SMART SYSTEMS

Standards for High Performance Embedded Computing

SMART Systems at A Glance

- **Based on Industry Standards And Open Source Software**
  Provides High Application Availability and Quick Application Implementation
- **Manageable and Self-Monitoring**
  System sensoring, monitoring and management capabilities
- **Adaptable And Scalable**
  Configuration flexibility to build to the exact needs of the application
- **Real-Time**
  Designed to process real time streams of sensor data

The revolutionary new SMART Systems™ from SKY Computers® are the first high performance embedded computers built to enable quick application implementation and high application availability. The SMARTpac™ 600 data acquisition server and SMARTpac 1200 compute server are the first products in the family based on SKY's SMART Systems Architecture, which combines widely accepted software, hardware, interconnect standards and open source software.

Reduced development and deployment risk are a primary requirement of today's mission-critical applications such as military and defense, homeland security, and software defined radio. SKY has taken the lead in addressing the demands of the embedded computer user for quick development and deployment of applications. By leveraging the unique capabilities of our intelligent system architecture, SKY is the only company in the high performance embedded systems market able to meet these needs.

SKY's SMART Systems family of embedded systems delivers the highest levels of reliability, availability, scalability, resilience and performance required to develop and deploy mission-critical applications into embedded environments.

SKYCOMPUTERS
THE MULTICOMPUTING EXPERTS

SMART Development Environment

- *Linux OS with POSIX threads and extensions*
- *IDE KDevelop*
- *ANSI-C and ANSI-C++*
- *Cache Optimizing Pre-processor*
- *SKY Optimized Libraries: Health Management, Fabric Management*
- *POSIX Libraries: libc, stdc++, sockets, pthreads*
- *Math Libraries: SML, VSIPL, BLAS, LAPACK*
- *Middleware: MPI*
- *SKY Multiprocessor Debugger*

SMART Runtime Environment

- *Configuration Tools*
  - *Linux kernel*
  - *-InfiniBand™ Fabric*
  - *-HAA Configuration*
- *Runtime Tools*
  - *-TimeTrac™ Event Analyzer*
  - *-SAF HPI application interface*
  - *-Interactive HAA interface*
  - *-SNMP tools interface*

SMART Systems Architecture: Reducing Risks

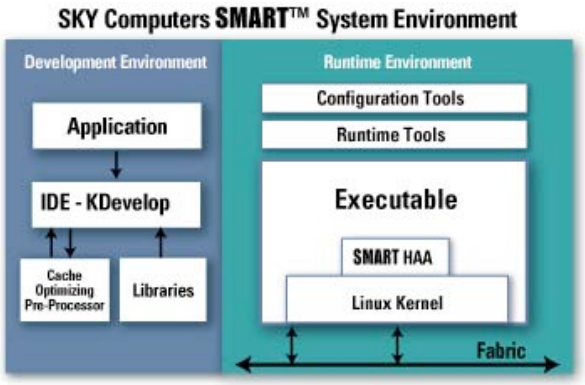
The SMART Systems Architecture consists of a development environment that provides quick application construction and refinement, and a runtime environment that enables high application availability. This system-wide architecture is designed to deliver high compute performance and interconnect bandwidth. Built on open source software and standard technologies such as Linux, InfiniBand™, MPI and VSIPL, SMART Systems reduce development time and accelerate time to deployment. The SMART Architecture is built with an intelligent fabric that can be configured to react to changes in its environment. By employing tightly integrated hardware and software components that continually monitor the health of the system, the SMART Architecture enables high application availability. Combined with proven development tools and libraries, SMART Systems are high performance systems that are easier and less expensive to develop, deploy and maintain.

With the SMART Architecture, SKY can, for the first time, give embedded developers the robustness, resiliency, and ease of integration provided by a standards-based, open software architecture. The SMART Architecture is based on two architectural tenets:

- Standards-based environment provides a wide choice of tools and libraries giving developers true application portability and vendor independence.

- Open source software makes developing embedded applications easier and more cost effective than ever before.

The SMART Development Environment includes standard integrated development environments, the Cache optimizing preprocessor to optimize cache use, as well as math and POSIX libraries. The SMART Runtime Environment provides a standards-based framework on which applications can be built to be highly available, with the ability to respond to changes within the system or the environment.



SMARTpac Systems Family: Performance Meets Resiliency

The SMARTpac 600 and the SMARTpac 1200 are designed as complementary systems. The SMARTpac 600 is an ideal solution for processing an application's front-end data acquisition needs, while the SMARTpac 1200 provides the back-end computational horsepower for computationally intensive signal processing and image analysis. The 19" rack mountable SMARTpac systems utilize the InfiniBand™ interconnect throughout the system yielding high bandwidth, low latency, secure data communications, and easy upgrades.

SMARTpac 600 Data Acquisition Server

The SMARTpac 600 is a 3U slide mountable chassis that can be configured with up to six uniprocessor or dual-processor PPC AltiVec compute blades. There are six PCI-X adapter slots, one per compute blade, available so that third party I/O options can easily be leveraged. Six InfiniBand connections are available on the rear of the chassis for inter-chassis connection and scaling or direct connection to a broader InfiniBand fabric. The SMARTpac 600 is ideal as the front-end data acquisition and processing engine for applications of large, real time data streams.

SMARTpac 1200 Compute Server

The SMARTpac 1200 is the complementary 3U compute server that can be configured with up to 12 uniprocessor or dual-processor PPC AltiVec compute blades. In a full configuration, this system delivers an industry-leading density of up to 24 PPC AltiVec processors in a 3U space. To provide maximum inter-chassis configuration flexibility, the SMARTpac 1200 provides six InfiniBand connections in the rear of the chassis. This powerful, high density processing system provides the compute power to process the most complex real-time algorithms.

SMARTpac 600 and SMARTpac 1200 Compute Blades

SMARTpac single processor and dual processor compute blades are available for members of the SMARTpac family. Since the SMARTpac 600 and SMARTpac 1200 share an identical systems architecture, the single and dual compute blades can be used in either the SMARTpac 600 or SMARTpac 1200. Both compute blades utilize the PPC 7447 AltiVec processor. Sixty-four MB of flash memory provides fast boot time by allowing the application to be pre-loaded in flash. Two GB of SDRAM is accessed over the 266 MHz local memory bus.

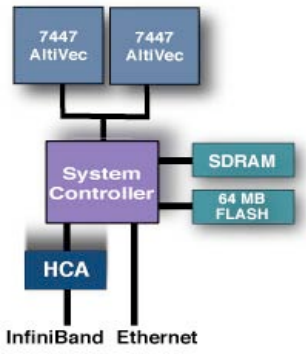
SMARTpac Systems Features

- *Standards Based*
- *Open Source Software*
- *High Performance AltiVec Processors*
- *3 GB/sec InfiniBand-based system Interconnect*
- *19" Rack mountable*

SMARTpac 600

SMARTpac 1200

SMARTpac Dual Processor Compute Blade



InfiniBand: High Performance and Superior Reliability

InfiniBand is the backbone of the SMART System architecture providing high bandwidth, very low latency to maximize system performance, system reliability, application resiliency, and high application availability. Built in security features and an adaptable network of continuous node discovery addresses hardware, software, and application errors by providing a self-reliant, self-repairing interconnect for the system. The serial technology used in 4x InfiniBand provides performance up to 1 GB/sec. in each direction.

InfiniBand technology is ideal for high performance applications because it provides the low processor overhead, simplified network management, reliability, availability, and serviceability required for high performance computing applications. No other interconnect fabric is as robust. As a SMART fabric with supporting software, it provides high performance embedded users with high application availability, which ultimately translates to lower cost of ownership and quicker deployment of embedded systems.

For complete information on the revolutionary new SMART Systems, go to www.skycomputers.com or contact the SMART hotline at 1 800 486 3400 or 1 978 250 1920.

SMARTpac 600 Data Acquisition Server

Configuration Options	One to six single processor or dual processor compute blades
Hard Drive	SCSI hard disk support, one (1) drive
I/O	Six PCI-X adapter slots, one per compute blade (PCI 32-bit/33Mhz up to PCI-X 64-bit/100Mhz)
System Fabric	4x InfiniBand with integrated switching
HAA Connection	Out-of-band 10/100 Ethernet network Two RJ45 connections in rear of chassis
Chassis Interconnect	Six (6) 4x InfiniBand connections in rear of chassis (1GB/sec., bidirectional)
Environmental Requirements Cooling	Normal commercial. Military spec available upon request. Front to back
Electrical Power	48 VDC, Power Consumption <800 Watts
Physical Dimensions	19 inch slide rack mountable H: 3U (5.25 inches), D: 26 inches, W: 19 inches

SMARTpac 1200 Compute Server

Configuration Options	One to twelve single processor or dual processor compute blades
System Fabric	4x InfiniBand with integrated switching
HAA Connection	Out-of-band 10/100 Ethernet network Two RJ45 connections in rear of chassis
Chassis Interconnect	Six (6) 4x InfiniBand connections in rear of chassis (1GB/sec., bidirectional)
Environmental Requirements Cooling	Normal commercial. Military spec available upon request. Front to back
Electrical Power	48 VDC, Power Consumption <1000 Watts
Physical Dimensions	19 inch slide rack mountable H: 3U (5.25 inches), D: 26 inches, W: 19 inches

SMARTpac Compute Blades

SMARTpac Uniprocessor Compute Blade

Processor	One (1) 1.0 GHz AltiVec MPC7447
Memory Controller	Discovery II 133 MHz MPX bus
Memory	Up to 2 GB DDR
Flash	64 MB
Host Channel Adapter	4X (1GB/sec., bidirectional) Infiniband Second Generation 64-bit/133MHz PCI-X interface to Memory Controller

SMARTpac Dual processor Compute Blade

Processor	Two (2) 1.0 GHz AltiVec MPC7447
Memory Controller	Discovery II 133 MHz MPX bus
Memory	Up to 2 GB DDR
Flash	64 MB
Host Channel Adapter	4X (1GB/sec., bidirectional) Infiniband Second Generation 64-bit/133MHz PCI-X interface to Memory Controller

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