

The IRIS Crimson is Silicon Graphics' first product based on the R4000SC superpipelined CPU. The IRIS Crimson uses the 64 MByte/second Crimson bus and is fully upwardly binary compatible with all IRIS 4D products.

The major functional elements of an IRIS Crimson CPU are as follows:

- 50MHz external, 100 MHz internal R4000SC with interface to 1 MB secondary cache;
- 16-256 MB of on-board CPU memory;
- 1Mbytes of EPROM, Four RS-232 Ports, Timer, and LED Register;
- Sync Bus Interface;
- Four proprietary ASICs providing for extremely high speed memory throughput;

### **A Revolutionary New Compute Engine**

At the heart of the IRIS Crimson is a 50 MHz R4000SC. The R4000SC is the first in a new generation of single-chip RISC processors that deliver exceptionally high floating point and integer performance. It is the first processor to integrate the CPU, FPU and cache on-chip, thereby eliminating the delays that result from passing signals between chips.

Combined with the R4000SC's superpipelined implementation, this high level of integration allows the processor's internal clock to run at 100 MHz, or twice the rate of its external clock.

Since all instructions execute at the extremely fast internal clock rate, the IRIS Crimson delivers uniformly high performance on all applications.

The R4000SC supports single-instruction loads and stores of 64-bit floating point data, which speeds execution of double precision floating point calculations.

### **Expandable and Configurable**

The IRIS Crimson contains two full-height and two half-height 5 1/4" SCSI peripheral slots capable of supporting 3.6 GB of internal disk storage. Other SCSI options include CD-ROM, 4 mm DAT, 8 mm Exabyte, and 150 MB QIC-150 cartridge tape units. Up to 36 GB of SCSI disk storage can be attached using an external enclosure. Four 9U-VME expansion slots are standard.

### **A Proven System Architecture**

The IRIS Crimson achieves its high compute performance through a combination of the R4000 technology and a number of advanced system architectural techniques. The system achieves a memory transfer rates of up to 400 MB per second through the extensive use of five proprietary application specific integrated circuits (ASICs). This allows the R4000SC chip to achieve extremely high fill rates for first and second level caches when cache misses occur, thereby avoiding a common compute bottleneck.



### **Fast, Hierarchical Memory**

The IRIS Crimson supports a 16 KB first level cache and 1 MB of high speed second level cache. Four banks of dynamic random access memory are supported, allowing for configurations of between 16 MB and 256 MB.

The IRIS Crimson includes a high performance I/O Processor, which provides two synchronous SCSI buses, a VME bus, and an Ethernet interface. Disk striping across the two SCSI buses is supported as a standard feature of IRIX, and is available on all systems configured with two or more SCSI disks. Striped SCSI disks deliver a sustained data transfer rate in excess of 4 MB per second. Crimson's VME bus will sustain transfer rates of up to 28 MB per second. VME bus slots can be used for additional SCSI controllers, IPI2 disk controllers, FDDI or HPPI network connections, parallel interfaces, or user-supplied VME boards.