

NVIDIA



GeForce2 Ti 3D GRAPHIC ACCELERATOR MANUAL

NVIDIA GeForce2 Ti User's Manual

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1. NVIDIA GeForce2 Ti

Memory Size:

SP6600TI/32M	GeForce2 Ti32MB on Board with DDRSDRAM
SP6600TI/32M-TV	GeForce2 Ti32MB on Board with DDRSDRAM +TV out
SP6600TI/64M	GeForce2 Ti64MB on Board with DDRSDRAM
SP6600TI/64M-TV	GeForce2 Ti64MB on Board with DDRSDRAM +TV out

GeForce2 Ti, redefines graphics for mainstream computers, delivering 1 billion pixels/sec. rendering power and producing an amazing 6.4GB/sec. of bandwidth. The GeForce2 Ti provides consumers with unprecedented visual experiences at mainstream price points.

Transform and Lighting (T&L) are two very mathematically intense processes. Combined, T&L radically enhance photo-realism to create worlds that come alive on your screen. NVIDIA GPUs use separate T&L engines so that each can run at maximum efficiency.

The NVIDIA Shading Rasterizer(NSR) combined with the blazing fill rate of an NVIDIA GPU, delivers incomparable resolution and accuracy. Complex scenes are now rich with detail. Features such as per-pixel bump mapping can be utilized to a more dramatic visual effect.

NVIDIA's high-definition video processor covers the most expensive part of HDTV by transforming your computer into the optimal home entertainment system.

1.1 NVIDIA GeForce2 Ti DDR SDRAM Features

2ND-GENERATION GPU FEATURES

- Per-Pixel Shading
- High Definition Video Processor
- High Performance Hardware Anti-aliasing
- 256-bit Graphics Architecture
- AGP 4X with Fast Writes
- 32-bit color
- DXTC Support
- 8 Texels Per Clock
- 2nd-generation T&L Engines
- Double Data Rate (DDR) Memory
- Cube Environment Mapping
- Industry's only true 32-bit Z/Stencil
- DirectX Texture Compression

PERFORMANCE

- 1.0 Giga Texel Fill Rate
- 6.4GB/sec Memory Bandwidth
- Maximum 3D/2D resolution of 2048 x 1536 @ 75Hz
- Complete DirectX 7, DirectX 6 and DirectX 5 support
- Memory configurations, up to 64MB DDR SDRAM
- >31 Million Triangles/sec
- 350 MHz RAMDAC

VISUALLY STUNNING INTERACTIVE 3D

- Optimized DirectX and OpenGL acceleration
- 8 texture-mapped, filtered, lit texels per clock cycle
- HW Anti-aliasing
- High Quality Texture Filtering, including Anisotropic
- Per-pixel dot product 3 bump mapping
- Projective textures
- Texture modulation
- Reflection maps
- DX6 texture compression
- Radial or linear
- Advanced per-pixel, perspective-correct texturing and shading
- BRDF Support: Bi-Directional Reflectance Distribution Functions
- 256-bit graphics engine
- Single pass multi-texturing
- 32-bit Z/stencil buffer
- Per-pixel lighting and shading
- Cub environment mapping
- Multi-texture and multi-pass
- Light maps
- Procedural textures
- Fog and Depth Cueing
- Per-vertex or per-pixel

HIGH-PERFORMANCE 256-BIT 2D ACCELERATION

- Optimized for multiple color depths including 32, 24, 16, 15, and 8-bits per pixel
- True-color hardware cursor
- Multi-buffering (double, triple, quad buffering) for smooth animation and video playback

HIGH-QUALITY HDTV/DVD PLAYBACK

- Independent hardware color controls for video overlay
- Hardware color space conversion (YUV 4:2:2 and 4:2:0)
- 5-tap horizontal by 3-tap vertical filtering
- 8:1 upscaling and downscaling
- Per-pixel color keying
- DVD sub-picture alpha blended compositing
- High Definition Video Processor (HDVP) for full-screen, full-frame video playback of all HDTV and DVD and resolutions
- Multiple video windows with hardware color space conversion and filtering
- Video acceleration for DirectShow, MPEG-1, MPEG-2, and Indeo

COMPREHENSIVE SYSTEM INTERFACE

- AGP 4X support, including Fast Writes and Execute Mode
- NTSC or PAL TV output (optional)
- DVI digital output connector, support TMDS Panellink resolution up to SXGA (optional)

OPERATING SYSTEM Support

- Windows XP, Windows 2000, Windows ME, Windows 98 and Linux

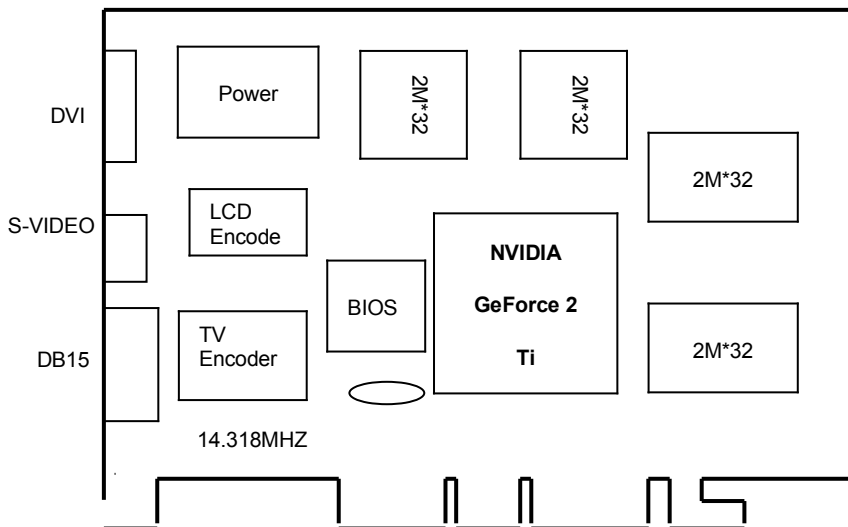
API Support

- OpenGL 1.2 and lower
- DirectX 7 and lower

2. GeForce2 Ti Board Outline

2.1 GeForce2 Ti using DDR SDRAM (SP6600TI/32M, SP6600TI/32M-TV)

32M on board – 2Mx32 DDR SDRAM x 4



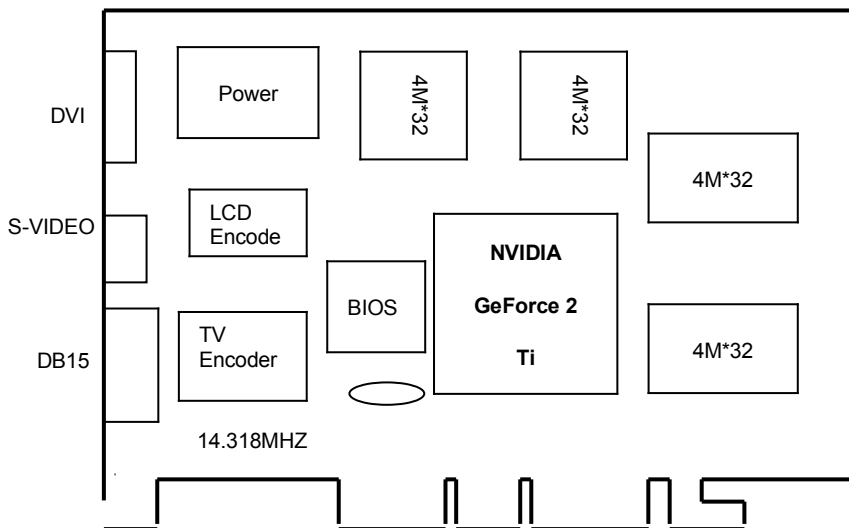
NOTE 1: TV output connector and TV encoder are reserved for optional

NOTE 2: DVI connector and LCD encoder are reserved for optional

2.2 GeForce2 Ti using DDR SDRAM (SP6600TI/64M, SP6600TI/64M-TV)

64M on board – 4Mx32 DDR SDRAM x4

64M on board – 2Mx32 DDR SDRAM x8



NOTE 1: TV output connector and TV encoder are reserved for optional

NOTE 2: DVI connector and LCD encoder are reserved for optional

3.Hardware installation

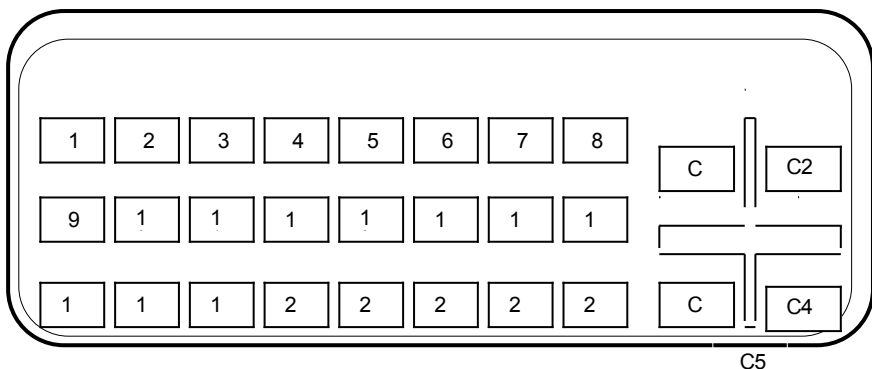
3.1 Package Contents

1. NVIDIA GeForce2 Ti 3D Accelerator card
2. CD title or Software diskettes
3. This manual

3.2 Installing the card

1. Turn off your computer
2. Remove the cover of the computer per the owner's manual
3. Install the card in the AGP bus slots
4. Replace the cover.

3.3 Micro Cross DVI Connector System



“Micro Cross:”/high speed pins;

- C1 Analog Red Video Out
- C2 Analog Green Video Out
- C3 Analog Blue Video Out
- C4 Analog Horizontal Sync
- C5 Analog Common Ground Return (Red , Green , Blue Video Out)

Main Pin Field:

- 1. TMDS Data 2-
- 2. TMDS Data 2+
- 3. TMDS Data 2/4 Shield
- 4. TMDS Data 4-
- 5. TMDS Data 4+
- 6. DDC Clock
- 7. DDC Data
- 8. Analog Vertical Sync
- 9. TMDS Data 1-
- 10. TMDS Data 1+
- 11. TMDS Data 1/3 Shield
- 12. TMDS Data 3-
- 13. TMDS Data 3+
- 14. +5V Power
- 15. Ground (+5, Analog H/V Sync)
- 16. Hot Plug Detect
- 17. TMDS Data 0-
- 18. TMDS Data 0+
- 19. TMDS Data 0/5 Shield
- 20. TMDS Data 5-
- 21. TMDS Data 5+
- 22. TMDS Clock Shield
- 23. TMDS Clock
- 24. TMDS Clock

3.4 Resolutions and colors supported:

Reference Table based on V21.83 Win9X Driver List

GeForce2 Ti

	B.P.P.	Refresh Rates (HZ)
640*480	8	60/70/72/75/85/100/120/140/144/150/170/200/240
	16	60/70/72/75/85/100/120/140/144/150/170/200/240
	32	60/70/72/75/85/100/120/140/144/150/170/200/240
800*600	8	60/70/72/75/85/100/120/140/144/170/200/240
	16	60/70/72/75/85/100/120/140/144/170/200/240
	32	60/70/72/75/85/100/120/140/144/170/200/240
1024*768	8	60/70/72/75/85/100/120/140/144/150/170/200/240
	16	60/70/72/75/85/100/120/140/144/150/170/200/240
	32	60/70/72/75/85/100/120/140/144/150/170/200
1152*864	8	60/70/72/75/85/100/120/140/144/150/170/200
	16	60/70/72/75/85/100/120/140/144/150/170/200
	32	60/70/72/75/85/100/120/140/144/150
1280*960	8	60/70/72/75/85/100/120/140/144/150/170
	16	60/70/72/75/85/100/120/140/144/150/170
	32	60/70/72/75/85/100/120/140/144/150
1280*1024	8	60/70/72/75/85/100/120/140/144/150/170
	16	60/70/72/75/85/100/120/140/144/150/170
	32	60/70/72/75/85/100/120/140/144/150
1600*900	8	60/70/72/75/85/100/120/140/144/150
	16	60/70/72/75/85/100/120/140/144/150
	32	60/70/72/75/85/100/120
1600*1200	8	60/70/72/75/85/100/120
	16	60/70/72/75/85/100/120
	32	60/70/72/75/85/100
1920*1080	8	60/70/72/75/85/100
	16	60/70/72/75/85/100
	32	60/70/72/75/85
1920*1200	8	60/70/72/75/85/100
	16	60/70/72/75/85/100
	32	60/70/72/75/85
1920*1440	8	60/70/72/75/85
	16	60/70/72/75/85
	32	60/70/72/75
2048*1536	8	60/70/72/75
	16	60/70/72/75
	32	60

Different driver version or different windows platform may have different support table.

4. Smart Installation

For Windows XP, Windows 2000, Windows 98, Windows ME

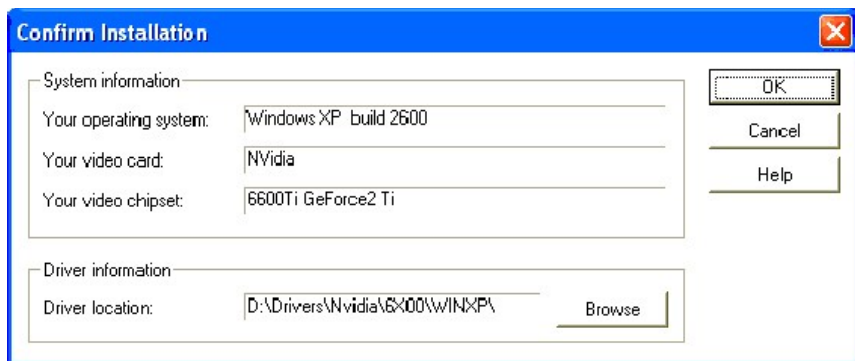
4.1 Put the DRIVERS CD in your CD-ROM



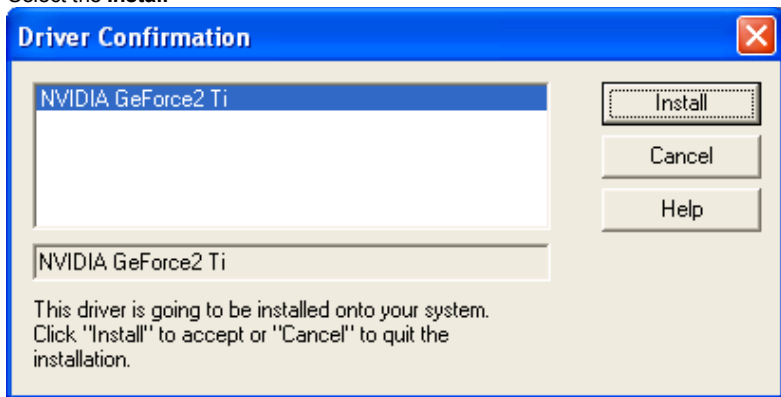
4.2 Click **Driver installation**

4.3 If everything fine, screen will show **Confirm Installation** window.

Then Select **OK**



- 4.4 Now appears the **Driver Confirmation** window
Select the **Install**



If the drivers is very new may not certified by Microsoft, if so, system will prompt you the drivers do not have "digital signature", still you can force to install.

- 4.5 Then **restart your computer**.



5. Manually install Windows XP drivers

5.1 Installation and Setup

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows XP drivers.

1. Insert the DISC (CD Title Driver).
2. Select **Control Panel** from **Start menu**
3. Select the **Display** icon
4. Double-click on the **Display** icon in the **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option from the pop-out menu.
5. Click **Settings**, and then **Advanced**
6. Now shows **[Plug And Play Monitor and NVIDIA...]** window
Select **Adapter**
7. Then show **Standard PCI Graphics...(or NVIDIA GeForce...)**
Select **Properties**
8. Then show **Adapter Properties ...**
Select **Driver** and click **Update driver...**
9. Then show **Hardware Update Wizard**
Select **Install from a list or specific location (Advanced)** – recommended for saving installation time
Then select **Next**.
10. Default setting will select **Search for the best driver in these locations**
Please check **Include this location in the search** – recommended for saving installation time
Select **Browse**
11. Then show **Browse for Folder**
Select **E:\drivers\ NVIDIA\6X00\WinXP**
Note: “E:”-> CD Drive, “NVIDIA”-> VGA chip brand name, “6X00”-> VGA model number
Then select **OK** and then click **Next**
12. If no problem occur, system will start to install the driver
13. Then show **Completing the Hardware Update Wizard**
Select **Finish**
14. Close the **Adapter Properties** window
15. Then show **System Settings Change**
Select **OK**, System will restart automatically.

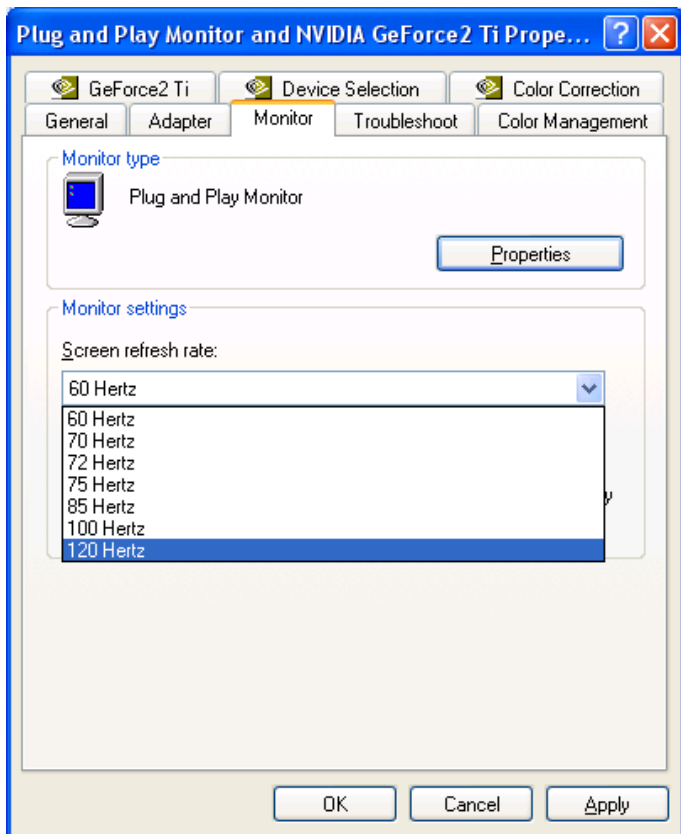
5.2 How to Change Color Depth and Resolution in Windows XP

1. **Make sure that you have installed Windows Driver.**
2. Select **Control Panel** from **Start menu**
3. Select the **Display** icon
4. Double-click on the **Display** icon in the **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option from the pop-out menu.
5. **Click Settings**
6. **Click on the pull-down arrow from the Color palette area to select color depth or adjust the sliding bar to either Less or More from the Desktop area**
7. **Select OK to restart System and new color depth or the new resolution takes effect.**

5.3 How to Change Refresh Rate in Windows XP

1. Make sure that you have installed windows XP Driver. Click on the **Start** box in the lower left corner and proceed to Setting, **Control Panel**
2. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and choose **Settings** click the **Advance Settings** choose **Monitor**
3. Click on the **Refresh Rate** sub window to change refresh rate
4. Select **OK** and new refresh rate takes effect
5. Refresh Rate default is Optimal.
6. If you change Refresh Rate from Optimal to another, you maybe need to restart Windows System for functional.

Note: If your monitor is not Branded or Plug&Play, you will only see Adapter default and optimal. Please contact your monitor supplier to get right or compatible drivers for your monitor. Otherwise you can not select the refresh rate you wanted.



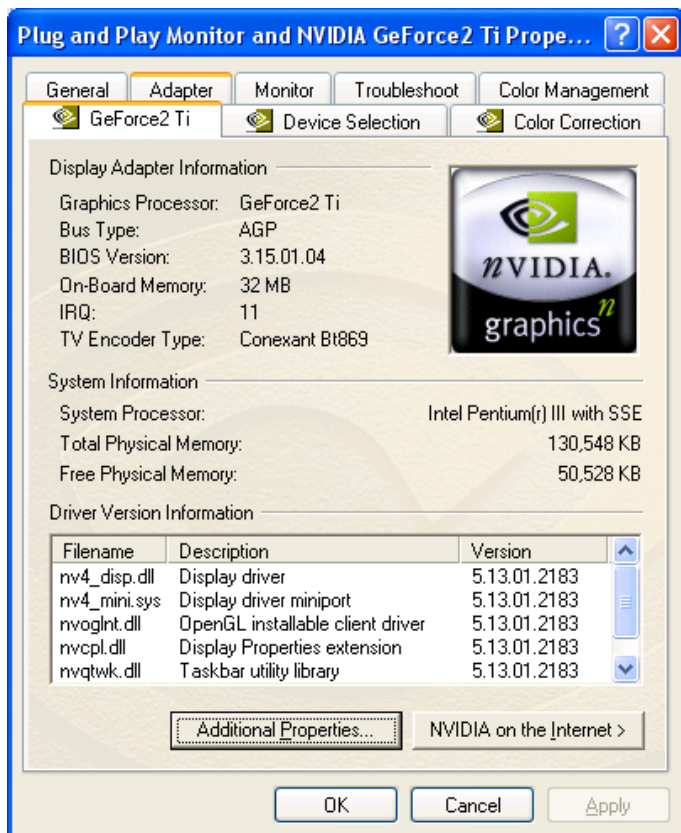
5.4 NVIDIA Utility in Windows System

5.4.1 GeForce2 Ti

Display Adapter Information Table, you can tell the BIOS and Drivers version, NVIDIA Chip model name, IRQ setting and many useful information.

Additional properties is for advance user to setting OpenGL, DirectX and other settings.

NVIDIA on the Internet can reach NVIDIA official web site for more NVIDIA news.



5.4.2 Device selection

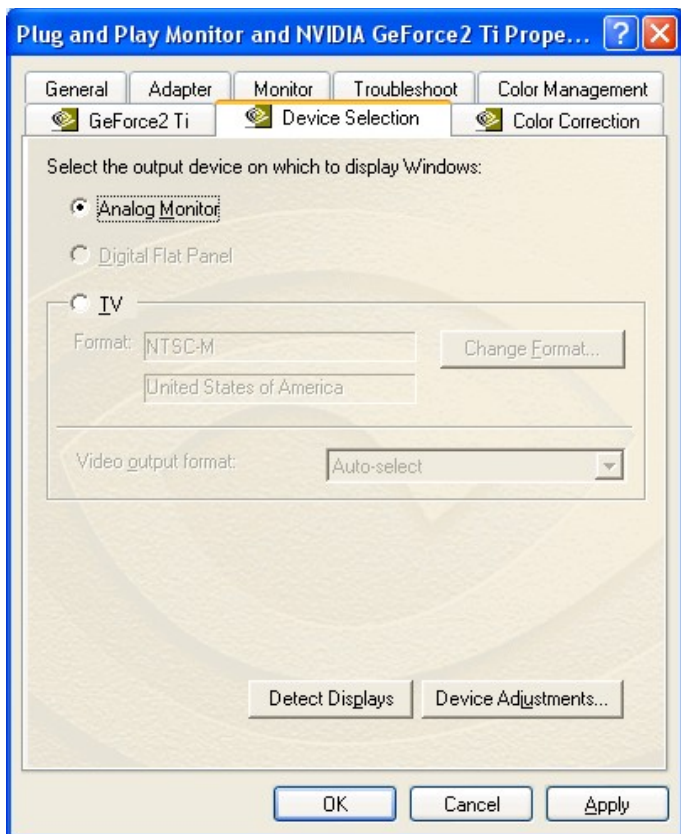
Select output device, if all the optional connector is connected, you will be able to select DVI or TV output as Windows default display device. Geforce2 Ti do not support TwinView. Only the device is plugged and functional, then you will be able to check the selection box. If you plug the connector after window boot up, click **Detect Displays** will functional the plugged output device check box.

For **Digital Flat Panel**, support only TMDS Panel Link compatible digital LCD monitor. Resolution support up to SXGA-1280x1024.

For **TV**, support both NTSC and PAL system TV, click **Change Format** to select your country and TV system.

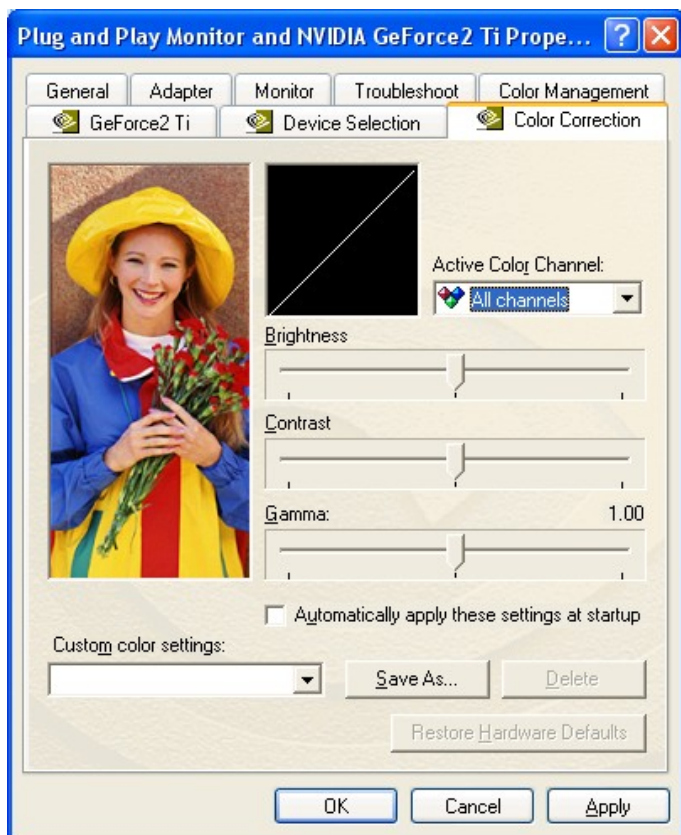
If you can not switch from PAL back to NTSC, please set resolution to 640x480 and try again.

For **Device Adjustments**, you can adjust the screen position



5.4.3 Color correction

This Window shows NVIDIA Digital Vibrance is functional and you can adjust Brightness, Contrast, Gamma and save it as your favorite setting. If you don't like your adjustments, you can also check **Automatically apply these settings at startup** to change it back.



6. Manually install Windows 98 and Windows ME drivers

6.1 Installation and Setup

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 98/ME drivers.

1. Insert the DISC (CD Title Driver).
2. Select **Control Panel** from **My Computer** group.
3. Select the **Display** icon
4. Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option from the pop-out menu.
5. Click the **Settings** tab.
6. Then show **[Unknown Device.] Properties** tab
Select **Adapter**
7. Then show **Standard PCI Graphics...** tab
Select **Change**
8. Then show **Update Device ...** tab
Select **Next**
9. Then show **Update Device ...** tab
Select **Search for a better...**
Then select **Next**.
10. Then show **Update Device ...** tab
If the **Specify a location** is wrong
Please select **Brows**
11. Then show **Browse for Folder** tab
Select **E:\drivers\ NVIDIA\6X00\Win9X (or \Winme)**
Note: "E:" -> CD Drive, "NVIDIA" -> VGA chip brand name, "6X00" -> VGA model number
Then select **OK**
12. Then show **Update Device Driver Wizard** tab
Select **CD-ROM driver**
Click the **Specify a locator**, if right
Then select **Next**
13. Then show **Update Device Driver Wizard** tab
Select **Next**
14. Then show **Update Device Driver Wizard** tab
Select **Finish**
15. Then show **System Settings Change** tab
Select **OK**

6.2 How to Change Color Depth and Resolution

1. **Make sure that you have installed windows 98/ME Driver.**
2. **Click on the Start box in the lower left corner and proceed to Control Panel.**
3. **Inside the Control panel group , click on Display icon to open the Display Properties folder and select the Setting table**
4. **Click on the pull-down arrow from the Color palette area to select color depth or adjust the sliding bar to either Less or More from the Desktop area**
5. **Select OK to restart Windows System and new color depth or the new resolution takes effect.**

6.3 How to Change Refresh Rate

1. Make sure that you have installed windows 98/ME Driver. Click on the **Start** box in the lower left corner and proceed to Setting, **Control Panel**
2. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and choose **Settings** click the **Advance Settings** choose **Adapter**
3. Click on the **Refresh Rate** sub window to change refresh rate
4. Select **OK** and new refresh rate takes effect
5. Refresh Rate default is Optimal.
6. If you change Refresh Rate from Optimal to another, you maybe need to restart Windows System for functional.

Note: If your monitor is not Branded or Plug&Play, you will only see Adapter default and optimal. Please contact your monitor supplier to get right or compatible drivers for your monitor. Otherwise you can not select the refresh rate you wanted.

7. Manually install Windows 2000 drivers

First time install drivers under windows2000

1. When system boot up, system will prompt find new device. Suppose the device is VGA, now system will find the default drivers for you.
2. If you want to install our drivers along with the SP6600TI pack. Please put the drivers CD in your CDROM drive. If now shows SmartInstall window, please click **EXIT** button to quit.
3. Drivers for windows2000 are located at \drivers\NVIDIA\6X00\win2000
4. If the drivers is very new may not certified by Microsoft, if so, system will prompt you the drivers do not have "digital signature", still you can force to install.
5. Follow on screen instructions will finish the installation.

The following steps describe how to update Windows2000 display drivers

1. Place the Disc (CD Title) into CDROM Drive. If now shows SmartInstall window, please click **EXIT** button to quit
2. Right click mouse button on Desktop Area, now shows a sub menu window. Please select **Properties**.
3. Now come up **Display Properties** window, please select **Settings** on the top.
4. Select **Advanced**
5. Select **Adapter**.
6. Select **Change**
7. Now comes up a update drivers wizard window. Please follow the on screen instruction to go on.
8. Please specify the drivers location at your CDROM:\drivers\NVIDIA\6X00\win2000 or the directory where you put your drivers
9. Select **Install** and click "**YES**" when the Installing Driver dialog box appears. If the drivers is very new may not certified by Microsoft, if so, system will prompt you the drivers do not have "digital signature", still you can force to install.

A message appears stating that drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart Windows2000 to run the new driver. Click **OK**.

FCC Statement

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. (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning:

Note: 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 the instructions, may cause harmful interference to radio or television reception. 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice:

(1) An Unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

(2) Use only shielded cables to connect I/O devices to this equipment.³

(3) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Trademark Acknowledgments

All brand names and trademarks are the property of their owners.

