

# **ENVIO** **ENGINEERING**



Bondtech QR Installation guide for the BCN3D Sigma



BCN3D Sigma Installation manual V2.0 2017-05-25

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Change Log:

- 1) Added comment regarding the e-step setting on R17 machines

## Introduction

This guide shows the installation of the Bondtech QR set on the BCN3D Sigma.

The procedure will be shown explained step by step for the right hand feeder and is identical to the for the left hand side.

Some steps might be slightly different depending on the kit type you are installing but all the major steps are the same.

Envio Engineering offers a complete kit for the awesome Sigma which includes ABS clamp mounts, bottom Bowden adapters and dedicated set of cables

If you are unsure of any steps feel free to contact us at: [info@envioeng.com](mailto:info@envioeng.com)

## List of tool required

1. 2mm Hex key
2. Small flat screw driver
3. 5.5mm Spanner or socket for M3 nuts

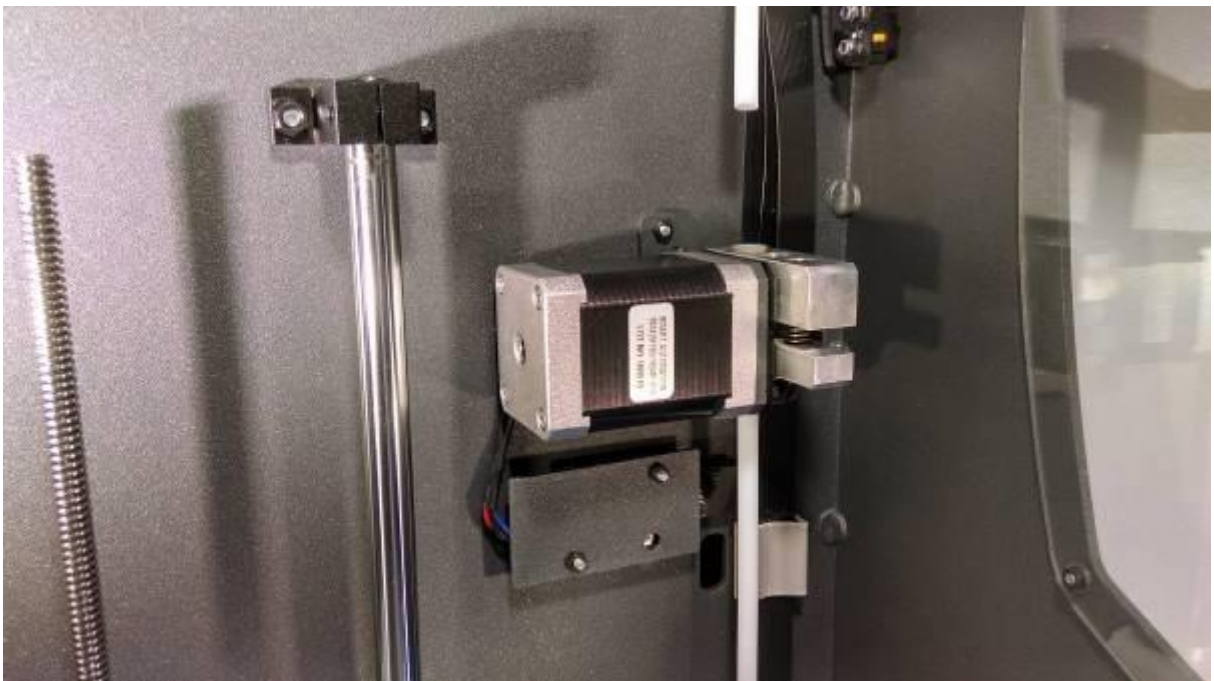
## Mechanical & Electrical Installation

Start by jogging glass build plate and lowering the Z axis enough to have clear access to the extruder feeder.

1. Switch off your printer and unplug the power cord at the back.



2. Pull the top feeder tube by pressing down on the grey ring and pulling the tube upwards



3. Remove the lower feeding tube by unscrewing the M3 hex screw from the feeder mechanism



4. Remove the two M3 nuts that hold the feeder on the frame. When removing the second nut hold the stepper motor of the feeder with one hand ensuring it will not fall off. Keep both nuts as they will be used in later steps



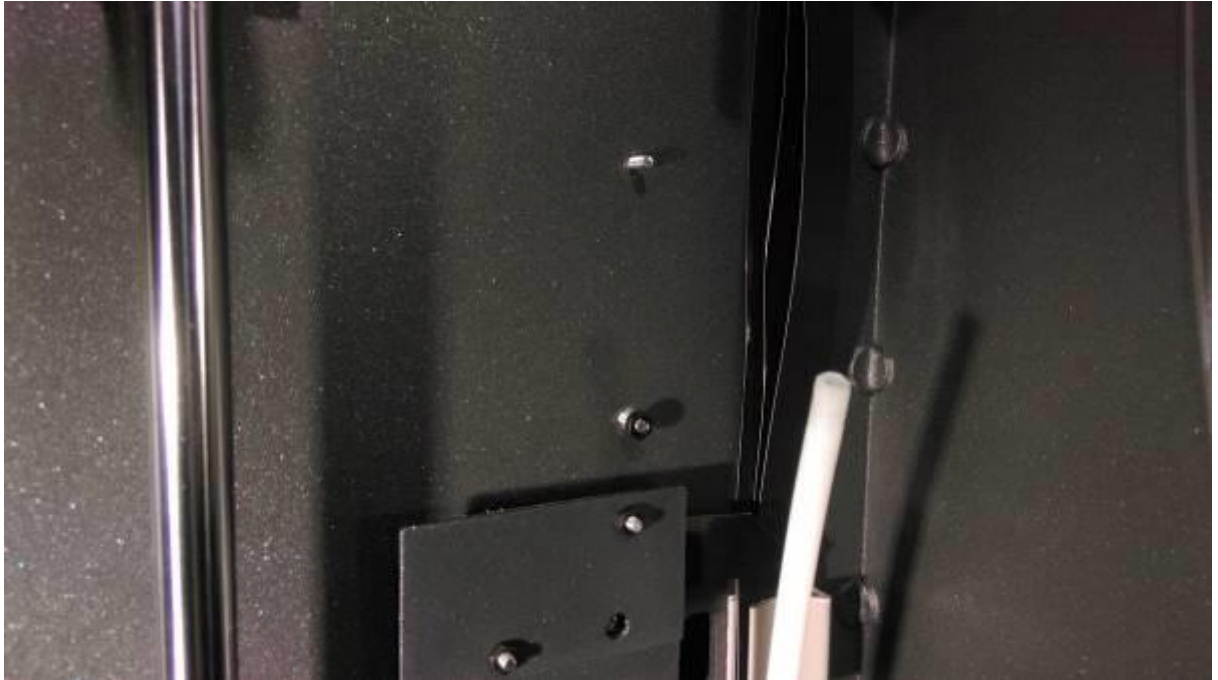
5. Unplug the stepper motor cable from the stepper driver and remove the feeder



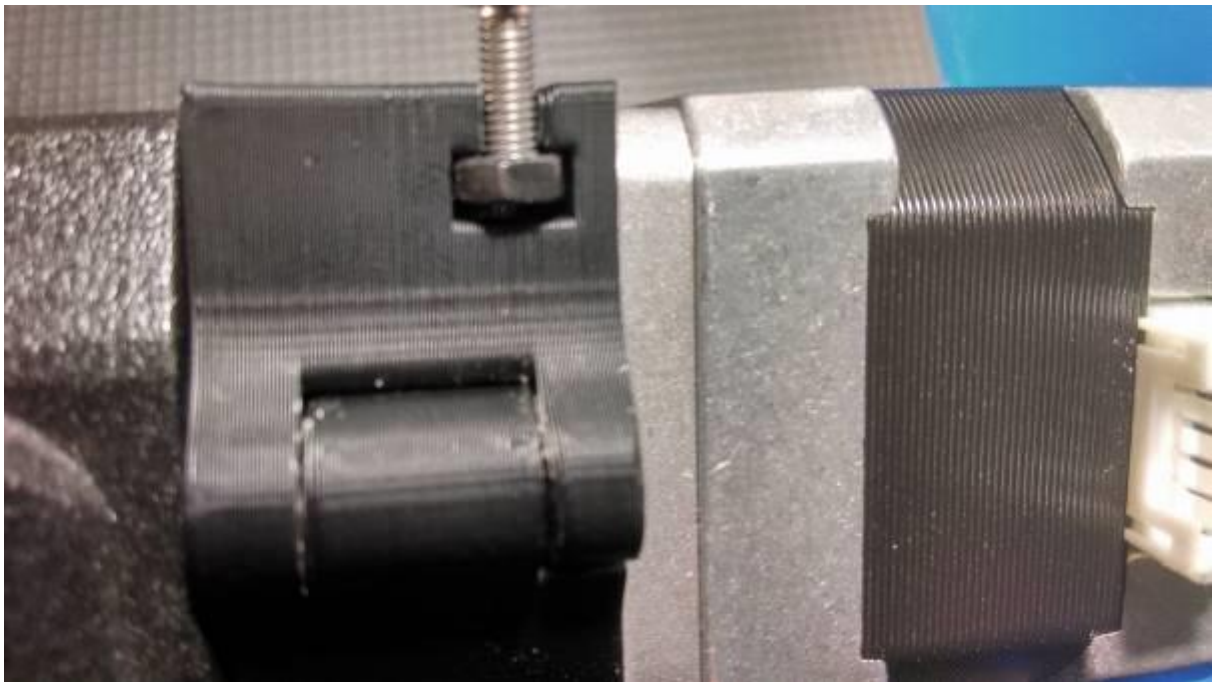
6. Take the Bondtech extruder off its box. If the clamp is not pre-installed you can find instruction of how to install it in the appendix of the guide



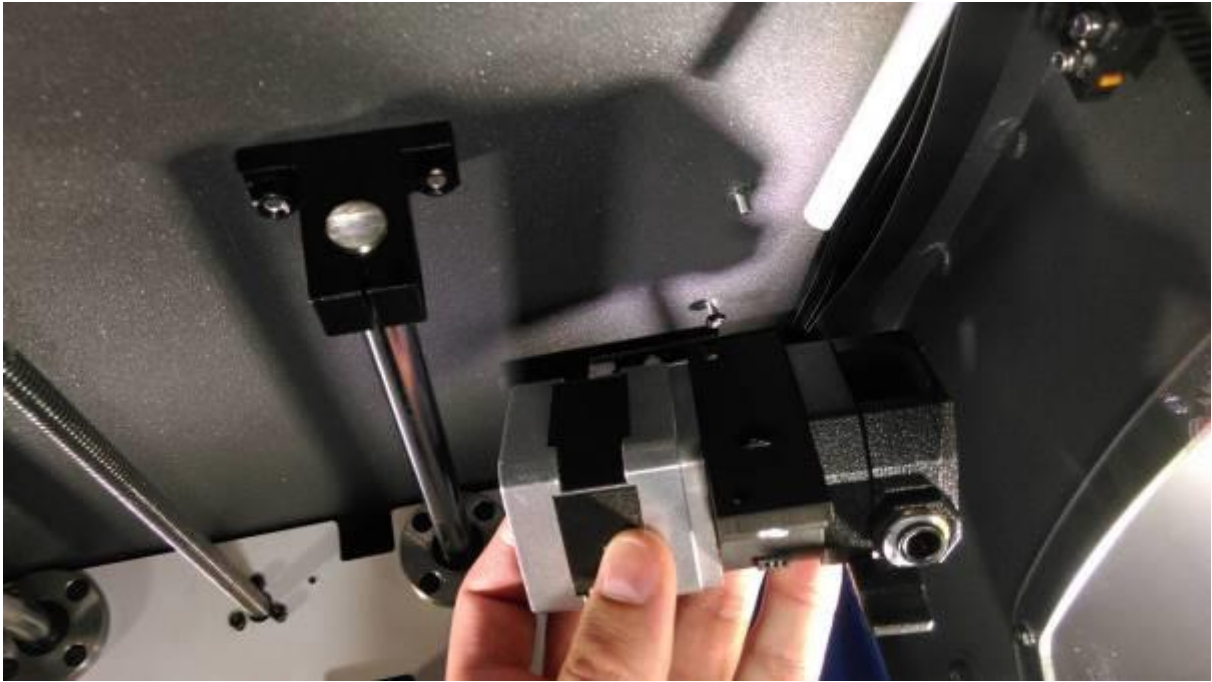
7. Screw the nut removed in step 4 on the lower stud so that they are flush.



a. Note: The stud and nut slot in the lower part of the mounting system



8. Place the bottom of the mounting system directly over the lower stud at a 45°. Push downwards slightly till the stud and nut are in slotted in place and twist so that the top mounting hole meets the top stud. Insert the top nut and tighten it.





9. Insert the top and bottom feeder tubes in the push fittings. Ensure the top tube is secure so it does not pop out while printing



10. Screw in place the spring loaded thumb screw, 4-6 turns should be sufficient

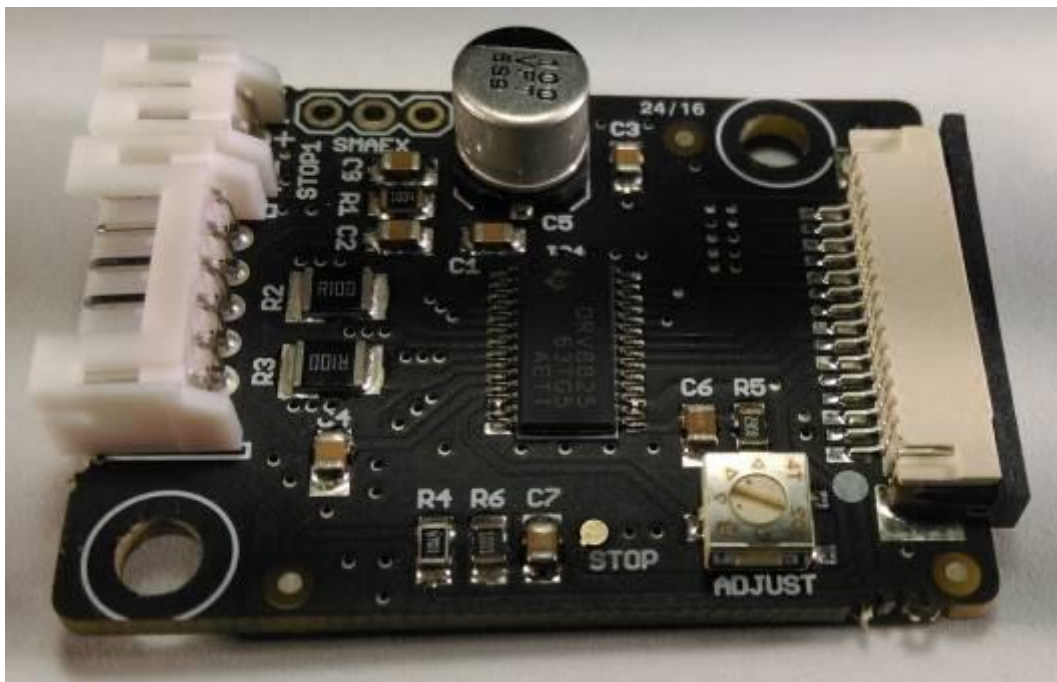


11. Remove the two M3 nuts holding the stepper driver and remove the aluminium cover. Be aware that there are 4 plastic spacers keeping the aluminium cover and are easily lost.

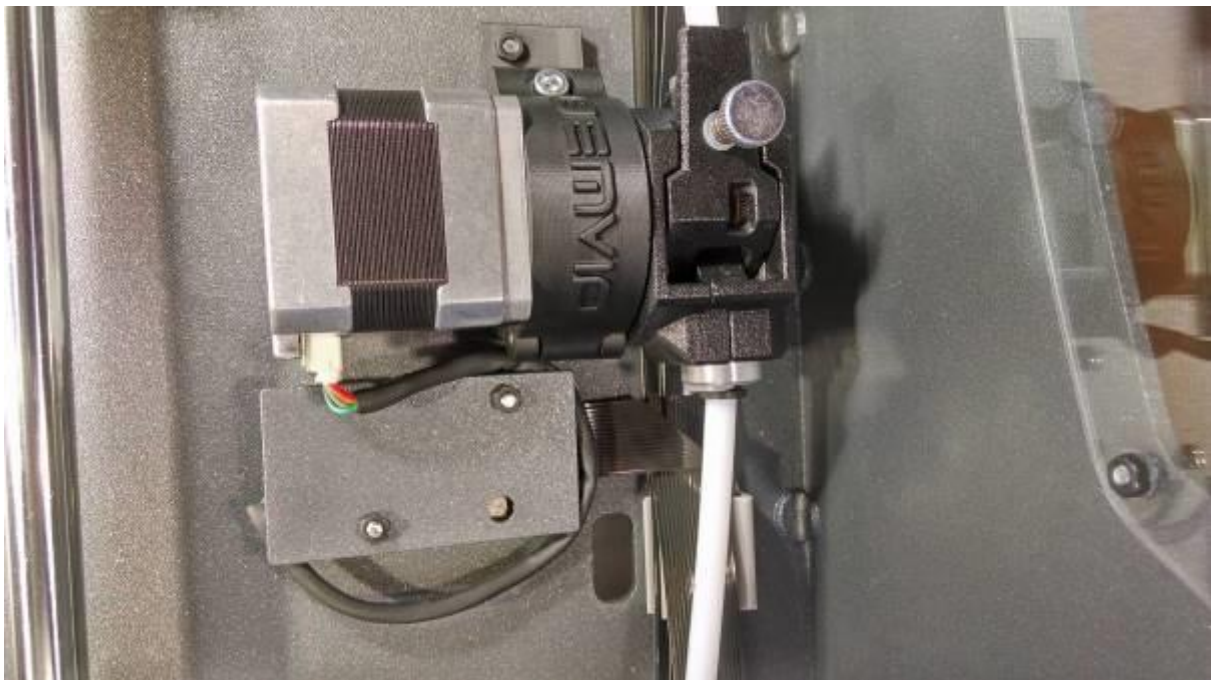
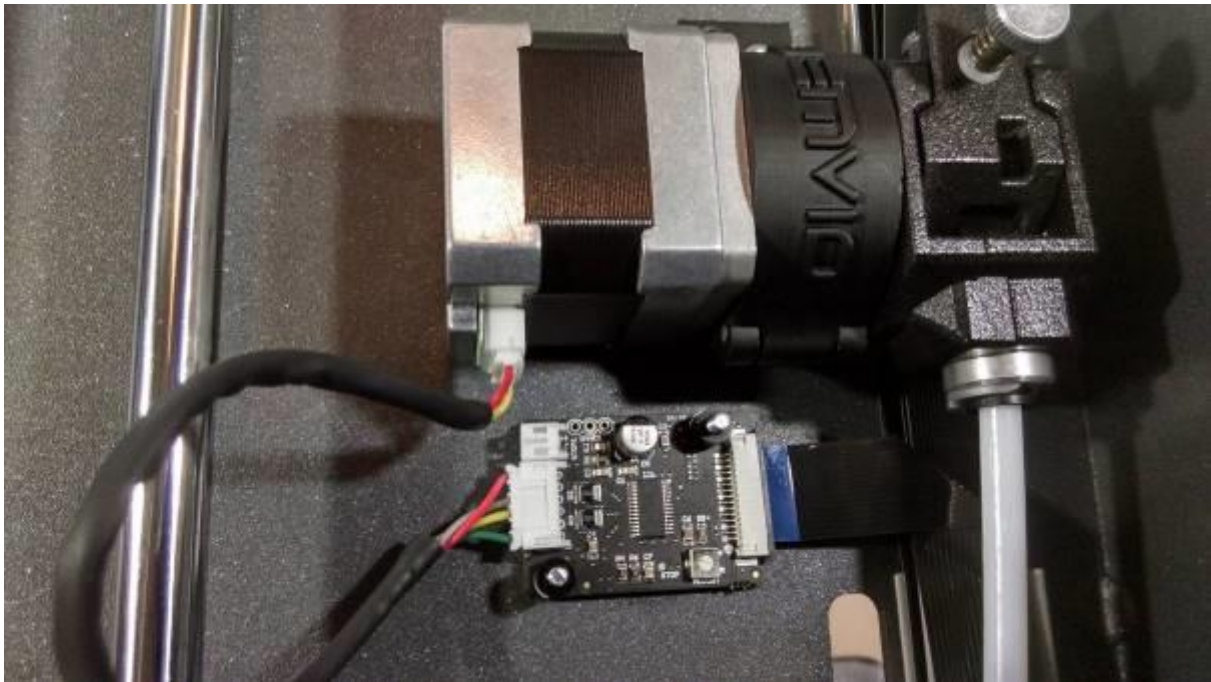


**12. This step is not needed on machines produced after November 2016 or on R17**

Turn the stepper driver adjustment trim pot with a small flat screw driver to the position shown below. The side of the slot with the two dots should be in between the triangular marks. You might need a magnifying glass as the marks are fairly small.



- a. Note: The stepper motor of the Bontech extruder is rated at 1.2Amps but runs very well 1 - 0.8 Amp. The maximum current value is controlled by the stepper driver and can be altered by the adjustment trim pot.
  - b. Another way to set more accurately the maximum current is to measure the voltage between the ground and one trim pot pin and set it to 0.55 - 0.4Volts
13. Connect the cable to the motor and to the stepper driver and fix the cover plate. Make sure there are 2 plastic spacers on each stud before installing the cover. Finally route the cable around the cover ensuring that is out of the path of the Z axis –bed



## Adjustment of steps/mm

The last step to this guide is the adjustment of the steps/mm of the extruders. This essentially tells the Sigma how many steps will have to send to the stepper motor for it to extruder 1mm of filament.

Typically, a well set up Sigma should run fine with **492.45 steps/mm** as the E-step value. It has come to our attention that **some machines** require this number to be increased to **503.77steps/mm**. If you suffer consistent underextrusion, please increase your e-step number.

### Early 2016 firmware versions (below 1.2.2)

In order to set the steps/mm value in your printer you can use the following method:

Connect to your printer with your favourite program that lets you send G-codes to your printer, or copy the following G-gode file and run it on your Sigma using the SD card

```
M92 E492.45  
M500
```

### Newer firmware versions includgin 1.2.2 and above

It has come to our attention in the newer versions of the firmware the EEPROM writing from gcode has been switched off. This has led to understandable user frustration.

You can confirm this by looking at the Marlin code in Config.h:

```

Marlin | BlinkM.cpp | BlinkM.h | Configuration.h | ConfigurationStore.cpp | ConfigurationStore.h | Configuration_adv.h | DOGMbitmaps

//=====
//-----Additional Features-----
//=====

// Custom M code points
#define CUSTOM_M_CODES
#ifndef CUSTOM_M_CODES
  #define CUSTOM_M_CODE_SET_Z_PROBE_OFFSET 851
  #define Z_PROBE_OFFSET_RANGE_MIN -15
  #define Z_PROBE_OFFSET_RANGE_MAX -5
#endif

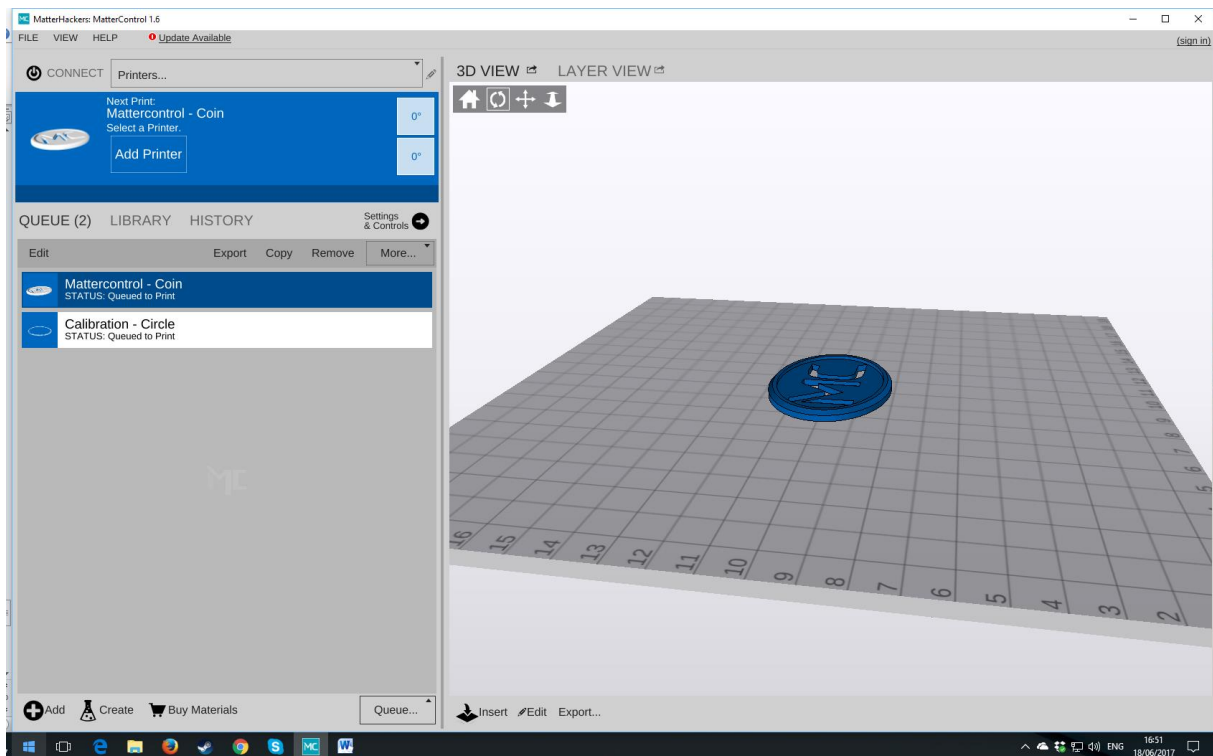
// EEPROM
// The microcontroller can store settings in the EEPROM, e.g. max velocity...
// M500 - stores parameters in EEPROM
// M501 - reads parameters from EEPROM (if you need reset them after you changed them temporarily).
// M502 - reverts to the default "factory settings". You still need to store them in EEPROM afterwards if you want to.
//define this to enable EEPROM support
#define EEPROM_SETTINGS
//to disable EEPROM Serial responses and decrease program space by ~1700 byte: comment this out:
// please keep turned on if you can.
//#define EEPROM_CHITCHAT

```

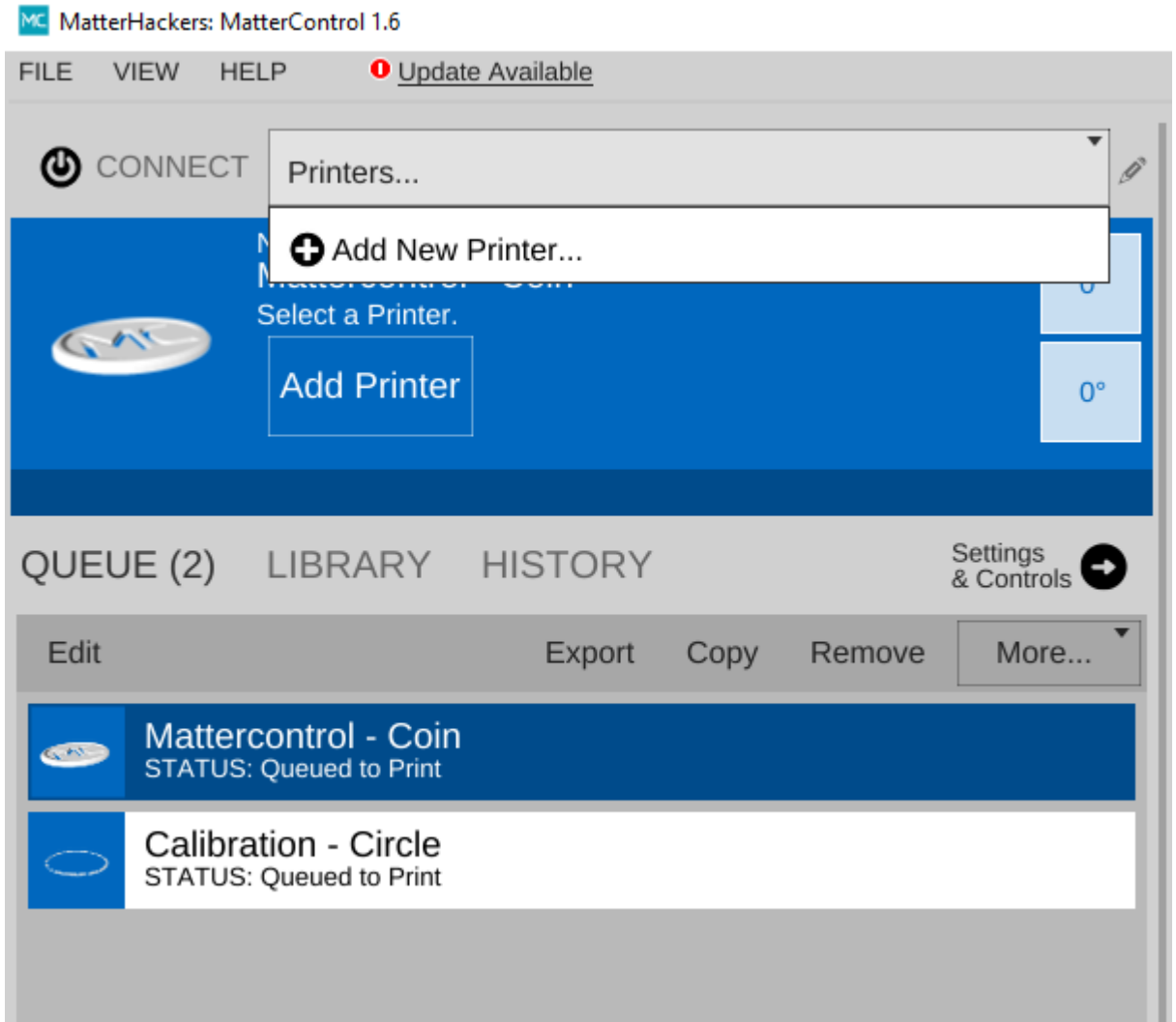
Luckily, there is a way to go directly into the memory and for this you will need a program that speaks directly to the EEPROM.

We recommend MatterControl here: <http://www.mattercontrol.com/>

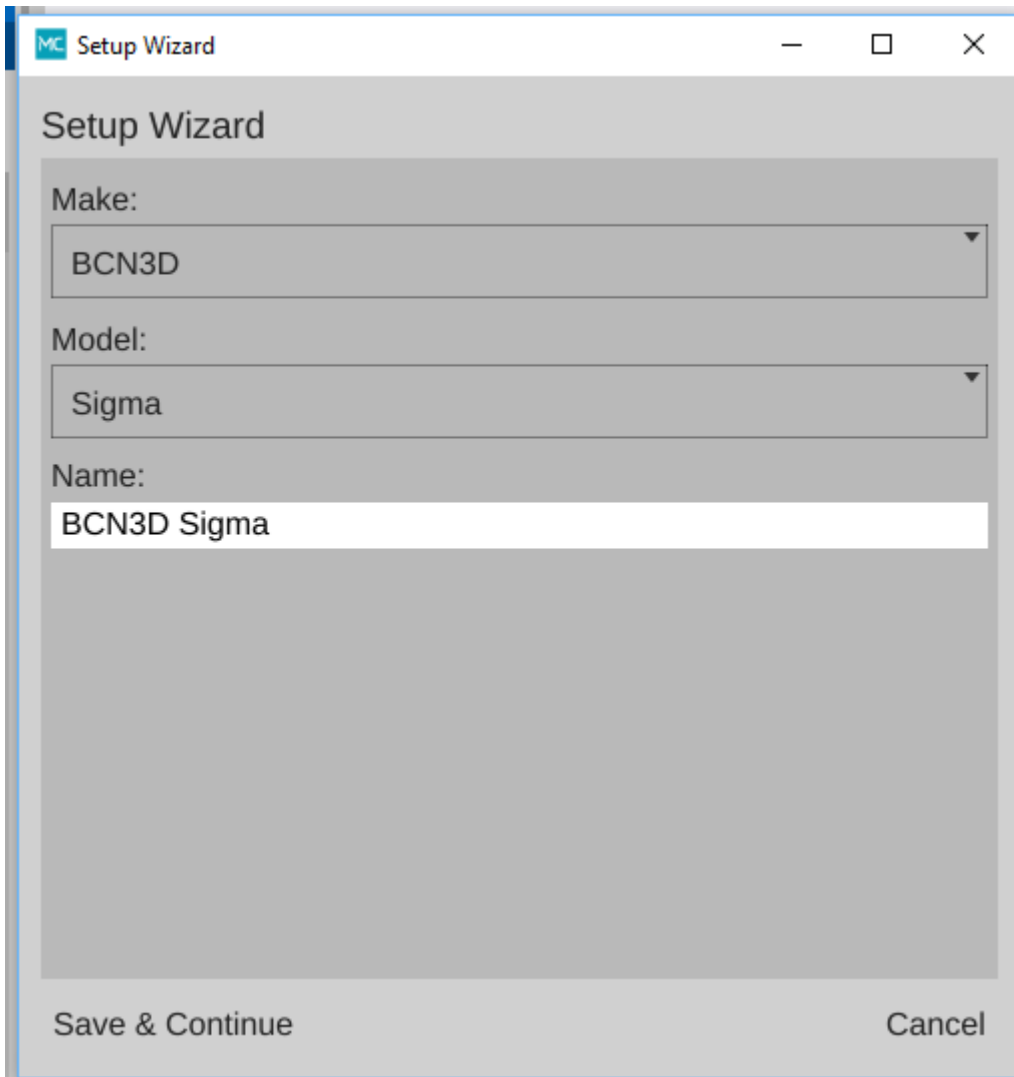
This is the main screen:



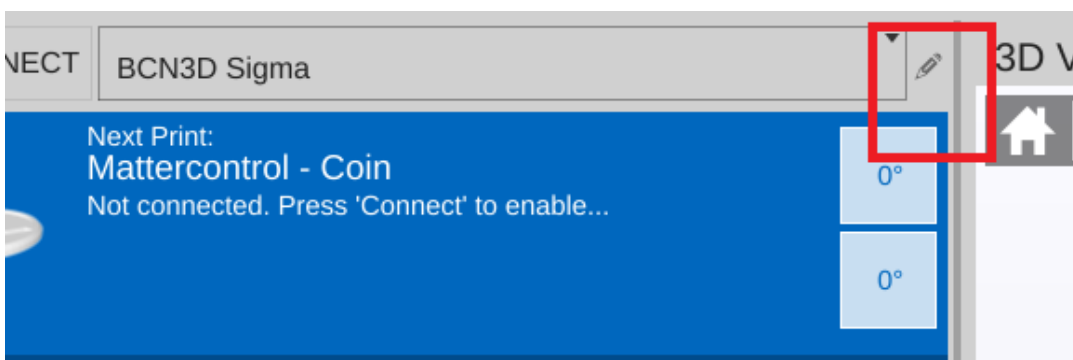
1. Connect the printer to your computer via USB.
2. To create a new printer click “Printers” drop down menu and select the option “Add New Printer”



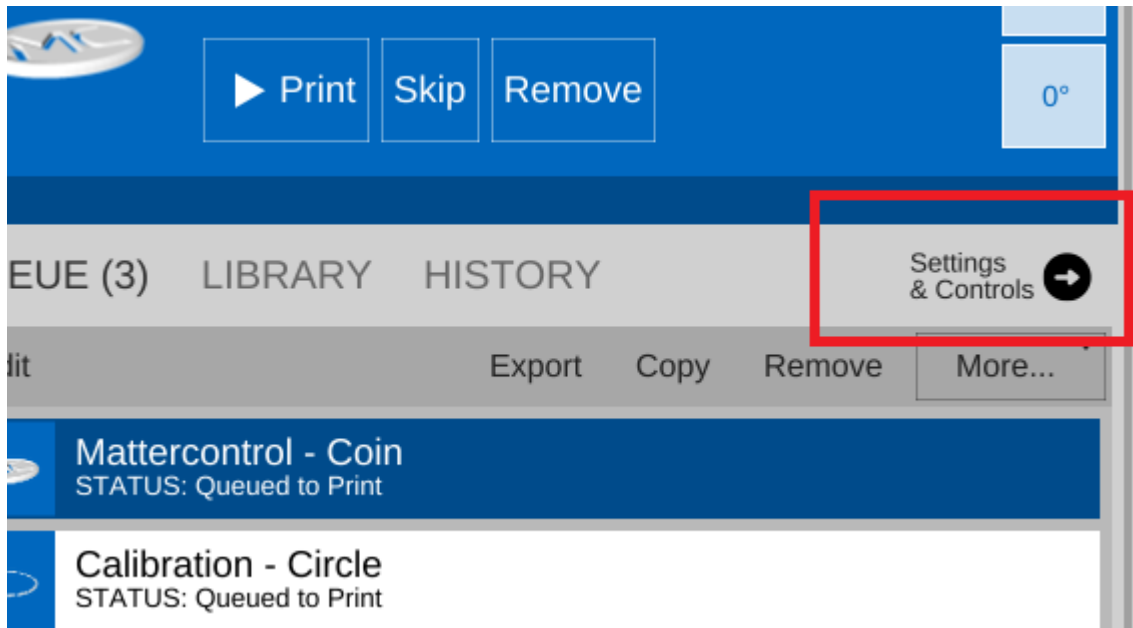
3. Use the wizard to select the BCN3D Sigma printer:



4. With the printer set up, attempt to connect using the connect button. If it does not connect you may need to manually edit the profile to select the right COM port. This is done by clicking on the pencil icon



5. Click on the “Settings & Controls” button

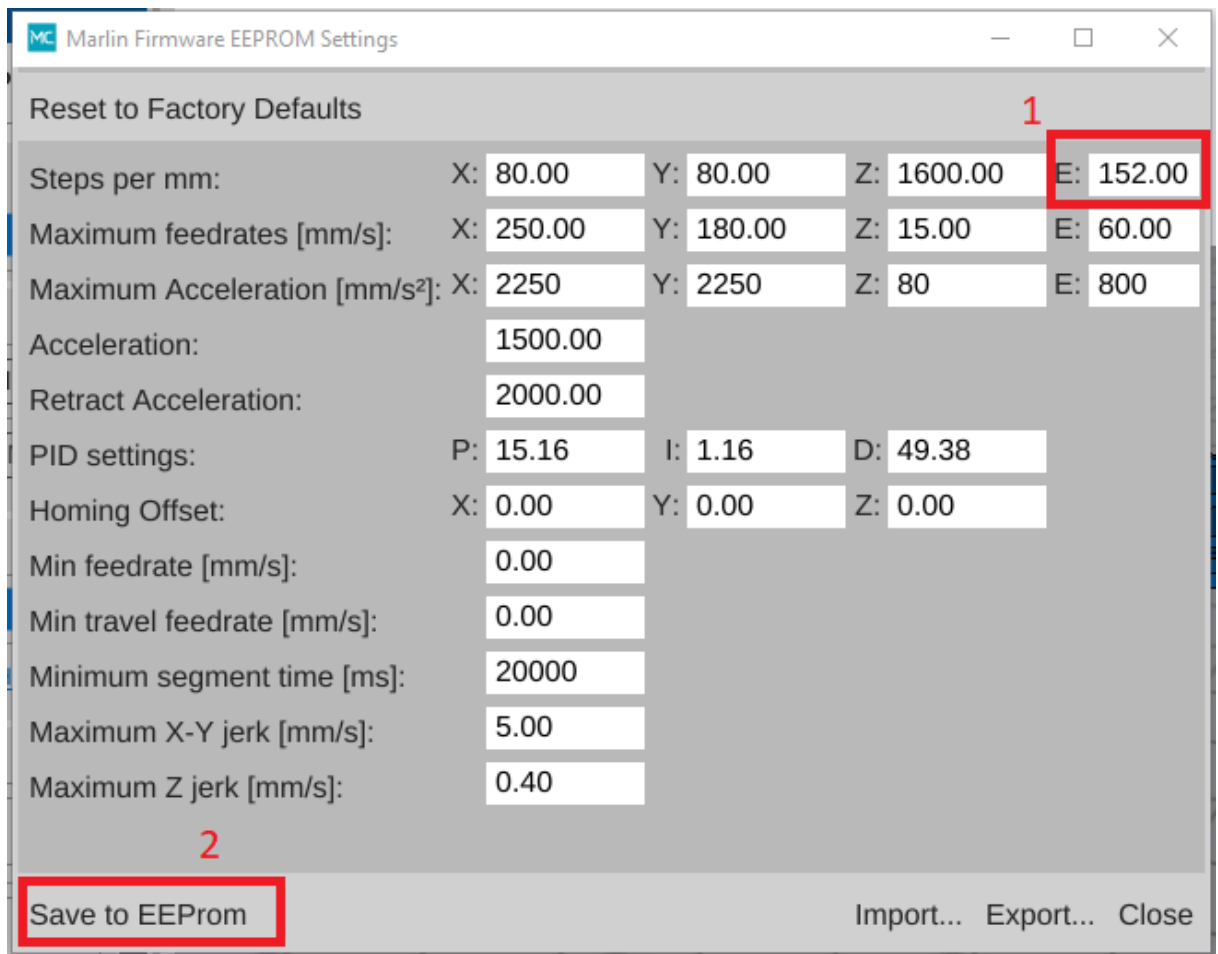


6. On the EEPROM tab click the Configure button



7. Through this menu we will be able to set the E-Steps permanently in memory by modifying the “E” value in the steps per mm box. The factory value is 152 and a good starting point for the Sigma is **492.45**.
8. Click on Save to EEPROM





9.

10. Verify that the number of steps is correct for your printer. We have had reports that the value may need to be increased to 503 steps/mm on some occasions.

### Done!

Enjoy the most powerful extruder out there!

If you have any questions please contact us by mail or telephone or if you fancy being old school pick up a pen and write to us!

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