

FlashDisk® Rugged Hybrid Disk Array RH-2U24 Series

Rugged 2U High Performance 12 GB/s Hybrid Disk Array for C4ISR Supports HDD/SSD/SED Drives - Rugged 1U Tray - COTS Prices

FlashDisk RH-2U24 is a rugged Hybrid Storage Array offering exceptionally high performance levels with Fibre Channel, SAS and iSCSI host connectivity support.

This hybrid array offers the performance of all flash arrays in a hybrid array that uses a modest number of SSDs to accelerate the performance of the standard hard disks with the newest 14th generation FlashDisk array. Now mobile deployments can obtain the speed they need without the full cost of an all flash array. SSDs in the base unit are assigned for read caching to accelerate performance of all the hard disks. For write intensive applications, SSDs can be assigned to dedicated volumes. The unit offers up to 12 GB/sec. data throughput and 250K random IOPS with one shelf and 500K IOPS with two shelves.

These RH-2U24 "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 - but far less expensive than fully rugged systems. It supports (24) 2.5" HDD/SSD/SEDs per shelf and provides up to 128 TB of storage in the base unit, expandable to 1.6 PB. It includes 64 GB controller cache expandable to 256 GB.



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

The RH-2U24 is the next generation of the rugged array already approved by the US Army for field use and deployed 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.



FlashDisk RH-2U24, shown in anodized black, supports a combination of HDD/SSD/SEDs - 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
 - Saves 3 ft of service space in rear
 - Front handle for pulling tray
- > Adds torsion strength and rigidity
- > Increases shock and 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 RH-2U24 with 1U mounting tray shown in US Navy Gray.



FlashDisk RH-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. Can mix both SED and non SED capable SSDs within the same array.

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 uses Super Caps to maintain controller cache

SSDs for Vibration Resistance: /SSDs offer capacity up to 15 TB each.

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

RH-2U24 Base Unit with Expansion Shelf



The RH-2U24 Series supports 92 TB in the base unit and 92 TB per expansion shelf.

RH-3U16 Rear View



Universal ports accept SFPs for 8 Gb & 16 Gb Fibre Channel and 10 Gb Ethernet that support simultaneous multi-protocol access. Protocols are easily changed with SFP swaps.

Rugged 1U Tray Interior and Mounting



Interior view of mounting tray



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

System Options

Advanced Storage Services

Increases snapshots from 64 to 256 per volume; from 128 to 4,096 total and increases volume copies from 64 to 256 total.

LUN Masking

Enables volume protection needed in SAN environment.

RH-2U24 RAID Base Unit

RAID controller

Single/Dual redundant 64-bit, 14th generation controller

RAID levels supported

0, 1, 3, 5, 6, 1+0, 15, 16, 30, 50, 60

Host interfaces

Up to 20 ports - 1GbE, 10GbE fiber, FC 8Gb, FC 16Gb

Expansion shelf interface

SAS 12Gb, 4 lanes - 48 Gb per port - up to 192 Gbps per array

Drives - Total capacity

24 (2.5") drives in 2U24 base to 92 TB; supports 14 expansion shelves

On-line capacity expansion

Automatically adds new drives to existing array - "on-the-fly"

Cache memory capacity

64 GB standard, expandable to 256 GB total for system

Non-volatile cache

Super Capacitor powered backup to flash memory

Maximum LUN size

512 TB

Maximum number of LUNs

1024 total, 64 per host ID

Maximum number of hosts

64 Fibre Channel

LUN mapping/filtering

Configurable per logical partition

Host adapters available for

PCI-X, PCI Express

Power supplies and AC inlets

Dual hot-swap redundant 530 W each; dual AC inlets

RX-2U24 Expansion Shelves

Expansion architecture

Dual/Quad SAS (Serial Attach SCSI) bus

Expansion shelf architecture

Multiplexed access to each drive within the shelf

Maximum drives/capacity

24 (2.5") SSDs per shelf to 300 TB each; up to 14 expansion shelves

Removable drive trays

Hot swappable; individual drive locks

Power supplies

Dual hot-swappable; 530 Watts each; 320 Watts typical draw

Cooling system

Dual hot-swappable fan modules

Active components

No active data path components on the midplane

S.E.S. monitoring controllers

Dual, hot-swappable SCSI Enclosure Services modules

Controls and Indicators

LCD front operation panel

2 x 16 character display, push button controls.

LED indicators

LED power, battery, controller, and system status

Alerting

Audible and visual alerts

Component failure

Failure indication through LCD and GUI

LCD front operating console

View/edit logical RAID/physical drives, setup hot-spare drives, map hosts, check parity, enable write-back cache, rebuild failed drive, view logs...

Compatibility

Operating systems

Supports Windows, Linux, MAC OS X, AIX and UNIX

Platforms supported

Intel, SUN, HP, IBM RS-6000, Apple, SGI

Cluster support

Supports 9 industry-standards on Windows, Linux and UNIX

Hypervisor support

VMware ESX, Citrix XenServer, Windows Hyper-V, RHEL KVM

Remote monitoring ports

RJ45 10/100 Ethernet

Communication protocols

TCP/IP, SNMP, SSH

Storage Management

Event notification

Automatic event and problem alert notification

FlashAlert call home service

24-hour call center available for immediate action

Manage out of band

Ethernet

FlashDisk Global Manager GUI

Manage storage services of multiple FlashDisks from any web browser

Environmental

Shock operating (half-sine)

5G, 11 ms pulse width

Vibration operating (random)

5-500 Hz, (0.25 gm operating, 1.00 gm non-operating), X/Y/Z, 30 min.

Vibration operating (sine)

5-500 Hz, (0.20 gm operating, 1.00 gm non-operating), X/Y/Z, 60 min.

Acoustic Noise

65 dBA boundary, 60 dBA normal

Humidity

5% to 90% operating, 5% to 95% non-operating (non-condensing)

Altitude

12,000 feet operating, 40,000 feet non-operating

Temperature

0° to 40° C operating, -40° to 60° C non-operating

General

Redundant AC power

Dual 90-260 VAC Inlet, 47-63 Hz

Power consumption

100 VAC @ 6/10A; 240 VAC @ 3/5 A; 530 W with PFC; 340 W draw

RAID unit dimensions

3.5" h x 17.5" w x 21" d

RAID unit weight

Approximately 50 lbs. fully loaded with drives

Cooling system

Two dual hot-swap, ball bearing blowers; 60 dB-A

Compliance

FCC, UL, CE

Warranty & Service

Standard warranty

Standard one year next day on site, advanced part replacement and toll free hotline during business hours (M-F, 8 AM - 5 PM)

Service contracts

Optional 24x7 on-site service, spare parts and advance parts replacement

Secure site

Customizable service programs for classified sites

Installation and service

On-site installation; 24x7 service available

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