User Manual

TeraStation iSCSI

TS-ITGL/R5

Congratulations on your new TeraStation! Your TeraStation iSCSI is a huge block of iSCSI storage, ready to add to your server or PC via ordinary wired Ethernet connections. This guide will help you configure it.

There are many ways to configure and use iSCSI storage products like the TeraStation. In this guide we give one example of configuring a simple iSCSI volume on a single workstation. Many other configurations are usable.

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 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 48 and 49.

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Door opens for access to hard drives.
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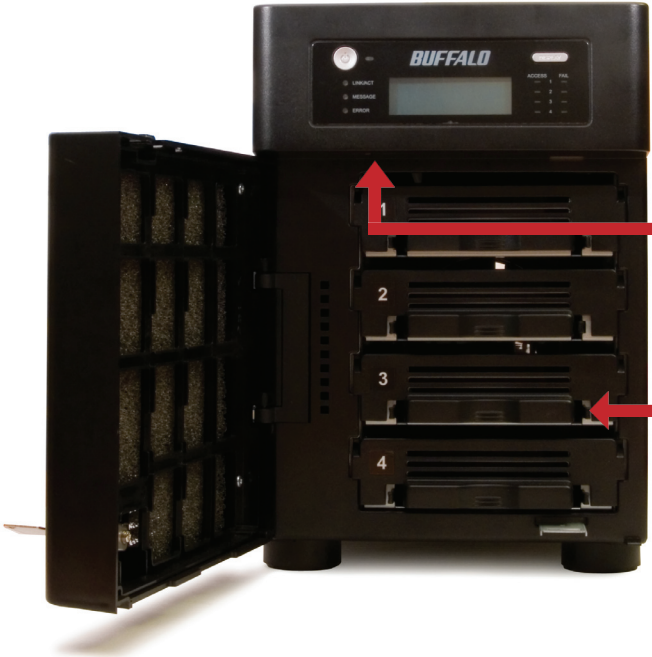


Init Button returns settings to factory defaults.

Hard Drives
(Squeeze tabs to release)


Power Cable (to outlet or surge protector)
USB in
Ethernet (to NIC, Router, or Switch)
UPS

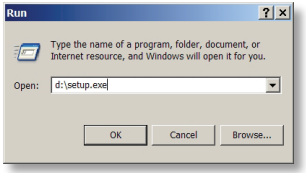
Begin by connecting your TeraStation's power and Ethernet cables. The Ethernet cable should be connected to an extra NIC on your server or to a router, hub, or switch on your network.

For best performance, all network equipment should be gigabit or better. Use a NIC with enough RJ-45 ports for all your iSCSI devices, or separate NICs for each iSCSI device. Assign static IP addresses for each iSCSI device. Bridge the ports for all the NICs in the server (including the LAN connection). Statically assign the IP address for the LAN to the "Bridged" connection, not on the actual NIC for the LAN. Provided uninterruptable power supplies for all iSCSI devices, as well as the server itself. Simpler configurations may work, but this kind of uncompromising setup is recommended for best performance and reliability.

After all connections are made, turn the TeraStation on by pushing the power button on the front panel. It will take about a minute to boot.

Confirm that your PC has Microsoft's iSCSI Initiator software installed. Insert the TeraNavigator CD into its CD-ROM drive.

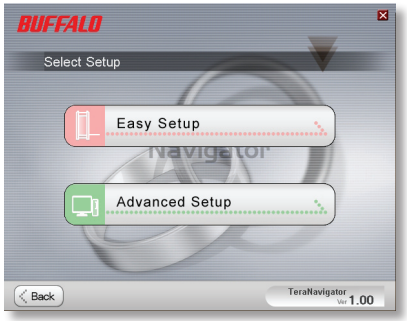
Setup should automatically launch, or you can manually launch it by pressing *Start* and selecting the *Run...* option. When the *Run* dialog opens, type **d:\TSnavi.exe** (where d is the drive letter of your CD-ROM drive). Press *OK* to continue.

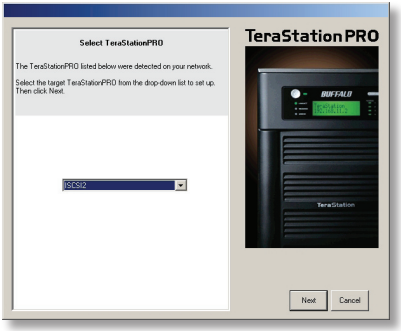


In this example, we'll connect iSCSI TeraStation(s) with all default settings to a Windows computer. Press the *Begin Installation* button to begin.

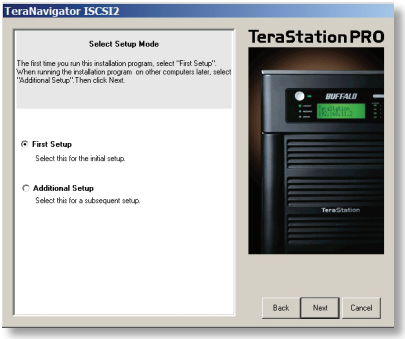
Easy Setup automatically configures your TeraStation and installs software. It's recommended for first-time users.

The *Advanced Setup* option only installs software. Depending on your network settings, you may have to manually change some of the Terastation's settings to connect to it successfully.



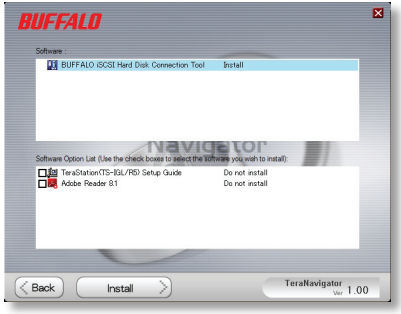


If your TeraStation is connected correctly when you get to this window, it will be highlighted in the drop-down list. If you have multiple units to set up, select the correct TeraStation from the list.



Select *First Setup* for the initial installation.

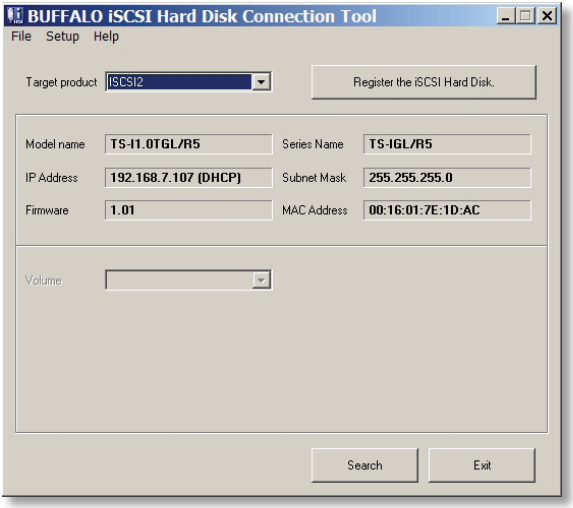
To install the software on additional computers, chose *Additional Setup*.



Once the TeraStation is installed, you'll need to install the iSCSI connection tool. Click *Next*, then continue to click *Next*, stepping through the menus until the iSCSI connection tool is installed.

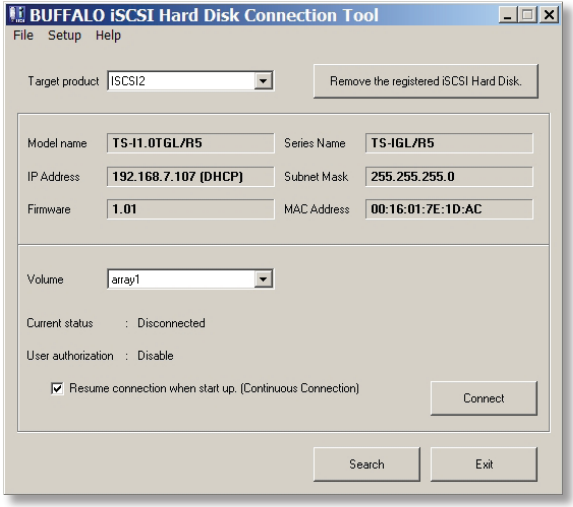
If you have additional iSCSI TeraStations to install, go back and rerun Easy Setup for each before launching the iSCSI connection tool.

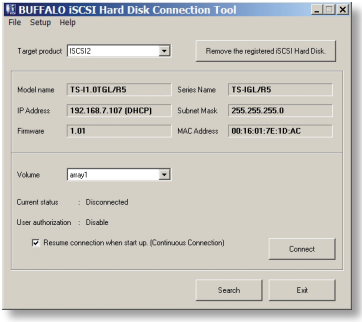
Click *Yes* to launch the iSCSI connection tool.



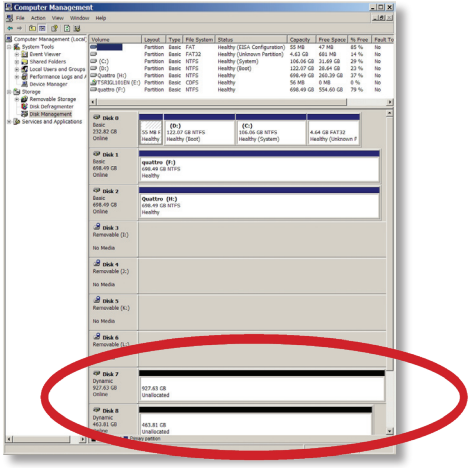
If the TeraStation has more than one volume, choose the volume you want to connect to from the drop down list. Check *Connect at start up*. Click *Connect*. Repeat these steps to add additional volumes if desired.

Make sure that your ISCSI TeraStation is selected in the *Target product* window. Click *Register the iSCSI Hard Disk*, and then *OK*.

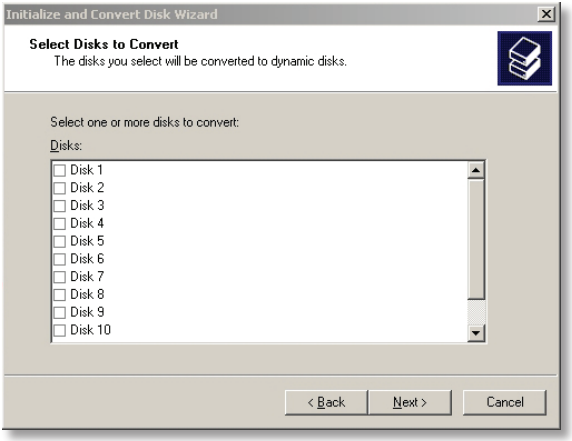




If Disk Management does not open automatically, you may launch it manually. From the *Setup* menu at the top of the window, choose *Launch Disk Management*.

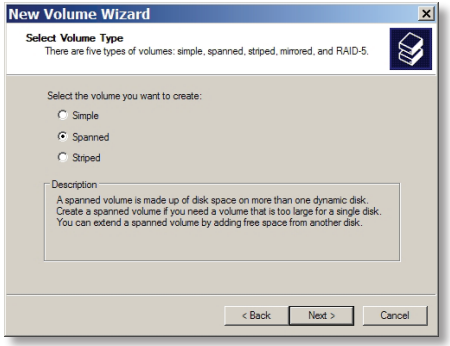


Each connected volume from your iSCSI TeraStation(s) now appears as a hard drive in Disk Management.

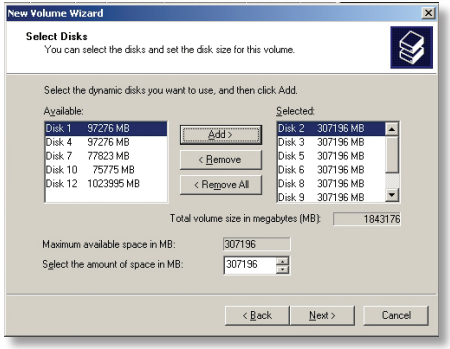


The *Initialize and Convert Disk Wizard* will open. Use it to convert your new logical volumes to dynamic disks. Put a checkmark next to each of your disks and click *Next* to step through the menu.

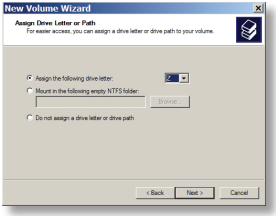
Right-click on the volume in *Disk Management* and click *New Volume* to start the *New Volume Wizard*. Click *Next*.



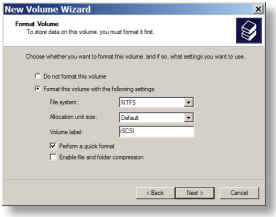
Choose your desired volume type. Use *Simple* if you have only one volume to mount. *Spanned* and *Striped* volumes require multiple disk volumes to create. Click *Next* when ready.



Add all dynamic disks that will be included in the volume to the *Selected* column by highlighting them and then clicking the *Add* button.

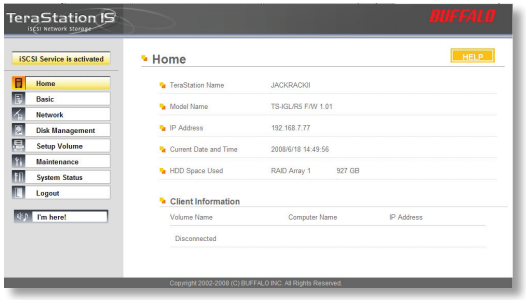


Choose your desired drive letter. Click *Next*.

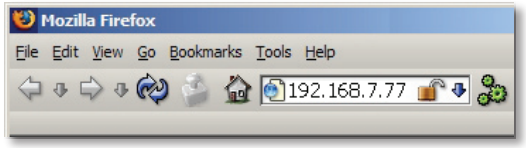


Choose your desired format and volume label. Click *Next*.

Your new volume is installed and ready to use!

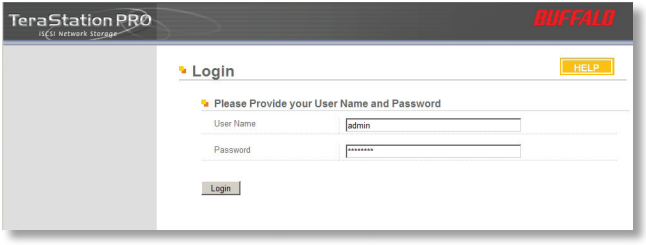


The Configuration GUI is where most of the TeraStation's settings can be changed.



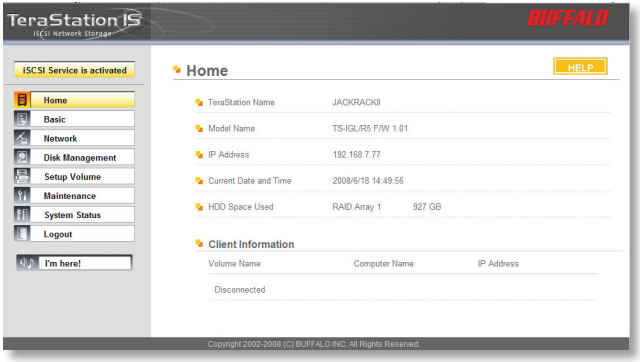
To access it, type the IP address of your TeraStation into the URL bar of a browser running on a computer connected to the same network as the TeraStation.

The 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*

Welcome to the configuration GUI for the 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.

Note that many settings cannot be changed while the iSCSI service is running. Click the button in the top left corner of the page to disable the iSCSI service if settings need to be changed. After changing settings, click the button again to restart the iSCSI service.

Note: Changing settings in the configuration GUI may break existing connections to the TeraStation. You may have to reconnect your computer to your iSCSI TeraStation after changing settings with the configuration GUI.

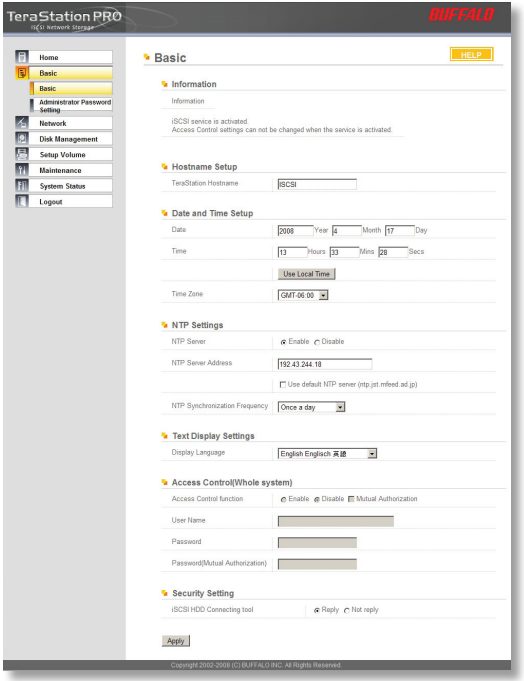
Basic

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.

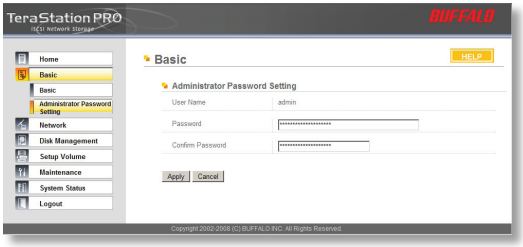
Ensure that both the *Display Language* and the *Windows Client Language* are set to languages that you're comfortable with.

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

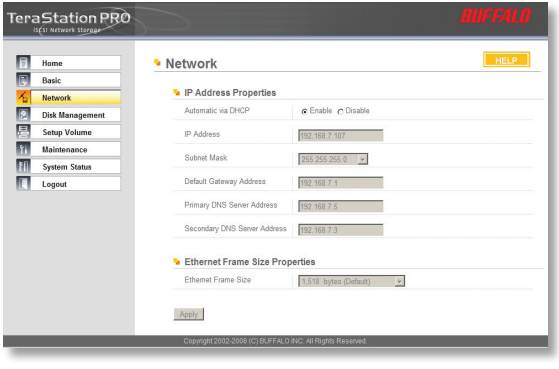


Admin Password

By default, the admin password is “password”. Change it to something more secure here.



Network (IP Address Properties)



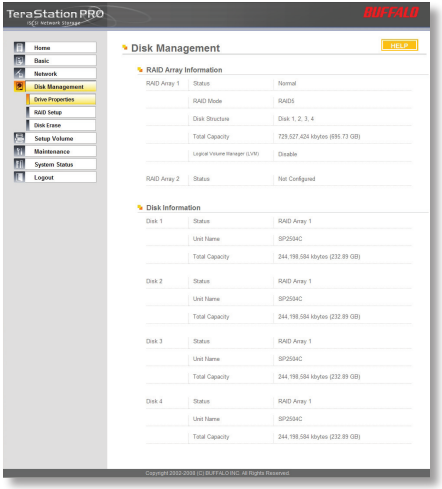
By default, the TeraStation will attempt to get its IP Address automatically from a DHCP server. You may disable DHCP here. If DHCP is disabled and an IP Address is not set manually, it will default to *192.168.11.150*. The TeraStation's *IP Address*, *Subnet Mask*, *Default Gateway Address*, and *DNS 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.

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

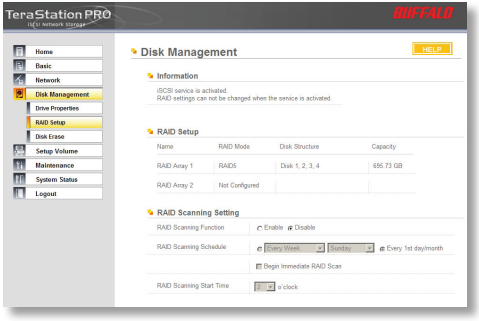
RAID 0 - All four drives are combined into one large, fast drive, giving the maximum capacity for your TeraStation. This size is the one listed on your TeraStation's box and shows the total capacity of the TeraStation with no data used for redundancy. RAID Spanning is fast and efficient, but with no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

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.

Disk Management (RAID Setup)



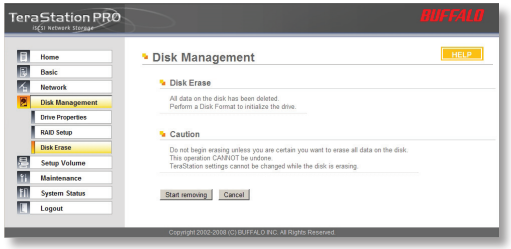
This page shows your current RAID arrays. You may delete old arrays or create new ones by clicking on the underlined *RAID Array #* under *RAID Array Configuration*.

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*.

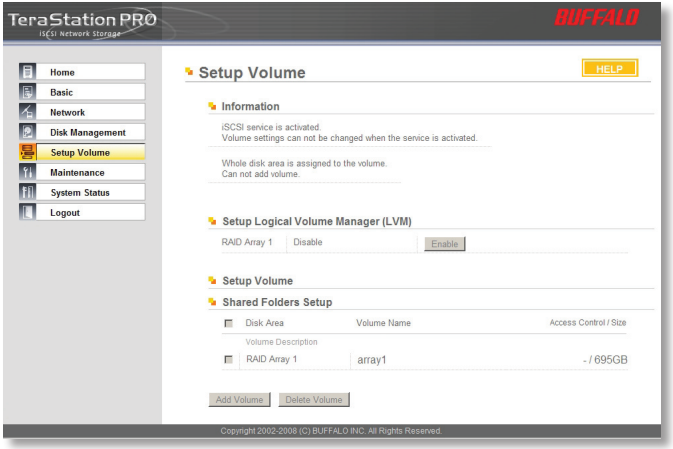
NOTE: TeraStation has four internal hard drives. Before creating a new RAID array, you may have to delete one or more pre-existing RAID Arrays to clear up the hard drives for your new one. This will destroy all data currently on the disks, so back up any important data before deleting RAID arrays. Whether 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 (Disk Erase)



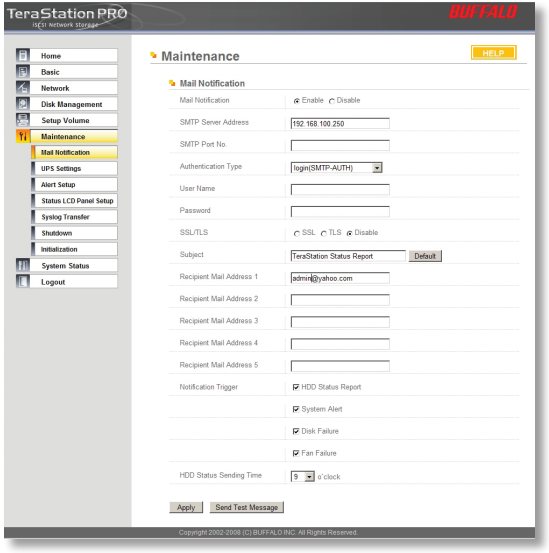
Disk Erase removes all data from the selected disk. This may take several hours to complete. It cannot be undone.

Volume Settings



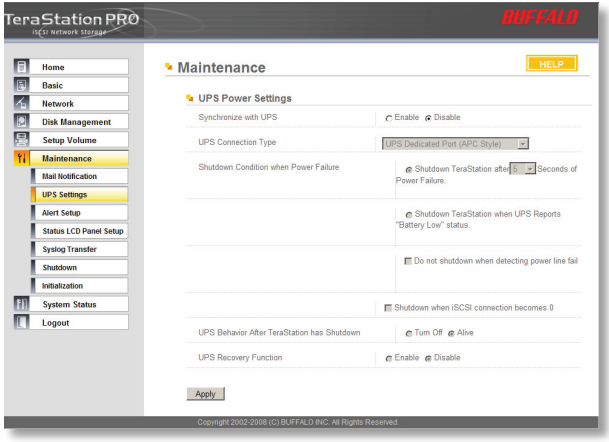
Here you can enable or disable volumes, shares, and folders.

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.

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. Turn to the next page for more on the TeraStation's UPS serial port.

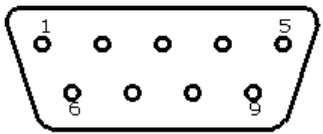
Maintenance (UPS Settings)

UPS / Maintenance port

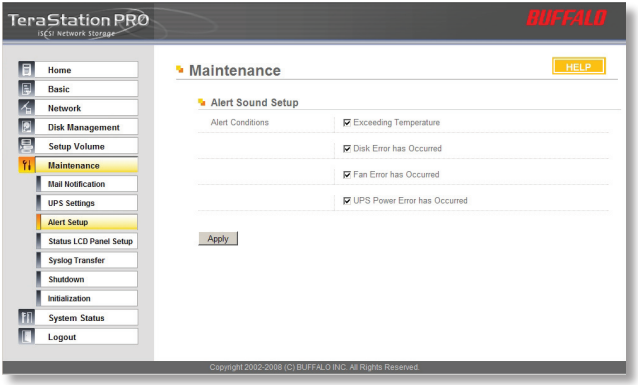
This is TeraStation's serial port pin assignment for serial UPS products.

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

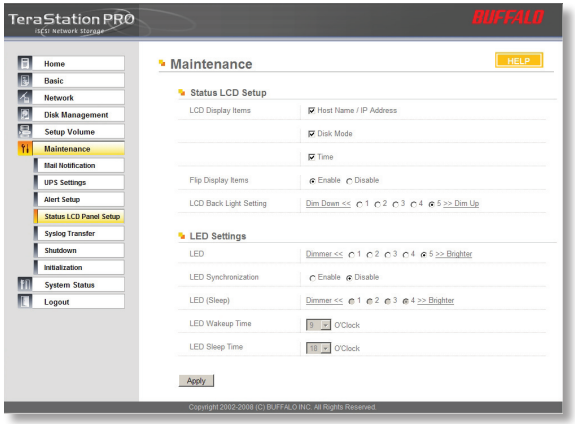


Maintenance (Alert Settings)



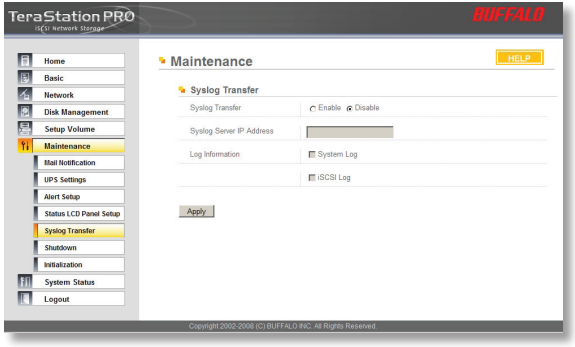
Alerts can be configured on the TeraStation to make audible noises when a problem is detected. Along with the audible noise, alert emails will be sent out if *Mail Notification* was properly configured. Please select the features you would like to receive an audible sound alert from and then press the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

Maintenance (Status LCD)



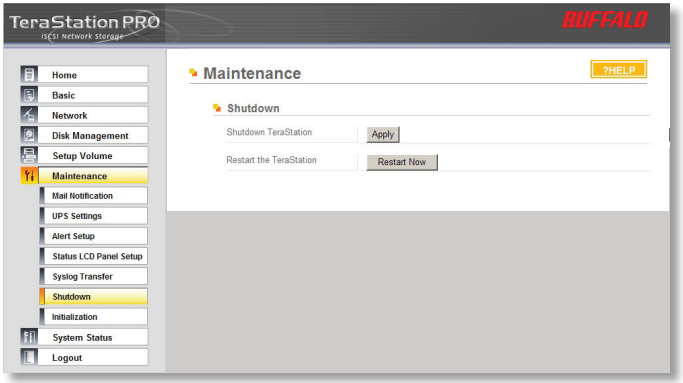
The Status LCD Setup allows configuration for the LCD display on the front of TeraStation. Please select the type of information that the front panel should display from the *LCD Display Items*. *Automatically Switch LCD* Items tells the TeraStation to cycle through the selected display items every 10 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.

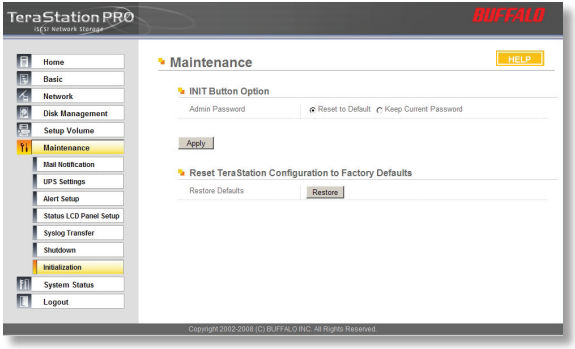
Maintenance (Shutdown)



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.

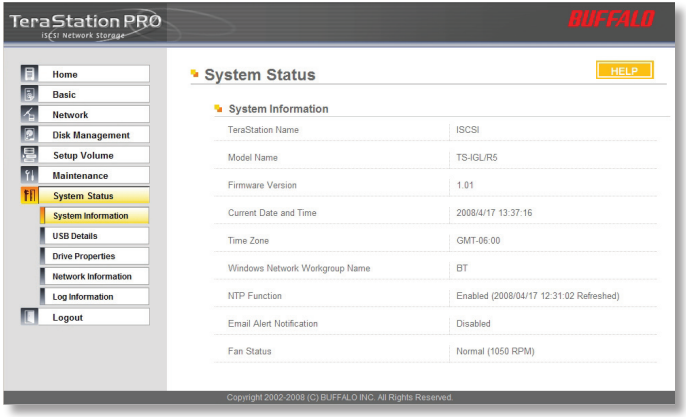
Maintenance (Initialization)

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.

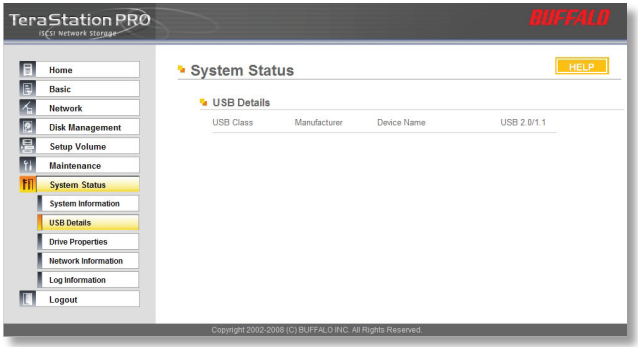
Press the *Restore* button to begin the initialization process; this will restore all settings to factory defaults but does NOT erase the data on the hard drives.



This page shows you the System Information for your TeraStation.

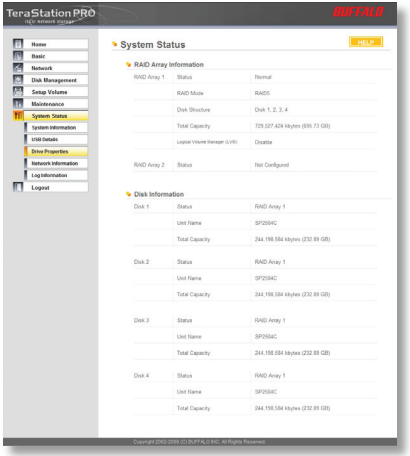
Firmware updates are occasionally available from *www.buffalotech.com* for the TeraStation Pro. These must be executed from a Windows PC on the same network. Your router, switch, or hub should pass through ports 8873 and 22939 for this to work (most do).

System Status (USB Details)



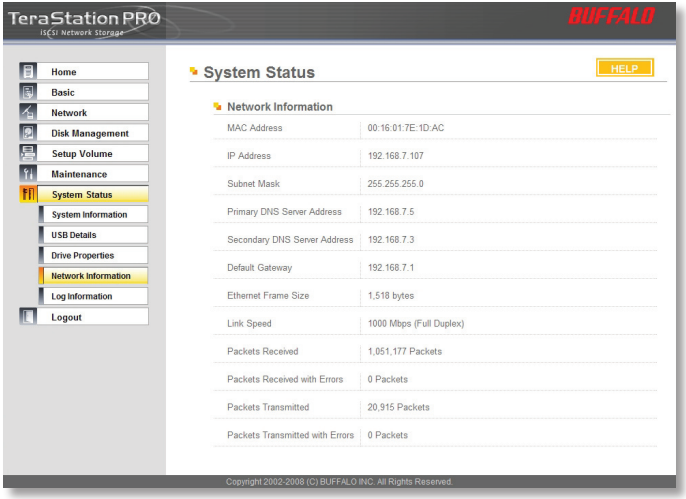
This page shows you details on USB hard drives and UPSs plugged into your TeraStation.

System Status (Drive Properties)



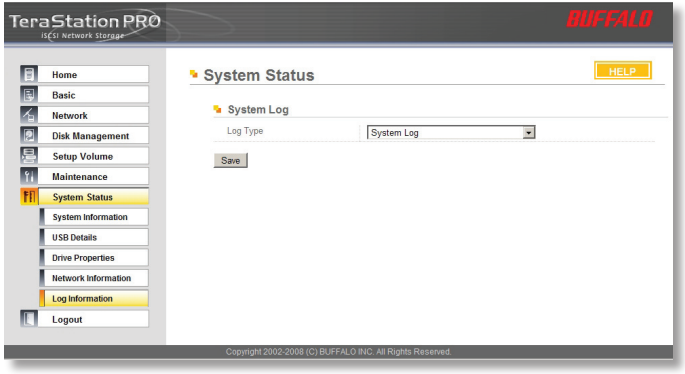
This page shows you the properties of all hard drives and RAID arrays in and attached to your TeraStation.

System Status (Network Information)



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

Log Information



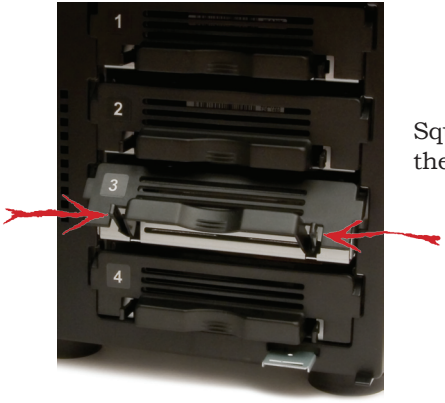
This page lets you save or display system log information. Choose the log you want from the *Log Type* dropdown and click *Save*. The dialog will let you save or display ("Open") the logfile.

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 47 and 48 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 LINE	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

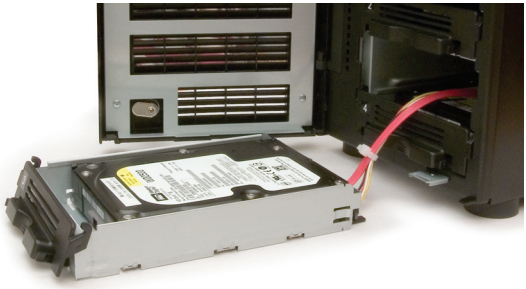
Turn the key counter-clockwise to open drive door.

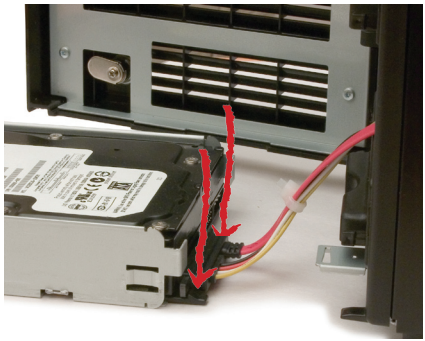


Squeeze the tabs gently and swing the tray latch upward.

The hard drive tray will now slide out.

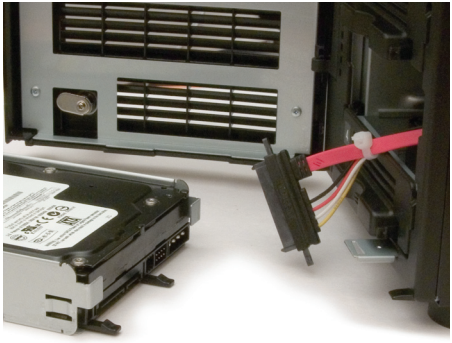
Lower the drive carefully to the work surface.

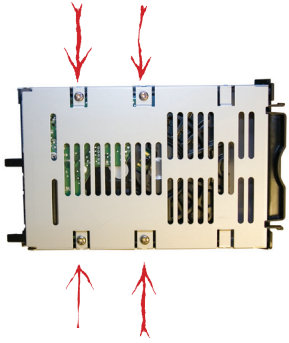




Gently push down on the two tabs to release the plug.

Pull the plug straight out to remove the drive.





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

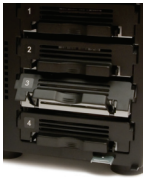
Install a new hard drive by doing the same steps in reverse order:

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.



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
Access Media:	CSMA/CD
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)
UPS:	UPS Compatible (Serial/USB connection)
Power Consumption:	~56W (Varies based on size)
Dimensions:	6.7” x 9.3” x 12.2” (170 x 235 x 310 mm.)
Weight:	~15.8 lb (7.2 kg) (Weight varies based on size)
Operating Environment:	32° - 95° F; 20-80% non-condensing

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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

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