



RamSan-820



- 24 TB usable eMLC Flash
- High availability
- No single point of failure
- 2D Flash RAID™
- 450,000 IOPS
- 4 GB/s bandwidth
- 25 µs latency
- 450 watts

Overview

The **RamSan-820** is the **ultimate application accelerator**. It is first **high availability** eMLC Flash system from Texas Memory Systems. This SSD has **no single point of failure**, and features:

- **12 or 24 TB** of usable storage (10 or 20 TB with **system-level RAID** and spare Flash Modules)
- **2D Flash RAID™**: RAID5 *across Flash chips* and RAID5 *across Flash Modules*
- **Redundancy** for power, data, and management
- 25-110 microseconds latency
- **1U** form factor
- Two dual-port 8 Gb/s **Fibre Channel** controllers or dual-port **QDR InfiniBand** controllers
- Proprietary **RamSan-OS™** featuring the Series-7 Flash Controller™

Key Applications

The RamSan-820 is perfect for running multitenant heterogeneous applications that lack built-in high availability features, like:

- **Transactional (OLTP) databases**
- **Analytical (OLAP) databases**
- **Virtualized infrastructure (VDI)**
- **High performance computing (HPC)**
- **Cloud-scale infrastructure**

Performance

The RamSan-820 provides **maximum performance**:

Metric	Read	Write
IOPS	450k	400k
Bandwidth	4 GB/s	3.5 GB/s
Latency	110 µs	25 µs

High Availability

The RamSan-820 has the reliability features required in true **enterprise storage**, including:

- No single point of failure
- Four layers of data correction
 - *Chip-level: Error Correcting Code (ECC)*
 - *Module-level: RAID5 across Flash Chips*
 - *Module-level: Variable Stripe RAID™ (VSR™)*
 - *System-level: RAID5 across Flash Modules*
- 2D Flash RAID™
- Redundant components
- Hot swappable Flash
- Low power (450 watts)

Texas Memory Systems, Inc.

(713) 266-3200 • RamSan.com • Sales@RamSan.com
10777 Westheimer, #600, Houston, Texas 77042, USA





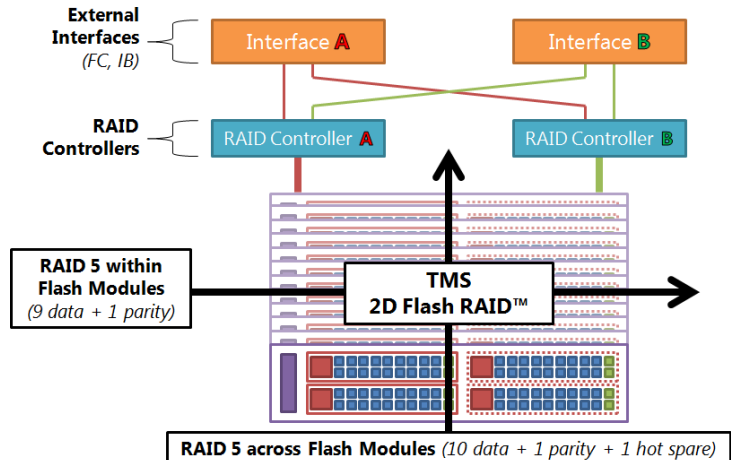
Architecture

The RamSan-820 is designed to be very fast, reliable, and small, with remarkably low latency. It is comprised of **12 Flash Modules** (half or full density) based on **Series-7™ Flash Controllers™**. The Flash Modules are connected through redundant high-speed internal data switches, redundant RAID5 controllers, two redundant Fibre Channel or InfiniBand interfaces, and redundant management controllers offering monitoring via Ethernet.

2D Flash RAID™ Data Protection

While most competing SSD suppliers offer a single RAID protection mechanism, TMS incorporates a **2D array** of data protection.

To lessen the chance of failure on the Flash Module, TMS has a RAID structure **across the Flash chips**, with **Variable Stripe RAID™ (VSR)** and the typical Flash ECC algorithm. A second RAID5 is structured **across the individual Flash Modules** to prevent module failures from causing data corruption.



Low Power Usage

Unlike competing products, RamSan SSDs use **purpose-designed** hardware and software, not repurposed server parts that rely on bloated software. With purpose-built hardware, the RamSan-820 delivers **efficient high performance** at low power levels.

The RamSan-820 uses about **75% less power** than competitors while retaining RamSan levels of performance. The RamSan-820 was designed with **speed, latency, simplicity, and reliability** in mind from the ground up to use fewer components, data buses, and power hungry Intel CPUs. By incorporating only a few fast buses, reprogrammable FPGAs, and a small amount of fast DDR RAM, the RamSan-820 **avoids the excessive power use** and heat of competing systems.

Series-7 Flash Controller™

Exclusively available from Texas Memory Systems, the **Series-7 Flash Controller™** is the seventh generation of RamSan Flash controllers. Its main features over other architectures include:

- **Better performance.** The highly parallel architecture of the Series-7 Flash Controller takes full advantage of the performance of each Flash chip by minimizing individual FPGA load. This parallel architecture is a core component of the RamSan design and is why the RamSan is the uncontested performance leader.
- **More reliability features.** Patented Variable Stripe RAID™ (VSR™) technology efficiently bypasses failed Flash planes and chips. Enhanced error correcting code (ECC) techniques help mitigate block failures.
- **Improved latency for small requests.** The Series-7 Flash Controller includes optimizations for small (512-byte) requests.