ARAID® User Manual

ACCORDANCE

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Introduction

Thank you for your purchase of ARAID™ for your data protection needs! This user manual is written assist you in installing and operating the complete line of ARAID internal and external RAID controllers including:

- ARAID 1000L and T1000L
- ARAID 1500
- ARAID 2000 and T2000
- ARAID 2200
- ARAID M100

Register your ARAID on our website at www.accordancesystems.com, then get started with the Quick Start on page 5. Additional information is available on our website at www.accordancesystems.com

Let Accordance help you to protect your data.

Revision B: ARAID User Manual
All Accordance ARAID products are FCC and CE compliant.

Table of Contents

Quick Start Guide
Five Steps to RAID 1

If you are familiar with PC hardware, you can follow these five steps for a quick and successful RAID 1 implementation. Should you have questions or problems, just refer to the rest of this manual.

1. Install the hard drives into the ARAID trays using the enclosed screws. The drives should be the same model and capacity. If you are installing EIDE drives, make certain that the drives are set to MASTER. Some EIDE drive models have a MASTER WITH SLAVE PRESENT or MASTER WITH NON-ATA COMPLIANT setting. This cannot be used. CABLE SELECT cannot be used.
2. Install the drive/tray assemblies into the ARAID unit.
3. Insert the ARAID unit into the PC and using the enclosed screws.
4. Attach the EIDE or SATA cable. The ARAID 1000 and M100 use an EIDE controller. The ARAID 1500 and 2000 will accept an EIDE controller or SATA controller. Attach the power connector.
5. Power on the system. The default factory setting, SINGLE, uses only the top drive/tray assembly. Once the PC is running, change the front panel switch to DEFAULT to start RAID 1 operation.

ARAID 1000L Unit

Purpose: Provides RAID 1 disk mirroring and rebuild functions.
Disk Controller: EIDE
Disk type: Utilizes two EIDE UDMA 33/66/100/133 3-1/2" hard drives from any manufacturer.
Cooling: Rear-mounted 80mm fan draws outside air through front tray vents and across hard drive surfaces.
Drive trays: Steel construction with metal or plastic bezels. Dual, removable, and lockable disk trays support hot swap.
Mounting requirements: Occupies two PC 5-1/4" drive bays (internal model). The internal unit is sized approximately the same as two CD drives. Actual internal unit dimensions are 236mm x 146 mm x 86mm.
Operating temperature: 0-70° C
Unit monitoring: LCD display indicates drive and basic unit status. LED indicates hard drive read/write access. An audible alarm warns of hard drive and cooling fan failure.
Remote monitoring: *ARAID-eye*™ provides local monitoring for a single ARAID unit connected to a Windows PC. *ARAID-SNMP*™ utilizes an SNMP agent to monitor one or more ARAID units over a TCP/IP network. *ARAID-SNMP*™ is compatible with any SNMP network management system.

System Requirements

1. Two adjacent 5-1/4" PC drive bays (internal model).
2. +5V and +12V power.
3. EIDE drive controller (internal and external EIDE models).
4. USB or Firewire ports (external ARAID models).
5. ARAID is a hardware-independent solution and has been tested with Windows 95/98/98SE/ME, Windows NT Server or Workstation, Windows 2000 Professional or Advanced Server, Windows XP Home or Professional, Windows 2003 Advanced Server, Mac-OS, Linux, Solaris, and BSD.
6. The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

Package Contents

1. ARAID unit body
2. Two drive trays
3. Tray keys
4. Mounting screws
5. ARAID CD
6. RS-232 cable
7. 9-pin serial connector back panel connector

Front View

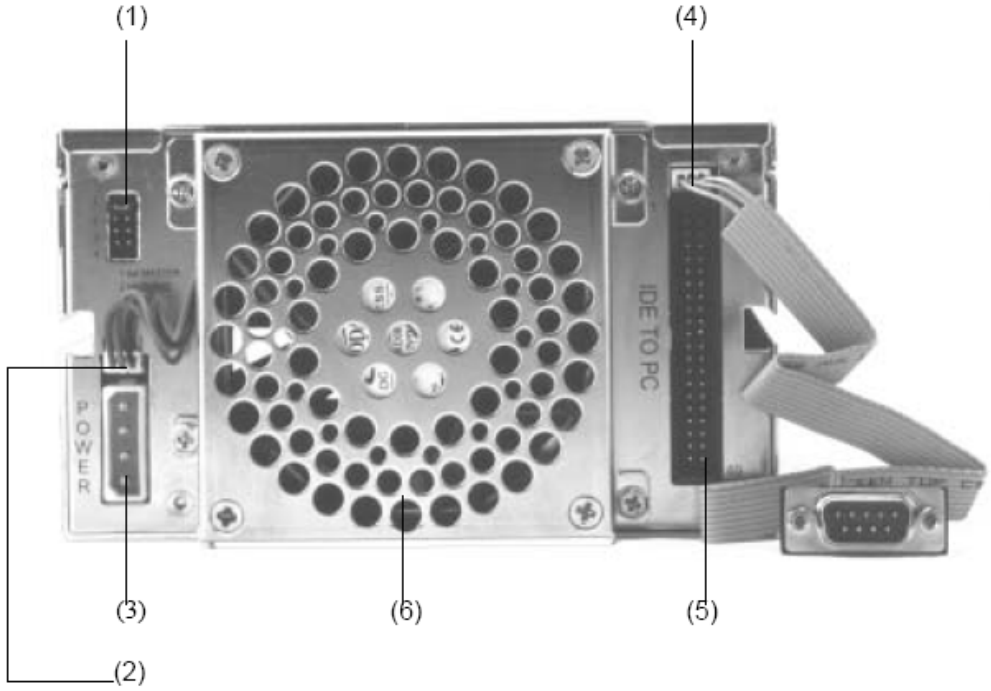
1—Tray 1 (top)
2—Tray 2 (bottom)
3—Key Locks
4—LCD

5—Hard drive 1 read/write LED
6—Hard drive 2 read/write LED
7—Operation mode selection switch
8—Audible alarm switch

Rear View and Jumper Settings - Internal Model

Jumper Settings – The jumper block is located in the upper left hand corner.

Pin set 1 – Set the jumper across these pins to set the device to be the master device on the EIDE channel (factory default).
Pin set 1 - Remove the jumper across these pins to set the device to be the slave device on the EIDE channel.
Pin set 2 – Reserved.
Pin set 3 – Set the jumper across these pins to enable the firmware's forced update mode. When this pin is set, the jumper on Pin set 1 must be removed. The ARAID can not operate when a jumper is set on Pin set 3.
Pin set 4 – Reserved.



1 – Function set-up jumpers
2 - Fan power connector
3 - Unit power connector
4 - RS232 port connector (used for ARAIDeye and SNMP device monitoring)
5 - EIDE connector
6 - 80mm fan

Hardware Installation – Internal Model

1. Set Pin set 1 of the function set-up panel to select whether the device will be master or slave on the EIDE channel. A jumper present at Pin set 1 will set the ARAID to be the master. Removing the jumper from Pin set 1 will set the ARAID to be the slave.
2. Turn the PC off and remove the case cover.
3. Install the unit in two adjacent 5.25" bays and fasten with the enclosed screws.
4. Connect the 4-Pin power supply connector to the ARAID.
5. Connect EIDE port cable (from motherboard) to the EIDE port on the back of the ARAID**.**
6. Install the source disk in tray 1 and target disk in tray 2.
7. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
8. Lock the trays with the key where necessary.
9. Power on the system and make certain the ARAID is recognized by the PC's BIOS.

Hardware Installation – External EIDE Model

1. Turn the PC off and remove the case cover.
2. Attach the ribbon end of the cable to the PC's EIDE port. Remember, the ARAID will be the master device on this EIDE channel.
3. Remove one of PC's expansion slot covers and replace with the included slot cover/cable assembly.
4. Replace the PC case cover.
5. Attach the rounded end of the EIDE cable to the back of the ARAID.
6. Connect the enclosed power cord to the back of the ARAID and to an 110V outlet.
7. Install the source disk in tray 1 and target disk in tray 2.
8. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
9. Lock the trays with the key where necessary.
10. Power on the ARAID first, followed by the PC and make certain the ARAID is recognized by the PC's BIOS.

Hardware Installation – External USB or Firewire Models

1. Attach the included USB or Firewire cable to the back of the ARAID.
2. Attach the other end of the USB or Firewire cable to the appropriate port on your PC.
3. Connect the enclosed power cord to the back of the ARAID and to an 110V outlet.
4. Install the source disk in tray 1 and target disk in tray 2.
5. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
6. Lock the trays with the key where necessary.
7. Power on the ARAID first, followed by the PC.
8. Follow your operating system's instructions for attaching removable drives.

ARAID 1000L Troubleshooting Guide

Nothing is displayed on the LCD screen.
Check that the power couplings are connected and tight. Verify that power is getting to the couplings.

The LCD display indicates that the top drive is on, but the bottom drive is off.
The ARAID is set in single drive mode or there is no drive in the bottom bay.

The LCD display indicates that one or both drives have failed.
Make certain the drives are installed in the trays correctly and the trays are inserted completely into the ARAID. Try the drives separate from the ARAID to verify functionality.

The PC's BIOS does not recognize the ARAID.
Check to make certain there is not more than one master or slave device on the EIDE channel. Set the BIOS to auto-recognize the ARAID. It may be necessary to temporarily remove SCSI devices (if installed) to troubleshoot this problem.

The ARAID is operating and both drives are marked as OK, but I cannot access the drives.
This is usually only an issue for external USB or Firewire models. Some operating systems require that you mount the drives. The process for doing this varies by operating system.

I have my ARAID connected to the motherboard's built-in RAID controller. The ARAID indicates that the drive has failed or operation is unreliable.

The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

ARAID 2000 Unit

Purpose: Provides RAID 1 disk mirroring and rebuild functions.
Disk Controller: SATA or EIDE
Disk type: Utilizes two SATA 3-1/2" hard drives from any manufacturer.
Cooling: Rear-mounted 80mm fan draws outside air through front tray vents and across hard drive surfaces.
Drive trays: Steel construction with metal or plastic bezels. Dual, removable, and lockable disk trays support hot swap.
Mounting requirements: Occupies two PC 5-1/4" drive bays (internal model). The internal unit is sized approximately the same as two CD drives. Actual internal unit dimensions are 236mm x 146 mm x 86mm.
Operating temperature: 0-70° C
Unit monitoring: LCD display indicates drive and basic unit status. LED indicates hard drive read/write access. An audible alarm warns of hard drive and cooling fan failure.
Remote monitoring: *ARAID-eye*™ provides local monitoring for a single ARAID unit connected to a Windows PC. *ARAID-SNMP*™ utilizes an SNMP agent to monitor one or more ARAID units over a TCP/IP network. *ARAID-SNMP*™ is compatible with any SNMP network management system.

System Requirements

1. Two adjacent 5-1/4" PC drive bays (internal model).
2. +5V and +12V power.
3. SATA or EIDE drive controller (internal model)
4. SATA (external SATA model).
5. USB or Firewire ports (external ARAID models).
6. ARAID is a hardware-independent solution and has been tested with Windows 95/98/98SE/ME, Windows NT Server or Workstation, Windows 2000 Professional or Advanced Server, Windows XP Home or Professional, Windows 2003 Advanced Server, Mac-OS, Linux, Solaris, and BSD.
7. The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "SATA mode".

Package Contents

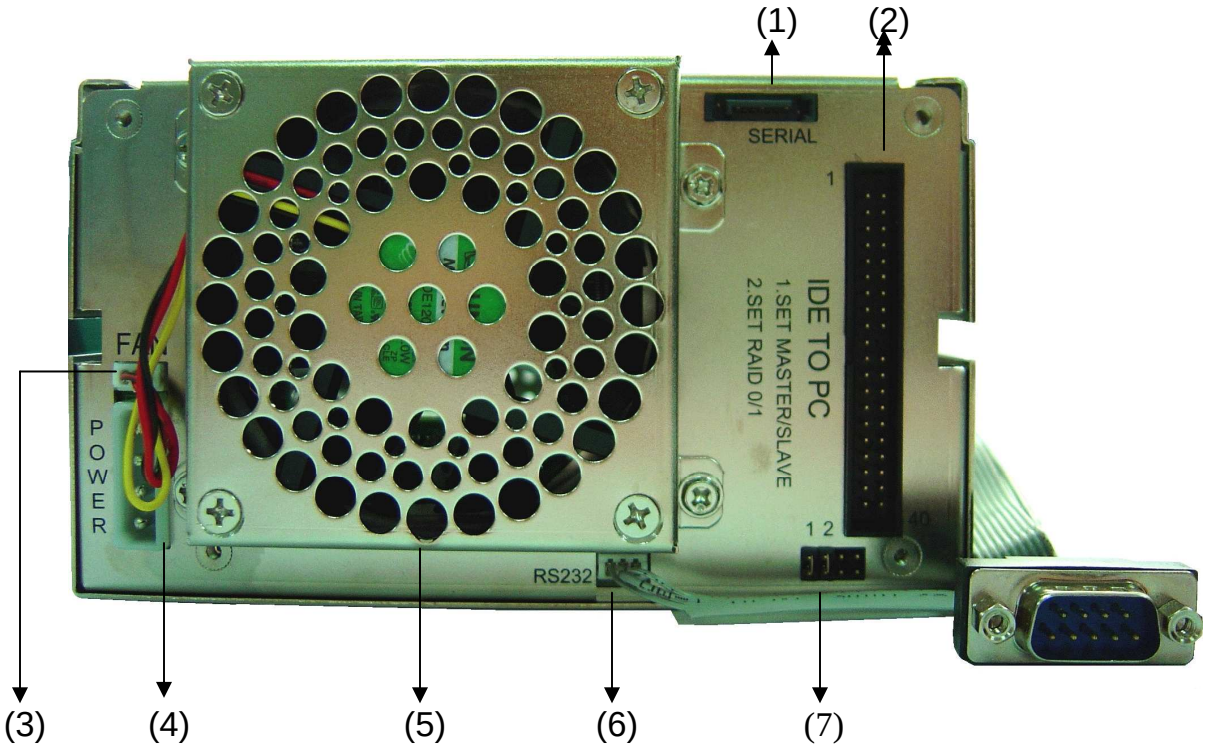
1. ARAID unit body
2. Two drive trays
3. Tray keys
4. Mounting screws
5. ARAID CD
6. RS-232 cable
7. 9-pin serial connector back panel connector

Front View

1—Tray 1 (top)
2—Tray 2 (bottom)
3—Key Locks
4—LCD

5—Hard drive 1 read/write LED
6—Hard drive 2 read/write LED
7—Operation mode selection switch
8—Audible alarm switch

Rear View and Jumper Settings (internal model)



1 – SATA connector
2 – EIDE connector
3 – Fan connector
4 - Unit power connector
5 – Fan
6 - RS232 port connector (used for ARAIDeye and SNMP device monitoring)
7 – Function set-up jumpers

Hardware Installation – Internal Model

1. Turn the PC off and remove the case cover.
2. The ARAID 2000 will utilize either SATA or EIDE as a disk controller. If you are using a SATA disk controller, connect the provided SATA cable between the motherboard's disk controller port and the SATA connector on the back of the unit.
3. If you are using and EIDE disk controller, set Pin set 1 of the function set-up panel to select whether the device will be master or slave on the EIDE channel. A jumper present at Pin set 1 will set the ARAID to be the master. Removing the jumper from Pin set 1 will set the ARAID to be the slave. Connect an EIDE cable between the motherboard's disk controller port and the EIDE connector on the back of the unit.
4. Install the unit in two adjacent 5.25" bays and fasten with the enclosed screws.
5. Connect the 4-Pin power supply connector to the ARAID.
6. Install the source disk in tray 1 and target disk in tray 2.
7. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
8. Lock the trays with the key where necessary.
9. Power on the system and make certain the ARAID is recognized by the PC's BIOS.

Hardware Installation – External SATA Model

1. Remove the PC case cover.
2. Attach a SATA cable to the PC's SATA port.
3. Remove one of PC's expansion slot covers and replace with the included slot cover/cable assembly.
4. Replace the PC case cover.
5. Attach the SATA cable to the back of the ARAID.
6. Connect the enclosed power cord to the back of the ARAID and to an 110V outlet.
7. Install the source disk in tray 1 and target disk in tray 2.
8. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
9. Lock the trays with the key where necessary.
10. Power on the ARAID first, followed by the PC and make certain the ARAID is recognized by the PC's BIOS.

Hardware Installation – External USB or Firewire Models

1. Attach the included USB or Firewire cable to the back of the ARAID.
2. Attach the other end of the USB or Firewire cable to the appropriate port on your PC.
3. Connect the enclosed power cord to the back of the ARAID and to an 110V outlet.
4. Install the source disk in tray 1 and target disk in tray 2.
5. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
6. Lock the trays with the key where necessary.
7. Power on the ARAID first, followed by the PC.
8. Follow your operating system's instructions for attaching removable drives.

Using the ARAID 2000 with an EIDE motherboard or controller

In some situations, it may be desirable to use SATA drives with a motherboard or disk controller conforming to the EIDE specification. Although this may limit the performance capabilities of the SATA drives as compared to SATA-to-SATA connectivity, the ARAID 2000 will allow for EIDE-to SATA connectivity.

Attach a high-density EIDE cable from the motherboard/controller EIDE port to the EIDE port mounted vertically on the back of the ARAID 2000 unit.

Depending upon the motherboard/controller used, some changes to your BIOS settings may be required. Look for the following:

1. Disable any EIDE RAID settings.
2. Set drive detection to AUTO (the ARAID 2000 can be connected to the primary or secondary EIDE controller).
3. The BIOS may identify the drive as "ARAID 2000".

Other installation notes:

1. Do not attach a SATA cable to the ARAID 2000's SATA port when using EIDE (simultaneous use of EIDE and SATA is not supported).
2. Make certain the cooling fan is not blocked for maximum cooling.
3. Use of identical drives in both ARAID 2000 bays is recommended. If sizes are mixed, make certain the drive in the primary bay is the lower capacity.
4. Partitioning of the drives within an ARAID 2000 is handled identically to a single drive.

5. Installation of an operating system or application software can be done with the ARAID 2000 in single or default mode. Consult your ARAID 2000 manual for other options.

ARAID 2000 Troubleshooting Guide

Nothing is displayed on the LCD screen.
Check that the power couplings are connected and tight. Verify that power is getting to the couplings.

The LCD display indicates that the top drive is on, but the bottom drive is off.
The ARAID is set in single drive mode or there is no drive in the bottom bay.

The LCD display indicates that one or both drives have failed.
Make certain the drives are installed in the trays correctly and the trays are inserted completely into the ARAID. Try the drives separate from the ARAID to verify functionality.

The PC's BIOS does not recognize the ARAID.
Check to make certain there is not more than one master or slave device on the EIDE channel. Set the BIOS to auto-recognize the ARAID. It may be necessary to temporarily remove SCSI devices (if installed) to troubleshoot this problem.

The ARAID is operating and both drives are marked as OK, but I cannot access the drives.
This is usually only an issue for external USB or Firewire models. Some operating systems require that you mount the drives. The process for doing this varies by operating system.

I have my ARAID connected to the motherboard's built-in RAID controller. The ARAID indicates that the drive has failed or operation is unreliable.
The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

ARAID 2200 Unit

Purpose: Provides RAID 1 disk mirroring and rebuild functions.
Disk Controller: SATA 150 or SATA 3G
Disk type: Utilizes two SATA 3-1/2" hard drives.
Cooling: Rear-mounted 80mm fan draws outside air through front tray vents and across hard drive surfaces.
Drive trays: Steel construction with metal or plastic bezels. Dual, removable, and lockable disk trays support hot swap.
Mounting requirements: Occupies two PC 5-1/4" drive bays (internal model). The internal unit is sized approximately the same as two CD drives. Actual internal unit dimensions are 236mm x 146 mm x 86mm.
Operating temperature: 0-70° C
Unit monitoring: LCD display indicates drive and basic unit status. LED indicates hard drive read/write access. An audible alarm warns of hard drive and cooling fan failure.

Important Notes for Previous Users of ARAID 1000L, 1500, or 2000 Models

- The ARAID 2200 is capable of storing hard drive serial numbers. When you install a new master drive in the top bay and power up the computer, you must press the **F1** key on the ARAID's front panel for about 1-2 seconds to activate the detect and store functions. Otherwise, the ARAID 2200 will not be able to detect and utilize the hard drive. You then must restart the computer. (First-time users: please refer to "Front Panel and F1 Button Functions").
- We recommend that two or more identical hard drives (same brand, model, capacity, place of production, firmware version) be used with this product for optimal performance and convenience. The hard drives used must be brand new or in excellent condition. It is always a good idea to test any drive, new or pre-used, with the drive manufacturer's verification tools.
- With new types of hard drives entering, you may not be able to obtain the same model of the hard drive in the future. Also, if there is a need for repairing your hard drive, its waiting time and quality afterwards are hard to manage. Therefore, we recommend you to purchase a number of hard drives in advance so that ARAID 2200 can be used to its full extent. However, if you cannot obtain identical types of hard drives, you may use larger, faster, newer hard drives made by the same manufacturer.

- With ARAID 2200, you do not have to execute the FDISK or FORMAT functions on the new hard drive in advance. You may proceed with **Auto-Mirror** to copy a new target disk.
- ARAID 2200 has a quiet, powerful 6-cm cooling fan built in. It provides excellent heat dissipation for 7200 and 10,000 RPM hard drives.. When you use two hard drives with at least 7200 RPM , it is best to use a PC case with an excellent overall reinforced heat dissipation design and adequate power supply. It will prevent PC or disk array failures caused by overheating.
- When using the ARAID 2200, the capacity of target disk (LBA/Sector number) must be equal to or larger than that of source disk. Otherwise, disk auto-mirror function will fail to proceed.
- Note that when the operation mode is set to **Single** on the front panel, the PC can only access the first hard drive (usually in the top bay) of the ARAID 2200. The second hard drive remains powered off and has no real time backup function. When the operation mode is set to **Dual**, the PC then can access both hard drives simultaneously and the real time backup function becomes available.

System Requirements

7. Two adjacent 5-1/4" PC drive bays (internal model).
8. +5V and +12V power.
9. SATA 150 or SATA 3G (internal model)
10. SATA (external SATA model).
11. USB or Firewire ports (external ARAID models).
12. ARAID is a hardware-independent solution and has been tested with Windows 95/98/98SE/ME, Windows NT Server or Workstation, Windows 2000 Professional or Advanced Server, Windows XP Home or Professional, Windows 2003 Advanced Server, Mac-OS, Linux, Solaris, and BSD.
8. The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "SATA mode".

Package Contents

8. ARAID unit body
9. Two drive trays
10. Tray keys
11. Mounting screws
12. SATA cable
13. Software CD (Flash Magic, Steel Vine Manager)

Installation of ARAID 2200

Follow the procedure below to connect install and ARAID 2200 in your PC.

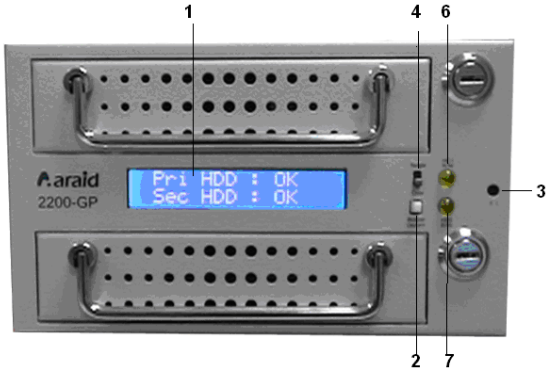
Before proceeding, make certain the front panel switch on your ARAID 2200 is set to *Dual*.

1. Shut off the PC.
2. Open the PC case cover.
3. Place the ARAID 2200 into the case into two adjacent open 5-1/4" bays.
4. Connect the power cord to the ARAID (Molex connector).
5. Connect the SATA cable. Select either the SATA or eSATA connector.
6. Connect the R1 or UR1 cable for ARAID monitoring.
   (a) Traditional (R1): The RS232 port is connected to the ARAID 2200 and the DB9 connector is secured to the rear end of the PC case.
   (b) USB (UR1): This port is used only when it is connected to a PC via a USB cable.
7. Secure the ARAID 2200 in place with included screws and close the PC case cover.
8. Insert your master or blank hard drive into an ARAID tray and use the included screws to secure it in the tray. Insert this drive/tray assembly into the ARAID 2200's upper bay.
9. After the PC's power is turned on or a new system is installed, place another hard drive into mobile rack 2. (Note: Please set both hard drives to SATA II mode

Your PC's BIOS and operating system will now see and operate as though the ARAID is a single hard drive.

FDISK and *FORMAT* commands will have the same effect on both ARAID hard drives simultaneously. In some operating systems, partitioning and formatting can be carried out without going through the steps mentioned above. You may install the operating system after booting from a CD. (When the front panel is switched to *Dual* mode, both hard drives are simultaneously being read or written. When the mode is set to "Single", only the first hard drive is being read or written. The second hard drive remains powered off). Both hard drives will always operate synchronously until one of them fails.

Front Panel and F1 Button Functions

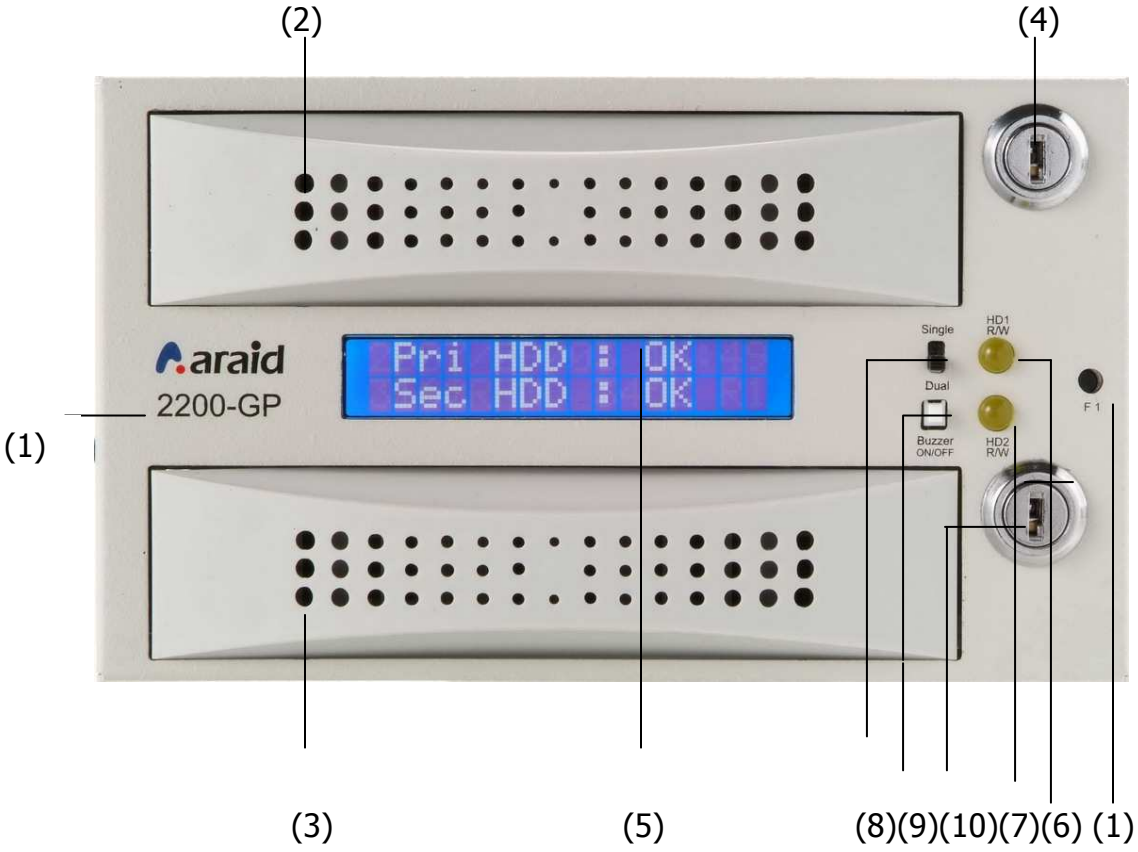


ARAID 2200 (metal face trays)

1. LCD display
2. Buzzer ON/OFF switch
3. **F1 button**: When installing new hard drives in the ARAID 2200 for the very first time or replacing both hard drives, press the "F1" button for about 1~2 seconds after turning on the power. The ARAID 2200 will re-detect, recognize, and store the hard drive's serial number in mobile rack 1 as the source disk.
4. ARAID 2200 operation modes:
   - **Default**: Dual Mode - Normal operation / double-disk operation mode. In this mode, the ARAID 2200 accesses (store and write) both hard drives simultaneously and supports double-disk real time backup functions.
   - **Single**: Single-disk operation mode - In this mode, the ARAID 2200 only accesses (store and write) the first hard drive. The second hard drive remains powered off.
5. When ARAID 2200 operates under the **Single** mode and is switched to the Dual mode, real time backup function (mirroring) will activate. (Note: upper bay drive mirrored to lower bay drive.)
6. **Read/Write LED:** LED display and HDD failure indicator for hard drive in

the upper bay.

7. **Read/Write: "**LED display and HDD failure indicator for hard drive in the lower bay.
8. HDD failure indicator: When the LED indicator alternates between 0.7 seconds of light-on and 0.7 seconds of light-off, it indicates a hard drive has not been installed in the mobile rack or it is in abnormal condition.



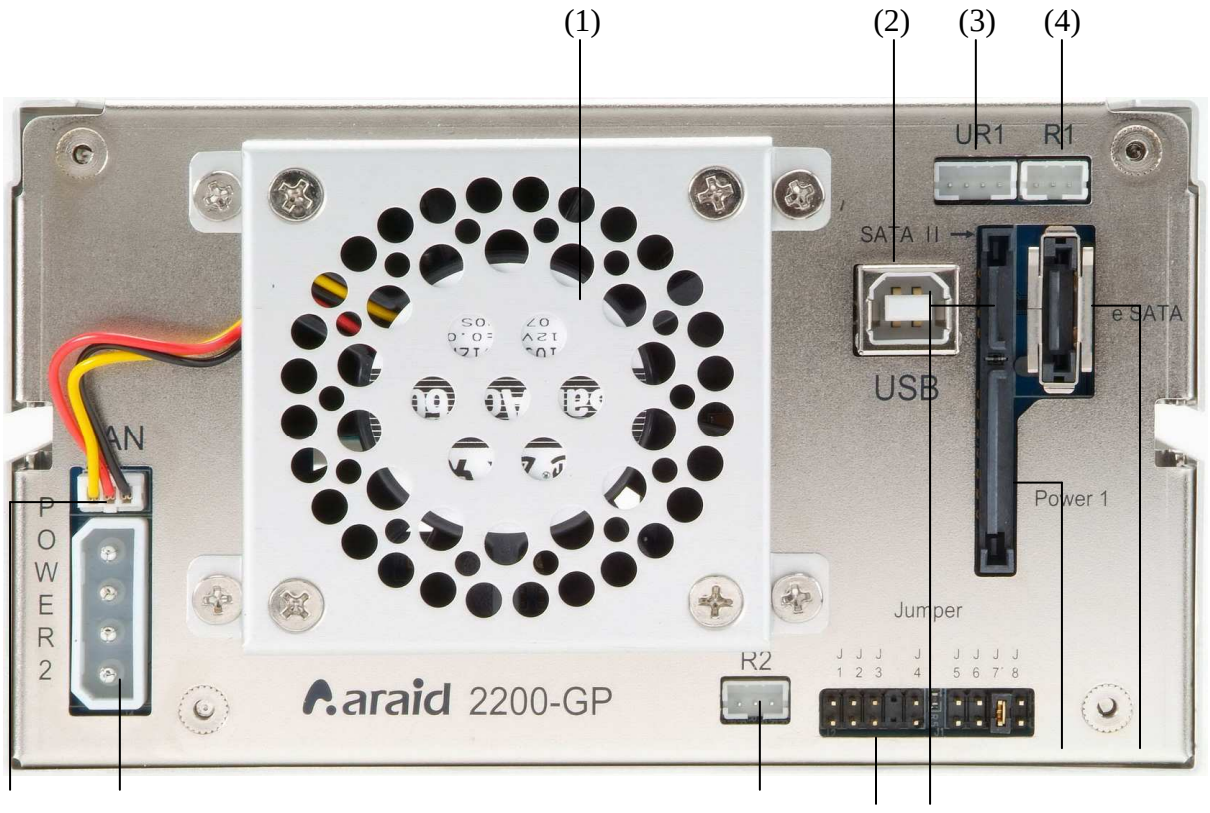
(1) Product model designation
(2) Tray 1: Upper bay with hard drive (primary)
(3) Tray 2: Lower bay with hard drive. (secondary)
(4) Key Lock
(5) LCD: Liquid crystal display.
(6) HD1 R/W LED: LED read/write and failure indicator for HDD1. (Pri.)
(7) HD2 R/W LED: LED read/write and failure indicator for HDD2. (Sec.)
(8) Single/Dual drive operation mode switch

(9) Buzzer ON/OFF switch

(10) Key Lock

(11) F1 button: Memory button for installation and replacement of new hard drives.

Rear View



Parts shown in the rear view:

(1) 6-cm cooling fan

(2) External USB connector

(3) UR1: RS-232 port of USB connector

(4) R1: Traditional 9-pin RS-232 port

(5) Power connector for cooling fan

(6) Power2: Molex 4-pin power socket

(7) R2: Second RS-232 port (Reserved for future function)

(8) Jumper settings (lower right corner)

① **J4**: Used for H.I.C. LPC2103 Firmware upgrade

② **J7**: **Close** (Default)⇨ Disable Verification Function after Disk Rebuild
Open⇨ Enable Verification Function after Disk Rebuild

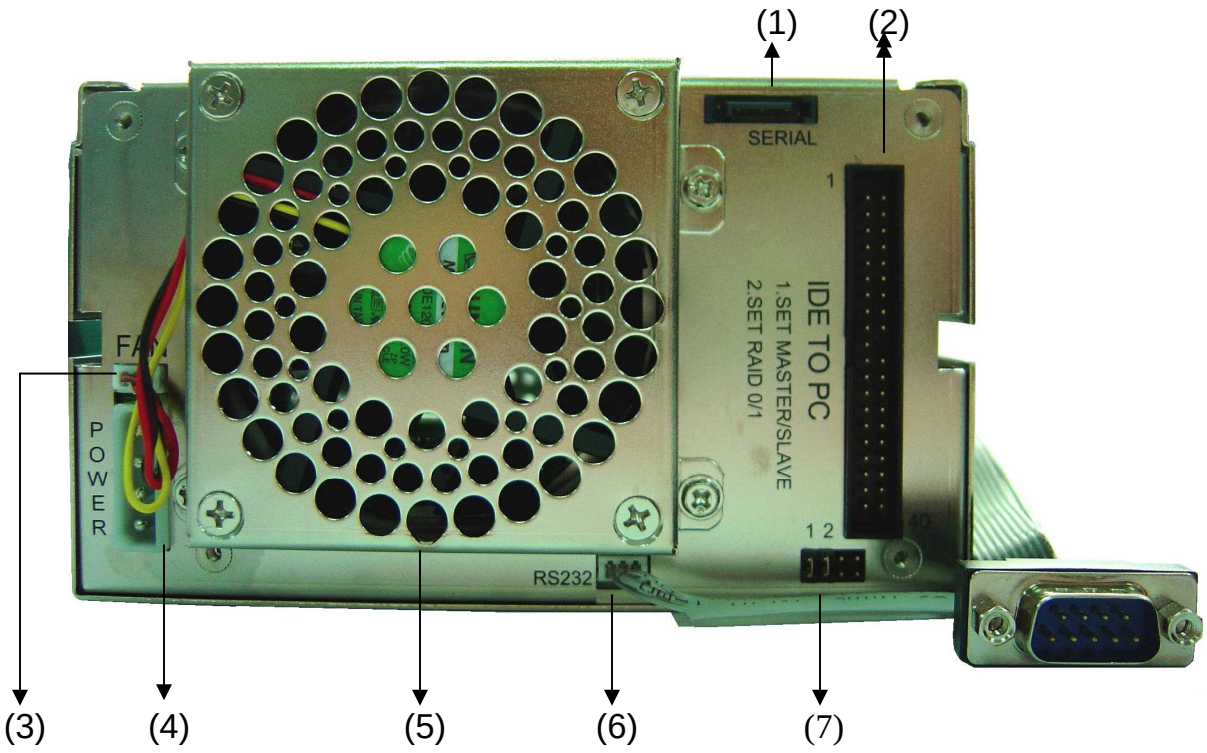
③ J1, J2, J3, J5, J6, J8: Reserved

(9) SATA II connector

(10) Power1: SATA power socket

(11) eSATA connector

Rear View and Jumper Settings



1 – SATA connector
2 – EIDE connector
3 – Fan connector
4 - Unit power connector
5 – Fan
6 - RS232 port connector (used for ARAIDeye and SNMP device monitoring)
7 – Function set-up jumpers

Hardware Installation – Internal Model

10. Turn the PC off and remove the case cover.
11. The ARAID 2000 will utilize either SATA or EIDE as a disk controller. If you are using a SATA disk controller, connect the provided SATA cable between the motherboard's disk controller port and the SATA connector on the back of the unit.
12. If you are using and EIDE disk controller, set Pin set 1 of the function set-up panel to select whether the device will be master or slave on the EIDE channel. A jumper present at Pin set 1 will set the ARAID to be the master. Removing the jumper from Pin set 1 will set the ARAID to be the slave. Connect an EIDE cable between the motherboard's disk controller port and the EIDE connector on the back of the unit.
13. Install the unit in two adjacent 5.25" bays and fasten with the enclosed screws.
14. Connect the 4-Pin power supply connector to the ARAID.
15. Install the source disk in tray 1 and target disk in tray 2.
16. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.
17. Lock the trays with the key where necessary.
18. Power on the system and make certain the ARAID is recognized by the PC's BIOS.

ARAID 2200 Tutorials

Section 1: Compatibility Tests of PCs/Motherboards with ARAID 2200

1. Prepare a PC, 2 or 3 hard drives of identical specifications, and the operating system.
2. Connect one of the hard drives to the PC and install the operating system. Remember to use the front panel F1 button when introducing a new drive in the ARAID.
3. Install this hard drive in the mobile rack, install in the upper bay of the ARAID 2200 (Check the panel to see if "Single" mode is selected at this time), and check to see if the operating system runs correctly, and the PC can be turned on/off without trouble.
4. If everything goes smoothly, set the switch from "Single" to "Dual" mode. Then insert the mobile rack with the second hard drive into the lower bay, the ARAID 2200 will auto-rebuild the target (mirrored) hard drive. When the disk mirroring is complete, the LCD will show **Pri: OK Sec: OK.**

5. If there are no problems encountered in the steps above, remove the hard drive either from the lower bay. The PC should still run properly and continue to read and write from the remaining hard drive.
6. The compatibility test is complete.

Section 2: When to use the F1 button

1. When using the ARAID 2200 for the first time, the ARAID 2200 will store the hard drive as a "source disk". The source disk's presence in the upper bay is detected each time the ARAID 2200 is powered on. This process continues until the source disk is replaced. If the source disk is not detected, the ARAID 2200 may not function properly.
2. Using a new source disk: After inserting any new source disk, press the **F1** button for about 1-2 seconds. The ARAID 2200 will store the new source disk's capacity, serial number, and hard drive information.

Section 3: Other F1 Requirements

1. Always use the F1 button even if you intend to run in single mode (a drive in the upper bay only).
2. If used dual mode, make sure no hard drive is installed in the lower bay.
3. Avoid touching the F1 button when the PC is on. Otherwise, unexpected situations may occur and possibly cause data damage.

Section 4: Please use a high-quality Power Supply

Based on the Accordance Systems' sales experiences of RAID 1 products accumulated over a decade (since 1998), a number of cases have been seen in which hard drive power cables (+5V and +12V) of PC power supplies have insufficient wattage output. They cannot provide steady and continuous current for the two high-RPM, large-capacity hard drives, resulting in failure of disk arrays. This type of case is rarely seen in major brand PCs. The failure rate has also been decreasing yearly to below 1%. If you encounter a similar situation, we recommend you to replace with a high-grade power supply.

Section 5: ARAID 2200 Auto Rebuild Function (A.R.F.) at RAID Level 1

ARAID 2200 supports most of the mainstream operating systems available on market as long as appropriate types of hard drives are used. Under the background mode, high-speed hard drive rebuild functions can be carried out simultaneously with normal hard drive read/write functions.

ARAID 2200 Troubleshooting Guide

Nothing is displayed on the LCD screen.
Check that the power couplings are connected and tight. Verify that power is getting to the couplings.

The LCD display indicates that the top drive is on, but the bottom drive is off.
The ARAID is set in single drive mode or there is no drive in the bottom bay.

The LCD display indicates that one or both drives have failed.
Make certain the drives are installed in the trays correctly and the trays are inserted completely into the ARAID. Try the drives separate from the ARAID to verify functionality. Use the drive manufacturer's test tools, available from their respective web sites, to verify the drives.

The PC's BIOS does not recognize the ARAID.
Set the BIOS to auto-recognize the ARAID. Try a different SATA cable and different SATA ports. It may be necessary to temporarily remove SCSI devices (if installed) to troubleshoot this problem.

I have my ARAID connected to the motherboard's built-in RAID controller. The ARAID indicates that the drive has failed or operation is unreliable.
The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "SATA mode".

ARAID 1500 Unit

Purpose: Provides RAID 1 disk mirroring and rebuild functions.
Disk Controller: SATA or EIDE
Disk type: Utilizes two SATA 3-1/2" hard drives from any manufacturer.
Cooling: Rear-mounted 80mm fan draws outside air through front tray vents and across hard drive surfaces.
Drive trays: Steel construction with metal or plastic bezels. Dual, removable, and lockable disk trays support hot swap.
Mounting requirements: Occupies two PC 5-1/4" drive bays (internal model). The internal unit is sized approximately the same as two CD drives. Actual internal unit dimensions are 236mm x 146 mm x 86mm.
Operating temperature: 0-70° C
Unit monitoring: LCD display indicates drive and basic unit status. LED indicates hard drive read/write access. An audible alarm warns of hard drive and cooling fan failure.
Remote monitoring: *ARAID-eye*™ provides local monitoring for a single ARAID unit connected to a Windows PC. *ARAID-SNMP*™ utilizes an SNMP agent to monitor one or more ARAID units over a TCP/IP network. *ARAID-SNMP*™ is compatible with any SNMP network management system.

System Requirements

1. Two adjacent 5-1/4" PC drive bays (internal model).
2. +5V and +12V power.
3. SATA or EIDE drive controller (internal model)
4. SATA (external SATA model).
5. ARAID is a hardware-independent solution and has been tested with Windows 95/98/98SE/ME, Windows NT Server or Workstation, Windows 2000 Professional or Advanced Server, Windows XP Home or Professional, Windows 2003 Advanced Server, Mac-OS, Linux, Solaris, and BSD.
6. The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

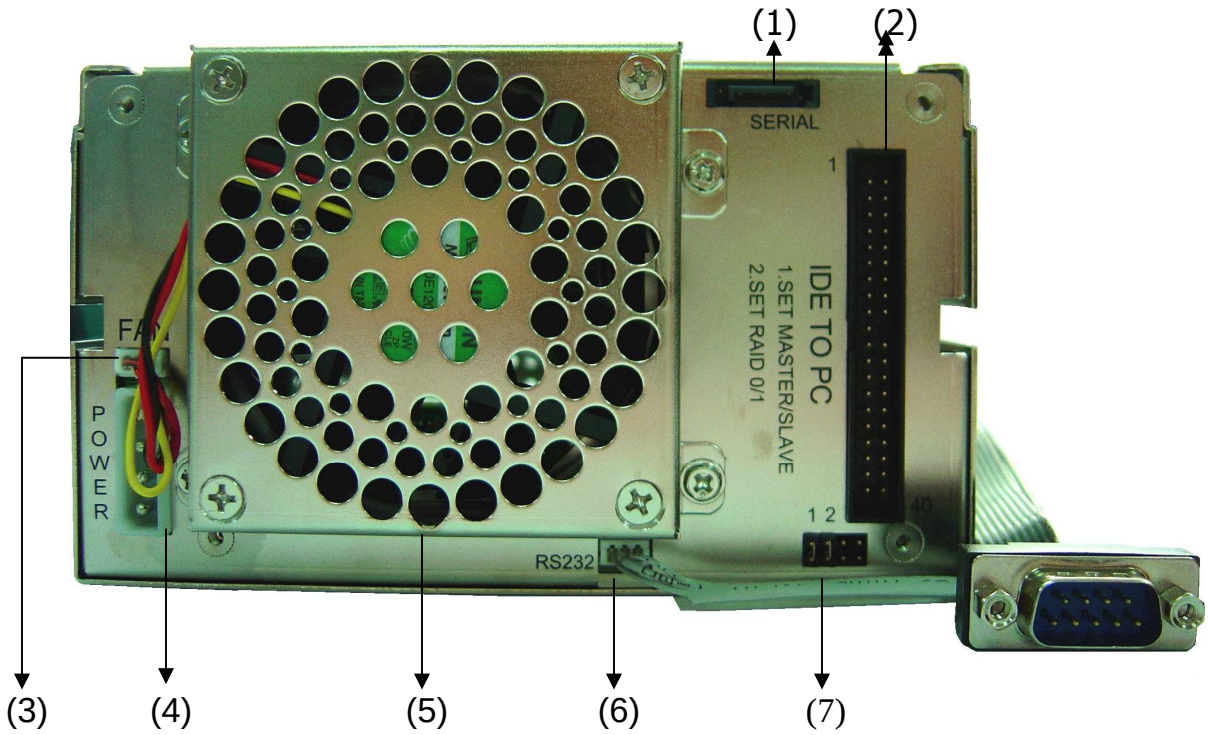
Package Contents

14. ARAID unit body
15. Two drive trays
16. Tray keys
17. Mounting screws
18. ARAID CD
19. RS-232 cable
20. 9-pin serial connector back panel connector

Front View

1—Tray 1 (top)
2—Tray 2 (bottom)
3—Key Locks
4—LCD

5—Hard drive 1 read/write LED
6—Hard drive 2 read/write LED
7—Operation mode selection switch
8—Audible alarm switch



1 – SATA connector
2 – EIDE connector
3 – Fan connector
4 - Unit power connector
5 – Fan
6 - RS232 port connector (used for ARAIDeye and SNMP device monitoring)
7 – Function set-up jumpers

Hardware Installation – Internal Model

1. Turn the PC off and remove the case cover.

2. The ARAID 1500 will utilize either SATA or EIDE as a disk controller. If you are using a SATA disk controller, connect the provided SATA cable between the motherboard's disk controller port and the SATA connector on the back of the unit.

3. If you are using and EIDE disk controller, set Pin set 1 of the function set-up panel to select whether the device will be master or slave on the EIDE channel. A jumper present at Pin set 1 will set the ARAID to be the master. Removing the jumper from Pin set 1 will set the ARAID to be the slave. Connect an EIDE cable between the motherboard's disk controller port and the EIDE connector on the back of the unit.

4. Install the unit in two adjacent 5.25" bays and fasten with the enclosed screws.

5. Connect the 4-Pin power supply connector to the ARAID.

6. Install the source disk in tray 1 and target disk in tray 2.

7. Insert disk/tray 1 assembly in the upper bay and disk/tray 2 in the lower bay of the ARAID.

8. Lock the trays with the key where necessary.

9. Power on the system and make certain the ARAID is recognized by the PC's BIOS.

Hardware Installation – External Models

Note: There are no external 1500 models that connect to EIDE, SATA, USB, or Firewire controllers.

Using the ARAID 1500 with an EIDE motherboard or controller

In some situations, it may be desirable to use EIDE drives with a motherboard or disk controller conforming to the EIDE specification.

Attach an EIDE cable from the motherboard/controller EIDE port to the EIDE port located on the back of the ARAID 1500 unit.

Depending upon the motherboard/controller used, some changes to your BIOS settings may be required. Look for the following:

- Set drive detection to AUTO (the ARAID 1500 can be connected to any EIDE controller).
- The BIOS may identify the drive as "ARAID 1500".

Other installation notes:

1. Do not attach a SATA cable to the ARAID 2000's SATA port when using EIDE (simultaneous use of EIDE and SATA is not supported).
2. Make certain the cooling fan is not blocked for maximum cooling.
3. Use of identical drives in both ARAID 1500 bays is recommended. If sizes are mixed, make certain the drive in the primary (top) bay is the lower capacity.
4. Partitioning of the drives within an ARAID 1500 is handled identically to a single drive.
5. Installation of an operating system or application software can be done with the ARAID 1500 in single or default mode. Consult your ARAID 1500 manual for other options.

ARAID 1500 Troubleshooting Guide

Nothing is displayed on the LCD screen.
Check that the power couplings are connected and tight. Verify that power is getting to the couplings.

The LCD display indicates that the top drive is on, but the bottom drive is off.
The ARAID is set in single drive mode or there is no drive in the bottom bay.

The LCD display indicates that one or both drives have failed.
Make certain the drives are installed in the trays correctly and the trays are inserted completely into the ARAID. Try the drives separate from the ARAID to verify functionality.

The PC's BIOS does not recognize the ARAID.
Check to make certain there is not more than one master or slave device on the EIDE channel. Set the BIOS to auto-recognize the ARAID. It may be necessary to temporarily remove SCSI devices (if installed) to troubleshoot this problem.

The ARAID is operating and both drives are marked as OK, but I cannot access the drives.
This is usually only an issue for external USB or Firewire models. Some operating systems require that you mount the drives. The process for doing this varies by operating system.

I have my ARAID connected to the motherboard's built-in RAID controller. The ARAID indicates that the drive has failed or operation is unreliable.
The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

ARAID M100 Unit

Purpose: Provides RAID 1 disk mirroring and rebuild functions for 2.5" EIDE (notebook) drives.
Disk Controller: EIDE
Disk type: Utilizes two EIDE UDMA 2.5" hard drives from any manufacturer (firmware revision 1.0 and later). Firmware revisions previous to 1.0 are restricted to drives manufactured by Fujitsu and Seagate. Use drives of 40 GB or greater capacity.
Cooling: Quiet 40mm fan draws outside air through front tray vents and across hard drive surfaces.
Drive trays: Steel construction with metal bezels. Dual, removable, and lockable disk trays support hot swap.
Mounting requirements: Occupies one PC 5-1/4" drive bays. The unit is sized approximately the same as a CD drive. Actual internal unit dimensions are 230mm x 149mm x 43mm.
Operating temperature: 0-70° C
Unit monitoring: LCD display indicates drive and basic unit status. LED indicates hard drive read/write access. An audible alarm warns of hard drive and cooling fan failure.
Remote monitoring: *ARAID-eye*™ provides local monitoring for a single ARAID unit connected to a Windows PC. *ARAID-SNMP*™ utilizes an SNMP agent to monitor one or more ARAID units over a TCP/IP network. *ARAID-SNMP*™ is compatible with any SNMP network management system.

System Requirements

1. Two adjacent 5-1/4" PC drive bays (internal model).
2. +5V and +12V power.
3. Utilizes EIDE drive controller.
4. ARAID is a hardware-independent solution and has been tested with Windows 95/98/98SE/ME, Windows NT Server or Workstation, Windows 2000 Professional and Advanced Server, Windows XP Home and Professional, Windows 2003 Advanced Server, Mac-OS, Linux, Solaris, and BSD.
5. The ARAID cannot be connected to a RAID controller on the motherboard or a RAID controller on a PCI RAID controller. Most controller manufacturers provide a means of disabling RAID on their controllers. They will usually refer to non-RAID operation as "native mode" or "EIDE mode".

Package Contents

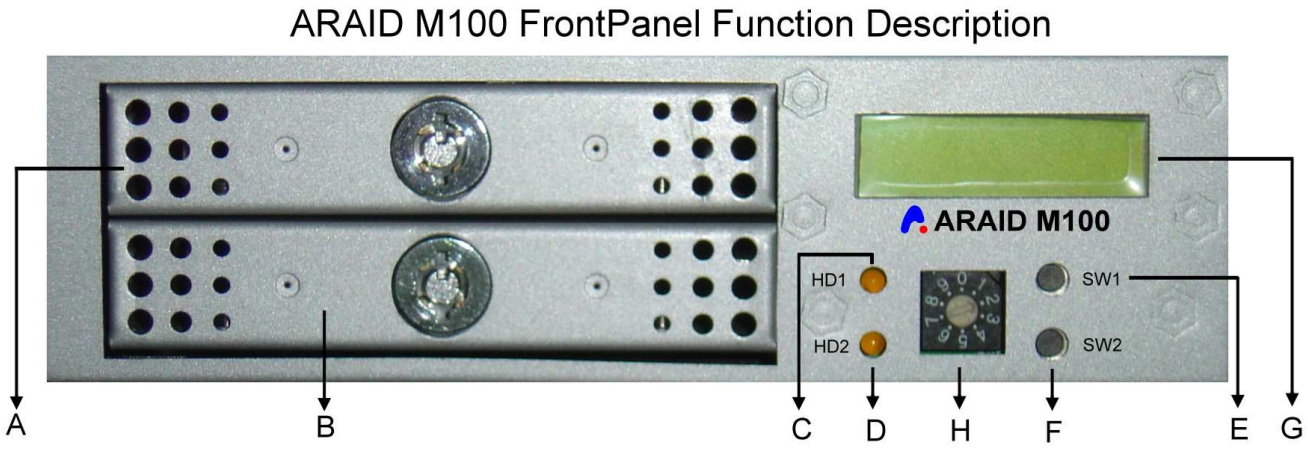
1. ARAID unit body
2. Two drive trays
3. Tray keys
4. Mounting screws
5. ARAID CD
6. RS-232 cable
7. 9-pin serial connector back panel connector

Installation Notes

- Set both hard drives in upper and lower trays to "Master" or "Single Drive" mode. Otherwise, ARAID will not detect the drives. Note that "Master" is the default jumper setting for most brand new 2.5" IDE hard disks.
- We recommend that two identical hard drives be used in all RAID implementations for RAID system performance and maintenance.
- If the ARAID M100 cannot work with the host EIDE port on your PC in UDMA mode, it will automatically switch to PIO mode 4 (or lower) to operate.
- The ARAID M100 has been designed using the strict EIDE command set with accurate timing for reliable and fast RAID on most operating systems without requiring the use of a device driver. If a hard drive has an

unusually number of bad sectors and fails to respond to ARAID's CPU, it will be reported as "FAIL" on the ARAID LCD. Though such hard drives may work on a PC without problems, we recommend using a new hard drive to prevent future problems.

Front View



A☐ Primary Disk Tray
B☐ Secondary Disk Tray
C☐ LED Indicator for primary Disk R/W Access
D☐ LED Indicator for secodary Disk R/W Access
E☐ SW1 (see description below)
F☐ SW2 (see description below)
G☐ LCD panel
H☐ Rotary Switch

Switch Description

SW1 (Switch 1)

Function 1☐Disable audible alarm - Press 0.5 second to disable audible alarm.
Function 2☐Disable access to HDD1 - Press 3 seconds before removing HDD1 from the ARAID M100.
Function 3☐Enable disk rebuild of HDD1 - Press 3 seconds to execute disk rebuild from HDD2 to HDD1.

SW2 (Switch 2)

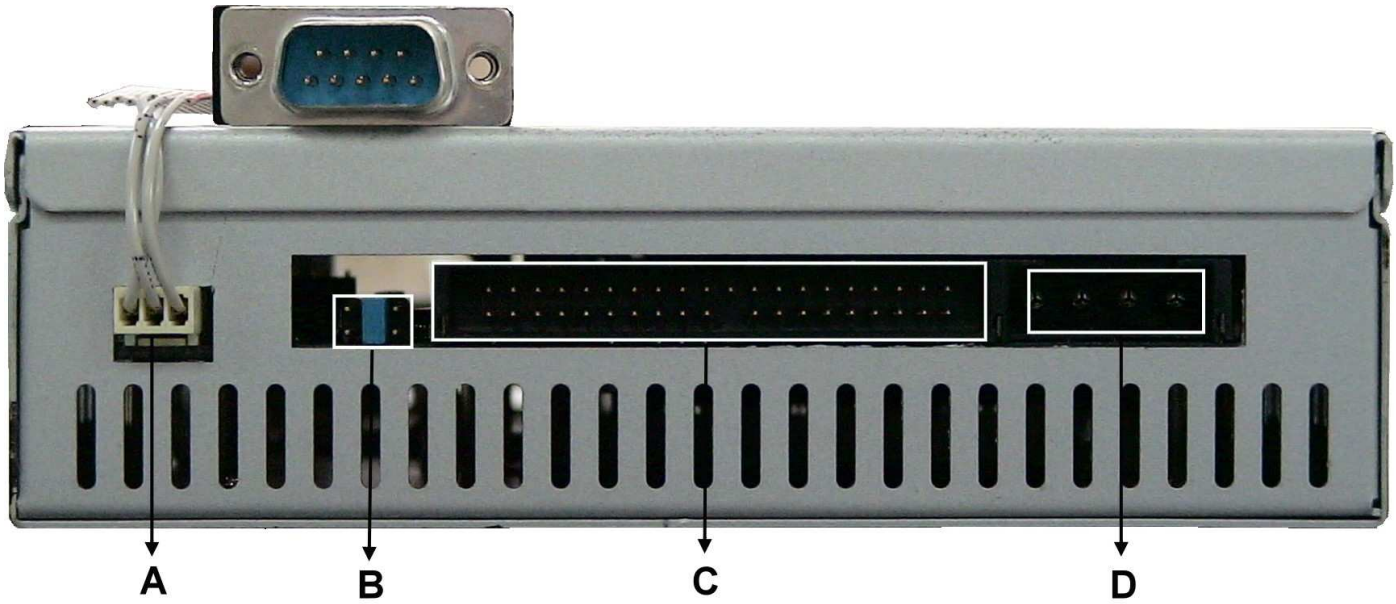
Function 1☐Disable Disk Access of HDD2 - Press 3 seconds before removing HDD2 from the ARAID M100.
Function 2☐Enable Disk Rebuild of HDD2 - Press 3 seconds to execute disk rebuild from HDD1 to HDD2.

Rotary Switch – Use the rotary switch to set ARAID M100 operation mode.

Position 2: Set M100 to operate in RAID 1 mode.
Position 4: Enable ARAID M100 firmware upgrade at RAID 1 mode.
Position 8: Set M100 to operate in NRAID mode.

The factory setting is Position 2 for RAID 1 Operation.

Rear View and Jumper Settings



A: RS232 Connector
B: ARAID M100 Jumper setting

- Left jumper: Reserved for factory use. Do not close this jumper.
- Middle jumper: Close to Set ARAID M100 to "Cable Select".
- Right jumper: Close to set ARAID M100 to "Master" mode.

A. IDE Connector
B. Jumper block (used for setting master/slave position on the EIDE bus)
C. EIDE cable port
D. Power connector

ARAID M100 Operation Guide

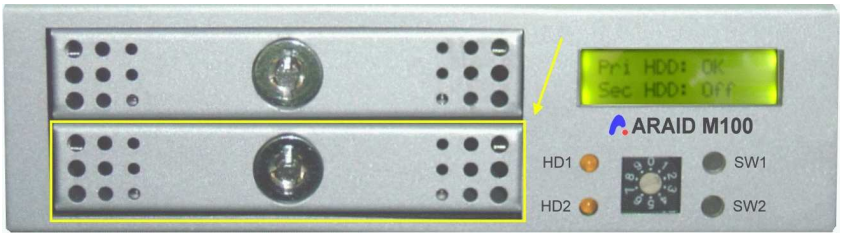
Audible alarms can be suppressed by pressing "SW1" for 0.3□0.5 second.

If either drive begins to fail, the LCD will mark the malfunctioning drive as **Fail** and its corresponding LED will stop flashing. You can remove the failed hard drive from the ARAID M100 while online without pressing SW1 or SW2. Your PC will keep working with the remaining healthy hard disk.

Performing an online disk rebuild (Disk Mirror/Disk Backup)

Example scenario: The drive in the lower bay fails and is removed from ARAID M100. The procedures for rebuilding a replacement drive are:

A. Replace the drive in the secondary tray with a drive identical to the one in the primary tray. Insert the drive tray assembly into the secondary bay.



B. Press SW2 for 3 seconds.

C. The disk rebuild from the primary to the secondary bay will start. Progress will be indicated on the LCD until complete.

Note: If the target drive's (the one being rebuilt) capacity is smaller than the source drive, or unrecoverable bad sectors are detected while performing disk rebuild, the LCD will indicate the condition and the disk rebuild process will terminate.

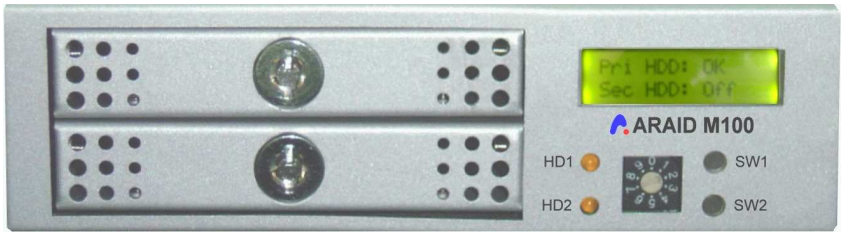
Remove a healthy hard disk from ARAID M100 for backup

When both drives are both designated as OK by the M100 during normal operation, you can safely remove a disk/tray assembly from either bay.

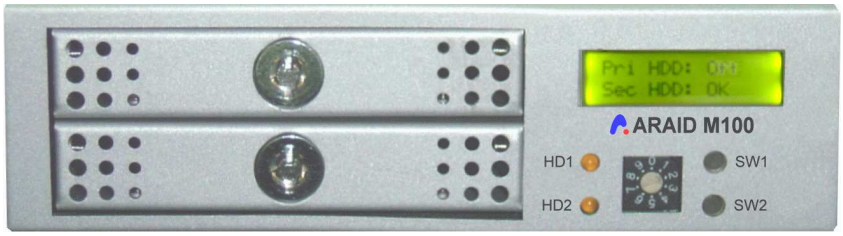
A. To remove the primary drive, press SW1 for 3 seconds to stop disk access to the primary drive, or

B. To remove the secondary drive, press SW2 for 3 seconds to stop disk access to the secondary drive.

C. The designated drive will stop operating and marked by "OFF" on the LCD. Its corresponding LED will no longer flash.



or



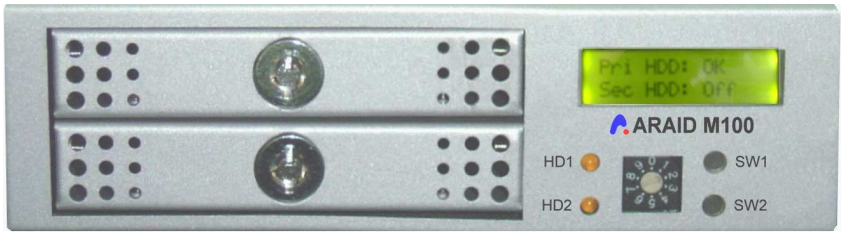
You can now unplug the designated drive from the M100. The offline hard drive is now ready for further backup, data analysis, virus detection, etc. Your PC will continue working with the other healthy hard drive.

Important Note: When a disk rebuild is in progress, you can press SW2 for 3 seconds to stop drive 2 to cancel the disk rebuild and then remove drive 2. But you should not press SW1 for 3 seconds to remove drive 1, because drive 1 is the unique surviving disk needed to operate. Removing the survival operating hard disk (drive 1 in this example) may halt up the computer and risk data loss.

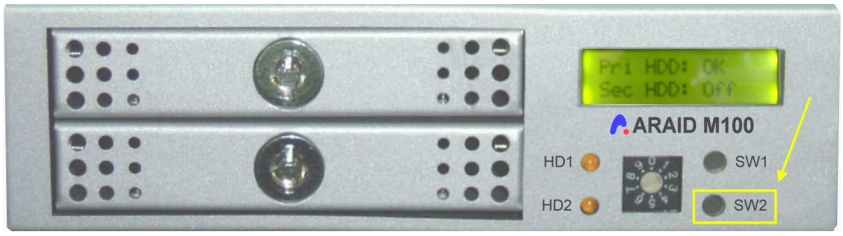
Backup on Demand of the entire hard drive

The *Backup on Demand* is composed of three progressive steps.

A. Insert the primary drive into the M100 without enabling a disk rebuild (do not press SW2 for 3 seconds). The LCD will show the secondary as OFF. The PC operates on the primary only.



B. To initiate an entire disk backup, press SW2 for 3 seconds.



C. The disk rebuild from primary to secondary will start.

D. Once the disk rebuild process is complete, press SW2 for 3 seconds again.

E. The secondary will be shown in OFF status. It is ready to be safely removed. You can now unplug it from the ARAID M100. The duplicated hard disk is ready for any purpose.

ARAID Firmware Upgrade – ARAID 1000L, 1500, and 2000 models

Accordance makes firmware upgrades available to address specific problems addressing chipset compatibility, evolving SATA specifications, and hard drive compatibility issues. Firmware upgrades can be found on Accordance USA's support web page found at www.accordancesystems.com. You will need the FLASH programming utility, the firmware image, and the installation instructions available there. Accordance does not recommend updating firmware unless you are experiencing system problems.

1. Remove disk/tray assemblies from the ARAID unit. If you have an external ARAID model, you will need to remove the ARAID body from the external chassis. Mark the drives "primary" and "secondary" so that you can return them to their original location when the upgrade process is complete.

2. Connect the ARAID to your Primary EIDE channel on the motherboard.

3. Set the ARAID jumper on the 3rd set of pins. (3 closed; 1, 2 and 4 open).

4. Create a bootable DOS floppy diskette. This disk must contain the flash file, *flash211.exe* and the bin file, AS1K129S.bin (for example).

5. After booting from the new floppy, use this command:

A:> *flash211 1 AS1K129S.bin <enter>*

6. The upgrade will begin.

7. Once the upgrade process is complete, the screen will display:

```
Identify Flash ROM ID Code!!!
The ROM chip is AMIC A290011--> Check Sum:2e6ef9
The new upgrade file: AS1K129S.bin
The old firmware code will be saved as a:\oldcode.bin
Do you want to save? (Y/N).....Y or N
Programming...Address: 0xFFFF
Verifying...Address: 0xFFFF
Program OK!! Please reboot your computer...!!!
```

8. Reset the ARAID jumper to Master/Slave and re-insert the drive/tray assemblies into the ARAID.

9. The firmware upgrade is complete.

ARAID Firmware Upgrade – ARAID M100 model

Accordance makes firmware upgrades available to address specific problems addressing chipset compatibility, and hard drive compatibility issues. Firmware upgrades can be found on Accordance USA's support web page found at www.accordancesystems.com. You will need the FLASH programming utility, the firmware image, and the installation instructions available there. Accordance does not recommend updating firmware unless you are experiencing system problems.

1. Remove disk/tray assemblies from the ARAID unit. Mark the drives "primary" and "secondary" so that you can return them to their original location when the upgrade process is complete.

2. Connect the ARAID to your Primary EIDE channel on the motherboard.

3. Set the rotary switch on the front panel to 4 (default setting is 2).

4. Create a bootable DOS floppy diskette. This disk must contain the flash file, *flash211.exe* and the bin file, *IGMR0935.bin*. This .bin file name is an example, yours may be different.

5. After booting from the new floppy, use this command:

A:> *flash211 0 IGMR0935.bin <enter>*

6. The upgrade will begin.

7. Once the upgrade process is complete, the screen will display:

```
Identify Flash ROM ID Code!!!
The ROM chip is AMIC A290011--> Check Sum:2e6ef9
The new upgrade file: IGMR0935.bin
The old firmware code will be saved as a:\oldcode.bin
Do you want to save? (Y/N)……Y or N
Programming…Address: 0xFFFF
Verifying…Address: 0xFFFF
Program OK!! Please reboot your computer…!!!
```

8. Set the rotary switch on the front panel to 2 and reinsert the drive/tray assemblies into the M100.

9. The firmware upgrade is complete. Reboot the PC. The new firmware revision will be indicated in the LCD display when the PC is powered up.

Frequently Asked Questions

1. The ARAID system has a buzzer and it is going off! I can turn off the buzzer, but would like to know why it is buzzing! The screen states that both drives are okay, but there is a bold "F" in the upper right corner that was not there before.

The F indicated on the LCD screen indicates that the ARAID fan is either rotating too slowly or has stopped altogether. A replacement fan is required, which you can get directly from Accordance Systems USA.

Accordance recommends the use of ARAIDeye or Accordance's SNMP agent which will constantly monitor and report status of your ARAID(s). ARAIDeye is a Windows hosted program and is available on the CD which accompanied the ARAID. The SNMP agent can be hosted on Windows or Linux. Contact Accordance Systems USA for a copy of the SNMP agent.

2. I am attempting to install Windows 2000 Server on a motherboard equipped with two SATA ports that can be utilized as RAID 0 or RAID 1. I want to disable the onboard RAID and use the ARAID instead, but the ARAID is not recognized by the motherboard.

There are several things to check here.

- Most motherboards featuring onboard RAID have a means to disable it in the BIOS. The procedure for doing this varies according to model, so consult your motherboard manual.
- If the motherboard does not natively support SATA, you will have to install the SATA driver when Windows (NT-based kernels) prompt you to press F6 during operating system installation.
- Check the support section of the www.accordancesystems.com web page to make certain your ARAID is running the latest firmware.

3. How do I update the ARAID firmware?

There are three downloadable files available from the support section of the www.accordancesystems.com web page needed to upgrade ARAID firmware. You will need the FLASH programming utility, the firmware image, and the installation instructions. Accordance does not recommend updating firmware unless you are experiencing system problems.

4. I need to backup data onto different drive sizes. For example, I may want to back up to a 120GB or 250GB or 500GB in the RAID. Is it possible to change drive sizes in the ARAID on the fly?

You can change drive sizes on an ARAID 1000L by placing the original drive (the drive to be copied) in the upper bay where it will be designated as the source drive. Insert the replacement drive into the lower bay. The disk auto rebuild sequence will now start automatically, or you can start it manually with the front panel operation mode switch. The only caveat is that the source drive be smaller or the same size as the drive you placed in the lower bay. Full details are

provided in the ARAID manual.

5. If I pull a drive out of one of the ARAID trays, can I read it if I connect it directly to the disk controller on the motherboard?

Yes, there is no difference in a drive used an ARAID compared to any other drive. Assuming your operating system, computer, and BIOS are otherwise capable of reading the drive, you should have no problems.

6. How can I find out if I have the latest firmware?

Go to Accordance's customer support web page and select the DOWNLOAD LATEST FIRMWARE link. Your ARAID device is listed by model and firmware version. When your ARAID is powered on, it will display the firmware version. Accordance does not recommend updating firmware unless you are experiencing system problems.

7. Are there any file types that the ARAID will not backup?

ARAIDs perform block copies from the primary to the secondary drive. It has no concept of files. This permits faster mirroring operations and also allows the ARAID to be used with Windows, Linux and Mac operating systems with no required changes to the ARAID.

The ability to backup operating system files, applications, user data, databases, and other open files is something you'd pay a lot for with other backup solutions like tape and ghosting. With ARAID, these capabilities are integral with its normal RAID 1 operation.

8. The ARAID's LCD display indicates that one or both of my hard drives have failed when I power on my computer. The drives are new. What is happening?

There is a good chance that your drive is actually the problem. Disconnect the drive from the ARAID and attach it directly to the motherboard. Use the drive manufacturer's drive utility to check the drive.

If the drive passes, try applying a firmware upgrade as described in the previous section, *ARAID Firmware Upgrade*.

If the problem persists, contact Accordance's support group. There may be compatibility issues with some drives that Accordance will work to correct.

9. What type of hard drive should be selected in the BIOS?

If you are using two identical hard drives, select HDD TYPE **AUTO**. If you replace a failed hard drive with a new disk with the same brand, and the same model series, but with a larger capacity, select HDD TYPE: **AUTO**, as well.

If the replacement drive is larger than the surviving drive, it is imperative that you place the smaller (surviving) drive in the primary bay, then boot the computer. When the operating system is booted, insert the new larger capacity disk in secondary bay.

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

Turn the PC on again and the disk rebuild will restart and continue, regardless of whether you are rebuilding from primary to secondary or from secondary to primary.

The PC will boot from the source disk, whether it is primary or secondary, and will automatically resume the disk rebuild sequence without further user intervention.

11. What should I do if I need to replace a defective hard drive?

To minimize the risk of losing mission critical data, make it a practice to keep a spare hard drive of the same make and model. Always restock your spare inventory with new hard drive(s) of the same model whenever a defective hard drive is replaced. These drives can be easily added and rebuilt in the ARAID disk array.

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 sequence will now start. If it fails to start, switch the front panel operation mode switch from "**Single**" to "**Default**" The BIOS HDD type can set to **Auto** in this case.

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.

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

The BIOS of some older computers may only be able to access hard drives of 8GB or less. In these instances, you must set the HDD TYPE in the BIOS to USER mode and then key in the *Head/Cylinder/Sector* data which is printed on the drive label or available from the manufacturer's website.

Appendix A
Limited Warranty Statement
Warranty Services

Accordance Systems' warranty obligations are limited to the terms set forth below.

Please note that Accordance Systems reserves the right to update from time to time the warranty terms provided for new purchases of Accordance Systems products, and to establish the effective date of those updated warranty terms. Please refer to www.AccordanceSystems.com for the then current form of Limited Warranty Statement for Accordance Systems brand products.
Please note that Accordance Systems products are distributed through local authorized distributors and resellers ("Resellers"). These Resellers generally offer a consumer warranty, and associated warranty services, to consumer purchasers. Accordance Systems recommends that consumers first contact the Reseller from whom they purchased the Accordance Systems product for all issues with regard to product defects and the applicable product warranty.
Accordance Systems warrants to the original consumer purchaser ("you") that new Accordance Systems disk drive products ("New Products") will be free from defects in material and workmanship for the Standard Warranty Period for the relevant New Product. The Standard Warranty Period for the various New Products marketed by Accordance Systems is twelve (12) months from date of purchase.

The warranty period on replacements for New Products is the remainder of the warranty on the original New Product or 90 days from the date of shipment of the replacement product, whichever is longer.

The start of the Warranty Period is the documented date of your purchase of the Product from Accordance Systems or Accordance Systems' authorized reseller. In the absence of a documented purchase date, the start of the Warranty Period will be deemed the date of original shipment by Accordance Systems to Accordance Systems' customer.

The Products are manufactured from parts and components that are new or equivalent to new in accordance with industry standards.

If you discover a defect in material or workmanship during the Warranty Period, and Accordance Systems agrees that the defect exists, Accordance Systems will, at its option, repair or replace the Product at no charge to you, provided it is returned during the applicable Warranty Period, with transportation charges prepaid, to the facility designated by Accordance Systems. The Product must be

properly packaged in Accordance Systems or Accordance Systems-approved packaging, with the Return Material Authorization clearly displayed on the outside of the packaging, to obtain warranty service. Products that fail within the first 30 days after purchase will be replaced with a new Product. Accordance Systems may require proper proof of purchase documentation prior to issuing the replacement Product.

If Accordance Systems elects to repair a Product, Accordance Systems owns all parts removed from the repaired Product. Accordance Systems uses new and reconditioned parts made by various manufacturers in conjunction with warranty repairs and replacement Products. Repair parts or replacement Products may, at Accordance Systems' option, include an equal or better model or features. Accordance Systems has no responsibility whatsoever with regard to any content or data on returned Products.

To request warranty service and before returning a Product to Accordance Systems, please contact Accordance Systems at info@accordancesystems.com or 866-334-4446. Once the Accordance Systems determines that a repair is required, Accordance Systems will issue an RMA number. A copy of your receipt or bill of sale bearing the name and location of Accordance Systems' authorized reseller and the Accordance Systems serial number and model number of the Product in which the defect has been reported may be required as a proof of your purchase for warranty service.

You are responsible for saving or backing up data contained in any Product returned to Accordance Systems in conjunction with warranty or any other services. Accordance Systems shall have no responsibility for such data whatsoever and shall have no liability arising out of any damage to, or loss or disclosure of, such data.

This limited warranty applies only to the Accordance Systems products that can be identified by the original, unaltered Accordance Systems trademark, trade name or logo affixed to them. Accordance Systems does not warrant any product that is not manufactured by, for, or with permission from Accordance Systems, or which is not otherwise distributed by Accordance Systems under the Accordance Systems brand.

This warranty does not cover any of the following conditions:

- Abuse, unreasonable use, mistreatment, or neglect
- Unusual physical or electrical stress or power fluctuations
- Damage caused during installation of the Product
- Damage or capacity/performance/operational resetting caused by the equipment or system with which the Product is used

- Damage caused by modification or repair not made or authorized by Accordance Systems
- Products whose Accordance Systems Serial Number and/or Material Number label have been removed, torn or defaced
- Damage caused by use of non-Accordance Systems packaging
- Damage caused by improper or improperly used packaging
- Damage caused by lack of ESD protection
- Products that are determined to be stolen.

Further, this limited warranty is void if the Product cover, or any label or seal on the Product, is removed or damaged.

Accordance Systems owns all parts removed from the repaired Products. Accordance Systems uses new and reconditioned parts in performing warranty repairs and building replacement products.

FAILURE TO COMPLETE AND RETURN ANY ACCORDANCE SYSTEMS PRODUCT REGISTRATION FORM WILL NOT DIMINISH YOUR WARRANTY RIGHTS.

Certain Products include software or firmware as a component ("Software"). Accordance Systems or its suppliers retain all rights of ownership in such Software and any use of the Software is subject to the license agreement provided by Accordance Systems accompanying such Software. If no license is provided by Accordance Systems, you are granted the limited right to use the Software as required for the operation of the Product and no other rights are granted whatsoever. EXCEPT AS OTHERWISE PROVIDED BY ACCORDANCE SYSTEMS IN A WRITTEN LICENSE AGREEMENT, SOFTWARE IS OFFERED "AS IS" AND ACCORDANCE SYSTEMS GRANTS NO WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, BY STATUTE, COMMUNICATIONS OR OTHERWISE WITH REGARD TO THE SOFTWARE. ACCORDANCE SYSTEMS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT WITH RESPECT TO THE SOFTWARE.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, WHETHER ORAL OR WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. OTHER THAN AS EXPRESSLY SET FORTH HEREIN, ACCORDANCE SYSTEMS SPECIFICALLY DISCLAIMS TO THE MAXIMUM EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED REPRESENTTIONS, WARRANTIES AND CONDITIONS AS TO THE PRODUCTS, SERVICES, OR ANY OTHER MATTER WHATSOEVER. IN PARTICULAR, BUT WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, ACCORDANCE SYSTEMS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED OR DEEMED WARRANTIES AND CONDITIONS OF SATISFACTORY QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE IN

A SKILLFUL AND WORKMANLIKE MANNER, AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS OR ANY OTHER WARRANTY ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE. THIS LIMITED WARRANTY DOES NOT APPLY TO, AND ACCORDANCE SYSTEMS MAKES NO WARRANTY TO YOU WITH REGARD TO, PRODUCTS ORIGINALLY SOLD AS AN INTEGRATED COMPONENT OF A SYSTEM NOT SUPPLIED BY ACCORDANCE SYSTEMS, OR PRODUCTS PROVIDED UNDER A THIRD PARTY LEASING OR SERVICE ARRANGEMENT. No Accordance Systems distributor, reseller, dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

ACCORDANCE SYSTEMS IS NOT RESPONSIBLE OR LIABLE FOR ANY INDIRECT, UNFORSEEABLE, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES HOWEVER CAUSED AND WHETHER OR NOT ACCORDANCE SYSTEMS WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INCLUDING BUT NOT LIMITED TO, COSTS OF PROCUREMENT OF SUBSTITUTE GOODS, LOSS OF DATA OR PROGRAMS, LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE OR REPLACEMENT OF EQUIPMENT AND PROPERTY, AND ANY COSTS OF RECOVERING, PROGRAMMING OR REPRODUCING ANY PROGRAM OR DATA STORED IN OR USED WITH ACCORDANCE SYSTEMS PRODUCTS OR ANY OTHER DAMAGES ARISING OUT OF THE PURCHASE, USE OR PERFORMANCE OF THE PRODUCT. Accordance Systems is not, and cannot be, responsible for any losses or damages arising out of any loss of, or any inability to access, data as a result from the failure of a Product, and accordingly you bear this risk. The allocation of risk under this limitation of liability is reflected in the purchase price of the Product. This limitation of liability, however, will not apply to claims for death or personal injury caused by the negligence of Accordance Systems or its associated companies, officers, representatives or agents.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or exclusions of implied or deemed conditions or warranties, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from jurisdiction to jurisdiction.

Please note that you are expressly not permitted to use the Products in conjunction with the operation of nuclear facilities, aircraft navigation, aircraft communication, aircraft flight control, aircraft air traffic control systems, weapons devices or systems, or in any devices or systems in which a malfunction (including, without limitation, software related delay or failure) would result in foreseeable risk of injury or death to the operator of the device or system, or to others.

This Statement of Limited Warranty shall be exclusively interpreted in accordance with the English language with the meaning of its terms. Should any provisions

of this Limited Warranty be declared invalid by any court of competent jurisdiction, the balance of this Limited Warranty will remain in full force and affect. In addition should a translation of this Limited Warranty deviate from the English language version, only the English language version shall apply and be binding.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