



RamSan-710 "Thor"

- **5 TB SLC Flash**
- **400,000 IOPS**
- **5 GB/s Bandwidth**
- **Series-7 Flash Controller™**
- **4 ports: 8 Gb/s Fibre Channel or QDR InfiniBand**



Overview

The RamSan-710 is the latest rackmount Flash storage system from Texas Memory Systems, with:

- **5 TB** of usable storage space
- **Four 8 Gb/s Fibre Channel** or **four 40 Gb/s QDR InfiniBand** ports
- **1U rackmount** form factor
- Enterprise grade **32nm single level cell (SLC) Flash** media from Toshiba
- New proprietary **Series-7 Flash Controller™** featuring **patented reliability features**

Key Applications

The RamSan-710 speeds up high-performance enterprise **storage area network (SAN)** environments. Customers around the world use RamSan SAN storage for applications like:

- **Large centralized databases**
- **Reporting and data warehousing**
- **Rendering and video editing**
- **Modeling and simulation**

Compatible with **Fibre Channel and InfiniBand interface cards and fabrics**, the RamSan-710 appears as a **standard block device** to applications.

Specifications

Metric		Read	Write
IOPS	(4 KB)	400 K	400 K
Bandwidth		5 GB/s	4.5 GB/s
Latency	(512 B)	75 µs	35 µs
	(4 KB)	175 µs	35 µs

Reliability

The RamSan-710 has the reliability features required in true **enterprise storage**, including:

- Standard **chip-level RAID** and patented **Variable Stripe RAID™ (VSR™)** protection against plane and chip failures
- **Enhanced Error Correcting Code (ECC)** protection against block failures
- Available **integrated spare Flash card** limiting maintenance downtime
- **Redundant power supplies** with active failover protection against single-source power issues

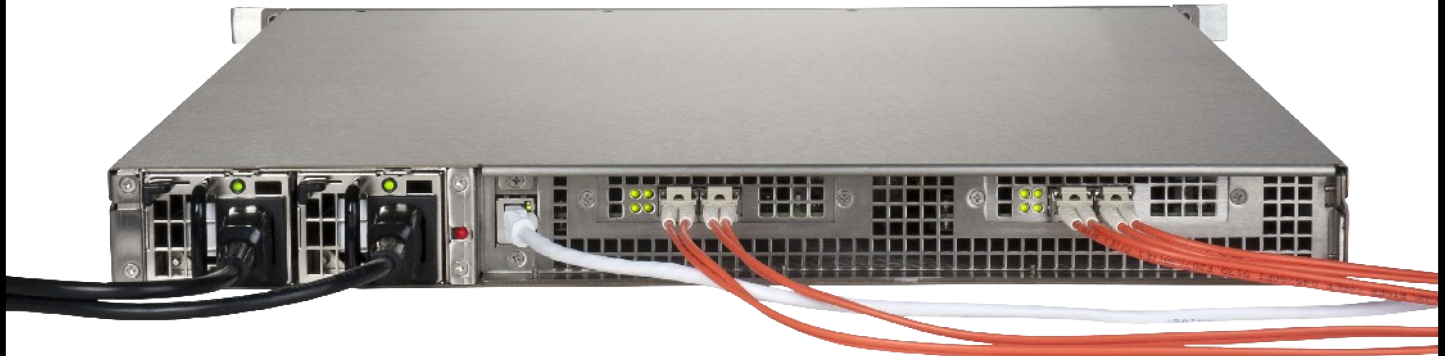
Learn more at <http://RamSan.com/Products/RamSan-710>.

Texas Memory Systems, Inc.

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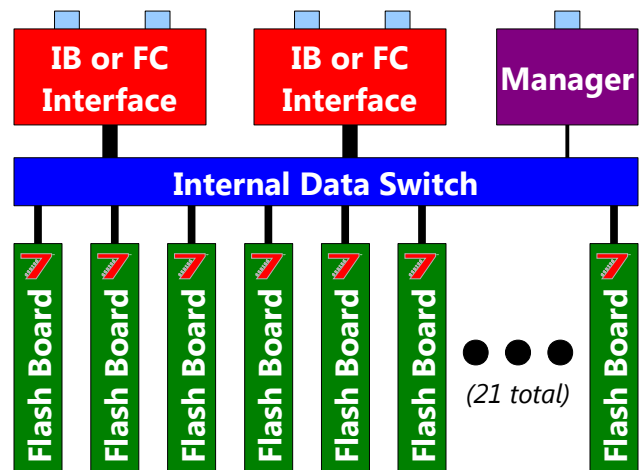
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Architecture

The RamSan-710 continues the TMS tradition of high bandwidth, low latency systems with most control logic implemented in hardware. It is built with **21 Flash boards** powered by the proprietary Texas Memory Systems **Series-7 Flash Controller™**. The boards are connected through a high-speed **internal data switch**, along with **two dual-port Fibre Channel or InfiniBand interfaces** and a **management controller** offering an Ethernet interface.



Variable Stripe RAID™ (VSR™)

The exclusive patented Variable Stripe RAID™ feature offered by the Series-7 Flash Controller reduces business interruptions and improves mean time between failures (MTBF) by providing a higher level of **protection** against common Flash plane failures and less common Flash device failures. VSR complements standard error-correction techniques to enable continued system operation in the event of Flash failures. It improves on traditional RAID by providing **greater stripe size granularity** and **variable stripe sizes**, allowing the controller to **skip bad areas** rather than failing or replacing them with a full spare chip. VSR accomplishes this by allowing XOR RAID stripes to be dynamically resized for distribution across fewer Flash devices. When a Flash device failure is detected, data is migrated to new stripes that do not include the failed chip or plane.

Ultimate Write Performance and Reliability

The RamSan-710 includes reserved Flash storage space used to **maximize performance and reliability**. 19% of the raw capacity is **overprovisioning**, and 11% is **RAID overhead**. Overprovisioning—the practice of including Flash storage space inaccessible to the user—**increases write performance**, primarily because it provides a supply of blocks that do not need to be erased before writing. Texas Memory Systems products typically have more overprovisioned space than competing products. **RAID overhead** is storage space for checksums and other redundant forms of data that provide **effective failure recovery**.