

User Manual
Rackmount TeraStation Pro
TS-RHTGL/R5

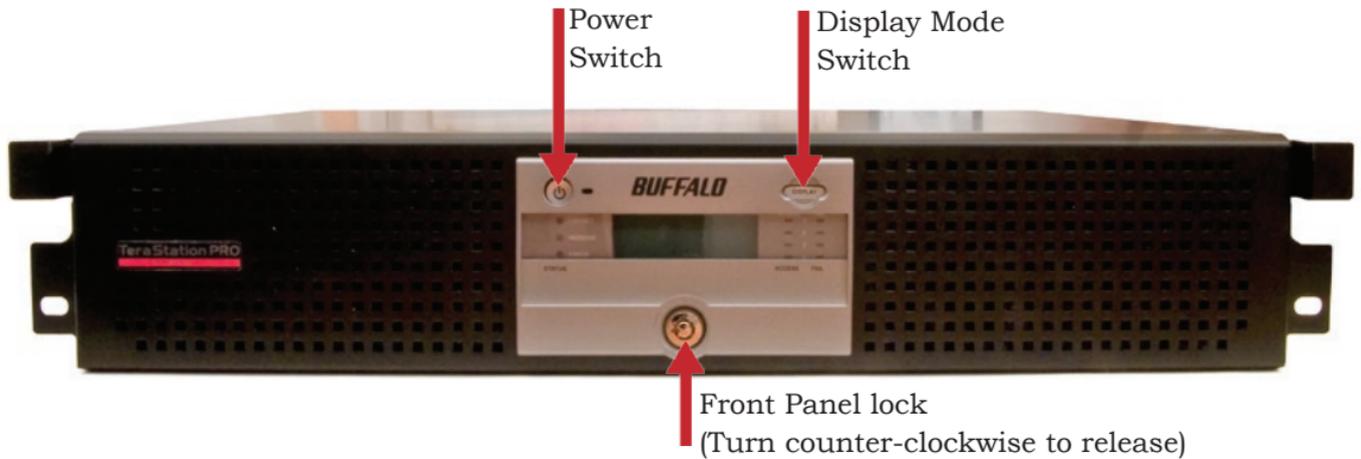


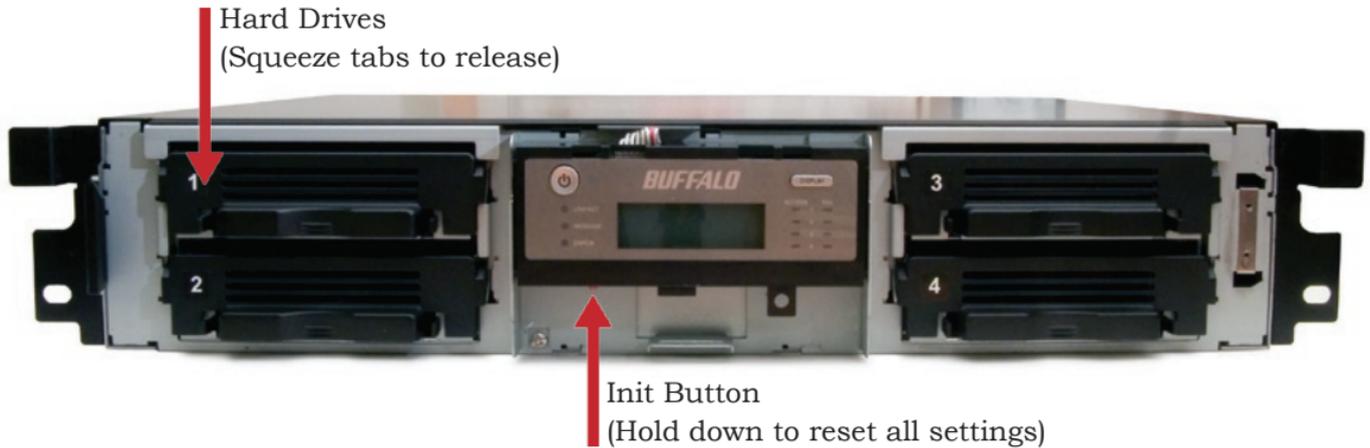
Congratulations on your new TeraStation! Your TeraStation Pro is a powerful file server that's as easy to use as a hard drive. With its straightforward configuration GUI, anyone can easily configure the TeraStation's settings. You don't even necessarily need to configure it at all; right out of the box it's ready to be plugged in and put to work. But the TeraStation remains a fast, reliable Linux-based server, with four hard drives that may be configured in RAID 0, RAID 1, RAID 5, or RAID 10 arrays. It also includes SAMBA 3.0, allowing it to join Active Directory domains, download users, passwords, and groups, and keep them up to date. This user manual is intended to assist you in configuring your new TeraStation.

Because we're constantly updating our product, the images and text in this manual may vary slightly from the images and text displayed by your TeraStation. These changes are minor and should not affect the ease of setup adversely. As time passes, future user interfaces, updated software, and later versions of this manual may be freely available for download at our web site: *www.buffalotech.com*.

If you run into difficulties or need additional help, feel free to contact our technical support. Contact information for Buffalo Technology and our technical support is available on pages 73 and 74.

| | |
|--|----|
| TeraStation Layout..... | 4 |
| Installation | 7 |
| Accessing TeraStation Data from a PC..... | 10 |
| Accessing TeraStation Data from a Mac..... | 14 |
| TeraStation Expansion | 18 |
| Advanced Settings..... | 19 |
| Network Settings..... | 23 |
| Hard Drive Settings..... | 25 |
| Adding Extra Hard Drives | 31 |
| Shared Folders..... | 37 |
| Groups | 41 |
| Users | 42 |
| Troubleshooting Multiple Shares..... | 44 |
| Backups | 46 |
| Maintenance Settings..... | 50 |
| UPS Settings..... | 51 |
| System Information..... | 58 |
| Client Utility | 63 |
| Troubleshooting..... | 65 |
| Changing Hard Drives..... | 67 |
| Technical Specifications | 72 |
| Technical Support..... | 73 |
| GPL Information | 75 |



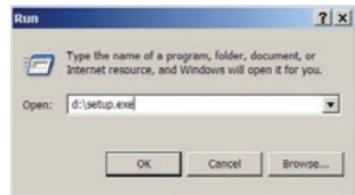




Begin by connecting your TeraStation's power and Ethernet cables. For best results, the Ethernet cable should be connected to a router, hub, or switch on your network. Turn the TeraStation on by pushing the power button on the front panel. It will take about a minute to boot.

Insert the TeraNavigator CD into your computer's CD-ROM drive.

On a PC, setup should automatically launch. If it does not, manually launch `setup.exe` by pressing *Start* and selecting the *Run...* option. When the *Run* dialog opens, type **d:\TSnavi.exe** (where d is the drive letter of your CD-ROM drive). Press *OK* to continue.



If you are installing the software on a Mac, open the CD and click *TeraNavigator* to begin installation.





Press the *Begin Installation* button to begin.

If you're installing on a PC, click on *Easy Installation* (the pink, upper button). Mac users can skip this step.

Click *Next* to step through the installation.





Follow the steps shown and continue pressing *Next* to step through the installation.

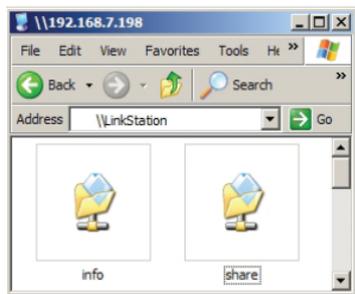
When installation is complete, click *Finish*.



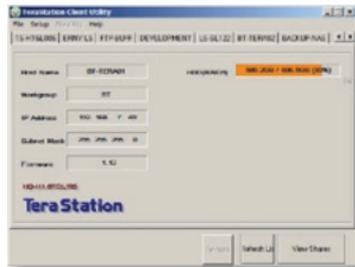
Using your TeraStation with a Windows PC



Two new icons will be on your desktop: *Shortcut for TS-TeraStation_name* and *Buffalo NAS Navigator*.



Clicking *Shortcut for TS-TeraStation_name* takes you directly to the folders on your TeraStation. *Share* is the main folder that you can put files and folders in. *Info* contains a copy of your user manual.

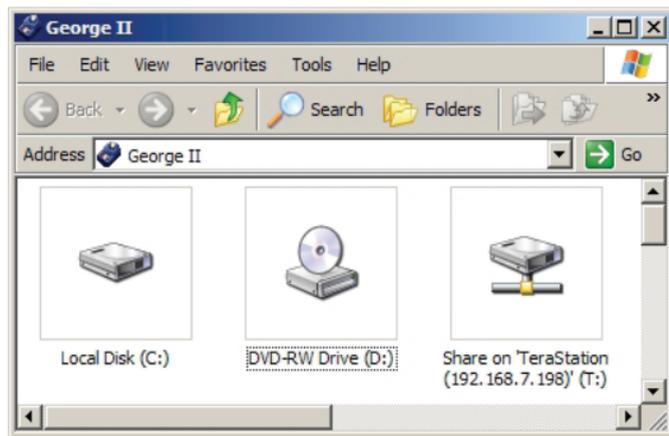
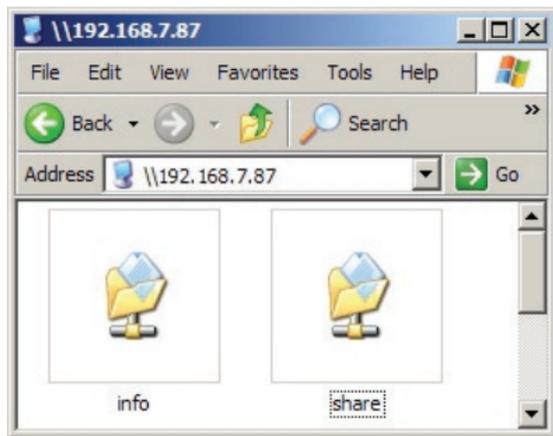


The *Buffalo NAS Navigator* icon opens the TeraStation's client utility. Turn to page 59 for more on using the NAS Navigator client utility.

Accessing TeraStation Data from your PC

To Access TeraStation Data from a PC:

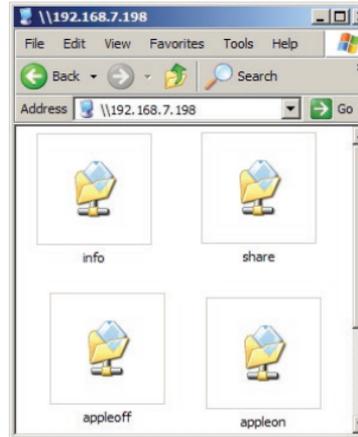
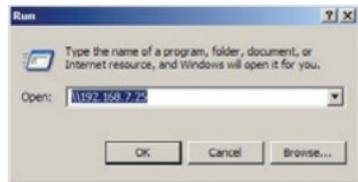
Your TeraStation uses “shares” (folders) to hold data. A share called “share” is already configured on your TeraStation, and you can create additional shares on page 37. To start using your TeraStation, you can either click on the *Shortcut for TeraStation* on your desktop, or you may just use *drive T* in My Computer, which setup has mapped to the default share in your TeraStation.



Accessing TeraStation Data from your PC

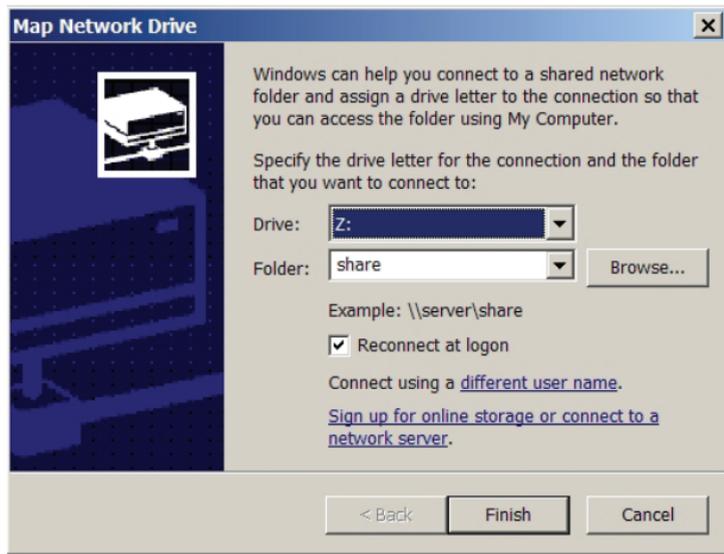
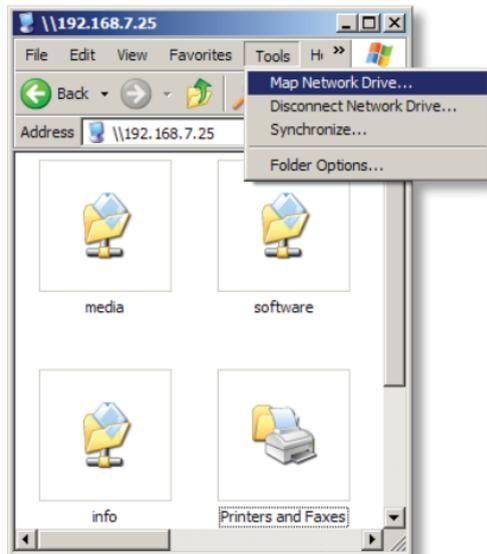
You can map additional drive letters to shares on your TeraStation. From the *Start* menu, select *Run....* Enter your TeraStation's hostname (you can get it from the NAS Navigator utility) or IP address. Press *OK*.

Your TeraStation should open. "Share" is a data folder in your TeraStation by default. "Info" contains your user manuals. If you have created other folders, they will be visible here too. You can map drive letters to any of these folders.



Accessing TeraStation Data from your PC

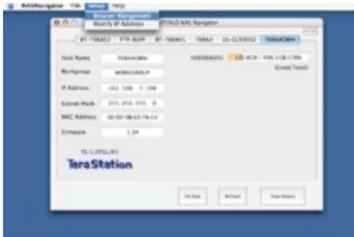
From the *Tools* pull-down menu, select *Map Network Drive*. Choose a drive letter from the *Drive:* pull down menu. To specify the folder to map, either find it with *Browse* or enter **\\TeraStation_Name\share_name** in the *Folder:* field, where *TeraStation_Name* is your TeraStation's hostname and *share_name* is the name of a folder on your TeraStation. Check the *Reconnect at logon* checkbox to have Windows connect to this mapped drive everytime it starts. When finished, press the *Finish* button. Your share is now mapped to a drive letter.



Using your TeraStation with a Mac



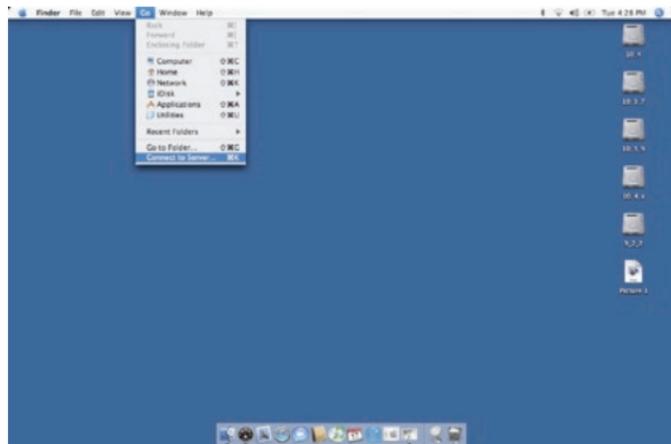
After installing the TeraNavigator software, your Mac will have a *NAS Navigator* icon on the desktop.



Clicking the *NAS Navigator* icon opens the TeraStation's client utility.

Accessing TeraStation Data from a Mac

You can add a link from your TeraStation's Shares (folders) to your desktop by adding them to the Mac's server list. Begin by clicking *Go*, and then choose *Connect to Server*.



In the *Server Address* field, enter your TeraStation's IP address in the form *smb://ipaddress* (where "ipaddress" is your TeraStation's IP address), and click *Connect*.

If you don't know your TeraStation's IP address, see page 17.

Accessing TeraStation Data from a Mac

Select *Guest* and click on *Connect*. Note: If you have configured share permissions on your TeraStation, select *Registered User* and enter your Registered User credentials.



Select the volume that you want to mount, such as *share* or *share-mac*, from the list of folders on the TeraStation.



The share will open. A link to the shared folder will appear on your desktop.



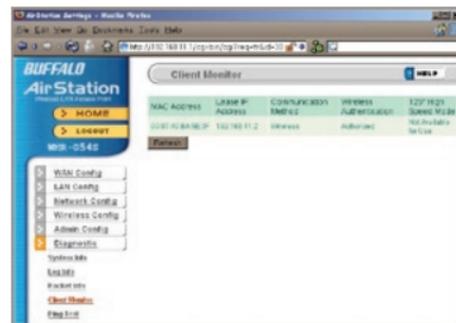
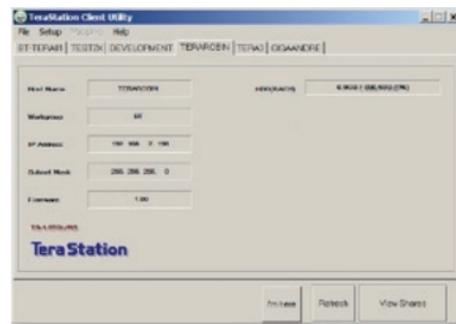
Accessing TeraStation Data from a Mac

If you don't know your TeraStation's IP address, there are several ways to get it.

One simple method is to use the NAS Navigator client utility (included on your CD) to find your TeraStation(s). Just click on the tab for your TeraStation and you'll be able to read its IP address.

You can get the TeraStation's IP address from the LCD display on the front of the TeraStation as it boots up.

You can always get the TeraStation's IP address from your router's configuration utility. Many Buffalo routers list this information on the *Client Monitor* page, as shown to the right. Consult your router's documentation for instructions on identifying the TeraStation's IP address.



TeraStation Pro has two USB 2.0 ports on the rear. These ports can be used for adding external USB Hard Drives or UPS systems. TeraStation will share connected USB storage devices, allowing everyone on the network to use them. Up to two external USB hard drives may be added to TeraStation Pro. To connect a USB hard drive or UPS to TeraStation, simply plug it into one of the USB Ports.

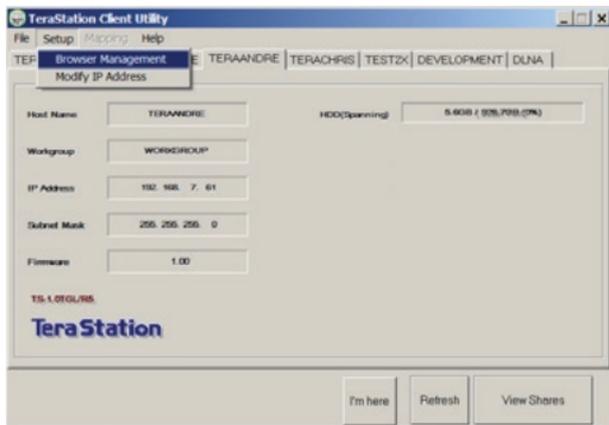
You may plug in additional USB hard drives to either of the USB ports on your TeraStation. See page 31 for setting up your USB hard drive on the TeraStation. Page 46 shows you how to set up TeraStation to backup to a USB Hard Drive.

See page 51 for more information on using the TeraStation with a UPS.

The Configuration GUI



The Configuration GUI may be accessed at any time by typing the IP address of your TeraStation into the URL bar of a browser running on a computer connected to the same network as the TeraStation. This works perfectly with OS X, Linux, and other non-Windows PCs.



You may also open the Configuration GUI from NAS Navigator by clicking on *Setup* and choosing *Configuration Settings*.

This login prompt will appear. Enter **admin** for the user name. Until you change it, the password for the admin account will be **password**. Press the *OK* button when finished.



User name: *admin*

Password: *password*

See page 43 to change your password.

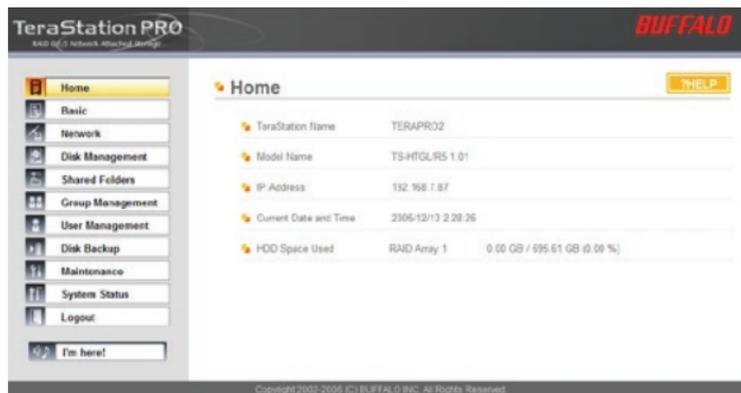
If this login prompt does not appear, your DHCP server may not be functioning correctly. If DHCP is disabled, you may re-enable it, or verify

that the TeraStation's IP Address is in the same range as that of your PC.

Note: Pages 63 and 64 describe how to configure the TeraStation with a Static IP Address.

Welcome to the configuration GUI for the TeraStation! Bookmark this page in your browser so it can be easily accessed for future configuration changes. If the TeraStation's IP Address changes, you will need to recreate the link. You can also get here by typing `http://TeraStation_Name` into a Web browser, where TeraStation_Name is the name of your TeraStation.

You are now at *Home*. Notice that the *Home* button is lit up in yellow. You can navigate this menu by clicking on the buttons at the left of the screen. Here at "Home", you can see basic information about your TeraStation's current configuration. You may close this screen by clicking *Logout* at the bottom left, or just by closing the browser window. If you have lost your TeraStation, clicking *I'm here!* at the bottom left will cause it to beep, making it easier to find.



The screenshot displays the TeraStation PRO configuration interface. The top left corner shows the product name "TeraStation PRO" and the Buffalo logo. A vertical sidebar on the left contains navigation buttons: Home (highlighted in yellow), Basic, Network, Disk Management, Shared Folders, Group Management, User Management, Disk Backup, Maintenance, System Status, Logout, and "I'm here!". The main content area is titled "Home" and features a "HELP" button. It lists the following configuration details:

| | |
|-----------------------|--|
| TeraStation Name | TERAPRO2 |
| Model Name | TS-HTGLRS 1.01 |
| IP Address | 192.168.1.87 |
| Current Date and Time | 2006/12/13 2:28:26 |
| HDD Space Used | RAID Array 1: 0.00 GB / 995.61 GB (0.00 %) |

At the bottom of the interface, a copyright notice reads: "Copyright 2002-2006 (C) BUFFALO INC. All Rights Reserved."

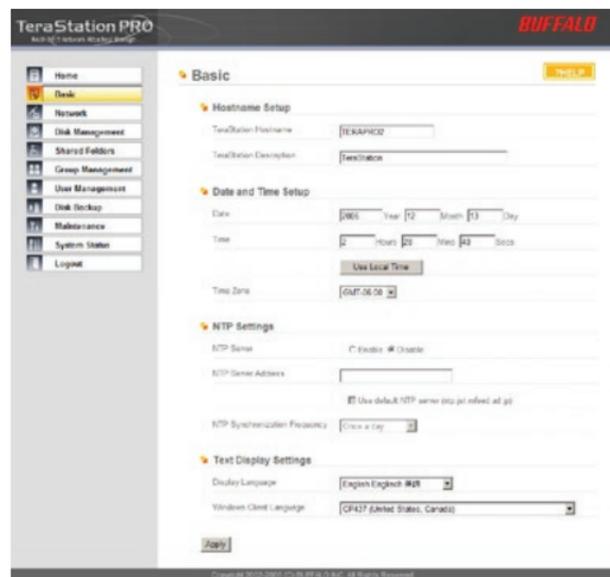
Basic

You may modify your TeraStation's hostname and description under *Hostname Setup*. A friendly, easy-to-remember name (e.g. "TeraStation") is recommended.

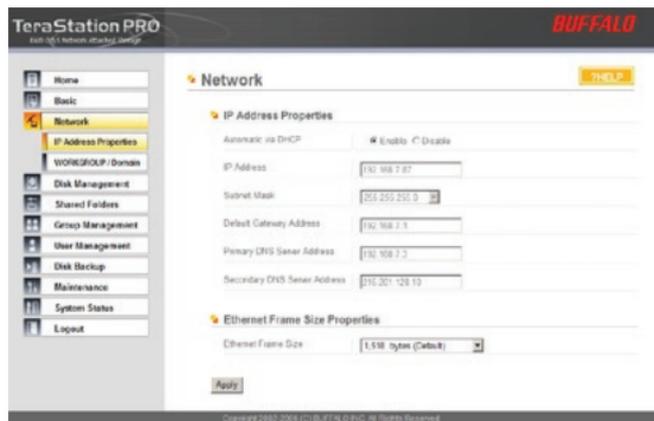
Make sure that the date and time are correct in *Date and Time Setup*. To synchronize time settings with those in your computer, press *Use Local Time*. To have your system time automatically set by an NTP server, enable *NTP Server* and enter an IP Address for the NTP server (e.g. 192.43.244.18) or use the supplied default NTP server.

Ensure that both the *Display Language* and the *Windows Client Language* are set to languages that you're comfortable with.

Once desired fields have been completed, press the *Apply* button.



Network (IP Address Properties)

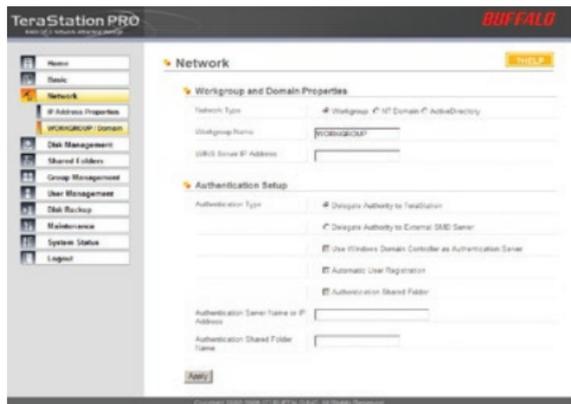


In most networks, TeraStation will get its IP Address automatically from a DHCP server. You may disable DHCP here. If DHCP is disabled and an IP Address is not set manually, it will default to *192.168.11.150*. The TeraStation's *IP Address*, *Subnet Mask*, *Default Gateway Address*, and *DNS Server address* may all be entered manually under *IP Address Properties*.

Ethernet Frame Size may also be set manually on this page. Only use JumboFrame settings when operating in a Gigabit environment where all other clients support the same JumboFrame setting.

Click *Apply* after making any changes.

Network (Workgroup/Domain)



If you are unfamiliar with Domain/Active Directory networking, then please leave the *Network Type* selected as *Workgroup* and *Workgroup Name* set to *Workgroup*.

To make your TeraStation a member of a workgroup or domain, enter the appropriate information into the fields on this page and click *Apply*. Do not select *Domain* unless you have a Windows Server Domain Controller on your network. Please leave the network type selected as *Workgroup* unless you are a network administrator or have been instructed to do so by one.

NOTE: If using *Domain*, TeraStation must be added as a member computer in the Domain Server.

Domain & Active Directory Authentication integrates the TeraStation Pro with Windows Domain and Active Directory Servers. The TeraStation Pro participates as a member device in the Domain and Active Directory networks, allowing the TeraStation to use Users and Groups that reside on the Domain or Active Directory System and update them automatically. If Active Directory is used, then FTP access to the TeraStation will be automatically disabled. To configure the TeraStation Pro on an Active Directory network, you must have the Domain Administrator login credentials. In an NT Domain environment, select NT Domain as the Network Type. Enter the Domain Name and Domain Controller into the appropriate fields. In an Active Directory environment, check the Active Directory Domain checkbox and fill in the fields. The Authentication Setup fields will be automatically filled out, so no input is needed there. Once you have finished, press *Apply*.

Disk Management (Drive Properties)

This page shows the current properties of your hard drives and RAID Arrays. To change these settings, click on *RAID Setup* at left.

TeraStation PRO **BUFFALO**

Disk Management

RAID Array Information

| RAID Array | Status | Mode |
|--------------|-----------------|-------------------------------|
| RAID Array 1 | Normal | Normal |
| | RAID Mode | RAID5 |
| | Drive Structure | Drive 1, 2, 3, 4 |
| | Total Capacity | 179,388,192 Bytes (168.41 GB) |
| | Amount Used | 0 Bytes (0.00 GB) |
| | Percent Used | 0.00% |
| | File Format | NTFS |
| RAID Array 2 | Status | Not Configured |

Disk Information

| Disk | Status | RAID Array |
|--------|----------------|-------------------------------|
| Disk 1 | Normal | RAID Array 1 |
| | Serial Name | WDCWD19L-20NC2B1 |
| | Total Capacity | 244,198,184 Bytes (230.49 GB) |
| Disk 2 | Normal | RAID Array 1 |
| | Serial Name | WDCWD19L-20NC2B1 |
| | Total Capacity | 244,198,184 Bytes (230.49 GB) |
| Disk 3 | Normal | RAID Array 1 |
| | Serial Name | WDCWD19L-20NC2B1 |
| | Total Capacity | 244,198,184 Bytes (230.49 GB) |
| Disk 4 | Normal | RAID Array 1 |
| | Serial Name | WDCWD19L-20NC2B1 |
| | Total Capacity | 244,198,184 Bytes (230.49 GB) |

USB Disk Information

| USB Disk | Manufacturer | Model |
|------------|--------------------|-----------------|
| USB Disk 1 | SanDiskCorporation | SDFPLD |
| | Model Name | USB Flash Drive |
| | Serial Name | USB Flash Drive |
| | Total Capacity | Not Detected |
| | File Format | Not Detected |
| USB Disk 2 | Status | Not Detected |

TeraStation uses *RAID* (“Redundant Array of Independent Disks”) technology to control the four hard drives in your TeraStation. RAID may be configured several ways:

RAID 0 - All four drives are combined into one large, fast drive, giving the maximum capacity for your TeraStation. This size is the one listed on your TeraStation’s box and shows the total capacity of the TeraStation with no data used for redundancy. RAID Spanning is fast and efficient, but with no redundancy, if one hard drive fails, all data on the TeraStation is lost.

RAID 1 (mirroring) - Hard drives are arranged in mirrored pairs. Each half of the pair reads and writes exactly the same data. This costs you half the total capacity of the array, but provides excellent redundancy. If a hard drive fails, the mirror continues to supply data, so you may work on normally. You may replace the damaged or defective drive at any time, and normal RAID 1 mirroring will then be automatically restored.

RAID 5 (parity) - All drives in a RAID 5 array reserve part of their data space for parity information, allowing all data to be recovered if a single drive fails. The parity information takes up about one hard drive’s worth of space, so if you set up all four drives in the TeraStation as a RAID 5 array, your usable capacity will be about 3/4 of the total capacity of the TeraStation. This is how your TeraStation is set up out of the box.

RAID 10 - Combines RAID 1 and RAID 0 for a fast, secure array. Half of the TeraStation’s total capacity is used for redundant information.

Buffalo Technology recommends *RAID 5* for its excellent balance of efficiency and security.

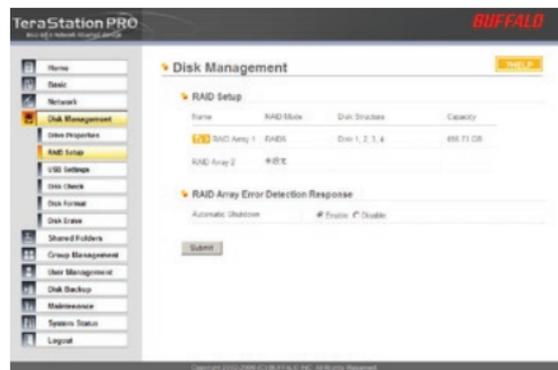
Disk Management (RAID Setup)

This page shows your current RAID arrays. You may delete old arrays or create new ones by clicking on the underlined *RAID Array #* under *RAID Array Configuration*.

The *RAID Scanning Settings* set a specific time for the TeraStation to scan and inspect its RAID arrays. It is recommended to set a time where the TeraStations usage will be minimal (perhaps the middle of the night). TeraStation will be significantly slower while the RAID scan occurs. *Begin Immediate RAID Scan* specifies the TeraStation to run a RAID Scan immediately.

You may also disable *RAID Array Error Detection Response* from this page. Normally, this is set to automatically shut down the RAID array when an error is detected. Though it is not recommended, you may disable that behavior by selecting *Disable*.

NOTE: TeraStation has four internal hard drives. Before creating a new RAID array, you may have to delete one or more pre-existing RAID Arrays to clear up the hard drives for your new one. This will destroy all data currently on the disks, so back up any important data before deleting RAID arrays. Whether you want to clear out an old array or create a new one, begin by clicking on the array's underlined *RAID Array #*, under *Name*.



Disk Management (RAID Configuration)

A configured RAID array may be deleted by pushing the *Delete RAID Array* button. This will free up all hard drives listed under Disk Structure.



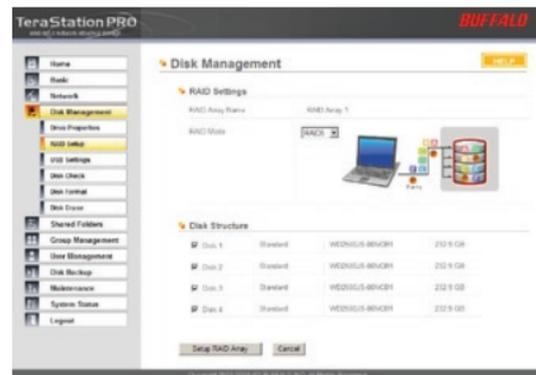
You will need to enter a confirmation number from the screen before the RAID array will be deleted.



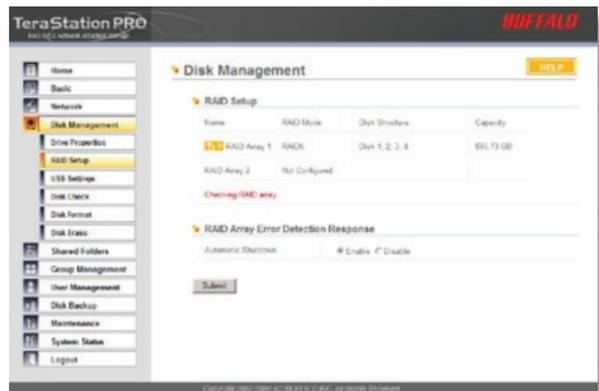
To configure an unconfigured array, begin by double clicking on the array you want to configure, e.g. “RAID Array 1”.



Choose your RAID mode under *RAID Settings* and put checks next to the hard disks you want included in the array under *Disk Structure*. Click *Setup RAID Array* when ready. It may take several minutes to complete setting up the RAID array. When it's finished, a Disk Check will run.



Disk Management (Disk Check)



When RAID Configuration is done, a disk check will run automatically. This may take several hours to complete. Performance of the TeraStation will be slower than normal while the disk check is running.

Disk Management (RAID Configuration)

The screenshot shows the TeraStation PRO web interface for RAID configuration. The left sidebar contains a navigation menu with options: Home, Basic, Network, Disk Management (highlighted), Drive Properties, RAID Setup (highlighted), USB Settings, Disk Check, Disk Format, Disk Erase, Shared Folders, Group Management, User Management, Disk Backup, Maintenance, System Status, and Logout. The main content area is titled "Disk Management" and includes a "HELP" button. Under "RAID Setup", there is a table with columns for Name, RAID Mode, Disk Structure, and Capacity. The table shows "RAID Array 1" configured as RAID5 using disks 1, 2, 3, and 4, with a capacity of 695.73 GB. "RAID Array 2" is currently unconfigured. Below the table, the "RAID Array Error Detection Response" section has an "Automatic Shutdown" option with radio buttons for "Enable" (selected) and "Disable". A "Submit" button is located at the bottom of the configuration area.

| Name | RAID Mode | Disk Structure | Capacity |
|--------------|-----------|-----------------|-----------|
| RAID Array 1 | RAID5 | Disk 1, 2, 3, 4 | 695.73 GB |
| RAID Array 2 | 未設定 | | |

You'll see this screen when your new RAID Array is completely configured. Click on *Shared Folders* and turn to page 37 to begin setting up shares on your TeraStation.

Disk Management (USB Settings)

If you've plugged an external USB hard drive into one of the USB ports on your TeraStation, you may set it up from this page. Click on its name under *USB Disk Setup* to begin.

The screenshot shows the TeraStation PRO web interface. The left sidebar contains a navigation menu with the following items: Home, Basic, Network, Disk Management (highlighted), Drive Properties, RAID Setup, USB Settings (highlighted), Disk Check, Disk Format, Disk Erase, Shared Folders, Group Management, User Management, Disk Backup, Maintenance, System Status, and Logout. The main content area is titled "Disk Management" and includes a "HELP" button. Underneath, there is a "USB Disk Setup" section with a table listing the disks.

| Name | Assigned Disk | Capacity |
|------------|------------------------------|-----------|
| USB Disk 1 | BUFFALO INC. USB-SATA Bridge | 232.82 GB |
| USB Disk 2 | Not Assigned | |

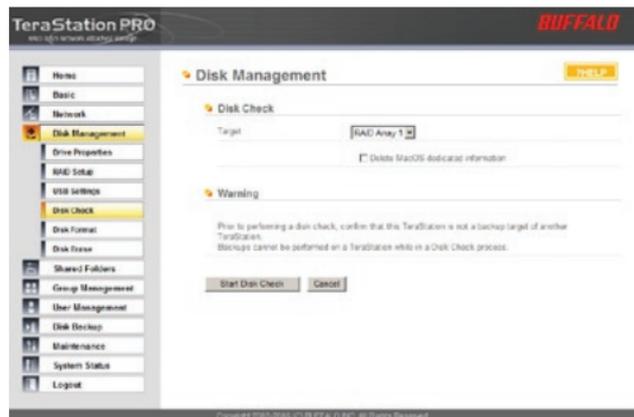
Copyright 2002-2006 (C) BUFFALO INC. All Rights Reserved.

Disk Management (USB hard drive setup)



From here you can see your USB hard drive's setup information. If the hard drive's information isn't displayed properly, try restarting your USB hard drive and then restarting your TeraStation. Some USB hard drives must be reformatted from within TeraStation before they can be assigned shares. Press *Format USB Disk*, or choose *Disk Format* from the left-side menu, to begin reformatting your USB hard disk. Turn to page 35 for more information on reformatting disks. Turn to page 36 to set up shares on your USB hard drives.

Disk Management (Disk Check)



To initiate a comprehensive disk check on a hard drive or array of drives, select the hard drive or array that you want to check from the *Target* dropbox and click the *Start Disk Check* button. Performance will be slower while the disk check is running.

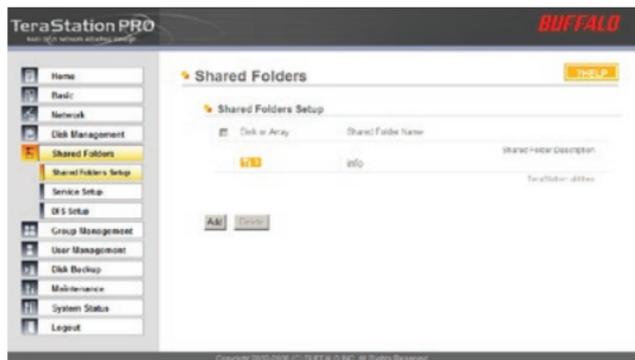
Disk Management (Disk Format)



To format a hard drive or array, select it from the *Target Disk* drop box. Choose the file system desired from the *File System* dropdown (internal drives can only be formatted with XFS). Note that FAT32 has a 2 gigabyte single file size limit. If you choose FAT32 for your file system, you will not be able to store single files larger than 2 gigabytes on the drive. Use of the *XFS* or *EXT3* file systems is recommended. Press *Select Target Disk* when done.

Depending on the size of the target hard disk or array, a Disk Format may take several hours to complete. Performance will be slow during the disk format.

Shared Folders



To add new shares to your TeraStation, select *Shared Folders* from the left side menu, and then click the *Add* button.

To delete a share or shares, check the checkbox next to the shares you'd like to delete, and press the *Delete* button. Deleting shares will remove the share and erase all of the files and folders inside that share.

Add a new Shared Folder

The screenshot shows the 'Shared Folders' configuration window in TeraStation PRO. The window has a sidebar on the left with navigation options: Home, Email, Network, Disk Management, Shared Folders (selected), Shared Folders Setup, Service Setup, NFS Setup, Group Management, User Management, Disk Backup, Maintenance, System Status, and Logout. The main area is titled 'Shared Folders' and contains a 'Add New Shared Folder' section. This section includes fields for 'Shared Folder Name' (containing 'share'), 'Shared Folder Description', 'Volume' (set to 'RAID Array 1'), 'Shared Folder Support' (with checkboxes for Windows, Apple, FTP, and Disk Backup), 'Shared Folder Attributes' (with radio buttons for Read Only, Read/Write, and Full Control Only (SMB)), 'Recycle Bin' (with radio buttons for Enable and Disable), 'File Operation Log' (with radio buttons for Enabled and Disabled), 'Remote Backup Password' (empty), and 'Offline File' (set to 'Disable Offline File'). Below this is an 'Access Restrictions' section with radio buttons for 'Access Restrictions' (Enabled/Disabled) and a grid for selecting groups and users. At the bottom are 'Apply' and 'Cancel' buttons. The footer of the window reads 'Copyright 2002-2010 © BUFFALO INC. All Rights Reserved'.

To add a new shared folder, enter a name for it in the *Shared Folder Name* box and choose the *Volume* it will reside in. You may also choose which operating systems and features the share will support by putting the appropriate checks next to *Shared Folder Support*, and whether the share supports the Recycle Bin by putting a selecting *Enable* or *Disable*. Enter a *Shared Folder Description* and a *Remote Backup Password* if desired. Click *Apply* to build the new shared folder.

Note: If AD is used on the TeraStation, FTP support will be disabled.

Checking “Apple” by *Shared Folder Support* enables Appletalk for legacy Macs. This gives you all of Appletalk’s limitations, including a 2GB maximum filesize and a 32 character limit for filenames. If a folder with AppleTalk enabled is accessed from a modern OS through SMB, these limitations will not apply.

Remote Backup Password will set a password on this share for other TeraStations who want to use it as a remote backup target. This password will not affect users attempting to access the share; it only pertains to remote TeraStations trying to access this share for backup tasks.

Shared Folders (Access restrictions)



To use *Access Restrictions* for a share, select *Enable*.

Highlight groups or users in the *All Groups/ Users* column and use the left-pointing arrow buttons (located just to the left of each box) to move individual groups or users from the *All Groups/Users* column to the *Read Only* box (if you want to give them read access only) or all the way to the *Writable* box, if you want to give them full access to the share. Right-pointing arrows will move highlighted users or groups back to the right.

Click *Apply* when you have your groups and users in the appropriate boxes.

To set up new groups and users, see pages 41 and 42.

Shared Folders (Service Setup)



To allow FTP Access to TeraStation, choose *Enable* for *FTP Server*. To enable legacy AppleTalk support, choose *Enable* for *AppleTalk Protocol*. FTP access will not be available if AD is in use.

FTP Server Info: Enabling the FTP Server will allow users to connect to shares via FTP protocol. Their username and password is used for their login credentials, and they will only have access to shares that have read-only or writeable access to on the TeraStation. The network administrator of your network may need to enable traffic on port 21 to the TeraStation for FTP to work over the Internet.

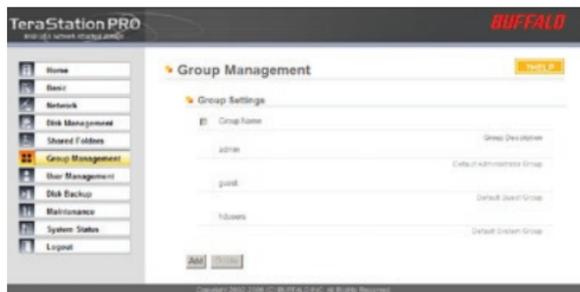
Click the *Apply* button to set up these services.

Shared Folders (DFS Setup)



To allow Distributed File System (DFS) technologies for Windows Server 2003 R2, select *Enable* and click the *Apply* button.

Group Management



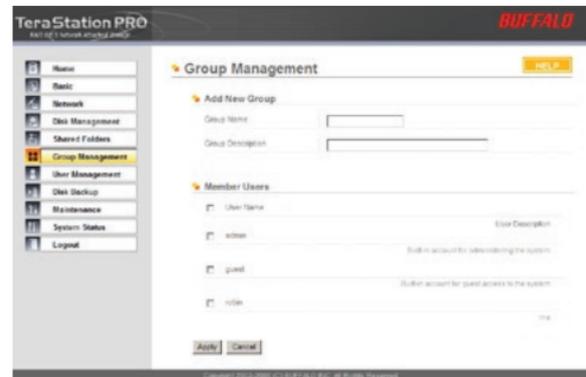
Groups allow for easier management of permissions in some networks, specifically networks with a lot of users in different departments.

To *Delete* a group, put a check next to its name and click *Delete*. To add a group to your TeraStation, click *Add*.

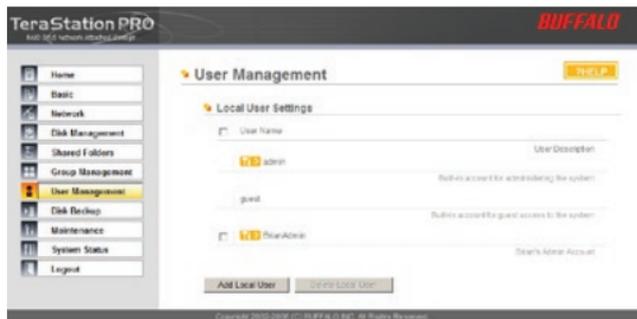
Add a name and a description to the *Add New Group* fields. Put checks next to each *Member User* that you want to be part of the group. Click *Apply* when your group is set up the way you want it.

Active Directory and Domain Groups are not shown here but are available under Share Management.

Members can be added or removed from a group at any time by editing the group. This is done by clicking on the Group name on the main Group Settings page.



User Management



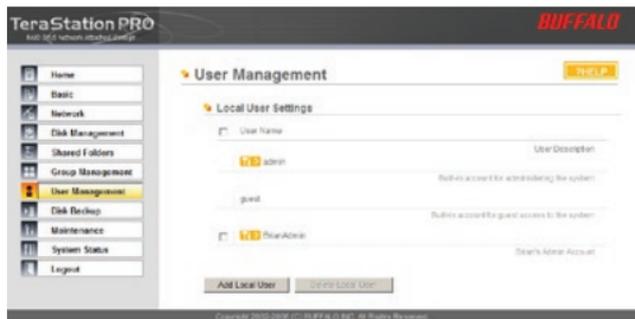
TeraStation is preconfigured with two users, *admin* and *guest*, out of the box. The *admin* and *guest* user accounts cannot be deleted. To delete any other user, put a check next to their name and click *Delete*. To add a new user, click *Add Local User*.

The *Add New User* dialog will appear. Enter a *User Name*, *Password*, and *User Description* for the new user and click the *Apply* button. If a user will be accessing the TeraStation from a Windows 95/98 computer, their password should be 15 characters or less. Mac OS 8 and OS 9 users' passwords should be 9 characters or less.

A Domain User List will be displayed if the TeraStation Pro is a member of a Domain or Active Directory environment.



User Management (changing passwords)



To change an account's password, click on the name of the account under *User Settings*. Note: if a user name and password are used to log into a user's windows computer or domain, the same user name and password should be used when creating the user's account on the TeraStation, or problems accessing shared folders may occur.

Enter the desired new password in both boxes and click *Apply*.



Troubleshooting Multiple Shares



When accessing multiple shares to a Windows PC, you may see this error message.

This is caused by having multiple shares to the same resource using different login credentials.

The error occurs when connecting to at least one secure, restricted share. Due to a constraint in Microsoft Windows, only one set of login credentials can access or map drive letters for a network resource such as the TeraStation. As such, only one username and password can be used while mapping drives to a PC. If unsecure, unrestricted shares are mapped and then an attempt to map a secure, restricted share is made from the same PC, then this error will occur. To prevent this, you must create all mapped shares using the same login and password information. Please follow the steps on the next page to remedy this problem.

Mapping Multiple Shares



When mapping any share, select the *Connect using a different user name* option. A login and password prompt will appear. Use the username and password required by any secure, restricted shares for *all* shares. All mapped shares on a single PC must use the same username and password!



If only unrestricted shares are being mapped, then it's not necessary to set a username and password for shares. Multiple mapped drives to unrestricted shares can exist without a username or password as long as no restricted, secure shares are mapped. If an unrestricted share and a restricted share are being mapped or accessed, use the restricted username and password for the unrestricted share login by using the *Connect using a different user name* option. This will allow a Windows PC to access both shares without any problems.

Disk Backup

The screenshot shows the 'Disk Backup' configuration page in the TeraStation PRO Buffalo interface. The left sidebar is active, with 'Disk Backup' selected. The main content area features a table of backup jobs and a search section.

| Job Number | Schedule | Status |
|------------|----------|-------------|
| 173 Job 1 | | Not Created |
| 173 Job 2 | | Not Created |
| 173 Job 3 | | Not Created |
| 173 Job 4 | | Not Created |
| 173 Job 5 | | Not Created |
| 173 Job 6 | | Not Created |
| 173 Job 7 | | Not Created |
| 173 Job 8 | | Not Created |

Below the table, there is a section titled 'Search for a Backup Destination by Password' with a text input field labeled 'Password to Search' and an 'Apply' button.

To create a backup job, click on a *Job Number*. The *Edit Backup Job* dialog will appear.

Disk Backup (Edit Backup Job)



A *Backup Job* can run regularly on a daily or weekly schedule, or immediately by appropriate choices in the *Backup Job Schedule* field. *Date* and *Time* for the backup may be entered, and *Encryption* and *Compression* enabled or disabled. Enable *Overwrite Backup* to have each scheduled backup write over the previous backup, or *Differential Backups* to backup only files changed since the previous backup.

Select the folder to be backed up from the *Local Backup Shared Folder* dropdown, and the destination for the backup files from the *Destination Backup Shared Folder* dropdown. The destination folder may be on a USB drive attached to the TeraStation, or another TeraStation on the network. Click on *Select* to approve the backup targets.

Click the *Apply* button when your backup job is set up the way you want it, or *Clear Job* to stop a job from running again.

Disk Backup (TeraStation List)



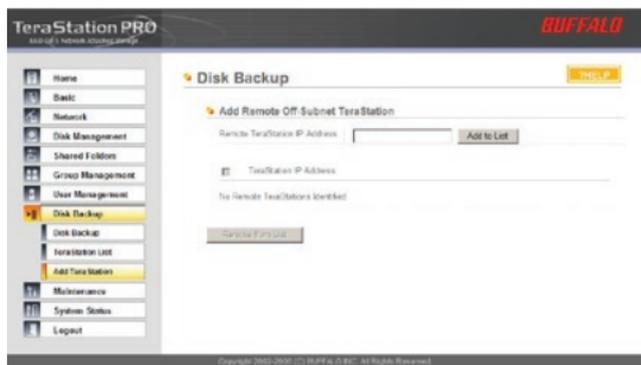
The screenshot shows the Buffalo TeraStation PRO web interface. The left sidebar contains navigation options: Home, Basic, Network, Disk Management, Shared Folders, Group Management, User Management, Disk Backup (selected), and a sub-menu for Disk Backup including TeraStation List (selected), Add TeraStation, Maintenance, System Status, and Logout. The main content area is titled 'Disk Backup' and contains a 'TeraStation List' table. The table has columns for Name, IP Address, Backup Support, and Disk Sleep. A 'Refresh' button is located below the table. The Buffalo logo is in the top right corner of the interface.

| Name | IP Address | Backup Support | Disk Sleep |
|-------------|---------------|----------------|----------------|
| LS-OLAB1 | 192.168.7.137 | Supported | Not Configured |
| EPHY-LS | 192.168.7.138 | Supported | Not Configured |
| TERRA-PRO | 192.168.7.87 | Supported | Not Configured |
| DEVELOPMENT | 192.168.7.25 | Supported | Not Configured |

The TeraStation list shows other TeraStations in your network that you can configure network backups to.

Press *Refresh* to get a list of TeraStations on your network.

Disk Backup (Add TeraStation)



To add a remote TeraStation to your network, enter its numerical IP Address in the *Remote TeraStation IP Address* field and click the *Add to List* button. For remote TeraStation backups, make sure both firewalls are configured to allow traffic in and out of their networks.

Note: Disk Backups between two TeraStations use port 8873 for encrypted backups and port 873 for backups with no encryption.

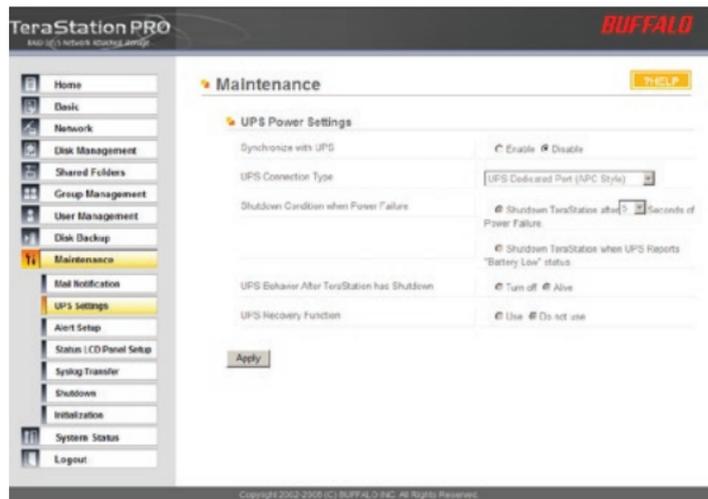
Maintenance (Notification)



If your TeraStation is remotely managed, you may choose to receive nightly status reports and be notified of any disk events by email. To set this up, enable *Mail Notification* and enter the IP Address of your SMTP server* in the *SMTP Server Address* field. Select a *Subject* line for the emails (i.e. “TeraStation Status Report”) and enter the email address of each person you want to receive notification emails into a *Recipient Mail Address* field.

* SMTP server must be an *open* type server. Currently, there’s no provision for entering a username or password.

Maintenance (UPS Settings)



You may enable *Synchronize with UPS* and *UPS Shutdown Conditions* from this page. Consult your Uninterruptable Power Supply's documentation for further information about setting up your UPS system.

Buffalo Technology recommends the use of APC SmartUPS Serial Uninterruptable Power Supplies. Other UPSs may use different pin configurations. Compatibility cannot be guaranteed with other UPSs. See page 52 for more on the TeraStation's UPS serial port.

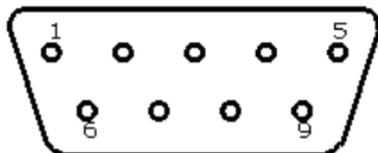
Maintenance (UPS Settings)

UPS / Maintenance port

This is TeraStation's serial port pin assignment for serial UPS products.

Connector Pin Assignment.

| Pin | Signal | Description |
|-----|--------|------------------|
| 1 | NC | NC |
| 2 | RXD | APC_Line_Fail |
| 3 | TXD | APC_UPS_Shutdown |
| 4 | NC | OMR_UPS_Shutdown |
| 5 | GND | GND |
| 6 | NC | NC |
| 7 | NC | +12V |
| 8 | NC | OMR_Line_Fail |
| 9 | NC | NC |



Maintenance (Alert Settings)

The screenshot displays the TeraStation PRO web interface. The left sidebar contains a navigation menu with the following items: Home, Basic, Network, Disk Management, Shared Folders, Group Management, User Management, Disk Backup, Maintenance (highlighted), Mail Notification, UPS Settings, Alert Setup (highlighted), Status LCD Panel Setup, System Transfer, Shutdown, Initialization, System Status, and Logout. The main content area is titled 'Maintenance' and features a 'HELP' button. Underneath, the 'Alert Sound Setup' section is active, showing 'Alert Sound Conditions' with four checked options: Exceeding Temperature, Disk Error has Occurred, Fan Error has Occurred, and UPS Power Error has Occurred. An 'Apply' button is located at the bottom of the configuration area. The footer of the interface reads 'Copyright 2002-2004 (c) BUFFALO INC. All Rights Reserved'.

Alerts can be configured on the TeraStation to make audible noises when a problem is detected. Along with the audible noise, alert emails will be sent out if *Mail Notification* was properly configured. Please select the features you would like to receive an audible sound alert from and then press the *Apply* button.

Maintenance (Status LCD)



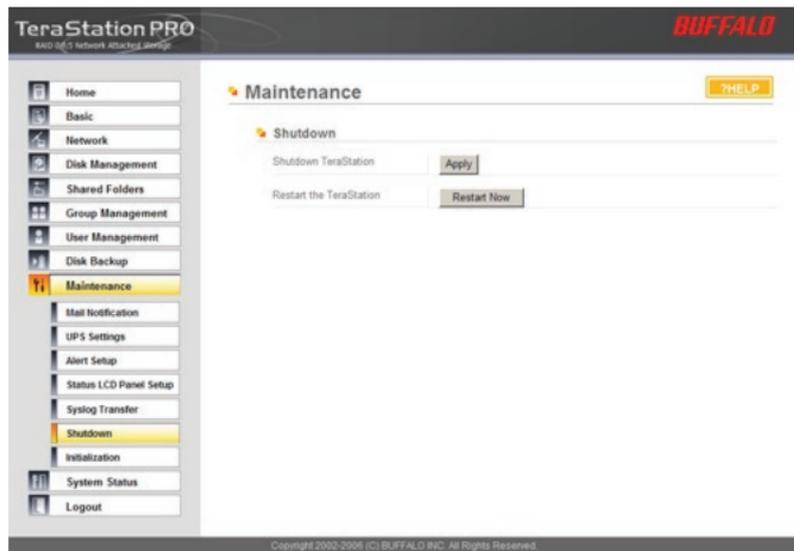
The Status LCD Setup allows configuration for the LCD display on the front of TeraStation. Please select the type of information that the front panel should display from the *LCD Display Items*. *Automatically Switch LCD Items* tells the TeraStation to cycle through the selected display items every 10 seconds. Disabling this feature means the LCD display does not cycle, and it will stay on the same display item until the *Display* button on the front of TeraStation is pressed. The LCD screen and green LED buttons brightness can be controlled via their respective settings. Press the *Apply* button once all of the settings have been configured.

Maintenance (Syslog Transfer)



Check *Enable* to allow system logs to be transferred. Press *Apply* once all of the settings have been configured.

Maintenance (Shutdown)



The screenshot displays the TeraStation PRO web interface. The top header includes the product name 'TeraStation PRO' and the Buffalo logo. A left-hand navigation menu lists various settings categories, with 'Maintenance' and its sub-item 'Shutdown' highlighted. The main content area is titled 'Maintenance' and contains a 'Shutdown' section with two rows of controls: 'Shutdown TeraStation' with an 'Apply' button, and 'Restart the TeraStation' with a 'Restart Now' button. A 'HELP' button is visible in the top right corner of the main content area. The footer contains the copyright notice: 'Copyright 2002-2006 (C) BUFFALO INC. All Rights Reserved.'

From the *Shutdown* page, press *Apply* to shutdown TeraStation. This has the same function as holding down the power button on the front of TeraStation, but may be done remotely. Turning on the TeraStation after a shutdown requires a physical button push on the front of TeraStation. The *Restart Now* button simply reboots the TeraStation, bringing it back to functionality after about 120 seconds.

Maintenance (Initialization)

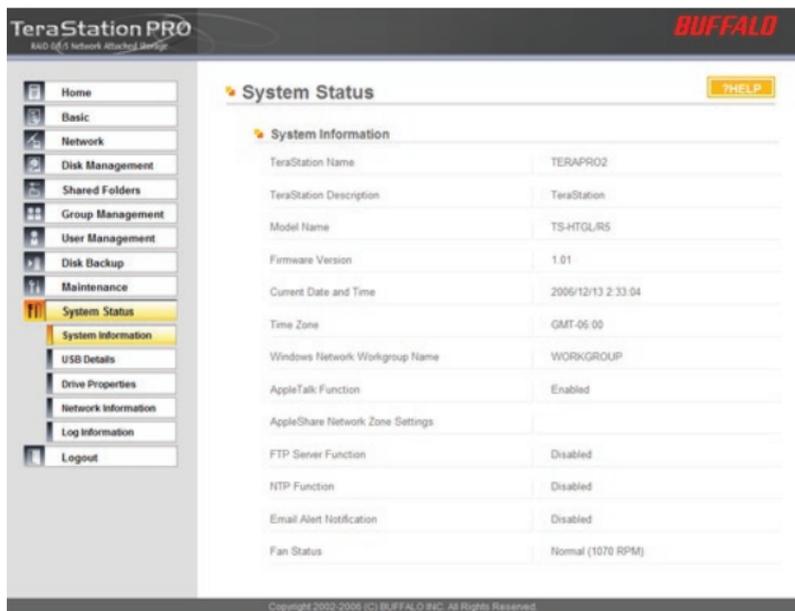
Initialization is a reset procedure that restores all settings back to the default, out of box, configuration. All configuration, users, groups, and backup jobs are lost, but actual data and shares on the hard are NOT lost. If you want all data to be erased, reformat the drive.

Specify whether the TeraStation shall keep its administrator password after a initialization or whether the password should be reset to the default password (default password is *password*). Press the *Apply* button once you make the selection.

Press the *Restore* button to begin the initialization process; this will restore all settings to factory defaults but will NOT erase the data on the hard drives. *Start Disk Formatting* begins a complete disk format that will erase all information on the TeraStation's internal hard drives. This cannot be undone.



System Status (System Information)



The screenshot displays the 'System Status' page of the TeraStation PRO web interface. The left sidebar contains navigation options: Home, Basic, Network, Disk Management, Shared Folders, Group Management, User Management, Disk Backup, Maintenance, System Status (highlighted), System Information (highlighted), USB Details, Drive Properties, Network Information, Log Information, and Logout. The main content area shows the following system information:

| System Information | |
|----------------------------------|--------------------|
| TeraStation Name | TERAPRO2 |
| TeraStation Description | TeraStation |
| Model Name | TS-HTGLR5 |
| Firmware Version | 1.01 |
| Current Date and Time | 2006/12/13 2:33:04 |
| Time Zone | GMT-05:00 |
| Windows Network Workgroup Name | WORKGROUP |
| AppleTalk Function | Enabled |
| AppleShare Network Zone Settings | |
| FTP Server Function | Disabled |
| NTP Function | Disabled |
| Email Alert Notification | Disabled |
| Fan Status | Normal (1070 RPM) |

Copyright 2002-2006 (C) BUFFALO INC. All Rights Reserved

This page shows you the System Information for your TeraStation.

Firmware updates are occasionally available from www.buffalotech.com for the TeraStation Pro. These must be executed from a Windows PC on the same network. Your router, switch, or hub should pass through ports 8873 and 22939 for this to work (most do).

System Status (USB Details)



The screenshot displays the TeraStation PRO web interface. The left sidebar contains a navigation menu with the following items: Home, Basic, Network, Disk Management, Shared Folders, Group Management, User Management, Disk Backup, Maintenance, System Status (highlighted), System Information, USB Details (highlighted), Drive Properties, Network Information, Log Information, and Logout. The main content area is titled 'System Status' and includes a 'HELP' button. Underneath, the 'USB Details' section shows a table of connected USB devices.

| USB Class | Manufacturer | Device Name | USB 2.0/1.1 |
|-----------|--------------|------------------------------|-------------|
| Storage | BUFFALO INC. | BUFFALO INC. USB-SATA Bridge | USB 2.0 |

Copyright 2002-2005 (C) BUFFALO INC. All Rights Reserved

This page shows you details on USB hard drives and UPSs plugged into your TeraStation.

System Status (Drive Properties)

This page shows you the properties of all hard drives and RAID arrays in and attached to your TeraStation.

The screenshot displays the 'System Status' page of a TeraStation PRO. The interface includes a navigation menu on the left with options like Home, Basic, Network, Disk Management, Shared Folders, Storage Management, User Management, Disk Backup, Maintenance, System Status (highlighted), System Information, USB Devices, Drive Properties, Network Information, Log Information, and Logout. The main content area is titled 'System Status' and contains three sections: RAID Array Information, Disk Information, and USB Disk Information.

RAID Array Information

| RAID Array 1 | Status | Name |
|----------------|-------------------------------|----------------|
| RAID Mode | RAID5 | |
| Disk Structure | Disk 1, 2, 3, 4 | |
| Total Capacity | 120,384,000 bytes (200.00 TB) | |
| Access Speed | 2,800 bytes/s @ 80.00 MB/s | |
| Parity Used | 8.00 TB | |
| File Format | NTFS | |
| RAID Array 2 | Status | Not Configured |

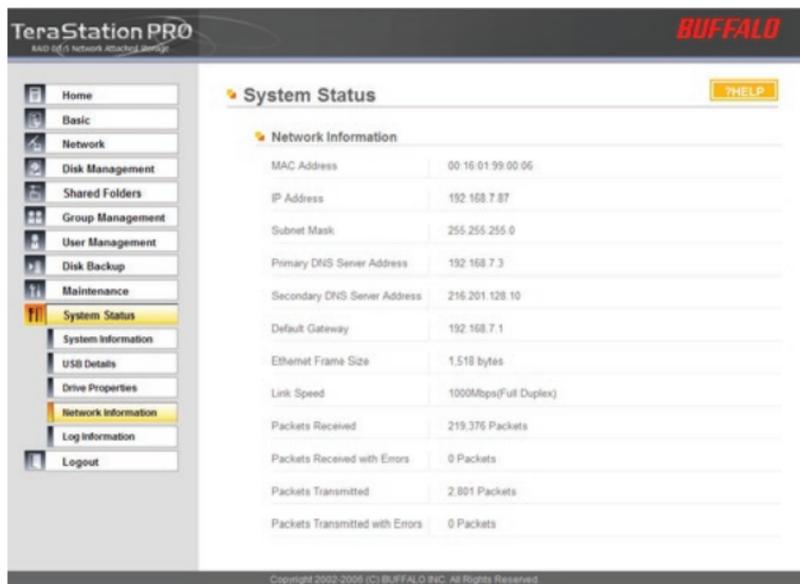
Disk Information

| Chan 1 | Status | RAID Array 1 |
|----------------|-------------------------------|--------------|
| Unit Name | WDCWUS15-00PC01 | |
| Total Capacity | 200,190,000 bytes (200.00 TB) | |
| Chan 2 | Status | RAID Array 1 |
| Unit Name | WDCWUS15-00PC01 | |
| Total Capacity | 200,190,000 bytes (200.00 TB) | |
| Chan 3 | Status | RAID Array 1 |
| Unit Name | WDCWUS15-00PC01 | |
| Total Capacity | 200,190,000 bytes (200.00 TB) | |
| Chan 4 | Status | RAID Array 1 |
| Unit Name | WDCWUS15-00PC01 | |
| Total Capacity | 200,190,000 bytes (200.00 TB) | |

USB Disk Information

| USB Disk 1 | Manufacturer | BUFFALO |
|----------------|------------------|--------------|
| Model Name | LU200 Flash Disk | |
| Unit Name | LU200 Flash Disk | |
| Total Capacity | Not Detected | |
| File Format | Not Detected | |
| USB Disk 2 | Status | Not Detected |

System Status (Network Information)



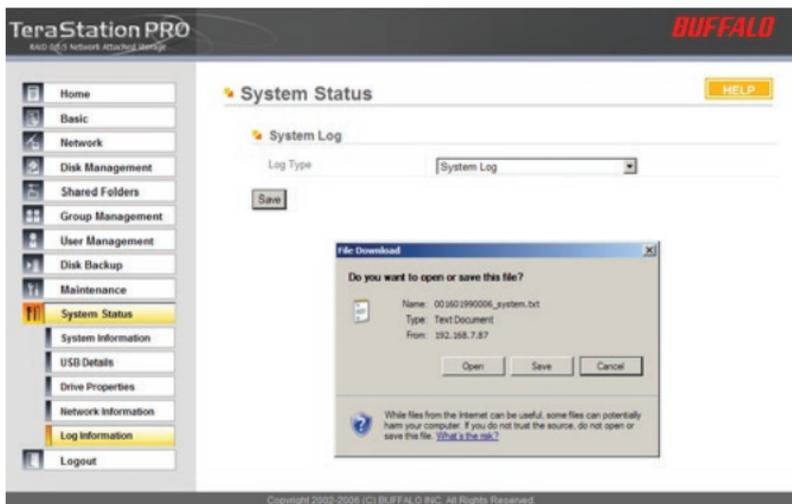
The screenshot displays the TeraStation PRO web interface. The top header includes the product name 'TeraStation PRO' and the Buffalo logo. A left-hand navigation menu lists various system management options, with 'System Status' currently selected. The main content area is titled 'System Status' and contains a 'Network Information' section. This section lists several network parameters and their values:

| Parameter | Value |
|---------------------------------|-----------------------|
| MAC Address | 00:16:01:99:00:06 |
| IP Address | 192.168.7.87 |
| Subnet Mask | 255.255.255.0 |
| Primary DNS Server Address | 192.168.7.3 |
| Secondary DNS Server Address | 216.201.128.10 |
| Default Gateway | 192.168.7.1 |
| Ethernet Frame Size | 1,518 bytes |
| Link Speed | 1000Mbps(Full Duplex) |
| Packets Received | 219,376 Packets |
| Packets Received with Errors | 0 Packets |
| Packets Transmitted | 2,801 Packets |
| Packets Transmitted with Errors | 0 Packets |

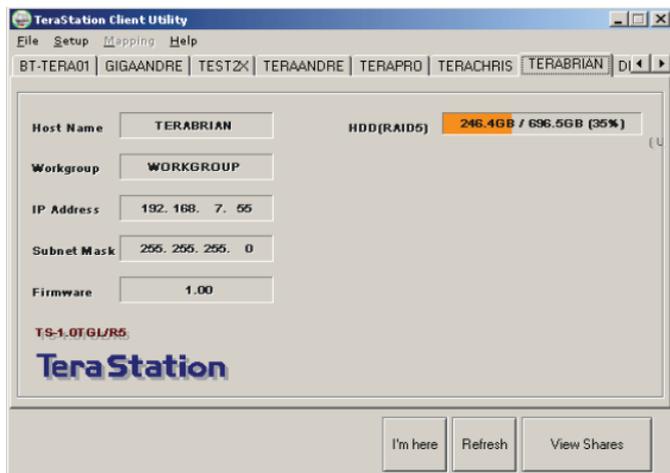
At the bottom of the page, a copyright notice reads: Copyright 2002-2006 (C) BUFFALO INC. All Rights Reserved.

This page shows you the System Information for your network connection.

Log Information



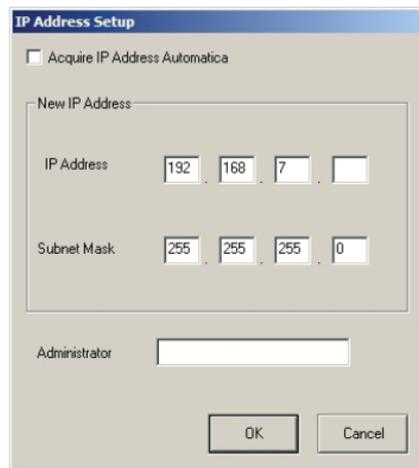
This page lets you save or display system log information. Choose the log you want from the *Log Type* dropdown and click *Save*. The dialog will let you save or display (“Open”) the logfile.



This is the *TeraStation Client Utility*. Installed on your PC, it allows you to access each of the TeraStations on your network. Click *Refresh List* to get tabs for each of your TeraStations. Each tab shows the Host Name, Workgroup, IP Address, and Subnet Mask of the associated TeraStation, as well as the version of firmware it's running.

With a TeraStation's tab selected, you can click on the *View Shares* button to go directly to its root share. Clicking the *Setup* pulldown menu and selecting *Browser Management* takes you to the configuration GUI. And clicking *Setup* and choosing *Modify IP Address* takes you to the following screen . . .

IP Address Setup



The screenshot shows a dialog box titled "IP Address Setup". At the top, there is a checkbox labeled "Acquire IP Address Automatica" which is currently unchecked. Below this, there is a section titled "New IP Address" containing two rows of input fields. The first row is labeled "IP Address" and contains four boxes with the values "192", "168", "7", and an empty box. The second row is labeled "Subnet Mask" and contains four boxes with the values "255", "255", "255", and "0". Below the "New IP Address" section is a text input field labeled "Administrator". At the bottom of the dialog box are two buttons: "OK" and "Cancel".

Here, you may enter your *IP Address* and *Subnet Mask* manually, or enable your TeraStation to acquire them automatically from a DHCP server. You'll need the administrator password to use this screen. Press *OK* when you're done.

If TeraStation encounters a disk error, it will be reported in the *TeraStation status* on the top of any of the Web-Based configuration screens. Run a Disk Scan in the event of this error. If that does not resolve the problem, a *format* is recommended. Formatting the drive will delete all of the data on it, so back up any data you can before formatting. Finally, if none of the above solutions help, then please contact Technical Support (see pages 73 and 74 for Technical Support contact information).

DIAG LCD Codes:

| Error Code | Description | Alert Sound |
|------------|--|-------------|
| E00 | MPU error: Main MPU is not responding. | A |
| E01 | Error on DRAM DATA LIN | A |
| E02 | Error on DRAM ADDRESS LINE | A |
| E03 | Error on RTC CHIP | A |
| E04 | Failed to load kernel (FLASH error) | A |
| E10 | UPS AC LINE FAIL Error | B |
| E11 | FAN Error: Fan rotation speed is low or fan is stopped. | B |
| E12 | Cooling Error: Cooling by fan cannot catch up. | B |
| E13 | Error has occurred on RAID Array x. | B |
| E14 | Cannot mount RAID Array x. | B |
| E15 | Not Used | |
| E16 | Cannot find HDDx. | B |
| E17 | Cannot communicate with RTC chip (IC12). | A |
| E18 | Cannot communicate with SATA chip (IC1). | A |
| E19 | Cannot communicate with SATA chip 2 (IC2) | A |
| E20 | Cannot communicate with USB chip (IC5) | A |
| E21 | Cannot communicate with Ethernet chip (IC13) | A |
| E22 | Cannot mount HDDx | B |
| E23 | HDDx faulty (HDDx is excluded from raid because of errors) | B |

Turn the key counterclockwise to unlock the front panel.



Pull on the right hand side of the front panel to remove it.



Replacing a Hard Drive



Squeeze the tabs gently and swing the tray latch upward.



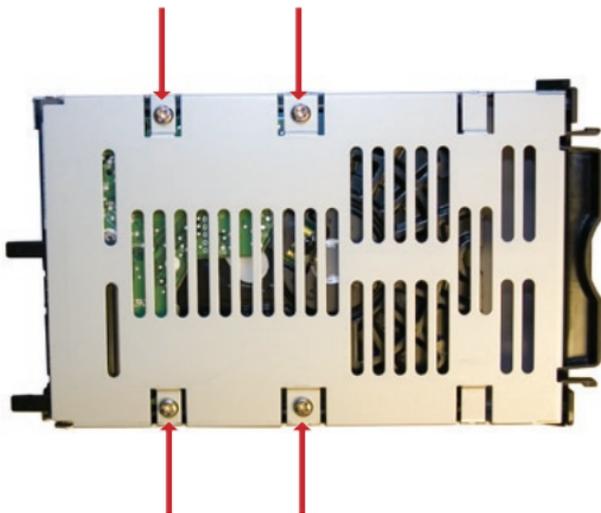
Slide out the drive tray.

Replacing a Hard Drive

Lower the drive carefully to the work surface.



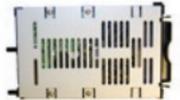
Pull the plug straight out.



To remove the hard drive from its cage, set the assembly on a soft surface and remove these four screws.

Install a new hard drive by doing the same steps in reverse order:

Begin by screwing the new hard drive into the cage.



Plug the power/data connector into the hard drive.



Slide the hard drive cage back into the TeraStation.



Press the latch down to lock the hard drive cage in place.



Reattach the front cover to the TeraStation.



| | |
|--------------------------|--|
| LAN Standards: | IEEE 802.3u 100BASE-TX; IEEE 802.3 10BASE-T |
| Transmission Types: | 1000Mbps/100Mbps/10Mbps; 100BASE-TX 4B/5B, MLT-3;10BASE-T Manchester Coding |
| UPS: | UPS Compatible (Serial/USB connection) |
| Media Interface: | RJ-45 |
| USB Standard: | USB 2.0 Hi-Speed (HS) Full-Speed (FS) Low-Speed (LS) |
| USB Connector: | USB A Connector (2) |
| Data Transmission Speed: | Max: 480 Mbps (HS Mode) Max: 12 Mbps (FS Mode) |
| Power Consumption: | ~17-56W (Varies with size) |
| Dimensions: | 16.9" x 3.4" x 13.8" (430 x 86 x 350 mm) |
| Weight: | ~15.8 lb. (7.2 kg.) (Weight varies with size) |
| Operating Environment: | 32° - 113° F; 20-80% non-condensing |

Buffalo Technology USA Inc.
11100 Metric Blvd, Suite 750
Austin, TX 78758

GENERAL INQUIRIES

Monday through Friday
8:30am-5:30pm CST

Direct: 512-794-8533 | **Toll-free:** 800-456-9799 | **Fax:** 512-794-8520 | **Email:** sales@buffalotech.com

TECHNICAL SUPPORT

North American Technical Support by phone is available 24 hours a day, 7 days a week. (USA and Canada).

Toll-free: (866) 752-6210 | **Email:** info@buffalotech.com

Buffalo Technology UK Ltd.
2 Bracknell Beeches, Old Bracknell Lane
Bracknell, Berkshire, SL1 4RD
United Kingdom

GENERAL INQUIRIES

Email: sales@buffalo-technology.com

TECHNICAL SUPPORT

Buffalo Technology provides technical support in English, German, French, Italian, and Spanish. For opening hours and relevant telephone numbers, please go to www.buffalo-technology.com/contact

Thank you for your interest in Buffalo products. Our GPL software delivery policy is outlined below.

For each individual product and revision, please send one individually packaged self addressed padded CD shipping envelope, containing a blank CD-R to the following address:

Buffalo Technology USA Inc.
11100 Metric Blvd., Suite 750
Austin, TX 78758
Attn. GPL Department

Within the envelope containing the self addressed padded CD shipping envelope, please include a bank draft or money order for \$20 (USD) (Made out to: Buffalo Technology) to cover our handling fee, postage and CD preparation. The CD-R should have the name of the product and revision number clearly written on the actual CD-R (not on the insert).

We do not send GPL source in bulk on a DVD. And order confirmation is not required by the GNU General Public License.

We are more than happy to comply with your request; however, we must ask you to comply with our GPL distribution policy, which complies with the GNU General Public License.

Sincerely,
Buffalo Technology GPL Department

Thank you for your interest in Buffalo products. Our GPL software delivery policy is outlined below.

For each individual product and revision, please send one individually packaged self addressed padded CD shipping envelope, containing a blank CD-R to the following address:

Buffalo Technology Ireland Ltd
Free Zone East, Shannon, Co. Clare
Ireland
Attn. GPL Department

Within the envelope containing the self addressed padded CD shipping envelope, please include a bank draft or money order for €20 (Euro) (Made out to: Buffalo Technology) to cover our handling fee, postage and CD preparation. The CD-R should have the name of the product and revision number clearly written on the actual CD-R (not on the insert).

We do not send GPL source in bulk on a DVD. And order confirmation is not required by the GNU General Public License.

We are more than happy to comply with your request; however, we must ask you to comply with our GPL distribution policy, which complies with the GNU General Public License.

Sincerely,
Buffalo Technology GPL Department