

LinkStation User Manual



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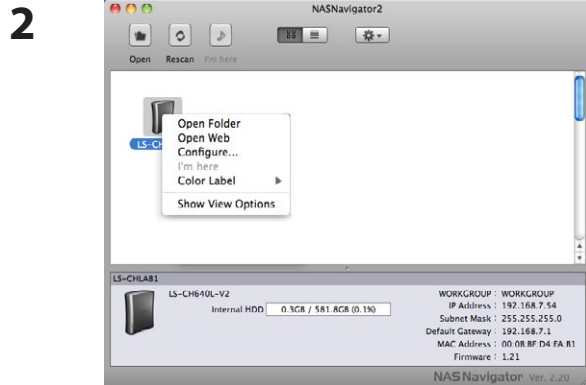
Chapter 1

Using your LinkStation

LinkStation Configuration Utility

To configure your LinkStation, use the web-based configuration utility 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.



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

Notes: If multiple LinkStations and TeraStations are connected to the network, multiple icons will be displayed. Click on the correct LinkStation.

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



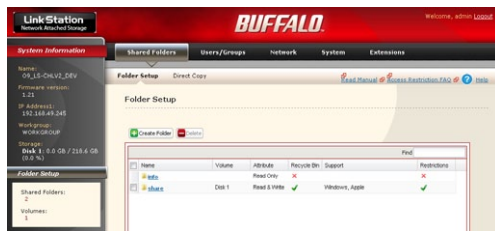
Enter your username and password, and click [Login]. Initially, use the default username and password:

Username: **admin**

Password: **password**

After you log in, change the password for security.

4



This is the LinkStation's configuration utility. This page displays the LinkStation's current status, including name, IP address, workgroup, and hard drive settings.

Note: Use Firefox, Internet Explorer, or Safari with the configuration utility. Other browsers may not display it correctly.

The configuration utility is organized by tabs across the top. The following tabs are available.



- **Shared Folder**
Add/delete shared folders, set access restrictions, and configure for a direct copy.
- **Users/Groups**
Register and delete users/groups.
- **Network**
Register and delete a network or workgroup.
- **System**
Perform Name, time, disk check format, backup, mail notification settings, timer ON/OFF, UPS synchronization settings, initialization, complete disk format.
- **Extensions**
Configure for WebAccess, Print Server, and Time Machine.

To open the LinkStation's configuration utility from a different computer, open a browser and type the LinkStation's IP address into the URL field. You recorded the LinkStation's IP address in step 2 on page 3.

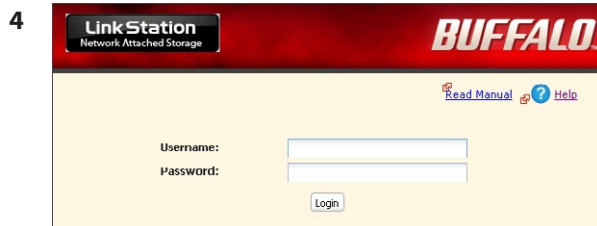
If you have a Mac, you can open the configuration utility from "Bonjour".

1 Launch Safari.

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



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



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.



The configuration utility opens.

The LinkStation's name, IP address and drive information are displayed on the left.

Adding shared folders

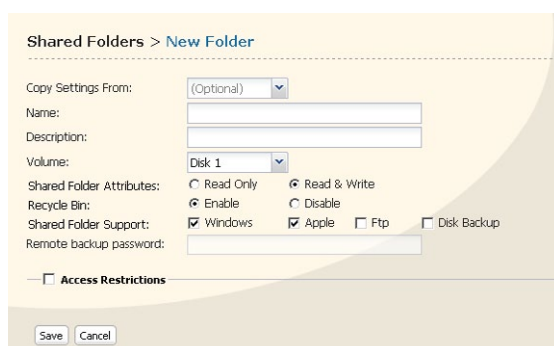
By default, the LinkStation includes one shared folder “share”. You may add additional folders as follows.

1



In the LinkStation configuration utility, navigate to [Shared Folders] and click [Folder Setup].

2



1 Enter desired characteristics for the new share.

Note: If you would like to copy the settings of an existing folder, select a source folder from the [Copy Settings from] dropdown.

2 Click [Save].

You have created a new share.

To protect your data from accidental deletion, you may enable a Recycle Bin for the share (not available for Apple and FTP connections). Deleted data in a shared folder will be temporarily moved to the [Recycle Bin] folder. To recover deleted data, open the Recycle Bin folder and move files.

Read-Only shares cannot be modified or deleted. To make a Read-Only share, select [Read Only] in the Shared Folder Configuration utility and click [Save].

Notes: • By default, shares are configured as [Read & Write].

- A shared folder set to Read Only cannot be written by any users or groups, even if they have read and write permissions. Read-Only folders are read-only for all users.
- Read Only shares are described as (Read Only)] in the shared folder description.

Notes:

- When using two-byte characters (such as Japanese), make folder or file names with 80 characters or less. You may not be able to copy a folder or a file whose name length is more than 80 characters.
- You cannot set hidden or read-only attributes to sub-folders or files on the LinkStation.
- If non-Roman alphabetical folder names or workgroup names do not display properly, rename the folder or workgroup with Roman alphabetical characters.
- Please don't use any of the following words as the name of a shared folder. These words are reserved for internal use by the LinkStation:

info, spool, usbdisk1, usbdisk2, usbdisk3, usbdisk4, lost+found, global, printers, homes, lp, auth, test, ram, disk1, disk2, disk3, disk4, array1, array2, msdfs_root, mt-daapd

- The following characters are handled differently by Mac OS X and Windows. Avoid using these characters when sharing data between Mac OS X and Windows:

— ~ || — € £ ¬

- The following characters are not displayed correctly by Windows, or by a Mac connected to the LinkStation via SMB. Avoid their use in file names that will be used with the LinkStation.

? [] / ¥ = + < > ; : " , | *

- Never turn off the LinkStation or unplug its network cable while data is being written. Doing so may result in an incomplete file that cannot be opened or deleted. If this happens, restart the LinkStation, delete the file, then retry copying the file.
- Your OS may update the date and timestamp stored on the LinkStation's hard drive, or on a USB drive connected to the LinkStation. This might result in inaccurate information for date-created or date-accessed data on the LinkStation.
- In the LinkStation's configuration utility, or from a Mac OS X 10.6 or later, drive size is displayed in gigabytes, where 1 gigabyte = 1,000,000,000 bytes. This is also how drive capacity is expressed on your LinkStation's packaging. However, if you check the drive size from an older Mac, or from a Windows computer, it may display the size of the drive in gibibytes, where 1 gibibyte = 1,073,741,824 bytes. Since a gibibyte is larger than a gigabyte, the displayed drive capacity will be a smaller number than the actual drive size.

Access Restrictions

There are several ways to restrict access to users of a LinkStation.

Access restrictions for locally registered users

The next page describes how to configure access restrictions for local users.

Access restrictions by using the Delegate Authority server feature

Follow the procedure on page 11 to configure.

- Notes:
- Permissions are assigned to shared folders. Child folders in a shared folder inherit their permissions from the parent folder. If a file or folder is moved into a new shared folder with different permissions from the folder it was originally in, it will now have the access restrictions from the new shared folder.
 - When accessing the LinkStation from Windows via SMB, changing permissions from the folder's security tab in the properties screen of a folder is not supported. Access restrictions for shared folders on the LinkStation can only be configured from within the LinkStation's configuration utility.

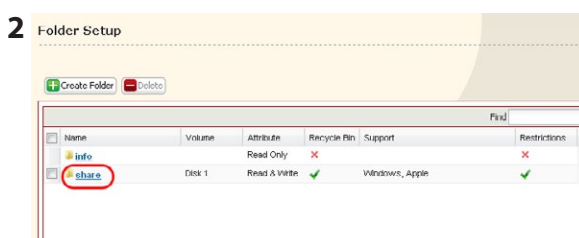
Restricting access for local users

You can set access restrictions for shared folders by username or group names for users that are registered on the LinkStation.

- 1 Create a new user accounts and passwords in Windows, or record existing Windows usernames and passwords. Each account on the LinkStation will have the same username and password as the user's Windows account.
- 2 Register users and groups on the LinkStation.
 - 1 Add users as described on page 20.
 - 2 Add groups as described on page 22.
- 3 Configure access restrictions for groups and/or users.

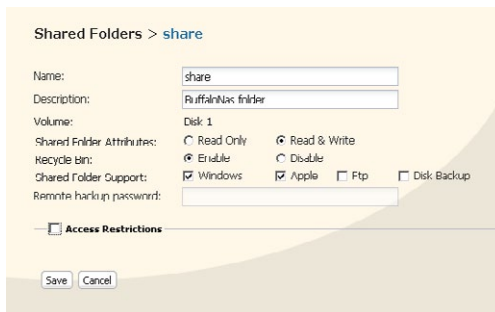


In the LinkStation configuration utility, navigate to Shared Folders/Folder Setup.



Click a shared folder you want to set access restrictions for.

3



Check [Access Restrictions] to enable.

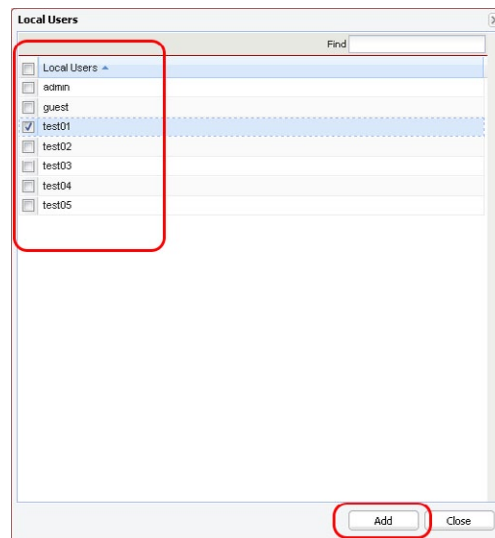
4



Click [Add].

Note: The procedure described here shows how to set access restrictions for users. To set access restrictions for a group of users, click [Local Groups] - [Add].

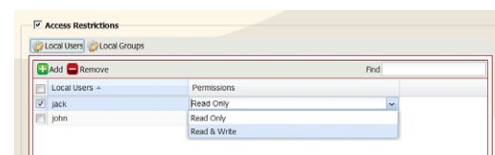
5



1 Check the users (or groups) that you want to permit to access the share.

2 Click [Add].

6



Select the level of access for the user or group you added.

7 Click [Save].

You have assigned access restrictions.

- If you log on from a Microsoft Network Domain, you can set the access restrictions with the users and/or groups which are registered on the domain.
- If both read-only and read-and-write permissions are given to a user, that user will have read-only access.

Access restrictions by using the Delegate Authority server feature

You may administer all user accounts and passwords centrally from a delegate server as described below. This procedure is intended for network administrators only.

- Notes:
- You can set access restrictions on shared folders. You cannot set different restrictions on folders in a shared folder. Child folders in a shared folder inherit their permissions from the parent folder.
 - When accessing the LinkStation from Windows via SMB, changing permissions from the folder's security tab in the properties screen of a folder is not supported. Access restrictions for shared folders on the LinkStation can only be configured from within the LinkStation's configuration utility.

There are restrictions when administrating through a delegate authority server:.

- To access the LinkStation, you must be logged into Windows with the account registered to the authentication server.
- 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 anonymously via FTP.

Notes:

Windows Vista and Windows Server 2003/Server 2008 users need to change the security settings to use the Delegate Authority to External SMB server feature to restrict access.

[Start] - [BUFFALO] - [File Sharing Security Level Change Tool] - [File Sharing Security Level Change Tool], and then select [Change Security level] to change the security settings (Select "Recover default security level" change it back to the previous setting).

For Windows Vista, the "File Security Tool" on the LinkNavigator CD will change this setting for you automatically.

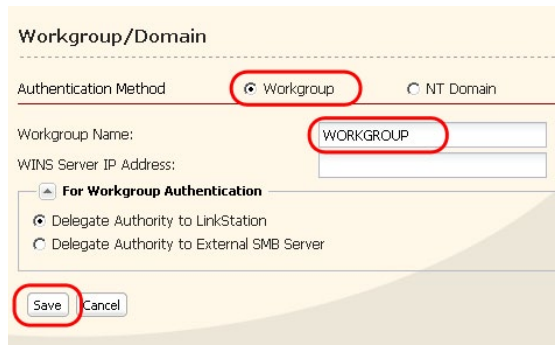
1



1 In the configuration utility, navigate to [Network] - [Workgroup].

2 Click [Modify Settings].

2

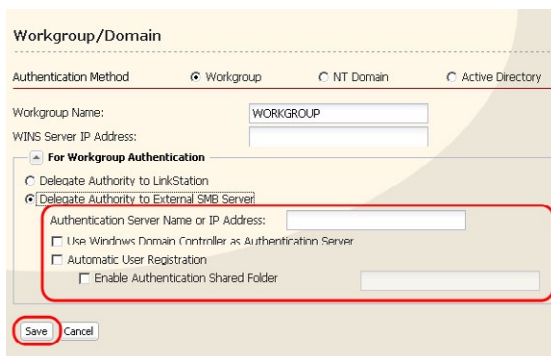


1 Double click "Workgroup" (even if you are in a domain environment).

2 Enter the workgroup name. To use a Windows Domain Controller as an external SMB authentication server, enter its name for the workgroup name.

3 Select [Delegate Authority to External SMB Server].

3



1 Enter the name or IP address of an authentication server.

Note: When connecting with AFP or FTP, an IP address is recommended.

2 Check [Use Windows Domain Controller as Authentication Server], [Automatic User Registration] and [Enable Authentication Shared Folder].

3 Enter the shared folder name for authentication.

4 Click [Save].

4 The shared folder for authentication should be created on the LinkStation

A user that has been registered to the specified authentication server will be automatically registered as a user on the LinkStation when they open the shared folder for authentication (you can also register users directly).

Configuration of the Authentication Server is complete.

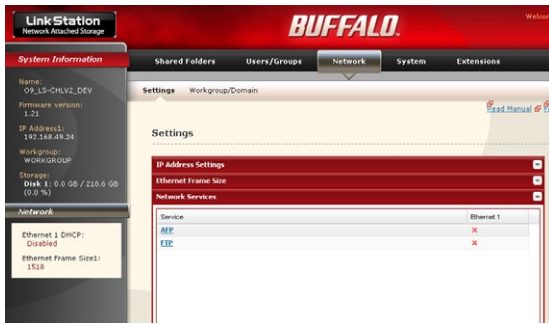
Notes:

- A user who is automatically registered will belong to the "hdusers" group. They added to other groups from within Group settings.
- You can restrict access to shared folders by username or group.
- The names of registered users are listed in [Users/Groups] - [External Users]. To delete an automatically registered user, select that user and click [Delete].
- When connecting through AFP or FTP, always use an IP address. Using a server name may cause problems with authentication.
- To specify a server from another subnet, enter its IP address.
- AFP and FTP connections don't support delegating authority to an external SMB server.

FTP Server

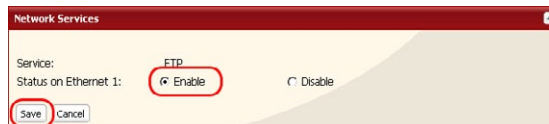
By default, the LinkStation's shares are only accessible by users connected to the same network or router as the LinkStation. The optional FTP server allows users to access the LinkStation from outside of the local network. You may enable it as follows.

1



In the configuration utility, navigate to [Network] - [Settings] - [Network Services] and click [FTP].

2

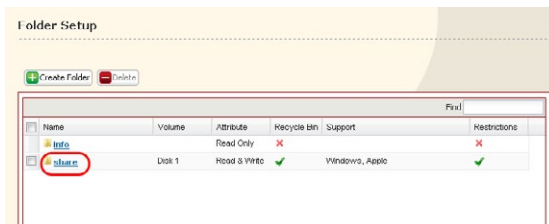


- 1 Select [Enable].
- 2 Click [Save].

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 writable.

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 LinkStation's configuration utility. Changing them remotely with FTP client software is not supported.

To access to the LinkStation with an FTP client

Configure your FTP client software with the following settings:

- Host Name IP address of the LinkStation.
- Username Username registered on the LinkStation
- Password Password registered to the LinkStation
- Port 21

Example ftp://192.168.11.150/

- You cannot write by FTP if the shared folder is set to read-only on the LinkStation.
- Access restrictions are applied based on the settings in the LinkStation. 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 LinkStation 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 LinkStation 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 LinkStation
- Username anonymous
- Password any set of characters
- Port 21

Example ftp://192.168.11.150/

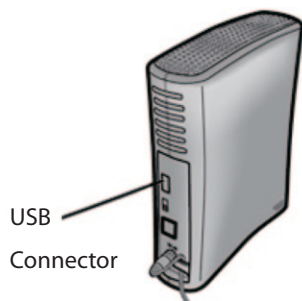
- To make your FTP share available from outside your network, you will need to configure your router and firewall. Consult your router's documentation for information on how to allow FTP traffic.
- If the LinkStation joins a domain, anonymous users cannot access it.
- Folders created or copied via an 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.

Direct Copy

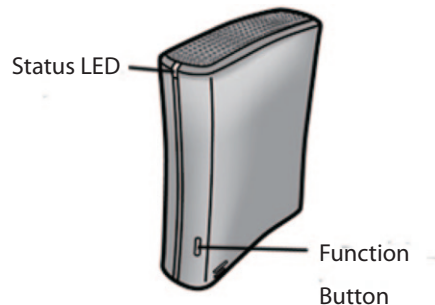
DirectCopy automatically copies movie, music, and images directly to the LinkStation from a USB device.

You can connect many types of USB devices to the LinkStation, 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 LinkStation.

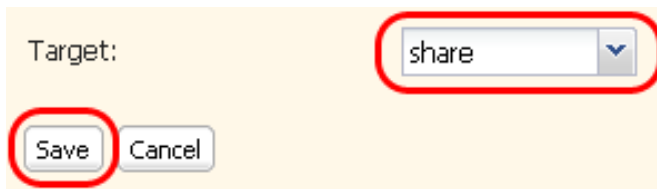


After the USB device is recognized, the function button is lit in blue for 60 seconds. After the function button is lit in blue, you can access the USB device.



If an unsupported USB memory device is connected to the LinkStation, 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 a shared folder on the LinkStation. The function button will flash blue during the copy. Push the function button again to abort the copy.



Files are copied to the folder:

<shared 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 configuration utility. 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 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 LinkStation is on, hold in the function button for 3 seconds. The blue LED will go out, and the USB device is dismounted. You may now unplug it safely.

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

Users/Groups

Adding Users

Add users as shown below.

1



1 In the configuration utility, navigate to [Users/ Groups] - [Local Users].

2 Click [Create User].

2

A screenshot of the 'Local Users > New User' form. The form has fields for 'Username:', 'User Id:', 'Description:', 'Password:', 'Confirm Password:', and 'Primary Group:'. The 'Username' field contains 'john'. The 'Password' and 'Confirm Password' fields are masked with dots. The 'Primary Group' dropdown is set to 'hdusers'. A red box highlights the 'Save' and 'Cancel' buttons at the bottom left.

1 Enter a name and description for the user.

2 Click [Save].

You have added a user.

Use the same username and password that the user logs into Windows with. If the username and passwords are different, the user may not be able to access restricted shares.

Notes:

- When using access restrictions, you can register up to 300 users on the LinkStation.
- Please do not use any of the following words as a username or a 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
- If you are using Mac OS 9 or earlier, do not use more than 9 alphanumeric characters for the user password, the user will not be able to access shared folders on the LinkStation.

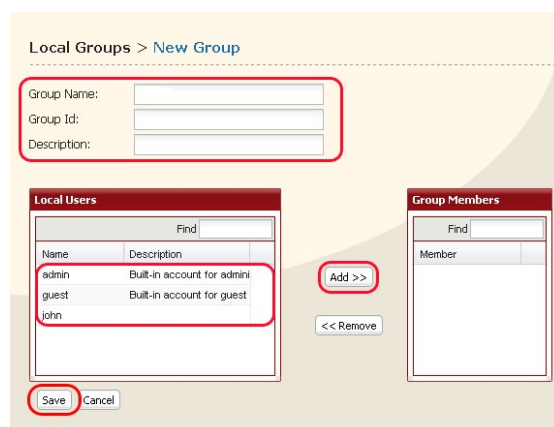
Adding Groups

Add groups as shown below:

- 1 In the configuration utility, navigate to [Users/Groups] - [Local Groups].
- 2 Click [Create Group].



- 1 Enter a name and description for the group.
- 2 Select users to include in the group.
- 3 Click [Add], then [Save].



You have added a group.

Please do not use any of the following words as a 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

Admin Password

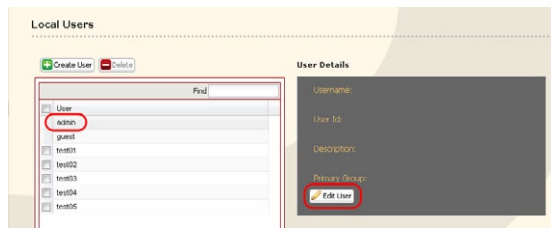
You may change the admin password as follows.

1



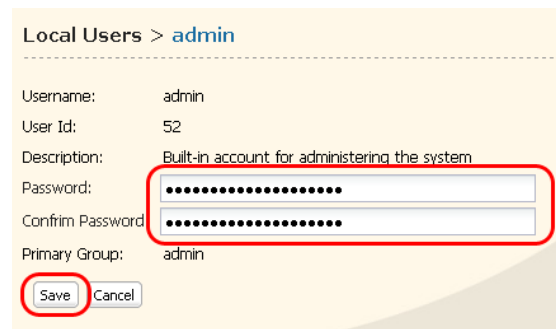
In the configuration utility, navigate to [Users/Groups - [Local Users].

2



Select [admin] and click [Edit User].

3



1 Enter a new password (twice).

2 Click [Save].

You have now changed the admin password.

Notes: • The administrator's username, "admin" cannot be changed.

- You cannot set access restrictions or use WebAccess with the admin account. Use the admin account only to log in to the LinkStation configuration utility.

Network

Jumbo Frames

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

1




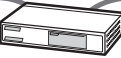



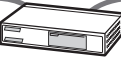



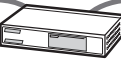



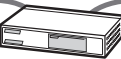


In the configuration utility, navigate to [Modify Settings] in [Network] - [Settings] - [Ethernet Frame Size].

2



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

- Notes:
- To use the LinkStation with jumbo frames, your router/switch/hub must support jumbo frames. Otherwise, you will not be able to transfer data.
 - 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 LinkStation/TeraStation to another LinkStation/TeraStation, set the Ethernet frame sizes of the LinkStations/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).

Connection			Transmission	
				Transmit Jumbo Frame (4102/7422/9694)
Jumbo Frame (4102/7422/9694)	Jumbo Frame supported	Jumbo Frame supported		
				Transmit normally(1518)
Jumbo Frame (4102/7422/9694)	Jumbo Frame Supported	Jumbo Frame <u>not supported</u>		
				Transmit normally(1518)
Jumbo Frame (4102/7422/9694)	Jumbo Frame <u>not supported</u>	Jumbo Frame <u>not supported</u>		
				No transmission
Jumbo Frame (4102/7422/9694)	Jumbo Frame <u>not supported</u>	Jumbo Frame supported		

System Settings

Name, Date and Time

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

1



In the configuration utility, navigate to [Modify Settings] in [System] - [Settings] - [Name].

2



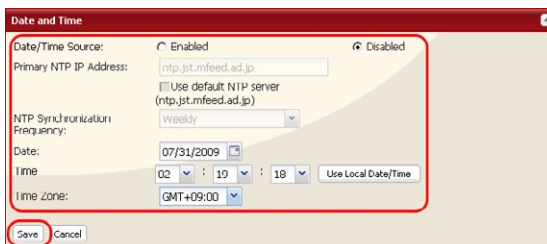
Enter the LinkStation's name and description, then click [Save].

3



In the configuration utility, 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 LinkStation.

By default, the LinkStation 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 <i>www.jst.mfeed.ad.jp</i> .
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 LinkStation.

Note: The LinkStation'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.

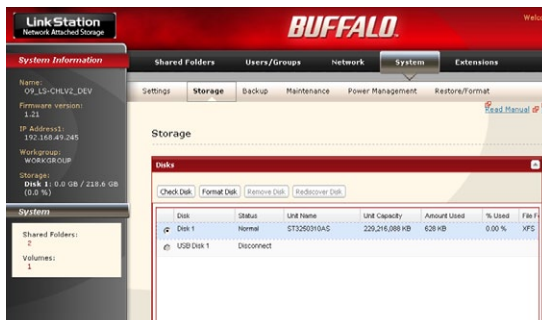
System-Storage

Check Disk

A disk check tests the data on a drive in the LinkStation 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 LinkStation during the disk check.

If Auto power is set to [AUTO], then the LinkStation will turn off when the disk check is finished. Run a disk check as follows:

1



In the configuration utility, navigate to [System] - [Storage].

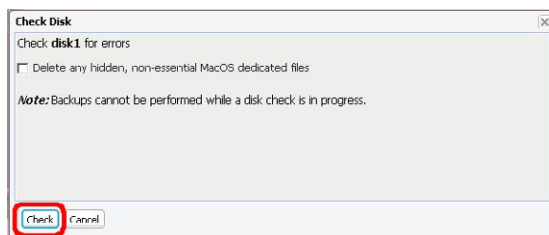
2



1 Select the hard drive to test.

2 Click [Check Disk].

3



Click [Check].

The Status LED on the front of the LinkStation will flash during the disk check.

Note: If a power outage disconnects the LinkStation in the middle of a disk check, then you may not be able to access shares on the LinkStation 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.

Note: 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 be able to access folders from the Macintosh. If you cannot access them, check [Delete any hidden, non-essential Mac OS dedicated files] in [System] - [Storage] - [Check Disk].

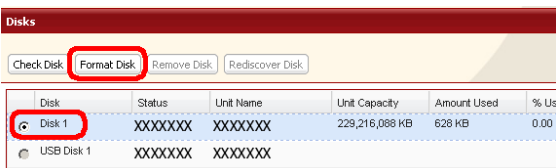
Format a Drive

- 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 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 Auto power is set to [AUTO], then the LinkStation will turn off when the format is finished.
- To erase all data on a disk, choose [Disk Management] - [Erase Disk].

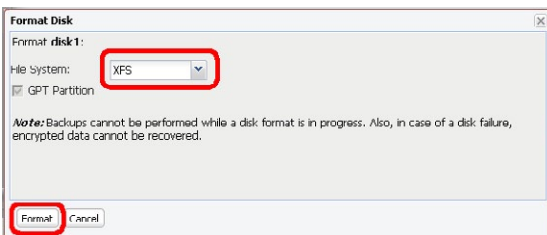
1 In the configuration utility, navigate to [System] - [Storage].



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.

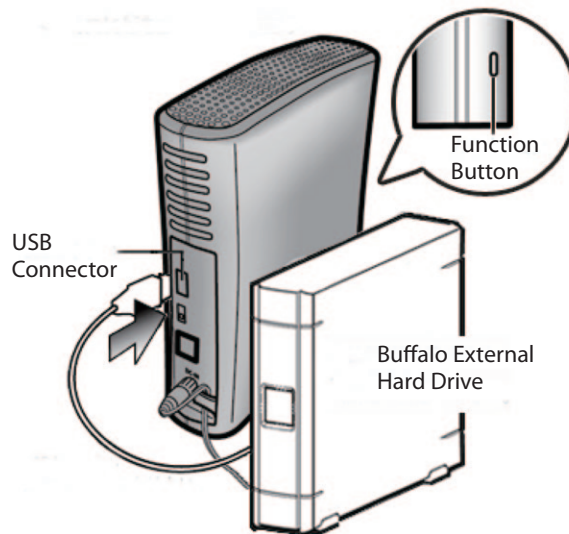
- Note:
- The time needed to format a hard drive varies based on the hard drive's size and format types (a few seconds to several minutes).
 - The Info LED on the front of the LinkStation will flash during formatting. The LinkStation's shared folders cannot be accessed until the disk format is complete.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

Adding Storage

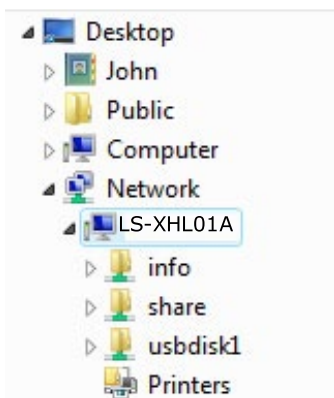
The LinkStation has a USB connector on the back. You can connect a Buffalo external hard drive to the USB port. It will appear as an additional shared folder on the LinkStation.

Connect the hard drive as shown below. If the hard disk is not formatted, format it from the configuration utility.

Refer to page 35 when removing the hard drive from the LinkStation.



- Only one hard drive can be connected to the LinkStation at a time. Bus powered drives are not supported. Always use the drive's AC adapter.



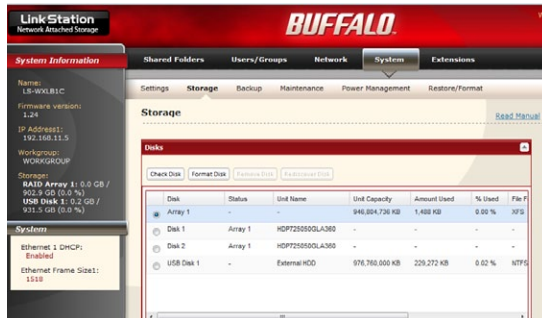
If the drive is connected properly, [usbdisk1] will be added to the shares under the LinkStation in Network.

Note: If the USB drive is formatted with FAT 32 (or FAT 16), files created by Mac OS X automatically (such as .DS_Store) cannot be backed up to this drive.

To format a USB hard drive

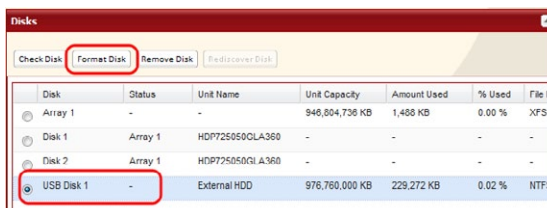
For best results with the LinkStation, reformat the external USB drive from the LinkStation's configuration utility. Formatting will delete all data on the drive. Back up any important data before formatting.

1



In the configuration utility, navigate to [System] - [Storage].

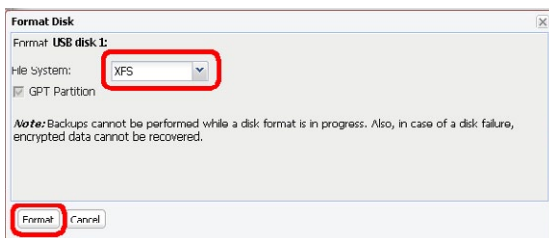
2



1 Select the USB hard drive.

2 Click [Format Disk].

3



1 Select a format type (see next page).

2 Click [Format].

4

The [Confirm Operation] screen will be displayed.

Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

5

Follow the instructions on the screen.

When the format is complete, create a shared folder on the drive.

Note:

Format type	Advantages	Disadvantages
FAT 32 Drives formatted with FAT 32 can be disconnected from the LinkStation and connected to a Windows or Mac computer directly. They work well with many devices, but do not support large filesizes.	<ul style="list-style-type: none"> • Read/Write support with LinkStation, PCs, and Macs. • You can connect the hard drive to a Windows PC or a Mac at any time and use it normally. 	<ul style="list-style-type: none"> • Cannot copy or back up files larger than 4 GB. • Cannot use some characters from Mac OS X such as [:]. • It takes extra time to access from the LinkStation's configuration utility or NAS Navigator2.
EXT3 This is recommended if you may have to reconnect to and use other LinkStation/TeraStation.	<ul style="list-style-type: none"> • Supports both Reading/ Writing. • Supports Journaling File System. • Also available when connecting to other LinkStation. 	<ul style="list-style-type: none"> • May take a while to format (a few minutes to several minutes). • Less space is available than XFS after format. • the more files in a folder, the slower the access. *You cannot read data by directly connecting a PC.
XFS This format is recommended when you only use the drive with a LinkStation or TeraStation.	<ul style="list-style-type: none"> • Supports both Reading/ Writing. • Supports Journaling File System. • More space is available with XFS after format. • Access speed will not degrade even though more files in 1 folder. 	Not supported by legacy LinkStations such as HD-LAN, HD-HLAN, HD-HGLAN Series. You cannot read data by directly connecting to a PC.
NTFS NTFS works well with Windows PCs. Read-Only from the LinkStation.	Can be used with Windows Vista/XP/2000, or Windows Server2003/Server2008.	<ul style="list-style-type: none"> • Read-only from the LinkStation or a Mac. • Not suitable for backup from the LinkStation.
HFS+ HFS+ works well with Macs. Read-Only from the LinkStation.	Can be used to connect to Mac OS X 10.3.9 or later.	<ul style="list-style-type: none"> • Read-only from the LinkStation. • Not suitable for use with Windows PCs.

To set access restrictions on an additional hard drive

You can set access restrictions for shares on an external USB hard drive. In the LinkStation's configuration utility, navigate to [Shared Folders] - [Folder Setup].

Note: Even if a shared folder is not visible, you can still format the drive, run a disk check, or back up to the external USB hard drive.

About the USB connector on the LinkStation

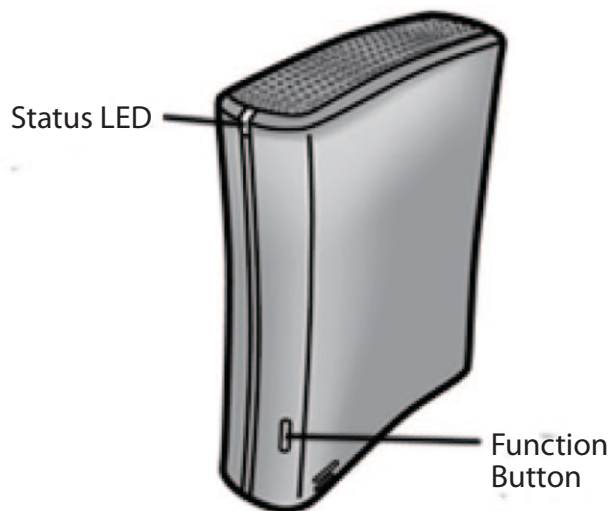
- You can connect many types of USB devices to the LinkStation, including USB hard drives, USB flash drives, single-card card readers, digital cameras, and USB printers. USB hubs, mice, keyboards, and card readers that support 2 or more cards are *not* supported.
- One hard drive or other device may be connected to the LinkStation at a time. USB hubs are not supported. Only Buffalo hard drives are supported.
- Hard drives with their power mode switch set to [Auto] may not be recognized by the LinkStation. Set the power mode switch to [Manual] for use with the LinkStation.
- Bus-powered hard drives are not supported. Always use the AC adapter for a hard disk.
- Only the primary partition of USB hard drives can be recognized. Secondary or other partitions will not be recognized.
- If the external USB drive is formatted as FAT32 or FAT 16, you may not be able to copy or back up files or folders from Mac OS X to it. These files may include characters that are not supported by FAT 32 or FAT 16.
- When you back up to a FAT 32 USB hard drive with Overwrite Backup (Differential) enabled, the system may overwrite data even though there are no difference in data. If the second of the date when the file created is an odd number, an overwrite backup is performed every time regardless of differences in the data.

Remove Disk

To remove the hard drive:

If the LinkStation is powered on, dismount the USB hard drive before unplugging it. Hold in the function button for 3 seconds. The blue LED will go out, and the drive is dismounted. You may now unplug it safely.

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

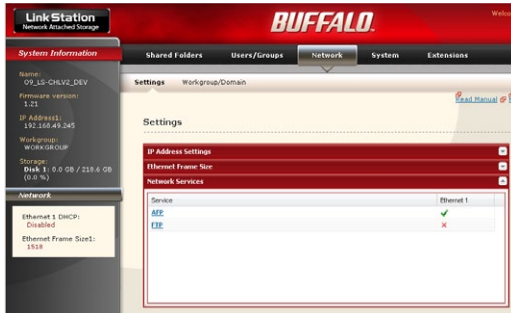


System-Backup

Time Machine

Time Machine is a backup program included with Mac OS X 10.5 and later version. It can back up to your LinkStation if you configure the LinkStation as follows:

1



Click [AFP] on [Network] - [Settings] - [Network Services].

2



Select [Enable] and click [Save].

3



1 Click [Shared Folders].

2 Select a shared folder to use as the backup destination for Time Machine, or create a new share and then select it.

4

Shared Folders > share

Name: share

Description: BuffaloNas folder

Volume: Disk 1

Shared Folder Attributes: ☐ Read Only ☒ Read & Write

Recycle Bin: ☒ Enable ☐ Disable

Shared Folder Support: ☒ Windows ☒ Apple ☐ Ftp ☐ Disk Backup

Remote backup password:

☐ Access Restrictions

Save Cancel

- 1 Select [Apple].
- 2 Click [Save].

5

LinkStation Network Attached Storage

System Information Shared Folders Users/Groups Network System Extensions

Time Machine

Time Machine: Enabled

Target Folder: share

Modify Settings

Mac Information

Target host name:

Target MAC address:

Create

- 1 Click [Extensions] - [Time Machine].
- 2 Click [Modify Settings].

6

Time Machine

Time Machine: ☒ Enable ☐ Disable

Target Folder: share

Save Cancel

- 1 Select [Enable].
- 2 Select the shared folder that you chose in step 3.
- 3 Click [Save].

7

Mac Information

Target host name:

Target MAC address:

Create

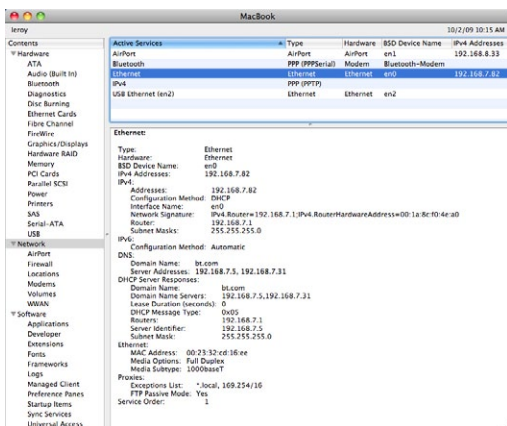
- 1 Enter the Mac's host name.
- 2 Enter the Mac's MAC address.
- 3 Click [Create].

- You can find the Mac's host name under [Computer Name] in [System Preferences] - [Sharing].



e.g.) If it is displayed as "bbbbbbbbbbb.local", enter "bbbbbbbbbbb" for the host name. If it is displayed as "ccccccccc.eee-ee.local", enter "ccccccccc" for the host name. If it is displayed as "ddddddddd.fff-ff.jp", enter "ddddddddd" for the host name.

- To verify the MAC address of the Mac:



- 1 Open [About This Mac] from the Apple menu and click [More Info].
- 2 When the System Profiler is open, click [Network] on the menu at the left of the screen.
- 3 Select the MAC address for the device whose BSD Device Name is [en0] under [Active Services]. Normally this will be listed below under "Ethernet MAC Address". Copy and paste it to [Target MAC address].

The folder <Macintosh host name>_<Macintosh MAC address>.sparsebundle will be created in the selected folder of the LinkStation. Be aware that changing this folder name or deleting this folder will prevent Time Machine from using it as a backup destination.

8 Select [System Preferences] from the Apple menu of Mac OS X 10.5.

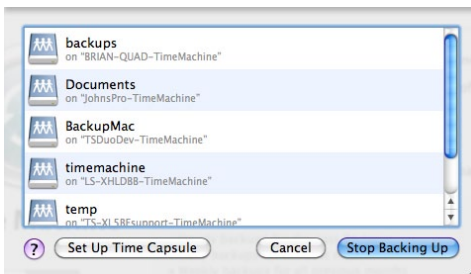
9 Click [Time Machine].



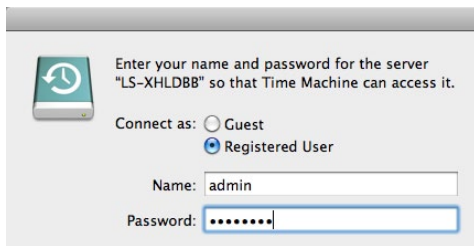
10 Click [Choose Backup Disk].



11 Select the folder on the LinkStation and click [Use for Backup].



12



Enter a username and password to access the shared folder on the LinkStation, and click [Connect].

If you do not use access restrictions for the shared folder of the LinkStation you set as a backup destination, enter "admin" in the username box and your password for "admin" in the password. If you use access restrictions, enter a username and password that has read and write access rights to the share.

13



Make sure that the switch for Time Machine is "on". The number of seconds displayed in [Next Backup] will count down and a backup job will start when it hits zero. The backup job will run in the background, so you can use and shut down the Mac as usual. To recover data or set items you want to exclude from backup, refer to Mac OS Help.

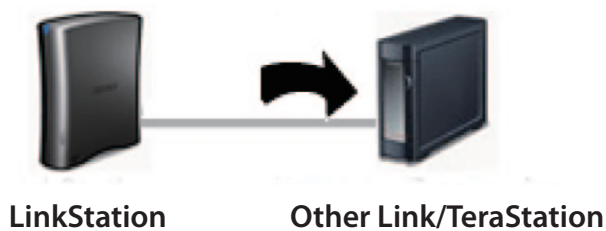
You've configured your LinkStation to work with Time Machine.

System-Backup

1 Back up data on the LinkStation

You can back up shared folders on the LinkStation from the configuration utility.

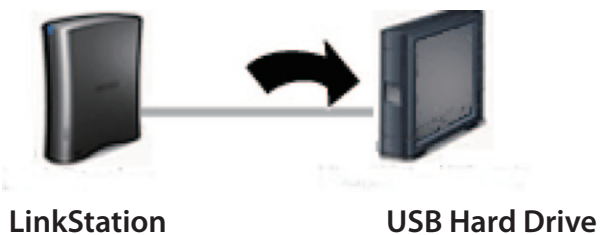
• Other LinkStation



The following sections will discuss how to:

- [Set up Backup destination]
- [Setting to set the other LinkStation/ TeraStation as a backup destination]
- [Set up Backup Source of the LinkStation]

• USB hard drive connected to the LinkStation



The following sections will discuss how to:

- [Set up Backup Source of the LinkStation]

2 Setting up the backup destination folder on LinkStation # 1

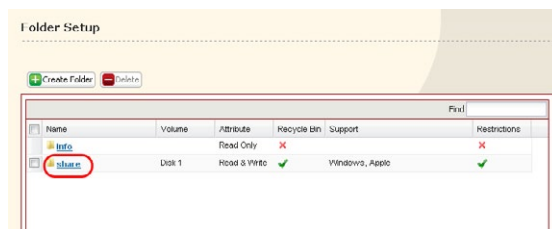
You may configure a destination folder on a LinkStation for backup jobs from a TeraStation or another LinkStation.

1



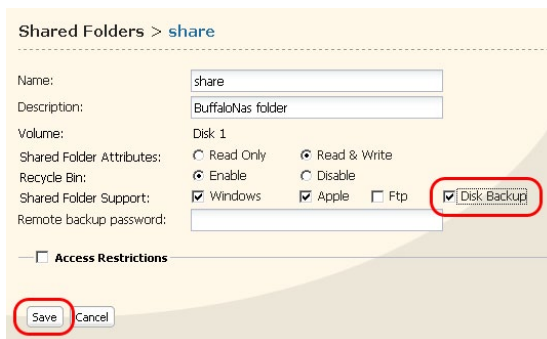
In the configuration utility, click on [Shared Folders].

2



Click the shared folder you want to set as a backup destination.

3



1 Check [Disk Backup].

Note: If you enter a backup password, users of other LinkStations (and TeraStations) will have to enter the password before using this LinkStation as a backup destination.

2 Click [Save].

3 Finding the backup destination folder from LinkStation # 2

If the password is set for the backup destination folder, you must enter the password to configure the folder as the destination for a backup job.

- 1 In the configuration utility, navigate to [System] - [Backup].



- 2 Click [Modify Settings] in [Search for Backup Destination by Password].

- 3 Enter the password for the folder that is the backup destination.
The search will find backup-enabled folders on the network that have the same password that you are searching for, or that have no password set.



4 Configuring LinkStation # 2 to use LinkStation # 1 as a backup destination

1



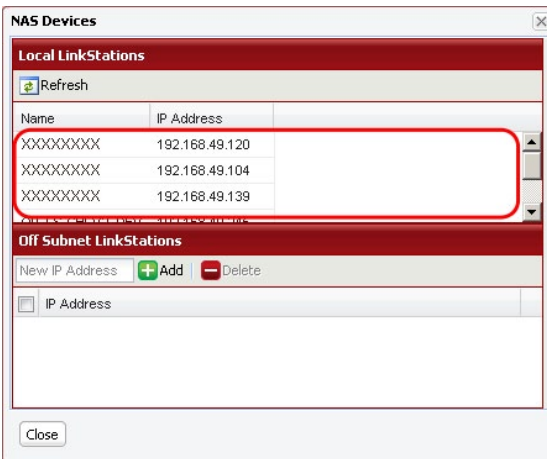
In the configuration utility, navigate to [System] - [Backup].

2



Click [View NAS Devices].

3



1 Check the IP address of the LinkStation you want to specify as a backup destination from [Local DEVICE_TYPES].

2 Enter IP address of the LinkStation you want to specify as a backup to [Off Subnet DEVICE_TYPES] and click [Add].

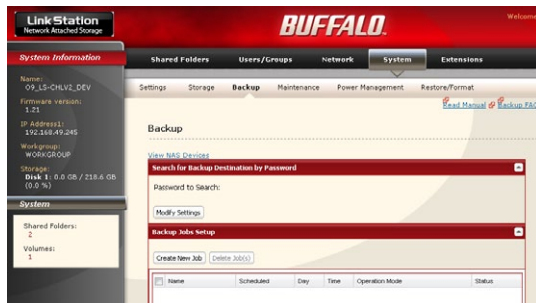
Notes:

If LinkStation # 2 (backing up) and LinkStation # 1 (with the destination folder) are on different networks, you must create a VPN connection between the two networks before the LinkStations will be able to see or back up to each other.

If you are using jumbo frames and back up data from one LinkStation or TeraStation to another LinkStation or TeraStation, set the Ethernet frame sizes of the LinkStations/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).

5 Set up a backup job on LinkStation # 2

1



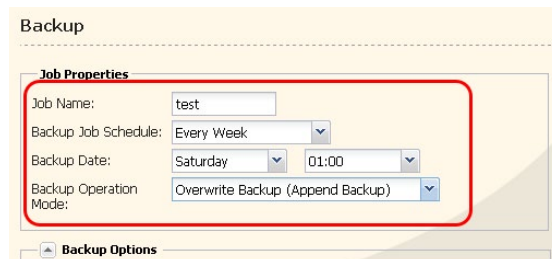
In the configuration utility, navigate to [System] - [Backup] - [Backup Jobs Setup].

2



Click [Create New Job].

3



Select backup options.

Backup operation modes

Three backup operation modes are available.

Normal Backup

All files in the source folder are backed up to the destination folder.

Overwrite Backup (Incremental Backup)

The first time the backup runs, it backs up all files in the source folder just like a normal backup. If later, file A is added to the backup source and file B is deleted, the next backup will add file A, but file B will not be deleted from the backup destination. This will use more space on the backup destination because of the files that are not deleted.

Overwrite Backup (Differential Backup)

The first time the backup runs, it backs up all files in the source folder just like a normal backup. If later, file A is added to the backup source and file B is removed, the next backup will add file A and delete file B. This uses the same space on the backup destination as a normal backup.

4

Backup

Job Properties

Job Name: test

Backup Job Schedule: Every Week

Backup Date: Saturday 01:00

Backup Operation Mode: Overwrite Backup (Append Backup)

Backup Options

Backup Folders

+ Add - Remove

Backup Sources	Backup Targets
----------------	----------------

Click [Add] in the [Backup Folders].

5

Source & Destination Folders

Backup Sources Backup Targets

Add Close

Select the backup source and backup destination folders, then click [Add].

6

Backup Folders

+ Add - Remove

Backup Sources	Backup Targets
share	LS-CHLAB1@test

Apply Cancel

Click [Apply].

Backup Jobs Setup

Create New Job Delete Job(s)

Name	Scheduled	Day	Time	Operation Mode	Status
test	Every Week	Sunday	00:00	Normal Backup	Idle

The task added is displayed to the backup list.

You've now configured a backup job.

Notes:

- You can register up to the second level of subfolders. However, folders with more than 80 characters in their names cannot be selected.
- The backup destination device must be configured as a backup destination in advance in order to select it.
- For best results, USB hard drives connected to the LinkStation for backup should be formatted with XFS or EXT3. If a hard disk connected to LinkStation is formatted in FAT 32 or FAT 16, the following restrictions apply:

You cannot back up more than 2 GB of data per file in FAT 16 and more than 4 GB of data per file in FAT 32.

Files created by Mac OS X cannot be backed up, since they contains character not allowed by FAT 32 or FAT 16.

- You must change the backup settings for backup if you format the hard drive after setting up backup. If there is no shared folder at the destination, an error message will be displayed.

RAID Arrays

Several RAID modes are available for LS-WXL and LS-WSXL LinkStations. LinkStations with only one hard drive do not support RAID modes.

Note:– All data is lost when the RAID mode is changed. Back up any important data before changing RAID modes.

- In this document, “Recovery” means putting the LinkStation back to the state it was in before the malfunction happened. It does not mean reading data from broken hard drives.
- When the use mode of the hard disk is changed, all the data in the hard disk gets deleted. Please take back-up before changing use mode so that the important data will not be lost.

• RAID 1 mode

Uses 2 hard drives in a mirrored array. One drive’s worth of space is usable. Identical data is written to both drives. If one drive is damaged, data can be recovered by replacing the damaged drive.

• RAID 0 mode(LS-WXL, LS-WSXL Default Settings)

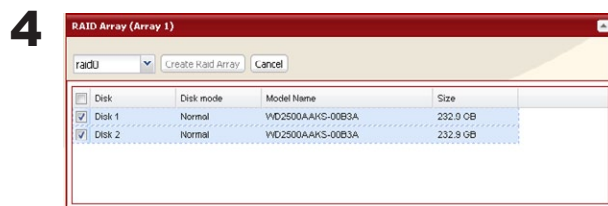
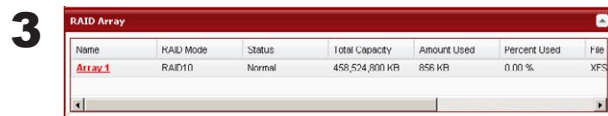
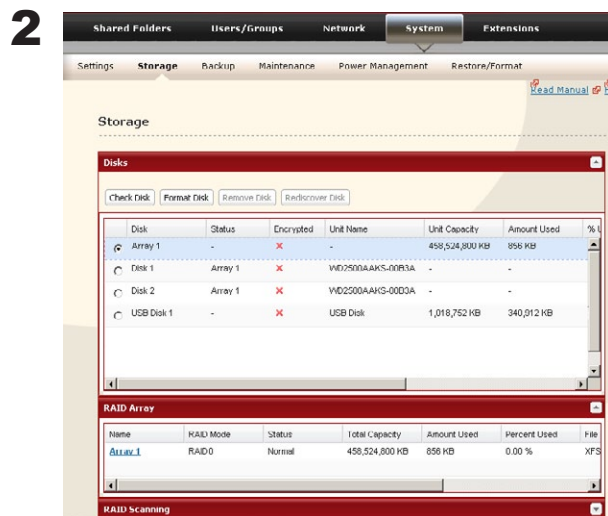
Multiple hard drives are combined into a single array. The total capacity of all drives is usable. This is the fastest of the LinkStation’s RAID modes. If any drive is damaged, all data on the array is lost.

• Normal Mode

Each drive is accessible as a separate, individual drive. The total capacity of each drive is usable. If any drive is damaged, all data on that drive is lost.

• Using in RAID 1 mode

1 Change system to normal mode (page 54).



6 The confirmation 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. Turn to page 7 to create a shared folder.

Note: –If power is turned off during a RAID rebuild, the RAID rebuild will continue when power is restored. (Example: In LinkStation of 1TB when power supply is changed from OFF to ON after lapse of 3 hours from construction of RAID then reconstruction of RAID should start in remaining 3 hours).

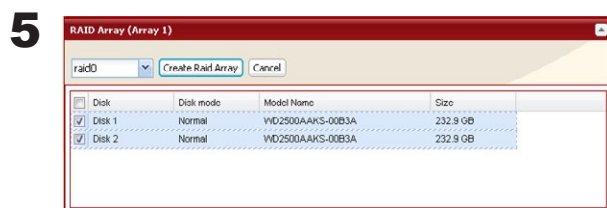
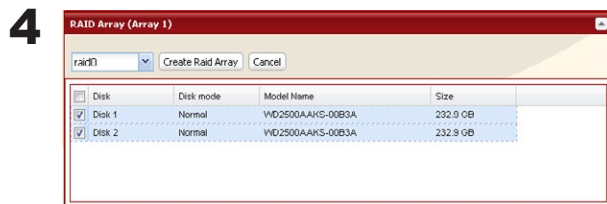
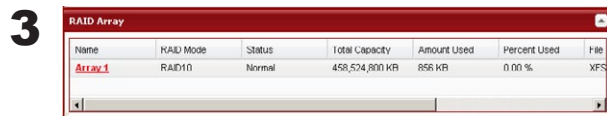
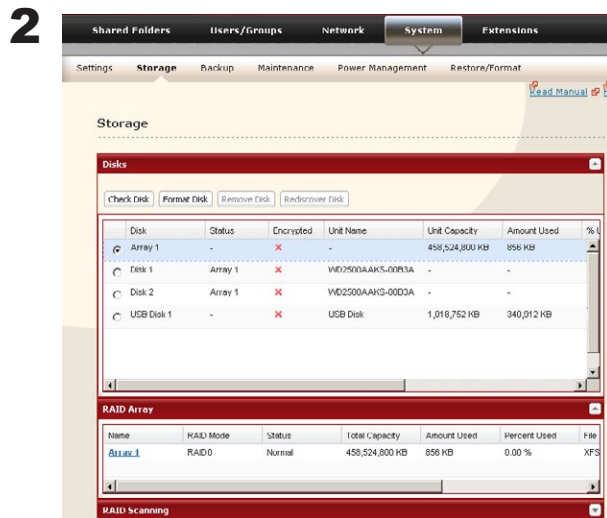
Confirmation screen

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

- Change RAID array (Create/Delete)
- Delete Folder
- Restore Factory Defaults
- Format LinkStation
- Format Array or Disk
- Remove Disk
- Rebuild RAID array

• Changing to RAID 0 mode

1 Change system to normal mode (page 54).

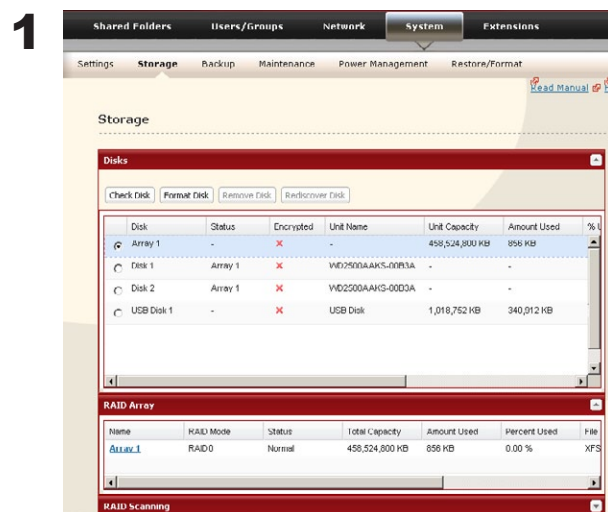


6 The confirmation screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].

7 Follow the instructions displayed on the screen.

You have set up a RAID 0 array. Turn to page 7 to create a shared folder.

• Changing to Normal mode



- 3** Click [Create RAID Array].
- 4** When [Are you sure you want to change RAID mode?] is displayed, click [Apply].
- 5** The confirmation 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 set up a Normal mode. Turn to page

7 to create a shared folder.

System-Maintenance

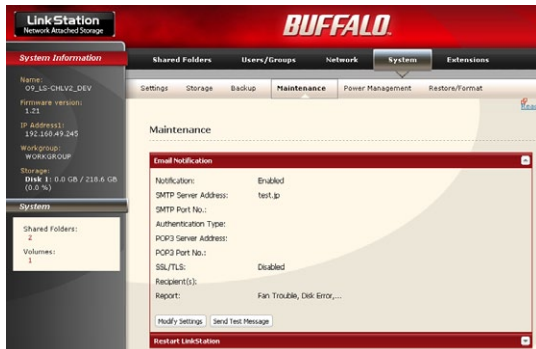
E-mail Notification

Your LinkStation can send you daily email reports. It can also send you an email when settings are changed or an error occurs.

The following things will be sent via E-mail:

- The condition of the hard drive
- Notification of completed backup jobs
- Notification of fan errors
- Notification of hard drive errors

1

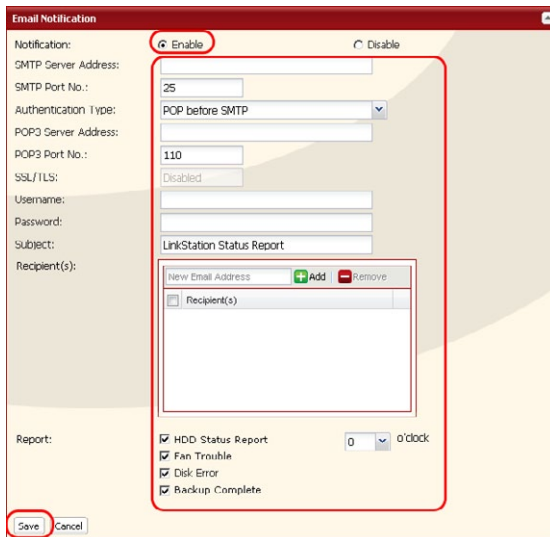


In the configuration utility, navigate to [System] - [Maintenance].

2

Click [Modify Settings] in [E-mail Notification].

3



1 Click [Enable] in 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. Click [Reset to Default] to reset the subject line to [Link-Station Status Report].
- 8 Enter a receiver's e-mail address. E-mail can be sent to up to 5 addresses.
- 9 Select conditions for emails to be sent.
 - HDD Status Report Sends status of hard drive periodically.
 - Fan Trouble Sends a message when a fan error occurs.
 - Disk Error Sends a message when a hard drive fails.
 - Backup Complete Sends a message when the backup is complete.
- 10 If you have selected [HDD Status Report] for sending condition, select time to send.
- 11 Click [Save].

4



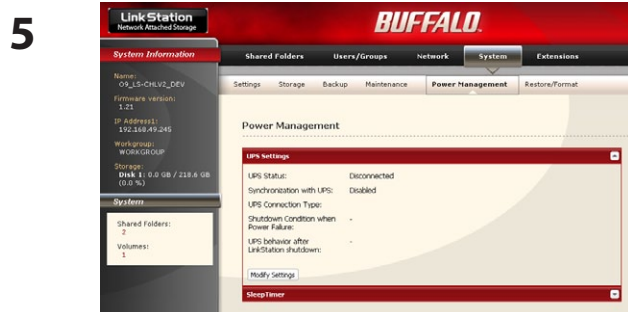
Click [Send Test Message] to send a test message.

System Power Management

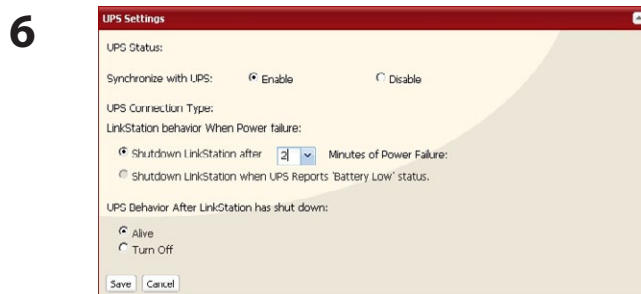
UPS Settings

A UPS (uninterruptible power supply) can automatically shut down your LinkStation in case of a power outage. To use the LinkStation with a UPS, configure the following settings:

- 1 Plug the power cable of UPS to a wall socket.
- 2 Connect the AC adapter of the LinkStation to the UPS.
- 3 Connect the UPS and the LinkStation with a USB cable.
- 4 Turn on the UPS, then the LinkStation.



In the LinkStation's configuration utility, navigate to [System] - [Power Management] - [UPS Settings] and click [Modify Settings].



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

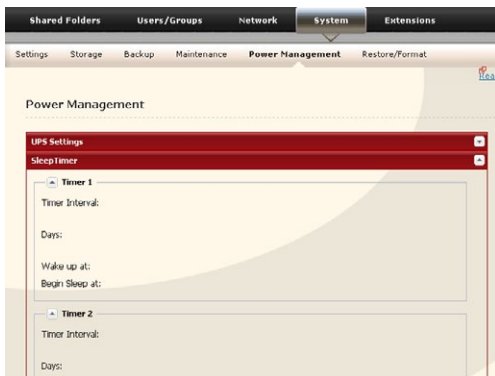
The LinkStation is now configured to work with the UPS.

Note: If the LinkStation shuts down automatically due to a power outage, make sure that the power issue is resolved before turning it back on. If the LinkStation is turned back on while it's still running on the UPS battery, the UPS will not shut it down again, even if the battery runs low.

Sleep Timer

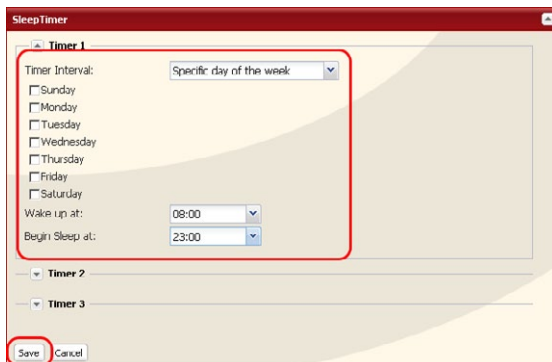
To save energy, you can specify times to put the LinkStation into sleep mode, where the hard disk and LED lights are turned off. The sleep timer only works when the LinkStation's power mode switch is "ON". This feature cannot be used when it is set to "AUTO" or "OFF".

1



- 1 In the LinkStation's configuration utility, navigate to [System] - [Power Management] - [Sleep Timer]
- 2 Click [Modify Settings].

2



- 1 Specify a timer interval, beginning time and ending time.
- 2 Click [Save] at the bottom of the screen.

- * You can set up to 3 timers.
- * You can set ending time from 0:00 to 27:45.
You can set beginning time from 0:00 to 23:45.
(If the ending time is 24:00 or later, the beginning time can be set from 4:00 to 23:45.)
If 24:00 is equivalent to 0:00 of the next day, and 27:00 is equivalent to 3:00 of the next day.
- * You can not set the ending time before or the same time as a beginning time.

- During processing disk check, disk format, and backup jobs or when a backup job is scheduled before and after 5 minutes of the current time, the LinkStation will not be proceeded to Standby mode even though the end time has reached.
- If time of the timers are duplicated, the longest interval time is used to operate.

Examples of multiple timers:

(e.g.1) Currently the timer set on Wednesday 10:00 is working:

Timer 1 Everyday 12:00 - 24:00

Timer 2 not used

Timer 3 not used

-> Nothing happens at 12:00 and goes into sleep mode at 24:00

(e.g.2) Currently the timer set on Wednesday 10:00 is working:

Timer 1 Everyday 9:00 - 18:00

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

Timer 3 not used

-> Except on Wednesdays, the LS powers on at 9:00 and goes into sleep mode at 18:00.

On Wednesdays, it goes into sleep mode at 20:00.

(e.g.3) Currently the timer set on Wednesday 10:00 is working:

Timer 1 Everyday 9:00 - 18:00

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

Timer 3 not used

-> Except on Wednesdays, the LS powers on at 9:00 and goes into sleep mode at 18:00.

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

(e.g.4) Currently the timer set on Wednesday 10:00 is working:

Timer 1 Everyday 9:00 - 18:00

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

Timer 3 not used

-> Except on Wednesdays, the LS goes into sleep mode at 18:00.

-> LS turns on Wednesday at 7:30, and goes into sleep mode at 22:00 of the next day.

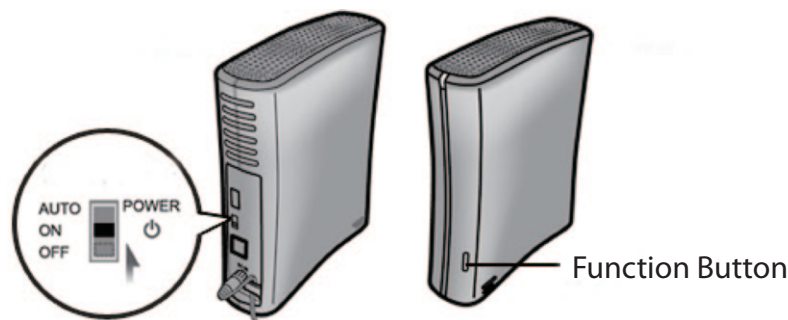
In standby mode, pressing the LinkStation's function button or moving the power mode switch to "AUTO" will turn the LinkStation on.

Sleep timer settings are now complete.

Restore Factory Defaults

To restore the configuration of the LinkStation, follow the procedure below.

- 1** Move the power switch to the “OFF” position to shut down the LinkStation.
- 2** Move the power switch to the “ON” position while holding down the function button. The function button will flash blue for 1 minute.



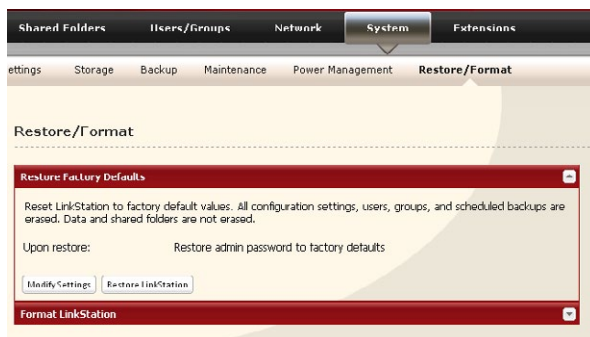
- 3** While the function button is flashing blue, press it again. The status LED will start flashing blue. It will start flashing amber when initialization begins (2 - 3 minutes).

- Notes:
- When the LinkStation is initialized, an IP address, an Ethernet frame size settings, and an administrator (admin) password are initialized. If you choose not to initialize the administrator's password on the configuration utility, only the IP address and Ethernet frame size settings are initialized. You can initialize other items from the configuration utility.
 - If you do not want to initialize the admin password when you initialize the LinkStation, select [Keep current admin password] in the [System] - [Restore/Format] - [Restore Factory Defaults] screen, and click [Save].
 - If you choose to not initialize the admin password from the function button, you can no longer configure the LinkStation if you forget the password! Write your password down and put it in a safe place.

Initialization from the configuration utility

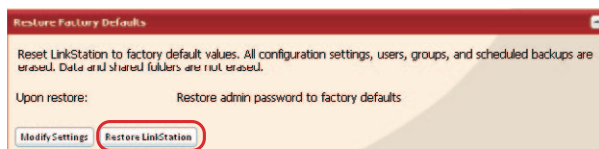
You can initialize the following settings from the configuration utility: LinkStation name, Description, NTP settings, Workgroup settings, Shared service settings, the access restrictions of the shared folder, User settings, User group, mail notification feature settings, UPS synchronization settings, Backup Settings, Administrator's password, Print server function, WebAccess feature, Language settings, Timer ON/OFF, HDD spin down, Media server, BitTorrent, and Time Machine.

1



In the LinkStation's configuration utility, navigate to [System] - [Restore/Format].

2



Click [Restore LinkStation].

3

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

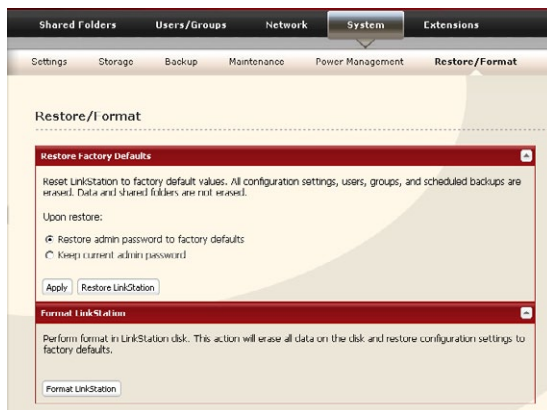
4

Follow the instructions displayed on the screen.

Your LinkStation has been initialized.

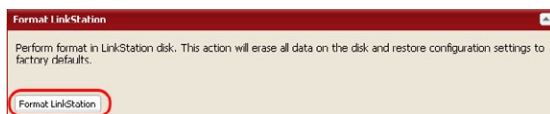
Format the LinkStation

1



In the LinkStation's configuration utility, navigate to [System] - [Restore/Format].

2



Click [Format LinkStation].

3

The [Confirm Operation] screen will be displayed.

Enter the number from the [Confirmation Number] field within 60 seconds, and click [Apply].

4

Navigate to [System] - [Restore/Format] in configuration utility. Follow the instructions displayed on the screen.

Warning: Formatting the LinkStation will erase all data on the drive! Back up any important data before formatting.

After the format, the status of the LinkStation will be as follows:

Hard drives in the LinkStation: Not formatted
All settings of the LinkStation: Factory Default

Extensions

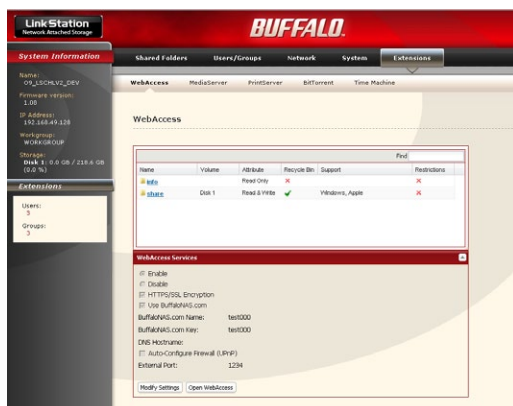
WebAccess

WebAccess lets you access files on the LinkStation from outside your network. You can access the LinkStation from anywhere with an Internet connection and play music, display pictures, and download or upload data.

On the LinkStation, you can set access restrictions for each shared folder. These restrictions will apply to users accessing the LinkStation via WebAccess as well as locally. LinkStation 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

Name	Volume	Attribute	Recycle Bin	Support	Restrictions
info		Read Only	×		×
share	Disk 1	Read & Write	✓	Windows, Apple	×

Choose the folder to be shared with WebAccess.

3

WebAccess Settings > share

Name: share

Description: BuffaloNas folder

WebAccess Settings: Allow Anonymous

Save Cancel

1 Select what users will have access.

- Disabled: WebAccess is not allowed.
- Allow Anonymous: Anyone can access shared folders.
- Allow All Groups / Users: All groups/users that are registered on the LinkStation 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

WebAccess Services

☒ Enable
☐ Disable

☐ HTTPS/SSL Encryption
☐ Use BuffaloNAS.com

BuffaloNAS.com Name:
 BuffaloNAS.com Key:

DNS Hostname:

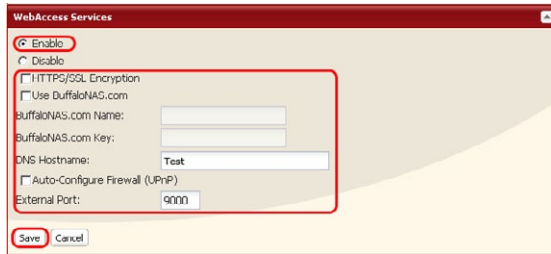
☐ Auto-Configure Firewall (UPnP)

External Port: 9000

Save Cancel

Click [Modify Settings].

5



- 1 Select [Enable].
- 2 Select [Enable] from [Use BuffaloNAS.com].
- 3 Enter the LinkStation name to be published in [BuffaloNAS.com Name].

Note: This is the name to enter when accessing BuffaloNAS.com. It does not have to be the same name as the actual LinkStation.

- 4 Enter the password to save and use the name in [BuffaloNAS.com Key].
- 5 Select [Enable] from [Auto-Configure Firewall (UPnP)].

Note: This does not work unless the router has UPnP enabled.

- 6 Click [Save].

Notes: • If you want to transmit data more securely by using SSL encryption, check [HTTPS/SSL Encryption].

- To use the generic DNS service instead of using BuffaloNAS.com, enter the host name in [Other DNS Hostname].
- If configuring manually without using UPnP, enter the external port of a router side. By default, the external port on the router side is transferred to the port 9000 of the LinkStation (The port on the LinkStation side is set to 9000).
- If the LinkStation is left unconnected from the Internet for a certain period of time, its name registration will be deleted on the BuffaloNAS.com server.

You have set up WebAccess on the LinkStation.

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 Tap [Safari] from [Home] screen, and connect to the Internet.
 - 2 Tap the address bar on top of the [Safari] screen.
 - 3 Enter *http://buffalonas.com* in the address bar, and select [Go].
- The screens in step 2 and later are from a PC. They look different from what is displayed on iPhone or iPod touch.
 - You cannot play video files or music files for which DRM is set by using this feature.
 - You cannot play video files or music files that were saved with access restrictions.
 - You cannot save files from the LinkStation to the iPhone or iPod touch with WebAccess. Video and music files are streamed, and picture files are displayed in the browser.
 - Compatibility with video and music files depends on the versions of Safari and Quicktime installed on the iPhone or iPod touch.
 - To create a video file which is playable on the iPhone, use off-the-shelf software to convert to playable formats for the iPhone or iPod touch.
 - Uploading files, changing file names, and deleting files are not supported on the iPhone or iPod touch.
 - 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 LinkStation.

To view without using BuffaloNAS.com, open the following URL on the Internet browser:

<http://global IP address of the LinkStation:9000>

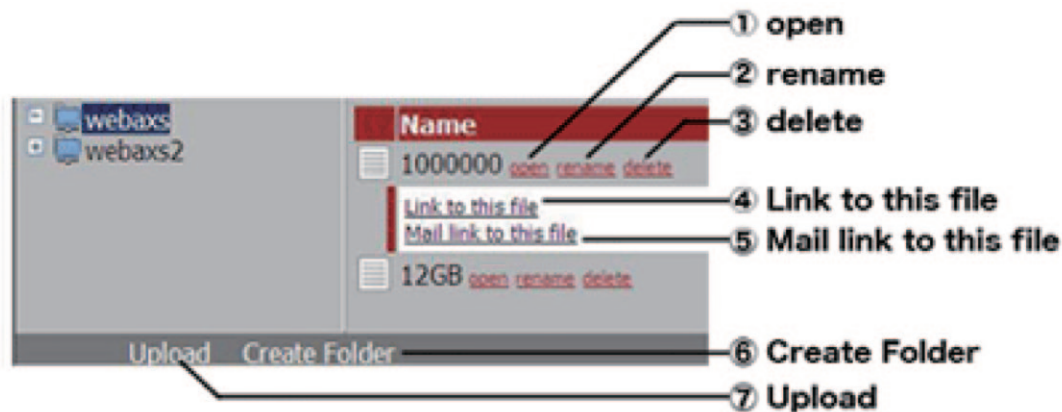
For SSL, use <https://global IP address of the LinkStation:9000>

To verify the IP address of your LinkStation, use NAS Navigator2.

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", "Upload"



- 1 open** Open a file and folder.

Clicking [open] will open the specified file/folder.

You can save a file on the local drive by right-clicking.

- 2 rename** Change a file/folder name.

Clicking [rename] will display the following screen. Enter a file name or folder name in [File Name] you want to change, and click [Change].

- Don't 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** Delete files/folders.

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

4 Link to this file Link to a file or folder.

When you click a file or folder name, a white area will be displayed. Right-click on [Link to this file] in the white area, and select [Copy Shortcut]. It will copy an address link that can be accessed to that file directly from outside. Use this feature when you want to give out this address link. From the right-click menu, select [Add to Favorites] to bookmark this directly accessible address link.

5 Mail link to this file Send the address link by e-mail.

When you click a file or folder name, a white area will be displayed. Click [Mail link to this file] in the white area, and your mail software will launch with a link address which is accessible from outside to that file included in the mail body. Use this feature when you want to distribute this address link by e-mail.

6 Create Folder Create a folder.

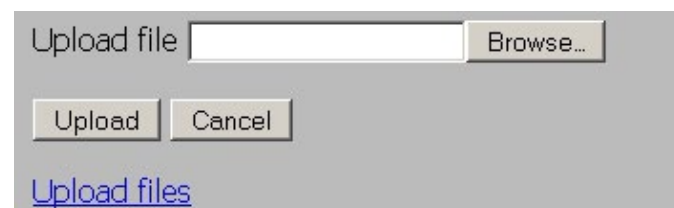
Click [Create Folder], and then the following screen will be displayed. Enter a folder name to create in [Folder Name], and click [Make]. The new folder will be created.



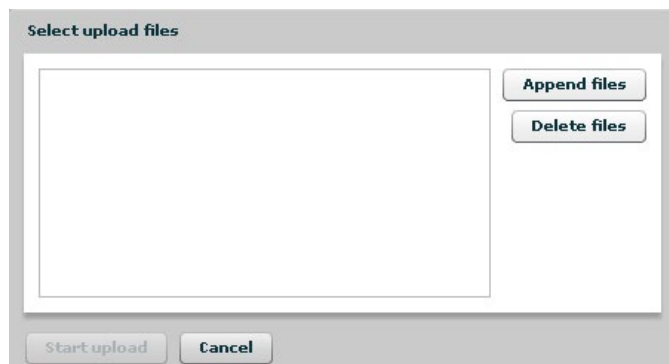
- You cannot include following characters in a file name/folder name: ????????????????
- You can use up to 80 characters for a folder name or file name.

7 Upload Upload files.

Clicking [Upload] will display the following screen. Click [Browse] in the upload files area, and select a file to be uploaded. Clicking [Upload] will start uploading the selected file.



Clicking [Upload Files] will display the following screen.



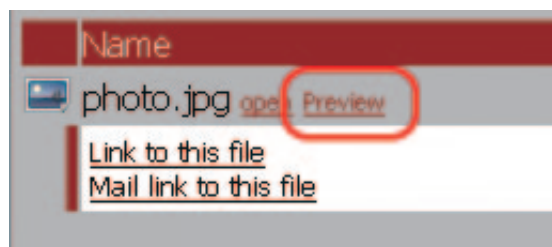
Select the files you want to upload in [Append files], and click [Start upload].

Notes: Files may be up to 2 GB in file 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.



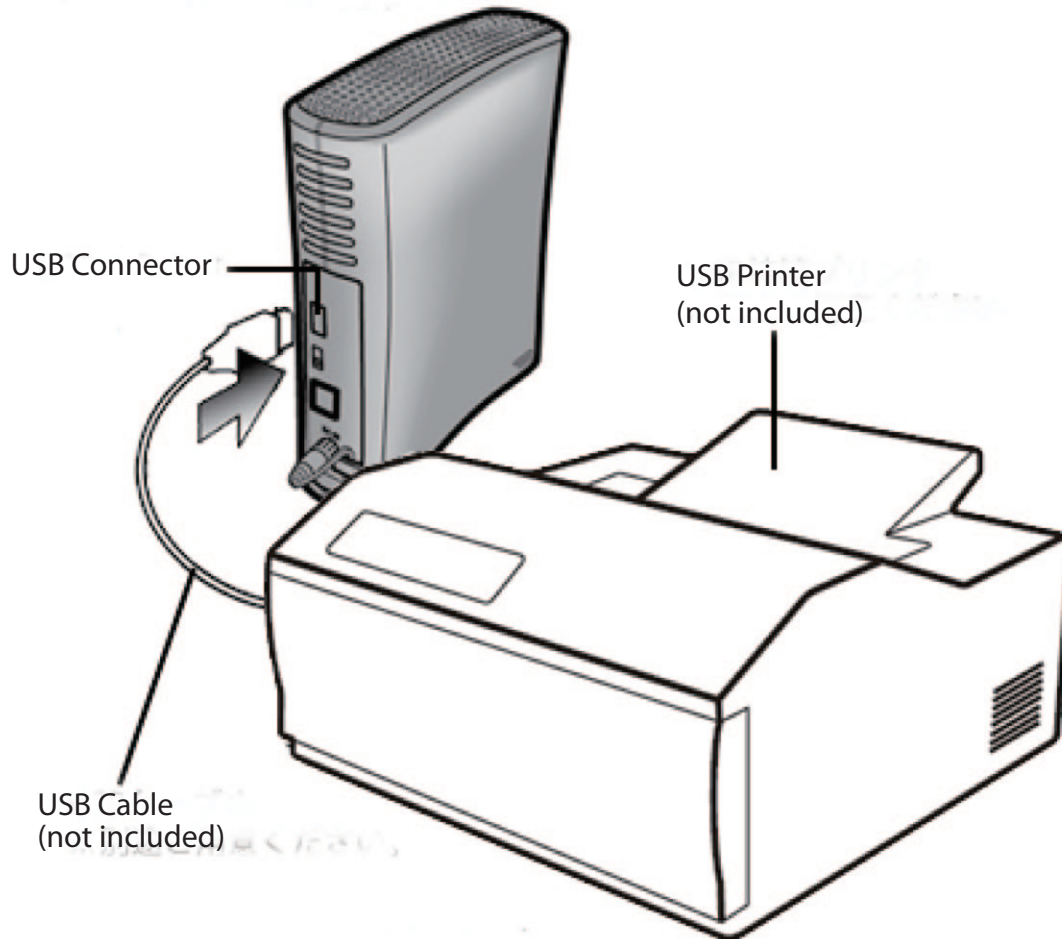
Click **CLOSE X** at the bottom of the image to finish displaying the preview.

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.

Print Server

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



Notes: • Only one printer can be connected to the LinkStation.

- The LinkStation 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 LinkStation.

Setting up a printer on Windows Vista

- 1** In the LinkStation's configuration utility, navigate to [Extensions] - [PrintServer] and click [Modify Settings].



- 2** Select [Enable] and click [Save].

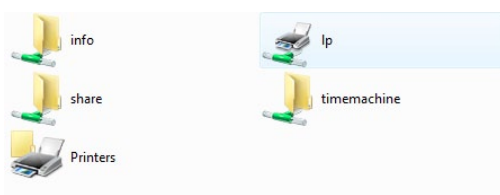


- 3** Refer to your printer's manual installation instructions. You may need to install the printer driver from a software disk.

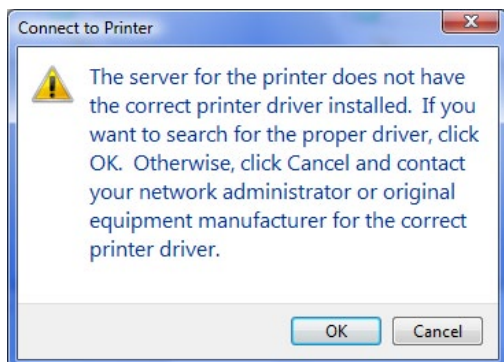
- 4** Click [Start] - [Network].

- 5** Double-click on the LinkStation's server name.

- 6** Double-click on the LinkStation'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 LinkStation's configuration utility, 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].

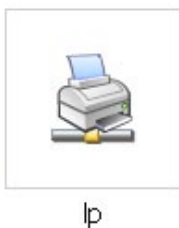
5

Click [Network and Internet Connections] icon.

6

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

7

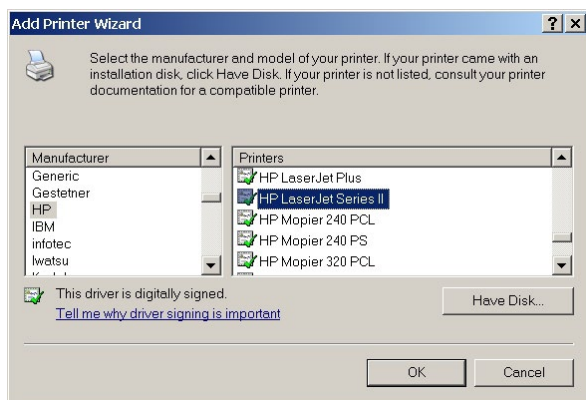


Double-click on the LinkStation's printer icon ("lp").

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 LinkStation's configuration utility, 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.

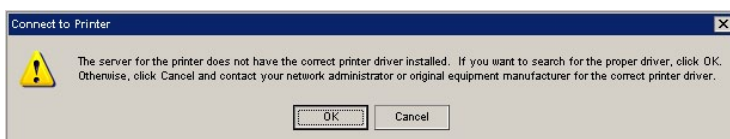
- 4 Double-click [My Network Places (*)] -[Entire Network] - (the LinkStation Server Name).

* On Windows NT 4.0 this is [Network].

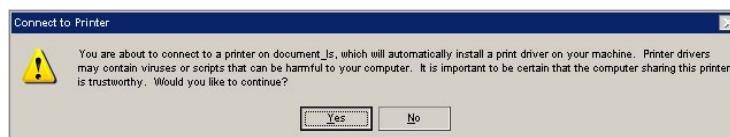
- 5 Double-click on the LinkStation's printer icon ("lp").



- 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.

BitTorrent Client

BitTorrent is a protocol for sharing files. You can download files quickly since files are distributed on the network and network traffic is not concentrated, even with a large file. It does not keep anonymity, and it is easily known who publishes what files.

Warning: Do not download copyrighted files without permission from the owner.

See <http://www.bittorrent.com/> for more information about BitTorrent.

Flow chart of downloading with BitTorrent:

- 1** Use a search engine to find the torrent for a file that you want. Download the torrent.

Notes: • Torrents are information files with a ".torrent" extension.

- Torrents can be downloaded from BitTorrent Inc.'s website or many other websites. Follow the terms of use and copyright rules for each website.

- 2** Send torrent information to a server called "tracker" and receive information about a terminal which has a file.
- 3** Start downloading based on the information received from the "tracker" server.
- 4** Download pieces of data from multiple terminals and make one file.

Use the following steps to download shared files to the LinkStation with BitTorrent.

Enabling BitTorrent and selecting folders

1



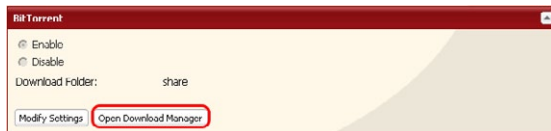
- 1 In the LinkStation's configuration utility, navigate to [Extensions] - [BitTorrent].
- 2 Click [Modify Settings].

2



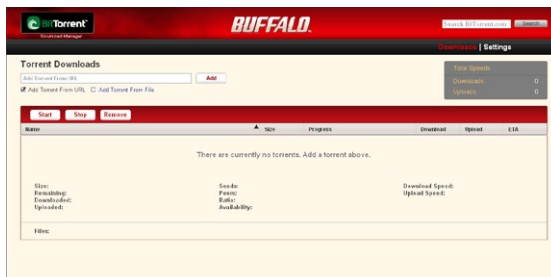
- 1 Click [Enable].
- 2 Select a folder for downloads from the folders on the LinkStation.
- 3 Click [Save].

3



Click [Open Download Manager].

4



The Download Manager will open. There are two methods for downloading: downloading by adding torrent information from a URL or from a file.

How to download from a torrent by URL

1



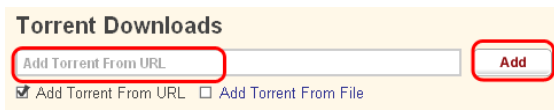
Torrent Downloads

Add Torrent From URL

☒ Add Torrent From URL ☐ Add Torrent From File

Click [Add Torrent From URL].

2



Torrent Downloads

Add Torrent From URL

☒ Add Torrent From URL ☐ Add Torrent From File

1 Enter the URL with Torrent Information to the frame at the left of [Add].

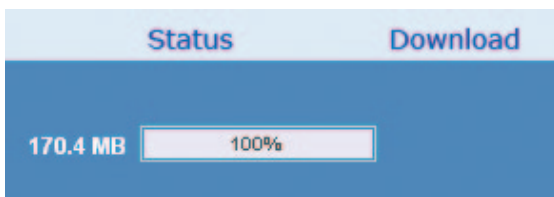
2 Click [Add].

3

Torrent URL has been sent.

When the message [Torrent URL has been sent.] is displayed, click [OK]. Downloading to the destination folder will begin.

4



Status Download

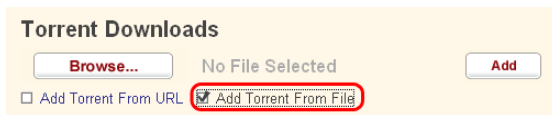
170.4 MB 100%

When progress reaches 100%, the download is complete.

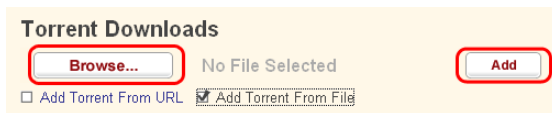
You have downloaded a file to the download folder from a torrent by URL.

How to download from a torrent by adding it from a file

1 Click [Add Torrent From File].

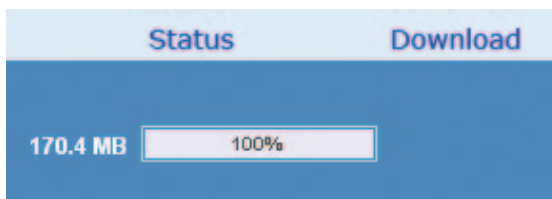


2 **1** Click [Browse...] and select the torrent file from the LinkStation or your computer.
2 Click [Add].



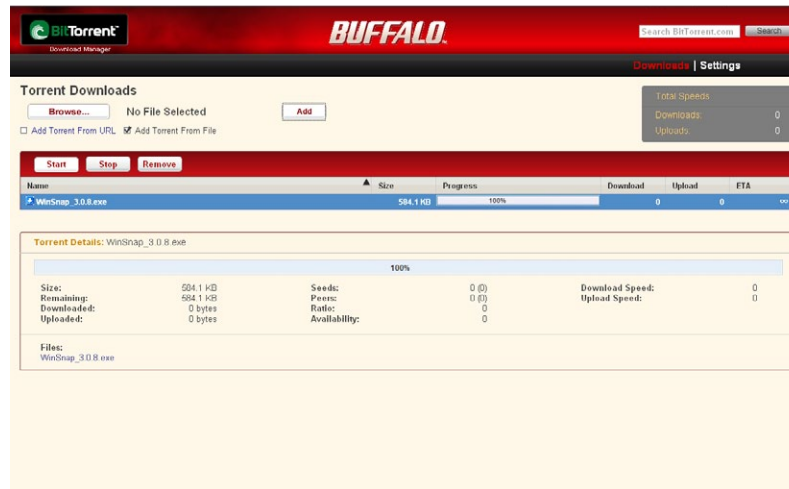
3 Downloading to the destination folder will begin.

4 When progress reaches 100%, the download is completed.



You have downloaded a file to the download folder from a torrent by adding it from a file.

What you can do in the download screen



Click a queue name and click [Stop]; this stops downloading.



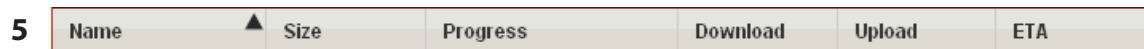
Click [Start] to resume downloading.



Click a queue name and click [Remove]; the file will be deleted.



Enter a phrase and click Search to search for torrents at www.bittorrent.com.



The order of the download queue can be changed by each item. The displayed order can be switched by clicking any of the following items.

[Name] [Size] [Progress] [Download] [Upload] [ETA]



Click [Settings] to display the BitTorrent configuration utility.

What you can do in the configuration utility

1 Port Settings

Changes the port used for BitTorrent communication. If UPnP is enabled, the LinkStation will automatically update the connected router to match.

To set the port manually without using UPnP, enter the port number (the default setting is [Standard Setting (6881)]) on any port number on the LinkStation side.

2 Bandwidth Management

If this is set to [Automatic], transmission bandwidth of BitTorrent will be automatically set. If this is set to [Manual], you can specify a maximum bandwidth for download, upload, and seeds. The default setting is [Automatic].

3 Seeds

Set the seed period for a file which is finished downloading.

[Seed until removed] will continue to seed until the torrent is deleted.

[Stop seeding when ratio reaches] will stop seeding when the upload percentage (a percentage of the number of byte downloaded against the number of byte uploaded) achieves the pre-defined value in %.

[Stop seeding after] stops seeding automatically after the pre-defined time in minute has passed.

The default setting is [Seed until removed].

Media Server

The LinkStation is equipped with a DLNA Media Server. Videos, pictures and music saved on the LinkStation can be displayed or played on TV, audio devices, game devices and other DLNA compatible network devices.

DLNA (Digital Living Network Alliance) defines Home Network Device Interoperability Guidelines, which are product design guidelines in the industry's standard technology in order to achieve the interconnecting environment for digital devices (computers, home appliance, mobile devices and so on).

To use DLNA on the LinkStation, begin by enabling it.

1



In the LinkStation's configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2



If it is set to [Disable], click [Enable].

3

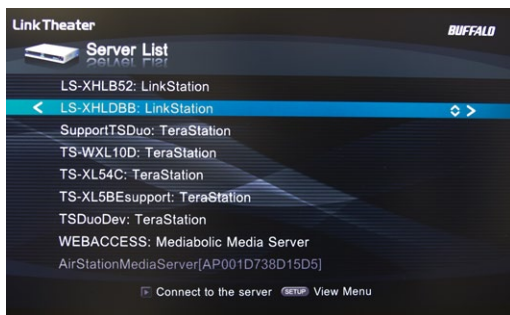
Click [Save] at the bottom of the configuration utility.

DLNA is now enabled on the LinkStation.

Connecting to the LinkStation and playing the files

This example shows how to use DLNA compatible media players to play files on the LinkStation. Screenshots are from a Buffalo LinkTheater LT-H90 media player.

- 1 Connect DLNA compatible devices to the network and turn them on.
Note: Refer to the devices' manuals for how to connect them.
- 2 Select the DLNA server of the LinkStation from the screen to select DLNA compatible devices



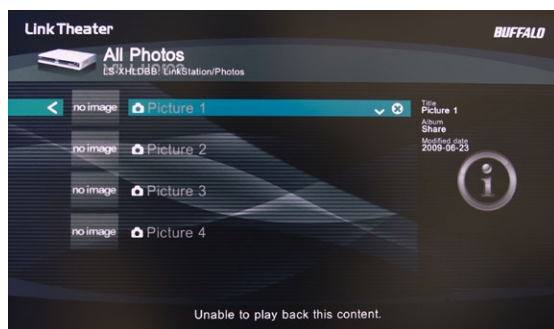
Select your LinkStation from the list of available devices. By default, its name will be its model number followed by the last 3 digits of its MAC address. For example, a LS-XHL LinkStation Pro whose MAC address ends in DBB will have the name LS-XHLDBB.

- 3 Select the contents you want to play.



Select from [Videos], [Music], or [Photos].

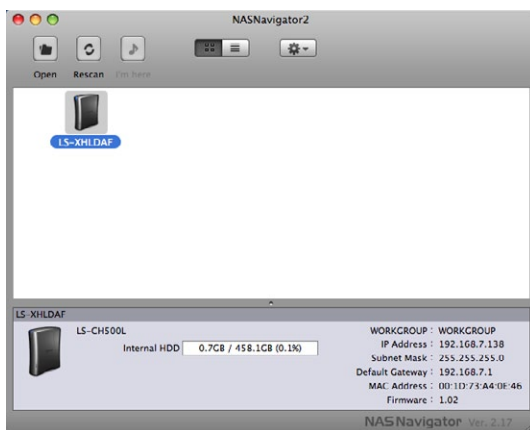
4 Select the file that you want to play, then play it.



Play on PSP®(Play Station Potable) *LS-CHL, LS-XHL only

Your Sony PSP® can access the LinkStation if they're connected to the same AP or wireless router. The PSP® can play audio files through RSS and save them to a memory stick.

- 1 Access the following URL from the PSP's browser:
`http://(IP address of the LinkStation):9050/rss`
Consult the PSP's documentation for instructions on using the PSP's browser. You can get the LinkStation's IP address with NAS Navigator2 (included on your CD)..



NAS Navigator2

The LinkStation's IP address is displayed in the bottom right corner of NAS Navigator2.

- ## 2


Audio files saved in the LinkStation's media folder can be sorted by [Playlist], [Artist], [Genre], and [Album], or click [Folder] to access all files.

Select the RSS link. RSS registration will begin.

- 4** Close your browser and select the [RSS channel] from the [Network] menu. Choose the channel you want to play.
- 5** A list of available audio files is displayed. Select the desired file to play.

Note: To save an audio file to a memory stick, push the [△] button and select [Save}.

Notes: • To play music on the PSP®, use firmware version 2.70 or later.

- "PlayStation" and "PSP" are registered trademarks of Sony Computer Entertainment Inc.
- "Memory Stick", "Memory Stick PRO Duo™", "Memory Stick Pro-HG Duo™", "Memory Stick Micro (M2)™", and "  " are trademarks of Sony Inc.
- The LinkStation is a product of Buffalo Technology and is not licensed or approved by Sony Computer Entertainment Inc.

Media Server Settings

By default, the LinkStation is set to allow all videos, pictures and music on the shared folder “share” and subfolders to be played. You may configure it to only play videos, pictures and music from a specific folder.

1



In the configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2



Shared folders and subfolder will be displayed in the pulldown menu of [Media Server published folder]. Select the folder you want to publish.

3

Click [Save] at the bottom of the configuration utility.

4

Only files saved on the folder you selected in step 2 can be selected or played from DLNA supported devices.

To view DLNA compatible devices connected to the LinkStation:

1



In the configuration utility, navigate to [Extensions] - [Media Server].

2

Click [Authorized DLNA Media Clients].

3



A list of DLNA compatible devices on the network will appear, showing MAC addresses, IP addresses and device names.

If a DLNA device doesn't broadcast its name or IP address, it will be displayed as [cannot be acquired].

After connecting a new DLNA device to the network, or changing its settings, click [Refresh client list].

DLNA Media List

The LinkStation will maintain a database of videos, pictures, and music saved in its media folder and distribute a list of available media to DLNA media players on the network. This list is distributed after each reboot and once every 60 minutes by default. Configure the database as described below.

1



In the configuration utility, navigate to [Extensions] - [Media Server] and click on [Modify Settings].

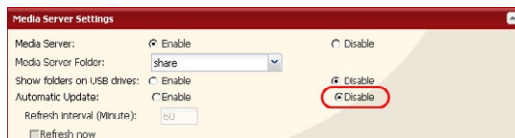
2



To distribute the list of available media, click [Enable] in [Automatic update], then click [Refresh now].



Optionally, you may choose a different refresh interval. To distribute the media list at a different interval, enter the desired interval in minutes in the [Refresh interval] field.



To completely disable distribution of the media list, click [Disable] for [Automatic Update]..

3 Click [Save] to save your settings.

If other DLNA media devices don't recognize the LinkStation:

If the Media Server on the LinkStation is disabled, other DLNA devices won't be able to see it. You may enable the Media Server on the LinkStation as follows.

1



In the configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2



Click [Enable].

3

Click [Save].

To disable to play any files from DLNA compatible devices:

By default, the LinkStation will allow playback from any compatible media player on the same network. To prohibit playback for a specific DLNA media player, follow the directions below.

1

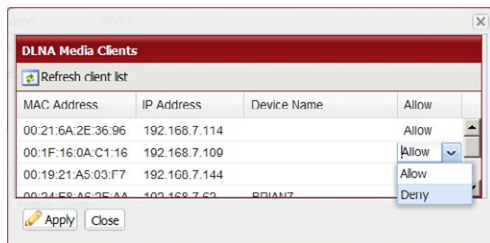


In the configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2

Click [Authorized DLNA Media Clients].

3



Select [Deny] for the DLNA media player(s) that you want to block from accessing media on the LinkStation. Media players that are allowed to access media on the LinkStation should be set to [Allow].

4

Click [Save].

Troubleshooting:

Problem: The DLNA media player can't see media files on the LinkStation

If your DLNA media players can't access the media files on the LinkStation, then the list of available media files should be updated. Try the following:

1



In the configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2



Select [Enable] for [Media Server] and [Automatic Update]. Check [Refresh now] and [Initialize database before refresh].

3

Click [Save].

If you cannot play certain files:

The LinkStation's DLNA media server supports the following types of files. Only files of these types will be available to DLNA media players on the network.

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

Your media player may not support all of these filetypes. Files that your media player doesn't support may not be visible from the media player. Check your media players documentation for a list of the types of files that it can play.

Using iTunes with the Media Server

Computers on the network running iTunes can access MP3, M4A, and M4P music files from the LinkStation's media server. Enable the LinkStation's media server as described below.

1



In the configuration utility, navigate to [Extensions] - [Media Server] and click [Modify Settings].

2



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

Note: If you add, change, or delete music files on the LinkStation, iTunes may halt playback until the database is updated and the media list distributed. After making changes to the media files, refresh the media list as described on the previous page and restart iTunes.

With the media server enabled, the LinkStation will appear in iTunes on computers on the network, and music files on the LinkStation can be played normally.

Web/Database Server (LS-WXL, LS-WSXL only)

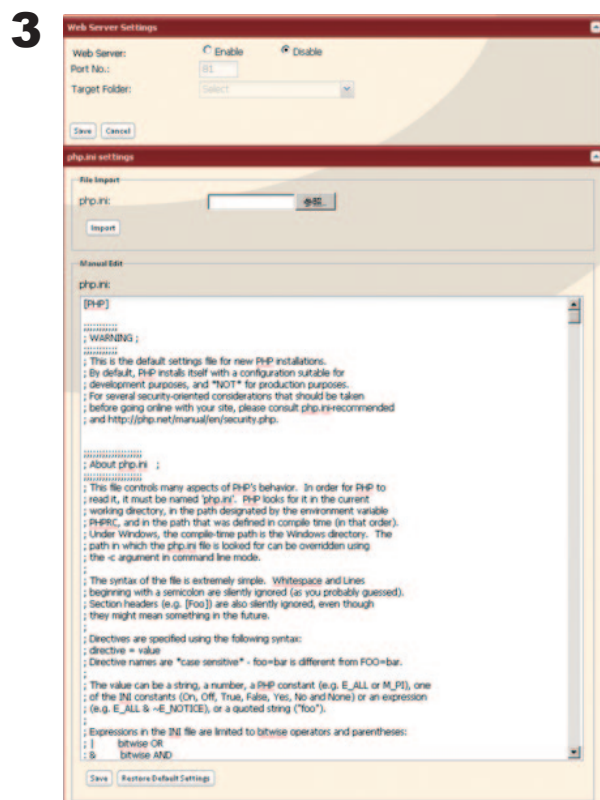
<Web server>

The LinkStation can be used as a Web server.

HTML, CGI scripts, images, and JavaScript are supported.

Note: – The LinkStation's Web server is for advanced users only. Don't enable it unless you know what you're doing.

- 1 Navigate to [Network] – [Web Server] in the Web Admin tool and click [Modify Settings].
- 2 [Enable] Web Server, choose an external port setting (81 is the default) and a Web server public folder, and click [Save].



Edit the php.ini file to change the PHP language interpreter settings,. Instructions are in the file.

The Web server is now configured.

<MySQL server>

The LinkStation can be used as a MySQL server.

A MySQL database may be installed and linked with the web server.

- Note:
- The LinkStation's MySQL server is for advanced users only.
 - Don't enable it unless you know what you're doing.

1 Navigate to [Network] – [MySQL Server] in the Web Admin tool and click [Modify Settings].

2 [Enable] MySQL Server, choose a port and a data folder, and click [Save].



The MySQL server is now configured.

Chapter 2

NAS Navigator2

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

Windows Vista/XP/2000 and Windows Server2003/Server2008

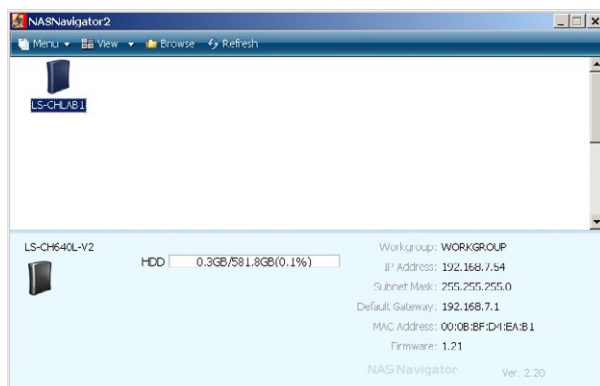
If you set up the LinkStation with the LinkNavigator CD, NAS Navigator2 is installed and configured to run automatically in the system tray at startup.



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].

Screen:

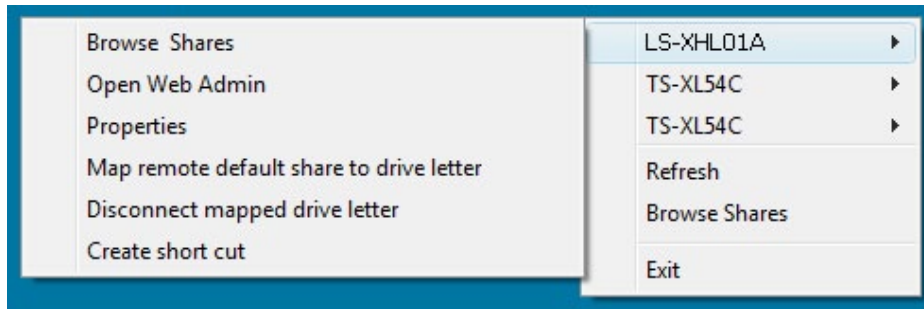


Clicking a LinkStation's icon will display its total capacity, capacity being used, IP address, workgroup, subnet mask, default gateway, MAC address, and firmware version.

Name		Descriptions
Menu	Map remote default share to drive letter (*)	Assigns the LinkStation's shared folder as a network drive.
	Disconnect mapped drive letter (*)	Removes the network drive mapping.
	Map all remote shares to drive letters	Assigns all the LinkStation's shared folders as network drives.
	Create desktop shortcut for Tera/LinkStation (*)	Creates a shortcut to the LinkStation's shared folder (share).
Menu	Launch NAS Navigator2 on startup	Launches NAS Navigator2 in the task tray when Windows boots.
	Display the error information	If an error occurs, an error message will pop up from the NAS Navigator2 icon in the task tray.
	Using a Default Browser	Uses Internet Explorer to display the LinkStation configuration utility.
	Properties (*)	Opens the selected LinkStation's Properties window.
	Close	Closes NAS Navigator2.
View	View	[Icon]: Displays icon for ease. [Details]: Displays Name, Product Name, Workgroup, IP Address, Subnet Mask, and Default Gateway.
	Sort by	Selects the sort order from following to display when multiple LinkStations are found: Host name, Product Name, Workgroup, IP Address, Subnet Mask, Default Gateway
Browse(*)		Opens the LinkStation's shared folder.
Refresh		Searches for NAS devices on the network again.

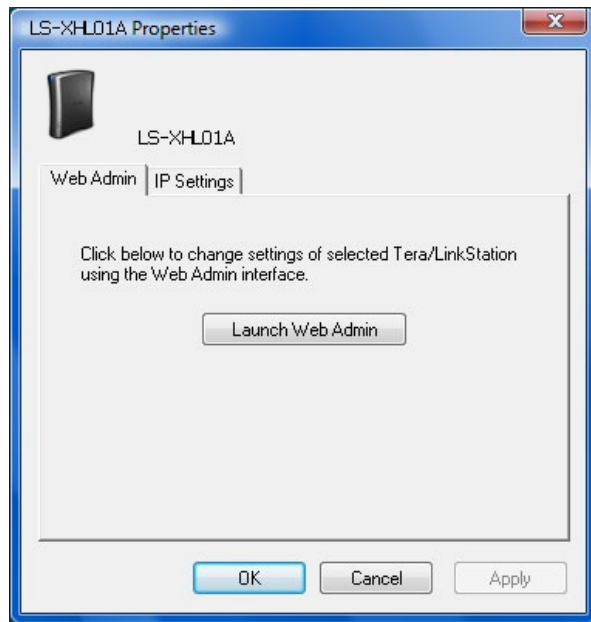
* not displayed unless the LinkStation's icon is clicked.

When NAS Navigator2 is minimized to the task tray, you have the following options from its icon.



Menu Item		Descriptions
LinkStation Name	Open Web Admin	Opens the LinkStation's configuration utility in a web browser.
	Properties	Opens the LinkStation's properties page.
	Map remote default share to drive letter	Assigns the LinkStation's default share as a network drive.
	Disconnect mapped drive letter	Unmaps the network drive.
	Create short cut	Creates a shortcut to a LinkStation's shared folder (share).
Refresh		Refreshes list of NAS devices.
Browse Shares		Displays NAS Navigator2 window.
Exit		Exits NAS Navigator2.

You can perform the following tasks from a LinkStation's properties window.



Menu Item	Descriptions
Web Admin	Opens a LinkStation's configuration utility.
IP Settings	If [Obtain an IP address automatically] is checked, the LinkStation will attempt to get its IP address automatically from a DHCP server. Alternately, you can manually enter the IP address, Subnet Mask, and Default Gateway Address for the LinkStation.

Mac OS X 10.3.9 or later

If you installed the LinkStation with the LinkNavigator CD, NAS Navigator2 was installed automatically. To launch it, click the NAS Navigator2 icon in the Dock.



Click on a LinkStation'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 LinkStation.

Name		Descriptions
Open		Opens the default shared folder for a selected LinkStation.
Rescan		Refreshes list of NAS devices.
Tool Menu	Open Web	Opens the selected LinkStation's configuration utility.
	Configure	Opens the selected LinkStation's configuration utility.
	Color Label	Selects the color of the name displayed below the icon.
	Show View Options	Sets the orders of icon sizes, label positions, and icons.

Chapter 3

Web Administration Tool

Home

The following options can be configured from the Home screen.

Name	Descriptions
Name	Displays the name of the LinkStation.
Firmware version	Displays the firmware version of the LinkStation.
IP Address	Displays the IP address of the LinkStation.
Workgroup	Displays the LinkStation's workgroup.
Storage	Displays the total capacity of the LinkStation's hard drive, as well as the amount used.
Shared Folders	Displays shared folders and disks on the LinkStation. If the [Users/Groups] tab is selected, Users and Groups are displayed. If the [Network] tab is selected, it shows if DHCP is Enabled or Disabled and displays the Ethernet Frame Size.
Logout	Log out of the LinkStation configuration utility.

Shared Folders

The following options can be set from the Shared Folders screen.

Name		Descriptions
Shared Folders Shared Folders > New Folder Click [Create Folder] to view this option.	Shared Folders	<p>Click [Create Folder] to open the Adding a New Shared Folder screen.</p> <p>Click a shared folder name to open the shared folder's settings screen.</p> <p>Select the shared folder and click [Delete] to delete the shared folder.</p> <p>Enter a letter in the [Find] field to display folders that begin with that letter. Click a folder name from the list to select the folder.</p> <p>The following tasks open the [Confirm Operation] screen.</p> <ul style="list-style-type: none"> • Delete Folder • Restore Factory Defaults • Format <p>Enter the number from the [Confirmation Number] field within 60 seconds, and click [Apply].</p>
	Copy Settings From	Select the shared folder you want to copy settings from.
	Name	<p>Enter a name for the share folder.</p> <p>You can enter up to 12 alphanumeric characters, or 6 two-byte characters. Alphanumeric characters, two-byte characters, hyphens, and underscores may be used.</p> <p>Do not use a number or symbol as the first letter of the name.</p>
	Description	<p>Enter a description for the shared folder.</p> <p>You can enter up to 50 alphanumeric characters, or 25 two-byte characters. Alphanumeric characters, two-byte characters, hyphens, and underscores may be used.</p>

Name		Description									
Shared Folders > New Folder Click [Create Folder] to view this option.	Volume	Select the volume for the shared folder.									
	Shared Folder Attributes	The shared folder may be read-only or writable.									
	Recycle Bin	<p>If enabled, deleted files are moved to a trashbox folder rather than actually deleted.</p> <p>You can enable recycle bin functionality for each shared folder on the LinkStation as well as usbdisk1.</p> <ul style="list-style-type: none">• To use Recycle Bin with usbdisk1, format it with EXT3, XFS, or FAT 32. NTFS and HFS+ are not supported because files cannot be deleted with these formats.• Recycle Bin is not supported while connecting via AFP or FTP.									
	Support	Select which operating systems and features the share will support.									
	<table><tr><th>Shared Folder Support</th><th>Description</th></tr><tr><td>Windows (SMB)</td><td>Check to enable SMB support for connection to Windows and Mac OS X.</td></tr><tr><td>Apple (AFP)</td><td>Check to enable AFP support for connection to Mac OS. Also, navigate to [Network]-[Network Settings]-[Network Services] and make sure that AFP is enabled there as well.</td></tr><tr><td>FTP</td><td>Check to enable remote FTP access to the share. Also, navigate to [Network]-[Network Settings]-[Network Services] and enable FTP there as well.</td></tr><tr><td>Disk Backup</td><td>Check to allow other LinkStations to use this share as a backup target.</td></tr></table>		Shared Folder Support	Description	Windows (SMB)	Check to enable SMB support for connection to Windows and Mac OS X.	Apple (AFP)	Check to enable AFP support for connection to Mac OS. Also, navigate to [Network]-[Network Settings]-[Network Services] and make sure that AFP is enabled there as well.	FTP	Check to enable remote FTP access to the share. Also, navigate to [Network]-[Network Settings]-[Network Services] and enable FTP there as well.	Disk Backup
Shared Folder Support	Description										
Windows (SMB)	Check to enable SMB support for connection to Windows and Mac OS X.										
Apple (AFP)	Check to enable AFP support for connection to Mac OS. Also, navigate to [Network]-[Network Settings]-[Network Services] and make sure that AFP is enabled there as well.										
FTP	Check to enable remote FTP access to the share. Also, navigate to [Network]-[Network Settings]-[Network Services] and enable FTP there as well.										
Disk Backup	Check to allow other LinkStations to use this share as a backup target.										

Name		Description
Shared Folders > New Folder	Remote backup password	<p>If another LinkStation will be backing up to this share, consider configuring a password for remote backup. This will make it easy to configure the other LinkStation to back up to the correct share and prevent other users from mistakenly backing up to it.</p> <p>Passwords may contain up to 8 alphanumeric, hyphen, and underscore characters. Don't use a hyphen as the first character.</p>
Click [Create Folder] from the Shared Folder Configuration Screen to view this option.		
Restrictions	Access Restrictions	<p>If using access restrictions, click [Add] to add users or groups that will be allowed to access the share.</p> <p>You may delete users and groups from the access list with the [Delete] button.</p> <p>With AFP and FTP connections, access restrictions can be set per user.</p>
Click [Access Restrictions] from the [Create Shared Folders] screen to view this option.		
DirectCopy	Target	Choose the destination folder for DirectCopy.
Click [Modify Settings] to change settings.		

Users/Groups

The following options can be set from the Users/Groups screen.

Name		Descriptions
Local Users	Local Users	<p>Displays Username, User ID, Description, and Primary Group.</p> <p>To create a new user, click [Create User].</p> <p>To edit the user, select the user name and click [Edit User]. To delete the user, select the user and click [Delete].</p> <p>If [Delegate Authority to External SMB Server][Network] - [Workgroup/Domain] is selected from [Network] - [Workgroup/Domain] for the authentication settings, a user who are registered at the LinkStation can be converted to an authorized user of the external SMB server by clicking [The selected user(s) will be converted to external users].</p> <p>Enter a letter in the [Find] field to list users that begin with that letter.</p> <p>The users [admin] and [guest] are built-in to the LinkStation. They cannot be deleted.</p> <p>If the LinkStation is a domain member, [Domain Users] will also be available. K</p>
	Local Users > New User	<p>Username</p> <p>Usernames may contain up to 20 alphanumeric characters, two-byte characters, hyphens, and underscores. Don't use a hyphen or underscore as the first character of the name.</p>
To display, click [Create a user]. Local Users	Description	<p>Descriptions may contain up to 50 alphanumeric characters or 25 two-byte characters. Letters, numbers, hyphens, underscores and spaces may be used.</p> <p>Do not use a space as the first character in a description.</p> <p>New users automatically belong to the [hdusers] group. You can change the group the user belongs to in Group Settings.</p>
	Password (within 20 characters)	<p>Enter the user's password. This should be the same password that the user uses to log in to his computer.</p> <p>Passwords may contain up to 20 alphanumeric characters. One-byte alphanumeric characters, hyphens, and underscores are supported. Don't use a hyphen as the first character of a password.</p> <p>If the user is using Mac OS, passwords must be limited to 9 or fewer characters. Otherwise, the user will not be able to access shared folders on the LinkStation.</p>
	Confirm Password	Enter the password again for confirmation.

Name		Descriptions
External SMB Server Users	External SMB Server Users	Navigate to [Network] - [Workgroup/Domain] - [For Workgroup Authentication] and select [Delegate Authority to External SMB Server] and [Automatic User Registration]. Users will be registered automatically and listed. To delete automatically registered users, select each user and click [Delete External User].

Name		Descriptions
Local Groups	Local Groups	<p>Displays Group Name, Group ID, and Description.</p> <p>To create a new group, click [Create Group].</p> <p>To edit a group, select it and click [Edit Group].</p> <p>To delete a group, select it and click [Delete].</p> <p>Note: Enter a letter in the [Find] field and groups beginning with that letter are displayed. Click on a group name in the list to select the group.</p>
Local Groups > New Group To display, click [Create Group] on the Group Screen.	Group Name	<p>Group names may contain up to 12 alphanumeric characters, hyphens, or underscores, or periods.</p> <p>Don't use a hyphen or period as the first character of a group name.</p>
	Description	<p>Group descriptions may contain up to 50 alphanumeric characters or 25 two-byte characters. You can use alphanumeric characters, two-byte characters, hyphens, spaces, and underscores.</p> <p>Don't use a space as the first character in a description.</p>
Local Users/Group Members	Local Users	<p>To add a user to the group, select the user and click [Add].</p> <p>Note: Domain Users from the Domain Controller cannot be added to groups here.</p>
	Group Members	<p>Displays users who are registered to a group. To unregister a user, select the user and click [Delete].</p>

Network

The following options can be set from the Network screen.

Name		Descriptions
IP Address Settings Click [Modify Settings] to change settings.	DHCP	If enabled, the LinkStation will attempt to get its IP address from a DHCP server on the network.
	IP Address	Set IP address.
	Subnet Mask	Set Subnet Mask.
	Default Gateway Address	Specify by IP address if Default Gateway Address exists.
	Primary DNS Server	Specify an IP address of the DNS server which has priority.
	Secondary DNS Server	Specify an IP address of an alternative DNS server.
Ethernet Frame Size Click [Modify Settings] to change settings.	Ethernet Frame Size	<p>Ethernet frame size is the maximum size of data that can be sent at a time. If all devices on your network support jumbo frames, you may be able to improve transmission efficiency by choosing a larger frame size than the default.</p> <ul style="list-style-type: none"> • 518 bytes (Default) Factory default value is 1518 bytes. • 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 Services	Network Services	<p>Enable or disable AFP and FTP.</p> <p>AFP must be enabled here for Mac OS computers to connect via AFP. Also, enable AFP in the shared folder settings to use AFP.</p> <p>FTP must be enabled here for remote users to access the LinkStation via FTP. Also, enable FTP in the shared folder settings to use FTP.</p>

Name		Descriptions
Workgroup/ Domain Click [Modify Settings] to change settings.	Workgroup Name	<p>Enter the workgroup name to have the LinkStation join a Microsoft network group.</p> <p>Workgroup names may contain up to 15 alphanumeric characters or 7 two-byte characters. You can use one-byte alphanumeric characters, two-byte characters, hyphens, underscores, and periods.</p> <p>Don't use a hyphen, underscore, or period as the first character of a workgroup name.</p>
	WINS Server IP Address	Enter the IP address of a WINS Server to use WINS Server.
Workgroup/ Domain	Authentication Method	<p>Select the user authentication method here.</p> <p>[Delegate Authority to LinkStation] (usually recommended) Only registered users may access the LinkStation. Usernames and passwords should be exactly the same as those used for Windows login.</p> <p>[Delegate Authority to External SMB Server] Users are authenticated by an external Authentication server. Microsoft network knowledge required for setup. Consult your System Administrator for details.</p> <p>[Use Windows Domain Controller as Authentication Server] Select this option when you want to authenticate against Domain Controller, but the LinkStation does not join the domain. Note: The Windows Domain Controller has been assigned to be an external authentication SMB Server. The workgroup name on the DEVICE_TYPE must be identical to the Windows Domain Name.</p> <p>[Automatic User Registration] Select to automatically register users allowed by the Authentication Server to the LinkStation's authenticated user list .</p> <p>[Enable Authentication Shared Folder] Use the folder as an authentication test folder which can be accessed by users registered to Authentication Server.</p>

Name		Descriptions
Workgroup/ Domain	Authentication Server Name or IP Address	<p>When [Delegate Authority to External SMB Server] is selected for the authentication method, specify the external server which is used for the user authentication by the server name or IP address of the server</p> <p>Note:</p> <ul style="list-style-type: none"> • When connecting using AFP or FTP/FTPS, always use an IP address. Authentication may fail if a server name is used. • Enter the IP address rather than the server name anytime that the server is not on the same subnet.
	Name	<p>When [Delegate Authority to External SMB Server] , [Automatic User Registration], and [Enable Authentication Shared Folder] are selected for the authentication method, specify the shared folder name for the authentication test. It can be registered as the users of the LinkStation automatically who open the shared folder for the authentication test.</p> <p>Note:</p> <ul style="list-style-type: none"> • You cannot create more than 2 shared folders for the Authentication test . • A user who is automatically registered will belong to the "hdusers" group. • You cannot use shared folder names which already exist as a shared folder name for the authentication test. • You can enter up to 12 alphanumeric characters or 6 two-byte characters. • You can use one-byte alphanumeric characters, two-byte characters, hyphens, and underscores. • Don't use a number or symbol as the first character of the name. • AFP and FTP/FTPS connection do not allow delegating authority to external SMB server to obtain user information.

System

The following options can be set from the System tab.

Name		Descriptions
Settings		
Name	LinkStation Name	Enter a name to identify the LinkStation on the network. Names may contain up to 15 alphanumeric characters, hyphens, and underscores. Don't use a hyphen or underscore as the first character of a name.
	Description	Descriptions may contain up to 50 alphanumeric characters or 25 two-byte characters. You can use alphanumeric characters, two-byte characters, spaces, hyphens, and underscores. Don't use a space as the first character in a description. Descriptions are only displayed in Windows. They will not be displayed on a Macintosh.
Date and Time	Date/Time Source	Select [Automatic] to use an NTP to correct system time automatically. Select [Manual] to set time manually.
	Primary NTP IP Address	Enter the DNS name or the IP address of an NTP server. You may use ntp.jst.mfeed.ad.jp or 192.168.11.123, for example. To specify ntp.jst.mfeed.ad.jp as the NTP server, select [Use the default NTP server (ntp.jst.mfeed.ad.jp)].
	NTP Synchronization Frequency	You may have NTP correct your system time [Daily], [Weekly], or [Every 3 hours].
	Time Zone	Specify Time Zone.
	Date	Displays year, month and date. Enter numbers to change these values.
	Time	Displays time. Enter numbers to change the value manually. Click [User Local Date/Time] to obtain time and time zone from the internal clock of your computer. Note: If system clocks on your network get more than 5 minutes off from each other, it may cause problems with your network. For best results, use an NTP server to automatically set the system time for all of your network devices, including the LinkStation.
Language	Display Language	Select the language to be displayed.
Click [Modify Settings] to change settings.	Windows Client Language	Select the language to be used in the Windows client.

Name		Descriptions
Storage		
Disks	Check Disk	<p>You may run a disk check on hard drives in or attached to the LinkStation via USB. Depending on the size of the disk, a disk check may take many hours to complete.</p> <p>Notes:</p> <ul style="list-style-type: none">• You cannot run a disk check at the same time as a backup job.• During the disk check, the file sharing service stops. <p>If the unit is disconnected abnormally from Mac OS, the database created by Mac OS may be destroyed and you can no longer connect to the unit. If this happens, select [Delete any hidden, non-essential Mac OS dedicated files] and run a disk check. All of the files listed below will be deleted, including sub directories..</p> <ul style="list-style-type: none">• AppleDB• AppleDesktop• AppleDouble• TheVolumeSettingsFolder• Network Trash Folder • Please make sure the LinkStation is not selected as a backup destination of other LinkStation before you run the disk check. If the LinkStation is selected as the backup destination, do not run the disk check.

Name		Descriptions				
Storage						
Disks	Format Disk	<p>You may format disks in or connected to the LinkStation. All data on the disk will be deleted if the drive is formatted. Back up any important data before formatting a disk.</p> <p>You cannot format a drive if you've scheduled a backup job. Also, don't format the drive if it's configured as the backup target of another LinkStation.</p> <p>The following tasks open a [Confirm communications] screen.</p> <ul style="list-style-type: none">• Delete Folder• LinkStation's Restore Factory Defaults• Erase Disk of the LinkStation <p>Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].</p> <p>The LinkStation can format or recognize the following format types:</p> <table><tr><th>Format type</th><th>Descriptions</th></tr><tr><td>EXT3 (USB hard drive only)</td><td><p>EXT3 is recommended for external drives attached to the LinkStation.</p><ul style="list-style-type: none">• You can perform both Read and Write.• Supports Journaling File System.• May take a while to format (a few minutes to a hour).• Less space is available than XFS after formatted.• More files in 1 folder, slower the access space.<p>Note: An EXT3 Reader is included in this package for reading EXT3 disks from a Windows PC.</p></td></tr></table>	Format type	Descriptions	EXT3 (USB hard drive only)	<p>EXT3 is recommended for external drives attached to the LinkStation.</p> <ul style="list-style-type: none">• You can perform both Read and Write.• Supports Journaling File System.• May take a while to format (a few minutes to a hour).• Less space is available than XFS after formatted.• More files in 1 folder, slower the access space. <p>Note: An EXT3 Reader is included in this package for reading EXT3 disks from a Windows PC.</p>
	Format type	Descriptions				
EXT3 (USB hard drive only)	<p>EXT3 is recommended for external drives attached to the LinkStation.</p> <ul style="list-style-type: none">• You can perform both Read and Write.• Supports Journaling File System.• May take a while to format (a few minutes to a hour).• Less space is available than XFS after formatted.• More files in 1 folder, slower the access space. <p>Note: An EXT3 Reader is included in this package for reading EXT3 disks from a Windows PC.</p>					

Name		Descriptions												
Storage														
Disks	Format Disk	<table><tr><th>Format type</th><th>Descriptions</th></tr><tr><td>XFS (USB Hard Drive/LinkStation Internal Hard Drive)</td><td><p>This format is recommended for the internal drive in the TeraStation or LinkStation.</p><ul style="list-style-type: none">• Supports both Reading/Writing.• Supports Journaling File System.• More space is available than XFS after formatted.• Access speed will not degrade even with many files in a single folder.<p>XFS is not supported by legacy LinkStations such as HD-LAN, HD-HLAN, or HD-HGLAN series.</p><p>You cannot read data on an XFS drive by directly connecting to your PC.</p></td></tr><tr><td>FAT32 (USB hard drive only)</td><td><p>FAT32 is recommended if you're going to connect the drive to Windows and Mac computers as well as the LinkStation. It works with most computers and devices.</p><ul style="list-style-type: none">• Supports both Reading/Writing.• Cannot copy or backup data with more than 4 GB per file.• Cannot use some characters which are used in Mac OS X such as [:].</td></tr><tr><td>NTFS (USB hard drive only)</td><td><p>Cannot format from the LinkStation configuration screen. This is Read Only for the LinkStation. It can be used read/write with Windows 7/Vista/XP/2000, or Windows Server2003/Server2008.</p><ul style="list-style-type: none">• Read Only (not writable for backup either).</td></tr><tr><td>HFS+ (USB hard drive only)</td><td><p>Cannot format from the LinkStation configuration screen. Read-Only.</p><p>Can be used to connect to Mac OS X 10.3.9 or later.</p><ul style="list-style-type: none">• Read Only (not writable for backup either).</td></tr></table>	Format type	Descriptions	XFS (USB Hard Drive/LinkStation Internal Hard Drive)	<p>This format is recommended for the internal drive in the TeraStation or LinkStation.</p> <ul style="list-style-type: none">• Supports both Reading/Writing.• Supports Journaling File System.• More space is available than XFS after formatted.• Access speed will not degrade even with many files in a single folder. <p>XFS is not supported by legacy LinkStations such as HD-LAN, HD-HLAN, or HD-HGLAN series.</p> <p>You cannot read data on an XFS drive by directly connecting to your PC.</p>	FAT32 (USB hard drive only)	<p>FAT32 is recommended if you're going to connect the drive to Windows and Mac computers as well as the LinkStation. It works with most computers and devices.</p> <ul style="list-style-type: none">• Supports both Reading/Writing.• Cannot copy or backup 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)	<p>Cannot format from the LinkStation configuration screen. This is Read Only for the LinkStation. It can be used read/write with Windows 7/Vista/XP/2000, or Windows Server2003/Server2008.</p> <ul style="list-style-type: none">• Read Only (not writable for backup either).	HFS+ (USB hard drive only)	<p>Cannot format from the LinkStation configuration screen. Read-Only.</p> <p>Can be used to connect to Mac OS X 10.3.9 or later.</p> <ul style="list-style-type: none">• Read Only (not writable for backup either).	Remove Disk	Select the USB hard drive and click [Remove Disk] to safely remove the USB hard drive.
		Format type	Descriptions											
		XFS (USB Hard Drive/LinkStation Internal Hard Drive)	<p>This format is recommended for the internal drive in the TeraStation or LinkStation.</p> <ul style="list-style-type: none">• Supports both Reading/Writing.• Supports Journaling File System.• More space is available than XFS after formatted.• Access speed will not degrade even with many files in a single folder. <p>XFS is not supported by legacy LinkStations such as HD-LAN, HD-HLAN, or HD-HGLAN series.</p> <p>You cannot read data on an XFS drive by directly connecting to your PC.</p>											
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	HFS+ (USB hard drive only)	<p>Cannot format from the LinkStation configuration screen. Read-Only.</p> <p>Can be used to connect to Mac OS X 10.3.9 or later.</p> <ul style="list-style-type: none">• Read Only (not writable for backup either).												
	Rediscover Disk	Not used for this product												

Name	Descriptions						
Storage							
Disks RAID Array *1 *1: LS-WXL, LS-WSXL only	<p>Configure RAID array from this menu.</p> <p>RAID 0 and RAID 1 mode are available for use. LinkStation will be used just as the two hard drives if RAID setting is disabled.</p> <p>Disk Structure:</p> <p>Displays the hard drive configuring RAID. To configure a RAID array, check the target drive, select RAID mode and click [Create Array]. To delete the RAID array, select [Remove Array].</p> <p>Changing RAID Array setting causes data loss. Back up any important data in advance.</p>						
RAID Scanning *1 *1: LS-WXL, LS-WSXL only	<p>A RAID scan tests your RAID array for errors. If errors are found, they are fixed automatically if possible. If you are using a RAID array, regular RAID scans are recommended.</p> <p>Recoverable errors found during standard file operations will be automatically repaired regardless of performing RAID scanning or not.</p> <table border="1"> <thead> <tr> <th>Status</th><th>Descriptions</th></tr> </thead> <tbody> <tr> <td>Recoverable errors</td><td>• Read error in the data area which are build in RAID 1(including RAID 1 system area)</td></tr> <tr> <td>Unrecoverable errors</td><td>• Writing error / RAID management area error / drive partition information area / Drive Detection Failure</td></tr> </tbody> </table> <p>If many recoverable errors (bad cluster) are found in one of the hard drives which builds RAID, that drive will be removed and the system will automatically move to degrade mode.</p> <p>Since the data is not protected in the degrade mode, it is strongly recommended to replace the erroneous hard drive immediately.</p> <p>When running RAID Scanning in the first time, it is strongly recommended to backup data on the LinkStation in advance.</p> <p>RAID Scanning: Set whether using RAID Maintenance or not.</p> <p>RAID Scanning Schedule: Select the schedule to perform RAID Maintenance.</p> <ul style="list-style-type: none"> •Every Week [Sun-Sat] • 1st [Sun-Sat] • 2nd [Sun-Sat] • 3rd [Sun-Sat] 	Status	Descriptions	Recoverable errors	• Read error in the data area which are build in RAID 1(including RAID 1 system area)	Unrecoverable errors	• Writing error / RAID management area error / drive partition information area / Drive Detection Failure
Status	Descriptions						
Recoverable errors	• Read error in the data area which are build in RAID 1(including RAID 1 system area)						
Unrecoverable errors	• Writing error / RAID management area error / drive partition information area / Drive Detection Failure						

Name		Descriptions
Storage		
RAID Scanning		<ul style="list-style-type: none"> • 4th [Sun-Sat] • 1st, 3rd [Sun-Sat] • 2nd, 4th [Sun-Sat] • Every 1st day / month <p>Select [Begin Immediate RAID Scan]] and click [Save] to immediately run the maintenance.</p> <p>RAID Scanning Start Time:</p> <p>Select time to start RAID from 0 to 23 o'clock.</p> <p>*Click [Abort RAID Scanning] to stop the operation.</p> <p>RAID Array Error Detection Response:</p> <p>When there is an error on RAID Array, the system will be automatically shut down to protect data (This feature is only for RAID 1. This does not work under normal mode or RAID 0 mode).</p> <p>The default setting is [Shutdown].</p>
Backup		
View NAS Devices	Local LinkStation	<p>Displays LinkStations and TeraStations on the network with shares enabled for backup.</p> <p>Click [Refresh] to update the list.</p>
	Off Subnet LinkStation	<p>You can add an off-subnet LinkStation or TeraStation to the list. Enter the IP address of the LinkStation/TeraStation and click [Add].</p> <p>Note: Only devices with active backup shares can be registered.</p>

Name		Descriptions				
Backup						
<div>Search for Backup Destination by Password</div> <div>Click [Modify Settings] to change settings.</div>	Password to Search	Enter a password to search for LinkStations and TeraStations with that password for backup.				
		Example of Configuration				
		Configuration on the LinkStation (Backup Destination)				
		Name		share1	share2	share_free
		Remote backup password		111	222	None
		Example of Configuration				
		Configuration on the LinkStation (Backup Source)				
		The shared folder as a backup destination displayed when "222" is set on "Search for Backup Destination by Password" on the LinkStation as a backup source.		View	Not Displayed	View
		The shared folder as a backup destination displayed when "222" is set on "Search for Backup Destination by Password" on the LinkStation as a backup source.		Not Displayed	View	View
		A shared folder as a backup destination displayed when the password is not set		Not Displayed	Not Displayed	View

Name		Descriptions
Backup		
<p>Search for Backup Destination by Password</p> <p>Click [Modify Settings] to change settings.</p>	<p>Password to Search</p>	<p>Steps for Setup</p> <p>1 In the configuration utility of the backup destination, set "Remote backup password" for each shared folder.</p> <p>2 When setting up the backup for the LinkStation which is the backup source, set the same password of "Search for Backup Destination by Password" as for "Remote backup password" which is set for the shared folder you want to display as the backup destination.</p> <p>3 Set up the backup at the LinkStation which is the backup source. Select the shared folders of the backup destination from the following.*</p> <ul style="list-style-type: none"> • Shared folders in the LinkStation which is the backup source. • The USB hard drive connected to the LinkStation which is the backup source. • A shared folder for which "Remote backup password" is not set in the Link/TeraStation which is the backup destination. • A shared folder whose "Remote backup password" in the LinkStation/TeraStation which is the backup source matches with "Search for Backup Destination by Password". <p>* "Backup" must be enabled as a published destination when setting up the shared folder.</p>
<p>Backup Jobs Setup</p>	<p>Backup Jobs Setup</p>	<p>Click [Create New Job] to set up to 8 backup timers.</p> <p>Back up data saved on the LinkStation to the USB external hard drive or another Link/TeraStation at the specified time.</p> <p>Notes: • If you choose the USB hard drive in order to utilize this backup feature, the USB drive must be formatted in FAT32, XFS or EXT3 The format type for a USB hard drive can be displayed on the LinkStation configuration utility, [System] - [Disk].</p> <ul style="list-style-type: none"> • If a USB drive is formatted in FAT32, the maximum file size that can be backed up is 4 GB. • Never unplug the LAN cable connected to the LinkStation or USB hard drive during backup. • Do not restore, run Check Disk, Backup Job setup and Folder Setup, User/Group, Add, Edit, or Delete User during backup. Otherwise, the backup may fail. • If an error occurs during a regularly scheduled backup (Every day/Every Week), the backup job will not be performed after that. You will need to configure the backup job again. However, this does not apply when "Ignore Errors and Proceed with Backup" option is selected.

Name		Descriptions
Backup		
Backup Jobs Setup	Job Name	Enter the name you want for a backup task.
	Backup Job Schedule	Select the schedule to run from [Not Scheduled], [Immediate], [Every Day], or [Every Week].
	Backup Date	Select the day or time to run the backup job.
	Backup Operation Mode	<p>Select the Backup Operation Mode from the following choice.</p> <ul style="list-style-type: none"> • Normal Backup • Overwrite Backup (Append Backup) • Overwrite Backup (Differential Backup) <p>Caution: If you select "Overwrite Backup (Differential Backup), any files which do not exist in the source will be deleted without further warning or notice.</p> <p>All operation modes other than normal backup will overwrite all data at the backup destination.</p> <ul style="list-style-type: none"> • 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 errors. In such a case, rerun the backup job.
Click [Create New Job] to display this option in the Backup Configuration Screen.		

Name		Descriptions			
Backup					
Backup Jobs Setup <					

Name		Descriptions
Maintenance		
E-mail Notification Click [Modify Settings] to change settings. Click [Send Test Message] to send a test e-mail to the e-mail address which has been set.	Notification	Select whether using E-mail notification feature or not. Following message is sent by using E-mail Notification. Note: Mail Server displays the list of "POP before SMTP (the method to give the permission to use SMTP server by authenticating at specified POP server before sending e-mail)". If this is set, this feature cannot be used.
	SMTP Server Address	Enter SMTP Server Address (Mail Server Address).
	SMTP Port No.	Enter SMTP Port number.
	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 (E-mail server address).
	POP3 Port No.	Enter POP Port number.
	SSL/TLS	When "LOGIN(SMTP-AUTH)" and "CRAM-MD5(SMTP-AUTH/CRAM-MD5)" are selected for Authentication Type, specify either using "S" or "TLS".
	Username	Enter a user name that will be used for authentication.
	Password	Enter the password used to access with above user name.
	Subject	Specify the subject of the e-mail to be sent. Use only one-byte characters, not two-byte characters.
	Recipient(s)	Enter the e-mail address of the receiver, and click [Add]. You can register up to 5 e-mail addresses as receivers.
	Report	Select the contents to send in the e-mail notification. <ul style="list-style-type: none"> • HDD Status Report Send the status other hard drive of the LinkStation on the specified time on [HDD Status Sending Time]. • Sent if a problem on the fan of the LinkStation. • Sent when an error occurs on the drive. • When the backup job is completed Sent if the backup of the LinkStation is completed.

Name		Descriptions
Maintenance		
Restart	Restart LinkStation	Click [Restart the LinkStation] to reboot the LinkStation.
Power Management		
UPS Settings Click [Modify Settings] to change settings.	UPS Status	This is the feature to shutdown the LinkStation 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. Note: This setting must be done after connecting the UPS and the LinkStation with a USB cable.
	Synchronize with UPS	Select [Enable] when using Synchronization with UPS feature. Note: [USB Port / APC Style (OMRON Style)] can be only set when an APC USB UPS is connected.
	UPS Connection Type	Select a connection method with UPS. Note: [USB Port / APC Style (OMRON Style)] can be only set when UPS manufactured by APC for USB connection is connected.
	LinkStation behavior When Power failure	Allows you to set the time until shutdown when the power failure continues. Or, it can shut down when it detects "Battery Low" from UPS. Note: Shutting down by Battery Low can be used only when UPS for USB connection is used.
	UPS behavior after LinkStation shutdown	Specify whether or not to shut down the UPS after shutting down the LinkStation.
Sleep Timer Click [Modify Settings] to change settings.	Timer Interval	Select Sleep Timer interval from [Disable], [Everyday], or [Specific day of the week]. If selecting [specific day of the week], specify the day by clicking the check box of the day. Timer can be set from 1 - 3.
	Wake up at	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 at	Specify the ending time to move from Normal state to Standby State. You can set time from 0:00 to 27:45. Note: You can not set the ending time before or the same time as a beginning time.

Name		Descriptions
Restore/Format		
Restore Factory Defaults	Upon restore	Click [Modify Settings] and select whether or not Initialization will reset the admin password. Note: If [Keep current admin password] has been selected, you cannot reconfigure the LinkStation without the password. Please write down the password and keep it in a safe place!.
	Restore LinkStation	The following settings are initialized by [Restore LinkStation]. LinkStation Name, Description, NTP Settings, Workgroup Settings, Shared Service Settings, Access Restrictions for Shared Folders, User Settings, User Group Settings, E-mail Notification, UPS Settings, Backup Jobs Setup, Admin password Note: The following tasks require a [Confirm communications] screen. <ul style="list-style-type: none"> • Delete Folder • Restore LinkStation • Format LinkStation • Erase Disk Enter the number shown in the [Confirmation Number] field within 60 seconds, and click [Apply].
Format LinkStation	Format LinkStation	Clicking [Format LinkStation] will erase data completely on the hard drive of the LinkStation. Note: <ul style="list-style-type: none"> • All data will be erased. There is no “undo” for this! • While erasing, the settings for the LinkStation cannot be changed.

Extensions

The following options can be set from the Miscellaneous tab.

Name		Descriptions
WebAccess		
Folders Setup	Edit WebAccess Settings	<p>Enable the WebAccess service first, then click a shared folder name to display the [Edit] screen.</p> <p>Folder information of the LinkStation to be published by WebAccess Settings will be displayed on [Name] and [Description]</p> <p>In [WebAccess Settings], the following Access Restrictions can be selected.</p> <p>Disabled:</p> <p>Does not publish shared folders.</p> <p>Allow Anonymous:</p> <p>Anyone can access (view) shared folders.</p> <p>Allow All Groups / Users</p> <p>Allow to access (or view) only groups or uses registered to the LinkStation.</p> <p>Use Inherited Folder Permissions</p> <p>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.</p>

Name		Descriptions
WebAccess		
WebAccess Service	WebAccess Service	<p>[Enabled/Disabled] Configure whether or not to use WebAccess.</p> <p>[HTTPS/SSL Encryption] Set to use SSL encryption.</p> <p>[Use BuffaloNAS.com] Configure to use "BuffaloNAS.com" to access the LinkStation easily. Files in the WebAccess Shared folder are not saved on "BuffaloNAS.com".</p> <p>[BuffaloNAS.com Name] Enter a nickname for the LinkStation to register to "BuffaloNAS.com" server.</p> <p>Note: • This is the name to enter when accessing BuffaloNAS.com. It does not have to be the same name as the actual LinkStation. • If the LinkStation is left unconnected from the Internet a certain period of time, its name registration will be deleted on the BuffaloNAS.com server.</p> <p>[BuffaloNAS.com Key] Enter the key to save or use the nickname of the LinkStation to be registered to "BuffaloNAS.com" server.</p> <p>[DNS Host name] Enter the host name if using the general DNS service instead of utilizing "BuffaloNAS.com" server.</p> <p>[Auto-Configure Firewall (UPnP)] Select to use UPnP to automatically configure firewall settings. If a router does not support UPnP or automatic setting does not work, try manually.</p> <p>[External Port] If configuring manually without using UPnP, enter the external port of a router side. Forward the external port of the router side to the port 9000 of the LinkStation.</p>
WebAccess Service	Click [Modify Settings] to change settings.	

Name		Descriptions
Media Server		
Media Server Settings Click [Modify Settings] to change settings.	Media Server	<p>Authorized DLNA Media Clients: Displays MAC address, IP address, and device name of the DLNA compatible device that is connected to the network. Click [Allow] item, select [Allow] from [Allow/Deny], and click [Apply]. This will allow access from the devices being selected. Click [Refresh client list] to update the DLNA compatible devices information connected to the network.</p> <p>Click [Restart Media Server] to restart the Media Server.</p> <p>Enabled/Disabled: Select [Enabled] if using Media Server feature.</p> <p>Media Server Folder: Select a folder to be published as a Media Server. Click [Show folders on USB drives] to publish a folder from the media connected via USB connector.</p> <p>Automatic Update: Select to automatically update the DLNA database. Select [Refresh Now] and click [Save] will start updating immediately. Click [Save] while selecting [Initialize database before refresh] to initialize it and then update.</p> <p>Refresh interval (Minutes): Automatic update interval can be set by minutes.</p> <p>Restart Media Server: Restart the Media Server</p>

Name		Descriptions
PrintServer		
Print Server Click [Modify Settings] to change settings.	PrintServer	<p>Select whether or not to use the PrintServer (Windows only).</p> <p>Click [Delete Print Queue] to delete printer jobs.</p> <p>Note: Some printers may not work with the PrintServer.</p>

Name		Descriptions
BitTorrent		
BitTorrent	BitTorrent	Enabled/Disabled: Select [Enable] to use Bit Torrent. Download Folder: If using BitTorrent, select a download destination folder and click [Save]. To display the download screen, click [Open Download Manager].
Click [Modify Settings] to change settings.		

Name		Descriptions
Time Machine		
Time Machine	Time Machine	Select [Enable] when using to specify the LinkStation as a backup destination for Time Machine on Mac OS X 10.5 or later. Select a shared folder as a backup destination in [Target Folder].
Click [Modify Settings] to change settings.		
Mac Information	Mac Information	Enter [Target host name] and [target Mac address] of the Macintosh that will be using Time Machine with the LinkStation.

Appendix

Default Configuration Settings

The following settings are factory defaults for the LinkStation.

Administrator's Name	admin (cannot be changed)
Password	password
Shared folders	By default, the folder "share" may be accessed from both Windows and Macintosh computers. The recycle bin is [Enabled] on 'share' by default.
DHCP Client	Normally, the LinkStation will get its IP address automatically from a DHCP server on the network. If no DHCP server is available, then an IP address will be assigned as follows: IP Address: 169.254.xxx.xxx where xxx are random numbers between 1 and 254. Subnet Mask: 255.255.0.0
Registered Group	The LinkStation has 3 default groups: hdusers, admin and guest. You cannot edit or delete these groups.
Microsoft Network Group Setting	WORKGROUP Note: If you installed the LinkStation from the LinkNavigator installation CD, then the LinkStation's workgroup is set to the same workgroup as the computer you used for setup.
Ethernet Frame Size	1518 bytes
AFP	Disabled
FTP Server	Disabled
NTP	Enabled
Print Server	Use
WebAccess	Disabled
Media Server (DLNA/iTunes)	Use
BitTorrent	Disabled

Note: The installation program on the LinkNavigator CD can only configure a LinkStation once. To automatically install a LinkStation a second time, use the Init button to initialize the LinkStation's configuration first.

Mapping Additional Shares

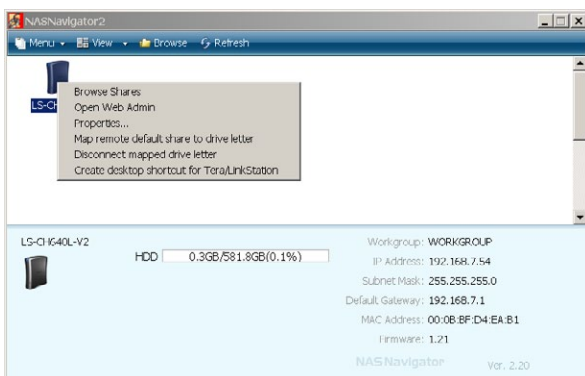
When you installed the LinkStation, a share was mapped as a network drive on the computer that was used for installation. You can map additional shares, or map shares to different computers.

Windows

With Windows 7/Vista/XP/2000 or Windows Server2003/Server2008, use NAS Navigator2 to map a driveletter to a shared folder on the LinkStation.

1 Click on the [Buffalo NAS Navigator2] icon on your Desktop. NAS Navigator2 will launch.

2



Right click on the LinkStation's icon and choose [Map Network Drive].

3



An icon for the mapped share will appear in [Computer] or [My Computer] . You can use this network drive just like other hard drives.

You've now mapped a driveletter to the network share. If the LinkStation is disconnected or off when your computer is booted, the message "The network path could not be found. The connection was not established" will be displayed.

Mac OS X

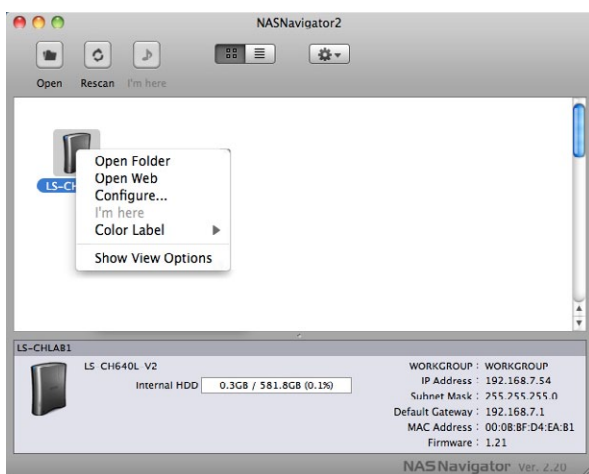
With Mac OS X 10.3 or later, use NAS Navigator2 to mount a share from the LinkStation as a drive on the Mac.

1



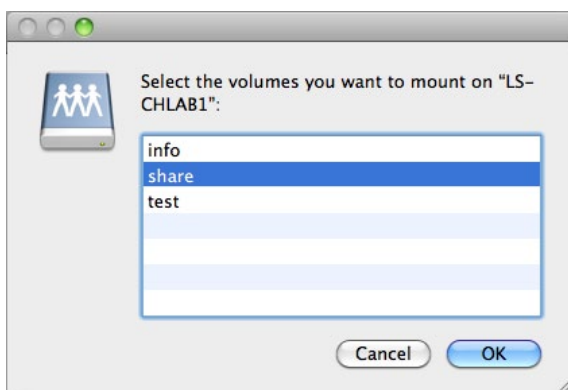
Click on the [NAS Navigator2] icon in the Dock. NAS Navigator2 will launch.

2



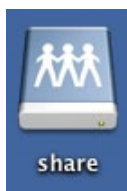
Hold the control key, click on your LinkStation's icon, then choose [Open Folder].

3



Select the folder that you want to mount and click [OK].

4



A drive icon will appear on the desktop. The shared folder is now mounted as a network drive. To dismount the share, drag and drop the share icon to the Trash.

File Sharing Security Level Change Tool

To use the LinkStation with Windows Vista, Windows Server2003, Windows Server2008, or Windows 7, you must change some security settings in Windows. The File Security Tool will make these changes for you automatically.

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

- 1 Click [Start] - [Buffalo] - [File Security Tool] - [File Security Tool].

The File Security Tool will launch. If "A program needs your permission to continue" is displayed, click [Continue].

- 2



- 1 When the [Change File Sharing Security Level] window opens, select [Change security level].
- 2 Click [Add].

- 3 The message, "Security level changed" is displayed. Click [OK].

- 4 The message, "Would you like to restart Windows now?" is displayed. Click [Yes].
Your PC should reboot.

You have changed the security level.

You can reset the security settings to their Windows defaults with the following procedure.

- 1** Click [Start] - [Buffalo] - [File Security Tool] - [File Security Tool]. If "A program needs your permission to continue" is displayed, click [Continue].
- 2** When the [Change File Sharing Security Level] window opens, select [Change back the file security level].
- 3** Click [Add].

The setting is now changed back.

Status LED (LS-XHL, LS-CHL)

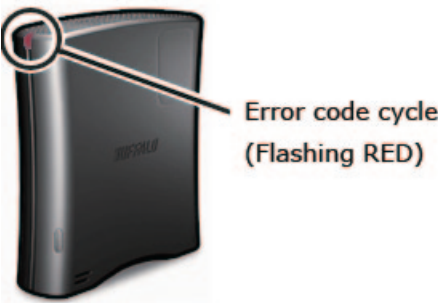
When the LinkStation is on, the blue Status LED is on. When it is off, the LED is also off.



Red flashing (Error)

The status LED flashes red if the LinkStation experiences an error. The way it flashes indicates the type of error.

Note: If there is an error, open NAS Navigator2. It may have an error message displayed.



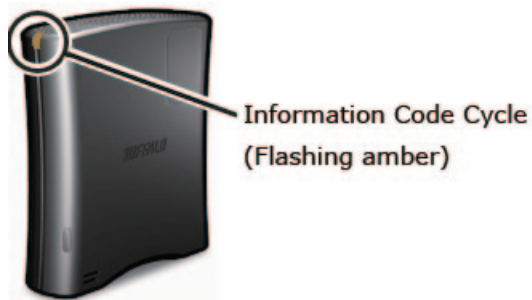
Place of an error code	The status of the light	Example of the display
Tens place of an error code	The LED illuminates for 1.0 seconds every 0.3 seconds. The number of flashes is the tens place of an error code.	Displaying E22
Ones place of an error code	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the ones place of an error code.	

Error code	Error Details
E01	Problems in DRAM DATA LINE. Contact a Buffalo service center for repair.
E02	Problems in DRAM ADDRESS LINE. Contact a Buffalo service center for repair.
E03	Problems in RTC CHIP. Contact a Buffalo service center for repair.
E04	Fail to extract Kernel. Contact a Buffalo service center for repair.
E06	The firmware is corrupted. Contact a Buffalo service center for repair. Wait for 5 minutes to show "E04" and turn off, or turn the power switch off.
E07	Hard disks are not detected. If the hard disks are connected, Contact a Buffalo service center for repair.
E10	UPS error. Operating from UPS battery. System will be safely shut down based on the configuration conditions. After the LinkStation shuts down, ensure that power is supplied to the UPS. If there is no problem, briefly press the function switch on the LinkStation (pressing and holding down the switch will not work).
E11	Fan Error. The fan is spinning too slowly or has stopped. Move the unit to a cool place with good airflow and no objects blocking the fan. If the LED remains lit, replace the fan with part OP-FAN/LS, sold separately.
E15	Hard disk IO error. Contact a Buffalo service center for repair.
E16	The hard disk is not connected or is malfunctioning. Contact a Buffalo service center for repair.
E17	Internal controller error. Contact a Buffalo service center for repair.
E20	The circuit board may be damaged. Disconnect and then reconnect power. Reboot the LinkStation. If the error persists, Contact a Buffalo service center for repair.
E21	Internal controller error. Contact a Buffalo service center for repair.
E22	Mount error. Contact a Buffalo service center for repair.
E23	The hard disk may be damaged. Contact a Buffalo service center for repair.

Amber flashing LED (Information code)

The status LED flashes amber with information codes. The way it flashes indicates the message.

Note: If the status LED is flashing amber, you can open NAS Navigator2. It will tell you the status of the LinkStation.

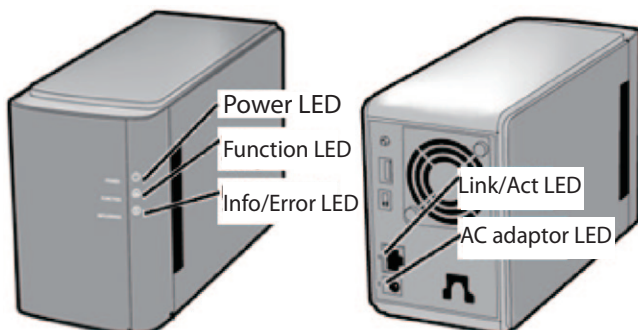


Place of numbers of the information code	The status of the light	Example of the display
Tens place of the information code	The LED illuminates for 1.0 seconds every 0.3 seconds. The number of flashes is the tens place of the information code.	Displaying I23
Ones place of the information code	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the ones place of the information code.	

Information codes	Meanings of the message
I19	Erasing disk (fills disk with zeros).
I23	Initializing the system settings.
I25	Updating the firmware.
I26	Initializing the Web settings.
I27	Checking a USB hard disk.
I28	Formatting a USB hard disk.

Status LED (LS-WXL)

There are 5 LEDs on the LinkStation: "Power", "Function", "Info/Error", "Link/Act", and "AC adaptor".



Power LED

Status	Meaning
Solid Blue	The LinkStation is powered on.
Blinking Blue	The LinkStation is starting up or shutting down.
LED is off	The LinkStation is off.

Function LED

Status	Meaning
Solid Blue	DirectCopy is ready (lights for 1 minute). USB device is dismounted (lights for 5 seconds). Initialization is in progress.
Blinking Blue	DirectCopy is in use. Notes: The function LED (blue) and the info/error LED (Orange) blink together if an error occurs during DirectCopy. Please do the following if this happens:. 1. Shut down the LinkStation . 2. Detach the USB device from the LinkStation. 3. Reattach the USB device to the LinkStation. 4. Power on the LinkStation.

Info/Error LED

The Info/Error LED blinks orange when it has a message. The message is coded by the pattern of blinking.

Note: – The messages are also available (uncoded) in NAS Navigator2.

Place	Status
10's place	The LED illuminates for 1 second every 0.3 seconds. The number of flashes is the ten's place of the information code.
1's place	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the one's place of the information code.

Information code	Message contents
I11	Many defective sectors have been found.
I13	The RAID array is being formatted.
I14	The RAID array is being checked.
I15	The error status of the RAID array is being investigated. Data transfers will be slower than usual until this is complete.
I16	The RAID array is being created.
I17	The RAID array is being resynchronized. Data transfers will be slower than usual until this is complete.
I18	The RAID array is being reconfigured. Data transfers will be slower than usual until this is complete.
I19	The RAID array is being erased.
I23	Initializing the system settings
I25	Updating the firmware
I27	Checking a USB drive
I28	Formatting a USB hard drive

The Info/Error LED blinks red to indicate an error.

The error may be identified by the pattern of blinking.

Note: – The error may also be viewed from NAS Navigator2.

Place	Status
10's place	The LED illuminates for 1 second every 0.3 seconds. The number of flashes is the ten's place of the error code.
1's place	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the one's place of the error code.

Error code	Error details
E00	MPU is abnormal; no power.
E01	DRAM data line is abnormal.
E02	DRAM address line is abnormal.
E03	RTC chip is abnormal.
E04	Kernel failure.
E14	The RAID array cannot be mounted. Turn off power, then turn power on again. If the same error is displayed, re-configure RAID.
E15	I/O error of hard drive.
E16	The hard drive is not connected, or data transfer has failed.
E17	Controller error.
E21	Controller error.
E23	The hard drive has crashed.

Link/Act LED

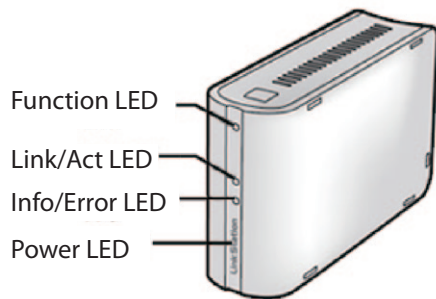
Status	Meaning
Solid green	Linking.
Blinking green	Accessing.

AC adaptor LED

Status	Meaning
Green	Power is connected.
Off	Power is not connected.

Status LED (LS-WSXL)

There are 4 LEDs on the LinkStation: "Function", "Info/Error", "Link/Act", and "Power".



Function LED

Status	Meaning
Solid Blue	DirectCopy is ready (lights for 1 minute). USB device is dismounted (lights for 5 seconds). Lights during initialization.
Blinking Blue	DirectCopy is in use. Notes: The function LED (blue) and the info/error LED (Orange) blink together if an error occurs during DirectCopy. Please do the following if this happens:. <ol style="list-style-type: none"> 1. Shut down the LinkStation . 2. Detach the USB device from the LinkStation. 3. Reattach the USB device to the LinkStation. 4. Power on the LinkStation.

Link/Act LED

Status	Meaning
Solid green	Linking.
Blinking green	Accessing.

Info/Error LED

The Info/Error LED blinks orange when it has a message.

The message is coded by the pattern of blinking.

Note: – The messages are also available (uncoded) in NAS Navigator2.

Place	Status
10's place	The LED illuminates for 1 second every 0.3 seconds. The number of flashes is the ten's place of the information code.
1's place	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the one's place of the information code.

Information code	Message contents
I11	Many defective sectors have been found.
I13	The RAID array is being formatted.
I14	The RAID array is being checked.
I15	The error status of the RAID array is being investigated. Data transfers will be slower than usual until this is complete.
I16	The RAID array is being created.
I17	The RAID array is being resynchronized. Data transfers will be slower than usual until this is complete.
I18	The RAID array is being reconfigured. Data transfers will be slower than usual until this is complete.
I19	The RAID array is being erased.
I23	Initializing the system settings
I25	Updating the firmware
I27	Checking a USB drive
I28	Formatting a USB hard drive

The Info/Error LED blinks red to indicate an error.

The error may be identified by the pattern of blinking.

Note: – The error may also be viewed from NAS Navigator2.

Place	Status
10's place	The LED illuminates for 1 second every 0.3 seconds. The number of flashes is the ten's place of the error code.
1's place	The LED illuminates for 0.5 seconds every 0.3 seconds. The number of flashes is the one's place of the error code.

Error code	Error details
E00	MPU is abnormal; no power.
E01	DRAM data line is abnormal.
E02	DRAM address line is abnormal.
E03	RTC chip is abnormal.
E04	Kernel failure.
E14	The RAID array cannot be mounted. Turn off power, then turn power on again. If the same error is displayed, re-configure RAID.
E15	I/O error of hard drive.
E16	The hard drive is not connected, or data transfer has failed.
E17	Controller error.
E21	Controller error.
E23	The hard drive has crashed.

Power LED

Status	Meaning
Solid Blue	The LinkStation is powered on.
Blinking blue	The LinkStation is starting up or shutting down.
Off	The LinkStation is off.

Compliance Information

FCC Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Environmental Information

- The equipment that you have purchased required the extraction and use of natural resources for its production.
- The equipment may contain hazardous substances that could impact health and the environment.
- In order to avoid the dissemination of those substances in our environment and to diminish the load on natural resources, we encourage you to use the appropriate take-back systems.
- The take-back systems will reuse or recycle most of the materials of your end of life equipment appropriately.
- The crossed-out wheeled bin symbol invites you to use those systems.
- If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administration.



Data Backup

While using the LinkStation, you may lose your important data due to sudden accidents, hard disk failure, or accidental misoperation. It is important to back up your data to recover data or minimize losses in such a case.

Use Mass Storage class hard disk manufactured by BUFFALO (such as TeraStation/LinkStation and a USB external hard disk) as Backup Targets.

GPL Information

The source code for Buffalo products that use GPL code is available at <http://opensource.buffalo.jp/>.