

Re-imaging CompactFlash Cards

Tutorial

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Revision History

The following table shows the revision history for this document.

Date	Version	Revision
04/05/06	1.0	Initial Xilinx release.

Table of Contents

Preface: About This Guide

Additional Resources	5
Conventions	5
Typographical	5
Online Document	6

Re-imaging CompactFlash Cards

Introduction	7
Cautionary Notes	7
Requirements	7
Procedure	8
Setting Up the Files	8
Creating a Checksum for an Image File	11

About This Guide

Many Xilinx evaluation and prototyping boards are equipped with System ACE™ CompactFlash interfaces. This guide takes you through the steps necessary to safely re-image a CompactFlash card.

Additional Resources

To find additional documentation, see the Xilinx website at:

<http://www.xilinx.com/literature/index.htm>.

To search the Answer Database of silicon, software, and IP questions and answers, or to create a technical support WebCase, see the Xilinx website at:

<http://www.xilinx.com/support>.

Conventions

This document uses the following conventions. An example illustrates each convention.

Typographical

The following typographical conventions are used in this document:

Convention	Meaning or Use	Example
Courier font	Messages, prompts, and program files that the system displays	<code>speed grade: - 100</code>
Courier bold	Literal commands that you enter in a syntactical statement	ngdbuild <i>design_name</i>
Helvetica bold	Commands that you select from a menu	File → Open
	Keyboard shortcuts	Ctrl+C

Convention	Meaning or Use	Example
Italic font	Variables in a syntax statement for which you must supply values	ngdbuild <i>design_name</i>
	References to other manuals	See the <i>Development System Reference Guide</i> for more information.
	Emphasis in text	If a wire is drawn so that it overlaps the pin of a symbol, the two nets are <i>not</i> connected.
Square brackets []	An optional entry or parameter. However, in bus specifications, such as bus [7:0] , they are required.	ngdbuild [<i>option_name</i>] <i>design_name</i>
Braces { }	A list of items from which you must choose one or more	lowpwr = { on off }
Vertical bar	Separates items in a list of choices	lowpwr = { on off }
Vertical ellipsis .	Repetitive material that has been omitted	IOB #1: Name = QOUT' IOB #2: Name = CLKIN' . . .
Horizontal ellipsis ...	Repetitive material that has been omitted	allow block <i>block_name loc1 loc2 ... locn</i> ;

Online Document

The following conventions are used in this document:

Convention	Meaning or Use	Example
Blue text	Cross-reference link to a location in the current document	See the section " Additional Resources " for details. Refer to " Title Formats " in Chapter 1 for details.
Red text	Cross-reference link to a location in another document	See Figure 2-5 in the <i>Virtex-II Handbook</i> .
Blue, underlined text	Hyperlink to a website (URL)	Go to http://www.xilinx.com for the latest speed files.

Re-imaging CompactFlash Cards

Introduction

CompactFlash cards can be reformatted and re-imaged to easily convey new or upgraded information to the embedded PowerPC™ processors within Virtex™-II Pro and Virtex-4 FPGAs on such boards as the ML310, ML410, ML421, and others.

This guide is a step-by-step tutorial that takes you through the re-imaging procedure. These steps must be followed carefully to avoid unintended consequences, such as erasing the contents of a drive other than the intended target. The *dd* command is a *destructive delete* utility and can erase any hard drive. Xilinx takes no responsibility for lost data or damaged hard drives.

Cautionary Notes

1. To avoid losing the data on the CompactFlash card, always make a backup copy of the card's contents before reformatting.
2. Device numbers sometimes change when a computer is restarted. Always verify the drive number before reformatting and re-imaging to avoid reformatting your *primary* drive. The reformat and re-image utilities do not check for improper use.
3. Make sure that you are imaging the correct disk. Choosing the wrong disk number will result in the loss of data and/or an unbootable system on your host machine.
4. Before removing the CompactFlash card from your CompactFlash adapter or PCMCIA slot, always properly eject the disk and wait for the message that indicates it is safe to remove the device. USB readers may not return a *safe to remove* message, in which case the device can be removed unless an error message or warning is displayed.

Requirements

- Microsoft Windows 2000 or Windows XP
- CompactFlash or PCMCIA adapter attached to a computer
- Image file suited to the specific development board you are using
 - ◆ See Xilinx On Board (www.xilinx.com/xob) to navigate to the board-specific documentation pages that contain the pertinent image files
- Command line utilities *dd* and *mount* and checksum application
 - ◆ See <http://www.xilinx.com/bvdocs/userguides/ug252.zip>

Procedure

[Table 1](#) lists the files contained in the ug252.zip file that accompanies this user guide.

Table 1: Files Included in ZIP

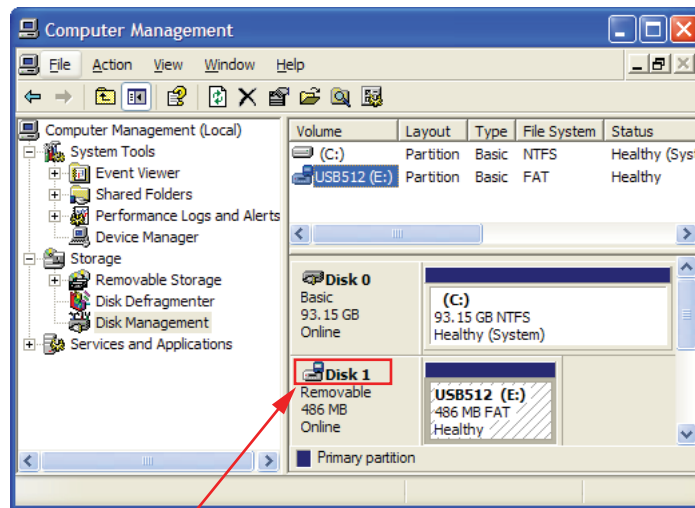
Name	Description
cygwin1.dll	Cygwin library required to run UNIX-style applications
dd.exe	Disk imaging executable
mount.exe	Disk mount executable
umount.exe	Disk unmount executable
md5sum.exe	Checksum generation executable

Setting Up the Files

1. *Make a backup copy* of the CompactFlash card that you will be imaging.
2. Download the utilities and image files that accompany this procedure. See [“Requirements,” page 7](#).
3. Extract the utilities and image zip files to a temporary directory. This tutorial uses a directory called `c:\imagetools`. In this tutorial, the `cf_image.zip` refers to the ZIP file that contains the image to be transferred to the CompactFlash card. The image file for your board might be named differently.
4. (Optional) Run `md5sum.exe` on the image to calculate the checksums. See [“Creating a Checksum for an Image File,” page 11](#).
5. Determine the drive number of the CompactFlash
 - a. Right-click **My Computer** → **Manage**.
 - b. Select **Storage** → **Disk Management**

In the lower right window pane, locate the disk number of the CompactFlash drive. In the example in [Figure 1](#), the CompactFlash drive is Disk 2, Removable 486 MB Online, with two partitions. On other systems the disk number and disk size are likely to be different.

Caution! Carefully review the system and determine the disk number of the CompactFlash drive each time you re-image a device. Failure to do so can result in reformatting a disk drive, including the primary C drive.



CompactFlash Disk Number

UG252_01_021606

Figure 1: Locate the Disk Number

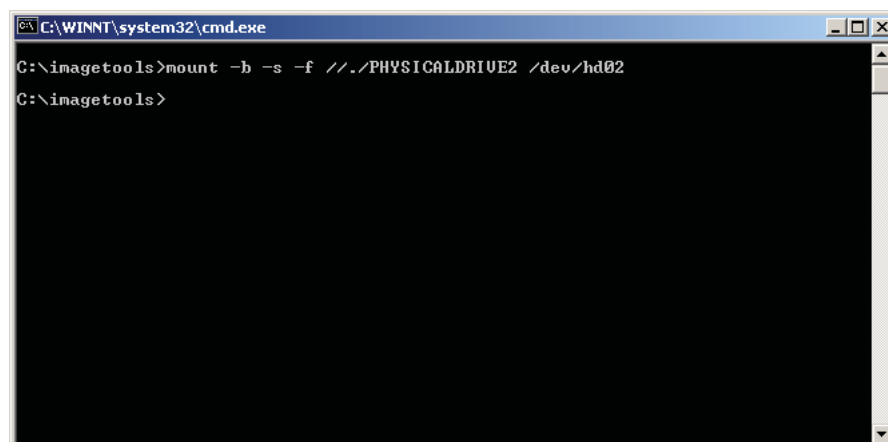
6. Mount the CompactFlash card.

Start a Windows command shell and CD to the temporary directory (*imagetools* in this example). Mount the CompactFlash card, replacing each *x* with your CompactFlash disk number. (See [step 5, page 8](#) for instructions on how to locate your CompactFlash disk number.)

```
mount -b -s -f ../PHYSICALDRIVEx /dev/hd0x
```

In the example in [Figure 2](#):

```
C:\imagetools>mount -b -s -f ../PHYSICALDRIVE2 /dev/hd02
```



UG252_02_021606

Figure 2: Mount the CompactFlash Card

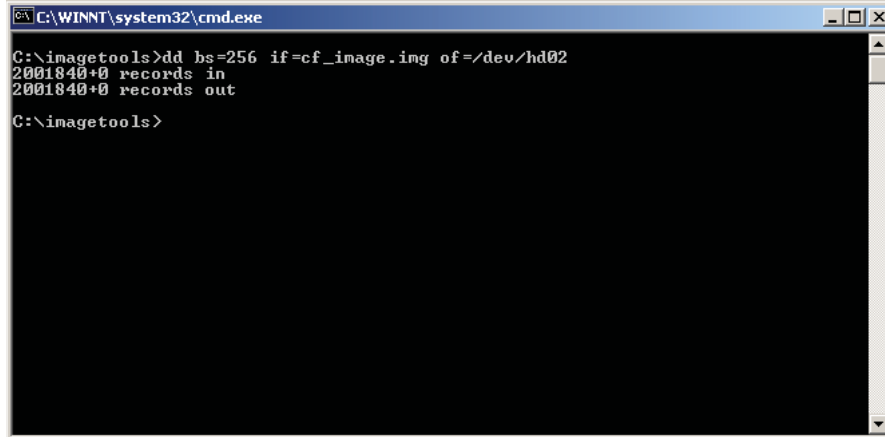
- Write the disk image to the CompactFlash card, again replacing the *x* with your CompactFlash disk number.

```
dd bs=256 if=<image filename>_of=/dev/hd0x
```

Caution! Failure to type the correct disk number will result in reformatting the wrong drive, even your primary drive. See [step 5, page 8](#).

In the example in [Figure 3](#):

```
C:\imagetools>dd bs=256 if=cf_image.img of=/dev/hd02
```



```
C:\WINNT\system32\cmd.exe
C:\imagetools>dd bs=256 if=cf_image.img of=/dev/hd02
2001840+0 records in
2001840+0 records out
C:\imagetools>
```

UG252_03_021606

Figure 3: Write Disk Image to the CompactFlash Card

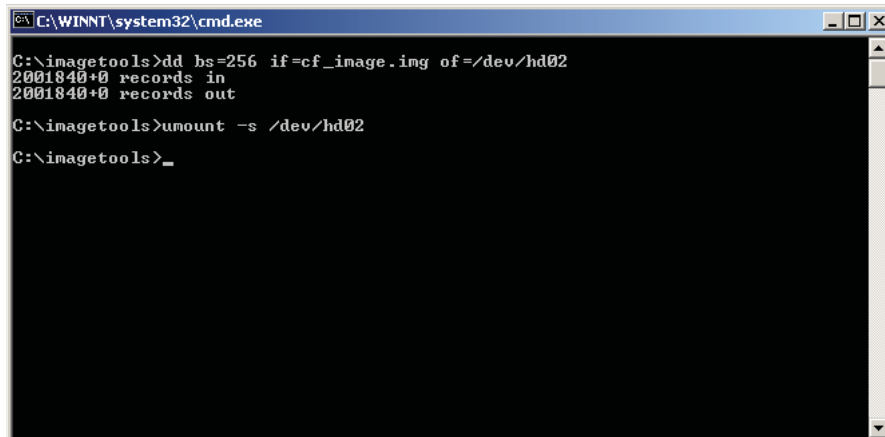
Note: Do not remove the CompactFlash card or close the command shell until the records in and records out are displayed, indicating the process is finished.

- Unmount the CompactFlash card, again replacing the *x* with your CompactFlash disk number.

```
umount -s /dev/hd0x
```

In the example in [Figure 4](#):

```
C:\imagetools>umount -s /dev/hd02
```

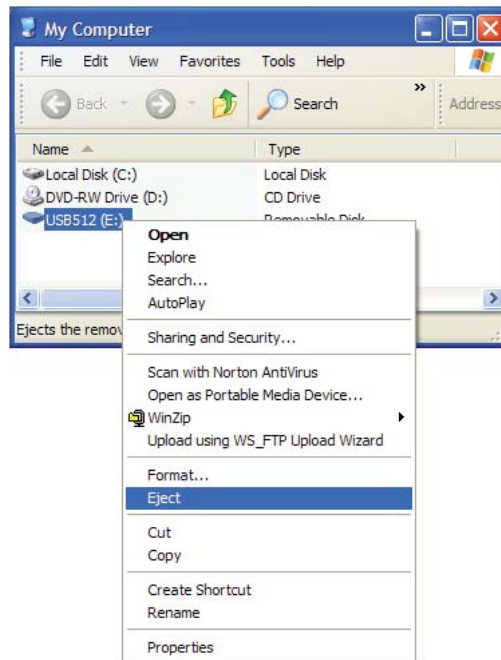


```
C:\WINNT\system32\cmd.exe
C:\imagetools>dd bs=256 if=cf_image.img of=/dev/hd02
2001840+0 records in
2001840+0 records out
C:\imagetools>umount -s /dev/hd02
C:\imagetools>_
```

UG252_04_021606

Figure 4: Unmount the CompactFlash Card

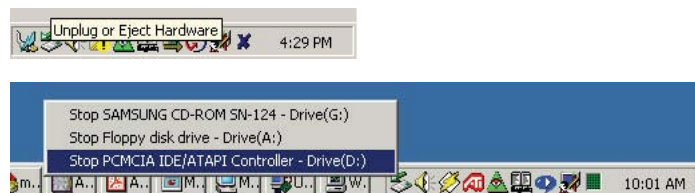
9. Stop and/or eject the CompactFlash card before removing it to ensure data integrity.
 - a. First, right-click on the CompactFlash drive and select **Eject**. Wait until a message indicates it is safe to remove the card.



UG252_05_021706

Figure 5: Eject Hardware

- b. Then, if using a PC card adapter, stop the CompactFlash hardware before removing it from the PC. From the system tray, use the Unplug or Eject Hardware icon.



UG252_06_021706

Figure 6: Stop or Eject

Creating a Checksum for an Image File

Checksums are used to verify that a file has not been corrupted or modified. When creating an image file, use the md5sum.exe file to generate a checksum. From a command line:

```
md5sum.exe <filename>
```

Copy the resulting output checksum, which is a 32-character hex number, into a text file (md5.txt, for example) and add it to the zip file along with the image. The checksum number can also be posted next to a link in a webpage.