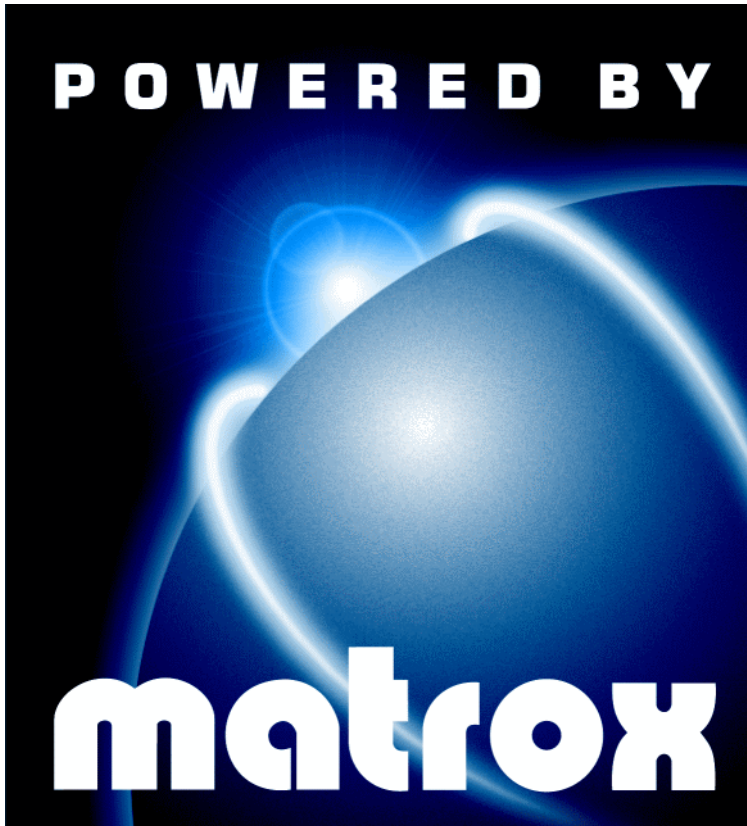


Matrox Graphics Architecture



**Matrox Millennium II for Mac
• Installation Guide •**

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ENGLISH

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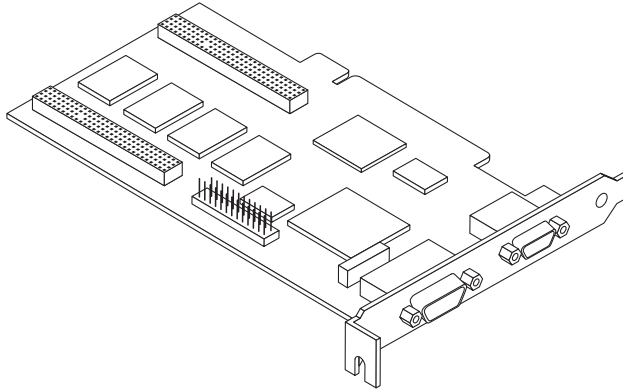
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Overview

Thank you for purchasing a Matrox Millennium II card for your Macintosh* computer. Millennium II is a high-performance graphics card that plugs into a PCI expansion slot inside your computer.



Your Millennium II card features:

- Matrox 64-bit graphics chip to accelerate 2D and 3D graphics and digital video
- Hardware-based texture-mapping and bus mastering for more 3D acceleration
- Display resolution support up to 1800×1440 and 1920×1200
- Graphics memory that can be upgraded up to 16 MB
- 100% VGA compatibility
- Support for all VESA standards
- Support for Apple monitors and DDC multisync monitors†
- QuickDraw and QuickDraw 3D support
- Matrox PowerDesk software to change display settings and access Matrox features including virtual desktops and PixelTOUCH zoom

* Your Millennium II card is for PCI Power Mac (and compatible) computers *only*.

† Non-DDC multisync monitors are *not* supported.

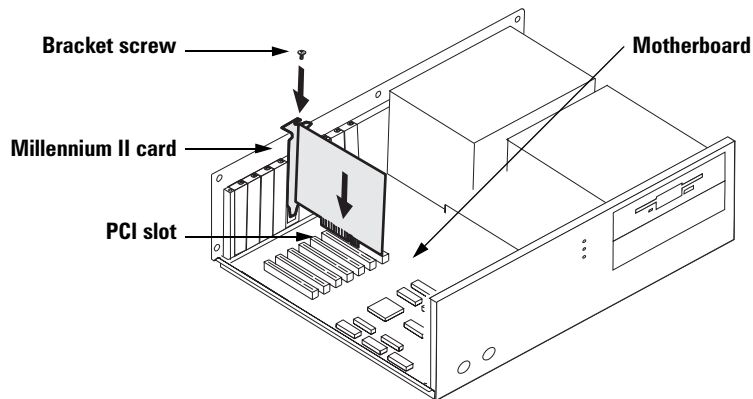
Installation

WARNING – Static electricity can severely damage electronic parts. Take these precautions:

- Before touching any electronic parts, drain the static electricity from your body. You can do this by touching the metal frame of your computer.
- Don't remove a card from the anti-static container it was shipped in until you're ready to install it. When you remove a card from your computer, place it back in its container.
- When handling a card, hold it by its edges, and avoid touching its circuitry.

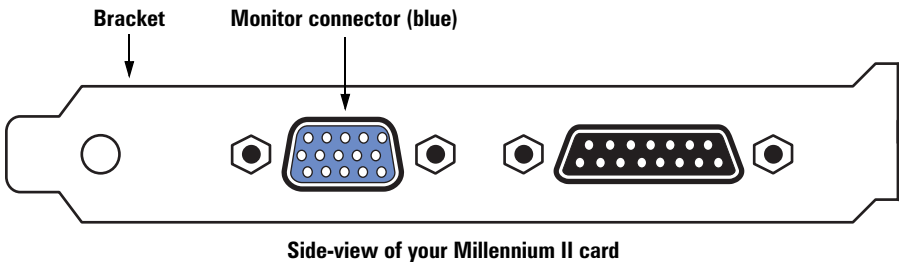
1 Insert your Millennium II card

Turn off your computer and all peripherals such as the monitor or printer. Open the computer and remove the cover for the expansion slot you intend to use. Save the screw for the mounting bracket. Position your Millennium II card over a PCI slot (your system manual should identify the PCI slots in your computer). Push the card in firmly and evenly until it's fully seated in the slot. Replace the screw to secure the bracket of your Millennium II card to the computer chassis.



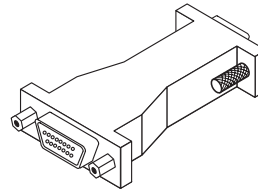
2 Connect your monitor

Simply plug your monitor cable into the monitor connector on your Millennium II card. Make sure the other end of the monitor cable is properly connected to your monitor. See your monitor manual for more information.



Apple monitors

The wider connector on your Millennium II card is *not* a connector for an Apple monitor. To connect an Apple monitor, use the adapter supplied with your Millennium II card. Attach the wide end of the adapter to your Apple monitor cable and attach the other end to the monitor connector of your Millennium II card.



Apple monitor adaptor

3 Install the software

Restart your computer, then insert the install disk in your disk drive. Double-click **Matrox Installer**, then follow the on-screen instructions. Restart your computer for changes to take effect.

The installation program creates*:

- **Matrox PowerDesk** in your **Control Panel** folder;
- **Matrox 3D Acceleration** and **Matrox GDX Mistral** in your **Extensions** folder;
- **Matrox Control Strip** in your **Control Strip Modules** folder.

Your hardware and software are now installed. See the next section for information on how to change your display settings.

* To uninstall the driver, simply remove these files from your system.

Display setup

After installing the software drivers, you can change your display resolution, color palette and other Matrox PowerDesk settings. To access Matrox PowerDesk settings, open **Control Panel** → **Matrox PowerDesk**.

Matrox Cards

This lists all the Matrox graphics cards in your computer. Select a card in the list to change settings for it.

Resolutions

Click this box to select a display area from 640×480 to 1800×1440 and 1920×1200 . Your display area – also called *display resolution* – is your on-screen work area, and is measured in pixels. (A pixel is the smallest element that can be drawn on your display.) The first number in a resolution is the width and the second number is the height.

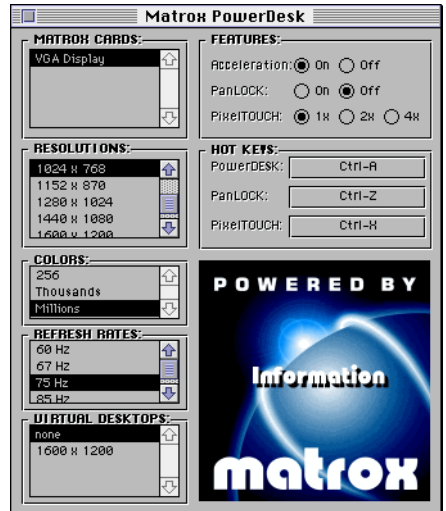
Colors

Click this box to select the number of simultaneous colors you want to be able to use in your current display. You can select from 256 to 16.8 million colors.

Depending on available graphics memory and your current display area, millions of colors may not be available. For more information, see [“Display information”](#), page 9.

Refresh Rates

Click this box to select a vertical refresh rate for your current display. Your *vertical refresh rate* is the number of times your graphics card refreshes the entire screen in one second, expressed in hertz (cycles per second). A higher vertical refresh rate results in less noticeable flicker in your display. You can have a different refresh rate for each resolution and color palette setting.



Note: When you change your monitor settings, your screen may flicker for a few seconds while the settings are being changed. If you select a refresh rate that your monitor doesn't support, your display may become garbled or unusable. If this happens, press [Enter] and your previous refresh rate will be restored. If incorrect settings are applied, see [“Troubleshooting”, page 11](#).

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

For a table of refresh rates supported by your Millennium II card, see [“Display information”, page 9](#).

Virtual Desktops

Click this box to select a *desktop area* that's larger than your on-screen work space (*display area*). While you're using a virtual desktop and PanLOCK is off, move your mouse pointer to the edge of your display to scroll in that direction.

Features

Acceleration – Lets you turn Matrox acceleration on or off. This may help you find out if a specific problem is related to your Matrox card. If a problem persists after acceleration is turned off, the problem is probably not related to your Matrox card.

PanLOCK – Use this feature to turn panning on or off when parts of your desktop area are outside your view area (as with a virtual desktop or the PixelTOUCH zoom feature). When panning is on, you can move your mouse cursor to the edge of your view area to pan in that direction.

PixelTOUCH – Use this feature to zoom in on your display. You can select the ×1 (actual size), ×2 or ×4 zoom factors. (The ×4 zoom factor is unavailable at display area resolutions 832 × 624 and lower.)

Hot Keys

Use this feature to assign keyboard shortcuts for **PanLOCK** and **PixelTOUCH**, and for opening the **Matrox PowerDesk** control panel.

Information

Click this box to see information related to your graphics card and how to contact Matrox customer support.

Display information

Maximum display resolutions

Graphics memory	Colors	Maximum display area	Maximum 3D display area
4 MB	256 colors (8-bit)	1800 × 1440 / 1920 × 1200	—
	64 K colors (16-bit)	1920 × 1080	1152 × 870
	16.8 M colors (32-bit)	1152 × 870	832 × 624
8 MB	256 colors (8-bit)	1800 × 1440 / 1920 × 1200	—
	64 K colors (16-bit)	1800 × 1440 / 1920 × 1200	1920 × 1080
	16.8 M colors (32-bit)	1440 × 1080	1152 × 870
12 MB	256 colors (8-bit)	1800 × 1440 / 1920 × 1200	—
	64 K colors (16-bit)	1800 × 1440 / 1920 × 1200	1800 × 1440 / 1920 × 1080
	16.8 M colors (32-bit)	1440 × 1080	1280 × 1024
16 MB	256 colors (8-bit)	1800 × 1440 / 1920 × 1200	—
	64 K colors (16-bit)	1800 × 1440 / 1920 × 1200	1800 × 1440 / 1900 × 1080
	16.8 M colors (32-bit)	1440 × 1080	1280 × 1024

Refresh rate ranges

Display resolution	Horizontal refresh rate (kHz)	Vertical refresh rate ¹ (Hz)
640 × 480	31–102	60–85
800 × 600	31–114	60–85
832 × 624	31–114	60–85
1024 × 768	48–113	60–85
1152 × 870	54–110	60–85
1280 × 1024	64–107	60–85
1440 × 1080	75–100	60–85
1600 × 1200	75–113	60–85
1920 × 1080	70–94	60–80
1920 × 1200	75–95	60–76
1800 × 1440	89–104	60–70

1. Maximum refresh rates can be obtained while using an 8- or 16-bit color palette.
Maximums may not be attainable at the highest display resolutions *with* a 32-bit color palette.

Hardware information

- MGA-2164W graphics chip, TI 3026 external RAMDAC
- Graphics cards –
 - MIL2P/4MAC series: 250 MHz RAMDAC, 4 MB WRAM
 - MIL2P/4MACB (Bulk) series: 250 MHz RAMDAC, 4 MB WRAM
 - MIL2P/MAC4N (North American) series: 250 MHz RAMDAC, 4 MB WRAM
 - MIL2P/8MAC series: 250 MHz RAMDAC, 8 MB WRAM
 - MIL2P/MAC8N (North American) series: 250 MHz RAMDAC, 8 MB WRAM
- Memory upgrades –
 - MIL2/MOD4: 4 MB WRAM (for MIL2P/4MAC, MIL2P/4MACB, MIL2P/MAC4N, MIL2P/8MAC and MIL2P/MAC8N)
 - MIL2/MOD8: 8 MB WRAM (for MIL2P/4MAC, MIL2P/4MACB, MIL2P/MAC4N, MIL2P/8MAC and MIL2P/MAC8N)
 - MIL2/MOD12: 12 MB WRAM (for MIL2P/4MAC, MIL2P/4MACB and MIL2P/MAC4N)

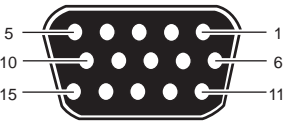
Technical features

- 64-bit VGA-compatible drawing engine
- Separate sync monitors only
- Supports PCI bus version 2.1 at clock speeds up to 33 MHz

Video specifications

- 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).

Monitor connector pinouts

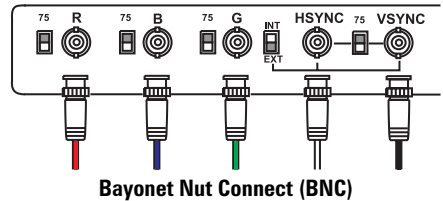
	<table><tr><td>1</td><td>Analog red output</td><td>10</td><td>Ground</td></tr><tr><td>2</td><td>Analog green output</td><td>11</td><td>Not connected</td></tr><tr><td>3</td><td>Analog blue output</td><td>12</td><td>SDA (DDC)</td></tr><tr><td>4</td><td>Not connected</td><td>13</td><td>TTL horizontal sync</td></tr><tr><td>5–8</td><td>Ground</td><td>14</td><td>TTL vertical sync</td></tr><tr><td>9</td><td>+5 V (DDC)</td><td>15</td><td>SCL (DDC)</td></tr></table>	1	Analog red output	10	Ground	2	Analog green output	11	Not connected	3	Analog blue output	12	SDA (DDC)	4	Not connected	13	TTL horizontal sync	5–8	Ground	14	TTL vertical sync	9	+5 V (DDC)	15	SCL (DDC)
1	Analog red output	10	Ground																						
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5–8	Ground	14	TTL vertical sync																						
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Troubleshooting

This section contains solutions to problems you may encounter with your Matrox graphics card.

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

- **Cause** – Your monitor’s video controls may be improperly set.
 - ☑ **Solution** – Adjust your monitor’s controls (brightness, contrast and so on). For more information, see your monitor manual.
- **Cause** – The monitor connections may be loose or incorrectly connected.
 - ☑ **Solution** – Make sure the monitor’s power cable is firmly in place.
 - ☑ **Solution** – Make sure the 15-pin connector to your Matrox graphics card is firmly in place.
 - ☑ **Solution** – If you are using an Apple monitor, make sure the adapter is firmly attached to your monitor cable and your Millennium II card.
 - ☑ **Solution** – If your monitor uses BNC connectors, make sure the Red, Green, Blue, Horizontal Sync (HSYNC – white or gray wire), and Vertical Sync (VSYNC – black wire) connections are firmly in place and plugged into the correct input.
- **Cause** – If your monitor uses BNC input (see picture), one or more connection settings may be incorrect.
 - ☑ **Solution** – Set each of your monitor’s 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.



Problem: After restarting, or after display settings are changed, the screen image is garbled or unusable

(rolling screen images, overlapping screen images or a blank screen)

- **Cause** – The MGA display driver may be trying to use settings your monitor doesn't support. This can happen if an incorrect refresh rate was applied, or if the monitor connected to your computer was changed without software monitor settings being changed.
 - ☑ **Solution** –
 - 1 Press [Ctrl]+[Command]+[Power] to restart your computer.
 - 2 Hold down [Shift] to restart with extensions off.
 - 3 Open your **System** folder → **Preferences** folder.
 - 4 Delete the **Matrox Preference** file.
 - 5 Restart your computer.

- **Cause** – You may be using a fixed-frequency monitor. To confirm this, see your monitor manual.
 - ☑ **Solution** – You may need a special adapter. For more information, please contact Matrox Technical Support.