

3Dlabs Wildcat 4210 Graphics User's Guide

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Warnings

Changes or modifications made to your 3Dlabs graphic accelerator card not expressly approved by 3Dlabs, Inc. void's the user's warranty.

To reduce the risk of electrical shock, do not attempt to open the equipment unless instructed. Do not use a tool for purposes other than instructed.

There are no user serviceable parts in the card. Refer all servicing of the card to qualified service personnel.

To comply with FCC Class A limits, you must use shielded cables with this device.

Specifications are subject to change without notice.

P/N DH001000

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About This Document

The *3Dlabs Wildcat 4210 Graphics User's Guide* contains information on the setup and use of the Wildcat 4210 and Wildcat 4210 VIO video cards, as well as troubleshooting information, connections, and specifications.

NOTE References to Wildcat 4210 in this document cover both Wildcat 4210 and Wildcat 4210 VIO unless otherwise noted.

If you purchased this card as part of a system, the card was factory installed and configured in your system prior to shipment. This document provides instructions for setting your display parameters and installing the video drivers and hardware in case you bought the card as part of an upgrade or add-on purchase.

The document is organized as follows:

- ◆ Chapter 1, "Introduction," describes the Wildcat 4210 video card, its features, and its external ports.
- ◆ Chapter 2, "Setup," provides step-by-step instructions for installing Wildcat 4210 hardware and driver software, and for connecting monitors and a stereo display device.
- ◆ Chapter 3, "Using the Video Card," provides instructions for configuring the video display and using Wildcat 4210 video card's features.
- ◆ Chapter 4, "Troubleshooting," describes ways to solve common problems and how to get help.
- ◆ Chapter 5, "Technical Information," provides general, functional, and performance specifications for the Wildcat 4210 video card, and describes its ports and connectors.

Getting Support

When you need software support or hardware maintenance, contact your system vendor.

For the latest Wildcat news and product information, visit <http://www.3dlabs.com> on the World Wide Web.

1 Introduction

The Wildcat 4210 video card equips your personal computer or personal workstation with powerful and professional 3D graphics capability. This video card infuses Intel Pentium II or greater computers running the Microsoft Windows 2000 or Windows NT 4.0 operating system with workstation-class 3D graphics features and performance.

NOTE References to Wildcat 4110 cover both Wildcat 4110 and Wildcat 4110 VIO unless otherwise noted.

Features

Card Interface	AGP Pro 110, designed for computers with a 110 Watt AGP Pro expansion card slot
	NOTE A Wildcat 4210 card cannot plug into a standard AGP expansion card slot.
Video Memory	Frame buffer 128 MB Texture buffer 128 MB DirectBurst 32 MB
Graphics Controller	High-speed Wildcat chipset technology with dual-display support
RAMDAC	250 MHz
Plug and Play Monitor	Supported
Accelerated 3D API	OpenGL
Maximum Resolution	1920 x 1440
Maximum Aspect Ratio	16:10
Maximum Refresh Rate	85 Hz
	NOTE Supported refresh rates, monitor resolutions, aspect ratios, and color depths depend on the monitor type, if you select multisampling, and if you use single or dual monitors. See Chapter 5, "Technical Information," for a list of maximum resolutions and refresh rates.
	NOTE To display at a specific resolution with the desired refresh rate, both the video card and the monitor must support it. Refer to the documentation delivered with the monitor for a list of supported video resolutions.
Power Management	Display Power Management Signaling (DPMS) Advanced Configuration and Power Interface (ACPI)

Geometry Acceleration	Model view matrix transformation of vertex and normal coordinates Perspective and viewport transformations Texture matrix transformation of texture coordinates Local display list storage and processing Full lighting calculations (up to 24 lights) View volume clipping Up to six user clip planes Image processing
Traditional 2D Operations	16- and 32-bit color depths (565, 8888) Solid and patterned area fills Vectors (diamond rule compliant) Block moves (screen-to-screen) Block gets (screen-to-system) Block puts (system-to-screen) Bilinear scaling
Open GL Operations	Image support for multiple formats, zooming, bilinear scaling, color matrix, and color tables Fogging: linear, exponential, exponential ² , and user-defined 2D/3D points, vectors, and polygons Texture mapping: point, bilinear, trilinear, and multiple internal formats 24- and 32-bit depth buffering Dithering Fast window clears Window clipping Fast window-mode double buffering Masking Frame-sequential and interlaced stereo support Stencil operations Matrix transformations

OpenGL Extensions	Imaging extensions – pixel buffer, color table, color matrix, convolution Blend extensions – color, minmax, function separate, subtract Fog extensions – fog function, fog offset Texture extensions – 3D textures (edge, border, and LOD clamps), mipmap generation Video extensions – interlace, interlace read 422 pixels Swap control extensions – swap control, swap frame lock, swap usage Texture color table Pixel texture and 3D texturing Stencil operation wrap Post-texturing specular
Additional Features	SuperScene full-scene multisampled anti-aliasing – point sampled with sixteen samples, sample location jittering, dynamic sample allocation, dynamic sample backoff Two video look-up tables Eight stencil planes Eight double-buffered overlay planes 32-bit Z buffer High-performance DACs that directly drive display devices DDC2B Display Data Channel standard Head-mounted displays and shutter glasses (frame sequential and interlaced stereo required) Onboard texture memory with full mipmapped trilinear interpolated texture processing Digital Video Interface (DVI)-I display support (Wildcat 4210 only) Direct image/alpha channel transfer support (Wildcat 4210 VIO only)

External Ports

The Wildcat 4210 has the following external ports (see Figure 1 and Figure 2):

- ◆ Primary and secondary DVI-I Out ports (Wildcat 4210 only)
- ◆ Two analog video out ports (Wildcat 4210 VIO only)
- ◆ Genlock In port
- ◆ Stereo Sync Out port
- ◆ Multiview In and Multiview Out ports

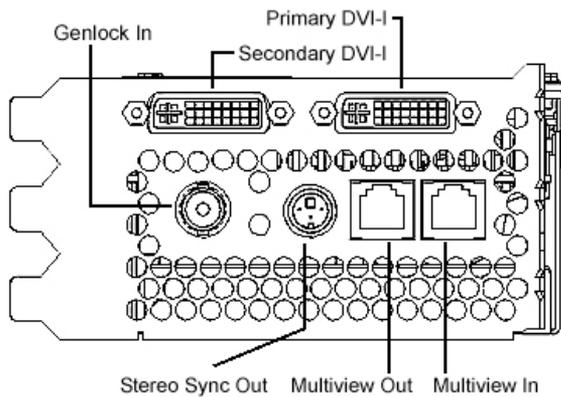


Figure 1. Wildcat 4210 External Ports

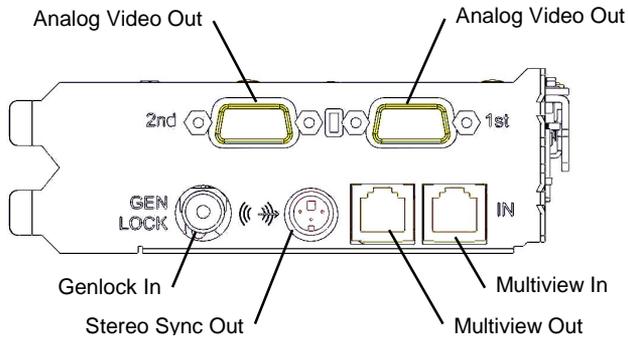


Figure 2. Wildcat 4210 VIO External Ports

See Chapter 5, “Technical Information,” for detailed information on each of the external ports.

2 Setup

This chapter contains instructions for installing a Wildcat 4210 video card and related software, and for connecting the computer's monitors and a stereo display device to the card. The instructions in this chapter are necessary only if you purchased your video card separately, or if you must replace your video card or reinstall its driver software.

NOTE References to Wildcat 4210 cover both Wildcat 4210 and Wildcat 4210 VIO unless otherwise noted.

Preparing for Installation

Make sure your system has the following items:

- ◆ Pentium II or greater processor
- ◆ Microsoft Windows 2000 or Microsoft Windows NT 4.0 with Service Pack 5 (or later)
- ◆ Accelerated Graphics Port (AGP) Pro 110 expansion slot
- ◆ One (for Wildcat 4210 VIO) or two (for Wildcat 4210) open Peripheral Component Interconnect (PCI) slots adjacent to the AGP Pro 110 slot
- ◆ 32 MB DRAM minimum (64 MB recommended)
- ◆ Industry-standard, multiple-frequency monitors (Wildcat 4210 and Wildcat 4210 VIO) or Digital Video Interface (DVI)-compliant digital display devices (Wildcat 4210 only)
- ◆ 3 MB of free space on the computer's primary system disk for the driver software

Make sure you have the following items:

- ◆ Wildcat 4210 or Wildcat 4210 VIO video card
- ◆ Delivery media with the Wildcat 4210 driver software
- ◆ Flat-head or Phillips screwdriver
- ◆ Monitor cables supplied with the computer or with the computer's monitors
- ◆ To connect VGA monitors, 15-pin DVI-VGA adapters for the monitor cables
- ◆ Grounding wrist strap

Static electricity can damage the components inside a computer or on a printed circuit card. To reduce the possibility of electrostatic discharge:

- ◆ Turn off power to the computer.
- ◆ Touch the metal chassis of the computer to drain off static electricity before touching the card.
- ◆ Wear a properly connected grounding wrist strap.
- ◆ 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.

Installing the Video Card

Refer to your computer's documentation for instructions on opening and closing the system, identifying the AGP Pro 110 and Peripheral Component Interconnect (PCI) expansion slots, and adding expansion cards.

To install the video card:

1. Turn off power to the computer and to the monitors, and disconnect the cables from the computer.
2. Open the computer to gain access to the AGP Pro 110 expansion slot.

CAUTION You must have one (for Wildcat 4210 VIO) or two (for Wildcat 4210) open PCI expansion slots adjacent to the ACP expansion slot. If necessary, move other installed PCI expansion cards to other PCI expansion slots to ensure this.

3. If you are removing a Wildcat 4210 VIO card, you may need to disconnect a ribbon cable from the internal VIO connector on the card (see Figure 3).
4. If the computer has an existing video card, remove it and keep the screws that secured it to the computer.
5. Align the Wildcat 4210 card with the AGP Pro 110 expansion slot and the adjacent PCI expansion slot. Make sure the gold-fingered connectors on the card's edges (see Figure 4) are aligned properly with the slot connectors.
6. Push the card into the expansion slots firmly and evenly until it is seated in the slot connectors.
7. Visually inspect the connections. If they do not appear to be correct, remove and reinstall the card.
8. Secure the card to the chassis using the screws you removed previously.
9. Close the computer and reconnect the power cord.

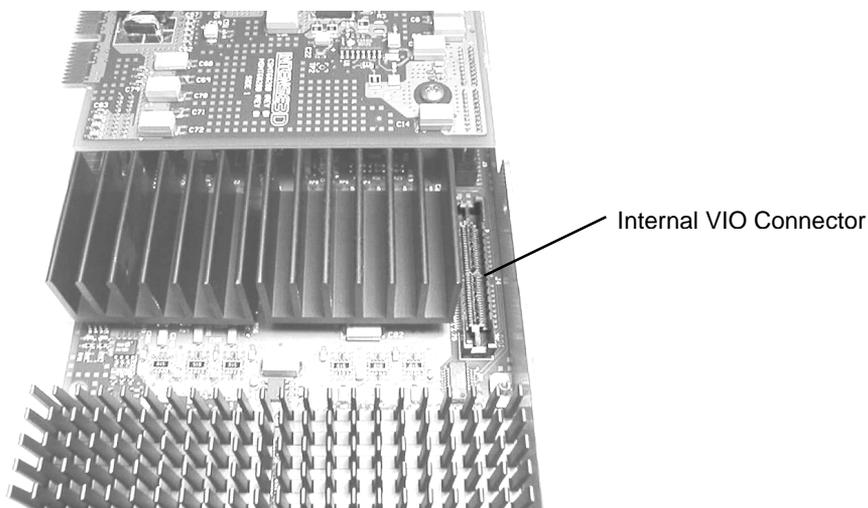


Figure 3. Internal VIO Connector (Wildcat 4210 VIO Only)

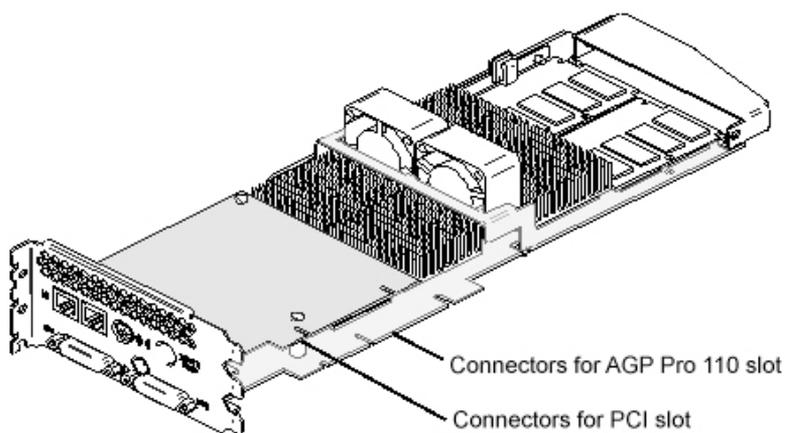


Figure 4. Expansion Slot Connectors (Shown On Wildcat 4210)

Connecting Monitors

Refer to the documentation delivered with the computer's monitors for information on the type of connection required. The monitor cables will have either a Digital Video Interface (DVI)-I connector or a 15-pin VGA connector.

NOTE Multiple monitor support is available only under Windows 2000. If you are connecting two monitors to the Wildcat 4210, see Chapter 3, "Using the Wildcat 4210," for information about configuring dual displays.

NOTE If the computer's monitors do not have built-in video cables, use shielded video cables. The cables should have DVI-I connectors or 15-pin VGA connectors (with adapters) at one end for the video output port on the card, and the appropriate connectors at the other end for the video input ports on the monitors. See the documentation delivered with the computer's monitors for more information.

NOTE If you installed the video card, the computer will boot into VGA mode. Go to "Installing Wildcat Driver Software" for instructions on installing the Wildcat driver software.

To connect DVI monitors to a Wildcat 4210 video card:

1. Make sure power to the computer and to the monitors is turned off.
2. Connect the cable for a single monitor to the Primary DVI-I port (see Figure 5). If needed, connect the cable for a second monitor to the Secondary DVI-I port.
3. Turn on power to the computer and to the monitors. If the monitors' Power On LEDs do not illuminate or the monitors do not display, refer to Chapter 4, "Troubleshooting."

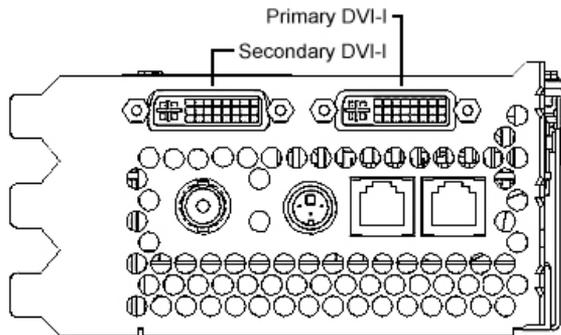


Figure 5. DVI-I Ports (Wildcat 4210 Only)

To connect VGA monitors to a Wildcat 4210 video card:

1. Make sure power to the computer and to the monitors is turned off.
2. Connect the VGA connector on each monitor cable to the VGA end of a DVI-VGA adapter.
3. If you are connecting a single monitor, connect the DVI-I end of the DVI-VGA adapter to the Primary DVI-I port (see Figure 5). If needed, connect the DVI-I end of the DVI-VGA adapter for a second monitor to the Secondary DVI-I port.
4. Turn on power to the computer and to the monitors. If the monitors' Power On LEDs do not illuminate or the monitors do not display, refer to Chapter 4, "Troubleshooting."

To connect VGA monitors to a Wildcat 4210 VIO video card:

1. Make sure power to the computer and to the monitors is turned off.
2. If you are connecting a single monitor, connect the VGA connector on the monitor cable to the analog video output port marked 1st (see Figure 6). If needed, connect the VGA connector on the monitor cable for a second monitor to the analog video output port marked 2nd.
3. Turn on power to the computer and to the monitors. If the monitors' Power On LEDs do not illuminate or the monitors do not display, refer to Chapter 4, "Troubleshooting."

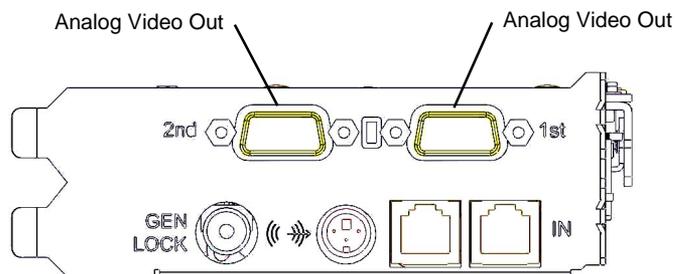


Figure 6. Analog Video Out Ports (Wildcat 4210 VIO Only)

Installing the Driver Software

Refer to the operating system documentation and online Help for more information on installing driver software.

Make sure the computer has the following before installing the Wildcat 4210 driver:

- ◆ Microsoft Windows 2000 or Windows NT Workstation 4.0 with Service Pack 5 (or later)
- ◆ 3 MB of free space on the computer's primary system disk

CAUTION You must have the correct driver for Windows 2000 or Windows NT 4.0. If you are unsure, refer to the README file on the driver CD or diskette for this information.

If you are reinstalling the Wildcat 4210 driver, you must first remove the currently installed Wildcat driver.

To remove the existing Wildcat driver in Windows 2000:

1. Log on to Windows 2000 using an account that has administrative privileges.
2. Go to Start » Settings » Control Panel » Add/Remove Programs » Change and Remove Programs.
3. Highlight the Wildcat Display Driver and click Change/Remove.

4. When prompted to confirm driver removal, click Yes and follow the prompts.
5. When notified that driver software removal is complete, click OK.
6. Restart the computer.

To remove the existing Wildcat driver in Windows NT 4.0:

1. Log on to Windows NT using an account that has administrative privileges.
2. Go to Start » Settings » Control Panel » Add/Remove Programs » Install/Uninstall.
3. Highlight the Wildcat Display Driver and click Add/Remove.
4. When prompted to confirm driver removal, click Yes and follow the prompts.
5. Restart the computer.

After removing the currently installed Wildcat driver, you can install the Wildcat 4210 driver.

To install the Wildcat 4210 driver in Windows 2000:

1. Log on to Windows 2000 using an account that has administrative privileges.
2. When the Found New Hardware Wizard displays, click Next.
3. Under Install Hardware Device Drivers, click Search for a suitable driver for my device (recommended), and then click Next.
4. Under Locate Driver Files, make sure the appropriate search location is selected, and that Disk 1 of the driver media is loaded in the appropriate drive (or the Disk 1 folder is selected); then click Next. The Wizard locates the driver installation files.
5. Under Driver Files Search Results, click Next to start the installation.
6. Insert Disk 2 when prompted (or select the Disk 2 folder), and then click OK to continue with the installation.
7. Once the driver successfully installs, click Finish to dismiss the Found New Hardware Wizard.

NOTE Windows 2000 recognizes the dual pipelines as two devices. The Found New Hardware Wizard will display a second time to finish the installation. You must repeat Steps 3 through 7 above to complete the installation.

8. When told that the computer must be restarted for the new settings to take effect, remove the delivery media from the disk drive (if applicable) and click Yes.

See Chapter 3, “Using the Video Card,” for instructions on defining the display properties.

To install Wildcat 4210 driver in Windows NT 4.0:

1. Log on to Windows NT using an account that has administrative privileges.
2. Insert the delivery media (diskettes or CD) into the appropriate device on the computer.
3. Go to Start » Settings » Control Panel » Display » Settings » Display Type » Change.
4. In the Change Display dialog, click Have Disk.
5. In the Install From Disk dialog, type the path to the directory that contains the delivery media.
6. In the Change Display dialog box, verify that the Wildcat 4210 driver is highlighted and then click OK.
7. Click Yes when asked if you want to install a third-party driver.
8. When a message displays that the driver installed successfully, click OK.
9. Click Close to exit the Display Type dialog.
10. Click Close to exit the Display Properties dialog.
11. When told that the computer must be restarted for the new settings to take effect, remove the diskette from the computer's floppy disk drive, if applicable, and click Yes.
12. After the computer restarts and you log in, a message displays stating that a new display driver has been installed, and that you should use the Display option in the Control Panel to select the preferred display resolution. Click OK.

See Chapter 3, "Using the Video Card," for instructions on defining the display properties.

Installing Heidi[®] Driver Software for AutoDesk Applications

The Heidi driver software allows full-screen multisampling of and compatibility with AutoDesk applications, as well as hardware acceleration of the Wildcat 4210 video card via OpenGL. To install the Heidi driver software and to activate full screen multisampling, refer to the README file on driver Disk 3 or in the Disk 3 folder of the driver CD.

Verifying the Default Video Display Driver**To verify the default video display driver in Windows 2000:**

1. Go to Start » Settings » Control Panel » Display » Settings.
2. Verify that two Wildcat 4210 devices are listed under Display.
3. Click Cancel to close the Display Properties dialog.

See Chapter 3, "Using the Video Card," for instructions on defining the display properties.

To verify the default video display driver in Windows NT 4.0:

1. Go to Start » Settings » Control Panel » Display » Settings » Display Type.
2. Verify that Wildcat 4210 is listed under Display.
3. Click Cancel to close the Display Properties dialog.

See Chapter 3, “Using the Video Card,” for instructions on defining the display properties.

Verifying the System Startup Version**To verify the default system startup version in Windows NT 2000:**

1. Go to Start » Settings » Control Panel » System » Advanced » Startup and Recovery.
2. Verify that Microsoft Windows 2000 Professional is listed as the default operating system and click OK.
3. Click OK to close the System Properties dialog.

See Chapter 3, “Using the Video Card,” for instructions on defining the display properties.

To verify the default system startup version in Windows NT 4.0:

1. Go to Start » Settings » Control Panel » System » Startup/Shutdown.
2. If Windows NT Workstation Version 4.x is not selected in the Startup list, select it and click Apply.

NOTE Do not select the VGA version of the operating system. The video display runs in VGA mode when the Wildcat driver software is not running.

3. Click OK to close the System dialog.

See Chapter 3, “Using the Video Card,” for instructions on defining the display properties.

Checking the Video Image**To check the video image:**

1. Go to Start » Settings » Control Panel » Display » Settings.
2. Click Test to test the display resolution.
3. Click OK to dismiss the Display Properties dialog.

See Chapter 3, “Using the Video Card,” for instructions on defining the display properties.

Connecting a Stereo Display Device

Refer to your stereoscopic display device's documentation for more information on cables and connectors.

To connect a stereo display device:

1. Connect one end of the stereo emitter cable to the input port on your stereoscopic display device.
2. Connect the other end of the stereo emitter cable to the Stereo Sync Out port on the video card (see Figure 7).
3. Configure the display settings to enable stereo display. See Chapter 3, "Using the Video Card," for more information.

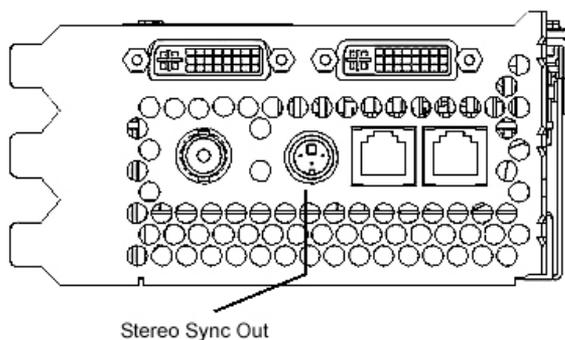


Figure 7. Stereo Sync Out Port (Shown On Wildcat 4210)

3 Using the Video Card

This chapter contains instructions for configuring the video display and enabling the stereo display. If you purchased your Wildcat 4210 video card with a computer, it was configured for use before shipment. The instructions in this chapter are necessary only if you purchased the card separately, or if you need to reconfigure the video display or stereo display.

Configuring the Video Display

On a computer running Windows NT 4.0, the Display Properties dialog will have two additional tabs: Wildcat Configuration and Wildcat Monitor. On a computer running Windows 2000, go to Display Properties » Settings » Advanced to see these tabs.

To use the Wildcat Configuration tab:

1. Make sure you are logged into a non-VGA version of Windows NT or Windows 2000 and close any open application programs.
2. Go to Start » Settings » Control Panel » Display. In Windows NT 4.0, click the Wildcat Configuration tab if it is not already displayed (see Figure 8). In Windows 2000, continue to Settings » Advanced and click the Wildcat Configuration tab.
3. Click Hardware Info to view hardware settings; click View Config to view the display configuration; or click Config Wizard to modify the display configuration or create a new one.



Figure 8. Wildcat Configuration Tab

To use the Wildcat Monitor tab:

1. Make sure you are logged into a non-VGA version of Windows NT or Windows 2000 and close any open application programs.
2. Go to Start » Settings » Control Panel » Display. In Windows NT 4.0, click the Wildcat Monitor tab if it is not already displayed (see Figure 9). In Windows 2000, continue to Settings » Advanced and click the Wildcat Monitor tab.

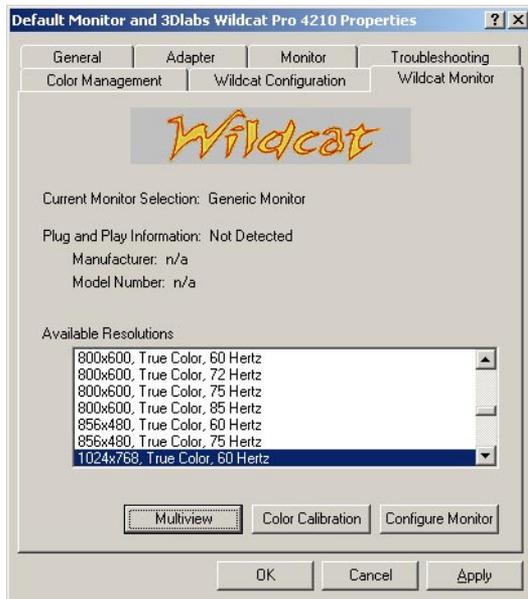


Figure 9. Wildcat Monitor Tab

3. Click Color Calibration to change the color settings. Make changes, and then click OK to accept the changes and dismiss the Color Calibration dialog, or click Cancel to close the Color Calibration dialog without making any changes. You are returned to the Wildcat Monitor tab.
4. Click Configure Monitor to change the display mode, select a monitor type, and change the resolution/refresh rate (see Figure 9). Once you have made the changes you require, click OK to accept the new configuration and dismiss the Configure Monitor dialog. You are returned to the Wildcat Monitor tab.

NOTE See “Enabling Stereo Display,” for instructions on changing the Display Mode. See Appendix A, “Specifications,” for a list of available monitor resolutions.

5. Click OK on the Display Properties dialog to accept the changes, or click Cancel to close the dialog without accepting any modifications.
6. Restart the computer if you are prompted to do so. Most changes will take effect without restarting.

Enabling Stereo Display

If you connect a device to the stereo port on the Wildcat 4210 video card, you must change the display mode to view in stereo. See Chapter 2, “Setup,” for the location of the stereo output port on the video card.

To enable stereo display:

1. Make sure your stereo display device is properly connected to the stereo output port on the Wildcat 4210 video card.
2. Go to Start » Settings » Control Panel » Display. In Windows NT 4.0, click the Wildcat Monitor tab if it is not already displayed. In Windows 2000, continue to Settings » Advanced and click the Wildcat Monitor tab.
3. Click Configure Monitor.
4. Select a Stereoscopic Display mode from the Display Mode list box and then click OK.
5. You may see the following message: “The selected monitor cannot display the current desktop area. Select a new resolution before applying these changes.” If you do, click OK and then select a resolution from the list of available resolutions.
6. Click OK if the display is correct and you wish to keep the new settings.
7. Click OK to accept the new display mode.

You must disable stereo mode when you no longer wish to view in stereo. To do this, follow the steps above, and select Monoscopic Display from the Display Mode list box.

Enabling Multiview and Genlock

The Wildcat 4210 video card features Multiview support for frame locking and rate locking of multiple computers. Genlock support allows video timing to be synchronized to an external timing source.

NOTE Your application must support Multiview for Multiview to work.

NOTE Refer to the Support pages on the Wildcat Web site for information on ordering the correct Multiview and Genlock cables.

To prepare computers to use Multiview:

1. Insert one end of a shielded RJ12 cable into the Multiview Out port (see Figure 10) of the first computer. This computer becomes the “master”
2. Insert the other end of the cable into the Multiview In port (see Figure 10) of the second computer. This computer becomes a “slave.”

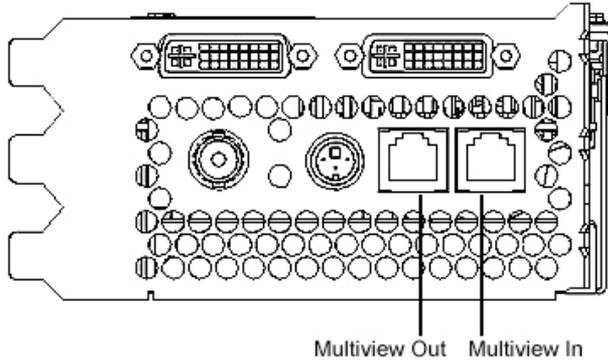


Figure 10. Multiview Ports (Shown On Wildcat 4210)

3. If connecting more than two computers, continue linking computers to one another by connecting the Multiview Out port of one computer to the Multiview In port of the next. The last computer should terminate the links and only have a cable plugged into the Multiview In port.

To confirm Multiview cables are detected:

1. On each "slave" computer, Go to Start » Settings » Control Panel » Display » Settings.
2. If the computer is running Windows NT 4.0, the input cables will display as Detected under Multiview Information.
3. If the computer is running Windows 2000, go to Advanced » Intense 3D Monitor » Multiview. The input cables will display as Detected under Multiview Information.

To enable Genlock:

1. Connect the external timing source to the Genlock In port on the "master" computer (see Figure 11).

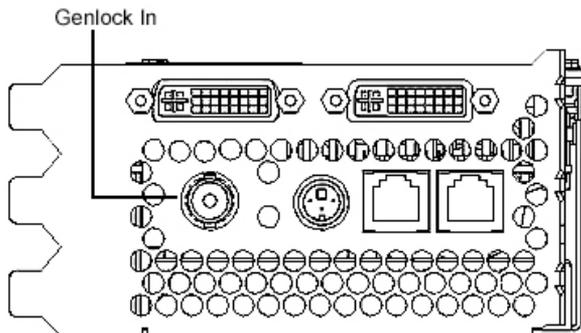


Figure 11. Genlock In Port (Shown On Wildcat 4210)

2. Go to Start » Settings » Control Panel » Display » Settings » Advanced » Wildcat Monitor » Multiview.
3. Under Genlock Configuration, choose Enable.
4. Choose the signal source from the Source list box.
5. Select the Signal Edge Response, Signal Lock Rate, and Pixel Align Offset appropriate for your application and hardware setup, and then click Apply.

Some monitors require custom timing file entries for Genlock to be properly maintained. Refer to the documentation delivered with your monitor for further information.

Enabling Dual Monitors in Windows 2000

The Wildcat 4210 video card supports dual monitors on a computer running Windows 2000. Two monitors can be connected to the Wildcat 4210 video card so the display area stretches across both monitors.

NOTE Before enabling dual monitors, connect the second monitor to the video card. See Chapter 1, "Setup," for more information.

To enable dual monitors:

1. Go to Start » Settings » Control Panel » Display » Settings » Advanced » Wildcat Configuration.
2. Next to Maximum Number of Displays, select 2, and then click Apply.
3. When prompted, click Yes to shut down the computer. When the computer has shut down, turn off power to the computer.
4. Turn on power to the computer and to the monitors. The primary monitor displays the startup sequence. If the monitors' Power On LEDs do not illuminate or the monitors do not display, refer to Chapter 4, "Troubleshooting."

To change monitor settings with a dual monitor configuration:

1. Go to Start » Settings » Control Panel » Display » Settings.
2. Drag the monitor icons to match the physical arrangement of your monitors (see Figure 14).
3. Click OK.

To adjust the colors or resolution of a monitor:

1. Go to Start » Settings » Control Panel » Display » Settings.
2. Click the icon for a monitor or select that monitor from the Display list box.

3. Make changes to the items under Colors or Screen Area.
4. Click OK.

NOTE Any changes made in the Advanced Properties dialog affects both monitors.

4 Troubleshooting

This chapter describes common problems and solutions, how to get a usable video resolution, and how to get help.

Finding Solutions for Common Problems

Problem	Cause	Solution
Display is black, not synchronized, or distorted	Display properties are not set correctly.	In Windows 2000, restart in Safe Mode and select a supported resolution and refresh rate. In Windows NT, use the Last Known Good option. See "Getting a Usable Video Resolution" in this chapter.
	Single monitor is not plugged into primary output port.	Turn off power to the computer. Disconnect the monitor from the secondary port and connect it to the primary port. See Chapter 2, "Setup," for more information.
Monitor does not support a selected resolution or refresh rate	The selected settings are not compatible with your monitor and video card.	In Windows 2000, restart in Safe Mode and select a supported resolution and refresh rate. In Windows NT, use the Last Known Good option. See "Getting a Usable Video Resolution" in this chapter. Reinstall the video driver. See Chapter 2, "Setup," for more information.
There is no VGA boot screen	The connections may not be set up properly.	Make sure the monitor cables are securely fastened to the video card. Make sure the monitors and computer are plugged into electrical outlets and are receiving power. Check any other external display connectors, if applicable. Make sure the video card is seated properly in its expansion slot.

Problem	Cause	Solution
Screen image is off-center	Monitor settings may be configured improperly.	Refer to your monitor's documentation for instructions on making horizontal and vertical adjustments.
Color balance is wrong	Monitor settings may be configured improperly.	Refer to your monitor's documentation for instructions on adjusting the color display.
There is no picture	Improper software setup or hardware problem.	Restart 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 computer is defective. See "Getting a Usable Video Resolution" in this chapter.
	Computer was not shut down and powered off after selecting the dual monitor feature in Windows 2000.	Shut down the computer and turn off power to it. Then turn on power to the computer and let it restart.
Screen image defects appear	Possible indication of a hardware problem.	Run diagnostics to check the graphics hardware.

Using Diagnostics

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

Getting a Usable Video Resolution

The computer 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, take the following actions, as appropriate.

In Windows 2000

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

To restart in Safe Mode:

1. Restart the computer.
2. At the boot screen, press F8 to enter the Windows 2000 Advanced Options Menu.
3. Select Safe Mode, and then press ENTER to return to the boot screen.

In Windows NT 4.0

Press CTRL+ALT+DEL but do not log on to the Windows NT operating system. Instead, shut down then use the Last Known Good option to return to the last known good configuration recorded by Windows NT.

To use the Last Known Good option:

1. Restart the computer.
2. Press the space bar when prompted to invoke the Last Known Good menu.

If this option fails to correct the video display problem, restart the computer in VGA mode and reconfigure your display to 640 x 480 resolution, 60 Hz refresh rate. Then restart the computer in non-VGA mode.

To restart in VGA mode:

1. Restart the computer.
2. At the boot screen, select the VGA version of the operating system.

Determining a Defective Unit

To determine a defective unit:

1. Save and exit from all files.
2. Shut down the operating system.
3. Turn off the power to the monitor and to the computer.

CAUTION Always turn off the power to the computer before connecting or disconnecting the cables.

4. Check and reseat all card and cable connections as needed.

5. Turn on the monitor power. If the Power On LED does not illuminate, see "Getting Help" in this chapter.
6. Turn on the power to the computer 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 chapter.

Getting Help

If the troubleshooting procedures in this chapter do not resolve the problem, please contact your computer vendor for technical assistance (refer to your system documentation for instructions). For information about your warranty, see your computer's documentation.

5 Technical Information

Functional Specifications

- ◆ Interface – AGP Pro 110
- ◆ Graphic controller – High-speed Wildcat chipset technology
- ◆ DAC speed – 250 MHz
- ◆ Data width – Frame buffer 256 bits; texture buffer 128 bits; DirectBurst 64 bits
- ◆ Video memory – Frame buffer 128 MB; texture buffer 128 MB; DirectBurst 32 MB
- ◆ Interrupts – PCI-assigned; Interrupt A for Wildcat 4210
- ◆ DMA channels – PCI, AGP 2x
- ◆ Ports – Two DVI-I outputs (Wildcat 4210) or two 15-pin D-sub analog video outputs (Wildcat 4210 VIO); BNC connector; two 6-pin modular jacks; 3-pin miniDIN stereo sync output; internal VIO connector (Wildcat 4210 VIO)

Requirements

- ◆ Expansion slots – One AGP Pro 110 slot and one (Wildcat 4210 VIO) or two (Wildcat 4210) adjacent and open PCI slots
- ◆ Power – 85 W maximum; 12.0 V 250 mA maximum; 5.0 V 9.8 A maximum; 3.3 V 10 A maximum

3D Performance

Performance numbers reflect maximum hardware rate. Numbers may vary depending on the application.

- ◆ 3D Gourad-shaded triangles, Z-buffered, 15-pixel – 12.0 M triangles/sec
- ◆ 3D Gourad-shaded triangles, Z-buffered, 25-pixel – 8.5 M triangles/sec
- ◆ 3D Vectors, solid color, 10-pixel – 17.6 M vectors/sec

Resolutions and Refresh Rates

The following are maximum supported monitor resolutions and refresh rates. These may vary depending on the monitor. SuperScene Antialiasing is only available at resolutions under 1152 x 864 on a single display.

Single display without SuperScene	1920 x 1440 @ 60 Hz	
	1600 x 1280 @ 76 Hz	
	2048 x 1152 @ 75 Hz	
	1920 x 1200 @ 75 Hz	
	1280 x 1024 @ 60 Hz	Stereo available
	1280 x 960 @ 60 Hz	Stereo available
Single display with SuperScene	1600 x 1200 @ 85 Hz	
	1600 x 1280 @ 76 Hz	
	1920 x 1080 @ 85 Hz	
	1824 x 1128 @ 75 Hz	
	1280 x 960 @ 60 Hz	Stereo available
Dual display without SuperScene	1920 x 1440 @ 60 Hz	
	1600 x 1280 @ 76 Hz	
	2048 x 1152 @ 75 Hz	
	1920 x 1200 @ 75 Hz	
	1280 x 1024 @ 60 Hz	Stereo available
	1280 x 960 @ 60 Hz	Stereo available
Dual display with SuperScene	1152 x 870 @ 75 Hz	
	1376 x 768 @ 60 Hz	
	1280 x 800 @ 90 Hz	
	1224 x 768 @ 60 Hz	Stereo available

Ports and Connectors

The Wildcat 4210 is an AGP Pro 110 card designed for computers that have an AGP Pro 110 slot. The card plugs into the AGP Pro 110 slot and an adjacent PCI slot.

NOTE A Wildcat 4210 cannot plug into a standard AGP slot.

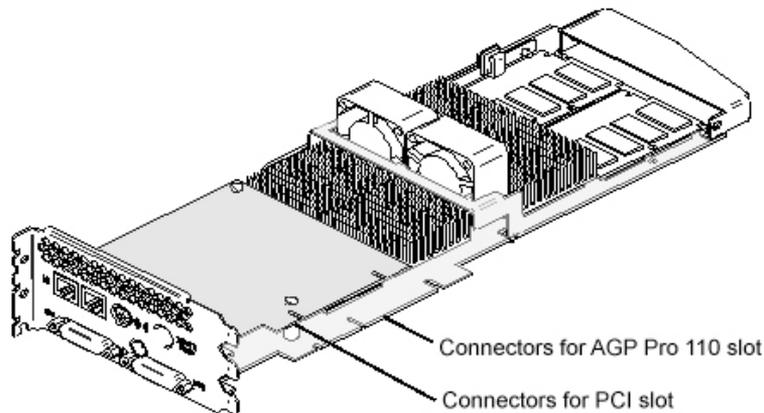


Figure 12. Expansion Slot Connectors (Shown On Wildcat 4210)

The card has several external ports for external devices and computer connections. The following sections describe the ports in detail. See Chapter 1, “Introduction,” for the location of the ports on the Wildcat 4210 and Wildcat 4210 VIO cards.

DVI-I Out Ports (Wildcat 4210 Only)

The primary and secondary digital video output ports are DVI-I receptacles with 29 signal contacts as specified by the Digital Visual Interface specification (Revision 1.0). These ports support pixel rates up to 112 MHz using the SII150 A PanelLink device from Silicon Image. The ports are fully compliant with the DVI specification, and support digital and analog displays.

Analog Video Out Ports (Wildcat 4210 VIO Only)

The analog video out ports are female, 15-pin, D-sub connectors. These ports provide connection to two analog CRT displays.

Multiview In and Out Ports

These ports are two 6-pin modular jack connectors. They allow Multiview support for frame locking and rate locking of multiple computers.

Genlock In Port

This port is a 75-ohm male BNC connector that is used to connect to a 75-ohm coaxial cable terminated with a female BNC connector. The port allows video timing to be synchronized to an external timing source. The port provides a periodic signal to the display system to lock vertical refresh rate.

Stereo Sync Out Port

This port is a female, 3-pin, mini-DIN connector. The port provides connection to the emitter module for LCD shutter glasses or to other stereo shutter devices.

VIO Connector (Wildcat 4210 VIO Only)

The internal VIO connector on a Wildcat 4210 VIO card provides a path for direct image and alpha channel data transfer to and from the card's frame buffers.

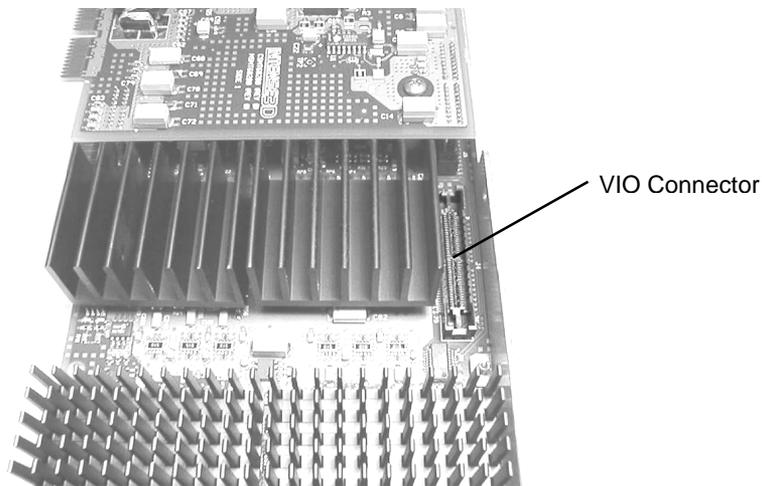


Figure 13. Internal VIO Connector (Wildcat 4210 VIO Only)