

*** Programming the T692A-3.xC Controller Board ***

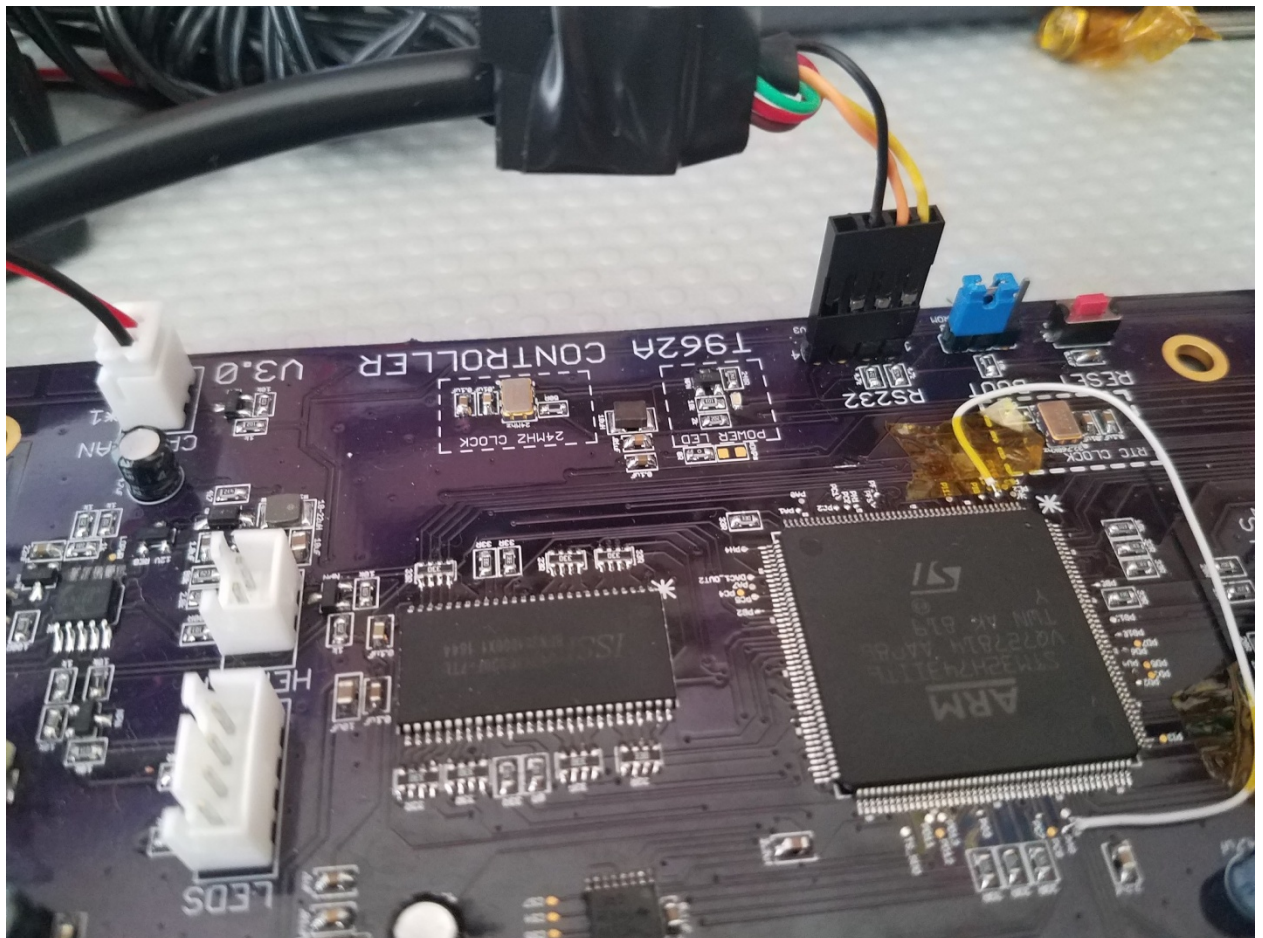
- 1) Connect up your FTDI->RS232 3.3V TTL cable to the board as shown in the picture below.

YELLOW connects to “Tx” pin on RS232 header

ORANGE connects to “Rx” pin on RS232 header

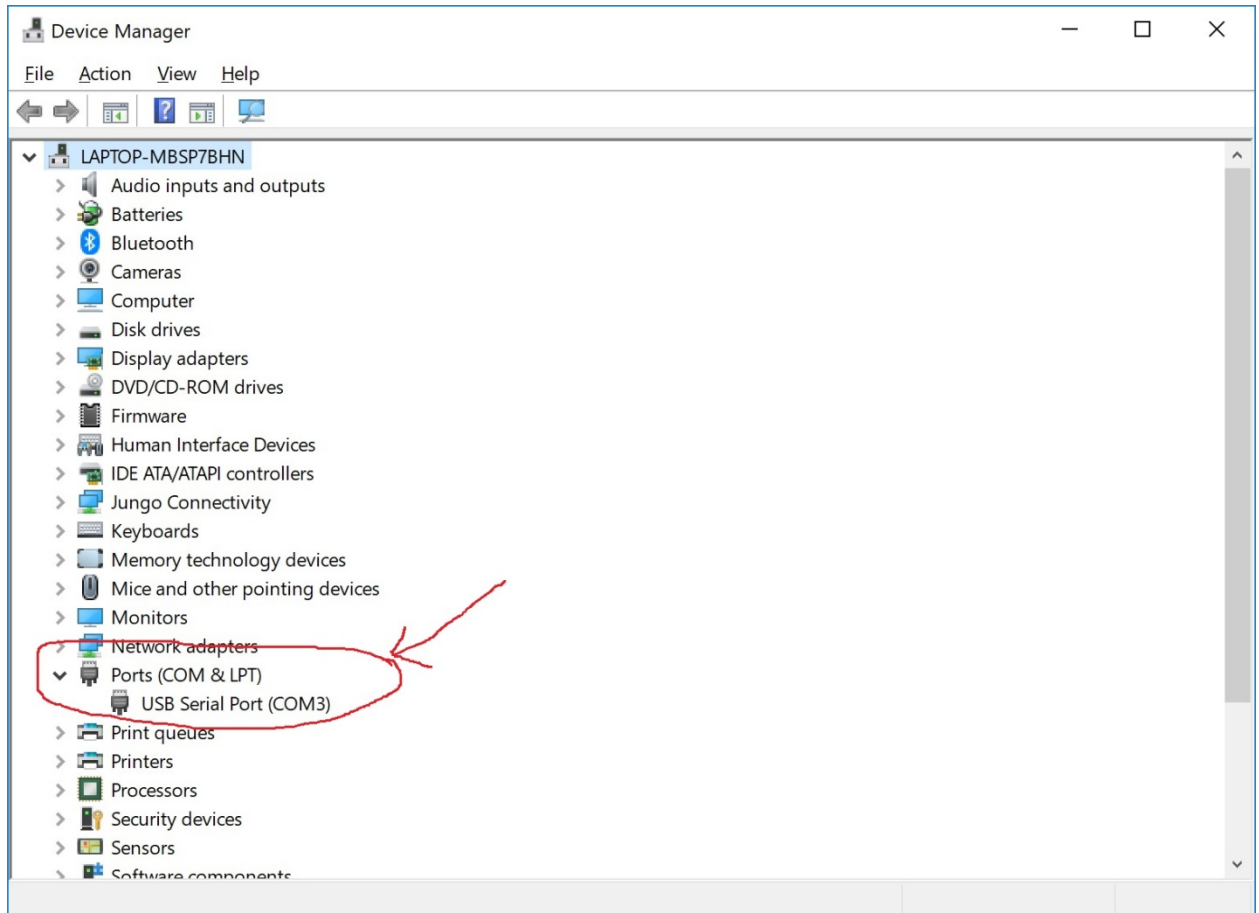
BLACK connects to “GND” pin on RS232 header

- 2) Move the “BOOT” jumper to the ROM position (see in attached picture)



3) Connect the USB end of your FTDI cable to your PC. Determine what COM port your FTDI cable is assigned.

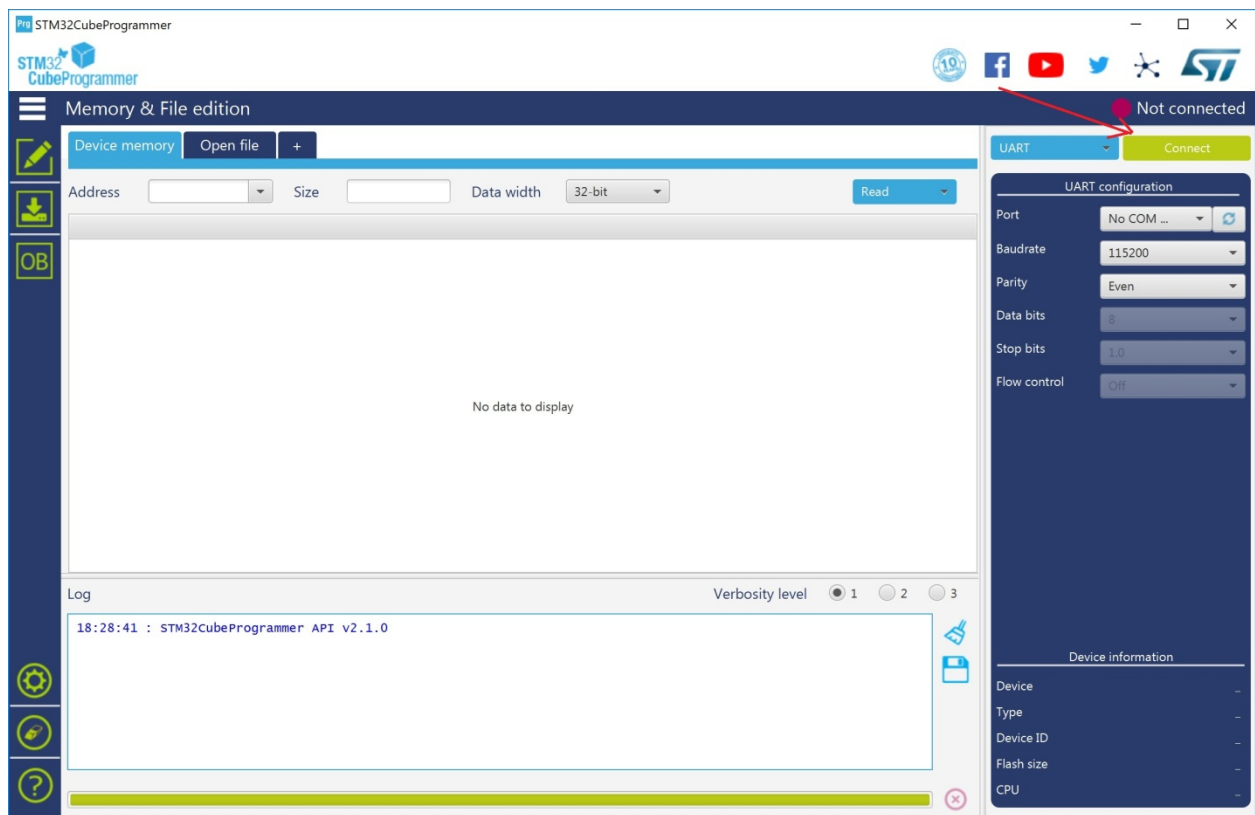
(see the example below)



4) Launch the “STM32 Cube Programmer” (or install It if you haven’t done so already:

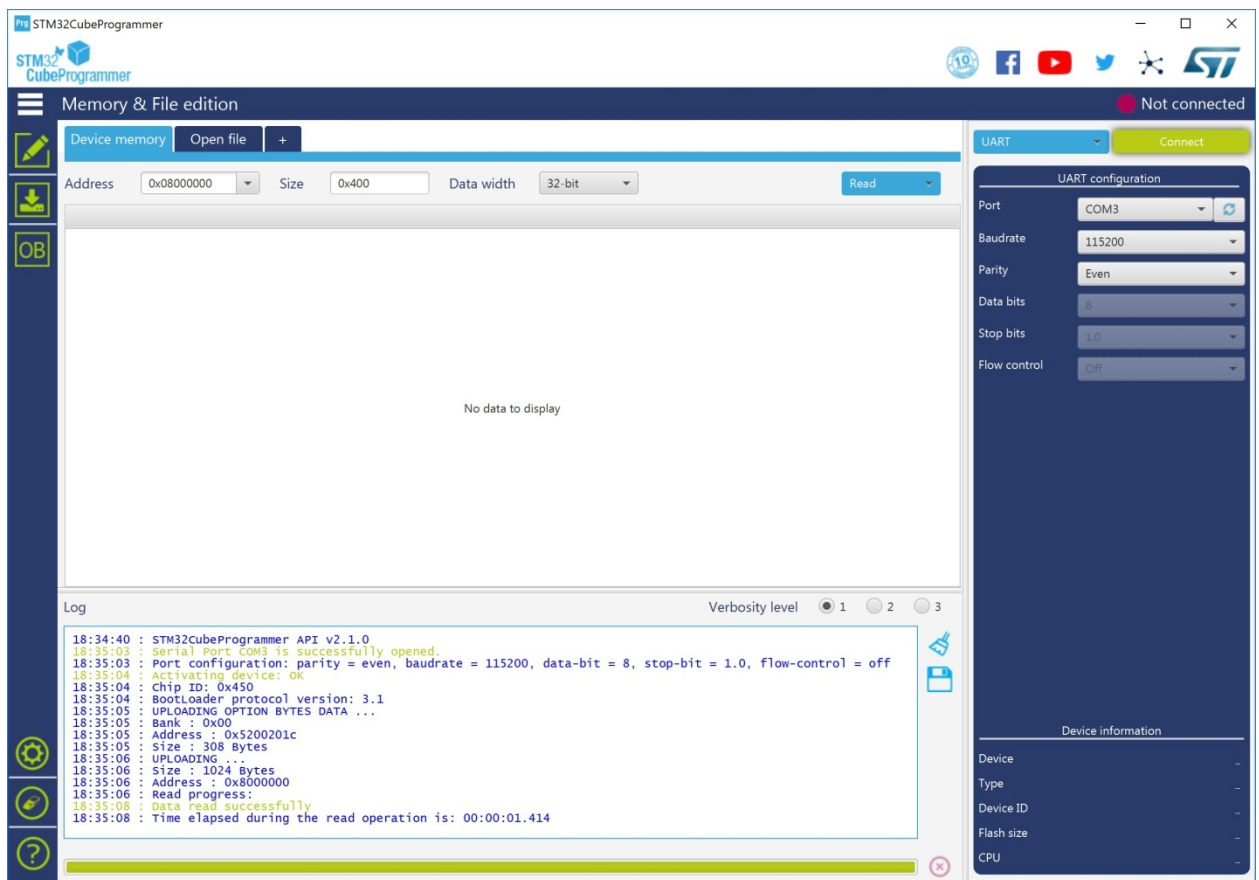
<https://www.st.com/en/development-tools/stm32cubeprog.html>

- 5) Once the main screen comes up as shown below, click on the drop-down menu next to the 'CONNECT' button, and select 'UART'.



6) In the 'UART Configuration', select the drop-down and pick the COM PORT your FTDI cable was assigned.

7) Power on your board, and click the 'CONNECT' button as shown in the above picture.



8) You should eventually see the screen below once the device is 'CONNECTED', it will display the device memory information, etc as shown below...

The screenshot displays the STM32CubeProgrammer software interface. The main window is titled "Memory & File edition" and shows the "Device memory" tab. The memory table displays addresses from 0x08000000 to 0x080000B0, with columns for Address, 0, 4, 8, C, and ASCII. The ASCII column shows the text "...\$%...A...E...".

Below the memory table is a "Log" window showing the following messages:

```

18:37:41 : timeout error occurred while waiting for acknowledgement.
18:37:41 : Activating device: OK
18:37:41 : chip ID: 0x450
18:37:41 : Bootloader protocol version: 3.1
18:37:43 : UPLOADING OPTION BYTES DATA ...
18:37:43 : Bank : 0x00
18:37:43 : Address : 0x5200201c
18:37:43 : Size : 308 Bytes
18:37:44 : UPLOADING ...
18:37:44 : Size : 1024 Bytes
18:37:44 : Address : 0x80000000
18:37:44 : Read progress:
18:37:45 : Data read successfully
18:37:45 : Time elapsed during the read operation is: 00:00:01.415
  
```

On the right side of the interface, the "UART" configuration is shown, with the "Port" set to COM3 and the "Baudrate" set to 115200. Below the UART configuration is the "Device information" section, which displays the following details:

- Device: STM32H7xx
- Type: MCU
- Device ID: 0x450
- Flash size: -
- CPU: Cortex-M7

9) Click on the button to go to the 'device programming' page:

The screenshot displays the STM32CubeProgrammer application window. The main area is titled 'Memory & File editor' and shows a table of memory addresses and their corresponding data. A red arrow points to the 'Device memory' button in the top left corner. The table has columns for Address, 0, 4, 8, C, and ASCII. The Log window at the bottom shows the following text:

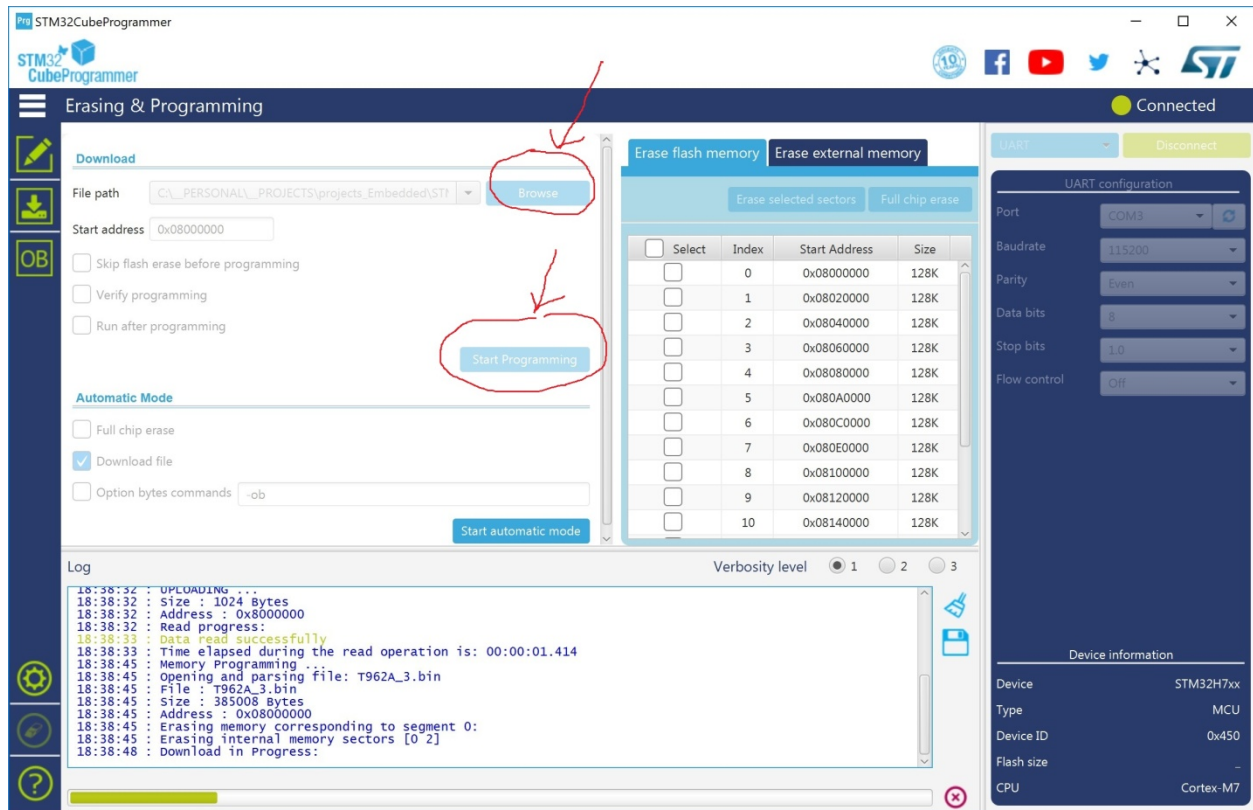
```
18:37:41 : timeout error occurred write waiting for acknowledgement.  
18:37:41 : Activating device: OK  
18:37:41 : Chip ID: 0x450  
18:37:41 : Bootloader protocol version: 3.1  
18:37:43 : UPLOADING OPTION BYTES DATA ...  
18:37:43 : Bank : 0x00  
18:37:43 : Address : 0x5200201c  
18:37:43 : Size : 308 Bytes  
18:37:44 : UPLOADING ...  
18:37:44 : Size : 1024 Bytes  
18:37:44 : Address : 0x8000000  
18:37:44 : Read progress:  
18:37:45 : Data read successfully  
18:37:45 : Time elapsed during the read operation is: 00:00:01.415
```

The right sidebar contains the 'UART configuration' section with settings for Port (COM3), Baudrate (115200), Parity (Even), Data bits (8), Stop bits (1.0), and Flow control (Off). Below this is the 'Device information' section showing:

Device information	
Device	STM32H7xx
Type	MCU
Device ID	0x450
Flash size	-
CPU	Cortex-M7

10) Click on the BROWSE button to select the “T962A_xxxxx.bin” (or whatever the compiled binary is named).

11) Click on the “Start Programming” button the begin the flash writing process. **** This will take a few minutes to complete ****



12) Once programming has completed you can power down the board, remove the FTDI cable, and restore the jumper back to 'FLASH'.

13) Format your MICROSD card to “FAT32”, copy the contents of the \MICROSD\ folder from the GITHUB repo to your SD card, and lock the microsd card into the socket on your board.

**** At this point the board should power on and BOOT. You should hear ONE immediate BEEP, and then after 5-10 secs. a DOUBLE BEEP which means successful boot.**

(any other long continuous beeps mean there was an error loading the MicroSD card... check your card's format and contents)