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## ***Table of Contents***

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<b>Chapter 1: Introduction.....</b>	<b>1</b>
1.1    Motherboard Features .....	1
1.2    Package Checklist.....	6
1.3    Layout & Components .....	7
<b>Chapter 2: Hardware Installation .....</b>	<b>8</b>
2.1    Central Processing Unit (CPU).....	8
2.2    Fan Headers .....	9
2.3    Memory Modules Installation.....	10
2.4    Connectors & Slots.....	11
<b>Chapter 3: Headers &amp; Jumpers Setup.....</b>	<b>13</b>
3.1    How to setup Jumpers.....	13
3.2    Detail Settings.....	13
<b>Chapter 4: Useful Help.....</b>	<b>20</b>
4.1    Award BIOS Beep Code .....	20
4.2    Extra Information .....	20
4.3    Troubleshooting .....	22
<b>Chapter 5: NVIDIA SLI Function.....</b>	<b>23</b>
5.1    Requirements.....	23
5.2    Placing the SLI-NF4 Selector Card.....	23
5.3    Things to Notice .....	25
5.4    Installing SLI-Ready Graphics Cards .....	25
5.5    Enabling Multi-GPU Feature in Windows .....	27
<b>Chapter 6: NVIDIA RAID Functions.....</b>	<b>29</b>
6.1    Operation System.....	29
6.2    Raid Arrays.....	29
6.3    How RAID Works.....	29
<b>Chapter 7: WarpSpeeder™ .....</b>	<b>32</b>
7.1    Introduction .....	32
7.2    System Requirement .....	32
7.3    Installation.....	33
7.4    [WarpSpeeder™] includes 1 tray icon and 5 panels .....	34

## CHAPTER 1: INTRODUCTION

### 1.1 MOTHERBOARD FEATURES

#### A. Hardware

##### CPU

- λ Supports Socket 939.
- λ Supports AMD Athlon 64 FX / Athlon 64 processor.
- λ HyperTransport™ technology up to 2000MHz Full duplex
- λ AMD 64 architecture enables simultaneous 32 and 64 bit computing.
- λ Supports HyperTransport™ and AMD Cool'n'Quiet™ Technology

##### Chipset

- λ **NVIDIA nForce4 CK8-04 SLI:**
  - Supports NVIDIA Firewall.
  - Supports Gigabit Ethernet.
  - Supports 10 USB 2.0 ports.
  - Supports NVIDIA nTune Utility.
  - Supports NVIDIA Secure Networking Processor.
  - Supports 2 PCI-Express x16 interface graphics cards.
  - Supports 4 SATA 2.0 ports, each channel up to 3Gb/s.
  - Supports NVIDIA RAID functions, including RAID 0, RAID 1 and RAID 0+1.
  - Supports 4 IDE disk drives with PIO Mode 5, Bride Mode and Ultra DMA 33/66/100/133 Bus Master Mode.
  - Compliant with AC'97 version2.3 specification.
  - Complains with PCI-Express Version 1.a specification.

##### Operating Systems

- λ Supports Windows 2000 and Windows XP.  
**Note:** Do not support Windows 98SE and Windows ME.

##### Dimensions

- λ ATX Form Factor: 29.4cm (L) x 24.35cm (W)

##### On-board IDE

- λ 2 on-board connectors support 4 IDE disk drives.
- λ Supports PIO mode 5, Block Mode and Ultra DMA 33/66/100/133 bus master mode.

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### System Memory

- λ Supports Dual Channel DDR.
- λ Supports 8 banks in total.
- λ Supports DDR333 and DDR400.
- λ Maximum memory size is 4GB.

DIMM Socket Location	DDR Module	Total Memory Size (MB)
DIMM1	128MB/256MB/512MB/1GB *1	Max is 4 GB.
DIMM2	128MB/256MB/512MB/1GB *1	
DIMM3	128MB/256MB/512MB/1GB *1	
DIMM4	128MB/256MB/512MB/1GB *1	

### Expansion Slots

- λ Three 32bit PCI bus master slots.
- λ **Normal Mode PCI-Express slots:**
  - One PCI-Express x16 slot: PEX16-1.
  - Three PCI-Express x1 slots: PEX16-2, PEX1-1 and PEX1-2 slots
- λ **SLI Mode PCI-Express slots:**
  - Two PCI-Express x8 slots: PEX16-1 and PEX16-2.
  - Two PCI-Express x1 slots: PEX1-1 and PEX1-2.

**Notice:**

Normal Mode and SLI Mode are switched by SLI-NF4 selector card.  
(Please read Chapter 5 for detail information.)

### Gigabit Ethernet LAN

- λ NVIDIA Gigabit MAC + VITESSE Gigabit PHY VSC8201.
- λ Supports 10Mb/s, 100Mb/s and 1GB/s auto-negotiation.
- λ Half/Full duplex capability.
- λ Supports personal Firewall setup.
- λ Supports ACPI power management.

### On-board AC'97 Audio Sound Codec

- λ Chip: ALC850:
- λ Compliant with AC'97 version2.3 specification.
- λ Supports 8 channels audio output.

### IEEE 1394A Chip (optional)

- λ Chip: VIA VT6307.
- λ Supports 2 ports with transfer up to 400Mb/s.

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### **Super I/O**

- λ Chip: ITE IT8712F.
- λ Low Pin Count Interface.
- λ Provides the most commonly used legacy Super I/O functionality.
- λ Environment Control initiatives,
  - H/W Monitor
  - Fan Speed Controller
  - ITE's "Smart Guardian" function

### **Serial ATA**

- λ 4 on-board Serial ATA connectors support 4 serial ATA (SATA) ports.
- λ Supports data transfer rates 1.5Gb/s or 3Gb/s.
- λ Compliant with SATA2.0 specification.

### **RAID Controller**

- λ Integrated in nForce4 CK8-04 SLI:
- λ NVIDIA RAID Technology:
  - RAID 0 disk striping for highest system and application performance
  - RAID 1 disk mirroring support for fault tolerance  
Support for both SATA and ATA-133 disk controller standards
  - RAID 0+1 disk striping and mirroring for highest performance with fault tolerance

### **Security**

- λ NVIDIA Network Management:
  - Remote access, configuration, monitoring
  - Command line interface (CLI)
  - WMI scripts.
- λ NVIDIA Firewall technology:
  - Native firewall solution, protects the PC from intruders by filtering unauthorized traffic.

### **Internal On-board Connectors and Headers**

- λ 1 audio-out header supports audio-out facilities.
- λ 1 front panel header supports front panel facilities.
- λ 1 CD-in connector supports CD-ROM audio-in function.
- λ 1 SPDIF-out connector supports digital audio-out function.

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λ 1 IEEE1394A header supports 1 1394A Firewire port (optional).

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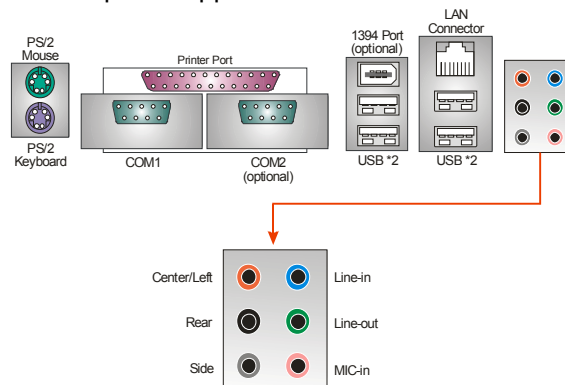
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- λ 1 SPDIF-in connector supports digital audio-in function (optional).
- λ 1 floppy connector supports 2 FDD devices with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
- λ 2 IDE connectors support 4 IDE disk drives.
- λ 3 USB headers support 6 USB 2.0 ports at front panel.
- λ 4 Serial ATA connectors support 4 SATA 2.0 devices.

### **Rear (Back Panel) Side Connectors**

- λ 1 Printer Port.
- λ 1 PS/2 Mouse Port.
- λ 1 PS/2 Keyboard Port.
- λ 1 Serial Port. (COM2 is optional.)
- λ 1 1394A Firewire Port (optional).
- λ 1 RJ-45 LAN jack.
- λ 4 USB 2.0 Ports.
- λ 6 audio ports support 8 channels audio-out facilities.



## **B. BIOS & Software**

### **BIOS**

- λ Award legal BIOS.
- λ Supports APM1.2.
- λ Supports ACPI.
- λ Supports USB Function.

### **Bundled Software**

- λ Supports 9th Touch™, WINFLASHER™ and FLASHER™.

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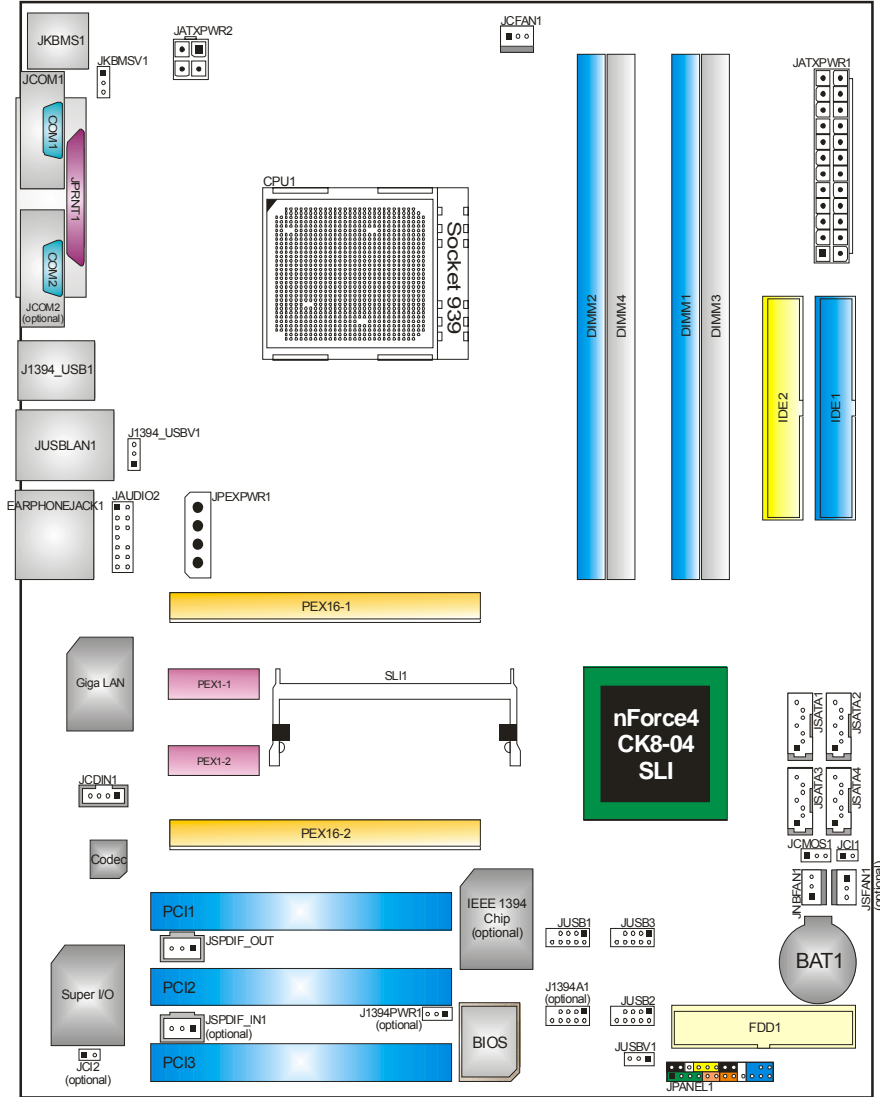
### ***1.2 PACKAGE CHECKLIST***

- λ FDD Cable x 1
- λ HDD Cable x 1
- λ User's Manual x 1
- λ Serial ATA Cable x 1
- λ BRI-2 SLI Bridge x 1
- λ Fully Setup Driver CD x 1
- λ Rear I/O Panel for ATX Case x 1
- λ SLI-NF4 Selector Card x 1 (pre-installed)
- λ SPDIF Cable x 1 (optional)
- λ USB 2.0 Cable x 1 (optional)
- λ Retention Bracket x 1 (optional)
- λ IEEE 1394A Cable x 1 (optional)
- λ Serial ATA Power Switch Cable x 1 (optional)



# N4SLI-A9

## 1.3 LAYOUT & COMPONENTS



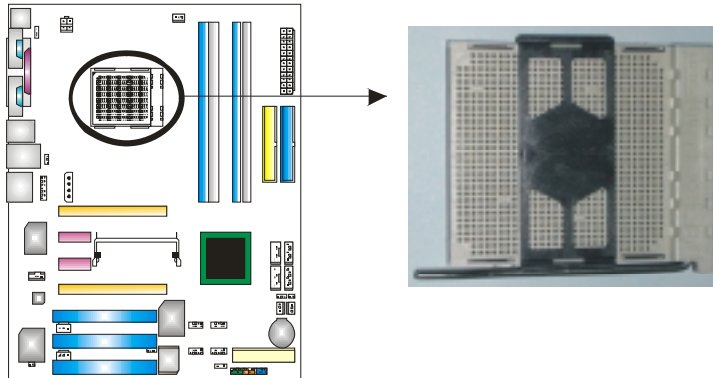
**Note:** ■ represents the 1<sup>st</sup> pin.

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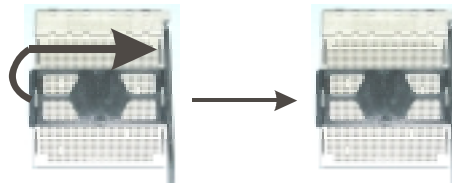
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## CHAPTER 2: HARDWARE INSTALLATION

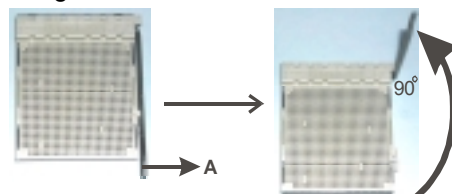
### 2.1 CENTRAL PROCESSING UNIT (CPU)



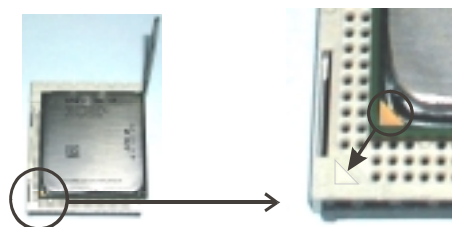
**Step 1:** Remove the socket protection cap.



**Step 2:** Pull the lever toward direction A from the socket and then raise the lever up to a 90-degree angle.



**Step 3:** Look for the white triangle on socket, and the gold triangle on CPU should point forwards this white triangle. The CPU will fit only in the correct orientation.

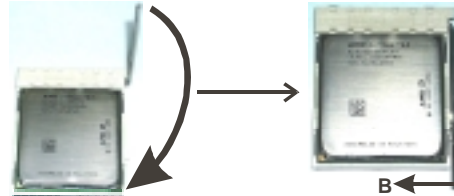


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## N4SLI-A9

**Step 4:** Hold the CPU down firmly, and then close the lever toward direct B to complete the installation.



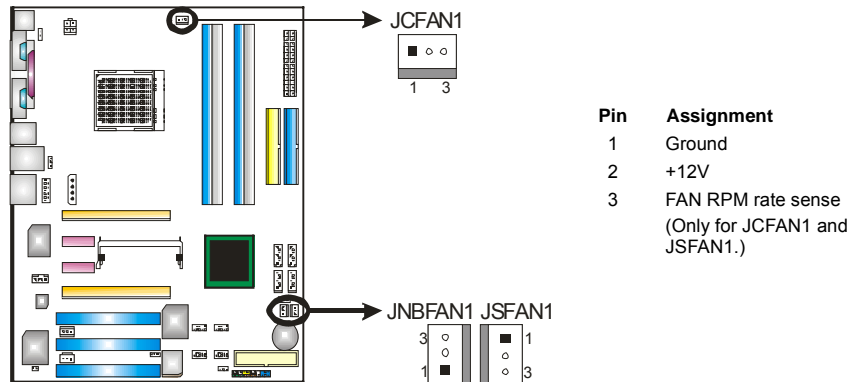
**Step 5:** Put the CPU Fan on the CPU and buckle it. Connect the CPU FAN power cable to the JCFAN1. This completes the installation.

### 2.2 FAN HEADERS

**JCFAN1: CPU FAN Power Header**

**JSFAN1: System Fan Power Header (optional)**

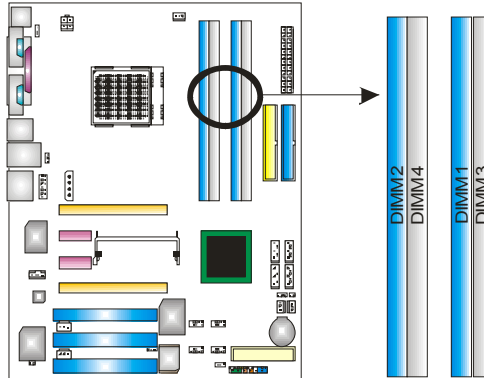
**JNBFAN1: Northbridge Fan Power Header**



**Note:**

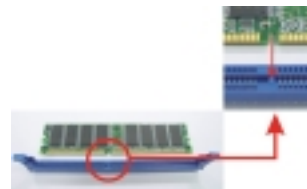
The JCFAN1 and JSFAN1 support system cooling fan with Smart Fan Control utility. It supports 3 pin head connector. When connecting with wires onto connectors, please note that the red wire is the positive and should be connected to pin#2, and the black wire is Ground and should be connected to GND.

**2.3 MEMORY MODULES INSTALLATION**



**2.2.1 DDR Module installation**

1. Unlock a DIMM slot by pressing the retaining clips outward. Align a DIMM on the slot such that the notch on the DIMM matches the break on the Slot.



2. Insert the DIMM vertically and firmly into the slot until the retaining chip snap back in place and the DIMM is properly seated.



**2.2.2 DDR Installation Notice**

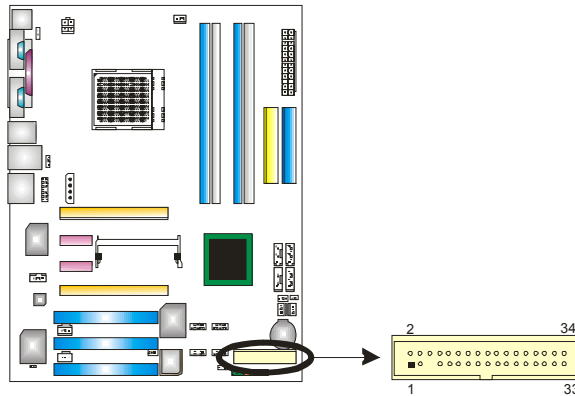
- λ Please follow the table below to install your DDR memory module, or the system may not boot up or may not function properly.
- λ "SS" represents Single Side DDR memory module.
- λ "DS" represents Double Side DDR memory module.
- λ Star sign "\*" represents leave the DIMM socket empty.

DIMM1	SS/DS	*	SS/DS	*	SS/DS
DIMM2	*	*	SS/DS	*	SS/DS
DIMM3	*	SS/DS	*	SS/DS	SS/DS
DIMM4	*	*	*	SS/DS	SS/DS

2.4 CONNECTORS & SLOTS

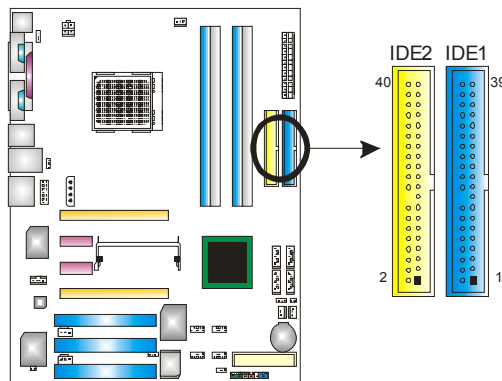
**FDD1: Floppy Disk Connector**

The motherboard provides a standard floppy disk connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.



**IDE1/IDE2: Hard Disk Connectors**

The motherboard has two 32-bit Enhanced PCI IDE Controller that provides PIO Mode 0~5, Bus Master, and Ultra DMA 33/66/100/133 functionality. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). The IDE connectors can connect a master and a slave drive, so you can connect up to four hard disk drives. The first hard drive should always be connected to IDE1.



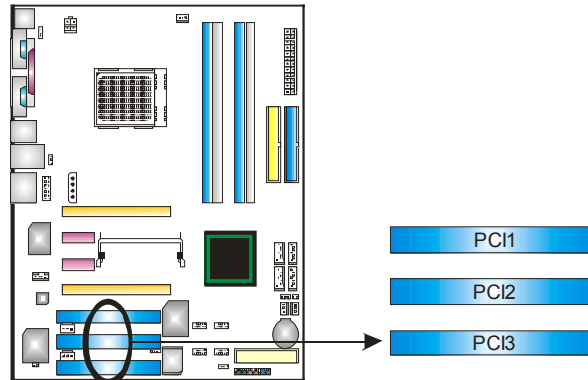
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## N4SLI-A9

### **PCI1~PCI3: Peripheral Component Interconnect Slots**

This motherboard is equipped with 3 standard PCI slot. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards. This PCI slot is designated as 32 bits.



### **PEX16-1/PEX16-2/PEX1-1/PEX1-2: PCI-Express Slots**

#### **PEX16-1 (Normal Mode):**

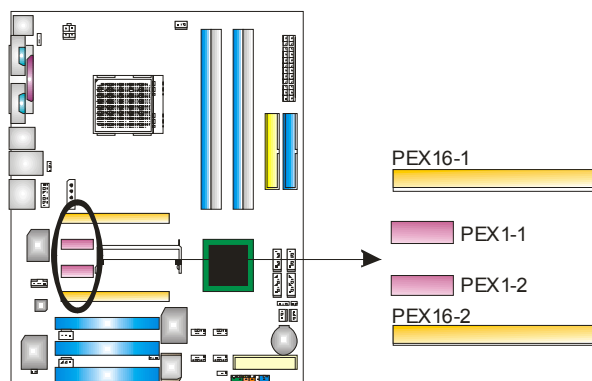
- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 4GB/s per direction.

#### **PEX16-1/PEX1-1/PEX1-2 (Normal Mode):**

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 250MB/s per direction.

#### **PEX16-1/PEX16-2 (SLI Mode):**

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 2GB/s per direction.



## CHAPTER 3: HEADERS & JUMPERS SETUP

### 3.1 HOW TO SETUP JUMPERS

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is “close”, if not, that means the jumper is “open”.



Pin opened



Pin closed

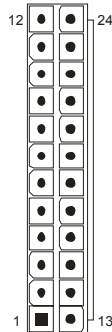
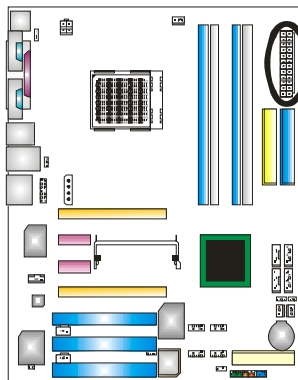


Pin1-2 closed

### 3.2 DETAIL SETTINGS

#### JATXPWR1/JATXPWR2: ATX Power Source Connectors

This connector allows user to connect 24-pin power connector on the ATX power supply.



Pin	Assignment
1	+3.3V
2	+3.3V
3	Ground
4	+5V
5	Ground
6	+5V
7	Ground
8	PW_OK
9	Standby Voltage+5V
10	+12V
11	+12V
12	Detect
13	+3.3V
14	-12V
15	Ground
16	PS_ON
17	Ground
18	Ground
19	Ground
20	-5V
21	+5V
22	+5V
23	+5V
24	Ground

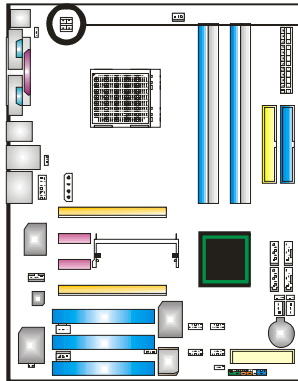
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### JATXPWR2: ATX Power Source Connector

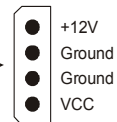
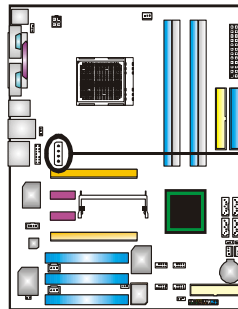
By connecting this connector, it will provide +12V to CPU power circuit.



Pin	Assignment
1	+12V
2	+12V
3	Ground
4	Ground

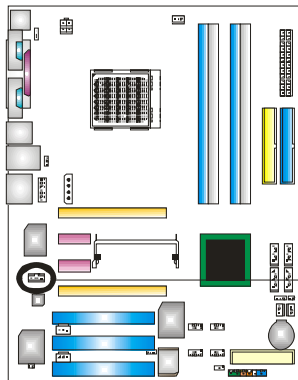
### JPEXPWR1: PCI-Express x16 Slot Power Source Connector

When SLI mode is enabled, please plug in this PEX power source connector to make sure the system is working under a stable environment. Please read Chapter 5 for detail information.



### JCDIN1: CD-ROM Audio-in Connector

This connector allows user to connect the audio source from the variety devices, like CD-ROM, DVD-ROM, PCI sound card, PCI TV turner card etc..



Pin	Assignment
1	Left channel input
2	Ground
3	Ground
4	Right channel input



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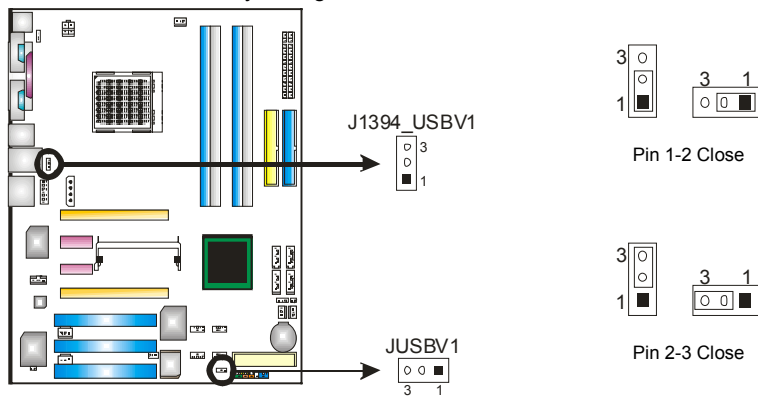
### J1394\_USBV1/JUSBV1: Power Source Headers for USB Ports

**Pin 1-2 Close:**

J1394\_USBV1: +5V for USB ports at J1394\_USB1 and JUSBLAN1.  
JUSBV1: +5V for front USB headers (JUSB1/JUSB2/JUSB3).

**Pin 2-3 Close:**

J1394\_USBV1: USB ports at J1394\_USB1 and JUSBLAN1 are powered with +5V standby voltage.  
JUSBV1: Front USB headers (JUSB1/JUSB2/JUSB3) are powered with +5V standby voltage.

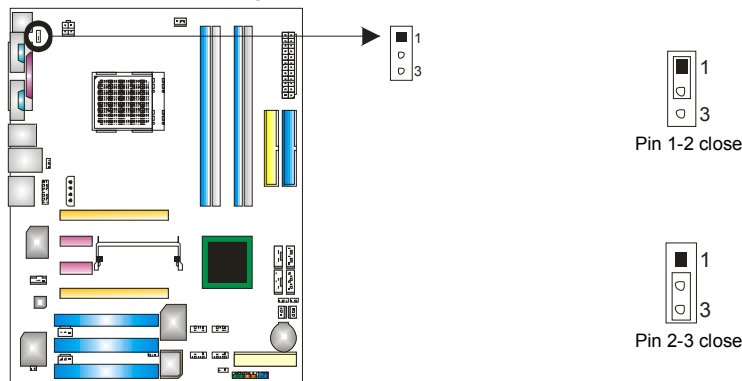


**Note:** In order to support this function “Power-on system via USB device,” “J1394\_USBV1/JUSBV1” jumper cap should be placed on Pin 2-3 individually.

### JKBMSV1: Power Source Header for PS/2 Keyboard/Mouse

**Pin 1-2 Close:** +5V for PS/2 keyboard and mouse..

**Pin 2-3 Close:** PS/2 keyboard and mouse are powered with +5V standby voltage.

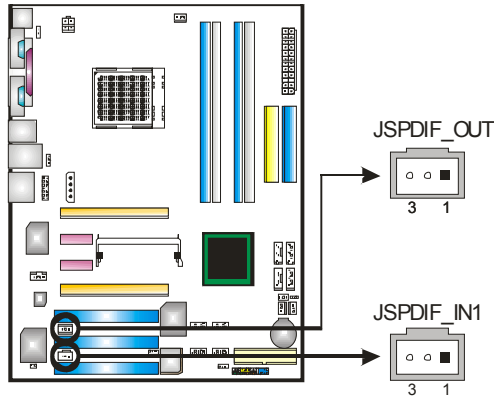


**Note:** In order to support this function “Power-on system via keyboard and mouse”, “JKBMSV1” jumper cap should be placed on Pin 2-3.

## N4SLI-A9

### JSPDIF\_OUT/JSPDIF\_IN1: Digital Audio-out Connectors (JSPDIF\_IN1 is optional.)

These connectors allow user to connect the PCI bracket SPDIF output or input header.



JSPDIF\_OUT:

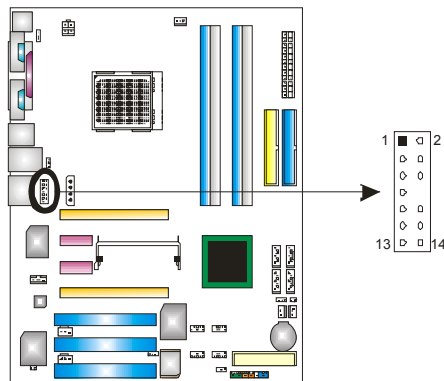
Pin	Assignment
1	+5V
2	SPDIF OUT
3	Ground

JSPDIF\_IN1:

Pin	Assignment
1	+5V
2	SPDIF IN
3	Ground

### JAUDIO2: Front Panel Audio-out Header

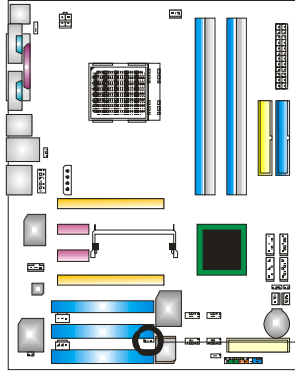
This connector will allow user to connect with the front audio out put headers on the PC case. It will disable the output on back panel audio connectors.



Pin	Assignment
1	MIC-in/ Stereo MIC-in R
2	Ground
3	Stereo MIC-in L
4	Audio power
5	Right line-out/ Speaker-out Right.
6	Right line-out/ Speaker-out Right
7	Reserved
8	Key
9	Left line-out/ Speaker-out Left
10	Left line-out/ Speaker-out Left
11	Right line-in (optional)
12	Right line-in (optional)
13	Left line-in (optional)
14	Left line-in (optional)

## N4SLI-A9

### J1394PWR1 (optional): Power Source Header for 1394 Chip



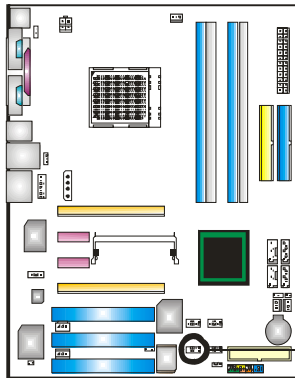
**Pin 1-2 Close:**  
+3.3V for 1394 chipset (default).



**Pin 2-3 Close:**  
+3.3V SB for 1394 chipset.

### J1394A1 (optional): Header for 1394A Firewire Port at Front Panel

This header allows user to connect the front 1394 port for digital image devices.

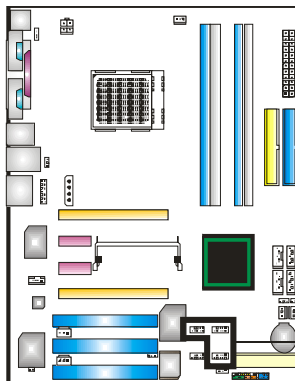


Pin	Assignment
1	A+
2	A-
3	Ground
4	Ground
5	B+
6	B-
7	+12v
8	+12V
9	Key
10	Ground



### JUSB1~JUSB3: Headers for USB Ports at Front Panel

This connector allows user to connect additional USB cables at PC front panel, and also can be connected with internal USB devices, like USB card reader.



Pin	Assignment
1	+5V (fused)
2	+5V (fused)
3	USB-
4	USB-
5	USB+
6	USB+
7	Ground
8	Ground
9	Key
10	NC

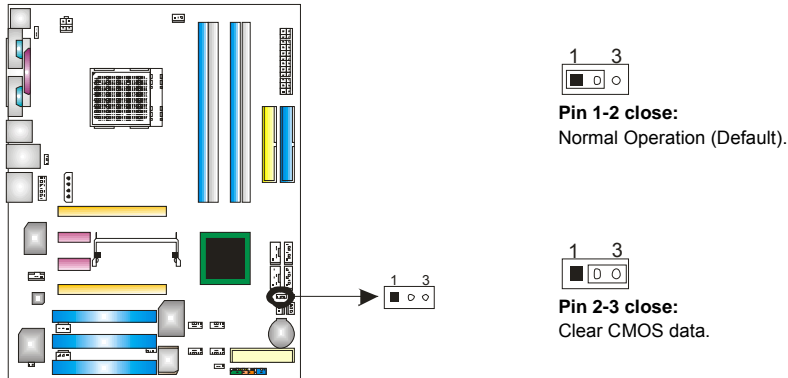
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## N4SLI-A9

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### JCMOS1: Clear CMOS Header

By placing the jumper on pin2-3, it allows user to restore the BIOS safe setting and the CMOS data, please carefully follow the procedures to avoid damaging the motherboard.

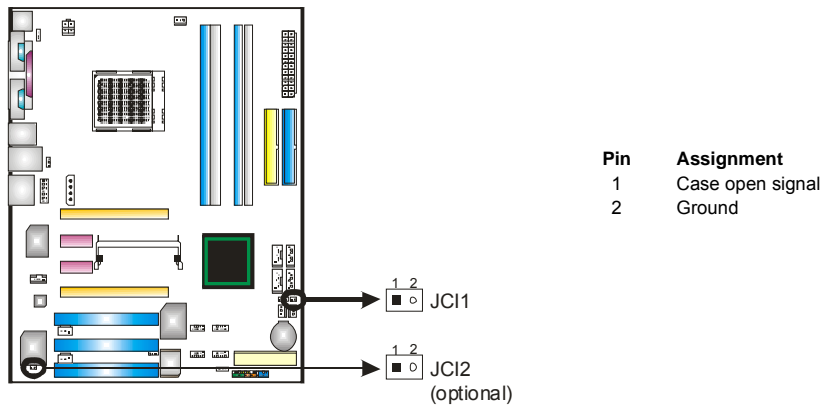


#### ※ Clear CMOS Procedures:

1. Remove AC power line.
2. Set the jumper to “Pin 2-3 close”.
3. Wait for five seconds.
4. Set the jumper to “Pin 1-2 close”.
5. Power on the AC.
6. Reset your desired password or clear the CMOS data.

### JCI1/JCI2: Case Open Headers (JCI2 is optional.)

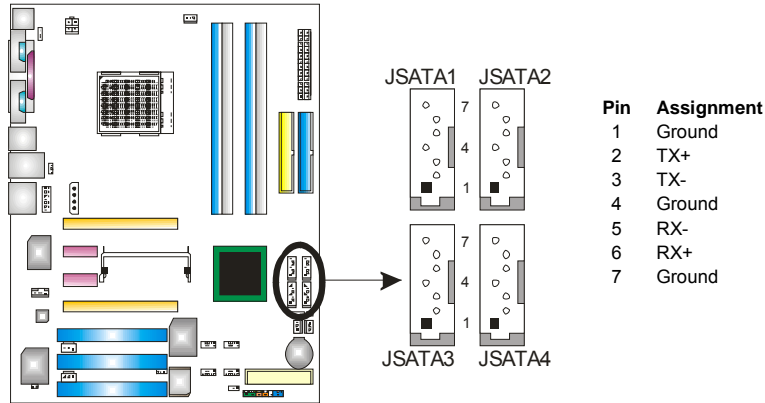
This connector allows system to monitor PC case open status. If the signal has been triggered, it will record to the CMOS and show the message on next boot-up.



## N4SLI-A9

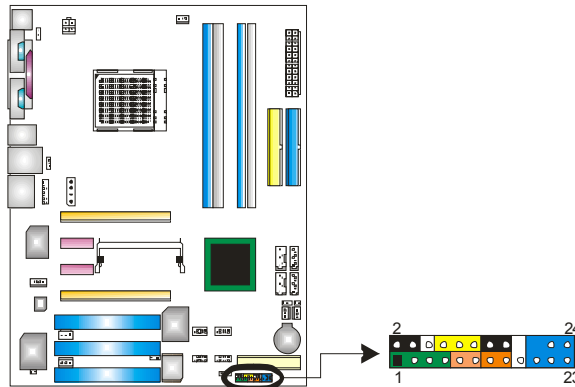
### JSATA1~JSATA4: Serial ATA Connectors

The motherboard has a SATA Controller in nForce4 CK8-04 SLI with 4 channels SATA interface, it satisfies the SATA 2.0 spec and with transfer rate of 3.0Gb/s.



### JPANEL1: Header for Front Panel Facilities

This 24-pin connector includes Power-on, Reset, HDD LED, Power LED, Sleep button, speaker and IrDA Connection. It allows user to connect the PC case's front panel switch functions.



Pin	Assignment	Function	Pin	Assignment	Function
1	+5V		2	Sleep control	Sleep button
3	N/A	Speaker Connector	4	Ground	
5	N/A		6	N/A	N/A
7	Speaker		8	Power LED (+)	Power LED
9	HDD LED (+)	Hard drive LED	10	Power LED (+)	
11	HDD LED (-)		12	Power LED (-)	
13	Ground	Reset button	14	Power button	Power-on button
15	Reset control		16	Ground	
17	N/A		18	Key	
19	N/A		20	Key	
21	+5V	IrDA Connector	22	Ground	IrDA Connector
23	IRTX		24	IRRX	

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## CHAPTER 4: USEFUL HELP

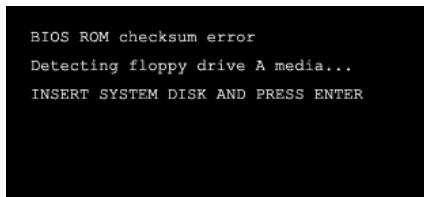
### 4.1 AWARD BIOS BEEP CODE

Beep Sound	Meaning
One long beep followed by two short beeps	Video card not found or video card memory bad
High-low siren sound	CPU overheated System will shut down automatically
One Short beep when system boot-up	No error found during POST
Long beeps every other second	No DRAM detected or install

### 4.2 EXTRA INFORMATION

#### A. BIOS Update

After you fail to update BIOS or BIOS is invaded by virus, the Boot-Block function will help to restore BIOS. If the following message is shown after boot-up the system, it means the BIOS contents are corrupted.



In this Case, please follow the procedure below to restore the BIOS:

1. Make a bootable floppy disk.
2. Download the Flash Utility "AWDFLASH.exe" from the Biostar website: [www.biostar.com.tw](http://www.biostar.com.tw)
3. Confirm motherboard model and download the respectively BIOS from Biostar website.
4. Copy "AWDFLASH.exe" and respectively BIOS into floppy disk.
5. Insert the bootable disk into floppy drive and press Enter.
6. System will boot-up to DOS prompt.
7. Type "Awdflash xxxx.bf/sn/py/r" in DOS prompt.
8. System will update BIOS automatically and restart.
9. The BIOS has been recovered and will work properly.

**B. CPU Overheated**

If the system shutdown automatically after power on system for seconds, that means the CPU protection function has been activated.

When the CPU is over heated, the motherboard will shutdown automatically to avoid a damage of the CPU, and the system may not power on again.

In this case, please double check:

1. The CPU cooler surface is placed evenly with the CPU surface.
2. CPU fan is rotated normally.
3. CPU fan speed is fulfilling with the CPU speed.

After confirmed, please follow steps below to relief the CPU protection function.

1. Remove the power cord from power supply for seconds.
2. Wait for seconds.
3. Plug in the power cord and boot up the system.

Or you can:

1. Clear the CMOS data.  
(See "JCMOS1: Clear CMOS Header" section)
2. Wait for seconds.
3. Power on the system again.

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**N4SLI-A9**

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**4.3 TROUBLESHOOTING**

<b>Probable</b>	<b>Solution</b>
<ol style="list-style-type: none"><li>1. No power to the system at all. Power light don't illuminate, fan inside power supply does not turn on.</li><li>2. Indicator light on keyboard does not turn on.</li></ol>	<ol style="list-style-type: none"><li>1. Make sure power cable is securely plugged in.</li><li>2. Replace cable.</li><li>3. Contact technical support.</li></ol>
System inoperative. Keyboard lights are on, power indicator lights are lit, and hard drive is spinning.	Using even pressure on both ends of the DIMM, press down firmly until the module snaps into place.
System does not boot from hard disk drive, can be booted from optical drive.	<ol style="list-style-type: none"><li>1. Check cable running from disk to disk controller board. Make sure both ends are securely plugged in; check the drive type in the standard CMOS setup.</li><li>2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.</li></ol>
System only boots from optical drive. Hard disk can be read and applications can be used but booting from hard disk is impossible.	<ol style="list-style-type: none"><li>1. Back up data and applications files.</li><li>2. Reformat the hard drive. Re-install applications and data using backup disks.</li></ol>
Screen message says "Invalid Configuration" or "CMOS Failure."	Review system's equipment. Make sure correct information is in setup.
Cannot boot system after installing second hard drive.	<ol style="list-style-type: none"><li>1. Set master/slave jumpers correctly.</li><li>2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.</li></ol>



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## CHAPTER 5: NVIDIA SLI FUNCTION

### 5.1 REQUIREMENTS

- λ Only Windows XP supports SLI (Dual Video) function.
- λ Two identical SLI-ready graphics cards that are NVIDIA certified.
- λ The graphics card driver should support NVIDIA SLI technology.
- λ The power supply unit must provide at least the minimum power required by the system, or the system will be unstable.

### 5.2 PLACING THE SLI-NF4 SELECTOR CARD

- λ There is a pre-installed SLI-NF4 selector card on the motherboard. The default setting is Normal Mode, only supports single graphics card.



- λ To use two graphics cards, firstly, you have to set the selector card to SLI Mode, to support dual video cards.

Step 1: Push the retention clips outward to release SLI-NF4 selector card.



Step 2: Pull the selector card out of the slot.



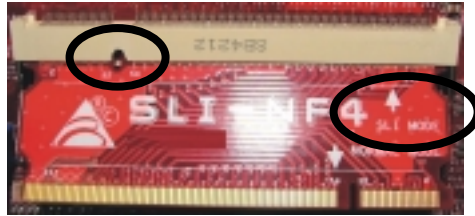
- ② pull out the selector card
- ① about 45° degree lift.

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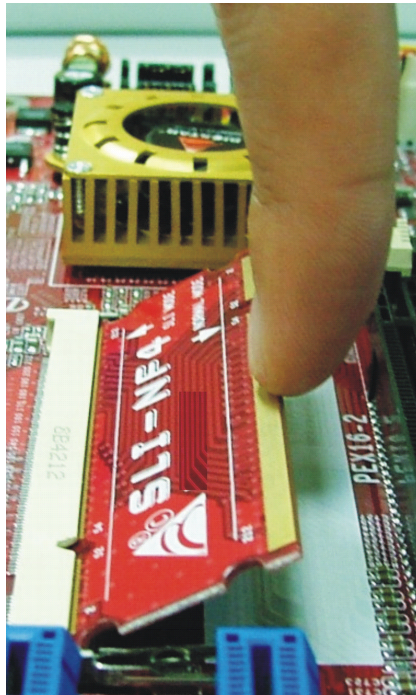
## N4SLI-A9

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Step 3: Invert the selector card and insert the edge labeled “SLI MODE”.



Step 4: Push down the selector card until the retention clips snap into place.



- ① Insert the card with a degree about 45°.
- ② Push the selector card downward.

**Notice:** Make sure to insert the card into the slot completely.

**5.3 THINGS TO NOTICE**

**λNormal Mode:**

- Only PEX16-1 slot supports PCI-Express x16 interface graphics card function.
- PEX16-2, PEX1-1 and PEX1-2 slots provide PCI-Express x1 interface expansion card function.

**λSLI Mode:**

- Use BRI-SLI connector to link two SLI-ready PCI-E x16 interface graphics cards.
- PEX16-1 and PEX16-2 slots provide PCI-E x8 data transfer rate.
- PEX1-1 and PEX1-2 slots provide PCI-Express x1 interface expansion card function.
- Coordinate with graphics card driver to set Dual Video function.

**5.4 INSTALLING SLI-READY GRAPHICS CARDS**

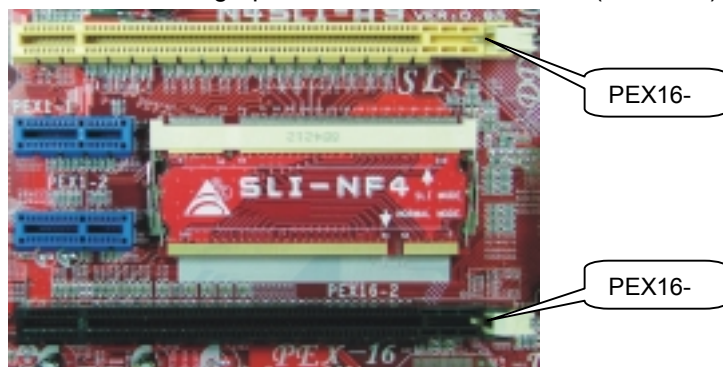
Step 1: Make sure the SLI-NF4 selector card is placed at SLI Mode.



Step 2: Prepare two graphics cards with PCI-E x16 interface.

Step 3: Insert the first one graphics card into the yellow slot (PEX16-1).

Step 4: Insert the second graphics card into the black slot (PEX16-2).



**Notice:**  
Make sure both the graphics cards are seated into slots completely.

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## N4SLI-A9

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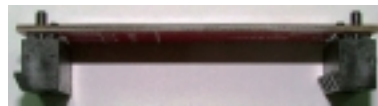
Step 5: Connect a 4-pin ATX power cable to PEX power connector (JPEXPWR1), this will ensure the stabilization of your system.



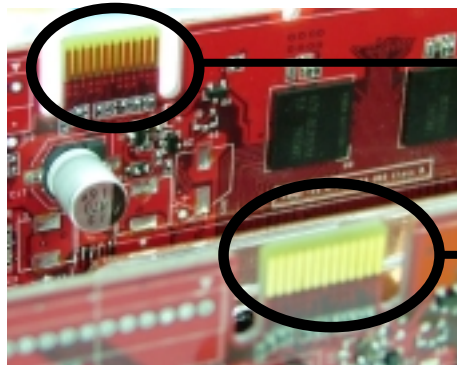
Step 6: Insert the SLI Bridge (BRI-2) connector on the gold-fingers on each graphics card.



Front view



Side view



Gold-fingers on  
two graphics

Step 7: To securely fix the connector between two graphics cards, a retention bracket must be installed.

Step 7-1: Remove any of the bracket cover between the two graphics cards.

Step 7-2: Align and insert the retention bracket into the slot and then fix it with a screw.

**Notice:**

1. Make sure the retention bracket supports the SLI Bridge (BRI-2) firmly.
2. Retention bracket is optional

### 5.5 ENABLING MULTI-GPU FEATURE IN WINDOWS

After the graphics cards are installed, enable the Multi-GPU feature in NVIDIA nView properties.

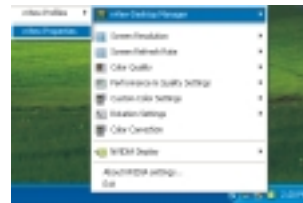
Step 1:

Click NVIDIA Settings icon on the Windows taskbar.



Step 2:

Select nView Properties in nView Desktop Manager pop-up menu.



Step 3:

Click Properties icon in Desktop Management tab to display Display Properties dialog box.



Step 4:

Click Advanced icon in Settings tab.



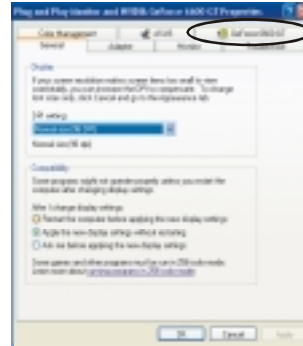
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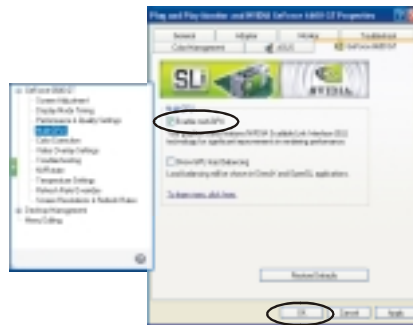
Step 5:

Select NVIDIA GeForce tab, and then click on Multi-GPU item on the left dialog box.



Step 6:

Check before Enable SLI multi-GPU item, and click on OK to complete the setting.



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## CHAPTER 6: NVIDIA RAID FUNCTIONS

### 6.1 OPERATION SYSTEM

λ Supports Windows XP Home/Professional Edition, and Windows 2000 Professional.

### 6.2 RAID ARRAYS

NVRAID supports the following types of RAID arrays:

**RAID 0:** RAID 0 defines a disk striping scheme that improves disk read and writes times for many applications.

**RAID 1:** RAID 1 defines techniques for mirroring data.

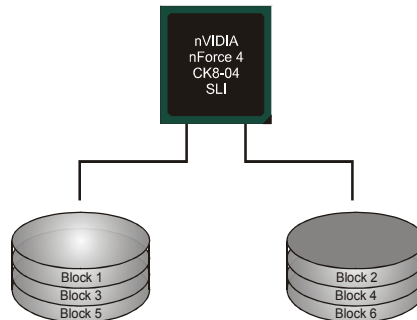
**RAID 0+1:** RAID 0+1 combines the techniques used in RAID 0 and RAID 1.

**Spanning (JBOD):** JBOD provides a method for combining drives of different sizes in to one large disk.

### 6.3 HOW RAID WORKS

#### RAID 0:

The controller “stripes” data across multiple drives in a RAID 0 array system. It breaks up a large file into smaller blocks and performs disk reads and writes across multiple drives in parallel. The size of each block is determined by the strip size parameter, which you set during the creation of the RAID set based on the system environment. This technique reduces overall disk access time and offers high bandwidth.



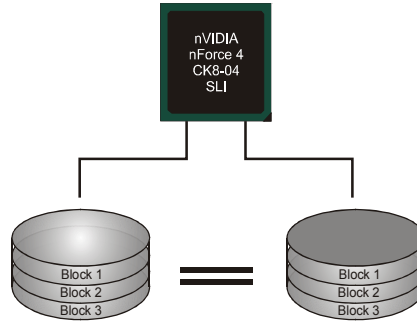
#### Features and Benefits

- **Drives:** Minimum 1, and maximum is up to 6 or 8. Depending on the platform.
- **Uses:** Intended for non-critical data requiring high data throughput, or any environment that does not require fault tolerance.
- **Benefits:** provides increased data throughput, especially for large files. No capacity loss penalty for parity.
- **Drawbacks:** Does not deliver any fault tolerance. If any drive in the array fails, all data is lost.
- **Fault Tolerance:** No.

**RAID 1:**

Every read and write is actually carried out in parallel across 2 disk drives in a RAID 1 array system. The mirrored (backup) copy of the data can reside on the same disk or on a second redundant drive in the array. RAID 1 provides a hot-standby copy of data if the active volume or drive is corrupted or becomes unavailable because of a hardware failure.

RAID techniques can be applied for high-availability solutions, or as a form of automatic backup that eliminates tedious manual backups to more expensive and less reliable media.

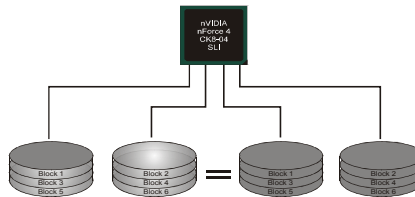


**Features and Benefits**

- **Drives:** Minimum 2, and maximum is 2.
- **Uses:** RAID 1 is ideal for small databases or any other application that requires fault tolerance and minimal capacity.
- **Benefits:** Provides 100% data redundancy. Should one drive fail, the controller switches to the other drive.
- **Drawbacks:** Requires 2 drives for the storage space of one drive. Performance is impaired during drive rebuilds.
- **Fault Tolerance:** Yes.

**RAID 0+1:**

RAID 0 drives can be mirrored using RAID 1 techniques. Resulting in a RAID 0+1 solution for improved performance plus resiliency.



**Features and Benefits**

- **Drives:** Minimum 4, and maximum is 6 or 8, depending on the platform.
- **Benefits:** Optimizes for both fault tolerance and performance, allowing for automatic redundancy. May be simultaneously used with other RAID levels in an array, and allows for spare disks.
- **Drawbacks:** Requires twice the available disk space for data redundancy, the same as RAID level 1.
- **Fault Tolerance:** Yes.



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### **Spanning (JBOD):**

JBOD stands for “Just a Bunch of Disks”. Each drive is accessed as if it were on a standard SCSI host bus adapter. This is useful when a single drive configuration is needed, but it offers no speed improvement or fault tolerance.



### **Features and Benefits**

- **Uses:** JBOD works best if you have odd sized drives and you want to combine them to make one big drive.
- **Benefits:** JBOD provides the ability to combine odd size drives using all of the capacity of the drives.
- **Drawbacks:** Decreases performance because of the difficulty in using drives concurrently.
- **Fault Tolerance:** Yes.

※ For more detailed setup information, please refer to the Driver CD, or go to [http://www.nvidia.com/page/pg\\_20011106217193.html](http://www.nvidia.com/page/pg_20011106217193.html) to download NVIDIA nForce Tutorial Flash.

## **CHAPTER 7: WARPSPEEDER™**



### **7.1 INTRODUCTION**

[WarpSpeeder™], a new powerful control utility, features three user-friendly functions including Overclock Manager, Overvoltage Manager, and Hardware Monitor.

With the Overclock Manager, users can easily adjust the frequency they prefer or they can get the best CPU performance with just one click. The Overvoltage Manager, on the other hand, helps to power up CPU core voltage and Memory voltage. The cool Hardware Monitor smartly indicates the temperatures, voltage and CPU fan speed as well as the chipset information. Also, in the About panel, you can get detail descriptions about BIOS model and chipsets. In addition, the frequency status of CPU, memory, AGP and PCI along with the CPU speed are synchronically shown on our main panel.

Moreover, to protect users' computer systems if the setting is not appropriate when testing and results in system fail or hang, [WarpSpeeder™] technology assures the system stability by automatically rebooting the computer and then restart to a speed that is either the original system speed or a suitable one.

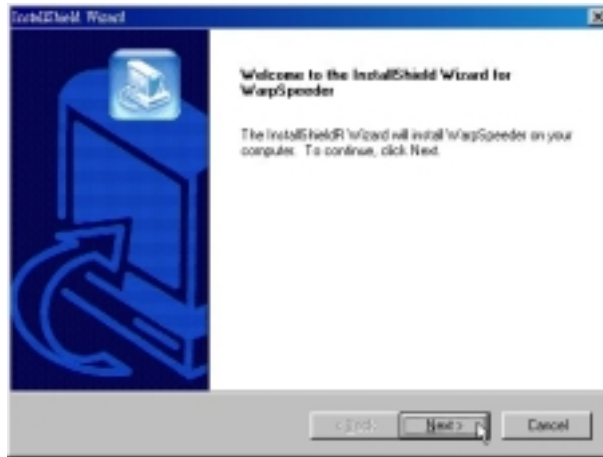
### **7.2 SYSTEM REQUIREMENT**

OS Support: Windows 98 SE, Windows Me, Windows 2000, Windows XP

DirectX: DirectX 8.1 or above. (The Windows XP operating system includes DirectX 8.1. If you use Windows XP, you do not need to install DirectX 8.1.)

**7.3 INSTALLATION**

1. Execute the setup execution file, and then the following dialog will pop up. Please click “Next” button and follow the default procedure to install.



2. When you see the following dialog in setup procedure, it means setup is completed. If the “Launch the WarpSpeeder Tray Utility” checkbox is checked, the Tray Icon utility and [WarpSpeeder™] utility will be automatically and immediately launched after you click “Finish” button.



**Usage:**

The following figures are just only for reference, the screen printed in this user manual will change according to your motherboard on hand.

**7.4 [WARPSPEEDER™] INCLUDES 1 TRAY ICON AND 5 PANELS**

**1. Tray Icon:**

Whenever the Tray Icon utility is launched, it will display a little tray icon on the right side of Windows Taskbar.



This utility is responsible for conveniently invoking [WarpSpeeder™] Utility. You can use the mouse by clicking the left button in order to invoke [WarpSpeeder™] directly from the little tray icon or you can right-click the little tray icon to pop up a popup menu as following figure. The “Launch Utility” item in the popup menu has the same function as mouse left-click on tray icon and “Exit” item will close Tray Icon utility if selected.

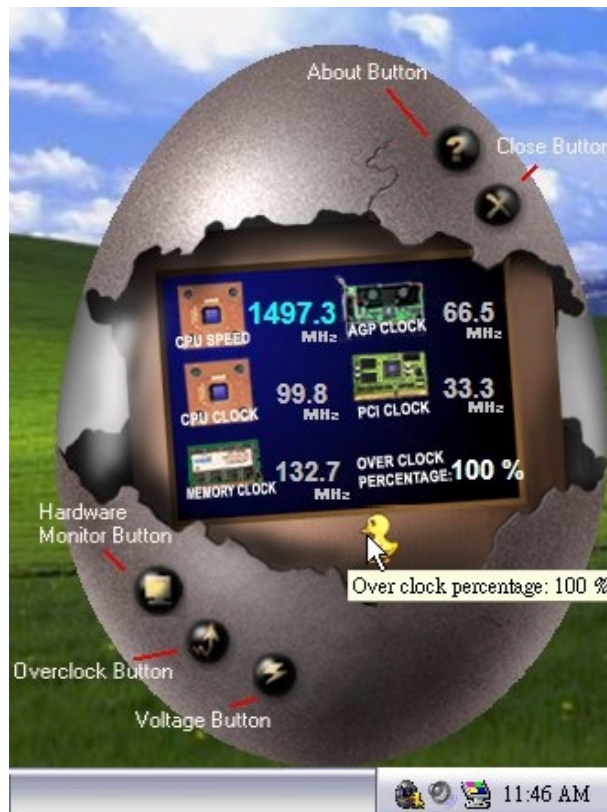


**2. Main Panel**

If you click the tray icon, [WarpSpeeder™] utility will be invoked. Please refer to the following figure; the utility's first window you will see is Main Panel.

**Main Panel contains features as follows:**

- a. Display the CPU Speed, CPU external clock, Memory clock, AGP clock, and PCI clock information.
- b. Contains About, Voltage, Overclock, and Hardware Monitor Buttons for invoking respective panels.
- c. With a user-friendly Status Animation, it can represent 3 overclock percentage stages:  
Man walking→overclock percentage from 100% ~ 110 %  
Panther running→overclock percentage from 110% ~ 120%  
Car racing→overclock percentage from 120% ~ above



**3. Voltage Panel**

Click the Voltage button in Main Panel, the button will be highlighted and the Voltage Panel will slide out to up as the following figure.

In this panel, you can decide to increase CPU core voltage and Memory voltage or not. The default setting is "No". If you want to get the best performance of overclocking, we recommend you click the option "Yes".



**4. Overclock Panel**

Click the Overclock button in Main Panel, the button will be highlighted and the Overclock Panel will slide out to left as the following figure.



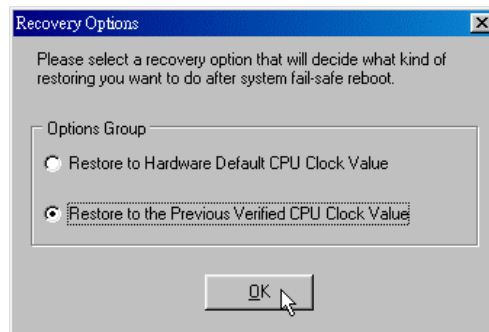
**Overclock Panel contains the these features:**

- a. “-3MHz button”, “-1MHz button”, “+1MHz button”, and “+3MHz button”: provide user the ability to do real-time overclock adjustment.

**Warning:**

Manually overclock is potentially dangerous, especially when the overclocking percentage is over 110 %. We strongly recommend you verify every speed you overclock by click the Verify button. Or, you can just click Auto overclock button and let [WarpSpeeder™] automatically gets the best result for you.

- b. “Recovery Dialog button”: Pop up the following dialog. Let user select a restoring way if system need to do a fail-safe reboot.



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## ***N4SLI-A9***

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- c. “Auto-overclock button”: User can click this button and [WarpSpeeder™] will set the best and stable performance and frequency automatically. [WarpSpeeder™] utility will execute a series of testing until system fail. Then system will do fail-safe reboot by using Watchdog function. After reboot, the [WarpSpeeder™] utility will restore to the hardware default setting or load the verified best and stable frequency according to the Recovery Dialog’s setting.
- d. “Verify button”: User can click this button and [WarpSpeeder™] will proceed a testing for current frequency. If the testing is ok, then the current frequency will be saved into system registry. If the testing fail, system will do a fail-safe rebooting. After reboot, the [WarpSpeeder™] utility will restore to the hardware default setting or load the verified best and stable frequency according to the Recovery Dialog’s setting.

**Note:**

Because the testing programs, invoked in Auto-overclock and Verify, include DirectDraw, Direct3D and DirectShow tests, the DirectX 8.1 or newer runtime library is required. And please make sure your display card’s color depth is High color (16 bit) or True color( 24/32 bit ) that is required for Direct3D rendering.

### **5. Hardware Monitor Panel**

Click the Hardware Monitor button in Main Panel, the button will be highlighted and the Hardware Monitor panel will slide out to left as the following figure.

In this panel, you can get the real-time status information of your system. The information will be refreshed every 1 second.

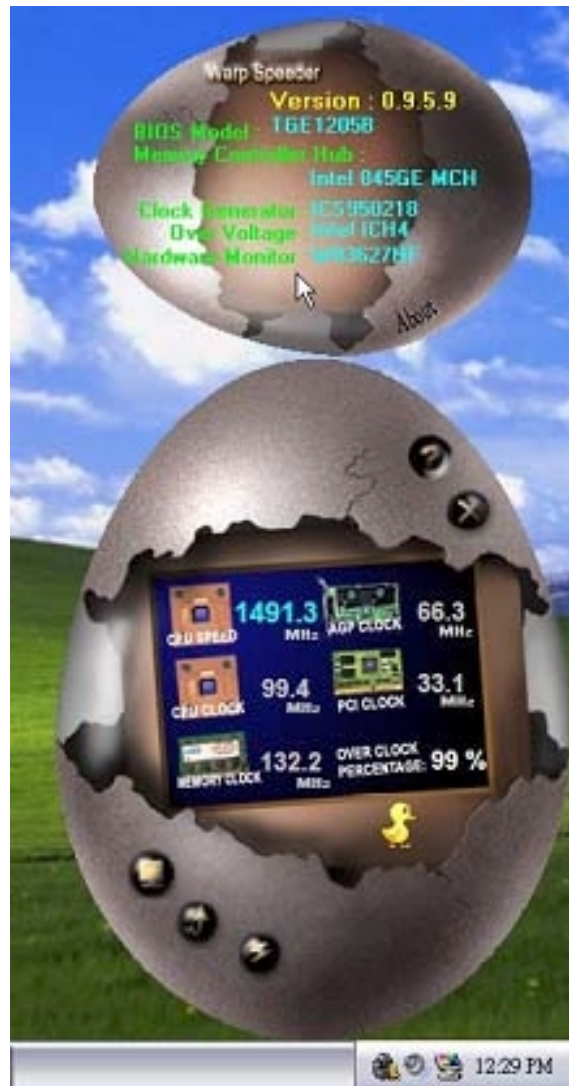




**6. About Panel**

Click the “about” button in Main Panel, the button will be highlighted and the About Panel will slide out to up as the following figure.

In this panel, you can get model name and detail information in hints of all the chipset that are related to overclocking. You can also get the mainboard’s BIOS model and the Version number of [WarpSpeeder™] utility.



## ***N4SLI-A9***

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### **Note:**

Because the overclock, overvoltage, and hardware monitor features are controlled by several separate chipset, [WarpSpeeder™] divide these features to separate panels. If one chipset is not on board, the correlative button in Main panel will be disabled, but will not interfere other panels' functions. This property can make [WarpSpeeder™] utility more robust.