

QIDI TECH I 3D Printer

(Quick Use Instructions)



This document is a ***non-official instructions manual*** for a basic and quick use of **QIDI TECH I 3D Printer** at the CWN laboratory. Please visit the manufacturer company's website for additional information such as technical specifications, performance and most importantly, follow their official safety guidelines.

Zhejiang QIDI Technology Co:
<http://www.qd3dprinter.com/>

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General Information:

The QIDI TECH I 3D Printer has an aluminum dual extruder which allows it to have 2 different filaments ready to use. It can be observed that each extruder is connected to an independent filament source, both located behind the printer. The ON/OFF switch is also located in the back of the printer, on the frame, at the side of where the power cable is connected and below the filaments.

Printer's Link: <http://www.qd3dprinter.com/products/qidi1/>

The printer is able to use a variety of filaments, for example ABS/PLA or dissolvable filaments (HIPS, PVA). In the lab, it is not restricted but highly preferred to use PLA. Inside the black shelf, normally, there is a stock of new PLA filaments ready to be loaded to the printer. If you can't find it, please send a PLA request to the lab Manager.

The PLA filament's melting point range is between 180 - 220 degrees Celsius but the optimal temperature for the extruders nozzles is about **200 degrees Celsius**. The Optimal temperature for the bed when using PLA filament is **50 degrees Celsius**. The PLA diameter that must be used is **1.75 mm**.

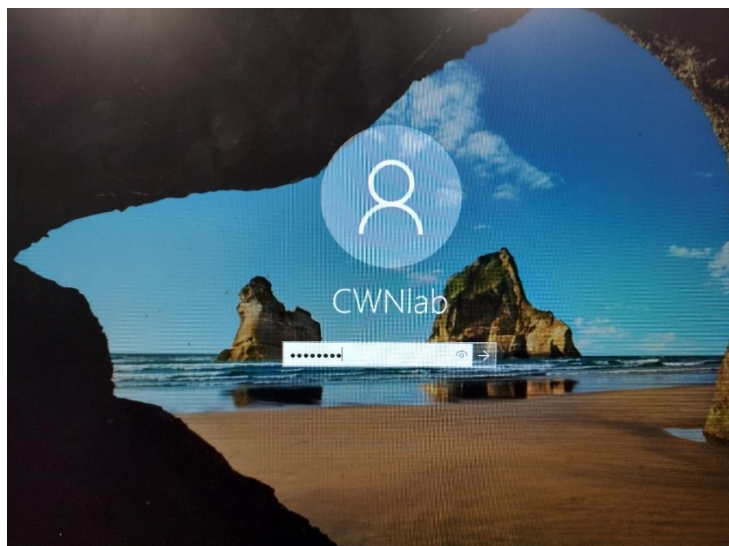
The ABS filament's melting point range is between 210 - 250 degrees Celsius but the optimal temperature for the extruders nozzles is about **230 degrees Celsius**. The Optimal temperature for the bed when using PLA filament is **110 degrees Celsius**. The PLA diameter that must be used is **1.75 mm**.

Printing Procedure:

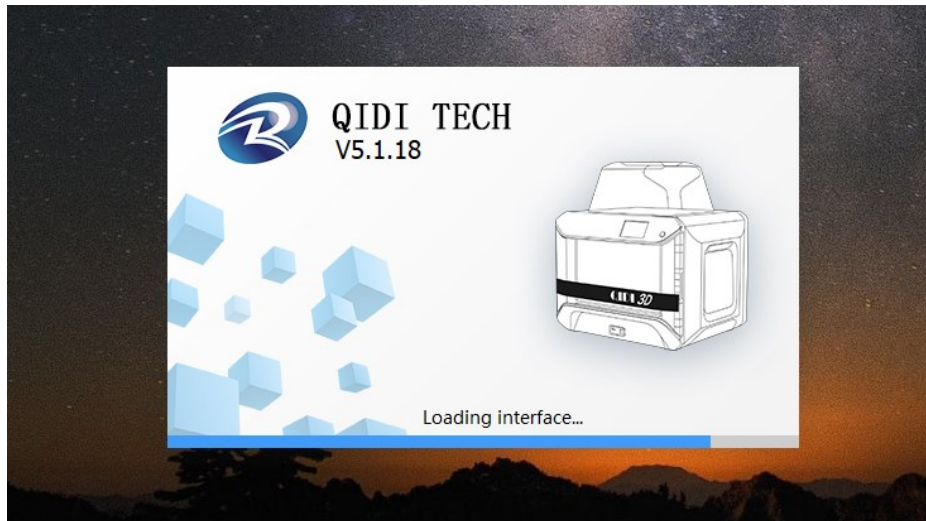
1. The 3D printing station in the lab consists of: the 3D printer linked to a desktop computer, screen, keyboard, and mouse, as it can be seen in the image below. If you already have your printing file saved in an SD card, please **skip to step 8**.



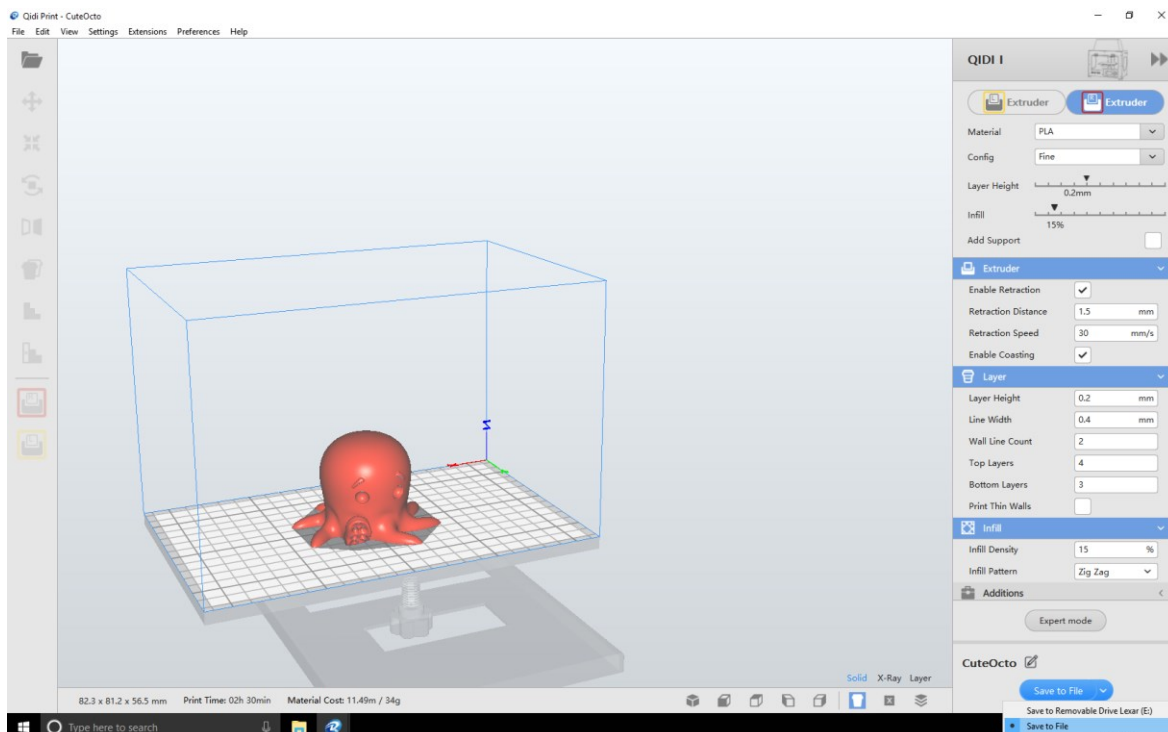
2. If you want to work on a design, turn ON the computer which is located below the printer. Ask the lab manager for the password to access the station and login as shown.



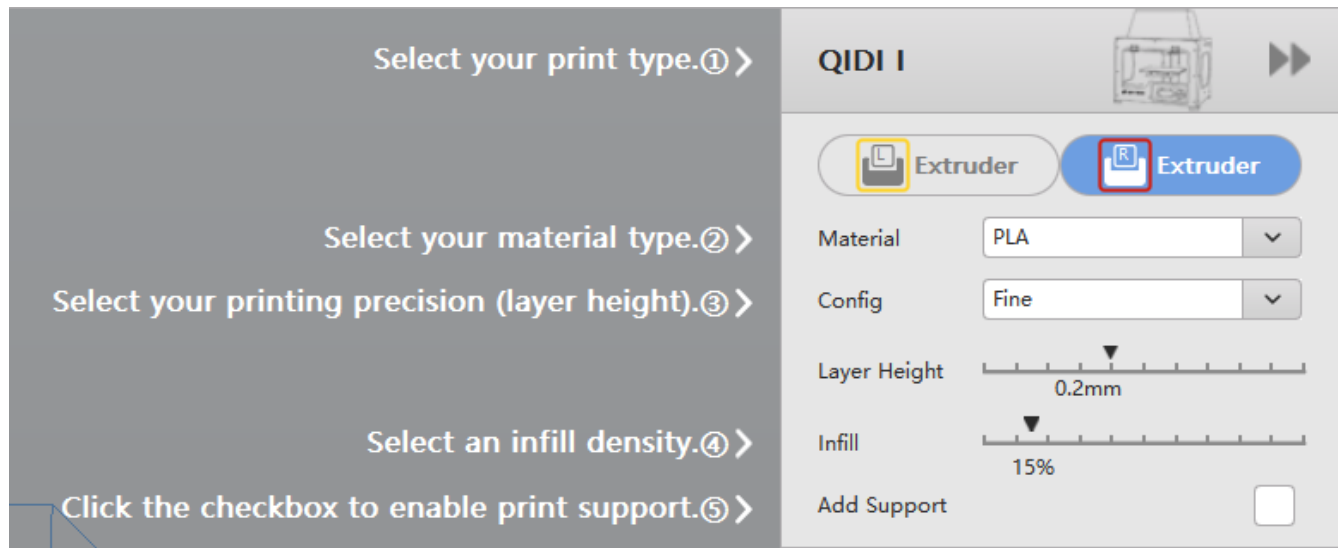
3. The computer has programs related to 3D model design, but the software shown below is most important because it was made by the printer's manufacturer. It can generate compatible printable files for the machine according to its dual architecture.



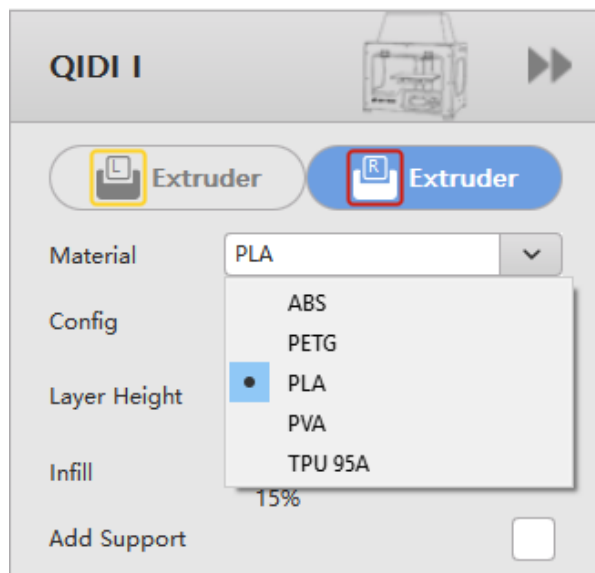
4. This is the first screen that appears when a 3D object is opened; there is an important parameter's column to the right-hand side of the screen. (If you click *help button* at the top left, there is a brief tutorial)



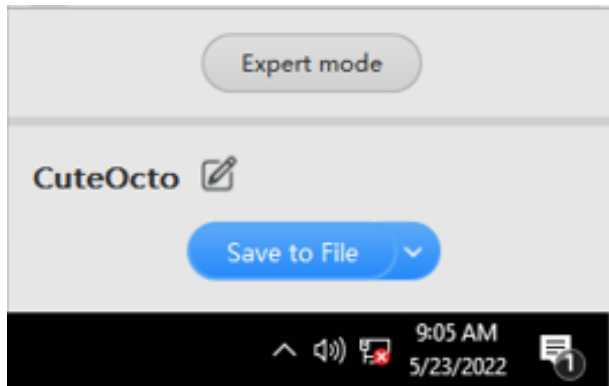
5. This is the process to generate X3G printable files. At the right-hand side column, it can be observed that the program allows the user to select between using the Left or Right extruder, which is more convenient for a multi-extruder printer.



6. It is possible to select from a list of materials that the printer can work with. Please select the filament that is currently loaded in the printer. It is highly recommended to load and print with PLA.



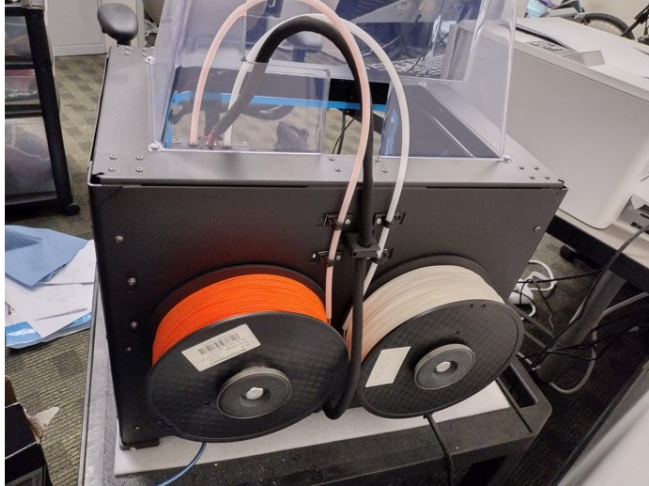
7. When the 3D object is finished, click on **Save to File** button, it will generate a printable X3G file from the 3D Object that you opened. Please transfer the X3G file to the SD card that is inserted in the 3D Printer or your own SD card. (G code contains machine instructions for your print)



8. Once the X3G file is saved in the SD card, open the frontal plastic gate, and insert the card in the slot. (It is important that you save your printable file in the SD card and insert it in the printer)



9. Turn On the 3D printer by pushing the switch that is located on the back of the printer below, where the filament reservoirs are. (It is on the metallic frame close by the power cable as it can be observed below)



10. Select the **'Preheat'** option in the main screen, then select **'Start Preheating'**. It prepares the printer by raising the temperature to optimal values according to the filament's parameters.

1) Click **Ok** on **'Preheat'**



2) Click **Ok** on **'Start Preheating'**



11. When the 'Preheat' instruction is successfully completed, click Ok on the option '**Print from SD**', then look for your file's name in the list and select it by clicking Ok over it. In this example, the file's name is '**CuteOcto.x3g**'. The printer will start working from this point.

1) Click **Ok** on '**Print from SD**'



2) Click **Ok** on '**Your File Name**'



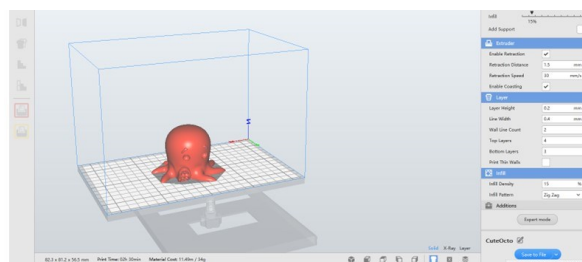
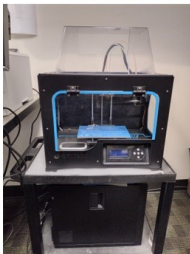
This is a brief video about how the file '**CuteOcto.x3g**' was printed after selecting it from the SD card list of files:

Printing Demo Video in the Lab:

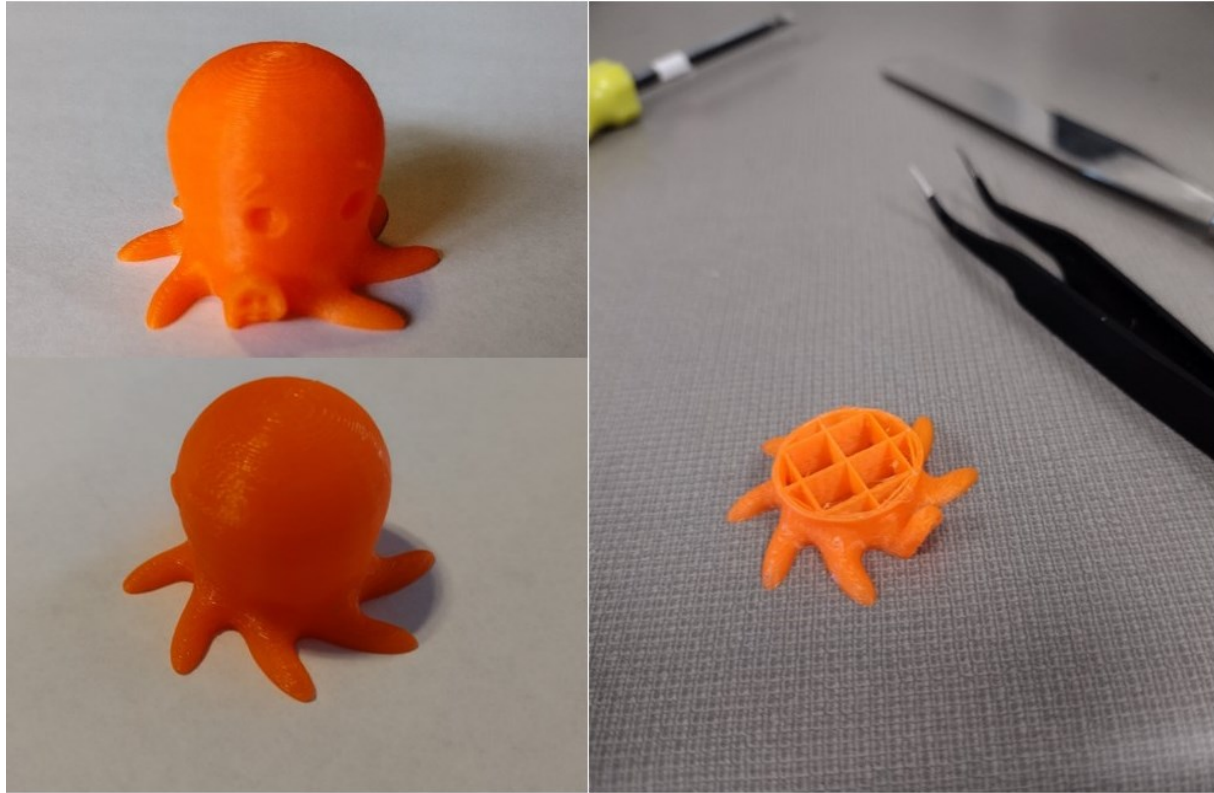
<https://youtu.be/28fz-TD5nCc>



From 3D Object
to Actual physical
Model QIDI Tech I



12. When the printer successfully concludes the '**print**' instruction as it was shown in the video, carefully pick up the finished model from the bed and verify printing quality. It is also possible to verify quality in different states of the process doing test prints.



The 3D object was successfully printed at this point. Please repeat the process to print your objects from a SD card. This is not the only printing method but is one of the easiest.

When you finish printing, it is important to set the temperature values for both nozzles and the bed to zero degrees, keeping the refrigeration fans ON for both Nozzles until their temperature is below 30 degrees Celsius. Then you can turn OFF the printer.

Temperature Printing Parameters

The Optimal temperature values given by the manufacturer for ABS and PLA are shown below, please check their website for updates:

ABS Parameters



PLA Parameters



<http://www.qd3dprinter.com/products/qidi1/>

Troubleshooting

There are many malfunctions that 3D printers could get at some point during their lifetime. I'll present a brief description about the most common malfunctions and provide some third-party links about how to solve them. If you ever have to troubleshoot, please do additional research as well and proceed with caution.

Extruder Filament Blockage

When plastic accumulates inside the nozzle, sometimes it gets blocked. It can be noticed when the printer is working but the filament is not coming out, it could be that the filament's wire tension is too low or maybe too high. If the problem is not related to the feeding filament tension, then it could be a blockage. Please check the following third-party video for some insights.

<https://www.youtube.com/watch?v=UXywpdRKLxE&t=211s>

Nozzle Too Close to Print Bed

This problem can be solved by calibrating the printer and leveling the bed to a horizontal position with proper height. The video below shows an example of how it can be done:

<https://www.youtube.com/watch?v=bNQ0xQmGrWo>

3D Design and Slice Programs

Some of the most popular programs that can be used for 3D models design are shown below:



<https://www.tinkercad.com>

Tutorial Starting with TinkerCAD: https://www.youtube.com/watch?v=gOs6Mdj7y_4

TinkerCad is a free browser-based software that is very easy to use. It is a program for beginners which is intuitive and has good library with customizable primitives.



<https://www.autodesk.com/autodesk-university/class/Modeling-Basics-3D-Printing-Using-AutoCAD-2014>

Tutorial Printing with AutoCAD: <https://www.youtube.com/watch?v=NOkvg6y5X0Y>

AutoCAD supports 3D printing as it can be read in their website. There are independent and official tutorials about CAD 3D print.



https://help.solidworks.com/2021/English/SolidWorks/sldworks/c_Print3D.htm

Tutorial Printing with Solid-Works: <https://www.youtube.com/watch?v=b11VMHI2X5g>

SolidWorks also supports 3D printing; it is commonly used by mechanical engineers for prototyping parts and mechanisms.



<https://zbrushcore.com/mini/> (Free Download and use program)

Tutorial Printing with ZBrush Core Mini: <https://www.youtube.com/watch?v=Jdm3JxvCu-Q>

ZBrush Core mini is a 3D design program specialized in organic forms. It is inspired on clay sculpting; it is free to use and a powerful tool for organic models and art applications.



Open Source parametric 3D CAD modeler

<https://www.freecadweb.org/> (Free Download and use program)

Tutorial Starting with Free CAD: https://www.youtube.com/watch?v=u8otDF_C_fw

FreeCAD is an Open-Source parametric 3D CAD modeler. It is widely used for a diverse variety of engineering fields and architecture among other professions.

Some of the most popular Slicing Programs:



<https://www.bcn3d.com/bcn3d-stratos/>

Tutorial Starting with BCN3D Stratos : https://www.youtube.com/watch?v=DCVR_67RTg8

“CN3D Stratos is a straightforward slicing software, designed for speed and efficiency while still ensuring top-quality prints for a powerful 3D printing process. The user-friendly interface is free and compatible with all BCN3D Sigma and Epsilon printers”



<https://ultimaker.com/software/ultimaker-cura>

Tutorial Starting with Ultimate Cura : <https://www.youtube.com/watch?v=NsGOoi3677M>

“Ultimaker Cura is the world’s most popular 3D printing software. Prepare prints with a few clicks, integrate with CAD software for an easier workflow, or dive into custom settings for in-depth control”

Some important software tools were introduced in this section. It is encouraged to research more and to use the tools that better fits the project and type of prints desired. The Laboratory’s printing terminal has **ZBrush Core Mini** and **FreeCAD** installed and ready to use. The models can be directly printed by inserting an SD card to the printer that contains printable file and executing the printing process from the menu.

Safety Guidelines

Please make sure you ***follow the manufacturer's safety guidelines*** before using the 3D printer. In addition to their recommendations, these are important safety rules to follow when printing:

- 1) *Unattended Printing:*** Never leave the printer ON in the lab or working unattended. It works with high temperatures; it is better to be aware of it to avoid fire if there is a malfunction.
- 2) *Always be with someone:*** Be with a lab partner or let them know explicitly that you are working with the printer, just in case you faint or get electrocuted, your partner can help and take action.
- 3) *Open Lab's door:*** PLA is one of the safest materials in terms of toxic fumes, but it is important to have good ventilation, especially with materials like ABS. Do not smell plastic fumes, those are toxic and in higher quantities, it could affect your health negatively and make you faint. (Use mask if necessary)
- 4) *Use heat proof and cut resistant gloves:*** Be very careful with your hands, especially when approaching the printer when it is ON and hot. Both, the nozzles, and the bed can get above 100 degrees Celsius which could give you bad burns. It is better to manipulate the printer when cold but always be very careful and use appropriate gloves. Be careful not to cut your hands when using sharp tools to remove the printed objects from the bed.
- 5) *Electrocution:*** Sometimes when the printer is not properly grounded, or a malfunction occurs in the power supply, the metallic frame could get raised to a higher potential which could lead to electrocution. Please be with someone when using the printer, and if anyone gets shocked, turn off the power, do not touch the person directly and **call 911**, for any life-threatening emergency.

Work Cited:

T3 Alliance. (2018, May 16). *Leveling Qidi Bed*. YouTube. Retrieved from :
<https://www.youtube.com/watch?v=bNQ0xQmGrWo>

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[Accessed 7 June 2022].