

# G-code Tutorial

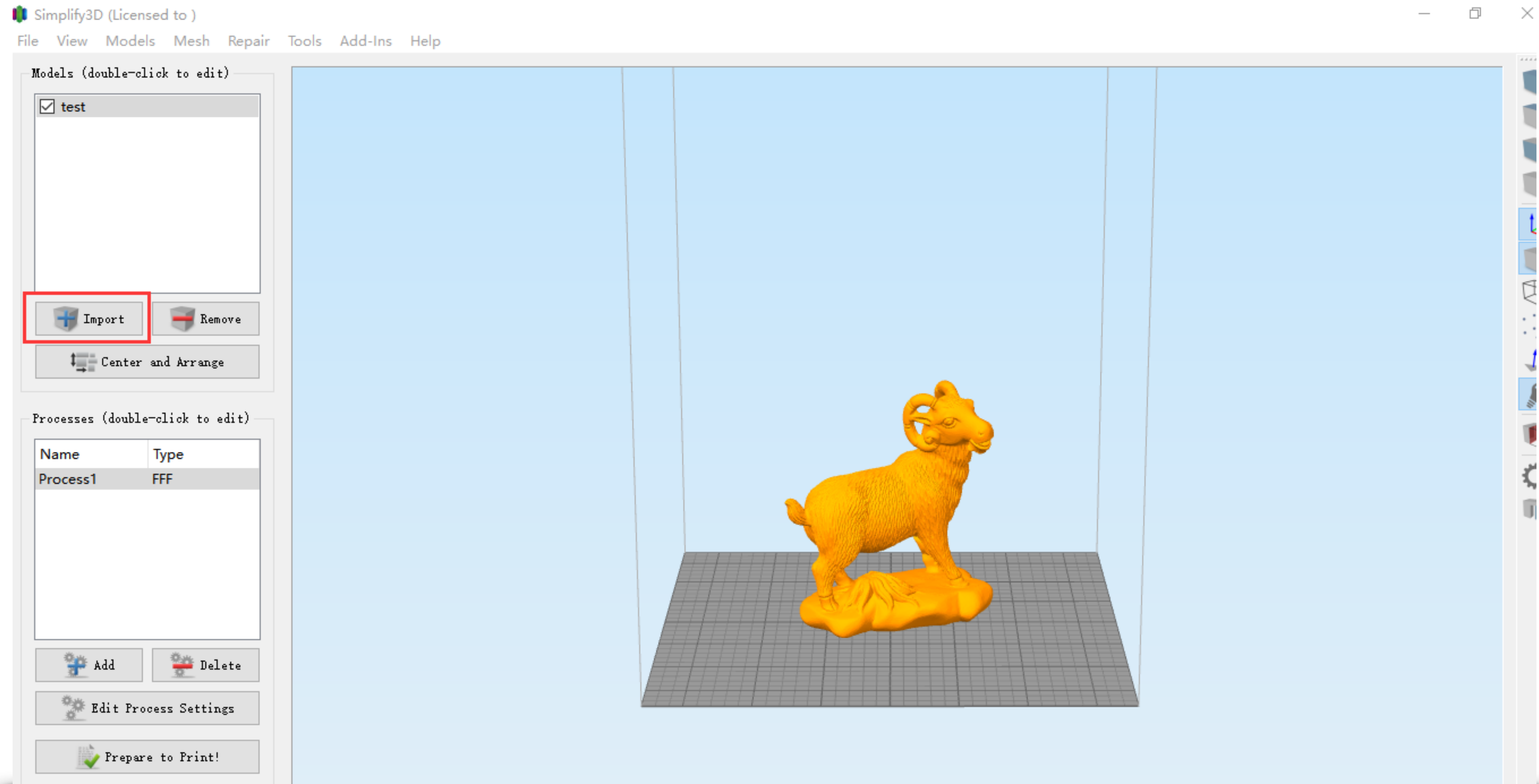
We need a slicer which can generate G-code:

You can use Simplify3D or other free slicers such as Slic3r, Cura, Kisslicer and etc.

Here we use simplify3D as an example.

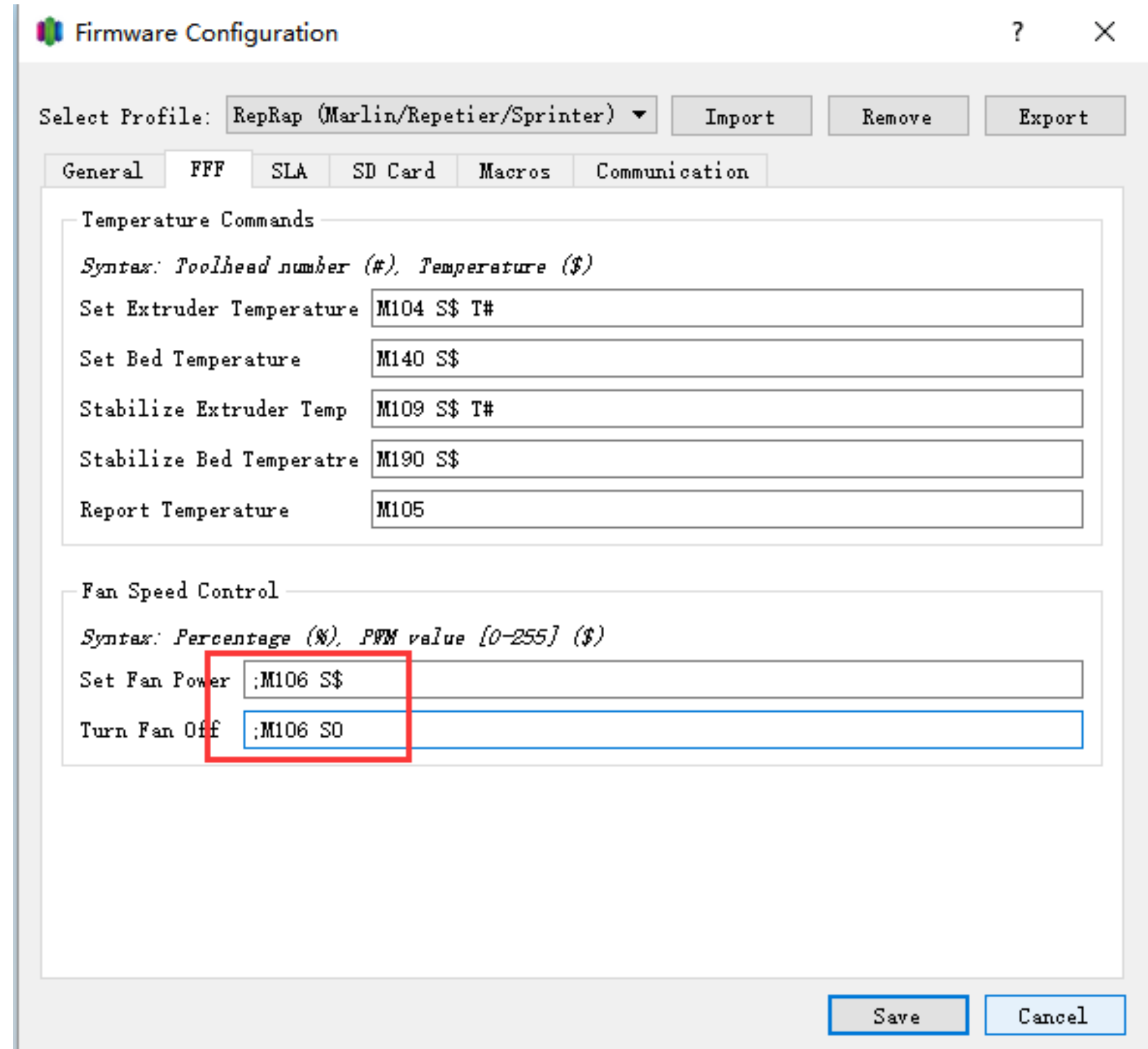
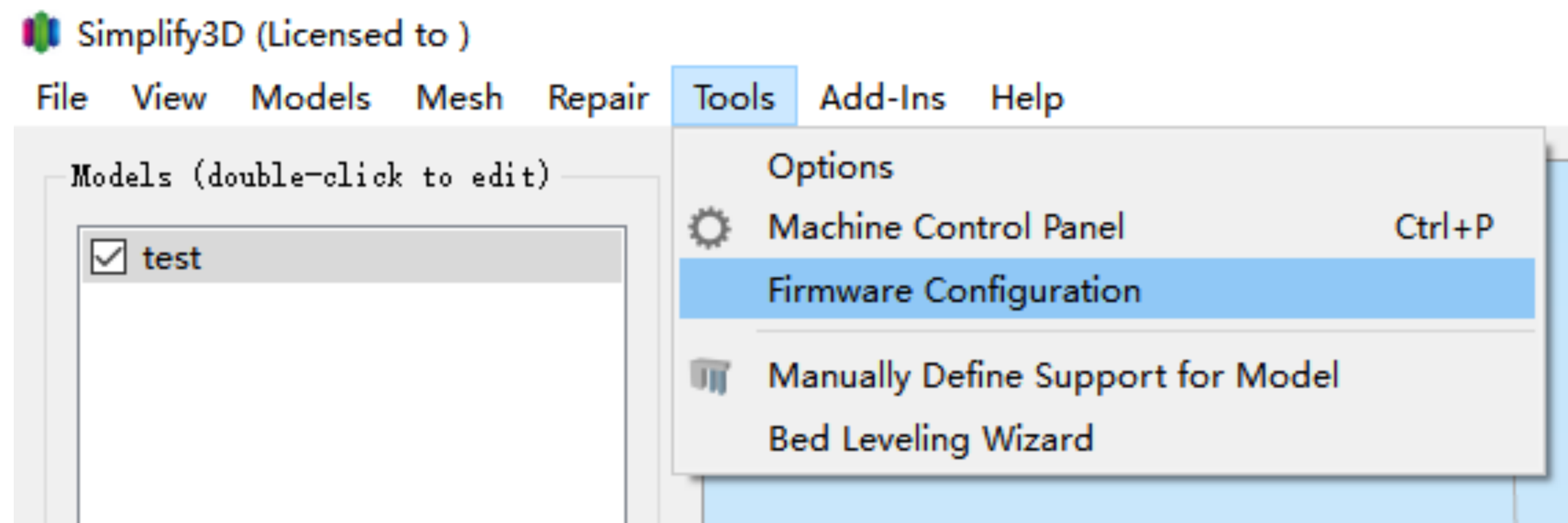
\*G-code feature is only available in UP Studio Version 2.0 and later.

# Step 1: Load a model

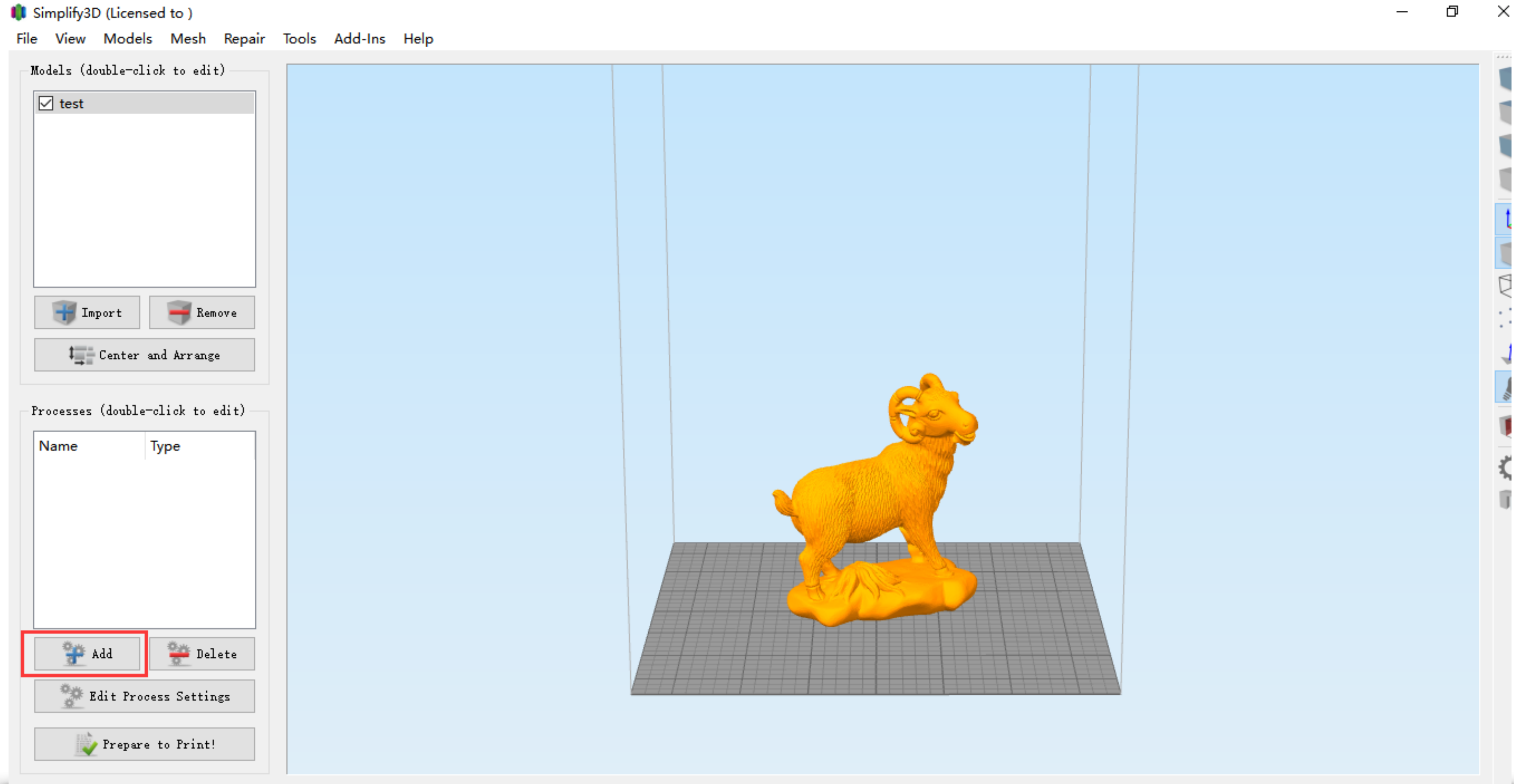


## Step 2: Configure firmware

Since there is no software fan control, use “;” to disable to corresponding commands, remember to click Save when finish.



# Step 3: Add a new Print Profile (FFF), or load existing profile.



# Step 4: Profile Configuration

Extrusion multiplier is recommend to set to 20.

Other extrusion related parameter should also multiply 20, eg. retraction.

The screenshot shows the 'FFF Settings' dialog box. At the top, 'Process Name' is 'Process1' and 'Select Profile' is 'mini2.fff'. Under 'Auto-Configure for Material', 'PLA' is selected and highlighted with a red box. Under 'Auto-Configure for Print Quality', 'Medium' is selected. In the 'General Settings' section, 'Infill Percentage' is set to 10%, and both 'Include Raft' and 'Generate Support' are checked. The 'Extruder' tab is active, showing an 'Extruder List' with 'Primary Extruder' selected. The 'Primary Extruder Toolhead' section has 'Extrusion Multiplier' set to 20.00, which is also highlighted with a red box. Other settings include 'Nozzle Diameter' at 0.40 mm, 'Extrusion Width' set to 'Manual' at 0.40 mm, and 'Ooze Control' settings: 'Retraction' (checked) with distance 1.00 mm, 'Coast at End' (unchecked) with distance 0.20 mm, and 'Wipe Nozzle' (checked) with distance 5.00 mm. At the bottom, there are buttons for 'Hide Advanced', 'Select Models', 'OK', and 'Cancel'.

FFF Settings

Process Name: Process1

Select Profile: mini2.fff [Import] [Remove] [Export]

Auto-Configure for Material: ☒ PLA ☐ ABS ☐ PVA ☐ Nylon

Auto-Configure for Print Quality: ☐ Fast ☒ Medium ☐ High

General Settings

Infill Percentage: 10% [Include Raft] [Generate Support]

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts 0

Extruder List (click item to edit settings)

Primary Extruder

Primary Extruder Toolhead

Overview

Extruder Toolhead Index: Tool 0

Nozzle Diameter: 0.40 mm

Extrusion Multiplier: 20.00

Extrusion Width: ☐ Auto ☒ Manual 0.40 mm

Ooze Control

☒ Retraction Retraction Distance: 1.00 mm

Extra Restart Distance: 0.00 mm

Retraction Vertical Lift: 0.00 mm

Retraction Speed: 1800.0 mm/min

☐ Coast at End Coasting Distance: 0.20 mm

☒ Wipe Nozzle Wipe Distance: 5.00 mm

[Add Extruder] [Remove Extruder]

[Hide Advanced] [Select Models] [OK] [Cancel]



# Step 5: Configure Printer

Use UP mini2 as an example:  
Go to G-code section and use  
the configuration shown in  
right.

Please note that the Origin  
Offset of Z axis should be  
equal to the nozzle height  
value measured from UP  
Studio, and you may still need  
to adjust this value to obtain  
the optimized first layer  
adhesion.

## UP Plus 2 Configuration

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material: ☒ PLA ☐ ABS ☐ PVA ☐ Nylon

Auto-Configure for Print Quality: ☐ Fast ☒ Medium ☐ High

General Settings

Infill Percentage:  10% ☒ Include Raft ☒ Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Other Advanced

G-Code Options

- ☒ 5D firmware (include E-dimension)
- ☐ Relative extrusion distances
- ☒ Allow zeroing of extrusion distances (i.e. G92 E0)
- ☐ Use independent extruder axes
- ☐ Include M101/M102/M103 commands
- ☒ Firmware supports "sticky" parameters

G-Code Offsets

	X-Axis	Y-Axis	Z-Axis
Offset	<input type="text" value="0.00"/> mm	<input type="text" value="0.00"/> mm	<input type="text" value="0.00"/> mm

Update Machine Definition

☒ Update Machine Definition using settings below

*This is a convenient way to update your machine definition along with your FFF profile. It is especially useful if you are constantly switching between different printers.*

Machine type:

	X-Axis	Y-Axis	Z-Axis
Build volume	<input type="text" value="120.0"/> mm	<input type="text" value="120.0"/> mm	<input type="text" value="120.0"/> mm
Origin offset	<input type="text" value="120.0"/> mm	<input type="text" value="0.0"/> mm	<input type="text" value="123.7"/> mm
Homing dir	<input type="text" value="Max"/>	<input type="text" value="Min"/>	<input type="text" value="Min"/>
Flip build table axis	<input type="checkbox"/> X	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> Z

OK Cancel

# UP Plus 2 Configuration

FFF Settings

Process Name: Process1

Select Profile: **up2.fff** Import Remove Export

Auto-Configure for Material: ☒ PLA ☐ ABS ☐ PVA ☐ Nylon

Auto-Configure for Print Quality: ☐ Fast ☒ Medium ☐ High

General Settings

Infill Percentage: 10% ☐ Include Raft ☒ Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Other Advanced

G-Code Options

- ☒ 5D firmware (include E-dimension)
- ☐ Relative extrusion distances
- ☒ Allow zeroing of extrusion distances (i.e. G92 E0)
- ☐ Use independent extruder axes
- ☐ Include M101/M102/M103 commands
- ☒ Firmware supports "sticky" parameters

G-Code Offsets

	X-Axis	Y-Axis	Z-Axis
Offset	0.00 mm	0.00 mm	0.00 mm

Update Machine Definition

☒ Update Machine Definition using settings below

*This is a convenient way to update your machine definition along with your PPP profile. It is especially useful if you are constantly switching between different printers.*

Machine type: Cartesian robot (rectangular volume)

	X-Axis	Y-Axis	Z-Axis
Build volume	140.0 mm	140.0 mm	140.0 mm
Origin offset	140.0 mm	0.0 mm	133.0 mm
Homing dir	Min	Min	Min
Flip build table axis	<input type="checkbox"/> X	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> Z

Hide Advanced Select Models OK Cancel

# UP BOX/UP BOX+ Configuration

FFF Settings

Process Name: Process1

Select Profile: **box (box+) .fff** Import Remove Export

Auto-Configure for Material: ☐ PLA ☒ ABS ☐ Nylon ☐ PET ☐ TPE

General Settings

Infill Percentage: 10% ☐ Include Raft ☒ Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Other Advanced

G-Code Options

- ☒ 5D firmware (include E-dimension)
- ☐ Relative extrusion distances
- ☒ Allow zeroing of extrusion distances (i.e. G92 E0)
- ☐ Use independent extruder axes
- ☐ Include M101/M102/M103 commands
- ☒ Firmware supports "sticky" parameters

G-Code Offsets

	X-Axis	Y-Axis	Z-Axis
Offset	0.00 mm	0.00 mm	0.00 mm

Update Machine Definition

☒ Update Machine Definition using settings below

*This is a convenient way to update your machine definition along with your PPP profile. It is especially useful if you are constantly switching between different printers.*

Machine type: Cartesian robot (rectangular volume)

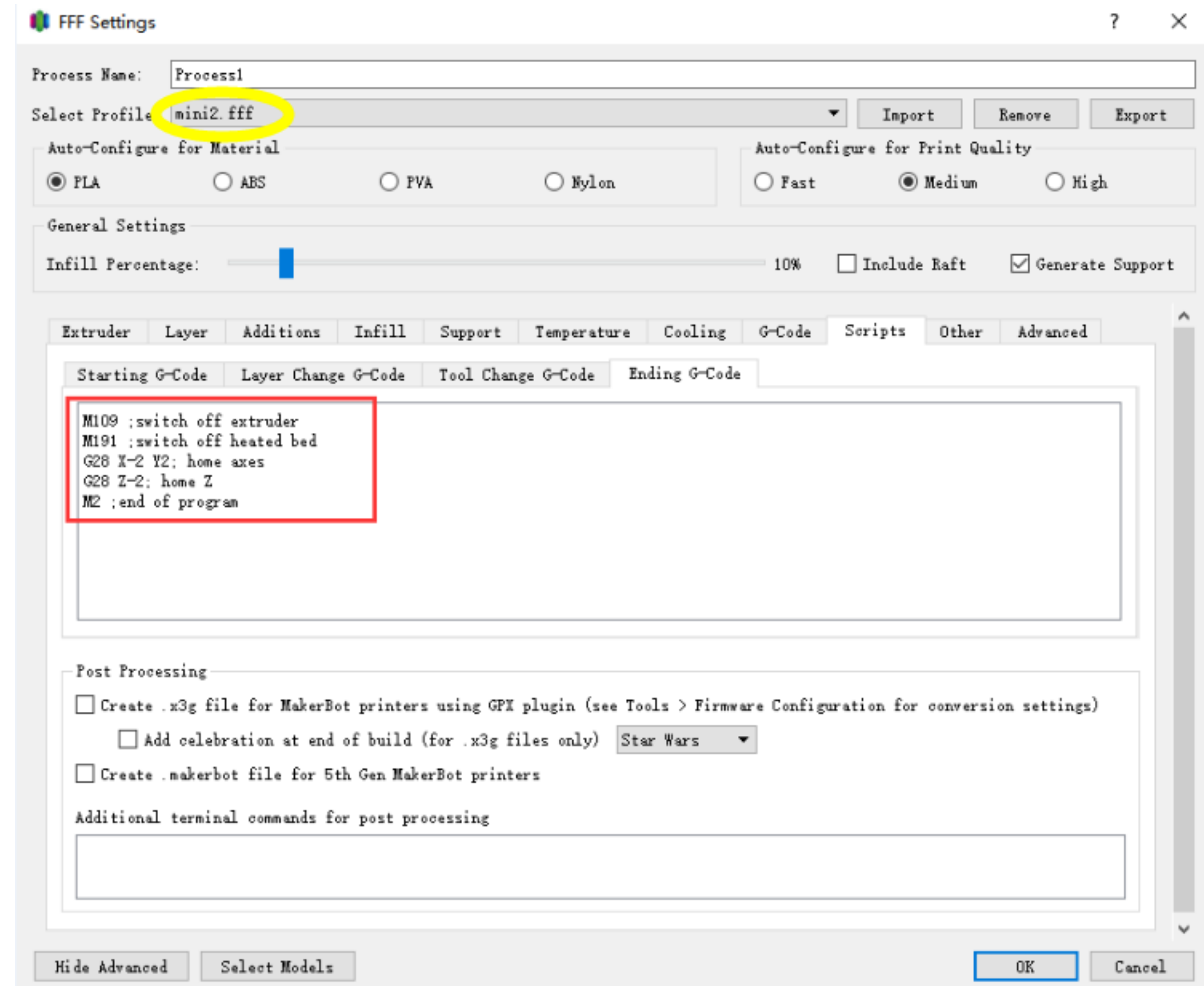
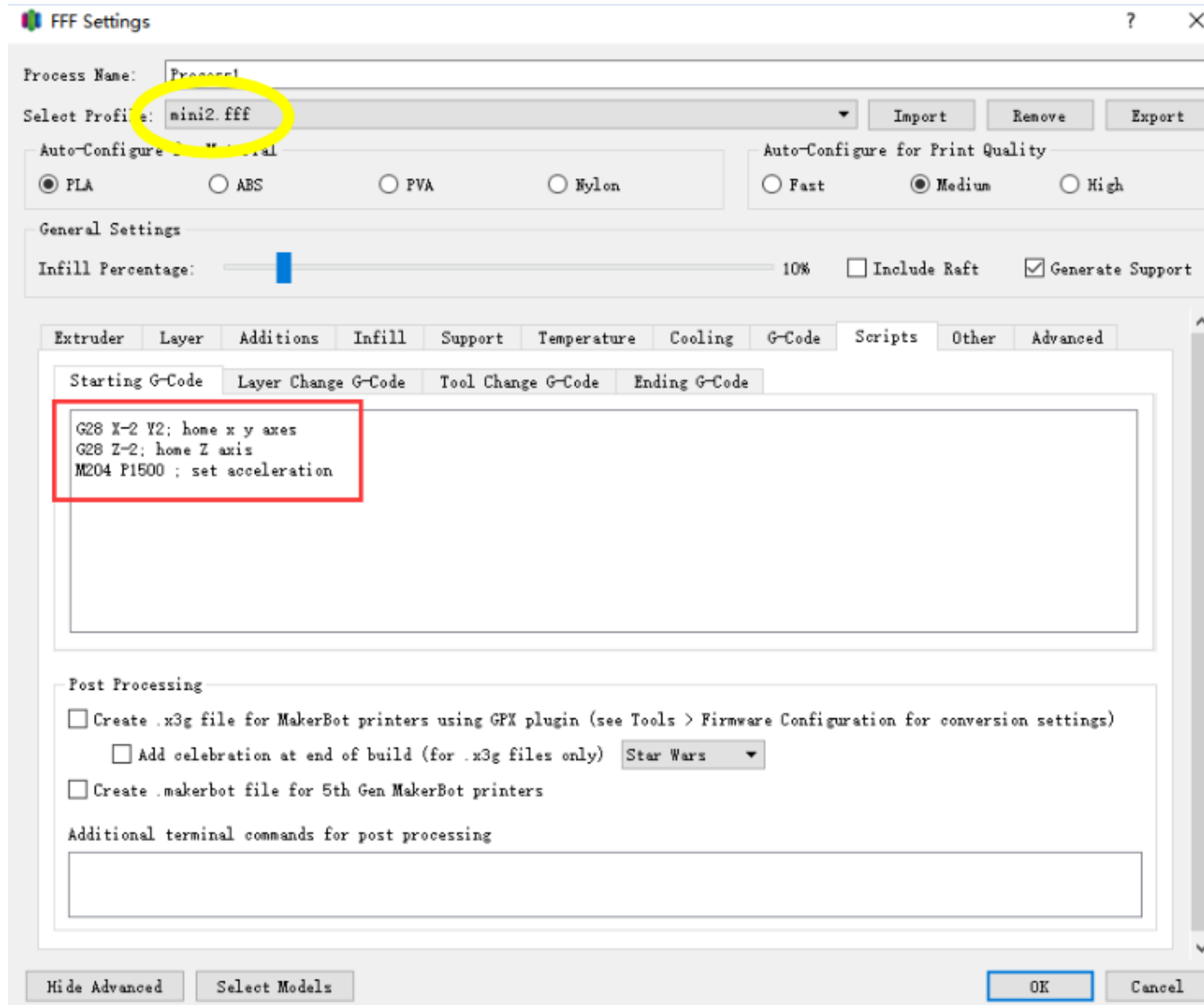
	X-Axis	Y-Axis	Z-Axis
Build volume	205.0 mm	255.0 mm	205.0 mm
Origin offset	6.0 mm	258.0 mm	207.8 mm
Homing dir	Min	Min	Min
Flip build table axis	<input type="checkbox"/> X	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> Z

Hide Advanced Select Models OK Cancel

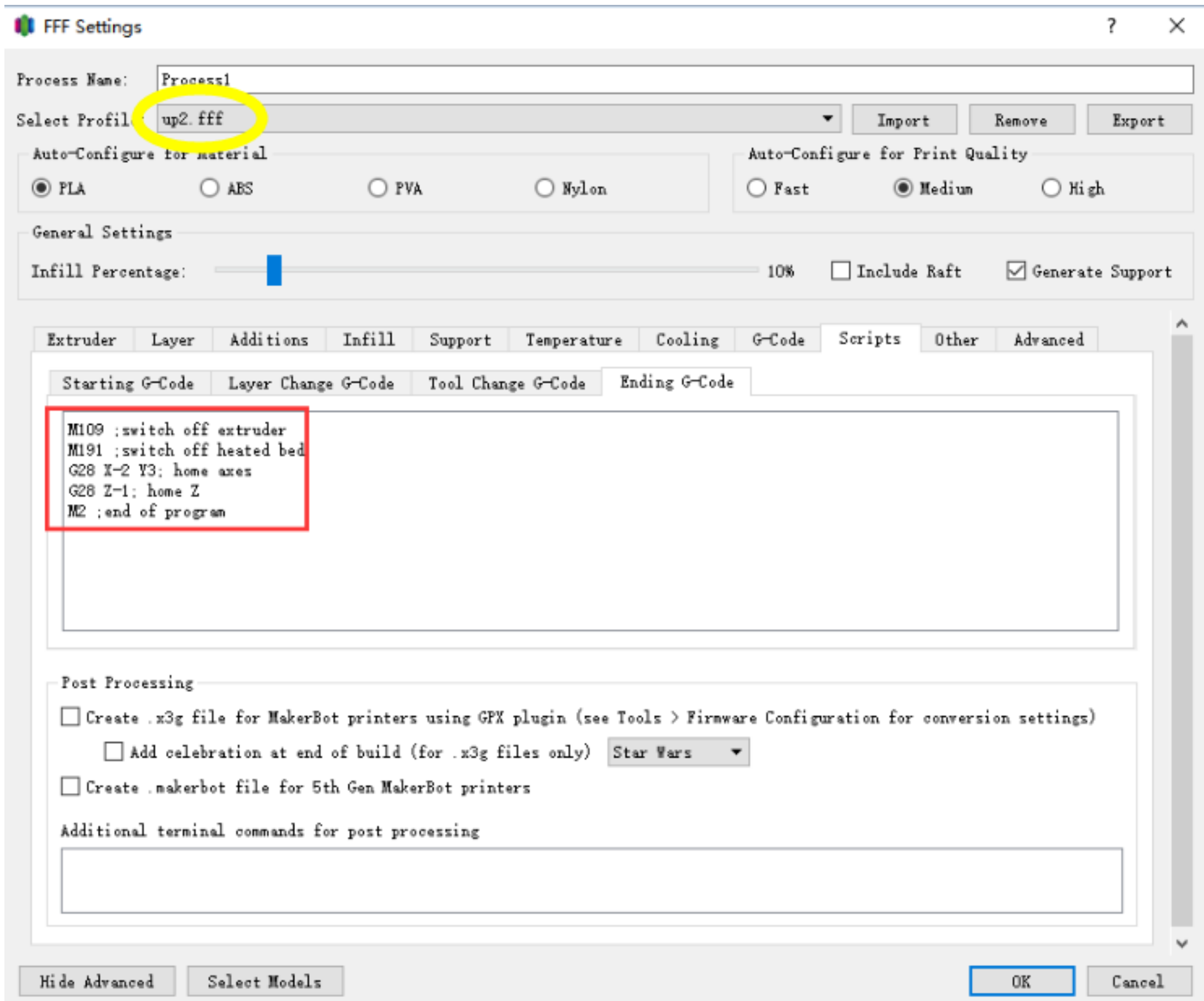
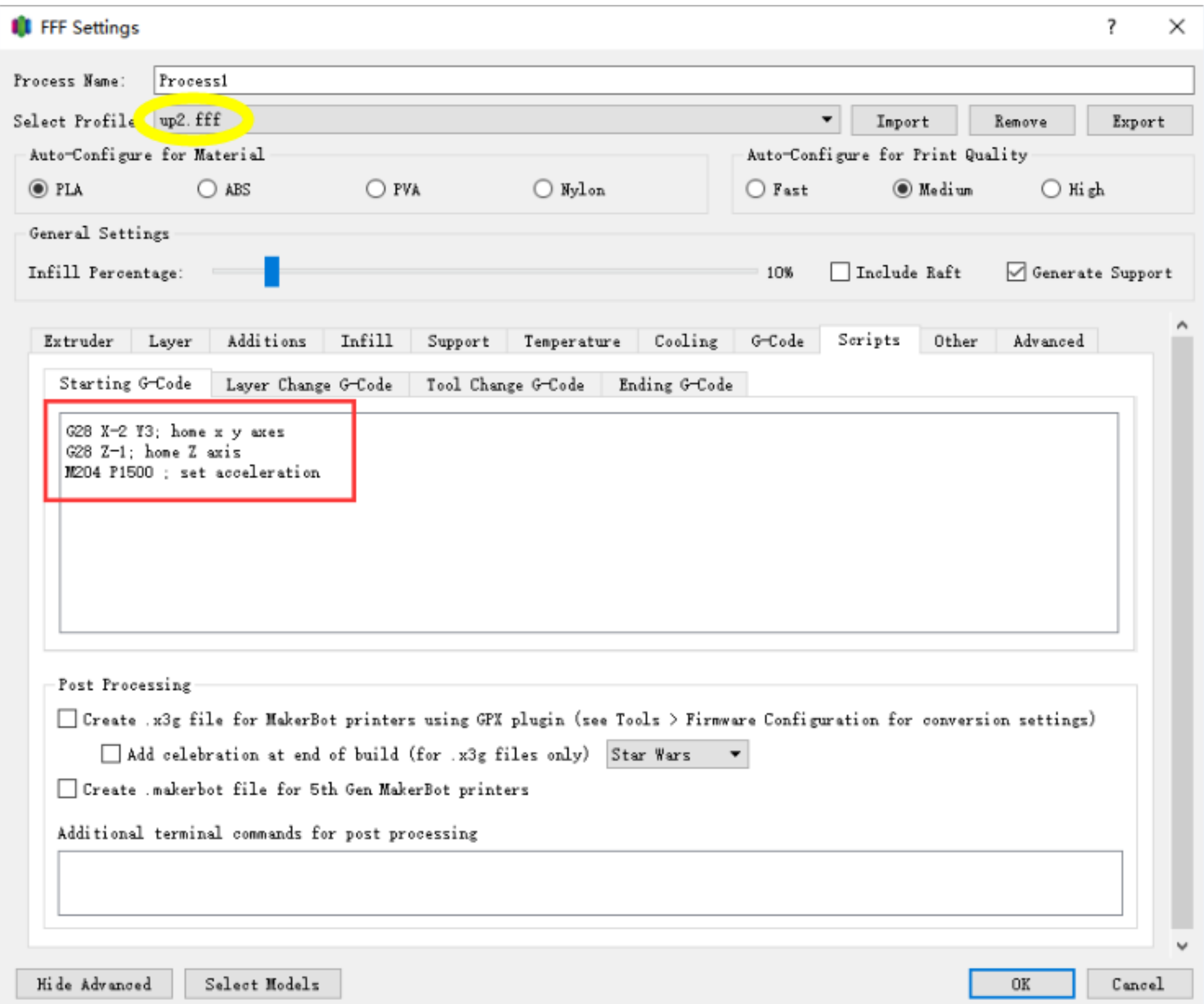


# Step 6: Set Starting and Ending G-code

## Starting and Ending G-code for UP mini 2:



# Starting and Ending G-code for UP Plus 2:



# Starting and Ending G-code for UP BOX/UP BOX+:

FFF Settings

Process Name:

Select Profile: box (box+) .fff Import Remove Export

Auto-Configure for Material

☐ PLA ☒ ABS ☐ Nylon ☐ PET ☐ TPE

General Settings

Infill Percentage:  10% ☐ Include Raft ☒ Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Other Advanced

Starting G-Code Layer Change G-Code Tool Change G-Code Ending G-Code

G28 Z-27; home Z axis  
G28 X2 Y-2; home x y axes  
M204 P1500 ; set acceleration

Post Processing

☐ Create .x3g file for MakerBot printers using GPX plugin (see Tools > Firmware Configuration for conversion settings)  
☐ Add celebration at end of build (for .x3g files only) Star Wars

☐ Create .makerbot file for 5th Gen MakerBot printers

Additional terminal commands for post processing

Hide Advanced Select Models OK Cancel

FFF Settings

Process Name:

Select Profile: box (box+) .fff Import Remove Export

Auto-Configure for Material

☐ PLA ☒ ABS ☐ Nylon ☐ PET ☐ TPE

General Settings

Infill Percentage:  10% ☐ Include Raft ☒ Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Other Advanced

Starting G-Code Layer Change G-Code Tool Change G-Code Ending G-Code

M109 ;switch off extruder  
M191 ;switch off heated bed  
G28 X-2 Y2; home axes  
G28 Z-2; home Z  
M2 ;end of program

Post Processing

☐ Create .x3g file for MakerBot printers using GPX plugin (see Tools > Firmware Configuration for conversion settings)  
☐ Add celebration at end of build (for .x3g files only) Star Wars

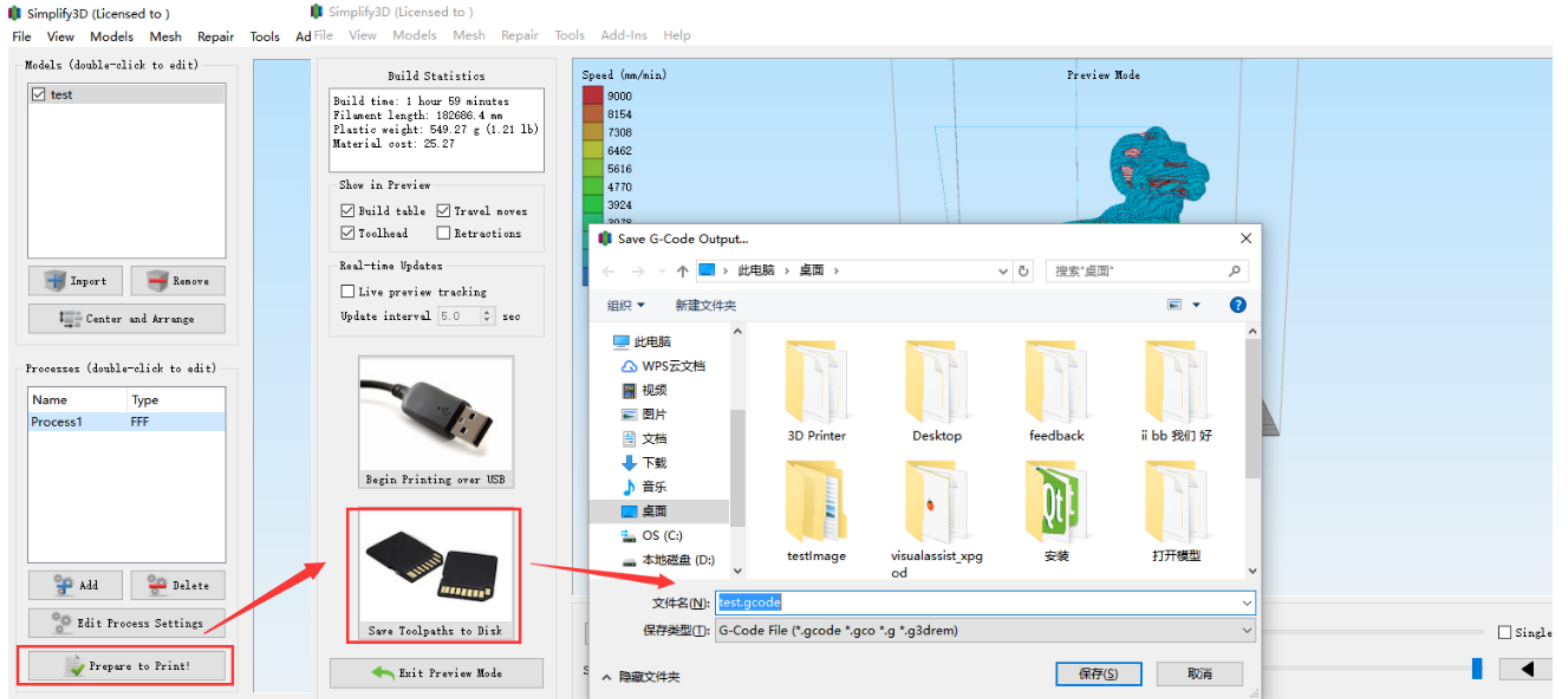
☐ Create .makerbot file for 5th Gen MakerBot printers

Additional terminal commands for post processing

Hide Advanced Select Models OK Cancel



# Step 7: Generate G-Code



# Step 8: Add G-code into UP Studio

