Statement:

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Trademark:

All trademarks are the property of their respective owners.

Version:

User's Manual V1.1b for C51XEM2AA motherboard.

P/N: 91-181C51M51E-00-G

Symbol description:

Note: refers to important information that can help you to use motherboard better.

Attention: indicates that it may damage hardware or cause data loss, and tells you how to avoid such problems.

Warning: means that a potential risk of property damage or physical injury exists.

More information:

If you want more information about our products, please visit Foxconn's website: http://www.foxconnchannel.com

This product and its accessories are produced after 13th Aug., 2005 and comply with the WEEE2002/96EC directive.

Declaration of conformity

CE

HON HAI PRECISION INDUSTRY COMPANY LTD
66 , CHUNG SHAN RD., TU-CHENG INDUSTRIAL DISTRICT,
TAIPEI HSIEN, TAIWAN, R.O.C.

declares that the product

Motherboard

C51XEM2AA

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

☑	EN 55022: 1998/A2: 2003	Limits and methods of measurements of radio disturbance characteristics of information technology equipment
☑	EN 61000-3-2/:2000	Electromagnetic compatibility (EMC) Part 3: Limits Section 2: Limits for harmonic current emissions (equipment input current <= 16A per phase)
☑	EN 61000-3-3/A1:2001	Electromagnetic compatibility (EMC) Part 3: Limits Section 2: Limits of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <= 16A
☑	EN 55024/A2:2003	Information technology equipment-Immunity characteristics limits and methods of measurement

Signature : James Liang

Place / Date : TAIPEI/2006

Printed Name : James Liang

Position/ Title : Assistant President

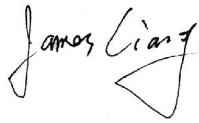
Declaration of conformity

Trade Name:	Foxconn
Model Name:	C51XEM2AA
Responsible Party:	PCE Industry Inc.
Address:	458 E. Lambert Rd.
	Fullerton, CA 92835
Telephone:	714-738-8868
Facsimile:	714-738-8838
Equipment Classification:	FCC Class B Subassembly
Type of Product:	Motherboard
Manufacturer:	**HON HAI PRECISION INDUSTRY COMPANY LTD**
Address:	66 , CHUNG SHAN RD., TU-CHENG INDUSTRIAL DISTRICT, TAIPEI HSIEN, TAIWAN, R.O.C.

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.

Tested to comply with FCC standards.

Signature : 

Date : 2006

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Attention:

1. Attach the CPU and heatsink using silica gel to ensure full contact.
2. It is suggested to select high-quality, certified fans in order to avoid damage to the motherboard and CPU due high temperatures.
3. Never turn on the machine if the CPU fan is not properly installed.
4. Ensure that the DC power supply is turned off before inserting or removing expansion cards or other peripherals, especially when you insert or remove a memory module. Failure to switch off the DC power supply may result in serious damage to your system or memory module.

Attention:

We cannot guarantee that your system will operate normally while over-clocked. Normal operation depends on the over-clock capacity of your device.

Attention:

Since BIOS programs are upgraded from time to time, the BIOS description in this manual is just for reference. We do not guarantee that the content of this manual will remain consistent with the actual BIOS version at any given time in the future.

Attention:

The pictures of objects used in this manual are just for your reference. Please refer to the physical motherboard.

This manual is suitable for motherboard of C51XEM2AA. Each motherboard is carefully designed for the PC user who wants diverse features.

- -L with onboard 10/100M LAN (Default is omitted.)
- -K with onboard Gigabit LAN
- -6 with 6-Channel audio (Default is omitted.)
- -8 with 8-Channel audio
- -E with 1394 function
- -S with SATA function
- -2 with DDR2 function
- -R with RAID function

You can find PPID label on the motherboard. It indicates the functions that the motherboard has.
For example:

On the black mark of the PPID label, it means the motherboard supports 6-Channel Audio (-6), 1394 port (-E), onboard 10/100M LAN (-L), SATA function (-S).

Chapter 1

Thank you for buying Foxconn's C51XEM2AA series motherboard. This series of motherboard is one of our new products, offers superior performance, and uses the advanced NVIDIA nForce® 590 SLI MCP.

This chapter includes the following information:

- Main Features
- Highlight Features
- Layout
- Rear I/O Ports

Main Features

Size

- ATX form factor of 12 inch x 9.6 inch

Microprocessor

- Supports AMD® Socket AM2 Athlon™ 64 X2 Dual-Core, Athlon™ 64 FX, Athlon™ 64 and Sempron™ processor
- Supports HyperTransport up to 2000MT/s

MCP

- NVIDIA nForce® 590 SLI MCP

System Memory

- Four 240-pin DIMM slots
- Supports Dual-Channel DDR2 533/667/800
- Supports up to 8GB DDR2 memory

USB 2.0 Ports

- Supports hot plug
- Ten USB 2.0 ports (six rear panel ports, two onboard USB headers providing four extra ports)
- Supports wake-up from S1 and S3 mode
- Supports USB 2.0 protocol up to 480Mbps transmission rate

Onboard Serial ATA II

- 300MBps data transfer rate
- Six Serial ATA II connectors
- NVIDIA MediaShield™ RAID with support for RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD
- Supports hot plug and NCQ (Native Command Queuing)

Dual Onboard LAN (-K)

- Two LAN interface built-in onboard
- Supports 10/100/1000 Mbit/sec Ethernet

Onboard 1394 (-E) (optional)

- Support hot plug
- Two 1394a port with rate of transmission at 400 Mbps
- One 1394b port with rate of transmission at 800 Mbps

Onboard Audio (-8)

- Supports 8-channel audio
- Supports S/PDIF output
- Supports Jack-Sensing function

Dual PCI Express x16 Support

- Supports 4 GB/sec (8 GB/sec concurrent) bandwidth
- Low power consumption and power management features

Green Function

- Supports ACPI (Advanced Configuration and Power Interface)
- Supports S0 (normal), S1 (power on suspend), S3 (suspend to RAM), S4 (Suspend to disk - depends on OS), and S5 (soft - off)
- Supports AMD® Cool 'n' Quiet™ technology

Expansion Slots

- Two PCI slots
- One PCI Express x1 slot
- One PCI Express x4 slot
- Two PCI Express x16 Graphics slots

Hightlight Features

Engineered for Enthusiasts

NVIDIA nForce® 590 SLI™ media and communication processors (MCPs) deliver the tools and performance enthusiasts demand. When combined with select NVIDIA GeForce graphics cards and other system components, you get automatic access to faster bus speeds. Ready for system overclocking and greater data throughput.

NVIDIA LinkBoost™ Technology

NVIDIA nForce 590 MCP automatically increases bandwidth when selected NVIDIA GeForce® graphics cards are detected.

NVIDIA® SLI™-Ready components

Look for other components including memory modules that are optimized for use with NVIDIA nForce 590 SLI MCP motherboards for maximum performance. These components automatically run at faster bus speeds and are ready for overclocking.

Designed for NVIDIA® SLI™ Technology

NVIDIA SLI Technology is a revolutionary platform innovation that allows users to intelligently scale graphics performance by combining multiple NVIDIA graphics solutions in a single system with an NVIDIA nForce SLI MCP.

2x16 PCI-E SLI Support

Two full-bandwidth, 16-lane PCI Express links ensure maximum graphics performance for next-generation GPUs and games. Offers twice the PCI Express bandwidth of X8 SLI solutions.

NVIDIA MediaShield Storage

Suite of features that safeguards your most important digital media assets; always reliable, scalable, and accessible. Includes RAID and SATA drive support.

Multiple Disk Setup

Through a simple wizard-based interface, you can effortlessly set up your drives for better data protection, faster disk access or maximum storage capacity. MediaShield automatically selects RAID 0, 1, 0+1 or 5 configuration according to your needs. Advanced users can access RAID options directly.

DiskAlert System

The event of a disk failure, MediaShield users see an image that highlights which disk has failed to make it easier to identify, replace, and recover.

RAID Morphing

MediaShield allows users to change their current RAID set-up to another configuration in a one-step process called morphing. This eliminates the need to back up data and follow multiple steps in the process.

Bootable Multidisk Array

MediaShield storage fully supports the use of multi-disk array for loading the operating system at power-up.

Six SATA 3Gb/s Drives

Combine up to 6 SATA drives into one volume for bigger, faster RAID. More drives mean more configuration options such as 6 RAID 0 (striped) drives for maximum throughput, or Dual RAID 5 arrays. Take advantage of the latest SATA-2, 3Gb/s hard disk drives with full support for native and tagged command queuing and hot plug. Native command queuing provides higher disk performance in a multi-threaded environment by performing out-of-order disk accesses.

Networking with NVIDIA nForce

NVIDIA networking delivers the highest network throughput at the lowest CPU utiliization. The manageable and stable NVIDIA networking solution results in better networking management and a lower total cost of ownership. Only NVIDIA integrates this level of networking features to allow you to take your online experience to the next level.

NVIDIA Native Gigabit Ethernet

The industry's fastest Gigabit Ethernet performance eliminates network bottlenecks and improves overall system efficiency and performance.

NVIDIA FirstPacket™ technology

Be the 'King of Ping' with NVIDIA FirstPacket technology. Get the crystal-

clear phone conversations and online gaming performance you expect. NVIDIA FirstPacket technology assures your game data, VoIP conversations, and large file transfers are delivered according to preferences set by you in an intuitive wizard.

NVIDIA DualNet® technology

Get Double-Barrel Gigabit Ethernet with two integrated networking connections on your NVIDIA nForce 500 series MCP.

Dual Gigabit Ethernet with Teaming

Teaming allows the two connection to work together to provide up to twice the Ethernet bandwidth for transferring large amounts of data from home file servers to other PCs. It also provides network redundancy through fail-over capability.

TCP/IP Acceleration

Delivers the highest system performance by offloading CPU-intensive packet filtering tasks in hardware, providing users with a PC networking environment that is faster.

NVIDIA nTune™ 4.0 Utility

Now with access to more settings from this Windows-based utility. NVIDIA nTune performance manager allows automatic tuning for optimal performance and the ability to customize. Once configured, nTune automatically chooses the right system settings for the application that is being run based on your saved profiles and personal rules.

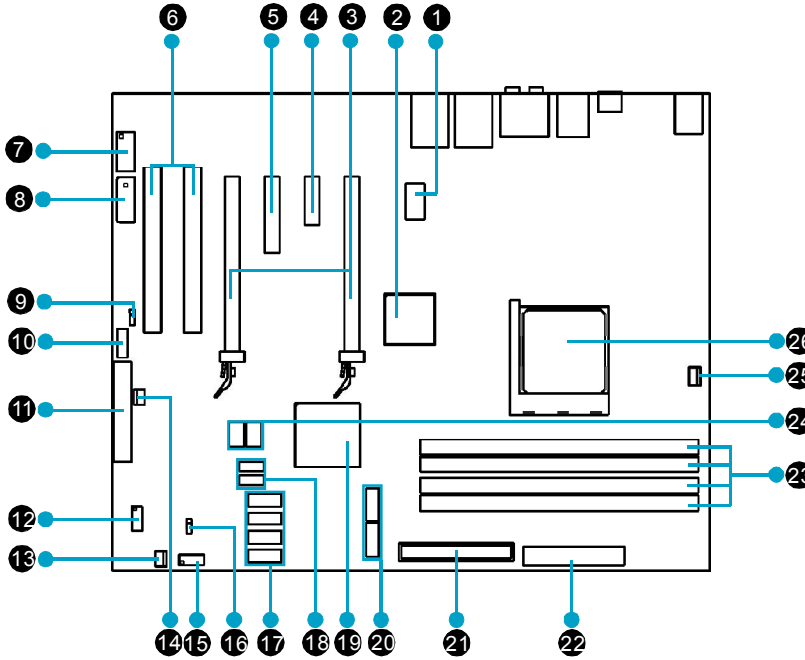
High Definition Audio (HDA)

High definition audio brings consumer electronics quality sound to the PC delivering high quality sound from multiple channels. Using HDA, systems can deliver 192 kHz/32-bit quality for eight channels, supporting new audio formats.

USB 2.0

A standard plug-and-play interface that provides easy-to-use connectivity for USB devices.

Layout

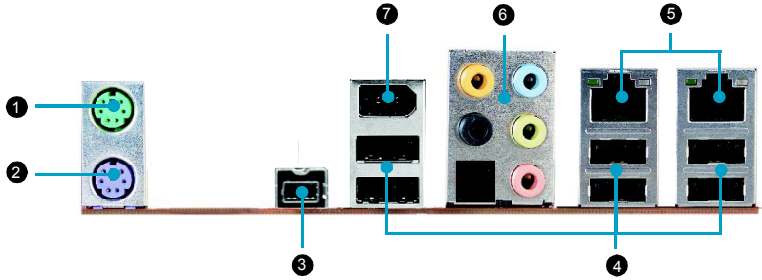


1. 8-pin ATX_12V Power Connector
2. C51XE
3. PCI Express x16 Slots
4. PCI Express x1 Slot
5. PCI Express x4 Slot
6. PCI Slots
7. IEEE1394a Connector
8. AUX PEX PWR Connector
9. Speaker Connector
10. Front Audio Connector
11. FDD Connector
12. COM1 Connector
13. SYS Fan Connector
14. MCP Fan Connector
15. Front Panel Connector
16. Clear CMOS Jumper
17. Serial ATA II Connectors
18. USB Connectors
19. MCP55P XE
20. Serial ATA II Connectors
21. ATA 133/100/66 IDE Connector
22. 24-pin ATX Power Connector
23. DDR2 DIMM Slots
24. Debug LED (optional)
25. CPU FAN Connector
26. Socket AM2

Note: The above motherboard layout is provided for reference only, please refer to the physical motherboard.

Rear I/O Ports

This motherboard provides the ports as below:



1. PS/2 Mouse Port
This port is used to connect a PS/2 mouse.

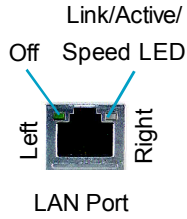
2. PS/2 Keyboard Port
This port is used to connect a PS/2 keyboard.

3. IEEE1394b Port
This port is used to connect a 1394b device.

4. USB2.0 Ports
The six ports are used to connect USB2.0 devices.

5. LAN Ports
The left LED is no function (always off). The right LED function sees below table.

Link/Active/Speed LED	
Status	**Description**
Yellow/Light Up/Blink	10Mbps/Link/Activity
Yellow and Green/Light Up/Blink	100Mbps/Link/Activity
Green/Light Up/Blink	1000Mbps/Link/Activity



6. Line in, Line out, Microphone, Rear, LEF/CEN Jacks & Optical S/PDIF Out Port

Port	2-channel	4-channel	6-channel	8-channel
Blue	Line In	Line In	Line In	Line In
Green	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	-	-	Center/Subwoofer	Center/Subwoofer
Black	-	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out

Optical S/PDIF Out Port
This port is used to connect an external audio output device via a optical S/PDIF cable.

7. IEEE1394a Port
This port is used to connect a 1394a device.

Chapter 2

This chapter introduces the hardware installation process, including the installation of the CPU, memory, power supply, slots, and pin headers, and the mounting of jumpers. Caution should be exercised during the installation of these modules. Please refer to the motherboard layout prior to any installation and read the contents in this chapter carefully.

This chapter includes the following information:

- CPU
- Memory
- Power supply
- Other Connectors
- Expansion Slots
- Jumpers

CPU

This motherboard supports AMD Socket AM2 Athlon™ 64 X2 Dual-Core, Athlon™ 64 FX, Athlon™ 64 and Sempron™ processor with Hyper-Transport Technology.

Attention:

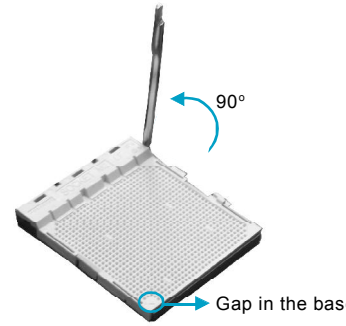
The CPU pins must be properly aligned with the holes in the socket, otherwise the CPU may be damaged.

For the detailed CPU vendor list qualified on this motherboard, please visit the website: http://www.foxconnchannel.com

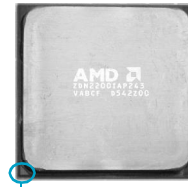
Installation of CPU

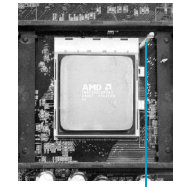
Follow these steps to install the CPU.

1. Unlock the socket by pressing the lever sideways, then lift it up to a 90° angle.



2. Align the cut edge to the gap in the base of the socket. Carefully insert the CPU into the socket until it fits in place.

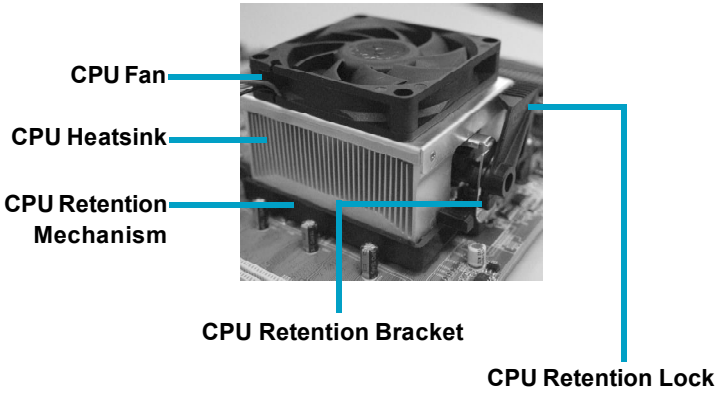




3. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

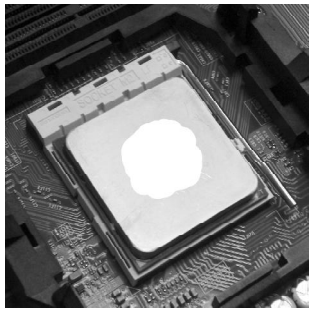
Installation of CPU Fan

New technology allows processors to run at higher and higher frequencies. To avoid problems arising from high-speed operation, for example, overheating, you need to install the proper fan. The following procedure is provided for reference only, please refer to your CPU fan user guide for the actual procedure.



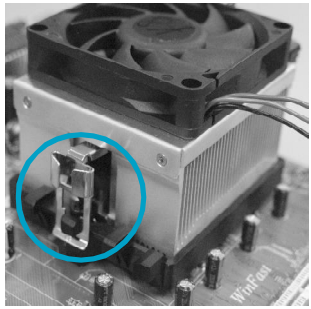
1.Locate the CPU retention mechanism base (surrounds the CPU socket).

2. If required, apply a light coating of silica gel to the top of the CPU.

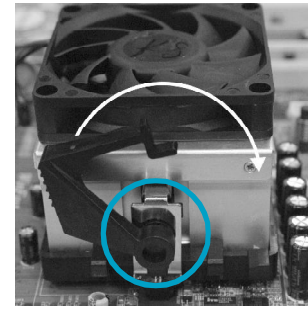


NOTE: The CPU heatsink may have a pre-applied thermal compound. In that case, the silica gel is not required.

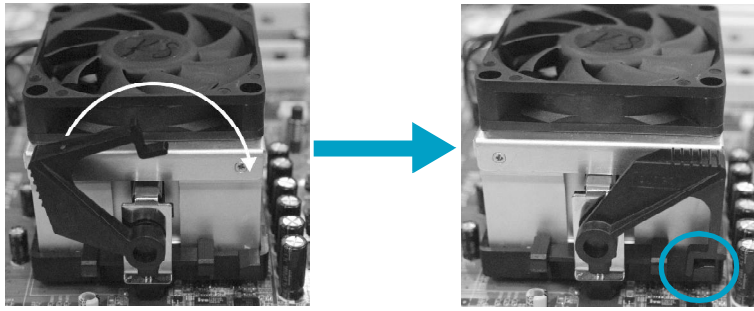
3. Place the cooling set onto the retention mechanism. Attach one end of the retention bracket to retention mechanism.



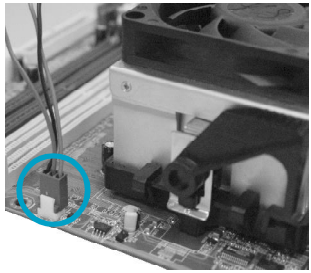
4. Align the other end of the retention bracket to fasten the cooling set on the top of the retention mechanism.



5. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to module base.



6. Connect the fan's power cable to the appropriate 3-pin terminal on the motherboard.



Memory

This motherboard includes four 240-pin slots with 1.8V for DDR2. These slots support 256 Mb, 512 Mb and 1 Gb DDR2 technologies for x8 and x16 devices, and support dual channel DDR2 memory technology up to 10.7GB/s. You must install at least one memory bank to ensure normal operation.

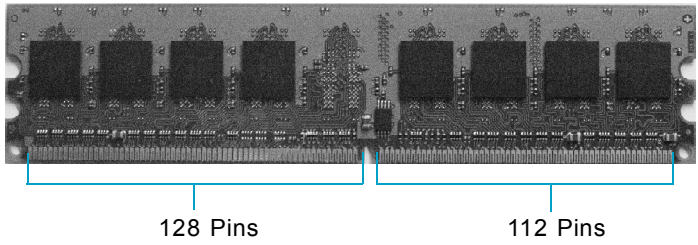
Recommended Memory Configurations

The following table list is the recommended memory configurations. Please install the memory according to the list.

Mode	DIMM1	DIMM2	DIMM3	DIMM4
Single Channel	Populated			
		Populated		
			Populated	
				Populated
Dual Channel	Populated		Populated	
		Populated		Populated
	Populated	Populated	Populated	Populated

Installation of DDR2 Memory

1. There is only one gap near the center of the DIMM slot, and the memory module can be fixed in one direction only. Unlock a DIMM slot by pressing the module clips outward.
2. Align the memory module to the DIMM slot, and insert the module vertically into the DIMM slot.



3. The plastic clips at both sides of the DIMM slot will lock automatically.

Warning :

Be sure to unplug the AC power supply before adding or removing expansion cards or other system peripherals, especially the memory devices, otherwise your motherboard or the system memory might be seriously damaged.

For the detailed memory support list on this motherboard, please visit the website: http://www.foxconnchannel.com

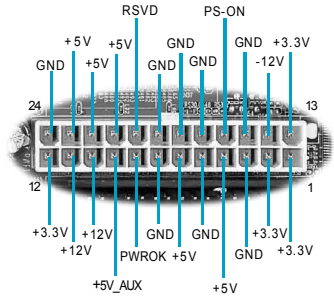
Power Supply

This motherboard uses an ATX power supply. In order to avoid damaging any devices, make sure that they have been installed properly prior to connecting the power supply.

24-pin ATX power connector: PWR1

PWR1 is the ATX power supply connector. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.

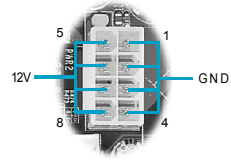
24-pin ATX Power Connector



8-pin ATX_12 V Power Connector: PWR2

The 8-pin ATX 12V power supply connects to PWR2 and provides power to the CPU.

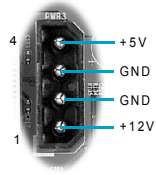
8-pin ATX_12 V Power Connector



Exclusive Graphics Power Connector: PWR3

This connector is a auxiliary power for graphics card. Exclusive power for graphics card is for better graphics performance and for future upgrade usage.

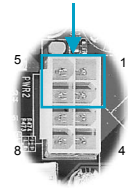
Exclusive Graphics Power Connector



Note:

We strongly recommend that you use 8-pin ATX 12V power supply. If you want to use 4-pin power supply, connect the 4-pin power connector as shown.

Connect a 4-pin power plug here



Other Connectors

This motherboard includes connectors for FDD devices, IDE devices, Serial ATA devices, USB devices, and others.

FDD Connector: FLOPPY

This motherboard includes a standard FDD connector, supporting 360K, 720K, 1.2M, 1.44M, and 2.88M FDDs.

IDE Connector: PIDE

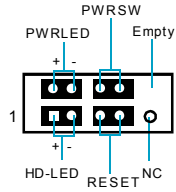
The IDE connector supports Ultra ATA 133/100/66 IDE hard disk drives. Connect the cable's blue connector to the IDE connector, then connect the gray connector to the slave device (hard disk drive) and the black connector to the Ultra ATA master device. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

Attention:

Ribbon cables are directional, therefore, make sure to always connect with the cable on the same side as pin 1 of the PIDE or FLOPPY connector on the motherboard.

Front Panel Connector: FP1

This motherboard includes one connector for connecting the front panel switch and LED indicators.



FP1

HDD LED Connector (HDD-LED)
The connector connects to the case's HDD indicator LED indicating the activity status of hard disks.

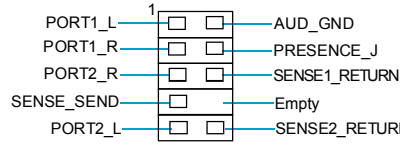
Reset Switch (RESET)
Attach the connector to the Reset switch on the front panel of the case; the system will restart when the switch is pressed.

Power LED Connector (PWRLED)
Attach the connector to the power LED on the front panel of the case. The Power LED indicates the system's status. When the system is in S0 status, the LED is on. When the system is in S1, S3, S4, S5 status, the LED is off.

Power Switch Connector (PWRSW)
Attach the connector to the power button of the case. Pushing this switch allows the system to be turned on and off rather than using the power supply button.

Audio Connector: F_AUDIO

The audio connector supports HD audio standard. It provides two kinds of audio output choices: the Front Audio, the Rear Audio. Front Audio supports re-tasking function.

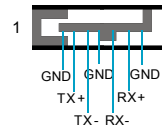


F_AUDIO

Serial ATA II Connectors: SATA_1, SATA_2, SATA_3, SATA_4, SATA_5, SATA_6

The Serial ATA II connector is used to connect the Serial ATA II device to the motherboard. These connectors support the thin Serial ATA II cables for primary storage devices. The current Serial ATA II interface allows up to 300MB/s data transfer rate.

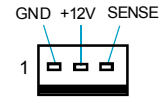
These six serial ATA connectors support RAID 0, RAID 1, RAID 5, RAID 0+1 and JBOD



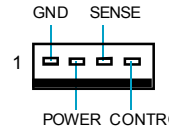
SATA II Connector

Fan Connectors: CPU_FAN, SYS_FAN, FAN

The fan speed can be detected and viewed in "PC Health Status" section of the CMOS Setup. These fans will be automatically turned off after the system enters S3, S4 and S5 mode.



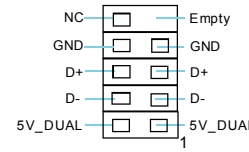
SYS-FAN
FAN



CPU_FAN

USB Headers: F_USB1, F_USB2

Besides six USB ports on the rear panel, the series of motherboards also have two 10-pin headers on board which may connect to front panel USB cable (optional) to provide additional four USB ports.

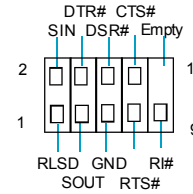


F_USB 1/2

Additional COM Connector: COM1 (optional)

This motherboard provides an additional serial COM header for your machine.

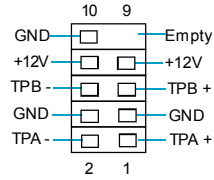
Connect one side of a switching cable to the header, then attach the serial COM device to the other side of the cable.



COM1

IEEE 1394a Connector: F_1394_1 (optional)

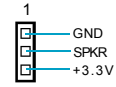
The 1394 expansion cable can be connected to either the front (provided that the front panel of your chassis is equipped with the appropriate interface) or real panel of the chassis.



F_1394_1

Speaker Connector: J1E1

The speaker connector is used to connect speaker of the chassis.



J1E1

Expansion Slots

This motherboard includes two 32-bit master PCI bus slots, one PCI Express x 1 slot, one PCI Express x4 slot and two PCI Express x 16 slots.

PCI Slots

The expansion cards can be installed in the two PCI slots. PCI slots support cards such as a LAN card, USB card, SCSI card and other cards that comply with PCI specifications.

PCI Express x1 Slot

This motherboard has one PCI Express x1 slot that designed to accommodate less bandwidth-intensive cards, such as a modem or LAN card.

PCI Express x4 Slot

This motherboard has one PCI Express x4 slot that designed to accommodate less bandwidth-intensive cards, such as a modem or LAN card.

PCI Express x16 Slots

This motherboard has two PCI Express x16 slots that reserved for graphics or video cards. The difference in bandwidth between the x16 and x1 slots is notable to be sure, with the x16 slot pushing 4GB/sec (8GB/sec concurrent) of bandwidth, and the PCI Express x1 slot offering 250MB/sec.
This motherboard design enables the support of dual PCI-Express graphics cards technology such as "SLI technology" and multiple display.

For the detailed PCI Express x16 graphics cards support list on this motherboard, please visit the website: http://www.foxconnchannel.com

Jumpers

The users can change the jumper settings on this motherboard if needed. This section explains how to use the various functions of this motherboard by changing the jumper settings. Users should read the following content carefully prior to modifying any jumper settings.

Description of Jumpers

1. For the jumpers on this motherboard, pin 1 can be identified by the silk-screen printed " △ " next to it. However, in this manual, pin 1 is simply labeled as "1".
2. The following table provides some explanation of the jumper pin settings. User should refer to this when adjusting jumper settings.

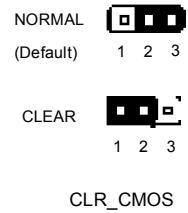
Jumper	Diagram	Definition	Description
		1-2	Set pin1 and pin2 closed
		2-3	Set pin2 and pin3 closed
		Closed	Set the pin closed
		Open	Set the pin opened

Clear CMOS Jumper: CLR_CMOS

The motherboard uses the CMOS RAM to store all the set parameters. The CMOS can be cleared by removing the CMOS jumper.

How to clear CMOS?

1. Turn off the AC power supply and connect pins 1 and 2 together using the jumper cap.
2. Return the jumper setting to normal (pins 2 and 3 together with the jumper cap).
3. Turn the AC power supply back on.



Warning:

1. Disconnect the power cable before adjusting the jumper settings.
2. Do not clear the CMOS while the system is turned on.

Chapter 3

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

This chapter includes the following information:

- Enter BIOS Setup
- Main Menu
- Standard CMOS Features
- Advanced BIOS Features
- Advanced Chipset Features
- Integrated Peripherals
- Power Management Setup
- PnP/PCI Configurations
- System Monitor
- Load Defaults
- Set Password
- Set User name
- Save & Exit Setup
- Exit Without Saving

Enter BIOS Setup

The BIOS is the communication bridge between hardware and software, correctly setting up the BIOS parameters is critical to maintain optimal system performance. Power on the computer, when the following message briefly appears at the bottom of the screen during the POST (Power On Self Test), press <Del> key to enter the Phoenix-Award BIOS CMOS Setup Utility.

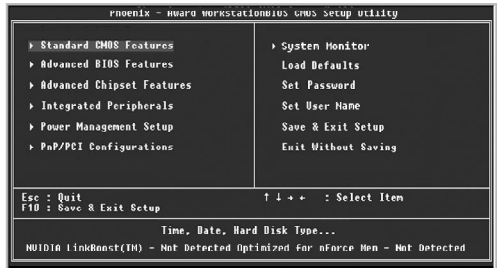
Press F1 to continue, DEL to enter Setup.

Note:

It is recommended that the default settings in the BIOS are not changed. The user accepts all responsibility for any damage that results from changing the default settings.

Main Menu

The main menu allows you to select from the list of setup functions and two exit choices. User the arrow keys to select among the items and press <ENTER> to accept or go to the sub-menu.



Main Menu

The items in the main menu are:

Standard CMOS Features

The basic system configuration can be setup through this menu.

Advanced BIOS Features
The advanced system features and boot sequence can be setup through this menu.

Advanced Chipset Features
Optimize system performance through this menu. Configure clocks, voltages, memory timings, and more.

Integrated Peripherals
Onboard peripherals such as RAID, USB, and MAC control can be setup through this menu.

Power Management Setup
Configure power management, power-on, and sleep features through this menu.

PnP/PCI Configurations
The system's Plug-and-Play and PCI configurations can be modified through this menu.

System Monitor
Monitor the real-time system status of your PC, including temperature, voltage, and fan speed.

Load Defaults
Load the NVIDIA LinkBoost™ Technology settings for LinkBoost™ enabled systems. Load default system settings for standard systems.

Set Password
Set the password to access the BIOS menu.

Set User Name
Set the BIOS Welcome screen name.

Save & Exit Setup
Save settings and exit setup.

Exit Without Saving
Abandon all setting changes and exit setup.

NVIDIA LinkBoost™ <STATUS>

This status appears at the bottom of the BIOS screen. <STATUS> can be:

Detected: System detects an LinkBoost capable components.

Not Detected: The LinkBoost components are not detected.

SLI-Ready Memory <STATUS>

This status appears at the bottom of the BIOS screen. <STATUS> can be:

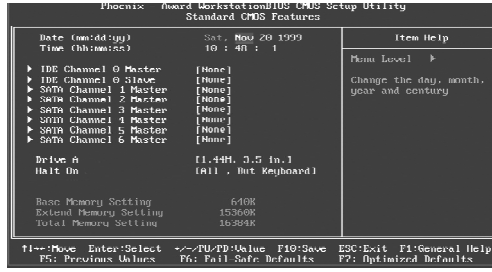
Enabled: SLI-Ready memory detected and enabled.

Disabled: SLI-Ready memory detected but disabled.

Not Detected: SLI-Ready memory not detected.

Standard CMOS Features

This sub-menu is used to set up the standard CMOS features, such as the date, time, HDD model and so on. Use the arrow keys select the item to set up, and then use the <PgUp> or <PgDn> keys to choose the setting values.



Standard CMOS Features Menu

Date

This option allows you to set the desired date (usually as the current day) with the <day><month><date><year> format.

Day—weekday from Sun. to Sat., defined by BIOS (read-only).

Month—month from Jan. to Dec..

Date—date from 1st to 31st, can be changed using the keyboard.

Year—year, set up by users.

Time

This option allows you to set up the desired time (usually as the current time) with <hour><minute><second> format.

IDE Channel 0 Master/Slave & SATA Channel 1/2/3/4/5/6 Master

These categories identify the HDD types of 1 IDE channel installed in the computer system. There are three choices provided for the Enhanced IDE BIOS: None, Auto, and Manual. “None” means no HDD is installed or set; “Auto” means the system can auto-detect the hard disk when booting up; by choosing “Manual” and changing Access Mode to “CHS”, the related information should be entered manually. Enter the information directly from the keyboard and press < Enter>:

Cylinder	number of cylinders	Head	number of heads
Precomp	write pre-compensation	Landing Zone	landing zone
Sector	number of sectors		

Award (Phoenix) BIOS can support 3 HDD modes: CHS, LBA and Large or Auto mode.

CHS	For HDD<528MB
LBA	For HDD>528MB & supporting LBA (Logical Block Addressing)
Large	For HDD>528MB but not supporting LBA
Auto	Recommended mode

Drive A

This option allows you to select the kind of FDD to be installed, including “None”, [360K, 5.25 in], [1.2M, 5.25 in], [720K, 3.5 in], [1.44M, 3.5 in] and [2.88 M, 3.5 in].

Halt On

This category determines whether or not the computer will stop if an error is detected during powering up.

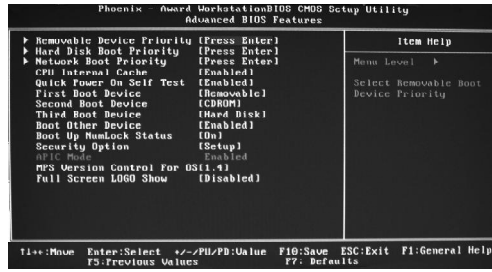
All Errors	Whenever the BIOS detects a nonfatal error, the system will stop and you will be prompted.
No Errors	The system boot will not stop for any errors that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; but it will stop for all other errors.
All, But Diskette	The system boot will not stop for a diskette error; but it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error, but it will stop for all other errors.

Memory

This is a Display-Only Category, determined by POST (Power On Self Test) of the BIOS.

Base Memory	The BIOS POST will determine the amount of base (or conventional) memory installed in the system.
Extended Memory	The BIOS determines how much extended memory is present during the POST.
Total Memory	Total memory of the system.

Advanced BIOS Features



Advanced BIOS Features Menu

❖**Removable Device Priority**

This option is used to select the priority for removable device startup. After pressing <Enter>, you can select the removable device using the <PageUp>/<PageDn> or Up/Down arrow keys, and change the removable device priority using <+> or <->; you can exit this menu by pressing <Esc>.

❖**Hard Disk Boot Priority**

This option is used to select the priority for HDD startup. After pressing <Enter>, you can select the HDD using the <PageUp>/<PageDn> or Up/Down arrow keys, and change the HDD priority using <+> or <->; you can exit this menu by pressing <Esc>.

❖**Network Boot Priority**

This option is used to select the priority for network startup. After pressing <Enter>, you can select the network using the <PageUp>/<PageDn> or Up/Down arrow keys, and change the network boot priority using <+> or <->; you can exit this menu by pressing <Esc>.

❖**CPU Internal Cache**

This option is used to enable or disable the CPU internal cache.

❖**Quick Power On Self Test**

Enable to reduce the time for power on self test.

❖**First/Second/Third Boot Device**

This option allows you to set the boot device's sequence.

❖**Boot Other Device**

With this function set to enable, the system will boot from some other devices if the first/second/thrist boot devices failed.

❖**Boot Up NumLock Status**

This item defines if the keyboard Num Lock key is active when your system is started.

❖**Security Option**

When it is set to “Setup”, a password is required to enter the CMOS Setup screen; When it is set to “System”, a password is required not only to enter CMOS Setup, but also to start up your PC.

❖**APIC Mode**

This option is used to enable or disable APIC function.

❖**MPS Version Control For OS**

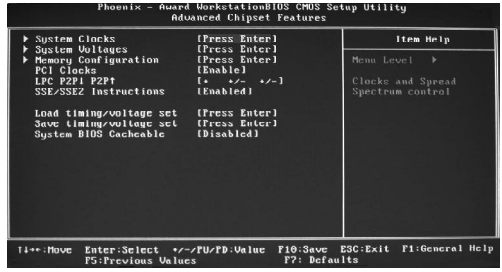
This option is used to set up the version of MPS Table used in NT4.0 OS.

❖**Full Screen LOGO Show**

This option allows you to enable or disable the full-screen logo.

Advanced Chipset Features

Use this section to control chipset features, specifically clocks, voltages, and memory timings.



Advanced Chipset Features Menu

❖**System Clocks**

Use this menu to control system clocks *(see System Clocks section below).*

❖**System Voltages**

Use this menu to control system voltages *(see System Voltages section below).*

❖**Memory Configuration**

Use this menu to control memory settings *(see Memory Configuration section below).*

❖**PCI Clocks**

Use this menu to turn off the PCI clock on the unused PCI slot.

❖**LPC P2P P2P**

Decoding mode for LPC and P2P.

❖**SSE/SSE2 Instructions**

Enable or disable Stream SIMD Extensions.

❖**System BIOS Cacheable**

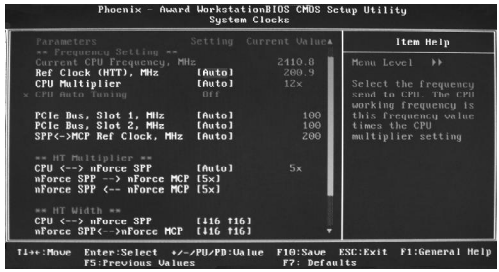
Enable the memory cache function for BIOS.

❖**Load timing/voltage settings**

Load timing and voltage settings from a profile.

❖**Save timing/voltage settings**

Save timing and voltage settings to a profile.



System Clocks menu

Frequency Settings

❖**Ref Clock (HTT)**

Reference clock frequency.

❖**CPU Multiplier**

The value of the CPU multiplier.

❖**PCIe Bus, Slot 1**

The frequency of the PCI-Express Bus, Slot 1.

❖**PCIe Bus, Slot 2**

The frequency of the PCI-Express Bus, Slot 2.

❖**SPP ←→ MCP Ref Clock**

The frequency of the reference clock between SPP and MCP chips.

HT Multiplier

❖**CPU ←→ nForce SPP**

The HT multiplier between the CPU and the SPP.

❖**nForce SPP → nForce MCP**

The HT multiplier from the SPP to the MCP.

❖**nForce SPP ← nForce MCP**

The HT multiplier from the MCP to the SPP.

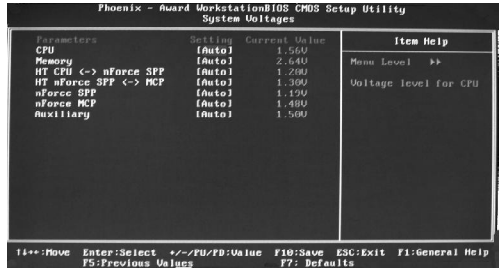
HT Width

❖**CPU ← → nForce SPP**

The HT width between the CPU and the SPP.

❖**nForce SPP ←→ nForce MCP**

The HT width between the SPP and the MCP.



System Voltages menu

❖**CPU**

Voltage to the CPU

❖**Memory**

Voltage to the DRAM

❖**HT CPU←→ nForce SPP**

Voltage of the HT link between the CPU and the SPP

❖**HT nForce SPP ←→ MCP**

Voltage of the HT link between the SPP and the MCP

❖**nForce SPP**

Voltage of the nForce SPP

❖**nForce MCP**

Voltage of the nForce MCP

❖**Auxiliary**

Voltage of the SPP auxiliary

Memory Configuration menu

❖**SLI-Ready Memory**

Enable memory settings that are SLI-Ready (only functional with DRAM that is SLI-Ready).

❖**Memory Timings**

Use this menu to control memory timings (see Memory Timings section below).

❖**Drive Strength setting**

Use this menu to control drive strength settings (see Drive Strength settings section below).

❖**Dram on-die termination**

Resistance of the on-die termination resistors.

❖**Read/Write queue bypass**

Number of times to bypass the read/write queue.

❖**Bypass Maximum**

Max number of times that the oldest memory access request can be bypassed.

❖**32 Byte Granularity**

32/64 byte DRAM access granularity.

❖**NVMEM memory test**

Run NVIDIA memory testing module during POST.

❖**DQS Training Control**

Perform/Skip DQS training.

❖**CKE base power down mode**

Enable or disable CKE base power down mode.

❖**CKE power down control**

CKE power down mode selection. It should be set to “per channel” for non mobile systems.

❖**Memclock tri-stating**

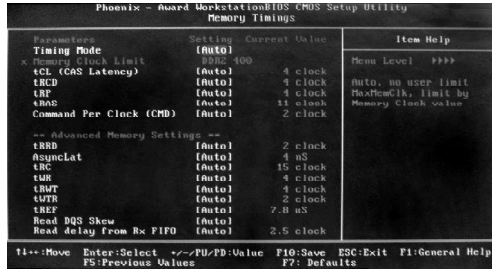
Memclock tri-stating during C3 and Alt VID.

❖**Memory Hole remapping**

Enable or disable memory hole remapping.

❖**Auto Optimize Bottom IO**

Auto optimize maximum DRAM size when kernel assigns PCI resources done.



Memory Timings menu

Standard Memory Settings

❖**Timing mode**

Select automatic or manual set memory timing.

❖**tCL (CAS Latency)**

CAS Latency (CAS# to read data valid).

❖**tRCD**

RAS# to CAS# delay for a RD/WR command to the same bank.

❖**tRP**

Row Precharge time Precharge-to-Active or Auto-Refresh of the same bank.

❖**tRAS**

Minimum RAS# active time

❖**Command Per Clock (CMD)**

Command timing setting (per clock unit).

Advance Memory Settings

❖**tRRD**

RAS# to RAS# delay of different banks.

❖**AsyncLat**

Max round trip latency from the CPU to the DRAM.

❖**tRC**

RAS# to RAS# or auto refresh time of the same bank.

❖**tWR**

Write recovery time.

❖**tRWT**

Minimum read to write turnaround time.

❖**tWTR**

Minimum write to read delay with same chip select.

❖**tREF**

DRAM refresh rate.

❖**Read DQS Skew**

Read DQS delayed with respect to the data. 1/96 MEMCLK per unit.

❖**Read delay from Rx FIFO**

Delay from DQS receiver enable to first data read from Rx FIFO.

Drive Strength settings menu

❖**DRAM driver weak mode**

DRAM data drive strength on DRAM.

❖**CKE drive strength**

Drive strength of the CKE pins.

❖**CS drive strength**

Drive strength of the CS and ODT pins.

❖**MA drive strength**

Drive strength of the Address, RAS, CAS, WE, and parity pins.

❖**MCLK drive strength**

Drive strength of the MEMCLK pins.

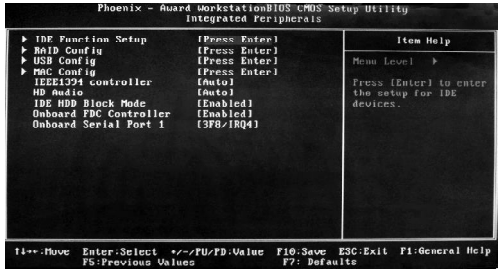
❖**MD drive strength**

Drive strength of the Data pins.

❖**DQS drive strength**

Drive strength of the DQS pins.

Integrated Peripherals



Integrated Peripherals Menu

❖**IDE Function Setup**
Use this menu to setup the data flow control for IDE.

❖**RAID Config**
Use this menu to enable or disable SATA RAID.

❖**USB Config**
Use this menu to setup USB interface.

❖**MAC Config**
Use this menu to turn off MAC.

❖**IEEE1394 controller**
Use this setting to set whether the IEEE 1394 function is enabled.

❖**HD Audio**
Use this setting to configure HD Audio.

❖**IDE HDD Block Mode**
Use this setting to configure HDD Block Mode.

❖**Onboard FDC Controller**
This option is used to set whether the Onboard FDC Controller is enabled.

❖**Onboard Serial Port 1**
This option is used to assign the I/O address and IRQ for onboard serial port 1.

Power Management Setup

Power Management Setup Menu

❖ **ACPI function**

ACPI stands for “Advanced Configuration and Power Interface”. ACPI is a standard that defines power and configuration management interfaces between an operating system and the BIOS. In other words, it is a standard that describes how computer components work together to manage system hardware. In order to use this function the ACPI specification must be supported by the OS (for example, Windows2000 or WindowsXP).

❖ **ACPI Suspend Type**

This option is used to set the energy saving mode of the ACPI function. When you select “S1 (POS)” mode, the power will not shut off and the supply status will remain as it is, in S1 mode the computer can be resumed at any time. When you select “S3 (STR)” mode, the power will be cut off after a delay period. The status of the computer before it enters STR will be saved in memory, and the computer can quickly return to previous status when the STR function wakes. When you select “S1 & S3” mode, the system will automatically select the delay time.

❖ **C States Support**

CPU power state selection.

❖ **Soft-Off by PBTN**

This option is used to set the power down method. This function is only valid for system using an ATX power supply.
When “Instant-Off” is selected, press the power switch to immediately turn off power.
When “Delay 4 Sec” is selected, press and hold the power button for four seconds to turn off power.

❖**WOL(PME#) From Soft-Off**
This item is used to set the system to wake-up on LAN.

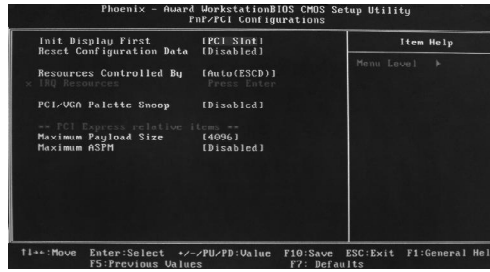
❖**WOR(RI#) From Soft-Off**
This item is used to set the system to wake-up on ring.

❖**AMD Cool 'n' Quiet[tm]**
Use this option to enable or disable AMD Cool 'n' Quiet™ Technology.

❖**Power-on by Alarm**
This item is used to set the timing of the power-on function.

❖**POWER ON Function**
This option is used to set the power on method for your PC.

PnP/PCI Configurations



PnP/PCI Configurations Menu

❖ **Init Display First**

This option is used to set which display device will be used first when your PC starts up.

❖ **Reset Configuration Data**

This option is used to set whether the system is permitted to automatically distribute IRQ, DMA, and I/O addresses each time the machine is turned on.

❖ **Resources Controlled by**

Use this option to determine if IRQ resources are automatically assigned or manually assigned

❖ **IRQ Resources**

Press <Enter> to manually assign IRQ resources.

❖ **PCI/VGA Pallette Snoop**

If you use a non-standard VGA card, use this option to solve graphic acceleration card or MPEG audio card problems (e.g. colors not accurately displayed).

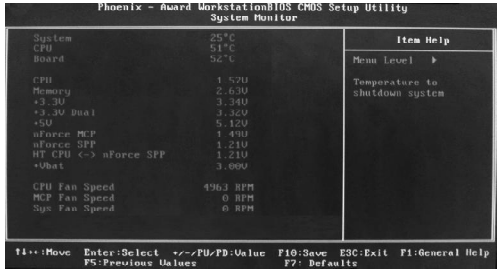
❖ **Maximum Payload Size**

This option is ued to set maximum TLP payload size for PCI Express devices.

❖ **Maximum ASPM**

Enable/Disable Advance State Power Management

System Monitor



System Monitor Menu

Temperature values

❖**System**

The temperature of the system.

❖**CPU**

The temperature of the CPU.

❖**Board**

The temperature of the motherboard.

Voltage values

❖**CPU**

The voltage of the CPU.

❖**Memory**

The voltage of the Memory.

❖**+3.3V**

The voltage of the +3.3V .

❖**+3.3V Dual**

The voltage of the +3.3V Dual.

❖**+5V**

The voltage of the +5V.

❖**nForce MCP**

The voltage of the nForce MCP chip.

❖**nForce SPP**

The voltage of the nForce SPP chip.

❖**HT CPU <-> nForce SPP**

The voltage of the HT between the CPU and the nForce SPP chip.

❖**+Vbat**

The voltage of +Vbat.

Fan Speed values

❖**CPU Fan Speed**

The CPU fan speed.

❖**MCP Fan Speed**

The MCP fan speed.

❖**Sys Fan Speed**

The system fan speed.

Load Defaults

The BIOS defaults sets the basic system functions that ensure system stability. If the system is NVIDIA LinkBoost™ enabled, the default settings are the LinkBoost settings.
If your computer cannot POST properly, you should load the Defaults to restore the original settings.

Set Password

The password can be used to start the system or modify the CMOS settings. When you select the Set Password option, the following message will appear in the center of the screen:

Enter Password:

Enter your password, not exceeding 8 characters, then press <Enter>. The password you enter will replace any previous password. When prompted, key in the new password and press <Enter>.

If you do not want to set a password, just press <Enter> when prompted to enter a password, and in the screen the following message will appear. If no password is keyed in, any user can enter the system and view/modify the CMOS settings.

Password Disabled!!!
Press any key to continue …

Set User Name

Set the name that will appear on the POST welcome screen.

Save & Exit Setup

When you select this option and press <Enter>, the following message will appear in the center of the screen:

SAVE to CMOS and EXIT (Y/N)?Y

Press <Y> to save your changes in CMOS and exit the program; press <N> or <ESC> to return to the main menu.

Exit Without Saving

If you select this option and press <Enter>, the following message will appear in the center of the screen:

Quit Without Saving (Y/N)?N

Press <Y> to exit CMOS without saving your modifications; press <N> or <ESC> to return to the main menu.

Chapter 4

The utility CD that came with the motherboard contains useful software and several utility drivers that enhance the motherboard features.

This chapter includes the following information:

- Utility CD content
- Start to install drivers

Utility CD content

This motherboard comes with one Utility CD. To begin using the CD, simply insert the CD into your CD-ROM drive. The CD will automatically displays the main menu screen.

1. Install Driver

Using this choice, you can install all the drivers for your motherboard. You should install the drivers in order and you need to restart your computer after the drivers all installed.

A. NVIDIA nForce Driver
B. Microsoft DirectX 9.0C
C. Realtek Audio Driver

2. Software

Use this option to install additional software programs.

A. NVIDIA nTune
B. Foxconn LiveUpdate
C. Adobe Acrobat Reader
D. Norton Internet Security

3. User Manuals

Click here to browse all user manuals content.

4. Browse CD

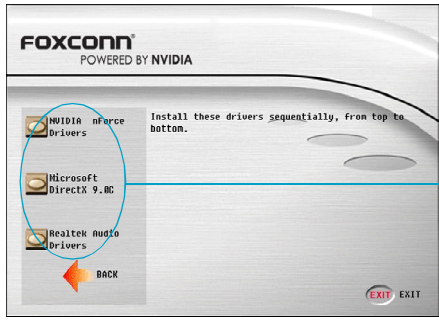
Click here to browse CD content.

5. Foxconn Website

Click here to visit Foxconn website.

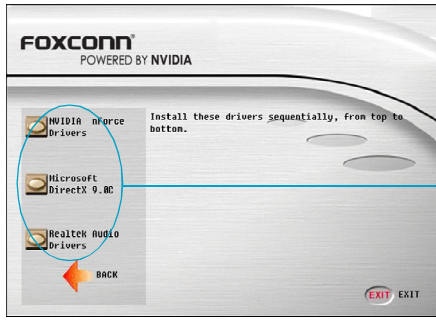
Installing Divers

Click the drivers that you want to install and begin the setup steps.



Installing Utilities

You can select the utilities that you want to install and begin the setup steps.



Chapter 5

This chapter will introduce how to use attached software.

This chapter provides the following information:

- NVIDIA nTune 4.0
- Fox LiveUpdate
- MediaShield RAID Manager
- Network Access Manager

NVIDIA nTune 4.0

NVIDIA nTune™ is a utility for accessing, monitoring, and adjusting your system components, including temperature and voltages, with clear, user-friendly control panels. Overclock your system for highest performance or underclock it for near silent operation. All changes are performed within the Microsoft® Windows® interface, enabling full functionality without the need to make changes in the BIOS and reboot your system.

nTune Category

To start NVIDIA nTune from the Desktop, select **Start** -> **All Programs** -> **NVIDIA Corporation** -> **nTune** -> **nTune**. Once nTune is launched, the category view will be available. To access nTune related features, select the **nTune** category.

Side Panel

The nTune 4.0 Side Panel is located to the left of every screen in nTune and provides access to help, recently used tasks, related tasks, and pending changes. Each of these are explained more below.

Help

From here, you can access help screens, search help, or go to the NVIDIA website for assistance.

Recent Tasks

Quickly toggle back to previous task pages by selecting them from the Recent Tasks menu in the left pane.

Related Tasks

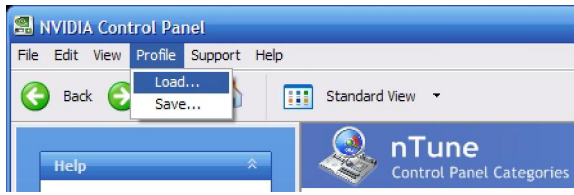
Tasks that are related to the page being viewed are listed in the Related Tasks menu. From here, you may quickly jump to a related task by selecting them from the Related Tasks menu in the left pane.

Pending Changes

When any changes have been made on a page, they can be applied or cancelled here by selecting Apply or Cancel.

Load or Save Profile

By selecting **Profile**, the user may then select to either **Load** a profile directly, or **Save** the current changes to a new profile.



nTune Task View

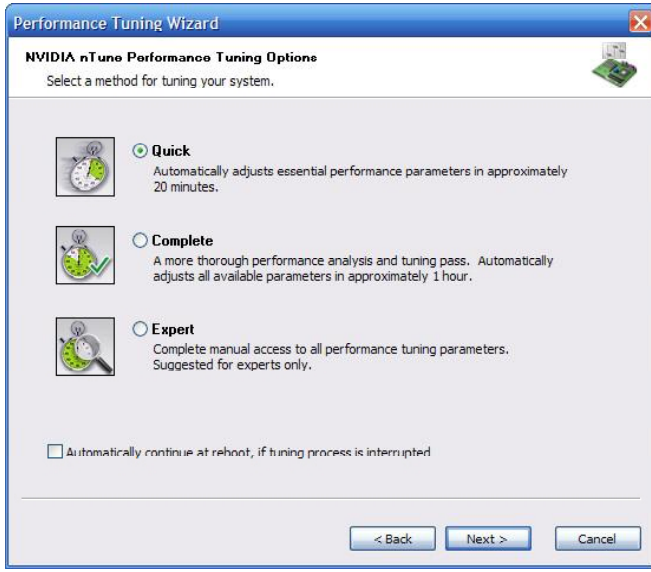
After selecting the nTune category, the task list is presented. Each of the tasks are grouped into two categories: System Performance and System Diagnostics.

The tasks available under these categories include:

- Performance tuning wizard
- Manage profile rules
- Adjust speeds and timings
- Diagnose system performance
- Adjust NVIDIA Monitor settings
- Adjust NVIDIA logging settings

Performance Tuning Wizard

The NVIDIA nTuneTM performance manager allows automatic tuning for optimal performance and the ability to customize. Once configured, nTune automatically chooses the right system settings for the application that is being run based on your saved profiles and personal rules.



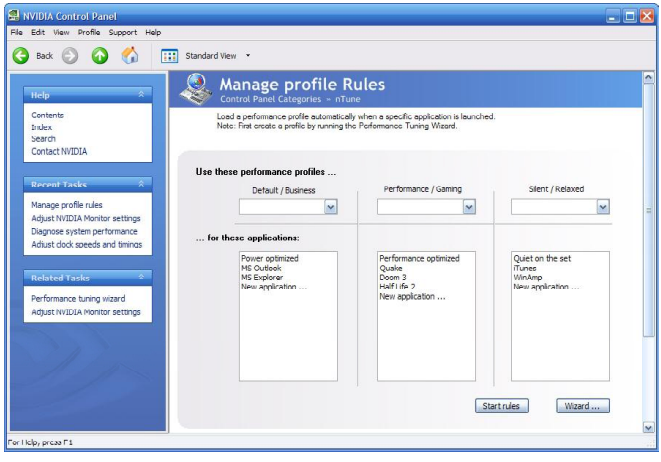
The **Quick** method takes approximately 20 minutes to run while it adjusts system bus speeds and parameters. It first saves current bus speeds as the Default.npe file. After performing a CPU intensive micro-benchmark, to ensure the system temperature stays low while fan noise is reduced, it saves a second file named Silent.npe. Finally, it ratchets up the bus speeds, runs micro-benchmark, and optimizes the system, saving those settings as a best system.npe file.

The **Complete** method takes approximately 60 minutes to perform a more thorough performance analysis. It will create default, silent, and best system files much in the same way as the quick process. Due to the additional complexity, additional passes may be required.

The **Expert** method allows users to manually select a test or group of tests, using the run button to start the tests. A progress bar will appear when the benchmarks are being executed. The user may cancel the tests at any time.

Manage Profile Rules

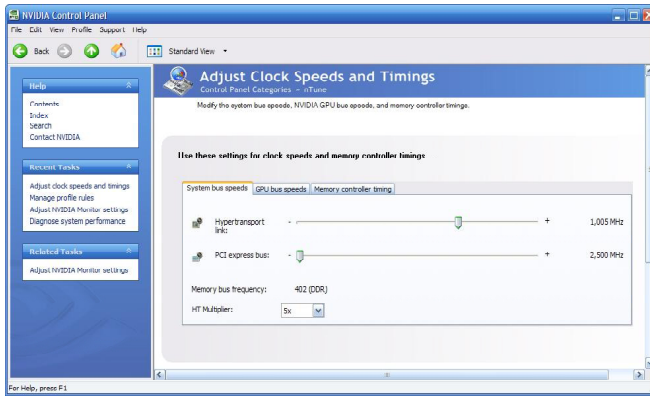
This task is used to assign specific applications to specific profiles. Each time the application is launched, the assigned profile will go into effect.



The profile menu may be pulled down to select a different profile. The list will be built from profiles currently existing in the profile directory. **Choose profile** may also be selected and will launch an explorer window. New applications may be added to the action list by selecting **New application** from the list window. Actions may be removed by selecting it from the list and pressing the <Delete> key. Select **Start rules** after applying changes to begin using them.

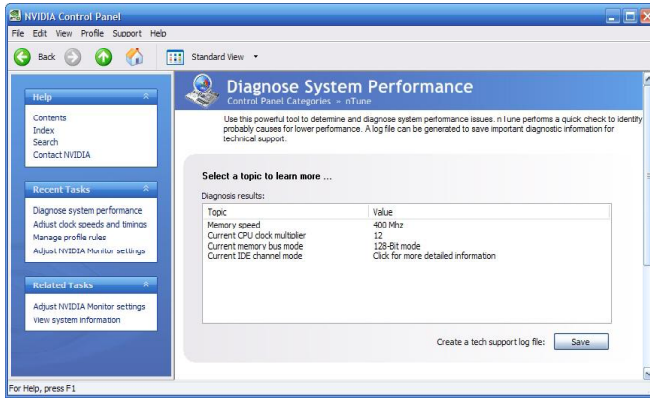
Adjust Clock Speeds and Timings

These controls allow the bus speeds to be adjusted manually to increase performance for gaming, or lower performance to conserve power and create a quieter user environment. The number to the right of the slider is the new bus speed that will be applied. Adjustments can be made by using the mouse to drag the slider. All changes will take effect immediately after selecting Apply; however, these setting will only remain active for the current Windows session. This will allow a user to safely return to Windows in the event of a crash, without any possibility of boot issues since the changes are not made directly to the BIOS settings.



Diagnose System Performance

This task is used to quickly diagnose potential system performance issues and relay valuable troubleshooting data to technical support. nTune performs a series of quick checks to identify probably causes of performance issues and then creates a list of the results, providing recommendations for improvements. The Save button is used to save the system information details in a log file that can then be provided to tech support.

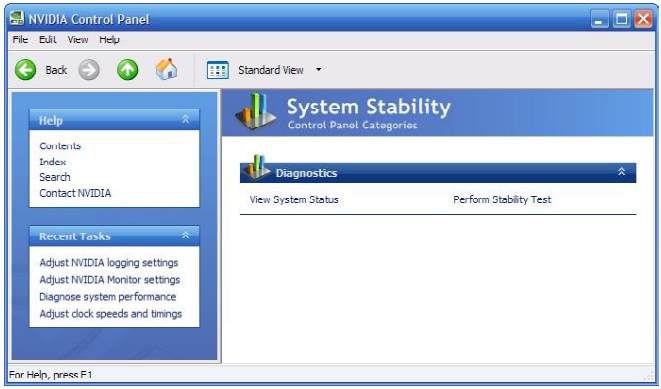


System Stability Category

To access System Stability related features, select the System Stability category.

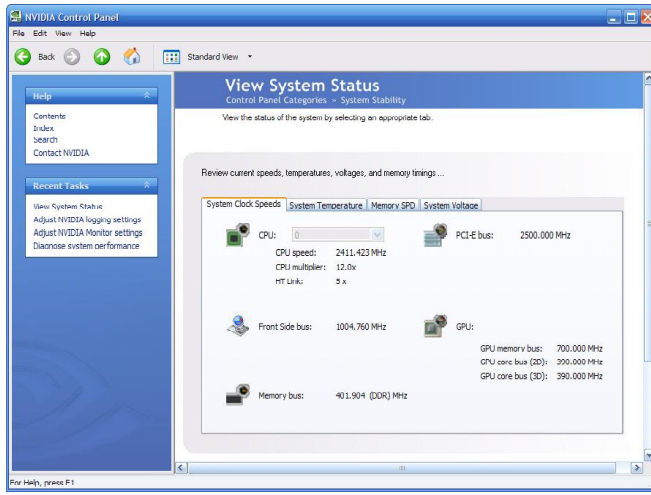
System Stability Task View

After selecting the System Stability category, a task list is presented. Under the Diagnostics heading, the tasks available include “View the system status” and “Perform a stability test”.



View System Status

The status of the system including current system clock speeds, system temperatures, memory timings, and system voltages is presented with View System Status.

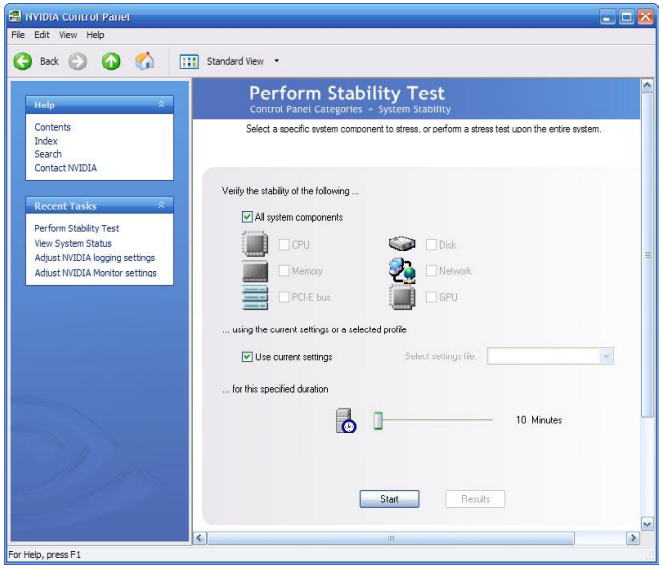


Specific settings that can be checked include:

- CPU speed and multiplier
- HyperTransport link multiplier
- PCI Express bus speed
- Front side bus speed (FSB)
- GPU memory bus speed
- GPU core bus speeds for 2D and 3D
- Memory bus speeds
- CPU, GPU and system temperatures and fan speeds
- Voltage settings for CPU, PCI Express, Memory, and GPU Core

Perform Stability Test

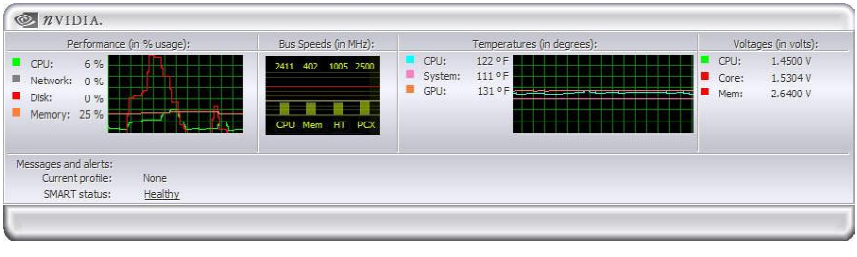
Once system settings have been modified using NVIDIA nTune, it is important to perform a stress test of the entire system to ensure system stability.



The following system components can be verified for stability: CPU, Memory, PCI-E bus, Disk, Network, and GPU. Each of these or all of these, depending on what components are selected, can be tested using a selected profile or current system settings. Once the components and settings are selected, the stress test can be set to run for a duration of 10/30/60 minutes or 2/6/12/24/48 hours.

nTune 4.0 NVMonitor

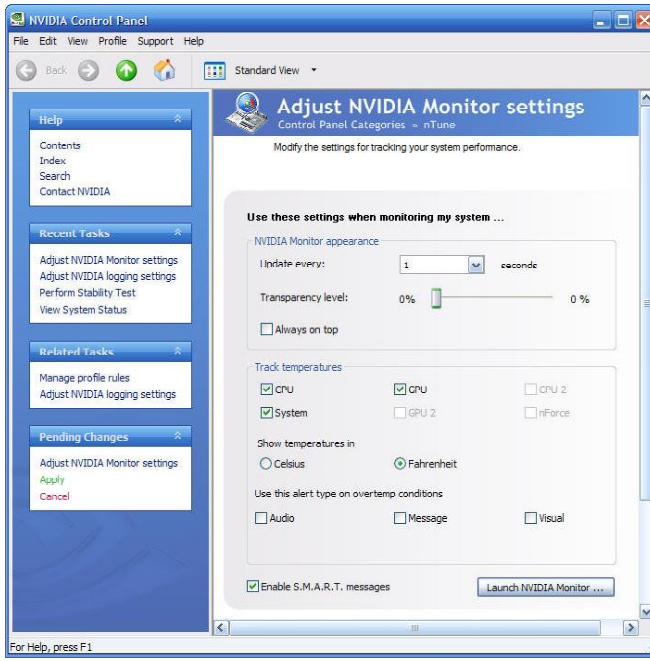
NVMonitor lets you monitor system performance, bus speeds, temperature and voltages using dynamic graphs. To start NVMonitor from the Desktop, select **Start -> All Programs -> NVIDIA Corporation -> nTune -> NVIDIA Monitor.**



NVMonitor displays performance for individual components including CPU, Network, Disk, and Memory. Bus speeds for CPU, Memory, HyperTransport (HT), and PCI Express (PCX) can be monitored along with temperature and voltages. The current profile is displayed alongside the SMART hard drive status if that has been enabled in the system BIOS.

Adjust NVIDIA Monitor Settings

The settings window allows a number of adjustments to be made to NVMonitor.



The following can be specified: the temperature reading interval, the transparency level of the NVMonitor so that background information may be viewed through it, the ability to keep NVMonitor always on top so it cannot be hidden by other tasks, temperature tracking by components, showing temperature in Celsius or Fahrenheit, and the ability to set over temperature conditions using audio, message, or visual signals. S.M.A.R.T. messages for hard drives can also be monitored by NVMonitor.

Fox LiveUpdate

Fox LiveUpdate is a useful utility for backuping and updating the system BIOS, drivers and utilities by local or online.

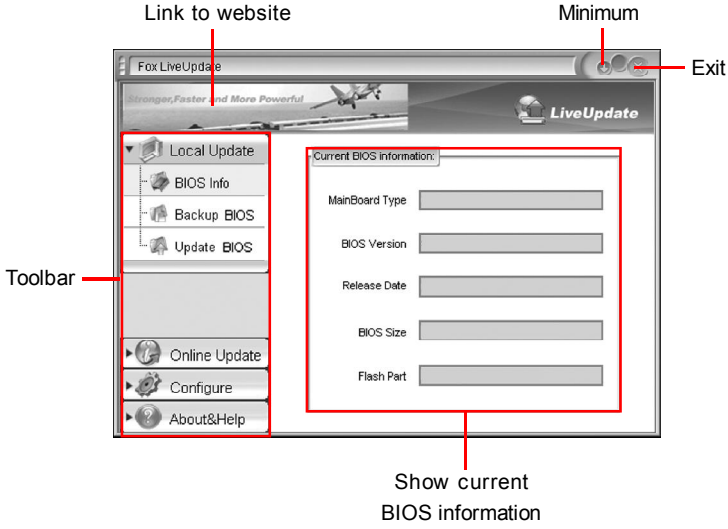
Supported Operating Systems:

-Windows 2000
-Windows XP (32-bit and 64-bit)
-Windows 2003 (32-bit and 64-bit)

Using Fox LiveUpdate:

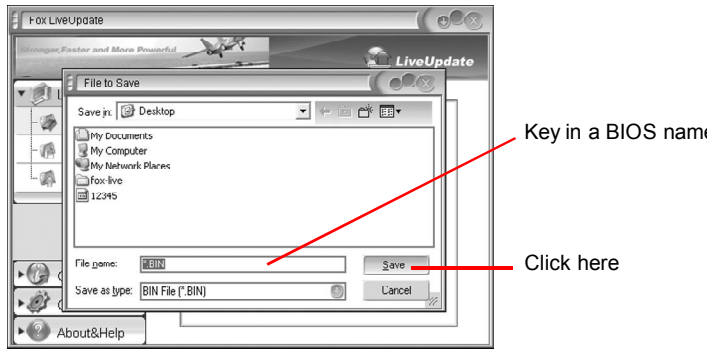
1.1 Local Update - BIOS Info.

This page lets you know your system BIOS information.



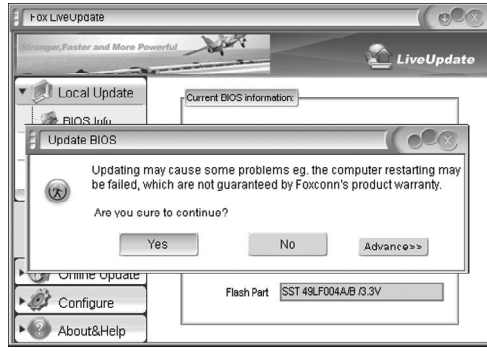
1.2 Local Update - Backup

This page lets you backup your system BIOS. Click “Backup”, then give a name. Click “Save” to finish the backup operation.



1.3 Local Update - Update

This page lets you update your system BIOS from Internet. After click “Update”, there will show warning message, please read it carefully. If you still want to continue, click “Yes”. Then load a local BIOS file and follow the wizard to finish the operation.

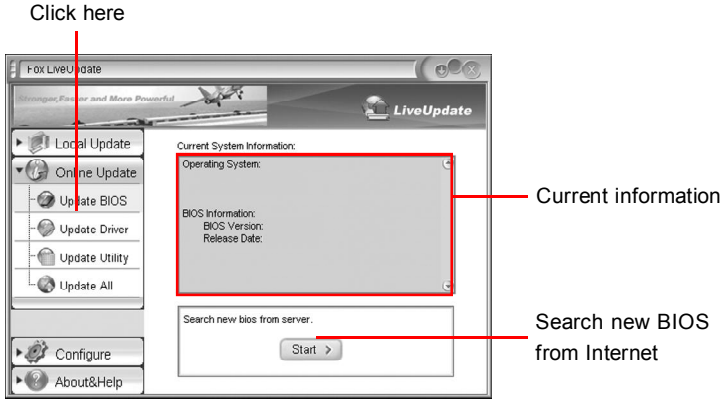


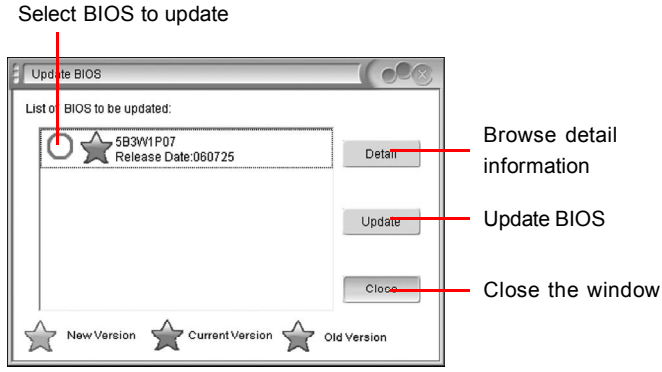
Note:

Fox LiveUpdate will auto backup BIOS before update because we have enabled this function in Configure option.

2.1 Online Update - Update BIOS

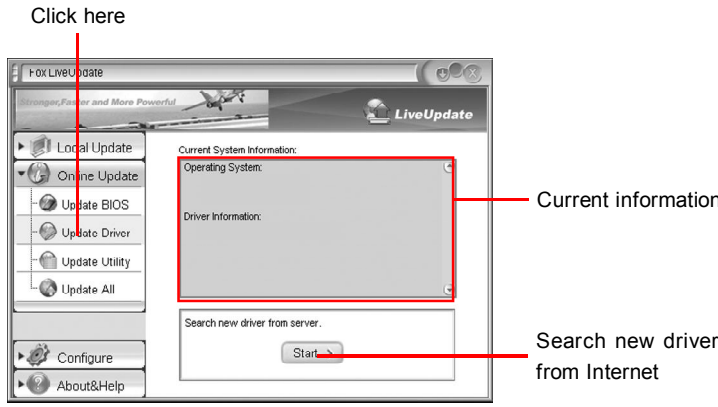
This page lets you update your system BIOS from Internet. Click “start”, it will search the new BIOS from Internet. Then follow the wizard to finish the update operation.

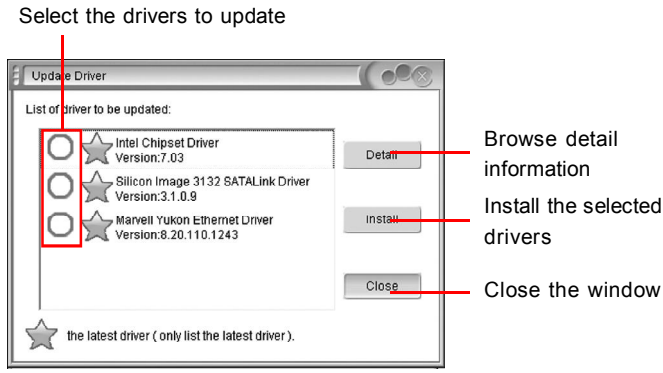




2.2 Online Update - Update Driver

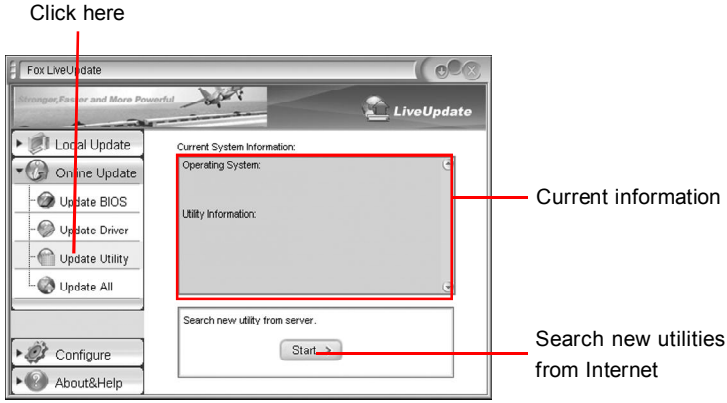
This page lets you update your system drivers from Internet. Click “start”, it will search the new drivers from Internet. Then follow the wizard to finish the update operation.





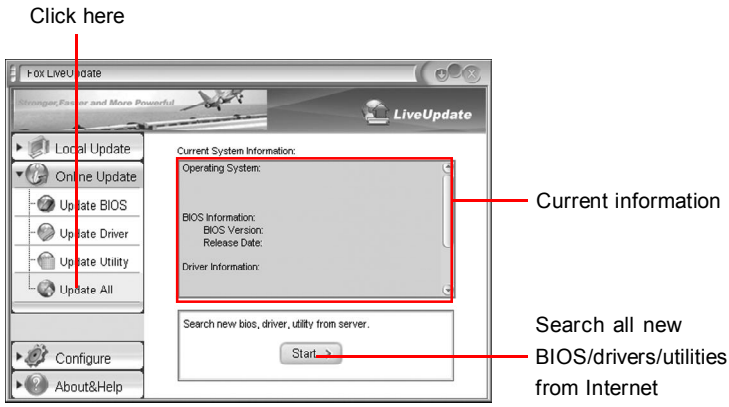
2.3 Online Update - Update Utility

This page lets you update utilities from Internet. Click “start”, it will search the new utilities from Internet. Then follow the wizard to finish the update operation.



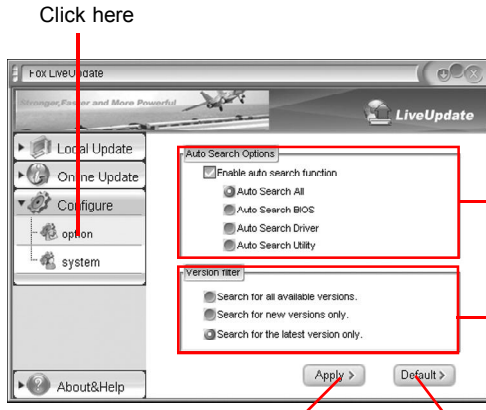
2.4 Online Update - Update All

This page lets you update your system drivers from Internet. Click “start”, it will search all new BIOS/drivers/utilities from Internet. Then follow the wizard to finish the update operation.



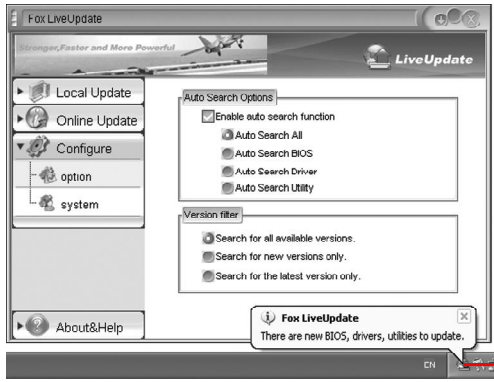
3.1 Configure - option

This page lets you set auto search options. After your setting, the utility will start searching and related information will show on the task bar.



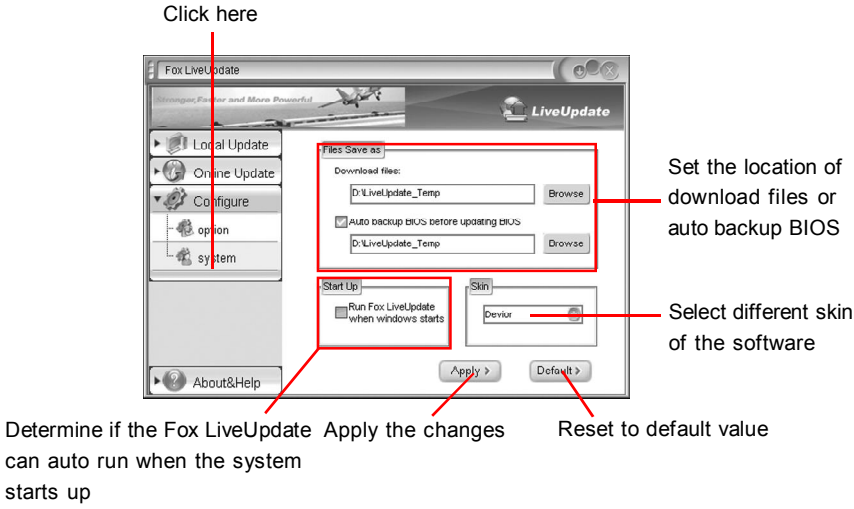
Note:

When enable auto search function, Fox LiveUpdate will appear searching result on task-bar. Double click the icon, you can see the detail information.



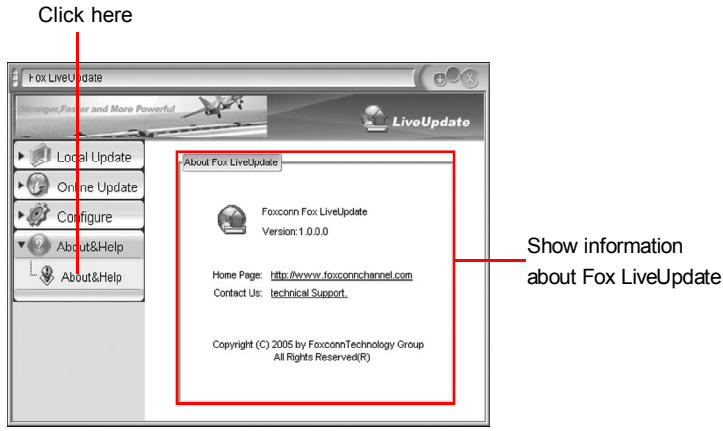
3.2 Configure - System

This page lets you set the backup BIOS location and change different skin of the utility.



4. About & Help

This page shows some information about Fox LiveUpdate.



MediaShield RAID Manager

MediaShield RAID Manager allows a user to:

- Create RAID Arrays
- View RAID Arrays
- Delete RAID Arrays
- Set up a spare RAID disk
- Morph RAID Arrays
- Hot Plug Array

The following sections give an overview of how to create/view/delete an array, and how to set up a spare RAID disk.

Morphing RAID arrays and Hot Plugging arrays are advanced user functions that are explained in detail in the MediaShield User Guide available for download on www.nvidia.com.

Create RAID Arrays

This section covers use of the MediaShield Creation Wizard. This wizard will step through configuration of your available storage.
As shown in Figure 1, the Wizard's Welcome screen lists the disks that are available for configuration.

Figure 1. MediaShield Creation Wizard Welcome Screen

1. Click Next to go to the following screen:

Figure 2. MediaShield Select-Configuration Screen

Note: You will only see this screen if you have less than 4 free disks in the system. If there are 4 or more free disks available, you will proceed to directly to custom setup.

Selecting the “Protection” option will automatically configure the best RAID option based on the number of drives and with the criteria that if a drive fails you will not lose your data.

Selecting the “Capacity”option will automatically configure the best RAID option based on the number of drives and the desire for maximum capacity. This array will NOT be fault-tolerant, so choose this option only if your data is non-critical or is being backed up.

Select the “Custom” option to create a custom RAID array that can be a:

- Striped Array
- Mirrored Array
- Stripe Mirrored Array
- Spanning Array
- RAID 5 Array

To set up a Striped Array, select “Striping” as RAID Mode and leave “Stripe Size” with its default value, as shown in Figure 3.

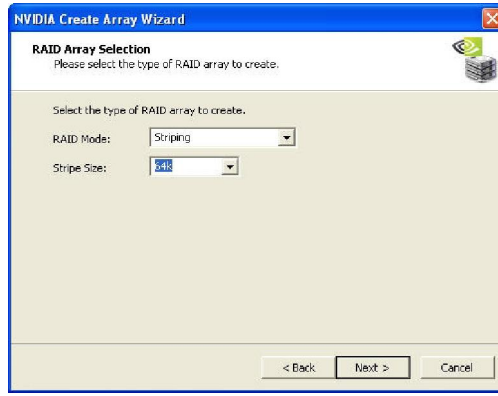


Figure 3. Creating a Striped Array

To select a Mirrored Array, select “Mirroring” as RAID mode and leave Stripe Size as default.

To select a Striped Mirror Array, select “Stripe Mirroring” as RAID Mode and leave Stripe Size as default.

To select a Spanning Array, select “Spanning” as RAID Mode and leave Stripe Size as default.

To select a RAID 5 Array, select “RAID 5” as RAID Mode and leave Stripe Size as default.

After selecting RAID Mode, click **Next**, and the following screen will appear:

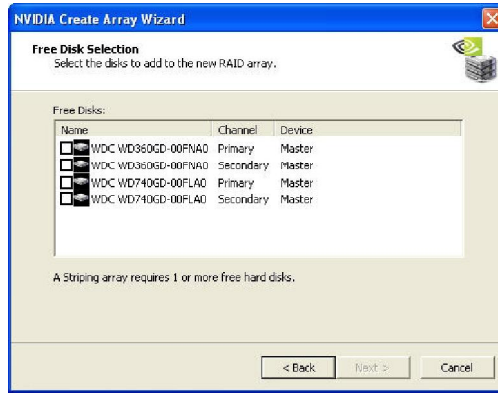


Figure 4. Selecting Disks

Select the disks you want to include in the Stripe set. Follow the next couple to complete creating the Array.

View RAID Arrays

To view your RAID configuration from Windows, launch the MediaShield RAID Management utility by double-clicking MediaShield. The RAID configuration information appears in the right-side pane, as shown in Figure 5.

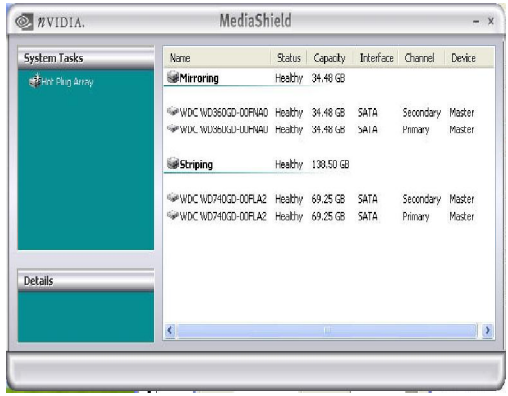
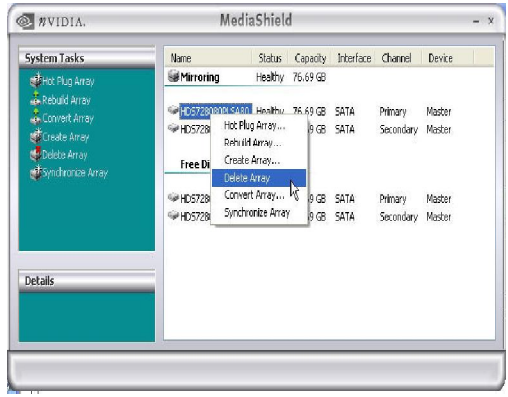


Figure 5. Viewing RAID Arrays

Delete RAID Arrays

To delete an Array do the following:

1. Launch the MediaShield application and right click on the RAID array that you want to delete (assuming that you have a RAID array already created) as shown in the following screen shot:



Follow the next couple of screens to complete Deleting the Array.

As shown in Figure 7, the array has been deleted and we see only free disks.

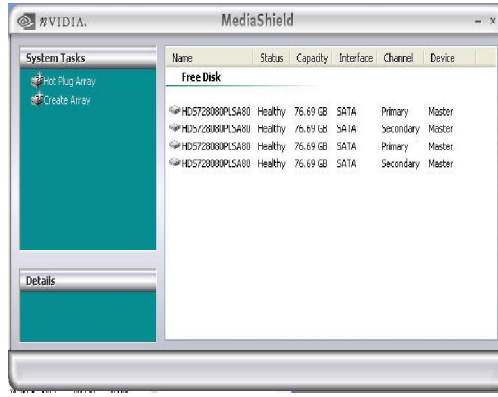


Figure 7. RAID Array deleted

Setting Up a Spare RAID Disk

You can designate a hard drive to be used as a spare drive for a RAID 1, RAID 0+1 or RAID 5 array2. The spare drive can take over for a failed disk. MediaShield RAID supports two types of spare drives:

Free Disk
A free disk is a disk that is not part of any RAID array, but can be used by any available RAID 1, RAID 0+1, or RAID 5 array that requires a particular disk when one of its disks crashes or becomes unusable. The process is automatic and doesn't require any userinteraction.

Dedicated Disk
A dedicated free disk is a disk that is assigned to a RAID 1, RAID 0+1, or RAID 5 array and that disk is used by that array only when needed, for example during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array.

Note: You must have at least two RAID arrays to use this feature.

Assigning a Free Disk

To mark a disk as free, or not a part of any array, do the following:

1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Enter the RAID BIOS and make sure that the drive is not part of any array (if one exists).
3. Boot into Windows and run the MediaShield program.
   The drive appears under the Free Disk section.

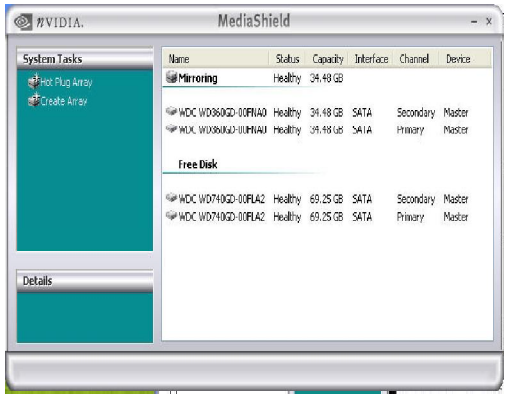


Figure 8. Free Disks

Assigning a Dedicated Disk

To mark a disk as dedicated, or reserve it for use by a specific array, you must have at least one free disk and you must also have at least two RAID 1, RAID 0+1, or RAID 5 arrays created.

1. To dedicate a free disk to an array, right click the array as shown in Figure 9.

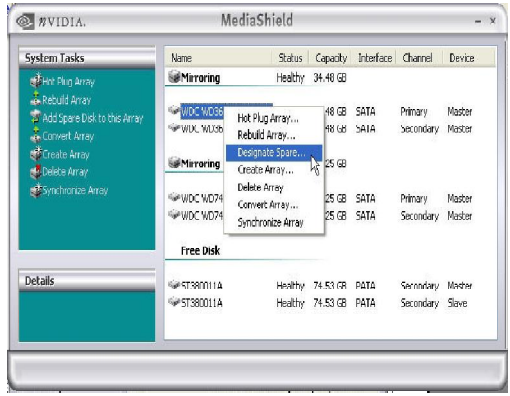


Figure 9. Dedicating a Disk to an Array

2. Select Designate Spare from the menu to launch the Spare Disk Allocation Wizard.

Figure 10. Disk Allocation Wizard

3. Click Next.

The Free Disk Selection page appears.

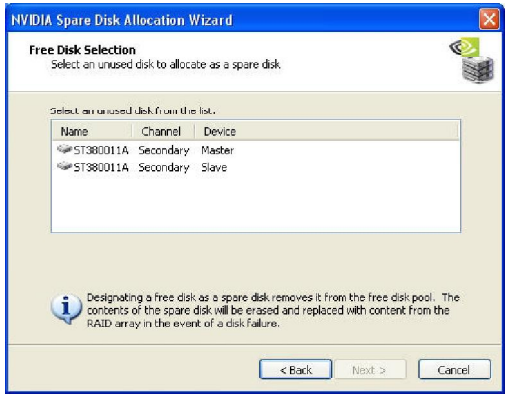


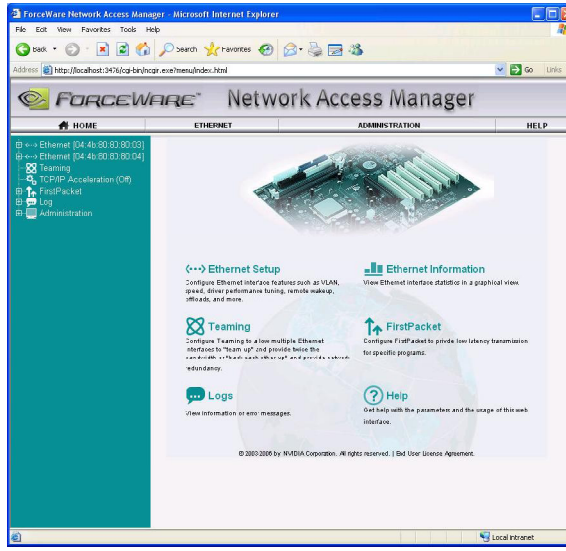
Figure 9. Dedicating a Disk to an Array

4. From the Free Disk Selection page, select a free disk. This disk will be designated to the array.

Network Access Manager

The NVIDIA® ForceWare® Network Access Manager (NAM) application helps you easily configure and control NVIDIA networking hardware and software, gather statistics, and monitor logs.

When you launch NAM for the first time, the following GUI appears.



Settings for Network Access Manager

As shown in the previous screenshot, these entries are available in NMA.

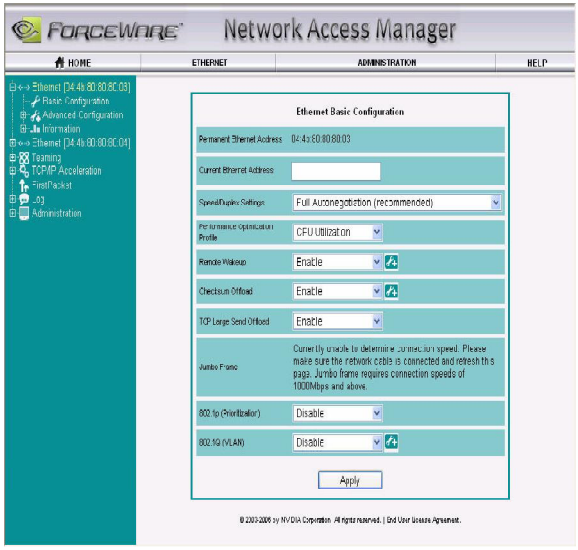
- Ethernet: This entry controls the configuration of the Ethernet interface, such as Ethernet speed, whether the connection is full-duplex or half-duplex, and so on.

  Note: Two Ethernet settings appear if your hardware supports two Ethernet ports; otherwise, only one setting appears.

- Teaming: Teaming controls load balancing and fail-over between two Ethernet ports.
- Logs: This setting enables/disables logging of various setting, such as Ethernet and teaming.
- TCP/IP Acceleration: This entry enables or disables TCP/IP acceleration and configuration. When TCP/IP acceleration is enabled, it lowers the CPU utilization and provides overall better system performance when the networking traffic is mainly TCP/IP.
- FirstPacket: FirstPacket enables/disables traffic prioritization and bandwidth control. This capability provides a better gaming experience over a broadband connection when multiple applications on the same PC are simultaneously transmitting data to the Internet.
- Administration: Administration, located at the top of the page, controls various system settings, such as font, font size, and whether remote administration is turned on or off.

Ethernet

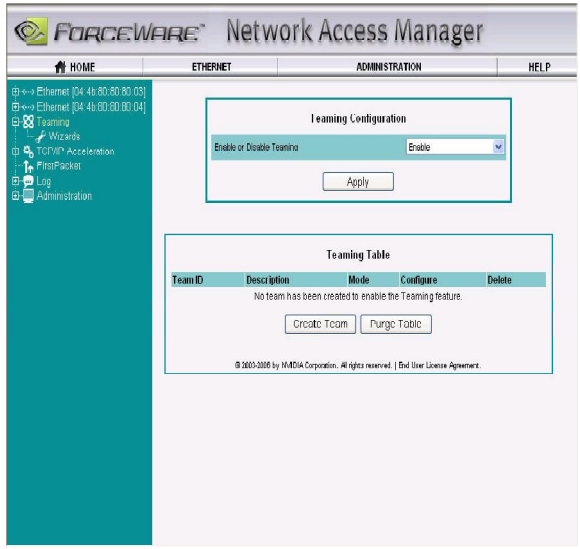
You can change various Ethernet settings on this page, such as Speed, Remote Wakeup, Checksum Offload, and more.



Teaming

What It Does

Teaming is the ability to provide load balancing and fail-over between two Ethernet ports. When this feature is enabled and configured properly, one IP address is visible on the network, and all networking traffic is distributed between the two Ethernet ports, depending on the Teaming mode of operation selected, as explained in the following topics.



Its Modes of Operation

Load Balance and Failover

When load balancing is configured over a collection of Ethernet interfaces, the collection is commonly known as a “team” or “bundle”.

- Within a team, there is a primary Ethernet interface that has special responsibilities. For example, it receives all multicast (and broadcast) traffic, and it transmits all outbound unicast traffic not destined for the subnet to which the team is attached (this traffic will later be referred to as non-local unicast traffic).
- The secondary Ethernet interfaces are available for load balancing of traffic to and from local machines (other machines within the same IP subnet to which the team is attached).

Failover Only

Load balancing (LB) is frequently used in conjunction with “failover” (FO), although it is possible to use failover alone. For instance, one Ethernet interface might be dedicated as a “hot standby” in the event that the primary Ethernet interface fails.

Team Mode: IEEE 802.3ad

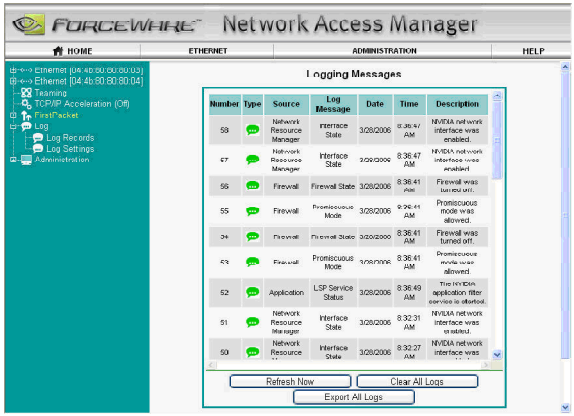
In 802.3ad, all the team members share a common MAC address. Other machines only know one MAC address for this machine’s IP address, so all its connections have to be sent to the MAC address it knows for this machine’s IP address.

Transmit-Only Load Balance and Failover

In a TX-only configuration, all the incoming (RX) traffic is received into one Ethernet interface, and the outgoing (TX) traffic is balanced across the available Ethernet interfaces.

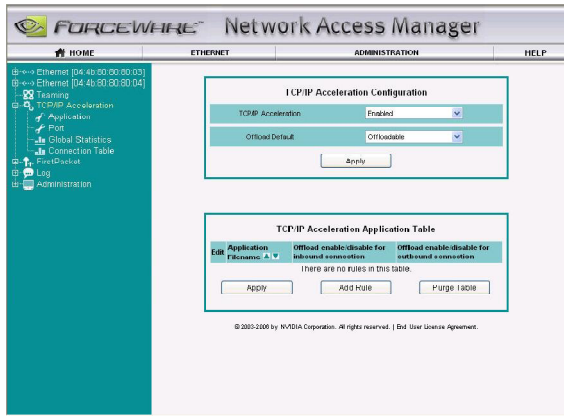
Logs

When logging is enabled and properly configured, you can log various information about the networking configuration - for example, you can track whether an Ethernet interface is enabled and working properly, or whether teaming is enabled.



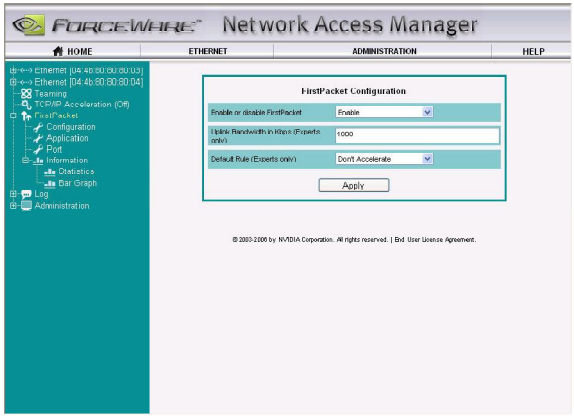
TCP/IP Acceleration

When TCP/IP acceleration is enabled and configured properly, most of the TCP/IP traffic is processed in hardware by the media and communications (MCP) chip. The advantage this technology offers is that it lowers the CPU utilization, which leads to overall better system performance since the CPU has more free cycles to focus on other tasks.



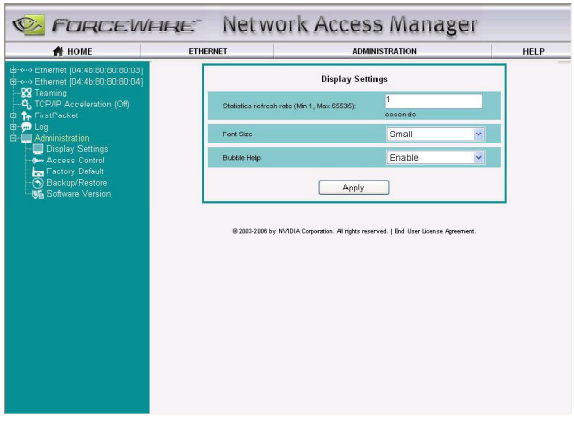
FirstPacket

FirstPacket™ provides an advanced level of outbound network traffic prioritization for broadband network connections such as DSL and cable modem. When this feature is enabled and configured properly, you can, among other capabilities, assign all gaming/VOIP (Voice Over IP) traffic to have a higher priority than file transfer or peer to peer traffic-leading to faster throughput and lower latency for the higher priority applications.



Administration

In the Administration area, you can change various parameters of the Web GUI, manage remote access, reset the software to its default setting, and more.



Summary

Network Access Manager is an easy-to-use Web interface that provides all the networking configuration, monitoring, and logging that users demand.

For more information about NAM, please read the ForceWare Networking and Firewall Administrator's Guide.

Chapter 6

This chapter will introduce how to use attached software.

This chapter provides the following information:

- NVIDIA SLI™ technology
- NVIDIA RAID
- Audio Configuration
- On board LED Code Table

NVIDIA SLI™ Technology

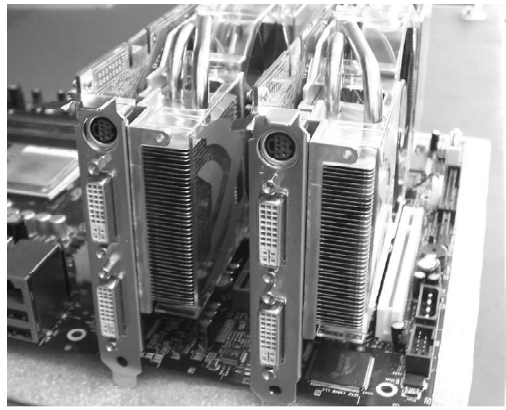
1. Introduction

NVIDIA® SLI™ (Scalable Link Interface) technology takes advantage of the increased bandwidth of the PCI Express™ bus architecture, and features intelligent hardware and software solutions to deliver earth-shattering PC performance in a multi NVIDIA GPU solution.

NVIDIA® nForce™5 SLI MCPs (media and communications processors) offer blistering graphics performance and overall PC performance for both AMD and Intel platforms. With the power of SLI™ technology you get the ability to connect two NVIDIA SLI-Ready PCI Express™ graphics cards for mind-blowing game play with brilliant and intensive 3D graphics.

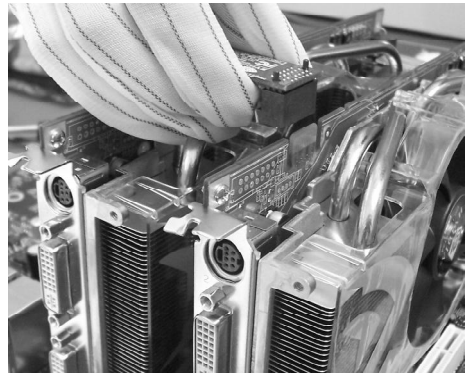
2. Using SLI™ Technology

Step1. Install two SLI-Ready Graphic cards on the two PCI Express x16 slots.



Step2. Connect power extension cable to the graphics card power connector and power supply connector.

Step 3. Install the SLI Bridge Board to the goldfingers on each graphics card. Make sure that the connector is firmly in place.

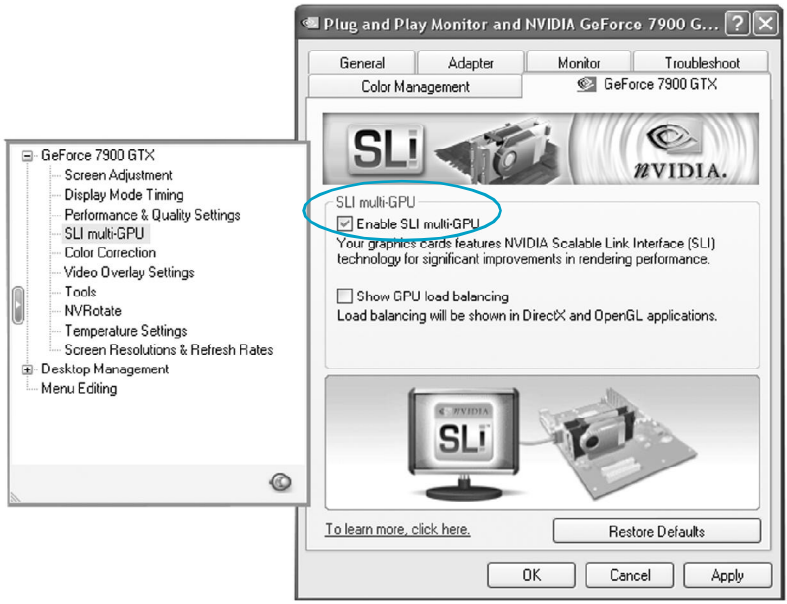


Step 4. Connect the 4-pin ATX power cable to the Auxiliary power connector to secure the system is stable.

Step 5. Power on your computer and boot into Operating System.

Step 6. Install the NVIDIA graphics card drivers and restart your computer.

Step 7. Right-click the mouse --> Select “Properties”--> Select “Setting” --> Click “Advanced” --> Select “GeForce xxxx xxx” --> Click “SLI multi-GPU” --> Click “Enable SLI multi-GPU”.



NVIDIA RAID

RAID Arrays

This section describes the following types of RAID arrays that NVIDIA RAID supports:

❖ RAID 0

RAID 0 defines a disk striping scheme that improves the disk read and write 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 arrays.

❖RAID 5

RAID 5 provides fault tolerance and better utilization of disk capacity.

❖Spanning (JBOD)

JBOD provides a method for combining drives of different sizes into one large disk.

Summary of RAID Configurations

Array	Advantages	Drawbacks	# Hard Disks	Fault Tolerance
RAID 0	High data throughput.	No fault tolerance.	multiple	None
RAID 1	100% data redundancy.	Requires two drives for the storage space of one drive.	2	Yes
RAID 0+1	Optimized for both 100% data redundancy and performance. Allows spare disks.	Requires two drives for the storage space of one drive - the same as RAID level 1.	4+	Yes
RAID 5	Fault tolerance and better utilization of disk space.	Decreased write performance due to parity calculations.	3+	Yes
JBOD	ombines and uses the capacity of odd size drives.	Decreases performance because of the difficulty in using drives concurrently or to optimize drives for different uses.	multiple	No

Additional RAID Features

NVIDIA RAID offers the following additional features:

❖Free Disk and Dedicated Spare Disk

A Free Disk or Dedicated Disk can be automatically used in case one drive of a fault-tolerant array fails. NVIDIA RAID defines a fault-tolerant array as either RAID 1, RAID 0+1, or RAID 5. A free disk can be used by any available fault-tolerant array, while a dedicated disk can be used only by the array to which it is assigned.

❖Bootable RAID

This allows you to install the operating system onto the RAID volume.

❖Morphing

Morphing is the ability to convert from one RAID mode to another RAID mode. This allows the user to upgrade their current disk or array for better performance, higher security, and increased capacity. More importantly, this is accomplished withouthaving to go through multiple steps. The morphing feature gives the user an upgradeable option to manage storage easily.

❖Hot Plug Array

A nice flexibility feature is the ability to move MediaShield RAID arrays from one nForce system to another. Since most nForce systems support SATA hot plug capability, you can add/remove a RAID array even while the system is running. This is done using the Hot Plug Array wizard.

Features and Benefits Summary

Features	Benefits
Spare Drive and Dedicated Drive Support	. Allows the user to dedicate a "spare" disk as a hot standby in the event of a array failure. . Offers additional protection in case of a failure in a mirrored array.
Bootable RAID	. Supports the use of a RAID drive for loading the operating system at power up for optimal performance
Morphing	. Allows the user to upgrade for more performance, security, and capacity. . Allows the user to change the current state of a disk/array to another array with a one step process called "morphing", without losing any data during the configuration change.
Disk Failure Identification	. Notifies the user when a disk fails and indicates which one to replace.
Hot Plug Array	. Allows the user to safely add a drive to the array when needed.

Basic Configuration Instructions

The following are the basic steps for configuring NVIDIA RAID:

Non-Bootable RAID Array

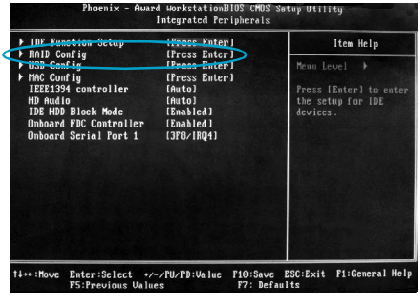
1. Choose the hard disks that are to be RAID enabled in the system BIOS.
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Stripe Mirroring (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.
3. Install the operating system on one hard disk, then reboot the computer.
4. Run the Windows nForce Setup application and install the RAID driver.
5. Initialize the NVRAID Array.

Bootable RAID Array

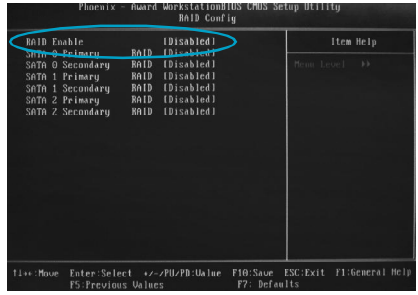
1. Choose the hard disks that are to be RAID enabled in the system BIOS.
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Mirrored Striping (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.
3. Boot from the Windows CD, then press F6 when the Windows Setup appears.
4. Insert the RAID driver floppy to Install the nForce RAID driver.
5. Initialize the NVRAID Array.

Setting Up the BIOS

1. Start up the computer, then press **Delete** to enter the BIOS setup. Use the arrow keys to select **Integrated Peripherals**, then press **Enter**.



2. Use the arrow keys to select the **RAID Config**, then press **Enter**.

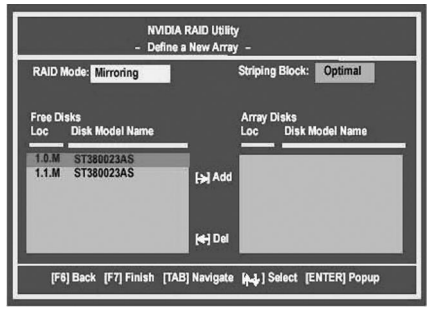


3. From the RAID Config window, enabled the **RAID Enable**, the other items would be light, then you can enable the disk that you want to use as RAID disks.
4. Press F10 to save the configuration and exit.

Entering the RAID BIOS Setup

1. After rebooting your PC, wait until you see the RAID software prompting you to press **F10**. The RAID prompt appears as part of the system POST and boot process prior to loading OS.

2. Press<**N**>, and the NVIDIA RAID Utility --- **Define a New Array** window will appear. The default **RAID Mode** is set to **Mirroring** and the default **Striping Block** is set to **Optimal**.



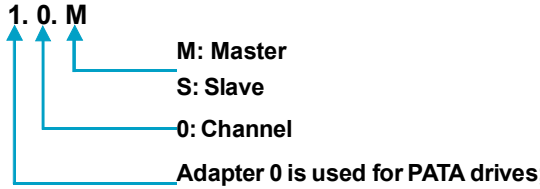
Understanding the "Define a New Array" Window

Use the Define a New Array window to

- Select the RAID Mode
- Set up the Striping Block
- Specify which disks to use for the RAID Array

Depending on the platform used, the system have one or more adapters. In a typical system there are usually one channel and multiple adapters, and each adapter have a slave and a master.

The adapter/channel/master/slave status of each hard disk is given in the Loc (location) columns of the Free Disks and Array Disks lists.



In the example above, 1.0.M means the hard drive is attached to Adapter 1, Channel 0, and the drive is set to Master. The following is a list of all possible combinations:

Parallel ATA

0.0.M Adapter 0, Channel 0, Master
0.0.S Adapter 0, Channel 0, Slave

Serial ATA

1.0.M Adapter 1, Channel 0, Master
1.1.M Adapter 1, Channel 1, Master
2.0.M Adapter 2, Channel 0, Master
2.1.M Adapter 2, Channel 1, Master
3.0.M Adapter 3, Channel 0, Master
3.1.M Adapter 3, Channel 1, Master

Note: There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the channel.

Using the Define a New Array Window

If necessary, press the tab key to move from field to field until the appropriate field is high lighted.

• Selecting the RAID Mode

By default, this is set to [Mirroring]. Change to a different RAID mode, press the down arrow keys until the mode that you want appears in the RAID Mode box—either [Mirroring], [Striping], [Spanning], [Stripe Mirroring] or RAID 5.

Note: Not all RAID levels are supported on all platforms.

• Selecting the Striping Block Size

Striping Block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default [Optimal], which is 32KB, but the values can be between [4 KB] and [128 KB].

• Assigning the Disks

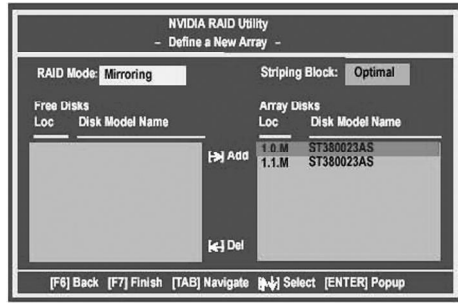
The disks that you enabled from the RAID Config BIOS setup page appear in the **Free Disks** block. These are the drives that are available for use as RAID array.

To designate a free disk to be used as a RAID array:

1. Tab to the **Free Disks** section. The first disk in the list is selected.

2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (→). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.

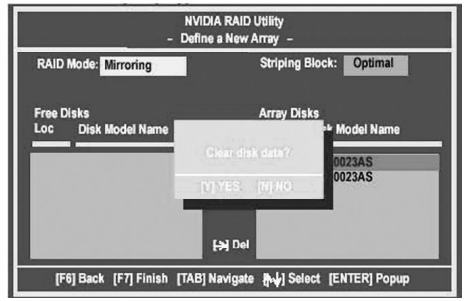
3. Continue pressing the right-arrow key (→) until all the disks that you want to use as RAID array appear in the **Array Disks** block.



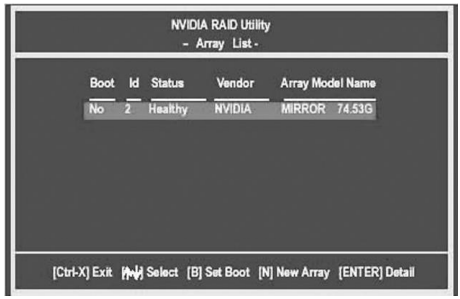
It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

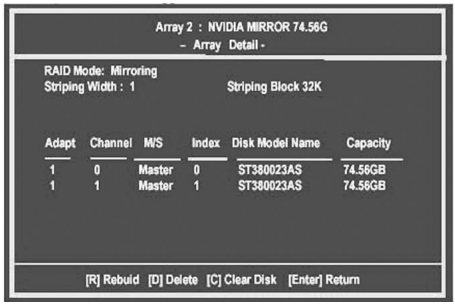
1. After assigning your RAID array mode, press **F7.** The Clear disk data windows prompt appears.



2. Press **Y** if you want to wipe out all the data from the RAID array, otherwise press **N**. You must choose **Yes** if the drives were previously used as RAID drives.
The **Array List** window appears, where you can review the RAID arrays that you have set up.



3. Use the arrow keys to select the array that you want to set up, then press **Enter.**
The **Array Detail** window appears.



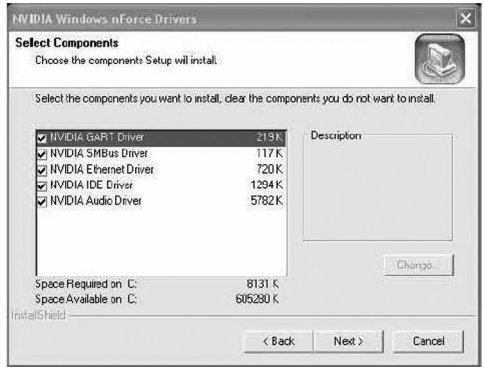
4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **F10** to exit the RAID setup.

NVIDIA RAID Utility Installation

Installing the NVIDIA RAID Software Under Windows (for Non-bootable RAID Array)

This section describes how to setup the application and install the RAID software .

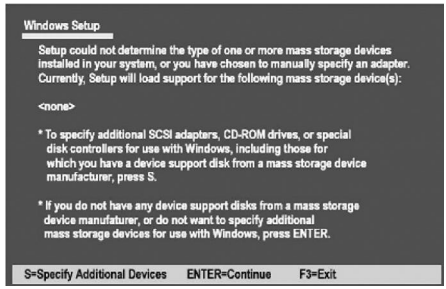
1. Start the nForce Setup program to open the NVIDIA Windows nForce Drivers page.



2. Select the modules that you want to install.
   Make sure that the “NVIDIA IDE Driver” is selected.
   You must install the NVIDIA IDE driver in order to enable NVIDIA RAID. If you do not install the NVIDIA IDE driver, NVIDIA RAID will not be enabled.
3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

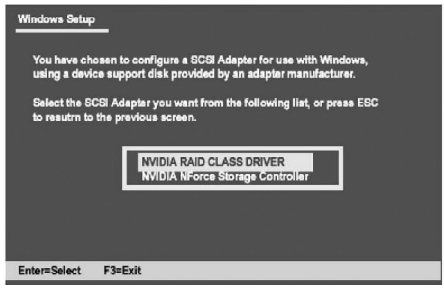
Installing the RAID Driver (for bootable RAID Array)

1. Create an F6 install floppy by using the "-x" option, then copy all files in "...\IDE\WinXP\sataraid" to a floppy disk. (For Windows 2000, substitute "Win2K" in the path.) After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows Setup program starts.
2. Press **F6** and wait for the Windows Setup screen to appear.



3. Specify the NVIDIA drivers:

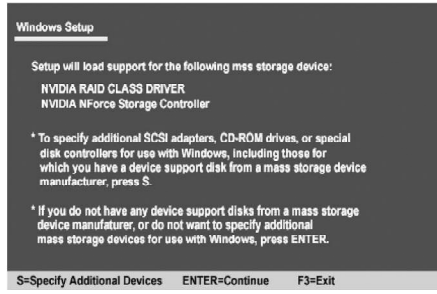
(1) Insert the floppy that has the RAID driver, press **S**. The Windows Setup screen appears as below:



(2) Select "NVIDIA RAID CLASS DRIVER" and then press **Enter**.

(3) Press **S** again at the Specify Devices screen, then press **Enter.**

(4) Select "NVIDIA NForce Storage Controller" and then press **Enter.** The following Windows Setup screen appears listing both drivers:



4. Press Enter to continue with operating system Installation. Be sure to copy the files from the floppy is complete, then take out the floppy.

5. Follow the instructions on how to install operating system. During the GUI portion of the installation you might be prompted to click Yes to install the RAID driver. Click Yes as many times as needed in order to finish the installation. This will not be an issue with a signed driver.

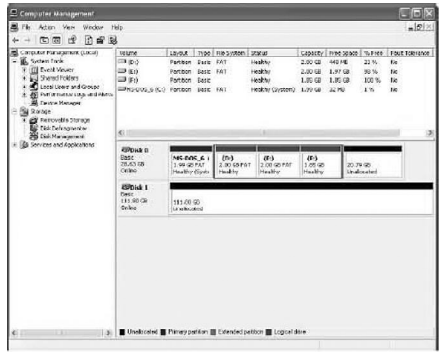
Note: Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

Initializing and Using the Disk Array

The RAID array is now ready to be initialized under Windows.

1. Launch Computer Management by clicking “Start” —> “Settings” —> “Control Panel” then open the “Administrative Tools” folder and double click on “Computer Management”.

2. Follow screen instructions to install. While finished, the “Computer Management” window appears.



The actual disks listed will depend on your system, and the unallocated partition is the total combined storage of two hard disks. You must format the unallocated disk space in order to use it.

3. Format the unallocated disk space. Right click “Unallocated space”, select “New Partition…” and follow the wizard. After the drive has been formatted, it is ready for use.

Audio Configuration

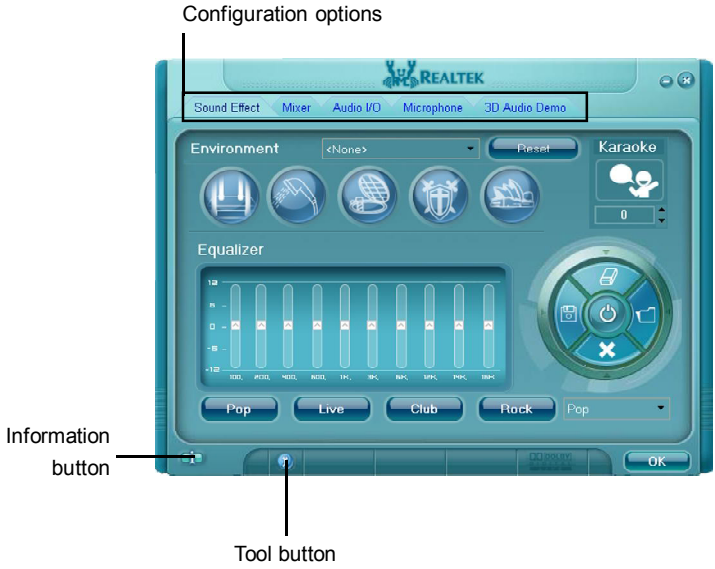
The ALC882 provide 10 channels of DAC that simultaneously support 7.1 sound playback, plus 2 channels of independent stereo sound output (multiple streaming) through the Front-Out-Left and Front-Out-Right channels. Flexible mixing, mute, and fine gain control functions provide a complete integrated audio solution for next generation multimedia PCs.

Now we will tell you how to install audio driver and use Realtek HD Audio Manager.

1. Click “Audio Driver” button and follow the installation wizard to install Realtek audio diver from Driver CD.

2. After the driver is correctly installed, you will find the icon  on the task bar. Double click it to display the Realtek HD Audio Manager.

3. Main Menu Introduction

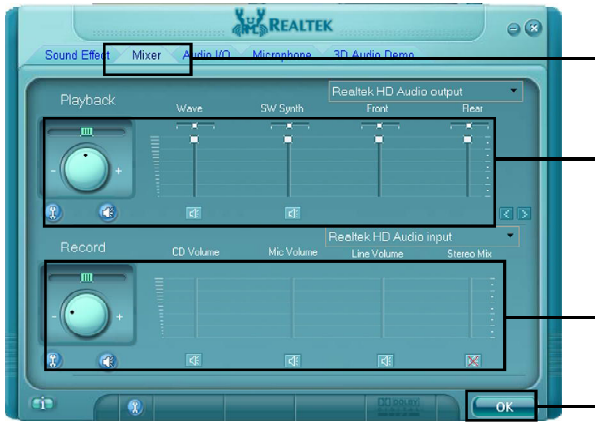


4. Sound Effect Introduction

Allows you to set your listening environment, adjust the equalizer, set the Karaoke, or select pre-programmed equalizer settings.

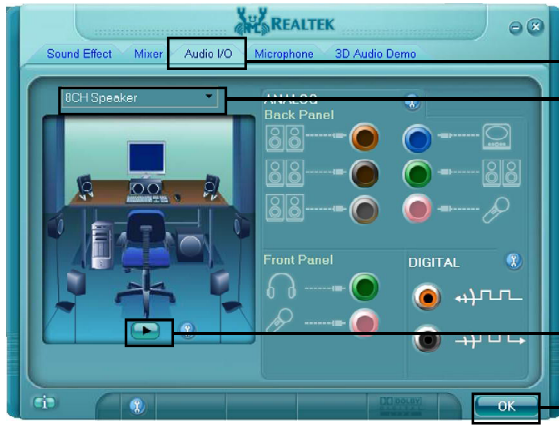
5. Mixer Introduction

Allows you to set audio output and audio input volume.



6. Audio I/O Introduction

Allows you to configure your input/output settings.



1. Click here
2. Select channel configuration
3. Test
4. Click OK

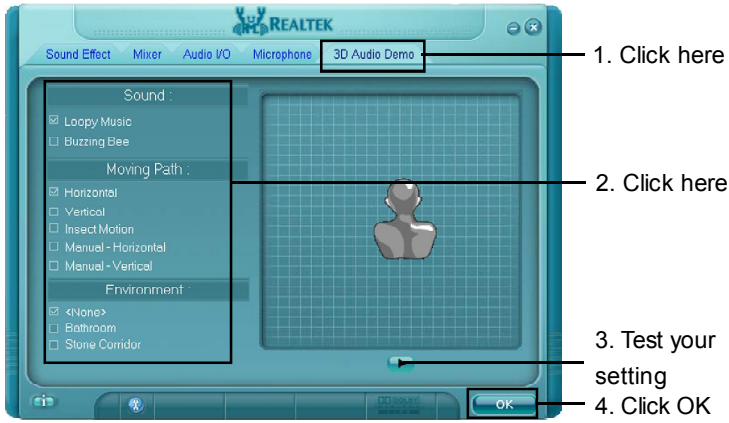
7. Microphone Introduction

Allows you to configure your input/output settings and to check if your audio devices are connected properly.

1. Click here
2. Click here
3. Click OK

8. 3D Audio Demo Introduction

This option gives you a demostration of the 3D audio feature.



On board LED Code Table

Code(hex)	Name	Description
01	Reserved	
02	Jumps to E000 segment	Execution of POST routines in E000
03	Early Superio	Init Early Initialized the super IO
04	Reserved	
05	Blank video	Reset Video controller
06	Reserved	
07	Init KBC	Keyboard controller init
08	KB test	Test the Keyboard
09	Reserved	
0A	Mouse Init	Initialized the mouse
0B	Reserved	
0C	Reserved	
0D	Reserved	
0E	CheckSum Check	Check the integrity of the ROM,BIOS and message
0F	Reserved	
10	Autodetect EEPROM	Check Flash type and copy flash write/erase routines
11	Reserved	
12	Test CMOS	Test and Reset CMOS
13	Reserved	
14	Load Chipset	Load Chipset Defaults
15	Reserved	
16	Init Clock	Initialize onboard clock generator
17	Reserved	
18	Init CPU	CPU ID and initialize L1/L2 cache
19	Reserved	
1A	Reserved	
1B	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
1C	CMOS Battery Check	Test CMOS and check Battery Fail

Code(hex)	Name	Description
1D	Early PM	Early PM initialization
1E	Reserved	
1F	Re-initial KB	Load keyboard matrix
20	Reserved	
21	HPM init	Init Heuristic Power Management (HPM)
22	Reserved	
23	Program chipset	Early Programming of chipset registers
24	Init PNP	Init PNP
25	Shadow VBIOS	Shadow system/video BIOS
26	Clock Gen	Init onboard clock generator and sensor
27	Setup BDA	Setup BIOS DATA AREA (BDA)
28	Reserved	
29	CPU Speed detect	Chipset programming and CPU Speed detect
2A	Reserved	
2B	Init video	Initialize Video
2C	Reserved	
2D	Video memory test	Test Video Memory and display Logos
2E	Reserved	
2F	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	Early keyboard reset	Early Keyboard Reset
34	Reserved	
35	Test DMA Controller 0	Test DMA channel 0
36	Reserved	
37	Test DMA Controller 1	Test DMA channel 1
38	Reserved	
39	Test DMA Page Registers	Test DMA Page Registers
3A	Reserved	
3B	Reserved	

Code(hex)	Name	Description
3C	Test Timer	Test 8254 Timer 0 Counter 2.
3D	Reserved	
3E	Test 8259-1 Mask	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
3F	Reserved	
40	Test 8259-2 Mask	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
41	Reserved	
42	Reserved	
43	Test Stuck Interrupt	Turn off interrupts then verify no 8259's Interrupt interrupt mask register is on. Test 8259 Force an interrupt and verify the interrupt occurred.
44	Reserved	
45	Reinit serial port	Reinitialize Preboot agent serial port
46	Reserved	
47	EISA Test	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag.
48	Reserved	
49	Size Memory	Size base memory from 256K to 640K and extended memory above 1MB.
4A	Reserved	
4B	Reserved	
4C	Reserved	
4D	Reserved	
4E	Init APIC	Initialize APIC and set MTRR
4F	Reserved	
50	USB init	Initialize USB controller
51	Reserved	

Code(hex)	Name	Description
52	Memory Test	Test all memory of memory above 1MB using Virtual 8086 mode, page mode and clear the memory
53	Reserved	
54	Reserved	
55	CPU display	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features
56	Reserved	
57	PnP Init Display	PnP logo and PnP early init
58	Reserved	
59	Setup Virus	Setup virus protect according to protect setup
5A	Reserved	
5B	Awdflash Load	If required, will auto load Awdflash. exe in POST
5C	Reserved	
5D	Onboard I/O	Init Initializing onboard superIO
5E	Reserved	
5F	Reserved	
60	Setup enable	Display setup message and enable setup functions
61	Reserved	
62	Reserved	
63	Initialize Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
64	Reserved	
65	PS2 Mouse special	Special treatment to PS2 Mouse port
66	Reserved	
67	ACPI init	ACPI sub-system initializing
68	Reserved	
69	Init Cache	Initialize cache controller
6A	Reserved	
6B	Setup	Enter setup check and autoconfiguration check up
6C	Reserved	

Code(hex)	Name	Description
6D	Initialize Floppy	Initialize floppy disk drive
6E	Reserved	
6F	FDD install	Install FDD and setup BIOS data area parameters
70	Reserved	
71	Reserved	
72	Reserved	
73	Initialize Hard Drive	Initialize hard drive controller
74	Reserved	
75	Detect HDD	IDE device detection
76	Reserved	
77	Detect serial ports	Initialize serial ports
78	Reserved	
79	Reserved	
7A	Detect parallel ports	Initialize parallel ports
7B	Reserved	
7C	HDD Write Protect	HDD check for write protection
7D	Reserved	
7E	Reserved	
7F	POST error check	Check POST error and display them and ask for user intervention
80	Reserved	
81	Reserved	
82	Security Check	Ask password security.
83	Write CMOS	Write all CMOS values back to RAM and clear screen
84	Display PNP	Display PNP devices
85	USB Final Init	Final USB initialization
86	Reserved	
87	Reserved	
88	Reserved	
89	Setup ACPI tables	Setup ACPI tables
8A	Reserved	
8B	Option ROM Detect	Scan for Option ROMs
8C	Reserved	
8D	Enable Parity Check	Enable Parity Check

Code(hex)	Name	Description
8E	Reserved	
8F	IRQ12 Enable	Enable IRQ12 if mouse present
90	Reserved	
91	Reserved	
92	Reserved	
93	Boot Medium Read	Detect and store boot partition head and cylinders values in RAM
94	Final Init	Final init for last micro details before boot
95	NumLock	Set NumLock status according to Setup
96	Boot Attempt	Set low stack Boot via INT 19h.
C0	Base CPU test	Read/Write CPU registers
C1	Memory Presence	Base memory detect
C2	Early Memory	Board Initialization
C3	Extend Memory	Turn on extended memory, cache initialization
C4	Special Display	First display initialization
C5	Early Shadow	Early shadow enable for fast boot
C6	Cache presence	External cache size detection
CF	CMOS Check	CMOS checkup
NVIDIA Added POST Codes		
F0	HW Ident	Identify HW in the system
F1	SLAM Table	Register the slam tables
F2	Early SLAM table	Early SLAM table
F3	Init Com Port	COM port initialization
00	HW Init	Initialize hardware devices
01	Override Parameters	Override input parameters etc.
		before QUERY
04	Process SPD	Read SPD & fill in arrays
08	Query HW	Query the hardware devices
0C	Load ROM Table	ROM table pointer
10	Init Memory Controller	Initialize the Memory Controller
20	Init PCI Express	PCI Express Initialization
30	Init Spread Spectrum	Load Spread Spectrum tables

Code(hex)	Name	Description
40	Set Top-Of-Memory	Set Top-Of-Memory registers
44	Late SLAM table	Late SLAM table
48	Previous Power State	Previous Power State SLAM
	SLAM table	table
4C	Hardware Workarounds	Hardware Workarounds
50	NVMM	Restore, and exit NVMM
54	NV Memory Test	NV Memory Test
FE	ERROR handler	ERROR handler
FF	Boot	