

## SC5832

**Up to 8.2 TFlops in a single, self contained cabinet. Achieve more with the world's most efficient computer: highest delivered performance per dollar and per Watt. Data Center not required.**

The SC5832™ packs in the most performance for the money: the highest delivered performance per dollar, and per Watt, of any system in its class. The HPCC benchmark results for the SC5832 rank among those of supercomputers costing millions more and consuming 4-5 times more electricity. This performance comes packaged in a self-contained single cabinet; no need for bundles of under-the-floor cabling, extensive electrical wiring or high-powered cooling systems. A fully-configured SC5832 delivering 8.2 TFlops of performance draws power from a single plug and requires only 70,000 BTU of air conditioning – a small fraction of that required by conventional clusters. Most SiCortex customers take advantage of the low power consumption/low cooling requirement to deploy their SC5832 systems right where the users are, instead of in remote data centers. And this deployment normally takes a few hours to complete, compared to up to several weeks for comparably powered cluster systems. SiCortex saves labor costs and, more importantly, significantly speeds “time-to-science.”

SiCortex computers are the most reliable HPC systems on the market. This reliability is built into the design, starting with simplicity of board design. The boards have processor node chips, memory chips, and I/O sockets; all

linked with the industry's fastest interconnect fabric. That is all – none of the superfluous components that come with conventional HPC systems built with commodity chips designed to solve general computing tasks. The story continues with pervasive error checking and correction (ECC), even in the cache memory. The final element of the SiCortex reliability story is its unique, self-cooling cabinet. Air is drawn in through the massive intake at the cabinet's midsection and flows straight up and out the top, keeping everything inside cool and running smoothly.

The SC5832 comes loaded with a powerful Linux development and operating environment that is pre-integrated, pre-installed and tuned. The compilers, libraries, Lustre parallel file system, tools, complete support for error checking/correction and performance monitors are in place and working together.

**“We believe that the power-efficient SiCortex architecture represents the way that high performance computers will be designed in the future.”**

– Rick Stevens, Associate Lab Director,  
Computing and Life Sciences, Argonne  
National Laboratory.



- Industry standard Linux: pre-integrated and installed. Compilers, libraries, Luster parallel file system, system management tools.
- Scalable: 1,944 processors (12 boards) to 5,832 processors (36 boards), delivering up to 8.2 TFlops.
- Memory to spare: configure 4GB or 8G per node, up to 8 TB for the total system
- Quick: the industry's fastest interconnect fabric based on the Kautz graph topology.
- Quick again: SiCortex FabriCache™ implementation allows nodes to reserve portions of their own RAM to act as solid-state disks.
- Designed for maximum uptime: low heat output coupled with effective air cooling; error checking and correction (ECC) everywhere.
- Easy to install: unpack, plug in, turn on

## The SiCortex Software Environment

The SiCortex software environment provides a powerful and fully integrated set of tools to support applications, combining maximum user-level performance with minimum system management overhead. All components of the environment have been tested together and pre-loaded into each SiCortex system prior to shipment, eliminating a major source of user integration effort and potential error.

SiCortex systems run standard Linux, rooted in the Linux 2.6 kernel, from linux-mips.org, continually updated. Changes to the kernel are minimal: they enable features such as native support of the Lustre file system, application performance monitoring, and extremely fast MPI. The standard Linux EDAC framework has been extended to reach the SiCortex hardware's pervasive use of ECC, which includes the L1 and L2 caches.

- Unified Open Source development environment and the PathScale Optimizing Compilers for Fortran, C and C++
- Rich debugging infrastructure, including memory debugger, GDB, and TotalView parallel debugger (license required).
- The industry's leading integrated, easy-to-use parallel performance analysis tool suite, including PAPI support and sophisticated TAU and Vampir (license required) visualization tools
- Rich selection of optimized open source scientific libraries for the SiCortex architecture, including fast math and string libraries, FFTW, PETSc, ATLAS, Scalapack and more.
- Optimized MPI implementation based on MPICH-2 and supports all MPI-1 operations and most MPI-2 operations, including MPI I/O. All nodes can also use standard TCP/IP over the fabric.
- Predominantly Open Source-based tools and codes; source code available for nearly everything
- 1000's of additional open source packages available through 3rd party repositories.
- Extensive online documentation library and an active user forum.

SiCortex systems include a System Service Processor (SSP), the focal point for user account management, system management, activity monitoring, environmental monitoring, job scheduling, logging, and booting. It is also the central storage and distribution point for operating system images and communications parameters. The SSP provides a convenient unified view for managing and monitoring the entire system.

For further information, refer to the SiCortex Software and Development Environment data sheet.

| SiCortex High Productivity Computer Systems | SC072-PDS<br>Personal Development System   | SC1458<br>Entry/Mid-range System       | SC5832<br>High Capability System                            |
|---|--|--|---|
| Minimum Processors                          | 72   | 324                                    | 1,944   |
| Maximum Processors                          | 72   | 1,458                                  | 5,832   |
| Maximum Memory                              | 96 GB  | 2 TB                                   | 8 TB  |
| Performance (Flops)                         | 100 GF   | 2 TF                                   | 8 TF  |
| Power Draw                                  | 300 Watts  | <5 kWatts                              | <20 kWatts  |
| Voltage                                     | 100-240VAC, single-phase   | 200-240VAC, single-phase               | 208VAC, three-phase (3P+E); 230/400VAC, three-phase(3P+N+E) |
| Current                                     | 3A (100-120V); 1.5A (200-240V)   | 26A                                    | 64A (208V); 34A (400V)                                      |
| Frequency                                   | 50-60Hz  | 50-60Hz                                | 50-60Hz   |
| Maximum Heat                                | 1,020 BTU/hr   | 17,700 BTU/hr                          | 70,300 BTU/hr   |
| Dimensions                                  | 18" H x 8.1" W x 23" D   | 70" H x 23" W x 42" D                  | 72" H x 60" W x 60" D                                       |
| Clearance                                   | Left 3", right 0"; front and rear, 3"  | Left 2.5" right, 0" front and rear 36" | Left and right, 18"; front and rear, 36"; above 22"         |
| Maximum Weight                              | 41 lb  | 470 lb                                 | 1500 lb   |
| Operating Temperature                       | 10-35C (50-95F), less 1C/300m above sea level (1.8F/1000') to a maximum of 3000m (10,000') |  |   |
| Relative Humidity                           | 20-80%, non-condensing   |  |   |
| Non-operating Temperature                   | -40-70C (-40-158F)   |  |   |

- The computers above are classified as information technology equipment (ITE) and carry the CSA, CE, FCC, and VCCI marks.
- The computers above are compliant with CSA 22.2 60950-1 and EN 60950-1.
- The computers above are Class A computing devices compliant with FCC Part 15 Subpart B, EN 55022, EN 55024, ICES-003, VCCI, CNS 13438, and AS/NZS 3548.

Revised: 11/12/2008

## About SiCortex

Headquartered near Boston, Mass., SiCortex, Inc. makes the world's most energy-efficient high-productivity computers. Its proven architecture was designed from the silicon up to provide breakthrough delivered performance at the lowest power consumption in the industry. SiCortex computers scale from 72 to 5,832 processors running standard Linux and other open-source codes, in packages ranging from deskside to departmental to data center. SiCortex systems are the compute-power behind some of the most important research initiatives at the country's national laboratories and academic institutions. For more information, visit [sicortex.com](http://sicortex.com)