

GPSTCXO/LC_XO FW Upgrade Manual

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1 GPSTCXO/LC_XO Firmware Upgrade Procedures

1.1 Overview

The following describes the GPSTCXO/LC_XO and GPSOCXO flash firmware upgrade procedure. These instructions are also applicable to the GPSTCXO/LC_XO Eval Board.

The latest firmware executable files are available for download on the Jackson Labs Technologies, Inc. website under the “support” tab at: www.jackson-labs.com. Upgrading the firmware will typically take less than 5 minutes to do.

1.2 Introduction

Please follow the instructions in order to prevent corrupting the GPSTCXO/LC_XO/GPSOCXO Flash, which may require reflashing at the factory.

With some practice, the entire Flash upgrade can be done in less than two minutes, even though the following seems like a fairly long list of instructions.

1.3 ISP Flash Loader Utility installation

There are two Flash loader utilities available to upgrade the GPSTCXO/LC_XO/GPSOCXO firmware. You can download the Philips LPC2000 utility from the Jackson Labs Technologies, Inc. website under the Support tab:

www.jackson-labs.com

The alternative Flash Magic utility is available for download on the Flash Magic website:

www.flashmagictool.com/

1.3.1 Philips LPC2000 Flash Utility

The first available application is the Philips LPC2000 utility version 2.2.3. Please note that some computers are known to be incompatible with the LPC2000 flash utility. Preliminary investigations show Windows Media Center and/or Centrino vPro processor systems tend to create download difficulties. Please use a different computer if you experience problems such as the download breaking up in the middle of the transfer. Or, alternatively, you may use the Flash Magic programming tool described below.

Please ensure that you have at least version 2.2.3 of the LPC2100 flash utility installed. Earlier versions may not recognize the LPC2138 processor used on the GPSTCXO/LC_XO/GPSOCXO boards.

1.3.2 Flash Magic Flash Programming Utility

The second utility is the Flash Magic tool available on the Flash Magic website:

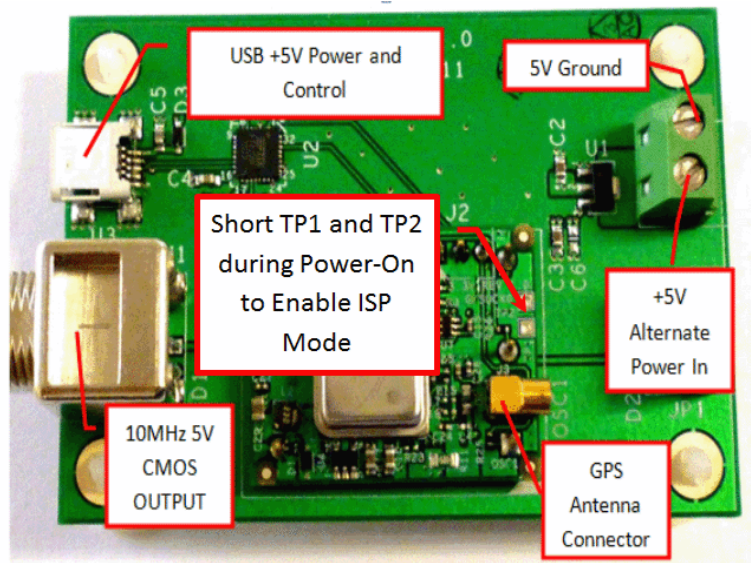
<http://www.flashmagictool.com/>

If the Philips LPC2000 tool doesn't work, please use this one.

1.4 Putting the PCB into In-Circuit Programming (ISP) mode

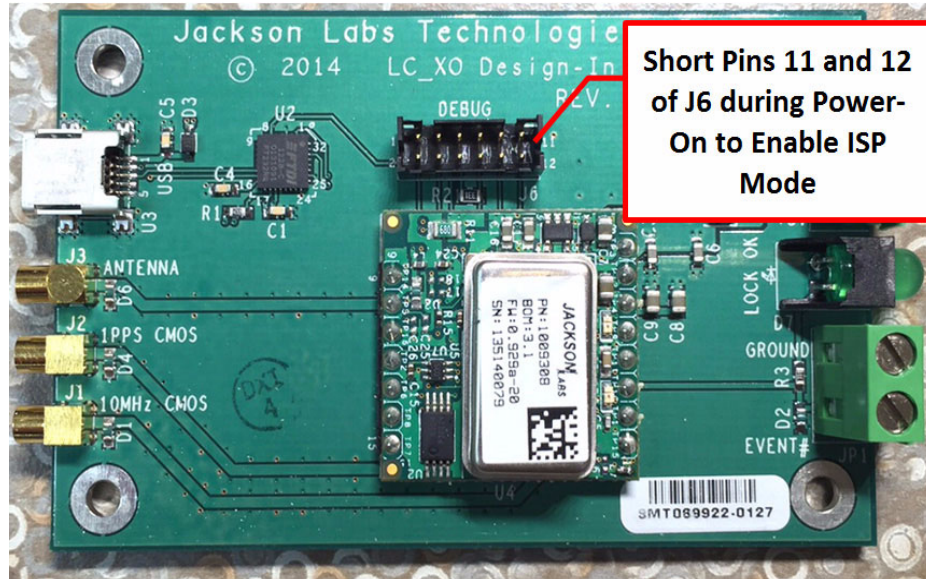
On the GPSTCXO/GPSOCXO and their respective eval boards, momentarily short-out the two test points TP1 and TP2 with a tweezer or other conductive material during power-on. See [Figure 1.1](#) for the location of TP1 and TP2. The LED should remain off during power up, indicating the unit is properly placed into ISP mode. If the LED lights up momentarily after power-on, the unit is not in ISP mode.

Figure 1.1 Location of ISP Jumpers TP1 and TP2 on the GPSTCXO Board



On the LC_XO Plus Kit PCB, the ISP pins that need to be shorted during Power-On are located on connector J6. These may be momentarily shorted-out using tweezers, a screwdriver, or any other small conductive object. Be careful not to touch adjacent pins while shorting out the jumper pins during Power-On. The LEDs on the PCB should remain off during power up, indicating the unit is properly placed into ISP mode. If the LEDs light up momentarily after power-on, the unit is not in ISP mode. See **Figure 1.2** for the position of the ISP pins on the LC_XO Plus PCB. For applications that use just the LC_XO module by itself, momentarily short out pins 13 (ISP#) and 11 (GND) during power-on to enable ISP mode.

Figure 1.2 Location of ISP Pins 11 and 12 of Connector J6 on LC_XO Plus PCB



1.5 Downloading the firmware

Download the latest version of GPSTCXO/LC_XO/GPSOCXO firmware from the Jackson Labs Technologies, Inc. support website and store it in a place that will be remembered. The file is in .hex format.

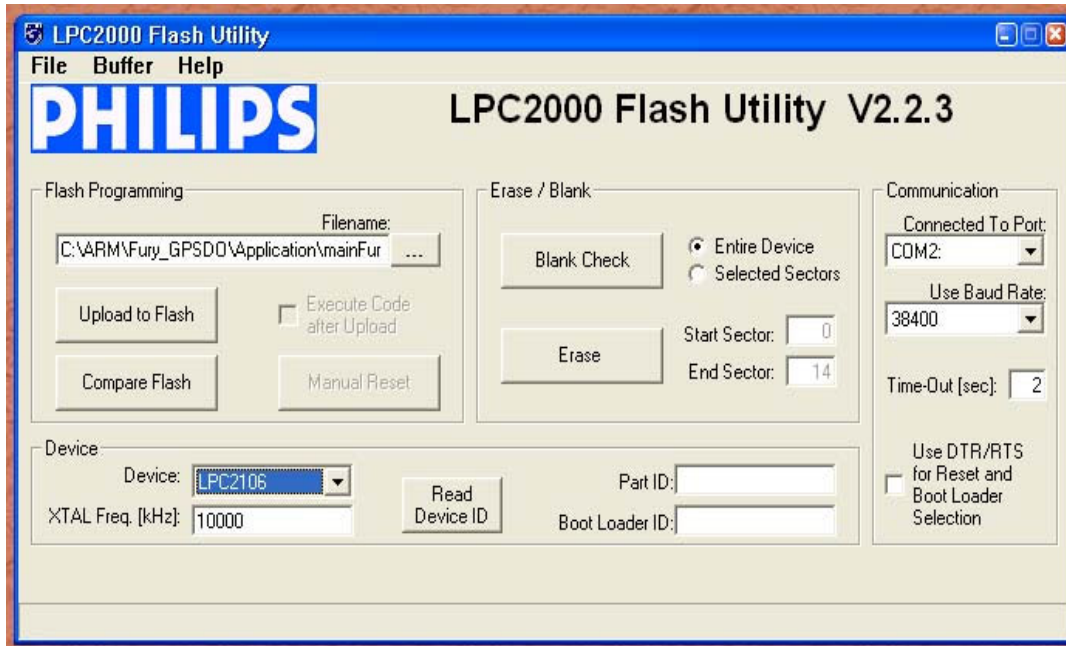
The unit needs to be connected to the computer's USB (GPSTCXO Eval Board and LC_XO Plus Kit) or TTL-level RS-232 (GPSOCXO/GPSTCXO/LC_XO) port prior to programming the firmware.

1.5.1 Philips LPC2000 Flash Utility

- A) Open the LPC2000 utility. Set the COM port in the LPC2000 application as needed on your PC.
- B) Select the Baud Rate of the LPC2000 utility to be 38400 or slower. Faster Baud rates will not work properly.
- C) Press the "READ DEVICE ID" button, this should then show "LPC2138" in the DEVICE window if the unit is communicating correctly to the application.

Warning: Make sure NOT(!) to press the “erase” button under any circumstances, this may erase factory calibration data, and the unit will not operate and will have to be returned to the factory. Pressing the “erase” button on the ISP utility will thus void the warranty.

Figure 1.3 LPC2000 flash utility



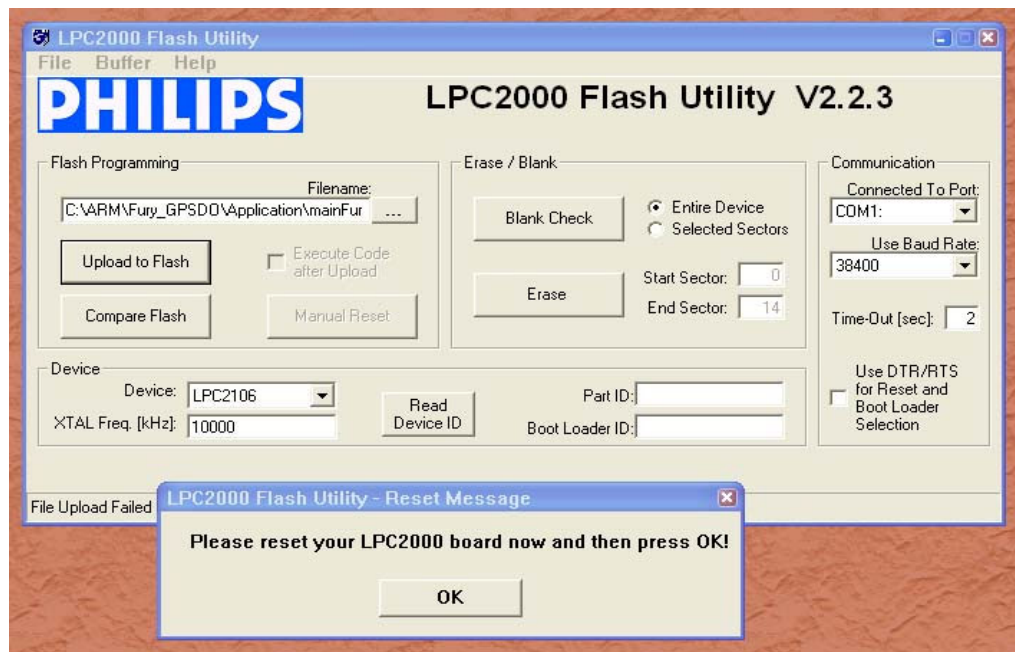
Please note that the “Use Baud Rate” setting needs to be set to 38400 Baud or less, it will not work faster than 38400 Baud.

The “DEVICE” should show up as “LPC2138” after pressing “READ DEVICE ID”

Also, please point the “Filename” to the directory where you have stored the latest firmware hex file that is to be downloaded.

D) Start the download by pressing “Upload to Flash” button. The window shown in [Figure 1.4](#) should appear if the correct COM port has been chosen etc:

Figure 1.4 Flash download window



Press the “OK” button, and the download should start. Sometimes the utility gets confused and this process (from item 1.5 B)) has to be tried several times.

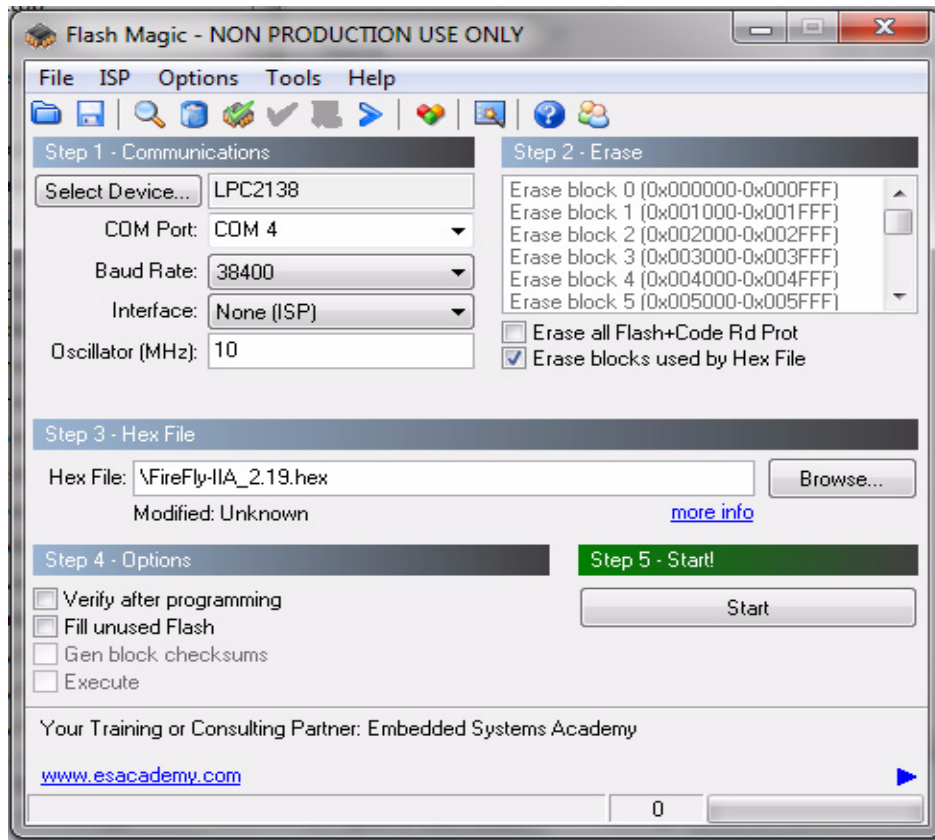
It is not necessary to press “reset” as the utility is asking. Just press “OK” on the utility window’s button.

Warning: DO NOT PRESS THE “ERASE” BUTTON AT ANY TIME! THIS WILL RENDER THE PCB USELESS AND CAN ONLY BE RECOVERED AT THE FACTORY!

1.5.2 Flash Magic Flash Programming Utility

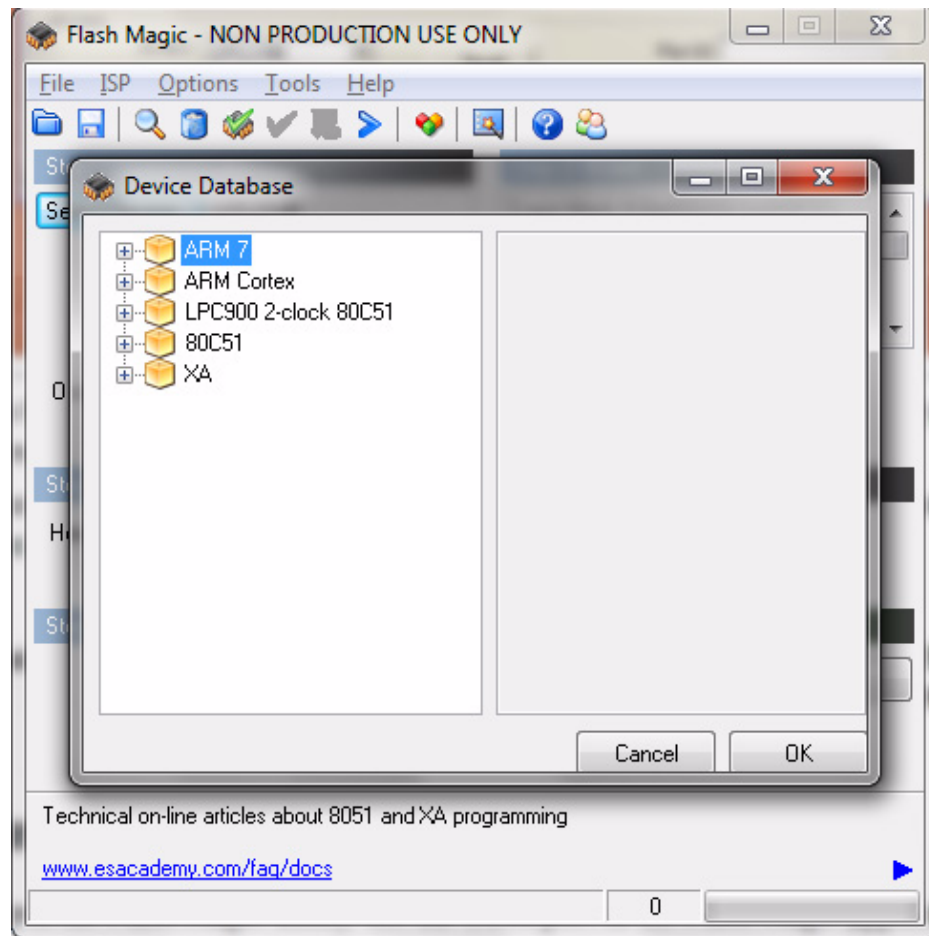
A) Open the Flash Magic utility. Set the COM port in the Flash Magic application as needed on your PC. Set “Interface” to “None (ISP)”.

Figure 1.5 Flash Magic utility



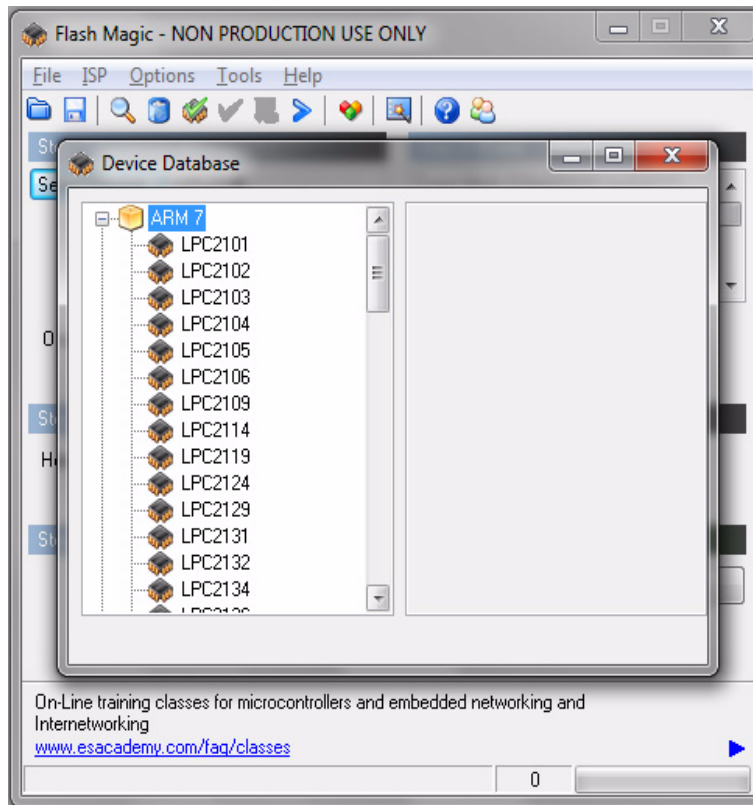
B) Press the “Select Device” button and the window shown in **Figure 1.6** will appear:

Figure 1.6 Device selection window



C) Expand the ARM7 folder and select the appropriate processor, in this case the LPC2138.

Figure 1.7 Expanded device selection window



D) Select the Baud Rate of the Flash Magic utility to be 38400 or slower. Faster Baud rates will not work properly.

E) Set the Oscillator (MHz) to “10”.

F) Check the box marked “Erase blocks used by Hex File”.

Warning: Make sure NOT(!) to check the box marked “Erase all Flash+Code Rd Prot” under any circumstances, this may erase factory calibration data, and the unit will not operate and will have to be returned to the factory. Checking this box on the ISP utility will thus void the warranty.

G) Under “Step 3 - Hex File” browse for the hex file that you downloaded in step 1.5 .

H) Go to Step 5 and press “Start”. You will observe the firmware being downloaded to the GPSTCXO/LC_XO/GPSOCXO.

1.6 Verifying Firmware Update

Close the programming utility and open a terminal window. Power cycle the unit. Both LED’s should blink.

During power on, the unit sends an ID string out of the serial port at 115200 Baud by default. The firmware version can also be queried by sending the *IDN? command. Verify that the firmware version is the new version that was downloaded.

