

ELAD FDM-DUO Dual Mode SDR Transceiver



FIRMWARE UPDATE

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Revision History

Revision	Date	Description	
Rev 1.0	11/2017	Document creation.	
		 Added note about how to activate manually the UI update mode. 	
Rev 1.1	07/2019	Added links to firmware.	
		• Added picture on section 2 - USB interface firmware update.	
		 Modified section 3 - FPGA firmware update. 	
		• Updated section 4 - User interface (UI) firmware update to support	
		both versions 11 and 12 of Flash Magic.	

Introduction

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

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

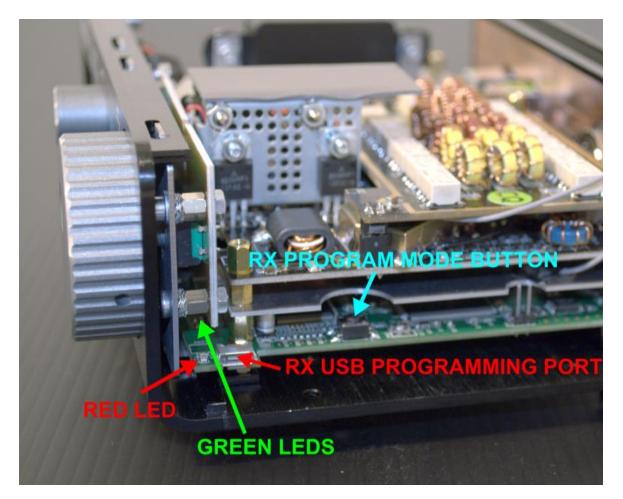
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1.1 RX firmware update

First of all, download the latest version of the RX firmware from here : <u>http://sdr.eladit.com/FDM-DUO/Firmware%20Releases/ARM%20Rx%20Firmware/index.php?lang=EN</u>. 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.

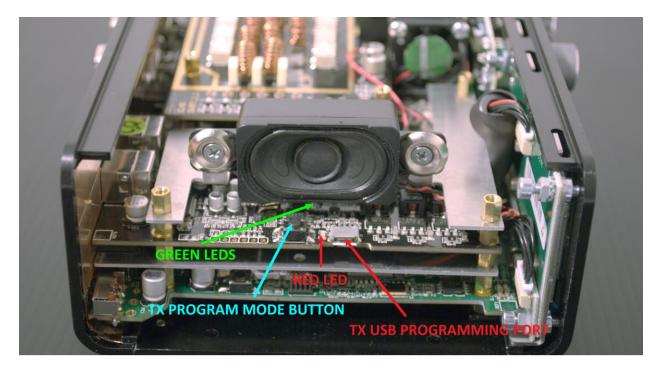


1.2 TX firmware update

First of all, download the latest version of the TX firmware from here : <u>http://sdr.eladit.com/FDM-DUO/Firmware%20Releases/ARM%20Tx%20Firmware/index.php?lang=EN</u>. 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 : <u>http://sdr.eladit.com/FDM-DUO/Firmware Releases/USB Interface Firmware/index.php?lang=EN</u>.

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.

Name	Date modified	Туре	Size	
README.txt	28/05/2015 12:02	TXT File	1 KB	
WinUsbFunctionsDII.dll	28/05/2015 11:40	Application extension	41 KB	
WinusbFwUpdateConsoleApp.exe	28/05/2015 11:40	Application	194 KB	
ELAD CONSOLE SOFTWARE for FDMD	UO CY FIRMWARE UPD	ATE. Version 1.0		x
ELAD CONSOLE SOFTWARE for FD SOFTWARE VERSION 1.0	MDUO CY FIRMWARE	UPDATE		
				=
THRN OFF ALL ANTIUIRUS SOFTW Press "Enter" to continue	ARES BEFORE STAR	TING FIRMWARE UPDA	TE PROCESS	
rress Enter to continue				
List of all ELAD winusb devi <pre>\\?\usb#vid_1721&pid_061a#6&</pre>	ces: 182a12da&0&5#{5d	f66425-2a8e-440d-a	d8b-b9e92141f86	7>
-	1 Usb PID: 061			
Usb Port: 6&	182a12da&0&5			
ELAD usb device selected => FDMDUO devic	e			
Insert command from 0 to 2 t Command 0: exit	o do:			
Command 1: firmware Command 2: read all	update			
Command 2: read all 1	configuration v	alues		
Start Firmware update on FDM	DUO device. Vers	ion 4.9.		
Press "Enter" to continue				
Loading VendAx file		. OK		
Check ĚEPROMOK Loading firmware				
Firmware updated successfully!!!				
				Disconnect USB cable and exi
Press "Enter" to exit softwa	re			
-				-

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

There is no update to do for the FPGA firmware.

4 User interface (UI) firmware update

Download the latest version of the user interface firmware from here : <u>http://sdr.eladit.com/FDM-DUO/Firmware%20Releases/UI%20User%20Interface%20Firmware/index.php?lang=EN</u>.

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 (UI) firmware, you need to install the Flash Magic software. This program is available here: <u>http://www.flashmagictool.com/</u>. There are two versions available, **Classic Version 11** and **Version 12**, this document covers the use of both.

4.1 Update mode activation

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 update 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 update 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 update mode, notice that the display remains turned off.



4.2 USB port identification

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

In the picture alongside the CAT USB port number is COM19.

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4.3 Update with Flash Magic Classic Version 11

Run Flash Magic 11 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"

🎲 Flash Magic - NON PRODUCTION USE ON	
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	.hex Browse
Modified: Unknown	more info
Step 4 - Options	Step 5 - Start!
Verify after programming	Start
Fill unused Flash	
Gen block checksums	
Activate Flash Bank	
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www.esacademy.com/fag/classes	•
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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 OF		sh Bank	Erase Diock 1 (UXUU1UUU-UXUU1FFF)
File IS	P Options Tools Help		OM Device Signature	×
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Elash 👝	Boot Vector and Status Byte	Erase block 1 (0x001000-0x001FFF) Erase block 2 (0x002000-0x002FFF)	Device ID: 0x 2	6013F33
	Display Memory	Erase block 3 (0x003000-0x003FFF)	ep (
	Erase Flash	Erase block 4 (0x004000-0x004FFF) Erase block 5 (0x005000-0x005FFF)	Bootloader Ver:	4.2
Bau	Erase Flash Pages	✓ Erase all Flash+Code Rd Prot	Serial Number: 11	85335324 1397565140 1323834993 4110417920
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	Start Bootloader		Jen DIOCK CHECKSUMS	
Step	Read Clocks			
Hex	Device Configuration	I.hex Browse		
V 1	Cyclic Redundancy Check	more info		
Step 🗸	Read MISR	Step 5 - Start!		
Ve Ve	Serial Number	Start		
🔲 Fill	Enable SoftICE	Start		
Ge	Additional Security Bits			
Ex Ad	Update Bootloader			
	EEPROM	J		
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www.esa	academy.com/fag/docs	►		
		0		

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.

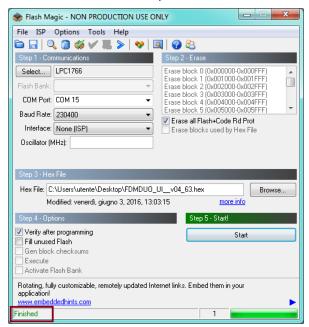
Flash Magic will now proceed to program the firmware.

🌧 Flash Magic - NON PRODUCTION USE	ONLY - Using 230400 ba			
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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 (MH2): "	Erase block 0 (0x000000-0x000FFF) Erase block 1 (0x001000-0x000FFF) Erase block 2 (0x002000-0x002FFF) Erase block 3 (0x003000-0x003FFF) Erase block 4 (0x004000-0x004FFF) Erase block 5 (0x005000-0x005FFF) Erase block 5 (0x005000-0x005FFF) Erase block 5 (0x005000-0x005FFF)			
Step 3 - Hex File				
Hex File: C:\Users\utente\Desktop\FDMDU				
Modified: venerdî, giugno 3, 2016, 1:	3:03:15 <u>more info</u>			
Step 4 - Options	Step 5 - Start!			
Verify after programming Fill unused Flash Gen block checksums Execute Activate Flash Bank				
On-Line training classes for microcontrollers an Internetworking <u>www.esacademy.com/fag/classes</u> Programming device (0x00031800)	d embedded networking and			

Then, Flash Magic performs the programming verification.

🎲 Flash Magic - NON PRODUCTION USE ONLY - Using 230400 ba 💷 💷 🛲				
File ISP Options Tools Help				
	國 🖓 😂			
Step 1 - Communications	Step 2 - Erase			
Select LPC1766	Erase block 0 (0x00000-0x000FFF) 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 Interface: None (ISP)	✓ Erase all Flash+Code Rd Prot Erase blocks used by Hex File			
Oscillator (MHz): Step 3 - Hex File Hex File: C:\Users\utente\Desktop\FDMDUO Modified: venerdi, giugno 3, 2016, 13				
Step 4 - Options	Step 5 - Start!			
 ✓ Verify after programming Fill unused Flash Gen block checksums Execute Activate Flash Bank 	Cancel			
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.

4.4 Update with Flash Magic Version 12

Run Flash Magic 12 and set the following parameters.

In the "Device" section :

- select LPC1766 (LPC1700),
- COM Port: the CAT USB COM port,
- Baud Rate: 115200.

In the "Erase" section :

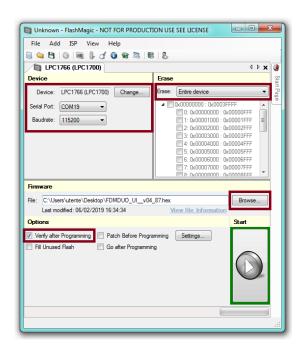
• choose "Entire device".

In the "Firmware" section :

 click on Browse and select the downloaded ".hex" file.

In the "Options" section :

• check "Verify after programming".



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

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Baudrate: Go Start Bootloader FAIM FAIM FAIM Read Checksums FS: 0x00002000 (x00003FFF FS: 0x00003000 (x00003FFF FS: 0x00005000 (x00003FFF FS: 0x00005000 (x00003FFF FS: 0x00005000 (x00003FFF FS: 0x00005000 (x00003FFF FS: 0x00007000 (x00003FFF FS: 0x0007000 (x0003FFF FS: 0x0007000 (x00003FFF FS: 0x0007000 (x0003FFF FS: 0x0007000 (x00				•	Close
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If the communication is working it is possible to proceed with the firmware update. Click on "close" on the "Signature" window. In the Flash Magic main window, click on "Start" to begin the programming.

Flash Magic will now proceed to program the firmware.

Unknown - FlashMagic - NOT FOR PRODUCTION USE SEE LICENSE File Add ISP View Help 🖹 😂 🕲 💷 🖡 🕑 🐼 😒 🐯 🗞 [Busy] LPC1766 (LPC1700) 4 Þ 🗙 🔇 Device Erase Device: LPC1766 (LPC1700) Change... Erase: Entire device • * III Serial Port: COM19 -Baudrate: 115200 💌 2: 0x0002000 : 0x0002FFF 3: 0x0003000 : 0x0003FFF 4: 0x00004000 : 0x00004FFF 5: 0x00005000 : 0x0005FFF 6: 0x00006000 : 0x00006FFF 7: 0x00007000 : 0x00007FFF <u> | 8: 0x00008000 : 0x00008EEE</u> Firmware File: C:\Users\utente\Desktop\FDMDUO_UI_v04_87.hex Browse... View file Information Last modified: 06/02/2019 16:34:34 Options Start Verify after Programming Patch Before Programming Settings... Go after Programming 🔲 Fill Unused Flash Programming 0x00034400..

Then, Flash Magic performs the programming verification.

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

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Then turn off and on the FDM-DUO.

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