Graid Technology SR-1001

Graid Technology SupremeRAID SR-1001 NVMe RAID Controller User Manual

Model: SR-1001

1. Introduction

The Graid Technology SupremeRAID SR-1001 is an advanced NVMe RAID controller designed to enhance storage performance in demanding computing environments. This PCIe Gen 3.0 x16 card leverages a GPU-based architecture to deliver high throughput and IOPS, making it suitable for tower and edge servers, professional workstations, and gaming desktops. It supports up to 8 NVMe SSDs and offers flexible RAID levels (0, 1, 5, 6, 10) for secure and adaptable data management. This manual provides essential information for the proper installation, operation, and maintenance of your SupremeRAID SR-1001.

Figure 1: The SupremeRAID SR-1001 NVMe RAID Controller, showcasing its compact design and integrated cooling fan.

2. Key Features

- **Precision Performance:** Achieves up to 6M IOPS and 80GB/s throughput for demanding workloads.
- **Scalability:** Supports up to 8 NVMe SSDs, ideal for professional environments requiring high-performance storage.
- **Flexible RAID Levels:** Offers RAID 0, 1, 5, 6, and 10 for secure and adaptable storage solutions.
- **Effortless Deployment:** Plug-and-play design ensures simple setup without additional cabling or motherboard reconfiguration.
- **Optimized Efficiency:** Offloads RAID tasks to the integrated GPU, freeing CPU resources.
- **Future-Ready Design:** Supports features like thin provisioning and encryption via software updates.
- **Broad Compatibility:** Compatible with major Linux distributions, Windows Server, Windows 11, and AMD, Arm, Intel platforms.

3. Setup and Installation

3.1 Package Contents

Verify that your package contains the following items:

- SupremeRAID SR-1001 NVMe RAID Controller card
- Quick Start Guide (if included)
- Driver and Software CD/USB (or download instructions)

3.2 System Requirements

- Available PCIe Gen 3.0 x16 slot
- Compatible operating system (Linux distributions, Windows Server 2019/2022, Windows 11)
- Compatible NVMe SSDs
- Sufficient power supply (Maximum 30 W for the card)

3.3 Hardware Installation

1. **Power Off System:** Ensure your computer or server is completely powered off and disconnected from the power source.
2. **Open Chassis:** Open the computer chassis to access the motherboard.
3. **Locate PCIe Slot:** Identify an available PCIe Gen 3.0 x16 slot.
4. **Insert Card:** Carefully align the SupremeRAID SR-1001 card with the PCIe slot and press firmly until it is securely seated. Ensure the retention clip (if present) engages.
5. **Secure Card:** Secure the card with the chassis screw or latch mechanism.
6. **Connect NVMe SSDs:** Connect your NVMe SSDs to the appropriate ports on your motherboard or via M.2 to U.2 adapters if using U.2 drives. The SR-1001 manages these drives, but they must be physically connected to the system.
7. **Close Chassis:** Close the computer chassis and reconnect the power source.

Figure 2: Rear view of the SupremeRAID SR-1001, showing the four mini-DisplayPort outputs of the integrated NVIDIA T400 GPU. These ports are typically not used for RAID functionality but are part of the GPU hardware.

3.4 Software Installation

1. **Boot System:** Power on your computer or server.
2. **Download Drivers:** Visit the official Graid Technology website to download the latest drivers and management software for your operating system.
3. **Install Software:** Follow the provided instructions to install the drivers and the SupremeRAID management utility. This utility is crucial for configuring RAID arrays and monitoring drive status.
4. **Reboot:** Reboot your system after installation to ensure all changes take effect.

4. Operating the SupremeRAID SR-1001

4.1 Initial Configuration

After successful driver installation, use the SupremeRAID management utility to configure your NVMe SSDs into RAID arrays.

1. **Launch Utility:** Open the SupremeRAID management utility.

2. **Detect Drives:** The utility should automatically detect all connected NVMe SSDs.
3. **Create RAID Array:** Select the drives you wish to include in a RAID array and choose your desired RAID level (0, 1, 5, 6, or 10).
4. **Confirm Settings:** Review the configuration settings and confirm to create the RAID array.
5. **Format Volume:** Once the RAID array is created, it will appear as a single logical volume in your operating system. Format this volume using your OS's disk management tools before use.

4.2 RAID Levels Explained

- **RAID 0 (Striping):** Offers maximum performance and capacity by striping data across multiple drives without redundancy. Data loss occurs if any drive fails.
- **RAID 1 (Mirroring):** Provides data redundancy by mirroring data across two drives. Capacity is limited to a single drive's size.
- **RAID 5 (Striping with Parity):** Stripes data and parity information across three or more drives. Offers good performance and fault tolerance for single drive failures.
- **RAID 6 (Striping with Dual Parity):** Similar to RAID 5 but includes a second independent parity block, allowing for fault tolerance against two simultaneous drive failures. Requires four or more drives.
- **RAID 10 (Striping and Mirroring):** Combines RAID 0 and RAID 1. Data is striped across mirrored pairs. Offers high performance and excellent fault tolerance. Requires four or more drives.

5. Maintenance

Regular maintenance ensures the longevity and optimal performance of your SupremeRAID SR-1001 and the connected NVMe SSDs.

- **Software Updates:** Periodically check the Graid Technology website for driver and firmware updates. Keeping your software up-to-date can improve performance, add features, and resolve issues.
- **Monitor Drive Health:** Use the SupremeRAID management utility to monitor the health and status of your NVMe SSDs. Replace failing drives promptly to prevent data loss, especially in non-redundant RAID configurations.
- **System Cooling:** Ensure adequate airflow within your system chassis to prevent overheating of the RAID controller and other components.
- **Data Backup:** Regularly back up critical data, even when using redundant RAID levels. RAID is not a substitute for a comprehensive backup strategy.

6. Troubleshooting

This section addresses common issues you might encounter with the SupremeRAID SR-1001.

6.1 Common Issues and Solutions

- **Card Not Detected:**
  - Ensure the card is fully seated in the PCIe slot.
  - Verify the PCIe slot is functional by testing with another known-good card.
  - Check BIOS/UEFI settings to ensure the PCIe slot is enabled.
- **Drives Not Detected by Utility:**
  - Confirm NVMe SSDs are properly connected to the motherboard.

- Ensure the latest SupremeRAID drivers are installed.
- Check if the NVMe SSDs are recognized by the system BIOS/UEFI.

- **RAID Array Creation Fails:**
  - Ensure all selected drives are healthy and unallocated.
  - Verify that you have enough drives for the chosen RAID level.
  - Consult the SupremeRAID management utility's logs for specific error messages.
- **Performance Issues:**
  - Ensure the card is in a PCIe Gen 3.0 x16 slot operating at full bandwidth.
  - Check for background processes consuming system resources.
  - Update drivers and firmware.
  - Monitor drive health; degraded drives can impact performance.

If you continue to experience issues, refer to the official Graid Technology support resources or contact their technical support.

7. Specifications

Feature	Detail
Host Interface	x16 PCIe Gen 3.0
Power Consumption	Maximum 30 W
Form Factor	2.713” H x 6.137” L, single-slot design
Weight	132.6 g
GPU Model	NVIDIA T400
Operating System Compatibility	Major Linux distributions (AlmaLinux, CentOS, Debian, openSUSE, Oracle Linux, SLES, RHEL, Rocky Linux, Ubuntu), Windows Server 2019/2022, Windows 11
Supported Platforms	AMD, Arm (Ubuntu only), Intel
Virtualization Support	KVM, Proxmox VE, Virtuozzo OpenVZ, Windows Server Hyper-V
Supported NVMe SSDs	Dapustor, Hagiwara, Intel/Solidigm, Kingston Technologies, KIOXIA, Memblaze, Micron, Petaio, Phison, Samsung, Scaleflux, Seagate, Western Digital

8. Warranty and Support

8.1 Product Warranty

Graid Technology products are covered by a limited warranty. For specific warranty terms and conditions, please refer to the warranty information included with your product packaging or visit the official Graid Technology website. Keep your proof of purchase for warranty claims.

8.2 Technical Support

For technical assistance, troubleshooting, or further inquiries, please contact Graid Technology support through their official website. You may find FAQs, knowledge bases, and contact forms for direct support.

Graid Technology Website: www.graidtech.com