# 3Dlabs, Inc.
# Wildcat4 Graphics Accelerator Card
# User's Guide

# CONTENTS

# CHAPTER 1– INTRODUCTION

# Welcome to 3Dlabs!

Thank you for selecting a 3Dlabs® Wildcat4™ Graphics Accelerator Card!

This User Guide is designed to provide information about Wildcat4 Graphics Accelerator Cards. In addition to this guide, you are strongly encouraged to use the online help included in the 3Dlabs driver software Help screens.

# System Requirements

- Intel® AGP 8x motherboard

- Microsoft Windows 2000 (SP2) or Windows XP (32-bit).

- AGP Pro 50 expansion slot Note: For maximum performance, the card should only be installed in systems that support AGP 3.0 at 8x speeds.

- One open PCI slot adjacent to the AGP Pro 50 slot

- 128 MB minimum, 512 MB (or greater) recommended for best performance

- Industry-standard, multiple-frequency monitor (VGA) or a Digital Video Interface (DVI-I) compliant digital display device

- 3 MB of free space on the computer's primary system disk for the video display driver software

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| NOTE: | If you purchased your Wildcat4 Graphics Accelerator Card as part of a system, it was preconfigured to operate in your system prior to shipment. No other modifications are necessary. Also, your system's video drivers were installed prior to shipment and are operative when you receive the system. No further installation or configuration is necessary unless you purchased a customer kit or need to reinstall your video card. Store the driver delivery media that came with your system in a safe place in case you ever need to reinstall the drivers. |
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For more detailed information on the operating system, refer to Microsoft's web site or to the printed documentation delivered with the system.

# Features

| | |
|---|---|
| Card Interface | AGP Pro 50 card designed for systems that have a 50-watt AGP Pro slot.<br><br>NOTE: THE WILDCAT4 7210 OR WILDCAT4 7110 CANNOT PLUG INTO A STANDARD AGP SLOT. |
| Video Memory | **Wildcat4 7210**<br>▪ Frame Buffer: 128 MB DDR memory<br>▪ Texture Buffer: 256 MB DDR memory<br><br>**Wildcat4 7110**<br>▪ Frame Buffer: 128 MB DDR memory<br>▪ Texture Buffer: 128 MB DDR memory |
| Graphics Controller | High-speed Wildcat4 chipset technology with dual display support. |
| RAMDAC | 320 MHz |
| Plug-and-Play Monitor Support | Yes |
| OpenGL 1.3 Support | Yes |
| DirectX 7 Support | Yes |
| OpenML 1.0 Support | Yes |
| Maximum Resolution; Aspect Ratio; Refresh Rate | 2048 x 1152; 16:9; 75 Hz<br><br>NOTE: SUPPORTED REFRESH RATES, MONITOR RESOLUTIONS, ASPECT RATIOS, AND COLOR DEPTHS DEPEND ON YOUR TYPE OF MONITOR, WHETHER OR NOT YOU HAVE MULTISAMPLING SELECTED AND IF YOU ARE USING SINGLE OR DUAL MONITORS. SEE *Appendix A, Specifications*, FOR A LIST OF SUPPORTED RESOLUTIONS AND REFRESH RATES.<br><br>TO DISPLAY AT A SPECIFIC RESOLUTION WITH THE DESIRED REFRESH RATE, BOTH THE VIDEO CARD AND MONITOR MUST SUPPORT THAT REFRESH RATE. REFER TO THE DOCUMENTATION THAT CAME WITH YOUR MONITOR FOR A LIST OF SUPPORTED VIDEO RESOLUTIONS. |
| Power Management Support | • Display Power Management Signaling (DPMS)<br>• Advanced Configuration and Power Interface (ACPI) |
| Geometry Acceleration | • Model view matrix transformation of vertex and normal coordinates<br>• Perspective and viewport transformations<br>• Texture matrix transformation of texture coordinates<br>• Local display list storage and processing<br>• Full lighting calculations (up to 32 lights)<br>• View volume clipping<br>• Up to six user clip planes<br>• Image processing |
| Traditional 2D Operations | • 16- and 32-bit color depths (565, 8888)<br>• Solid, patterned, and gradient area fills<br>• Vectors (diamond rule compliant)<br>• Block moves (screen-to-screen)<br>• Block gets (screen-to-system)<br>• Block puts (system-to-screen)<br>• Bilinear scaling |

| Features, cont. | |
|---|---|
| Texture Modes | Global and local |
| OpenGL (1.3 Compliant) Extension Support | • Imaging Extensions:<br>  Pixel buffer<br>  Color table<br>  Color matrix<br>  Convolution<br>• Blend Extensions:<br>  Color<br>  Minmax<br>  Function separate<br>  Subtract<br>  Transpose Matrix<br>• Fog Extensions:<br>  Fog function<br>  Fog offset<br>• Occlusion culling<br>• Texture Extensions:<br>  3D textures: edge, border, and LOD clamps<br>  Mipmap generation<br>  Color table<br>  Color masking<br>  LOD<br>  4D<br>• Video Extensions:<br>  Interlace<br>  Interlace read<br>  422 pixels<br>• Swap Control Extensions:<br>  Swap control<br>  Swap frame lock<br>  Swap usage<br>• Pixel texture and 3D texturing<br>• Pbuffer<br>• Image buffer<br>• Gamma<br>• Stencil operation wrap<br>• Separate specular<br>• Post-texturing specular |

| Features, cont. | |
|---|---|
| OpenGL Operations | • Points (2D, 3D, wide)<br>• Vectors (2D and 3D lines and line strips; wide, stippled)<br>• Polygons (triangles, triangle strips, quads, quad strips, polygons, point/line polygon mode)<br>• Antialiased points, vectors, and polygons<br>• Image support (multiple formats, zoom, color matrix, color tables)<br>• Alpha Operations<br>• Scissoring<br>• Window clipping<br>• Masking<br>• Fogging (linear, exponential, exponential$^2$, user-defined)<br>• Texture mapping (point, bilinear, trilinear, 3D, cube-mapped, bump-mapped)<br>• Multiple Internal Texture Formats (RGBA: 8888, 5551, 4444; luminance-alpha)<br>• Multi-texturing (2 sets of texture coordinates)<br>• Extensive texture environments (blend, modulate, decal, replace, add, subtract, interpolate, dot3)<br>• Stencil Operations<br>• Dithering<br>• Rich set of blending operations<br>• Depth buffering (24- and 32-bit) |
| Additional Features | • SuperScene full-scene multisampled anti-aliasing:<br>    Point sampled with sixteen samples<br>    Sample location jittering<br>    Dynamic sample allocation<br>    Dynamic sample backoff<br>• Two video look-up tables<br>• Eight stencil planes<br>• Eight double-buffered overlay planes<br>• 32-bit Z buffer<br>• High-performance DACs that directly drive display devices<br>• DDC2B Display Data Channel standard<br>• Stereoscopic Viewing Support—Interlaced or Frame Sequential<br>• Multiview and Genlock support (Wildcat4 7210 only).<br>• Onboard texture memory with full mipmapped trilinear interpolated texture processing<br>• Digital Video Interface (DVI) display support (single or dual DVI-I support)<br>• Big and Little Endian support<br>• Global and local texture modes<br>• Textures per screen |

# CHAPTER 2 – SETUP

# Preparing for Installation

**NOTE:** **If you purchased your Wildcat4 Graphics Accelerator Card as part of a system, it was installed and configured prior to shipment. The following instructions for hardware installation are necessary only if you purchased a customer kit or need to reinstall your video card.**

## *Before you begin your installation*

1. Save any work in progress and exit any open applications. Always back up your system before you install any new hardware or software.
2. Have a Phillips-head screwdriver ready.
3. Turn off power to the computer.

**IMPORTANT:** **Physically remove the power cord from the system and wait 15 to 30 seconds for standby power to dissipate. Damage can occur to add-in components if power is not physically removed from the system during installation procedures.**

4. Take every possible precaution against static electricity as you prepare to install the card. Static can damage components. If an anti-static wrist strap was included in your box, please use it during hardware installation. You should also try to work in a static free area (such as on a tile floor rather than carpet).

   - Touch the metal chassis of the computer to drain off any static electricity before touching the card.
   - Do not wear wool or polyester clothing.
   - Work in an area with a relative humidity of at least 50 percent.
   - Keep the card in the anti-static bag until you are ready to install it.
   - Handle the card as little as possible and only by the edges.

**NOTE:** **Be sure to register your new card using one of the options described on page 16.**

## *Installing your Wildcat4 Graphics Accelerator Card*

1. Refer to your computer's documentation for instructions on opening and closing the computer, identifying the AGP Pro expansion slot and PCI expansion slots, and adding expansion cards.
2. Check your system documentation to locate the appropriate slots in which to install your card. Both cards must have an adjacent PCI slot empty for cooling purposes.
3. Turn off power to the computer and to the monitor and disconnect the cables from the computer (follow the instructions under "Before you begin your installation").

**NOTE:** **If you are replacing a graphics card, be sure to uninstall your old video driver software before tuning off your system and removing your old graphics card. Refer to *Installing the Driver Software* later in this chapter for details on uninstalling drivers.**

4. Remove the cover from your system so you can access the slots into which you will be installing your Wildcat4 Graphics Accelerator Card. If you have not already removed any existing graphics card(s) from your system, then do so now.
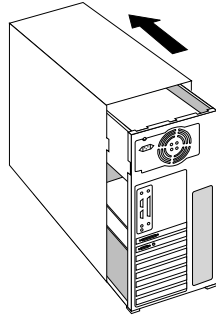


5. If necessary, remove the back panel covers from the slots into which you are installing your Wildcat4 Graphics Accelerator Card, using a Phillips-head screwdriver.
6. If an anti-static wrist strap was included in your box, attach it to your wrist and attach the other end to a bare metal (as opposed to painted or sticker covered) surface on your system's chassis.
7. Remove your Wildcat4 Graphics Accelerator Card from its anti-static packaging. Write down the
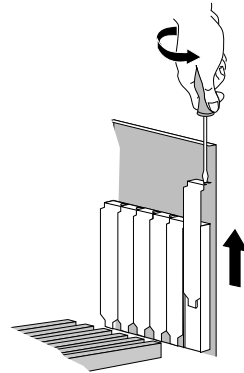


serial number for product registration and future use. The serial number is located on a board label and looks like this:



136001B123456  Made in XXX Week XXXX

8.   Place the card into the correct slots and seat firmly. See your system documentation for instructions on securing the card to the chassis. Loose cards and connections can cause grounding and operating problems.

9.   Remove the anti-static wrist strap, if used, and replace the cover on your system.

10.  Reconnect the power cord.
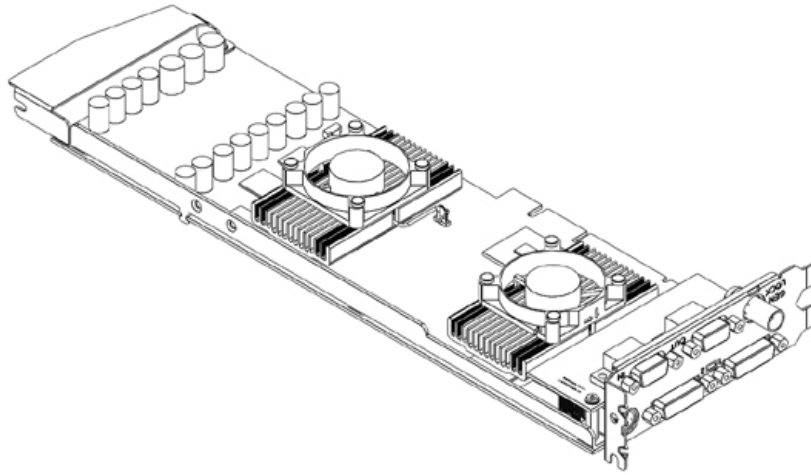


**Wildcat4 7210**
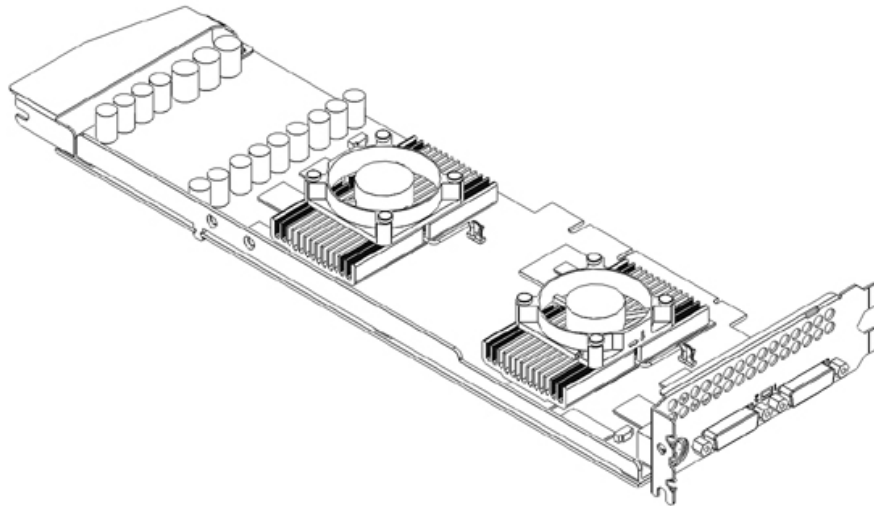


**Wildcat4 7110**

## *If you are upgrading the graphics card in your system*

| NOTE: | These instructions may be different than how you normally upgrade your graphics card or other devices, but have been found to be the best method of insuring a successful installation of your new hardware and software. |
|---|---|

1. Uninstall the drivers for your old graphics card. Refer to your old graphics card's documentation or Help files for instructions on removing or uninstalling the old graphics card's driver software.
2. Remove the existing graphics card from your system. To install your Wildcat4 Graphics Accelerator Card, see the hardware installation instructions.
3. Install the Wildcat4 Graphics Accelerator Card driver software; see "*Installing the Driver Software*" later in this chapter.

## *Connecting the Monitor*

The **Wildcat4 7210** supports six standard external connectors:

1. Primary and Secondary DVI-I output ports (also support analog monitors with additional adapter)
2. One Genlock In connector
3. One 3-Pin, MiniDIN Stereo Sync Output connector
4. Multiview In and Multiview Out ports (two 9-pin, D-sub connectors)

The **Wildcat4 7110** supports connections for three standard external connectors:

1. Primary and Secondary DVI-I output ports (also supports analog monitors with additional adapters)
2. One 3-Pin, MiniDIN Stereo Sync Output connector
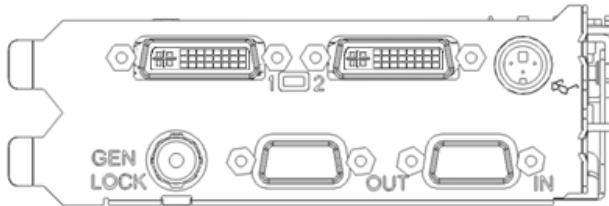


Wildcat4 7210 Input/Output panel                    Wildcat4 7110 Input/Output panel
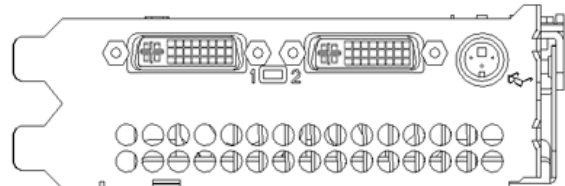
## *Connecting a DVI monitor*

1. Make sure the power to the computer is turned off.
2. See the documentation that came with your monitor for information on the type of connection that is required. Your monitor cable will have either a Digital Video Interface (DVI)-I connector or a 15-pin VGA connector depending on monitor type. If your monitor is a VGA monitor see *"Connecting a VGA monitor"* in this chapter.
3. Connect the workstation monitor's video cable to the primary DVI-I port on the Wildcat4 video card. This connector is labeled "1" in the picture above and on the I/O panel of your card.

4. Turn on power to the workstation. If the monitor's Power On LED does not illuminate or the monitor does not display the startup sequence, consult Chapter 4, *"Troubleshooting."*

**CAUTION:** **If you are connecting only one monitor to the Wildcat4, you must plug that monitor into the Primary DVI-I port (labeled "1" on the I/O panel of your card).**

**NOTE:** **If you are connecting an additional monitor to the Wildcat4, connect the additional workstation monitor's video cable to the secondary DVI-I port. See *"Enabling the Dual Monitor Feature"* later in this document for information on configuring dual displays.**

## Connecting a VGA monitor

**NOTE:** **You must use a DVI-to-Analog adapter to connect a VGA monitor to the Wildcat4. You can purchase this adapter from our e-store.**

1. Connect the monitor's 15-pin VGA connector to the VGA end (see below) of the DVI-to-Analog adapter.
2. Connect the DVI-I end of the adapter to the primary DVI-I port (label "1") on the 3Dlabs Wildcat4 video card.

**NOTE:** **If you are connecting both a VGA and digital flat panel monitor, you must connect the VGA monitor to the primary DVI-I port (labeled "1").**

3. Turn on power to the workstation. If the monitor's Power On LED does not illuminate or the monitor does not display the startup sequence, consult Chapter 4, "Troubleshooting."
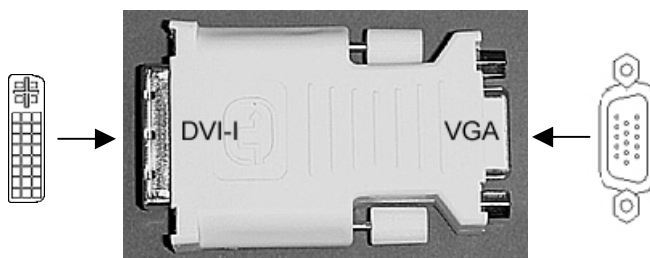


**NOTE:** **If your monitor does not have a built-in video cable, use a shielded video cable with either a DVI-I receptacle or a 15-pin VGA video connector (with adapter) at one end for the video output port on the card, and the appropriate connectors at the other end for the video input port on the monitor. See the documentation delivered with your monitor for more information.**

**If you ordered the Wildcat4 video card with a system, it was installed and configured prior to shipment. See Chapter 3, *"Using the Video Card,"* for instructions on adjusting the resolution, color depth, and refresh rate.**

# Attaching a Stereo Device

Power off your system and connect the stereo hardware to the round, stereo connector on the card. See the documentation that came with your stereo hardware for information on how to use stereoscopic display. Plug in and start up your system, including peripherals, and log on to your operating system.

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| **NOTE:** | **To configure the display settings for stereo display, see Chapter 3, "*Using the Video Card"* for step-by-step instructions.** |
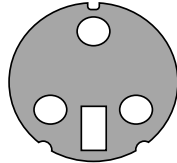
3-Pin Mini-DIN
Stereo Connector

# Installing the Driver Software

If you received your Wildcat4 Graphics Accelerator with a system, the graphics drivers were installed prior to shipment. This section only applies if you purchased your Wildcat4 as an upgrade, are reinstalling the driver, or are updating the operating system.

## *Make sure your computer is ready*

Make sure your workstation has the following before installing Wildcat4 driver software:

- Microsoft Windows 2000 (SP2) or Windows XP (32-bit) operating system software installed
- 3 MB of free space on the computer's primary system disk

| | |
|---|---|
| **IMPORTANT:** | **You must have the correct Wildcat driver for the Windows operating system you are running. If you are unsure, refer to the README.TXT file located on the driver delivery media for this information. Refer to Microsoft Windows documentation and online Help for more information on installing drivers and software application programs. If you are removing and reinstalling the Wildcat4, see Chapter 4 "*Reinstalling the Video Driver.***"** |

## *Removing an existing driver under Windows 2000*

1. Log on to Windows 2000 using an account that has administrative privileges. Please consult your system administrator or Microsoft Windows 2000 User's Manual for more information on Administrator privileges.
2. From the Start menu, go to Settings/Control Panel and click Add/Remove Programs.
3. Under Change or Remove Programs, highlight the current Display Driver and click Change/Remove.
4. Click Yes when prompted to confirm the driver removal, and follow the prompts to complete the driver removal.
5. Click OK when notified that the driver removal is complete and reboot your system before installing the new Wildcat4 driver.

## *Removing an existing driver under Windows XP*

1. Log on to Windows XP using an account that has administrative privileges. Please consult your system administrator or Windows XP User's Manual for more information on Administrator privileges.
2. From the Start menu, go to Control Panel.
3. Under Change or Remove Programs, highlight the current Display Driver and click Change/Remove.
4. Click Yes when prompted to confirm the driver removal.
5. Click OK when notified you must reboot your system for driver removal to occur and reboot your system before installing the new Wildcat4 driver.

## *Installing the Wildcat4 driver*

1. This driver must be installed by a user with Windows Administrator privileges. Please consult your system administrator or Microsoft operating systems User's Manual for more information on Administrator privileges.
2. Start Windows. If the Found New Hardware Wizard appears, click Cancel to dismiss the dialog box. In Windows XP, dismiss the balloon asking if you want Windows XP to set your resolution.
3. Locate the driver delivery media which contains the 3Dlabs Wildcat4 driver. Insert the media in the appropriate drive or change directories to locate the driver.
4. Double click on the setup.exe file located under the wcgdrv directory in the driver package.
5. In the Wildcat4 Driver Installation Message dialog box, click OK to begin the driver install procedure.
6. The workstation must be restarted for the new settings to take effect. Remove the delivery media from the disk drive (if applicable). Click Yes to restart the workstation. In Windows XP, choose Log off, then choose Turn off computer, then Restart.

# Heidi Driver for AutoDesk Applications

The Wildcat4 Heidi® device driver allows full-screen multisampling of and compatibility with AutoDesk® applications as well as hardware acceleration of the Wildcat4 through the use of OpenGL. To install the Heidi driver and to activate full screen multisampling, consult the README.TXT located under the Heidi directory of the Wildcat4 driver delivery media. The SETUP.EXE file under the same directory will initiate the install program.

| NOTE: | If setup is not able to find your AutoDesk application in the system registry, you will be asked to enter an installation path. This will be the directory where the AutoDesk application is installed on your system. |
| --- | --- |
| | You must configure the properties settings in your AutoDesk application to use the Heidi driver. Consult your application documentation for configuring your application to use the Heidi driver. |

# 3ds max Driver

To install the Wildcat4 custom driver for 3ds max™, consult the README.TXT located under the 3dsmax directory of the Wildcat4 driver delivery media. The SETUP.EXE file under the same directory will initiate the install program. To use the driver, you must configure the properties settings in 3ds max. Consult your application documentation for configuring the application to use a custom driver.

| NOTE: | If setup is not able to find 3ds max in the system registry, it will not install the driver and will exit. Consult your 3ds max application's documentation to verify that the application is installed correctly. The driver setup program will only install for a registered application. |
|---|---|

# Verify the Default Video Display Driver

## *Verifying under Windows 2000*

1. From the Windows Start menu, go to Settings/Control Panel/Device Manager.
2. Under Display Adapters, verify that two Wildcat devices are listed. This indicates that the appropriate driver is installed.

| NOTE: | If only one Wildcat4 device is listed, you may not have completed installation. Refer to "*Installing the Driver Software"* for instructions. |
|---|---|

3. Click Cancel to close the Display Properties dialog box.

## *Verifying under Windows XP*

1. From the Windows Start menu, go to Control Panel/Performance and Maintenance/ System Hardware/ Device Manager.
2. Under Display Adapters, verify that two Wildcat devices are listed. This indicates that the appropriate driver is installed.

| NOTE: | If only one Wildcat4 7210 device device is listed, you may not have completed installation. Refer to "*Installing the Driver Software"* for instructions. |
|---|---|

3. Click Cancel to close the Display Properties dialog box.

# Verify the System Startup Version

## *Verifying under Windows 2000*

1. From the operating system Start menu, go to Settings/Control Panel/System/Advanced.
2. Click Startup and Recovery.
3. On the Startup and Recovery dialog box, verify that "Microsoft Windows 2000 Professional" is the listed as the Default operating system. It is IMPORTANT that your operating system matches the driver you installed. Click OK.
4. Click OK again to close the System Properties dialog box.

## *Verifying under Windows XP*

1. From the operating system Start menu, go to Control Panel/Performance and Maintenance/System/Advanced.
2. Click the Settings button under Startup and Recovery.
3. On the Startup and Recovery dialog box, verify that "Microsoft Windows XP Professional" is the listed as the Default operating system. It is IMPORTANT that your operating system matches the driver you installed. Click OK.
4. Click OK again to close the System Properties dialog box.

# Registering Your 3Dlabs Graphics Accelerator Card

When you register your 3Dlabs Graphics Accelerator Card you:

**Activate your warranty**

**Receive notification of software updates**

**Qualify for technical support**

You can complete the registration card and return it to us in the mail, or register on-line once your hardware and software installations are complete. (You must have Internet access to register on-line.)

1. Open your Internet browser.
2. Go to http://www.3dlabs.com/support/register_product.htm
3. Fill out the registration form that appears on your screen, and click Submit when you are finished.

# CHAPTER 3 – SOFTWARE CONFIGURATION

# The 3Dlabs Wildcat4 Driver

The 3Dlabs Wildcat4 driver software allows you to optimize the working relationship between your card, your system, and your applications.

This chapter contains instructions for configuring the video display, stereo display, and dual monitors.

# Configuring the Video Display

Once the Wildcat driver is installed properly, the Display Properties dialog box will have two additional tabs: Wildcat Configuration and Wildcat Monitor.

## *Using the Wildcat Configuration tab*

1. Make sure you are logged into the non-VGA version of Windows. Refer to Windows documentation or online Help for instructions, if necessary.
2. Close any open applications.
3. Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click the Settings tab, then click Advanced.
4. Click the Wildcat Configuration tab if it is not already displayed. On the Wildcat Configuration tab:
   - Click **Hardware Info** to view the current hardware settings.
   - Click **View Config** to view your current display configuration.
   - Click **Config Wizard** to activate a step-by-step interface that will help you modify your current display configuration or create a new one. On the Wildcat Configuration Wizard, click Next and follow the prompts to create a new configuration, or modify or delete an existing one. See "*Enabling application-specific optimizations*" and "*Creating a custom configuration*" later in this chapter for more information.
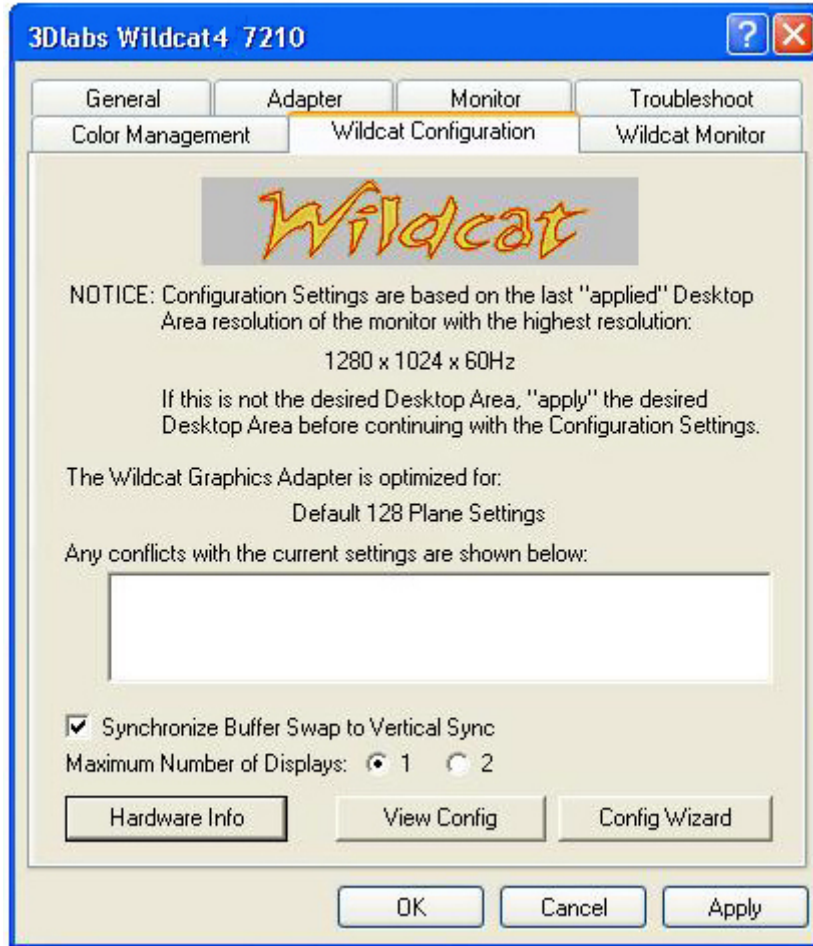
## *Using the Wildcat Monitor tab*

1. On the Display Properties dialog box, click the Wildcat Monitor tab. This tab contains commands for adjusting the resolution, color depth, and refresh rate. See the steps under *Using the Wildcat Configuration tab* if you need instructions on opening the Display Properties dialog box.
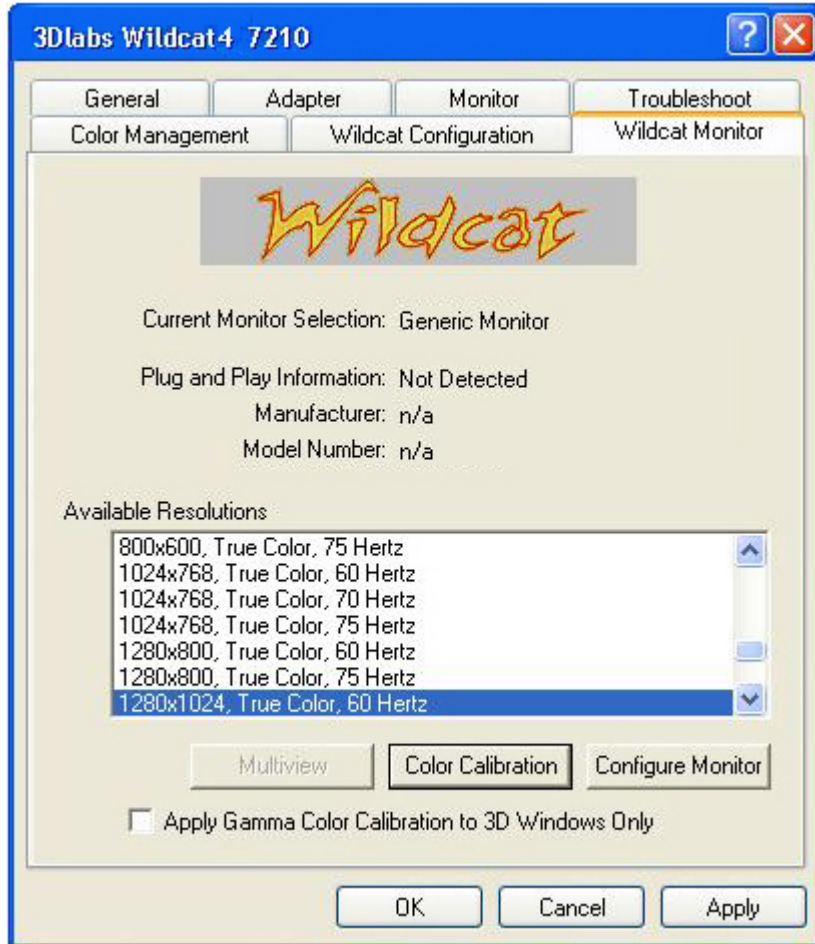
2. Click Color Calibration to modify the color settings. Make modifications to the Color Calibration dialog box, then check the Apply Gamma Color Calibration to 3D Windows Only box if you don't want the desktop affected. Click OK to accept the changes and dismiss the Color Calibration dialog box, or click Cancel to close the Color Calibration dialog box without making any changes. You are returned to the Wildcat Monitor Display Properties dialog box.
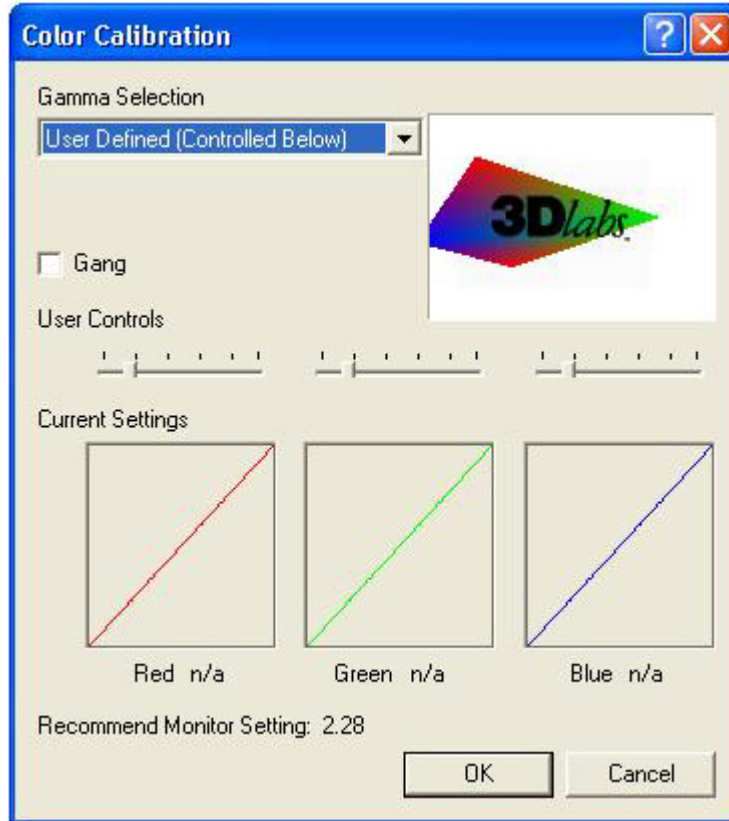
3. On the Wildcat Monitor Display Properties dialog box, click Configure Monitor to change the display mode, select a monitor type, or change the resolution/refresh rate. Once you have made the changes you require, click OK to accept the new configuration and dismiss the Configure Monitor dialog box or Cancel to reset to the default settings. You are returned to the Wildcat Monitor Display Properties dialog box.

4. Click OK on the Display Properties dialog box to accept the changes. Reboot the workstation if you are prompted to do so. Most changes will take effect without rebooting.

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**NOTE:** **See *Appendix A "Specifications*," for a list of available monitor resolutions. See "*Enabling Stereo Display"* in this chapter for instructions on changing the Display Mode. See "*Enabling the Dual Monitor Feature"* in this chapter for instructions on configuring dual displays.**

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## *Enabling stereo display*

If you connect a device to the stereo port on the Wildcat4, you must change the display mode to view in stereo. See *Chapter 2 "Setup"* for an illustration of the stereo output port.

1. Make sure your stereo display device is properly connected to the stereo output port on the Wildcat4. See *Chapter 2 "Connecting a Stereo Display Device"* for more information.
2. On the Wildcat4 Monitor tab under Display Properties, click Configure Monitor. The Configure Monitor dialog box displays.
3. Select one of the Stereoscopic Display modes from the Display Mode pulldown, then click OK to return to the Display Properties dialog box. If you are prompted with the following message: "The selected monitor cannot display the current desktop area. Select a new resolution before applying these changes," click OK then select a resolution from the list of available resolutions.
4. Click OK if the display is correct and you wish to keep the new settings. The Display Properties dialog box is dismissed.
5. Click OK to accept the new display mode and dismiss the Display Properties dialog box.

> **NOTE:** **You must disable stereo mode when you no longer wish to view in stereo. Follow the steps above, and select Monoscopic Display under Display Mode to disable stereo mode.**

# Enabling Multiview and Genlock on the Wildcat4 7210

The Wildcat4 7210 comes with Multiview support for frame locking and rate locking of multiple workstations. Genlock support allows video timing to be synchronized to an external timing source.

> **NOTE:** **Your application must support Multiview for Multiview to work. Please visit our e-store at www.3dlabs.com to order cables.**

> **IMPORTANT:** **Multiview on the Wildcat4 7210 is also compatible with Multiview on the Wildcat III 6210 product, but not compatible with Multiview on any other previous Wildcat product. Users should only connect Wildcat4 7210 and/or Wildcat III 6210 cards together in a Multiview configuration.**

## *Enabling Multiview features*

1. Insert one end of a shielded DB-9 cable into the Multiview Out port of the first workstation. This workstation becomes the "Master."
2. Insert the other end of the cable into the Multiview In port of the second workstation. This workstation becomes a "Slave."
3. If connecting more than two workstations, continue linking workstations to one another by connecting the Multiview Out port of one workstation to the Multiview In port of the next. The last workstation should terminate the links and only have a cable plugged into the Multiview In port.

## *Confirming multiview cables are detected*

1. On the Slave workstation(s), right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click the Settings tab, then click Advanced.
2. Click the Wildcat4 Monitor Tab, then click Multiview.
3. The Input Cables will show as Detected under Multiview Information.

## *Enabling genlock features*

1. Turn off your system, then connect the external timing source to the Genlock In port on the back of theWildcat4 7210. If you have Multiview enabled, connect the external timing source to the Genlock In port of the Master workstation.
2. Turn your on system and log on to Windows using an account that has administrative privileges.
3. Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click Settings/Advanced/Wildcat4 Monitor tab, then click Configure Monitor.
4. Select Vendor Monitor. From the menu below, select your monitor vendor and model from the list or select Genlock as the vendor and Default for the model.
5. Choose a resolution in the bottom box.
6. Click OK to accept the resolution change. If you get no video or scrambled video, wait 10 seconds and your previous settings will be restored.
7. Click OK, then Yes to accept changes. You are returned to the Wildcat Monitor tab.
8. Click Multiview.
9. Choose the signal source from the Source pull-down menu.
10. Select the Signal Edge Response, Signal Lock Rate, and Pixel Align Offset appropriate for your application and hardware setup.
11. Click the Enable check box, then Apply. If the genlock signal is present and the correct source is selected, the applet will display genlock signal "detected."

---

**NOTE:** **Some monitors require custom timing file entries for Genlock to be properly maintained. Please refer to the documentation delivered with your monitor for further information.**

---

# Configuring Dual Monitors

The Wildcat4 feature support for dual monitors under Windows 2000 or Windows XP (but not under Windows NT).  The dual monitor feature allows two monitors — either two digital, two analog (with an adapter), or a combination of digital and analog — to be connected to the card so the display area stretches across both monitors.

## *Enabling the Dual Monitor Feature*

1. Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click the Settings tab, then click Advanced.
2. Click the Wildcat Configuration Tab, then next to Maximum Number of Displays, select 2.
3. Click Apply.

4.  When asked if you want to reboot, choose No. Follow the directions below for your operating system:

    - Windows 2000 -- go to the Start menu and choose Shutdown, then choose Shutdown from the displayed menu.
    - Windows XP -- go to the Start menu and select Turn off computer.

5.  If you have not already done so, connect the second monitor, then turn on power to the workstation. The primary monitor will display the startup sequence. If either monitor's Power On LED does not illuminate, or if the primary monitor does not display the startup sequence, consult *Chapter 4 "Troubleshooting.*"

6.  Start Windows and log on using an account with administrative privileges.

7.  Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu.

8.  On the Display Properties dialog box, click the Settings tab. The monitors display as icons labeled 1 (for primary) and 2 (for secondary).

9.  Highlight monitor 2 and click "Extend my Windows desktop onto this monitor."

10. Drag the monitor icons to match the physical arrangement of your monitors.
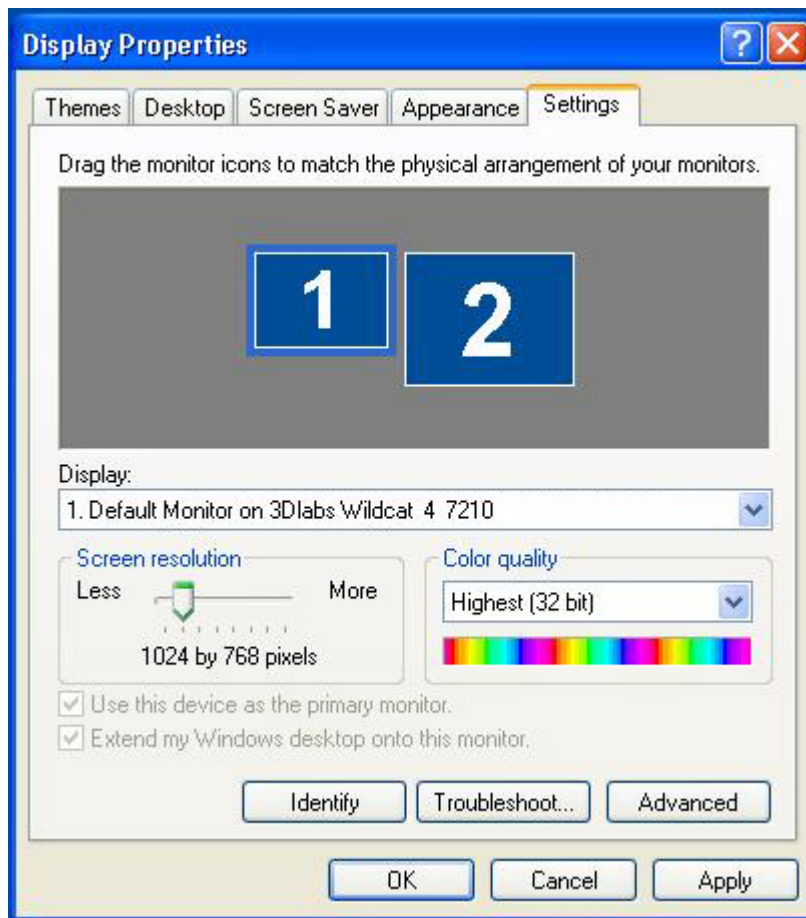
## *Adjusting colors or resolutions of either monitor*

1. Click the icon for that monitor or select the monitor from the pulldown menu under Display.
2. With the monitor to adjust selected, click Advanced. Select Wildcat Monitor and make changes to the Colors or Screen area. Click OK.
3. Select the other monitor icon or select from the pulldown menu under Display to change the color or resolution of the other monitor.

---

**NOTE:** **Any changes made under Wildcat Configuration will affect both monitors.**

---

# Optimizing the Wildcat Driver

Refer to the documentation that came with your application for information on optimization support. If your application supports optimized configurations, you can choose to enable the application manufacturer's pre-set configurations or create your own.

## *Enabling application-specific optimizations*

1. Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click the Settings tab, then click Advanced.
2. Under the Wildcat Configuration tab, select Configuration Wizard. Click Next to continue.
3. If your application supports optimized configurations, select the configuration for your application from the Configuration pulldown menu and click Next to view a summary of the application-specific configuration.
4. Click Finish to save your configuration and dismiss the Wizard, or click Cancel to close the Wizard without accepting any changes.

---

**NOTE:** **You cannot alter the application manufacturer's pre-set configuration. If you want some (but not all) features of the application manufacturer's configuration, you must create a customized configuration. See "*Creating a custom optimization*" for instructions.**

---

# Creating a Custom Optimization

1. Right click on the Windows desktop (or left click if you've altered the default mouse setup) and choose Properties from the menu. Click the Settings tab, then click Advanced.
2. Under the Wildcat Configuration tab, select Configuration Wizard. Click Next to continue.
3. Select New Configuration on the pulldown menu, then click Next.
4. Enter a name for the new configuration, then select the configuration you want to use as a model for your customized configuration.
5. The Wizard will step you through driver optimization. When you are finished, click Finish to view the Configuration Summary.
6. Click Finish to save your configuration or Cancel to dismiss the Wizard.

# CHAPTER 4 – TROUBLESHOOTING

# Troubleshooting

If you have trouble using your 3Dlabs Wildcat4 Graphics Accelerator Card or a 3D application, you may find the answer to your problem in the following sections. Always start your problem- solving efforts with the simplest solution and work up to the more complex ones.

# Monitors and Display Resolutions

**Problem:** **My monitor is either blank, or the displayed image is distorted, scrambled or smaller than I expected.**

Solution: If the monitor is blank, be sure that your system and monitor are plugged in and turned on. Is the monitor's power cord attached securely? Check each component's documentation for the location and use of power connectors and switches.

Solution: Make sure that your video cable is connected securely to the monitor *and* to the monitor connector on your Wildcat4 Graphics Accelerator Card. If you're using only one monitor, make sure that monitor is plugged into the primary connector labeled "1" on the back of the card. See your monitor documentation and *Chapter 1 – "Installation,"* in this document.

Solution: Your card might not be seated properly in the AGP Pro slot. Remove and reinstall your card as described in *Chapter 1 – "Installation."* Remember to use the anti-static wrist strap when opening your system and handling the card.

Solution: Reboot into VGA/Safe Mode and select a supported resolution and refresh rate. See *"Obtaining a Usable Video Resolution"* later in this chapter for instructions.

Solution: Reboot into VGA/Safe Mode to verify the display properties are configured correctly for the monitor type. If the software setup is correct, use a similar type monitor (if available and functioning properly) to determine if the workstation is defective. See *"Obtaining a Usable Video Resolution"* in this chapter for instructions on determining if you have a defective unit.

**Problem:** **The performance of and/or the available resolutions for my Wildcat4 Graphics Accelerator Card are not what I expected.**

Solution: The Wildcat4 Graphics Accelerator Card driver may not have installed fully, or a file may have been corrupted. Try installing the driver again.

Solution: You may have selected a display setting that is incompatible with accelerated 3D graphics applications. See the Wildcat Monitor tab in your 3Dlabs display control panel for a list of compatible resolutions.

Solution: You may have not selected the correct monitor for your monitor vendor and type. Go to the Wildcat Monitor tab and select your monitor vendor and type from the list. If your vendor and/or monitor is not listed, consult your monitor documentation for alternatives..

Solution: Restart Windows 2000 in Safe Mode and select a supported resolution and refresh rate. See *"Obtaining a Usable Video Resolution"* later in this chapter for instructions.

# Diagnostics

Diagnostics utilities for checking the video card and instructions for using these utilities may be available from your computer vendor.

# Obtaining a Usable Video Resolution

The system operates in VGA mode when the video display driver is not running to accommodate all monitor types. VGA mode is used during initial installation of the video display driver and when experiencing video problems. If you select a resolution that causes the monitor to display incorrectly, try the following procedures to obtain a usable video resolution.

## *Booting into Safe Mode*

Press CTRL+ALT+DEL but do not log on to the Windows 2000 or Windows XP operating system. Instead, shut down then boot into Safe Mode to choose another resolution or reinstall the video driver.

1. Restart the system.
2. At the boot screen, hit F8 to enter the advanced options menu.
3. Choose Safe Mode, then hit ENTER to return to the boot screen.

| | |
|---|---|
| **NOTE:** | **If this option fails to correct the video display problem, restart the system in VGA mode and reconfigure your display to 640 x 480 resolution, 60 Hz refresh rate. Then restart Windows again in non-VGA mode.** |

## *Determining a defective unit*

1. Save and exit from all files, if possible, then shut down the operating system.
2. Turn off the power to the monitor and to the workstation.

| | |
|---|---|
| **IMPORTANT:** | **Always turn off the power to the workstation before connecting or disconnecting the cables.** |

3. Check and reseat all card and cable connections as needed.
4. Turn on the monitor power. If the Power On LED does not illuminate, see Getting Help in this section.
5. Turn on the power to the system base unit. If the Power On LED on the base unit does not illuminate, or if the BIOS beep codes indicate a failure, see Getting Help in this section.

# Reinstalling the Video Driver

| | |
|---|---|
| **NOTE:** | **You must have the correct driver for the your operating system. If you are unsure, refer to the README.TXT file located on the driver delivery media for this information.** |
| | **Refer to Microsoft Windows documentation and online Help for more information on installing drivers and software application programs.** |
| | **If you are installing the Wildcat4 driver, you must remove the current driver prior to installing the update.** |

## *Removing an existing driver under Windows 2000*

1. Log on to Windows 2000 using an account that has administrative privileges. Please consult your system administrator or Microsoft Windows 2000 User's Manual for more information on Administrator privileges.
2. From the Start menu, go to Settings/Control Panel and click Add/Remove Programs.
3. Under Change or Remove Programs, highlight the current Wildcat Display Driver and click Change/Remove.
4. Click Yes when prompted to confirm the driver removal, and follow the prompts to complete the driver removal.
5. Click OK when notified that the driver removal is complete and reboot your system.

## *Removing an existing driver under Windows XP*

1. Log on to Windows XP using an account that has administrative privileges. Please consult your system administrator or Windows XP User's Manual for more information on Administrator privileges.
2. From the Start menu, go to Control Panel.
3. Under Change or Remove Programs, highlight the current Wildcat Display Driver and click Change/Remove.
4. Click Yes when prompted to confirm the driver removal.
5. Click OK when notified you must reboot your system for driver removal to occur.

## *Reinstalling the video driver*

1. This driver must be installed by a user with Windows Administrator privileges. Please consult your system administrator or Microsoft operating systems User's Manual for more information on Administrator privileges.
2. Start Windows. If the Found New Hardware Wizard appears, click Cancel to dismiss the dialog box. In Windows XP, dismiss the balloon asking if you want Windows XP to set your resolution.
3. Locate the driver delivery media which contains the 3Dlabs Wildcat4 driver. Insert the media in the appropriate drive or change directories to locate the driver.
4. Double click on the setup.exe file located under the wcgdrv directory in the driver package.
5. In the Wildcat4 Driver Installation Message dialog box, click OK to begin the driver install procedure.
6. The workstation must be restarted for the new settings to take effect. Remove the delivery media from the disk drive (if applicable). Click Yes to restart the workstation. In Windows XP, choose Log off, then choose Turn off computer, then Restart.

# Online Information

If you cannot find the problem you are experiencing, or the solution to a problem, listed in this chapter, check the Troubleshooting section of the 3Dlabs web site at:
http://www.3dlabs.com/support/troubleshooting/index.htm, or contact your vendor for additional help.

# APPENDIX A – SPECIFICATIONS

# A Specifications

| General | |
|---|---|
| Manufacturer | 3Dlabs |
| Model number | Wildcat4 7210 or Wildcat4 7110 |
| **Functional** | |
| System | **NOTE: IF YOU ORDERED THIS VIDEO CARD WITH A SYSTEM, IT WAS PREINSTALLED AND CONFIGURED FOR USE IN YOUR SYSTEM PRIOR TO SHIPMENT.** |
| Interface | AGP Pro 50 |
| Graphic controller | High-speed Wildcat4 chipset technology |
| DAC speed | 320 MHz |
| Data width (dual pipeline) | • Frame Buffer: 128 bits per pipe<br>• Texture Buffer: 64 bits per pipe |
| Connectors | **Wildcat4 7210**<br>• One 3-Pin, Mini-DIN stereo sync output<br>• Two DVI compatible Digital Video Output Ports<br>• One BNC Connector<br>• Two 9-pin, D-sub connectors | **Wildcat4 7110**<br>• One 3-Pin, Mini-DIN stereo sync output<br>• Two DVI Digital Video Output Ports |
| Interrupts | PCI-assigned, interrupt A |
| DMA channels | AGP 3.0 support, 4X and 8X modes of operation |
| Video memory | **Wildcat4 7210**<br>• **Frame Buffer: 128 MB**<br>• **Texture Buffer: 256 MB** | **Wildcat4 7110**<br>• **Frame Buffer: 128 MB**<br>• **Texture Buffer: 128 MB** |
| 3D Performance | **NOTE: PERFORMANCE NUMBERS REFLECT MAXIMUM HARDWARE RATE. NUMBERS MAY VARY DEPENDING ON APPLICATION.**<br><br>Wildcat4 7210<br>• 3D, Gouraud-shaded, Z-buffered triangles: 37.9 M/sec.<br>• 3D, Vectors, solid-color, 10-pixel: 33.9 M/sec.<br>• Trilinear textured fill rate: 400 Mpixels/sec.<br><br>Wildcat4 7110<br>• 3D, Gouraud-shaded, Z-buffered triangles: 35.1 M/sec.<br>• 3D, Vectors, solid-color, 10-pixel: 29.4 M/sec.<br>• Trilinear textured fill rate: 400 Mpixels/sec. |
| | Height | 1.6" |
| | Length | 13.92" |
| | Width | 4.97" |
| | Slots Required | • One AGP Pro 50 slot<br>• One PCI slot (for mechanical and cooling purposes) |
| **Power Requirements** | 50 W maximum |

## Supported Resolutions

**Note:** **These are MAXIMUM supported monitor resolutions and refresh rates. Resolutions and refresh rates may vary depending on your monitor.**

**SuperScene antialiasing is available at resolutions under 1920 x 1080 on a single display**

Key

1 – Refresh rate not supported in dual display mode.
2 – Resolution not supported in frame sequential stereo mode.
IL = Interlaced
FS = Frame Sequential
SS = Superscene antialiasing
128 = 128 plane mode
192 = 192 plane mode

| Resolution | Aspect Ratio | Analog Refresh Rates (Hz) | Digital Refresh Rates (Hz) | Stereo Refresh Rate (Hz) | Genlock Refresh Rate (Hz) | Single Display | | | | Dual Display | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SS Off | | SS On | | SS Off | | SS On | |
| | | | | | | 128 | 192 | 128 | 192 | 128 | 192 | 128 | 192 |
| 2048 x 1536 | 4:3 | 60 | - | - | - | ✓ | ✓ | | | ✓ | | | |
| 2048 x 1152 | 16:9 | 75,72,70, 60 | - | - | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1920 x 1440 | 4:3 | 75[1],60 | - | - | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1920 x 1200 | 16:10 | 76,70,65, 60 | - | IL=120 | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1920 x 1080 | 16:9 | 85,75,72, 70,60 | 60 | IL=120 | - | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| 1856 x 1392 | 4:3 | 85[1],80[1], 75[1],60 | - | - | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1824 x 1368 | 4:3 | 85[1],75,70,6 5,60 | - | IL=120 | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1824 x 1128 | 16:10 | 75,60 | 60 | - | - | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| 1792 x 1344 | 4:3 | 75,60 | - | - | - | ✓ | ✓ | | | ✓ | ✓ | | |
| 1792 x 1120 | 16:10 | 75 | - | - | - | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| 1600 x 1200 | 4:3 | 90,85,80, 75,70,65, 60 | 60 | IL=120,98 | 60,50 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 1600 x 1024 | 16:10 | 76 | - | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 1600 x 900 | 16:9 | 85 | - | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 1520 x 856 | 16:9 | 90,85,75, 70,60 | 90,85,75, 70,60 | IL=120 FS=106 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | | |
| 1440 x 900 | 16:10 | 90,85,75, 60 | 90,85,75, 60 | IL=120 FS=100 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | | |
| 1360 x 766 | 16:9 | 90,85,75, 72,60 | 90,85,75, 72,60 | IL=120 FS=118 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓[2] | |

## Supported Resolutions (con't)

| Resolution | Aspect Ratio | Analog Refresh Rates (Hz) | Digital Refresh Rates (Hz) | Stereo Refresh Rate (Hz) | Genlock Refresh Rate (Hz) | Single Display | | | | Dual Display | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SS Off | | SS On | | SS Off | | SS On | |
| | | | | | | 128 | 192 | 128 | 192 | 128 | 192 | 128 | 192 |
| 1280 x 1024 | 5:4 | 85,84,75, 70,60 | 85,84,75, 70,60 | IL=120,86 FS=120, 104,100, 96,84 | 90,60,50 | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | | |
| 1280 x 960 | 4:3 | 85,75,60 | 85,75,60 | IL=120 FS=120, 112,106 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | | |
| 1280 x 800 | 16:10 | 90,85,75, 60 | 90,85,75, 60 | IL=120 FS=112, 100 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓[2] | |
| 1280 x 720 | 16:9 | 75,60 | 75,60 | FS=120, 110 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓[2] | ✓[2] |
| 1152 x 864 | 4:3 | 85,75,70, 60 | 85,75,70, 60 | IL=120 FS=120 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓[2] | |
| 1152 x 720 | 16:10 | - | - | FS=120, 110 | - | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] |
| 1024 x 768 | 4:3 | 85,84,75, 70,60 | 85,84,75, 70,60 | IL=120,86 FS=120, 100,84 | 60,50 | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] |
| 856 x 480 | 16:9 | 75,60 | 75,60 | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 800 x 600 | 4:3 | 85,75,72, 60 | 85,75,72, 60 | IL=120 FS=120, 100 | 60,50 | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] |
| 640 x 480 | 4:3 | 85,75,72, 60 | 85,75,73, 60 | IL=120 FS=120 | 60,50 | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] | ✓ | ✓[2] |

# APPENDIX B – SOFTWARE LICENSE

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# APPENDIX C – REGULATORY STATEMENTS

# DECLARATION OF CONFORMITY

**Manufacturer's Name:**      3Dlabs Ltd, a Creative Labs subsidiary
**Manufacturer's Address:**     9668 Madison Blvd., Madison, AL  35758

**declares that the product**

**Product Name:**     Wildcat4 7110/7210 Graphics Accelerator Cards

**conforms to the following product specifications:**

Following provisions of the 89/336/EEC Directive

| *Specification* | *Class / Level* |
|---|---|
| EN 55022:1994 (CISPR 22 limits) | **Class B**<br>Radiated Electric Field Emissions |
| EN 55022:1994 (CISPR 22 limits) | **Class B**<br>Power Line Conducted Emissions |
| 47 CFR Part 15,Subpart B (ANSI C63.4:1992) | **Class B**<br>Radiated Electric Field Emissions |
| 47 CFR Part 15,Subpart B (ANSI C63.4:1992) | **Class B**<br>Power Line Conducted Emissions |
| VCCI V-4/99.05 | **Class B**<br>Radiated Electric Field Emissions |
| VCCI V-4/99.05 | **Class B**<br>Power Line Conducted Emissions |
| AS/NZS 3548:1995 | **Class B**<br>Radiated Electric Field Emissions |
| AS/NZS 3548:1995 | **Class B**<br>Power Line Conducted Emissions |
| EN 55024:1998<br>(IEC 61000-4-3) | Radiated Electromagnetic Field Immunity |
| EN 55024:1998<br>(IEC 61000-4-2) | Electrostatic Discharge Immunity |
| EN 55024:1998<br>(IEC 61000-4-4) | Electrical Fast Transient/Burst Immunity |
| EN 55024:1998<br>(IEC 61000-4-6) | Conducted Disturbance Immunity |
| EN 55024:1998<br>(IEC 61000-4-11) | Voltage Dips and Interruptions Immunity |
| EN 55024:1998<br>(IEC 61000-4-5) | Surge Immunity |
| CNS 13438 (8473.30.10.90) | **Class B**<br>Taiwanese EMI Emissions and Immunity |

**Date of Declaration:** 30-08-02

**Issued by:** ………………………………… Principal Production Engineer, 3Dlabs Ltd. +44 (0) 1784 476646

This product complies with Part 15 of 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 interferences that may cause undesired operation.

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

This Class B digital apparatus meets the Korean criteria for preventing electromagnetic interference for Information Technology Equipment using specifications outlined in ANSI C63.4 and CISPR22.

**UL 1950 PAG1.7-003:** This graphics card is for use with UL Listed personal computers that have installation instructions detailing user installation of card cage accessories

# APPENDIX D – TERMS AND DEFINITIONS

# Terms and Definitions

**AGP**

Advanced Graphics Port. A dedicated graphics bus that transfers data at significantly higher speeds than the PCI bus.

**Alpha Blending**

This means to create transparent objects by allowing for the blending of pixels to simulate the transparency characteristics of an object. With alpha information, an object can be designed from being totally transparent to opaque.

**Alpha Buffer**

A portion of the frame buffer used to define the transparency value of a pixel in the frame buffer. This data can be used to blend the frame buffer pixel with the pixel to be drawn to create a composite pixel.

**Antialiasing**

A technique employed to remove any jagged edges from an object to appear smooth. This is accomplished by gradually modifying the hue and saturation of pixels. (See also: SuperScene Antialiasing)

**API**

Application Programming Interface. The API translates the instructions from the application program into device commands that are specific to the screen's display controller, the graphics board.

**Atmospheric Effects**

The effect derived from adding one or more layers around an object.

**Bilinear Sampling**

The process whereby texture mapping is done through filtering.

**Bit Depth**

Bit depth is another way of expressing the numbers of colors available. A color bit depth of 8 is equivalent to 256 colors, a bit depth of 16 (15 bit of color plus a 1 bit overlay) yields 32768 colors, and a bit depth of 32 (24 bit RGB plus 8 bit of overlays) equals 16.7 million colors. The latter is often referred to as true color.

**Clipping**

Removal of elements or sections not contained within the active viewing area.

**CPU (Central Processing Unit)**

The part within a PC that executes programs in main memory.

**DAC**

Digital to Analog Converter.

**DDR SDRAM**

Double Data Rrate SDRAM is synchronous dynamic RAM that improves memory clock speed.

**Depth Cueing**

A technique used to give the illusion of depth. With depth cueing, the part of an object that is farther away is displayed with a lower intensity to give the effect of depth.

**Digital Flat Panel Display**
A digital, flat-panel display uses a digital (instead of analog) cable connection to transfer data to the display screen. This can eliminate some display artifacts. Flat panel displays occupy less desk space than conventional monitors.

**DirectX**
Microsoft's APIs developed to access various system hardware.

**Dithering**
The process of converting an image with a certain bit depth to one with a lower bit depth. Dithering enables the application to convert an image's colors that it cannot display into two or more colors that closely resemble the original. Dithering works because the mind is tricked by the pattern of colors into thinking it's a different color.

**Double Buffering**
With double buffering, images are rendered in the back buffer and then displayed on the screen once the drawing is completed. This results in the smooth, flicker-free rotation and animation of 3D models and scenes.

**Driver**
A driver is a special interface program that is developed to perform the communication between the application program, the device (i.e., graphics peripheral) and the operating system.

**EVGA**
Extended Video Graphics Array. EVGA runs at 1024 x 768.

**Flat Shading**
The simplest method of shading. Each triangle is assigned one single color, resulting in a faceted appearance of the surface.

**Frame Buffer**
A 24-bit, true-color frame buffer provides 8 bits for each red, green and blue primary display color. This results in 16.8 million color combinations. A second, or double, buffer enables system to calculate pixels one step ahead of the screen display for smooth, distortion free images.

**Gamma**
A curve representing both the contrast and brightness of an image. Changing the shape of the curve changes the RGB color output. (Not to be confused with GLINT Gamma, the 3Dlabs geometry processing device.)

**Geometry**
The intermediate stage of the 3D pipeline, geometry determines the location of the object and the frame of reference of the viewer in relation to the object.

**Gouraud Shading**
This method of shading, more complex than flat shading, shows subtle color changes across an object. Gouraud Shading is accomplished by adding pixels in a graduated scale of colors.

**Graphics Accelerator Card**
A graphics accelerator performs 3D functions in the hardware, thereby relieving the CPU of repetitive, complex and intensive calls. This results in enhanced performance and speed.

**Heidi**
The API developed by Autodesk to work with its products, such as AutoCAD.

**MIP-Mapping (for texture processing)**
A feature that delivers photo-realistic images by wrapping 2D bitmaps around 3D objects closely matching the texture to the object. MIP-Mapping allows different versions of a texture to be used for objects of different sizes. It also enables faster performance as textures do not need to be scaled in real time.

**Multiple Resolution Support**
The ability to support multiple resolutions on the screen.

**OpenGL**
The industry standard library of advanced 3D graphics functions developed by Silicon Graphics, Inc.

**Perspective Correction**
A function that allows an object to maintain its 3D textural features as it moves away from the viewer, into the background.

**Pipelining**
A basic hardware tool for accelerating processes.

**Pixel**
The smallest addressable element of a cathode ray tube display. More simply put, the individual dots that make up the screen image.

**Point Sampling**
The basic method of adding texture to an object. Point sampling does not include any filtering of textures.

**RAMDAC**
The final component in the graphics subsystem that translates a digital image into an analog representation.

**Rasterization**
A method to fill in colors for all pixels bound by vertices.

**Rendering**
The final and most rigorous stage in the 3D pipeline where an object undergoes shading, texturing, etc.

**RISC**
Reduced Instruction Set Computing.

**SDRAM**
Synchronous Dynamic Random Access Memory (SDRAM) is a cost-effective solution to improve bandwidth to and from memory, resulting in increased graphics performance.

**SGRAM**
Synchronous Graphics Random Access Memory allows data to be written in a single operation, rather than a (slower) sequence of operations. It also handles background and foreground image fills effectively.

**SDTP**
Super Desktop Publishing. SDTP runs at 1600 x 1200.

**Stencil Buffer**

Similar to stipple masking, the stencil buffer assists with the creation of transparent effects.

**Stipple masking**

A technique that spatially creates transparent effects by rendering an object through various patterns.

**Streaming SIMD**

An instruction set developed by Intel for Pentium -processor based systems. Streaming SIMD can improve 3D vertex transformation and lighting, among other operations.

**SuperScene Antialiasing**

SuperScene antialiasing (*see Antialiasing*) is an enhanced version of multisampling and offers true, multisampled, scene-based antialiasing of *all OpenGL* primitives in a scene. SuperScene Antialiasing is a feature found only on Wildcat graphics accelerators.

**SVGA**

Super Video Graphics Array. SVGA runs at 800 x 600.

**Tessellation**

The initial part of the 3D pipeline where the object is described by a set of triangles.

**Texture Mapping**

A technique that enables 2D graphic images to be "wrapped" around or "pasted" on to a 3D primitive. Perspective correction and lighting calculations allow for added realism.

**Transformation**

The change in rotation, size, position, and perspective of an object in 3D space.

**Transparency**

A function that refers to the rendering of transparent (non-opaque) objects. Transparency is generally accomplished on a polygon rendering system using either screen-door transparency or alpha blending.

**Vectors/second**

Lines drawn per second.

**VGA**

Video Graphics Array. VGA runs at 640 x 480.

**VHR**

Very High Resolution. VHR runs at 1280 x 1024.

**VRAM**

Video Random Access Memory is an expensive, fast type of RAM that is used as display memory on high-end graphics boards.

**VRML**

Virtual Reality Modeling Language.

**Z-Buffer**

Also known as the Depth Buffer, the Z-Buffer is a region of memory containing the depth component of a pixel. Used, for example, to eliminate hidden surfaces from the image.

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