

FlashDisk® RAID

RF-2U24 Series

Rugged 2U RAID (2.5") at COTS Prices & Self Encrypted Drives (SEDs) Hybrid HDD & SSD - 5,200 MB/sec. - 1,400,000 IOPS - Rugged 1U Tray

FlashDisk RF-2U24 is a rugged version of the commercial FX-2U24 with the same performance levels and Fibre Channel, iSCSI and SAS host support. However, these "COTS Rugged" disk arrays are designed to MIL-STD 810E/833E to store and protect data in harsh operating environments: tolerating levels of dust, moisture, shock and vibration not possible with standard commercial units - and far less expensive than fully rugged systems. It supports 24 SAS 2.5" disks (HDDs, SEDs or SSDs) per shelf and provides up to 48 TB of storage in the base unit, expandable to 720 TB. The US Army approved these units 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 also contains a heavy-duty filter to trap dust particles and provide a moisture shield to protect internal components. The LCD front panel is easily viewed by field personnel, is EMI shielded, and uses heavy-duty "positive feel" pushbuttons. The door also features a dust and raindrop seal. Optionally, the US Army, Navy and Air Force mount the unit to a chassis using five bolts, secured in a triangulated pattern for strength, to a Rugged 1U Tray for land, sea and air operations.



Pushbuttons designed for "gloved hands," shown US Army Green.

Restricted Airflow Model

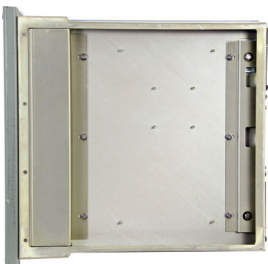


RF-2U24 mounts flush to submarine bulkhead.



Side air intake provides cooling to disk drives and electronics.

Rugged 1U Tray Interior and Mounting



Interior view of mounting tray.



Rugged unit on mounting tray with aluminum ball-bearing rails fully extended for rear access.



FlashDisk RF-2U24, shown in anodized black, offers 48 TB with 24 disks to 2 TB each - ideal for mobile applications - providing field reliability and data protection at COTS prices.

Rugged 1U Tray

1U Tray Advantages

- > Provides easy access to system
 - Ballbearing aluminum rails, or heavy-duty steel slide rails
 - Full extension from rack
 - Rear access from front
 - Save 3 ft of service space in rear
 - Front handle for pulling tray
- > Adds torsion strength and rigidity
- > Increases shock & crash tolerance
- > Customizable tray functionality
 - Add UPS module into tray
 - Add EMI filters into tray
 - Add AC/DC power inverter
 - Add twist-lock power connectors
 - Enables special cable routing
- > Short 21" depth matches system and accommodates shallow racks
- > Lightweight aluminum construction



FlashDisk RF-2U24 with 1U mounting tray shown in US Navy Gray.



FlashDisk RF-2U24 rear view with 1U mounting tray.



Rugged 1U mounting tray fully extends for rear service access from the front.

Rugged Design Features

MIL-STD 810E/833E; NEBS Level 3 Environmental, shock and vibration.

200G Shock: Tested for the US Navy to withstand 200G shock with 1U mounting tray.

Milled Aluminum Door: 3/4" milled aluminum provides rigidity and structural integrity; dust and raindrop seal.

Reusable Air Filter: Dust and moisture protection, field proven in harsh environments, washable.

Rugged LCD: Shatterproof LCD protects display under harsh usage and is EMI shielded.

Gloved Access: Heavy duty "positive feel" LCD pushbuttons and door thumbscrews for gloved use.

Front Access Power Switch: Perfect when no rear access.

SEDs & Secure Erase: Self Encrypted Drives (AES-256) with FIPS 140-2 validation, Seagate Instant Secure Erase.

Auto Power On: Unit restarts after brownouts and blackouts.

Transit Case: Field deployable transit case available.

1U Tray: Mounting tray secured to chassis by five bolts to in triangulated pattern for strength.

Choice of Finish: Doors and trays painted or anodized neutral black, US Army green, US Navy grey or custom.

Batteryless Operation: For fire safety, RAID unit runs without Lithium Ion battery and data written only to disk.

SSDs for Vibration Resistance: SSDs offer capacity to 2 TB each.

Silent Running: Includes fan speed control to maintain low noise levels.

RF-2U24 Base Unit with Expansion Shelf



The RF-2U24 Series supports 720 TB with 2U24 expansion shelves or 1,392 TB with 2U12 expansion shelves.

RF-2U24 Redundant Controller Model Rear Views



RF-2U24 with 4 Fibre Channel 16Gb ports plus 8 iSCSI 1GbE ports.



RF-2U24 with 8 Fibre Channel 8Gb ports plus 8 iSCSI 1GbE ports.



RF-2U24 with 4 iSCSI 10GbE ports plus 8 iSCSI 1GbE ports.



RF-2U24 with 16 iSCSI 1GbE ports.



RF-2U24 with 4 SAS 6Gb ports plus 8 iSCSI 1GbE ports.



RF-2U24 base unit with 8 iSCSI 1GbE ports.



RX-2U24 expansion with 4 SAS 6Gb ports.

System Options

Advanced Storage Services

LUN Masking

RF-2U24 RAID Base Unit

RAID controller
RAID levels supported
Host interfaces
Expansion shelf interface
HDD/SED/SSDs - Total capacity
On-line capacity expansion
Cache memory capacity
Non-volatile cache
Maximum LUN size
Maximum number of LUNs
Maximum number of hosts
LUN mapping/filtering
Host adapters available for
Power supplies and AC inlets

RX-2U24 Expansion Shelves

Expansion architecture
Expansion shelf architecture
Maximum drives/capacity
Removable drive trays
Power supplies
Cooling system
Active components
S.E.S. monitoring controllers

RX-2U12 Expansion Shelves

Maximum drives/capacity

RX-3U16 Expansion Shelves

Maximum drives/capacity

EX-4U60 Expansion Shelves

Maximum drives/capacity

Controls and Indicators

LCD front operation panel
LED indicators
Alerting
Component failure
LCD front operating console

Compatibility

Operating systems
Platforms supported
Cluster support
Hypervisor support
Remote monitoring ports
Communication protocols

Storage Management

Event notification
FlashAlert call home service
Manage out of band
FlashDisk Global Manager GUI

Environmental

Shock operating (half-sine)
Vibration operating (random)
Vibration operating (sine)
Acoustic Noise
Humidity
Altitude
Temperature

General

Uninterruptible power supply
Redundant AC power
Power consumption
RAID unit dimensions
RAID unit weight
Cooling system
Compliance

Warranty & Service

Standard warranty
Service contracts
Secure site
Installation and service

Increases snapshots from 64 to 256 per volume; from 128 to 4,096 total and increases volume copies from 64 to 256 total.
Enables volume protection needed in SAN environment.

Single/Dual redundant 64-bit, 13th generation controller
0, 1, 3, 5, 6, 1+0, 15, 16, 30, 50, 60
1GbE, 10GbE (copper or fiber), SAS 6Gb, FC 8Gb, FC 16Gb
SAS 6Gb, 4 lanes - 24Gb per port - up to 48Gb per array
24 (2.5") disks in 2U24 base; 720 TB max. with (14) 2U24 expansions
Automatically adds new drives to existing array - "on-the-fly"
16 GB per controller, included standard
Li-ION battery powered backup to flash memory
512 TB
1024 total, 64 per host ID
8 SAS or 64 Fibre Channel
Configurable per logical partition
PCI-X, PCI Express
Dual hot-swap redundant 530 W each; dual AC inlets

Dual/Quad SAS (Serial Attach SCSI) bus
Multiplexed access to each drive within the shelf
24 (2.5") disks per shelf to 48 TB each; up to 14 expansion shelves
Hot swappable; individual drive locks
Dual hot-swappable; 530 Watts each; 320 Watts typical draw
Dual hot-swappable fan modules
No active data path components on the midplane
Dual, hot-swappable SCSI Enclosure Services modules

12 disks (2.5"/3.5") per shelf to 96 TB each; up to 14 expansion shelves

16 disks (2.5"/3.5") per shelf to 128 TB each; up to 14 expansion shelves

60 disks (2.5"/3.5") per shelf to 480 TB each; up to 5 expansion shelves

2 x 16 character display, push button controls.
LED power, battery, controller, and system status
Audible and visual alerts
Failure indication through LCD and GUI
View/edit logical RAID/physical drives, setup hot-spare drives, map hosts, check parity, enable write-back cache, rebuild failed drive, view logs...

Supports Windows, Linux, MAC OS X, AIX and UNIX
Intel, SUN, HP, IBM RS-6000, Apple, SGI
Supports 9 industry-standards on Windows, Linux and UNIX
VMware ESX, Citrix XenServer, Windows Hyper-V, RHEL KVM
RJ45 10/100 Ethernet
TCP/IP, SNMP, SSH

Automatic event and problem alert notification
24-hour call center available for immediate action
Ethernet
Manage storage services of multiple FlashDisks from any web browser

MIL-STD 810E/833E

5G, 11 ms pulse width
5-500 Hz, (0.25 gm operating, 1.00 gm non-operating), X/Y/Z, 30 min.
5-500 Hz, (0.20 gm operating, 1.00 gm non-operating), X/Y/Z, 60 min.
65 dBA boundary, 60 dBA normal
5% to 90% operating, 5% to 95% non-operating (non-condensing)
12,000 feet operating, 40,000 feet non-operating
0° to 40° C operating, -40° to 60° C non-operating

Required when using write-back cache
Triple 90-260 VAC Inlet, 47-63 Hz
100 VAC @ 6/10A; 240 VAC @ 3/5 A; 530 W with PFC; 340 W draw
3.5"h x 17.5"w x 21"d
Approximately 60 lbs. fully loaded with drives
Two dual hot-swap, ball bearing blowers; 60 dB-A
FCC, UL, CE, CSA

Three year factory warranty and toll free hotline during business hours
Optional on-site service, spare parts and advance parts replacement
Customizable service programs for classified sites
On-site installation; 24x7 service available

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