

## STM32F4 Discovery Firmware update, MMos HID USB firmware flashing – Beano, April'15

**Step 1:** Download and install the ST-Link software, STSW-LINK004

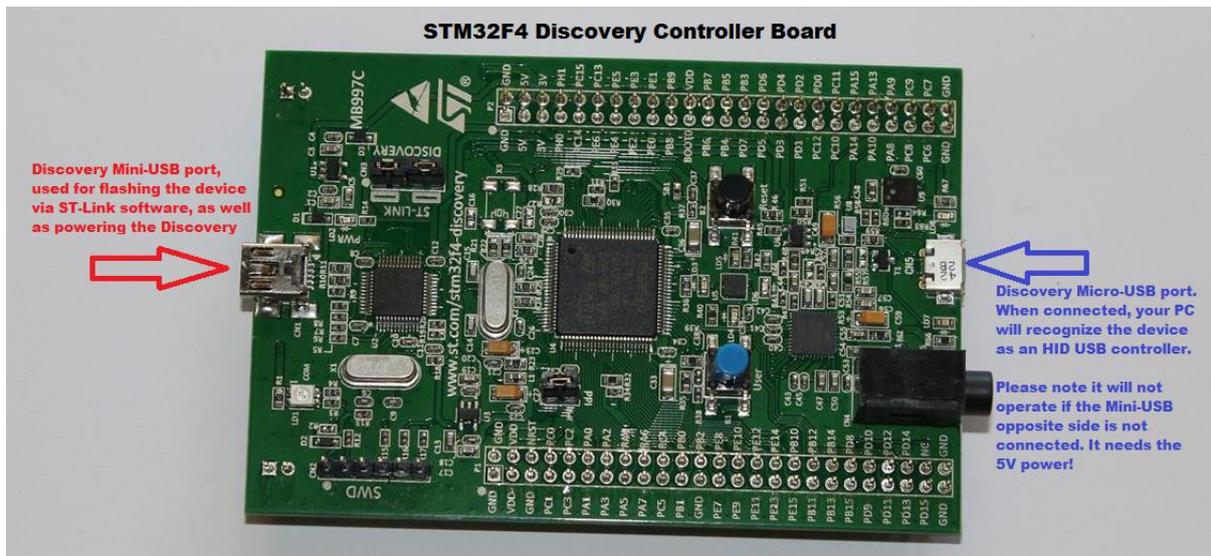
[http://www.st.com/web/catalog/tools/FM147/SC1887/PF258168?s\\_searchtype=partnumber](http://www.st.com/web/catalog/tools/FM147/SC1887/PF258168?s_searchtype=partnumber)

**Step 2:** Download and save the MMos latest HID USB Firmware, to a known location on your PC

<http://forum.virtualracing.org/showthread.php/92420-DIY-USB-Force-Feedback-Controller>

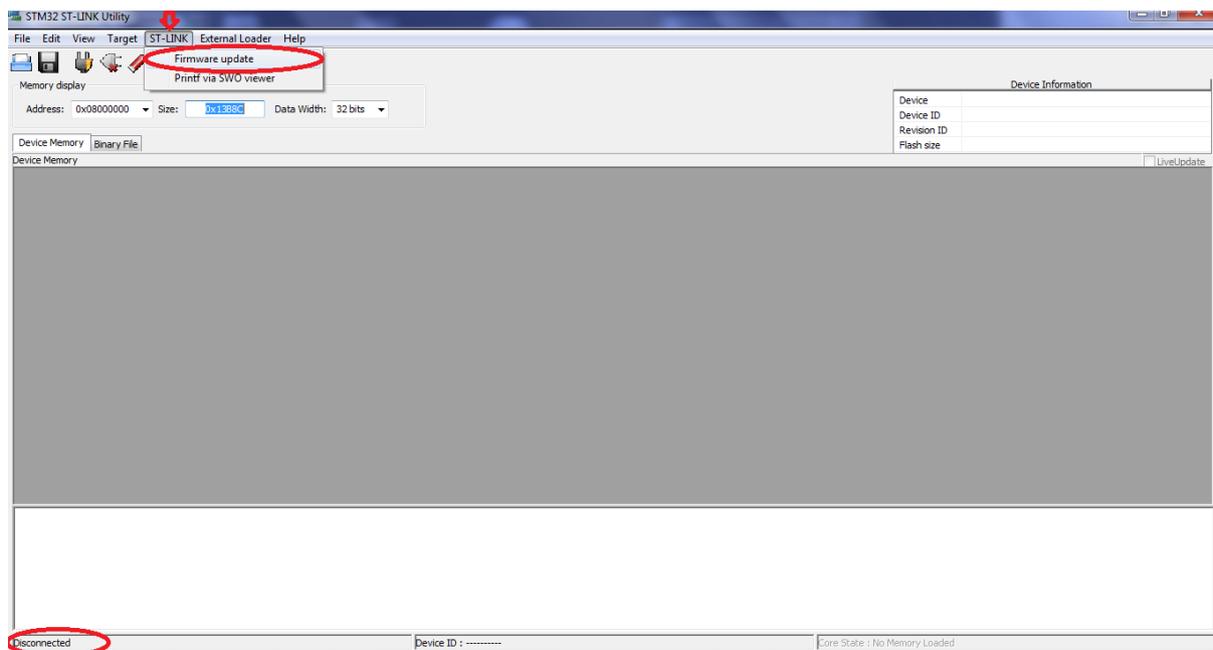
**Step 3:**

Connect both USB mini (Disco flash) and micro-USB (HID USB) ports on the discovery to your PC.



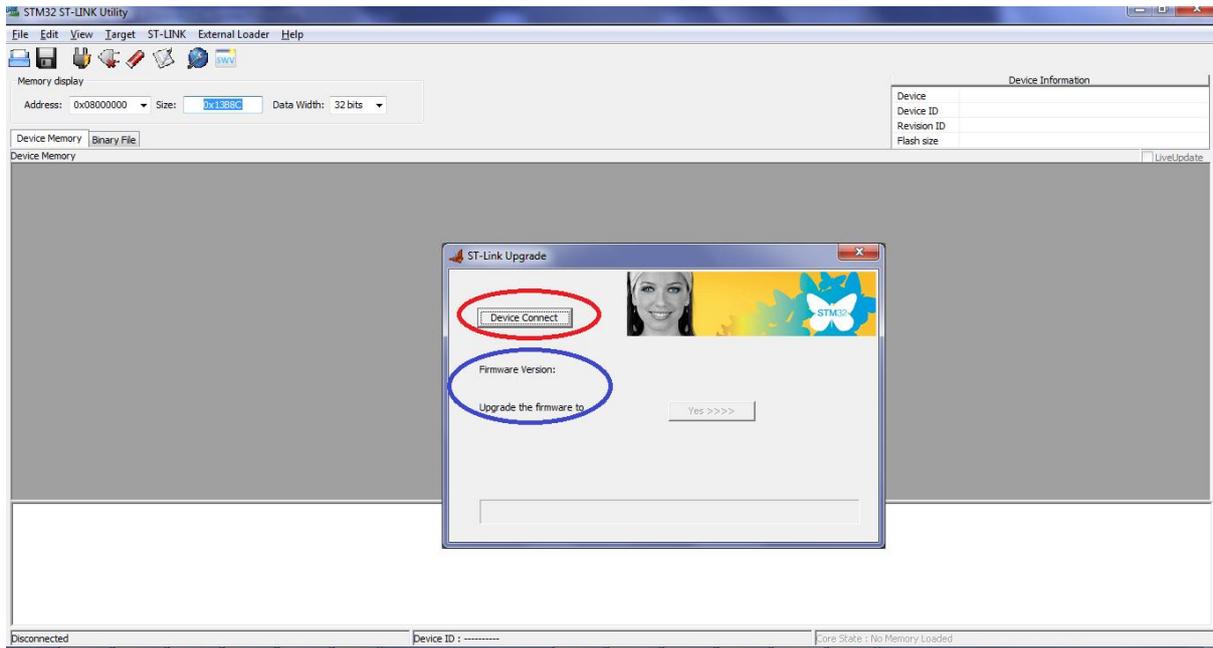
**Step 4:**

Open ST-Link; follow the following steps exactly as below. Select ST-Link and Firmware update, note the 'Disconnected' in the bottom left of the picture.



**Step 5:**

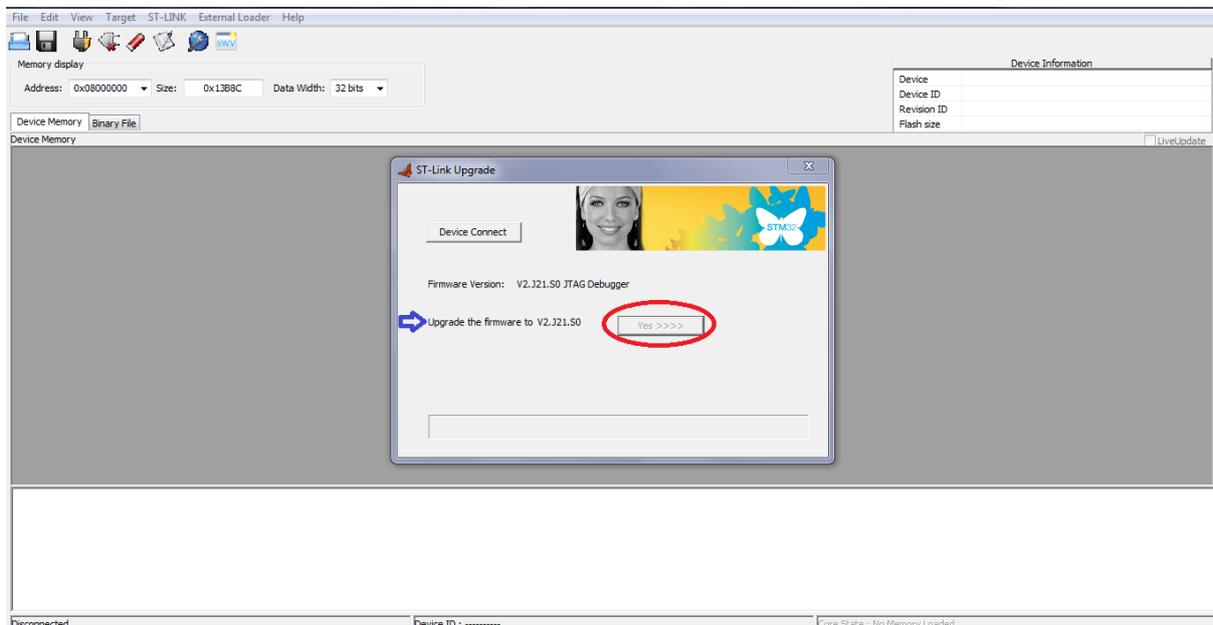
Note the empty firmware versions, then click 'Device Connect'



**Step 6:**

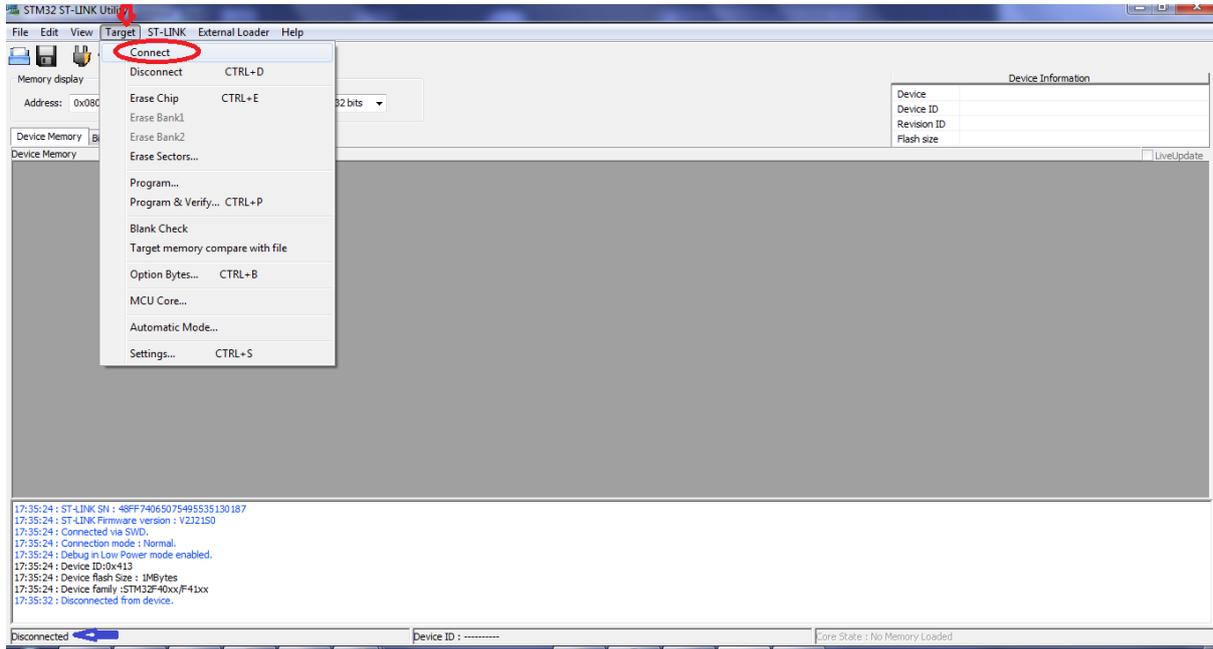
After selecting 'Device Connect' both the original factory firmware, as well as the new version, will be displayed. Select 'Yes' and the Discovery will update its internal flash.

Note my 'Yes' button is greyed out as I have done this earlier.



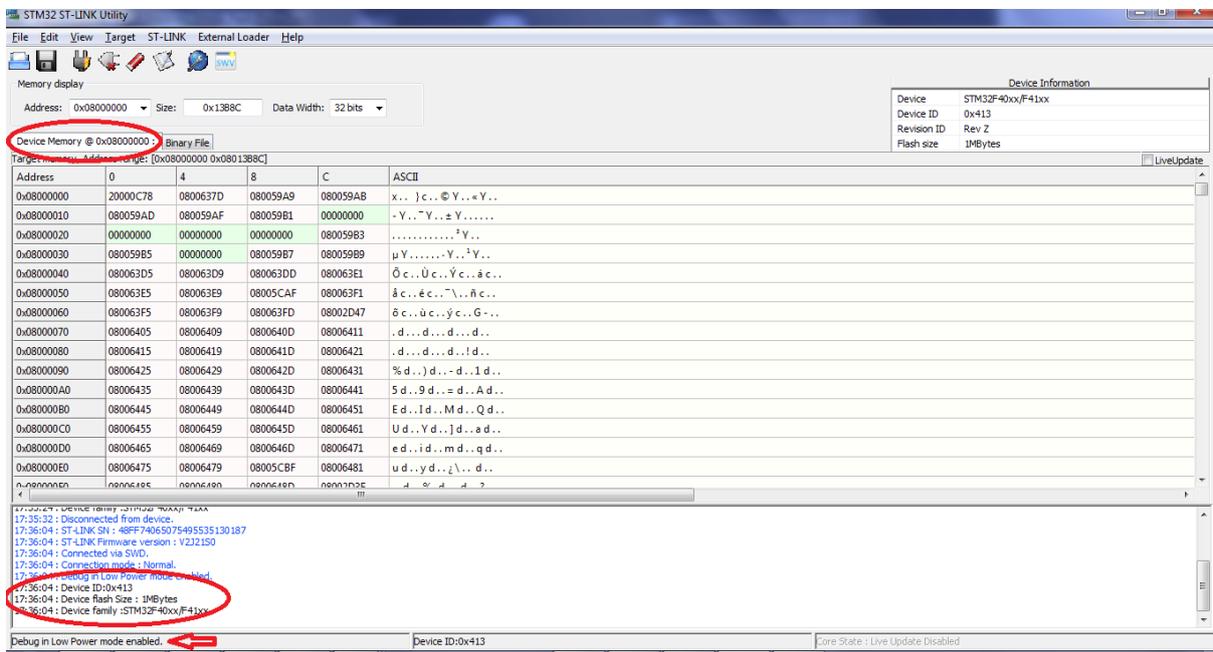
### Step 7:

Now onto the next part, where we will turn the device into a DD FFB steering wheel controller, by flashing the MMos firmware. Select the 'Target' dropdown from the main menu, and then 'Connect'.



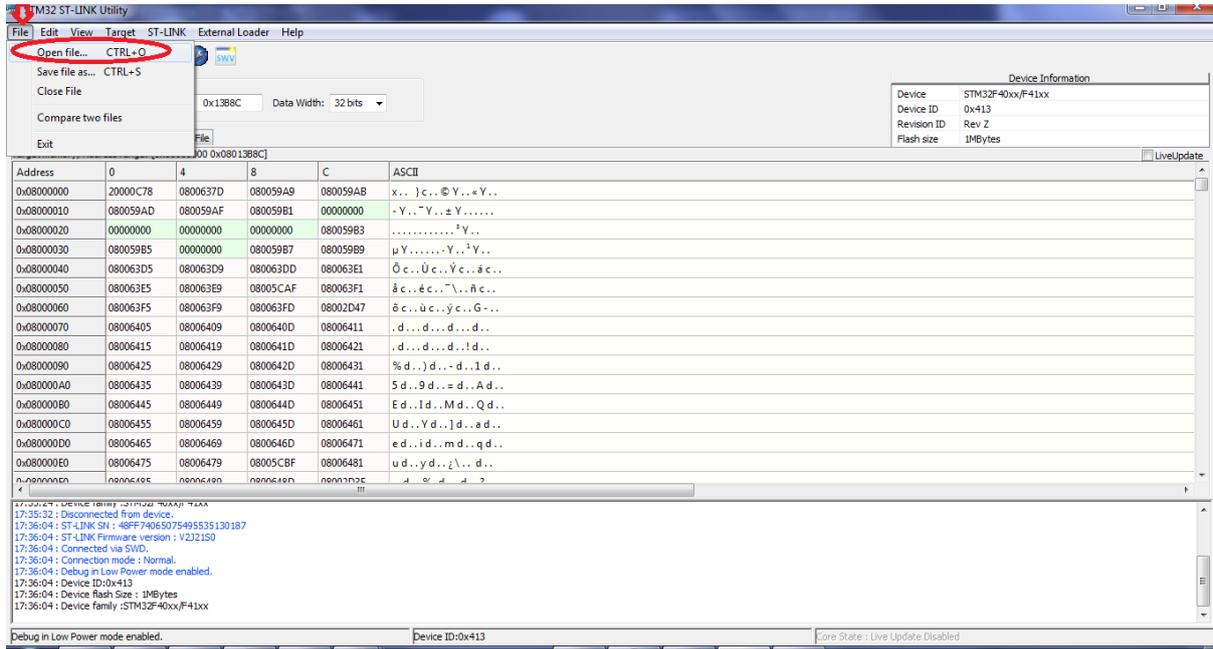
### Step 8:

Device will now be connected, and you should see the factory memory contents of the Discovery controller.



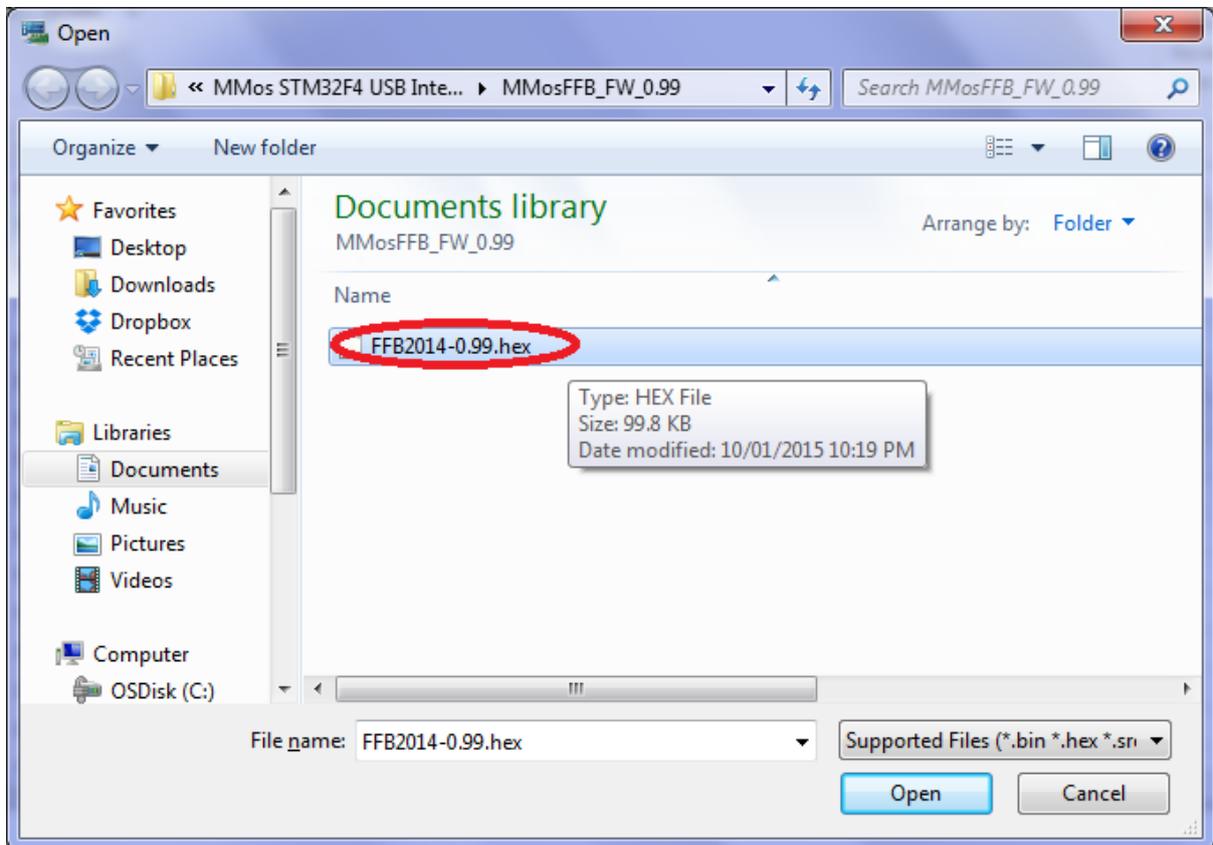
**Step 9:**

Next we will open the newly downloaded MMos firmware file, the link in Step 2 above. From the dropdown menu, select 'File' and then 'Open file'



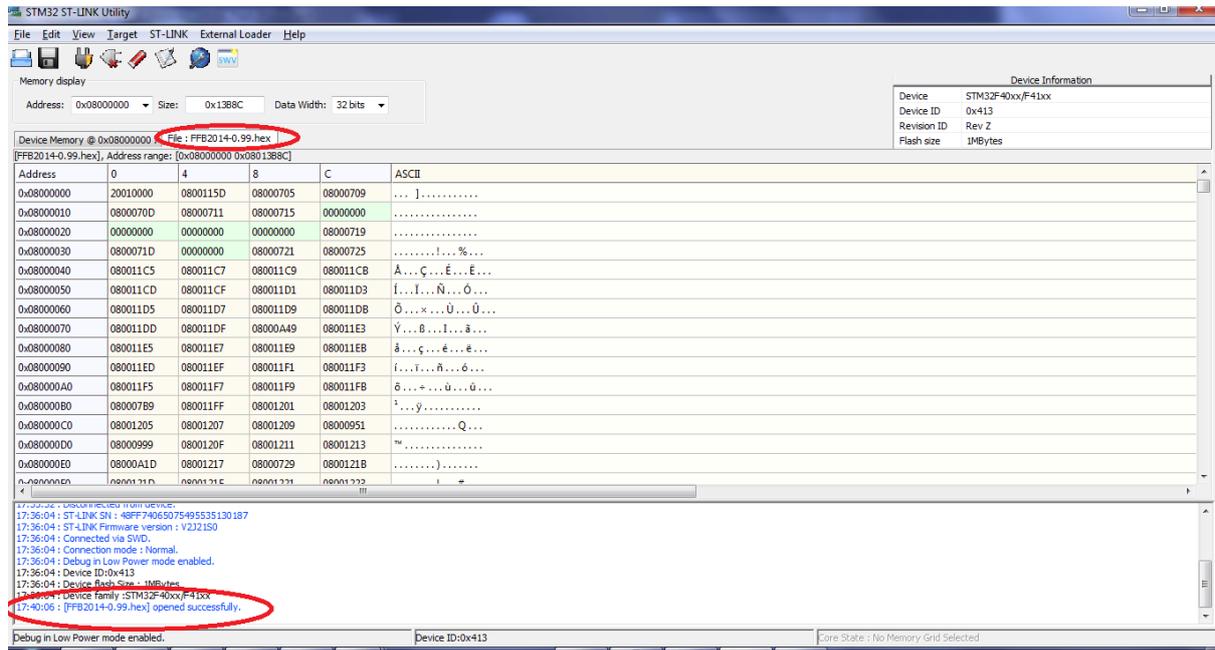
**Step 10:**

Navigate to where you have earlier saved the MMos firmware file, as below. Select it and then 'Open' from the dialog button.



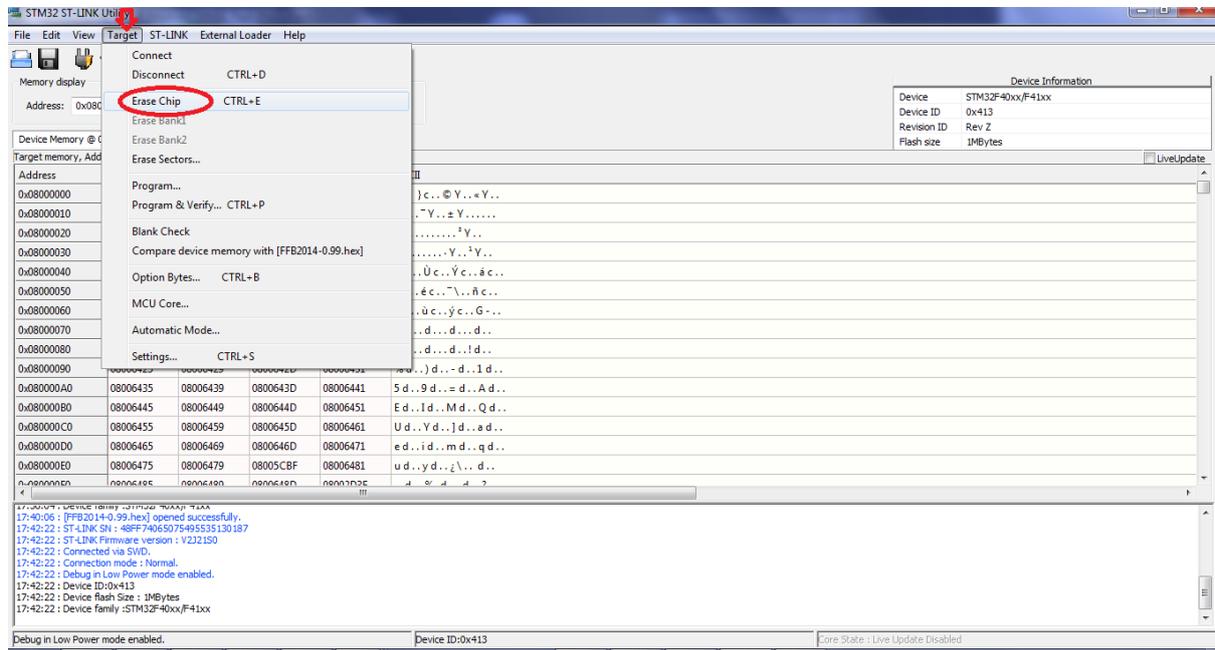
**Step 11:**

You should see something similar to the display below, note the areas marked in red ellipses.



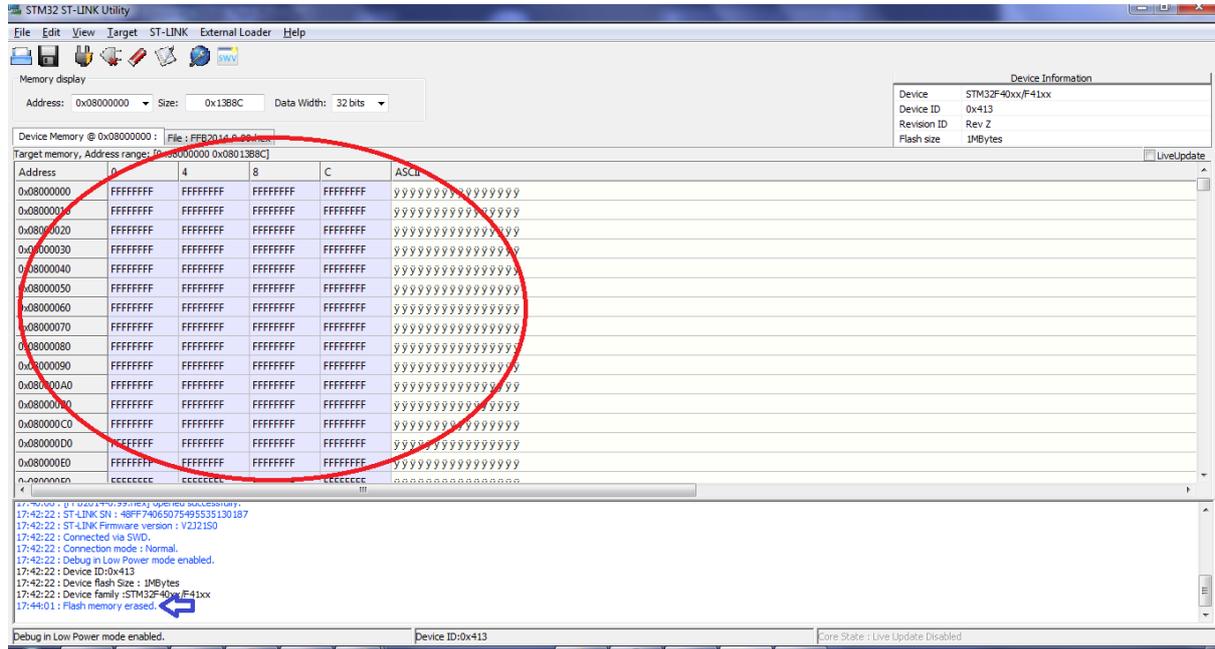
**Step 12:**

From the dropdown menu, select 'Target' followed by 'Erase chip'.



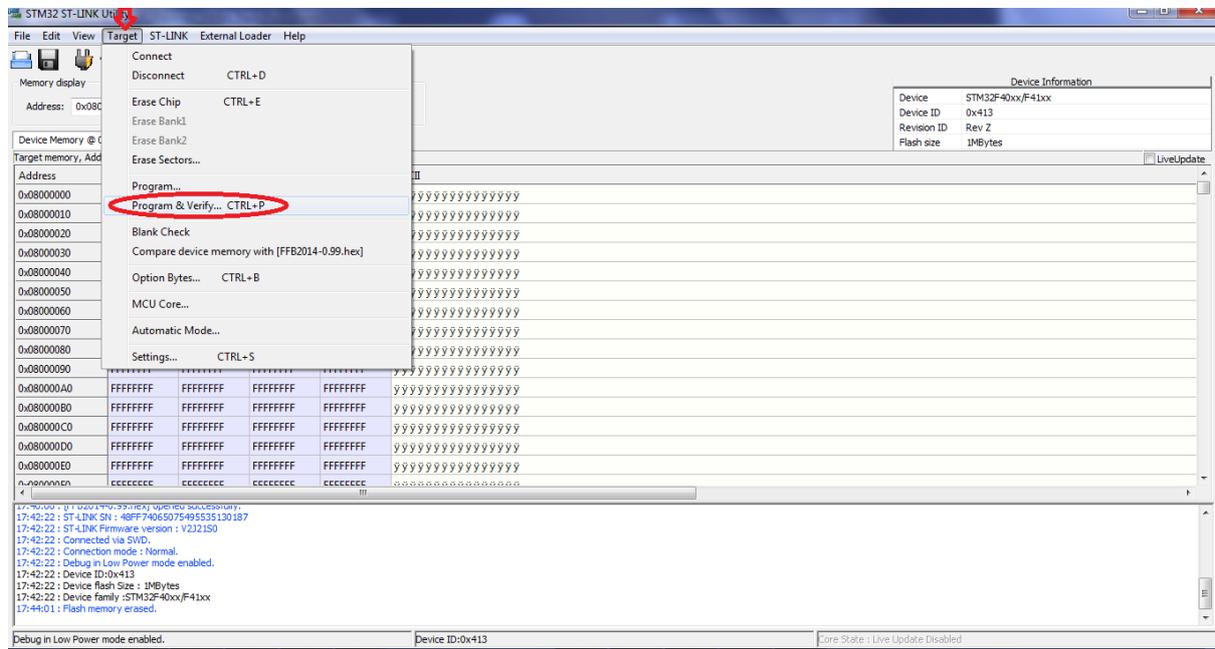
**Step 13:**

After completion, memory contents should display 'FFFFFFFF' in all memory locations, and the text should indicate as per the blue arrow in the bottom left hand corner.



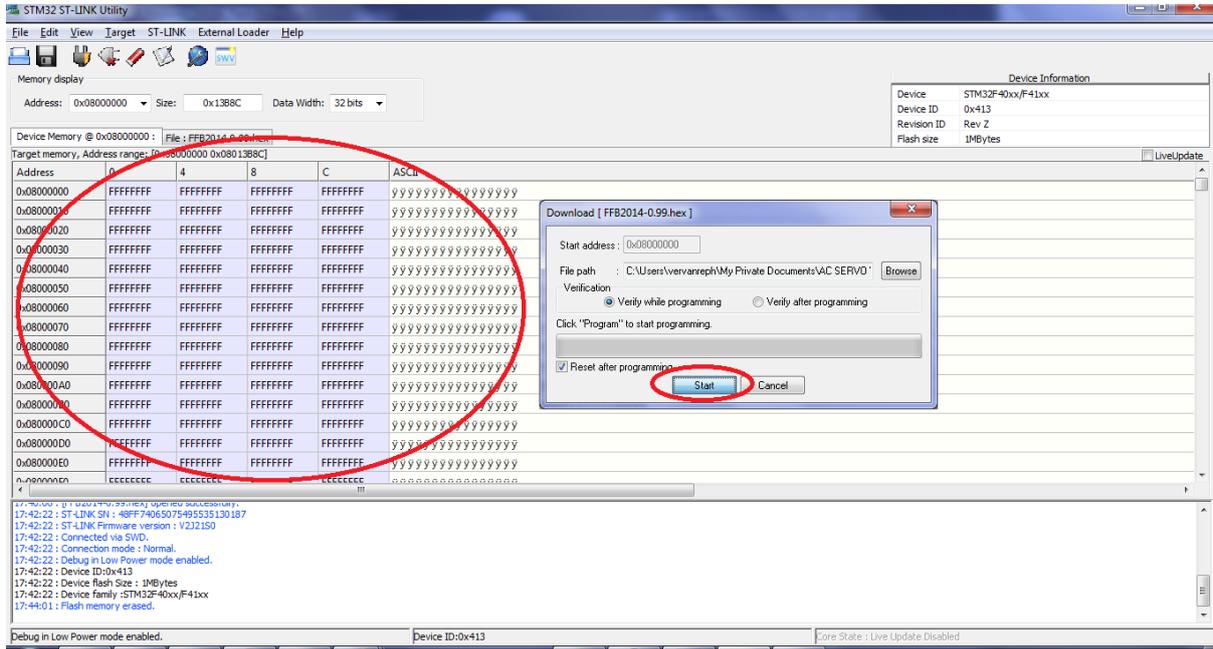
**Step 14:**

The next step would be to program the MMos Firmware, as well as verification of the event. Select 'Target' from the dropdown menu, followed by 'Program & Verify'



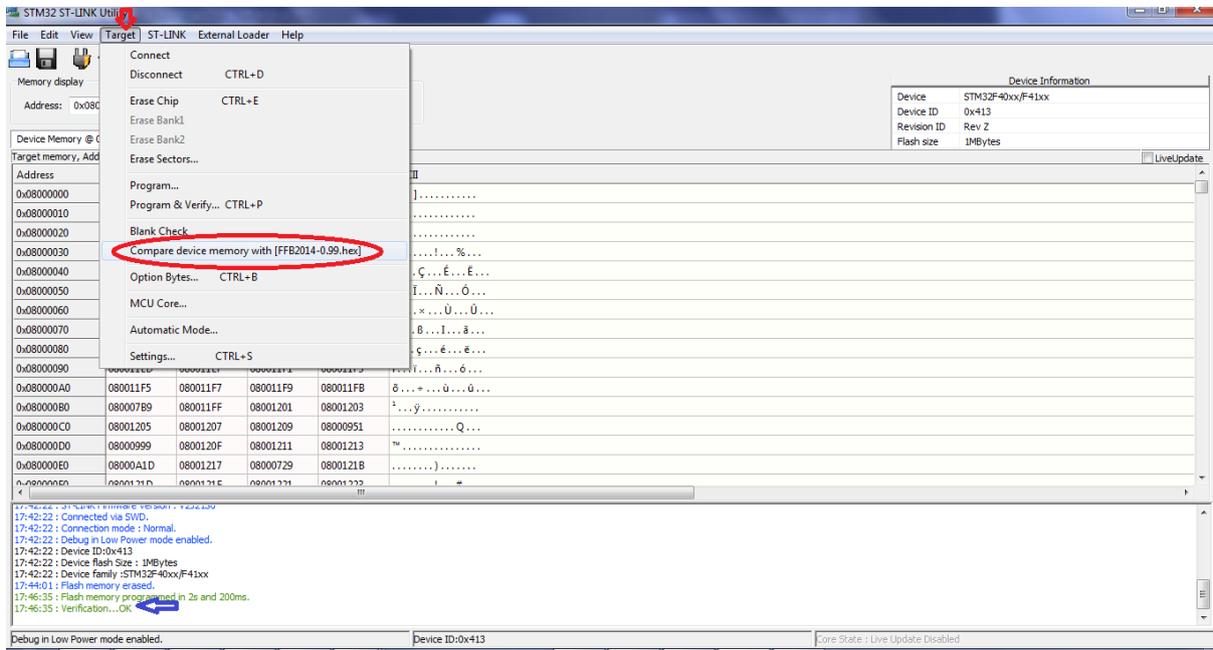
**Step 15:**

A dialogue box should appear, with the name of the correct MMos hex file in the top bar, this case 'FFB2014-0.99.hex'. Select 'Start' and wait for the progress bar to finish.



**Step 16:**

After completion of the flash process, I always make sure the Discovery Memory contents are the same as the file flashed from. Select 'Target' from the dropdown menu, followed by 'Compare device memory with [MMos hex file]'



### Step 17:

The result of Step 15 should be as per below, the most important part is the 'No difference found' – if you are at this point, you are almost done.

STM32 ST-LINK Utility

Memory display  
Address: 0x08000000 Size: 0x1388C Data Width: 32 bits

Device Memory @ 0x08000000 : File: FFB2014-0.99.hex Comparison: Device Memory Vs [FFB2014-0.99.hex]  
Target memory, Address range: [0x08000000 0x0801388C]

Address	0	4	8	C	ASCII
0x08000000	20010000	0800115D	08000705	08000709	... ].....
0x08000010	0800070D	08000711	08000715	00000000	.....
0x08000020	00000000	00000000	00000000	08000719	.....
0x08000030	0800071D	00000000	08000721	08000725	.....!...%...
0x08000040	080011C5	080011C7	080011C9	080011CB	À...Ç...È...É...
0x08000050	080011CD	080011CF	080011D1	080011D3	Î...Ï...Ñ...Ï...
0x08000060	080011D5	080011D7	080011D9	080011DB	Ï...x...Û...Ü...
0x08000070	080011DD	080011DF	08000A49	080011E3	Ý...ß...I...ä...
0x08000080	080011E5	080011E7	080011E9	080011EB	à...ç...é...è...
0x08000090	080011ED	080011EF	080011F1	080011F3	í...ï...ñ...ò...
0x080000A0	080011F5	080011F7	080011F9	080011FB	ô...+...ú...û...
0x080000B0	080007B9	080011FF	08001201	08001203	¹...ÿ.....
0x080000C0	08001205	08001207	08001209	08000951	.....Q...
0x080000D0	08000999	0800120F	08001211	08001213	™.....
0x080000E0	08000A1D	08001217	08000729	0800121B	.....)

Information  
No difference found.  
This file is already downloaded.  
OK

17:44:01 : Flash memory erased.  
17:46:35 : Flash memory programmed in 2s and 200ms.  
17:46:35 : Verification : OK  
17:50:24 : No difference found.  
This file is already downloaded.  
17:51:52 : No difference found.  
This file is already downloaded.  
17:52:42 : No difference found.  
This file is already downloaded.

Debug in Low Power mode enabled. Device ID:0x413 Core State : No Memory Grid Selected

### Step 18:

Next, select the 'Disconnect' icon and the connection to the discovery should terminate

STM32 ST-LINK Utility

Memory display  
Address: 0x08000000 Size: 0x1388C Data Width: 32 bits

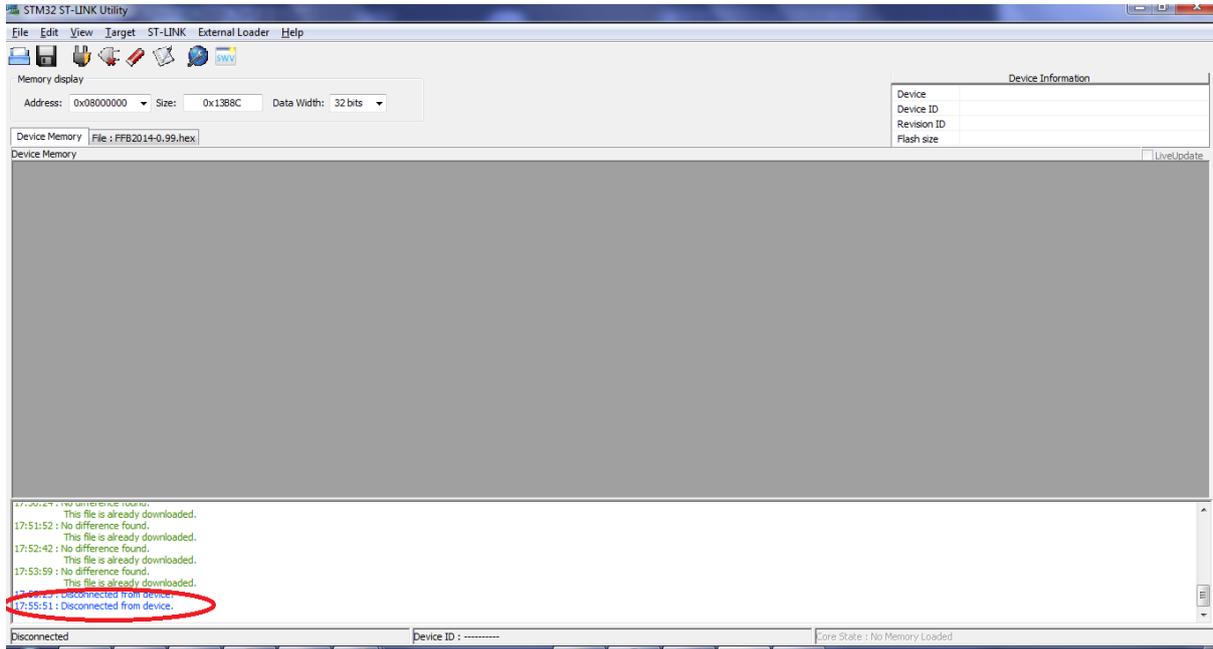
Device Memory @ 0x08000000 : File: FFB2014-0.99.hex Comparison: Device Memory Vs [FFB2014-0.99.hex]  
Target memory, Address range: [0x08000000 0x0801388C]

Address	0	4	8	C	ASCII
0x08000000	20010000	0800115D	08000705	08000709	... ].....
0x08000010	0800070D	08000711	08000715	00000000	.....
0x08000020	00000000	00000000	00000000	08000719	.....
0x08000030	0800071D	00000000	08000721	08000725	.....!...%...
0x08000040	080011C5	080011C7	080011C9	080011CB	À...Ç...È...É...
0x08000050	080011CD	080011CF	080011D1	080011D3	Î...Ï...Ñ...Ï...
0x08000060	080011D5	080011D7	080011D9	080011DB	Ï...x...Û...Ü...
0x08000070	080011DD	080011DF	08000A49	080011E3	Ý...ß...I...ä...
0x08000080	080011E5	080011E7	080011E9	080011EB	à...ç...é...è...
0x08000090	080011ED	080011EF	080011F1	080011F3	í...ï...ñ...ò...
0x080000A0	080011F5	080011F7	080011F9	080011FB	ô...+...ú...û...
0x080000B0	080007B9	080011FF	08001201	08001203	¹...ÿ.....
0x080000C0	08001205	08001207	08001209	08000951	.....Q...
0x080000D0	08000999	0800120F	08001211	08001213	™.....
0x080000E0	08000A1D	08001217	08000729	0800121B	.....)

17:44:01 : Flash memory programmed in 2s and 200ms.  
17:46:35 : Verification : OK  
17:50:24 : No difference found.  
This file is already downloaded.  
17:51:52 : No difference found.  
This file is already downloaded.  
17:52:42 : No difference found.  
This file is already downloaded.

**Step 19:**

Refer to the below picture, evidence that the Discovery Controller is now disconnected from the ST-Link software. Almost there.



**Step 20:**

Navigate to 'Control Panel > Hardware and Sound > devices and Printers>' and ensure your 'MMos ForceFeedback2014' Device is detected. ☺ Beano

