Matrox G450 MMS
User Guide
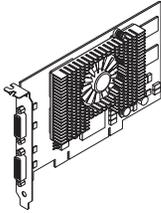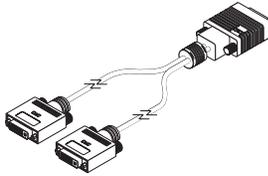
Overview

Thank you for purchasing a G450 MMS (Multi-Monitor Series) graphics card. Your Matrox MMS card is a high-performance graphics card that plugs into an expansion slot inside your personal computer. With this card, you can use 2 or 4 computer monitors or TVs at a time.
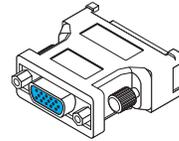
Hardware supplied

| G450 MMS card* | Dual-monitor cable† | DVI-to-HD15 adapters‡ |

*   Pictured is a G450×4 MMS card.
†   2 dual-monitor cables are included with Matrox MMS×4 products.
‡   2 DVI-to-HD15 adapters are included for each dual-monitor cable.

Software supplied (for Windows 2000/XP and NT 4.0)

- **Matrox PowerDesk** – to use your Matrox graphics hardware

- **Other software** – see the CD-ROM *Readme* file

Installation overview

ℹ️ **Note:** If your Matrox product is already partially or fully installed on your computer, some or all the installation information in this guide may not apply to you. However, this information may be useful if you need to reinstall your Matrox product.

To install your Matrox product:

1 Install the Matrox card – see "Hardware installation", page 3.

2 Install the software – see "Software installation", page 7.

Hardware installation

This section describes how to install your Matrox card. For information specific to your computer, like how to remove its cover, see your system manual.

⚠️ **WARNING:** To avoid personal injury, turn off your computer, unplug it, and then wait for it to cool before you touch any of its internal parts. Also, static electricity can severely damage electronic parts. Before touching any electronic parts, drain static electricity from your body (for example, by touching the metal frame of your computer). When handling a card, carefully hold it by its edges and avoid touching its circuitry.

## 1 Switch to the standard VGA display driver

If you're running Windows 2000/XP on your computer, this step isn't necessary.

If you're using another operating system (for example, Windows NT 4.0), see its documentation for how to switch to VGA mode.

2 Open your computer and remove your existing graphics card*

If a graphics card *isn't* already installed in your computer, skip to step 3.

a Turn off your computer and all peripherals such as your monitor or printer.

b Open the computer and remove your existing graphics card (if any). (If graphics hardware is built into the motherboard of your computer, this graphics hardware should automatically disable itself after your Matrox card is installed.)

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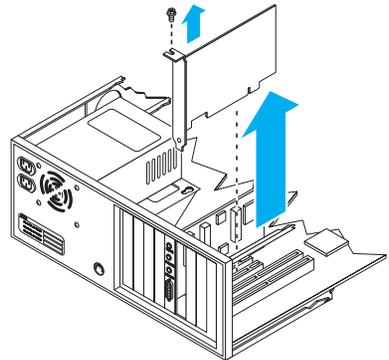
* With multi-display mode, you may be able to use your existing graphics card. For Windows 2000/XP, see Windows 2000/XP online help under "Multiple Display Support". For Windows NT 4.0, only Matrox graphics card models supported by the Matrox display driver can be used.

3 Choose a PCI slot

a Most computers have different types of expansion slots. Choose a PCI slot for your graphics card. Your system manual should identify the location of each type of expansion slot in your computer.

b Remove the cover for the slot you intend to use (if it's not already removed). Save the screw for the mounting bracket. (If another slot is uncovered, you can seal it with the cover you just removed.)

(Back of computer)

AGP slot

PCI slot (64-bit)

ISA slot

PCI slot (32-bit)
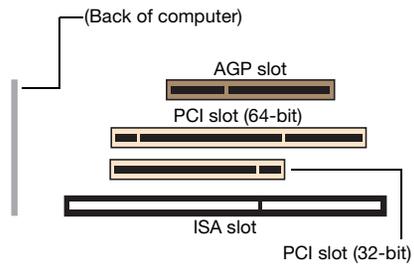
Note: If you're using a PCI graphics card in a PCI-X compatible slot, your choice of PCI slot may affect your card or system performance. For more information, see your computer manual.

WARNING: Inserting your Matrox card into the wrong type of slot could damage your card, your computer, or both.

If you're using a 64-bit PCI slot, your card's edge connector should be inserted into only part of the PCI slot (the part closest to the back of the computer).

PCI card

AGP card
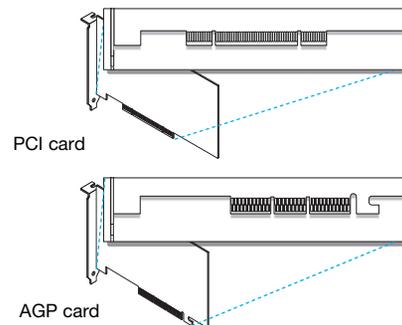
4 Insert your Matrox card

a Position your Matrox card over the expansion slot you've chosen.

b Push the card in firmly and evenly until it's fully seated in the slot.

c Replace the screw to secure the bracket of your Matrox card to the computer frame.
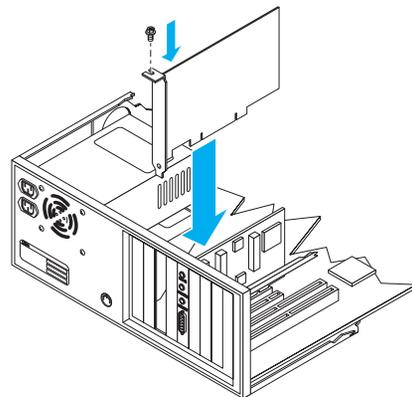
Connection setup

This section describes how to connect computer monitors to your Matrox product.

> **Note: Windows 200/XP –** If you want to use TV output with your Matrox product, you first need to connect at least one (1) computer monitor to be able to install the display driver. After the display driver is installed with TV output support, you can connect your dual-TV-output cables. For more information, see "TV output" in the online version of this guide.

1 Connect your dual-monitor cables

Attach your Matrox dual-monitor cables* to the connectors on the bracket of your Matrox MMS card. Make sure the connectors are firmly in place.

WARNING: To avoid damaging the LFH-60 connector on your dual-monitor cable or on your graphics card, carefully insert the connector on your dual-monitor cable as straight as possible into the connector on your graphics card. Specifically, inserting the connectors into each other at an angle is likely to bend and damage the pins on the connector of the dual-monitor cable.

Dual-monitor cable

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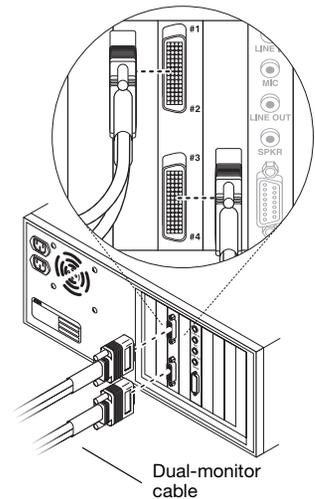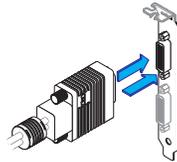
* Only one dual-monitor cable is included with Matrox MMS×2 cards.
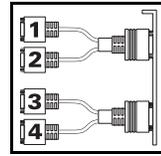
2   Connect your monitors

If your monitor has an HD-15 connector, use a DVI-to-HD15 adapter included with your product to connect your monitor cable to your dual-monitor cable. The DVI-to-HD15 adapter may already be connected to your dual-monitor cable.

HD-15 connector

DVI-to-HD15 adapter

If your monitor has a DVI connector, connect your monitor cable directly to the dual-monitor cable without using a DVI-to-HD15 adapter. You may have to remove the DVI-to-HD15 adapter to connect your monitor.

Make sure all connectors are firmly in place and properly fastened.
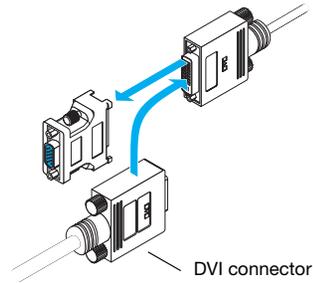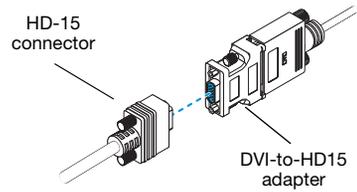
DVI connector

i **Note:** Monitors are numbered consecutively based on which connector each is attached to. Numbering starts with the *primary display* – the one that first displays information when you restart your computer. If another graphics card is installed in your computer, display numbering may be different.

i **Note:** To connect a *digital* monitor (a monitor that uses digital input, usually a flat panel monitor) to your Matrox product, your monitor must have a DVI connector.

HD-15 connector (analog)

Some monitors with DVI connectors support both digital and analog input. If you're using one of these monitors with your Matrox product, make sure it's configured to use the correct type of input. For more information, see your monitor documentation.

DVI connector (digital)

DVI connector (analog/digital)
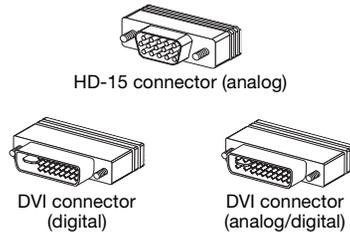
Your Matrox card is now installed. Restart your computer and install your Matrox software (see "Software installation", page 7).

Software installation

W This section describes how to install Matrox software for *Windows 2000/XP or NT 4.0*.

You may need administrator rights to install certain software. For more information, see Windows documentation.
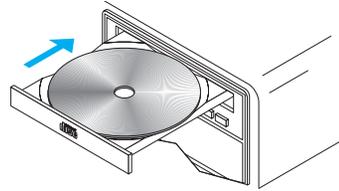
1 **Restart your computer** **If you're using Windows 2000/XP**, it detects new hardware when you restart. If Matrox display drivers haven't been previously installed, Windows reports finding a PCI adapter. Windows prompts you to install a display driver. Follow the on-screen instructions. (The Matrox Windows 2000/XP display driver is in the *Win2k* folder.)

2 **Install required software** After your computer has restarted, insert (or reinsert) the Matrox installation CD-ROM in your CD-ROM drive – the setup program automatically starts.[*] This setup program works with Windows 2000/XP and NT 4.0, and detects which operating system you're using. If the required display software isn't already installed, the setup program automatically prompts you to install this software. Follow the on-screen instructions. If you want to use TV output, you need to enable the feature when you install the display driver. For more information on TV output, see "TV output" in the online version of this guide.

After the required display software is installed, you're prompted to restart your computer for changes to take effect. Leave your Matrox CD-ROM in your CD-ROM drive.

3 **Install optional software** After your computer restarts, the setup program shows you a list of additional items you can install. For each item you want to install, select a list item, click **Install**, then follow the on-screen instructions.

4 **Set up your display software** See "Display setup", page 8.

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[*] If Windows doesn't automatically start the setup program, you can start it manually from the root folder of the CD-ROM.

Display setup

W **Windows 2000/XP or NT 4.0 –** Your Matrox display driver includes Matrox PowerDesk software. This software helps you get the most out of your Matrox graphics card. This section has important information on how to configure your display settings using Matrox PowerDesk software.

Accessing PowerDesk property sheets

Many display controls are on Matrox PowerDesk property sheets. You can identify Matrox PowerDesk property sheets by the icon appearing on the tab. To access these property sheets:

- **Windows 2000/XP –** Right-click your Windows desktop background, then click **Properties → Settings → Advanced**. If you're using a multi-display desktop, select a display before clicking **Advanced**.

- **Windows NT 4.0 –** Click **Start → Settings → Control Panel → Matrox Display Properties** (double-click).

Also, to quickly access PowerDesk features, click the Matrox QuickDesk icon ( ) on your Windows taskbar. To see the QuickDesk icon in Windows XP, you may need to click the **Show hidden icons** button ( ) on your Windows taskbar.

ℹ **Note:** Multi-display mode is supported under Windows 2000/XP and NT 4.0. For more information on multi-display mode, see Windows 2000/XP online help under "Multiple Display support".

Monitor setup

Before changing your display resolution, color palette, or other Matrox PowerDesk settings, make sure correct software monitor settings are selected. If you have a Plug-and-Play (DDC) monitor, correct settings are usually automatically selected. The following explains how to make sure your monitor settings are okay.

⚠ **WARNING:** If incorrect software monitor settings are applied, *some* monitors can be permanently damaged. For more information, see your monitor manual.

Windows 2000/XP – If you have a Plug-and-Play (DDC) monitor, Windows should automatically use correct settings for your monitor. To make sure the correct monitor is selected in Windows:
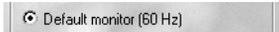
1 Right-click your Windows desktop background, then click **Properties → Settings → Advanced → Monitor**. If you're using a multi-display desktop (see "Multi-display setup", page 10), select a display before clicking **Advanced**.

2 If the monitor name listed doesn't match your monitor, click **Properties → Driver → Update driver**. Follow the on-screen instructions.

3 If you're using a multi-display desktop (see "Multi-display setup", page 10), repeat steps 1–2 for each display in your Windows desktop.

For more information on Windows monitor settings, see Windows documentation.

If you want to customize your Windows monitor settings:

1 Access the PowerDesk **Monitor Settings** property sheet (see "Accessing PowerDesk property sheets", page 8).

2 Depending on what you want to do, click one of the buttons in the **Monitor settings selection method** box, then follow the on-screen instructions.

Windows NT 4.0 –

1 Access the PowerDesk **Monitor** property sheet (see "Accessing PowerDesk property sheets", page 8).

2 **If you have a Plug-and-Play monitor:**
Make sure the **Plug-and-Play (DDC) monitor** button is selected. If so, the Matrox display driver *automatically* uses correct settings for your monitor. If not, click this button, then click **Apply**.

    ⊙ Plug-and-Play (DDC) monitor

If you don't have a Plug-and-Play monitor:
See if the **Default monitor (60 Hz)** button is selected. If so, use the Matrox monitor selection method. For more information on Matrox monitor selection, see Matrox PowerDesk online documentation.

    ⊙ Default monitor (60 Hz)

3 If you're using a multi-display desktop (see "Multi-display setup", page 10), repeat steps 1–2 for each display in your Windows desktop.

Multi-display setup

To set up multi-display mode:

Windows 2000/XP – If multi-display mode isn't automatically enabled when you restart Windows:

1   Right-click your Windows desktop background, then click **Properties → Settings**.

2   Select the disabled display, enable the **Extend my Windows desktop onto this monitor** check box, then click **Apply**.

3   To change resolution and color settings for each display, select a display, then change the **Screen area** and **Colors** settings. When you're done, click **OK**.

Windows NT 4.0 –

1   Access the PowerDesk **Settings** property sheet (see "Accessing PowerDesk property sheets", page 8).

2   Click **Multi-Display Desktop** ( ).

3   Move the **Desktop area** slider to adjust your multi-display desktop, then click **OK** to accept your changes.

ℹ️ **Note:** In multi-display mode under Windows NT 4.0, the same display settings (resolution and color palette) are used for each display.

Advanced multi-display setup

Windows 2000/XP – Use **Matrox Hybrid Display** to configure advanced display settings. With this software, you can:

- Combine 2 or more individual displays into a single Windows display. (A *Windows display* is a display that Windows recognizes and that can be adjusted with Windows controls.)

- View a *clone* (copy) of a Windows display on one or more other displays.

- Use up to 16 displays at a time by combining or copying displays. To do this, you need more than one supported Matrox graphics card installed in your computer. (Without this software, the maximum number of displays you can use at a time with Windows 2000/XP is 10.)

- Rotate one or more displays to support portrait orientation. (A *portrait* orientation is taller than wide.)

- Change the display layout to reflect the physical layout of your monitors.

To setup an advanced multi-display desktop:

1 Click the Matrox QuickDesk icon (![icon]) on your Windows taskbar, then click **Matrox Hybrid Display**. To see the QuickDesk icon in Windows XP, you may need to click the **Show hidden icons** button (![icon]) on your Windows taskbar.

2 Make sure **Use a new multi-display setup** is selected, then click **Next**.

3 Select the maximum number of Windows displays you want to use, then click **Next**. (Using only 1 Windows display for all your individual displays is also referred to as an *NT-style* multi-display setup.)

4 Select the first **Undefined** display, then click **Display Setup**.

5 Make sure each of the following controls are using the setting you want. Adjust them in this order:

  a **Number of clones**

  b **Display layout**

  c **Display orientation**

  d **Display resolution**

  e **Color palette**

  f **Refresh rate**

6 Click **OK**.

7 Repeat steps 4 to 6 until there are no more **Undefined** or available displays. An **Undefined** display won't be used when Windows restarts.

8 Click **Finish**. For changes to take effect, your computer must be restarted.

For more information on specific controls, see context-sensitive help.

ℹ️ **Note:** You can position each Windows display through the Windows controls. To access these controls, right-click your Windows desktop background, then click **Properties → Settings**.

More PowerDesk information

For more information on Matrox PowerDesk:

Windows 2000/XP or NT 4.0 – For context-sensitive help where available, click the " [?] " icon in the title bar, then click the item you want help on. Right-click a help topic for a pop-up menu that lets you print or copy it. (Some help topics are only available through context-sensitive help.)

Windows 2000/XP – Access the PowerDesk **Information** property sheet (see "Accessing PowerDesk property sheets", page 8), then click **Help** or **View Readme File**.

Windows NT 4.0 –

- Access the Matrox PowerDesk **Information** property sheet (see "Accessing PowerDesk property sheets", page 8).

- Click the Matrox QuickDesk icon ( ) on your Windows taskbar, then click **Help → PowerDesk Guide** or **Help → View Readme File**.

Troubleshooting

Basic procedures

This section explains basic procedures that are referred to by some troubleshooting items in this guide.

W Restarting in VGA mode

What follows is information on how to restart your computer in *VGA mode*.

If your primary display is *usable*:

Windows 2000/XP or NT 4.0 –

1 Restart your computer:

- **Windows 2000/XP** – Click **Start** → **Shut Down** → **Restart** → **OK**.

- **Windows NT 4.0** – Click **Start** → **Shut Down** → **Restart the computer** → **Yes**.

2 **Windows 2000/XP** – *Before* Windows starts, press [F8] for the Windows startup menu to appear. (If [F8] doesn't work, instead try pressing and holding [Ctrl] before Windows starts.)

3 Select "VGA mode", then press [Enter].

If your primary display is *unusable*:

Windows 2000/XP –

1 Restart your computer. For more information, see your system manual.

2 *Before* Windows starts, press [F8] for the Windows startup menu to appear.

3 Select "VGA mode", then press [Enter].

Windows NT 4.0 –

1 Press [Ctrl]+[Alt]+[Del] → [Tab] → [Tab] → [Enter] → [↓] (down arrow) → [Enter] to restart your computer.

2 From the startup menu, choose Windows "VGA mode".

Main troubleshooting

This section addresses possible problems that could prevent you from using your computer.

Problem **Computer doesn't display information or boot after Matrox card is installed**

Cause Your Matrox card may not be properly installed.

Solution Make sure your Matrox card is properly installed. Specifically, make sure the card is firmly inserted in its expansion slot and that all connections to it are firmly in place. For more information, see "Hardware installation", page 3.

Cause There may be an unsupported graphics adapter in your computer. (For Matrox *multi-display mode* in Windows NT, all graphics cards in your computer must be Matrox cards supported by the display driver.)

Solution If an unsupported graphics card is plugged into an expansion slot, remove it.

Solution If a graphics adapter is built-in to your computer motherboard, your system may not have automatically disabled it when you inserted your Matrox card. Check your system manual for instructions on how to disable your computer built-in graphics adapter.

Cause Your computer BIOS (Basic Input/Output System) may not be up to date. For more information on your computer BIOS, see your system manual.

Solution Reinstall your previous graphics card and, if possible, update your computer BIOS. This can usually be done with software from the manufacturer of your computer. Contact your system vendor or manufacturer to get a BIOS update for your computer.

To get the correct BIOS update, you may need to know the serial number your computer displays when it restarts. (This number is usually in the lower-left corner of the display.)

Cause The BIOS of your Matrox graphics card may need to be updated or restored.

Solution **For advanced users –** If you have another VGA-compatible graphics card (ISA or PCI), you can try resetting the BIOS of your Matrox graphics card:

1 Turn off your computer and insert the other graphics card into an expansion slot. For more information on expansion slots, see "Choose a PCI slot", page 4.

2 Plug your monitor into the other graphics card and restart your computer.

> ℹ **Note:** Make sure your computer uses the other graphics card to control your primary display. The graphics card that controls your primary display is the one that first displays information when you restart your computer.
>
> Your computer BIOS (Basic Input/Output System) and the slot type (ISA, PCI, or AGP – see "Choose a PCI slot", page 4) of each graphics card help determine which graphics card controls your primary display.
>
> To control which graphics card is used for your primary display, you may be able to change the configuration of your computer BIOS. For information on how to change your computer BIOS settings, see your system manual.

3 Make sure **Matrox System Utilities** are installed on your computer. (These can be installed from your Matrox CD-ROM.)

W **4** **Windows 2000/XP or NT 4.0** – Click **Start → Run**, type *c:\matrox\util\pbioswin*, then click **OK**. Follow the on-screen instructions.

DOS – Restart your computer in DOS mode, then type:

> *cd c:\matrox\util* [Enter]
> *upbiosdos* [Enter]

5 Turn off your computer, remove the other graphics card, then plug your monitor into your Matrox graphics card.

6 Restart your computer.

Problem **Wrong color balance, screen image off-center, or no picture at all**

Cause Your monitor video controls may be improperly set.

Solution Adjust your monitor controls (brightness, contrast, and so on). For more information, see your monitor manual.

Cause Your monitor may not be properly connected.

Solution Make sure your monitor is properly connected to the correct connector on your Matrox graphics card (see "Connect your dual-monitor cables", page 5).

Solution Make sure the monitor power cable is firmly in place.

Solution   Make sure the connection to the back of the monitor is firmly in place.

If your monitor uses BNC input, make sure the Red (**R**), Green (**G**), Blue (**B**), Horizontal Sync (**HSYNC** – white or gray wire), and Vertical Sync (**VSYNC** – black wire) connections are firmly in place and plugged into the correct input.

Bayonet Nut Connect (BNC)
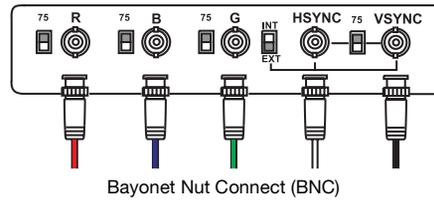
Cause   If your monitor uses BNC input, one or more connection settings may be incorrect.

Solution   Set each of your monitor RGB input and sync switches (if available) to 75 ohms, with the sync set to "external". These controls are usually switches on the back of your monitor.

Cause   If display problems occur after the startup screen of your operating system, your software monitor settings may be incorrect.

Solution   Make sure correct software monitor settings are selected.

W   If your primary display is still usable, see "Monitor setup", page 8. Otherwise, see the next troubleshooting item.

Problem   **After the startup screen, or after display settings are changed, the screen image is garbled or unusable**
(blank screen, rolling or overlapping screen images)

Cause   **Analog monitors only** – The Matrox display driver may be trying to use settings your monitor doesn't support. This can happen if a monitor was never selected in the software and the display resolution was changed to one your monitor doesn't support, or if the monitor connected to your computer was changed without it being changed in the software

⚠️   WARNING: If incorrect software monitor settings are applied, *some* monitors can be permanently damaged. For more information, see your monitor manual.

Solution   Make sure the correct monitor is selected in Windows.

W   **Windows 2000/XP** –

1   If your primary display is unusable, restart your computer in VGA mode (see "Restarting in VGA mode", page 13).

2   Right-click the Windows desktop background, then click **Properties** → **Settings**.

3   Move the **Screen area** (Windows 2000) or **Screen Resolution** (Windows XP) slider down to its lowest setting, then click **OK**.

4 Restart your computer normally.

5 Make sure the correct monitor is selected in Windows (see "Monitor setup", page 8).

6 Make sure you're not using inappropriate monitor setting customizations: Access the PowerDesk **Monitor Settings** property sheet (see "Accessing PowerDesk property sheets", page 8), then click **Delete all customizations**.

7 If necessary, restore your original display settings (see steps 2 and 3).

ⓘ **Note:** In multi-display mode, each display has its own monitor settings (refresh rates). Make sure correct software monitor settings are selected for *each* monitor.

Windows NT 4.0 –

1 If your primary display is unusable, restart your computer in VGA mode (see "Restarting in VGA mode", page 13).

2 Right-click the Windows desktop background, then click **Properties → Settings**. Windows may prompt you that the display settings are incorrect for the current mode; click **OK** to continue.

3 Move the **Desktop area** slider down to its lowest setting, then click **OK**.

4 Restart your computer normally.

5 With the Matrox PowerDesk **Monitor** property sheet, select monitor settings for each display, then adjust your display settings. For more information, see the Matrox PowerDesk online documentation.

6 If necessary, restore your original display settings (see steps 2 and 3).

Cause Files on your system may have been deleted or corrupted.

Solution Remove, then restore Matrox software:

ⓘ **Note:** Before removing software, make sure you have all the necessary files to reinstall software that may still be needed. Also, make sure the display driver you reinstall supports *all* Matrox products in your computer.

Windows 2000/XP or NT 4.0 –

1 If your primary display is currently unusable, restart your computer in safe mode or VGA mode (see "Restarting in VGA mode", page 13).

2 To remove Matrox software:

- **Windows 2000/XP** – Click **Start → Settings*** → **Control Panel → Add/Remove Programs** (double-click*) → **Matrox Graphics Software (remove only)** → **Change/Remove → Yes**. (* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

- **Windows NT 4.0** – Click **Settings → Control Panel → Add/Remove Programs** (double-click) → **Install/Uninstall → Matrox Graphics Software (remove only)** → **Add/Remove → Yes**.

3 After removing Matrox software, install the latest display driver for your Matrox graphics card. You may also need to reinstall other Matrox software.

ⓘ Note: **Windows 2000/XP** – You may need administrator rights to remove certain software. For more information, see Windows documentation.

More information

We provide additional information in help files and in the online version of this guide. This guide is available on your installation CD-ROM as an Adobe Acrobat file (*Doc\English\Guide\Guide_en.pdf*). To view or print PDF files, use the **Acrobat Reader** program, which you can install from the "Matrox Installation" CD-ROM.

ⓘ Note: Be sure to check for any last-minute release notes at the end of this manual and in the Matrox CD-ROM *Readme* file. Also, check the Matrox Web site (www.matrox.com/mga) for the latest Matrox software, technical support, and product information.

TV output

With your Matrox card, you can use dual-TV-output cables instead of dual-monitor cables. With dual-TV-output cables, you can view or record your displays with TVs or video recorders. While using TV output, all your displays use TV output settings. If you want to use this feature and dual-TV-output cables weren't included with your Matrox product, you can purchase them separately (see http://shopmatrox.com). This section describes how to use the *TV output* feature.
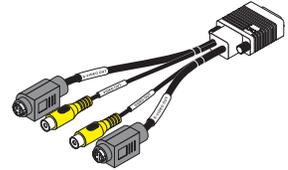
Dual-TV-output cable

ⓘ **Note:** To use TV output, you need to enable the feature when you install the display driver for your Matrox product. If TV output isn't enabled, you need to reinstall the display driver and enable TV output. For more information, and .

ⓘ **Note:** TV output isn't supported with full-screen DOS display modes (for example, the information you see before Windows starts) or with standard VGA mode (for example, when you restart Windows in "safe mode"). Older programs may use these display modes. While one of these display modes is in use, your TV displays nothing (black).

Connection setup

1 Turn off computer

W **Windows 98/Me/2000/XP** – To shut down your computer, click **Start → Shut Down → Shut down → OK**, then turn off your computer.

⚠ **WARNING:** Don't change monitor connections while your computer is turned on. While your computer is turned on, it may be using monitor settings that are specific to the current monitor connections.

If a display device (monitor, TV or video recorder) is connected while your computer is using settings intended for another display device, the display of the new device may be garbled or unusable. *Some* devices may be permanently damaged if incorrect settings are used.

2 Replace your dual monitor cables

a Disconnect any computer monitor connected to your dual-monitor cables.

b Detach any dual-monitor cable from your Matrox card.

c Attach your dual-TV-output cables to your Matrox graphics card.[*]
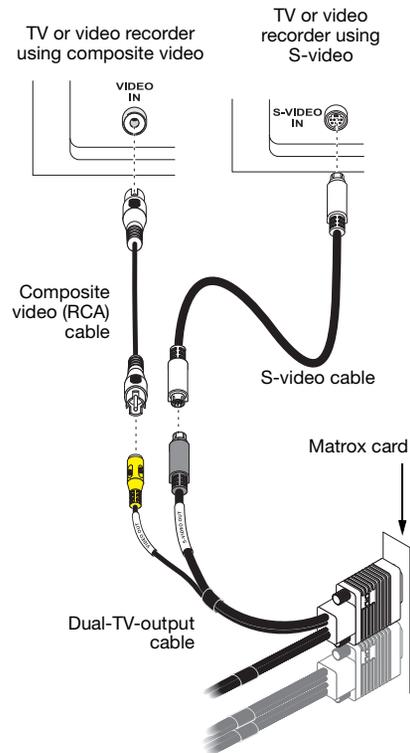
Dual-monitor cable

Dual-TV-output cable
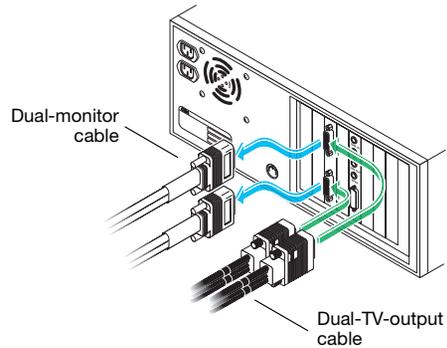
3 Connect video output

To connect to a TV or a video recorder, you'll need a composite video (RCA) or S-video cable.

If your video device (a TV or a video recorder) didn't come with one of these cables, these types of cable are available at most electronics stores. The type of cable you use depends on what your video device supports. Many video devices support composite video connections, and some higher-quality video devices support S-video connections.

For each TV or video recorder, you want to connect to your Matrox product:

a Attach one end of your composite video or S-video cable to the appropriate connector on your dual-TV-output cable.

b Attach the other end to the **VIDEO IN**[†] connector on your TV[‡] or video recorder.

c Before viewing or recording video output directly from your computer,

TV or video recorder using composite video

TV or video recorder using S-video

VIDEO IN

S-VIDEO IN

Composite video (RCA) cable

S-video cable

Matrox card

Dual-TV-output cable

(Note: Using the Matrox composite video *and* S-video connectors at the same time is optional.)

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[*] Only one (1) dual-TV-output cable can be connected to Matrox MMS×2 cards.

[†] The labels on your devices may not be consistent with what's in this guide. Different manufacturers sometimes use different labels for the same type of controls and connectors. For example, the **VIDEO IN** connector on your TV may be labeled **VIDEO 1** (or **VIDEO 2**). To match labels, see the documentation for your video devices.

make sure your TV or video recorder is set up to use *line* input. For example, if your TV has a **TV/VIDEO** switch, set it to **VIDEO**; or if your video recorder has a **TUNER/LINE** switch, set it to **LINE**.

Optionally, if you use the composite video *and* S-video connectors on your Matrox TV adapter, you can directly connect two different video devices at the same time.

To view *and* record output from the same Matrox video connector, you can connect it to a video recorder and connect the video recorder to a TV. For more information, see your video recorder and TV manuals.

4   Connect audio output

Typically, the sound output from a computer comes from speakers connected to your sound card. If you prefer, you can hear or record the sound output from your computer using the same TV or video recorder you connect to your graphics card. To do this, you need an audio cable with a stereo jack on one end and two RCA connectors on the other end. If you don't have this type of cable, you can buy one at most consumer electronics stores.

a   Plug the stereo-jack end of the audio cable into the **LINE OUT***(❨❨❨❩) connector on your sound card.

b   Plug the other end of the cable into the left (**L**) and right (**R**) **AUDIO IN** connectors of your video device. For more information, see your sound card manual.

TV or video recorder

Sound card

---
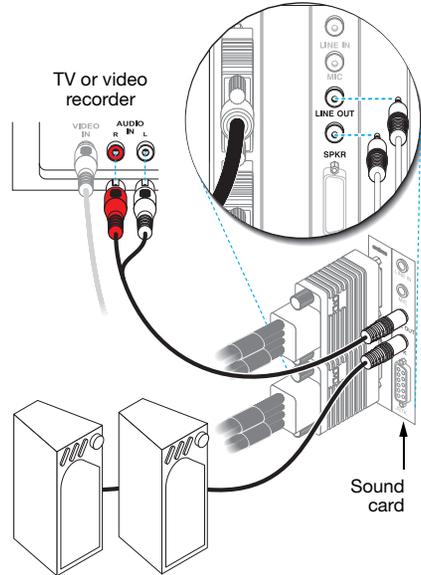
‡ If your TV only has an antenna or cable TV connector, you can use an *RF modulator* to connect it to your Matrox card. RF modulators are available at most electronics stores.

* If your computer has no audio **LINE OUT** connector, you can use its **SPKR** (speaker) connector instead. In this case, all your computer sound output goes to the video device you connected to.

Software setup

W If a TV or video recorder is connected to your Matrox product, you can use TV output mode to view or record your display on your TV or video recorder. (To connect video devices to your computer, see page 19.)

TV settings have lower resolutions and refresh rates than typical computer monitor settings. Lower refresh rates may result in more noticeable flicker.

> ⓘ **Note:** Two TV standards are supported for TV output. The NTSC standard is used in North America and Japan, among other places. The PAL standard is used in most of Western Europe and in China, among other places.
>
> If an incorrect TV standard is selected in Matrox software, the output from your computer may not appear or record properly on your TV or your video recorder. To find out what standard your TV or video recorder supports, see its documentation.

Windows 98/Me/2000/XP – To adjust TV settings, access the Matrox PowerDesk **DualHead** property sheet (see "Accessing PowerDesk property sheets", page 8).

Extra troubleshooting

Graphics

The following troubleshooting items address problems related to graphics cards.

Problem   **Can't use Windows, Windows reports a configuration error, and/or can't install or uninstall display driver**

ⓘ   **Note: Windows 2000/XP or NT 4.0 –** You may need administrator rights to install certain software. For more information, see Windows documentation.

Cause   The problem may be specific to the motherboard in your computer.

Solution   There may be a software update available for your motherboard. To find out what motherboard model your computer is using, see your system manual. For more information, contact the maker of your motherboard or computer. Many motherboard or computer manufacturers have software updates available on their Web site.

Cause   Files on your system may have been deleted or corrupted.

Solution   Remove, then restore Matrox software. For more information, .

Problem   Monitor settings aren't automatically detected

⚠️ | **WARNING:** If incorrect software monitor settings are used, your display may become unusable and *some* monitors can be permanently damaged. For more information, see your monitor manual.

ℹ️ | **Note:** To check if your monitor settings are properly selected:

1 **Windows 2000/XP** – Right-click your Windows desktop background, then click **Properties → Settings → Advanced → Monitor**. If you're using multi-display mode, select a display before clicking **Advanced**.

Windows NT 4.0 – Access the Matrox PowerDesk **Monitor** property sheet (see "Accessing PowerDesk property sheets", page 8). If you're using multi-display mode, select a display number.

2 If you see the name of your monitor or "Plug-and-Play", your monitor settings are properly selected.

If you see the wrong monitor name or **Default monitor**, your monitor settings aren't properly selected.

Cause   Your monitor may not be Plug-and-Play. Most new monitors are Plug-and-Play but many older ones aren't. Software can't automatically detect settings for monitors that aren't Plug-and-Play.

Solution   Manually select your monitor settings in the software. For Windows 2000/XP or NT 4.0, see "Monitor setup", page 8.

Cause   If a monitor was changed or added while Windows was running, the new monitor may not be detected by the software.

Solution   Restart your computer. If your monitor is a Plug-and-Play (DDC) monitor, it should be automatically detected by the software.

Cause You may be using BNC connectors with a Plug-and-Play monitor. The Plug-and-Play feature of a monitor can't be used with BNC connectors.

Solution If there's an HD-15 connector at the back of your monitor, use this connector instead of the BNC connectors.

BNC (Bayonet Nut Connect)   HD-15 connector
          connectors
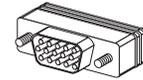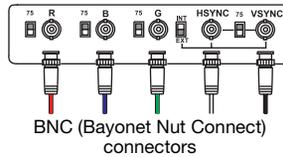
Problem **Built-in network card doesn't work after multi-monitor graphics card is installed**

Cause The installation of a multi-monitor graphics card may have caused your computer to reallocate system resources.

Solution Try reinstalling your network drivers.

Solution Try moving your Matrox multi-monitor graphics card to another PCI slot in your computer.

Problem **3D and video programs don't work**

Cause Your computer or program may not work well with bus mastering.

Solution
W Disable bus mastering:
(If you want to continue using bus mastering, see the other solutions.)

Windows 2000/XP –

1 Access the Matrox PowerDesk **Options** property sheet (see "Accessing PowerDesk property sheets", page 8).

2 Clear the **Use bus mastering** check box.

3 Click **OK** → **OK** → **Yes** to accept the changes.

Windows NT 4.0 –

1 Click **Start** → **Settings** → **Control Panel** → **Matrox Display Properties** → **Performance**.

2 Clear the **Use bus mastering** check box.

**3** Click **OK** → **Yes** to accept the changes and restart your computer.

Cause Your Matrox card may be in a "slave" expansion slot on a computer that makes a distinction between bus mastering and slave slots.

Solution Change slots – Shut down your computer, disconnect it from the power supply, remove your Matrox card and then insert it into a different PCI expansion slot. For instructions on how to safely install your Matrox card, see "Hardware installation", page 3.

Cause Your computer may not have given an IRQ (interrupt request) to your Matrox graphics card or may have given one used by another device in your computer. This may be because your computer's "Plug-and-Play" feature is turned off.

W **Windows 2000/XP –** To check the display adapter's IRQ:

1 Click **Start → Settings*** **→ Control Panel → Performance and Maintenance*** **→ System** (double-click*) **→ Hardware → Device Manager.** (* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

2 Click the plus sign to the left of the **Display adapters**. An "**X**" through an icon means the hardware has been disabled. A circled exclamation point through the icon means the hardware has a problem.

3 Double-click the name of your Matrox display adapter to open a properties dialog box. The type of problem is displayed in the **General** tab → **Device status** area. Check also the **Resources** tab → **Resource settings** list for an **Interrupt Request**.
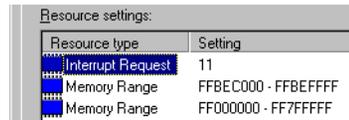
Resource settings:	
Resource type	Setting
Interrupt Request	11
Memory Range	FFBEC000 - FFBEFFFF
Memory Range	FF000000 - FF7FFFFF

Solution Change settings in your computer BIOS setup utility.

If your computer has the options of enabling Plug-and-Play detection, or assigning an IRQ to a VGA adapter, make sure they're enabled. If your computer doesn't have these options, you may be able to manually assign an IRQ to your graphics card using the BIOS setup utility.

For more information on the BIOS setup utility of your computer, see your system manual or contact your system manufacturer.

Cause Your computer's other BIOS settings may be incorrect.

Solution Reset your computer BIOS settings to the factory defaults using your computer built-in BIOS setup utility. The factory defaults are usually the "safest" settings. Check your system manual for more information.

Problem

W

After game for Windows 2000/XP starts, monitor doesn't display properly

(blank screen, rolling or overlapping screen images)

Cause If your game uses a low-resolution (640 × 480 and below), full-screen display mode, your monitor may not support the refresh rate the Matrox driver is using.

Solution **Windows 2000/XP –**

1 If the game is still running in full-screen mode and your monitor is unusable, exit the game. To do this, press [Alt]+[Tab] *once*, right-click the name of the game on the Windows taskbar, then click **Close**.

2 Make sure the correct monitor is selected in Windows (see "Monitor setup", page 8).

Solution Make sure your Matrox monitor settings are correct-

1 If the game is still running in full-screen mode and your monitor is unusable, exit the game. To do this, press [Alt]+[Tab] *once*, right-click the name of the game on the Windows taskbar, then click **Close**.

2 Access the Matrox PowerDesk **Monitor Settings** property sheet (see "Accessing PowerDesk property sheets", page 8).

3 Click **Select customizations from the Matrox list**.

4 From the Matrox monitor list, select the monitor model you're using. If your monitor model doesn't appear in the list, select a monitor that runs at 60 Hz at 640 × 480 (for example, **Standard Monitor Types → Vesa 1024X768 @60Hz → Next**). Follow the on-screen instructions to complete the selection.

Problem

W

Using multiple displays under Windows 2000/XP or NT 4.0, program doesn't work with main graphics card

Cause Your main graphics card may not be controlling your primary display. The graphics card that controls your primary display is the one that first displays information when you restart your computer.

A program that doesn't recognize multiple displays may not work with a graphics card unless it's controlling your primary display.

Your computer BIOS (Basic Input/Output System) and the slot type (ISA, PCI or AGP – see "Choose a PCI slot", page 4) of each graphics card help determine which graphics card controls your primary display.

Solution If you're having problems with a program that can be moved on your Windows desktop, run this program on your primary display. Make sure the program window doesn't overlap any other display. If the program doesn't work with the graphics card controlling your primary display, or you want your main graphics card to control your primary display, see the other solutions.

Solution Change the configuration of your computer BIOS so that the slot type of your main graphics card has priority for becoming the primary display. For information on how to change your computer BIOS settings, see your system manual.

If your computer BIOS doesn't let you select which slot type has priority for becoming the primary display, a BIOS update may be available to let you do this. (The BIOS of most computers can be updated with software.) For a possible BIOS update for your computer, contact your system vendor.

Solution If there's a graphics controller built into the motherboard of your computer, by changing your computer BIOS settings, you may be able to change which device controls your primary display. For more information, see your system manual.

Solution If you don't need to use the graphics card that's controlling your primary display, remove it from your computer. If your primary display is controlled by the motherboard of your computer, see your system manual for information on how to disable this graphics controller.

Cause The program you're using may not work properly with systems using more than one display at a time.

Solution An update may be available for the program you're using. This update may fix problems this program has with multi-display systems. For more information, contact the software distributor for the program you're using.

Solution **Windows 2000/XP – For advanced users –** To use a program that doesn't support multi-
W display systems, you can disable all displays other than your primary display:

1 Restart your computer in "VGA" mode ().

2 Click **Start → Settings*** **→ Control Panel → Performance and Maintenance*** **→ System** (double-click*) **→ Hardware → Device Manager**. (* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

3 Click the plus sign to the left of the **Display adapters**.

4 For each display adapter, *except* for the one controlling your primary display, right-click the name of a display adapter, then click **Disable → Yes**.

ⓘ | **Note:** Your primary display can't be disabled.

5   Restart your computer for changes to take effect.

i   **Note:** To restore display adapters, repeat steps 2–5, but click **Enable** in step 4.

Problem   **Not all graphics cards in the computer are fully supported**
W   (Software doesn't work with a certain graphics card, or another graphics card doesn't work at all)

Cause   If you have different models of graphics cards in your computer, your Matrox display driver may not support all the graphics cards in your computer.

Under Windows 2000/XP, a display driver may support one or more graphics cards. If a display driver doesn't support a certain card, a different display driver must be used for that card. Software that depends on a certain display driver may not work with a graphics card that's not using the same display driver.

Under Windows NT 4.0, only one display driver at a time may be used. To use more than one graphics card, the display driver must support all the graphics cards installed. If an unsupported graphics card is installed in your computer, that card either isn't used or your computer restarts in VGA mode (single-display, 640 × 480 resolution, 16 colors).

Solution   Install the latest unified display driver for your Matrox graphics cards. (A *unified* display driver supports more than one model of graphics card.) This driver is available on the Matrox Web site (www.matrox.com/mga). Make sure that the display driver supports *all* Matrox products in your computer. Install the display driver by running the setup program included with it.

i   **Note:** If your Matrox product was provided by the manufacturer of your computer, check the Web site of that manufacturer for the latest display driver. A display driver provided by the manufacturer of your computer is more likely to be tested with your computer model.

i   **Note:** A unified Matrox display driver may not be available for all the models of Matrox graphics cards installed in your computer (especially for older models). Under Windows 2000/XP, you can use more than one display driver in this case.

Solution   If a graphics card isn't supported, you may need to remove it. If there's a graphics processor built into the motherboard of your computer that's not supported by your software, see your system manual for information on how to disable this graphics processor.

Cause   **Windows 2000/XP** – If the Windows method for display driver installation was used (instead of running the setup program included with your Matrox display driver), the driver may not be installed for all the graphics cards it supports.

Solution   Run the setup program included with the Matrox display driver. The setup program automatically installs the display driver for each Matrox graphics card it supports.

Problem   **In multi-display mode, displays aren't numbered consecutively**

W

Cause   If you have more than one graphics card in your computer, the display numbering may not be consecutive for the displays of a multiple-display card. Display numbering depends on the types of expansion slots used in your computer (AGP and PCI) and the BIOS settings of your computer.

Solution   **Windows 2000/XP** – Move the displays in Windows.

   1   Right-click your Windows desktop background, then click **Properties → Settings**.

   2   Select a display and move it according to the physical position of the monitor it's associated with.

   ℹ   **Note:** In multi-display mode for Windows NT 4.0, you have limited control over the arrangement of your displays. For more information, see Matrox PowerDesk documentation.

Problem   **Screen image defects appear or program doesn't run properly, or Windows doesn't work properly**
(example: mouse pointer not drawn properly)

Cause   Some programs may not work properly with some Matrox acceleration.

Solution   Disable specific types of software acceleration:

   Windows 2000/XP –

   1   Access the Matrox PowerDesk **Options** property sheet (see "Accessing PowerDesk property sheets", page 8).

   2   Clear one or more check boxes, starting with **Use device bitmaps caching**.
   For more information, see context-sensitive help.

   3   Click **OK → Close** to accept the changes. (Depending on the feature you disabled, you may have to restart your computer for the changes to take effect.)

Windows NT 4.0 –

1 Access the Matrox PowerDesk **Performance** property sheet (see "Accessing PowerDesk property sheets", page 8).

2 Clear one or more check boxes. For more information, see context-sensitive help.

3 Click **OK → Yes** to accept the changes. (Depending on the feature you disabled, you may have to restart your computer for the changes to take effect.)

Solution   Disable Windows effects:

Windows 2000 –

1 Right-click your Windows desktop background, then click **Properties → Effects**.

2 Disable one or more features under **Visual effects**.

Windows XP –

1 Right-click your Windows desktop background, then click **Properties → Appearance → Effects**.

2 Disable one or more features.

Solution   If possible, update your Matrox display driver. Matrox makes new display drivers available on the Matrox Web site (www.matrox.com/mga).

i   **Note:** If your Matrox product was provided by the manufacturer of your computer, check the Web site of that manufacturer for the latest display driver. A display driver provided by the manufacturer of your computer is more likely to be tested with your computer model.

Solution   **Windows 2000/XP –** Disable Matrox hardware acceleration:

1 Right-click your Windows desktop background, then click **Properties → Settings → Advanced → Troubleshooting** (or **Troubleshoot**).

2 Move the **Hardware acceleration** slider to **None**.

3 Click **OK → OK** to accept the changes.

i   **Note:** If you identify a program that doesn't work well with Matrox acceleration, please contact Matrox technical support (see page 49) and describe the problem. This information may help us come up with a fix or work-around in a future driver release.

Problem   **Program window or dialog box doesn't appear on screen**

Cause   Another window or dialog box may be covering the window or dialog box you want to see.

Solution   Move, close, or minimize any window or dialog box that may be covering the window or dialog box you want to see.

Cause
W   If you're using multi-display mode, the program window or dialog box may be in a display or on a monitor that's unusable. (For example, your monitor may not be properly connected or configured.)

Solution   Make sure all the displays and monitors you want to use are usable. For more information, see other troubleshooting items in this guide.

Cause   The software may be using a display you didn't intend to use or the software may be configured to use more displays than the actual number of monitors you have.

Solution
W   Disable the display:

Windows 2000/XP –

1   Right-click your Windows desktop background, then click **Properties → Settings**.

2   Select the display you want to disable, then clear the **Extend my Windows desktop onto this monitor** check box.

Windows NT 4.0 –

1   Access the Matrox PowerDesk **Settings** property sheet (see "Accessing PowerDesk property sheets", page 8).

2   Move the **Desktop area** slider until the number of displays used matches the number of monitors connected, then click **OK** to accept your changes. (The display you disable must be the last one, if it's not, to change your display configuration, see page 30.)

Cause
W   The program window or dialog box may be somewhere off-screen.

Solution   If the program window you want to see is named on the Windows taskbar, right-click on it and select **Maximize**. (If you click **Restore** the program window goes back to its previous position. To fix this problem, see the other solutions.)

Solution   Manually move the program window or dialog box:

1   Press [Alt]+[Space].

2   If you see a pop-up menu, click **Move**. If you don't see a pop-up menu, press [M] (for **Move**).

3 Press on one of the arrow keys once and move your mouse pointer to where you want the window or dialog box to appear, then click. The program window or dialog box should appear where you clicked.

Solution   **Windows 2000/XP** – Use the **Move All Windows to Primary Display** feature to move the program window or dialog box. Simply press the keyboard shortcut assigned to this feature.

To assign a keyboard shortcut to this feature:

1 Click the Matrox QuickDesk icon (![icon]) on your Windows taskbar, then click **Hot Keys**.

2 Create a keyboard shortcut for the **Move All Windows to Primary Display** feature.

Solution   **Windows 2000/XP or NT 4.0** –

1 **Windows 2000/XP** – Click the Matrox QuickDesk icon (![icon]) on your Windows taskbar, then click **Multi-Display Controls**.

Windows NT 4.0 – Access the Matrox PowerDesk **PowerDesk** property sheet (see "Accessing PowerDesk property sheets", page 8).

2 Enable one or more of the following features:

- **Open program windows in display**

- **Use CenterPOPUP** (Windows 2000/XP)

- **Center dialog boxes** (Windows NT 4.0)

3 Choose where you want the program window or dialog box to appear.

For more information, see Matrox PowerDesk context-sensitive help.

Problem   Display on digital monitor appears blurry or uses only a portion of the screen

Cause   You may be using a lower display resolution than what your digital monitor supports. If your monitor supports display scaling, the image on your screen may appear blurry. If display scaling isn't supported, the display may use only a portion of your screen.

Solution   Select the highest display resolution available. This generally results in better image quality.

Problem   Can't select one or more display resolutions supported by your monitor

Cause   **Windows 2000/XP** – Windows may be disabling display resolutions that it can't detect as
W   supported by your monitor.

Solution   Install the latest monitor software from your monitor manufacturer.

Solution   Change Windows monitor settings:

1   Right-click your Windows desktop background, then click **Properties → Settings**.

2   If you're using a multi-display desktop, select a display.

3   Click **Advanced → Monitor**, disable **Hide modes that this monitor cannot display**, then click **OK → OK**.

Video

The following troubleshooting items address problems related to video files.

Problem   Video file playback is jerky (skipping frames)

ⓘ   **Note:** Jerky video file playback may be the result of slow playback or recording. Slow recording causes frames to be dropped (frames aren't recorded). If jerky video is caused by frames that were dropped during recording, the problem can only be fixed by recapturing the video under better conditions.

Cause   Your hard disk may be too slow.

Solution   Try *defragmenting* your hard disk.

W   **Windows 2000/XP** – To defragment a hard disk, click **Start → Programs** (or **All Programs**) → **Accessories → System Tools → Disk Defragmenter**.

Solution   If possible, try using a faster disk.

ⓘ   **Tip:** If your computer has more than one hard disk, you may get better results if you play back or capture video files with a disk *other than* the one where the Windows swap file is stored. The Windows swap file is usually stored on drive "*C:*".

Solution   Make sure the drive you're using (a hard disk or DVD drive) is using DMA (if your drive
W   supports DMA transfers). To use DMA:

⚠   **WARNING:** Not all drives support DMA well. For more information, see the documentation that came with your hard disk.

Windows 2000/XP –

1 Click **Start → Settings*** **→ Control Panel → Performance and Maintenance*** **→ System** (double-click*) **→ Hardware → Device Manager**. (* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

2 Double-click the **IDE ATA/ATAPI controllers** list item to expand it, then double-click the name of the appropriate controller.

3 Change each **Transfer Mode** setting to "**DMA if available**".

4 Click **OK** to accept the changes.

Windows NT 4.0 – Install a DMA driver. For most computers, a DMA driver is available for Windows NT 4.0 (for example, the "PIIX Bus Master IDE" driver supports many computers). For more information on how to get this driver, contact your system vendor.

Cause Too many programs may be running (using up computer resources).

Solution Close other programs, including memory resident programs like **System Agent**.

Cause Your display settings may be too high. As a result, video file playback may not be fully supported by your Matrox hardware.

Solution Try lowering your display settings. We recommend a 1024 × 768 or lower display resolution with a 16-bit color palette.

W To access display settings:

- **Windows 2000/XP –** Right-click your Windows desktop background, then click **Properties → Settings**.

- **Windows NT 4.0 –** Access the Matrox PowerDesk **Settings** property sheet (see "Accessing PowerDesk property sheets", page 8).

Cause Your Matrox graphics card may be sharing an IRQ (interrupt request) with another PCI card in your computer (for example, a network card).

Solution Try moving the other PCI card to another PCI slot in your computer. For more information, see the documentation for this card or see your system manual.

Solution Try moving your Matrox graphics card to another PCI slot in your computer.

Problem **Mouse pointer flickers or disappears when it's over a video window**

Cause You may be using a customized mouse pointer. Windows draws customized mouse pointers in a way that may cause them to flicker or disappear while they're over a video window.

Solution **Windows 2000/XP or NT 4.0 –** Use default Windows mouse pointers:

W

1   Click **Start → Settings*** **→ Control Panel → Printers and Other Hardware*** **→ Mouse** (double-click*). (* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

2   Click the **Pointers** tab.

3   In the **Scheme** box, select (or reselect) "**(None)**", then click **OK**.

Problem **Can't view video**

Cause Your display settings may be too high.

Solution Try lowering your display settings (resolution, color palette, and/or refresh rate). For information on changing display settings, see "Display setup", page 8.

Sound

The following troubleshooting items address problems related to sound cards.

Problem **Sound doesn't record, video files play back with no sound, or sound output is distorted or too loud**

Cause If the sound problem is with a particular device (for example, TV or speaker), the volume control on the device itself may need adjusting.

Solution Adjust the volume control on the device itself.

Cause Audio cables may be loose or incorrectly wired.

Solution Make sure your sound card cables are properly connected.

Cause Your sound card's Windows software settings may be incorrect. Specifically, input or output may be disabled, or volume levels may be too low or too high.

Solution **Windows 2000/XP or NT 4.0 –** Make sure your sound card's Windows software settings are correct:

W

1   Double-click the speaker icon (or) on the Windows taskbar.

If you *don't* see the speaker icon:

Windows 2000 or NT 4.0 –

a Click **Start → Settings → Control Panel**.

b Double-click the **Multimedia** or **Sounds and Multimedia** icon.

c Enable the "**Show volume control on the taskbar**" check box.

d Click **OK**.

e Double-click the speaker icon on the taskbar.

Windows XP –

a Click **Start → Settings*** **→ Control Panel → Sound, Speech and Audio Devices*** **→ Sounds & Audio Devices**. (* Depending on your configuration of Windows, this part of the step may not be necessary.)

b Enable the "**Place volume icon in the taskbar**" check box.

c Click **OK**.

d Double-click the speaker icon on the taskbar.

2 Click **Options → Properties**.

3 Click the **Recording** button, enable all check boxes in the list box, then click **OK**.

4 For the **Line In** and/or **Microphone** controls, make sure the **Volume** slider levels are okay (if you're not sure, try half level), and the appropriate **Select** check box is enabled.

5 Click **Options → Properties**.

6 Click the **Playback** button, enable all check boxes in the list box, then click **OK**.

7 For the **Master**, **Line**, and/or **Wave** controls, make sure the **Volume** sliders are at one-quarter to one-half levels (if you're not sure, try half level), and the **Mute** check boxes are cleared.

8 Close the dialog box.
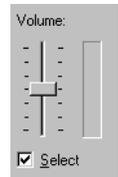
Note: Depending on your sound driver, certain labels may be different. For example, **Line In** may be labeled **Line**.

Cause   The problem may be specific to the sound card you have.

Solution   For more information, see your sound card manual.

Display information

- Your Matrox graphics card is 100% VGA compatible and supports all VESA standards: VBE 2.0 (Super VGA modes), DPMS (energy saving), and DDC-2B (Plug-and-Play monitor).

- The display resolutions available depend on your Matrox graphics card, display driver, and software monitor settings. Different software monitor settings have different resolutions available to them. With your software monitor settings, some of the resolutions listed in this section may not be available, *or* resolutions not listed in this section may be available. For more information on software monitor settings with Windows 2000/XP or NT 4.0, see "Monitor setup", page 8.

- Many Plug-and-Play monitors don't automatically report if they're capable of 1152×864, or 1600×1200 and higher display resolutions. To use these resolutions, or higher refresh rates than those reported by the monitor, you can use the Matrox monitor selection method. To use Matrox monitor settings with Windows 2000/XP or NT 4.0, see "Monitor setup", page 8.

- The maximum refresh rates listed in this section have been rounded and are based on a monitor with a maximum horizontal refresh rate of 130 kHz. Depending on your monitor, refresh rate capabilities may vary. For information on the capabilities of your monitor, see your monitor documentation.

- If you're using BNC connectors with a Plug-and-Play monitor, the Plug-and-Play feature of your monitor can't be used. To use the Plug-and-Play feature of your monitor, instead of the BNC connectors, use the 15-pin connector at the back of your monitor.

- In multi-display mode, each monitor has its own monitor settings (refresh rates). Make sure correct software monitor settings are selected for *each* monitor.

- You may experience problems viewing certain types of video (for example, DVD video). If you experience this problem, try lowering your display settings (resolution, color palette, and/or refresh rate). For information on changing display settings, see "Display setup", page 8.

Maximum display resolutions (for each display)

Aspect ratio	Maximum resolution*
4:3/5:4 (traditional)	2048 × 1536
16:9/16:10 (wide)	1920 × 1200

* With most digital monitors, the maximum display resolution is 1280 × 1024. For digital monitors that support reduced timings, the maximum display resolution may be 1600 × 1200.

Maximum refresh rates

Aspect ratio	Display resolution*	Maximum vertical refresh rate (Hz)†	Maximum horizontal refresh rate (kHz)†
4:3/5:4 (traditional)	640 × 480	200	130t
	800 × 600	200	130
	1024 × 768	160	130
	1152 × 864	140	130
	1280 × 1024	120	130
	1600 × 1200	100	130
	1800 × 1440	85	130
	1920 × 1440	85	130
	2048 × 1536	85	130
16:9/16:10 (wide)	856 × 480	200	130
	1280 × 720	160	130
	1600 × 1024	120	130
	1920 × 1080	110	130
	1920 × 1200	100	130

* Maximum refresh rates are attainable when using 8- or 16-bit color palettes.
Maximums may not be attainable at the highest display resolutions *with* a 24- or 32-bit color palette.

† Based on a monitor with a maximum horizontal refresh rate of 130 kHz

Supported VESA modes

In the table below, VESA modes supported by your Matrox graphics card are indicated by a VESA mode number. Many Super VGA DOS programs use VESA modes.

Display resolution	16 colors	256 colors	32 K colors	64 K colors	16 M colors
640 × 400	—	100	—	—	—
640 × 480	(VGA)	101	110	111	112
800 × 600	102	103	113	114	115
1024 × 768	—	105	116	117	118
1280 × 1024	—	107	119	11A	11B

Digital flat panel information

Matrox G450 MMS products that support digital monitors are fully DVI 1.0 compliant. The following maximum simultaneous display settings are supported with digital flat panels:

- 112 MHz pixel clock

- 1280 × 1024[*†] display resolution (SXGA)

- 60 Hz vertical refresh rate (with standard VESA monitor timings)

- millions of simultaneous display colors

* With digital (flat panel) monitors that don't support display scaling, if you use a display resolution lower than the maximum display resolution, the display may only use a portion of the screen (the rest of the screen will be black).

† DOS display modes may not be supported with some 1280 × 1024 digital flat panel monitors that don't support display scaling. For a possible work-around or fix for this problem, contact Matrox.

Hardware information

Features

	G450×2 MMS	G450×4 MMS
Graphics chip model	Matrox G450 (256-bit DualBus)	
RAMDAC	360 MHz (internal)	
Memory type	DDR (Double Data Rate) SDRAM	
Card type	PCI (32-bit, 33 MHZ)	
# of displays supported (# of graphics chips)	2	4
Memory	2 × 32 MB	4 × 32 MB
# of dual-monitor cables (Part #: DL-CAB-DVI-I)	1	2
# of DVI-to-HD15 adapters (Part #: DVI-I-VGA)	2	4
Digital monitor support	DVI	DVI
Model #	G45X2DUAL-B	G45X4QUAD-B

Technical features

- Supports PCI bus version 2.1 and 2.2 at clock speeds up to 33 MHz

- Hint HB4 PCI bridge controller

Video specifications

- Separate sync monitors only

- The video follows the PS/2 standard, with no sync on RGB, and no blanking pedestal. Black or blank – 0.0 V; White – 0.700 V.

- There are five connections to a monitor that uses BNC (Bayonet Nut Connect) connectors – R, G, B, HSYNC (white or gray wire), and VSYNC (black wire).

Environmental specifications

- Minimum/maximum ambient operating temperatures: 0 to 55º C

- Minimum/maximum storage temperature: -40 to 75º C

- Maximum altitude for operation: 3,000 meters

- Maximum altitude for transport: 12,000 meters

- Operating humidity: 20 to 80% relative humidity (non-condensing)

- Storage humidity: 5 to 95% relative humidity (non-condensing)

- Estimated mean time before failure (MTBF): 37,931 hours (4.33 years) at 50º C, 26,893 hours (3.07 years) at 70º C

Digital flat panel information

- TMDS (Transition Minimized Differential Signaling) encoding based on the Silicon Image PanelLink standard

- DDWG (Digital Display Working Group) compliant DVI connector

- EDID (Extended Display Identification Data) 1.2 and 2.0 support

Pin usage for the graphics card connector (LFH-60)
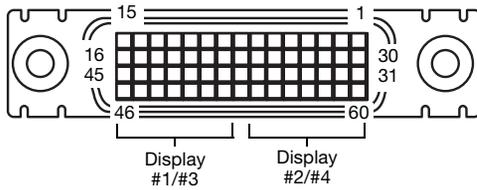
	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
Display #2/#4	1	Ground	24	—	31	TMDS data1+	54	Ground
	2	Analog red output	25	—	32	TMDS data1–	55	VSYNC
	3	Analog blue output	26	—	33	TMDS clock data+	56	HSYNC
	4	Ground	27	TMDS data2–	34	TMDS clock data–	57	Ground
	5	5V Power	28	TMDS data2+	35	—	58	—
	6	SCL (DDC)	29	TMDS data0–	36	Hot plug detection	59	Analog green output
	7	SDA (DDC)	30	TMDS data0+	37	—	60	Ground
	8	—	23	—	38	—	53	—
Display #1/#3	9	SDA (DDC)	16	TMDS data0+	39	—	46	Ground
	10	SCL (DDC)	17	TMDS data0–	40	Hot plug detection	47	Analog green output
	11	5V Power	18	TMDS data2+	41	—	48	—
	12	Ground	19	TMDS data2–	42	TMDS clock data–	49	Ground
	13	Analog blue output	20	—	43	TMDS clock data+	50	HSYNC
	14	Analog red output	21	—	44	TMDS data1–	51	VSYNC
	15	Ground	22	—	45	TMDS data1+	52	Ground

PIN usage with a dual-TV-output cable (see "TV output", page 19)

Display #1/#3   Display #2/#4
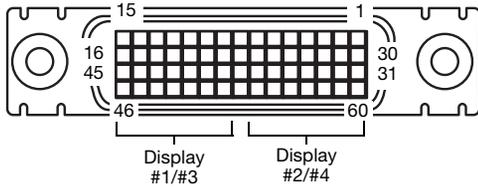
	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
Display #2/#4	1	—	24	—	31	—	54	Ground
	2	—	25	—	32	—	55	—
	3	—	26	Ground	33	—	56	—
	4	—	27	—	34	—	57	Ground
	5	—	28	—	35	Composite video	58	Luminance (S-video)
	6	Shorted with 7 by adapter	29	—	36	—	59	—
	7	Shorted with 6 by adapter	30	—	37	Chrominance (S-video)	60	—
	8	—	23	—	38	—	53	—
Display #1/#3	9	Shorted with 10 by adapter	16	—	39	Chrominance (S-video)	46	—
	10	Shorted with 9 by adapter	17	—	40	—	47	—
	11	—	18	—	41	Composite video	48	Luminance (S-video)
	12	—	19	—	42	—	49	Ground
	13	—	20	Ground	43	—	50	—
	14	—	21	—	44	—	51	—
	15	—	22	—	45	—	52	Ground

PIN usage with a SCART dual-TV-output cable (see "TV output", page 19)
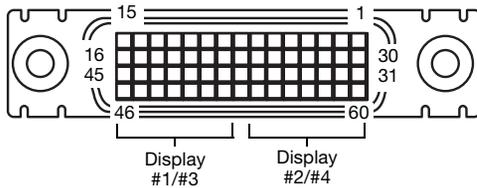
	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
Display #2/#4	1	RGB switching control (Composite)	24	—	31	—	54	Ground (RGB)
	2	—	25	Sync (RGB)	32	—	55	—
	3	—	26	Ground (RGB/Composite)	33	—	56	—
	4	Ground (RGB)	27	—	34	—	57	Ground (RGB)
	5	RGB switching control (RGB)	28	—	35	Red (RGB) / Composite (Composite)	58	Green (RGB)
	6	Shorted with 7 by adapter	29	—	36	—	59	—
	7	Shorted with 6 by adapter	30	—	37	Blue (RGB)	60	—
	8	—	23	—	38	—	53	—
Display #1/#3	9	Shorted with 10 by adapter	16	—	39	Blue (RGB)	46	—
	10	Shorted with 9 by adapter	17	—	40	—	47	—
	11	RGB switching control (RGB)	18	—	41	Red (RGB) / Composite (Composite)	48	Green (RGB)
	12	Ground (RGB)	19	—	42	—	49	Ground (RGB)
	13	—	20	Ground (RGB/Composite)	43	—	50	—
	14	—	21	Sync (RGB)	44	—	51	—
	15	RGB switching control (Composite)	22	—	45	—	52	Ground (RGB)

Pin usage for analog (HD-15) connector
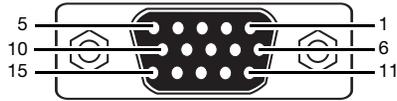
Pin	Signal	Pin	Signal	Pin	Signal
1	Analog red output	6	Ground	11	—
2	Analog green output	7	Ground	12	SDA (DDC)
3	Analog blue output	8	Ground	13	TTL horizontal sync
4	—	9	+5 V (DDC)	14	TTL vertical sync
5	Ground	10	Ground	15	SCL (DDC)

Pin usage for a digital (DVI-I) connector
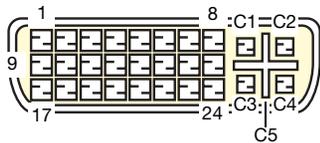
Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2−	9	TMDS data 1−	17	TMDS data 0−
2	TMDS data 2+	10	TMDS data 1+	18	TMDS data 0+
3	TMDS data 2/4 shield	11	TMDS data 1/3 shield	19	TMDS data 0/5 shield
4	TMDS data 4−	12	TMDS data 3−	20	TMDS data 5−
5	TMDS data 4+	13	TMDS data 3+	21	TMDS data 5+
6	DDC clock	14	+5 V power	22	TMDS clock shield
7	DDC data	15	Ground (for +5 V, Hsync, & VSync)	23	TMDS clock+
8	Analog vertical sync	16	Hot plug detection	24	TMDS clock−
C1	Analog red	C3	Analog blue	C5	Analog ground (Analog R, G, & B return)
C2	Analog green	C4	Analog horizontal sync		

Pin usage with an analog dual-monitor adapter (DVI-I to HD-15)
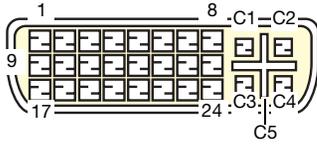
Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2−	9	TMDS data 1−	17	TMDS data 0−
2	TMDS data 2+	10	TMDS data 1+	18	TMDS data 0+
3	TMDS data 2/4 shield	11	TMDS data 1/3 shield	19	TMDS data 0/5 shield
4	Analog red (2)	12	TMDS data 3−	20	Analog blue (2)
5	Analog horizontal sync (2)	13	TMDS data 3+	21	DDC Clock (2)
6	DDC clock (1)	14	+5 V power	22	TMDS clock shield
7	DDC data (1)	15	Ground (for +5 V, Hsync, & VSync)	23	TMDS clock+
8	Analog vertical sync (1)	16	Hot plug detection	24	TMDS clock−
C1	Analog red (1)	C3	Analog blue (1)	C5	Analog ground (Analog R, G, & B return) (1)
C2	Analog green (1)	C4	Analog horizontal sync (1)		

Maximum card dimensions

⩽0.75 in. / ⩽3.61 cm

6.5 in. / 16.51 cm

3.8 in. / 9.70 cm
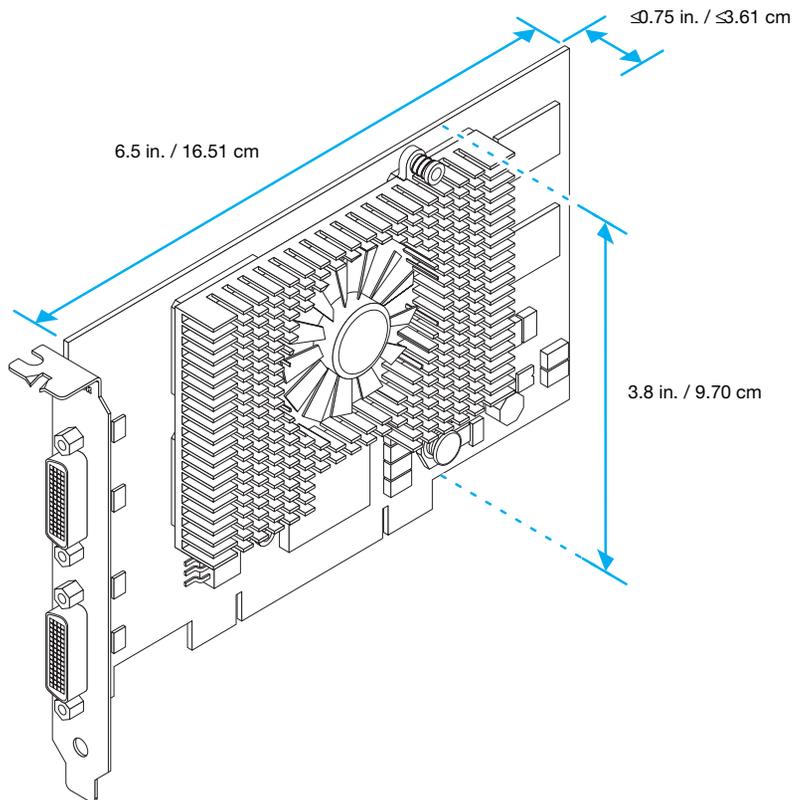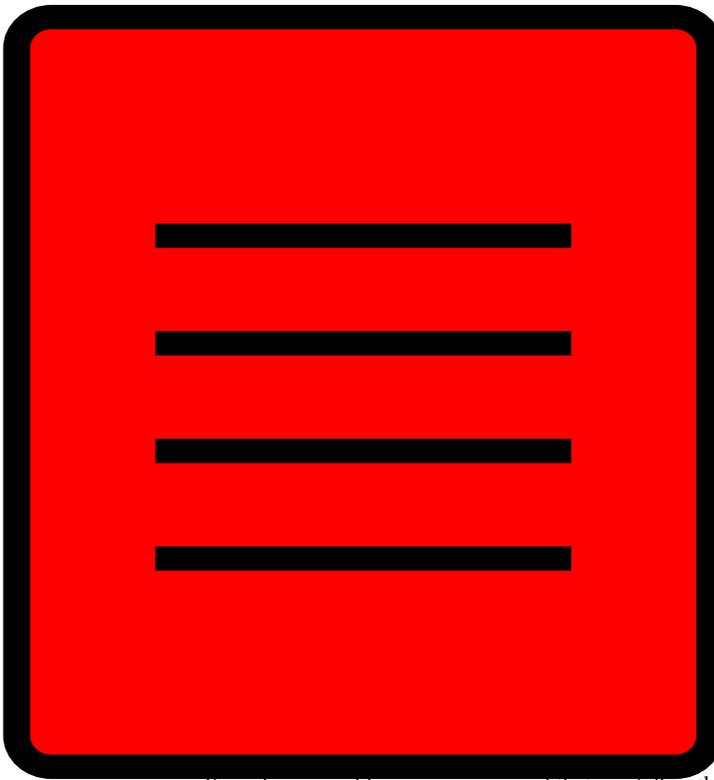
and File Transfer Protocol (FTP) site. Our
aterial, a sales office list, trade show
ntains current drivers for Matrox products.
can access our FTP server independently,

If you have a problem, we recommend that you follow the procedure below for the quickest results.

1 **Contact your dealer** – This is usually the quickest and most effective method of technical assistance. Your dealer is local and may be familiar with your complete system. In the case of hardware warranty assistance, the product must be returned to the dealer, who will return it to Matrox.

2 If your Matrox product was provided by your computer manufacturer, contact this manufacturer. For contact information, see your computer documentation or contact the vendor.

3 **Direct Matrox Technical Assistance** – If you still can't resolve a problem (and your Matrox product wasn't provided by your computer manufacturer), you can get direct technical assistance four ways:

- Call Technical Support (Canada) at **514-685-0270**. For residents of Quebec only, call **514-822-6330**. Make sure you have a registered client ID number before calling technical support. You can obtain your client ID number by registering your Matrox product at www.matrox.com/mga/registration/home.cfm.

- Send e-mail to mmssupport@matrox.com.

- Visit our technical support Web site at www.matrox.com/mga/support/tech_support/home.cfm.

- Visit our technical support forum at
  www.matrox.com/mga/support/forum/agree.cfm.

- See our FAQs (Frequently Asked Questions) at
  http://forum.matrox.com/cgi-bin/mgaforum/Ultimate.cgi#faq.

- Write a letter to Graphics Customer Support at our Corporate Headquarters. The
  address is:
  Matrox Graphics Inc., 1055 St. Regis Blvd., Dorval, QC, Canada, H9P 2T4.

Information we need

Please give a complete description of the problem, and include:

- Matrox card serial number, model number, revision number, BIOS number, driver type
  and version, and memory address at which the Matrox card is installed.

- Computer brand name, system BIOS manufacturer and version number or date, bus
  type, model, processor speed, and amount of memory.

- Monitor brand and model name.

- Operating system and version – if you're using a memory manager, its brand and version.
  Also, list any memory-resident programs in use.

- If you're using a network card, its brand and version.

- Brand and model of any other cards and devices installed on your system.

Program specific problems

If a problem appears with a specific program, please give us the following information:

- Display settings (color palette, display resolution, and so on) applied when the problem
  occurs.

- Program name and version. Name any add-on packages you're using.

- If possible, take note of the file and segment address that caused the problem.

- Detailed steps known to cause the bug, so we can reproduce it.

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W

Where to get information

For display information:

- **Windows 2000/XP or NT 4.0** – Access the **Information** property sheet (see "Accessing PowerDesk property sheets", page 8).

For system information:

- **Windows 2000** – Right-click the **My Computer** icon on your Windows desktop background, then click **Properties**.

- **Windows 2000/XP** – Click **Start → Programs** (or **All programs**) → **Accessories → System Tools → System Information**.

- **Windows XP** – Click **Start → Settings*** → **Control Panel → Performance and Maintenance*** → **System** (double-click*). (* Depending on your configuration of Windows, this part of the step may not be necessary.)

- **Windows NT 4.0** – Click **Start → Administrative Tools (Common) → Windows NT Diagnostics**.

Warranty

A. Limited Warranty Statement

1. Matrox Graphics Inc. ("Matrox") warrants to the end-user customer, who provides adequate proof of purchase that Matrox hardware products purchased from Matrox authorized dealers will be free from defects in materials and workmanship for a period of three (3) years from the date of purchase. This warranty applies only to the original end-user purchaser and is non-transferable. Conditions and limitations of Matrox's warranty are stated below.

2. Matrox's limited warranty covers only those defects which arise as a result of normal use of the hardware and does not apply to any:

   a. improper or inadequate maintenance;

   b. incompatibilities due to the user's hardware or software applications with or in which the Matrox product interfaces;

   c. product of a special or custom-made nature;

   d. unauthorized modification or misuse;

   e. improper installation, misapplication or negligence;

   f. operation outside the product's environmental specifications;

   g. improper site preparation or maintenance;

   h. software;

   i. other causes that do not relate to a product defect;

   j. defects or damage suffered as a result of force majeure (including theft);

   k. defects or damage suffered as a result of normal wear and tear; and/or

   l. stolen goods.

3. If Matrox receives, during the applicable warranty period, notice of a defect in a warranted hardware product and the defective Matrox product in question, Matrox shall at its sole option, either repair or replace the product, and shall return the repaired product or a replacement product within a reasonable delay. The replacement product may not be new, provided that it has functionality at least equal to that of the product being replaced.

4. This warranty is valid in any country where Matrox hardware products are distributed by Matrox or its authorized dealers.

5. This Limited Warranty Statement gives the customer specific legal rights. The customer may also have other rights which vary from state to state in the United States, from province to province in Canada, and from country to country elsewhere in the world.

B. Limitations of Warranty

1. NEITHER MATROX NOR ANY OF ITS THIRD PARTY SUPPLIERS MAKES ANY OTHER WARRANTY OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, WITH RESPECT TO MATROX PRODUCTS. MATROX SPECIFICALLY DISCLAIMS (and the customer, by accepting the Matrox product, specifically accepts such disclaimer and waives) ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR OR INTENDED PURPOSE OR USE AND THE WARRANTY AGAINST LATENT DEFECTS, WITH RESPECT TO THE HARDWARE AND/OR SOFTWARE. MATROX FURTHER DISCLAIMS ANY WARRANTY THAT MATROX PRODUCTS, IN WHOLE OR IN PART, WILL BE FREE FROM INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY OR PROPRIETARY RIGHTS.

2. To the extent that this Limited Warranty Statement is inconsistent with the law of the locality where the customer purchases the Matrox product, this Limited Warranty Statement shall be deemed modified to be consistent with such local law. Under such local law, certain limitations of this Limited Warranty Statement may not apply to the consumer.

3. To the extent allowed by local law, the remedies provided in this Limited Warranty Statement are the customer's sole and exclusive remedies.

C. Limitations of Liability

1. EXCEPT FOR THE OBLIGATIONS SPECIFICALLY SET FORTH IN THE LIMITED WARRANTY STATEMENT, IN NO EVENT SHALL MATROX BE LIABLE FOR:

   a. any direct, indirect, special, incidental, consequential, foreseeable or unforeseeable, or punitive damages, whether based on contract, tort, delict or any other legal theory and whether advised of the possibility of such damages; and/or

   b. damages arising from the loss of use, data, production revenue and/or profit of in connection with the Matrox product or any business interruption.

2. Without prejudice to the foregoing, any liability of Matrox for any breach of warranty shall be limited to the amount paid by the customer for the defective hardware in question.

3. To the extent allowed by local law, Matrox's entire liability and the customer's exclusive remedy shall be the repair or replacement of any defective product during the warranty period. Matrox does not offer any other warranty with respect to Matrox hardware or software or any other hardware or software.

4. Customer shall be responsible for all applicable taxes, duties and customs fees on any replacement unit, as well as all transport, insurance, storage and other charges incurred on all returned products.

D. Obtaining Service

1. Verify that your Matrox product was installed and configured according to the information in its accompanying documentation.

2. Read the "Troubleshooting" information included with the Matrox product to see if you can solve the problem yourself.

3. If you are still experiencing difficulties, please contact your dealer where you purchased your Matrox product.

4. If you must return a Matrox product, leave the configuration as it was when you were using it, and leave all identification stickers on the product. Pack the product in its original box and return to your Matrox dealer where the product was purchased, together with your proof of purchase. Your Matrox dealer will return the product for you. Alternatively, if this first option is unavailable to you, you may contact the Matrox Technical Support group who will issue an Return Merchandise Authorization (RMA) number, upon receipt of adequate proof of purchase, and inform you of shipping instructions. DO NOT RETURN THE PRODUCT TO MATROX WITHOUT MATROX'S RMA NUMBER AND EXPRESS AUTHORIZATION.

E. General

This limited warranty shall be governed by the laws of the Province of Quebec, Canada and the federal laws of Canada applicable therein and the courts of the Province of Quebec shall have exclusive jurisdiction to hear and decide any dispute instituted by the customer in connection with this limited warranty; the customer waives, by accepting the product, its rights to institute proceedings in connection with this warranty against Matrox in any jurisdiction other than Quebec.

Software license agreement

Single User Products   This Matrox software (the "Software") is copyrighted by Matrox Graphics Inc. All rights are reserved. The purchaser is granted a license to use the software only, subject to the following restrictions and limitations.

1. The license is for the original purchaser only, and is not transferable without written permission of Matrox.

2. The original purchaser may use the Software on a single computer owned or leased by the original purchaser. You may not use the Software on more than a single computer, even if you own or lease more than one computer, without written consent of Matrox.

3. The original purchaser may make back-up copies of the Software for his or her own use only, subject to the use limitations of this license.

4. The original purchaser may not engage in, nor permit third parties to engage in, any of the following:
   • Providing or disclosing the Software to third parties.
   • Providing use of the Software in a computer service business, network, time-sharing, multiple CPU or multi-user arrangement to users who are not individually licensed by Matrox.
   • Making alterations or copies of any kind in the Software (except as specifically permitted above).
   • Attempting to unassemble, de-compile or reverse engineer the Software in any way.
   • Granting sublicenses, leases, or other rights in the Software to others.
   • Making copies, or verbal or media translations, of the user's guide.
   • Making telecommunication data transmissions of the Software.

Matrox reserves the right to terminate this license if there is a violation of its term or default by the Original Purchaser. Upon termination, for any reason, all copies of the Software must be immediately returned to Matrox, and the Original Purchaser shall be liable to Matrox for any and all damages suffered as a result of the violation or default.

Limited warranty   Matrox warrants to you, for a period of ninety (90) days normal use from your date of purchase, that:

1. The CD/disks on which the software is furnished and the documentation are not defective.

2. The Software is properly recorded upon the CD/disks included.

3. The documentation is substantially complete and contains all the information Matrox deems necessary to use the software.

4. The Software functions substantially as described in the documentation.

Matrox's entire liability and your exclusive remedy shall be the replacement of any CD/Disks or documentation not meeting these warranties, which is returned to Matrox or an authorized dealer, together with a copy of your paid receipt. The above is the only warranty of any kind, either express or implied, including, but not limited to the implied warranties of merchantability and fitness for a particular use that is made by Matrox on this Licensed Software. In no event shall Matrox be liable to you or to any third party for consequential, special, indirect or incidental damages which you may incur as a result of using the licensed software, including, but not limited to, loss of data, or information of any kind which you may experience.

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Thank you for choosing Matrox

Please register online (www.matrox.com/mga/registration/home.cfm) to be eligible for customer support, new product announcements, and information on special offers and upcoming events.

matrox

(English) European user's information – Declaration of Conformity

Remark for the Matrox hardware products supported by this guide   These devices comply with EC Directive 89/336/EEC for a Class A digital device. They have been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures.To meet EC requirements, shielded cables must be used to connect the monitor and other peripherals to the card. These products have been tested in a typical class A compliant host system. It is assumed that these products will also achieve compliance in any class A compliant system.

(Français) Informations aux utilisateurs Européens – Déclaration de conformité

Remarque sur les produits matériels Matrox couverts par ce guide   Ces unités sont conformes à la directive communautaire 89/336/EEC pour les unités numériques de classe A. Les tests effectués ont prouvé qu'elles sont conformes aux normes EN55022/CISPR22 et EN55024/CISPR24. Le fonctionnement de ces produits dans un environnement résidentiel peut causer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre les mesures appropriées. Pour respecter les impératifs communautaires, les câbles de connexion entre le moniteur ou autres périphériques et la carte doivent être blindés. Ces produits ont été testés dans un système hôte typique compatible classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible classe A.

(Deutsch) Information für europäische Anwender – Konformitätserklärung

Anmerkung für die Matrox Hardware-Produktunterstützung durch dieses Handbuch   Diese Geräte entsprechen EC Direktive 89/336/EEC für ein digitales Gerät Klasse A. Sie wurden getestet und entsprechen demnach EN55022/CISPR22 und EN55024/CISPR24. In einer Wohnumgebung können diese Produkte Funkinterferenzen erzeugen, und der Benutzer kann genötigt sein, entsprechende Maßnahmen zu ergreifen. Um EG-Anforderungen zu entsprechen, müssen zum Anschließen des Monitors und anderer Peripheriegeräte an die Karte abgeschirmte Kabel verwendet werden. Diese Produkt wurden in einem typischen, der Klasse A entsprechenden, Host-System getestet. Es wird davon ausgegangen, daß diese Produkte auch in jedem Klasse A entsprechenden System entsprechend funktionieren.

(Italiano) Informazioni per gli utenti europei – Dichiarazione di conformità

Nota per i prodotti hardware Matrox supportati da questa guida   Questi dispositivi sono conformi alla direttiva CEE 89/336/EEC relativamente ai dispositivi digitali di Classe A. Sono stati provati e sono risultati conformi alle norme EN55022/CISPR22 e EN55024/CISPR24. In un ambiente domestico, questi prodotti possono causare radiointerferenze, nel qual caso all'utente potrebbe venire richiesto di prendere le misure adeguate. Per soddisfare i requisiti CEE, il monitor e le altre periferiche vanno collegati alla scheda grafica con cavi schermati. Questi prodotti sono stati provati in un tipico sistema host conforme alla classe A. Inoltre, si dà per scontato che questi prodotti acquisiranno la conformità in qualsiasi sistema conforme alla classe A.

(Español) Información para usuarios europeos – Declaración de conformidad

Observación referente a los productos de hardware de Matrox apoyados por este manual   Estos dispositivos cumplen con la directiva de la CE 89/336/EEC para dispositivos digitales de Clase A. Dichos dispositivos han sido sometidos a prueba y se ha comprobado que cumplen con las normas EN55022/CISPR22 y EN55024/CISPR24. En entornos residenciales, estos productos pueden causar interferencias en las comunicaciones por radio; en tal caso el usuario deberá adoptar las medidas adecuadas. Para satisfacer las disposiciones de la CE, deberán utilizarse cables apantallados para conectar el monitor y demás periféricos a la tarjeta. Estos productos han sido sometidos a prueba en un típico sistema anfitrión que responde a los requisitos de la clase A. Se supone que estos productos cumplirán también con las normas en cualquier sistema que responda a los requisitos de la clase A.

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