

## **ELAD FDM-DUO** Dual Mode SDR Transceiver



## **FIRMWARE UPDATE**

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## **Revision History**

Revision	Date	Description	
Rev 1.0	11/2017	<ul> <li>Document creation.</li> <li>Added note about how to activate manually the UI reprogramming mode.</li> </ul>	

## Introduction

This document describes how to update the various firmware of the FDM-DUO. The latest firmware versions are available here: <u>http://sdr.eladit.com/FDM-DUO/Firmware%20Releases/</u>.

# TO FACILITATE THE PROCEDURE, PLEASE UPDATE THE USER INTERFACE (UI) FIRMWARE AFTER DOING THE OTHERS FIRMWARE UPDATES.

## 1 RX and TX firmware update

To update the RX and TX firmware, you must remove the FDM-DUO top cover. Remove the four screws in the FDM-DUO chassis bottom as shown in the figure below.



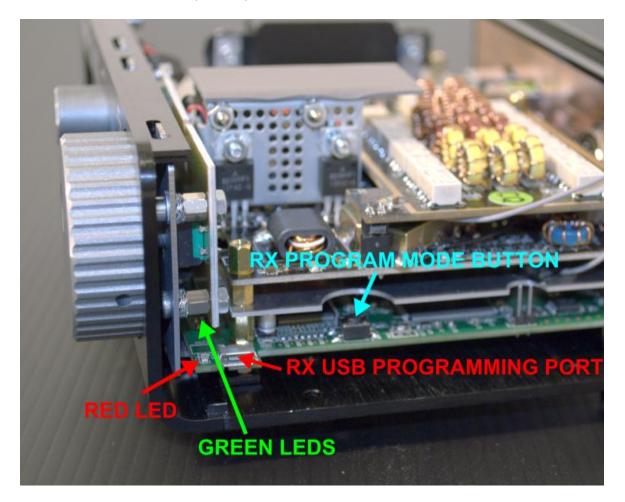
Then remove the top cover of the FDM-DUO

### **1.1 RX firmware update**

First of all, download the latest version of the RX firmware. Unzip the archive and copy the file *"fdmduorx.bin"* in the USB flash drive provided with the FDM-DUO. If the file already exists, replace it.

#### The file *"fdmduorx.bin"* must be in the root of the USB flash drive. For example : *"E:\fdmduorx.bin"*.

Connect the provided USB flash drive to the FDM-DUO "RX USB PROGRAMMING PORT" using the provided micro-USB adapter. See the picture below. Connect the power supply, keep pressed the "RX PROGRAM MODE BUTTON" and power up the FDM-DUO.



- Keep pressed the "RX PROGRAM MODE BUTTON" until the "RED LED" turns on.
- Release the "RX PROGRAM MODE BUTTON".
- Wait until the "RED LED" turns off.
- Turn off the FDM-DUO, disconnect the USB flash drive and power up the FDM-DUO.

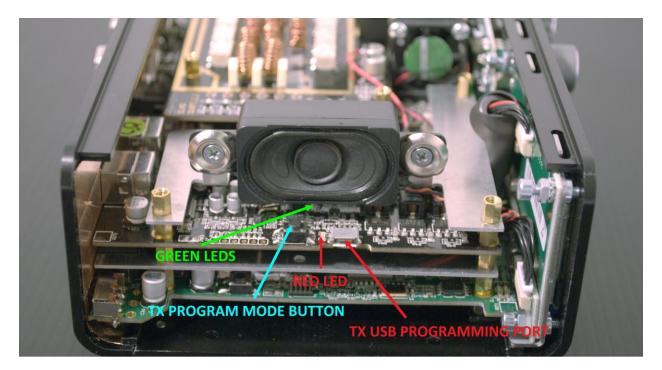
If during the firmware update the "GREEN LEDS" are blinking together quickly, it means that the update process ended not successfully. In this case contact the ELAD technical assistance.

#### **1.2 TX firmware update**

First of all, download the latest version of the TX firmware. Unzip the archive and copy the file *"fdmduotx.bin"* in the USB flash drive provided with the FDM-DUO. If the file already exists, replace it.

#### The file *"fdmduotx.bin"* must be in the root of the USB flash drive. For example : *"E:\fdmduotx.bin"*.

Connect the provided USB flash drive to the FDM-DUO "TX USB PROGRAMMING PORT" using the provided micro-USB adapter. See the picture below. Connect the power supply, keep pressed the "TX PROGRAM MODE BUTTON" and power up the FDM-DUO.



- Keep pressed the "TX PROGRAM MODE BUTTON" until the "RED LED" turns on.
- Release the "TX PROGRAM MODE BUTTON".
- Wait until the "RED LED" turns off.
- Turn off the FDM-DUO, disconnect the USB flash drive and power up the FDM-DUO.

If during the firmware update the "GREEN LEDS" are blinking together quickly, it means that the update process ended not successfully. In this case contact the ELAD technical assistance.

### 2 USB interface firmware update

Download the latest version of the USB interface firmware here : <a href="http://sdr.eladit.com/FDM-DUO/Firmware Releases/USB Interface Firmware/index.php?lang=EN">http://sdr.eladit.com/FDM-DUO/Firmware Releases/USB Interface Firmware/index.php?lang=EN</a>.

#### Before starting the firmware update, disable all anti-virus programs to avoid any inconvenience.

Turn on the FDM-DUO and connect the USB RX connector to a USB 2.0 port of your computer. Unzip the archive, launch the executable file inside and follow the instructions to update the firmware.

#### Do not disconnect the USB cable and do not turn off the FDM-DUO.

Once the update is completed, turn off and on the FDM-DUO.

## **3 FPGA firmware update**

Download the latest version of the FPGA firmware.

#### Before starting the firmware update, disable all anti-virus programs to avoid any inconvenience.

Turn on the FDM-DUO and connect the USB RX connector to a USB 2.0 port of your computer. Unzip the archive, launch the executable file inside and follow the instructions to update the firmware.

#### Do not disconnect the USB cable and do not turn off the FDM-DUO.

Once the update is completed, turn off and on the FDM-DUO.

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PROGRAM MODE

## 4 User interface (UI) firmware update

Download the latest version of the user interface firmware.

# Before starting the firmware update, it is recommended to disable all antivirus programs in order to avoid any inconvenience.

In order to update the user interface firmware, you need to install the Flash Magic software. This program is available here: <u>http://www.flashmagictool.com/</u>

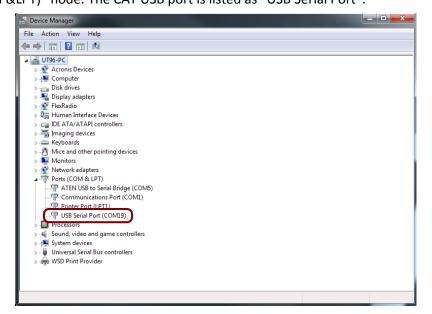
Turn on the FDM-DUO and connect the CAT USB port to a USB 2.0 port of your computer. Follow the steps below to enable the user interface reprogramming mode :

- Press the MENU F5 key, turn the E2 knob to go to the menu 80 (SERVICE), press E2 to enter in the menu,
- turn E2 to display "ON" and press E2 to confirm,
- turn E2 to go to the menu 82 (UI Update), press E2 to enter in the menu,
- turn E2 to display "YES" and press E2 to confirm.

<u>Important note</u> : it is also possible to enable manually the user interface reprogramming mode. To do this :

- turn off the FDM-DUO,
- keep pressed the UI PROGRAM MODE BUTTON,
- turn on the FDM-DUO,
- release the UI PROGRAM MODE BUTTON,
- the UI is now in reprogramming mode, notice that the display remains turned off.

Then you need to identify the CAT USB port number. Open the windows "Device Manager" and expand the "Ports (COM &LPT)" node. The CAT USB port is listed as "USB Serial Port".



In this case the CAT USB port number is COM19.

#### Firmware Update - Rev. 1.0 - 11/2017

Run Flash Magic and set the following parameters.

In the "Step 1 – Communication" section:

- Select LPC1766,
- COM Port: the CAT USB COM port,
- Baud Rate: 230400,
- Interface: None (ISP).

In the "Step 2 – Erase" section:

• Check "Erase all Flash+Code Rd Prot".

In the "Step 3 – Hex File" section:

• Click on Browse and select the update ".hex" file.

In the "Step 4 – Options" section:

• Check "Verify after programming.

象 Flash Magic - NON PRODUCTION USE ONLY							
File ISP Options Tools Help							
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Step 1 - Communications	Step 2 - Erase						
Select LPC1766	Erase block 0 (0x000000-0x000FFF)						
Flash Bank:	Erase block 1 (0x001000-0x001FFF) Erase block 2 (0x002000-0x002FFF)						
COM Port: COM 19 🗸	Erase block 3 (0x003000-0x003FFF) Erase block 4 (0x004000-0x004FFF)						
Baud Rate: 230400 👻	Erase block 5 (0x005000-0x005EEE)						
Interface: None (ISP) 👻	Erase all Flash+Code Rd Prot						
Oscillator (MHz):							
Step 3 - Hex File							
Hex File: C:\Users\UT96\Desktop\FDMDU0_U	JI.hex Browse						
Modified: Unknown	more info						
Step 4 - Options	Step 5 - Start!						
Verify after programming Start Start							
Gen block checksums							
Execute Activate Flash Bank							
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www.esacademy.com/faq/classes							
	U						

Check the communication with the FDM-DUO clicking on "ISP" and then on "Read Device Signature". If the communication with the FDM-DUO is working, a new window with some device information is opened.

🍘 Flash Magic - NON PRODUCTION USE C		sh Bank Erzee Moek 5 (0x001000-0x001FFF)
File ISP Options Tools Help		ON Device Signature
Blank Check	1 3 8	iud Manufacturer ID: 0x
Step Read Security	Step 2 - Erase	nte Device ID 1: 0x
Seli Read Device Signature	Erase block 0 (0x000000-0x000FFF)	scill Device ID 2: 0x
Boot Vector and Status Byte	Erase block 1 (0x001000-0x001FFF) Erase block 2 (0x002000-0x002FFF)	Device ID: 0x 26013F33
Display Memory	Erase block 3 (0x003000-0x003FFF)	Bootloader Ver: 4.2
CO 🍞 Erase Flash	Erase block 4 (0x004000-0x004FFF) Erase block 5 (0x005000-0x005FFF)	ax F
Bau Erase Flash Pages	V Erase all Flash+Code Rd Prot	Serial Number: 185335324 1397565140 1323834993 4110417920
Int 🍑 Verify	Erase blocks used by Hex File	Close
Osc Execute Reset		
So		Gen block checksums
Step Start Bootloader Read Clocks		
Hex Device Configuration	I.hex Browse	
Cyclic Redundancy Check	more info	
Step 🚩 Read MISR	Step 5 - Start!	
Serial Number	Start	
Fill Enable SoftICE	Start	J
Ge Additional Security Bits		
Ex Update Bootloader		
EEPROIVI		_
Technical on-line articles about 8051 and XA pro	ogramming	
www.esacademy.com/faq/docs	•	•
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If the communication is working it is possible to proceed with the firmware update. Click on "close" on the "Device Signature" window. In the Flash Magic main window, click on "Start" to begin the programming.

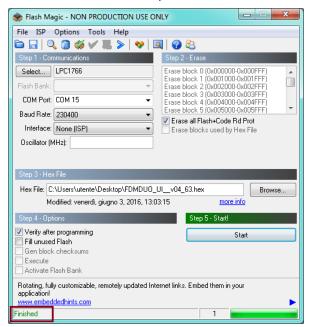
Flash Magic will now proceed to program the firmware.

🌧 Flash Magic - NON PRODUCTION USE ONLY - Using 230400 ba 📼 💷 🗮 🌠							
File ISP Options Tools Help							
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Step 1 - Communications	Step 2 - Erase						
Select       LPC1766         Flash Bank:       *         COM Port:       COM 15         Baud Rate:       230400         Interface:       None (ISP)         Oscillator (MHz):	Erase block 0 (0x00000-0x000FFF) Erase block 1 (0x001000-0x001FFF) Erase block 2 (0x002000-0x002FFF) Erase block 3 (0x003000-0x003FFF) Erase block 4 (0x004000-0x004FFF) Erase block 5 (0x005000-0x005FFF) ✓ Erase all Flash+Code Rd Prot Erase blocks used by Hex File						
Step 3 - Hex File         Browse           Hex File:         C:\Users\utente\Desktop\FDMDU0_UI_v04_63.hex         Browse           Modified: veneral, giugno 3, 2016, 13.03.15         more info							
Step 4 - Options Step 5 - Start							
Step 3-State       Verify after programming       Fill unused Flash       Gen block checksums       Execute       Activate Flash Bank							
On-Line training classes for microcontrollers and embedded networking and Internetworking www.esacademy.com/fag/classes Programming device (0x00031800) 0							

Then, Flash Magic performs the programming verification.

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File ISP Options Tools Help								
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Step 1 - Communications	Step 2 - Erase							
Select LPC1766	Erase block 0 (0x000000-0x000FFF) Erase block 1 (0x001000-0x001FFF) Erase block 2 (0x002000-0x002FFF)							
COM Port: COM 15	Erase block 3 (0x003000-0x003FFF) Erase block 4 (0x004000-0x004FFF) Erase block 5 (0x005000-0x005FFF)							
Baud Rate: 230400	Erase all Flash+Code Rd Prot							
Interface: None (ISP)	Erase blocks used by Hex File							
Step 3 - Hex File           Hex File:         C:\Users\utente\Desktop\FDMDU0_UIv04_63.hex         Browse           Modified: venerdi, giugno 3, 2016, 13:03:15         more info								
Step 4 - Options	Step 5 - Start!							
Verify after programming Fill unused Flash Gen block checksums Execute Activate Flash Bank								
Visit the "Flash Magic" home page for info on t	Visit the "Flash Magic" home page for info on the latest revision							
www.esacademy.com/software/flashmagic								
Verifying (0x00002C00)	0							

Wait until the end of the process, it should result like the picture bellow.



Then turn off and on the FDM-DUO.

If some problems occur during the firmware update procedure, please contact the ELAD technical assistance.