



Datasheet

Silicon Graphics® O2+™

Advanced Digital Media Capabilities in a Value-Rich UNIX® Desktop Visual Workstation

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



Features

MIPS® R12000A™ 400 MHz processor, 2MB L2 cache or PMC-Sierra™ RM5200™ 300 MHz processor, 1MB L2 cache

Standard 32-bit double-buffered graphics, native OpenGL® graphics subsystem with hardware support for texture mapping, Z buffering, anti-aliased points and lines, stencil, fog, and colorspace conversions

Unified Memory Architecture (UMA)

Supports up to 1GB SDRAM

Dual Ultra Fast/Wide SCSI implementation, 64-bit PCI expansion bus, and other I/O options

Built-in digital media capabilities

Binary compatibility with SGI® IRIX® products

Advanced digital video options

O2+ Dual Display option

Rack-mountable configurations

Benefits

High-performance RISC processing and a price/performance choice to suit your needs

Industry-leading 3D performance and quality

High-speed processing, even with very large data sets; the UMA design accommodates simultaneous data flows from the system resources (CPU, graphics, video, imaging, compression, and I/O); each computing resource has equal access to the 2.1GB-per-second unified main memory subsystem

Interactivity with very large data sets and support for over 900MB resident texture memory from available system memory

Outstanding expandability and flexibility

The ability to easily enhance designs with digital media content and to create Web pages that incorporate video, audio, and 3D graphics

A low-cost development or client seat for other SGI® products

A range of professional-quality digital video capabilities

Cost-effective dual-monitor capabilities

Power and throughput for rendering, Web serving, and imaging

Advanced Capabilities Made Affordable

Based on the innovative Unified Memory Architecture SGI introduced with the original Silicon Graphics® O2® visual workstation, the new O2+ platform enables stunning 3D graphics, powerful image processing, and real-time video processing far beyond any other machine available in its class. These features make the new O2+ visual workstation the ideal platform for scientific visualization, 2D and 3D animation, broadcasting, simulation, defense, and medical imaging.

Integrated, Industry-Leading Feature Set Delivers Customer Value

The Silicon Graphics O2+ visual workstation is designed for creative and technical professionals who need maximum flexibility and productivity. The O2+ architecture integrates video, audio, and real-time compression technologies. This integration of digital media tools throughout the O2+ user environment changes the way users interact with their computers and with each other.

High-Performance Unified Memory Architecture

O2+ data resides in main memory, where each computing engine has direct, fast access to it. System memory, frame buffer, Z buffer, texture memory, rendering memory, image memory, and video memory are all the same. Unlike dedicated pools of proprietary memory, graphics and imaging data is flexibly manipulated and shared and application performance is 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 data flow in and out of the system for high-speed processing.

High-Bandwidth I/O

The O2+ I/O engine maximizes performance by removing bandwidth bottlenecks. O2+ systems deliver peak performance on 10Base-T/100Base-TX Ethernet networks, 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 the MIPS R12000A or the PMC-Sierra RM5200 processor. The advanced R12000A processor delivers the highest level of performance available on the O2+ platform. The RM5200 processor is a cost-effective option for less compute-intensive applications. The unique Unified Memory Architecture maximizes the return on your O2+ purchase. A processor upgrade also provides a graphics performance increase.

Flexible, Modular Design

The O2+ system has a five-piece modular design that simplifies upgrades and maintenance. Disk drives, the system module, and PCI cards can be easily accessed from the rear of the system. O2+ system administration tools easily guide users through maintenance and configuration functions. Additional service is available through a series of warranty options and online support systems.

Graphics and Image-Processing Performance

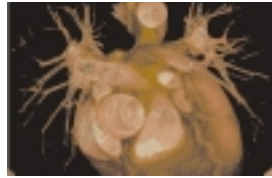
The O2+ system is built upon a native OpenGL graphics subsystem and the Unified Memory Architecture. O2+ provides standard 32-bit double-buffered graphics and advanced hardware-accelerated features, including texture mapping, Z buffer, and anti-aliased points and lines as well as stencil, fog, and colorspace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

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



Visual Simulation

The O2+ Unified Memory Architecture offers access to nearly unlimited texture capacity. Combined with its affordability, O2+ is the ideal modeling station for real-time visual simulation applications.



Scientific Imaging

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



Entertainment

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



Defense

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

Native Digital Media Integration

The O2+ visual workstation is a native digital media system—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. The graphics, image-processing, and compute engines can then 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 unrivaled in this system 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 can view video in its native format by utilizing the O2+ visual workstation's capability for displaying nonsquare video pixels.

Professional Video Capabilities and Tools

O2+ delivers real-time JPEG compression and decompression hardware. Supporting compression ratios of up to 4:1, the O2+ system delivers the quality needed for video post-production. The O2+ system optionally provides two channels of simultaneous input and one channel of output for serial digital and analog video. Bundled digital media tools enable any user to easily develop compelling digital media content that incorporates video, audio, and 3D graphics. Additionally, independent audio can be synchronized to video data.

Cross-Format Video Output

In addition to their 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.

Screen Display Capture 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, O2+ supports one input and two output streams of uncompressed 8- or 10-bit CCIR 601/SMPTE 259M serial digital video. The optional Silicon Graphics® DVLink provides a complete IEEE-1394 digital video solution.

Industry-Leading Solutions

The complete, easy-to-use O2+ desktop environment accelerates workflow and enhances user productivity. Advanced SGI 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 make the O2+ system the ideal solution for industries where reliability, scalability, and serviceability are key requirements.

Silicon Graphics O2+ Technical Specifications



Base System Features

Processor Support

- 1 MIPS R12000A 400 MHz processor, 2MB L2 cache
- PMC-Sierra RM5200 300 MHz processor, 1MB L2 cache

Memory Capacity

- 512MB–1GB synchronous DRAM [SDRAM] for R12000A processor-based systems
- 256MB–1GB synchronous DRAM [SDRAM] for RM5200 processor-based systems

System Graphics

Maximum Resolution [with Double-Buffered 32-Bit Color]

- 1280x1024 at 75 Hz
- 1600x1024 at 60 Hz¹

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, and 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 [R12000A]

Communication

- Single 10Base-T/100Base-TX port
- Single 100Base-TX port
- Dual serial RS232 DB-9 ports
- Single IEEE-1284C parallel port
- Two audio I/O ports

Display Options

- 19" color monitor [standard]
- 21" color monitor [optional]
- 18" Silicon Graphics® F180 flat panel display [optional]
- 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-I, Cinepak encode/decode, and full QuickTime support

Video I/O [Optional]

- S-video, composite, Silicon Graphics digital video input and output or NTSC and PAL standards; real-time graphics-to-video output [includes standard audio features]

Digital Video I/O [Optional]

- 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 [Optional]

- IEEE-1394 PCI card, cable, and bundled software [requires IRIX 6.5.2 or greater]

Digital Audio [Optional]

- 8 channels 24-bit ADAT optical I/O • AESII synchronization
- 2 channels 24-bit AES-3id I/O

Expansion Options

- PCI, single-port Ultra SCSI, single-attached FDDI, dual-attached FDDI, digital audio

Networking

- Second 100Base-TX Ethernet
- ATM adapter OC3 [155Mb/sec], 1 PCI port

Storage Options

- | | |
|---|---|
| Internal | External |
| • 18GB Ultra Fast/Wide drive | • 18GB Ultra Fast/Wide drive [optional] |
| • 36GB Ultra Fast/Wide drive [optional] | • 20GB 4 mm DDS4 DAT drive |
| • 40X CD-ROM | • 120MB external SCSI floppy drive |
| | • ATM adapter OC3 [155Mb/sec], 1 PCI port |

Software System

- IRIX 6.5 Advanced Workstation Environment
- X/OPEN XPG4 Base 95, IEEE POSIX 1003.2 and 1003.1b, 1003.1c, FIPS 151-2
- UNIX SVR4, BSD 4.3 extensions, SVID3
- X11 R6, Motif window manager 1.2
- MIPS ABI
- REACT™ real-time extensions

Graphics

- OpenGL, OpenGL Performer™, OpenGL Volumizer™, OpenGL Optimizer™, OpenGL Vizserver™, ImageVision Library®, Open Inventor™

System and Network Management

- SGIconsole™, Embedded Support Partner [ESP], FailSafe™ high-availability solution, Performance Co-Pilot™, Platform Computing Load Sharing Facility [LSF] Suite, TCP/IP, RSVP, DHCP, NetVisualizer™, SNMP management, SNMP MIB, NIS/ONC+

Filesystem and Data Management

- XFS™ 64-bit journaled filesystem with guaranteed rate I/O, Clustered XFS [CXFS™], ISO 9660 [CDFFS], NFS V3, Samba

Desktop Environments

- IRIX Interactive Environment with Personal System Administration for ease of use without system administrator assistance; Common Desktop Environment; GNOME [freeware]; KDE [freeware]

Development Tools

- MIPSpro™ C, C++, Fortran 77/90 compilers, Ada95, ProDev™ Workshop debugger with SpeedShop performance analysis tool, Power Fortran, APO [Automatic Parallelization Option], SCSL libraries and Message Passing Toolkit for MPI, PVM and SHMEM programming

Interoperability

- NFS V3, Samba [freeware]

Collaboration Software

- OpenGL Vizserver [client only], Adobe® Acrobat Reader®, Netscape Communicator®, SGImeeting™, SGI® Web Server based on Apache, Telefect

Utility Software

- InfoSearch for online documentation, RoboInst for streamlined software and update installation across a network of SGI systems, Impressario printing software

Security

- Trusted IRIX™ BI security

Support Services

Embedded Support Partner [ESP]

- 7x24 system monitoring, flexible real-time notification, and proactive system management for increased system availability

SGI Supportfolio™

- Instant Web access to customer support information

SGI Knowledgebase

- Online access to thousands of proven support solutions

Hardware and Software Support

- Mission Critical, FullExpress™, FullCare™, HardwareCare, SoftwareCare

Digital Media

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

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
- 170 W power supply

Voltage and Frequency

- 100–132/200–264 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

¹O2+ offers backward compatibility with the 17.3" Silicon Graphics® 1600SW flat panel display, which supports 1600x1024 at 60 Hz resolution.



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