

Simple Print (MK1)

HYREL 3D TRAINING SERIES

Agenda

- ◉ “Terra Firma”
- ◉ Physical Setup
- ◉ Print Vase

Terra Firma

- Q: What is / why “Terra Firma”?
- A: Terra Firma translates to “Solid Earth”.

This is the “firm ground” from which we will help build your knowledge, experience, and confidence to a point where you can explore, build, and be successful with your future projects with your HYREL machine(s) on your own.

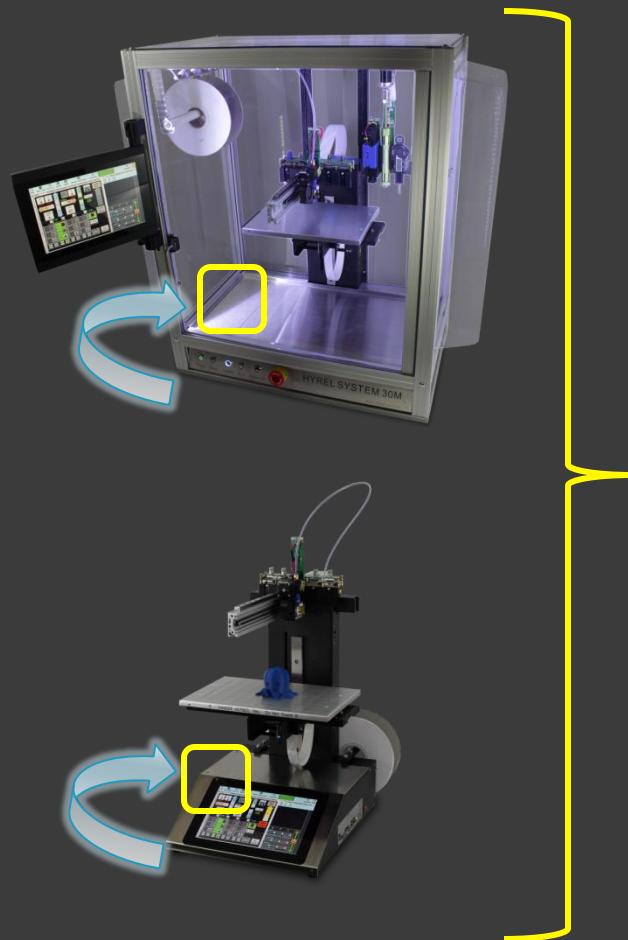
With firm ground under your feet, we can be sure your HYREL machine is operating properly.
- The purpose of this guide is to bring you back to firm ground if you suspect there are issues with your machine, G-code, slicing, .stl, etc.

Terra Firma

- For this to be effective, your HYREL machine must be able to do the following:
 - Turn on
 - Check communications
 - Move all axis
 - Heat up heated build platform
- After your HYREL performs the above, you have confirmed a firm foundation from which to create your models.

Terra Firma

Step 1: Turn on



Power Supply:
ATX Form Factor
500W



Terra Firma

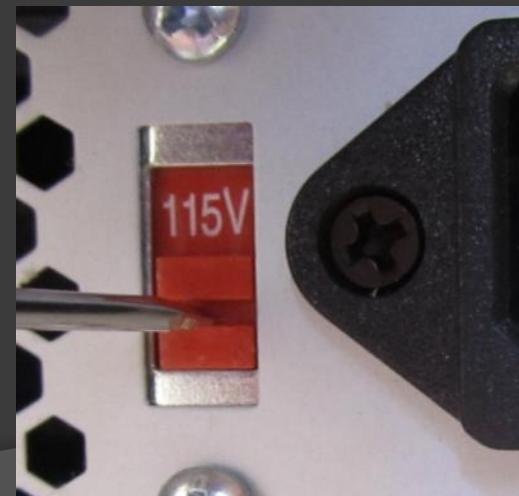
Step 1: Turn on

CAUTION:

Make sure you know your Outlet's Voltage Requirements.

If you are unsure, start with the Power Supply set to 230V and turn it on. If the machine does not turn on with the Power Supply set to 230V, then Set the Power Supply to 115V and turn it on.

Doing this in reverse WILL blow a capacitor in your Power Supply and will void your warranty.



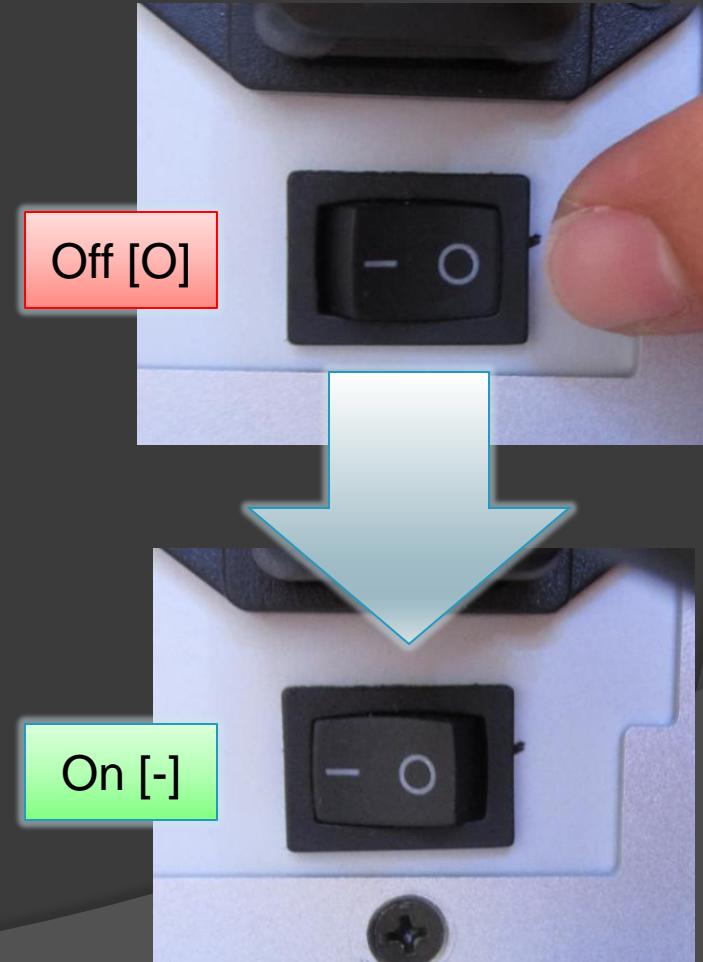
Terra Firma

Step 1: Turn on

1. Plug in your power cord

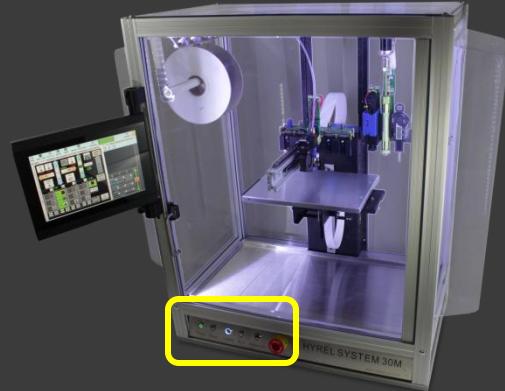


2. Turn on your Power Supply



Terra Firma

Step 1: Turn on



System 30M Power On Button



Engine Power On Button



Terra Firma

Step 2: Check communications



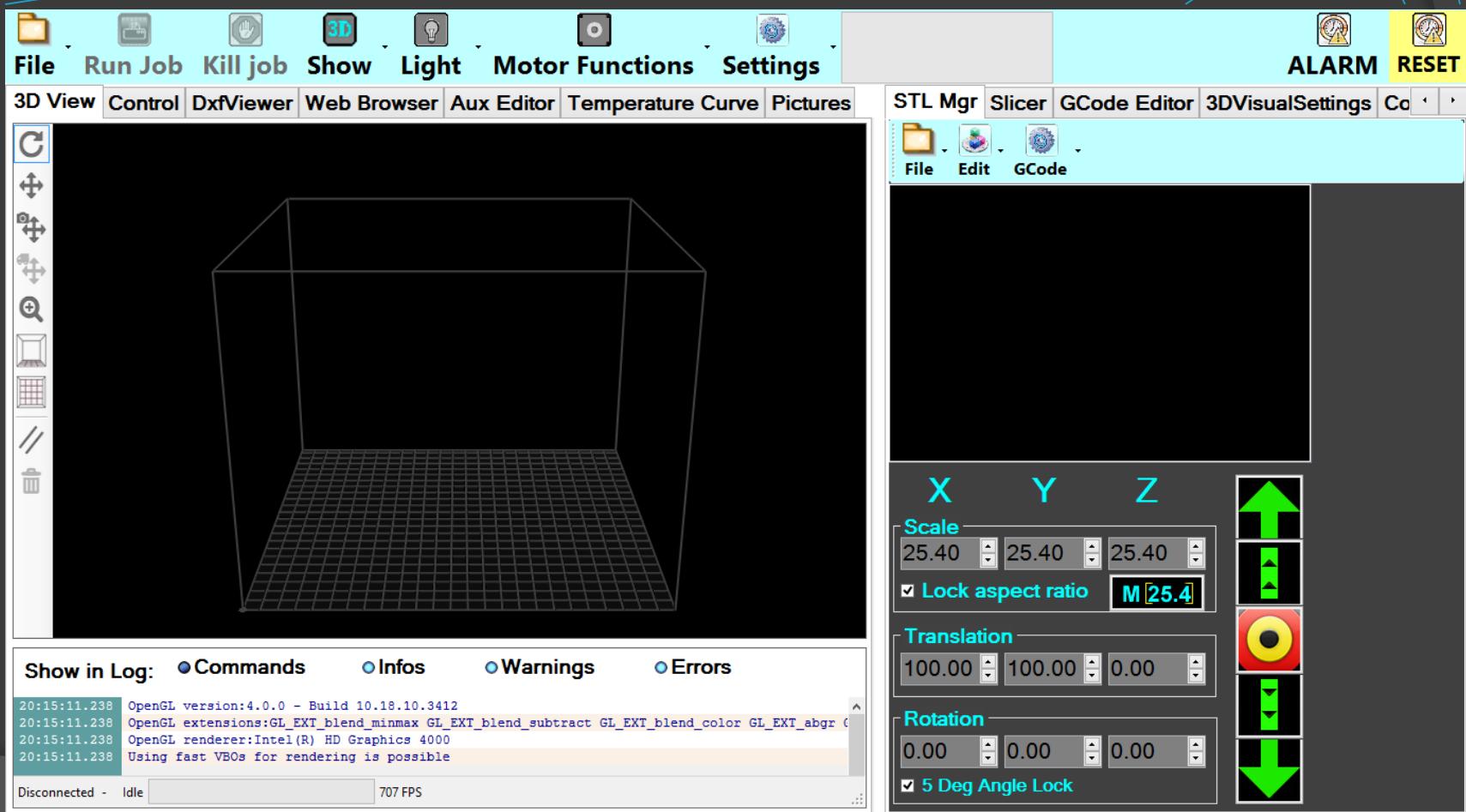
System 30M
Emergency Off Button

Turn Clockwise
to disengage

Terra Firma

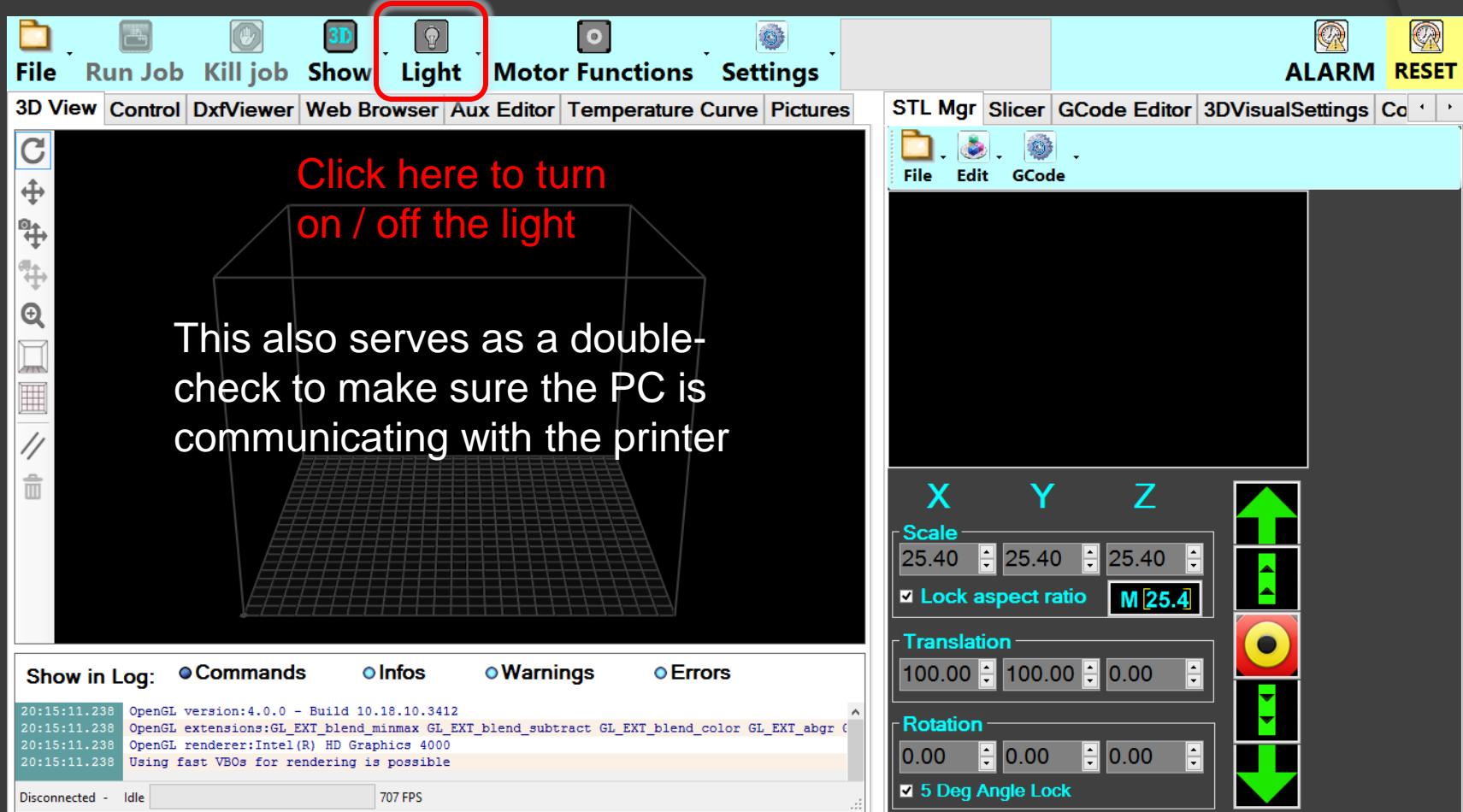
Step 2: Check communications

Desktop Icon
opens this window:



Terra Firma

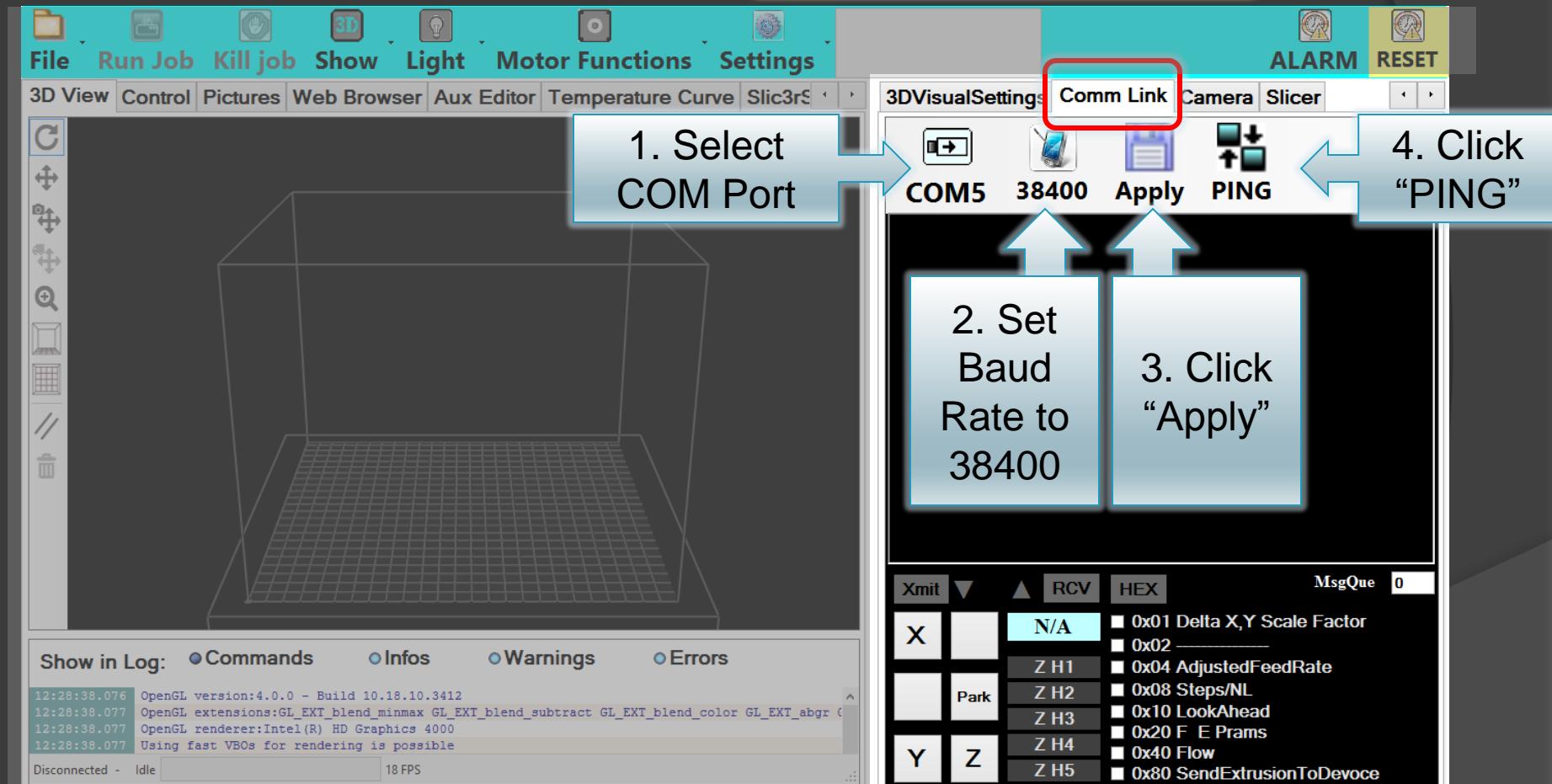
Step 2: Check communications



Terra Firma

Step 2: Check communications

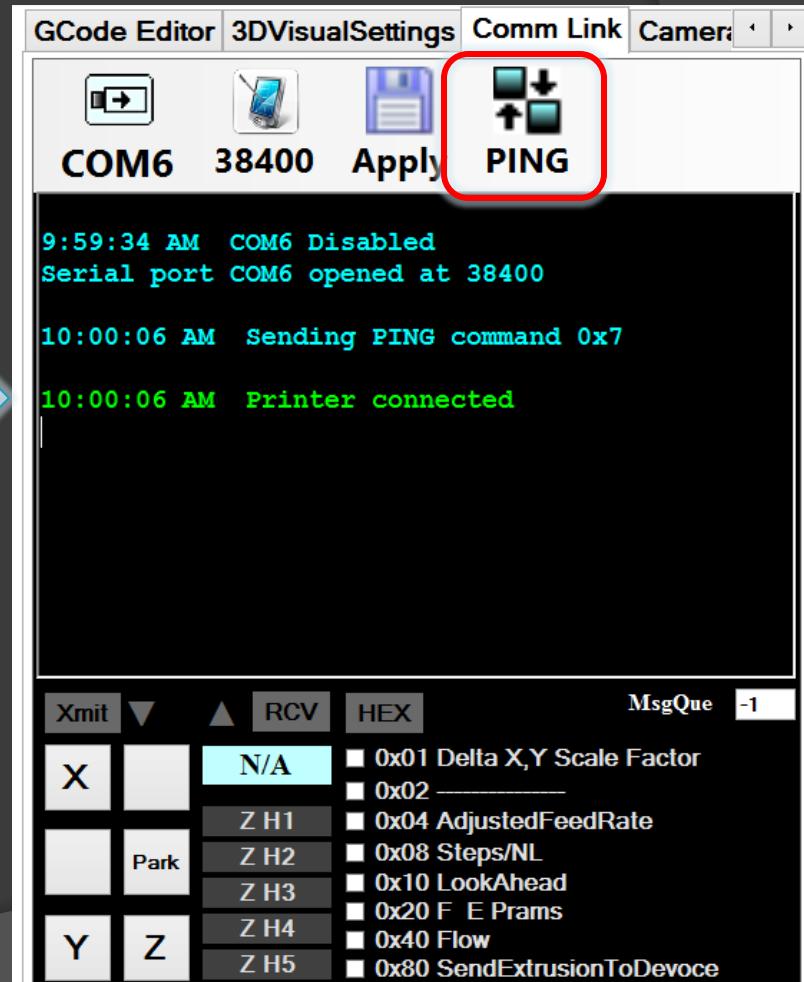
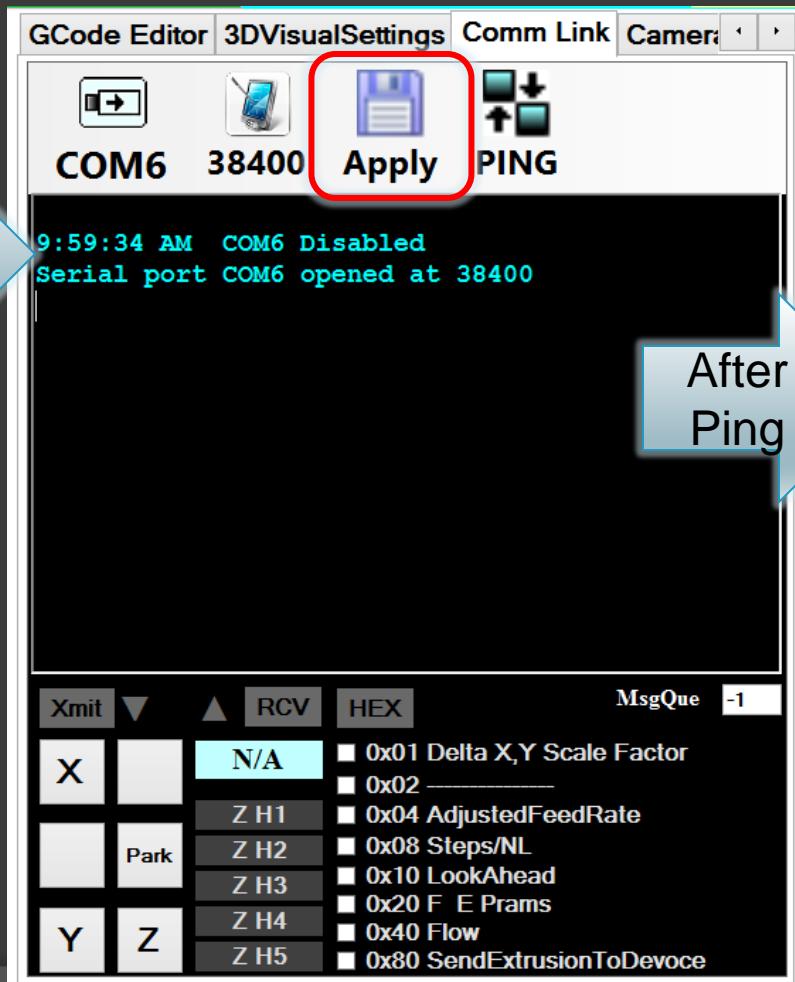
NOTE: Only do this step if the light and/or motors are not moving



Terra Firma

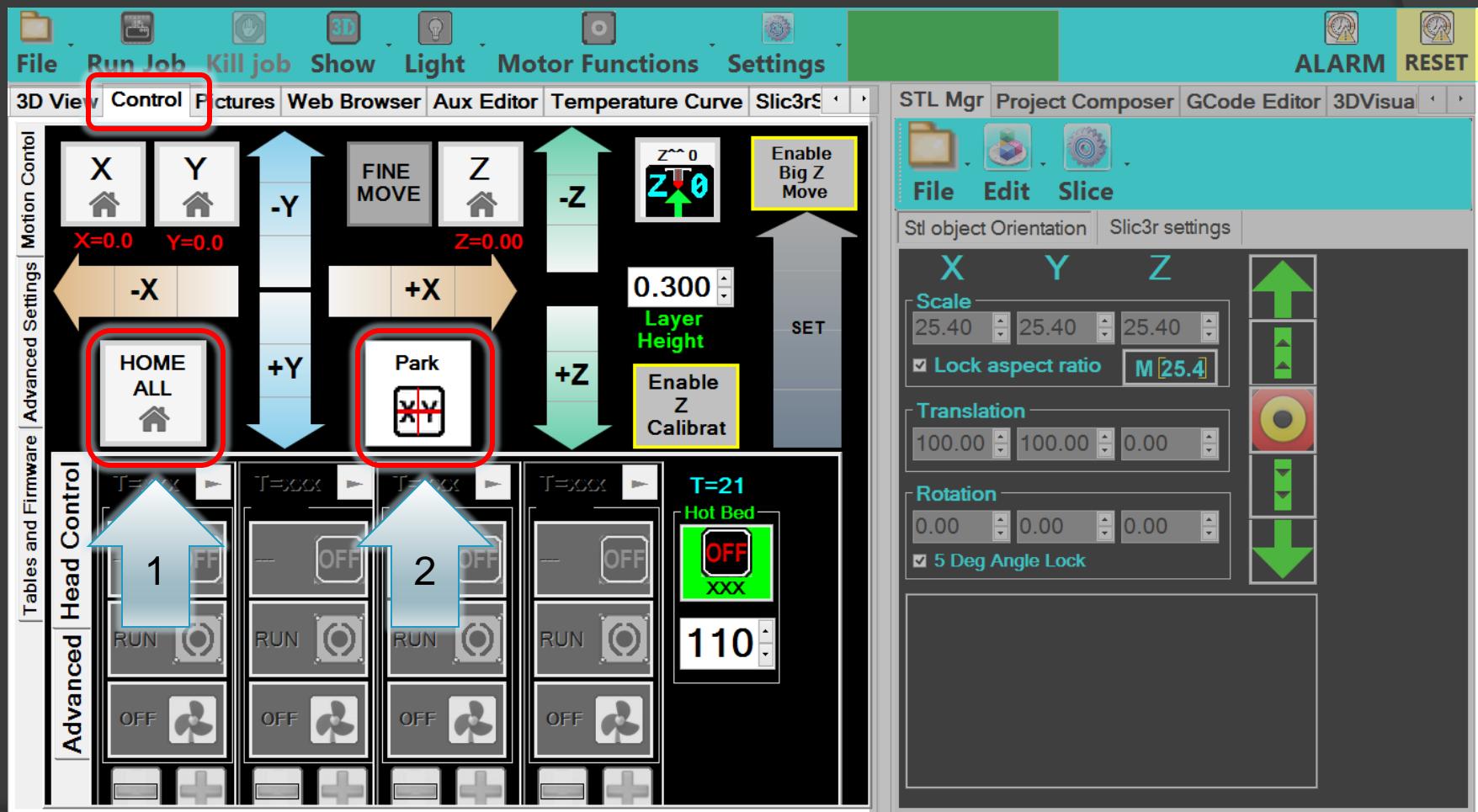
Step 2: Check communications

NOTE: If you do not see that the printer connected with the PC, try the reset button at the top right of REPETREL, or the reset button on the front of the System 30Ms (with tablets) and retry.



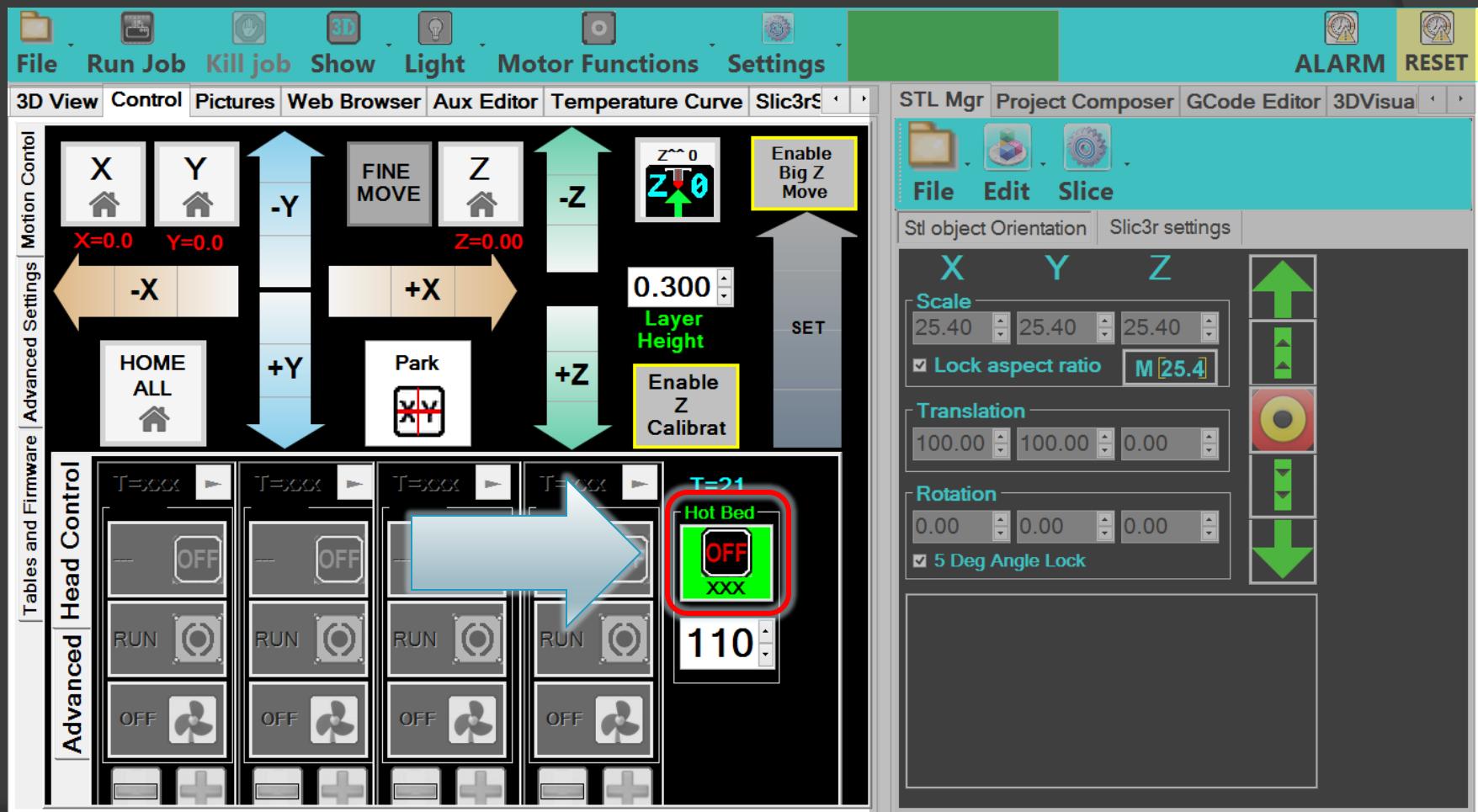
Terra Firma

Step 3: Move all axis



Terra Firma

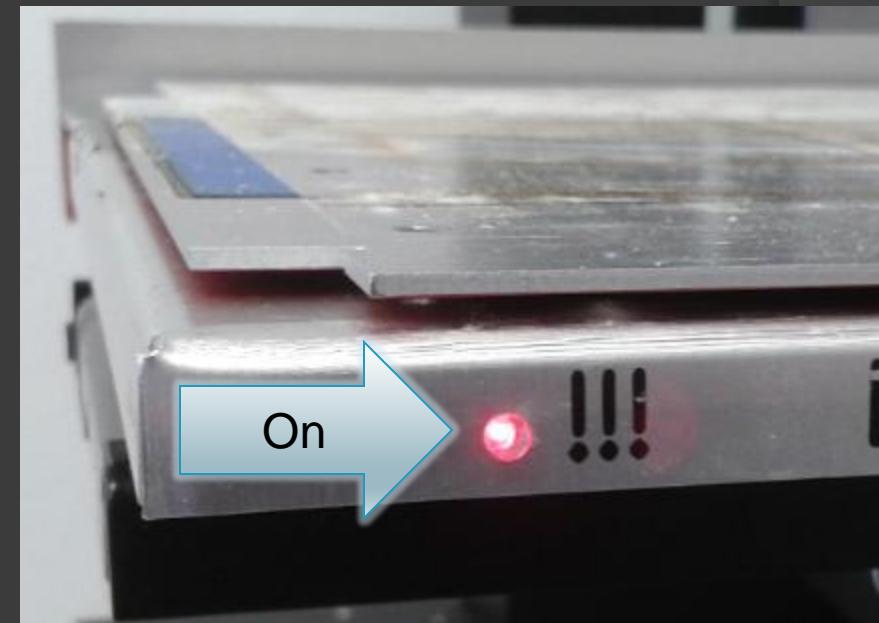
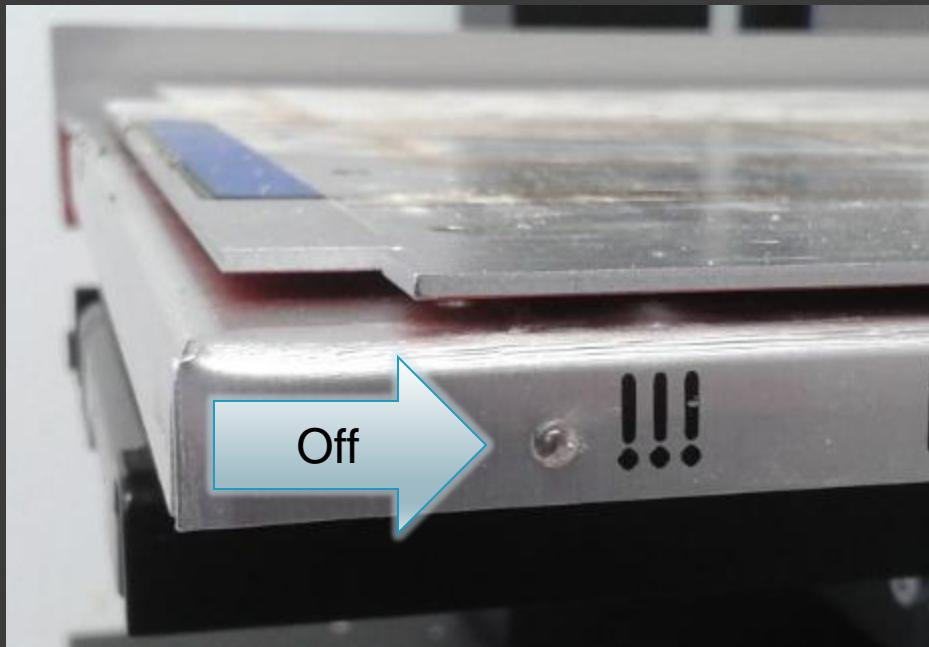
Step 4: Heat up heated build platform



Terra Firma

Step 4: Heat up heated build platform

When the heated build platform button is activated, the embedded LED on the front, left of the heated build platform turns on.



Click the heated build platform button again to turn off your heated build platform.

Physical Setup

- Q: What is / why do the “Physical Setup”?
- A: All machinists perform a physical setup (calibration) of their machines before they build. This process of leveling / putting things in tram and setting head offsets is vital to produce parts to specifications. In addition, this process *prevents* head crashes, which can damage heads and other parts of the machine.
- Performing the following steps will ensure the next level of “Terra Firma” calibration.

Physical Setup

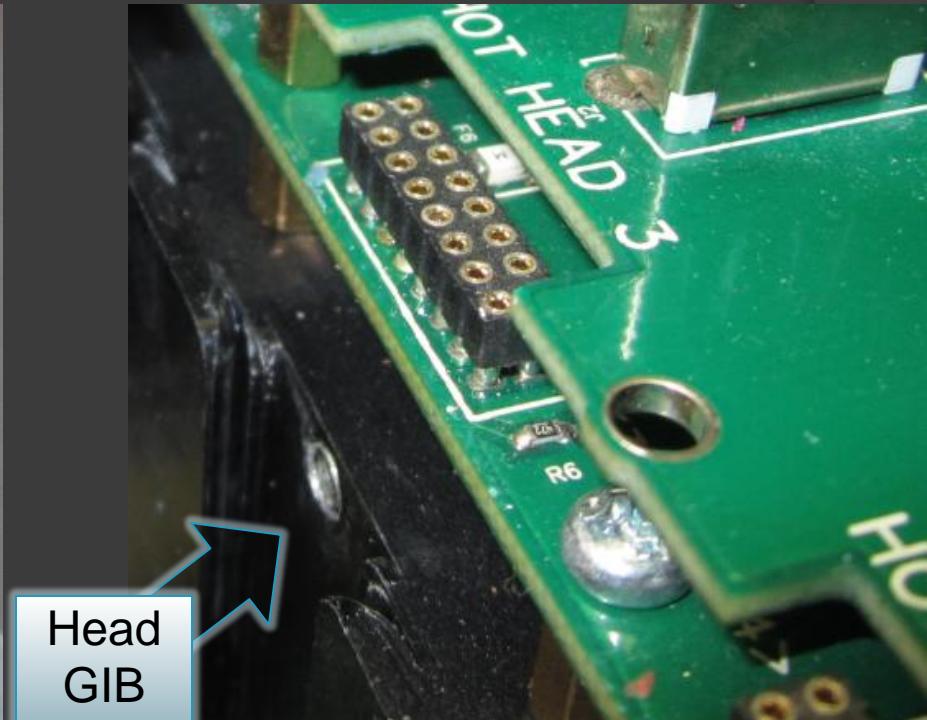
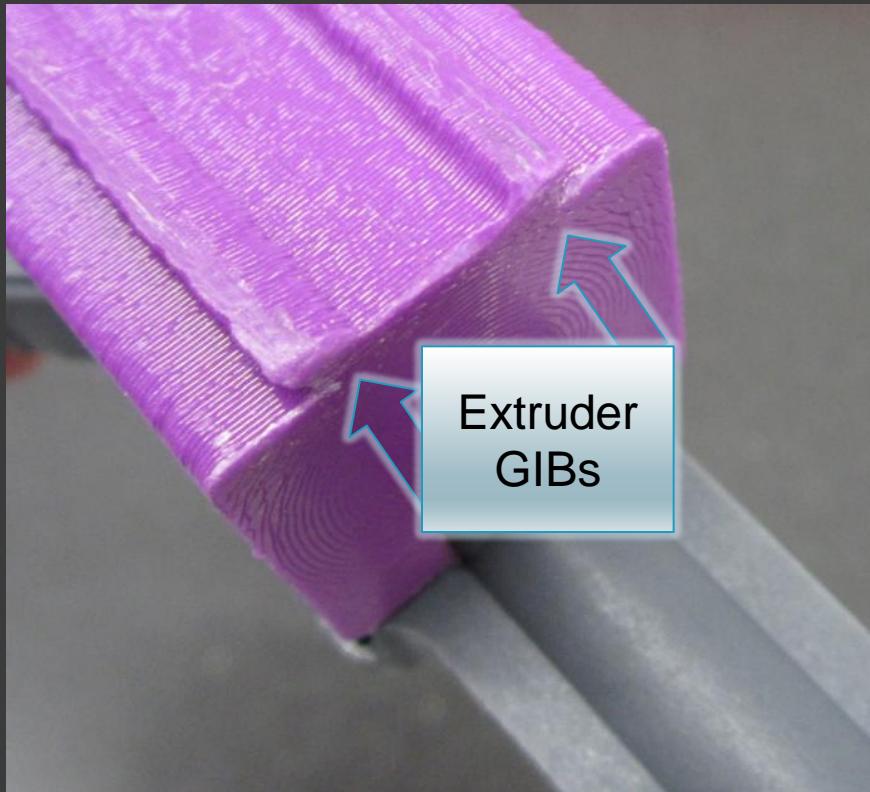
- Tram
- Install MK1 extruder
- Unload / load filament
- Heat up & purge MK1 extruder
- Set MK1 extruder Z-axis offset
- Prepare heated build platform
- Load G-code file

- After the above has been performed,
your HYREL will be ready to print the vase.

Physical Setup

Tram

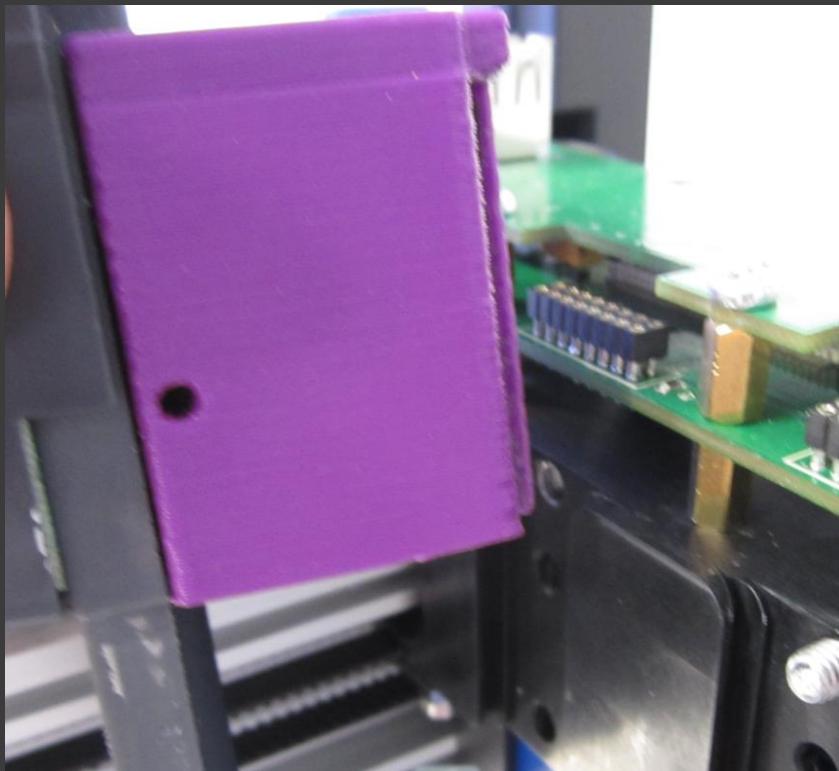
Step 1: Install Digi-tram



Physical Setup

Tram

Step 1: Install Digi-tram



Slide into place



Physical Setup

Tram

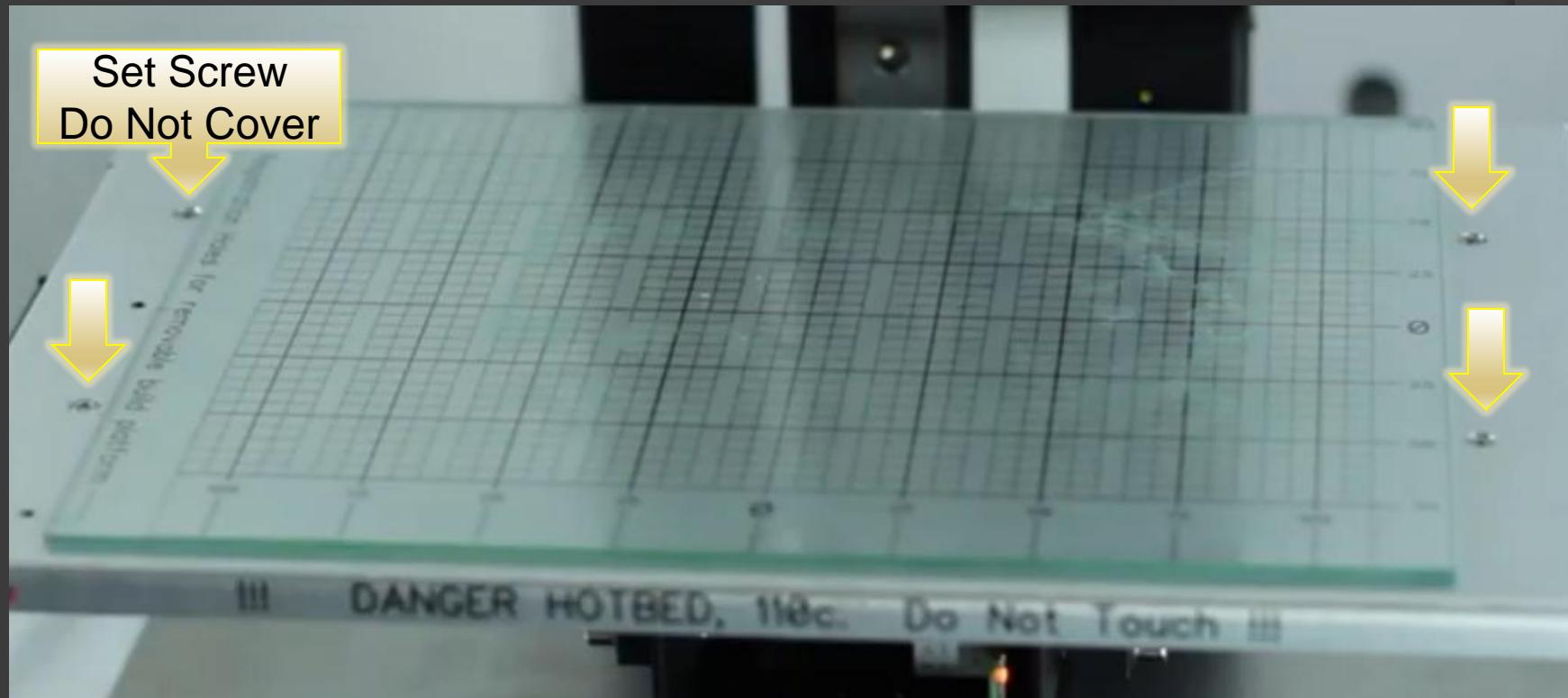
Step 1: Install Digi-tram



Physical Setup

Tram

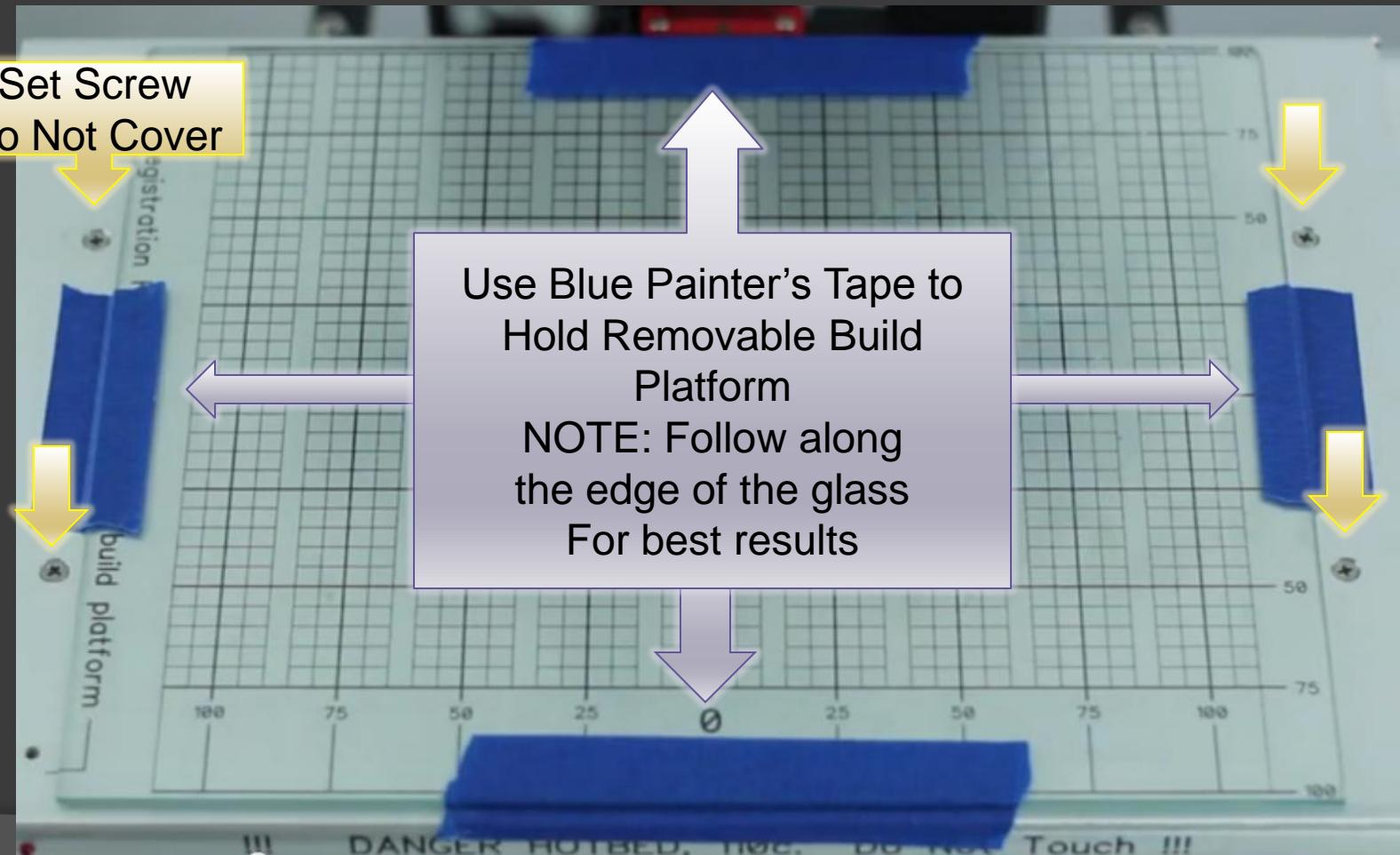
Step 2: Place Removable Build Platform



Physical Setup

Tram

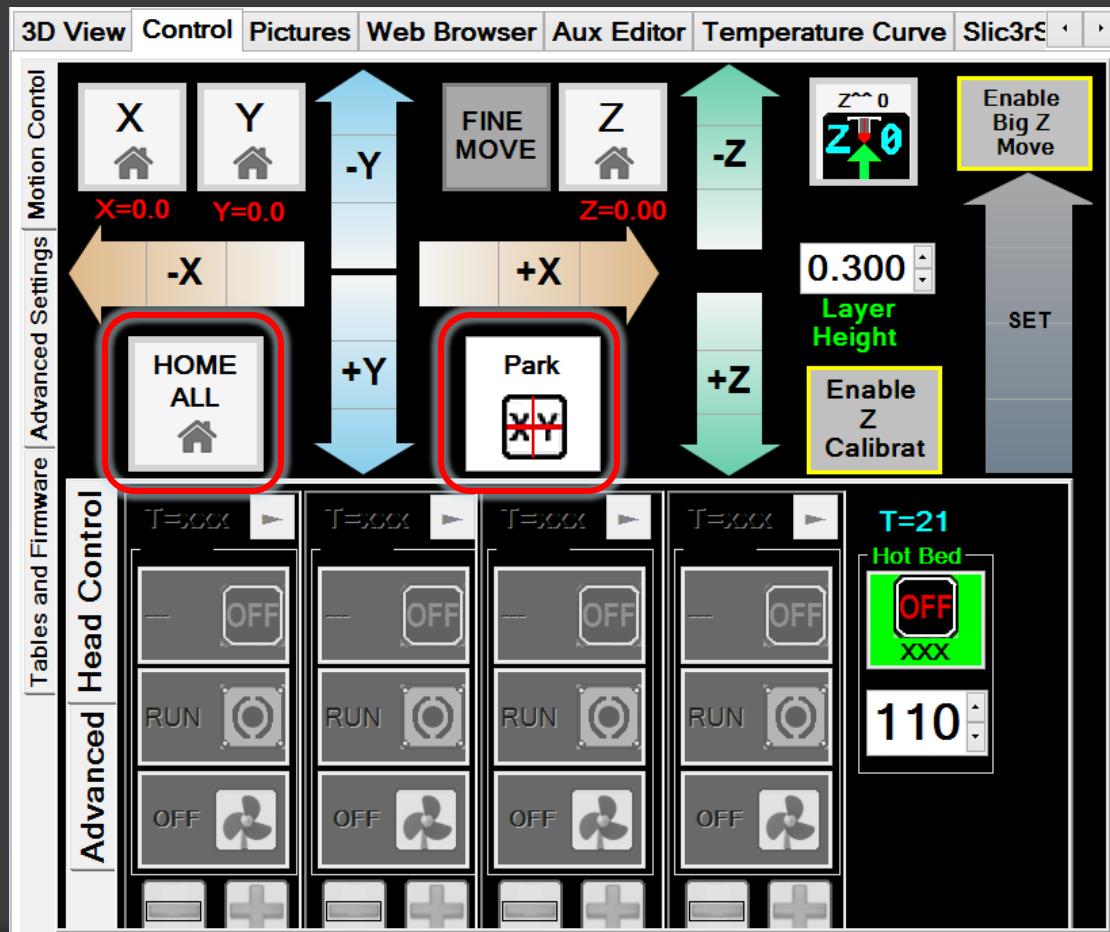
Step 2: Place Removable Build Platform



Physical Setup

Tram

Step 3: Home, then Park

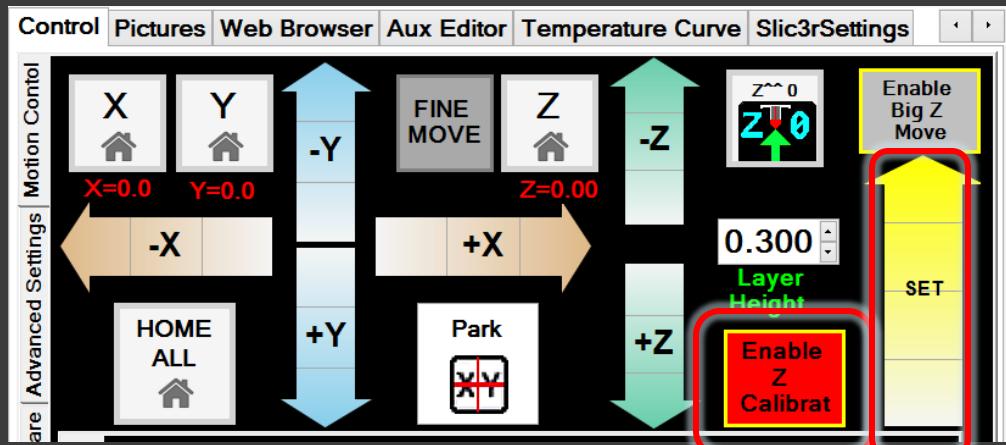


This will place the Digi-tram over the center of the build platform

Physical Setup

Tram

Step 4: Setting the Zero



Elevate the build platform just pass the point
the pin of the Digi-tram touches.

The Digi-tram will register the distance the pin
was displaced.



Physical Setup

Tram

Step 4: Setting the Zero

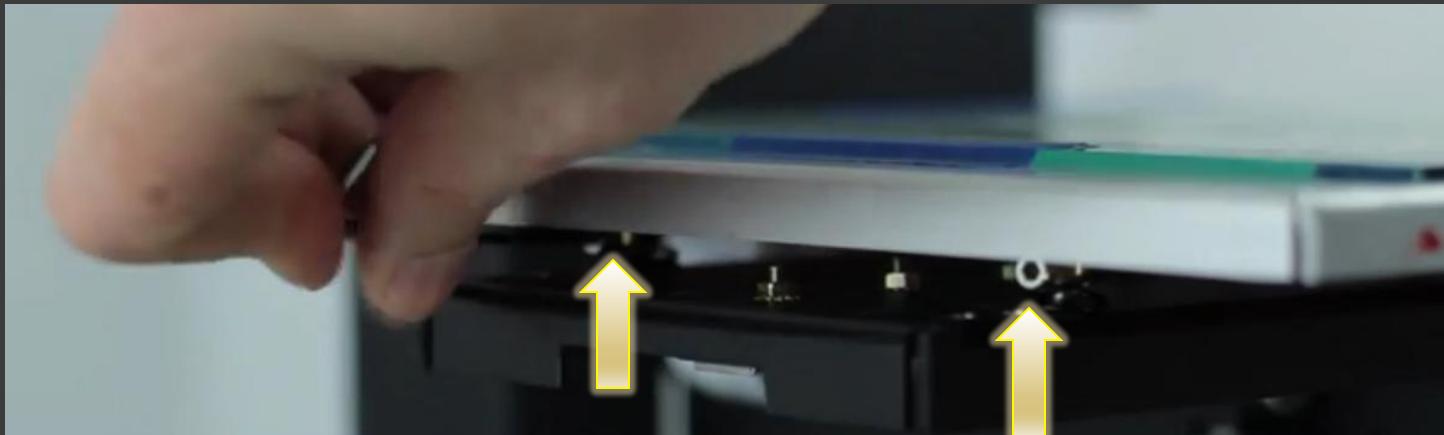


Press the “Zero” button to set this point to zero

Physical Setup

Tram

Step 5: Unlock the Four (4) Lock Screws



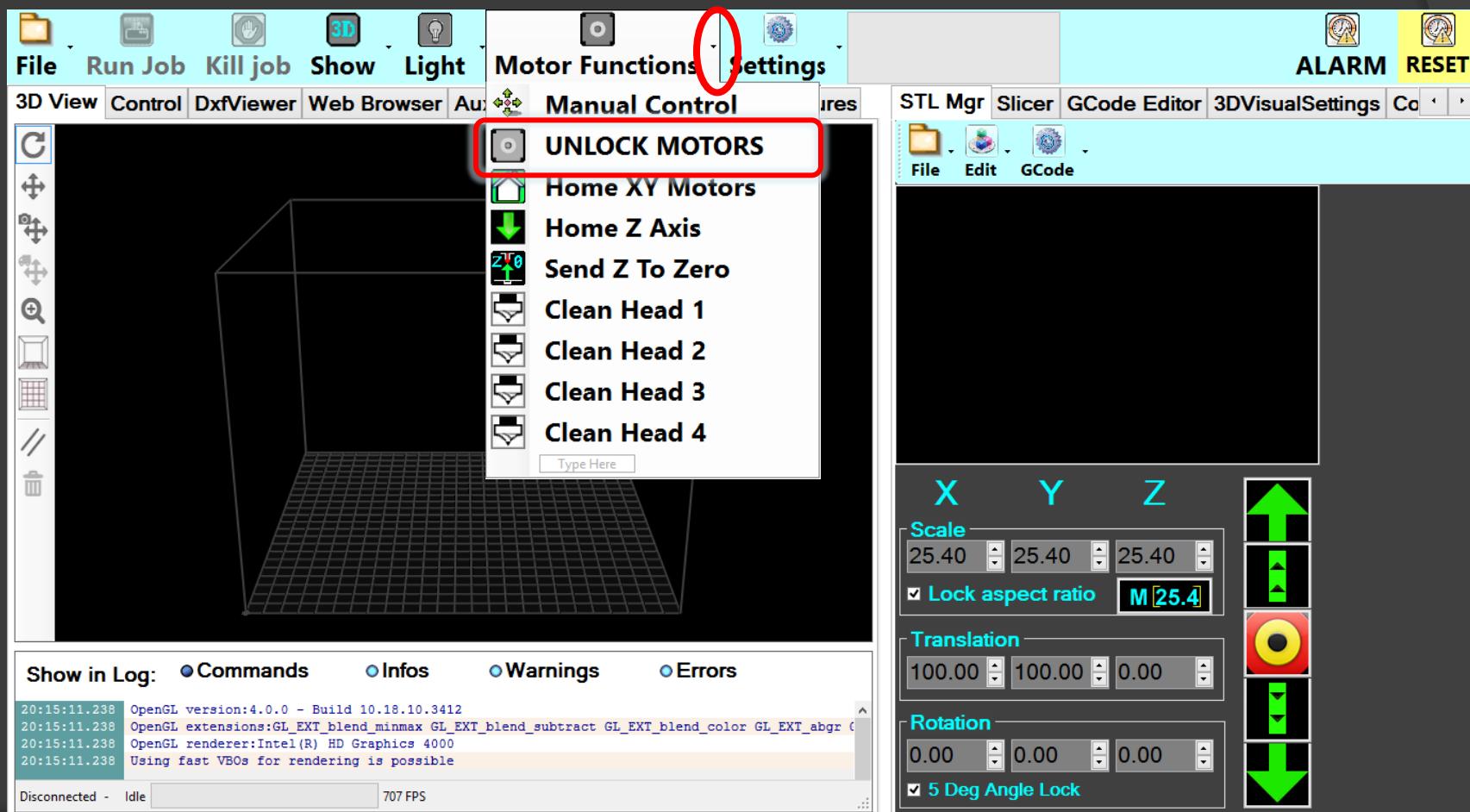
Included in your kit, use the 2.5mm Allen wrench to unlock the four (4) lock screws under the build platform



Physical Setup

Tram

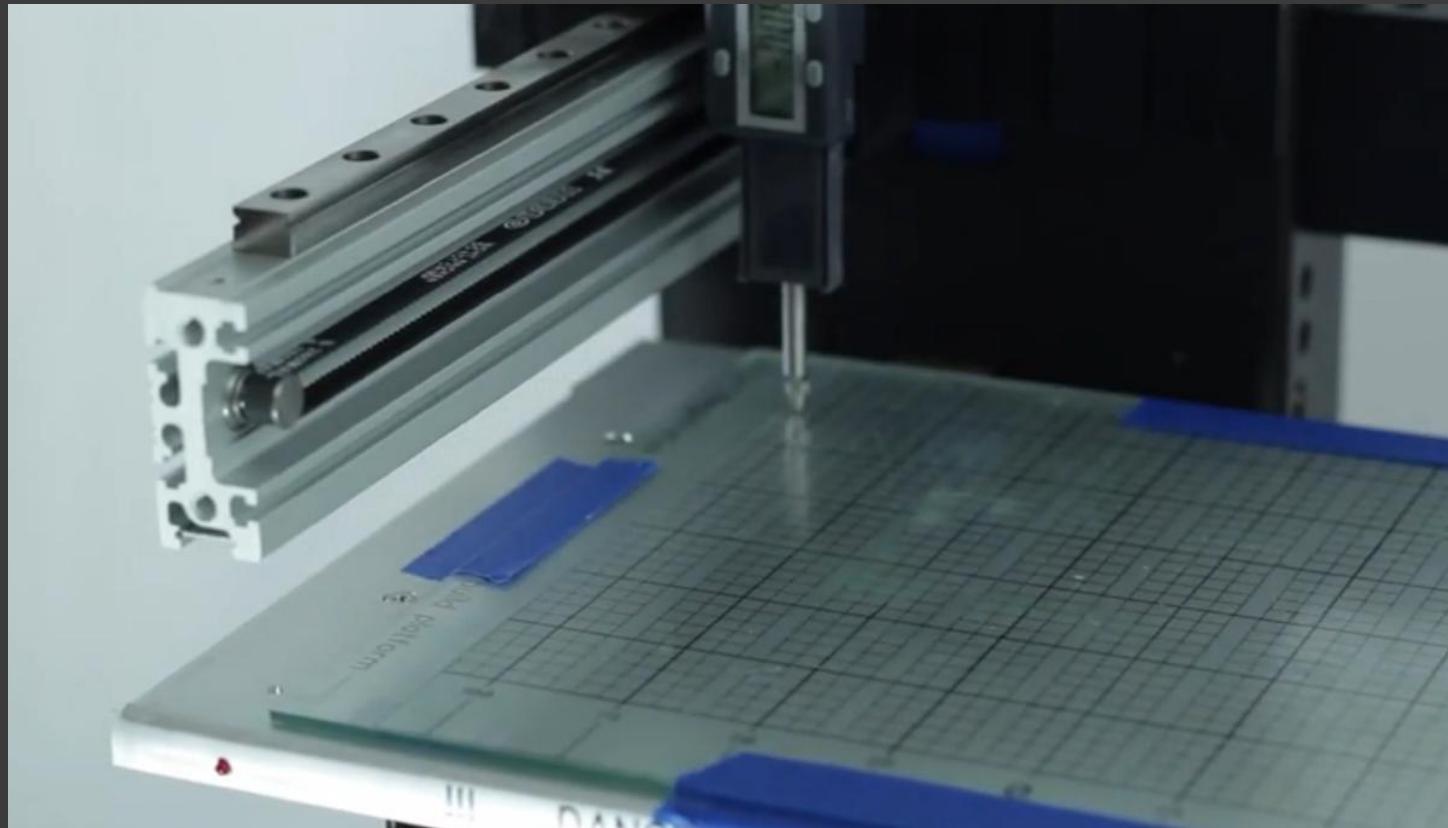
Step 6: Unlock your Motors



Physical Setup

Tram

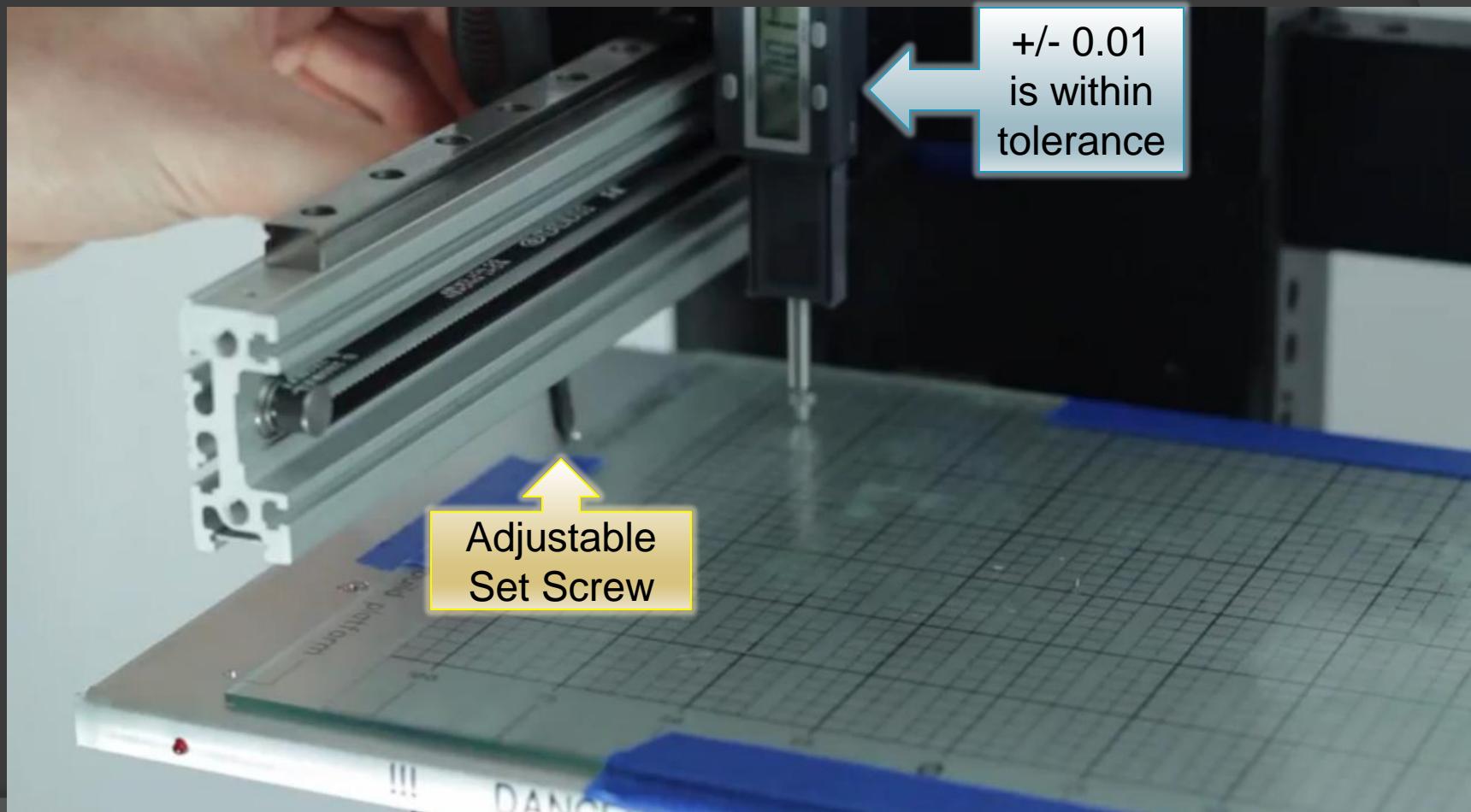
Step 7: Position Pin in first corner



Physical Setup

Tram

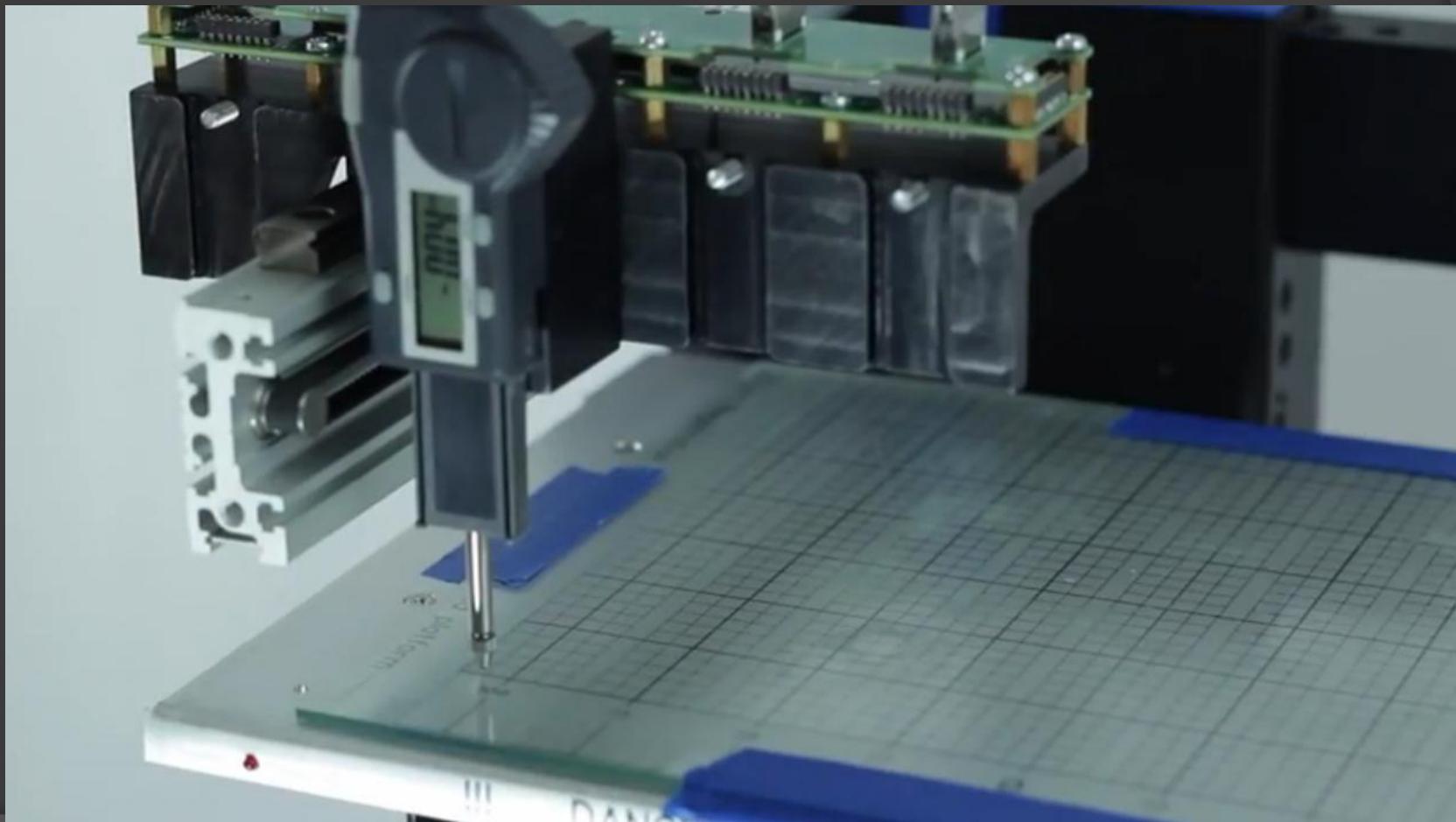
Step 8: Adjust Set Screw with Philips Head Screwdriver



Physical Setup

Tram

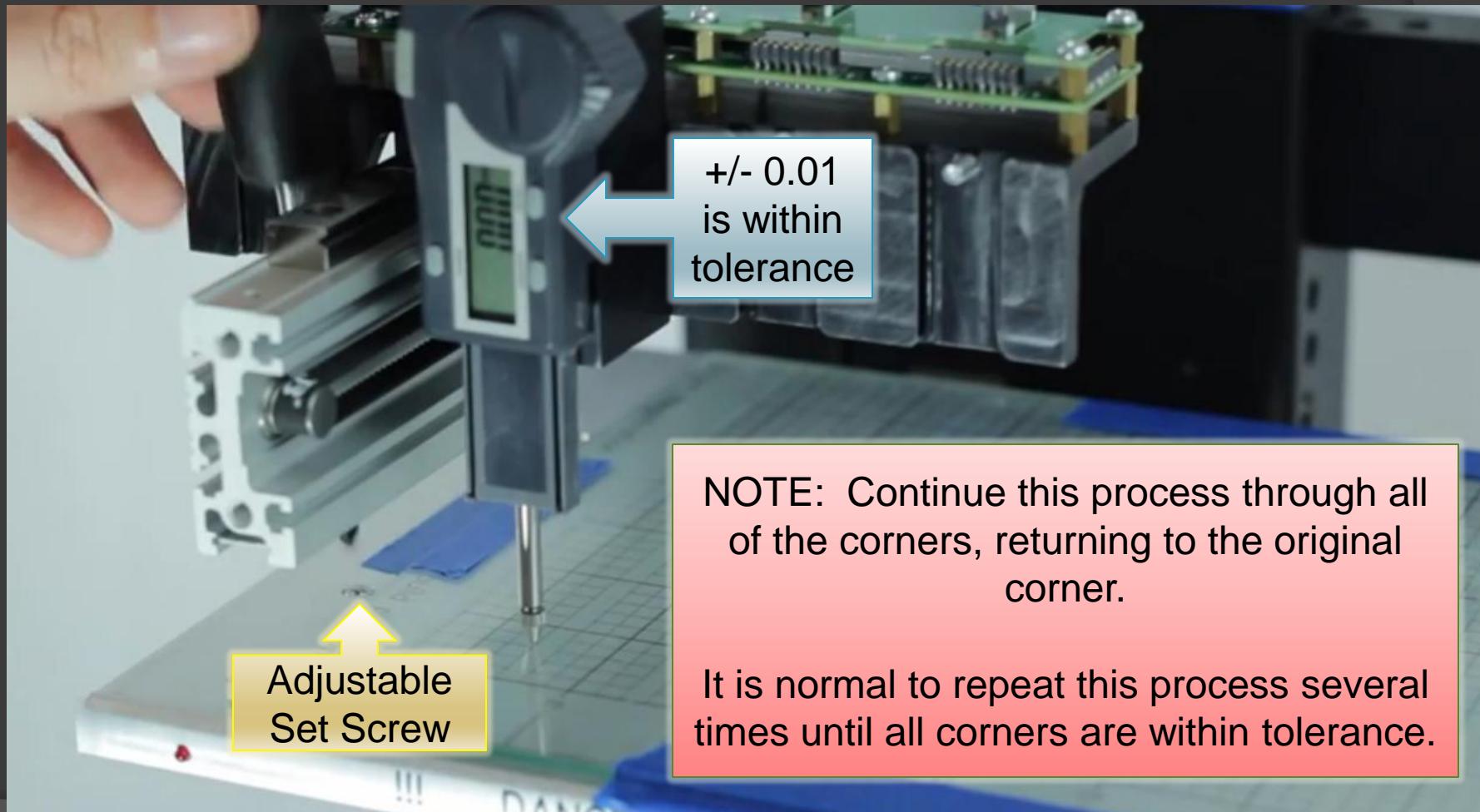
Step 9: Position Pin in next corner



Physical Setup

Tram

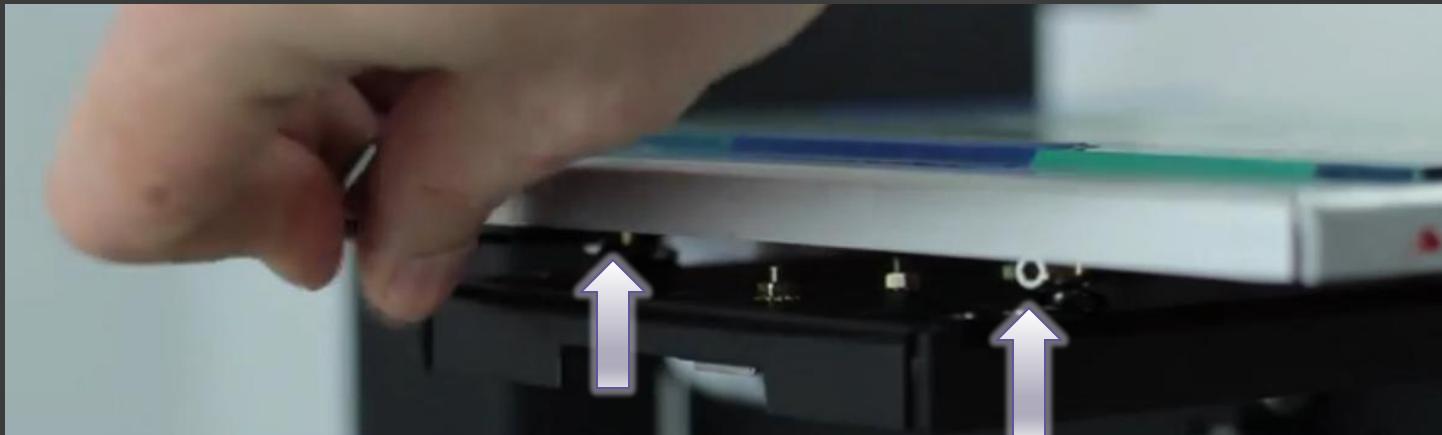
Step 10: Adjust Set Screw with Philips Head Screwdriver



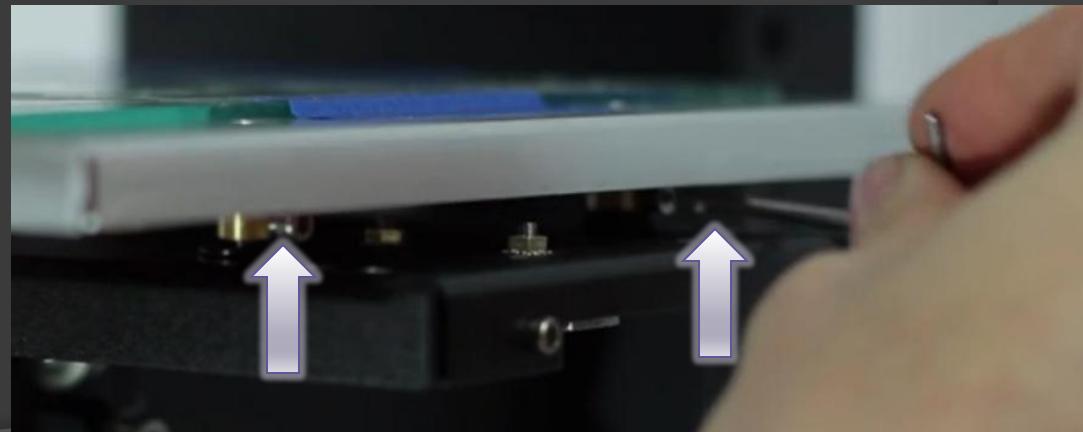
Physical Setup

Tram

Step 11: Lock the build platform lock screws



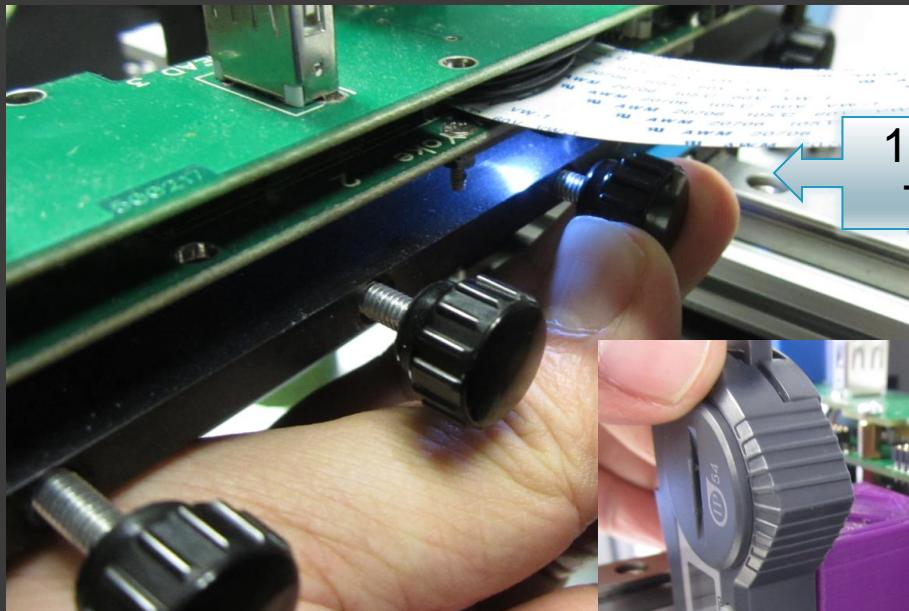
Included in your kit, use the 2.5mm Allen wrench to lock the four (4) lock screws under the build platform.



Physical Setup

Tram

Step 12: Remove Digi-tram



1. Unlock Yoke Thumbscrew



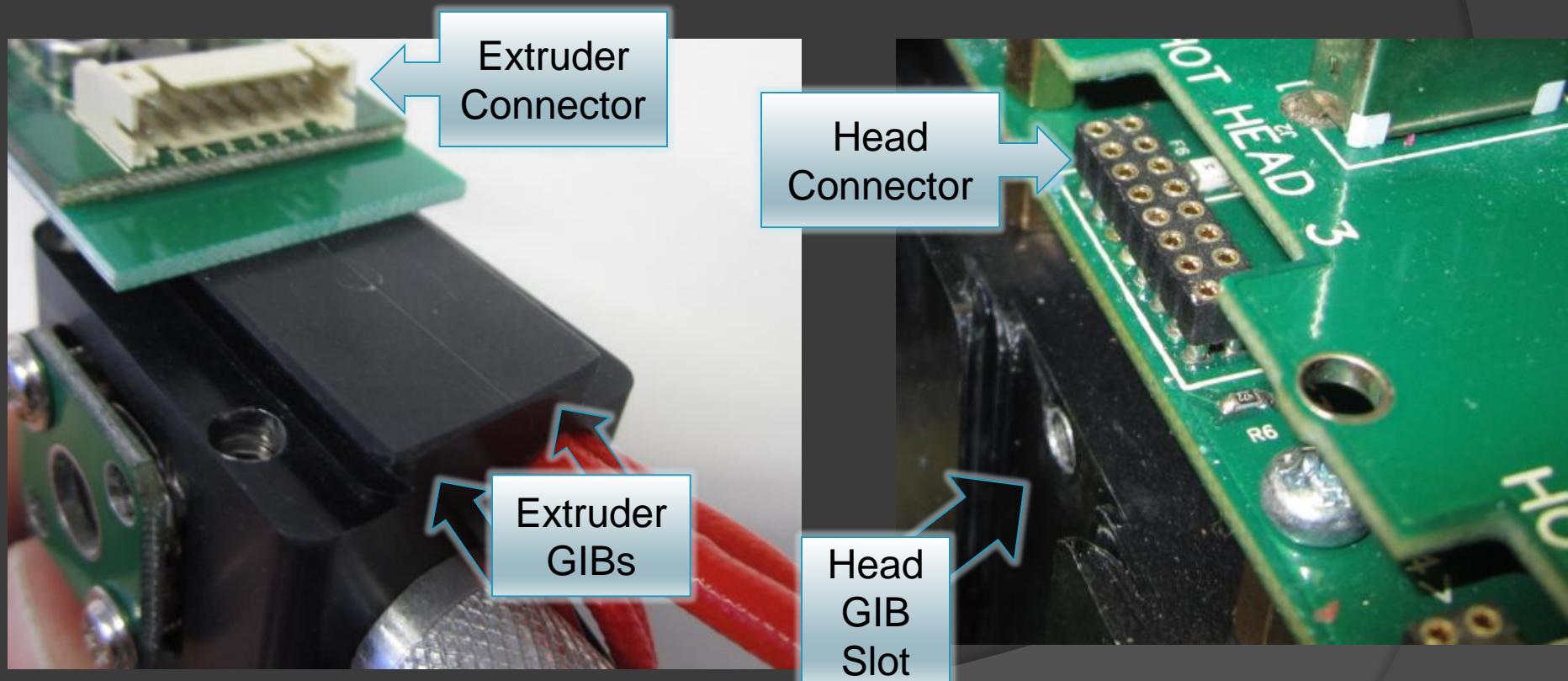
2. Remove Digi-tram



Physical Setup

MK1 Installation

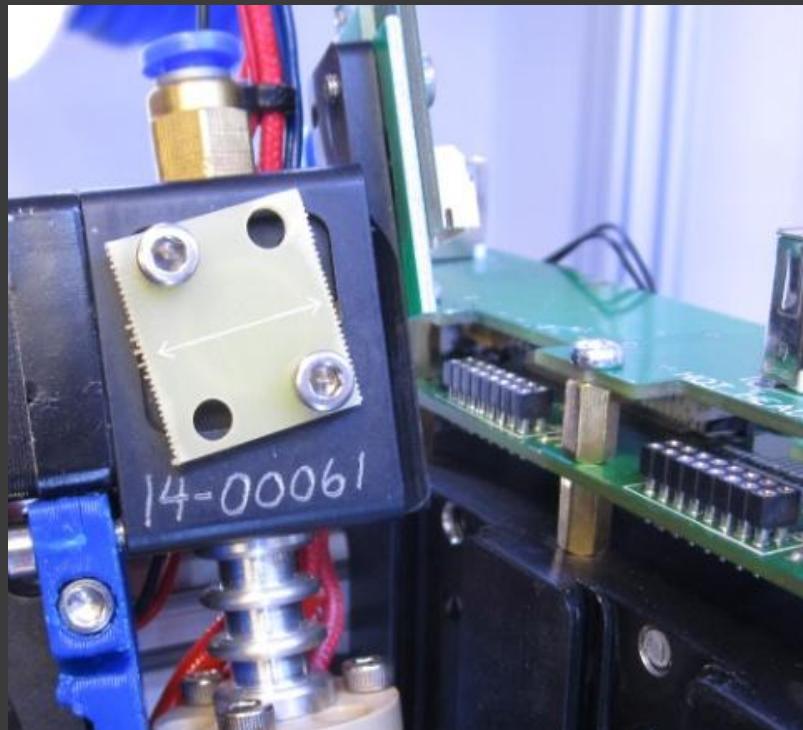
Step 1: Locate the MK1 & yoke and both gibs & connectors



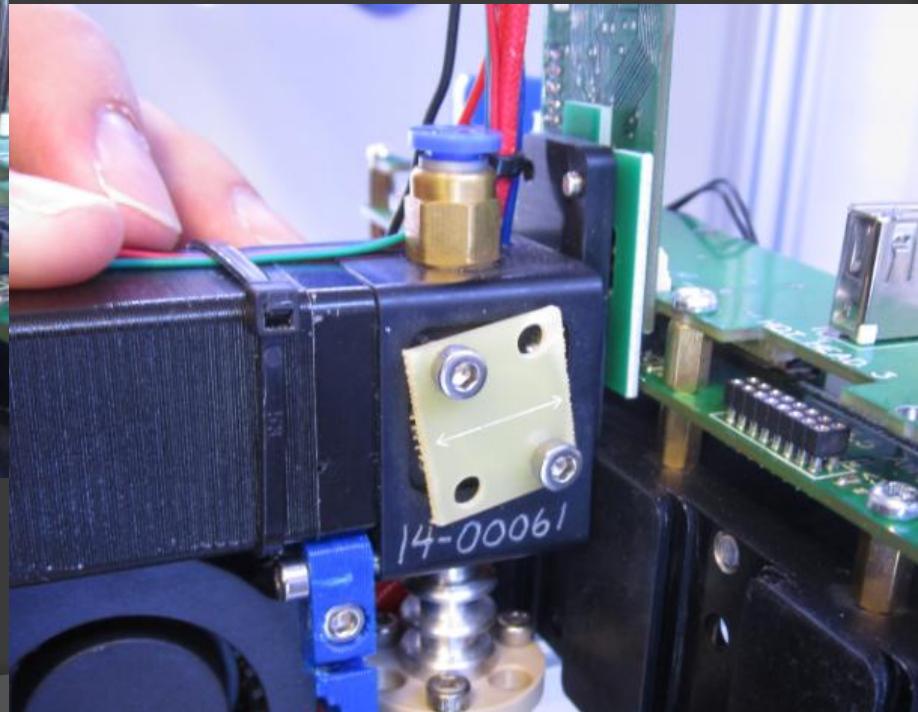
Physical Setup

MK1 Installation

Step 2: Align the gib on the MK1 extruder and slide them into the yoke gib slot



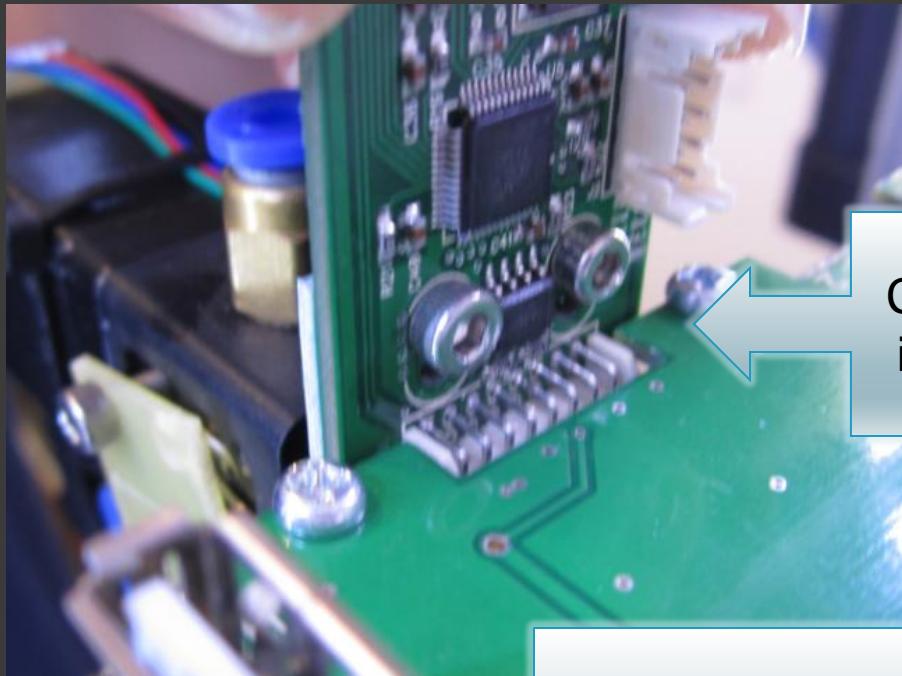
Slide into place



Physical Setup

MK1 Installation

Step 3: Check connection, then lock MK1 extruder into place on yoke



Ensure
Connector
is Seated
Properly



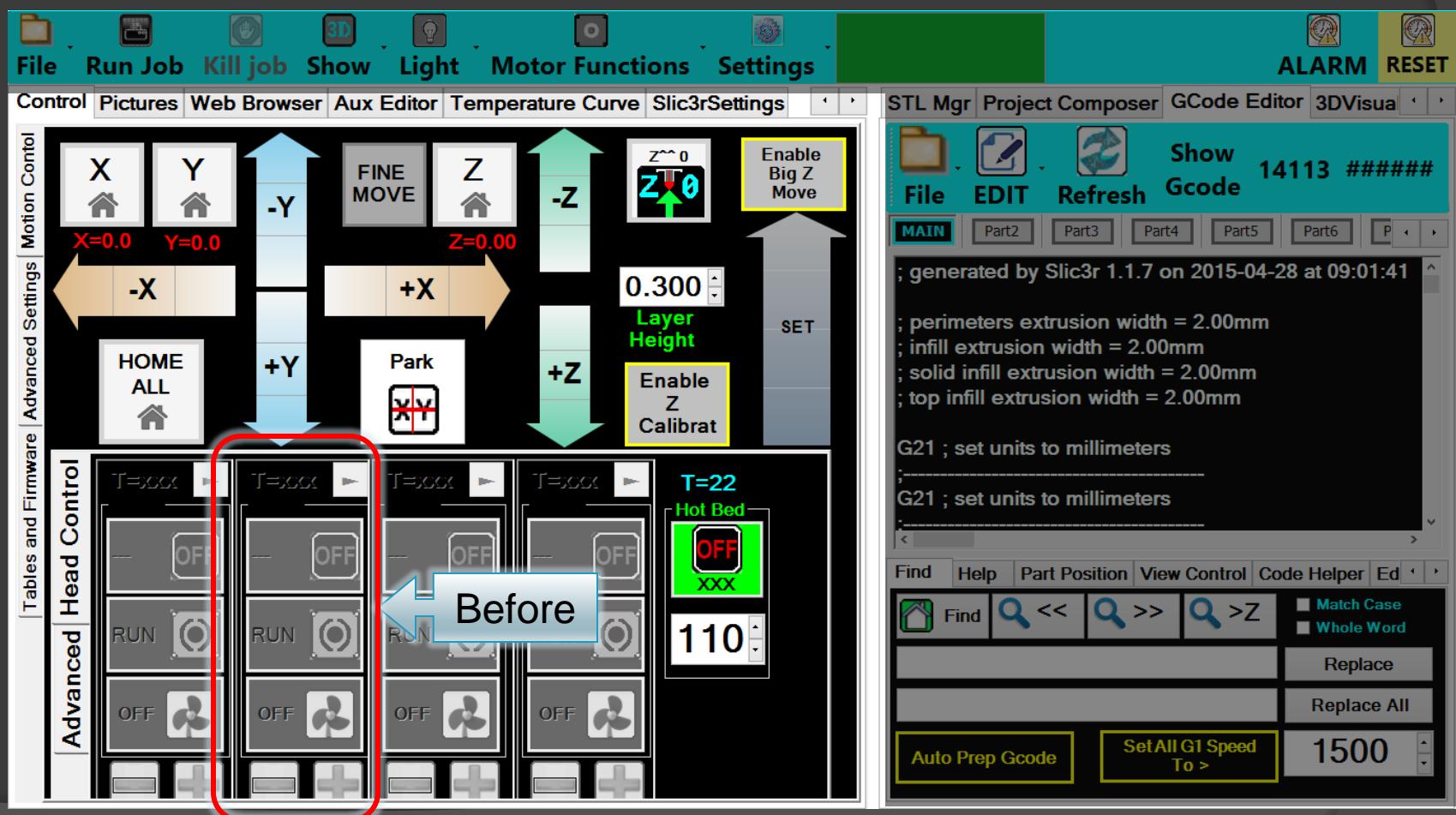
Tighten thumbscrew
in rear of Yoke to lock
in the Extruder



Physical Setup

MK1 Installation

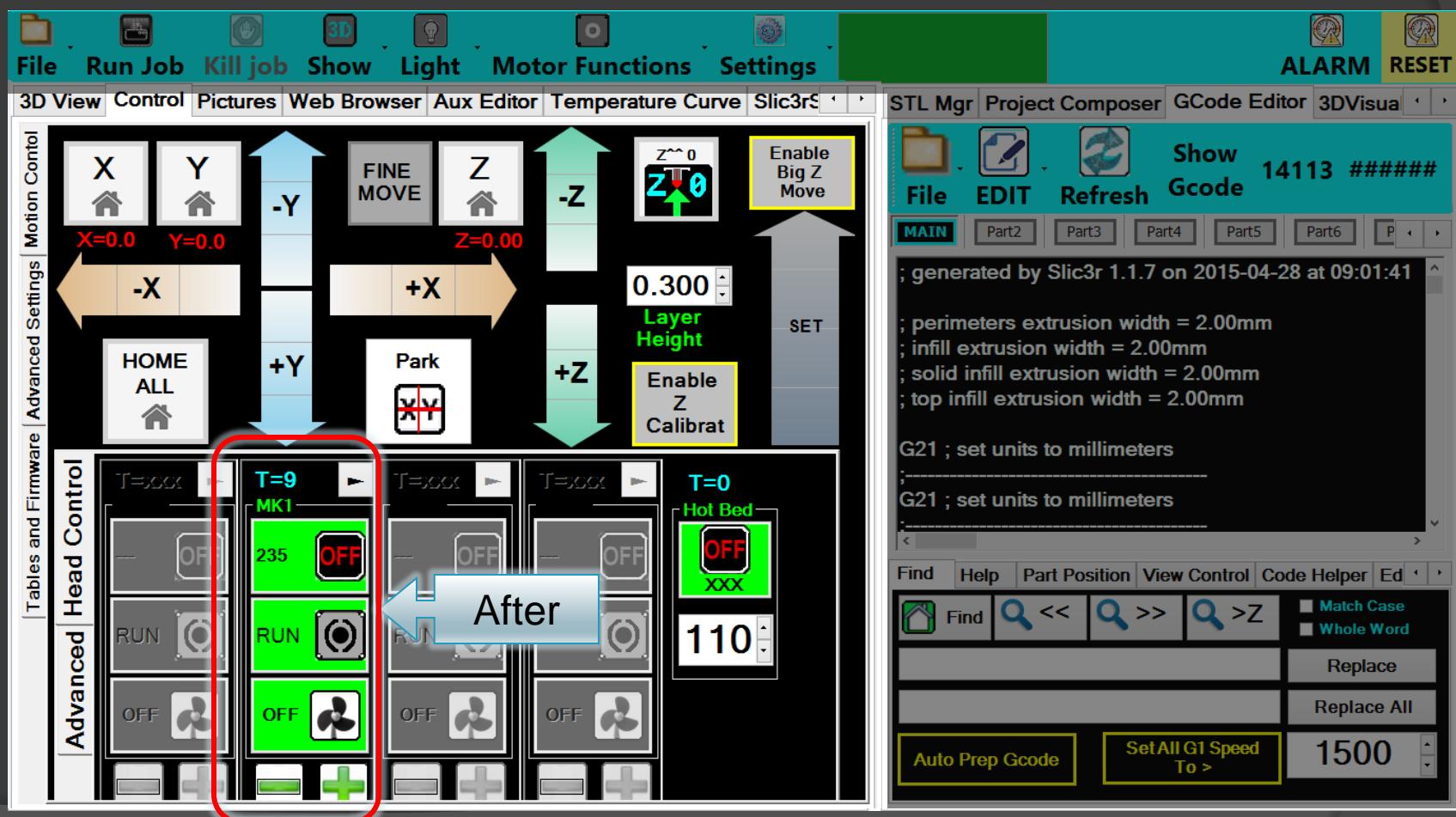
Step 4: What you see in REPETREL, 1 of 2



Physical Setup

MK1 Installation

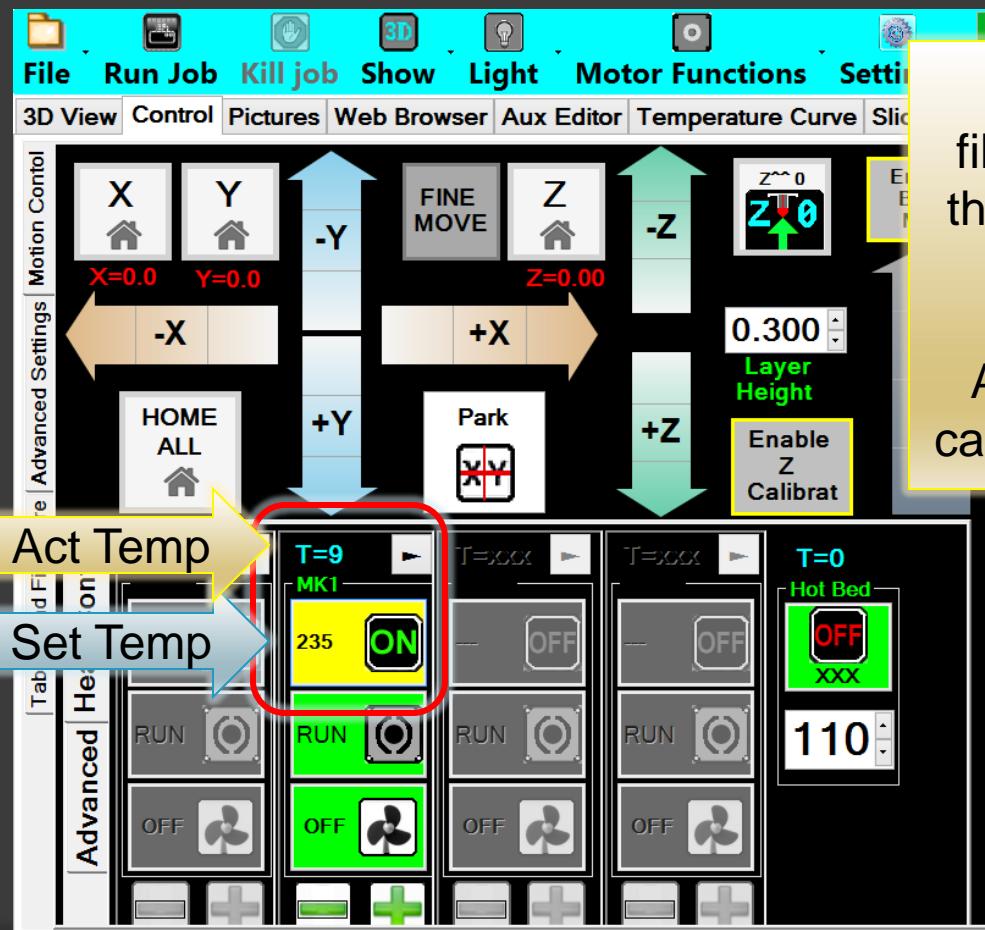
Step 4: What you see in REPETREL, 2 of 2



Physical Setup

Unload / Load filament

Step 1: Heat up MK1 extruder



NOTE: Always unload / load filament into your MK1 extruder **at** the extruding / service temperature of the material.

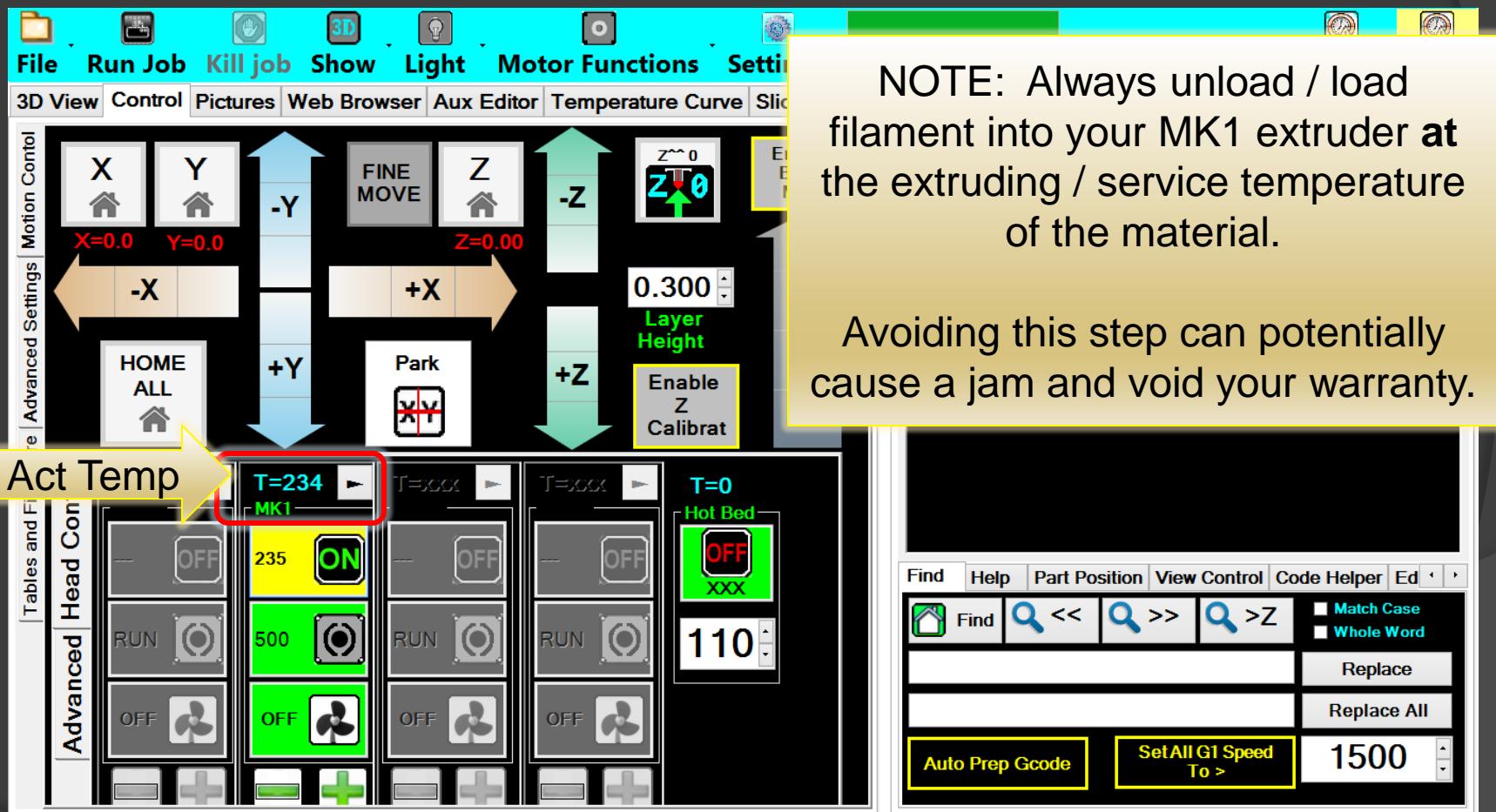
Avoiding this step can potentially cause a jam and void your warranty.

Xmit ▼	RCV	HEX	MsgQue -1
X	N/A	■ 0x01 Delta X,Y Scale Factor	
		■ 0x02	
Z H1		■ 0x04 AdjustedFeedRate	
Z H2		■ 0x08 Steps/NL	
Z H3		■ 0x10 LookAhead	
Z H4		■ 0x20 F E Prams	
Z H5		■ 0x40 Flow	
		■ 0x80 SendExtrusionToDevice	

Physical Setup

Unload / Load filament

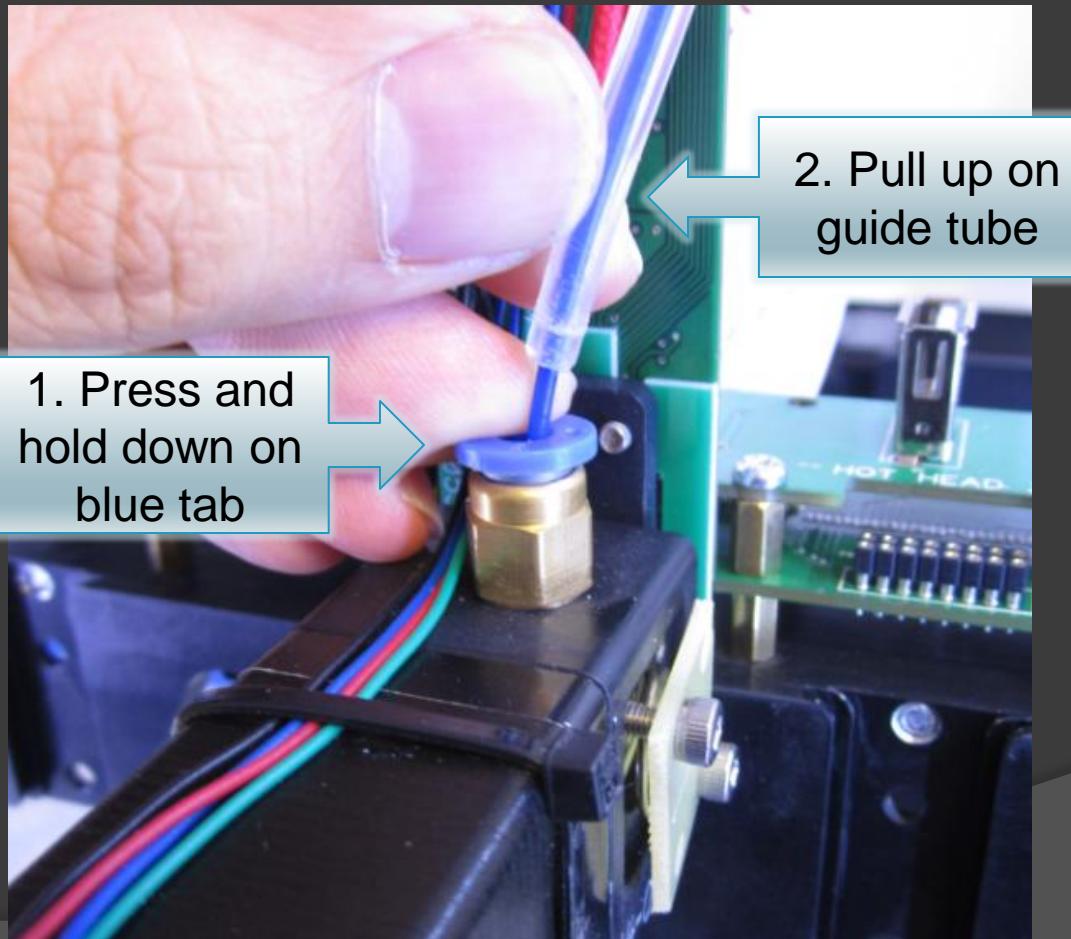
Step 1: Heat up MK1 extruder



Physical Setup

Unload / Load filament

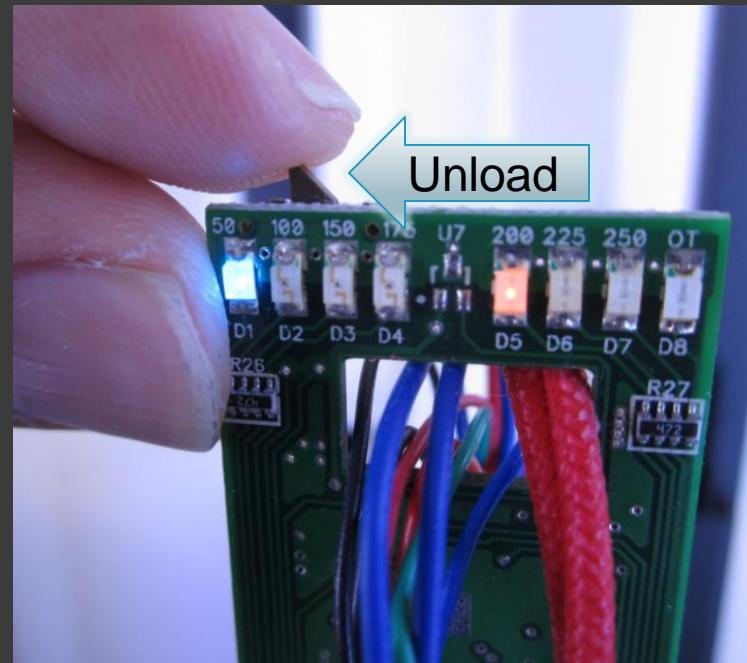
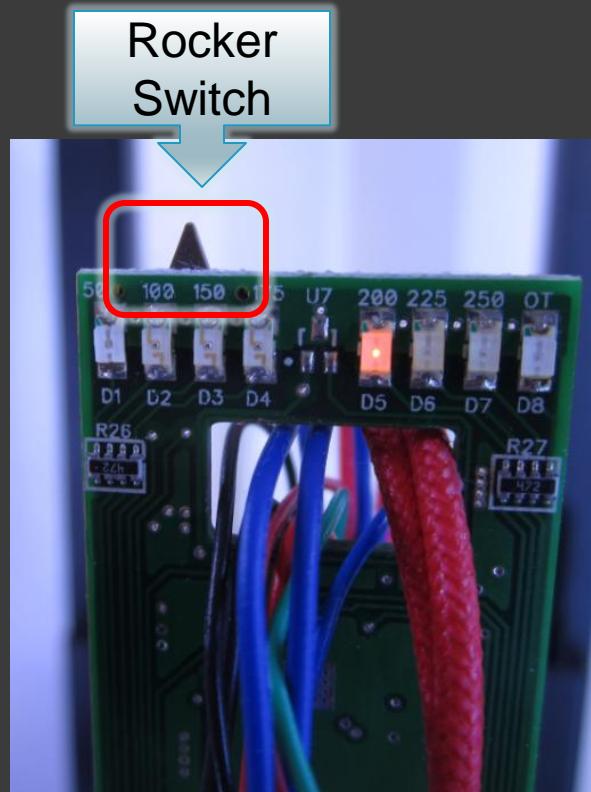
Step 2: Unload filament – Release guide tube



Physical Setup

Unload / Load filament

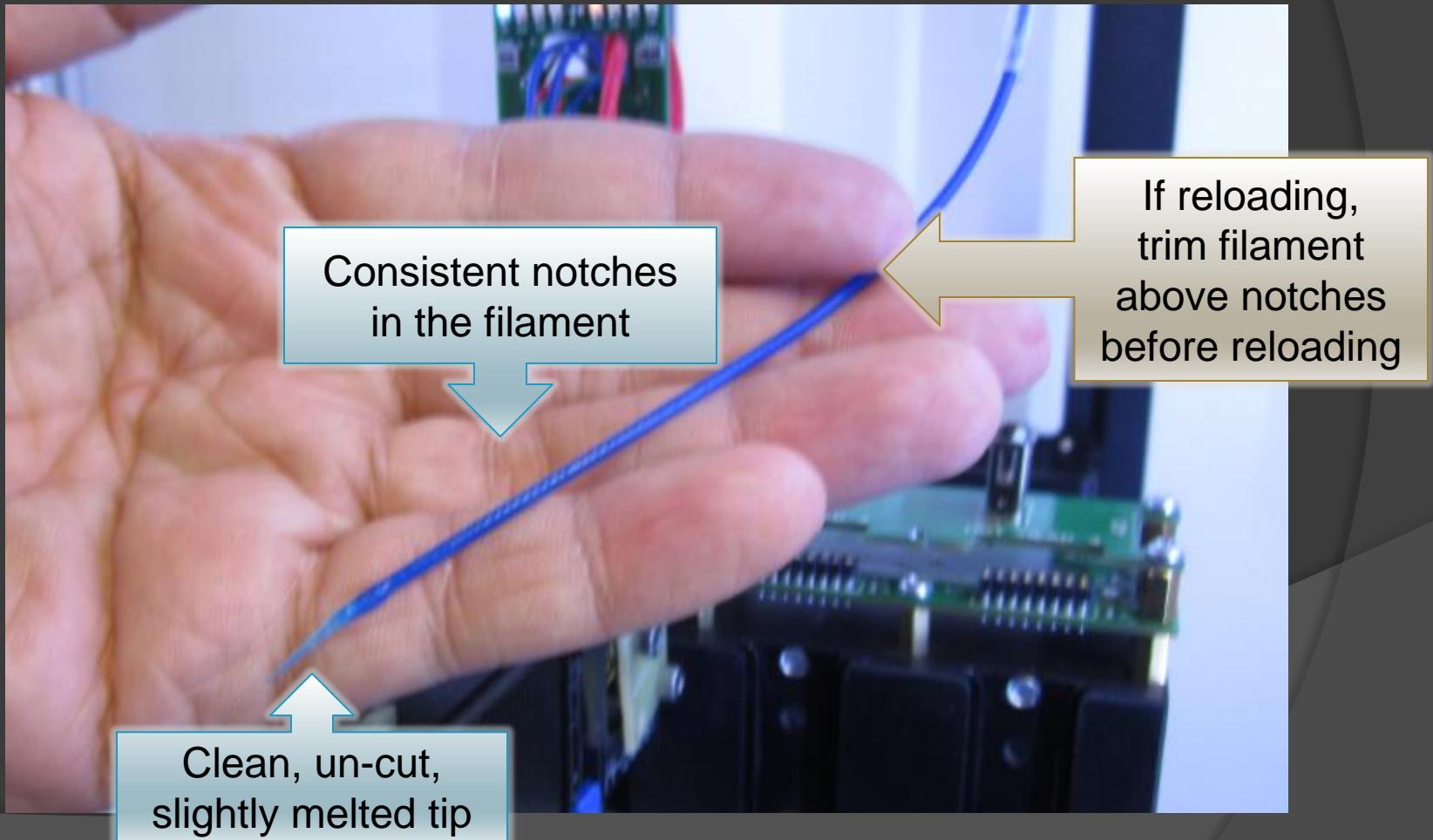
Step 3: Use Rocker switch to unload the filament from the MK1 extruder



Physical Setup

Unload / Load filament

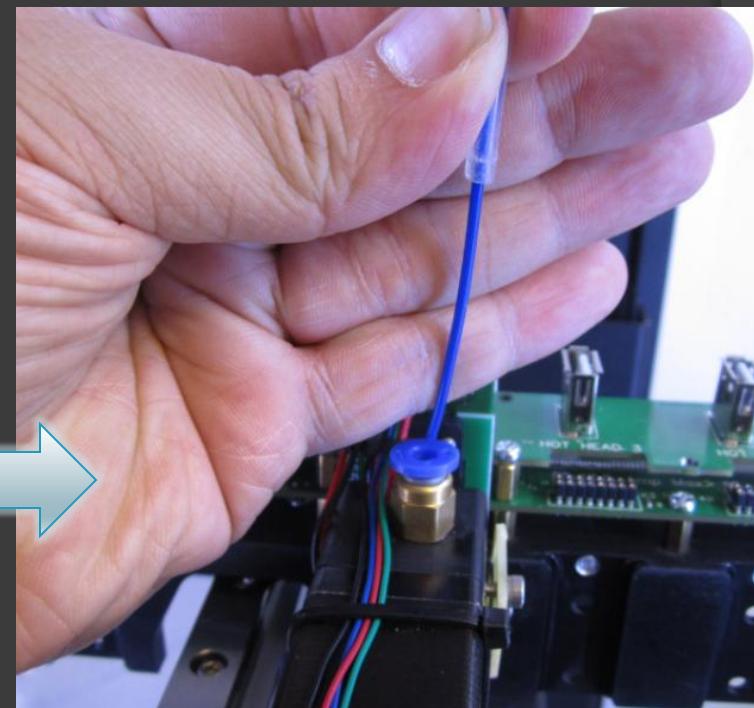
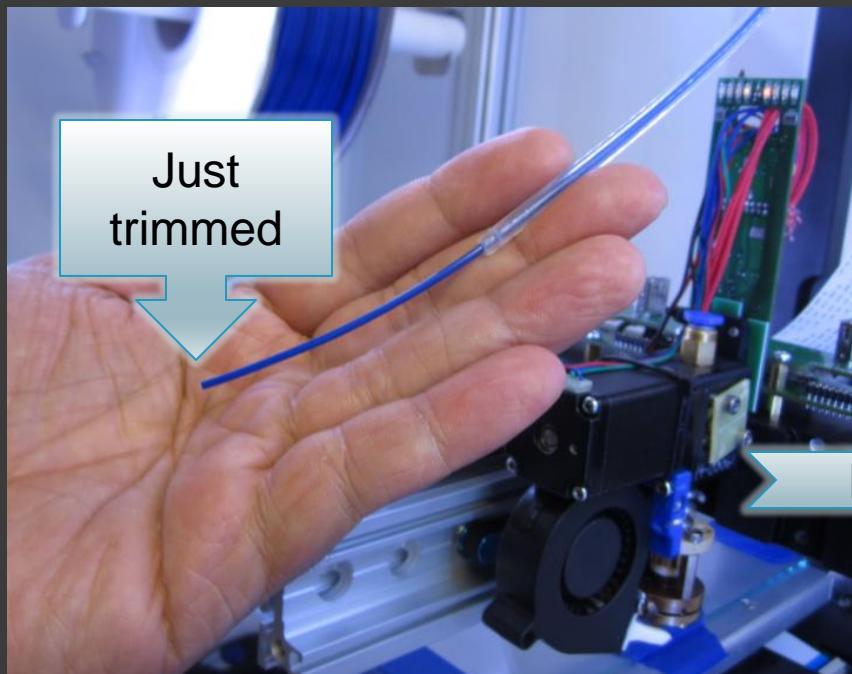
Step 4: Inspect the unloaded filament



Physical Setup

Unload / Load filament

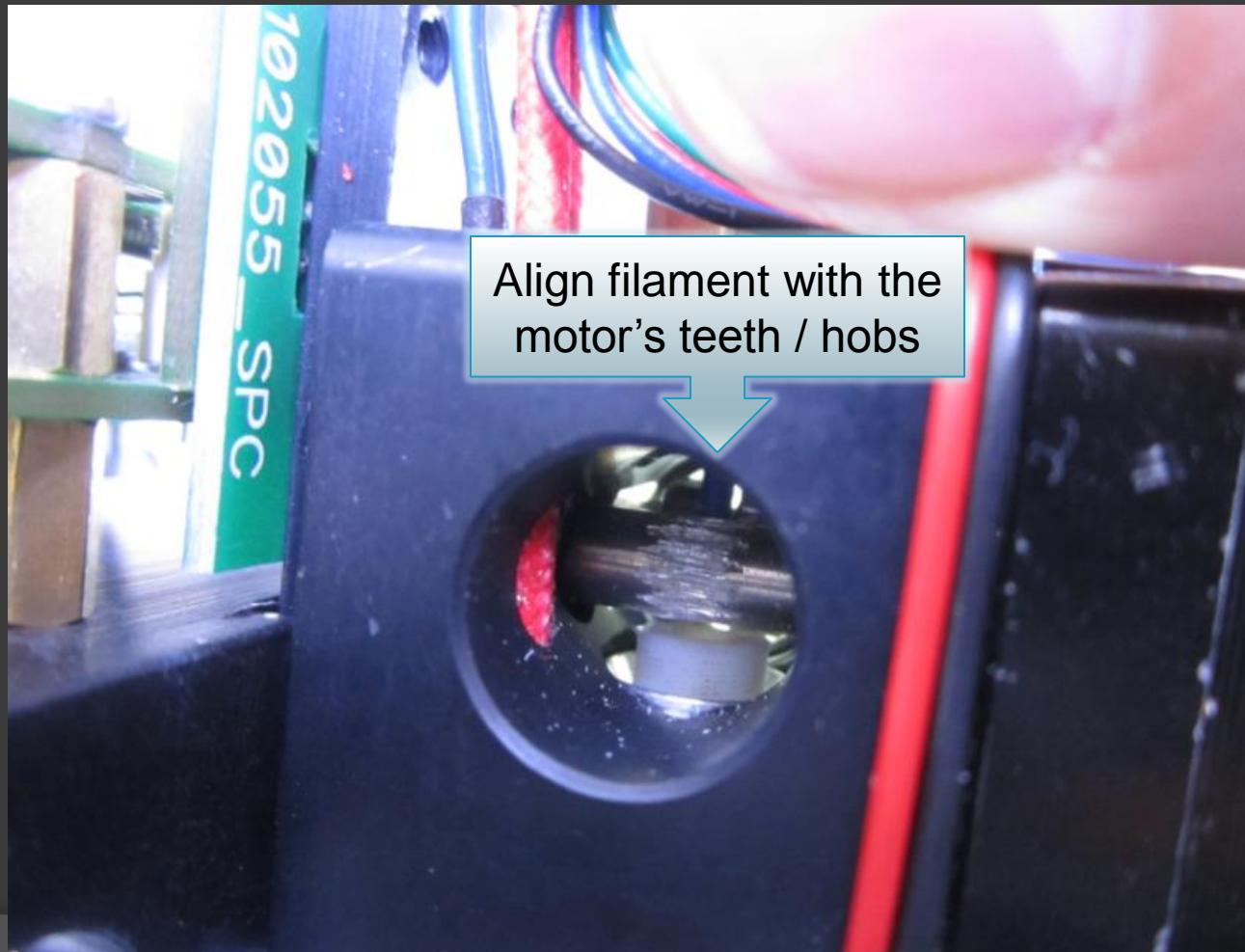
Step 5: Load the filament into the MK1 extruder



Physical Setup

Unload / Load filament

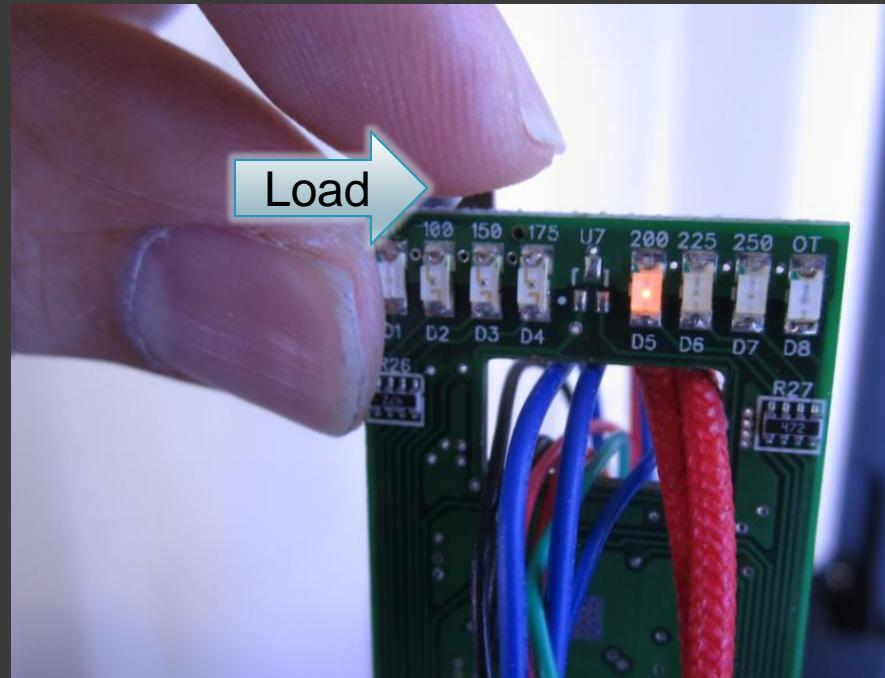
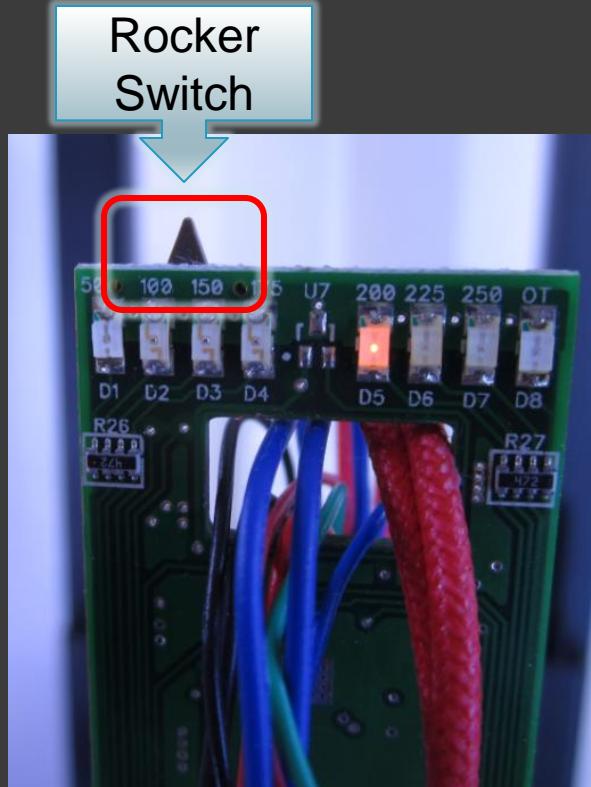
Step 5: Load the filament into the MK1 extruder



Physical Setup

Unload / Load filament

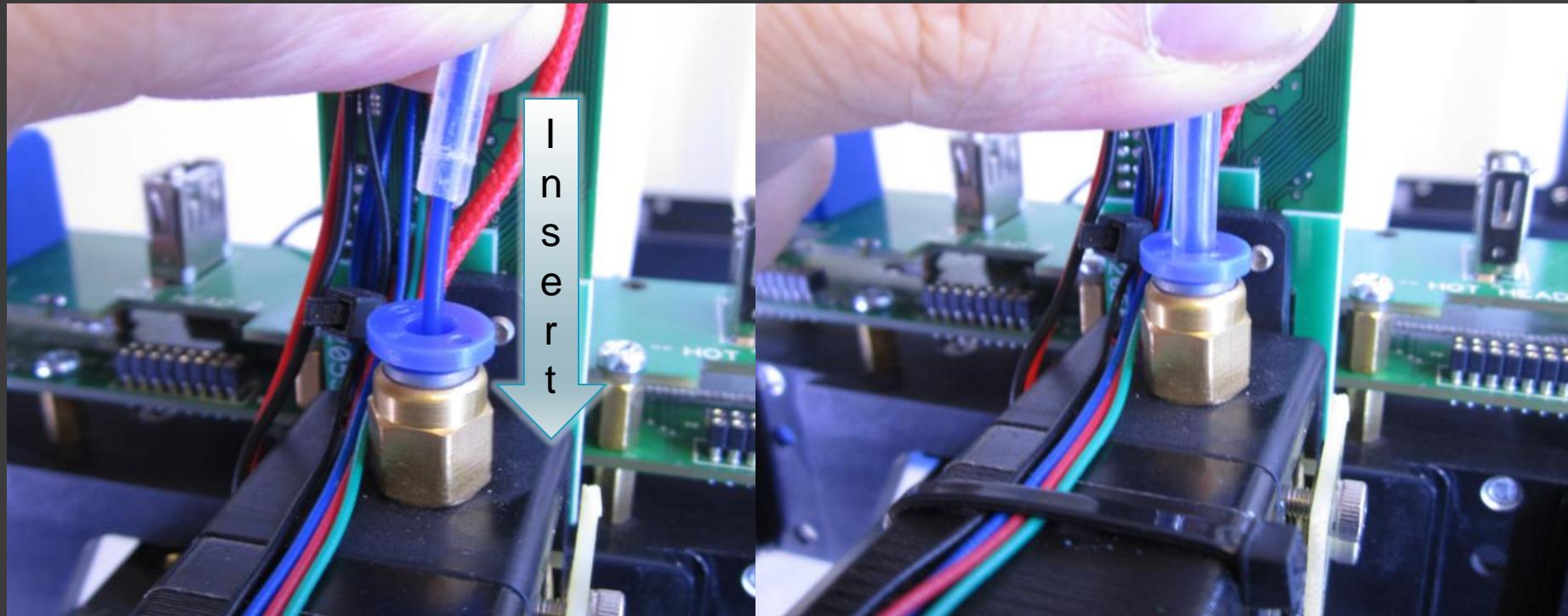
Step 6: Use Rocker switch to load



Physical Setup

Unload / Load filament

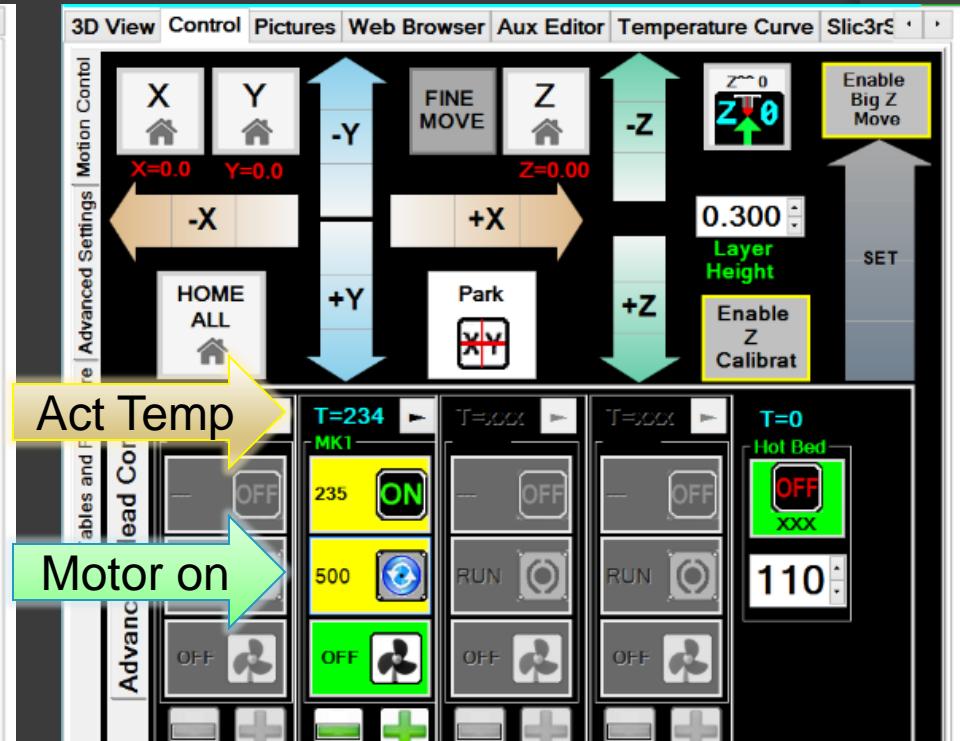
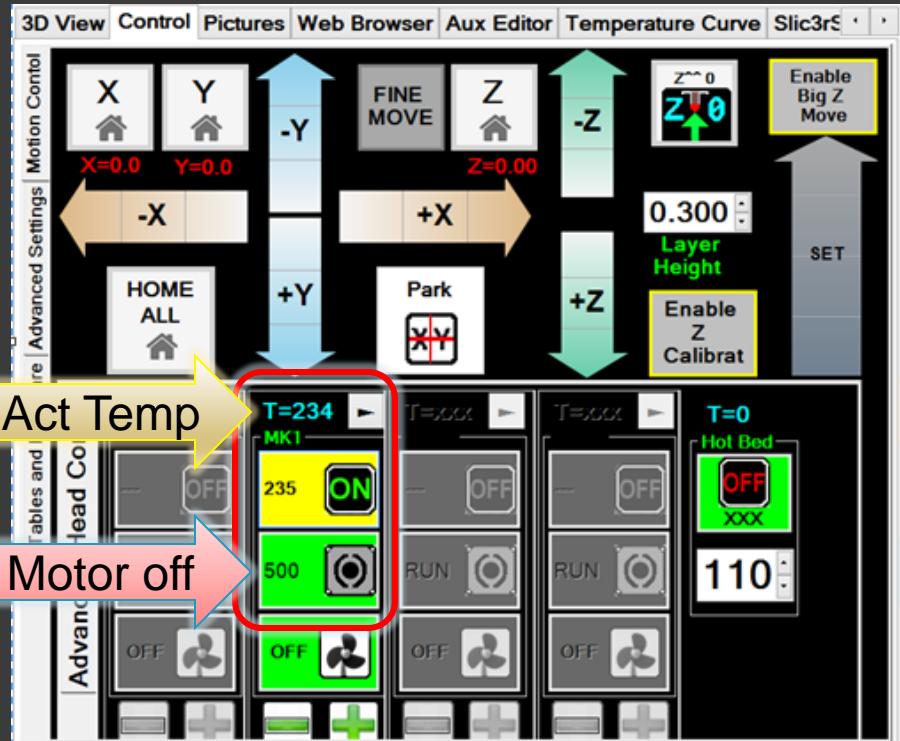
Step 7: Lock filament guide tube



Physical Setup

Heat up & purge MK1 extruder

Step 1: With the MK1 extruder at the material's service temperature, run the extruder's motor to purge the older material.



Physical Setup

Heat up & purge MK1 extruder

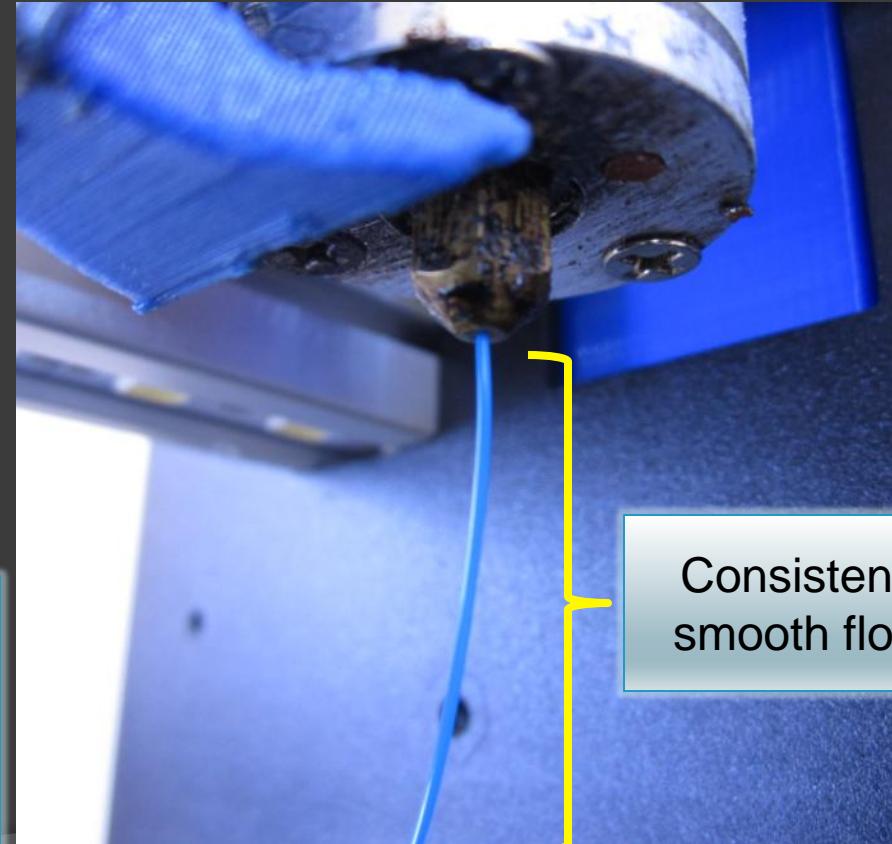
*Step 2: After 8-10 in / 20-30cm has been extruded, **stop** the MK1 motor from extruding. The extruded filament should have flowed consistently.*

NOTE: It may take 3-5 seconds before any material starts to extrude, this is normal.



Some dribble is normal.

The heat causes the filament in the head to expand, and a small amount usually pushes out the bottom of the nozzle.



Consistent, smooth flow

Physical Setup

Set Z-Height to MK1 extruder nozzle

Step 1: Remove any filament dribble from the MK1 extruder nozzle

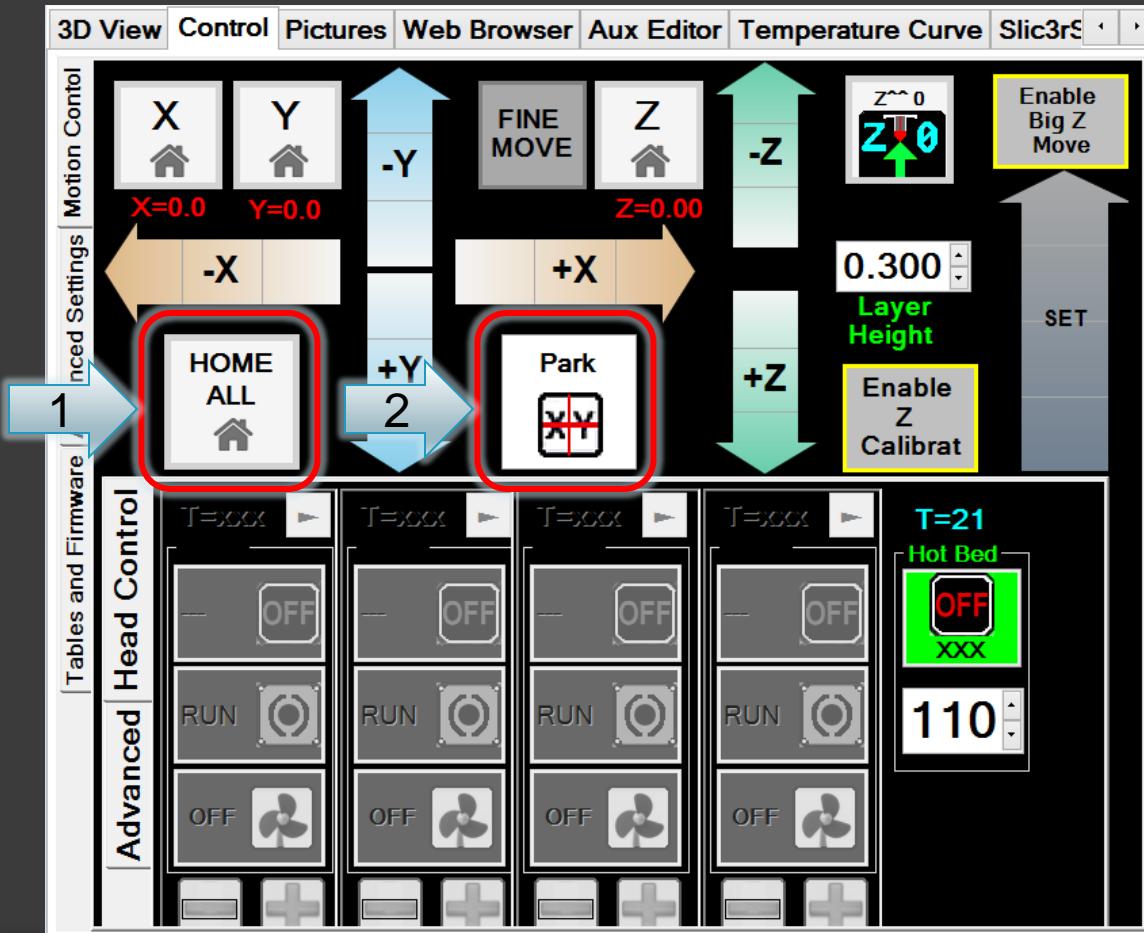


Use the included
wire brush or
tweezers to
remove

Physical Setup

Set Z-Height to MK1 extruder nozzle

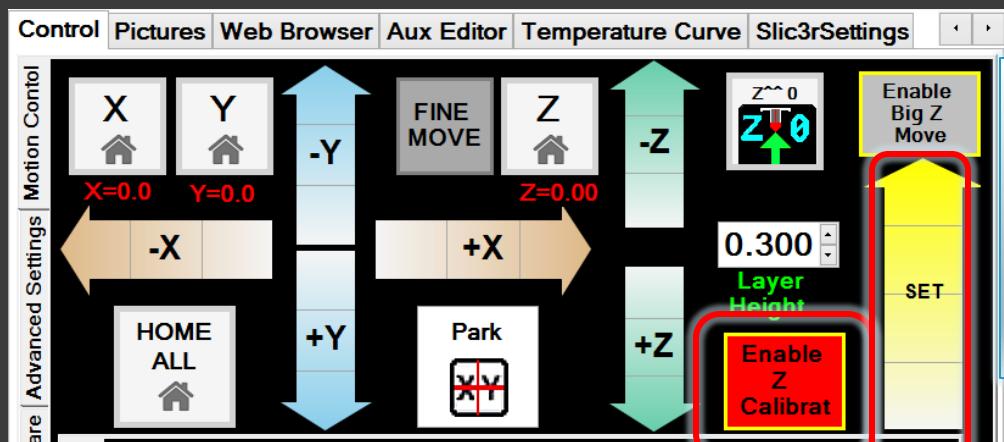
Step 2: Press Home then Park to center the MK1 extruder over the print area.



Physical Setup

Set Z-Height to MK1 extruder nozzle

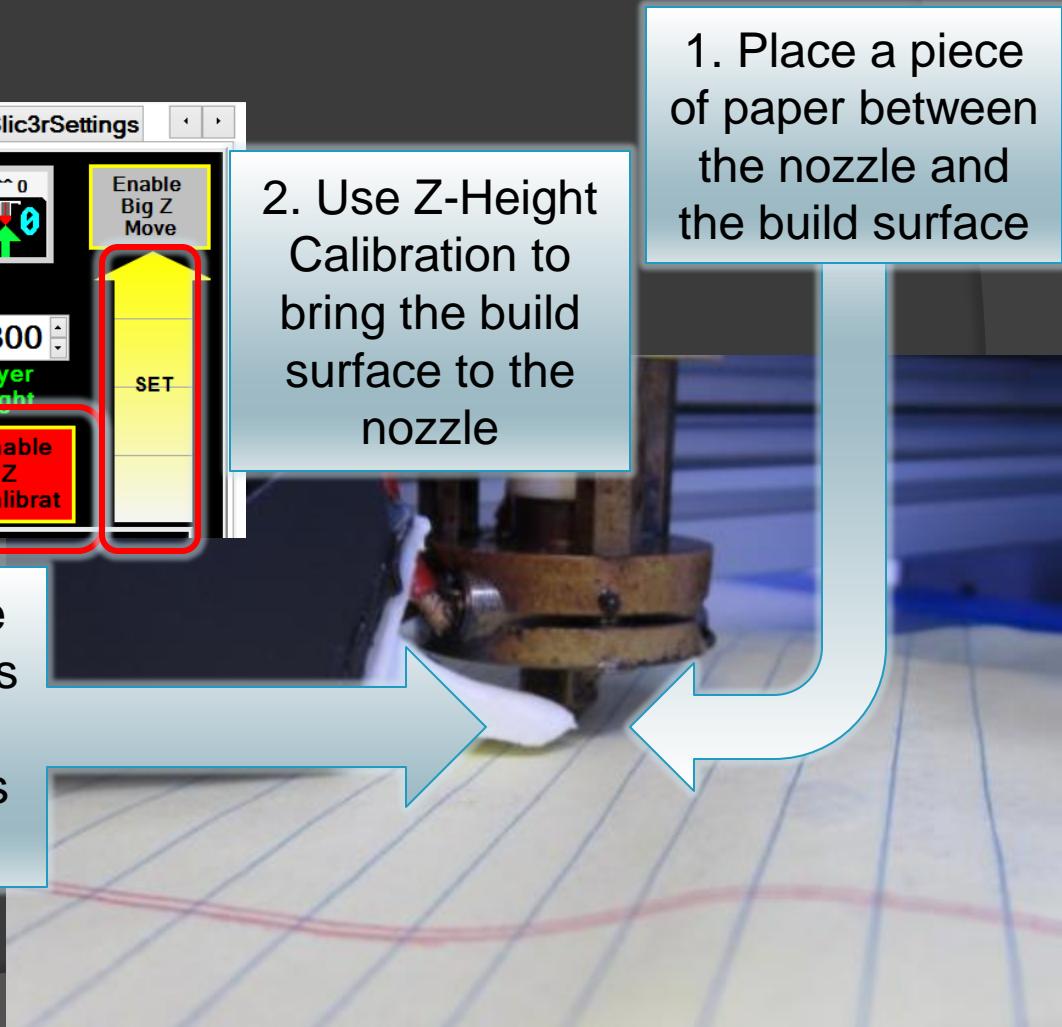
Step 3: Setting the Z-Height



2. Use Z-Height Calibration to bring the build surface to the nozzle

3. Once the piece of Paper just starts to pinch, the Extruder Height is correct.

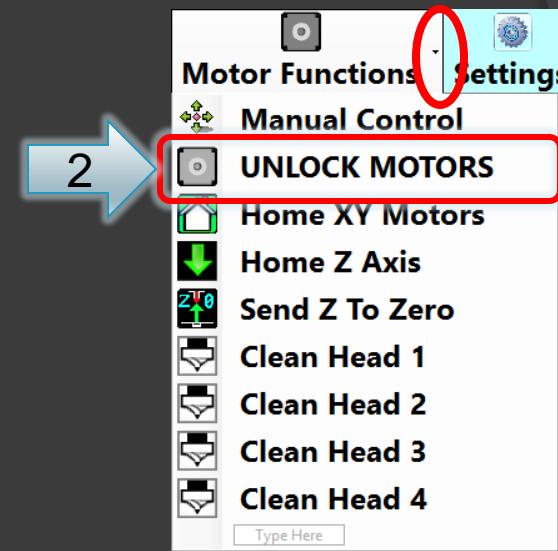
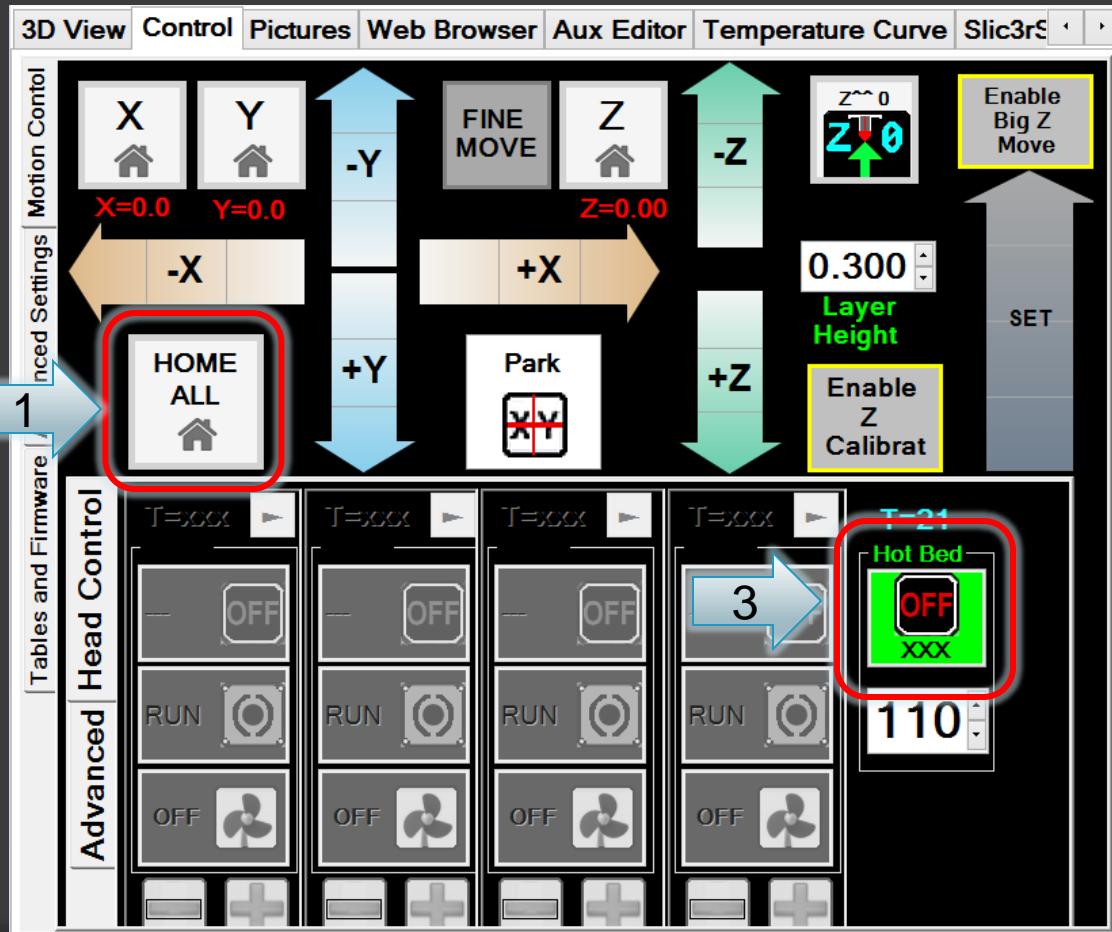
1. Place a piece of paper between the nozzle and the build surface



Physical Setup

Bed Preparation

Step 1: Press Home, unlock motors, and turn on the heat to the bed

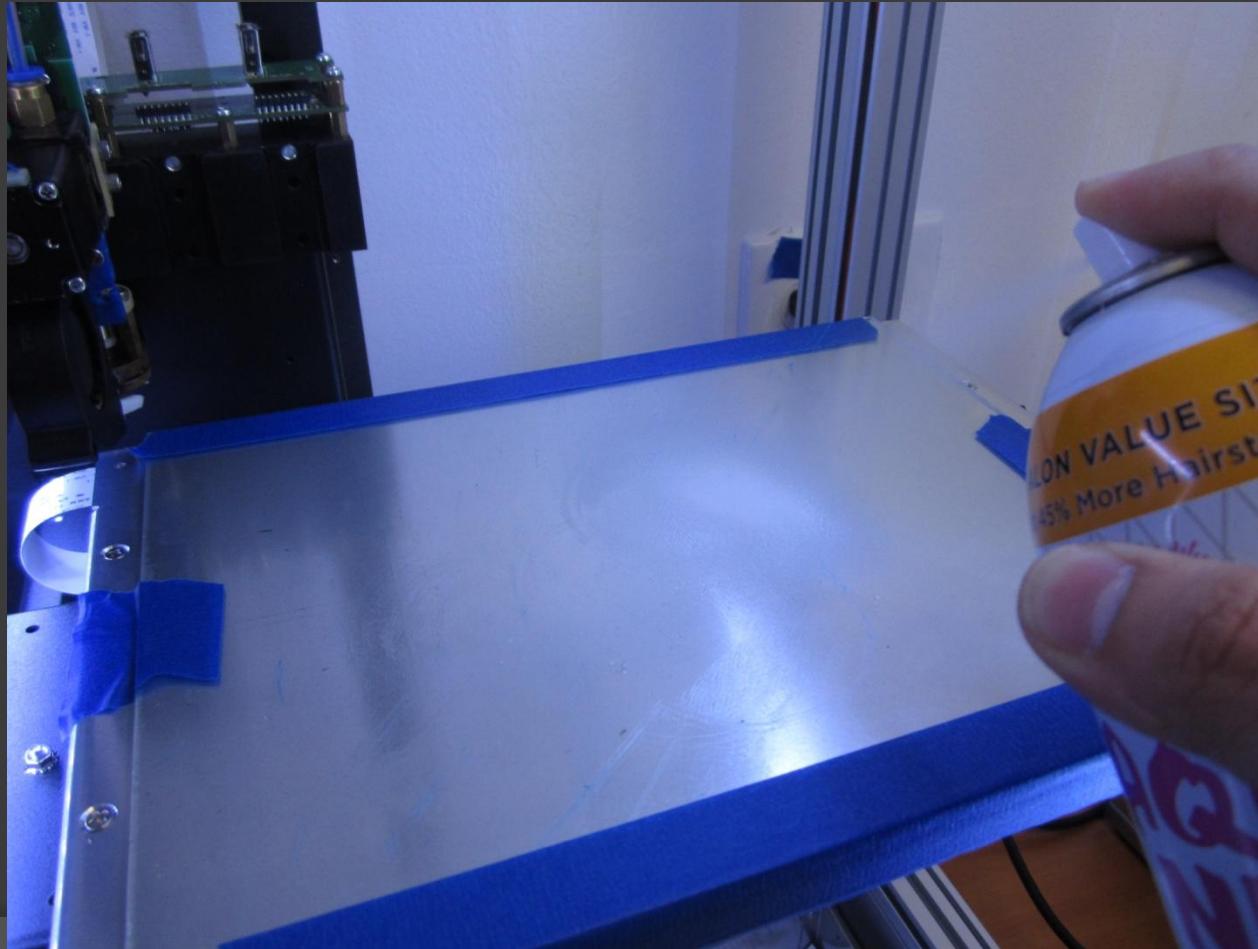


Physical Setup

Bed Preparation

Step 2: Slide the bed to a position where you can spray the bed with AquaNet

NOTE: Never get any spray on the linear slide bearings. Use a piece of paper to shield them as necessary.

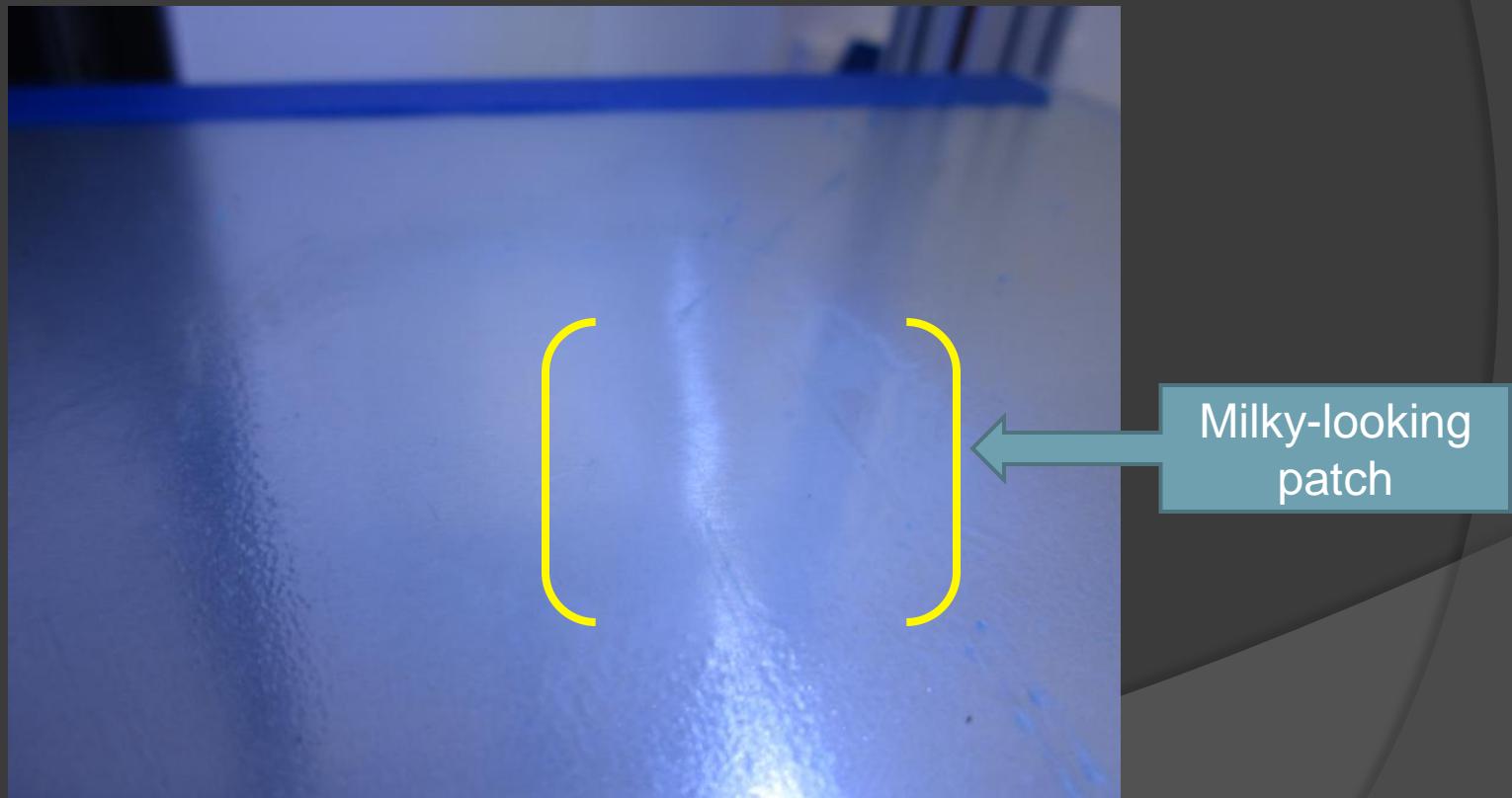


Physical Setup

Bed Preparation

Step 3: Allow the “wet” or “milky” looking patches on the glass bed to dry.

Do not touch the spray applied areas with your fingers, the oils from your fingers will prevent proper adhesion.



Physical Setup

Bed Preparation

NOTE: About sprays / AquaNet

- Adhesion of the filament to the bed is of upmost importance because the bed is the only fixture for making the part.
- We prefer to use AquaNet hairspray (specifically the unscented version) when printing with ABS filament.
- The hairspray, when applied to the bed and dried, acts as a glue to keep ABS filament sticking to the bed.

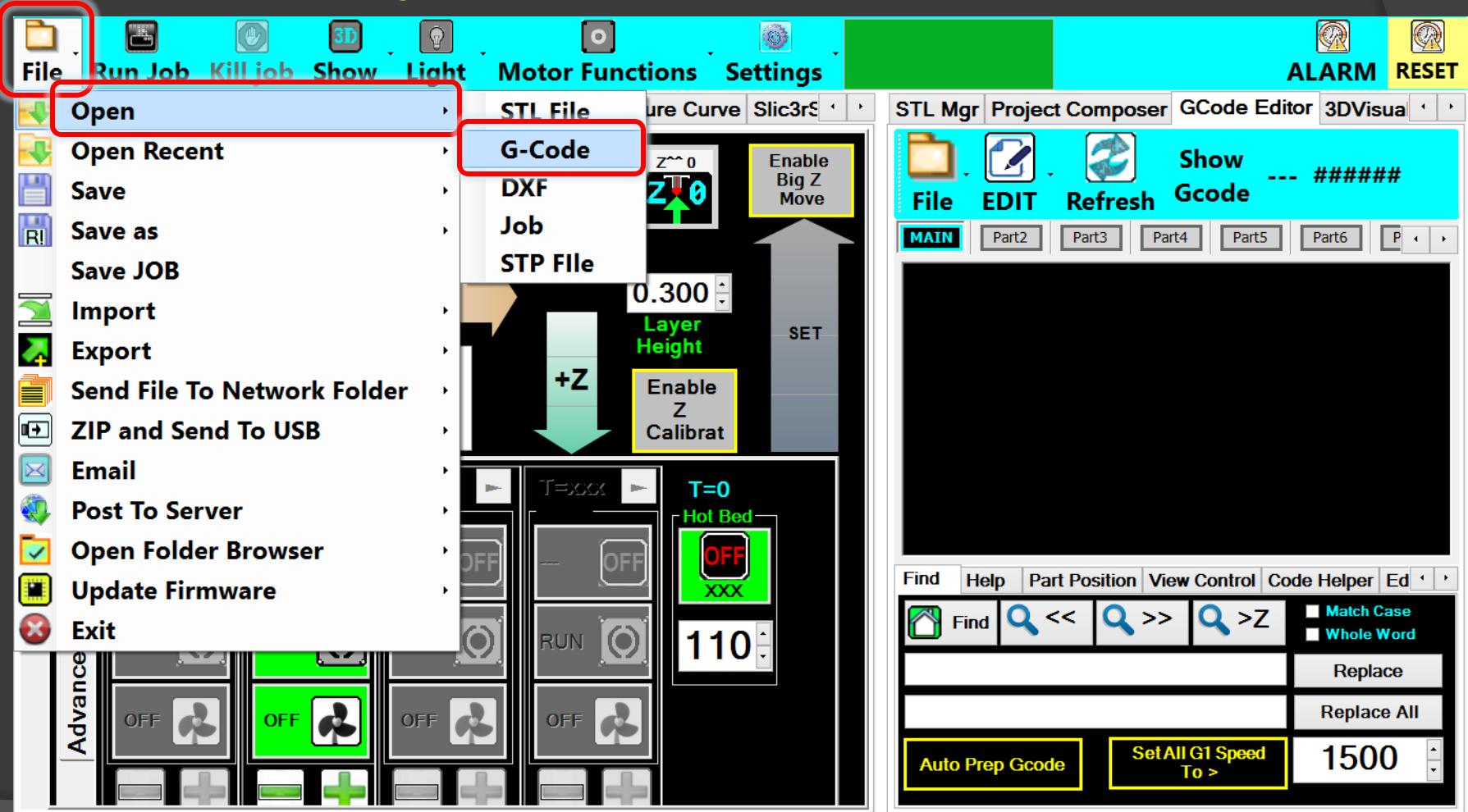
- The heat of the heated build platform keeps a few of the bottom layers of ABS from completely shrinking and pulling off of the bed.
- Make sure your bed temperature is at least 55°C before printing with ABS.

- There are other techniques for getting ABS and other filament materials to stick to the bed. These other techniques are covered in a separate presentation on our website.

Physical Setup

Loading a G-Code file

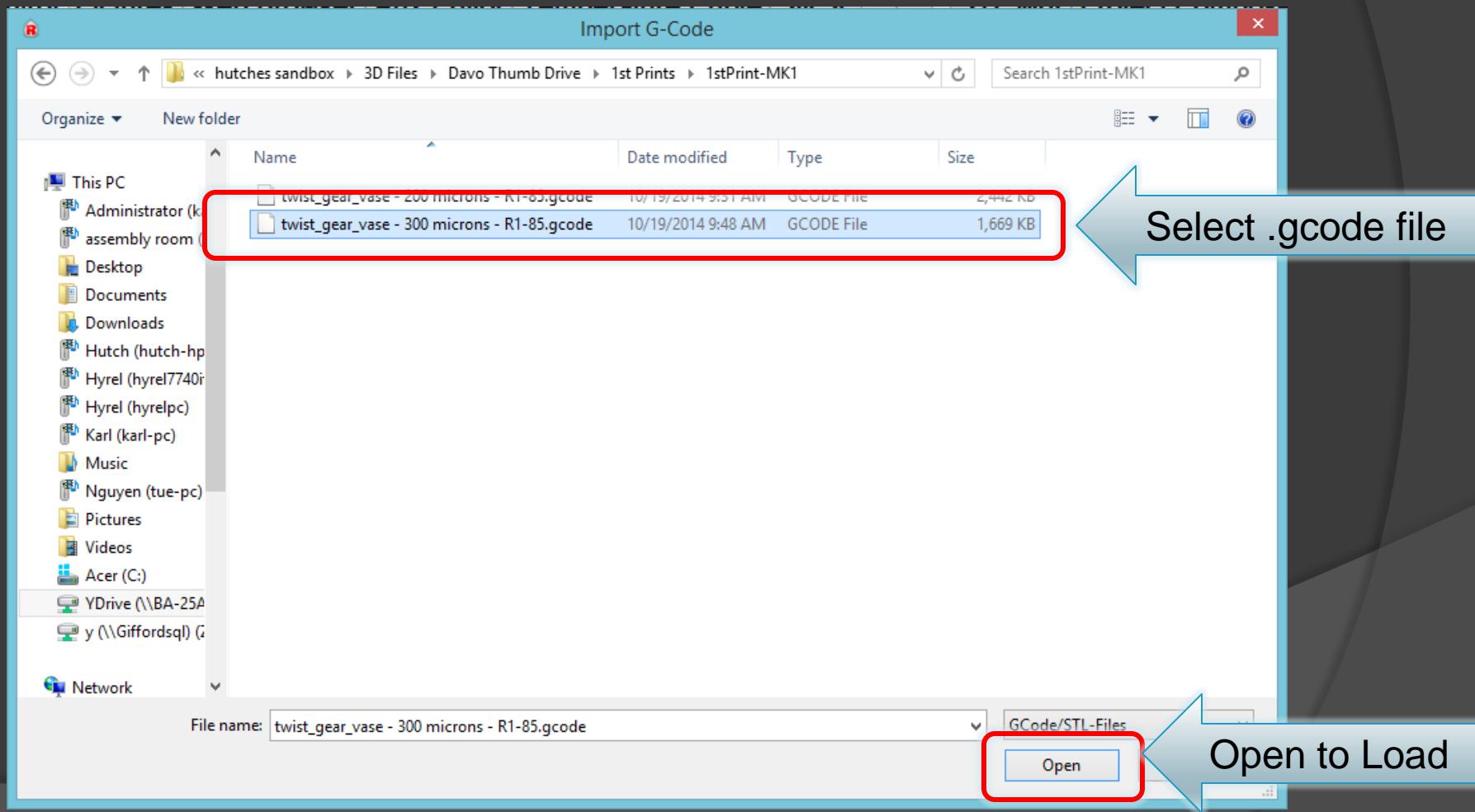
Step 1: Open a .gcode file



Physical Setup

Loading a G-Code file

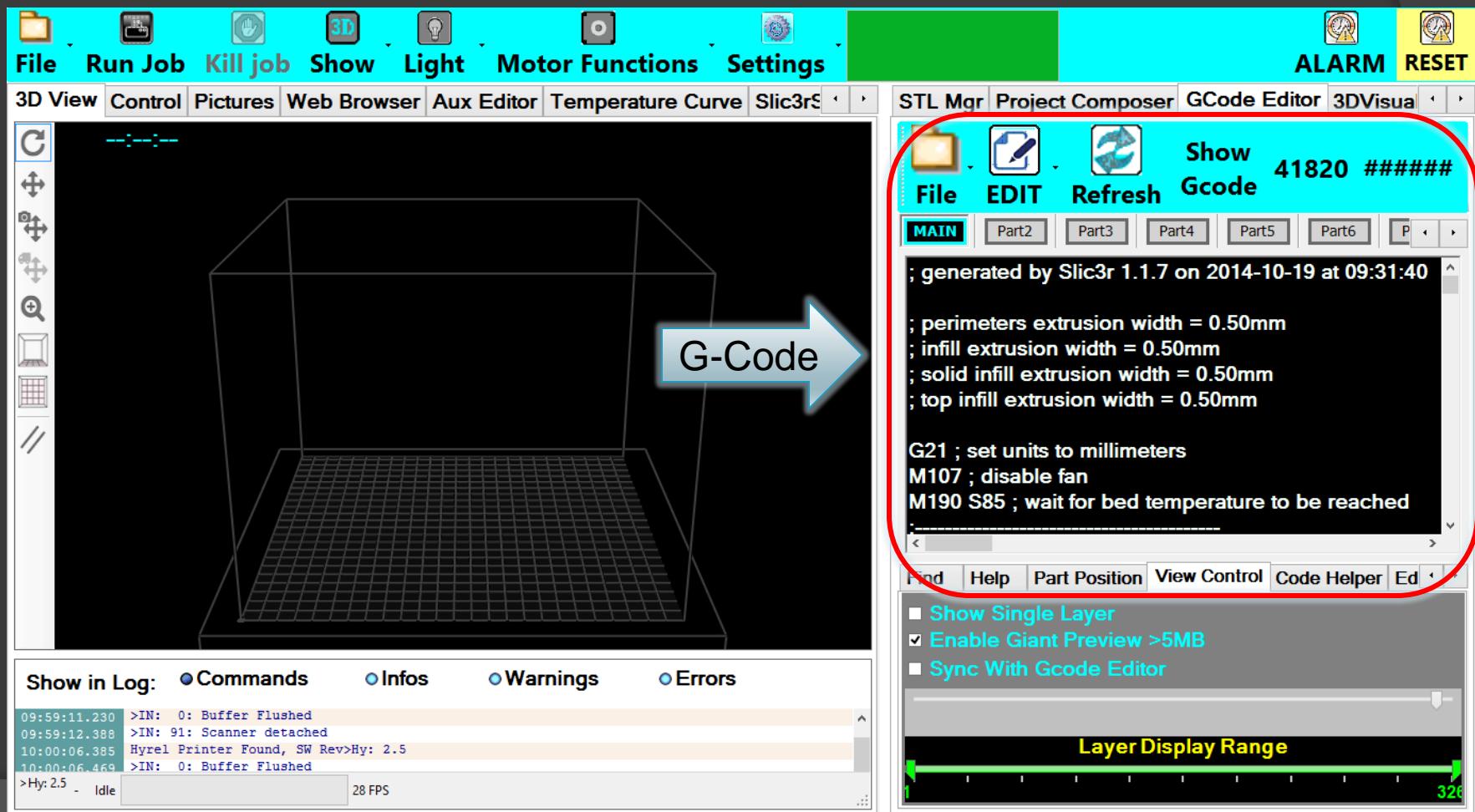
Step 2: Browse and select .gcode file



Physical Setup

Loading a G-Code file

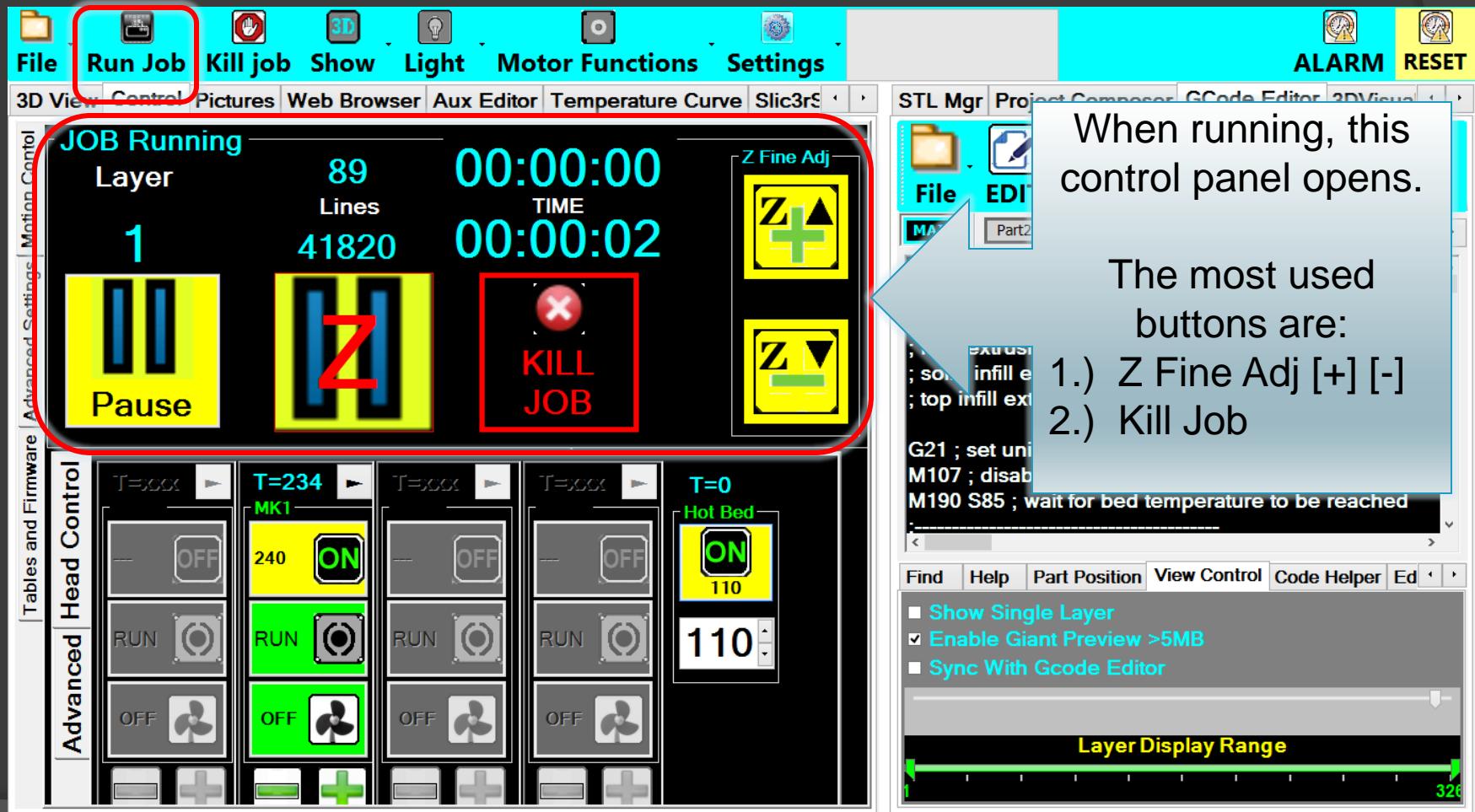
Step 3: This is the screen you will see when the .gcode file is loaded.



Print Vase

Printing

Step 1: Press “Run Job” button



Print Vase

Printing

Step 2: Pay close attention to the first layers & adjust height while printing



For ABS, this
print is near
perfection



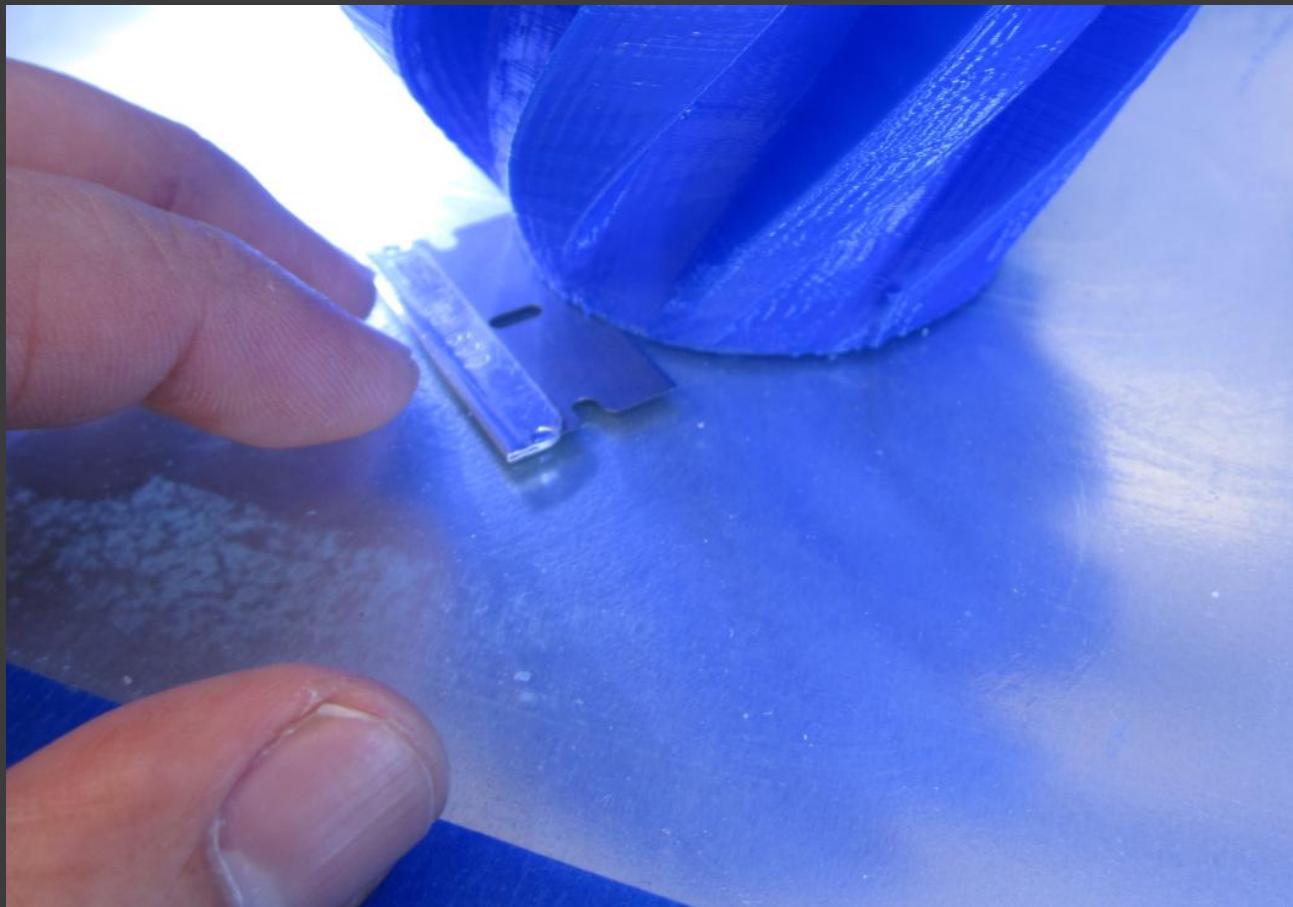
Use when
lines are
not
touching

Use when
lines are
50%
wider than
the
adjacent
lines

Print Vase

Printing

Step 3: When complete, remove print from build surface



More Information Available at:

HYREL LLC

2900 Cole Court

Norcross, GA 30071

www.hyrel3d.com

www.hyrel3d.net

sales@hyrel3d.com

(404)-914-1748 (US Shop Phone)

Skype: Hy.Rel

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