

# ZOTAC<sup>®</sup>

*GRAPHICS CARDS*



*USER'S MANUAL*



## Electronic Emission Notices

### **Federal Communications Commission (FCC) Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- REORIENT OR RELOCATE THE RECEIVING ANTENNA
- INCREASE THE SEPARATION BETWEEN THE EQUIPMENT AND THE RECEIVER
- CONNECT THE EQUIPMENT INTO AN OUTLET ON A CIRCUIT DIFFERENT FROM THAT OF THE RECEIVER
- CONSULT THE DEALER OR AN EXPERIENCED AUDIO/TELEVISION TECHNICIAN

### **NOTE:**

Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

### **CE Declaration of conformity**

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A for ITE, the essential protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

### **Canadian Department of Communication Statement**

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

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## Precautions - Read this first!

### 1) Before playing video games

Do not play when you are tired or short of sleep. Make sure that the room is well illuminated and lighting is adjusted to the brightness of the monitor. Keep a suitable distance from the display monitor. Take a break of 10 to 15 minutes every hour while playing.

Extremely pronounced lighting effects such as fast image changes, repetitions of simple geometric shapes, flashes of light may induce epileptic fits or blackouts in some persons. Even persons with no previous known tendency to epilepsy may be in danger. If you or member of your family has been diagnosed as prone to epilepsy, please consult your physician before playing the video game. Parents should monitor their children carefully when they play video games. Stop playing immediately if the following symptoms are detected: nausea, vision disturbance, muscle tension or cramps, orientation problems, involuntary movements or brief loss of consciousness.

### 2) Static electricity precautions

Do not take the graphics card out from the original static electricity protection package until you are ready to install it. Before installing, wear a grounded wrist strap if possible, or discharge static electricity by touching the bare metal surface of the system chassis. Carefully hold the graphics card by its rear bracket, and avoid touching the "gold finger" PCB edge connector unless it is necessary.

### 3) Turn off system power before installing the graphics card

Turn off the AC main power to the system, by the AC main power switch or by detaching the AC power cord. Damage to the graphics card or the system components, or injury to you may result if power is turned on during the installation. Please consult a qualified technician if necessary. The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation by unauthorized service personnel.

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## 1. System Requirements

- 800MHz or higher speed processor
- At least 128MB system memory
- AGP or PCI-Express slot (depending on graphics card type)
- CD-ROM or DVD-ROM drive
- 200MB free hard disk space
- Microsoft® Windows 7 / Vista / XP

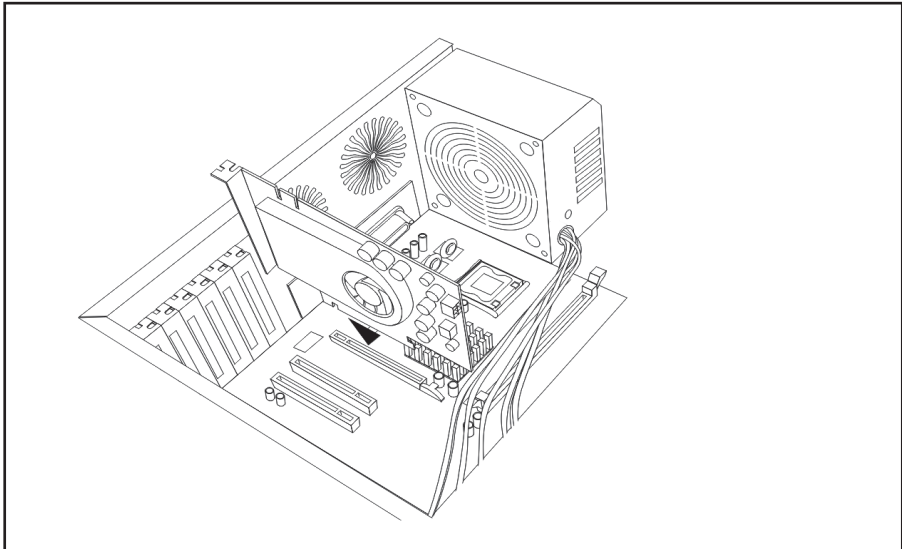
## 2. Installing the Graphics Card

### ***Important!***

*Read the precautions before starting the installation*

### **For system without an existing graphics card**

1. Shut down the system and unplug the power cable from the AC power source.
2. Open the system chassis to access the AGP or PCI Express slot. Refer to your system manual for instructions.
3. Remove the metal bracket cover near the AGP or PCI Express slot. Save the screw for later use.
4. Remove the graphics card from its anti-static packaging.
5. Hold the card firmly and insert its golden connectors into the AGP or PCI-Express slot.
6. Make sure that the card is properly seated in the slot, and then secure the card metal bracket with a screw.
7. Connect the DC power plug from the system power supply unit if your card has an auxiliary power connector (for specific cards only). Some models may come with a DC power cable, which connects between the card and the system power supply unit.
8. Replace the system cover and re-connect all power cables.



*Fig 2-1 Insert the graphic card to the slot*

## For system with an existing graphics card

1. Uninstall the current VGA driver by accessing the Windows® Control Panel / Add or Remove Programs
2. Shut down the system and unplug the power cable from the AC power source.
3. Open the system chassis to locate the existing graphics card at the AGP or PCI Express slot. Refer to your system manual for instructions.
4. Remove the graphics card from the AGP or PCI Express slot. Save the screw for later use.
5. Remove the graphics card from its anti-static packaging.
6. Hold the card firmly and insert its golden connectors into the AGP or PCI Express slot.
7. Make sure that the card is properly seated in the slot, and then secure the card the card metal bracket with a screw.
8. Connect the DC power plug from the system power supply unit if your card has an auxiliary power connector (for specific cards only). Some models may come with a DC power cable, which connects between the card and the system power supply unit.
9. Replace the system cover, and re-connect all power cables.

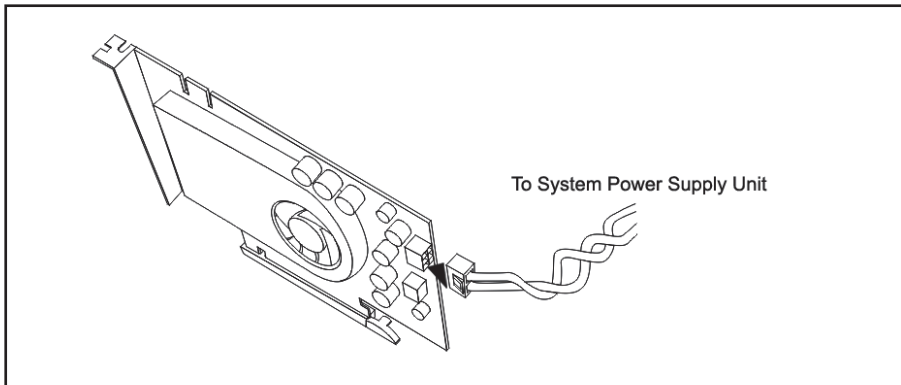


Fig 2-2 Connect the DC power plug to the card



## Installing multiple graphics cards in SLI

PCI Express graphics card models with SLI (Scalable Link Interface) feature are equipped with a gold finger connector at the top edge of the PCB for multiple GPU operations. This feature allows two graphics cards (with identical GPU types) to run simultaneously on an SLI enabled motherboard for significant performance improvements.

1. Follow the installation steps above to install two identical (SLI compatible) graphics cards in the system.
2. Locate the SLI bridge (cable adaptor). This item is sold separately and typically included with SLI compatible motherboards.
3. Hold the SLI bridge firmly and insert the connector on both ends of the graphics cards SLI gold finger connectors, located at the top edge of the PCB.
4. Replace the system cover and re-connect all power cables.

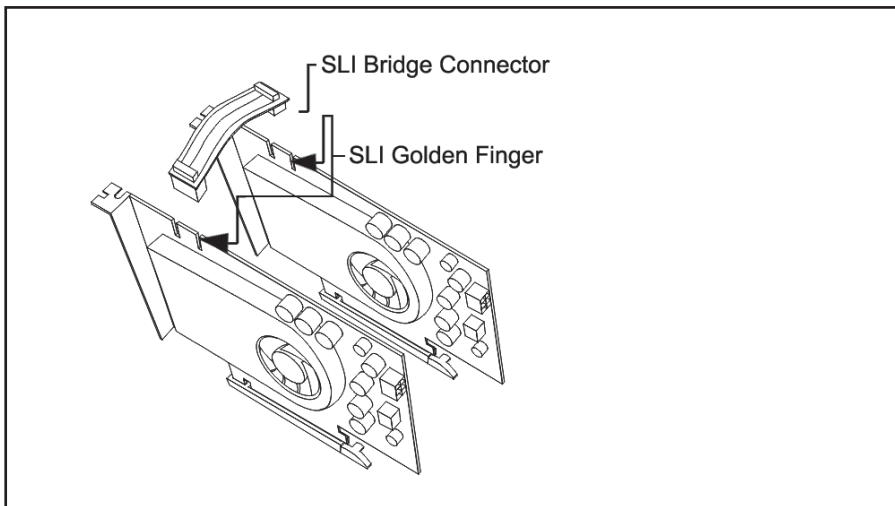


Fig 2-3 Connect the SLI bridge between two graphic cards

### 3. Connecting Display Devices

#### VGA Port

Connect the VGA Monitor Signal Cable to the VGA port on the graphics card.

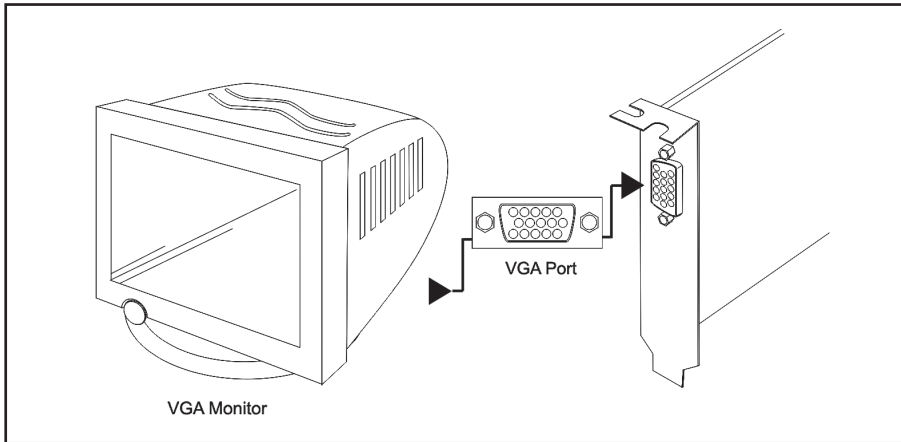


Fig 3-1 Connect the VGA Monitor

#### Composite / S-Video / HDTV Port

Connect the Composite / S-Video Signal Cable to S-Video port on the graphic card. Specific model of graphics cards may come with HDTV cable, which connects to HDTV.

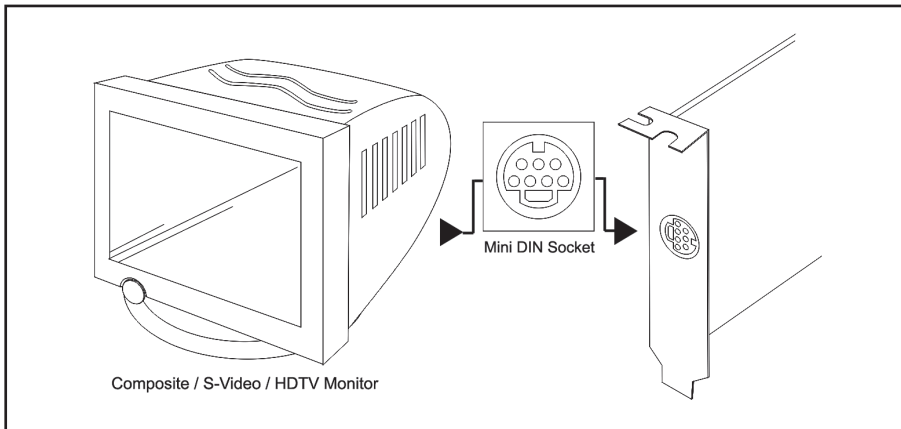


Fig 3-2 Connect the Composite / S-Video / HDTV Monitor

## DVI Port

Connect the DVI Signal Cable from Flat Panel Display to DVI port on the graphics card.

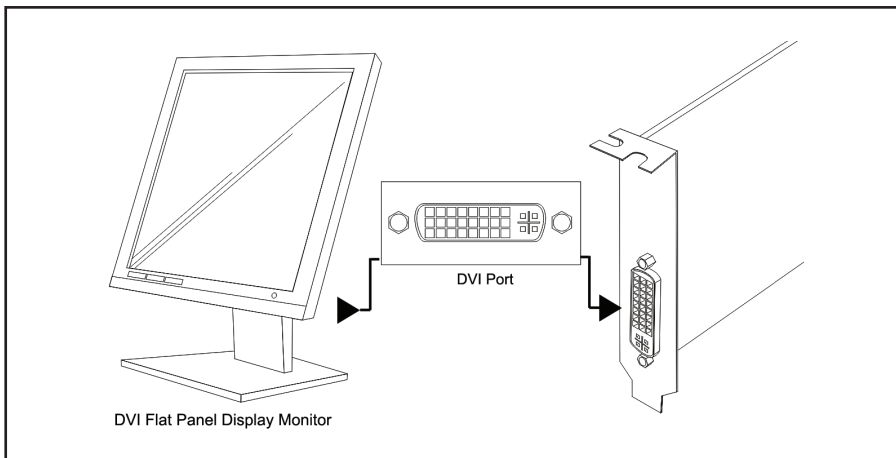


Fig 3-3 Connect the DVI Flat Panel Display Monitor

## HDMI Port

Specific models are equipped with HDMI port on the graphics card. Connect the HDMI signal cable from Flat Panel Display or HDTV (with HDMI) to the HDMI port. Some models without HDMI port may be connected via the DVI-HDMI Dongle Adaptor.

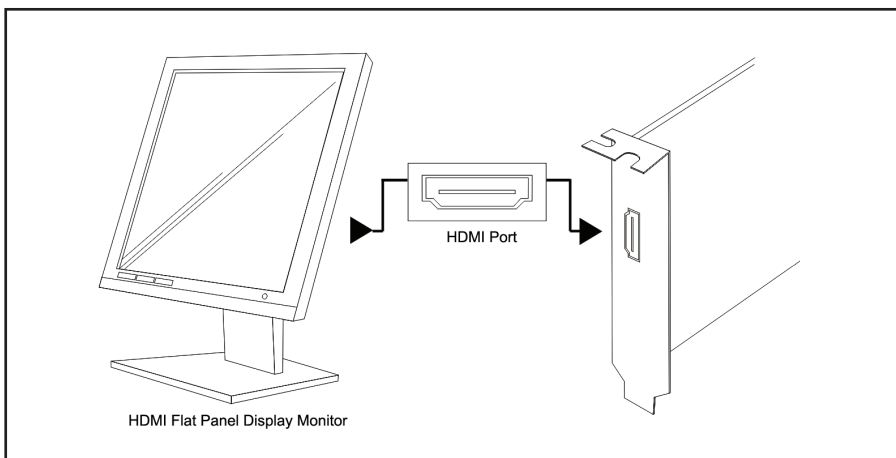
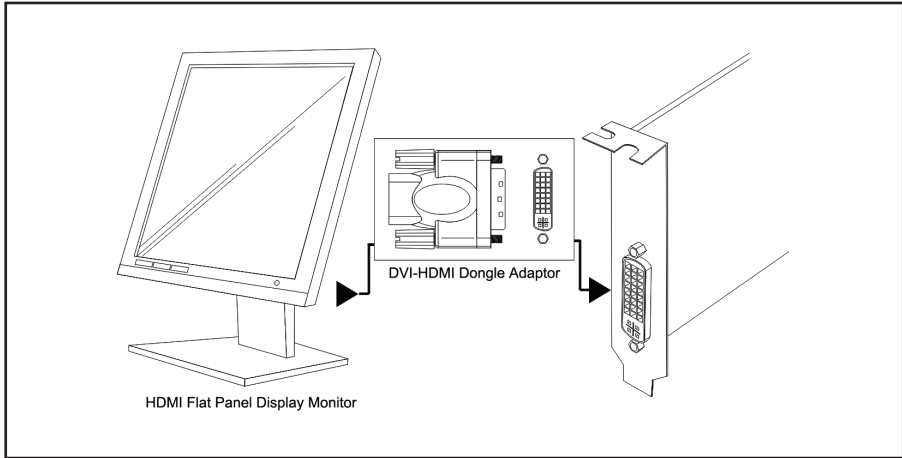


Fig 3-4 Connect the HDMI Flat Panel Display Monitor via HDMI port



*Fig 3-5 Connect the HDMI Flat Panel Display Monitor via DVI-HDMI Dongle Adaptor*

## 4. Enabling S/PDIF audio input

To enable audio output over HDMI or DVI with a GeForce 8 series or newer graphics card, follow the steps below:

1. Find the S/PDIF audio cable bundled with the GeForce series graphics card (GeForce 8 series and newer).
2. Locate end with white connector on S/PDIF audio input cable.
3. Connect white connector to S/PDIF input connector on the GeForce series graphics card (GeForce 8 and newer). Ensure the connector matches up with the notch on the connector.
  - a. If there's no visible connector on the GeForce series graphics card, the connector may be hidden by a rubber cover (GeForce GTX 200 series). Remove the cover and proceed to connect the cable.
4. Locate the S/PDIF audio header on your motherboard or sound card (consult user manual for details).
5. Locate pins for SPDIF\_OUT and GND (or GROUND) on motherboard or sound card (consult user manual for details).
6. Connect connector labeled "SPDIF" (white) on cable to corresponding SPDIF\_OUT pin on motherboard or sound card.
7. Connect connector labeled "GND" (black) on cable to corresponding GND or GROUND pin on motherboard or sound card.

*Note: Connecting the S/PDIF audio input cable incorrectly can cause damage to your GeForce series graphics card.*

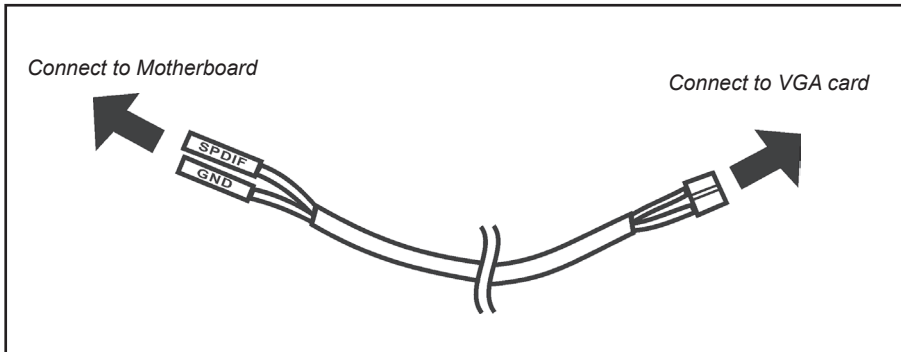


Fig 4-1 Connect the S/PDIF audio cable

## 5. Graphics Card Driver Installation

Graphics card driver is the software program that makes the device work with your computer's Operating System. Each type of Operating System requires its own set of driver software for each graphics card. The following types of Operating Systems are supported by the graphics card driver:

- **Windows® 7**
- **Windows® Vista**
- **Windows® XP**

Please see the recommended methods in this section to install, update, or remove the graphics card driver, after the graphics card is installed in the system.

### Installing driver from CD

The procedure listed below are suitable for newly installed computer system, with no previous graphics driver installed, or the graphics driver is already removed. The driver software is on the CD bundled with the graphics card package.

1. Start the computer system and boot to Windows® 7/Vista/XP Operating System.
2. When the system shows the "Found New Hardware Wizard" dialog box, click "Cancel".

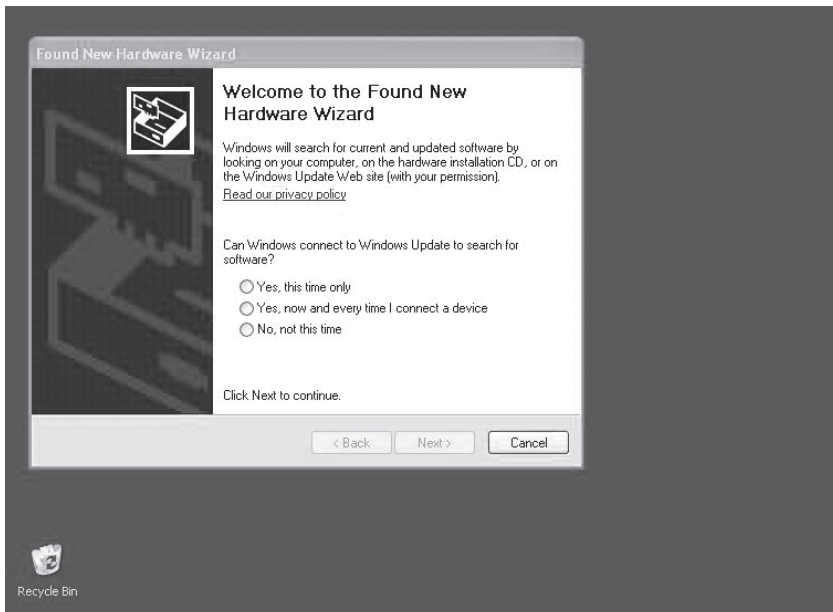


Fig 5-1 Found New Hardware Wizard

3. Insert the graphics card's bundled CD in the CD-ROM / DVD-ROM drive. If autorun is enabled, the Driver Installation Main Menu will show up automatically. If autorun is disabled, you may click the file Launch.EXE to bring up the Driver Installation Main Menu. Windows Vista may ask for further confirmation, please click "Allow" or "OK" to proceed.

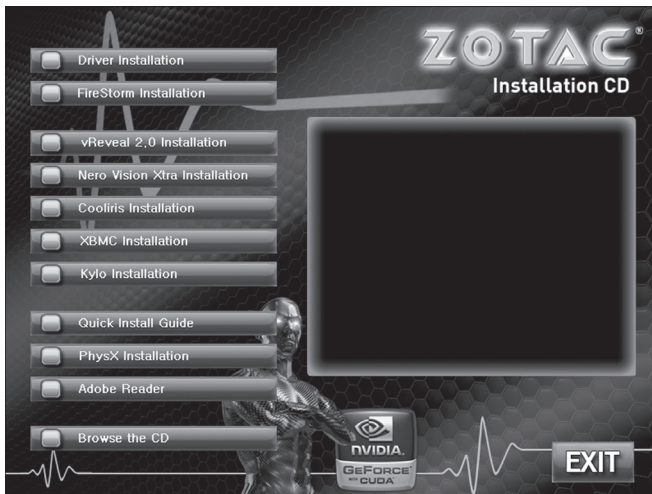
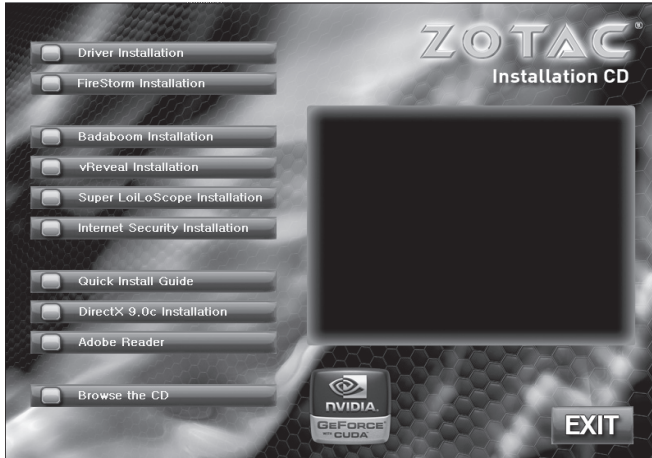


Fig 5-2 Driver Installation Main Menu

4. Click the box "Driver Installation", then the GPU (Graphics Processing Unit) selection box will show up.
5. Click the Scroll Bar to locate the GPU type which is used on the graphic card and then click to select the GPU.
6. The Operating System selection box will show up. Select the target Operating System and then click OK to start the driver installation.
7. Follow the instructions on the screen to complete the installation of graphics card driver and restart the system to let the driver take effect.
8. After the system restarts, bring up the Control Panel / Display Properties to select the display resolutions and color depth that meets your application and monitor requirements.



## Installing and updating driver from downloaded file

The procedure listed below is suitable for existing running computer systems, in which an older graphic driver was installed, or when the driver CD is unavailable, or an updated version graphic driver is necessary to fix certain known issues.

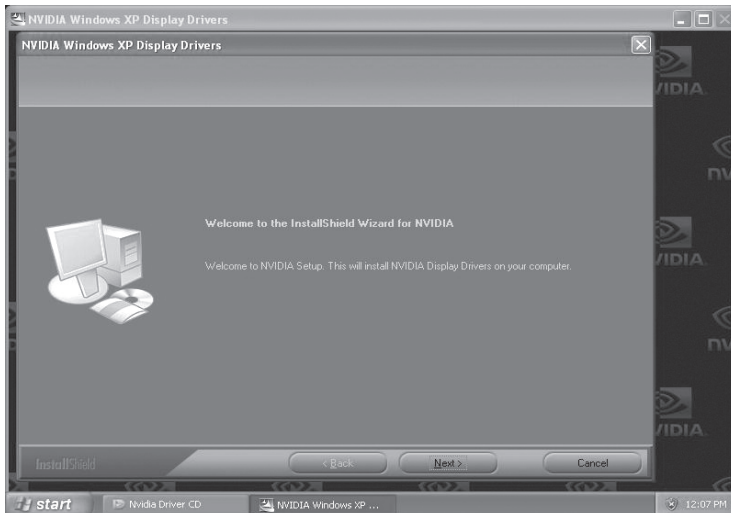
1. Identify the exact GPU on the graphic card, the target system Operating System type and download the graphic driver from the relevant web sites:

**ZOTAC Web Site:** <http://www.zotac.com>

**NVIDIA Web Site:** <http://www.nvidia.com>

The downloaded driver file may be in ZIP or EXE file type. If it is a ZIP file type, please expand the file using suitable software tools. Copy the EXE file or the expanded files to the hard disk drive on the target system.

2. On the target system, click the EXE file, or the Setup.EXE to start the graphic driver installation.



*Fig 5-3 NVIDIA Graphic Driver installation wizard screen*

3. Follow the instructions on the screen to complete the installation of graphic card driver and restart the system to let the new driver take effect.
4. After the system restarts, bring up the Control Panel / Display Properties to select the display resolutions and color depth which meets your application and monitor requirements.

## Removing graphics card driver

It may be necessary to remove an existing graphics card driver from the system, as for example, when changing the graphics card to a brand new GPU type. Follow the procedures below to remove the graphics card driver.

1. Start the computer system and boot to Windows® 7/Vista/XP Operating System.
2. Click “Start”, then “Control Panel” to bring up the functions for Control Panel.
3. Double click the “Add or Remove Programs” icon.

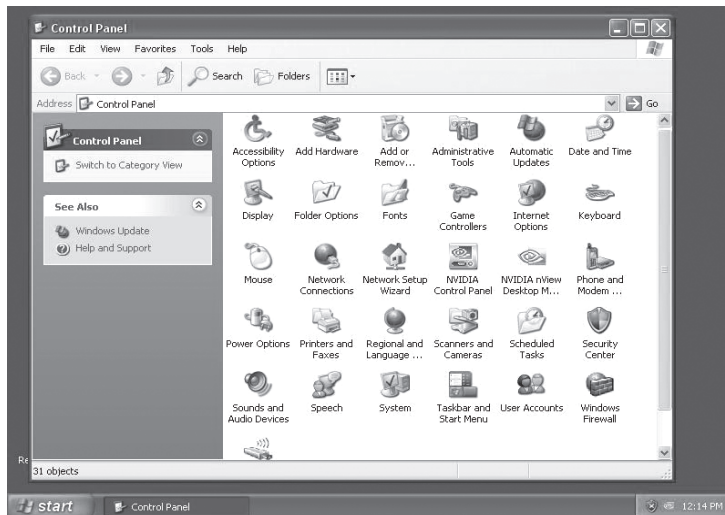
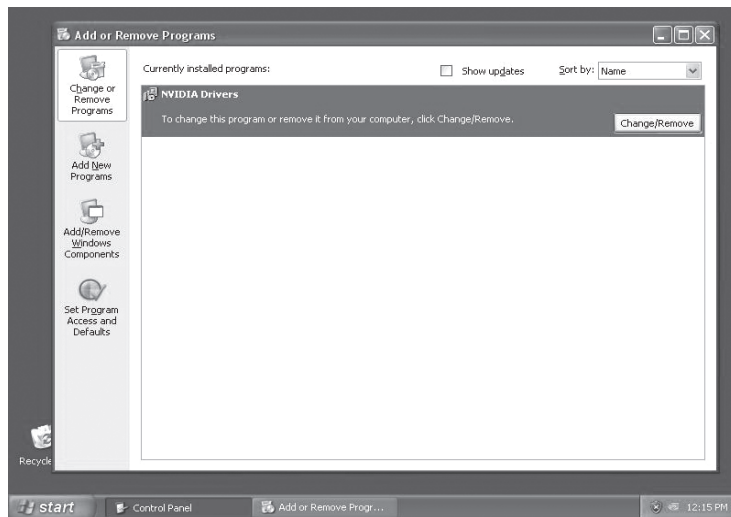


Fig 5-4 Control Panel - Add or Remove Programs

4. From the list of “Currently installed programs”, locate the target item, eg. “NVIDIA Drivers”, then click the “Change/Remove” box.



*Fig 5-5 Add or Remove Programs - Currently installed programs*

5. Follow the instructions on the screen to remove the graphics card driver.  
Restart to complete the process.
6. Shut down the system, turn off the main power and proceed to install the new graphics card.

## Appendix - Basic Troubleshooting

Symptom	Possible Cause	Solution
1. No display after the graphics card is installed	<p>The graphics card is not properly installed</p> <p>The display monitor is not properly connected</p> <p>The auxiliary DC power connector is not connected on the graphic card</p> <p>Insufficient power from the system power supply unit</p> <p>The graphics card is not supported by the motherboard in the system</p>	<p>Check the card to make sure it is properly secured into the slot.</p> <p>Check the signal cable to ensure the connectors are properly plugged into the graphics card and display monitor</p> <p>Check the auxiliary DC power socket on the graphics card to make sure it is properly plugged</p> <p>Check the technical documentation of the system to make sure the power supply unit is capable</p> <p>Check the technical documentation of the system, eg. AGP voltage requirement, to confirm that the card is supported on the motherboard</p>
2. Wrong display screen, wrong color, or distorted graphic on the screen	<p>The graphics card is not properly installed</p> <p>The display monitor is not properly connected</p> <p>The display monitor is unable to support the current resolution or refresh rate</p> <p>Connectors for component colors (HDTV) were not correctly plugged</p> <p>Another set of graphics card driver was installed in the system, which causes conflict</p> <p>The graphics card driver is corrupted</p>	<p>Check the card to make sure it is properly plugged into the slot</p> <p>Check the signal cable to ensure the connectors are secured and properly plugged into the graphic card and display monitor</p> <p>Check the technical documentation of the display monitor to make sure the current setting is supported</p> <p>Check the connectors for component colors (HDTV) to ensure proper connection</p> <p>Remove the driver, for which the graphics card is not present in the system</p> <p>Remove and re-install the graphics card driver</p>
3. Cannot switch to higher resolution, or higher color modes	<p>The graphic card driver is not installed or corrupted</p> <p>The attached display device does not support the high resolution mode</p>	<p>Remove and re-install the graphics driver</p> <p>Check the technical documentation of the display monitor and set to lower resolution if necessary</p>
4. Some LCD display monitors go blank during Windows® booting	<p>The LCD display monitor needs special driver software</p> <p>Current setting of display resolution is beyond the capability of the LCD display</p>	<p>Install the driver software for the LCD display monitor</p> <p>Enter Windows® Safe Mode and set a lower resolution</p>

## Glossary

### **AGP (Accelerated Graphics Port)**

An interface specification for graphics cards on older PCs. AGP was designed to offer the necessary bandwidth and latency to perform texture mapping directly from system memory.

### **BIOS (Basic Input/Output System)**

BIOS is a set of routines that control how the computer transfers data between computer components, such as memory, disks and the display adapter. The BIOS instructions are built into the computer's read-only memory. You can update the BIOS using a suitable software tool.

### **CPU (Central Processing Unit)**

The CPU, also called "Processor," actually functions as the "brain" of the computer. It interprets and executes program commands and processes data stored in the system memory.

### **Device Driver (software)**

A software routine that links a peripheral device to the operating system. It acts as a translator between the device and the applications that use it. Each device has its own set of specialized commands known only to its driver while the applications access devices using high-level generic commands. The driver translates these commands into the commands required by the devices.

### **DRAM (Dynamic Random Access Memory)**

A type of RAM that requires refresh cycles to prevent the loss of the data stored in it.

### **OS (Operating System)**

The software that controls the overall operation of a computer system. The OS tasks include memory allocation, input and output distribution, interrupt processing, job scheduling, and various other duties.

### **PCIe (PCI Express)**

The latest technology and interface specification for graphics cards, which enables high-performance 3D graphics on current PCs. PCIe offers larger bandwidth for data transfer, as compared with AGP bus.

### **POST (Power On Self Test)**

When you turn ON the computer, it will first run through the POST, a series of software-controlled diagnostic tests. The POST checks system memory, the motherboard circuitry, the display, the keyboard, the diskette drive, and other I/O devices.

### **RAM (Random Access Memory)**

The computer's primary storage area used to write, store, and retrieve information and program instructions which are passed to the CPU for processing. The information in RAM can be repeatedly re-written with new data. Compared to other storage media like magnetic tape, floppy disk, and hard disk, RAM has an extraordinarily fast access rate. RAM, however, is volatile, which means that the data stored in it are lost when the system power is turned off, or if power glitches occur.

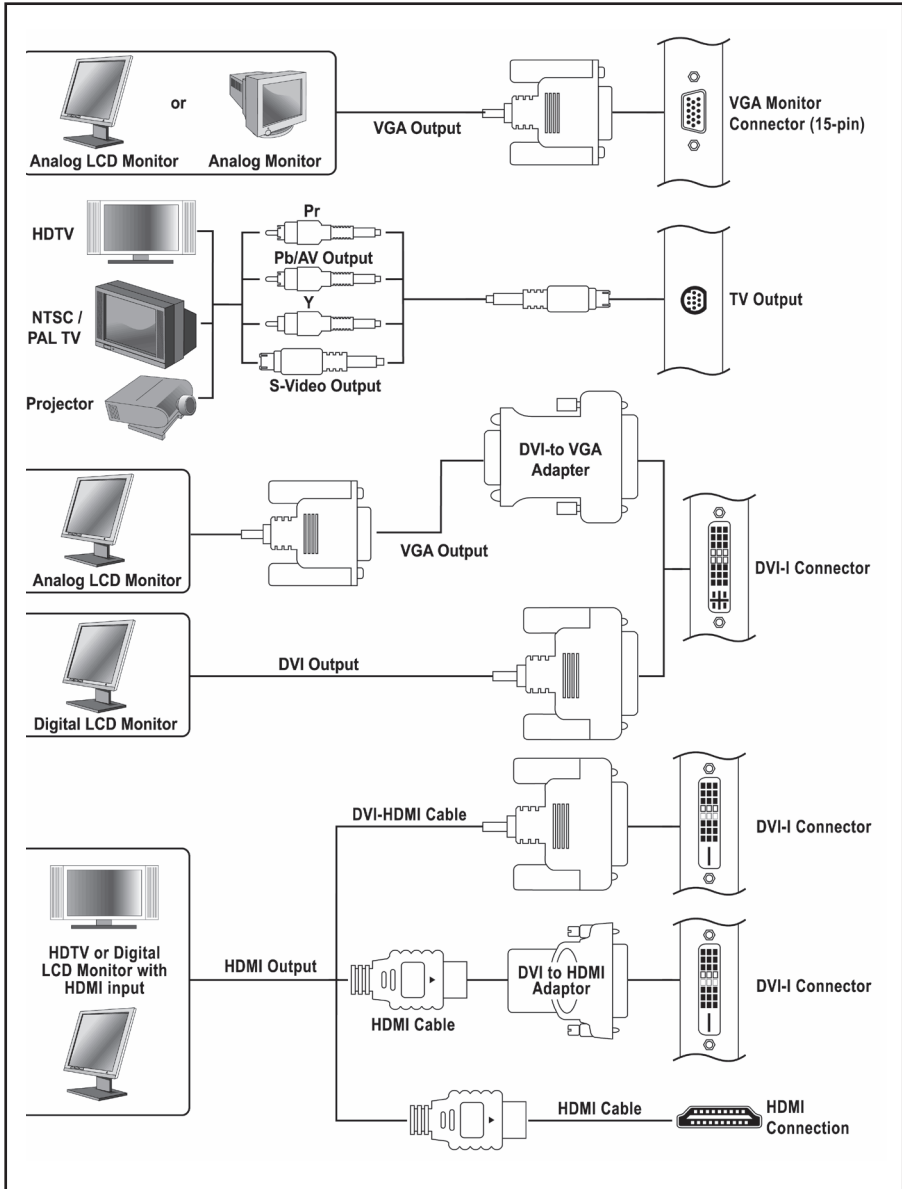
### **ROM (Read Only Memory)**

An integrated circuit chip containing program and data that can be accessed and read but not modified.

### **SDRAM (Synchronous DRAM)**

A type of DRAM with access signals that are synchronized with the CPU clock, eliminating the delay associated with data transfers between the CPU and memory. SDRAM takes memory access away from the CPU control; internal registers in the memory accept the request, and lets the CPU do something else while the data requested is assembled for the next time the CPU talks to the memory.

# Connecting Your Monitor



# ZOTAC®

*It's Time to Play.*

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