

# GPSTCXO/LC\_XO FW Upgrade Manual

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# **GPSTCXO/LC\_XO FW Upgrade Manual**

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# 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

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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.

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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.



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File Buffer Help		32, co co c				
LPC2000 Flash Utility V2.2.3						
Flash Programming	Erase / Blank	Communication				
Filename:		Connected To Port:				
C:\ARM\Fury_GPSD0\Application\mainFur	Blank Check	COM2:				
Upload to Flash		38400 V				
ate Optoad	Erase Start Sector:					
Compare Flash Manual Reset	End Sector: 14	Time-Out [sec]: 2				
Device		Lise DTB/BTS				
Device: PC2106  For Reset and						
XTAL Freq. [kHz]: 10000 Device ID Boot Loader ID: Selection						
17						

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:

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LPC2000 Flash Utility ile Buffer Help DHILDDS	LPC2000 Flash Utility	/2.2.3
Flash Programming Filename: C:\ARM\Fury_GPSD0\Application\mainFur Upload to Flash Compare Flash Manual Reset	Erase / Blank Blank Check  Erase Era	Communication Connected To Port COM1: • Use Baud Rate 38400 • Time-Out [sec]: 2
Device: LPC2106 XTAL Freq. [kHz]: 10000	Read Part ID: evice ID Boot Loader ID:	Use DTR/RTS for Reset and Boot Loader Selection
Please reset your LPC2	IN COLOR DE LA COL	

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)".

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Rest Magic - NON PRODUCTION USE ONLY								
File ISP Options Tools Help								
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Step 1 - Communications	Step 2 - Erase							
Select Device LPC2138	Erase block 0 (0x000000-0x000FFF)							
COM Port: COM 4	Erase block 1 (0x001000-0x001FFF)     Erase block 2 (0x002000-0x002FFF)							
Baud Rate: 38400	Erase block 3 (0x003000-0x003FFF) Erase block 4 (0x004000-0x004FFF)							
Interface: None (ISP)	Erase block 5 (0x005000-0x005FFF)							
Oscillator (MHz): 10	Erase all Flash+Code Rd Prot Erase blocks used by Hex File							
Step 3 - Hex File								
Hex File: \FireFly-IIA_2.19.hex	Browse							
Modified: Unknown	more info							
Step 4 - Options	Step 5 - Start!							
Verify after programming	Start							
Fill unused Flash								
Your Training or Consulting Partner: Embr	added Sustems Academu							
Four Haining of Consulting Faither. Embl	Jaco oystems Academy							
www.esacademy.com								
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#### Figure 1.5 Flash Magic utility

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

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#### Figure 1.6 Device selection window

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



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File ISP Option	ns <u>T</u> ools <u>H</u> elp			
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	17         LPC2101         LPC2102         LPC2103         LPC2104         LPC2105         LPC2106         LPC2109         LPC2114         LPC2119         LPC2124         LPC2131         LPC2132         LPC2134			
On-Line training classes for microcontrollers and embedded networking and Internetworking www.esacademy.com/fag/classes				
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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.

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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.

