TeraStation User Manual

www.buffalotech.com

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Diagrams and Layout

Diagrams and Layout

<TS-XL, TS-XEL>

Front View

Rear View

<TS-WXL>

Front View

Rear View

<TS-RXL>

with cover attached

with cover removed

Rear View
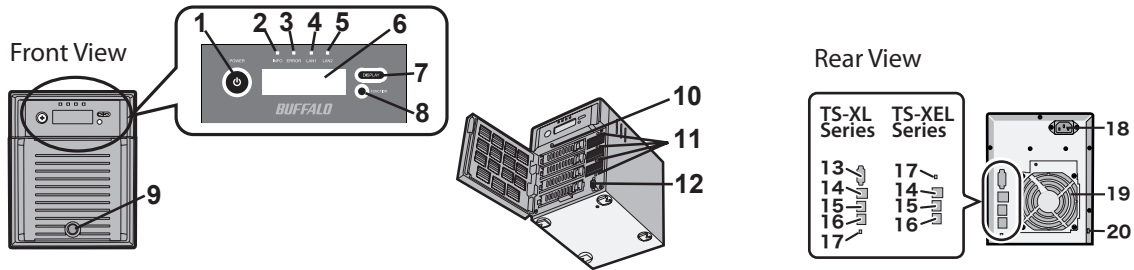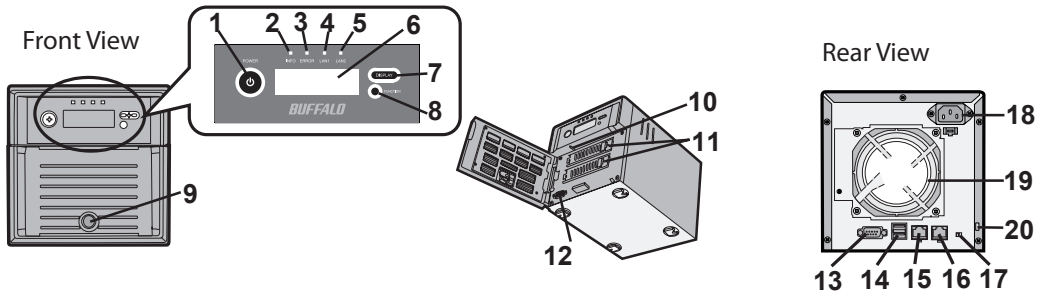
1 Power Button

Power ON: Push the Power button. When the power is ON, the power button will be illuminated in green (except TS-RXL series).
Power OFF: Press and hold the Power button for 3 seconds (or until it beeps).

2 Info LED

If there is a message about the current status, the amber Info LED is illuminated. Check the LCD display for current status.

3 Error LED

The red Error LED is illuminated when an error occurs. Check the LCD display for more information.

4 LAN1 LED

When the LAN1 Port is connected to a network, it is illuminated in green (the light next to the LAN Port1 will be illuminated as well).

5 LAN2 LED

When the LAN2 Port is connected to a network, it is illuminated in green (the light next to the LAN Port2 will be illuminated as well).

6 LCD Display

Displays the status of the TeraStation.

7 Display Button

Switches between the different display modes.

8 Function Button

Use this button to perform the following operations:
• DirectCopy
• Removal of USB devices
• Rebuild RAID after replacing hard drives

9 Drive Lock

Open the front panel with the key to replace hard drives or press the Reset Button.

10 Reset Button

With the TeraStation powered on, hold down this button until it beeps (about 5 seconds), to reset the TeraStation's IP address and Password to the factory defaults. The password will not be reset if this functionality has been disabled from within the Web Admin.
Note: To access the TS-RXL series' reset button, insert the tip of an unfolded paper clip.

11 Status LEDs 1 - 4

LEDs 1 through 4 will be illuminated in green when the corresponding hard drives are accessed. If an error occurs on a hard drive, the corresponding LED will be illuminated or flash in red or amber.

12 Factory Use Only

TS-XEL Series doesn't have this port.

13 UPS Port

Connect a UPS (Uninterruptable Power Supply).
TS-XEL Series doesn't have this port.

14 USB Connector (USB 2.0/1.1 Series A)

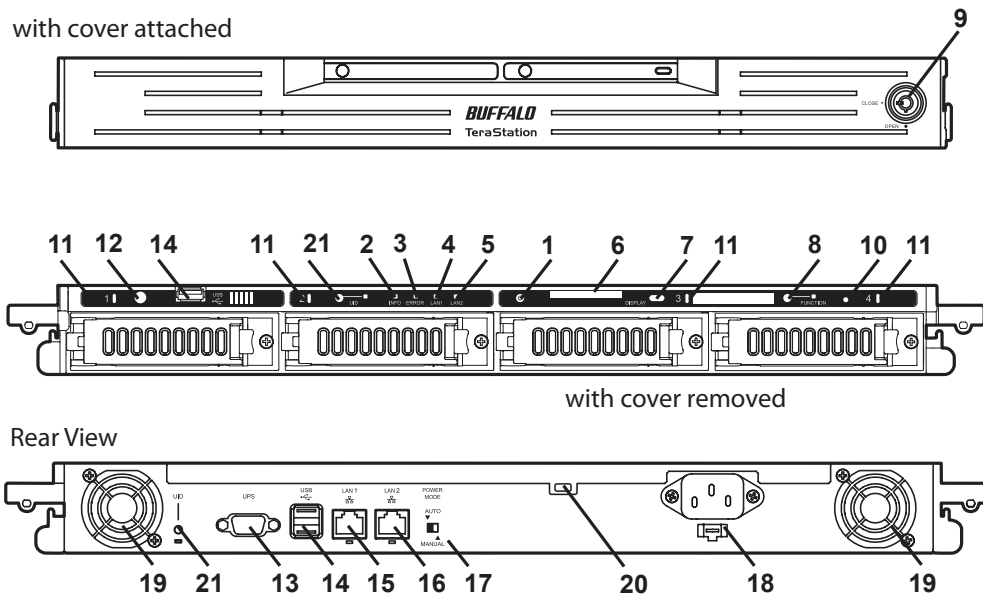Compatible Buffalo USB hard drives, USB flash drives, and Digital Cameras can be connected. USB hubs are not supported.

15 LAN Port 1

Connect to a router, hub, or switch on your Ethernet network.

16 LAN Port 2

Use this second Ethernet port for redundancy or backup. For backup, a second TeraStation may be connected directly.

17 Power Mode Switch

Switches between Auto and Manual power modes (page 6).

18 Power Connector

Use the included AC cable to connect to an UPS, surge protector, or outlet.

19 Fan

Do not block the fan when installing the unit.

20 Anti-Theft Security Slot

You can also secure it using an off-the-shelf wire lock.

21 UID Button

The blue LED next to the UID button will be illuminated or turned off every time you push this button on the front or back.

Auto Power Mode

The TeraStation can be configured to automatically turn on and off with your computer. To use this feature, install NAS Navigator 2 on your computer(s) and then set the Power Mode Switch on the back of your TeraStation to *Auto*.
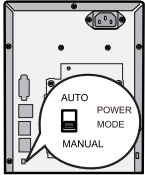
TS-XL   TS-XEL
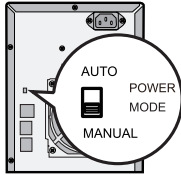
Manual (default):
In this position, the power button on the front of the TeraStation turns it on and off. It is not affected by the power state of connected computers.

Auto:
In this position, if all connected computers are turned off, the TeraStation will turn off too. If a connected computer is powered on, the TeraStation will power on too.

TS-WXL
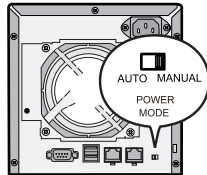
TS-RXL
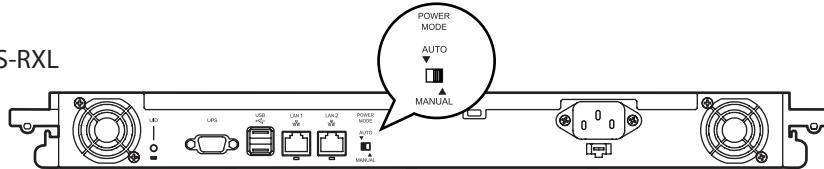
Notes:

- After you turn off your computer, it may take several minutes for the TeraStation to shut down.
- When the Power Mode Switch is changed from Auto to Manual or vice-versa, it takes about five minutes for the change to take effect.
- Power on the TeraStation before moving the switch to the Auto position.
- Auto Power Mode doesn't work if port trunking is enabled or if NasNavi detection is disabled.
- Install NAS Navigator 2 on all computers that will be accessing the TeraStation before switching to Auto Power Mode.
- Some networks may not support the Auto Power Mode. If you have problems with it, just use Manual power mode.

Chapter 2
Using your TeraStation

Opening Web Admin

To configure your TeraStation, use the web-based Web Admin from a browser on a computer connected to the same network.

1 Launch NAS Navigator2. For Windows, click on the [BUFFALO NAS Navigator2] icon on your desktop. For Mac OS X, double-click on the [NAS Navigator2] icon in the Dock.

2
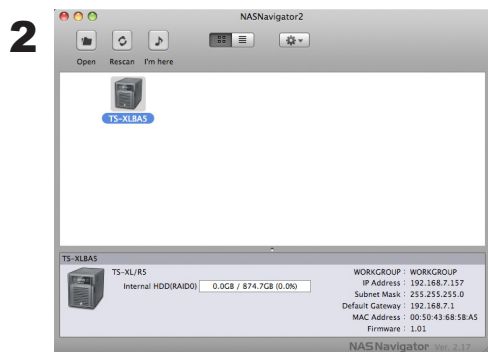
Right-click on the TeraStation icon (on Mac OS X, click the icon while holding down the control key) and select [Open Web Admin] from the menu.

Notes:

• If multiple TeraStations and TeraStations are connected to the network, multiple icons will be displayed. Click on the correct TeraStation.

• Record the TeraStation's IP address from the bottom right of the NAS Navigator2 window.

3

1 Enter your username and password, and click [Login]. Initially, use the default username and password:
Username: **admin**
Password: **password**

2 After you log in, change the password for security.

Note:

• To login as a guest, type "guest" for the Username, leave the password blank, and click [OK]. Guests can check the TeraStation's name, IP address, workgroup, and disk status. Regular users can change their login passwords as well as check the TeraStation name, IP Address, workgroup, and disk status. Administrator user, "admin" by default, can configure all options.

4
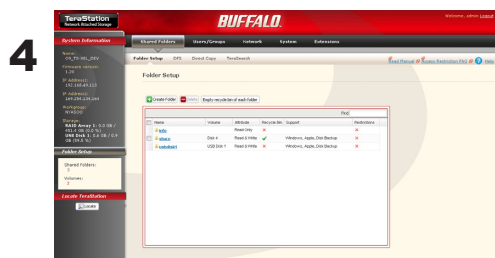
This is the TeraStation's Web Admin. This page displays the TeraStation's current status, including name, IP address, workgroup, and hard disk settings.

Notes:

• The Web Admin supports Firefox 1.5 or later, Internet Explorer 6.0 with SP2 or later, and Safari 3 or later. It may not display properly in other browsers.

• The Web Admin may not display correctly in Internet Explorer due to your browser security settings. If this happens, navigate to [Tools] - [Internet Options] - [Security] on Internet Explorer, and set the Security Settings to [Local Intranet].

The Web Admin is organized by tabs across the top. The following tabs are available.
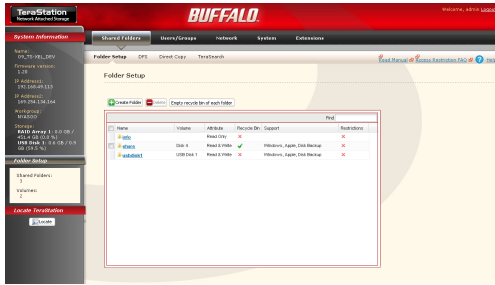
- Shared Folder
  Add or delete Shared Folders; configure Access Restrictions, DirectCopy, DFS and TeraSearch.

- Users/Groups
  Add, delete, and configure Users and Groups.

- Network
  Configure Network, Workgroup, and NFS settings.

- System
  Configure Name, Date and Time, RAID setup, RAID Scanning, Check Disk/Format Disk, Backup, Replication, Email Notification, Sleep Timer, UPS Settings, Restore/Format.

- Extensions
  Configure Web Access, Print Server, and Time Machine.

Notes:

•To open the Web Admin from a different computer, refer to Quick Setup Guide and install NAS Navigator2. After the installation, follow Chapter 2, or, you may type the IP address of TeraStation on a web browser.

• You may also open the TeraStation's Web Admin by typing the IP address that you wrote down in step 2 into the address field of your browser. Press the <Enter> key and bookmark this page in your browser so that you can return to it easily.

•With Mac OS X 10.4 or later, you can open the TeraStation's Web Admin from within Safari with Bonjour.

1 Launch Safari.

2 Select [View] - [View Bookmark Bar] from Safari's menu.

3   Select [Bonjour] from the left-side menu, then click on your TeraStation in the bookmark list.

4

1 Enter your username and password.

2 Click [Login].

Note: To log in as a guest, type "guest" as the username and leave the password blank.

5

The Web Admin opens.

The TeraStation's name, IP address and disk information are displayed on the left.

Chapter 3
Changing RAID Modes

RAID Arrays

TS-XL, TS-XEL and TS-RXL series TeraStations default to RAID 5 mode (4 hard drives), TS-WXL/R1 series default to RAID 1 mode, and TS-WXL/1D series default to Normal mode. The characteristics of each type of RAID are described below. If you change the RAID mode, all of the data on the hard drive is deleted. Always back up any important data before changing the RAID mode.

Note:

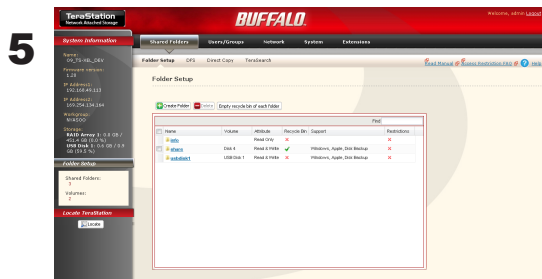• In this document, "recovery" means putting the TeraStation back to the state it was in before the malfunction happened. It does not mean reading data from failed hard drives.

• RAID 5 mode (4 hard drives) (Default for TS-XL, TS-XEL and TS-RXL)

Note:

TS-WXL/R1 and TS-WXL/1D TeraStations don't support this mode, as they don't have 4 hard drives.

Uses 4 hard drives as one array. It generates parity during writes, so access speeds are slower than other RAID modes. Usable space is the sum of 3 hard drives' space. If one hard drive in the array is damaged, you can recover data by replacing the hard drive. You cannot recover data if 2 or more drives are damaged.

• RAID 5 mode (3 hard drives)

Note:

TS-WXL/R1 and TS-WXL/1D TeraStations don't support this mode, as they don't have 3 hard drives.

Uses 3 hard drives as one array. It generates parity during writes, so access speeds are slower than other RAID modes.   Usable space is the sum of 2 hard drives' space. You can designate a 4th drive as a hot spare, which will boot automatically if one of the drives in the array fails. If one hard drive in the array is damaged, you can recover data by replacing the hard drive. You cannot recover data if 2 or more drives are damaged.

• RAID 10 mode

Note:

TS-WXL/R1 and TS-WXL/1D TeraStations don't support this mode, as they don't have 4 hard drives

RAID 10 combines 4 hard drives into a single array. Usable space is the sum of the capacity of 2 hard drives. Data is written quickly and access speed is faster than other RAID modes except for RAID 0. Since the same data is written to 2 hard drives at the same time, if drive in a pair (1-2 or 3-4) is damaged, data can be recovered by replacing the damaged hard drive. If both 1-2 or 3-4 hard drives are damaged, you cannot recover data.

• RAID 1 mode (Default for TS-WXL/R1)

Uses 2 hard drives as one array. You can use up to 2 arrays on TS-XL, TS-XEL and TS-RXL Series. The space you can use is 1 hard drive's space for each array. The same data is written to 2 drives at once. If a drive is damaged, data can be recovered by replacing the damaged hard disk. If both drives in an array are damaged, data cannot be restored. You can create an array and designate another drive as a hot spare (which will boot automatically when one of the hard drive fails) in TS-XL and TS-RXL TeraStations. You can use 2 drives to create a RAID 1 array, use anther drive as a hot spare, and use another as a regular drive, all at once.

• RAID 0 mode

This mode uses multiple hard drives as a single array. The disk space you can use is the total space of all hard drives used. This is the fastest of the TeraStation's RAID modes. If any hard disks are damaged, you cannot recover data.

• Normal Mode (Default for TS-WXL/1D)

This mode uses the hard drives inside the TeraStation as individual hard disks. It is sometimes referred to as JBOD. The disk space you can use is the total space of all hard drives in the TeraStation. If a hard disk is damaged, you cannot recover data from that drive.

Note:

During a recovery, the TeraStation's front LED display shows "RAID ARRAY* Resyncing" and file transfer speeds are slower than usual until the RAID array is rebuilt.

Using Normal mode
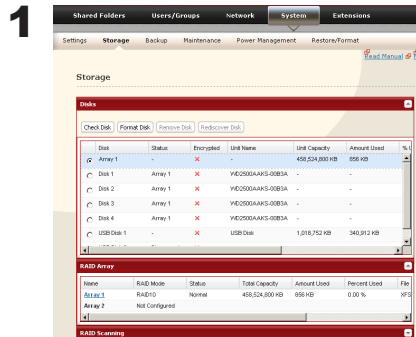
1   Click [System] - [Storage] - [RAID Array] in the Web Admin.

2   Select the array you want to configure.

3   Click [Delete RAID Array].

4   When the RAID Array operation window opens, click [Apply].

5   The Confirm Operation screen will appear.
Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

6   Follow the instructions displayed on the screen.

You have now set up Normal mode. Refer to page 34 to create a shared folder.

Confirm Operation screen

When you perform any of the following tasks, a Confirm Operation screen is displayed . To continue, enter the displayed number within 60 seconds and click [Apply].

- Changing structures of RAID array (Create/Delete)
- Delete Folder
- TeraStation's Restore Factory Defaults
- Format TeraStation
- Empty recycle bin of each folder

- Format Array or Disk
- Remove Disk
- Rebuild RAID array
- Configure hot spare
- Configure normal mode
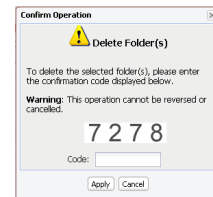
Confirm Operation Screen

Using RAID 5 mode (4 hard drives)

1 Change system to normal mode (previous page).
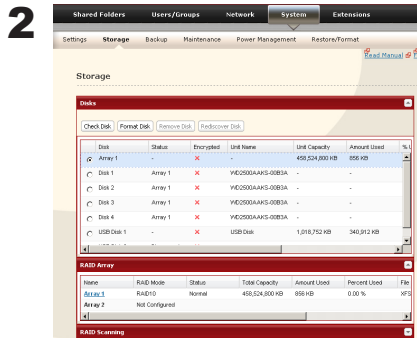
2

Click [System] - [Storage] - [RAID Array] in the Web Admin.

3

Click the array you want to configure.

4
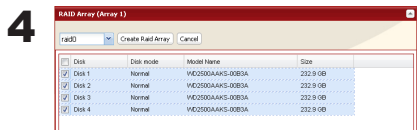
Select hard disks (all 4 of them) to use in RAID5.
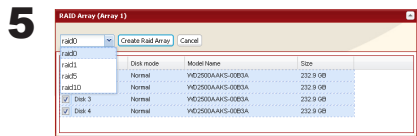
5

1 Select [RAID5].

2 Click [Create RAID Array].

Note:
After the RAID array is changed, the TeraStation will perfom a RAID check that will take about 5 hours per TB. File transfers will be slower during this period. While the "RAID ARRAY x Resyncing" message is displayed on the LCD screen, do not turn off the TeraStation. If you turn it off, the RAID check will start over.

6 The Confirm Operation screen will appear.
Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

7 Follow the instructions displayed on the screen.

You have now set up a RAID 5 array. Turn to page 34 to create a shared folder.

Using RAID 5 mode (3 hard drives)

1 Change system to normal mode (page 11).

2 Click [System] - [Storage] - [RAID Array] in the Web Admin.

3 Click the array you want to configure.
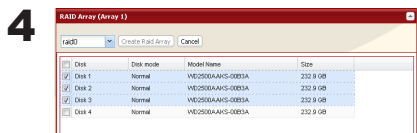
4 Select hard disks (3 of them) to use in RAID5.
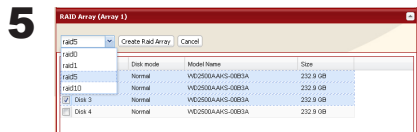
5
1 Select [RAID5].
2 Click [Create RAID Array].

Note:
After the RAID array is changed, the TeraStation will perfom a RAID check that will take about 5 hours per TB. File transfers will be slower during this period. While the "RAID ARRAY x Resyncing" message is displayed on the LCD screen, do not turn off the TeraStation. If you turn it off, the RAID check will start over.

6 The Confirm Operation screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

**7** Follow the instructions displayed on the screen.

You have now set up a RAID 5 array. Refer to page 17 to configure a hot spare with the remaining drive. Turn to page 34 to create a shared folder.

Using RAID 10 mode

1 Change system to normal mode (page 11).

2

Click [System] - [Storage] - [RAID Array] in the Web Admin.

3

Click the array you want to configure.

4
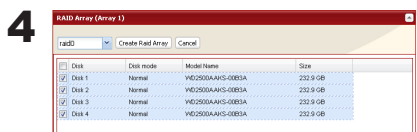
Select hard drives (all 4 of them) to use in RAID10.

5
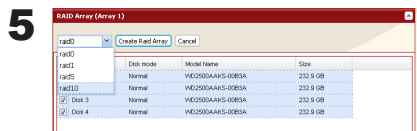
1 Select [RAID 10].

2 Click [Create RAID Array].

Note:
After the RAID array is changed, the TeraStation will perfom a RAID check that will take about 5 hours per TB. File transfers will be slower during this period. While the "RAID ARRAY x Resyncing" message is displayed on the LCD screen, do not turn off the TeraStation. If you turn it off, the RAID check will start over.
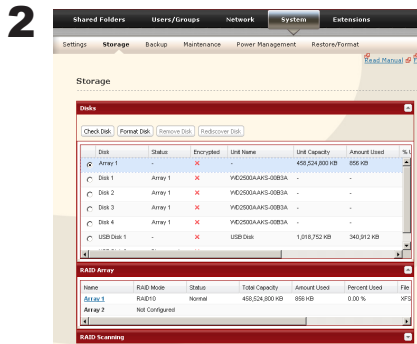
6 The Confirm Operation screen will appear.
Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

7 Follow the instructions displayed on the screen.

You have now set up a RAID 10 array. Turn to page 34 to create a shared folder.

Using RAID 1 mode

1 Change system to normal mode (page 11).

**2** Click [System] - [Storage] - [RAID Array] in the Web Admin.

3 Click the array you want to set.
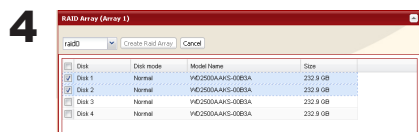
4 Click hard disks (Disk 1 and Disk 2, or Disk 3 and Disk 4) in RAID1.

5
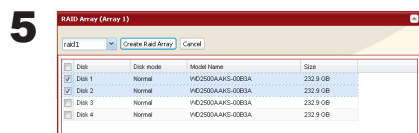
    1 Select [RAID 1].

    2 Click [Create RAID Array].

> **Note:**
> After the RAID array is changed, the TeraStation will perfom a RAID check that will take about 5 hours per TB. File transfers will be slower during this period. While the "RAID ARRAY x Resyncing" message is displayed on the LCD screen, do not turn off the TeraStation. If you turn it off, the RAID check will start over.

6 The Confirm Operation screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

7 Follow the instructions displayed on the screen.

You have set up a RAID 1 array. Repeat the steps to create a second RAID 1 array with the other two drives, or refer to page 17 to configure a hot spare with one of the remaining drives. Turn to page 34 to create a shared folder.

Using RAID 0 mode

1 Change system to normal mode (page 11).
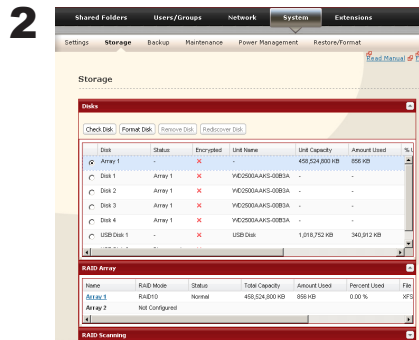
2 Click [System] - [Storage] - [RAID Array] in the Web Admin.

3 Click the array you want to configure.
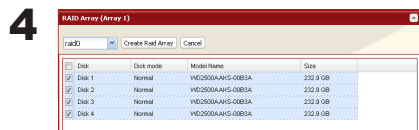
4 Select all available hard drives.
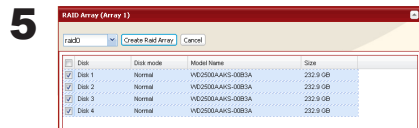
5
1 Select [RAID 0].
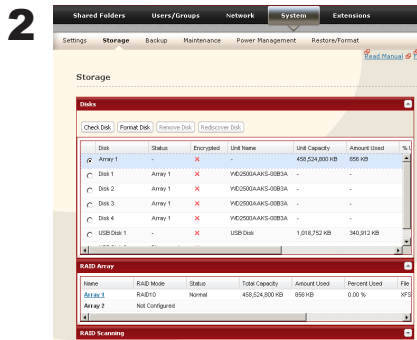**2** Click [Create RAID Array].

6 The Confirm Operation screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds, then click [Apply].

7 Follow the instructions displayed on the screen.

You have set up a RAID 0 array. Turn to page 34 to create a shared folder.

Configuring a Hot Spare

If you have 3 drives in a RAID 5 array, or 2 drives in a RAID 1 array, then you can configure another drive as a hot spare. If one of the drives in the array fails, the TeraStation will switch over to the hot spare immediately.
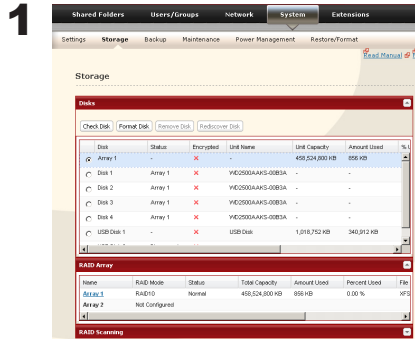
1 Click [System] - [Storage] - [RAID Array] in the Web Admin.

2 Choose a RAID 5 or RAID1 array.
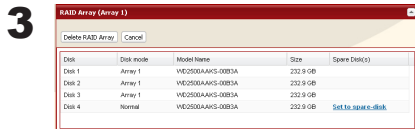
3 Click [Set to spare-disk].

Note:
If a hot spare is configured, click [Set to normal disk] to change the hot spare to a normal disk.
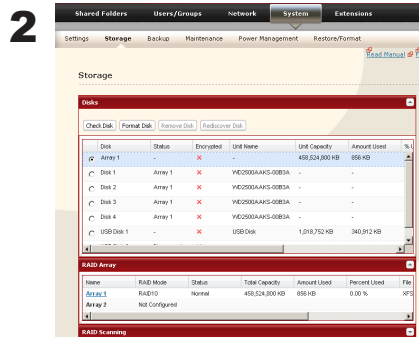
4 The Confirm Operation screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds and click [Apply].

5 Follow the instructions displayed on the screen.

You have now configured a hot spare.

Note:

All data in the hot spare drive will be deleted when it is configured as a hot spare and again when it changes over from a spare to a drive in the array.

Chapter 4
Adding an External Hard Drive

Connect an External Drive

Your TeraStation includes 2 USB connectors (3 if it's a TS-RXL). You can connect a Buffalo external hard drive to it for backup or extra storage.

Connect the external drive as shown below. If the hard drive is already formatted, it will be detected automatically. If it is not formatted, format it from within the Web Admin (page 19).

One external hard drive may be connected to each USB port on the TeraStation. USB hubs are not supported.

Warning! Do not unplug the drive from the TeraStation without dismounting it first. Turn to page 21 for directions on dismounting a connected drive.

<TS-XL, TS-XEL Series>

USB Connector

Buffalo External Hard Drive (not included)

USB Cable (not included)

<TS-RXL Series>

USB Connector (Series A)

TS-RXL Series

USB Cable (not included)

Rack (not included)

USB Connector (Series B)

Buffalo External Hard Drive (not included)

<TS-WXL Series>

USB Connector

Buffalo External Hard Drive (not included)

USB Cable (not included)
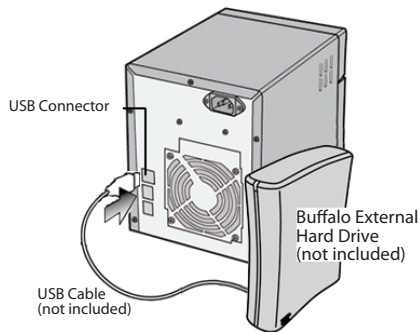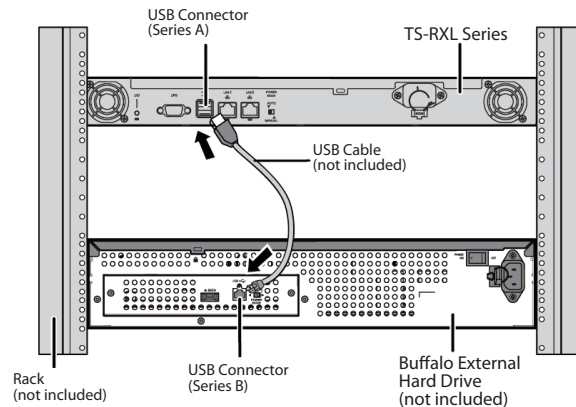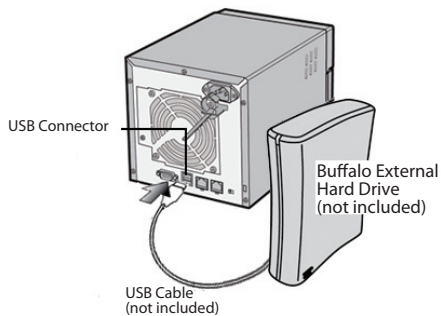
A third hard drive can be connected to the USB connector on the front panel of the TS-RXL TeraStation if the front panel is removed.
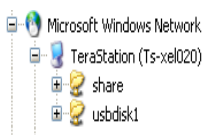
If the drive properly connected, *usbdiskX* is added to the TeraStation's shares on the network, where X is the # of the drive.

- **Note:** Files that are automatically created by Mac OS X cannot be backed up to a FAT 32 drive because they contain characters that are not allowed in FAT 32.

Formatting the External Drive

- A format deletes all data from a hard drive. Be careful! Back up any important data on a drive before formatting it. It will take a several minutes to format a drive.
- Shared folders cannot be accessed during formatting.
- Do not turn off or disconnect power to the TeraStation while formatting a hard drive.
- If Auto power is set to [Auto], then the TeraStation will turn off when the format is finished.
- To erase all data on a disk, choose [System] - [Restore/Erase].
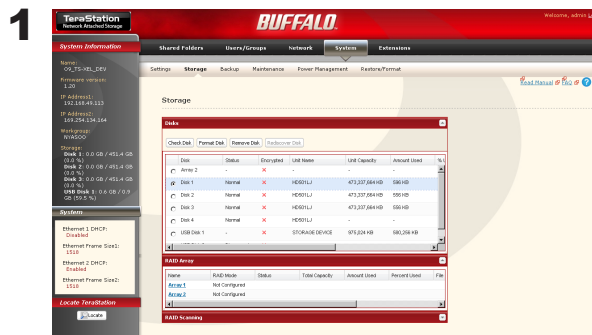
1 In the Web Admin, navigate to [System] - [Storage].
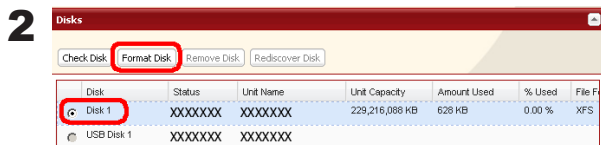
2
1 Select the drive to format. Make sure that you have the right drive!
2 Click [Format Disk].
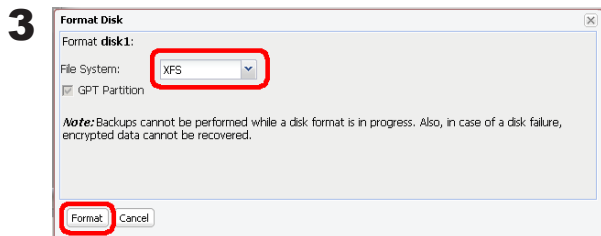
3 Click [Format].

4 The [Confirm Operation] screen will be displayed. Type the displayed number into the [Confirmation Number] field within 60 seconds, then click [Apply].

5 Follow the instructions displayed on the screen.

Notes:

- The time needed to format a hard drive varies based on the hard drive's size and format type (a few seconds to several minutes).
- The Info LED on the front of the TeraStation will flash during formatting. The TeraStation's shared folders cannot be accessed until the disk format is complete.
- If the hard drive is connected to the USB connector, partitions will be recreated.

Set Access Restrictions on the External Drive

You can set the access restrictions on the new drive. Use the procedure on page 33 to set the access restrictions.

Note:

Even if a shared folder is not visible, you can still format the drive, run a disk check, and back up to the new drive.

Restrictions

- The TeraStation supports many types of USB devices including USB storage devices, card readers, digital cameras, and USB printers. Other devices are not supported, such as USB hubs, card readers that recognize multiple memory cards, and USB mice and keyboards.

- You can connect up to 2 hard drives to a TeraStation via its USB connectors (3 for a TS-RXL). Only Buffalo drives are supported.

  * The TeraStation may not recognize a hard drive whose power mode is set to *Auto*. Set the power mode to *Manual* for drives connected to the TeraStation.

  * Direct Copy doesn't work with the HD-DU2 series DriveStation unless it has been reformatted.

  * The TeraStation can supply bus power to a single external drive only. For multiple drives, or if you experience power problems, connect an AC adapter to each hard drive.

- Only the primary partition of the hard drive connected via USB connector will be recognized. Secondary and other partitions will not be recognized.

Chapter 5
Removing External Hard Drives

If the TeraStation is on, always dismount external hard drives before disconnecting them. You may dismount drives with the Function button, or from within the Web Admin. If the TeraStation is turned off, dismounting is not necessary.

Dismounting with the Function button

To dismount a USB drive, press and hold the function button for 7 seconds.   The Function button will be illuminated in blue (The LED next to the Function button will be illuminated in blue on the TS-RXL). After the light in the function button goes out, you can safely remove your USB device.
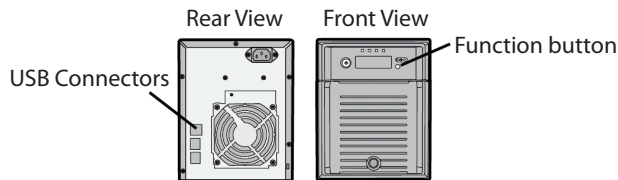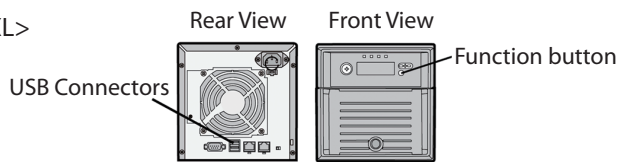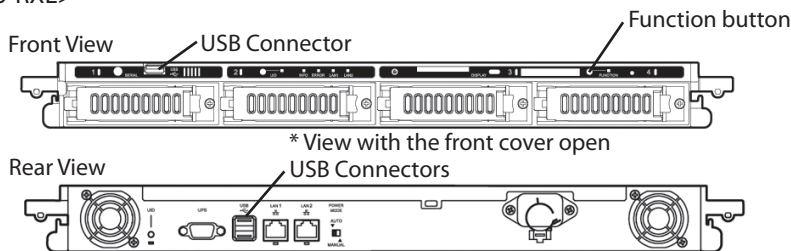
Note:

Wait 3 minutes before reconnecting a dismounted USB drive. It may not be recognized if you attempt to connect it immediately.

Dismounting from the Web Admin

Alternately, you can dismount an external drive from within the TeraStation's Web Admin.

1
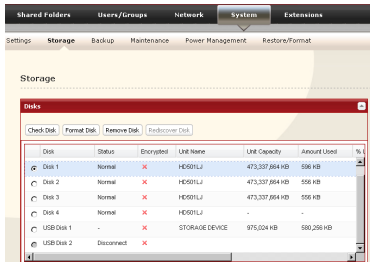
In the Web Admin, click [System] – [Storage].

2
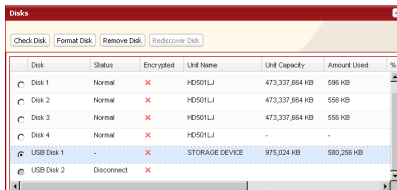
1 Select the USB drive.

2 Click [Remove Disk].

When the Confirm Operation screen opens, enter the displayed number within 60 seconds and click [Apply].

3 The function button will flash blue (on the TS-RXL, the LED next to the function button will flash). Remove the USB device within 30 seconds.

Note:
After 30 seconds, the drive will be remounted. If this happens, perform another dismount before removing it.

The USB drive may now be safely disconnected.

Chapter 6
Backup

Backup Data from your Windows PC

To back up data from your PC to the TeraStation, use the Memeo Backup program, included with your TeraStation. Memeo backup can be installed from your TeraNavigator CD. After installation, refer to [(All) Programs] - [BUFFALO] - [Memeo Backup] - [Memeo Backup] for instructions on how to use it.

Backup Data on the TeraStation

You can back up folders on the TeraStation to any of the following destinations:

• Another TeraStation (instructions on pages 23, 24, and 25)
• A different folder on the same TeraStation (instructions on pages 23 and 25)
• A USB hard drive connected to the TeraStation (instructions on page 25)

• Set up Destination for Backup

Before backing up to a TeraStation, you must configure a folder on the TeraStaion as a backup destination.
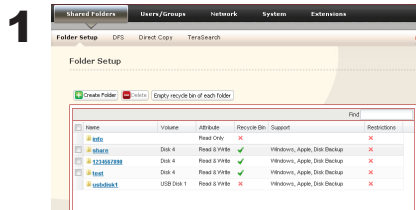
1 In the TeraStation's Web Admin, click [Shared Folders] - [Folder Setup].
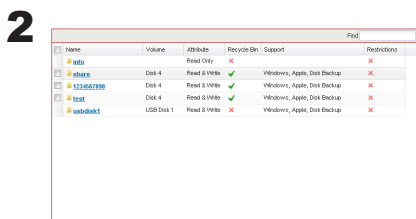
2 Choose the folder you want to set as a backup destination.
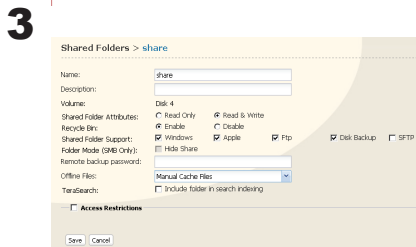
3 Check [Disk Backup] from Shared Folder Support.

i

Optional: To configure a password for backup jobs to this share, enter it in the [Remote backup password] field. If you do not want to set a password, do not enter anything.

4 Click [Save] at the bottom of the screen.

Backing up to another TeraStation on the local network

If the target TeraStation is configured with a password for backup, you can find it on the network by searching for the password.

1 In the target TeraStation's Web Admin, navigate to [System] – [Backup].

2 Under [Search for Backup Destination by Password], click [Modify Settings].

3

Enter a password and click [Save].

Now, you can easily find this target TeraStation when configuring backup jobs on a source TeraStation.

Backing up to a TeraStation on another network which is connected by a VPN

You can back up to a TeraStation on another network as long as the two networks are connected by a VPN. Follow the procedure below to enter IP address of the target TeraStation.

1 In the source TeraStation's Web Admin, click [System] – [Backup] - [View NAS Devices].

2
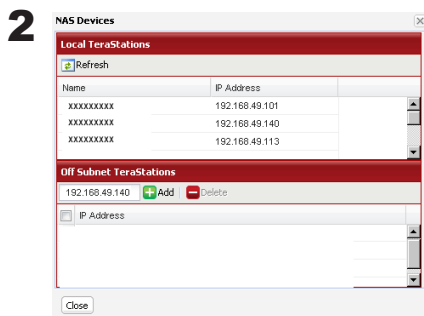
Under [Off Subnet TeraStation], enter the IP address of the target TeraStation and click [Add].

If you meet the following conditions, then you don't have to configure the settings described above:
• Not setting a password for backup on the target TeraStation.
• Source TeraStation and target TeraStation are on the same network.
Instead, just turn to the next page and configure a backup job

Configuring a backup job

1 To create a backup job, navigate to [System] - [Backup] - [Back Jobs Setup] - [Create New Job] in the source TeraStation's Web Admin.

    Note: Up to 8 backup jobs can be configured.

2   Select backup settings such as date and time to run.
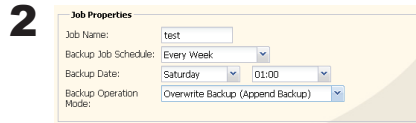
Select backup settings such as date and time to run.

Note:

Refer to page 125 for more on backup options.

Note:

The following types of backup job may be selected:

Normal Backup

All files in the source will be backed up to the destination.

Overwrite Backup (Append Backup)

The first time the backup job runs is just like a normal backup. Each addditional time the backup job runs, if file A was added to and file B removed from the backup source, then file A is added to but file B is not removed from the backup destination. Over time, the backup destination folder will become larger than the backup source folder.

Overwrite Backup (Differential Backup)

The first time the backup job runs is just like a normal backup. Each addditional time the backup job runs, if file A was added to and file B removed from the backup source, then file A is added to and file B is removed from the backup destination. The backup destination folder is always the same as the backup source folder.

3 Click [Backup Folders] - [Add].
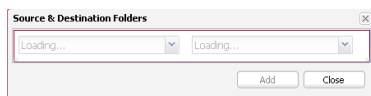
4
    1 Select Backup source and Backup destination folders.
    2 Click [Add].
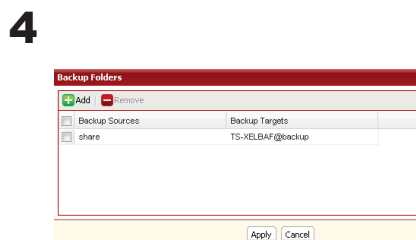
Click [Apply].
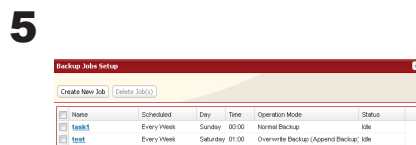
5 The backup job is added to the list of backup jobs.

Backup Notes:

- Subfolders may be selected, but not subfolders of subfolders. Folders with more than 80 characters in their total path may not be selected.
- Before they can be selected as backup target folders, folders on other TeraStations must be configured as backup destinations.
- To use a folder on an external hard drive as a backup target, you should format it with XFS, FAT or EXT3.
- If you are using PC Power Management, your system will automatically boot 15 minutes before the backup job begins.
- If your PC enters sleep mode just before a scheduled backup, the backup job may not have time to reboot the system before the backup job begins. If this happens, the backup job may fail.
- Source and target TeraStations should be configured with similar jumbo-frame settings. If you are experiencing problems backing up one TeraStation to another, try setting the frame size for both to the default (1518 bytes).
- If you change formatting or RAID array settings, previously created backup jobs may no longer run correctly. Delete the old backup jobs and create new backup jobs for the new share(s).
- Backups on EXT3 formatted USB disks can be read from a Windows PC with the provided Buffalo EXT3 reader software.

Restrictions regarding to Backup

- When performing backup to USB hard disk (FAT32 format) with Overwrite Backup (Differential) option, it may overwrite even though there are no difference in data. This is because of the specification of FAT 32. If the second of the date when the file created is an odd number, Overwriting backup is performed every time regardless of the differences in data.

- If you are using Jumbo Frame and backup data on TeraStation/TeraStation to another TeraStation/TeraStation, set the Ethernet frame size of those 2 TeraStation/TeraStation to the closest value. If Ethernet frame sizes of these are significantly different, the backup job may not be properly performed. In such a case, select the default frame size (1518 bytes).

- When backing up data by using TeraStation's Web Admin screen, if a file name or folder name to backup contains 2 bytes characters, a file/folder name of a log file may not be output correctly.

- If you change settings for formatting or RAID array after setting for backup, you must change the settings for backup. If there is no shared folder at the destination, an error message will be displayed.

Replication

Replication will mirror data on your TeraStation to a second TeraStation. An exact duplicate of a data share on the first TeraStation is copied to the second TeraStation virtually simultaneously. To configure Replication, use an Ethernet cable to connect LAN port 2 on the first TeraStation to LAN Port 2 on the second TeraStation. The first TeraStation should be connected to the local Network by LAN Port 1.

Notes:

• If the first TeraStation goes down, you can switch to the second TeraStation by moving the main Ethernet cable from the first TeraStation to the second TeraStation's LAN Port 1.

• Replication copies data only, not users or settings. To back up users, groups, and passwords from a TeraStation, use the NS-SHFT utility.

• If a backup password is set for a share, then that share cannot be selected as a backup target for replication.

• Replication copies data from the source folder to a target folder. Please note that any data in the target folder that is not in the backup source folder will be deleted.
Only folders on TeraStations which support Replication (TS-XL, TS-XEL, TS-WXL, TS-RXL, TS-HTGL, TS-RHTGL. etc.) can be selected as replication source folders or target folders.
Up to 64 shares can be selected for replication.

• Only data written by SMB and CIFS (Windows) and AFP, NFS, SFTP, FTP, and FTPS (Apple) can be mirrored by replication.

• Replication transfers files asynchronously. It may take time to transfer files depending on the network environment or status of the TeraStation.

• Replication will retry file transfers if they fail because of a network problem. If the retry fails, the TeraStation's Error LED will light and an alarm will sound. To repair, fix the network problem, then, in the TeraStation's Web Admin, navigate to [System] - [Backup] - [Replication] and click [Resynchronize].

• Do not set multiple Backup Targets for one Backup Source. Multiple transfer processes for Replications will run, and system performance will be adversely affected.

• Do not replicate a share that is the target of Time Machine backups by Mac OS X.

• System performance may be degraded if Mac OS X writes to the replication source folder with an AFP connection. If this occurs, connect via SMB for better performance.

• When replicating to a USB drive, a folder which has the same name as the backup source will be created on the USB drive. If the same folder name already exists on the USB drive, any files in that folder will be deleted.

• External hard drives formatted with FAT 16 or FAT 32 should not be used with replication. For best results with the TeraStation, format your external USB hard drives with XFS or EXT3.

Configure replication as described below.
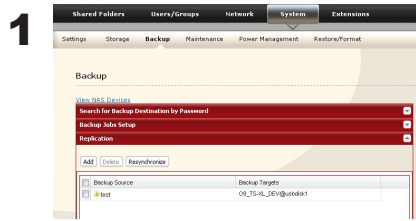
1 In the source TeraStation's Web Admin, click [System] - [Backup] - [Replication].

2 Click [Add].

3
   1 Select replication source folder.
   2 Select replication target folder.
   3 Click [Save].

4 Read the alert message carefully and click [OK].

Replication is configured.

Replication to a TeraStation on a different network

If your target TeraStation is on a different network or subnet, you may still configure replication as described above, but you must first add the target TeraStation to your list of off-subnet TeraStations as described below.
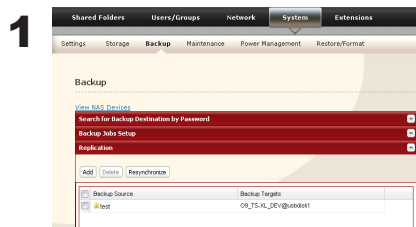
1 In the source TeraStation's Web Admin, navigate to [System] - [Backup]. Click on [View NAS Devices].
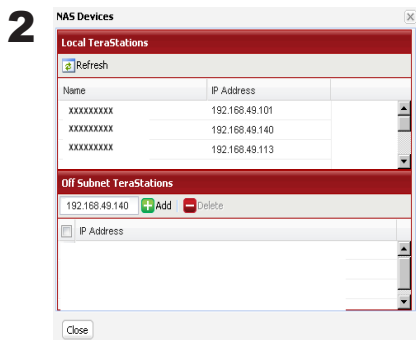
2 Under [Off Subnet TeraStations], enter the target TeraStation's IP address in the [New IP Address] field. Click [Add].

Note: If the Target TeraStation is behind a router, enter the router's WAN side IP address. You will need to map ports 873, 22938, 22939 to the target TeraStation in the router for this to work correctly.

3 Click [Close].

You can now configure Replication as described in the previous section.

Time Machine

Time Machine is a backup program included with Mac OS X 10.5 or later. To use it with the TeraStation, configure the TeraStation as described below.

1
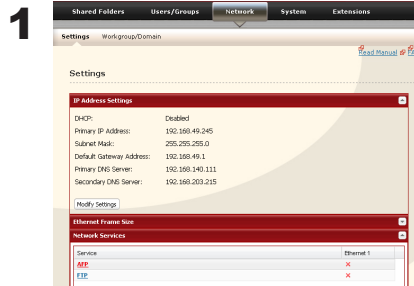
In the TeraStation's Web Admin, navigate to [Network] - [Settings] - [Network Services] and click [AFP].

2

Select [Enable] and click [Save].

Note:

Settings for both LAN Port 1 and 2 are the same (ports cannot be configured separately).
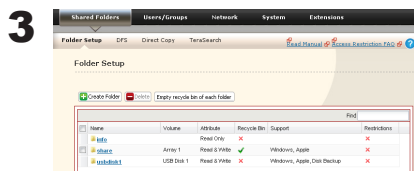
1 Click [Shared Folders].

3

2 Choose a shared folder to configure as a backup destination for Time Machine.

4
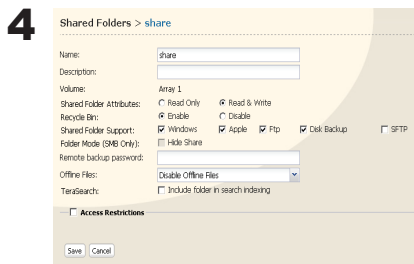
1 Check [Apple] under [Shared Folder Support].

2 Click [Save].

5
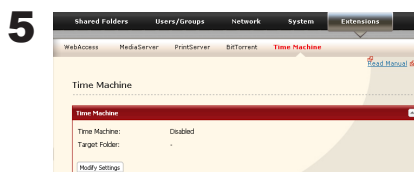
1 Navigate to [Extensions] - [Time Machine].

2 Click [Modify Settings].

6

1 Select [Enable].

2 Select the shared folder that you set in step 3.

3 Click [Save].

7

1 Enter the Mac's host name.

2 Enter the Mac's Ethernet MAC address.

3 Click [Create].

Notes: • A Macintosh computer's host name can be found under [Computer Name] in [System Preferences] - [Sharing].
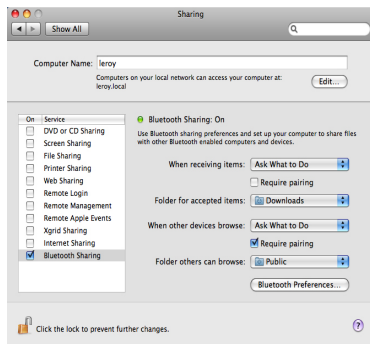
Examples:
If Computers on your local network can access your computer at "bbbbbbbbbb.local", enter 'bbbbbbbbbb" for the host name. If it is "cccccccccc.eee-ee.local", enter "cccccccccc" for the host name. If it is "dddddddddd.fff-ff.jp", enter "dddddddddd" for the host name.

• A Macintosh computer's Ethernet MAC address is available from its network page.
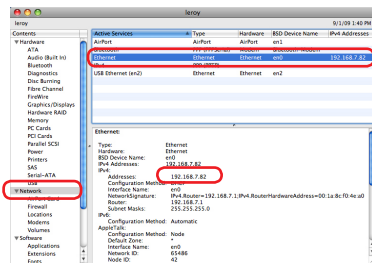
1 From the Apple menu, select [About This Mac], then [More Info].

2 System Profiler will open. Click [Network] on the left side.

3 The Ethernet MAC address will have a BSD Device Name of "en0". It will be labeled "IPv4 Addresses". Copy the address and paste it into [Target MAC address].

Note:
The folder <Macintosh Host Name>_<Macintosh MAC address>.sparsebundle will be created in the shared folder that was selected as the target share for Time Machine in step 3. Do not delete this folder or change its name, or Time Machine will not work properly.

8 From the Apple menu, select [System Preferences].

9
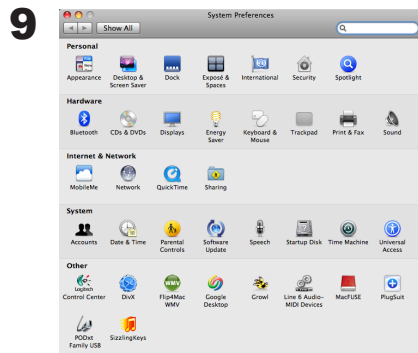
Click [Time Machine].

10

Click [Choose Backup Disk].

11
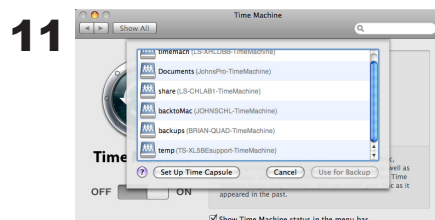
Select TeraStation, and click [Use for Backup].

12
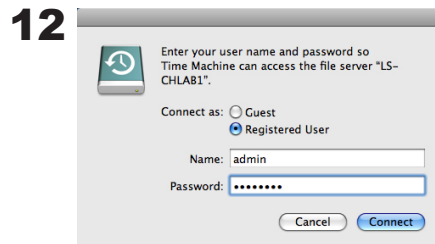
Enter a user name and password with the rights to access the shared folder of the TeraStation, and click [Connect].

Note:
If the backup target folder on the TeraStation does not have access restrictions configured, type "admin" for the username and "password" for the Password.

13
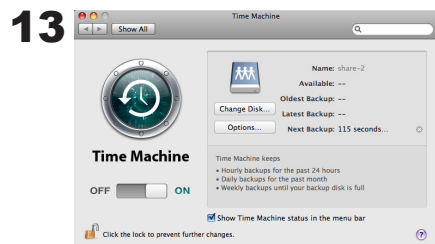
Make sure that Time Machine is "on". A backup will start in 120 seconds. Time Machine will run in the background, and you can use your Mac as usual. For information on using Time Machine, do a search for "Time Machine" in your Mac's help.

Your TeraStation is now configured for use with Time Machine.

Chapter 7
Configuring Access Restrictions

TeraStation allows you to set permissions for users or groups to access specific shared folders. Four types of Access Restrictions are available:

• Access Restrictions for Users and/or Groups on the TeraStation
> Follow the procedure on page 41 to configure.

• Access Restrictions on NT Domain
> Follow the procedure on page 43 to configure.

• Access Restrictions on Active Directory
> Follow the procedure on page 45 to configure.
> **Notes:**
> • This chapter describes the procedure to use Active Directory with Windows 2000 Server, Server 2003, and Server 2008.
> • Depending on the security settings, the TeraStation may not be able to join, or may be able to join but may not be authenticated by a domain. In such a case, it is recommended to restrict access by delegating authority.

• Restrict access by delegating authority
> Follow the procedure on page 47 to configure.

Notes:

• Access restrictions on the TeraStation are configured for shared folders in the root folder. Subfolders inherit their permissions from their parent folder and may not be configured separately.

• Permissions on the TeraStation are configured from within the TeraStation's Web Admin. Changing TeraStation permissions on the fly from within Windows or OS X is not supported.

Adding a Shared Folder

1
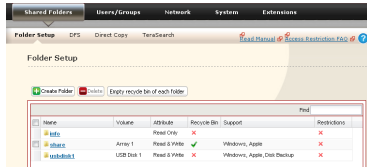
1 In the Web Admin, click [Shared Folders] - [Folder Setup].

2 Click [Create Folder].

2
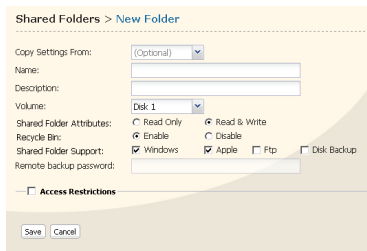
1 Configure the desired settings for the new folder.

2 Click [Save].

Notes:
- Shared folder names can contain up to 12 alphanumeric charactors (or 6 2-byte charactors). Hyphens and underscores may be used. Do not use a number or symbol as the first letter of a shared folder name. You can enter up to 50 alphanumeric characters (25 characters for 2-byte) for the description. Hyphens, underscores, and spaces may be used. Do not use a number or symbol as the first letter of the name.
- You may create up to 400 shared folders on the TeraStation.

You have created a new shared folder.

Recycle Bin

Each shared folder on the TeraStation that is connected by SMB may have the recycle bin enabled or disabled from within the Web Admin. If enabled, deleted data from a shared folder will be temporarily moved to a [Trashbox] subfolder. To recover deleted data, open the [Trashbox] folder and move files.

Notes: To delete all files in the Recycle Bin, click [Shared Folders] - [Folder Setup] - [Empty recycle bin of each folder] on the Web Admin.

Read-only Shares

A folder may be configured as read-only by selecting [Read Only] from Shared Folder Attributes.

Notes: The default setting is [Read & Write].
A shared folder whose attribute is set to read-only is read-only for all users, even if they are assigned write permissions on the share.
When a shared folder is configured to be read-only, the message "(Read Only)" is added to the description of that share folder.

Hidden Shares

In the Web Admin, click [Shared Folders] and select [Hide Share] on [Folder Mode (SMB Only)]. Click [Save].

Only SMB shares may be hidden. If other protocols are checked for the share, such as AFP, FTP, or SFTP, you cannot select [Hidden Share].

To open a hidden share, click [Start] - [Run] and enter \\TeraStation Name\Shared Folder name$\. Example: If your TeraStation is named "TS-XL001" with the default share "share" hidden, enter \\TS-XL001\share$\.

Technical Restrictions

- Windows does not support some characters that OS X and the TeraStation allow. So, if you create a filename on a Mac with any of the following characters, it will not display correctly on a Windows computer. With Mac OS X 10.2 or later, you may have to connect to the TeraStation via AFP in order to display or copy any of the following characters: ? [ ] / ¥ = + < > ; : ", | *

- Do not use any of the following words as a Username or Group Name: root, bin, daemon, sys, adm, tty, disk, lp, sync, shutdown, halt, operator, nobody, mail, news, uucp, ftp, kmem, utmp, shadow, users, nogroup, all, none, hdusers, admin, guest, man, www, sshd, administrator, ftpuser, apache, mysql.

- Do not use any of the following words as a shared folder name: info, spool, usbdisk1, usbdisk2, usbdisk3, usbdisk4, lost+found, global, printers, homes, lp, auth, ram, disk1, disk2, disk3, disk4, array1, array2.

- When using 2-byte characters (such as Japanese), make folder and file names with 80 characters or less. Total pathlength is limited to 1024 bytes (512 two-byte characters). You may not be able to copy a folder or file whose name is more than 80 two-byte characters long, or whose pathname is more than 1024 bytes total.

- You cannot set hidden or read-only attributes to folders or files on a TeraStation from Windows. To set an attribute for a share on the TeraStation, use the TeraStation's Web Admin. In [Shared Folders] - [Folder Setup], click the shared folder you want to configure. Select [Read Only] or [Read & Write] from [Shared Folder Attributes], and [Hide Share] from [Folder Mode (SMB Only)].

- If local characters aren't displayed properly in a Shared Folder or Workgroup name, use alphabetical character.

- If you access a shared folder from a Macintosh computer, information files for Macintosh may be automatically generated. Do not delete these files from a Windows computer. Otherwise, you may no longer access folders from Macintosh.

- A volume name mounted by Finder from Mac OS X 10.3.9 may be corrupted when connected via SMB. File names and data should be fine.

- On Mac OS X 10.5 - 10.5.6, you cannot search by Spotlight while connected via AFP. In such a case, use SMB connection or use Mac OS X 10.5.7 or later.

- TeraStation belongs to the default zone specified by an AppleShare Server. You cannot specify a zone.

- Date and Time stamp information stored on a TeraStation's hard disk or a USB hard disk connected to the TeraStation may be updated by an attached OS, and its accuracy cannot be guaranteed.

- If you display size of hard drives through the Web Admin, it will show a larger value than that shown by Windows' drive properties.

- If you change a TeraStation's settings or add a USB hard drive while transferring files, the file transfer may be aborted.

- Copying files to TeraStation is protected by the Journaling File System. However, if power is suddenly disconnected in the middle of a file copy, the following events may occur:

  - Data configured (TeraStation, User or Group names) may be lost.

  - The copied file may be incomplete and it may not be deleted. In such a case, restart TeraStation and delete the file, and try copying the file again.

- Although you format TeraStation's hard disk, [Percent Used] or [Amount Used] in the Web Admin will not show 0 (zero). This is because some space is used for the system.

- Set the TeraStation's username and password the same as the user's username and password for logging into the Windows network. If they are different, you may not be able to access share folders with access restrictions.

- Click [Shared Folders] - [Folder Setup] - [Empty recycle bin of each folder] in the Web Admin to delete all of the contents of the [Recycle Bin] folder in the shared folder.

- Do not set the same network address for LAN Port1 and LAN Port 2, or data transmission may be unstable. If this happens, initialize the TeraStation with the Reset Button.

- If you want to access a different network from the TeraStation, use LAN Port 1. LAN Port 2 cannot access beyond the local subnet as it doesn't have a default gateway.

Examples: You cannot use Mail Notification (cannot find the mail server), or you cannot find a TeraStation by IP address to configure as a backup destination.
To resolve, place the TeraStation on the same subnet as the device that you are trying to connect to via LAN Port 2.

Adding Users
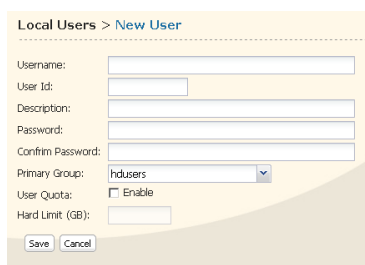
1
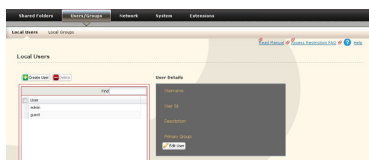
1 Click [Users/Groups] - [Local Users].

2 Click [Create User].

2

1 Enter [Name], [Password], and [Description].

2 Click [Save].

Notes:

• Usernames can contain up to 20 alphanumeric characters. Hyphens, underscores, and periods may be used. Do not use a symbol as the first character of a name.

• User descriptions may contain up to 50 alpha-numeric characters (25 characters for 2-byte characters). Hyphens and underscores may also be used. Do not use a number or symbol as the first character of a user description.

• You may register up to 300 local users with the TeraStation.

• Passwords can contain up to 20 alphanumeric characters. Hyphens, underscores, commas, semi-colons, periods, @, !, #, $, %, &, ', (,), *, +, /, <, >, =, ?, [,], ^, {, }, |, and ~ (tildes) may be used. Do not use any symbol except the underscore as the first letter of a password.

• Set the TeraStation's username and password the same as the user's username and password for logging into the Windows network. If they are different, the user may not be able to access shared folders with access restrictions.

• Repetitive deletions and additions of users may cause the Quota feature to not work properly. Even though the data is copied by the backup function of the TeraStation, the Quota feature may not work properly if a user ID/group ID is duplicated. In such a case, use a user name/group name of an unused user ID or group ID.

• To assign Quotas for users, check [Enable] for User Quota and enter a limit in GB. (Instructions on page 82)

• If the user ID is left blank, a user ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that user ID are unique.

Importing Users

To import many users at once, enter the following information in the [Input CSV format data] field on [Users/Groups] - [Local Users] on the Web Admin, and click [Import].

Format of the user information: Username (required), Password (required), and Description (optional)

Example)
username1, password1, description1
username2, password2, description2
username3, password3, description3
…
…
…

Notes: • It may take about 1 hour depending on the number of users you import. Please note that you cannot use the Web Admin while the system is busy.

• Use commas as separators. Do not use spaces before or after the commas.

• If a line is incorrectly formatted, then the user in that line will not be registered.

• If a username is already registered on the TeraStation, that user will be overwritten.

• Commas should not be used in usernames, passwords, or user descriptions

Adding Groups

1
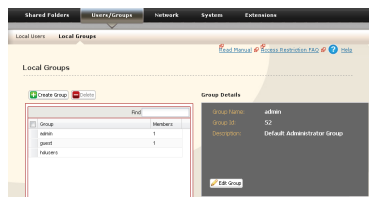
1 Click [Users/Groups] - [Local Groups] in the Web Admin.

2 Click [Create Group].

2
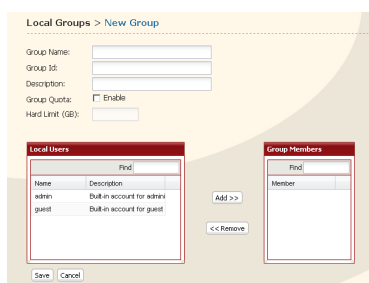
1 Enter Group Name and Description.

2 Select users who join a group, click [Add].

3 Click [Save].

Notes:

• Group names can contain up to 12 alphanumeric letters. Hyphens, underscores, and periods may be used. Do not use any symbol except underscore as a first letter of the name.

• Group descriptions may contain up to 50 alphanumeric characters (25 characters for 2-byte characters). Hyphens and underscores may also be used. Do not use a number or symbol as the first character of a group description.

• You may register up to 300 groups with the TeraStation.

• Repetitive deletions and additions of groups may cause the quota feature to not work properly. Even though the data is copied by the backup function of the TeraStation, the Quota feature may not work properly if a user ID/group ID is duplicated. In such a case, use a user name/group name of an unused user ID or group ID.

• If the Group ID is left blank, a Group ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that a user ID does not duplicate to other users.

• To set a Quota for a group, check [Enable] for Group Quota, and enter the maximum disk space allotted in GB. (Instructions on page 84)

Access Restrictions

Setting Access Restrictions for Users/Groups

The TeraStation allows you to specify which groups and users can access specific shared folders.

1 Register Users and Groups to the TeraStation as described in the previous sections.
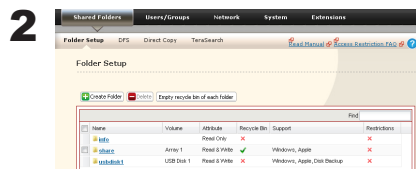
2

1 In the Web Admin, click [Shared Folders] - [Folder Setup].

2 Click the shared folder you want to set Access Restrictions for.

3

Click [Access Restrictions].

4
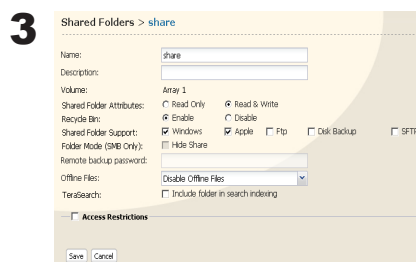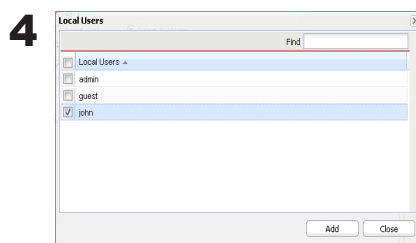
Click [Add].

Note:
The procedure described here shows an example of how to set the access restrictions for local users. To set the access restrictions on Local Groups bases, click [Local Groups] - [Add].

5
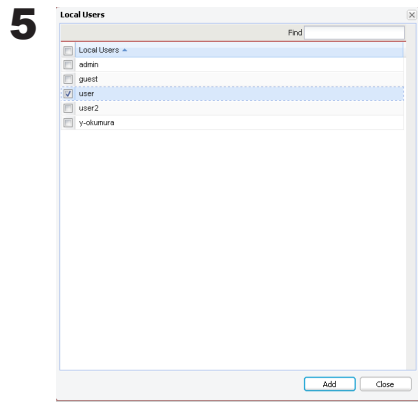
1 Check users or groups that you want to allow to access to the share.

2 Click [Add].

6
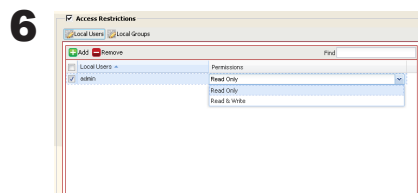
Select the level of privilege for the user or group you added.

7 Click [Save].

You have completed configuring access restrictions.

Notes:

- If you log on from a Microsoft Network Domain, you can set the access restrictions with the user names/group names which are registered on the domain.
- If a specific user is assigned both Read Only and Read & Write, they will have Read Only access. The most restrictive access is always used.

Access Restrictions on NT Domain

The TeraStation can download users, groups, and passwords from an NT Domain server. This procedure is recommended for system administrators only.

1 Create an account on the Domain Controller for the TeraStation.
   Note: If there is an option to "Accept accounts for computers with Windows 2000 or earlier", then select it.
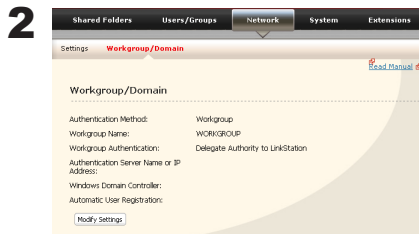
2 Click [Network] - [Workgroup/Domain] - [Modify Settings] in the Web Admin.

3
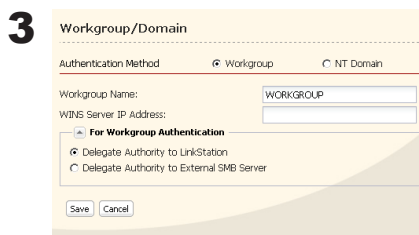
1 Select [NT Domain].

2 Select [NT Domain Name].

3 Select [NT Domain Controller Name].

4 Enter an Administrator password.

5 Enter an Administrator password.

6 Enter WINS Server IP Address (Optional)

7 Click [Save].

4 Follow the instructions in the previous section to add access restrictions to the domain.

Notes:

• Domain names can contain up to 15 alphanumeric letters. Hyphens, underscores, and periods may be used. Do not use a number or symbol as the first letter of a domain name.

• Domain controller names can contain up to 12 alphanumeric letters. Hyphens, underscores, and periods may be used. Do not use a number or symbol as the first letter of a domain name.

Restrictions

- If you change the TeraStation's Name, you will no longer be able to use Domain Users/Groups or access restrictions. Rejoin the domain.

- If a domain user name contains more than 20 characters, the TeraStation truncates it to 20 characters.

- The TeraStation only downloads the first 1000 users or the first 1000 groups from a Domain Controller.

- If you operate TeraStation as a member server of NT Domain or Active Directory Domain, you cannot connect as a guest user via AFP.

- When you change the user or group settings on the domain controller, these changes may not take effects immediately on TeraStation. If you need to reflect changes on the domain controller immediately, reboot TeraStation.

- While you are operating TeraStation as a member server of NT Domain or Active Directory and you change the [Authentication Method] in [Network] - [Workgroup Settings] to [Workgroup] on the Web Admin, the computer account on the domain controller will not be deleted automatically.

- If it has joined a domain network, you cannot connect to the TeraStation via FTP.

Access Restrictions on Active Directory

The TeraStation can download users, groups, and passwords from an Active Domain server. This procedure is recommended for system administrators only.

1
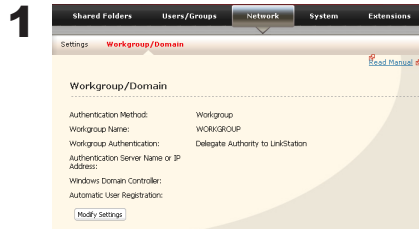
1 Click [Network] - [Workgroup/Domain] - [Modify Settings] in the Web Admin.

2
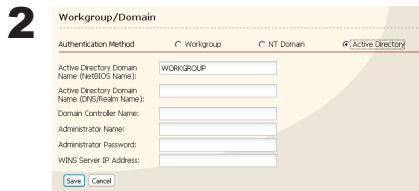
1 Select [Active Directory].

2 Enter an Active Directory Domain Name (NetBIOS name).

3 Enter an Active Directory Domain Name (DNS name).

4 Enter an Active Directory Domain Controller Name (Computer name).

5 Enter an Administrator password.

6 Enter an Administrator password.

7 Enter WINS Server IP Address (Optional)

8 Click [Save].

3 Follow the instructions on page 41 to 42 to add Access Restrictions to Domain Users/Domain Groups.

You have completed the settings for this feature.

Restrictions when administrating in Active Directory Domain

• When you have the TeraStation joined to an Active Directory domain, you must specify the DNS Server which can resolve names for Active Directory domain.

• After building an Active Directory domain, the administrator's password which is needed to join the Active Directory Domain must be changed at least once, or joining the Active Directory domain will fail.

• Active Directory domain's DNS name and NetBIOS name must be identical.

• If there are more than 5 minutes differences between the TeraStation's clock and the domain controller's clock, joining the domain or authenticating domain user or group may fail.

Access Restrictions through Delegate Authority to External SMB Server

To permit access to the TeraStation by administrating all user accounts and passwords together using a delegate server, follow procedures below. This is recommended for network administrators only.

Notes:

For Windows 7/Vista, Windows Server 2003/Server 2008 Users

When setting Access Restrictions via Delegate Authority to External SMB Server, you need to change the security setting on Windows 7/Vista and Windows Server 2003/Server 2008.

Select [Start] - [Buffalo] - [File Security Tool] - [File Security Tool] and select [Change the file security level] to change the security level (when changing back again, select [Change back the file security level]).

[File Security Tool] can be installed only on Windows 7/Vista, Windows Server 2003/Server 2008 from the CD included with this product.

During the initial setup, the message, [Changing the security level. Are you sure?] is displayed. Click [Yes] and follow the instructions on the screen to restart your PC .

Clicking [Yes] on the message for converting to Local Users which is displayed when applying changing External SMB Server Settings will convert all Local Users registered on the TeraStation to External SMB Server Users. You must set the Local user password again after resetting the External SMB Server.

1

In the Web Admin, click [Network] - [Workgroup/Domain] - [Modify Settings].

2
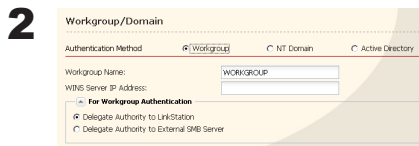
1 Double click [Workgroup].

Note: Even if you will use this unit in a domain environment, select [Workgroups].

2 Select [Delegate Authority to External SMB Server].

3
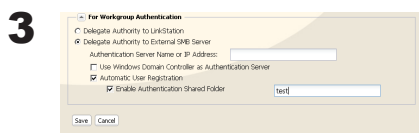
1 Click [Automatic User Registration]. Check [Enable Authentication Shared Folder]. If using Windows Domain Controller, check [Use Windows Domain Controller as Authentication Server].

2 Enter [Authentication Server Name or IP Address].

Note:

If you will be connecting using AFP and FTP, entering an IP address for the authentication server is recommended.

3 Enter an Authentication Share Folder Name.

4 If you want to allow access by local users in addition to externally authenticated use, select [Allow].

5 Click [Save].

Notes:

• Match the Workgroup name of this product and the Windows domain controller's domain name if you would like to specify the Windows domain controller as an external authentication server.

• A Workgroup Name can be up to 15 alphanumeric characters or 7 two-byte characters. Hyphens, underscores, and periods may be used.

• Do not use a number or symbol as the first letter of a workgroup name.

4 An Authentication Shared Folder is created on the TeraStation.
When a user who is registered to the specified External Server opens the Authentication Shared Folder, he/she will be automatically registered as a TeraStation user (you can directly register users).

Notes:
• A user who is automatically registered will belong to the "hdusers" group. They can be set to belong to any group from the Group settings.
• Access Restrictions to shared folders can be set for the User Name obtained
• User Name registered will be displayed when clicking [Users/Groups] - [External Users]. To delete a user that automatically registered, select the user and click [Delete External Users].
• When connecting using AFP and FTP, always use an IP address. Authentication may fail if a Server Name is used.
• Enter the IP address when specifying a server in a different subnet.
• AFP and FTP connections do not allow obtaining user information by delegating authority to External SMB Server.

5 Follow the instructions on pages 41 and 42 to add access restrictions to External Users/Groups.

You have completed the settings for the Authentication Server.

Restrictions when administrating Delegate Authority option

• If you cannot access the TeraStation while logged into Windows using the account information registered to the authentication server, you cannot access shared folders on the TeraStation or set access restrictions.
• If you use the Delegate Authority option, you cannot connect as a guest user via AFP.
• If you use the Delegate Authority option, you cannot connect as a Anonymous user via FTP.

Chapter 8

Managing your TeraStation

Name, Date and Time

Configure the TeraStation's host name, date, or time as follows:

1
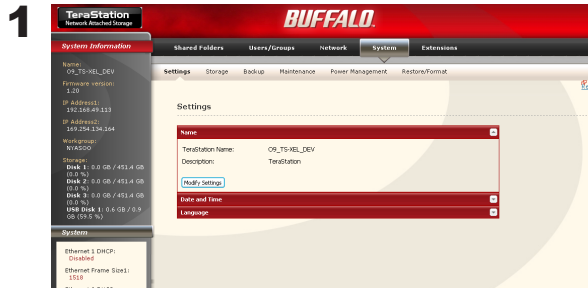
In the Web Admin, navigate to [Modify Settings] in [System] - [Settings] - [Name].

2

3
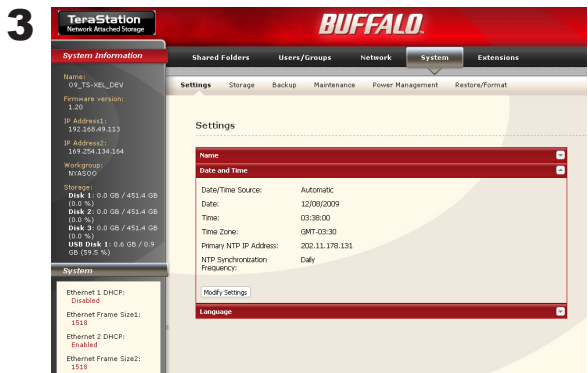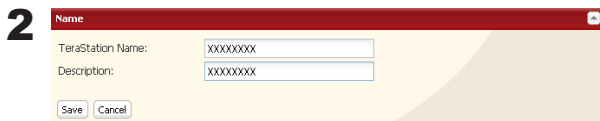
In the Web Admin, navigate to [Modify Settings] in [System] - [Settings] - [Date and Time].

4
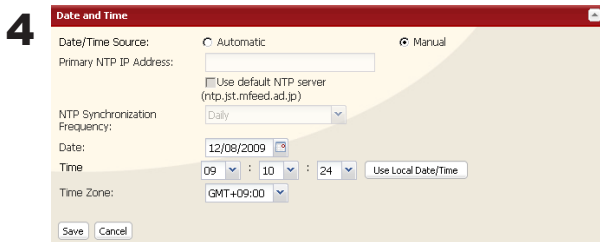
1 Enter the year, month, day, and time.

2 Click [Save].

Click [Use Local Date/Time] to use your computer's time settings for the TeraStation.

By default, the TeraStation adjust its clock automatically by using an NTP server.

> **NTP**
> NTP may not be usable in some networks.
> The default NTP Server (ntp.jst.mfeed.ad.jp) belongs to Internet Multi Feed Inc. For more information, please visit www.jst.mfeed.ad.jp.
> Use NTP at your own risk. Buffalo Technology is not responsible for any loss or damage caused by using of this service, stopping the service, or missing service.

You've completed hostname and time settings for the TeraStation.

Note:

The TeraStation's internal clock may run at a slightly different speed from other clocks on you network, and over a long period of time your network devices may show different times. If clocks on your network vary by more than 5 minutes it may cause unexpected behavior. For best results, keep all clocks on the network set to the same time by adjusting them regularly, or use an NTP server to correct them all automatically.

RAID Scanning

RAID Scanning allows regular scans of your RAID arrays to be configured to run automatically. Errors will be fixed as they are found if possible.

For best results, schedule regular RAID scans if you use RAID arrays in your TeraStation.

1
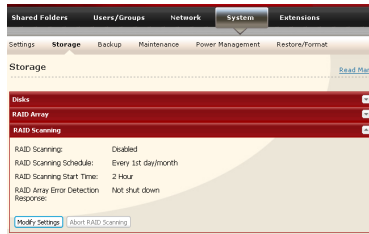
1 In the Web Admin, click [System] - [Storage] - [RAID Scanning].

2 Click [Modify Settings] under [RAID Scanning].

2

1 Click [Enable].

2 Select a schedule for RAID scans.

Notes:

•Select [Shutdown] to have the TeraStation to shut down automatically when an error is detected.
• If [Begin Immediate RAID Scan] is selected, then a RAID scan will begin immediately.
• To stop a RAID scan, click [Abort RAID Scanning].

3 Click [Save].

You have configured RAID Scanning.

Disk Check

A disk check tests the data on a drive in the TeraStation or connected via USB. Errors are fixed automatically. A disk check may run for more than ten hours. Shared folders cannot be accessed during the disk check. Do not turn off power to the TeraStation during the disk check.

If the Power Mode Switch is set to [AUTO], then the TeraStation will turn off when the disk check is finished.

Run a disk check as follows:

1

In the Web Admin, navigate to [System] - [Storage].

2
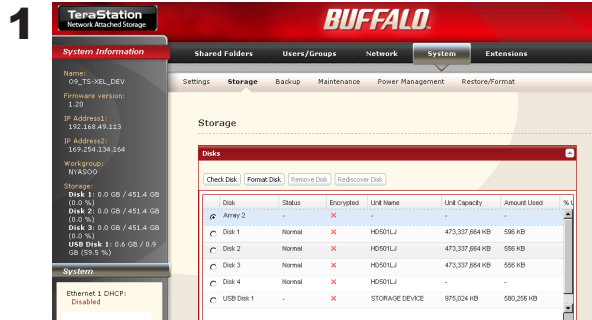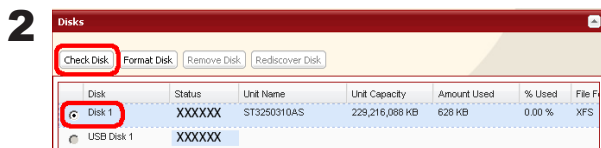
1 Select the hard drive to test.
2 Click [Check Disk].

3
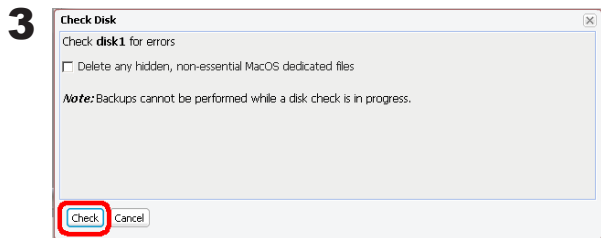
Click [Check].

The Status LED on the front of the TeraStation will flash during the disk check. The TeraStation's shared folders cannot be accessed until the disk check is complete.

Note:
If a power outage disconnects the TeraStation in the middle of a disk check, then you may not be able to access shares on the TeraStation from Mac OS. This is because the database created by Mac OS is damaged. To resolve, navigate to [System] - [Storage] - [Check Disk] and check [Delete any hidden, non-essential Mac OS dedicated files]. Rerun the disk check when done.

Encrypt Hard Drives on the TeraStation

If encryption is selected during a refomat of a drive or array, it will be encrypted with 128 bit AES. The drive or array will then be only readable from that specific TeraStation. To unencrypt the hard drive, untick [Encrypt] and format it again.

Notes:
• Performance will be slower if an array or drive is encrypted.
• USB drives cannot be encrypted.
• Data recovery services will probably not be able to recover data from an encrypted drive or array.

Formatting Disks

Notes:

• Formatting deletes all data from a hard drive. Be careful! Back up any important data on a drive before formatting it. It will take a several minutes to format a hard drive.

• Shared folders cannot be accessed during formatting.

• Do not turn off the power switch or disconnect power while formatting a hard drive.

• If the Power Mode Switch is set to [Auto], then the TeraStation will turn off when the format is finished.

• To erase all data on a disk, choose [System] - [Restore/Erase] instead of formatting.

1

In the Web Admin, navigate to [System] - [Storage].

2
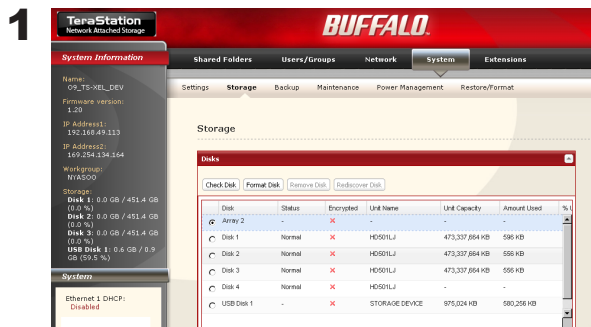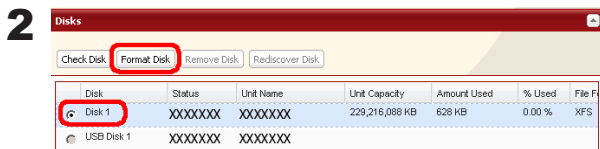
1 Select the drive to format.

2 Click [Format Disk].
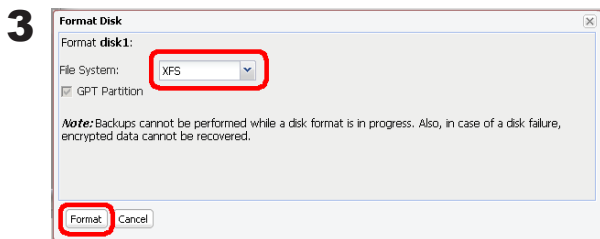
3

Click [Format].

4 The [Confirm Operation] screen will be displayed. Type the displayed number into the [Confirmation Number] field within 60 seconds, then click [Apply].

5 Follow the instructions displayed on the screen.

Notes:

• The time needed to format a hard drive varies based on the hard drive's size and format types (a few seconds to several minutes).

• The Info LED on the front of the TeraStation will flash during formatting. The TeraStation's shared folders cannot be accessed until the disk format is complete.

• If the hard drive is an external USB drive, its partitions will be recreated.

E-mail Notification

Your TeraStation can send you daily e-mail reports. It can also send you an e-mail when settings are changed or an error occurs.

The following contents will be sent via E-mail.
- Sends the status of hard drives at specified time
- Changes to RAID configuration
- Fan error alert
- Hard drive replacement alert

- Notifies when backup jobs are completed
- RAID error alert
- Hard drive read error alert
- Notification of Quota changes or limits

1
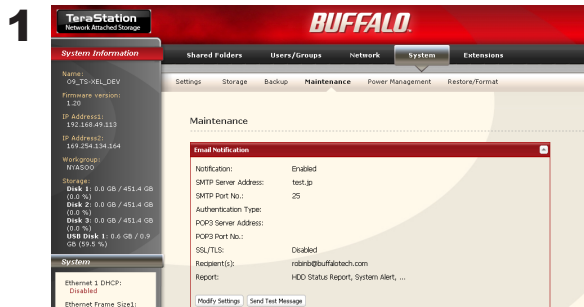
In the Web Admin, navigate to [System] - [Maintenance].

2 Click [Modify Settings] in [Email Notification].

3
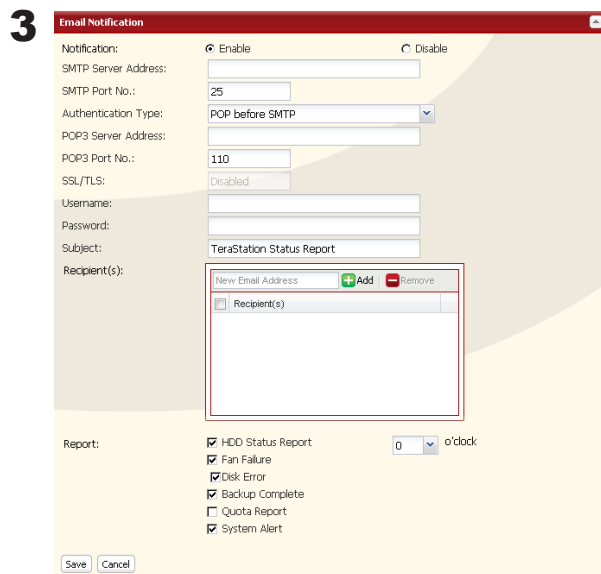
1 Click [Enable] under [Notification].

2 Type the SMTP Server Address and SMTP Port Number.

Note:

If using POP before SMTP, enter POP3 Server Address and POP3 Port Number.

3 Select User verification method (Disabled/pop before smtp/login(SMTP-AUTH)/cram-md5 (SMTP-AUTH)).

4 Enter a username.

5 Enter a password that will be used to verify.

6 To use a secured connection, select SSL/TLS.

7 Enter the subject for notification e-mail.

8 Enter an e-mail address, then click [Add] . E-mails can be sent to up to 5 addresses.

9 Select conditions for e-mails to be sent.
  - HDD Status Report   Sends the condition of the hard drives at the specified time.
  - Fan Failure   Sends when the fan error is recognized.
  - Disk Error   Sends when an hard drive error is recognized
  - Backup Complete   Sends when the backup is complete.
  - Quota Alert Notification   Sends when the Quota Space Limitation is exceeded at the time which is specified on HDD Status Report.
  - System Alert   Sends when system is rebooted or shut down, or RAID configuration is changed.

10 If you have selected [HDD Status Report] for sending condition, select time to send.

11 Click [Save].

4

Email Notification	
Notification:	Enabled
SMTP Server Address:	test.jp
SMTP Port No.:	25
Authentication Type:	
POP3 Server Address:	
POP3 Port No.:	
SSL/TLS:	Disabled
Recipient(s):	robinb@buffalotech.com
Report:	HDD Status Report, System Alert, ...

[Modify Settings] [Send Test Message]
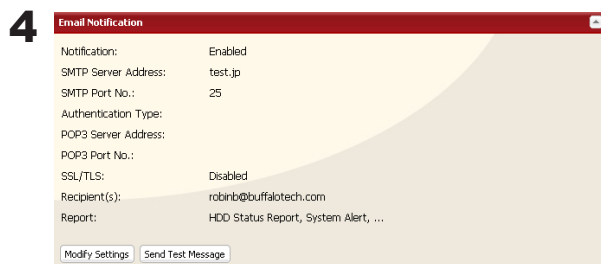
Click [Send Test Message] to send a test message.

Notes:

The following examples show notification e-mails for each selection:

• The content of the mail which include the periodical report when "HDD Status Report" is selected
TeraStation Status Report: Periodical Report: Information
[TeraStation Information]
TeraStation Name: TS-xxxxx
Time Stamp: 2009/03/23 00:00:01
IP Address: 172.16.37.62
Configuration Scree: http://172.16.37.62/
Continuous operating time: 13:51:57

• The content of mail which is sent periodically when "Disk Error" is selected
TeraStation Status Report: DISK Error Notification: Failure: Fail to mount a disk
DISK Error Notification
The error occurred on HDD.
The erroneous disk drive: Disk 1
Disk could not be mounted.

• The content of mail which is sent periodically when "Fan Failure" is selected
TeraStation Status Report: FAN Error Notification: Failure: FAN stopped.
FAN Error Notification
The FAN has stopped.
The internal temperature is now over the threshold. Shut down the system.
System temperature: 52 [°C]

UPS Settings

An uninterruptible power supply (UPS) can protect the TeraStation from power outages and brownouts. To use the TeraStation with a UPS, proceed as follows:

1 Plug the power cable of the UPS to a wall socket.

2 Connect the AC cable of the TeraStation to the UPS.

3 Connect the UPS to the TeraStation with a USB or serial connection.

Note:
• TS-XEL Series doesn't have UPS Port.

4 Turn on the UPS, then the TeraStation.

5 In the TeraStation's Web Admin, click [System] - [Power Management] - [UPS Settings].

6 Click [Modify Settings].

7
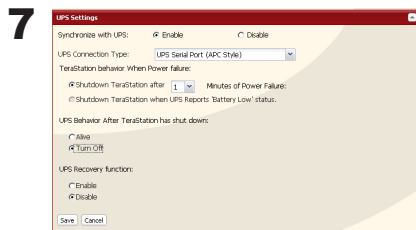
1 Check [Enable].
2 Configure settings.
3 Click [Save].

Notes:
• If the UPS has shut down the TeraStation because of a power outage, make sure that power has been restored before restarting the TeraStation. If the TeraStation is restarted after a shutdown, but power is not available, then the UPS will not shut down the TeraStation a second time even if its battery is running low.
• If the TeraStation is set to use UPS recovery, then the UPS will restart the TeraStation when normal power is restored.

Beep Alerts

You can set the TeraStation to beep when certain erros occur.

1 In the configuration utiltiy, select [System] - [Maintenance] - [Alert Sound Settings] - [Modify Settings].

2

1 Select the conditions to beep the alert from high temperature, drive error, fan error, or UPS power outage detection.

2 Click [Save].

You've now configured alerts.

LCD Display Settings

You may configure the LEDs and LCD screen on the front of the TeraStation here.

1 In the Web Admin, select [System] - [Maintenance] - [Front Panel Settings].   Click [Modify Settings].

2
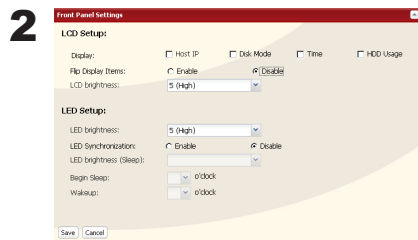
Several settings can be configured, including displayed information and the brightness of the LCD screen and the LEDs. Click [Save] when done.

You have completed the settings for the display panel.

Changing the Admin Password
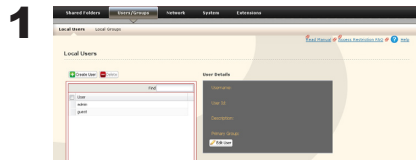
1   In the Web Admin, select [Users/Groups] - [Users].
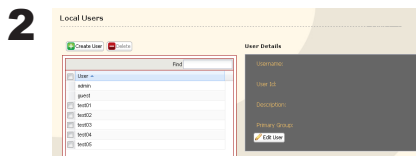
2
- **1** Click [admin] from the user list.
- **2** Click [Edit User].
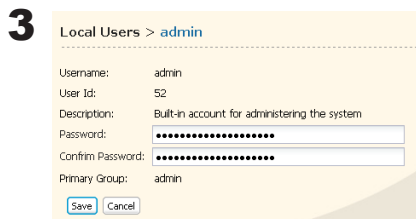
3
- **1** Enter a new password twice.
- **2** Click [Save].

You've now changed the admin password.

Notes:
- Passwords can contain up to 20 alphanumeric letters. Spaces, hyphens, underscores, commas, semicolons, (,), @, !, #, $, %, &, ', *, +, /, <, >, =, ?, [,], ^, {, }, |, and ~ (tildes) may be used. Do not use a symbol besides underscore as the first letter of a password.
- You cannot assign access restrictions to the "admin" account, or use it for WebAccess.

Erase Data on the TeraStation Completely

Data on the hard drive is not completely erased by just performing "Delete" or "Format". If you want to completely delete data from a TeraStation that you are going to donate, give away, or send in for repairs, do the following.

1 In the Web Admin, select [System] - [Restore/Erase] - [Erase TeraStation].

2 Click [Erase TeraStation].

3 The [Confirm Operation] screen will appear. Enter the number from the [Confirmation Number] field within 60 seconds, then click [Apply].

4 Follow the instructions displayed on the screen.

Notes: This will erase all data on the TeraStation and replace it with zeros. When the process is complete, the TeraStation will be configured as follows:

    Hard drives in Normal mode
    Shared folders (share 1 - 4 on TS-XL, TS-XEL, and TS-RXL; share 1 and 2 on TS-WXL) on each drive.
    All settings to factory defaults
    Logs: All deleted
    Data: All deleted

If you remove a drive and then erase all data on the TeraStation, the LCD display will show the error "HDx Error E22 HDx Can't Mount" where x is the hard drive you removed. You can still use the TeraStation.

Initialization

Restore Factory Defaults

To reset the TeraStation to its factory default settings, power on the unit and hold down the reset button for five seconds.

Location of the reset button varies according to model. You will need to open or remove the drive door to access it. A key for the drive door is included in your TeraStation package.

TS-XL, TS-XEL   TS-WXL

Reset Button
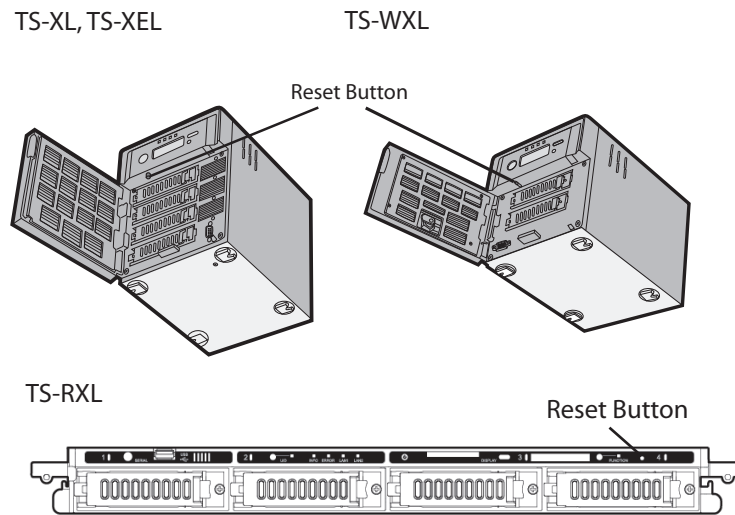
TS-RXL

Reset Button

* View with the front cover open

To press the reset button on the TS-RXL TeraStation, insert the tip of an unfolded paper clip.

To reset the TeraStation to its factory default settings, power on the unit and hold down the reset button for five seconds.

Notes:

- Normally, holding down the reset button initializes settings for IP address, Ethernet frame size, admin password, SSL key, port trunking (default is off), and NASNavi detection (default is on). The ability to reset the admin password may be turned off in the Web Admin. You can also initialize settings from within the Web Admin (next page).
- To disable resetting the admin password from the initialization button, navigate to [System] - [Restore/Format] and select [Keep current admin password]. Click [Save].
- If you disable resetting the admin password from the reset button, you can no longer configure the TeraStation if you forget the password. Write down your password and keep it in a safe place.

Initialization from within the Web Amin

In the Web Admin, you can initialize the following settings, including things that are not initialized from the reset button.

TeraStation Name, Description, NTP Settings, Workgroup Settings, Network Services, Shared Folders Settings, USB Disk Settings, RAID Scanning, Timer ON/OFF, Upon restore, Restrictions on Shared Folders, User Settings, User/Group, Notification Settings, Synchronization with UPS, Backup Settings, Admin password, Network Settings (IP Address, Subnet Mask and etc.), Time Machine, Web Access, DFS, DirectCopy, NFS, TeraSearch, Alert Sound Settings, Front Panel Settings, Language, Syslog, PrintServer

1 In the Web Admin, navigate to [System] - [Restore/Format].

2 Click [Restore TeraStation].

3 The [Confirm Operation] screen will open. Enter the number from the [Confirmation Number] field within 60 seconds, then click [Apply].

4 Follow the instructions displayed on the screen.

Notes:

• To disable resetting the admin password from the reset button, navigate to [System] - [Restore/Format] and select [Keep current admin password]. Click [Apply].

• If you disable resetting the admin password from the reset button, you can no longer configure the TeraStation if you forget the password. Write down your password and keep it in a safe place.

Changing the IP Address

Normally, the TeraStation's IP address is set automatically from a DHCP server on your network. If you prefer, you can set it manually. To change the TeraStation's IP address settings, your computer should be connected to the same router (subnet) as the TeraStation and should be running NAS Navigator2 (included on your TeraNavigator CD).

1 For a PC, double-click the [NAS Navigator2] icon on your Desktop.   For a Mac, click the [NAS Navigator2] icon in the Doc. NAS Navigator2 will launch.

2 For a PC, right-click your TeraStation and choose [Properties]. Select [IP Address]. For a Mac, hold the control key and click your TeraStation's icon, then choose [Open the device configuration screen] - [IP Address].

3
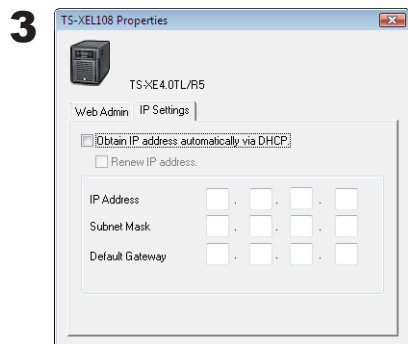
Uncheck [Obtain an IP address automatically]. Enter the desired IP address and subnet mask. Click [OK], or [Apply Now] if you're using a Mac.

You've configured a static IP address for the TeraStation. To return to using DHCP, reopen the Network Properties screen and recheck [Obtain an IP address automatically].

Network

Jumbo Frames

If your other network devices support it, you may be able to increase network performance with jumbo frames.

1
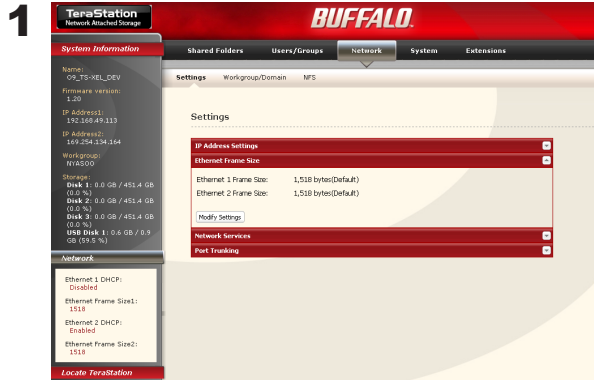
In the Web Admin, navigate to [Modify Settings] in [Network] - [Settings] - [Ethernet Frame Size].

2
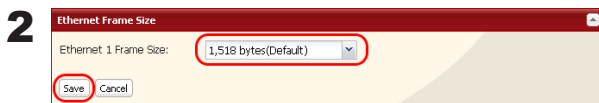
1 Select Ethernet Frame Size.
2 Click [Save].

3

Connection			Transmission	
TeraStation Jumbo Frame (4102/7422/9694)	Jumbo Frame supported	Jumbo Frame supported	○	Transmit Jumbo Frame (4102/7422/9694)
TeraStation Jumbo Frame (4102/7422/9694)	Jumbo Frame Supported	Jumbo Frame not supported	△	Transmit normally(1518)
TeraStation Jumbo Frame (4102/7422/9694)	Jumbo Frame not supported	Jumbo Frame not supported	△	Transmit normally(1518)
TeraStation Jumbo Frame (4102/7422/9694)	Jumbo Frame not supported	Jumbo Frame supported	✕	No transmission

Notes:

• To benefit from using jumbo frames in the TeraStation, your router/switch/hub should support jumbo frames.

• To use jumbo frames (4102/7422/9694 bytes), your computer's NICs and all switches, hubs, and routers on the transmission route need to support jumbo frames. If any device on the route doesn't support jumbo frames, use standard transmission (1518 bytes) instead.

• If you are using jumbo frames and back up data from a TeraStation/TeraStation to another TeraStation/TeraStation, set the Ethernet frame sizes of the TeraStations/TeraStations to the same settings (or the closest available). If the Ethernet frame sizes are significantly different, the backup job may fail. If you have problems with backup jobs, select the default frame size (1518 bytes).

Port Trunking

You may use two separate LAN connections for redundancy, speed, and reliability.

Note:

To use Port Trunking, your hub or switch must support it.

The following Port Trunking modes are available:

Disabled: Port trunking is not used.
Round-robin policy(*1):
    Sets a round-robin policy for fault tolerance and load balancing.
Active-backup policy :
    Sets an active-backup policy for fault tolerance.
XOR policy(*1) :
    Sets an XOR (exclusive-or) policy for fault tolerance and load balancing.
Broadcast policy:
    Sets a broadcast policy for fault tolerance.
Dynamic link aggregation (*2):
    Sets an IEEE 802.3ad dynamic link aggregation policy.
Adaptive transmit load balancing (TLB):
    Sets a Transmit Load Balancing (TLB) policy for fault tolerance and load balancing

*1   Your switch must support this. Configure the two ports on the switch in advance. Refer to your switch's manual for instructions on configuring it.
*2   Your switch must support this. Enable LACP (Link Aggregation Control Protocol) in the switch in advance. Refer to your switch's manual for instructions on configuring it.

Important:

After configuring port trunking in the TeraStation's Web Admin, reboot the TeraStation by holding down the power button until it shuts down, then restarting it.

To configure port trunking,

1 Connect LAN Port 1 on the TeraStation to a port on the switch. Do not connect LAN Port 2 yet.

2 In the Web Admin, navigate to [Network] - [Settings] - [Port Trunking].

3 Under [Port Trunking], click on [Modify Setiings].

4 Connect LAN Port 2 on the TeraStation to the switch.

5 Hold down the TeraStation's power button for 3 seconds to turn it off. P ress it again to restart the TeraStation.

Port Trunking is now configured.

Chapter 9
Extensions

WebAccess

WebAccess lets you access files on the TeraStation from outside your network. You can access the TeraStation from anywhere with an Internet connection and play music, display pictures, and download or upload data. You can set access restrictions for each shared folder. These restrictions will apply to users accessing the TeraStation via WebAccess as well as locally. TeraStation also supports UPnP for configuring your router and redirects with buffalonas.com (similar to Dynamic DNS).

To Configure WebAccess:

1
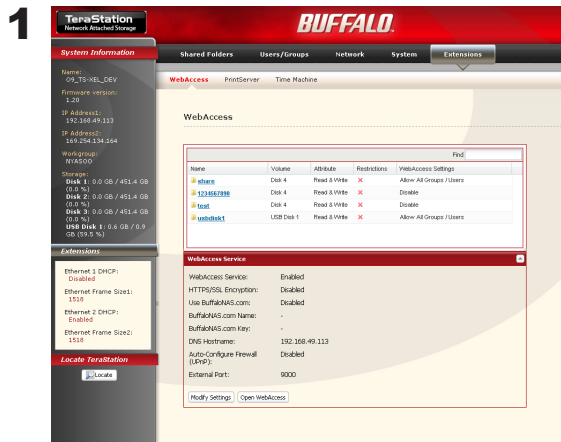
1 Click [Extensions].

2 Click [WebAccess].

2
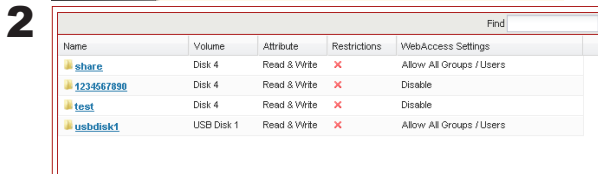
Choose the folder to be shared with WebAccess.

3
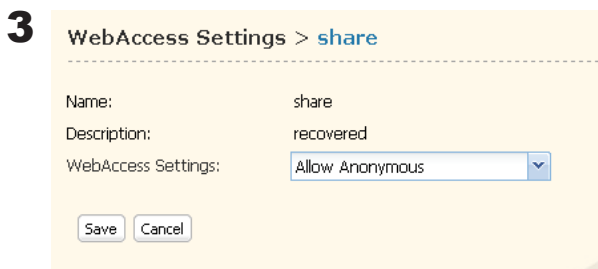
1 Choose what access users will have.
- Disabled: WebAccess is not allowed.
- Allow Anonymous: Anyone can access shared folders.
- Allow All Groups / Users: All groups/users that are registered on the TeraStation can access with WebAccess.
- Use Inherited Folder Permissions: All users have the same rights that they would have locally. If access restrictions are not configured, then this option is not displayed.

2 Click [Save].

4   Click [Modify Settings].

5
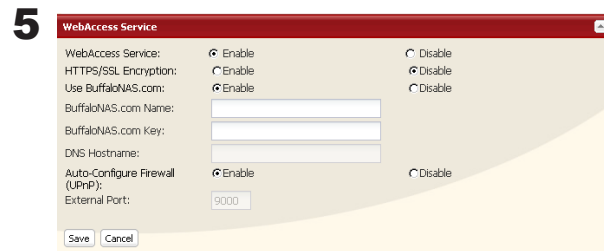
1 Enable [WebAccess Service].

2 Enable [Use BuffaloNAS.com].

3 Enter a name for your account in [BuffaloNAS.com Name].
Note:
You'll use this name to access your TeraStation through BuffaloNAS.com. It does not have to be the same name as your TeraStation.

4 Enter a password for your account in [BuffaloNAS.com Key].

5 Enable [Auto-Configure Firewall (UPnP)].
Note:
UPnP must be enabled in your router for this to work.

6 Click [Save].

Notes:

• Check [HTTPS/SSL Encryption] to encrypt your data transfers.

• To use another DNS service instead of BuffaloNAS.com, enter the host name in [Other DNS Hostname].

• To configure manually without using UPnP, enter port number for data access. The default port is 9000.

• Your account will be stored for at least 60 days even if it it not used. If your TeraStation is disconnected from the Internet for more than 60 days, your BuffaloNAS account may be deleted.

WebAccess is configured.

Accessing folders with WebAccess

1 Open the following URL in an Internet browser.
http://buffalonas.com

To access BuffaloNAS.com from iPhone/iPod touch:

1 Connect to the Internet and open [Safari].

2 Enter *http://buffalonas.com* in the address bar, and select [Go].

Notes:

•The screenshots below show WebAccess from a Windows PC. WebAccess screens on an iPhone or iPod touch look slightly different.

•Video and audio files that are protected with DRM may not be accessed from the iPhone/iPod.

•Files saved with access restrictions are not accessible from the iPhone/iPod.

•Files cannot be copied to the iPhone or iPod with WebAccess. Video and music files are streamed and picture files are displayed in the browser.

•Not all video and audio formats are playable on the iPhone/iPod. Many types of software are available to convert non-compatible formats to playable formats for the iPhone and iPod touch.

•Uploading files, changing file names, and deleting files are not supported from the iPhone and iPod.

•iPhone and iPod touch are trademarks of Apple Inc.

2 Enter your BuffaloNAS.com name and click [Connect].
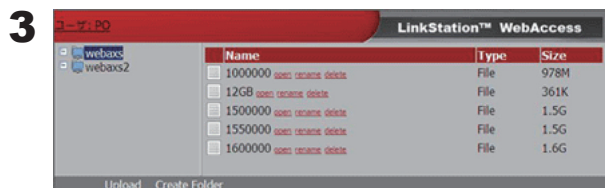
3 From your browser, you can view folders and files from the TeraStation.

To view without using BuffaloNAS.com, open the following URL on the Internet browser: *http://IP_address: 9000*, where IP_address is the WAN-side IP address of the network that has your TeraStation on it.

Notes:

• To find your WAN-side IP address, contact your ISP, or go to an IP sensing website like *whatismyipaddress.com* or *www.whatismyip.com* from a PC on your network.

•To view folders with restricted access, click [Login] and enter your username and password.

What can you do with WebAccess?

You can perform the following operations from the WebAccess screen: *open*, *rename*, *delete*, *Link to this file*, *mail link to this file*, *Create Folder* , and *Upload*.
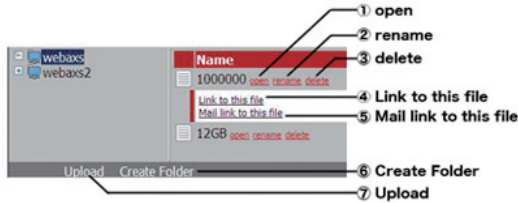
1 open - Click [open] to open a file or folder. To save a file to the local drive, right-click on it.

2 rename - To change a filename or folder name, click [rename]. The window below will open. Enter a new name for the file or folder and click [Rename].

- Do not use any of the following characters in a file name or folder name: ?
- Folder and file names may contain up to 80 characters.

3 delete - Clicking [delete] will display the following screen. Click [Yes] to delete the selected file.

4 Link to this file - Right-click on [Link to this file] in the white area and select [Copy Shortcut] to copy an address link that can be used to access that file directly. You can then give this link to your friends and they will be able to go directly to that file or folder. From the right-click menu, select [Add to Favorites] to bookmark the link.
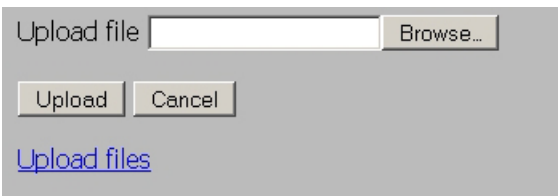
5 **Mail link to this file -** Sends the address link by e-mail. Click [Mail link to this file] to launch your mail software and send the address link in the mail body.

6 **Create Folder -** Click [Create Folder], then enter a name for the new folder and click [Make]. A new folder will be created.

Folder name [ ] Make Cancel

- You cannot include following characters in a file name/folder name: ?
- Folder and file names may include up to 80 characters.

7 **Upload -** Click [Upload] to display the following screen. Click [Browse] and select a file to be uploaded. Click [Upload] to begin uploading the selected file.

Upload file [ ] Browse…

Upload   Cancel

Upload files

Clicking [Upload Files] will display the following screen.
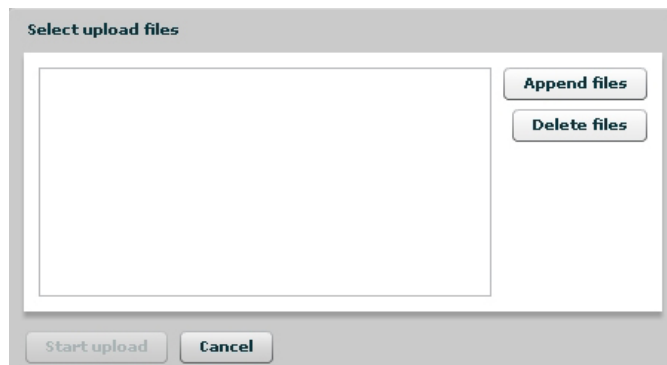
Select the files you want to upload in [Append files], and click [Start upload].

Files may be up to 2 GB in size

You may select up to 100 files per upload

You cannot upload a file if the same file name already exists at the destination. Delete the file with the identical name in the destination before uploading the new file.

If a selected file is graphic data, the word [Preview] is displayed next to the file name. Clicking [Preview] will display a preview of the file in the browser.
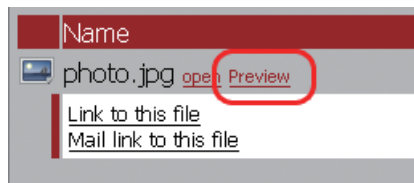
Click [CLOSE ✕] at the bottom of the image to finish displaying the preview.

Move the mouse cursor to the top right of the preview image, and [NEXT] will be displayed (unless there are no more graphics files). Clicking [NEXT] will display the next graphic.

Move the mouse cursor to the left top of the preview image, and [PREV] will be displayed (unless there is no previous graphic file). Clicking [PREV] will display the previous graphic.

Direct Copy

DirectCopy automatically copies movie, music, and images directly to the TeraStation from a USB device.

You can connect many types of USB devices to the TeraStation, including USB hard drives, USB flash drives, single-card card readers, digital cameras, and USB printers. USB hubs, mice, keyboards, and card readers that support 2 or more cards are not supported.

1 Connect to a USB device (USB flash/digital camera/hard disk/card reader) to the TeraStation.

TS-XL, TS-XELSeries

Front View   Rear View   Function Button

USB Connector
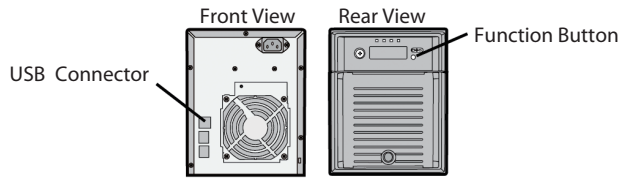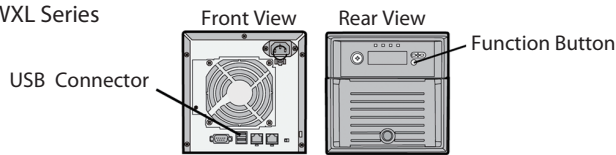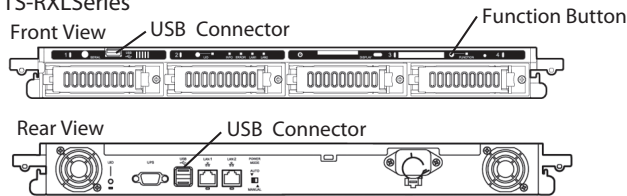
After the USB device is recognized, the function button is lit in blue for 60 seconds. After the function button is lit in blue, you can access the USB device.

TS-WXL Series   Front View   Rear View   Function Button

USB Connector

TS-RXLSeries

Front View   USB Connector   Function Button

Rear View   USB Connector

If an unsupported USB memory device is connected to the TeraStation, then the function button will not light up in blue, and the device will not be mounted.

2 While the function button is blue, press it to automatically copy data from the USB device to the DirectCopy folder on the TeraStation. The function button will flash blue during the copy. Push the function button again to abort the copy.
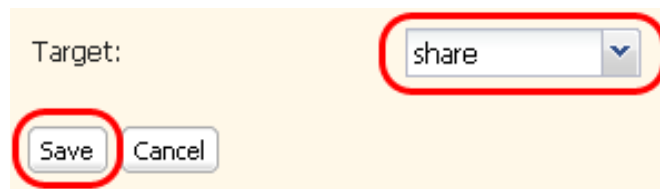
Files are copied to the folder:

\<DirectCopy folder\>/pictures/yyyymmdd
  yyyy: year copied
  mm: month copied
  dd: date copied

You may change the destination shared folder for DirectCopy in [Shared Folders] - [Direct Copy] - [Modify Settings] in the Web Admin. Subsequent DirectCopy folders are created at:

\<DirectCopy folder\>/pictures/yyyymmdd/n
  yyyy: year copied
  mm: month copied
  dd: date copied
  n: 1st time n=0, 2nd time n=1, 3rd time=2 and so on.

For USB Mass Storage class USB devices, files with following extensions will be copied.

avi, divx, asf, mpg, mpe, m1v, vob, mts, m2ts, m2t, mpeg, mpeg2, vdr, spts, tp, ts, 3gp, mov, m4v, wmv, dvr-ms, xvid, mp4, jpg, jpeg, gif, png, tif, tiff, yuv, bmp, mp3, mpa, wma, aac, apl, ac3, lpcm, pcm, wav, m3u, m4a, m4b, aif, aiff, flac, ogg, mp2, mp1

For digital cameras and other devices that don't follow the USB Mass Storage Class standard, all files on the device will be copied.

3 When the access LED of the USB device goes off, the copy is finished. Dismount the USB device before unplugging it.

To dismount the USB device if the TeraStation is on, hold in the function button for 6 seconds. The blue LED will go out, and the USB device is dismounted. You may now unplug it safely.

If you turn off the TeraStation, the USB device is already dismounted, and you can remove it safely.

PrintServer

TeraStation is equipped with a USB connector on the back. You can connect a USB printer to the TeraStation as shown below.
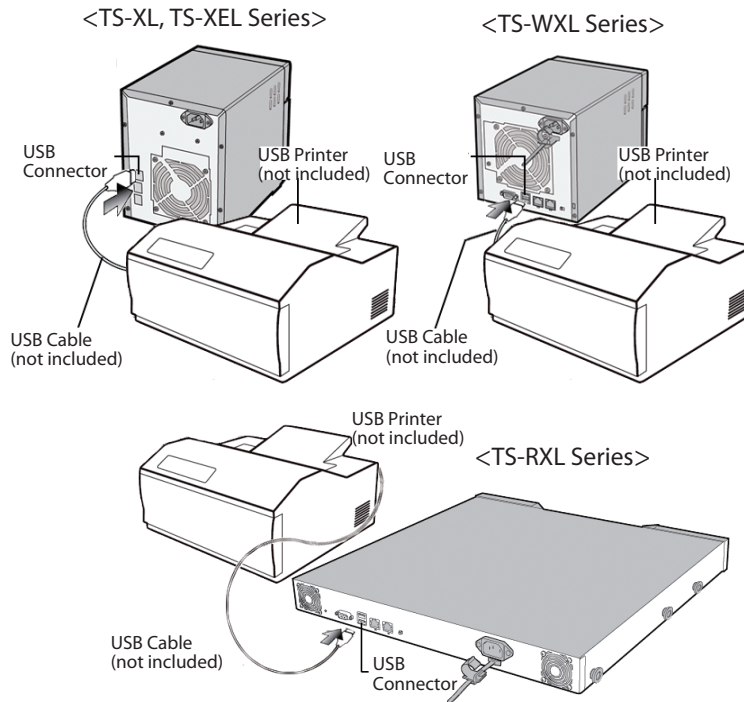
Notes:

• Only one printer can be connected to the TeraStation.

• The TeraStation does not support 2-way communication. For example, it cannot tell you the amount of ink left.

• Multi-function printers are not supported.

• Printers which only support 2-way communication or WPS (Windows Printing System) are not supported.

• Mac OS X cannot print to a printer connected to the TeraStation.

Setting up a printer on Windows 7/Vista
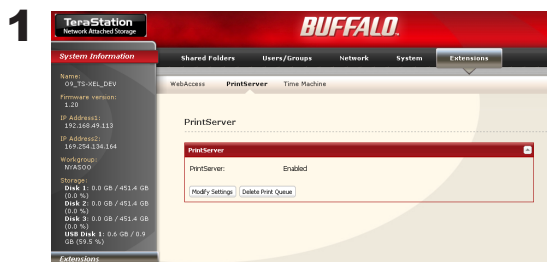
1

In the TeraStation's Web Admin, navigate to [Extensions] - [PrintServer] and click [Modify Settings].

2
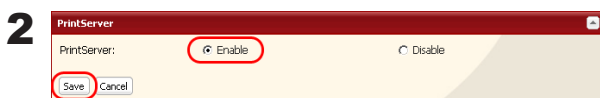
Select [Enable] and click [Save].

3 Refer to your printer's manual installation instructions. You may need to install the printer driver from a software disk.

4 Click [Start] - [Network].

5 Double-click on the TeraStation's server name.
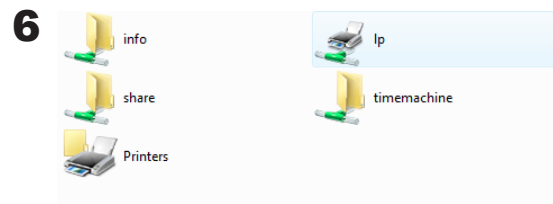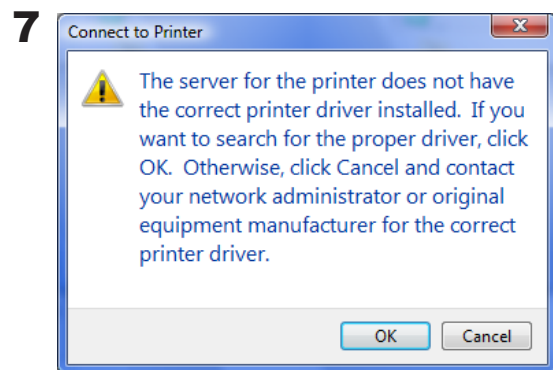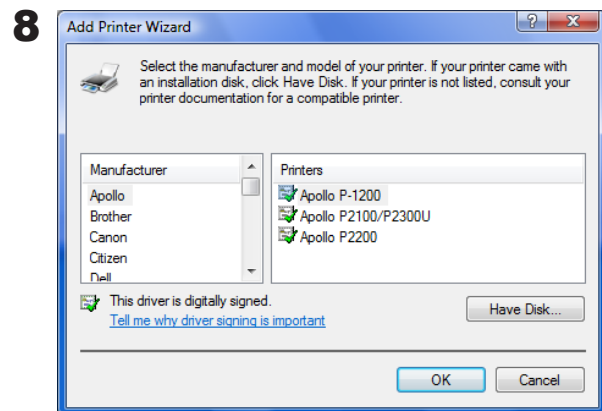
6 Double-click on the TeraStation's printer icon ("LP").

7 Click [OK].

8

1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.

2 Click [OK].

You have added a printer.

Setting up a printer on Windows XP
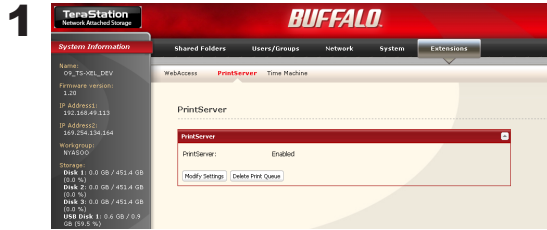
1

In the TeraStation's Web Admin, navigate to [Extensions] - [PrintServer] and click [Modify Settings].

2

1 Choose [Enable] and click [Save].

3 Refer to your printer's manual installation instructions. You may need to install the printer driver from a software disk.

4 Click [Start] - [Control Panel].

5 Click [Network and Internet Connections] icon.

6 Double-click on [View workgroup computers] - (Name of the TeraStation Server name) in this order.

7

lp
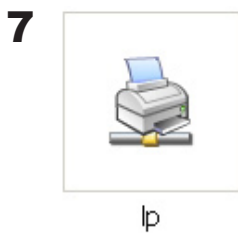
Double-click on the TeraStation's printer icon ("lp").

8 If "The printer driver to your computer will be automatically installed. (...) Would you like to continue?" is displayed, click [Yes].
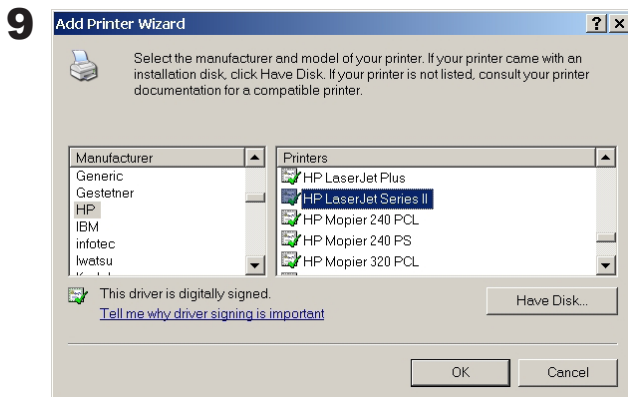
9

1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.

2 Click [OK].

You have added a printer.

Setting up a printer on Windows 2000
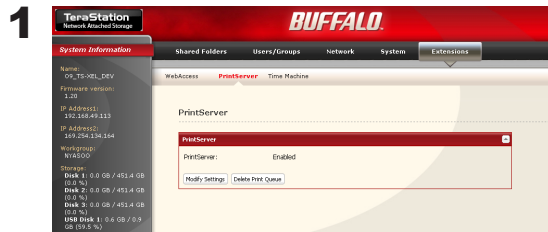
1 In the TeraStation's Web Admin, navigate to [Extensions] - [PrintServer] and click [Modify Settings]..

2
1 Click [Enable].
2 Click [Save].

3 Refer to your printer's manual to install the printer driver.

4 Double-click [My Network Places (*)] -[Entire Network] - (the TeraStation Server Name).
 * On Windows NT 4.0 this is [Network].

5 Double-click on the TeraStation's printer icon ("lp").
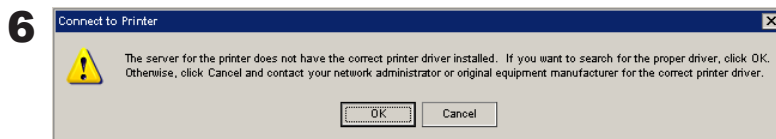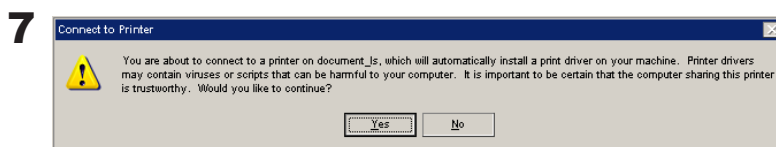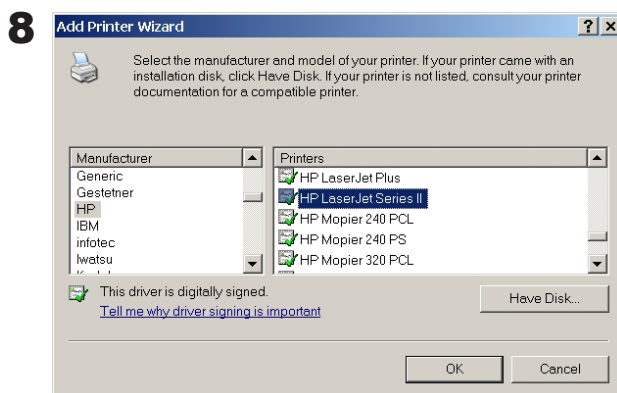
6 Click [Yes].

7 Click [OK].

8
1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.
2 Click [OK].

You have added a printer.

Sleep Timer

Sleep Timer will automatically turn your TeraStation on and off at specific times to save energy. In Sleep mode, the TeraStation's hard drives, display panel, and LED lights are turned off. To use Sleep Timer, set your TeraStation's Power Mode Switch to "Manual". Sleep Timer is not usable when the Power Mode Switch is set to "Auto".

1 In the Web Admin, navigate to [System] - [Power Management] - [Sleep Timer].

2 Click [Modify Settings].

3
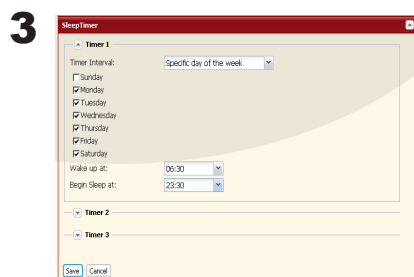
Specify the Timer Interval, Wake up time, and Begin Sleeping time. You can set up to 3 timers. Wake up at times may be set from 0:00 to 23:45. Begin Sleep times may be set from 0:00 to 27:45. If "Begin Sleep at" is set to 24:00 or later, then "Wake up at" can be set from 4:00 to 23:45. 24:00 is equivalent to 0:00 of the next day, and 27:00 is equivalent to 3:00 of the next day. Wake up times should be earlier in the day than Begin Sleep times. Do not set the same time for both Awaken Time and Begin Sleeping time.

Click [Save] when done.

Notes:

•To exit sleep mode, hold in the power button on the TeraStation for about 3 seconds. The unit will power on.

•The TeraStation will not go into sleep mode while performing Check Disk, Disk Format, or Backup, or if a backup is scheduled within 5 minutes of the current time.

•If multiple sleep timers conflict, the longest interval time is used. Here are some examples of multiple timers:

  A timer is set to turn the unit on for Wednesday at 10:00:

  Timer 1   Everyday   12:00 - 24:00

  Timer 2   Disabled

  Timer 3   Disabled

   -> Nothing happens at 12:00 and the unit enters sleep mode at 24:00

  A timer is set to turn the unit on for Wednesday at 10:00:

  Timer 1   Everyday   9:00 - 18:00

  Timer 2   Select Day   Wednesday   10:00 - 20:00

  Timer 3   Disabled

   -> Except on Wednesdays, the unit powers on at 9:00 and moves to sleep mode at 18:00.

   -> On Wednesday, it enters sleep mode at 20:00.

  A timer is set to turn the unit on for Wednesday at 10:00:

  Timer 1   Everyday   9:00 - 18:00

  Timer 2   Select Day   Wednesday   10:00 - 25:00

  Timer 3   Disabled

  -> Except on Wednesdays, the unit powers on at 9:00 and moves to sleep mode at 18:00.

  -> Except on Wednesdays, it enters sleep mode at 1:00 of the next day.

  A timer is set to turn the unit on for Wednesday at 10:00:

  Timer 1   Everyday   9:00 - 18:00

  Timer 2   Select Day   Wednesday   07:30 - 22:00

  Timer 3   Disabled

  ->Except on Wednesdays, the unit powers on at 9:00 and enters sleep mode at 18:00.

  -> On Wednesday, the unit powers on at 7:30 and enters sleep mode at 22:00 of the next day.

Disk Quotas

Notes:

• When using quotas, disable the recycle bin or empty the trash folder. The limited space includes the space used for trash.

• Quotas apply per drive or per array. If a Quota is set to 1 GB, each array or drive can use maximum of 1 GB.

• Quotas can't be set for external USB hard drives connected to the TeraStation, only internal drives.

Disk space quotas for users

To limit the space of shared folders that each user can use, follow the procedure below.
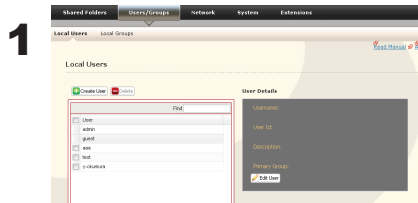
1

1 In the Web Admin, select [Users/Groups] - [Local Users].

2 Click [Create User].

2
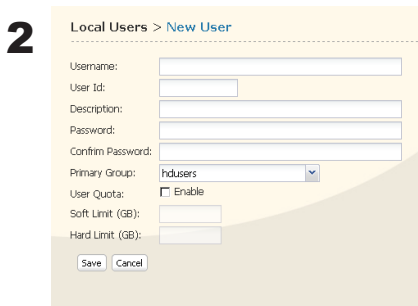
1 Enter username, user ID, password, and user description.

Note:

User IDs may be between 1000 and 1999. Do not duplicate user IDs.

2 Check [Enable] for User Quota.

3 Enter the maximum space this user is allowed for the [Hard Limit]. If a [Soft Limit] is entered, the user will receive a warning when the soft limit is reached. The soft limit should be smaller than the hard limit.

4 Click [Save].

Notes:

• Username and password must be the same one that the user logs into Windows with. If these values are different, shared folders with access restrictions cannot be accessed.

• Deleting or adding users repeatedly may cause quotas to not work properly.

Select [Shared Folders].

3 Click [Create Shared Folder].
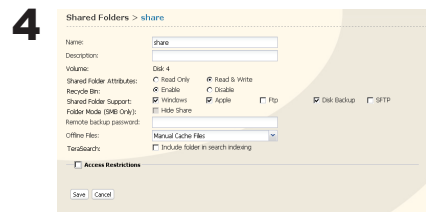
4

1 Set a shared folder name, attributes and other settings.

2 Click [Access Restrictions].

5 Click [Add].

6
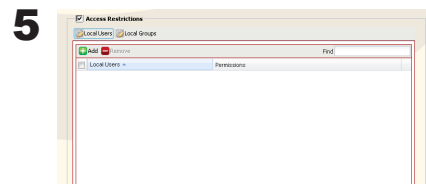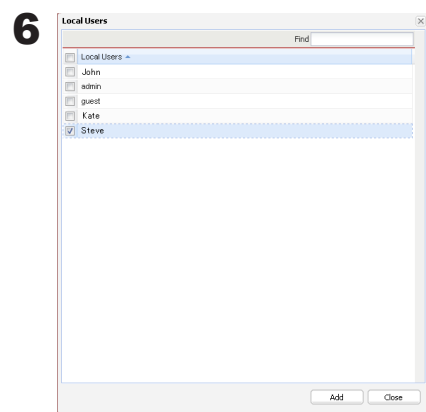
1 Check the user you created in step 2.

2 Click [Add].
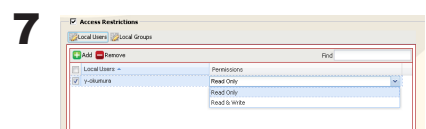
7 Select level of access privileges for the user you added.

8 Click [Save].

You've configured a disk quota.

Disk space quotas for groups

To limit the space of shared folders that each group can use, follow the procedure below.
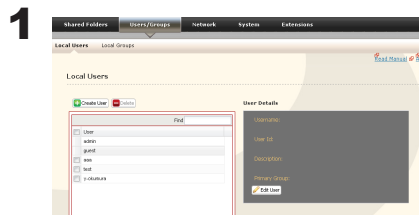
1

1 In the Web Admin, select [Users/Groups] - [Local Users].

2 Click [Create User].

2
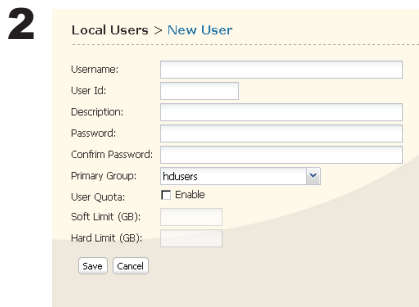
1 Enter username, user ID, password and user description.
   Note: User IDs may be between 1000 and 1999. Do not duplicate user IDs.

2 Click [Save].

   Repeat steps 1 and 2 for each user in the group.

Notes:

• Usernames and passwords should be the same ones that the users log in to Windows with.

• If two different quotas apply, such a a user quota and a group quota, the smaller quota is applied.

3
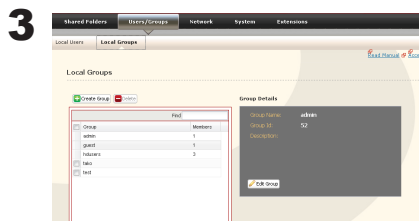
1 Select [Users/Groups] - [Local Groups].

2 Click [Create Group].

4
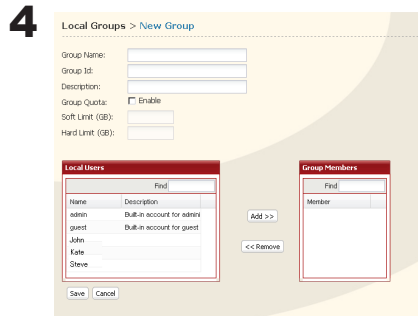
1 Enter Group Name, Group ID and Group Description.
   Note:
   The group ID may be any number from 1000 and 1999. Do not duplicate Group IDs.
2 Click [Enable].
3 Enter the stotal space that the group can use in the Hard Limit (GB) field.
4 Select users from step 2 in [Local User], and click [Add] for each.
5 Click [Save].

Note:

Deleting and adding groups repeatedly may cause quotas to not work properly.

5
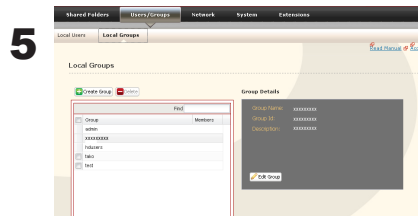
1 Click [Users/Groups] - [User].
2 Select a user from step 2, and click [Edit User].

6
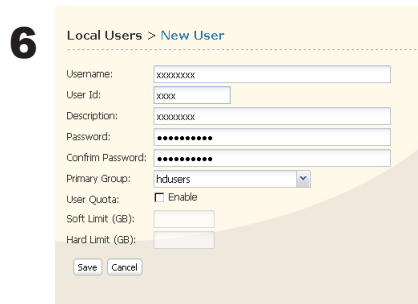
Select the group created in step 4 for [Primary Group] and click [Save].

7 Click [Shared Folder].

8 Click [Create Shared Folder].

9
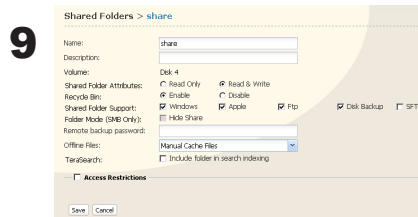
1 Set a shared folder name, attributes and other settings.
2 Click [Access Restrictions].

10
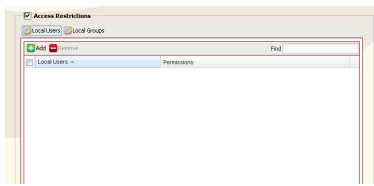
1 Click [Local Group].

2 Click [Add].

11
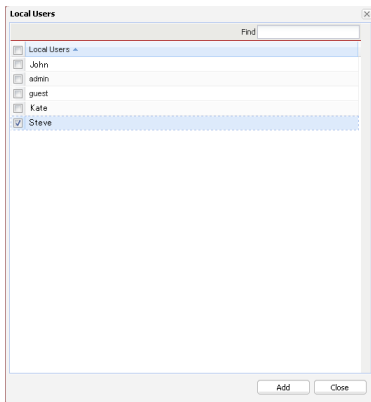
1 Check the group you created step 2.

2 Click [Add].

12
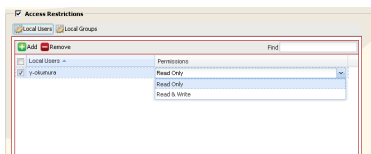
Select privilege of group you added.

13 Click [Save].

You have configured a group quota.

TeraSearch

Enable TeraSearch to allow text searches for strings (such as from a text file or data) on the TeraStation.

1 In the Web Admin, select [Shared Folders] - [Folder Setup].
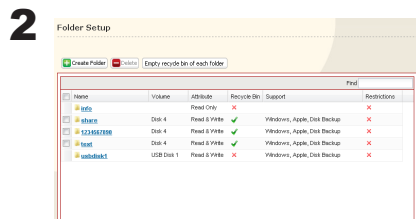
2 Click the shared folder to create an index for.

3
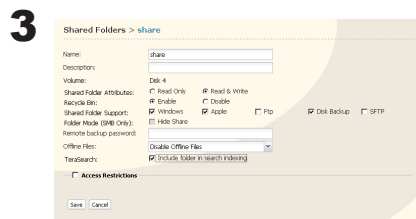
    1 Click [Include folder in search indexing].
    2 Click [Save].

4 Click [Shared Folders] - [TeraSearch] on the Web Admin.

5 Click [Modify Settings].

6 Select [Enable], and click [Save].]

Note:
If you want to update the index regularly, click [Modify Settings] and specify a Time to update the index.

7 Click [Update the index now].

8 Open and display the following URL in an Internet browser.
http://(IP address of TeraStation) :3000/

   Tip: You can get the IP address of your TeraStation from its front panel LCD display, or from NAS Navigator 2.

9 Enter a username and password from an account on the TeraStation and click [Login]. For example, the guest account, with blank password, will work.

10 Enter a keyword to search for. If you check [Enhanced Search], you can also specify filename, owner, update date/time, and size to search for.

11 Click [Search].

Your search results are now displayed.

Offline Files

Your PC can access files from the TeraStation even when it's not connected to the network if Offline Files are enabled. Offline Files are updated and saved on the computer when it's online. Offline Files work with Windows 2000, Windows XP Professional, Vista, and Windows 7. Windows Me and XP Home Edition are not supported.

Configure your PC to use files offline as follows:

1 In the Web Admin, select [Shared Folders] - [Folder Setup].
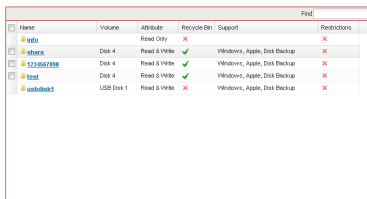
2 Select a folder to be available offline. Double-click on the folder's name.
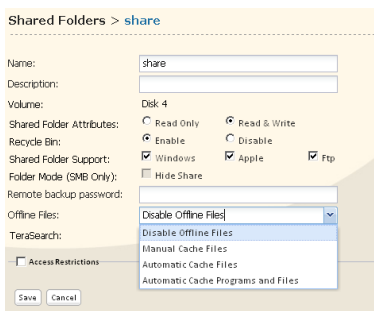
3 From the [Offline Files] dropdown, select [Manual Cache Files], [Automatic Cache Files] or [Automatic Cache Programs and Files].

Manual Cache Files - Manually select the files to be available offline.

Automatic Cache Files - Opened files are cached locally and may be used offline. Old files that cannot be synchronized will be deleted automatically and replaced by new ones.

Automatic Cache Programs and Files - Opened files are cached locally and may be used offline. Old files and network applications that cannot be synchronized will be deleted automatically and replaced with new ones.

If you're running Windows 7, skip steps 4 & 5 and move to step 6.

To check if Offline Files are enabled, follow the instruction below.

1 Open the Windows folder, press [Alt] on the keyboard, and select [Tool] - [Open Synchronize Center] from the popup menu.

2 Click [Manage offline files] on the left side of the [Synchronized Center] screen.

3 If you see [Offline Files is enabled] on the [General] tab, Offline Files are enabled.
Click [Disable offline files] to disable Offline Files.
If Offline Files are disabled, click [Enable Offline Files] to enable them.

4 Open Windows folder. Select [Folder Options] from the [Tool] menu.
Note:
Select [Control Panel] - [Folder Options] in Windows 2000 Server.

5
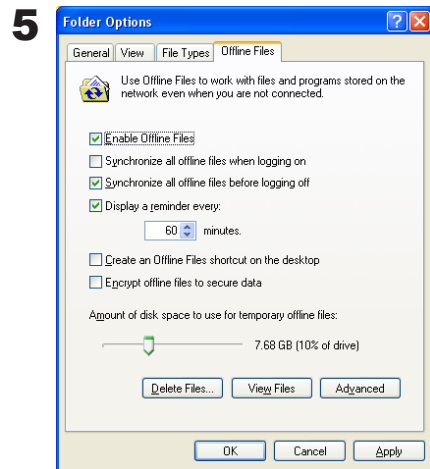
1 Click [Offline Files] tab.

2 Click [Enable Offline Files].

3 Click [OK].

Note:
If [Fast User Switching] in Windows XP is enabled, the screen above will not be displayed. In such a case, open [User Accounts] in the Control Panel and uncheck [Use Fast User Switching].

6
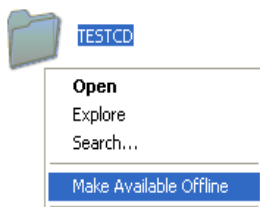
1 Right-click on the icon of the shared folder on the TeraStation you have set the offline feature for.

2 Click [Make Available Offline].

7 When the Offline File Wizard opens, follow the instructions on the screen to configure. For more information, refer to the Windows Help File.

8 After configuration, your offline files and folders display as below (from Windows XP).

9 After the synchronization is complete, you can open offline files even after disconnecting from the network that the TeraStation is on. Offline files can be accessed through the UNC to the original location.
Note: If offline files are available, the icon is displayed in the systray.
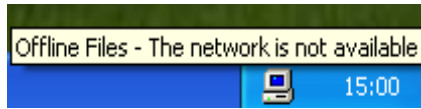
* Editing Offline Files
  Offline files can be edited or deleted just like regular files. Differences between data in different locations will be resolved by re-synchronization when the network connection is re-established.

* Synchronizing Offline Files
  Offline files are automatically synchronized when you log on or off the network.

* Version Conflicts
  Conflicts occur when the offline and original files are both modified differently before they are re-synchronized. If conflicts occur, the following wizard opens. Step through the wizard to resolve the conflicts.
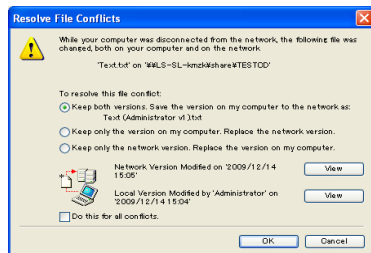
You've configured offline files.

DFS (Distributed File System)

Distributed File System (or DFS) combines shares on the network server together into one tree.

In the following example, when the client computer addresses //tera/share/backup, it's actually looking at files located at //pc_srv/backup. This is transparent to the user of the client computer. If the TeraStation is configured to address multiple DFS shares, then shares on other devices could be addressed as native shares on the TeraStation. For example, //tera/share/share might actually address data located at //link/share.
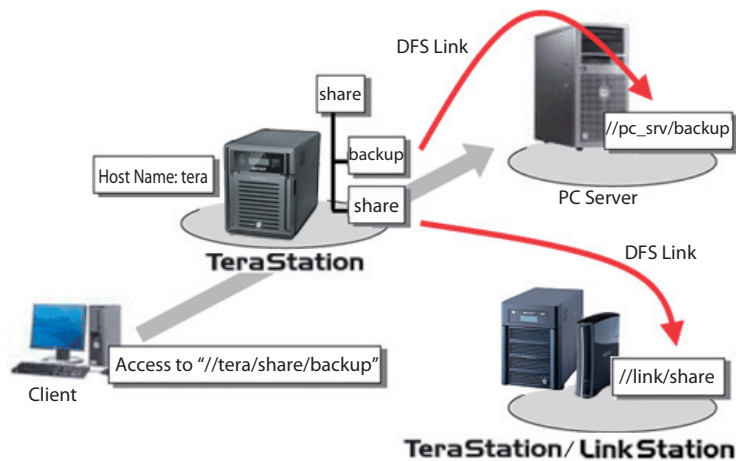
Notes:

• Buffalo does not support using DFS with Mac OS X.

• Windows 2000 and Windows Server 2003 cannot properly address DFS link destinations that have access restrictions on one or more folders.

• DFS only works with SMB connections. AFP and FTP connections are not supported.

• Access restrictions configured on DFS link destinations are applied to the shared folder link. Access restrictions on the DFS root or DFS links are not visible.

Set up DFS as described below:

1 In the Web Admin, select [Shared Folders] - [DFS].

2 Under [DFS Service], click [Modify Settings].

3
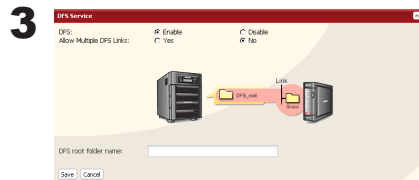
1 Click [Enable].

2 Choose whether to allow multiple DFS links, or just one.

[No] allows just one DFS link to be addressed.

[Yes] allows up to 8 DFS link destinations to be used.

3 Enter the [DFS Root Folder Name].

4 Click [Save].
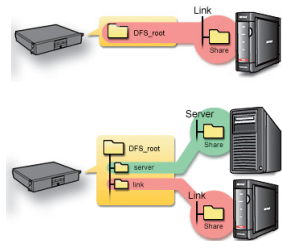
4 Under [DFS Links], click [Add Link].

5

1 Type Destination Hostname and Destination Folder.
Notes:
The following machines can be DFS link destinations:
• TeraStations
• Windows PC with SMB (Mac OS and Linux are not supported)

2 Click [Save].

DFS has been configured.

FTP Server

By default, the TeraStation's shares are only accessible by users connected to the same network or router as the TeraStation. The optional FTP server allows users to access the TeraStation from outside of the local network. You may enable it as follows.

1
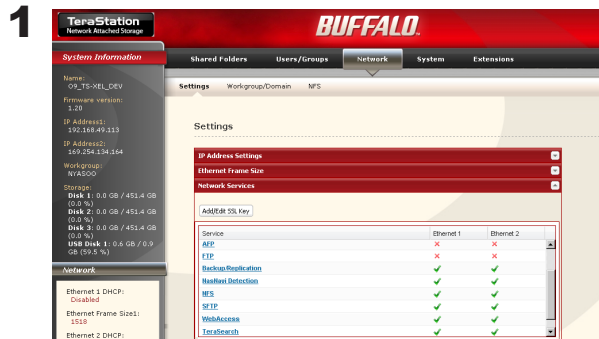
In the Web Admin, navigate to [Network] - [Settings] - [Network Services] and click [FTP].

2

1 Select [Enable].

2 Click [Save].

3 Click [Shared Folders] - [Folder Setup].

4
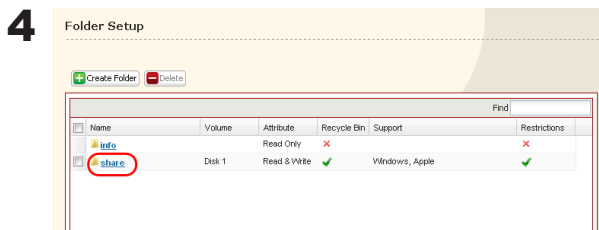
Click the folder to enable remote FTP access on.

5
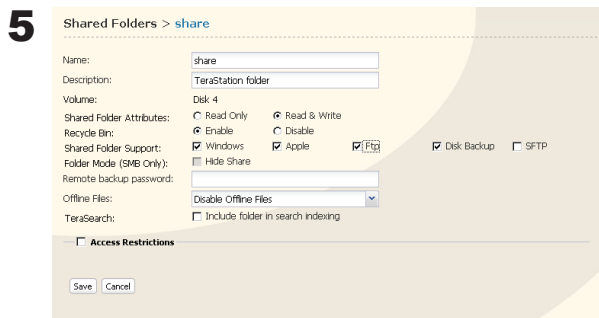
1 Select whether the shared folder is to be read-only or writeable.

2 Check [FTP].

3 Click [Save].

The folder is now configured for FTP access. Don't forget to give read (or write) permissions for the FTP share to any users that will be accessing the share remotely. Folder permissions can only be changed from the TeraStation's Web Admin. Changing them remotely with FTP client software is not supported.

To access the TeraStation with an FTP client

Configure your FTP client software with the following settings:
- Host Name   IP address of the TeraStation.
- Username   Username registered on the TeraStation
- Password   Password registered to the TeraStation
- Port   21

Example ftp://192.168.11.150/
- You cannot write by FTP if the shared folder is set to read-only on the TeraStation.
- Access restrictions are applied based on the settings in the TeraStation. The restrictions aren't displayed for users without permissions for the share.
- To access your FTP share from outside of your network, you may need to configure your router and firewall. Consult your router documentation for more information.
- Shared folders appear as follows when connected by FTP:
  - disk1 share
  - usbdisk1
  - info
- The internal hard drive of the TeraStation is displayed as disk1, and a USB hard drive (optional) will be displayed as usbdisk1.
- "usbdisk1" is not displayed when the USB hard drive is not connected, or if access is restricted.

Accessing the TeraStation with an Anonymous user:

To allow anonymous access to your FTP share, disable access restrictions on the FTP share. Configure your FTP client as follows:
- Host Name   IP address of the TeraStation
- Username   anonymous
- Password   any set of characters
- Port   21

Example ftp://192.168.11.150/
- To make your FTP share available from outside your network, you will need to configure your router and firewall. Consult your router's documentation for information on how to allow FTP traffic.
- If the TeraStation joins a domain, anonymous users cannot access it.
- Folders created or copied via an AFP connection may not be deleted from the AFP connection. This is because an automatically generated ".AppleDouble" folder begins with a dot. To delete these files, use an SMB connection.
- Do not exceed 250 characters for a file/folder name including directory path when you are creating it by using an FTP connection. Otherwise, you cannot view or delete it in Explorer or other applications.

Accessing from a NFS Client

Use the following procedure configure the TeraStation for access from UNIX with NFS.

Note: This section is for information only. Unix and NFS are not supported by Buffalo. If you choose to configure your TeraStation this way, it does not void your warranty, but you are on your own for tech support.

1 In the Web Admin, select [Network] - [NFS] - [Modify Settings].

2
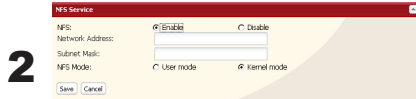
    1 Click [Enable].

    2 Click [Save].

    Note:
    To set access restrictions by IP addresses, specify a [Public Network Address] and [Public Subnet Mask] from the screen above.

        E.g.) To allow access from a client with the IP address 192.168.11.xxx:
            [Public Network Address]:   192.168.11.0
            [Public Subnet mask]:   255.255.255.0
            xxx can be 1 to 254. Enter 0 (zero) for the [Publishing Network Address].
        E.g.) To allow access from a client with the IP address 192.168.xxx.xxx:
            [Public Network Address]:   192.168.0.0
            [Public Subnet mask]:   255.255.255.0
            xxx can be 1 to 254. Enter 0 (zero) for the [Publishing Network Address]

3 Click [NFS Folders Setup].

4 Choose a shared folder.

5
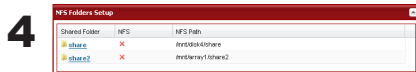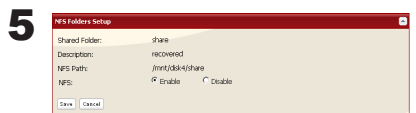
    1 Write down the NFS public path.

    2 Click [Enable].

    3 Click [Save].

6 Click [NFS Client Setup].
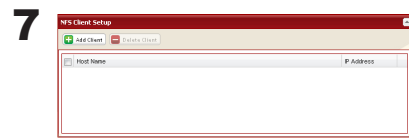
7 Click [Add Client].
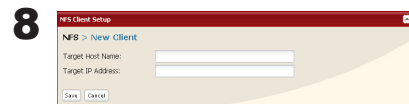
8 **1** Type the IP address and hostname of the NFS UNIX client.

2 Click [Save].
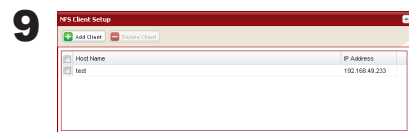
9 The IP address and the hostname of the client are added.

Notes:
• To remove, check the box next to the hostname and click [Delete Connected Client].
• You may be able to connect via NFS from a computer that is not registered as a client.

10 Examples of commands to access a folder on the TeraStation from the NFS client:

From Linux:
mount -t nfs <IP Address>:<NFS public path for the TeraStation><the mounting point on the local computer>

e.g.,   mkdir /mnt/tsxl
           mount -t nfs 192.168.11.10:/mnt/array1/share /mnt/tsxl
               In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share",
               and a mount point on the local computer is "/mnt/tsxl".

From Windows Services for Unix 3.5:
mount <IP Address>:<NFS publishing path for the TeraStation> <a network drive's letter (an error occurs if not available)>

e.g.,   mount 192.168.11.10:/mnt/array1/share z:
               In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share",
               and a network drive letter is "z".

From Solaris10:
mount -<F nfs IP Address>:<NFS publishing path for the TeraStation><the mounting point on the local computer>

e.g.,   mkdir /mnt/tsxl
           mount -F nfs 192.168.11.10:/mnt/array1/share /mnt/tsxl
               In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share",
               and a mount point on the local computer is "/mnt/tsxl".

Notes:
• Settings on the NFS Client will be applied to file access. However, if you write on root, uid and gid for all will
  be 99.
• You cannot unify the uid and gid for user management on the TeraStation and for the users on NFS clients.
• Root (admin) rights are required to perform the mount operation.
• If you mount as root for other users, each user will need access rights for the mount point.

You've completed the steps to access the TeraStation via NFS.

Encrypting Data Transmission

• Encrypting Data from the Web Admin

Access *https://<TeraStation's P address>* instead of *http://...* to encrypt all data from the Web Admin.

Note:

Your computer may display "there is a problem with this site's security", but you may ignore this message and work normally.

• Encrypting FTP Transfer Data

First, in the Web Admin, navigate to [Public] - [FTP]. Check the box by each shared folder to encrypt data transfers. Enable SSL security in your FTP client to encrypt login passwords and files by using SSL/TLS for FTP communication. Examples: In FileZilla's settings, select [FTP over TLS (explicit encryption)] for the server type. For Smart FTP, select [FTP over SSL explicit] in the settings.

Notes:

• Encryption processes may seriously reduce data transfer speeds. Your transfers may be as much as 10 times slower when using encryption.

• Depending on your computer's security settings, the message "there is a problem with this site's security" may be displayed, but you may ignore this message and work normally.

• SSL Key

Note:

This procedure is described for network administrators and advanced users. Do not try to configure this unless you know exactly what you're doing.

You may use encrypted keys such as https and FTPS for the Web Admin operations and FTP connections.

SSL (Secure Socket Layer) is a public key encryption method. SSL operation is managed by 2 files:

(1) server.crt (Server Certificate)

TeraStation will send this certificate to other computers, which will use it as a key for encryption. The TeraStation will then receive encrypted data and use the server.key (a private key) to decrypt them.

This key includes Server Certificate on SSL, and your PC may decide if the certificate can be trusted or not. Your computer may display the message "There is a problem with the site's security certificate."

(2) server.key (Private key)

This is used to decrypt data encrypted by the server certificate.
Note:
Prepare the decrypted passphrase for the server.key (private key).

Updating SSL Key

To update a server certificate and a private key for SSL, follow the procedure below.

1 In the Web Admin, navigate to [Network] - [Network] - [Network Service] - [Edit SSL key].

2 Register server.key for [Private key] and server.crt for [Server Certificate], then click [Import].
Note:
Save SSL key files (server.key and server.crt) on the root of Drive C. They should not be saved in a folder or path whose name includes two-byte or special characters.

You've updated the SSL key.

Notes:

• The SSL key should not be password protected.
• If the TeraStation's Web Admin isn't accessible after updating, initialize the TeraStation.
• Updating the firmware will initialize an SSL key.

Chapter 10

NAS Navigator2

NAS Navigator2 is a utility program that makes it simple to display the TeraStation's Web Admin, change its IP address, or check its hard drive.

Windows 7/Vista/XP/2000 and Windows Server2003/Server2008

If you set up the TeraStation with the TeraNavigator CD, NAS Navigator2 was installed and configured to run automatically in the system tray at startup.

You can launch NAS Navigator2 in either of the following ways:
- Click the NAS Navigator icon on your Desktop.
- Click [Start] - [(All) Programs] - [BUFFALO] - [BUFFALO NAS Navigator2]-[BUFFALO NAS Navigator2].
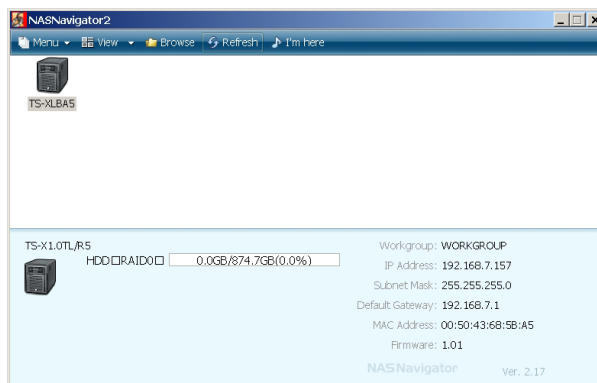
Clicking a TeraStation's icon will display its total capacity, capacity being used, IP address, workgroup, subnet mask, default gateway, MAC address, and firmware version.

Name		Descriptions
Menu	Map remote default share to drive letter*	Assigns the searched TeraStation's shared folder as a network drive.
	Disconnect mapped drive letter *	Unmaps the network drive.
	Map all remote shares to drive letter	Assigns the all TeraStation's shared folders found as a network drive.
	Create desktop shortcut for Tera/LinkStation *	Creates the shortcut icon to searched TeraStation's shared folder (share).
	Launch NAS Navigator 2 on startup	Launches NAS Navigator 2 when Windows is booted.
	Display the error information	Displays an error message on NAS Navigator 2 icon in the task tray when an error occurs.
	Properties *	Opens the selected TeraStation's Properties window.
	Close	Closes NAS Navigator 2 window.
View	View	[Icon]: Displays icon for ease. [Details]: Displays Name, Product Name, Workgroup, IP Address, Subnet Mask, and Default Gateway.
	Sort Order	Selects the sort order from following to display when multiple TeraStations are found: Host Name, Product Name, Work group, IP Address, Subnet Mask, and Default Gateway
Browse*		Opens the displayed shared folder on the TeraStation.
Refresh		Searches the TeraStation again.
I'm here (*)		Ring a tone from the TeraStation when click it (This option is disabled if the product does not support this feature).

* Right-click on your TeraStation's icon to display these options.

When NAS Navigator2 is minimized, right-click on the NAS Navigator2 icon in the task tray for the following options:
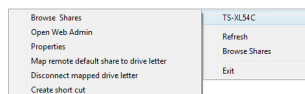
Menu Item		Descriptions
TeraStation Name	Browse Shares	Opens a shared folder on the TeraStation.
	Open Web Admin	Opens the selected TeraStation's Web Admin.
	Properties	Opens the selected TeraStation's Properties window.
	Map remote default share to drive letter	Assigns the searched TeraStation's shared folder as a network drive.
	Disconnect mapped drive letter	Unmaps the network drive.
	Create desktop shortcut for Tera/LinkStation	Creates the shortcut icon to the searched TeraStation's shared folder (share).
	I'm here	Rings a tone from the TeraStation (This option is disabled if the product does not support this feature).

The following tasks may be performed from the TeraStation's Properties window.

Screen:

Menu Item	Description
Web Admin	Click [Open Web Admin] to display the TeraStation's Web Admin.
IP Address	Insert the check mark in [Obtain an IP address automatically] to assign IP address from DHCP server automatically. If there is no DHCP server in the network, you cannot use this function. If you insert the checkmark into [Obtain IP address again], it will obtain an IP address from DHCP server again. You can manually enter the IP address, Subnet mask and Default gateway.

Mac OS X 10.3.9 or later

If you installed the TeraStation with the TeraNavigator CD, NAS Navigator2 was installed automatically. To launch it, click the NAS Navigator2 icon in the Dock.
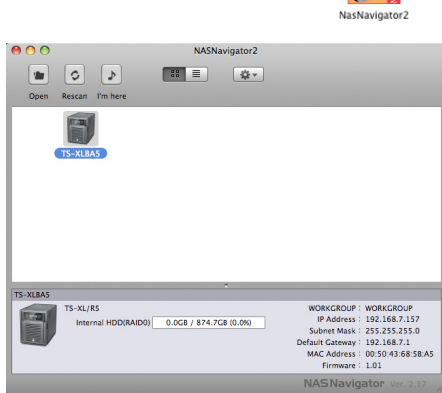
Click a TeraStation's icon to display its total capacity, used capacity, IP Address, Workgroup, Subnet Mask, and Default Gateway Address. Double-click to open a share on the TeraStation.

Menu Item		Descriptions
Open		Opens a shared folder on the TeraStation.
Update		Searches the TeraStation again.
I'm here		Ring a tone from the TeraStation when click it (This option is disabled if the product does not support this feature).
Menu displayed when click TeraStation Icon while pressing the Control Key	Opens a shared folder	Opens a shared folder on the TeraStation.
	Open Web Admin	Opens the selected TeraStation's Web Admin.
	Open the device settings screen	Displays the screen to open the Web Admin screen or change an IP Address.
	I'm here	Ring a tone from the TeraStation when click it (This option is disabled if the product does not support this feature).
	Color Label	Selects the color of the name displayed below the icon.
	View display options	Sets the orders of icon sizes, label positions, and icons.

Chapter 11
Software

NAS Navigator2

NAS Navigator2 client software is described on page 101.

File Security Tool

Before using the TeraStation with Windows 7, Vista, Windows Server 2003, or Windows Server 2008, you will need to change the security settings to allow access to NAS devices. The File Security Tool makes these changes for you automatically during installation from the TeraNavigator CD, or you may run it manually as described below.

Notes: • This will be installed only on Windows 7/Vista and Windows Server 2003/Server 2008.

• During the initial setup, the message, "Changing the security level. Are you sure?" is displayed. Click [Yes] and follow the instructions on the screen to restart your PC .

1 Click [Start] - [BUFFALO] - [File Security Tool] - [File Security Tool].
The File Security Tool will launch.
Note: When [A program needs your permission to continue] is displayed, click [Continue].

2

1 Select [Change security level].

2 Click [Change].

3 The message, "Change security level" is displayed; click [Yes].

4 The message, "Would you like to restart Windows now?" is displayed; click [Yes].
Your PC will reboot.

You have changed the security settings.

Notes:

To reset security settings to their factory defaults, use the following procedure.

1 Click [Start] - [BUFFALO] - [File Security Tool] - [File Security Tool].
When [A program needs your permission to continue] is displayed, click [Continue].

2 Select [Change back the file security level].

3 Click [Change].

　　　Security settings are now restored to their default settings.

Memeo Backup

Memeo is software for backing up data from your computer to the TeraStation. After setup, open [Start] - [(All) Programs] - [BUFFALO] - [Memeo Backup] - [Memeo Backup Manual] for instructions on how to use it.

Note:

To back up data on the TeraStation, use the backup program in the TeraStation's Web Admin.

NS-SHFT

This software stores your TeraStation's configuration settings as a file on your computer. You may use it to restore settings on the TeraStation, or copy the settings to a different TeraStation of the same model. After installation, read the help files at [(All) Programs] - [BUFFALO] - [NS-SHFT] - [Manual (PDF)] for instructions on how to use it.

Notes:

• NS-SHFT supports Windows XP, Windows 7, and Vista. It doesn't work with Windows Server 2003/Server 2008, Windows 2000 Server, or Mac OS.

• NS-SHIFT does not save data to the TeraStation.

• If NS-SHFT displays the message "Failed" after saving configuration data, then your configuration has not been saved. In such a case, save the configuration again.

EXT3 Reader

The best format for external USB hard drives attached to the TeraStation is EXT3, a native Linux format, but this format is not normally supported by Windows. The EXT3 Reader software allows you to ready files from an EXT3 hard drive directly connected to your Windows PC.

To use EXT3 Reader.

1 Dismount the EXT3-formatted USB hard disk from your TeraStation. Unplug it, then connect it to your Windows PC.
> **Notes:**
> • USB hard drive that includes TurboUSB support will work fine with EXT3 Reader. Disable TurboUSB before using EXT3 reader, because the two programs do not always play well together.
> • EXT3 only recognises the primary partition on the USB hard drive.
> • Before connecting the EXT3 hard drive to your PC, it must be properly dismounted from the TeraStation.
> • EXT3 volumes created on GUID partitions (GPT) cannot be read by Windows 2000 or Windows XP.

2 Select [Start] - [(All) Programs] - [EXT3 Reader], - [EXT3 Reader], and launch EXT3 Reader.

3 Click [Enable].

4 Right-click on the icon (,   ,   ) in the task tray and select [USB mass storage device] in the displayed menu. When the message "you can now safely remove hardware" appears, unplug the drive.

5 After a few seconds, reconnect the USB hard drive to your PC.

6 You can now read data from the hard drive normally. Note that you can only read data, not write, edit, or delete it.

EXT3 Reader is now working on your PC.

Removal: To remove the hard drive while disabling the EXT3 reader, use the following procedure.
If you remove it while it is enabled, use only step 3 (step 1, 2 and 4 are not required to be performed).

1 Select [Start] - [(All) Programs] - [EXT3 Reader] - [EXT3 Reader], and launch EXT3 Reader.

2 Click [Disable].

3 Righ-click on the icon (,   ,   ) in the task tray, and select [USB mass storage device] in the displayed menu. If the message "you can now safely remove hardware", remove it.

4 Restart Windows.

You have disconnected the EXT3 drive from your PC..

Chapter 12
List of Settings in the Web Admin

The following options can be set from the Web Admin.

Common items (left side of the screen)

Common items (Displayed on the left side of the screen)	
Name	Displays the TeraStation's name.
Firmware version	Displays TeraStation's Firmware version number.
IP Address	Displays the IP addresses of the TeraStation's LAN Ports 1 and 2.
Workgroup	Displays workgroups on the TeraStation.
Storage	Displays total space and used space of internal hard drives.
Share	When [Shared Folders] is selected, the number of shared folders and the number of disks are displayed. When [User/ Group] is selected, the number of users and the number of groups are displayed. When [Network] is selected, Enabling/Disabling DHCP and Ethernet frame size are displayed.
I'm Here!	Causes the TeraStation to beep.
Logout (displayed on the upper right of the screen)	Log out of the TeraStation's Web Admin.

Shared Folders

Shared folders		
Shared Folders	Shared Folders	Click [Create Folder] to add a new shared folder. Click the shared folder name to edit the shared folder's information. Select the shared folder and click [Delete] to delete the shared folder. * Enter a letter in the [Find] field to see folders that start with that letter. Click an item on the list to select the folder name. * Click [Empty recycle bin of each folder] to delete the data in the recycle bins.

	Use other shared folder settings	Select the shared folder you want to copy settings from.	
	Shared folder name	Enter a share folder's name. * You can enter uptown 12 alphanumeric characters (6 characters for two-byte). * You can use alphanumeric characters, two-byte characters, - (hyphen), _ (underscore). * Don't use a number or symbol for the first letter of a name.	
	Shared folder Description	Enter a description for the shared folder * You can enter up to 50 alphanumeric characters, or 25 two-byte charactors. * You can use alphanumeric characters, two-byte characters, - (hyphens), and _ (underscores).	
	Disk Space	Select where to create a share folder.	
	Share Folder Attribute	Shared folders may be read-only or writable.	
Shared Folder > New Shared Folder * Displayed when clicking [Create a shared folder] on the shared folder configuration screen.	Recycle Bin	If deleting files in the selected shared folder or usbdisk, the [trashbox] folder is automatically created in the shared folder and files will be moved into this folder. * Directory information will also be sustained in the [trashbox]. * One [trashbox] folder can be set per shared folder on the TeraStation and per connected USB hard drive. * The USB hard drives must be formatted as EXT3, XFS or FAT 32 in order to use trashbox. Files in NTFS or HFS+ formats cannot be deleted. * You cannot use this feature while connecting via AFP. * You cannot use this feature while connecting via FTP.	
	Shared Folder Support	Select which operating systems and features the share will support.	

Shared Folder Support	Descriptions
Win/MacOS (SMB)	Allow or reject connection via SMB from Windows PC or Mac OS.
MacOS (AFP)	Allow or reject the connection via Appletalk (AFP) from MacOS.
FTP	Set to allow/disallow to manipulate folders via FTP. * It is required to configure to use FTP in [Network] - [Settings] - [Network Services] beforehand.
Backup	Set to enable/disable to use as a backup destination.
SFTP	Select when connecting by SFTP.

* If you uncheck [Windows], [Apple], [Ftp] and [SFTP] and only check [Disk Backup], only TeraStation's backup programs will be able to see the share. If you want to be able to access TeraStation's backup folders from a computer, check the [Windows] option.

| | Shared Folder Attributes | If you choose [Hide Share], the configured shared folder will be invisible.
* If [Apple], [Ftp], or [SFTP] are checked, you cannot select [Hide Share].
* To open the hidden shared folder, click [Start] - [Run], and enter \\TeraStation Name\ Shared Folder name\.
For example, if TeraStation name is "TS-XL001" and the shared folder name is *share*, type "// TS-XL001/share$/". | |

	Remote backup password	When you back up data from other TeraStation to this unit via network, you can set up the password so that this unit is mistakenly selected as a backup destination. * You can use up to 8 characters including alphanumeric characters and hyphen (-) and underscore (_). * You cannot use hyphen (-) for the first letter.
	Offline Files	Options: [Disable Offline Files] : Disables offline file. [Manual Cache Files]: Enables offline files. You need to select the files to use offline yourself. [Automatic Cache Files]: Enables offline files. Open files are cached locally and may be used offline. Old files that cannot be synchronized are replaced by newer files or deleted automatically. [Automatic Cache Programs and Files]: Enables offline files. Opened files are cached locally and may be used offline. Old files and network applications that cannot be synchronized are replaced by newer files or deleted automatically.
	TeraSearch	To create an index for TeraSearch, check [Include folder in search indexing] and click [Save]..
Access Restrictions Click [Access Restrictions] on [Create Shared Folders] to view this option.	Access Restrictions	Enable access restrictions. Click [Add] and select the user or group name which are allowed to access, then click [Add]. To remove access, select the username and group, then click [Delete]. If using FTP/FTPS/SFTP connection, access restrictions can be set per user.
DFS Click [Modify Settings] to change settings.	DFS	Select to enable or disable Distributed File System (DFS).
	Allow multiple DFS	Enable to allow multiple DFS connections.
	DFS Root Folder Name	Enter the displayed SMB name of the DFS root folder. * You cannot use a name which has already used. * You can enter up to 12 alphanumeric characters (6 characters for two-byte). * You can use alphanumeric characters, two-byte characters, - (hyphens), and _ (underscores). * Don't use a number or symbol as the first letter of a name.
DFS Link	Add Link	Enter Shared Folder Name, Link Name and Host Name to link. If it is possible to resolve the name in SMB, use the UNC host name. Otherwise, enter the IP address.
	Delete Link	Delete selected DFS link.
Direct Copy Click [Modify Settings] to change settings.	Direct Copy Destination	Change the shared folders as a DirectCopy destination.
TeraSearch Click [Modify Settings] to change settings.	TeraSearch	Select [Enable] to use TeraSearch. Specify the time to update the index in [Update Index at] option. To update the index immediately, click [Update Index].

Users/Groups

Users/Groups-Users		
Users	Users	Displays Username, User ID, and User Description, and Primary Group. To create a new user, click [Create User]. To edit the user, select the user name and click [Edit User]. To delete the user, select the user and click [Delete]. If you have selected [Delegate Authority to External SMB Server], you can convert the user you registered at the TeraStation to the external SMB server certificated user when you clicking [Convert the local users to the external user]. Selecting [guest] and then clicking [Enable] or [Disable] will let you configure [guest] to be enabled or disabled. * Enter a letter in the [Find] field, the choice of the user name with the first letter matching with the letter will be displayed. Click one of the users listed, and the folder name is selected. * The users [admin] and [guest] have already set in the factory default. You cannot delete them. The [guest] can be disabled. * If you are joining the network as a domain, [Domain User List] is also displayed on the above screen. * [Input CSV format data] will let you obtain user information (in CSV) at once..
Local User > New User To display, click [Create a user] on the user screen.	Username	Enter the Username you register to the TeraStation * Enter up to 20 alphanumeric characters. * You can use alphanumeric characters, - (hyphen), and _ (underscore). * You cannot use any symbol (except underscore) for a first letter of the name. Use only 15 or less alphanumeric characters for password of the User which is registered to the TeraStation if you are using Windows 98SE/98/95. Use alphanumeric 9 character or less if you are using Mac OS. Otherwise, you will not be able to access shared folders.
	User Id	If a user ID is left blank, a user ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that a user ID does not duplicate to other users.
	Description	Set the description of a user name. * You can enter uptown 50 alphanumeric characters (25 characters for two-byte). * You can use alphanumeric characters, two-byte characters, - (hyphen), _ (underscore), and space. * You cannot use a space as a first letter. * Additional users will automatically belong to the [hdusers] group. You can change the group the user belongs from Group Settings.
	Password (within 20 characters)	Enter the password needed to access the TeraStation. * Enter up to 20 alphanumeric characters. * You can use alphanumeric characters, - (hyphen), and _ (underscore). * You cannot use any symbol (except underscore) for a first letter of the name. * If using Mac OS, use up to 9 alphanumeric characters for user password to login to TeraStation. Otherwise, you will not be able to access shared folders.
	Confirm Password	Enter the password for confirmation.
	Primary Group	When the user belongs to the multiple groups, select which group is the main for that user. If the space usage is limited by the Quota feature for the group, the limitation of the usage of the group selected is applied
	User Quota	To use a quota to restrict the space which is available for a user, click [Enable].
	Soft Limit (GB)	Set the space which if exceeded will trigger an email notification.
	Hard Limit (GB)	Set space to be available to use (in GB). * Quotas only restrict the available hard drive space. This feature does not provide quotas per user; it should be managed by individual users. To verify the owner, open the new window and click [Owner] tab by selecting [Security] tab on Properties screen for each file or folder and click [Advanced Settings]. (The steps to check the owner may vary according to your OS. The example above is for Windows XP).

Domain User	Domain User	The list of Domain Users is displayed when it joins NT Domain or ActiveDirectory Domain.
Domain Group	Domain Group	The list of Domain Groups is displayed when it joins NT Domain or ActiveDirectory Domain.
List of External Authenticated Users	List of External Authenticated Users	[Delegate Authority to External SMB Server] and [Automatic User Registration], from [Network] - [Workgroup/Domain] - [Workgroup Authentication] are selected and user is automatically registered, the list of user who is automatically registered is displayed. To delete a user that automatically registered, that user and click [Delete External Users].

Users/Groups-Groups			
Group	Group		Displays group names, group ID, and group descriptions. To create a new group, click [Create Group]. Select a group name and click [Edit Group] to display Edit Group Information Screen. To delete the group, select the group and click [Delete]. * Enter a letter in the [Find] field, the choice of the group name with the first letter matching with the letter will be displayed. Click one of the shared folder listed, and the group name is selected.
Local Group > New Group To display, click [Create Group] on the Group screen.	Group Name		Set the name of the group. * Enter up to 12 alphanumeric characters. * You can use alphanumeric characters, - (hyphen), _ (underscore), and . (dot). * You cannot use any symbol (except underscore) for a first letter of the name.
	Group Id		If Group ID is left blank, a group ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that the group ID does not duplicate to other groups.
	Description		Set the description of the group. * You can enter uptown 50 alphanumeric characters (25 characters for two-byte). * You can use alphanumeric characters, two-byte characters, - (hyphen), _ (underscore). * You cannot use a space as a first letter.
	Group Quota		To use a quota to restrict the space which is available for a group, click [Enable].
	Soft Limit (GB)		Set the space which if exceeded will trigger email notification.
	Hard Limit (GB)		Set space to be available for use (in GB). * Quota feature only restricts the available hard drive space. This feature does not show the space that each group is currently using; It should be managed by individual group. To verify the owner, open the new window and click [Owner] tab by selecting [Security] tab on Properties screen for each file or folder and click [Advance Settings] button. (The steps to check the owner may very depending on OS. The example above shows for Windows XP).
Local User/ Group Member	Local Users		Select a user name which have belong to the group and click [Add]. This will add the selected as Group Members. * You cannot let Domain Users that are obtained from the Domain Controller belong to any group.
	Group Members		Displays users who are registered to a group. Select User group register and click [Remove] to unregister from the group.

Network

Network		
IP Address Setting Click [Modify Settings] to change settings. * The LAN cable connected to LAN Port 2 should be set for Ethernet 2.	DHCP	If enabled, DHCP will configure your IP settings automatically. A DHCP server on the network is required for use.
	Primary IP Address	If DHCP is disabled, you can enter an IP address manually.
	Subnet Mask	Set a subnet mask.
	Default Gateway Address	Specify the IP address for a default gateway..
	Primary DNS Server	Specify an IP address of the primary DNS server.
	Secondary DNS Server	Specify an IP address of the secondary DNS server.
Ethernet Frame Size Click [Modify Settings] to change settings. * The LAN cable connected to LAN Port 2 should be set for Ethernet 2.	Ethernet Frame Size	You can improve transmission efficiency by changing the maximum size of data that can be sent at a time. • 1518 bytes (Default) It is set to 1518 bytes at default. • 4102 bytes (Jumbo Frame) Transfer at 4102 bytes. • 7422 bytes (Jumbo Frame) Transfer at 7422 bytes. • 9694 bytes (Jumbo Frame) Transfer at 9694 bytes.
Network Serivces	Network Services	HTTP is enabled by default. * You cannot open the TeraStation's Web Admin from a network for which [Disable] is selected. HTTPS is enabled by default. * You cannot open the TeraStation's Web Admin through SSL from a network for which [Disable] is selected. * You cannot access the TeraStation via SMB from a network where [Disable] is selected. AFP: It is initially set to [Enable]. * You cannot connect TeraStation via AFP from a Mac even if you add [AFP] in the shared folder settings. FTP: FTP is disabled by default. * You cannot connect to the TeraStation via FTP from a Mac, even if you add [FTP] to the shared folder settings.To use FTP, change this setting to [Enable]. Backup is enabled by default. * You cannot use the TeraStation as a backup destination from a network connected for which [Disable] is selected. NAS Navigator detection is enabled by default. * If disabled, NAS Navigator2 will not be able to detect the TeraStation. * NAS Navigator2 detection should be enabled to update firmware, use auto power management, or use NS-SHIFT. NFS is enabled by default. * You cannot access the TeraStation from NFS clients if [Disable] is selected. SFTP is enabled by default. * You cannot access the TeraStation via SFTP if [Disable] is selected. WebAccess is enabled by default. * You cannot access the TeraStation via WebAccess feature if [Disable] is selected. TeraSearch is enabled by default. * You cannot use the TeraSearch if [Disable] is selected. Auto Power Management is enabled by default. * You cannot use the auto power management if [Disable] is selected. * If Ethernet 1 and 2 are both disabled, and the Power Mode Switch is set to [Auto}, the TeraStation will not turn on. Move the Power Mode Switch to [Manual] to allow the TeraStation to power on again.
	Edit SSL Key	Set when updating SSL Server certification and the private key.

Port Trunking
Click [Modify Settings]
to change settings.
	Port Trunking	Enable Port Trunking to use two Ethernet connections to the TeraStation. The following configurations are available:
		Disable: Do not use port trunking.
		Round-robin policy:
		   Sets a round-robin policy for fault tolerance and load balancing.
		Active-backup policy :
		   Sets an active-backup policy for fault tolerance.
		XOR policy:
		   Sets an XOR (exclusive-or) policy for fault tolerance and load balancing.
		Broadcast policy:
		   Sets a broadcast policy for fault tolerance.
		Dynamic link aggregation:
		   Sets an IEEE 802.3ad dynamic link aggregation policy.
		Adaptive transmit load balancing (TLB):
		   Sets a Transmit Load Balancing (TLB) policy for fault tolerance and load balancing.	

Workgroup/ Domain Click [Modify Settings] to change settings.	Authentication Method	Select the method to join the network ([Workgroup], [NT Domain], or [Active Directory]). [Workgroup] is the default. Networking knowledge is required to configure other methods. Consult your network administrator for details.	
	Workgroup Name	To join a workgroup, enter the name of your workgroup. * You can enter up to 15 alphanumeric characters (or 7 two-byte characters). * You can use alphanumeric characters, two-byte characters, - (hyphens), _ (underscores), and . (periods). * Don't use a symbol as the first letter of the workgroup.	
	WINS Server IP Address	Enter the IP address of your WINS server to use WINS Server.	
	NT Domain Name (NetBIOS Name)	Enter the Domain name to use NT Domain as the method to join the network. * You can enter up to 15 alphanumeric characters (or 7 two-byte characters). * You can use alphanumeric characters, two-byte characters, - (hyphens), _ (underscores), and . (periods). * Don't use a symbol as the first letter of the domain.	
	NT Domain Controller Name (Computer Name)	Enter the Host Name of the Domain Controller to use NT Domain as a method to join the network. Register the computer account which has the same name as the TeraStation to the Domain Controller. * You can enter uptown 63 alphanumeric characters (31 two-byte characters). * You can use alphanumeric characters, - (hyphens), and _ (underscores). * Don't use a symbol as the first letter of the domain.	
	Active Directory Domain Name (NetBIOS Name)	Enter the Active Directory Domain Name to use Active Directory. * You can enter up to 15 alphanumeric characters (or 7 two-byte characters). * You can use alphanumeric characters, two-byte characters, - (hyphens), _ (underscores), and . (periods). * Don't use a symbol as the first letter of the domain.	
	Active Directory Domain Name (DNS/Realm Name)	Enter the Active Directory Domain Name (DNS/Realm Name) when selecting [Active Directory] as a method to join the network. * Enter up to 255 alphanumeric characters. * You can use alphanumeric characters, two-byte characters, - (hyphens), _ (underscores), and . (periods).	
	Administrator Password	Enter the Administrator's password. * This must be entered if [NT Domain] or [Active Directory] is selected for [Authentication Method]. * Enter up to 256 alphanumeric characters. * You can use alphanumeric characters, two-byte characters, - (hyphens), and _ (underscores). * Don't use a symbol as the first letter of the password.	

Workgroup/ Domain Click [Modify Settings] to change settings.	ActiveDirectory Domain Controller Name	Enter the hostname of the ActiveDirectory Domain Controller to use [Active Directory]. * You can enter up to 63 alphanumeric characters (31 two-byte characters). * You can use alphanumeric characters, two-byte characters, - (hyphens), and _ (underscores).
	Administrator Name	Enter the Administrator account username. * This must be entered if [NT Domain] or [Active Directory] is selected for [Authentication Method]. * Enter up to 256 alphanumeric characters. * You can use alphanumeric characters, two-byte characters, - (hyphens), _ (underscores), and . (periods). * Don't use a symbol as the first letter of the username.
Workgroup/ Domain	Verification Settings	Select to access the TeraStation from a workgroup network. [Delegate Authority to the TeraStation] (recommended) Only users that are registered in the TeraStation can access it. Local users' usernames and passwords must match the usernames and passwords of their Windows logins. [Delegate Authority to External SMB Server] Access to the TeraStation is controlled by an Authentication Server. Microsoft networking knowledge is required to configure this. Consult your network administrator for details. [Use Windows Domain Controller as Authentication Server] Users are verified by a Domain Controller, but the TeraStation does not join the domain. * If you specify the Windows Domain Controller as an external SMB authentication server, the workgroup name of the TeraStation and the domain name of the Windows Domain Controller must match. [Automatic User Registration] Select to add users allowed by the authentication server to the TeraStation's authenticated user list . Example: Use automatic registration for a while to add users, then disable to limit users to those who accessed the shared folder during the authentication registration process. [Enable Authentication Shared Folder], Use the folder as an authentication test folder that can be accessed by users registered to the authentication server.
	Authentication Server Name or IP Address	When [Delegate Authority to External SMB Server] is selected for [Authentication Method], specify the external server to be used for user authentication by its name or IP address. * When connecting via AFP, FTP, FTPS, or SFTP, always use an IP address. The server name may not work. * Always use the IP address when specifying a server that is not in the same subnet of the network as the TeraStation.

Workgroup/ Domain	Name	When selecting [Delegate Authority to External SMB Server], [Automatic User Registration], and [Enable Authentication Shared Folder], specify the folder name for the authentication test. It can registered users automatically when they open the folder. * You cannot create more than 2 shared folders for the Authentication test . * A user who is automatically registered will belong to the "hdusers" group. * Don't use preexisting shared folders for authentication. Specify a new folder name. * You can enter up to 12 alphanumeric characters (6 two-byte characters). * You can use alphanumeric characters, two-byte characters, hyphens, and underscores. * Don't use a number or symbol for the first character of the name. * AFP, FTP, FTPS, and SFTP connections don't support obtaining user information by delegating authority to external SMB server.
NFS	NFS Service Click [Modify Settings] to change settings.	Enable to access shared folders with NFS (Network File System). Enter a remote network address and remote subnet mask to restrict access.
	NFS Folders Setup	Click the folder for remote access via NFS. The NFS path for the folder you clicked is displayed. When accessing from an NFS client, enable NFS.
	NFS Client Setup	[Add Client] adds an NFS Client. To add a client, enter the IP address and host name of NFS client. To delete a client, select it and click [Delete Client].

System

System - Settings		
Name Click [Modify Settings] to change settings.	TeraStation Name	Enter a name to identify the TeraStation on the network. * Enter up to 12 alphanumeric characters. * You can use alphanumeric characters, hyphens, and underscores. * Don't use a symbol as the first letter of a name.
	Description	Enter a description of the Terastation (optional) to describe it on the network. * You can enter up to 50 alphanumeric characters (25 two-byte characters). * You can use alphanumeric characters, two-byte characters, hyphens, and underscores. * Don't use a space as the first letter of the description. * Only Windows computers display the description.
Date and Time Click [Modify Settings] to change settings.	Date/Time Source	Select [Automatic] to use NTP to adjust the TeraStation's time automatically. Select [Manual] to set the time manually.
	Primary NTP IP Address	Enter the DNS name or IP address of the NTP server. Example: ntp.jst.mfeed.ad.jp or 192.168.11.123 To specify ntp.jst.mfeed.ad.jp as the NTP server, check [Use default NTP server].
	NTP Synchronization Frequency	Select how often to access the NTP server and correct the time from [Daily], [Weekly], or [Every 3 hours]. *If you access the NTP server through a proxy server, access may fail in some networks.
	Time Zone	Specify the time zone.
	Date	Displays year, month and date. Enter numbers to change these values.
	Time	Displays time. Enter numbers to change the time. * To match the time to your PC, click [Use Local Date/Time]. * If the TeraStation's internal clock settings are more than 5 minutes different from other devices on your network, you may experience access problems. For best results, configure all devices on your network to correct their time settings automatically from an NTP server.
Language Click [Modify Settings] to change settings.	Display Language	Select the language to be displayed.
	Windows Client Language	Select the language to be used in the Windows client.

System - Storage		

Disks	Check Disk	Checks hard drives for errors and problems, both internal drives and attached USB drives. Time required for a disk check will depend on the size of the drive. Large drives may take several hours.
		* You cannot run a disk check while a backup job is scheduled.
		* During a disk check, all file sharing services stop.
		If the TeraStation disconnected abnormally from power while connected to a Mac, the Mac database may be damaged and your connection lost. If this happens, select [Delete any hidden] and run a disk check. All of the files listed below will be deleted (including sub directories) and you may be able to connect again.
		• .AppleDB
		• .AppleDesktop
		• .AppleDouble
		• TheVolumeSettingsFolder
		• Network Trash Folder
		* Please make sure the TeraStation is not selected as a backup destination of other TeraStations before running a disk check.
		* You cannot run Disk Check for the following types of drives.
		  • USB hard drive formatted in NTFS
		  • USB hard drive formatted in HFS+
		* If you have a FAT 32 USB hard drive larger than 1 TB, the disk check will take a very long time. For best results with such a drive, connect it to a Windows PC and run a disk check from within Windows.

	Format Disk	Format the additional hard disk installed to the TeraStation and the USB connector. Data will be completely erased if the disk is formatted. Please use extra caution not to loose your important data. The time required to format a disk will vary depending on the space to be used (a few minutes). * You cannot format a disk when you have set up a backup job. Warning: Do not format a drive if the TeraStation is configured as a backup device for another TeraStation. * Format type TeraStation can format or recognize the following format types:

Format type	Descriptions
EXT3 (USB hard drive only)	It is recommended when you may reconnect to TeraStation and use it. • Supports both Reading/Writing. • Supports Journaling File System. • Takes for a long time to format (a several minutes or more). • Less space is available than XFS after formatted. • More files in 1 folder, slower the access space. * Use EXT3 Reader included in this package when reading data directly connected to your PC.
XFS (USB Hard Drive/ TeraStation Internal Hard Drive)	This format is recommended when you use the additionally installed hard disk at the TeraStataion. • Supports both Reading/Writing. • Supports Journaling File System. • More space is available than XFS after formatted. • Access speed will not degrade even though more files in 1 folder. This is not supported by legacy TeraStation (such as HD-LAN, HD-HLAN, HD-HLWG, HD-HGLAN Series). * You cannot read data by directly connecting a PC.
FAT32 (USB hard drive only)	We recommend this format type when you want to connect the hard drive to your PC to view data in it. You can still connect the hard drive to Windows PC in case that the TeraStation fails. • Supports both Reading/Writing. • Cannot copy, backup, or replicate data with more than 4 GB per file. • Cannot use some characters which are used in Mac OS X such as [:].
NTFS (USB hard drive only)	Cannot format from TeraStation's Web Admin. It is Read-Only. Be able to use to connect to Windows 7/Vista/XP/2000, or Windows Server2003/Server2008. • Read-only (not writable during backup or replication either).
HFS+ (USB hard drive only)	Cannot format from TeraStation's Web Admin. Read-Only. Can be used to connect to Mac OS X 10.3.9 or later. • Read-only (not writable during backup or replication either).

Disks

* If USB hard drive with more than 2.2 TB of its size are connected to the TeraStation, it is recommended selecting [GPT Partition]. If you do not select this option, the size of the hard drive may not be detected correctly. However, please note that selecting this option cannot recognize it on other than PC equipped with Windows 7/Vista、Windows Server2003 ServicePack1 or later, Mac OS X10.4 or later and the TeraStation/Linkstation (TS-XL, TS-XEL, TTS-WXL, LS-XHL, LS-CHL series and such).

Disks	Remove Disk	To remove a hard disk, select the disk you want to disconnect and click [Remove Disk]
	Rediscover Disk	After performing the procedure to remove the hard drive, taking it off physically, and replacing to another hard drive, click here to have the TeraStation recognize a drive again without restarting the unit.
RAID Array	RAID Array	This is displayed when clicking the name on the RAID array Screen. If you have not set RAID, you can select from [RAID5], [RAID1], [RAID10], and [RAID0] for TS-XL and TS-XEL Series, [RAID1] and [RAID0] for TS-WXL series. If you do not select from any of the above, the unit is used as a normal mode (4 hard drives). Drive Composition: Displays the hard drives that consist of RAID. To configure RAID, check the hard drives you are going to use, select RAID mode, and click [Create RAID Array]. • To configure (build) RAID1, click 2 drives you are going to use and insert checkmarks. • To configure (build) RAID10 and RAID0, click all drives and insert checkmarks. * TS-WXL Series cannot be set to RAID10. • To configure (build) RAID5, click all drives or 3 drives you are going to use and insert checkmarks. * TS-WXL Series cannot be set to RAID5 • When delete RAID composition, click [Delete RAID Array]. * Changing or deleting RAID settings will erase all data in the hard drive. Back up your important data before performing any operations described above. * If you have a hard drive in the normal mode while building RAID5 (3 hard drives) or RAID1, it can be set as a spare by clicking [Set to spare-disk]. If it has already set to a spare drive, click [Set to normal disk] to set it to the hard drive in the normal mode. * [Set to spare-disk] will not be displayed on TS-WXL Series.

	RAID Scanning	RAID Scanning is the feature to read check for all sectors in the data area of hard drives which build RAID 1, 5 and 10.
		An error possible to repaired* (bad sectors) which is found during check will be automatically repaired.
		Also an error possible to repaired* which is found during standard file operations will be automatically repaired regardless of performing RAID Scanning or not.

Status	Descriptions
The error possible to repair*	• Read error in the data area which are build in RAID 1, 5, or 10 (including RAID 1 system area)
Errors impossible to repair	• Write Error • RAID management area error • Drive partition information area error • Drive recognition failure, etc.

If many errors possible to repair *(bad cluster) are found in one of the hard drives which build RAID, that drive will be removed and the system will automatically move to degrade mode.

Data are not protected in the degrade mode, it is strongly recommended to immediately replace the erroneous hard drive.

When running RAID Scanning in the first time, it is strongly recommended to backup data on the TeraStation in advance.

RAID Scanning:
Set whether using RAID Scanning or not.
RAID Scanning Schedule:
Select the schedule to perform RAID Scanning.
• Every Week [Sun - Sat]
• 1st [Sun - Sat]
• 2nd [Sun - Sat]
• 3rd [Sun - Sat]
• 4th [Sun - Sat]
• 1st, 3rd [Sun - Sat]
• 2nd, 4th [Sun - Sat]
• Every 1st day/month
Select [Begin Immediate RAID Scan] and click [Save] to immediately run the maintenance.
RAID Scanning Start Time:
Select time to start RAID Scanning from 0 to 23 o'clock.
* To stop RAID Scanning, click [Abort RAID Scanning].

RAID Array Error Detection Response:
When there is an error on RAID Array, the system will be shut down automatically to protect data (This feature is only for RAID 1, 5 or 10. This does not work while in normal mode or RAID 0).It is set initially set to [Shutdown].

RAID Scanning:
Click [Modify Settings]
to change settings.

System-Backup		
View NAS Devices	Local TeraStations	Displays the list of the LinkStation/TeraStation (*) on the network. Click [Refresh] to update the list with the latest information. * Caution: Only the LinkStation/TeraStation which support Backup via the network will be displayed.
	Off Subnet TeraStations	If there is the LinkStation/TeraStation(*) which is not listed on the list or the you are going to add the LinkStation/TeraStation(*) on other network, enter the IP address of the LinkStation/TeraStation(*) and click [Add]. Select the LinkStation/TeraStation (*) you just added, and click [Delete]. That will delete the registration. * Caution: Only the LinkStation/TeraStation which support Backup via the network can be registered.
Search for Backup Destination by Password Click [Modify Settings] to change settings	Password to Search	Enter this password when you want to specify the shared folders on another TeraStation via the network as a backup destination. Enter the password to search for Backup which is set for the shared folders of another TeraStation. If you do not enter it, you cannot backup to the shared folders for which the authentication password has been set. * [Search for Backup Destination by Password] you can enter on the backup source TeraStation is only one. * The shared folder with different [Remote backup password] cannot be set as a backup destination as well. * Searching backup destination shared folder by entering [Search for Backup Destination by Password] is only available for TeraStation other than the backup source. ■**Steps for Setup** 1. On the TeraStation's Web Admin of the backup destination, set [Remote backup password] for each shared folder. 2. Set the same password for [Remote backup password] of a shared folder you want to display as a backup destination as [Search for Backup Destination by Password] when you configure backup for the backup source TeraStation. 3. Configure backup at the TeraStation which is the backup source. Select the shared folders of the backup destination can from followings.※ • Shared folders in the TeraStation which is the backup source. • The USB hard drive connected to the TeraStation which is the backup source. • A shared folder for which [Remote backup password] is not set in the TeraStation which is the backup destination. • A shared folder whose [Search for Backup Destination by Password] matches [Remote backup password] of the TeraStation which is the backup destination. * [Backup] must be enabled as a remote backup destination when setting up the shared folder.

■**Example of Configuration**
Configuration on the TeraStation (Backup Destination)

Shared folder name	share1	share2	share_free
Remote Backup Password	111	222	None

■**Example of Configuration**
Configuration on the TeraStation (Backup Source)

The Backup destination shared folder which is displayed when setting "111" to [Search for Backup Destination by Password] for the backup source TeraStation	View	Not Displayed	View
The Backup destination shared folder which is displayed when setting "222" to [Search for Backup Destination by Password] for the backup source TeraStation	Not Displayed	View	View
A shared folder as a backup destination displayed when the password is not set	Not Displayed	Not Displayed	View

Backup Jobs Setup	Backup Jobs Setup	Click [Create New Job] to set up to 8 backup timers. Backup Configuration Screen will be displayed when clicking [Job Name]. Backup data saved on the TeraStation to the USB external hard drive or another Link/TeraStation at the specified time. * If you choose the USB hard drive in order to utilize this backup feature, USB drive must be formatted in FAT32, XFS or EXT3 (Format type for a USB hard drive can be displayed on the TeraStation's Web Admin, [System] - [Storage]. * If a USB drive is formatted in FAT32, the maximum file size to be able to backup is 4 GB. * Never unplug LAN cable connected to the TeraStation or USB hard drive during backup. * Do not initialize the TeraStation, format, run disk check, backup settings, and , add, edit or delete shared folder and user group/user during backup. Otherwise, it may halt in error. * If any error occurs during a scheduled backup (Every day/Every Week), the backup task which had error will not be performed after that. You need to configure the backup task again which causes error to run backup again. However, this does not apply, [Ignore Errors and Proceed with Backup] option is set.

	Job Name	Enter a name for the backup job.
	Backup Job Schedule	Select schedule to run backup from [Not Scheduled], [Immediate], [Every Day], [Every Week].
	Backup Date	Select the day or time to run the backup job.
Backup Jobs Setup Click [Create New Job] to display this option in the Backup Configuration Screen.	Backup Operation Mode	Select the Backup Operation Mode from the following choice. • Normal Backup • Overwrite Backup (Append Backup) • Overwrite Backup (Differential Backup) * If you select [Overwrite Backup (Differential Backup)], any files which do not exist in the source will be deleted without showing the confirmation screen for deletion. Be careful not to delete the necessary data. * All operation mode other than normal backup will overwrite all of the data to the backup destination. Be careful not to delete the necessary data. * Do not perform any file operations (such as rename or delete a file) in the Backup Sources during the Backup. If you do so, the backup job may halt with error. In such a case, after the error is completed, try to perform the backup again. Following table shows the behavior during each operation mode. The behavior will make a big difference whether or not selecting [Create Target Folder for Backup] in Backup option. * The example here uses "/target" as Backup Destination Folder. • If the data is backup to the USB hard drive, the "target" below will be displayed as "usbdisk*". The character * expresses 1 - 2 (number). • If the data is backup to the TeraStation, the "target" below the shared folder name of the backup source will be displayed. • Backup Log is created under following name within the backup source folder. backuplong (backup task number_(backup starting time).txt Example: If the date the backup is started on March 27, 2004, 19:55, " backuplog1_200403271955.txt" is created. * If the backup mode is set to [Overwrite Backup (Differential)], data in the backup destination may be deleted depending on the backup settings.

Normal (Copy all files without overwriting previously backed up data every time)			
Folder which Can Identify Backup Source	Backup Source Folder	Backup Destination Folder, Result	Remarks
Create (forcibly)	/share	/target/(Date/Time)*1/share	
	/share/folder	/target/(Date/Time)*1/folder	

	Backup Operation Mode	■ Overwrite (Append) (Only copy and overwrite the files with changes based on the file size and time stamp*2)			
Backup Settings Click [Add Backup Task] to display this option in the Backup Configuration Screen.		Folder which Can Identify Backup Source	Backup Source Folder	Backup Destination Folder, Result	Remarks
		Create	/share	/target/_backups/	
			/share/folder	/target/_backups/folder	
		Do not create	/share	/target	
			/share/folder	/target/folder	

■ Overwrite (Differential)
(Only copy and overwrite the files with changes based on the file size and time stamp*2)
* Files/Folders exit only on the Backup Destination will be deleted.

Folder which Can Identify Backup Source	Backup Source Folder	Backup Destination Folder, Result	Remarks
Create	/share	/target/_backups/	
	/share/folder	/target/_backups/folder	*3
Do not create	/share	/target	
	/share/folder	/target/folder	*3

*1 The format of the folder is yyyymmddhhmm by using the backup starting time.
    For example, if the starting time is March 27, 2004, 19:55, the folder name is displayed as "200403271955".
*2 "Time Stamp" here is not the time information that can be verified Windows Macintosh, but the time information managed by TeraStation.
*3 If there is the difference in the shared folders that is above the backup folder, files will not be deleted.

	Backup Options	[Create Target Folder for Backup] The options you have selected on the Backup Operation Mode will make a big differences on behavior. Refer to the table described in the Operation Mode. [Create Backup Log File] Create the backup log file. [Use Encrypted Transfer Method] Select whether having data to be transferred encrypted or not when backup data. * The throughput is degraded if the encryption is enabled. * Do not select this option when the backup destination is a USB hard drive. [Use Compressed Transfer Method] Select whether having data to be transferred compressed or not when backup data. * If running a backup job via the network, the compressed transfer may improve the transfer speed when the network bandwidth is narrow (this does not mean that data is archived into 1 file and backed up). * Do not select this option when the backup destination is a USB hard drive. [Ignore Errors and Proceed with Backup] The next backup will be performed even though the last backup is halt in error. [Exclude trash boxes from backup target] Exclude the data in the trash boxes to backup. [Complete Backup] Overwrite the files which have not changed.

Backup Folders Click a task number to display this option in the Backup Configuration Screen.	Backup Folders	Select the backup source and the shared folder on the backup destination folders, and click [Add]. You can select following folder as a shared folder on the backup destination. • Shared folders on the Link/TeraStation displayed in [View NAS Devices] • usbdisk1 and usbdisk2 connected to the backup source of the TeraStation * Do not specify the backup source folder which include Japanese katakana in the folder name. The backup job will halt if any of these characters are included.
Replication	Replication	Click [Add] to display the screen to select a shared folder which is a replication source and another LinkStation/TeraStation which is a replication destination. Data saved on the replication source are automatically written to the shared folder of the replication destination. To delete the settings, select replication settings and click [Delete]. Click [Resynchronize] to overwrite (differential) data in replication source to replication destination folder.

System - Maintenance		
Email Notification Click [Modify Settings] to change settings. Click [Send test mail] to send a test email to the email address which has been set.	Notification	Select whether using Email notification feature or not.
	SMTP Server Address	Enter SMTP Server Address (Mail Server Address).
	SMTP Port No.	Enter SMTP Port Number. * The standard port number (25) is used if not specified. Also, User authentication method is set to [Disable] or [POP before SMTP], the standard port number (25) is used regardless of the number you entered in this field.
	Authentication Type	Select Authentication Type from [POP before SMTP], [LOGIN(SMTP-AUTH)], and [CRAM-MD5(SMTP-AUTH/CRAM-MD5)].
	POP3 Server Address	Enter the POP3 Server Address (Email server address).
	POP3 Port No.	Enter POP3 Port Number. * The standard port number (110) is used if not specified.
	SSL/TLS	When [LOGIN(SMTP-AUTH)] and [CRAM-MD5(SMTP-AUTH/CRAM-MD5)] are selected for Authentication Type, specify either using [SSL] or [TLS].
	Username	Enter a user name that will be used for authentication.
	Password	Enter a password that will be used to verify.
	Subject	Specify the subject of the email to be sent. * Use characters. Do not use two-byte characters. It may cause the character corruption.
	Recipient(s)	Enter the email address of the receiver, and click [Add]. * You can register up to 5 email addresses as receivers.

	Report	Select the contents to send in the email notification.
		• HDD Status Report
		  Sends the condition of the hard drives at the specified time on [HDD Status Report].
		• System Alert
		  Sends when system is rebooted or shut down, or RAID configuration is changed.
		• When a drive error is occurred
		  Sends when an hard drive error is recognized.
		• Fan Failure
		  Send when the fan error is recognized.
		• Backup Complete
		  Sents when the backup is complete.
		• Quota Alert Notification
		  Sends when the Quota Space Limitation is exceeded at the time which is specified on HDD Status Report.

Syslog Click [Modify Settings] to change settings.	Syslog	Select [Enable] in Log information transmission and select [Save] to transmit the system log. To view a log, select [Syslog] - [File Log (SMB)] - [FTP Log] from View Log. You can transmit the log by entering the IP address of the syslog server in [Syslog Server IP Address] field from [Syslog] - [File Log (SMB)].
		* [FTP Log] does not support to output a log to the syslog server.
		  [Store Files Locally]
		  Select [Enable] to create the link to the log on the shared folder and select the target shared folder will create the link to browse the system log in the shared folder. The folder called "log" is displayed under the shared folder you have selected, and each type of log file will be displayed in the folder.
		* File Operation Log only records the file operation done in the internal hard drives. Note that file operations for a USB drive are logged.

Alert Sound Settings Click [Modify Settings] to change settings.	Alert Sound Settings	Select the conditions that trigger alert beeps from [Overheating], [Disk Error], [Fan Error], and [UPS power Error].
Front Panel Settings Click [Modify Settings] to change settings.	Display	Select items to display on LCD display at the front of the TeraStation from [Host IP], [Disk Mode], [Time] and [HDD Usage].
	Flip Display Items	Set if automatically switching the item to display on the LCD or not.
	LCD brightness	Adjust backlight brightness of the LCD display in 5 levels.
	LED brightness	Adjust the brightness at the front of the TeraStation in 5 levels.
	LED Synchronization	Select whether using the feature to change the LED brightness synchronized with time.For example, you can change the brightness on day time and night time.
	LED Brightness (Sleep)	Adjust the brightness of LED in 4 levels while in dark.
	Begin Sleep	Set the time (0 to 23 o'clock) to darken LED brightness. This can be set in every 00 minute at 1 hour interval.
	Wake up	Set the time (0 to 23 o'clock) to change LED brightness back to the normal setting. This can be set in every 00 minute at 1 hour interval.
Restart TeraStation	Restart	Click [Restart] to reboot the TeraStation. * To avoid damaging your data, make sure that you are not working on with any data before shutting down the TeraStation.
Shutdown TeraStation	Shutdown	Click [Shutdown] to turn off the TeraStation. * You cannot turn on the power of the TeraStation from the Web Admin. Press the power switch on the TeraStation to turn it on. * To avoid damaging your data, make sure that you are not working on with any data before shutting down the TeraStation.

System - Power Management			
UPS Settings Click [Modify Settings] to change settings.	Display Status	This is the feature to shutdown the TeraStation automatically when the UPS runs by battery due to power outage and such. If the UPS is connected, it shows the status of the UPS. * This setting must be done after connecting the UPS and the TeraStation with a USB cable.	
	UPS Connection Type	Select a connection method with UPS. * [USB Port/APC Style (or OMRON Style)] can be set only when you are using USB type UPS manufactured by APC. * The items to select will vary depending on a UPS model number and a cable. Refer to BUFFALO's website (www.buffalotech.com) for details.	
	Synchronize with UPS	Select [Enable] when using Synchronization with UPS feature. * [USB Port/APC Style (or OMRON Style)] can be set only when you are using USB type UPS manufactured by APC.	
	TeraStation behavior When Power failure	Allows you to set the time until shutdown when the power failure continues. Or, you can set to shutdown TeraStation when UPS Reports 'Battery Low' status. * Shutting down by Battery Low can be used only when UPS for USB connection is used.	
	UPS behavior After TeraStation has shutdown	Specifies whether shutting down UPS or not after shutting down the TeraStation.	
	UPS Recovery function	Reboot the TeraStation Automatically after recovering supply from AC power to UPS.	
Sleep Timer Click [Modify Settings] to change settings.	Timer Interval	Select the interval option from [Disable], [Every Day], or [Every Week] for Sleep Timer. If selecting [Specific day of the week], specify the day by tick the box for that day. Timer can be set up to 3 (1-3).	
	Wake up	Specify the restart time which recover from the Standby to the Normal state. You can set time from 0:00 to 23:45.	
	Begin Sleep	Specify the ending time to move from Normal state to Standby State. You can set time from 0:00 to 27:45. * You can not set the ending time before or the same time as a beginning time.	

System - Restore/Format		
Restore Factory Defaults	Upon restore Click [Modify Settings] to change settings.	Select whether or not you would like to initialize the administrator's password for the TeraStation when initializing the unit (press and hold the initialization switch you can find when opening the front cover for about 5 seconds) . * You may no longer be able to configure TeraStation if you forget the password if selecting [Keep current admin password]. Never forget the password.
	Restore TeraStation	Following settings are initialized when clicking [Restore Factory Defaults]. TeraStation Name, Description, NTP Settings, Workgroup Settings, Shared Service Settings, Shared Folder Settings, USB Disk Settings, RAID Scanning, Sleep Timer, Upon restore, Shared Folder Access Restrictions, User Settings, User/Group, Email Notification Settings, Synchronization with UPS Settings, Backup Settings, Administrator Name and Password, Network Settings (IP address, Subnet Mask and such), Time Machine, Web Access, DFS, DirectCopy, NFS, TeraSearch, Alert Sound Settings, Front Panel Settings, HDD Spindown, RAID Array Failure Settings
Format TeraStation	Format TeraStation	Clicking [Format TeraStation] will erase data on the drives on the TeraStation completely. * Data erased cannot be recovered. * You cannot change the configuration of the TeraStation while erasing data.

Extensions

Extensions - WebAccess		
Shared Folders with WebAccess	WebAccess Settings	Click shared folder name to display Edit Screen. Folder information on the TeraStation which will be published with Web Access Feature is displayed in [Shared Folder Name] and [Shared Folder Description]. On [WebAccess Settings], following Access Restrictions can be selected. [Disable]: Does not publish shared folders. [Allow Anonymous]: Anyone can access (view) shared folders. [Allow All Groups / Users] Allow to access (or view) only groups or uses registered to the TeraStation. [Use Inherited Folder Permissions] Use same permissions as set on the Shared Folder Screen. If access restrictions are not set in the Shared Folder Screen, this option is not displayed.
WebAccess Service Click [Modify Settings] to change settings.	WebAccess Service	[Enable/Disable] Configure if using Web Access or not. [HTTPS/SSL Encryption] Set if using SSL encryption to perform the transmission more safely. [Use BuffaloNAS.com] Configure if utilize "BuffaloNAS.com" to access the TeraStation easily. Files in the Web Access Shared folder are not saved on "BuffaloNAS.com". [BuffaloNAS.com Name] Enter a nickname for the TeraStation to register to "BuffaloNAS.com" server. * This is the name to enter when accessing BuffaloNAS.comIt does not have to be the same name as the actual TeraStation. * If the TeraStation is left unconnected from the Internet a certain period of time, its name registration will be deleted on the BuffaloNAS.com server. [BuffaloNAS.com Key] Enter the key to save or use the nickname of the TeraStation to be registered to "BuffaloNAS.com" server. [DNS Hostname] Enter the host name if using the general DNS service instead of utilizing "BuffaloNAS.com" server. [Auto-Configure Firewall (UPnP)] Select if setting for transmission between a router and the TeraStation will be done automatically by using UPnP or not. If a router does not support UPnP or automatic setting does not work, try manually. [External Port] Enter the external port of a router side when configuring it manually without using UPnP. Forward the external port of the router side to the port 9000 of the TeraStation.

Extensions - PrintServer		
PrinterServer Click [Modify Settings] to change settings.	PrinterServer	Select whether or not using PrintServer feature for Windows. Click [Delete Printer Job] to delete a printer job.

Extensions-Time Machine		
Time Machine Click [Modify Settings] to change settings.	Time Machine	Select [Enable] when using Time Machine on Mac OS X 10.5 to specify the TeraStation as a backup destination. Select a shared folder as a backup destination in [Target Folder].
Mac Information	Mac Information	Enter [Target host name] and [Target MAC address] of Macintosh on which Time Machine feature is used.

Appendix

Assign as Network Drive (Windows)

You can easily map the TeraStation's shared folder as a network drive by using NAS Navigator2 included in the package.

1 Click [BUFFALO NAS Navigator2] icon on your Desktop.
NAS Navigator2 launches.
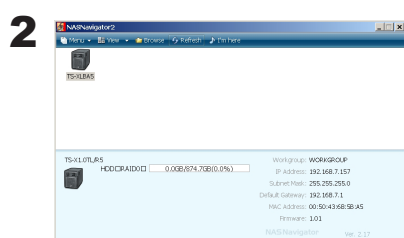
2 Right-click on TeraStation's icon and click [Map Network Drive].

The example shows the display of TS-XL Series.

3 TeraStation's network drive icon should be added into [Computer (or My Computer)] .You can use this network drive just like other hard disks.

Note:
If TeraStation is not connected to the network or is OFF at the time your computer is booted, "The network path could not be found. The connection was not established" is displayed.

If you want to assign a folder other than the shared folder as a network drive manually using the function built into your OS, refer to OS's help file.

Mount as a Network Drive (Mac OS X 10.3.9 or later)

You can easily map the TeraStation's shared folder as a network drive by using NAS Navigator2 included in the package on Mac OS X 10.3.9 or later.

1 Click [NAS Navigator2] icon in the Dock.
NAS Navigator2 launches.
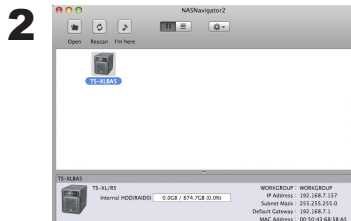
2 Click TeraStation's icon while holding on Control key button, and select [Open Shared Folder].

The example shows the display of TS-XL Series.

3 **1** Select a shared folder name you want to mount.

2 Click [OK].

4 The following icon will be displayed on the Desktop after it is mounted (It may be displayed on on Finder side bar on Mac OS x 10.5 or later).

Notes:
- The displayed characters are the shared folder name. The characters vary depending on the folder name being configured.
- It may be displayed on the Finder side bar on Mac OS X 10.5 or later.• To unmount, drug and drop the icon to the Trash Can.
- To unmount, drug and drop the icon to the Trash Can.

Now you have mapped the network drive.

If you want to assign a folder other than the shared folder as a network drive manually using the function built into your OS, refer to OS's help file.

Factory Defaults

The TeraStation is initially configured as shown in the followings.

- Administrative User name: admin
- Password: password
- Shared Folder: share (for both Windows and Macintosh)
                 Trash can function of the shared folder is set to "Enable" as a default.
- DHCP Client
  Automatically Obtained when DHCP Server is in the network.
  If DHCP Server is not found in the network, the following settings are automatically used:
  IP Address: 169.254.xxx.xxx (xxx is assigned randomly when booting the TeraStation).)
  Subnet Mask: 255.255.0.0
- Registered Group
  Default groups (hdusers, admin and guest) have been already set as a default on TeraStation. You cannot edit or delete them.
- Microsoft Network Group Setting
  WORKGROUP
- Ethernet Frame Size: 1518 bytes
- AFP Feature: Enabled
- FTP Server: Disabled
- NTP: Enabled
- Print Server: Enabled
- Web Access: Disabled
- Time Machine: Disabled
- TeraSearch: Disabled
- RAID Mode: RAID 5 mode for TS-XL, TS-XEL Series (4 hard drives)
            RAID 5 mode for TS-RXL Series (4 hard drives)
            RAID 1 mode for TS-WXL Series
            Normal mode for TS-WXL/1D Series

Note:

To restore factory defaults, refer to "Initialize settings" on page 61.

List of LCD Display

TeraStation has the LCD panel on the front of the unit. The following list shows the displayed items and their meanings.

Normal Display

You can switch the display by pressing the Display switch button on the front of the TeraStation. Also, you can configure the displayed items in [System]-[Maintenance]-[Display Panel Settings] on the Web Admin.

Examples of LCD		Meaning
LINK SPEED * If connecting a LAN cable to the LAN Port 2, "LINK SPEED2" is displayed.	LINK SPEED 　NO LINK	Not connected to the network.
	LINK SPEED 　10Mbps HALF	Connected as 10 Mbps half-dulpex.
	LINK SPEED 　10Mbps FULL	Connected as 10 Mbps full-dulpex.
	LINK SPEED 　100MbpsHALF	Connected as 100 Mbps half-dulpex.
	LINK SPEED 　100MbpsFULL	Connected as 100 Mbps full-dulpex.
	LINK SPEED 　1000Mbps	Connected as 1000 Mbps full-dulpex.
Host Name/IP Address * The example shows the display for TS-XL Series.	TS-XL xxx 192.168.11.150	Displays the host name and the IP address The letter F (the static IP address) or D (expresses that the IP address is automatically obtained by the DHCP server) is displayed at the end of IP address. * If connecting a LAN cable to the LAN Port 2, the Host Name is displayed as "NETWORK2".
Calendar clock	DATE　　　　　　　　　　TIME 2007/11/11 11:11	Displays the date and time that is set to TeraStation.
Operation, MODE * The example shows the display for TS-XL Series.	HD　1-2-3-4 　　RAID5	Structuring RAID 5 using the hard drive 1 to 4.
	HD　1-2-3:　RAID 5 　　4:　　　SINGLE	Structuring RAID 5 using hard drives 1 to 3, and 4 as a Normal mode.
	HD　1-2-3:　RAID 5 　　4 :　　　STANDBY	Structuring RAID 5 using hard drives 1 to 3, and 4 as a Hot Spare.
	HD　1-2-3-4 　　RAID 0	Structuring RAID 0 using the hard drive 1 to 4.
	HD　1-2-3-4 　　RAID 10	Structuring RAID 10 using the hard drive 1 to 4.
	HD　1, 2, 3, 4 　　SINGLE	Using 4 hard drive (1 - 4) as stand-alone drives.
	HD　1 - 2 :　RAID 1 　　3 - 4:　RAID 1	Structuring RAID 1 with the hard drive 1, 2 and 3, 4.
	HD　1 - 2 :　RAID 1 　　3, 4 :　SINGLE	Structuring RAID 1 with hard drives 1 and 2, and using hard drives 3 and 4 as stand-alone drives.
	HD　1, 2 :　SINGLE 　　3 - 4 :　RAID 1	Using hard drives 1 and 2 as stand alone drives, and structuring RAID 1 with hard drives 3 and 4.
Disk Space * The example shows the display for TS-XL Series.	HDD　　　　　　　　　　　　　∧ USED　　　　　　　1▃2▊3▐4▌	Indicates the usage of TeraStation's internal hard drives 1 - 4 in bar graph. If the hard disk is full, "∧" is displayed. * If you are using TS-RXL Series, it is displayed as a following example (the displayed value is approximate, and it is displayed every 6 to 7 %. "D1: 13% D2: 0% D3: Full D4: 25%

* If you are using TS-RXL Series, LCD display with the height of 1 line contains 2 line's worth of information. You can scroll horizontally to view it.

Status

Displays the current status when changing the settings or formatting drives.

Examples of LCD		Meaning
HDx Warning Bad Sectors	I11	Bad sectors in Xth hard drive may reach the dangerous zone. Replace Xth hard drive.
Operation Mode DEGRADE MODE	I12	RAID Degrade mode is running.
RAID ARRAYx Formatting	I13	Formatting Xth RAID Array.
RAID ARRAYx Checking	I14	Checking Xth RAID Array.
RAID ARRAYx Scanning	I15	Investigating the error status occurred in Xth RAID array. * During the investigation, transfer speed will be degraded.
RAID ARRAYx Creating	I16	Creating Xth RAID Array.
RAID ARRAYx Resycing	I17	Resycing Xth RAID Array. * While resycing, the transfer speed will be degraded.
RAID ARRAYx Rebuilding	I18	Rebuilding Xth RAID Array. * While rebuilding, the transfer speed will be degraded.
RAID ARRAYx 0 Filling	I19	Deleting data completely by filling 0 into Xth RAID array.
DISK DISKx Formatting	I20	Formatting Xth hard drive.
DISK DISKx Checking	I21	Checking Xth hard disk.
DISK DISKx 0 Filling	I22	Deleting data in Xth hard drive.
SYSTEM Initializing	I23	Initializing the system.
Network Setting Config	I24	Setting the network such as obtaining an IP address.
SYSTEM F/WUPDATING	I25	Updating the TeraStation's firmware. * Do not turn off the TeraStation while updating.
Web Setting Initializing	I26	Initializing web configuration.
USB Diskx Checking	I27	Checking Xth USB hard disk.
USB Diskx Formatting	I28	Formatting Xth USB hard drive.
Press FuncSW New Diskx ready	I31	This message is displayed when restructure RAID by pressing a function switch after replacing the hard drive.
Set From Web New Diskx ready	I32	This is displayed when RAID needs to be restructured on the Web Admin or formatted after replacing the hard drive.

* If you are using TS-RXL Series, LCD display with the height of 1 line contains 2 line's worth of information. You can scroll horizontally to view it.

Error and Warning

Displays the current status when changing the settings or formatting drives.

Examples of LCD		Meaning
SYSTEM Error MPU No Response	E00	System is not responding. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
DRAM LINES DATA Failure	E01	Some parts of internal IC is not working properly. Contact BUFFALO's service center for repair.
DRAM LINES ADDRESS Failure	E02	Some parts of internal IC is not working properly. Contact BUFFALO's service center for repair.
RTC Chip No RTC Clock	E03	Some parts of internal IC is not working properly. Unplug the power code of the TeraStation and reboot it. The error still persists, contact BUFFALO's service center for repair.
SYSTEM Error Can't Load Krnl!	E04	The firmware is corrupted. Contact BUFFALO's service center for repair.
WDT SYSTEM Stopped	E05	System hung up. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
TFTP MODE Lost boot image	E06	The firmware is corrupted. Contact BUFFALO's service center for repair. Wait for 5 minutes to show "E04" and turn off, or press and hold the power button for 10 seconds.
HD ALL ALL HD Not Found	E07	Hard disks are not found. Even if the hard disks are connected but this message is displayed, contact BUFFALO's service center for repair.
UPS Dependent Mode	E10	Operating using UPS battery due to the power outage. System will be shut down safely. Check the power supplied to UPS, and turn TeraStation off if there is no problem on UPS.
SYSTEM TOO HOT!	I10	Temperature in the system may be over the limits of warranty. Do not place any object around the TeraStation. Or move the TeraStation to the cooler place.
SYSTEM Error Fan Failure	E11	There is a problem with the number of fan spinning. Check if there is any objects or dusts on the fan. If you see any objects or dusts, remove them by tweezers or an air duster. The error still persists, contact BUFFALO's service center for repair.
SYSTEM Error Cooling Failure	E12	Temperature in the system is over the limits of warranty. Do not place any object around the TeraStation. Or move the TeraStation to the cooler place.
RAID Error ARRAYx Error	E13	An error occurs in Xth RAID array. When rebooting the TeraStation, it will run as degrade mode when RAID 1 or RAID 5 is used. You can use an erroneous drive by rebuilding, but it is recommended that you replace the erroneous drive immediately.
RAID Arrayx Can't Mount	E14	Xth RAID array could not be mount. Turn off TeraStation, and turn it on again. If the error still persists, rebuild RAID. If the error still persists, contact BUFFALO's service center for repair.
HDx Error Many Bad Sectors	E15	The bad sector in xth hard drive has reached the dangerous zone. Replace xth hard drive.
HDx Error HDx Not Found	E16	Cannot find the Xth hard drive. The Xth hard drive may not connected or may be damaged. Replace the hard drive.

Examples of LCD		Meaning
Chip Error RTC Failure	E17	The circuit board is damaged. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
Chip Error SATA1 Failure	E18	The circuit board is damaged. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
Chip Error SATA2 Failure	E19	The circuit board is damaged. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
Chip Error USB Failure	E20	The circuit board is damaged. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
Chip Error Ethernet Failure	E21	The circuit board is damaged. Unplug the power code of the TeraStation and reboot it. If the error still persists, contact BUFFALO's service center for repair.
HDx Error HDx Can't Mount	E22	Failed to mount the hard drive. Format the hard disk. After formatting, reboot the system. If the error is still displayed, replace the hard disk. The error still persists, contact BUFFALO's service center for repair.
HDx Error HDx Is Faulty	E23	An error occurred and the Xth hard disk was removed from RAID array. Replace xth hard drive.
SATAx Error COMM. Failure	E24	An error occurred to communicate with the Xth hard drive. Reboot the TeraStation. The error still persists, contact BUFFALO's service center for repair.
Replication Replicate Failure	E26	The error occurred during Replication. Click [Resynchronize] under [System] - [Backup] - [Replication] in the TeraStation's Web Admin and re-sync. The error still persists, contact BUFFALO's service center for repair.

* If you are using TS-RXL Series, LCD display with the height of 1 line contains 2 line's worth of information. You can scroll horizontally to view it.

Update the TeraStation's Firmware

Visit BUFFALO's web site to download the TeraStation's firmware update, and run the update program.
Double click the file you downloaded, and the file will be extracted and HTML file which shows to update is automatically displayed.
Follow the instructions in the HTML files to update the firmware.

Term Lists

AFP (Apple Filing Protocol)
The name of protocol that is used for AppleShare to share file on AppleTalk Network.

DHCP (Dynamic Host Configuration Protocol) Server
DHCP Server manages information related to the network (such as IP address, default router's IP address, and domain name).When DHCP Client is launched, it will automatically assign information such as IP address. When DHCP server exists on the network, you don't need to set the information such as IP address to the computers or the TeraStations on the network.

DFS (Distributed File System)
Feature to gather file shares distributed on the server within the network to one single tree.

FTP (File Transfer Protocol)
The protocol which is used to transfer files on the network consisted of TCP/IP. Transfer is made by using the FTP client software. Transfer can be performed independent on OS.

Gateway
Device, computer or software which connect network to network. Packets will pass through when it goes outside.

IP Address
The address used at the network which uses TCP/IP protocol. It is like the identification number which indicates an address of each computer. It is not recognized properly if IP address of the network devices are duplicated

Jumbo Frame
Extends data size per transmission on the LAN from 1518 bytes to Jumbo Frame (4102/7422/9694 bytes).

MAC (Media Access Control) address
The unique physical address assigned to each network card. It consists of the first 3 bytes is the vendor code (manufacture ID) and 6 bytes user code. Ethernet sends and receives frames based on this address.

NTP (Network Time Protocol)
The protocol to correct time via the network. It periodically synchronize the time with that of NTP server and correct the time.

Offline Files
This feature allows your PC to access files on the TeraStation as if it is online when your PC is offline, by using the offline file function equipped with Windows 2000 or later (except Windows XP Home Edition).When it is online, updated files will be synchronized and saved.

PDC (Primary Domain Controller)
The server to administer the logon verification and the user or security on the Microsoft Network domain user.

RAID (Redundant Arrays of Inexpensive Disks)
The technology to achieve to create the mass and highly reliable storage device by spreading access by using multiple hard drives. RAID can be divided into a several level depending on each feature. RAID 1 and RAID 5 are well-known levels.

SMB (Server Message Block)
The protocol to provide services such as file sharing and printer sharing.

Subnet mask
The value to divide IP address into the network address number and the host address number. This is used for the router to send and receive packets.

TCP/IP (Transmission Control Protocol / Internet Protocol)
One of the protocol (Communication standard) when building network. It combines TCP protocol (data separation and error detection) and IP protocol (providing a receiver and sender IP address).

UPS (Uninterruptible Power Supply)
Uninterruptible Power Supply. It contains the battery for backup, and it will run the system for a few minutes when utility power is not available so that the system can be shut down safely.

WINS (Windows Internet Naming Service)
It is the feature of Windows NT Name Server. It assigns the host name or domain name to IP address automatically in Windows Network Environment.

Journaling File System
The file system which has the ability to backup the file update history in order to recover the hard drives immediately when they malfunction.

Degrade
Drives which consists of RAID 1, 5, 10 are failed or missing. The integrity of data will be maintained, but the error occurs after this cannot be repaired, and all data may be lost. It is a dangerous condition. It is recommended that you replace the hard drive with an error.

Domain
On Windows 7/Vista/XP/2000/NT based network, it logically groups multiple computers.

Native mode
One of the operation mode of Active Directory on Windows 2000Server/Server 2003.

Firewall
It is the feature to prevent the intruder from entering the network. This feature is included in the OS such as Windows XP or later or anti-virus software (such as released by Microtrend or Virus Buster).

Port Trunking
The feature uses multiple cable and it can continue to transmission by using another line even if one of the lines failed.

Hot Spare
The feature to replace a damaged hard drive with a spare drive automatically.

Hot Swap
It means plugging and unplugging the parts while the main power of the unit is ON.

Workgroup
The groups which exists in the small Windows network. This is not for manage large networks. Files or printers can be shared within the workgroup. Windows provides this work group network feature as a standard feature.

Replication
This copies exactly same data.