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The Oxygen™ VX1
and
Oxygen™ GVX1
Graphics Accelerator
User's Guide

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2. Increase the separation between the equipment and receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
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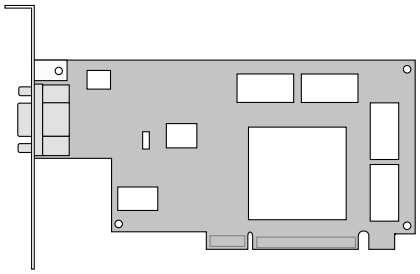
Introduction

Welcome to 3Dlabs!

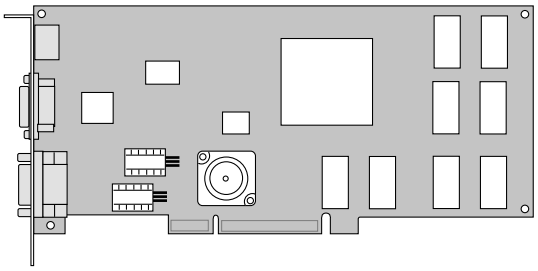
Thank you for selecting a 3Dlabs® Oxygen™ graphics accelerator card!

The Oxygen VX1 accelerator uses 3Dlabs' new GLINT® R3 graphics processor to deliver genuine, industrial strength workstation graphics for the same price as a games-only board. Oxygen GVX1 is the first workstation graphics board to bring the heavy-duty power of hardware-based geometry acceleration below $1,000. Oxygen GVX1 integrates the GLINT R3 rasterization and the GLINT Gamma G1 geometry processing hardware on a single card.

Both cards use innovative 3Dlabs' technologies, like PowerThreads™ SSE software to distribute OpenGL throughput across multiple processors, and Virtual Textures to shatter the limitations of on-board graphics memory.



Oxygen VX1



Oxygen GVX1

Overview

Your Oxygen card has the following features:

- **The GLINT R3 rasterization engine**

  The GLINT R3 rasterization engine accelerates tasks like true-color shading, texture mapping, anti-aliasing, and transparency operations.

- **Virtual Textures**

  Virtual Textures is a hardware-based, full demand-paged virtual texture storage sub-system. With it, your Oxygen card can cache up to 256MB of textures stored in main system memory.

- **PowerThreads SSE geometry processing**

  PowerThreads SSE software distributes OpenGL operations across multiple CPU's (where available) for faster rendering of your files, and leverages the Intel® Pentium® III and Pentium III Xeon™ Streaming SIMD extensions for optimal geometry and lighting performance.

- **32 MB memory**

  32 MB of SDRAM (Oxygen VX1) or SGRAM (Oxygen GVX1) memory supports high-precision, high-performance acceleration.

- **High-precision, high resolution display**

  Your Oxygen card has a 300 MHz RAMDAC enabling flicker-free resolutions up to 2048 x 1536.

- **16, 24, and 32-bit linear Z-buffer**

  The Z-buffer provides the highest level of depth-precision, even at the highest resolutions.

- **Full AGP sideband addressing**

  Sideband addressing ensures high-performance 3D acceleration through the advanced features of the AGP bus.

- **SoftEngine AutoCAD support**

  SoftEngine enhances AutoCAD R12, R13, R14, and LT performance by up to four times on Windows NT systems.

- **Colorific screen-to-print color matching**

  Colorific simplifies color matching without sacrificing accuracy.

- **Optimized Application Settings**

  Your card comes with preset driver configurations for mainstream Direct3D and OpenGL applications. You can quickly switch between configurations at any time with several mouse clicks on the Windows Taskbar and also create your own settings.

The Oxygen GVX1 card adds:

- GLINT Gamma G1 geometry processing

  The GLINT Gamma G1 chip accelerates the 3D geometry pipeline in hardware, performing all vertex transformation and lighting calculations required by OpenGL applications.

- Dynamic load balancing

  When the GLINT Gamma processor is busy, geometry and transform calculations are automatically shared between the CPU and the GLINT Gamma.

- Digital Flat Panel support

  Oxygen GVX1 allows direct connection of a digital, flat-panel display for dramatically improved on-screen image quality at resolutions up to 1280 x 1024.

- Quad-buffered stereo

  Left and right buffers are flipped simultaneously to preserve synchronization in your stereo 3D images at resolutions up to 1280 x 1024.

- Multiple Monitor Support

  By installing additional Oxygen GVX1 cards, you can support up to four monitors with full windows management capabilities.

System Requirements

Your system needs the following features in order to support Oxygen VX1:

- Intel-compatible, 166 MHz (minimum) system
- Windows® 95, 98, or NT 4.0 (or later) operating system
- 64 MB RAM (Random Access Memory)
- 16 MB minimum available hard drive space
- AGP expansion slot for AGP-based Oxygen VX1 cards
- VGA multisync monitor

Oxygen GVX1 requires these features:

- Intel-compatible, 166 MHz (minimum) system
- Windows® NT 4.0 (or later) operating system, SP4 (or later)
- 64 MB RAM (Random Access Memory)
- 16 MB minimum available hard drive space
- AGP expansion slot for AGP-based Oxygen GVX1 cards
- PCI expansion slot for PCI-based Oxygen GVX1 cards
- VGA multisync monitor

Software Partners

Your Oxygen VX1/Oxygen GVX1 card has been tested with a variety of graphics software packages, several of which are listed below. As testing continues and performance optimizations are made, the results and techniques are posted on the 3Dlabs, as well as the appropriate software partner's, website.

Software Application	Web Site Address
AutoCAD	http://www.autodesk.com
Colorific	http://www.colorific.com
3D Studio MAX	http://www.ktx.com
Lightscape	http://www.lightscape.com
LightWave 3D	http://www.newtek.com
Maya	http://www.aw.sgi.com
MicroStation	http://www.bentley.com
Pro/ENGINEER	http://www.ptc.com
SDRC I-DEAS	http://www.sdrc.com
Softimage | 3D	http://www.softimage.com
SolidWorks	http://www.solidworks.com
Unigraphics	http://www.ug.eds.com/ug/

CHAPTER 1 - INSTALLATION

Getting Ready

To successfully use your new Oxygen VX1 or Oxygen GVX1 card, you must install the card and the accompanying driver software. Whether you install your new card or the driver first depends on whether a video card is already present in your system.

If there is a video card in your system: Uninstall the drivers for the existing card, then install the Oxygen driver. Once the new driver is loaded, remove the old card and install your Oxygen VX1 or Oxygen GVX1 card. The instructions for uninstalling an old driver and installing the new driver begin on page 6.

If there is not a video card in your system: Install your new card as described in the Installing Hardware section, below, then install the driver.

Once the basic installation is complete, you can choose to install the SoftEngine and Colorific enhancements as described on page 7.

NOTE! Be sure to register your new card using one of the options described on page 8.

✏*Before You Start*

- Take every possible precaution against static electricity as you prepare to install the card: static can damage components. We have included an anti-static wrist strap for you to wear while installing the hardware: you should also try to work in a static free area (such as on a tile floor rather than carpet). You might even consider wearing special ESD, or at least rubber-soled, shoes.
- Save any work in progress and exit any open applications. Always back up your system before you install new hardware or software.
- Have your anti-static strap and a Philips-head screwdriver ready.

Installing Hardware

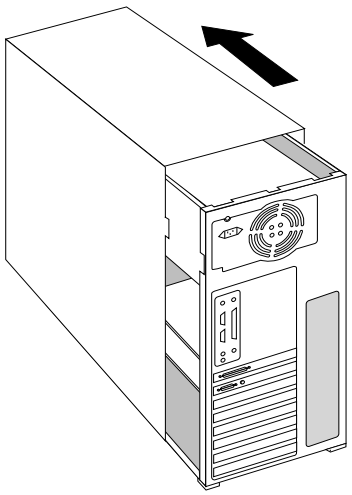
Oxygen GVX1 and Oxygen VX1 cards are available in PCI and AGP versions. Check the documentation for your system for the location of PCI and AGP expansion slots in your system.

✏ *To remove an old card from your system*

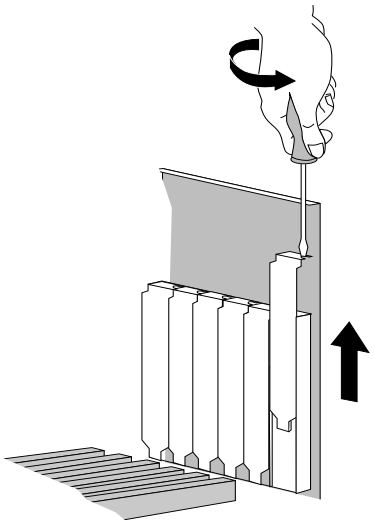
1. Make sure you have uninstalled any old drivers and installed the Oxygen driver in their place.
2. Turn off and unplug the power source for your system and each of its peripherals.
3. Unplug the monitor cable from the old card.
4. Remove the cover from your system.
5. Attach the anti-static strap to your wrist, and attach the other end to a bare, conductive (as opposed to painted or sticker-covered) area of your system's chassis.
6. Remove any screws securing the card to the chassis.
7. Lift the card out of the slot.

✏ *To install your Oxygen card*

1. Turn off and unplug the power source for your system and each of its peripherals, if you have not already done so.
2. Remove the cover from your system so you can access an appropriate expansion slot. See your system documentation for AGP and PCI slot locations.

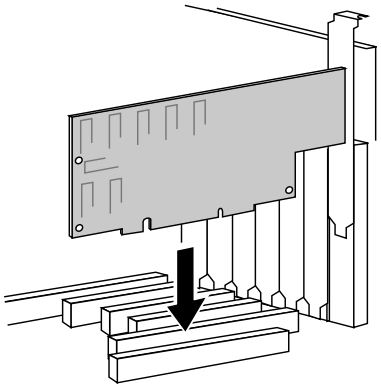


3. Determine which slot you are going to use and remove its slot cover.

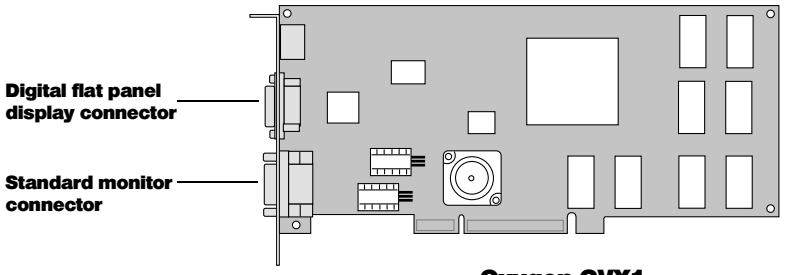


4. Attach the anti-static strap to your wrist, and attach the other end to a bare, conductive (as opposed to painted or sticker-covered) area of your system's chassis.
5. Remove the card from its anti-static packaging. **Write down the serial number for registration and future use.**
6. Place the card into the expansion slot and seat it firmly.

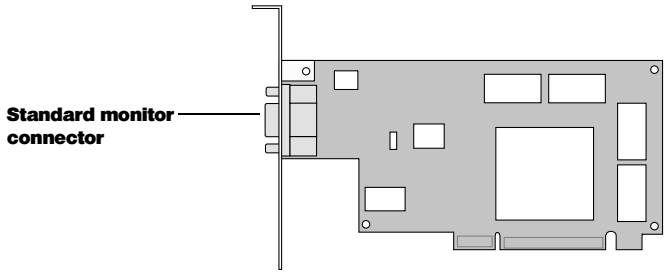
IMPORTANT! See your system documentation for instructions on securing the card to the chassis. Loose cards and connections can cause grounding and operating problems.



7. Oxygen GVX1 users can install additional Oxygen GVX1 PCI cards for multiple monitor support. To install a second Oxygen GVX1 card, repeat steps 3 through 6.
8. Remove the anti-static strap and replace the cover on your system.
9. Connect the video cable from your monitor to the video connector on the card.



Oxygen GVX1



Oxygen VX1

10. Plug in and start up your system, including peripherals, and log on to your operating system.

✏ *To install additional Oxygen GVX1 cards for multiple monitor support*

- Repeat the steps in "To install your Oxygen card" to install up to a total of four Oxygen GVX1 cards in your system. Install an additional Oxygen GVX1 card in any available AGP slot for an AGP card or PCI slot for a PCI card.

Installing Software

The *Oxygen Product CD-ROM for the Oxygen VX1/Oxygen GVX1* includes Oxygen PowerThreads video driver software, which lets you set image quality and performance preferences for your card. It also includes the Soft Engine AutoCAD accelerator and productivity tool package, and Colorific screen-to-print color matching software. Installing Soft Engine on your AutoCAD equipped system will improve graphics performance by up to four times, while Colorific painlessly ensures that what you see is what you print.

This section describes the three software installation processes for supported Windows operating systems.

✏*To uninstall an old video driver*

1. If there is an icon for the video card on the taskbar, desktop, or on the Control Panel, select the icon and then check for an uninstall option. If an uninstall option exists, select the option and follow the instructions. (To display the Control Panel, click the Start button, point to Settings, and click Control Panel.)
2. If an uninstall option does not exist, click the Start button, point to Settings, and click Control Panel.
3. Double-click the Add/Remove Programs icon.
4. Click the name of the video card driver you want to remove.
5. Click Add/Remove and follow the instructions.

✏*To install the Oxygen Windows NT driver*

1. Start up Windows. If you are running Windows NT, log onto an account with administrator privileges.
2. Place the Oxygen Product CD-ROM in your CD-ROM drive. When the installation window opens, choose the Oxygen driver installation.
3. Follow the instructions that appear on your screen. (Be sure to read the software license agreement.)
4. Restart your system at the prompt.

✏*To install the Oxygen Windows 98 driver*

1. After installing your Oxygen graphics card, restart your system. Windows 98 automatically detects the new hardware and starts the New Hardware Wizard.
2. In the Add New Hardware Wizard, click Next.
3. Insert the Oxygen Product CD in the CD drive.
4. Confirm that *Specify a Location* is selected, and then type **x:\Win98** (where "x" is the letter of your CD drive).

5. Click Next in the next two steps of the wizard. The wizard copies the files to the correct location.
6. Click Finish, and then restart your system.

✏ *To install Soft Engine*

NOTE! Soft Engine works exclusively with AutoDesk's AutoCAD R12, R13, R14, and LT software. Install Soft Engine if you use one of these AutoCAD programs. Do not install Soft Engine if you do not use one of these AutoCAD programs; it will have no beneficial effect.

---

1. Place the Oxygen Product CD-ROM in your CD-ROM drive. When the installation window opens, choose Install Soft Engine. A menu appears.
2. Select your AutoCAD product type to start the installation.
3. Follow the instructions that appear on your screen.

✏ *To install Colorific*

1. Place the Oxygen Product CD-ROM in your CD-ROM drive. When the installation window opens, choose the Colorific installation.
2. Follow the instructions that appear on your screen.

Registering Oxygen VX1/Oxygen GVX1

When you register your Oxygen 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/register
3. Fill out the registration form that appears on your screen, and click Submit when you are finished.

CHAPTER 2 - SOFTWARE CONFIGURATION

The Oxygen VX1/Oxygen GVX1 Driver

The Oxygen driver software lets you optimize the working relationship between your card, your system and your applications. The 3Dlabs Display Control Panel allows you to customize and create driver settings. The Taskbar based Configuration Manager provides quick and convenient access to most of the Display Control Panel features, and allows you to quickly switch between alternative driver settings.

The Task Bar - based Configuration Manager

When you install the Oxygen VX1/Oxygen GVX1 card and software, the 3Dlabs logo appears in your system tray, also called the task bar. Click the logo with your right mouse button to access the Display Configuration Manager and its shortcuts to these configuration tools:

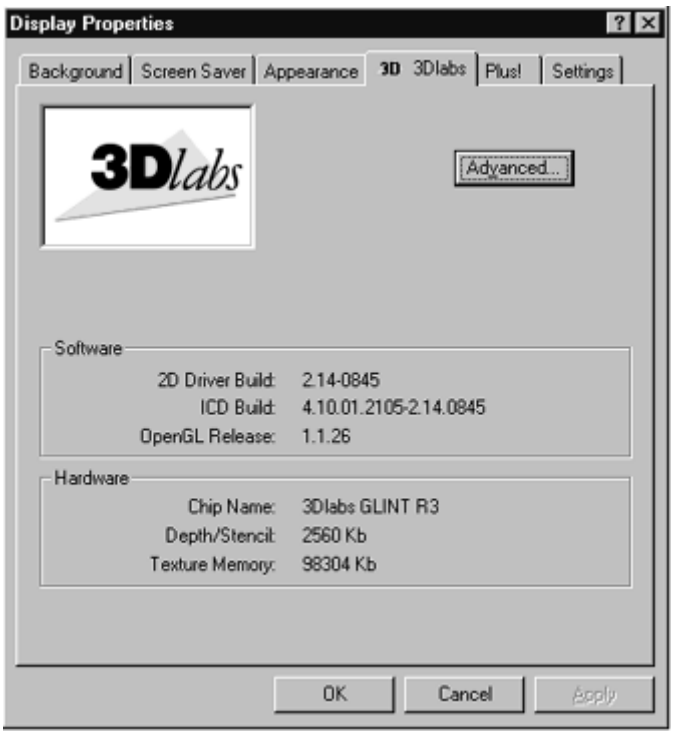


- *Remove from System Tray* lets you delete this task bar utility from your system. You will still be able to access the driver configuration options with the Display Control Panel.
- *About 3DL Display Manager* displays version information for this configuration utility.
- *Go to 3Dlabs Website* takes you directly to www.3dlabs.com through your existing Internet connection.
- *Pop up the Display Panel* reaches the 3Dlabs section on the display control panel.
- *Display Driver Information* provides quick access to information about your Oxygen card configuration.
- *Change Display Resolution* brings up a pop-up list of supported resolutions. Each resolution has an associated pop-up list of available refresh rates.
- *Select Optimized Application* quickly accesses a list of supported applications. Click an application in the list to optimize card settings for your selected option. (The Display Control Panel allows you to create new application settings.)
- *Help* provides standard Windows-style help on the driver and its settings.

NOTE! The Control Panel and the Configuration Manager are not supported by Windows 95.

The Display Control Panel

When you first click the 3Dlabs tab in the Display Control Panel, this introductory page appears:



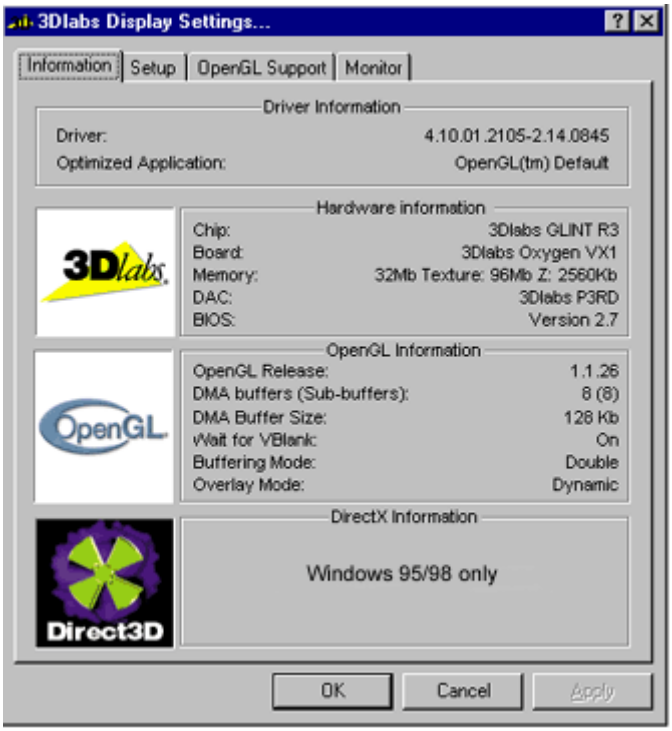
It provides software version and basic hardware specifications, and a point-of-entry to the full set of Oxygen driver customization tools. Click the Advanced button for access to these panels:

- Information
- Setup
- Direct3D (Windows 98 only)
- OpenGL Support
- Monitor (Windows NT only)

The following sections describe each in detail.

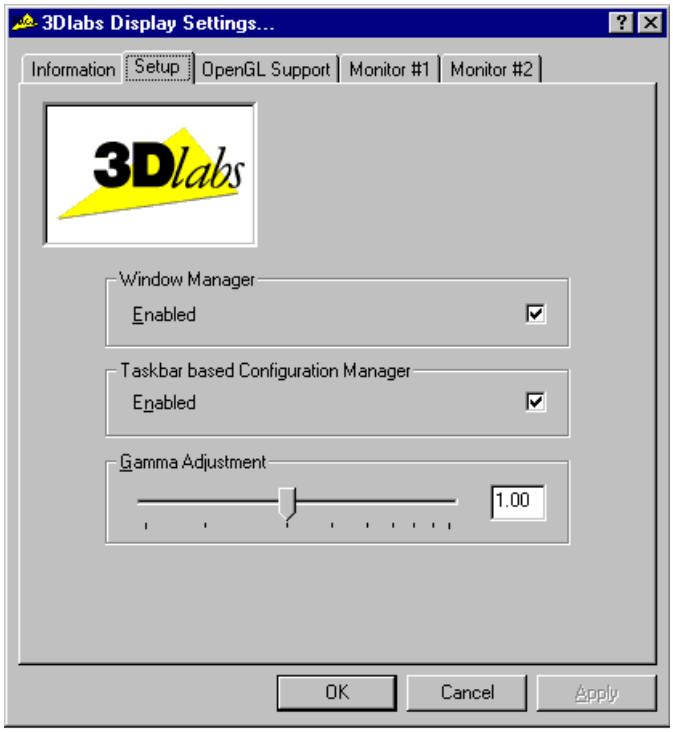
Information Screen

The Information screen provides in-depth information about your selected (or the default) settings, as well as detailed hardware, software, and Direct3D specifications. This information can be especially useful if you should need to contact technical support about your Oxygen card.



Setup Screen

The Setup screen lets you configure settings that are not specifically related to Direct3D or OpenGL.



- You can enable (check) and disable (uncheck) the *3Dlabs multi-monitor Windows Manager*, which requires a system restart. This option is only available if there is more than one 3Dlabs display card in the system.
- You can enable (check) or disable (uncheck) the *Taskbar based Configuration Manager* with a mouse click. The default setting is enabled. This application provides quick access to the main features of the Control Panel. When the taskbar application is enabled, it appears on the taskbar (system tray) each time the system is started. To remove the application from the taskbar, disable (uncheck) the option and restart the system.
- The *Gamma Adjustment* slider on the Setup screen lets you simultaneously adjust RGB color curves and define the color output for your display. You can also enter a precise Gamma value, rather than use the slider, when you know which value is appropriate for your monitor and ambient lighting conditions.

Direct3D Support Screen

The Direct3D Support screen controls Direct3D application specific driver settings for Oxygen VX1 Windows 98 users, and lets you create your own settings. When the panel first appears, the *Defaults*, *Add New* and *Remove Settings* buttons, as well as the *Advanced Options* section, are hidden. They appear when you click the *Advanced* button.



- Click *Driver is optimized for application* to reach a drop down list of Direct3D applications, then select the application you want to use. The rest of your selections on this screen will apply to the specified application. You can also click *Select optimized application* in the Configuration Manager and select your application from that pop-up list.
- The *Add New* button lets you create a new setting, with a user specified name. *Remove Setting* will remove user created settings, but will not remove the default settings created at driver installation time. *Default* will restore the factory default settings.
- *Texture Origin at Top Left Corner* shifts textures slightly as they are applied to objects, and may result in better image quality with some applications.
- *8Bit RGB textures* enables Direct3D support for 8bit textures that do not use a separate “look-up” table to specify color. These can be useful for applications which use the new features of DirectX 6, but older applications can misinterpret these new formats. If you have problems such as incorrect colors or poor quality texturing, try disabling this option.

- *Disable 16-bit alpha-luminance* textures enables Direct3D support for monochrome (luminance) textures. These can be useful for applications which use the new features of DirectX 6, but older applications can misinterpret these new formats. If you have problems such as incorrect colors or poor quality texturing, try disabling this option.
- *Enable Palettized textures* enables Direct3D support for 8bit textures which use a separate "look-up" table to specify the color. These are useful for graphics cards with a small amount of memory. However, they can be slower than the alternatives available on cards with large amounts of memory. For best performance this option should only be enabled for applications that will not operate correctly otherwise.
- *Disable Direct3D Gamma Controls* lets you turn off DirectX gamma control if you experience an extremely dark screen, potentially caused by an application's use of an incorrect default.
- *Gamma adjustment for this application* affects the entire screen display. As with the contrast on your television, you can adjust this value if your application causes the display to consistently look too dark or too light.

OpenGL Support Screen

This screen controls OpenGL-application-specific driver settings and enables you to create your own settings. When the panel initially appears the *New* and *Remove Settings* buttons, as well as the *Advanced Options* section, are hidden. They appear when you click the *Advanced* button at the top of the screen.



- Click *Driver is optimized for application* to reach a drop down list of applications, then select the one you want to use. The rest of your actions on this screen will apply to that choice. You can also click *Select optimized application* in the Configuration Manager and select your application from that pop-up list.
- Click *New* to add an application to the list and customize its settings. *Remove Setting* will remove a user created setting, but will not remove default settings created at driver installation time.
- *Number of DMA Buffers* lets you configure the number of visible 3D windows that can be supported with full speed acceleration. For most applications, 8 buffers is sufficient.
- *Size of each DMA buffer* controls the size (in bytes) of the Direct Memory Access (DMA) buffer. DMA is a technique whereby a device can directly read commands from host memory.
- *Number of DMA Sub-Buffers* lets you set the number of Direct Memory Access (DMA) buffers allocated for use by OpenGL. (DMA is a technique whereby a device can directly access memory without having to go through the CPU). Each DMA

buffer is sub-divided into sub buffers which are used in conjunction with a queued DMA mechanism to reduce latency in the system. The number of sub buffers can be set. Setting it to 2 will disable the queued DMA mechanism.

- *Overlay / Alpha Mode* provides additional control of the overlay plane capabilities exported in the OpenGL pixel formats. It is specific to just two applications: *Alpha Only* is required by the Alias / Wavefront application “Maya” where retained alpha planes are required (e.g. the particle system package), and *Overlay Only* is for the Parametric Technology application “Pro/3DPaint”. Selection of the above applications from the application menu cause the correct mode to be set automatically. The *Dynamic* setting should be chosen for all other cases.
- *Wait for Vblank* lets you determine whether the OpenGL driver will attempt to synchronize screen updates to the vertical blanking interval. Smooth animation of 3D applications can be achieved by rendering (drawing) to an off-screen window/ desktop-sized color buffer and copying or swapping the contents to the displayable front buffer at the completion of each frame.

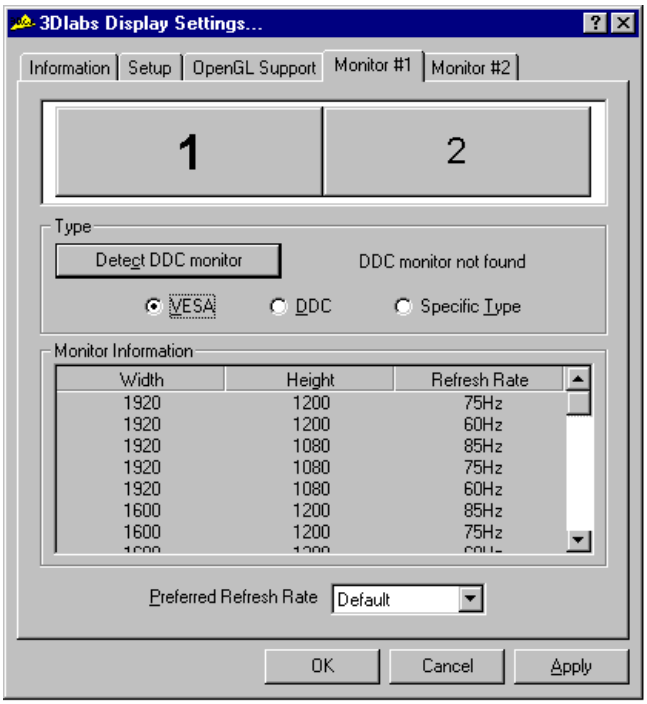
  Visible "tearing" can occur if *Wait for VBlank* is not selected. Disabling this option gives the highest rendering frame rates of double buffered applications. You should disable this option, for instance, when running benchmarks.
- *Stereo View Support* can be enabled (checked) and disabled (unchecked). This option provides control over the export of stereo capable OpenGL pixel formats. You should enable this option when there is a requirement to run OpenGL applications that require stereo support, since additional graphics memory resources are consumed when stereo is enabled. The stereo support provided is quad buffered and frame interleaved. You must restart your system for a change to this setting to take effect. For additional information, see “Configuring your Oxygen GVX1 Card for Stereo Viewing” on page 21.

Monitor Screen

This page allows Windows NT users to specify a monitor type and display the available settings, but it does not permit the actual selection of different monitor modes. To select modes, click the Settings tab at the top of the Display Properties panel.

When you open the Display Properties panel and the DDC button is selected, your system automatically checks whether it is connected to a DDC-type monitor. If so, the available modes will be displayed. It is possible, however, for the display settings to fall out of synchronization. This can happen, for example, if you hot-swap monitors. The Detect DDC monitor button lets you manually tell your system to look for the DDC monitor again.

The *Type* section shows which type of monitor was detected when you opened the control panel, and allows you to select a different type if desired. The *Monitor Information* section lists supported monitors. If your monitor is shown in this list, select *Specific Type* in the *Type* section. If your monitor does not appear in the list and is not a DDC-type monitor, select *VESA*.

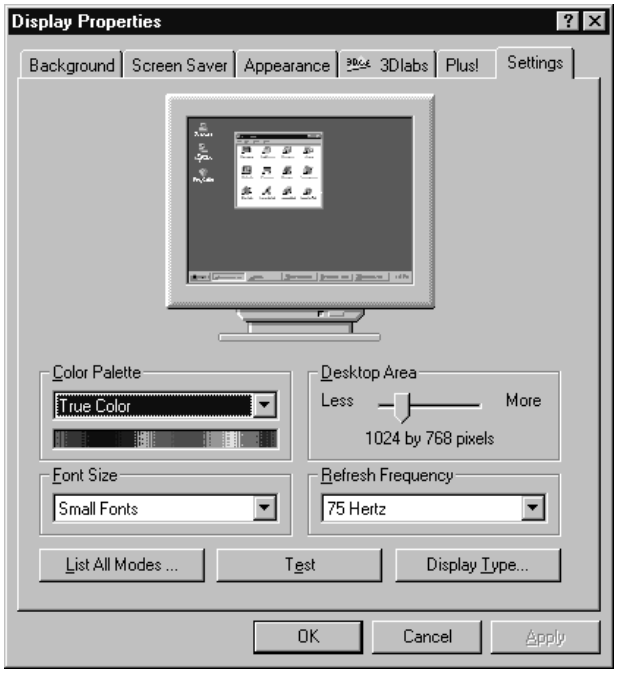


Configuring Multiple Monitors

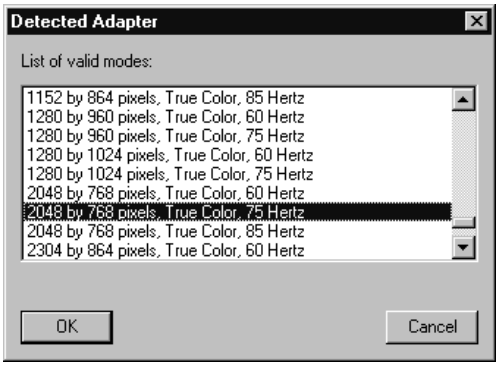
You can configure your system to support up to four monitors by installing additional Oxygen GVX1 cards and connecting additional monitors.

✏ *To configure additional Oxygen GVX1 cards*

1. In the Display Properties Control Panel, click the Settings tab.



2. Click List All Modes.



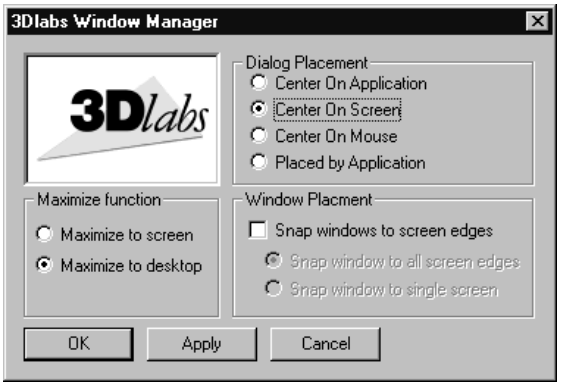
3. In the List of Valid Modes click a resolution and then click OK. Select a resolution that is twice the width of your current resolution. For example, if your current resolution is 1024 x 768, select 2048 x 768, 75 Hertz for your new resolution.

4. On the Display Properties Panel, click Test. This tests the new mode on the second monitor screen for five seconds.
5. Click Ok to test the new mode.
6. Click OK if you saw the test bitmap correctly.
7. In the Display Properties Control Panel, click OK. Your second Oxygen GVX1 card is now configured for dual monitor mode.

✏ *Using the Windows Manager*

The 3Dlabs Window Manager provides enhanced control over the positioning of windows and dialog boxes in multi-monitor systems. When running in single monitor mode, the Window Manager is disabled. To access the Window Manger, right-click the title bar of any window and select 3Dlabs WM from the drop-down menu.

1. Right-click the toolbar.
2. Select 3Dlabs WM, select Preferences, and then click Windows Manager.



3. Select the display options you want and click OK.

   Maximize Function lets you maximize windows to one monitor screen or to span windows across the desktop of both monitor screens.

   Display Placement lets you specify the placement of dialog boxes on your monitor.

   Windows Placement lets you specify placement of windows in 3D applications. You can specify that windows be split across two monitors or kept to a single monitor screen.

4. Click Apply and then click OK. These settings will apply to all future work sessions until you change them.

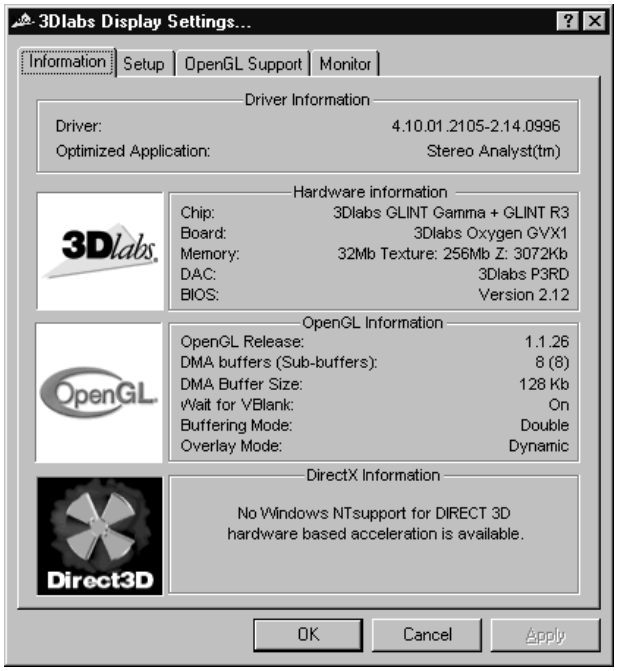
Configuring your Oxygen GVX1 Card for Stereo Viewing

The Oxygen GVX1 card supports 3D stereo viewing. This requires that the appropriate equipment such as stereo glasses be connected to the 3-pin miniature DIN connector on the Oxygen GVX1 card. It is recommended that you use a monitor with a vertical refresh frequency of at least 100 Hertz.

In addition, it is recommended that you turn off fluorescent lighting before viewing stereo images to prevent a possible headache.

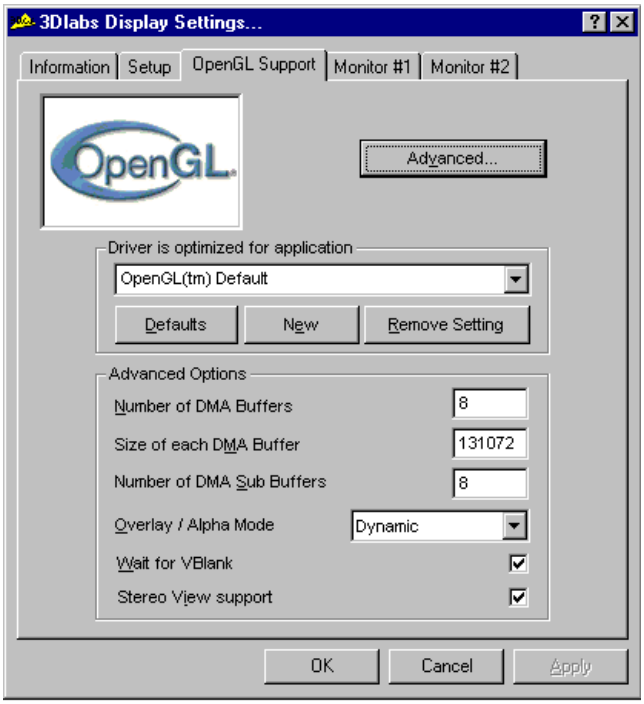
✏ *To set up and configure stereo viewing*

1. Connect the stereo hardware to the round, stereo connector at the top of the Oxygen GVX1 card. See the documentation that came with your stereo hardware.
2. In the Display Properties Control Panel, click the 3Dlabs tab.
3. In the 3Dlabs Display Properties screen, click Advanced.

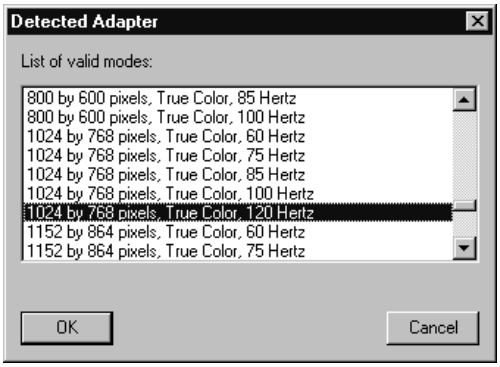


4. Click the OpenGL Support tab.

5. In the OpenGL Support screen, click Advanced.



6. Click the checkbox to the right of Stereo Support to select it.
7. Click Apply and then click OK.
8. In the Display Settings Control Panel, click the Settings tab.
9. Click List All Modes.



10. Select a screen refresh frequency of 100 Hertz or higher and then click OK. If you are using a DDC-type monitor, modes with suitably high refresh rates should be available in the List of Valid Modes. If no high refresh modes are listed, open the Display Properties Control Panel, click the 3Dlabs tab, and then click the Monitor

tab. Click DDC and check for stereo settings. If they still do not appear, click VESA and check again. If necessary, restart your system.

11. On the Display Properties Panel, click Test. This tests the new mode on the monitor screen for five seconds.
12. Click OK to test the new mode.
13. Click OK if you saw the test bitmap correctly.
14. In the Display Properties Control Panel, click OK. Your Oxygen GVX1 card is now configured for stereo viewing.

CHAPTER 3 - TROUBLESHOOTING

Troubleshooting

If you have trouble using your Oxygen VX1/Oxygen GVX1 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

QUESTION: 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 Oxygen card. See your monitor documentation and *Chapter 1 - Installation*, in this document.

SOLUTION: Your card might not be seated properly in the AGP 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: If you have multiple Oxygen cards installed, try connecting the monitor cable to one of the other Oxygen cards and then refer to the section "Configuring Multiple Monitors" on page 19.

QUESTION: The performance of and/or the available resolutions for my Oxygen card are not what I expected.

SOLUTION: The Oxygen 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 Monitor Screen in your 3Dlabs display control panel for a list of compatible resolutions. Monitor screen information appears on page 18 in this guide.

SOLUTION: If the performance is different from what you expected, check to see that the correct application or setting has been selected in the Optimized Application Setting in the Taskbar Based Configuration Manager.

SOLUTION: If the performance is different from what you expected, check to see that the *Wait for VBlank* setting has been set correctly in the Display Control Panel under Direct3D Support or OpenGL Support.

QUESTION: When I restart my system, an "Invalid Display Settings" message appears on-screen, followed by "The default display resolution has been temporarily used by the system."

SOLUTION: Within a few seconds, the error messages should be replaced by a window that allows you to set a display resolution. Pick your preferred resolution from the list and you should get the sharp results you expected.

Systems and Networks

QUESTION: Since installing the Oxygen card, my system either hangs or crashes to a blue screen when I try to start up, or the system starts up but VGA graphics don't display.

SOLUTION: Try to disable "VGA Palette Snoop." Follow these steps.

1. Remove the Oxygen card and reinstall your old graphics card. See *Chapter 1 - Installation*, for instructions.
2. Restart your system and enter Setup at the on-screen prompt. The key command to enter Setup can differ with each BIOS, so consult your system documentation if you do not see the command displayed as the system boots.
3. Disable VGA Palette Snoop, again consulting your system documentation for its specific location in your BIOS.
4. Choose Exit and Save Settings.
5. Shut down, remove your old graphics card, and reinstall your Oxygen card.

SOLUTION: Make sure that you are not using an old graphics board driver, and that you have uninstalled any other graphics drivers — particularly those provided by other companies using 3Dlabs chipsets.

SOLUTION: Please see the Oxygen and Permedia System Integration Guide in the Troubleshooting FAQ section at http://www.3dlabs.com/support

SOLUTION: You may need to update your system BIOS. See your system documentation for system BIOS update information.

QUESTION: I'm experiencing network problems since I installed my Oxygen card.

SOLUTION: You may need to reinstall or update your Ethernet driver. See your system or Ethernet adapter documentation for more information.

Online Information

If you cannot find the problem you are experiencing, or the solution to a problem, listed in this chapter, check the Troubleshooting FAQ list at http://www.3dlabs.com/support, or contact your Oxygen card vendor for additional help.

APPENDIX A - SPECIFICATIONS

Oxygen VX1 Specifications

Item	Specification
Card size	NLX shortcard, AGP or PCI, single-slot
Power requirement	10.25 W @ 3v3, 1.0 W @ 5V
Geometry processing	PowerThreads SSE
Rasterizer	GLINT R3 rasterization engine
RAMDAC frequency	300 MHz
Memory	32 MB SDRAM

Oxygen GVX1 Specifications

Item	Specification
Card size	Half-length ATX form factor, single slot
Power requirement	14.4 W @ 3v3, 6.46 W @ 5V
Geometry processing	GLINT Gamma G1 with PowerThreads SSE
Rasterizer	GLINT R3 rasterization engine
RAMDAC frequency	300 MHz
Memory	32 MB SGRAM

Monitor Resolutions

Oxygen GVX1 and Oxygen VX1 are capable of supporting monitor resolutions up to 2048 x 1536, in color depths of 8, 16 and 32 bits, and with refresh rates from 60Hz to 200Hz – dependent on your system hardware, operating system, graphics driver version, and your monitor's capabilities.

NOTE! In multi-monitor configurations using more than one Oxygen GVX1 card, the driver provides additional resolutions corresponding to the total size of the desktop. By default, the driver starts on the first monitor and may be expanded to the second monitor by selecting one of these multi-monitor resolutions. For instance, if the chosen resolution per monitor is 1024 x 768, then in a dual-monitor configuration the second monitor may be enabled by selecting the 2048 x 768 resolution.

Appendix B - Software License

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APPENDIX C - REGULATORY STATEMENTS

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Fax 408-530-4701
United States of America

declare under our sole responsibility that the products

3Dlabs® Oxygen™ VX1
3Dlabs Oxygen GVX1

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EN 55024:1998, clause 4.2.1
EN 55024:1998, clause 4.2.2
EN 55024:1998, clause 4.2.3
EN 55024:1998, clause 4.2.3.2
EN 55024:1998, clause 4.2.6
EN 55022:1994, clause 5
EN 55022:1994, clause 6
IEC950:1991, 2nd Edition
EN60950:1992

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San Jose, California, May 14, 1999
3Dlabs, Inc.

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Appendix D - Glossary

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.

Anti-Aliasing
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.

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.

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.

Direct 3D
Microsoft's API dedicated to 3D graphics, and a component of DirectX.

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.

Floating Point
The portion of the mathematics execution unit of a processor generally associated with multiply and divide operations.

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 3D Studio MAX and 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 III-processor based systems. Streaming SIMD can improve 3D vertice transformation and lighting, among other operations.

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 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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