

Millennium G400 Series

Dramatically different high performance graphics

- New **Matrox G400** 256-bit DualBus graphics chip
- Explosive **3D, 2D** and **DVD** performance
- **DualHead Display**
- Superior **DVD** and **TV output**
- 3D Environment-Mapped **Bump Mapping**
- **Vibrant Color Quality²** rendering
- **UltraSharp DAC** of up to 360 MHz
- **3D Rendering Array Processor**
- Support for **16 or 32 MB** of memory



Introducing the Millennium G400 Series. A dramatically different, high performance graphics experience. Armed with the industry's fastest graphics chip, the Millennium G400 Series takes explosive acceleration two steps further by adding unprecedented image quality, along with the most versatile display options for all your 3D, 2D and DVD applications. Cutting-edge features like *true* **Environment-Mapped Bump Mapping** add incredible visual realism to 3D environments, while its unique **DualHead Display** feature enables a single card to output to two independent displays. Its support for a second display allows for up to eight different configurations using an RGB monitor, TV or Flat Panel display. As the most powerful and innovative tool in your PC's arsenal, the Millennium G400 Series will not only change the way you see graphics, but will revolutionize the way you use your computer.



Millennium G400 MAX
September 1999



Millennium G400 MAX
November 1999



Millennium G400 MAX
December 1999



Millennium G400 MAX
December 1999



Millennium G400
February 2000

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www.matrox.com/mga

DualHead Display Configuration Options

- Two RGB monitors
- RGB monitor + NTSC / PAL TV
- RGB monitor + digital Flat Panel*
- RGB monitor + analog Flat Panel
- Two analog Flat Panels
- Analog Flat Panel + RGB monitor
- Analog Flat Panel + NTSC/PAL TV
- Analog Flat Panel + digital Flat Panel*

List of Games to Support EMBM and DualHead Display

Environment-Mapped Bump Mapping

BattleZone™ 2 from Activision/Pandemic
 Carmageddon TDR 2000™ from Sci/Torus
 Descent™ 3 from Interplay/Outrage
 Descent™ 3: Mercenary from Interplay/Outrage
 Drakan™ from Psygnosis/Surreal
 Dungeon Keeper™ 2 from EA/Bullfrog
 Expendable™ from Rage Software
 Experience™ from The Whole Experience
 Final Countdown™ from Diversal/Sylynium
 Hired Team from New Media Generation
 Ka-52 Team Alligator™ from Kuju/Simis
 LithTech2™ Engine from Monolith
 Planet Heat™ from HumanSoft
 Silent Space from Crytek Studios
 Slave Zero™ from Infogrames/Accolade

Speed Busters™ from Ubi Soft
 Spirit of Speed 1937™ from Hasbro
 Interactive/Broadsword
 Street Luge Racing from Head
 Games/nFusion

EMBM + DualHead Display

Evenstar: Senshi-no Shiken™ from
 DreamStone Entertainment
 Incoming Forces™ from Rage Software
 Kick™ from Acclaim/Kick Engine
 Offroad GT Racing™ from Rage Software
 PowerRender™ 3 from Egerter Software
 Rollcage™ Stage II from Psygnosis
 Silent Hunter™ 2 from SSI/Aeon
 Wild Metal Country™ from Gremlin/DMA

DualHead Display

Baseball 2000 from Microsoft
 Combat Flight Simulator™ from Microsoft
 Extreme Wing Chun VR™ from Zen Tao
 Interactive
 Fire & Darkness™ from Singularity
 Flight Sim™ 2000 from Microsoft
 Flight Sim™ '98 from Microsoft
 Renegade Racers™ from Promethean
 Designs
 Star Trek™: Armada from Activision
 SurRender™ engine from Hybrid
 War Monkeys™ from Silicon Dreams

Product Versions

Retail only	Display Features	Memory	RAMDAC	Part number
Millennium G400 MAX	DualHead	32 MB SGRAM	360 MHz RAMDAC	G4+MMDHA32GR
Millennium G400	DualHead	32 MB SGRAM	300 MHz RAMDAC	G4+MDHA32GR
Millennium G400	DualHead	16 MB SGRAM	300 MHz RAMDAC	G4+MDHA16GR
Bulk only				
Millennium G400 SH	Single display	See our web site for details	See our web site for details	See our web site for details
Millennium G400 DH	DualHead display	See our web site for details	See our web site for details	See our web site for details

Upgrades

	Millennium G400 MAX	Millennium G400 (DualHead)	Millennium G400 (16 MB single display)	Millennium G400 (32 MB single display)
Rainbow Runner G-Series • hardware MJPEG video editing	✓	✓	—	—
Matrox G400 Flat Panel add-on	✓	✓	✓	✓
Matrox G400 DualHead† add-on (for bulk versions only)	Already on board	Already on board	✓	✓

Operating Systems supported

- Windows 98 (full DualHead support)
- Windows NT4, 2000 (limited DualHead resolution/refresh rate support)
- Windows 95, (limited DualHead feature support)

Support for 3D APIs

- Direct3D
- OpenGL (ICD included)

Software bundle

Picture Publisher®

Simply 3D®

PointCast™



MATROX SOFTWARE
DVDPLAYER

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† RGB monitor and TV output for a second display

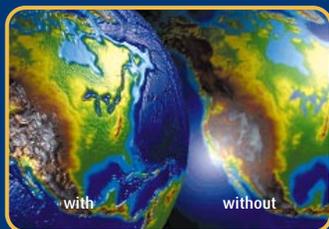
* Requires the Matrox G400 Flat Panel add-on

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\$6E-5129-B
Rev 3 March 16, 2000

The **Millennium G400 Series** pushes graphics acceleration to its limit with the absolute fastest 3D, 2D and digital video performance ever harnessed in a single card. And as the undisputed leader in image enhancement technology, it also delivers astounding new features that will literally change the way you see graphics.



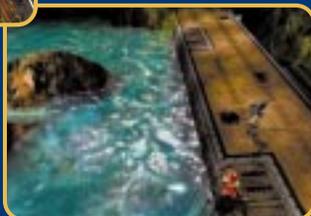
3D Environment-Mapped Bump Mapping



Vibrant Color Quality² (VQ²) Rendering
(G400 TechDemo by Digital Illusions)



3D Environment-Mapped Bump Mapping
(Slave Zero from Accolade)



3D Environment-Mapped Bump Mapping
(Expendable from Rage Software)

Explosive 3D, 2D and DVD acceleration

Matrox G400 256-bit DualBus

The unique 256-bit DualBus of the Matrox G400 combined with a full 128-bit memory bus results in the fastest Windows acceleration ever. For the first time, business desktops run at the same speed at 1600 x 1200, 32bpp as at 640 x 480, 8bpp.*

3D Rendering Array Processor

This new technique from Matrox uses powerful single cycle multi-texturing with a throughput of over 5 million triangles per second and 3D rendering at up to 2048 x 1536 resolution to deliver the world's fastest 3D performance.

Advanced AGP Support

Designed for AGP from the ground up, the Millennium G400 Series delivers lightning fast texturing from AGP memory to support high resolution AGP textures.



Dramatically different high performance graphics

Stunningly realistic image quality

Environment-Mapped Bump Mapping

The Millennium G400 Series is the only hardware to integrate support for DirectX Environment-Mapped Bump Mapping - a dramatically different feature that provides incredible new visual realism for 3D environments.

Vibrant Color Quality² (VQ²)

The new VQ² architecture ensures vibrant color rendering for multi-textured 3D applications by adding extra precise alpha-blending units to a 32-bit rendering pipeline capable of reading, writing and combining 32-bit textures.

UltraSharp DAC

With either a 300 or 360 MHz RAMDAC, the Millennium G400 Series provides high quality analog output signals to ensure saturated colors and rock solid text at resolutions as high as 2048 x 1536, 32bpp@85Hz.

Other cutting-edge 3D features

The Millennium G400 Series supports other 3D features like stencil buffering, trilinear filtering, alpha-blending, anti-aliased vectors, vertex and table fogging, specular highlights, a 32-bit Z-buffer and more.

The tests were performed without independent verification by Ziff-Davis. Ziff-Davis makes no representations or warranties as to the result of the tests. WinBench 99 Business run at 1600 x 1200 True Color with a 75Hz refresh rate. 3D WinBench 2000 run at 1024 x 768 x 32bpp used for TNT2 Ultra tests and was configured with 32MB of SGRAM for the AGP bus and using driver revision 4.12.01.0353. ATI Rage Fury was used for Rage 128 GL tests and was configured with 32MB of SGRAM for the AGP bus and using driver revision 4.11.01.0204. 512B Voodoo3 3500 was used for 3Df/x Voodoo3 3500 tests configured with 16MB of SDRAM for that AGP bus.

DualHead Display and TV output

Changing the way you use computers

The Millennium G400 Series introduces the highly versatile DualHead Display feature. Unique to Matrox, this revolutionary technology allows a single AGP card to support two separate displays, using either an RGB monitor or analog Flat Panel as your primary display and a separate RGB monitor, TV, analog or digital Flat Panel as your secondary display. Unlike traditional multi-monitor solutions that simply allow you to extend your applications across two monitors, DualHead Display offers a variety of new display features and productivity-enhancing software utilities that will revolutionize the way you use your computer. The Millennium G400 Series also allows you to recycle your old monitors and TVs, thereby reducing the total cost of ownership.



DualHead Multi-Display

Allows you to double your Windows desktop for a larger viewing area and a less crowded desktop. You can then extend one application across two monitors or open multiple applications at once.

Imagine the possibilities

- Display a canvas full-screen with tool bars on the secondary display
- Access data from the Internet while creating a PowerPoint® presentation
- Extend Microsoft Project® across two monitors
- Play 3D games across two monitors**



DualHead Zoom

Allows you to select any region on your primary display and have it zoomed so that it appears full-screen on your secondary output. High quality filtering can be disabled for pixel-by-pixel retouching. You can also move the zooming window around in real-time like a magnifying glass.

Imagine the possibilities

- Retouch part of an image with exceptional precision by zooming it to full-screen
- Instantly zoom into thumbnails and small images from the Internet in full-screen on a second display for easy instant viewing
- Adobe Photoshop®, QuarkXPress®, Web surfers and CAD users will benefit immensely



DualHead DVD Max

Similar to a hardware DVD solution, this feature enables DVD and other video streams to be displayed full-screen out to TV, while leaving a fully accessible Windows desktop on your primary display. Also includes hardware subpicture and scaling for maximum image quality.

Imagine the possibilities

- Watch DVD titles full-screen on a TV while monitoring e-mail on your primary display or waiting for a download off the Internet
- View a computer-based training video on a TV while following along on your primary monitor



DualHead TV output

Allows a TV to display surfaces up to 1024 x 768, 32 bpp while the primary display runs at up to 1600 x 1200, 32 bpp @ 85Hz, with both displays being flicker-free. The Millennium G400 is the only multi-monitor solution that allows you to use a TV as a second display for Windows® 98 Multi-Display operation with independent resolutions, color depths and refresh rates.

Imagine the possibilities

- Output corporate presentations to a larger second display
- Display video created in a video-editing application full-screen out to TV



DualHead Clone

DualHead Clone allows the secondary display (monitor, TV, or flat panel) to show a mirrored image of the primary display at independent refresh rates. With a TV, DualHead Clone enables up to 1024 x 768, 32 bpp @ 150 Hz on the primary monitor with simultaneous flicker-free output to TV. Other TV output solutions lock the refresh rate of the primary monitor to that of the TV†.

Imagine the possibilities

- Play a 3D game on a big screen TV
- Clone your desktop and applications for easy viewing by multiple viewers