ServeRAID M5025 SAS/SATA Controller

Quick Install Guide



Thank you for purchasing the ServeRAID M5025 SAS/SATA controller. Please take a few minutes to read this Quick Install Guide before you install the controller. For more information about any topic covered in this guide, refer to the other documents on your ServeRAID M Documentation CD.

Note: Record your controller serial number in a safe location in case you need to contact IBM.

The ServeRAID M5025 SAS/SATA controller (Serialattached SCSI/SATA) is a PCI Express 2.0, low-profile RAID controller based on the SAS2108ROC, which is a SAS/SATA RAID On-a-Chip device. The controller controls eight external 6-Gb/s SAS/SATA ports through two SFF-8088 x4 Mini SAS external connectors.

The ServeRAID M5000 Series Battery Assembly can be mounted directly to the controller using a daughtercard or remotely using a cable.

You can use the ServeRAID M5000 Series Advanced Feature Key to enable support for RAID 6 configurations and self-encrypting disks (SED).

For more information about this controller, the iBBU, and the key, refer to the *ServeRAID M5025 SAS/SATA Controller User's Guide* on the ServeRAID M Documentation CD.

Note: SATA II is the only type of SATA supported by this controller.

SERVERAID M5025 CONTROLLER INSTALLATION

Attention: Back up your data before you change your system configuration or you could lose data.

Perform the following steps to install the controller.

Step 1 Unpack the Controller

Important: When you handle static-sensitive devices, take precautions to avoid damage from static.

Unpack the controller in a static-free environment. Remove the controller from the antistatic bag and inspect it for damage.

If the controller appears to be damaged, or if the ServeRAID M Documentation CD is missing, contact your place of purchase.

For the utility programs and the device drivers for the operating systems, go to the following website: http://www.ibm.com/support/en/us/.

- ServeRAID M5025 SAS/SATA Controller User's Guide
- ServeRAID-MR Software User's Guide
- ServeRAID-MR Device Driver Installation User's Guide

Step 2 Prepare the Computer

Review all safety information provided with the computer. Unplug the power cords from the power supplies, disconnect the computer from the network, and remove the computer cover. See the documentation provided with the computer for instructions.

Attention: Before you install the controller, make sure that the computer is disconnected from the power and from any networks.

Step 3 Review the Connectors

Figure 1 shows the location of the connectors.

Figure 1 ServeRAID M5025 SAS/SATA Controller Card Layout



Table 1 describes the connectors on theServeRAID M5025 controller.

Table 1 Jumpers and Connectors

| Jumper/ Connector | Туре | Description |
|----------------------|--|--|
| J1A1 | Universal Asyn- chronous Receiver/ Transmitter (UART) debugging | 4-pin connector Reserved for IBM use. |
| J1A2 | ServeRAID M5000 Series Advanced Feature Key header | 2-pin connector Enables support for RAID 6 configurations and self-encrypting disks (SED). |
| J1A4 | x4 SAS Ports 4–7 Mini SAS 4i connector | Connects the cables from the con- troller to SAS drives or SATA II drives, or a SAS expander. |
| J1B1 | x4 SAS Ports 0–3 Mini SAS 4i connector | Connects the cables from the con- troller to SAS drives or SATA II drives, or a SAS expander. |
| J6A1 | Global Drive Fault LED header | 2-pin connector Connects to an LED that indicates whether a drive is in a fault condition. |
| J6A2 | SAS Activity LED header | 2-pin connector Connects to an LED that indicates drive activity. |
| J6A3 | Write-pending Indi- cator (dirty cache) LED connector | 2-pin connector Connects to an LED that indicates when the data in the cache has yet to be written to the storage devices. Used when the write-back feature is enabled. |
| J6B1 | Remote Battery Backup Unit connector | 20-pin connector Connects the intelligent Battery Backup Unit remotely to the controller. |
| J6B2 | Battery Backup Unit connector | 20-pin connector Connects the intelligent Battery Backup Unit directly to the controller. |

Note: J6A1, J6A2, and J6A3 are behind the iBBU when it is installed directly, but they are still accessible.

Step 4 Install the Controller on the Motherboard

Insert the controller in a PCI Express slot on the motherboard, as shown in Figure 2.

Press down gently but firmly to seat the card correctly in the slot. Secure the controller to the computer chassis with the bracket screw.

Note: This is a PCI Express x8 card and it can operate in x8 or x16 slots. However, some PCIe slots support only PCIe graphics cards; if a RAID controller is installed, it will not function.

Refer to your motherboard guide for information about the PCI Express slot.

Figure 2 Installing the ServeRAID M5025 SAS/ SATA Controller



Step 5 Configure and Install the SAS Devices, SATA II Devices or Both

Configure the SAS devices, SATA II devices, or both, and install them in the external enclosure.

- Note: Refer to the documentation for the external devices for pre-installation configuration requirements.
- Note: The ServeRAID M5025 controller supports SATA II protocols but not SATA I protocols. All references to SATA in this guide are to SATA II.
- Step 6 Connect the Controller to the SAS Devices, SATA II Devices, or Both

Connect the cables between the controller and the SAS devices, SATA II devices, or both. Refer to the external device documentation to view connector locations for the external devices.

Note: Refer to the *ServeRAID M5025 SAS/SATA Controller User's Guide* for information about the cables and the connectors.

Step 7 Turn on the Power to the Computer

Reinstall the computer cover and reconnect the power cords.

Turn on the power to the computer, making sure that the power is turned on to the SAS devices and the SATA II devices before or at the same time as the host computer. If the power is turned on to the computer before it is turned on to the devices, the computer might not recognize the devices.

During boot, a BIOS message similar to the following displays:

LSI MEGARAID BIOS VERSION xxxx [date] Copyright(c) 2010, LSI Corporation HA-1 (Bus x Dev y) MegaRAID 9260-8i PCI-Express RAID Controller Standard FW xxxx DRAM=xxx MB(SDRAM)

The firmware takes several seconds to initialize. During this time the adapter scans the bus(es).

Attention: The battery in the iBBU must charge for at least six hours under normal operating conditions. To protect your data, the firmware changes the Write Policy to *write-through* until the battery unit is sufficiently charged. When the battery unit is charged, the controller firmware changes the Write Policy to *write-back* to take advantage of the performance benefits of data caching.

Step 8 Run the WebBIOS Configuration Utility

- Run the WebBIOS Configuration Utility to configure the physical arrays and the logical drives. When the message Press <Ctrl><H> for WebBIOS displays on the screen, press CTRL+H immediately to run the utility.
- Note: Refer to the ServeRAID-MR Software User's Guide on the ServeRAID M Documentation CD for detailed steps on configuring the physical arrays and the logical drives.

Step 9 Install the Operating System Driver

The ServeRAID M5025 controller can operate under various operating systems. To operate under these operating systems, you must install software drivers.

View the supported operating systems and download the latest drivers for the controller at

http://www.ibm.com/support/en/us. For updates, click **Downloads and drivers**. Access the download center and follow the steps to download the driver.

Refer to the ServeRAID-MR Device Driver Installation User's Guide on the CD for details on installing the driver. Be sure to use the latest Service Packs provided by the operating system manufacturer and review the readme file that accompanies the driver.

SUPPORTED RAID LEVELS

The ServeRAID M5025 controller supports drive groups using the following RAID levels:

- RAID 0 (data striping): Data is striped across all drives in the group, enabling very fast data throughput. There is no data redundancy. All data is lost if any drive fails.
- RAID 1 (drive mirroring): Data is written simultaneously to both drives in the drive group, providing complete data redundancy if one drive fails. RAID 1 supports an even number of drives from 2 to 32 in a single span.
- RAID 5 (drive striping with distributed parity): Data is striped across all drives in the group. Part of the capacity of each drive stores parity information that reconstructs data if a drive fails. RAID 5 provides good data throughput for applications with high read request rates.
- RAID 6 (drive striping with distributed parity across two drives): Data is striped across all drives in the group and two parity drives are used to provide protection against the failure of up to two drives. In each row of data blocks, two sets of parity data are stored.
 - **Note:** The ServeRAID M5000 Series Advanced Feature Key is required to make RAID 6 configurations on the ServeRAID M5025 SAS/SATA controller. For information about the Feature Key, see the *ServeRAID M5000 Series Advanced Feature Key Quick Install Guide.*
- RAID 10 (RAID 1 and RAID 0 in spanned groups): RAID 10 uses mirrored pairs of drives to provide

complete data redundancy. RAID 10 provides high data throughput rates.

- RAID 50 (RAID 5 and RAID 0 in spanned groups): RAID 50 uses both parity and drive striping across multiple drives to provide complete data redundancy. RAID 50 provides high data throughput rates.
- RAID 60 (RAID 6 and RAID 0 in spanned groups): RAID 60 uses both distributed parity across two parity drives and drive striping across multiple drives to provide complete data redundancy and high fault tolerance.
 - Note: Refer to the ServeRAID-MR Software User's Guide on the ServeRAID M Documentation CD for more information about RAID levels.

DISPOSAL OF BATTERY BACKUP UNITS

<u>Warning</u>: If the iBBU is damaged in any way, toxic chemicals may be released.

The material in the battery pack contains heavy metals that can contaminate the environment. Federal, state, and local regulations prohibit the disposal of rechargeable batteries in public landfills. Be sure to recycle the old battery packs properly. IBM reminds you that you must comply with all applicable battery disposal and hazardous material handling laws and regulations in the country or other jurisdiction where you are using the iBBU.

For battery disposal instructions, see the *IBM Systems Environmental Notices and User Guide* on the ServeRAID M Documentation CD.

Important: Replace your battery with only the same or equivalent type recommended by the manufacturer. For the replacement battery part number, see the ServeRAID M Problem Determination and Service Guide on the IBM Support website.

TECHNICAL SUPPORT

Refer to the *Important Notices* document for information about the technical support available for this product.



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