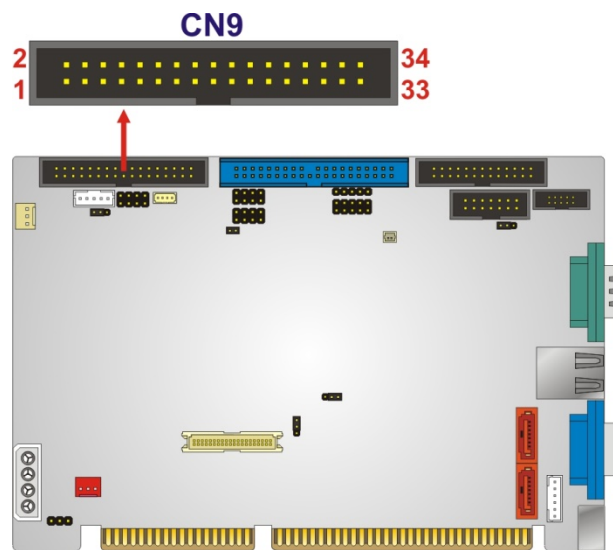
Figure 3-9: FDD Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	DRVDEN0
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOT0#-
11	GROUND	12	N/C
13	GROUND	14	DSA#-
15	GROUND	16	N/C
17	GROUND	18	DIR#

PIN	DESCRIPTION	PIN	DESCRIPTION
19	GROUND	20	STEP#
21	GROUND	22	WDATA#
23	GROUND	24	WGATE#
25	GROUND	26	TRK0#
27	GROUND	28	WP#
29	N/C	30	RDATA#
31	GROUND	32	HDSEL#
33	N/C	34	DSKCHG#

Table 3-10: FDD Connector Pinouts

3.2.9 Front Panel Connector (8-pin)

CN Label: CN6

CN Type: 8-pin header, p=2.54 mm

CN Location: See Figure 3-10

CN Pinouts: See Table 3-11

The front panel connector connects to the power button, reset button and hard drive LEDs located on the front panel of the chassis.
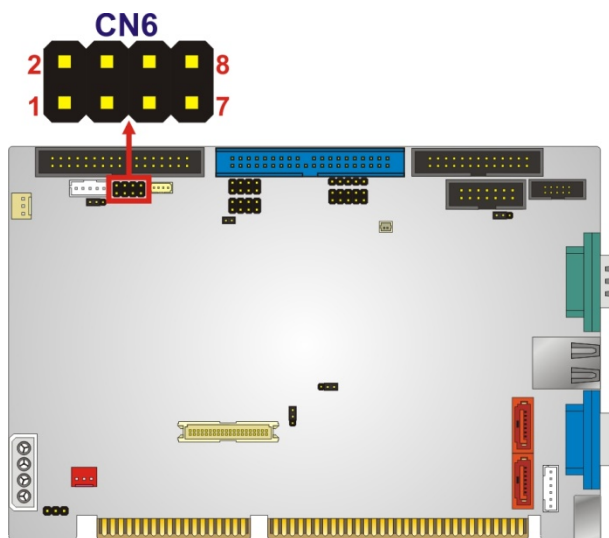
Figure 3-10: Front Panel Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	PWRBTN	2	+5V
3	GROUND	4	GROUND
5	+5V	6	RESET
7	HDDLED-	8	GROUND

Table 3-11: Front Panel Connector Pinouts

3.2.10 IDE Connector (40-pin)

CN Label:	CN11
CN Type:	40-pin box header, p=2.54 mm
CN Location:	See Figure 3-11
CN Pinouts:	See Table 3-12

One 40-pin IDE device connector on the IOWA-LX-600 supports connectivity to two hard disk drives.
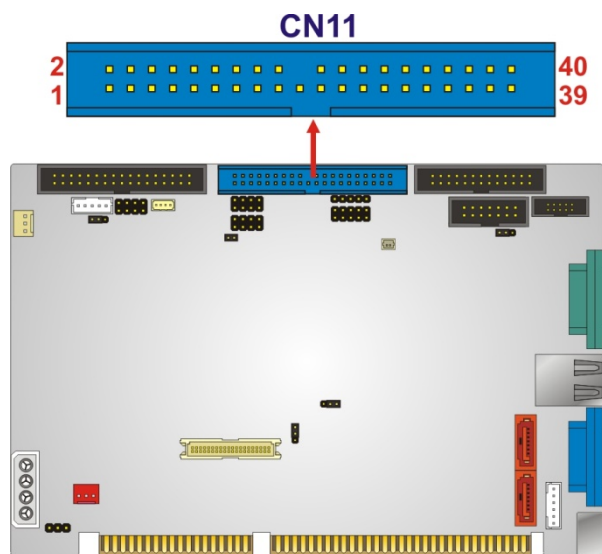
Figure 3-11: IDE Device Connector Locations

IEI Integration Corp.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	CHRDY	28	(PULL LOW TO GND)
29	DACK#	30	GROUND
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

Table 3-12: IDE Connector Pinouts

3.2.11 Infrared Interface Connector (5-pin)

CN Label: CN15

CN Type: 5-pin header, p=2.54 mm

CN Location: See Figure 3-12

CN Pinouts: See Table 3-13

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.
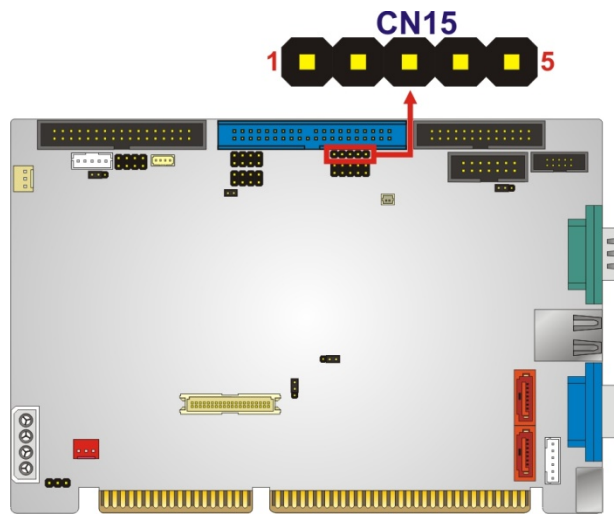
Figure 3-12: Infrared Connector Pinout Locations

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-13: Infrared Connector Pinouts

3.2.12 Keyboard/Mouse Connector

CN Label:	CN25
CN Type:	6-pin wafer, p=2.00 mm
CN Location:	See Figure 3-13
CN Pinouts:	See Table 3-14

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.
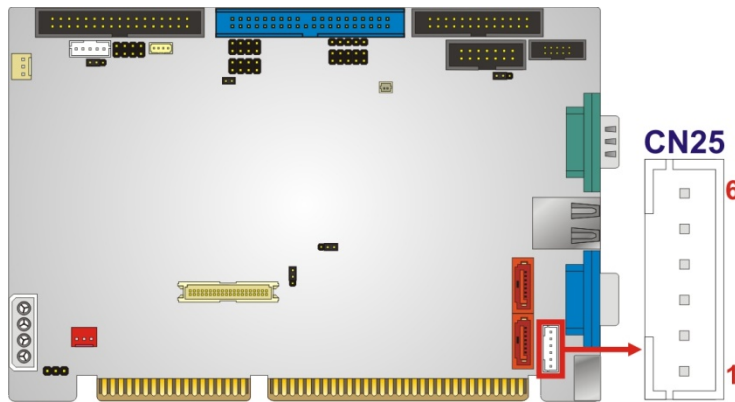
Figure 3-13: Keyboard/Mouse Connector Location

PIN	DESCRIPTION
1	+5V
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	Ground

Table 3-14: Keyboard/Mouse Connector Pinouts

3.2.13 Parallel Port Connector

CN Label: CN17

CN Type: 26-pin box header, p=2.54 mm

CN Location: See Figure 3-14

CN Pinouts: See Table 3-15

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.
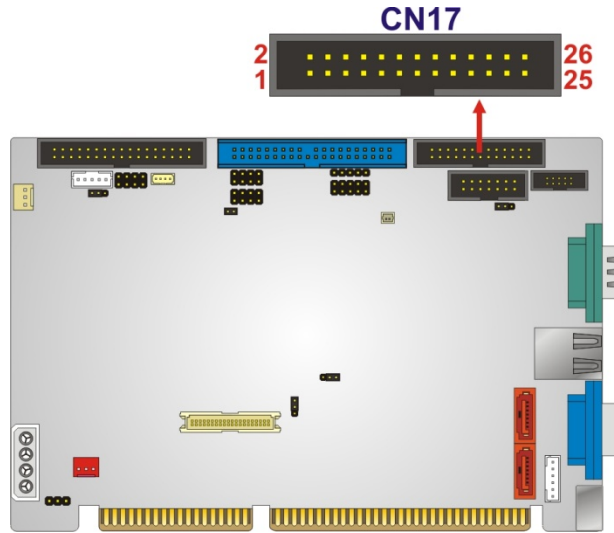
Figure 3-14: Parallel Port Connector Location

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

Table 3-15: Parallel Port Connector Pinouts

3.2.14 Power Connector

CN Label: CN2

CN Type: 4-pin power connector, p=5.08 mm

CN Location: See Figure 3-15

CN Pinouts: See Table 3-16

The 4-pin power connector is connected to a power supply.
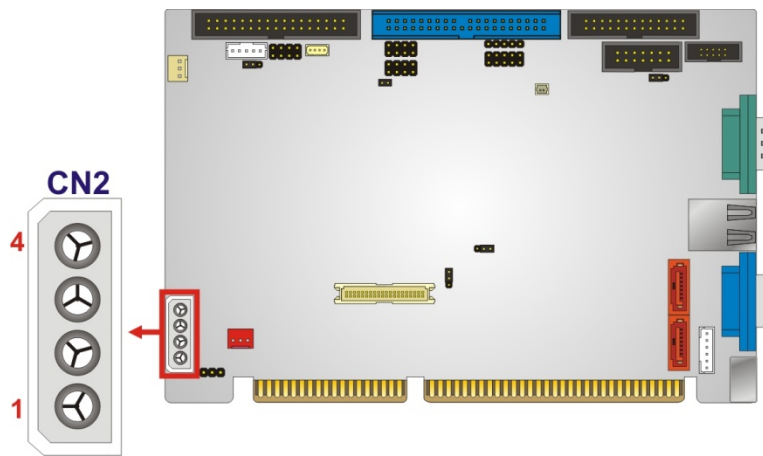
Figure 3-15: Power Connector Location

PIN	DESCRIPTION
1	+5V
2	GND
3	GND
4	+12V

Table 3-16: Power Connector Pinouts

3.2.15 SATA Drive Connectors (Optional)

CN Label:	CN26 and CN27
CN Type:	7-pin SATA drive connectors
CN Location:	See Figure 3-16
CN Pinouts:	See Table 3-17

The SATA connectors connect to SATA 1.5Gb/s hard drives or optical drives. The SATA connectors are optional and only for IOWA-LX-600S model.
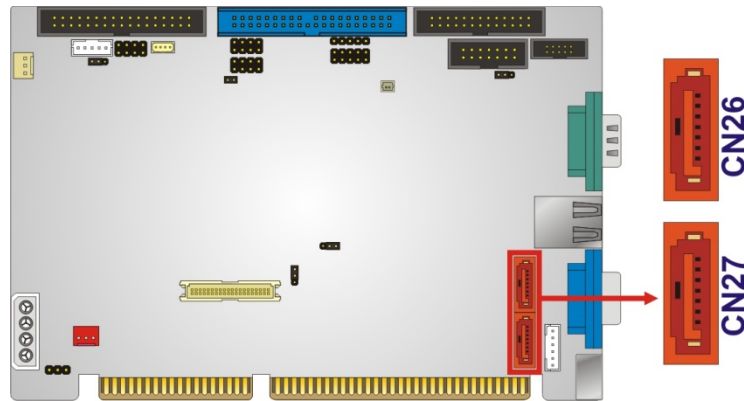
Figure 3-16: SATA Drive Connector Locations

PIN	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-17: SATA Drive Connector Pinouts

3.2.16 Serial Port Connector (RS-232/422/485)

CN Label:	CN18
CN Type:	14-pin box header, p=2.54 mm
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-18

This connector provides RS-232 communications via pin 1 ~ pin 10 as COM2.

Pin 11 ~ pin 14 of this connector provides RS-422 or RS-485 communications as COM3.
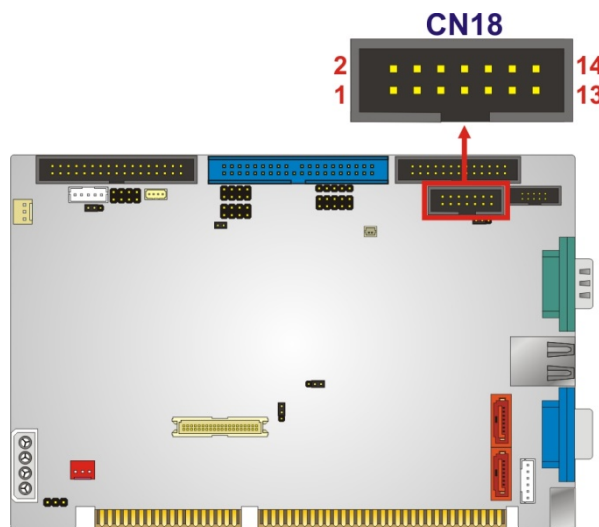
Figure 3-17: Internal Serial Port Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)
11	TxD485+	12	TxD485#
13	RxD485+	14	RxD485#

Table 3-18: Internal Serial Port Connector Pinouts

3.2.17 TTL Connector

CN Label:	CN10
CN Type:	40-pin crimp, p=1.25 mm
CN Location:	See Figure 3-18
CN Pinouts:	See Table 3-19

The 40-pin TTL connector can be connected to a TFT LCD panel .
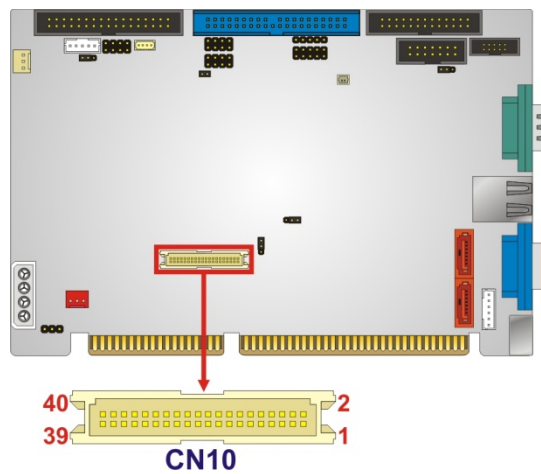
Figure 3-18: TFT LCD Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCD_VCC	2	VCD_VCC
3	GROUND	4	GROUND
5	VCD_VCC	6	VCD_VCC
7	I_SDATA	8	GROUND
9	TFT_B0	10	TFT_B1
11	TFT_B2	12	TFT_B3
13	TFT_B4	14	TFT_B5
15	TFT_B6	16	TFT_B7
17	TFT_G0	18	TFT_G1
19	TFT_G2	20	TFT_G3
21	TFT_G4	22	TFT_G5
23	TFT_G6	24	TFT_G7

PIN	DESCRIPTION	PIN	DESCRIPTION
25	TFT_R0	26	TFT_R1
27	TFT_R2	28	TFT_R3
29	TFT_R4	30	TFT_R5
31	TFT_R6	32	TFT_R7
33	GROUND	34	GROUND
35	FPCLK	36	VSYNC
37	LCD_EN	38	HSYNC
39	I_SCLK	40	DISPEN

Table 3-19: TFT LCD Port Connector Pinouts

3.2.18 Internal USB Connectors

CN Label: CN12 and CN13

CN Type: 8-pin header, p=2.54 mm

CN Location: See Figure 3-19

CN Pinouts: See Table 3-20

The 2x4 USB pin connectors each provide connectivity to two USB 2.0 ports. Each USB connector can support two USB devices. The USB ports are used for I/O bus expansion.
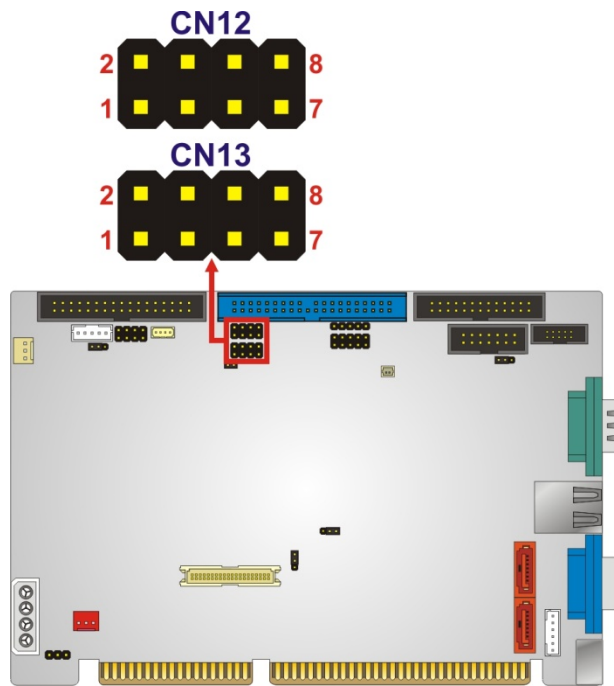
Figure 3-19: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	GROUND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GROUND	8	VCC

Table 3-20: USB Port Connector Pinouts

3.2.19 -VCC Power Connector

CN Label: CN1

CN Type: 3-pin header, p=2.54 mm

CN Location: See Figure 3-19

CN Pinouts: See Table 3-20

The –VCC power connector provides –5V and –12V power to legacy expansion ISA devices installed on the backplane. The power supply is connected to the –VCC power connecter and transmitted to the ISA devices through the backplane.
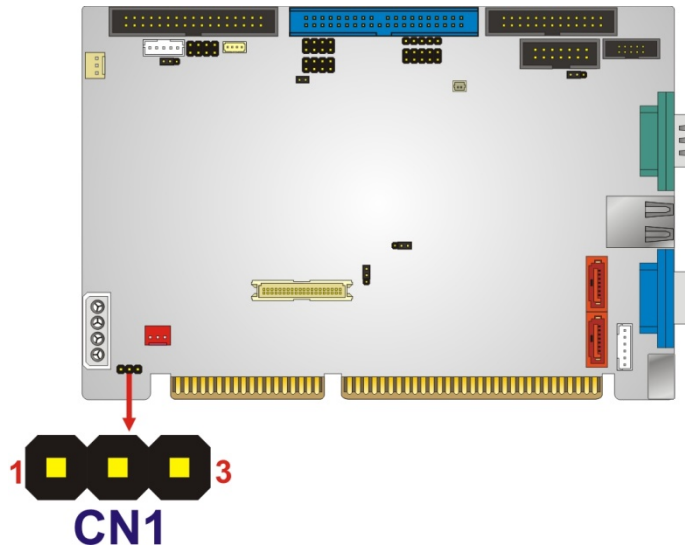
Figure 3-20: -VCC Power Connector Pinout Locations

PIN	DESCRIPTION
1	-5V
2	GROUND
3	-12V

Table 3-21: -VCC Power Connector Pinouts

3.3 External Peripheral Interface Connectors

The IOWA-LX-600 external peripheral interface connectors are listed below and shown in Figure 3-21:

- 1 x PS/2 Keyboard/Mouse connector
- 1 x RJ-45 Ethernet connector
- 1 x Serial communications port
- 1 x VGA port
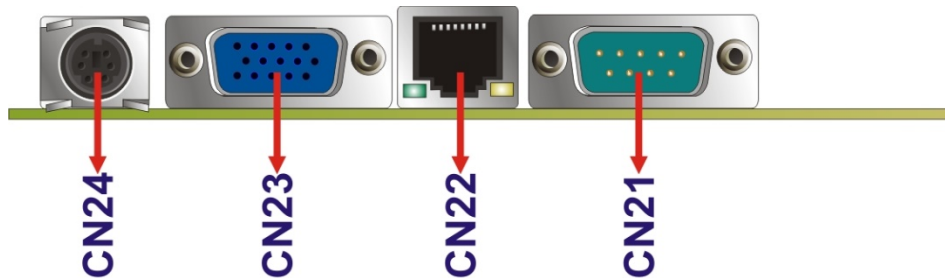
Figure 3-21: IOWA-LX-600 On-board External Interface Connectors

3.3.1 PS/2 Keyboard/Mouse Connector

CN Label:	CN24
CN Type:	PS/2
CN Location:	See Figure 3-21
CN Pinouts:	See Figure 3-22 and Table 3-22

The PS/2 connector can be connected to a keyboard or mouse.
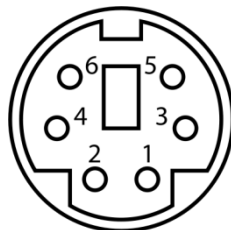
Figure 3-22: PS/2 Pinouts

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

Table 3-22: PS/2 Connector Pinouts

3.3.2 RJ-45 Ethernet Connector

CN Label:	CN22
CN Type:	RJ-45
CN Location:	See Figure 3-21
CN Pinouts:	See Table 3-23

The RJ-45 Ethernet connector on the IOWA-LX-600 provides connectivity to a 10/100 megabit Ethernet connection between the IOWA-LX-600 and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	8	N/C
2	GROUND	9	ACT_LED-
3	TX-	10	ACT_LED+
4	RX+	11	LINK_LED -
5	GROUNG	12	LINK_LED+
6	RX-	13	GROUND
7	N/C	14	GROUND

Table 3-23: RJ-45 Ethernet Connector Pinouts

ACT   LNK
LED   LED
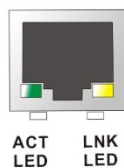
Figure 3-23: RJ-45 Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked.

SPEED LED		LINK LED	
Status	Description	Status	Description
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 3-24: J7 Connector LEDs

3.3.3 Serial Port Connector (COM 1)

CN Label:	CN21
CN Type:	DB-9 connector
CN Location:	See Figure 3-21
CN Pinouts:	See Table 3-25 and Figure 3-24

The 9-pin DB-9 COM 1 serial port connector is connected to RS-232 serial communications devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	COM_RI1		

Table 3-25: RS-232 Serial Port (COM 1) Pinouts
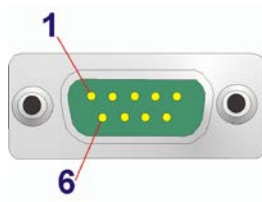
Figure 3-24: COM1 Pinout Locations

3.3.4 VGA Connector

CN Label:	CN23
CN Type:	DB-15
CN Location:	See Figure 3-21
CN Pinouts:	See Table 3-26

The standard 15-pin female DB-15 VGA connector connects to a CRT or LCD monitor directly.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	DDCDAT
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	DDCCLK

Table 3-26: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

> ⚠ **WARNING:**
>
> Failure to take ESD precautions during the installation of the IOWA-LX-600 may result in permanent damage to the IOWA-LX-600 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IOWA-LX-600. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IOWA-LX-600 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 IOWA-LX-600, place it on an antic-static pad. This reduces the possibility of ESD damaging the IOWA-LX-600.
- **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 IOWA-LX-600 is installed. All installation notices pertaining to the installation of the IOWA-LX-600 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IOWA-LX-600 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 IOWA-LX-600, IOWA-LX-600 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 IOWA-LX-600 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 IOWA-LX-600 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 IOWA-LX-600 off:

o When working with the IOWA-LX-600, 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 IOWA-LX-600 **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.

4.3 Unpacking

When the IOWA-LX-600 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the IOWA-LX-600 vendor reseller/vendor where the IOWA-LX-600 was purchased or contact an IEI sales representative.

4.4 SO-DIMM Installation

NOTE:

Using incorrectly specified SO-DIMM may cause permanently damage the IOWA-LX-600. Please make sure the purchased SO-DIMM complies with the memory specifications of the IOWA-LX-600. SO-DIMM specifications compliant with the IOWA-LX-600 are listed in **Chapter 2**.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to Figure 4-1.
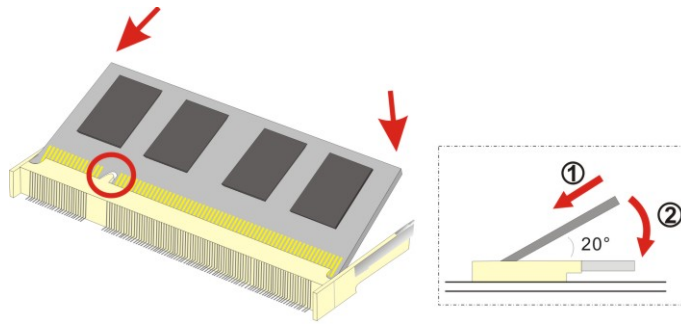
Figure 4-1: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket**. Place the IOWA-LX-600 on an anti-static pad with the solder side facing up.

Step 2: **Align the SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 3: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See Figure 4-1)

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

Step 5: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

4.5 CF Card Installation

 NOTE:

The IOWA-LX-600 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type I or Type II) onto the IOWA-LX-600, please follow the steps below:

Step 1:   **Locate the CF card socket**. Place the IOWA-LX-600 on an anti-static pad with the solder side facing up. Locate the CF card on the solder side.

Step 2:   **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.

Step 3:   **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See Figure 4-2.
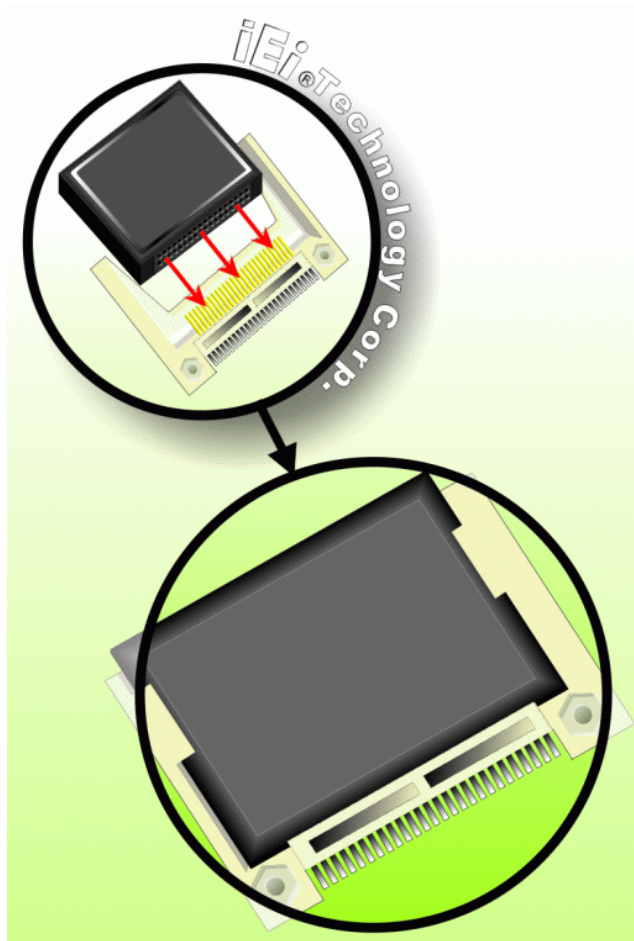
Figure 4-2: CF Card Installation

4.6 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.
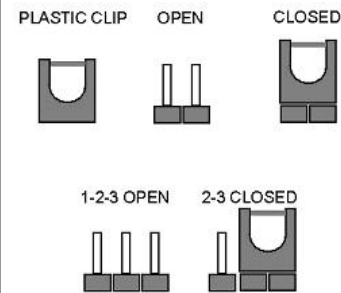
Figure 4-3: Jumper Locations

Before the IOWA-LX-600 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IOWA-LX-600 are listed in **Table 4-1**.

Description	Type	Label
AT/ATX power mode setting	2-pin header	JP2
CompactFlash® card setup	3-pin header	JP7
COM3 RS-422/485 select	3-pin header	JP3
LCD voltage select	3-pin header	JP5
LCD TTL clock select	3-pin header	JP6

Table 4-1: Jumpers

4.6.1 AT/ATX Power Select

Jumper Label:	**JP2**
Jumper Type:	2-pin header
Jumper Settings:	See **Table 4-2**
Jumper Location:	See **Figure 4-4**

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. AT/ATX Power Select jumper settings are shown in **Table 4-2**.

Setting	Description
Short	Use AT power (Default)
Open	Use ATX power

Table 4-2: AT/ATX Power Select Jumper Settings

The location of the AT/ATX Power Select jumper is shown in **Figure 4-4** below.
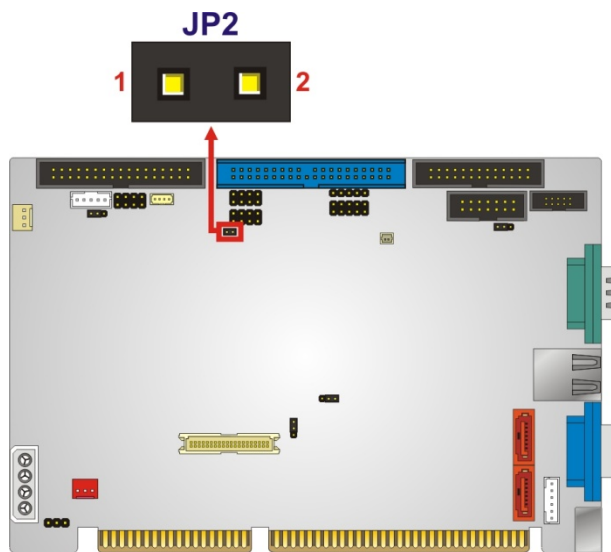
Figure 4-4: AT/ATX Power Select Jumper Location

4.6.2 CF Card Setup

Jumper Label:	JP7
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-5**

The CompactFlash® slot is connected through an IDE connection. This jumper sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
Short 1-2	Slave
Short 2-3	Master

Table 4-3: CompactFlash® Setup Jumper Settings
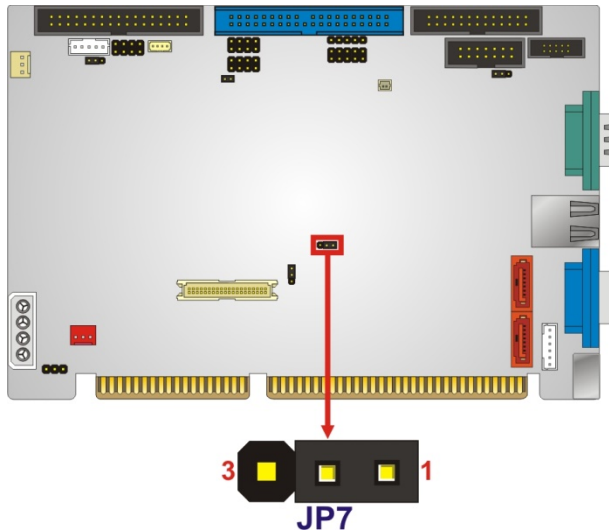
Figure 4-5: CompactFlash® Setup Jumper Location

4.6.3 COM 3 Function Select

Jumper Label:	JP3
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-4**
Jumper Location:	See **Figure 4-6**

The COM 3 Function Select jumper sets the communication protocol used by the third serial communications port (COM 3) as RS-422 or RS-485. The COM 3 Function Select settings are shown in the table below.

Setting	Description
Short 1-2	RS-422 (Default)
Short 2-3	RS-485

Table 4-4: COM 3 Function Select Jumper Settings
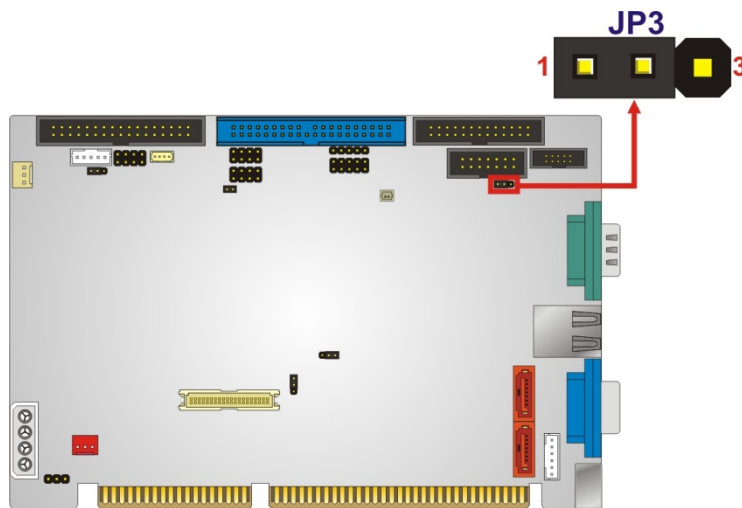
Figure 4-6: COM 3 Function Select Jumper Location

4.6.4 LCD Voltage Select

⚠️ **WARNING:**

Incorrect voltages can destroy the LCD panel. Make sure to select a voltage that matches the voltage required by the LCD panel.

Jumper Label: **JP5**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-5**

Jumper Location: See **Figure 4-7**

The LCD voltage selection jumper sets the voltage of the power supplied to the LCD panel.

Setting	Description
Short 1-2	+3.3 V (Default)
Short 2-3	+5.0 V

Table 4-5: LVDS Voltage Selection Jumper Settings
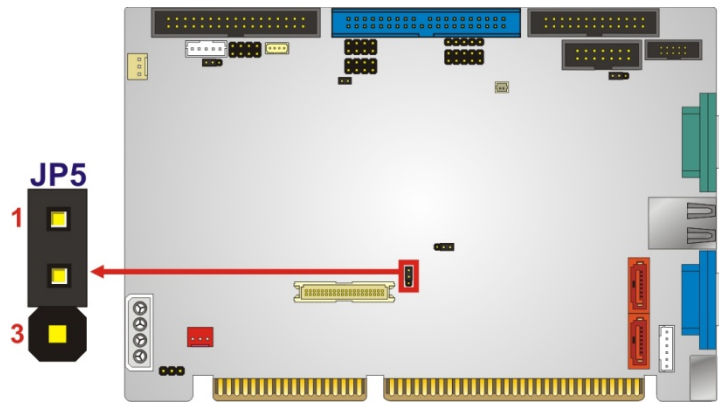
Figure 4-7: LVDS Voltage Selection Jumper Locations

4.6.5 LCD Clock Select Jumper

Jumper Label:	**JP6**
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-1
Jumper Location:	See Figure 4-8

This jumper inverts the LCD clock of the LCD connector (CN10).

Setting	Description
Short 1-2	FPCLK
Short 2-3	FPCLK#

Table 4-6: LCD Clock Select Jumper Settings
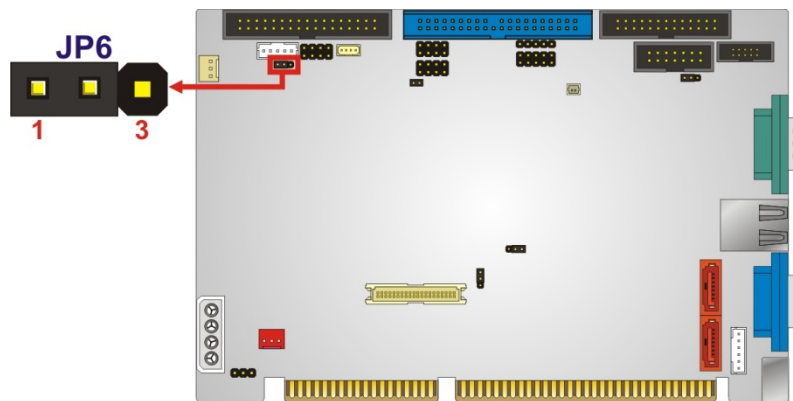
Figure 4-8: LCD Clock Select Jumper Location

4.7 Chassis Installation

4.7.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IOWA-LX-600 must have air vents to allow cool air to move into the system and hot air to move out.

The IOWA-LX-600 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.7.2 Backplane Installation

Before the IOWA-LX-600 can be installed into the chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis to see how to install the backplane into the chassis.

NOTE:

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

4.7.3 CPU Card Installation

To install the CPU card onto the backplane, carefully align the CPU card edge connector with the CPU card socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

4.8 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors

4.8.1 5.1 Channel Audio Kit Installation

The audio kit attaches to the audio connector. The audio kit provides 5.1 channel audio. To install the audio kit, please refer to the steps below:

Step 1: **Connect the cable to the audio kit.** Connect the included cable to the audio kit. Make sure pin 1 aligns with the marked pin.

Step 2: **Conect the cable to the board**. Connect the other end of the cable to the board. Make sure to line up the marked pin 1.
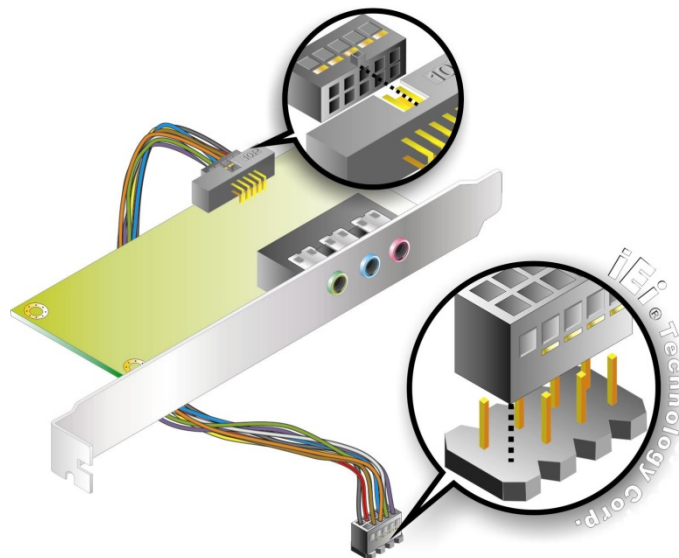
Figure 4-9: 5.1 Channel Audio Kit

Step 3: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the board, secure the audio kit bracket to the system chassis.

Step 4: **Connect the audio devices**. Connect speakers and external audio sources to the audio jacks on the audio kit.

Step 5: **Install the driver**. Install the 5.1 channel audio driver included with the board.

4.8.2 ATA Flat Cable Connection

The IDE cable can connect to one or two IDE devices. To connect the IDE devices, follow the steps below.

Step 1: **Locate the IDE connector**. Locate the IDE connector on the board.

Step 2: **Insert the connector**. Connect the IDE cable connector to the on-board connector. See Figure 4-10. A key on the front of the cable connector ensures it can only be inserted in one direction.
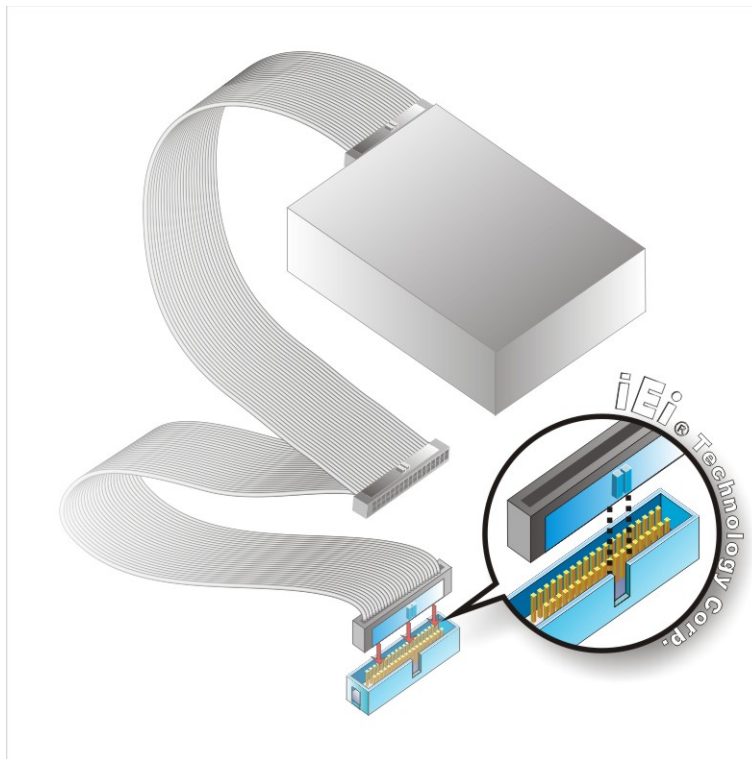
Figure 4-10: IDE Cable Connection

Step 3: **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.

4.8.3 USB Cable

The IOWA-LX-600 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

![WARNING icon] **WARNING:**

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IOWA-LX-600 USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the IOWA-LX-600, connect the cable connectors to the on-board connectors. See Figure 4-11.
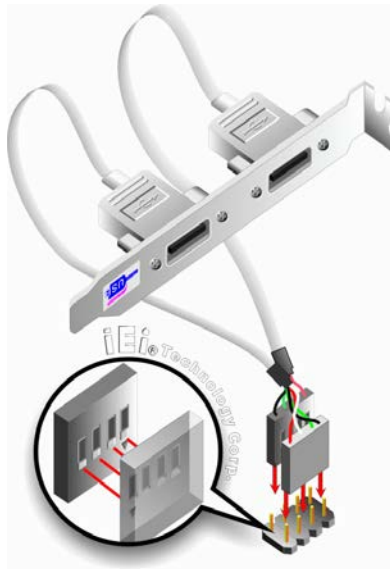
Figure 4-11: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

Step 1: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.9 Available Drivers

All the drivers for the IOWA-LX-600 are available on IEI Resource Download Center (https://download.ieiworld.com). Type IOWA-LX-600 and press Enter to find all the relevant software, utilities, and documentation.
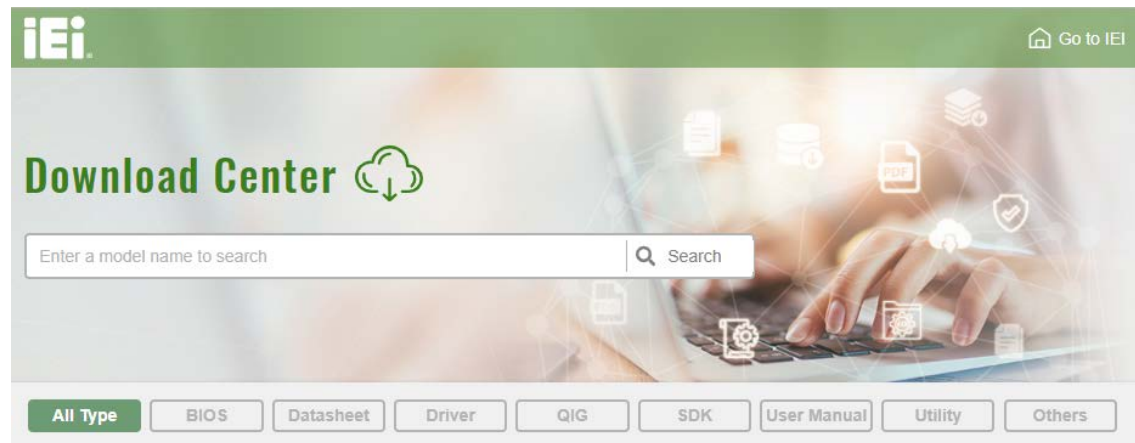
Figure 4-12: IEI Resource Download Center

4.9.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

Step 1: Go to https://download.ieiworld.com. Type IOWA-LX-600 and press Enter.
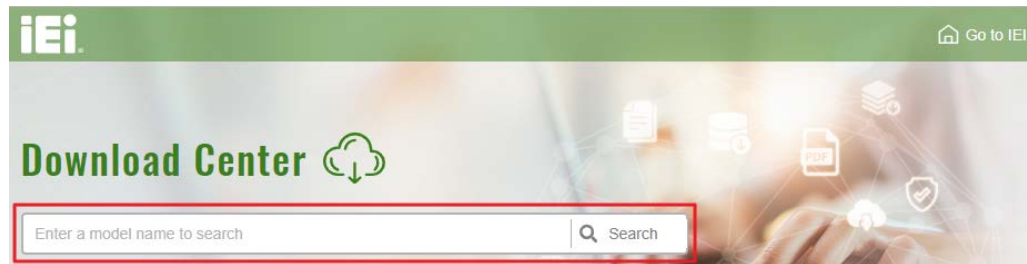
Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.
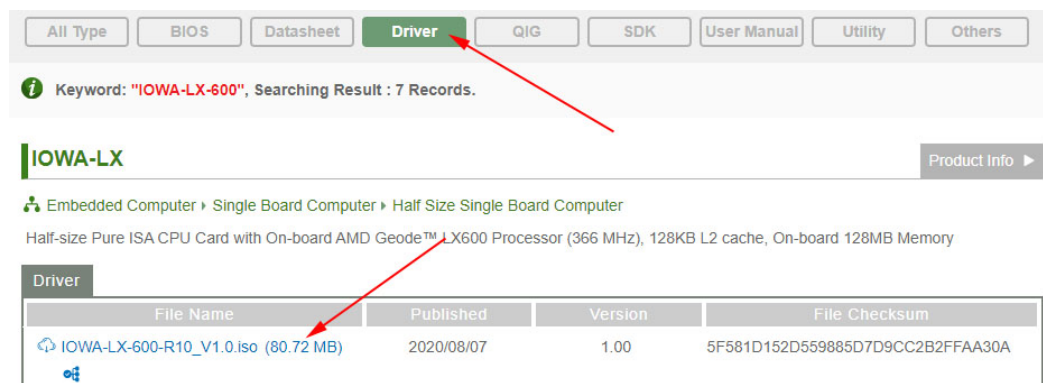
Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).
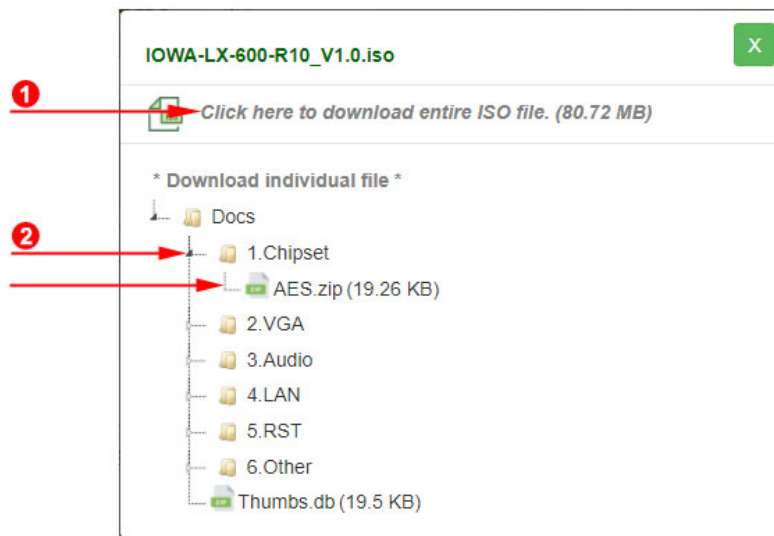
 NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

4.10 RAID Configuration (S Model Only)

The IOWA-LX-600S can provide data protection for serial ATA (SATA) disks through V-RAID Utility. To access the V-RAID Utility, please follow the steps below.

⚠️ **WARNING!**

1. Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

2. Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

3. Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 1: **Connect SATA drives to the system**. Connect two SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

Step 2: **Enable SATA drives and enable RAID support** for all SATA devices **in BIOS**. .

Step 3: **Save and Exit BIOS**. After the SATA support option is enabled, save and exit the BIOS.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the BIOS.

Step 5: **Press Ctrl+Z during the system boot process** to enter the V-RAID Utility.

Step 6: **Use the V-RAID Utility to configure the RAID settings**.

Chapter

5

BIOS Screens

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.

![NOTE icon] **NOTE:**

> Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, press **F1** for help and press **Esc** to quit. Navigation keys are shown below.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Page up / +	Increase the numeric value or make changes
Page down / -	Decrease the numeric value or make changes

Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F7	Load optimized defaults
F10	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot After Configuration Changes

If the system cannot be booted after changes are made, restore the CMOS defaults. Refer to **Section 3.2.4** for more information.

5.1.5 Main BIOS Menu

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

```
                  Phoenix - AwardBIOS CMOS Setup Utility

 > Standard CMOS Features            Load Fail-Safe Defaults

 > Advanced BIOS Features            Load Optimized Defaults

 > Advanced Chipset Features         Set Supervisor Password

 > Integrated Peripherals            Set User Password

 > Power Management Setup            Save & Exit Setup

 > PnP/PCI Configurations            Exit Without Saving

 > PC Health Status

 Esc=Quit                          ←→↑ ↓=Select Item
 F10=Save & Exit Setup

                   Time, Date, Hard Disk Type...
```
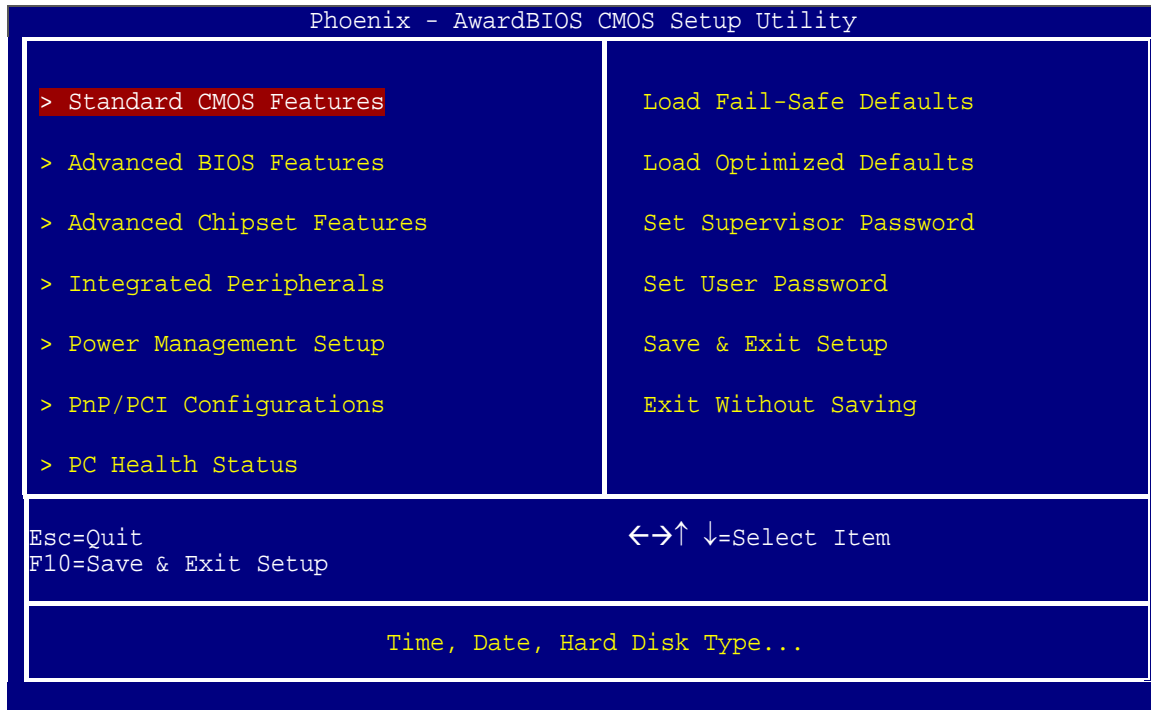
BIOS Menu 1: Award BIOS Setup Utility

NOTE:

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

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

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

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

➔ **Load Fail-Safe Defaults**

Use the **Load Fail-Safe Defaults** option to load failsafe default values for each BIOS parameter in the setup menus. Press **F6** for this operation on any page.

➔ **Load Optimized Defaults**

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

➔ **Set Supervisor Password**

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

➔ **Set User Password**

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

➔ **Save & Exit Setup**

Use the **Save & Exit Setup** option to save any configuration changes made and exit the BIOS menus.

➔ **Exit Without Saving**

Use the **Exit Without Saving** option to exit the BIOS menus without saving any configuration changes.

5.2 Standard BIOS Features

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

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                         Standard CMOS Features

     Date (mm:dd:yy)              Mon, Jan  1 2007              Item Help
     Time (hh:mm:ss)              0:29:49
                                                         Menu Level >
   > IDE Primary Master           [ None]
   > IDE Primary Slave            [ None]                 Change    the    day,
                                                          month,   year    and
     Drive A                      [1.44M, 3.5 in.]        century

     Base Memory                    640K
     Extended Memory                97024K
     Total Memory                   97792K




   ←→↑ ↓:Move  Enter:Select +/-/PU/PD:Value  F10:Save   Esc:Exit F1:General Help
     F5=Previous Values      F6:Fail-Safe Defaults       F7 Optimized Defaults
```
BIOS Menu 2: Standard CMOS Features

➔ **Date [Day mm:dd:yyyy]**

Use the **Date** option to set the system date

➔ **Time [hh/mm/ss]**

Use the **Time** option to set the system time.

➔ **IDE Master and IDE Slave**

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

■ IDE Primary Master
■ IDE Primary Slave

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

➔ Drive A [None]

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

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

➔ Base Memory:

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

➔ Extended Memory

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

➔ Total Memory

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

5.2.1 IDE Primary Master/Slave

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

```
              Phoenix - AwardBIOS CMOS Setup Utility
                         IDE Primary Master

   IDE HDD Auto-Detection         [Press Enter]              Item Help

   IDE Primary Master            [Auto]           Menu Level >
   Access Mode                   [Auto]
                                                  To  auto-detect  the
   Capacity                          0 MB         HDD's size, head...
                                                  on this channel
   Cylinder                         0
   Header                           0
   Precomp                          0
   Landing Zone                     0
   Sector                           0




←→↑ ↓:Move  Enter:Select +/-/PU/PD:Value  F10:Save   Esc:Exit F1:General Help
   F5=Previous Values      F6:Fail-Safe Defaults     F7 Optimized Defaults
```
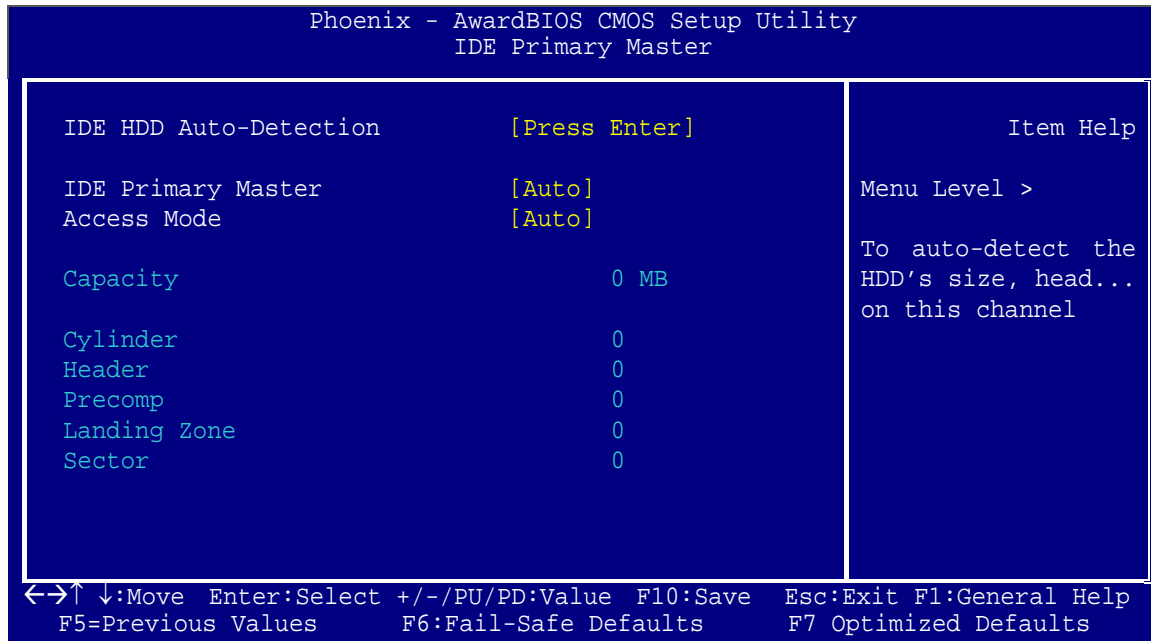
BIOS Menu 3: IDE Channel Master

➔ **IDE HDD Auto-Detection [Press Enter]**

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

➔ **IDE Primary Master [Auto]**

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

- Channel 0 Master
- Channel 0 Slave

➔ **None**   If no drives are connected to the IDE channel select this option. Once set, this IDE channel becomes inaccessible and any drives attached to it are undetected.

➔ **Auto**   (Default)   Setting this option allows the device to be automatically detected by the BIOS.

➔ **Manual**   Selecting this option allows manual configuration of the

device on the IDE channel in BIOS.

➔ **Access Mode [Auto]**

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

➔ **CHS** Select this mode if the HDD capacity is less than 504MB.

➔ **LBA** Select this mode if the HDD capacity is more than 8.4GB.

➔ **Large** This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.

➔ **Auto** (Default) If you are unsure of what access mode to set, select this option.

➔ **Capacity**

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

➔ **Cylinder**

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

➔ **Head**

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

➔ **Precomp**

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

➔ **Landing Zone**

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

➔ **Sector**

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

5.3 Advanced BIOS Features

Use the **Advanced BIOS Features** menu (**BIOS Menu 4**) to configure the CPU and peripheral device configuration options.

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

  Virus Warning                [Disabled]                 Item Help
  CPU Internal Cache           [Enabled]
  Boot From Lan Control        [Disabled]       Menu Level >
  SATA Boot Rom Control        [Disabled]
  First Boot Device            [HDD-0]          Allow you to choose
  Second Boot Device           [SCSI]           the  VIRUS  warning
  Third Boot Device            [LS120]          feature for IDE Hard
  Boot Other Device            [Enabled]        Disk   boot   sector
  Boot Up Floppy Seek          [Enabled]        protection. If this
  Boot Up NumLock Status       [On]             function is enabled
  Gate A20 Option              [Fast]           and someone attempt
  Typematic Rate Setting       [Disabled]       to write data into
X Typematic Rate (Chars/Sec)    6              this area, BIOS will
X Typematic Delay (Msec)        250            show   a    warning
  Security Option              [Setup]          message  on  screen
  OS Select For DRAM > 64MB    [Non-OS2]        and alarm beep
  HDD S.M.A.R.T. Capability    [Disabled]
  Console Redirection          [Disabled]
X Baud Rate                     19200
  Agent after boot             [Disabled]
  Full Screen LOGO Show        [Enabled]
  Small Logo(EPA) Show         [Diabled]

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

BIOS Menu 4: IDE Channel Master

➔ **Virus Warning [Disabled]**

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

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

➔ **Enabled** Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or HDD partition table.

➔ **Disabled** (Default) No warning message appears when there is an attempt to access the boot sector or HDD partition table.

➔ **CPU Internal Cache [Enabled]**

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

➔ **Disabled** The internal CPU cache is disabled.

➔ **Enabled** (Default) The internal CPU cache is enabled.

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

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

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

➔ **Enabled** The system can be booted from a remote system

through the LAN.

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

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

➔ **Disabled** (Default)   Disables SATA IDE use in DOS mode.

➔ **Enabled**   Enables SATA IDE use in DOS mode.

➔ **Boot Device**

Use the **Boot Device** options to select the order of the devices the system boots from. There are three boot device configuration options:

- **First Boot Device** [Default: HDD-0]
- **Second Boot Device** [Default: SCSI]
- **Third Boot Device** [Default: LS-120]

Using the default values, the system first looks for a FDD to boot from. If it cannot find an FDD, it boots from a HDD. If both the FDD and the HDD are unavailable, the system boots from a LS-120 drive.

Boot Device configuration options are:

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

➔ **Boot Other Device [Enabled]**

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

➔ **Disabled**   The system does not look for second and third boot devices if the first one is not found.

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

➔ **Boot Up Floppy Seek [Enabled]**

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

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

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

➔ **Boot Up Numlock Status [On]**

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

➔ **Off**   The keys on the keypad are not activated.

➔ **On**   (Default)   Activates the keys on the keypad.

➔ **Gate A20 Option [Fast]**

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

➔ **Normal**   The keyboard controller does the switching.

➔ **Fast**   (Default)   The chipset does the switching.

➔ **Typematic Rate Setting [Disabled]**

Use the **Typematic Rate Setting** configuration option to specify if only one character is allowed to appear on the screen if a key is continuously held down. When this option is enabled, the BIOS reports as before, but it then waits a moment, and, if the key is still held down, it begins to report that the key has been pressed repeatedly. This feature accelerates cursor movement with the arrow keys.

➔ **Disabled**   (Default)   Disables the typematic rate.

➔ **Enabled**   Enables the typematic rate.

➔ **Typematic Rate (Chars/sec) [6]**

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

➔ **6**   (Default)   6 characters per second

➔ **8**   8 characters per second

➔ **10**   10 characters per second

➔ **12**   12 characters per second

➔ **15**   15 characters per second

➔ **20**   20 characters per second

➔ **24**   24 characters per second

➔ **30**   30 characters per second

➔ **Typematic Delay (Msec) [250]**

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

➔ **250** (Default) 250 milliseconds

➔ **500** 500 milliseconds

➔ **750** 750 milliseconds

➔ **1000** 1000 milliseconds

➔ **Security Option [Setup]**

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

➔ **Setup** (Default) The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.

➔ **System** The system boots, but access to Setup is denied if the correct password is not entered at the prompt.

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

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

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

➔ **Non-OS2** (Default) Select this option when not using the OS/2 operating system.

➔ **OS2** Specifies the operating system used as OS/2.

➔ **HDD S.M.A.R.T Capability [Disabled]**

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Disabled** (Default)   Select this value to prevent the BIOS from using the SMART feature.

➔ **Enabled**   Select this value to allow the BIOS to use the SMART feature on support hard disk drives.

➔ **Console Redirection [Disable]**

Use the **Console Redirection** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**   (Default)   Console redirection is disabled.

➔ **Enabled**   Console redirection configuration option shown below appear:

                                    Baud Rate

                                The configuration option is discussed below.

➔ **Baud Rate [19200]**

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

■ 9600
■ 19200   (Default)
■ 38400
■ 57600
■ 115200

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

➔ **Agent after boot [Disabled]**

Use the **Agent after boot** option to keep agent running after bootup.

➔ **Disabled** (Default) Stop agent running after bootup

➔ **Enabled** Keep agent running after bootup

➔ **Full Screen LOGO Show [Enabled]**

Use the **Full Screen LOGO Show** option to specify whether to display the full-screen logo when the system boots.

➔ **Disabled** (Default) Full-screen logo does not appear during boot up.

➔ **Enabled** Full-screen logo appears during boot up.

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

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

➔ **Disabled** (Default) EPA logo does not appear during boot up.

➔ **Enabled** EPA logo appears during boot up.

5.4 Advanced Chipset Features

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

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

    CPU Frequency                  [366 MHz]                     Item Help
    Memory Frequency               [Auto]
    Video Memory Size              [ 32 M]             Menu Level >

    Output display                 [Panel & CRT]
  > Flat Panel Configuration       [Press Enter]

    Onboard Audio                  [Enabled]
    Onboard USB1.1                 [Enabled]
    Onboard USB2.0                 [Enabled]
    Onboard IDE                    [Enabled]
    Memory Hole At 15M-16M         [Disabled]



←→↑ ↓:Move  Enter:Select +/-/PU/PD:Value  F10:Save   Esc:Exit F1:General Help
   F5=Previous Values       F6:Fail-Safe Defaults      F7 Optimized Defaults
```
BIOS Menu 5: Advanced Chipset Features

➔ **CPU Frequency [366 MHz]**

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

➔ **Memory Frequency [Auto]**

Use the **Memory Frequency** option to set the frequency of the installed DRAM modules. The **Memory Frequency** options are:

■ Auto   (Default)

■ 200MHz

■ 266MHz

■ 333MHz

➔ **Video Memory Size [32 M]**

Use the **Frame Buffer Size** option to specify the amount of memory allocated to the integrated graphics processor when the system boots up. Configuration options are.

- Disable
- 8 M
- 16 M
- 32 M (Default)
- 64 M
- 128 M
- 254 M

➔ **Output Display [Panel & CRT]**

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

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

➔ **Onboard Audio [Enabled]**

Use the **Onboard Audio** option to enable or disable the chipset codec.

➔ **Enabled**   (Default)   The onboard audio codec is enabled.

➔ **Disabled**   The onboard audio codec is disabled.

➔ **Onboard USB 1.1 [Enabled]**

Use the **Onboard USB 1.1** option to enable or disable the chipset USB controller.

➔ **Enabled**   (Default)   Chipset USB 1.1 controller enabled

➔ **Disabled**   Chipset USB 1.1 controller disabled

➔ **Onboard USB 2.0 [Enabled]**

Use the **Onboard USB 2.0** option to enable or disable the chipset USB controller.

➔ **Enabled** (Default) Chipset USB 2.0 controller enabled

➔ **Disabled** Chipset USB 2.0 controller disabled

➔ **Onboard IDE [Enabled]**

Use the **Onboard IDE** option to specify if the system uses the integrated primary IDE channel or not.

➔ **Disabled** The primary IDE channel is not used.

➔ **Enabled** (Default) The primary IDE channel is used.

➔ **Memory Hole At 15M – 16M [Disabled]**

Use the **Memory Hole At 15M – 16M** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled** (Default) Memory is not reserved for ISA expansion cards.

➔ **Enabled** Memory is reserved for ISA expansion cards.

5.4.1 Flat Panel Configuration

Use the **Flat Panel Configuration** menu to configure the screen resolution.

```
               Phoenix - AwardBIOS CMOS Setup Utility
                       Flat Panel Configuration

   Resolution                    [800x600]                     Item Help
   Data Bus Type                 [9-24 bits, 1 ppc]
   Refresh Rate                  [ 60 Hz]           Menu Level >
   HSYNC Polarity                [Normal low]
   VSYNC Polarity Active         [Normal low]       Configure the panel
   SHFCLK Active Period          [Free running]     resolution
   LP Active Period              [Free running]







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

BIOS Menu 6: Flat Panel Configuration

➔ **Resolution [800 x 600]**

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

- 320 x 240
- 640 x 480
- 800 x 600 (Default)
- 1024 x 768
- 1152 x 864
- 1280 x 1024
- 1600 x 1200
- 320 x 234
- 640 x 240
- 800 x 480
- 1280 x 800

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

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

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

➔ **Refresh Rate [60Hz]**

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

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

➔ **HSYNC Polarity [Normal low]**

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

- Normal high
- Normal low (Default)

➔ **VSYNC Polarity Active [Normal low]**

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

- Normal high
- Normal low (Default)

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

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

- Active Only
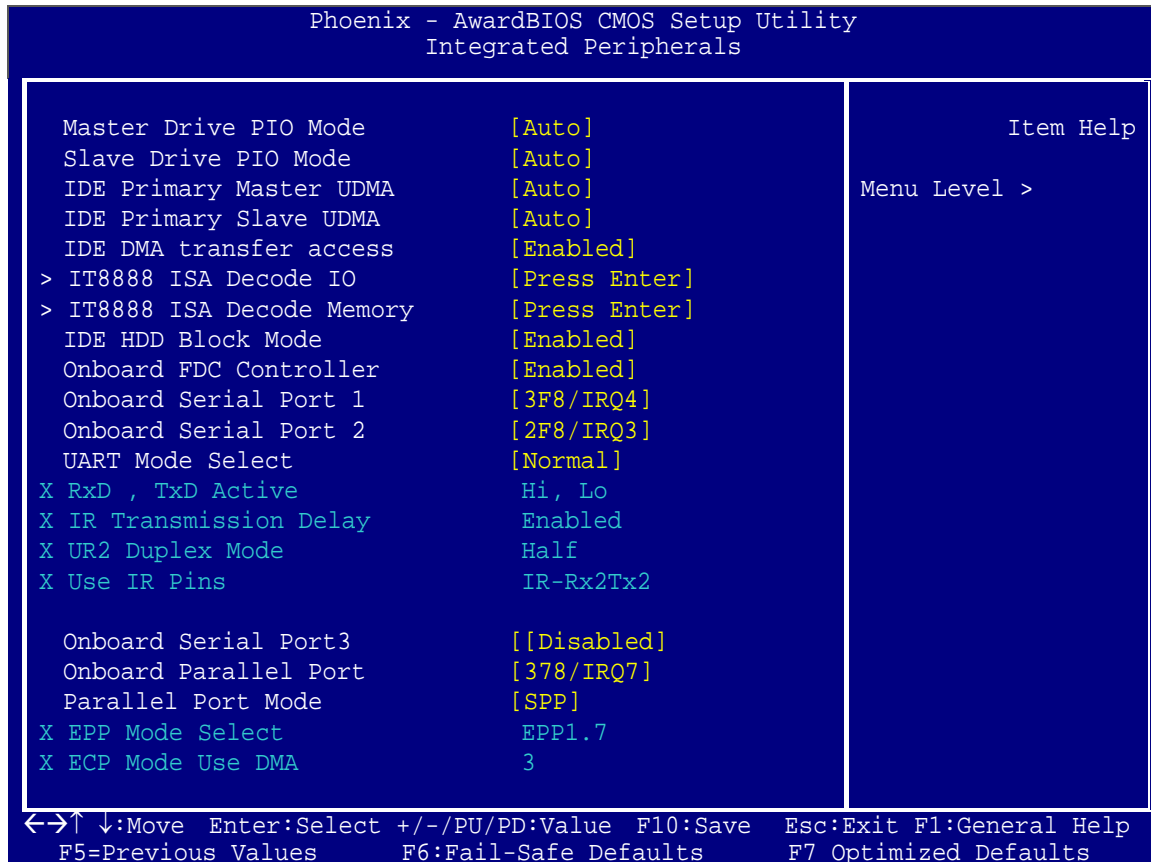- Free running (Default)

➔ **LP Active Period [Free Running]**

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

- Active Only
- Free running (Default)

5.5 Integrated Peripherals

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

```
               Phoenix - AwardBIOS CMOS Setup Utility
                        Integrated Peripherals

   Master Drive PIO Mode          [Auto]                        Item Help
   Slave Drive PIO Mode           [Auto]
   IDE Primary Master UDMA         [Auto]               Menu Level >
   IDE Primary Slave UDMA          [Auto]
   IDE DMA transfer access         [Enabled]
 > IT8888 ISA Decode IO            [Press Enter]
 > IT8888 ISA Decode Memory        [Press Enter]
   IDE HDD Block Mode              [Enabled]
   Onboard FDC Controller          [Enabled]
   Onboard Serial Port 1           [3F8/IRQ4]
   Onboard Serial Port 2           [2F8/IRQ3]
   UART Mode Select                [Normal]
 X RxD , TxD Active                 Hi, Lo
 X IR Transmission Delay            Enabled
 X UR2 Duplex Mode                  Half
 X Use IR Pins                      IR-Rx2Tx2

   Onboard Serial Port3           [[Disabled]
   Onboard Parallel Port          [378/IRQ7]
   Parallel Port Mode             [SPP]
 X EPP Mode Select                  EPP1.7
 X ECP Mode Use DMA                 3


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

BIOS Menu 7: Integrated Peripherals

➔ **Drive PIO Mode [Auto]**

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

■ Master Drive PIO Mode
■ Slave Drive PIO Mode

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

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

➔ **Mode 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps.

➔ **Mode 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps.

➔ **Mode 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps.

➔ **Mode 4**   PIO mode 4 selected with a maximum transfer rate of
16.6MBps.

➔ **IDE UDMA [Auto]**

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

- ■ IDE Primary Master UDMA
- ■ IDE Primary Slave UDMA

➔ **Disabled**   The UDMA for the HDD device is disabled.

➔ **Auto**   (Default)   The computer selects the correct UDMA.

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

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

➔ **Disabled**   All IDE drive DMA transfers are disabled. The IDE drives
use PIO mode transfers.

➔ **Enabled**   (Default)   All IDE drive DMA transfers are enabled.

➔ **IDE HDD Block Mode [Enabled]**

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

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

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

➔ **Onboard FDC Controller [Enabled]**

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

➔ **Disabled**   The FDD controller is disabled.

➔ **Enabled**   (Default)   The FDD controller is enabled.

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

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

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

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

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

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

➔ **UART Mode Select [Normal]**

Use the **UART Mode Select** to select the UART mode for the system

➔ **IrDA**   IrDA compliant serial infrared port

➔ **ASKIR**   Amplitude shift keyed infrared port

➔ **Normal**   (Default)   RS-232C serial port

➔ **RxD, TxD Active [Hi, Lo]**

The **RxD, TxD Active** option can only be selected if the **UART Mode Select** option is set to IrDA mode or ASKIR mode. Use the **RxD, TxD Active** option to set the infrared reception (RxD) and transmission (TxD) polarity. The **RxD, TxD Active** options are:

- Hi, Hi
- Hi, Lo (Default)
- Lo, Hi
- Lo, Lo

➔ **IR Transmission Delay [Enabled]**

Use the **IR Transmission Delay** option to specify whether or not there should be a delay for the IR transmission.

➔ **Disabled**   There is no transmission delay.

➔ **Enabled**   (Default)   There is a transmission delay.

➔ **UR2 Duplex Mode [Normal]**

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

➔ **Full**   Full-duplex mode allows transmission in both directions at the same time.

➔ **Half**   Default   Half-duplex mode allows transmission in one direction at a time only.

➔ **Use IR Pins [IR-Rx2Tx2]**

Use the **Use IR Pins** options to specify how the IR pins respond. The **Use IR Pins** options are:

- RxD2,TxD2
- IR-Rx2Tx2 (Default)

➔ **Onboard Serial Port3 [Disabled]**

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

- Disabled   (Default)
- 3F8/IRQ7
- 2F8/IRQ5
- 3E8/IRQ7
- 2E8/IRQ5

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

The **Onboard Parallel Port** BIOS option assigns the I/O port address of the parallel port. The following address options are available:

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

➔ **Parallel Port Mode [SPP]**

The Parallel Port Mode selection selects the mode the parallel port operates in.

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

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

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

➔ **ECP+EPP**   The parallel port is compatible with both ECP and EPP devices.

➔ **Normal**

➔ **EPP Mode Select [EPP1.7]**

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

➔ **EPP1.9**   EPP 1.9 is selected as the EPP standard.

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

➔ **ECP Mode Use DMA [3]**

Use the **ECP Mode Use** option to select which DMA channel should be used for this port.

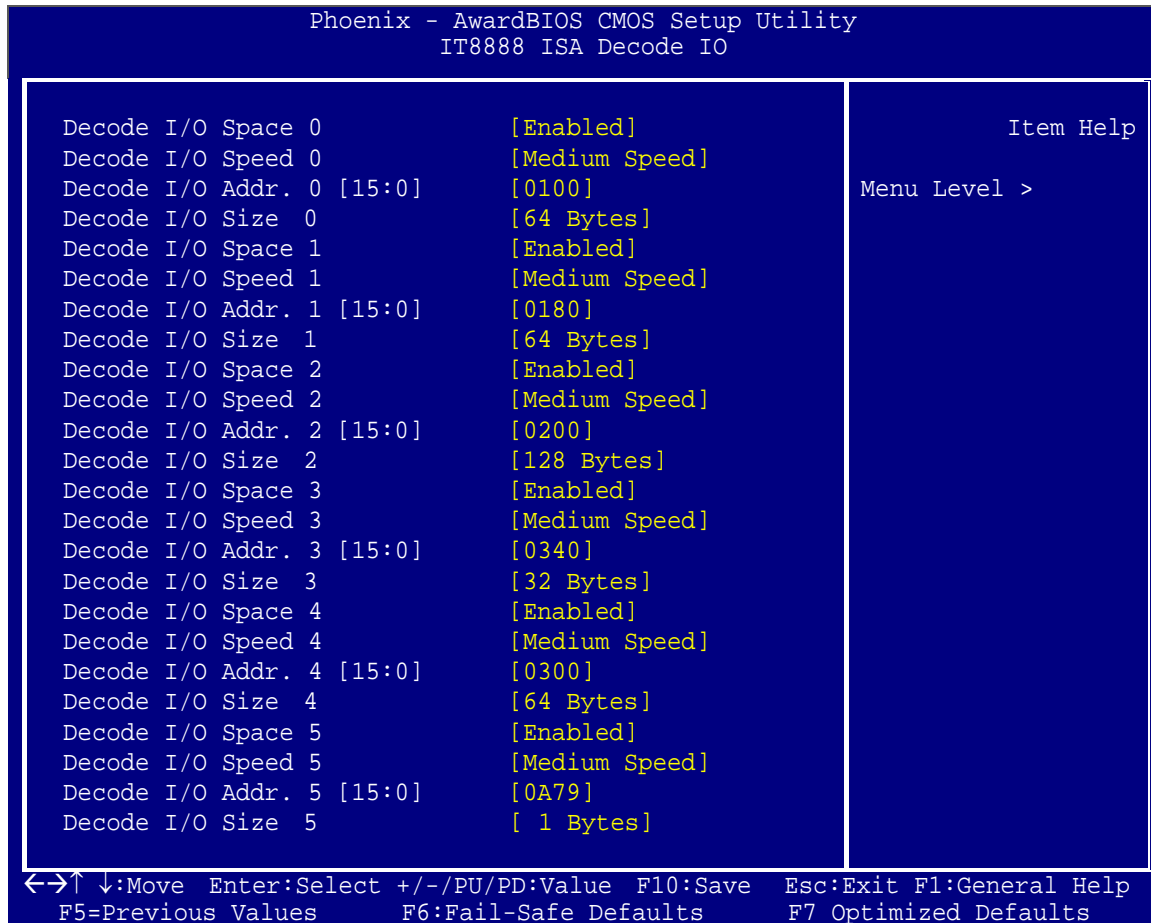➔ **1**   The parallel port uses DMA Channel 1 in ECP mode.

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

5.5.1 IT8888 ISA Decode IO

Access the **IT8888 ISA Decode** configuration settings (BIOS Menu 8) in the Integrated Peripherals menu and make the appropriate I/O space settings.

```
                Phoenix - AwardBIOS CMOS Setup Utility
                        IT8888 ISA Decode IO

   Decode I/O Space 0              [Enabled]                    Item Help
   Decode I/O Speed 0              [Medium Speed]
   Decode I/O Addr. 0 [15:0]       [0100]              Menu Level >
   Decode I/O Size  0              [64 Bytes]
   Decode I/O Space 1              [Enabled]
   Decode I/O Speed 1              [Medium Speed]
   Decode I/O Addr. 1 [15:0]       [0180]
   Decode I/O Size  1              [64 Bytes]
   Decode I/O Space 2              [Enabled]
   Decode I/O Speed 2              [Medium Speed]
   Decode I/O Addr. 2 [15:0]       [0200]
   Decode I/O Size  2              [128 Bytes]
   Decode I/O Space 3              [Enabled]
   Decode I/O Speed 3              [Medium Speed]
   Decode I/O Addr. 3 [15:0]       [0340]
   Decode I/O Size  3              [32 Bytes]
   Decode I/O Space 4              [Enabled]
   Decode I/O Speed 4              [Medium Speed]
   Decode I/O Addr. 4 [15:0]       [0300]
   Decode I/O Size  4              [64 Bytes]
   Decode I/O Space 5              [Enabled]
   Decode I/O Speed 5              [Medium Speed]
   Decode I/O Addr. 5 [15:0]       [0A79]
   Decode I/O Size  5              [ 1 Bytes]

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

BIOS Menu 8: IT8888 ISA Decode IO

➔ **Decode IO Space x [Enabled]**

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

➔ **Disabled**   IO space decoding is disabled

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

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

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

➔ **Slow Speed**   Set the I/O speed to Slow

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

➔ **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: 0200
- IO Space 3: 0340
- IO Space 4: 0300
- IO Space 5: 0A79

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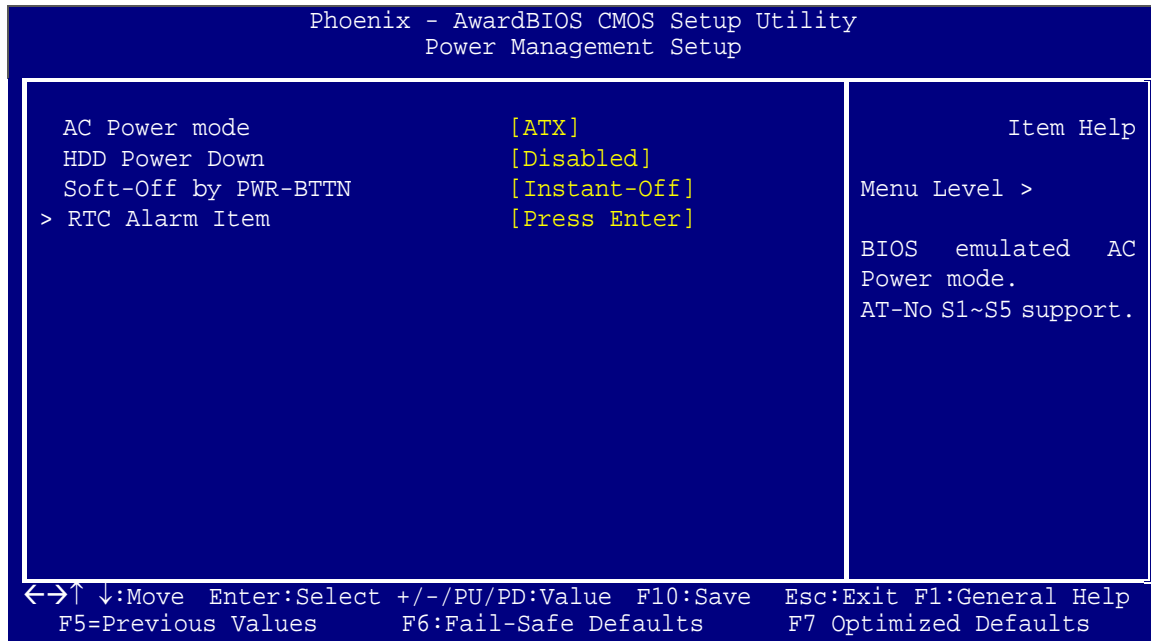
Use the **Decode IO Size** option to manually enter the size of the IO space. The defaults for the different IO spaces are shown below

- IO Space 0: 64 Bytes
- IO Space 1: 64 Bytes
- IO Space 2: 128 Bytes
- IO Space 3: 32 Bytes
- IO Space 4: 64 Bytes
- IO Space 5: 1 Bytes

5.5.2 IT8888 ISA Decode Memory

Access the **IT8888 ISA Decode Memory** configuration settings (**BIOS Menu 9**) in the Integrated Peripherals menu and make the appropriate I/O space settings.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                          IT8888 ISA Decode Memory

    Decode Memory Space 0            [Disabled]                    Item Help
  X Decode Memory Speed 0             Fast Speed
  X Decode Memory Addr. 0             0D0              Menu Level >
  X Decode Memory Size  0              64 KB
    Decode Memory Space 1            [Disabled]
  X Decode Memory Speed 1             Subtractive Speed
  X Decode Memory Addr. 1             000
  X Decode Memory Size  1             16 KB
    Decode Memory Space 2            [Disabled]
  X Decode Memory Speed 2             Subtractive Speed
  X Decode Memory Addr. 2             000
  X Decode Memory Size  2             16 KB
    Decode Memory Space 3            [Disabled]
  X Decode Memory Speed 3             Subtractive Speed
  X Decode Memory Addr. 3             000
  X Decode Memory Size  3             16 KB


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

BIOS Menu 9: 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**

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

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

➔ **Slow Speed** Set the Memory Speed to Slow Speed

➔ **Medium Speed** Set the Memory Speed to Medium Speed

→ **Fast Speed**　　　　　　　　　　　Set the Memory Speed to Fast 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: 0D0
- 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 KB
- Memory Space 1: 16 KB
- Memory Space 2: 16 KB
- Memory Space 3: 16 KB

5.6 Power Management Setup

Use the **Power Management Setup** menu (BIOS Menu 10) to set the BIOS power
management and saving features.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                      Power Management Setup

    AC Power mode              [ATX]                        Item Help
    HDD Power Down             [Disabled]
    Soft-Off by PWR-BTTN       [Instant-Off]     Menu Level >
  > RTC Alarm Item             [Press Enter]
                                                 BIOS   emulated   AC
                                                 Power mode.
                                                 AT-No S1~S5 support.
















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

BIOS Menu 10: Power Management Setup

➔ **AC Power mode [ATX]**

Use the **AC Power mode** option to specify whether an AT or ATX power supply is connected to the system.

➔ **ATX**   (Default)   An ATX power supply is used.

➔ **AT**   An AT power supply is used.

➔ **HDD Power Down [Disabled]**

Use the **HDD Power Down** option to specify how long the computer must wait for no activity before the HDD powers down. If this option is disabled, the HDD does not power down. The following settings can be made.

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec

■ 45 Sec

■ 1 Min

■ 5 Min

■ 10 Min

■ 15 Min

■ 30 Min

■ 45 Min

■ 60 Min

■ 90 Min

■ 120 Min

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

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

➔ **Instant-Off**   (Default)   When the power button is pressed, the system is immediately shutdown.

➔ **Delay 4-sec**   To shutdown the system the power button must be held down longer than four seconds otherwise the system enters a low power usage state.

➔ **Power-On by Alarm [Disabled]**

The **Power-On by Alarm** determines when the computer will be roused from a suspended state.

➔ **Disabled**   DEFAULT   The computer will stay turned off

➔ **Enabled**   If selected, the following will appear with values that can be selected:

➔ **Tim Alarm**

After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

5.7 PnP/PCI Configurations

Use the **PnP/PCI Configurations** menu (BIOS Menu 11) to set the plug and play, and PCI options.

```
               Phoenix - AwardBIOS CMOS Setup Utility
                       PnP/PCI Configuraions

  PNP OS Installed              [No]                          Item Help
  Reset Configuration Data      [Disabled]
                                                   Menu Level >
  Resources Controlled By       [Auto(ESCD)]
x IRQ Resources                  Press Enter       To auto-detect the
x DMA Resources                  Press Enter       HDD's size, head...
x Memory Resources               Press Enter       on this channel

  PCI/VGA Palette Snoop         [Disabled]




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

BIOS Menu 11: PnP/PCI Configurations

➔ **PNP OS Installed [No]**

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

➔ **No**   (Default)   If the operating system does not meet the Plug and Play specifications, BIOS configures all the devices in the system.

➔ **Yes**   Set this option if the system is running Plug and Play aware operating systems. The operating system changes the interrupt, I/O, and DMA settings.

➔ **Reset Configuration Data [Disabled]**

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

➔ **Disabled**　(Default)　ESCD will not be reconfigured

➔ **Enabled**　　　　　ESCD will be reconfigured after you exit setup

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

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

➔ **Auto(ESCD)**　(Default)　BIOS automatically configures plug and play devices as well as boot devices.

➔ **Manual**　　　　　Manually configure the plug and play devices and any other boot devices.

➔ **IRQ Resources [Press Enter]**

The **IRQ Resources** option can only be selected if the **Resources Controlled By** option is set to **Manual**.

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

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

The above options all have the following default options.

➔ **PCI/ISA PnP**　(Default)　The IRQ is reserved by BIOS for PCI and ISA PnP devices.

➔ **Legacy ISA**　　　The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard

whether designed for PCI or ISA bus architecture.

➔ **DMA Resources [Press Enter]**

The **DMA Resources** menu can only be accessed if the **Resources Controlled By** option is set to **Manual**. Use **DMA Resources** to assign each system DMA channel a type.

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

- DMA-0 assigned to
- DMA-1 assigned to
- DMA-3 assigned to
- DMA-5 assigned to
- DMA-6 assigned to
- DMA-7 assigned to

The above options all have the following default options.

➔ **PCI/ISA PnP**   (Default)   The DMA is reserved by BIOS for PCI and ISA PnP devices.

➔ **Legacy ISA**   The DMA is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

➔ **Memory Resources [Press Enter]**

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

The **Memory Resources** menu has the following option:

➔ **Reserved Memory Base [N/A]**

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

- N/A (Default)
- C800
- CC00
- D000
- D400
- D800
- DC00PC

5.8 Health Status

The **PC Health Status** menu (BIOS Menu 12) has no user configurable options, but shows system operating parameters that are essential to the stable operation of the system.

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

    Current CPU Temperature     19ºC/ 66ºF                            Item Help
    Current CPU Fan Speed       0 RPM                        _____
    Vcore                       1.20V
    Vmem                        2.51V                        Menu Level >
    Vcc3                        3.39V
    Vcc5                        5.02V
    Vcc12                       12.03V
    AVCC                        3.34V
    VBAT (V)                    3.31V
    Vcc3SB                      3.34V




    ←→↑ ↓:Move  Enter:Select +/-/PU/PD:Value  F10:Save  Esc:Exit F1:General Help
    F5=Previous Values         F6:Fail-Safe Defaults    F7 Optimized Defaults
```
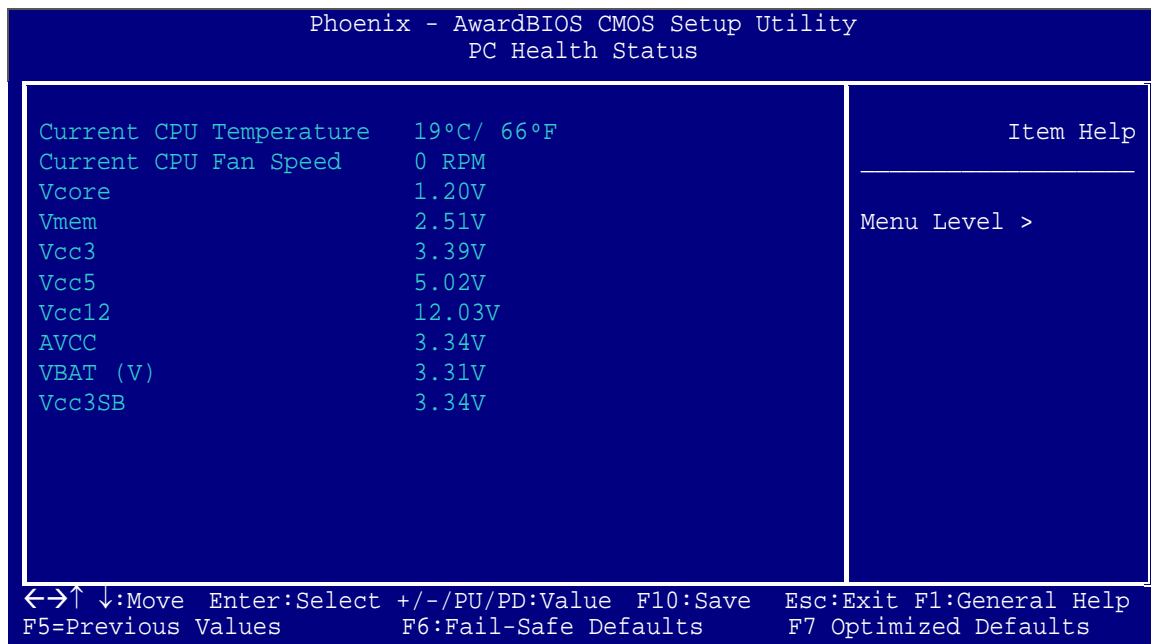
BIOS Menu 12: PC Health Status

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

➔ **System Temperature**

The following temperature is monitored:

◼ Current CPU Temperature

➔ **Voltages**

The following voltages are monitored:

◼ Vcore

◼ Vmem

◼ Vcc3

◼ Vcc5

◼ Vcc12

◼ AVCC

◼ VBAT

◼ Vcc3SB

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

■ This device may not cause harmful interference, and
■ This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

Product Disposal

⚠️ **CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

▪ Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

▪ Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.
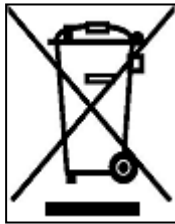
EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

BIOS Menu Options

Appendix

D

Digital I/O Interface

The DIO connector on the IOWA-LX-600 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 8-bit digital inputs and 8-bit digital outputs. The digital inputs and digital outputs are generally 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.

![NOTE icon] **NOTE:**

> For further information, please refer to the datasheet for the Super I/O chipset.

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH
Sub-function:
AL – 8 : Set the digital port as INPUT **AL** : Digital I/O input value

Assembly Language Sample 1

MOV	*AX, 6F08H*	; setting the digital port as input
INT	*15H*	;

AL low byte = value

AH – 6FH
<u>Sub-function:</u> **AL – 9** : Set the digital port as OUTPUT **BL** : Digital I/O output value

Assembly Language Sample 2

MOV	*AX*, *6F09H*	; setting the digital port as output
MOV	*BL*, *09H*	; digital value is 09H
INT	*15H*	;

Digital Output is 1001b

Appendix

E

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 EMI 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 E-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. While 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, 30H              ;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

F

Error Beep Code

F.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

F.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

G

Hazardous Materials Disclosure

G.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

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)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	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 Directive (EU) 2015/863. 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 Directive (EU) 2015/863.										

G.2 China RoHS

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	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
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/T11364-2014 與 GB/T26572-2011 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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。						