FlashPath™-Smart Media and FlashPath™-MultiMediaCard
Installation and User's Guide
for IBM® PC and Compatibles

with
Red Hat® 6.1 Linux Operating Systems

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Chapter 1 Welcome to FlashPath for Linux

Shaped like a 3.5-inch floppy disk, the FlashPath can write data to and read data from media using your computer's internal floppy disk drive. Just slip the FlashPath into your PC's floppy drive and access it as you would a normal floppy disk.

FlashPath for Linux supports IBM-PC compatible computers with 3.5-inch, 1.44 MB floppy drives.

The FlashPath is not designed to work with an external floppy drive, a USB floppy drive, a FireWire floppy drive, a floppy disk drive connected via a PC card, or a 120MB high capacity floppy disk drive.

3 mode drives are not supported as 3 mode under Linux.

CAUTION: Using the FlashPath in a 120MB high capacity floppy disk drive could damage your drive.

Note: Do not store the media in the FlashPath. To protect the FlashPath and floppy disk drive, remove the FlashPath from your floppy disk drive and place it in its jewel case as soon as you have finished using it.

Note: Avoid operating and storing the product in an environment subject to excessive temperature fluctuations which may result in condensation forming on the FlashPath.

Sleep Mode

Flashpath has a sleep mode to save batteries. When the FlashPath is left unused in the floppy drive for five minutes, it enteres sleep mode. If you are unable to communicate with the FlashPath and it has been left unused in the drive for over 5 minutes, it has probably entered this mode.

Simply eject the FlashPath, wait awhile, and reinsert the FlashPath to wake it up.

System Requirements

Supported Linux Kernel Versions

This driver is designed to operate on the Linux 2.2.x series kernels. It does not support and not designed to work on any earlier (Linux 2.1.x, Linux 1.2.x, etc) or later (Linux 2.3.x, etc) kernels.

Supported Linux Distributions

The Red Hat 6.1 distribution is the only distribution that has been fully tested. Other distributions that include the GNOME windowing toolkit and conform to the LSB standards *may* work with the driver but they have not been tested.

Most Linux software should work properly with the SmartDisk driver.

In general, directly writing information to an unmounted SmartDisk FlashPath device is strongly discouraged.

Disk Formatting: fdformat, mkdosfs, mke2fs, etc.

Linux disk formatting utilities are not intended for use with specialized hardware like the SmartDisk FlashPath. Lab testing indicates these utilities will seriously corrupt the information on the SmartMedia and MMC media.

If you must format your media, you MUST format the media in your digital appliance. Follow your digital appliance recommendations for formatting the media.

Direct Disk I/O: Writing

Linux, like many Unix systems, provides a device file for the floppy drive (namely `/dev/fd0`). Users can use this device file to directly access the contents of the device in a sector-by-sector manner.

Users often use this concept to write disk images to a floppy or create boot disks (using `LILO` or some other utility). While reading from the SmartDisk FlashPath device file is supported by the driver, writing to certain areas of the device is known to corrupt the media.

Do not use any utility other than the FlashPath driver to write to the media.

Operating and Storage Conditions

Storage	Temperature:	0 to + 65°C
	Temperature Change:	< 20°/hr.
	Humidity:	20-80% (non-condensing)
Operating	Temperature:	0 to + 55°C
	Temperature Change:	< 20°/hr.
	Humidity:	20-80% (non-condensing)

Installing Batteries

Your FlashPath comes with batteries already installed. When batteries expire, replace both batteries with new CR2016 lithium button cell batteries. **Batteries cannot be re-charged.**

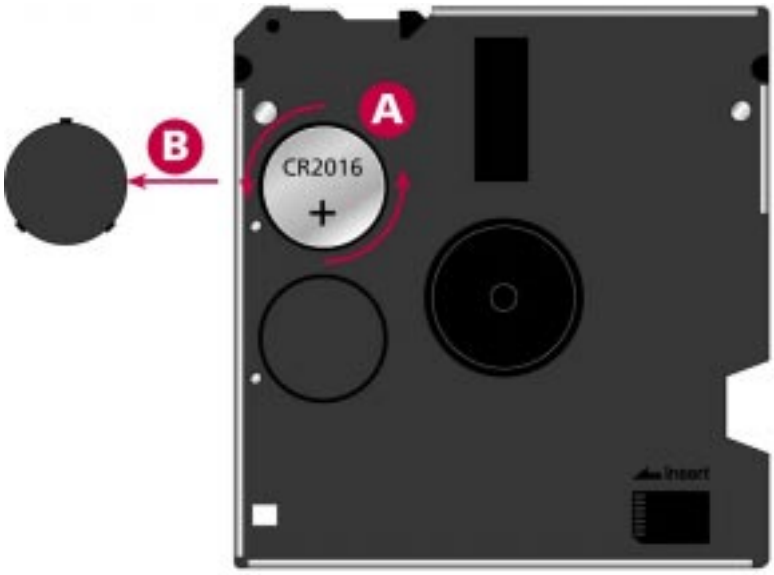
To change batteries

Place your FlashPath on a flat surface and gently press down on the battery cover.

a. Turn each cover counter-clockwise until the battery compartment is open.

b. Install new lithium button cells. Make sure the positive side (marked with a + sign) is up and that the side spring contact is located on the side of the battery. The contact must not be trapped beneath the battery.

CAUTION: Make certain the battery covers are properly replaced and secured before placing the Flashpath into your floppy drive.

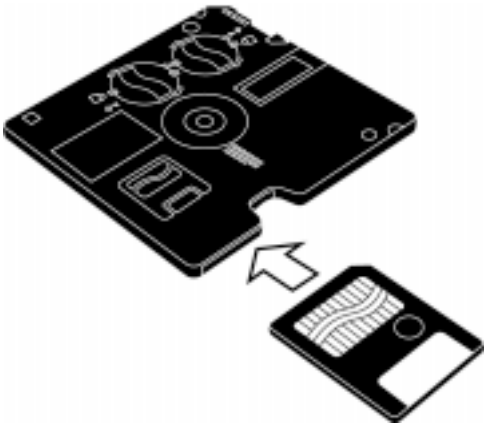


Changing Batteries

Note: Always replace both batteries at the same time. Use lithium button battery CR2016.

Inserting Media into the FlashPath

Insert the media into the FlashPath with the electronic contacts facing away from the metallic top cover of the FlashPath. Insert the media only until the media seats in the FlashPath.



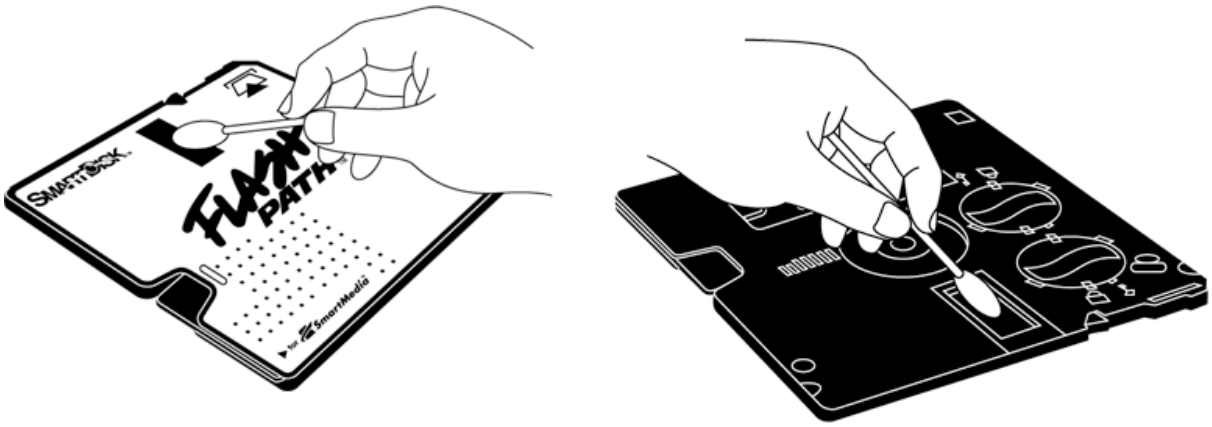
Caution: Do not use excessive pressure. If you fail to completely insert the media, remove the media; check that contacts and case are clean, and try again.

Note: FlashPath will not operate if media is not inserted completely.

Cleaning

Remove the FlashPath from the floppy disk drive; remove the media from the FlashPath. Use a clean, dry, lint free cloth or cotton swab to wipe off any oil, dust, or particles in the slot on the front and the back of the FlashPath.

If necessary, clean the remainder of the outside of the FlashPath with a clean, lint free cloth or paper towel and denatured alcohol.



Cleaning the FlashPath

After cleaning, place FlashPath in its jewel case for storage.

Chapter 2 Installing FlashPath for Linux Software

Getting the Driver

The driver is available from the Linux Downloads section of the SmartDisk website (http://www.smartdisk.com/Downloads/FPDrivers/LinuxDownload.htm).

It is delivered as a tarred and gzipped archive.

The downloaded driver's filename should be in the format `flashpath-X.Y.Z.tar.gz` where `X` is the major release version, and `Y` is the minor release, and `Z` is the patch level.

Unpacking the Driver

After downloading the driver, copy it to the `/tmp` directory. Extract the driver with the following commands (replacing `X.Y.Z` with the version number of the driver that was downloaded):

```
$ cd /tmp
$ tar zxvf flashpath-X.Y.Z.tar.gz
$ cd flashpath-X.Y.Z
```

Configuring the Driver

At this point, the driver should be unpacked, and you are in the `/tmp/flashpath-X.Y.Z` directory. Now, simply run the following command to configure the driver for the system and kernel version it will be running upon:

```
$ ./configure
```

The `configure` program should autodetect the system's configuration. If an error was reported by `configure`, or if you need to perform custom configuration, please skip to the *Troubleshooting: Installation: `configure`* section of this document.

Building the Driver

To build the driver, just run the following command in the `flashpath-X.Y.Z` directory:

```
$ make
```

If any errors are reported, see the *Troubleshooting: Installation: `make`* section.

Installing the Driver

To install, run the following command in the `flashpath-X.Y.Z` directory. Note that this command *must* be run as the *root* user. Again, if any errors are reported, see the *Troubleshooting: Installation: `make install`* section.

```
# make install
```

Two files are installed:

. `/lib/modules/A.B.C-D/block/flashpath.o`

The SmartDisk FlashPath device driver. In the above path, "`A.B.C-D`" is the current Linux kernel version.

. `/usr/local/bin/fpmonitor`

The SmartDisk FlashPath status monitor.

Chapter 3 Using the FlashPath for Linux Software

Starting the Driver

To enable the use of the FlashPath, the device driver must be loaded. To load the driver, first log in as the user *root*, then run the following command:

```
# /sbin/modprobe flashpath
```

To have the driver automatically loaded at boot-up on Red Hat 6.1 systems as *root*, use the following command:

```
# echo /sbin/modprobe flashpath >>/etc/rc.d/rc.modules
```

To activate this change, run the following command. This will allow the system to automatically load the driver when the system restarts.

```
# chmod 0755 /etc/rc.d/rc.modules
```

Starting the Status Monitor

The status monitor program, `fpmonitor`, can be run as any user. It will run in the background and pops-up status messages on the console. If run in an X11 session, status messages will be popup dialogs. If run from a text console, these messages will appear as text.

The only supported options are:

-V to get the version of the `fpmonitor` software.

-k to kill any currently running `fpmonitor`.

See the following usage examples and the section *Stopping the Status Monitor* below.

Examples:

```
$ fpmonitor -V
FlashPath Status Monitor v0.2.1
$ fpmonitor
FlashPath Status Monitor v0.2.1: started (12345)
```

Mounting a FlashPath device

To use the FlashPath device under Linux, you must mount it. The most reliable way to do this under Red Hat is to use the following command as *root*:

```
# mount -t vfat /dev/fd0 /mnt/floppy
```

Unmounting a FlashPath device

Before the FlashPath can be removed, it must be unmounted.

Unmounting is performed with the following command:

```
# umount /mnt/floppy
```

Unmounting the FlashPath may take a while, as up to 64Mb of information may be queued up. You must wait for the drive light to go out before removing the FlashPath from the floppy drive.

Stopping the Status Monitor

To stop the Status Monitor, use the `fpmonitor -k` command:

```
$ fpmonitor -k
FlashPath Status Monitor v0.2.1: stopped (12345)
```

Stopping the Driver

To stop the driver, use the `rmmod` utility:

```
# rmmod flashpath
```

Restarting the Driver

To restart the driver run the following command:

```
# /sbin/modprobe flashpath
```

Important

Do not compress files on the media in the FlashPath using a drive space stacker, etc. You can store Zip files on the media; however, you cannot compress the file system on the media.

To Erase Old Pictures from Media

1. First copy any file you want to keep to your hard drive or other media.
2. Use the delete function to remove any unwanted files.

Chapter 4 Troubleshooting

General

Becoming the Root User

You can become the *root* user by either logging in as the user *root*, or by becoming `su` as follows:

```
$ su
Password:       (enter password here)
#
```

To end the *root* user session, use the `exit` command, as shown:

```
# exit
$
```

Determining Whether a Package Has Been Installed

To verify whether a package has been installed, run the rpm query command:

```
$ rpm -q -i packagename
```

If the package is not installed, the user should follow the documentation that came with their distribution and install the package from the Red Hat CDROM.

Determining if the FlashPath Driver is Loaded

To determine if the FlashPath driver is loaded, run the following command, and you should get a table simular to:

```
$ cat /proc/modules
flashpath       91844   2
cs4232          2704    0
sound           56792   0       [cs4232]
soundlow        420     0       [sound]
soundcore       2628    5       [sound]
```

If the `FlashPath` driver is loaded, it will be in the first column. The second column indicates the amount of memory (in bytes) the driver is using. The third column is the number of programs using the driver, and the last column is for diagnostic information.

Determining the FlashPath Driver Version

The `FlashPath.o` driver should indicate its version number in the system logs when it is loaded. For example:

```
# /sbin/modprobe flashpath

# tail /var/log/messages

. . .

kernel: FlashPath: Copyright 2000, SmartDisk Corp.

kernel: FlashPath: Driver (v0.2.1) loaded

. . .
```

The driver's version number can also be determined *before* it is loaded with the following command:

```
$ strings /lib/modules/`uname -r`/block/flashpath.o |
grep Driver

<6>FlashPath: Driver (v0.2.1) loaded

<6>FlashPath: Driver (v0.2.1) unloaded
```

Determining the Status Monitor Version

The status monitor (`fpmonitor`) will print out its version number with the -V option, ie:

```
$ fpmonitor -V

FlashPath Status Monitor v0.2.1
```

Installation

configure Utility

The `configure` utility is designed to autodetect the system configuration and modify the driver to suit the system. In some cases, either the autodetection fails to find a crucial system component or misidentifies an existing component.

A common problem is that the user hasn't installed the proper packages to compile and install the driver.

Verify that the following packages are installed:

```
kernel-headers
egcs
egcs-c++
make
binutils
gnome-libs-devel
```

```
xpm-devel
esound-devel
gtk+-devel
XFree86-devel
ORBit-devel.
```

All of these packages should be installed by default, but some users may have opted not to install the development packages.

make Utility

If the `configure` step completes successfully, so should the `make` step.

make install

If the `make` step completes successfully, so should the `make install` step.

The most common problem with the install step is not running `make install` as the *root* user. This will result permission errors as the installer tries to write to places where the user has no permission. Just become the *root* user and try again.

Device Driver (`flashpath.o`)

Determine that the device driver is loaded.

If the driver is loaded but you can't access the FlashPath, check the kernel message logs.

Status Monitor (`fpmonitor`)

If the Status Monitor version does not match the version number of the device driver, you should reinstall the FlashPath software.

Notes

1. LSB Linux Standard Base - a standard for system file structure and support services that a Linux distribution should profile.
2. `tar` - *T*ape *AR*chive - is the classic Unix archive program, and `gzip` is the most common Unix compression utility in use today. Together they are used to create compressed archives that are about as efficiently packed as PK-Zip compressed archives.
3. X11 - X Window System, Version 11 - the display subsystem that all Linux GUIs are built upon. In general, if someone is talking about icons, windows, and mice on Linux, they're running X11.

Frequently Asked Questions

1. **FlashPath is in the sleep mode. What should I do?**

   Eject the FlashPath from the floppy drive, wait awhile, and then reinsert it.

2. **The computer does not recognize the FlashPath. Why?**

   If you attempt to access the FlashPath while inserting it in the floppy disk drive, the FlashPath may not be recognized and the message: "The disk in the floppy is not formatted" may be displayed accidentally.

   In most cases, the computer will recognize the FlashPath if you eject the FlashPath from the floppy drive, wait awhile, and then reinsert it.

   The computer may not recognize the FlashPath under the following conditions:

   - **FlashPath automatically powers off after 5 minutes of inactivity, to extend battery life.** If this occurs, eject the FlashPath from the floppy drive, wait awhile, and then reinsert it.
   - **The batteries are not loaded or are almost completely exhausted.** Replace the batteries.
   - **The batteries are loaded in the wrong direction. The (+) pole of each battery should face the battery cover when inserted correctly.** Reinsert the batteries.
   - **The FlashPath driver has not been installed.** Install the FlashPath drivers if they were not installed previously.

3. **I am using a FlashPath and I can't seem to format the media. What should I do?**

   You MUST format the media in your digital appliance. Follow your digital appliance recommendations for formatting the media.

   Do not format media using any other format utility.

4. **Is it necessary to reformat the media before reusing it in a device?**

   No, you can use the delete function to remove unwanted files from the media. Before erasing, copy any files you do want to save to the computer's hard drive or to other storage media,

Safety

For maximum safety, please observe the following precautions.

Definition of Terms

WARNING

Incorrect handling and/or operation could cause serious injury.

CAUTION

Incorrect handling and/or operation could cause damage to equipment or files.

WARNINGS

When handling batteries:

- Do not disassemble or modify the battery.
- Keep the batteries out of the reach of small children. If swallowed, poisoning or asphyxiation can result. Seek medical treatment immediately.
- Do not combine old and new batteries.
- Do not disassemble, modify, repair or charge the batteries.
- Do not connect the positive and negative terminals with any metal such as wire.
- Do not transport or store batteries together with metallic objects.
- Do not heat batteries or directly expose them to fire.
- Do not drive nails into, strike with a hammer, or step on the battery. **Failure to observe the above could result in battery leaks, heat emission, ignition, rupturing, skin burns or other injury.**
- Observe the positive and negative polarity indications when inserting the batteries. Do not allow dead batteries to remain in the battery compartment.
  Failure to observe the above could result in battery leaks, heat emission, rupturing, skin burns or other kind of injury.
- If leaking occurs, do not allow battery fluid to come in contact with the skin. Doing so could result in skin burning. If battery fluid gets on your skin or clothes, wash immediately with water. If battery fluid gets in your eyes, flush with water and seek medical treatment immediately.
- Use only the recommended type of batteries.
  Failure to do so could result in battery leaks, heat emission, rupturing, skin burns or other kind of injury.

CAUTIONS

- Do not use FlashPath near sources of heat or flame**. Doing so could result in smoke or fire.**
- Do not immerse FlashPath in liquids such as water, chemicals or oil. **Doing so could result in short circuiting, electric shock or fire.**
- If bent, dropped or exposed to strong impact, the product should be inspected at the place of purchase or by SmartDisk**. Failure to do so could result in smoke or fire.**
- Do not attempt to repair, modify or disassemble FlashPath**. Doing so could result in fire, electric shock or injury.**
- Do not make direct contact with or touch the pins (connecting surface) of the media with metal. **Data could be damaged or erased by static electricity.**
- Do not turn the power off while downloading data from media. **Doing so could damage or erase the internal data on the media.**
- Do not unplug or expose to vibration or impact while uploading data to or downloading data from media. **Doing so could damage or erase the internal data on the media.**
- Be sure to save data to another medium at regular intervals in case the data stored in media is damaged or lost. **We are not liable, however, for data saved to any medium.**
- Make sure the media contains no essential data or files before formatting. **Failure to do so will result in loss of data.**
- Do not turn off the power or touch the floppy disk drive push button while the floppy disk drive is operating. **Doing so could damage or erase data on the media.**
- When media is formatted, all the data saved on the media is erased.
- If a strange odor, sound or smoke is emitted from the FlashPath during use, immediately turn off the power and unplug the computer power cord from the electric outlet. **Failure to do so could result in fire or equipment damage.**