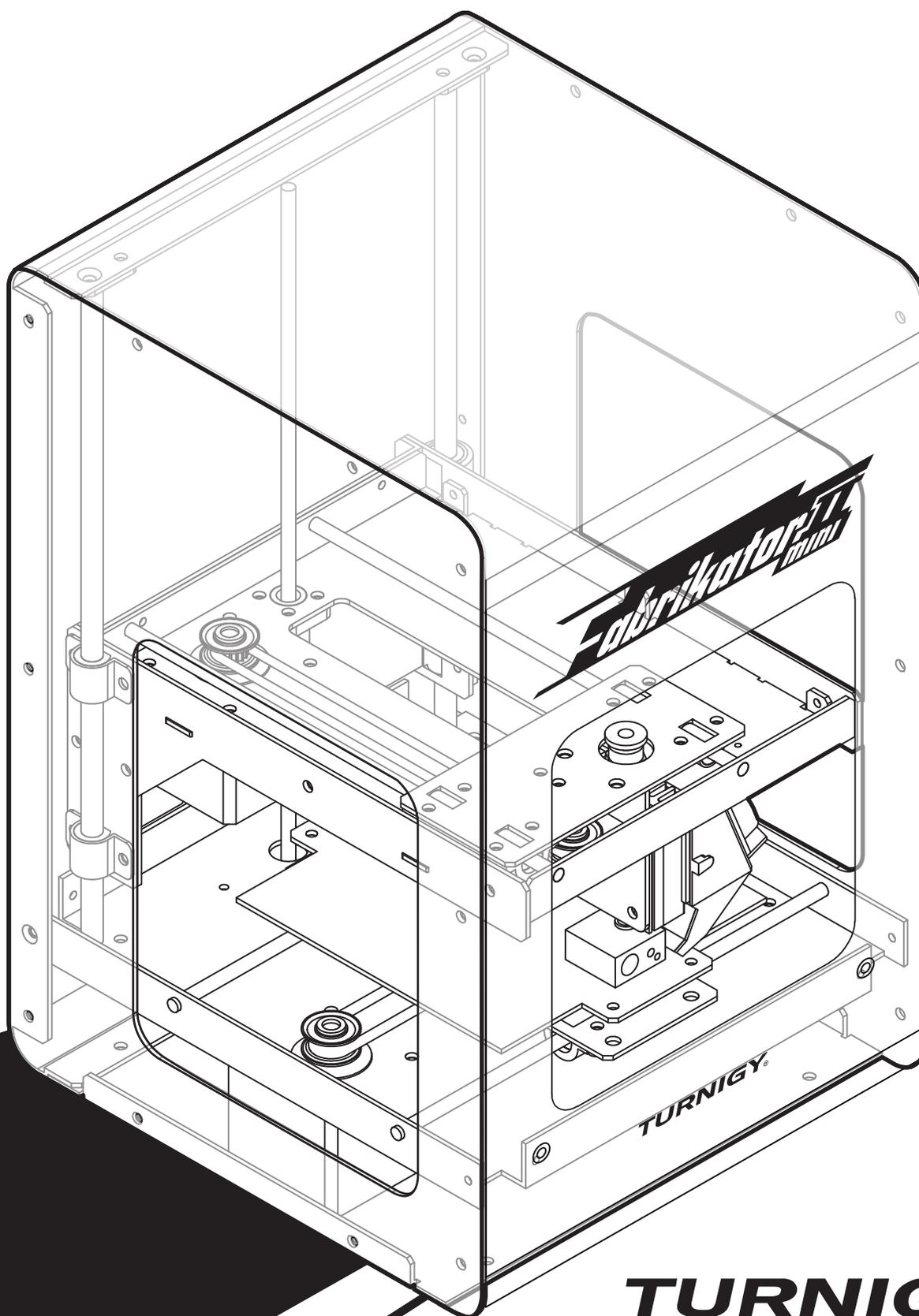


Fabrikator *mini*

INSTRUCTION MANUAL



TURNIGY®

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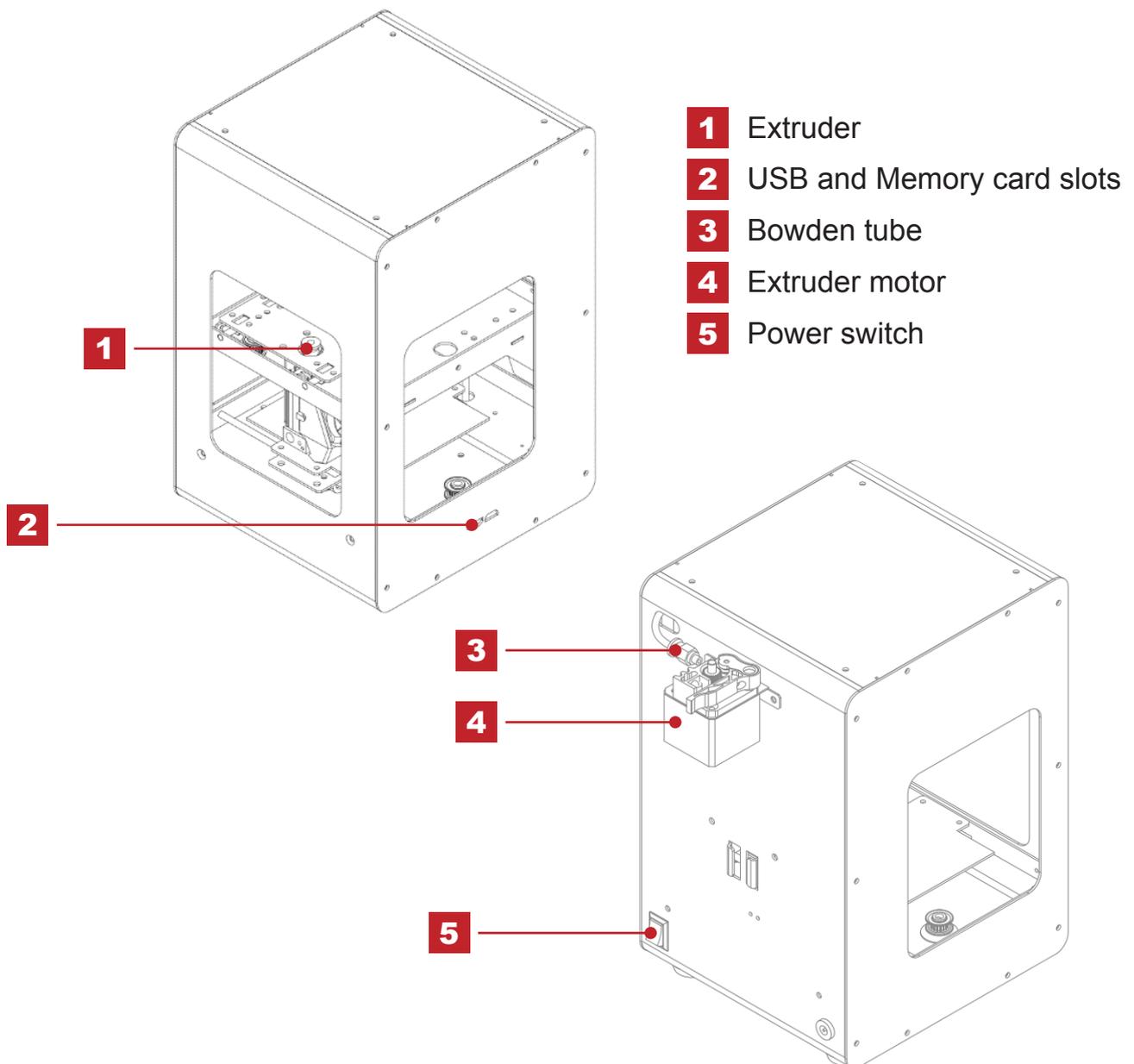
A. PRECAUTIONS

1. Do not remove the print surface from the platform, it is a special tape that allows the first layer of your print to adhere to the print bed.
2. Do not remove the tape or insulation from the nozzle, it is for maintaining nozzle temperature.
3. Use this printer using the correct voltage input and follow all local laws.
4. Beware the heat blocks, nozzles, extruded filament and heating plate can be extremely hot and will burn your skin if you are not careful.
5. Do not wear gloves when operating or repairing to avoid entanglement.
6. Do not leave the machine unattended when it is in operation.
7. At the end of its life please dispose of your 3D printer responsibly.
8. Do not load unsupported filament.
9. Keep your 3D printer and all accessories out of children's reach.
10. When printing via USB, keep a stable connection between the PC and the printer.
11. Do not move the extruder during printing.
12. Do not pull or twist the power cable during operation.
13. Do not force or tear anything during unpacking and setup. This may damage the printer.
14. WARNING
 - a) Never reach inside while it is in operation. Always allow it to cool down before reaching inside.
 - b) If opening the printer for service, ensure that the power supply is turned off and the cord is disconnected.
15. CAUTION
 - a) Please take your time and be careful while unpacking and setting up your 3D printer; there are many components that can be damaged if it is not set up or handled correctly.

B. CHECKLIST

3D Printer	1
Micro USB cable	1
Micro Memory card	1
Power adapter	1
Power line	1
Plastic scraper	1

C. COMPONENT DIAGRAM



D. SPECIFICATIONS

Product	FDM Desktop 3D Printer
Usage	Rapid Prototyping, print 3D models, samples, parts, toys...
Construction	Aluminum
Extruder	Single
Nozzle diameter	0.4 mm (0.015 in)
Positioning Precision	XY 11 microns (0.0004 in), Z 2.5 micron (0.0001 in)
Layer Resolution	100 micron (0.0039 in)
Input Power	100-240V, Max:80W
Nozzle heating	Max 250°C
Filaments	1.75mm diameter PLA
Interface	Memory card, USB and wireless network
Build Surface	Heating bed with PEI coating
Supported File	STL, OBJ/G-Code
OS	Windows10, Mac OS X, Linux
Certificate	CE, ROHS, FCC,ISO 9001:2008
Warranty	6 months
Product Dimension	About 17.2x18.3x27 cm
Build Volume	100x100x100 mm
Shipping Box	About 220x220x320 mm

E. HARDWARE INSTALLATION

1. Connect the power line and the Micro USB line.

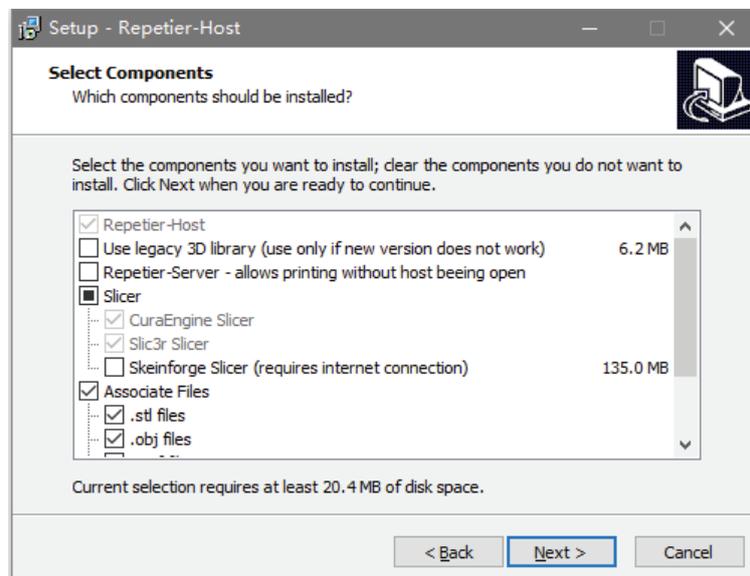


F. SETTING UP

Software installation on PC

1. Installation

To get started you will need a PC or laptop with an SD card reader, that is turned on and in proximity to your Mini Fabrikator V2 3D printer. You will also need access to mains power to connect to the printer's power supply. Included in the provided SD memory card you will find the Repetier installation package, this is a slicer tool that you use to convert your 3D files to the commands the printer needs to make your objects, it is also one of the interfaces you can use to set up your printing parameters such as temperatures and movements, please open this file and follow the steps below to install this software.

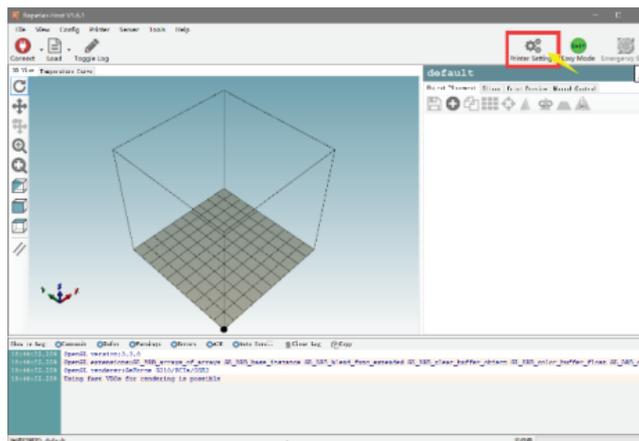


After the installation is complete, click Finish to run the software.

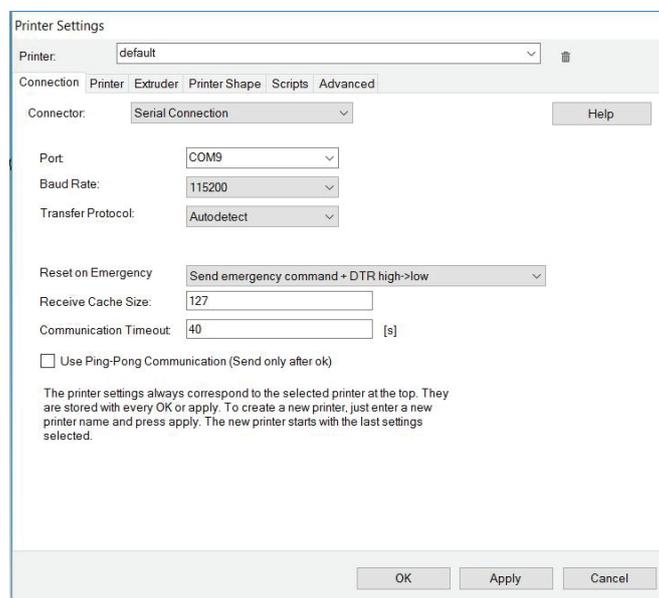


2. Set print parameters

After running the software you can begin to adjust the parameters of the software to suit to the Mini Fabrikator V2 by clicking on the printer settings icon the top right corner of the window.



In the settings window, click on the “Connection” tab, please refer to the following settings to set the parameters.



Then click on the “Printer” tab and input the settings below:

Printer Settings

Printer: default

Connection Printer **Extruder** Printer Shape Scripts Advanced

Travel Feed Rate: 2000 [mm/min]

Z-Axis Feed Rate: 100 [mm/min]

Manual Extrusion Speed: 2 [mm/s] 20 [mm/s]

Manual Retraction Speed: 30 [mm/s]

Default Extruder Temperature: 190 °C

Default Heated Bed Temperature: 0 °C

Check Extruder & Bed Temperature

Remove temperature requests from Log

Check every 3 seconds.

Park Position: X: 0 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 Flip X and Y

OK Apply Cancel

Then click on the “Extruder” tab and input the settings below:

Printer Settings

Printer: default

Connection Printer **Extruder** Printer Shape Scripts Advanced

Number of Extruder: 1

Max. Extruder Temperature: 250

Max. Bed Temperature: 60

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

Finally click on the “Printer Shape” tab and input the settings below:

Printer Settings

Printer: default

Connection Printer Extruder **Printer Shape** Scripts Advanced

Printer Type: Classic Printer

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

X Min: 0 X Max: 100 Bed Left: 0

Y Min: 0 Y Max: 100 Bed Front: 0

Print Area Width: 100 mm

Print Area Depth: 100 mm

Print Area Height: 100 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

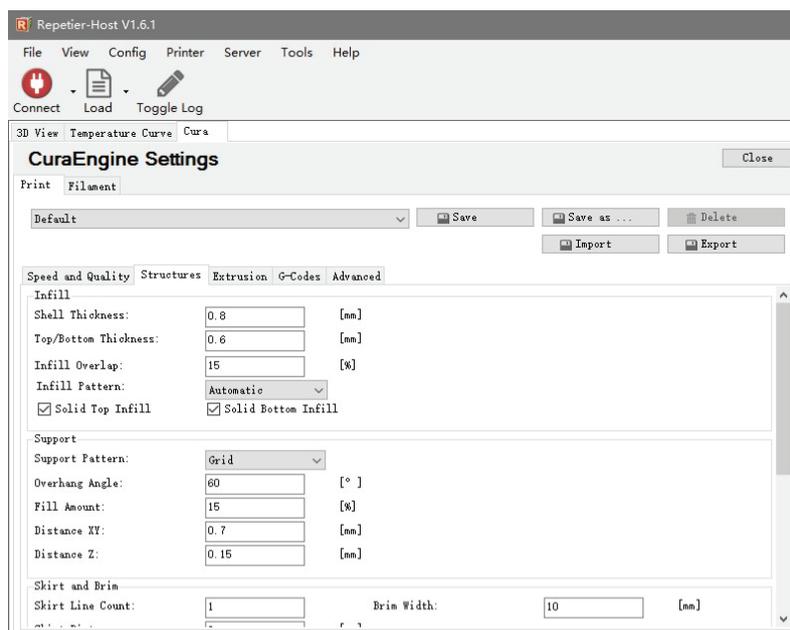
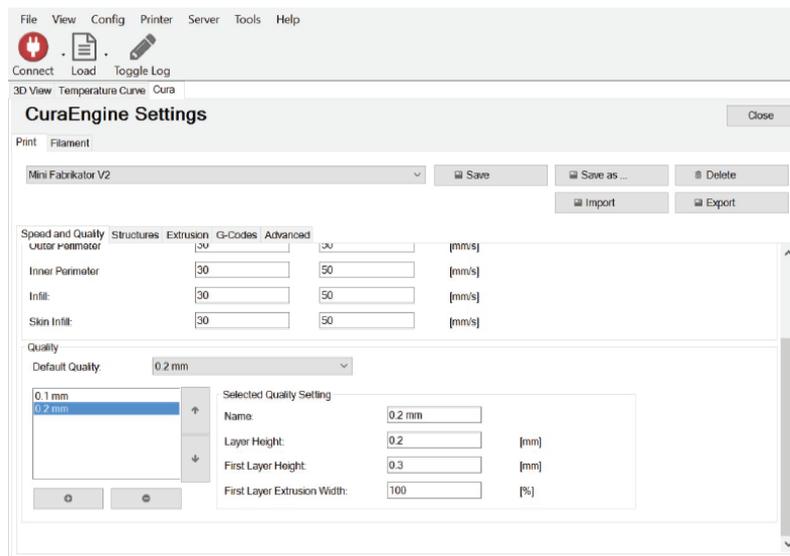
0

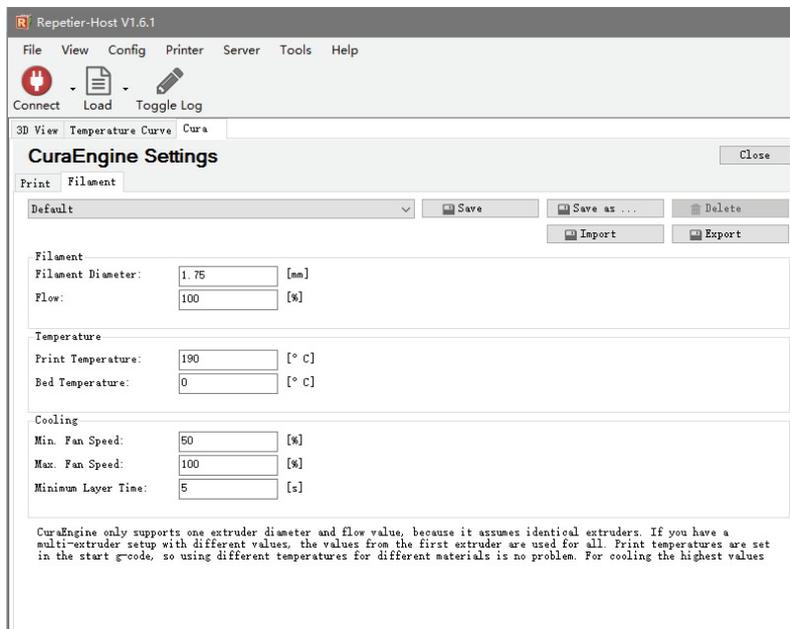
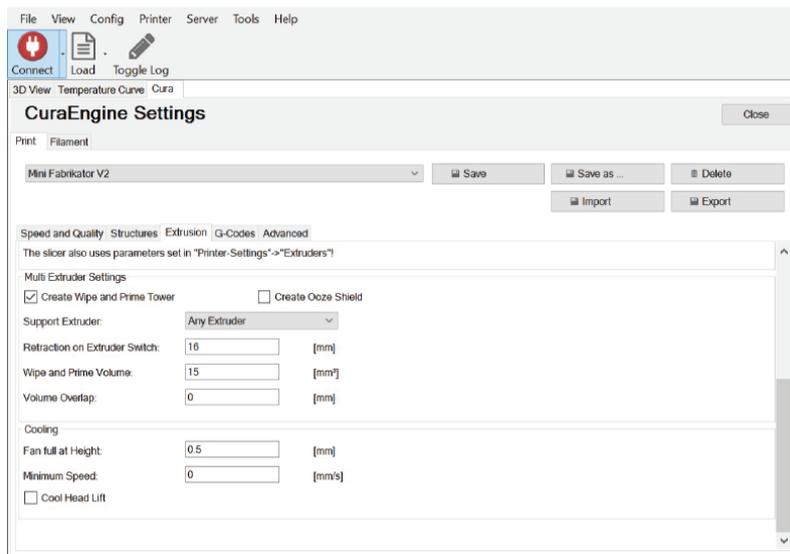
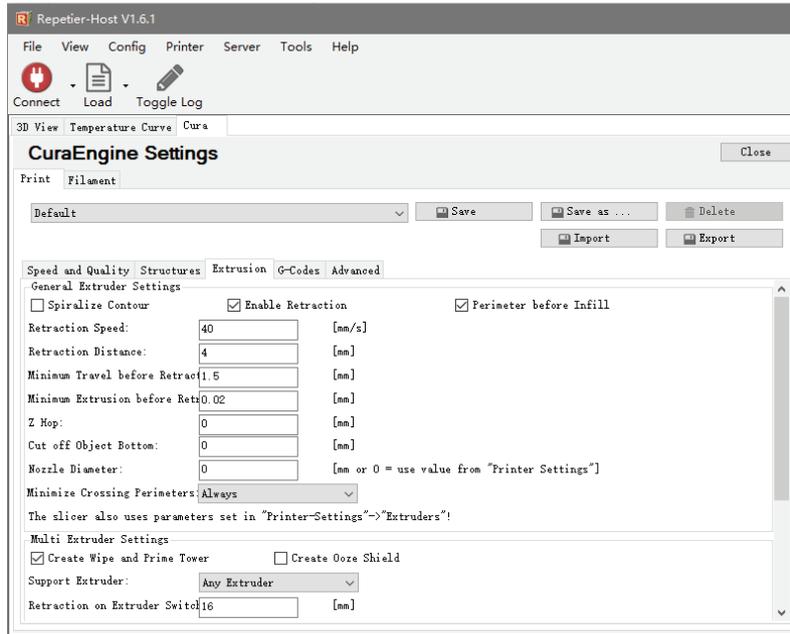
E

OK Apply Cancel

3. Set CuraEngine

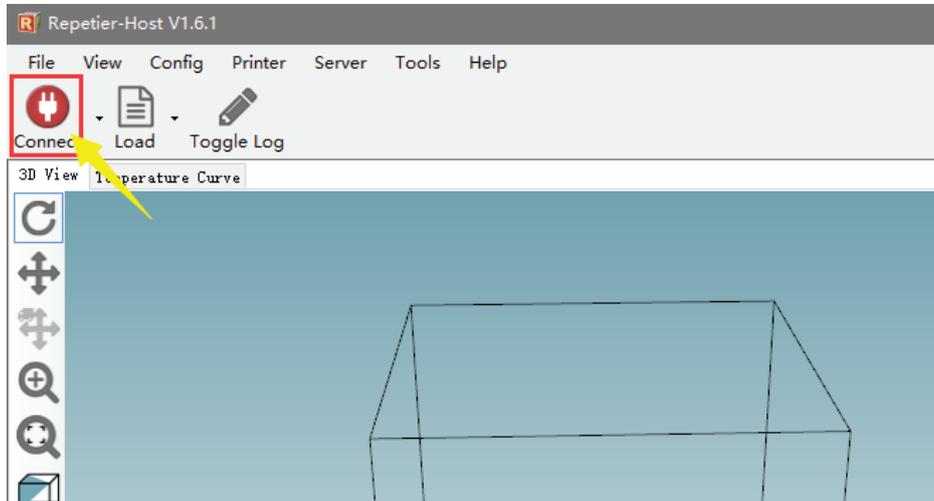
Now that the printer is set-up it is time to set up the slicer program that works with Repetier, there a few slicer engines to choose from we recommend Cura. To make things easier we made a pre-configured Mini Fabrikator V2 file that can just be imported. If you don't have access to this file you can quickly configure the Cura Slicer in the following steps. Let's head back to Repetier-Host program. Look along the top right and find the "Slicer" tab. Select the "CuraEngine" from the drop down. The screen should look like the diagram below. Click on the "Configuration" button so we can import the file we just downloaded. Following the data shown in the images below, fill in the data for each of the first 4 tabs then click Save. Double check these settings match those below and don't forget to click save.





4. Connect 3D printer

After setting up your parameters you can now connect to the Mini Fabrikator, click “Connect” to connect your 3D printer. When the connection is successful, the button will turn green.

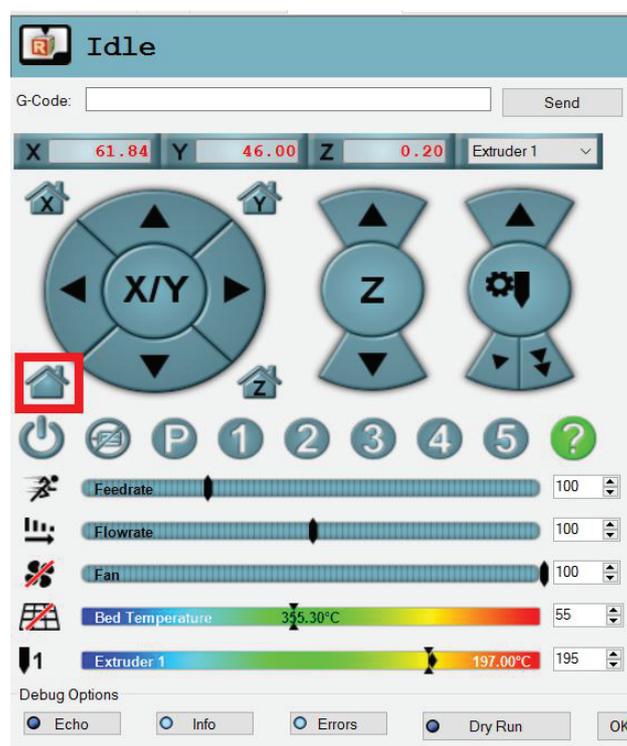


G. COMMISSIONING

1. Adjusting the build platform

The build platform has been adjusted before leaving the factory, but it may have moved during transport, it should be checked and calibrated before printing.

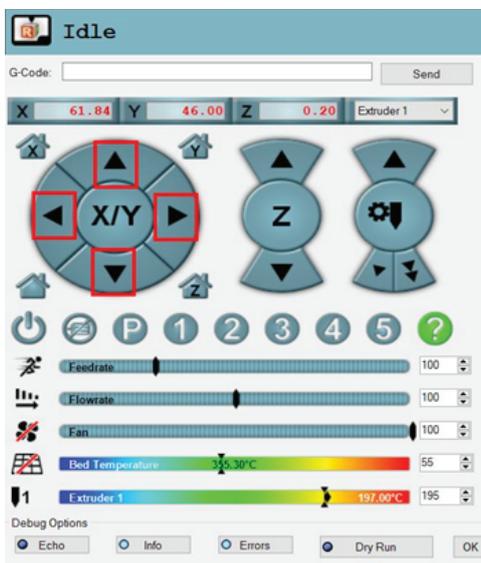
To calibrate the bed connect the printer to your PC and use the Manual Control in Repetier to return the print head to its home position:



Finally click on the “Printer Shape” tab and input the settings below:

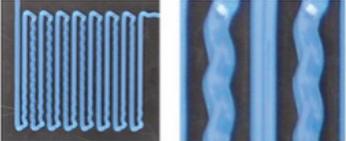
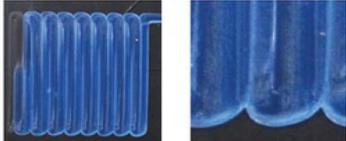


Using the X/Y axis buttons in the manual control move the print head to each corner (about 5mm from the edges) and adjust the bed height at each corner until the print head is very close to the printer platform, use a piece of ordinary A4 paper between the print head nozzle and the platform to set the gap. The paper should be able to slide with minimal resistance. If the paper is too tight, for instance there is a distinct indentation in the paper or you need to pull hard to move the paper, lower the bed using the adjustment screw. If it is too loose, for instance the paper moves with no resistance, raise the bed slightly.



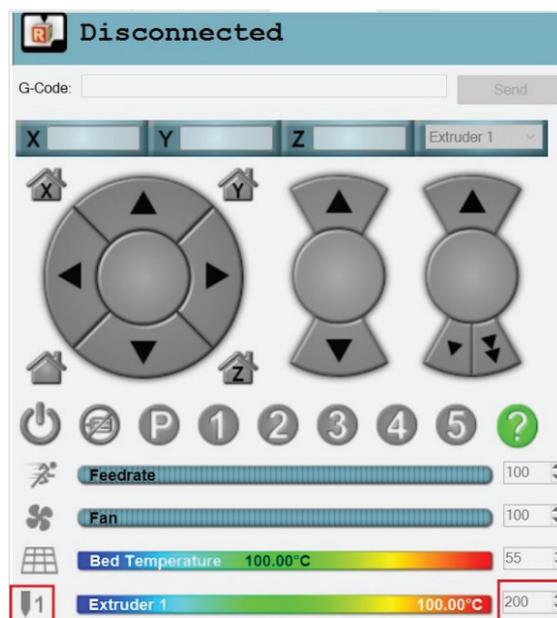
Why you need to calibrate the print bed:

- If the distance between heat bed and nozzle is too large prints may not stick to print bed correctly.
- If the nozzle is too close to the heat bed the printing surface may be damaged during printing.
- Leveling the base plate before printing helps to ensure the print object stick to the heating plate correctly.

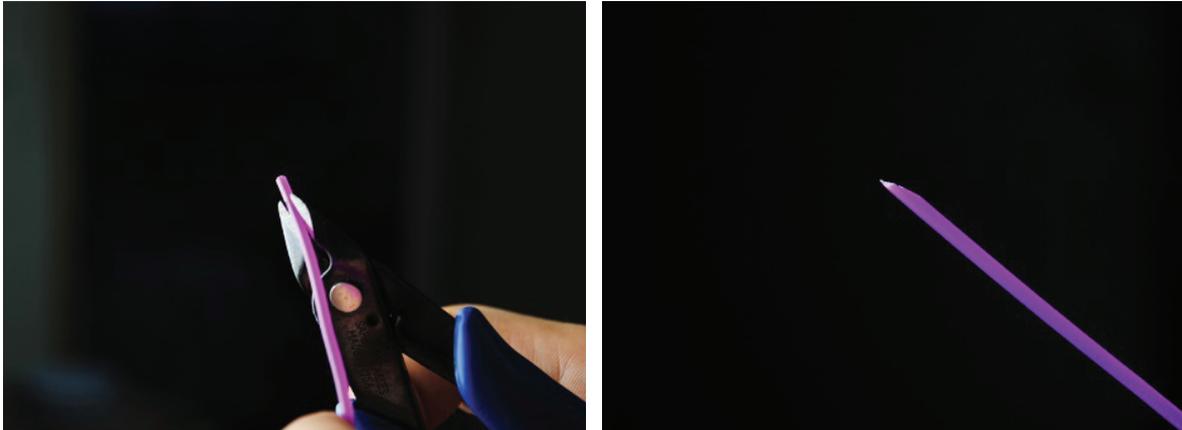
Wrong		Nozzle and platform too far, will lead to material out of the base plate in the printing process
Correct		Correct distance
Wrong		Nozzle and platform too close, will damage the nozzle and the base plate

3. Installing filament

Using the manual control in Repetier again, click on the extruder symbol in the bottom left hand corner so that it is no longer struck through and the adjust the temperature in the selection box to the right the correct temperature for the filament you are using. If you are using PLA set this to around 195°C or ABS around 210°C, this is not necessarily the temperature you will print at, it is simply to get the print nozzle hot enough to allow you to push the filament through.

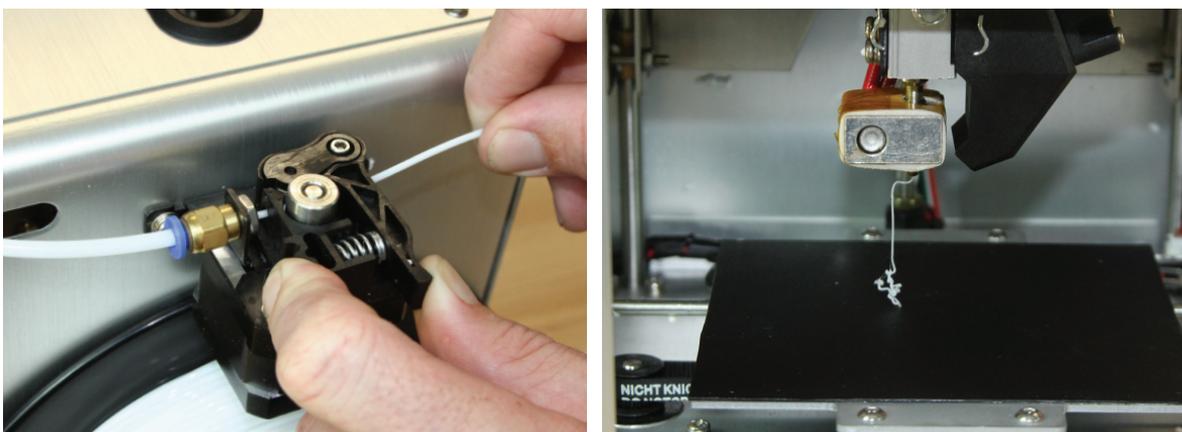


Now take the end of your filament and using sharp side cutters or a hobby knife snip the tip off at a sharp angle, this helps the filament slide through the feeder and print head easily.



To start loading use one hand to hold the charging handle and the other hand to push the filament through the Bowden tube connector and along the Bowden tube until you feel a slight resistance, this means you have reached the extruder where the path narrows and the filament now needs to be pushed a little harder to get through this. It is important that you do this next step in a single forward motion and that you don't pull the filament back at any stage as this can cause the filament to form a plug which will block the extruder. You will notice that the filament becomes slightly easier to push through and a thin stream of filament will begin to be extruded from the print nozzle, the extruder is now charged and ready to print.

Tip: To make it easier to thread the filament you can disconnect the Bowden tube and pull through some filament slack so you don't have to hold charge handle while pushing the filament through extruder. Once you have the extruder charged, hold the charge handle and push the extra filament back towards the roll until you can reconnect the Bowden tube.



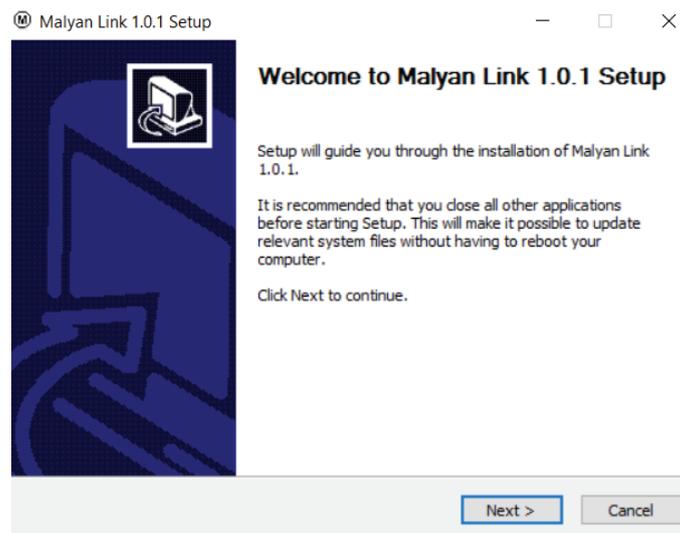
Tip: When removing the filament you can use the same method in reverse, but just make sure before you pull the filament back that you push it forward first so that some filament is extruded and then pull back gently, but quickly to disengage the filament from the extruder.

NOTE: The extruder cooling fan will come on anytime the extruder is above 50°C and will turn off automatically when the extruder cools below 50°C, it is very important you let the fan cool the extruder before removing power or this could cause the extruder to jam or clog next time you use it.

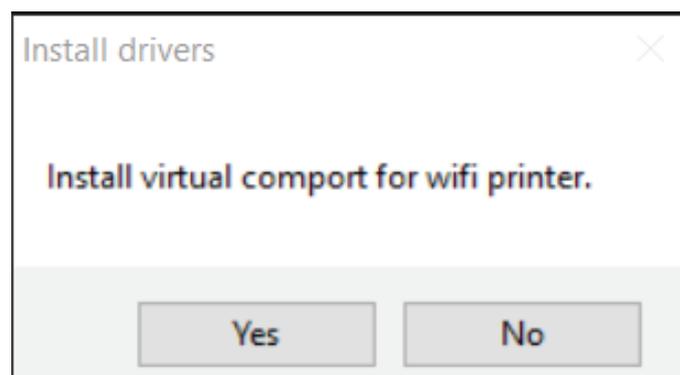
H. WIRELESS NETWORK FUNCTION

1. Installation

In the Memory card you will find the Malyan Link installation package, please follow the prompts to install this software.

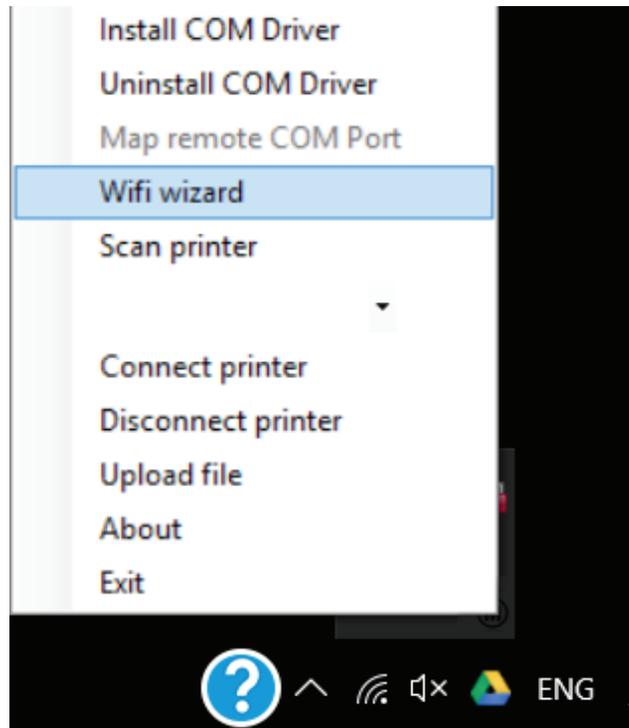


Once installation is complete Click Yes to install Virtual comport

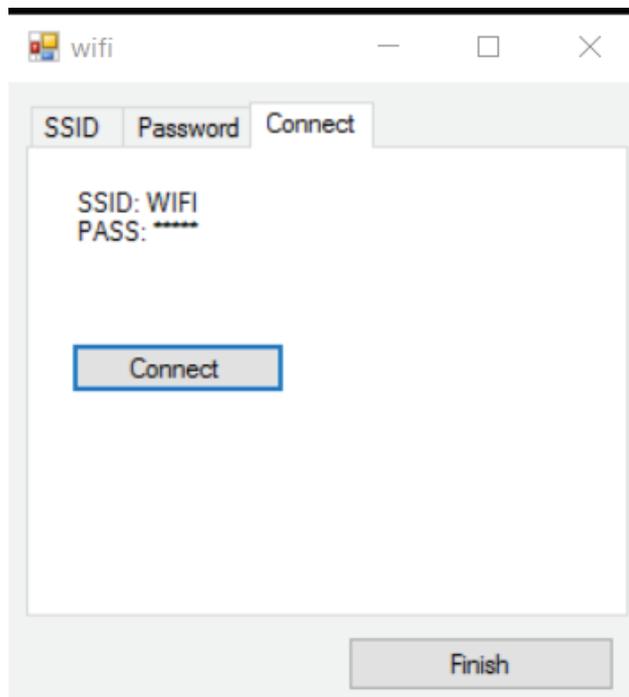


2. Setting Up

Connect the printer to the PC using USB to complete the WIFI setup. Right click on Malayan link icon in the task bar and select WIFI Wizard.



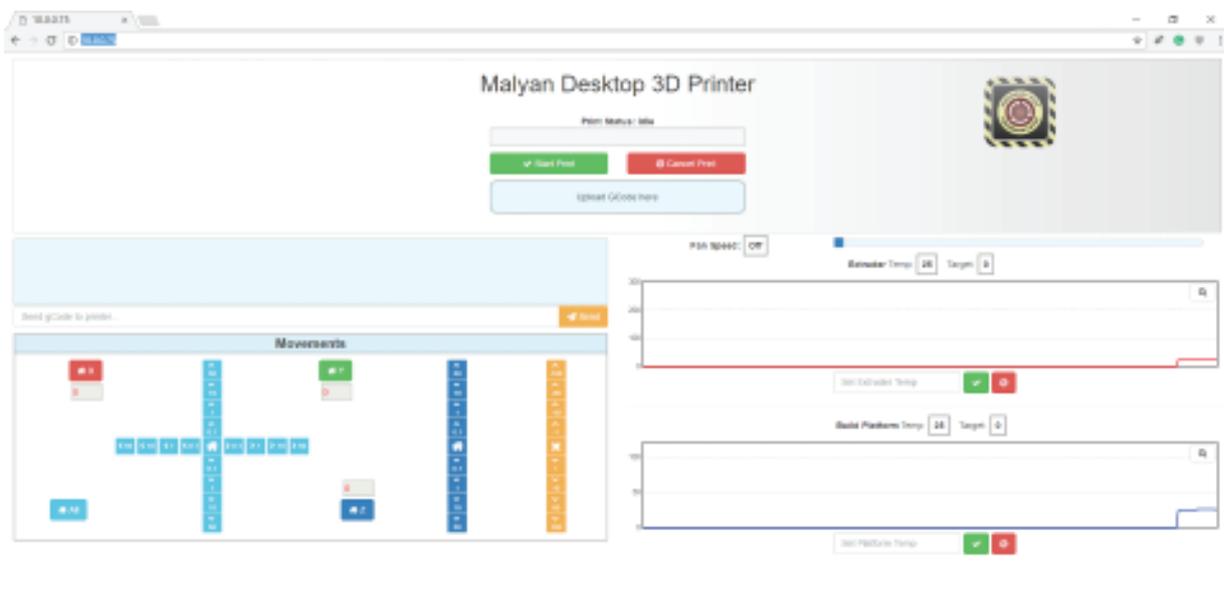
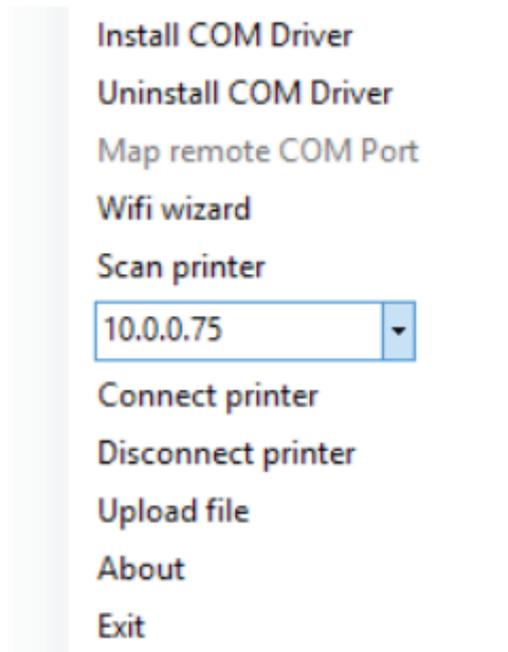
Enter the SSID and password for your WIFI router then click connect



Disconnect the printer from the USB once prompted and click finish. The printer will now connect to the WIFI router and be available as a virtual comport (COM100) in Repetier.

3. Web Browser Interface

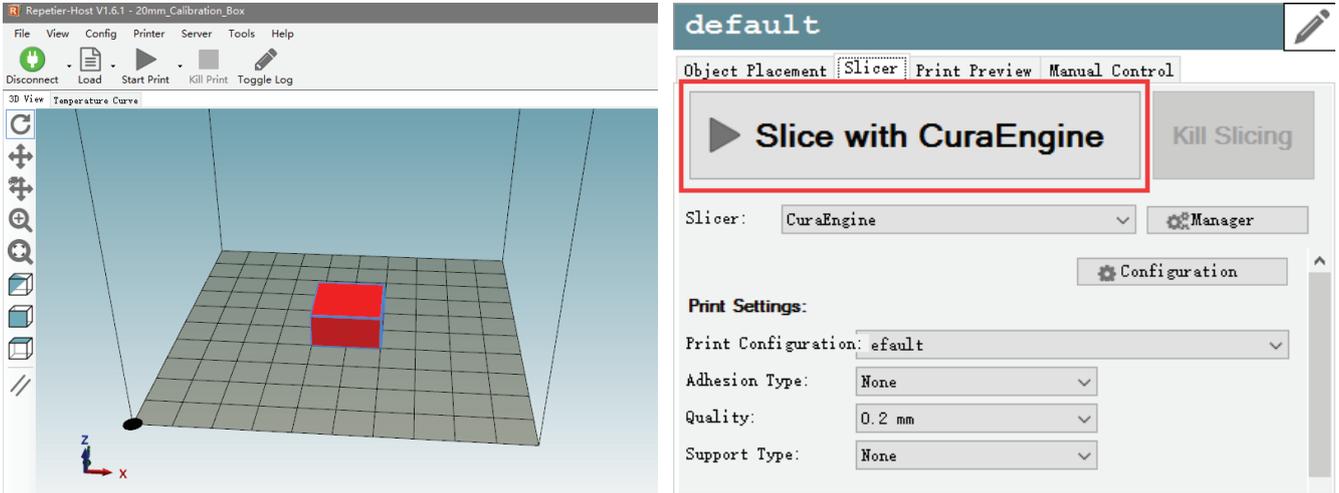
The printer also supports control through the web interface. Please note the IP address of the printer using the Malyan link software. Entering this IP address in your web browser will allow the printer to be controlled through the web interface. Note this IP address is not always the same so check it by right clicking the Malyan Link icon.



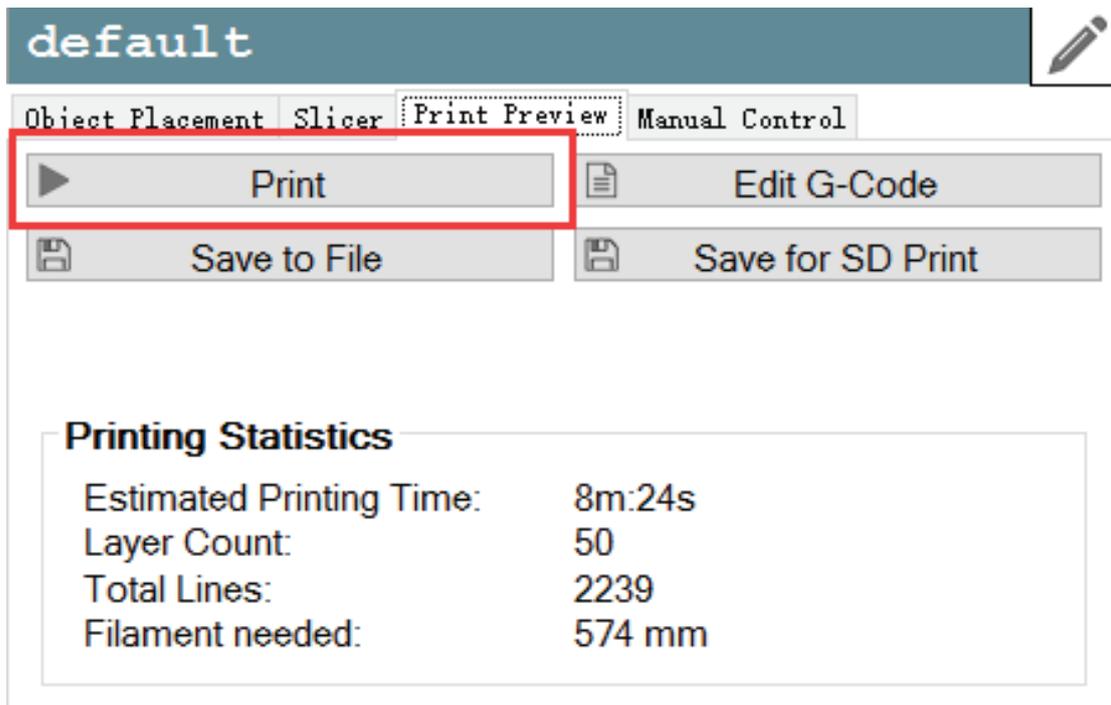
I. Printing

1. PC printing

After connecting your PC, load the STL or G Code documents and slice with Cura engine.

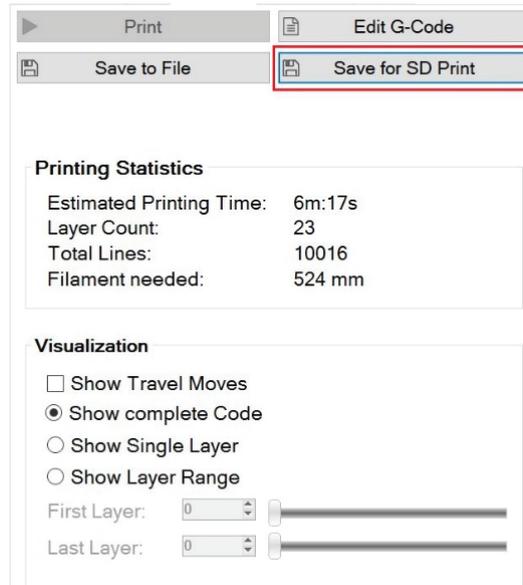


After slicing is completed, you can click “Print” and your project will start printing over the USB cable.

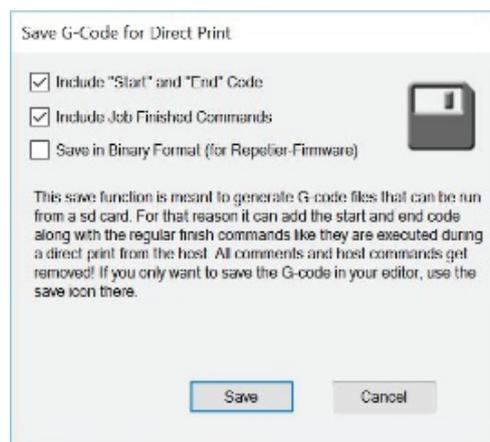


2. Memory card printing

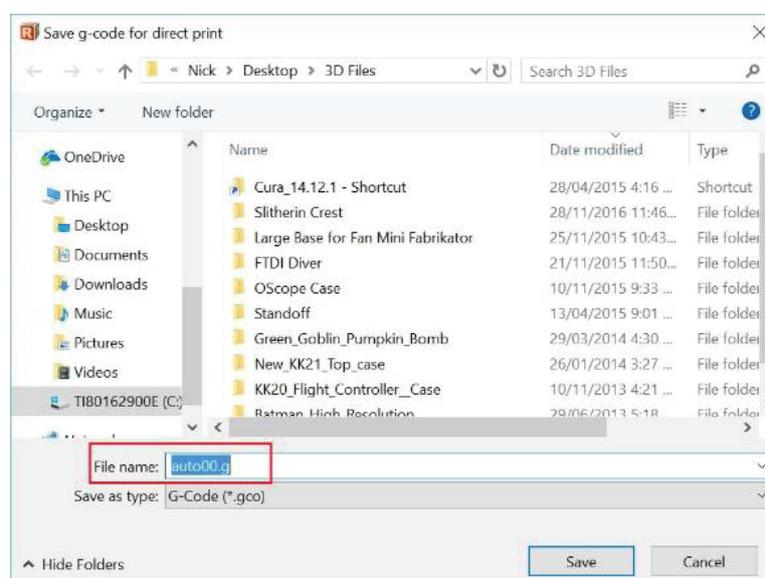
After slicing is completed, save the G Code file to SD.



Click save here:



When the save dialogue box comes up, save the file as "auto00.g", this name will be automatically read as the file to print by the Mini Fabrikator.



Now insert the SD card into the SD slot on the side of the printer. There is a button beside USB and Memory card slot. When you insert the SD card the button will be lit orange. When you are ready to print, click the button once and it will turn blue showing that the printer is printing or preparing to print the file you named “auto00.g”.



3. Other functions of the button

- Press the button once while printing will pause the print, pressing it once again will resume the print.
- Press and holding the button for 4 seconds while printing will cancel the job.
- Press and holding the button for 4 seconds in idle state will initialise the wireless network smart configuration.

J. Troubleshooting

1 Nozzle seems blocked:

First check and make sure the extruder motor is rotating and pulling filament and that temperatures are right. If the extruder motor is working and the temperature is correct you may have a blocked extruder. See below.

2 Software prompts timeout, no response while operating:

Please close the software, restart the printer, then reconnect to PC printing.

3 Extruder blocked with filament:

Please turn off the printer, remove the four screws on the extruder cooling block, remove the fan and remove the extruder, then, using a pair of pliers to hold the extruder restart the printer and heat up the extruder to the melting point of the filament, use tweezers to remove the residual plastic filament. If this doesn't work, remove the nozzle and use tweezers to pull the blockage down. If the blockage is in the nozzle it is usually simple enough just to heat the nozzle with a heat gun and the blockage will ooze out.

4 X/Y/Z axis has irregular stripes on the finished object:

Check that the belts are tight, that the X/Y motors move freely and the limit switch is not being obstructed. If all these factors seem ok it may be a slider setting problem in the file.

6 Objects are warping or non-sticking to the platform while printing:

Check whether the distance between the nozzle and platform is too big, or change the tape on the glass.

7 Printing from SD card doesn't start when connected via USB cable:

Turn off printer, disconnect USB, turn printer on again and then press the function button, which should then turn blue and start printing.

K. Maintenance

1. Clean extruder and nozzle frequently
2. Oil the X/Y/Z axis occasionally with specialised belt lubricant.
3. Preheat extruder properly before loading filament.
4. Check the extruder and platform calibration regularly.
5. Keep platform clean and empty when idle.
6. Keep printer away from dust and grime.
7. Keep printer clean and dry.
8. Keep printer at room temperature.

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