

# FlashDisk® COTS Rugged RAID Storage



## Highlights

- Designed for harsh operating environments, tolerating high levels of dust, moisture, shock and vibration.
- 3/4-inch milled aluminum door with dust and raindrop seal provides rigidity, structural integrity and prevents flying-object hazards.
- Heavy-duty washable air filter traps dust, provides moisture shield.
- Redundant, hot-swappable controllers, drives, power supplies, fans, and BBUs.
- Purpose built for demanding, high-performance workloads.
- Up to 1.2 million IOPS, 5,500 MB/s throughput, and 576TB capacity.
- Tunable for high throughput, high IOPS, or both.
- FlashD2D non-disruptive, application-consistent disk to disk backups.
- 3.5" and 2.5" solid-state and hard-disk drive systems and expansions.
- Interface Options:
  - 16 and 8 Gbps Fibre Channel
  - 10 and 1 Gbps iSCSI
  - 6 Gbps SAS
  - Simultaneous Fibre Channel and iSCSI
  - Simultaneous SAS and iSCSI
- Designed to meet various testing standards.
- Rugged 1U-tray mount available for land, sea and air operations.
- Custom design services available.



RF-3000 series 3U system

## Purpose-Built To Perform

FlashDisk COTS Rugged disk arrays are designed to store and protect data in harsh operating environments, tolerating levels of dust, moisture, shock and vibration not possible with standard commercial units. Far less expensive than fully MIL-rugged systems, FlashDisk COTS Rugged arrays come equipped with single or dual redundant controllers with mirrored cache, and are expandable to 576 TB. FlashDisk supports nine different RAID levels, including RAID 6, which protects against two simultaneous drive failures and ensures successful disk rebuilds.

The US Army tested and approved FlashDisk COTS Rugged storage systems for field use, and has deployed them worldwide in Humvee communication trailers. The front door is crafted of 3/4-inch milled aluminum to provide rigidity, structural integrity and prevent flying-object hazards. It protects internal components using a heavy-duty washable air filter to trap dust particles and provide a moisture shield. The door also features a dust and raindrop seal.

The shatter-proof LCD front panel is easily viewed by field personnel, EMI shielded, and uses heavy-duty "positive feel" pushbuttons. Optionally, the US Army, Navy and Air Force secure the unit to a Rugged 1U Tray for land, sea and air operations using a triangulated bolt pattern for strength.

Leveraging decades of commercial-storage as well as military-storage experience, FlashDisk COTS Rugged arrays combine embedded-systems architecture, streamlined firmware and hardware-acceleration ASICs to deliver up to 1.2 million I/O operations per second (IOPS) and 5,500 MB/second data throughput.

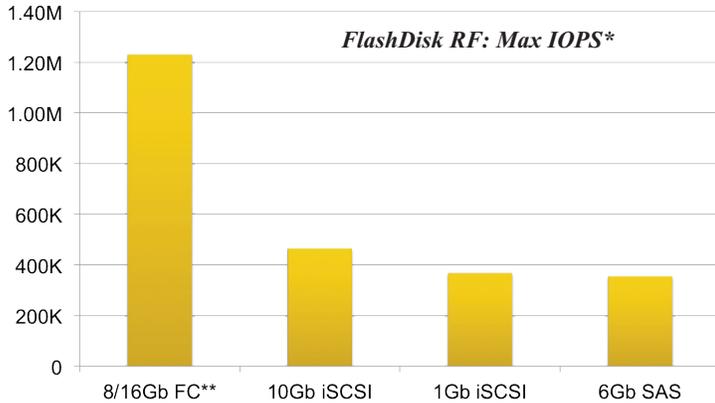
Each hot-swappable controller module plugs into the back of a purpose-built storage shelf, and presents external host and expansion interface ports. Plugging two controllers into the same shelf creates an active-active redundant configuration, eliminating single points of failure *and* enhancing performance. This modular approach also enables entry-level FlashDisk systems to deliver the same top-end performance as their large-scale siblings.

FlashDisk storage services include volume snapshots, mirroring and both synchronous and asynchronous replication. FlashD2D, included with every FlashDisk, enables *non-disruptive* disk to disk backups using automated, *application consistent* snapshots and mirroring. FlashDisk Global Manager provides centralized, "single pane of glass" management and event notification for all installed FlashDisk storage systems.

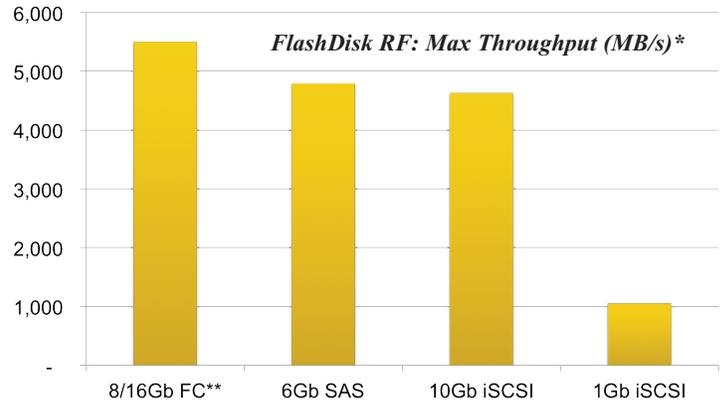
[www.winsys.com](http://www.winsys.com)

# FlashDisk Specs

FlashDisk RF series systems contain the latest controller technology, and provide the highest possible performance and capacity. For less-demanding workloads, Winchester Systems offers its previous-generation FlashDisk RV.



\*Best-case benchmark results using IOmeter.  
\*\*16Gb using half the number of FC ports.



\*Best-case benchmark results using IOmeter.  
\*\*16Gb using half the number of FC ports.

Both FlashDisk RF and RV come in 2U and 3U rack-mount sizes, and support 2.5" and 3.5" SAS hard disk drives and SSDs. FlashDisk RV systems are also available in a 1U size. Host interconnect options include 8 or 16 Gbps Fibre Channel, 1 or 10 Gbps iSCSI, and simultaneous Fibre Channel and iSCSI.



| FlashDisk® Series                                     | RF-2000   | RF-3000            | RV-1000   | RV-2000  | RV-3000            |
|---|---|--------------------|---|--|--------------------|
| Form Factor   | 2U Rack-mount   | 3U Rack-mount      | 1U Rack-mount   | 2U Rack-mount  | 3U Rack-mount      |
| Internal SAS Drive Bays                               | 24 (2.5"), 12 (3.5")  | 16 (3.5")          | 12 (2.5")   | 24 (2.5"), 12 (3.5")   | 16 (3.5")          |
| Max # of Drives (same size expansion shelves)         | 168 (2.5"), 108 (3.5")  | 144 (3.5")         | 84 (2.5")   | 144 (2.5"), 84 (3.5")  | 112 (3.5")         |
| Max Capacity (raw)                                    | 168TB (2.5"), 432TB (3.5")  | 576TB              | 84TB  | 144TB (2.5"), 336TB (3.5")   | 448TB              |
| 8/16 Gbps FC Performance*                             | IOPS: 1230K; Seq. Read: 5500MB/s, Seq. Write: 3960MB/s  |                    | IOPS: 140K; Seq. Read: 2850MB/s, Seq. Write: 1063MB/s |  |                    |
| 10 GbE iSCSI Performance*                             | IOPS: 464K; Seq. Read: 4630MB/s, Seq. Write: 1990MB/s   |                    | IOPS: 79K; Seq. Read: 1330MB/s, Seq. Write: 706MB/s   |  |                    |
| 1 GbE iSCSI Performance*                              | IOPS: 367K; Seq. Read: 1053MB/s, Seq. Write: 1037MB/s   |                    | IOPS: 75K; Seq. Read: 918MB/s, Seq. Write: 585MB/s    |  |                    |
| 6 Gbps SAS Performance*                               | IOPS: 354K; Seq. Read: 4791MB/s, Seq. Write: 3102MB/s   |                    | IOPS: 116K; Seq. Read: 2616MB/s, Seq. Write: 1187MB/s |  |                    |
| Max Snapshots   | 4096  |                    |   |  |                    |
| Max Local Mirror/Replicas                             | 256 (from up to 32 source volumes)  |                    |   |  |                    |
| Max Remote Replicas                                   | -   |                    | 64 (from up to 16 source volumes)                     |  |                    |
| RAID Levels   | 0, 1, 3, 5, 6, 10, 30, 50, 60   |                    |   |  |                    |
| Cache (per controller)                                | 8GB DDR-III   |                    | 2-4GB DDR-II  |  |                    |
| Cache Backup  | CompactFlash  |                    |   |  |                    |
| Redundant, Hot-Swap Controllers                       | Single or Dual (active-active)  |                    |   |  |                    |
| Redundant, Hot-Swap Power Supplies & Fans             | Yes   |                    |   |  |                    |
| Automated, App-Consistent Snapshots and Volume Copies | FlashD2D  |                    |   |  |                    |
| Dimensions (H x W x D)                                | 3.5" x 17.5" x 21"  | 5.1" x 17.5" x 21" | 1.7" x 17.5" x 19.6"                                  | 3.5" x 17.5" x 21"   | 5.1" x 17.5" x 21" |
| Approx. Weight (fully loaded)                         | 63 lbs.   | 77 lbs.            | 39 lbs.   | 63 lbs.  | 77 lbs.            |
| Input Voltage   | Dual 90-260 VAC, 47-63 Hz (auto switching)  |                    |   |  |                    |
| Power Consumption                                     | 350W, 262-285W draw (single controller)<br>530W, 345-367W draw (dual controller)  |                    | 250W (single controller)<br>380W (dual controller)    | 350W, 262-285W draw (single controller)<br>530W, 345-367W draw (dual controller) |                    |
| Operating Temp  | 0° to 40° C   |                    |   |  |                    |
| Storage Management                                    | Front Panel LCD keypad, RS-232, Ethernet;<br>FlashDisk Global Manager ("single pane of glass" management of multiple systems) |                    |   |  |                    |

\*Best-case benchmark results using IOmeter. 16Gb FC is available only on FlashDisk RF; results obtained using half the number of FC ports.

## Accessories

Fibre Channel switches and cables  
Ethernet Switches and cables  
Host-bus adapters  
Uninterruptable Power Supplies (UPSes)  
Cabinets  
*Anything else you need? Just ask!*

[www.winsys.com](http://www.winsys.com)

**WINCHESTERSYSTEMS®**  
Purpose-Built Storage

101 Billerica Ave., Bldg. 5, Billerica, MA 01862  
800-325-3700 · 781-265-0200 · fax: 781-265-0201