ROMANOFF SINCE 1949
INTERNATIONAL SUPPLY CORPORATION

PRODUCT MANUAL

SKU: 68-51C

FLASHFORGE®

WaxJet 51C User Guide

This guide is only applicable to FLASHFORGE WaxJet 51C 3D printer

Note: Please read this User Guide carefully before operating the product.Please keep this Guide properly for future reference.

Content

Preface

Note: Each device must be tested before leaving factory. If there are some residues in nozzles or some tiny scratches on the build plate, it is normal and won't affect the printing quality.

Dear Flashforge users,

Thanks for your choice of Flashforge products and thanks for your supports for Flashforge.

The Flashforge 3D printers are of high quality and excellent performance. Even if you are familiar with earlier FlashForge machines or 3D printing technology, we still recommend that please read this guide, as there is lots of important information about the WJ51C for you to get a better 3D experience. The entire Flashforge team is always ready to provide you with the best quality service.

The service

If the issues that are not covered by this guide while using the printer, please contact FlashForge's customer support. Please visit the FlashForge website for contact information: www.flashforge.com and offer the firmware version of 3D printer before contacting after-service team.(see "Firmware version" on page 27) and hardware serial number (see "Identify Printer" on page 15).

Software support

If there are some software issues that are not covered by this guide, contact FlashForge's Customer Support. Please visit the FlashForge website for contact information: www.flashforge.com and offer the softeware version of 3D printer before contacting after-service team.(see "Firmware version" on page 27) and hardware serial number (see "Identify Printer" on page 15).

Introduction

Note

· Please read 《Flashforge WJ51C Industrial 3D printer User Guide》 before operation.
· The WaxJetPrint software is constantly being updated and screenshots in the user guide are for reference only.

The WaxJetPrint software is constantly being updated and screenshots in the user guide are for reference only. The FlashForge WJ51C 3D Printer User Guide contains the information needed for you to set up and use this device.

This User Guide including the following parts: Preface, Introduction and After-sale service.

The Preface section includes resource acquisition channel, the overall framework of the manual, and the problems that should be paid attention to while printing.

The introduction section contains the overview of 3D printing technology, equipment introduction, unpacking and installation of equipment, software installation and use.

After-sale section contains the user how to get the support and help.

Important Safety Information

Please make sure to read the following Safety guidelines carefully

Safety Symbols and Definitions

Hot surface danger:
There is a hot surface around this sign or behind the access port. Avoid touch. Hot surfaces can cause burns or fire. Make the surface cool down before touching. The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Keep fingers away from sharp objects:
Putting your fingers in front of sharp objects may cause serious injury.

Wear gloves:
Please wear suitable gloves as needed. wear heat-resistant gloves when contacting hot surfaces to avoid burns.

Wear glasses:
In the case of possible leakage or splashing of part materials, protective glasses with side shields should be worn to protect the eyes.

Risk of electric shock:
There will be high voltage near this sign or behind the access port. High Voltage Association causes severe burns or death, or fire.The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Hand involvement warning:
There is a danger of gears or moving parts near this sign or behind the access port. The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Note:
Used to prompt important information rather than critical information.

General

Improper use of the 3D printer system can cause personal injury.

When operating the machine, please follow the following safety guidelines:

- Read and follow all 3D printer system instructions. The printer should only be operated by professionals.
- Please follow all safety rules and pay attention to all precautions in this guide and warning.
- Do not try to open the top cover during printing.
- Do not use any materials before viewing the globally harmonized standard/safety data sheet (GHS/SDS).
- Do not attempt to use, repair or adjust before viewing the user's routine maintenance program documentation, except for trained professionals.
- Only certified maintenance personnel who have completed FlashForge maintenance training can perform tasks that are authorized and certified to allow the above personnel to complete.
- Do not ignore the warning signs issued during the maintenance operation of the 3D printer system. If an error message is displayed on the user interface of the 3D printer system, please refer to the "Troubleshooting " in this guide before resuming operation.

Precautions

Electrical

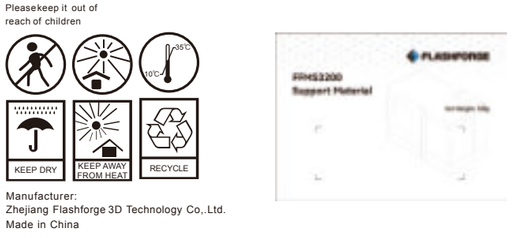
- Please make sure to ground the equipment. Do not modify the plug of the equipment .(ungrounded/incorrectly grounded plug will inevitably increase the risk of electrical leakage)
- Do not expose the device in a damp or direct sunlight environment.(Damp environment will increase leakage of electricity.Exposure to the sunlight will accelerate the aging of plastic parts.)
- Do not abuse the power cable, and be sure to use the power cable provided by Flashforge.
- Bundle the power cable and communication cable at the back of the printer neatly to avoid tripping.
- Do not use the machine during thunderstorms.
- If you do not use the machine for a long time, please turn off the machine and unplug the power cable.

Safety precautions for personal operation

- Do not touch the printhead and build plate while the printer is running.
- Do not touch the printhead when the printing is just finished.
- Do not wear scarves, gloves, jewelry or other objects that are easy to get involved in the printer when operating the machine.
- Do not operate the printer after drinking or taking medicine.
- Do not touch the parts with electric shock warning signs to avoid electric shock and burning. Never try to measure the voltage value.
- Do not touch the parts with warning signs of danger on hot surface to avoid scalding.
- Wash the skin with cold water immediately if it comes into contact with melted filaments.
- Flush your eyes with plenty of water for at least 15 minutes after eye contact. If symptoms persist, please seek professional medical advice immediately.
- It is not recommended to wear contact lenses when handling liquid materials. If the liquid splashes into the eyes while wearing contact lenses, wash your eyes with cold water immediately. Make sure that the contact lenses are removed from the eyes during flushing.
- Under normal operation, the material will not enter the body by inhalation. Please always use filaments in well ventilated areas to avoid inhalation of smoke. If accidentally inhaled smoke, transfer the person who inhales smoke to an area where fresh air can be breathed. Artificial respiration or cardiopulmonary resuscitation (CPR) shall be performed if necessary. In case of dyspnea, a constant supply of oxygen is required and please seek medical advice immediately.
- The possibility of intake is very low. Please drink plenty of water and seek medical advice immediately if intake by mistake. Do not induce vomiting.

Material handling and safety

- The WJ51C materials can be handled or disposed of in the same way as standard household wax products. The material shall not be used in situations that violate the intent of the material application such as medical transplantation, food or beverage processing.
- When you receive the material, check the appearance of the cardboard box. If a leak is observed, do not open the box and call the FlashForge technical support hotline.



- The "Recertification date" of the material should be checked before each use. If the material box has reached the Recertification date, a FlashForge certified partner or FlashForge technical support can help resolve issues related to materials that require re-certification.

Material (part / support)	FFWJ1200(part)	FFMS3200(support)
Shelf Life	5 years	5 years
Enviroment	Cool and dry area with good ventilation	
Temperature	18℃-26℃	
The highest storage environment	35°C	

- FFWJ1200 part materials and FFMS3200 support materials should be stored in a storage cabinet that is close to the printer and easy to access. Storage cabinets are recommended to prevent long-term exposure of components and materials to external UV light sources, such as sunlight, overhead lighting or other UV light sources. The material storage temperature must not exceed the specified maximum of 35°C(95°F). FFWJ1200 part materials should be stored away from strong oxidants such as hydrogen peroxide, bromine or chromic acid.
- It is very important not to tilt the material box containing the remaining material. Otherwise, the material will seep into the exhaust hole and cause blockage. This will cause damage to the material cassette and hinder subsequent printing. Place the material box containing the remaining materials in the base of the material box vertically for storage, and tighten the bottle cap.
- There are no regulatory requirements for supporting materials, which can be disposed of as ordinary office waste. Please contact your local waste recycling service provider to obtain waste disposal requirements. (The local environmental regulatory agency can provide a list of qualified suppliers.) A GHS/SDS(Globally Harmonized Standard/Safety Data Sheet) of the relevant materials should be provided to the waste recycling service provider. For SDS information on structure and support materials, please contact your local machine dealer.
- FlashForge has no responsibility or obligation for the correct disposal of part materials. The user is solely responsible for the correct disposal of part materials.
- Please refer to the Safety Data Sheet (SDS) provided by the manufacturer for the disposal method of isopropyl ethanol (IPA) waste.

Machine placement requirements

- WJ51Cseriesprinters are for indoor use only.
- The equipment needs to be placed in a dry and ventilated environment. Leave at least 30 centimeters of space at the back of the wax printer to ensure air circulation (for the convenience of later maintenance, it is suggested to reserve at least an additional 20 centimeters), at least 50 centimeters of space on the left for air circulation and opening of the maintenance cabin door, at least 50 centimeters of space on the right for opening the build chamber door, and at least 80 centimeters of space at the front for operating the machine. The equipment should be placed on a sturdy table that measures no less than length x width x height =1.2mx0.8mx0.8m.
- The location of the 3D printer should be equipped with a standard wall-mounted power socket or power supply device (such as a UPSpower supply) to power the 3D printer system. For 220V areas, it is recommended to have a 3-hole 10A socket. The wiring should use a power cord of no less than 1.5square (copper wire). For the 110V area, it is recommended to use 3-hole 16A sockets.The wiring should adopt power lines (copper wires) of no less than 2.5 square.
- Everyprinter needs ground connections, which protects users to a certain extent.
- Before using the printer to print, you must first save or export the print data file as .stl .slc file industrial standard format and submit it via the network.WaxJetclient software can be installed on selected user workstations to facilitate users to select, preview and submit print jobs, and manage print queues.
- The WJ51Cseriesprinting system needs to be equipped with an Ethernet connection to transfer print jobs from the workstation to the printer.
- Please set up and start the installed TCP/ IP network. The RJ45 Ethernet network connection must be installed, tested and operated at the receipt location for each printer to come. DHCP or an assigned static IP address is also allowed. The DHCP server can automatically generate the IP address; or, the network administrator can assign a permanent IP address to each printer that is to be connected to the network.
- The operating temperature of the system should be in the range of 18°Cto 24°C(64F to 75°F), and the maximum temperature must not exceed 26°C(79°F). The relative humidity should be in the range of 30% to 70% (non-condensing).
- The facility air-conditioning system of the printer operating environment should have a heat dissipation capacity of 2.0 kW, or be able to meet the temperature requirements. Make sure that any air-conditioning outlets do not directly face the 3D printer system. It is recommended to place the machine in a room with four times air changes per hour.
- The storage temperature of the system should be in the range of 0°Cto 35°C(32°F to 95°F), and the relative humidity range should be 20% to 90% (non-condensing).
  The 3D printer system is equipped with a build chamber with built-in lighting and a display panel. It is necessaryto provide lighting for regular areas when operating and maintaining the system. Therefore, for indoor lighting, fluorescent lamps or LEDsare the best system lighting options.Do not place the printer near windows that can be exposed to sunlight.
- The altitude should not exceed 2000 meters (6561.68feet).

Machine use guide

- Do not leave the running equipment for a long time.
- Do not make any modifications to the equipment by yourself.
- Pleaseoperate the equipment in a ventilated environment.
- Do not use this device to conduct illegal and criminal activities.
- Do not use this equipment to make food storage products.
- Do not use this equipment to make electrical products.
- Do not put the printed model in the mouth.
- Do not use brute force to remove the printed model.
- Pleasekeep the printer away from flammable gas, liquid and dust when working. (Thehigh temperature generated by equipment operation may react with dust, liquid, and flammable gas in the air to causea fire)
- Children and untrained personnel should not operate the equipment alone.

Material Requirements

- Please make sure you use the FlashForge Material . Poor quality or incompatible consumables can easily cause Printhead blockage and Printhead damage.

Project prohibited by law

- Do not copy or print any items that are prohibited by law.
- According to local laws, it is generally illegal to copy or print the following items:
  1. Guns
  2. Copy works protected by copyright. Some copyrighted works can be partially copied for "fair use".Multiple copies will be regarded as improper use. An artistic work is equivalent to a copyrighted work.
- The above list is for reference only and does not include all the content. The Flashforge is not responsible for its completeness and accuracy. If you have questions about the legality of copying or printing certain items, please consult legal counsel.

Legal Notice

- All the information in this document is subject to any amendment or change without the official authorization from FlashForge.
- The user has no right to make any modification on this user guide.The Flashforge will not be responsible for any safety accident caused by customer's disassembly or modification of the printer. No one is allowed to modify or translate this guide without the permission of Flashforge. This user guide is protected by copyright and Flashforge reservesits right of final interpretation of this guide.

Chapter 1 3D Printing Technology

3D printing technology is a technology of transforming 3D models into real 3D objects. The 3D printing technology that can realize batch printing is called MJP(Multi-Jet Printing), which is adopted by the WJ51C3Dprinter. The WJ51Cworks via selectively print liquid material through high-temperature printhead. Thematerial are cured after cooling down, and the 3D objects are formed by stacking the material layer by layer.

1.1 3D printing process

3D printing includes 3 steps: obtain the model, edit the model and print the model.

1.1.1 Get 3D printing files

For the time being, there are the following three ways to obtain the model:

① 3D Modeling:

You can choose the 3D modeling software from the mainstream market to design your 3D model on your own. AutoCAD, Solidworks, Pro-E, SketchUp, Rhino, UG, etc are the most popular ones. Such 3d modeling methods are suitable for professional engineers or users who have a certain knowledge about modeling software. Happy 3D, 3D Tada are two non-professional modeling software for beginners.

② 3D scanning:

3D scanning is an alternative to 3D modeling. 3D scanners save files in the computer via digitizing objects and collecting their geometric data. 3D scanning can also be realized by installing the corresponding apps on the mobile device.

③ Download from Internet:

Currently, to download 3D models from the websites is the most popular and convenient way to get them. Registered users are also allowed to upload their own 3D models on the websites.

e.g: www. thingiverse.com

1.1.2 Slice 3D printing files

Users edit 3D models through specific slicing software and transform the model file into the .wjx file that can be read by 3D printers. WaxJetPrintis a slicing software independently developed by Flashforge for WaxJetseries products. WaxJet-Print splits 3D models into various layers and outputs the slicing file in .wjx format that can be read by WJ51C. Thefiles are able be transferred to WJ51Cthrough network cable and USB disk.

1.1.3 Start 3D printing

After the machine has warmed up, send the slicing file to the printer and the printer will begin to print layer by layer to transform the 3D model into objects.

1.2 The basic process of 3D printing

Printing process

Preparation for first printing

Printer Installation

start up the printer > warm up > load the filaments

Software Installation

install the software > start up the software

Daily printing

Printing models

obtain the model file > load the model > edit the model > set printing parameters > submit printing task

Post-process

Obtain the model > remove the support

Chapter 2 Machine Introduction

2.1 Machine introduction

2.1.1 Machine view

Front

Side

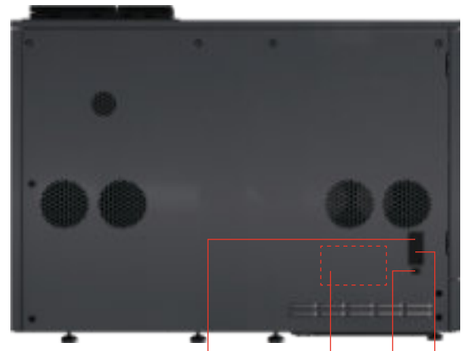
Right

Back

Left

2.1.2 Machine front view

2.1.3 Machine back view



2.1.4 Machine side view

2.1.5 Machine top view

2.2 Accessories

A packed WJ51C professional printing system with the following accessories and materials.

- Two build plates (in accessory box)
- A box of butyl rubber gloves
- A network cable
- A pack of dust-free cloth
- An after-sales service card
- A USB stick
- A scraper knife
- HMS (Head Maintenance Station)
- Waste Box

2.3 Features

WJ51CSeries3Dprinters use multi-jet print technology, print high-precision wax patterns with big, printing build size. It can print many parts with flat and vertical build simultaneously.Each layer thickness is 0.015mm. With superior surface quality, fine details and superior precision, fast workflows, high-volume customization, and increased casting efficiency and productivity. The patterns can be used directly investment casting with high efficiency.

2.4 Applications

It is suitable for precision investment casting, such as precision manufacturing, jewelry, watches, aviation fields and so on.

2.5 Terms

Material density	The mass per unit volume of materials in a specific volume state.
3D printing technology	There are two materials (support material and part material)) to print a three-dimensional solid model. Support material is a kind of wax, which adhere the model to the build plate and used to support the hanging part model. The part material is also a kind of wax. Models are connected to the build plate via support material after modelling.
Build plate	Detachable platform for model building. Use the supporting material to paste the part and the build plate, and it will be removed from the printer after printing.
Resolution	The precision of the image, WJ51Cusesthe unit of DPI to describe.
Waste material	Uncured support and/or part materials produced during the modeling process. When disposing of any waste, it must wear nitrile gloves, lab coats and protective goggles.
Post-processing	The final process: to clean the support materials in the surface of the model, thus making the finished model more smooth before polish and decoration.
part wax	It is a kind of modeling wax. You must wear nitrile gloves, lab coats and protective glasses when handling any material. The materials are provided to the printhead through umbilical as needed.
HMS	It is used to maintain the printhead.
Melting point	The temperature at which the solid state and liquid state of the materials are in equilibrium under a certain pressure.
Softening Point	The temperature of material softens, which refers to the temperature at which the amorphous polymer starts to soften.

Investment casting	A casting process via soluble and disposable materials; an industrial process based on lost-wax casting.
Log	The log file is a compressed file that contains the log used by the support service. The log file will be used to solve potential problems that may produced with the 3D printer system.
Shrink rate	It is used to adjust the expected shrinkage during the printing process, so that the size of the produced model can be closer to the actual size.
WaxJetPrint	Software client, which slicing the stl file and send data to 3D printer.
Micro Piezo Nozzle	An industrial ink-jet nozzle to ensure the smooth output of liquid from the designated hole.
X-axis	The left to right direction on build plate.
Y-axis	The front to back direction on build plate.
Z-axis	The top-down direction on build plate.
Support wax	A material for wax base: to connect the model with the build plate, to support the suspended structure and hollow structure.
User interface (UI)	The user interface is located on the left side of the printer. Use UI to control or check a variety of functions, such as print job status, printer materials, printer shutdown, etc. You can also check some settings in the printer.
.stl file	A file, created by 3D solid computer-aided design (CAD)software, which is used to produce parts.

2.6 Parameters

Printer model	WJ51C
Build size	235*138*100mm
Technology	Mult-Jet print technology (MJP)
Touchscreen	13.3“ touchscreen
Resolution	XHD：2900*2900*1700DPI
Layer thickness	0.015mm
Printing accuracy	±0.04mm / 20mm
Input file format	STL/SLC
Part materials	FFWJ1200 Net weight：72g/block（maximum 6 blocks can be put into the part wax tank）
Support material	FFMS3200 Net weight：180g/block（maximum 6 blocks can be put into the part wax tank）
Power supply	100-240V~ 50/60Hz 2200W
Equipment size (unpacking)	865*506*650mm
Equipment size (packing)	1020*660*900mm
Weight	Packing 145kg ;Unpacking 115kg
E-mail notification	Support
Hard drive capacity	500G
Connection method	Network 10/100/1000 ethernet interface/ USBinterface
Guest operating system	Windows 10 / Windows 11

Feature	condition	FFWJ1200	FFMS3200
Ingredients		100% wax	Support wax
Color		Red	White
Density		0.79g/cm3	0.85g/cm3
Melting point		68°C	55°C
Softening point		63 °C	N/A
Volume shrink rate	SH/T 0588-1994	1.10%	N/A
Linear shrink rate		0.70%	N/A
Penetration	GB/T 4985-2010	9	N/A
Ash	GB/T 14235.3-1993	<0.01%	N/A
description		High precision casting wax	Contact-free soluble support wax

Chapter 3 Machine settings

3.1 Start the machine

Printer start-up steps

1. Put the power plug of the printer into the socket (220V 10A/110V 16A).
2. Turn on the power switch.

3. When the printer is powered on, it takes about one minute for the UI to display. When the Flashforge icon appears in one minute, the screen lights up showing the status of the printer.
4. If the printer restarts at low temperatures, 2 hours are needed for the printer to warm up before restarting a print job. During preheating, Printer Status in the user interface will show Preheating.

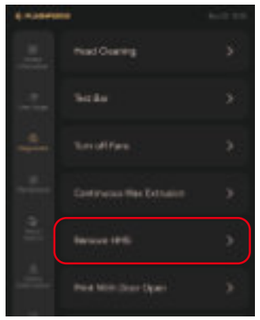
Note: the printing file of the models can be uploaded during warm-up, but printing can only be started after the printer is completely warm and alarm-free.

3.2 Clean up the HMS

Clean up HMS before printing, please follow the steps:

1. Click the [Remove HMS] button in the diagnosis of Tool tab.
2. Please wear protective heat-resistant gloves and take out the HMS.
3. Check all the remaining waste in the HMS. If necessary, wipe off all stains with a dust-free cloth and isopropanol.
4. Put the HMS back.

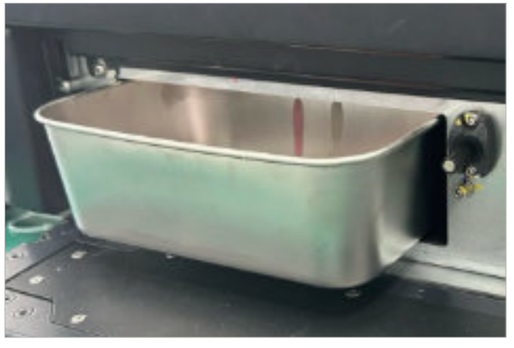
Note: The HMS is magnetically fixed in the designated area. The temperature just after printing is approximately 50℃ or so. Please take appropriate protective measures to avoid burns.



3.3 Clean up the waste materials

Clean the waste box before printing, please follow the next steps

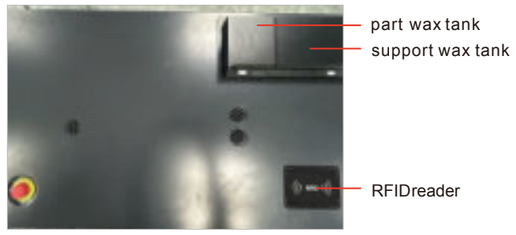
1. Please wear protective heat-resistant gloves, then press the lower front panel on the left of the printer to open the waste bin.
2. Remove the waste box and dispose it by following the local regulations
3. Check all the remaining waste in the waste box. If necessary, wipe off all stains with a dust-free cloth and isopropanol.
4. Put the waste box back, then close the waste box chamber.



3.4 Installation of materials

Note: The printing materials are in the form of wax blocks. The red one is the part wax, the white one is the support wax, both of which are in sealed packaging. The size of the red wax block is small and the white one is big.

1. Obtain the sealed wax block to ensure that the materials inside are consistent with the material model name.



Note: The part wax tank is on the left, which is smaller in size, and the support wax tank is on the right which is bigger in size. Smaller red part wax block is for the smaller tank on the left while the bigger white wax is for the bigger tank on the right. Please do not put them in the incorrect place.

2. Put the RFID card on the reader, making sure the label on the card is the same as the one on the wax block packaging.

Note: The maximum number of wax blocks can be added into each wax tank is 6. Please put in at least two wax blocks for each tank before the first printing job. In later printing, the number of wax blocks can be added according to the printing requirement and the amount of wax remaining in the tank as displayed on the printer screen.

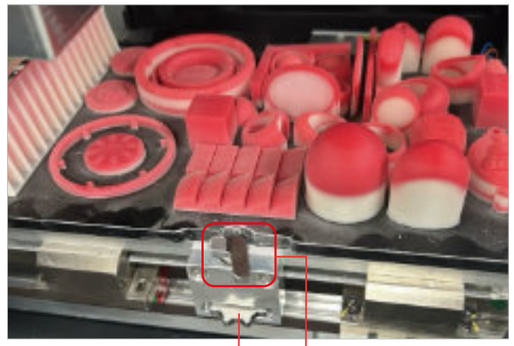
3. Press the front button of the wax tank and wait for the lid pop open, and put the wax block into the corresponding wax tank opening.

Note: The printer should be preheated before opeing the lid and the wax block can be put in. The wax block should not be put into the cooled printer by force.

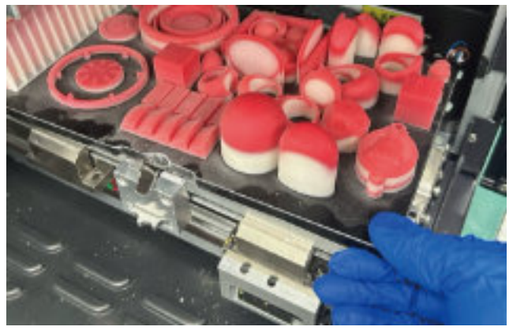
4. Close the lid after finishing the wax adding process.
5. The material level in the tank can be checked through the material tab on the printer screen.

3.5 Removal and installation of build plate

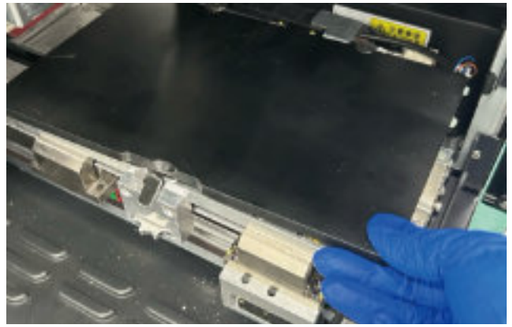
1. Make sure that the printer is turned on and that the printer status is in ready mode.
2. Open the building chamber door.
3. Turning the wheel to the right several times, the clip will be loosened automatically.

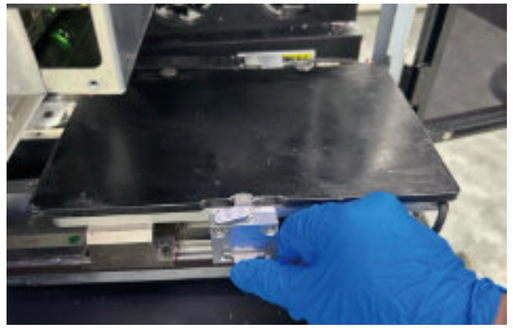


4. The printing platform can be lifted and removed.



5. Install a new printing platform. After the rear positioning column comes into contact, turn the upper clip to the left and hold the printing platform in place, then turn the lower wheel to the left several times to fix the fastener tight with platform.





3.6 Identification of machine

Identify your printer with the following tags:
A. Serial number mark - Please offer this number when requesting service.
B. Model Mark - This mark provides the printer's model type, specifications, power requirements, voltage warnings, and FlashForge customer service contact information.

Note: Both markings are located near the bottom on the back of the printer and are generally placed near the printer's power connection. Please offer the information on these tags when supporting customer support to confirm your printer.

3.7 Internet connection

Processed printing file can be transferred from WaxJetPrint to the WJ51C series printer via Ethernet or Wi-Fi networks. The RJ45 network connector is located near the power connection on the back of the printer.

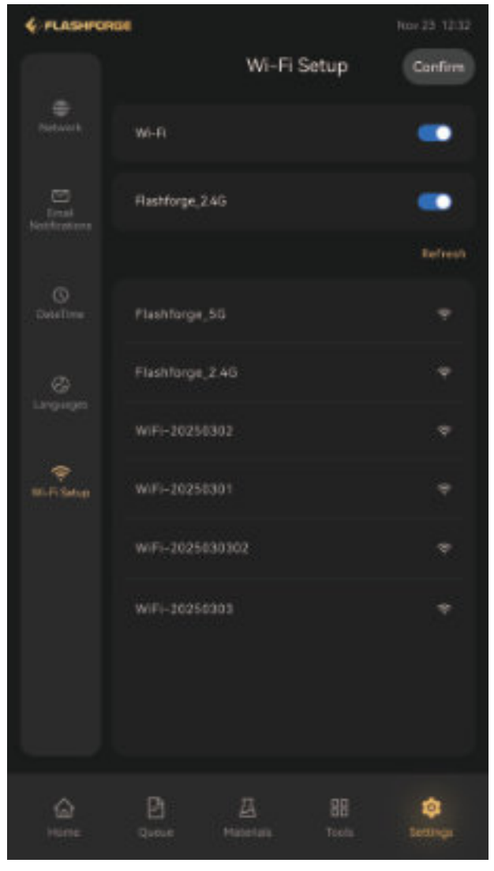
Note: A 2-meter network connection cable is provided in the accessory package. If the cable provided is not long enough to connect from the printer to the factory's network connection point, purchase the appropriate cable by yourself.

Note: When you find that the printer and computer are not connected properly, first check that the printer is properly connected to the factory's network connection point, and then check that the printer and computer are in the same local area network.

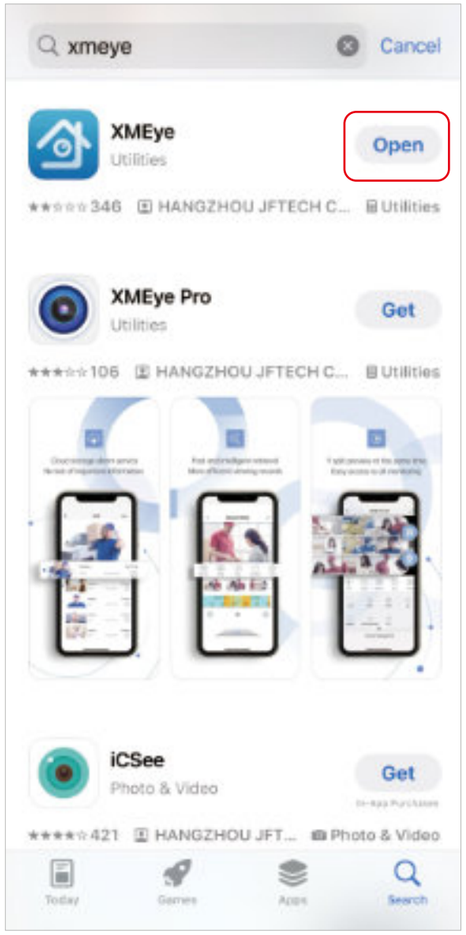
Configure the network

This section is intended to provide instructions when you need to change your network settings. Within the network page, you can configure the printer's static IP address.
Static IP address - You must enter an IP address, a subnet mask, and a gateway address for the printer. The network address configuration operation is as follows:

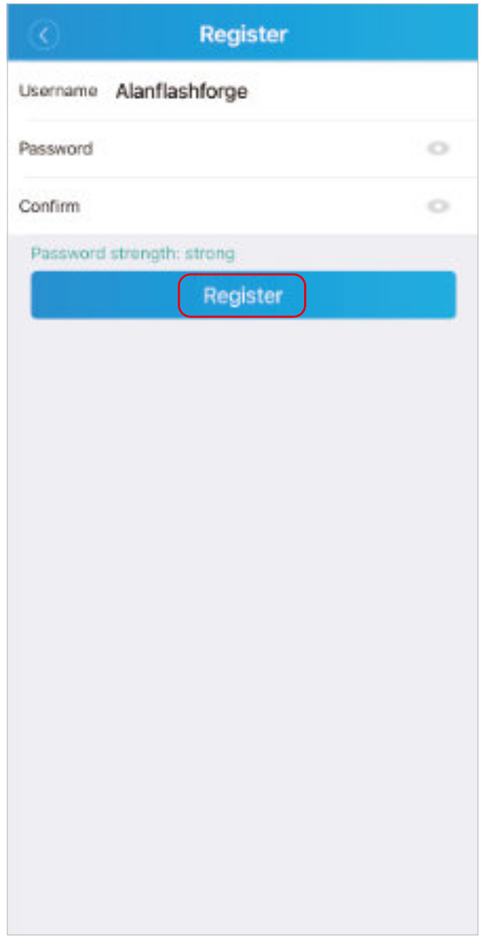
1. Turn on the power of the printer.
2. Tap the icons " Settings" in the interface , enter the " Network" setting.
3. Configure the IP address, subnet mask, and gateway address, and click the 【Apply】 button to complete the configuration.



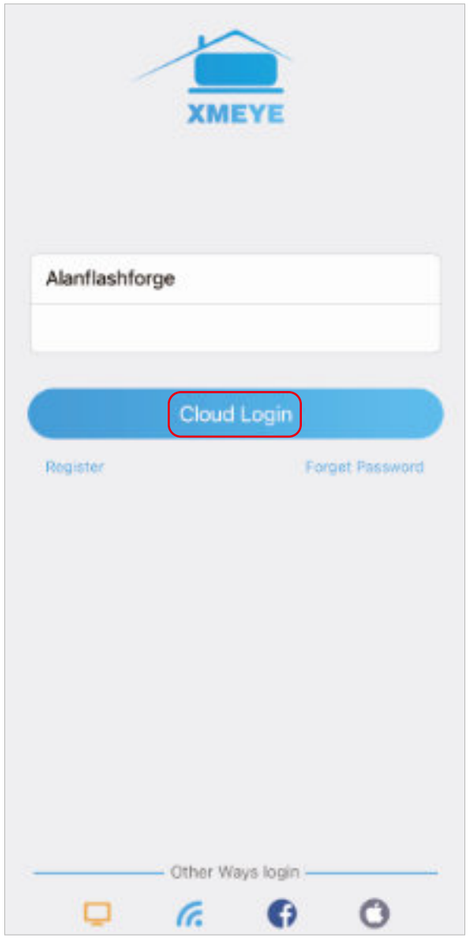
3.8 Remote monitoring configuration



1. Download and Install XMEye
Search for and download the "XMEye" app from your mobile app store.

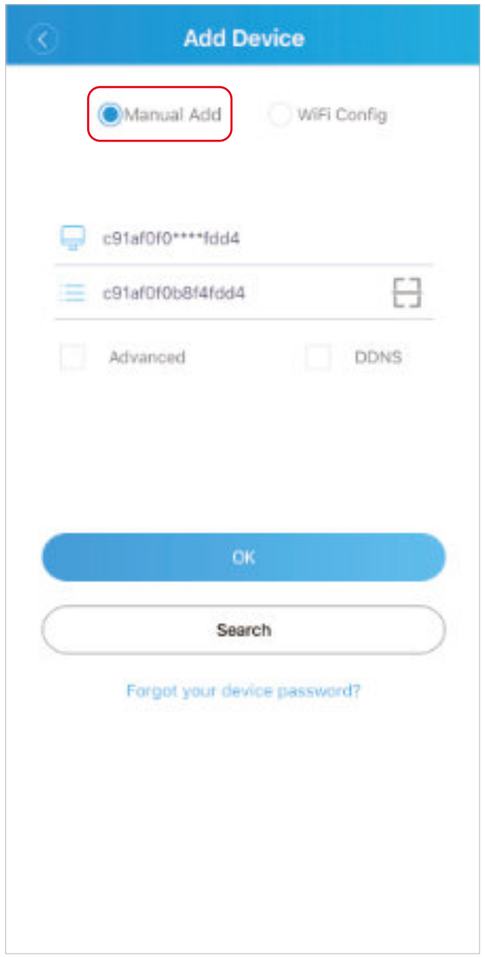


2. Register and Log in
Open XMEye. First-time users need to register. Click [Register], fill in your mobile number, password, and other required information on the registration page, and follow the prompts to complete registration.
After registration, go to the login page, enter your mobile number and password, and click [Cloud Login] to log in.

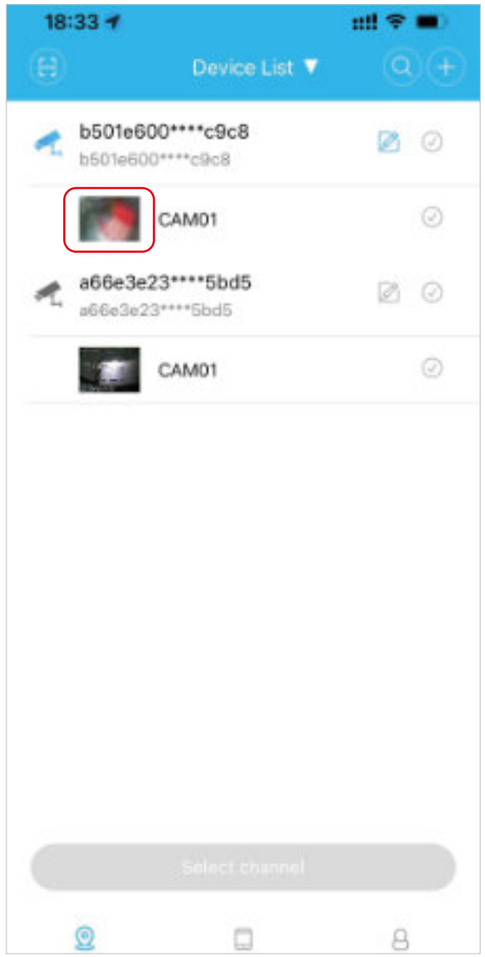


After registration, go to the login page, enter your mobile number and password, and click [Cloud Login] to log in.

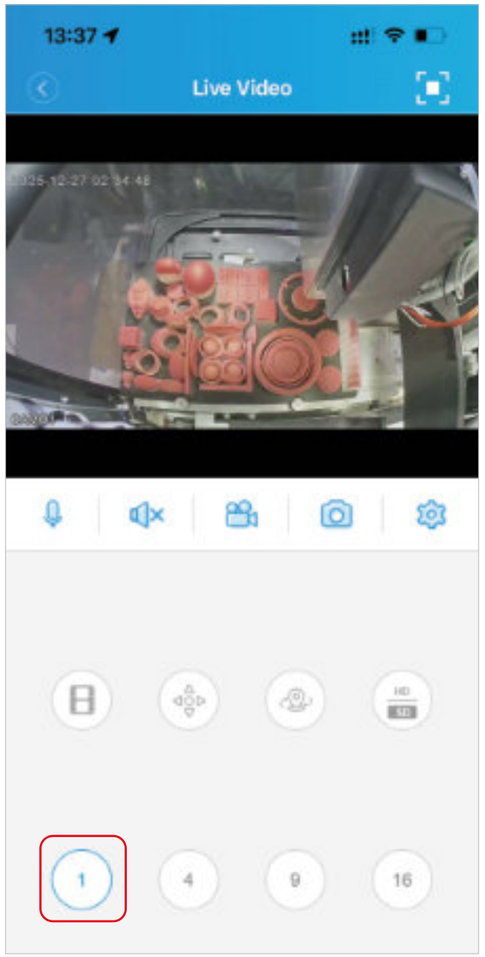
3. Add a Device
After logging in, click [+] in the upper right corner.



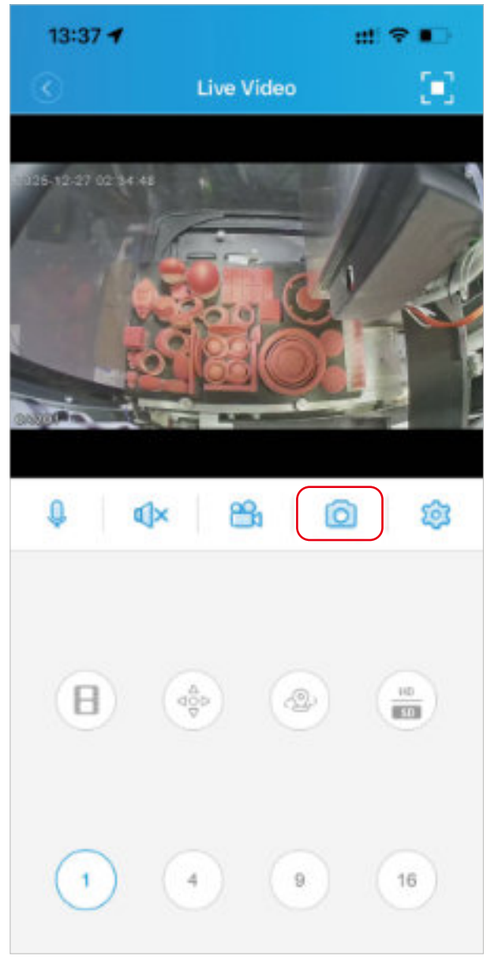
To add a device using a QRcode: Click the scan button and scan the QRcode on the device.
To add a device using a serial number: Click the button to manually enter the device's serial number.
Follow the prompts to complete the device adding process.



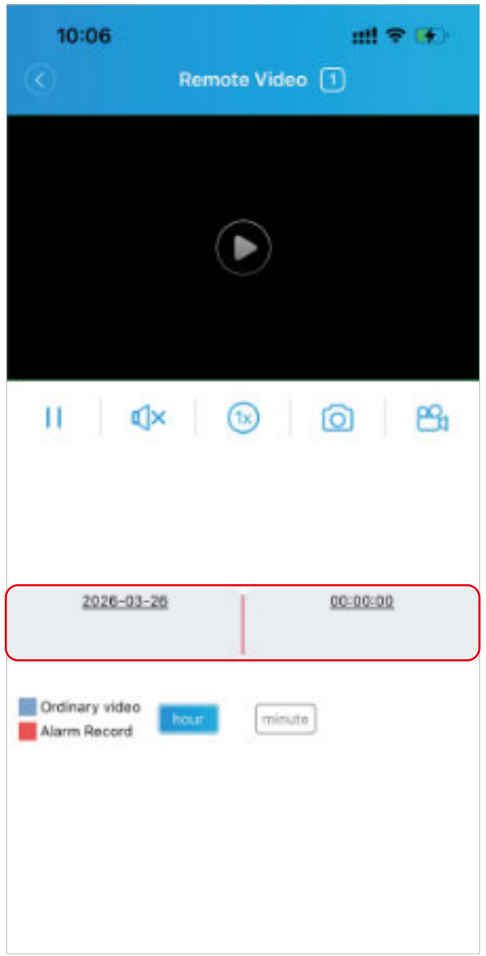
4. View Live Video
In the device list, select the device you want to monitor and tap its name to enter the video page.



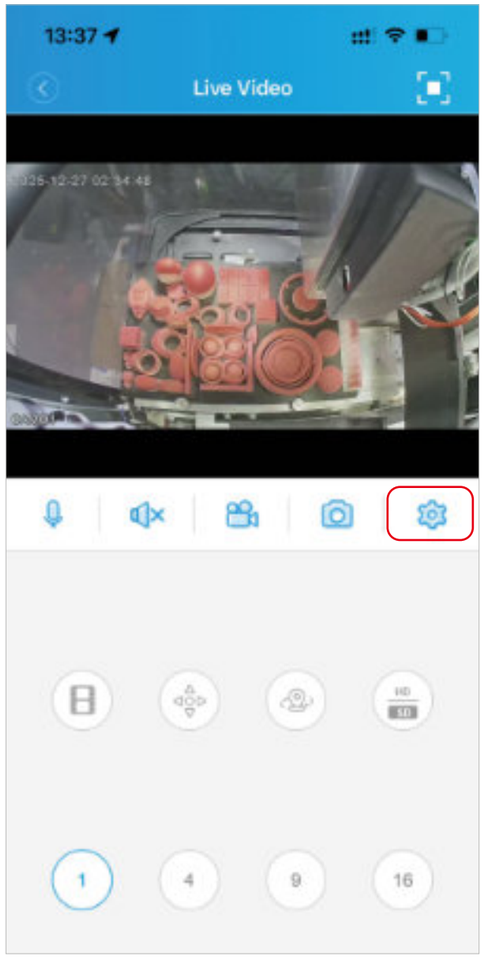
On the video page, you can see the live video preview.
Below the video, you can switch between different preset camera positions by clicking the different number buttons.。



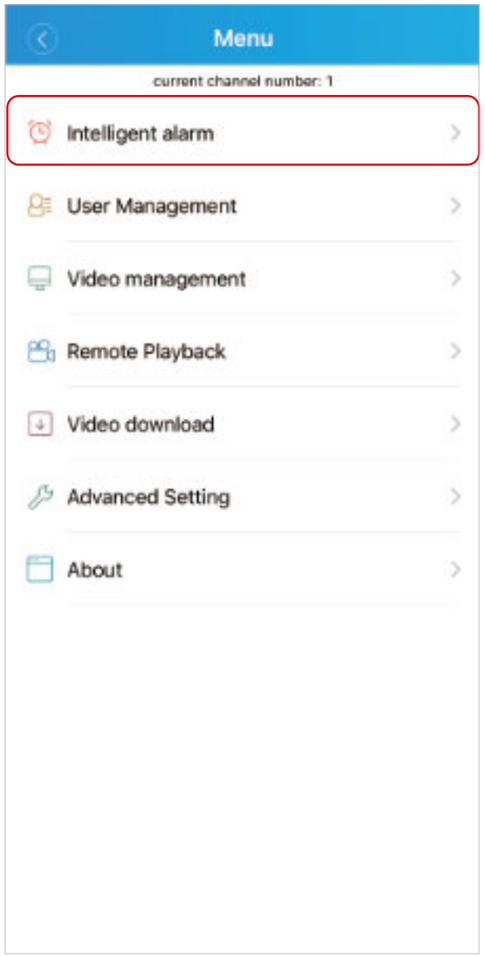
5. Video Playback
On the video page, click the recorder button below the video.



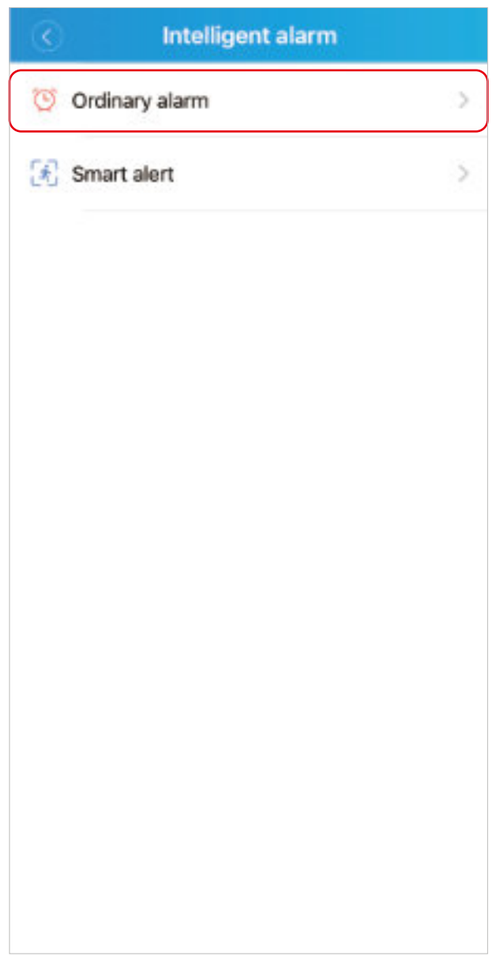
On the playback page, you can select the date for which you want to view the device's recorded video. After selection, you can view the recorded video for that time period.
Click a recording bar for a specific time period to play the recorded video for that time period.



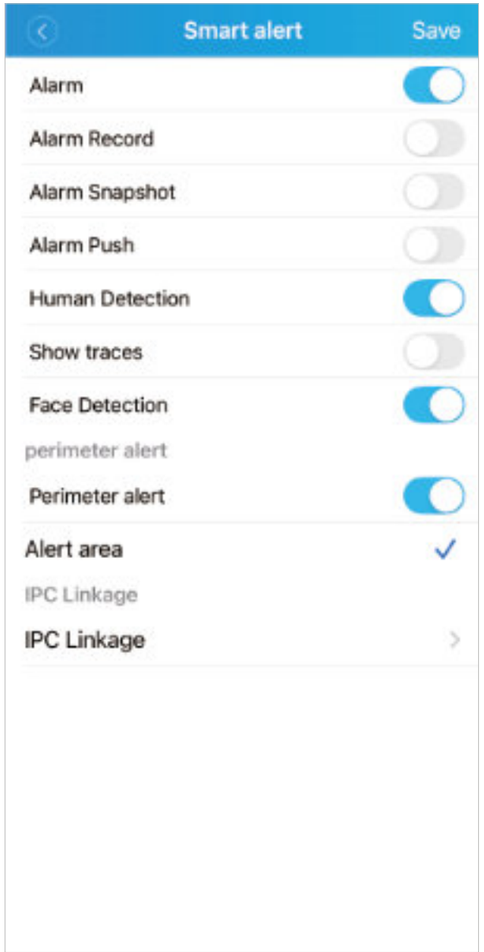
6. Alarm Notifications
On the video page, click the settings button below the video.

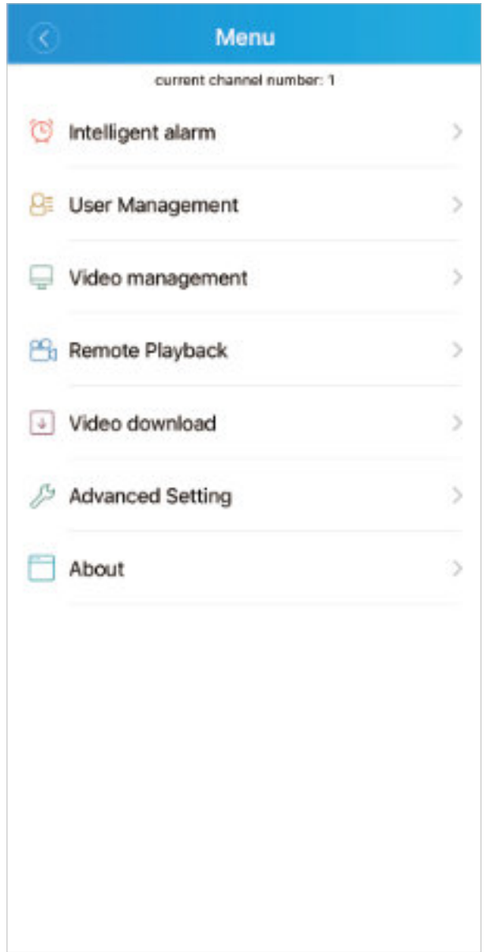


On the settings page, you can select [Intelligent alarm] to choose the alarm mode.



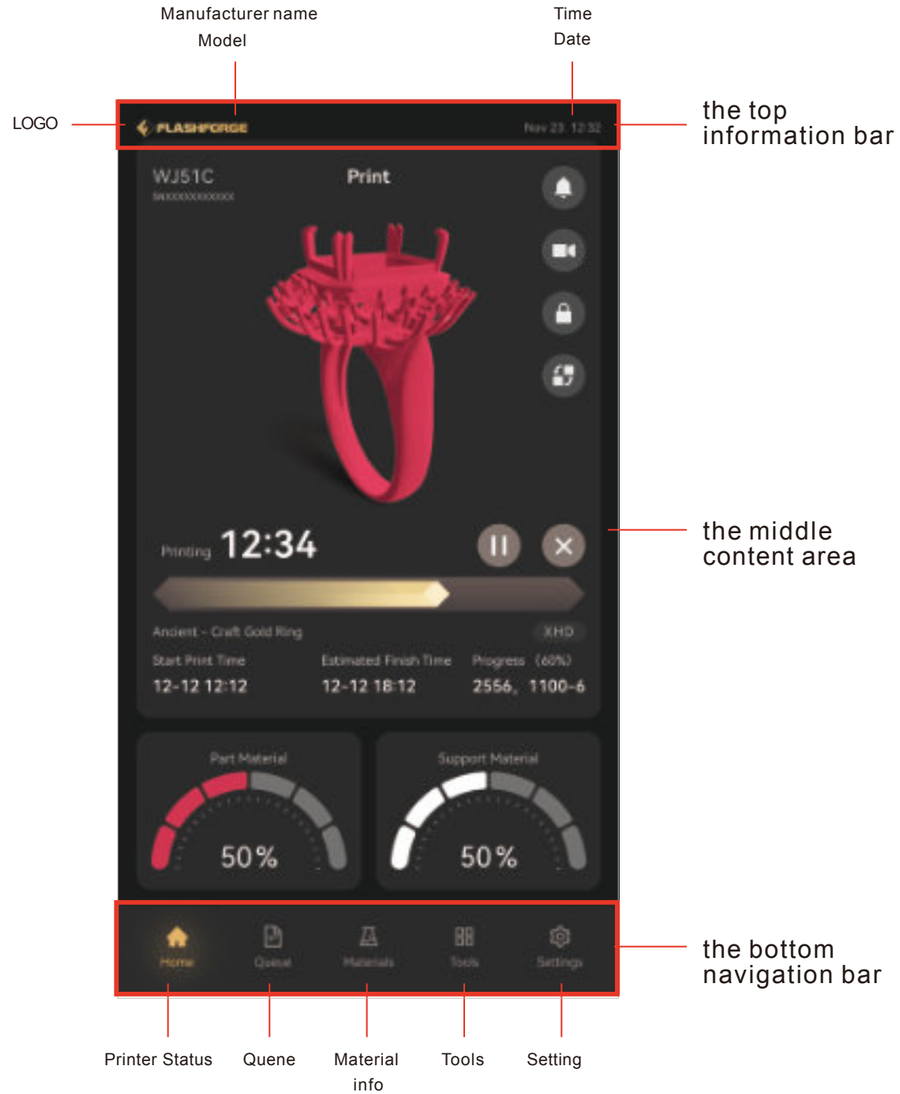
On the alarm page, you can customize the device's alarm conditions by applying filters.





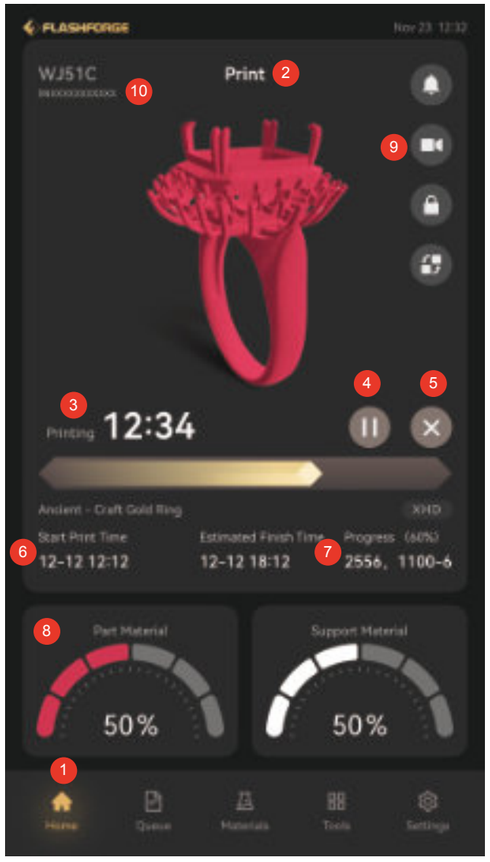
Chapter 4 User Interface

The user interface contains three sections: the top information bar, the bottom navigation bar, and the middle content area.



The top information bar contains manufacturer information, printer model, time and date display. The bottom navigation contains the status of the device, material information, print queues, tools and settings. The intermediate content area displays what is currently contained in the corresponding navigation based on the navigation switch.

4.1 Print status interface



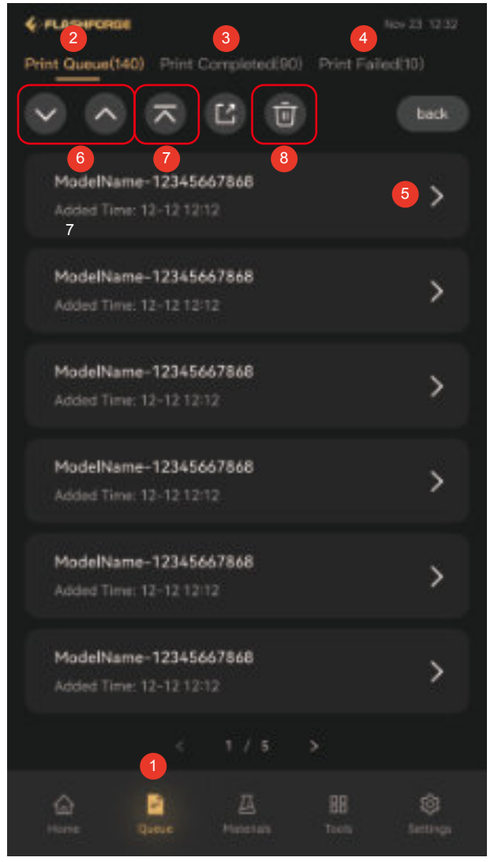
1. Tap here to access the device print status interface.
2. Print status: check the status of the printer at any given time. For information on the various statuses of the printer, see below:
Keep warm： the printer is ready to accept printing tasks;
Printing: the printer is printing now;
Sleep mode: the printer is in a low power state;
Pause: Print is currently paused and can be resumed by selecting the button.
Completed: The print is currently complete and the part can be removed from the printer;
Preheat: The printer is warming up to "ready";

3. The remaining time.
4. Pause/Continue Printing: Click to pause/continue to print the current print task.
5. Stop printing.
6. Start/finish time: Displays the print time information for the print job.
7. Print mode/layer: Displays the current layer and print mode information.
8. Remaining material information.
9. Access the camera to view the print area using the built-in camera.
10. SN and MAC, check the SN code and MAC address of this device

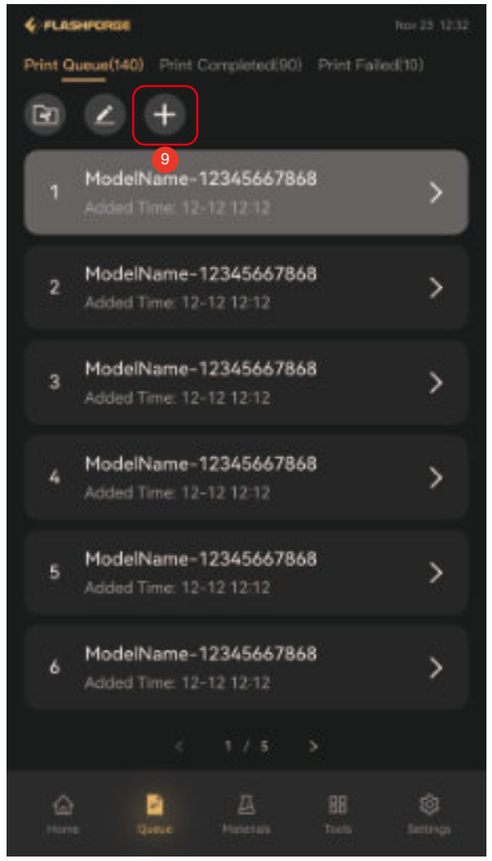
4.2 Material info interface

1. Material-related information display.
2. The chart shows the remaining material in the material tank, which is divided into a total of 6 sections for the max number of blocks that can added. The color-filled section represents the approximate amount of wax material in the tank for reference.

4.3 Printing list interface

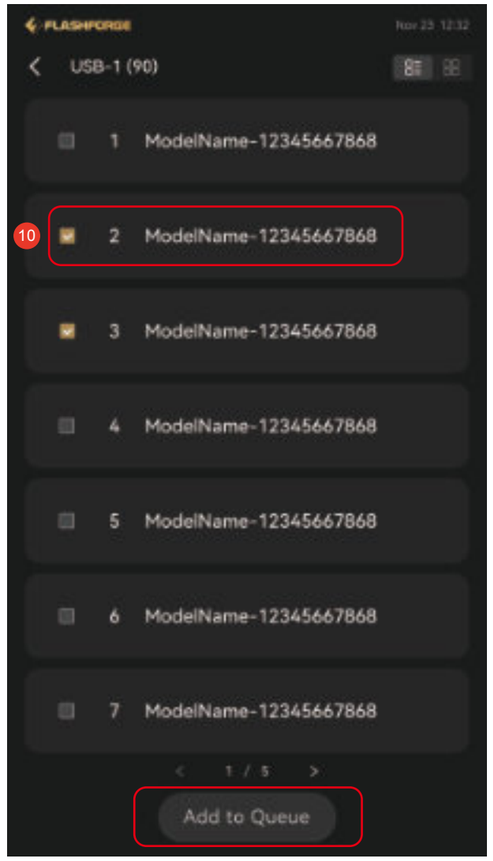


1. Tap here to enter the quene
2. The waiting tasks list
3. The completed task list
4. The fail task list
5. Tap into the details page
6. Tap to change the sequence of the printing tasks.
7. Tap to go to the top of the queue
8. Delete the selected printing task



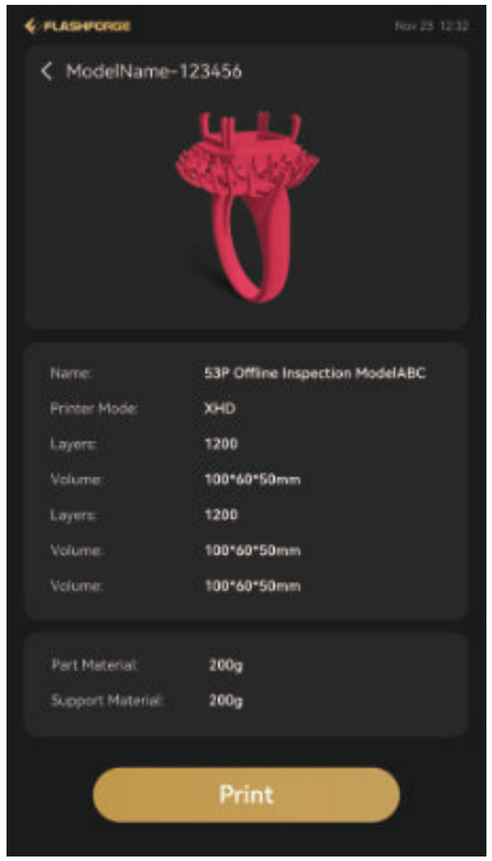
(Figure 4.3.1)

9. Insert the USBdrive, tap the back button on the upper right corner, and then you can see the icon （+）， tap the icon to add new printing tasks from the USBdrive.



(Figure 4.3.2)

10. Select the file, click "Add to Queue" to add the printing task to the queue.



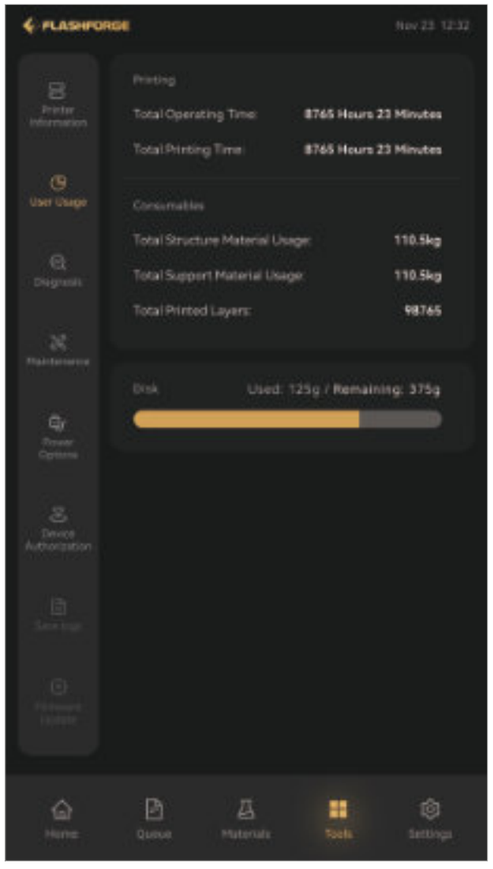
(Figure 4.3.3)

Printing file details page

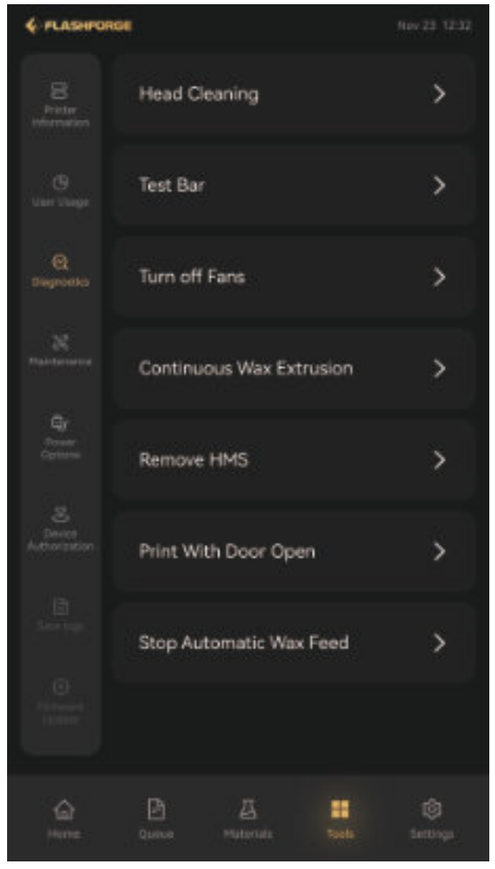
1. Tap here and enter to the tools interface

Tools interface including printer information, user usage,Diagnosis， maintenance， power option， device authorization, save logs and firmware update. Tap each option and enter the appropriate details page.
Printer information: Display information of printer and version.

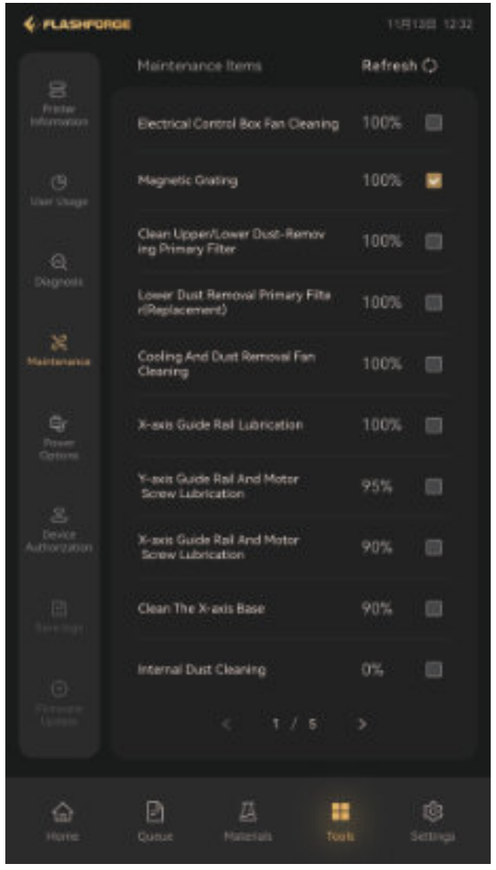
4.4 Tools interface



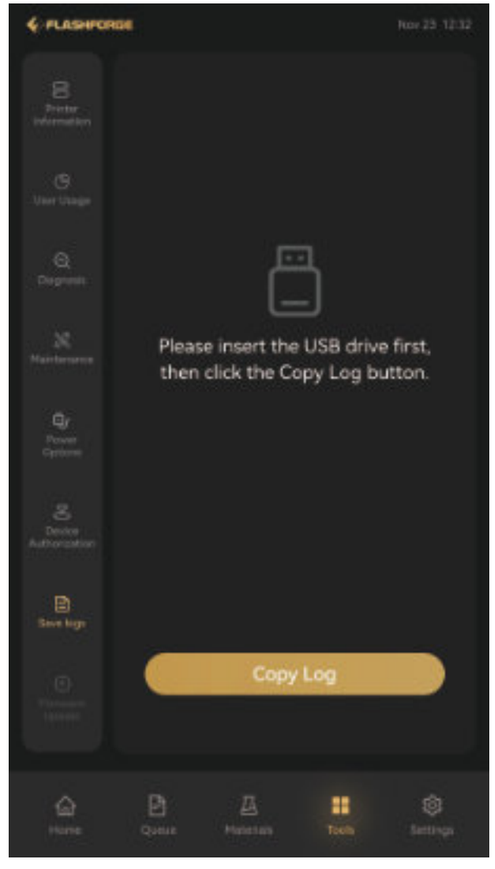
Printer usage status： display the usage info of printer.



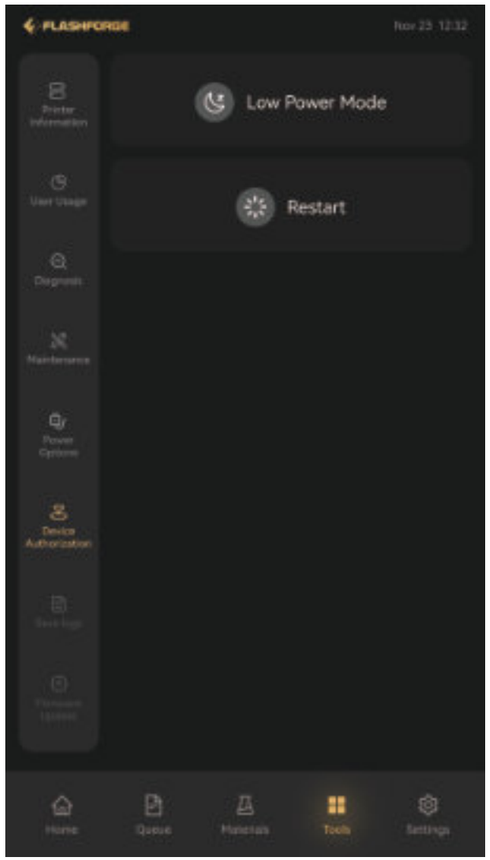
Head cleaning: This performs wax extrusion and wiping procedures for printhead maintenance.
Test bar: Print part and support test bars.
Turn off Fan： Stop the fans inside the equipment for relevant maintenance and cleaning operations.
Continuous jetting: The printer will repeatedly perform the pressing cycle to empty the secondary ink cartridge and the wax inside the nozzles.
Remove HMS:t is used to move up the printhead to facilitate the removal of the HMS,clean it, and then put it back.
Print with door open: During normal printing , if the printing chamber door is opened, the printing will stop automatically. This option allows printing when the door is open, which is used for technicians to repair and maintain the printer.
Stop automatic wax feed: Stop the automatic wax supply process from the material tanks so that the printer can be repaired and maintained by technicians.



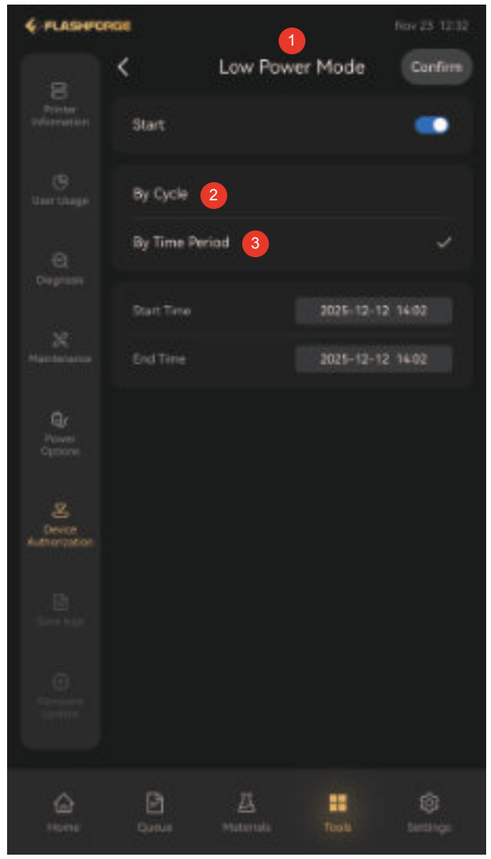
maintenance: click the <maintenance> to enter the interface. Please click the maintenance project and refresh the calculator after cleaning. Before starting any maintenance project, the printer must be in preparation status and the clean printing platform must be installed.



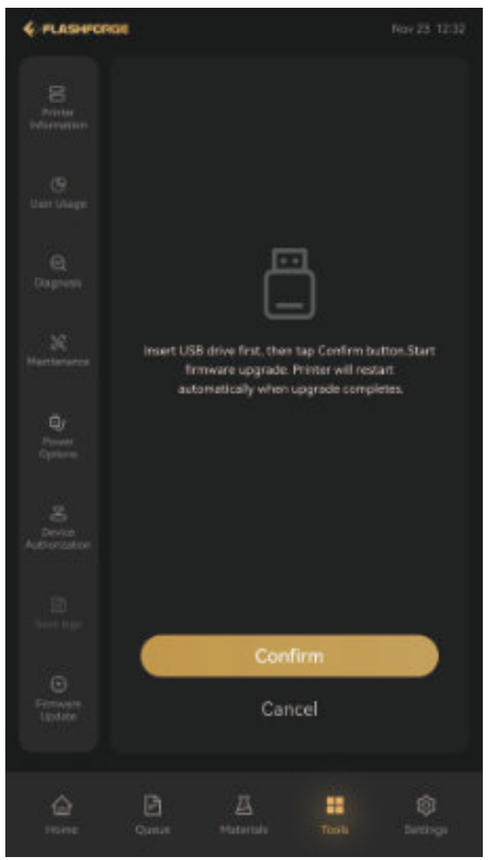
Save log： support save printer working log files.



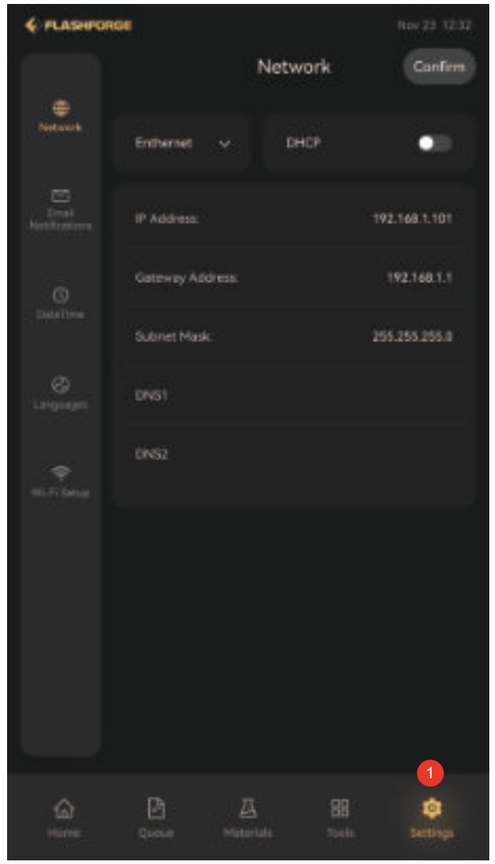
Power options： Choose“ power option” button to close 3D printer or enter sleep mode. It is suggested to close the 3D printer by UI interface.
Sleep Mode : Designed to optimize printer energy efficiency, it automatically enters standby mode when idle, significantly reducing energy consumption and extending the lifespan of material. This mode can automatically maintain a ready state until the set end time, ensuring that print tasks can be scheduled promptly.



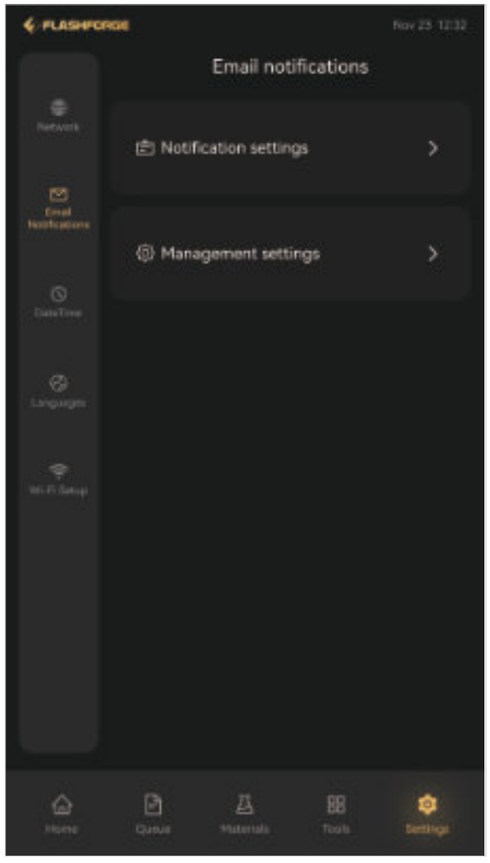
1. If sleep mode is enabled, the device will automatically enter sleep mode according to the set time when it is on standby. The start time refers to when the device enters this mode, and the end time refers to when it exits this mode and returns to standby mode.
2. The first mode follows a weekly cycle, allowing the device to enter sleep mode on selected days of the week.
3. The second mode follows a one-time cycle, allowing the device to enter sleep mode for a specified period.



USBupdate： support update firmware by USBstick.

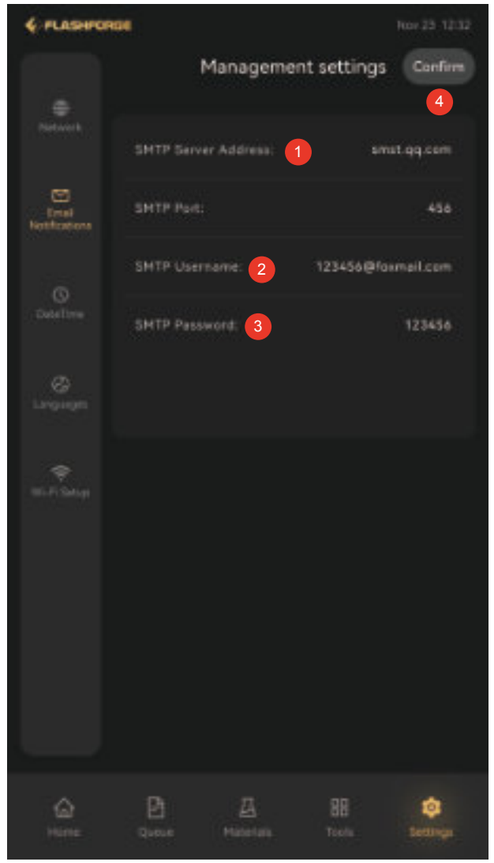


1. Click here to access the settings page.
The settings page includes Network settings, Email notification, Date and time, Language and Wi-Fi.
Network setting: set the network.
Connection Method: It offers both wired and Wi-Fi connection options.
DHCP:Turn on to automatically obtain an IP address, or turn off to manually enter the IP address and gateway.

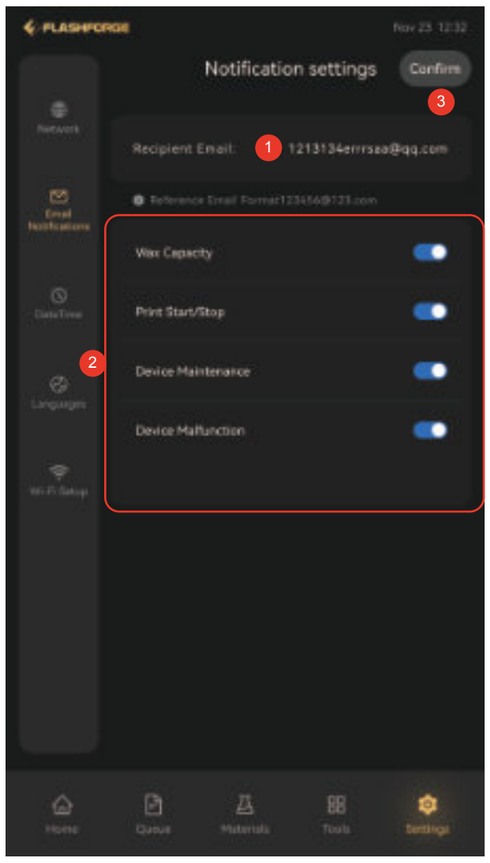


Email notification: Setup e-mail notifications to receive notifications about printer events.
Management : Add the server, port, username, and password for the email sending information.
Notification: Add the email address and message type for receiving information emails.

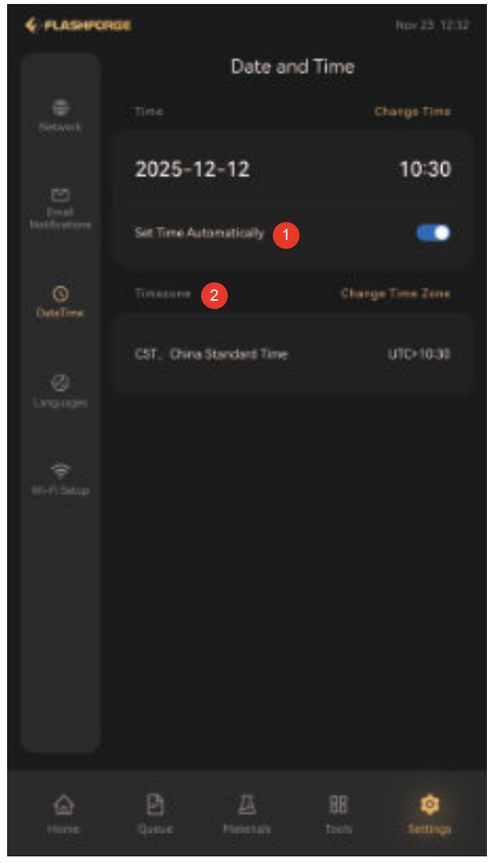
⚠ Note: Some e-mail clients may block accessto this application during e-mail setup. If you're having trouble in email setting, make sure your email provider isn't blocking access.



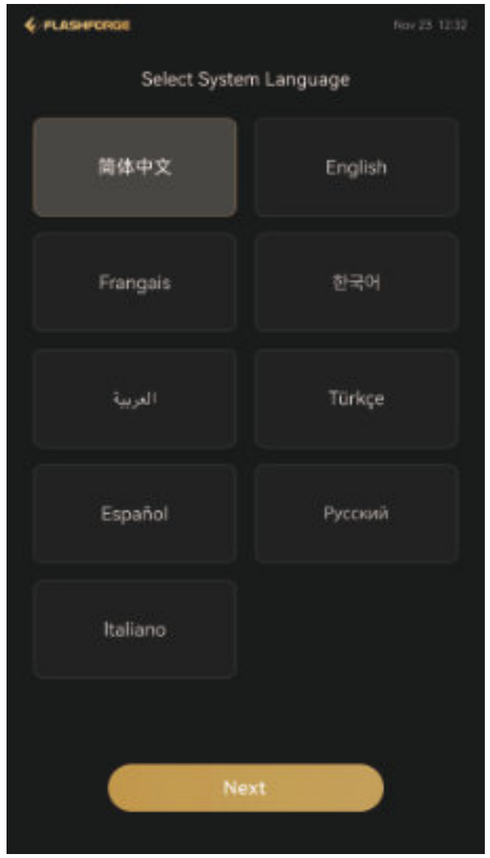
Email setting steps are as follows:
1. Enter the host address of the outgoing mail server.
2. Enter the sender's email address.
3. Enter the sender's email login password.
4. Click[confirm] to confirm the configuration.



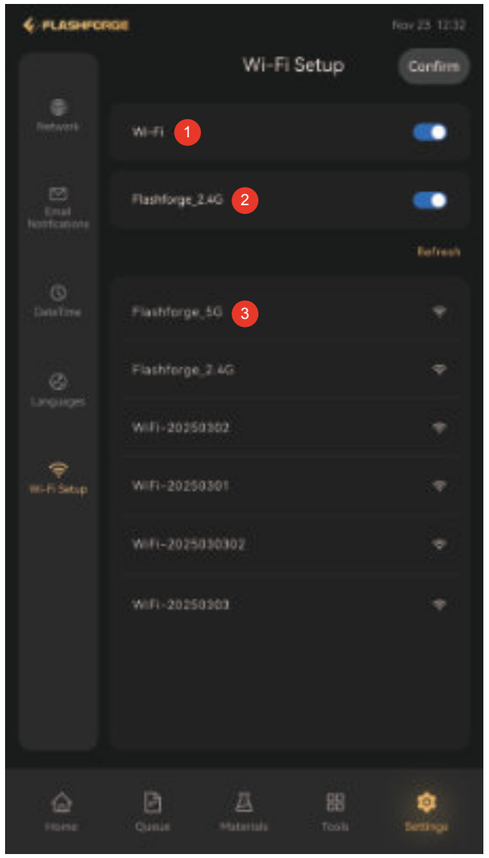
Email setting steps are as follows:
1. Enter the recipient's email addresses, separated by commas, with no limit on quantity
2.Selectthe information you want to receive.
3. Click[confirm] to confirm the configuration.



1. Configure Device Date and Time
If "Auto obtain" is selected, the device will synchronize the local date and time via the network.
If "Auto obtain" is turned off, you can manually set the device's date and time.
2. Select Time Zone
Choosethe time zone corresponding to the country/region where the device is located.



Language Selection: Choose your preferred language.
Supported languages include Simplified Chinese, English, French, Korean, Turkish, Spanish, Russian and Italian.



1. Turn on the Wi-Fi connection.
2. Display the currently connected Wi-Fi network.
3. Show available Wi-Fi networks.
Signal strength is indicated by an icon; the higher the value, the stronger the signal. It is recommended to connect to the network with the strongest signal.

⚠ Note: The device can only connect to Wi-Fi networks that have a login password set, and the Wi-Fi network password cannot be empty. Please set the Wi-Fi login password before connecting.

Chapter 5 WaxJetPrint Introduction

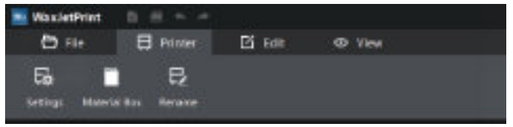
1. Software Download
There are two ways to obtain the packages of WaxJetPrint:
① Insert the USB stick from the toolkit into the computer to find the nearest updated package.
② Enter the official website of Flashforge<www.flashforge.com>. The nearest updated package can be found in the softtware center.

2. Software installation and start-up
Follow the prompts and complete the installation after download. The WaxJetPrint is ready for use after installation.

3. Initialization
Please ensure the normal connection between the printer and computer before initialization.

⚠ Note: when the printer cannot be connected to the computer, please first check the connection between the printer and the factory net and next check whether the printer and computer are in the same local area network. In terms of the network configuration, please refer to <network connection> on page16.

1. Open WaxJetPrint and click setting;



2. In setting interface, click scan and double click the targeted printer;

3. Choose the material;

4. Choose the printing mode;

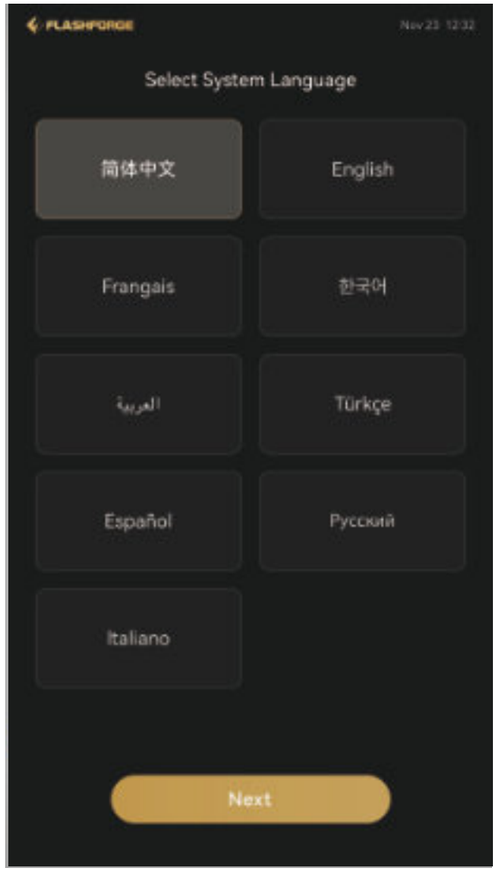
5. Choose the building mode and save the setting.

Chapter 6 Printing process

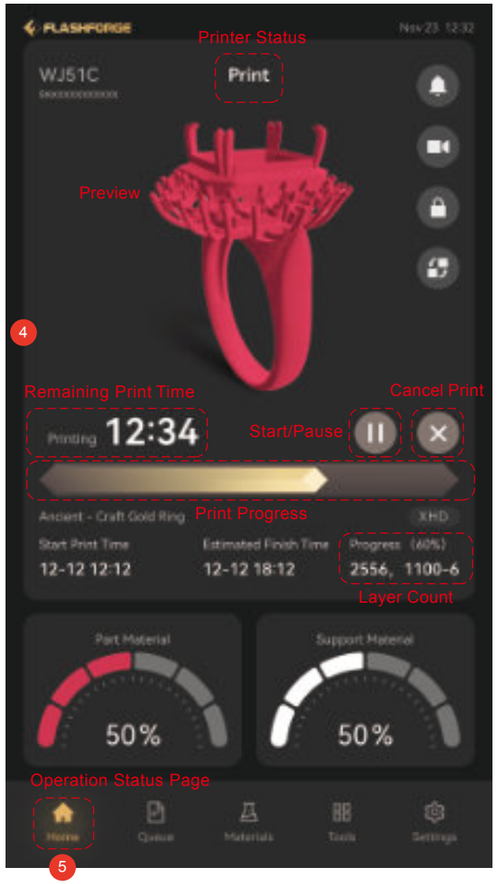
This chapter provides you with detailed guidance on how to transform a 3D model into an entity. Before printing, it is recommended that you review the process of machine start up, preheating and material installation on the chapter 3 and check the functionality and performance of the WaxJetPrint software.

1. Power on the device and check the startup screen.

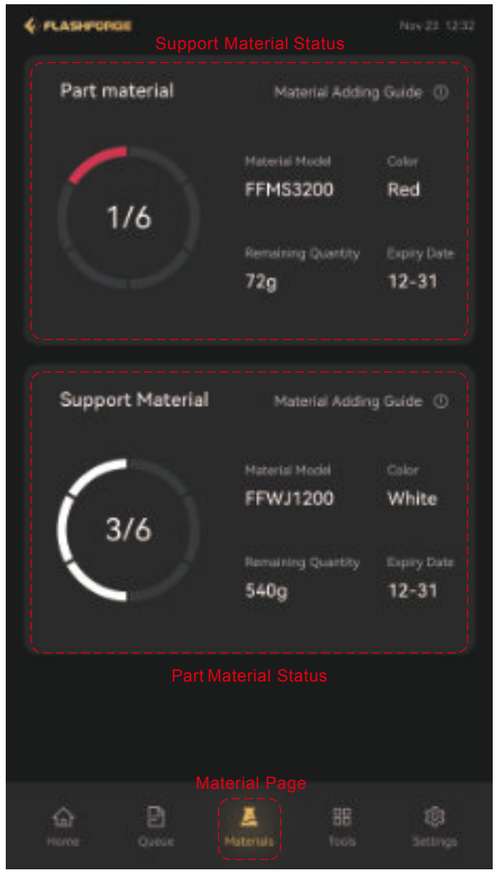
2. Confirm the Privacy Policy, User Agreement and After - sales Agreement



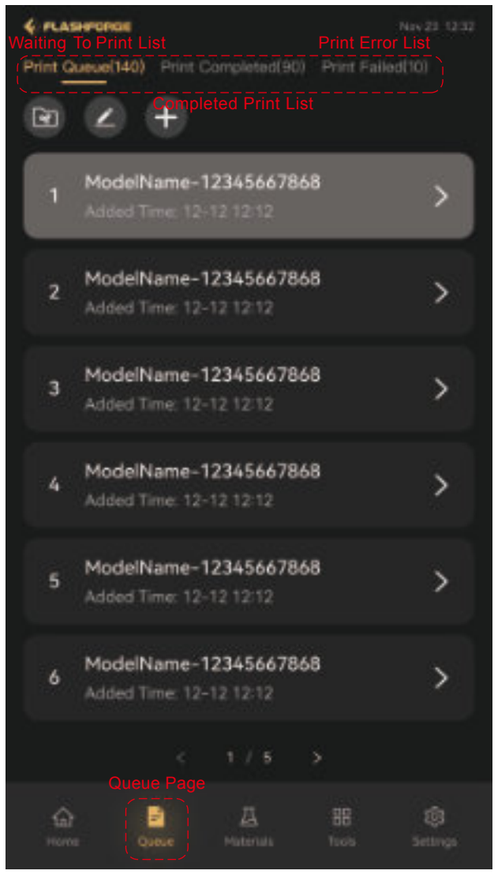
3. Set the language and go through the User Guide.



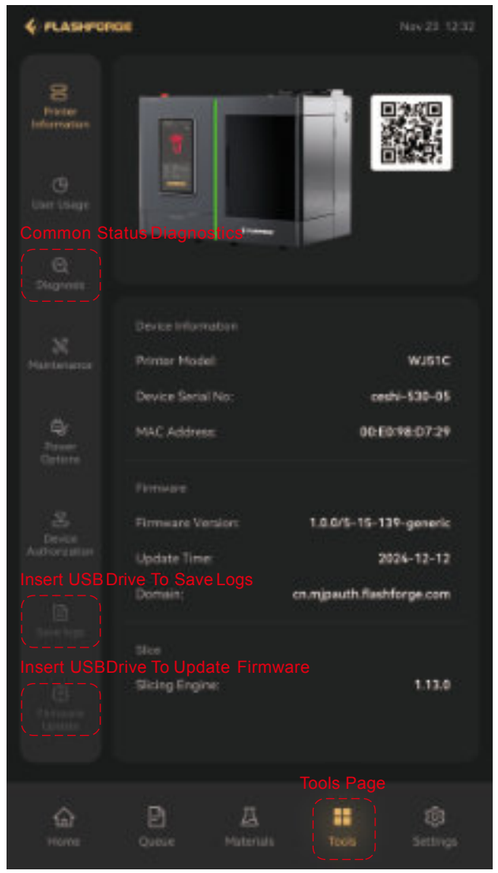
4. The device enters the preheating status.
5. Homepage guide



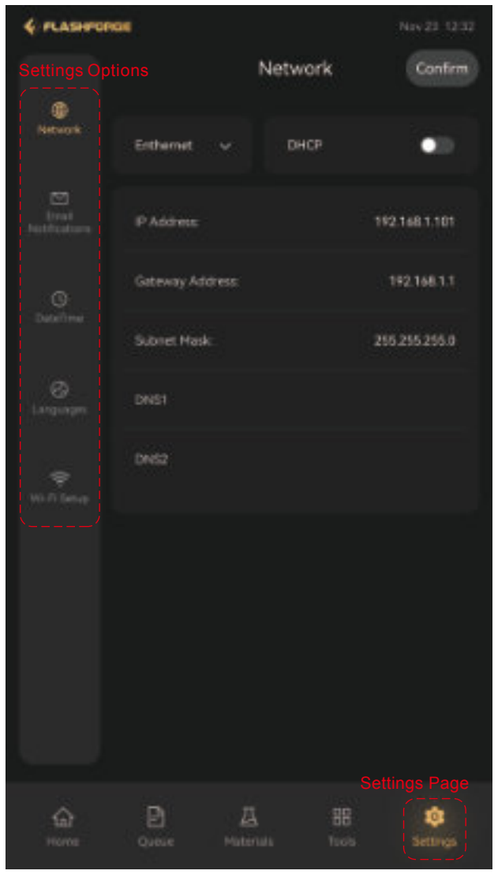
6. Materials page guide



7.Queue page guide



8. Tools page guide



9. Settings page guide

10. The printer is powered on and warming up.

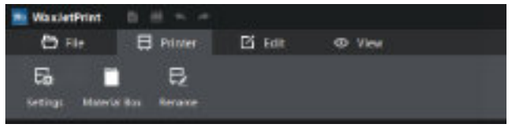
11. Swipe the card and install the materials.

12. The printer stay warm after preheat finished.

13. Turn on the WaxJetPrintsoftware via the shortcut on desktop.

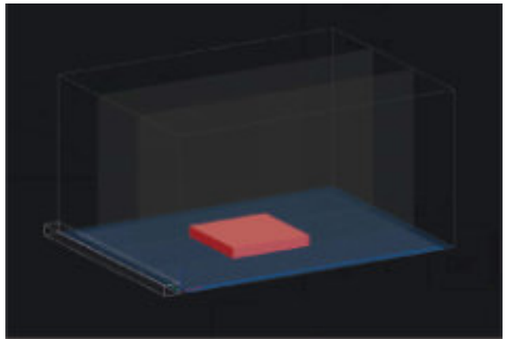
14. Connect the printer.

⚠ Note: if it is the first time to connect the printer, please see initial setting (page 38). Click setting, choose printer. Material , printing mode, printing pattern and save the settings.



15. Printed file layout.

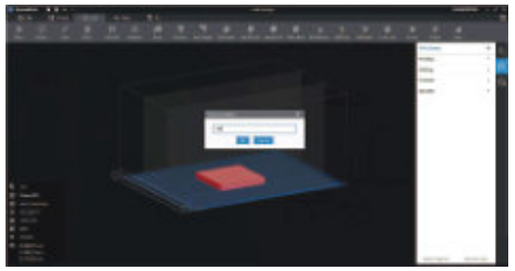
⚠ Note: during typesetting, the distance between each model shall be more than 0.5mm. If stacking prints is required, the distance between the upper and lower models shall not be less than 0.5-1 mm. Please make sure that the models are at the same level to avoid a waste of time and material.



16. Send the printing files to the printer.

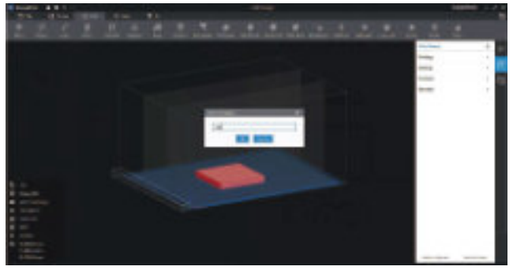
A. send the files via network.

1) Click [Add to Queue];
2) Enter the name and click [Yes];
3) The files appear in the printing task list after the files sending finished.

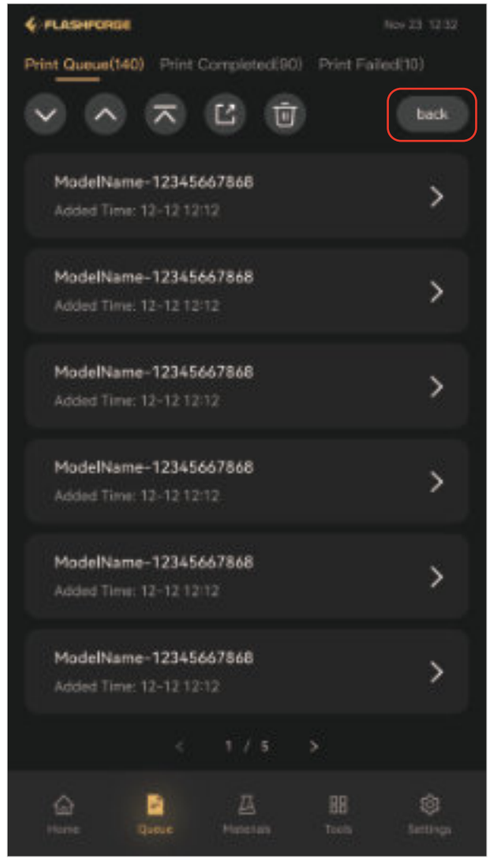


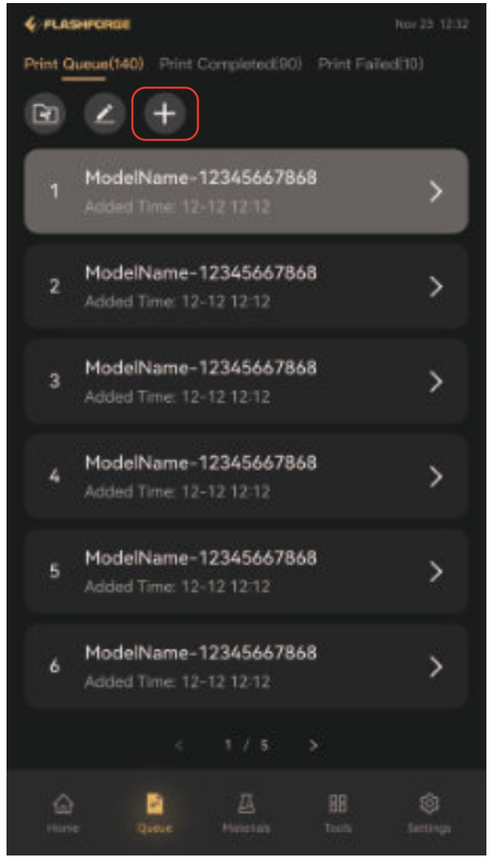
B. Copy files into the printer by USBstick.

1) Click [Saveto the local];
2) Modify the file name and choosethe saving path;

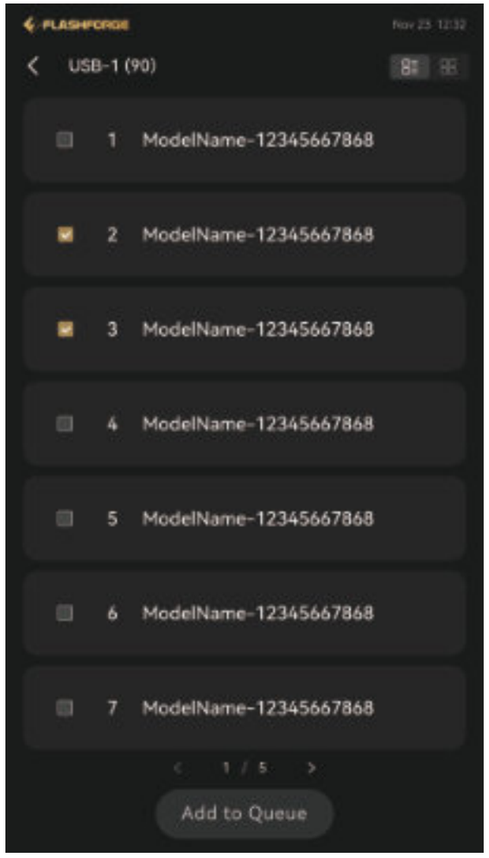


3) Save the printing file into the USBstick;
4) Insert the USBstickinto the printer first and Tap Backbutton on the top right, and tap add icon " + " on the top to enter the USBstick file list;

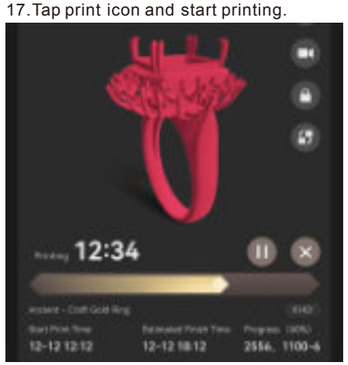




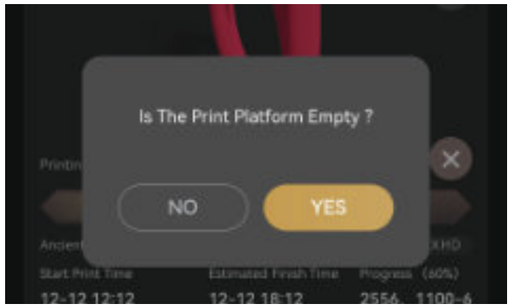
5) Choose one file and copy it into the printer by tapping the Add to Quque button.

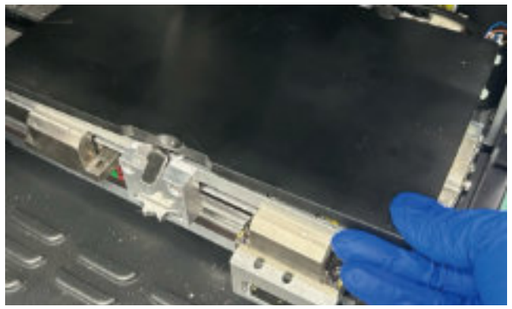


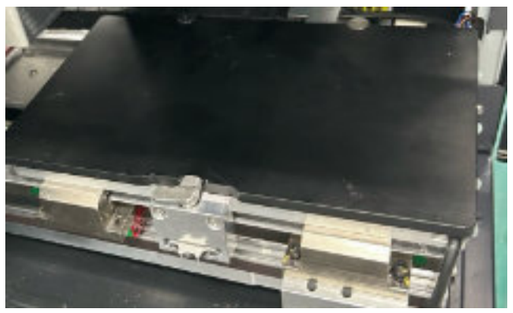
17. Tap print icon and start printing.



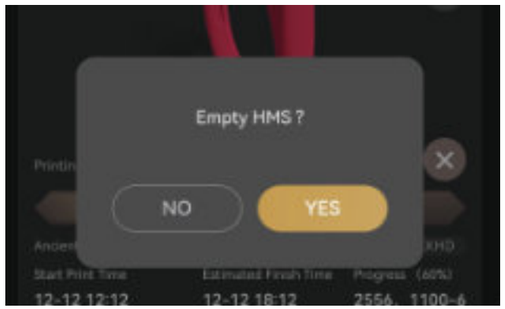
18. Install a new printing platform. After the rear positioning column comes into contact, tturn the upper clip to the left and hold the printing platform in place, then turn the lower wheel to the left several times to fix the clip tight with platform.



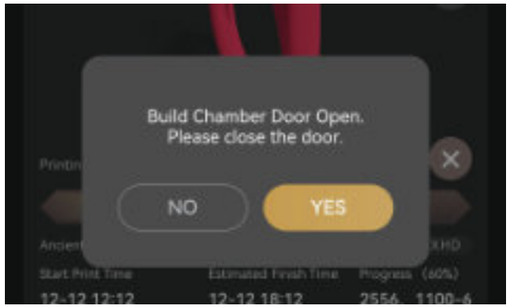




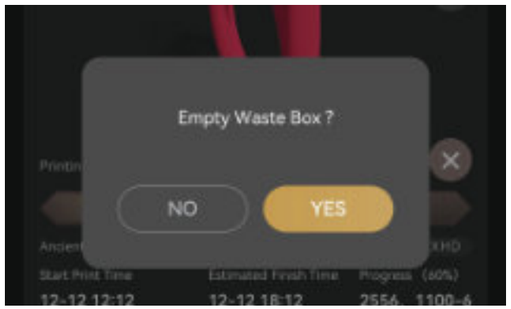
19. Clean HMS. Take it out, clean it thoroughly, and then put it back.



20. Closethe build chamber door gently by hand.



21. Clean waste. Open the waste chamber, remove and clean the wastes box, Then put it back.



Chapter 7 Post-Processing Guide

7.1 Support removal

The after-processing guide is the standard guide of removing FFMS3200support. Please prepare some The actual results may be somewhat different from the following process. Please prepare the items in the next column before the procedure. Also, make sure that the room where the execution is performed is well ventilated or that the ventilation cover is placed.

· Magnetic agitators · Solvent basin · Model basin
· Isopropanol · PPG400 · Waterless ethanol
· The protective glasses · Dust masks · rubber gloves

1. Place the build plate on the heated platform of the magnetic agitator. Remove the model one by one when the support material is softened.

⚠ Note: there are a lot of thin printed objects on the build plate, please start heating from the all around to the center and remove the model carefully.

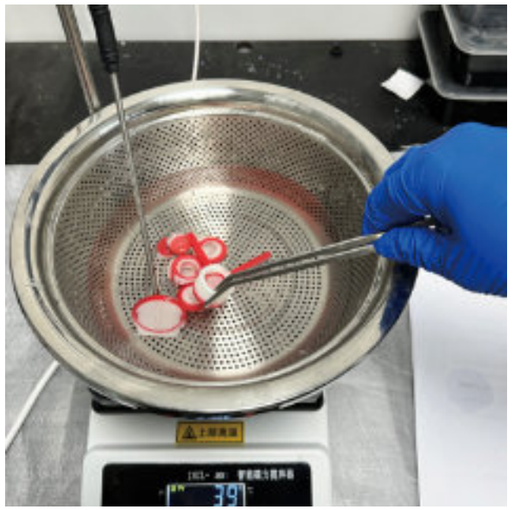
⚠ Note: please wear protective glasses, dust masks and rubber gloves before removing the support.

2. Pre-configure three dissolved solvents.
Dissolved solvent 1, which be used first and to wash 90% support wax.
(Ingredient, PPG400*1, ethanol*2, isopropanol*2, The pre-prepared solvent should be shaken well before use.)
Dissolved solvent II, used second to wash the remaining support wax in detail.
(Ingredient, PPG400*1, ethanol*2, isopropanol*2. The pre-prepared solvent should be shaken and mixed before use)
Dissolved solvent III, which be used to clean the remaining solvent.
（Ingredient, PPG400*1, ethanol*3, isopropanol*3)

3. Put the Solvent basin and other containers on the magnetic stirrer; add dissolved solvent I and turn on the heating to keep the temperature at 40 ℃; the temperature shall not exceed 43 ℃.

4. Remove the support materials
Before dissolving the support, part of the support material can be stripped with tweezers to reduce the support removal time.

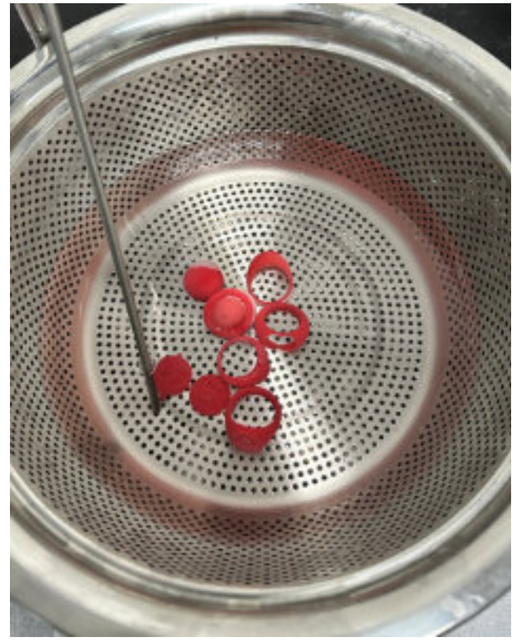
5. Put the models into the model basin; please do not put too many models for one time to avoid collision.



6. Put the model basin into the Solvent basin and adjust its height to keep a distance from the stirrer.

7. Turn on the stirring and gradually increase the rotating speed (the fast stirring speed is beneficial to the cleaning), and the speed shall not too fast to shake the models.

8. Check the degree of dissolving of the support material every 1 minute.

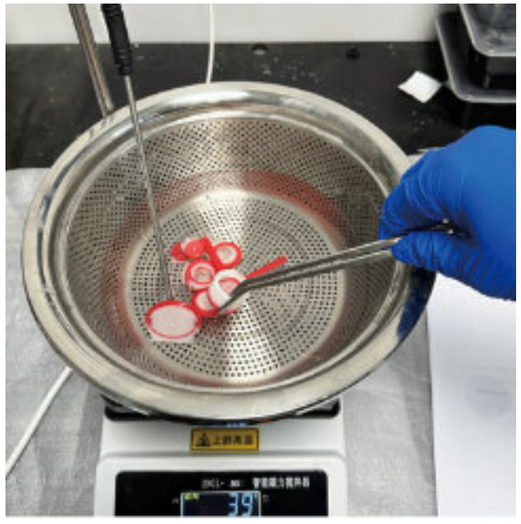


⚠ Note: The dissolving effect of solvents decreases with the increase in the number of uses, will not easily to remove the support materials. FlashForge recommends that no more than 100-120 grams of supporting material dissolved per liter of dissolved solvent.

9. Please take out the models on which the support material has been removed; do not let the models be immersed into the solvent for a long time.

10. Clean the solvent on the surface of the model via dissolved solvent II for 2-10min.

11. Remove the model from the mesh basket in dissolved solvent III for 20 seconds.



Note: The wax objects can be picked up with a thin wire, or it can be picked up with a tweezers wrapped with a hose at the front.

12. The finished models can be dry in the air on absorbent papers or things alike.

7.2 Clean up build plate

After each removal of the model, it's necessary to clean up the build plate and plug it back into the printer. Follow these steps to clean up the build plate.

Before proceeding, prepare the following items:

· Magnetic stirrer · Dust-free paper
· High temperature-resistant gloves.

1. Wear high-temperature gloves.
2. Preheat the build plate with a magnetic agitator.
3. Wipe with dustless paper after surface residue material is soften.
4. When cleaning the printing platform, make sure that both sides and surroundings of the build plate are cleaned.

Note: The build plate should remain clean before installing and using the build plate. Keep room temperature steady.

Chapter 8 Maintenance

There are some necessary maintenances for WJ51C series regularly.

Note: For routine maintenance, the printer must be on standby and a clean build plate must be installed.

Maintainance Schedule

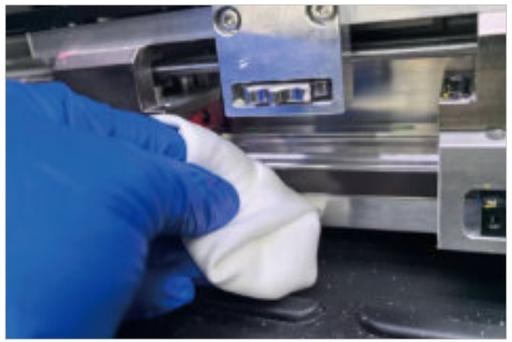
Note: Maintenance tasks must be performed regularly to ensure good operation of the equipment and the accuracy of printed objects.

Maintenance task	As needed	Every day	Every week	Every month	Every half year
Clean the X-axis grating strip Clean the upper and lower filters and air ducts			√		
Replace the upper filter			√		
Replace the lower filter				√	√
Clean the cooling fan and dust collector fan					
Clean the waste box	√			√	
Apply oil for X-axis guide					√
Apply oil for Y-axis guide and the motor screw rod					√
Apply oil for Z-axis guide and the motor screw rod					√
Clean the X-axis base		√			
Clean internal dust		√			
Clean dust around the sensors		√			
Clean the outer surface			√		
Clean build chamber		√			
Clean build plate	√			√	
Clean the touchscreen					
Clean MDM			√		
Clean the bottom side of Y-beam			√		
Clean the blade at HMS			√		
Clean the planarizer and its blade			√		

The recommended operating environment recommends operating temperature range: 18-26 degrees C(64-79 degrees F)
Recommended temperature range: 18-24 degrees C(64-75 degrees F) Recommended humidity range: 30%-70%

Clean the X-axis magnetic grating strip

Please regularly and gently wipe the X-axis magnetic grating strip with a non-woven cloth and isopropyl alcohol to keep it clean and in good working condition.



Clean the upper and lower primary filters and air ducts

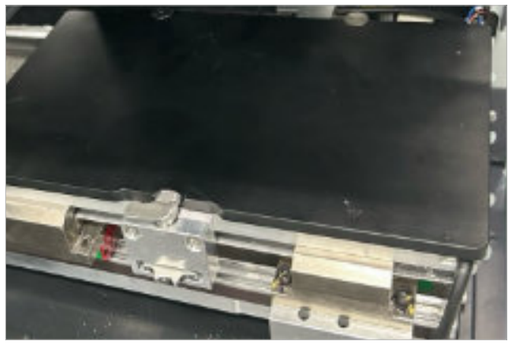
1. Clean the upper primary filter and air duct.

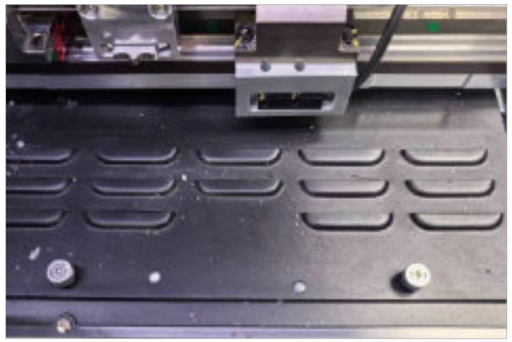
Unscrew the dust collection pipes for the HMS and planarizer separately. Then, use a vacuum cleaner to clean the pipes thoroughly.

Open the left panel of the machine, unscrew the hand screws of the upper dust box at the upper part inside the door. Open the lid and remove the filter, clean it with a vacuum cleaner and then put it back.

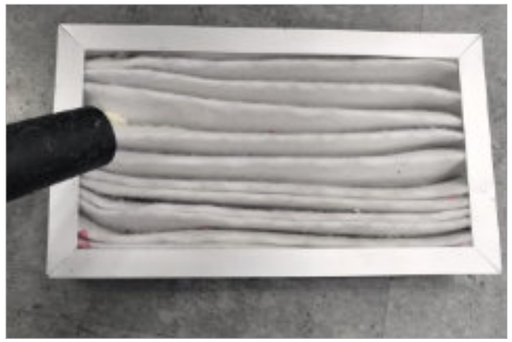
2. Clean the lower primary filter and air duct.

Open the printing chamber door, loosen the two hand screws, remove the cover of the lower dust box and take out the primary filter inside.





Remove the lower primary filter cover and pull out the filter mesh inside.
Over time, the primary filter mesh will accumulate a lot of dust. Use a vacuum cleaner to thoroughly clean it.



Replace the filter

The filter is used to remove particles, odors and gases from the building area and the planarizer. You can follow the previous steps in the cleaning filter section to locate the upper and lower filter, take them out and replace it with new ones. Finally, put the cover plate back on and tighten the screws.

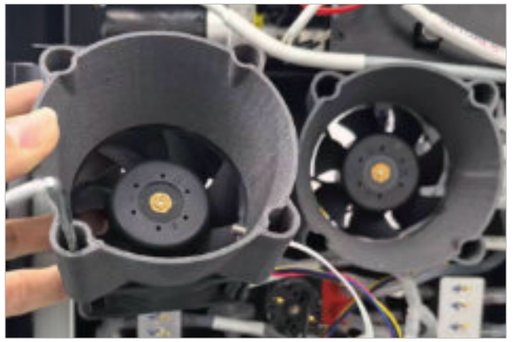
⚠ Note: This part can be replaced by the customer.
G4 Primary Filter - P/N 61000663.

Filter to be replaced

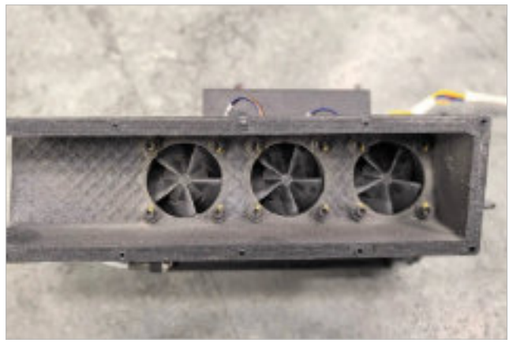
New filter

Clean the cooling fan and dust collector fan

Step 1: Open the rear cover of the machine, remove the side fans respectively, and use a brush to clean the fans and the dust around them.



Step 2: Remove the front and rear fan components. Use a brush to clean the fans and surrounding areas where dust has accumulated.

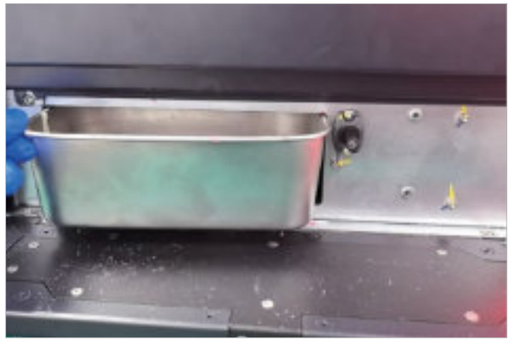


Step3: Remove the upper dust fan inside the left side panel of the equipment, and use a brush to clean the fan and surrounding areas where dust has accumulated.

Step4: Refer to the steps for removing the lower filter. The lower dust removal fan is located below the filter. Remove the dust fan and use a brush to clean the fan and turrounding areas where dust has accumulated.

Clean the waste box

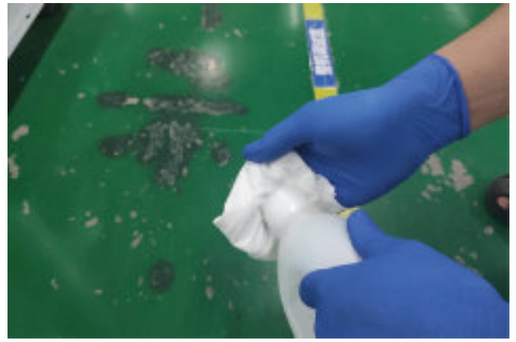
Press the lower front panel on the left of the printer to open the waste chamber, then take the waste box out.



The waste wax produced in the process of printing and stored in the waste box. Install the clean waste box back to the printer after cleaning the waste box.

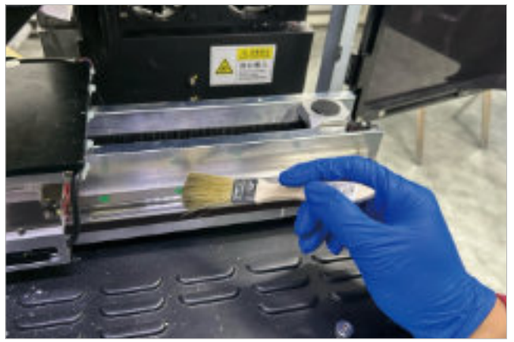
Apply oil for X-axis guide

Wear the rubber glove and wet a dust-free cloth with ethanol.



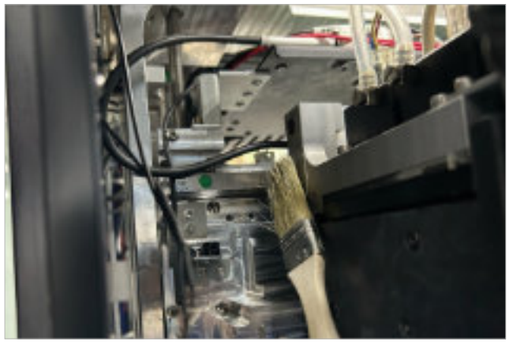
Clean the guide by dust-free cloth.

Apply oil on the X-axis guide by brush.

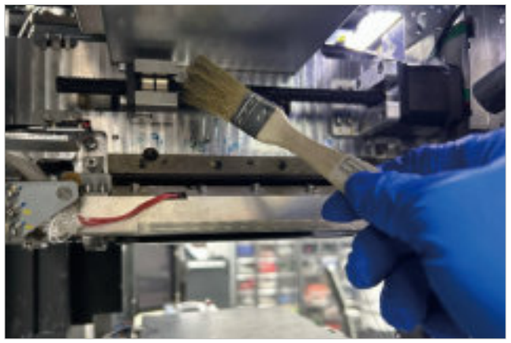


Apply oil for Y-axis guide and the motor screw rod

Apply oil on the Y-axis guide by brush.



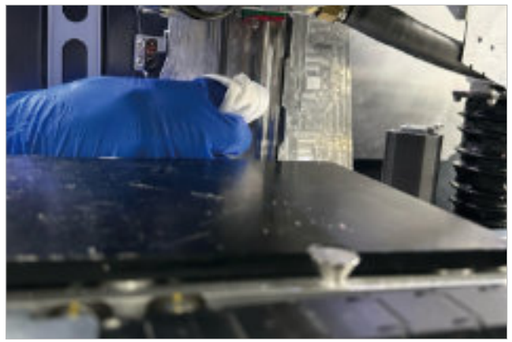
Wear the rubber glove and apply grease to the Y-axis screw rod.

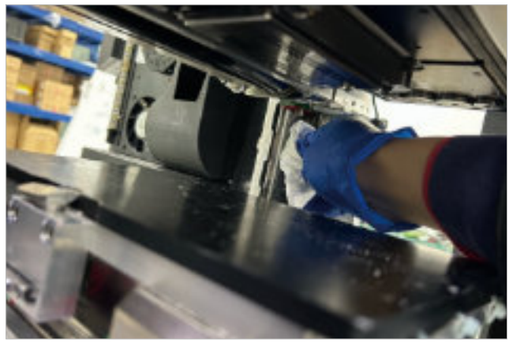


Apply oil for Z-axis guide and the motor screw rod

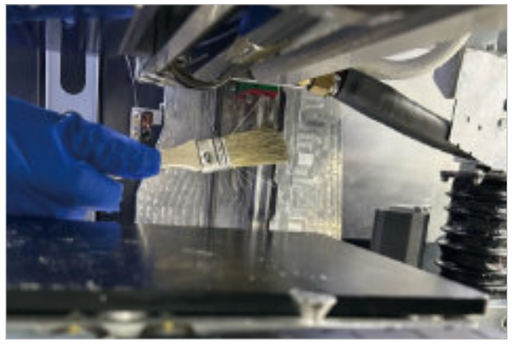
Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

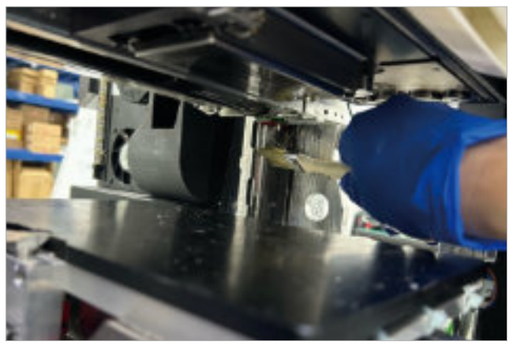
Clean the guide by dust-free cloth.





Apply oil on the Z-axis guide by brush.





Clean the X-axis base

Check that the X-axis base is clean before each printing, follow these steps to clean the X-axis base:
1. Open the right door and move the build plate to home position;
2. Use a stainless steel scraper to clean the wax drops or wax blocks on the X-axis base.

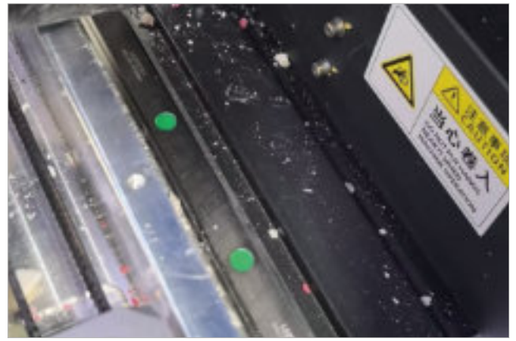
3. Close the door.

Clean internal dust

⚠ Too much dust inside the equipment or failure to clean up the internal dust for a long time can cause nozzle damage, please follow these steps to clean up the internal dust:

Use a vacuum cleaner to clean the wax dripping on the X-axis base.

Use a vacuum cleaner to clean the internal dust of the printer.



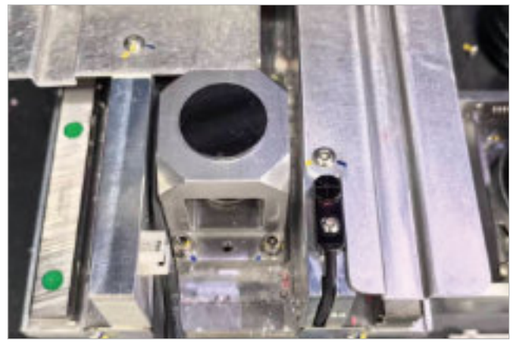
Clean dust around the sensors

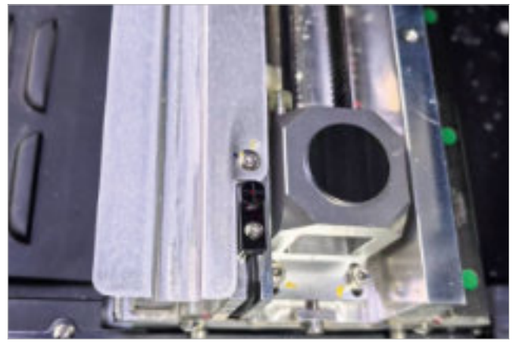
After long-term use, dust is deposited near the sensor and cleaned up. Follow the procedure below to clean.

⚠ Always wear rubber gloves when cleaning the proximity sensor.

1. Open the printing chamber.
2. Find the home sensor and the maximum position sensor.

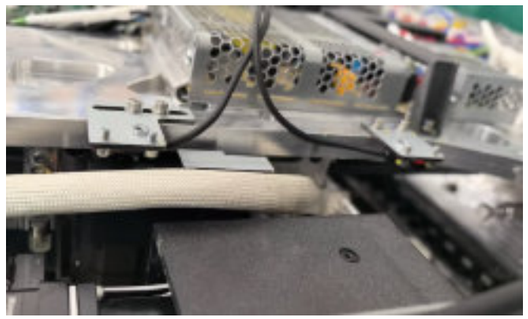
Clean front and back photoelectric switch on X-axis.





Clean photoelectric switch in the front of Y-axis.

Clean photoelectric switch in the front of Z-axis.



3. Use a cotton swab to extract isopropyl ethanol and gently wipe all dust around the sensor.

4. After removing any dust around the sensor, close the printing chamber.

Clean the outer surface

⚠ Note: The device must be on standby before cleaning to avoid disruption of printing.

Do not remove any external panels while cleaning the printer. The panel can only be removed by a qualified FlashForge technical support representative.

⚠ Note: Only use non-abrasive, non-ethanolic cleaners to clean the surface. Never use multi-purpose cleaners that contain crude oil-based polishes such as wax water.

Wipe with a dry, clean, lint-free cloth to remove dust from the outside surface of the printer. Spray the clean cloth with a multi-purpose cleaner and gently wipe away the dust and oil stains on the outside surface of the printer.

Clean build chamber

Use a dust-free cloth to extract isopropanol to clean the building door. Gently wipe off the dust from the surface using a damp cloth.

Clean build plate

⚠ Note: before installation and use, please keep the build plate clean and keep the room temperature steady.

After each finish of printing, it is suggested to clean up the build plate and reinsert it into the printer. Follow these steps to clean up the build plate:

1. Use a flat blade or greased knife to remove excess auxiliary material from the build plate surface.
2. Spray the build plate with isopropanol (IPA) and wipe it with a paper towel.
3. Make sure that both sides of the build plate are cleaned.

Clean the touchscreen

Remove all printed parts before cleaning the screen. Prevents any operation on the printer from accidentally pressing the control key.

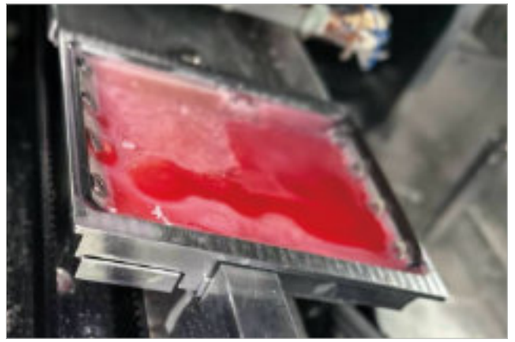
Spray water-based solvents, dust-free cloths, and never wipe or spray detergent directly onto the touch screen with a dry cloth.
Gently wipe with a clean, dust-free cloth containing amino glass cleaners to remove dust and structural material residue from the touch screen.

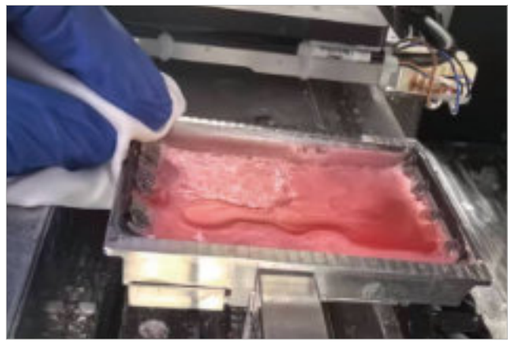
⚠ Note: The following cleaning products will cause damage to the touch screen, do not use!
· Dry cloth;
· any cleaning product containing acetone, butronone or ethanol ;
· Any abrasive cleaning product.

Clean the scraper

Wear rubber gloves and dip a dust-free cloth in a little alcohol.

Wipe the rubber scraper clean with the cloth.

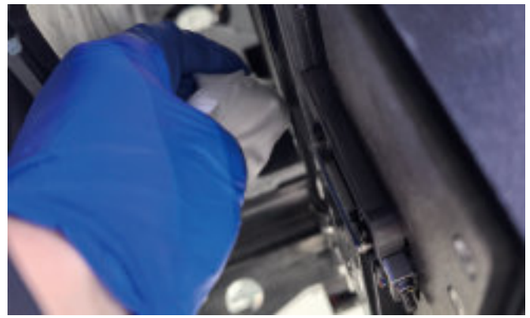




Clean the planarizer and its blade

Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

Clean the blade and planarizer with the dust-free cloth in ethanol.



Chapter 9 Troubleshooting

If the printer detects an issue that may affect printing, it is indicated in the alert information page. This chapter introduce the trouble-shooting and follow the steps to solve the main failures of ®WJ51C.
If there are some issues not covered by this guide, or if you need to order replacement parts, contact your dealer or FlashForge Account Manager.

9.1 Shrink compensation

During the phase change from liquid to solid state, the thermoset material shrink.
WaxJetPrint client software provides shrink compensation function to improve the accuracy of the model.
The following are the shrink compensation defaults for all materials ®WaxJet(as of 2020501). The default values may be adjusted at any time without a software update notification.

Printer	Material	X	Y	Z
WJ51C	FFWJ1200	100.9%	100.6%	100%

Use the CAD program to check the exact X and Y dimensions of the model.
· Most CAD programs and simple .stl file viewers will provide a way to view the model and its dimensions .
· Record the actual X and Y dimensions as XCAD and YCAD.

Print and post-process the model and measure the printed objects.
· It is recommended to measure the important dimensions of the geometry, measure in multiple areas and average it.
· Measurements can be made using a caliper or better measurement method.
· Record the X and Y dimensions of the printed model and mark it as XPART and YPART.

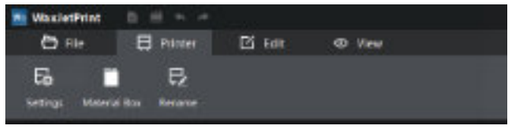
Determines the shrink scale

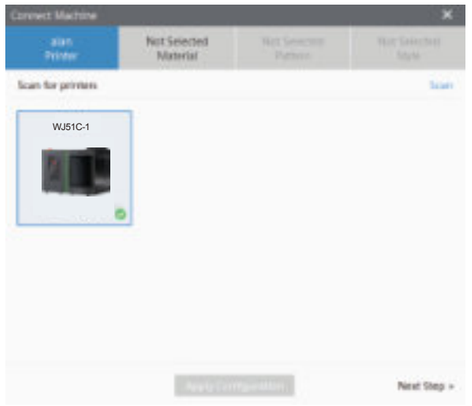
Use the following formula to calculate the scale:
X-scale factor = 100% + (XCAD- XPART)/ XPART x 100 (%)
Y-scale factor = 100% + (YCAD- YPART)/ YPART x 100 (%)

Example:
The X dimension of the CAD model = 3.000"
The Y dimension of the CAD model =5.000"
The X-size of the printed part = 2.998"
The Y-size of the printed part = 4.989"
X-scale factor = 100% + (3.000 - 2.998) / 2.998 x 100 = 100.067%
Y-scale factor = 100% + (5.000 - 4.989) / 4.989 x 100 = 100.22%

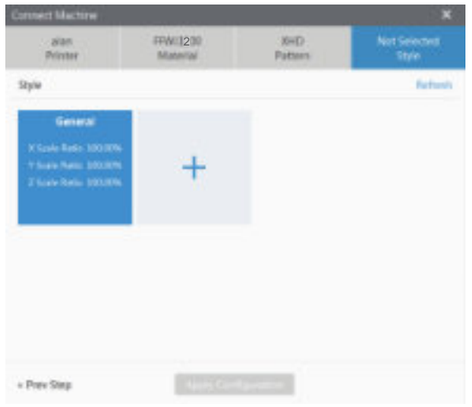
Set the shrink scale

1. Open the WaxJetPrint client software and select Print > Setting > Connect machine.

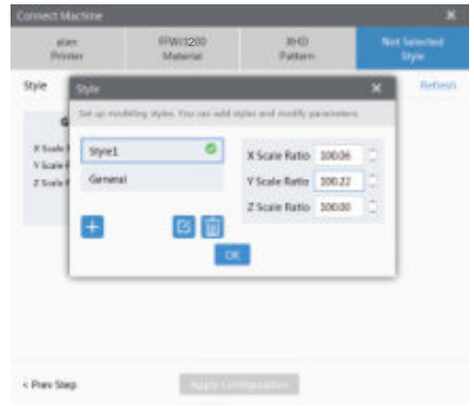




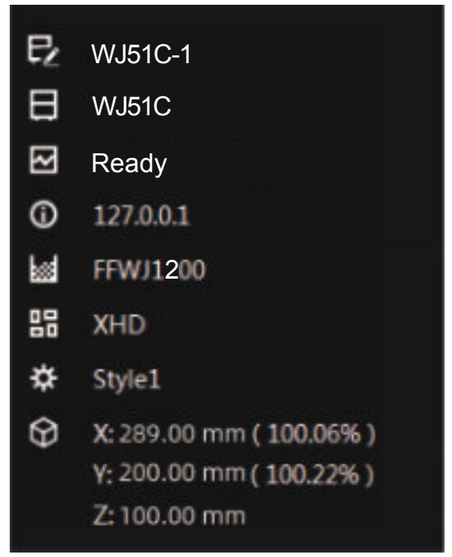
2. Choose the printing mode.



3. Click + to add a new model, enter the new XYZ, then click yes and save the setting.



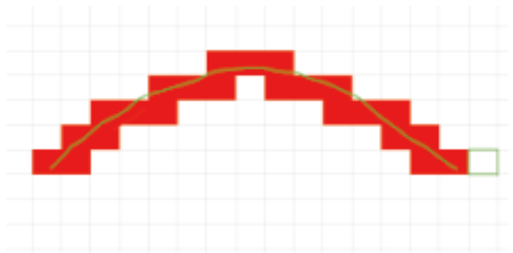
4. The printer has defaulted to a new set of shrink compensation values. The information window in the lower right corner shows the corresponding new maximum printable dimensions for the XYZ based on each shrink compensation values. You can now use these shrink compensation values when loading jobs and printing.



9.2 Layout Guide for Models

9.2.1 Model slicing principle

- Based on Cartesian Coordinate System, the XY plane images are riped according to the 1200DPI grid and Z axis is layered with 0.015mm thickness.
- After riped, each pixel has only two states, with or without data.
- During the RIP, 50% will be adopted as the standard to judge whether the pixel is valid. If the model in a single pixel occupies more than 50%, the pixel will be determined as a valid one for printing. Otherwise it will be judged as invalid and will not be printed.
- As shown in the following figure: the green line is the edge of the 3D model, and the red grid is the valid data after RIP.



- It can be seen that the data presents jagged fluctuations after RIP, which is inevitable. The larger the radian is, the more obvious the jagged fluctuations are. This is the point where attention should be paid to when placing or designing models.

9.2.2 Layout Rules

1. Basic Layout Rules

- WJ51C, the printing time depends on the height of model and the number of occupied lane;
  please reduce the height as much as possible to reduce the printing time.
- Try to place the models in one lane to avoid the doubled printing time in multi-lanes.
- Increase the distance between models spacing if space allows.
- A larger spacing is required for larger models than for smaller models.
- The printing effect of model surface is sorted in decrease turn: XY > XZ > XY. Please adjust the model surfaces in this order if necessary.
- The printing effect of non-support surface is superior to that of surface with support.

2. Layout for models in large curved surface

A certain angle from 10° to 25° shall be formed between the large curved surface of models and the flat surface of Coordinate System so as to aviod the jagged fluctuations after RIP.

3. Layout for models in large flat surface

For heat dissipation and other reasons, a lurch of 10 to 15 degrees between the flat surface and x-axis or y-axis can be created to improve the end results.

4. Stacking

Though possible, please avoid cascade printing as far as possible. If cascade printing is to be adopted, please ensure the number of layers is less than four. Besides, the printing result of lower layers will be worse than that of the top layer.

5. Cross-lane Layout

Avoid cross-lane layout as far as possible. If it's a must, please choose those models with low accuracy requirements.

Chapter 10 After-sales Service Policy

Flashforge After-Sales Service Agreement

Thank you for choosing FLASHFORGE's WaxJet series 3D printers. We are delighted to provide you with high-quality products and professional services. To ensure your satisfaction, we are committed to offering you the best after-sales service!

The warranty service for your WaxJet series 3D printer (hereinafter referred to as the "Equipment") is provided by Zhejiang Flashforge 3D Technology Co., Ltd. (hereinafter referred to as Flashforge) or its authorized dealers. This after-sales service card is applicable to 3D printers shipped after July 1, 2024.

If your Equipment was purchased directly from Flashforge, we will provide you with warranty service directly. If your Equipment was purchased from an authorized dealer of Flashforge, then that authorized dealer will provide warranty service for your 3D printer. Please note: In some cases, your warranty service may be transferred from Flashforge to an authorized dealer. You can check the authorized dealers in your region on the FLASHFORGE official website at https://enterprise.flashforge.com/en, or email us at waxjetsupport@flashforge.com for more information.

I. Warranty Terms and Conditions

1. We provide all end users with a 365-day warranty service from the date of equipment installation. Warranty service refers to providing free repair parts for equipment within the warranty period, excluding labor costs such as on-site service.

2. To purchase an extended warranty, you can do so at the following times:
   • Purchase an extended warranty at the same time you purchase the equipment;
   • Purchase an extended warranty before the original warranty period of the equipment expires.

3. The extended warranty period will start from the expiration date of the original warranty period of the equipment. Extended warranties cannot be purchased for products that are out of warranty. Extended warranty service refers to providing free repair parts for equipment within the extended warranty period, excluding labor costs such as on-site service.

4. This after-sales service card applies only to the main components and casing components of this equipment. All software, easily damaged parts, and printing materials are not covered by the warranty.

5. Repair parts installed for you may be refurbished. Flashforge will ensure that the parts function properly. Any repair parts are covered under warranty only for the remaining time of the original warranty period or extended warranty period of this equipment.

II. Non-Warranty Situations

1. The warranty service provided for this equipment does not cover software, easily damaged parts, and the following accessories:
   • HMS blade
   • Planarizer blade
   • Air tube
   • Build plate
   • USB stick
   • Printing materials
   • Nitrile gloves
   • Scraper
   • Dust-free cloth
   • Stabilized power supply
   • Magnetic stirrer
   • Stir bar
   • Constant temperature heating plate
   • Stainless steel basin
   • Stainless steel cover
   • Stainless steel ladle
   • Tray
   • Measuring cup
   • Stainless steel tweezers
   • Oxygen pump
   • Water bath tank
   • Plastic bag
   • Allen wrench
   • Filter
   • Filter mesh
   • Filter cotton
   • Fuse
   • Open-end wrench
   • Glass slide
   • Microscope
   • Spirit level
   • Tool kit and tools inside the kit

2. The warranty service does not cover the following

situations:
• The equipment serial number does not match the one on the after-sales service card;
• The warranty period of the entire equipment and parts has expired;
• Defects or disqualifications caused by external events;
• Use of non-Flashforge 3D printer accessories and printing materials;
• Modification, repair, or assembly of the equipment by any party other than Flashforge or its authorized dealers;
• Failure to use and maintain the equipment according to the after-sales training content and the user guide;
• Equipment malfunction or damage caused by incorrect installation or use;
• Equipment malfunction or damage caused by use in non-specified working environments;
• Equipment malfunction or damage caused by misuse or abuse;
• Equipment malfunction or damage caused by improper maintenance;
• Normal wear and tear, aging, or surface scratches or defects caused by equipment operation.

III.Special Notice
To ensure the normal and safe use of this equipment, please do not use NON-FLASHFORGE printing materials and accessories. Once non-Flashforge printing materials are used, a warning message will appear on the equipment's operation screen. The equipment will pause printing in the event of an alert and temporarily enter an out-of-warranty state. If a fault occurs during the out-of-warranty period, you will not be able to receive official repair services.

Please contact Flashforge as soon as possible according to the prompts on the operation screen. Flashforge or its authorized dealers will guide you in providing relevant information and handling the non-Flashforge printing materials as required. If you fail to contact Flashforge within 30 days, your equipment will be permanently out of warranty.

IV.Complaints and Suggestions
After-sales service engineers from Flashforge or its authorized dealers will provide you with on-site after-sales service to address any technical issues that may arise. If you have any questions about product use or service, please feel free to contact the Flashforge official customer support team at waxjetsupport@flashforge.com. For specific issues and suggestions, please contact mtk2@flashforge.com. We will promptly respond to your needs and provide you with a satisfactory solution!

Once again, thank you for your support and trust. We wish you a pleasant life and a satisfying experience with our products!

Chapter 11 Help and support

Note: It is suggested to contact the dealer first when you need help.

If the certified partner cannot provide assistance, you can call the Flashforge customer support hotline. Before calling customer support for questions, please get the following information in advance:
· WJ51C printer serial number:
The printer serial number is printed on the label on the back of the printer. You can also check the serial number in the user interface, tap the interface Tools> Printer Information.

· A brief description of the problem, including accurate error message content.
· The time of the problem occurred. For example, when starting or ending printing and submitting a job, or when restoring the state before shutdown, etc.

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After-Sales Service: support@romanoff.com