

# Allworx<sup>®</sup> 24x Service and Troubleshooting Guide



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## **1 Safety Instructions**

### **1.1 Electrical**

- Before working inside the Allworx system, unplug the unit and disconnect all T1, network, telephony, USB, door and relay, and audio connections from the front panel, to help prevent electrical shock or system damage.
- To help prevent electrical shock, the ground connecting screw located next to the power receptacle on the rear panel must be permanently connected to earth using 18 AWG wire or larger. The power cable is also equipped with a three-pronged plug to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from the cable. If an extension cord is required, use a three-wire cable with properly grounded plugs.
- To reduce the risk of fire, use only 26 AWG or larger UL listed or CSA certified telecommunications line cord.
- To help protect the Allworx system from sudden transient increases and decreases in voltage, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Be sure nothing rests on or interferes with the system's power cables.
- Make sure the cables are not located where they can be stepped on or tripped over.
- Do not spill food or liquids on the Allworx system.
- Do not push any objects into the openings of the system. Doing so can damage the unit or cause electrical shock.
- Keep the Allworx system away from heat sources such as radiators.
- Do not block the air vents on the rear panel.

### **1.2 Electrostatic Discharge**

Static electricity can harm the components inside the Allworx system. To prevent static damage, discharge electricity from your body before you touch any of the unit's electronic components. You can do this by touching the ground connecting screw on the unit's rear panel.

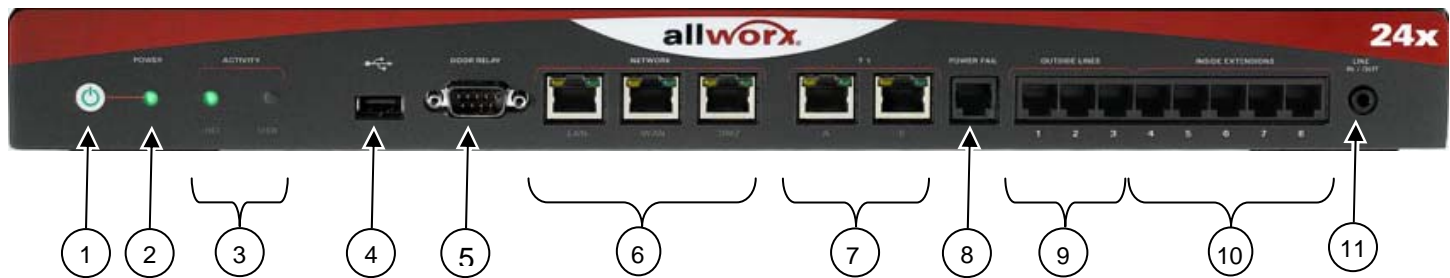
As you continue to work inside the unit, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated and use an anti-static strap.

You can also take the following precautions to prevent damage from electrostatic discharge:

- When unpacking a static-sensitive component, do not remove the component from its anti-static packing material until you are ready to install the component. Be sure to discharge static electricity from your body just before you un-wrap the component.
- When transporting a static-sensitive component, first place it in an anti-static container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use anti-static floor pads, straps, and workbench pads.

## 2 Chassis Views

Figure 1: Front Chassis View



- 1 Power switch  
Press & Release – Normal shutdown within a few seconds  
Press & Hold – Forced shutdown
- 2 Power LED – Indicates system start up activity
- 3 Activity LEDs – Green indicates mounted drive; blinking light indicates activity
- 4 USB Host Port
- 5 Door and paging relay port
- 6 RJ-45 10BaseT/100BaseTX Auto-Sensing Auto-MDI/MDIX Local Area, Wide Area, and Demilitarized Zone (DMZ)\* Network Ethernet ports.
- 7 T1 Ports (A/B)
- 8 RJ-11 Power Fail analog phone connector
- 9 RJ-11 loop-start FXO for central office connection (Ports 1-3)
- 10 RJ-11 FXS ports for inside extensions (Ports 4-8)
- 11 3.5 mm stereo audio mini jack for music-on-hold (input) and overhead paging (output)

\* Future Feature

Figure 2: Rear Chassis View



- 12 Air intake vent
- 13 Ground connecting screw
- 14 Air exhaust vent
- 15 IEC Power cord connector

### 3 Exterior Cleaning

Use the following tools and supplies to clean the exterior of the Allworx system:

- Soft lint-free cleaning cloth
- Small vacuum with brush attachment

Cleaning Procedures:

1. Use the vacuum to remove dust and debris from the fan area, intake vents (See Figure 2 item 12), and exhaust vents (See Figure 2 item 14) on the rear panel.
2. Wipe the exterior surfaces with a clean, soft, lint-free cloth. If necessary, the cloth can be slightly dampened with water. Avoid getting moisture in any of the openings.

## 4 Troubleshooting and Repair Procedures

### 4.1 Top Cover Removal and Replacement

While the top cover is removed, an anti-static strap must be around your wrist and connected to the ground connecting screw on the system's rear panel at all times.

**Caution: Failure to follow this precaution may result in equipment damage and a voided product warranty.**

#### Required Tools

- Anti-static strap
- #1 Phillips screw driver

#### Removal Procedure

1. Shutdown the unit by either:

##### Normal Shutdown:

A normal shutdown is performed when the Power button on the front panel is pressed and released. The power LED flashes green and then, within a few seconds, the unit will power down.

##### Forced Shutdown:

A forced shutdown is performed when the Power button is pressed and held for at least 4 seconds. Release the button once the LED turns off. Only force a shutdown when the normal shutdown does not succeed in powering down the unit.

2. Wait for the Power indicator to go off and then unplug the unit from the power source.

**Caution: Failure to follow this precaution may result in personal injury or equipment damage and a voided product warranty.**

3. Disconnect all T1, network, telephony, USB, door relay, and audio connections from the front panel. To facilitate reinstallation, label all cables by recording the port numbers/locations.

**Caution: Failure to follow this step may result in personal injury or equipment damage and a voided product warranty.**

4. Remove the unit from the rack or wall, if mounted.
5. Place the anti-static strap around your wrist and connect the other end to the ground connecting screw on the rear panel.
6. Remove the 3 screws from the back panel of the chassis.
7. Carefully slide the top cover towards the back of the unit about one half (1/2) inch.
8. Using your thumb and first finger, grasp the rear of top cover and lift up to remove.

#### Replacement Procedure

1. With one hand holding each side of the top cover, place it over the chassis, align it with the slots of the chassis, and lower it into place.
2. Slide the top cover forward.
3. Replace the 3 top cover retaining screws on rear of the unit.



4. Install the system in the rack or on the wall as appropriate.
5. Reconnect all T1, network, telephony, USB, door relay, and audio connections.

## 4.2 System Power Up

Connect the unit to the power source with the AC power cord. The Allworx system will automatically begin to power up after power is stable for a few seconds. This is part of the design to automatically boot up after a power failure. As it progresses through the power up sequence, the front panel lights will respond as shown Table 2 below:

Power Up Sequence	Front Panel Light	Power-Up Sequence Description
Normal Mode	Power	Flashes green as the power up sequence progresses; steady green when the unit is ready.
	Activity – HD	Solid green when drive mounted; blinking light indicates activity.
	Activity - USB	Solid green when device attached and enabled; blinking light indicates activity.
Safe Mode	Power	Turns amber to indicate a safe mode boot has been initialized; Flashes green as the power up sequence progresses; Steady amber when the unit is in safe mode.
	Activity – HD	Off
	Activity – USB	Off
Mirror Drive Replication	Power	Flashes green; solid green once completed.
	Activity – HD	Flashes green; solid green once completed.
	Activity - USB	Off

**Table 1: Front Panel Indicators**

If the Power indicator is on solid amber, the unit is in Safe Mode. If this is unexpected or if the LED is in any other state, follow the steps listed in *Troubleshooting – Start Here* (Section 4.4).

## 4.3 Entering Safe Mode

The unit can enter Safe Mode in one of three ways:

- **Boot up fault detection** – If a fault is detected during boot up that prevents the unit from running in Normal Mode, it will enter Safe Mode.
- **Normal Mode maintenance page** – The administrator can command the system to restart such that the system will enter Safe Mode after the restart. This can be done by selecting Maintenance (on the left hand side of the web administration page), Restart, and “Enter Safe Mode after restart”.
- **Power Up in Safe Mode** – When the unit is off, if the power button is held for more than 1 second, the system will enter Safe Mode.

When in Safe Mode, the Power indicator will be lit solid amber.

- The Safe Mode administrative interface to the system is accessed using a web browser. The steps to connect to this interface are:
  1. Plug your PC into the Allworx system’s LAN port.
  2. Set up the PC’s network interface to obtain an IP address automatically (using DHCP).

3. You may need to release and renew the PC's IP address from a Windows Command Prompt window to get an IP address from the Allworx system.
4. Verify that the PC has an IP address of 192.168.2.XXX on the network.
5. Open your browser and enter the URL of http://192.168.2.254:8080.

## **4.4 Troubleshooting – Start Here**

1. Locate the Power Switch (See Figure 1 item 1) and Power Indicator (See Figure 1 item 2) on the front panel.
2. When the system is off, if the power switch is pressed and released, the power indicator should turn on green. If the Power indicator is not lit, verify that the unit is plugged in and that the power outlet is active. Note: if power switch is held for more than 1 second, the power indicator will turn amber and the unit will boot up in Safe Mode.
3. If the Power indicator is still not lit, diagnose the problem as instructed in Troubleshooting a Power Problem (Section 4.5).
4. If the Power indicator is amber, diagnose the problem as instructed in *Troubleshooting an Amber Power Indicator* (Section 4.6).
5. If the Power indicator is red, diagnose the problem as instructed in *Troubleshooting a Red Power Indicator* (Section 4.7).

States of the Power Indicator LED are shown in Table 1 below:

<b><i>Power/Boot State</i></b>	<b><i>Power Indicator</i></b>
<i>Off</i>	<i>Off</i>
<i>Power Switch Pressed</i>	<i>Green Solid</i>
<i>Normal Booting</i>	<i>Green Slow Blink</i>
<i>Ready</i>	<i>Green Solid</i>
<i>Safe Mode Booting</i>	<i>Amber then Green Blink</i>
<i>Safe Mode Ready</i>	<i>Amber Solid</i>
<i>Alert</i>	<i>Red Solid or Blinking</i>

**Table 2: Power Indicator States**

## 4.5 Troubleshooting a Power Problem

1. Remove the top cover assembly as instructed in *Top Cover Removal and Replacement* (Section 4.1).
2. Visually locate the green power indicators (LED1 and LED2) located on the motherboard (See Figure 3 Section 4.12).
3. With the AC power cord attached, LED2 should be on (green).
4. If LED2 is not on, replace the power supply as instructed below:

### Power Supply Removal and Replacement

#### Required Tools

- Antistatic strap
- #1 Phillips screw driver

#### Removal Procedure

- a. Unplug the AC power cord from the unit
- b. Locate the power supply cover at the rear left corner of the chassis (See Figure 3 Section 4.12).

**Caution: The unit must be unplugged from the AC power source before the power supply cover is removed. Hazardous voltages are present in the power supply area below the cover.**

- c. Remove the 4 screws securing the power supply cover to the bottom of the chassis and 1 screw securing the power supply cover to the back panel of the chassis, and then carefully remove the power supply cover.
- d. Disconnect the AC (1 black, 1 white cable plug) and DC (3 black, 3 white cable plug) cables from the power supply.
- e. Remove the 4 screws securing the power supply to the bottom of the chassis.
- f. Lift the power supply out of the chassis.

#### Replacement Procedure

- a. Place the power supply in the chassis and secure with 4 screws. Make sure the AC connector (2 pins) is towards the rear of the chassis and the DC connector (6 pins) is towards the front of the chassis.
  - b. Reconnect the motherboard AC and DC cables to the power supply.
  - c. Replace the power supply cover and secure with 5 screws.
  - d. Replace the top cover assembly as instructed in *Top Cover Removal and Replacement* (Section 4.1).
  - e. Power up the unit as instructed in *System Power Up* (Section 4.2).
5. If LED2 is lit, confirm that LED1 is on, indicating that the motherboard power is enabled.
  6. If LED1 did not light, the motherboard is not functioning; therefore the system must be replaced.
  7. If LED1 is lit, confirm that the front label flex tail (See Figure 3 Section 4.12) is seated properly in connector J13.
  8. If the Power Indicator on the front panel (See Figure 1 item 2) is still not lit, the motherboard is not functioning; therefore the system must be replaced.

## **4.6 Troubleshooting an Amber Power Indicator**

When the power indicator is amber, the system is in Safe Mode. Connect a PC to the Safe Mode web administration interface as instructed below:

1. Plug your PC into the Allworx system's LAN port.
2. Set up the PC's network interface to obtain an IP address automatically (using DHCP).
3. You may need to release and renew the PC's IP address from a Windows Command Prompt window to get an IP address from the Allworx system.
4. Verify that the PC has an IP address of 192.168.2.XXX on the network.
5. Open your browser and enter the URL of <http://192.168.2.254:8080>.

To get out of Safe Mode, perform the following steps in order. If the unit boots into Normal Mode after any step, then Section 4.3 is complete.

1. Select Reboot in Normal Mode on the Safe Mode web administration page.
2. Follow the steps found under *Reseat All Connectors and Reboot Task* (Section 4.6.1).
3. If the unit has mirrored disks, follow the steps found under *Isolate Mirrored Disks Task* (Section 4.6.2).
4. Follow the steps found under *Fix Disk Task* (Section 4.6.3). If the unit has mirrored disks, perform this task on each disk, one at a time, by pulling the cables from the other disk.

### **4.6.1 Reseat All Connectors and Reboot Task**

1. Insure power is not applied to the unit
2. Remove the top cover assembly as instructed in *Top Cover Removal and Replacement* (Section 4.1).
3. Pull out and then reinsert the disk drive and power supply cables from the motherboard. Do not remove the ribbon cables directly from the disk drives.
4. Reconnect AC power and power up the unit as instructed in *System Power Up* (Section 4.2).

### **4.6.2 Isolate Mirrored Disks Task**

One bad disk may affect the other disk in a mirrored disk unit.

1. Insure power is not applied to the unit
2. Pull the secondary disk drive cable (top) from the motherboard (do not pull the ribbon cable directly from the disk drive).
3. Reconnect AC power and power up the unit as instructed in *System Power Up* (Section 4.2).
4. If the unit boots into Normal Mode, then the disconnected disk drive is corrupted and needs to be replaced. Replace the disk as instructed in *Disk Replacement* (Section 4.8). If the unit boots into Safe Mode, then the disconnected disk drive was working correctly. Reinsert the cable back into the motherboard.
5. Repeat steps 1 through 4 with the primary disk cable (bottom).

### **4.6.3 Fix Disk Task**

Something is wrong with the disk. It may be anything from the data on the disk being corrupted to a problem with the disk itself. These steps are ordered to try to maintain, on the disk, as much existing data as possible. If the unit boots into Normal Mode after any step, then Section 4.6 is complete.

1. Perform the *Fix Application Software Task*.

If the application software is damaged, it will prevent the unit from booting into Normal Mode. This task attempts to restore the application software.

- a. Perform the Mount operation found on the Safe Mode web administration page. Do NOT perform the Format operation. If the Mount button is not enabled or if the operation fails, the application software cannot be fixed. Therefore, proceed to step 2.
- b. Select Reboot in Normal Mode on the Safe Mode web administration page (if able). If the unit boots into Normal Mode, then Section 4.6 is complete. However, if this option is not available, proceed to step 1c.
- c. Perform a Software Update as instructed on the Safe Mode web administration page. If the unit boots into Normal Mode, then Section 4.6 is complete. If the system does not boot into Normal Mode, then proceed to step 2.

## 2. Perform the *Fix System Configuration Task*.

The system configuration settings may be so damaged that the unit will not boot into Normal Mode. This task attempts to restore the settings from a backup image (if available) or reset them to factory defaults.

- a. Restore the configuration settings using a backup image (if available). If a backup image is not available proceed to step 2c.

**Caution: Using a backup image, you will revert your system configuration settings, user data (voicemail, email, calendar, contact information, and files), and system software back to the information that was on the system at of the time of the backup.**

- b. If restoring from a backup, perform the OfficeSafe restore, as described in the Backing up and Restoring Data section of the *Allworx System Administration Guide*<sup>\*\*</sup>. If the unit boots in Normal Mode, then Section 4.6 is complete. If the system does not boot into Normal Mode, then proceed to step 2c.
- c. To reset to factory default settings perform the Mount operation on the Safe Mode web administration page. Do NOT perform the Format operation. If the Mount button is not enabled or if the operation fails, the system configuration cannot be fixed. Therefore, proceed to step 3. If the Mount succeeds, perform the “Reboot in Normal Mode with Factory Defaults restored” operation on the Safe Mode web administration page.

**Caution: Resetting to factory default settings, the system user data will not be changed, but the configuration settings on the network, system, and feature key pages will need to be reentered.**

- d. If the unit boots in Normal Mode, then Section 4.6 is complete. If the system does not boot into Normal Mode, then proceed to step 3.

## 3. Perform the *Fix System Database Task*.

The system database (configuration settings and user data) may be so damaged that the unit will not boot into Normal Mode. This task attempts to restore the data from a backup image (if available), or reset the configuration settings and erase the user data.

- a. When resetting to factory default settings and erasing the user data, perform the Mount operation on the Safe Mode web administration page. Do NOT perform the Format operation. If the Mount button is not enabled or if the operation fails, the system database cannot be fixed. Therefore, proceed to step 4. If the Mount succeeds, perform the “Reboot in Normal Mode with Factory Defaults restored AND all user settings and files erased” operation on the Safe Mode web administration page.

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<sup>\*\*</sup> Allworx System Administration Guide for the 24x can be found at [www.allworx.com/downloads.asp](http://www.allworx.com/downloads.asp)

**Caution:** Resetting to factory default settings and erasing the user data, will cause the entire configuration settings (users, phones, call routes, etc.) and user data (voicemail, email, calendar, contact information, and files) to be deleted. Therefore, all system information will need to be re-entered.

- b. If the unit boots in Normal Mode, then Section 4.6 is complete. If the system does not boot into Normal Mode, then proceed to step 4.

#### 4. Perform the *Fix File System Task*.

The file system may be so damaged that the disk must be reformatted. Reformatting will erase all data on the disk.

- a. Perform the Format operation, and then perform the Mount operation on the Safe Mode web administration page. If either operation fails, the file system cannot be fixed. Therefore, proceed to step 5.
- b. Restore the entire system database using a backup image (if available). If there is not a backup image available (or the restore failed), perform a Software Update as instructed on the Safe Mode web administration page.
- c. If a backup image was not restored, the entire configuration settings (users, phones, call routes, etc) and all user data (voicemail, email, calendar, contact information, and files) will need to be re-entered.
- d. If the unit boots in Normal Mode, then Section 4.6 is complete. If the system does not boot into Normal Mode, then proceed to step 5.

5. If none of the above steps are successful in enabling the unit to boot into Normal Mode, the disk hardware is bad and must be replaced as instructed in *Disk Replacement* (Section 4.8).

## 4.7 Troubleshooting a Red Power Indicator

1. Open a web browser on a PC that is on the same network as the Allworx system's LAN.
2. Go to the Allworx system's web administration URL. This will be at the system's LAN IP address and port 8080. For example, if the system's LAN IP address is 192.168.25.254, then the correct URL to get to the web administration home page is 192.168.25.254:8080.
3. Click on the About link on the web administration home page.
4. Look at the status of the Primary Disk and Mirror Disk. If either drive is marked "FAILED", then replace that drive as instructed in *Disk Replacement* (Section 4.8).

## 4.8 Disk Replacement

To replace a disk drive, follow these steps:

1. Insure power is not applied to the unit.
2. Remove the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
3. Remove the disk as instructed below:

### Required Tools

- Antistatic strap
- #1 Phillips screw driver

### Procedure Steps:

- Disconnect the ribbon cables for both disks (if present) from the mother board. **Do NOT remove the ribbon cable from the drive.** (See Figure 3 Section 4.12). The primary disk (bottom disk)

connects to motherboard connector J20. The secondary disk (top disk) connects to motherboard connector J21.

- Remove the disk mounting bracket by removing the 4 screws which attach it to the bottom of the chassis. Lift the disk assembly out of the chassis.
- Remove the retaining screws from each side of the disk that is to be removed.
- Slide the disk out of the mounting bracket.

4. Install the new disk as instructed below:

#### Required Tools

- Antistatic strap
- #1 Phillips screw driver

#### Procedure Steps

- Slide the disk into the mounting bracket. Be sure the ribbon cable connector on the disk is facing out of the mounting bracket
- Install the retaining screws into each side of the disk, securing it to the mounting bracket.
- Attach ribbon cable to the drive (if necessary).
- Place the disk assembly into the chassis and secure it to the bottom of the chassis using 4 screws.
- Attach the ribbon cables from both disks (if present) to the motherboard (See Figure 3 Section 4.12). The primary disk (bottom disk) connects to motherboard connector J20. The secondary disk (top disk) connects to motherboard connector J21.

5. Replace the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
6. Reconnect the AC power cord and turn on the unit as instructed in *System Power Up* (Section 4.2).
7. If replacing a disk in a Mirrored Disk System, then follow the instructions in *Mirror Drive Replication* (Section 4.9). If replacing a disk in a Single Disk System proceed to step 8.
8. If a backup image is available, recover the disk data as instructed in the How to Restore Data section of the *Allworx System Administration Guide*<sup>\*\*</sup>. If backup is not available, reinstall the software on the disk as instructed in the Upgrading System Software section of the *System Administration Guide*<sup>\*\*</sup>.

## **4.9 Mirror Drive Replication**

### How to start replication

1. Enter Safe Mode, and then Safe Mode Administration web page as instructed in *Entering Safe Mode* (Section 4.3).
2. Click on the Mount disk operation. The front panel Power and HD Activity indicator will be blinking green (refer to Table 2 Section 4.2). Copying the primary disk to the secondary disk takes approximately 1 minute per gigabyte of data.

The replication is completed when the Power and HD Activity indicators become solid green (refer to Table 2 Section 4.2).

### How to know if replication has completed successfully

When the primary disk has been successfully replicated to the secondary disk, the About link on the Normal Mode web administration page will indicate that both disks are in use.

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<sup>\*\*</sup> Allworx System Administration Guide for the 24x can be found at [www.allworx.com/downloads.asp](http://www.allworx.com/downloads.asp)

1. After the unit is rebooted into Normal Mode, open a web browser on a PC that is on the same network as the Allworx system's LAN.
2. Go to the Allworx system's web administration URL. This will be at the Allworx system's LAN IP address and port 8080. For example, if the Allworx system's LAN IP address is 192.168.25.254, then the correct URL to get to the web administration home page is 192.168.25.254:8080.
3. Click on the About link on the web administration home page.
4. Look at the status of the Primary Disk and Mirror Disk. If both disks are marked "Formatted and In Use", then the mirror operation has completed successfully.

## **4.10 Mirrored Disk Installation in a Single Disk System**

A disk can be added to a single disk system to make it a mirrored disk system.

1. Insure power is not applied to the unit.
2. Remove the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
3. Install the new disk in the top position and format the disk as instructed below:

Always install the new disk in the secondary disk position, which is located above the primary disk. When selecting a disk for installation as a secondary (mirrored) disk, be sure the disk is the same capacity or larger than the existing single disk that is installed in the system.

### Required Tools

- Antistatic strap
- #1 Phillips screw driver

### Procedure Steps

- Slide the disk into the mounting bracket. Be sure the ribbon cable connector on the disk is facing out of the mounting bracket.
- Install the retaining screws into each side of the disk, securing it to the mounting bracket.
- Attach ribbon cable to the drive (if necessary).
- Place the disk assembly into the chassis and secure it to the bottom of the chassis using 4 screws.

Format the new drive to avoid having it possibly being used as the source drive for the mirror copy operation.

- a. Remove all the disk drive cables from the motherboard. Attach the new secondary disk cable (top disk) to the motherboard connector J20. Turn on the unit as instructed in *System Power Up* (Section 4.2).
- b. Enter Safe Mode, and then the Safe Mode Administration web page as instructed in *Entering Safe Mode* (Section 4.3).
- c. Perform the Format operation on the Safe Mode web administration page.
- d. Shutdown the unit by either:

### Normal Shutdown:

A normal shutdown is performed when the Power button on the front panel is pressed and released. The power LED flashed green and then, within a few seconds, the unit will power down.

### Forced Shutdown:

A forced shutdown is performed when the Power button is pressed and held for at least 4 seconds. Release the button once the LED turns off. Only force a shutdown when the normal shutdown does not succeed in powering down the unit.



- e. Move the new secondary disk cable from connector J20 to connector J21. Plug the primary disk cable into the motherboard connector J20.

**Warning: If the above instructions are not all followed, then a loss of all data on the existing disk could result.**

4. Replace the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
5. Turn the unit on as instructed in *System Power Up* (Section 4.2).

The replication operation may start automatically upon power up. The front panel Power and HD Activity indicators will be blinking green to indicate this (Refer to Table 2 Section 4.2). Replication will take approximately 1 minute for each gigabyte (so a 40GB drive will take about 40 minutes). The replication is completed when the Power and HD Drive indicators become solid green (refer to Table 2 Section 4.2). If replication does not start upon power up, proceed to step 6.

6. Replicate the data from the pre-existing disk to the new mirrored disk as instructed in *Mirror Drive Replication* (Section 4.9).

## **4.11 Fan Assembly Removal and Replacement**

### Required Tools

- Antistatic strap
- #1 Phillips screw driver

### Removal Procedure

1. Unplug the AC power cord from the unit.
2. Remove the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
3. Locate the power supply cover at the rear left corner of the chassis (as viewed from the front of the unit).
4. Remove the 5 screws securing the power supply cover and remove the power supply cover.

**Caution: The unit must be unplugged from the AC power source before the power supply cover is removed. Hazardous voltages are present in the power supply area below this cover.**

5. Disconnect the fan power cable from the motherboard connector P1 (See Figure 3 Section 4.12).
6. Remove the 4 screws securing the fan assembly from the rear of the chassis.
7. Lift the fan assembly out of the chassis.

### Replacement Procedure

1. Place the fan assembly in the chassis and secure with 4 screws.
2. Reconnect the fan power cable to the motherboard connector P1 (See Figure 3 Section 4.12).
3. Replace the power supply cover and secure with 5 screws.
4. Replace the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
5. Power up the unit as instructed in *System Power Up* (Section 4.2).

## 4.12 Battery Removal and Replacement

### Required Tools

- Antistatic strap

### Removal Procedure

1. Unplug the AC power cord from the unit.
2. Remove the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
3. Locate the battery in the battery holder mounted on the motherboard, position J19 (See Figure 3 Section 12).
4. Press down on the middle tab to release the battery from the holder.
5. Slide battery out of the holder.

**Caution: The unit must be unplugged from the AC power source before the power battery is removed. Hazardous voltages are present in the area below this cover.**

### Replacement Procedure

1. Place the battery in the battery holder underneath the three tabs.
2. Press down firmly on the side of the battery adjacent to the tabs until the battery sits level in the holder.
3. Replace the top cover as instructed in *Top Cover Removal and Replacement* (Section 4.1).
4. Power up the unit as instructed in *System Power Up* (Section 4.2).

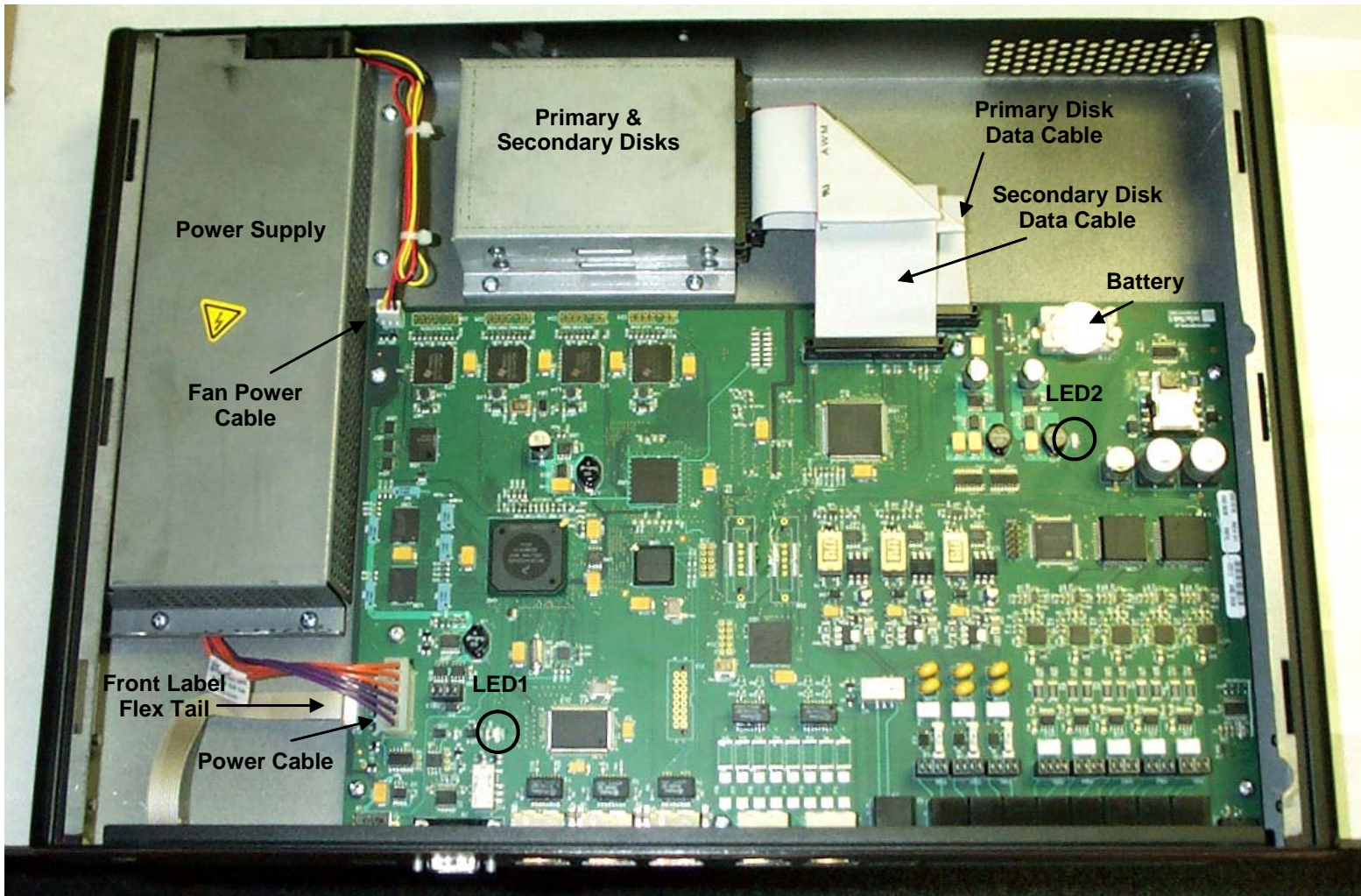
**Caution: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instruction**

### 4.13 Internal Parts Locations

Below is a labeled picture showing the locations of some of the internal parts. This picture will be an aid to locating these parts during the diagnostic and repair procedures.

Figure 3 shows the locations of the LED1, LED2, primary and secondary (optional) mirror disks and cables, the battery, and the fan power cable.

**Figure 3: Inside of a 24x**



## 5 Physical and Environmental Specifications

Dimensions (W x H x D)	17 x 1.75 x 12 inches (43.2 x 4.4 x 30.5 cm)
Weight (Base Model)	9.5 lbs (4.28 kg)
Power	115/230 VAC, 1/0.7A, 50/60Hz
Temperature	0° ~ 40° C
Humidity	15% ~ 90% RH, Non-condensing

**Table 3: Specifications**

## 6 Replacement Parts List

Item	Part Number
Power Supply	2100400
Disk Drive Kit (drive, cable & screws)	8210021
Fan Assembly	3000601

**Table 4: Parts List**