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**User's Manual**

**Single Board Computer 3307675**

**Version 1.0, April 2007**

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# Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the GLOBAL AMERICAN, INC. reseller or vendor you purchased the 3307675 from or contact a Global American sales representative directly. To contact a Global American sales representative, please send an email to salesinfo@globalamericaninc.com.

The items listed below should all be included in the 3307675 package.

- 1 x 3307675 single board computer
- 1 x IDE cable
- 3 x SATA power cables
- 6 x SATA cables
- 1 x Dual RS-232 cable
- 1 x USB cable
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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# Glossary

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

**Chapter**

**1**

# Introduction

## 1.1 Overview

The 3307675 PICMG 1.3 form factor CPU card is a LGA775 Intel® Core™2 Quad, Pentium® D, Pentium® 4 or Celeron® D platform. Up to 8GB of DDR2 SDRAM and up to six SATA II hard disk drives (HDD) are supported. High-performance PCI Express (PCIe) Gigabit Ethernet (GbE) connectivity is integrated into the system. Six USB 2.0 connectors (two external and four internal) enable system flexibility and expansion.

### 1.1.1 3307675 Expansion Options

The 3307675 PICMG 1.3 form factor enables PCIe x16, PCIe x4, PCIe x1 and PCI expansion cards to easily be added to the PICMG 1.3 compatible backplane the 3307675 is installed on. Expansion cards in the combinations shown in **Table 1-1** below can be installed on compatible backplanes.

|  | PCIe x16 | PCIe x4 | PCIe x1 | PCI |
|---|---|---|---|---|
| **Combination 1** | 1 | 1 | 0 | 4 |
| **Combination 2** | 1 | 0 | 4 | 4 |
| **Combination 3** | 0 | 1 | 1 | 4 |
| **Combination 4** | 0 | 0 | 5 | 4 |

**Table 1-1: Technical Specifications**

### 1.1.2 3307675 Features

Some of the 3307675 features are listed below.

- Supports LGA775 Intel® CPUs including:
    - Intel® Core™2 Quad
    - Intel® Core™2 Duo
    - Intel® Pentium® D
    - Intel® Pentium® 4
    - Intel® Celeron® D
- Maximum FSB of 1066MHz
- Supports four 240-pin 533MHz, 667MHz or 800MHz 2GB DDR2 memory modules

■ Six SATA II drives with transfer rates of 3.0Gb/s supported

■ Two Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported

■ Six USB 2.0 devices supported

■ Dual PCIe GbE Ethernet connectors

■ PICMG 1.3 form factor

■ RoHS compliant

■ Supports ATX power supplies

## 1.2 3307675 Overview

### 1.2.1 3307675 Overview Photo

The 3307675 has a wide variety of peripheral interface connectors. **Figure 1-1** is a labeled photo of the peripheral interface connectors on the 3307675.
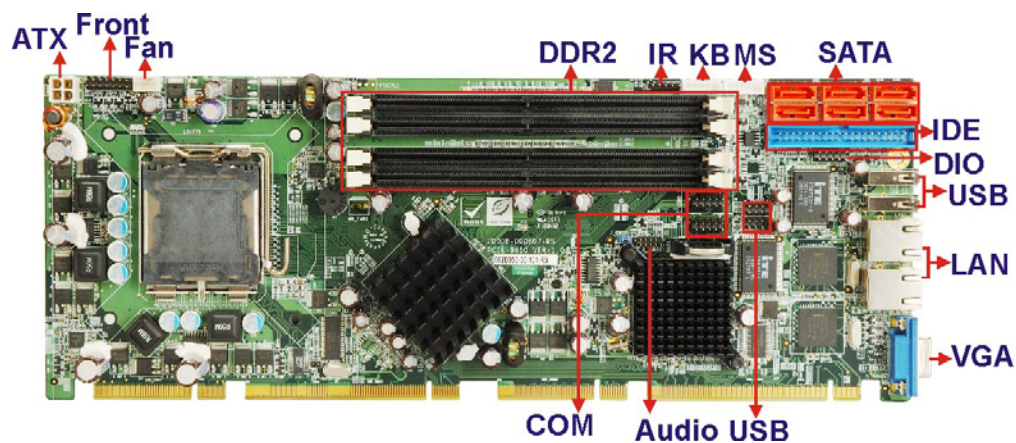


**Figure 1-1: 3307675 Overview [Front View]**

### 1.2.2 3307675 Peripheral Connectors and Jumpers

The 3307675 has the following connectors on-board:

■ 1 x ATX power connector

■ 1 x Audio connector

■ 1 x Digital input/output connector

■ 1 x Fan connector

■ 1 x Front panel connector

■ 1 x IDE disk drive connector

- 1 x Infrared interface connector
- 1 x Keyboard connector
- 1 x Mouse connector
- 6 x Serial ATA II (SATA II) drive connectors
- 2 x Serial port connectors
- 2 x USB 2.0 connectors

The 3307675 has the following external peripheral interface connectors on the board rear panel

- 2 x Ethernet connectors
- 2 x USB 2.0 port connectors
- 1 x VGA connector

The 3307675 has the following on-board jumpers:

- Clear CMOS

## 1.2.3 Technical Specifications

3307675 technical specifications are listed in **Table 1-2**. See **Chapter 2** for details.

| Specification | 3307675 |
|---|---|
| Form Factor | PICMG 1.3 |
| System CPU | LGA775 Intel® Core™ 2 Quad<br><br>LGA775 Intel® Core™ 2 Duo<br><br>LGA775 Intel® Pentium® D<br><br>LGA775 Intel® Pentium® 4<br><br>LGA775 Intel® Celeron® D |
| Front Side Bus | 533MHz, 800MHz or 1066MHz |
| System Chipset | **Northbridge**: Intel® Q965<br><br>**Southbridge**: Intel® ICH8DO |

## 3307675 PICMG 1.3 CPU Card

| | |
|---|---|
| **Memory** | Four dual channel 240-pin DDR2 DIMM sockets support four 533MHz, 667MHz or 800MHz DIMMs with a maximum capacity each with a maximum capacity of 2GB |
| **Display** | VGA integrated into the Intel® Q965 |
| **BIOS** | AMI Flash BIOS |
| **Audio** | 7.1 channel HD audio kit with Realteck ALC883 and dual audio streams supported |
| **LAN** | Dual Intel® PC82573L PCIe GbE chipset |
| **COM** | Two RS-232 serial ports (two internal, one external) |
| **USB2.0** | Six USB 2.0 devices supported |
| **IDE** | One 40-pin IDE connector connects to two Ultra ATA33/66/100 devices |
| **SATA** | Six 3.0Gb/s SATA II drives supported |
| **Keyboard/mouse** | One internal keyboard connector<br>One internal mouse connector |
| **Watchdog Timer** | Software programmable 1-255 sec. by super I/O |
| **Power Supply** | ATX power only |
| **Power Consumption** | 5V@8.93A, 12V@7.42A and 3.3V@6.42A<br>(Intel® Core™2 Extreme QX6700 2.66GHz, 4GB 800MHz DDR2) |

| Temperature | 0ºC – 60ºC (32ºF - 140ºF) |
|---|---|
| Humidity (operating) | 5%~95% non-condensing |
| Dimensions (LxW) | 338mm x 122mm |
| Weight (GW/NW) | 1200g/ 474g |

**Table 1-2: Technical Specifications**

Chapter

2

# Detailed Specifications

## 2.1 Dimensions

### 2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**:        338mm
- **Width**:        122mm
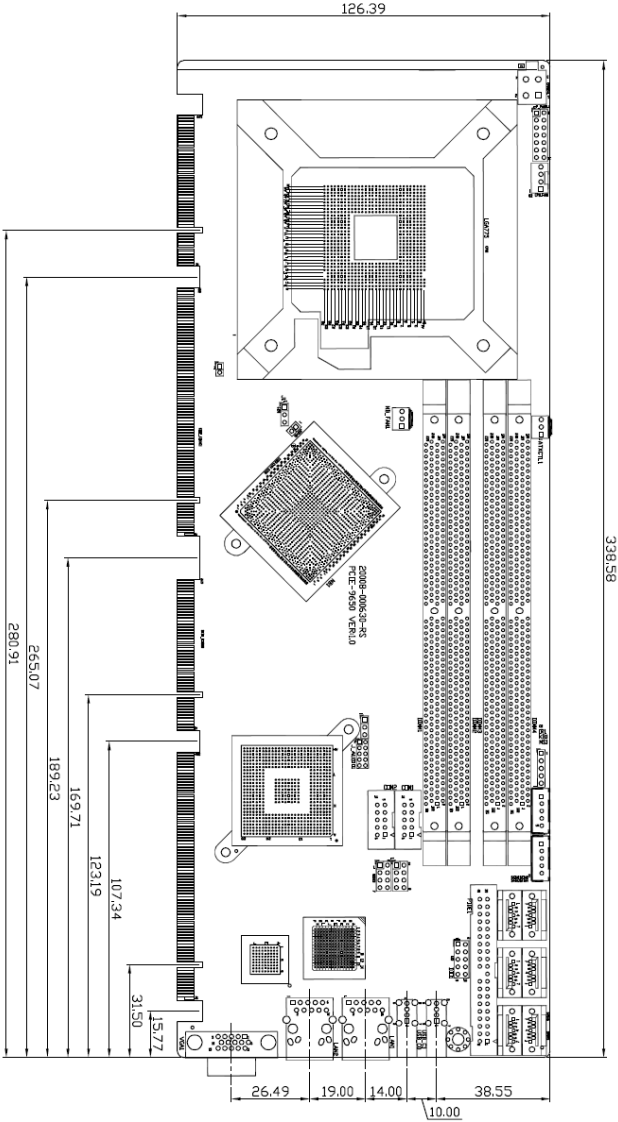


**Figure 2-1: 3307675 Dimensions (mm)**

### 2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.
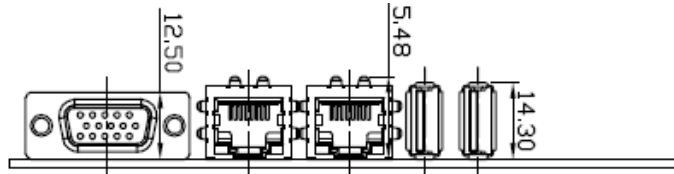


**Figure 2-2: External Interface Panel Dimensions (mm)**

## 2.2 Data Flow

**Figure 2-3** 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.
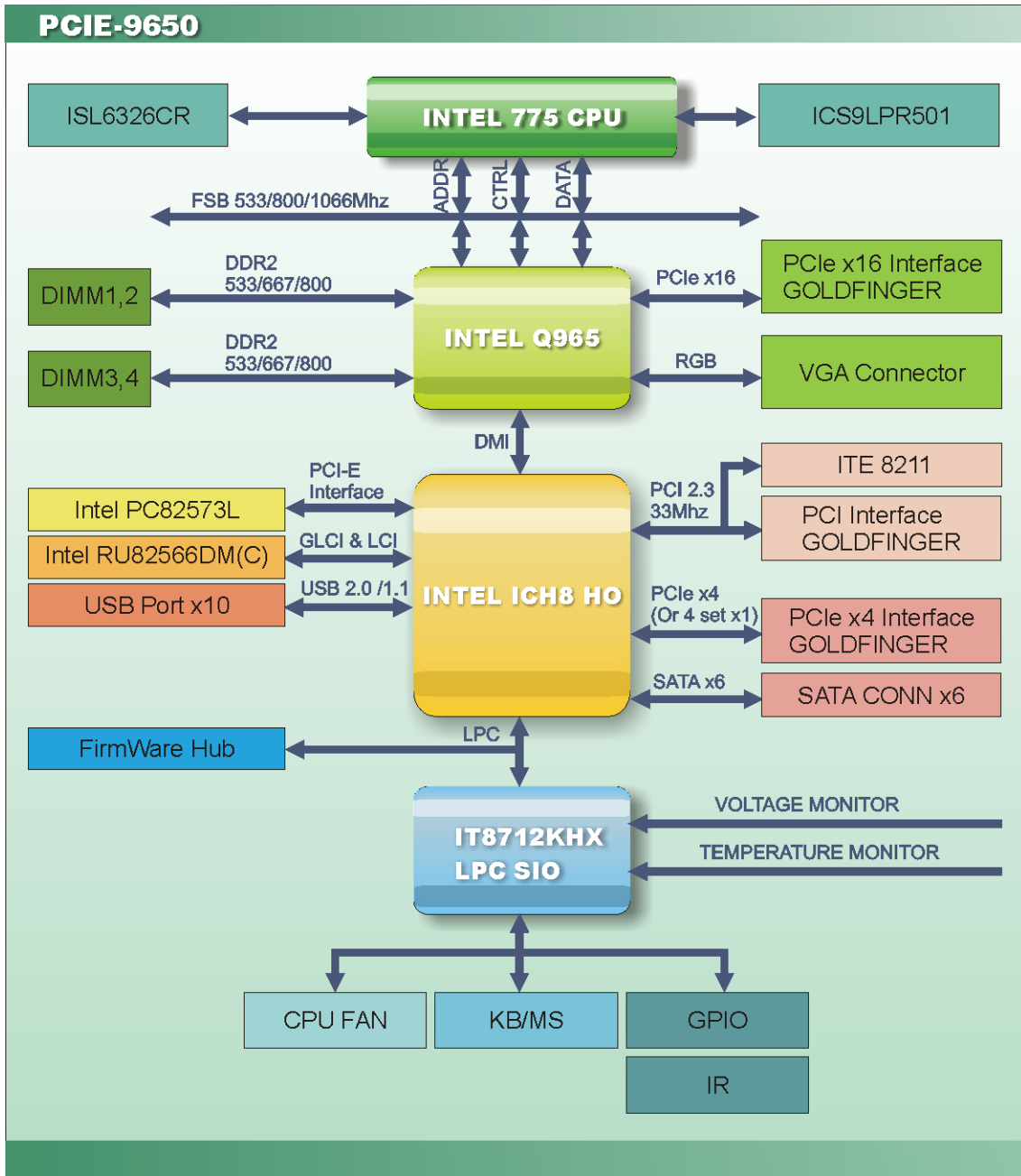
**Figure 2-3: Data Flow Block Diagram**

## 2.3 Compatible Processors

The 3307675 supports the following LGA775 processors:

- Intel® Core™2 Quad
- Intel® Core™2 Duo
- Intel® Pentium® D
- Intel® Pentium® 4
- Intel® Celeron® D

All of the above processors are interfaced with an Intel® Q965 northbridge chipset through the front side bus (FSB). Features of the supported processors are listed in sections below.

### 2.3.1 Intel® Core™2 Quad Features

Intel® Core™2 Quad features include:

- Four processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability
- Intel® Smart Memory Access
- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

### 2.3.2 Intel® Core™2 Duo Features

Intel® Core™2 Duo features include:

- Two processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability Intel® Smart Memory Access
- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

### 2.3.3 Intel® Pentium® 4 Features

Intel® Pentium® 4 features include:

- Hyper-Threading Technology
- Enhanced Intel SpeedStep® Technology
- Intel® Extended Memory 64 Technology
- Execute Disable Bit

### 2.3.4 Intel® Pentium® D Features

Intel® Pentium® D features include:

- Dual core processing improves performance and multimedia management
- Intel® Visualization Technology
- Dual 2MB level 2 cache
- 800MHz FSB
- Execute Disable Bit
- Intel® Extended Memory 64 Technology
- Enhanced Intel SpeedStep® Technology
- Streaming SIMD solutions

### 2.3.5 Intel® Celeron® D Features

Intel® Celeron® D features include:

- Intel® Extended Memory 64 Technology
- 512KB Level 2 cache
- 533MHz FSB
- Execute Disable Bit
- Streaming SIMD solutions

## 2.4 Intel® Q965 Northbridge Chipset

### 2.4.1 Intel® Q965 Overview

The Intel® Q965 (G)MCH supports LGA775 processors. The (G)MCH supports a FSB frequency of 533 MHz, 800 MHz or 1066 MHz. Some of the features of the Intel® Q965 (G)MCH Include:

- Support for the following processors.
    - Intel® Core™2 Quad
    - Intel® Core™2 Duo
    - Intel® Pentium® D
    - Intel® Pentium® 4
    - Intel® Celeron® D
- Supports Hyper-Threading Technology (HT Technology)
- Supports FSB Dynamic Bus Inversion (DBI)
- Supports 36-bit host bus addressing, allowing the processor to access the entire
- 64 GB of the (G)MCH's memory address space
- Has a 12-deep In-Order Queue to support up to twelve outstanding pipelined address requests on the host bus
- Has a 1-deep Defer Queue
- Uses GTL+ bus driver with integrated GTL termination resistors
- Supports a Cache Line Size of 64 bytes

### 2.4.2 Intel® Q965 Memory Support

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⚡ **WARNING:**

Only DDR2 memory module can be installed on the 3307675. Do not

install DDR memory modules. If a DDR memory module is installed on

the 3307675, the 3307675 may be irreparably damaged.

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The Intel® Q965 supports up to four 2GB DDR2 DIMMs with the following specifications:

- Only un-buffered DIMMs supported

- DDR2 only

- Maximum supported bandwidth (assuming DDR2 800 MHz):

  - *Single-channel*: 6.4 GB/s

  - *Dual-channel asymmetric mode*: 6.4 GB/s

  - *Dual-channel interleaved mode*: 12.8 GB/s

- Capacities of 256MB, 512MB, 1GB or 2GB

- Transfer speeds of 533MHz, 667MHz or 800MHz

The memory sockets are shown in Figure 2-4.
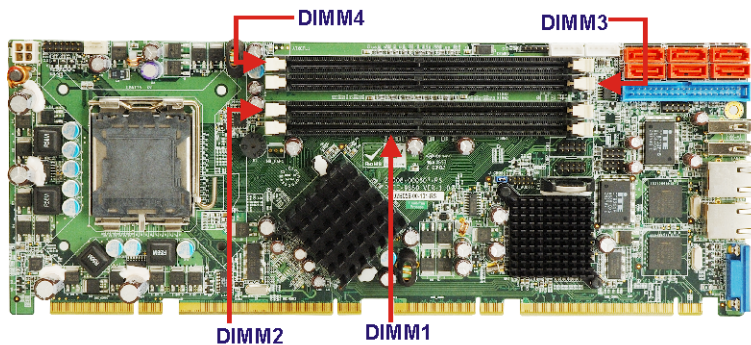


**Figure 2-4: 240-pin DIMM Socket**

## 2.4.2.1 Intel® Q965 Analog CRT Support

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® Q965 graphics engine. The Intel® Q965 internal graphics engine, with an 400MHz integrated 24-bit RAMDAC. Some of the graphics features are listed below.

- Analog Display Support
- 400 MHz Integrated 24-bit RAMDAC
- Up to 2048x1536 @ 75 Hz refresh
- Hardware Color Cursor Support
- DDC2B Compliant Interface

## 2.4.3 Intel® Q965 PCIe x16

### 2.4.3.1 PCIe x16 Bus Overview

The Intel® Q965 northbridge has on 16-lane PCIe port that is intended for an external PCIe graphics card. The PCIe x16 graphics card is installed on a compatible PICMG 1.3 backplane and interfaced to the northbridge through the two golden fingers shown in **Figure 2-5**. Note that the 16 lanes of the PCIe x16 northbridge bus are connected to two golden fingers.
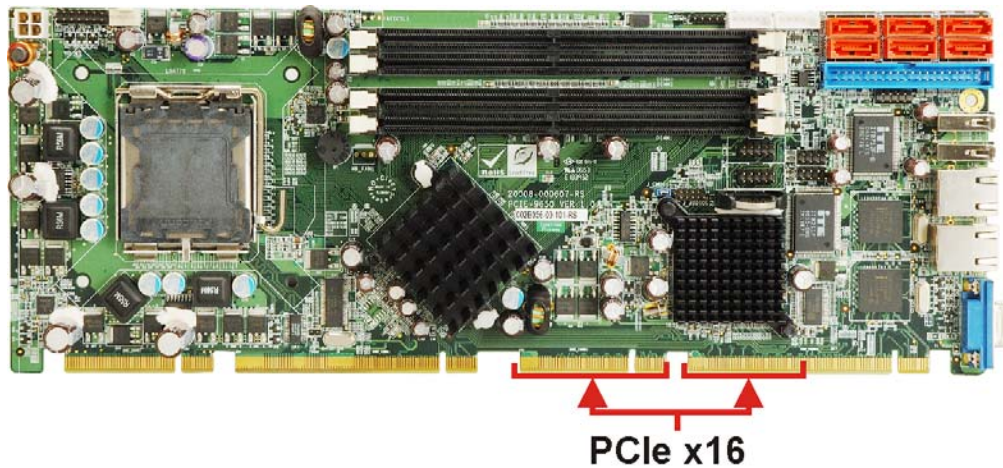


Figure 2-5: PCIe x16 Golden Fingers

### 2.4.3.2 PCIe x16 Expansion Options

The PCIe x16 can be interfaced to either one PCIe x16 graphics card or a single PCIe x1 expansion card on a compatible PICMG 1.3 backplane.

### 2.4.3.3 PCIe x16 Bus Specifications

The PCIe port is compliant with the *PCI Express\* Base Specification* revision 1.1. The PCIe x16 port operates at a frequency of 2.5 Gb/s on each lane while employing 8b/10b encoding; the port supports a maximum theoretical bandwidth of 40 Gb/s in each direction. Some of the features are listed below.

- One, 16-lane PCIe port intended for graphics attach, compatible to the PCI Express\* Base Specification revision 1.1a.
- PCI Express frequency of 1.25 GHz resulting in 2.5 Gb/s each direction

- Raw bit-rate on the data pins of 2.5 Gb/s results in a real bandwidth per pair of 250 MB/s given the 8b/10b encoding used to transmit data across this interface

- Maximum theoretical realized bandwidth on the interface of 4 GB/s in each direction simultaneously, for an aggregate of 8 GB/s when x16.

- PCI Express* Graphics Extended Configuration Space. The first 256 bytes of configuration space alias directly to the PCI Compatibility configuration space. The remaining portion of the fixed 4-KB block of memory-mapped space above that (starting at 100h) is known as extended configuration space.

- PCI Express Enhanced Addressing Mechanism. Accessing the device configuration pace in a flat memory mapped fashion.

- Automatic discovery, negotiation, and training of link out of reset

- Supports traditional PCI style traffic (asynchronous snooped, PCI ordering)

- Supports traditional AGP style traffic (asynchronous non-snooped, PCI Express relaxed ordering)

- Hierarchical PCI-compliant configuration mechanism for downstream devices (i.e., normal PCI 2.3 Configuration space as a PCI-to-PCI bridge)

- Supports "static" lane numbering reversal. This method of lane reversal is controlled by a Hardware Reset strap, and reverses both the receivers and transmitters for all lanes (e.g., TX[15]->TX[0], RX[15]->RX[0]). This method is transparent to all external devices and is different than lane reversal as defined in the PCI Express Specification. In particular, link initialization is not affected by static lane reversal.

## 2.4.4 Intel® Q965 Direct Media Interface (DMI)

Intel® Q965 northbridge GMCH is connected to the Intel® ICH8DO Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel® Q965 DMI are listed below:

- chip-to-chip connection interface to Intel ICH8
- 2GB/s (1GB/s in each direction) bus speed
- 32-bit downstream address
- 100 MHz reference clock (shared with PCI Express Graphics Attach)
- APIC and MSI interrupt messaging support

- Message Signaled Interrupt (MSI) messages
- SMI, SCI and SERR error indication
- DMA, floppy drive, and LPC bus master

# 2.5 Intel® ICH8DO Southbridge Chipset

## 2.5.1 Intel® ICH8DO Overview

The Intel® ICH8DO southbridge chipset is connected to the Intel® Q965 northbridge GMCH through the chip-to-chip Direct Media Interface (DMI). Some of the features of the Intel® ICH8DO are listed below.

- Complies with PCI Express Base Specification, Revision 1.1
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations and AHCI support interfaced to six SATA connectors on the 3307675
- Supports the eight USB 2.0 devices on the 3307675 with five UHCI controllers and two EHCI controllers
- Integrated 10/100/1000 GbE MAC with System Defense
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Intel High Definition Audio
- Supports Intel® Matrix Storage Technology
- Supports Intel® Active Management Technology (ICH8DO only)
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Serial Peripheral Interface (SPI) support

## 2.5.2 Intel® High Definition Audio

The 3307675 onboard audio connector can connect to an optional audio kit. The codec on the optional audio kit is connected to the ICH8DO controller through the Intel® High Definition Audio serial link. The DMA engines in the controller move samples of digitally encoded data between system memory and the audio kit codec.

## 2.5.3 Intel® ICH8DO Low Pin Count (LPC) Interface

The ICH8DO LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH8DO is connected to the following components:

- BIOS chipset
- Super I/O chipset

## 2.5.4 Intel® ICH8DO PCI Interface

The PCI interface on the ICH8DO is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

The PCI bus is connected to an interface gold finger on the bottom of the CPU cards and supports four expansion PCI cards on the backplane. The PCI interface bus is also connected to an IDE controller to provide connectivity to IDE HDDs. For more details please refer to *Section 2.7*.

## 2.5.5 Intel® ICH8DO PCIe Ports

There are six root PCIe ports on the Intel® ICH8DO. Port 5 and port 6 provides PCIe x1 connectivity to the Intel® PC82573L PCIe GbE controller. Port 1 to port 4 is connected to the golden finger that is installed on a compatible socket in a PICMG v1.3 compatible

backplane. This enables up to four PCIe x1 or one PCI x4 compatible expansion boards to be installed on the backplane.

## 2.5.6 Intel® ICH8DO Low Pin Count (LPC) Interface

The ICH8DO LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH8DO is connected to the following components:

- BIOS chipset
- Super I/O chipset

## 2.5.7 Intel® ICH8DO PCI Interface

The PCI interface on the Intel® ICH8DO is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

## 2.5.8 Intel® ICH8DO Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH8DO. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

## 2.5.9 Intel® ICH8DO SATA Controller

The two integrated SATA controllers on the ICH8DO southbridge support six SATA II drives on the 3307675 with independent DMA operations. The SATA controller contains two modes of operation – a legacy mode using I/O space, and an AHCI mode using memory space. SATA controller specifications are listed below.

- Supports independent DMA operation on up to six ports
- Supports six SATA drives

- Supports 3Gb/s data transfer speeds
- Supports Serial ATA 1.0 Specification, Revision 1.0
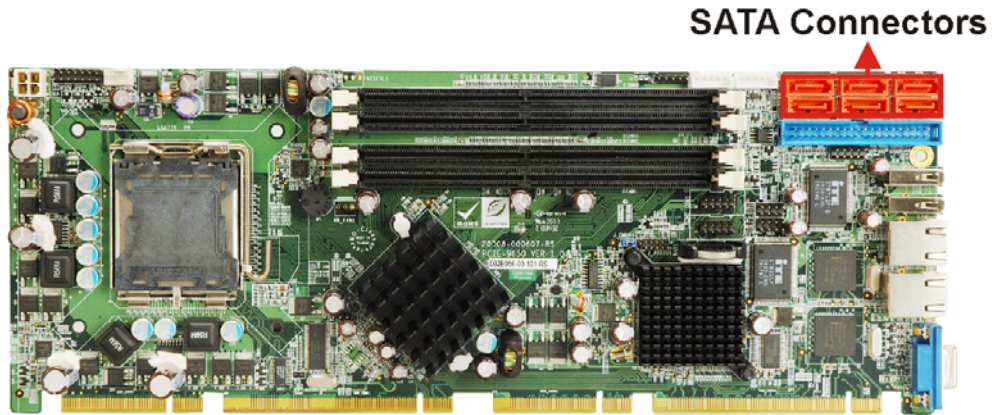


**Figure 2-6: SATA Connectors**

## 2.5.10 Intel® ICH8DO USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the ICH8DO on the 3307675. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH8DO integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH8DO integrated Universal Host Controller Interface (UHCI) controllers.

# 2.6 Intel® ICH8DO PCIe Bus Components

## 2.6.1 PCIe Bus Overview

The PCIE-9659 Intel® ICH8DO southbridge PCIe bus is split into two PCIe x1 channels and one PCIe x4 channel. One PCIe x1 channel is connected to a PCIe Gigabit Ethernet (GbE) controller. The PCIe x4 channel is connected to a golden finger on the bottom of the CPU card. The remaining PCIe x1 channel is shared with the GLCI (Gigabit LAN Connect Interface) bus which is in turn connected to a GbE controller.

### 2.6.2 PCIe x4 Interface Goldfinger

The PCIe x4 from the southbridge consists of four lanes. The four lanes are connected to a single golden finger as shown in **Figure 2-7**.



**Figure 2-7: PCIe x4 Golden Finger Connection**

The PCIe x4 is interfaced to one PCIe x4 expansion card or four PCIe x1 expansion cards on a compatible PICMG 1.3 backplane.

### 2.6.3 PCIe Gigabit Ethernet (GbE) Controller

There is one Intel® PC82573L PCIe GbE controller installed on the 3307675. The Intel® PC82573L is interfaced through a PCIe x1 channel to the Intel® ICH8DO. The Intel® PC82573L controller is then connected to an RJ-45 Ethernet connector enabling the 3307675 to be connected to an external network.

**PCIe GbE Controllers**
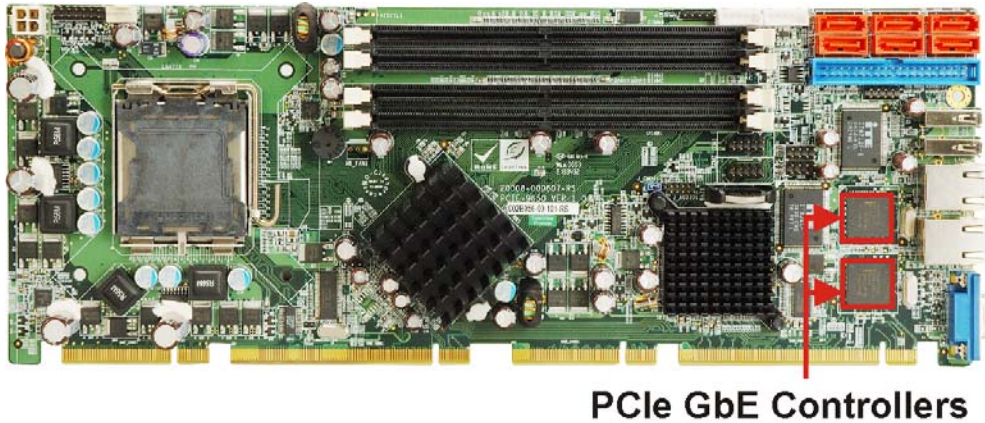
**Figure 2-8: Ethernet Controllers**

The Intel® PC82573L controller is a low power 10/100/1000 Mbps PCIe GbE controller that is ideal for non-managed platforms. Some of the Intel® PC82573L features are listed below.

- 2 Gbps peak bandwidth per direction
- PCI Express Rev 1.0a specification
- Wide, pipelined internal data path architecture
- Optimized transmit (Tx) and receive (Rx) queues
- 32 KB configurable Rx and Tx first-in/first-out (FIFO)
- IEEE 802.3x*-compliant flow-control support with software controllable pause times and threshold values
- Programmable host memory Rx buffers (256 B-16 KB)
- Descriptor ring management hardware for Tx and Rx
- Mechanism for reducing interrupts from Tx/Rx operations
- Integrated PHY for 10/100/1000 Mbps (full- and half-duplex)
- IEEE 802.3ab* auto-negotiation support
- IEEE 802.3ab PHY compliance and compatibility
- Tx/Rx IP, TCP, and UDP checksum offloading
- Tx TCP segmentation

# 2.7 PCI Bus Components

## 2.7.1 PCI Bus Overview

The 33MHz PCI bus connects the Intel® southbridge to the components listed below.

- ITE 8211 ATA controller chipset
- PCI interface goldfinger

## 2.7.2 ITE 8211 ATA Controller Chipset

The 40-pin IDE connector on the 3307675 is connected to the ATA/ATAPI-6 ITE 8211 ATA controller chipset, which is then connected to the Intel® ICH8DO southbridge chipset. The controller and connector are shown in **Figure 2-9** below.
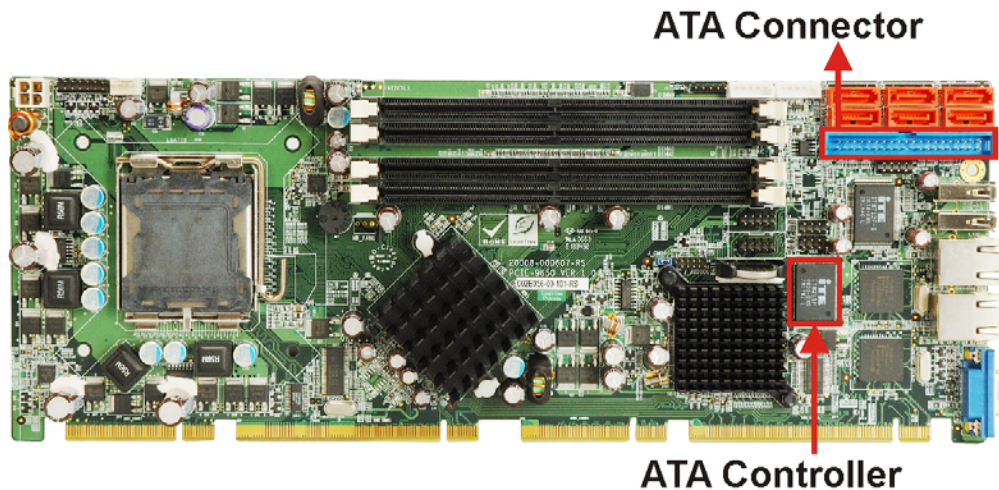


**Figure 2-9: ATA controller**

Two ATA/ATAPI-6 hard disks can be connected to the IDE connector. Specifications for the ITE 8211 are listed below.

- Compatible with ATA/ATAPI-6 specifications
- Supports ANSI ATA proposal PIO modes 0, 1, 2, 3, and 4 with flow control, DMA modes 0, 1, and 2 and Ultra DMA modes 0, 1, 2, 3, 4, 5 and 6.
- 512 bytes FIFO for data transfer per IDE channel

■ Supports pre-fetch and post-write function for PIO mode.

### 2.7.3 PCI Interface Goldfinger

The PCI interface goldfinger is connected to the PCI bus on the backplane and connects the PCI backplane expansion boards with connectivity to the Intel® ICH8DO. The PCI bus golden finger is shown in **Figure 2-7**.
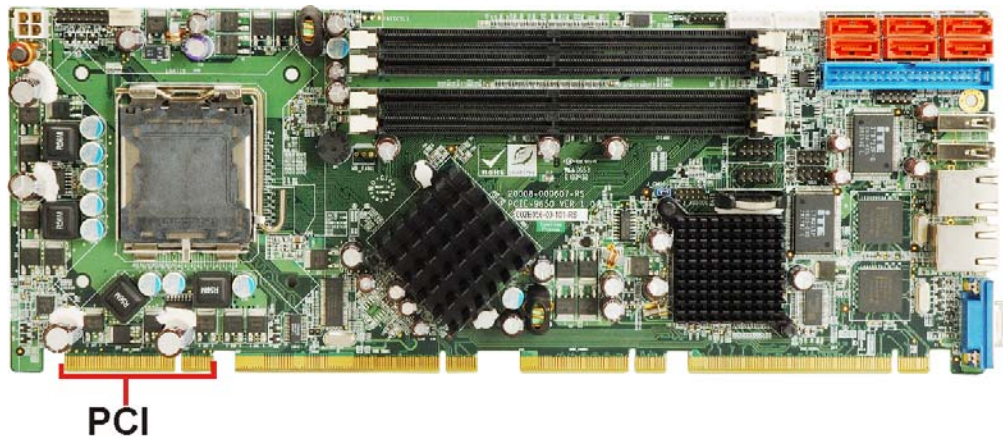


**Figure 2-10: PCI Golden Finger Connection**

The PCI is interfaced to four standard PCI expansion cards a compatible PICMG 1.3 backplane.

## 2.8 LPC Bus Components

### 2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

■ BIOS chipset
■ Super I/O chipset

### 2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

## 2.8.3 Super I/O chipset

The iTE IT8712F Super I/O chipset is connected to the ICH8DO southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8712F chipset are listed below:

- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

## 2.8.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

### 2.8.3.2 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

### 2.8.3.3 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

### 2.8.3.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

### 2.8.3.5 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

## 2.9 Environmental and Power Specifications

### 2.9.1 System Monitoring

Three thermal inputs on the 3307675 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- System temperature
- Power temperature
- CPU temperature

Eight voltage inputs on the 3307675 Super I/O Enhanced Hardware Monitor monitor the following volatages:

- Vcore
- +2.5V
- +3.3V
- +5.0V
- +12.0V
- DDR Vtt
- +1.5V
- 5VSB

The 3307675 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The 3307675 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

## 2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 3307675 are listed below.

- Minimum Operating Temperature: 0ºC (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.

### 2.9.3 Power Consumption

**Table 2-1** shows the power consumption parameters for the 3307675 running with a 2.66GHz Intel® Core® 2 Extreme QX6700 processor with 4GB of 800MHz DDR2 memory.

| Voltage | Current |
|---------|---------|
| +3.3V   | 6.42    |
| +5V     | 8.93A   |
| +12V    | 7.42A   |

**Table 2-1: Power Consumption**

## 2.10 Expansion Options

### 2.10.1 Expansion Options Overview

A number of compatible Global American, Inc. PICMG 1.3 backplanes and chassis can be used to develop and expanded system. These backplanes and chassis are listed below.

### 2.10.2 GLOBAL AMERICAN, INC. Expansion PICMG 1.3 Backplanes

The backplanes listed in **Table 2-2** are compatible with the 3307675 and can be used to develop highly integrated industrial applications. All of the backplanes listed below have 24-pin ATX connector and a 4-pin ATX connector. For more information about these backplanes please consult the GLOBAL AMERICAN, INC. catalog or contact your vendor, reseller or the GLOBAL AMERICAN, INC. sales team at salesinfo@globalamericaninc.com.

## 3307675 PICMG 1.3 CPU Card

| Model | Total Slots | System | Expansion Slots | | | | System Type |
| | | | PCIe | | | PCI | |
| | | | x16 | x4 | x1 | | |
|---|---|---|---|---|---|---|---|
| 1107790 | 4 | One | 1 | 1 | - | 1 | Single |
| 1107780 | 4 | One | 1 | - | - | 2 | Single |
| 1107800 | 4 | One | 1 | - | 2 | - | Single |
| 1107810 | 5 | One | 1 | 1 | - | 2 | Single |
| 1107820 | 5 | One | 1 | - | 3 | - | Single |
| 1107740 | 6 | One | 1 | - | - | 3 | Single |
| 1107840 | 6 | One | 1 | 1 | - | 3 | Single |
| 1107770 | 6 | One | 1 | - | 3 | 1 | Single |
| 1107750 | 5 | One | 1 | - | 3 | - | Single |
| 1107850 | 5 | One | 1 | - | 2 | 1 | Single |
| 1107860 | 7 | One | 1 | - | 2 | 3 | Single |
| 1107870 | 7 | One | 1 | - | 4 | 1 | Single |
| 1107880 | 8 | One | 1 | - | 3 | 3 | Single |
| 1107890 | 9 | One | 1 | - | 4 | 3 | Single |
| 1107900 | 10 | One | 1 | - | 4 | 4 | Single |
| 1107910 | 10 | One | 1 | - | 4 | 4 | Single |
| 1107920 | 13 | One | 1 | 1 | - | 2 | Dual |
| | | Two | 1 | - | 4 | 2 | |
| 1107930 | 13 | One | 1 | - | 3 | 8 | Single |
| 1107940 | 19 | One | 1 | - | 1 | 16 | Single |

**Table 2-2: Compatible GLOBAL AMERICAN PICMG 1.3 Backplanes**

## 2.10.3 GLOBAL AMERICAN, INC. Chassis

GLOBAL AMERICAN, INC. chassis available for 3307675 system development are listed in **Table 2-3**.

For more information about these chassis please consult the GLOBAL AMERICAN, INC. catalog or contact your vendor, reseller or the GLOBAL AMERICAN, INC. sales team at salesinfo@globalamericaninc.com.

| Model | Slot SBC | Mounting | Max Slots | Backplanes |
|---|---|---|---|---|
| 1407460 | Full-size | Wall | 4 | 1107790 1107780 1107800 |
| 1401422 | Full-size | Wall | 6 | 1107810 1107820 1107840 1107770 |
| 1404540 | Full-size | Wall | 6 | 1107810 1107820 1104840 1107770 |
| 1404580 | Full-size (4U) | Rack | 14 | 1107740 1107900 1107910 1107920 1107930 1107940 |
| 1404600 | Full-size (4U) | Rack | 14 | 1107740 1107900 1107910 1107920 1107930 |
| 1407670 | Full-size (4U) | Rack | 14 | 1107740 1107900 1107910 1107920 1107930 |
| 1404150 | Full-size (4U) | Rack | 14 | 1107740 1107900 1107910 1107920 1107930 1107940 |

| Model | Slot SBC | Mounting | Max Slots | Backplanes |
|---|---|---|---|---|
| 1401032 | Full-size | Wall | 7 | 1107740 1107860 1107870 |
| 1401412 | Full-size | Wall | 10 | 1107740 1107880 |
| 1407660 | Full-size | Wall | 6 | 1107840 1107770 |
| 1404570 | Full-size (2U) | Rack | 6 | 1107750 1107850 |
| 1404552 | Full-size (2U) | Rack | 6 | 1107750 1107850 |

**Table 2-3: Compatible GLOBAL AMERICAN Chassis**

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**Chapter**

**3**

# Unpacking

## 3.1 Anti-static Precautions

---

⚠️ **WARNING:**

Failure to take ESD precautions during the installation of the 3307675 may result in permanent damage to the 3307675 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3307675. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3307675, 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 3307675, place it on an antic-static pad. This reduces the possibility of ESD damaging the 3307675.
- *Only handle the edges of the PCB*:-: When handling the PCB, hold the PCB by the edges.

## 3.2 Unpacking

### 3.2.1 Unpacking Precautions

When the 3307675 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the 3307675 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

## 3.3 Unpacking Checklist
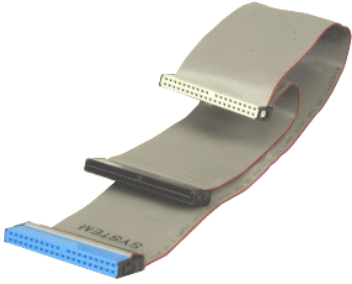
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![NOTE icon] **NOTE:**

> If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the GLOBAL AMERICAN, INC. reseller or vendor you purchased the 3307675 from or contact a Global American sales representative directly. To contact a Global American sales representative, please send an email to salesinfo@globalamericaninc.com.

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### 3.3.1 Package Contents

The 3307675 is shipped with the following components:

| Quantity | Item and Part Number | Image |
|---|---|---|
| 1 | 3307675 | |
| 1 | ATA 66/100 flat cable |  |
| 1 | Dual RS-232 cable |  |

| 6 | SATA cables |  |
|---|---|---|
| 3 | SATA power cables |  |
| 1 | Mini jumper Pack |  |
| 1 | Quick Installation Guide |  |
| 1 | Utility CD |  |
| 1 | USB cable |  |
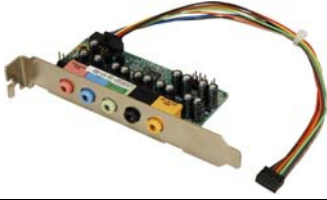
**Table 3-1: Package List Contents**

## 3.4 Optional Items

| | |
|---|---|
| Audio kit<br><br>(**P/N**: 1007760) |  |
| 5-pin Wafer-to-PS/2<br><br>(**P/N**: 1208370) |  |
| 4-port USB cable<br><br>(**P/N**: 1207689) |  |
| CPU cooling kit<br><br>(**P/N**: 2107695 |  |
| | |
| PCIe x16 VGA output SDVO card with<br><br>dual display support<br><br>(**P/N**: 3907690) |  |
| PCIe x16 DVI output SDVO card with<br><br>dual display support<br><br>(**P/N**: 3907680) |  |

**Table 3-2: Package List Contents**

# Connector Pinouts

## 4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. Section 4.1.2 lists all the peripheral interface connectors seen in Section 4.1.2.

### 4.1.1 3307675 Layout

**Figure 4-1** shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.
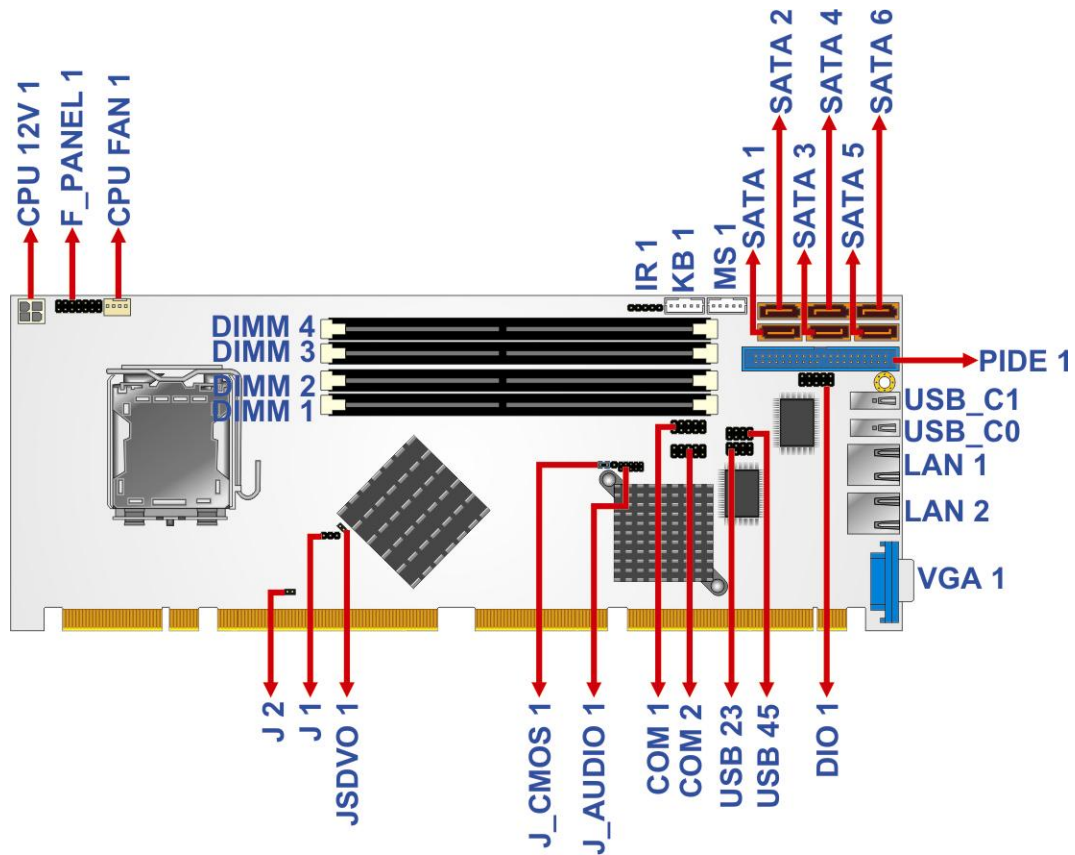


**Figure 4-1: Connector and Jumper Locations**

### 4.1.2 Peripheral Interface Connectors

**Table 4-1** shows a list of the peripheral interface connectors on the WAFER-LX. Detailed descriptions of these connectors can be found below.

| Connector | Type | Label |
|-----------|------|-------|
| ATX power connector | 4-pin header | CPU12V1 |
| Audio connector | 9-pin header | J_AUDIO1 |
| Cooling fan connector | 4-pin header | CPU_FAN1 |
| Digital input/output connector | 10-pin header | DIO1 |
| Front panel connector | 10-pin header | F_PANEL1 |
| IDE Interface connector | 40-pin box header | PIDE1 |
| Infrared (IrDA) connector | 5-pin header | IR1 |
| Keyboard connector | 5-pin wafer | KB1 |
| Mouse connector | 5-pin wafer | MS1 |
| Serial ATA drive connector | 7-pin SATA | SATA1 |
| Serial ATA drive connector | 7-pin SATA | SATA2 |
| Serial ATA drive connector | 7-pin SATA | SATA3 |
| Serial ATA drive connector | 7-pin SATA | SATA4 |
| Serial ATA drive connector | 7-pin SATA | SATA5 |
| Serial ATA drive connector | 7-pin SATA | SATA6 |
| Serial port connector (COM1) | 10-pin header | COM1 |
| Serial port connector (COM2) | 10-pin header | COM2 |
| USB connectors | 8-pin header | USB23 |
| USB connectors | 8-pin header | USB45 |

**Table 4-1: Peripheral Interface Connectors**

### 4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the WAFER-LX. Detailed descriptions of these connectors can be found in **Section** Error! Reference source not found. on **page** Error! Bookmark not defined.

| Connector | Type | Label |
|---|---|---|
| Ethernet connector | RJ-45 | LAN1 |
| Ethernet connector | RJ-45 | LAN2 |
| USB port | USB port | USB_C0 |
| USB port | USB port | USB_C1 |
| VGA port connector | 15-pin female | VGA |

**Table 4-2: Rear Panel Connectors**

## 4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the 3307675.

### 4.2.1 ATX Power Connector

**CN Label:**     CPU12V1

**CN Type:**      4-pin ATX power connector (2x2)

**CN Location:**   See Figure 4-2

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

The 4-pin ATX power connector is connected to an ATX power supply.
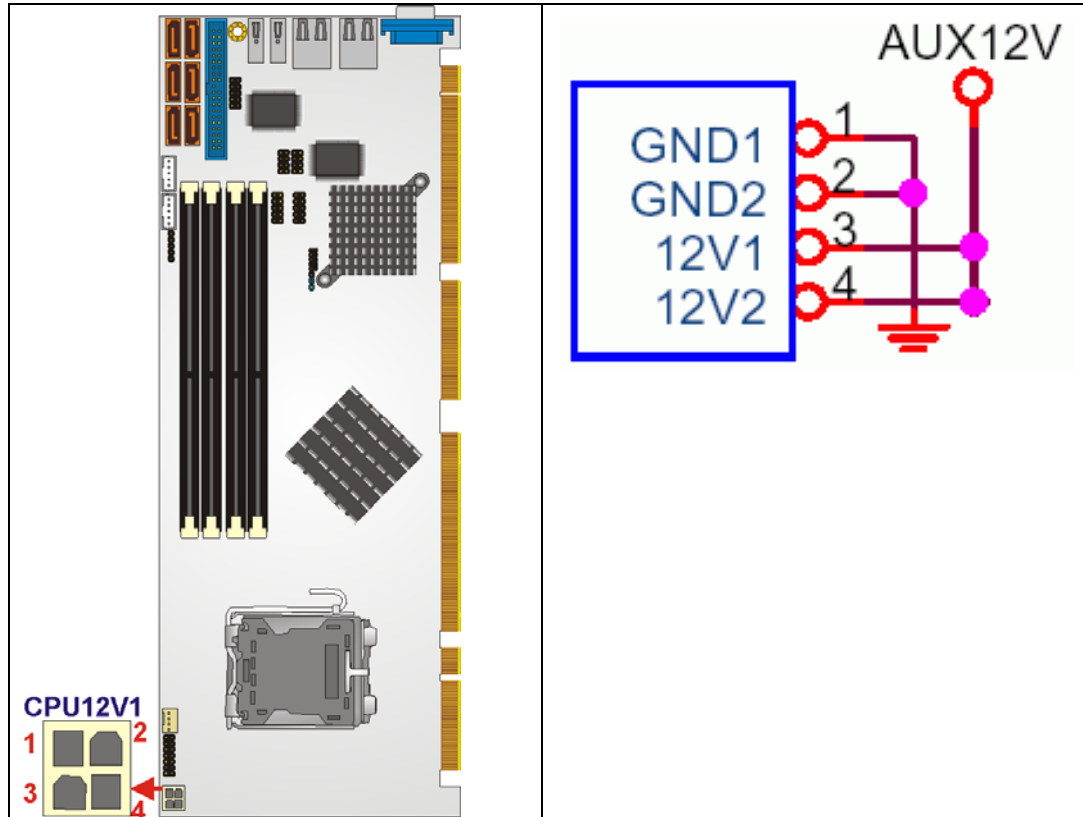
**Figure 4-2: ATX Power Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | GND |
| 2 | GND |
| 3 | +12V |
| 4 | +12V |

**Table 4-3: ATX Power Connector Pinouts**

## 4.2.2 Audio Connector

**CN Label:**     J_AUDIO1

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

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

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

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.
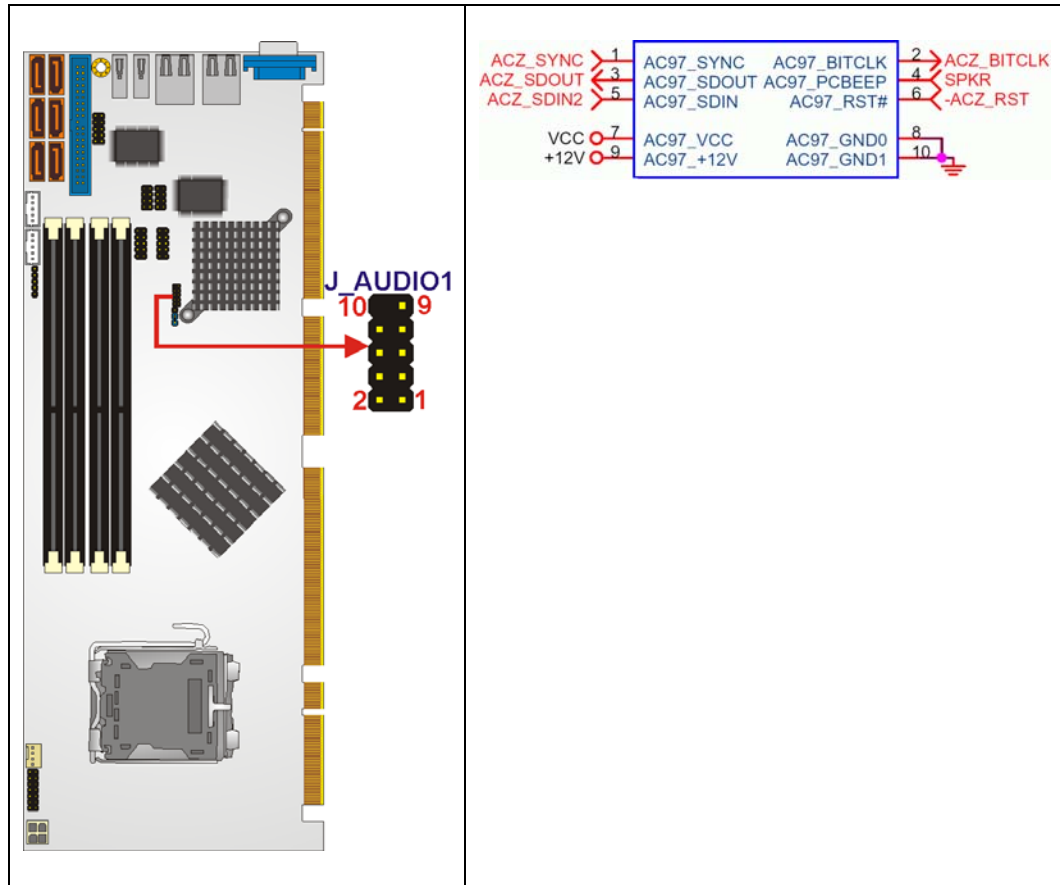


**Figure 4-3: Audio Connector Location (9-pin)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | SYNC | 2 | BITCLK |
| 3 | SDOUT | 4 | PCBEEP |
| 5 | SDIN | 6 | RST# |
| 7 | VCC | 8 | GND |
| 9 | +12V | 10 | GND |

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

## 4.2.3 Digital Input/Output (DIO) Connector

**CN Label:**          DIO1

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

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

**CN Pinouts:**       See Table 4-5

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.
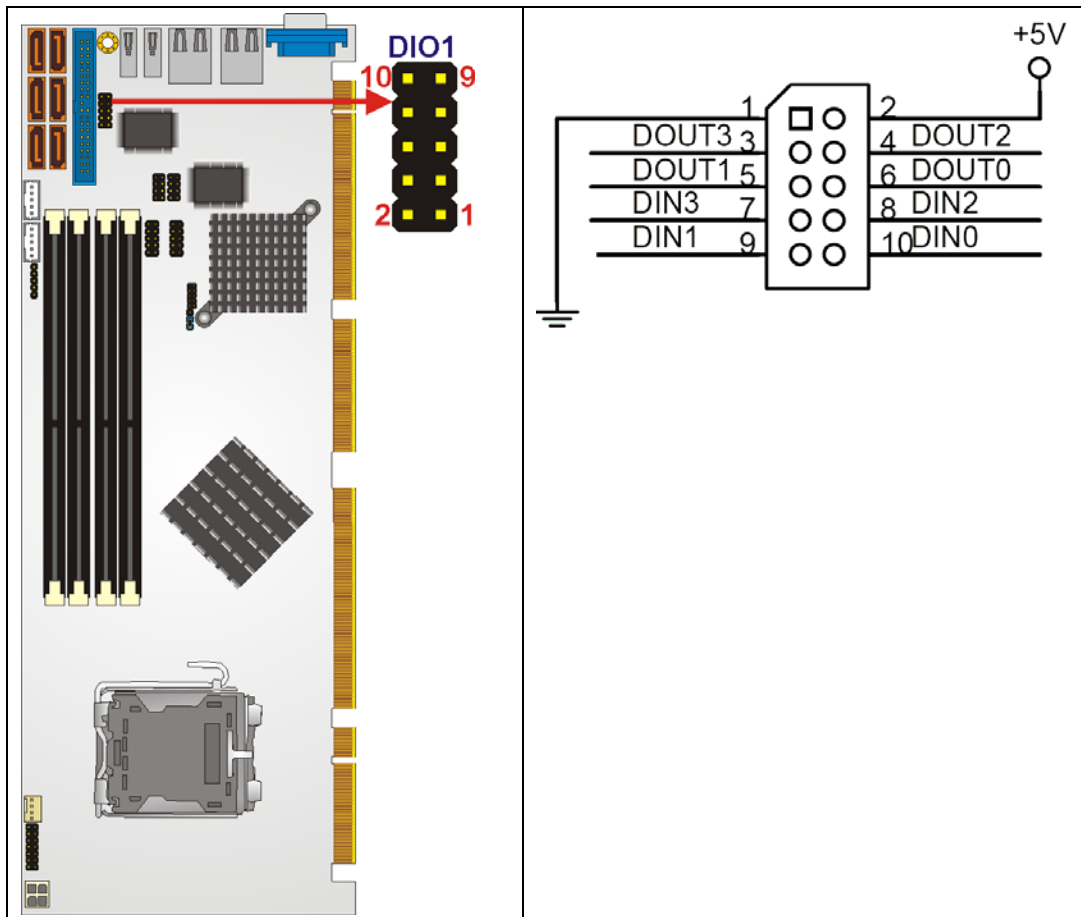


**Figure 4-4: DIO Connector Connector Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | VCC |
| 3 | Output 3 | 4 | Output 2 |
| 5 | Output 1 | 6 | Output 0 |
| 7 | Input 3 | 8 | Input 1 |
| 9 | Input 1 | 10 | Input 0 |

**Table 4-5: DIO Connector Connector Pinouts**

## 4.2.4 Fan Connector (+12V)

**CN Label:**        CPU_FAN1

**CN Type:**        4-pin header

**CN Location:**     See Figure 4-5

**CN Pinouts:**     See Table 4-6

The cooling fan connector provides a 12V, 500mA 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.
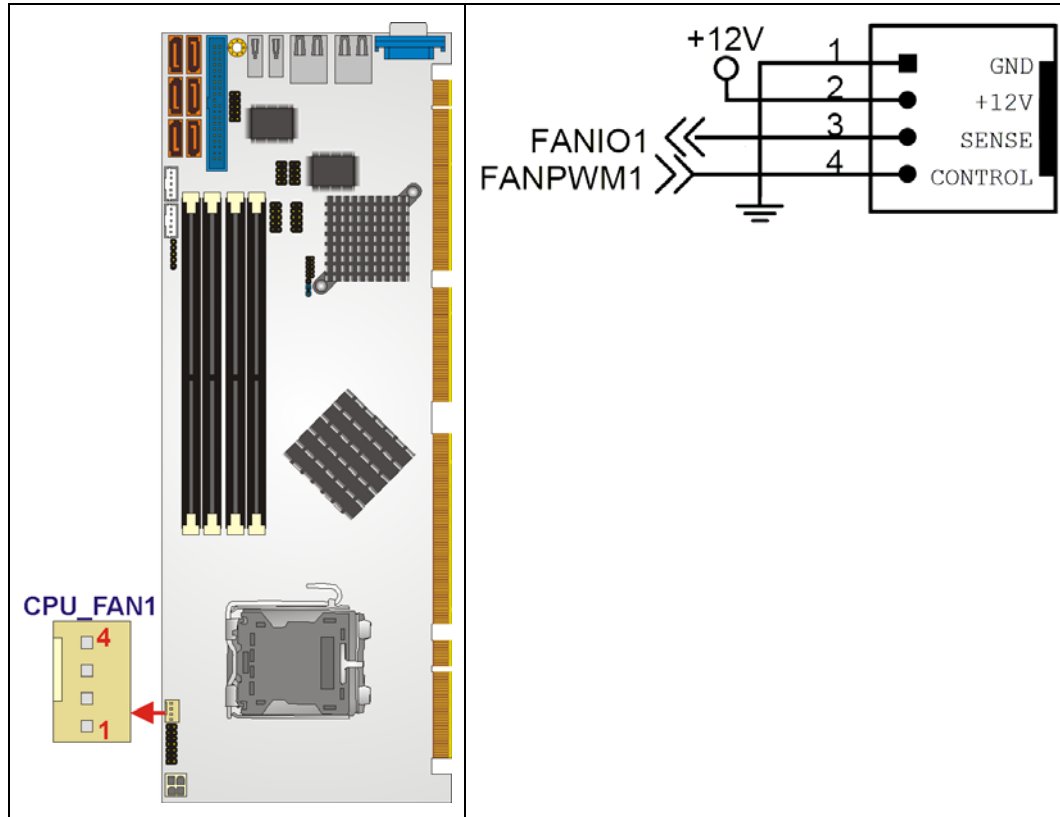
**Figure 4-5: +12V Fan Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | GND |
| 2 | +12V |
| 3 | Rotation Signal |
| 4 | Control |

**Table 4-6: +12V Fan Connector Pinouts**

## 4.2.5 Front Panel Connector (14-pin)

**CN Label:**       F_PANEL1

**CN Type:**       12-pin header (2x6)

**CN Location:**     See Figure 4-6

**CN Pinouts:**        See Table 4-7

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

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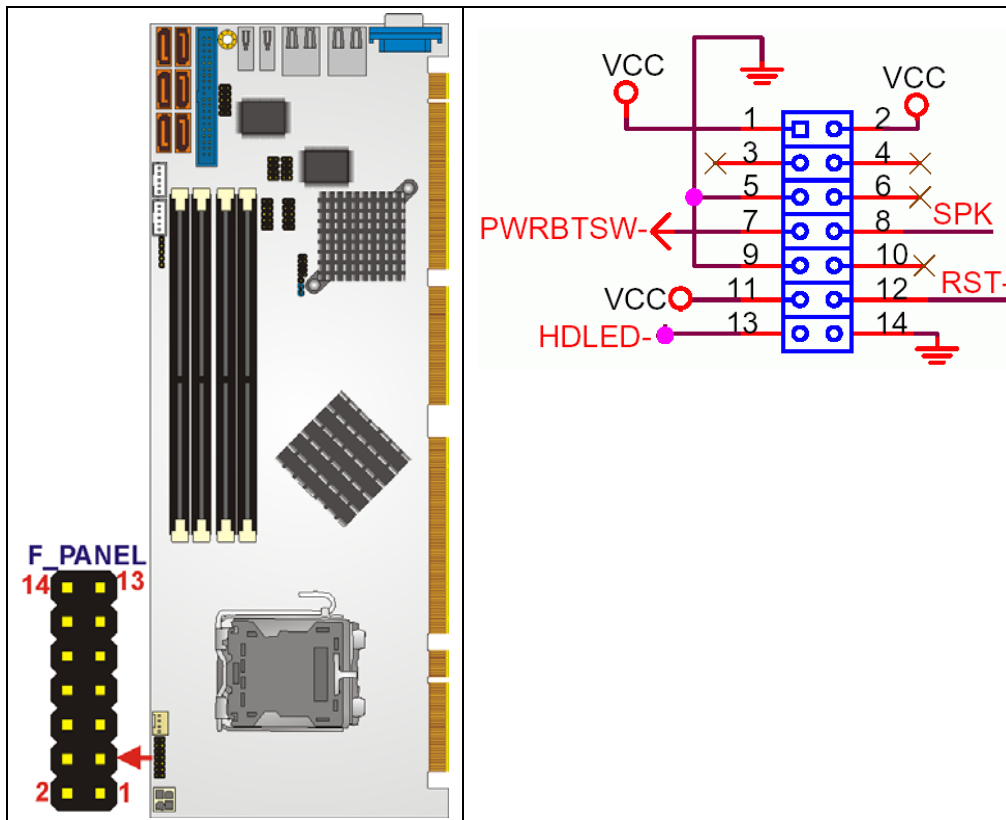


**Figure 4-6: Front Panel Connector Pinout Locations (14-pin)**

| FUNCTION | PIN | DESCRIPTION | FUNCTION | PIN | DESCRIPTION |
|----------|-----|-------------|----------|-----|-------------|
| Power | 1 | LED+ | Speaker | 2 | +5V |
| LED | 3 | N/C | | 4 | N/C |

| | 5 | GND | | 6 | N/C |
|---|---|---|---|---|---|
| **Power** | 7 | PWRBTSW+ | | 8 | Speaker |
| **Button** | 9 | PWRBTSW- | **Reset** | 10 | N/C |
| **HDD LED** | 11 | +5V | | 12 | RESET- |
| | 13 | HDD LED- | | 14 | GND |

**Table 4-7: Front Panel Connector Pinouts (14-pin)**

## 4.2.6 IDE Connector (40-pin)

**CN Label:**      PIDE1

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

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

**CN Pinouts:**    See **Table 4-8**

One 40-pin IDE device connector on the 3307675 supports connectivity to two hard disk drives.
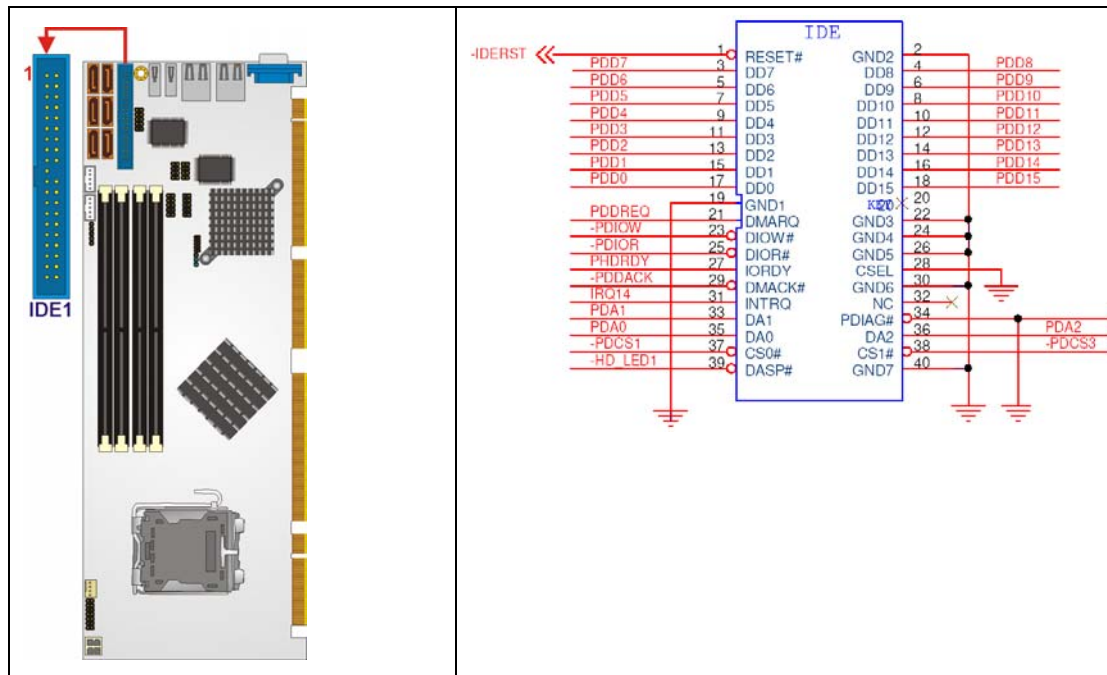


**Figure 4-7: IDE Device Connector Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | RESET# | 2 | GROUND |
| 3 | DATA 7 | 4 | DATA 8 |
| 5 | DATA 6 | 6 | DATA 9 |
| 7 | DATA 5 | 8 | DATA 10 |
| 9 | DATA 4 | 10 | DATA 11 |
| 11 | DATA 3 | 12 | DATA 12 |
| 13 | DATA 2 | 14 | DATA 13 |
| 15 | DATA 1 | 16 | DATA 14 |
| 17 | DATA 0 | 18 | DATA 15 |
| 19 | GROUND | 20 | N/C |
| 21 | IDE DRQ | 22 | GROUND |
| 23 | IOW# | 24 | GROUND |
| 25 | IOR# | 26 | GROUND |
| 27 | IDE CHRDY | 28 | GROUND |
| 29 | IDE DACK | 30 | GROUND—DEFAULT |
| 31 | INTERRUPT | 32 | N/C |
| 33 | SA1 | 34 | N/C |
| 35 | SA0 | 36 | SA2 |
| 37 | HDC CS0# | 38 | HDC CS1# |
| 39 | HDD ACTIVE# | 40 | GROUND |

**Table 4-8: IDE Connector Pinouts**

## 4.2.7 Infrared Interface Connector (5-pin)

**CN Label:**       CN19

**CN Type:**        5-pin header (1x5)

**CN Location:**    See Figure 4-8

**CN Pinouts:**     See Table 4-9

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.
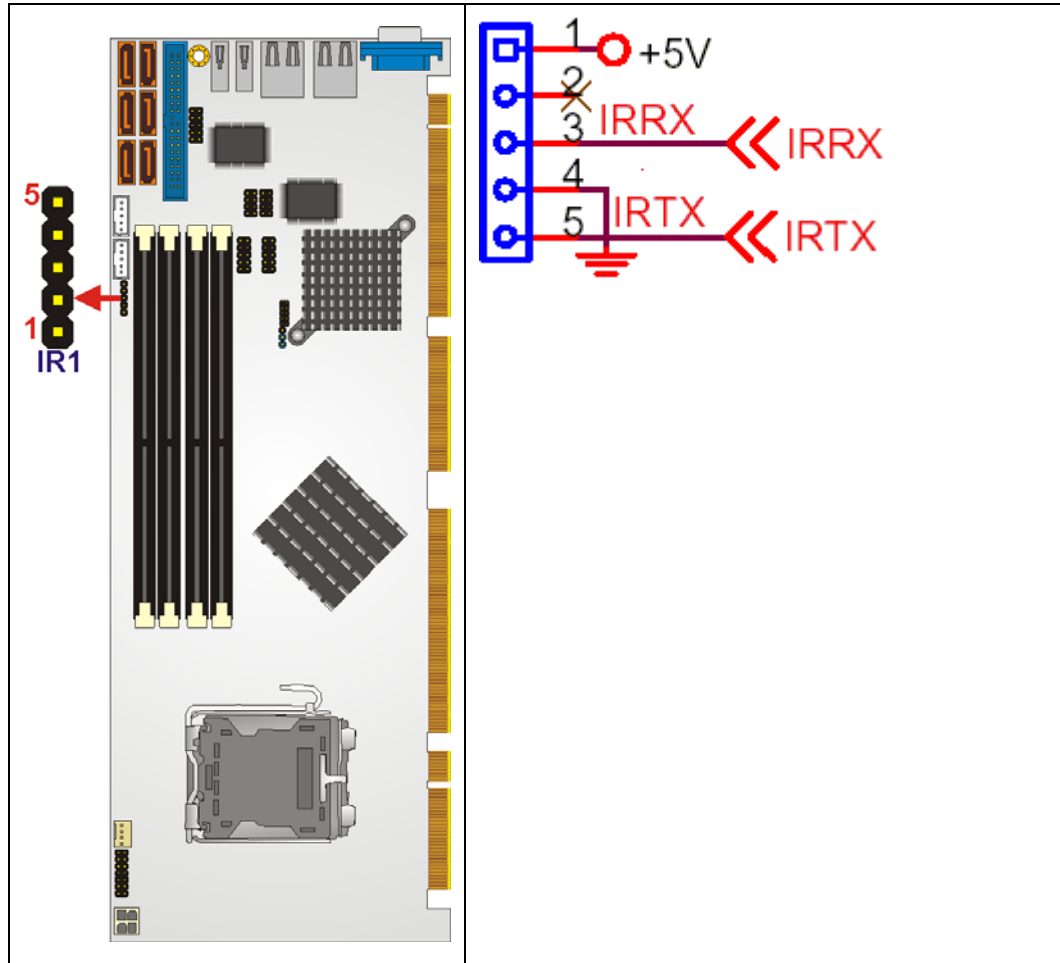
**Figure 4-8: Infrared Connector Pinout Locations**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | VCC |
| 2 | NC |
| 3 | IR-RX |
| 4 | GND |
| 5 | IR-TX |

**Table 4-9: Infrared Connector Pinouts**

## 4.2.8 Keyboard Connector

**CN Label:**       KB1

**CN Type:**          5-pin header (1x5)

**CN Location:**      See Figure 4-9

**CN Pinouts:**       See Table 4-10

The keyboard connector can be connected to a standard PS/2 cable to add keyboard functionality to the system.
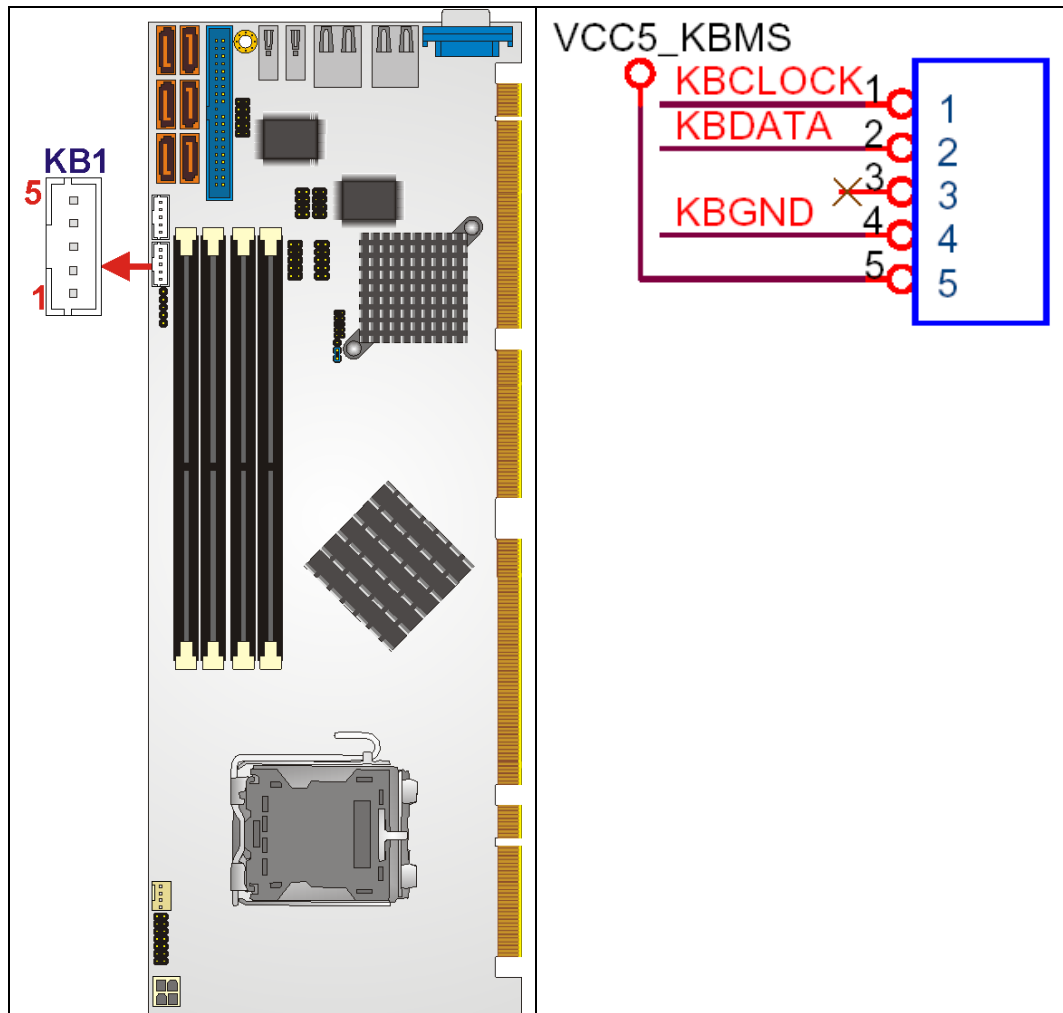


 **Figure 4-9: Keyboard Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | KEYBOARD CLOCK |
| 2 | KEYBOARD DATA |
| 3 | N/C |

| 4 | GROUND |
|---|--------|
| 5 | VCC |

**Table 4-10: Keyboard Connector Pinouts**

## 4.2.9 Mouse Connector

**CN Label:**        MS1

**CN Type:**        5-pin header (1x5)

**CN Location:**     See Figure 4-9

**CN Pinouts:**      See Table 4-10

The mouse connector can be connected to a standard PS/2 cable to add keyboard and mouse functionality to the system.
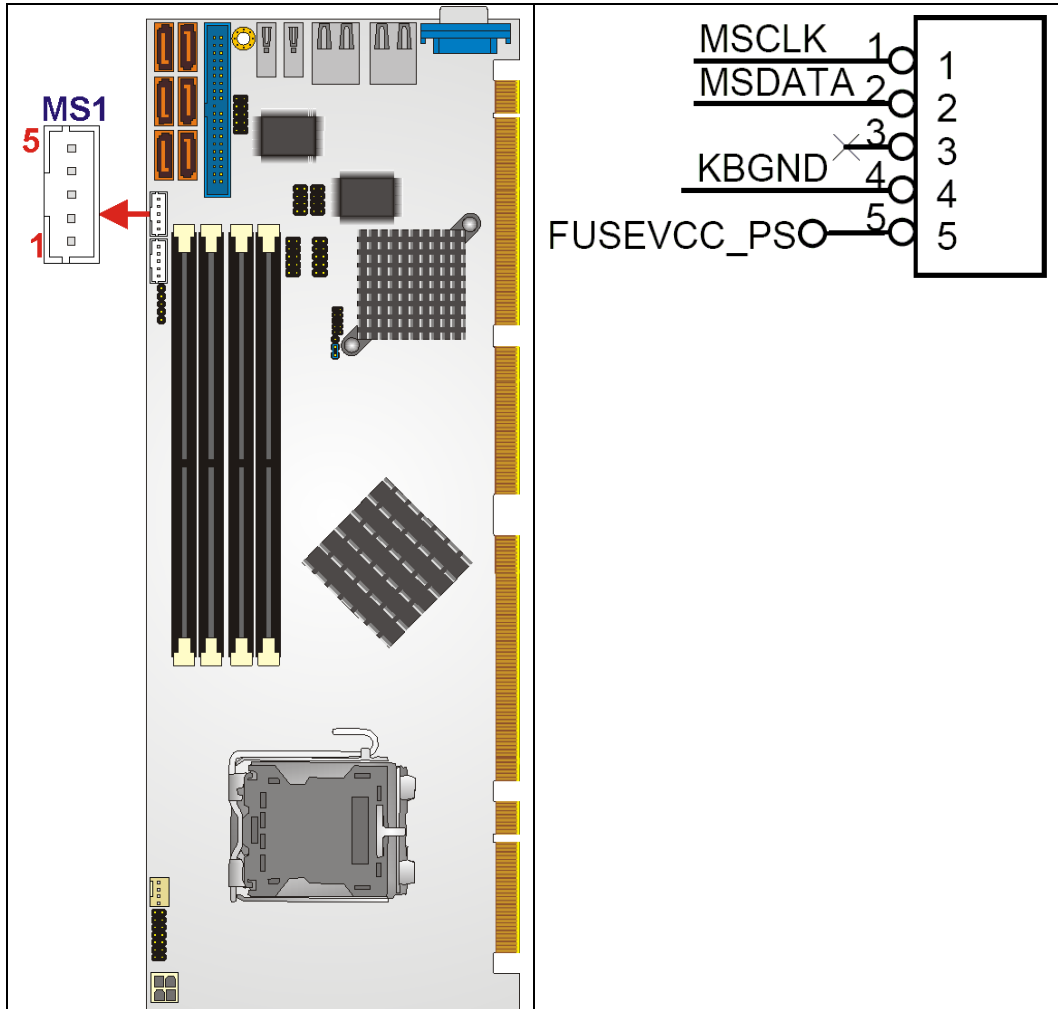
**Figure 4-10: Mouse Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | MOUSE CLOCK |
| 2 | MOUSE DATA |
| 3 | N/C |
| 4 | GROUND |
| 5 | VCC |

**Table 4-11: Mouse Connector Pinouts**

## 4.2.10 SATA Drive Connectors

**CN Label:**        SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6

## 3307675 PICMG 1.3 CPU Card

    **CN Type:**            7-pin SATA drive connectors

    **CN Location:**     See Figure 4-11

    **CN Pinouts:**      See Table 4-12

The two SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.
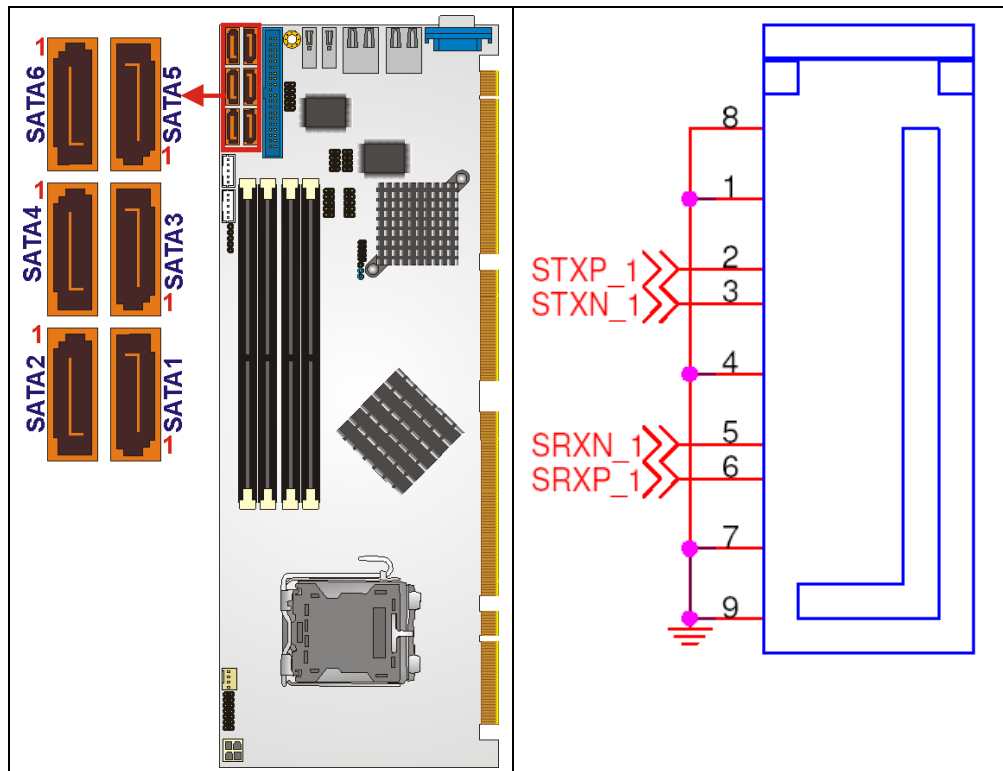


**Figure 4-11: SATA Drive Connector Locations**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | GND |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |

| 7 | GND |
|---|-----|

**Table 4-12: SATA Drive Connector Pinouts**

## 4.2.11 Serial Port Connector (COM1 and COM2)

**CN Label:** COM1 and COM2

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

**CN Location:** See **Error! Reference source not found.**

**CN Pinouts:** See **Error! Reference source not found.**

The 10-pin serial port connector provides a second RS-232 serial communications channel. The COM 2 serial port connector can be connected to external RS-232 serial port devices.
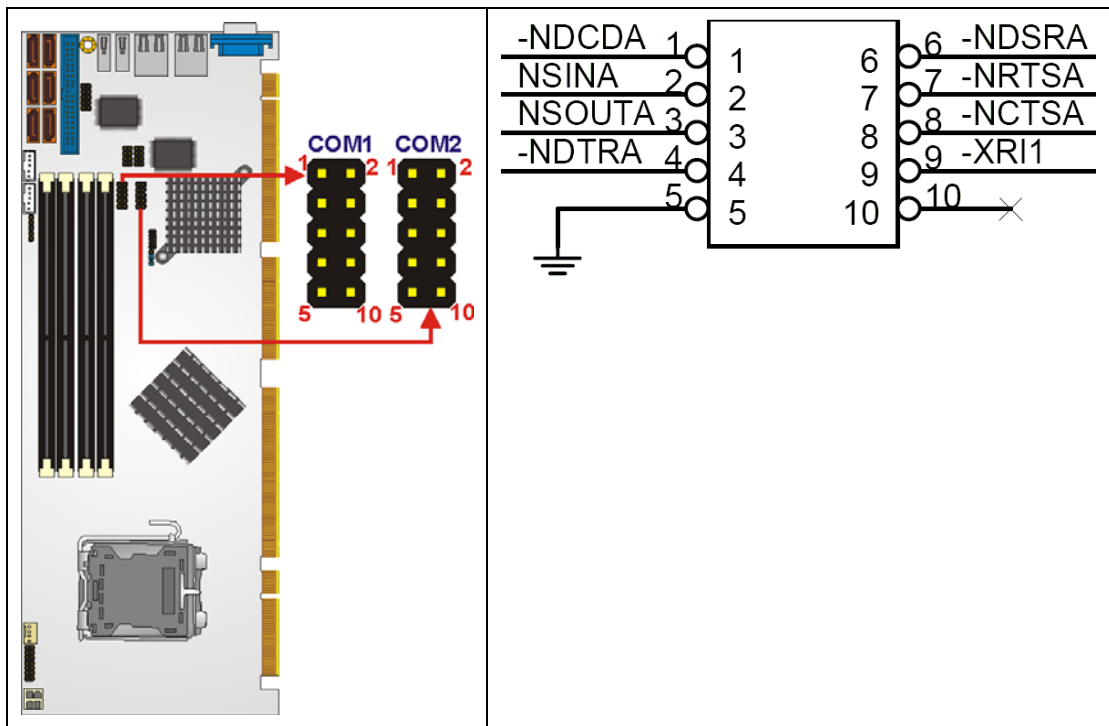


**Figure 4-12: COM 2 Connector Pinout Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | NDCD | 6 | NDSR |
| 2 | NSIN | 7 | NRTS |
| 3 | NSOUT | 8 | NCTS |
| 4 | NDTR | 9 | XRI |
| 5 | Ground (GND) | 10 | |

**Table 4-13: COM1 and COM2 Connector Pinouts**

## 4.2.12 USB Connectors (Internal)

**CN Label:**          USB23, USB45

**CN Type:**          8-pin header (2x4)

**CN Location:**          See Figure 4-13

**CN Pinouts:**          See Table 4-14

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices.. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.
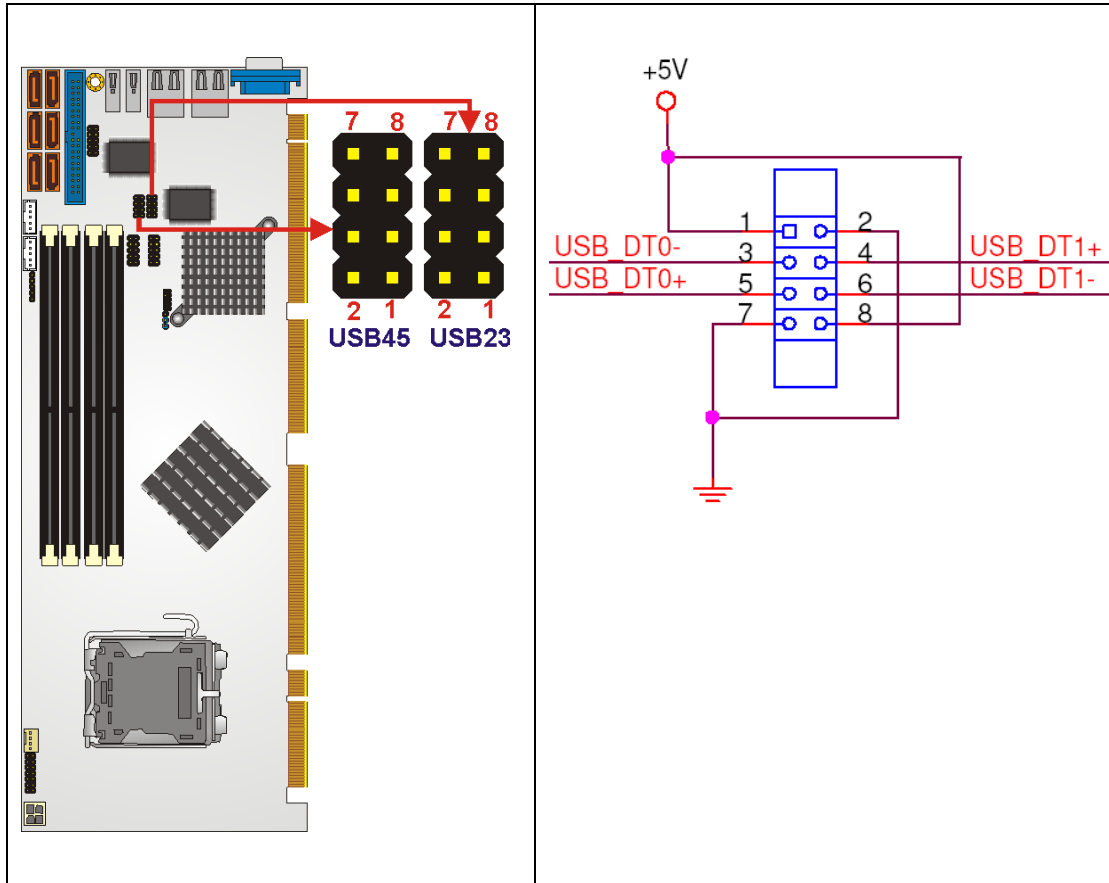
**Figure 4-13: USB Connector Pinout Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | VCC | 2 | GND |
| 3 | DATAN- | 4 | DATAM+ |
| 5 | DATAN+ | 6 | DATAM- |
| 7 | GND | 8 | VCC |

**Table 4-14: USB Port Connector Pinouts**

## 4.3 External Peripheral Interface Connector Panel

**Figure 4-14** shows the 3307675 external peripheral interface connector (EPIC) panel. The 3307675 EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 2 x USB connectors

■   1 x VGA connector
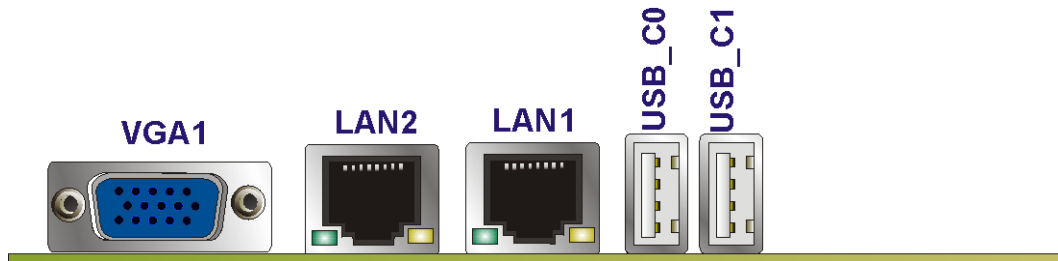


**Figure 4-14: 3307675 External Peripheral Interface Connector**

## 4.3.1 LAN Connectors

**CN Label:**          LAN1 and LAN2

**CN Type:**           RJ-45

**CN Location:**       See **Figure 4-14**

**CN Pinouts:**        See **Table 4-15**

The 3307675 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | TXA+ | 5 | TXC- |
| 2 | TXA- | 6 | TXB- |
| 3 | TXB+ | 7 | TXD+ |
| 4 | TXC+ | 8 | TXD- |

**Table 4-15: LAN Pinouts**
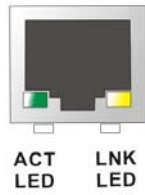
**Figure 4-15: RJ-45 Ethernet Connector**

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. See **Table 4-16**.

| STATUS | DESCRIPTION | STATUS | DESCRIPTION |
|--------|-------------|--------|-------------|
| GREEN | Activity | YELLOW | Linked |

**Table 4-16: RJ-45 Ethernet Connector LEDs**

## 4.3.2 USB Connector

**CN Label:**  USB_C1 and USB_C0

**CN Type:**  USB ports

**CN Location:** See Figure 4-14

**CN Pinouts:** See Table 4-17

The 3307675 has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | USBV3L 5V | 1 | USBV3L 5V |
| 2 | USBP4N | 2 | USBP5N |
| 3 | USBP4P | 3 | USBP5P |
| 4 | GND | 4 | GND |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|

**Table 4-17: USB Port Pinouts**

### 4.3.3 VGA Connector

**CN Label:**       VGA1

**CN Type:**        15-pin Female

**CN Location:**    See Figure 4-14

**CN Pinouts:**     See Figure 4-16 and Table 4-18

The 3307675 has a single 15-pin female connector for connectivity to standard display devices.
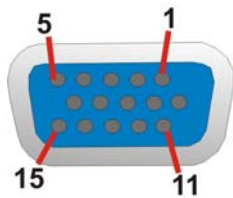


**Figure 4-16: VGA Connector**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | NC |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | VCC / NC | 10 | GND |
| 11 | NC | 12 | DDC DAT |
| 13 | HSYNC | 14 | VSYNC |
| 15 | DDCCLK | | |

**Table 4-18: VGA Connector Pinouts**

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**Chapter**

**5**

# Installation

## 5.1 Anti-static Precautions

---

⚠️ **WARNING:**

> Failure to take ESD precautions during the installation of the 3307675 may result in permanent damage to the 3307675 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3307675. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3307675, 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 3307675, place it on an antic-static pad. This reduces the possibility of ESD damaging the 3307675.
- *Only handle the edges of the PCB*:-: When handling the PCB, hold the PCB by the edges.

## 5.2 Installation Considerations

 **NOTE:**

The following installation notices and installation considerations should be read and understood before the 3307675 is installed. All installation notices pertaining to the installation of the 3307675 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 3307675 and injury to the person installing the motherboard.

### 5.2.1 Installation Notices

 **WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the 3307675, 3307675 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 3307675 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 3307675 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 3307675 off:

○ When working with the 3307675, 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 3307675 **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.

## 5.2.2 Installation Checklist

The following checklist is provided to ensure the 3307675 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The 3307675 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  ○ Primary and secondary IDE device
  ○ SATA drives
  ○ Keyboard and mouse cable
  ○ Audio kit
  ○ Power supply
  ○ USB cable
  ○ Serial port cable
  ○ Parallel port cable
- The following external peripheral devices are properly connected to the chassis:
  ○ VGA screen

      ○   Keyboard

      ○   Mouse

      ○   RS-232 serial communications device

      ○   Parallel port

## 5.3 Unpacking

### 5.3.1 Unpacking Precautions

When the 3307675 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 5.1**.
- Make sure the packing box is facing upwards so the 3307675 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 3** are present.

**NOTE:**

If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the GLOBAL AMERICAN, INC. reseller or vendor you purchased the 3307675 from or contact a Global American sales representative directly. To contact a Global American sales representative, please send an email to salesinfo@globalamericaninc.com.

## 5.4 CPU, CPU Cooling Kit and DIMM Installation

**WARNING:**

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, 3307675 and other electronic components attached to the system may be

incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the 3307675. If one of these components is not installed the 3307675 cannot run.

## 5.4.1 LGA775 CPU Installation

**NOTE:**

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology (that has been met by the 3307675)
- **OS**: An operating system that has optimizations for HT Technology

**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 socket is shown in Figure 5-1.
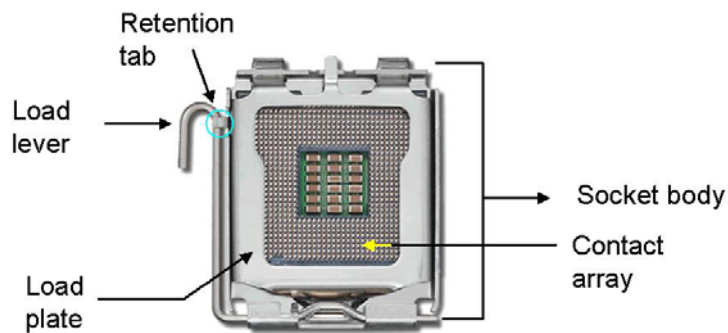
**Figure 5-1: Intel LGA775 Socket**

To install a socket LGA775 CPU onto the 3307675, follow the steps below:

 **WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the

pins at the bottom of the CPU.

**Step 1:** **Remove the protective cover.** Remove the black protective cover by prying it

off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and

use your fingernail to pry the protective cover off. See **Figure 5-2**.
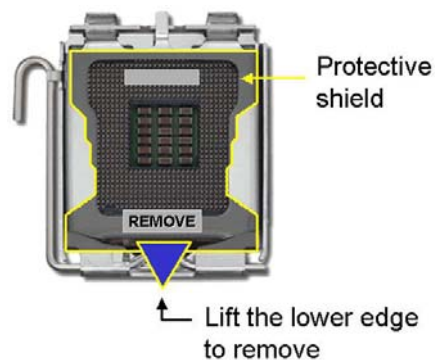


**Figure 5-2: Remove the CPU Socket Protective Shield**

**Step 2:** **Open the socket**. Disengage the load lever by pressing the lever down and

slightly outward to clear the retention tab. Rotate the load lever to a fully open

position. Then rotate the load plate towards the opposite direction. See **Figure 5-3**.
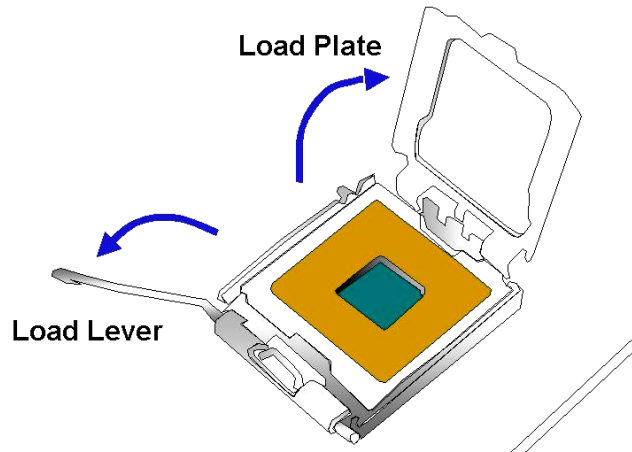


**Figure 5-3: Open the CPU Socket Load Plate**

**Step 3:** **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

**Step 4:** **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

**Step 5:** **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

**Step 6:** **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

**Step 7:** **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 5-4**.
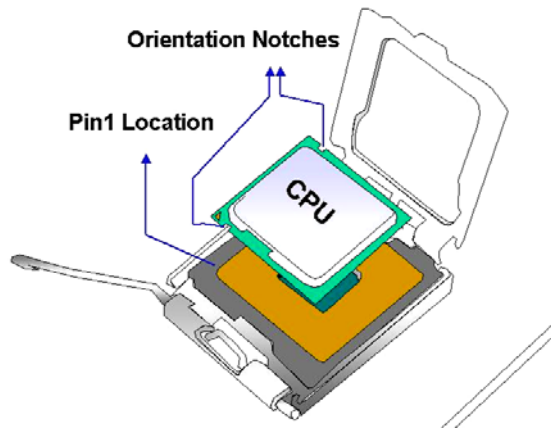
**Figure 5-4: Insert the Socket LGA775 CPU**

**Step 8:** **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

**Step 9:** **Connect the CPU 12V cable to the 12After the cooling kit is installed** connect the CPU cable to the CPU 12V power connector**Step 0:**

## 5.4.2 LGA775 Cooling Kit Installation

 **WARNING:**

**It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the 3307675.**

GLOBAL AMERICAN, INC.'s cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

**Figure 5-5: GLOBAL AMERICAN, INC. 2107695 Cooling Kit**

Two optional, separately purchased LGA775 GLOBAL AMERICAN, INC. CPU cooling kits are available. The GLOBAL AMERICAN, INC. 2107695 is shown in **Figure 5-5** and can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

 **WARNING:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit follow the instructions below.

**Step 1:** **Place the cooling kit onto the socket LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

**Step 2:** **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

**Step 3:** **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

**Step 4:** **Secure the cooling kit**. From the solder side of the PCB, align the support

bracket to the screw threads on heat sink that were inserted through the PCB

holes. (See **Figure 5-6**)
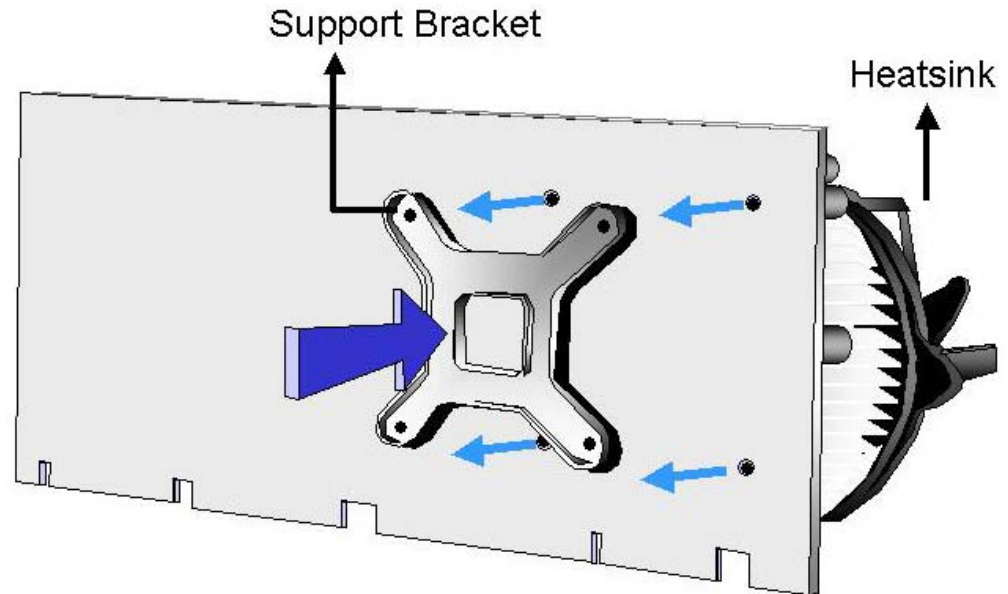


**Figure 5-6: Securing the Heat sink to the PCB Board**

**Step 5:** **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each

nut a few turns at a time and do not over-tighten the screws.

**Step 6:** **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on

the 3307675. Carefully route the cable and avoid heat generating chips and fan

blades.**Step 0:**

## 5.4.3 DIMM Installation

⚡ **WARNING:**

Using incorrectly specified DIMM may cause permanently damage the

3307675. Please make sure the purchased DIMM complies with the

memory specifications of the 3307675. DIMM specifications compliant

with the 3307675 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-7**.
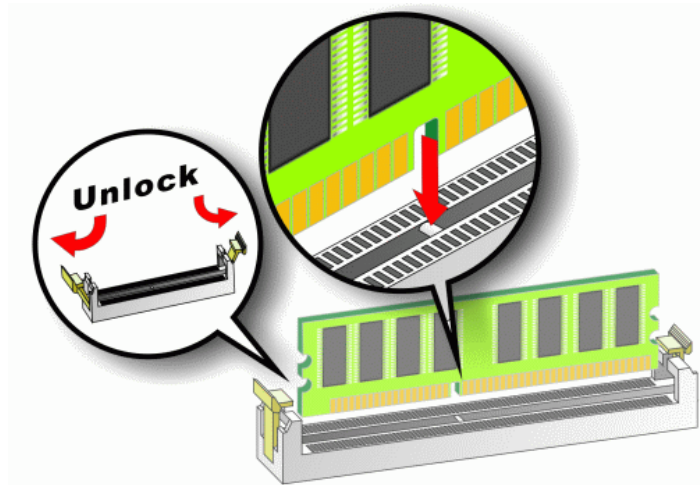


**Figure 5-7: Installing a DIMM**

**Step 1:** **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-7**.

**Step 2:** **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-7**.

**Step 3:** **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-7**.

**Step 4:** **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.**Step 0:**

## 5.5 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 means removing the plastic clip from a jumper.
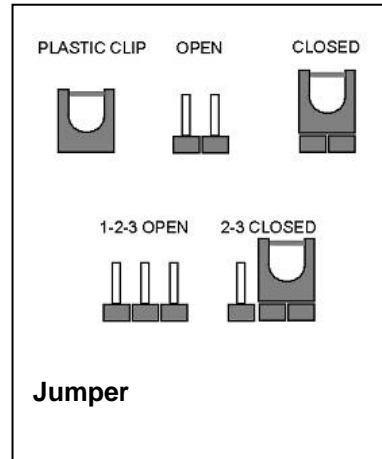
Before the 3307675 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 3307675 are listed in **Table 5-1**.

| Description | Label | Type |
|-------------|-------|------|
| Clear CMOS | J_CMOS1 | 3-pin header |

**Table 5-1: Jumpers**

## 5.5.1 Clear CMOS Jumper

**Jumper Label:**        J_CMOS1

**Jumper Type:**        3-pin header

**Jumper Settings:**      See Table 5-2

**Jumper Location:**      See Figure 5-8

If the 3307675 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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. The clear CMOS jumper settings are shown in **Table 5-2**.

| Jumper Select | Description | |
|---|---|---|
| Short 1 - 2 | Keep CMOS Setup | Default |
| Short 2 - 3 | Clear CMOS Setup | |

**Table 5-2: Clear CMOS Jumper Settings**

The location of the clear CMOS jumper is shown in **Figure 5-8** below.
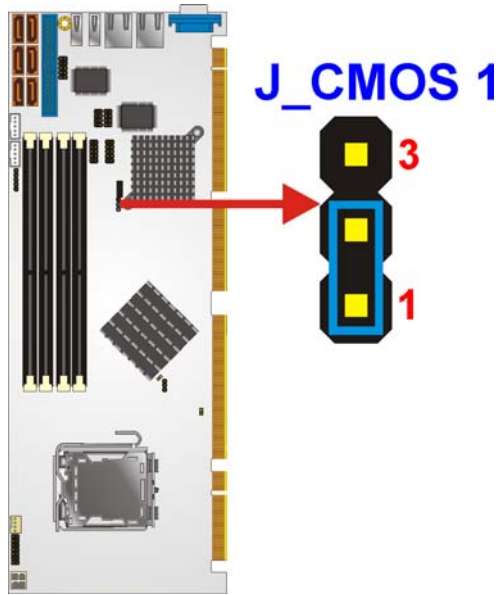
**Figure 5-8: Clear CMOS Jumper**

## 5.6 Chassis Installation

### 5.6.1 Airflow

 WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 3307675 must have air vents to allow cool air to move into the system and hot air to move out.

The 3307675 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.

Note:

> GLOBAL AMERICAN, INC. has a wide range of backplanes available. Please contact your 3307675 vendor, reseller or a Global American sales representative at salesinfo@globalamericaninc.com or visit the GLOBAL AMERICAN, INC. website (http://www.globalamericaninc.com) to find out more about the available chassis.

## 5.6.2 Backplane Installation

Before the 3307675 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:

> GLOBAL AMERICAN, INC. has a wide range of backplanes available. Please contact your 3307675 vendor, reseller or a Global American sales representative at salesinfo@globalamericaninc.com or visit the GLOBAL AMERICAN, INC. website (http://www.globalamericaninc.com) to find out more about the available chassis.

## 5.6.3 CPU Card Installation

To install the 3307675 CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding 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.

## 5.7 Internal Peripheral Device Connections

### 5.7.1 Peripheral Device Cables

The cables listed in **Table 5-3** are shipped with the 3307675.

| Quantity | Type |
|----------|------|
| 1 | ATA 66/100 flat cable |
| 1 | Dual RS-232 cable |
| 1 | 5-pin wafer-to-PS/2 cable |
| 6 | SATA drive cables |
| 3 | SATA drive power cables |
| 1 | USB cable |

**Table 5-3: GLOBAL AMERICAN, INC. Provided Cables**

Separately purchased optional GLOBAL AMERICAN, INC. items that can be installed are listed below:

- Audio kit
- 5-pin wafer-to-PS/2 cable
- 4-port USB cable
- PCIe x16 VGA output SDVO card
- PCIe x16 DVI output SDVO card

For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

### 5.7.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the 3307675 to one or two IDE devices. To connect an IDE HDD to the 3307675 please follow the instructions below.

**Step 1:** **Locate the IDE connector**. The location/s of the IDE device connector/s is/are

shown in **Chapter 3**.

**Step 2:** **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-9**. A key on the front of the cable connector ensures it can only be inserted in one direction.
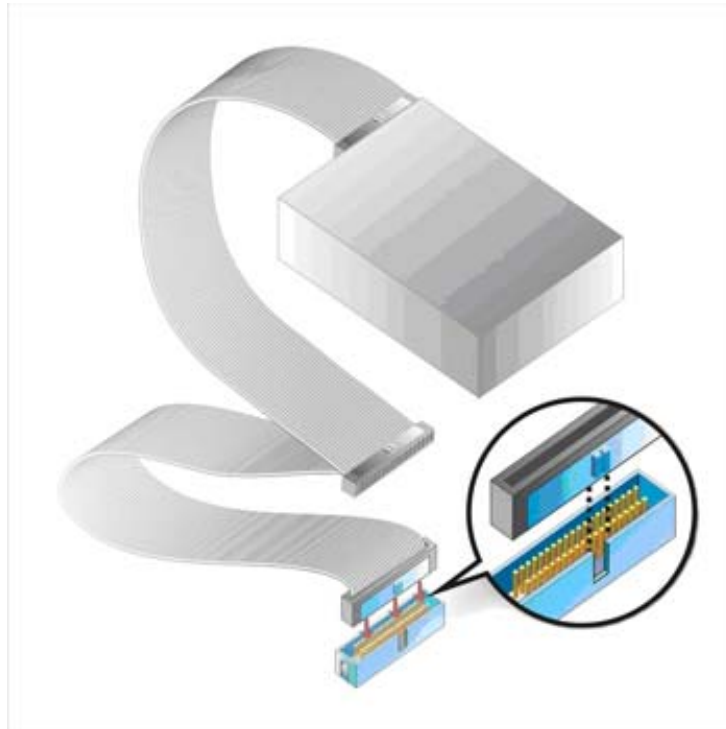


**Figure 5-9: IDE Cable Connection**

**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**Step 0:**

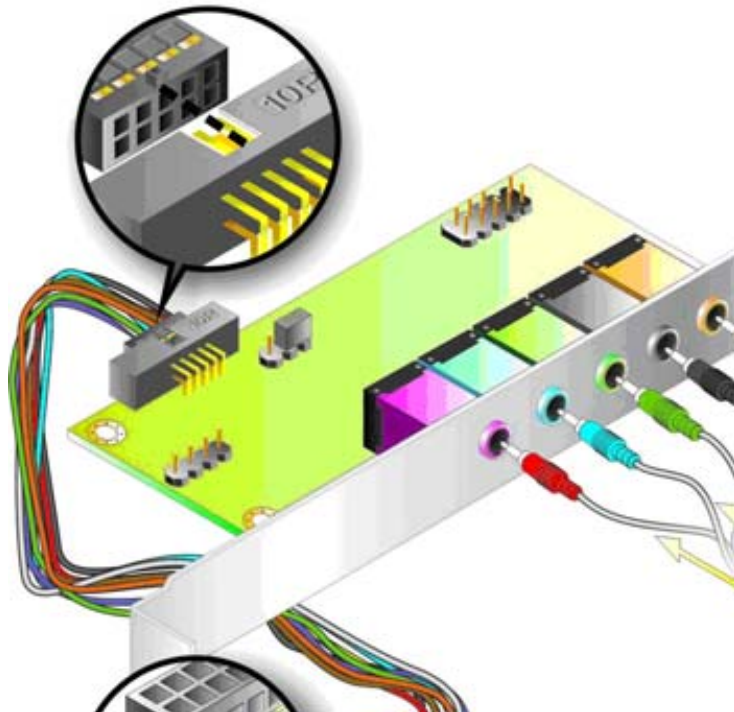## 5.7.3 Audio Kit Installation

An optional audio kit that is separately ordered connects to the 9-pin audio connector on the 3307675. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Front-In, Front-Out, Rear-Out and subwoofer connect to four speakers including a subwoofer. To install the audio kit, please refer to the steps below:

**Step 1:** **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

**Step 2:** **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-10**.



**Figure 5-10: Audio Kit Connection**

**Step 3:** **Connect the audio devices**. Connect the speakers and the subwoofer to the appropriate audio jack shown in **Figure 5-10**.**Step 0:**

## 5.7.4 Keyboard/Mouse Installation

To install a keyboard or mouse, a PS/2 cable must be attached to the keyboard or mouse connector. The 3307675 has an independent 5-pin keyboard connector and independent 5-pin mouse connector on board. To connect either of these connectors to a keyboard or mouse, please do the following.

**Step 1:** **Locate the keyboard or mouse connector**. The locations of the 5-pin keyboard connector and the 5-pin mouse connector are shown in **Chapter 3**.

**Step 2:** **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the cable connector. See **Figure 5-10**.
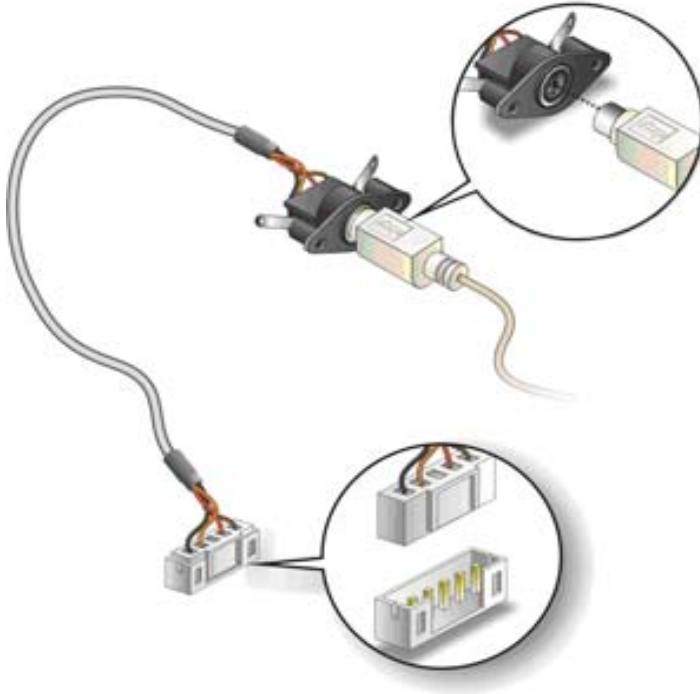


**Figure 5-11: Keyboard/Mouse Connection**

**Step 3:** **Secure the PS/2 connector to the chassis**. Use two retention screws to secure the PS/2 on the end of the cable to the chassis.

**Step 4:** **Connect the keyboard or mouse**. If the cable has been connected to the 3307675 keyboard connector, connect a PS/2 keyboard to the PS/2 connector on the cable. If the cable has been connected to the 3307675 mouse connector, connect a PS/2 mouse to the PS/2 connector on the keyboard. **Figure 5-10**.

**Step 0:**

## 5.7.5 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1:    **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2:    **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.
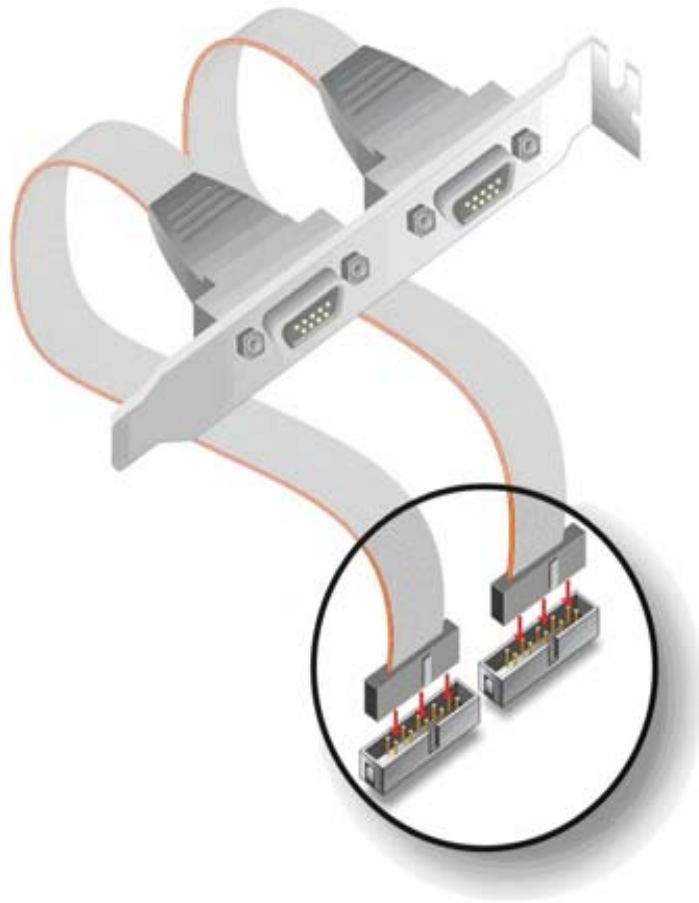


**Figure 5-12: Dual RS-232 Cable Installation**

Step 3:    **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please

refer to the reference material that came with the chassis**Step 0:**

## 5.7.6 SATA Drive Connection

The 3307675 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

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

**Step 2:** **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-13**.



**Figure 5-13: SATA Drive Cable Connection**

**Step 3:** **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-14**.

**Step 4:** **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-14**. **Step 0:**

**Figure 5-14: SATA Power Drive Connection**

## 5.7.7 USB Cable (Dual Port)

The 3307675 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:**

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 3307675 USB connector.

**Step 3:** **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the 3307675, connect the cable connectors to the onboard connectors. See **Figure 5-15**.
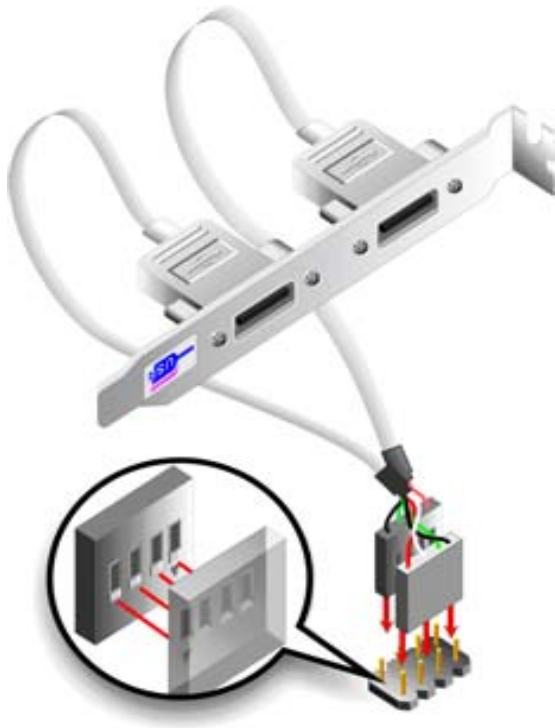
**Figure 5-15: Dual USB Cable Connection**

**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 0:**

## 5.7.8 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from GLOBAL AMERICAN, INC.. To install a four port USB cable onto the 3307675, please follow the steps below.

**Step 1:** **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

⚠️ **WARNING:**

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

**Step 2:** **Align the connectors**. Each cable has two connectors. Correctly align pin 1on
each cable connector with pin 1 on the 3307675 USB connectors.

**Step 3:** **Insert the cable connectors**.. Once the cable connectors are properly aligned
with the USB connectors on the 3307675, connect the cable connectors to the
onboard connectors. See **Figure 5-15**.
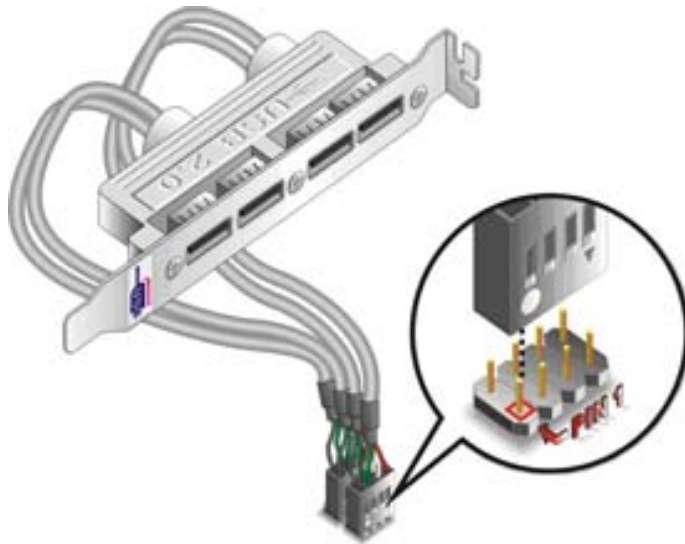


**Figure 5-16: Four Port USB Cable Connection**

**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 0:**

## 5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral
interface connectors.

■ VGA monitors

■ RJ-45 Ethernet cable connectors

■ USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 3307675 external peripheral interface connector making sure the pins are properly aligned.

## 5.8.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

**Step 1:** **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

**Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the 3307675. See **Figure 5-17**.
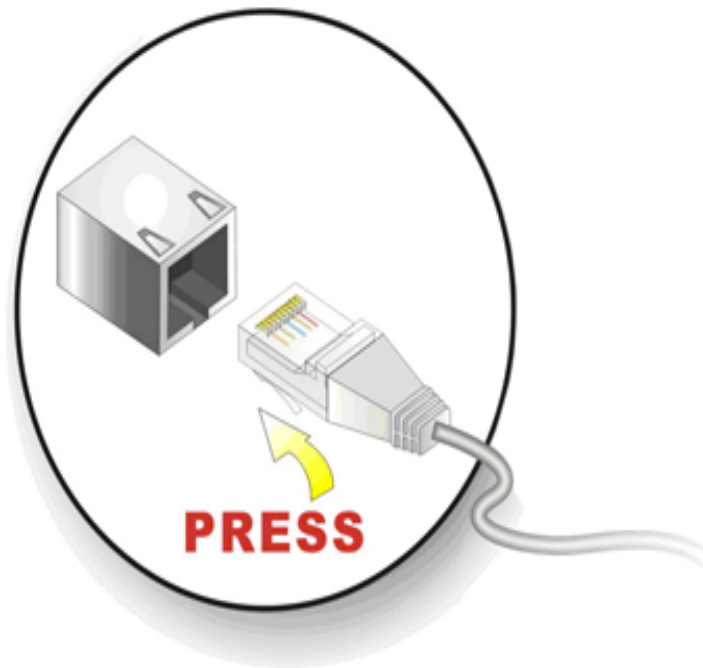
**Figure 5-17: LAN Connection**

**Step 3:** **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.  **Step 0:**

## 5.8.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the 3307675. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

**Step 1:** **Located the USB connectors**. The locations of the USB connectors are shown in **Chapter 4**.

**Step 2:** **Align the connectors.** Align the USB device connector with one of the connectors on the 3307675. See **Figure 5-17**.
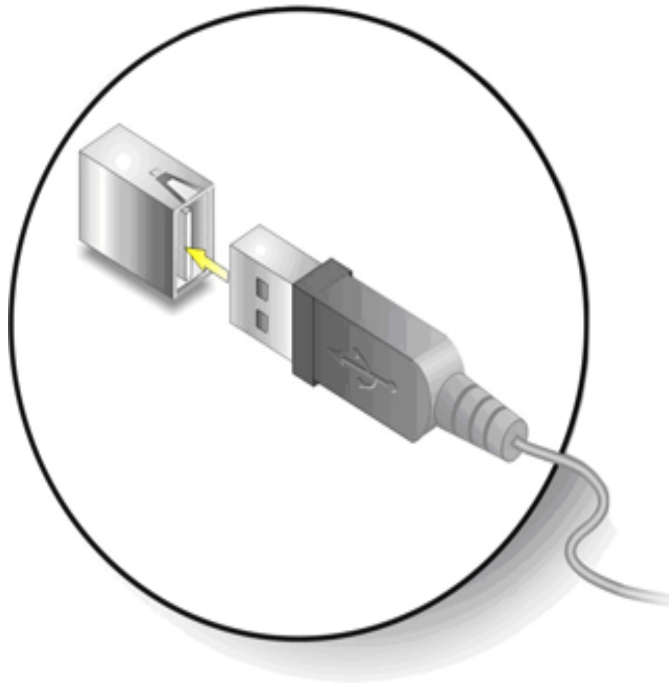


**Figure 5-18: USB Device Connection**

**Step 3:** **Insert the device connector.** Once aligned, gently insert the USB device

connector into the onboard connector.  **Step 0:**
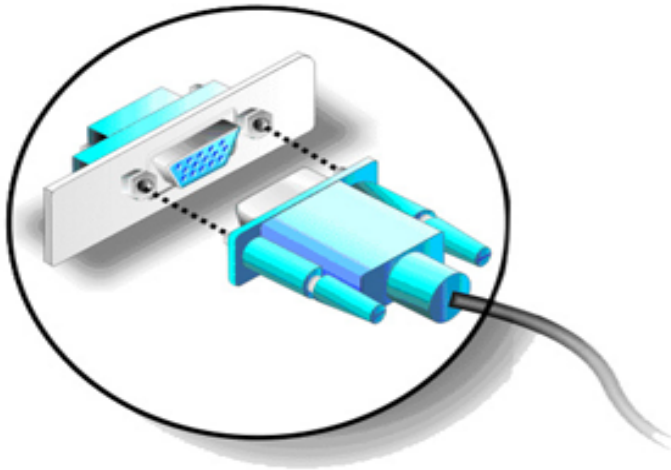
### 5.8.3 VGA Monitor Connection

The 3307675 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the 3307675, please follow the instructions below.

**Step 1:**   **Locate the female DB-15 connector**. The location of the female DB-15

connector is shown in **Chapter 3**.

**Step 2:**   **Align the VGA connector**. Align the male DB-15 connector on the VGA screen

cable with the female DB-15 connector on the external peripheral interface.

**Step 3:**   **Insert the VGA connector**. Once the connectors are properly aligned with the

insert the male connector from the VGA screen into the female connector on the

3307675. See **Figure 5-19**.

S



**Figure 5-19: VGA Connector**

**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.  **Step 0:**

**Appendix**

# B

# DIO Interface

## A.1 DIO Interface Introduction

The DIO connector on the 3307675 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-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:**

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

## A.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | VCC |
| 3 | Output 3 | 4 | Output 2 |
| 5 | Output 1 | 6 | Output 0 |
| 7 | Input 3 | 8 | Input 2 |
| 9 | Input 1 | 10 | Input 0 |

## A.3 Assembly Language Samples

### A.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

| MOV | AX, 6F08H | Sets the digital port as input |
| INT | 15H | Initiates the INT 15H BIOS call |

### A.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

| | | |
|---|---|---|
| **MOV** | **AX, 6F09H** | Sets the digital port as output |
| **MOV** | **BL, 09H** | |
| **INT** | **15H** | Initiates the INT 15H BIOS call |

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# Watchdog Timer

**NOTE:**

> The following discussion applies to DOS environment. GLOBAL
> AMERICAN, INC. support is contacted or the GLOBAL AMERICAN,
> INC. 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 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 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, 30          ; time-out value is 48 seconds
        INT     15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1          ; is the application over?
        JNE     W_LOOP          ; No, restart the application

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

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**Appendix**

# D

# Address Mapping

## C.1 Address Map

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

**Table C-1: IO Address Map**

## C.2 1st MB Memory Address Map

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

**Table C-2: 1st MB Memory Address Map**

## C.3 IRQ Mapping Table

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

**Table C-3: IRQ Mapping Table**

## C.4 DMA Channel Assignments

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

**Table C-4: IRQ Mapping Table**

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**Appendix**

# E
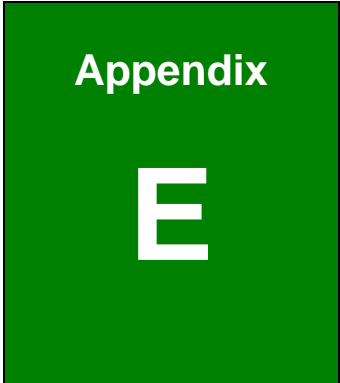
# Intel® Matrix Storage Manager

## D.1 Introduction

The Intel® ICH7R chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

## ⚠ 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.

### 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 cables within the chassis to avoid system down time.

## D.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

## D.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

**Step 1:** **Connect SATA drives to the system**. Connect two or more 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. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

**Step 2:** **Enable SATA drives in BIOS**. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

**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+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

**Step 6:** **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

**Step 7:** **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.**Step 0:**

# D.4 RAID Configuration

## D.4.1 Creating a RAID Volume

⚠️ **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.

**Step 1:** **Select** "**Create RAID Volume**." Use the arrow keys to highlight **Create RAID**

**Volume** and press **ENTER**. See Figure D-1.
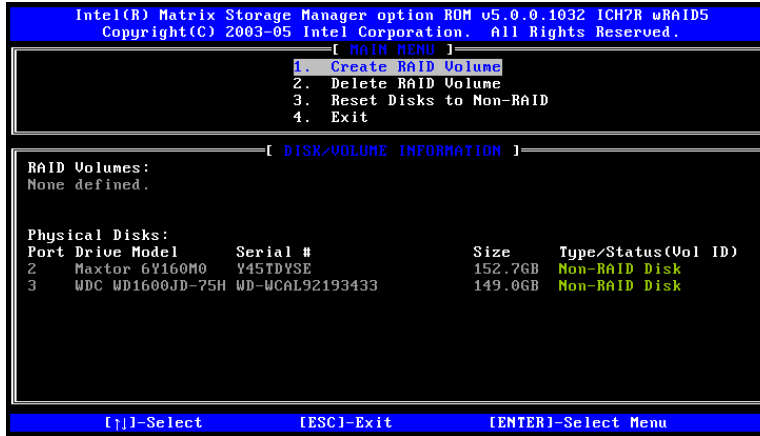


**Figure D-1: Matrix Storage Manager Main Menu**

**Step 2:** **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to

accept the default volume name. Upper and lower case alphabetic, numeric,

space, and underscore characters are all applicable for naming an array. See

Figure D-2.
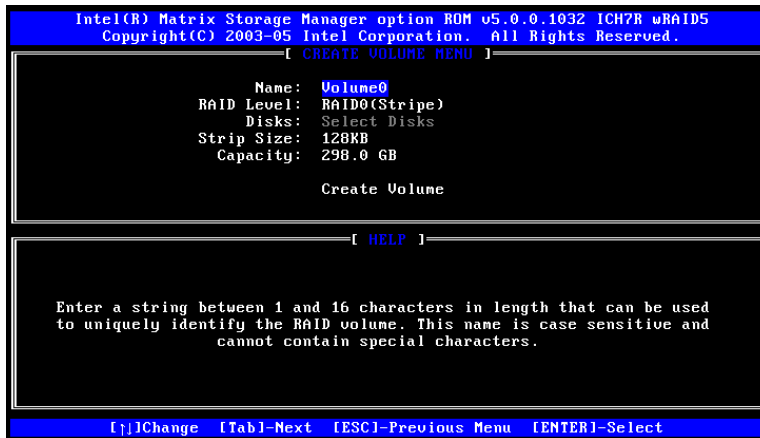


**Figure D-2: Create RAID Volume Name**

**Step 3:** **Choose the RAID level**. Select a RAID level from the list. RAID levels include

RAID 0, 1, 5 and 10. See Figure D-3.

---

**NOTE:**

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

---



**Figure D-3: Choose the Raid Level**

**Step 4:** **Select the Stripe Size**. Select a stripe size from the list. See Figure D-4.
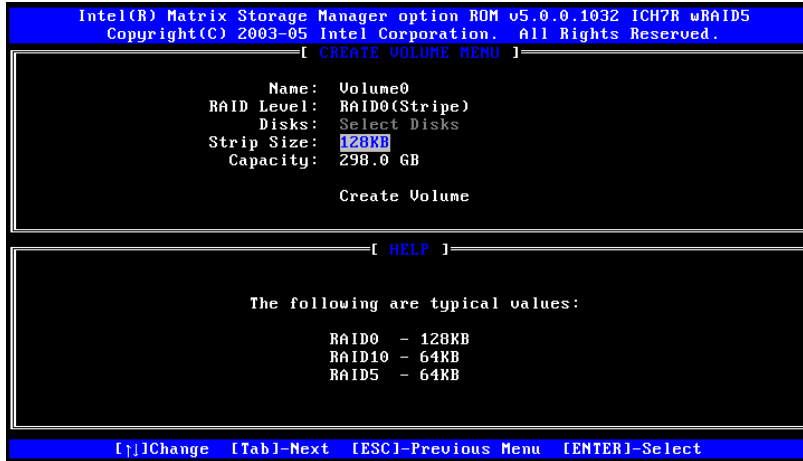


**Figure D-4: Select the Stripe Size**

**Step 5:** **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to

accept the default capacity. See Figure D-5.



**Figure D-5: Enter the Volume Capacity**

**Step 6:** **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified.

See Figure D-6.
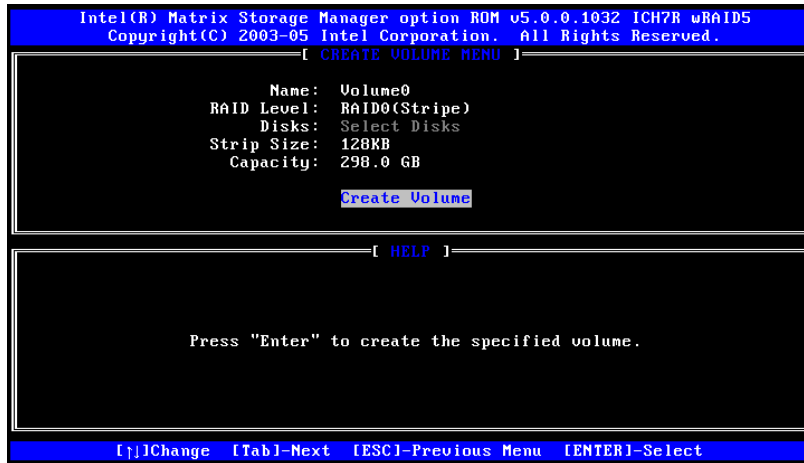


**Figure D-6: Create the RAID Volume**

**Step 7:** **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu.

See Figure D-7. **Step 0:**
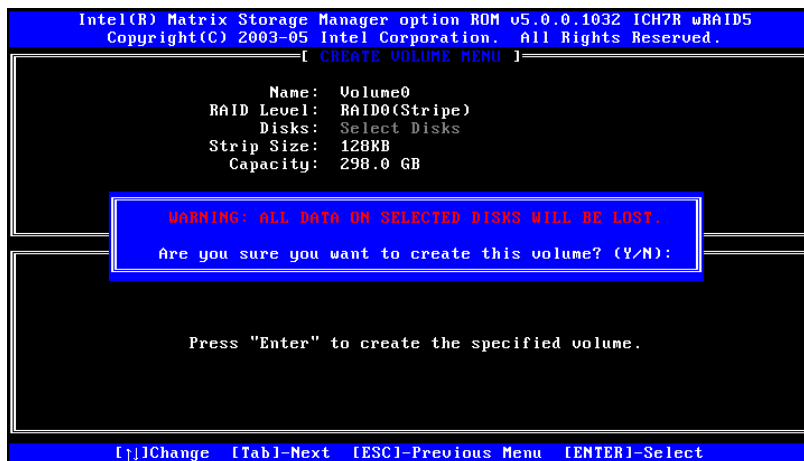


**Figure D-7: Create RAID Volume Verification**

## D.4.2 Deleting a RAID Volume

⚠️ **WARNING!**

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

**Step 1:** **Select** "**Delete RAID Volume**." Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See Figure D-8.



**Figure D-8: Delete RAID Volume Menu**

**Step 2:** **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID

volume to be deleted and press ENTER. See Figure D-9.
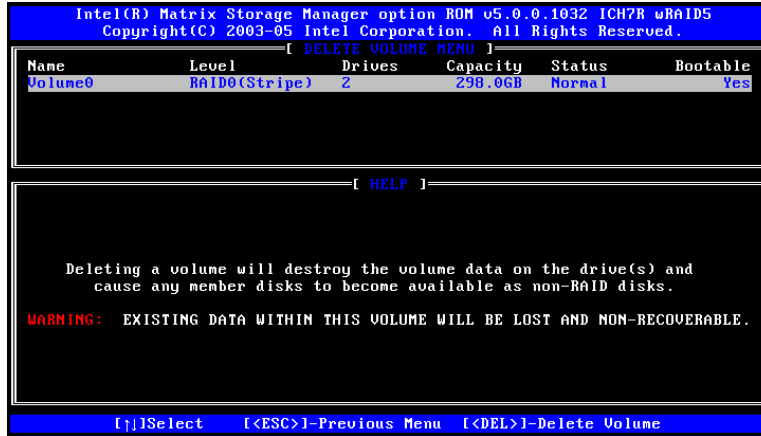


**Figure D-9: Select RAID Volume to be Deleted**

**Step 3:** **Delete Volume Verification**. After reading the warning, press **Y** to delete the

specified RAID volume, or **N** to return to the **Delete Volume** menu.

See Figure D-10.
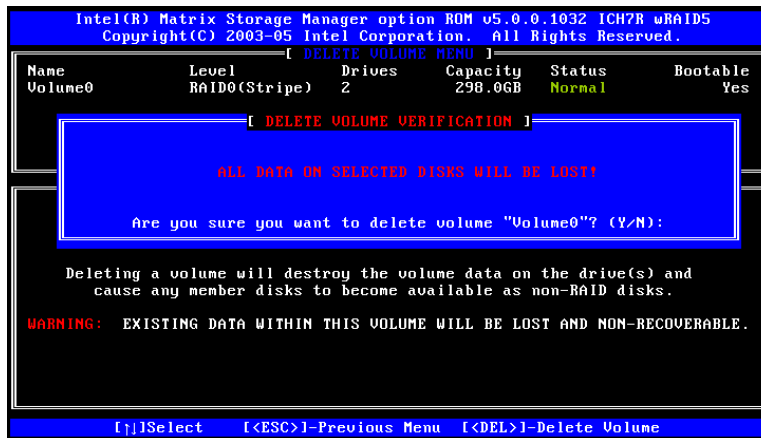


**Figure D-10: Delete Volume Verification**

**Step 4:** **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See Figure D-11. **Step 0:**



**Figure D-11: Non-RAID Disks**

## D.4.3 Resetting a Disk to Non-RAID

⚠ **WARNING!**

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

**Step 1:** **Select** "**Reset Disk to Non-RAID**." Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See Figure D-12.
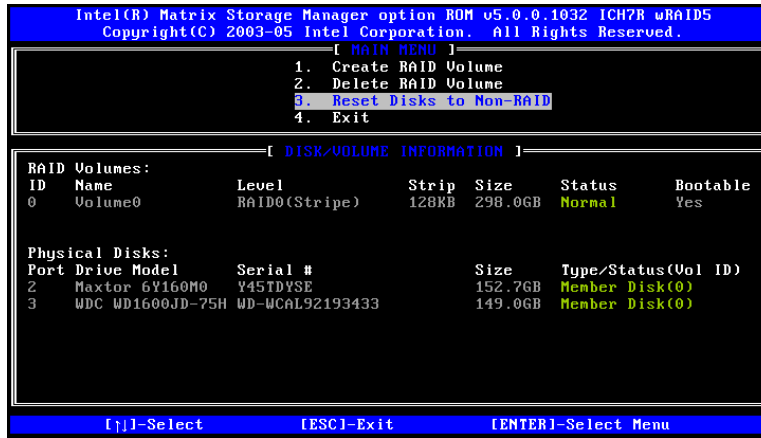


**Figure D-12: Reset Disk to Non-RAID Menu**

**Step 2:** **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See Figure D-13.
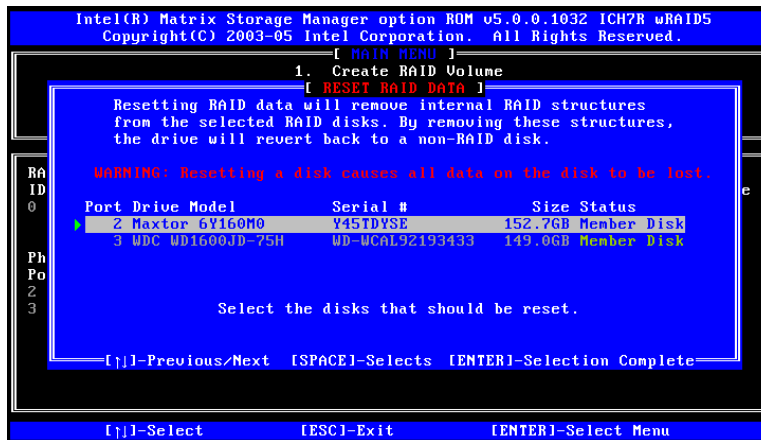


**Figure D-13: Select Disk to Reset**

**Step 3:** **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected

disks as non-RAID, or **N** to return to the **Reset RAID Data** menu.

See Figure D-14.



**Figure D-14: Reset Disk Verification**

**Step 4:** **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the

**Matrix Storage Manager Main** menu is shown indicating the status of the RAID

volumes and disk drives. See Figure D-15. **Step 0:**



**Figure D-15: Disk Drive and RAID Volume Status**

## D.4.4 Exiting the Matrix Storage Manager

**Step 1:**   **Select** "**Exit**." Use the arrow keys to highlight **Exit** and press **ENTER**.

See Figure D-16.



**Figure D-16: Exit Menu**

**Step 2:**   **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to

the **Main** menu. See Figure D-17.  **Step 0:**



**Figure D-17: Exit Verification**

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.



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