

active™

S T O R A G E

QUICK START GUIDE

mRAID I Quick Start Guide

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mRAID User's Guide

Thank you for purchasing the mRAID, an advanced RAID storage system offering superior performance, capacity, scalability and reliability.

The mRAID is carefully designed for quick easy installation and years of trouble free service.

This guide is provided to get you started and up and running with the mRAID, but is not meant to replace the assistance of your Authorized Active Storage Reseller or Active Storage customer support.

While the mRAID system is complete and ready to use out of the box in most applications, we highly recommend installation by a qualified technician.

All the components required for installation are included but should be checked against the packing list and your order.

This guide assumes the user has a working knowledge of all components and most operating systems, and general knowledge of RAID storage.

mRAID systems are ready for use out of the box and will provide excellent performance and reliability in nearly all possible configurations. For assistance in optimizing the mRAID for your application, please contact your Reseller or Active Storage customer support.

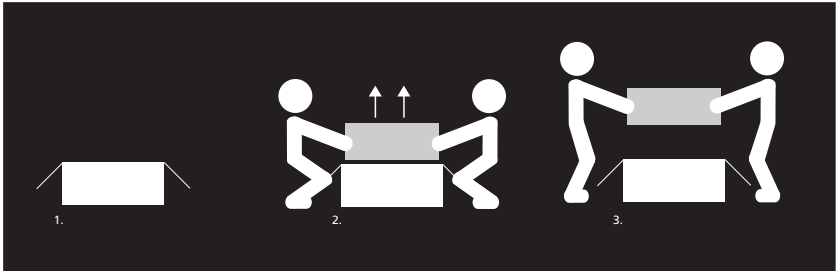
www.active-storage.com | 818.709.1133

Unpacking and Installing the System

The mRAID is complete with all components and hard drives installed. The packaging has been specifically designed to protect the system from damage and facilitate safe removal. Please inspect the packaging for any signs of damage prior to removing the system. If damage is noted, carefully check your mRAID to ensure the packaging damage has not affected the unit. If any damage has occurred, please contact your Reseller immediately.

Follow the steps below to remove the system from the packaging.

1. Locate a sturdy table, bench, cart or other flat surface capable of supporting 150lbs (68kg). Make sure the surface is large enough to allow the system proper support.
2. The system is packaged using an outer and inner box. Carefully cut open the outer box and fold back the flaps. Do the same with the inner box, and remove the accessory box and place it aside. Two people are required to remove the system from the inner box. With one person on each side of the package, remove the upper protective foam and carefully slide your hands under each side of the mRAID and lift it out of package and place gently on the surface previously designated.



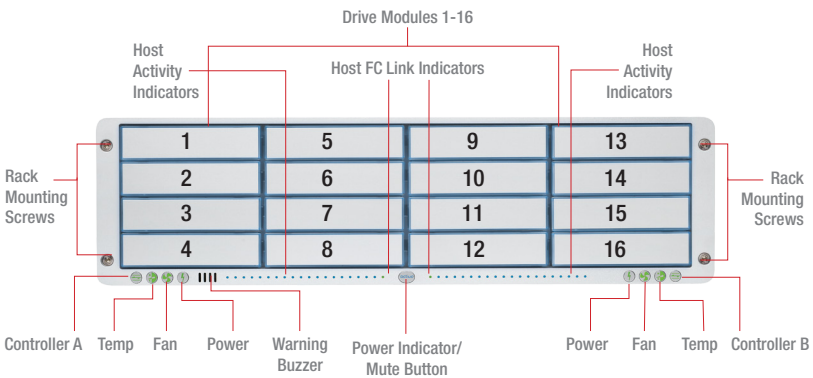
3. Remove protective film from system – this must be removed before powering the system on to prevent damage to the system.
4. Check to make certain all components are properly seated.
5. The system is now ready for installation into a 4 post equipment rack using the instructions found on the mounting rails. It is recommended that two people are used to install the system into the rack – one in front of the rack and one in the rear of the rack to guide the installation. The system uses front to rear cooling, please keep that in mind when mounting in the equipment rack. The mRAID was designed to deliver maximum performance and trouble free use, but in order to achieve this, the rack it will be installed into must exhibit good rack stability. It is suggested that the mRAID be installed in the lower half of the rack and away from tape loaders which may produce excessive vibration.
6. After the system is slid into the rack, secure it with the included mounting screws and install the power cords.
Note: Power requirements for the mRAID can be found at www.active-storage.com/support.

Getting to know your mRAID

The mRAID system is designed for easy deployment and operation. The system is ready to use out of the box after unpacking and installing in an equipment rack. However, you should take a few minutes to familiarize yourself with the system and its components. Each connector is clearly marked and each component is easily accessible. The mRAID has been designed to provide visual and audible status indication on the front of the system including the hot-swappable drive modules as well as on each swappable component on the rear of the system. These indicators work in conjunction with the Active Viewer and management tools. If you have any questions on system installation or components, please contact your Reseller or Active Storage customer support for assistance.

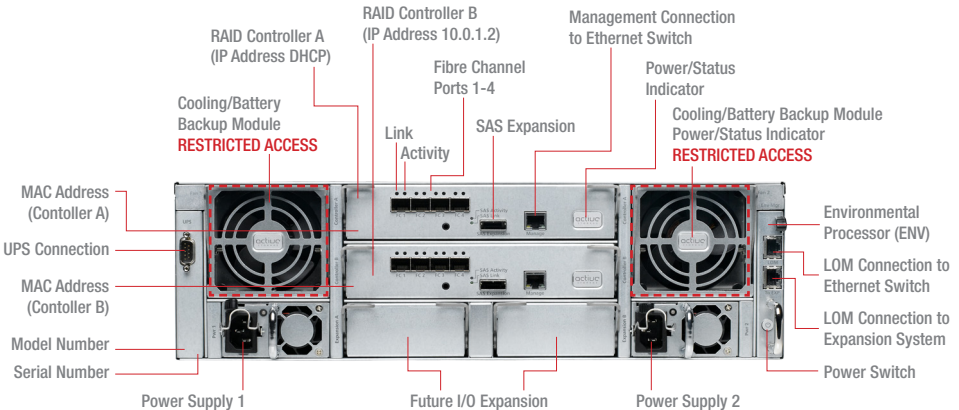
Front Panel

fig.1



Rear Panel

fig.2



WARNING: Hazardous moving parts. Keep away from moving fan blades.

Connecting your mRAID

The mRAID utilizes a redundant RAID controller design that provides four 8Gb/s Fibre Channel connections on each RAID controller to a Fibre Channel host or network. The system offers the flexibility to connect two to eight connections depending on the user environment and intended usage. It is recommended that a minimum of two Fibre Channel connections be made, one to each RAID controller. The charts below describe some possible configurations. Note: Using all Fibre Channel connections ensures maximum throughput and redundancy.

Controller A	Controller B	Maximum Throughput Possible*	Fail Over Path	Degraded Controller Performance*	Notes:
FC Port 1 Connected	No Connection	8GB/s	No	Fail over not possible, no redundant operation	Not recommended
No Connection	FC Port 1 Connected	8GB/s	No	Fail over not possible, no redundant operation	Not recommended
FC Port 1 Connected	FC Port 1 Connected	16Gb/s	Yes	8Gb/s (Half overall)	Minimum recommended configuration for a single mRAID
FC Ports 1-2 Connected	FC Ports 1-2 Connected	32Gb/s	Yes	16Gb/s (Half overall)	Minimum recommended configuration for a single mRAID and Expansion
FC Ports 1-3 Connected	FC Ports 1-3 Connected	48Gb/s	Yes	24Gb/s (Half overall)	Acceptable configuration, but may provide unbalanced performance
FC Ports 1-4 Connected	FC Ports 1-4 Connected	64Gb/s	Yes	32Gb/s (Half overall)	Recommended configuration for mRAID and Expansion systems

*Theoretical port performance, not indicative of your actual throughput

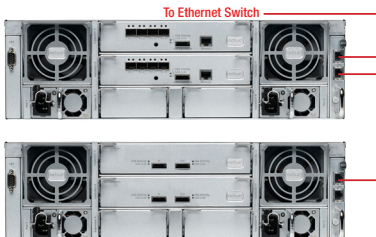
The mRAID supports 4Gb and 8Gb Fibre Channel connections using either industry standard optical or Apple copper Fibre Channel cables* or any combination of either. The latest recommended SFP and optical cables, and FC switches can be found at www.active-storage.com/support.

Monitoring and managing the mRAID is done using an Ethernet connection on each RAID controller. The system provides dual Ethernet ports which provide redundant connections to the Ethernet network. The system will function with one, two or no Ethernet connections, although this is not recommended.

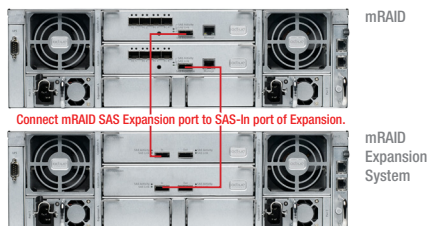
A Lights Out Management (LOM) ethernet port is located on the Environmental Processor (ENV). It is highly recommended this be connected to your internal ethernet network. The additional ethernet connection on the ENV is used to directly connect to the LOM connection on a mRAID Expansion system.

*Limited to 4Gb/s throughput using Apple FC cable.

LIGHTS OUT MANAGEMENT ETHERNET CONNECTION



CONNECTING AN mRAID EXPANSION



Connecting your mRAID (continued)

The mRAID supports most popular UPS (Uninterruptible Power Supplies) systems. If you are not sure if your UPS is supported, a list of supported systems can be found at www.active-storage.com/support.

The UPS can be plugged directly into the UPS 9 pin port on the mRAID; the system will automatically recognize it. If your UPS uses a different connection see Active Storage Support for more information (www.active-storage.com/support).



Using the mRAID

Once you have connected your mRAID to the Fibre Channel network or host computer, you can switch the system on by depressing the power button on the ENV at the rear of the system.



The system will begin extensive internal diagnostics. During the approximately 3 minute start up routine, the system will cycle through and blink certain indicator lights, sound the buzzer, and cycle the cooling modules as it tests each component. Once the diagnostic cycle is complete, the system status indicators will illuminate indicating the status of the various components of the system, and the Active Storage front bezel logo button will glow blue.

The system is now ready for use. If this is the first time you are using the mRAID, you should download the latest version and launch the mRAID Admin utility and Active Viewer. These can be downloaded at www.active-storage.com/support.

Shutting Down your mRAID

The mRAID is designed to be used 24/7/365 and rarely requires shutdown, but in the case of a shutdown, the system is designed to provide the greatest protection of data possible. Following these simple steps will ensure a proper and safe shutdown.

1. Unmount all mRAID volumes from the host computer or network before beginning a shutdown
- 2a. **Using the mRAID power button** – Depress and hold the power button for 5 seconds. Doing this will place the mRAID into the shutdown sequence. Fibre Channel activity will cease (all requests from the host will be rejected if the system is unintentionally still mounted), any data remaining in the controller or drive cache will be flushed to the hard drives, hard drives will be put into an idle state, batteries will be shut off, and the system will power down; this takes approximately 10-50 seconds.
- 2b. **Using the Active Storage Management Suite** - Select shutdown from the menu.

WARNING: Improper Shut Down May Cause Data Loss

Using The Active Storage Management Suite

Please refer to the help guides included in the management software

System Indicators

Operation of the status indicators - Front

Status Indicator	Color and Action	Description
Active Logo	Blue Blinking	System OK Buzzer muted
FC Link	Off Green	No FC Link FC Link Established
Controller Icon	Green Red	Controller OK Failure
Power Indicator	Green Red	Power Supply OK Failure or Power Cord Removed
Temp Indicator	Green Red	Temperature OK Over temp condition
Fan Indicator	Green Red	Fans OK Fan Fail
Drive Module	Off Blue Red	OK Activity Drive Fail
Host Activity (40 LEDs)	Off Blue	No Fibre Channel Host Activity Indicates level of activity

Operation of the status indicators - Rear

Status Indicator	Color and Action	Description
Fan Active Logo	Blue Red	System OK Failure
Controller Active Logo	Green Blinking Green Red	Controller OK System Booting Failure
Power Supply	Green Green Blinking Red Off	Power Supply OK – System on Power Supply OK – System off Failure Power Cord Removed

System Problems

If you should ever experience a problem with your mRAID system, you can quickly assess the problem using the Active Viewer software on a remote computer. In addition, if you are near the system, you can refer to the system status indicators on the enclosure in order to determine the component at fault.

Since the mRAID has been designed for quick and easy field service, the faulty component can easily be replaced by the user, reseller, or authorized mRAID service person.

If you are unsure about replacement or require a service part, you can contact your reseller, or call Active Storage support directly at 1-818-709-1133. Alternately you can contact support at support@active-storage.com or visit www.active-storage.com/support for the diagnostic information.

Caution:

The pre-installed hard drive modules were designed specifically for use in the mRAID and mRAID Expansion System. They will not function correctly in ActiveRAID systems. Using these hard drive modules in an ActiveRAID may result in data loss.

CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
WHEN THE BATTERY REACHES THE END OF ITS USEFUL LIFE, THE SPENT BATTERY SHOULD BE
DISPOSED OF BY A QUALIFIED RECYCLER OR HAZARDOUS MATERIALS HANDLER. CONTACT
ACTIVE STORAGE, INC. FOR RECYCLING OR DISPOSAL INFORMATION.**



Communications Regulation Information

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used in accordance with Active Storage's instructions, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense. Important changes or modifications to this product not authorized by Active Storage, Inc., could void the EMC compliance and negate your authority to operate the product.

Important Safety Information

To ensure your own safety, and the safety of your Active Storage mRAID system, always follow the precautions below:

The only way to disconnect power completely from the system is to remove the two power cords. Make sure at least one end of each power cord is within easy reach so that you can unplug the mRAID. For your own safety and that of your mRAID system, always take the following precautions.

Disconnect the power cords (by pulling the plug, not the cord) if any of the following conditions exists:

- the power cord or plug becomes frayed or otherwise damaged
- your mRAID system is exposed to rain or any other excess moisture
- your system has been dropped or the enclosure has otherwise been damaged
- you want to clean the enclosure (call Active Storage for instructions before using any cleaning products on the enclosure)
- you spill something into the enclosure

Be sure that you always do the following:

- Protect your system from dampness or wet weather, such as rain, snow, etc.
- Keep your system away from any exposure to liquid from a washbasins, bathtubs, shower etc.
- Follow all instructions and warnings when working with your system

All electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by trained personnel. Do not allow children access to the inside of any electrical product and do not permit them to handle any cables. This system is certified as a component for use only with equipment for which the suitability of the combination has been determined by a Nationally Recognized Testing Laboratory.

High-Risk Safety Warning

This system is not intended for use in the operation of nuclear facilities, aircraft navigation or communications systems, or air traffic control systems, or for any other use where the failure of the system could lead to death, personal injury or severe environmental damage.

Notes

mRAID | Quick Start Guide



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