

ARAID[®] USER MANUAL



ACCORDANCE

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 **araid® Model 3500 / S3500**
User's Manual – Revision A

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Thank you for purchasing ARAID 3500 / S3500

Before you begin, please read the following:

ARAID 3500 / S3500 complies with standard RAID 1 (disk mirroring) and RAID 0 (disk striping) definitions.

Important Please set both primary and secondary drives at SATA II (3.0Gb) mode before installation.

Note: 3G mode is the factory default setting when you purchase drives from market.

Please DO NOT mix SATA II (3G) with SATA I (1.5G) drives on this device.

- **Use Two Identical Hard Drives as possible** We recommend that two identical drives (same brand, model, capacity, place of production, firmware version) be used with this product for optimal performance and convenience. The drives used must be brand new or in excellent condition. Accordance also recommends using the drive manufacturer's testing tool to scan the drives for bad sectors and correct mechanical and electrical operation.
- **Purchase Spare Drives** With new types of drives rolling out to the market at a fast pace, you may not be able to obtain the same model of the drive in the future. Therefore, we recommend users purchase a number of identical brand new drives in advance, so ARAID 3500 / S3500 can be used to its full extent. However, if users cannot obtain identical types of drives, users may use newer drives made by same manufacturer.
- **No Need to pre-FORMATTING Brand New Drives** When using ARAID 3500 / S3500, you do not need to do FDISK and FORMAT steps for brand new drives. You can directly use "Auto-Rebuild" feature to duplicate/clone new target drive.
- **Heat Dissipation** ARAID 3500 / S3500 is designed with a 6cm high quality cooling fan with long life. It provides excellent heat dissipation for two 7200 RPM drives. With two 7200 RPM drives, it is best to use a PC enclosure with excellent overall reinforced heat dissipation design. It prevents the PC or disk array failures caused by long durations of poor heat dissipation..

Notice for RAID 1 Users (Front Panel Switch Setting)

Dual: Dual drive mode – This is the default normal operating mode for RAID 1. The ARAID 3500 / S3500 will access both Primary and Secondary drives. Content on both drives are constantly synchronized.

Single: Single drive mode – In this mode, power to the secondary drive is shut down. The ARAID can't synchronize when set to single drive operation. .

Mirror-On-Demand: You can perform a manual Mirror-On-Demand (duplicate primary drive to secondary drive) by switching from Single mode to Dual mode. If ARAID is switched from Dual mode to Single mode, the secondary drive will stop performing read/write and real-time backup operations.

Notice for RAID 0 Users (Front Panel Switch Setting)

Dual: Dual drive mode – This is the default normal operating mode for RAID 0. RAID 0 (Disk Stripe) employs two drives to increase disk capacity and increase performance.

Single: DO NOT set switch for RAID 0 operation. Although RAID 0 operation requires two on-line drives, the Single mode is not allowed. Use a small piece of tape to mistakenly switch to Single mode which causes data loss.

Warning: If users mistakenly switch to Single mode, then turn off and power on the ARAID, it may cause data loss.

Unpacking ARAID 3500 / S3500

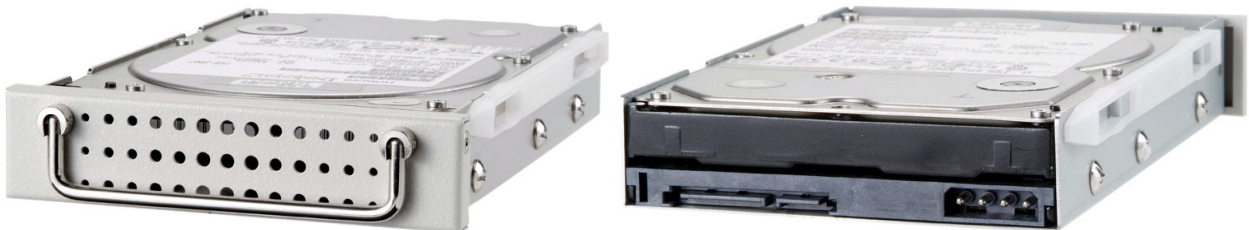
1. Please remove ARAID 3500 / S3500 from the package.
2. Check the package for the following items.
Contact your retailer immediately for any missing or damaged items.
 - ① Mobile rack 1 (in upper bay)
 - ② Mobile rack 2 (in lower bay)
 - ③ Two security keys
 - ④ Bag of screws
 - ⑤ User's Manual
 - ⑥ RS232 cables (one set)
 - ⑦ Software CD
3. Optional Management Software:
 - a. AraidEye for Linux
 - b. SNMP Agent for ARAID 3500 / S3500
 - c. SNMP Network Server Software: Accordance OpManager



Mobile Racks

(Note: Drive as optional item)

- (a) ARAID 3500 / S3500 Tray with drive.



ARAID 3500 / S3500 Features

- ARAID 3500 / S3500 complies with standard RAID Level 1 and RAID Level 0 definitions.
- Supports PC operating systems without installation of additional drivers.
- Connects to SATA II or IDE host port of a PC. Add-on cards not required, true plug-and-play design.
- ARAID 3500 / S3500 supports AHCI mode.
- Supports major brand SATA II (3G) drives, such as Seagate, Hitachi, WD.
- Supports disk hot swap, hot-plug and Automatic Rebuild Function (ARF). There is no need to turn off the PC when replacing a drive.
- User Interface 1: LCD shows drives, fan and temperature status.
- User Interface 2: LED indicator shows drive's read/write status.
- User Interface 3: Buzzer alerts of drive failure, fan failure, or over-heating.
- Monitoring Interface 4: Supports COM & USB ports for physical or virtual RS-232 communication.
- Monitoring Interface 5: Supports SNMP function for standard network management.
- Equipped with a quiet, powerful 6-cm Japan durable cooling fan with
- Power Requirements: +5V/+12V.
- Security locks and keys for drive trays
- ARAID S3500 can enable a hard drive's security feature. Any hard drive (with security feature) which has been used in an ARAID S3500, its data cannot be read/written by any PC or other different ARAID Model. The hard drive's data is secure.
- AnIDE Bridge for legacy designs using and IDE interface.

Specifications

- **Dimensions:** Length- 195mm, Width- 146mm, Height- 86mm
- **Weight** (without hard drive): approximately 1.27kg
- **Operating Temperature:** 0°C ~ 55°C
- **Storage Temperature:** -20°C ~ 70°C

System Requirements

- PC and PC compatibles
- Host Interface: Standard Serial ATA II (3G) interface or IDE port.
- Hard Disk Drive Interface: Standard Serial SATA II (3G) interface.
- **Supported Operating Systems (no need for drivers):** Windows DOS6.22, Linux, SCO UNIX, Free BSD, NetWare, Solaris, MAC OS, IBM OS/2, real-time kernels



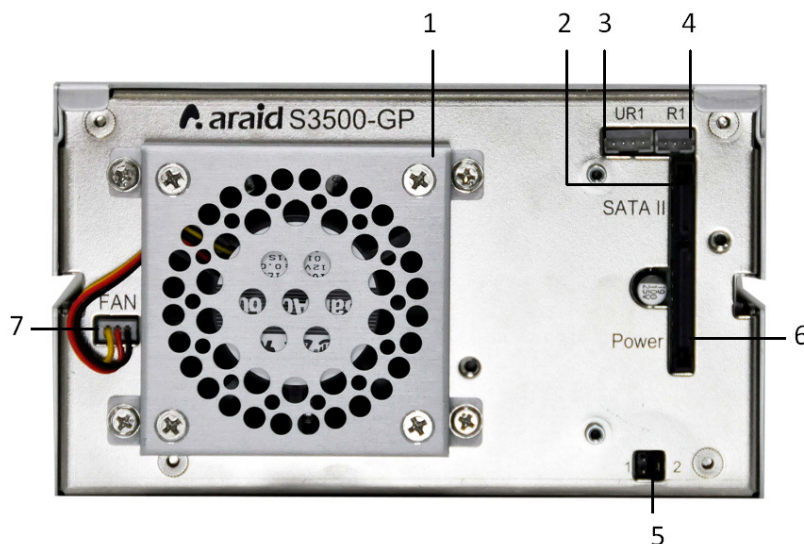
Front View of ARAID 3500 / S3500



1. LCD display
2. Single/Dual drive operation mode switch
3. HD1 LED Read/Write: indicator for hard drive in mobile rack 1.
4. HD2 LED Read/Write: indicator for hard drive in mobile rack 2. Alarm On/Off Switch

ARAID 3500 / S3500 Front View

Rear View and Jumper Settings of ARAID 3500 / S3500



1. 6cm fan
2. SATA II connector (connects to PC)
3. UR1: RS-232 port to USB connector
4. R1: Legacy 9-pin RS-232 port
5. Jumper settings

Mode	J1	J2
Open	RAID 1 (Default)	Master (Default)
Close	RAID 0	Slave

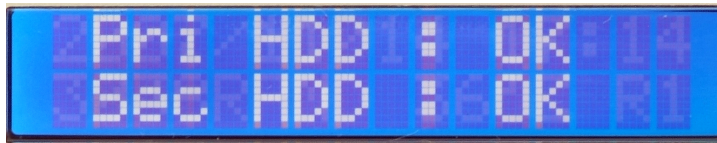
6. 15-pin power socket
7. Power connector for 6cm cooling fan

ARAID 3500 / S3500 Rear View

How to Use A.R.F. Properly

Use ARF. (Auto Rebuild Function)-compatible hard drives and operating systems to ensure normal operation. Also, please note that different operation modes are activated when the switch on the front panel is set to Single or Dual.

1. Turn on your PC with only one drive installed in the upper bay.
2. When the operating system completes the start-up process, set the switch to Dual and insert the second drive at the same time. ARF. will go active. (If the switch is set to Single, the LCD message will show that the second drive is still OFF even after the insertion of second drive.)
3. After few seconds, the ARF operation will start.
4. ARF progress is shown in percentage on the LCD display.
5. Maximum ARF. rate reaches 80-120 GB/hour under optimal conditions.
6. After the new drive is rebuilt completely, the LCD display will again show both drives are OK.



LCD Display: After completing Auto Rebuild Function

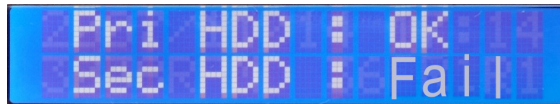
Operating with Dual Mode (RAID 1)

Note: The Dual mode is the default RAID 1 operating mode.

Set the front panel switch at "DUAL" mode, ARAID would work as followings:

- (1) ARAID can boot the system with one hard drive from either bay. However, we strongly recommend considering the drive in upper bay as Primary (**Pri.**).

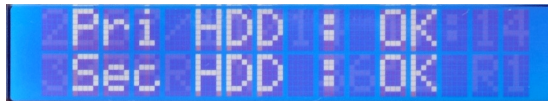
When a drive is installed in the upper bay (HD1):



⊙Switch in **Dual** mode

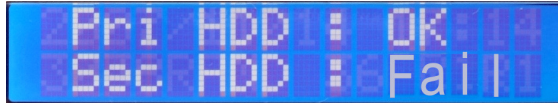
- (2) When two drives are installed, ARAID 3500 / S3500 will boot the system from primary HDD. But when the primary drive fails, ARAID then will boot the system from secondary HDD.

(a) Two drives are installed:



⊙Switch in **Dual** mode

(b) System boots from the drive marked as OK:

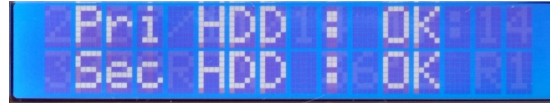


©Switch in **Dual** mode

installing a new secondary drive will cause disk rebuild to auto-start.



Disk rebuild progress 02%



Rebuilding Completed

©Switch in **Dual** mode

Note: Do not change the operating mode from **Dual** to **Single** while two drives are operating. Otherwise, the power to the Secondary drive will be shut down immediately and the real-time backup (mirroring) function will be terminated. ARAID then will only operate with a single drive (Primary HDD).

Operating with Single Mode (RAID 1)

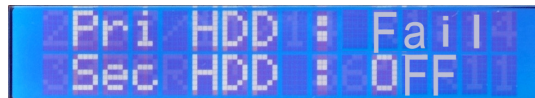
Set the front panel switch as “SINGLE” mode, ARAID would work as follows:

- (1) If you want to operate ARAID with one single drive, place the only drive in the upper bay. ARAID can only access this drive only in this mode.



©Switch in **Single** mode (OFF indicates power for secondary drive is OFF)

If you place an only drive in the lower bay, ARAID would not be able to access it.



©Switch in **Single** mode (OFF indicates power for secondary drive is OFF)

- (2) Even two drives are installed, ARAID only access the Primary drive, because the power of Secondary drive is still OFF.



©Switch in **Single** mode (OFF indicates power for secondary drive is OFF)

Switching from Single Mode to Dual Mode (RAID 1) (Performing a Manual Mirror-On-Demand)

When you switch the operation mode switch from **Single** to **Dual**, the disk Auto-Rebuild Function will start automatically.



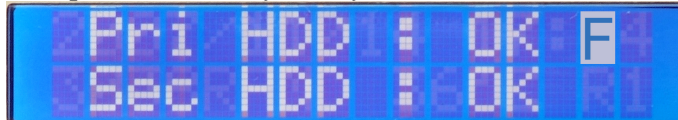
©Change mode from **Single** to **Dual**, *Auto-Rebuild Starts*

Warning: Do not remove any drive while Disk Rebuilding is in progress.

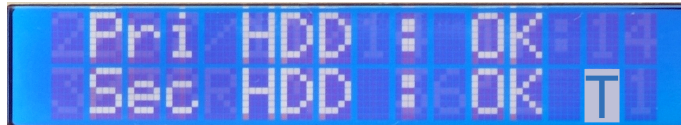
Fan, Temperature and RAID Management

1. LCD Messages (Fan & Temperature)

When the cooling fan stops or rotates very slowly, LCD shows **F**:

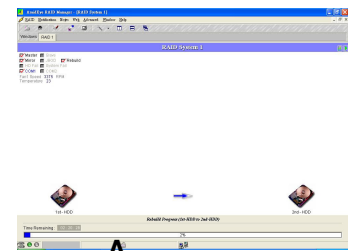


If the temperature is higher than the default setting (a preset number, typically 65°C or 149°F), LCD shows **T**:



2. Local Monitoring via AraidEye

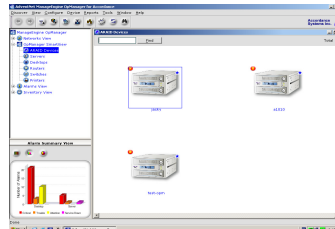
AraidEye (Windows version is bundled with the ARAID as free of charge, Linux version is an optional purchase) allows users to see information about the drive, fan and temperature status of your ARAID via an RS-232 connection in Microsoft Windows or Linux X-Windows.



A
AraidEye

3. Network Management by ARAID SNMP Agent software (Optional Purchase)

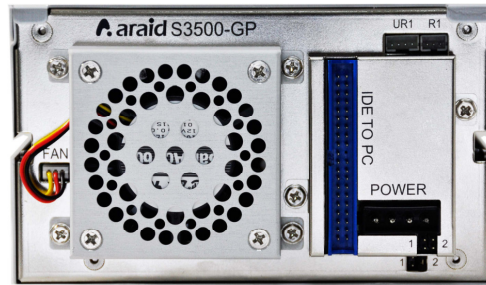
Windows- and Linux-versions of SNMP Agent are available. They allow mid-and large-scale network managers to easily manage tens to thousands of ARAID disk arrays. They can be used with other network management software, such as HP OpenView, IBM NetView, and Accordance OpManager, to serve as centralized management, where status of drive, cooling fan, and temperature is accessible at any time. Accordance Systems provides enterprise proprietary MIB and traps.



OpManager

ARAID T3500 / TS3500 Family Products

1. Add IDE Bridge



Rear View of ARAID 3500 / S3500-IDE

2. ARAID T3500 / TS3500 (External model)

(1) Front View




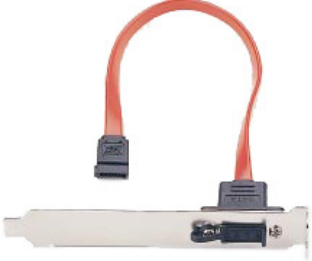








(2) Rear View



1. Power ON/OFF Switch
2. AC 110 ~ 220V Power Connector
3. RS-232 Connector (DB-9)

ARAID T3500 / TS3500 For eSATA/USB/1394/IDE

3. ARAID T3500 / TS3500 Rear View

Interface	Cable	Description
		<p>eSATA Interface</p> <ol style="list-style-type: none"> 1. Connect eSATA port of motherboard to the Rear slot of PC
		<p>USB 2.0 or 3.0 Interface</p> <ol style="list-style-type: none"> 1. USB Connector
		<p>1394a(400MB) Interface</p> <ol style="list-style-type: none"> 1. 1394a Connector
		<p>USB+1394a Interface</p> <ol style="list-style-type: none"> 1. USB Connector 2. 1394a Connector
		<p>IDE Interface</p> <ol style="list-style-type: none"> 1. IDE connector 2. Connect IDE port of motherboard to the Rear slot of PC 3. Connect from PC enclosure to an External model ARAID T3500 / S3500

Failure and Troubleshooting Guide for RAID 1

1. When both drives are working properly, LCD shows:



2. When the drive in the upper bay is working properly but the one in the lower bay fails, LCD shows:



ARAID 3500 / S3500 can still read/write the normal drive, but replace the failed one in the lower bay as soon as possible.

3. When the drive in lower bay is working properly but the one in the upper bay fails, LCD shows:



ARAID 3500 / S3500 can still read/write the normal drive, but replace the failed one in the upper bay as soon as possible.

4. When both drives failed, LCD show:



At this time, ARAID 3500 / S3500 can no longer read/write the hard drive. Please replace both drives as soon as possible.

Note: Always replace new drives with an identical model or a model in same series with larger capacity from the same manufacturer.

Questions & Answers (for RAID 1 Users)

Power failure while disk rebuild is in progress

Q1: What should I do if the power fails while auto-rebuild is in progress?

A1: Just turn on the PC again, the disk rebuild will restart and continue, regardless of whether you are rebuilding from primary to secondary (upper bay to lower bay) or rebuilding from secondary to primary (lower bay to upper bay). The PC will boot from the source drive, whether it is primary or secondary, then it will automatically resume the disk rebuild procedure without further user intervention. (Notice: the switch of front panel of ARAID 3500 / S3500 should be in **Dual** mode)

Preventing and recovering from an unexpected virus attack

Q2: How can I prevent or recover from a virus attack by utilizing Mirror-On-Demand function provided by ARAID? (for RAID 1 users only).

A2: Prevention is the most important factor in preventing a virus attack. Accordance recommends the use of commercial grade Anti-Virus software and a hardware firewall. Remember to check with the AV and firewall manufacturer's website frequently for the latest updates to their products.

If you find that you are infected, run the AV software first to clean or quarantine the virus. Here are some other recommendations you can optionally use.

Method 1: Generate a grandfather/father/son, multi-generation backup. Use the ARAID on-the-fly disk rebuild and disk hot swap function to duplicate a clone periodically as you require. Keep the archive of your generated backup drives in safe place. If both drives in an ARAID are affected by a virus, remove them and replace with the latest unaffected archived drive and rebuild a clean drive.

Method 2: Use Accordance the mirror-on-demand function on the front panel operation mode switch to initiate a disk duplication whenever you need. While the system is clean and virus-free, make sure to generate clone drives and keep them in safe place.

Replacing and Upgrading Hard Drives

Q3: What should I do if I need to replace a defective hard drive?

- A3:**
1. To minimize the risk of losing data, make it a practice to keep a spare hard drive of the same brand and model for the next three to five years. Always restock your spare inventory with new hard drive(s) of the same model whenever a defective hard drive is replaced.
 4. If your replacement drives are the same manufacturer as the original drives but are a larger capacity, place the surviving drive in the upper bay where it will be designated as the source drive. Boot the PC from the upper bay source drive. When the operating system is ready to serve, insert the replacement drive into lower bay. The disk auto rebuild procedure will now start. If it fails to start, switch the front panel operation mode switch from Single to Dual.

For normal operation, always put the smaller capacity drive in upper bay and larger capacity drive in lower bay. Never place the larger capacity drive in the upper bay.

Tip: Label each tray with the disk capacity, brand, and model for future reference.

5. CASE STUDY:

- Company ABC uses two Seagate Family ST3250823AS (Seagate250GB) drives on one ARAID disk array.
- Company ABC should keep an inventory of spare ST3250823AS drives.
- Company ABC experiences a Seagate250GB disk crash and has no more ST3250823AS to replace. Instead a new Seagate Family ST3300622AS (Seagate250GB) is available for replacement. For daily operation, the smaller drive, the Seagate250GB, needs to be put in upper bay and the larger drive, the Seagate300GB, must be put in the Lower Bay as a mirrored couple. In this scenario, the mirror couple of Seage250GB + Seagate300GB, its effective capacity is 250GB. *RAID 1 disk array capacity is always defined by the capacity of the smaller drive.*
- For Windows User ONLY:
If at some later point the 2nd drive Seagate250GB malfunctions and the Seagate300GB is the surviving drive, you can enlarge the Seagate300GB's partition size from 250GB to 300GB by using a third party's program, such as *Symantec's Ghost* or *Partition Magic*. Then mirror it to

another Seagate300GB and gather a 300GB disk capacity.

Appendix A

Product Question Report



No. _____ Date: ____ / ____ / ____

Company Name: _____ Name: _____

Accordance Product Name & Model	
Serial No.	
Firmware Revision	
Manufactured Date or Purchase Date	

Equipment & Environment	
PC or Motherboard Brand & Model (**)	
BIOS (**) Phoenix or Award or AMI	
Chipset (**)	
HDD 1(**) Brand/Model/Series number	
HDD 2(**) Brand/Model/Series number	
IDE operation Mode (*)	
CPU	
RAM	
Version of Windows, Linux, other	
Benchmark / Application if available	

(**) Mandatory (*) Optional, but it helps to identify problem.

Test Procedure & Error Messages	
1	
2	
3	
...	

Symptom	
1	
2	
3	
...	



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