

TeraStation™

HD-HTGL/R5 Series

User Manual

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How to Use this Manual

Included in this manual are both basic and advanced instructions and information on the setup and usage of the TeraStation. Visit us online at www.buffalo-technology.com for additional resources and software to help you get the most out of your TeraStation.

Basic Terminologies

- When referring to Windows computers, drive configurations are referenced as:
 C: - Hard Drive where program files are installed **D:** - CD-ROM Drive
- Microsoft Windows Millennium Edition is referred to as Windows ME.
- Microsoft Windows 98 Second Edition is referred to as Windows 98SE.
- HD-HTGL is referred to as TeraStation.
- HD-HLAN is referred to as LinkStation

Product Addition Notice

Buffalo Technology has added the following products to the TeraStation Series.

HD-H0.6TGL/R5

HD-H1.6TGL/R5

- The usage and warranty statements for these products are the same as those of the HD-H1.0TGL/R5

The differences between each product is as follows:

	HD-H1.0TGL/R5	HD-H0.6TGL/R5	HD-H1.6TGL/R5
Standard Mode	250GB x 4	160GB x 4	400GB x 4
Spaning Mode	1TB(1000GB) x 1	0.6TB(640GB) x 1	1.6TB(1600GB) x 1
Mirroring Mode	250GB x 2	160GB x 2	400GB x 2
Parity Mode RAID 5	750GB x 1	480GB x 1	1.2TB(1200GB) x 1

- References to 250 GB and 1TB(1000GB) should be read as 160 GB and 0.6TB(640GB) in the case of the HD-H0.6TGL/R5, and as 400 GB and 1.6TB(1600GB) in the case of the HD-H1.6TGL/R5.

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Introduction

Before setting up your TeraStation, it is recommended to get familiar with some of the basic features and terminologies associated with the device. Depending on the operating system of the systems that will be attaching to the TeraStation, a summary of important limitations is included as well.

Special Notes

- The Gigabit Ethernet LAN interface is backward compatible with 1000BASE-T/100BASE-TX/10BASE-T Ethernet LAN interfaces. It is not necessary to use only 1000BASE-T LAN hardware with the TeraStation.
- Group and User Level access can be customized for each Shared Folder you create on the TeraStation drives. By default, Shares will be created with full access to every user, so to maximize the security of a new Shared Folder, select Groups and Users that should be allowed access at the time the Share is created.
- Should there be no disk access over a 30 minute period of time, TeraStation will safely stop the revolution of the internal drives to preserve disk life. Should an access be requested, the drives will automatically begin operating again - creating a minimal delay to allow for safe start up of the disk.
- USB 2.0/1.1 ports are located on the front and rear panel of the TeraStation. External USB drives can be attached to expand the total capacity of network attached storage or be used as backup destinations for the contents of the internal hard drives. If a USB printer is attached, the TeraStation can act as a print server to make it available to other network devices.
- TeraStation offers four Disk Modes for the internal drives. The type of mode selected should correspond to the desired usage and capacity of the network available storage.

Standard Mode (250GB×4)

Each drive is recognized as a single 250 GB share. Should a drive failure occur, the contents of the drive will be lost. Therefore, in Standard Mode, it is vital to implement an effective backup procedure to another TeraStation or USB drives if data loss due to drive failure is not acceptable.

Spanning Mode (1TB×1)

All four drives are recognized as a single 1000 GB share. Should a drive failure occur, the contents of all 4 drives will be lost. Therefore, in Spanning Mode, it is vital to implement an effective backup procedure to another TeraStation or USB drives if data loss due to drive failure is not acceptable.

Mirroring Mode RAID 1 (250GB×2)

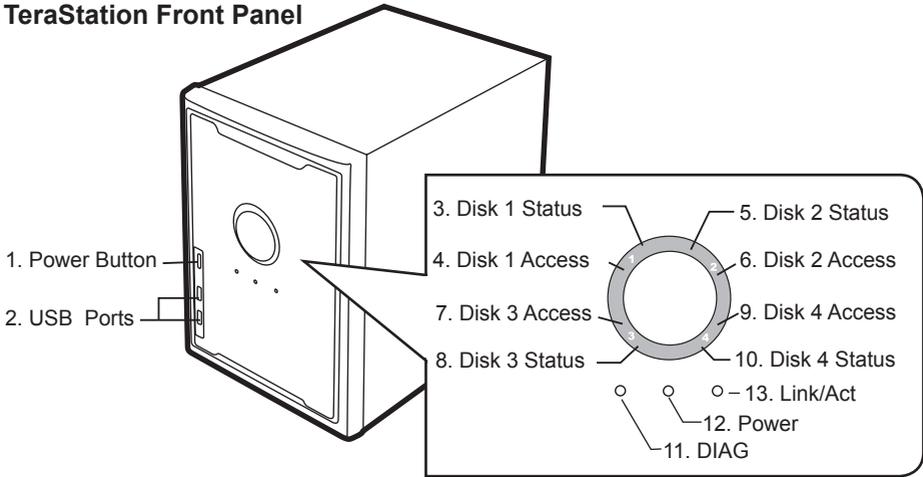
Two pairs are created from the 4 drives as two separate 250 GB shares. Data stored on each pair is mirrored automatically to the drive it is paired with. Therefore, should a single drive fail, data is not lost as it is also located on the mirrored drive of the pair. Drive replacement and rebuilding of the Mirror should occur as soon as possible though.

Parity Mode RAID 5 (750GB×1)

All four drives are recognized as a single 750 GB share. Using parity and striping data across all four drives, data can be salvaged in the event of a disk failure, but a failed drive should be replaced as soon as possible.

Introduction

TeraStation Front Panel



1

1. Power Button

Power ON - Press the Power Button.
Power OFF - Press and hold the Power Button for three seconds and release.

2. USB 2.0/1.1 Ports (Series A)

External USB Hard Drives and USB Printers can be connected for sharing over the network.
Other USB devices are not supported - such as USB card readers and flash drives.

3. Disk 1-4 Status/Full (also 5, 8 and 10)

- a. OFF - Corresponding hard drive not detected
 - b. Green - Corresponding hard drive detected
 - c. Green Blinking - Disk Check/Format in progress
 - d. Red - Drive capacity at over 90% used
- Red Blinking - Possible physical drive failure

4. Disk 1-4 Access (also 4, 7 and 9)

Green Blinking - Hard drive being accessed

Note: While the TeraStation is in the startup process, the above LEDs will blink in a pattern like a roulette wheel. Once startup has completed, normal or diagnostic operation will resume.

11. DIAG

When an error occurs, the DIAG LED will blink in a pattern that can be read to understand an error message or alert. Reference page 91 of this manual for the error codes and recommended correcting actions.

Note: While a firmware update is taking place the Power and DIAG LEDs will flash. This does not indicate any errors or problems, but rather a warning to not interrupt or turn off the TeraStation. Never turn off or remove power from the TeraStation while upgrading the firmware.

12. Power

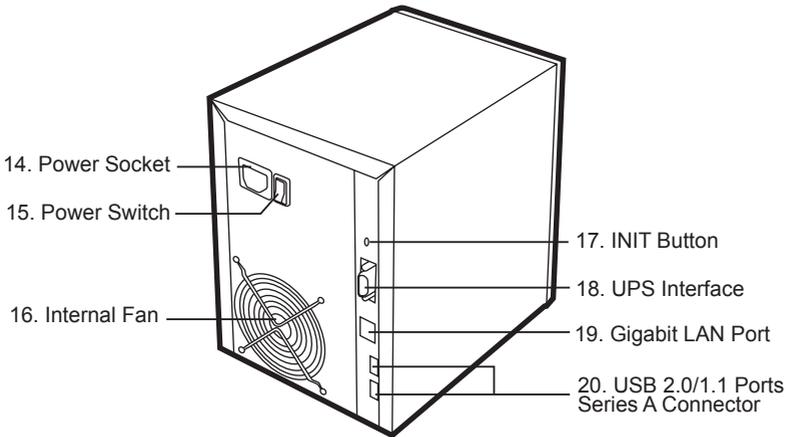
- OFF - Power source is off
- Green - Power source is on
- Green Blinking - System booting or shutting down
- Green Slow Blinking - Disk Sleep Mode

13. Link/Act

- Blue - 1000Mbps link detected
- Green - 100Mbps link detected
- Red - 10Mbps link detected

When the Link/Act LED is blinking, it denotes network activity in or out of the TeraStation LAN adapter.

TeraStation Rear Panel



14. Power Socket

The connector for attaching the power cord to the TeraStation.

15. Power Switch

The main power switch for the TeraStation. Once set to the ON position, the Power Button on the front panel of the TeraStation can be used for controlling the starting and shutdown of TeraStation.



Note: If the power switch is left in the OFF position for an extended period of time, the internal system clock of the TeraStation may reset to its default setting of November 1, 2004. The system time will need to be set again to keep the local system time accurate should this occur.

16. Internal Fan

The internal fan will adjust its speed depending on the temperature of the TeraStation. To prevent possible overheating, keep the fan clear and clean of any obstacles or dust accumulation.

17. INIT Button

The INIT switch is used to restore factory default settings on the TeraStation. Reference page 71 of this manual for further instructions on this process.

18. UPS Interface

The connector for attaching the TeraStation to a UPS Power Supply to allow safe shutdown of the TeraStation in the event of a power failure.

19. Gigabit LAN Port

The connector for attaching the TeraStation to a network via Ethernet cable.

20. USB 2.0/1.1 Ports (Series A Connector)

External USB Hard Drives and USB Printers can be connected for sharing over the network. Other USB devices are not supported - such as USB card readers and flash drives.

Important Limitations

Note: The following information is based on the status of the latest released firmware for TeraStation. Future updates will be reflected in updated manuals. For the latest firmware available, check our company website at www.buffalotech.com.

- The writing of files greater than or equal to 2 GB is prevented due to operating system limitations with Windows 98SE/98/95 and Mac (AppleTalk) operating systems.
- The writing of files greater than or equal to 4 GB is prevented due to operating system limitations with the Windows Millennium operating system.
- File names and folder names should not contain more than 120 characters in their entire directory path to prevent errors when attempting to copy to them.
- TeraStation does not support the Hidden File attribute.
- Over extended periods of time, the set time of the TeraStation may slip behind and require the clock to be reset. To circumvent this behavior, use the NTP client feature which is explained fully on page 50 of this manual.
- When using Chinese characters in a Shared Folder or Workgroup name, there may be occasional problems with the name properly displayed. To circumvent this behavior, use non-Chinese characters when the behavior is displayed.
- The following terms are not allowed to be used as names when creating Users or Groups on the TeraStation:
root,bin,daemon,sys,adm,tty,disk,lp,sync,shutdown,halt,operator,nobody,mail,news,uucp,ftp,km
em,utmp,shadow,users,nogroup,all,none,hdusers,admin,guest
- The following terms are not allowed to be used as names when creating Shared Folders on the TeraStation:
info,spool,usbdisk1,usbdisk2,usbdisk3,usbdisk4,lost+found,global,printers,homes,lp
- The following characters are not allowed to be included in the name used for a file or Shared Folder when using Mac OS (AppleTalk) devices with the TeraStation.
? [] \ / = + < > ; : " , | *

- For Users that will be accessing the TeraStation Shared Folders from Windows 98SE/98/95 computers, do not create a password longer than 15 alphanumerical characters. For Users that will be accessing the TeraStation Shared Folders from Mac OS computers, do not create a password longer than 9 alphanumerical characters.
- Though the TeraStation uses a Journaling File System to prevent data loss in the event of a power failure, there is a remote possibility of the following phenomenon occurring during a power failure during a file copy:
 - File attributes can be lost for a file that was midway through copying at the point of the power failure.
 - A hard drive error may be indicated falsely that requires the TeraStation to be rebooted and a Disk Check run and a re build of any RAID arrays.
 - A file that was midway through copying at the point of power failure may not be able to be deleted unless the TeraStation is restarted.
- The status of the internal drive capacities, capacity used and available space may not add up to the total size of the hard drive. This is due to some of the drive space being used for system information.
- When a Windows user name and password is used to log into a Windows computer or domain, the same user name and password should be used when creating the user's account on the TeraStation. Otherwise, problems accessing Shared Folders may occur.
- When copying a file that uses superscript in its file name (common with some international character sets), the date and time attributes may not be properly set on the TeraStation for that particular file.
- The drive volume indicated from the TeraStation browser interface and the drive volume indicated by Windows may vary.
- When using Windows ME/98SE/98/95 operating system, do not use the Windows Family Logon with TeraStation. Instead, use the Windows Network Login service with an identical user name and password created for the user on the TeraStation.
- The Disk Backup and Disk Sleep services can not be used concurrently on the TeraStation. To avoid conflicts, only use one of these services on your TeraStation. The TeraStation will still stop the spinning of its internal disks if Disk Backup is used and there is 30 minutes of non-activity.
- If a Mac OS user logs on to a Microsoft Windows Domain, the same credentials can not be used for the user name and password to access a TeraStation.
- File and directory attributes can not be modified by an FTP client when the TeraStation FTP server is enabled. To modify attributes, use the browser management instructions shown on page 75 of this manual.
- When using Jumbo Frame, the switch must support the Jumbo Frame standard designated (4100 bytes/7418 bytes). For further information, reference page 79 of this manual.
- When backing up one TeraStation to another as shown on page 72, the same Ethernet frame size must be used on both TeraStations as shown on page 51 of this manual.
- If the Disk Sleep mode is enabled while a backup is in progress, the backup job in progress will complete and then be disabled. No further backups will occur unless Disk Sleep mode is disabled.
- If the Disk Mode or Shared Folders are moved or deleted after a backup has already been scheduled, be sure to modify the scheduled backups to reflect the change to prevent loss of data due to failed backups.

Mac OS Limitations

- When using Mac OS X (post 10.2 with AppleTalk) without SMB, do not use Japanese characters in folder or file names to prevent errors accessing the data over a network.
- Mac OS 9 and Mac OS X can not see files on the network with names made up of over 32 characters.
- Occasionally, when a file is accessed by a Mac OS computer within a Shared Folder, an information file will be created in the same folder. If the file is then deleted by a Windows OS computer, the original file may no longer be accessible by Mac OS computers.
- Updating the TeraStation's firmware from a Macintosh computer is not possible.
- The AppleZone given out by default by the AppleShare Server is used by the TeraStation. It is not possible to change the AppleZone that the TeraStation joins.

USB Limitations

- Only external USB hard drives and USB printers are supported by TeraStation.
- If a USB peripheral does not support Plug and Play, it may be necessary to turn the TeraStation off when plugging in or unplugging the USB peripheral and restarting.
- Up to four external USB hard drives can be connected to TeraStation concurrently. For best performance, use Buffalo external hard drives.
- If a USB hard drive has two partitions, only the first partition will be detected by TeraStation.
- If a USB hard drive is connected to TeraStation formatted as FAT16/32, the following restrictions apply:
 - The drive can not be used as a Shared Folder. The available space can only be used as a backup destination target.
 - Backups of files greater than or equal to 2 GB can not be performed.
 - Files created by Mac OS X such as DS_Store can not be backed up to the FAT16/32 USB drive and errors may occur.
- Only one printer can be connected to the TeraStation via USB at a time.
- An attached printer can not use the following when being shared by TeraStation:
 - WPS (Windows Printing System) Printer
 - Non-PostScript Printer (Macintosh)
 - Duplex-only communication (Two-Way)
 - Errors may occur with some duplex printers, yet printing will still complete. Also some features such as the printer reporting low ink levels over the network may not function due to not supporting Two-Way communication.
- When a multi-function (all-in-one) printer is attached to the TeraStation, only the printing function will work. Features like fax or scanning will not function.
- Some attributes may not be included with files and folders when backed up to a USB drive formatted with FAT32.

Microsoft Domain Limitations

- If TeraStation is to be part of a Windows Domain, the TeraStation should be added beforehand on the Domain Controller with a compute account in Server Manager.
- TeraStation does not support digitalized SMB packets. Depending on some settings with Windows 2003 Server, the TeraStation may not be able to join the domain.
- Macintosh users will not be able to verify the TeraStation as a domain member.
- FTP connections will not be able to verify the TeraStation as a domain member.
- If the TeraStation name is changed, the new name will need to be registered with the Domain Controller as a member of the domain by giving it a computer account.
- If the access certification of the TeraStation to a domain expires or becomes invalid, the process of joining the TeraStation to the domain will need to be redone.
- If a user name for a domain exceeds 20 characters, TeraStation will accept the user name as shortened to only 20 characters.
- TeraStation does not conform to domains after Windows 2000 native mode. Dynamic updates are not supported.
- Only 1000 user names can be acquired by TeraStation from a domain.
- Groups can not be acquired by TeraStation from a domain. Only user names can be acquired and used for access restrictions to TeraStation resources.

UPS Limitations

- TeraStation can not receive a shutdown signal from an attached UPS until at least 10 seconds have passed since it completed its startup process.

Advanced Configuration

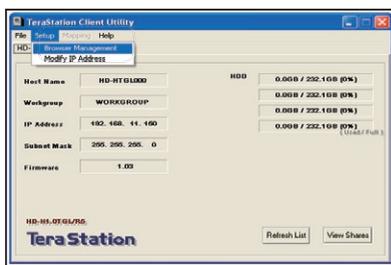
TeraStation is fully configurable from any browser. If the IP Address is known, it can be simply entered in the address bar of your browser. Otherwise, use the TeraStation Client Utility to launch your management session.

Launching the Browser Manager

To launch a browser management session use the TeraStation Client Utility tool located on the TeraNavigator CD. If the tool is already installed, follow the steps below.

1 Click Start -> Programs -> Buffalo -> TeraStation -> Client Utility

The client utility will launch.



2 Click Setup -> Browser Management

* If necessary the IP Address of the TeraStation can be modified under Setup as well.

* If multiple TeraStations are active on your network, choose the one you wish to configure via the name of the device on the tab.



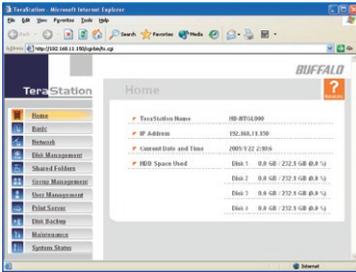
3 Login as the admin user.

The default username is "admin" and the password is "password" (without quotes). The password can be changed with the browser management interface.

4 Click OK.

5 The Browser Management will display in a few moments.

For best display, use a version 5+ browser.



Basic status of the TeraStation is displayed on the Home page of the browser interface.

Note: To access this page in the future, the IP Address or Hostname can be entered into the address bar of your browser. This will allow interfacing with your TeraStation without using the client utility.

Terastation Configurations

The TeraStation can be highly customised. Though basic network sharing can be accomplished in just a few minutes, some advanced features should be well planned and carefully executed to prevent data loss or security breaches.

Hostname Setup

TeraStation Hostname	<input type="text" value="HD-HTGL000"/>
TeraStation Description	<input type="text" value="TeraStation"/>

TeraStation Hostname

The unique name by which the TeraStation will be known as on the network.

The Hostname Description will only be visible to Windows devices.

Date and Time Setup

Date	<input type="text" value="2005"/> Year <input type="text" value="1"/> Month <input type="text" value="21"/> Day
Time	<input type="text" value="11"/> Hour <input type="text" value="12"/> Min <input type="text" value="37"/> Sec
	<input type="button" value="Use Local Time"/>
Time Zone	<input type="text" value="GMT-08:00"/>

Date and Time Setup

Keeping the date accurate on the TeraStation is important for file attributes and scheduling backups or sleep time.

Click **Use Local Time** to automatically update the TeraStation with the time from the computer you are currently using.

If the TeraStation seems to be losing track of time over an extended period, use NTP to automatically have it updated.

NTP Settings

NTP Function	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
NTP Server Address	<input type="text"/>

NTP Server

When configured to use an NTP Server, the TeraStation will update its system time every three hours from an outside source.

The NTP Server must be entered as a valid IP Address. For a list of free NTP Servers, visit www.ntp.org

Network Sharing Services

AppleTalk Protocol	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
FTP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Network Sharing Services

To allow communication between many Apple systems, the AppleTalk protocol should be enabled on the TeraStation.

Enabling the FTP protocol will allow FTP to be configured for either anonymous visitors or for authenticated users. Configuration of FTP is performed under Shared Folders.

IP Address Properties

Automatic via DHCP	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
IP Address	<input type="text" value="192.168.11.150"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Default Gateway Address	<input type="text"/>
DNS Server Address	<input type="text" value="192.168.11.1"/>

Ethernet Frame Size Properties

Ethernet Frame Size	<input type="text" value="1,518 bytes (Default)"/>
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Workgroup and Domain Properties

Network Member	<input checked="" type="radio"/> Workgroup <input type="radio"/> Domain
Workgroup Name	<input type="text" value="WORKGROUP"/>
Domain Name	<input type="text"/>
Domain Controller Name	<input type="text"/>
WINS Server IP Address	<input type="text"/>

IP Address

By default, the TeraStation will attempt to acquire an IP Address via DHCP. If a DHCP Server can not be located, it will set 192.168.11.150 as its IP Address.

If a static IP Address is to be assigned, make sure that the addresses are valid and that each field is populated.

Note: If the TeraStation is assigned an IP Address already in use by another device on the network, both the TeraStation and the other device will have network communication problems due to the conflict.

Ethernet Frame Size

To improve network efficiency and speed, the TeraStation can modify the size of packets that it will transmit.

Note: Care should be taken if the TeraStation has this property modified as using Jumbo Frames with equipment that does not support Jumbo Frames can lead to communication failure.

Workgroup and Domain Properties

TeraStation can become a member of either your Microsoft Workgroup or Windows NT 4 Domain.

Should the TeraStation be added to a domain, it is necessary to designate the Domain Controller of the domain. Prior to configuring the TeraStation for the domain, it should have its Hostname added to the domain on the Domain Controller.

The usage of a WINS Server is optional

Note: TeraStation does not support Active Directory. See Page 9 of this manual for more limitations.

Disk Management

Internal and External Drive Properties

RAID Array Information

RAID Array	Status	Configuration
RAID Array 1	Status	Not Configured
RAID Array 2	Status	Not Configured

Disk Information

Disk 1	Status	Standard Mode
Unit Name		WDC WD2500BB-22-G1A0
Total Capacity		243,362,256 kbytes
Amount In Use		960 kbytes
Percentage In Use		0.00 %
File Format		XFS

RAID Array Configuration

Name	RAID Mode	Disk Structure	Capacity
RAID Array 1	Not Configured		
RAID Array 2	Not Configured		

RAID Array Error Detection Response

Automatic Shutdown Enable Disable

RAID Settings

RAID Array Name	RAID Array 1
RAID Mode	RAID1

Disk Structure

Disk 1(WDC WD2500BB-22-G1A0)	RAID Array 1	232.2 GB
Disk 2(WDC WD2500BB-22-G1A0)	RAID Array 1	232.2 GB

Internal and External Drive Properties

Detailed information about the internal drives is displayed. Also, if any USB drives are presently connected to the TeraStation, they will be displayed as well.

Note: When using USB 2.0 external drives, a USB 2.0 compliant cable should be used. Otherwise the drive will only operate in USB 1.1 mode.

RAID Array Configuration

If the drives are grouped into a RAID Array, the basic information will be displayed. For further information about the RAID Array or to make modifications, click on the array's name.

RAID Array Error Detection Response

If the drives are configured as RAID1 or RAID5, enabling this feature will allow the drives to be safely shutdown to minimize the chances of data loss.

RAID Settings

Basic details are provided about the RAID Array name and current mode

Disk Structure

The disk structure identifies which specific drives comprise the RAID Array. The **Delete RAID Array** button should only be used when absolutely necessary.

Note: Deleting a RAID Array will permanently delete any data stored on the RAID Array. Always make backups of any critical data that should not be deleted prior to deleting a RAID Array.

USB Disk Setup

Name	Assigned Disk	Capacity
USB Disk 1	USB2 IDE Bridge	232.8 GB
USB Disk 2	Not Assigned	
USB Disk 3	Not Assigned	
USB Disk 4	Not Assigned	

USB Disk Setup

USB Disk Name	USB Disk 1
---------------	------------

Assigned Disk

USB2 IDE Bridge	Status	Mounted
	Manufacturer	BUFFALO INC.
	Unit Name	WD-C WD2500BB-14G
	Capacity	232.9 GB

Disk Check

Target Disk	USB Disk 1
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Warning

Prior to performing a disk check, confirm that this TeraStation is not a backup target of another TeraStation. Backups can not be performed on a TeraStation while in a Disk Check process.

Format

Target Disk	USB Disk 1
File System	XFS(Default)

Warning

Prior to formatting, confirm that this TeraStation is not a backup target of another TeraStation. The backup process will fail if it attempts to launch while the target TeraStation is in a format process. Please make sure any scheduled backups have completed.

USB Disk Setup

If one or more USB drives are connected to the TeraStation, the basic information will be displayed. For further information about the USB Drive or to make modifications, click on the drive's name.

USB Options

The TeraStation can accommodate up to 4 USB drives. If USB drives are cycled on the TeraStation, a previous drive may need to be removed for the new drive to be recognised. This can be accomplished with the **Remove USB Assignment**.

The USB drive can be formatted with one of several file systems. See the Appendix for further information on the different file systems.

Note: All data will be deleted from the USB drive during a format.

Disk Check

Any internal or external drive can have a Disk Check performed on it. Having a drive or RAID Array checked will allow the TeraStation to fix any minor errors on the disk and improve performance.

Note: Disk Check will not launch if the TeraStation has Disk Sleep enabled. The Disk Check process can take anywhere from several minutes to several hours.

Disk Format

Any internal or external drive can have a Disk Format performed on it. The drive can be formatted with one of several file systems. See the Appendix for further information on the different file systems.

Note: All data will be deleted from the USB drive during a format.

Shared Folders

Shared Folders Setup

Shared Folder Name	Disk Area	Shared Folder Description
<input type="checkbox"/> share	Disk 1	open access share
<input type="checkbox"/> usbdisk1	USB Disk 1	USB Disk1

Add new Shared Folder

Shared Folder Name:

Shared Folder Description:

Disk Space:

Shared Folders OS Support: Windows Macintosh FTP Disk Backup

Shared Folder Attributes: Read Only Writable

Recycle Bin: Enable Disable

Remote Backup Confirm Password:

Recycle Bin

Enabling the Recycle Bin will allow deleted files to be placed into a temporary location until they are permanently deleted.

Remote Backup Password

If the Shared Folder is designated as a back-up target, it can have a Backup Password assigned to it. This will allow other TeraStations to backup their data to the folder, however the data will be protected from being overwritten by non-authorized devices.

Access Restrictions

Access Restrictions: Enable Disable

	Writable	Read Only	All Groups / Users
Group	<input type="text"/>	<input type="text"/>	<input type="text" value="InUsers"/>
User	<input type="text"/>	<input type="text"/>	<input type="text" value="admin guest"/>

Shared Folders Setup

To add a new Shared Folder to the TeraStation, Click the **Add** button. To delete a Shared Folder click the **Delete** button.

Note: All data stored in the Shared Folder will be deleted when the Delete button is pressed.

Add New Shared Folder

When a new Shared Folder is added, there are several setting options.

Shared Folder Name/Description

The **Name** will be visible over the network to other devices. Only Windows based devices can view the **Description**.

Disk Space

The drive or RAID Array can be selected where the Shared Folder will be created.

OS Support

Besides designating which devices should have access to the Shared Folder by their operating system, the folder can be designated as accessible via FTP or as a backup destination.

Shared Folder Attributes

The folder can be designated as read-only to prevent inadvertant deletion of critical files by non-admin users.

Access Restrictions

By enabling Access Restrictions, a Shared Folder can be secured through group and user level permissions. Groups and users can be assigned either read-only or writable permissions to a Shared Folder. With Access Restrictions enabled, any groups or users not specifically given permission will be able to access the Shared Folder.

Anonymous FTP Setup

Anonymous FTP Server	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Anonymous User Public Shared Folder	Music
Anonymous FTP Access	<input type="radio"/> Read Only <input checked="" type="radio"/> Writable

Apply

Anonymous FTP Server

If FTP has been enabled from the Basic Settings - Network Sharing Services section then a Shared Folder can be made available for access by any user, even from the Internet.

Once a Shared Folder has been selected for anonymous FTP access, select whether the data within the folder should be read-only or writable.

Group Management

Group Settings

Group Name	Group Description
hdusers	Default System Group
family	Members of the Family

Add Delete

Note: The hdusers group is a system group that all users are members of by default. The hdusers group has access to any Shared Folder that does not have Access Restrictions enabled. The hduser group can not be deleted.

Add New Group

Group Name	Friends
Group Description	Guest Access for Friends

Member Users

User Name	User Description
admin	Built-in account for administering the system
guest	Built-in account for guest access to the system
sven	User account for Sven
saysha	User Account for Saysha

Group Settings

Groups are convenient for assigning permissions to multiple users in a minimum number of steps. Users that are included in a group inherit the same privileges that are assigned to the group they are a member of.

Click Add to create a new group. Delete will permanently delete the group, but the users that are members of the group will still exist.

To edit an existing group, click on the group's name.

Group Creation

Add a name and description for the new group.

Select users from the list by checking their name for inclusion in the new group.

Additional users can be added or removed from the group within Group Management.

User Settings

User Settings

<input type="checkbox"/>	User Name	User Description
<input type="checkbox"/>	admin	Built in account for administering the system
<input type="checkbox"/>	guest	Built in account for guest access to the system
<input checked="" type="checkbox"/>	sven	User account for Sven
<input checked="" type="checkbox"/>	saysha	User Account for Saysha

Note: The users admin and guest are system users that can not be deleted.

Add New User

User Name	<input type="text" value="Abby"/>
Password	<input type="password" value="*****"/>
Confirm Password	<input type="password" value="*****"/>
User Description	<input type="text" value="User Account for Abby"/>

Note: All new users are members of the hdusers group.

User Settings

By creating users for your network users, Access Restrictions can be taken advantage of to secure the stored data. Users can inherit their privileges from group membership or they can be specifically assigned permissions to Shared Data.

Click Add to create a new user. Delete will permanently delete the user. To modify a user's information, click on the user's name.

User Creation

Add a name and description for the new user. Both are limited to 20 alphanumeric characters. The description may include spaces.

The user password is limited to 20 alphanumeric characters.

Print Server

Print Server Settings

Windows Print Server	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Macintosh Print Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Delete Print Queue

Warning

Clearing the Print Queue will require that all print jobs be resent to the TeraStation print server. The process can not be cancelled or paused once it has started.

Print Server Settings

Depending on the members of the network, Windows and Apple Print Services can be enabled or disabled.

Delete Print Queue

Occasionally a print job may jam the Print Service. The quickest way to resolve the issue is to delete all the print jobs in the Print Server's queue.

All print jobs will need to be resent to the TeraStation Print Server.

Disk Backup

Disk Backup

Task Number	Schedule	Status
Task1		Not Created
Task2		Not Created
Task3		Not Created
Task4		Not Created
Task5		Not Created
Task6		Not Created
Task7		Not Created
Task8		Not Created

Backup Destination Search Password

Search Password

Disk Backup

A maximum of 8 backup jobs can be scheduled. There are multiple ways of backing up the stored data of the TeraStation.

Search for Backup Destination

When a Shared Folder is created and has the attribute as a Backup destination set, a password can be set to protect the folder from having its stored backup data overwritten.

By entering the password of a Backup Shared Folder, all possible destination backup directories on the network can be found by the TeraStation.

2

Edit Backup Job

Job Number Job 2

Backup Job Schedule Not Scheduled Immediately Every day Every week

Backup Date

Backup Time Hour Minute

Encrypted Transfer Enable Disable

Compressed Transfer Enable Disable

Overwrite Backup Enable Disable

Use Differential Backup

Differential Backups

A differential backup contains all files that have changed since the last FULL backup. The advantage of a differential backup is that shortens restore time compared to a full backup. The length of time required to restore backups fully though will be lengthened significantly.

If you perform the differential backup too many times, the size of the differential backup might grow to be larger than the baseline full backup.

Add/Edit Backup Job

Backups can be scheduled for immediate, daily or weekly execution. Also, make sure that the system time of the TeraStation is correct so that Backup Jobs execute at the right time.

Encrypted Transmission

Backups that travel over a network can be encrypted to prevent intercepted data during transmission to be usable by another source. Encrypted backups can be expected to take a bit longer to complete. Encrypted transmission should not be used when backing up to a locally attached USB drive.

Compressed Transfer

When backing up to another network location, it is often best to compress the transfer to allow the backed up data to be transmitted quicker. Compressed Transfers should not be used when backup up to a locally attached USB drive.

Overwrite Backup

Backups can be configured to overwrite the previous backup job data. This should only be enabled when archived data holds no value over up to date backups.

Differential Backups

A differential backup contains all files that have changed since the last FULL backup. The advantage of a differential backup is that it shortens restore time compared to a full backup.

Backup Target Folder

Source Backup Shared Folder Destination Backup Shared Folder

Choose a source and destination folder for backup and click Select

Music BACKUPTERA@Backups

Select Remove

TeraStation List

Name	IP Address	Backup Support	Disk Sleep
BACKUPTERA	192.168.11.150	Support	Not Configured
TERA1	192.168.11.151	Support	Not Configured

Refresh

FILE | F11 | CTRL+SHIFT | 192.168.11.150-2 | 192.168.11.150-2 | 76 GB | 45

Add Remote Off-Subnet TeraStation

Remote TeraStation IP Address Add to List

TeraStation IP Address

No Remote TeraStations Identified

Remove from List

Backup Target Folder

The backup source directory and destination directory should be selected from the drop-down list boxes.

TeraStation List

If additional TeraStations are located on the network, the TeraStation will attempt to detect them and verify if they are potential backup partners. Vital items like whether the TeraStation has Shared Folders designated as backup targets and whether Disk Sleep is enabled will be displayed.

Add Remote TeraStation

If a TeraStation is reachable on a separate subnet, it can be manually added as a backup partner. The TeraStation IP Address should be used rather than the Hostname.

Maintenance

Mail Notification

Mail Notification Enable Disable

SMTP Server Address [Text Box]

Subject [Text Box] Default

Recipient Mail Address 1 [Text Box]

Recipient Mail Address 2 [Text Box]

Recipient Mail Address 3 [Text Box]

Recipient Mail Address 4 [Text Box]

Recipient Mail Address 5 [Text Box]

Apply Send Test Message

Mail Notification

To receive emails from the TeraStation about local activity, backup status and emergencies, fill out the Mail Notification form.

When the information is entered, use the Send Test Message button to ensure that the information is entered correctly. It may be necessary to configure your SMTP Server to allow the message to pass through. The SMTP address should be entered by its IP Address.

UPS Power Properties

Synchronize with UPS Enable Disable

UPS Automatic Shutdown Enable Disable

Apply

UPS Power Properties

The TeraStation can be attached to a UPS power supply to allow a safe shutdown in the event of a power outage. Configuration of the UPS may be needed. Please consult the documentation included with your UPS for further instruction.

▸ Disk Sleep Scheduling

Disk Sleep Enable Disable

Disk Sleep Time 0 Hour 00 Minute

Disk Wake Up Time 12 Hour 00 Minute

Disk Sleep Scheduling

The TeraStation can be scheduled to enter and wake up from a sleep time. Enabling sleep time will increase the lifespan of your hard drives.

If Disk Sleep is enabled though, backups can not be performed. Also, large moves of data should be avoided when a Disk Sleep time is approaching to prevent data loss.

Note: Some USB drives support automatic power down/wake up. This feature will also increase the lifespan of your USB hard drives when they are attached to the TeraStation. Buffalo DriveStations offer this feature. More information is available about our USB Hard Drives at www.buffalo-technology.com.

▸ Shutdown

Shutdown TeraStation

Shutdown

The TeraStation can be shutdown via the browser interface when using the power button on the front of the device is not possible. To restart the device, the power button will need to be pressed.

2

▸ INIT Button Option

Admin Password Reset Remain

INIT Button Option

If you want to keep current admin password when someone initialises TeraStation by INIT button then use this option

▸ Restore TeraStation Configurations to Factory Defaults

Restore Defaults

Restore Factory Defaults

When Factory Defaults are restored, the following configurations are affected: TeraStation Hostname, TeraStation Description, NTP Settings, Workgroup Setting, Access Restrictions, User Settings, Group Settings, Mail Notifications, UPS Settings, Disk Sleep, Disk Backup and the Admin Password.

System Status

System Information

TeraStation Name	TFRA1
TeraStation Description	TeraStation
Firmware Version	1.03
Current Date and Time	2005/12/14 2:24
Time Zone	GMT+06:00
Windows Network Workgroup / Domain Name	WORKGROUP
AppleTalk Function	Enabled
AppleShare Network Zone Settings	
FTP Server Function	Enabled
NTP Function	Disabled
Disk Sleep Function	Disabled
Email Alert Notification	Disabled
Fan Status	Normal (64 RPM)

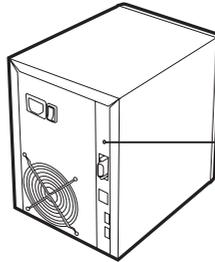
System Status Pages

The pages under System Status will provide status information about the different parts of your TeraStation. Some of the information available for display is basic system status, USB status, internal drive status, network performance and user access.

Restoring Factory Defaults

Using the INIT Button

To restore factory defaults, the INIT button (red, recessed button on rear of TeraStation) can be used. However, this initialisation resets only Administrator password, Ethernet Frame Size and IP Address.



INIT Button

By using a thin pen or pin, and depressing the INIT button, the restore factory defaults process can be manually launched.

Note: When Factory Default are restored from the browser management interface, the following configurations are affected: TeraStation Hostname, TeraStation Description, NTP Settings, Workgroup Settings, Access Restrictions, User Settings, Group Settings, Mail Notifications, UPS Settings, Disk Sleep, Disk Backup and the Admin Password. Once factory defaults are restored, there is not a path to recover previous configurations.

Defaults and Internal Drives

Factory Default Settings

TeraStation comes with the following default settings:

- Administrator Username: admin
- Administrator Password: password
- Shared Folder: share
 - Accessible
 - Recycle Bin not enabled
- DHCP Client enabled
 - IP Address acquired automatically if DHCP Server is available
 - If DHCP Server is unavailable, IP Address settings fallback by default to:
IP Address 192.168.11.150
Subnet Mask 255.255.255.0
- Groups
 - Default Group: hdusers
- Microsoft Windows Workgroup: WORKGROUP
- Ethernet Frame Size: 1518 bytes
- FTP Server not enabled
- Local System Time:
November 1, 2004
- NTP Client not enabled
- Print Server: Enabled
- Disk Mode: RAID5 Mode

Protecting the RAID Array

To protect data when an error occurs in a RAID1 or RAID 5 Array, follow the steps below.

- 1 Reference Page 12 for instructions on entering the Browser Management interface.
- 2 Click Disk Management and then RAID Configuration



- 3
1. Enable Automatic Shutdown under RAID Array Error Detection Response.
2. Click Apply

The configuration changes will be saved.

Should a Hard Drive Fail

3

When using RAID1 or RAID5

If Automatic Shutdown is enabled as shown above, TeraStation will automatically shutdown should a hard drive fail in a RAID1 or RAID5 array.

The failed drive will have a red light blinking in the STATUS/FULL position of the front display. Should the TeraStation shutdown and you need to know which hard drive has failed, power the unit on and watch which Disk Status LED illuminates as a red light. Make note of the drive number and proceed to Page 26 to replace the drive.

When using Standard Mode

The failed drive will have a red light blinking in the STATUS/FULL position of the front display. To see which drive has failed in a shutdown TeraStation, power the unit on and watch which LED illuminates red. Make note of the drive number and proceed to Page 26 to replace the drive.

When using Spanning Mode

All drives will have a red light blinking in the STATUS/FULL position of the front display. Data recovery is not possible by replacing a drive. Please reference the warranty and contact information in the warranty card.

Replacing a Hard Drive

If a drive has a STATUS/FULL LED blinking red, make note of the drive number and carefully follow the procedure below.

Please find a clean work area to replace the hard drive. Keep each screw that is removed in a safe place to aid in reassembly. **Do not remove any screws or parts that are not removed in the instructions below.** Failure to heed this warning could lead to unsafe operation or damage to the product.

To reassemble the TeraStation, follow the instructions below in reverse order.

Note: The TeraStation is a sensitive piece of equipment. Please be gentle with the product to prevent damage. TeraStation weighs approximately 7.2Kg. Dropping the equipment could cause bodily harm. Some interior edges have sharp metal pieces, to prevent any cuts or abrasions, work carefully when accessing the internal areas of the TeraStation. Because the process of replacing a hard drive and any damage that may be inflicted on the TeraStation or yourself is beyond the scope of the warranty or responsibility of Buffalo, please work very carefully and acknowledge these two important items before beginning this process.

Note: Please work in a static free environment that is clear of any magnets. Static electricity and magnets can damage the TeraStation and the internal drives.

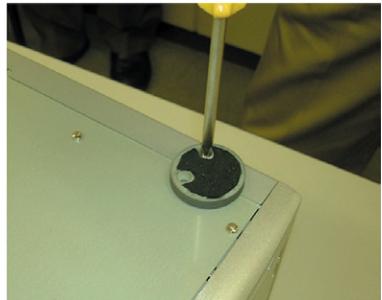
- 1 Remove all cables and place the unit on its top, exposing the four rubber feet.

Be sure to power off the unit before removing the power cable. Place the unit on a flat, dry surface clear of clutter.



- 2 Remove the rubber feet. Each foot is held in place by one screw.

Note: To ease the reattachment of the rubber feet, note the position of the feet and how they are removed.

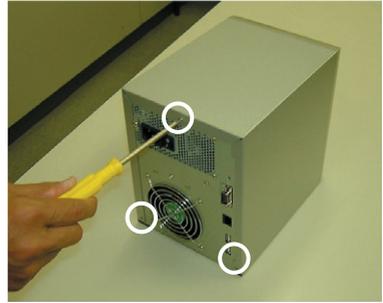


M3 Screw 6mm

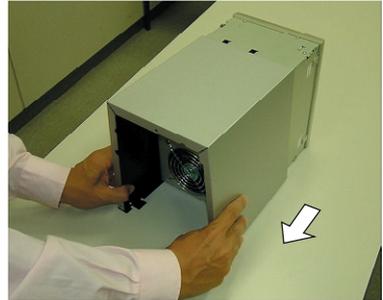
- 3 Place the unit on its bottom. Remove the 3 screws from the rear panel as indicated.



M3 Screw 4mm



- 4 Carefully remove the cover by pulling it towards the rear of the TeraStation.



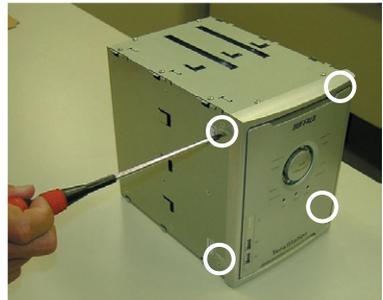
3

- 5 Remove the front panel by removing the 4 screws indicated.

Note: When reattaching the front panel after the drive is replaced, be careful not to tighten the screws too tightly to prevent the plastic from breaking.

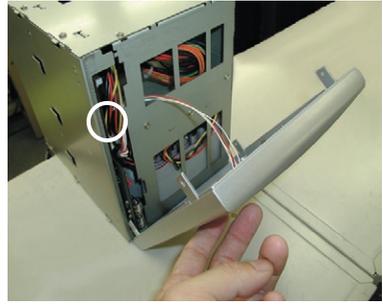


M2.5 Screw 4mm



- 6 Remove the LED cable.
The LED should be detached at the same point as is circled in the picture.

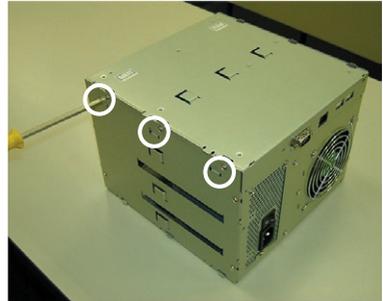
Note: When reattaching the LED cable, be sure to pull it through the same path as shown in the picture.



- 7 Lay the unit on it's side. Remove the 3 screws from the side panel



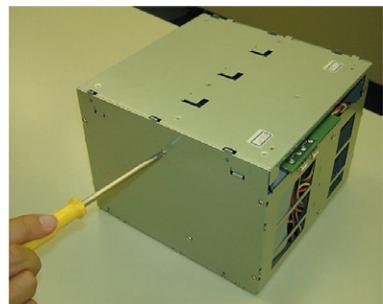
M3 Screw 4mm



- 8 Remove the indicated screw from the base panel.

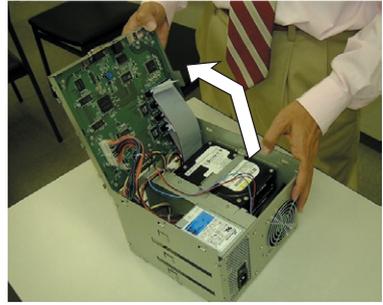


M3 Screw 4mm



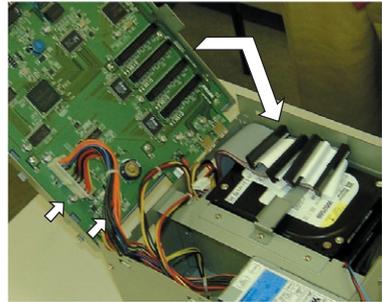
- 9 The side panel can be opened towards the front of the TeraStation.

Note: Use care not to detach any cables while opening the side panel to prevent damage to the mainboard.



- 10 Remove the power and hard drive cables from the mainboard.

Once the cables are carefully removed, the main board can be placed safely to the side.

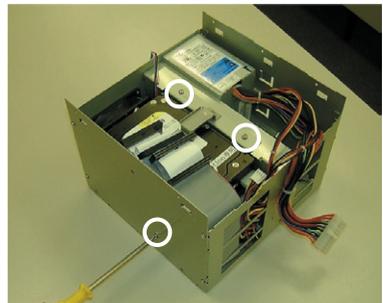


3

- 11 Remove the three screws as indicated from the hard drive chassis.

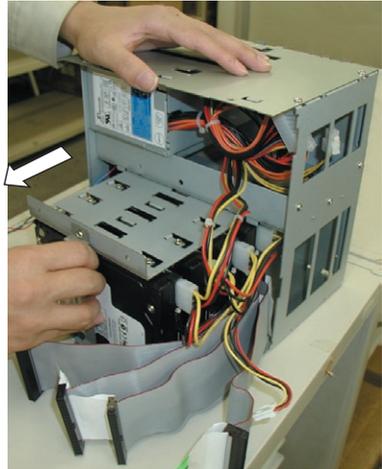


M3 Screw 4mm



12 Place the TeraStation on its base and slide out the hard drive chassis.

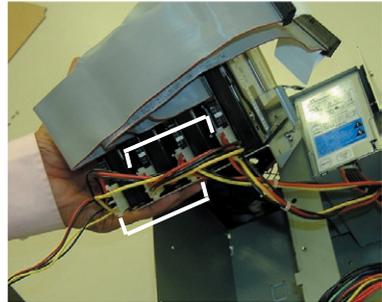
Note: While sliding out the chassis, make sure to not bend any cables or put excessive pressure on any cables that are attached to prevent any damage.



13 Remove the power cord attached to the hard drives.

All power cables should be removed from all four hard drives.

Note: There are two power cables coming from the power supply that each split into two separate connectors to the hard drives.



14 Remove the screws as indicated from the hard drive that is to be replaced.

The hard drive chassis has a number for each drive that corresponds to the drive number on the front display.



4mm X 4

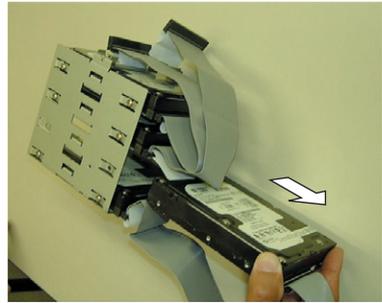


Note: Be sure to remove the correct hard drive to avoid having to redo this process.

15 Remove the failed hard drive from the chassis.

Pulling slowly and gently wiggling from side to side should allow the drive to slide out easily.

Detach the grey IDE cable from the drive.



16 Install the replacement hard drive.

Firmly attach the grey IDE cable. Be sure to correctly align the pins.

Note: The new hard drive should be set as MASTER. If necessary refer to your user manual that came with the hard drive.



3

17 To reassemble the TeraStation, perform the disassembly steps in reverse. As before, use patience and handle the equipment gently.

18 Reconnect the cables and power on the TeraStation.

19 Login to the Browser Manager as shown on page 10.

20 Click the error link on the first page of the management interface.

21 Follow the steps shown in the manager to rebuild the RAID Array.

The TeraStation should now be back in the state it was in prior to the hard drive failure.

