

FastTrak TX4000, FastTrak S150 TX2plus, FastTrak S150 TX4 PROMISE ARRAY MANAGEMENT (PAM) User Manual

Version 1.1

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Chapter 1: Introduction

Promise Array Management (PAM) is a utility application designed specifically for monitoring and managing Promise Technology RAID products, such as the FastTrak TX4000, FastTrak S150 TX2plus, and FastTrak S150 TX4. Promise includes BIOS-based RAID management utilities with each of its products. PAM, however, runs over a local area network and makes possible RAID monitoring and management from any computer on the network and even over Internet. This allows your IT manager to watch your RAIDs and take care of them over the network.

PAM Components

There are three components to PAM. Depending on your installation, all three may be on the same workstation or work separately across your network:

Monitoring Utility — The Monitoring Utility is a Graphic User Interface (GUI) that reports on the condition of the RAID array. It receives and displays reports on RAID condition and operation through the Message Server. The Monitoring Utility works on any PC with a TCP/IP network connection to your RAID.

When installed on the computer that operates the RAID, the Monitoring Utility also provides a complete set of RAID management tools.

Message Server — The Message Server is the link connecting a PC with the Monitoring Utility. Normally, the Message Server runs on a network file server. But it can also run on the PC controlling the RAID.

Message Agent — The Message Agent runs on the PC that controls the RAID, called the "RAID PC". It directly monitors the RAID and sends messages through the Message Server to all PCs running the Monitoring Utility.

How They Work Together

The Promise Array Management (PAM) utility provides and easy way to set up, monitor, modify and repair your RAID. PAM works with the Promise FastTrak TX4000, FastTrak S150 TX2plus, and FastTrak S150 TX4 RAID Controller cards.

PAM watches the RAID and when significant events happen, or it discovers a problem, the Message Agent sends a warning to the Message Server. The Message Server passes the warning along to all PCs running the Monitoring Utility.

Warnings appear on the PC in the form of email messages and popup alerts. You can select either one or both. You can also select which events and problems PAM will report.

A major benefit of PAM is that it runs over a TCP/IP network. This enables remote monitoring of your RAIDs, including offsite monitoring over an Internet connection.

Once you become aware of a problem, go to the PC that controls the RAID, called the "RAID PC" to take corrective action. If you have more than one RAID PC on your network, PAM will indicate which one has the problem.

PAM allows only monitoring access through the network. Management access occurs only at the RAID PC.

PAM Installation Options

Following are some examples of ways you can incorporate PAM into your network and RAID systems.



Figure 1-1. LAN and Internet connections.

In the example on the facing page, there are three PCs with FastTrak cards connected to the company's LAN. The PAM Message Agent runs on each of the PCs with a FastTrak card. The PAM Message Server runs on the company's file server. The PAM Monitoring Utility runs on networked PCs and also on remote PCs connecting to the company network through the Internet. With this arrangement, you can monitor RAID condition and activity from offsite, such as a hotel room or home office.



Figure 1-2. Company LAN without a File Server

In the above example, there are three PCs with FastTrak cards connected to the company's LAN, the same as before. But this network has no file server, so the PAM Message Server runs on one of the networked PCs. PAM Monitoring Utility runs on both networked PCs. If this LAN were upgraded with a suitable router and an Internet connection, you could set up offsite monitoring as in Figure 1-1.





Promise's FastTrak card is designed to setup and control a RAID within the PC's enclosure. They have the same need of monitoring and management as an external RAID subsystem. All three PAM components run on the PC itself.



Important

This manual accompanies a special version of PAM optimized to run with the FastTrak TX4000, FastTrak S150 TX2plus, and FastTrak S150 TX4.

Other versions of PAM will run reliably on the Promise RAID product with which they ship. They will also run reliably on several Promise RAID products in normal use. However, they may not perform adequately with a FastTrak TX4000, FastTrak S150 TX2plus, or FastTrak S150 TX4.

Chapter 2: Installation

To install Promise Array Management (PAM) is an uncomplicated procedure, once you understand your systems and how you want to use PAM. The purpose of this Chapter is to help you plan and carry out your installation of PAM.

By way of review, PAM consists of three components:

- Monitoring Utility
- Message Server
- Message Agent

These were described in the previous chapter. Before proceeding with the installation, you must know which component goes where. If you plan to run PAM over a network, you must know the IP addresses of each computer on the network that will be involved in your RAID monitoring and management activity.

Installation Locations

In the table below, possible locations for each of the three PAM components.

	Monitoring Utility	Message Server	Message Agent
Internet-connected PC	•		
Network PC	•	•	
Network File Server	•	•	
RAID PC	•	•	•

Table 2-1. Acceptable PAM Component Installation Locations.

Monitoring Utility

The Monitoring Utility installs on any computer you will use to monitor and manage the RAIDs.

If your RAID runs without a network connection, install it on the RAID PC with the rest of the PAM components.

If your RAIDs are networked, you can install the Monitoring Utility on any computer connected to the network.

If your company has networked RAIDs and Internet access, you may choose to install the Monitoring Utility on a laptop or home-based PC for dial-in remote access.

Limit your installation to the computers of RAID users and your IT administrator. PAM features password protection to further limit access and provide security of your data.



Figure 2-1. Networked RAID has many installation options.

Message Server

The Message Server is required if your RAID PC connects to a network.

If you want run PAM over a network, install the Message Server on one of your networked computers including a file server, a networked PC or the RAID PC.

Only one installation of the Message Server is required for PAM to work over a network. You may install Message Server on more than one network PC or file server, but PAM's network configuration will only use one of them, thus any additional installations are useless.

Do not install the Message Server on any PC that may be disconnected from the network, such as a laptop or a computer that connects via the Internet. Not only will a disconnect cause PAM to fail, but reconnecting again may involve time-consuming network configuration.

Network configuration is discussed later in this chapter.

Message Agent

The Message Agent installs on the RAID PC, whether your RAID is networked or not. In order for PAM to monitor and manage a RAID, it must have Message Agent installed.

If you have more than one PAM-compatible RAID PC on your network, you may install a copy of Message Agent on all of them.

Operating System Support

PAM is a utility designed to run on top of previously installed Promise FastTrak card. Generally, if your PC runs the FastTrak card properly, it will run PAM also.

Promise Technology recommends Windows NT 4.0, 2000 and XP Professional to take full advantage of all the features of PAM. In some cases, you can run PAM on other Windows operating systems. This becomes an issue when running PAM over a network where there are PCs with different operating systems.

Network Requirements

If you plan to install PAM on a network be sure all the hosts and servers are connected and running. That is, each of the PCs, RAIDs and Servers must have a working network connection before you install PAM.

In order for PAM to be configured over a network, you must know the IP (network) address of the RAID PC(s) in your system. The Message Server uses IP addresses to communicate with the Message Agent on the RAID PCs and the Monitoring Utility on the network PCs.

See the Appendix for help in finding the IP Address of the RAID PC.

Installation Procedure

Before you start...

If you are installing PAM to run over a network, determine the computers and servers onto which you will install PAM. Obtain the IP addresses of all RAID PCs where PAM will be installed.

PAM Installation

With that information ready, follow these steps to install PAM on each computer or server:

1. Boot the PC/server and launch Windows.

If the computer is already running, exit all programs.

- 2. Insert FastTrak CD into your CD-ROM drive.
- 3. Open the CD and locate the PAM folder.
- 4. Inside the PAM folder, look for the PAM Setup icon. See below.



5. Double-click the icon to run the installer. The opening screen appears.



Figure 2-2. PAM Setup Opening Screen.

6. In the Setup Opening Screen, select *Customize* from the dropdown menu and click Next. The Setup dialog box appears.

暑 Setup		X
Setup Please select an item from the Select NOTE: If you select Other from the Please select an item from the Components from the Components from the Components for the Compo	Hardware list. Then choose a Pro ogram Mode list, you must manuar Select Hardware Type FastTrak TX4000 Program Mode RAID Server RAID Agent RaID Agent C. Bemote Client C. Local Client C. Other	ygram Mode. Jly select individual software Components: Remote Monitoring Utility Message Server Wessage Agent SupeTrak Component FastTak Component UtiraTrak Component FT_S150_TX4/Component FT_S150_TX4/Component FT_S150_TX4/Component FT_S150_TX4/Component FT_S150_TX4/Component
	The Local Client allows monitorin array components used with this Promise RAID controller and PC	I Select All gof the particular only.

Figure 2-3. The Setup dialog box.

7. In the Setup dialog box, choose your FastTrak card from the Select Hardware Type dropdown menu. If you have more than one type of FastTrak in your PC, select All. 8. In the Program Mode box, select the installation option appropriate for your system.

RAID Server – Installs the Message Server on a file server or other networked computer.

RAID Agent – Installs the Message Agent and FastTrak component(s) on the RAID PC. Use this option when you plan to monitor the RAID Array from another computer on the network.

Remote Client – Installs the Monitoring Utility on a networked computer in order to monitor the RAID over the network.

Local Client – Installs the Message Agent, Monitoring Utility and FastTrak component(s) on the RAID PC. Use this option when you plan to monitor the RAID Array from the RAID PC.

Other – Enables manual selection of components. Use this option for special arrangements, such as installing a RAID Server with the other components on the RAID PC.

When you have finished your selections, click Next or press Enter to continue. The Installation Summary Screen appears.



Figure 2-4. Installation Summary Screen.

9. In the Installation Summary Screen, review your selections and click Finish to proceed with the installation. Click Back to make a change.

So	ftware License Agreement	×
	Please read the following License Agreement. Press the PAGE DOWN key to s the rest of the agreement.	ee
	0EM SOFTWARE USAGE AND DISTRIBUTION LICENSE AGREEMENT	^
	IMPDRTANT: By opening this package or installing, distributing or using the SOFTWARE, you agree to the terms of this Agreement. Do not open this package until you have carefully read and agreed to the following terms and conditions. If you do not agree to the terms of this Agreement, promptly return the unopened package.	
	Please also note: - If you are an OEM, the complete LICENSE AGREEMENT applies - If you are an End-User, only Exhibit A, the PROMISE LICENSE AGREEMENT, applies	
	Subject to the terms of this Agreement, Promise Technology grants you the right to copy and distribute the enclosed software:	~
	Do you accept all the terms of the preceding License Agreement? If you choose No, Set will close. To install Promise Array Management, you must accept this agreement.	ир
	< <u>B</u> ack <u>Y</u> es <u>N</u> o	

Figure 2-5. The License Agreement.

 When the License Agreement appears, click the Yes button to agree to the terms and continue the installation. If you click No, PAM Setup will exit.



Figure 2-6. Choose Destination dialog box.

11. When the Choose Destination dialog box appears, click the Browse button to specify a destination folder other than the default. When you are satisfied with the folder location, click Next or press Enter.



Figure 2-7. Select Program Folder dialog box.

12. The Select Program Folder dialog box adds the PAM Remote Monitoring Utility in your Windows Start menu. When it appears, you may accept this folder name or change it. When you are satisfied with the folder name, click Next or press Enter.



Figure 2-8. Start Copying Files dialog box.

13. When the Start Copying Files dialog box appears review the selection of application (Promise Array Management) and its destination. If you want

to make a change, click the Back button. Otherwise, click Next or press Enter to continue with the installation.



Note If you are only installing the Message Server, this completes the installation.

Install Message Server	for Monitoring Utili	i y	
	Setup will use the follo your RAID server:	wing information for connecting to	
	Server Description	RAIDSERVER1	
<u> 2</u>	Correct the Server De needed and then clicl is already correct	scription and IP Address as < Next. Click Skip if the information	
	< <u>B</u> ack	<u>N</u> ext > Skip	>

Figure 2-9. Install Message Server dialog box.

14. When the Install Message Server dialog box appears, type in the IP address of the RAID PC, that is, the PC with the FastTrak card. Click Next or press Enter to continue.

Add User Account for Ad	lministration		×
	Setup wishes to c your computer. If y created and do Ni account, click the Name Password Confirm Password WARNING: Addir users, and initialize	reate a User Administrator account on rou already have other accounts T want to add this User Administrator "Skip" button. administrator g a new user will delete all existing the user database.	
	< <u>E</u>	lack Next> Skip	

Figure 2-10. Add User Account dialog box.

15. When the Add User Account dialog box appears, you may accept the default name or enter a new one in the Name field.

Enter your password in the Password and Confirm Password fields. When you are done, click Next or press Enter to continue.



Figure 2-11. The PAM Installation dialog box.

16. When the PAM Installation dialog box appears, the installation is complete.

Check one or both boxes to see the latest ReadMe file and launch PAM. When you are done, click Finish or press Enter.

This completes the PAM installation. Go on to Chapter 3, Initial Setup.

Chapter 3: Initial Setup

After you have completed installation, you must setup your PAM Monitoring Utility to work with your RAID.



Figure 3-1. PAM in the Start Menu.

In the Windows Start Menu, launch the PAM Monitoring Utility. The opening screen appears.

If you are running PAM from the RAID PC, choose Local Monitoring Utility.

If you are monitoring RAIDs on other PCs over a network, choose *Remote Monitoring Utility*.



Note

If you only installed the Message Server, this shortcut does not appear. The Message Server works only through network connections and has no user interface. Go to the RAID PC or a Networked PC to setup PAM.



Figure 3-2. The PAM Monitor window has three views.

The Monitor window is the user interface for PAM. It has three views:

Tree View — Displays the elements of your RAID system. It works like Windows Explorer with hierarchical menus. You can expand individual items to see their components.

If you selected Remote Monitoring Utility, a different icon will appear in place of Local Agent in Tree View (right).



Object View — Displays icons representing the devices below the highlighted device in the Tree View.

Information View — Displays information on the item highlighted in the Tree View. This may include text boxes, list boxes, fields and buttons. It varies with the item selected.

Local Agent Log-in

The Message Server relays data and commands between the Monitoring Utility on this computer and the Message Agent on the RAID PC.



Figure 3-3. Logging in to the Local Agent.

1. Right click on the Local Agent icon 🕮 in Tree View. Select Login from the popup menu. See Figure 3-3. The Login dialog box appears.

Login to LOCALA	GENT		? 🔀
	Username: Password:	administrator xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	

Figure 3-4. Login dialog box.

2. In the Login dialog box, type your Username and Password, and click OK.

Initially, administrator is the only user. Use the administrator's password selected during installation.



Figure 3-5. Successful login.

When login is successful, the Local Agent changes to the name of the RAID PC. See Figure 3-5.

Remote Message Server Log-in

The Message Server relays data and commands between the Monitoring Utility on this computer and the Message Agent on the RAID PC.



Figure 3-5. Logging in to the Remote Agent.

 Right click on a Remote Server icon in Tree View. Select Login from the popup menu. See Figure 3-3. The Login dialog box appears.



Figure 3-6. Login dialog box.

2. In the Login dialog box, type your Username and Password, and click OK.

Create a New User

With the Message Agent accessed, you can add a new user. The Administrator is created by default. You must create additional users manually.

 Right-click on the Users icon select New > User from the popup menu (right). A new user icon appears.

User Name: Sammy A Password: ****** Confirm Password: ****	
■ MyConsole Array Administration Rights Corr ■ ■ ■ ■ □ ■ ■ ■ □ □ ■ ■ ■ □ □ ■ ■ ■ ■ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	nmit :set
Refresh Adapter Maintenance Rights	
Expand User Account Rights	
Enabled	
Hide Pane	

Figure 3-7. User Information View.

2. Click on the new user icon to display the User Information View. The User Information View displays a request for new user identification and access rights.

Rights	Definition
Array Administration	Create, delete and maintain arrays. View statistics
Adapter Maintenance	Modify cache and performance parameters of the RAID controller
User Account	Allows user to modify his/her own rights and to create and delete other users

Only an administrator can create and delete arrays and view array statistics.

3. Type in a type in the Username and Password in their respective fields. Check all the appropriate boxes to set access rights. Click the Commit button when you are done.

HyConsole

The new user's name appears in the Tree View (right).

Create an Array

- In Tree View, click the + to the left of the Controller icon to see the Channels.
- Click the + to the left of each Channel to see the disk drive. If there is no +, the Channel does not recognize a disk drive.

In the example (right) there are three disk drives available to make an array.



The available RAID selection depends

on the number of disk drives available. The table below lists the options. See the Appendix for a more detailed description.

RAID Level	Name	Minimum drives	Maximum drives
0	Striping	1	4
1	Mirroring	2	2
0+1	Striping + Mirroring	4	4

Table 3-1. RAID Levels for FastTrak TX4000, S150 TX2plus and TX4.



Caution

This caution applies to FastTrak S150 TX2plus, which has a combination of Serial and Parallel ATA Channels.

With some models of hard drives, if the Master hard drive fails, it may cause the Slave hard drive to be unrecognized by the computer's operating system. Where a RAID 1 (Mirroring) array exists on the Master/Slave pair, this condition may cause the operating system to freeze.

Do NOT create a RAID 1 (Mirroring) array with two Parallel ATA hard drives using the Master/Slave arrangement on Channel 3 (the Parallel ATA port).

You can create a RAID 1 (Mirroring) array by combining hard drives on:

- Channels 1 and 2 (Serial ATA only)
- Channels 1 and 3 (one Serial, one Parallel)
- Channels 2 and 3 (one Serial, one Parallel)
- Right-click on the Controller icon Select New > Array from the popup menu (right).

The Select Disk dialog box appears showing the available (unassigned) disk drives.





Figure 3-8. Select Disk dialog box.

4. Click on a drive icon to select it. Hold down the Shift or Ctrl key for multiple selections. Click Next to continue. The Select RAID mode dialog box appears.

Select RAID mode	X
RAIDO(STRI RAID1(MIR RAID0(STRI RAID1(MIR RAID0+1(S	
Select the RAID mode from the above list.	
< <u>B</u> ack <u>N</u> ext> Cancel Help	

Figure 3-9. Select RAID mode dialog box.

5. Click on an array icon to select it. Only the arrays that can be created from your selection of disk drives will display.

Click Next to continue. The Finish Creation dialog box appears.

Finish Conversion		\mathbf{X}
	You will create the following array: Array name: FirstArray Block size: 64 To confirm that you want to do so, please press FINISH button, if you want to select another disk or RAID mode, please press BACK, if you change your mind, please press CANCEL	
< <u>B</u> ack	K Finish Cancel Help	

Figure 3-10. The Finish Creation dialog box.

6. Type in an Array name.

If this is a Striping (RAID 0) Array or a Striping+Mirroring (RAID 0+1) Array, select a Stripe Block Size from the dropdown menu. The default Block size is 64KB.

Click Finish to continue. The following message appears, reminding you to reboot your PC in order to access your new Array.



Figure 3-11. Array Created and Reboot messages.

A new array icon appears in the Tree View (right).



At this point, the new array is ready to be partitioned and formatted In Windows.

Setup Email Alert Notification

PAM alerts you to the problems and processes happening to your RAID through email and popup messages. These steps describe how to setup the email function.

1. Click on the Local Agent icon . Information for the Local Agent appears in Information View.

Host name	LOCALAGENT
IP address	192.168.1.126
Static Enable Anti-SP/ (Limits repe	NT system event log AM Protection : If error and/or event repeats, send new message every 🚺 🛨 hrs at error or event message to set time interval, i.e. once per hour)

Figure 3-12. Static portion of Information View.

- 2. Click on the Enable NT system event log, if it is not already checked.
- 3. If you want Anti-SPAM Protection, to block repeated error and event messages within a set period of time, click on this option and set an hour interval.

E-Mail Server		
💌 Email alert o	n error	
SMTP server	192.168.1.94	<u>C</u> hange
(SMTP server na	ame or IP. For example: smtp.mydomain.com, or 123.45.67.89)	
Authentication Method	Login Plain 💌	
Username	Arraywatch	
Password	NAXANA AND AND AND AND AND AND AND AND AND	

Figure 3-13. Email Server portion of Information View.

- 4. Click on the Email alert on error box, if it is not already checked.
- 5. In the SMTP server field, type in the SMTP address for your mail server.
- 6. Select among Authentication Methods:
 - Cram MD5
 - Authenticated Login
 - Plain Login
 - None

- 7. If you choose an Authentication Method, enter a Username and Password in the fields provided.
- 8. Click the Change button to update your configuration.



Figure 3-14. Email Sender and Recipients.

- 9. Scroll down to the Email Sender and Recipients box.
- 10. In the Email ID of Alert Sender field, type in the email address of this computer.

This address will appear in the From field of the email alerts. Recipients may reply to this address, if it is valid.

11. Click the Change button to update your configuration.

Add a User to the Recipient List

After you have setup email alert notification, you must specify who shall receive the alerts.

- 1. Click on the Message Agent icon 🕮 to which you wish to add an email alert message recipient.
- 2. In the Alert Recipients Email Address List, type in the email address of the user who you wish to receive alerts. See Figure 3-14.
- 3. Click the Add button when you are done. The names appear in the Current Recipients window.



Figure 3-15. Current Email Alert Recipients

4. Repeat Step 2 until all addresses have been added.

Specify Alert Notification Events

PAM can be configured to report a variety of alerts, by email, popup message or both. This section describes how to tell PAM what to report and which method to use.

- 1. Click on the Local Agent icon 🕮 whose alert notification events you wish to modify.
- 2. In the Information View, scroll down to see the Add Events window.

Event	Email	Popuj 🔨	<u>C</u> hange
Drive Fail	Yes	Yes	
Drive Installation	Yes Ye	s 📄	
Reserve Sector	Yes No		
Bad Sector	Yes	100	
Rebuild Begin.	Yes	Yes	
Rebuild Completed	Yes	Yes	
Array Rebuild Begun	Yes	Yes	
Rebuild Halt	Yes	Yes	
Synchronization Begun	Yes	Yes 🔽	
<		>	
Lie many Click on the item that	a coloret VEC or M	0.1	

Figure 3-16. Specifying Events for Alert Notification.

- 3. From the left column, select an Event you want reported.
- 4. Right click on the Email column. Select Yes or No from the popup menu.
- 5. Right click on the Popup column. Select Yes or No from the popup menu.

Selecting Yes adds that item to the Email or Popup list. Selecting No deletes the item.

6. When you are finished, click the Change button.
Chapter 4: PAM User Interface

This chapter describes PAM's Graphic User Interface (GUI). You should understand that PAM is software running on top of the Promise RAID BIOS and other applications that came with your Promise RAID product. PAM adds a graphic user interface to make RAID management functions easier to understand and perform.



Figure 4-1. The PAM Monitor window has three views.

Tree View

The Monitor window is the user interface for PAM. It has three views: Tree View, Object View and Information View which were introduced in Chapter 3. The Tree View displays all of the elements of your RAID system. Use it to navigate to specific components.



Figure 4-2. An example of a RAID system in Tree View.

Normally, the Tree View is present. To close it, right-click on any object and select Hide Pane from the popup menu. To open it again, go to View menu and Outline.

Tree View and Component Specific Menus

In PAM, like most Windows applications, you can access the various commands and functions by opening dropdown menus and clicking on icons. Each time you click on a component in Tree View, PAM's menu bar also displays that component's dropdown menu. Below are some examples.



Figure 4-3. Each item in Tree View has its own dropdown menu in the menu bar.

Rather than access the menu bar, you can right click on the icon of the component you are working with. The menu bar and popup menus for Tree View items are identical.

Object View

Object View is visible whenever the Tree View is visible. The items appearing in Object View are determined by which component you select in Tree View. In the example below, we selected a Controller icon in Tree View.



Figure 4-4. Object View of a Controller's components.

As a result, you see the components of that Controller, in this case, six channels, an enclosure and an array. This feature makes it easy to find an individual component as well as see what items are assigned to higher level components. Double-click on these items to see their components in Object View and their configuration in Information View.

Information View

Information View, like Object View, changes its content depending on which item you select in Tree View. The difference is that you use Information View to obtain data, input settings and information.

Disk Parameters	s		
🔽 Enable Cac	he 💿 Write Throu	gh 📀 Write Back	
🔽 Enable S.M	.A.R.T check		
Rebuild Setting			
🔲 Disable Ho	t Spare/Auto Rebuild		
Rebuild Rate	Low	- <u></u>	High
	Reset	Apply	

Figure 4-5. Information View showing part of the setup for an Array.

Status Bar

The PAM Status Bar is the same as other Windows applications. It indicates such things as the selected RAID is rebuilding, and the current user is the Administrator (shown below).

Figure 4-6. PAM Status Bar.

Normally the Status Bar is visible. To show or hide the Status Bar, go to the View menu and check or uncheck Status Bar.

Pulldown Menus

As indicated above, the left-most item of the Pulldown Menus changes according to which component is selected in the Tree View. The Pulldown menu and popup (right-click) menus are the same.

Main

When no item in Tree View is selected, the left-most menu item is Main.



Figure 4-7. Main Menu.

Its only function is Exit, which quits the PAM application.

View

The View menu displays or hides three items:

- Toolbar
- Status Bar
- Tree View (Outline)



Figure 4-8. View Menu.

Check to display or uncheck to hide each one as you prefer.

Connection

The Connection menu deals with server connections. Use it to:

- Create a new Message Server
- Connect to a RAID Server
- Disconnect from a RAID server



Figure 4-9. The Connection Menu.

To create a new Message Server, click on the MyConsole icon , then select Connection > New Server.

To connect a Message Server to a RAID server, click on the Message Server icon 2, the select Connection > Connect.

To disconnect a Message Server from a RAID server, click on the Message Server icon **a**, the select Connection > Disconnect.

Preference

The Preference menu allows you to:

- Select the font PAM displays
- Select the background colors of the Views
- Have PAM run automatically when your PC boots



Figure 4-10. The Preference Menu.

Fonts and colors are a matter of individual preference. PAM will display any font properly loaded on your PC. PAM uses the Windows color palette, allowing you to select any color your monitor can display.

If you are using PAM for remote monitoring, running PAM automatically is a good idea. This way, your PC will be connected to the RAID and you will receive all the alerts messages you have specified.

Help

Under Help, PAM has:

- Full online Help file
- Table of keyboard shortcuts
- Auto Demo display
- About page with PAM information



Figure 4-11. Help Menu.

PAM's online help follows the standard three-panel interface with Contents, Index and Find.



Figure 4-12. Online Help panels: (L to R) Contents, Index, Find.

The table of keyboard shortcuts lists effort saving ways to perform certain functions.

Keyboard Help	
Meaning 	ShortCut
F12	Start/Stop Auto Demo
F10	Demo Next
F11	Demo Prev.
F5	Refresh object
<shift> + F10</shift>	Property Menu
<ctrl> Tab</ctrl>	Tab to Next Dialog
<ctrl> + Arrow Keys</ctrl>	Scroll Property View
PgUp / PgDown	Scroll Property View

Figure 4-13. Keyboard shortcuts.

The Auto Demo display provides a level-by-level display of each screen in the PAM interface. There are keyboard shortcuts for controlling the Auto Demo.

The about page provides information about the PAM software. This information may be of use should you find the need to contact Promise Technical Support.

Toolbar

The Toolbar is a series of buttons that are shortcuts to performing specific tasks. You will never see all buttons active as in the example below.



Figure 4-14. The Toolbar.

They become active when you click on specific system components in Tree View. Only the tool buttons pertaining to that component are active.

Most of these functions require User Account Rights. These are specified when a User is added or modified. Following is a description of the Toolbar buttons:

😫 New Server. Available when you select the MyConsole icon. Creates a new Message Server.

😫 Connect. Available when you select a Message Server icon. Initiates a connection with the RAID Server.

📕 Disconnect. Available when you select a Message Server icon. Disconnects from the RAID Server. Used when you want to shut down a RAID server for repair.

🐯 Rebuild Array. Available when you select an Array icon for RAID level 1 or 0+1. Begins the process of restoring data after a drive was replaced.

Synchronize Array. Available when you select an Array icon for RAID 1 or 0+1. Writes mirrored data to ensure both drives have identical data.

💋 Delete Array. Available when you select an Array icon. Deletes the array from the RAID system.

😻 Create Array. Available when you select a Message Agent icon. Allows you to create a new array on the RAID system.

🕺 Delete User. Available when you select a User icon. Deletes a user from monitoring and alert access.

X New User. Available when you select the Users icon.

Continue. Available when you have paused the rebuild of an Array. Resumes the rebuild process.

- Pause. Available when you are rebuilding an Array. Temporarily interrupts the rebuild process.
- Stop. Available when you are rebuilding an Array. Permanently halts the rebuild process.
- Help. Always available. Brings up the Online Help.

Popup Menus

In addition to the commands in the dropdown menus, there is a corresponding set of commands you can access via popup menus.

In a popup menu, you can use any of the commands that are in black. You will notice that some functions are grayed out, meaning that you cannot use them. Many functions require that you have User Account Rights to perform them.

All the menus have these three features, relating to Tree View but not the icon itself:

- Refresh the screen display
- Expand / Collapse the Tree
- Hide Tree View

MyConsole Icon

Right-click on the MyConsole icon store to access the following commands (right):

- Create a new Message Server
- Rename MyConsole

This menu matches the MyConsole pulldown menu.

Remote Agent Icon

Right-click on the Message Server icon a to access the following commands (right):

- Modify this Message Server. See Information View
- Delete this Message Server
- Connect / Disconnect this Message Server from the Message Agent
- Rename this Message Server

This menu matches the Server pulldown menu.





Local Agent Icon

Right-click on the Message Agent icon 🕮 to access the following commands (right):

- Login to / Logout from this Message Agent
- Rename this Message Agent

This menu matches the RAIDMachine pulldown menu.

Device Icon

The Device icon **b** represents the FastTrak PCI card (right). There are no commands for this item. This menu matches the RAIDSystem pulldown menu.

Controller Icon

Right-click on the Controller icon to access the following commands (right):

- Create a new Array
- Read controller events
- Clear controller events
- Toggle the Synchronize/Rebuild beeper on and off. Checked is ON.

This menu matches the Controller pulldown menu.

Channel Icon

The Channel icon 🔛 represents an individual channel on the FastTrak PCI card (right). There are no commands for this item.

This menu matches the Channel pulldown menu.



Refresh Rename

Expand

Hide Pane

MyConsole
 MyConsole
 MyConsole

Ē.





Disk Icon

Right-click on the Disk icon O of an *unassigned* drive to add it to a new array.

If you right-click on the Disk icon 🕅 of an *assigned* drive, this command will be grayed out.

This menu matches the Disk pulldown menu.

Array Icon

Right-click on the Array icon 😫 to access the following commands (right):

- Rebuild this array
- Synchronize this array
- Delete this array
- Pause, Continue or Stop the Rebuild or Synchronize procedure

This menu matches the Array pulldown menu.

Users Icon

Right-click on the Users icon storeate a new User account (right).

This menu matches the User Account pulldown menu.

User Icon

Right-click the User icon R to delete or rename this user.

This menu matches the User pulldown menu.







Chapter 5: RAID Monitoring and Maintenance with PAM

This chapter describes using PAM to monitor and manage your RAID system. The chapter is divided into sections for major PAM components:

- Remote Message Server
- Local Agent
- Controller
- Channel
- Enclosure
- Array

Remote Message Server Log-in

The Message Server relays data and commands between the Monitoring Utility on this computer and the Message Agent on the RAID PC.



Figure 5-1. Logging in to the Remote Agent.

1. Right click on a Remote Server icon 🕮 in Tree View. Select Login from the popup menu. See Figure 5-1. The Login dialog box appears.

Login to LOCALA	GENT	? 2	
	Username: Password:	administrator Messeeteeteeteeteeteeteeteeteeteeteeteete	

Figure 5-2. Login dialog box.

2. In the Login dialog box, type your Username and Password, and click OK.

Remote Message Server

In order to perform the following procedures, you, as a user, must have Array Administration Rights. User rights are discussed in the Message Agent section of this chapter.

Create a New Remote Message Server

PAM has one Remote Message Server by default. If you want to create additional Servers, follow this procedure:

- Click on the MyConsole icon in the Tree View.
- 2. Right-click and select New > Server from the popup menu (right).

OR click the New Server button 🔁 in the Toolbar.

This action adds a new server RAIDSERVER1 icon (see Figure 5-3).

3. Click on the new server icon to select it.

The Information window displays fields to add a Label and IP Address.



🗃 Promise Array Management - Remote Monito	r		
Server View Connection Preference Help			
1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	?		
MyConsole	Label ServerName IP Address	RAIDSERVER1 New Server 127 · 0 · 0 · 1	
For Help, press F1		nouser	NUM //

Figure 5-3. The Remote Message Server's Label and IP Address.

Note: The IP Address shown above: 127.0.0.1, means that this computer is equipped with a FastTrak card.

If you are performing this procedure on a networked PC, input the actual IP Address of the RAID PC in this field. See the Appendix for help in finding a PC's IP address.

4. Click the Commit button. PAM connects the Message Server and connects over the network to the Local Agents on other RAID PCs (see Figure 5-4).

Promise Array Management - Remote Monito	
Server View Connection Preference Help	
MyConsole	GH5-MULTI MICHAELC Victorp.ptu alexchou.p redrum
	Label RAIDSERVER1
	ServerName DanielDoornbos.ptu.promise.com
	IP Address 127 . 0 . 0 . 1 Beset Commit
For Help, press F1	nouser NUM

Figure 5-4. The RAID PCs on the Network as seen in Object View.

Delete a Remote Message Server

If the Server's IP address has changed, it will no longer function. You must delete the existing Server and create a new one with the current IP address.

- Right click on the Message Server icon a in Tree View.
- 2. Select Delete from the popup menu (right).



Disconnect a Remote Message Server / Logout of RAID Server

When you are about to perform maintenance or repair on a RAID server, use this procedure. This action will preserve your connection settings. PAM will still see the Message Server and show a disconnected status.



Important

This is the only correct way to log out a RAID Server from the system.

To disconnect a Message Server, select it in Tree View then click the Disconnect button **the Toolbar**, or:

- Right click on the Message Server icon k in Tree View.
- 2. Select Disconnect from the popup menu (right).

Reconnect a Remote Message Server

To reconnect a message Server you have taken offline, select it in Tree View then click on the Connect button

🔁 in the Toolbar, or:

- Right click on the Remote Message Server icon in Tree View.
- 2. Select Connect from the popup menu (right).





Remote Message Server Address Change

Occasionally, the IP address of a RAID server may change. This happens when the PC running Remote Message Server:

- Is physically moved to a different location
- Gets a new static IP address
- The DHCP-assigned IP address was disconnected or shut down

To make the address change, do the following:

- 1. Delete the existing Remote Message Server.
- 2. Create a new Remote Message Server.

Local Agent Log-in

The Message Server relays data and commands between the Monitoring Utility on this computer and the Message Agent on the RAID PC.



Figure 5-5. Logging in to the Local Agent.

 Right click on the Local Agent icon in Tree View. Select Login from the popup menu (Above). The Login dialog box appears.

Login to LOCALA	GENT		? 🗙
₽	Username: Password:	administrator	_
		DK Cancel	

Figure 5-6. Login dialog box.

2. In the Login dialog box, type your Username and Password, and click OK.

Initially, administrator is the only user. Use the administrator's password selected during installation.



Figure 5-7. Successful login.

When login is successful, the Local Agent changes to the name of the RAID PC (Above).

Manage Users

Create a New User

With the Message Agent accessed, you can add a new user. The Administrator is created by default. You must create additional users manually.

 Right-click on the Users icon and select New > User from the popup menu (right). A new user icon appears.

	User Name: Sammy A
	Password:
	Confirm Password:
MyConsole DANIELDORN FASTTRAK_TX4000 Refresh Rename Expand Collapse Hide Pane	Array Administration Rights Create Array Delete Array Array Statistics Maintain Array Adapter Maintenance Rights F Enabled User Account Rights F Enabled

Figure 5-8. User Information View.

2. Click on the new user icon to display the User Information View. The User Information View displays a request for new user identification and access rights.

User Rights	Definition
Array Administration	Create, delete and maintain arrays. View statistics
Adapter Maintenance	Modify cache and performance parameters of the RAID controller
User Account	Allows user to modify his/her own rights and to create and delete other users

Only an administrator can view array statistics.

 Type in a type in the Username and Password in their respective fields. Check all the appropriate boxes to set access rights. Click the Commit button when you are done. MyConsole
 MyConsole
 ANIELDORN
 Figure FASTTRAK_S150_SX4
 H
 Som FTP1
 Susers
 Vsers
 Sammy A

The new user's name appears in the Tree View (right).

Delete a User

- In the Tree View, right-click on the icon for the User you wish to delete and select Delete from the popup menu (right).
- 2. In the confirmation dialog box, click OK.

Note: PAM will always keep one user account with access rights, typically the Administrator. This action protects you from being locked out of the system.

Another way to delete a User: Select the User's

icon otin Tree View then click the Delete User button <math>
otin the Toolbar.

Object Icons

Select the Users icon 🏶 in Tree View to see a display of individual Users in Object View.



Figure 5-9. Users in Object View



Alert Notification

PAM alerts you to the problems and processes happening to your RAID through email and popup messages. These steps describe how to setup the email function.

Click on the Local Agent icon so or Remote Message Server icon from which you wish to receive email alert messages.

Host name	LOCALAGENT
IP address	192.168.1.126
Static Enable Anti-SP (Limits repe	NT system event log AM Protection : If error and/or event repeats, send new message every T + hrs at error or event message to set time interval, i.e. once per hour)

Figure 5-10. Static portion of Information View.

- 2. Click on the Enable NT system event log, if it is not already checked.
- 3. If you want Anti-SPAM Protection, to block repeated error and event messages within a set period of time, click on this option and set an hour interval.

E-Mail Server			
💌 Email alert of	n error		
SMTP server	192.168.1.94		<u>C</u> hange
(SMTP server na	me or IP. For example: smtp.mydomain.com, o	r 123.45.67.89)	
Authentication Method	Login Plain 💌		
Username	Arraywatch		
Password	*XXXXXX		

Figure 5-11. Email Server portion of Information View.

- 4. Click on the Email alert on error box in the Information View, if it is not already checked.
- 5. In the SMTP server field, type in the SMTP address for your mail server.
- 6. Click the Change button to update your configuration.

E-Mail Sender and Recipients	
Email ID of Alert Sender	
"RAID Computer" <danield@promise.com></danield@promise.com>	<u>C</u> hange
(Input the email ID recipient for this machine, which i or "name" <email>. For example: "Administrator"<administrator< td=""><td>s name<replyemail>, nin@mydomain.com>)</replyemail></td></administrator<></email>	s name <replyemail>, nin@mydomain.com>)</replyemail>
Alert Recipients Email Address List	
	Add
(Input the email address like name <email> or "name" For example: "Joe Recipient"<myemail@myisp.com></myemail@myisp.com></email>	<email>.)</email>

Figure 5-12. Email Sender and Recipients.

- 7. Scroll down to the Email Sender and Recipients box.
- 8. In the Email ID of Alert Sender field, type in the email address of this computer.

This address will appear in the From field of the email alerts. Recipients may reply to this address, if it is valid.

9. Click the Change button to update your configuration.

Add a User to the Recipient List

After you have setup email alert notification, you must specify who shall receive the alerts.

- 1. Click on the Message Agent icon 🕮 to which you wish to add an email alert message recipient.
- 2. In the Alert Recipients Email Address List, type in the email address of the user who you wish to receive alerts (see below).
- 3. Click the Add button when you are done. The names appear in the Current Recipients window.

Current Recipients "Jenny Kumar" <jtkumar@promise.com> "Jordan Turk" <jordie@promise.com> "Sufan Kang" <skang@promise.com></skang@promise.com></jordie@promise.com></jtkumar@promise.com>	<u>R</u> emove

Figure 5-13. Current Email Alert Recipients

4. Repeat Step 2 until all addresses have been added.

Delete a User from the Recipient List

To remove a recipient from the Email Address List, do the following:

1. Click on the Message Agent icon sfrom which you wish to delete an email alert message recipient.

The Current Recipients window appears in the Information View. See Figure 5-12.

Current Recipients "Jenny Kumar" <itkumar@promise.com></itkumar@promise.com>	Remove
"Jordan Turk" <jordie@promise.com> "'Sufan Kang" <skang@promise.com></skang@promise.com></jordie@promise.com>	
J	

Figure 5-14. Select and remove a recipient.

- 2. Select the recipient you wish to delete
- 3. Click the Remove button or press Delete to remove the address from the list.

Specify Alert Notification Events

PAM can be configured to report a variety of alerts, by email, popup message or both. This section describes how to tell PAM what to report and which method to use.

- 1. Click on the Message Agent icon shows a lert notification events you wish to modify.
- 2. In the Information View, scroll down to see the Add Events window.

Event	Email	Рориј 🐴	<u>C</u> hange
Drive Fail	Yes	Yes	
Drive Installation	Yes Y	'es 📄	
Reserve Sector	Yes M	lo lo	
Bad Sector	Yes	100	
Rebuild Begin.	Yes	Yes	
Rebuild Completed	Yes	Yes	
Array Rebuild Begun	Yes	Yes	
Rebuild Halt	Yes	Yes	
Synchronization Begun	Yes	Yes 🔽	
<			
Lie many Click on the item that		NOL	

Figure 5-15. Specifying Events for Alert Notification.

- 3. From the left column, select an Event you want reported.
- 4. Right click on the Email column. Select Yes or No from the popup menu.
- 5. Right click on the Popup column. Select Yes or No from the popup menu.

Selecting Yes adds that item to the Email or Popup list. Selecting No deletes the item.

6. When you are finished, click the Change button.

Device

The term Devices refers to a Promise RAID product: a FastTrak card.

There are no control functions in PAM for Devices. But you can access information about them. To do so, select the Device icon B in Tree View.



Figure 5-16. A Device in Object View (top) and Information View (bottom).

Controller

The Controller deals with creating new Arrays, reading events from the memory buffer, setting cache and performance options. Array creation is covered in the Arrays section of this chapter.

View Event Log

The Controller's Memory Buffer records all the events that happen on the RAID, classified as Errors, Warnings and Information. These are very useful for diagnosing and solving problems on your system.



To see the Event Log, right-click on the Controller icon Sin Tree View and select Read Events from the popup menu (right).

Date	Time	Level	Name	Description
03/08/02	10:50:12	Warning	Array Created	Create a new array Array1 (0x00000018).
03/08/02	10:50:12	Information	Synchronization Beg	Synchronization begun for Array SEAGATE ST320424A (0x
03/08/02	10:27:06	Warning	Array Deleted	Delete array 0x00000018.
12/31/69	16:00:19	Warning	Array Rebuild Begun	Automatic rebuild begun by Engine on Drive Maxtor 4G160H
02/21/02	10:52:38	Warning	Read/Write Error	Drive Maxtor 4G160H8 (0x00000002 ch 4) of Array Array1 (I
02/20/02	06:21:01	Warning	Read/Write Error	Drive WDC AC313000R (0x00000001 ch 3) of Array Array1
02/19/02	18:17:04	Error	Fan Stopped	Fan Stop for Enclosure in ch6 for Disk Maxtor 5T020H2 (0x
02/13/02	04:50:24	Warning	Read/Write Error	Drive Maxtor 4G160H8 (0x00000002 ch 4) of Array Array1 (I
na/na/na	na:na:na	Warning	Rebuild Halt	Rebuild halted by User on Drive Maxtor 4G160H8 (0x00000
12/31/69	16:00:19	Warning	Array Rebuild Begun	Automatic rebuild begun by Engine on Drive Maxtor 4G160H

Figure 5-17. The Event Viewer.

In the Event Viewer, you can view the events, make a permanent record by saving them to a file, and clear the events from the Viewer. You can also clear the events using the popup menu in Tree View.

Note that the collecting and reporting of these Events is independent from the Alert Notification preferences set in the Message Agent.

Controller Options

The Controller has system information and settings for disk cache and performance features. Click on the Controller icon in Tree View to see the Options in Information View.

Disk Parame	eters				
🔽 Enable	Cache	• Write Three	ough	C Write Back	
🔽 Enable	S.M.A.R.T	check			
Rebuild Set	ting				
🔲 Disable	Hot Spare	/Auto Rebuild			
Rebuild Rate	Low				High
_	Reset		Apply		

Figure 5-18. Controller Options for FastTrak.

Disk Parameters: Enable Hard Disk's Write Cache

Speeds hard disk performance by writing data to the cache to increase performance. Note that you can lose data if a power failure occurs.

Disk Parameters: Write Through and Write Back

A Write Though cache passes data to the hard drive while holding a copy in case the data is needed again. This option is safer.

A Write Back cache accepts data and holds it before writing to the hard disk. This action increases performance. Note that you can lose data if a power failure occurs.

Disk Parameters: SMART Check

SMART, an acronym for Self-Monitoring Analysis and Reporting Technology, is a feature of the disk drive software. It monitors the internal performance of the drive and reports to the PC when it finds a potential failure. SMART warns you of a developing drive failure so you can replace the drive before it actually fails.

Rebuild Options: Disable Hot Spare/Auto Rebuild

For fault-tolerant arrays (RAID 1 and 0+1), this option turns off the hot spare drive and automatic rebuilding. The default is unchecked, hot spare and automatic rebuilding enabled.

Rebuild Options: Rebuild Rate

A High setting assigns most of the system resources to rebuilding. Rebuilding goes faster, restoring redundancy sooner but read/write requests are handled slower.

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 rebuild takes longer.

See Rebuild an Array later in this chapter for more information on the rebuilding process.

Arrays

Create an Array

- In Tree View, click the + to the left of the Controller icon to see the Channels.
- Click the + to the left of each Channel to see the disk drive. If there is no +, the Channel does not recognize a disk drive.

In the example (right) there are three disk drives available to make an array.



The available RAID selection depends on the number of disk drives available. The table below lists the options. See the Appendix for a more detailed description.

RAID Level	Name	Minimum drives	Maximum drives
0	Striping	1	4
1	Mirroring	2	2
0+1	Striping + Mirroring	4	4

Table 5-1. RAID Levels for FastTrak TX4000, S150 TX2plus and TX4.



Caution

This caution applies to FastTrak S150 TX2plus, which has a combination of Serial and Parallel ATA Channels.

With some models of hard drives, if the Master hard drive fails, it may cause the Slave hard drive to be unrecognized by the computer's operating system. Where a RAID 1 (Mirroring) array exists on the Master/Slave pair, this condition may cause the operating system to freeze.

Do NOT create a RAID 1 (Mirroring) array with two Parallel ATA hard drives using the Master/Slave arrangement on Channel 3 (the Parallel ATA port).

You can create a RAID 1 (Mirroring) array by combining hard drives on:

🖃 🕰 MyConsole

DANIELDORN

🚘 FASTTRAK 5150 SX4

Read Events

Clear Events

ETP1 New

- Channels 1 and 2 (Serial ATA only)
- Channels 1 and 3 (one Serial, one Parallel)
- Channels 2 and 3 (one Serial, one Parallel)
- Right-click on the Controller icon . Select New > Array from the popup menu (right).

The Select Disk dialog box appears showing the available (unassigned) disk drives.



Figure 5-19. Select Disk dialog box.
4. Click on a drive icon to select it. Hold down the Shift or Ctrl key for multiple selections. Click Next to continue. The Select RAID mode dialog box appears.

Select RAID mode	×
RAIDO(STRI RAID1(MIR RAID0+1(S	
Select the RAID mode from the above list.	
< Back Next > Cancel Help	

Figure 5-20. Select RAID mode dialog box.

- 5. Click on an array icon to select it. Only the arrays that can be created from your selection of disk drives will display.
- 6. Click Next to continue. The Finish Conversion dialog box appears.

Finish Conversion		×
	You will create the following array: Array name: FirstArray Block size: 64 To confirm that you want to do so, please press FINISH button, if you want to select another disk or RAID mode, please press BACK, if you change your mind, please press CANCEL	
< <u>B</u> ack	k Finish Cancel Help	

Figure 5-21. The Finish Creation dialog box.

7. Type in an Array name and select a Stripe Block Size from the dropdown menu. The default Block size is 64KB.

Note that some RAID levels do not offer a choice of Block sizes.

Click Finish to continue. The following message appears, reminding you to reboot your PC in order to access your new Array.



Figure 5-22. Array Created and Reboot messages.

A new array icon appears in the Tree View (right).



At this point, the new array is ready to be partitioned and formatted In Windows.

Synchronize an Array

Promise uses the term *synchronization* to mean an automated process of checking and correcting data and parity. It applies to RAIDs 1, and 0+1. Synchronizing takes place when an array is first created and then, optionally, on a regularly scheduled basis to maintain content integrity.

Scheduled Synchronization

Schedule a time for synchronization when the RAID is least busy reading and writing data. The early morning hours are often a convenient time.

Array Synchronization Sch	edule		
🔽 Enabled			
C By Minute	every	30 min	<u>C</u> hange
O By Hour	every	8 hrs	
By Day	start at	2: 00 AM	
C By Week	every	FRIDAY	
C By Month	on the	1 st 🛫	



To enable scheduled synchronization:

- 1. In Tree View, select the Local Agent icon 🕮.
- 2. In Information View, scroll down to the bottom. Check the Enabled box
- 3. Click on the radio button beside the time interval (by minute to by month) you want.
- 4. Based on the time interval you selected, enter the number of units or clock time for the synchronization process to begin.
- 5. When you are done, click the Change button.

The Synchronization Schedule is set. If the Schedule is disabled, it will remember its current settings.

On-Demand Synchronization

To synchronize an Array immediately, do the following:

- In Tree View, right-click on the icon of the array you want to synchronize.
- 2. Select Synchronize from the popup menu.

OR click the Synchronize Array button Sin the Toolbar.

While the Array is synchronizing, it is still available to

read and write data. If the beeper is enabled, it will beep slowly during this process.

To turn the beeper on or off, right-click on the Controller icon so or the Enclosure icon and in Tree View and check or uncheck Beeper in the popup menu.

Tree View and Information View display the progress.

FirstArray Synchronizing 50%	RAID Mode	:	MIRRORING
th1\Maxtor 87000A8 ch2\Maxtor 87000A8	Array Status	:	Synchronizing 50%
	Array Size	:	6.518 GB (6675 MB)

Figure 5-24. Synchronization in progress.

When Synchronization is complete PAM reports a Functional array status.



Rebuild an Array

Rebuilding is the process of restoring redundancy to a RAID 1 or 0+1 array after one of its drives has failed. When the replacement drive has been installed, the RAID can read and write data but there is no redundancy until the RAID has been rebuilt, that is, the new drive receives all the data from the remaining original drive.

When a drive fails for any reason, the Array goes Critical. This condition is noted when you select the Array Critical icon in Tree View. The RAID alarm beeps quickly to call your attention to the condition.

FirstArray (Critical)	RAID Mode	:	MIRRORING
	Array Status	:	Critical
	Array Size	:	8.487 GB (8691 MB)

Figure 5-25. An Array in Critical condition highlighted in Tree View (left) and shown in red in Information View (right).

Automatic Rebuild

Normally, the rebuild process begins automatically when you repair or replace the faulty disk drive. The Array recognizes the drive and begins the process a few moments later.

FirstArray Rebuilding 50% Ch3\WDC WD400BB-53DEA0 Ch4\IBM-DJNA-370910	RAID Mode	:	MIRRORING
	Array Status	:	Rebuilding 50%
	Array Size	:	8.487 GB (8691 MB)
FTP1	Disk Model	:	IBM-DJNA-370910
Ch1 Ch2 Ch3 Ch4 FirstArray Rebuilding 50% Ch3 Ch3 Ch4 Ch	Disk Status	:	Rebuilding
	Disk Size	:	8.467 GB (8671 MB)
	Mode Setting	:	UDMA mode 4
	Configuration	:	Assigned to an array
	S.M.A.R.T Status	:	Functional

Figure 5-26. Check rebuilding progress for the array (top) or the disk drive (bottom).

If your RAID has a hot spare, the rebuild begins without waiting for a replacement drive. Be sure to replace the faulty drive as soon as possible.

During the Rebuild process, the array is still available to read and write data but it may run noticeably slower.

To turn the beeper on or off, right-click on the Controller icon and check or uncheck Beeper in the popup menu (right).



When the rebuild is successfully completed, a popup message appears (below).



Figure 5-27. Rebuilding complete message.

When the rebuild is complete Tree View returns to normal and Information View displays Functional.

Manual Rebuild

To initiate an Array rebuild manually:

- In Tree View, select the Array icon Boot of the array you want to rebuild.
- 2. Right click on the icon and select Rebuild from the popup menu.



OR Click the Rebuild Array 🔯 button in the Toolbar.

The Rebuild Wizard appears.

Select disk to Rebuild	
Ch1VMaxtor 87000A8 Ch1VMaxtor Ch2VIBM-D 87000A8 Ch2VIBM-D 6rb2VIBM-D Ch2VIBM-D Ch2VIBM-D Ch2VIBM-D	
< Back Next > Cancel	Help

Figure 5-28. Rebuild Wizard disk drive selection window.

3. In the Rebuild Wizard, select the drive to be rebuilt and click Next. A confirmation message appears.



Figure 5-29. Rebuild Wizard Confirmation window.

4. To confirm the rebuild choice, click Finish.

Tree View and Information View display the progress (above).

During the rebuild progress, the array will be available for use but it may run noticeably slower. If the beeper is enabled, it will beep slowly during this process.

When the rebuild is successfully completed, a popup message appears (below).





Figure 5-30. Rebuilding completed message.

When the rebuild is complete Tree View returns to normal and Information View displays Functional.

Stop, Pause, Continue

Promise recommends that you let your synchronization or rebuild run to completion. If you need to stop or pause the process:

- 1. Click on the icon Boot of the Array that is rebuilding.
- 2. Click the Stop 📕 or Pause 🛄 buttons on the Toolbar.

The following warning appears. Click OK to continue.

Promise	Array Management 🛛 🗙
⚠	Pausing Rebuild or Synchronize could cause the Array to lose fault tolerance and/or data integrity. Are you sure?
	Cancel

Figure 5-31. Stop Warning.

To resume after a pause:

3. Click on the Array icon 😂.

Click the Continue button 🕨 on the Toolbar.

Object View

Select the Array icon line Tree View to see a display of individual disk drives in Object View.



Figure 5-32. Disk Drives in Array Object View.

Delete Array

The Delete Array function has been disabled in PAM for safety reasons. Please refer to your *FastTrak User Manual* for instructions on deleting arrays using the FastBuild Utility.

Array Status

Array Condition	Meaning
Functional	Online and ready for use.
Synchronizing	The process of verifying data integrity by recalculating redundant data and matching the data on the disk drives. See page 70.
Rebuilding	The process of reconstructing an array in Critical mode by placing redundant data on a replacement disk drive. See page 72.
Critical	Degraded array condition due to a failed or removed disk drive. Applies to mirrored arrays (RAID 1 and 0+1) only. Fault tolerance is lost but the data is still accessible.
	Triggers automatic rebuilding. See page 73.
Offline	Striped arrays (RAID 0): Degraded array condition due to one failed or removed disk drive. The data is not accessible. Contact Promise Technical Support for assistance. See page 82.
	Mirrored arrays (RAID 1 and 0+1): Degraded array condition due to two failed or removed disk drives. Fault tolerance is lost. The data is not accessible. Contact Promise Technical Support for assistance. See page 82.

Appendix

RAID

RAID is an acronym that stands for Redundant Array of Independent Disks. It is divided into different numbered Levels. The numbers of these Levels do not mean that one Level is higher or better than another. Each Level has its own advantages and shortcomings.

PAM allows you to select the RAID Level when you create an Array. The available RAID Level selection depends on which Promise product you have and the number of disk drives available. The table below lists the options.

RAID Level	Name	Minimum drives	Maximum drives
0	Striping	1	4
1	Mirroring	2	2
0+1	Striping + Mirroring	4	4

Table A-1. RAID Levels for FastTrak TX4000, S150 TX2plus and TX4.

Following is a discussion of the RAID Levels you can achieve with Promise products.

RAID 0

RAID 0 is a method of striping, or writing data over two or more hard disks at the same time. Multiple disks can read and write data faster than one. However, there is no data redundancy with this arrangement, so if one disk fails, all your data is lost.



Disk Drives

RAID 1

RAID 1 takes the data written on one disk and copies it to another, making a mirror or exact copy. This arrangement does not have a significant performance advantage. If one disk fails, there is no data loss. There is no rebuild, just a copy of the data to the disk.



Disk Drives



RAID 0+1

Disk Drives

RAID 0+1 is a combination the high data rates of RAID 0 and full redundancy of RAID 1. A disadvantage is that you must have at least 4 hard disks to implement it. If one disk fails, there is no data loss. There is no rebuild, just a copy of the data to the disk.

IP Address

In order for PAM to be configured over a network, you must know the IP (network) address of every component. The Message Server uses IP addresses to communicate with the Message Agent on the RAID PCs and the Monitoring Utility on the network PCs.

To find the IP network address, go to Start > Programs > Accessories > Command Prompt. Type *IPConfig* and press Enter.



Figure A-2. Use the Command Prompt to find your PC's IP address.

Locate and record the IP addresses of all PCs and Servers on your network that will work with PAM. This document will help you recall individual PCs when it is time to specify their connections.

DHCP Issues

Referring to Figure A-1 above, note that it says Address Type: *Assigned by DHCP*. This means that a DHCP server gave this IP address to this PC when the PC connected to the network. DHCP stands for Dynamic Host Configuration Protocol and refers to software that allows a file server to assign IP addresses to computers on the network.

DHCP is very helpful in reducing the number of IP address a company or organization requires. The DHCP server assigns an IP address to a computer as it logs onto the network. The IP address will remain the same until the computer logs off or disconnects for any reason, such as a power failure. When the computer logs on again, it will receive a different IP address.

Because IP addresses are subject to change when a DHCP server is involved, make it a point to maintain the RAID PC network connections at all times. When a disconnection happens for any reason, you must find the new IP address and enter it into the Message Server. Instructions for doing this appear under *Message Server Address Change* in Chapter 5.

To avoid having to make Message Server address changes, assign the RAID PC a permanent IP address. See your IT Manager for guidance.

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

Technical Support Services

Promise Online [™] Web Site	http://www.promise.com
	(tech documents, drivers, utilities, etc.)

USA Tech Support Center

E-mail Support	support@promise.com
Fax Technical Support	(408) 228-6401 Attention: Technical Support
Phone Technical Support	(408) 228-6402 7:30-5:00pm M-F Pacific Standard Time
If you wish to write us for support:	Promise Technology, Inc. Attn: Technical Support 1745 McCandless Drive Milpitas, CA 95035, USA

European Tech Support

E-mail Support	support@promise.nl
Fax Technical Support	+31 (0)40-256-9463 Attention: Technical Support
Phone Technical Support	+31 (0)40-235-2600 8:30-5:00pm The Netherlands Time
If you wish to write us for support:	Promise Technology Europe B.V. Attn: Technical Support Luchthavenweg 81-125 5657 EA Eindhoven, The Netherlands

Pacific Rim Sales Office

E-mail Support	support@promise.com.tw
Fax Technical Support	+886-3-578-2390 Attention: Technical Support
Phone Technical Support	+886-3-578-2395 (Ext. 8870) 9:00-6:00pm Taiwan Time
If you wish to write us for support:	Promise Technology, Inc. Attn: Technical Support 2F, No. 30, Industry E. Rd. IX Science-based Industrial Park Hsinchu, Taiwan, R.O.C.

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E-mail Support	support-china@promise.com
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Phone Technical Support	+86 (0) 10-687-23941 9:00-6:00pm China Time
If you wish to write us for support:	Promise Technology China Attn: Technical Support Room 3217, No. 11 South Zhong Guan Cun Street Hai Dian District Beijing 100081 P.R. China