



FASTTRAK
TX2200, TX2300
USER MANUAL

Version 3.2

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Chapter 1: Introduction

- About This Manual, below
- Overview (page 2)
- FastTrak TX Series (page 2)
- WebPAM Software (page 3)
- Key Features and Benefits (page 3)
- Specifications (page 6)

Thank you for purchasing Promise Technology's FastTrak TX2200 or TX2300 RAID Controller card.

About This Manual

This *User Manual* describes how to setup, use and maintain your FastTrak TX Series RAID Controller cards.

This manual includes a full table of contents, chapter task lists and numerous cross-references to help you find the specific information you are looking for.

Also included are four levels of notices:



Note

A *Note* provides helpful information such as hints or alternative ways of doing a task.



Important

An *Important* calls attention to an essential step or point required to complete a task. Important items include things often missed.



Caution

A *Caution* informs you of possible equipment damage or loss of data and how to avoid them.



Warning

A *Warning* notifies you of probable equipment damage or loss of data, or the possibility of physical injury, and how to avoid them.

Overview

The PC which you are using either already contains FastTrak TX2200 or TX2300 RAID Controller card installed by a third-party or you have acquired a FastTrak TX2200 or TX2300 retail product for your existing PC and plan to install the card yourself.

- For PC owners wishing to install their TX2200 or TX2300 RAID Controller card, go to *Chapter 2: Installation* on page 5.
- For PCs with a FastTrak TX2200 or TX2300 RAID Controller card already installed, and you are experiencing any difficulties with the disk drives being recognized by the card, go to *Chapter 6: Troubleshooting* on page 51.
- If your operating system has crashed for some reason or you have downloaded updated drivers from the Promise website (www.promise.com), you may wish to reinstall software drivers for the FastTrak TX2200 or TX2300 RAID controller card. See *Chapter 4: Installing Drivers* on page 33.

FastTrak TX Series

Promise originally designed the FastTrak TX2200 or TX2300 as a cost-effective, high performance RAID controller cards that add performance and/or reliability to PC desktops and/or servers using Serial ATA drives.

FastTrak TX2200 and TX2300 have two independent data channels to support a maximum of two Serial ATA drives and supports:

- Stripe (RAID 0) – Identical drives can read and write data in parallel to increase performance.
- Mirror (RAID 1) – Mirror increases read performance through load balancing and elevator sorting while creating a complete backup of your files.

A FastTrak TX2200 or TX2300 striped logical disk can double the sustained data transfer rate of Serial ATA drives.

FastTrak TX2200 and TX2300 offer fault tolerant, data redundancy for entry-level network file servers or simply for desktop PC users wanting to continually protect valuable data on their PC.

Should a drive that is part of a mirrored logical disk fail, FastTrak TX2200 or TX2300 use the mirrored drive (which contains identical data) to assume all data handling. When a new replacement drive is later installed, FastTrak TX2200 or TX2300 rebuild data to the new drive from the mirrored drive to restore fault tolerance.

FastTrak TX2200 and TX2300 bootable BIOS supports individual drives larger than 137 GB. With FAT32 and NTFS partitioning, the logical disk can be addressed as one large single volume.

WebPAM Software

The Web-based Promise Array Management (WebPAM) RAID management software offers local management and monitoring of FastTrak disk arrays. Browser-based GUI provides email notification of all major events or alarms, memory cache management, logging for Windows servers, disk array maintenance, rebuild, and access to all components in disk array (server, controller, data channels, individual drives, and enclosure).

WebPAM also displays messages about critical events on the Host PC's monitor screen even if your browser is closed.

For information on using WebPAM, refer to "Chapter 5: WebPAM" on page 43.

Key Features and Benefits

The following information offers an overview of the major features of your new Promise FastTrak TX2200 and TX2300.

Advanced Hardware Design	
Features	Benefits
Supports 66 MHz PCI bus motherboards (automatically backward compatible with 33 MHz PCI slots)	Allows maximum data transfers of up to 266MB per second (133 MB/s in 33 MHz slot) over the bus to dramatically reduce the time to save and retrieve large files.
Supports: data stripe (RAID 0) and mirror (RAID 1)	Provides dramatic increase in drive performance and/or fault tolerant options. Offers performance customization and data rebuilds from the BIOS menu.
TX 2300 supports Serial ATA Specification II	Burst data transfer rates up to 300 MB/s from Serial ATA drives to boost overall system performance.
TX 2200 supports Serial ATA Specification 1.0a	Burst data transfer rates up to 150 MB/s from Serial ATA drives to boost overall system performance.
Independent data channels for Serial ATA drives	Drives can multiply their data transfer performance when striped together and each drive uses a separate data channel.
PCI Plug-n-Play, PCI Interrupt sharing and coexists with motherboard IDE and SCSI controllers	Easy to install; supports up to 4 Serial ATA drives on the FastTrak RAID Controller card while still supporting 4 devices on motherboard ATA controller.

Advanced Hardware Design	
Features	Benefits
Supports multiple logical disks	TX2200 and TX2300 support up to 2 logical disks.
Supports online logical disk expansion	Add disk drives to the logical disk without affecting data availability.
Supports online logical disk migration	Change RAID level without affecting data availability.
Utilizes FastBuild™ automenu from the FastTrak onboard BIOS	Has “Auto Setup” option for quick and easy logical disk builds.
Displays status and error checking messages during bootup	Notifies user of possible errors and allows for recovery of mirrored drive logical disks directly from FastBuild™.
Supports S.M.A.R.T. monitoring and reporting	Polls status every 15 minutes, reports through WebPAM.
Employs the latest Promise PCI Serial ATA ASIC technology	Fully supports Serial ATA specifications with 150 and 300 MB/sec timing and CRC error-checking at high speeds.
Mirror supports automatic background rebuilds	Fault tolerance can be restored automatically without rebooting.
DOS based flash upgrade of BIOS and Firmware	Verifies proper file, option to backup existing file. Download files from Promise website.
Gigabyte Rounding	Allows easier interchangeability among disk drive vendors.
System reboot not required after create, delete, migrate or expand logical disk	System boot process continues without restarting.

Compatibility	
Features	Benefits
Complies with PCI v2.3 Local Bus standard	Provides highest level of hardware compatibility.
Complies with SATA Specification 1.0a	Provides full compatibility with first generation Serial ATA hard drives.
Complies with Serial ATA II: Extensions to Serial ATA 1.0a Specification	Provides enclosure and drive monitoring compatibility.
Compliant with PCI Bus Master standard. PCI Bus Master support	Provides 32-bit I/O and, Bus Master, and Serial ATA performance for optimal system performance.
Tested compatibility to coexist with motherboards that have integrated IDE controllers	Improves system performance and minimizes system conflicts for new and existing installations.
Compatible with all major SATA generation 1 and SATA generation 2, phase 1 and phase 2 disk drives	Promise performs verification testing with major drive manufacturers and development partners.
Features LBA support	Supports drives greater than 137 GB capacity.
Supports BIOS Boot Specification	All logical disks attached to the FastTrak card appear in the BBS-compliant motherboards BIOS boot list.
Compatible with Promise SuperSwap enclosures	Provides enclosure management including fan, temperature and voltages.

Specifications

- Low-profile printed circuit board
- PCI Slot 33 MHz or 66 MHz
- Controller card dimensions (HWD):
2.25 x 4.75 x 0.33 inches (57 x 121 x 8 mm)
- Operating temperatures: 32° to 122°F (0°C to 50°C)
- Operating humidity: 5% to 95% non-condensing

Chapter 2: Installation

- Unpack Your FastTrak Card (below)
- Install the FastTrak Card (page 8)
- Install the Disk Drives (page 9)
- Create Your Logical Drive (page 11)
- WebPAM Installation (page 14)

This Chapter is designed to quickly get your FastTrak TX Series RAID Controller card up and running.

If you plan to run the WebPAM software, you must also install the driver appropriate to your operating system. See “Chapter 3: Install Drivers” on page 23.

Unpack Your FastTrak Card

When you receive the FastTrak TX Series RAID Controller card, the package should contain the items listed below:

- FastTrak TX2200 or TX2300 Serial ATA RAID Controller card
- *Quick Start Guide*
- Two 1.5 Gb, 0.65 m (26 inch) SATA data cables for TX2200
Two 3.0 Gb, 0.65 m (26 inch) SATA data cables for TX2300
- One Y power splitter cable
- CD with all Promise RAID Management (WebPAM) software, Windows drivers and *FastTrak TX2200, TX2300 User Manual*

If any of the items are missing or appear to be damaged, please contact your dealer or distributor immediately.



Warning

The electronic components on the FastTrak RAID Controller card are sensitive to damage from Electro-Static Discharge (ESD). Observe appropriate precautions at all times when handling the FastTrak card or its subassemblies.



Warning

Before installing the adapter into an existing system, backup any important or useful data. Failure to follow this accepted PC practice could result in data loss.



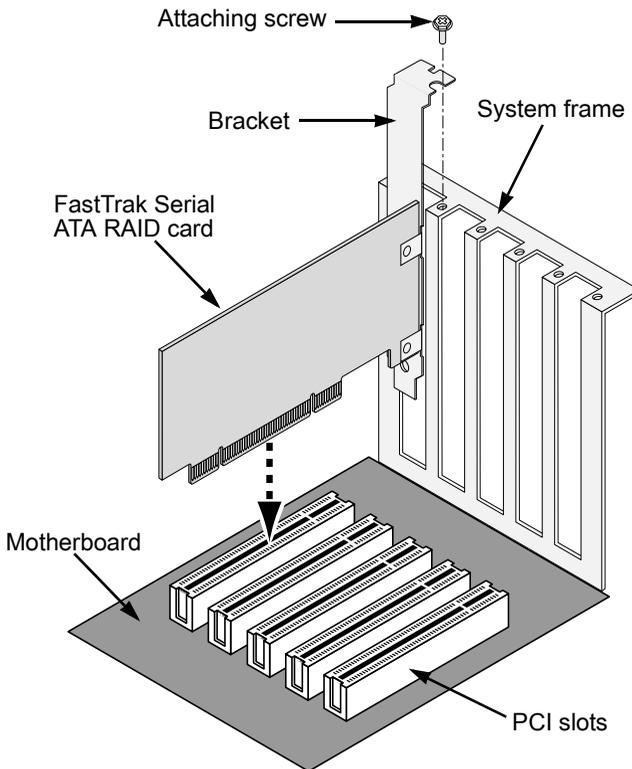
Note

The FastTrak TX Series RAID Controller card is a PCI Plug-n-Play (PnP) device. No changes are necessary in the motherboard CMOS/BIOS Setup for resources or drive types in most applications.

Install the FastTrak Card

The FastTrak TX2200 or TX2300 Serial ATA RAID card fits into any available PCI slot on your PC's motherboard (below):

- 32-bit PCI slot (must be PCI 2.2 or 2.3 compliant)
- The 32-bit portion of a 64-bit PCI or PCI-X slot



1. Remove the cover of your system.
2. Install the FastTrak Serial ATA RAID card into the open PCI slot.

3. Fasten the controller card bracket to the system's frame.
4. Attach your system case's 2- or 4-pin LED cable to the LED connector on the FastTrak card (see *Install the Disk* below).

Install the Disk Drives



Important

If you wish to include your current bootable SATA drive using the Windows operating system as part of a bootable Mirrored (RAID 1) logical drive on your FastTrak card, do NOT connect the disk drive to the FastTrak yet. You MUST install the Windows driver software first onto this drive while it is still attached to your existing disk drive controller.

The FastTrak TX2200 and TX2300 Controller cards support only SATA disk drives. For optimal performance, install disk drives of the same model and capacity. The drives' matched performance allows the logical drive to function better as a single drive.

Level	Number of Drives
RAID 0	any number
RAID 1	2 only
JBOD	1 only

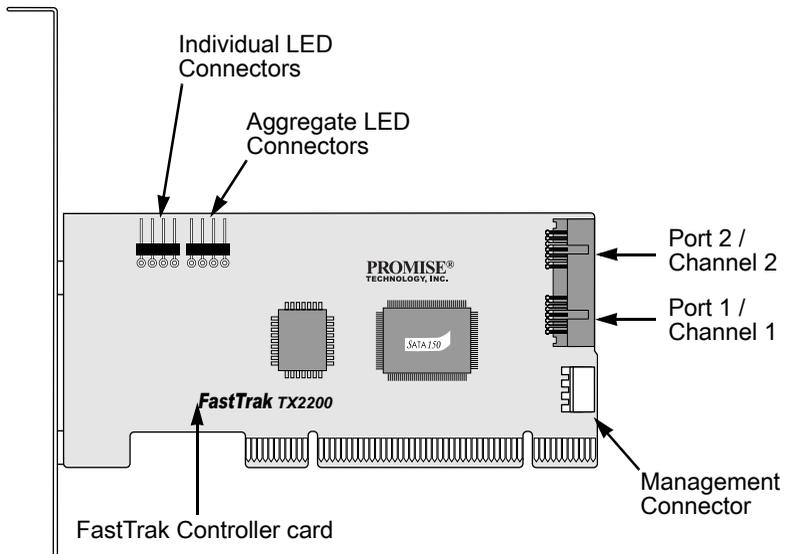
The table above shows the number of drives required for each RAID level. If you plan to create a mirror (RAID 1) for protection, you can use two new drives OR use an existing drive and a new drive. The new drive must be the same size or larger than the existing drive.

1. Install the disk drives into the open drive bays of your system.



Caution

Use of removable physical (disk) drive enclosures other than Promise Technology's SuperSwap is not supported and may result in performance loss or other undesired results.



2. Attach one SATA data cable to each disk drive. Then attach the other ends of the cables to the connectors on the FastTrak card (above).
3. Attach the Y-cable power splitters to your SATA disk drives.

If you are using a Promise SuperSwap 1100 or 4100 enclosure in your PC:

- Connect the power cables to the SuperSwap enclosure.
- Attach a SMBus cable from the Management Connector on the FastTrak card to the Management Connector on the first enclosure

These actions are described in Chapter 2 of the *SuperSwap User Manual*.

Create Your Logical Drive

You will now use the onboard FastBuild BIOS utility to create a logical drive with the attached drives.

For an explanation of the logical drive concepts, see Chapter 6



Note

You can omit this step, proceed with the WebPAM installation on page 15, then create your logical drive using WebPAM. See “Create a Logical Drive” on page 67.

1. Boot your system. If this is the first time you have booted with the FastTrak card and drives installed, the Promise onboard BIOS will display the following screen (below).

```
FastTrak TX2300 (tm) BIOS Version 2.5.0.xx
(c) 2004-2005 Promise Technology, Inc. All rights reserved.

No Array is defined...
```

2. Press the Ctrl-F keys to display the FastBuild Utility Main Menu (below).

```
FastBuild (tm) Utility (c) 2004-2005 Promise Technology, Inc.
[ Main Menu ]

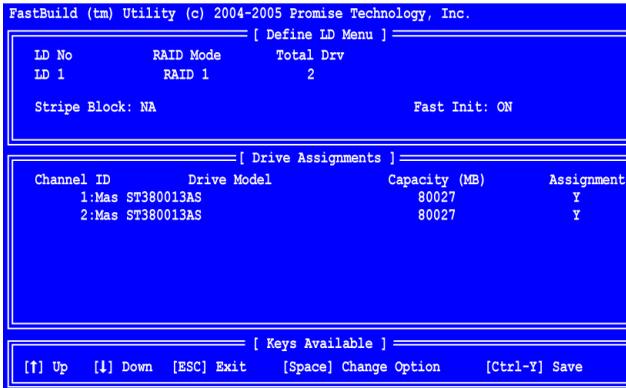
View Drive Assignments ..... [ 1 ]
Define LD..... [ 2 ]
Delete LD..... [ 3 ]
Controller Configuration..... [ 4 ]

[ Keys Available ]
Press 1..4 to Select Option [ESC]..Exit
```

3. Press 2 on the Main Menu screen to display the Define LD Menu (below).



4. Press the arrow keys to highlight a logical drive number you want to define and press Enter to select it. The Define LD Menu for the logical drive number you selected will next appear (below).



5. Choose the RAID Level you want. In the Define LD Menu section, press the Spacebar to toggle through logical drive types:
 - RAID 0 (Stripe)
 - RAID 1 (Mirror)
 - JBOD (Single Drive)

See "Introduction to RAID" on page 91 for more information.
6. Press the arrow keys to move to the next option. Option choices depend on the RAID Level you selected.

- Fast Init erases the Master Boot Record (MBR) of the physical drives when this feature is set to ON.
 - Stripe Block Size. Press the Spacebar to toggle through 32 KB, 64 KB, or 128 KB. 64 KB is the default. Applies to RAID 0.
7. Press the arrow keys to move to Disk Assignments. Press the spacebar to toggle between N and Y for each available drive. Y means this physical drive will be assigned to the logical drive.
Assign the appropriate number of physical drives to your logical drive.
 8. Press Ctrl-Y to save your logical drive configuration.
 9. If you set Fast Init to ON, the following message displays:

```
<Press Ctrl-Y Key if you are sure to erase MBR!>
<Press any other key to ignore this option>
```

- Press Ctrl-Y to continue logical drive creation and perform the Fast Initialization.
- Press any other key to cancel logical drive creation.

If you set Fast Init to OFF, the following message displays:

```
Do you want the disk image to be
duplicated to another or do quick
initialize or create only? (Y/N)
Y - Create and Duplicate
N - Create Only
```

Press N to finish logical drive creation.

10. Press Esc to exit to the Main Menu. Press Esc again to exit the Utility.
11. Press Y to restart the computer.

You have successfully created a new RAID logical drive.



Important

You must be partition and format your new logical drive before you can use it. Use the same method of partitioning and formatting a logical drive as you would any other fixed disk added to your computer system.

WebPAM Installation



Important

Install the FastTrak software drives for your operating system before installing WebPAM. See “Chapter 3: Install Drivers” on page 23 for instructions.

WebPAM installation software will install two major components:

- Utility Server – WebPAM RAID monitoring and Networking software
- Java Runtime Environment (if not previously installed)

Utility Server

The Utility Server installs on the PC with the FastTrak RAID Controller card (the “Host PC”).

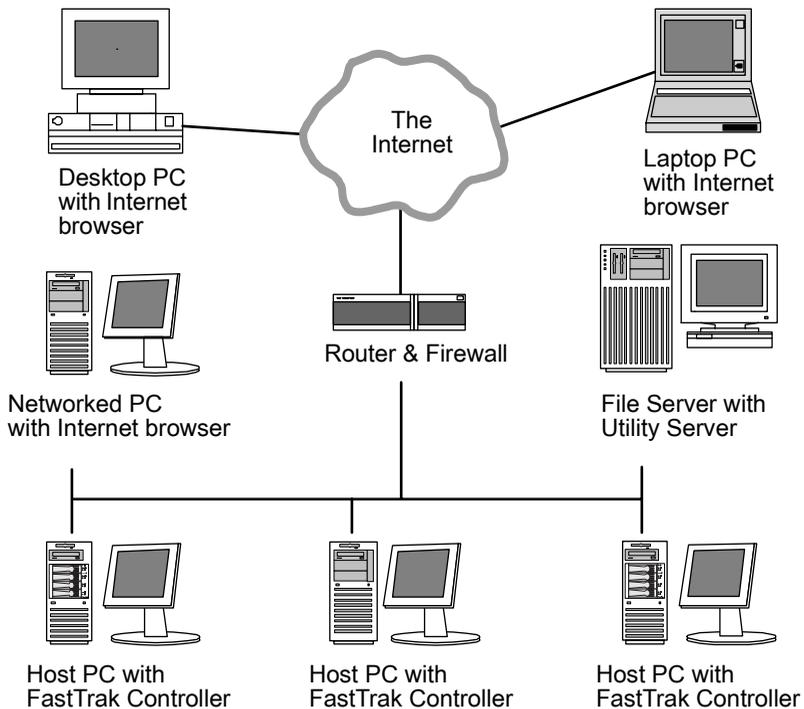


Figure 12. WebPAM on a network

Java Runtime Environment

If you are planning to use other applications that rely on JRE or JDK, always install them first before you install WebPAM. WebPAM will use the existing JRE rather than installing a second one.

WebPAM will install JRE 1.4 on your system unless you already have JRE or JDK versions 1.3.0 or 1.4.

Operating System Support

On the Host PC where you install the FastTrak controller and WebPAM, Promise Technology recommends:

- Windows 2000
- Windows XP Professional
- Windows 2003
- Red Hat EL 4.0
- SuSE ES 9.0

The Utility Server supports these operating systems. Choose one of them to take full advantage of all the features of WebPAM.

Install WebPAM

Windows

Follow these steps to install WebPAM on your Windows-based PC or Server.

1. Boot up the PC/server and launch Windows.
If the computer is already running, exit all programs.
2. Insert the software CD into your CD-ROM drive.
3. Double-click on the Install CD's icon to open it.
4. Double-click on the Installer icon to launch it (right).



PromiseWebPAM

The first WebPAM installation dialog box appears. Go to "WebPAM Installation for Windows and Linux, continued" on page 16

Linux

Follow these steps to install WebPAM on your Linux-based PC or Server.

1. Boot up the PC/server and launch the Linux GUI.
If the computer is already running, exit all programs.
2. Insert the software CD into your CD-ROM drive.
3. In the CD window, double-click on the **webpam...bin** icon to begin installation (right).

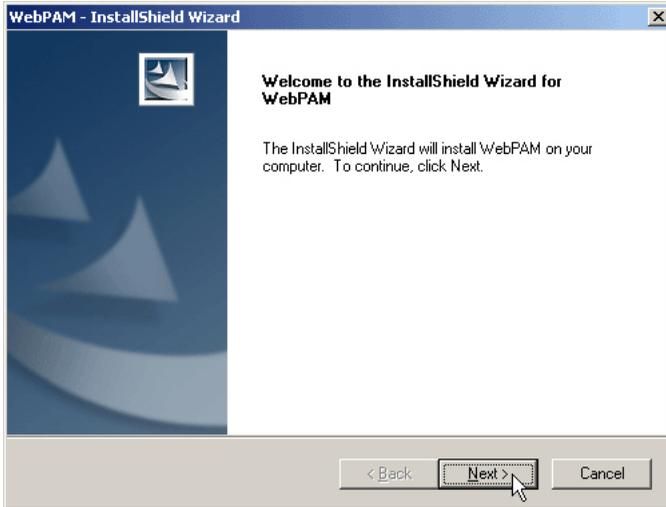


webpamxxxx.bin

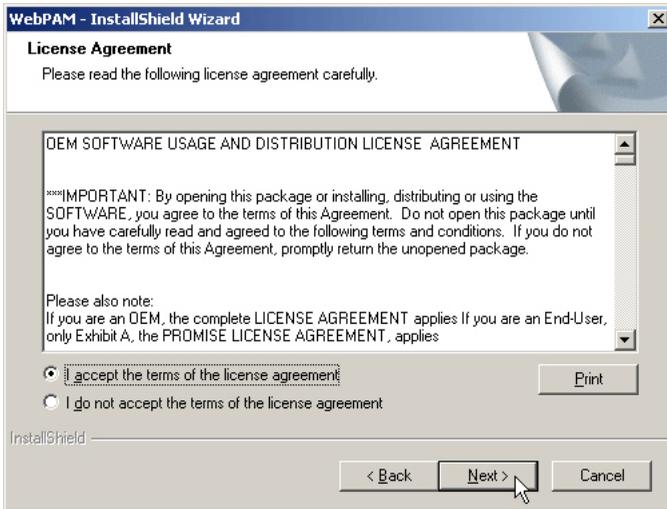
4. When the Run or Display? dialog box appears, click *Run in Terminal*.
After several moments, the Terminal window closes and the first WebPAM PRO installation dialog box appears.

WebPAM Installation for Windows and Linux, continued

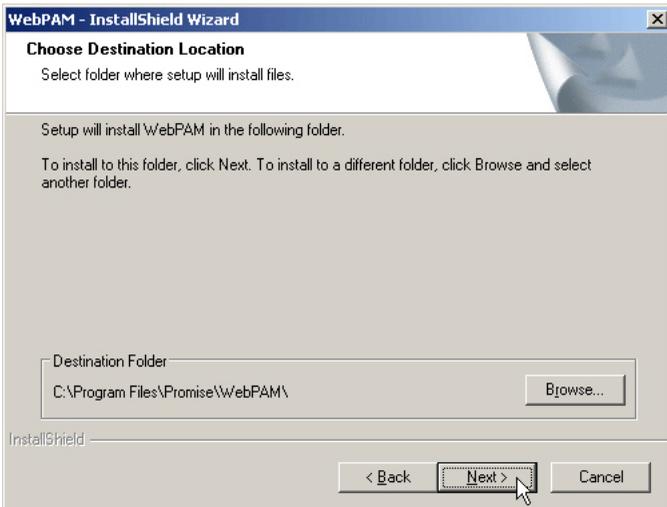
The first WebPAM installation dialog box appears, as shown below.



5. When the Introduction screen appears (above), click the **Next** button.



6. When the License Agreement appears (above), click the “I accept the terms of the license agreement” option. Then click the **Next** button.



7. When the Choose Install Folder screen appears (above), make your selection of a folder for the WebPAM applications you are installing. The default folder is **C:\Program Files\Promise\WebPAM**. If you want a different folder, type its location or click the **Browse** button and select a new location.

If you change your mind and want the default location, click on the **Back** button, then the **Next** button.

Click the **Next** button when you are finished.



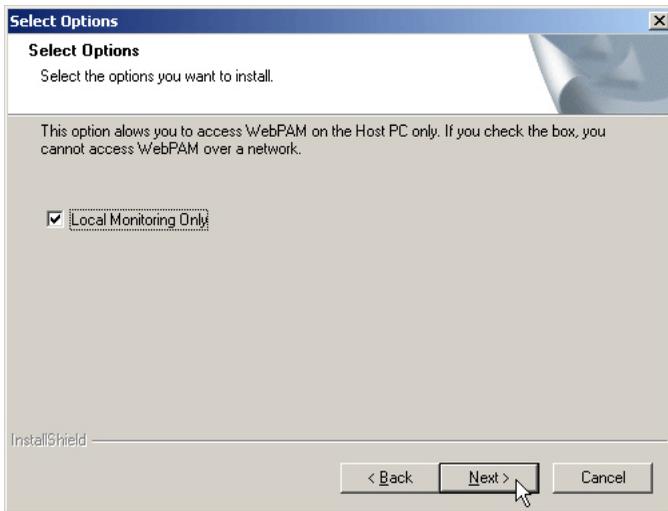
8. When the SSL Security Options screen appears (above), you can check External Security. An explanation follows.

External SSL Security – Applies security to all connections involving the Internet or outside your company firewall.

Security options are invisible to authorized users.

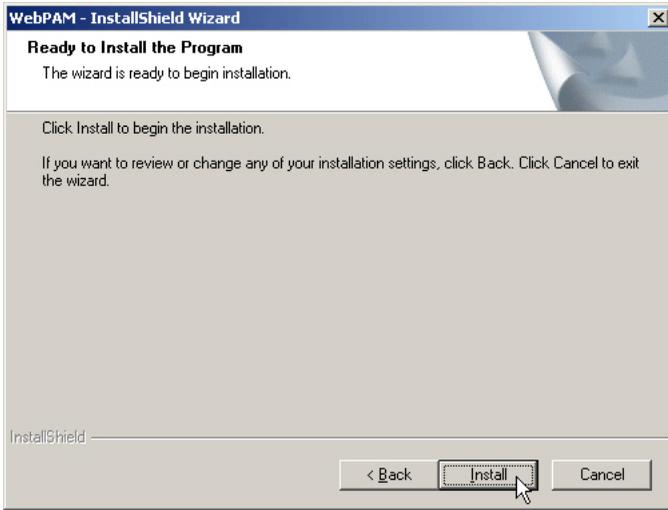
Promise Technology provides a default certificate for the server as well as for internal data communication. However, in some cases, it is better to install and verify your own certificate for the webserver. And, if possible, have your certificate verified by a certificate authority such as Verisign or Thwate. See your MIS Administrator for guidance.

Click the **Next** button when you have made your choice.

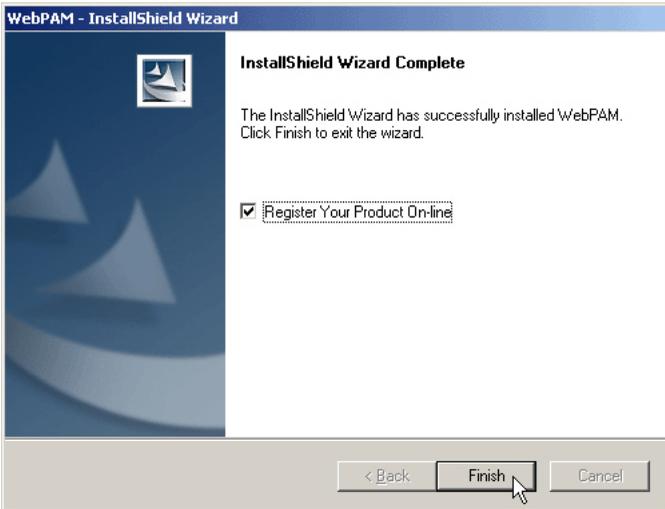


9. When the Select Options screen appears (above), you have the option of choosing *Local Monitoring Only*.
- If you check this option, you can only log into WebPAM from the Host PC. You cannot log into WebPAM over a network.
 - If you do not check this option, you can log into WebPAM from the Host PC or over a network.

To continue, click the **Next** button.



10. When the Ready to Install screen appears (above), click the **Install** button.



11. When the Install Complete screen appears (above), the installation process is finished. Click the **Finish** button to go to the Promise Registration website.



Important

Registration of your FastTrak and WebPAM provides useful information that helps Promise Technologies to offer better products and support. Please take a few minutes to register. Thanks!

This completes the WebPAM installation. Go to “Chapter 5: WebPAM” on page 43 for information about using WebPAM.

Chapter 3: Install Drivers

- Make a Driver Installation Diskette, page 24
- Windows Server 2003
 - New, page 25
 - Existing, page 26
 - Confirm, page 26
- Windows XP
 - New, page 27
 - Existing, page 28
 - Confirm, page 28
- Windows 2000
 - New, page 29
 - Existing, page 30
 - Confirm, page 30

Following are driver installation procedures for the Windows operating systems that support the FastTrak TX Series RAID Controller card. The FastTrak drivers for Windows are included on the CD.

Drivers and installation instructions for Linux are downloadable from the Promise website at www.promise.com.



Important

If you wish to include your current bootable drive using the Windows 2000, XP or Server 2003 operating system as part of a bootable Mirrored (RAID 1) disk array, you **MUST** install the FastTrak driver to this drive while it is still attached to your existing disk drive controller.

Make an Installation Floppy Diskette

This procedure requires one write-enabled blank 3.5-inch diskette.

1. Place your blank diskette in the appropriate drive.
2. Insert the Promise CD into your CD-ROM drive.
The display screen should open automatically.
If the display screen does not open, click on MyComputer > CD Drive D: and double-click on the *Launch.exe* icon.
3. Click on the **Windows Driver** button.
The Disk Copy Utility opens.
4. Click the **Create** button in the Utility.
A confirmation box appears.
5. Click the **Yes** button in the confirmation box.
The utility prepares your driver installation diskette.
When the utility is finished, it displays a message.
6. In the message, click the **OK** button.
7. Click the **Exit** button to close the Promise CD.

Windows Server 2003

New Installation

The following details the installation of the FastTrak TX Series RAID Controller drivers while installing Windows Server 2003.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows Server 2003 installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows Server 2003 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak driver diskette into drive A: and press Enter.
4. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen, and then press the Enter.
5. Press S to use the driver on the floppy disk and then press Enter to continue with installation.
6. The Windows Server 2003 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Windows Promise FastTrak TX [2200, 2300] (tm) Controller".
NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.
7. From the Windows Server 2003 Setup screen, press the Enter. Setup will now load all device files and then continue the Windows Server 2003 installation.

Existing Installation

After installing the FastTrak TX Series RAID Controller card and rebooting your system, Windows Server 2003 setup will show a “Found New Hardware” dialog box. Under Windows 2003, “RAID Controller” will be displayed.

1. Insert the FastTrak driver diskette into the A:\ drive.
2. Choose *Install the software automatically* and press the Enter key.
3. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen, and then press the Enter key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click Continue anyway.
5. When the New Hardware Wizard has finished installing the FastTrak driver, click Finish.

Confirm Installation

1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the “+” in front of SCSI and RAID controllers. “Windows Promise FastTrak TX [2200, 2300] (tm) Controller” and “Promise RAID Console SCSI Processor Device” should appear.

Windows XP

New Installation

The following details the installation of the FastTrak TX Series RAID Controller drivers while installing Windows XP.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows XP installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows XP Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak driver diskette into drive A: and press Enter.
4. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen, and then press the Enter.
5. Press S to use the driver on the floppy disk and then press Enter to continue with installation.
6. The Windows XP Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Windows Promise FastTrak TX [2200, 2300] (tm) Controller".

NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.
7. From the Windows XP Setup screen, press the Enter. Setup will now load all device files and then continue the Windows XP installation.

Existing Installation

After installing the FastTrak TX Series RAID Controller card and rebooting your system, Windows XP setup will show a “Found New Hardware” dialog box.

1. Insert the FastTrak driver diskette into the A:\ drive.
2. Choose Install the software automatically and press the Enter key.
3. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen, and then press the Enter key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click Continue anyway.
5. When the New Hardware Wizard has finished installing the FastTrak driver, click Finish.

Confirm Installation

1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the “+” in front of SCSI and RAID controllers. “Windows Promise FastTrak TX [2200, 2300] (tm) Controller” and “Promise RAID Console SCSI Processor Device” should appear.

Windows 2000

New Installation

The following details the installation of the FastTrak TX Series RAID Controller drivers while installing Windows 2000.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows 2000 installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows 2000 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak driver diskette into drive A: and press Enter.
4. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen then press Enter.
5. The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Windows Promise FastTrak TX [2200, 2300] (tm) Controller".
NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.
6. From the Windows 2000 Setup screen, press Enter. Setup will now load all device files and then continue the Windows 2000 installation.

Existing Installation

After installing the FastTrak TX Series RAID Controller card and rebooting your system, Windows 2000 setup will show a “New Hardware Found” dialog box. Under Windows 2000, “PCI Mass Storage Controller” will be displayed.

1. Choose Add New Hardware Wizard from the list, and then press Enter.
2. Choose Add/Troubleshoot a device and click Next. The new hardware wizard will show device list
3. Choose Mass Storage controller and click Next. At the following screen click Finish.
4. Choose Display a list the known drivers for this device so that I can choose a specific driver then click Next.
5. When the Windows 2000 supported SCSI adapter drivers list appears, click Have disk.
6. Insert the FastTrak driver diskette in drive A:\.
7. Type A:\Win2000 in the text box. Click OK.
8. Choose *Windows Promise FastTrak TX [2200, 2300] (tm) Controller* from the list that appears on screen, then click Next.
9. Click Yes to confirm continue the installation and copy the driver to system.
10. Remove the diskette and click Finish to restart the system.

Windows 2000 will then restart for the driver installation to take effect.

Confirm Installation

1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the “+” in front of SCSI controllers. “Windows Promise FastTrak TX [2200, 2300] (tm) Controller” and “Promise RAID Console SCSI Processor Device” should appear.

Chapter 4: FastBuild™ Utility

- FastTrak BIOS (below)
- Main Menu (page 32)
- View Drive Assignments (page 33)
- Create a Logical Drive (page 34)
- Delete Logical Drive (page 39)
- Controller Configuration (page 41)
- Logical Drive Problems (page 42)

FastTrak BIOS

The FastTrak BIOS is a built-in component of the FastTrak TX Series RAID Controller card.

When the FastTrak BIOS loads during bootup, it displays pertinent information about the RAID logical drives that it finds. At this point, you can press Ctrl-F to enter the FastBuild Configuration Utility.

```
FastTrak TX2300 (tm) BIOS Version 2.5.0.xx
(c) 2004-2005 Promise Technology, Inc. All rights reserved.

ID      MODE          SIZE      TRACK-MAPPING      STATUS
-----
1       1x2 RAID 1    39999M    4963/255/63        Functional

Press <Ctrl-F> to enter FastBuild (tm) Utility..
```

When the FastTrak BIOS screen appears, press Ctrl-F to enter the FastBuild Utility.

The FastTrak BIOS screen displays the following information:

ID – An identification number assigned to each logical drive by the BIOS.

Mode – The RAID mode (level) configuration of the logical drive

Size – The data capacity of the logical drive in MB (Megabytes).

Track-Mapping – This is the CHS (Cylinder/Head/Sector) equivalent of the logical drive geometry as hosted by the FastTrak BIOS int 13h disk services.

Status – Shows one of three logical drive conditions:

Functional – The logical drive is fully operational, and no problems are present.

Critical – The logical drive is operational, but has lost its fault tolerance. For RAID 1, the logical drive contains a failed drive. You must identify and replace the failed disk drive.

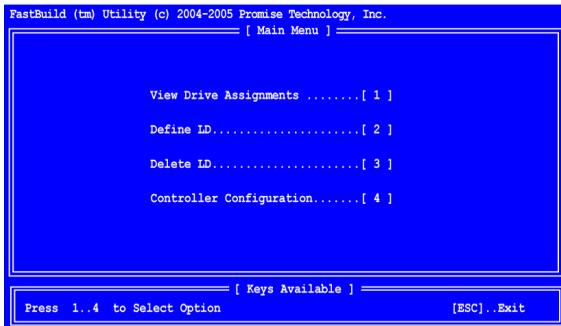
Offline – The logical drive is no longer operational and the FastBuild utility cannot rebuild it. You must identify and replace the failed drive(s). Then you can create a new logical drive and copy your data to it from the last tape backup or other device.

For RAID 1, both disk drives in the logical drive have failed.

For a RAID 0 or JBOD, one disk drive has failed.

Main Menu

When the FastTrak BIOS displays on your computer screen, press Ctrl-F to launch the FastBuild utility and display the Main Menu.



The Main Menu (above) has five options:

- Press 1 to view disk drive assignments
- Press 2 to create a logical drive or view information about an existing logical drive.
- Press 3 to delete a logical drive.
- Press 4 to view and change controller configuration.
- Press Esc (Escape) to exit the menu.

View Drive Assignments

From the Main Menu screen, press 1 to see the View Drive Assignments screen (below).

Channel:ID	Drive Model	Capacity (MB)	Assignment
1:Mas	ST380023AS	80027	LD 1
2:Mas	ST380023AS	80027	Free

[Keys Available]

[↑] Up [↓] Down [PgDn] Next Page [PgUp] Previous Page [ESC] Exit

This screen reports physical (disk) drive assignments and provides the following information:

Channel: ID – Shows the FastTrak Controller channel ID (1 and 2) to which a particular disk drive is attached.

Drive Model – Identifies the manufacturer, model, and model number (if applicable) of each disk drive.

Capacity (MB) – Reflects the capacity in MB (megabytes) of the disk drive.

Assignment – This field identifies the logical drive to which the disk drive belongs. LD 1 means logical drive 1. JBOD also appears as LD on this screen.

Unassigned drives are labeled *Free*. Unassigned drives may also be used to create a new logical drive at any time.

See "Introduction to RAID" on page 91 for more information.

4. Press the arrow keys to move to the next option. Option choices depend on the RAID Level you selected.
 - Fast Init erases the Master Boot Record (MBR) of the disk drives when this feature is set to ON.
 - Stripe Block Size. Press the Spacebar to toggle through 32 KB, 64 KB, or 128 KB. 64 KB is the default. Applies to RAID 0.
5. Press the arrow keys to move to Disk Assignments. Press the spacebar to toggle between N and Y for each available drive. Y means this disk drive will be assigned to the logical drive.

Assign the appropriate number of disk drives to your logical drive.

6. Press Ctrl-Y to save your logical drive configuration.
7. If you set Fast Init to ON, the following message displays:

```
<Press Ctrl-Y Key if you are sure to erase MBR!>  
<Press any other key to ignore this option>
```

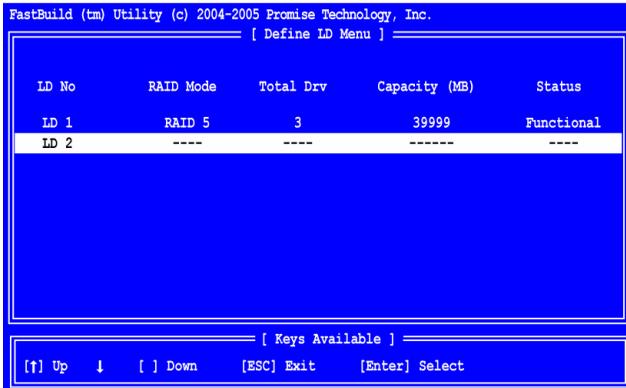
- Press Ctrl-Y to continue logical drive creation and perform the Fast Initialization.
- Press any other key to cancel logical drive creation.

If you set Fast Init to OFF, the following message displays:

```
Do you want the disk image to be  
duplicated to another or do quick  
initialize or create only? (Y/N)  
Y - Create and Duplicate  
N - Create Only
```

Press N to finish logical drive creation.

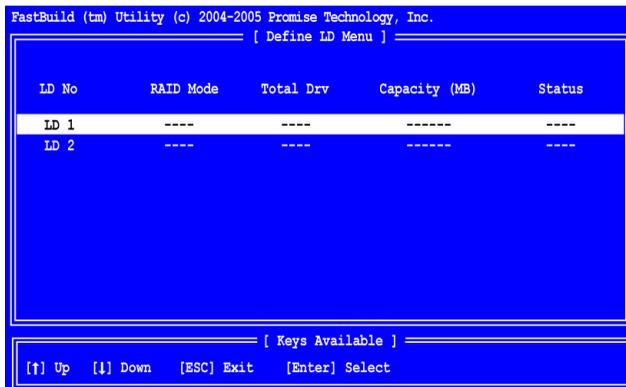
When the logical drive is created, the Define LD Menu displays with the new logical drive.



Create a Logical Drive: Create and Duplicate Option

The Create and Duplicate option is for RAID 1 logical drive where you want to copy the content of one of the disk drives to make a mirror of the content on the other drive.

1. From the Main Menu screen, press 2 to display the Define LD Menu (below).



2. Press the arrow keys to highlight an logical drive number you want to define and press Enter to select it.

The Define LD Menu for the logical drive number you selected will next appear (below).

```
FastBuild (tm) Utility (c) 2004-2005 Promise Technology, Inc.
----- [ Define LD Menu ] -----
LD No      RAID Mode      Total Drv
LD 1       RAID 1         2
Stripe Block: NA                      Fast Init: ON

----- [ Drive Assignments ] -----
Channel ID  Drive Model      Capacity (MB)  Assignment
1:Mas ST380013AS      80027          Y
2:Mas ST380013AS      80027          Y

----- [ Keys Available ] -----
[↑] Up      [↓] Down  [ESC] Exit  [Space] Change Option  [Ctrl-Y] Save
```

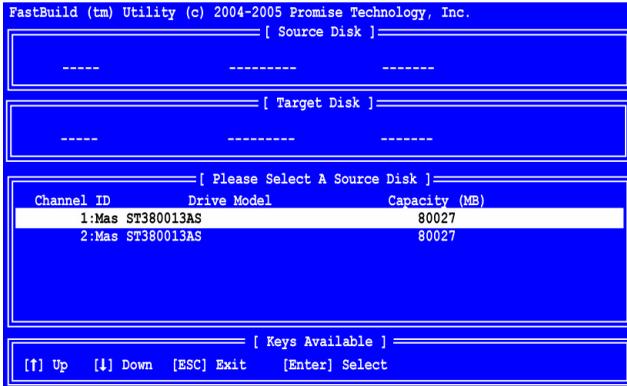
3. In the Define LD Menu section, under RAID Mode, press the Spacebar to toggle to RAID 1.
4. Press the arrow keys to move to the Fast Init option, then press the Spacebar to toggle to OFF.
5. Press the arrow keys to move to Disk Assignments. Press the spacebar to toggle to Y for both drives.
6. Press Ctrl-Y to save your logical drive configuration.

The following message displays:

```
Do you want the disk image to be
duplicated to another or do quick
initialize or create only? (Y/N)
Y - Create and Duplicate
N - Create Only
```

7. Press Y to proceed with the Create and Duplicate option.

The Source Disk Selection screen displays:



Caution

Be sure you select the drive with the data as the source disk. If you select the wrong drive, all of your data will be lost.

8. In the Source Disk Selection screen, press the arrow keys to highlight the source disk and press Enter.

The following message displays:

```
Start to duplicate the image...
Do you want to continue? (Y/N)
Y - Continue, N - Abort
```

9. Press Y to create a RAID 1 logical drive creation using the Create and Duplicate option.

The following message displays:

```
Please wait...
Duplicating The Image 1 % Completed
```

Duplication takes several minutes, depending on the size of your disk drives. If you press N, Fast Build will create a regular RAID 1 logical drive.

When the logical drive is created, the Define LD Menu displays with the new logical drive.

```

FastBuild (tm) Utility (c) 2004-2005 Promise Technology, Inc.
----- [ Define LD Menu ] -----

  LD No      RAID Mode   Total Drv   Capacity (MB)   Status
  LD 1       RAID 5      3           39999           Functional
  LD 2       ----        ----        -----        ----

----- [ Keys Available ] -----
{↑} Up      ↓      [ ] Down   [ESC] Exit  [Enter] Select

```

Delete Logical Drive



Caution

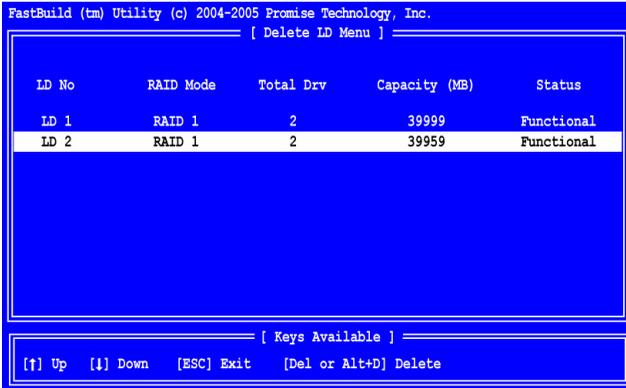
Deletion of an existing logical drive will result in the loss of all data saved on the logical drive.

Record all logical drive information, including RAID level, disk members, stripe block size and gigabyte boundary, in case you wish to undo a deletion.

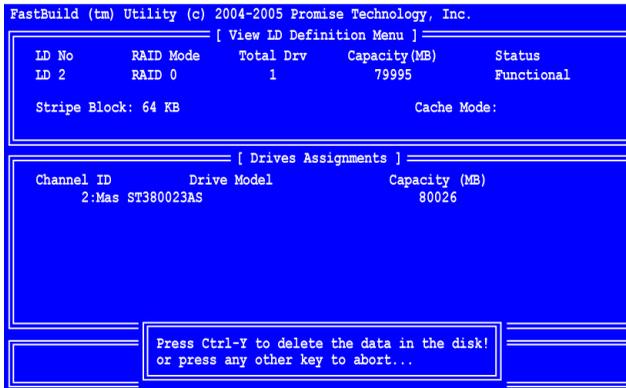
Logical drives may possibly be recovered after deletion by immediately re-defining the logical drive with information identical to the original configuration.

To delete a logical drive:

1. From the Main Menu screen, press 3 to display the Delete LD Menu (below).



2. Highlight the logical drive you wish to delete and press the Del key or Alt-D. The Delete LD Menu for the selected logical drive appears (below).



3. Press Ctrl-Y to confirm and complete logical drive deletion. The screen returns to the Delete LD Menu. Press Esc to return to the Main Menu.

Controller Configuration

From the Main Menu screen, press 4 to display the Controller Configuration Options screen (below).

```
FastBuild (tm) Utility (c) 2004-2005 Promise Technology, Inc.
----- [ Adapter Configuration - Options ] -----
                No Parameters Defined for Current Disk(s)

----- [ System Resources Configuration ] -----

Controller IRQ: 11

ATA IO Address: DC80
XOR and HDMA IO Address: 0
Sequence Control IO Address: D800
Flash and SRAM Memory Address: DFEDF000

----- [ Keys Available ] -----
[ESC] Exit
```

The information in the System Resources section might be helpful for troubleshooting purposes:

- The system IRQ used by the FastTrak card
- ATA IO Address
- XOR and HDMA IO Address
- Sequence Control IO Address
- Flash and SRAM IO Address

Logical Drive Problems

While disk drives are highly reliable, on occasion a disk drive can fail. Fault-tolerant (RAID 1) logical drives go *Critical* when a disk drive fails. Non-fault-tolerant logical drives (RAID 0) and JBOD go *Offline* when a disk drive fails.

```
FastTrak TX2300 (tm) BIOS Version 2.5.0.xx
(c) 2004-2005 Promise Technology, Inc. All rights reserved.

ID      MODE      SIZE      TRACK-MAPPING      STATUS
-----
1       1x2 RAID 1  39999M    4963/255/63       Critical

Problem is detected with Array : 1
Critical Status:
A disk member of an array has failed or is not responding.
Please refer to your Promise User Manual for further details.

Press <Ctrl-F> to enter FastBuild (tm) Utility...
```

When you boot your system, the FastTrak BIOS screen informs you if there is a critical or offline logical drive. Allow your PC to finish booting and use WebPAM to identify the failed drive and to rebuild your logical drive.

See “Logical Drive Critical / Offline” on page 84 for more information.

Chapter 5: WebPAM

- Log-in to WebPAM (page 43)
- Log-out of WebPAM (page 45)
- User Management (page 45)
- Host Management (page 53)
- Utility Configuration (page 54)
- FastTrak (page 55)
- Controller (page 56)
- Physical Drives (page 60)
- Logical Drives (page 67)
- Enclosures (page 88)
- Spare Drives (page 90)

WebPAM is a RAID management software application. If you have not installed WebPAM on your PC, see “WebPAM Installation” on page 14.

Log-in to WebPAM

Double-click on the WebPAM icon on your desktop (right). Or,

1. Launch your Browser.
2. In the Browser address field, type in the IP address of the Host PC, as explained below.



If you did *not* choose the External Security option during WebPAM installation (see page 18), use the *Regular* connection.

If you chose the External Security option during WebPAM installation, use the *Secure* connection.

Regular Connection

- WebPAM uses an HTTP connection http://
- Enter the Host PC's IP address 127.0.0.1 or localhost
- Enter the Port number :8080
- Add to launch WebPAM /promise

Together, your entry looks like this:

http://127.0.0.1:8080/promise or **https://localhost:8443/promise**

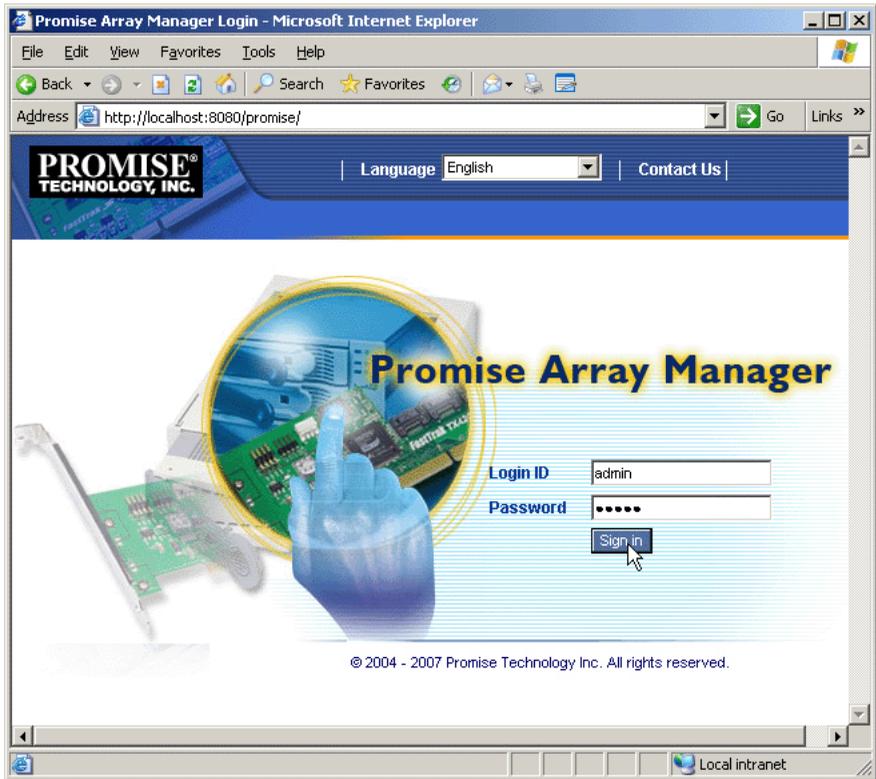
Secure Connection

- WebPAM uses a secure HTTP connection https://
- Enter the Host PC's IP address 127.0.0.1 or localhost
- Enter the Port number :8443
- Add to launch WebPAM /promise

Together, your entry looks like this:

https://127.0.0.1:8443/promise or **https://localhost:8443/promise**

Note that the IP address shown above applies to a log-in at the Host PC. When you log in over a network, you will enter the Host PC's actual IP address.



When the opening screen appears (above):

1. Type **admin** in the Login ID field.
2. Type **admin** in the Password field.
3. Click the **Sign in** button.

This is the default login for the Administrator. Each user will have their own Login ID (the User ID) and password. See “Add a User” on page 45 and “Change a User’s Password” on page 49 for more information.

The Login ID and Password are case sensitive.

Log-out of WebPAM

There are two ways to log out of WebPAM PRO:

- Close your browser window
- Click **Logout** on the WebPAM banner (below)



After logging out, you must enter your user name and password to log in again. Clicking **Logout** brings you back to the Login Screen.

User Management

- Add a User (below)
- Change a User's Password (page 49)
- Event Notification (page 46)
- Change a User's Email Address (page 50)
- Delete a User (page 49)
- Change a User's Access Rights (page 51)

Add a User

1. In Tree View, click on the User Management  icon.
2. Click on the Create tab.

User Management Help

Information
Create
Delete

✔ **User Creation**

User ID	<input type="text" value="sammy"/> <small>(4-20 character(s))</small>
Display Name	<input type="text" value="Samuel Adams"/>
Password	<input type="password" value="*****"/> <small>(0-8 character(s))</small>
Retype Password	<input type="password" value="*****"/>
Email	<input type="text" value="sadams@promise.com"/>

✔ **Host User Rights**

Host Name	Creation Rights	Deletion Rights	Maintenance Rights	Notification Rights
localhost	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

3. Type a User ID into the User ID field.

- This will be the User's login name.
4. Type the user's display name into the Display Name field.
This could be the User's actual name.
 5. Type a password into the Password field.
Use up to 8 letters and numbers but no spaces or other characters.
 6. Type the same password into the Retype Password field.
 7. If you plan to set up Event Notification, type the user's email address in the Email field.
 8. Under Host User Rights, check the boxes to select rights for this user.

Right	Meaning
Creation	Permission to create a logical drive and a spare drive
Deletion	Permission to delete a logical drive and a spare drive
Maintenance	Permission to migrate, rebuild and synchronize a logical drive; to run Media Patrol on a disk drive; make controller and disk drive settings
Notification	Permission to receive notification of events affecting the logical drive

9. Click on the **Submit** button.

Event Notification

1. In Tree View, click on the User Management  icon.



2. Click on the User ID link.
3. Click on the Settings tab.

Select Events Help

Information **Settings** **Events**

tech-pubs-pc(127.0.0.1)

Email Notification

Select All Events

Select All Information Events Select All Warning Events Select All Error Events

Disk Events

<input checked="" type="checkbox"/> Disk Plugged In	<input checked="" type="checkbox"/> Disk BSL Update	<input checked="" type="checkbox"/> Disk BSL Cleared
<input checked="" type="checkbox"/> Disk Error Fixed	<input checked="" type="checkbox"/> Disk Patrol Progress	<input checked="" type="checkbox"/> Disk Medial Patrol Started

Other Events

<input checked="" type="checkbox"/> Memory Multi Bit Error		
<input checked="" type="checkbox"/> Unknown		

The image above was shortened to fit into the available space.

4. Check the boxes of the notification events that you want to have reported to you via email and popup messages.
To select events by their severity, check one of the four Select Events boxes at the top of the window. See the table on the next page.
5. Click on the **Submit** button.

Event Notification Severity Levels

Information Events

Disk Plugged In
Disk BSL Update
Disk BSL Cleared
Disk Error Fixed
Disk Patrol Progress
Disk Media Patrol Started
Disk Media Patrol Completed
Disk Media Patrol Paused
Disk Media Patrol Resumed
Disk Media Patrol Aborted
Array Online
Array Created
Array Deleted
Synchronization Started
Synchronization Completed
Synchronization Paused
Synchronization Resumed
Synchronization Aborted
Synchronization Progress
Synchronization Inconsistency Fixed
Redundancy Check Started
Redundancy Check Completed
Redundancy Check Paused

Warning Events

Disk Unplugged
Disk Timeout
Task Error
Disk Media Patrol Aborted with Error
Array Critical
Array Degrade
Synchronization Requested
Redundancy Check Rejected
Fan Error
Voltage 3.3 Out Of Range
Voltage 5 Out Of Range
Voltage 12 Out Of Range
Temperature Above Threshold
PCI Parity Error

Information Events, continued

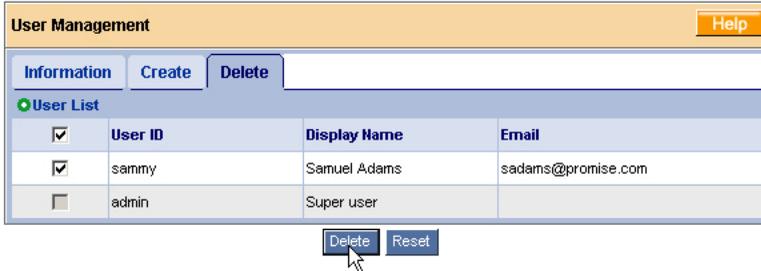
Redundancy Check Resumed
Redundancy Check Aborted
Redundancy Check Progress
Rebuild Started
Rebuild Completed
Rebuild Paused
Rebuild Resumed
Rebuild Aborted
Rebuild Restarted
Rebuild Progress
Background Initialization Progress
Background Initialization Started
Background Initialization Completed
Background Initialization Paused
Background Initialization Resumed
Background Initialization Aborted
Migration Started
Migration Completed
Migration Paused
Migration Resumed
Migration Aborted
Migration Progress

Error Events

Disk Setdown
Disk S.M.A.R.T. Error
Array Offline
Synchronization Aborted with Error
Redundancy Check Aborted with Error
Redundancy Check Inconsistency Found
Rebuild Aborted with Error
Background Initialization Aborted with Error
Migration Aborted with Error
PCI System Error
Unknown (error)

Delete a User

1. In Tree View, click on the User Management  icon.
2. Click on the Delete tab.



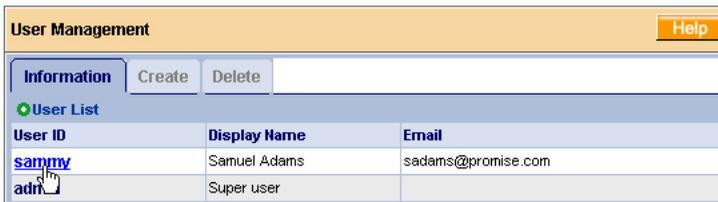
3. Check the box to the left of the user you want to delete.
4. Click the **Delete** button.
5. In the Confirmation box, click the **OK** button.

Change a User's Password

In WebPAM, each user can change his/her own password. To change a user's password:



1. Log into WebPAM under the User name.



2. Click on your User ID link.
3. Click on the Settings tab.

The screenshot shows the 'User Management' interface with the 'Settings' tab selected. Under 'User Settings', the following fields are visible:

- User ID: sammy
- Display Name: Samuel Adams (0-20 character(s))
- New Password: (4-8 character(s))
- Retype Password: (4-8 character(s))
- Email: sadams@promise.com

Below the settings is a table for 'Host User Rights':

Host Name	Creation Rights	Deletion Rights	Maintenance Rights	Notification Rights
tech-pubs-pc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Submit Reset

4. Type a new password in the New Password field.
5. Retype the new password in the Retype Password field.
6. Click the **Submit** button.



Important

If a user forgets his/her password, the Administrator must delete that User and create a new User, as described above.

Change a User's Email Address

In WebPAM, each user can change his/her own email address or the Administrator can do it. To change a user's email address:

The screenshot shows the 'User Management' interface with the 'User List' tab selected. The table below lists the users:

User ID	Display Name	Email
sammy	Samuel Adams	sadams@promise.com
admin	Super user	

1. Click on the User ID link for the user whose email address will change.
2. Click on the Settings tab.

The screenshot shows the 'User Management' interface with the 'Settings' tab selected. The 'User Settings' section contains the following fields:

- User ID: sammy
- Display Name: Samuel Adams (0-20 character(s))
- New Password: [masked] (4-8 character(s))
- Retype Password: [masked]
- Email: sadams@promise.com

Below the settings is the 'Host User Rights' section, which includes a table of rights for the user 'tech-pubs-pc':

Host Name	Creation Rights	Deletion Rights	Maintenance Rights	Notification Rights
tech-pubs-pc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

At the bottom of the form are 'Submit' and 'Reset' buttons. A mouse cursor is pointing at the 'Submit' button.

3. Type a new email address in the Email field.
4. Click the **Submit** button.

Change a User's Access Rights

In WebPAM, the Administrator can change a user's access rights. To change a user's access rights:

1. Log in as the Administrator.

The screenshot shows the 'User Management' interface with the 'Information' tab selected. The 'User List' section contains a table of users:

User ID	Display Name	Email
sammy	Samuel Adams	sadams@promise.com
adm	Super user	

A mouse cursor is pointing at the 'adm' User ID link.

2. Click on the User ID link for the user whose access rights will change.
3. Click on the Settings tab.

User Management Help

Information
Settings
Events

✔ **User Settings**

User ID	sammy
Display Name	Samuel Adams
Email	sadams@promise.com

✔ **Host User Rights**

Host Name	Creation Rights	Deletion Rights	Maintenance Rights	Notification Rights
tech-pubs-pc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Submit
Reset

4. Under Host User Rights, check the boxes to select rights for this user.

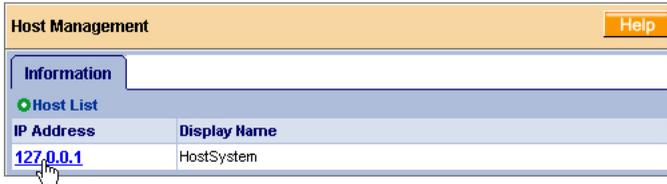
Right	Meaning
Creation	Permission to create a logical drive and a spare drive
Deletion	Permission to delete a logical drive and a spare drive
Maintenance	Permission to migrate, rebuild and synchronize a logical drive; to run Media Patrol on a disk drive; make controller and disk drive settings
Notification	Permission to receive notification of events affecting the logical drive

5. Uncheck the boxes of rights to be deleted.
6. Click the **Submit** button.

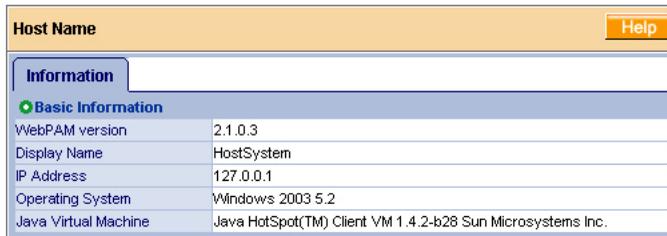
Host Management

This function provides information only. There are no user settings. To access Host Management:

1. Under Administrative Tools in Tree View, click on the Host Management  icon.



2. Under Host List, click on the link to the host you want to see.
The Host IP address is always 127.0.0.1. If you log in over a network, the actual IP address of the PC or server with the FastTrak card is shown.



The Information tab displays with information about the Host PC.

- WebPAM Version – The version number of the WebPAM software.
- Display Name – The display name of the Host PC. “localhost” is the default.
- IP Address – 127.0.0.1 is the IP address of the Host PC, accessed at the Host PC. Other addresses, such as 192.168.1.184, refer to a Host PC accessed over the network.
- Operating System – The Operating System running on the Host PC.
- Java Virtual Machine – The version number of JVM running on the Host PC.

Utility Configuration

Use this function to make email settings for WebPAM and also to set the refresh interval for the Event Frame.

1. Under Administrative Tools in Tree View, click on the Utility Configuration

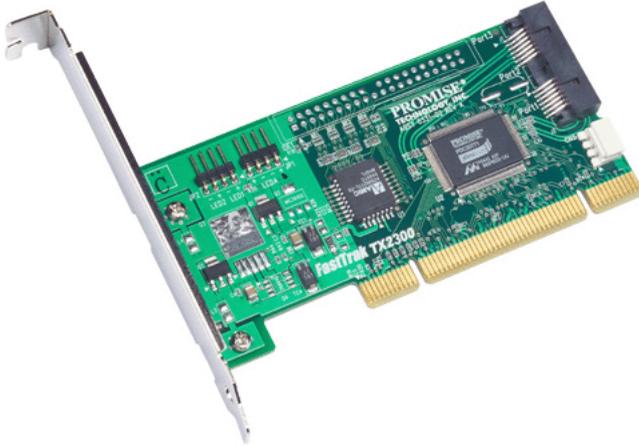
A screenshot of the 'Utility Configuration' window. The window has a title bar with 'Utility Configuration' and a 'Help' button. Below the title bar is a 'Settings' tab. Underneath is a 'Configuration' section with a green checkmark icon. It contains four rows of configuration fields: 'Email Sender' with the value 'RAIDmanager@promise.com', 'Email Server' with 'mail.promise.com', 'Email Subject' with 'Promise Controller Error', and 'Event Frame Refresh Time' with '30' and 'secs' to its right. To the right of each field is a descriptive text. At the bottom of the window are 'Submit' and 'Reset' buttons, with a mouse cursor pointing at the 'Submit' button.

Utility Configuration		Help
Settings		
Configuration		
Email Sender	<input type="text" value="RAIDmanager@promise.com"/>	Display email of the person from whom every email notification is sending out.
Email Server	<input type="text" value="mail.promise.com"/>	Display name of the Email Server.
Email Subject	<input type="text" value="Promise Controller Error"/>	Display subject of the every Email Notification sending out.
Event Frame Refresh Time	<input type="text" value="30"/> secs	Display Refreshing time of the event frame.
<input type="button" value="Submit"/> <input type="button" value="Reset"/>		

2. Enter the Sender's address in the Email Sender field.
Be sure the sender has an account in your email system. See your IT administrator.
3. Enter your email server in the Email Server field.
4. Keep or change the Email Subject line.
5. Type a new interval (in seconds) in the Event Frame Refresh Time field.
30 seconds is the default interval.
6. Click the **Submit** button when you are done.

FastTrak

The FastTrak–Information tab displays a photograph of the FastTrak TX Series RAID Controller card installed in your system.



WebPAM will display the FastTrak controller installed in your system.

To display this screen in Management View, click on the FastTrak  icon in Tree View.

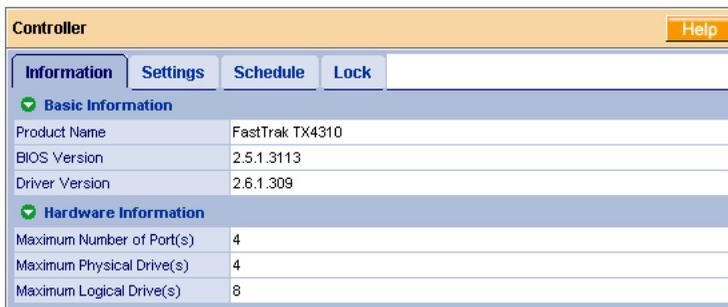
If you have multiple FastTrak controller cards in the same system, they will appear under the FastTrak icon as Controller 1, Controller 2, and so on.

Controller

- Controller Information (below)
- Controller Settings (page 57)
- Controller Schedule (page 58)
- Controller Lock (page 59)

The term Controller refers to the device that controls your RAID. To access the controller, click on the Controller  icon in Tree View.

Controller Information



The screenshot shows a window titled "Controller" with a "Help" button in the top right corner. Below the title bar are four tabs: "Information", "Settings", "Schedule", and "Lock". The "Information" tab is selected and active. It contains two sections: "Basic Information" and "Hardware Information", each with a green checkmark icon. The "Basic Information" section lists: Product Name (FastTrak TX4310), BIOS Version (2.5.1.3113), and Driver Version (2.6.1.309). The "Hardware Information" section lists: Maximum Number of Port(s) (4), Maximum Physical Drive(s) (4), and Maximum Logical Drive(s) (8).

Basic Information	
Product Name	FastTrak TX4310
BIOS Version	2.5.1.3113
Driver Version	2.6.1.309
Hardware Information	
Maximum Number of Port(s)	4
Maximum Physical Drive(s)	4
Maximum Logical Drive(s)	8

The Information tab displays with information about the controller.

- **Product Name** – The Promise product name for this controller.
- **BIOS Version** – Version number of the controller's BIOS.
- **Driver Version** – Version number of the controller's software driver.
- **Maximum Number of Ports** – The number of ports on the controller.
- **Maximum Physical Drives** – The maximum number of physical (disk) drives the controller can support.
- **Maximum Logical Drives** – The maximum number of logical drives (arrays) the controller can support.

Controller Settings

Controller	
Help	
Information	Settings
Schedule	Lock
View/Change Controller Parameter	
Rebuild Rate	<input type="radio"/> Low <input checked="" type="radio"/> Medium <input type="radio"/> High
Media Patrol Rate	<input type="radio"/> Low <input checked="" type="radio"/> Medium <input type="radio"/> High
Migration/Expansion Rate	<input type="radio"/> Low <input checked="" type="radio"/> Medium <input type="radio"/> High
Initialization Rate	<input type="radio"/> Low <input checked="" type="radio"/> Medium <input type="radio"/> High
Synchronization Rate	<input type="radio"/> Low <input checked="" type="radio"/> Medium <input type="radio"/> High
Automatic Rebuild Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Buzzer Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
S.M.A.R.T. Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
S.M.A.R.T. Check Polling Interval	120 Second(s)
<input type="button" value="Submit"/> <input type="button" value="Reset"/> <input type="button" value="Default"/>	

Click on the Settings tab to access controller settings.

- **Rates** – Allocates system resources between the background process (such as Rebuild, Media Patrol, Expansion/Migration, Initialization and Synchronization) and the data read/write activity.

A *High* setting assigns most of the system resources to background processes. The process will finished sooner but read/write requests are handled slower.

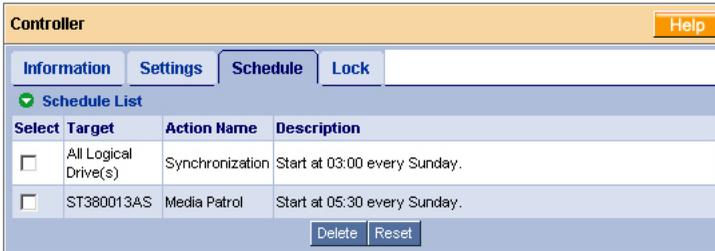
A *Medium* setting tries to balance system resources between the background processes and data input/output activity.

A *Low* setting assigns most of the system resources to handling read/write requests. Read/write requests are handled at nearly normal speed while the background processes take longer.

- **Automatic Rebuild Status** – When enabled, a critical or degraded logical drive will rebuild itself automatically after you replace the failed disk drive. Automatic Rebuilding applies to RAID 1 logical drives only.
- **Buzzer** – When enabled, the FastTrak controller's buzzer will sound to report a problem.
- **S.M.A.R.T. Status** – SMART, an acronym for Self-Monitoring Analysis and Reporting Technology, is a feature of the disk drive software. When enabled, the FastTrak controller polls the disk drives for SMART information and reports it to you.
- **S.M.A.R.T. Check Polling Interval** – The FastTrak controller periodically polls the physical drives for SMART information and displays it in WebPAM.

Choose an interval from the dropdown menu. The range is 0 to 120 seconds. A setting of 0 seconds disables the polling function.

Controller Schedule

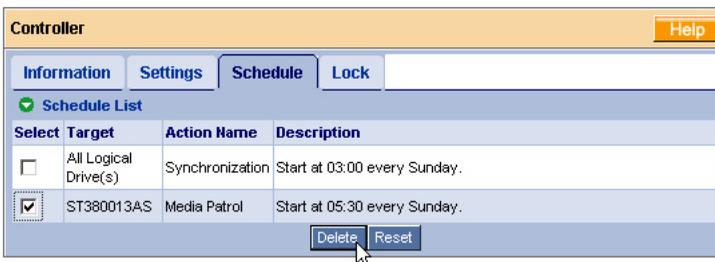


Click on the Schedule tab to access scheduled background processes (such as Rebuild, Media Patrol, Expansion/Migration, Initialization and Synchronization).

To access or schedule a Rebuild, Expansion, Migration, Initialization or Synchronization, click on the Logical Drive  icon in Tree View then select the appropriate tab in Management View.

To access or schedule a Media Patrol, click on the Physical Drive  icon in Tree View then select the Media Patrol tab in Management View.

Delete a Scheduled Process



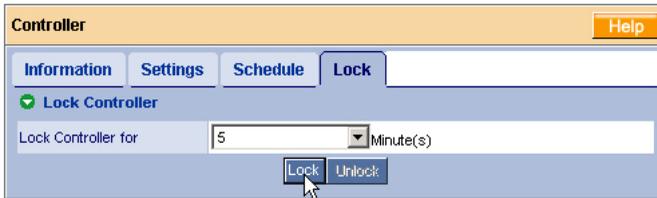
To delete a scheduled process:

1. Click on the Controller  icon in Tree View.
2. Select the Schedule tab in Management View.
3. Check the box to the left of the process you want to delete.
4. Click the **Delete** button.
5. In the Confirmation box, click the **OK** button.

Alternative method to delete a scheduled process:

1. Go to its function tab under the Physical Drive  or Logical Drive  icon.
2. Under Schedule, click the **Disable** option.

Controller Lock



The Lock tab displays lock status and enables you to lock or unlock a subsystem controller. The locking mechanism isolates the controller during maintenance operations and other periods when you want to avoid interruption from other users trying to access the logical drives under this controller.

To lock the Controller on the Host PC:

1. Click on the Controller  icon in Tree View.
2. Select the Lock tab in Management View.
3. From the dropdown menu, select a period of time to hold the lock.
The lock time range is 1 to 30 minutes.
4. Click on the **Lock** button to set the lock.
The lock will release itself automatically at the end of the period you specified.
5. To release the lock before the scheduled time, click the **Unlock** button.

Physical Drives

- Physical Drive View (below)
- Media Patrol Schedule (page 60)
- Physical Drive Information (page 62)
- Physical Drive Settings (page 63)
- Physical Drive Media Patrol (page 63)
- Physical Drive Bad Sector Log (page 65)
- Locate a Physical Drive (page 66)

Physical Drive View

Drive Model	Port Number	Capacity	Status
ST380013AS	1	80.02 GB	Functional
ST380013AS	2	80.02 GB	Functional

To access Physical Drive View, click on the Physical Drive View  icon in Tree View. From this window, you can click on the links to access information and functions of individual physical drives and use the Split and Merge feature.

Media Patrol Schedule

The Physical Drive View–Media Patrol tab allows you to start Media Patrol on all physical (disk) drives. You can also run Media Patrol on individual physical drives, see page 63.

Media Patrol is a routine maintenance procedure that checks the magnetic media on each physical drive, sector by sector. Media Patrol checks physical drives assigned to logical drives, spare drives and currently unassigned physical drives that were once part of a logical drive or a spare. Media Patrol does not check new physical drives that have never been configured nor physical drives assigned as JBOD.

Unlike Synchronization and Redundancy Check, Media Patrol is concerned with the condition of the media itself, not the data recorded on the media. If Media

Patrol encounters a suspect sector, it will attempt to regenerate the data and write to the suspect sector. If the write operation is successful, Media Patrol continues checking other sectors. If the write operation fails, Media Patrol reports the error to your PC's system log and to the physical drive's Bad Sector Log (see page 65). This action triggers a BSL update message and an email message if you enabled that notification option (see page 46).

To schedule Media Patrol:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Media Patrol tab in Management View.



Physical Drive View Help

Information Split Merge **Media Patrol Schedule**

Schedule

Disable Enable

By Day Start At 0 : 0

By Week Start At 5 : 30 Every Sunday

By Month Start At 0 : 0 On the 1st

Example 10:30(hh:mm)

Schedule

3. Click on the **Enable** option.
4. Click on the **by Day, by Week** or **by Month** option.
5. From the dropdown menus, select a start time and a day of the Week or Month, if applicable.
Start time is based on a 24-hour clock.
6. Click the **Schedule** button.

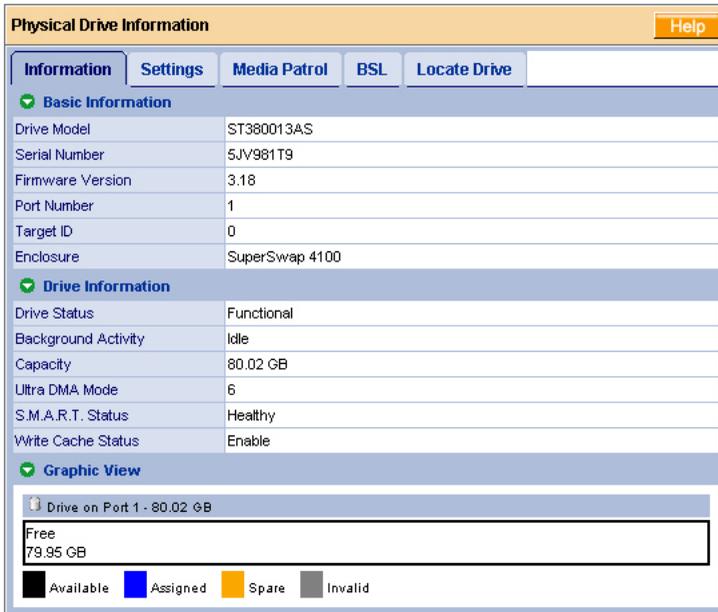
To cancel the scheduled Media Patrol operation:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Media Patrol tab in Management View.
3. Click the **Disable** option.

Physical Drive Information

To access information about a physical drive:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.



Physical Drive Information Help

Information Settings Media Patrol BSL Locate Drive

Basic Information

Drive Model	ST380013AS
Serial Number	5JV981T9
Firmware Version	3.18
Port Number	1
Target ID	0
Enclosure	SuperSwap 4100

Drive Information

Drive Status	Functional
Background Activity	Idle
Capacity	80.02 GB
Ultra DMA Mode	6
S.M.A.R.T. Status	Healthy
Write Cache Status	Enable

Graphic View

Drive on Port 1 - 80.02 GB

Free	79.95 GB
------	----------

Available Assigned Spare Invalid

The information tab displays the following information:

- **Drive Model** – The physical (disk) drive manufacturer’s model name or number.
- **Serial Number** – The serial number of this physical drive.
- **Firmware Version** – The version number of the firmware on this physical (disk) drive.
- **Enclosure** – The model of SuperSwap enclosure in which the physical drive is installed. If there is no SuperSwap enclosure, the field says None.
- **Drive Status** – The operational of this physical drive. Functional means normal. The alternative status is Offline.
- **Background Activity** – The current background activity affecting this physical drive. Idle means no activity. Others include Initializing and Rebuilding.
- **Capacity** – The data capacity of this physical drive in GB.

- **Ultra DMA Mode** – The UDMA mode in which this physical drive currently operates.
- **S.M.A.R.T. Status** – SMART, an acronym for Self-Monitoring Analysis and Reporting Technology, is a feature of the physical drive's software. When this feature is supported, the drive will pass SMART information to the FastTrak controller when it polls the physical drives.
- **Write Cache Status** – Indicates whether the physical drive's write cache is Enabled or Disabled. You can change this status under the Settings tab (see below).

Physical Drive Settings

Physical Drive Settings allows you to enable or disable the Write Cache and Native Command Queuing (NCQ) on an individual physical drive. To access the physical drive setting:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the Settings tab in Management View.



4. Click the Write Cache **Enable** or **Disable** option.
5. Click the NCQ **Enable** or **Disable** option.
6. Click the **Submit** button.

Physical Drive Media Patrol

The Physical Drive–Media Patrol tab allows you to start Media Patrol on an individual physical (disk) drive. You can also run Media Patrol on all physical drives at the same time, see page 60.

Media Patrol is a routine maintenance procedure that checks the magnetic media on each physical drive, sector by sector. Media Patrol checks physical drives assigned to logical drives, spare drives and currently unassigned physical drives that were once part of a logical drive or a spare. Media Patrol does not check new physical drives that have never been configured nor physical drives assigned as JBOD.

Unlike Synchronization and Redundancy Check, Media Patrol is concerned with the condition of the media itself, not the data recorded on the media. If Media Patrol encounters a suspect sector, it will attempt to regenerate the data and write to the suspect sector. If the write operation is successful, Media Patrol continues checking other sectors. If the write operation fails, Media Patrol reports the error to your PC's system log and to the physical drive's Bad Sector Log (see page 65). This action triggers a BSL update message and an email message if you enabled that notification option (see page 46).

To start Media Patrol immediately:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the Media Patrol tab in Management View.



4. Click the **Start Now** button.

To schedule Media Patrol to run at a later time:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the Media Patrol tab in Management View.



4. Click on the **Enable** option.

5. Click on the **by Day, by Week** or **by Month** option.
From the dropdown menus, select a start time and a day of the Week or Month, if applicable.
Start time is based on a 24-hour clock.
6. Click the **Schedule** button.

To cancel the scheduled Media Patrol operation:

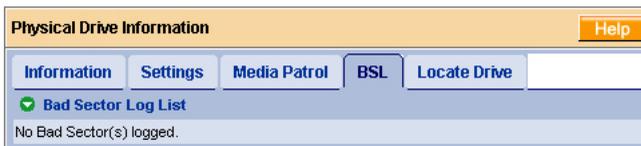
1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the Media Patrol tab in Management View.
4. Click the **Disable** option.

Physical Drive Bad Sector Log

On occasion, an error can arise with the media on a physical drive. WebPAM keeps track of bad sectors in order to inform you of the condition of individual physical drives.

To access a physical drive's bad sector log:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the BSL tab in Management View.



If any bad sectors are found, they are listed here. WebPAM informs you by popup and email messages when a bad sector error is logged (see page 46).

After 10 bad sectors have been discovered on a physical drive, WebPAM issues a warning to replace the drive.

After 20 bad sectors have been discovered:

- On fault-tolerant (RAID 1) logical drives, the FastTrak controller will set down the physical drive (take it offline) and the logical drive will go critical.
Replace the physical drive and rebuild your logical drive.
- On non-fault-tolerant (RAID 0) logical drives, the physical drive remains online.

Backup your data, replace the physical drive, create a new logical drive and copy your data to it.

See “Logical Drive Rebuild” on page 77 and “Logical Drive Critical / Offline” on page 84.

See the *SuperSwap User Manual* for more information about replacing a physical drive.

Locate a Physical Drive

When it becomes necessary to access a physical drive installed in a SuperSwap enclosure, this function will help you identify the physical drive you want. To locate a physical drive:

1. Click on the Physical Drive View  icon in Tree View.
2. Click on the Physical Drive  icon.
3. Click on the Locate Drive tab in Management View.



4. Click the **Locate Drive** button.

The Management Window will display the message “Identified started” and the Status LED for this physical drive will flash rapidly on the SuperSwap enclosure.

If you remove the physical drive, the Status LED stops blinking, the Activity LED goes dark and WebPAM will report that the physical drive was unplugged. When you replace the drive, the LEDs will return to normal operation.

If you do not remove the physical drive, click on the **Located Release** button to stop the Status LED from blinking. For more information, see the *SuperSwap User Manual*.

Logical Drives

- Logical Drive View (below)
- Create a Logical Drive (page 67)
- JBOD (page 71)
- Delete a Logical Drive (page 72)
- Logical Drive Information (page 72)
- Logical Drive Settings (page 73)
- Logical Drive Migration and Expansion (page 74)
- Logical Drive Rebuild (page 77)
- Synchronize/Redundancy Check All Logical Drives (page 79)
- Logical Drive Synchronization/Redundancy Check (page 81)
- Logical Drive Initialization (page 83)
- Logical Drive Activation (page 83)
- Logical Drive Critical / Offline (page 84)

Logical Drive View

Logical Drive View provides a list of all logical drives currently on the Host PC. To access Logical Drive View, click on the Logical Drive View  icon in Tree View.

Logical Drive View Help														
Information	Create	Delete	Synchronization Schedule											
<div style="display: flex; align-items: center;"> ✔ Logical Drive Overview </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Assigned Name</th> <th style="text-align: left;">RAID Level</th> <th style="text-align: left;">Status</th> <th style="text-align: left;">Background Activity</th> <th style="text-align: left;">Capacity</th> </tr> </thead> <tbody> <tr> <td>Logical Drive 1</td> <td>RAID 5</td> <td>Functional</td> <td>Idle</td> <td>105.00 GB</td> </tr> </tbody> </table>					Assigned Name	RAID Level	Status	Background Activity	Capacity	Logical Drive 1	RAID 5	Functional	Idle	105.00 GB
Assigned Name	RAID Level	Status	Background Activity	Capacity										
Logical Drive 1	RAID 5	Functional	Idle	105.00 GB										

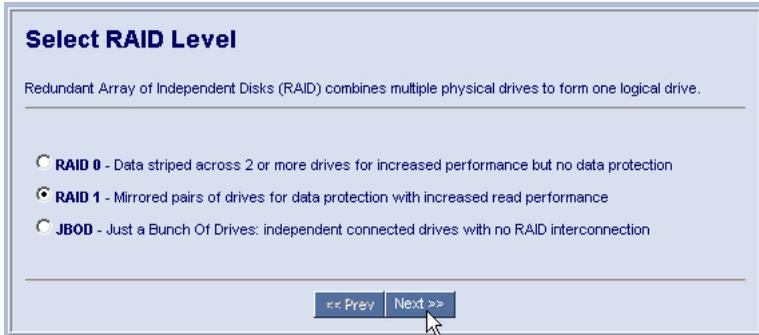
From this screen, you can click on the links to access information and functions of individual logical drives and use the Create and Delete features.

Create a Logical Drive

A logical drive is a collection of physical drives in a RAID.

To create a new logical drive:

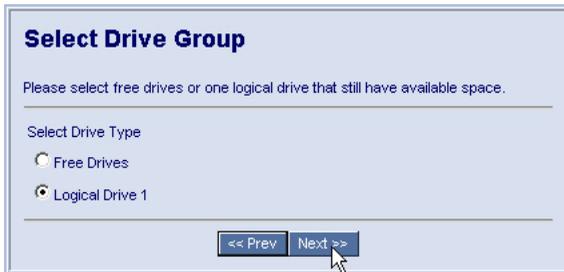
1. Click on the Logical Drive View  icon.
2. Click on the Create tab.



3. Select the option button beside the RAID level you want for your logical drive.

WebPAM displays the RAID levels you can use with the available physical (disk) drives. You can also select JBOD on this screen.

See “Choosing a RAID Level” on page 94 for information about the advantages and requirements of the available RAID levels and JBOD.



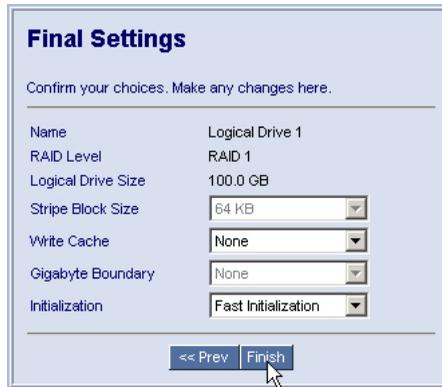
4. In the Select Drive Group screen, click on the option button for one of the following:
 - **Free Drives** – Select all Free (unassigned) physical drives
 - **Logical Drive** – Select the Free portion of physical drives whose other portion is assigned to a Logical Drive

The available choices depend on the RAID level you selected and the physical drives available.

5. Click the **Next** button.

6. If you want to create a logical drive with unused capacity, enter the assigned (used) capacity in the Logical Drive Size field.
To use the maximum capacity, check the Use Maximum Capacity box.
7. Click on the physical drives to select them.
Available drives have a black frame. Selected drives have a red frame.
8. Click the **Next** button.
If you selected JBOD, click the **Finish** button on the Select Drives screen.
This completes the creation process for JBOD.

9. Enter a name for the logical drive in the field provided.
10. Click the **Next** button.



11. For RAID 0 logical drives, select a Stripe Block Size of 32 KB, 64 KB, or 128 KB. 64 KB is the default.

See “Stripe Block Size” on page 96 for more information.

12. Select an Initialization policy from the dropdown menu.
 - **Fast Initialization** – Erases the Master Boot Record (MBR) of the physical drives being added to the logical drive.
 - **Full Initialization** – Erases all sectors of the physical drives being added to the logical drive.
 - **None** – No initialization. This choice is not recommended.

13. Click the **Finish** button.

If there are physical drives available, the Select RAID Level screen appears again, where you can create an additional logical drive.

The screenshot shows the 'Logical Drive Information' window with the 'Information' tab selected. The 'Basic Information' section displays the following details:

Assigned Name	Logical Drive 1
RAID Level	RAID 1
Stripe Size	64 KB
Capacity	100.00 GB
Status	Functional
Background Activity	Idle

The 'Graphic View' section shows two drives on separate ports, each with 100.00 GB capacity. The first drive (Port 1) has 59.95 GB free, and the second drive (Port 2) also has 59.95 GB free. A legend at the bottom indicates: Available (black), Assigned (blue), Assigned to Logical Drive 1 (green), Spare (orange), and Invalid (grey).

Click on the Logical Drive  icon to see all of the information about your new logical drive.

Before you can use your new logical drive, you must partition and format the logical drive using your PC's operating system. See "Appendix A: Partition and Format" on page 113 for more information.

JBOD

In WebPAM, JBOD is created, managed and deleted the same as a logical drive. You can also use the FastBuild utility for this purpose. See "Chapter 4: FastBuild™ Utility" on page 31 for more information.

The screenshot shows the 'Logical Drive Information' window with the 'Information' tab selected. The 'Basic Information' section displays the following details:

Assigned Name	JBOD on port 04 (00)
RAID Level	JBOD
Capacity	80.02 GB
Status	Functional

The 'Graphic View' section shows a single drive on Port 4 with 80.02 GB capacity. A legend at the bottom indicates: Available (black), Assigned (blue), Assigned to JBOD on port 04 (00) (green), Spare (orange), and Invalid (grey).

JBODs do not have Settings, Rebuild, Synchronization, or other functions that pertain to RAID logical drives. See page 74 for information about Migration and Expansion with a JBOD.

If you attach a physical drive that was initialized using Windows disk management, that drive will be automatically recognized as a JBOD by the FastTrak controller and WebPAM.

Delete a Logical Drive

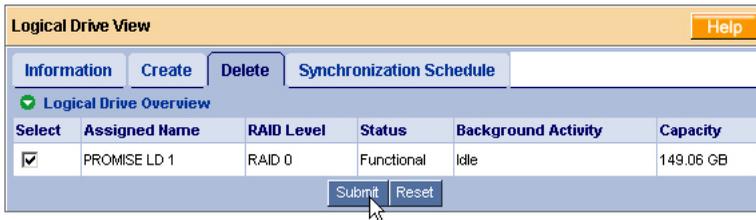


Warning

When you delete a logical drive, you delete all data on the logical drive. Be sure to backup any important data before you delete a logical drive!

To delete a logical drive:

1. Click on the Logical Drive View  icon.
2. Select the Delete tab.



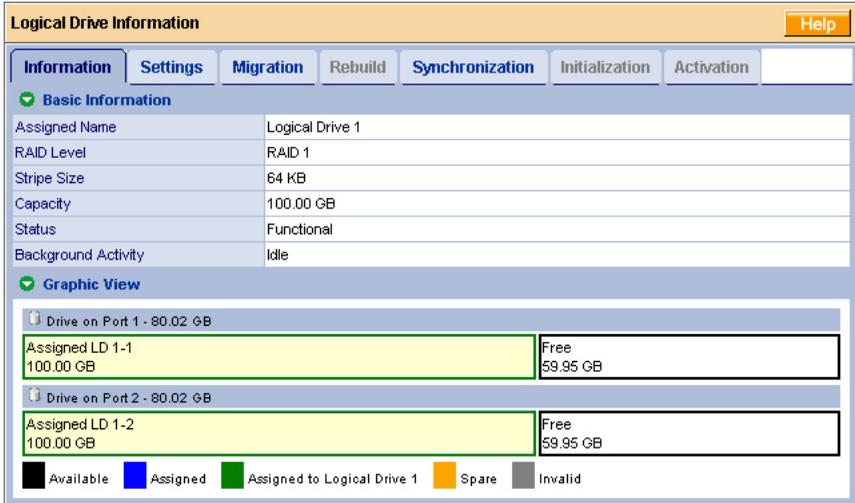
3. Check the box to the left of the logical drive you want to delete.
4. Click the **Submit** button.
5. In the Confirmation box, click the **OK** button.
6. In the Warning box, click the **OK** button.

The selected logical drive is deleted.

Logical Drive Information

Logical Drive View provides a list of all logical drives currently on the Host PC. To access Logical Drive View:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to see.



Logical Drive Information Help

Information Settings Migration Rebuild Synchronization Initialization Activation

✓ **Basic Information**

Assigned Name	Logical Drive 1
RAID Level	RAID 1
Stripe Size	64 KB
Capacity	100.00 GB
Status	Functional
Background Activity	Idle

✓ **Graphic View**

Drive on Port 1 - 80.02 GB

Assigned LD 1-1 100.00 GB	Free 59.95 GB
------------------------------	------------------

Drive on Port 2 - 80.02 GB

Assigned LD 1-2 100.00 GB	Free 59.95 GB
------------------------------	------------------

Available Assigned Assigned to Logical Drive 1 Spare Invalid

From this screen, you can click on the links to access the Settings, Drive Mapping, Migration, Rebuild, Synchronization, Initialization and Activation features. The features that apply to this logical drive have blue tabs. Features that do not apply have grayed tabs.

Logical Drive Settings

Logical Drive Settings allows you to assign a name to a logical drive and to change its controller cache settings. To access logical drive settings:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to see.
3. Click on the Settings tab in Management View.



Logical Drive Information Help

Information Settings Migration Rebuild Synchronization Initialization Activation

✓ **View/Change Logical Drive Parameters**

Assigned Name

4. Enter a name in the Assigned Name field, as desired.
5. Click the **Submit** button when you are done.

Logical Drive Migration and Expansion

The Logical Drive–Migration tab enables you to migrate or expand a logical drive. Migration is the process of changing the RAID level of an existing logical drive. Expansion is the process of adding more physical drives to a logical drive while keeping the same RAID level.

The Migration feature applies to certain combinations of RAID level and number of physical drives, as described in the table below.

From	To	Result
RAID 0: 1 drive	RAID 0: 2 drives	Increased performance and capacity
	RAID 1: 2 drives	Adds redundancy

For more information, see “Logical Drive Expansion” on page 96 and “RAID Level Migration” on page 97.

You can set up an Migration to begin immediately (on demand) or schedule a Migration for a time when there is less demand on the RAID system.



Caution

Before you begin logical drive Expansion or RAID Level Migration, always back up your important data.

JBOD

Migration and Expansion are not available for JBOD. Delete the JBOD to make it an unassigned physical drive. See “Delete a Logical Drive” on page 72.

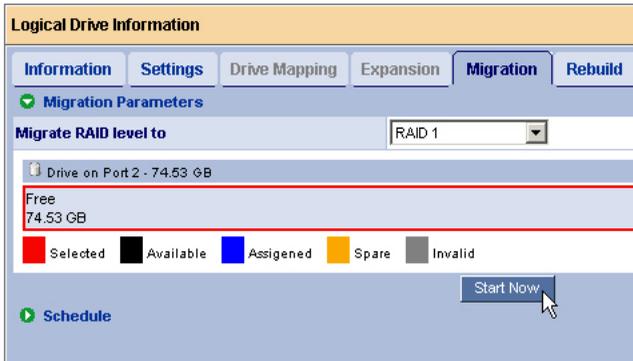
Then you can:

- Add the unassigned physical drive to an existing single-drive RAID 0 logical drive, as shown in the table above.
- Create a RAID 1 logical drive with two unassigned physical drives. See “Create a Logical Drive” on page 67.

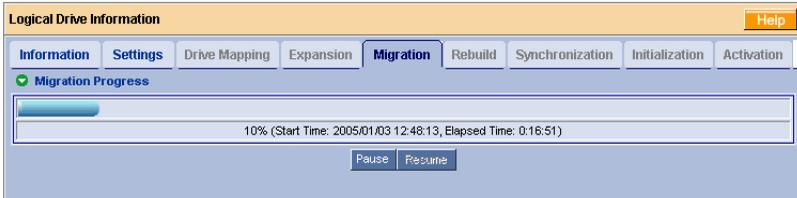
On Demand

To migrate a logical drive:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to migrate.
3. Click on the Migration tab in Management View.



4. Click on the free physical drive to select it.
Available drives have a black frame. Selected drives have a red frame.
5. Click the **Start Now** button.

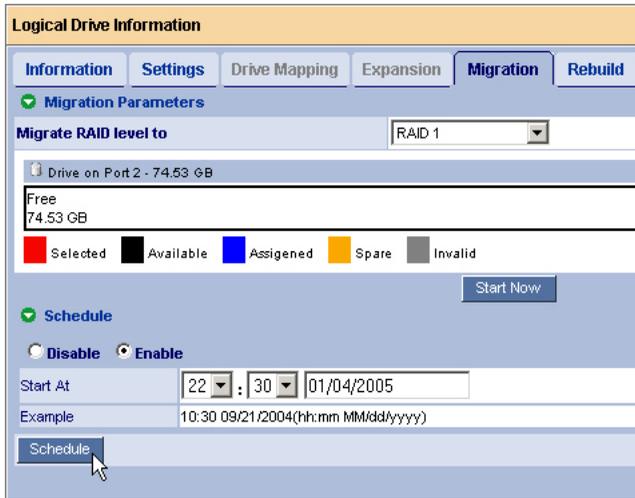


You can monitor Migration or Expansion progress on the Logical Drive Migration tab. Click the respective buttons to pause and resume the Migration.

Scheduled

To schedule a Migration or Expansion:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to migrate or expand.
3. Click on the Migration tab in Management View.



4. Click on the free physical drive to select it.
Available drives have a black frame. Selected drives have a red frame.
5. Click on the **Enable** option.
6. From the dropdown menus, select a start time.
Start time is based on a 24-hour clock.
7. Click in Start At field to display a popup calendar.
8. Click on the start date in the calendar or enter a date manually.
9. Click the **Schedule** button.

Cancel a Schedule

If you want to cancel the scheduled Migration, do the following:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon.
3. Click on the Migration tab in Management View.
4. Click on the **Disable** option.

Logical Drive Rebuild

Rebuild refers to the process of repairing a logical drive by reconstruction the data on one of its physical drives. This feature only RAID 1 logical drives.

You can set up a Rebuild to:

- Begin immediately (on demand)
- Schedule a Rebuild for a time when there is less demand on the RAID system
- Begin automatically when you replace the failed physical drive

On Demand

To rebuild a logical drive:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to rebuild.
3. Click on the Rebuild tab in Management View.



4. Select the physical drive to use in the rebuild.
Available drives have a black frame. Selected drives have a red frame.
5. Click the **Start Now** button.



You can monitor Rebuild progress on the Logical Drive Rebuild tab.

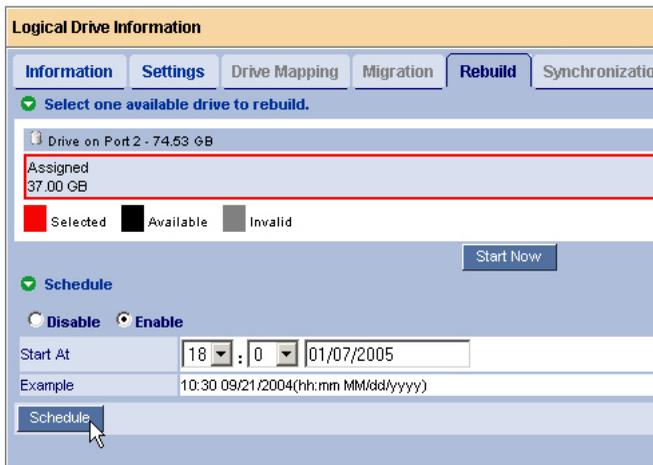
Click the respective buttons to pause and resume the Rebuild.

Click the Abort button to stop the Rebuild. After an abort, click the Restart button to start the Rebuild from the beginning (zero percent).

Scheduled

To schedule a Rebuild:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to rebuild.
3. Click on the Rebuild tab in Management View.



Logical Drive Information

Information Settings Drive Mapping Migration **Rebuild** Synchronization

✓ Select one available drive to rebuild.

Drive	Assigned	Status
Drive on Port 2 - 74.53 GB	37.00 GB	Selected

Selected
 Available
 Invalid

Start Now

Schedule
 Disable
 Enable

Start At: [18] : [0] [01/07/2005]

Example: 10:30 09/21/2004(hh:mm MM/dd/yyyy)

Schedule

4. Select the physical drive you want to rebuild.
Available drives have a black frame. Selected drives have a red frame.
5. Click on the **Enable** option.
6. From the dropdown menus, select a start time.
Start time is based on a 24-hour clock.
7. Click in Start At field to display a popup calendar.
8. Click on the start date in the calendar or enter a date manually.
9. Click the **Schedule** button.

Cancel a Schedule

If you want to cancel the scheduled Rebuild, do the following:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon.

3. Click on the Rebuild tab in Management View.
4. Click on the **Disable** option.

Automatic Rebuild

Automatic rebuilding of a logical drive is possible under the following conditions:

- The logical drive is a RAID 1.
See “Create a Logical Drive” on page 67.
- You have replaced the failed physical (disk) drive with a new one.
- Automatic Rebuild Status is enabled in the Controller Settings.
See “Controller Settings” on page 57.

If the three above conditions are met, a logical drive will rebuild itself automatically. WebPAM will report the critical logical drive and automatic rebuild in its user interface as well as via popup messages. Depending on your Event Notification settings (see page 46), WebPAM can also notify you via email message.

Synchronize/Redundancy Check All Logical Drives

The Logical Drive View–Synchronization Schedule tab enables you to synchronize all logical drives. You can also synchronize an individual logical drive, see page 81.

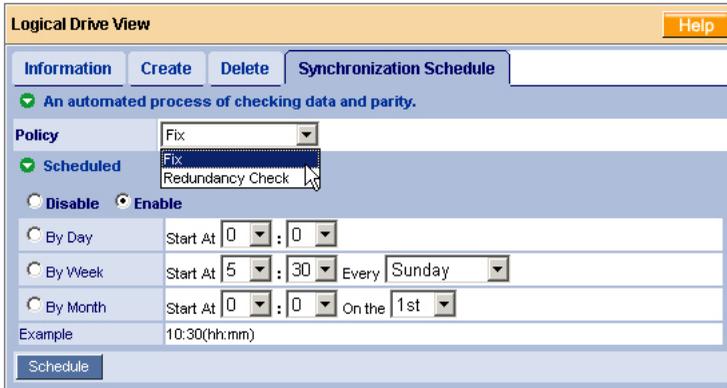
Synchronization refers to an automated process of checking and correcting data and parity. Unlike a Rebuild, Synchronization is a maintenance operation.

Redundancy Check is an automated process of checking data and parity but it only reports and does not correct, any inconsistencies that it finds.

Synchronization and Redundancy Check apply to RAID 1 logical drives. When an logical drive is first created and you select Full Initialization, the same action as Synchronization takes place.

To schedule Synchronization for all logical drives:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Synchronization Schedule tab in Management View.



3. In the Policy dropdown menu, select *Fix* if you want Synchronization or *Redundancy Check* if you do not want to correct inconsistencies.
4. Click on the **Enable** option.
5. Click on the **by Day**, **by Week** or **by Month** option.
6. From the dropdown menus, select a start time and a day of the Week or Month, if applicable.
Start time is based on a 24-hour clock.
7. Click the **Schedule** button.

If you want to cancel the scheduled Synchronization, do the following:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Synchronization tab in Management View.
3. Click on the **Disable** option.

Logical Drive Synchronization/Redundancy Check

Synchronization refers to an automated process of checking and correcting data and parity. Unlike a Rebuild, Synchronization is a maintenance operation. You can also synchronize all logical drives at the same time, see page 79.

Redundancy Check is an automated process of checking data and parity but it only reports and does not correct, any inconsistencies that it finds.

Synchronization and Redundancy Check apply to RAID 1 logical drives. When an logical drive is first created and you select Full Initialization, the same action as Synchronization takes place.

You can set up a Synchronization or Redundancy Check to begin immediately (on demand) or schedule a Synchronization or Redundancy Check for a time when there is less demand on the RAID system.

On Demand

To Synchronize or Redundancy Check a logical drive:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to synchronize.
3. Click on the Synchronization tab in Management View.



4. In the Policy dropdown menu, select *Fix* if you want Synchronization or *Redundancy Check* if you do not want to correct inconsistencies.
5. Click the **Start Now** button.

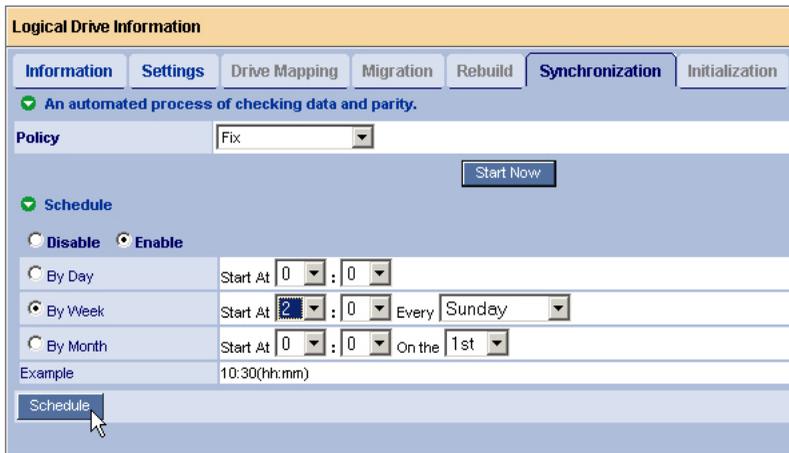


You can monitor Migration progress on the Logical Drive Migration tab. Click the respective buttons to pause, resume or abort the Synchronization or Redundancy Check.

Scheduled

To schedule a Synchronization or Redundancy Check:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to synchronize.
3. Click on the Synchronization tab in Management View.



Logical Drive Information

Information Settings Drive Mapping Migration Rebuild **Synchronization** Initialization

✓ An automated process of checking data and parity.

Policy

✓ **Schedule**

Disable **Enable**

By Day Start At :

By Week Start At : Every

By Month Start At : On the

Example 10:30(hh:mm)

4. In the Policy dropdown menu, select *Fix* if you want Synchronization or *Redundancy Check* if you do not want to correct inconsistencies.
5. Click on the **Enable** option.
6. Click on the **by Day, by Week** or **by Month** option.
7. From the dropdown menus, select a start time and a day of the Week or Month, if applicable.
Start time is based on a 24-hour clock.
8. Click the **Schedule** button.

Cancel a Schedule

If you want to cancel the scheduled Synchronization or Redundancy Check, do the following:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon.

3. Click on the Synchronization tab in Management View.
4. Click on the **Disable** option.

Logical Drive Initialization

When logical drive is first created, you can select one of three choices for initialization:

- **Quick Initialization** – Erases the reserve and master boot sectors of the physical drives being added to the logical drive.
- **Full Initialization** – Erases all sectors of the physical drives being added to the logical drive.
- **None** – No initialization. This choice is not recommended.

When you select full initialization, the process takes some time, depending on the size of the physical drives selected for the logical drive. The Initialization tab enables you to pause the initialization process so that more of FastTrak's resources are available for other operations. When the other operations are done, you can resume the initialization of your new logical drive.

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive whose initialization you want to pause.
3. Click on the Initialization tab in Management View.
4. Click the **Pause** button.
The initialization process stops.
5. Click the **Resume** button.
The initialization resumes from the point where you paused it.

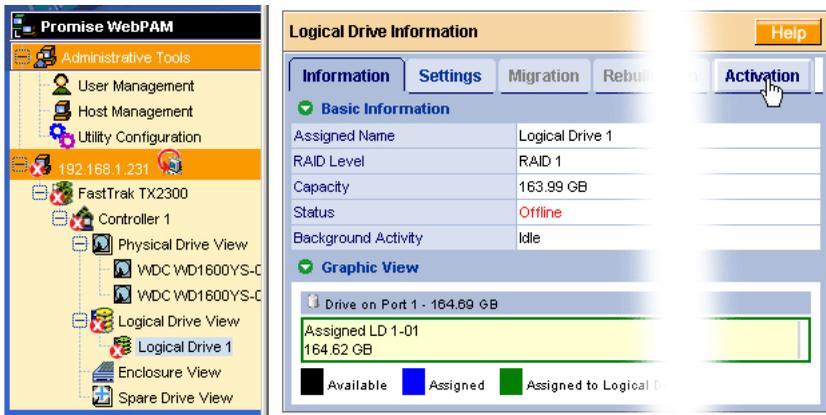
Logical Drive Activation

This feature enables you to convert a RAID 1 logical drive from *offline* to *critical* status, so you can rebuild the logical drive and access your data. This condition occurs when a single physical (disk) drive from a RAID 1 logical drive is connected to the FastTrak Controller card.

Note the this feature does not apply to an offline *RAID 0* logical drive.

In the example below, icons of a white X within a red circle appear over the FastTrak, Controller, Logical Drive View, and Logical Drive icons. In Management View, the status is shown as *Offline*.

The image below was narrowed to fit on the page.



To activate an offline RAID 1 logical drive:

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the offline logical drive.
3. Click on the Activation tab in Management View.
4. Click the **Activation** button.

The logical drive converts to *Critical* status. You can now rebuild the logical drive. See “Logical Drive Rebuild” on page 77.

Logical Drive Critical / Offline

A RAID 1 logical drive goes critical when a physical (disk) drive is removed or fails. Due to the fault tolerance of the logical drive, the data is still available and online. However, once the logical drive goes critical, it has lost its fault tolerance and performance may be adversely affected.

If the fault was caused by a failed physical drive, the drive must be replaced by another drive, either identical or larger, in order for the RAID system to rebuild and restore optimal configuration.

A non-fault tolerant logical drive—RAID 0—goes offline when a physical drive is removed or fails. Since the logical drive is not fault tolerant, the data stored in the disk array is no longer accessible.

If one physical drive fails, all of the data on the logical drive is lost. You must replace the failed drive. Then, if the logical drive had more than one disk drive, delete the logical drive and re-create it. Restore the data from a backup source.

When a Disk Drive Fails

The following will occur when a physical drive fails or goes offline:

- The FastTrak Controller's audible alarm sounds (if the alarm is enabled).
- The SuperSwap Status LED changes from green to red.
- WebPAM displays a message in the upper right corner of the Host PC's monitor screen. This message appears even if your browser is closed.



- WebPAM displays a popup message.



- WebPAM sends you an email message (if Event Notification is enabled).
- WebPAM reports the condition in Tree View and Management View.



Logical Drive View			
Information	Create	Delete	Synchronization Schedule
<div style="text-align: center;"> Logical Drive Overview </div>			
Assigned Name	RAID Level	Status	Background
Logical Drive 1	RAID 1	Critical	Idle

In the example above, amber ! icons appear over the FastTrak, Controller, Logical Drive View, and Logical Drive icons. Click on the Logical Drive View  or Logical Drive  icons to verify the condition of the logical drive.

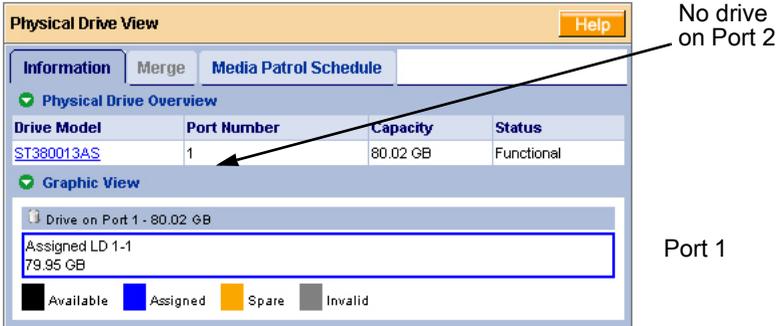
In this example, the Status is *Critical* and Background activity is *Idle*. This combination indicates that there is no automatic rebuild, so you must take action to restore the logical drive:

1. Identify the failed physical drive.

2. Replace the failed physical drive.
3. Rebuild your logical drive.

Identify the Failed Physical Drive

Click on the Physical Drive View  icon in the WebPAM user interface. Look for a missing physical drive. A drive that used to be present but is suddenly absent is the failed disk drive.



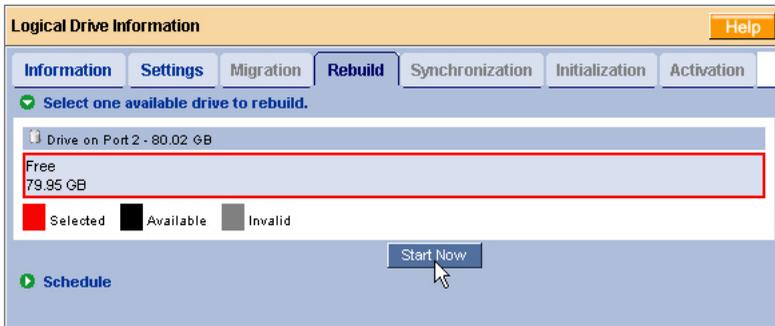
In this example, there were four disk drives connected to the FastTrak Controller. Notice that there is no drive on Port 2. This is the failed drive.

Replace the Failed Physical Drive

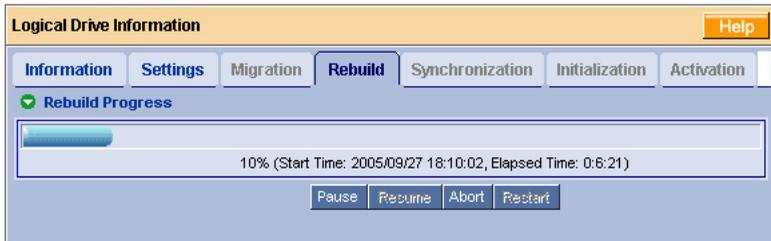
Replace the failed physical drive with a new one of equal or greater capacity. Then rebuild the logical drive. See “Install the Disk Drives” on page 9 and the *SuperSwap User Manual* for more information about replacing a physical drive.

Rebuild Your Logical Drive

1. Click on the Logical Drive View  icon in Tree View.
2. Click on the Logical Drive  icon of the logical drive you want to rebuild.
3. Click on the Rebuild tab in Management View.



4. Select the physical drive you just replaced.
5. Click the **Start Now** button.

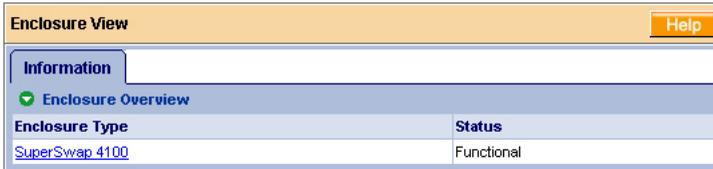


You can monitor Rebuild progress on the Logical Drive Rebuild tab. Click the respective buttons to pause and resume the Rebuild. When the Rebuild is finished, your logical drive will be Functional again.

Enclosures

Enclosure View

Enclosure View provides a list of all enclosures currently on the Host PC. To access Enclosure View, click on the Logical Drive View  icon in Tree View.

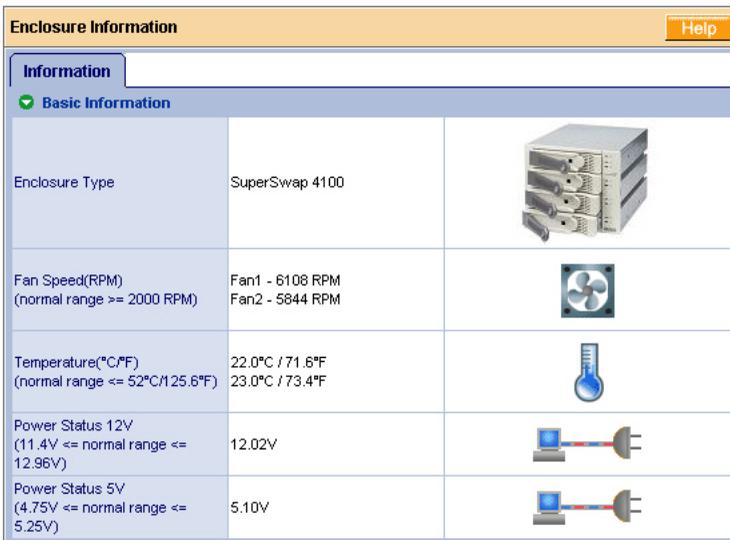


From this window, you can click on the links to access information and functions of individual Enclosures.

Enclosure

To access information about an Enclosure:

1. Click on the Enclosure View  icon in Tree View.
2. Click on the Enclosure  icon.



The information tab displays the following information:

- **Enclosure Type** – The manufacturer’s model name or number.
- **Fan Speed** – The RPM of the enclosure’s cooling fans.
- **Temperature** – The internal temperature of the enclosure. Each reading reflects a separate measurement.
- **Power Status** – The voltages supplied by the enclosure’s 12V and 5V systems.

The Fan, Temperature and Power icons change color when an error is indicated, as shown below.



	LEDs		
State	💡 Status	🗄 Activity	🕒 Enclosure
Green	Disk drive is present and ready	Disk drive is present and ready	Normal status
Blinking	n/a	Read/write activity	n/a
Amber	Disk drive: <ul style="list-style-type: none"> • is spinning up • is critical • is rebuilding • reports a SMART error 	n/a	1 incident (see below) Enclosure is critical but still functional Attention required
Red	Disk drive: <ul style="list-style-type: none"> • is offline • is not installed 	n/a	2 or more incidents (see below)
Dark	Power is off	Disk drive: <ul style="list-style-type: none"> • has failed • is not installed 	Disk drives are spinning up
An incident refers to one occurrence of out-of-range voltage, temperature or fan speed. Any incident requires immediate attention.			

For more information on Enclosures, replacing disk drives and other repair operations, refer to the *SuperSwap User Manual*.

Spare Drives

A spare drive is a physical drive designated to function as a hot spare drive. This feature is not applicable to FastTrak TX200 or TX2300 because these controllers only support two physical drives.

Chapter 6: Technology

- About FastTrak, below
 - Introduction to RAID, below
 - Choosing a RAID Level (page 94)
 - Other Logical Drive Features (page 96)
-

About FastTrak

FastTrak TX Series RAID controller card features concurrent data channel operation and onboard BIOS. The channels on the FastTrak card support concurrent operation that allows for overlapped I/O under multi-tasking operating systems and sharing the workload between multiple drives.

Adapter BIOS

The FastTrak card contains a BIOS code that extends the standard disk service routine provided through Int13. The BIOS is bootable for DOS and other operating systems that rely on the system BIOS for drive operation. When the FastTrak BIOS appears during bootup, press Ctrl-F to enter the FastBuild setup to select from menu settings.

Introduction to RAID

RAID (Redundant Array of Independent Disks) allows multiple hard drives to be combined together into a logical drive. The operating system sees the logical drive as a single storage device, and treats it as such. The RAID software and/or controller handle all of the individual drives on its own. The benefits of a RAID can include:

- Higher data transfer rates for increased server performance
- Increased overall storage capacity for a single drive designation (such as, C, D, E, etc.)
- Data redundancy/fault tolerance for ensuring continuous system operation in the event of a hard drive failure

Different types of logical drives use different organizational models and have varying benefits. Also see Choosing RAID Level on page 94. The following outline breaks down the properties for each type of RAID logical drive:

RAID 0 – Stripe

When a logical drive is striped, the read and write blocks of data are interleaved between the sectors of multiple disk drives. Performance is increased, since the workload is balanced between drives or “members” that form the logical drive. Identical drives are recommended for performance as well as data storage efficiency. The logical drive's data capacity is equal to the number of drive members multiplied by the smallest logical drive member's capacity.

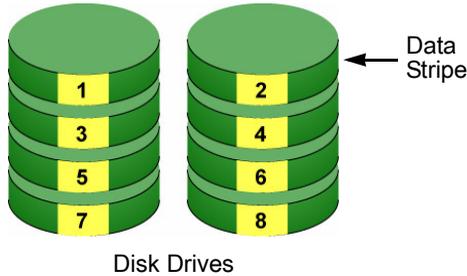


Figure 1. RAID 0 Stripe interleaves data across multiple drives

For example, one 100GB and three 120GB drives will form a 400GB (4 x 100GB) logical drive instead of 460 GB.

RAID 0 logical drives on the FastTrak TX Series RAID consist of one or more disk drives.

RAID 1 – Mirror

When a logical drive is mirrored, identical data is written to a pair of disk drives, while reads are performed in parallel. The reads are performed using elevator seek and load balancing techniques where the workload is distributed in the most efficient manner. Whichever drive is not busy and is positioned closer to the data will be accessed first.

With RAID 1, if one disk drive fails or has errors, the other mirrored disk drive continues to function. This is called Fault Tolerance. Moreover, if a spare disk drive is present, the spare drive will be used as the replacement drive and data will begin to be mirrored to it from the remaining good drive.

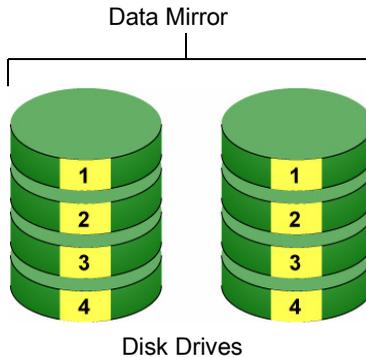


Figure 2. RAID 1 Mirrors identical data to two drives

Due to the data redundancy of mirroring, the capacity of the logical drive is only the size of the smallest disk drive. For example, two 100GB disk drives which have a combined capacity of 200GB instead would have 100GB of usable storage when set up in a mirrored logical drive. Similar to RAID 0 striping, if disk drives of different capacities are used, there will also be unused capacity on the larger drive.

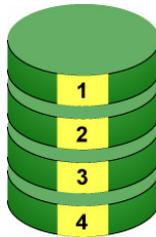
RAID 1 logical drives on the FastTrak TX Series consist of two disk drives.

JBOD – Single Drive

An alternative to RAID, JBOD capacity is equal to the size of the disk drive itself.

JBOD appears in the User Interface as one individual drive.

There are no performance or fault-tolerance features. When one disk fails, all data on that disk is lost. The other disks are unaffected.



Disk Drive

Choosing a RAID Level

There are several issues to consider when choosing the RAID Level for your FastTrak logical drive. The following discussion summarizes some advantages, disadvantages and applications for each choice.

RAID 0

Advantages	Disadvantages
Implements a striped disk logical drive, the data is broken down into blocks and each block is written to a separate disk drive I/O performance is greatly improved by spreading the I/O load across many channels and drives No parity calculation overhead is involved	Not a true RAID because it is not fault-tolerant The failure of just one drive will result in all data in an logical drive being lost Should not be used in mission critical environments

Recommended Applications for RAID 0

- Image Editing
- Pre-Press Applications
- Any application requiring high bandwidth

RAID 1

Advantages	Disadvantages
Simplest RAID storage subsystem design Can increase read performance by processing data requests in parallel since the same data resides on two different drives	Very high disk overhead - uses only 50% of total capacity

Recommended Applications for RAID 1

- Accounting
- Payroll
- Financial
- Any application requiring very high availability

JBOD

Advantages	Disadvantages
Enables you to manage a large number of disk drives from a single controller The failure of one drive has no effect upon the data in other disk drives	An alternative to RAID without any RAID advantages Should not be used in mission critical environments

Recommended Applications for JBOD

- Any application requiring multiple disk drives but where read/write speed or fault-tolerance are not important
- Applications were low-cost operation critical

Other Logical Drive Features

Stripe Block Size

The stripe block size value can be set to 32 KB, 64 KB, and 128 KB.

64 KB is the default. This selection will directly affect performance. There are two issues to consider when selecting the stripe block size.

- Choose a stripe block size equal to or smaller than the smallest cache buffer found on any physical drive in your logical drive. A larger value slows the logical drive down because physical drives with smaller cache buffers need more time for multiple accesses to fill their buffers.
- If your data retrieval consists of fixed-size data blocks, such as some database and video applications, choose that data block size as your stripe block size.

Generally speaking, email, POS and web servers prefer smaller stripe block sizes. Video and database applications prefer larger stripe block sizes.

Initialization

Fast Initialization erases the Master Boot Record (MBR) in all of the selected disk drives. Use this function when one or more disk drives has been used in a previous logical drive. This function is available in the FastBuild utility and in WebPAM.

Full Initialization erases all the data on the selected disk drives, including the MBR. Use this function when one or more disk drives has been used in a previous logical drive and you want to remove all data stored on the drive. This function is available in WebPAM.

Hot Spare Drive

This feature does not apply to FastTrak TX2200 and TX2300 because the controller only supports two physical drives.

Cache Settings

Cache settings are not adjustable on the FastTrak TX Series RAID Controller card.

Logical Drive Expansion

To *expand* a logical drive is to increase the number of disk drives.

The FastTrak TX Series RAID Controller card supports logical drive expansion. However, you must use the WebPAM software to access this function.

See “Logical Drive Migration and Expansion” on page 74.

Expansion takes place on an existing Functional logical drive without disturbing the existing data. While the logical drive is expanding, you can access the data as before. When expansion is complete, your logical drive will have a larger capacity.

The following table lists the Expansion option supported by FastTrak TX Series.

From	To	Result
RAID 0: 1 drive	RAID 0: 2 drives	Increased performance and capacity

JBOD

Expansion is not available for JBOD. Delete the JBOD to make it an unassigned physical drive. See “Delete a Logical Drive” on page 72.

Then you can add the unassigned physical drive to an existing single-drive RAID 0 logical drive, as shown in the table above.



Caution

Before you begin a logical drive Expansion, always back up your important data.

RAID Level Migration

To *migrate* a logical drive is to change its RAID level. The FastTrak TX Series RAID controller card supports RAID Level Migration. You must use the WebPAM software to access this function.

See “Logical Drive Migration and Expansion” on page 74.

Migration takes place on an existing Functional logical drive without disturbing the existing data. While the logical drive is migrating, you can access the data as before. When migration is complete, your logical drive will have a different RAID level and/or a larger capacity.

The following table lists the RAID Level migration option supported by FastTrak TX Series.

From	To	Result
RAID 0: 1 drive	RAID 1: 2 drives	Adds redundancy

JBOD

Migration is not available for JBOD. Delete the JBOD to make it an unassigned physical drive. See “Delete a Logical Drive” on page 72.

Then you can create a RAID 1 logical drive with two unassigned physical drives. See “Create a Logical Drive” on page 67.



Caution

Before you begin a RAID Level Migration, always back up your important data.



Important

- RAID 1 (mirror) works with two disk drives only
 - You cannot migrate a logical drive when it is Critical or performing activities such as Synchronizing, Rebuilding and PDM
 - RAID level migration is not possible to or from JBOD
-

Chapter 7: Support

- Frequently Asked Questions
 - Pre-Installation, below
 - Motherboard Issues (page 100)
 - System CMOS Issues (page 100)
 - Drive Issues (page 101)
 - Operating System-Related Issues (page 103)
 - Installation Issues (page 104)
 - Post-Installation (page 105)
 - Performance Tips (page 105)
 - Contact Technical Support, page 106
 - Limited Warranty, page 109
 - Return Product for Repair, page 111
-

Frequently Asked Questions

This section lists frequently asked questions and other issues with the FastTrak TX Series RAID Controller card.

Pre-Installation

(Speed, Device Types, Capacity, Cabling)

What kind of hard drives can I use for a FastTrak disk array?

You can use any Serial ATA disk drive(s) to create disk arrays on the FastTrak Serial ATA RAID Controller card. Use matching drives for multiple-disk arrays to maximize capacity usage as well as performance.

Will ACPI work with disk drives on the FastTrak?

Yes.

Can I use ATAPI devices on the FastTrak?

No. The FastTrak TX Series does not support ATAPI devices.

How can I change the resources that the FastTrak Controller uses?

The FastTrak TX Series is fully PnP. This means all the resources that it uses are given to it by the PnP BIOS on the motherboard. The FastTrak Serial ATA RAID Controller does support IRQ sharing, but this will not work unless ALL the concerned devices support the feature. If your motherboard

allows you to control the assignment of these resources, you may be able to remedy the problem by:

- Changing the IRQ assignments to the PCI slots in the motherboard BIOS during boot up.
- Reset the configuration data in your CMOS. This is usually an option in the PnP section of your CMOS.
- Otherwise, switch the FastTrak card to a different PCI slot.

Motherboard Issues

Freeing additional IRQ resources

Since the Promise card supports PCI Interrupt sharing, it is possible to use IRQs already assigned to another PCI card. Interrupt Sharing is not supported with onboard IDE controllers. If the onboard IDE controller(s) are not used, you may disable the controllers to free IRQ 14 and/or 15.

Configuring PCI IRQ resources

Setting the IRQ for a particular PCI slot will be different depending on the motherboard BIOS. This setting is usually made in the PCI Configuration and/or Plug and Play (PnP) section of the motherboard BIOS setup.

Consult your motherboard manual for information that is specific to your motherboard.

System CMOS Issues

Set motherboard CMOS Boot sequence to boot to FastTrak Controller

On some Motherboard BIOS, it is necessary to set the Boot sequence to SCSI, A:, C: since the Promise card is identified as a SCSI card.

Motherboard CMOS displays C: or D: drive failure during startup

See the Drive-Related Errors section.

Using an onboard IDE card with FastTrak Controller

If an onboard IDE controller is installed with hard disks, enable support in the Motherboard Standard CMOS Setup for the drives. Note that the onboard IDE hard drives will then be the bootable hard disk unless the system BIOS has a boot sequence setting with the option to specify booting to a different device.

Drive Issues

Can I add a drive to a FastTrak disk array via hot-swap and dynamically adjust the disk array size?

Yes. The FastTrak TX Series supports dynamically adjustable RAID size and RAID level. See “Logical Drive Migration and Expansion” on page 74.

Do the disk drives on the FastTrak have to be the same size?

The disk drives connected to the FastTrak TX Series do not have to be the same size. If the sizes differ, the FastTrak controller will truncate the bigger drive so the drives match. The resulting difference in drive space is unusable, so avoid using disk drives of significantly different capacities.

I already have a disk array on an older FastTrak controller. Can I move that disk array to my new FastTrak TX Series?

Yes, provided your disk array was build using Serial ATA disk drives. All FastTrak controllers read the disk arrays the same way so you can move them from one controller to another.

Can I take a drive used in a FastTrak disk array and access it directly with a different controller, such as the one integrated on the motherboard?

Only Single-drive striped (RAID 0) and mirrored (RAID 1) disk array configurations allow the drive(s) to be accessed individually on another controller. Multiple-drive striped (RAID 0) drives will not work.

If I have a problem with one of the drives on the FastTrak Controller, how can I low-level format it to correct the problem?

Do NOT do this. Low-level formatting is unnecessary and generally does not correct problems commonly experienced. If you think the disk drive is faulty, run the drive manufacturer’s diagnostic utility on it.

Errors such as bad sectors or ECC/CRC failure are best remedied by completely replacing the drive. For this reason, do NOT low-level format the drives attached to the FastTrak controller.

Do I have to install disk management software on my disk array in order to access the full storage capacity of drives?

No! Disk management software will only complicate things. The disk array should be fully addressable by your OS as it is. Remember that some operating systems have varying limits on the sizes of partitions and disk arrays that can be defined. Consult your OS documentation about partitioning larger drives.

What system BIOS setup settings do I use for the drives on the FastTrak?

None. The drives on the FastTrak TX Series are supported by the FastTrak BIOS and/or OS drivers, not by your system BIOS.

How do I partition/format my FastTrak disk array?

The FastTrak TX Series represents the disk array as a single disk drive to your system. Therefore, anything that you can do to a single disk drive you can do to a FastTrak disk array. You can partition the disk array as you see fit using any file system you want.

Critical disk array (array) status error reported during boot

```
FastTrak TX2300 (tm) BIOS Version 2.5.0.xx
(c) 2004-2005 Promise Technology, Inc. All rights reserved.

ID      MODE      SIZE      TRACK-MAPPING      STATUS
-----
1       1x2 RAID 1  39999M    4963/255/63        Critical

Problem ic detected with Array : 1
Critical Status:
A disk member of an array has failed or is not responding.
Pleae refer to your Promise User Manual for further details.

Press <Ctrl-F> to enter FastBuild (tm) Utility...
```

If a critical status error message appears on the FastTrak BIOS startup screen for a RAID1 disk array, there is a drive in the disk array that has failed or is not responding. The mirrored disk array has lost its fault tolerance, but will still perform normal drive reads and writes. See "Logical Drive Critical / Offline" on page 84.

Disk drives cannot be formed into a disk array

Disk drives must support Serial ATA and be free of media defects in order to be added to a disk array. Promise recommends using new identical disk drives for each disk array. Also, re-check the data and power cabling and connections.

System CMOS displays C: or D: drive failure during Startup

Do not reference C: or D: in the Motherboard Standard CMOS for drives attached to the FastTrak Serial ATA RAID Controller. Only enter drive information in the Motherboard CMOS for drives attached to the onboard IDE controller.

The disk array constantly goes critical or offline during reboot.

This condition may occur when the *Master Boot Record (MBR)* of one of the drives has become corrupt or bad. Removing (erasing) the MBR will remedy any issue related directly to a bad MBR.



Warning

Before removing the MBR of the drive(s), backup any existing data. Removal of the MBR of any disk drive permanently deletes all existing data on the drive.

To erase the MBR, follow these steps:

1. Backup any important data from the disk array.
2. Note the disk array information, including which drives are used, the number of drives, RAID Level, etc.
3. Delete the disk array.
4. Create a new disk array using the specifications from the previous disk array.
5. During the disk array creation process:
 - In FastBuild, set the Fast Init feature to ON
 - In WebPAM, select Fast or Full Initialization
6. Partition and format the disk array using your PC's operating system. See "Appendix A: Partition and Format" on page 113.

Unable to partition or format disk array

See "The disk array constantly goes critical or offline during reboot," above.

Cannot rebuild mirrored (RAID 1) disk array

See "The disk array constantly goes critical or offline during reboot," above.

Fatal errors or data corruption are constantly reported when reading or writing to the disk array

See "The disk array constantly goes critical or offline during reboot," above.

Operating System-Related Issues

The Operating System no longer boots after creating a Mirrored disk array using your existing boot drive using Windows

This is due to Drive Geometry issues. You can verify this if you move the original drive back to the onboard controller and it boots successfully. Each controller can view a drive differently. This can be an issue for a new

controller that loads the original Master Boot Record (MBR) and then has a problem translating it or the Operating System boot record.

Promise recommends a clean install of the Operating System. This action restores the MBR and OS boot record. This action requires partitioning and formatting the drive.

Promise Windows driver does not appear in Device Manager

Windows may already be listing the controller under Other Devices instead of the Hard disk controllers section. In Device Manager under Other Devices to see if it lists a PCI Card or RAID Controller. If so, highlight this listing and click on the Properties button then click on the Driver tab. Depending on your version of Windows, choose either Change Driver or Update Driver. Follow the on-screen prompts to complete installation of the driver. If Windows asks if you want to test if the device can be removed safely, click on CANCEL. Reboot the system to complete installation of the driver.

“Inaccessible Boot Device” message appears during floppyless installation of Windows

The F6 key was not pressed at the appropriate time. Reboot the system, and press the F6 key when the message “Press F6 if you need to install third party SCSI or RAID driver” appears in Windows.

“No Hard Drives Found” message appears during CD-ROM installation of Windows

The F6 key was not pressed at the appropriate time. Reboot the system, and press the F6 key when the message “Press F6 if you need to install third party SCSI or RAID driver” appears in Windows.

Installation Issues

How can I change the system boot sequence in order to boot from the FastTrak disk array?

The boot sequence is controlled by the system BIOS. As far as the system BIOS is concerned, the FastTrak Serial ATA RAID Controller and its defined disk arrays are categorized as a SCSI device. This allows you to set the boot sequence in your BIOS setup utility to boot from SCSI first, rather than IDE.

If there are multiple SCSI add-in controllers in the system, then the boot sequence among is determined by their PCI slot priority. PCI slot #1 will be first, slot #2 second, etc. If you want to boot from the disk array, put the FastTrak Controller in the PCI slot where it will be accessed before the other SCSI controllers.

How can I change the boot sequence between a PCI SCSI card and the FastTrak disk array?

Since all PCI devices are PnP, it is difficult to determine which device is addressed first. Some newer motherboard BIOSes have advanced options that identify devices and allow you to select which device will be assigned resources first. Otherwise you may have to physically switch the device cards on the PCI slots so that the boot device is in the highest priority slot number, as described in the previous answer.

Post-Installation**Why can't I see the drives on the FastTrak Controller card under FDISK?**

You have not created a disk array yet. If no disk array has been created, the system will not recognize drive(s) attached to the FastTrak card.

Why can't I log into WebPAM over the network?

Verify that you have the correct IP address for the Host PC where the FastTrak controller card is installed.

If you checked the Local Monitoring Only option when you installed WebPAM, you can only access WebPAM from the Host PC. To obtain network access, reinstall WebPAM and be sure you do NOT check the Local Monitoring Only option. See "Install WebPAM" on page 15.

Performance Tips

Here are some tips that may optimize performance in a RAID 0 striped disk array. If you are using an audio/video-editing card, we also recommend reviewing your card's documentation for additional information.

Use FastTrak array as D: or other non-bootable drive in a striped disk array

For Audio/Video editing, keep the original system boot drive on the standard IDE controller as C: drive. Partitioning software will see the disk array as one physical drive, D: or later. This will prevent file fragmentation and provide better accessibility to the disk array.

Re-Configure PCI Latency Setting

The PCI Latency setting appears in some Motherboard BIOS. The setting governs how much time is allocated to service each PCI slot. Promise recommends a value of 64. An optimal value will vary from system to system.

Contact Technical Support

Promise Technical Support provides several support options for Promise users to access information and updates. We encourage you to use one of our electronic services, which provide product information updates for the most efficient service and support.

If you decide to contact us, please have the following information available:

- Product model and serial number
- Firmware, BIOS and driver version numbers
- A description of the problem / situation
- System configuration information, including: motherboard and CPU type, hard drive model(s), SATA/ATA/ATAPI drives & devices, and other controllers.

Technical Support Services

Promise Online™ Web Site	http://www.promise.com/support (technical documents, drivers, utilities, etc.)
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United States

E-mail Support	e-Support On-Line
Fax Support	(408) 228-1097 Attn: Technical Support
Phone Support	(408) 228-1400 option 4
If you wish to write us for support:	Promise Technology, Inc. 580 Cottonwood Drive Milpitas, CA 95035, USA

The Netherlands

E-mail Support	e-Support On-Line
Fax Support	+31 (0) 40 256 9463 Attn: Technical Support
Phone Support	+31 (0) 40 235 2600
If you wish to write us for support:	Promise Technology Europe B.V. Science Park Eindhoven 5542 5692 EL Son, The Netherlands

Germany

E-mail Support	e-Support On-Line
Fax Technical Support	+49 (0) 2 31 56 76 48 - 29 Attn: Technical Support
Phone Technical Support	+49 (0) 2 31 56 76 48 - 10
If you wish to write us for support:	Promise Technology Germany Europaplatz 9 44269 Dortmund, Germany

Italy

E-mail Support	e-Support On-Line
Fax Support	0039 06 367 12400 Attn: Technical Support
Phone Support	0039 06 367 12626
If you wish to write us for support:	Promise Technology Italy Piazza del Popolo 18 00187 Roma, Italia

Taiwan

E-mail Support	e-Support On-Line
Fax Support	+886 3 578 2390 Attn: Technical Support
Phone Support	+886 3 578 2395 (ext. 8811)
If you wish to write us for support:	Promise Technology, Inc. 2F, No. 30, Industry E. Rd. IX Science-based Industrial Park Hsin-Chu 30075, Taiwan (R.O.C.)

China

E-mail Support	e-Support On-Line
Fax Support	+86-10-8857-8015 Attn: Technical Support
Phone Support	+86-10-8857-8085/8095
If you wish to write us for support:	Promise Technology China Room 1205, Tower C Webok Time Center, No.17 South Zhong Guan Cun Street Hai Dian District, Beijing 100081, China

Limited Warranty

Promise Technology, Inc. (“Promise”) warrants that for three (3) years from the time of the delivery of the product to the original end user:

- a) the product will conform to Promise’s specifications;
- b) the product will be free from defects in material and workmanship under normal use and service.

This warranty:

- a) applies only to products which are new and in cartons on the date of purchase;
- b) is not transferable;
- c) is valid only when accompanied by a copy of the original purchase invoice.
- d) Is not valid on spare parts, fans, and power supplies

This warranty shall not apply to defects resulting from:

- a) improper or inadequate maintenance, or unauthorized modification(s), performed by the end user;
- b) operation outside the environmental specifications for the product;
- c) accident, misuse, negligence, misapplication, abuse, natural or personal disaster, or maintenance by anyone other than a Promise or a Promise-authorized service center.

Disclaimer of other warranties

This warranty covers only parts and labor, and excludes coverage on software items as expressly set above.

Except as expressly set forth above, Promise **DISCLAIMS** any warranties, expressed or implied, by statute or otherwise, regarding the product, including, without limitation, any warranties for fitness for any purpose, quality, merchantability, non-infringement, or otherwise. Promise makes no warranty or representation concerning the suitability of any product for use with any other item. You assume full responsibility for selecting products and for ensuring that the products selected are compatible and appropriate for use with other goods with which they will be used.

Promise **DOES NOT WARRANT** that any product is free from errors or that it will interface without problems with your computer system. It is your responsibility to back up or otherwise save important data before installing any product and continue to back up your important data regularly.

No other document, statement or representation may be relied on to vary the terms of this limited warranty.

Promise's sole responsibility with respect to any product is to do one of the following:

- a) replace the product with a conforming unit of the same or superior product;
- b) repair the product.

Promise shall not be liable for the cost of procuring substitute goods, services, lost profits, unrealized savings, equipment damage, costs of recovering, reprogramming, or reproducing of programs or data stored in or used with the products, or for any other general, special, consequential, indirect, incidental, or punitive damages, whether in contract, tort, or otherwise, notwithstanding the failure of the essential purpose of the foregoing remedy and regardless of whether Promise has been advised of the possibility of such damages. Promise is not an insurer. If you desire insurance against such damage, you must obtain insurance from another party.

Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitation may not apply to you.

This warranty gives specific legal rights, and you may also have other rights that vary from state to state. This limited warranty is governed by the State of California.

Your Responsibilities

You are responsible for determining whether the product is appropriate for your use and will interface with your equipment without malfunction or damage. You are also responsible for backing up your data before installing any product and for regularly backing up your data after installing the product. Promise is not liable for any damage to equipment or data loss resulting from the use of any product.

Return Product For Repair

If you suspect a product is not working properly, or if you have any questions about your product, contact our Technical Support Staff through one of our Technical Services, making sure to provide the following information:

- Product model and serial number (required)
- Return shipping address
- Daytime phone number
- Description of the problem
- Copy of the original purchase invoice

The technician will assist you in determining whether the product requires repair. If the product needs repair, the Technical Support Department will issue an RMA (Return Merchandise Authorization) number.



Important

Obtain an RMA number from Technical Support *before* you return the product and write the RMA number on the label. The RMA number is essential for tracking your product and providing the proper service.

Return **ONLY** the specific product covered by the warranty (do not ship cables, manuals, diskettes, etc.), with a copy of your proof of purchase to:

USA and Canada: Promise Technology, Inc.
 Customer Service Dept.
 Attn.: RMA # _____
 47654 Kato Road
 Fremont, CA 94538

Other Countries: Return the product to your dealer
 or retailer.
 Contact them for instructions
 before shipping the product.

You must follow the packaging guidelines for returning products:

- Use the original shipping carton and packaging
- Include a summary of the product's problem(s)
- Write an attention line on the box with the RMA number
- Include a copy of proof of purchase

You are responsible for the cost of insurance and shipment of the product to Promise. Note that damage incurred due to improper transport or packaging is not covered under the Limited Warranty.

When repairing returned product(s), Promise may replace defective parts with new or reconditioned parts, or replace the entire unit with a new or reconditioned unit. In the event of a replacement, the replacement unit will be under warranty for the remainder of the original warranty term from purchase date, or 30 days, whichever is longer.

Promise will pay for standard return shipping charges only. You will be required to pay for any additional shipping options (such as express shipping).

Appendix A: Partition and Format

In order for your operating system to recognize and work with the disk drives attached to your FastTrak TX Series RAID controller card, the drives must be partitioned and formatted.

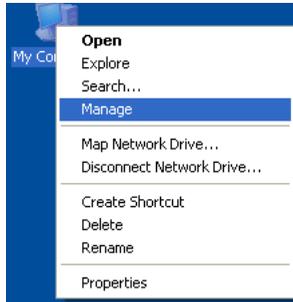
- If your drives were previously partitioned and formatted they are ready to use and you can skip this procedure
- If your drives have not been partitioned and formatted, you must do that job before you can use them

The actions of partitioning and formatting create a file structure on the disk drives with which your operating system can work. In the example below, we show how this is done in Windows. A similar procedure is required for Linux PC's. However, partitioning and formatting in Linux is not automated, therefore please refer to your system documentation for the exact procedure.

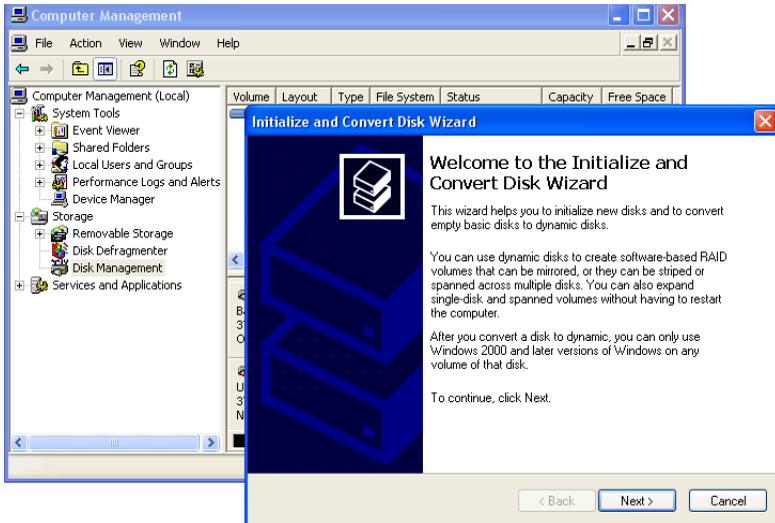


Note

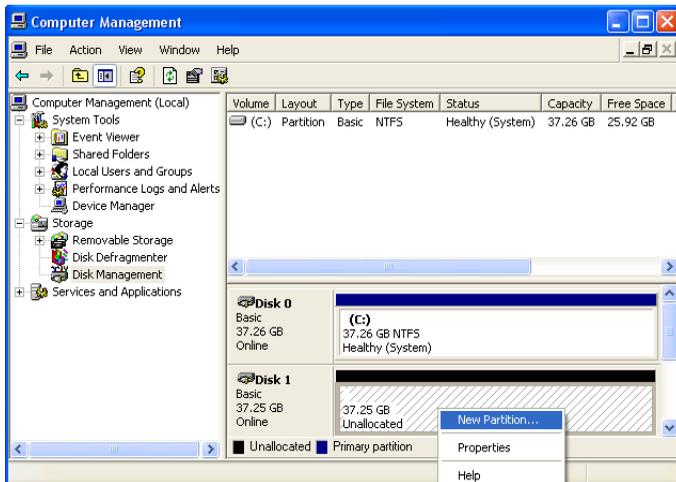
If you plan to boot your computer from this disk array, go to Windows and Device Driver Installation under the Installation section for instructions. The instructions here are for data disk arrays only.



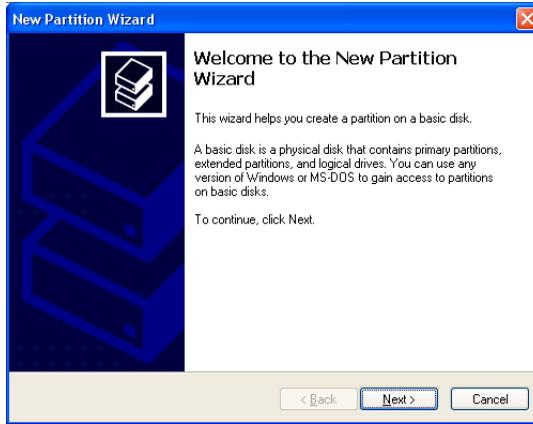
1. From the desktop, right-click on the My Computer icon and select *Manage* from the popup menu. The Computer Management window opens.
2. From the left menu, click on Disk Management. The Disk Management window opens with your new disk array identified as Disk 1. The Initialize Wizard appears automatically.



3. Click the **Next** button to start the Wizard.
4. In the following windows, select Disk 1 to Initialize. Do not select any disks to Convert. Click the **Finish** button to Initialize the disk array.

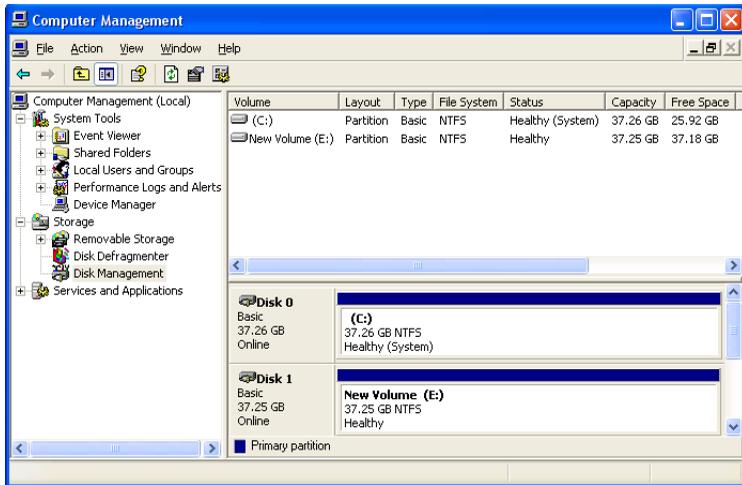


5. Right-click on the Unallocated portion of Disk 1 and select *New Partition...* from the popup menu. The New Partition Wizard appears.

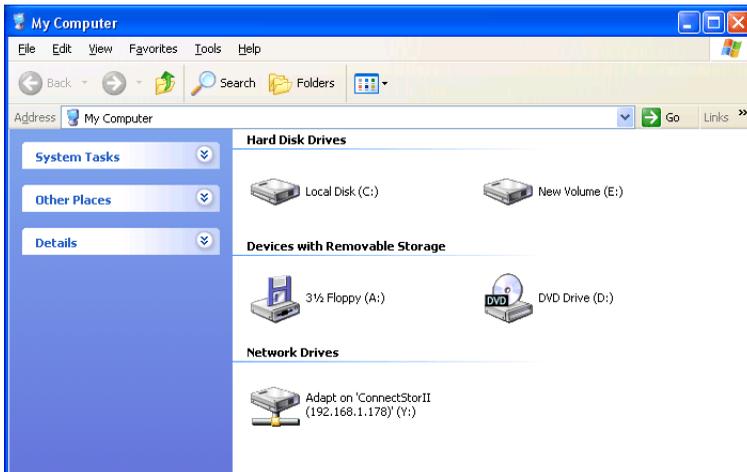


6. Click the **Next** button to start the wizard.
7. In the following windows, do the following actions. Click **Next** to move to the next window.
 - Select Primary Partition
 - Specify the maximum available partition size in MB
 - Assign the available drive letter of your choice
 - Choose Format this partition with the following settings
 - File system: NTFS
 - Allocation unit size: Default
 - Volume label: Enter your choice of name
 - Do not check "Perform a quick format" or "Enable file and folder compression"
8. Review your selections and click **Finish**. The New Partition Wizard will disappear while partitioning and formatting begin.

This process will take some time. The Disk Management window displays the progress.



When formatting is complete, your disk array will appear as a hard drive in the Disk Management window (above) and the My Computer window (below).



Appendix B: Upgrades

- BIOS and Firmware Upgrade (page 117)
 - Software Driver Upgrade (page 119)
 - WebPAM Upgrade (page 122)
-

BIOS and Firmware Upgrade

Follow this procedure to upgrade the BIOS and Firmware on your FastTrak TX Series Controller card.

The FastTrak card must be properly installed in your PC or server in order to perform the upgrade. See “Install the FastTrak Card” on page 8 for more information.

Step 1: Preparation

To perform this procedure, you need a:

- DOS-bootable diskette
- Blank DOS formatted diskette

Step 2: Download BIOS File

1. Go to the Promise website www.promise.com/support.
2. Click on *Downloads*.
3. Click on the Select Product popup menu and choose *FastTrak TX2200* or *TX2300* depending on which FastTrak controller you have.
4. Click on the Select Category popup menu and choose *BIOS*.
5. Click the **GO** button.

The list of current BIOS options displays. Be sure you select the appropriate BIOS for your system.

6. Click on BIOS you want.
7. In the File Download dialog box, click the **Save** button.
8. In the Save As dialog box, direct the file to save to a convenient location on your PC.
9. Unzip the file and copy the contents to the DOS-bootable diskette.
10. Label this diskette *FastTrak Upgrade*.

Use the upgrade diskette to install the BIOS and firmware upgrade package to the FastTrak controller. Go to step 3, below.

Step 3: Install the BIOS Package



Cautions

- Before you begin, backup any important or useful data.
 - Do NOT skip any steps in the procedure.
 - Do NOT power off your PC during the procedure.
-

1. Boot your PC from the DOS-bootable diskette.
2. When the A:\> prompt appears, remove the DOS-bootable diskette and insert the FastTrak Upgrade diskette.
3. Find your model of FastTrak controller and type corresponding line at the A:\> prompt:
 - TX2200, type **pflash /f 571.bin** and press Enter
 - TX2300, type **pflash /f 771.bin** and press Enter
4. When the A:\> prompt appears, remove the upgrade diskette and insert the DOS-bootable diskette.
5. Reboot your PC from the DOS-bootable diskette.
6. When the A:\> prompt appears, remove the DOS-bootable diskette and insert the FastTrak Upgrade diskette.
7. Find your model of FastTrak controller and type corresponding line at the A:\> prompt:
 - TX2200, type **pflash /f 571.bin** and press Enter
 - TX2300, type **pflash /f 771.bin** and press Enter
8. When the A:\> prompt appears, remove the FastTrak Upgrade diskette.
9. Reboot your PC normally.

This completes BIOS upgrade procedure.



Note

For systems with multiple FastTrak TX Series controllers:
With the new BIOS installed, only the FastTrak in the lowest numbered PCI slot will appear in the BIOS screen. However, all properly installed FastTraks will appear in WebPAM.

Software Driver Upgrade

Follow this procedure to upgrade the FastTrak software drivers on your PC or server.

Step 1: Preparation

You need one blank, formatted diskette to perform this procedure.

Step 2: Download Driver Files

1. Go to the Promise website www.promise.com/support.
2. Click on *Downloads*.
3. Click on the Select Product popup menu and choose *Windows Promise FastTrak TX2200 or TX2300* depending on which FastTrak controller you have.
4. Click on the Select Category popup menu and choose *Driver*.
5. Click the **GO** button.
The list of current drivers displays. Promise provides 32-bit and 64-bit versions of its drivers. Be sure you select the appropriate driver for your system.
6. Click on the driver you want.
7. In the File Download dialog box, click the **Save** button.
8. In the Save As dialog box, direct the driver to save to a convenient location on your PC.
9. Copy the files to one of the blank, formatted floppy diskettes.
For Windows driver files: Unzip the downloaded driver package and copy the files to the diskette.
For Linux driver files:
 - On a Windows PC, run the rawrite.exe utility and extract the image file to the diskette.
 - On a Linux PC, run the command **dd if=imagefilename of=floppydevice name bs=10k** to copy the image file to the diskette.
imagefilename = the disk image file name
floppydevice name = the device name, such as /dev/fd0.
10. Label the diskette *FastTrak Driver*.
Use the FastTrak Driver diskette to upgrade to the latest software driver. Go to step 3, below.

Step 3: Install the Software Drivers

Windows Server 2003, XP and 2000

1. Insert the FastTrak Driver diskette in the A: drive.
2. In the Start Menu, go to Settings > Control Panel. Double-click on the System icon. Click on the Hardware tab. Click on the **Device Manager** button.
3. At the Device Manager, click on the "+" icon to the left of SCSI and RAID Controllers to expand the list.
4. Right-click on *Promise FastTrak TX [2200, 2300] (tm) Controller* and select *Update Driver...*
5. In the Hardware Update Wizard, select *No, not this time* and click *Next*.
6. In the Hardware Update Wizard, select *Install from a list or specific location (Advanced)* and click *Next*.
7. Under Please choose your search and installation options, select *Don't search. I will choose the driver to install* and click *Next*.
8. Under Select the device driver you want to install, click *Have Disk...*
9. Under Install from Disk, type **A:** and click *OK*.
10. Under Select the device driver you want to install, click *Next*.
If a warning about Digital Signature appears, click *Continue Anyway*.
11. Under Completing the Hardware Update Wizard, click *Finish*.
12. Click *Yes* to restart your PC.
13. Remove the FastTrak Driver diskette.

Red Hat Enterprise Linux 4.0

1. Insert FastTrak Driver diskette into the floppy drive.
2. Log in as *root*.
3. Run **mount -r /dev/fd0 /media/floppy**.
4. Run **cd /media/floppy**.
5. Run **sh ./install**.
6. When the Installer asks, *You are installing a driver on an existing OS. Is it true (y/n)?*, type **Y** and press Enter.
7. Run **cd; umount /media/floppy**.
8. Remove the FastTrak Driver diskette.
9. Run **reboot** to restart the system.

SuSE Linux ES 9.0

1. Insert FastTrak Driver diskette into the floppy drive.
2. Log in as *root*.
3. Run **mount /dev/fd0 /media/floppy**.
4. Run **cd /media/floppy**.
5. Run **./install**.
6. Run **cd; umount /media/floppy**.
7. Remove the FastTrak Driver diskette.
8. Run **reboot** to restart the system.

WebPAM Upgrade

Follow this procedure to upgrade the WebPAM Software on your PC or server.

Step 1: Download the WebPAM File

1. Go to the Promise website www.promise.com/support.
2. Click on *Downloads*.
3. Click on the Select Product popup menu and choose *FastTrak TX2200 or TX2300*.
4. Click on the Select Category popup menu and choose *Utility*.
5. Click the **GO** button.

The list of the current WebPAM software displays. Promise provides versions of WebPAM software for Windows and Linux. Be sure you select the appropriate version for your system.

6. Click on the WebPAM you want.
7. In the File Download dialog box, click the **Save** button.
8. In the Save As dialog box, direct the software to save to a convenient location on your PC.
9. Unzip the downloaded WebPAM package.

The result is a single installer file. Go to step 2, below.

Step 2: Install WebPAM

You can install the latest version of WebPAM over an existing installation. The installer will delete the previous version and then install the new one. See "Install WebPAM" on page 15 for installation instructions.