



Duplicator 4S

Desktop 3D Printer

USER MANUAL



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This User Guide is designed to start your journey with the WANHAO Duplicator 4S Desktop 3D Printer in the right direction. Even if you are familiar with earlier WANHAO machines, it is essential that you read through this guide, as there are several important and exciting updates with the WANHAO Duplicator 4S.

In chapter A and B, you will learn the basics of the WANHAO Duplicator 4S, how to unbox safely, and how to get set up. Chapters C~E will take you through leveling, printing, maintenance, and troubleshooting,

WANHAO is excited to welcome you to the world of the WANHAO Duplicator 4S. Following this guide will help ensure that you are getting the most out of your machine, and that you continue to make amazing things,

WARNING: The WANHAO Duplicator 4S generates high temperatures and includes moving parts that can cause injury. Never reach inside the WANHAO Duplicator 4S while it is in operation. Always allow the WANHAO Duplicator 4S to cool down before reaching inside.

WARNING: Do not leave the WANHAO Duplicator 4S unattended during operation.

CAUTION: If opening the WANHAO Duplicator 4S for service, ensure that the power supply is turned off and the cord is disconnected.

SPECIFICATIONS

PRINTING

Print Technology: FDM Technology
The Max Printing Size: 22.5*14.5*15cm
Layer Resolution: High 100 microns {0.0039 in}
Medium 270 microns {0.0106 in}
Low 340 microns {0.0133 in}
Positioning Precision: XY : 11 microns {0.0004 in}
Z : 2.5 microns {0.0001 in}
Filament Diameter: 1.75mm {0.069 in}
Nozzle Diameter: 0.4mm {0.015 in}

TEMPERATURE

Ambient Operating
Temperature: 15° – 32° C [60° – 90° F]
Storage Temperature: 0° – 32° C [32° – 90° F]

ELECTRICAL

AC Input: 100 – 240 V, ~2 amps, 50 – 60 Hz
Power Requirements: 24 V DC @ 6.25 amps
Connectivity: USB, SD card [FAT 16, max. 2GB]

Software

Software Bundle : WANHAO Replicator G Sailfish WanHao Edition
File Types: .stl, .Gcode
Supports: Windows (XP / 7/8)
Linux (Ubuntu 10.04+)
Mac OS X (10.7 / 10.8)

PHYSICAL DIMENSIONS

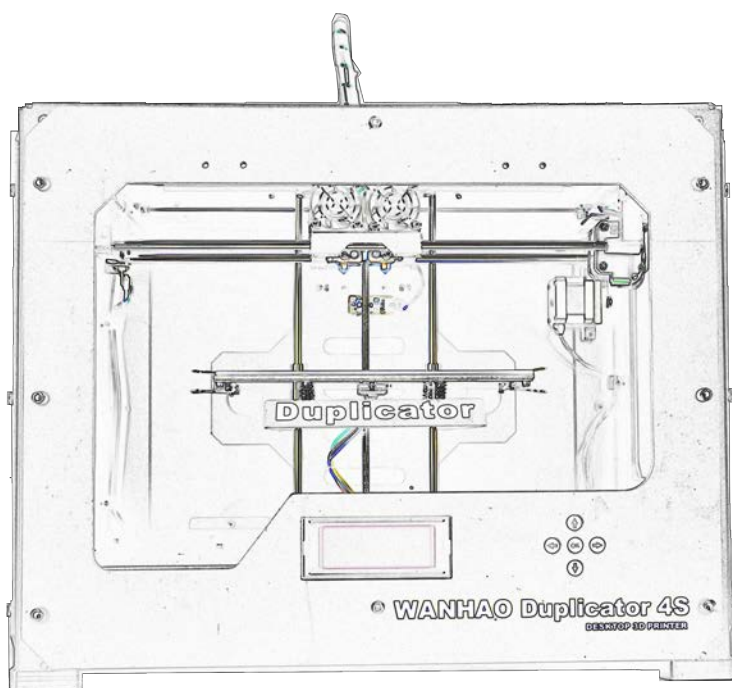
Without Spool: 47*32*38 cm
With Spool: 47*32*38 cm
Shipping Box: 59*43*54 cm
Net Weight: 11.5kg /19kg
Shipping Weight: 15kg/ 21kg

MECHANICAL

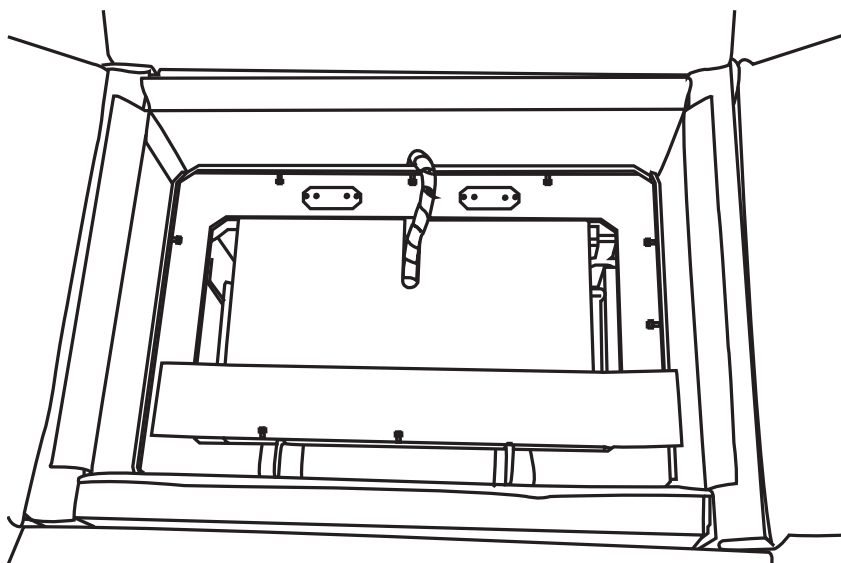
Chassis: Stainless steel
Body: DPP Panels
Build Platform: Aluminium Heating
plate/ Silicon Glass
XYZ Bearings: Wear-resistant,
oil-infused bronze
Stepper Motors: 1.8° step angle with
1/16 micro-stepping

HOW DOES IT WORK

The WANHAO Duplicator 4S makes solid, three-dimensional objects out of melted WANHAO PLA/ABS Filament. Your 3D design files are translated into instructions for the WANHAO Duplicator 4S and sent to the machine via USB cable or SD Card. Then the WANHAO Duplicator 4S heats the WANHAO PLA Filament and squeezes it out through a nozzle to make a solid object layer by layer. This method is called Fused Filament Fabrication [FFF].



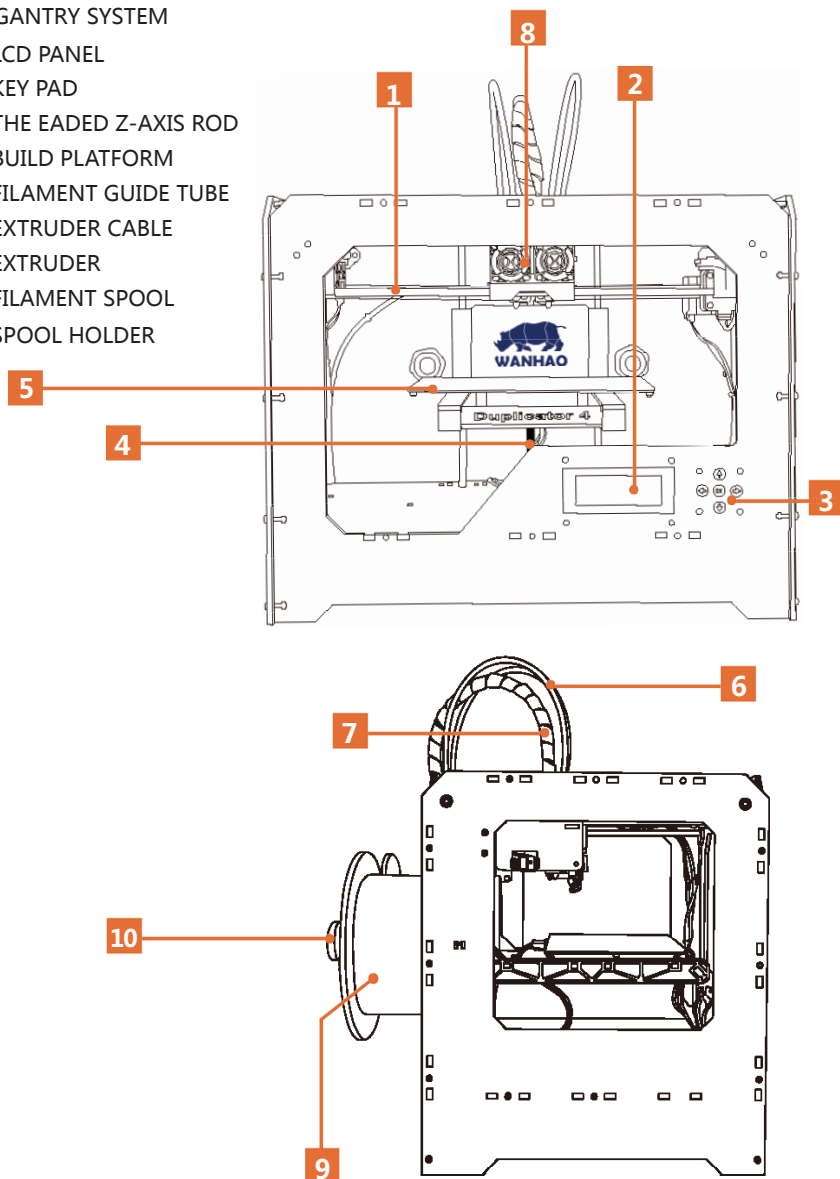
When you set up your WANHAO Duplicator 4S Desktop 3D Printer, remember that it was build and packaged very carefully at the WANHAO factory. We hope you' ll take your time and be just as careful unpacking it and getting it set up.



NOTE: Do not force or tear anything during unpacking and set up. This may damage the WANHAO Duplicator 4S Desktop 3D Printer. **SETTING UP YOUR WANHAO DUPLICATOR 4S DESKTOP 3D PRINTER**

SPECIFICATIONS

- [1] GANTRY SYSTEM
- [2] LCD PANEL
- [3] KEY PAD
- [4] THE EATED Z-AXIS ROD
- [5] BUILD PLATFORM
- [6] FILAMENT GUIDE TUBE
- [7] EXTRUDER CABLE
- [8] EXTRUDER
- [9] FILAMENT SPOOL
- [10] SPOOL HOLDER



UNPACKING YOUR WANHAO DUPLICATOR 4S

1. Opening the Box

- A. Place the WANHAO Duplicator 4S box on the ground. Open the box and remove the top cardboard sheet.
- B. Remove the WANHAO Duplicator 4S User Manual. We recommend that you use the manual to guide you through the setup process and keep it at hand as you unpack the contents of the box. If you find that anything described in the manual is missing, email us at support@wanhao3dprinter.com.
- C. Remove the layer of foam and the sheet of cardboard underneath.
- D. Remove the two protective bumper box pieces from the side of the Duplicator 4S.



UNPACKING YOUR WANHAO DUPLICATOR 4S

2. Removing the WANHAO Duplicator 4S from the Box A.

Open the plastic covering and firmly grasp the frame of the WANHAO Duplicator 4S from the outside. Lift it out of the box and place it on a stable surface.

NOTE: The black cable is not a handle. Do not pull or twist the black cable at any time.



3. Removing the Accessory Box

- A. Remove the two remaining protective foam pieces from the bottom of the Duplicator 4/4x' s box.
- B. Pull out the accessory box. This box contain the remaining items from the "What' s in the Box" section.

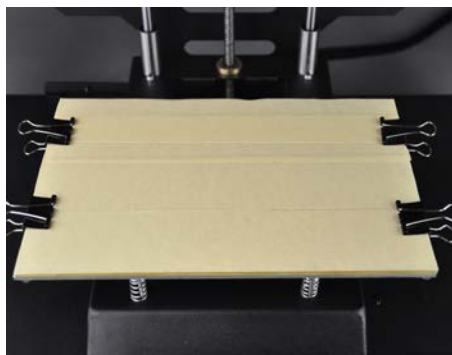


NOTE: Your WANHAO Duplicator 4S should now be fully unpacked. We recommend that you keep the box and foam inserts in case you need to transport your WANHAO Duplicator 4S in the future.

INSTALLING BUILD PLATE

4. Installing the Build Plate

Never tear off the yellow kapton tape on the aluminium plate. You can either put the silicon glass onto the platform to make the build plate perfect flat or without silicon glass plate (for freshman recommended). Please adjust the 4 knobs under HBP to re-level the heating plate if you are adding the silicon glass plate. Wanhao masking tape is used for both ABS and PLA printing which can make filament stick to the platform easier.



5. Freeing the Extruder



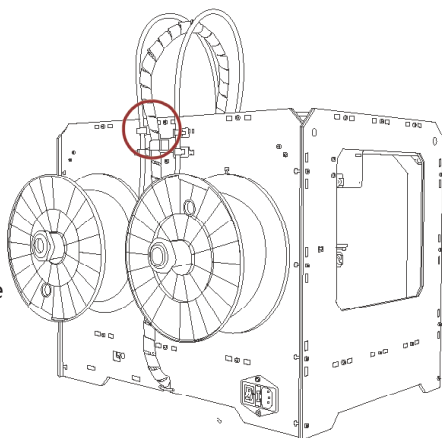
- A. Use strong scissors or a wire cutter to cut the zip ties holding the gantry system in place. Discard the zip ties and the plastic pieces holding them in place.
- B. A small plastic piece attached to the X-axis belt and gantry rods prevents the extruder from moving. Carefully snap the piece off of the rods and tilt it to slide it off of the belt.

NOTE: Operate scissors with care.

INSTALLING FILAMENT GUIDE TUBE AND SPOOL HOLDER

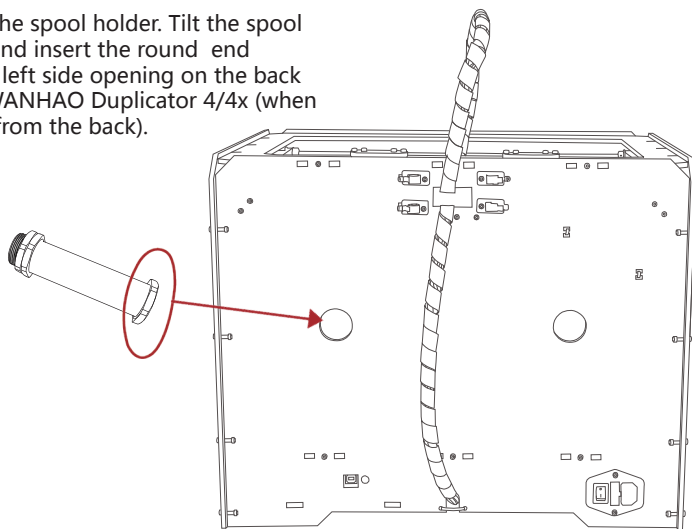
6. Installing the Filament Guide Tube

- A. Locate the filament guide tube. Insert one end into the hole at the top of the extruder and push the tube in as far as it will go.
- B. Insert the other end of the filament guide tube into the left guide tube holder (when viewed from the back) on the back of the WANHAO Duplicator 4/4x. Make sure that the end of the filament guide tube is flush with the bottom of the guide tube holder. The filament guide tube should not hang down past the bottom of the guide tube holder.



7. Installing the Spool Holder

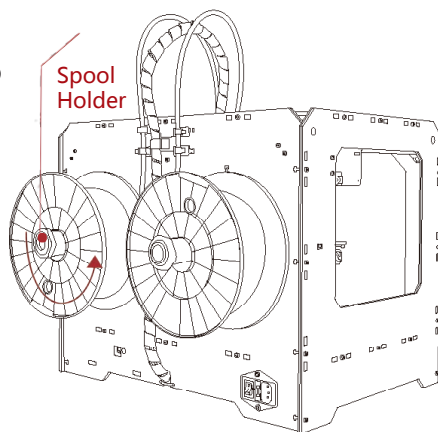
- A. Locate the spool holder. Tilt the spool holder and insert the round end into the left side opening on the back of the WANHAO Duplicator 4/4x (when viewed from the back).



INSTALLING BUILD PLATE

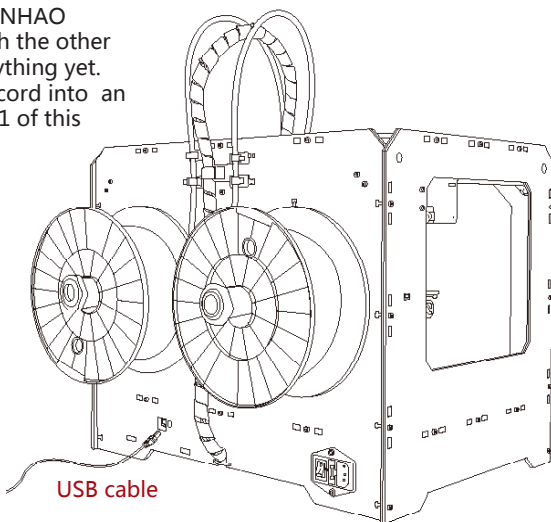
8. Mounting the Filament Spool

- A. Open the box containing the WANHAO ABS and PLA Filament. Remove the spool from its bag.
- B. Fit the spool onto the spool holder. Ensure that the WANHAO ABS and PLA filament unwinds counterclockwise (when viewed from the back). Squeeze the spool holder and push the spool on until it locks.



9. Attaching the USB Cable

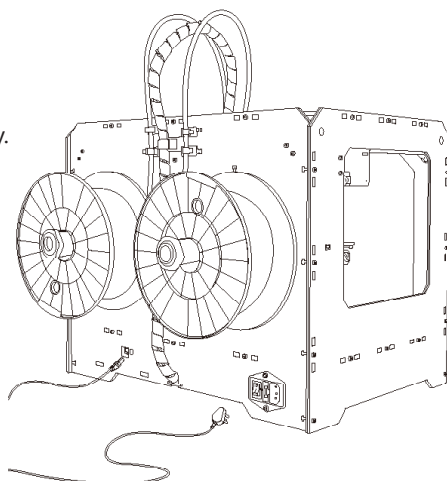
- A. Locate the USB-A to USB-B cable. Insert the USB cable into the USB-B Port on the back of the WANHAO Duplicator 4S. Do not attach the other end of the USB cable to anything yet. Do not plug the AC power cord into an electrical outlet until step 11 of this chapter.



ATTACHING POWER SUPPLY AND POWERING ON

10. Attaching the Power Supply

- A. Locate the power supply cable.
Attach the cable to the power supply.
- B. Ensure that the power switch on the WANHAO Duplicator 4S is set to the OFF position.
- C. Insert the power supply connector into the power input on the back of the Duplicator 4S. Ensure that the flat side of the connector faces down.



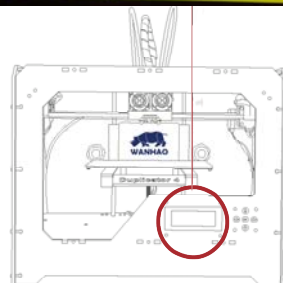
Power Supply

11. Powering On the WANHAO Duplicator 4S

- A. Plug the AC power cord into an electrical outlet.
- B. Set the power switch to the ON position.
- C. The WANHAO Duplicator 4S will display The Duplicator text on the LCD panel. This is the beginning of the startup script that will guide you through initial calibration and your first build.



NOTE: The socket-outlet shall be installed near the equipment and shall be easily accessible.

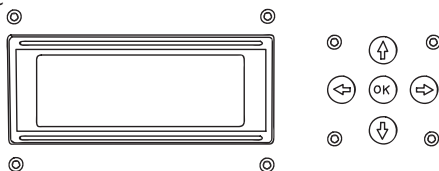


After you power on the WANHAO DUPLICATOR Desktop 3D Printer, the LCD panel will light up and display text. The LCD panel will now run the Startup Script. The Startup Script will guide you through leveling the build plate, loading WANHAO PLA Filament, and creating your first build.



THE LCD KEYPAD

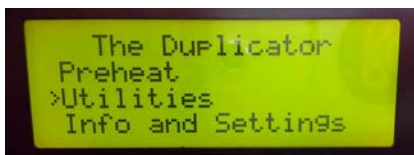
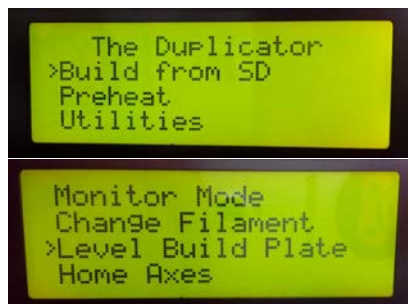
- Four arrow buttons surround a central OK button. Use the arrows to navigate through the LCD menus and make selections.
- The left arrow usually allows you to go back or cancel an action.
- OK button means the Printer is working.



NOTE: Use the up and down arrow buttons to scroll through the top-level menu on the LCD panel, and use the OK button to select Utilities. You can use the left arrow to return to the Startup at any time. We also have videos for you about this item. If you have problems or questions, refer to the troubleshooting chapter in this manual or contact WANHAO Support at support@wanhao3dprinter.com.

INSTALLING BUILD PLATE

After the initial welcome message, the LCD will display the followings:



1. Start printer the LCD display the items for operating.
2. Navigate to Utility and press OK.
3. Choose this item to start platform leveling.

! Why Leveling Is Important

- If the build platform is too far from the extruder nozzle, or if one part of the plate is farther away from the nozzle than another part, your builds might not stick to the build plate.
- If the build platform is too close to the extruder nozzle, the build plate can block the Printer PLA Filament from extruding from the nozzle. This can also scratch the build plate.
- Leveling your build plate often will help ensure that objects adhere well to the plate.

* How to Level the Build Plate

To level the build plate, you must adjust the four knobs which under the build platform. These four knobs lower and raise the build plate.

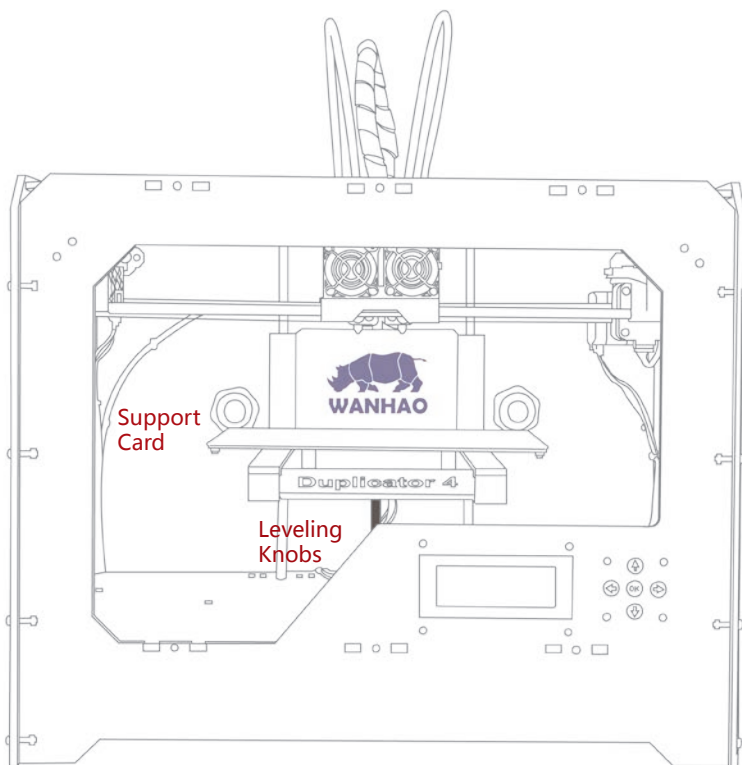
- Tightening the knobs [turning them to the right] moves the build plate away from the extruder nozzle.
- Loosening the knobs [turning them to the left] moves the build plate closer to the extruder nozzle.
- The distance between the extruder nozzle and the build plate should be about the thickness of the A4 paper.

LEVELING THE BUILD PLATE

1. Make Some Room Between the Build Plate and the Nozzle

When directed by the LCD screen, tighten each of the four knobs under the build platform about four turns.

Find the 4 knobs on the bottom of the platform and tighten four or five turns.

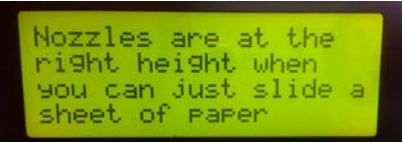


LEVELING THE BUILD PLATE

2. Adjust the Knobs as Directed

The script will prompt you to adjust the knobs individually. As you adjust each knob, make sure the A4 Paper just slides between the nozzle and build plate.

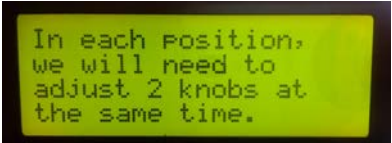
You should feel some friction on the A4 Paper but still be able to easily pass the Paper between the plate and the extruder nozzle without tearing or damaging the paper.



Nozzles are at the
right height when
you can just slide a
sheet of paper

3. Adjust Each Knob Again

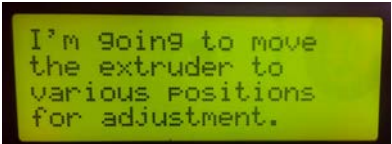
The script will prompt you to adjust each knob again. This allows for fine tuning. This time, the A4 Paper should slide between the build plate and nozzle with more friction.



In each position,
we will need to
adjust 2 knobs at
the same time.

4. Confirm your Adjustment

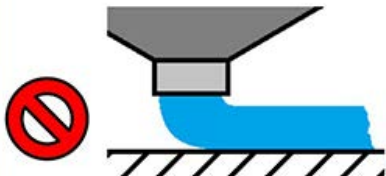
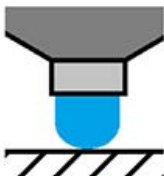
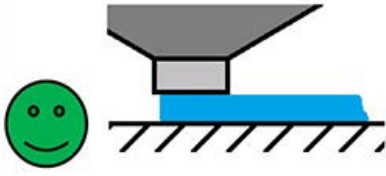
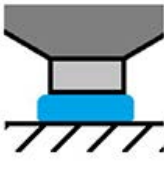
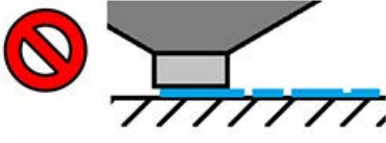
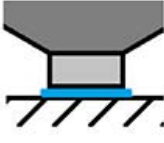
After the second set of adjustments, the nozzle will move to the center of the build plate. Confirm that the the A4 Paper slides between the nozzle and plate with a moderate amount of friction.




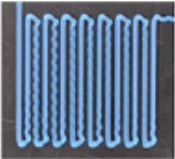
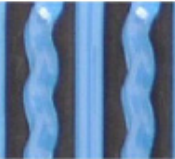

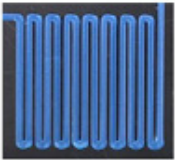

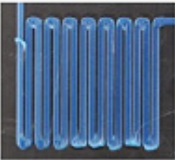

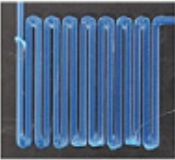

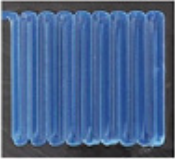
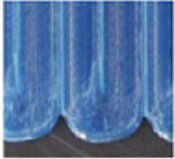


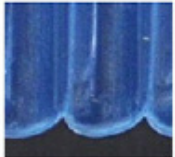
I'm going to move
the extruder to
various positions
for adjustment.

LEVELING THE BUILD PLATE

5. Compare your printed raft with the following Nozzle height checking diagram to ensure you have the correct nozzle height and filament width.

SIDE VIEW	END VIEW	COMMENTS
		NOZZLE TOO HIGH: Not enough pressure on the filament into the bed, therefore small contact area between filament and bed. Raft may detach in mid print.
		OK: Filament pushed into the bed slightly to maximise surface area contact with bed, but still maintain extrusion flow.
		NOZZLE TOO LOW: Not enough clearance for the filament to be extruded, damaging either the extruder or the bed.

LEVELING THE BUILD PLATE

	RAFT	MAGNIFICATION	NOTES
			NOZZLE TOO HIGH: Wavey tracks, or tracks narrower than 1.2 mm (use vernier calipers to check).
			
			
			
			
			NOZZLE TOO LOW: Tracks sides pushed over neighbouring tracks.

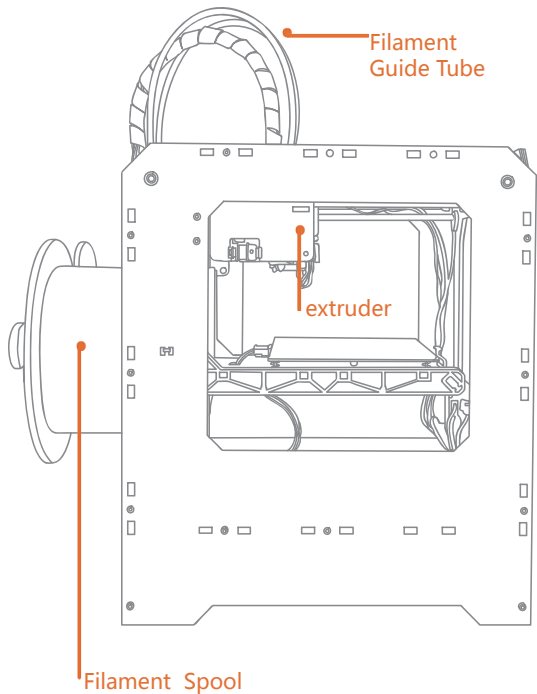
NOTE: If you have problems, or if you need to level your build plate again, you can use the up and down arrows to scroll through the top-level menu on the LCD panel and use the OK button to select Utilities. Scroll to Level Build Plate and select it. You can use these menus to return to the leveling script at any time.

Loading PLA Filament

When you have completed the initial leveling tasks, the LCD menu will display the following text: "I am Ready" . Before building, you must load the PLA Filament into the extruder. The extruder will heat the PLA Filament and use the melted material to build things.

* What You Will Do

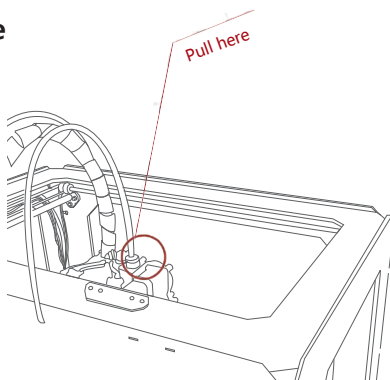
- Remove the end of the filament guide tube from the hole in the top of the extruder.
- Feed the free end of the PLA Filament from the spool into the end of the filament guide tube where it attaches to the back of the Printer
- Push the PLA Filament all the way through the filament guide tube.
- Wait for the PLA Filament to heat and extrude.



Loading PLA Filament

1. Detach the Filament Guide Tube

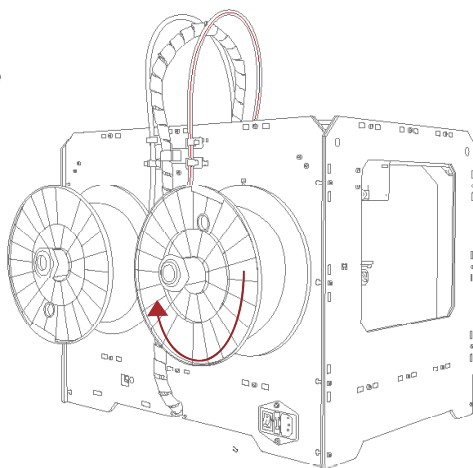
Locate where the filament guide tube attaches to the top of the extruder. You must remove the filament guide tube from the extruder. To remove the tube, gently pull it out of the hole in the top of the extruder.



2. Feed the Filament Through the Filament Guide Tube

Free the end of the PLA Filament from the filament spool. With a pair of scissors, cut a clean edge. Feed the end of the PLA Filament into the end of the guide tube where it attaches to the back of the Printer. Feed the PLA Filament through the guide tube until it emerges from the other end of the tube.

NOTE: To avoid filament jams, ensure that the PLA Filament feeds from the bottom of the spool toward the top of the spool. Put the right filament into the left filament tube. Put the left filament into the right filament tube.

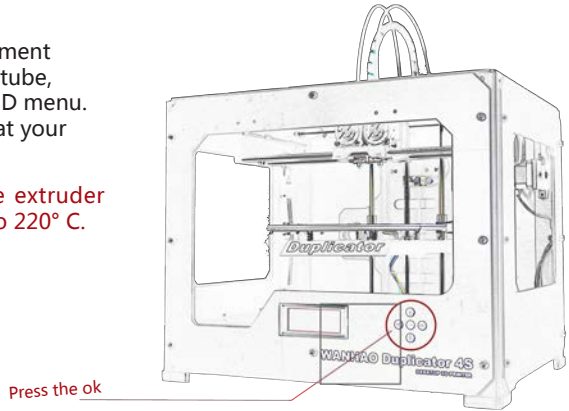


LEVELING THE BUILD PLATE

3. Press the OK to Begin Heating the Extruder

After you' ve fed the PLA Filament all the way through the guide tube, press the OK button on the LCD menu. The Duplicator will start to heat your extruder.

WARNING: Do not touch the extruder while it is heating — it heats to 220° C.



4. Press the " O K " to Continue

After the extruder reaches 220° C, the LCD panel will prompt you to load the PLA Filament into the extruder. Click through the message until your Printer asks you to press the OK when you see plastic extruding.

LEVELING THE BUILD PLATE

5. Push the Filament into the Extruder

To use one hand to push the loading button down and Take the end of the PLA Filament closest to the extruder and firmly push it into the hole in the top of the extruder. Ensure that the filament goes into the center of the opening and doesn't get caught at the edge of the opening.

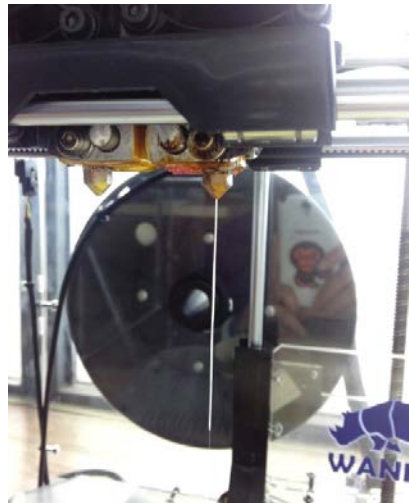
Maintain pressure on the filament and continue pushing it into the opening. After about five seconds, you should begin to feel the motor pulling in the filament. Maintain pressure for another five seconds and then let go.



6. Stop Extrusion

Watch the extruder nozzle. After a few moments, you should see a thin string of the PLA Filament that you loaded come out of the nozzle. Press the OK button to stop extrusion.

NOTE: Don't be surprised if the filament that initially comes out of the nozzle is not the color you expected. There's probably some filament inside the extruder left over from our testing process in factory. Wait until you see the color that you loaded come out of the nozzle before you press the OK button.



LEVELING THE BUILD PLATE

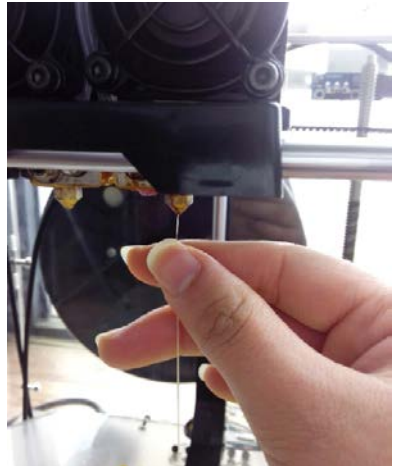
7. Return the Filament Guide Tube

Push the guide tube back into the opening on the top of the extruder.

NOTE: If you have problems or need to load the PLA Filament again, you can use the up and down arrows to scroll through the top-level menu on the LCD panel and use the OK button to select Utilities. Scroll to Change Filament and select it. Then select Load. You can use these menus to return to the load script at any time.

8. Remove the Extruded PLA

Wait a few minutes for the extruded PLA to cool, then pull it off the nozzle. You can discard this extra filament. Don't touch the nozzle; it may still be hot. Don't leave plastic clinging to the extruder nozzle. This can cause newly extruded plastic to stick to the nozzle instead of the build platform.



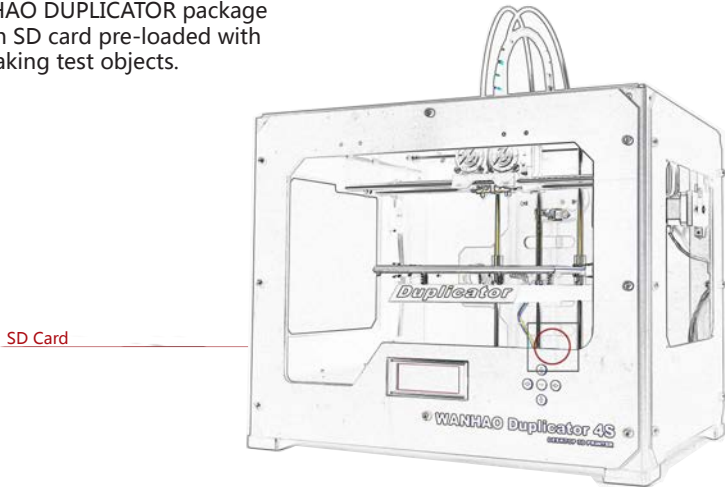
*Unloading PLA Filament

If you need to unload the PLA Filament, the LCD menu will walk you through the process. To run the script for unloading the filament, go to the LCD panel and select Utilities > Filament Options > Unload.

MAKING A TEST OBJECT FROM THE SD CARD

1. Locate the SD Card

The WANHAO DUPLICATOR package includes an SD card pre-loaded with files for making test objects.



2. Select a Project from the SD Card

After you have successfully leveled the build platform and loaded the PLA Filament into the extruder, the LCD panel will say: "I am ready"

- A : Use the up and down arrow buttons to navigate through the list of models on the SD card.
- B : To select a model, press OK.
- C : The Printer will begin to build your object. You can use the LCD panel to monitor the temperature of the extruder and the status and progress of your object.

more object available please download from our websiteShare
: WWW.THINGSHARES.com



Using WanHao Replicator G

Replicator G is software that prepares 3D models for building and sends them to your WanHao Duplicator Desktop 3D Printer for building.

Download and Install WanHao Replicator G.

- a. Go to the computer you plan to connect to your WanHao Duplicator and open a browser session.
- b. Enter the URL www.wanhao3dprinter.com and download the correct Replicator installer for your operating system.
- c. After downloading, open the installer and follow the directions to install the software.
- d. Use the supplied USB cable to connect your WanHao Duplicator to your computer.



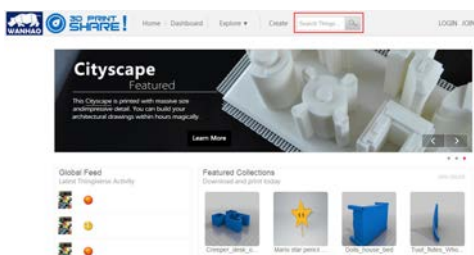
NOTE: You can find a video of this tutorial at <http://www.wanhao3dprinter.com>

USING WANHAO REPLICATOR.G

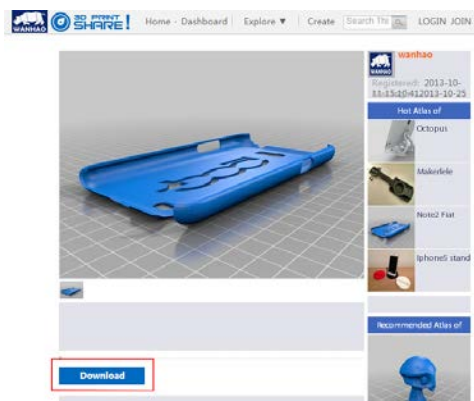
2. Download an Object From WanHao Thingshares

Thingshares is a website where WanHao users and others can share design files. ThingShares

- A. Open a browser session and go to www.thingshares.com. Use the search field at the upper middle to search for "what files you want" . Your search results should include that. Click on the link.



- B. At the left of the page you will see a button that says "Download" Click this button to open the Downloads window.



USING WANHAO REPLICATOR G

3. Open WanHao Replicator G

[1] Zoom in and out : You can also use the scroll wheel on your mouse to zoom in and out.

[2] View: Click the View button to go into View mode. In this mode, click and drag with your mouse to rotate the plate and the object.

[3] Move : Click the Move button to go into Move mode. In this mode, click and drag with your mouse to move an object around the plate.

[4] Rotate: Click the Rotate button to go into Turn mode. In this mode, click and drag with your mouse to rotate the object in all directions.

[5] Mirror: Click the Mirror button to go into Mirror mode. In this mode, click the buttons at the upper side of the right to reflect the object in X, Y, Z respectively.

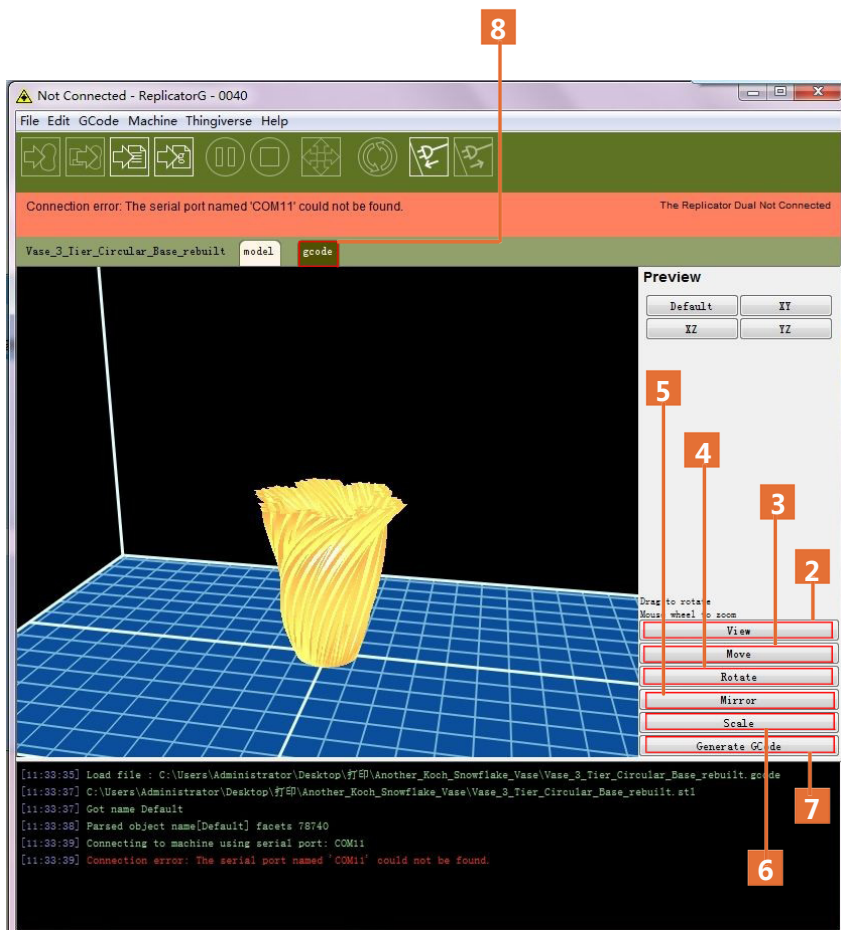
[6] Scale : Click the Scale button to go into Scale mode. In this mode, click and drag with your mouse to enlarge or shrink your object. Use the buttons at the upper side of the Scale button to open the Change Dimensions submenu and scale by a percentage or to a specific measurement.

[7] Generate GCode: Click this button to open the Generate GCode dialog, where you can specify print resolution and other options and click Generate GCode for building.

[8]Click the "gcode" at the forth Status Bars and adjust the HBP printing temperature based on your printing material (see FAQ on www.wanhao3dprinter.com). After adjustment, choose printing. ABS HBP printing temperature: 110 °C ; PLA HBP printing temperature : 60°C

USING WANHAO REPLICATOR G

3. Open WanHao Replicator G | Continued



USING WANHAO REPLICATOR G

4. Open the .stl files in WANHAO REPLICATOR G

- a. Click on the File button. Navigate to the location of the file .stl and select it. The file will open at the center of the build plate.
- b. Use the buttons on the left side to adjust the object's size, location, etc. Then generate Gcode. You will see the Generate GCode dialogue:

[1] **Slicing Profile:** Select Replicator slicing default, if not already selected.

[2] **Extruder:** Choose the extruder you are going to use.

[3] **Raft:** Select this to have your object built on a raft. Rafts provide a base for supports and help your object stick to the build plate.

[4] **Support :** Select this to have your object include easily removable support structures under overhanging parts of the object.

[5] **Object infill:** Select this to make your object infill rate. It's better to make 10%

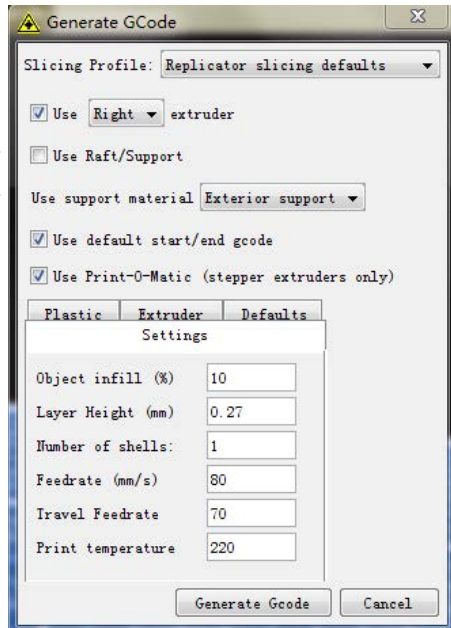
[6] **Layer Height:** Select this to change your printing layer height to specify your printing quality.

[7] **Number of shells:** Select this to specify you shell numbers, suggested data: 1

[8] **Feedrate(mm/s):** Select this to change your printing speed: 30-80mm/s

[9] **Travel Feedrate:** Select this to change your travel speed:70

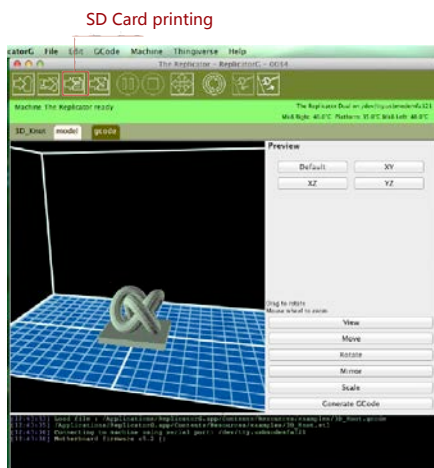
[10] **Print temperature:** Select this to change your extruder printing temperature: 220



USING WANHAO REPLICATORG

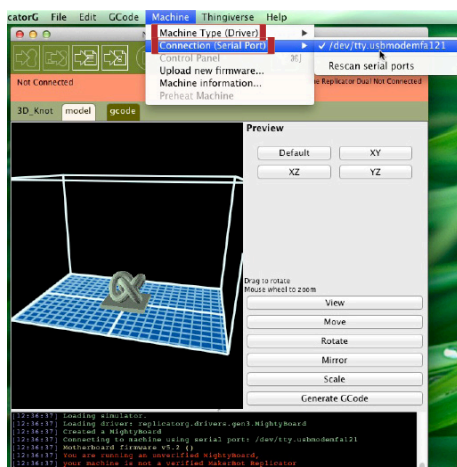
4. Build from SD Card

- 4a. Press the third button in the green bar to "Build to File for use with SD card" And save the file as .x3g format to your SD card. Specify a name for the file.
- 4b. Put the SD card to the card slot and choose the saved file to print.

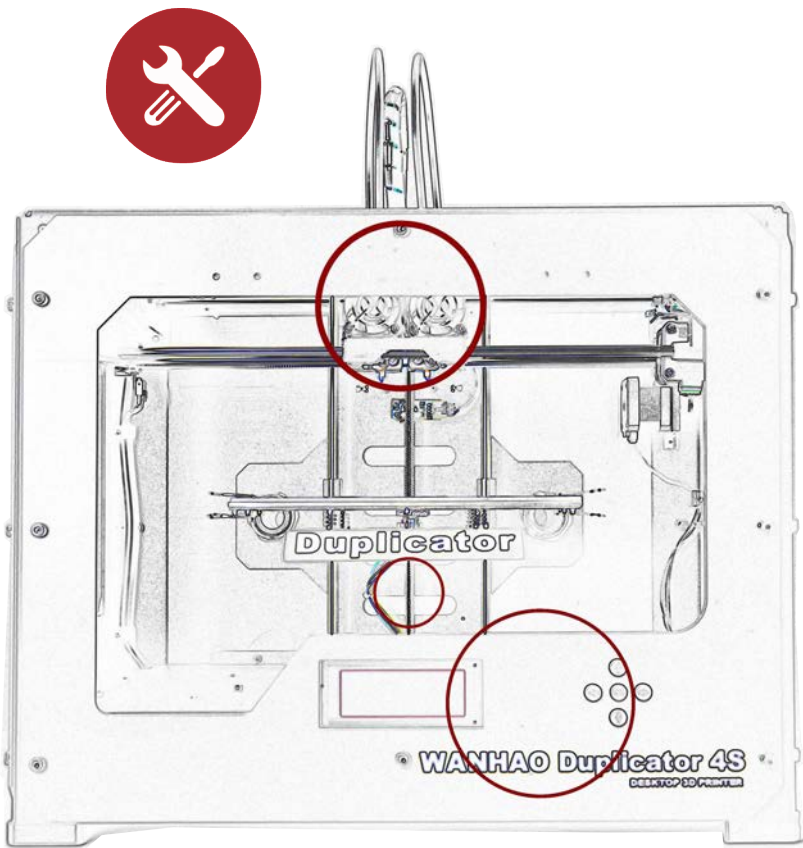


5. Build with Computer

- 4c. Choose your machine type in replicator G , then connection serial port in Machine button. Then press connect button. After connection, press print.



This chapter describes basic troubleshooting and maintenance tasks for your WANHAO Duplicator4S Desktop 3D Printer. For details on more advanced troubleshooting and maintenance tasks, go to wanhao3dprinter.com/FAQ.



USING WANHAO REPLICATORG

PROBLEM	SOLUTION
1. Can't load WanHao Filament into the extruder	<p>Make a fresh cut at the end of the Filament. Cut the Filament at an angle—a narrow tip will help with loading.</p> <p>Use more force when pushing the Filament into the extruder. Grasp the filament firmly and push it into the middle of the hole on top of the extruder.</p> <p>Ensure that you insert the Filament straight down into the extruder, not diagonally.</p> <p>After you feel the motor grab the filament, continue to maintain pressure on the filament for another five seconds.</p>
2. Object is stuck to build plate	<p>Wait for the object to cool down. Objects will detach more easily after they have cooled.</p> <p>If the object is still stuck, take a thin metal craft spatula and carefully work the blade under the edge of the object. When the blade is most of the way under the object, twist the handle slightly. The object should come free.</p>
3. Can't remove the Filament from extruder	<p>Run the filament load script in the onboard Utilities menu and let the filament advance for about five seconds. Then run the unload script again.</p>

DIAGNOSTICS LCD PANEL | TOP-LEVEL MENU

Build from SD	Displays the list of models on the SD card. Select one to start a build
Preheat	Allows you to preheat the extruder.
Utilities	Tools that allow you to configure and maintain your Duplicator 4S.

DIAGNOSTICS LCD PANEL | UTILITIES MENU

UTILITIES

Monitor Mode	Displays the current temperature of the extruder. When making an object, displays the percent completed.
Change Filament	Scripts that walk you through tasks associated with the Filament. LOAD(Left / Right): Script that walks you through the process of loading the Filament. UNLOAD(Left / Right): Script that walks you through the process of unloading the Filament.
Level Build Plate	Script that walks you through the process of leveling the build plate.

LCD PANEL | INFO AND SETTINGS MENU

Bot Statistics: Displays the estimated total hours and minutes of building in the lifetime of your duplicator 4S and the duration in hours and minutes of the last build.

General Settings:Optional settings and information

1,Sound:Turns the duplicator 4S' s indicator sounds on or off.

2,Heat hold:Specifies a time period for your extruder to continue heating when a 3D print is canceled

Preheat Settings:Allows you to change the temperature setting for the extruder. Before you print,you can set the temperature when you generate G code.

MAINTENANCE

Lubricating the Threaded Rod and the X-Axis Idler Pulley

1. Find the tube of PTFE-based grease, included with your wanhao 3d printer.
2. Grasp both sides of the build platform and push it gently to the bottom of duplicator 4S , Use a clean, lint-free rag [or your finger],to spread the PTFE-based grease onto the top section of the threaded rod.Grasp both sides of the build platform and move it to the top of the duplicator 4S , Use a clean, lint-free rag [or your finger] to spread the PTFE-based grease onto the bottom section of the threaded rod. Make sure you get the grease inside of the threads themselves
3. Locate the X-axis idler pulley. If you are,facing the front of duplicator 4S, the idler pulley is at the top left side. The idler pulley is one of the pulleys that allow the rubber belt to move the extruder from left to right, or along the X-axis.The pulley at the other side of the gantry is called the timing pulley and does not require lubrication.

Cleaning the Drive Gear

The drive gear is the part of the extruder that pushes filament through the extruder. When you make things with your wanhao 3d printer , small pieces of hardened PLA/ABS can stick to the drive gear. If you are having problems with your extruder, cleaning the drive gear might help.

- 1.** Unload the wanhao PLA/ABS Filament from the extruder. To start the script for unloading the wanhao PLA/ABS Filament, go to the LCD panel and select Utilities > Filament Options > Unload.
- 2.** Unscrew the two bolts at the lower corners of the fan guard using the 2.5 mm hex key included with your duplicator 4S .As one piece, remove the fan guard, the fan, the heat sink, and spacers. Keep these pieces together and set them aside.
- 3.** Unclip the motor wires.
- 4.** Pull the motor assembly out.
- 5.** Find the drive gear on the motor shaft.Using a small instrument like a makeup brush, toothbrush or toothpick, remove all the pieces of filament stuck to the drive gear.
- 6.** Reseat the motor assembly.
- 7.** Plug in the motor wires
- 8.** Add the fan guard, the fan, the heat sink, and spacers to the front of the extruder and bolt them on.
- 9.** Reload the wanhao PLA/ABS Filament. To do this, go to the LCD panel and select Utilities > Filament Options > Load.

Glossary Of Terms

24V fan : The fan that cools the wanhao Filament as it extrudes.

Yellow Tape: Yellow masking tape that makes a great build surface for objects printed with wanhao Filament. You can find yellow tape at any hardware store.

Build plate : The acrylic surface on which the Duplicator 4S builds an object.

Drive gear: The gear that drives the Wanhao Filament into the heater

Extruder: The assembly that draws the filament from the spool, melts it , and pushes it through the nozzle onto the build plate.

Filament guide tube: The plastic tube that guides the wanhao Filament from the filament spool to the extruder.

FIRMWARE: The software that runs on your wanhao 3d printer

GANTRY : The metal rods that allows the duplicator 4S' s extruder to move on the X and Y axes.

GCode: The computer language used to describe the toolpath your wanhao 3d printer will use to build an object. GCode is converted to .x3g before being sent to your machine.

LCD control panel : The display at the front lower right corner of the wanhao duplicator 4S. This control panel provides status information about the wanhao duplicator 4S and includes control menus and diagnostics.

Wanhao ABS/PLA Filament: ABS/ PLA is a renewable bioplastic. Wanhao ABS/ PLA Filament is the source material from which you make objects on the wanhao duplicator 4S.

Replicator G: Free software created by wanhao that allows you to load, rotate, scale and move 3D models and send them to the wanhao duplicator 4S for building.

Motor assembly: The stepper motor and the drive block that push filament into the extruder.

Motor wires : The bundle of electrical wires that provide power to the motor.

Nozzle: The opening on the end of the extruder from which heated wanhao Filament emerges to be spread onto the build plate.

Plunger: A part of the extruder assembly. The MK9 plunger pushes the wanhao Filament against the drive gear.

Power supply: The power supply for the wanhao duplicator 4S. It includes a block and two plugs.

SD Card: Secure Digital memory card that can store digital data and be read by duplicator 4S and has a maximum capacity of 2GB.

Spacers: The plastic pieces that keep the extruder fan and heat sink secure and in place.

Spool holder: The plastic piece that attaches to the back of wanhao duplicator 4/4X and holds the spool of wanhao Filament. The spool holder ensures that the Filament is fed evenly to the extruder.

Thingshares: A website for uploading and downloading 3D model files for use with the wanhao duplicator 4S.

Threaded rod: The long rod behind the build platform that is threaded along its entire length. This rod allows the build platform to move up and down, or along the Z-axis.

.stl : A widely used file format for 3D models.

USB cable : The cable that allows the wanhao duplicator 4S to communicate with a computer using the USB interface on the computer.

.X3G: A compact format for describing the toolpath your wanhao duplicator 4S will use to build an object.