Declaration of conformity

CE

QUANTUM DESIGNS(HK) LTD.
5/F Somerset House, TaiKoo Place 979 Kings Road,
Quarry Bay, Hong Kong

declares that the product

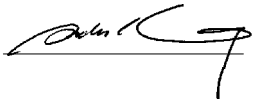
GeniuX 4 Mainboard

is in conformity with
(reference to the specification under which conformity is declared in accordance with 89/336 EEC-EMC Directive)

☑	EN 55022	Limits and methods of measurements of radio disturbance characteristics of information technology equipment
☑	EN 50081-1	Generic emission standard Part 1: Residential, commercial and light industry
☑	EN 50082-1	Generic immunity standard Part 1: Residential, commercial and light industry

European Representative:

QDI COMPUTER (UK) LTD	QDI COMPUTER (SCANDINAVIA) A/S
QDI SYSTEM HANDEL GMBH	QDI COMPUTER (NETHERLANDS) B. V.
QDI COMPUTER (FRANCE) SARL	QDI COMPUTER HANDELS GMBH
QDI COMPUTER (ESPANA) S.A.	QDI COMPUTER (SWEDEN) AB

Signature :  . Place / Date : HONG KONG/1999

Printed Name : Anders Cheung Position/ Title : President

Declaration of conformity

Trade Name:	QDI Computer (U. S . A.) Inc.
Model Name:	GeniuX 4
Responsible Party:	QDI Computer (U. S. A.) Inc.
Address:	41456 Christy Street
	Fremont, CA 94538
Telephone:	(510) 668-4933
Facsimile:	(510) 668-4966
Equipment Classification:	FCC Class B Subassembly
Type of Product:	Mainboard
Manufacturer:	**Quantum Designs (HK) Inc.**
Address:	5/F, Somerset House, TaiKoo Place
	979 Kings Road, Quarry Bay, HONG KONG

Supplementary Information:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Signature : _____ Date : 1999

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Chapter 1
Introduction

Overview

The GeniuX 4 is a highly integrated, high performance mainboard designed for mid-range and higher-end servers and workstations. It is centered on the Intel®440GX AGPset and supports two Intel Pentium®II Xeon™processors. It supports up to 2GB of ECC memory, 6 PCI slots (1 ISA shared) and 7 cooling fans for a high reliability architecture. It also provides advanced features such as wake -up on LAN, wake-up on internal/external modem, key-board password power-on function and SecurityEasy function. Together with its integrated Intel 82558 LAN and integrated Adaptec AIC-7890 Ultra 2 SCSI, you get a powerful system for critical business server applications.

Key Features

Microprocessor

- Supports all Intel Pentium®II Xeon™processors at 400/450MHz or higher frequency with 512KB/1MB/2MB L2 cache.
- Supports dual Slot 2 processors.
- Supports 100MHz host bus speed.
- CPU core frequency = Bus speed x2, x4, x4.5, or other ratio supported by Intel.
- The CPU core and L2 Cache voltage adjustable from 1.3V to 3.5V automatically through onboard switching voltage regulator with VID(Voltage ID).

Chipset

- Intel®440GX AGPset: 82443GX, 82371EB(PIIX4E)

System memory

- Provides four 168 pin 3.3V unbuffered DIMM sockets.
- Supports 100MHz SDRAM memory and registered memory.
- Supports maximun memory capacity up to 2GB.
- SDRAM 64 bit data interface with ECC support.

On-board IDE

- Supports two PCI PIO and Bus Master IDE ports.
- Two fast IDE interfaces supporting four IDE devices including IDE hard disks and CD-ROM drives.
- Supports up to PIO Mode 4 timing.
- Supports “Ultra DMA/33” Synchronous DMA mode, transferring data up to 33Mbytes/sec.
- Integrated 16x32bit buffer for IDE PCI Burst Transfers.

On-board I/O

- Use Winbond W83977EF super I/O chip.
- One floppy port supporting up to two 3.5" or 5.25" floppy drives with 360K/720K/ 1.2M/1.44M/2.88M format.
- Two high speed 16550 compatible UART (COM1/COM2/COM3/COM4 selective) with 16-byte send/receive FIFOs.
- One enabled parallel port at the I/O address 378H/278H/3BCH with additional bi-direction I/O capability and multi-mode as SPP/EPP/ECP (IEEE 1284 compliant).
- Circuit protection provided, preventing damages to the parallel port when a connected printer is powered up or operates at a higher voltage.
- Supports LS-120 floppy disk drive.
- All I/O ports can be enabled/disabled in the BIOS setup.

Onboard SCSI

- Based on the Adaptec AIC-7890 PCI to SCSI controller and AIC-3860 chip.
- Supports Ultra 2, Wide and Narrow SCSI interface.
- Date transfer rate up to 80MB/Sec.
- Provides drivers for Dos, Windows 95, Windows NT, Netware, OS/2. SCO Unix, Unixware.
- SCSI terminator can be enabled/disabled automatically.
- Provides an external wide SCSI cable. (manufacturing option)

Onboard LAN

- Based on the Intel 10/100Mbps PCI to LAN controller 82558.
- Supports auto-negotiation protocol.
- Supports Full Duplex Flow Control.
- Supports Wake-up On LAN (WOL).
- Supports Adapter Fault Tolerance (AFT).
- Supports Adaptive Load Balancing (ALB).
- Supports Fast Ether Channel (FEC).
- Supports Hotplug.

Advanced features

- PCI 2.2 specification compliant.
- Provides Trend ChipAwayVirus®On Guard.
- Provides on-board PS/2 mouse and PS/2 keyboard ports.
- Supports two USB ports.
- Provides infrared interface.
- Supports Windows 95/98 software power-down.
- Supports wake-up on LAN and wake-up on internal/external modem.
- On-board Winbond 83782 supports system monitoring (monitors CPU and system temperatures, system voltages and FAN speed).
- Supports keyboard password power-on function.

BIOS

- Licensed advanced AWARD BIOS, supports DIP flash ROM with 2M bits memory size, plug and play ready.
- Supports IDE CD-ROM or SCSI boot up.

Green function

- Supports ACPI (Advanced Configuration and Power Interface) and ODPM (OS Directed Power Management).
- Supports three green modes: Doze, Standby and Suspend.

SecurityEasy function

- Provides advanced SecurityEasy function
- Three ways are provided to enter the SecurityEasy lock status: sleep button/ Keyboard Inactive Timer/ Hot key.
- Power switch, reset button, PS/2 mouse and keyboard are locked in the SecurityEasy lock status.

Expansion slots

- 6 PCI slots and 1 ISA slot.
- 1 AGP slot.

Board size

- 320mm x 305mm.

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Chapter 2
Installation Instructions

This section covers Jumper Settings, Processor Installation, Expansion cards, External Connectors and Memory Configuration. Refer to the mainboard layout chart for locations of all the jumpers, external connectors, slots and I/O ports. Furthermore, this section lists all necessary connector pin assignments for your reference. The particular state of the jumpers, connectors and ports are illustrated in the following figures. Before setting the jumpers or inserting these connectors, please pay attention to the directions.

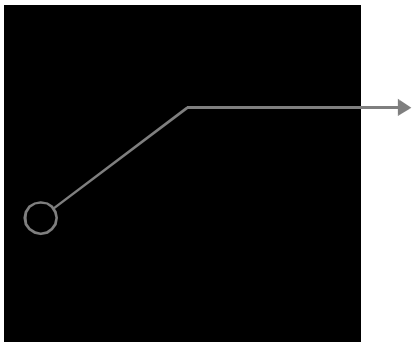
Be sure to unplug the AC power supply before adding or removing expansion cards or other system peripherals, otherwise your mainboard and expansion cards might be severely damaged.

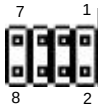
Jumper Settings

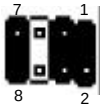
Jumper settings are located on the mainboard. Pin 1 of all jumpers are located on the side with a thick white line (Pin 1 ⟶ ), referring to the mainboard silkscreen. Jumpers with two pins will be shown graphically as  for close and  for open. Jumpers with three pins will be shown as  to represent pin1& pin2 connected and  to represent pin2 & pin3 connected.

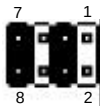
Processor Frequency Selection (JP5)

Jumper JP5 sets the processor frequency. The details are as shown below.



200MHz  JP5

400MHz  JP5

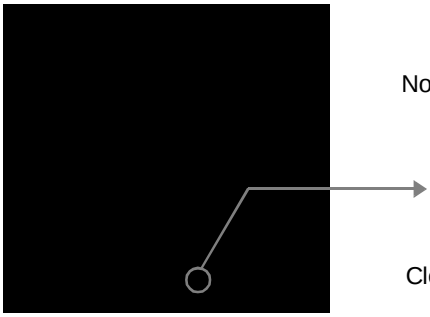
450MHz  JP5

Carefully set the processor frequency by referring to the list below. The default setting is 400MHz.

Pentium®II Xeon™ Processor	JP5			
	7- 8	5 - 6	3 - 4	1 - 2
200MHz	OPEN	OPEN	OPEN	OPEN
400MHz	CLOSE	OPEN	CLOSE	CLOSE
450MHz	CLOSE	OPEN	CLOSE	OPEN

Clear CMOS (JP6)

If you want to clear CMOS, unplug the AC power supply first, close JP6 (pin1& pin2) once, set JP6 back to normal status with pin2 & pin3 connected, then power on the system.

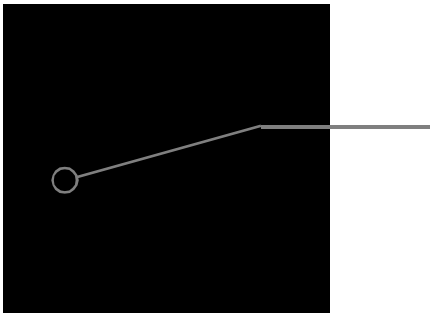


Normal status: 1 2 3 JP6

Clear CMOS: 1 2 3 JP6

Enable/Disable onboard LAN (JP17)

If using onboard LAN, close JP17 (default). Otherwise, set JP17 open for disabling the onboard LAN.

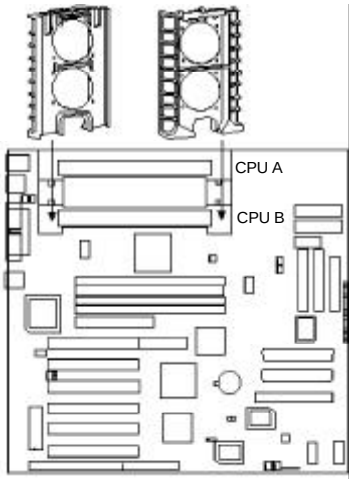


Enable: 1 2 JP17

Disable: 1 2 JP17

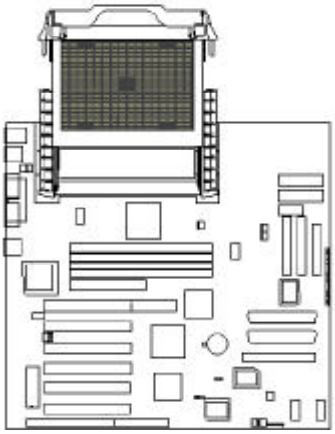
Processor Installation

Before installing the Pentium®II Xeon™ processor, make sure the processor frequency is set properly according to the specification of the processor. When a single processor is used, only the CPU A slot (refer to chart below) can be selected to install the processor, while the GTC (GTL Terminator Card) must be plugged into the CPU B slot. When dual processors are used, they should be identical.
The installation steps are as shown below.



1. Place the outter side guides of the retention module onto the mainboard, paying attention to the 4 holes on the mainbaord around slot 2, then secure the 4 screws.

2. Place the upper guide onto the Pentium®II Xeon™ processor, securing it.



3. Slide the processor with upper guide connected, inserting it onto the mainboard

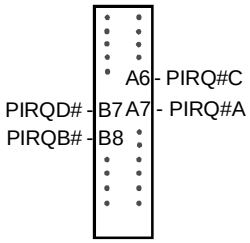
4. Finally screw the 4 nuts on the top of the retention module.

Expansion Cards

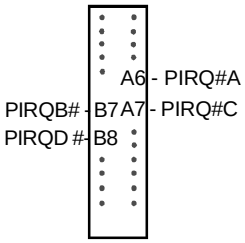
PCI1, PCI2, PCI3, PCI4, PCI5, PCI6

The PCI bus uses its own internal interrupt system for dealing with requests from the cards on the bus. These interrupts are often called "PIRQ#A", "PIRQ#B", "PIRQ#C" and "PIRQ#D" to avoid confusion with the normal numbered system IRQs (IRQ0~15). These interrupts, if needed by cards in the slots, are mapped to the normal system IRQs. The following chart show how the PCI slots connect these internal interrupts.

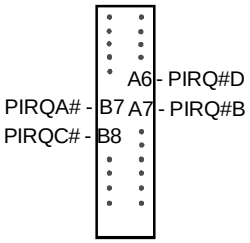
PCI1 / PCI6



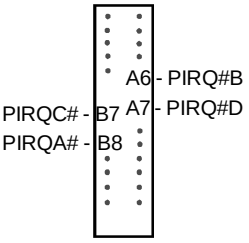
PCI2 / PCI4



PCI3



PCI5



SCSI

The onboard SCSI adapter AIC-7890 occupies PIRQ#C of the PCI interrupt.

LAN

The onboard LAN adapter 82558 occupies PIRQ#B of the PCI interrupt.

AGP

Normally AGP card occupies PIRQ#A of the PCI interrupt.

PCI Resource Configuration

Normally PCI card uses A6 as the IRQ line, and AGP occupies PIRQ#A of the PCI interrupt. Based on this assumption, we recommend the PCI resource configuration listed in the table below.

PCI Interrupt		PIRQ#A	PIRQ#B	PIRQ#C	PIRQ#D
Onboard Device		——	LAN	SCSI	——
AGP		AGP	——	——	——
USB		——	——	——	USB
PCI	PCI Slots (Refer to above chart)	PCI2, PCI4	PCI 5	PCI1 PCI6	PCI 3
	Devices Installed	1. If the add-in AGP card can share the interrupt with other devices, the master device can occupy one slot, however slave devices can be installed on both slots at the same time, or simultaneously install one master and one slave device. 2. If the add-in AGP card can not share the interrupt, only slave devices can be installed.	Slave device only.	Slave device only.	1. If no USB device is connected and the option "Assign IRQ For USB" in "PNP/PCI CONFIGURATION" of CMOS setup is disabled, both master and slave devices can be installed, 2. If a USB device is connected, or the option "Assign IRQ For USB" in "PNP/PCI CONFIGURATION" of CMOS setup is enabled, only slave devices can be installed.

Narrow SCSI

Narrow SCSI interface uses an 8-bit bus and a 50-pin connector. It supports Ultra narrow SCSI peripherals and supports data transfer rate of 20MB/S. Be sure the red side of the cable is aligned with the end of the connector which is marked with " △ "

Wide SCSI

Wide SCSI interface uses a 16-bit bus and a 68-pin connector. It supports Ultra Wide SCSI peripherals and supports data transfer rate of 40MB/s.

Ultra 2 SCSI

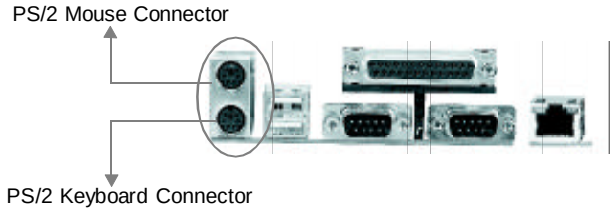
Ultra 2 SCSI interface use a 16-bit bus and a 68-pin connector. It supports Wide Ultra2 SCSI peripherals and supports data transfer rate of 80MB/S. Please note:

1. **Ultra Wide SCSI HDDs can be connected to either Wide SCSI connector or Ultra 2 SCSI connector. In both ways the data transfer rate is 40MB/S.**
2. **Ultra 2 SCSI HDDs can also be connected to either Ultra 2 SCSI connector or Wide SCSI connector. Supports the data transfer rate of 80MB/S only when connecting to Ultra 2 SCSI connector. If connecting to Wide SCSI connector, the data transfer rate is 40MB/S**
3. **If an Ultra wide SCSI HDD is connected to Ultra 2 SCSI channel, and all other HDDs connected are Ultra 2 SCSI HDDs, the data transfer rate supported will be 40MB/S for all.**

External Connectors

PS/2 Keyboard Connector, PS/2 Mouse Connector

PS/2 keyboard connector is for the usage of PS/2 keyboard. If using a standard AT size keyboard, an adapter should be used to fit this connector. PS/2 mouse connector is for the usage of PS/2 mouse.

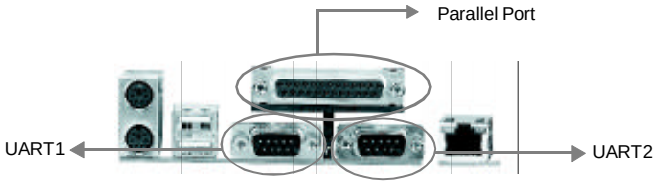


USB1, USB2

Two USB ports are available for connecting USB devices.

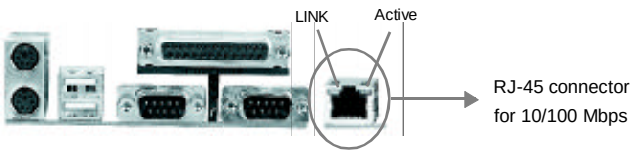
Parallel Port Connector and Serial Port Connector (UART1, UART2)

The parallel port connector can be connected to a parallel device such as a printer, while the serial port connectors can be connected to serial port devices such as a serial port mouse. You can enable/disable them and choose the IRQ or I/O address in "INTEGRATED PERIPHERALS" from AWARD BIOS SETUP.



LAN Connector

The onboard LAN supports IEEE802.3 10 BASE-T and 100 BASE-TX. An RJ-45 connector is provided for twisted-pair cabling. Data transfer speed is automatically determined by the auto-negotiation protocol. Two LED indicators are provided: LINK and Active.



Power Supply Connector(J21, J22, J23) & Power Switch (POWER)

The GeniuX 4 green mainboard supports the standard industrial ATX power supply. Check the ratings of the power supply installed to ensure it meets the following requirements.

Power requirement

Normally the maximum rating power for the power supply installed should be at least 300W. If there are too many peripheral devices in your system, a stronger power supply is needed.

Current requirements

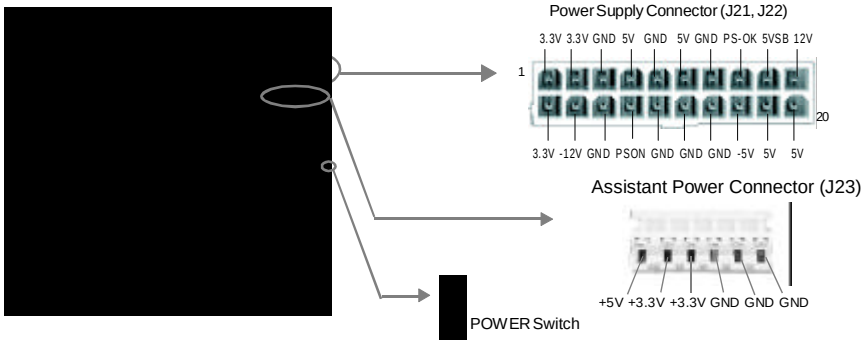
Voltages	+3.3V	+5V	+12V	-5V	-12V	5VSB
Currents	14A	24A	10A	0.25A	0.5A	0.72A

The 5VSB line current of the power supply should be taken into consideration. If it is less than 0.72A, the system may not work properly. If a PCI card using 5VSB line is inserted, the 5VSB line current of the power supply should be more.

The mainboard provides three power connectors (J21, J22, J23), as noted below:

1. **Using two power supplies simultaneously is prohibited. This will result in serious damages to your mainboard.**
2. **Connetors(J21, J22, J23) can be used only by one power supply with related plugs. For example, if two Intel Pentium® II Xeon™ Processors are used on the system, it is necessary to use the power supply which has at least two power plugs (a big one for J21/J22 and a small one for J23).**

The power switch (POWER) should be connected to a momentary switch. When powering up your system, first turn on the mechanical switch of the power supply (if one is provided), then push once the button of the power switch. When powering off the system, you needn't turn off the mechanical switch, just push once the button of the power switch. If you change "soft-off by PWR-BTTN" from default "Instant-off" to "Delay 4 Secs" in BIOS Setup (POWER MANAGEMENT SETUP), the power button should be pressed for more than 4 seconds before the system powers down.



Hard Disk LED Connector (HDLED)

The connector connects to the case' s HDD LED indicating the activity status of IDE hard disk/CD-ROM drive or SCSI hard disk/CD-ROM drive. The connector has an orientation. If one way doesn' t work, try the other way.

Reset Switch (RESET)

The connector connects to the case' s reset switch. Press the switch once, the system resets.

Speaker Connector (SPEAKER)

The connector can be connected to the speaker on the case.

Power LED Connector (PWRLED)

The power LED has two status. When the system is in power-off status, the LED is off. When the system is powered up, the LED is on.

Key-Lock Connector (KEY_L)

The connector can be connected to the keyboard lock switch on the case for locking the keyboard.

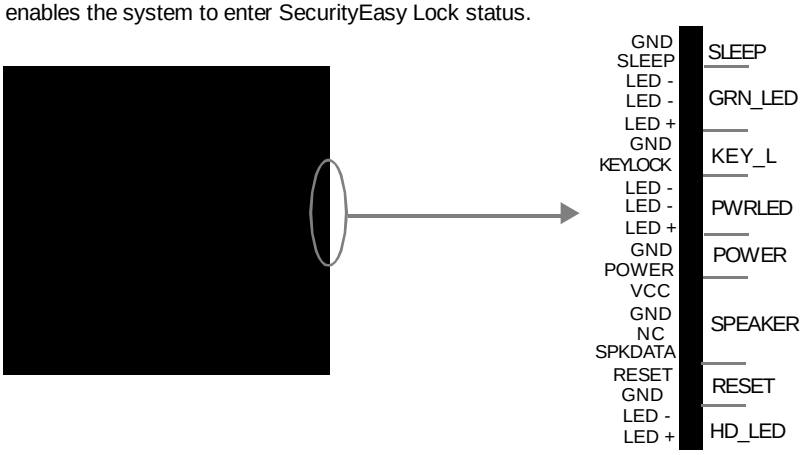
ACPI LED Connector (GRN_LED)

The LED Connected to this header shows the status of the system as described below:

LED Status	System Status
Off	The system is in power-off status.
On	The system is in power-up status.
Flashing at a frequency of about 1Hz	The system is in Green Mode.
Flashing at a frequency of about 1/2Hz	The system is in SecurityEasy Lock status.

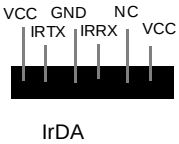
Hardware Green Connector (SLEEP)

Push this switch once, the system enters suspend mode. Push the switch again, the system will be woken up. If the SecurityEasy function is enabled, pushing the switch enables the system to enter SecurityEasy Lock status.

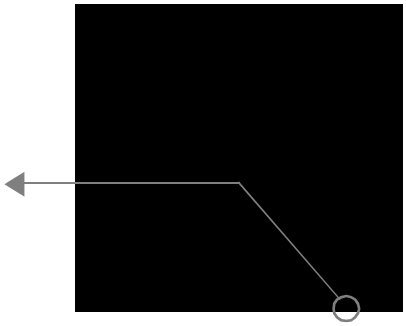


Infrared Header (IRDA)

This connector supports wireless transmitting and receiving. You must set "Serial Port 2 Mode" to **IrDA** or **ASKIR** and configure the settings in the "INTEGRATED PERIPHERALS" section of the BIOS.

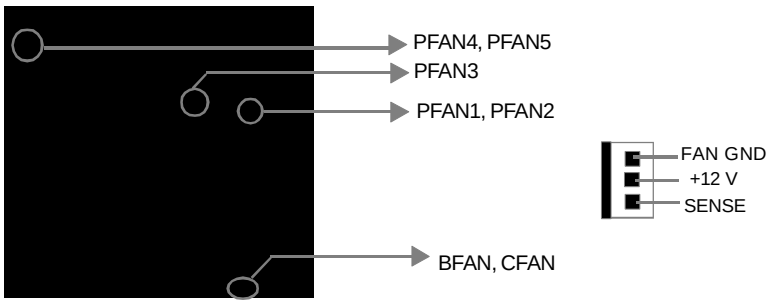


IrDA



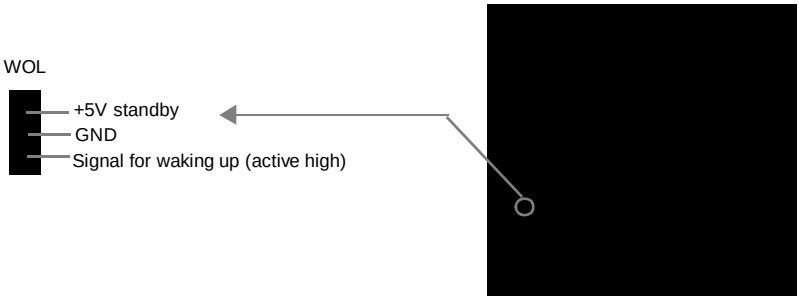
Fan Connector (PFAN1, PFAN2, PFAN3, PFAN4, PFAN5, BFAN, CFAN)

PFAN1/PFAN5 refers to processor fan1/5. BFAN refers to BAKFAN and CFAN refers to chassis fan. The speed of these seven fans can be detected by the system, and viewed in "System Monitor" of the BIOS.



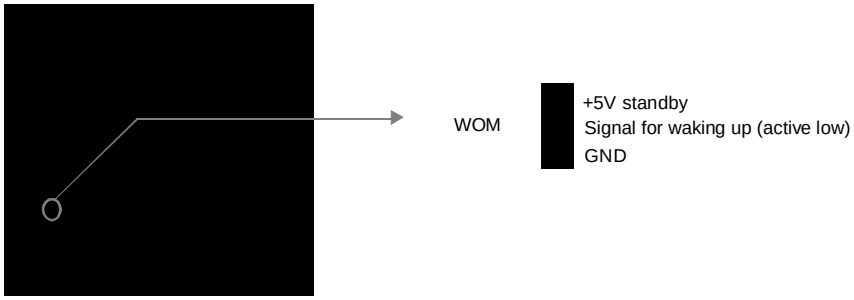
Wake-Up On LAN (WOL)

This connector is reserved for the usage of the customer' s own LAN card. Through Wake-up On LAN function, a wake event occuring from network can wake up the system. If this function is to be used, please be sure an ATX 2.01 power supply of which 5VSB line is capable of delivering 720mA, and a LAN adapter which supports this function are used. Then connect this header to the relevant connector on the LAN adapter, set "Resume by Ring or LAN" as Enabled from the "POWER MANAGEMENT SETUP" section of the BIOS. Save & exit, then boot the operating system once to make sure this function takes effect.



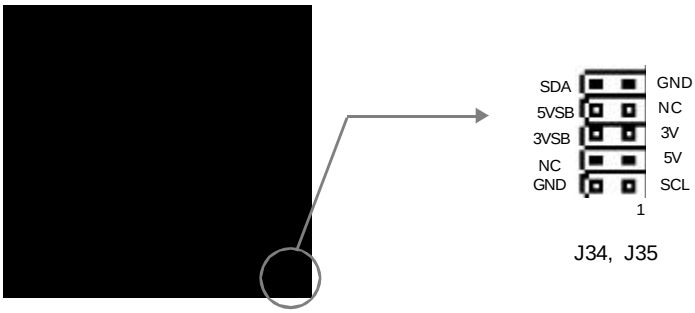
Wake-Up On Internal Modem (WOM)

Through the Wake-Up On Internal Modem function, the system which is in power-off status can be powered up by a ring signal received from the internal modem. If this function is to be used, please be sure an internal modem card which supports this function is used. Then connect this header to the relevant connector on the modem card, set "Resume by Ring or LAN" to Enabled from the "POWER MANAGEMENT SETUP" section of the BIOS. Save & exit, then boot the operating system once to make sure this function takes effect.



I²C Bus Connector (J34, J35)

The I²C-bus connectors are provided to connect the system devices by using I²C bus.



J34, J35

Memory Configuration

This mainboard provides four 168 pin 3.3V un-buffered DIMM sockets to support a flexible memory size ranging from 8MB to 2GB. Both 100MHz SDRAM and registered DIMMs are supported. The following set of rules allow optimum configurations.

Rules for populating a 440GX memory array:

- SDRAM and registered DIMMs can not be used on the same system, it is advised you use only one kind of DIMM.
- Possible SDRAM DIMM memory sizes are 8MB, 16MB, 32MB, 64MB, 128MB or 256MB in each DIMM socket.

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