Datasheet

Silicon Graphics® O2®

Visual Workstation

The Silicon Graphics O2 visual workstation uniquely integrates high-quality graphics performance and powerful image processing with built-in video in an affordable entry-level UNIX® system.

Features	Benefits
MIPS R12000™ 300 MHz processor, 1MB L2 cache QED RM5200™ 300 MHz processor, 1MB L2 cache	Provides users the power of RISC processing with price/performance choices to suit their needs
Standard 32-bit double-buffered graphics, native OpenGL® graphics subsystem with hardware support for advanced features and image processing extensions	Gives users industry-leading 3D performance and quality; accelerated texture mapping, Z buffering, anti-aliased points and lines, stencil, fog, and color space conversions
Unified Memory Architecture	High-speed processing, even with very large data sets; simultaneous data flows from the system resources (CPU, graphics, video, imaging, compression, and I/O) have equal access to the 2.1GB-per-second unified main memory subsystem
Supports up to 1GB SDRAM	Interactivity with very large data sets, support for over 900MB resident texture memory from available system memory
Dual Ultra Fast/Wide SCSI implementation, 64-bit PCI expansion bus, and other I/O options	Provides outstanding expandability and flexibility
Built-in digital media capabilities	Users in any market can creatively combine video, audio, 3D graphics, and images
Binary compatibility with SGI IRIX® products	A low-cost development or client seat for other SGI products, including the Silicon Graphics® Octane2™ visual workstation and the Silicon Graphics® Onyx2® graphics supercomputer
Advanced digital video options	Provide a range of professional-quality digital video capabilities
Supports the Silicon Graphics® 1600SW flat panel display option	Provides high resolution (1600x1024 @ 60 Hz) for fully digital display of up to two full pages of information; facilitates professional-quality image editing
O2 Dual Display Option	Offers cost-effective dual-monitor capabilities
Rack-mountable configurations	Power and throughput for rendering, Web serving, and imaging for customers who require high-density installations

Advanced Capabilities Made Affordable

Based on an innovative Unified Memory Architecture (UMA), O2 enables stunning 3D graphics, powerful image processing, and real-time video processing far beyond that of any other machine available in its class. These features make O2 the ideal platform for scientific visualization, 2D and 3D animation, broadcasting, simulation, defense, and medical imaging.

Integrated, Industry-Leading Feature Set Designed for Customer Value

The Silicon Graphics O2 visual workstation is designed for creative and technical professionals who need maximum flexibility and productivity. O2 is the only UNIX workstation to integrate video, audio, and real-time compression technologies as fundamental components of its architecture.

High-Performance Unified Memory Architecture

All O2 data resides in main memory, where every computing engine has direct, fast access to it. There are no dedicated pools of proprietary memory; system memory, frame buffer, Z buffer, texture memory, rendering memory, image memory, and video memory are all the same. This means that graphics and imaging data can be more flexibly manipulated and shared and application performance can be optimized. Unlike traditional (e.g., PCI or AGP) workstation architectures that require data to be transferred across narrow buses and between separate boards, the O2 design accommodates simultaneous flows of data in and out of the system for high-speed processing. Higher-quality products can be generated on the O2 system by creatively combining graphics, images, and video data.

High-Bandwidth I/O

The O2 I/O engine maximizes performance by removing the bandwidth bottlenecks that would otherwise starve even the fastest system components. O2 systems deliver peak performance on 10Base-T/100Base-TX Ethernet networks. O2 also features a dual Ultra Fast/Wide SCSI implementation, a 64-bit PCI expansion bus, and several other standard I/O options.

Leading Processing Power

The O2 visual workstation is powered by either a MIPS R12000 or a QED RM5200 processor. The MIPS processor is the advanced processor used in other SGI IRIX OS-based workstations and servers, delivering the highest level of performance available on the O2 platform. The RM5200 processor offers users a price/performance option for less compute-intensive applications. With every configuration, the unique O2 UMA means that O2 users can enjoy a graphics performance boost with a simple processor upgrade.

A Flexible, Modular Design

The O2 system has a five-piece modular design to simplify upgrades and maintenance. Disk drives, the system module, and PCI cards can be easily accessed from the rear of the system. This simplicity is also reflected in the O2 system administration tools, which guide users through simple maintenance and configuration functions. Further servicing is available through a series of warranty options and online support systems.

All the Graphics and Image Processing You Need, Right Out of the Box

Built upon a native OpenGL graphics subsystem and Unified Memory Architecture, the O2 system provides standard 32-bit double-buffered graphics with advanced features accelerated in hardware. Accelerated features include texture mapping, Z buffer, and anti-aliased points and lines as well as stencil, fog, and color space conversion. These image-processing extensions allow users to manipulate large, high-resolution image data sets in real time—making it as easy to manipulate a 200MB image as a 2MB image.

The Unified Memory Architecture enables access to nearly unlimited texture capacity. Unlike traditional graphics boards that set a limit on texture memory, the flexible UMA allows users to scale the amount of memory that can be allocated for textures.

Visual Simulation

The O2 Unified Memory Architecture enables access to nearly unlimited texture capacity. This feature, combined with its affordability, makes O2 the ideal modeling station for real-time visual simulation applications.

Scientific Imaging

With high-performance texturing, volume visualization capabilities, and high bandwidth for large data set manipulation, O2 is the platform of choice for scientific imaging professionals.

Entertainment

In the entertainment industry, creative professionals can take advantage of the O2 workstation's support for compressed or uncompressed video, excellent compositing performance, and the ability to create high-quality fully textured 3D models.

Defense

The ability of O2 to handle large, complex data sets allows users to easily manipulate images in real time while maintaining high-quality resolutions. Its form factor and modular design make O2 easy to deploy in the field. Ruggedized O2 systems are available through third-party vendors.

A Native Digital Media Workstation

The O2 visual workstation is truly a native digital media machine—it integrates video, audio, and real-time compression technologies as fundamental components of its architecture. The flexible O2 architecture allows digital media to be brought directly into memory as a standard data type. Once there, the graphics, image-processing, and compute engines can access and manipulate the data in real time.

Flexible Video Processing

With every engine able to access all data residing in main memory, the O2 system delivers video manipulation capabilities never before available in this class. Applications can decode a compressed video source and use it as a texture map or utilize the image-processing hardware to blur or distort a live video stream in real time. Users view video in its native format due to the O2 visual workstation's ability to display nonsquare video pixels.

Professional Video Capabilities and Tools

O2 delivers real-time JPEG compression and decompression hardware in every system. Supporting compression ratios of up to 4:1, the O2 system delivers a level of quality that meets the needs of the video post-production market. Each O2 system provides the option for two channels of simultaneous input and one channel of output for serial digital or analog video. The bundled digital media tools give any user the ability to easily develop compelling digital media content that incorporates video, audio, and 3D graphics. Independent audio can be synchronized to video data.

Cross-Format Video Output

In addition to real-time capabilities, O2 systems implement a wide range of video compression algorithms through software, including industry standards such as QuickTime™, AVI, and Cinepak. These built-in capabilities allow users to create and edit video on the O2 system and then distribute video via the Web to any computer for playback.

Capturing the Screen Display as Video

The O2 system turns your application into a video source by allowing any portion of the screen to be recorded directly to disk in real time. You can also directly output the screen recording to an external video device via the optional composite video, S-Video, or serial digital interfaces. With the O2 Digital Video Option, the workstation supports one input and two output streams of uncompressed 8- or 10-bit CCIR 601/SMPTE 259M serial digital video. Silicon Graphics DVLink provides a complete IEEE-1394 digital video solution.

Industry-Leading Solutions

The complete, easy-to-use O2 desktop environment helps users accelerate workflow and enhance productivity. SGI's expertise in graphics and system architectures—combined with a flexible, high-performance operating system, high-bandwidth I/O, and support for the most strategic and demanding applications—makes the O2 system the ideal solution in industries for which reliability, scalability, and serviceability are key requirements.

Silicon Graphics O2
Technical Specifications

Base System Features

Processor Support
- 1 MIPS R12000 300 MHz processor, 1MB L2 cache
- 1 QED RM5200 300 MHz processor, 1MB L2 cache

Memory Capacity
- 256MB–1GB synchronous DRAM (SDRAM) for R12000 based systems
- 128MB–1GB synchronous DRAM (SDRAM) for RM5200 based systems

Display Resolutions (with Double-Buffered 32-Bit Color)
- 1280x1024 at 75 Hz
- 1600x1024 at 60 Hz (optional Silicon Graphics 1600SW flat panel display)

Visual Formats
- 8-bit + 8-bit double-buffered
- 16-bit + 16-bit double-buffered
- 32-bit + 32-bit double-buffered

Graphics Features
Texture mapping in hardware, native OpenGL graphics subsystem, hardware Z buffer, triangle rasterization in hardware, hardware image-mapping support, hardware stencil planes, hardware anti-aliasing, source plus destination alpha in hardware, fast Xline performance

Storage and I/O
- Internal single-ended SCSI controller
- External single-ended SCSI controller
- 2 internal 3.5" storage bays (RM5200)
- 1 internal 3.5" storage bay (R12000)

Communication
- Single 10Base-T/100Base-TX port
- Single 100Base-TX port
- Dual serial RS422/RS423
- DB-9 ports
- Single IEEE-1284C parallel port
- Two audio I/O ports

Display Options

Monitors
- 19" color monitor (standard)
- 21" color monitor
- 17.3" Silicon Graphics 1600SW flat panel display
- O2 Dual Display option

Digital Media Features

Analog Audio (Standard)
- Mono-microphone, one 16-bit stereo input channel and one 16-bit stereo output channel, stereo headphone output, stereo external speaker system output

Video Compression (Standard)
- Variable-rate single-stream real-time motion-JPEG encode/decode, software-based MPEG-1, Cinepak encode/decode, and full QuickTime support
- 8 channels 24-bit ADAT optical I/O
- 2 channels 24-bit AES-3id I/O
- AES11 synchronization

Video I/O
- S-Video, composite, Silicon Graphics digital video input and output for NTSC and PAL standards; real-time graphics to video output (includes standard audio features)

Digital Video I/O
- Two 8- or 10-bit CCIR 601/SMPTE 259M serial digital video inputs or outputs for NTSC and PAL (includes standard audio features), real-time graphics to video output

Silicon Graphics DVLink, IEEE-1394
- IEEE-1394 PCI card, cable and bundled software (requires IRIX 6.5.2 or greater)

Expansion Options
- PCI
- Single-port Ultra SCSI
- Single-attached FDDI
- Dual-attached FDDI
- Digital audio

Networking
- Second 100Base-TX Ethernet
- ISDN basic rate interface
- ATM adapter OC3 (155Mb/sec), 1 PCI port
- Fibre Channel adapter

Storage Options

Internal
- 9GB Ultra Fast/Wide drive (standard)
- 18GB Ultra Fast/Wide drive
- 40X CD-ROM (standard)

External
- 9GB Ultra Fast/Wide drive
- 18GB Ultra Fast/Wide drive
- 3.5" floppy drive
- 12GB 4 mm DAT drive
- Digital linear tape

Bundled Software

Collaboration
- Outbox
- InPerson®
- IRIS Annotator™
- IRIS Showcase™
- Netscape Communicator® 4.05
- Cosmo Player
- Cosmo Create
- Netscape® FastTrack Server
- Adobe® Acrobat Reader®
- InfoSearch
- SGI™ Meeting
- Teleffect

Connectivity
- NFS™
- ISDN/PPP support
- Novell NetWare™ Client
- Xinet AppleTalk®
- Samba

Digital Media
- SoundEditor
- MovieMaker
- ImageWorks
- SoundTrack
- FX Builder
- MediaRecorder
- MediaPlayer
- CD/DAT player
- Audio panel
- Video panel
- Synth panel
- Media convert

Run-Time Libraries
- OpenGL
- OpenGL image extensions

Physical Environment

System Dimensions
- 9" W x 12" H x 10.5" D
- 22 lb
- 19" monitor: 18.42" H x 18.03" W x 18.85" D

Skinless Rack-Mountable System Dimensions
- 7.75" W x 10.5" H x 9.0" D
- 17 lb
- 175 W power supply

Voltage and Frequency
- 00-132/200-264 VAC

Heat Dissipation
- <900 BTU/hour
- +10°C to +35°C (operating)
- -40°C to +65°C (nonoperating)

Relative Humidity
- 10% to 80% operating, no condensation
- 5% to 95% nonoperating, no condensation

Altitude
- 10,000 ft operating
- 40,000 ft nonoperating

Vibration
- 0.1" displacement with all axes
- 0.25G, 5-380-5 Hz (operating)
- 0.5G, 5-380-5 Hz (nonoperating)

Regulatory Agency
- Canada DOC Class A
- CISPR22: 1993/EN 55022: 1988 Class A
- EN 50082-1:1992
- EN 61000-4-2:1995/IEC 1000-4-2:1995 ESD
- IEC 1000-4-3:1995 Radiated RF
- EN 61000-4-4:1995/IEC 1000-4-4:1995 EFT

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