Q3D OneUp/TwoUp w/ RAMPS Electronics Manual

Thank you for your purchase of a OneUp/TwoUp kit!

Please read the 1-page printed insert for the most up to date information on your printer. The kits are being updated constantly to provide the best user experience possible.

The newest version of this kit includes an upgrade to RAMPS electronics instead of Printrboard electronics that were used on the previous version. The electronics and software setup manual and assembly manual are now in two different files. Please be sure to download the assembly documentation for RAMPS electronics.

For technical support please visit our support page at http://quintessentialuniversalbuildingdevice.com/support/ and create a ticket.

TOOLS TO COMPLETE ASSEMBLY

Set of Allen wrenches for the M3, M4 and 3/8" socket cap screws.

BEFORE BEGINNING ASSEMBLY

Please take an inventory of all parts in the kit to ensure that any parts that were damaged or missing in transit are accounted for. If you are missing any parts we will send replacements free of charge for the first time only. All subsequent requests for replacement parts will be at retail cost, plus S&H so it is important to take a detailed inventory to ensure that only one request is made. Replacement parts requests must be made within 15 days of receipt of your printer. Requests made out of this time period will be charged retail cost, plus S&H.

Please assemble in a well lit area with plenty of room to spread out all the parts. There are LOTS of small pieces that are easily lost. Using some bins or bowls to contain the smaller parts during assembly will prevent lost pieces. Exposed electronics ARE SENSITIVE TO STATIC ELECTRICITY, so wearing a grounding strap before removing the electronics from its anti-static bag is critical.

SAFETY

DO NOT UNDER AND CIRCUMSTANCES LEAVE THE 3D PRINTER UNATTENDED DURING OPERATION.

ELECTRICITY WARNING: All components of the assembly operate at 12v or less, however the power cord coming into the power supply operates at full line voltage. Please take extra care and ensure everything is unplugged from the wall before touching any portion of the electronics. Under no circumstances should the metal casing of the power supply be opened.

STATIC ELECTRICITY WARNING: The electronics are VERY susceptible to static electricity (especially the stepper drivers). Do not assemble or operate the 3D printer on or near carpeted surfaces. Always touch some bare metal before touching any electronics in this kit to discharge any built up static!

TEMPERATURE WARNING: The hotend can reach temperatures of 250 Celsius which can cause severe burns. Never touch the hotend while the unit is plugged in. Wait 10 minutes after unplugging the 3D printer before touching the hotend. The stepper drivers and motors can also get very hot, please follow the same precautions as the hot end. Do not operate the printer near anything flammable! A smoke detector nearby is highly recommended, just in case!

Open Source

The OneUp and TwoUp are fully open source printers (as is everything we make). All the files that we use to laser cut the printers are available online at http://www.q3dprinter.com/files . The bill of materials found within this instruction manual include all the parts used to construct the kit. We are 100% open source so feel free to do as you wish with this design, even for commercial use as we believe that innovation should not be stifled by non-commercial clauses.

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Software Download and Setup

Drivers: Download and install the newest version of the Arduino IDE at http://www.arduino.cc/downloads (this is a FREE). This is the software that allows the uploading of firmware for the RAMPS 1.4 electronics board that is used to control your 3D printer. It includes the necessary drivers to allow the OneUp or TwoUp 3D printer to be recognized by your computer. Additionally if at any time the firmware needs to be updated, this is the software to use to do so. Your printer comes preloaded and tested with Marlin (open source) firmware, so it is ready out of the box.

Host Software: We recommend Repetier Host to control this printer although there are many others that work well but are not officially supported. Repetier Host can be downloaded free of charge from http://www.repetier.com/download . This software controls the printer. Please visit the below links for more information:
http://www.repetier.com/documentation/repetier-host/

Slic3r

Repetier comes bundled with the Slic3r and Cura slicing engines. These programs take a 3D model as input and using user defined parameters, slice them into layers and save the files as g-code that is interpreted as movement by the Host Software to print an object. Please visit the below links for more information: http://manual.slic3r.org/

Software Setup

The screenshots below will show you the process required to set up the printer so it can be recognized and controlled by Repetier Host. Please pay special attention to how to home your printer.

After the Arduino IDE and Repetier Host are installed and the printer is assembled, launch Repetier Host and follow the below screenshots to set up Repetier for use with your OneUp or TwoUp printer.
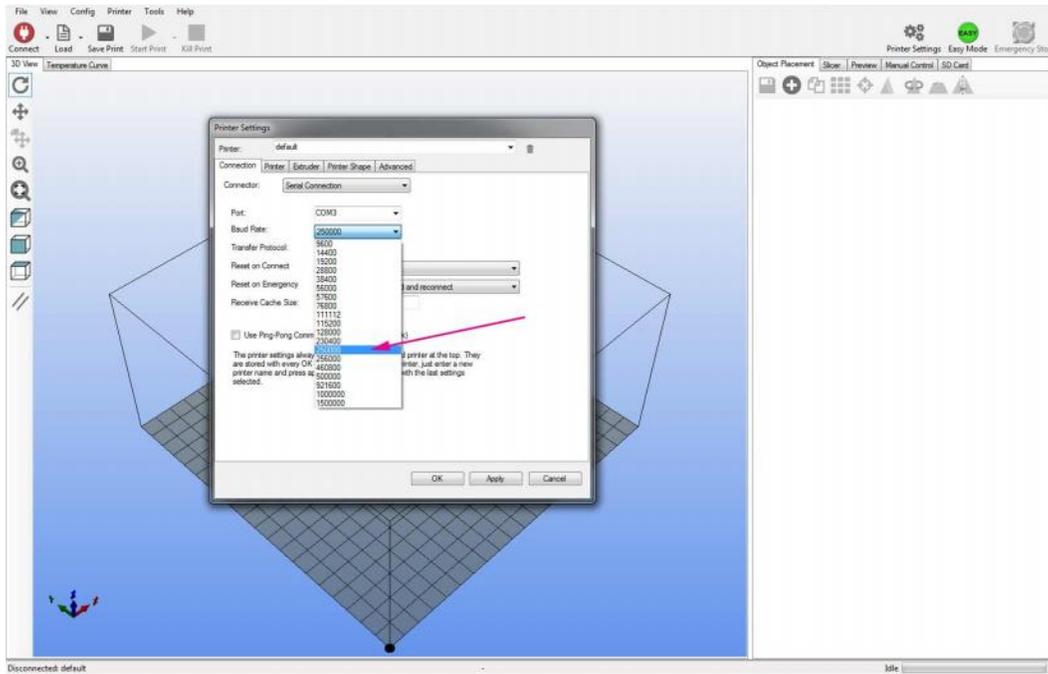
Step 1: Go To Printer Settings
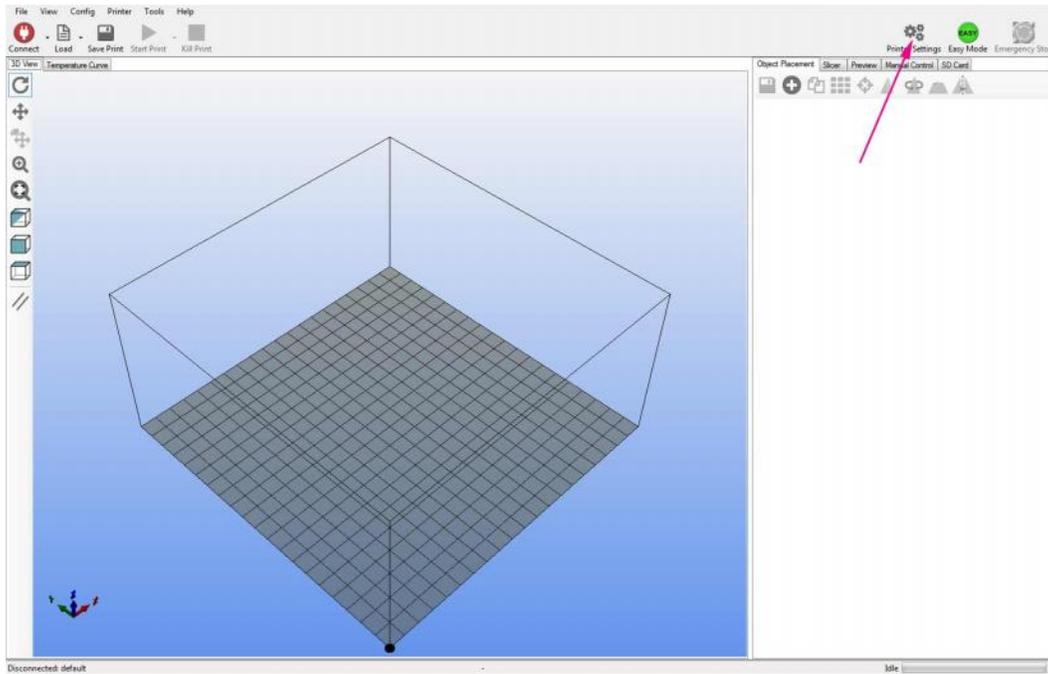
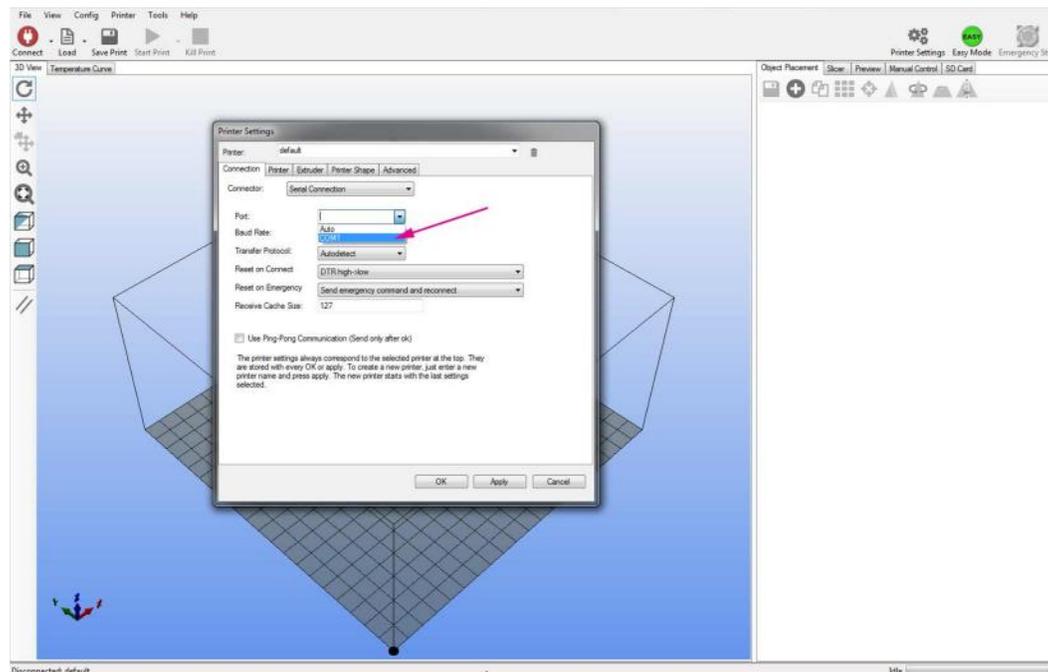## Step 2: Select DTR High>Low
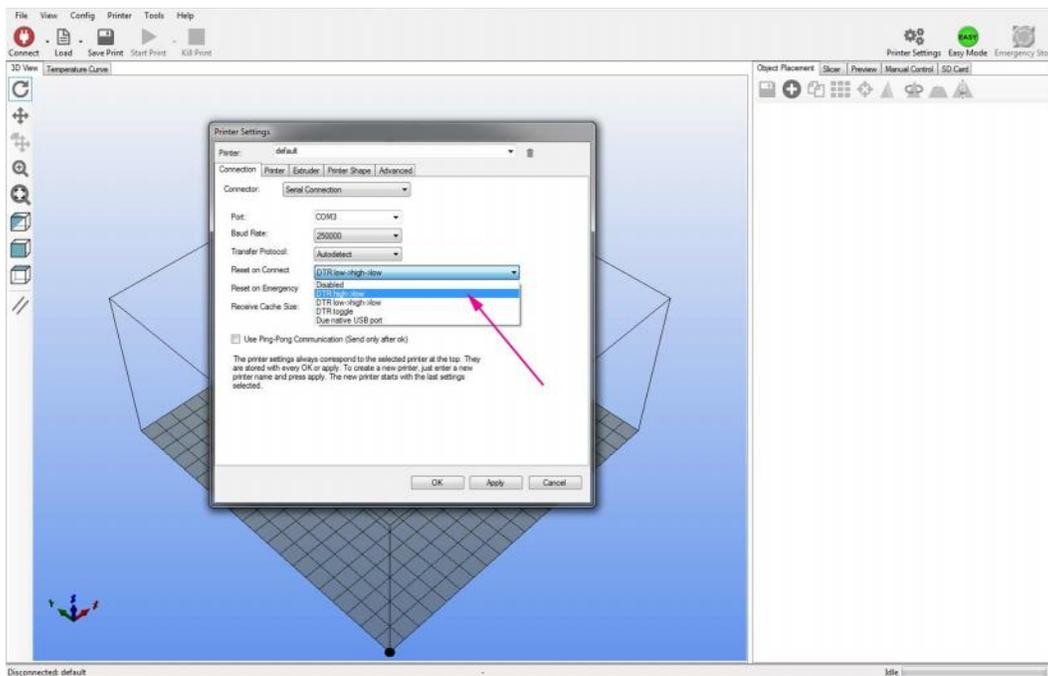
## Step 3: Select Baud Rate to 250000

Step 4: Click Refresh Ports

## Step 5: Select COM Port Farthest to Bottom of List (COM Port Number is Not Important)

Homing Your Printer:

The OneUp and TwoUp printers do not have endstops so in order for them to know where they are in space you have to home them manually. This is a good thing for entry level 3D printers because relying on endstops to be perfectly calibrated can cause major printing problems. By homing them manually you are ensuring they are exactly where they should be. To home the printer, viewing it from the front, by hand and with the motors turned off, push the extruder all the way to the left, press the bed all the way back and turn the z-screw, by hand counterclockwise until the nozzle just barely touches the bed surface. Your printer should look like the picture below:
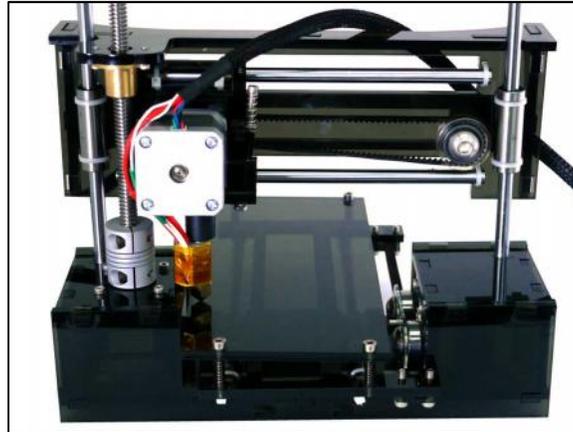
At this point, with the printer in its homed states, press the X-Home, Y-Home and Z-Home buttons as indicated in the below picture.
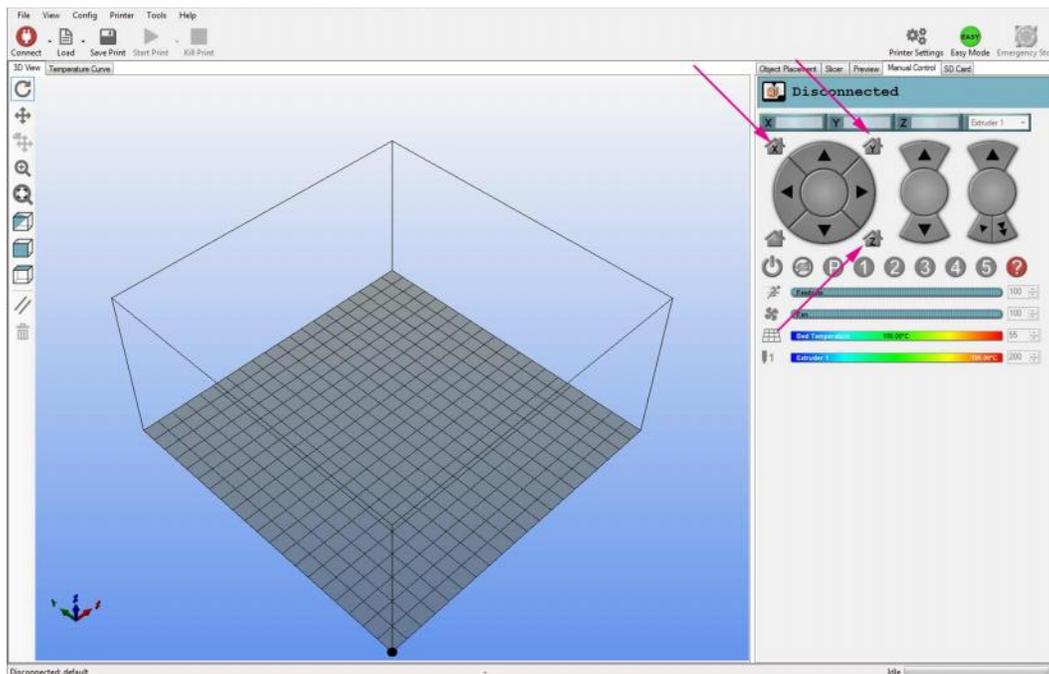
Mounting Electronics, Power Supply and Fan

One of the changes made to the newest version of the kit is the active cooling of the electronics. The active cooling improves reliability and performance of the electronics and is provided by the included 40mm fan.

Required Components:
Hardware Bag #7
Electronics Plate (EBOTTOM)
Fan Bracket
RAMPS Electronics (inside the box labeled RAMPS 1.4)
Power Supply (inside the glossy white box)
40mm Fan (inside the 4"x4" bag with the Delrin ACME nut)

1: Align the through holes on the Electronics Plate with the threaded inserts on the bottom of the Power Supply and use the 2x M3x8 bolts to secure the power supply in two locations.

2. Align the through holes of the RAMPS electronics with the undersized holes on the top of the Electronics Plate and use the 2x M3x25 bolts to secure the RAMPS electronics to the Electronics Plate by screwing them directly into the electronics plate. DO NOT OVERTIGHTEN THE SCREWS

3. Insert the Fan Bracket into the two rectangular slots at the edge of the Electronics Plate. Then attach the fan with the colored label facing the RAMPS electronics to the Fan Bracket using the 2x M3x16 bolts by screwing them directly into the Fan Bracket.

4. Your completed Electronics Plate should look like the picture below.
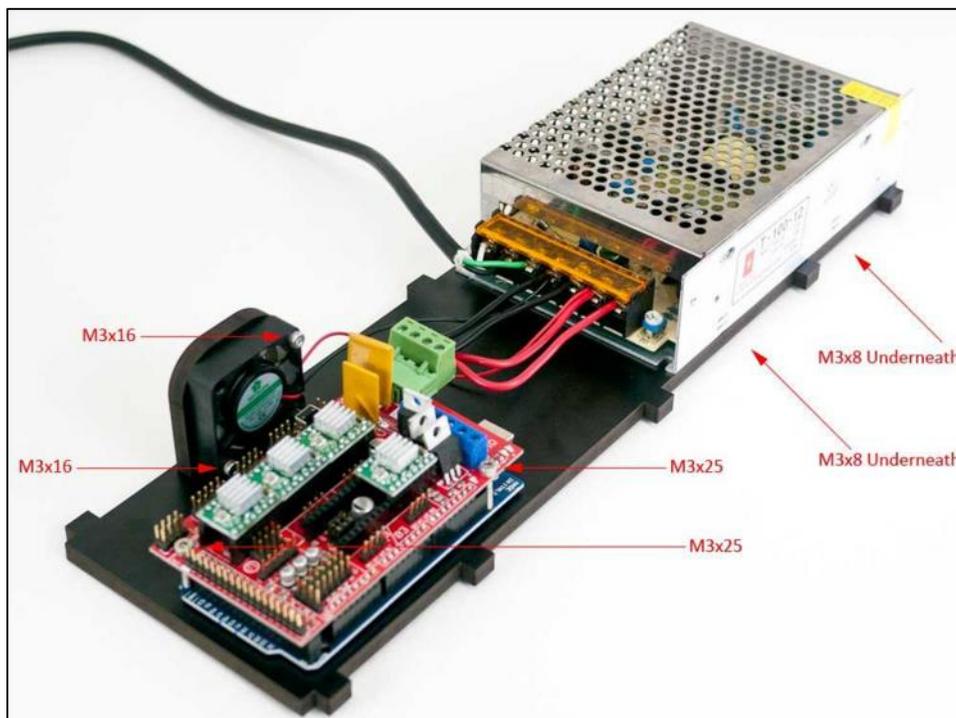
Wiring the RAMPS 1.4 Board

For extensive technical information please see: http://reprap.org/wiki/RAMPS_1.4

The RAMPS board, along with the Arduino Mega 2560 and the (4) stepper drivers are preassembled. All you need to do is connect the quick disconnect Molex and Dupont connectors to their appropriate places and run the red (+ positive) and black (- negative) wires from the power supply to the correct screw terminals on the RAMPS board. Please take care to ground yourself as static electricity can very easily damage the RAMPS and Arduino boards.

Step 1: Connect the (2) RED Cables to the +Positive Terminals on the RAMPS and the RED lead from the fan to the +Positive Terminals on the Power Supply

Step 2: Connect the (2) BLACK Cables to the –Negative Terminals on the RAMPS and the BLACK lead from the fan to the +Positive Terminals on the Power Supply

Step 3: DO NOT PLUG IN THE POWER CORD TO AN ELECTRICAL OUTLET AT THIS TIME. Connect the White, Black and Green Wires to the L , N and Ground screw terminals respectively on the power supply.

Step 4: Confirm your wiring looks EXACTLY as pictured below before connecting power. Please note that the +Positive and –Negative cables are alternating in orientation.
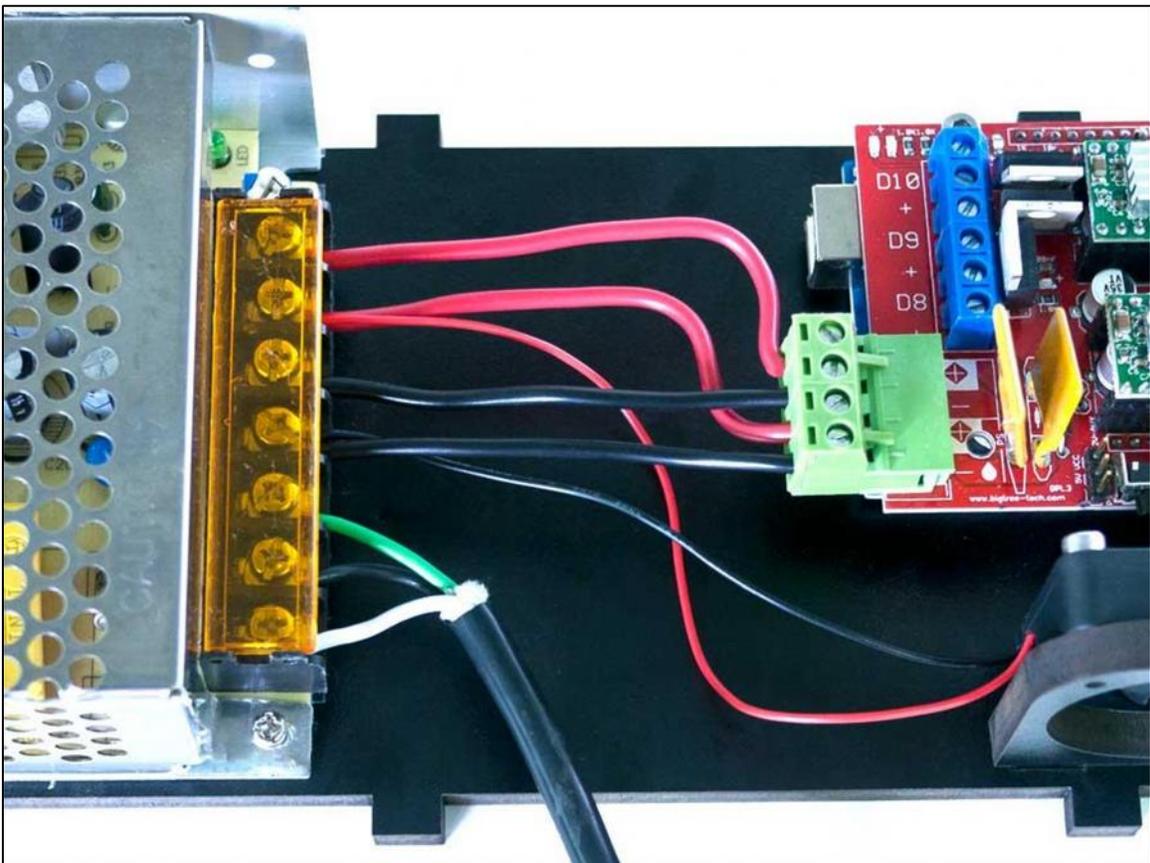
Connect the rest of the components WHILE UNPLUGGED FROM WALL (stepper motors, heater cartridge, thermistor) as shown below (please note the orientation of the stepper motor wire colors):
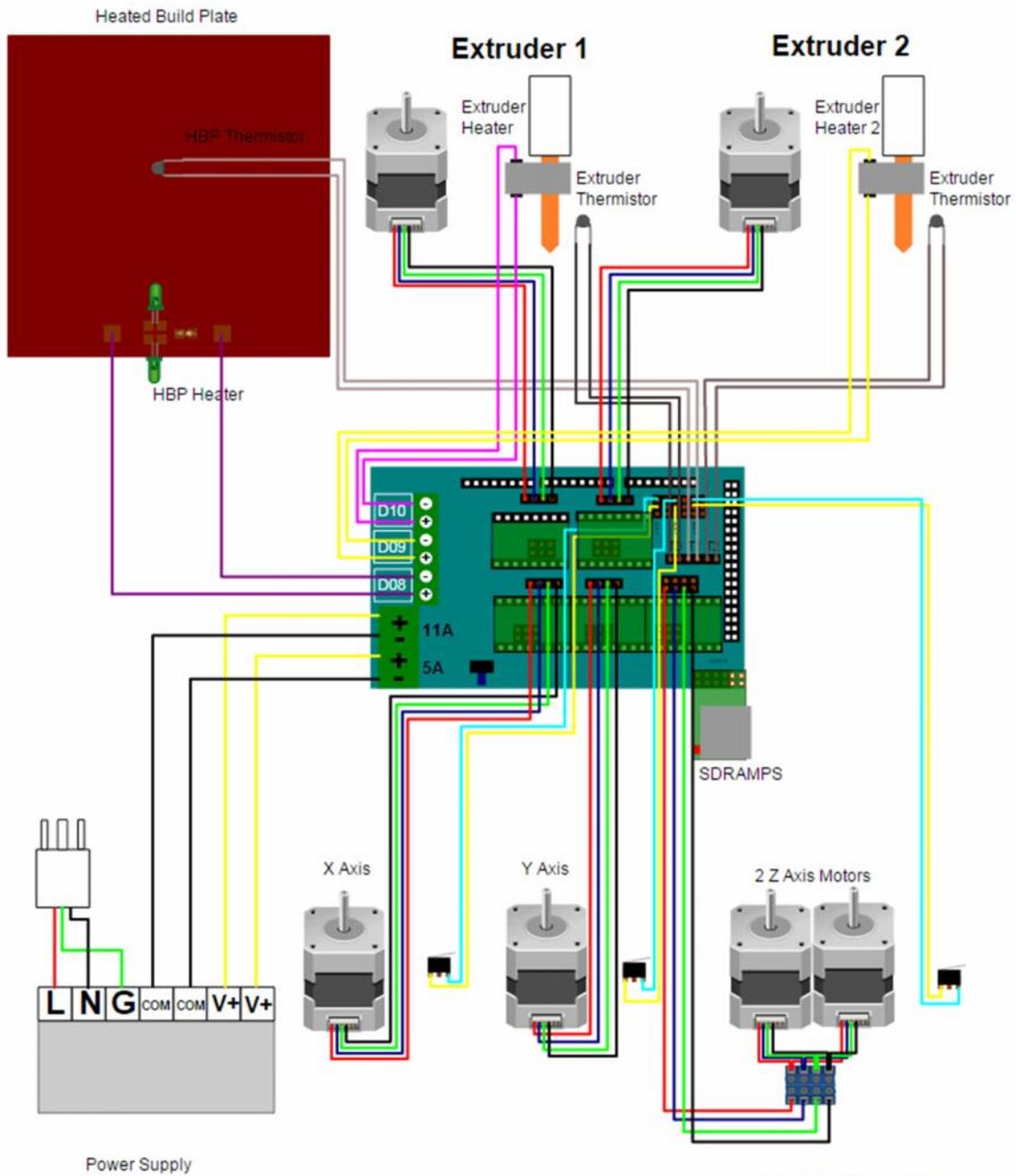
Special Thanks to Neil Underwood for this Awesome Diagram

Please note that while the RAMPS board does support a second extruder, for now the OneUp and Twoup are single extruder only.
Endstops are shown in the diagram for future expandability but are not included or required for proper operation.
The RAMPS board supports two Z-motors for future expandability. The second Z motor is not included or required for proper operation.
The heated build plate is INCLUDED with heated bed versions of the kit ONLY. They are available for $79 extra.