

RAM-SAN™

The World's Fastest Storage®

RamSan-440

- 512-GB RAM Storage
- 600,000 IOPS (Sustained)
- 4.5 Gigabytes per Second
- 350-sec Backup/Restore
- Fibre Channel

Solid State Disk (SSD)

Texas Memory Systems' (TMS) RamSan-440 solid state disk (SSD) is the **World's Fastest Storage**. It sits at the top of the storage pyramid and is increasingly referred to as Tier-0 storage. It is used to accelerate applications such as Microsoft SQL Server or Oracle databases. The RamSan-440 accommodates many more concurrent users and simultaneous transactions and is more economical than adding hard disk RAID units, servers, internal RAM, or constant application tuning.

By utilizing **RAM chips**, the RamSan-440 delivers much lower latency and higher bandwidth than mechanical spinning hard disks or Flash media. As **Enterprise systems** get faster and more critical, the RamSan-440 is the most cost-effective SSD solution to eliminate I/O bottlenecks.

Increased performance is achieved by using fast RAM chips and tightly integrating them with the Fibre Channel controllers. With eight Fibre Channel links for multiple accesses to storage during heavy computer activity, the RamSan-440's performance does not degrade.

Installation and Management

All TMS SSDs install quickly as external storage devices attached by Fibre Channel cables. They are integrated into sophisticated SAN systems for use as the top tier storage accessible by hundreds of servers or attached behind storage appliances, virtualization switches, and NAS filers.

Call or Email TMS at Sales@RamSan.com

Texas Memory Systems, Inc.

10777 Westheimer, Suite 600, Houston, Texas 77042

(713) 266-3200

www.RamSan.com

Solid State Disk



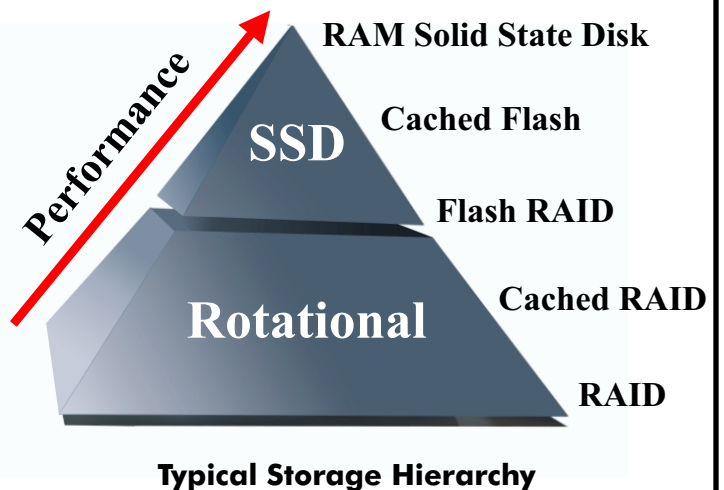
RamSan-440

The RamSan-440 can be monitored and configured from any browser via a protected Java applet. Command line management is also available through secure shell (ssh). The front panel displays instantaneous I/O activity.

TMS SSDs are designed to operate in lights-out data centers. Our systems constantly monitor internal components for error conditions. A system administrator can access our units through a built-in management port that provides remote network connectivity. The management port generates notifications if any errors occur. Also, the RamSan-440 supports SNMP traps and email notification.

Highly Reliable Storage

As with any storage device, reliability is a primary concern. The RamSan-440 is designed to offer superior reliability to other RAID or SSD devices. The primary RAM storage media is protected from RAM chip failures by ChipKill™ and from RAM board failures by RAIDed RAM boards.



HIGHLY RELIABLE STORAGE (Continued)

The RamSan-440 has redundant hot-swappable power supplies with internal batteries (N+1). For power down conditions, data is stored in an internal Flash subsystem in 350-sec. In addition, Fibre Channel ports support active-active multipathing.

MANAGEMENT

- Browser-enabled system monitoring and configuration
- Supports SNMP traps and email notification
- Command line management via secure shell (SSH)
- Instantaneous I/O activity displayed on front panel

LUN SUPPORT

- 1 to 1024 LUNs with variable capacity per LUN
- Flexible assignment of LUNs to ports
- Hardware LUN masking

FIBRE CHANNEL CONNECTION

- 4-Gbit Fibre Channel (2-Gbit capable) controllers available
- 2 ports standard; up to 8 ports available
- Supports point-to-point, arbitrated loop, and switched fabric topologies
- Interoperable with Fibre Channel Host Bus Adapters, switches, and operating systems

PATENTED IO² (INSTANT-ON INPUT OUTPUT)

The RamSan-440 includes Texas Memory Systems' patented IO² feature. IO² improves system availability by making data in the RamSan-440 instantly accessible after the system is powered on. With competing SSDs, applications wait idly while SSDs fully load data from hard disk drives into memory.

Specifications	
Capacity	256-512 GB
I/Os per second	600,000
Bandwidth	4.5 GB/sec
Fibre Channels: 4-Gb, 2-Gb	2 to 8 Ports
Latency	<15 microseconds
Primary Storage Media	RAM (RAIDed)
Secondary Storage	Flash (RAIDed)
Power Supplies	Redundant Hot-Swap
Batteries	3 Redundant
Size	7" (4U) x 24"
Power Consumption (peak)	650 Watts
Weight (maximum)	90 lbs



NON-VOLATILE BACKUP METHODS

- The RAM used to give the RamSan-440 record-breaking performance would lose its data if the power was lost. To transform a box of RAM into a non-volatile storage solution, the RamSan-440 includes batteries and automatic backup methods which copy data at 1.4 GB/sec to the redundant internal Flash based RAID. This ensures that all data written to the RamSan-440 is safely stored when the system needs to be powered down.
- The RamSan-440 leverages RAM for the primary storage media and Flash memory for backup. Flash, while considerably slower than RAM, is much faster than disks and allows the system to shut down dramatically faster than any other SSD.

RELIABILITY AND AVAILABILITY

- High availability architecture
- Primary RAM storage media protected from chip failures by ECC and Chipkill™ technology
- Protected from board failures by RAIDed memory boards
- Soft Error Correction detects and rewrites transient errors
- Internal redundancies:
 - Power supplies and fans
 - Backup battery power (N+1)
 - RAIDed Flash modules
 - RAIDed primary RAM storage media
- Active:Active FC controllers

BACKUP PROCEDURES

- Supports two backup modes that are configurable per system or per LUN:
- Data Sync mode - synchronizes data to redundant internal Flash modules before shut down or with power loss.
- Active Backup™ mode (optional) - backs up data constantly to internal redundant Flash modules without impacting system performance.

Call or email TMS at Sales@RamSan.com

Texas Memory Systems, Inc.

10777 Westheimer, Suite 600, Houston, Texas 77042

(713) 266-3200

www.RamSan.com