User's Manual

2807730

Version 1.0
6/23/2007

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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 2807730 from or contact a GLOBAL AMERICAN, INC. sales representative directly. To contact a GLOBAL AMERICAN, INC. sales representative, please send an email to salesinfo@globalamericaninc.com.

The items listed below should all be included in the 2807730 package.

- 1 x 2807730 single board computer
- 1 x IDE cable
- 3 x SATA power cables
- 6 x SATA cables
- 2 x Dual RS-232 cable
- 1 x Single RS-232 cable
- 1 x I/O shielding
- 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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List of Tables

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Glossary

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

Chapter

1

Introduction

1.1 Overview

The 2807730 ATX form factor motherboard is a LGA775 Intel® Core™2 Quad, Core™2 Duo, Pentium® D, Pentium® 4 or Celeron® D platform with a 533MHz, 800MHz or 1066MHz front side bus (FSB). 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. One PCIe x16, three PCIe x4 slots, three PCI slots and eight USB 2.0 connectors (four external and four internal) provide flexible expansion options. Added system security is provided with Trusted Platform Module (TPM v1.2) supported.

1.1.1 2807730 Features

Some of the 2807730 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
- Added security with support for TPM v1.2
- Expansion slots include:
  - One PCIe x16 slots
  - Three PCIe x4 slots
  - Three PCI slots
- Six SATA II drives with transfer rates of 3.0Gb/s supported
- Four Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Eight USB 2.0 devices supported
- Dual PCIe GbE Ethernet connectors
- PICMG 1.3 form factor
- RoHS compliant

- Supports ATX power supplies

1.2 2807730 Overview

1.2.1 2807730 Overview Photo

The 2807730 has a wide variety of peripheral interface connectors. **Figure 0-1** is a labeled photo of the peripheral interface connectors on the 2807730.

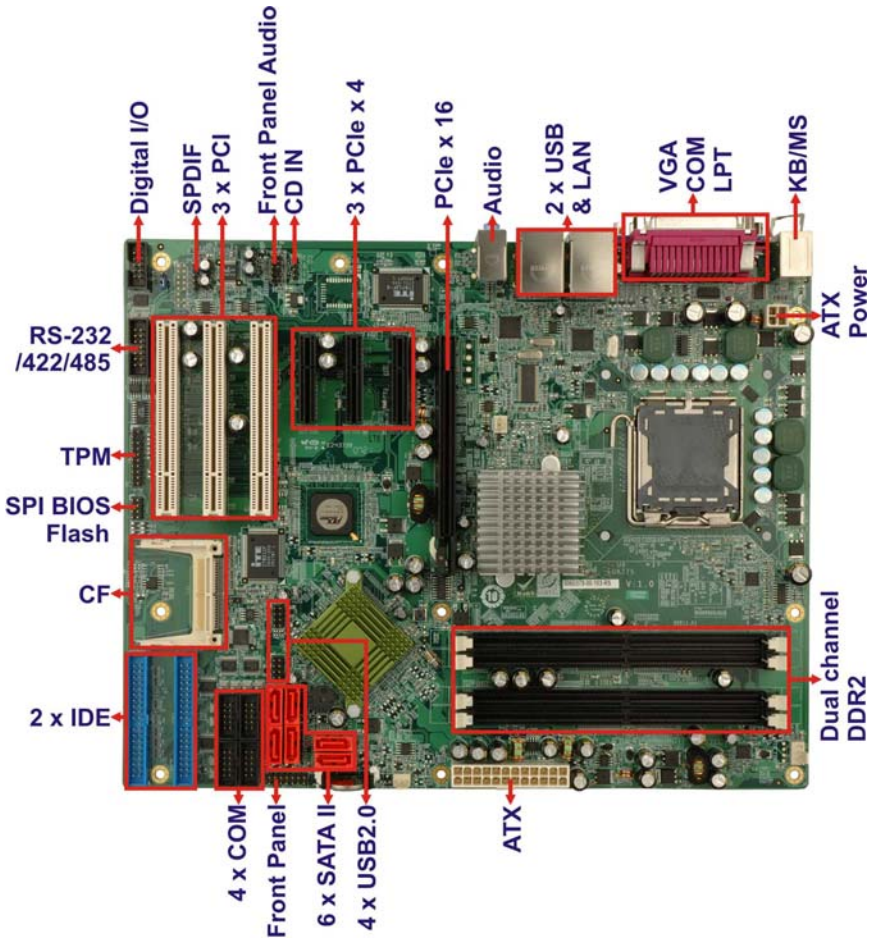

Figure 0-1: 2807730 Overview [Front View]

1.2.2 2807730 Peripheral Connectors and Jumpers

The 2807730 has the following connectors on-board:

- 1 x ATX +12V power connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x CompactFlash® Type II (CF Type II) socket
- 1 x Digital input/output (DIO) connector
- 3 x Fan connectors
- 1 x Front panel connector
- 2 x IDE disk drive connectors
- 1 x Infrared interface connector
- 1 x Keyboard and mouse connector
- 3 x PCI expansion slots
- 1 x PCIe x16 expansion slot
- 3 x PCIe x4 expansion slots
- 6 x Serial ATA II (SATA II) drive connectors
- 5 x Serial port connectors
- 1 x SPDIF connector
- 1 x SPI flash connector
- 1 x TPM connector
- 2 x USB 2.0 connectors

The 2807730 has the following external peripheral interface connectors on the board rear panel

- 3 x Audio jacks
- 2 x Ethernet connectors
- 1 x Parallel port connector
- 1 x Serial port connector
- 4 x USB 2.0 port connectors
- 1 x VGA connector

The 2807730 has the following on-board jumpers:

- Clear CMOS
- CF card setting
- Select RS-232/422/485 for COM2

1.2.3 Technical Specifications

2807730 technical specifications are listed in **Table 0-1**. See **Chapter 2** for details.

Specification	2807730
Form Factor	ATX
System CPU	LGA775 Intel® Core™ 2 Quad LGA775 Intel® Core™ 2 Duo LGA775 Intel® Pentium® D LGA775 Intel® Pentium® 4 LGA775 Intel® Celeron® D
Front Side Bus	533MHz, 800MHz or 1066MHz
System Chipset	**Northbridge**: Intel® Q965 **Southbridge**: Intel® ICH8DO
Memory	Four dual channel 240-pin DDR2 DIMM sockets support four 533MHz, 667MHz or 800MHz DIMMs each with a maximum capacity of 2GB (A total of 8GB DDR2 supported)
Display	VGA integrated into the Intel® Q965
BIOS	AMI Flash BIOS
Audio	7.1 channel HD audio kit with Realtek ALC883 and dual audio streams supported
TPM	One 20-pin connector TPM v1.2 module

Expansion Options	One PCIe x16 slot Three PCIe x4 slots Three PCI slots
Infrared (IrDA)	One IrDA by pin header
LAN	Dual Intel® Broadcom BCM5787M PCIe GbE chipsets with ASF 2.0 support
SuperIO	ITE IT8712F
SSD	CF Type II
Digital I/O	8-bit digital I/O, 4-bit input/4-bit output
COM	Five RS-232 serial ports (four internal, one external) One RS-232, RS-422 or RS-485 serial port (internal)
USB 2.0	Eight USB 2.0 devices supported
IDE	Two 40-pin IDE connector connects to two Ultra ATA33/66/100 devices
SATA	Six 3.0Gb/s SATA II drives supported
Keyboard/mouse	Two PS/2 connectors for keyboard and mouse
Parallel Port	One external parallel port of connection to parallel communications device (e.g. printer)
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	ATX power only
Power Consumption	5V@4.62A, 12V@9.71A and 3.3V@5.74A (Intel® Pentium® 4 3.73GHz, 1066MHz FSB CPU and 1GB 667MHz DDR2)
Temperature	0ºC – 60ºC (32ºF - 140ºF)

Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	304.80 mm x 243.84 mm
Weight (GW/NW)	1350g/750g

Table 0-1: Technical Specifications

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Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 304.80mm
- **Width**: 243.84mm

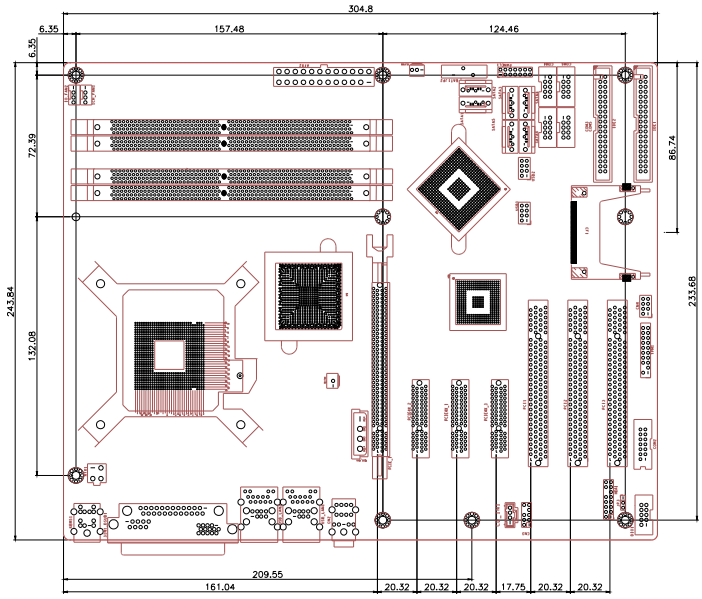

Figure 2-1: 2807730 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

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

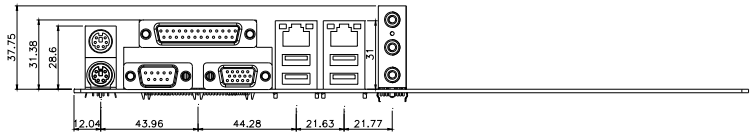

Figure 2-2: External Interface Panel Dimensions (mm)

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.

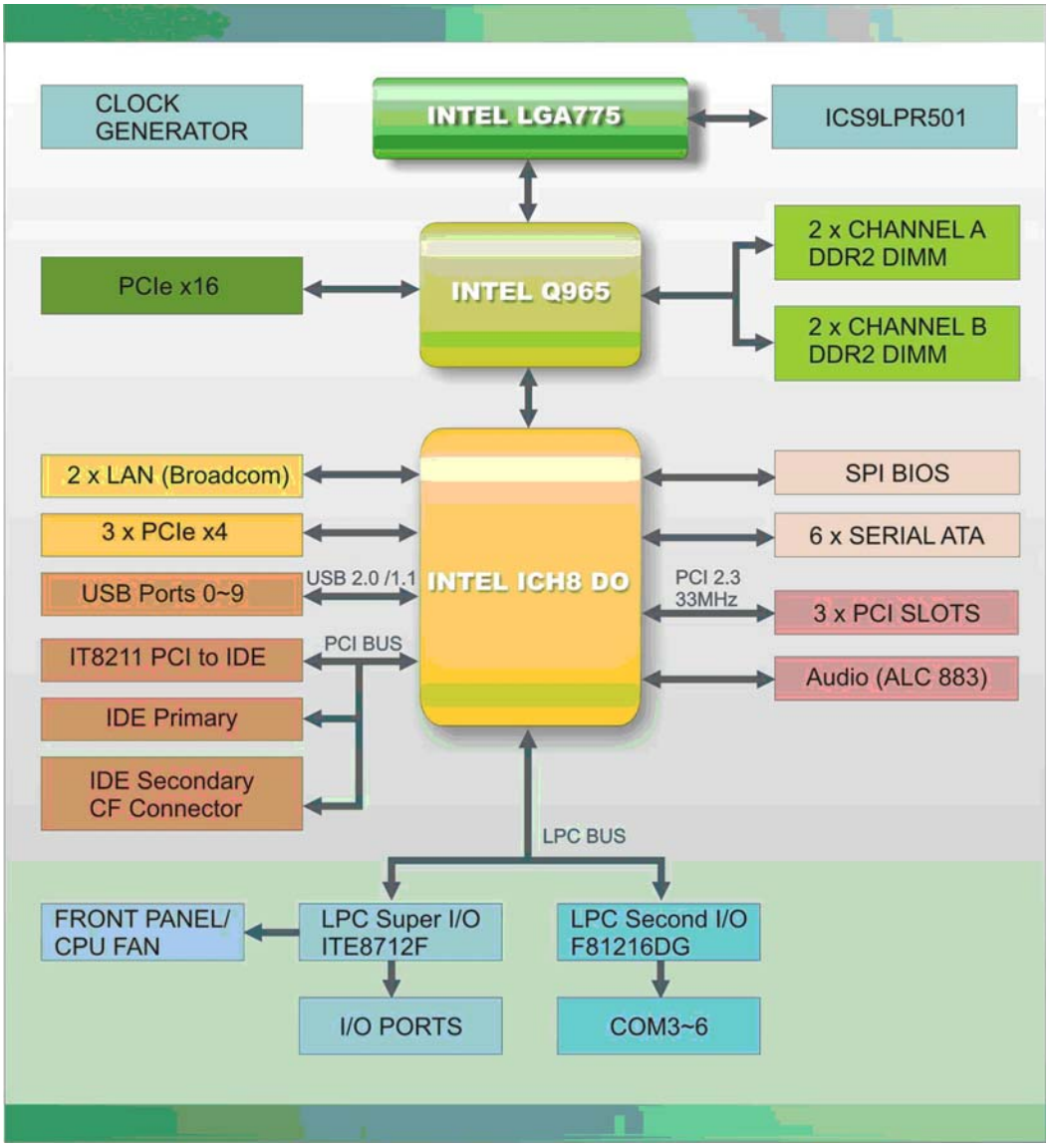

Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

The 2807730 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

WARNING:

Only DDR2 memory module can be installed on the 2807730. Do not install DDR memory modules. If a DDR memory module is installed on the 2807730, the 2807730 may be irreparably damaged.

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.

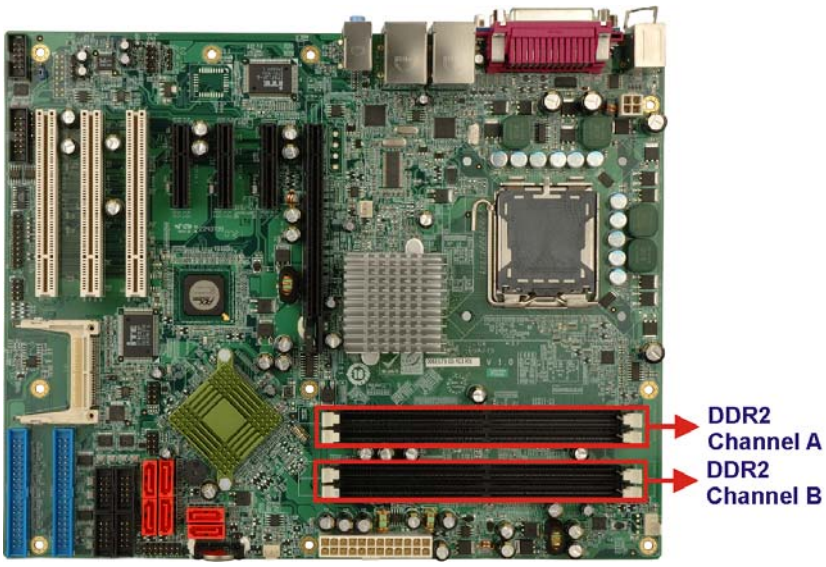

Figure 2-4: 240-pin DIMM Sockets

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 one 16-lane PCIe port that is intended for an external PCIe graphics card. The PCIe x16 graphics card is installed on the PCIe x16 slot (**Figure 2-5)** and interfaced to the northbridge directly.

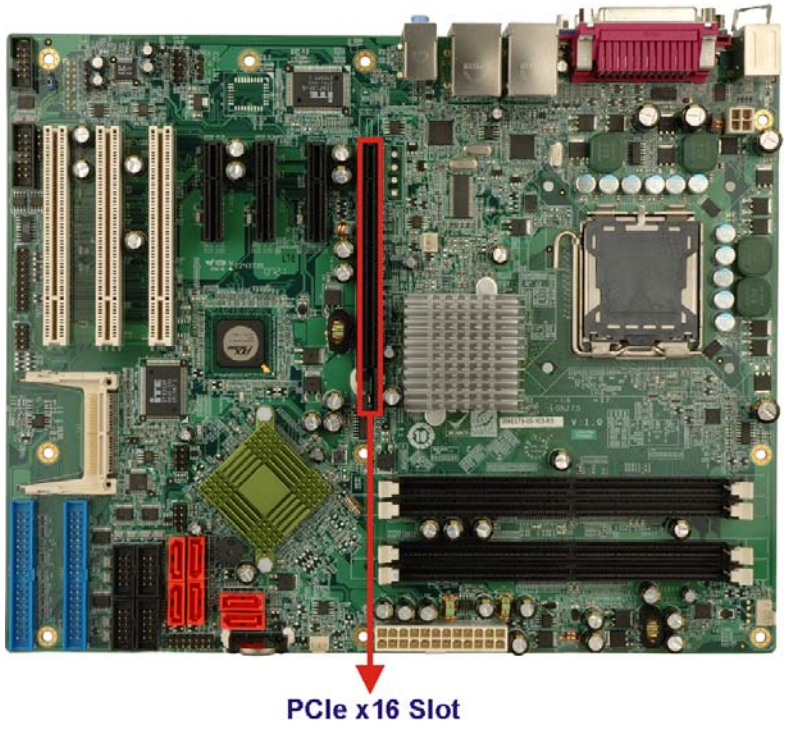

Figure 2-5: PCIe x16 Expansion Slot

2.4.3.2 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 2807730
- Supports the eight USB 2.0 devices on the 2807730 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 SPI BIOS Chipset:

A licensed copy of AMI BIOS installed is an onboard SPI (Serial Peripheral Interface) BIOS 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

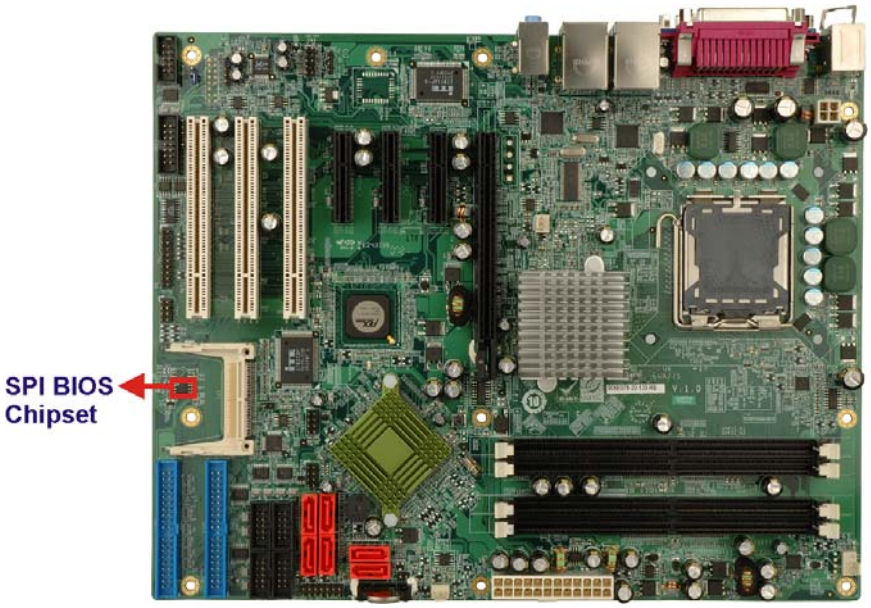

Figure 2-6: SPI BIOS Chipset

2.5.3 Intel® High Definition Audio

The 2807730 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.

2.5.4 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

2.5.5 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 three PCI channels are connected to three PCI expansion sockets. One PCI channel is connected to an IDE controller to provide connectivity to IDE HDDs. For more details please refer to ***Section 2.7***.

2.5.6 Intel® ICH8DO PCIe Ports

There are six root PCIe ports on the Intel® ICH8DO. Port 5 and port 6 provides PCIe x1 connectivity to two Broadcom PCIe GbE controllers. Port 1 to port 4 are connected to a PLX PCIe express switch. The PCIe express switch is connected in turn to three PCIe x4 expansion slots.

2.5.7 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

2.5.8 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 2807730 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 2-7: SATA Connectors

2.5.10 Intel® ICH8DO USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH8DO on the 2807730. 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.

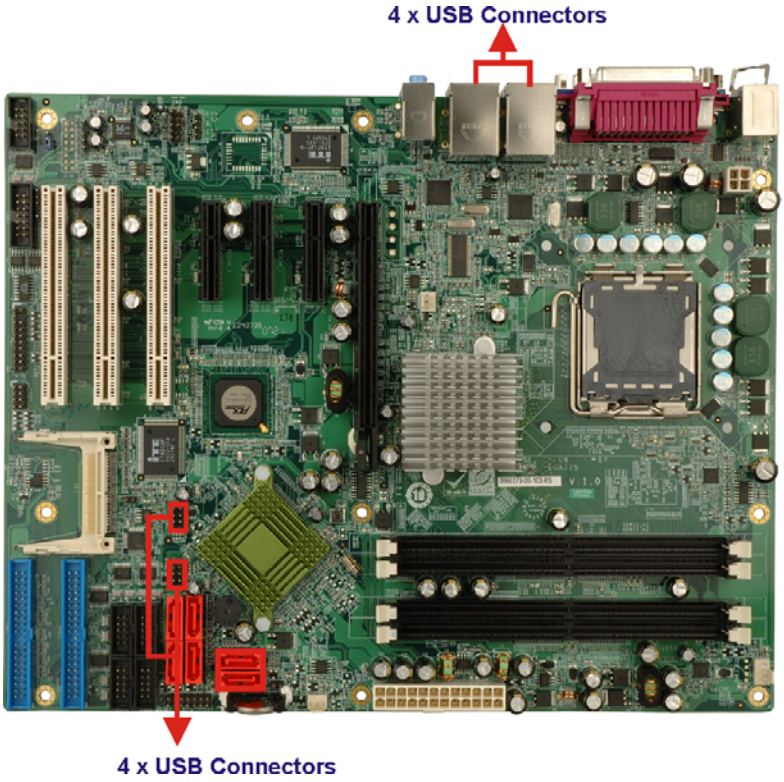

Figure 2-8: USB Connector

2.6 Intel® ICH8DO PCIe Bus Components

2.6.1 PCIe Bus Overview

The IMBA-X6954 Intel® ICH8DO southbridge PCIe bus is split into two PCIe x1 channels and one PCIe x4 channel. The two PCIe x1 channels are each connected to a Broadcom PCIe GbE controller. The PCIe x4 channel is connected to a PLX PEX8518 PCIe switch which is connected in turn to three PCIe x4 slots.

2.6.2 PCIe x4 Interface Goldfinger

The PCIe x4 from the southbridge consists of four lanes. The four lanes are connected to a PLX PEX8518 PCIe switch, which is then connected to three PCIe x4 expansion slots as shown in **Figure 2-9**.

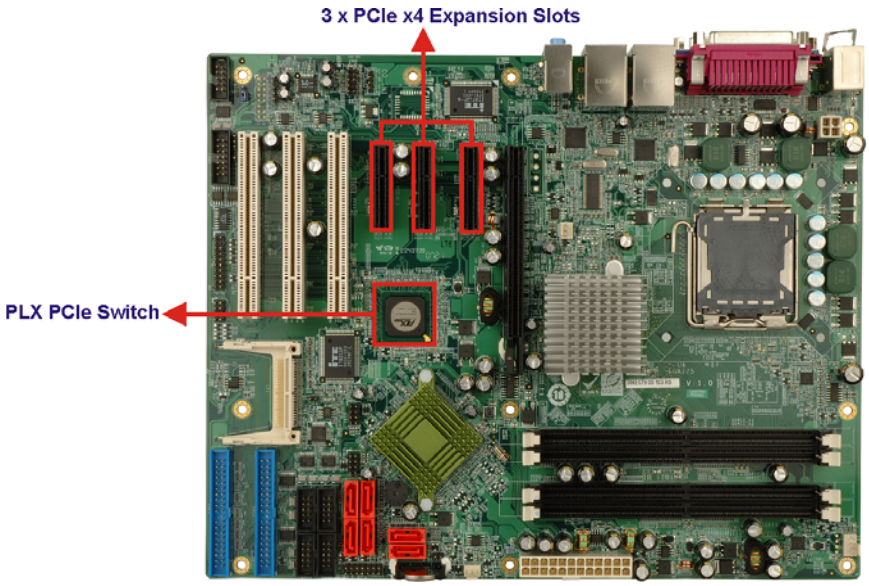

Figure 2-9: PCIe x4 Expansion

The PLX PEX8518 has 16 ports. Four ports are interfaced to four of the PCIe switch ports from the ICH8D0 southbridge. The remaining twelve PCIe ports are interfaced to the three PCIe x4 expansion slots. Some of the features of the PLX PEX8518 are listed below.

- 16-lane PCI Express switch
- Maximum Power: 3.53 Watts
- PCI Express Base Specification, rev. 1.1 compliant
- Non-blocking switch fabric
- Full line rate on all ports

2.6.3 PCIe GbE Ethernet

Two PCIe x1 lanes from the are connected to two Broadcom BCM5787M PCIe GbE controllers shown in **Figure 2-10** below.

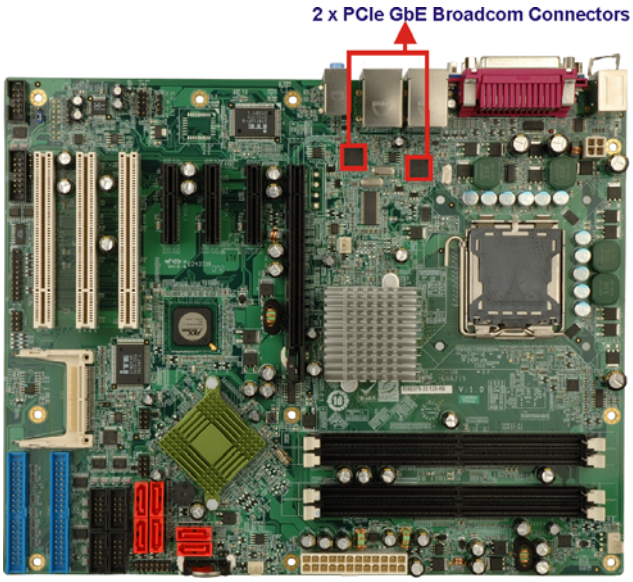

Figure 2-10: Broadcom PCI GbE Controllers

The Broadcom BCM5787M is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support

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
- Four PCI expansion slots

2.7.2 ITE 8211 ATA Controller Chipset

The 40-pin IDE connectors and the CompactFlash® socket on the 2807730 are connected to the ATA/ATAPI-6 ITE 8211 ATA controller chipset, which is then connected to the Intel® ICH8DO southbridge chipset through the PCI bus. The controller and connectors are shown in **Figure 2-11** below. The following IDE device combinations are supported:

- Three ATA/ATAPI-6 hard disks and one CF Type I/II card
- Four ATA/ATAPI-6 hard disks and no CF Type I/II cards

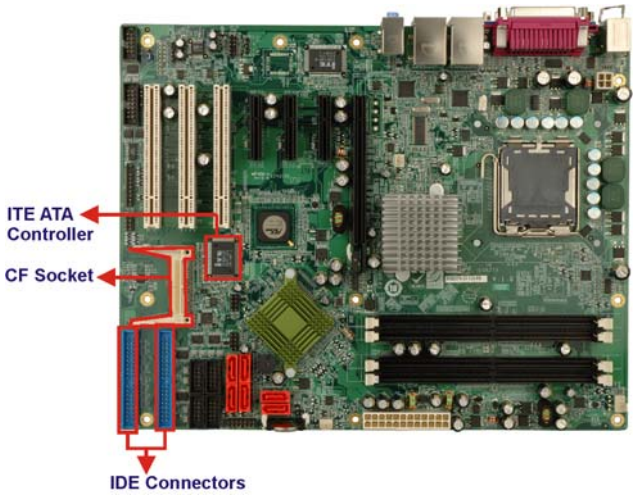

Figure 2-11: ATA controller

Four ATA/ATAPI-6 hard disks can be connected to the two IDE connectors or three ATA/ATAPI-6 hard disks and one CF card can be installed. 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 Expansion Sockets

Three PCI expansion sockets are interfaced to the ICH8DO southbridge through the PCI bus. These expansion sockets support standard PCI expansion cards. The PCI expansion sockets are shown in **Figure 2-9**.

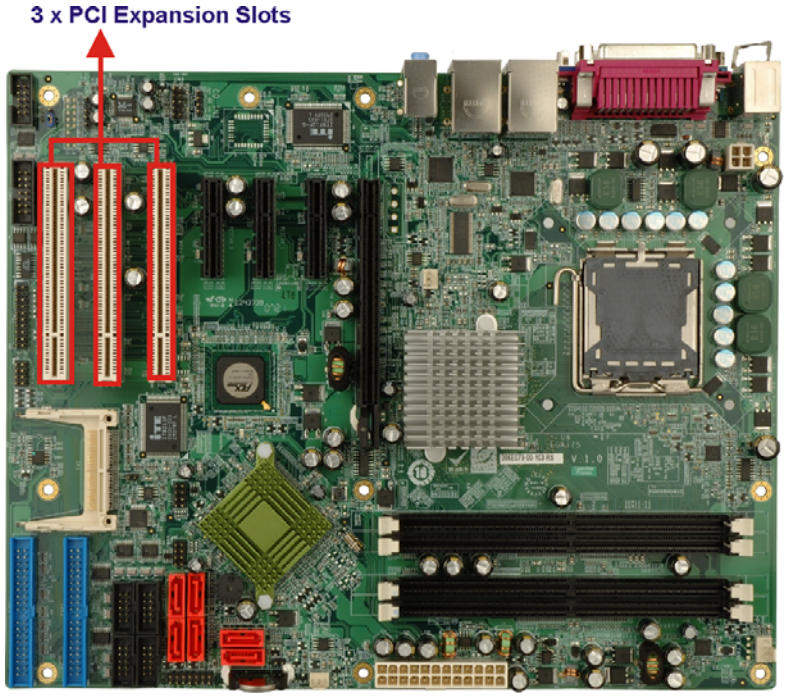

Figure 2-12: PCI Expansion Sockets

2.8 LPC Bus Components

2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- Super I/O chipset
- Serial port chipset

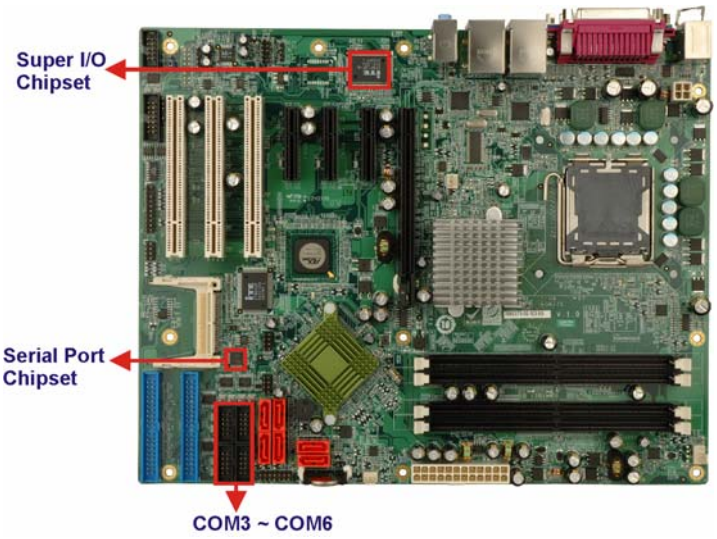

Figure 2-13: LPC Bus Components

2.8.2 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:

2.8.2.1 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.

2.8.2.2 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).

2.8.2.3 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.

2.8.2.4 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.

2.8.2.5 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

2.8.3 Serial Port Chipset

The 2807730 has a Fintek F81216DG chipset onboard enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
  - 3 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48MHz
- Powered by 3Vcc

2.9 Environmental and Power Specifications

2.9.1 System Monitoring

Three thermal inputs on the 2807730 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- Temperature sensor 1
- Temperature sensor 2
- Temperature sensor 3

All three fan speeds are monitored and can be seen in the BIOS as:

- FAN1 Speed
- FAN2 Speed
- FAN3 Speed

Eight voltage inputs on the 2807730 Super I/O Enhanced Hardware Monitor monitor the following volatages:

- Vcore
- Vcc
- +3.30V
- +5.00V
- +12.0V
- +1.2V
- +1.5V
- +1.25V
- VBAT

The 2807730 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

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 2807730 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 2807730 running with a 1066MHz FSB 3.73GHz Intel® Pentium® 4 processor with 1GB of 667MHz DDR2 memory.

Voltage	Current
+3.3V	5.74A
+5V	4.62A
+12V	9.71A

Table 2-1: Power Consumption

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Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the 2807730 may result in permanent damage to the 2807730 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2807730. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2807730, 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 2807730, place it on an antic-static pad. This reduces the possibility of ESD damaging the 2807730.
- ***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 2807730 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 2807730 does not fall out of the box.
- Make sure all the components shown in Section 3.3 are present.

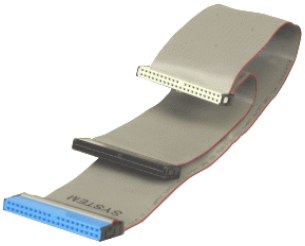
3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the GLOBAL AMERICAN, INC. reseller or vendor you purchased the 2807730 from or contact a GLOBAL AMERICAN, INC. sales representative directly. To contact a GLOBAL AMERICAN, INC. sales representative, please send an email to salesinfo@globalamericaninc.com.

3.3.1 Package Contents

The 2807730 is shipped with the following components:

Quantity	Item and Part Number	Image
1	2807730	
1	ATA 66/100 flat cable	
2	Dual RS-232 cable	

1	Single RS-232 cable	
1	I/O Shielding	
6	SATA cables	
3	SATA power cables	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.4 Optional Items

2-port USB cable (w bracket)	
4-port USB cable	
CPU cooling kit (**P/N**: 2107695)	
Dual RS-232/422/485 cable	
PCIe x16 VGA output SDVO card with dual display support (**P/N**: 3907690)	
PCIe x16 DVI output SDVO card with dual display support (**P/N**: 3907680)	
Infineon TPM module (**P/N**: 1007790)	

Sinosun TPM module (**P/N**: 1007800)	
Winbond TPM module (**P/N**: 1007810)	

Table 3-2: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 0 shows peripheral interface connector locations. Section 0 lists all the peripheral interface connectors seen in Section 0.

4.1.1 2807730 Layout

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

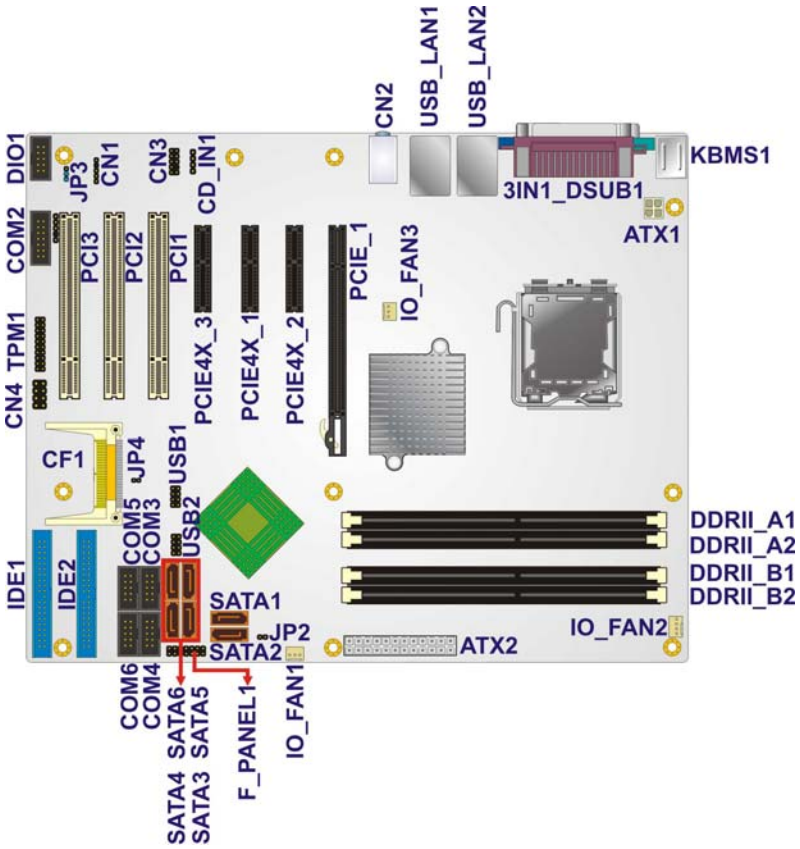


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the 2807730. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX +12V power connector	4-pin ATX	CPU12V1
ATX power connector	24-pin ATX	PWR1
Audio CD In connector	4-pin header	CD_IN1
Audio connector	10-pin header	CN3
CF Type II socket	50-pin socket	CF1
Cooling fan connector, CPU	4-pin wafer	IO_FAN2
Cooling fan connector, system	3-pin wafer	IO_FAN1
Cooling fan connector, system	3-pin wafer	IO_FAN3
Digital input/output connector	10-pin header	DIO1
Front panel connector	14-pin header	F_PANEL1
IDE Interface connector	40-pin box header	IDE1
IDE Interface connector	40-pin box header	IDE2
Infrared (IrDA) connector	5-pin header	IR1
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 (COM2)	14-pin header	COM2
Serial port connector (COM3)	10-pin header	COM3
Serial port connector (COM4)	10-pin header	COM4
Serial port connector (COM5)	10-pin header	COM5
Serial port connector (COM6)	10-pin header	COM6
SPDIF connector	5-pin header	CN1
SPI connector	8-pin header	CN4
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB1
USB connectors	8-pin header	USB2

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 2807730. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 74**

Connector	Type	Label
Audio connector	3 x audio jacks	CN2
Keyboard and mouse connector	Dual PS/2	KBMS1
Parallel port connector	D-Sub 25-pin female	LPT1
Serial port connector (RS-232)	D-Sub 9-pin male	COM1

Dual USB and LAN Combo	Dual USB ports and RJ-45	USB_LAN1
Dual USB and LAN Combo	Dual USB ports and RJ-45	USB_LAN2
VGA port connector	D-Sub 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 2807730.

4.2.1 ATX +12V Power Connector

CN Label: ATX1

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.

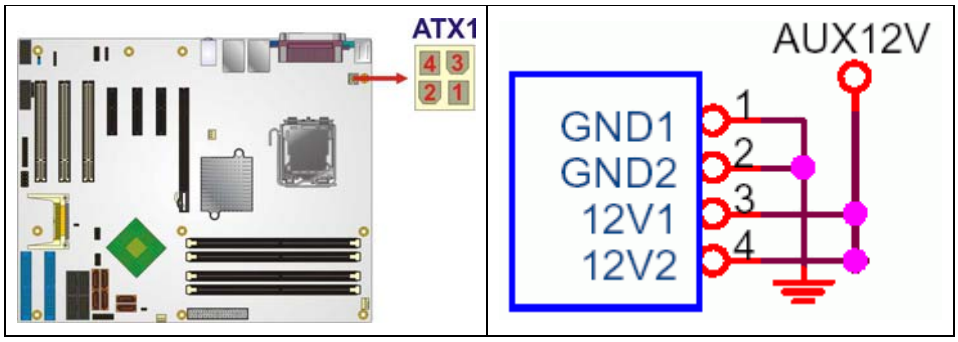


Figure 4-2: ATX Power Connector Location

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

Table 4-3: ATX Power Connector Pinouts

4.2.2 ATX Power Connector

CN Label: ATX2

CN Type: 24-pin ATX (2x12)

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

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

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

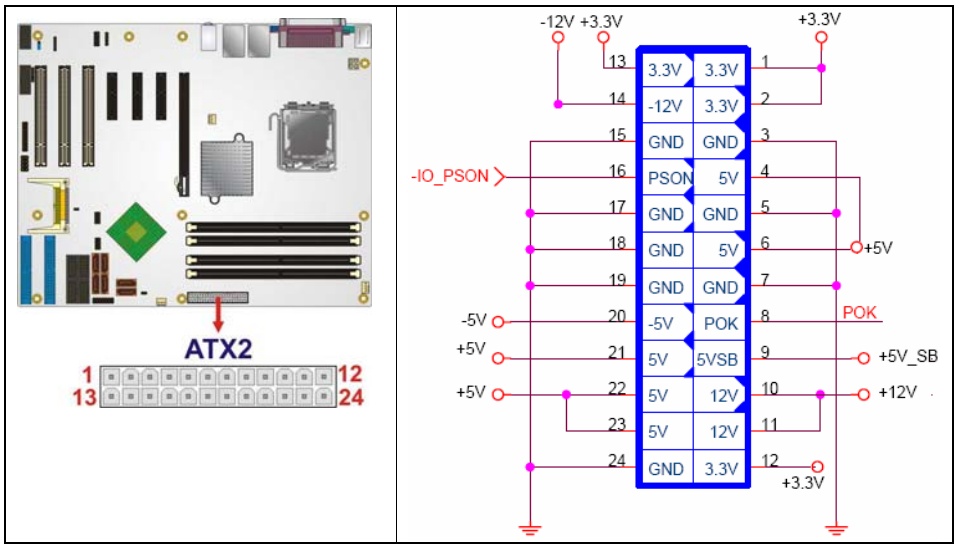


Figure 4-3: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GROUND	15	GROUND
4	+5V	16	PS-ON
5	GROUND	17	GROUND
6	+5V	18	GROUND
7	GROUND	19	GROUND
8	POWER GOOD	20	GND
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 4-4: ATX Power Connector Pinouts

4.2.3 Audio CD In Connector (4-pin)

CN Label: **CN9**

CN Type: 10-pin header

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

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

The 4-pin audio CD in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

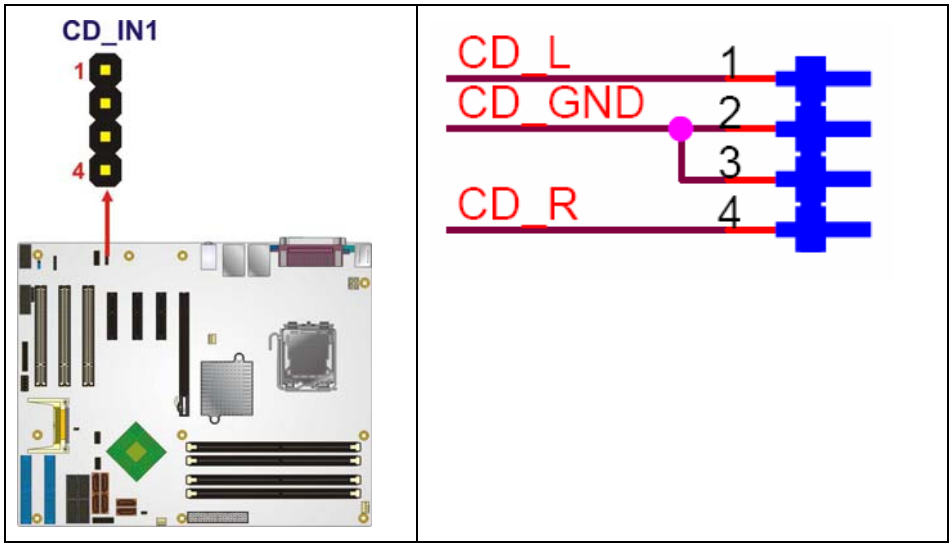


Figure 4-4: Audio CD In Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION
1	CD Signal (Left)
2	Ground
3	Ground
4	CD Signal (Right)

Table 4-5: Audio CD In Connector Pinouts

4.2.4 Audio Connector

CN Label: CN3

CN Type: 9-pin header (2x5)

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

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.

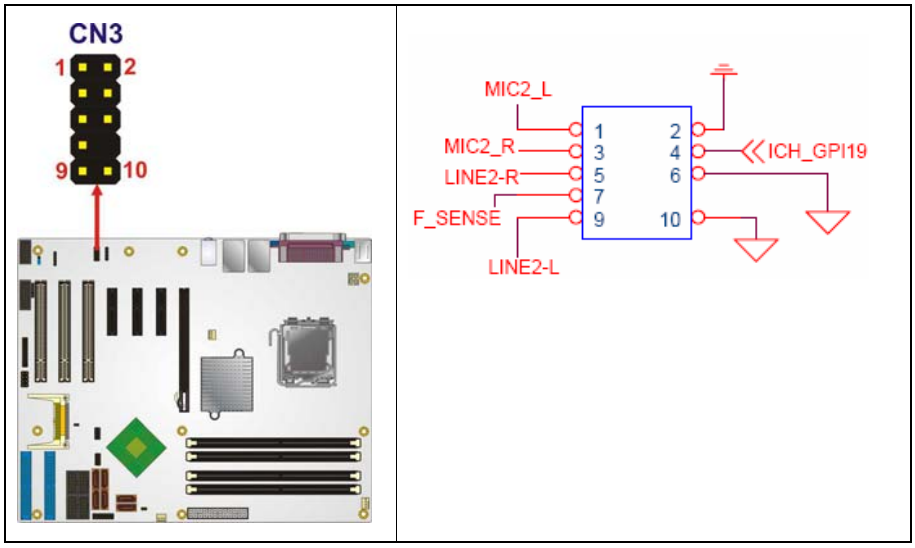


Figure 4-5: Audio Connector Location (9-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC-L	2	GND
3	MIC-R	4	+5V
5	LINE OUT-R	6	PULL DOWN
7	LINE OUT SENSE	8	KEY
9	LINE OUT-L	10	PULL DOWN

Table 4-6: Audio Connector Pinouts

4.2.5 Compact Flash Socket

CN Label: **CN24** (solder side)

CN Type: 50-pin header (2x25)

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

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

A CF Type I or Type II memory card is inserted into the CF socket on the 2807730.

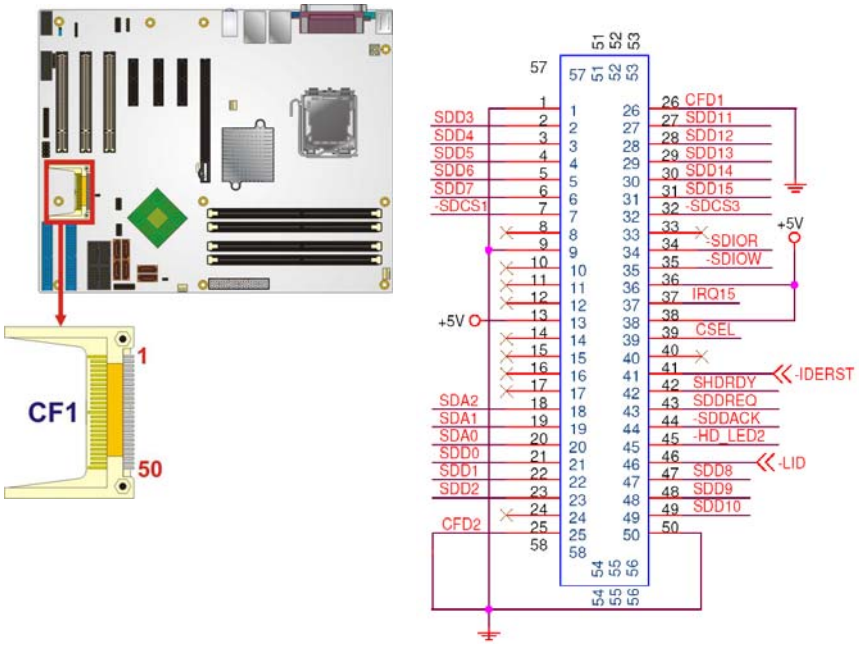


Figure 4-6: CF Card Socket Location

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

5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 4-7: CF Card Socket Pinouts

4.2.6 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-7

CN Pinouts: See Table 4-8

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

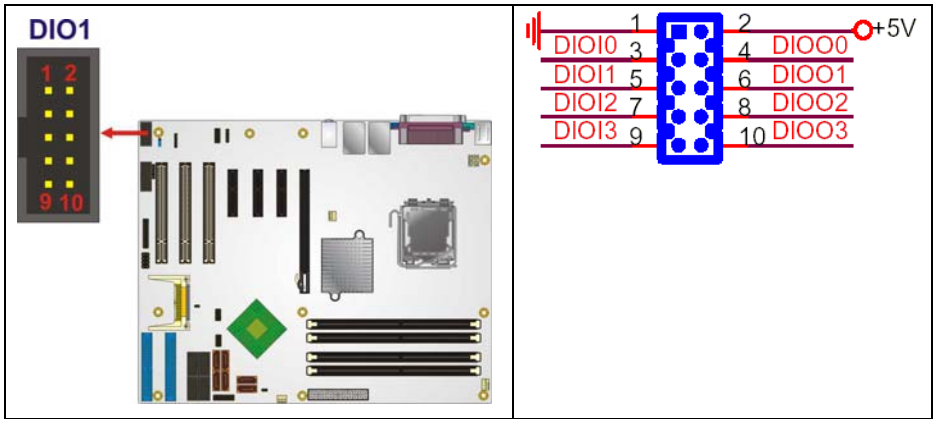


Figure 4-7: DIO Connector Connector Locations

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

Table 4-8: DIO Connector Connector Pinouts

4.2.7 Fan Connector (+12V) (CPU Cooling Fan)

CN Label: IO_FAN2

CN Type: 4-pin wafer

CN Location: See Figure 4-8

CN Pinouts: See Table 4-9

The CPU cooling fan connector provides a 12V, 500mA current to a CPU 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.

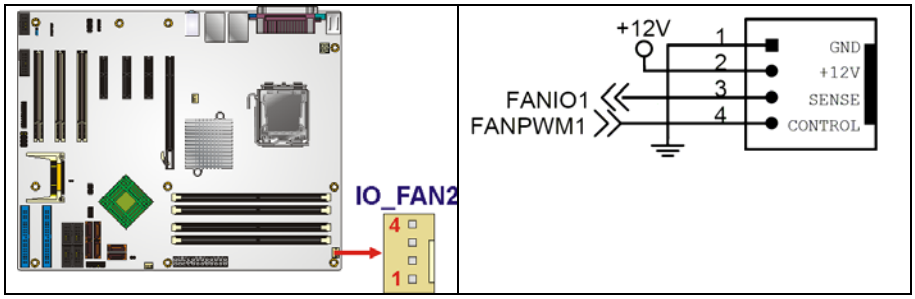


Figure 4-8: +12V Fan Connector Location

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

Table 4-9: +12V Fan Connector Pinouts

4.2.8 Fan Connector (+12V) (System Cooling Fans)

CN Label: **IO_FAN1, IO_FAN3**

CN Type: 3-pin header

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

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

Two system cooling fan connectors provide a 12V, 500mA current to two system cooling fans. The connectors have 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.

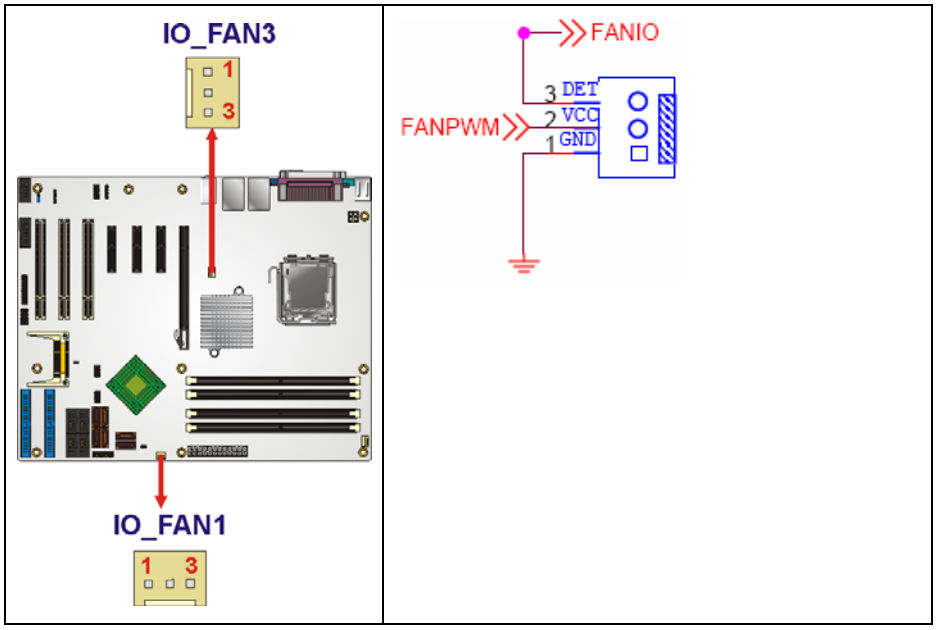


Figure 4-9: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Fan Speed Detect

Table 4-10: +12V Fan Connector Pinouts

4.2.9 Front Panel Connector (14-pin)

CN Label: F_PANEL1

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

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

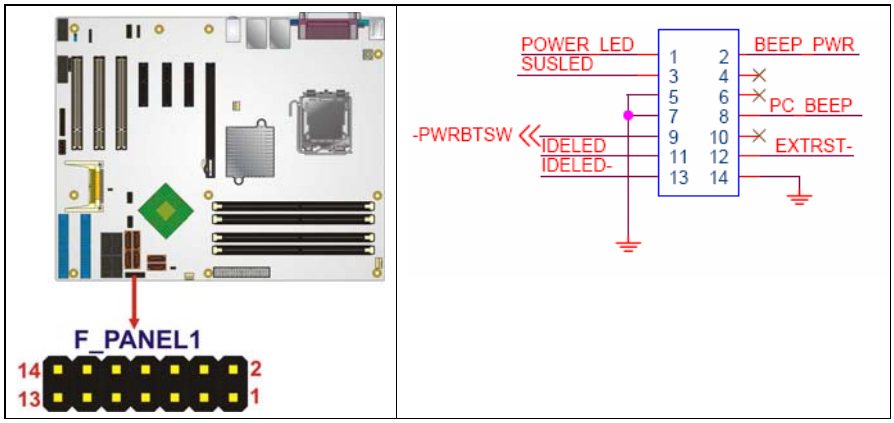


Figure 4-10: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED+	Buzzer	2	BUZZER-
	3	N/C		4	N/C
	5	GND		6	N/C
Power Button	7	PWRBTSW-		8	VCC
	9	PWRBTSW+	Reset	10	N/C
HDD LED	11	IDE_LED+		12	RESET-
	13	IDE_LED-		14	GND

Table 4-11: Front Panel Connector Pinouts (14-pin)

4.2.10 IDE Connector (40-pin)

CN Label: IDE1, IDE2

CN Type: 40-pin header (2x20)

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

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

Two 40-pin IDE device connectors on the 2807730 support connectivity to four ATA/33, ATA/66 or ATA/100 hard disk drives.

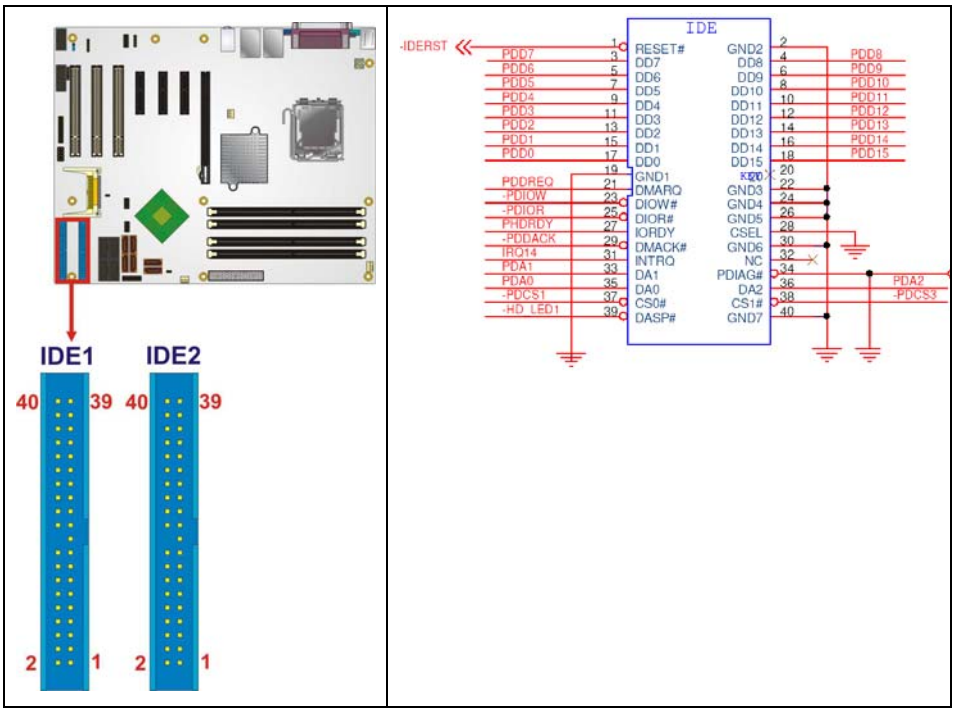


Figure 4-11: IDE Device Connector Locations

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 4-12: IDE Connector Pinouts

4.2.11 Infrared Interface Connector (5-pin)

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-12

CN Pinouts: See Table 4-13

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

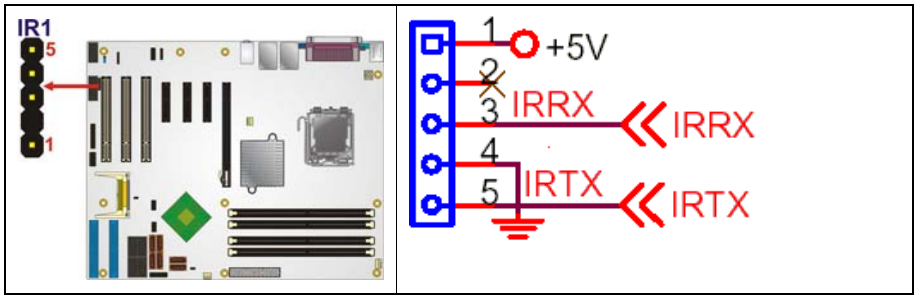


Figure 4-12: Infrared Connector Pinout Locations

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

Table 4-13: Infrared Connector Pinouts

4.2.12 PCI Slot

CN Label: **PCI1**

CN Type: PCI Slot

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

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

The PCI slot enables a PCI expansion module to be connected to the board.

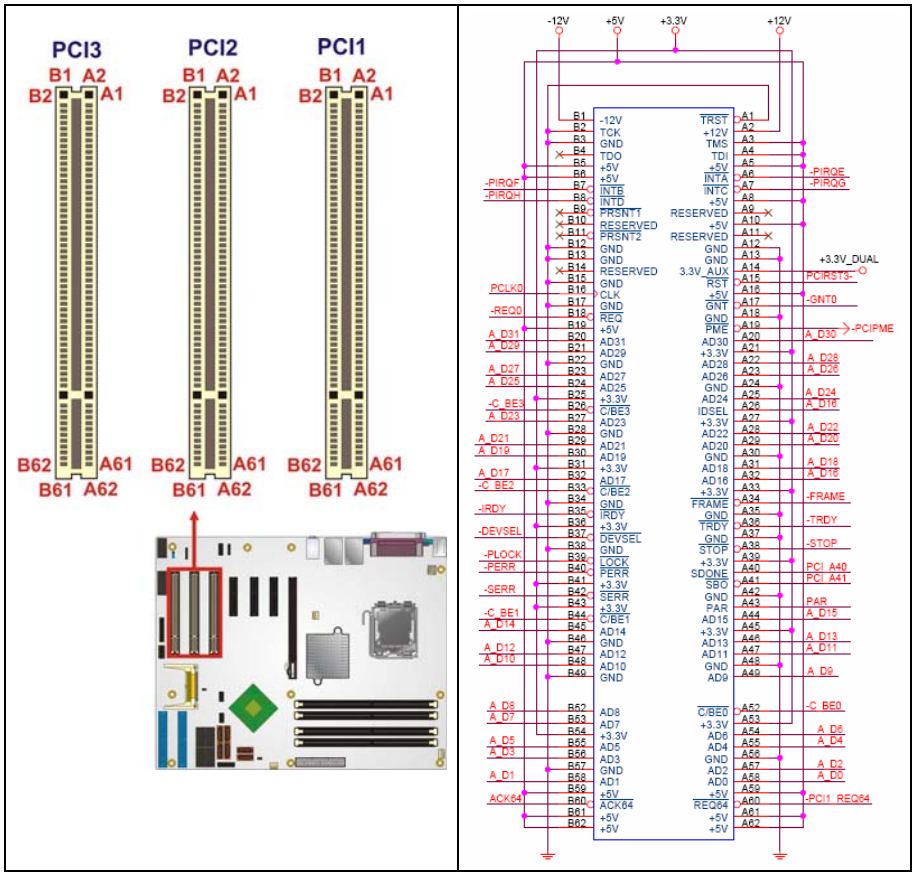


Figure 4-13: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1

A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17
A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V

A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 4-14: PCI Slot

4.2.13 PCI Express x4 Slot

CN Label: **PCIE4X_1, PCIE4X_2, PCIE4X_3**

CN Type: 64-pin PCIe x4 slots

CN Location: See Figure 4-14

CN Pinouts: See Table 4-15

PCIe x4 expansion devices can be inserted into the PCIe x4 slots.

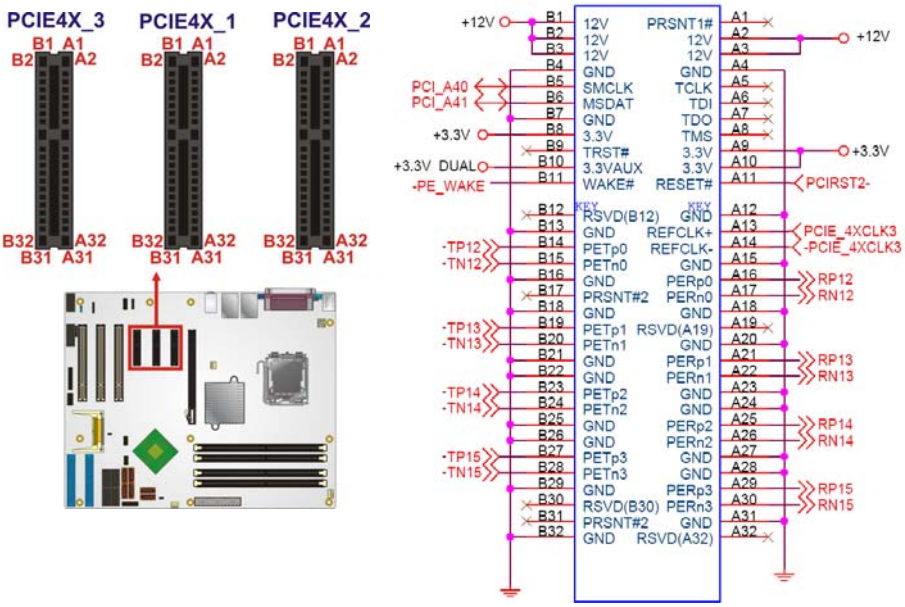


Figure 4-14: PCIe x4 Connector Locations

SIDE A				SIDE B			
PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	N/C	A2	+12V	B1	+12V	B2	+12V
A3	+12V	A4	GND	B3	+12V	B4	GND
A5	N/C	A6	N/C	B5	SMCLK	B6	SMDAT
A7	N/C	A8	N/C	B7	GND	B8	+3.3V
A9	+3.3V	A10	+3.3V	B9	N/C	B10	3.3V
A11	RESET	A12	GND	B11	WAKE#	B12	N/C
A13	REFCLK+	A14	REFCLK-	B13	GND	B14	HSOp(0)
A15	GND	A16	HSIp(0)	B15	HSOn(0)	B16	GND
A17	HSIn(0)	A18	GND	B17	N/C	B18	GND
A19	N/C	A20	GND	B19	HSOp(1)	B20	HSOn(1)
A21	HSIp(1)	A22	HSIn(1)	B21	GND	B22	GND
A23	GND	A24	GND	B23	HSOp(2)	B24	HSOn(2)
A25	HSIp(2)	A26	HSIn(2	B25	GND	B26	GND
A27	GND	A28	GND	B27	HSOp(3)	B28	HSOn(3)

A29	HSIp(3)	A30	HSIn(3)	B29	GND	B30	N/C
A31	GND	A32	N/C	B31	N/C	B32	GND

Table 4-15: PCIe x4 Pinouts

4.2.14 PCI Express x16 Slot

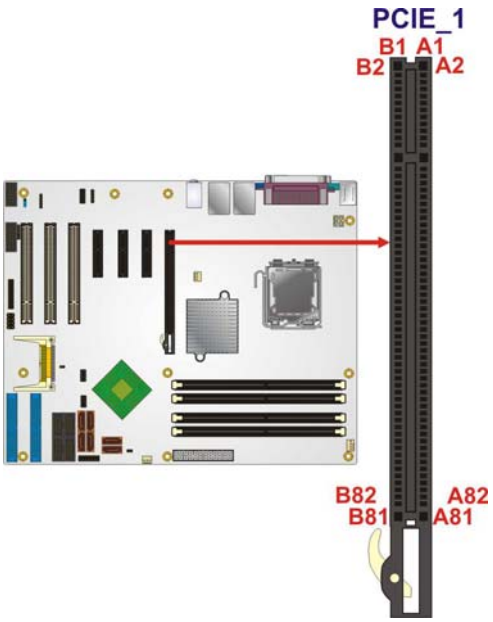
CN Label: **PCIE_1**

CN Type: 164-pin PCIe x16 slot

CN Location: See Figure 4-25

CN Pinouts: See **Table 4-16** (**Side A**) **Table 4-17 (Side B)**

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.



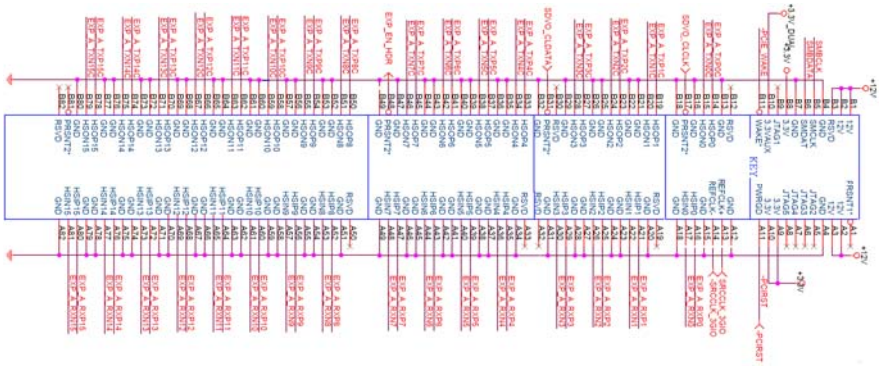


Figure 4-15: PCIe x16 Connector Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		

A21	GND	A42	GND	A63	GND		

Table 4-16: PCIe x16 Side A Pinouts

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3Vaux	B31	PRNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 4-17: PCIe x16 Side B Pinouts

4.2.15 SATA Drive Connectors

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

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-16

CN Pinouts: See Table 4-18

The six SATA drive connectors are each connected to a second generation SATA drive. Second generation SATA drives transfer data at speeds as high as 300Mb/s. The SATA drives can be configured in a RAID configuration.

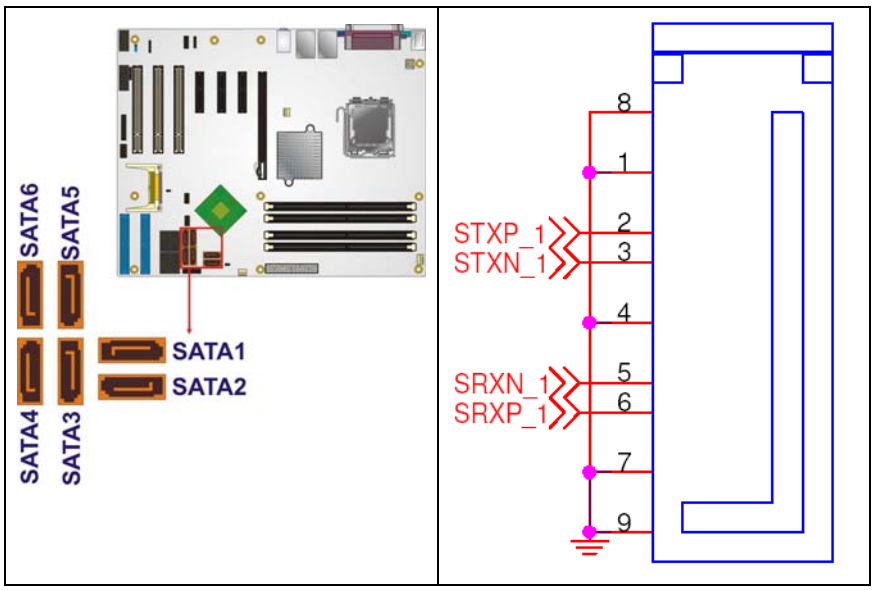


Figure 4-16: SATA Drive Connector Locations

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

Table 4-18: SATA Drive Connector Pinouts

4.2.16 Serial Port Connectors (RS-232)

CN Label:	**COM3, COM4, COM5 and COM6**
CN Type:	10-pin header (2x5)
CN Location:	See **Figure 4-17**
CN Pinouts:	See **Table 4-19**

The four 10-pin serial port connectors provide four additional RS-232 serial communications channels. The four internal RS-232 serial port connectors can be connected to external RS-232 serial port devices.

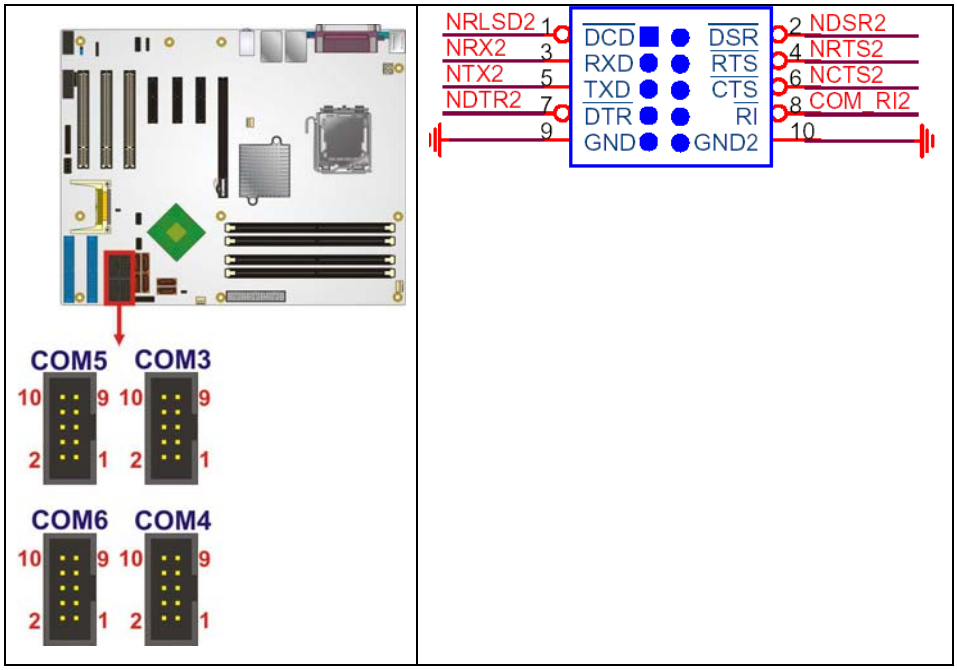


Figure 4-17: RS-232 COM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)

7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)

Table 4-19: RS-232 COM Connector Pinouts

4.2.17 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 4-18**

CN Pinouts: See **Table 4-20**

The 14-pin serial port connector connects to the COM 2 serial communications channels. COM 2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the COM 2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

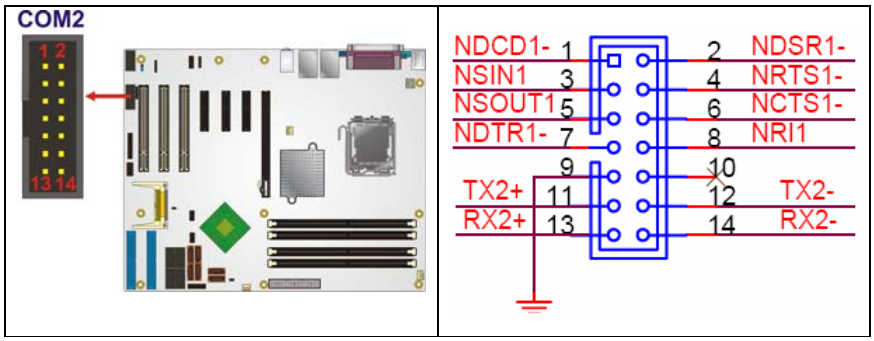


Figure 4-18: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	NDSR2
3	RXD	4	NRTS2
5	TXD	6	NCTS2
7	DTR	8	NRI2
9	GND	10	GND

11	TXD85+	12	TXD485#
13	RXD85+	14	RXD485#

Table 4-20: RS-232/RS-485 Serial Port Connector Pinouts

4.2.18 SPDIF Connector

CN Label: CN1

CN Type: 5-pin header

CN Location: See Figure 4-19

CN Pinouts: See Table 4-21

Use the SPDIF connector to connect digital audio devices to the system.

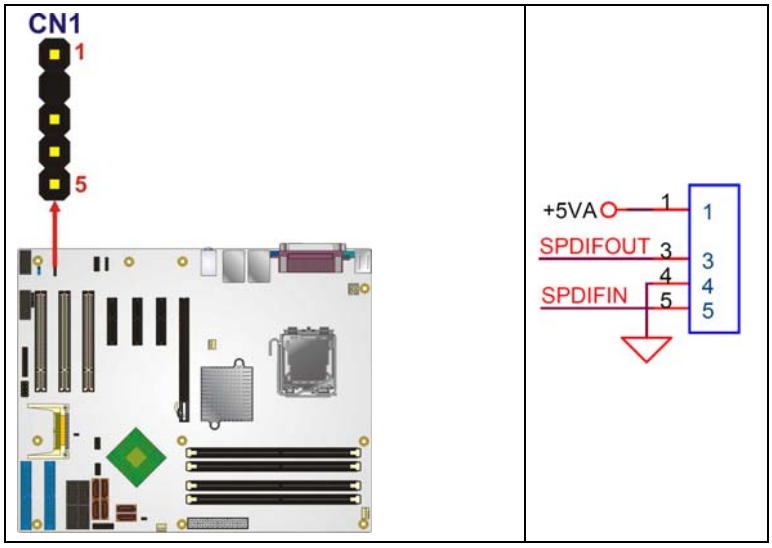


Figure 4-19: SPDIF Connector Pinout Locations

PIN	DESCRIPTION
1	VCC AUDIO
2	NC
3	SPDIF OUT

4	GND AUDIO
5	SPDIF IN

Table 4-21: SPDIF Connector Pinouts

4.2.19 SPI Flash Connector

CN Label: CN4

CN Type: 8-pin header

CN Location: See Figure 4-20

CN Pinouts: See Table 4-22

Use the SPI Flash connector to connect a serial peripheral interface (SPI) flash memory module to the 2807730.

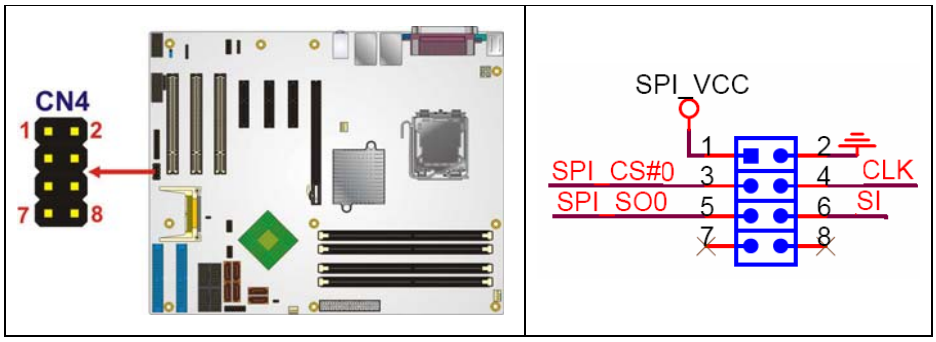


Figure 4-20: SPI Flash Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	N/C	8	N/C

Table 4-22: SPI Flash Connector Pinouts

4.2.20 Trusted Platform Module (TPM) Connector

CN Label: **TPM1**

CN Type: 20-pin header (2x10)

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-23**

The Trusted Platform Module (TPM) connector secures the system on bootup.

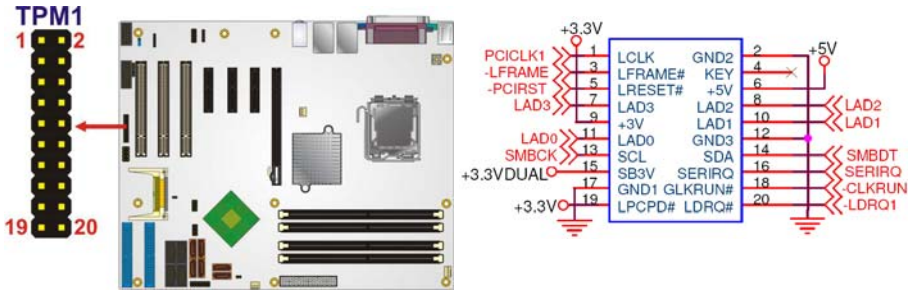


Figure 4-21: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1

11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-23: TPM Connector Pinouts

4.2.21 USB Connectors (Internal)

CN Label: USB1, USB2

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-22

CN Pinouts: See Table 4-24

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.

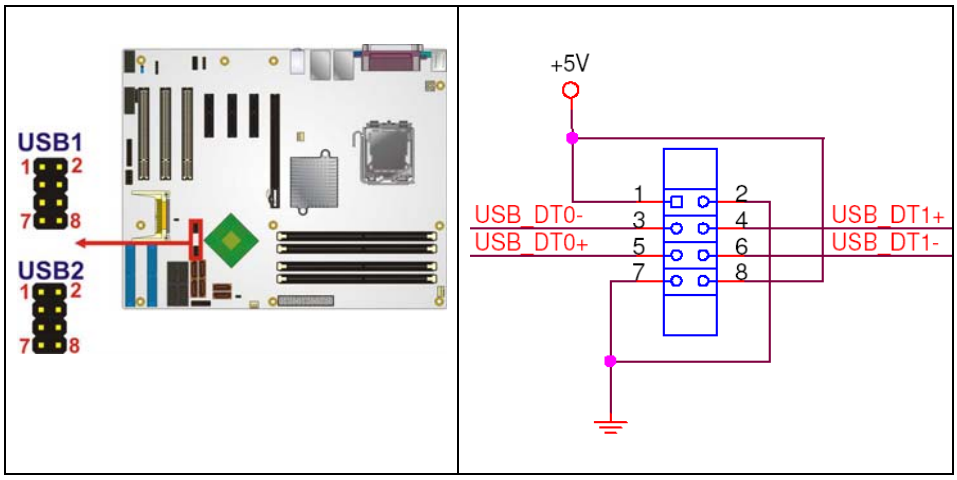


Figure 4-22: USB Connector Pinout Locations

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

Table 4-24: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

The external peripheral interface connectors on the back panel are connected to devices externally when the 2807730 is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 2 x RJ-45 Ethernet connector
- 3 x Audio jacks
- 4 x USB 2.0 connectors
- 1 x VGA connector
- 1 x Serial port connector

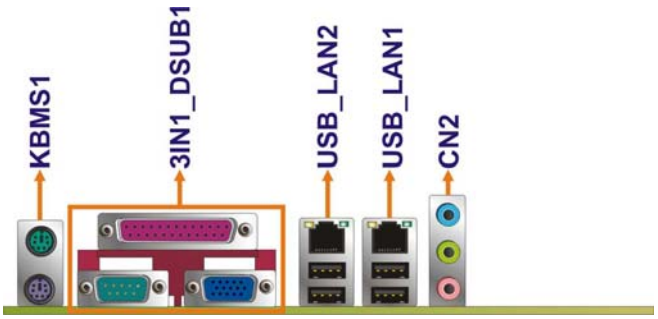


Figure 4-23: 2807730 External Interface Connectors

4.3.1 Keyboard/Mouse Connector

CN Label: KBMS1

CN Type: PS/2 connector

CN Location: See Figure 4-23

CN Pinouts: See Figure 4-24 and Table 4-25

The 2807730 keyboard and mouse connectors are standard PS/2 connectors.

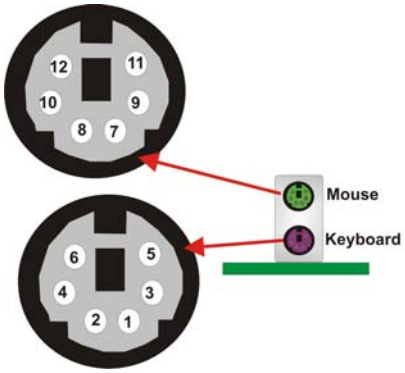


Figure 4-24: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-25: PS/2 Connector Pinouts

4.3.2 Parallel Port Connector

CN Label: LPT1

CN Type: DB-25

CN Location: See Figure 4-23

CN Pinouts: See Figure 4-25 and Table 4-26

These ports are usually connected to a printer. 2807730 includes one on-board parallel ports accessed through one 25-pin D-type female connector.

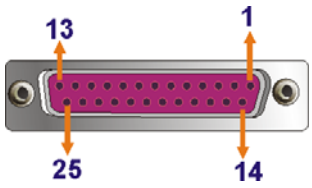


Figure 4-25: Parallel Port Connector Pinout Locations

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

Table 4-26: Parallel Pinouts

4.3.3 Audio Connectors

CN Label: CN2

CN Type: Audio jack

CN Location: See Figure 4-23

CN Pinouts: See Figure 4-26

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Speaker Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

Figure 4-26: Audio Connector

4.3.4 LAN Connectors

CN Label: J20 and J21

CN Type: RJ-45

CN Location: **Figure 4-23**

CN Pinouts: **Table 4-27**

The 2807730 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 4-27: LAN Pinouts

Figure 4-27: 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 4-28**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
YELLOW	Activity	GREEN	Linked

Table 4-28: RJ-45 Ethernet Connector LEDs

4.3.5 USB Connectors

CN Label: USB_LAN1, USB_LAN2

CN Type: Dual USB port

CN Location: See Figure 4-23

CN Pinouts: See Figure 4-28 and Table 4-29

USB devices connect directly to the USB connectors on the external peripheral connector panel.

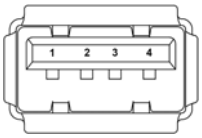


Figure 4-28: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-29: USB Connector Pinouts

4.3.6 VGA Connector

CN Label: VGA

CN Type: HD-D-sub 15 Female connector

CN Location: See Figure 4-23 (labeled 6)

CN Pinouts: See **Figure 4-29** and **Table 4-30**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

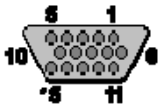


Figure 4-29: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND

PIN	Description	PIN	Description
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-30: VGA Connector Pinouts

4.3.7 Serial Communications Connector

CN Label: COM1

CN Type: D-sub 9 Male connector

CN Location: See Figure 4-23 (labeled 7)

CN Pinouts: See **Figure 4-30** and **Table 4-31**

The serial connector on the external interface panel provides serial connection in the RS-232 mode.

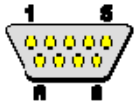


Figure 4-30: Serial Communications Connector Pinout Locations

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)

7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

Table 4-31: COM1 RS-232 Mode Connector Pinouts

Chapter

5

Installation

4.4 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the 2807730 may result in permanent damage to the 2807730 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2807730. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2807730, 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 2807730, place it on an antic-static pad. This reduces the possibility of ESD damaging the 2807730.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.5 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the 2807730 is installed. All installation notices pertaining to the installation of the 2807730 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 2807730 and injury to the person installing the motherboard.

4.5.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the 2807730, 2807730 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 2807730 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 2807730 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 2807730 off:

- When working with the 2807730, 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 2807730 **DO NOT:**

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

4.5.2 Installation Checklist

The following checklist is provided to ensure the 2807730 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 2807730 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
  - CF Type I/II card
  - SATA drives
  - Power supply
  - USB cables
  - Serial port cables
  - I/O Shielding
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - Keyboard

- Mouse
- RS-232 serial communications device
- Parallel port device (printer)
- LAN connection

4.6 Unpacking

4.6.1 Unpacking Precautions

When the 2807730 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 4.4**.
- Make sure the packing box is facing upwards so the 2807730 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 2807730 from or contact an GLOBAL AMERICAN, INC. sales representative directly. To contact an GLOBAL AMERICAN, INC. sales representative, please send an email to salesinfo@globalamericaninc.com.

4.7 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, 2807730 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 2807730. If one of these components is not installed the 2807730 cannot run.

4.7.1 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 2807730)
- **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 0-1.

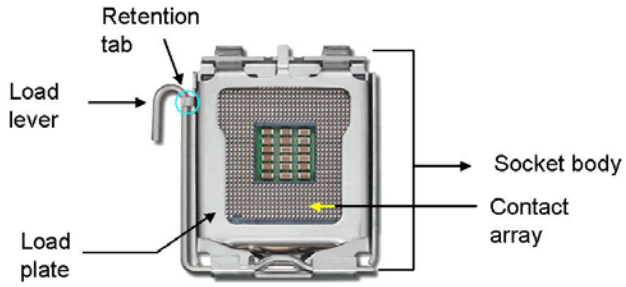


Figure 0-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the 2807730, 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 0-2**.

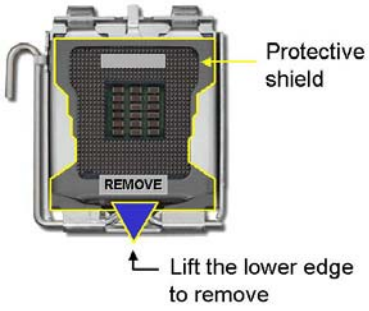


Figure 0-2: Remove the CPU Socket Protective Shield

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 0-3**.

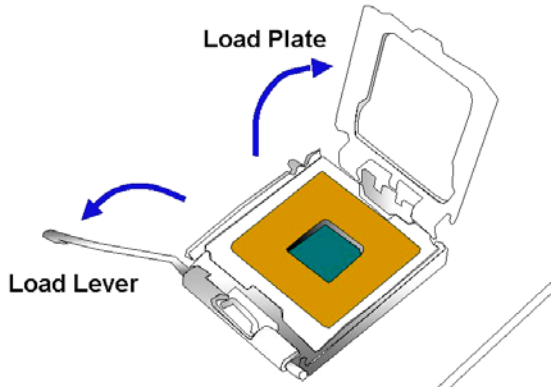


Figure 0-3: Open the CPU Socket Load Plate

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 0-4**.

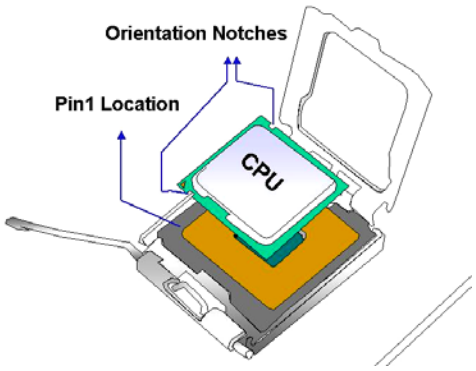


Figure 0-4: Insert the Socket LGA775 CPU

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.** After the cooling kit is installed connect the CPU cable to the CPU 12V power connector

4.7.2 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 2807730.

GLOBAL AMERICAN, INC.'s cooling kit includes 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 0-5: GLOBAL AMERICAN, INC. 2107695 Cooling Kit

One optional, separately purchased LGA775 GLOBAL AMERICAN, INC. CPU cooling kits is available. The GLOBAL AMERICAN, INC. 2107695 is shown in **Figure 0-5** 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 0-6**)

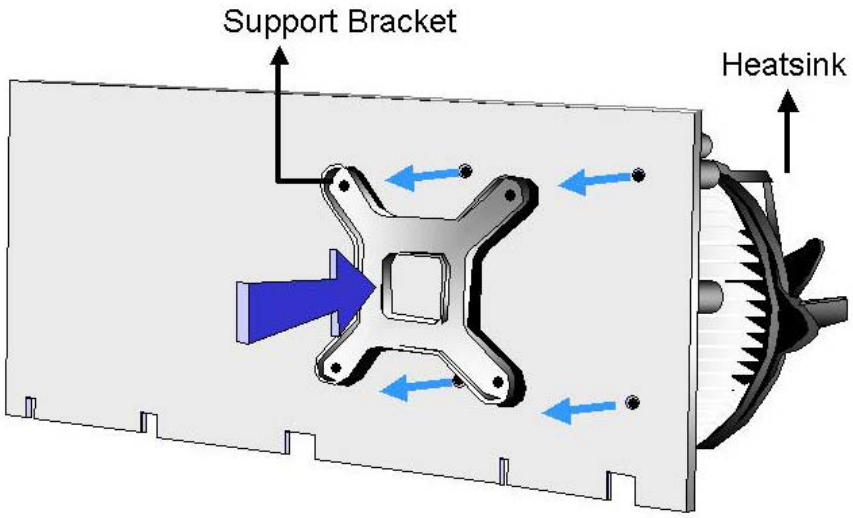


Figure 0-6: Securing the Heat sink to the PCB Board

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 2807730. Carefully route the cable and avoid heat generating chips and fan blades.

4.7.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the 2807730. Please make sure the purchased DIMM complies with the memory specifications of the 2807730. DIMM specifications compliant with the 2807730 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 0-7**.

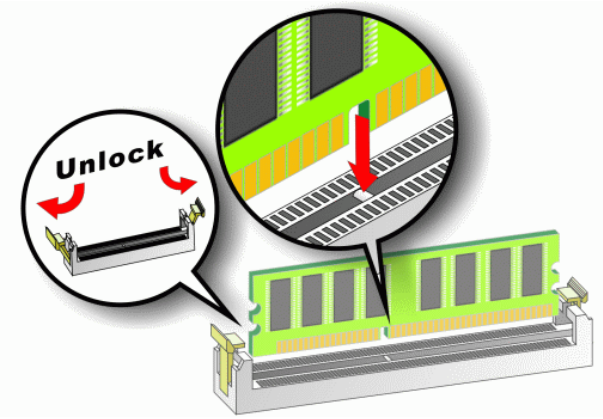


Figure 0-7: Installing a DIMM

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 0-7**.

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 0-7**.

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 0-7**.

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

4.7.4 CF Card Installation

NOTE:

The 2807730 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type 1 or Type 2) onto the 2807730, please follow the steps below:

Step 1: **Locate the CF card socket**. Place the 2807730 on an anti-static pad with the

solder side facing up. Locate the CF card.

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

Step 3: **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 0-8**.

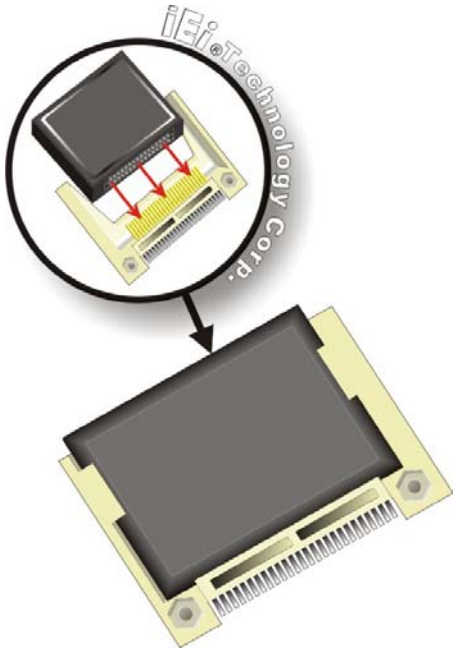
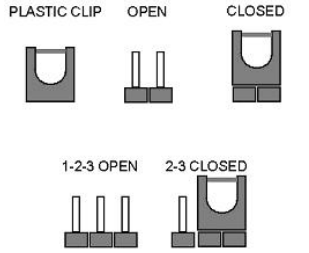


Figure 0-8: CF Card Installation

4.8 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.



Jumper

Before the 2807730 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 2807730 are listed in **Table 0-1**.

Description	Label	Type
CF card setup	JP4	3-pin header
Clear CMOS	JP2	3-pin header
RS-232/422/485 Serial Port Select	JP3	3-pin header

Table 0-1: Jumpers

4.8.1 CF Card Setup

Jumper Label: **JP4**

Jumper Type: 3-pin header

Jumper Settings: See **Table 0-2**

Jumper Location: See **Figure 0-9**

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 0-2**.

AT Power Select	Description	
Short 1-2	Slave	Default
Short 2-3	Master	

Table 0-2: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in **Figure 0-9**.

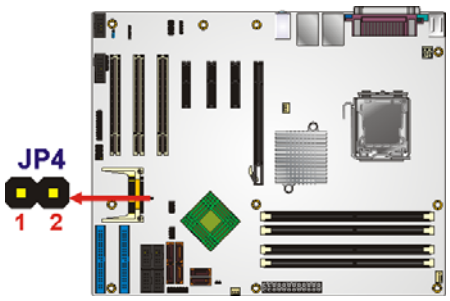


Figure 0-9: CF Card Setup Jumper Location

4.8.2 Clear CMOS Jumper

Jumper Label:	JP2
Jumper Type:	2-pin header
Jumper Settings:	See Table 0-3
Jumper Location:	See Figure 0-10

If the 2807730 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 1 and 2 for a few seconds then remove the jumper cap and enable pins 1 and 2 to remain open.

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 0-3**.

Jumper Select	Description	
Open	Keep CMOS Setup	Default
Short	Clear CMOS Setup	

Table 0-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 0-10** below.

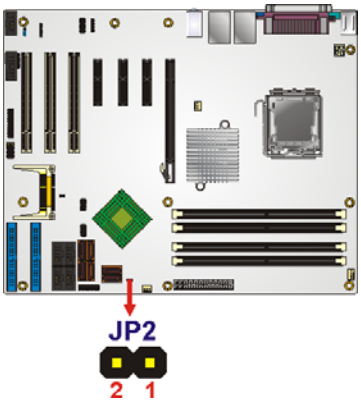


Figure 0-10: Clear CMOS Jumper

4.8.3 RS-232/RS-422/485 Serial Port Select Jumper

Jumper Label:	**JP3**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 0-4**
Jumper Location:	See **Figure 0-11**

The RS-232/RS-422/485 Serial Port Select jumper configures the serial port connector as an RS-232 or RS-422/485 serial port. The RS-232/RS-422/485 Serial Port Select jumper selection options are shown in **Table 0-4**.

AT Power Select	Description	
Short 1 – 2	RS-232	Default
Short 2 – 3	RS-422/485	

Table 0-4: Serial Port Mode Select Jumper Settings

The RS-232/RS-422/485 Serial Port Select jumper location is shown in **Figure 0-11** below.

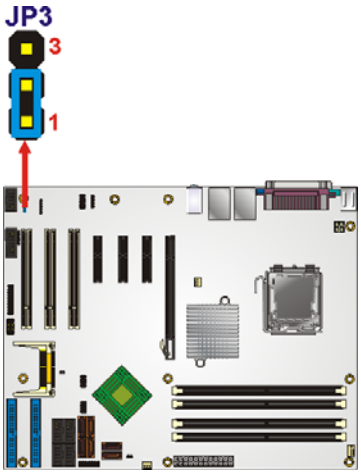


Figure 0-11: Serial Port Mode Select Jumper Pinout Locations

4.9 Chassis Installation

4.9.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 2807730 must have air vents to allow cool air to move into the system and hot air to move out.

The 2807730 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 2807730 vendor, reseller or a GLOBAL AMERICAN, INC. sales representative at salesinfo@globalamericaninc.com or visit the GLOBAL AMERICAN, INC. website www.globalamericaninc.com to find out more about the available chassis.

4.10 Internal Peripheral Device Connections

4.10.1 Peripheral Device Cables

The cables listed in **Table 0-5** are shipped with the 2807730.

Quantity	Type
1	ATA 66/100 flat cable
1	Dual RS-232 cable
2	Single RS-232 cable
6	SATA drive cables
3	SATA drive power cables

Table 0-5: GLOBAL AMERICAN, INC. Provided Cables

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

- 2-port USB cable
- 4-port USB cable
- Dual RS-232/422/485 cable
- PCIe x16 VGA output SDVO card
- PCIe x16 DVI output SDVO card
- TPM module

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

4.10.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the 2807730 to one or two IDE devices. To connect an IDE HDD to the 2807730 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 0-12**. A key on the front of the cable connector ensures it can only be inserted in one direction.

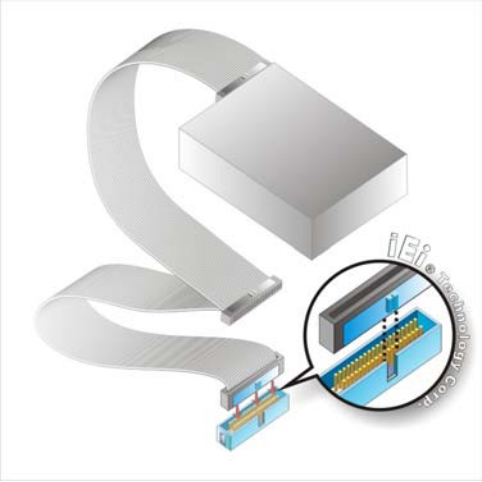


Figure 0-12: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

4.10.3 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector 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 slot. 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 0-13**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

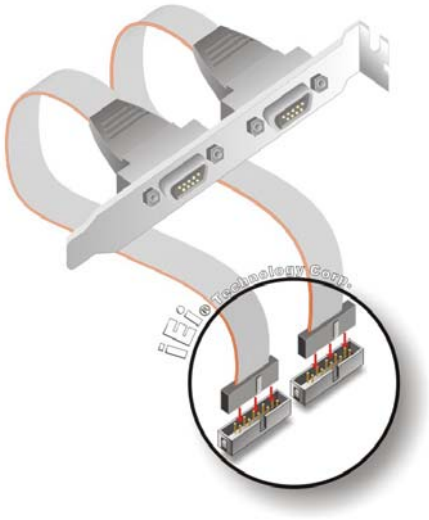


Figure 0-13: Dual RS-232 Cable Installation

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

4.10.4 Single RS-232 Cable with Slot Bracket

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

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 0-14**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

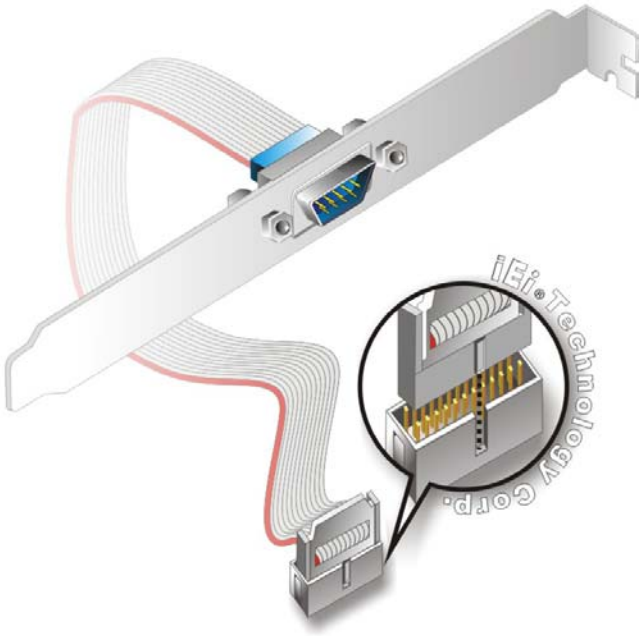


Figure 0-14: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has one D-sub 9 male connector secured to a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

4.10.5 Dual RS-232/422/485 Cables

The 2807730 is shipped with one RS-232/422/485 dual serial port connector cable. The dual serial port connector cable connects the serial port connectors on the cable to the RS-232/422/485 serial port connectors on the 2807730. Follow the steps below to connect the dual serial port connector cable.

Step 1: **Locate the serial port connector**. The location of the RS-232/422/485 serial port connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the 2807730 COM2 serial port connector.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the COM2 serial port connector on the 2807730, connect the cable connector to the onboard connectors. See Figure 0-15.

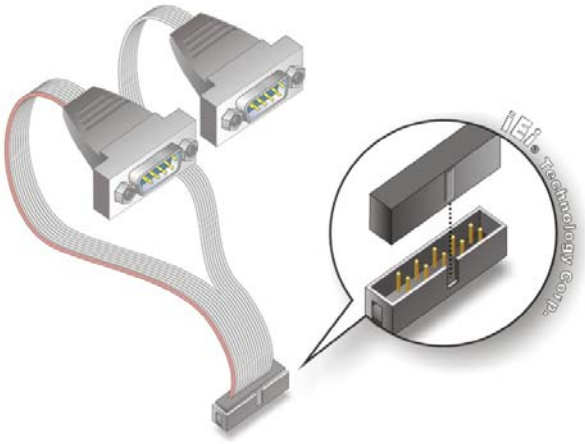


Figure 0-15: Dual Serial Port Connector Cable Connection

Step 4: **Attach DB-9 serial port connectors to the chassis**. The dual DB-9 serial port connectors can be inserted into dual preformed holes in the chassis. Once, inserted the DB-9 connectors should be secured to the chassis with retention screws.

4.10.6 SATA Drive Connection

The 2807730 is shipped with six SATA drive cables and three SATA drive power cables. 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 0-16**.

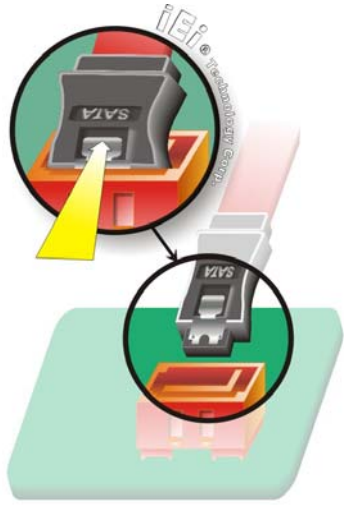


Figure 0-16: SATA Drive Cable Connection

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 0-17**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 0-17**.

Figure 0-17: SATA Power Drive Connection

4.10.7 USB Cable (Dual Port)

The 2807730 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 2807730 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the 2807730, connect the cable connectors to the onboard connectors. See **Figure 0-18**.

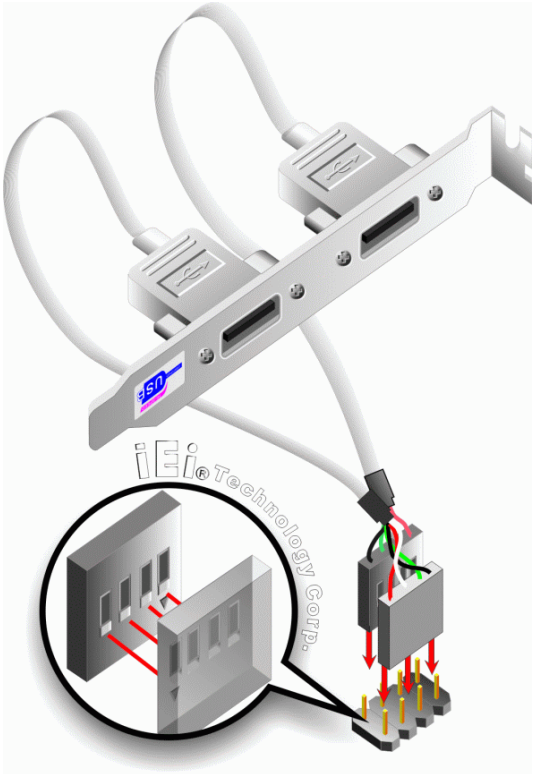


Figure 0-18: Dual USB Cable Connection

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.

4.10.8 USB Cable (Four Port) (Optional)

Four port USB 2.0 cables can be separately purchased from GLOBAL AMERICAN, INC.. To install a four port USB cable onto the 2807730, 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 2807730 USB connectors.

Step 3: **Insert the cable connectors**.. Once the cable connectors are properly aligned with the USB connectors on the 2807730, connect the cable connectors to the onboard connectors. See **Figure 0-18**.

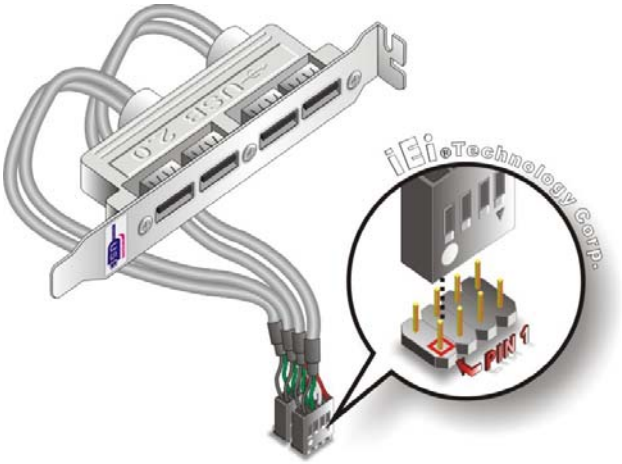


Figure 0-19: Four Port USB Cable Connection

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:**

4.11 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 2807730 external peripheral interface connector making sure the pins are properly aligned.

4.11.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the 2807730.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 0-20.

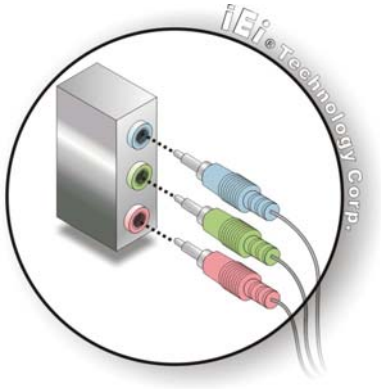


Figure 0-20: Audio Connectors

4.11.2 LAN Connection

There are two external RJ-45 LAN connectors for PCIe GbE connection. 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 2807730. See **Figure 0-21**.

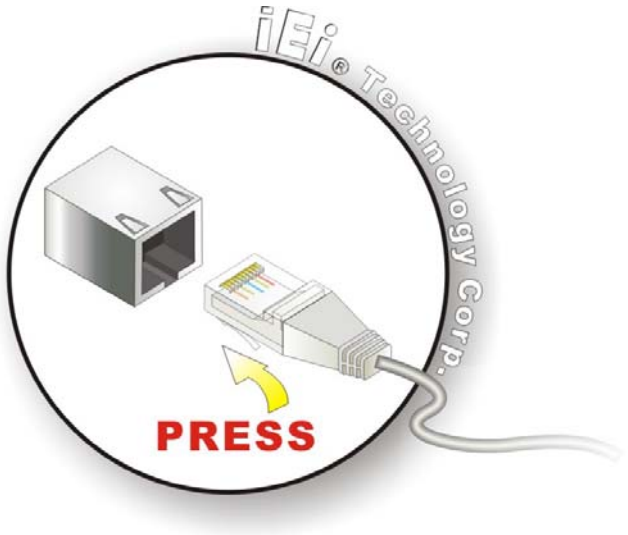


Figure 0-21: LAN Connection

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.

4.11.3 Parallel Device Connection

A single female DB-25 connector on the external peripheral interface panel connects to parallel communications devices. Follow the steps below to connect a parallel device.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in

Chapter 3.

Step 2: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 0-22.

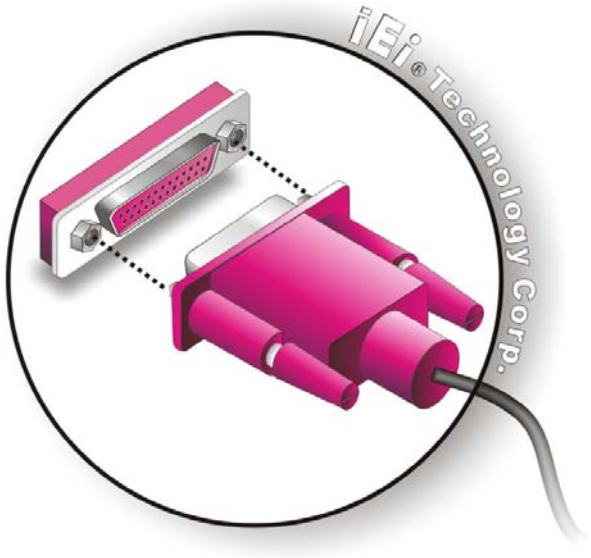


Figure 0-22: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

4.11.4 PS/2 Keyboard and Mouse Connection

The 2807730 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the 2807730.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral

interface connector. See Figure 0-23.

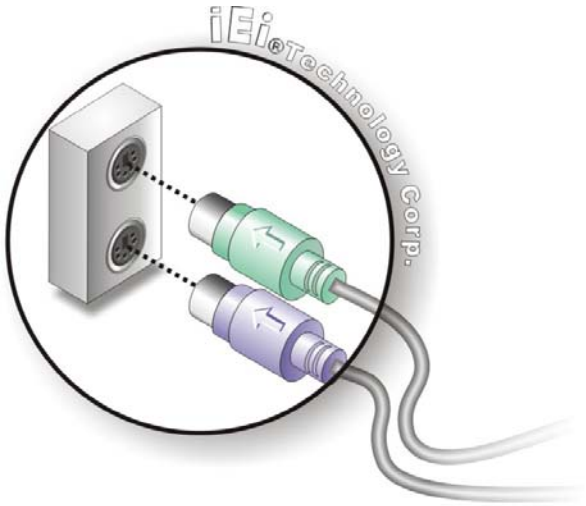


Figure 0-23: PS/2 Keyboard/Mouse Connector

4.11.5 Serial Device Connection

The 2807730 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the 2807730.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 0-24.

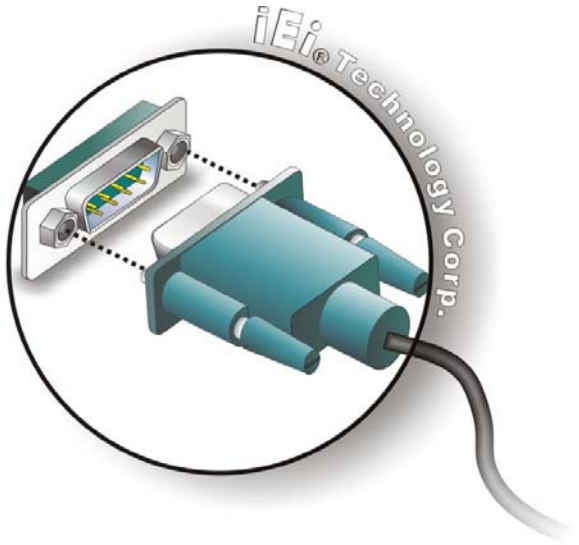


Figure 0-24: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.11.6 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the 2807730.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 0-25.

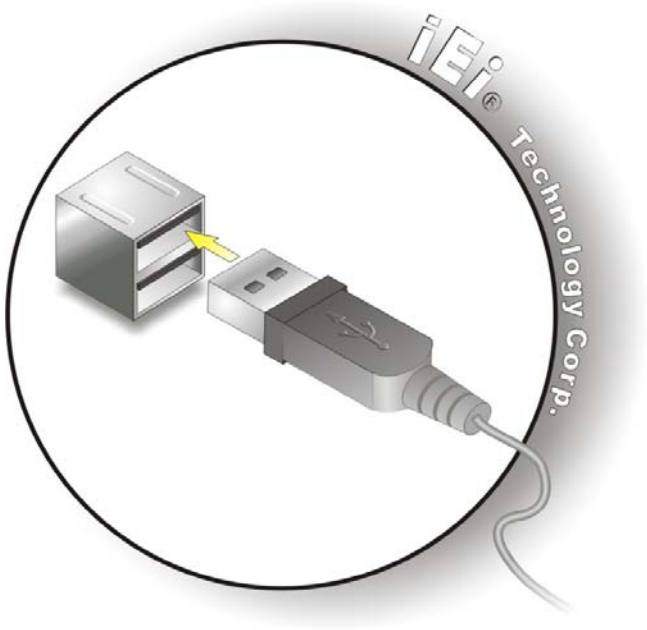


Figure 0-25: USB Connector

4.11.7 VGA Monitor Connection

The 2807730 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 2807730, 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 2807730. See **Figure 0-26**.

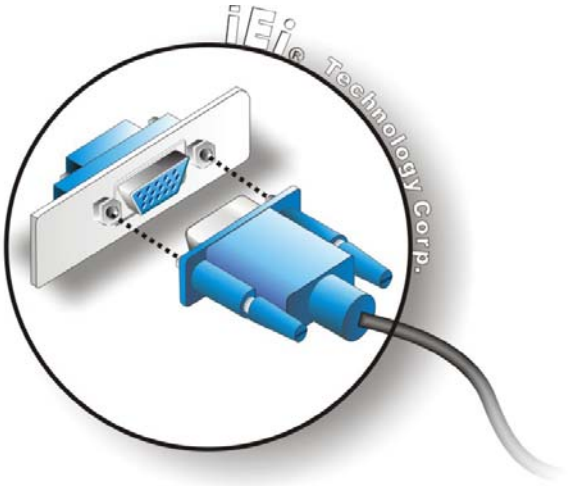


Figure 0-26: VGA Connector

Step 4: **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.

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Appendix

B

DIO Interface

B.1 DIO Interface Introduction

The DIO connector on the 2807730 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.

B.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

B.3 Assembly Language Samples

B.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
```

B.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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Appendix

C

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 C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. 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

D.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 D-1: IO Address Map

D.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 D-2: 1st MB Memory Address Map

D.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 D-3: IRQ Mapping Table

D.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 D-4: IRQ Mapping Table

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Appendix

E

Intel® Matrix Storage Manager

E.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.

E.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.

E.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

E.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:**

E.4 RAID Configuration

E.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 E-1.

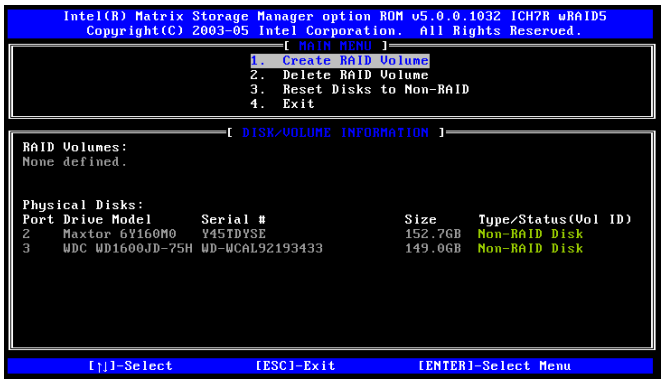

Figure E-1: Matrix Storage Manager Main Menu

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 E-2.

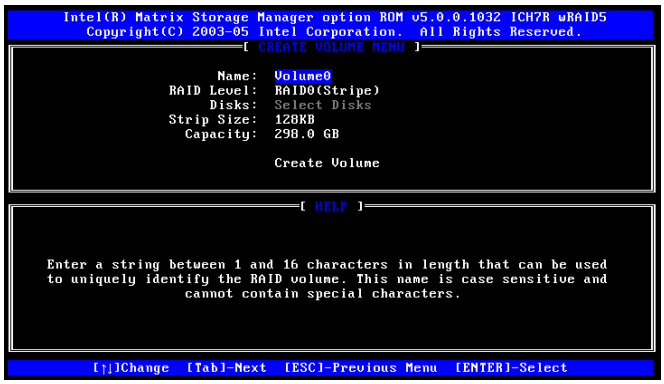

Figure E-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure E-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.

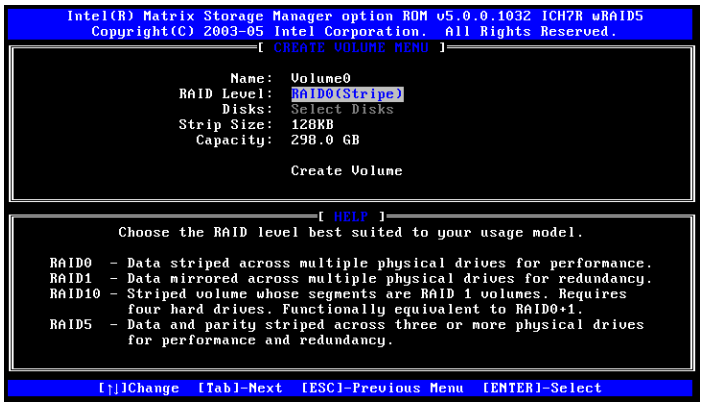

Figure E-3: Choose the Raid Level

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

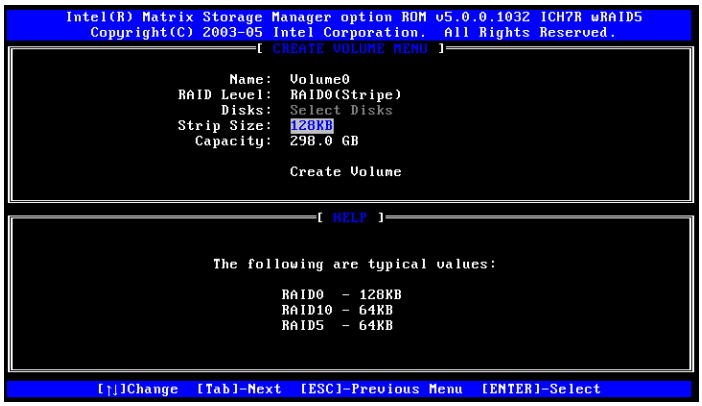

Figure E-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity. See Figure E-5.

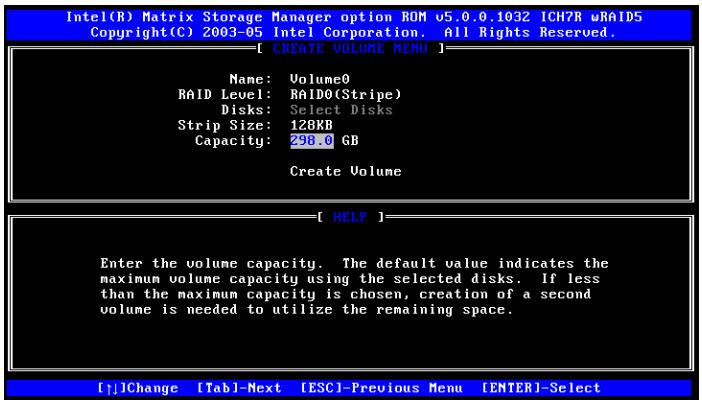

Figure E-5: Enter the Volume Capacity

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

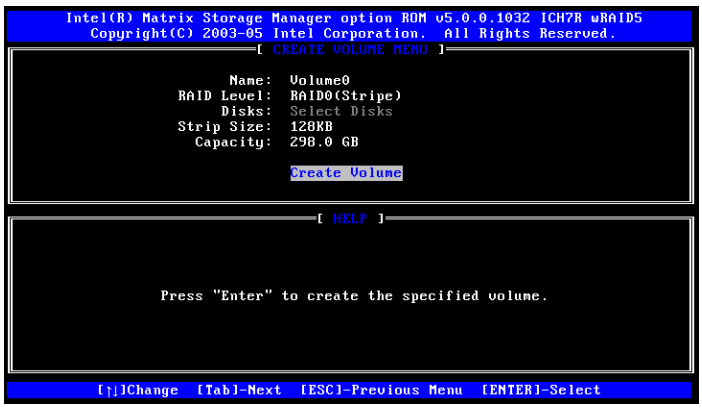

Figure E-6: Create the RAID Volume

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 E-7. **Step 0:**

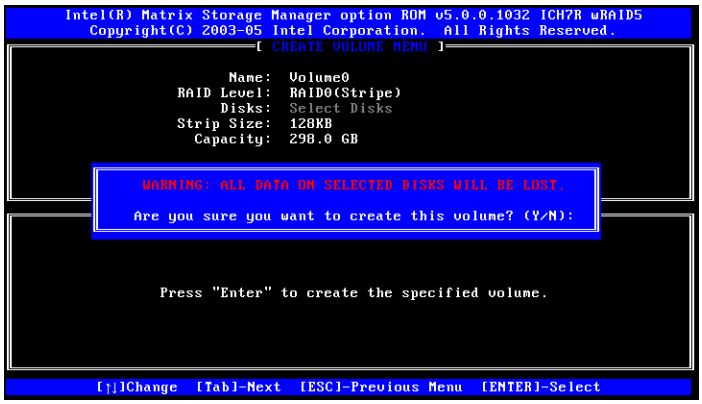

Figure E-7: Create RAID Volume Verification

E.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 E-8.

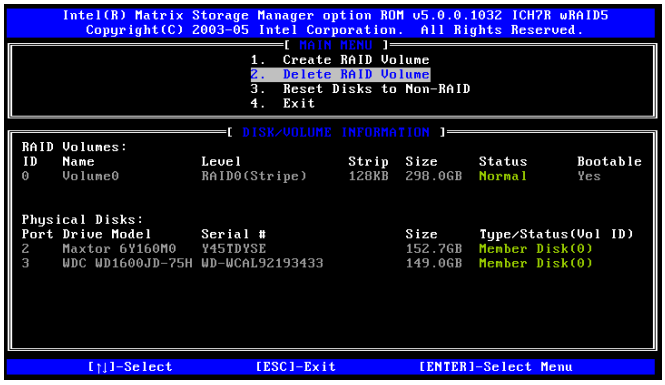

Figure E-8: Delete RAID Volume Menu

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 E-9.

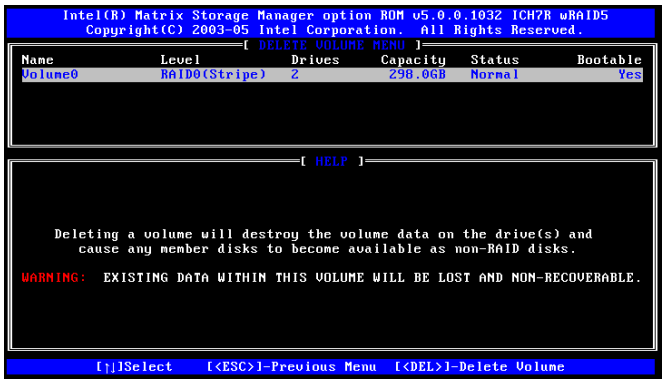

Figure E-9: Select RAID Volume to be Deleted

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 E-10.

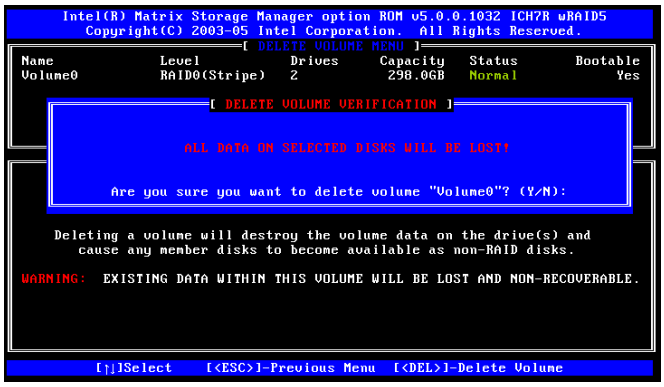

Figure E-10: Delete Volume Verification

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 E-11. **Step 0:**

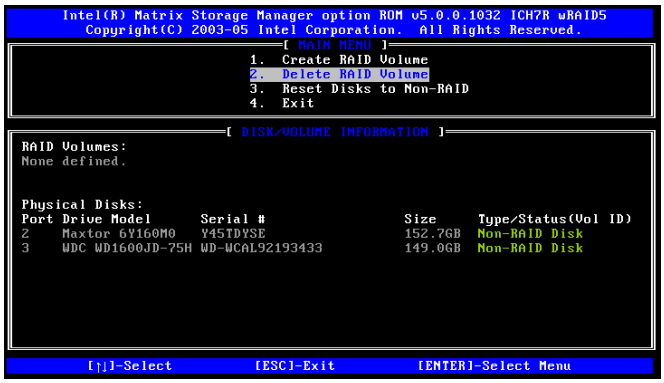

Figure E-11: Non-RAID Disks

E.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 E-12.

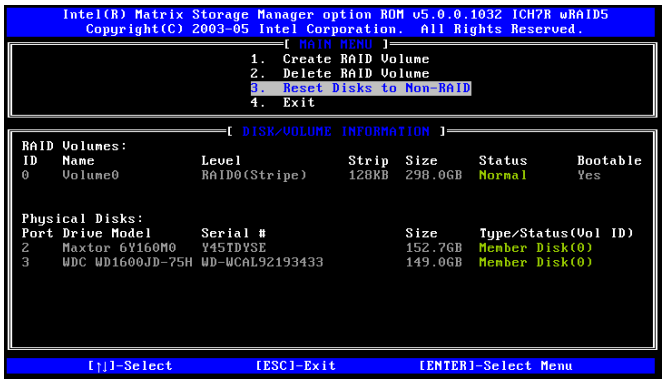

Figure E-12: Reset Disk to Non-RAID Menu

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 E-13.

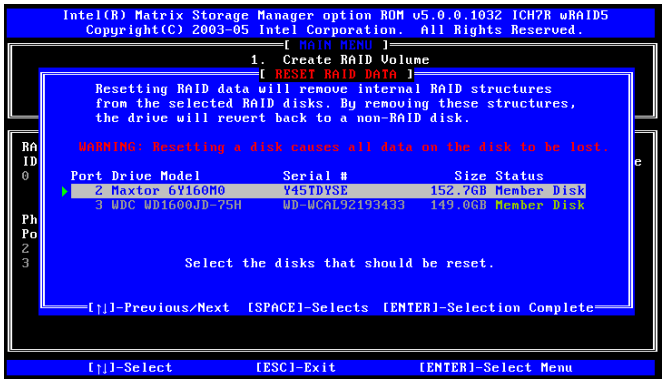

Figure E-13: Select Disk to Reset

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 E-14.

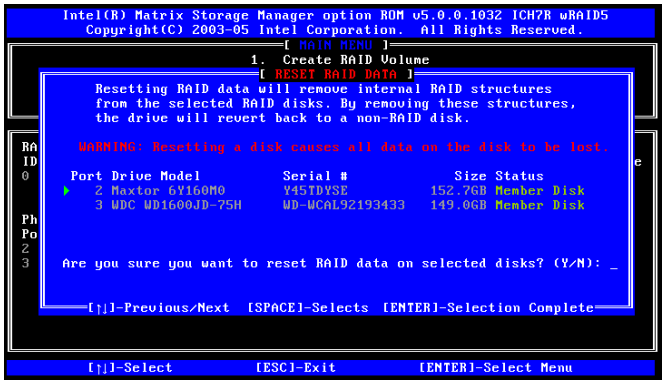

Figure E-14: Reset Disk Verification

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 E-15. **Step 0:**

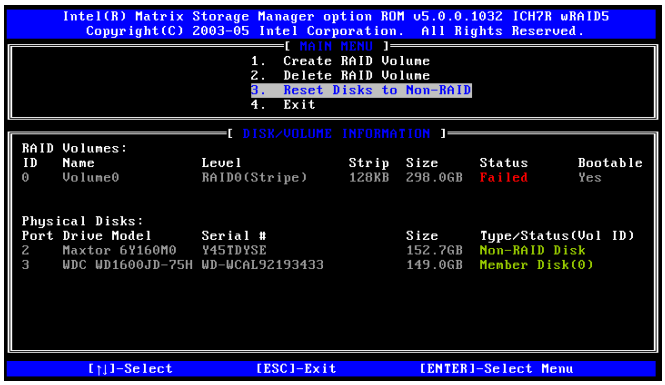

Figure E-15: Disk Drive and RAID Volume Status

E.4.4 Exiting the Matrix Storage Manager

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

See Figure E-16.

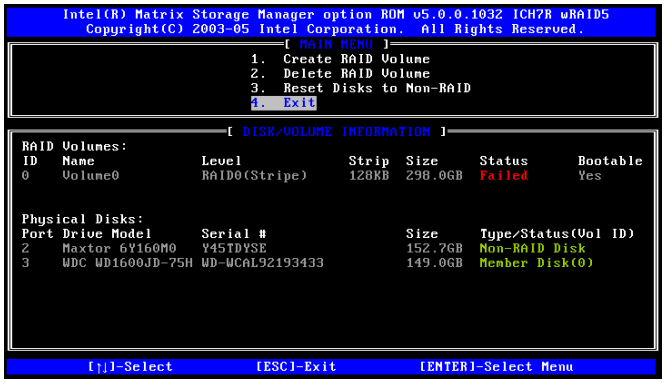

Figure E-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See Figure E-17. **Step 0:**

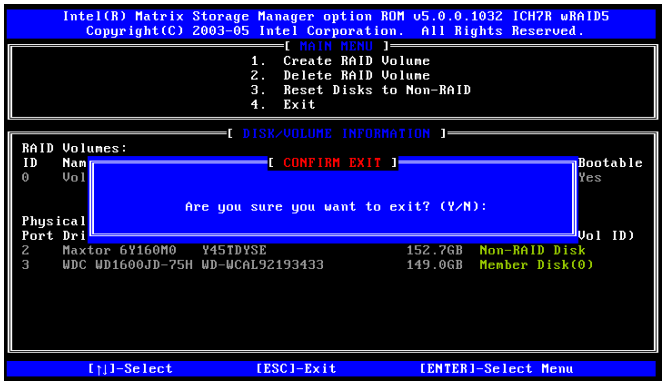

Figure E-17: Exit Verification

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 you for your products, projects and business.

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