

# Makertech

## DSE Stage 06 - Firmware and Motion Checks

Written By: Makertech



## Step 1 — Downloads



- Download the GitHub repository for the [Proforge 2S](#). Inside will include the following that you will need for this stage of the build:
  - Marlin Printer Firmware
  - Touch Screen Firmware
  - USB Drivers
- Also download pronterface:
  - Pronterface - Printer Control Software: --- [PC](#)---[MAC](#)

## Step 2 — Arduino IDE

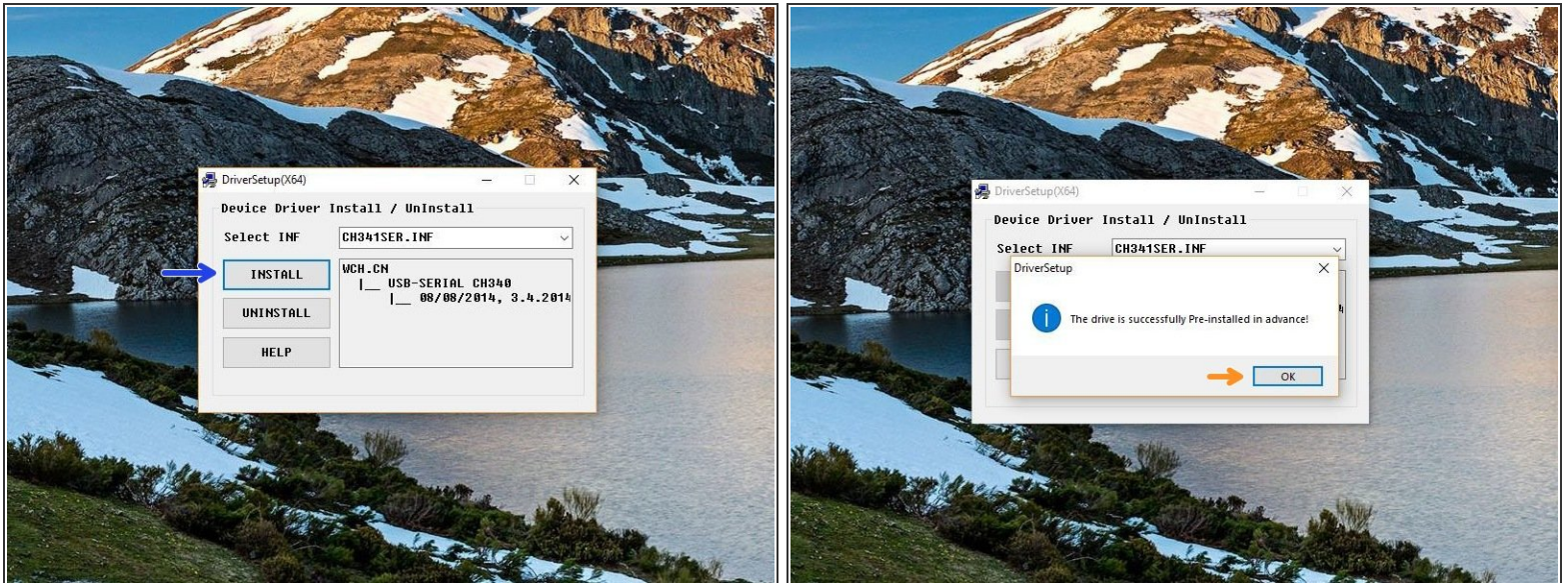


 You will also need to download and install the Arduino IDE.

 We recommend downloading V1.8.1, as this is what is used in this guide.

 [Download here.](#)

## Step 3 — Installing USB Drivers

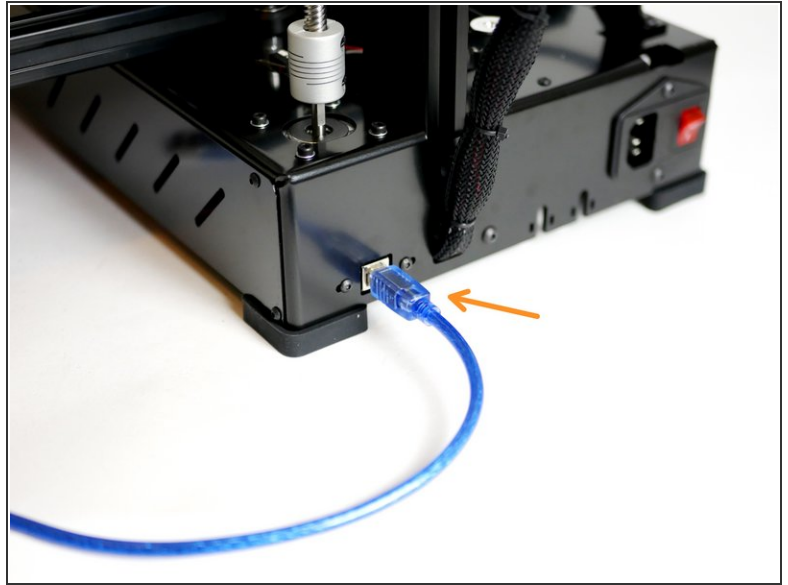
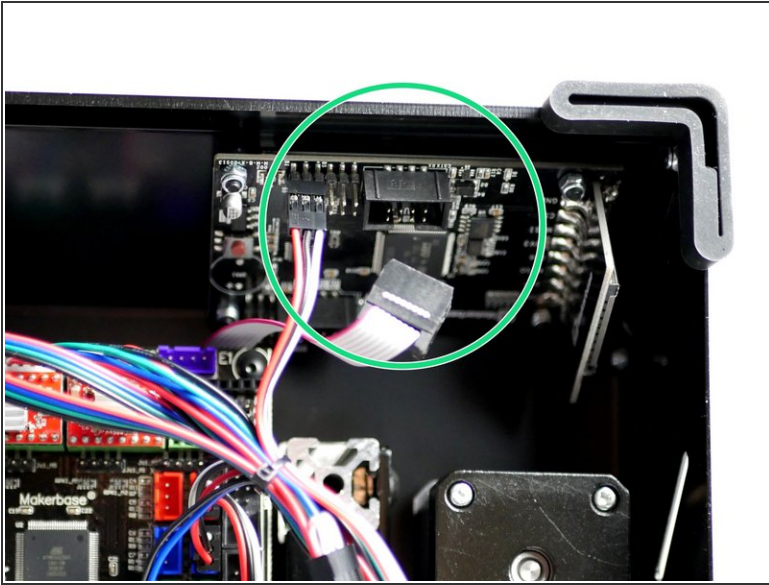


**i** In the USB driver folder on PC double click on the *CH341SER Driver - PC.EXE* file. On MAC see the Readme.pdf file in the Mac folder.

**★** You may need to right click, "run as admin" to open.

- Once open, click *INSTALL*.
- Once done, you should get a success message, click OK and close the programme.

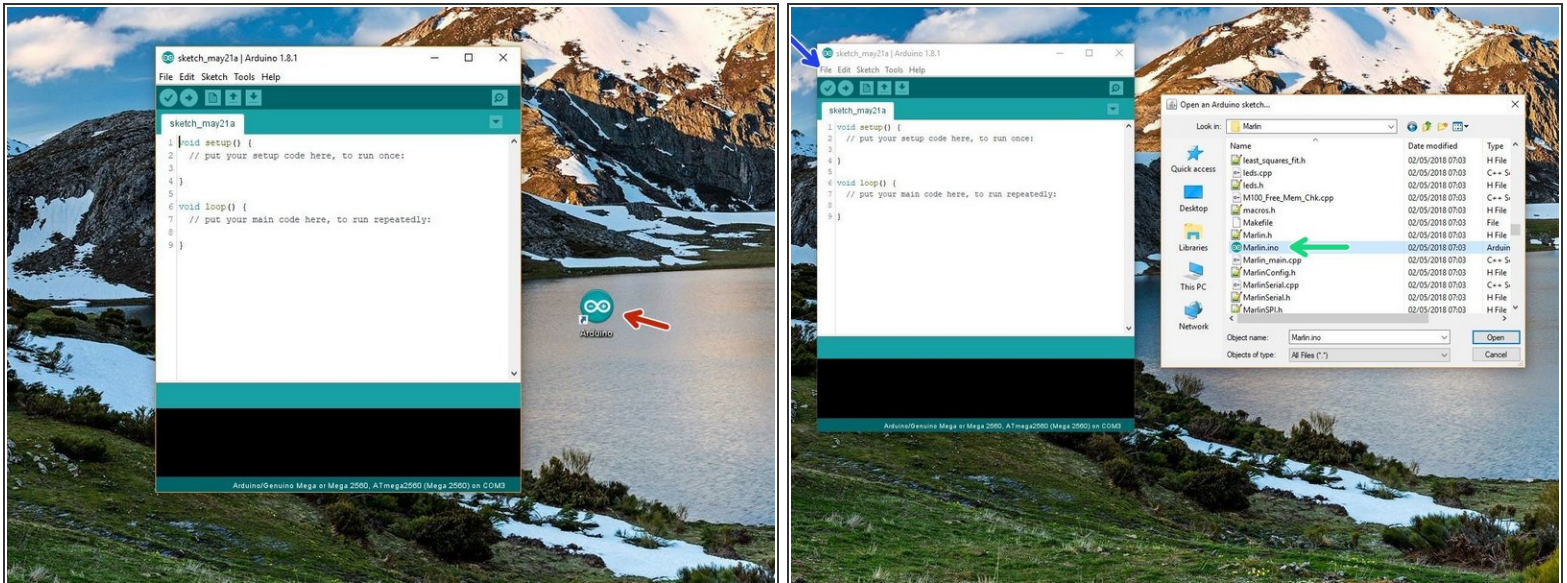
## Step 4 — Connecting to the Proforge 2/2S



- Disconnect the touch Screen display from the control board.
- Connect the printer to your computer via the blue USB cable.

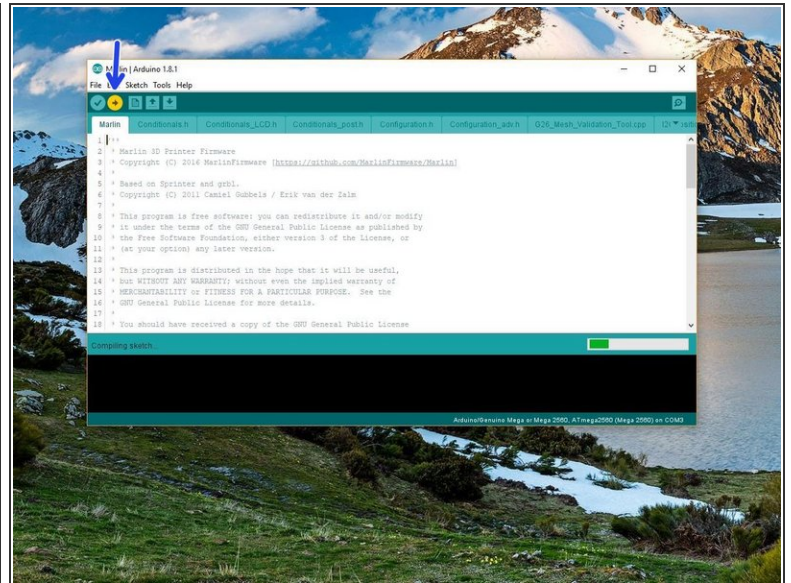
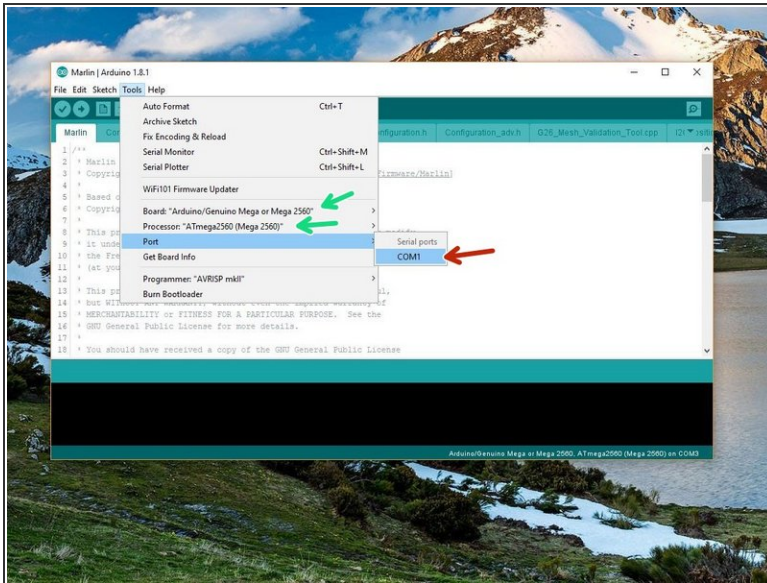


## Step 5 — Uploading the Printer Firmware



- Open the Arduino IDE that you installed in step 2.
- ☑ Right click, Run as Admin
- Go to *File -> Open*
- Navigate to the folder *Marlin -> Marlin.ino* in the Printer Firmware folder that you downloaded.
- ⚠ Check you have downloaded the correct firmware depending on whether you are building the **Proforge 2 Dual** or **2S Dual**.

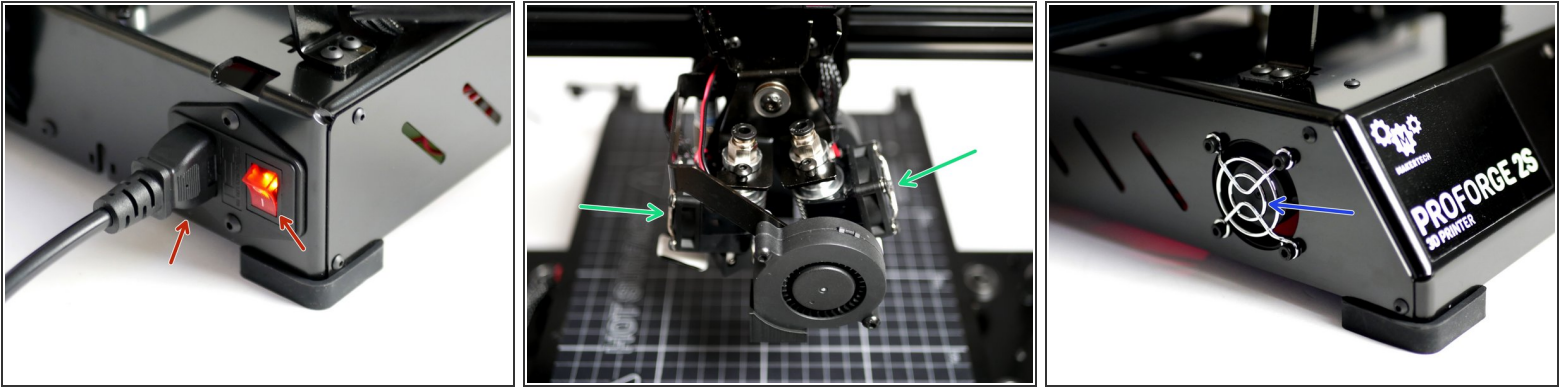
## Step 6 — Uploading Printer Firmware Cont.



- Go to Tools -> Port and select the port the Proforge 2/2S is connected to.
  - ❗ There should only be one, but if you have others disconnect the Proforge from your computer to deduce the correct COM port.
- Set the Board and Processor to **Mega 2560**
- Click upload.

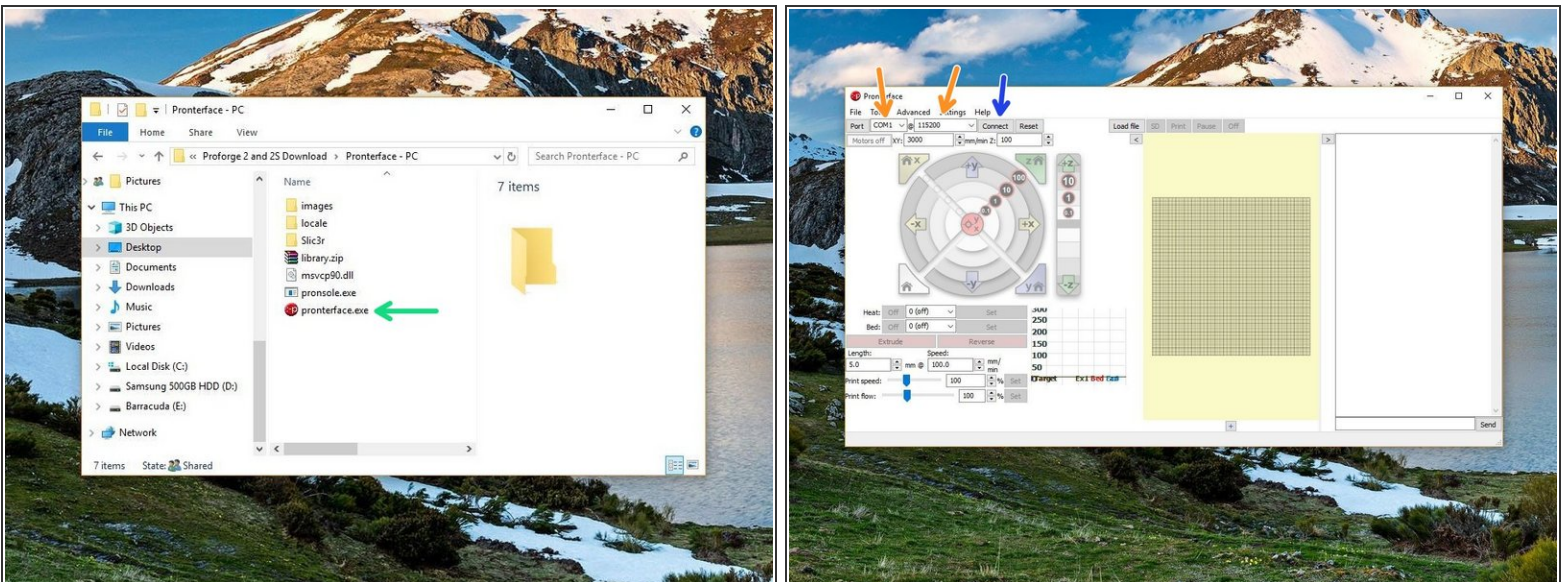


## Step 7 — Mains Power and Fan Checks



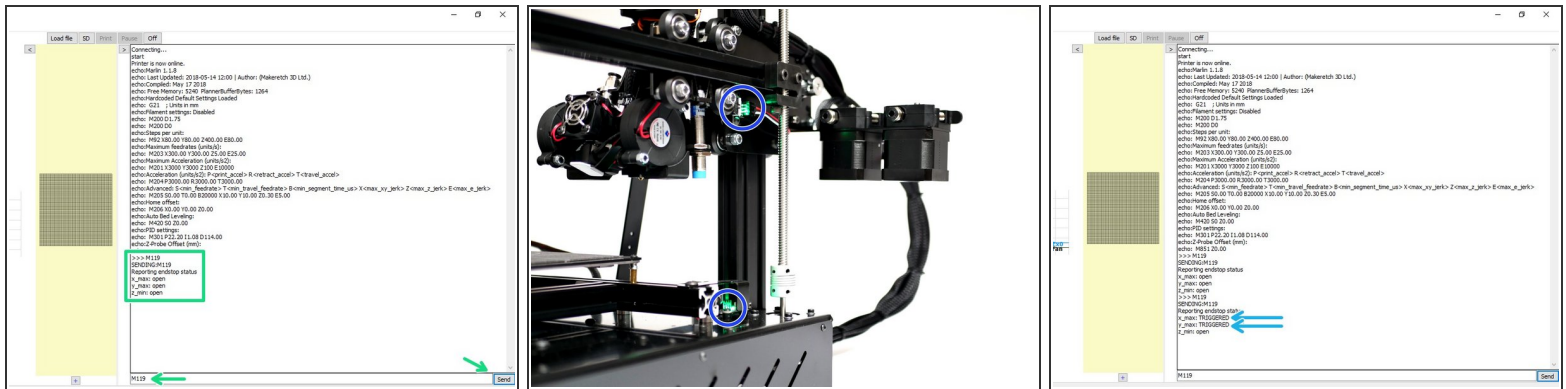
- Once the firmware is done uploading keep the USB cable connected and power up the Proforge 2/2S via the mains power cable.
- Check that both of the Hotend fans are spinning.
- Check that the electronics fan is also spinning.

## Step 8 — Connect to Pronterface



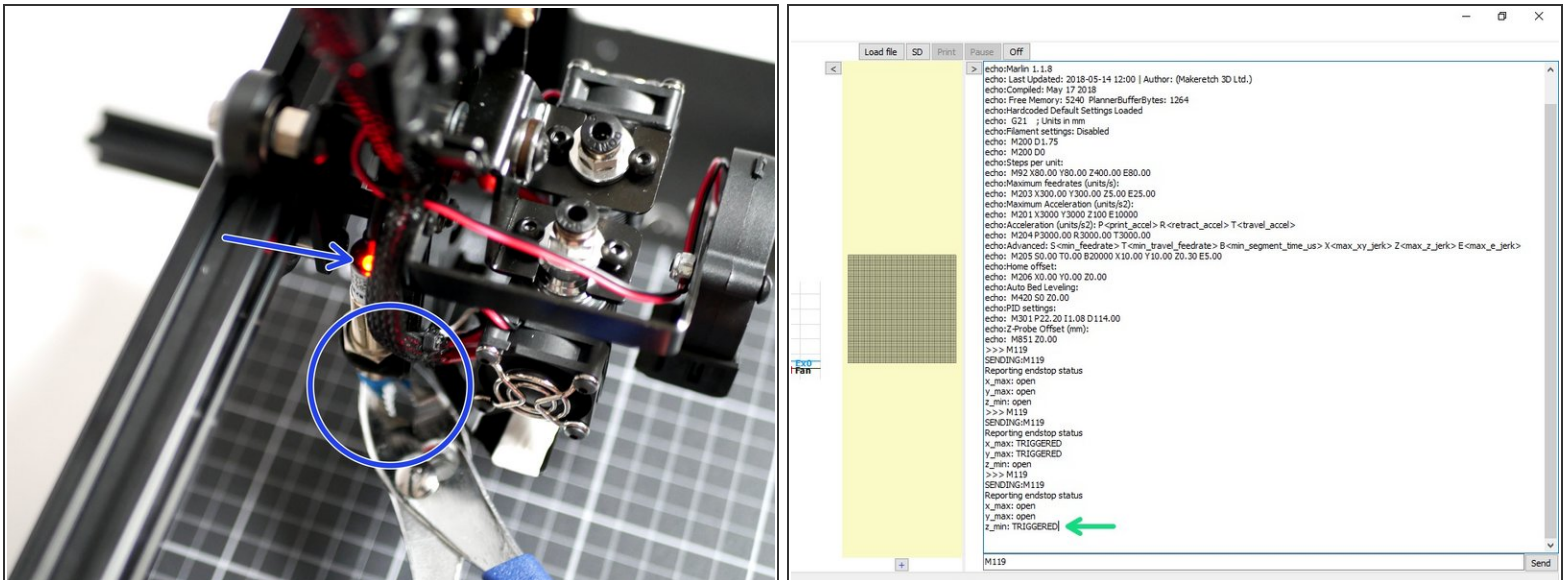
- Launch Pronterface directly from it's folder.
- Select your COM port, and set the baudrate to 250000.
- Connect to the Proforge 2/2S.

## Step 9 — Endstop Checks



- Once connected send an *M119* command through the terminal on Pronterface.
- It should read back open for both the endstops and probe.
- Move by hand the axes so as to trigger the X & Y endstops. A green light should shine.
- Send the *M119* command again - the X & Y endstops should return with a *TRIGGERED* message.

## Step 10 — Probe Check

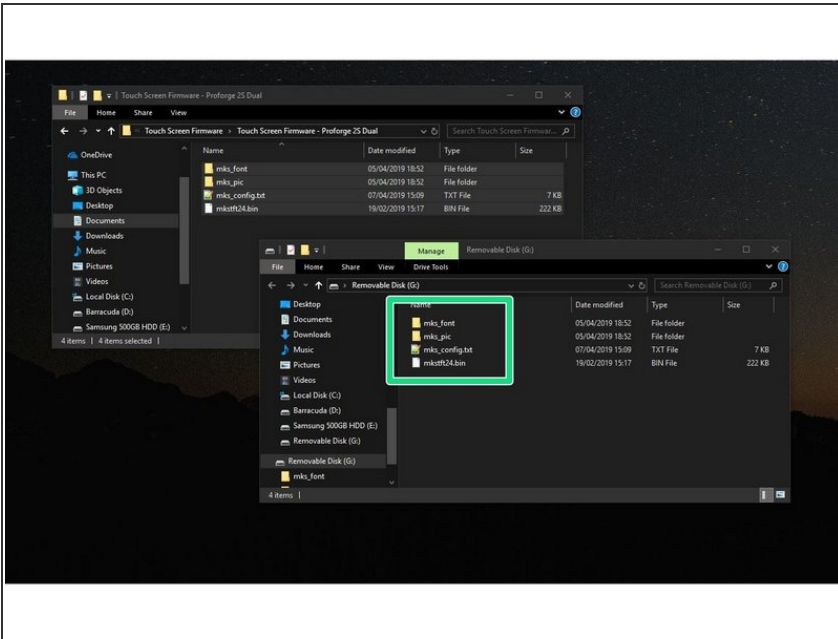


- Whilst holding a metal object under the probe (a red light should shine) send the *M119* command.
- Pronterface should return: **z\_min: TRIGGERED.**

Disconnect the USB Cable and power off the printer from the mains.

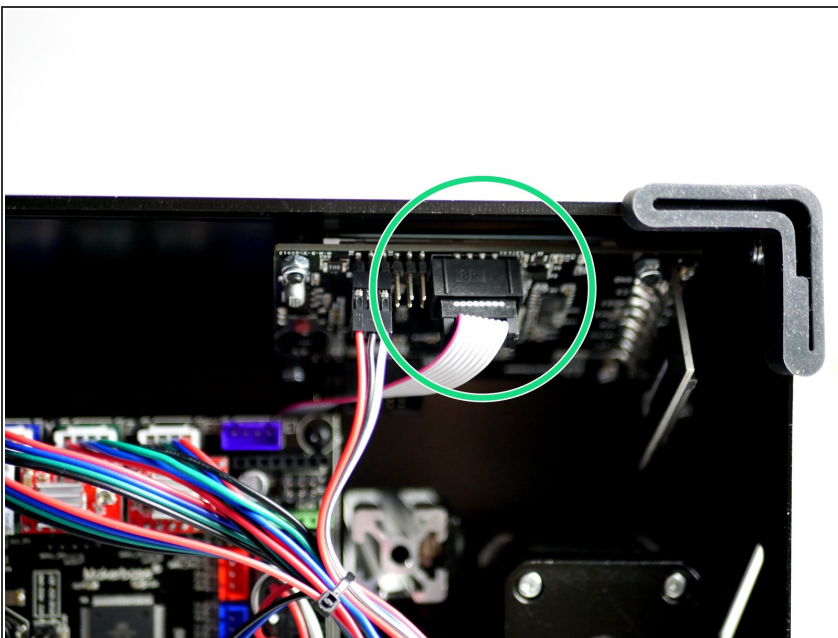


## Step 11 — Touch Screen Firmware



- Copy the contents of the Touch Screen Firmware folder (depending on whether you're building a Proforge 2 Dual or 2S Dual) to the included SD card.
- ☑ Make sure that only the **contents** of the folder is on the SD card.

## Step 12 — Reconnecting the Touch Screen



- ❗ Make sure the printer is powered off and disconnected from your computer.
- Reconnect the Touch Screen to the control board.

## Step 13 — Uploading the Touch Screen Firmware



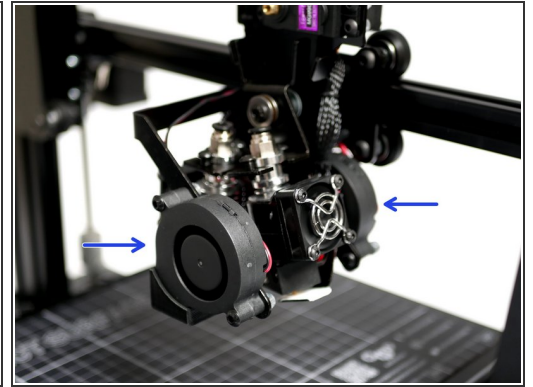
- Insert the SD card with touch screen firmware on it.
  - Power up the Proforge 2/2S. The Touch Screen display should now power up also and begin installing the firmware.
- i** Wait for the install on the Touch Screen to finish, it should only take a minute.

## Step 14 — Touch Screen Display



- i** Once done uploading you should have a screen that looks like this.
- Check that you are getting correct temperature readings (Celsius), ie. room temperature.

## Step 15 — Print Fan Check



- Go to Settings -> Fan
- Power up to 100%
- Both of the blower fans should start running.

## Step 16 — Motion Check



- Go to Tools -> Move.
- Press the toggle switch to set motion to 10mm.



## Step 17 — Motion Check Cont.



- X-Axis: Pressing the left arrow will move the bed to the right, and vice versa.
    - ☑ This is correct as the **nozzle position** has moved in a negative direction relative to the platform.
  - Y-Axis: Pressing the down arrow will move the Hotend towards the front of the printer and vice versa.
  - Z-Axis: Pressing the double up arrow will move the gantry up and vice versa.
    - ☑ You will not be able to move to a positive position from your original starting position - this is normal.
- ⚠ If an axis moves in the opposite direction double check that you have uploaded the Proforge 2S Firmware if you are building with TMC2100 drivers. If you've uploaded the correct firmware and are still getting incorrect motion, see next step.
- ⚠ If an axis is not moving power down the printer and check steps 19, 20 and 21 relating to the [stepper drivers](#) and [stepper driver jumpers](#).

## Step 18 — Inverting Motor Directions



- If an axis from the previous step moves in the wrong direction power off your printer and disconnect the touchscreen.
- In the arduino IDE go to the "configuration.h" tab.
- Scroll down to lines 855-858. (Go to File -> Preferences and check "Display line numbers")
  - `#define INVERT_X_DIR true`
- Change *true* to *false* to switch the motors direction depending on the problem axis (X, Y or Z).
- Re-upload the firmware.
- Once uploaded, connect back the touch screen and power up the printer from the mains again.
- Continue from the previous step.