

How to upgrade Marlin Firmware on Artillery Hornet Printer.

1) Download Marlin Firmware for Hornet from my github <https://github.com/mirama/Marlin>

1.1) If you find any bug or issue that is not present in the stock firmware, please open an issue on the github so I can try to figure out why it is happening

2) Download and install VSCode

2.1) Install platformio and Marlin Auto Build plugins

2.2) For this steps please follow the instructions located here
https://marlinfw.org/docs/basics/install_platformio_vscode.html

2.3) If you are able to build Marlin following those steps, you are 1 step ahead to Succeed!!!

3) Download and install STM32CubeProgrammer (<https://www.st.com/en/development-tools/stm32cubeprog.html>)

3.1) This program will be used to upload the firmware to the printer, we will use DFU mode for that.

3.2) Platformio has dfu-util that in theory should work to upload the firmware to the printer, but I wasn't able to make it work. STM32CubeProgrammer is the official software from ST to upload data to STM32 microcontrollers (artillery ruby board has an STM32F401 microcontroller)

4) Disconnect your Printer from Mains voltage, **you will not need to connect it to Mains until the end of this tutorial, power to the board will be through the USB port.** Open the back of your printer

4.1) You will need 1 Phillips #2 screwdriver and your hands

4.2) Remove the 3 screws located on the bottom of the printer



Photo taken from <https://www.cnckitchen.com/blog/artillery-hornet-3d-printer-first-look>

4.3) Using your hands carefully remove the cover

4.4) Inside you will find the Artillery Ruby board

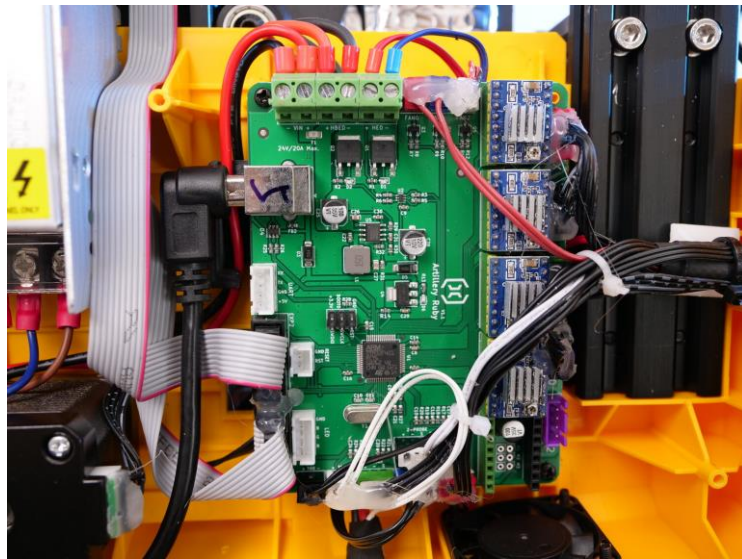


Photo taken from <https://www.cnckitchen.com/blog/artillery-hornet-3d-printer-first-look>

4.5) In the board you will find a 2x3 pin header, and in that header 2 pins labeled "BOOT0" and "3.3V"



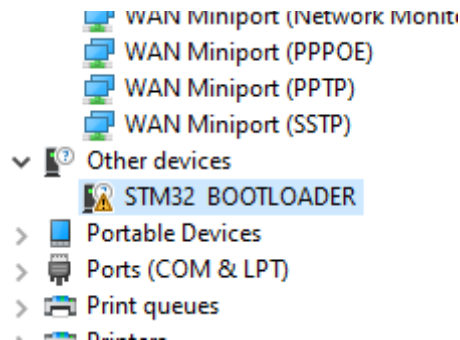
4.6) To enter DFU mode you will have to connect those 2 pins, you could do this via a jumper or connect those 2 pins to a switch.

4.6.1) If you use the switch option (It is what I recommend), you can route it to the back of the printer (or anywhere you want) and close the case. Using the switch you can enter DFU mode whenever you want, without opening the printer again.

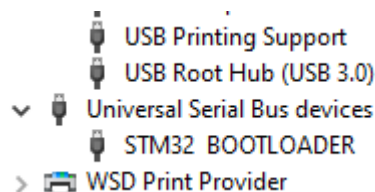


4.7) With “BOOT0” and “3.3V” connected, you can now connect your printer to your computer via the USB port on the side of the printer. If everything worked ok, the LCD on the print will show nothing (or it will freeze, both are OK)

4.7.1) If you are using Windows and you see this under device manager, **please go to step 5.**



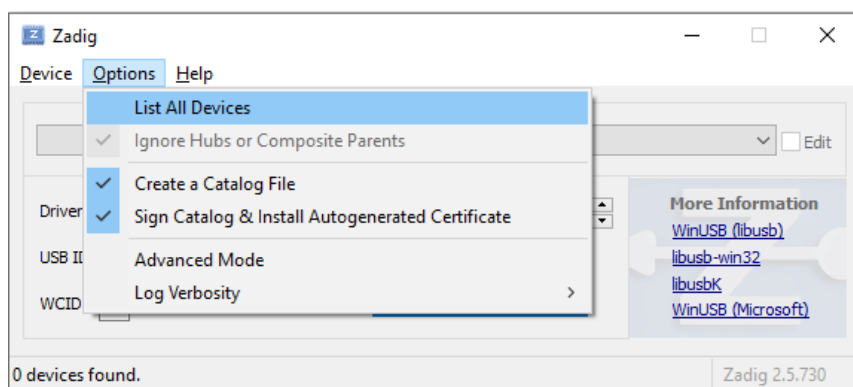
4.7.2) If you are using Windows and you see this under device manager, **you can go directly to step 6.**



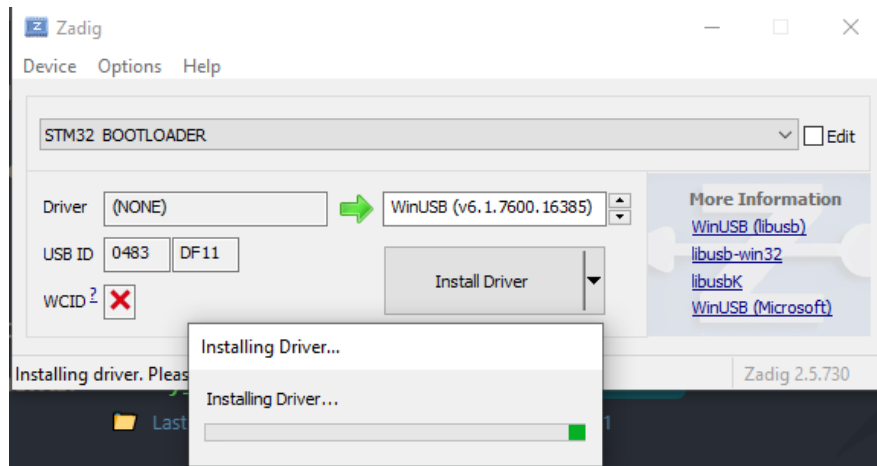
5) Fixing the unknown device in device manager

5.1) Download Zadig's USB driver software from here <https://zadig.akeo.ie/>

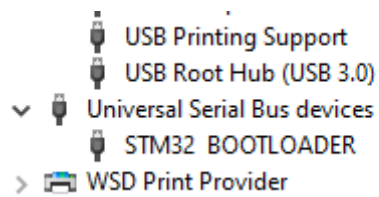
5.2) Open the downloaded software and under options tab press “List all Devices”



5.3) You should be able to find “STM32 BOOTLOADER” in the list now. Select it, and install the WinUSB driver (This will take some minutes)

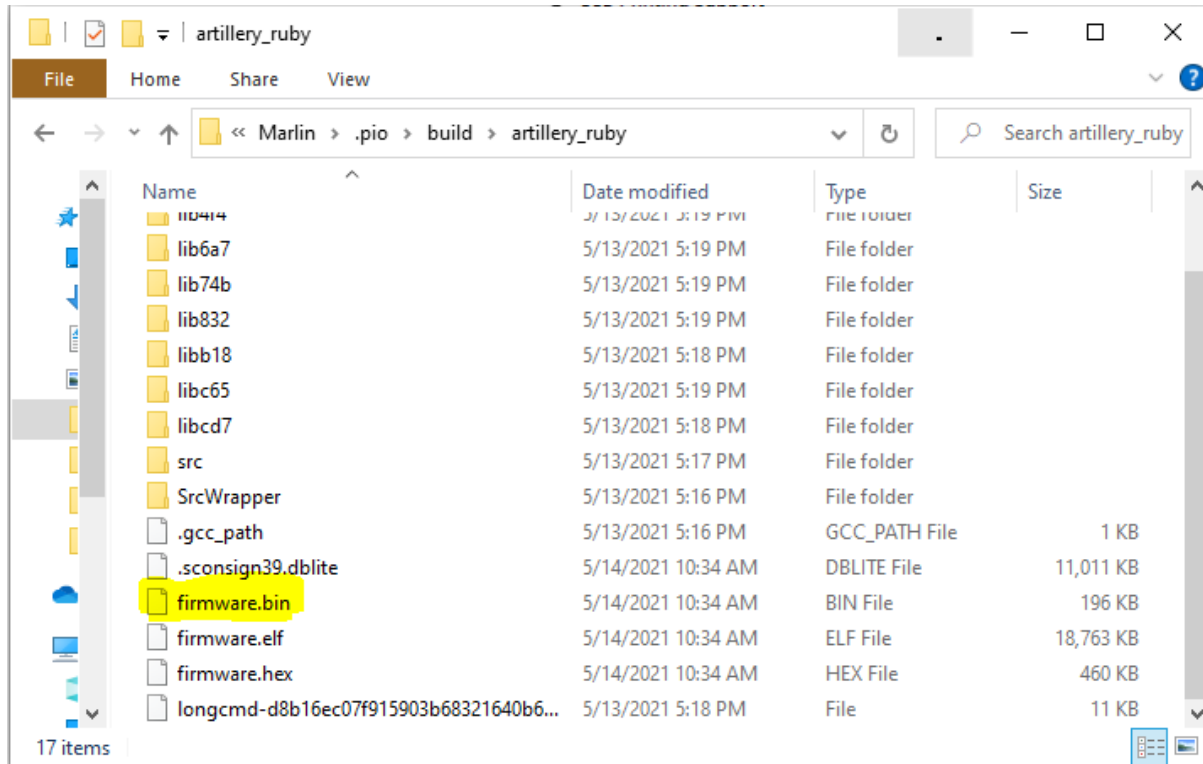


5.4) Now, under device manager, you should see this:



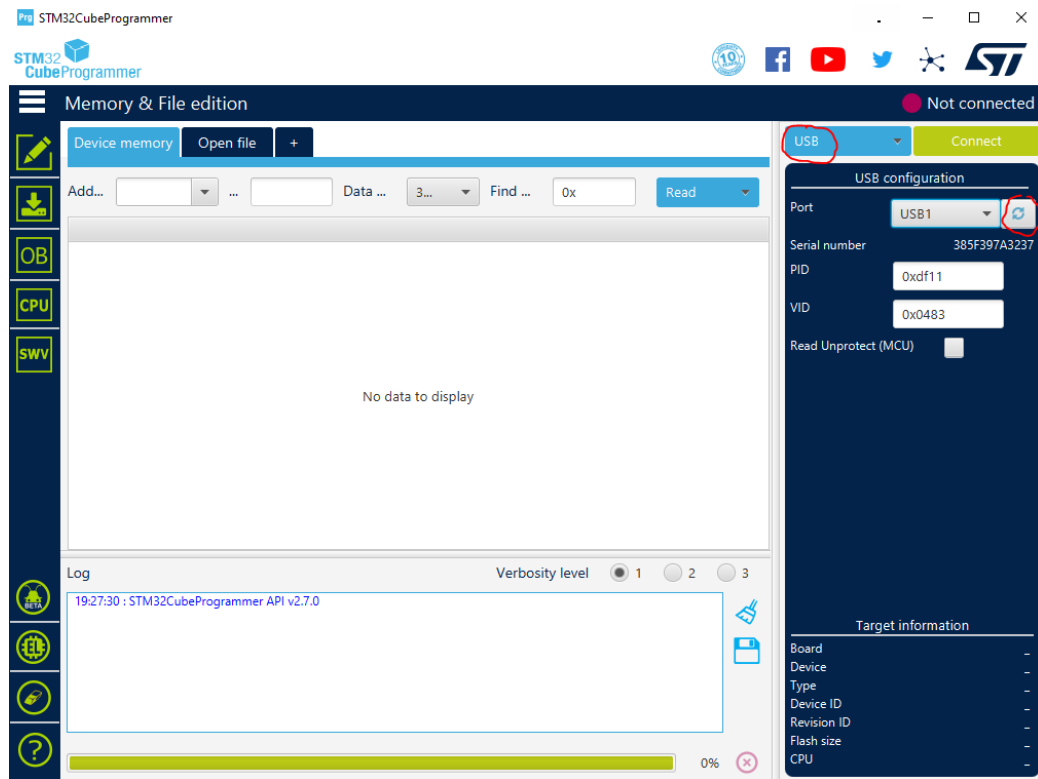
6) Now we are ready to upload the firmware to the printer!

6.1) If you already compiled Marlin firmware you will find the binary file that we need to upload under <path_to_your_Marlin_installation>\Marlin\.pio\build\artillery_ruby if not, go ahead and compile it

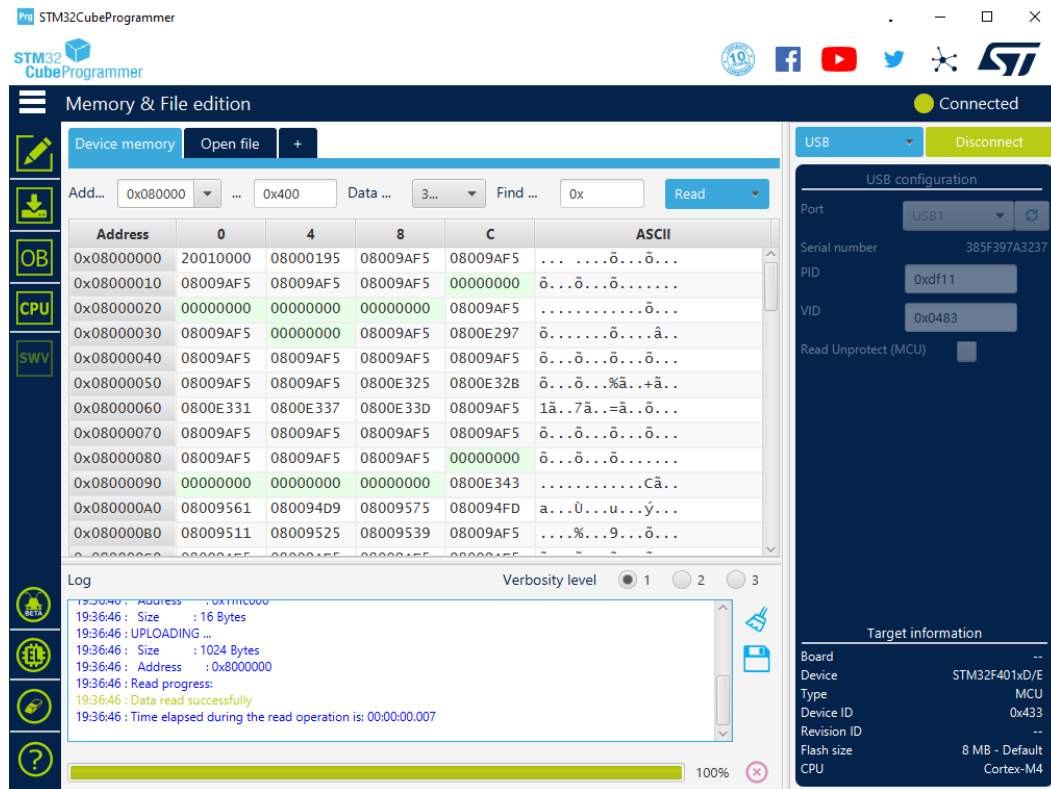


6.2) Open STM32CubeProgrammer

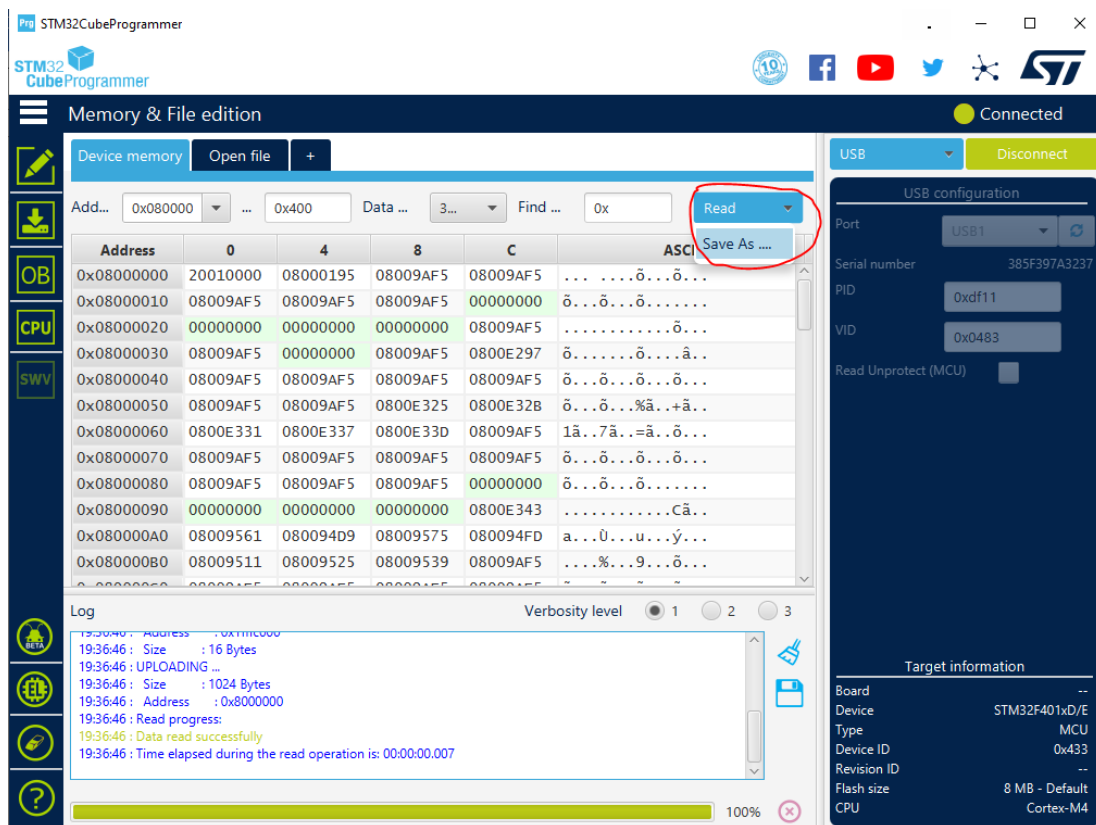
6.3) On the right side of the software you have to select USB and then press the refresh button, if everything is OK you should see something like this



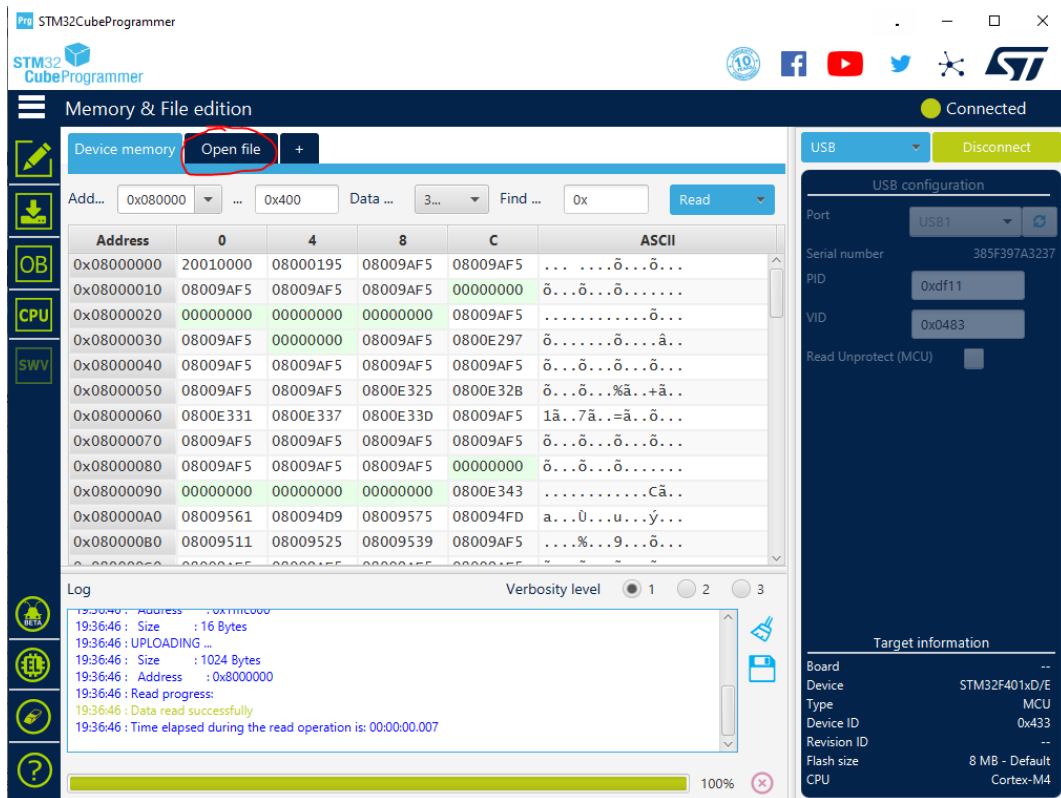
6.4) Now press the connect button, it will read the memory of your microcontroller, you will see something like this (your code will not be the same as mine, because I already change it)



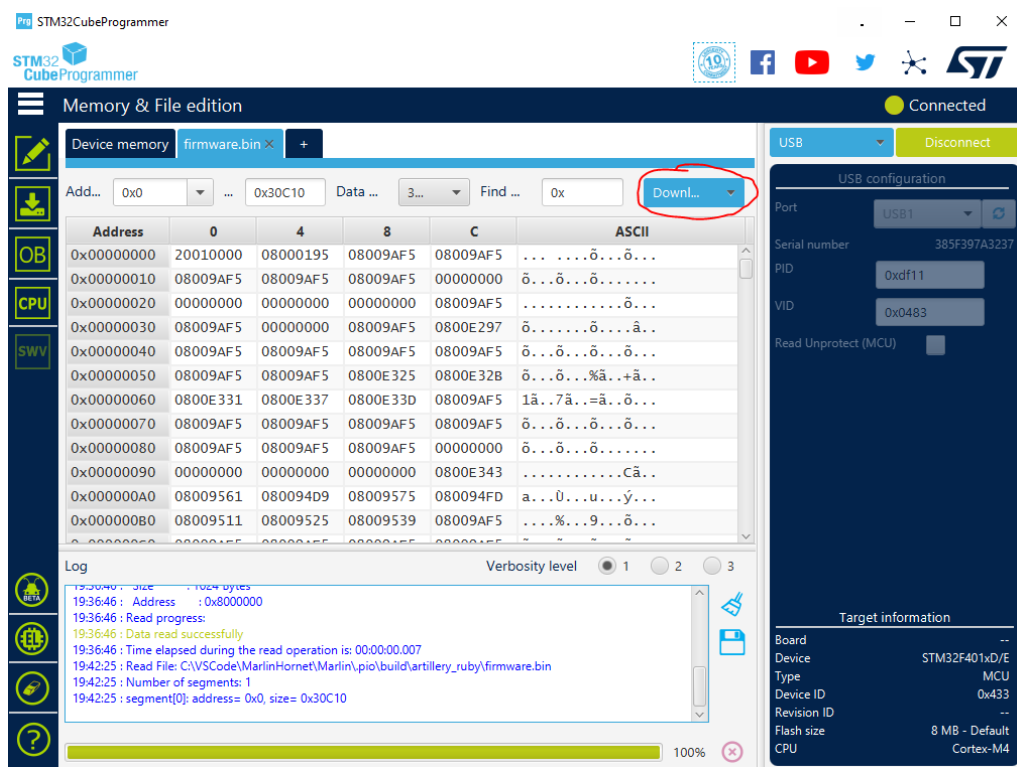
6.4.1) Press the down arrow next to “Read” and press “Save as” this will save a binary file of your stock configuration if you want to go back.



6.5) Now press “Open file” and select your binary file



6.6) Now press the “Download” button



6.7) If everything is OK it will start to change your firmware

The screenshot shows the STM32CubeProgrammer interface. The 'Memory & File edition' tab is active, displaying a memory editor for 'firmware.bin'. The editor shows a table of memory addresses and their corresponding data. The 'Log' window at the bottom shows the progress of erasing internal memory sectors. The 'USB configuration' panel on the right shows the device is connected via USB1. The 'Target information' panel shows the board is STM32F401xD/E, MCU, with device ID 0x433, revision ID, 8 MB flash size, and Cortex-M4 CPU.

Address	0	4	8	C	ASCII
0x00000000	20010000	08000195	08009AF5	08009AF5	...
0x00000010	08009AF5	08009AF5	08009AF5	00000000	...
0x00000020	00000000	00000000	00000000	08009AF5	...
0x00000030	08009AF5	00000000	08009AF5	0800E297	...
0x00000040	08009AF5	08009AF5	08009AF5	08009AF5	...
0x00000050	08009AF5	08009AF5	0800E325	0800E32B	...
0x00000060	0800E331	0800E337	0800E33D	08009AF5	...
0x00000070	08009AF5	08009AF5	08009AF5	08009AF5	...
0x00000080	08009AF5	08009AF5	08009AF5	00000000	...
0x00000090	00000000	00000000	00000000	0800E343	...
0x000000A0	08009561	080094D9	08009575	080094FD	...
0x000000B0	08009511	08009525	08009539	08009AF5	...

Log: 19:43:20: Erasing internal memory sectors [0-2]
19:43:28: erasing sector 0000 @: 0x08000000 done
19:43:28: erasing sector 0001 @: 0x08004000 done
19:43:28: erasing sector 0002 @: 0x08008000 done
19:43:29: erasing sector 0003 @: 0x0800c000 done
19:43:30: erasing sector 0004 @: 0x08010000 done
19:43:32: erasing sector 0005 @: 0x08020000 done
19:43:32: Download in Progress: 39%

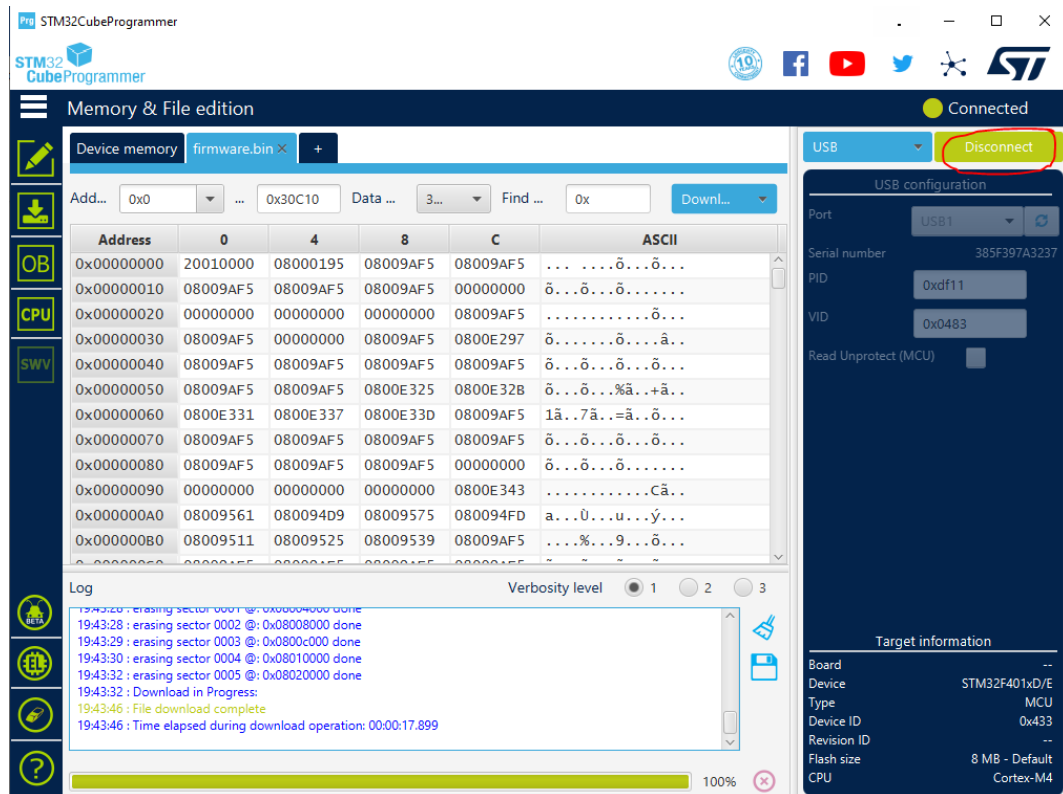
The screenshot shows the STM32CubeProgrammer interface. The 'Memory & File edition' tab is active, displaying a memory editor for 'firmware.bin'. The 'Log' window at the bottom shows the progress of erasing internal memory sectors. The 'USB configuration' panel on the right shows the device is connected via USB1. The 'Target information' panel shows the board is STM32F401xD/E, MCU, with device ID 0x433, revision ID, 8 MB flash size, and Cortex-M4 CPU. A 'File download complete' message box is displayed over the memory editor.

Address	0	4	8	C	ASCII
0x00000000	20010000	08000195	08009AF5	08009AF5	...
0x00000010	08009AF5	08009AF5	08009AF5	00000000	...
0x00000020	00000000	00000000	00000000	08009AF5	...
0x00000030	08009AF5	00000000	08009AF5	0800E297	...
0x00000040	08009AF5	08009AF5	08009AF5	08009AF5	...
0x00000050	08009AF5	08009AF5	0800E325	0800E32B	...
0x00000060	0800E331	0800E337	0800E33D	08009AF5	...
0x00000070	08009AF5	08009AF5	08009AF5	08009AF5	...
0x00000080	08009AF5	08009AF5	08009AF5	00000000	...
0x00000090	00000000	00000000	00000000	0800E343	...
0x000000A0	08009561	080094D9	08009575	080094FD	...
0x000000B0	08009511	08009525	08009539	08009AF5	...

Log: 19:43:20: Erasing internal memory sectors [0-2]
19:43:28: erasing sector 0000 @: 0x08000000 done
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19:43:29: erasing sector 0002 @: 0x08008000 done
19:43:30: erasing sector 0003 @: 0x0800c000 done
19:43:32: erasing sector 0004 @: 0x08010000 done
19:43:32: erasing sector 0005 @: 0x08020000 done
19:43:32: Download in Progress:
19:43:46: File download complete
19:43:46: Time elapsed during download operation: 00:00:17.899 100%

6.8) Congratulations, now you have your board with the new Firmware!!!

6.9) Disconnect your printer from the software



6.10) Unplug your USB cable

6.11) Disconnect the "BOOT0" from the "3.3V" pin

6.12) Connect your printer to Mains, turn it ON and Happy Printing!!