



Computing RAID Systems

F-RAM ideal for advanced internal or external RAID systems

Redundant Array of Independent Disks, or RAID, is a technology that supports the integrated use of two or more hard-drives in a variety of configurations. Additional definitions of RAID include Redundant Array of Inexpensive Disks, among others.

RAID systems are traditionally used in servers, but can be also found in workstations. The purpose of RAID is to increase the performance of the storage subsystem by using numerous hard drives simultaneously, as well as protecting against data loss due to hard drive crashes. RAID is used when fault tolerance and maximum up-time is essential.

RAID systems are designed to keep working even if there is a drive failure — allowing disks to be hot-swapped and data to be recovered automatically while the system keeps running. Systems without RAID capability have to be shut down while the data is recovered.

Why use F-RAM?

In RAID5, RAID6 or higher, RAID systems require a nonvolatile RAM to save configuration settings and transaction logs. Ramtron's F-RAM is used in both external and internal RAID controllers for these purposes due to its small footprint, high endurance and nonvolatility without the need for a battery.

Transaction database logs include:

- **Access logging** – The access log contains detailed information about client connections and the operations performed. The access log can be indispensable when diagnosing access problems, verifying server configuration settings, and evaluating server usage patterns.
- **Audit logging** – The audit log contains detailed information about all changes made to each database as well as to server configuration.



F-RAM eliminates the need for external capacitors, reducing board size, component count and costs, and further improving data reliability. F-RAM is an ideal replacement for Flash memory in RAID application design.

- **Error logging** – The error log contains detailed error, warning, and informational messages encountered during normal server operation.
- **Transaction logging** – Upon accepting an update operation — add, modify, delete, or modular — a log message about the operation is written to the transaction log. Durable transaction logging ensures data integrity. It does so by ensuring each update operation is committed to the transaction log before the result code for the update operation is returned to the client application.

F-RAM
by RAMTRON

For more information about Ramtron's complete line of computing nonvolatile memory products, visit:

www.ramtron.com/go/computing, or call

1-800-545-3726