



MOOZ OPERATION INSTRUCTION

V2.0 2018-09



DOBOT

Shenzhen Yuejiang Technology Co., Ltd | China

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Contents

I. Fast Assembly	
1.1. MOOZ-1	1
1.2. MOOZ-2	3
II. Operation Panel	
2.1. Home Page	6
2.2. 3-Point Leveling Interface	6
2.3. File Directory Interface	6
2.4. Control Tools Interface	6
2.5. 3D Print Functional Module Control Interface	7
2.6. Laser Engraving Functional Module Control Interface ..	7
2.7. CNC Carving Functional Module Control Interface	7
2.8. Zero Point Setting Interface	7
2.9. X/Y/Z Motion Control Interface	8
2.10. Other Settings Interface	8
2.11. Working Process Control Interface	8
III. 3D Printing	
3.1. 3-Point Leveling	9
3.2. Set the Zero Point	10
3.3. Install/Remove the Filament	11
3.4. Use the Slicing Software	12
3.4.1. Install the Slicing Software	12
3.4.2. Configuration for Initial Use	12
3.4.3. Online Printing	13
3.4.4. Offline Printing	15
3.5. Printing Control	16
3.6. Filament Runout Detection	17
3.7. Notes for Printing with Soft Filament	17
IV. Laser Engraving	
4.1. Fix the Workpiece and Replace the Functional Module ..	17
4.2. Set the Zero Point	18
4.3. Use Software to Generate Gcodes	19
V. CNC Carving	
5.1. Replace the Platform and Fix the Workpiece	20
5.2. Install the CNC Bit	21
5.3. Set the Zero Point	21
5.4. Use Software to Generate Gcodes	22
VI. Troubleshooting	
6.1. 3D Printing Failure	23
6.2. Whole Machine Failure	23
6.3. 3D Print Functional Module Failure	24
6.4. Maintenance of 3D Print Functional Module	25
6.4.1. Disassembly of 3D Print Functional Module	25
6.4.2. Assembly of 3D Print Functional Module	26
Parameters	27

Symbol Description



Description

Basic terms or reference information.



Note

Important precaution: ignoring it may cause malfunction of the machine and the corresponding risk.



Warning

Important warning: rules must be strictly observed, otherwise it may cause machine breakdown and personal injury.

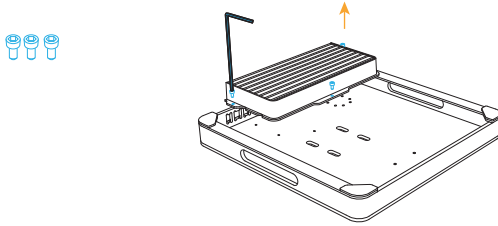


Note: Updated Firmwares, User Manuals, Softwares and Tutorial Videos will be uploaded to our official website www.dobot.cc constantly, please use them for better experience. Any support, please contact us: mooz@dobot.cc.

1.1 MOOZ-1

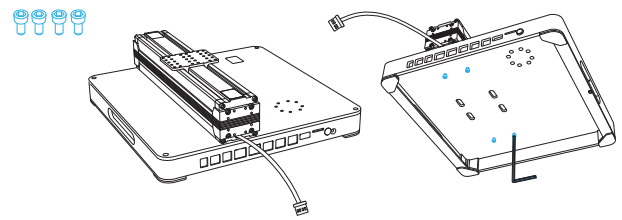
1.1.1 Remove the Main Control Board

Remove the screws (M3x5 hex screw x3) and take down the main control board. As shown below



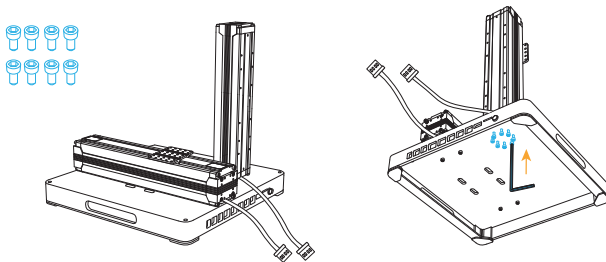
1.1.2 Install the Y-axis Linear Actuator

Install the Y-axis on the base with screws (M3x8 hex screw x4). As shown below



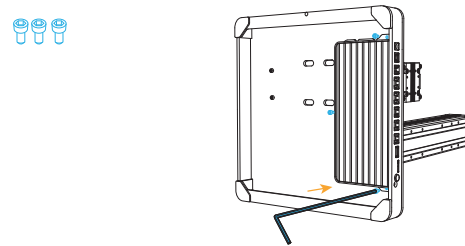
1.1.3 Install the Z-axis Linear Actuator

Install the Z-axis on the base with screws (M3x8 hex screw x8). As shown below



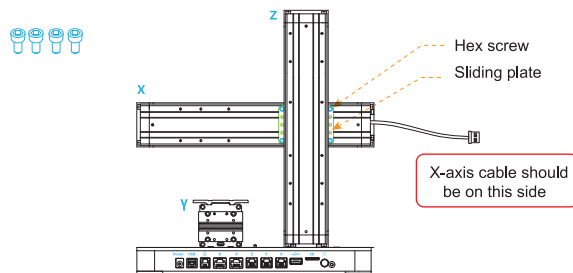
1.1.4 Install the Main Control Board

Install the Main control board back with screws (M3x5 hex screw x3). As shown below



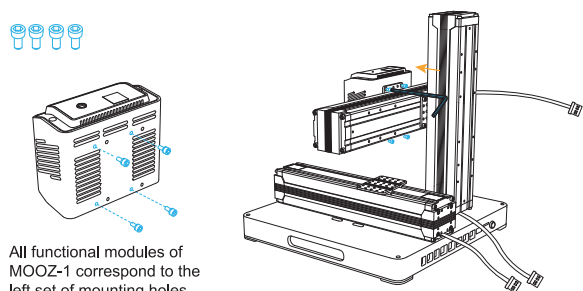
1.1.5 Install the X-axis Linear Actuator

Install the X-axis on the Z-axis sliding plate with screws (M3x8 hex screw x4). As shown below



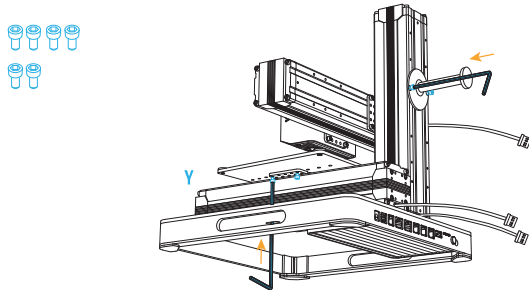
1.1.6 Install the Functional Module

Select the functional module you need and fix it on the X-axis with screws (M3x7 hex screw x4). As shown below



1.1.7 Install the Platform and Filament Support

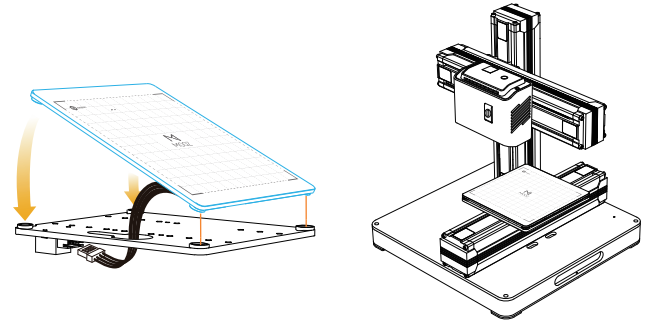
Move the Y-axis sliding plate to an appropriate position and fix the platform on it with screws (M3x7 hex screw x4). Fix the filament support on the Z-axis with screws (M3x8 or M3x7 hex screw x2). As shown below.



! Note: Please be sure to tighten the screws to fix the platform. Check them regularly in case of looseness after long time use.

1.1.8 Install the Heated Bed

Align the heated bed to the platform, run the black cable through hole on the platform, embed the round magnets into the ledges and connect the cable to the socket.

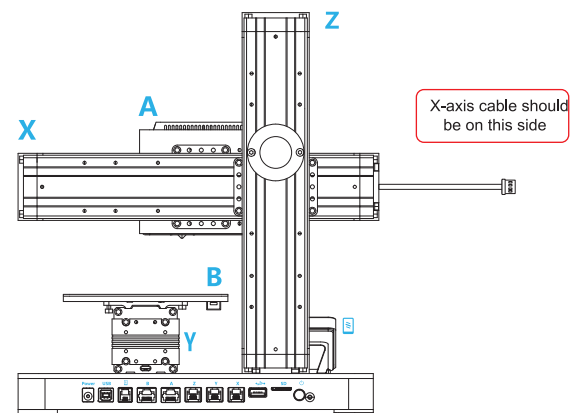
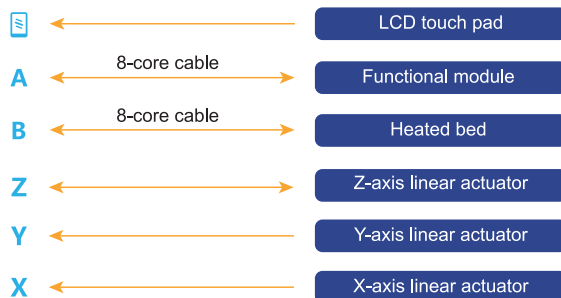
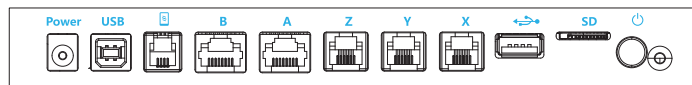


⚡ Warning: Heated bed (including the glass and magnets) is a fragile component, please operate with care! Do not mount and dismount it regularly during daily use.

1.1.9 Connect the Cables

⚡ Warning: Wrong connection of cables may cause burnout of main control board! Hot-plug is strictly prohibited! Always make sure that all cables are plugged in place before power-on! Plugging of cables during power-on status will cause malfunction!

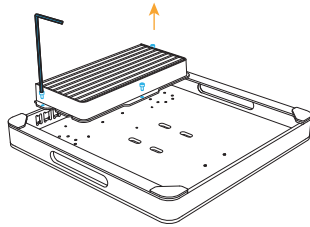
Before power on the machine, please follow the chart below and connect all modules to the main control board correctly.



1.2 MOOZ-2

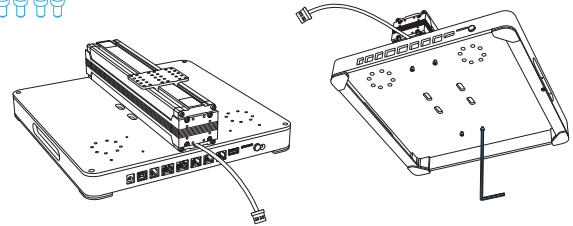
1.2.1 Remove the Main Control Board

Remove the screws (M3x5 hex screw x3) and take down the main control board. As shown below



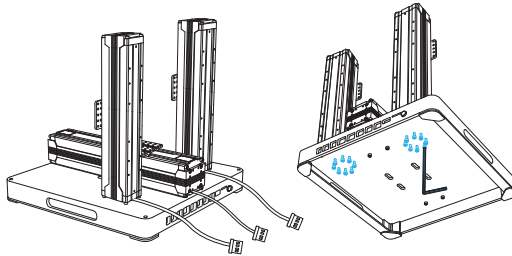
1.2.2 Install the Y-axis Linear Actuator

Install the Y-axis on the base with screws (M3x8 hex screw x4). As shown below



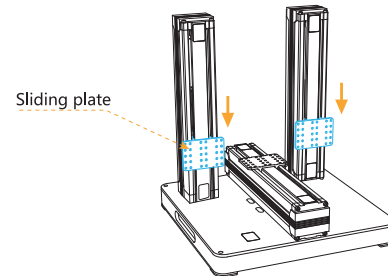
1.2.3 Install the Z-axis Linear Actuators

Install the Z-axis actuators on the base with screws (M3x8 hex screw x16). As shown below



1.2.4 Adjust the the Position of Z-axis Sliding Plates

Push two sliding plates of Z-axis downwards to the end. As shown below



1.2.5 Install the X-axis Linear Actuator

Install X-axis on the sliding plates of Z-axis with screws. As shown below

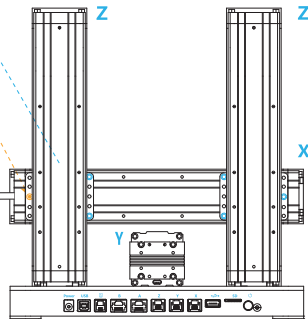


M3x8 hex screws x 5



M3x7 hex screws x 1

X-axis cable should be on this side

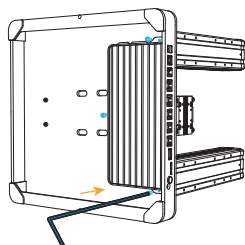


Note: 1. Pay attention to the direction of X-axis cable before installation.

2. Yellow position as shown at left should be fixed with M3x7 screw, since M3x8 screw is too long and will puncture the motor inside!
3. Firstly you should screw on the 6 screws without tightening, so the X-axis can self-adjust by gravity.
4. Do not change the position of Z-axis sliding plates during the installation, or it will cause the print surface to be uneven. It is recommended to tighten the screws after confirming that two sliding plates of Z-axis linear actuators are at the bottom.
5. Tighten the screws gently with the longer end of L-type screwdriver, note that excessive tightness will affect the smoothness and service life of Z-axis linear actuators!

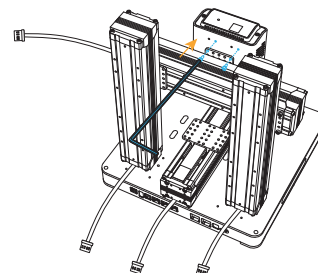
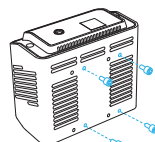
1.2.6 Install the Main Control Board

Install the main control board back with screws (M3x5 hex screw x3).
As shown below



1.2.7 Install the Functional Module

Adjust the X-axis linear actuator to the proper height, select the functional module you need and fix it on the X-axis with screws (M3x7 hex screw x4).
As shown below

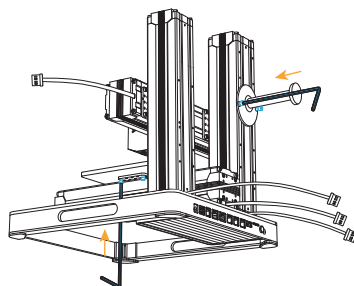


All functional modules of
MOOZ-1 correspond to the
left set of mounting holes

1.2.8 Install the Platform and Filament Support

Move the Y-axis sliding plate to an appropriate position and fix the platform on it with screws (M3x7 hex screw x4).

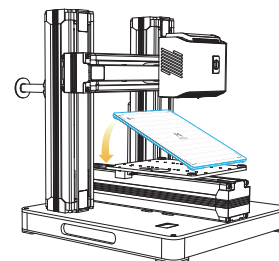
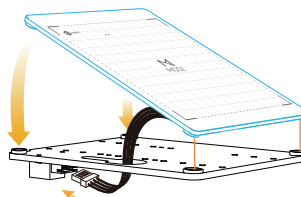
Fix the filament support on the Z-axis with screws (M3x8 or M3x7 hex screw x2). As shown below.



Note: Please be sure to tighten the screws to fix the platform. Check them regularly in case of looseness after long time use.

1.2.9 Install the Heated Bed

Align the heated bed to the platform, run the black cable through hole on the platform, embed the round magnets into the ledges and connect the cable to the socket.



Warning:

Heated bed (including the glass and magnets) is a fragile component, please operate with care! Do not mount and dismount it regularly during daily use.

1.2.10 Connect the Cables

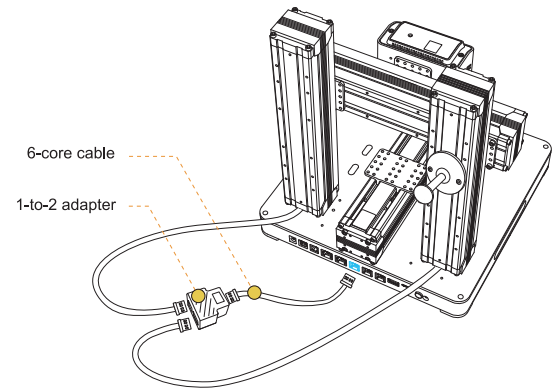
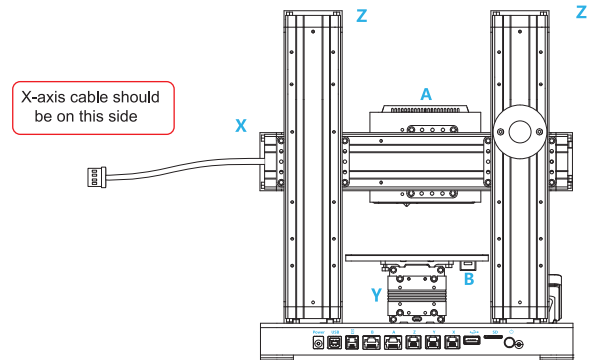
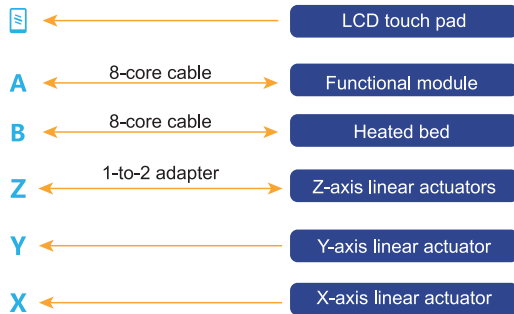
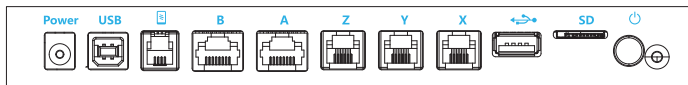


Warning: Wrong connection of cables may cause burnout of main control board! Hot-plug is strictly prohibited! Always make sure that all cables are plugged in place before power-on! Plugging of cables during power-on status will cause malfunction!



Note: Please use the "1-to-2 adapter" to connect the Z-axis linear actuators to the main control board.

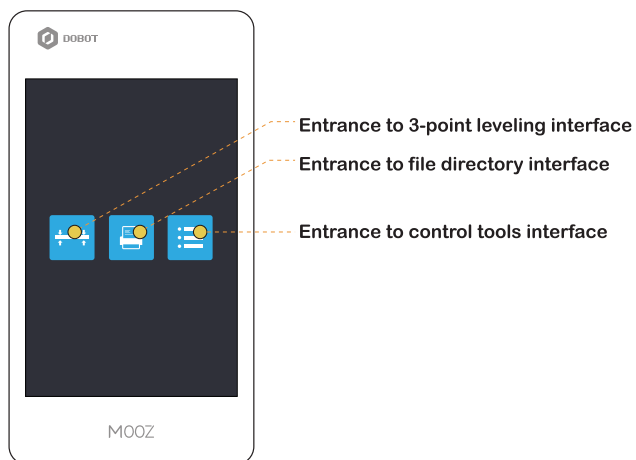
Before power on the machine, please follow the chart below and connect all modules to the main control board correctly.



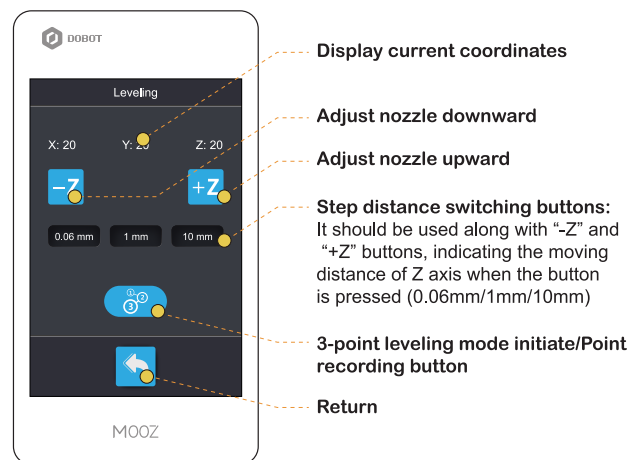
II

Operation Panel

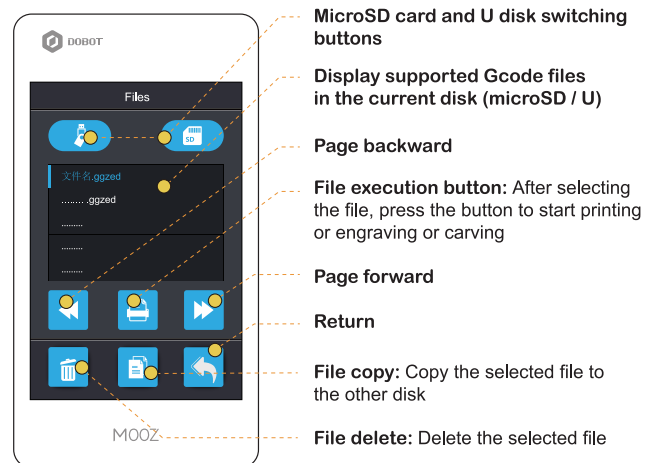
2.1 Home Page



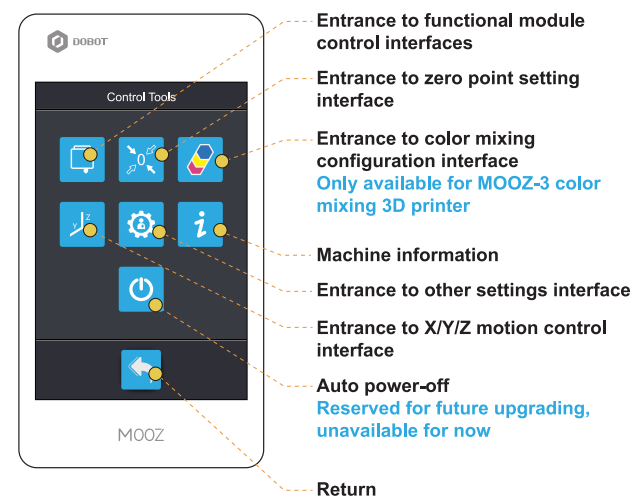
2.2 3-Point Leveling Interface



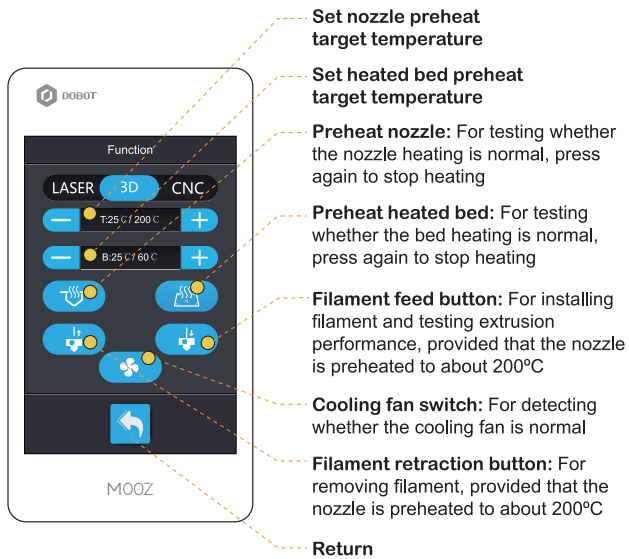
2.3 File Directory Interface



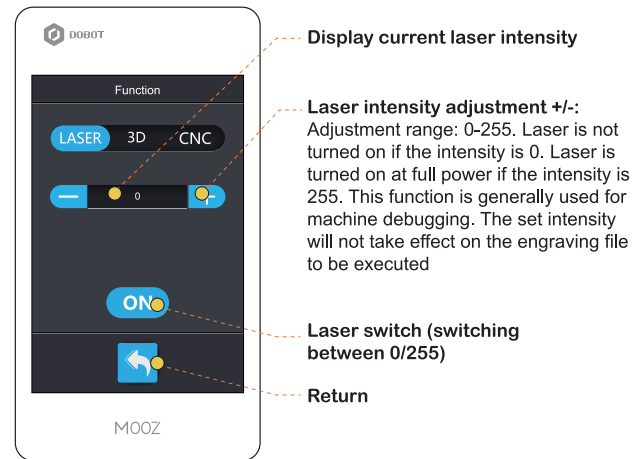
2.4 Control Tools Interface



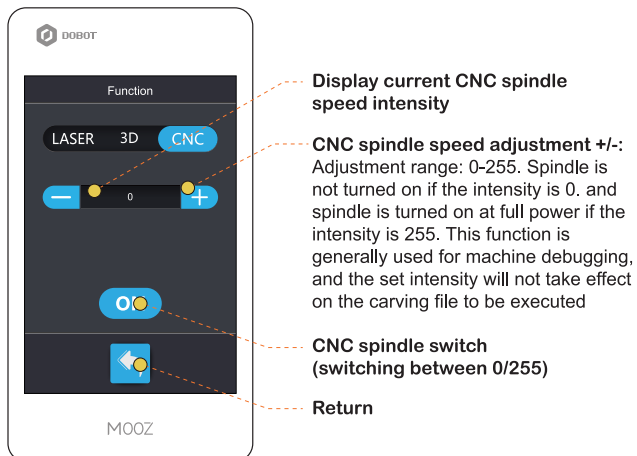
2.5 3D Print Functional Module Control Interface



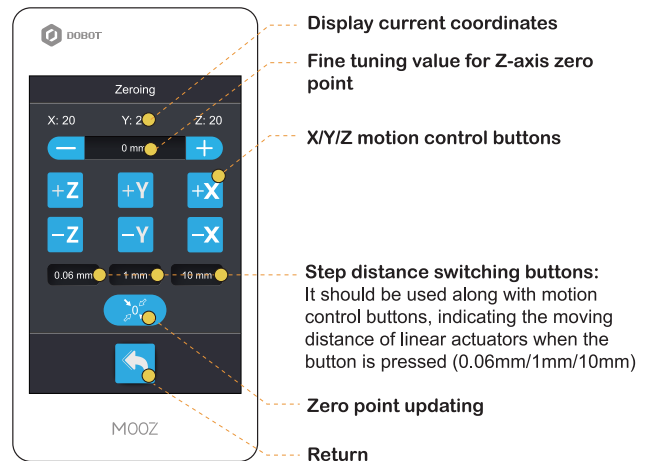
2.6 Laser Engraving Functional Module Control Interface



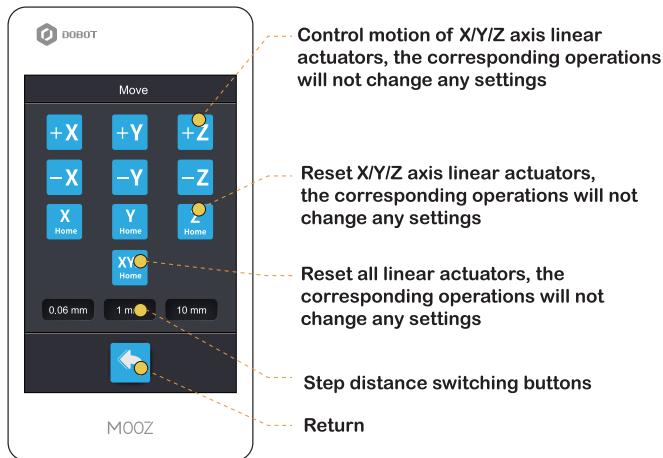
2.7 CNC Carving Functional Module Control Interface



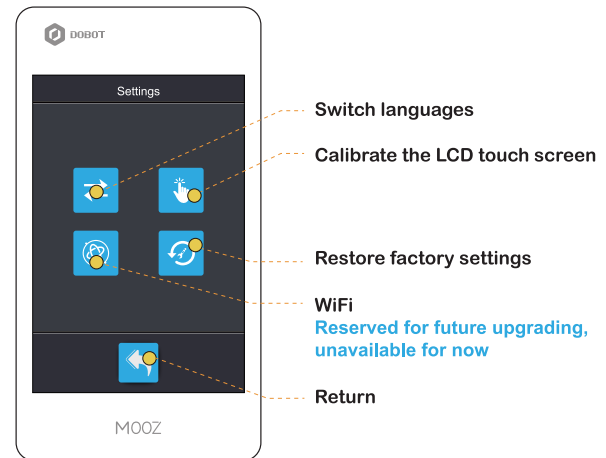
2.8 Zero Point Setting Interface



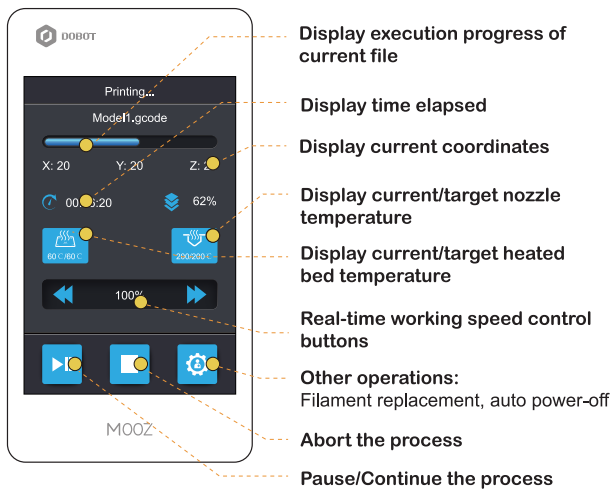
2.9 X/Y/Z Motion Control Interface



2.10 Other Settings Interface

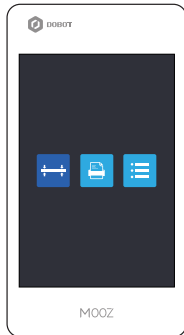


2.11 Working Process Control Interface

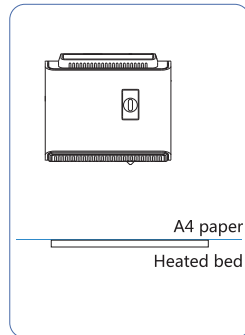


3.1 3-Point Leveling

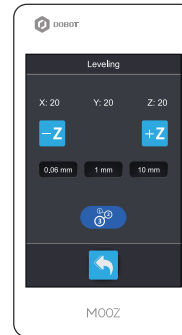
Please follow the guide of the machine to record three different points to define a plane parallel to the heated bed, these three points must be recorded in order with nozzle in the areas shown in the drawing below, one in each. The calibration requires to be set only for the first use. Before the operation, please insert filament to turn off the filament runout detection. Do not insert any further once the filament runout detection is turned off, since correct filament installation method is described in Section 3.3. Operation steps:



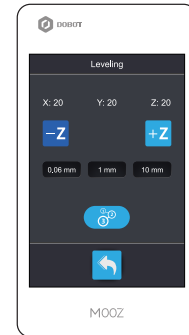
Press the "Entrance to 3-point leveling interface" button



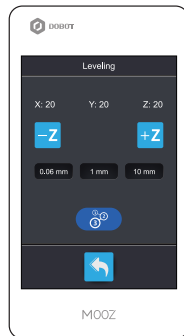
Place a piece of A4 paper on the heated bed



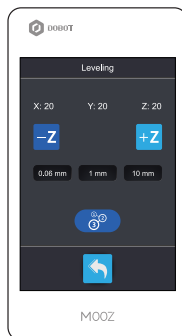
Press the "3-point leveling mode initiate/Point recording" button to enter 3-point leveling mode, and the nozzle will automatically go to a position right above Point ①



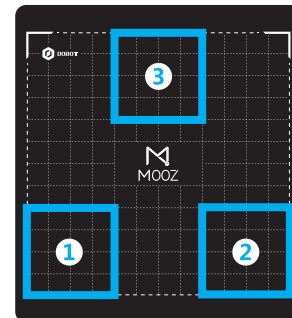
Press the "-Z" button to get the nozzle closer to the heated bed, and move the A4 paper back and forth at the same time. Stop just when the paper can slip with slight friction



Press the "3-point leveling mode initiate/Point recording" button to record Point ①. The nozzle will automatically go to a position right above Point ② after successful recording



Do the same height adjusting and point recording steps to record Point ② and ③. After successful leveling, the machine will home again and exit 3-point leveling mode



Note: 1. Please access to www.dobot.cc to download and upgrade the mainboard firmware!

2. 3-point leveling mode can only be entered with 3D printing head connected.

3. Only Z coordinates will be recorded, so all you need to do is adjusting the height with a piece of paper.

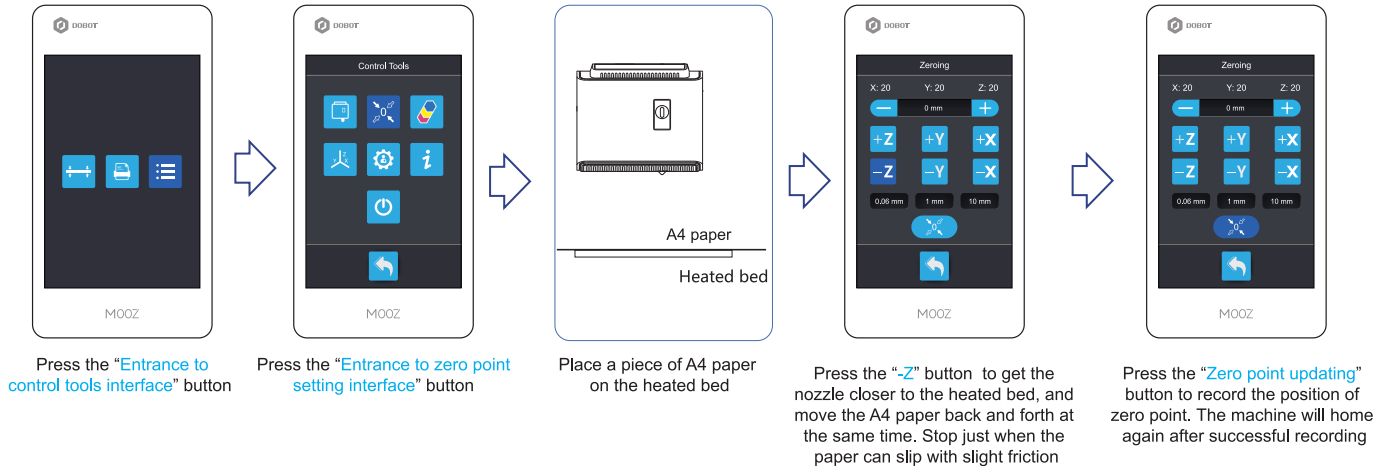
4. The recorded points will not be lost after power-off. But, once entering 3-point leveling mode, previously recorded points will be cleared automatically.

5. Friction status of the three points should be as uniform as possible. Pay attention when traveling the head downward, especially when the nozzle is getting too close to the bed. Even though the height detect protection will take effect and force the machine to go 0.06mm each press, the heated bed may also get burnt if you continuously move it downward without testing the height with a piece of paper.

6. A re-assembled machine should be re-levelled.

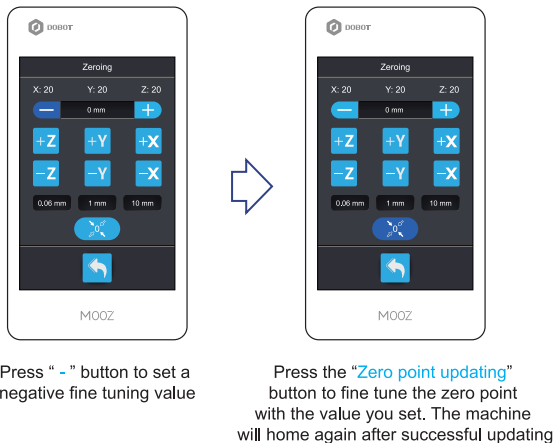
3.2 Set the Zero Point

Zero point is the start point for the machine to print, which requires to be set only for the first use. Operation steps:



Fine tuning:

This function allows users to fine tune the zero of Z-axis according to bonding status of the first layer, in case the zero point is not satisfactory after standard setting procedures. For instance, if the zero point is too high and causing bonding failure of the first layer:

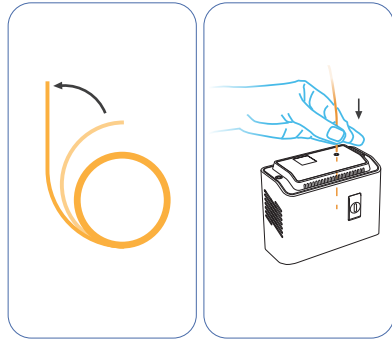


Note:

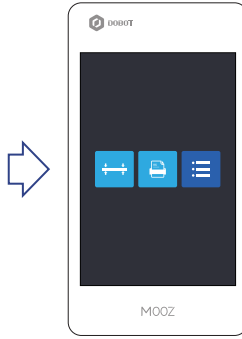
1. For the 3D printing function, only the zero of Z-axis need to be set and recorded. Zeros of X-axis and Y-axis are system default values and will not and cannot be changed.
2. Too high Z-axis zero position will lead to loose bonding at the bottom, causing the model falling off, and too low position will make it difficult to take off the model or even scratch the heated bed. Dedicated fine tuning is always required to obtain satisfactory first several layers. If the zero point is too high, please use a negative fine tuning value and use a positive fine tuning value if the zero point is too low.
3. Pay attention when moving the head downward, especially when the nozzle is getting too close to the bed. Even though the height detect protection will take effect and force the machine to go 0.06mm each press, the heated bed may also get burnt if you continuously move it downward without testing the height with a piece of paper.
4. The zero point will not be lost after power-off, so there's no need to reset it. However, the zero point may be deviated and needs to be reset after the machine is reassembled or the functional module is switched.
5. If your printer prints in the mid air, the zero point must be wrongly set. After correct zeroing and homing, the coordinate of Z should be about 130.
6. Please be prudent with the "Zero point updating" button, pressing it will change zero point of the machine. If the fine tuning value remains 0, the operation will record current height of the nozzle as zero point. If the fine tuning value is not 0, the operation will update zero point of Z-axis using fine tuning value you set.

3.3 Install/Remove the filament

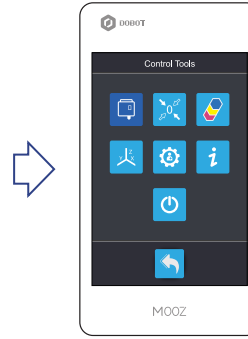
Operation steps:



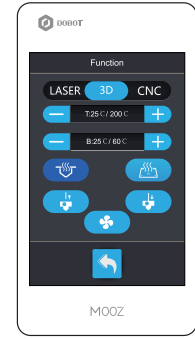
Straighten the filament manually, insert filament to turn off the filament runout detection



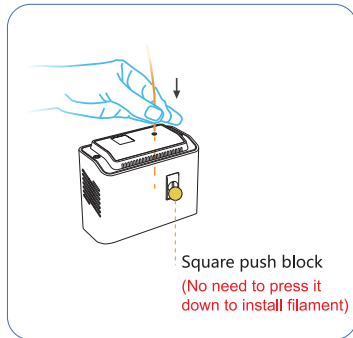
Press the "Entrance to control tools interface" button



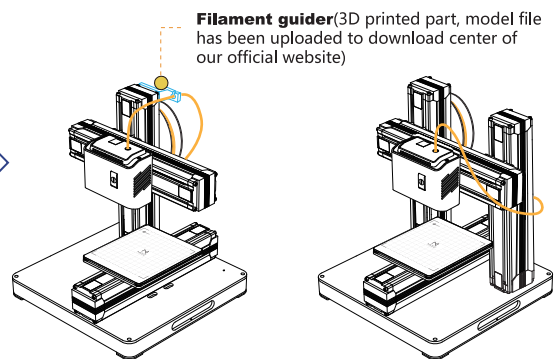
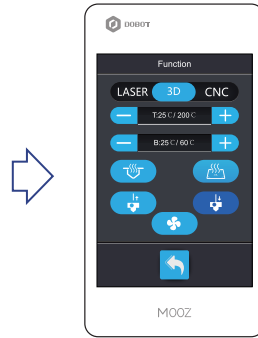
Press the "Entrance to functional module control interfaces" button



Press the "Preheat nozzle" button, and wait for the temperature to reach about 200°C



Pressure the filament down firmly. At the same time, press "↓" button until melted filament flows out of the nozzle.



Rearrange the filament after installing



Warning: 1. Please do not let the filament residue(snapped or about to use up) get "swallowed" by the extruder, otherwise it will jam the extruder!

2. Please do not try to install the filament by pressing down the square push block and insert the filament to the bottom of the nozzle, you may deflect the filament and break the fan blades.



Note: 1. After pressing "↓" button on the screen, you can feel the filament being "fed" into the extruder evenly. If you can not successfully install the filament according to the above method, please press down the square push block with one hand, and insert the filament down further for about 5mm to get it clamped by extruder gear, and then press "↓" button until melted filament flows out of the nozzle. In case the extruder or nozzle is jammed, please refer to Section 6.4 for maintenance.

2. Please keep the filament inserted and runout detection remains turned off, otherwise nozzle heating will be interrupted.

3. Method to remove the filament: Heat the nozzle to 200 °C (For PLA), press the "↓" button twice to extrude some filament, and then press the "↑" button twice to retract it for some distance, stop nozzle heating and wait nozzle temperature drops down to 80 °C or lower, then press down the square push block and pull the filament out.

3.4 Use the Slicing Software



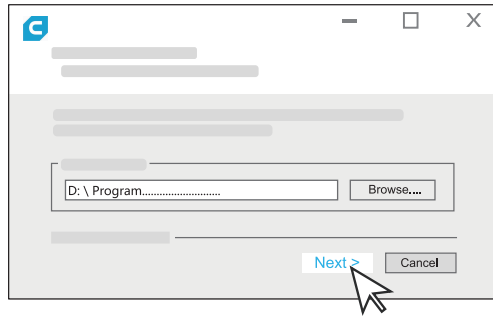
Description: MOOZ supports most third-party printing softwares, such as Cura, Repetier-Host, etc. Cura 3.1.0 is described here as an example.

3.4.1 Install the Slicing Software

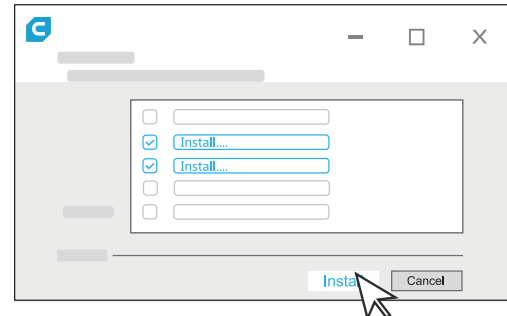
Operation steps: ① Double-click  to install the software:

Cura3.1.0.exe

② Select the installation directory. It is recommended to keep the default, click "Next":



③ Select the features you need. It is recommended to keep the defaults, click "Install":



④ The window of installing arduino driver will pop up in the process of installation. Please follow the prompts to complete the installation.

3.4.2 Configuration for Initial Use



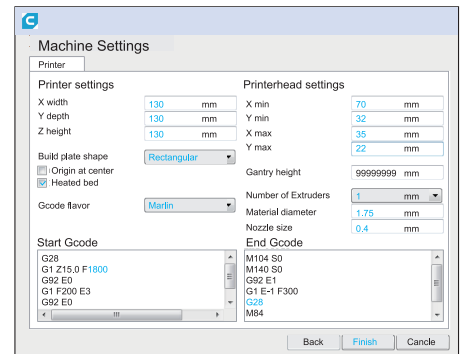
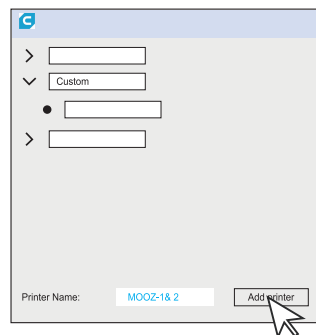
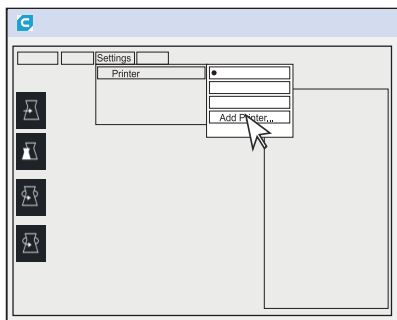
Description: Please visit www.dobot.cc to download the related tutorial videos and softwares.

Operation steps:

① Run Cura 3.1.0 and go "Settings" > "Printer" > "Add Printer" > "Custom", name your printer "MOOZ-1&2", and click "Add printer", dialog of Machine Settings will popup



② Configure the machine



Note: Origin of MOOZ-1 and MOOZ-2 is defaulted at left-bottom corner of the heated bed, so do not check the "Origin at center" box, otherwise the model will be printed outside of the heated bed.

3.4.3 Online Printing



Note: If the computer enters sleep mode during online printing, the printing process will be interrupted. Please check the power status of the computer before printing.

Online steps:

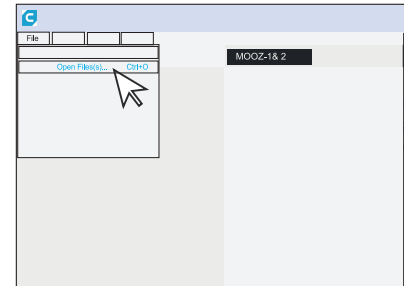
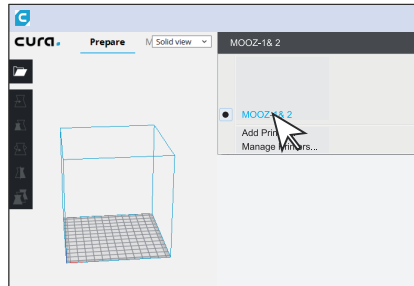
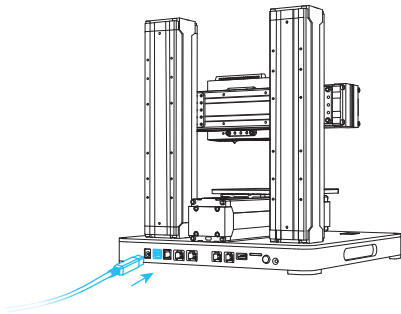
- ① Connect to the computer with USB cable, and power up the machine



- ② Restart Cura 3.1.0, and select the printer you added and configured in Section 3.4.2

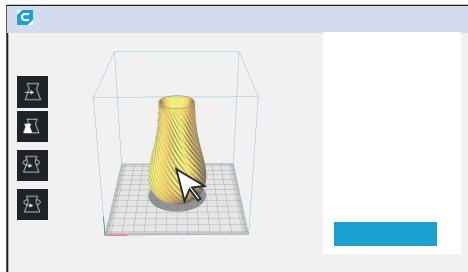


- ③ Go "File" > "Open File(s)..." and select the model you want to slice. Cura supports STL/OBJ/AMF format models

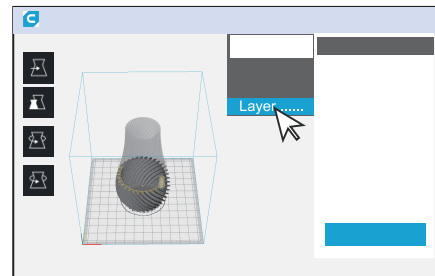


Profile the model:

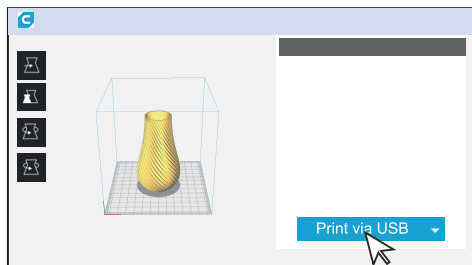
- ① Adjust the model: left click on the model, four options "Solid view", "Wireframe view", "Layer view", and "Cross-section view" will appear on the left side of the interface, and you can adjust as needed.



- ② View the details of the slice: click the drop-down list on the upper middle corner of the interface and select "Layer view" to view the details of the slice.



- ③ Click the drop-down list on the right bottom corner of the interface and select "Print via USB".



Note: Please make sure the machine has been properly linked to your PC, power it on before starting Cura. Your computer may need to install CH340 driver, please access to www.dobot.cc to download it.



Description of key profile settings:

- ① **Layer Height:** For the height of each layer of printing, smaller value will produce finer surface, but cost more printing time. Suggested range is 0.05 to 0.3, not exceeding 3/4 of the diameter of the nozzle. MOOZ used 0.4mm nozzle, means not exceeding 0.3.
- ② **Wall Thickness:** For the printing thickness of the outer surface of the model, the setting of 1.2 indicates that the outer surface will go three rounds, since the width of each round equals to the diameter of the nozzle, namely 0.4.
- ③ **Top/Bottom Thickness:** Determine the bottom/top thickness of the model.
- ④ **Infill Density:** Determine the filling density of the internal grid of the model, generally set at 15% or less.
- ⑤ **Printing Temperature:** Need to be set according to filament type. Suggested value for PLA is 190~220 C°, and for TPU is 210~230 C°, and for ABS is 230~260 C°.
- ⑥ **Build Plate Temperature:** Need to be set according to filament type. Suggested value for PLA is 60~80 C°, and for ABS is 80~100 C°.
- ⑦ **Travel Speed:** Travel speed should be set no greater than 40mm/s, otherwise the Z linear actuators may lose some steps when traveling downward from home position too fast and cause zero point deviation.
- ⑧ **Support Placement:** If the model has any hovering part, the option must be switched on. Generally, "Everywhere" indicates that support can be added on the model itself. If you select "Touching buildplate", it indicates that support can be added only between the print platform and the model hovering position, not on the model.
- ⑨ **Build Plate Adhesion:** "Brim" indicates that a few layers of outer ring should be added on the bottom edge of the model so as to prevent warping. And "Raft" is used to get the whole model raised by adding a raft-like base on the bottom when the heated bed leveling status is not satisfying.
- ⑩ **Spiralize Outer Contour (i.e., vase mode):** Only the outer surface and the bottom of the model are printed, and continuous spiral lift will appear when printing the outer surface, which can improve the surface quality, but has requirements for the model, and that is, the model can only have one outer surface and can not be hovered.



Note:

1. Hover the mouse over the option, and the corresponding hint will appear.
2. Right-click anywhere within the parameter setting area, you can "Configure setting visibility".
3. Tutorial video for using Cura is available on our official website.

MOOZ-1&2

Material

PLA

Printer Setup

Recommended

Custom

Profile :

Fine 0.1mm

Layer Height

0.12 mm

Shell

Wall Thickness

1.2 mm

Top/Bottom Thickness

1.2 mm

Infill

Infill Density

20 %

Infill Pattern

Grid

Gradual Infill Steps

0

Material

Printing Temperature

205 °C

Build Plate Temperature

70 °C

Diameter

1.75 mm

Flow

100 %

Enable retraction

☒

Retraction Distance

5 mm

Retraction Speed

50 mm/s

Speed

Print Speed

40 mm/s

Infill Speed

40 mm/s

Wall Speed

15 mm/s

Travel speed

40 mm/s

Cooling

<

Support

<

Build Plate Adhesion

Build Plate Adhesion Type

Raft

Raft Extra Margin

4 mm

Raft Air Gap

0.2 mm

Initial Layer Z Overlap

0.1 mm

Raft Top Layers

4

Raft Print Speed

15 mm/s

Special Mode

Print Sequence

All at Once

Spiralize Outer Contour

☐

3.4.4 Offline Printing



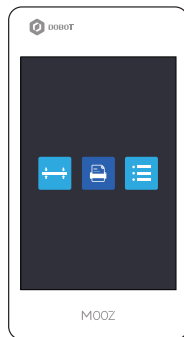
Warning: After printing finished, please wait until heated bed cools down to ambient temperature. Place a knife or spatula under the print and apply a small amount of force to remove it. Do not try to drag or pull the print off, otherwise the heated bed sticker may swell and result in severe unevenness.



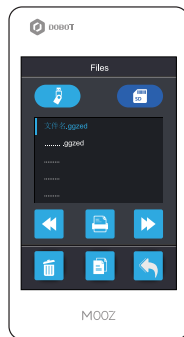
Note: 1. The U disk or microSD card format shall be Fat32 with the capacity not greater than 32GB.
2. Make sure the machine has been properly leveled and zeroed before executing any Gcode files.
3. Applying gummed textured paper before printing can greatly reduce risk of getting the heated bed sticker scratched!

Operation steps:

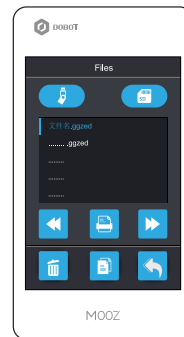
1. Preheat nozzle and heated bed to target temperature, and test extrusion performance of the 3D print functional module. Refer to Section 3.3.
2. Follow the steps below to execute the Gcode file.



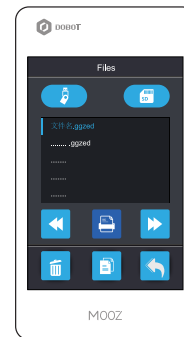
Press the "Entrance to file directory interface" button



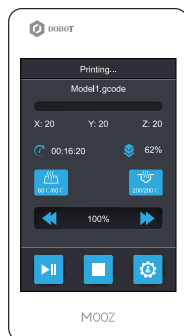
Switch to microSD card or U disk



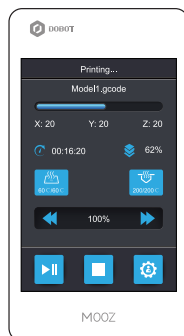
Press to select the file you want to print



Press the "File execution" button to start printing



Wait for the heated bed and nozzle to be heated to the target temperature



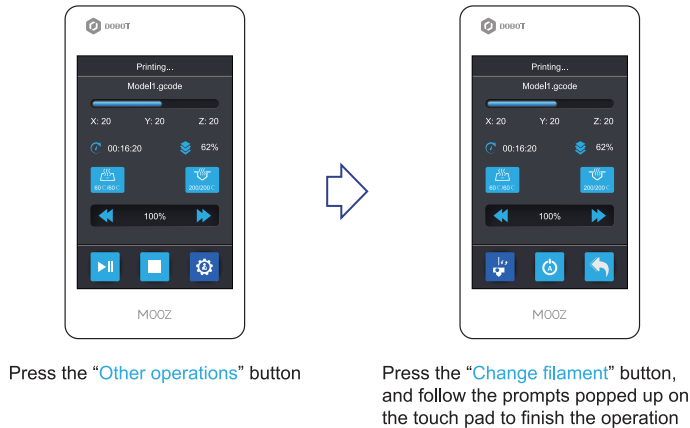
Start printing automatically

3.5 Printing Control

1. **Speed Control:** Change printing speed in real-time. Note that too high speed may sacrifice accuracy and service life of the machine.
2. **Process Control—Pause/Continue:** Press to pause the printing process, press again to continue.
3. **Process Control—Abort:** Press to abort current printing process. The process will be unrecoverable once aborted, please be prudent.



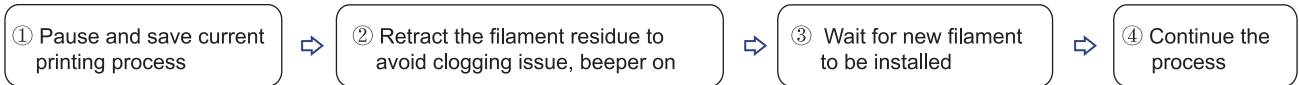
4. **Change filament:** If the filament is about to runout or your desire to use another roll of filament to finish the print, please follow the steps below to change the filament. (Refer to Section 3.3 for correct filament installation and removal methods)



3.6 Filament Runout Detection

The 3D print functional module is designed with build-in filament detection sensor.

1. The filament runout detection must be turned off to preheat the nozzle, and the preheating process will be interrupt if the filament runout detection is turned on during the process.
2. If the filament runs out during printing, state of the sensor will change from “runout detection turned off” to “runout detection turned on”, and the filament runout detection function will work as follows:

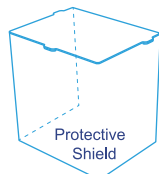


3. The filament detection sensor module has adopted modular design. If you do not need the function, or if the sensor is not working, you can unplug the temperature sensor cable (white) from the module, remove the module connecting cable (black) from the PCB board on the bottom of plastic cap, and plug the temperature sensor to the PCB board directly. Refer to Section 6.4.

3.7 Notes for Printing with Soft Filament

1. Compared to PLA, soft filament like TPU requires higher printing temperature to reduce feeding resistance, recommended value for TPU is 210 C~230 C.
2. You must reduce extrusion force when printing with soft filament, replacing the spring or adjusting by using the rotary knob on the functional module can serve that purpose. Refer to Section 6.4. Different kinds of soft filament may vary in required extrusion force. Since extrusion force is proportional to the spring force, inadequate or intermittentoff feeding issue will occur if the spring force is set too small. On the other hand, if the spring force is set too big, the filament may curl inside the extruder under high feeding resistance condition. In that case, please refer to Section 6.4 for maintainance.
Recommended spring force adjustment for printing with TPU: Use the spare spring, and tighten the rotary knob.

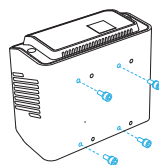
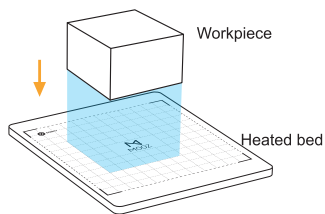
IV Laser Engraving



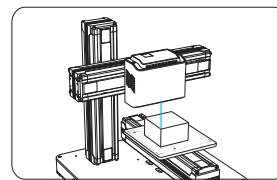
Note: Please be sure to wear the goggles and use the protective shield for safety!

4.1 Fix the Workpiece and Replace the Functional Module

Operation steps: Stick a small piece of tape to the bottom of workpiece (traceless double-sided tape is recommended), keeping the edges of the workpiece aligned with grids and adhere it to the heated bed.



All functional modules for MOOZ-1 correspond to left set of mounting holes, and for MOOZ-2, use the other four holes



Wear the protective glasses to focus the laser and set zero point

4.2 Set the Zero Point



Warning: Make sure that the cables are plugged in place before power-on! Hot-plug will cause malfunction!

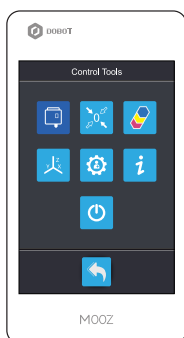


Note: 1. For the laser engraving function, the zeros of X, Y and Z axes shall all be set.

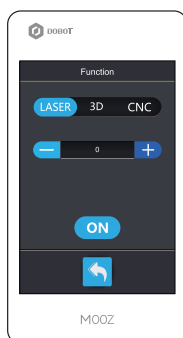
2. Zero point will not be lost after power-off, so there's no need to reset it. However, the zero point may be deviated and needs to be reset after the machine is reassembled or the functional module is switched. 3. If the position or size of the workpiece changes, it is necessary to refocus and set the zero point.

4. The laser unit is featured with focus length of 5~10mm, so it may not need to switch to 0.1mm step distance for focusing.

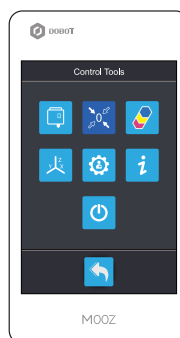
Operation Steps:



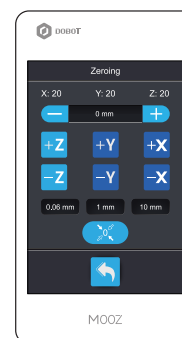
Press the "Entrance to functional module control interfaces" button



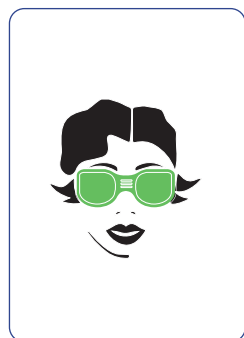
Press "+" to make the laser output at intensity of 5, and press the "Return" button



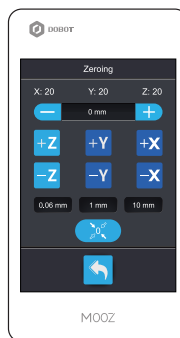
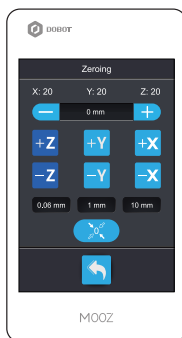
Press the "Entrance to zero point setting interface" button



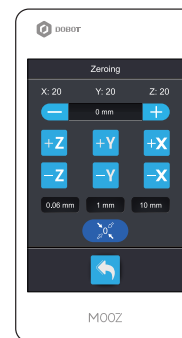
Control the X-axis and Y-axis to make the laser spot irradiated on the workpiece



Wear the goggles to control the Z-axis to focus the laser beam (until the spot is the minimum which should be judged by naked eyes). Switch the step distance to 1mm for fine tuning



Adjust the X-axis and Y-axis to move the laser spot to desired position, generally intersection at the lower left corner of the workpiece



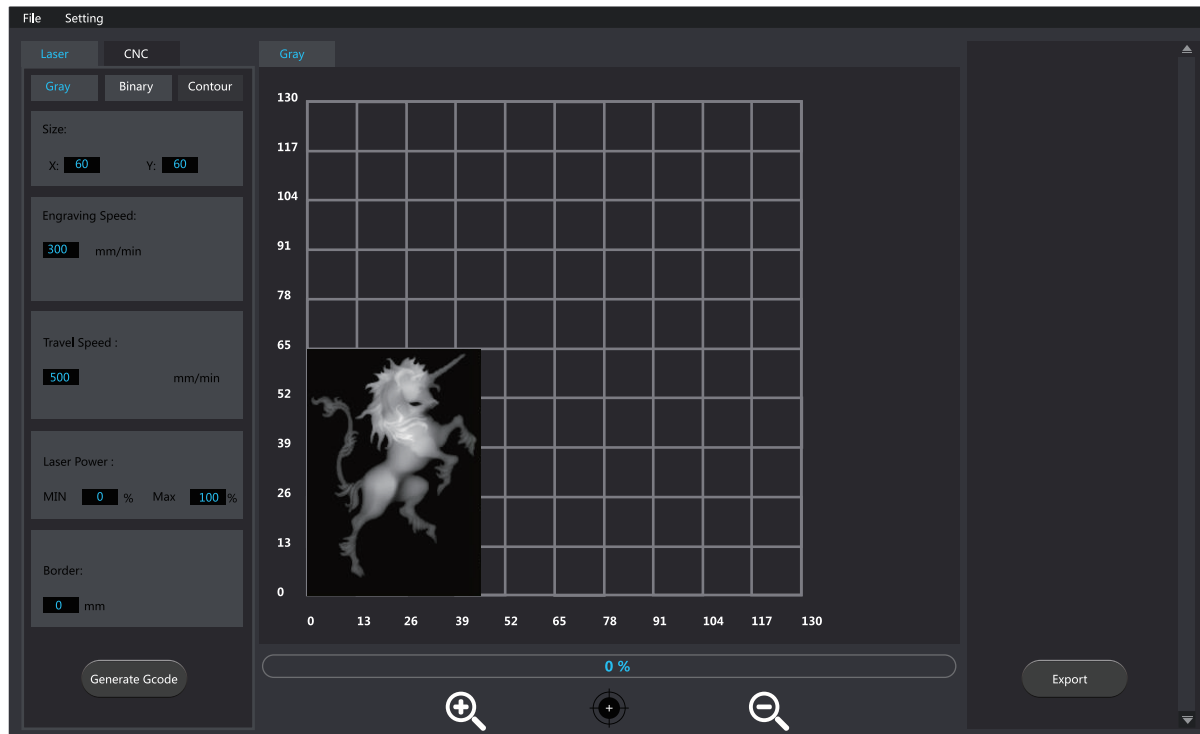
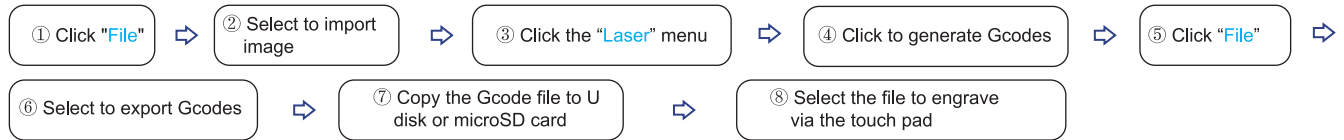
Press the "Zero point updating" button to record the position of zero point. The machine will home again after successful recording

4.3 Use Software to Generate Gcodes



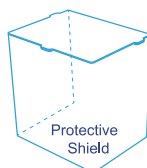
Note: Currently the software only supports offline working. Please visit www.dobot.cc to download the related tutorial videos and softwares.

Operation steps:



Setting Description:

- ① **Size**: Adjust the size of the engraving pattern, use the zoom buttons for rough adjusting.
- ② **Engraving Speed**: Adjust according to the engraving effect of different materials, the materials that are more difficult to engrave require slower speed.
- ③ **Border**: Engrave the border of the pattern, default setting will not add border.
- ④ **Snap to origin**: Use the button on the bottom (between the zoom buttons) to align the image to origin.



Note: Please be sure to wear the goggles and use the protective shield for safety!

5.1 Install the CNC Platform and Workpiece



Warning: Heated bed (including the glass and magnets) is a fragile component, please operate with care! Do not mount and dismount it regularly during daily use.

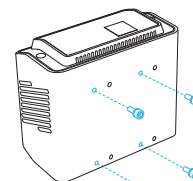
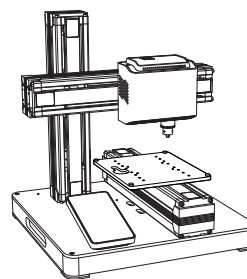
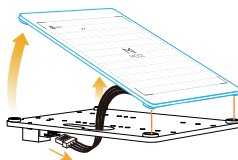
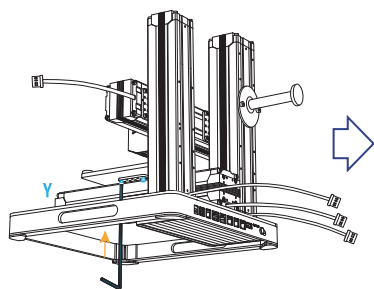
Move the Y-axis sliding plate to a suitable position, remove the screws and take down the platform together with the heated bed



Unplug the heating cable, and separate the heated bed and platform carefully



Install the CNC carving functional module



All functional modules for MOOZ-1 correspond to left set of mounting holes, and for MOOZ-2, correspond to the other four holes.

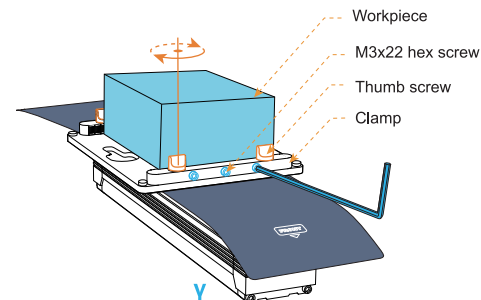
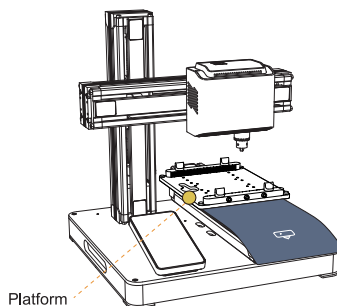
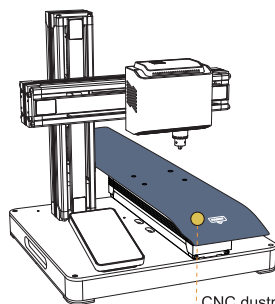
Keep the mounting holes aligned and fix the CNC dust gasket and platform on Y-axis sliding plate with M3x7 hex screws



Loosen the thumb screws, adjust the mounting position of the clamp according to the size of your workpiece and tighten the thumb screws



Tighten the M3x22 hex screws to fix the workpiece



Note: Please be sure to tighten the screws to fix the platform. Check them regularly in case of looseness after long time use.

5.2 Install the CNC Bit

Operation steps:

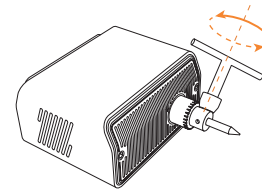
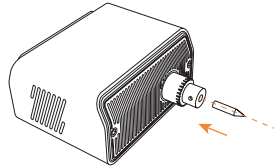
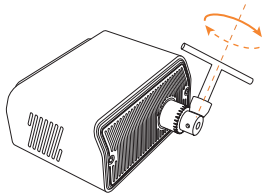
① Rotate counterclockwise to expand the chuck with the wrench



② Insert the CNC bit into the chuck as far as you can

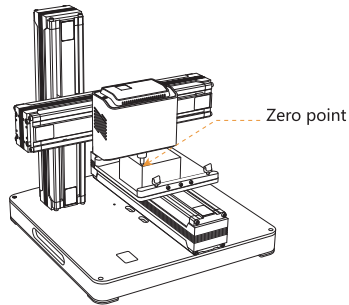


③ Rotate clockwise to clamp the CNC bit



5.3 Set the Zero Point

Operation steps: Similar to laser engraving (Refer to Section 4.2 for details on setting the zero point)



Warning: Adjust the position of Z-axis with smaller step distance (0.1 / 1mm) as much as possible so as to prevent the Z-axis from traveling downwards for a long distance, causing the collision between the tool and workpiece!



Note: 1. Keep the tool tip just or about to touch the upper surface of the workpiece in case of setting Z-axis zero point.

2. The current fixing method may damage the surface of the workpiece, and the user may place a block between the hex screws and the workpiece as needed to compress the workpiece, provided that the block shall not interfere movement of the tool.

3. CNC chuck is easy to get rusty for long-time exposure to moisture. Please regularly apply anti-rust oil. In case of not in use for a long time, please remove the entire module and wrap it with plastic bag!

4. The linear actuators contain precision components, please be sure to install the dustproof gasket to prevent intrusion of flying chips.

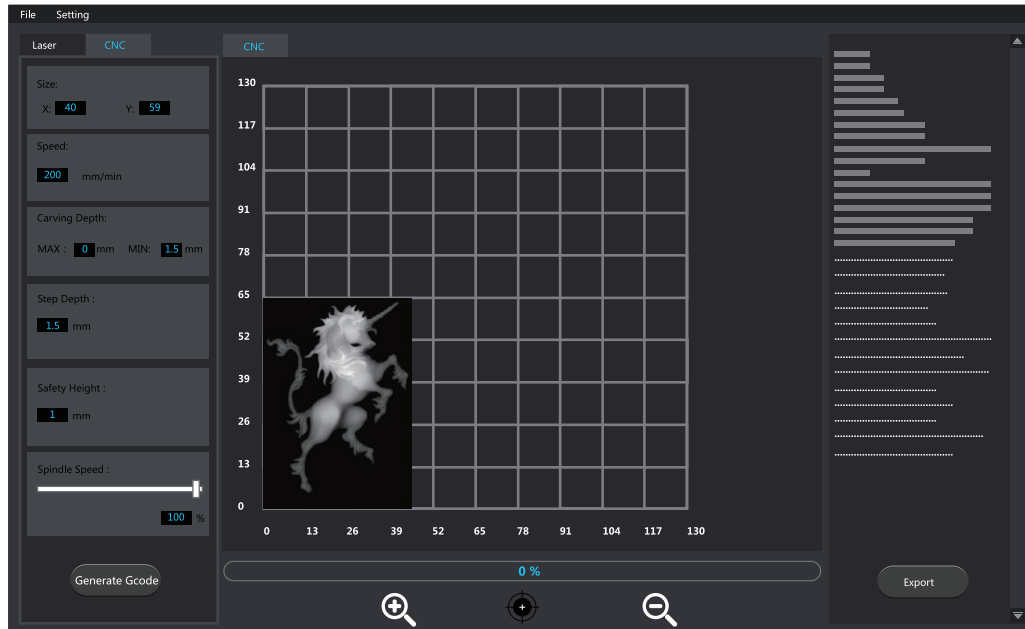
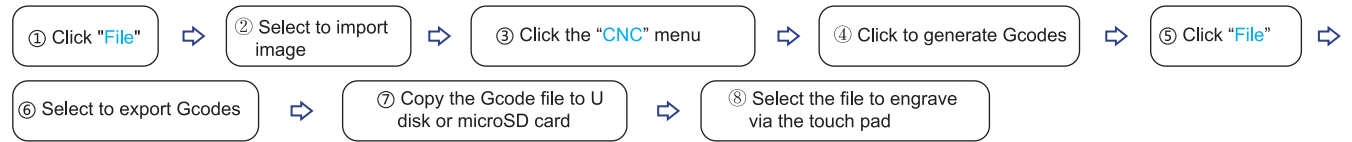
5. The machine may produce disturbing noise during working, you may leave it somewhere away from people and wait the work to be done.

6. Always use vacuum cleaner to remove the produced sawdust, blowing it away will contaminate the linear actuators and affect service life of the machine!

7. Please decide whether there is collision risk between the tool and CNC clamps according to the size of workpiece and pattern you about to carve, elevate the workpiece with block, or put plastic spacer between the workpiece and clamp if necessary.

5.4 Use Software to Generate Gcodes

Operation steps:



Setting Description:

- ① **Size**: Adjust the size of the carving pattern, use the zoom buttons for rough adjusting.
- ② **Carving Speed**: Adjust according to the hardness of different materials, the materials that are more difficult to carve require the slower speed. Carving speed can be adjusted real-time through the touch screen. The recommended values for wood are as follows: 3mm / layer - 120mm / min; 2mm / layer - 200mm / min; 1mm / layer - 260mm / min. For MOOZ-1, please cut the recommended values in half.
- ③ **Carving Depth**: Including the settings for maximum depth and minimum depth of embossment.
- ④ **Step Depth**: The carving depth of each layer. If the total carving depth (MAX-MIN) is greater than the step distance, the software will slice in layers.
- ⑤ **Safety Height**: The height coordinates of tool when the path is switched.
- ⑥ **Spindle Speed**: Use lower spindle speed can reduce noise and vibration in case of cutting soft material.



Warning: Since output torque is also reduced at lower spindle speed, if you try to cut hard material with low spindle speed, the spindle may stall and get burnt! Please do not reduce the spindle speed sharply.



- Note:
1. Contour mode for CNC carving is under development, please stay tuned.
 2. MOOZ supports some third-party CAM softwares, such as ArtCAM, Carbide Create, etc.

6.1 3D Printing Failure

Q : Print center is at left-bottom corner of the heated bed

A : Wrong machine setting in slicing software, the “ Origin at center ” box shall not be checked, refer to Section 3.4.2.

Q : Print center is about 15mm off heated bed center in X direction

A : 1. Check whether the right set of mounting holes is used to install the print functional module. Refer to Section 1.2.7.
2. Check if the X-axis linear actuator is installed in the right direction. Refer to Section 1.2.5.

Q : The machine prints in the air after file execution

A : Check if the zero point is appropriate. Methods:
1. Check if coordinate of Z is about 130 after homing operation.
2. Move Z coordinate to 0 manually and check the friction status with a piece of A4 paper.

Q : Poor first layer

A : 1. Check if the fixing screws of the platform is loose.
2. Re-level the heated bed.
3. Heated bed is too far from nozzle, result in loose bonding: Zero point is too high, reset or fine tune it. Refer to Section 3.2.
4. Heated bed is too close to nozzle, result in squeezing, scratching and extruder step losing issues: Zero point is too low, reset or fine tune it.

Q : The print falls off from the heated bed, melted filament flowing upwards and clogging around the nozzle

A : Please set the zero point correctly, increase heated bed temperature, and make sure the first layer is successful before leaving. Dealing method: Remove the bottom plastic cap, and heat the nozzle to make the cleaning easier. Refer to Section 6.4. Be careful of hot nozzle!

Q : Unable to read Gcode files in U disk or microSD card

A : 1. Check if the file system format of your U disk or microSD card is FAT32, and with capacity not greater than 32GB.
2. Check if the Gcode files are stored in the root directly.
3. Reboot the machine, unplug and plug the U disk or microSD.
4. Please use qualified U disk or microSD.

Q : Fail to finish the print

A : 1. Check if the filament is stuck by the filament roll support.
2. Check if the extruder can feed normally at standby state.
3. Reinstall the filament.
4. Open the Gcode file with text editor and check if there is any garbled codes at the end of the file.

6.2 Whole Machine Failure

Q : Unable to control X/Y/Z movements

A : 1. Check and make sure all cables are properly connected to the right sockets.
2. Check if green indicator light inside the functional module is on.
3. Connect the 3D print functional module and check if the nozzle temperature is normal, displaying “0” means unable to read nozzle temperature. In this case, please use the spare temperature sensor and apply the method described in Section 3.6-3 to decide if the failure is caused by faulty temperature sensor or filament runout detector. Refer to Section 6.4 for maintenance.

Q : Unable to exit filament runout detection interface

A : Use the spare temperature sensor and apply the method described in Section 3.6-3 to decide if the failure is caused by faulty temperature sensor or filament runout detector. Refer to Section 6.4 for maintenance.

Q : Movement of X/Y/Z linear actuator is abnormal

A : 1. Check and make sure the cables are in good connection.
2. Check crossly(i.e. connect X-axis linear actuator to Y port and Connect Y-axis linear actuator to X port and Connect) to decide if the failure is caused by the faulty linear actuator or control board.

Q : Unable to exit "starting..." interface after power up

A : 1. Unplug the cables, U disk and microSD card orderly, restart the machine to decide if the failure is caused by corresponding faulty component.
2. Update the mainboard firmware.
3. Check if green indicator light inside the functional module is on. Update the touch pad firmware if so.

Q : Unable to start the machine, auto shutdown or restart

A : 1. Unplug the cables, U disk and microSD card orderly, restart the machine to decide if the failure is caused by corresponding faulty component.
2. If the issue is solved after unplugging the 3D print functional module, then the failure may caused by faulty PCB board inside the functional module.

Q : Auto shutdown after pressing nozzle heating button

A : 1. Unplug the cables, U disk and microSD card orderly, restart the machine to decide if the failure is caused by corresponding faulty component.
2. If the issue is solved after unplugging the 3D print functional module, please check if failure is caused by short-circuit of heating rod cables. Refer to Section 6.4 for maintenance.

Q : Buzzer on after starting, the machine shutdown a few seconds later automatically

A : Check if the 3D print functional module and heated bed are reversely connected.

6.3 3D Print Functional Module

Q : Able to heat nozzle, but unable to reach target temperature

A : Check if the temperature sensor falls out of the heating block. Refer to Section 6.4.

Q : Abnormal nozzle temperature, displays "0" other than ambient temperature

A : 1. Check if temperature sensor cable and filament runout detection cable are connecting to the correct socket properly. Refer to Section 6.4.
2. Use the spare temperature sensor and apply the method described in Section 3.8-3 to decide if the failure is caused by faulty temperature sensor or filament runout detector. Refer to Section 6.4 for maintenance.

Q : Unable to preheat the nozzle

A : 1. Check if nozzle temperature displays normally.
2. Check if red indicator light inside the functional module is on/flashing.
3. Check if the heating rod cable is connecting to the correct socket properly. Refer to Section 6.4.
4. Heating rod is damaged.

Q : Unable to extrude filament normally

A : Refer to Section 6.4 for maintenance.

Q : The 3D print functional module produces deep loud abnormal noise

A : The extruder cooling fan blades are damaged.

6.4 Maintenance of 3D Print Functional Module

6.4.1 Disassembly of 3D Print Functional Module

Remove the fixing screws ① of upper plastic cap ②. Screw off the rotary knob ⑩ and take down the spring ⑨. Take out the filament runout detection module ②. No need to unplug any cables for now.

Diagnose extruder feeding issue:

Turn on the machine to test the extruder. Use external light source to check if the gear ⑬ can turn normally, or if it is slipping. Check if there is filament residue inside the extruder and result in blockage. Try to remove the filament residue or extrude it out after heating nozzle to target temperature. No need to disassemble any further if the issue is solved.

Remove the fixing screws ⑬ of bottom plastic cap ⑭. Unplug the blower cooling fan ⑭, push downwards to remove the fan ⑭ together with the cap ⑭.

Unplug all the cables, remove the upper plastic cap ② and filament runout detection module ②.



Be careful with the temperature sensor cable ⑥ and filament runout detection cable ④, do not drag the thin cable directly for removal to prevent breakage.

Remove the fixing screws ⑬ of extruder mounting plate ⑪.

Push the square block ⑧ to the innermost, and pull upwards to separate the extruder assembly (⑦ ⑪) and shell ⑬.

Remove the fixing screws ② of extruder cooling fan ⑲, take down the fan ⑲ and washers ⑱.

Solve the extruder feeding issue:

Clean up the filament residue and tighten the gear jack screw. Do not change the position of the gear, and make sure the jack screw is on the motor side. For replacing the hot-end suite or temperature sensor, please continue the disassembling:

Loosen the fixing screw ②⑥, and remove the heating rod & temperature sensor suite ②⑤.

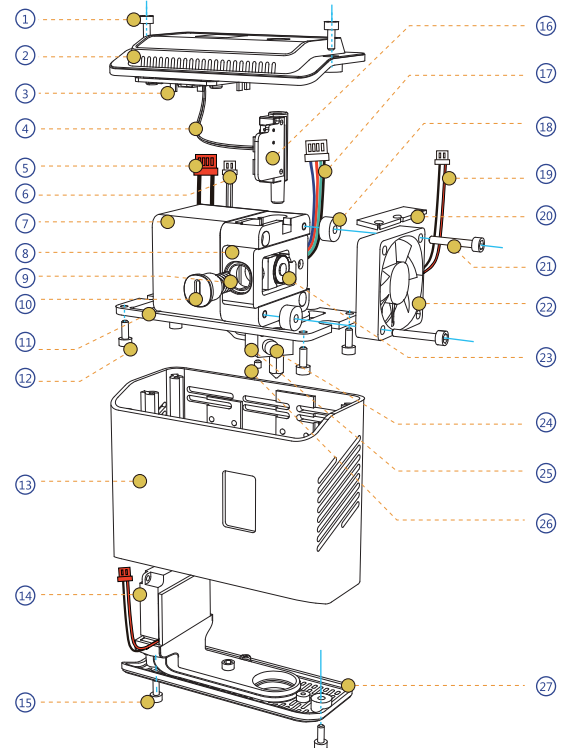
Remove the hot-end suite ②⑤ with a wrench or plier by turning anti-clockwisely.



Note:

You may need to heat the hot-end suite to make the operation easier, in case of stuck by concretionary filament.

- | | |
|-----------------------------------|--|
| ① Upper plastic cap fixing screw | ⑩ Filament runout detection module |
| ② Upper plastic cap | ⑪ Extruder motor cable |
| ③ PCB board | ⑫ Fan washer |
| ④ Filament runout detection cable | ⑬ Extruder cooling fan cable |
| ⑤ Heating rod cable | ⑭ Thermal insulation EVA |
| ⑥ Temperature sensor cable | ⑮ Extruder cooling fan fixing screw |
| ⑦ Extruder | ⑯ Extruder cooling fan |
| ⑧ Square push block | ⑰ Gear |
| ⑨ Extruder spring | ⑱ Heating rod & temperature sensor suite |
| ⑩ Rotary knob | ⑲ Hot-end suite (Brass nozzle -Aluminum heating block-Steel filament barrel) |
| ⑪ Extruder mounting plate | ⑳ Heating rod fixing screw |
| ⑫ Fixing screw | ㉑ Bottom plastic cap |
| ⑬ Shell | |
| ⑭ Blower cooling fan | |
| ⑮ Bottom plastic cap fixing screw | |



6.4.2 Assembly of 3D Print Functional Module



Description: Please visit www.dobot.cc to download the related tutorial videos.

Screw the brass nozzle on the heating block, tighten it. Make sure the nozzle is on the side where the jack screw ②⑥ is installed.

Put a sealing gasket inside the nozzle mounting hole, and keep it lay flat.



Note:

The sealing gasket is disposal, please clean up the old one before assembling. If the spare sealing gaskets are lost or used up, you can use silicone adhesive as an alternative. Method to apply silicone adhesive: Coat small amount of silicone adhesive on thread of the nozzle and filament barrel before installing. Do not spill the adhesive into the filament passage.

Install the filament barrel on the other side of the heating block, pay attention not to loose the nozzle during the operation.

Install the hot-end suite on the extruder ⑦, tighten it with a wrench or plier by clamping the nozzle.



Warning:

Please clamp the nozzle to tighten hot-end suite, otherwise you may loose the nozzle and result in leakage. Control tightening force to prevent breaking the filament barrel.

Choose the best side to insert the heating rod & temperature sensor suite ②③, straighten out the cables and tighten the fixing screw ②⑥.

Place the square push block ⑧ in the right direction.

Fix the extruder cooling fan ②② with washers ①③ and screws ②①. Note that the fan cable and extruder motor cable should be on the same side.

Straighten out the cables and put the extruder assembly (⑦⑪) into the shell ①③.

Fix the extruder mounting plate ①① on the shell ①③ with screws ①②.

Install the spring ⑨ and rotary knob ⑩.

Fix the upper plastic cap ② with screws ①.

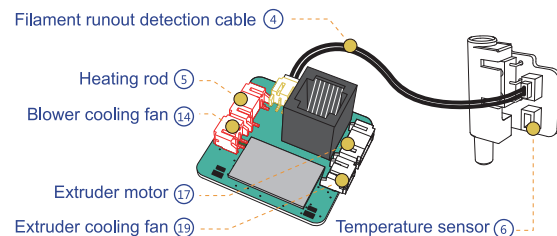


Warning:

Pay attention to positions of the cables to prevent squeezing, especially the blower cooling fan cable ①④.

Straighten out the cables and fit the upper plastic cap ②.

Connect the cables correctly.



Paste the thermal insulation EVA ②①.

Place the filament runout detection module ①⑥ into the extruder.

Straighten out the cables and install the bottom plastic cap and blower cooling fan assembly ②④ with screws ①⑤.

Parameters

Overall Dimensions: 285 * 285 * 318mm

Adapter Input: 100-240V~50/60Hz, 1.8A Max.

Adapter Output: 12V~6.5A

Main Material: Aircraft-grade aluminum

Operation Panel: 3.5' LCD touch pad

3D Printing

Nozzle Diameter: 0.4mm (0.2~0.8mm for optional)

Layer Resolution: 0.05~0.3mm

Nozzle Temperature: 260 °C Max.

Heated bed Temperature: 100 °C Max. (at 25 °C ambient temperature)

Forming Size: X130 * Y130 * Z130mm

Applicable Materials: 1.75mm PLA, ABS

Printing Speed: 10~150mm/s

Operating Temperature: 0~40 °C

Laser Engraving

Working Range: X130 * Y130mm

Laser Power: 0.5W (standard) / 1.6W (optional)

Laser Service Life: 4000H (non-continuous using).

Supported Materials: Wood, paper products, some plastics, leather, etc.

CNC Carving

Working Range: X130 * Y130mm

Spindle idle Speed: 8000rpm Max.

Clamping Range of CNC Chuck: 0~4mm

Size of Standard CNC Bit : 3.175mm * 0.3mm * 30° V cutter

Supported Materials: Wood (box wood and peach wood are recommended), plastics, PCB boards and most non-metallic materials

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