



DESKTOP 3D PRINTER

User Guide

MD-16



MINGDA TECHNOLOGY CO.,LTD

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Contents

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© Contents

| | | |
|----------|---|-----------|
| 1 | Brief Introduction | 1 |
| | User-guide instructions | 1 |
| | Learn more information | 1 |
| | Safety precautions | 1 |
| 2 | Overview | 2 |
| | Front view and left view of 3d printer | 3 |
| | Tool box accessories | 4 |
| 3 | Installation | 5 |
| | Install Machinery | 5 |
| | Install the Filament holder | 5 |
| | Dismantle the Model | 5 |
| | Paste the Masking Tape | 6 |
| | Install the filament | 6 |
| 4 | Manual Calibration | 7 |
| | Preparation for Calibrating | 7 |
| | Adjusting the overall height of the printing platform | 7 |
| | Fine tune the print platform | 8 |
| | Printing the Test Files | 8 |
| 5 | Printing Operation | 9 |
| | Display panel | 9 |
| | Display Panel HOME Overview | 9 |
| 6 | Software | 12 |
| | Download Printing Software | 12 |
| | Install the Printing Software (for example, Cura) | 12 |
| | Create STL file | 14 |
| | Cura over view | 14 |

| | |
|--|-----------|
| Open STL file with Cura | 19 |
| Model rotation, scaling, mirroring with Cura..... | 19 |
| Transfer stl Model into gcode Document with Cura | 21 |
| Printing parts..... | 22 |
| Pause of continue to print | 22 |
| Power outages | 23 |
| 7 General Maintenance | 23 |
| Daily preventive maintenance | 23 |
| 500 hours maintenance | 23 |
| 1000 hours maintenance | 24 |
| 8 Trouble Removal..... | 24 |
| Trouble removal | 24 |
| 9 Support | 25 |
| Customer support | 25 |
| Working computer specifications | 25 |
| MINGDA limited warranty statement..... | 25 |
| 10 Quality Assurance | 26 |

1 Brief Introduction

MD Series Industrial 3D Printers adhere to the design concept of the simple to the extreme. It can print product quickly and easily, even if you've never used a 3D Printer.

The printer prints the model with PLA or ABS, so the products will be strong and durable. You can make drilling, tapping, grinding and painting on the PLA or ABS models. MD Series 3D Printers combine proprietary hardware, software and filaments technologies creatively.

Welcome to a new world of 3D printing!

User-Guide Instructions

This User Guide has been carefully organized into "Installation", "Operation", "Maintenance" and "Troubleshooting" sections for client to read and understand. Be sure to read the sections carefully to get the best use of your 3D printer.

Learn More Information

SD card provides the electronic user guide. This guide provides information as following topics:

1. troubleshooting information
2. important safety statements and regulatory information
3. Printing supplies related information
4. Detailed instructions for use

You can also find more information on the official website.

<http://www.md-3d.com> <http://www.3dMINGDA.com>

Safety Precautions

The following precautions ensure that the customer uses the printer correctly and protects the printer from damage. Please always follow these precautions.

1. Use the specified power supply voltage. Do not connect multiple devices to the printer's power outlet to avoid overload.
2. Make sure the printer is properly grounded, Or it may cause electric shock, fire or electromagnetic interference.
3. Contact your after-sales or local service before disassembling or repairing the printer by yourself. Check the "Support" section in the User Guide.
4. It is recommended to use the power cord that came with the

printer. Do not damage, cut or repair the power cord. Damaged power cords present a risk of fire or electric shock. Please replace the damaged power cord with a quality-certified power cord. Do not allow metal or liquid to come into the printer and contact with the internal parts of the printer. It may cause fire, electric shock or other serious accident.

5. Turn off the printer and unplug the power cord from the electrical outlet under the following conditions:

- 1) The printer emits smoke or emits an abnormal smell.
- 2) The printer emits abnormal noise that has never occurred during normal operation.
- 3) Metal or liquid (not required for cleaning or routine maintenance) come into the printer.
- 4) Thunderstorm weather.
- 5) Power off

This guide contains the following categories.



Note: potentially dangerous situation, if not avoided, may result in minor or moderate injury.



Warning: potentially dangerous situation, if not avoided, may result in serious injury.



High temperature surface: The high temperature surface symbol indicates the presence of high temperature equipment. When working near hot parts, be careful and wear safetygloves.



Gloves: When performing some maintenance procedures, the machine may be hot, so need to use gloves to avoid burns.



Safety glasses: Please wear safety glasses to avoid eye injury.



Lifting hazard: Two or more people should cooperate when lifting, so as not to cause serious injury.



Recovery: Use the correct method for recovering filaments and packaging filaments.



ESD: Use standard electrostatic discharge (ESD) precautions when working with or near electronic components.

2 Overview

The printing process of the MD series 3D printer is as follows: the slicing software CURA convert the .stl document into a .gcode document,

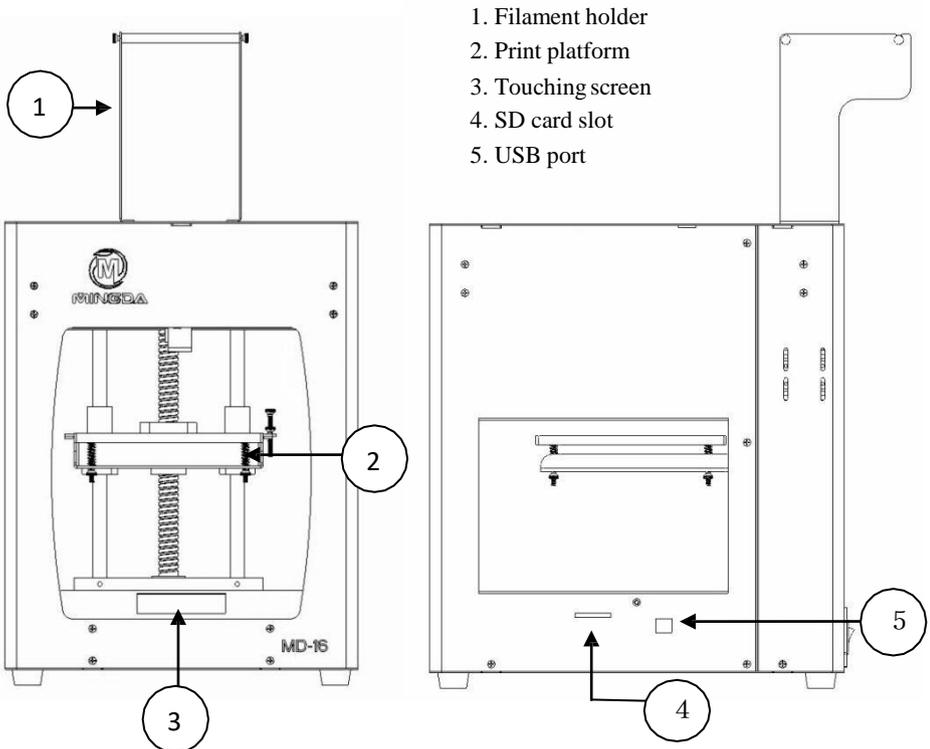
and 3D printer read the .gcode document and print the raw filament into a 3D product.

Cura is a slicing software that runs on Windows XP, Windows Vista, Windows 7, Windows 8, or Windows 10.

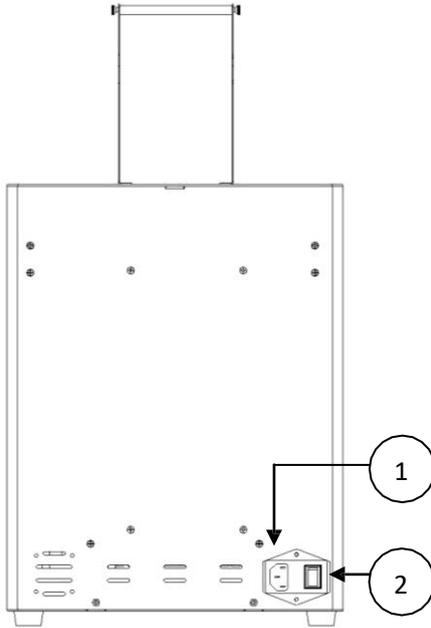
The product size and print size of MD series 3D printer are as follows. Each filament holder can hold 1kg of printed filament, 1 kg filament can continue to print for about 120 hours, you can also add a second roll of filament for continuous printing.

| Model | Product Dimensions (W×D×H)mm | The size can be made (W×D×H)mm |
|-------|---------------------------------|-----------------------------------|
| MD-16 | 300×350×380 | 160×160×160 |

Front View and Left View of 3D Printer



Filament holder and printer back view



1. Power Socket
2. ON-OFF switch

Tool box accessories



3 Installation

Install Machinery

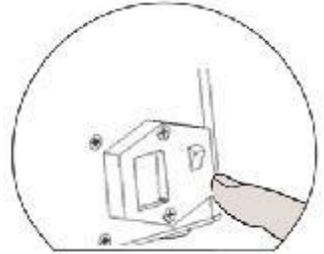
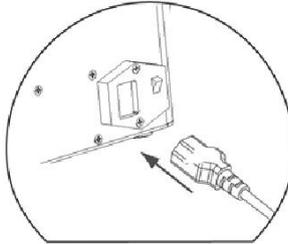
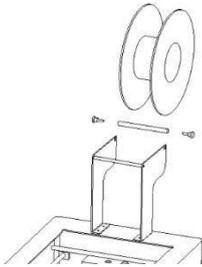
Take Out the Machine, can not pull the optical axis inside the machine, otherwise it will cause deformation of the optical axis.

Install the Filament holder

Note: Use the M3 screw, which attached in the accessory box

Plugged in

Turn on the power switch

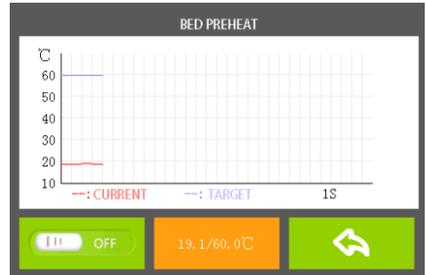
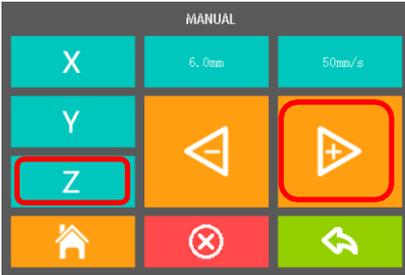


Dismantle the Model

1. Click “Application” on display panel, Enter the “Manual” control, Choose “Z” (which means Heating bed move up and Down), click on the  to let hot bed fell to a suitable height

2. Click BACK to return, then click on the hot bed pattern to BED PREHEAT interface, input 80 and turn “on”  OFF , hot bed temperature is automatically heated to 80°C.





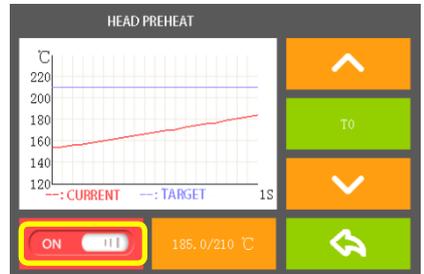
3. About 2 minutes heating, Gently take out the model with the scraper knife.

Paste the Masking Tape

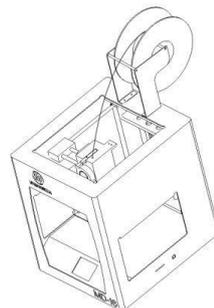
Remove the broken tapes and paste new ones, pay attention not to overlap and too large clearance.(If the tape is not broken, it can be reused)

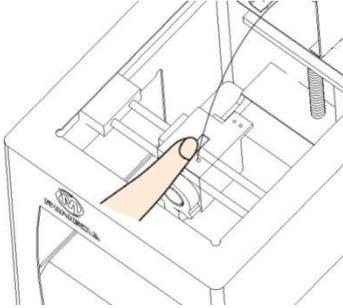
Install the Filament (for example, PLA filaments)

1. Click Control Panel from “Unload” to “ head preheat”, adjust the extrusion nozzle temperature to 200°C. Turn "ON" (left), extrusion nozzle temperature is automatically heated to 200°C.



2. Insert the filament





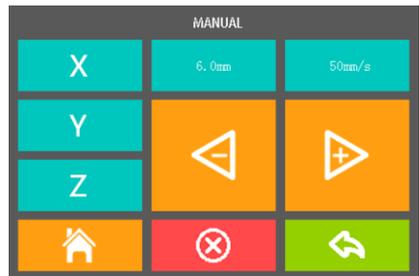
3. When the temperature rises to 200°C, press the filament at the entrance of shrapnel, insert the filament, the filament squeezing down, if the filament is melted and flow out from nozzle, and the filament is inserted successfully.

4 Manual Calibration (This step can be skipped)

Note: before calibration, you need to dismantle the model and put a new tape.

Preparation for Calibrating

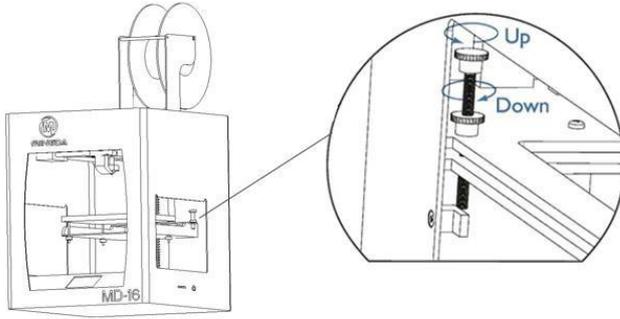
1. Click "Application" on the display panel, Enter the Manual control.
2. Click on the Z axis reset icon, the hot bed will rise to the maximum height.
3. Click on the red "⊗" icon, the motors will be unlocked..



Adjusting the overall height of the Printing Platform

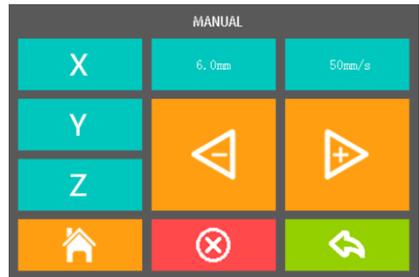
Observe the distance/Gap between the printing nozzle and printing platform.

If it is greater than 0.5 mm, you can rotate height regulation nut up or down, and reset Z Axis Home until the gap about 0.1 mm (about one A4 paper thickness). **Before shipment, factory has adjusted height of platform, you can get into the fine tuning steps directly.**

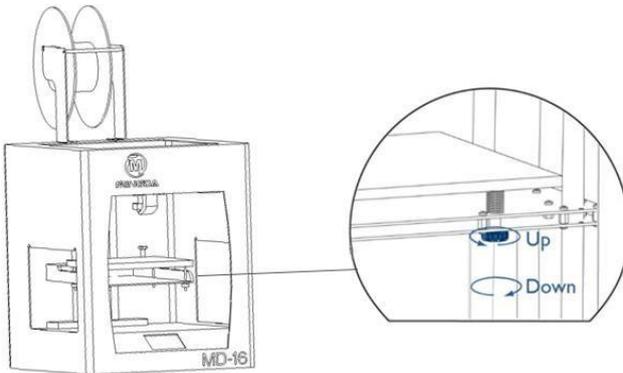


Fine Tune the Printing Platform

1. let the hot bed rose to maximum height and Cancel the motor lock, then the printing head can be lightly pushed to everywhere by hand. It can be moved by Manual Control.



2. Observe the distance/Gap between the printing nozzle and printing platform, it should be about 0.1 mm (about one A4 paper thickness). You can check the gap by inserting a sheet of A4 into it, then move the extruder head to the plate 4 corners in order, under this way.



Printing the Test Files

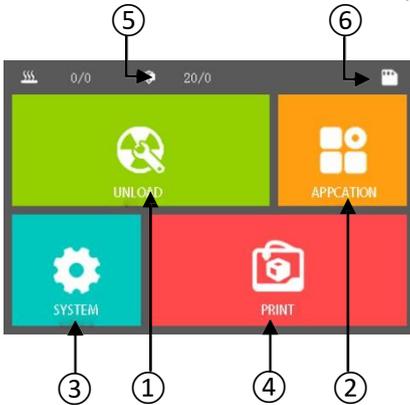
Click on the SD card icon, chose a gcode file which you want to print. Click on print icon, the machine will automatically start to print.

(When printing bottom layer, Observe the print nozzle. If the filament can not pasted on the hotbed, you need to Adjusting nut counter clockwise. If the tape was broken, you need to Adjust the nut clockwise.

5 Printing Operation

Display Panel

The main user interface of the printer is a display panel.



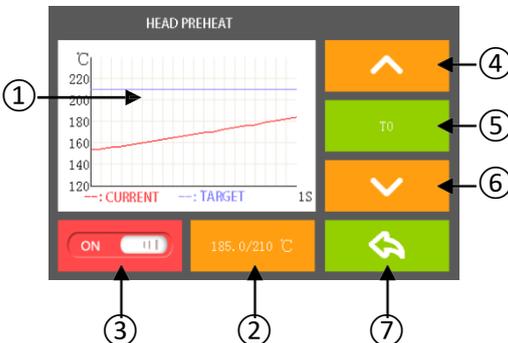
1. Install filament
2. Application
3. System
4. Printing
5. Temperature Display
6. SD card condition

MD Series Desktop 3D Printers display panel is full touch screen resistive screen, click the menu in the content items.

Display Panel HOME Overview

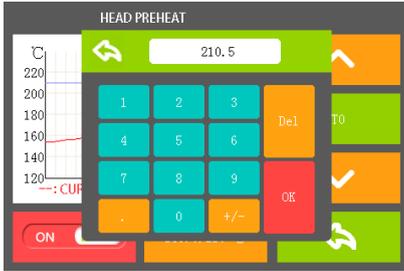
1. "Install filament"

1.1 Preset Head temperature: use to set up the nozzle temperature, as for the different filaments need to set up the different temperature. For example, ABS is set to 225°C, PLA is set to 185°C.



1. Temperature monitoring curve
2. Manually enter the temperature
3. Turn on or off the heating
4. Filament retraction (Be careful)
5. Extruder Head "T0"
6. Extrusion
7. Return Back

Only if the nozzle is heated to preset temperature can you extrude the filament. Using retraction may cause nozzle clogged.



1.2 Value input

Such as input Printer Head and Heating Bed Temperature degree value, pls write and confirm "OK".

2. Application : Pre-heating build plate ,Manual, Auto manual, update, Fan and Return.



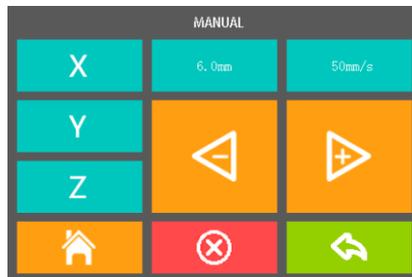
2.1 Auto calibrating: Without installation

2.2 Update. Update the display. Before updating, pls ensure have insert SD card in case failure.

2.3 "Cooling fan" PWM speed adjust: When click this button, it will appear value input interface, PWM (1-255). "255" is the fan fastest speed

2.4. Pre-heating build plate. The operation is the same as the head preheat, ABS is set to 80-110°C, PLA is set to 50°C).

2.5 "Manual": Click  into "Manual" adjustment interface.



1)  XYZ means X/Y/Z axis. "X/Y" which control Extruder Head move Left and right, Front and Back. "Z" means build plate Up and Down.

- 2) **6.0mm** **50mm/s** is move "X/Y/Z" move distance and speed.
- 3)   is Direction:  move toward Original Point ,  move away from Original point. (The Original Point located at the Left Front corner)
- * Pls select X、 Y or Z Axis first, Then click  or  to move
- 4)  Return to the Original point. When Choose X、 Y or Zaxis, "" will move "X/Y/Z" back to Original Point accordingly. If not, It will control "X/Y/Z" axis all to the Original Point.
- 5)  Unlock. Which control Motor Pause Working/ the movement Stop.

3. SD card file list

- 3.1 Choose  and enter into SD cad file list. select file to print.



3.2 Printing Display

During printing, it shows printing position, Head/ build plate temperature, File name, printing time and its printing bar. In addition, you can click "Printing head""Heating bed" to adjust the real temperature.

- 1)  Cancel Printing and Return X/Y axis to the Original Position
- 2)  Pause Printing, Printing head will move away.
- 3)  Continue Printing. 4)  Adjust Printing speed, 100% is normal speed,200% means Double speed.



4. System

NOTICE : It contains three function setting

“About” it contains the Firmware information.

“Language” Alternative

We do not suggest changing at will.



6. Software

Download Slicing Software

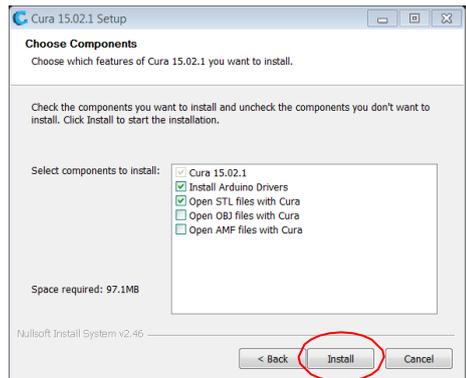
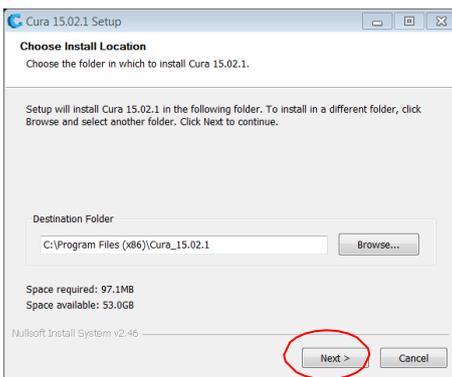
MD series 3D printers can support Cura, RepetierHost, Simplify 3D and other slicing software for printing. You can get the latest installation software in two ways:

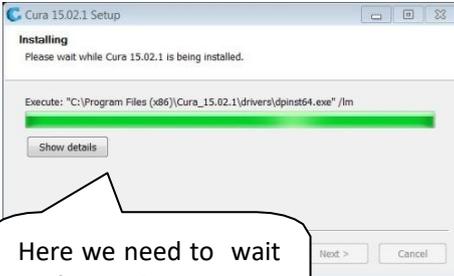
1. Install from the included SD card
2. Download directly from MINGDA official website

<http://www.md-3d.com/index.php?s=/products/software.html>

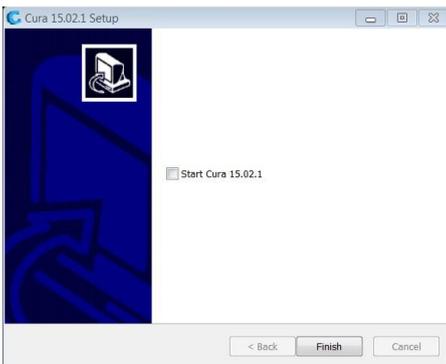
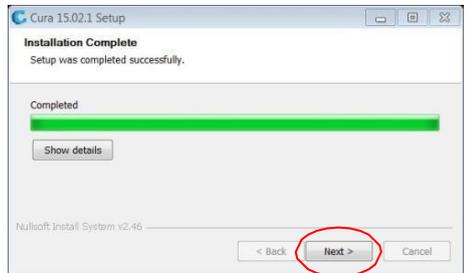
Install the Printing Software (take Cura as an example)

1. Double click Cura_XX.XX.exe to install
2. Install the software as follows, all installed by default.





Here we need to wait a few minutes to install the program.

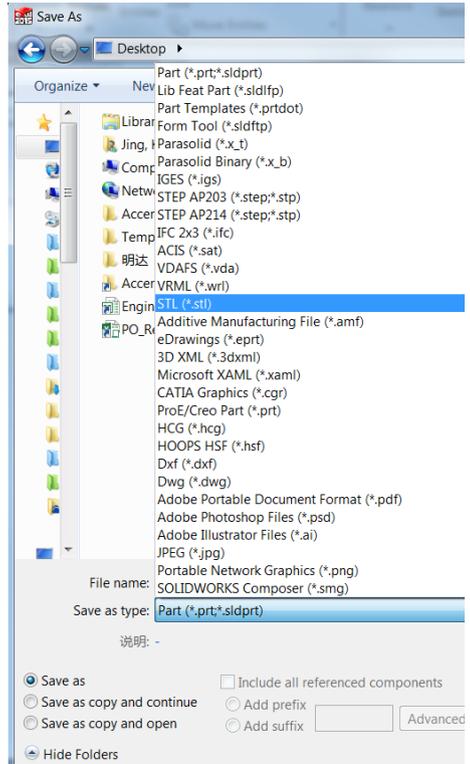


Create STL File

The stl model can be searched online for download or modeled with 3D software modeling.

Take the CAD software Solidworks, the computer system for Windows as an example, the example to create an STL file

1. Launch Solidworks from your computer.
2. Open the 3D map.
3. Click "File" - "Save As" and select the "STL(*.stl)" format.



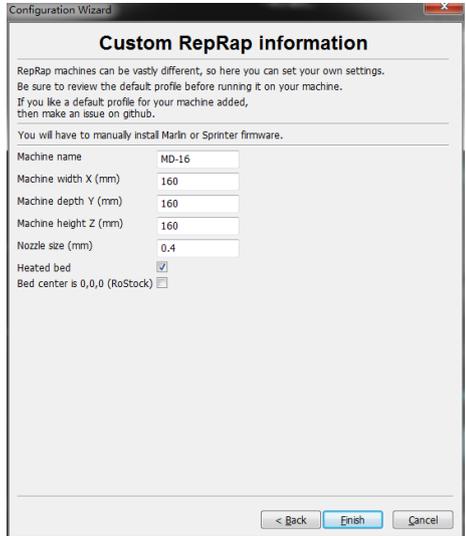
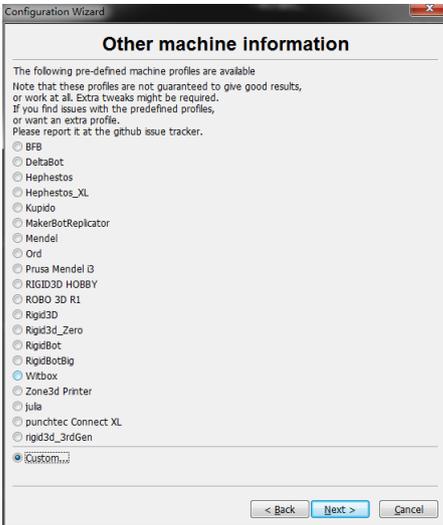
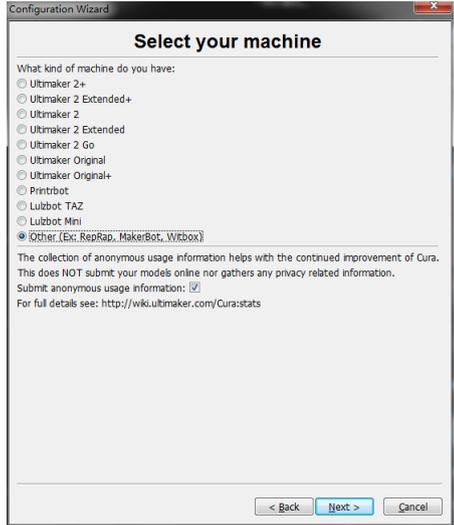
Cura Overview

Take the version Cura_15.02.1 and Windows 7 as an example to illustrate the Cura software settings.

1. Add new machine

- 1) Start Cura
- 2) Click on "machine" - "add new machine."
- 3) Take "MD-16" as an example, set as follows. The "model name" can be arbitrarily set, for example, set to "MD-16", the width is set to 160 mm, the depth is set to 160 mm, and the height is set to 160 mm. The nozzle

size is set to 0.4mm, select the hot bed, do not select the platform center.



2. Basic Set up

1) **Layer height:** The height of each layer is the important parameter that determines the quality of side and printing time. The setting range is 0.05-0.3, the high quality setting is 0.1, and the medium quality setting is 0.2.

2) **Shell Thickness:** The thickness of the outer wall of the side of the model is set to an integral multiple of the diameter of the nozzle. If the nozzle is 0.4mm, the recommended wall thickness is 1.2.

3) **Enable Retraction:** MINGDA recommended to select.

4) **Bottom /Top Thickness:** The wall thickness above and below the model is generally an integral multiple of the layer thickness. It is recommended to be the same as the wall thickness and set to 1.2.

5) **Fill Density:** The filling density inside the model can be set to 10%~100% according to the actual situation. The larger the value, the denser the interior.

6) **Print Speed:** The moving speed of the print head during printing. It is recommended to set the low speed of the complicated parts and the high speed printing of the simple parts. Generally set around 30-50, recommended PLA setting 50, ABS setting 30. (Global speed defaults to print speed).

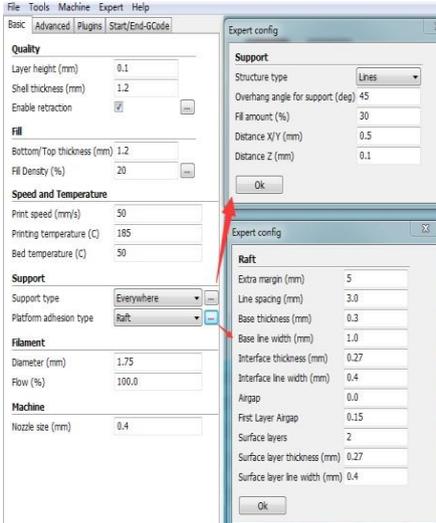
7) **Printing Temperature:** the temperature used by the nozzle to melt the consumables, the consumables of different manufacturers. The melting temperature is different. It is recommended to set the PLA to 190 degrees and the ABS setting to 230. Excessive or too low temperatures can cause plugging.

8) **Bed Temperature:** print platform temperature, recommended PLA setting 50 °C, ABS setting 80-110 °C.

9) **Support Type:** support mode when printing a model with a suspended part, "None" means no support, "Touching buildplate" means creating support that can reach the workbench part, "Everywhere" means that all parts are suspended. Create support. It is recommended to select "Everywhere".

10) **Platform Adhesion Type:** None defaults to print one layer at a minimum, Brim refers to a skirt, and Raft refers to a bottom plate. It is recommended to select Raft, the PLA first layer Airgap is set to 0.15, and the ABS first layer Airgap is set to 0.1 or lower.

- 11) **Diameter:** The filament supplied is 1.75mm.
- 12) **Flow:** Default 100.



3. Advanced Setup:

1) **Nozzle Size:** Nozzle diameter is generally 0.4mm. If you customize other nozzle sizes, fill in here. The nozzle size does not affect the accuracy of the layer thickness and only affects the minimum print detail. The size of the nozzle and the printing speed are squared, and increasing the nozzle size greatly increases the printing speed.

2) **Speed:** The speed of retracting consumables is generally 50.

3) **Distance:** The length of the retractable consumables, the specific length depends on the actual situation of the model. Generally set to 5.

4) **Initial Layer Thickness:** refers to the thickness of the first layer printed. A slightly thicker first layer allows the model to stick more firmly to the bed. The recommended default setting is 0.3.

5) **Initial Layer Line Width:** The recommended default setting is 100.

6) **Cut off Object Bottom:** Cut the bottom of the model to a certain height to flatten the bottom of the uneven model. Or cut off the height of the model that has already been printed, which is convenient for stitching when continue to print from the breakpoint. The default is 0.

7) **Dual Extrusion Overlap:** Double-nozzle printing, which makes the double-head printing partially overlap, which allows two different colors

to be better combined.

8) **Travel Speed:** The speed of movement when not printing. The recommended setting is 80.

9) **Bottom Layer Speed:** The first layer speed, recommend PLA setting 30, ABS setting 20.

10) **Infill speed:** the speed of filling the model, Setting it to 0 will use the global speed. A slightly faster speed can save the printing time. It is recommended to set the PLA setting 50 and ABS setting 30.

11) **Top/bottom speed:** top and bottom print speed, the slower the print, the stronger the model. Recommended PLA setting 40, ABS setting 30.

12) **Outer Shell Speed:** The speed of outer wall. A slightly slower speed will make the outer wall of the model better. Note that too much difference in speed between the outer and inner walls will affect the print quality of the model. Recommended PLA setting 40, ABS setting 30.

13) **Inner Shell Speed:** The speed of inner wall. The inner wall is faster than the outer wall to save printing time. Recommended PLA setting 50, ABS setting 30

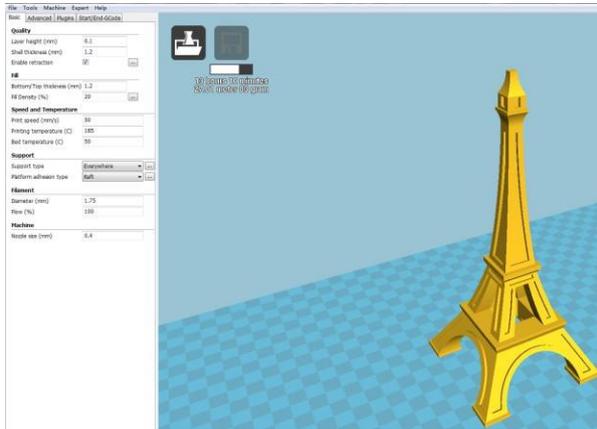
14) **Minimal Layer Time:** Recommended setting is 5 seconds.

15) **Enable Cooling Fan:** speed up filament cooling, PLA check, ABS is not checked

| File Tools Machine Expert Help | |
|--|-------------------------------------|
| Basic Advanced Plugins Start/End-GCode | |
| Retraction | |
| Speed (mm/s) | 50 |
| Distance (mm) | 5 |
| Quality | |
| Initial layer thickness (mm) | 0.3 |
| Initial layer line width (%) | 100 |
| Cut off object bottom (mm) | 0 |
| Dual extrusion overlap (mm) | 0.15 |
| Speed | |
| Travel speed (mm/s) | 80 |
| Bottom layer speed (mm/s) | 30 |
| Infill speed (mm/s) | 50 |
| Top/bottom speed (mm/s) | 40 |
| Outer shell speed (mm/s) | 40 |
| Inner shell speed (mm/s) | 50 |
| Cool | |
| Minimal layer time (sec) | 5 |
| Enable cooling fan | <input checked="" type="checkbox"/> |

Open STL File with Cura

Click “File” – “Load model file”- double click stl format documents.

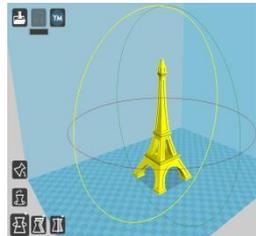


Model rotation, scaling, mirroring with Cura

1. Model Rotation

1) Click on the model and the rotation, zoom, and mirror icons will appear in the lower left corner of the software window.

2) Click the rotation icon to drag the three axial control loops in the view to rotate around the X, Y, and Z axes.



Tips:

The specific orientation of the product determines the smoothness of the surface and allows the printer to provide the smoothest surface for a specific area. For example, if you print the Eiffel Tower, placing the Eiffel Tower for vertical printing can get a smoother surface.

2. Model scaling

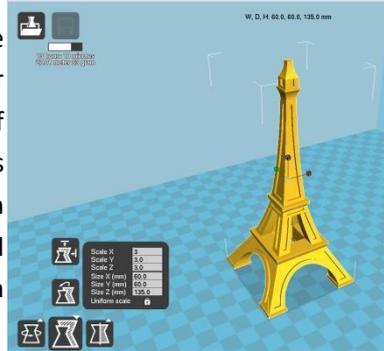
Click scaling icon

You can enter the scale of the zoom in any of the "Scale X", "Scale Y", "Scale Z" option boxes. As shown in the figure, you only need to change the scale to 2.0 and the model will be magnified 2 times. If it is more

appropriate to determine the size of 3 times, change the ratio to 3.0.

Tips:

The "lock" icon on the right side of "Uniform Scale" indicates whether the XYZ axis direction ratio is locked. If the icon is clicked, the unlock state is displayed, and the XYZ axis direction size ratio is no longer maintained, and the ratio of the XYZ axis direction can be arbitrarily modified.

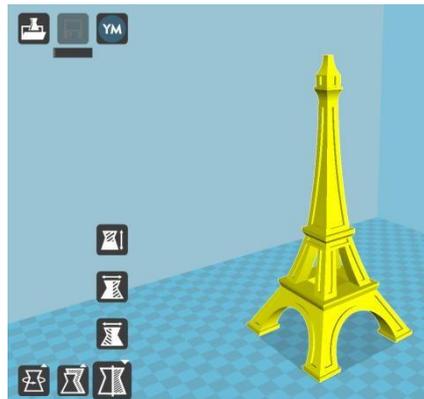


Size X (mm), Size Y (mm) and Size Z (mm) mean the actual size of the model at the current scale, you can adjust the size to the size you need (Scale X, Y, Z will update accordingly).

If the scale is too large, the model will be out of print scale and turn to gray, then you need to scale down the model appropriately.

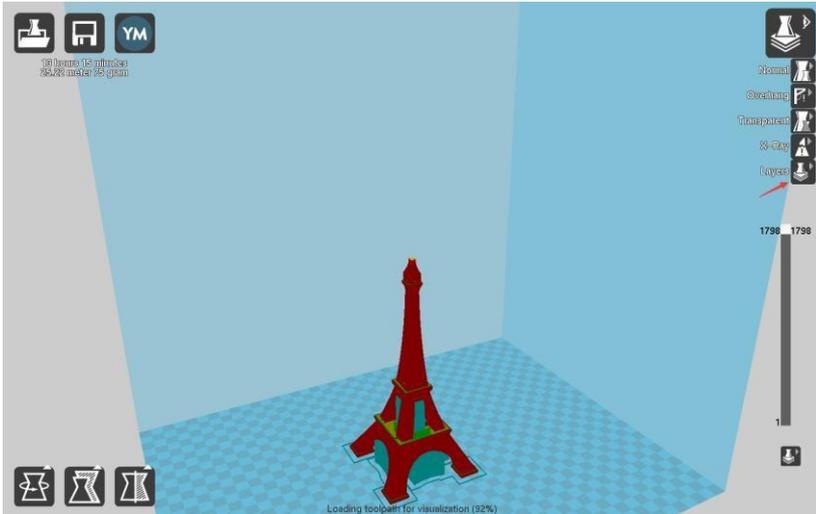
3. Model mirror image

- 1) Click the mirror icon
- 2) Click on the corresponding icon to control the model to mirror around the XYZ axis.



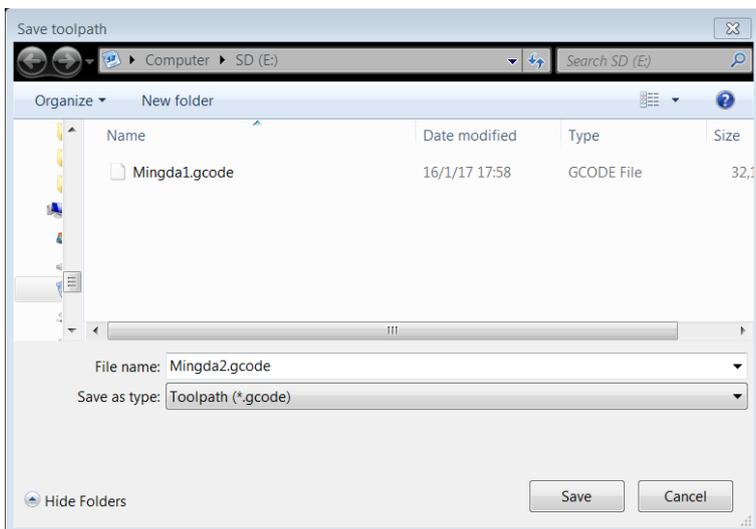
4. Model preview

- 1) After the slicing is completed, the print time and the weight of the consumables will be displayed in the upper left corner.
- 2) After the slice is completed, click on the upper right corner to select Layers to preview the print. You can also check if the preview is consistent with the source document. If it is inconsistent, check the stl document.



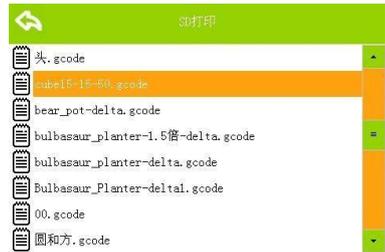
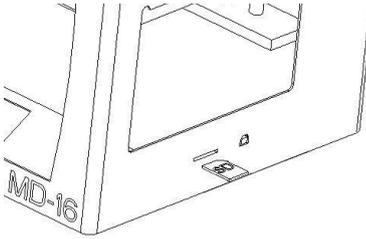
Transfer stl Model into gcode Document with Cura

1. Insert the SD card, and establish a folder named "GCODE" first.
2. Click "file" – "save GCode".
3. Set GCODE directory in SD card. click "save" .(the file name should not be too long)
4. Take out the SD card.



Printing Parts

1. Stick the tape to the printing platform.
2. Insert the SD card.
3. Reset the Z axis and move the printing head to check the distance between the nozzle and platform.
4. Preheat the head and bed, check whether it feed smoothly.
5. Click "SD" icon on the display panel, enter into SD card content.
6. Choose the Gcode file to print.
7. after finish printing , Remove the printed model with the shovel in the kit



Pause or Continue to Print

While printing files, you can pause it at any time.

1. When printing, you can click temperature icon to change temperature .And click icon  to change the printing speed by percent.



2. Press the "pause" on the display panel, the machine will be suspended to print, press again to continue.

3. When printer pause, you can feed the filament and change another filament.

4. If press stop icon, the printer will stop printing.

Power Outages

If want to cut off the printer power, please press the power button again. You could do it at anytime, it will not damage the printer. And there is no need to operate any other steps. If you do it when printer is making parts, it will not finish the current printingtask.

Note: After turning off the power switch, the system cooling fan and indicator light will continue to work for a fewseconds.

7 General Maintenance

Daily Preventive Maintenance

1. Before printing, reset the Z-axis to check the distance between the nozzle and the platform to prevent the nozzle from scratching the platform.

2. Before printing, check the smoothness of the guide rails. Regular lubrication can ensure the machine runs efficiently and stably.

3. Before printing, preheat the nozzle to check feeding. If it is not smooth, clean or replace the print nozzle assembly.

4. After printing is completed, clean all the accumulated filaments and stains on the printing platform, the guide screw and the inside of the machine.

5. Filament that are not used for a long time should be sealed and stored. Excessive absorption of moisture from the air can make the filament brittle.

500 Hours Maintenance

About every 500 hours you should clean up the printer.

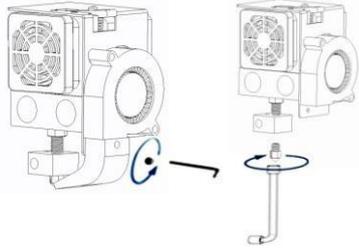
1. Clean the door and do not use ammonia-containing cleaners to avoid damaging the window. An ethanol cleaner can be used.

2. To clean the guide rails, first wipe the sides of the guide rails with anti-rust paint and re-add lubricant.

3. Check the screws, check if the mounting screws such as the synchronous wheel, optical axis and motor are loose. If it is loose, it should be tightened in time.

1000 Hours Maintenance

After more than 1000 hours of running, the nozzle may become clogged or worn, which may have a negative impact on the surface smoothness and detail of the model. A new screw tube and print nozzle need to be replaced at this time. You can contact MINGDA for related videos.



1. Cut off the printer power completely.
2. Use sleeve to twist down the nozzle.
3. Take out the new nozzle from kit and then install in original position.
4. Use sleeve tight up the printing nozzle.

8 Trouble Removal

Trouble Removal

| Problems | Suggestions |
|--------------------------------|--|
| Without power | <ol style="list-style-type: none"> 1. Verify whether the power cord is firmly inserted. 2. Turn on the power switch, whether the power switch is on or not. 3. Verify whether the AC wall socket is provided or not. |
| Not extruded filament | Filaments may be stuck in the nozzle, please refer to 《1000 hours maintenance》 |
| Print misplacement | <p>Please check the lubricating condition, wipe oil on the optical axis and evenly lubricate again.</p> <p>Another possibly reason is rack affected by external force during transport (At the moment you need to contact MINGDA after sales service)</p> |
| SD card read abnormally | SD card damaged; SD card slot damaged; SD card inserted deep insufficient; the slots line is loose. |
| Can't show temperature or heat | The temperature sensor the heater is in poor contact or damaged; the main board is faulty |

9 Support

Customer Support

Please visit <http://www.md-3d.com/index.php?s=/news/support.html>.

Working Computer Specifications

Operation system Microsoft Windows XP、Microsoft Windows Vista or Microsoft Windows 7 processor minimum value : 2.4 GHz, faster processor could shorten the processing time

RAM minimum value: 1GB (Windows Vista or Windows 7 is 2 GB)
Recommendation: 2 GB (Windows Vista or Windows 7 is 3 GB)

Hardware installation: 90 MB monitor graphics resolution minimum value: 1024x768

Recommendation: 1280x1024 (can use the wide-screen)

Necessary video card: In line with OpenGL accelerated graphics card
Recommendation: OpenGL hardware support to recommend 128 MB graphics card memory

MINGDA Limited Warranty Statement

Besides limited warranty, within the maximum range allowed by law. MINGDA or any authorized dealer have not made any other statements or implied guarantee, including marketability and special-purpose applicability of implied warranties. MINGDA has not supplied, undertake or provide, authorized to assume responsibility for it or any other guarantee, including any authorized dealer or other express or implied warranties to the independent third party.



10 Quality Assurance

MINGDA Workshop has developed a strict producing and testing processes from every component to the assembled 3D printer, tested with sophisticated detection tools. Each machine before delivered out, must go through a dozen testing procedures, high temperature, noise, extreme wall thickness , Print speed, cantilever speed, angle test and more. Only to ensure a stable machine performance. In this way, we convince users a high quality 3D printer, which can fully realize the value of the product.

Lifetime technical support

MINGDA provide lifetime free technical support to customers, If there is any technical problem with the machine, please contact our professional after-sales technicians on the work time, we will provide the perfect solution for you.



3D Printer Leading Brand

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