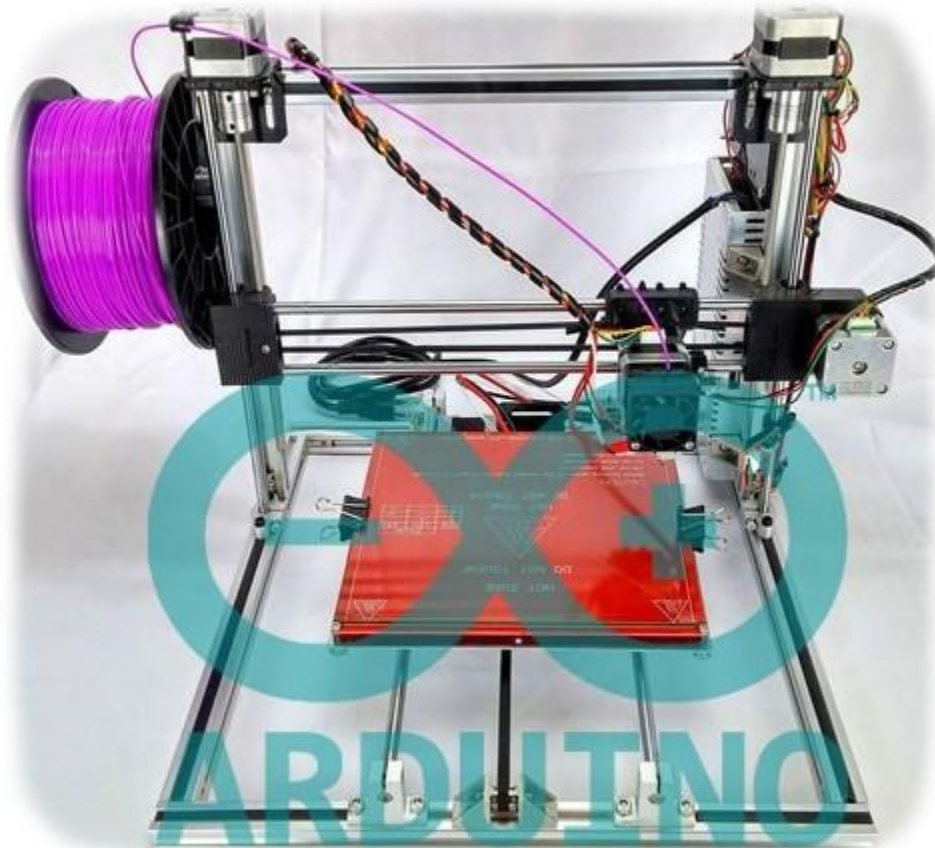# FOLGER TECHNOLOGIES, LLC
2020 i3 – 3D Printer Kit

CONFIG GUIDE
Rev. A

You did it! You built your Folger Tech 2020 i3 Printer and now you are ready to upload the firmware, configure your software, and finally start printing! Before you get started with the configuration portion of your build, please make note again of the following resources that are available to you before, during, and after your build.

Official RepRap Forum Thread:
http://forums.reprap.org/read.php?4,512329,512329#msg-512329

Visit us on IRC:
irc.freenode.net
#folgertech

Email:
support@folgertech.com

This guide was made using a PC. Mac users can follow the same steps though the interface might be slightly different. The software settings we use in this guide are tested and preferred by the staff at Folger Tech. They are a guideline and you might choose to follow them or you might choose to make changes based on your own personal print preferences. The good thing about open source is that nothing is set in stone and you have the option to make any changes you want! So use these settings, or make your own, the choice is yours!

As always, thanks again for your continued support. We look forward to offering future parts, kits, and printers down the road!

- Folger Tech Team

Step 1: Download the Firmware & Slicer Settings from our Google Drive.

1. Visit the following link: https://goo.gl/6Or0i2
    Note: the contents of our Google Drive changes as we make changes and updates. We recommend you bookmark the page and check back for future variations.
2. For the Firmware Download: Marlin_RAMPS_EPCOS_i38.**zip**
3. For the Slicer Settings Download: FTECH-2020-i3-Repetier-Slicer_PLA&ABS.**zip**
4. Unzip each of these files to a folder you can easily locate later.

Step 2: Download and install the Arduino software on your computer.

1. Visit the following website: http://www.arduino.cc/en/Main/Software
2. Click the installer that is appropriate for your version of windows to start the download of Arduino installer.

3. Locate the downloaded Arduino installer on your computer and run through the installer. I kept all the values default and didn't make any changes to the install destination. *Note: Click yes/install/continue to any prompts that pop up during the installation.*

Step 4: Upload the firmware to your Arduino Mega.

1. Plug your USB cable from your computer to the Arduino Mega on your 3D printer. *Note: your computer should recognize the board and isntall the drivers automatically. If your computer does not see the Arduino board, you may have some of your wiring wrong. In that case, un-plug your USB cable and check all of your wiring, especially the end stops.*

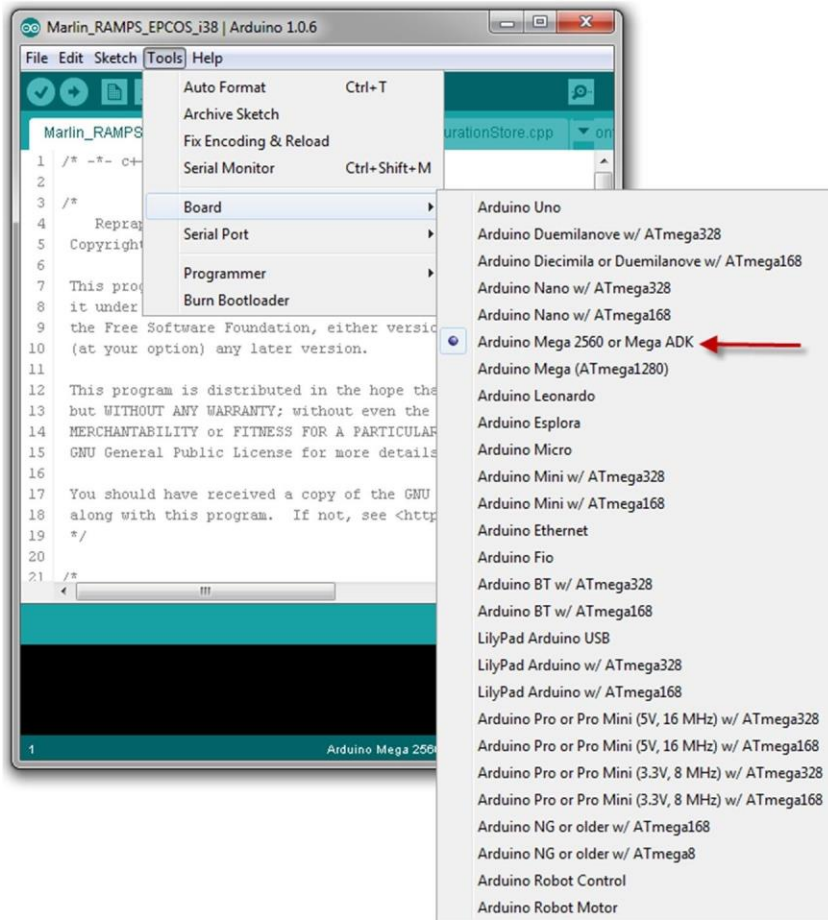2. Open the Arduino IDE software on your computer.

3. Open the .ino file located in the folder you unzipped the firmware too in step 1.
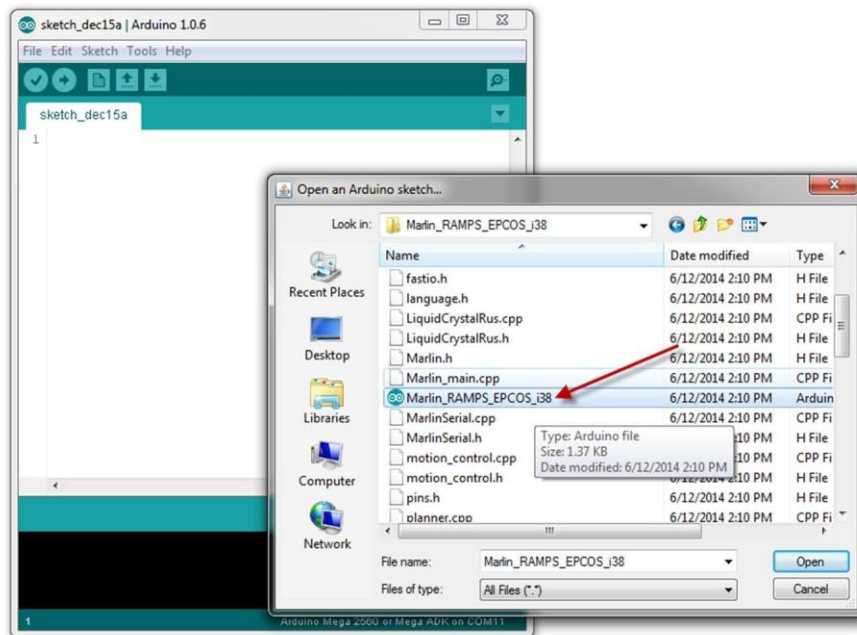

4. In the Arduino IDE software, open the Tools menu, then select Serial Port; choose the highest number COM port you see. *Note: the highest COM port usually will have the Arduino Mega listed next it (but not always).*

---
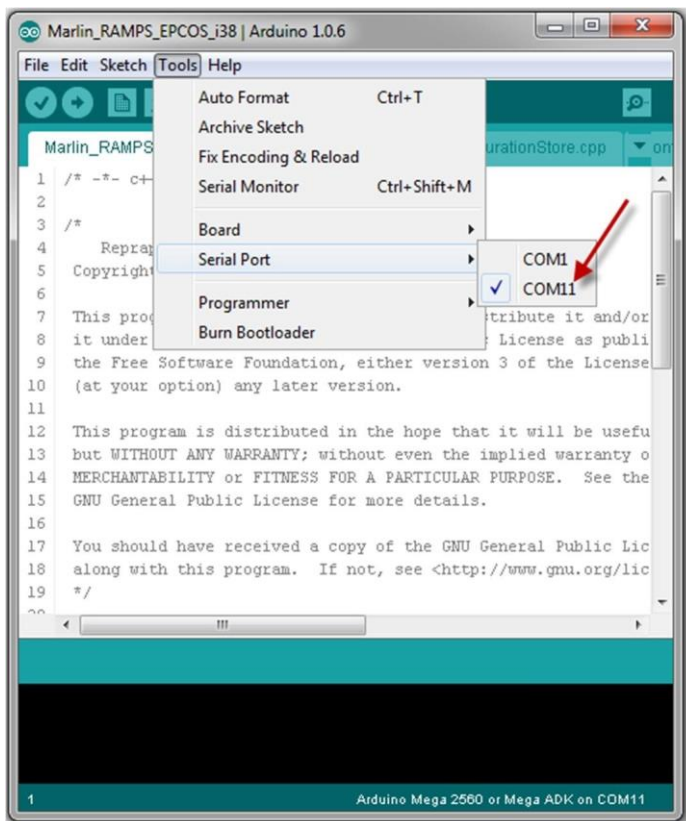
5. In the Arduino IDE software, open the Tools menu, then select Board; choose the Arduino Mega 2560 or ADK.

6. In the Arduino IDE software, click the upload bottom (the right facing arrow)
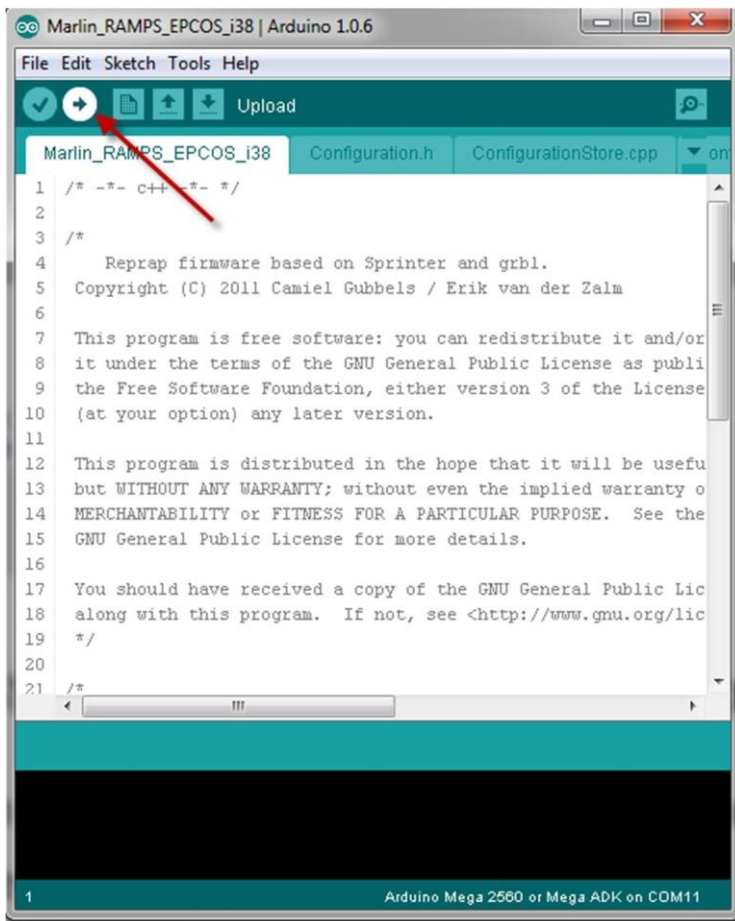
7. Once the sketch is done uploading you can close the IDE application.

**Step 4:** Download and install Repetier Host on your computer.

1. Visit the following website: http://www.repetier.com/download/
2. Click the installer that is appropriate for your version of windows to start the download of Repetier Host.
3. Locate the downloaded Repetier Host installer that you download and run through the installer.

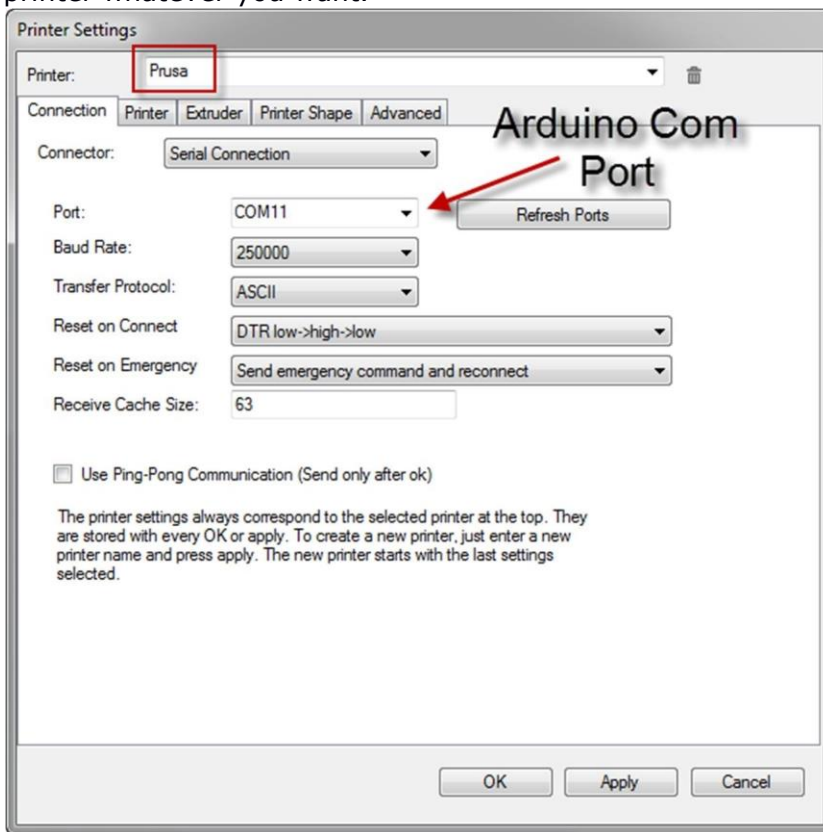**Step 5:** Configure Printer Settings in Repetier Host.
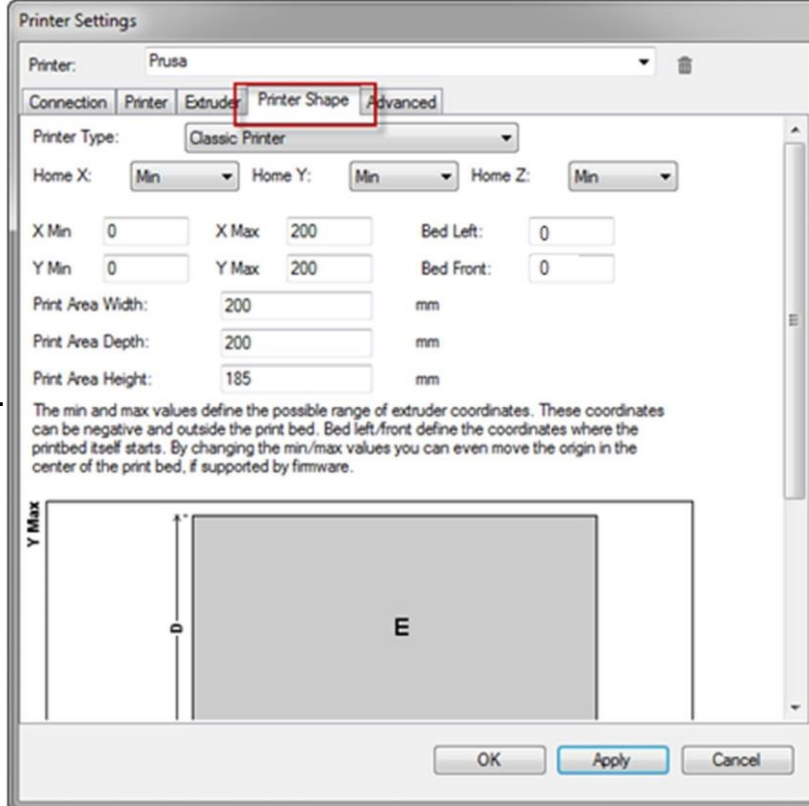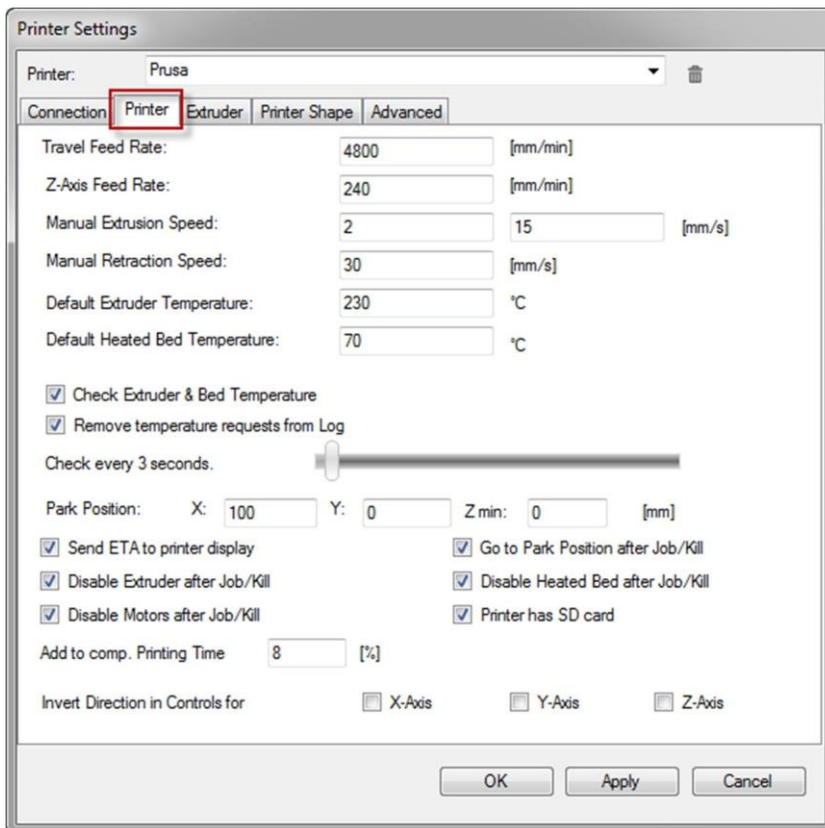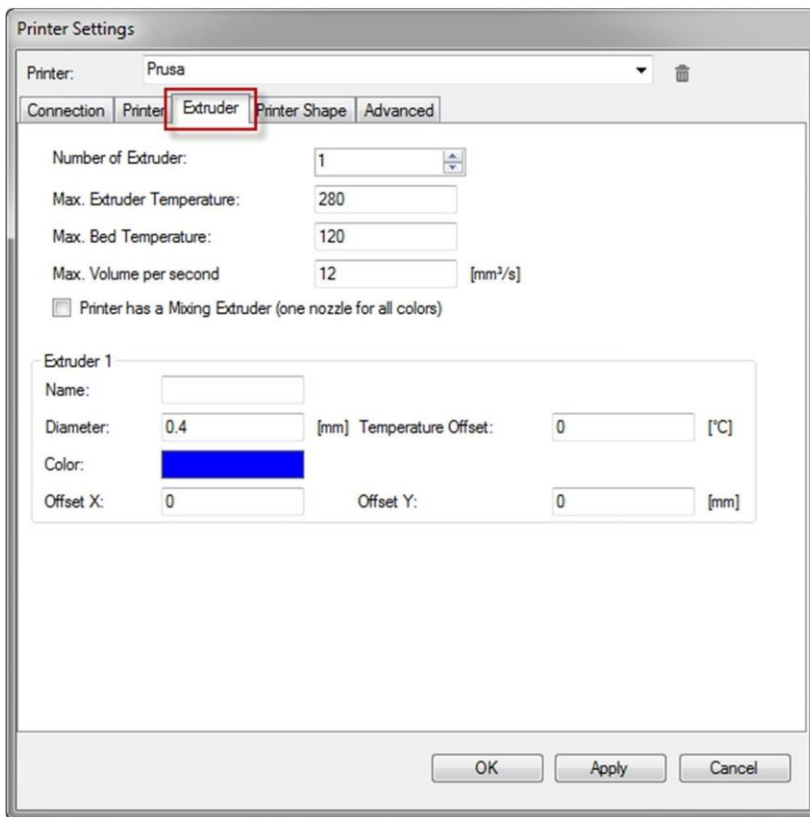
1. Open Repetier Host software.

2. Click "Printer Settings" Make sure the "Easy" mode is turned off (red)

---
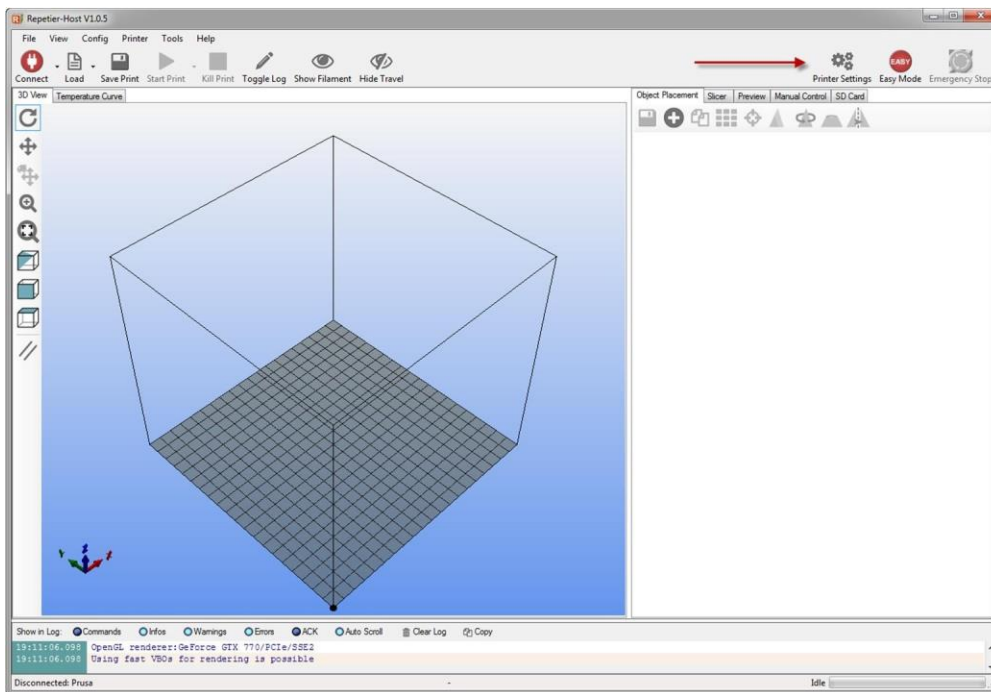
3. Enter the settings as shown below, where I typed "prusa" up top you can name the printer whatever you want.

Printer Settings

Printer: Prusa

| Connection | **Printer** | Extruder | Printer Shape | Advanced |

Travel Feed Rate:	4800	[mm/min]
Z-Axis Feed Rate:	240	[mm/min]
Manual Extrusion Speed:	2	15	[mm/s]
Manual Retraction Speed:	30	[mm/s]
Default Extruder Temperature:	230	°C
Default Heated Bed Temperature:	70	°C

☑ Check Extruder & Bed Temperature
☑ Remove temperature requests from Log
Check every 3 seconds.

Park Position: X: 100   Y: 0   Z min: 0   [mm]

☑ Send ETA to printer display   ☑ Go to Park Position after Job/Kill
☑ Disable Extruder after Job/Kill   ☑ Disable Heated Bed after Job/Kill
☑ Disable Motors after Job/Kill   ☑ Printer has SD card

Add to comp. Printing Time   8   [%]

Invert Direction in Controls for   ☐ X-Axis   ☐ Y-Axis   ☐ Z-Axis

[OK]   [Apply]   [Cancel]

Printer Settings

Printer: Prusa

| Connection | Printer | Extruder | **Printer Shape** | Advanced |

Printer Type: Classic Printer

Home X: Min   Home Y: Min   Home Z: Min

| X Min | 0 | X Max | 200 | Bed Left: | 0 |
| Y Min | 0 | Y Max | 200 | Bed Front: | 0 |

Print Area Width: 200 mm
Print Area Depth: 200 mm
Print Area Height: 185 mm

The min and max values define the possible range of extruder coordinates. These coordinates can be negative and outside the print bed. Bed left/front define the coordinates where the printbed itself starts. By changing the min/max values you can even move the origin in the center of the print bed, if supported by firmware.

Y Max

E

[OK]   [Apply]   [Cancel]

Printer Settings

Printer: Prusa

Connection | Printer | **Extruder** | Printer Shape | Advanced

Number of Extruder: 1

Max. Extruder Temperature: 280

Max. Bed Temperature: 120

Max. Volume per second: 12 [mm³/s]

☐ Printer has a Mixing Extruder (one nozzle for all colors)

Extruder 1

Name:

Diameter: 0.4 [mm]   Temperature Offset: 0 [°C]

Color: ▮

Offset X: 0   Offset Y: 0 [mm]

OK   Apply   Cancel

Step 6: Configure Slicer Settings in Repetier Host.

1. In Repetier Host, click the Slicer Tab and click Configuration.
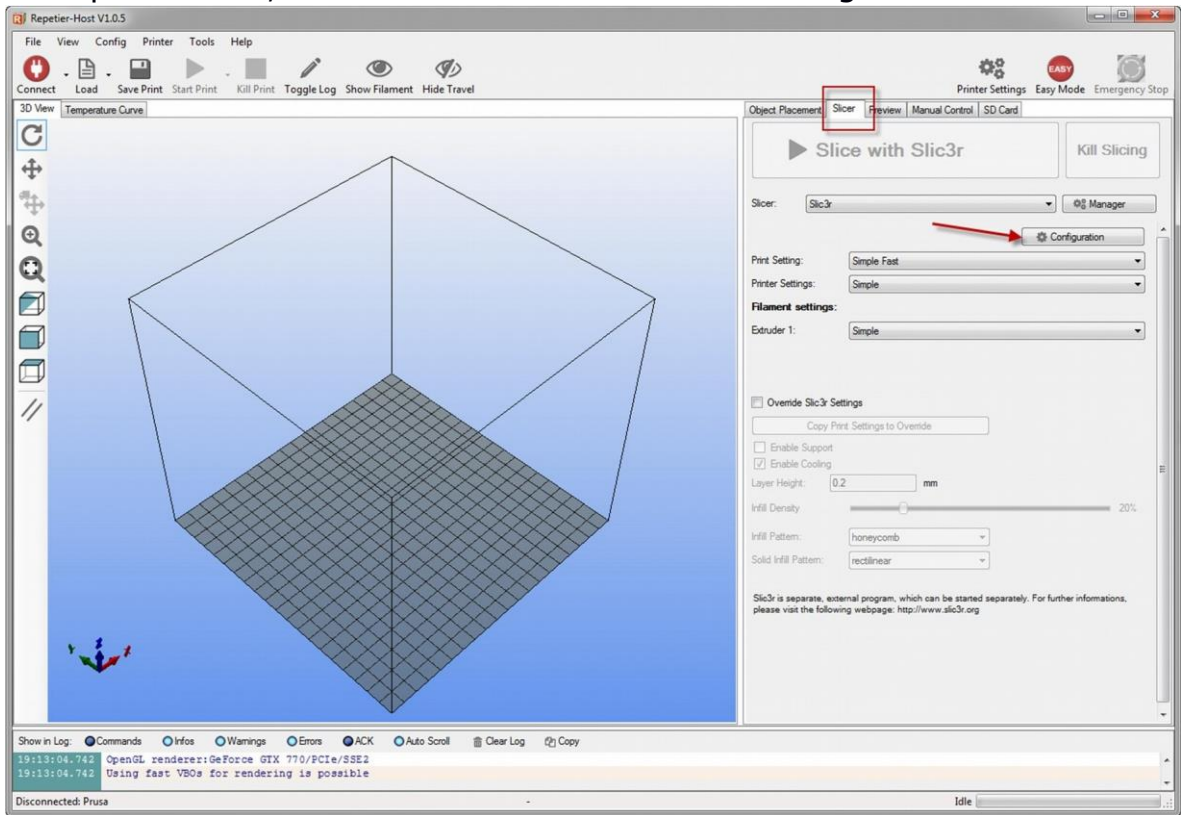
2. In the Slic3r configuration click File, and click Load Config Bundle
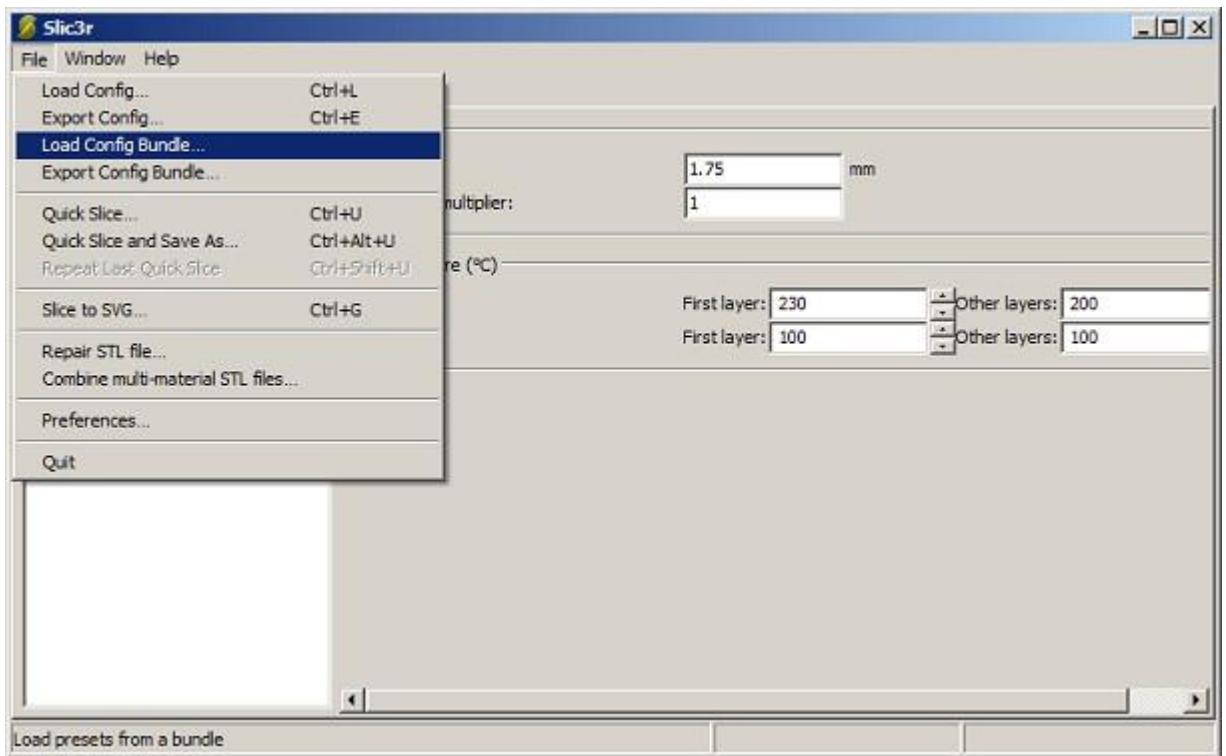
3. Select the ABS configuration file that you unzipped earlier by locating the file.
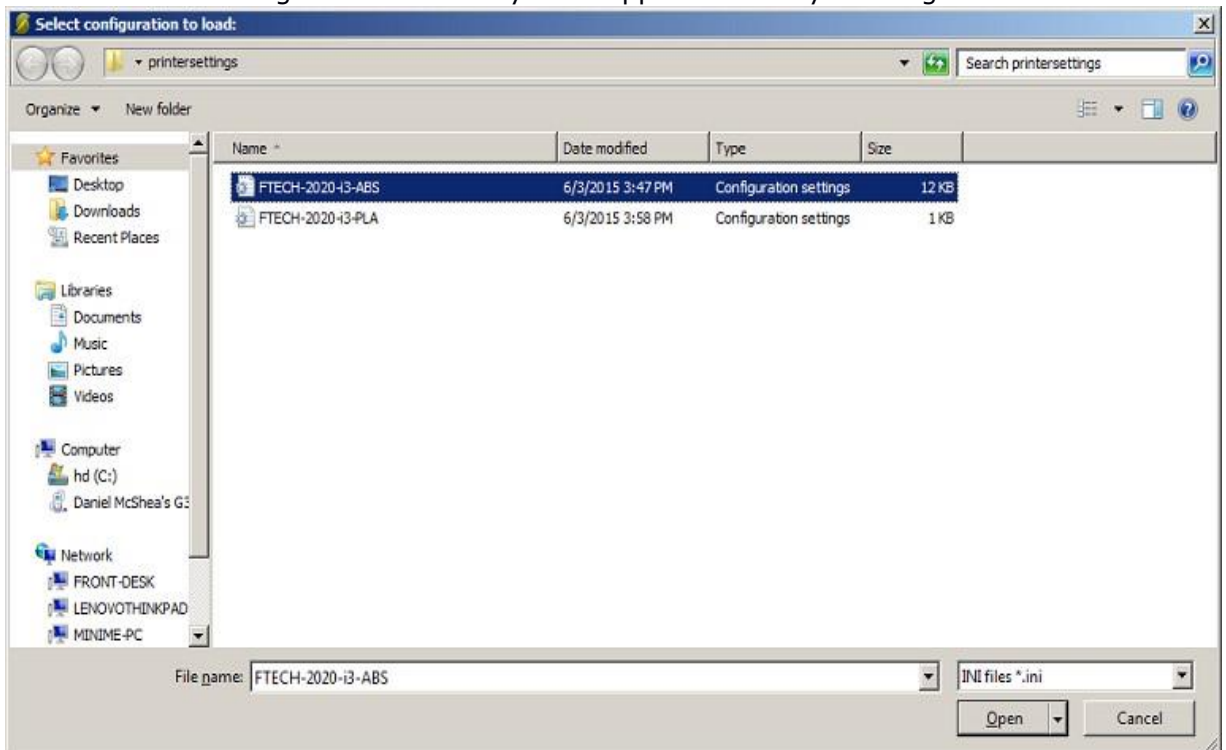
4. Do step 3 again but this time select the PLA configuration file that you unzipped earlier.

Step 7: Connect to printer in Repetier host.

1. Make sure your printer is plugged into the wall (110v power)
2. In Repetier Host click "Connect" at the top left corner.
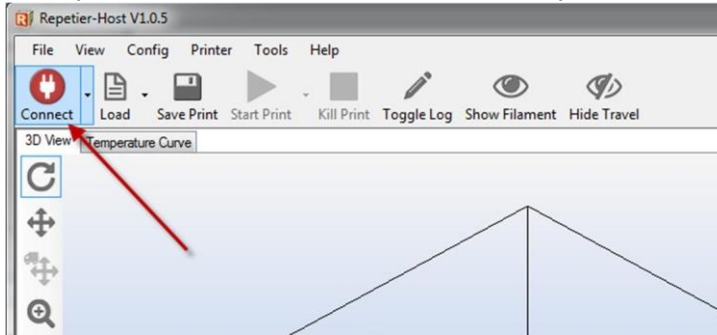
You should see this listed in the log below:
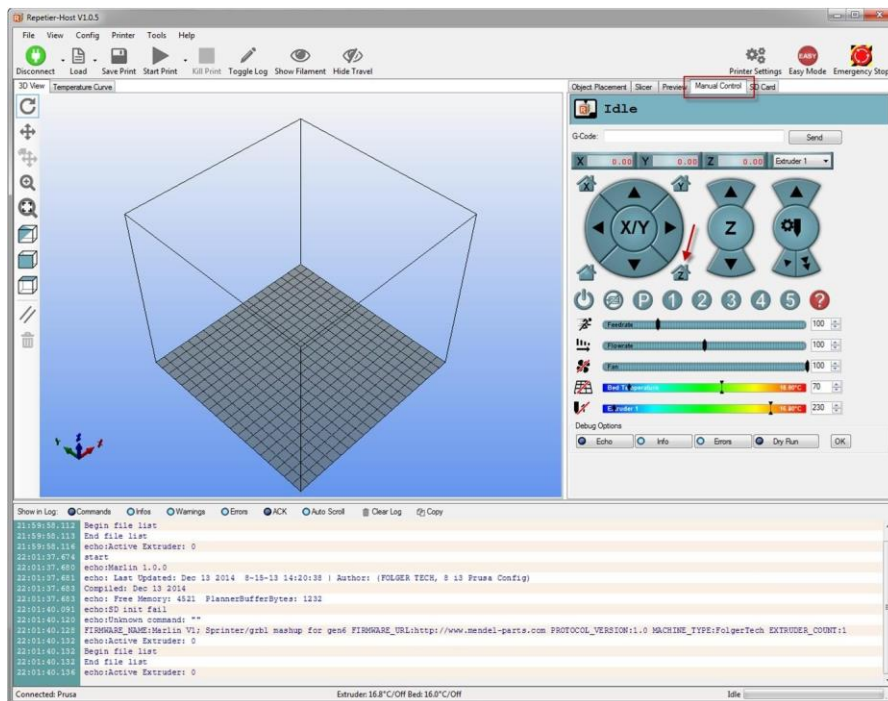
Step 8: Home X and Y Axis

1. Click on the Manual Control tab in Repetier Host and click on the Home X and Home Y Buttons.
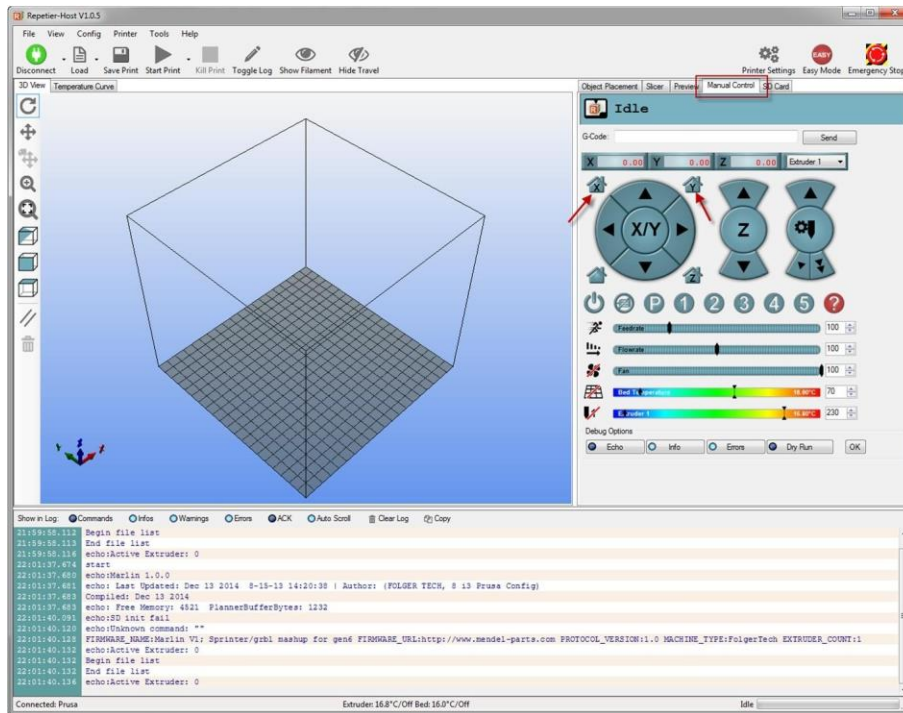
2. The X and Y home position should be at the back right of the print bed, you want this to be about 1mm from the corner, adjust the X and Y end stops to adjust the distance.

Step 9: Home the Z Axis

1. Still using the Manual Control Tab, click the Home Z Button.

2. This will bring the entire X carriage down so the hot end just about contacts the bed. Before you adjust the end stop for the Z axis, measure the distance between the bed and the nozzle. If you can it helps to make a cardboard spacer for the next step.

Step 10: Level Print Bed

1. Click "Disconnect" in the top left corner of Repetier Host and disconnect the printer from the 110v power as well as the USB cable from the computer.

2. Using the spacer you made in Step 11, manually move the print head to the left side of the printer. Use the spacer to adjust the bed height with the thumbscrews at each corner. Move the bed to the back and repeat the process for the front left of the bed. Move the print head to the right side of the front of the bed and repeat.

The goal here is to ensure you have the same distance at every corner of the heat bed between the heat bed and the nozzle on the hot end. **Step 11:** Set Proper Z End Stop Height

1. Connect the printer to the 110v power and connect the USB cable to the computer. Open Repetier Host and connect it to the printer.
2. Go back to the "Manual Control" tab and Home X, Y, and Z
3. Grab a sheet of paper to set the Z height properly, bring the Z axis end stop down slightly and re-home the Z axis. We want the hot end nozzle to cause friction between the paper and the glass on the heated bed.
4. Don't get discouraged, this is the most challenging part of setting up any 3D printer, keep at it and you will get it right!
5. Once you have the height set right at the X and Y home, use the controls in Repetier Host to lift the Z axis 1mm and move the X to the other side. Don't worry, it won't go

further than the firmware will allow (which is 200mm). Move the Z axis down 1mm and check the gap with the paper on that side. Use the thumb nut on the underside of the bed to finely adjust the tension between the paper and the glass on the bed. Repeat this step for the front left and right corners of the bed.

6. Between moving the end stops, and adjusting the thumb screws on the heated bed, just like in step 10 with the spacer, you are just trying to make it so the nozzle is the same distance from the glass all the way around the heated bed, this will ensure even prints later on.

Step 12: Load Filament

1. Click the fan and extruder icon to turn on the hot end.
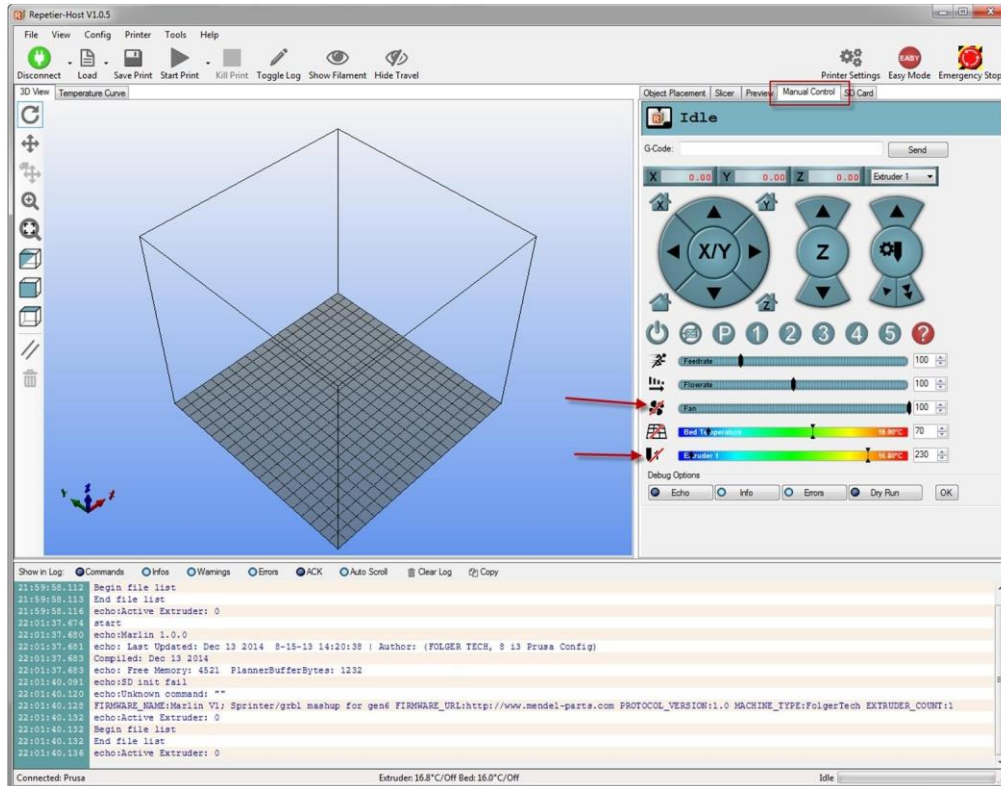
2. When the hot end reaches temp, insert the filament into the right side of the top of the extruder and manually extrude 50mm of filament, it will start coming out of the nozzle as it feeds through.

Congratulations you are now ready to start printing! Leveling and calibrating the bed will be a challenge to beginners to start, but keep at it and you will see what adjustments change what when printing. The slicer settings we loaded are for both PLA and ABS and depending on which filament you are using you will want to choose the correct settings when slicing your print. Check out Thingiverse.com for some fun ideas and objects already ready to print!