I.   Firmware Update Overview

The LBC-4000 L-Band Up/Down Converter System is factory-shipped with the latest version of operating firmware. If you need to update the firmware, you can apply the update to the LBC-4000 without having to remove it from operation. You may directly acquire the download from Comtech EF Data's web site (www.comtechefdata.com), or receive the archive file by e-mail from Comtech EF Data Product Support.

LBC-4000 Installation and Operation Manuals

Before proceeding, you should be familiar with your converter product. Read the LBC-4000 L-Band Up/Down Converter System Installation and Operation Manual (CEFD P/N MN/LBC4000.IOM)

LBC-4000 Firmware Update Procedure Summary

1. Download the firmware update archive file to a user-supplied PC. The PC must be Microsoft Windows® compatible.
2. Connect a user-supplied Ethernet cable from the User PC to the LBC-4000 rear panel '10/100 ETHERNET' RJ-45 100BaseTX port.
3. Connect a user-supplied serial cable from the User PC to the LBC-4000 rear panel 'J1 | COM1' DB-9F port.
4. Extract the firmware update files from the archive download file. You may then use Comtech's "CReflash" utility. Otherwise, you must use the LBC-4000 Management IP Address to connect the FTP client to an FTP server, and then FTP-transfer the files from the User PC to the LBC-4000.

About Firmware Numbers, File Versions, and Formats

The Comtech EF Data Web site catalogues its firmware update archive files by product type (e.g., router, modem, etc.), the specific model, and optional hardware configurations. The LBC-4000 files are provided under "Home | Support | Software Downloads | Flash & Software Update Files | Converters | LBC-4000."

The LBC-4000 firmware download hyperlink for the Ethernet-ready (current) production unit is F0020503x_V###.

The LBC-4000 firmware download hyperlink for the original non-Ethernet unit is F9965x_V####.

Note that 'x' is the firmware revision letter, and '###' or '####' represents the firmware version number (e.g., V125 = Version 1.2.5).

Comtech EF Data provides its archive download files in two compressed formats – *.exe (self-extracting) and *.zip (compressed):
- The self-extracting *.exe file does not require use of a third-party utility program.

- Some firewalls do not allow the download of self-extracting *.exe files. You must instead download the *.zip file, and extract the firmware files from the download with a user-supplied third-party file archiver and compression utility program such as PKZIP for Windows, WinZip, ZipCentral, etc. (PKZIP for DOS is not supported due to file naming conventions). Comtech EF Data does not provide this utility program.

For detailed information on handling archived files, read your utility program's Help documentation.

II.   Prepare for the Firmware Download

Required User-supplied Items: You will need a Microsoft Windows-based PC equipped with available serial and Ethernet ports, a compatible Web browser (e.g., Internet Explorer), and a terminal emulator program (e.g., Tera Term or HyperTerminal).

Configure the Terminal Emulator Program

Read your terminal emulator program user guide or HELP feature for operating and configuration instructions.

On the User PC – Open the terminal emulator program, and then configure the program's serial port communication and terminal display operation:
- Baud Rate = 38400 bps
- Data Bits = 8
- Stop bits = 1
- Parity = NO
- Local Echo = ON
- Port Flow Control = NONE
- Display New Line Rx/Tx = CR

Get the LBC-4000 Management IP Address and Firmware Information

1. **On the LBC-4000** – Apply power to the unit. Typical for either the standard AC unit or the optional DC unit, from behind the unit front panel, switch the power ON.
2. Use the LBC-4000 front panel to identify your default Management IP Address. You will not be able to access the LBC-4000 HTTP Interface without this information.
3. Get the firmware information using one these methods:
    - Use the LBC-4000 front panel;
    - Use the LBC-4000 HTTP (Web Server) Interface (for Ethernet-ready units only);
    - Use the LBC-4000 Serial Interface.

Use the LBC-4000 Front Panel to Get the Management IP Address and Firmware Information

- You may view find the factory-assigned Management IP Address within the **SELECT:CONFIG → REMOTE→ ETHERNET → ADDRESS** menu branch:

```
IP Address/Range:
   XXX.XXX.XXX.XXX/YY
```

- You may view the current Firmware M&C version at the top-level menu of the front panel display (press the **[CLEAR]** key several times):

```
        LBC-4000
 VER X.X.X SN:########
```

- You may view the detailed firmware information within the **SELECT:UTILITY → FIRMWARE→ INFO → IMAGE#1** *or* **IMAGE#2 → BULK** menu branches:
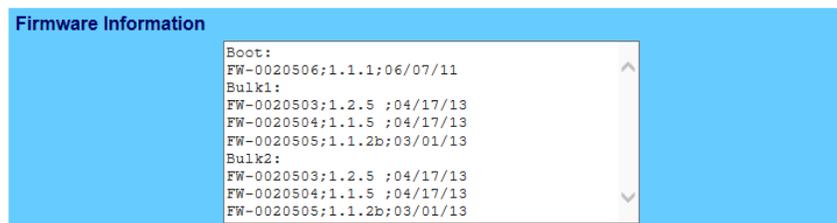
```
Image#X: BULK APP FPGA
```

```
Bulk#X: FW-0020503x
X.X.X.  MM/DD/YY
```

Use the LBC-4000 HTTP Interface to Find the Firmware Information (Ethernet-ready Chassis Only)

Do these steps:

1. Go to either of these pages to review the firmware information:

   - The 'Firmware Information' section of the 'Config | Utility' page provides the firmware details as Boot, Bulk1, and Bulk2, as shown in this example:

   Firmware Information
   ```
   Boot:
   FW-0020506;1.1.1;06/07/11
   Bulk1:
   FW-0020503;1.2.5 ;04/17/13
   FW-0020504;1.1.5 ;04/17/13
   FW-0020505;1.1.2b;03/01/13
   Bulk2:
   FW-0020503;1.2.5 ;04/17/13
   FW-0020504;1.1.5 ;04/17/13
   FW-0020505;1.1.2b;03/01/13
   ```

   - The 'Summary' section of the 'Status | Summary' page provides the firmware details – "FW Revision", "Active Software Image", and "Next Reboot Image" – as shown in this example:

Summary Refresh

PARAMETER	STATUS	PARAMETER	STATUS
Circuit Idenitification :	[FIRST-LINE]CRAWL-TEXT--[SECOND-LINE]CRAWL-TEXT-	Summary Fault :	OK
Serial Number :	000000001	External Reference :	N/A
Model Number :	LBC-4000	Reference Tuning (Vdc) :	5.2 V
FW Revision :	1.2.5	Number Unread Faults :	063
Active Software Image :	Bulk 1		:
Next Reboot Image :	Bulk 1	Date (mm/dd/yy) :	11/13/14
Redundancy :	ON	Time (hh:mm:ss) :	20:26:26

2. Write down your firmware information for further reference or to provide to Comtech EF Data Product support.

Use the LBC-4000 Serial Interface to Find the Firmware Information

Depending on your chassis version (i.e., Serial-only or Ethernet-ready), use your terminal emulator program to execute the "FRM" or "FRW" remote query to find the firmware information:

- **<DEV/FRM_{cr}**
  (returns the current (Ethernet-ready) firmwares running under Boot, Bulk1, and Bulk2 in the form FW-AAAAAAA; B.B.B; DD/MM/YY, where:
  o FW-AAAAAAA = the firmware part number
  o B.B.B = the firmware version number
  o MM/DD/YY = the firmware release date (Month/Day/Year)
- **<DEV/FRW_{cr}**
  (returns the legacy (Serial operation only) firmwares in the form:
  o BULK=FW/9965X (where X is the Revision Letter)
  o M&C=FW/9966X (where X is the Revision Letter)
  o FPGA=FW/9967X (where X is the Revision Letter)

## <u>Make a Temporary Folder (Subdirectory) on the User PC</u>

The temporary folder is where you store the firmware archive download. There are several ways you can make a temporary folder on a Windows PC:

- Use the Windows Desktop;
- Use Windows Explorer;
- Use the Run and Browse windows;
- Use Windows Command-line or the Command Prompt.

These examples specify drive letter "c:". You can use any valid, writable drive letter.
Typical for many of the tasks that follow, type the command as instructed and then press **Enter**.
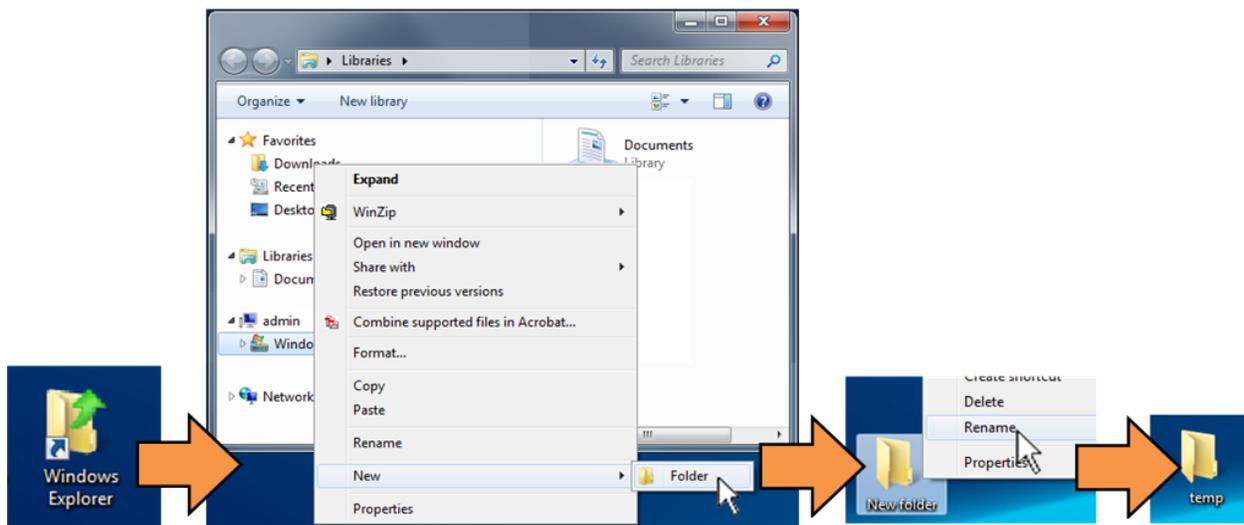
Use Windows Desktop to Make a Folder
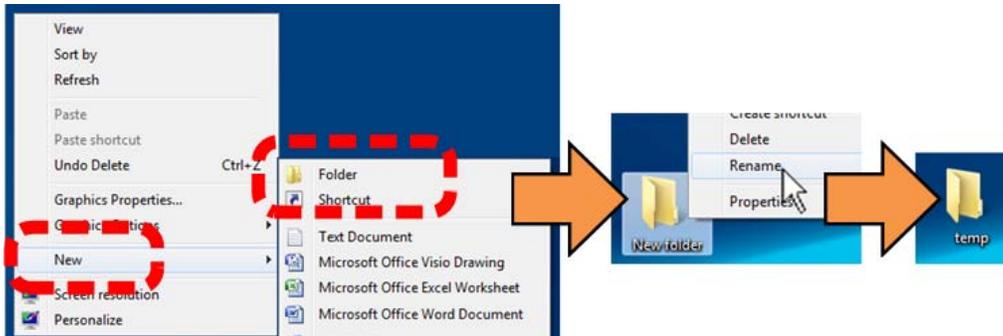
Do these steps:
1. Right-click anywhere on the desktop to open the popup submenu.
2. Select **New > Folder** to make the new, temporary folder on the desktop.
3. Right-click on the new folder and then select Rename from the popup submenu. Rename this folder to "temp" or some other convenient, unused name.

## Use Windows Explorer to Make a Folder

Do these steps:
1. Left-double-click the Windows Explorer icon on the Windows Desktop.
2. Depending in your Windows OS version: select **File > New > Folder**, or click your Folder Destination (e.g., Windows (C:) and then **New Folder** to make the new, temporary folder in the active location.
3. Right-click the **New Folder** name, and then **Rename** this folder to "temp" or some other convenient, unused name.
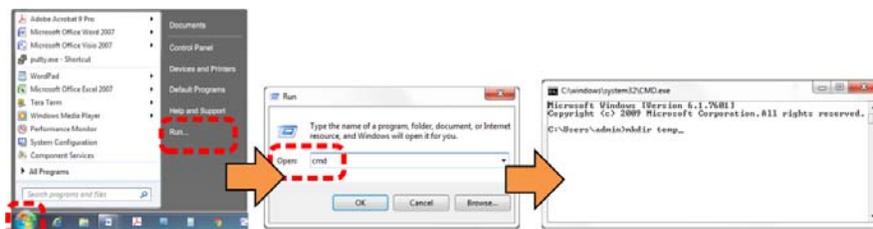
Use the Run and Browse Windows to Make a Folder
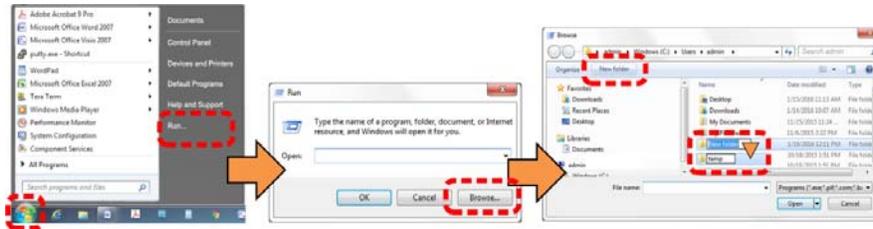
Select Start on the Windows taskbar and then do these steps:

1. Click **Run…** to open the Run window.
2. Click **Browse…** to open the Browse window.
3. Click **New Folder**. This can be an icon or a text label, depending on the Windows OS version.
4. Right-click the **New Folder** name, and then **Rename** this folder to "temp" or some other convenient, unused name.

Use Windows Command-line or Command Prompt to Make a Folder

Select Start on the Windows taskbar and then do these steps:

1. Click **Run…** to open the Run window (or, depending on Windows OS version prior to Windows 95, click the MS-DOS Prompt icon from the Main Menu).
2. Open a Command-line window:
    *   For Windows 95 or Windows 98 – type "**command**".
    *   For any Windows OS versions later than Windows 98 – type "**cmd**" or "**command**".
    *   Alternately, from Start, select the **All Programs > Accessories** popup submenu, and then select **Command Prompt**:
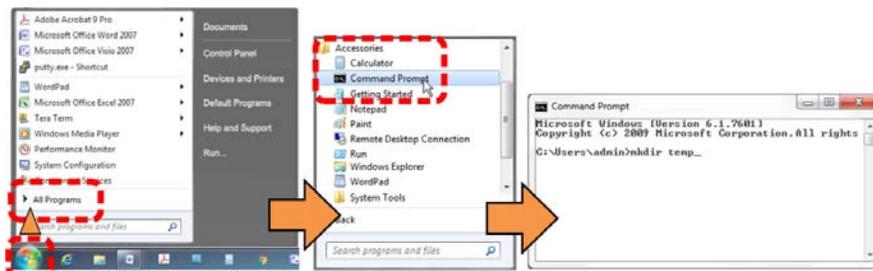
3. From the c:\> prompt, type either "**mkdir temp**" or "**md temp**" (both "**mkdir**" and "**md**" mean *make directory*), and then press **Enter**.

There will now be a "temp" folder created and available for placement of the firmware file download. You may download and extract the firmware files.

III. Download and Extract the Firmware Update Archive Files

Do these steps:

1. Go online to www.comtechefdata.com.
2. On the Main page – Under **Support Information** or the **Support** tab, select the **Software Downloads** hyperlink.
3. On the Software Downloads page – Click **Download Flash and Software Update Files**.
4. On the Flash Updates Index page – Select the **(Select a Product Line) Converters** hyperlink.
5. On the Converters product page – Select your LBC-4000 product hyperlink.
6. Select the appropriate firmware archive EXE or ZIP file download hyperlink.
7. Once you select the EXE or ZIP hyperlink, the File Download dialogue opens on your browser and prompts an action. You may otherwise click **[Cancel]** to quit the file download process. Note the following:
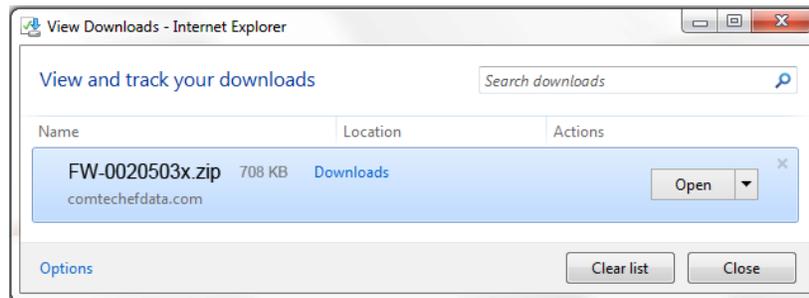
   - For EXE files:

     o Click **[Run]** to open the self-extractor dialogue window. Use **[Browse]** to select your destination folder. Click **[Unzip]** to extract the files. Your results display as per this example – click **[OK]** to close. Your files are now available for transfer to the LBC-4000.
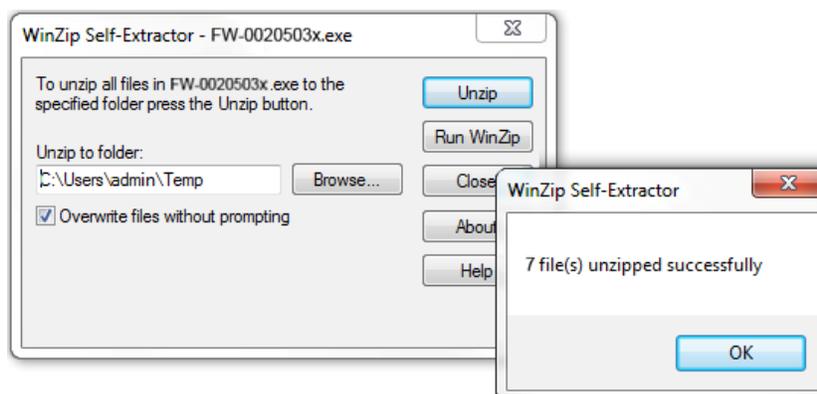
     o Click **[Save]** to download the EXE file to your Downloads folder. Once the download is complete the dialogue prompts you to either **[Run]** the self-extracting file, or to open or view the Windows Downloads folder for further action.
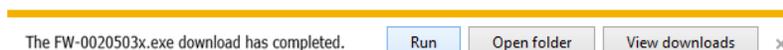
- For ZIP files:

  - Click **[Open]** to open the archive file. Use the WinZip features to select the files for extraction to your destination folder.
  - Click **[Save]** to download the ZIP file to your Windows Downloads folder. Once the download is complete the dialogue prompts you to either **[Open]** the archive file, or to open or view the Windows Downloads folder for further action.

8. If not already done with **File Download > Open**, you must extract, at a minimum, these files (filenames are subject to change):
   - FW-0020503x_LBC4000_Ethernet_#.#.#.bin – The Firmware Bulk image file
   - LBC-4000ReleaseNotes_v#-#-#.pdf – The Firmware Release Notes PDF file
   - CReflash.exe –The Firmware Update Utility program

   > WHERE: 'X' is the firmware revision letter, and '#-#-#' or '#.#.#' is the firmware version (e.g., FW Ver. 1.2.5)

9. Confirm availability of the firmware files in the temporary folder. There are several ways you can view the contents of the temporary folder on a Windows-based PC:
   - Use the Windows Desktop to view the folder contents;
   - Use Windows Command-line or Command Prompt to view the folder contents.

Use Windows Desktop to View Folder Contents

From the Windows Desktop, do these steps:
1. Double-left-click the Windows Explorer icon, and then double-left-click as needed to locate, and then open, the "temp" folder (directory) created earlier on the Windows Desktop.
2. Use the Browse window (Start > ...Run > Browse) to locate, and then double-click to open, the "temp" folder.

Use Windows Command-line to View Folder Contents

From Windows Command-line or the Command Prompt, do these steps:
1. Type "cd c:\temp" at the Windows Command-line prompt to change to the temporary folder (directory) created earlier using Command-line.
2. Type "dir" to list the files extracted to the temporary folder from the downloaded archive file.

After you confirm the availability of the firmware files, you may upload the firmware update to the LBC-4000.

IV. Upload the Firmware Files and Update the LBC-4000 Unit Firmware

Important Considerations

Before you proceed with the firmware update, make sure that:
* You connect the LBC-4000 '10/100 ETHERNET' port to a Windows-based PC Ethernet port with a CAT5e Ethernet cable.
* Your PC is running a terminal emulation program for operation of the LBC-4000 Telnet or serial interfaces.
* You have noted your LBC-4000 Management IP Address.
* Your PC is running a compatible Web browser for operation of the LBC-4000 HTTP Interface.
* You download or otherwise have Comtech's latest firmware files and the "CReflash" utility available on the User PC in an accessible temporary folder.
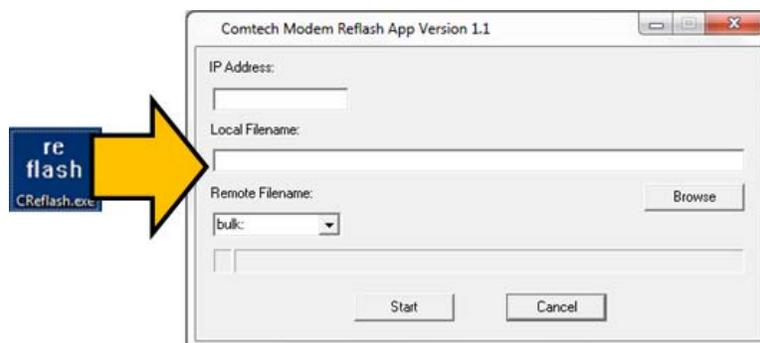
Steps to "CReflash" Upload the Firmware Files

The "CReflash" utility is provided with the firmware download. Ver5x and earlier chassis units (i.e., non-Ethernet units) must use this procedure.

Do these steps:
1. From the temporary folder – Locate, and then double-click, the "CReflash" filename or icon. The CReflash utility opens:

2. **Enter** your upload parameters information into CReflash:
   a. Left-click in the "IP Address:" text box, and enter the default Management IP Address.
   b. Left-click in the "Local Filename:" text box. Then, click **[Browse]** and navigate to the temporary folder created earlier. Click on the firmware "bin" filename, and then click **[Open]**. The filename will appear in the "Local Filename:" text box.
   c. Make sure the drop-down list remains set to "bulk:".
   d. Click **[Start]** to begin the upload process. If the information was correctly entered into CReflash, the utility displays an animated progress bar at the bottom of the window, along with a series of messages:

- "Opening FTP"
- "Sending data file to modem:"
- "Writing FLASH: # of #"
- "Success!"

3. When done, click **[Cancel]** to exit CReflash.

Steps to FTP Upload the Firmware Files

1) Typical for all steps: "xxx.xxx.xxx.xxx" represents the assigned unit Management IP Address.
2) Type all commands without quotes, and press **Enter** to execute.

1. To proceed, you should already have noted the Management IP Address for the LBC-4000 as instructed previously.
2. Use Windows Command-line to send a ping command. To ping the unit, type "ping xxx.xxx.xxx.xxx" at the Windows Command-line prompt. The response should confirm whether the unit is connected and communicating correctly with the User PC.
3. Use Windows Command-line to transfer the files from the User PC to the LBC-4000 via FTP:
   a. Type "ftp xxx.xxx.xxx.xxx" to open the FTP session.
   b. Type "bin" to set the binary transfer mode.
   c. Type "prompt".
   d. Type "hash".
   e. To begin the file transfer, type
      "put FW-0020503x_LBC4000_ Ethernet_#_#_#.bin bulk:"

      The destination "bulk:" must be all lower-case.

      Press **Enter**. The unit reports the update progress (e.g., first "Programming App Flash … Please wait." and then "Programming main FPGA … Please wait.")
   f. Wait for the file transfer to end.
   g. Type "bye" to close the FTP session.
   h. Close the Windows Command-line window.
4. To verify that the PC-to-unit FTP file transfer was successful, find the current firmware information via the front panel or the HTTP or Serial Interface.

Steps to Complete the Firmware Update Procedure

Use the LBC-4000 Front Panel or the HTTP Interface to select the new firmware image. You must then reboot the unit for the update to take effect.

Use the Front Panel to Select the Boot Image

Do these steps from the LBC-4000 Front Panel:
1. Go to the **UTILITY → FIRMWARE→ SELECT** menu branch.

```
Current Active Image: #2
Next Reboot Image: #1 #2
```

2. On the bottom line, use the ◄ ► arrow keys to change to the other image.

> You must be in **LOCAL MODE** to perform this task. If you are not in Local Mode (via the **CONFIG →REMOTE** menu branch), the unit will prompt you to take an action before continuing:

```
Remote Mode: press ENTER
For local mode, or CLEAR
```

3. You must cycle power to hard-reboot the unit.

Use the HTTP Interface to Select the Boot Image

Do these steps from the HTTP Interface '**Config | Utility**' page:
1. Use the 'Next Reboot Image' drop-down list to select Image 1 or 2 as the preferred Current Active Firmware Image:

Current Active Firmware Image : 1   Next Reboot Image: 1 Submit

2. Click **[Submit]**.
3. You must then hard-reboot or soft-reboot the LBC-4000.

Hard-reboot the LBC-4000 from the Chassis

Typical for either the standard AC unit or the optional DC unit:
1. From behind the unit front panel, switch the power OFF, and then turn the power back ON.
2. Verify the new firmware version has booted; for example, check the firmware version displayed on the LBC-4000 front panel:

```
        LBC-4000
 VER X.X.X   SN:########
```

Soft-reboot the LBC-4000 from the HTTP Interface

Do these steps from the HTTP Interface '**Config | Utility**' page:
1. In the 'Perform Soft Reboot' section, click **[Reboot Now]**:

Perform Soft Reboot   Reboot Now

2. Wait while the LBC-4000 reboots with the Current Active Firmware Image.
3. To load a second image, repeat the tasks as instructed previously.

The LBC-4000 is now operating with its latest firmware. The firmware update process is complete.

Notes: