



FEES

PROJECT

FEES MAIN BOARD PROGRAMMING

The main board has several ways to be programmed :

- Via Jtag-SWD through the St-Link programmer of any ST- Discovery Board.
- Via USB through the ST D-fuse - using the Bootloader of any STMicroelectronics produced MCU.
- Via Serial, using TX and RX pins.

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In this document only the first way will be explained, since I used the second for a while and was very uneasy and required a pin connector to be inserted or removed to switch between programming or program mode. I also never tried the third and it is time expensive and also pointless to look for it since its redundancy and the handiness of the first method.

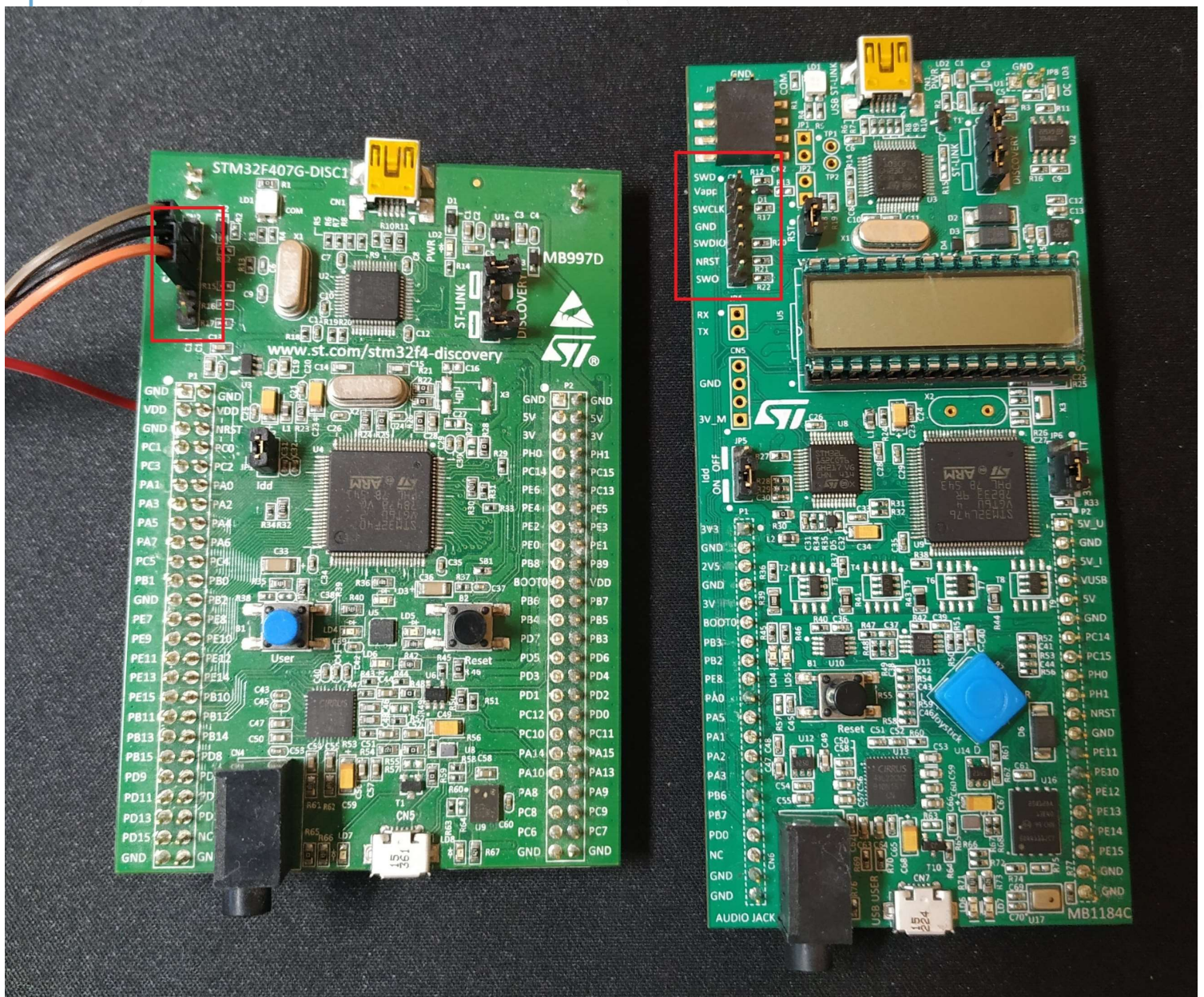


What you will need:

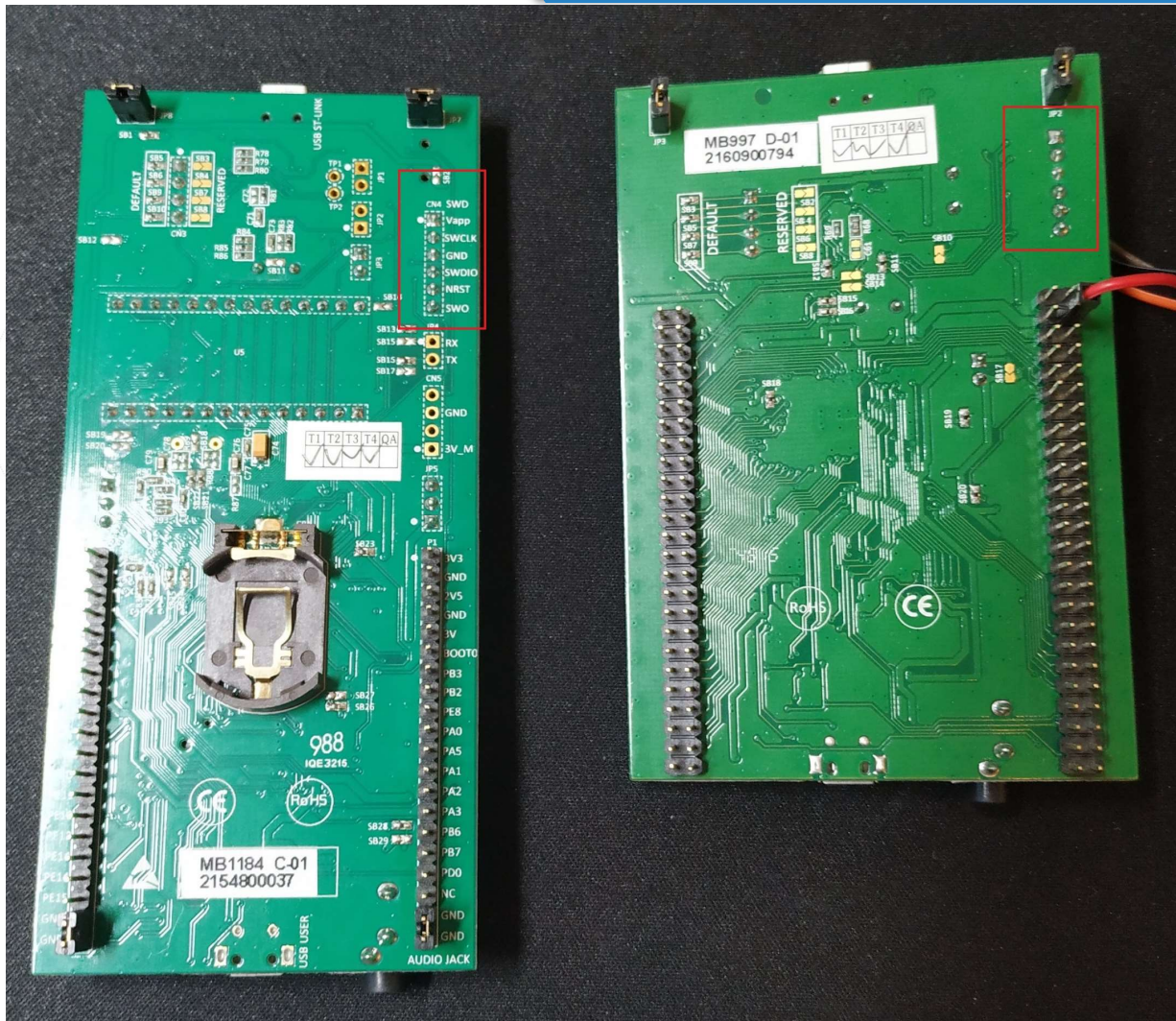
- Any ST- Discovery Board.

(In the following figure a STM32F407-Disc on the left and a STM32L4 on the right.)

(the SWD connector is highlighted with the red square)



(Front Side)



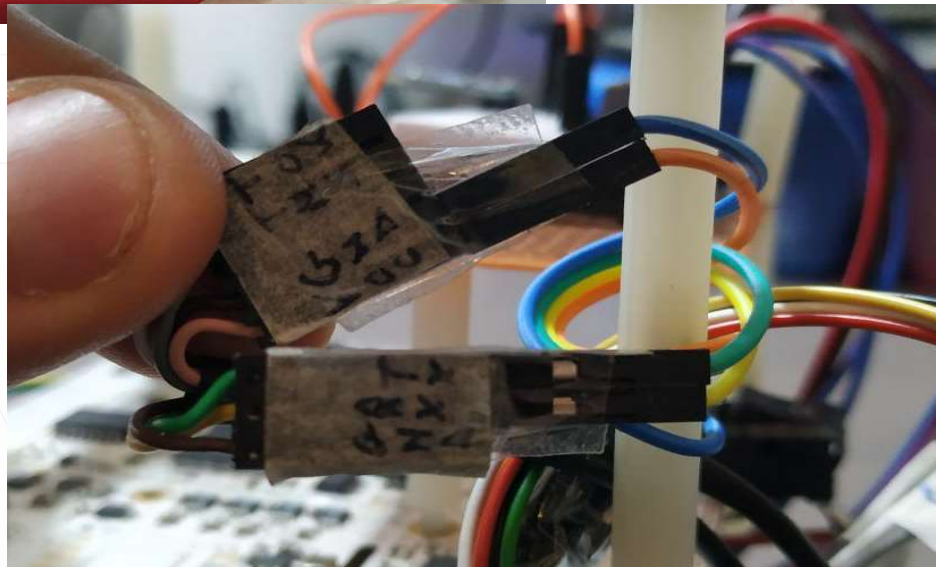
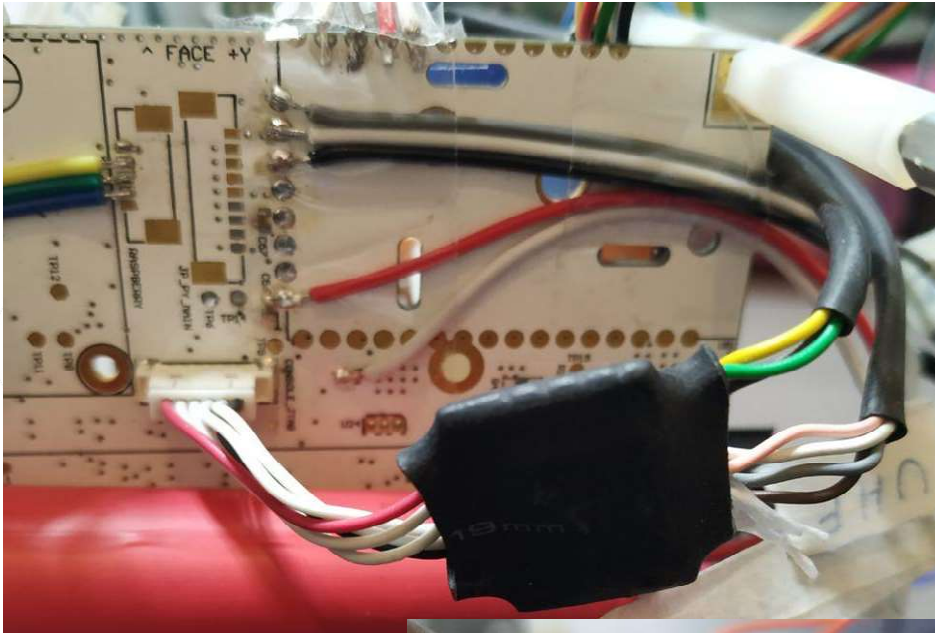
(Back Side)

- Some jumper wires
(Preferably Female-To-Male)





- The Custom connector-cable for the bottom board connector:

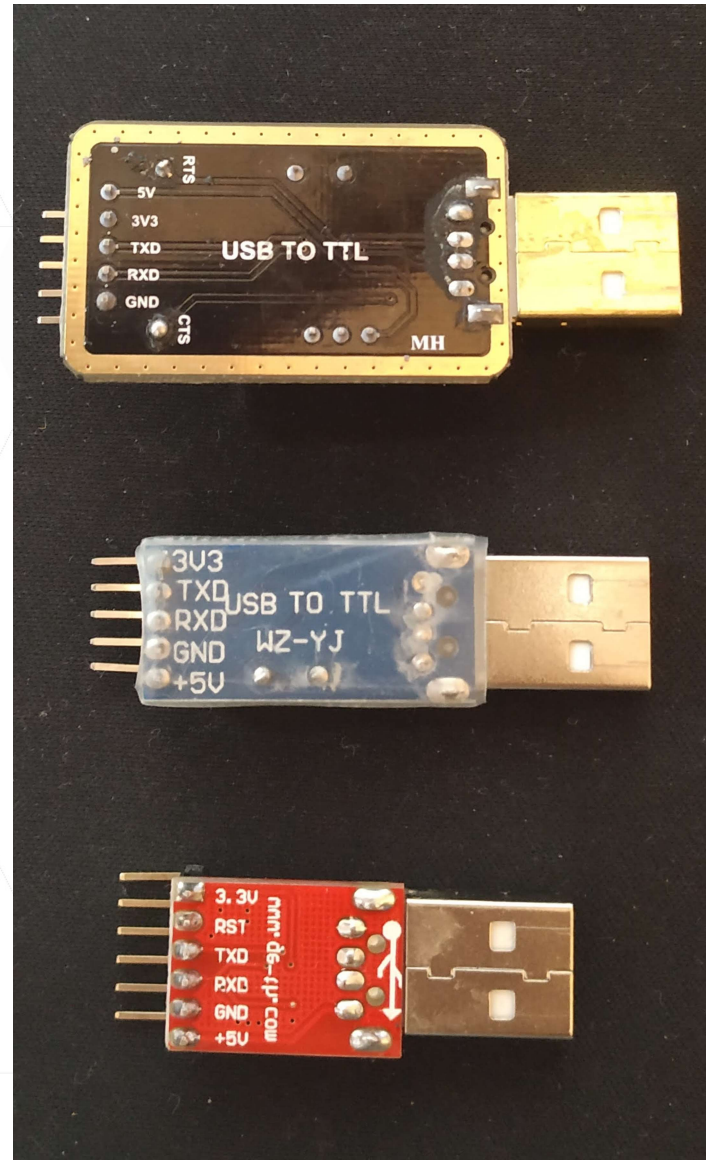
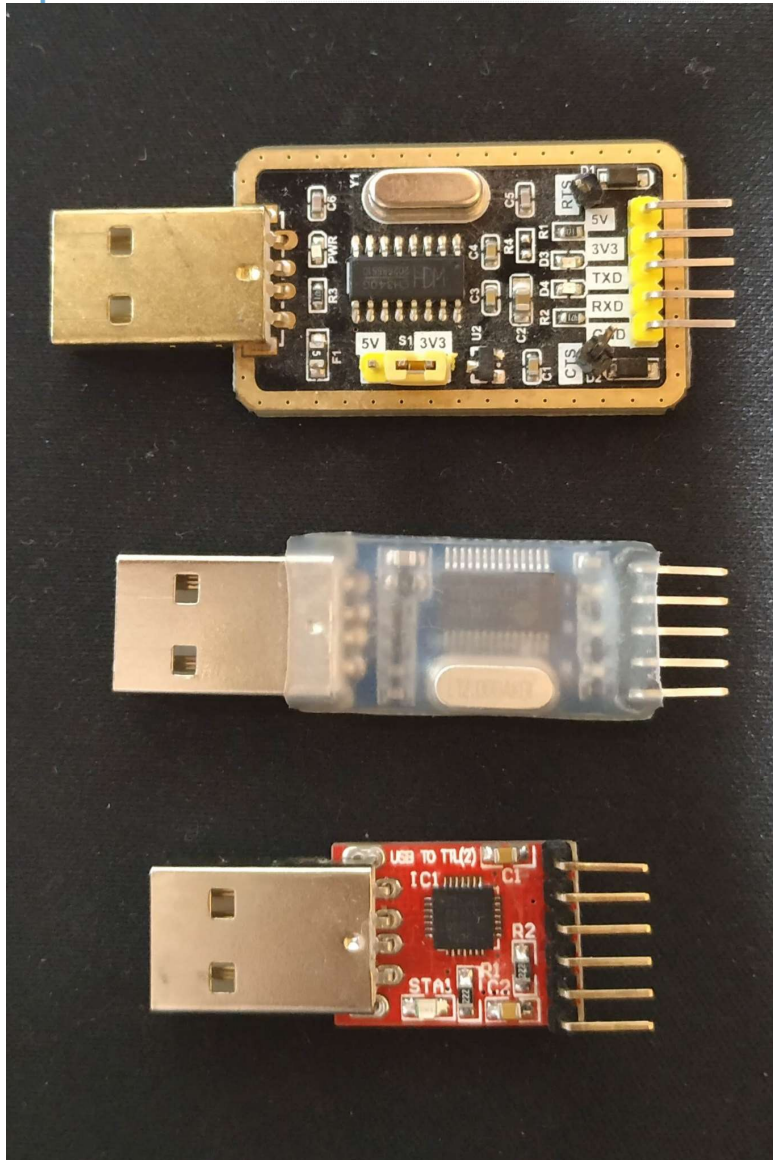


(It has 3,3v(VDD) , GND , TCK, TMS, TX, RX)

So, it hosts 1 Serial port (the third) and one Jtag port (Plus Alimentation) so, 6 connections, actually 7 since mine has 2 GND connections.



For receiving data through the serial port
→ A TTL-USB converter.



(Here is three of them, it is preferable to have one like the first one since it has a 5v-3,3v level selector , since normally USBtoTTL converter has 0-5v levels and the STM32 works at 3,3v .
It is Risky and Unrecommended to use a 5v level Tx signal.)



Now that we have all that we need we can start!

1st Method - The JTAG - SWD programming.

You have to use the ST-Link programmer built-in on every ST - Discovery Board.

The connections required to program the FEES system through the SWD are described in the following picture:

STM32 XX - Discovery Board

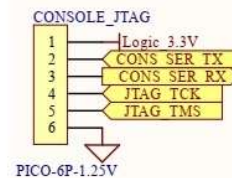
ST-Link Programmer

SWD Connector



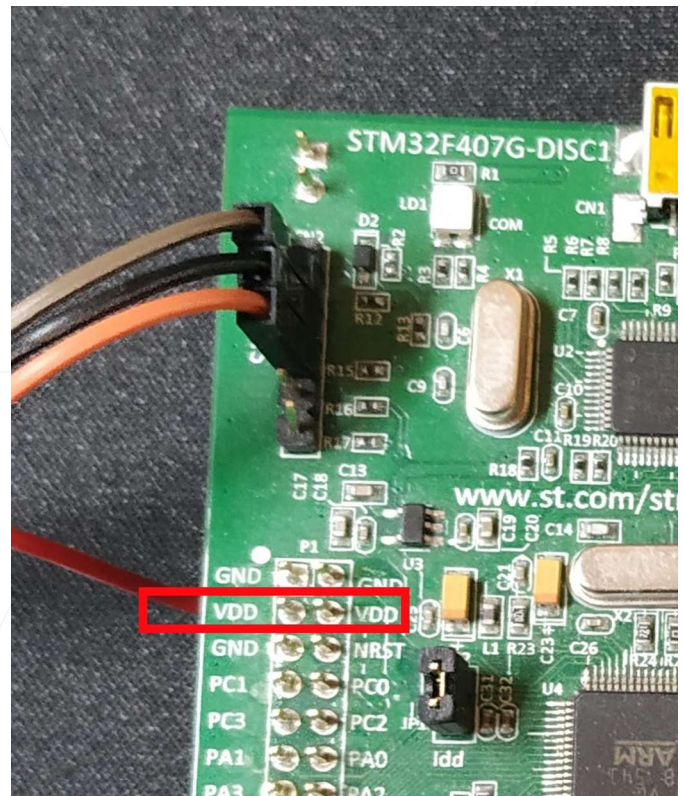
FEES - Main Board

JTAG Connector



The 1st pin is the one on the top of the connector.

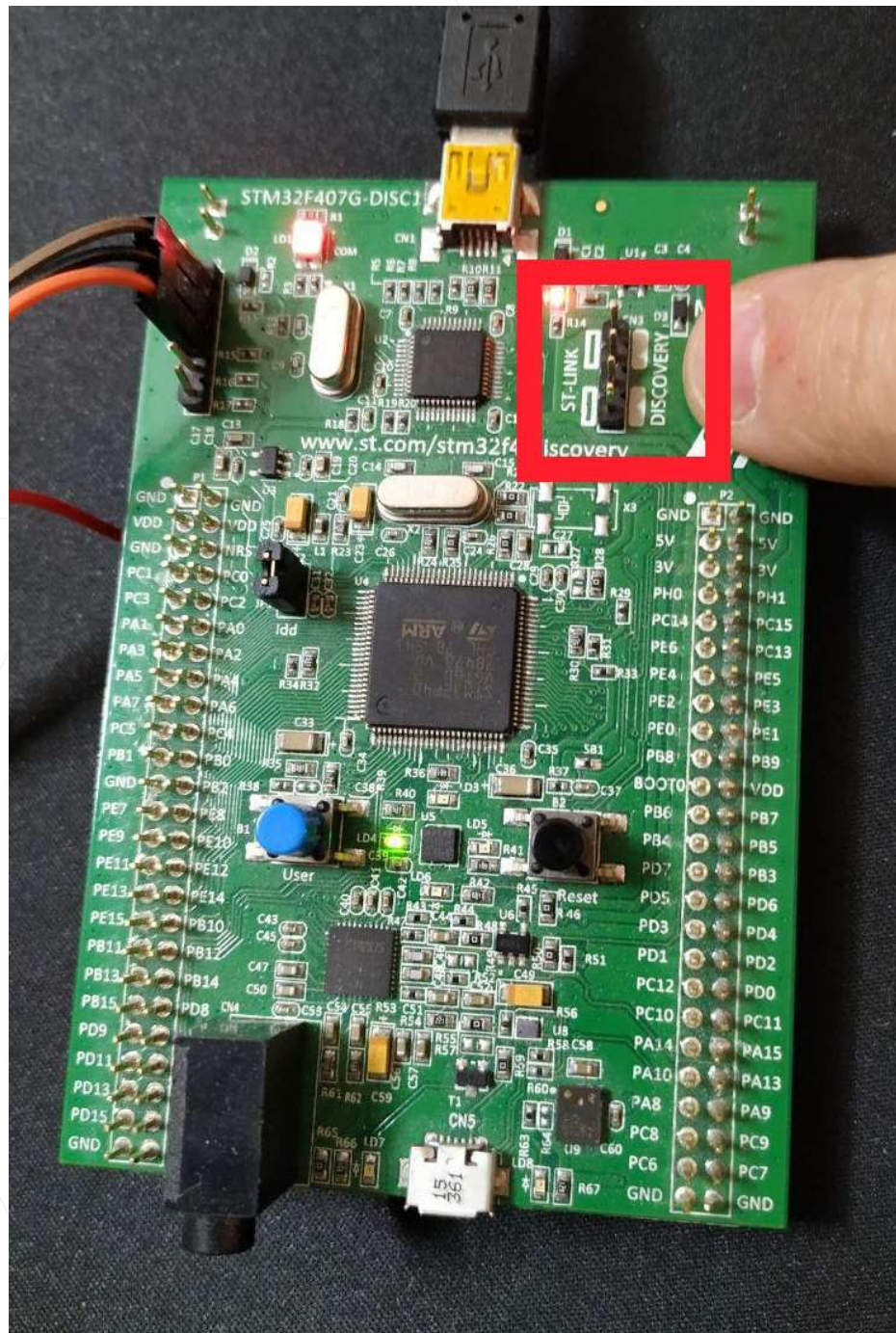
You can use as +3,3v the second pin of the STM32F4 board . To power it. ----->





Once all the connections with the Fees System are correctly connected
You can proceed with the following procedure:

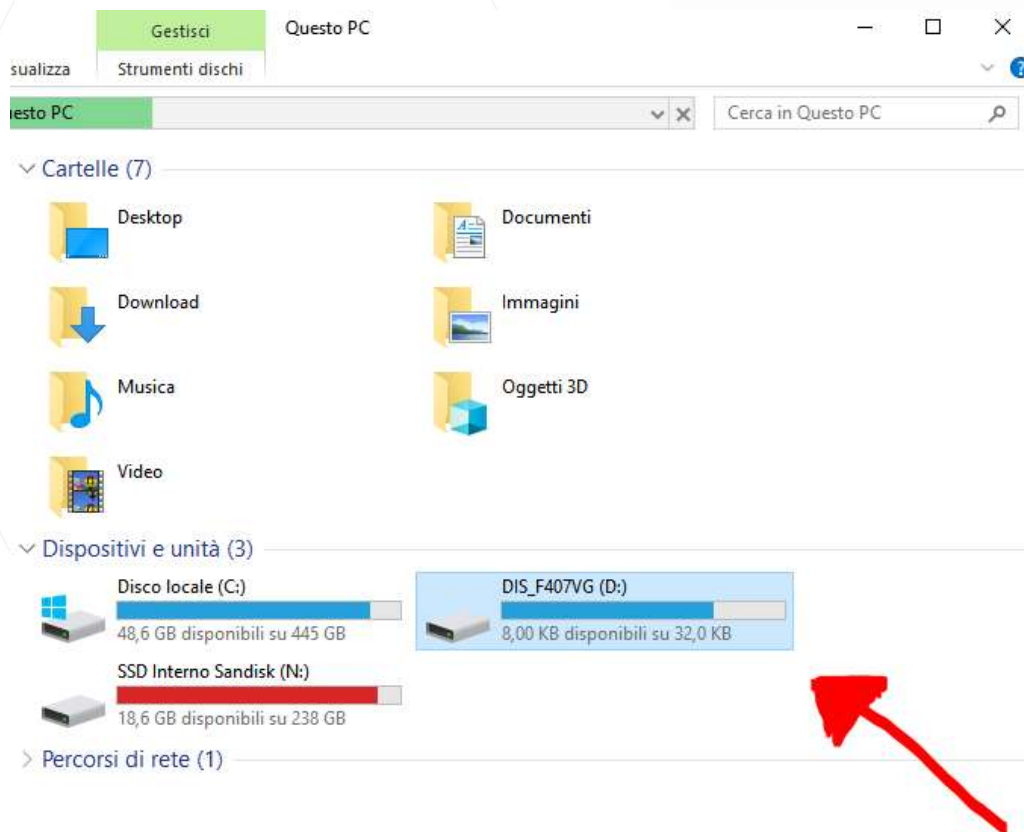
REMOVE the two bridges from the Top-Left Pins.





Connect the Discovery board to the pc using the USB connector.

A memory device will be detected in “My Pc” Window from a Windows pc.
(Just like a flash memory Usb Device).



Now you can Drag-and-Drop or Copy-Paste your firmware (****.bin)
And it will be automatically flashed over your STM32X Device through the Jtag port.

(you can find the firmware for the Terno-Void Chamber Test in the folder:
/FEESshared/FEES_Firmware(Stefano)/Github_FEES-ChibiOs/DEIB-DAER-project/ChibiOS/demos/STM32/LASERNAV_STM32407_FEES/build/FEES.bin)

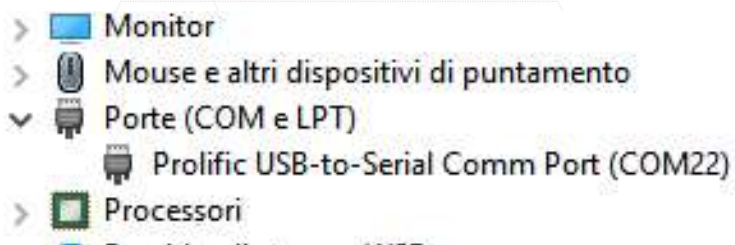


Capturing-Recording data from the SERIAL PORT:

Once flashed the the Terno-Void Chamber Test firmware will capture data from the device's sensors and push all of the data through the 3rd Serial Port (wich is the one that is incorporated in the Custom connector.)

if you connect the TTLtoUsb connector to the TX, RX and GND you'll be able to receive and send data to the board,

Look for a com port in the device manager



Once you know wich port your device is on you can use that information to set the program you are using to access it (Putty , SuperPutty , Termite , ArduinoIDE)

(The baud rate for the Terno-Void Chamber Test firmware is 115200)



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**This file is part of the FEES project documentation,
This particular one is intended for instruction purpose only, in the eventuality of
the TVTC test and following firmware updating/debugging by the
GPAdvancedProject company and/or Associates.**

**Author: Ing. Stefano Ampolo
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