Heavy Metal™

Interactive Computing Systems for Visual Simulation and Training Applications

Image courtesy Carmel Applied Technologies, Inc.

The Standard in PC-Based Visual Computing Systems

Integrators and developers worldwide employ Quantum3D™'s open architecture Heavy Metal systems for deploying commercial and military visual simulation and training applications. Heavy Metal combines Quantum3D's value-added graphics subsystems with the most advanced PC components to provide the industry's leading high-performance, low-cost integrated solution spanning land, sea, and air applications. Quantum3D's realtime 3D graphics subsystems deliver the scalability, performance, and advanced features of traditional image generators at a fraction of the price.

Key Features

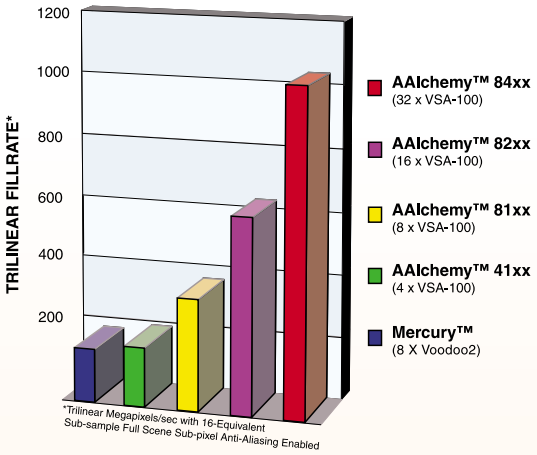
- Mission-critical features
  - Full-scene, sub-pixel hardware anti-aliasing
  - Precision multi-channel synchronization
- Ruggedized enclosures
- High-performance, low-cost, industry-specific focus delivers unparalleled value
- System and graphics subsystem scalability enables integrators to tailor Heavy Metal to meet exact application needs
- Open architecture
  - Compatible with leading realtime 3D scene managers, graphics APIs, database file formats, and operating systems
  - Protects customer investment in application software
- Built-in upgradability ensures easy migration to next generation technology

QUANTUM3D™

Heavy Metal™

Scalable Systems and 3D Graphics Subsystems

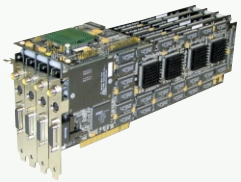
Heavy Metal is available in two scalable base system configurations, Heavy Metal BX and Heavy Metal GX+. Each system includes industry-specific features that make them ideal for a wide range of applications.



Unparalleled Value

Heavy Metal systems, equipped with value-added graphics subsystems and industry-specific features, deliver mission-critical performance at a fraction of the price of traditional cost-prohibitive image generation systems.

SYSTEM VERSION



Heavy Metal BX

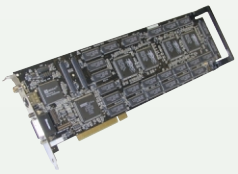
- Deployment of high-performance, low-cost, non-anti-aliased single or multi-channel applications
- Ideal as a development platform
- PC-IG master in rack configurations with either Heavy Metal BX or GX+
- Intel® BX motherboard for low-cost, single or dual Pentium® III CPUs

Heavy Metal GX+

- Deployment of high-performance single or multi-channel applications
- Ideal for applications requiring full-scene, sub-pixel anti-aliasing
- Intel GX+ motherboard, dual Pentium III processors, and dual independent PCI busses

Heavy Metal 3D Graphics Subsystems

Heavy Metal can be configured with a scalable range of Quantum3D and OEM graphics subsystems, enabling developers and integrators to tailor Heavy Metal systems and subsystems specifically to meet their application requirements.



High Performance Graphics Options Without Full-Scene Anti-Aliasing	Advanced Graphics Options With Full-Scene Sub-Pixel Anti-Aliasing
Quantum3D Obsidian® • Supports SyncLock™ and SwapLock™ for precision multi-channel synchronization • Quantum3D single board SLI Voodoo™ architecture • 180 megapixels per second trilinear MIP mapping fill rate performance Quantum3D Ventana™ • 2D/3D graphics • Voodoo3 based PCI, 16 mb SGRAM • 166 MHz and 183 MHz options OEM 3dfx® Voodoo3® and nVidia® • 2D/3D graphics • PCI and AGP	Quantum3D Mercury™ • Based on 3dfx Voodoo2 • 180 megapixels per second trilinear MIP mapping fill rate performance • Supports SyncLock and SwapLock for precision multi-channel synchronization Quantum3D AAlchemy™ • 1-32 3dfx VSA-100™ graphics chips • 140 megapixels per second to more than one gigapixel per second per channel • High resolution texture mapping up to 2048 x 2048 texels per texture map • Peak texture download rates of up to 528 megatexels per second • 32-bpp color • Supports SyncLock and SwapLock for

Open Architecture

Heavy Metal and its subsystems protects your investment in both hardware and software by providing a range of configurations compatible with leading realtime 3D scene managers, 3D graphics APIs, database file formats, and operating systems.

RT3D Scene Managers	3D Graphics APIs	RT3D File Formats	Operating Systems
CATI X-IG™ CG2 Vtree™ EAI Sense8® WorldToolKit® MultiGen-Paradigm Vega™ (NT) Quantum3D OpenGVS™ ReaLimation Ltd. RealiMation™ Reality2 Tiepolo™ Soft Reality SoftVR™ TTS SPACE Magic™	3dfx Glide® Microsoft™ Direct3D® OpenGL® Quantum3D SimGL™	Kinetix 3D Studio™ MultiGen-Paradigm OpenFlight® TERREX Terra Page™	Microsoft Windows® 98 Microsoft Windows NT® Microsoft Windows 2000® Red Hat® Linux®

Easy Migration to Next Generation Technology

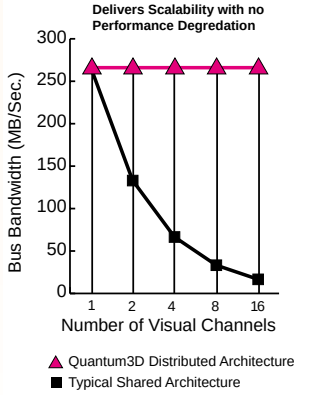
Heavy Metal's inherent upgradability ensures that throughout project life cycles integrators can easily scale or upgrade system software, visual channels, graphics subsystems, processors, memory, and other components as needed.

- Ensures path for Pre-Planned Product Improvement (P^3I)
- Enables performance and image quality improvements without changing application or database software

Distributed Architecture for Scalable, Precision Multi-channel Performance

Heavy Metal systems may be configured for multi-channel deployment using shared or distributed architecture. Quantum3D's value-added, advanced realtime 3D graphics subsystems support patent-pending SyncLock and SwapLock technologies for precision, pixel-level synchronization for multi-channel applications. Heavy Metal's distributed architecture dedicates all the resources of a powerful, multi-processor capable PC (including CPUs, memory, I/O buses, and graphics subsystems) to each visual channel.

- Integrators can seamlessly scale single-channel systems to multi-channel systems with no performance degradation
- SwapLock and SyncLock synchronize buffer-swaps and vertical retrace signals of inter-connected visual channels, eliminating inter-channel visual anomalies
- AAlchemy supports edge blending and distortion correction for advanced multi-channel applications



Quantum3D: Pioneering PC-Based Technology

Quantum3D, Inc., is the leader in interactive 3D PC-based visual computing systems. With decades of experience in graphics systems and subsystems design and engineering, we focus on visual simulation requirements to craft open architecture, scalable visual computing system products tailored for the market and for configuration management. Our manufacturing uses ISO 9002 certified partners to deliver the highest quality product - on time.

Heavy Metal Specifications	HEAVY METAL BASE SYSTEM
Industrial Chassis	• 18 Gauge Steel 4U industrial rack mount chassis • Shock mounted drive bay; retention mechanism for CPUs and add-in boards • Rack mount ears standard; optional slides or deskside mounting kits available • 6.81 ins H x 21.50 ins D x 16.88 ins W (17.3 cm H x 54.61 cm D x 42.88 cm W)
Forced Air Cooling	• Dual 120mm, 150 CFM Bezel Fans with removable filter • Integral ball bearing power supply, CPU and graphics subsystem fans
Power Supplies **(For Nominal & Max Input Power—See Heavy Metal Product Profiles)**	• 400W, 750W or 950W 120/240 VAC 1 phase 50-60 Hz auto-sensing input (Standard; AAlchemy 4xxx or 81xx; AAlchemy 82xx) • 1.2kW 208-240VAC 3 phase 50-60 Hz auto-sensing input (AAlchemy 84xx) • 24V-48V DC power options available
Motherboard Options	• BX: Intel Seattle II, BX+: SuperMicro P6 or GX+: Intel GX+
CD & DVD-ROM	• 32X ATAPI EIDE CD-ROM; 8x/24x EIDE DVD-ROM
Floppy Drive	• 3.5" 1.44 MB Floppy (Black Bezel)
Operating Specifications	• Operating shock: 2G (2ms @ 1/2 sine wave) • Operating vibration: 0.25G (3.5-500 Hz sine sweep, 0 to peak) • Operating temperature: +0º C-+50º C with relative humidity 10-90%; non-condensing
System MTBF	• 25,000 hours per system (calculated)
Warranty	• One year return-to-factory (parts and labor); express option available
Safety and EMI	• FCC A, CE, and ETL certified

Components	HEAVY METAL BX	HEAVY METAL™ GX+
Peak Realtime 3D Graphics I/F Bandwidth	• 133 MB/sec (1 x 33 MHz, 32-bit PCI) • 266 MB/sec (AGP 2x)	• 399 MB/sec (1 x 33 MHz, 32-bit PCI; 1 x 66 MHz, 32-bit PCI)
RT3D Graphics Subsystem Options **(See graphics subsystem specs for details)**	• 1 – 2 x Ventana3 • 1 – 2 x Obsidian2 200SBi-8440 (3D Only)	• 1 – 2 x Ventana3 • 1 – 2 x Obsidian2 200SBi-8440 (3D Only) • Mercury • AAlchemy 4xxx and 8xxx
2D/VGA Options	• Ventana3 2D/3D PCI • 3dfx Voodoo3, Voodoo4, Voodoo5 AGP (OEM) • nVidia TNT2 32 MB AGP or GeForce™ 32/64 MB AGP (OEM) • Other products available by OEM request	• Integrated Cirrus Logic 2D/VGA with 4 MB SDRAM • Ventana3 2D/3D PCI
System Memory (ECC PC-100 DIM SDRAM)	• 128 MB - 512 MB	• 256 MB - 1 GB
Intel Pentium-III Slot-1 Processor(s)	• 1 - 2 x 500+ MHz	• 2 x 550+ MHz
Inter-channel Synchronization	• SwapLock and SyncLock via custom cable assembly available with select graphics systems.	
Standard Disk Drive Options	• 1-2 x 13 GB or 20 GB UDMA-33/EIDE	• 1-2 8.4 GB or 18 GB Ultra Wide SCSI-II
	(One may be packaged in removeable drive carrier; other drives may be available upon OEM request)	
LAN & WAN Options	• Ethernet: 1 or 2 x Add-in PCI NIC 10/100 • USB V.90 Modem	• Ethernet: Integrated PCI 10/100 NIC Standard • Optional 2nd Ethernet NIC via Add-in PCI 10/100 • USB V.90 Modem
Operating Systems	• Windows 98 (Single Processor Only) • Windows NT 4.0 SP6, Windows 2000 • Linux	• Windows NT 4.0 SP6 • Windows 2000 (1H2000) • Linux
Special I/O Controllers	• Quantum3D GCI • Quantum3D Q-Force™ Force Feedback Controller	
Audio Options	• Aureal Semi-conductor Vortex PCI • Creative Labs 64-PCI • Quantum3D 20W or 80W AudioAMP™	
Rack and Connectivity Kit Options	• 10U, 20U, 30U or 40U RETMA rack or 20U transit case with shipping crate • 8-Port Garrett 10/100 Ethernet Hub w/CAT-5 Cable Kit for Frame Sync • 4/8/16-Port Raritan K/V/M Switch & Cable Kit • PS/2 keyboard and 2-button mouse; 3-button mouse available • International Power Distribution Bar with power cable (NAFTA std.)	

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