Indigo² IMPACT™ 10000

Unmatched Realism and Interactivity for the Desktop

The Silicon Graphics® Indigo² IMPACT 10000 workstation family marks the convergence of three powerful industry-transforming technologies that revolutionize desktop visual computing. No other desktop system fuses the fastest RISC micro-processors with the most interactive and realistic graphics in a true 64-bit software environment for unrivaled performance.

Breakthrough Graphics for Realism and Interactivity

The Indigo² IMPACT 10000 family sets a new standard for desktop visualization. Designed for 3D solid modeling applications, Indigo² Solid IMPACT™ delivers the fastest 3D geometry performance in its price class. Indigo² High IMPACT™ provides real-time image processing and photo-realistic 3D graphics for a broad range of applications, including 3D animation, game authoring, and scientific visualization. The flagship of the workstation family, Indigo² Maximum IMPACT™, brings new applications to the desktop, including digital prototyping, visual simulation, and broadcast graphics for the highest-performance textured 3D graphics and imaging capabilities currently available.

R10000™—The New Computational Leader

The Indigo² IMPACT 10000 workstation features the new 64-bit MIPS® R10000 processor. With out-of-order execution, large flexible caches, and a superscalar design, R10000 brings top performance to applications, delivering two- to three-times the performance of previous processors. R10000 offers a combination of leading integer performance and supercomputer-class floating-point capabilities, enabling the integration of new applications to the desktop.

Making the Connections

With an assortment of industry-standard networking and I/O capabilities, Indigo² IMPACT 10000 is a flexible, expandable member of your computing environment. Its built-in functionality includes AUI and 10Base-T Ethernet™, two serial ports, a parallel port, and five audio connections. Peripheral configuration is facilitated by two independent Fast/Wide SCSI-2 controllers.

Robust Digital Media

To satisfy the demanding requirements of post-production and broadcast professionals, Indigo² IMPACT Video delivers the first 10-bit all-digital option board. With multiple channels of input and output, industry-standard video formats, and real-time video processing, Indigo² IMPACT is transformed into a digital video workstation. Combined with the Indigo² IMPACT Compression card, Indigo² IMPACT Video allows for the capture of two streams of video and JPEG compression with ratios as low as 2:1 for the highest-quality video images available on the desktop today.

Powerful Display Options

The Indigo² IMPACT Channel Option (ICO) gives you multiple video output channels and head-mounted display (HMD) formats for applications involving visual simulation, entertainment, and virtual reality. For applications that require additional screen space, the Indigo² IMPACT 10000 workstation supports a dual-head option. For programming flexibility, dual-head configurations support independent windows on each head for advanced data modeling and analysis applications.

Indigo^2 IMPACT 10000

Technical Specifications

SYSTEM

	R4400®	R10000	R10000
CPU/FPU			
MHz	250MHz	175MHz	195MHz
Primary cache (I/D)	16K/16K	32K/32K	32K/32K
Secondary cache	2MB	1MB	1MB
Memory storage	32MB to 384MB (R4400)		
	32MB to 640MB (R10000)		

I/O		
	2	3 1/2" bays
	1	5 1/4" half-height bay
	2	Serial RS422 (38.4k baud)
	1	Bidirectional parallel
	5	Audio I/O connectors
	1	Ethernet (AUI or 10Base-T)
	2	GIO-64 slots
	3	EISA slots
	(shared with graphics)	
SCSI	2	SCSI-2 channels

GRAPHICS

Advanced features	Alpha blending, accumulation buffer, anti-aliased RGB lines and points, texture mapping, fog, lighting features (spot lighting, eight light sources, two-sided lighting, ambient, diffused, and specular) arbitrary clipping planes, depth cueing, soft shadow and depth of field, sub-pixel positioning, stenciling, stereo graphics, pan and zoom, X11 pixel operations
Color maps	1 (4,096 colors each) IRIS GL™/OpenGL®RGBA quad buffer (stereo)
Display modes	RGBA double buffer RGBA single buffer Color index double buffer Color index single buffer Color index overlay

AUDIO/VIDEO

Input	Mono/stereo microphone (mono electret condenser microphone ships standard) Line-level stereo analog Serial digital stereo (IEC958)
Output	Stereo headphone output/mono (combined stereo) internal speaker Line-level stereo analog Serial digital stereo (IEC958)
Sampling rates	48, 44.1, 32KHz, and many lower rates Input and output rates are independent
Converters	Combined DAC and ADC 16-bit, delta-sigma, 64x-oversampling Two stereo audio codecs
Connectors	All 1/8-inch (3.5mm) stereo jacks
Video/compression	Options available on all Indigo^2 IMPACT systems
Genlock	Available through video options

GRAPHICS BENCHMARKS

Viewperf performance results (frames/sec)

	Indigo^2 Solid IMPACT	Indigo^2 High IMPACT	Indigo^2 Maximum IMPACT
Pro CDRS	25.98	32.36	48.39
Data Explorer	7.42	7.40	9.54
Design Review	4.69	5.21	6.72
Lightscape	.97	.97	1.02
Advanced Visualization	N/A	10.90	17.60
Graphics primitives			
X lines	3.26M	3.26M	3.26M
AA depth cued (fogged) lines	1.28M	1.28M	1.85M
Gouraud tri strips**	1.25M	1.25M	2.2M
Lit Gouraud z tri strips*	1.02M	1.02M	1.8M
Lit textured Gouraud z tri strips**	N/A	652k	1.16M
Lit Gouraud z independent quads	384k	384k	676k
Gouraud fill (pixels/sec)	120M	120M	240M
Textured gouraud z fill (pixels/sec)	N/A	68.5M	119M
Convolutions 3x3 general (comps/sec)	13.7M	13.7M	24.4M
Convolutions 5x5 general (comps/sec)	6.0M	6.0M	10.5M
Color lookups (comps/sec)	20.8M	20.8M	36.6M

NOTE: *25 pixel triangles, **50 pixel triangles

PROCESSOR BENCHMARKS

	R4400/250	R10000/175	R10000/195
AIM	160	N/A	N/A
SPEC 92int	176	N/A	N/A
SPEC 92fp	165	N/A	N/A
SPECint95	N/A	8.0	8.9
SPEC fp95	N/A	10.3	10.6
SPECint_base95	N/A	7.7	8.5
SPECfp_base95	N/A	9.9	10.2
LINPACK 1000x1000DP	87.1	N/A	218

Bundled software: Desktop Special Edition InPerson™, WebMagic™, WebSpace Navigator, Showcase™, MediaMail™, Mindshare™ OutBox, Adobe Acrobat™, Netscape Navigator™

PHYSICAL ENVIRONMENT

System	5" H x 18.5" W x 18.5" D; 40 lbs.
19-inch monitor	18.7" H x 18.9" W x 19.9" D; 71.6 lbs.
Power requirements	Voltage and frequency; 100–120/200–240 VAC
Heat dissipation	1320 BTU/hour (Indigo^2 IMPACT) 1000 BTU/hour (Indigo^2™ XZ/XL)
Ambient temperature	+ 13° to + 35° C operating - 10° to + 65° C non-operating
Relative humidity	10% to 80% operating no condensation 10% to 95% non-operating no condensation
Altitude	10,000' operating; 40,000' non-operating
Vibration	0.02", 5–19Hz; 0.35 G, 19–500Hz

REGULATORY AGENCY APPROVALS

Electromagnetic Emission	FCC Class A Canada DOC Class A CISPR 22 Class B Germany VDE Class B VCCI Class 2

ICO Output Formats

Resolution	Timing	Number of Channels
640x486 Interlaced	Component NTSC/RS-170 (RGB)	4
640x480	VGA	4
	Field Sequential	2
Non-Interlaced	VGA (Full Scene Anti-Aliasing)	1
800x486 Interlaced	RS170-Field Sequential	2
	RS170-Field Parallel Component	2
800x600 Non-Interlaced	SVGA	2*
800x808 Interlaced	Field Sequential	2*
1024x946 Interlaced	Field Sequential	2*
1060x940 Interlaced	Field Sequential	2*

*These models only supported on Indigo^2 Maximum IMPACT

SiliconGraphics
Computer Systems

MIPS RISC