

This document is aimed to jump-start the user with the 'LF240xA Flash Programming Utilities, based on the JTAG Connection. For more details refer to the README2.PDF document included with the utilities.

**Check-list: Before you get started, go over the following points:**

1. Make SURE you have the version of flash utilities intended for the specific devices you want to program !  
i.e. if you want to program LF240xA get LF240xA parts and tools. LF240xA need their own flash utilities. The LF2401A has separate flash utilities too.
2. Make sure the Vccp control jumper on your EVM or target is set to Vccp=high(5V). With a custom target make sure that the **Vccp pin is connected to 5V DIRECTLY, DO NOT use a resistor in series with the 5V supply**. Also note that for LF240x devices, Vccp = 5V is required for programming. For normal operation this voltage is not needed. The Vccp pin MUST NOT be left floating.
3. Make sure that the utilities are assembled / linked for the correct frequency. See the Readme2.pdf, Section 2.3. Using utilities at the wrong frequency can cause **PERMANENT DAMAGE** to the target device / other incorrect operation.
4. Make sure that all RESET sources are disabled during programming. This may include, for example, another host processor resetting the device, hitting the reset button, and so on.
5. Follow the steps below to program the flash.

**Programming Flash**

1. Plug in the JTAG cable to the EVM (or other 240x target device).
2. Plug in the power cable to the EVM. Turn on power switch.
3. From your Windows Explorer, or from Command Prompt, run portio.exe or spi515.exe depending on whether you have a XDS510PP or XDS510PP\_PLUS / XDS510 interface. This will reset the Emulator. In case this does not work check steps 4 and 5 as applicable.
4. Setting UP the emulator: **The installation of the flash utilites puts in a new sdopts.cfg file. THIS MAY CAUSE the EMULATOR to stop working. [Code Composer shares the driver, so it may stop functioning as well]. To recover you may need to set up your emulator configuration (SDOPTS.CFG).**
5. The prg2xxw95 emulator driver selects the appropriate configuration based on the -p <Address> option. See prg2xxw.txt for details.
6. Run BTEST.BAT. This loads a dummy program just to verify the JTAG link. This runs, and says "Finished" when done. If this fails, (gives an error message) you need to check the connections and so on and make sure this works correctly before proceeding to the next step. Once your setup is up and running you can skip this step.
7. In case of a revision 'A' part, i.e. for the 'LF240xA' devices, if the device does NOT have a password programmed into the password locations, proceed directly to step 9. In case of a device with the password programmed, proceed with unlocking the device flash, step 8.
8. To do this, you must know the password.
  - a. Once you know the password, locate the 'key.asm' file in the 'key' sub-dir. Type in the password in there, and then assemble and link the file. To do this run 'key.bat'.
  - b. Once the key.out file is created run the 'unlock.bat' file to unlock the flash.

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9. These utilities have three more batch files which you run **EVERY TIME IN THE SAME SEQUENCE**. These are CLR\_ALL.BAT (Clear, Step 10), ER\_ALL.BAT (Erase, Step 11), and BP32K.BAT (Program, Step 12). Running these out of sequence can cause **PERMANENT DAMAGE** to the device.
10. Run CLR\_ALL.BAT. It Clears the entire flash array and sets it all to zeros. It must run successfully, i.e. say "Finished", before running the next step. If any error messages occur refer README2.PDF and correct before proceeding. For sector wise operations see README2.PDF
11. Next Run the batch file ER\_ALL.BAT. This runs and sets all the bits in the flash array to ones, i.e. erases the entire flash. This too must be completed successfully, i.e. say "Finished". For sector wise operations see README2.PDF.
12. Once this is done edit the Batch file BP32K.BAT which will program a COFF file ( the '?????.out' file) into the flash array. This file invokes the following command:  

```
prg2xx -p 240 -m 0x0006 -w 6 src\c2xx_bpX.out l32kn.out
```

 Change l32kn.out to whatever coff file you have generated from your code. This must be copied to the flash util directory or point to it with a complete path e.g.  

```
prg2xx -p 240 -m 0x0006 -w 6 src\c2xx_bpX.out c:\myproj\final\motor.out
```

 where the file "motor.out" is in c:\myproj\final.
- Note:** The batch file bp32k.bat uses l32kn.out by default which will not fit into the flash on the LF2401A device. Use the supplied coff file/batch files l8kn.out and bp8k.bat for this device.
13. Always follow the CLEAR-ERASE-PROGRAM sequence in steps 10 to 12. Do not do erase without clear or use any other sequence.
14. If no password was programmed into the flash in step12, then you can perform a separate step of 'locking' the flash memory. To do this follow step 8a to create the password file. Once that is complete, run the 'lock.bat' file to lock the flash. THE FLASH SECURITY IS NOT ACTIVATED AT THIS TIME. The device must be turned off and back on to do this. Do not run lock.bat after programming if the programming step put in a password into the device. This can corrupt the password, potentially leaving the device in a secured state.

TIP: The emulator in some cases can feed enough power to the device to keep the device from locking, even though the device is 'turned off'. If you observe this, remove the emulator connection, and disable ANY other power sources into the chip.