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User's Manual

Single Board Computer 3307880

Version 1.0, October 2006

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# Glossary

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

Chapter

1

# Introduction

---

## **1.1 3307880 CPU Board Overview**

The 3307880 PCI CPU card is fully equipped with a high performance processor and advanced multi-mode I/Os. The 3307880 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

### **1.1.1 3307880 CPU Board Applications**

The 3307880 CPU board has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

### **1.1.2 3307880 CPU Board Benefits**

Some of the 3307880 CPU board benefits include,

- Reduced hardware costs
- Reduced software costs
- Reduced maintenance costs
- Client crash prevention
- Central resource control

### **1.1.3 3307880 CPU Board Features**

Some of the 3307880 CPU board features are listed below:

- PCI CPU card with AMD LX-800 processor installed
- RoHS compliant
- Up to 1GB of DDR 333/400MHz SO-DIMM memory supported
- CRT and TTL display supported
- Two SATA channels with transfer rates up to 150MB/s on-board
- Four USB 2.0 devices on-board
- Two RS-232 serial port on-board
- One RS-422/485 serial port on-board



## 1.2 3307880 CPU Board Overview

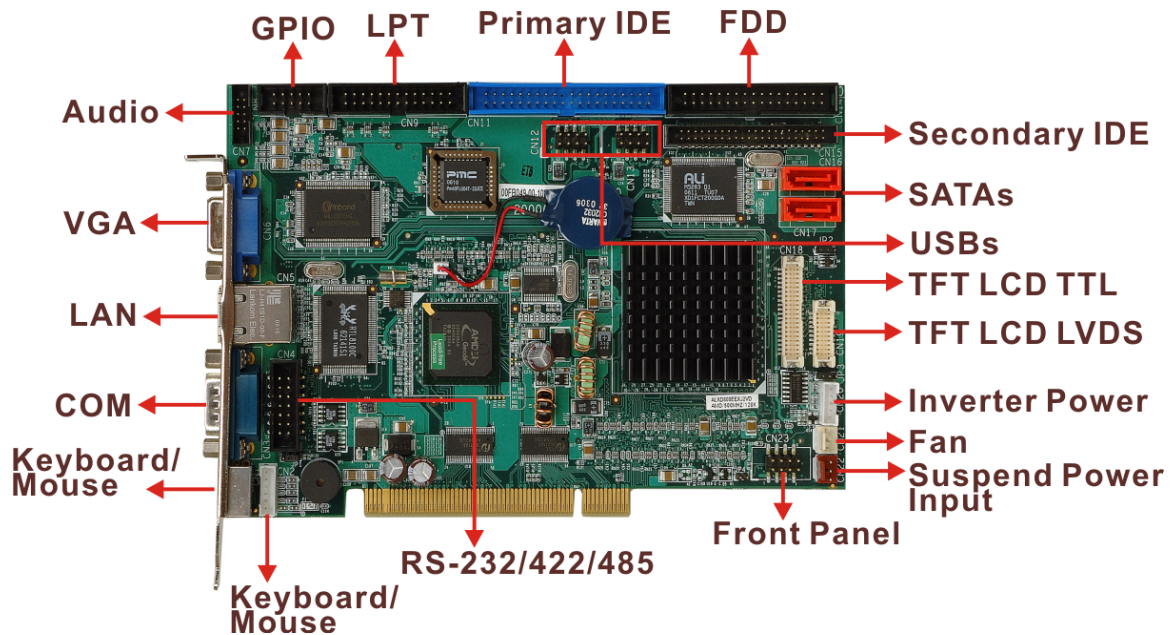


Figure 1-1: 3307880 CPU Board Overview (Front View)

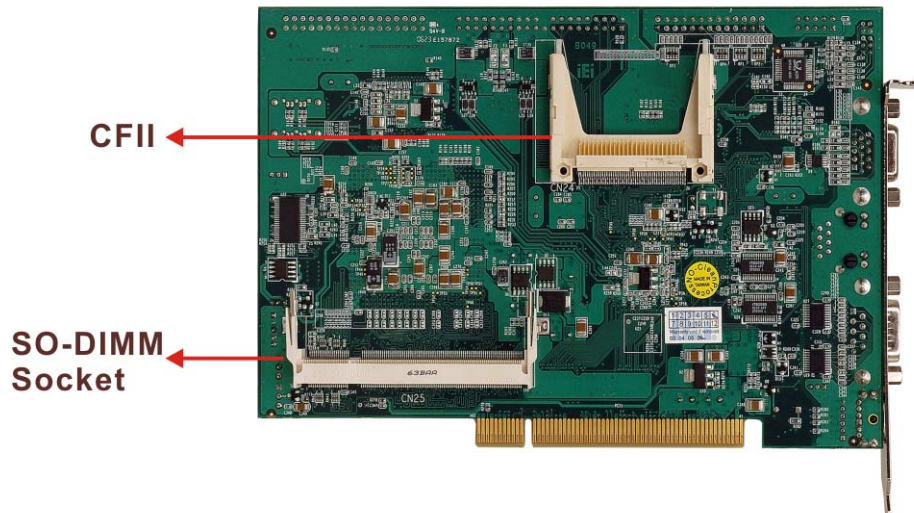


Figure 1-2: 3307880 CPU Board Overview (Solder Side)

### 1.2.1 3307880 CPU Board Connectors

The 3307880 CPU board has the following connectors onboard:

- 1 x Audio connector

- 1 x Battery connector
- 1 x CompactFlash® slot
- 1 x DDR SO-DIMM slot
- 1 x Fan connector
- 1 x Floppy disk drive connector
- 1 x Front panel connector
- 1 x GPIO connector
- 2 x IDE device connectors
- 1 x Inverter power connector
- 1 x Keyboard/Mouse connector
- 1 x Parallel port connector
- 1 x RS-232/422/485 serial port connector
- 2 x SATA connectors
- 1 x Suspend power input connector
- 1 x TFT LCD LVDS connector
- 1 x TFT LCD TTL connector
- 4 x USB 2.0 connectors

The 3307880 CPU board has the following connectors on the board rear panel:

- 1 x RJ-45 Ethernet connector
- 1 x Keyboard/Mouse connector
- 1 x Serial port connector
- 1 x VGA connector

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

**NOTE:**

There are no configuration jumpers or connectors on the soldering side.

---

## 1.2.2 Technical Specifications:

3307880 CPU board technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2**.

Specification	3307880
<b>CPU</b>	AMD® Geode™ LX 800 500Mhz
<b>Southbridge Chipset</b>	AMD® Geode™ CS5536
<b>Display</b>	CRT and 24-bit TTL integrated in AMD® Geode™ LX800
<b>TTL/LVDS</b>	18-bit single channel LVDS
<b>Memory</b>	Supports one 1GB DDR 333/400 200-pin SO-DIMM SDRAM module
<b>BIOS</b>	Award BIOS
<b>SSD</b>	CompactFlash® (CF)
<b>Super I/O</b>	W83627EHG
<b>Audio</b>	AC'97 Codec Realtek ALC203
<b>LAN</b>	Realtek RTL8100C for 10/100 Mbps
<b>COM</b>	One RS-232 One RS-232/422/485
<b>USB2.0</b>	Four USB 1.1 or USB 2.0 devices supported
<b>IDE</b>	Two IDE interfaces connect to four Ultra ATA33/66/100 devices
<b>Floppy</b>	One floppy disk drive connector
<b>Parallel Port</b>	One LPT port connector
<b>SATA</b>	Two SATA connectors with transfer rates up to 150MB/sec
<b>KB/MS</b>	One on-board keyboard/mouse connector

<b>Watchdog Timer</b>	Software programmable 1-255 sec. by supper I/O
<b>Digital I/O</b>	8 bit digital I/O, 4 input/4 output
<b>Fan connector</b>	One system fan connector
<b>Power Supply</b>	AT/ATX power support
<b>Temperature</b>	0°C - 60°C
<b>Humidity (operating)</b>	5%~95% non-condensing
<b>Dimensions</b>	165mm x 115mm
<b>Weight (GW)</b>	1.0Kg

**Table 1-1: Technical Specifications**

Chapter

2

# Detailed Specifications

---

## 2.1 Overview

This chapter describes the specifications and on-board features of the 3307880 in detail.

## 2.2 CPU Support

The 3307880 CPU card comes with a preinstalled AMD® Geode™ LX 800 500MHz CPU.

### 2.2.1 AMD® Geode™ LX 800 500MHz Specifications

The specifications for the 500MHz AMD® Geode™ LX 800 are listed below

- x86/x87-compatible core
- Processor frequency up to 500 MHz
- 64K I/64K D L1 cache and 128K L2 cache
- Split I/D cache/TLB (Translation Look-Aside Buffer)
- 64-bit DDR Memory interface up to 400MHz (LX 800), up to 333MHz (LX 700)
- Integrated FPU that supports the Intel MMX® and AMD 3DNow!™ Technology instruction sets
- 9 GB/s internal GeodeLink™ Interface Unit (GLIU)
- Security Block
  - 128-bit AES (CBC/ECB)
  - True Random Number Generator
- High-resolution CRT and TFT outputs (simultaneous operation)
  - Support for High Definition (HD) and Standard Definition (SD) standards
  - Support 1920x1440 in CRT mode and 1600x1200 in TFT mode
- VESA 1.1 and 2.0 VIP/VDA support
- 0.13 micron process
- 481-terminal PBGA (Plastic Ball Grid Array) with internal heatspreader

### 2.2.2 AMD® Geode™ LX 800 500MHz Power Management

The power management for the 500MHz AMD® Geode™ LX 800 is listed below:

- 1.8W Typical (3.9W TDP) @ 500MHz
- GeodeLink active hardware power management
- Hardware support for standard ACPI software power management
- I/O companion SUSP#/SUSPA# power controls

- Lower power I/O
- Wakeup on SMI/INTR

## 2.3 System Chipset

The 3307880 CPU card has a preinstalled AMD® Geode™ CS5536 system chipset. The system chipset features are listed below.

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

- 8 Multi-Function General Purpose Timers (MFGPTs)
- Real-Time Clock (RTC) with CMOS RAM
- Power Management Controller
- ACPI v2.0 compliant

## 2.4 Data Flow

Figure 2-1 shows the data flow between the two on-board chipsets and other components installed on the CPU card and described in the following sections of this chapter.

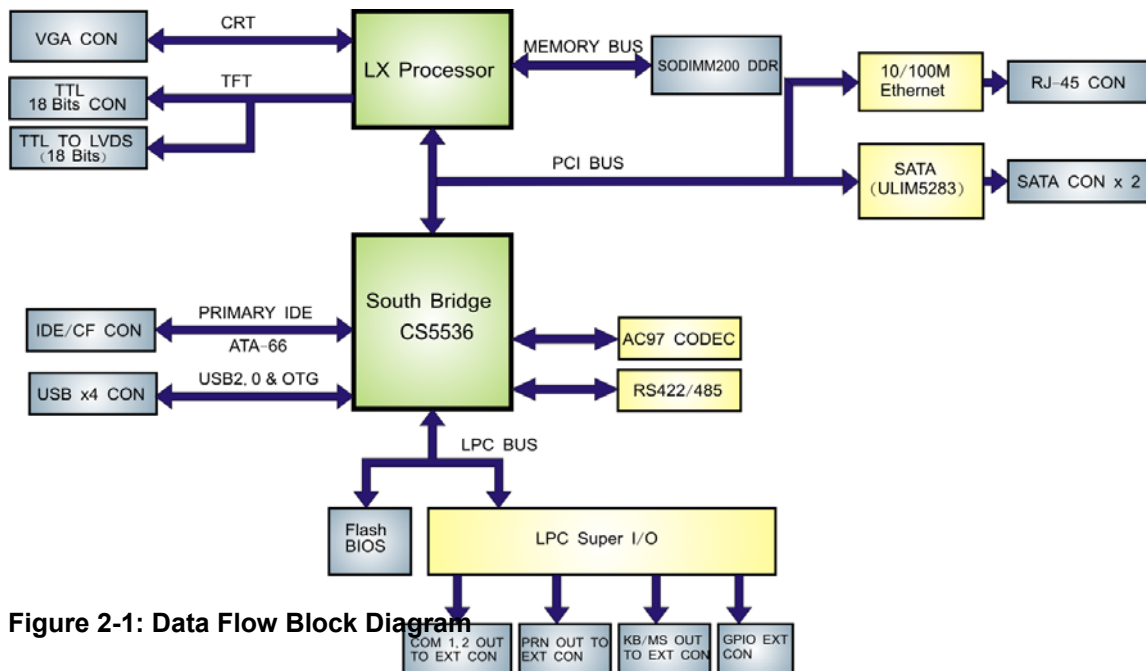


Figure 2-1: Data Flow Block Diagram

## 2.5 Graphics Support

The Geode LX processor's Graphics Processor is a BitBLT/vector engine that supports pattern generation, source expansion, pattern/source transparency, 256 ternary raster operations, alpha blenders to support alpha- BLTs, incorporated BLT FIFOs, a GeodeLink interface and the ability to throttle BLTs according to video timing. New features added to the Graphics Processor include:

- Command buffer interface
- Hardware accelerated rotation BLTs



- Color depth conversion
- Paletized color
- Full 8x8 color pattern buffer
- Separate base addresses for all channels
- Monochrome inversion

**Table 2-1: Geode LX Graphics Features** lists a complete list of Geode LX graphics features. For more details, please refer to the AMD website or the Geode LX series data book available from AMD.

Feature	AMD Geode™ LX Processor
Color Depth	8, 16, 32 bpp (A) RGB 4 and 8-bit indexed
ROPs	256 (2-src, dest and pattern)
BLT Buffers	FIFOs in Graphics Processor
BLT Splitting	Managed by hardware
Video Synchronized BLT/Vector	Throttle by VBLANK
Bresenham Lines	Yes
Patterned (stippled) Lines	Yes
Screen to Screen BLT	Yes
Screen to Screen BLT with mono expansion	Yes
Memory to Screen BLT	Yes (throttled rep movs writes)
Accelerated Text	No
Pattern Size (Mono)	8x8 pixels
Pattern Size (Color)	8x8 pixels
Monochrome Pattern	Yes (with inversion)
Dithered Pattern (4 color)	No
Color Pattern	8, 16, 32 bpp
Transparent Pattern	Monochrome
Solid Fill	Yes
Pattern Fill	Yes
Transparent Source	Monochrome
Color Key Source Transparency	Y with mask
Variable Source Stride	Yes
Variable Destination Stride	Yes
Destination Write Bursting	Yes

Selectable BLT Direction	Vertical and Horizontal
Alpha BLT	Yes (constant $\alpha$ , $\alpha/\text{pix}$ , or sep. $\alpha$ channel)
VGA Support	Decodes VGA Register
Pipeline Depth	Unlimited
Accelerated Rotation BLT	8, 16, 32 bpp
Color Depth Conversion	5:6:5, 1:5:5:5, 4:4:4:4, 8:8:8:8

**Table 2-1: Geode LX Graphics Features**

## 2.6 Memory Support

The 3307880 has one 200-pin DDR SO-DIMM SDRAM socket that supports one 333 MHz or 400MHz DDR SO-DIMM memory module with a maximum capacity of 1GB.

## 2.7 PCI Bus Interface Support

The PCI bridge on the 3307880 has the following features:

- 33MHz Revision 2.2 is implemented
- Maximum throughput: 133MB/sec
- PCI and GLIU interface control
- Read and write FIFOs

## 2.8 Ethernet Controller Specifications

### 2.8.1 Overview

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

The RTL8100C(L) also supports remote wake-up (including AMD Magic Packet™ and Microsoft® Wake-up frame) to increase cost-efficiency in network maintenance and management. It is an ideal solution for notebook/CPU card-embedded network designs.

## 2.8.2 Features

- Integrates Fast Ethernet MAC, physical chip, and transceiver onto a single chip
- 10Mbps and 100Mbps operation
- Supports 10Mbps and 100Mbps N-way auto-negotiation
- Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- Complies with PC99/PC2001 standards
- Supports ACPI power management
- Provides PCI bus master data transfer
- Provides PCI memory space or I/O space mapped data transfer
- Supports PCI clock speed of 16.75MHz-40MHz
- Advanced power saving mode
- Supports Wake-on-LAN and remote wake-up (AMD Magic Packet™, Link Change, and Microsoft® Wake-up frame)
- Half/Full duplex capability
- Supports Full Duplex Flow Control (IEEE 802.3x)
- Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- Provides PCI clock run pin
- Provides LED pins for network operation status indication
- 2.5/3.3V power supply with 5V tolerant I/Os

## 2.9 Drive Interfaces

The 3307880 can support the following drive interfaces.

- 2 x SATA drives
- 2 x IDE devices
- 1 x FDD
- 1 x CF II card

### 2.9.1 SATA Drives

The 3307880 supports two, first generation SATA drives with transfer rates of up to 150MB/s.

## 2.9.2 IDE HDD Interfaces

The 3307880 system chipset IDE controller supports up to two HDDs with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports the following Ultra ATA devices:
  - **Ultra ATA/100**, with data transfer rates up to 100MB/s
  - **Ultra ATA/66**, with data transfer rates up to 66MB/s
  - **Ultra ATA/33**, with data transfer rates up to 33MB/s

## 2.9.3 Floppy Disk Drive (FDD)

The 3307880 supports a single FDD. The following FDD formats are compatible with the board.

- 5.25": 360KB and 1.2MB
- 3.5": 720KB, 1.44MB and 2.88MB

## 2.9.4 Compact Flash Support

A standard CF II card can be inserted into the compact flash slot on the solder side of the 3307880 PCB.

## 2.10 Serial Ports

The 3307880 has two high-speed UART serial ports, configured as COM1 and COM2/COM3. The serial ports have the following specifications.

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

CN4 (COM2/COM3 serial port) can be configured as RS-232, RS-422 or RS-485.

## 2.11 Real Time Clock

256-byte battery backed CMOS RAM

## **2.12 System Monitoring**

The 3307880 is capable of self-monitoring various aspects of its operating status including:

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

## **2.13 USB Interfaces**

The 3307880 has four internal USB interfaces (on two pin header connectors). The USB interfaces support USB 2.0.

## **2.14 BIOS**

The 3307880 uses a licensed copy of AWARD BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-**B**oot **E**xecution **E**nvironment) support
- USB booting support

## **2.15 Operating Temperature and Temperature Control**

The maximum and minimum operating temperatures for the 3307880 are listed below.

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

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

## 2.16 Audio Codec

The 3307880 has an integrated RealTek ALC203 codec. The RealTek ALC203 is a 20-bit DAC and 18-bit ADC full-duplex AC'97 2.3 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio, and AMR/CNR based designs. The codec meets performance requirements for audio on PC99/2001 systems

- Single chip with high S/N ratio (>100 dB)
- Meets performance requirements for audio on PC2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 20-bit DAC and 18-bit ADC resolution
- 18-bit Stereo full-duplex CODEC with independent and variable sampling rate
- Complies with AC'97 2.3 specifications
  - LINE/HP-OUT, MIC-IN and LINE-IN sensing
  - 14.318MHz -> 24.576MHz PLL saves crystal
  - 12.288MHz BITCLK input can be consumed
  - Integrated PCBEEP generator to save buzzer
  - Interrupt capability
  - Page registers and Analog Plug & Play
- Support of S/PDIF out is fully compliant with AC'97 rev2.3 specifications
- Three analog line-level stereo inputs with 5-bit volume control: LINE\_IN, CD, AUX
- High quality differential CD input
- Two analog line-level mono input: PCBEEP, PHONE-IN
- Supports double sampling rate (96KHz) of DVD audio playback
- Two software selectable MIC inputs
- +6/12/20/30dB boost preamplifier for MIC input
- Stereo output with 6-bit volume control
- Mono output with 5-bit volume control
- Headphone output with 50mW/20Ohm amplifier
- 3D Stereo Enhancement
- Multiple CODEC extension capability
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Stereo MIC record for AEC/BF application
- DC Voltage volume control

- Auxiliary power to support Power Off CD
- Adjustable VREFOUT control
- 2 GPIO pins with smart GPIO volume control
- 2 Universal Audio Jacks (UAJ)® for front panel
- Supports 32K/44.1K/48K/96KHz S/PDIF output
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-Pin LQFP Package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D Positional Audio
- Sensaura™ 3D Enhancement (optional)
- 10 Bands of Software Equalizer
- Voice Cancellation and Key Shifting in Karaoke mode
- AVRack® Media Player

## 2.17 Power Consumption

**Table 2-2** shows the power consumption parameters for the 3307880 when an AMD Geode LX 800 processor is running with one 1GB DDR400 memory module.

Voltage	Current
+5V	1.73A

**Table 2-2: Power Consumption**

## 2.18 Packaged Contents and Optional Accessory Items

### 2.18.1 Package Contents

The 3307880 is shipped with the following components.

- 1 x 3307880 PCI CPU card
- 1 x Mini jumper pack

- 1 x ATA 66/100 flat cable
- 1 x Audio cable
- 1 x KB/MS cable
- 1 x USB cable
- 1 x RS-232/422/485 cable
- 1 x Utility CD
- 1 x Quick Installation Guide

### **2.18.2 Optional Accessory Items**

The items shown in the list below are optional accessory items are purchased separately.

- ATA 33 44P/44P flat cable
- FDD cable
- LPT cable



Chapter

3

# Connectors and Jumpers

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## 3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. Section 3.1.2 lists all the peripheral interface connectors seen in Section 3.1.1.

### 3.1.1 3307880Layout

Figure 3-1 and Figure 3-2 show the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

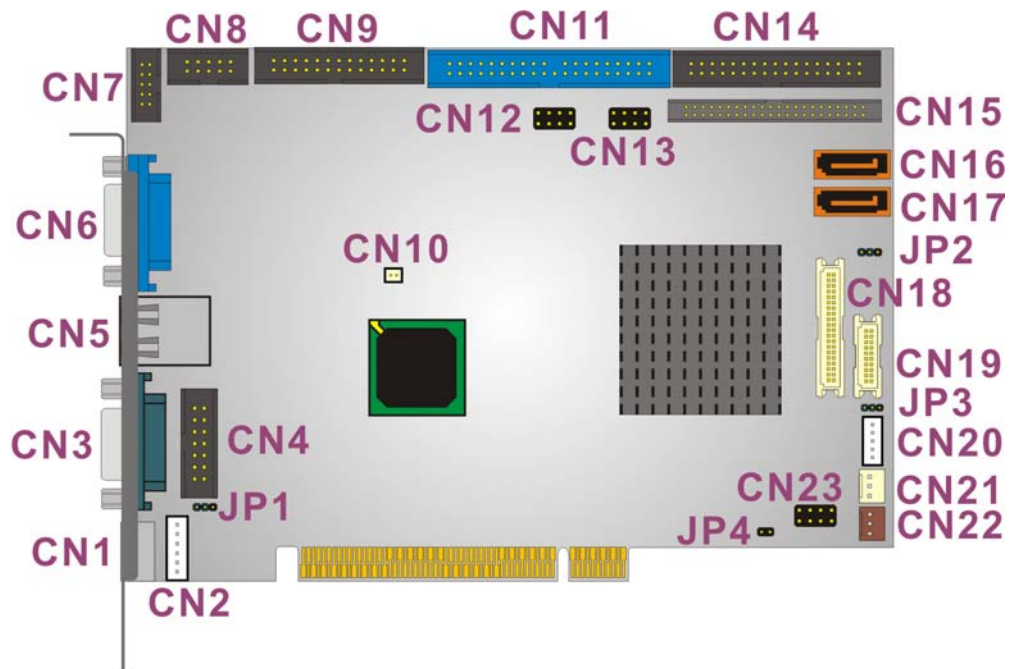


Figure 3-1: Connector and Jumper Locations

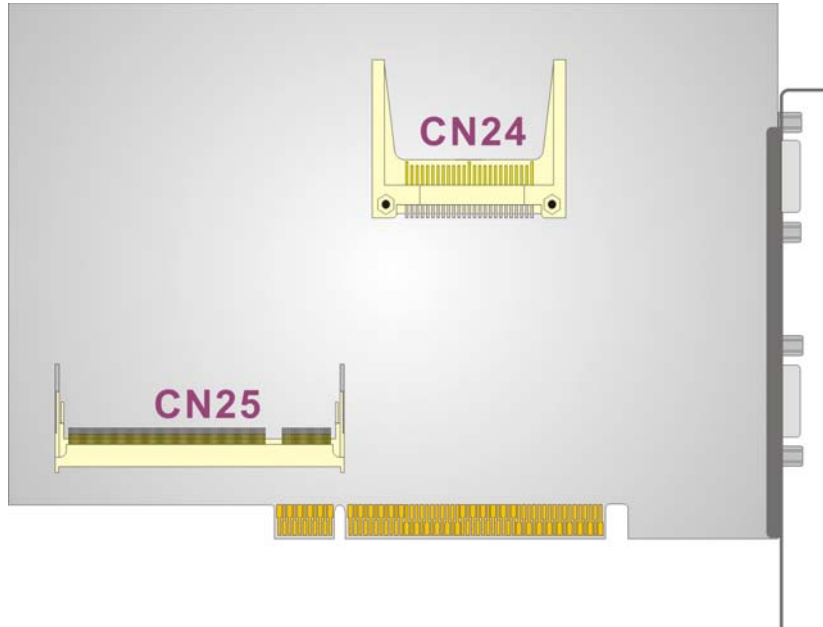


Figure 3-2: Connector and Jumper Locations (Solder Side)

### 3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the 3307880. Detailed descriptions of these connectors can be found in Section 3.2.

Connector	Type	Label
Audio connector	10-pin header	CN7
Battery connector	2-pin header	CN10
CompactFlash® (CF) connector	50-pin header	CN24
DDR SO-DIMM slot	200-pin SO-DIMM slot	CN25
Fan connector	3-pin header	CN21
Floppy Disk connector	34-pin header	CN14
Front panel connector	8-pin header	CN23
GPIO connector	10-pin header	CN8
IDE Interface connector (primary)	40-pin header	CN11

## 3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. Section 3.1.2 lists all the peripheral interface connectors seen in Section 3.1.1.

### 3.1.1 3307880 Layout

Figure 3-1 and Figure 3-2 show the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

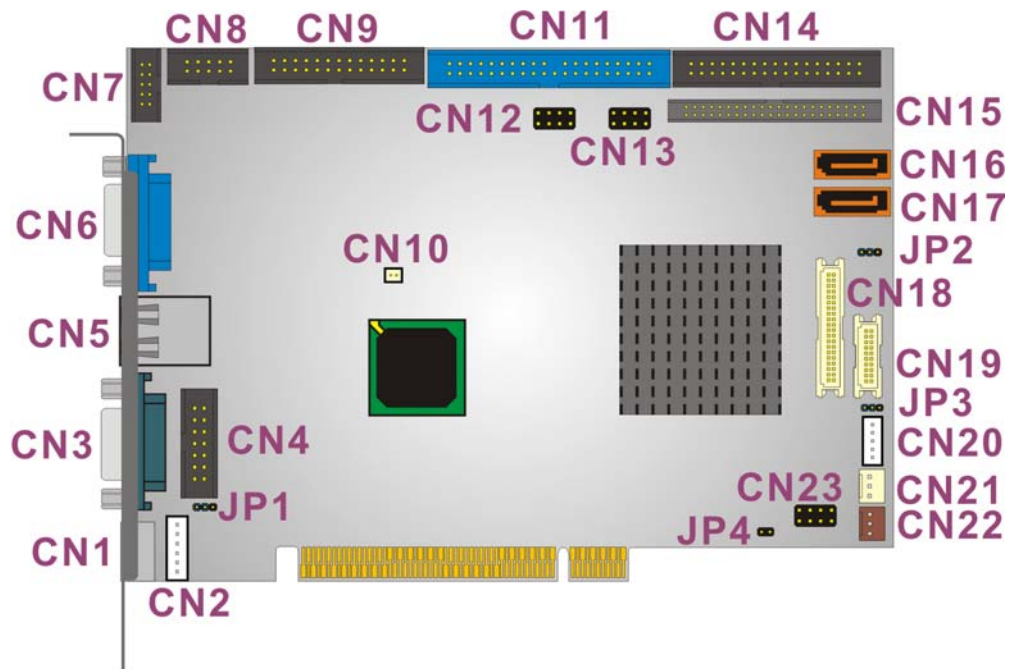


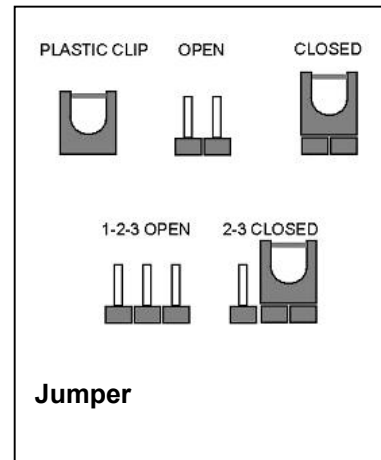
Figure 3-1: Connector and Jumper Locations

### 3.1.4 On-board Jumpers



#### NOTE:

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



**Table 3-3** lists the on-board jumpers. Detailed descriptions of these jumpers can be found in **Section 4.5**.

Description	Label	Type
AT power select	JP4	2-pin header
COM 3 mode setup	JP1	3-pin header
LCD clock select	JP2	3-pin header
LCD voltage select	JP3	3-pin header

**Table 3-3: On-board Jumpers**

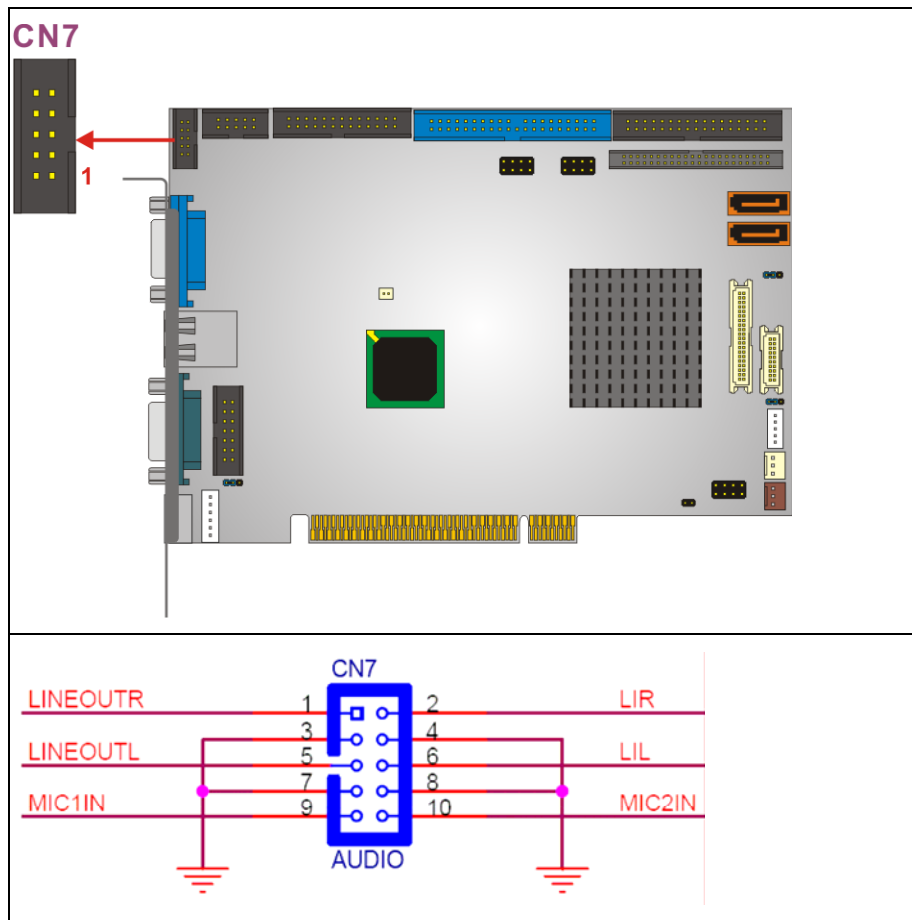
## 3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the CPU card and are only accessible when the CPU card is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the 3307880.

### 3.2.1 Audio Connector

<b>CN Label:</b>	CN7
<b>CN Type:</b>	10-pin header (2x5)
<b>CN Location:</b>	See Figure 3-3
<b>CN Pinouts:</b>	See Table 3-4

The audio connector is connected to an on-board codec. An external audio connector kit can be connected to the connector to provide sound input and output.



**Figure 3-3: Audio Connector Location**

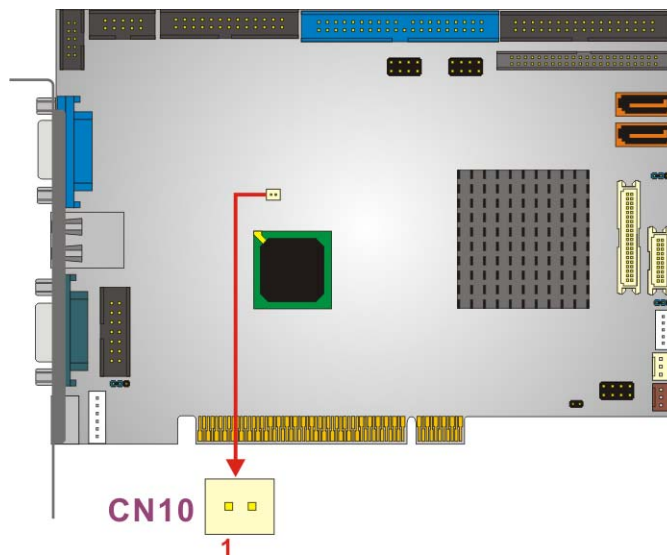
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUT-R	2	LINE_IN-R
3	GND	4	GND
5	LINE_OUT-L	6	LINE_IN-L
7	GND	8	GND
9	MIC-IN	10	NC

**Table 3-4: Audio Connector Pinouts**

### 3.2.2 Battery Connector

<b>CN Label:</b>	CN10
<b>CN Type:</b>	2-pin header (1x2)
<b>CN Location:</b>	See Figure 3-4
<b>CN Pinouts:</b>	See Table 3-5

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 3-4: Battery Connector Location**

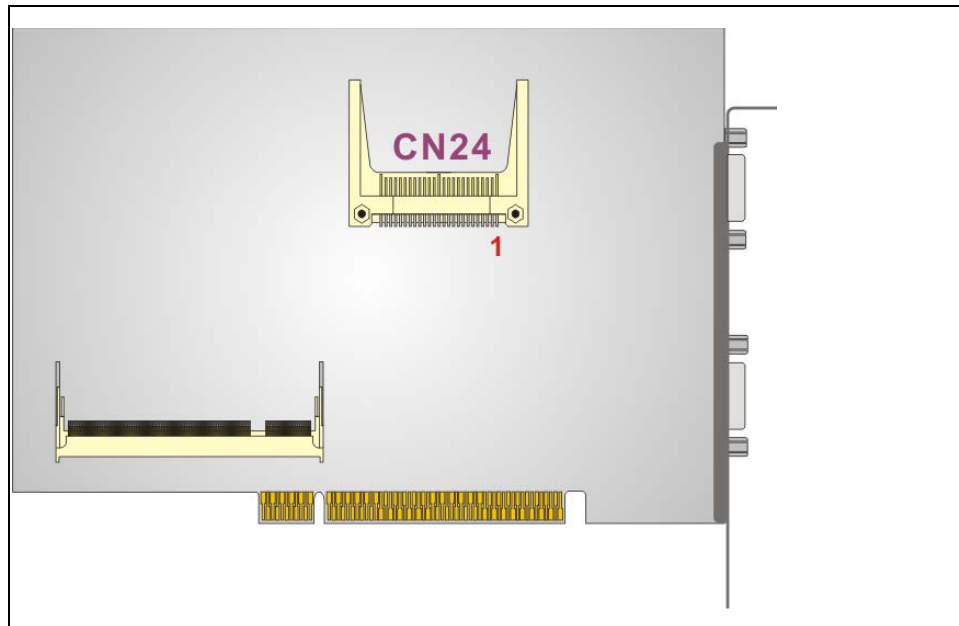
PIN NO.	DESCRIPTION
1	Battery+
2	Battery-

Table 3-5: Battery Connector Pinouts

### 3.2.3 CompactFlash® Connector

- CN Label:** CN24 (solder side)
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 3-5
- CN Pinouts:** See Table 3-6

A compact flash memory module is inserted to the CompactFlash® connector (CN24) on the solder side of the 3307880.





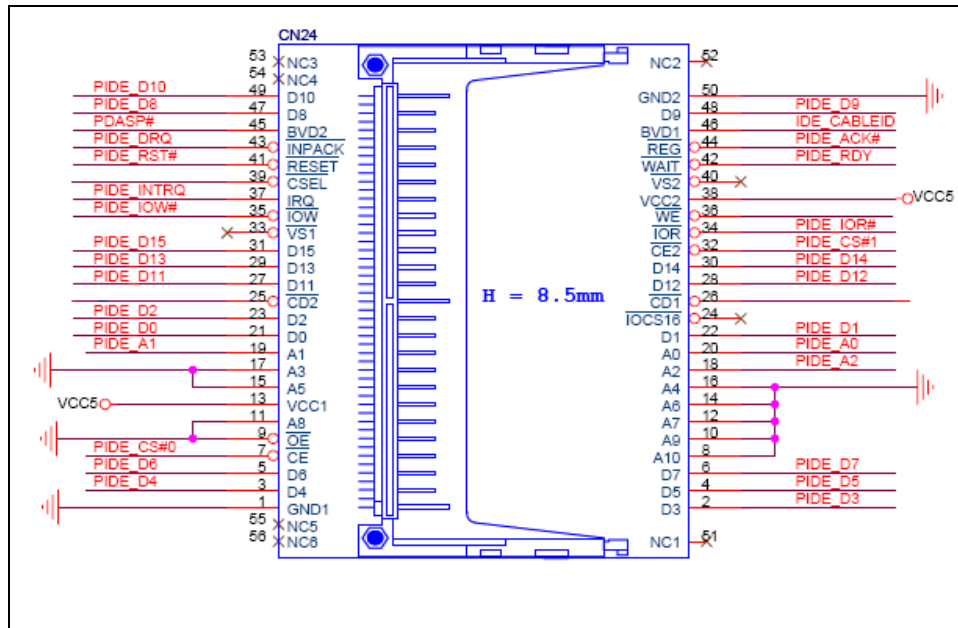


Figure 3-5: Compact Flash Connector Location (Solder Side)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY

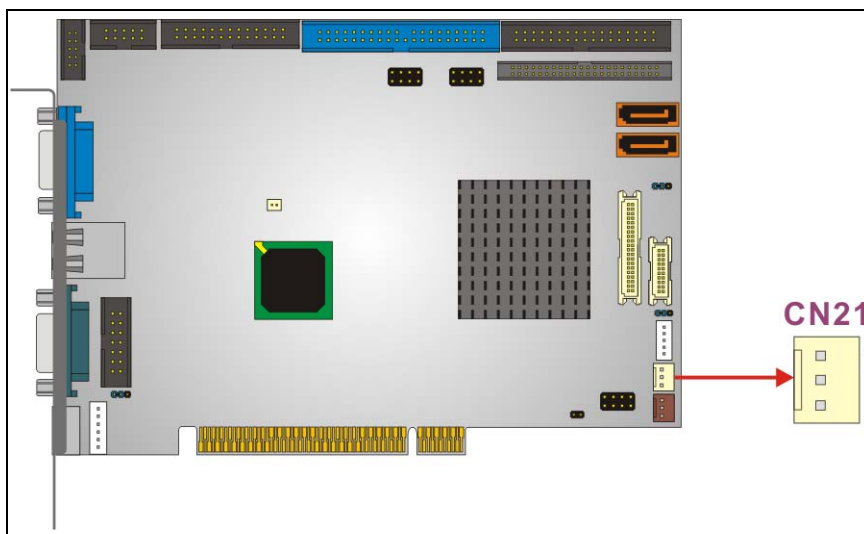
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

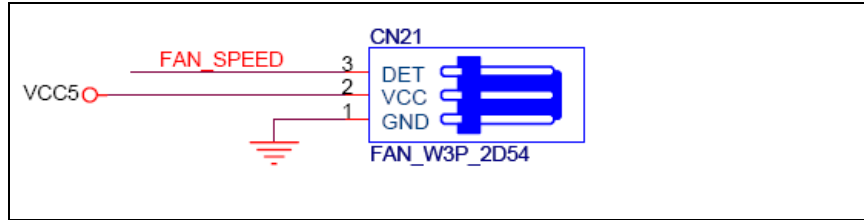
**Table 3-6: Compact Flash Connector Pinouts**

### 3.2.4 Fan Connector

- CN Label:** CN21
- CN Type:** 3-pin header
- CN Location:** See Figure 3-6
- CN Pinouts:** See Table 3-7

The cooling fan connector provides a 5V current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.





**Figure 3-6: Fan Connector Location**

PIN NO.	DESCRIPTION
1	GND
2	+5V
3	SPD_DET

**Table 3-7: Fan Connector Pinouts**

### 3.2.5 Floppy Disk Connector

<b>CN Label:</b>	CN14
<b>CN Type:</b>	34-pin header (2 x 17)
<b>CN Location:</b>	See Figure 3-7
<b>CN Pinouts:</b>	See Table 3-8

The floppy disk connector (FDD1) is connected to a floppy disk drive.

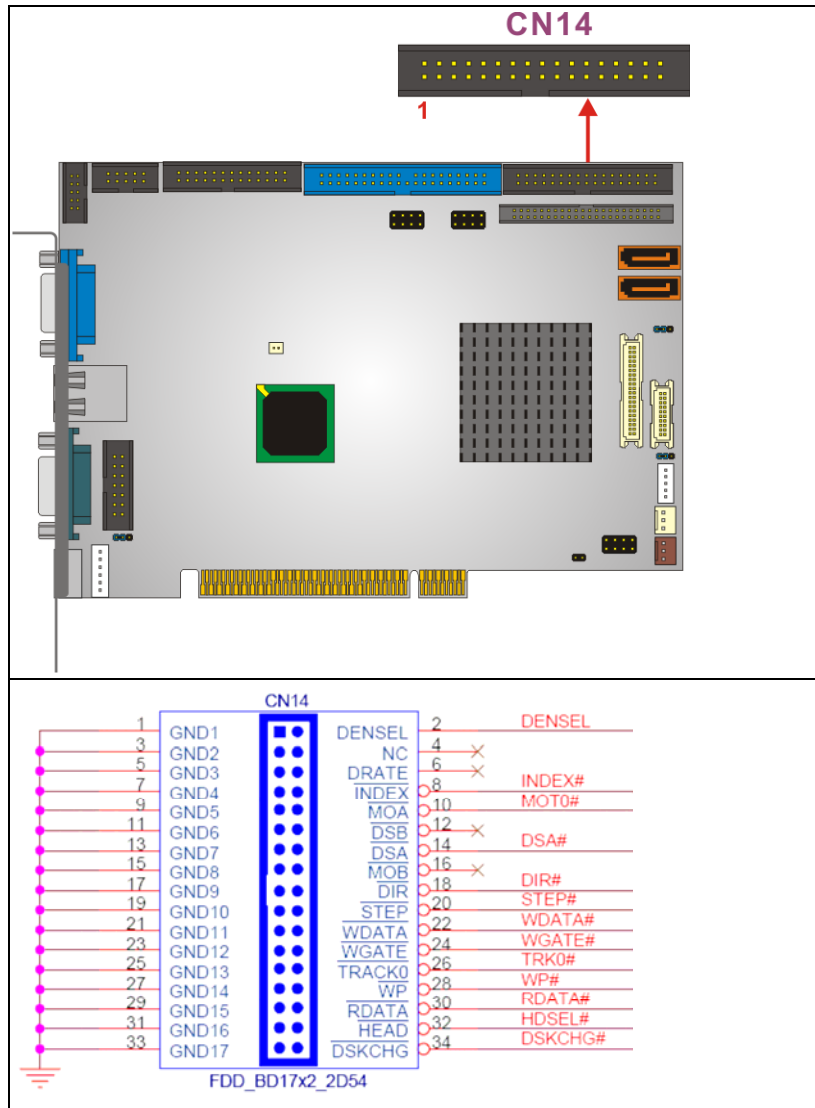


Figure 3-7: FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	DENSEL
3	GND	4	NC
5	GND	6	NC
7	GND	8	INDEX#
9	GND	10	MOA#
11	GND	12	NC
13	GND	14	DSA#
15	GND	16	NC

17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRACKO#
27	GND	28	WP#
29	GND	30	RDATA#
31	GND	32	HEAD#
33	GND	34	DSKCHG#

**Table 3-8: FDD Connector Pinouts**

### 3.2.6 Front Panel Connector

- CN Label:** CN23
- CN Type:** 8-pin header (2x5)
- CN Location:** See Figure 3-8
- CN Pinouts:** See Table 3-9

The front panel connector connects to several external switches and indicators to monitor and control the CPU card. These indicators and switches include:

- Power button
- Reset button
- HDD LED
- Power LED

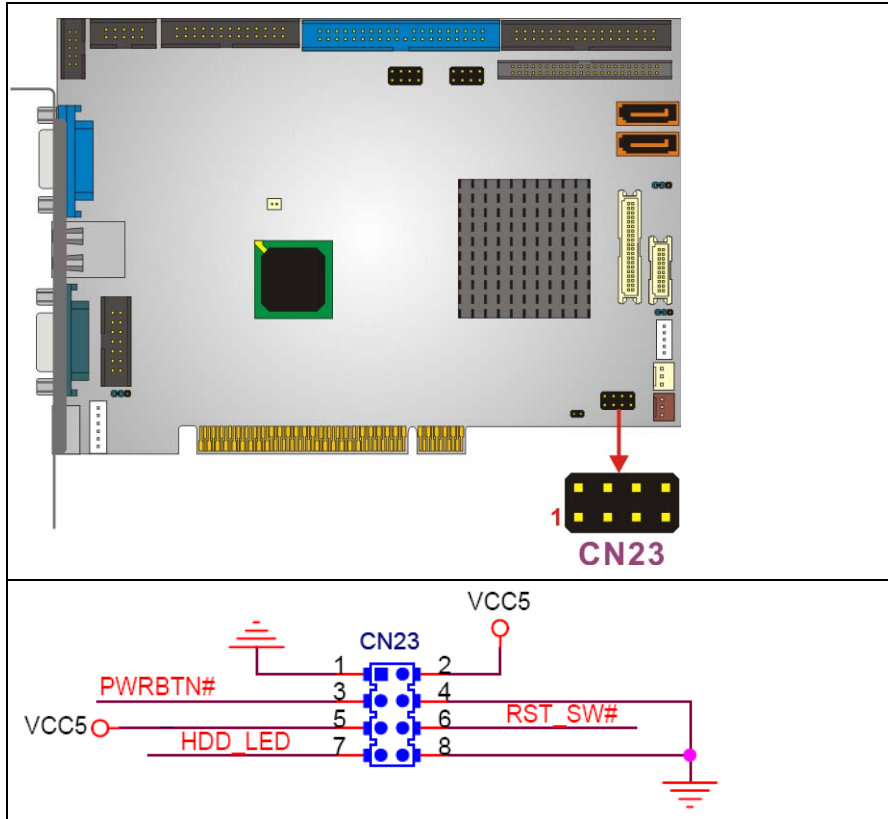


Figure 3-8: Front Panel Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	PWRLED+
3	PWRBTN#	4	PWRLED-
5	HDDLED+	6	RESET#
7	HDDLED-	8	GND

Table 3-9: Front Panel Connector Pinouts

### 3.2.7 GPIO Connector

- CN Label:** CN8
- CN Type:** 10-pin header (2x5)
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-10

The General Purpose Input Output (GPIO) connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

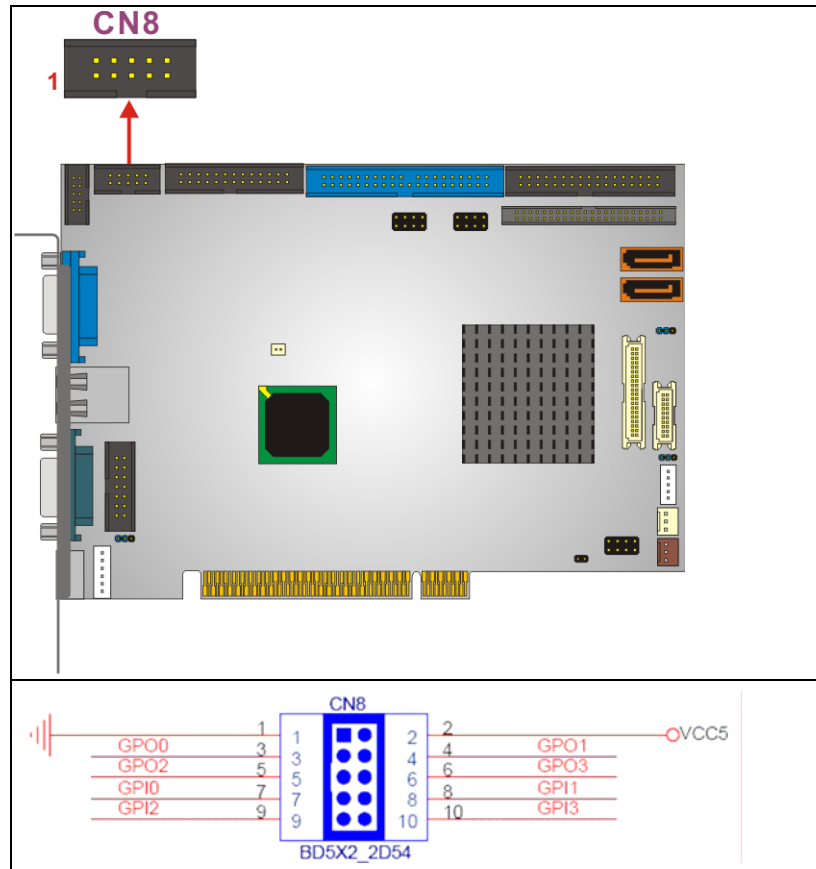


Figure 3-9: GPIO Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	GPO0	4	GPO1
5	GPO2	6	GPO3
7	GPI0	8	GPI1
9	GPI2	10	GPI3

Table 3-10: GPIO Connector Pinouts

### 3.2.8 Primary IDE Connector

CN Label: CN11

**CN Type:** 40-pin header (2x20)

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

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

One 40-pin IDE device connector on the 3307880 CPU card supports connectivity to Ultra ATA 33/66/100 IDE devices with data transfer rates up to 100MB/s.

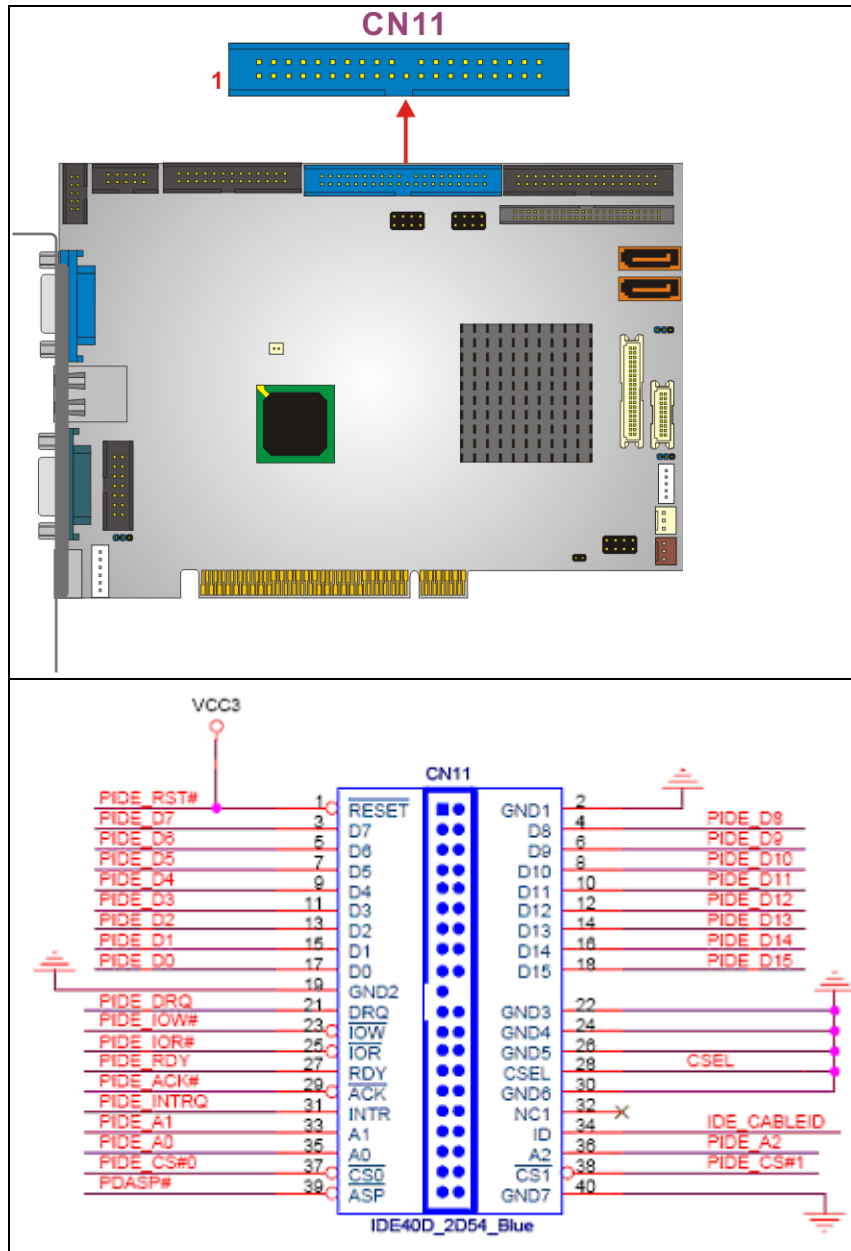


Figure 3-10: Primary IDE Device Connector Locations



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	RDY	28	NC
29	ACK#	30	GND
31	INT	32	NC
33	A1	34	CABLEID
35	A0	36	A2
37	CS0#	38	CS1#
39	ASP#	40	GND

Table 3-11: Primary IDE Connector Pinouts

### 3.2.9 Secondary IDE Connector

- CN Label:** CN15
- CN Type:** 44-pin header (2x22)
- CN Location:** See Figure 3-11
- CN Pinouts:** See Table 3-12

One 44-pin IDE device connector on the 3307880 CPU card supports connectivity to Ultra ATA 33 IDE devices with data transfer rates up to 33MB/s.

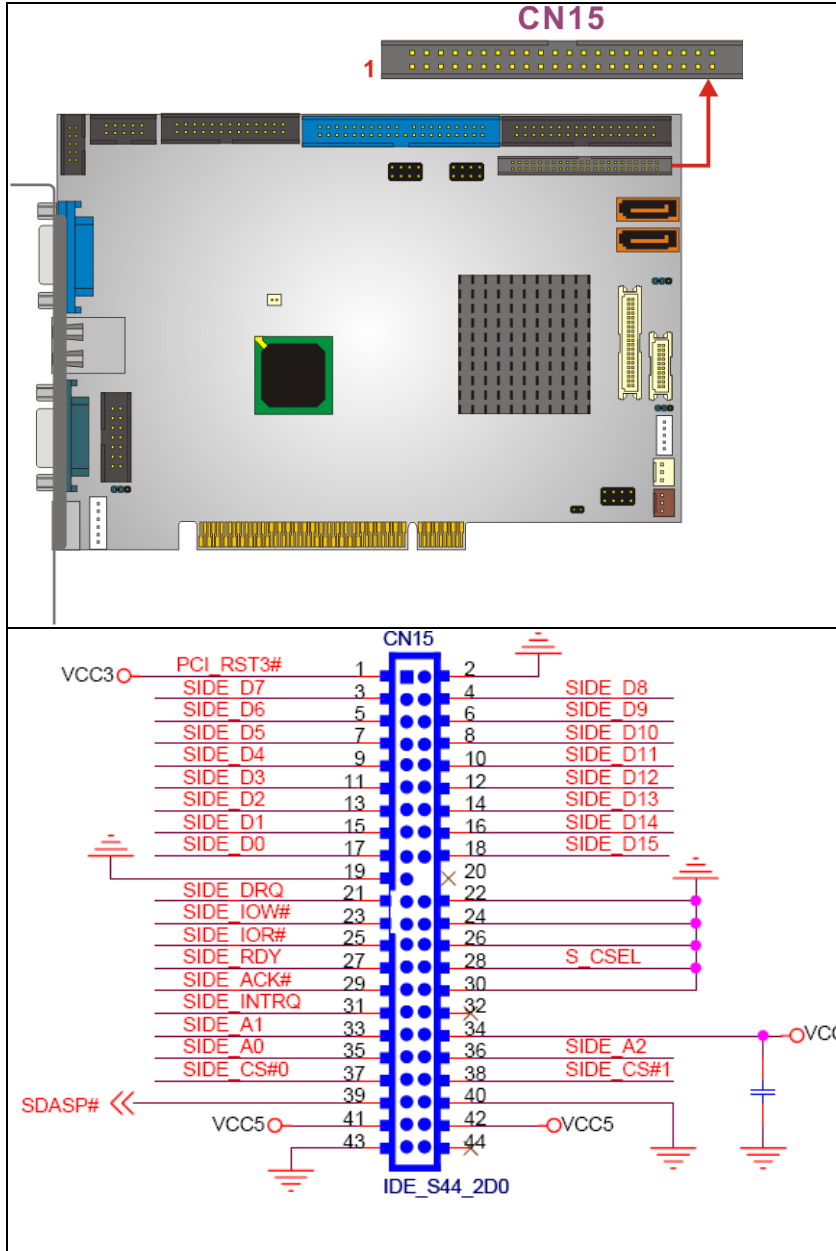


Figure 3-11: Secondary IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11

11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	RDY	28	NC
29	ACK#	30	GND
31	INT	32	NC
33	A1	34	CABLEID
35	A0	36	A2
37	CS0#	38	CS1#
39	ASP#	40	GND
41	+5V	42	+5V
43	GND	44	NC

**Table 3-12: Secondary IDE Connector Pinouts**

### 3.2.10 Inverter Power Connector

- CN Label:** CN20
- CN Type:** 5-pin header (1x5)
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-13

The inverter connector is connected to the LCD backlight.

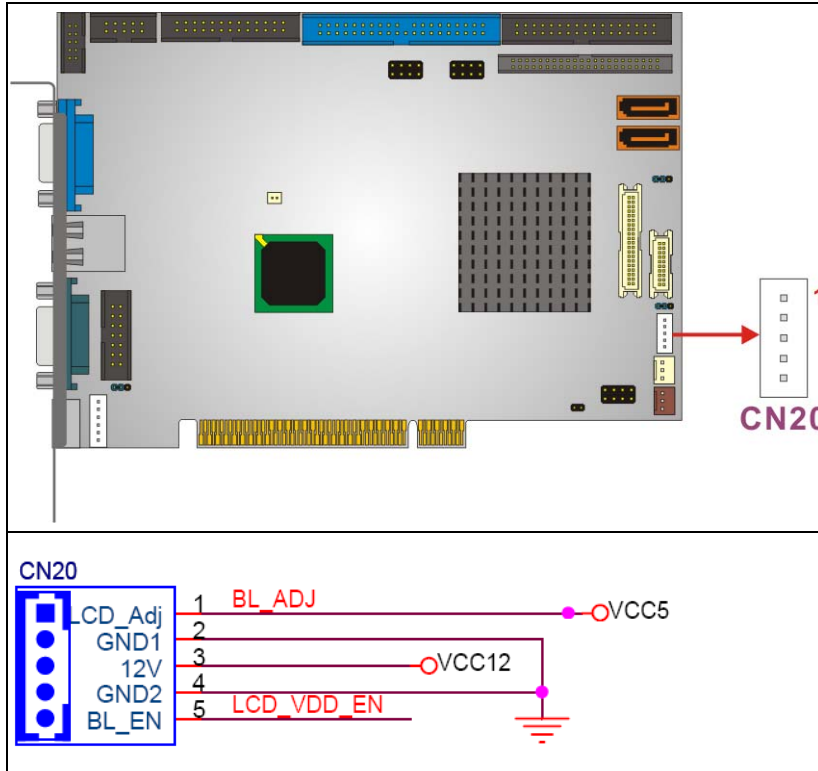


Figure 3-12: Inverter Connector Locations

PIN NO.	DESCRIPTION
1	ADJ (Def: GND)
2	GND
3	12V
4	GND
5	BL_EN

Table 3-13: Inverter Power Connector Pinouts

### 3.2.11 Keyboard/Mouse Connector

- CN Label:** CN2
- CN Type:** 6-pin header (1x6)
- 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.

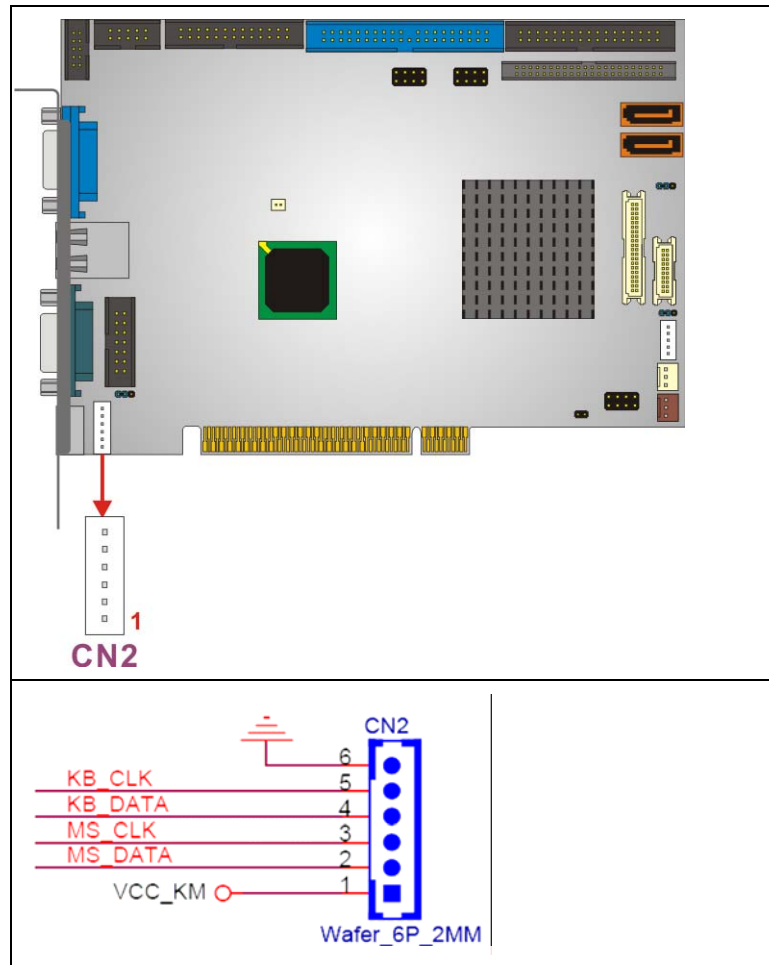


Figure 3-13: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	+5V
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	GND

Table 3-14: Keyboard/Mouse Connector Pinouts

### 3.2.12 Parallel Port Connector

- CN Label:** CN9
- CN Type:** 26-pin header (2 x 13)
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-15

The 3307880 has one parallel port connector that can be connected directly to a printer.

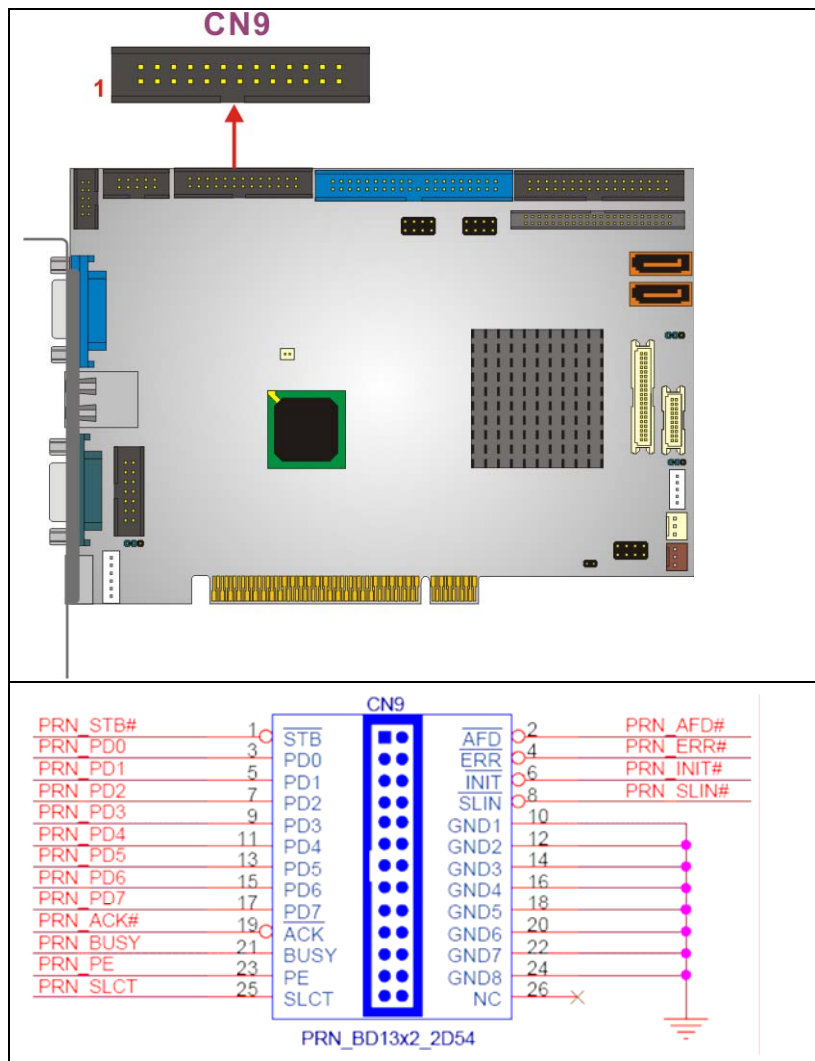


Figure 3-14: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

**Table 3-15: Parallel Port Connector Pinouts**

### 3.2.13 RS-232/422/485 Cable Connectors

- CN Label:** CN4
- CN Type:** 14-pin header (2x7)
- CN Location:** See Figure 3-15
- CN Pinouts:** See Table 3-16

The COM2/COM3 serial port combination connector connects to RS-232 serial port devices. The COM2 port is located on pin 1 to pin 10 and the COM3 is located on pin 11 to pin 14 of CN4.

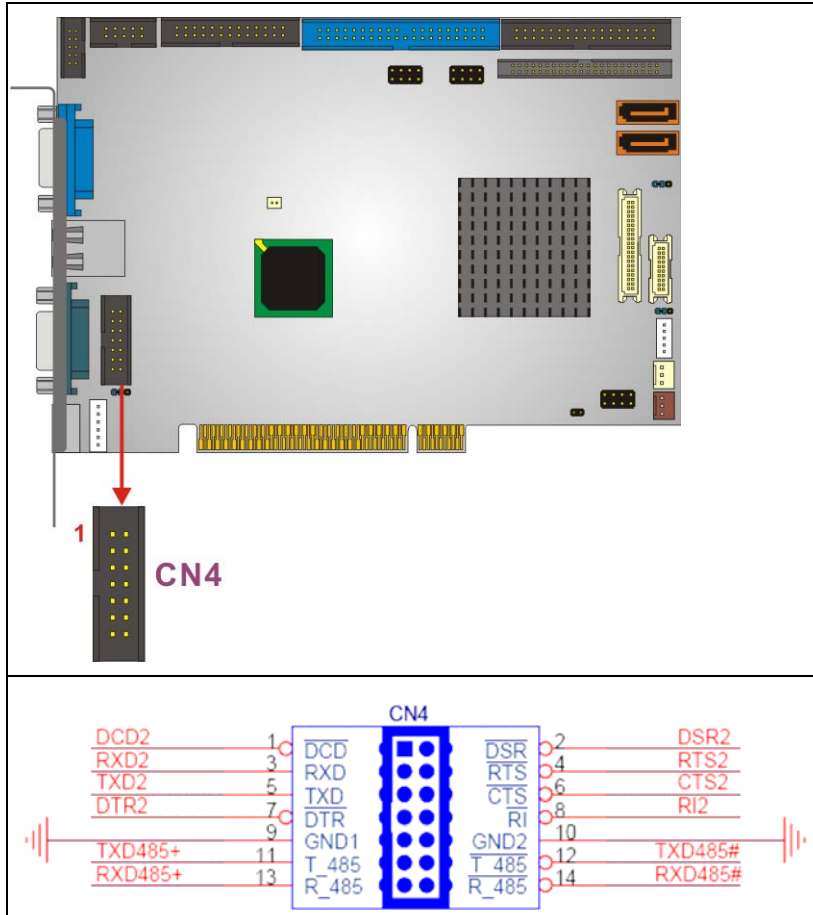


Figure 3-15: RS-232 Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#	2	DSR#
3	RxD	4	RTS#
5	TxD	6	CTS#
7	DTR#	8	RI# / Vout
9	GND	10	GND
11	TxD485+	12	TxD485-
13	RxD485+	14	RxD485-

Table 3-16: RS-232/422/485 Serial Port Connector Pinouts



### 3.2.14 SATA Drive Connectors

<b>CN Label:</b>	CN16 and CN17
<b>CN Type:</b>	7-pin SATA drive connectors
<b>CN Location:</b>	See Figure 3-16
<b>CN Pinouts:</b>	See Table 3-17

The two SATA drive connectors are connected to two first generation SATA drives. First generation SATA drives transfer data at speeds as high as 150MB/s.

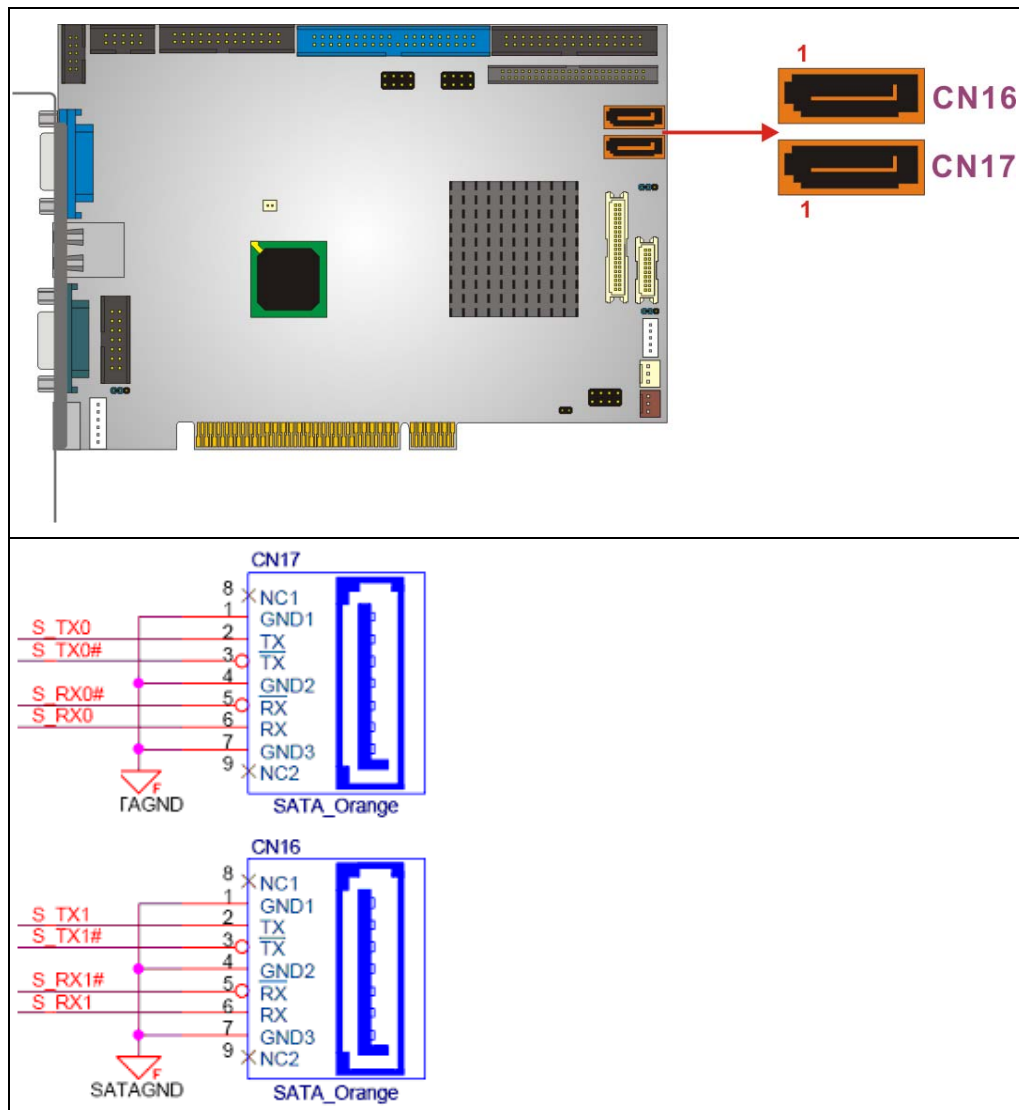


Figure 3-16: SATA Drive Connector Locations

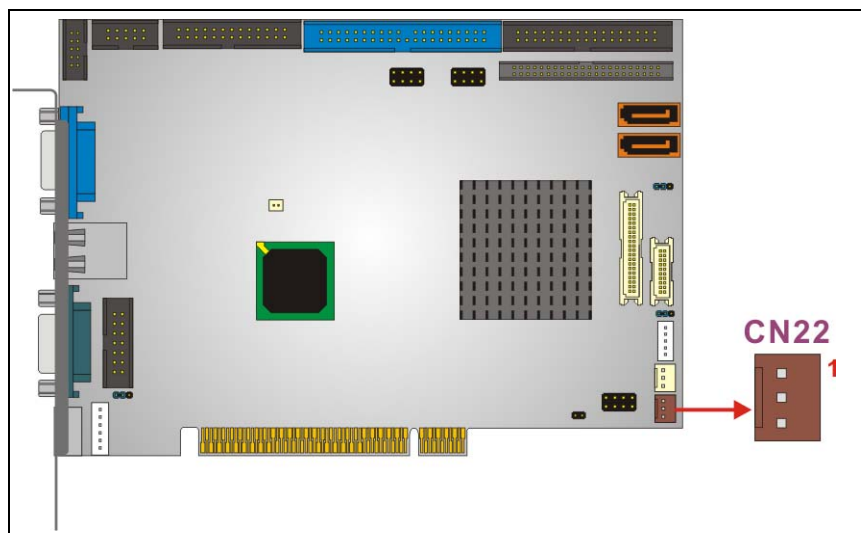
PIN NO.	DESCRIPTION
1	GND
2	TX1+
3	TX1-
4	GND
5	RX1-
6	RX1+
7	GND

Table 3-17: SATA Drive Connector Pinouts

### 3.2.15 Suspend Power Input Connector

- CN Label:** CN22
- CN Type:** 3-pin header (1x3)
- CN Location:** See Figure 3-17
- CN Pinouts:** See Table 3-18

The connector is for suspend power input and AT power select jumper.



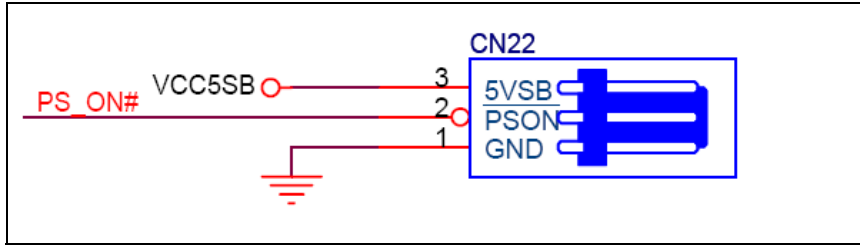


Figure 3-17: Suspend Power Input Connector Location

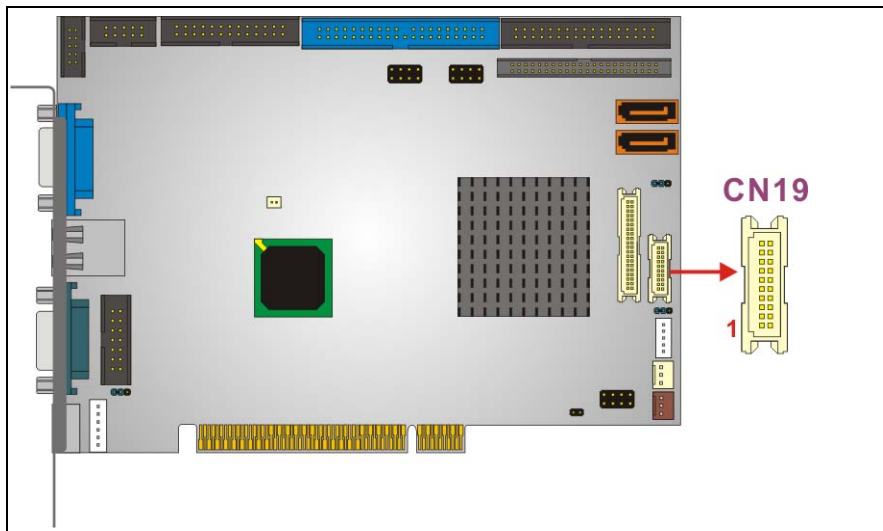
PIN NO.	DESCRIPTION
1	GND
2	PSON#
3	+5VSB

Table 3-18: Suspend Power Input Connector Pinouts

### 3.2.16 TFT LCD LVDS Connector

- CN Label:** CN19
- CN Type:** 20-pin header (2x10)
- CN Location:** See Figure 3-18
- CN Pinouts:** See Table 3-19

The TFT LCD LVDS connector can be connected to a TFT LCD screen directly.



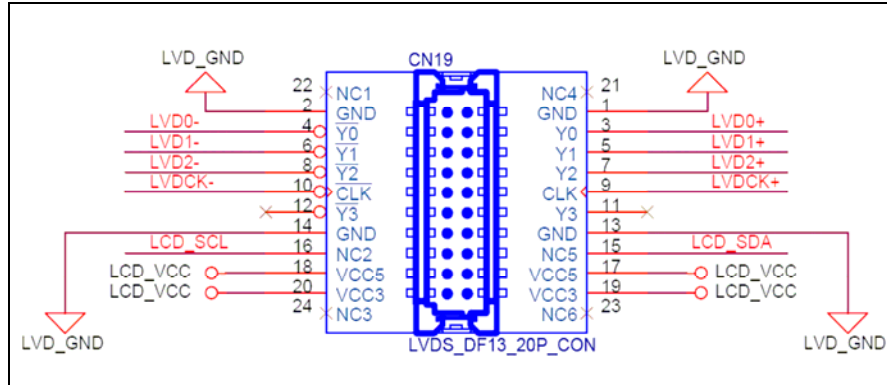


Figure 3-18: TFT LCD LVDS Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	D0+	4	D0-
5	D1+	6	D1-
7	D2+	8	D2-
9	CLK+	10	CLK-
11	NC	12	NC
13	GND	14	GND
15	SDA	16	SCL
17	LCD_VCC	18	LCD_VCC
19	LCD_VCC	20	LCD_VCC

Table 3-19: TFT LCD LVDS Port Connector Pinouts

### 3.2.17 TFT LCD TTL Connector

- CN Label:** CN18
- CN Type:** 40-pin header (2x20)
- CN Location:** See Figure 3-19
- CN Pinouts:** See Table 3-20

The TFT LCD TTL connector can be connected to a TFT LCD (TTL signal) screen directly.

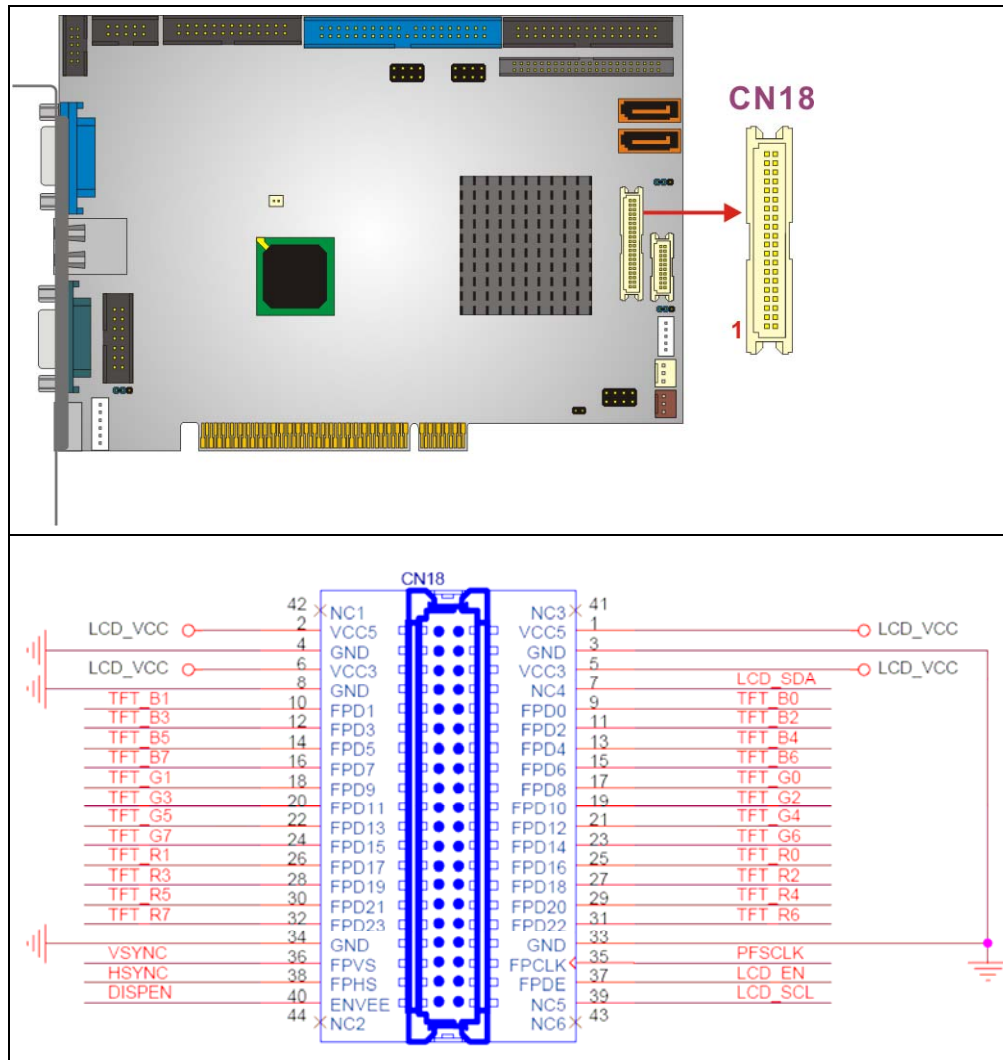


Figure 3-19: TFT LCD TTL Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_VCC	2	LCD_VCC
3	GND	4	GND
5	LCD_VCC	6	LCD_VCC
7	SDA	8	GND
9	B0	10	B1
11	B2	12	B3
13	B4	14	B5
15	B6	16	B7
17	G0	18	G1

19	G2	20	G3
21	G4	22	G5
23	G6	24	G7
25	R0	26	R1
27	R2	28	R3
29	R4	30	R5
31	R6	32	R7
33	GND	34	GND
35	CLK	36	VSYNC
37	LCD_EN	38	HSYNC
39	SCL	40	DISP_EN

**Table 3-20: TFT LCD TTL Port Connector Pinouts**

### 3.2.18 Internal USB Connectors

- CN Label:** CN12 and CN13
- CN Type:** 8-pin header (2x4)
- CN Location:** See Figure 3-20
- CN Pinouts:** See Table 3-21 and Table 3-22

The 2x4 USB pin connector provides connectivity to two USB 2.0 devices. The USB ports are used for I/O bus expansion.

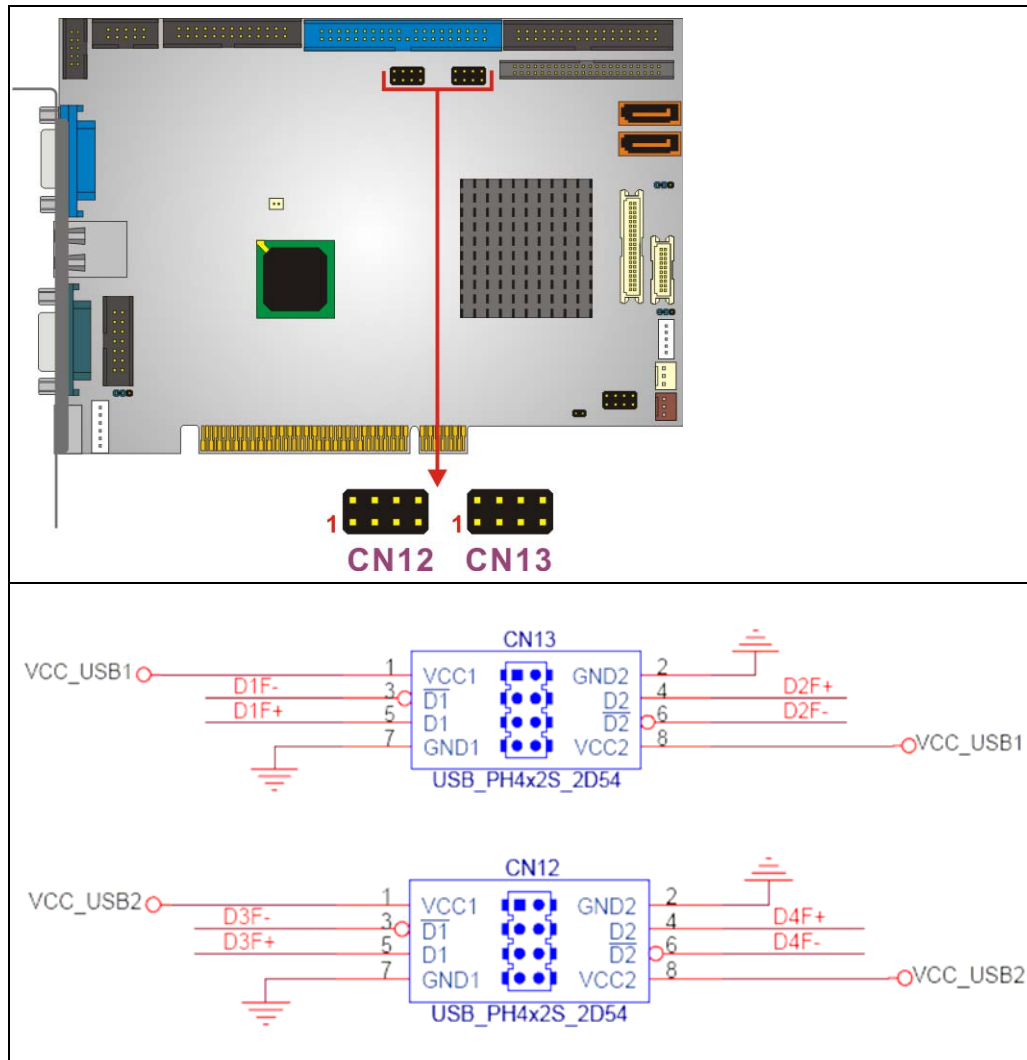


Figure 3-20: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	D3-	4	D4+
5	D3+	6	D4-
7	GND	8	+5V

Table 3-21: USB Port (CN12) Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	D1-	4	D2+
5	D1+	6	D2-

7	GND	8	+5V
---	-----	---	-----

Table 3-22: USB Port (CN13) Connector Pinouts

### 3.3 External Interface Connectors

#### 3.3.1 External Interface Connector Overview

Figure 3-21 shows the 3307880 CPU card external interface connectors. The 3307880 on-board external interface connectors are listed below and shown in Figure 3-21:

- 1 x Ethernet connector
- 1 x Keyboard/Mouse connector
- 1 x Serial communications port
- 1 x VGA port

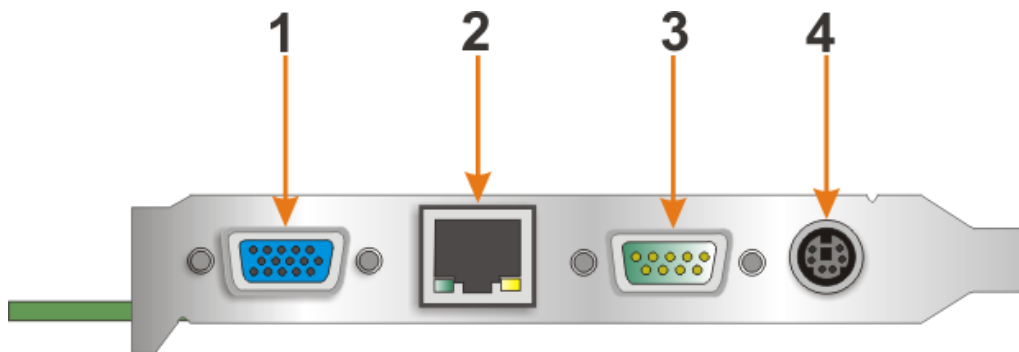


Figure 3-21: 3307880 On-board External Interface Connectors

#### 3.3.2 Ethernet Connector

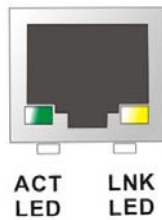
- CN Label:** CN5
- CN Type:** RJ-45
- CN Location:** See Figure 3-21 (labeled number 2)
- CN Pinouts:** See Table 3-23

A 10/100Mbps connection can be made between the Ethernet connector and a Local Area Network (LAN) through a network hub.



PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	5	N/C
2	N/C	6	RX-
3	TX-	7	N/C
4	RX+	8	N/C

**Table 3-23: Ethernet Connector Pinouts**



**Figure 3-22: Ethernet 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: Ethernet Connector LEDs**

### 3.3.3 Keyboard/Mouse Connector

**CN Label:** CN1

**CN Type:** PS/2

**CN Location:** See Figure 3-21 (labeled number 4)

The 3307880 Keyboard/Mouse connector is a standard PS/2 connector.

### 3.3.4 Serial Communications COM 1 Connector

- CN Label:** CN3
- CN Type:** RS-232 serial connector
- CN Location:** See Figure 3-21 (labeled number 3)
- CN Pinouts:** See Table 3-25 and Figure 3-23

The RS-232 serial connector provides serial connection in the RS-232 mode.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD#	2	RxD
3	TxD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#		

Table 3-25: COM1 Pinouts

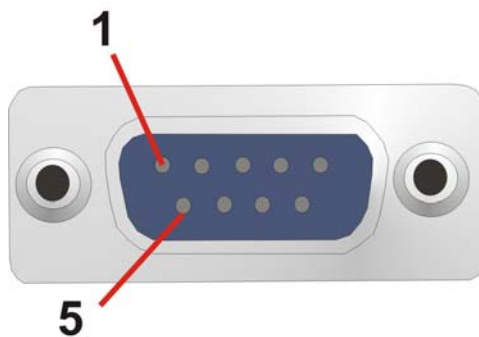


Figure 3-23: COM1 Pinout Locations

### 3.3.5 VGA Connector

- CN Label:** CN6
- CN Type:** VGA Connector

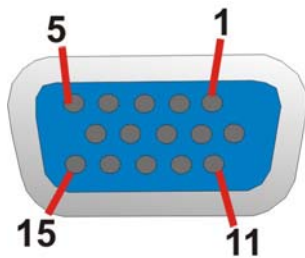
**CN Location:** See Figure 3-21 (labeled number 1)

**CN Pinouts:** See Table 3-26 and Figure 3-24

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

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

**Table 3-26: VGA Connector Pinouts**



**Figure 3-24: VGA Connector**

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Chapter

4

# Installation and Configuration

---

## 4.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3307880. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the 3307880 (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wrist band:** - Wearing a simple anti-static wrist band 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.

## 4.2 Installation Considerations

---



### NOTE:

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

---

### 4.2.1 Installation Notices

Before and during the installation of the 3307880, please **do** the following:

- Read the user manual:
  - The user manual provides a complete description of the 3307880, 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 CPU card on an antistatic pad:

- When installing or configuring the CPU card, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn off all power to the 3307880:
  - When working with the CPU card, 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 3307880 **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

---



#### NOTE:

If any of the items listed below are missing when the 3307880 is unpacked, do not proceed with the installation and contact the 3307880 reseller or vendor.

---

#### 4.3.1 Unpacking Precautions

Before installing the 3307880, unpack the CPU card. Some components on 3307880 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged, follow these precautions:

- The user should ground them self to remove any static charge before touching the 3307880. To do so wear a grounded wrist strap at all times or frequently touch any conducting materials that is connected to the ground.
- Handle the 3307880 by its edges. Do not touch the IC chips, leads or circuitry if not necessary.

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

## 4.3.2 Checklist

When unpacking the 3307880, please make sure that the package contains the following items.

- 1 x 3307880 PCI CPU card
- 1 x Mini jumper pack
- 1 x ATA 66/100 flat cable
- 1 x Audio cable
- 1 x KB/MS cable
- 1 x USB cable
- 1 x RS-232/422/485 cable
- 1 x Utility CD
- 1 x Quick Installation Guide
- ATA 33 44P/44P flat cable (optional)
- FDD cable (optional)LPT cable (optional)

If one or more of these items are missing, please contact Global American, Inc. and do not proceed any further with the installation.

## 4.4 3307880CPU card Installation



### **WARNING!**

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

---



### **WARNING!**

When installing electronic components onto the CPU card always take the anti-static precautions listed above in order to prevent ESD damage to the CPU card and other electronic components like the SO-DIMM modules

---



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

- SO-DIMM module
- Peripheral device connection

## 4.4.1 SO-DIMM Module Installation

### 4.4.1.1 Purchasing the Memory Module

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

- The 200-pin SO-DIMM socket can support a memory chip with a maximum size of 1GB
- The SO-DIMM socket supports DDR speeds of 333MHz and 400MHz

### 4.4.1.2 SO-DIMM Module Installation

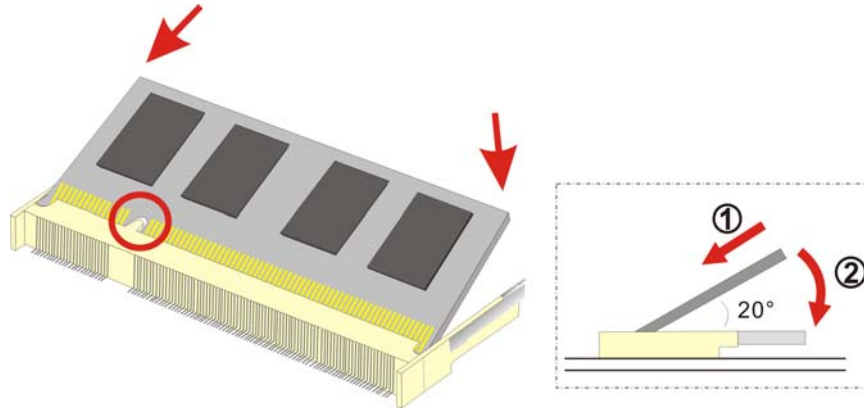
The 3307880 CPU card has one DDR SO-DIMM socket. To install the SO-DIMM module, follow the instructions below.

**Step 1:** Locate the SO-DIMM module socket on the solder side of the CPU card.

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

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

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



**Figure 4-1: SO-DIMM Module Installation**

#### 4.4.2 Peripheral Device Connection

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

Quantity	Type
1	Audio cable
1	ATA 66/100 flat cable
1	Keyboard/Mouse cable
1	RS-232/422/485 cable
1	USB cable
Optional	ATA 33 44P/44P flat cable
Optional	FDD cable
Optional	LPT cable

**Table 4-1: GAI Provided Cables**

##### 4.4.2.1 IDE Disk Drive Connector (CN11)

The cable used to connect the CPU card to the IDE HDD is a standard 40-pin ATA 66/100 flat cable. To connect an IDE HDD to the CPU card, follow the instructions below.

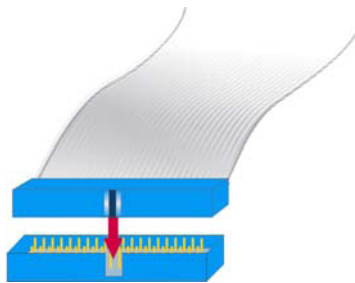
- Step 1:** Find the ATA 66/100 flat cable in the kit that came with the CPU card.
  - Step 2:** Connect one end of the cable to the CN11 connector on the CPU card. A keyed pin on the IDE connectors prevents it from being connected incorrectly.
  - Step 3:** Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.
  - Step 4:** Connect the other side of the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.
- 



## NOTE:

When two EIDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

---



**Figure 4-2: Connection of IDE Connector**

### 4.4.2.2 Floppy Drive Connector (CN14)

The floppy drive connector provides access to one (1) externally mounted floppy drive.

A 26-pin FPC connector cable is required for the connection to the floppy drive. The cable should come with a 26-pin FPC-cable connector and floppy disk drive connector on the other end. Follow the instructions below to connect an IDE HDD to the CPU card.

- Step 1:** Plug the 26-pin FPC-cable connector into CN14. Make sure that the red wire corresponds to pin one on the connector.

**Step 2:** Attach the appropriate connector on the other end of the cable to the floppy drive.

Only one connector in the set can be used.

#### 4.4.2.3 Parallel Port Connector (CN9)

The onboard parallel port connector (CN9) connects to a printer. The 3307880 comes with a multi-mode (ECP/EPP/SPP) parallel port. The parallel port interface features a 26-pin flat-cable connector that requires an adapter cable if a traditional DB-25 connector is used. The parallel port interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. The default interrupt channel is IRQ7. Select ECP or EPP DMA mode using the BIOS configuration utility.

#### 4.4.2.4 Audio Interface (CN7)

AC'97 Audio signals are interfaced through a 10-pin flat-cable connector. The signals include microphone line-in, line-in stereo and line-out stereo. An audio 10-pin-to-phone-jack adapter kit is required.

#### 4.4.2.5 COM Port Connectors (CN4)

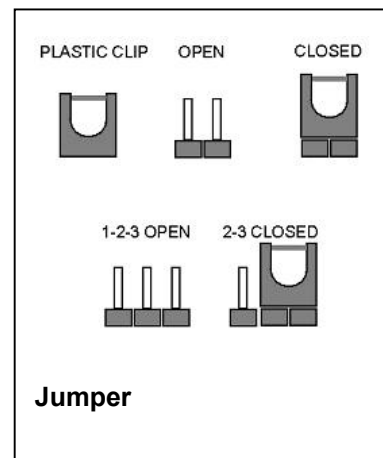
The 3307880 provides one internal RS-232/422/485 serial port interfaced through one 14-pin male header. The serial port facilitates the connection to serial devices or a communications network, e.g., terminal console.

## 4.5 Jumper Settings



### NOTE:

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



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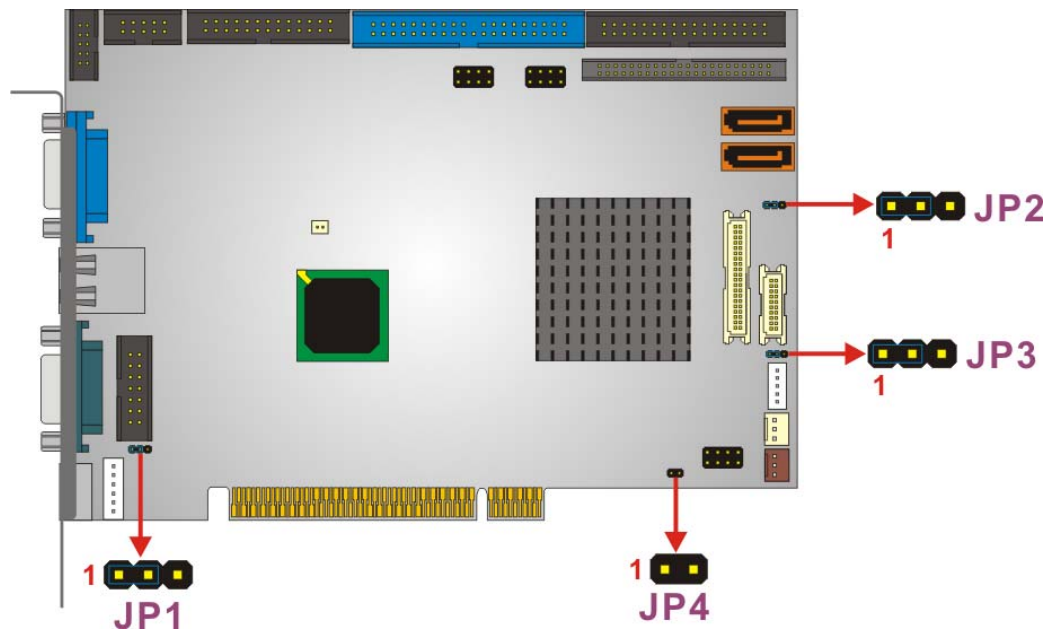
means removing the plastic clip from a jumper.

---

Before the 3307880 is installed in the system, the jumpers must be set in accordance with the desired configuration. The 3307880 CPU card has six on-board jumpers. The jumpers are described in **Table 4-2** and shown in **Figure 4-3**.

Description	Label	Type
AT power select	JP4	2-pin header
COM 3 mode setup	JP1	3-pin header
LCD clock select	JP2	3-pin header
LCD voltage select	JP3	3-pin header

**Table 4-2: Jumpers**



**Figure 4-3: Jumper Locations**

### 4.5.1 Clear CMOS Jumper



#### NOTE:

The battery connector (CN10) is used as the clear CMOS jumper on the 3307880.

<b>Jumper Label:</b>	CN10
<b>Jumper Type:</b>	2-pin header
<b>Jumper Settings:</b>	See Table 4-3
<b>Jumper Location:</b>	See Figure 4-3

If the 3307880 fails to boot due to improper BIOS settings, use this connector to clear the CMOS data and reset the system BIOS information. To do this, disconnect CN10 and keep it disconnected for at least five seconds. After five seconds has elapsed, reinsert the connector.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

Clear CMOS	DESCRIPTION
Closed	Keep CMOS Setup
Open	Clear CMOS Setup

**Table 4-3: Clear CMOS Jumper Settings**

### 4.5.2 AT Power Select Jumper Settings

<b>Jumper Label:</b>	JP4
<b>Jumper Type:</b>	2-pin header
<b>Jumper Settings:</b>	See Table 4-4
<b>Jumper Location:</b>	See Figure 4-3

The AT/ATX Power Mode Select jumper specifies the systems power mode. Jumper settings are shown in **Figure 4-3**.

AT Power Select	Description	
Short	Use AT power	Default
Open	Use ATX power	

**Table 4-4: AT Power Select Jumper Settings**

### 4.5.3 COM3 Setup Jumper Settings

<b>Jumper Label:</b>	JP1
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See Table 4-5
<b>Jumper Location:</b>	See Figure 4-3

The 3307880 COM3 serial port setup jumper settings are shown in **Figure 4-3**. The COM3 port can be configured as an RS-422 serial port or as an RS-485 serial port.

COM 3 Setup	Description	
Short Pin 1 ~ Pin 2	RS-422	
Short Pin 2 ~ Pin 3	RS-485	Default

**Table 4-5: COM3 Setup Jumper Settings**

#### 4.5.4 LCD Clock Select Jumper

<b>Jumper Label:</b>	JP2
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See Table 4-6
<b>Jumper Location:</b>	See Figure 4-3

Use LCD clock select jumper to select LCD clock situation. The settings are shown in **Table 4-6**.

JP2	Description	
Short Pin 1 ~ Pin 2	Normal clock	Default
Short Pin 2 ~ Pin 3	Invert clock	

**Table 4-6: LCD Clock Select Jumper Settings**

#### 4.5.5 LCD Voltage Select Jumper



#### **WARNING:**

Making the wrong setting on this jumper may cause irreparable damage to both the CPU card and the LCD screen connected to the onboard connector.

<b>Jumper Label:</b>	JP3
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See Table 4-7
<b>Jumper Location:</b>	See Figure 4-3

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the



required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 4-7**.

JP3	Description	
Short Pin 1 ~ Pin 2	+3.3V	Default
Short Pin 2 ~ Pin 3	+5V	

**Table 4-7: LCD Voltage Select Jumper Settings**

## 4.6 Chassis Installation

The CPU card can be mounted into a chassis only after the CPU, the cooling kit, and the SO-DIMM module have been installed, the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configured. Refer to the chassis user guide for instructions on how to mount the CPU card into a chassis.

## 4.7 Rear Panel Connectors

### 4.7.1 LCD Panel Connection

The conventional CRT monitor connector, VGA1, is a 15-pin, female D-SUB connector. Pin assignments can be seen in that can be connected to external monitors.

### 4.7.2 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 1Gb/s.

### 4.7.3 Serial Connection

The rear panel serial connector (CN3) provides easy and quick access to external serial devices

### 4.7.4 Keyboard and Mouse Connection

A PS/2 keyboard and a PS/2 mouse can be connected to the appropriate PS/2 connector on the rear panel.

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Appendix

A

# Watchdog Timer

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**NOTE:**

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

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

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

**INT 15H:**

<b>AH – 6FH Sub-function:</b>	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

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

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

**Example program:**

```

; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

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

;
; ADD YOUR APPLICATION PROGRAM HERE
;

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

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

;
; EXIT ;

```

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Appendix

**B**

# Address Mapping

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## B.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-05F	8254 timer
060-06F	Keyboard Controller
070-07F	NMI Mask/Real time Clock
080-09F	DMA Controller
0A0-0BF	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F8	Fixed Disk
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table B-1: IO Address Map

## B.2 1st MB Memory Address Map

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

Table B-2: 1<sup>st</sup> MB Memory Address Map



### B.3 IRQ Mapping Table

IRQ	Description	IRQ	Description
IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	Available
IRQ2	Cascade to IRQ Controller	IRQ10	AC '97 CODEC
IRQ3	COM2	IRQ11	Intel 82562ET LAN
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Available	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Parallel Port	IRQ15	Secondary IDE

Table B-3: IRQ Mapping Table

### B.4 DMA Channel Assignments

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

Table B-4: DMA Channel Assignments

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Appendix

C

# External AC'97 Audio CODEC

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## C.1 Introduction

The motherboard comes with an on-board Realtek ALC203 CODEC. Realtek ALC203 is a 20-bit DAC and 18-bit ADC full duplex AC'97 Rev. 2.3 compatible audio CODEC.

### C.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through three phone jacks on the rear panel of the motherboard.

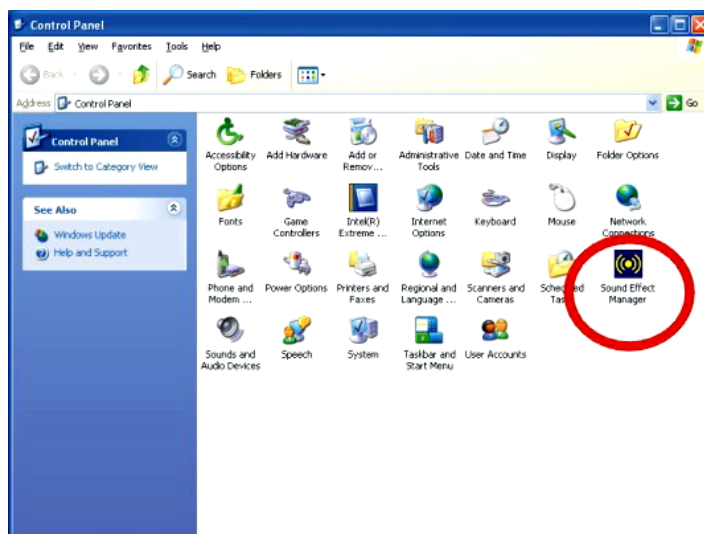
The phone jacks include:

3. A LINE input shared with surround output
4. A MIC input shared with Center and LFE output
5. A LINE output
6. A MIC input line.

### C.1.2 Driver Installation

The driver installation has been described in **Chapter 6, Section 6.3**.

After rebooting the sound effect configuration utility appears in the Windows Control Panel (see **Figure C-1**). If the peripheral speakers are properly connected, sound effects should be heard.



**Figure C-1: Sound Effect Manager Icon**

## C.2 Sound Effect Configuration

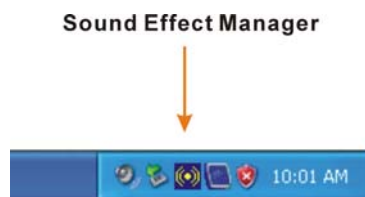
### C.2.1 Accessing the Sound Effects Manager

To access the **Sound Effects Manager**, please do the following:

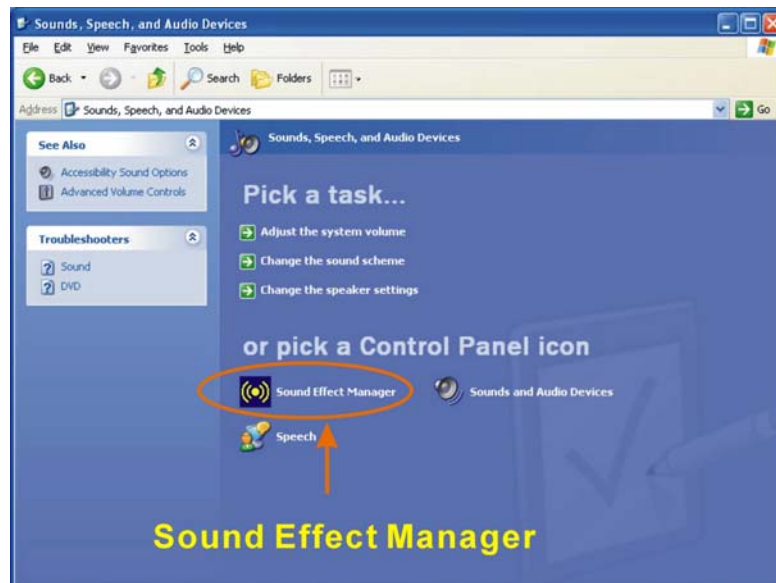
**Step 1:** Install the audio CODEC driver.

**Step 2:** Click either:

- The Sound Effect Manager icon in the Notification Area of the system task bar (see **Figure C-2**), or
- The Sound Effect Manager icon in the Control Panel (see **Figure C-3**).

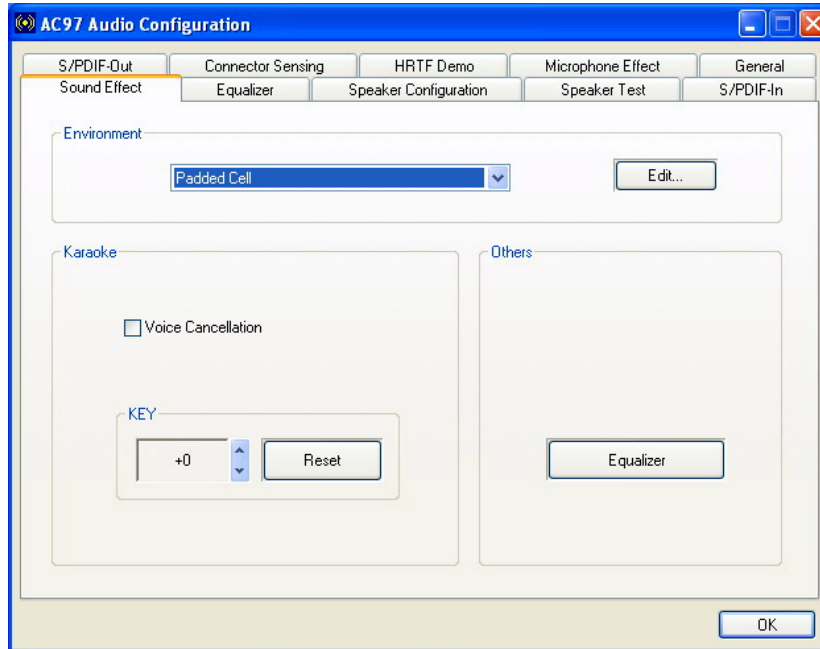


**Figure C-2: Sound Effect Manager Icon [Task Bar]**



**Figure C-3: Sound Effect Manager Icon [Control Panel]**

**Step 3:** The sound effect manager appears. (See **Figure D-4**)



**Figure C-4: Sound Effects Manager (ALC203)**



**NOTE:**

The Sound Effect Manager shown in **Figure C-4** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

### **C.2.2 Sound Effect Manager Configuration Options**

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** in **Figure C-4**.

**NOTE:**

The **Karaoke Mode** is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

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- Sound Effect
  - Karaoke Mode
  - Equalizer
  - Speaker Configuration
  - Speaker Test
  - S/PDIF-In
  - S/PDIF-Out
  - Connector Sensing
  - HRTF Demo
  - Microphone Effect
  - General
- 

**NOTE:**

Not all RealTek **Sound Effect Managers** have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

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Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- **Sound Effect**:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click “**EDIT**.”
- **Karaoke Mode**:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enables users to define a key

that fits a certain vocal range.

- **Equalizer Selection:**- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
  
- **Speaker Configuration:**- Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings
  
- **Speaker Test:**- Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
  
- **S/PDIF-In & S/PDIF-Out:**- These functions are currently not supported.
  
- **Connector Sensing:**- Realtek ALC655 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in a warning message appears.
  
- **HRTF Demo:**- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.
  
- **Microphone Effect:**- Microphone noise suppression is enabled in this menu.
  
- **General:**- General information about the installed AC'97 audio configuration utility is listed here.



Appendix

D

# ALi<sup>®</sup> RAID for SATA

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## D.1 Introduction

The ALi M5283 SATA RAID chipset can control parallel ATA (PATA) and serial ATA (SATA) disks. The ALi controller supports PATA UDMA transfer mode up to mode 6 and SATA 1 disk drives. The ALi M5283 also has a cost-effective RAID functionality that can increase the data read/write speed and provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID 1).



### CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

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### D.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.



### WARNING!

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.



### CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the

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cables within the chassis to avoid system down time.

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## D.2 Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Supported Operating Systems include: Windows 98/Me, Windows 2000 and Windows XP
- Windows-based software for RAID management

## D.3 Accessing the ALi RAID Utility

To access the **Ali RAID Utility**, please follow the steps below:

- Step 4:** 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.

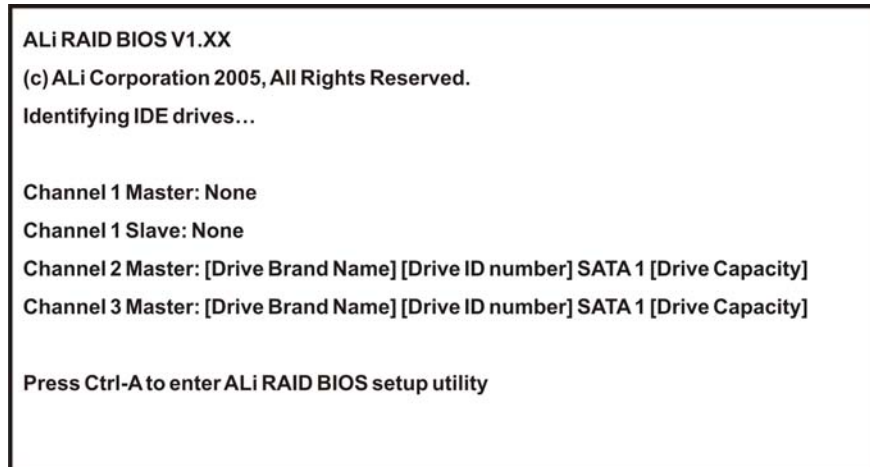


### NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration (JBOD, RAID 0 or RAID 1). If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

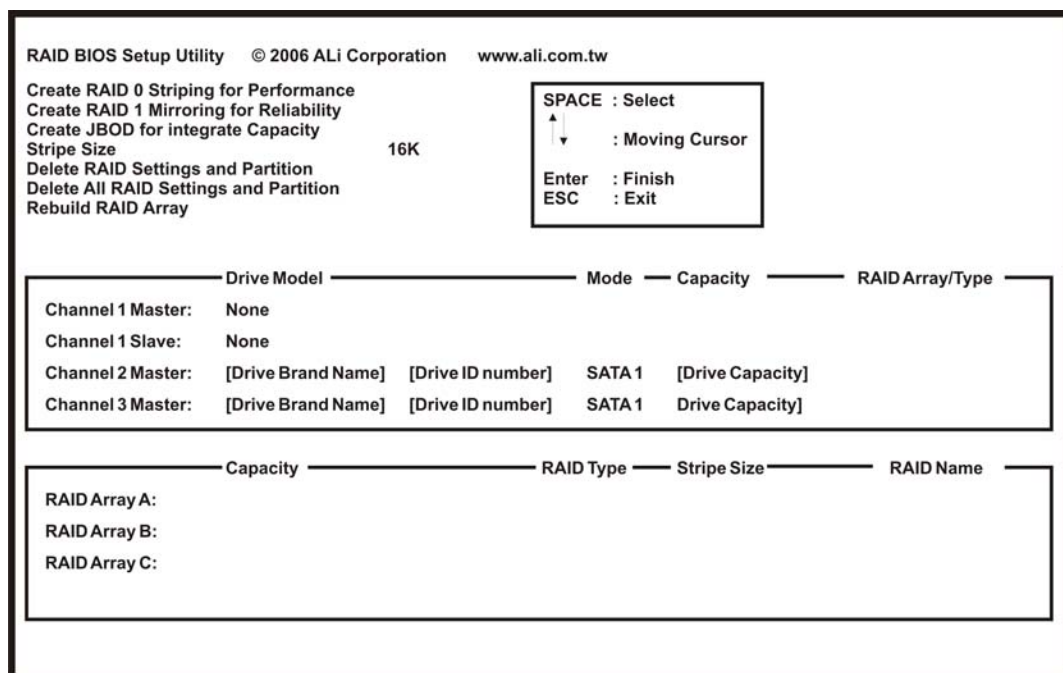
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- Step 5:** Enable SATA drives in BIOS. Start the computer and access the Phoenix Award BIOS setup program. Next, open the Advanced BIOS Features menu. Enable the SATA BOOT ROM Control BIOS option.
- Step 6:** Save and Exit BIOS. After the SATA BOOT ROM Control BIOS option is enabled, save and exit the BIOS.
- Step 7:** Reboot the system. Reboot the system after saving and exiting the BIOS.
- Step 8:** Press Ctrl-A. When the screen in Figure 6-38 appears press Ctrl-A to enter the ALi RAID BIOS setup program.



**Figure 6-38: Accessing ALi RAID BIOS Utility**

**Step 9:** Delete RAID settings and partitions. The RAID BIOS Setup Utility in **Figure 6-39** appears. Before configuring the array select the “Delete All RAID Setting & Partition”.



**Figure 6-39: RAID BIOS Setup Utility**

**Step 10:** Configure the RAID settings. Use the RAID BIOS Setup Utility in **Figure 6-39** to configure the RAID array. Brief descriptions are given below.

**Step 11:** Install the OS. After the RAID array has been configured (see below) install the

OS. To do this, please refer to the documentation that came with the OS.

## D.4 RAID Options:

### D.4.1 Create RAID 0 Striping for Performance

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#### **WARNING!**

All data previously stored on the member drives of a RAID configuration **are destroyed** during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

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- Step 1:** Select “Create RAID 0 Striping for Performance”. Use the arrow keys to highlight Create RAID0 Striping for Performance and press ENTER. A flashing ‘S’ appears on the Drive Menu where the member drives to be included in the RAID 0 array can be chosen.
- Step 2:** Select RAID array drive members. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case ‘s’ once any of the connected disk drives has been selected. Follow the same method to select another member drive.
- Step 3:** Confirm. The Create RAID0(Y/N) confirm box appears. Press Y.
- Step 4:** Name the array. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.
- 



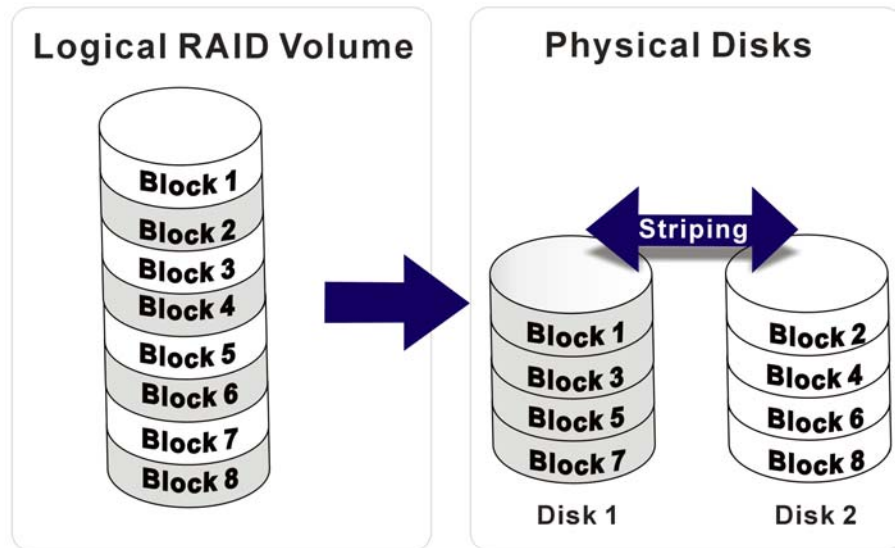
#### **NOTE:**

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 0 array. Avoid
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mixing PATA and SATA disk drives in a RAID 0 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.




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#### D.4.2 Create RAID 1 Mirroring for Reliability

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#### WARNING!

All data previously stored on the member drives of a RAID configuration is **destroyed** during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

- 
- Step 1:** Select “Create RAID 1 Striping for Reliability”. Use the arrow keys to highlight Create RAID 1 Striping for Reliability and press ENTER. A flashing ‘S’ appears on the Drive Menu where the member drives to be included in the RAID 0 array can be chosen.
  - Step 2:** Select RAID array drive members. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case ‘s’ once any of the connected disk drives has been selected. Follow the same method to select

another member drive.

**Step 3:** Confirm. The Create RAID0(Y/N) confirm box appears. Press Y.

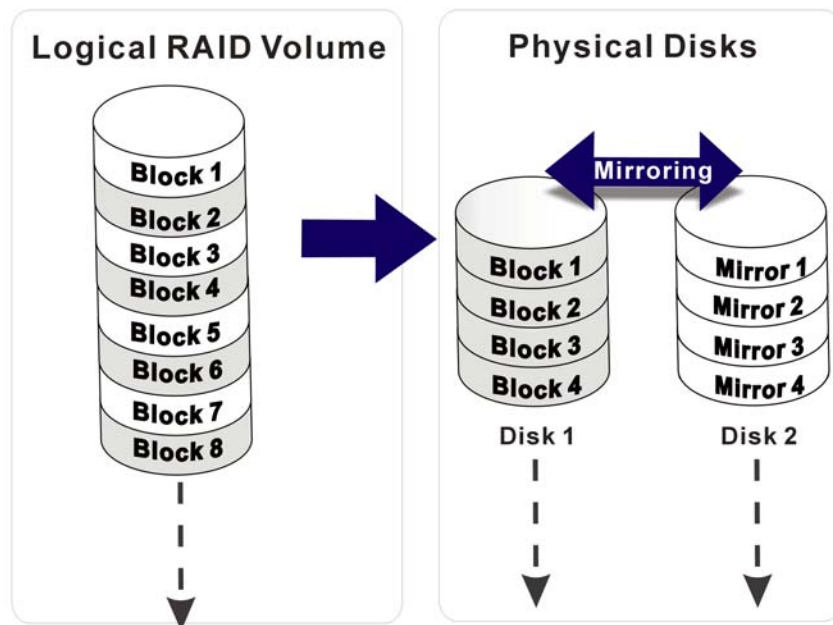
**Step 4:** Name the array. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array

**Step 5:** View the array. A prompt appears to proceed with drive copy. The Source and Destination drives are indicated as "M" and "m" in the Drive Menu.



**NOTE:**

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 1 array. Avoid mixing PATA and SATA disk drives in a RAID 1 array.
2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.



### D.4.3 Create JBOD for Integrated Capacity

JBOD is defined as “Just a Bunch of Drives.” JBOD provides neither performance gains nor data redundancy.



#### **WARNING!**

All data previously stored on the member drives of a RAID configuration is **destroyed** during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

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- Step 1:** Select “Create JBOD for Integrated Capacity”. Use the arrow keys to highlight Create JBOD for Integrated Capacity and press ENTER. A flashing ‘J’ appears on the Drive Menu where the member drives to be included in the JBOD array can be chosen.
- Step 2:** Select RAID array drive members. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case ‘s’ once any of the connected disk drives has been selected. Follow the same method to select another member drive.
- Step 3:** Confirm. The Create RAID 0 (Y/N) confirm box appears. Press Y.
- Step 4:** Name the array. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array



#### **NOTE:**

To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID1 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID1 array.

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## D.4.4 Stripe Size

Changing the stripe size effects RAID 0 arrays. Configurable options are:

- 64K (default)
- 32K
- 16K
- 8K
- 4K

Select a small stripe size if the I/Os to the hard drives are small and occur randomly. Choose a larger stripe size if the I/Os are mostly large and come in sequential orders, e.g., A/V playback and editing applications. The default value should be appropriate for most applications.

## D.4.5 Delete RAID Setting & Partition

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### WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

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**Step 1:** Delete a RAID setting. Use the arrow keys to highlight Delete RAID Setting & Partition and press ENTER. A flashing 'E' appears at the Drive Menu where the member drives to be removed can be chosen.

**Step 2:** Confirm Delete. The Data on RAID drives will be erased (Y/N) confirm box appears. Press Y.

## D.4.6 Delete All RAID Setting & Partition

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### WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

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**Step 1:** Delete RAID Settings. Use the arrow keys to highlight Delete All RAID Setting & Partition and press ENTER.

**Step 2:** Confirm delete. The Data on RAID drives will be erased (Y/N) confirm box appears. Press Y.

#### D.4.7 Rebuild RAID Array

The **Rebuild RAID Array** option can rebuild a RAID array if a member of a RAID configuration should fail. Neither RAID 0 nor JBOD provides data redundancy. The **Rebuild RAID Array** option only applies to RAID1 arrays and is applicable when a member of a RAID1 configuration has failed.

**Step 1:** Select Rebuild Array. Use the arrow keys to highlight Rebuild RAID Array and press ENTER. A flashing 'R' appears in the list of existing arrays. The source and destination drives will be displayed.

**Step 2:** Confirm rebuild array. Press Y to begin the rebuild process.



#### **NOTE:**

A status bar will indicate the rebuild progress. Rebuild consumes considerable system resources and the time required for rebuilding a RAID array may vary depending on the size of stored data, disk drive capacity, and drive performance.

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#### D.4.8 Select Boot Drive

**Step 1:** Select the Boot Drive. Use the arrow keys to highlight Select Boot Drive and press ENTER. A flashing 'A' appears at the Drive Menu where the boot drive can be chosen.

**Step 2:** Press **ENTER**. Press ENTER or the space bar to finish the configuration.

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Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



Address: Global American, Inc.  
17 Hampshire Drive  
Hudson, NH 03051

Telephone: Toll Free (U.S. Only) 800-833-8999  
(603)886-3900

FAX: (603)886-4545

Website: <http://www.globalamericaninc.com>

E-Mail: [salesinfo@globalamericaninc.com](mailto:salesinfo@globalamericaninc.com)

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